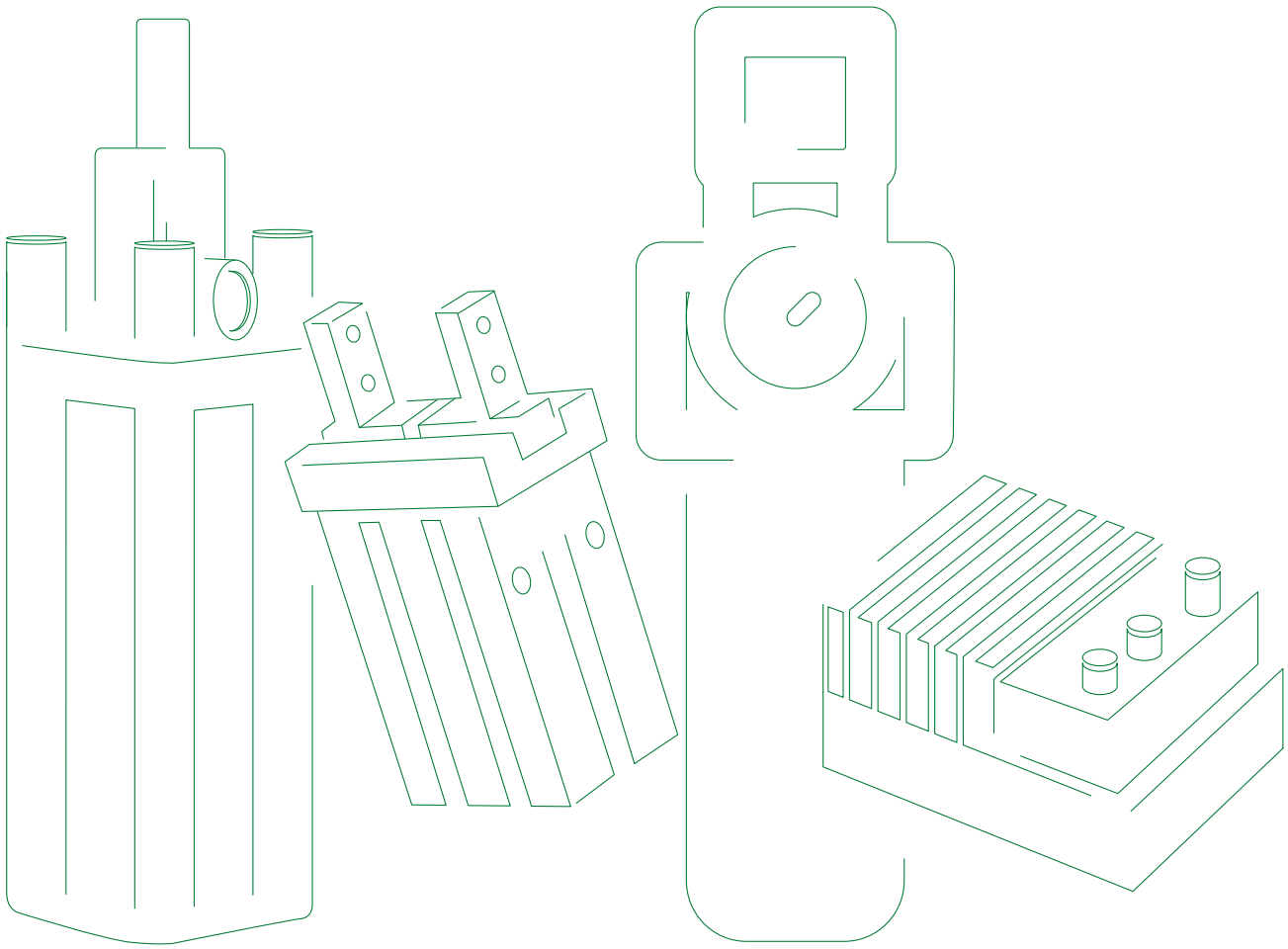
PNEUMAX



# GENERAL CATALOGUE 2025

SOLUTIONS FOR PNEUMATIC AUTOMATION

# General catalogue

## Solutions for pneumatic automation

This catalogue includes the products range manufactured by Pneumax Industrial Automation Business Unit: air service units and pneumatic components for air distribution and motion control.

**Visit pneumaxspa.com**

Find out the documentation that complete the Industrial Automation offer

**VACUUM TECHNOLOGY**



**PNEUMATIC FITTINGS**



**ELECTRIC ACTUATION**



Discover more on catalogues which include the product range offered by the other Pneumax Business Units: **AUTOMOTIVE** and **PROCESS AUTOMATION**

# General index

## Solutions for pneumatic automation

Introduction

**About Pneumax** 12

Section 01
**Air distribution**

### Valves and solenoid valves



**Spool type valves and solenoid valves**
Single and manifold versions, mechanical and manual or pneumatic command

| | | | | | |
|---|---|---|---|---|---|
| Series 104 | 1.1 | Series 800 | 1.68 | Series 2100 Line-Flat-Base | 1.124 |
| Series 105 | 1.12 | Series 888 | 1.77 | Series 2400 Line-Flat-VDMA | 1.139 |
| Series 200 | 1.21 | Series 400 | 1.91 | Series 2600 Line-Flat-VDMA | 1.160 |
| Series T200 | 1.54 | Series T400 | 1.110 | | |



**Direct operated solenoid valves**
Pilot valves, high flow rate performance 2/2 ways and 3/2 ways, version miniaturised available as well

| | | | | | |
|---|---|---|---|---|---|
| Series 300 | 1.175 | Series CNOMO | 1.197 | UL solenoid coils | 1.202 |
| Solenoid coils | 1.189 | Series S | 1.200 | | |
| Series M (mechanical) | 1.193 | 300-UL solenoid coils | 1.202 | | |



**Poppet valves and solenoid valves**
3/2 and 2/2 valves and solenoid valves for compressed air and vacuum, with aluminium and technopolymer body

| | |
|---|---|
| Series 700 | 1.204 |
| Series PG | 1.207 |
| Series T772-773 | 1.224 |
| Series T771 | 1.239 |



**“Namur” valves and solenoid valves**
NAMUR valves and solenoid valves with technopolymer or aluminium body, also available in versions classified for use in potentially explosive environments (Directive 2014/34/EU)

| | | | |
|---|---|---|---|
| Series 514/N | 1.247 | Series 514 High Performance | 1.254 |
| Series T514 | 1.249 | Series 515 High Performance | 1.260 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice



## ISO 5599/1 valves and solenoid valves

Valves and solenoid valves according to standard ISO 5599/1 available in 3 sizes with M12 5/2, 5/3 connectors, aluminium and technopolymer body


| | |
|---|---|
| Series 1000 - Size 1, 2 and 3 | 1.264 |
| Series 1000-M12 - Size 1, 2 and 3 | 1.281 |


# Accessories



## Pneumatic circuit accessories

Flow control valves, quick exhaust valves, selectors, silencers, unidirectional valves, manifolds, blocking valves, economizers, gang mounting manifolds, spry valves


| | |
|---|---|
| Series 600 - M5 - G1” | 1.288 |




## Complementary valves

Pressure switches, impulse generators, timers, two hands safety valve, oscillator valve, signal amplifier, progressive start up valve, high-low pressure device

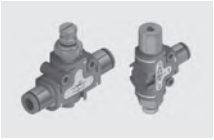

| | |
|---|---|
| Series 900 | 1.302 |




## Blocking valves

Unidirectional and bidirectional blocking valves, aluminium and technopolymer versions, with G1/8”- G1/4”- G3/8”- G1/2” connections


| | |
|---|---|
| Series 50-T50 | 1.310 |

## Function fittings

Miniaturised logic function with technopolymer body:
RFU, RP, VB, VSR, VS-or, VS-and, IP, AP, RP+IP, VB+RFU, VB+VSR


| | |
|---|---|
| Series 55 Tecno-FUN | 1.315 |




## Miniaturised pressure regulators

Brass versions rod G1/8” and with technopolymer body and integrated gauge version


| | |
|---|---|
| Series 1750 - 1760 | 1.330 |




## Compact fittings for lubrication

Nichel plated brass compact fittings, with straight male adaptor


| | |
|---|---|
| Series Mini-RAP | 1.332 |

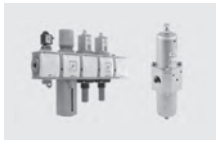

# Valves and solenoid valve manifolds



Wide range of multipolar and serial system, available with main fieldbus protocols


| | | | | | |
|---|---|---|---|---|---|
| Series PX | 1.334 | Series 2200 Optyma-Sc | 1.429 | Series 2700 EVO | 1.465 |
| Series 3000 EVO | 1.355 | Series 2500 Optyma-F EVO | 1.438 | EVO Electronics | 1.486 |
| Series 2200 Optyma-S EVO | 1.408 | Series 2500 Optyma-T EVO | 1.451 | Series 2300 Enova® | 1.504 |

Section 02
# Air treatment



## Air service units
Wide range of components for compressed air treatment, available in aluminium, technopolymer and steel, in several sizes with connections from 1/8" to 1" and flow rates up to 8000 Nl/min.


Air quality **2**.1
Series AIRPLUS **2**.2
Series 1700 **2**.85
Series 1700 Steel line **2**.159




## Proportional technology
The proportional pressure regulators range includes 3 product series: 1700 standard, 1700 miniaturised and WPR (Wide Pressure Regulators).


Series 1700 standard **2**.176
Series 1700 miniaturised **2**.192
Series WPR **2**.208




## Measuring devices
Digital pressure switches and pressure gauges, panel mounting or manifold versions.


Pressure switches Series DS **2**.215
Pressure gauges Series DS **2**.217




## Pressure booster
3 sizes aluminium pressure boosters available or technopolymer with 1:2 compression ratio.


Series 1700 **2**.219
Series P+ **2**.224


Section 03
# Pneumatic actuation

## Cylinders with piston rod according to standard



## ISO 6432 Microbore cylinders
Versions available: with threaded end covers, rolled end covers, aluminium, stainless steel and technopolymer versions


Series 1200 Threaded end covers cylinders **3**.1
Series 1200 Tecno-MIR **3**.4
Series 1200 Rolled end covers MIR **3**.10
Series 1200 Rolled end covers MIR-INOX **3**.13
Series 1200, Steel line **3**.18



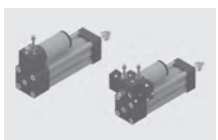

## CNOMO-CETOP-ISO cylinders
Cylinders manufactured according to standards CNOMO, CETOP and ISO: standard versions, through rod versions, tandem push with common rod, tandem push with independent rods or opposed tandem with common rod


Series 1303-1308 **3**.30




## Cylinders according to standard ISO 15552
Cylinders according to ISO 15552 with bores from Ø32 to Ø200 mm and strokes up to 1250 mm. Available versions: ECOPLUS with aluminium or technopolymer end plates, ECOLIGHT optmized in weight and dimensions, Steel line completely in stainless steel, round tube versions tie rod (Ø250-Ø320 mm)


Series 1319-1320-1321 **3**.41
Series 1348-1349-1350 Non rotating cylinders **3**.44
Series Ecoplus - HP **3**.47
Series Ecolight 1390-1391-1392 **3**.51
Series Ecolight with protective bellows **3**.58
Series 1315 Round tube cylinders **3**.73
Series Steel line - AISI 316 **3**.77

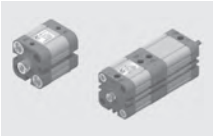



## Hydro-pneumatic speed control cylinders according to standard ISO 15552
ISO 15552 Hydro-pneumatic speed control cylinders with internal hydraulic circuit for movement control


Series 1450 - 1463 -Ø50 - Ø63 **3**.86



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice



## Compact cylinders according to standard ISO 21287

Compact cylinders according to standard ISO with integrated slots suitable for sensors mounting without adaptors. Bores from Ø20 to Ø100 mm. Versions with end stroke adjustable pneumatic cushioning are also available according to ISO 21287

Series 1500 Ecompact **3**.92

## Cylinders with piston rod not according to standard



### Threaded body microbore cylinders

Special performance microbore cylinders with hexagonal or round body and either completely threaded or threaded with a plain rod ending

Series 1200 **3**.108
Special performance microbore cylinders



### Profile tube cylinders, non rotating

Non rotating cylinders twin rod version, available with bores from Ø32 to Ø100 and strokes up to 500 mm

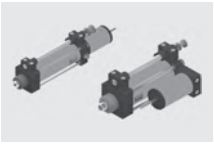
Series 1325-1326-1345-1347 **3**.110
Twin rod cylinders



### Flat profile cylinders

ECOFLAT cylinders available with sizes from Ø25 to Ø63 mm and strokes up to 300 mm. Profiled tube has two “T” slots to host sensors 1580._, MRS._, MHS._. without adaptors. Two additional connections are also available on rear cover for cylinder feeding

Series ECOFLAT **3**.115



### Hydraulic speed control cylinders

Hydraulic speed control cylinders with outward, inward and outward/inward control, with lateral or in-line tank. Available with SKIP valve (accelerating device) and blocking valve (STOP)

Series 1400 - Ø40 - Ø63 **3**.121



### Compact cylinders

Short stroke and compact cylinders with bores from Ø20 to Ø100 mm, available in single and double acting versions, tandem and through rod with magnetic piston versions. The Europe version is compliant with the ISO or UNITOP standard (depending on bores), while the Ecompact-S versions have connections and rods according to the ISO 15552 standard

Series 1500 - Short stroke cylinders **3**.132
Series 1500 Europe **3**.139
Series Ecompact-S **3**.147



### Multimount cylinders

Multimount cylinders available with bores from Ø10 to Ø25 mm, with strokes up to 50 mm and with magnetic piston versions

Series 6500 **3**.152



### Guided compact cylinders

These cylinders are available in sizes Ø12 to Ø80 mm, and comprise a single compact cylinder with integral guide rods, the rod guide is available in two styles: self-lubricating bronze bushes and bearing bushes

Series 6100-6101-6110 **3**.154



### Slide cylinders

Slide cylinders manufactured with bores from Ø8 to Ø25 mm, with strokes up to 150 mm. Available with simple and double regulation end stroke and also with front and rear shock absorber

Series 6600 **3**.168

Section 03
Pneumatic actuation / **Cylinders with piston rod not according to standard (following)**



## Slide units

Twin-rod linear guide units with bores from Ø10 to Ø32 mm, and with control unit with bronze bush versions, with control unit with bearing bush versions. Are also available the through twin-rod slide units and the compact slide units

Series 6200 **3**.179
Twin-rod slide units

Series 6210 **3**.183
Through twin-rod slide units

Series 6700 **3**.188
Guide cylinders

## Rodless cylinders



### Rodless cylinders - Standard

Rodless cylinders with bore from Ø16 to Ø63 mm, and strokes up to 6000 mm, available also with linear control unit

Series 1605 **3**.195

Series 1605 Ø16 mm **3**.206

## Rotary actuators



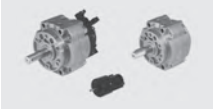
### Rack rotary actuators

Double or single rack & pinion rotary actuators

Series 1330 - 1331 - 1332 - 1333, rotary actuators **3**.211

Series 6400 - Double rack actuators with turn table **3**.215

Series 6411 **3**.218



### Vane type rotary actuators

Vane type rotary actuators with the shaft that runs into ball bearings, available with sizes from Ø10 to Ø100 mm

Series 6420 **3**.221

## Handling



### Pneumatic grippers

Pneumatic grippers manufactured with 2 angular fingers (from -10° to +30°), wide opening 180°, or 3 finger parallel style. Swing clamp cylinders has been developed to meet the need to clamp a workpiece by means of a clamping arm.

Series 6300 **3**.231

Series RT **3**.245

## Sensors



### Magnetic sensors

Magnetic sensors with Reed type or Hall effect

Series SA **3**.250


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice



## Miniaturised magnetic sensors

Miniaturised magnetic sensors with Reed and Hall style versions, available with rectangular, square, square section UL/CSA approved, and round section versions


| | | | | | |
|---|---|---|---|---|---|
| Series SR | **3**.262 | Series SQ | **3**.267 | Series ST | **3**.271 |
| Series SU | **3**.266 | | | | |


## Accessories and fixing devices



### Piston rod lock

Piston rod lock for cylinders with bores from da Ø12 to Ø125 mm


| | |
|---|---|
| Series 1260 - 1320 | **3**.279 |




### Linear guiding units

Linear guiding units series 1200 (Ø20-25 mm) and series 1320 (from Ø32 to Ø80 mm)


| | |
|---|---|
| Series 1260 - 1320 | **3**.281 |




### Shock absorbers

Shock absorbers with M8x1-M10x1-M14x1,5-M20x1,5-M27x1,5 threads


| | |
|---|---|
| Series 6900 | **3**.283 |


# Appendix

A


| | |
|---|---|
| Pneumatic symbols | **A**.1 |
| Air quality | **A**.4 |
| Dimensioning | **A**.5 |
| Measure and conversion units | **A**.14 |
| Alphanumeric index | **A**.18 |

# GLOBAL VISION and ITALIAN HEART

## Excellence in automation since 1976
## Made in italy

For more than 45 years, Pneumax has represented Italian excellence worldwide: three business units dedicated to Industrial Automation, Process Automation and Automotive respectively, manufacturing pneumatic components and systems, electric actuators and components for controlling liquid and gaseous fluids, integrating mechanical, electronic and digital skills.

Our presence in over 50 countries around the world is ensured by a network of subsidiaries and authorised distributors. All of our production activity is concentrated in the 10 production units of the Pneumax Group based in Italy. Seven of those units are located in the Pneumax Spa headquarters in Lurano (Bg). In addition to those production plants there are three other companies in the Group: Titan Engineering (San Marino), AutomationWare (Martellago-VE) and Simtech (Lurano-BG).

**10** Production sites

**29** Companies in the Group

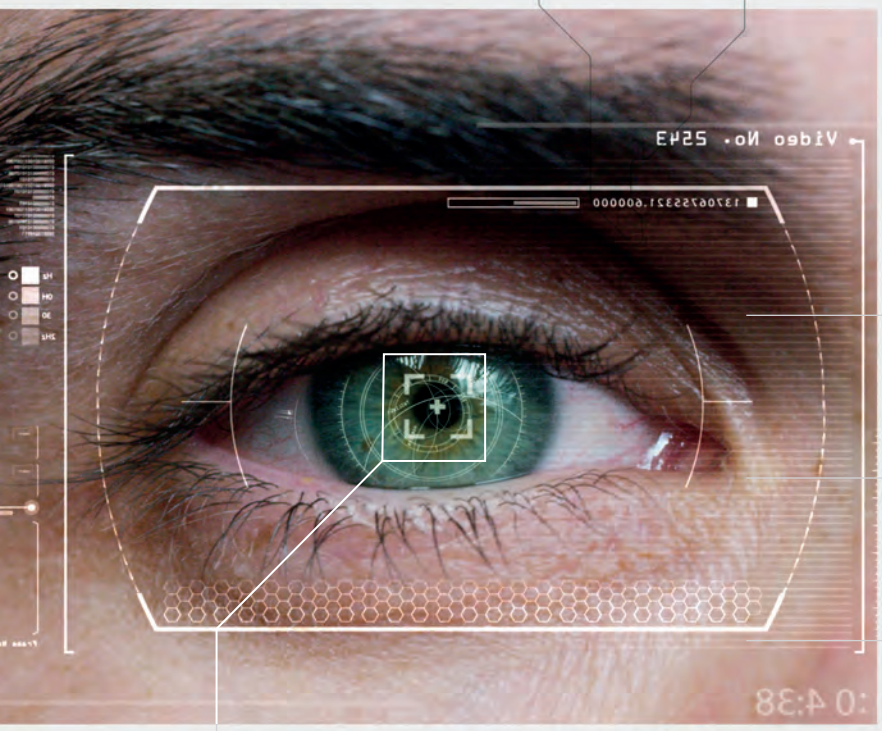
**160.000** $m^2$ Headquarters







Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice



Foundation **1976**

Employees **850**

Branches

PNEUMAX

BUSINESS UNITS

- INDUSTRIAL AUTOMATION
- PROCESS AUTOMATION
- AUTOMOTIVE

| Italy | Europe | World |
|---|---|---|
| Milan | Germany | United States |
| Turin | Czech Republic | Singapore |
| Florence | United Kingdom | Brazil |
| Vicenza | Spain | India |
| Bari | France | China |
| Modena | Portugal | |
| Rimini | Scandinavia | |
| Parma | | |

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# EMPOWERING PEOPLE FOR SUSTAINABLE DEVELOPMENT

Enhancing human resources and the local area, respect for the environment and ethical approach to business

We believe sustainable development means empowering people, through innovation, acting ethically and being respectful of the environment.

*Imagining, designing and implementing solutions through the combination of technologies and skills*

## Our Vision

Efficient organisation, continuous enhancement of skills and technological innovation: is what drives the strategy of Pneumax whose main objective has always been to foster sustainable development and to support its customers as a true technology partner. A result that can only be achieved by providing products and services to meet the different needs of customers.
All this while guaranteeing the highest quality standards and implementing a business model that combines the pursuit of continuous improvement, enhancement of the local area and respect for people and the environment.

The Pneumax Code of Ethics is the document underpinning every company decision to build a business model that values people, relationships and skills.


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The desire to offer solutions specifically designed for the applications of different sectors has led to structuring the production and sales organisation into three Business Units: Industrial Automation, Process Automation and Automotive.

Pneumax Business Units are capable of producing a wide range of components made from different materials, from technopolymers to brass, as well as steel and aluminum, according to the relevant international regulations concerning both production processes and product characteristics.

PNEUMATIC TECHNOLOGY

ELECTRIC ACTUATION

FLUID CONTROL

PNEUMAX

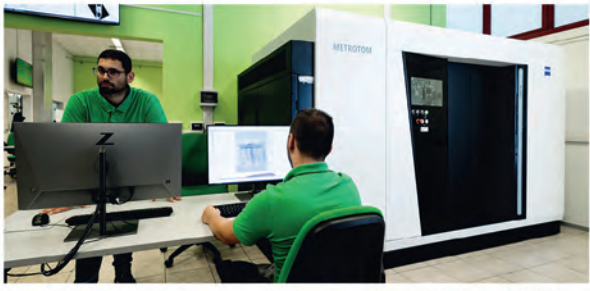


# TOTAL QUALITY MANAGEMENT

Product quality stems from the quality of the processes and the competence of the people who carry them out

Pneumax constantly invest in new product and manufacturing processes. Through research, quality perfection is the target of each company, that operates in compliance with ISO 9001 : 2015, ISO 14001 : 2015, and ISO 45001 : 2018 standards.

Working according to Total Quality means guaranteeing our customers with the highest reliability of our products and services, because the most prestigious certification is the one that comes from the trust of our partners.






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## Ongoing Improvement

Measuring, controlling and pursuing perfection

### Company
Management & Infrastructure

### People
Expertise & Experience

### Technology
Products & Production Processes

## System and product certifications

- **CSA**
  PRODUCT CERTIFICATION ACCORDING TO CANADIAN STANDARDS
- **IEC 61508**
  SIL CERTIFICATES OF COMPLIANCE WITH IEC 61508 STANDARDS
- **UL**
  PRODUCT CERTIFICATION ACCORDING TO US STANDARDS
- **EAC**
  CERTIFICATION OF CONFORMITY FOR THE FREE MOVEMENT OF PRODUCTS IN THE EURO ASIAN ECONOMIC COMMUNITY
- **ISO 45001:2018**
  OCCUPATIONAL HEALTH AND SAFETY ASSESSMENT SERIES
- **MOCA**
  FOOD CONTACT
- **EN ISO 13849**
  PRODUCTS CERTIFIED AND/OR 'WELL TRIED' AND SUITABLE FOR APPLICATIONS IN SAFETY CIRCUITS
- **ISO 9001**
  REQUIREMENTS FOR A QUALITY MANAGEMENT SYSTEM
- **ATEX 2014/34/EU**
  SYSTEMS FOR POTENTIALLY EXPLOSIVE ATMOSPHERES
- **ISO 14001**
  ENVIRONMENTAL MANAGEMENT STANDARDS
- **2006/42/CE**
  COMPLIANCE WITH REGULATIONS 2006/42/EC FOR MACHINERY
- **NSF**
  FOOD CONTACT

The Pneumax quality department use's the latest measuring technology. Continuously scanning and analyzing components using structured light laser systems that digitize objects to provide dimensional analysis efficiently via dedicated software: 3D High Resolution X-ray Axial Computed Tomography (CT), with which it is possible to scan components, carry out any measurement required, even in areas that are not accessible or not visible with other instruments.
Plastics and elastomers are monitored through the observation of thermograms provided by DSC (differential scanning calorimetry).
All metrological information collected in the company's databases is used for conformity assessments and reprocessed according to statistical control models to allow engineers to work on continuous product improvement.

# WORLDWIDE NETWORK

## Global vision, local service

Through a network of branches and exclusive distributors, Pneumax operates in over **50 countries** around the world, offering support to it's customers throughout every stage of the supply process, from application to after sales assistance.

Each market and each sector has distinctive characteristics that make them unique. The aim of Pneumax network is to provide services that can enhance these peculiarities by working as a true strategic partner.











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# Pneumax
# Business Attitude



An operating model that stems from the ability to combine sector, technology and application expertise through customer collaboration with relevant Sales Engineers, sector Business Specialists and Product Specialists focused on products and technologies.
The BUs, industrial automation, process automation and automotive, constantly interface to transfer the excellence and experience of each sector to the others: from the study of the materials needed in petrochemicals, to the integration of electronics and digital in industrial automation or meeting the quality standards required in automotive processes. An organisation that allows all customers to enjoy the most effective mix of sectoral excellence.

**PRODUCT SPECIALISTS**
Specific knowledge
• Products and Technologies

**BUSINESS SPECIALISTS**
Dedicated competences
• Sectors and Applications



**SALES ENGINEERS**
Worldwide Presence
• Relationship management







Section 01

# Air distribution

## Valves, solenoid valves and devices for compressed air distribution and control

### Valves and solenoid valves

#### Spool type valves and solenoid valves

Single and manifold versions, mechanical and manual or pneumatic command



**Series 104** 1.1


**Series 105** 1.12


**Series 200** 1.21


**Series T200** 1.54


**Series 800** 1.68


**Series 888** 1.77


**Series 400** 1.91


**Series T400** 1.110


**Series 2100**
Line-Flat-Base 1.124


**Series 2400**
Line-Flat-VDMA 1.139


**Series 2600**
Line-Flat-VDMA 1.160


#### Direct operated solenoid valves

Pilot valves, high flow rate performance 2/2 ways and 3/2 ways, miniaturised version available as well



**Series 300** 1.175


**Solenoid coils** 1.189


**Series M (Mechanical)** 1.193


**Series CNOMO** 1.197


**Series S** 1.200


**300-UL solenoid coils** 1.202


**UL solenoid coils** 1.202



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## Poppet valves and solenoid valves

3/2 and 2/2 valves and solenoid valves for compressed air and vacuum, with aluminium and technopolymer body



**Series 700** 1.204


**Series PG** 1.207


**Series T772-773** 1.224

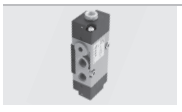

**Series T771** 1.239


## "Namur" valves and solenoid valves

NAMUR valves and solenoid valves with technopolymer or aluminium body, also available in versions classified for use in potentially explosive environments (Directive 2014/34/EU)



**Series 514/N** 1.247


**Series T514** 1.249


**Series 514 High Performance** 1.254


**Series 515 High Performance** 1.260


## ISO 5599/1 valves and solenoid valves

Valves and solenoid valves according to standard ISO 5599/1 available in 3 sizes with M12 5/2, 5/3 connectors, aluminium and technopolymer body



**Series 1000 - Size 1, 2 and 3** 1.264


**Series 1000-M12 - Size 1, 2 and 3** 1.281


# Accessories

## Pneumatic circuit accessories

Flow control valves, quick exhaust valves, selectors, silencers, unidirectional valves, manifolds, blocking valves, economizers, gang mounting manifolds, spry valves



**Series 600 - M5 - G1"** 1.288


## Blocking valves

Unidirectional and bidirectional blocking valves, aluminium and technopolymer versions, with G1/8"- G1/4"- G3/8"- G1/2" connections



**Series 50-T50** 1.310


## Complementary valves

Pressure switches, impulse generators, timers, two hands safety valve, oscillator valve, signal amplifier, progressive start up valve, high-low pressure device



**Series 900** 1.302


## Function fittings

Miniaturised logic function with technopolymer body:
RFU, RP, VB, VSR, VS-or, VS-and, IP, AP, RP+IP, VB+RFU, VB+VSR



**Series 55 Tecno-FUN** 1.315

## Accessories (following)

### Miniaturised pressure regulators

Brass versions rod G1/8" and with technopolymer body and integrated gauge version



**Series 1750 - 1760** 1.330


### Compact fittings for lubrication

Nichel plated brass compact fittings, with straight male adaptor



**Series Mini-RAP** 1.332

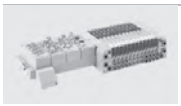

## Valves and solenoid valve manifolds

Wide range of multipole and serial systems, available with main fieldbus protocols



**Series PX** 1.334


**Series 3000 EVO** 1.355


**Series 2200 Optyma-S EVO** 1.408


**Series 2200 Optyma-Sc** 1.429


**Series 2500 Optyma-F EVO** 1.438


**Series 2500 Optyma-T EVO** 1.451


**Series 2700 EVO** 1.465


**EVO Electronics** 1.486


**Series 2300 Enova®** 1.504



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## Series 104

The micro valves 104 series are a cost effective solution with reduced overall dimensions, easy to install and manage.
Their main characteristic is the possibility to choose between the version with lateral or rear pneumatic connections realized with quick fitting for Ø4mm tube included.
The valves are available with 2 or 3 ways versions, normally closed or open, 5 ways and 5 ways 3 positions open centres and pressured centres.
The 5 ways version is made with two 3 ways valves placed side by side with common inlet.
The operators available for this valve are push button (different versions), selector (key, short and long lever), lever (lever roller or level undirectional) and pneumatic.
It is also possible to combine the 2 and 3 ways valves with electrical switches, normally closed or open.



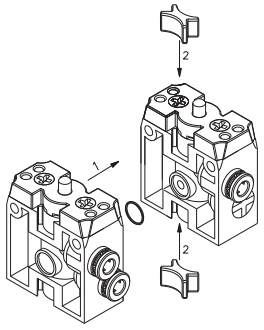
### Construction characteristics

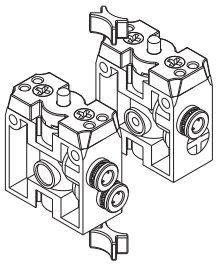
| | |
|---|---|
| Body and cover | Technopolymer |
| Spacers | Technopolymer |
| Seals | NBR |
| Springs | Spring steel |
| Operators | Plastic material for buttons and switches |
| Pistons | Aluminium (for pneumatic command version) |
| Spools | Steel |

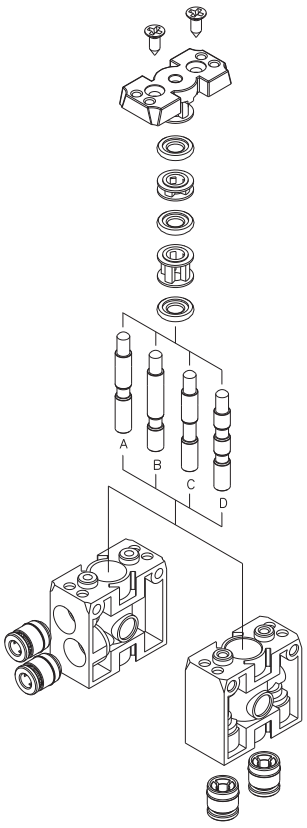
### Use and maintenance

This valves have an average life of 15 million cycles depending on the application and air quality.
Filtered and lubricated air using specified lubricants will reduce the wear of the seals and ensures long and trouble free operation.
Please ensure that the valve is being used according with the manufacturers specification, such as air pressure and temperature.

**ATTENTION:** use hydraulic oil class H for lubrication such as CASTROL MAGNA SW32.






A : 2/2 N.C.
B : 2/2 N.O.
C : 3/2 N.C.
D : 3/2 N.O.

## Tappet - Spring

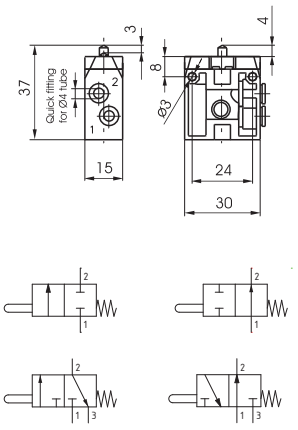
**Coding:** 104.Ⓣ.0.1.Ⓦ.Ⓕ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 90 |
| Orifice size (mm) | 2.5 |
| Working ports size | ø4 tube |

| | | | |
|---|---|---|---|
| Ⓣ | TYPE | Ⓕ | FUNCTION |
| | **22** = 2 ways, 2 positions | | **A** = Normally Open |
| | **32** = 3 ways, 2 positions | | **C** = Normally Closed |
| Ⓦ | CONNECTION TYPE | | |
| | **L** = Lateral | | |
| | **P** = Rear | | |

***2/2 - 3/2 - Lateral connections***



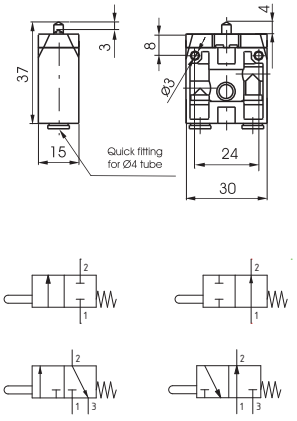



Weight 20 g
Operating force 13 N

104.Ⓣ.0.1.L.Ⓕ

***2/2 - 3/2 - Rear connections***






Weight 20 g
Operating force 13 N

104.Ⓣ.0.1.P.Ⓕ

## Push button - Spring

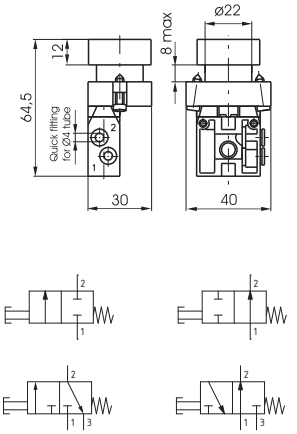
**Coding:** 104.Ⓣ.6.22/Ⓒ.Ⓦ.Ⓕ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 90 |
| Orifice size (mm) | 2.5 |
| Working ports size | ø4 tube |

| | | | |
|---|---|---|---|
| Ⓣ | TYPE | Ⓦ | CONNECTION TYPE |
| | **22** = 2 ways, 2 positions | | **L** = Lateral |
| | **32** = 3 ways, 2 positions | | **P** = Rear |
| | **52** = 5 ways, 2 positions | Ⓕ | FUNCTION (only for 2/2 or 3/2 ways) |
| Ⓒ | BUTTON COLOR | | **A** = Normally Open |
| | **1** = Red | | **C** = Normally Closed |
| | **2** = Black | | |
| | **3** = Green | | |
| | **4** = Yellow | | |

***2/2 - 3/2 - Lateral connections***



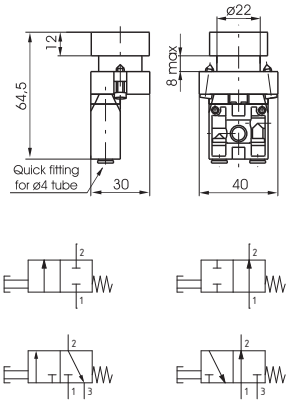



Weight 50 g
Operating force 18 N

104.Ⓣ.6.22/Ⓒ.L.Ⓕ

***2/2 - 3/2 - Rear connections***



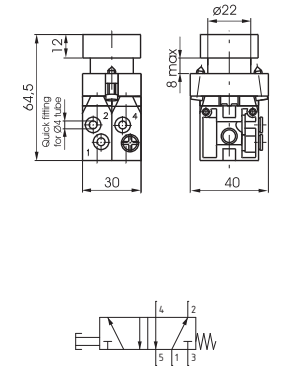



Weight 50 g
Operating force 18 N

104.Ⓣ.6.22/Ⓒ.P.Ⓕ

***5/2 - Lateral connections***



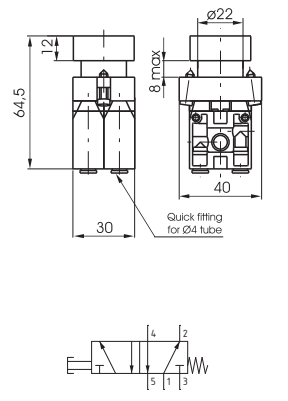



Weight 105 g
Operating force 30 N

104.52.6.22/Ⓒ.L

***5/2 - Rear connections***






Weight 105 g
Operating force 30 N

104.52.6.22/Ⓒ.P



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Push button 2 positions (step - step)

**Coding:** 104.Ⓣ.6.31.Ⓦ.Ⓕ

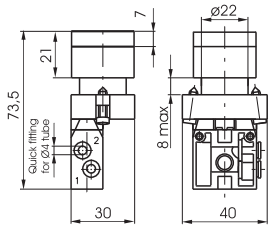
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 90 |
| Orifice size (mm) | 2.5 |
| Working ports size | ø4 tube |

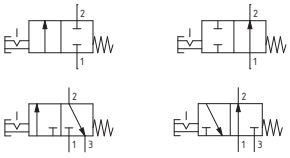
| | |
|---|---|
| Ⓣ | TYPE |
| | **22** = 2 ways, 2 positions |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓦ | CONNECTION TYPE |
| | **L** = Lateral |
| | **P** = Rear |

| | |
|---|---|
| Ⓕ | FUNCTION (only for 2/2 and 3/2 ways) |
| | **A** = Normally Open |
| | **C** = Normally Closed |

***2/2 - 3/2 - Lateral connections***





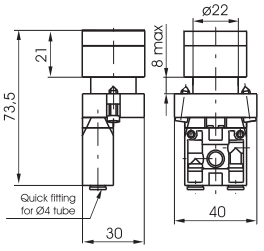



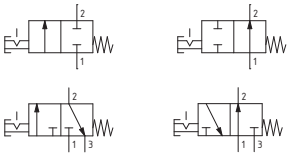
Weight 60 g
Operating force 18 N

104.Ⓣ.6.31.L.Ⓕ

***2/2 - 3/2 - Rear connections***





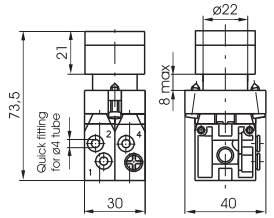



Weight 60 g
Operating force 18 N

104.Ⓣ.6.31.P.Ⓕ

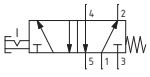
***5/2 - Lateral connections***





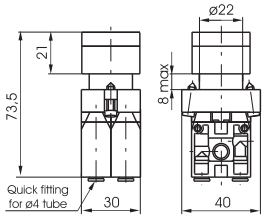

Weight 110 g
Operating force 30 N

104.52.6.31.L



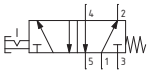
***5/2 - Rear connections***






Weight 110 g
Operating force 30 N

104.52.6.31.P



## Raised Push button - Spring

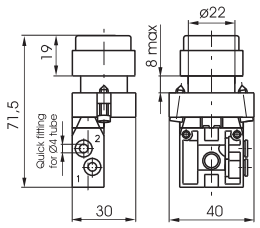
**Coding:** 104.Ⓣ.6.23/Ⓒ.Ⓦ.Ⓕ

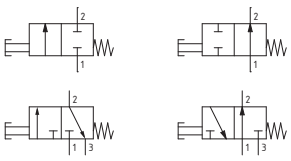
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 90 |
| Orifice size (mm) | 2.5 |
| Working ports size | ø4 tube |

| | | | |
|---|---|---|---|
| Ⓣ | TYPE | Ⓦ | CONNECTION TYPE |
| | **22** = 2 ways, 2 positions | | **L** = Lateral |
| | **32** = 3 ways, 2 positions | | **P** = Rear |
| | **52** = 5 ways, 2 positions | Ⓕ | FUNCTION (only for 2/2 or 3/2 ways) |
| Ⓒ | BUTTON COLOR | | **A** = Normally Open |
| | **1** = Red | | **C** = Normally Closed |
| | **2** = Black | | |
| | **3** = Green | | |
| | **4** = Yellow | | |

***2/2 - 3/2 - Lateral connections***





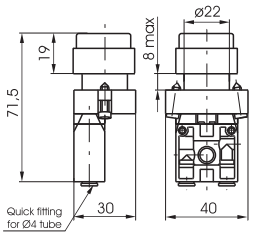



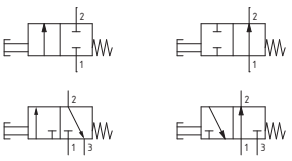
Weight 50 g
Operating force 18 N

104.Ⓣ.6.23/Ⓒ.L.Ⓕ

***2/2 - 3/2 - Rear connections***





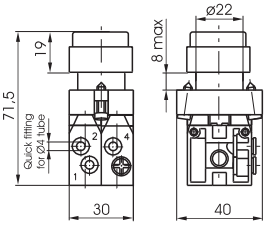



Weight 50 g
Operating force 18 N

104.Ⓣ.6.23/Ⓒ.P.Ⓕ

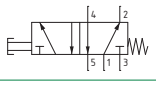
***5/2 - Lateral connections***





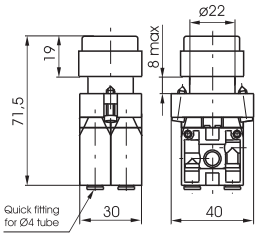

Weight 105 g
Operating force 30 N

104.52.6.23/Ⓒ.L



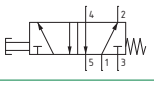
***5/2 - Rear connections***






Weight 105 g
Operating force 30 N

104.52.6.23/Ⓒ.P





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Palm button 2 position

**Coding:** 104.Ⓣ.6.25.Ⓦ.Ⓕ

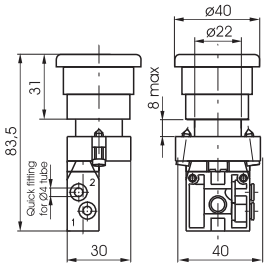
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 90 |
| Orifice size (mm) | 2.5 |
| Working ports size | ø4 tube |

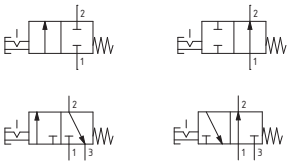
| | |
|---|---|
| Ⓣ | TYPE |
| | **22** = 2 ways, 2 positions |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓦ | CONNECTION TYPE |
| | **L** = Lateral |
| | **P** = Rear |

| | |
|---|---|
| Ⓕ | FUNCTION (only for 2/2 and 3/2 ways) |
| | **A** = Normally Open |
| | **C** = Normally Closed |

***2/2 - 3/2 - Lateral connections***





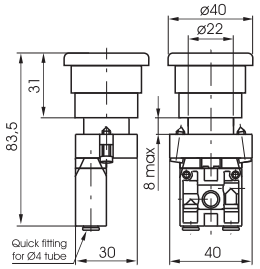



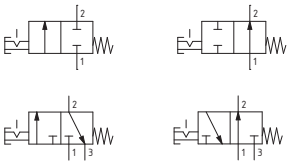
Weight 65 g
Operating force 19 N
Emergency - Rotate to unlock

104.Ⓣ.6.25.L.Ⓕ

***2/2 - 3/2 - Rear connections***





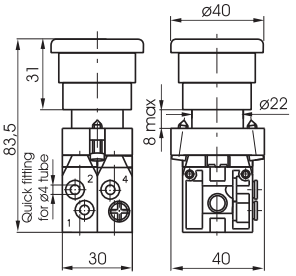



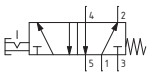
Weight 65 g
Operating force 19 N
Emergency - Rotate to unlock

104.Ⓣ.6.25.P.Ⓕ

***5/2 - Lateral connections***





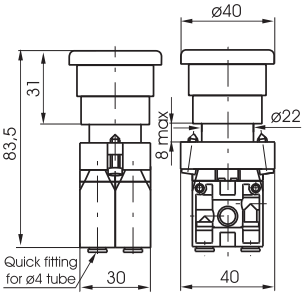



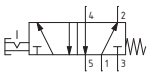
Weight 120 g
Operating force 32 N
Emergency - Rotate to unlock

104.52.6.25.L

***5/2 - Rear connections***





Weight 120 g
Operating force 32 N
Emergency - Rotate to unlock

104.52.6.25.P

## Switch - short lever

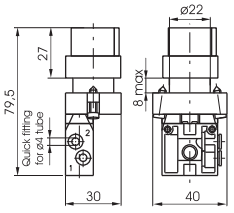
**Coding:** 104.Ⓣ.Ⓕ¹.6.30.Ⓢ.Ⓦ.Ⓕ²

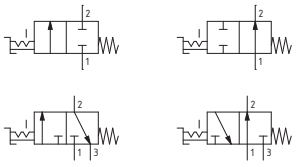
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 90 |
| Orifice size (mm) | 2.5 |
| Working ports size | ø4 tube |

| | |
|---|---|
| Ⓣ | TYPE |
| | **22** = 2 ways, 2 positions |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| | **53** = 5 ways, 3 positions |
| Ⓕ¹ | FUNCTION 1 (only for 5/3 ways) |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓢ | SWITCH POSITION (only for 5/3 ways) |
| | **0** = 3 instable positions |
| | **1** = 3 stable positions |
| Ⓦ | CONNECTION TYPE |
| | **L** = Lateral |
| | **P** = Rear |
| Ⓕ² | FUNCTION 2 (only for 2/2 or 3/2 ways) |
| | **A** = Normally Open |
| | **C** = Normally Closed |

### 2/2 - 3/2 - Lateral connections





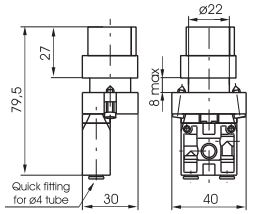



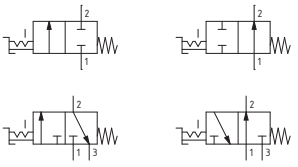
Weight 65 g
Switch 2 positions stable

104.Ⓣ.6.30.L.Ⓕ²

### 2/2 - 3/2 - Rear connections





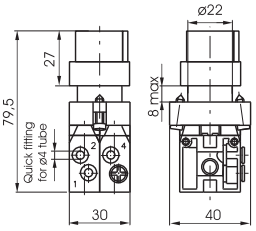



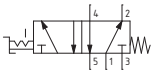
Weight 65 g
Switch 2 positions stable

104.Ⓣ.6.30.P.Ⓕ²

### 5/2 - Lateral connections





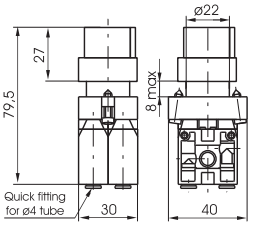



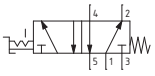
Weight 120 g
Switch 2 positions stable

104.52.6.30.L

### 5/2 - Rear connections





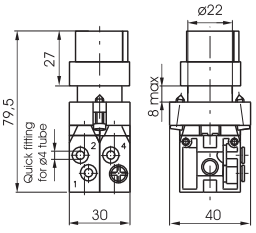



Weight 120 g
Switch 2 positions stable

104.52.6.30.P

### 5/3 - Lateral connections





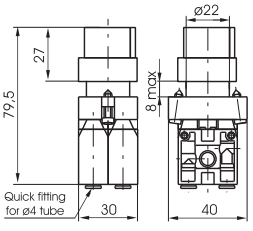

Weight 120 g

104.53.Ⓕ¹.6.30.Ⓢ.L



### 5/3 - Rear connections






Weight 120 g

104.53.Ⓕ¹.6.30.Ⓢ.P





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Switch - long lever

**Coding:** 104.Ⓣ.Ⓕ¹.6.27.Ⓢ.Ⓦ.Ⓕ²

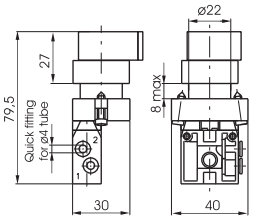
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 90 |
| Orifice size (mm) | 2.5 |
| Working ports size | ø4 tube |

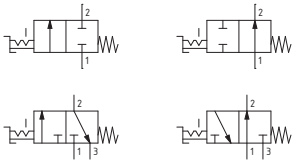
| | |
|---|---|
| Ⓣ | TYPE |
| | **22** = 2 ways, 2 positions |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| | **53** = 5 ways, 3 positions |
| Ⓕ¹ | FUNCTION 1 (only for 5/3 ways) |
| | **32** = Open centres |
| | **33** = Pressured centres |

| | |
|---|---|
| Ⓢ | SWITCH POSITION (only for 5/3 ways) |
| | **0** = 3 instable positions |
| | **1** = 3 stable positions |
| Ⓦ | CONNECTION TYPE |
| | **L** = Lateral |
| | **P** = Rear |
| Ⓕ² | FUNCTION 2 (only for 2/2 or 3/2 ways) |
| | **A** = Normally Open |
| | **C** = Normally Closed |

### 2/2 - 3/2 - Lateral connections





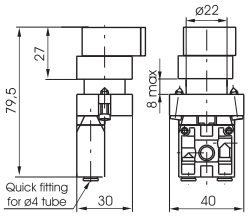



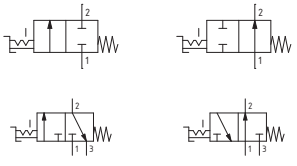
Weight 65 g
Switch 2 positions stable

104.Ⓣ.6.27.L.Ⓕ²

### 2/2 - 3/2 - Rear connections





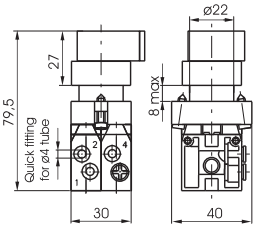



Weight 65 g
Switch 2 positions stable

104.Ⓣ.6.27.P.Ⓕ²

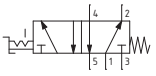
### 5/2 - Lateral connections





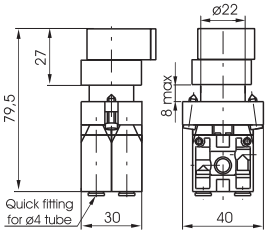

Weight 120 g
Switch 2 positions stable

104.52.6.27.L



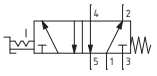
### 5/2 - Rear connections





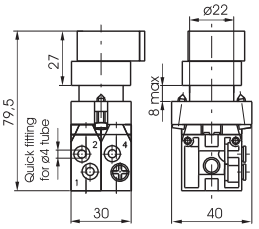

Weight 120 g
Switch 2 positions stable

104.52.6.27.P



### 5/3 - Lateral connections





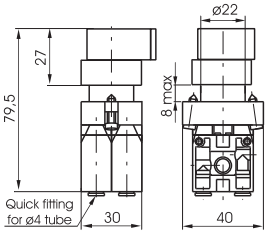

Weight 120 g

104.53.Ⓕ¹.6.27.Ⓢ.L



### 5/3 - Rear connections






Weight 120 g

104.53.Ⓕ¹.6.27.Ⓢ.P



## Key switch

**Coding:** 104.Ⓣ.Ⓕ¹.6.28.Ⓢ.Ⓦ.Ⓕ²

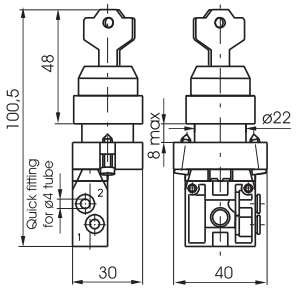
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 90 |
| Orifice size (mm) | 2.5 |
| Working ports size | ø4 tube |

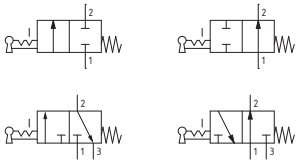
| | |
|---|---|
| Ⓣ | TYPE |
| | **22** = 2 ways, 2 positions |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| | **53** = 5 ways, 3 positions |
| Ⓕ¹ | FUNCTION 1 (only for 5/3 ways) |
| | **32** = Open centres |
| | **33** = Pressured centres |

| | |
|---|---|
| Ⓢ | SWITCH POSITION (only for 5/3 ways) |
| | **0** = 3 instable positions |
| | **1** = 3 stable positions |
| Ⓦ | CONNECTION TYPE |
| | **L** = Lateral |
| | **P** = Rear |
| Ⓕ² | FUNCTION 2 (only for 2/2 or 3/2 ways) |
| | **A** = Normally Open |
| | **C** = Normally Closed |

### 2/2 - 3/2 - Lateral connections





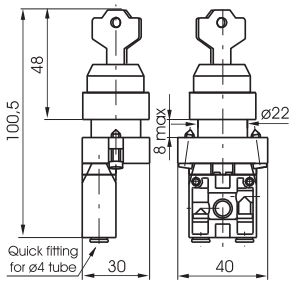



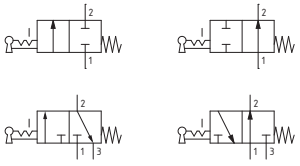
Weight 100 g
Switch 2 positions stable

104.Ⓣ.6.28.L.Ⓕ²

### 2/2 - 3/2 - Rear connections





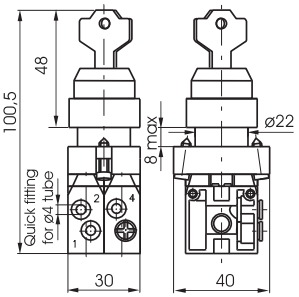



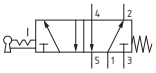
Weight 100 g
Switch 2 positions stable

104.Ⓣ.6.28.P.Ⓕ²

### 5/2 - Lateral connections





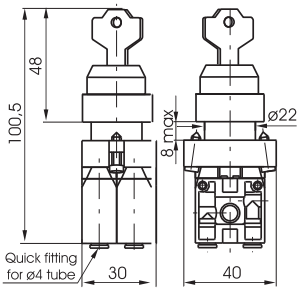



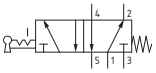
Weight 155 g
Switch 2 positions stable

104.52.6.28.L

### 5/2 - Rear connections





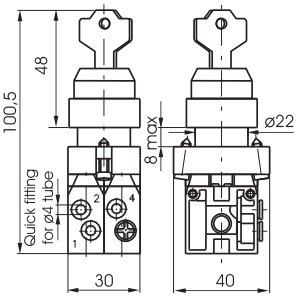



Weight 155 g
Switch 2 positions stable

104.52.6.28.P

### 5/3 - Lateral connections





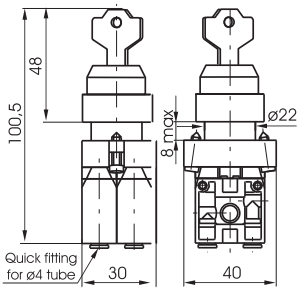



Weight 155 g

104.53.Ⓕ¹.6.28.Ⓢ.L

### 5/3 - Rear connections








Weight 155 g

104.53.Ⓕ¹.6.28.Ⓢ.P



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

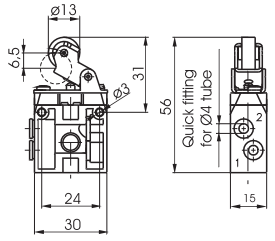
## Lever roller - Spring

**Coding:** 104.Ⓣ.2.1.Ⓦ.Ⓕ

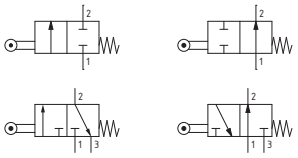
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 90 |
| Orifice size (mm) | 2.5 |
| Working ports size | ø4 tube |

| | | | |
|---|---|---|---|
| Ⓣ | TYPE | Ⓕ | FUNCTION |
| | **22** = 2 ways, 2 positions | | **A** = Normally Open |
| | **32** = 3 ways, 2 positions | | **C** = Normally Closed |
| Ⓦ | CONNECTION TYPE | | |
| | **L** = Lateral | | |
| | **P** = Rear | | |

***2/2 - 3/2 - Lateral connections***



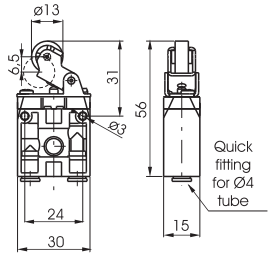


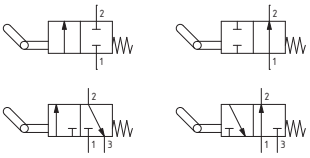
Weight 31 g
Operating force 9 N

104.Ⓣ.2.1.L.Ⓕ

***2/2 - 3/2 - Rear connections***





Weight 31 g
Operating force 9 N

104.Ⓣ.2.1.P.Ⓕ

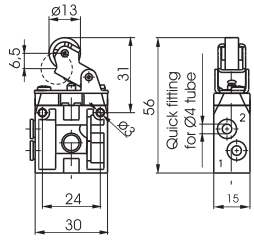
## Lever roller ball bearing - Spring

**Coding:** 104.Ⓣ.2.1/1.Ⓦ.Ⓕ

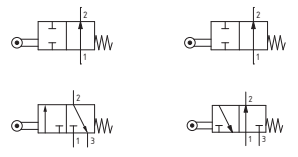
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 90 |
| Orifice size (mm) | 2.5 |
| Working ports size | ø4 tube |

| | | | |
|---|---|---|---|
| Ⓣ | TYPE | Ⓕ | FUNCTION |
| | **22** = 2 ways, 2 positions | | **A** = Normally Open |
| | **32** = 3 ways, 2 positions | | **C** = Normally Closed |
| Ⓦ | CONNECTION TYPE | | |
| | **L** = Lateral | | |
| | **P** = Rear | | |

***2/2 - 3/2 - Lateral connections***



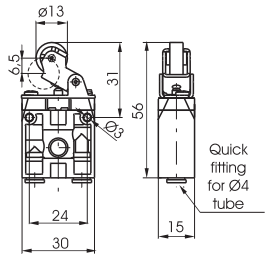


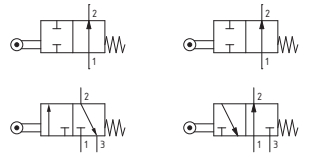
Weight 46 g
Operating force 9 N

104.Ⓣ.2.1/1.L.Ⓕ

***2/2 - 3/2 - Rear connections***





Weight 46 g
Operating force 9 N

104.Ⓣ.2.1/1.P.Ⓕ

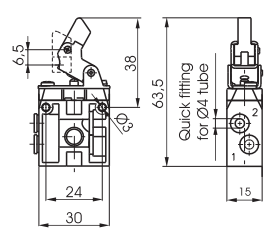
## Lever unidirectional - Spring

**Coding:** 104.Ⓣ.3.1.Ⓦ.Ⓕ

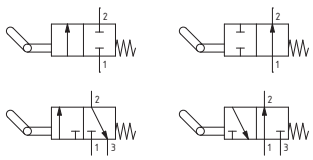
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 90 |
| Orifice size (mm) | 2.5 |
| Working ports size | ø4 tube |

| | | | |
|---|---|---|---|
| Ⓣ | TYPE | Ⓕ | FUNCTION |
| | **22** = 2 ways, 2 positions | | **A** = Normally Open |
| | **32** = 3 ways, 2 positions | | **C** = Normally Closed |
| Ⓦ | CONNECTION TYPE | | |
| | **L** = Lateral | | |
| | **P** = Rear | | |

***2/2 - 3/2 - Lateral connections***



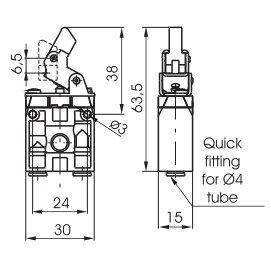


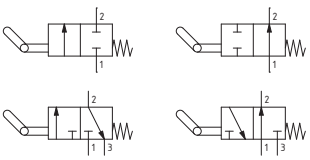
Weight 31 g
Operating force 9 N

104.Ⓣ.3.1.L.Ⓕ

***2/2 - 3/2 - Rear connections***





Weight 31 g
Operating force 9 N

104.Ⓣ.3.1.P.Ⓕ

## Complete lever roller operator

**Coding:** 104.2.1



## Complete lever roller ball bearing operator

**Coding:** 104.2.1/1



## Complete lever unidirectional

**Coding:** 104.3.1



## Fixing plate

**Coding:** 104.00

***Complete with fixing screws***



## Push button

**Coding:** 104.6.22/Ⓒ



| Ⓒ | BUTTON COLOR |
|---|---|
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |
| | **4** = Yellow |

## Raised Push button

**Coding:** 104.6.23/Ⓒ



| Ⓒ | BUTTON COLOR |
|---|---|
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |
| | **4** = Yellow |

## Push button 2 positions

**Coding:** 104.6.31

***(step - step)***



## Palm button 2 position

**Coding:** 104.6.25

***Emergency - Rotate to unlock***



## Switch - short lever

**Coding:** 104.6.30.Ⓢ



| Ⓢ | SWITCH POSITION (only for 3 position) |
|---|---|
| | **0** = 3 instable positions |
| | **1** = 3 stable positions |

***Switch 2 positions stable***
104.6.30
***Switch 3 positions***
104.6.30.Ⓢ

## Switch - long lever

**Coding:** 104.6.27.Ⓢ



| Ⓢ | SWITCH POSITION (only for 3 position) |
|---|---|
| | **0** = 3 instable positions |
| | **1** = 3 stable positions |

***Switch 2 positions stable***
104.6.27
***Switch 3 positions***
104.6.27.Ⓢ

## Key switch

**Coding:** 104.6.28.Ⓢ



| Ⓢ | SWITCH POSITION (only for 3 position) |
|---|---|
| | **0** = 3 instable positions |
| | **1** = 3 stable positions |

***Switch 2 positions stable***
104.6.28
***Switch 3 positions***
104.6.28.Ⓢ

## Joystick selector switch, 3 instable positions

**Coding:** 104.6.39.0



## Contact electric element

**Coding:** 104.Ⓕ



| Ⓕ | FUNCTION |
|---|---|
| | **NO** = Normally Open |
| | **NC** = Normally Closed |

## Complete Pneumatic Operator

**Coding:** 104.11



## Push button protection cover

**Coding:** 104.02





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pneumatic - Spring

**Coding:** 104.Ⓣ.11.1.Ⓦ.Ⓕ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 90 |
| Orifice size (mm) | 2.5 |
| Working ports size | ø4 tube |
| Pilot ports size | M5 |

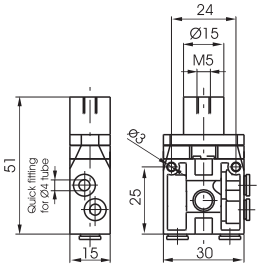
| Ⓣ | TYPE |
|---|---|
| | **22** = 2 ways, 2 positions |
| | **32** = 3 ways, 2 positions |

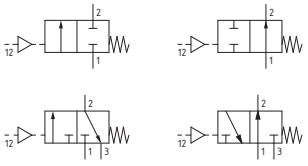
| Ⓦ | CONNECTION TYPE |
|---|---|
| | **L** = Lateral |
| | **P** = Rear |

| Ⓕ | FUNCTION |
|---|---|
| | **A** = Normally Open |
| | **C** = Normally Closed |

***2/2 - 3/2 - Lateral connections***





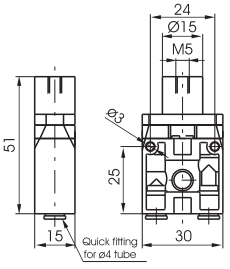



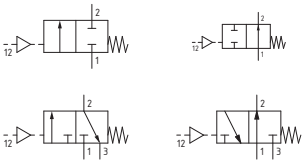
Weight 25 g
Minimum pilot pressure 2,5 bar

104.Ⓣ.11.1.L.Ⓕ

***2/2 - 3/2 - Rear connections***





Weight 25 g
Minimum pilot pressure 2,5 bar

104.Ⓣ.11.1.P.Ⓕ

## Series 105

The series 105 consist of a broad range of miniature valves and valves with various type of actuation.
The connections are M5 for this series
Due to their special construction with a balanced spool, these valves can be used interchangeably as 3 ways or 5 ways.
The 3 ways can be used normally closed or normally open and the 5 ways can be fed through the exhausts 3 and 5 with different pressures according to the need.
The spool, as it is moving, isolates the connections without being affected by the inlet pressure.



### Construction characteristics

| | M5 |
|---|---|
| Body | Aluminium |
| Spacers | Technopolymer |
| Seals | NBR |
| Springs | Spring steel |
| Operators | Nickel plated brass<br>Stainless steel for roller levers and button levers;<br>Zinc plated steel for side levers;<br>Plastic material for handles, buttons and switches<br>Aluminium (for pneumatic command version) |
| Pistons | Aluminium (for pneumatic command version) |
| Spools | Steel |

### Use and maintenance

This valves have an average life of 15 million cycles depending on the application and air quality.
Filtered and lubricated air using specified lubricants will reduce the wear of the seals and ensures long and trouble free operation.
Please ensure that the valve is being used according with the manufacturers specification, such as air pressure and temperature.
The exhaust port of the distributor has to be protected in a dusty and dirty environment.
Repair kits including the spool complete with seals are available for overhauling the valves.
However, although this is a simple operation it should be carried out by a competent person.

**ATTENTION:** use hydraulic oil class H for lubrication such as CASTROL MAGNA SW32.

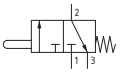

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

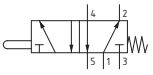
## Tappet panel - Spring

**Coding:** 105.Ⓣ.0.1

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

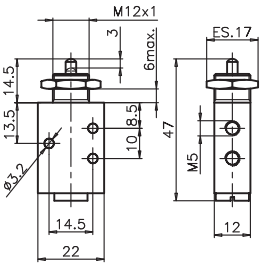
| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |


105.32.0.1


105.52.0.1

***3/2 ways***

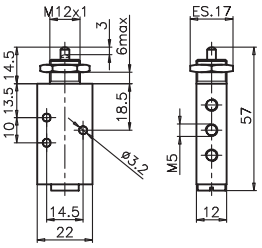





Weight 70 g
Operating force 14 N

***5/2 ways***





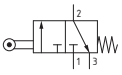

Weight 87 g
Operating force 14 N

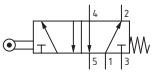
## Lever roller - Spring

**Coding:** 105.Ⓣ.2.1

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

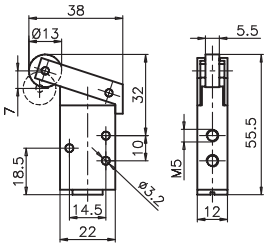
| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |


105.32.2.1


105.52.2.1

***3/2 ways***

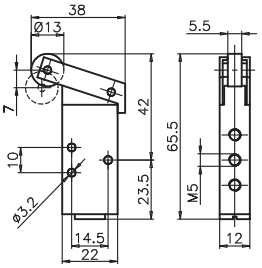





Weight 85 g
Operating force 6 N

***5/2 ways***





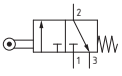

Weight 102 g
Operating force 6 N

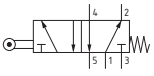
## Lever roller ball bearing - Spring

**Coding:** 105.Ⓣ.2.1/1

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

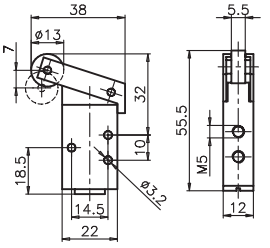
| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |


105.32.2.1/1


105.52.2.1/1

***3/2 ways***

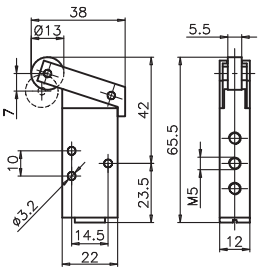





Weight 100 g
Operating force 6 N

***5/2 ways***





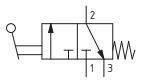

Weight 177 g
Operating force 6 N

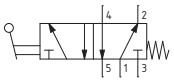
## Lever button - Spring

**Coding:** 105.Ⓣ.2.6/Ⓒ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

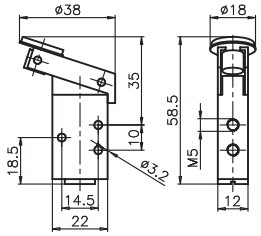
| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |


105.32.2.6/Ⓒ


105.52.2.6/Ⓒ

***3/2 ways***

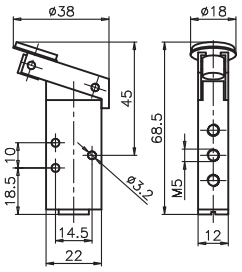





Weight 85 g
Operating force 6 N

***5/2 ways***





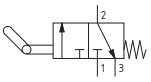

Weight 102 g
Operating force 6 N

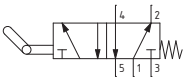
## Lever unidirectional - Spring

**Coding:** 105.Ⓣ.3.1

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

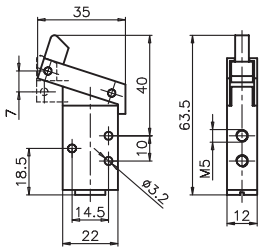
| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |


105.32.3.1


105.52.3.1

***3/2 ways***

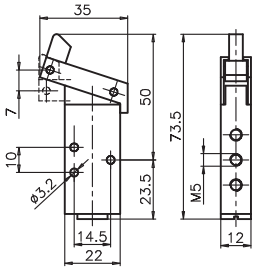





Weight 85 g
Operating force 6 N

***5/2 ways***





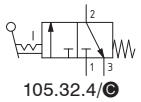

Weight 102 g
Operating force 6 N

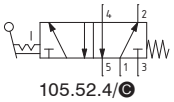
## Lever panel Ø22 - 2 positions

**Coding:** 105.Ⓣ.4/Ⓒ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

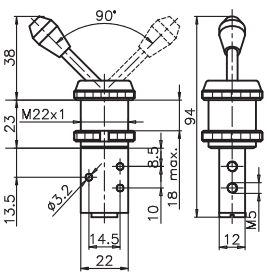
| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | LEVER COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |


105.32.4/Ⓒ


105.52.4/Ⓒ

***3/2 ways***

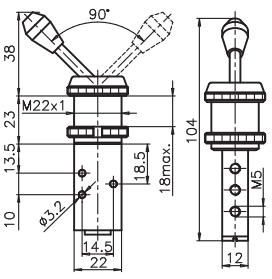





Weight 125 g

***5/2 ways***






Weight 142 g



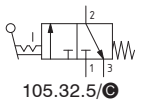
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

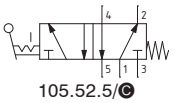
## Lever panel Ø30 - 2 positions

**Coding:** 105.Ⓣ.5/Ⓒ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

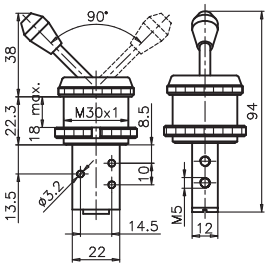
| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | LEVER COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |


105.32.5/Ⓒ


105.52.5/Ⓒ

***3/2 ways***

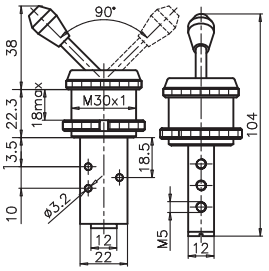





Weight 165 g

***5/2 ways***





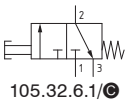

Weight 182 g

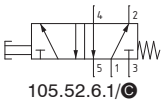
## Push button Ø30 - Spring

**Coding:** 105.Ⓣ.6.1/Ⓒ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

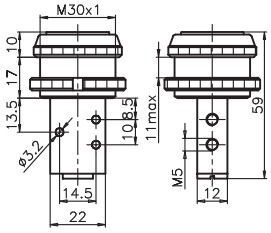
| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |


105.32.6.1/Ⓒ


105.52.6.1/Ⓒ

***3/2 ways***

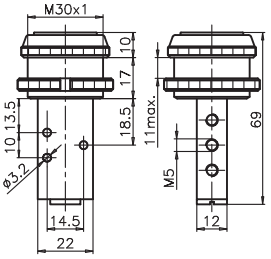





Weight 123 g
Operating force 14 N

***5/2 ways***





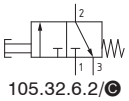

Weight 140 g
Operating force 14 N

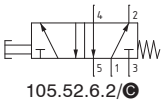
## Push button Ø22 - Spring

**Coding:** 105.Ⓣ.6.2/Ⓒ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

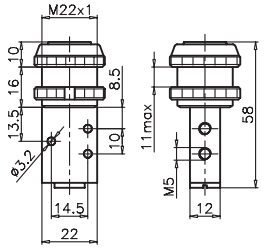
| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |


105.32.6.2/Ⓒ


105.52.6.2/Ⓒ

***3/2 ways***

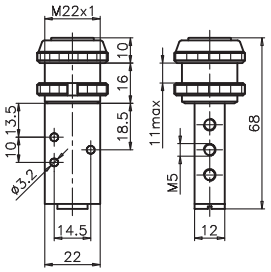





Weight 102 g
Operating force 14 N

***5/2 ways***





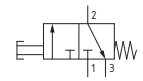

Weight 119 g
Operating force 14 N

## Push button - Spring

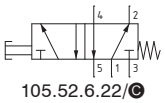
**Coding:** 105.Ⓣ.6.22/Ⓒ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |
| | **4** = Yellow |



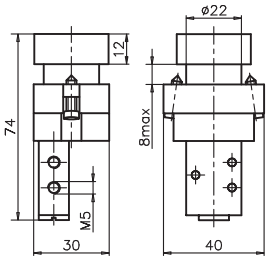
105.32.6.22/Ⓒ



105.52.6.22/Ⓒ

***3/2 ways***

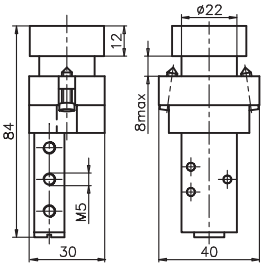





Weight 165 g
Operating force 14 N

***5/2 ways***





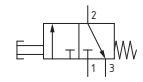

Weight 182 g
Operating force 14 N

## Raised Push button - Spring

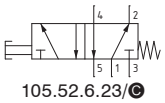
**Coding:** 105.Ⓣ.6.23/Ⓒ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |
| | **4** = Yellow |



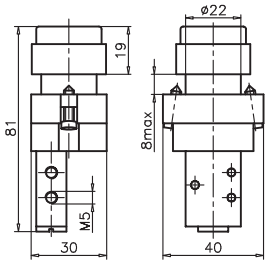
105.32.6.23/Ⓒ



105.52.6.23/Ⓒ

***3/2 ways***

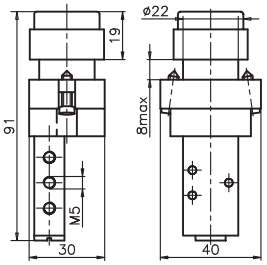





Weight 170 g
Operating force 14 N

***5/2 ways***





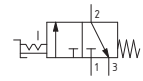

Weight 187 g
Operating force 14 N

## Switch 2 positions

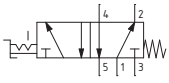
**Coding:** 105.Ⓣ.6.27

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



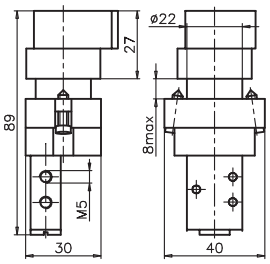
105.32.6.27



105.52.6.27

***3/2 ways***

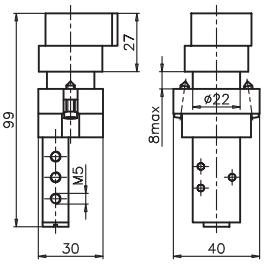





Weight 185 g

***5/2 ways***






Weight 202 g



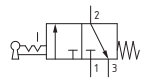
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

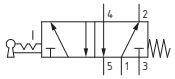
## Key switch 2 positions

**Coding:** 105.Ⓣ.6.28

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

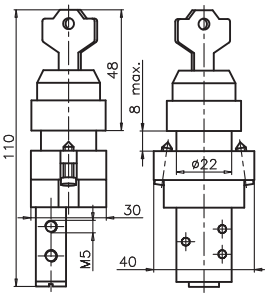
| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |


105.32.6.28


105.52.6.28

***3/2 ways***

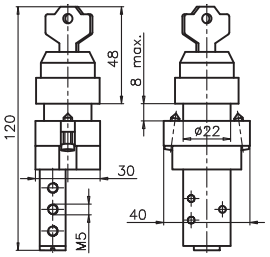





Weight 215 g

***5/2 ways***





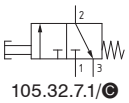

Weight 232 g

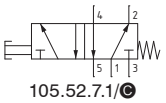
## Palm pushbutton Ø30 - Spring

**Coding:** 105.Ⓣ.7.1/Ⓒ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

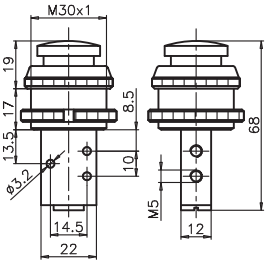
| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |


105.32.7.1/Ⓒ


105.52.7.1/Ⓒ

***3/2 ways***

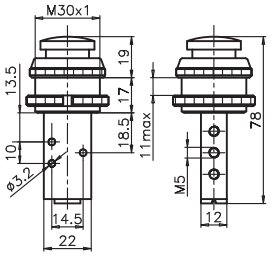





Weight 126 g
Operating force 14 N

***5/2 ways***





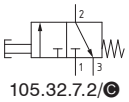

Weight 143 g
Operating force 14 N

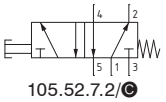
## Palm pushbutton Ø22 - Spring

**Coding:** 105.Ⓣ.7.2/Ⓒ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

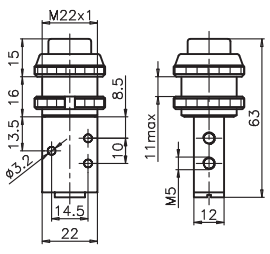
| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |


105.32.7.2/Ⓒ


105.52.7.2/Ⓒ

***3/2 ways***

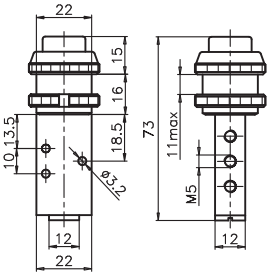





Weight 103 g
Operating force 14 N

***5/2 ways***





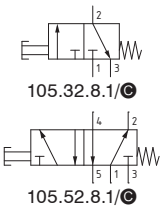

Weight 120 g
Operating force 14 N

## Push button

**Coding:** 105.Ⓣ.8.1/Ⓒ

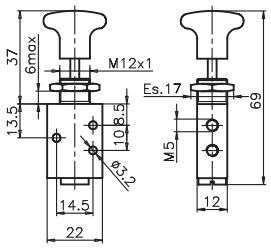
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |




***3/2 ways***

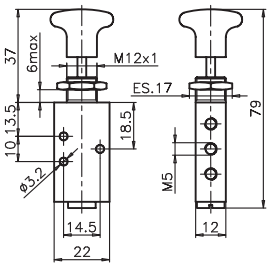





Weight 75 g
Operating force 14 N

***5/2 ways***





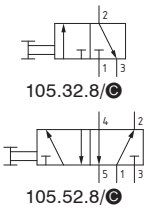

Weight 92 g
Operating force 14 N

## Push button 2 positions

**Coding:** 105.Ⓣ.8/Ⓒ

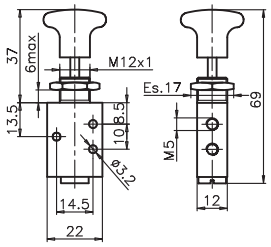
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |




***3/2 ways***

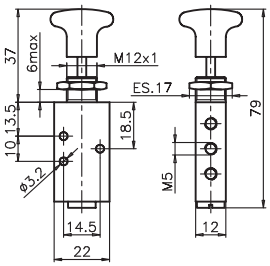





Weight 75 g
Operating force 14 N

***5/2 ways***





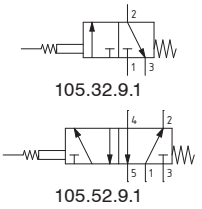

Weight 92 g
Operating force 14 N

## Whisker - Spring

**Coding:** 105.Ⓣ.9.1

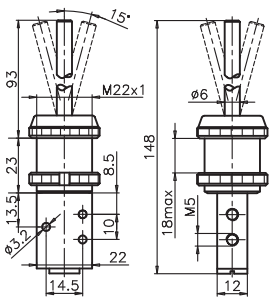
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |




***3/2 ways***

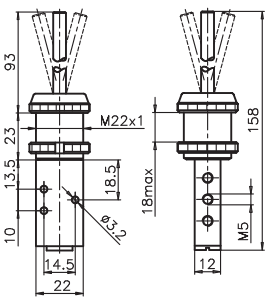





Weight 136 g

***5/2 ways***






Weight 153 g



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Handle with valve

**Coding:** 105.Ⓣ.6.Ⓐ.Ⓕ

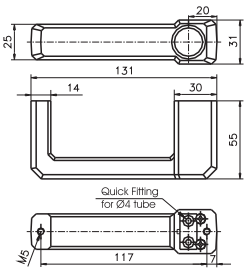
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 - Quick Fitting for Ø4 tube |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

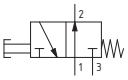
| | FEEDING |
|---|---|
| Ⓐ | **40** = Left feeding |
| | **40D** = Right feeding |

| | FUNCTION (only for 3 ways) |
|---|---|
| Ⓕ | **A** = Normally Open |
| | **C** = Normally Closed |

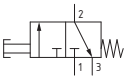





Weight 165 g
Operating force 14 N



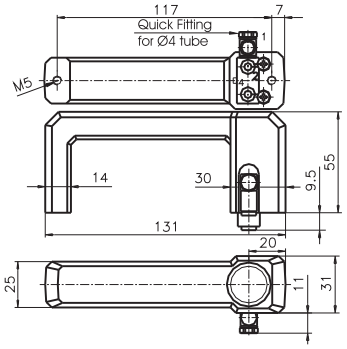

105.32.6.40A



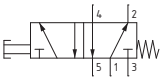

105.32.6.40C

***Left feeding***





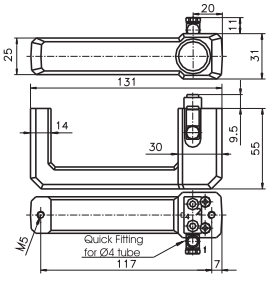

Weight 190 g
Operating force 14 N



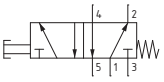

105.52.6.40

***Right feeding***






Weight 190 g
Operating force 14 N



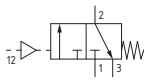

105.52.6.40D

## Pneumatic - Spring

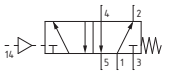
**Coding:** 105.Ⓣ.11.1

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |
| Pilot ports size | M5 |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



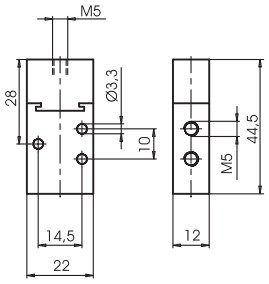

105.32.11.1




105.52.11.1

***3/2 ways***

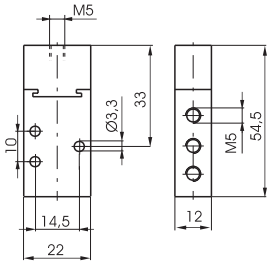





Weight 90 g
Minimum pilot pressure 2,5 bar

***5/2 ways***





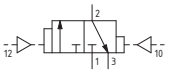

Weight 100 g
Minimum pilot pressure 2,5 bar

## Pneumatic - Differential

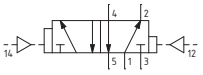
**Coding:** 105.Ⓣ.11.12

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |
| Pilot ports size | M5 |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



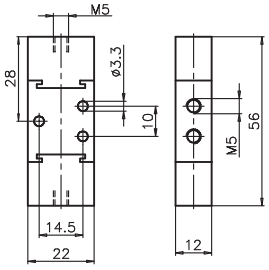

105.32.11.12




105.52.11.12

***3/2 ways***

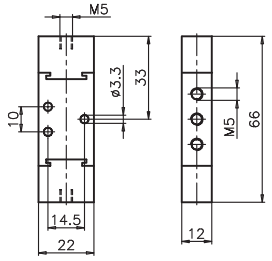





Weight 110 g
Minimum pilot pressure 2,5 bar

***5/2 ways***





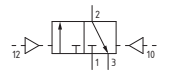

Weight 120 g
Minimum pilot pressure 2,5 bar

## Pneumatic-Pneumatic

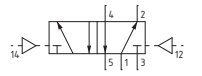
**Coding:** 105.Ⓣ.11.11

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |
| Pilot ports size | M5 |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



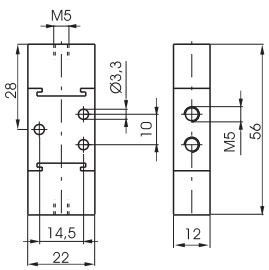

105.32.11.11




105.52.11.11

***3/2 ways***

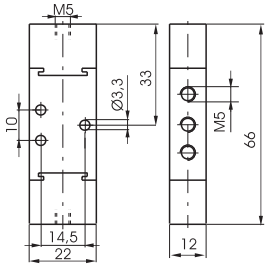





Weight 110 g
Minimum pilot pressure 2,5 bar

***5/2 ways***






Weight 120 g
Minimum pilot pressure 2,5 bar



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 200

The series 200 consist of a broad range of valves with various type of actuation.
The connections for this series are from G 1/8" to G 1".
Due to their special construction with a balanced spool, these valves can be used interchangeably as 3 ways or 5 ways.
The 3 ways can be used normally closed or normally open and the 5 ways can be fed through the exhausts 3 and 5 with different pressures according to the need.
The spool, as it is moving, isolates the connections without being affected by the inlet pressure.



### Construction characteristics

| | G 1/8" - G 1/4" - G 1/2" - G 1" |
|---|---|
| Body | Aluminium |
| Spacers | Technopolymer<br>Aluminium for G1" (211) |
| Seals | NBR<br>PUR for 212/2 |
| Springs | Spring steel |
| Operators | Aluminium<br>Technopolymer |
| Pistons | Technopolymer, for 228 pneumatic command valves Aluminium, for 224, 212, 212/2 and 211 pneumatic command valves |
| Spools | Steel<br>Aluminium, for 212/2 |

### Use and maintenance

This valves have an average life of 15 million cycles depending on the application and air quality.
Filtered and lubricated air using specified lubricants will reduce the wear of the seals and ensures long and trouble free operation.
Please ensure that the valve is being used according with the manufacturers specification, such as air pressure and temperature.
The exhaust port of the distributor has to be protected in a dusty and dirty environment.
Repair kits including the spool complete with seals are available for overhauling the valves.
However, although this is a simple operation it should be carried out by a competent person.

**ATTENTION:** use hydraulic oil class H for lubrication such as CASTROL MAGNA SW32.

## Tappet - Spring

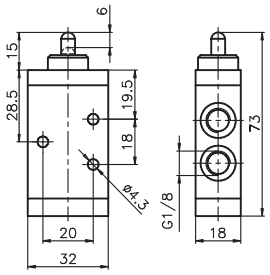
**Coding:** 228.Ⓣ.0.1

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

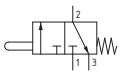
***3/2 ways***





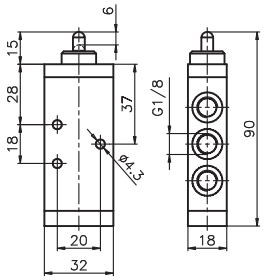

Weight 85 g
Operating force 33 N

228.32.0.1



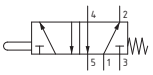
***5/2 ways***






Weight 105 g
Operating force 33 N

228.52.0.1



## Tappet panel - Spring

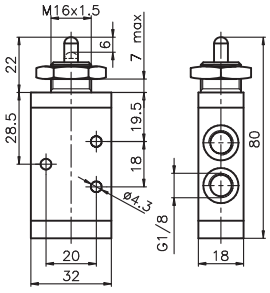
**Coding:** 228.Ⓣ.1.1

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

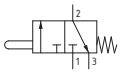
***3/2 ways***





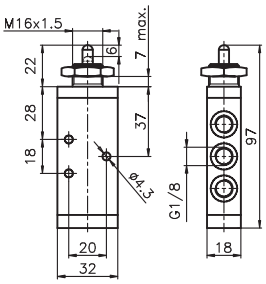

Weight 102 g
Operating force 33 N

228.32.1.1



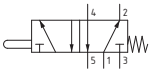
***5/2 ways***






Weight 122 g
Operating force 33 N

228.52.1.1



## Lever roller-Spring

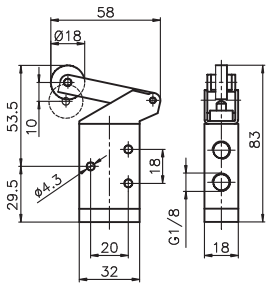
**Coding:** 228.Ⓣ.2.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VERSION |
| | **1** = Plastic roller |
| | **1/2** = Metal roller |

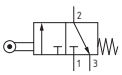
***3/2 ways***





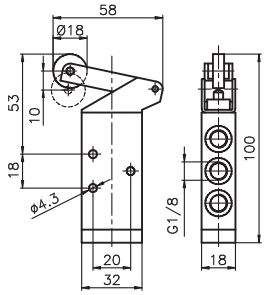

Weight 115 g
Operating force 15 N

228.32.2.Ⓥ



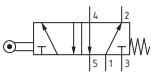
***5/2 ways***






Weight 135 g
Operating force 15 N

228.52.2.Ⓥ





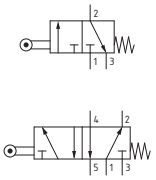
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Lever roller ball bearing - Spring

**Coding:** 228.Ⓣ.2.1/1

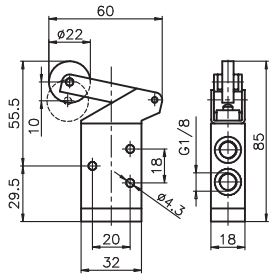
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



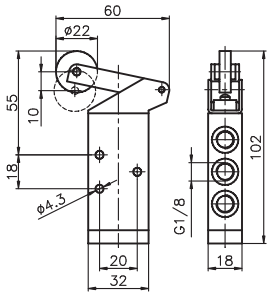



Weight 130 g
Operating force 15 N

228.32.2.1/1

***5/2 ways***






Weight 150 g
Operating force 15 N

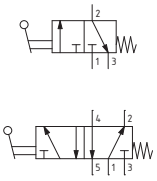
228.52.2.1/1

## Lever button - Spring

**Coding:** 228.Ⓣ.2.6/Ⓒ

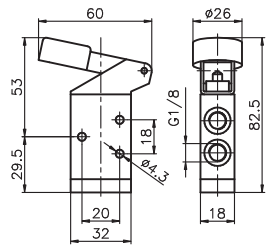
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



***3/2 ways***



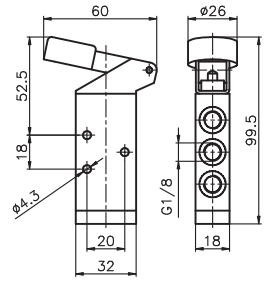



Weight 120 g
Operating force 15 N

228.32.2.6/Ⓒ

***5/2 ways***






Weight 120 g
Operating force 15 N

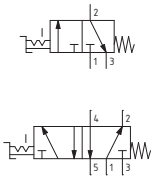
228.52.2.6/Ⓒ

## Switch lateral 2 positions

**Coding:** 228.Ⓣ.27

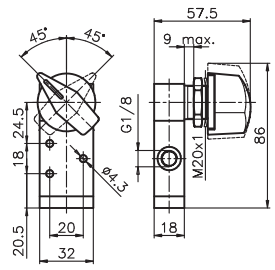
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



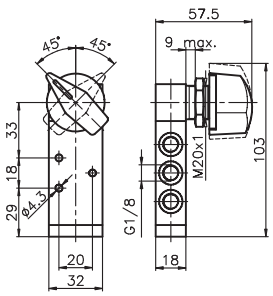



Weight 190 g

228.32.27

***5/2 ways***






Weight 210 g

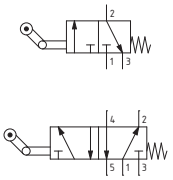
228.52.27

## Lever roller unidirectional - Spring

**Coding:** 228.Ⓣ.3.Ⓥ

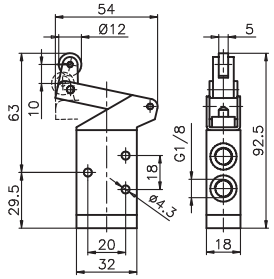
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| | VERSION |
| Ⓥ | **1** = Plastic roller |
| | **1/2** = Metal roller |



*3/2 ways*

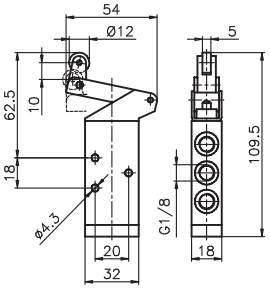





Weight 110 g

228.32.3.Ⓥ






Weight 130 g

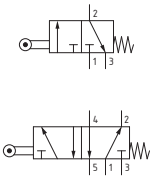
228.52.3.Ⓥ

## Lever roller lateral bidirectional - Spring

**Coding:** 228.Ⓣ.4.1

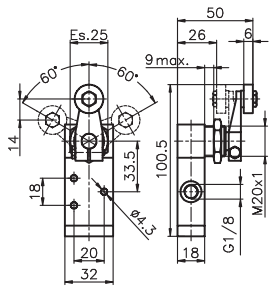
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



*3/2 ways*



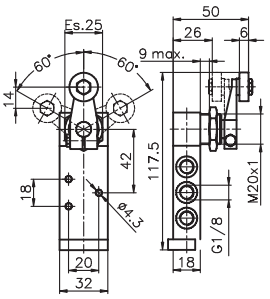



Weight 180 g

228.32.4.1

*5/2 ways*






Weight 200 g

228.52.4.1

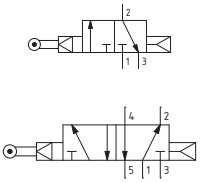
## Lever sensitive - differential

**Coding:** 228.Ⓣ.4.13

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

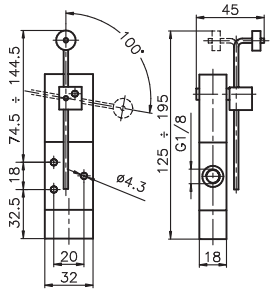
| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

Minimum rotation angle 11°



*3/2 ways*



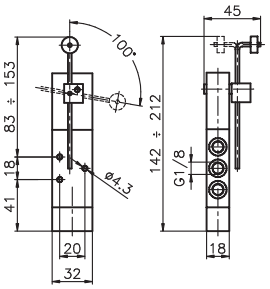



Weight 200 g
Minimum working pressure 2,5 bar

228.32.4.13

*5/2 ways*






Weight 220 g
Minimum rotation angle 11°
Minimum working pressure 2,5 bar

228.52.4.13



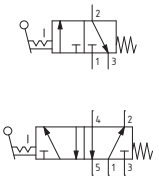
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Lever panel Ø30 - 2 positions

**Coding:** 228.Ⓣ.5/Ⓒ

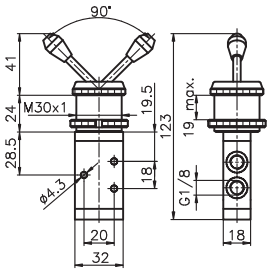
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | LEVER COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



***3/2 ways***



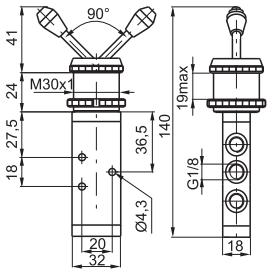



Weight 198 g

228.32.5/Ⓒ

***5/2 ways***






Weight 218 g

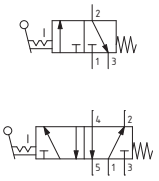
228.52.5/Ⓒ

## Frontal lever - 2 positions

**Coding:** 228.Ⓣ.55/Ⓒ

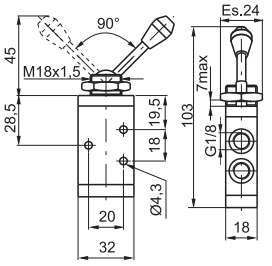
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | LEVER COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



***3/2 ways***



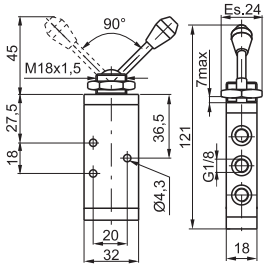



Weight 115 g

228.32.55/Ⓒ

***5/2 ways***






Weight 135 g

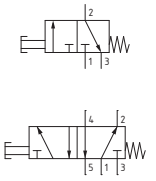
228.52.55/Ⓒ

## Push button Ø30 - spring

**Coding:** 228.Ⓣ.6.1/Ⓒ

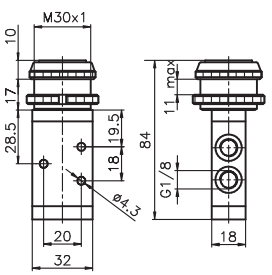
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



***3/2 ways***



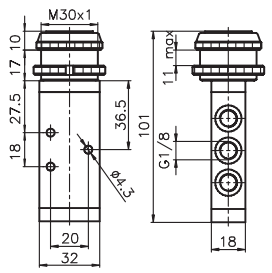



Weight 155 g
Operating force 33 N

228.32.6.1/Ⓒ

***5/2 ways***






Weight 175 g
Operating force 33 N

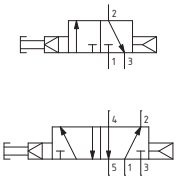
228.52.6.1/Ⓒ

## Sensitive push button Ø30 - differential

**Coding:** 228.Ⓣ.6.13/Ⓒ

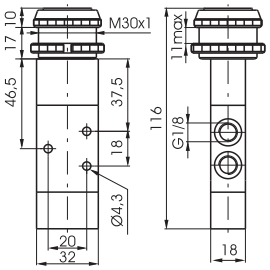
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



***3/2 ways***



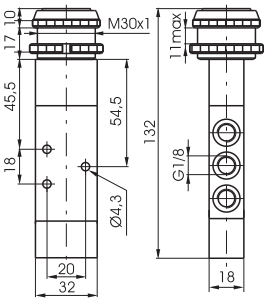



Weight 197 g
Operating force 18,5 N (at 6 bar)

228.32.6.13/Ⓒ

***5/2 ways***






Weight 217 g
Operating force 18,5 N (at 6 bar)

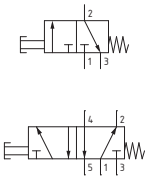
228.52.6.13/Ⓒ

## Push button - Spring

**Coding:** 228.Ⓣ.6.22/Ⓒ

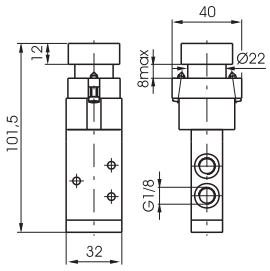
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |
| | **4** = Yellow |



***3/2 ways***



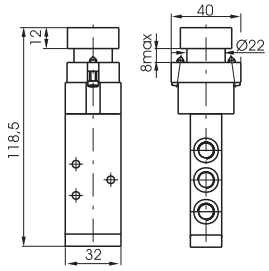



Weight 225 g
Operating force 33 N

228.32.6.22/Ⓒ

***5/2 ways***






Weight 245 g
Operating force 33 N

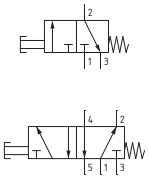
228.52.6.22/Ⓒ

## Raised push button Ø22 - Spring

**Coding:** 228.Ⓣ.6.23/Ⓒ

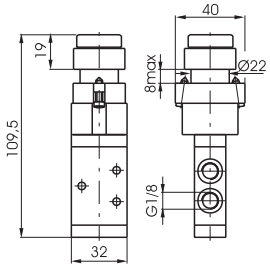
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |
| | **4** = Yellow |



***3/2 ways***



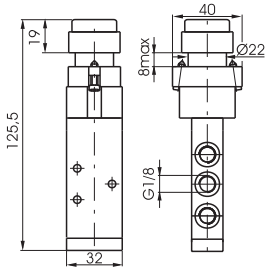



Weight 230 g
Operating force 33 N

228.32.6.23/Ⓒ

***5/2 ways***






Weight 250 g
Operating force 33 N

228.52.6.23/Ⓒ



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

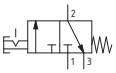
## Push button Ø22 - 2 positions

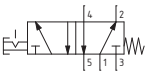
**Coding:** 228.Ⓣ.6.25

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

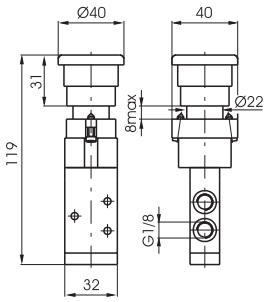
Emergency - Rotate to unlock





***3/2 ways***



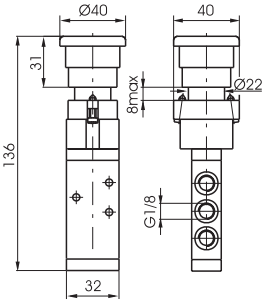



Weight 235 g
Operating force 33 N

228.32.6.25

***5/2 ways***






Weight 235 g
Operating force 33 N

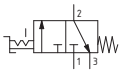
228.52.6.25

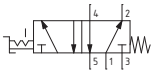
## Switch 2 positions

**Coding:** 228.Ⓣ.6.27

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

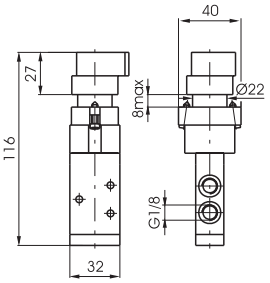
| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |





***3/2 ways***



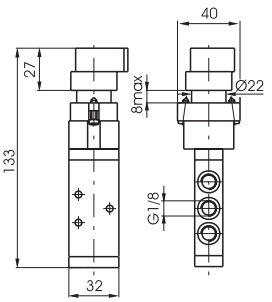



Weight 230 g

228.32.6.27

***5/2 ways***






Weight 250 g

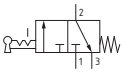
228.52.6.27

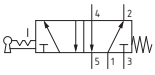
## Key switch 2 positions

**Coding:** 228.Ⓣ.6.28

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

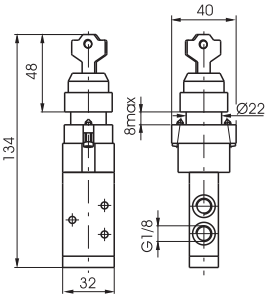
| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |





***3/2 ways***



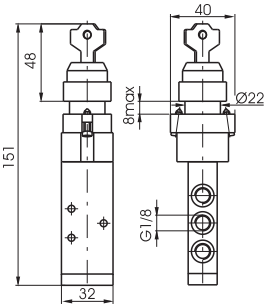



Weight 230 g

228.32.6.28

***5/2 ways***






Weight 250 g

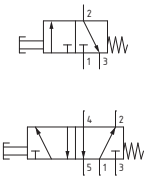
228.52.6.28

## Palm push button Ø30 2 positions

**Coding:** 228.Ⓣ.7.1/Ⓒ

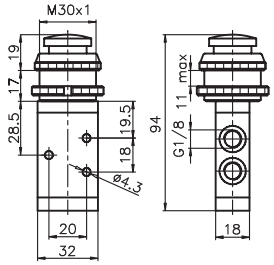
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



***3/2 ways***



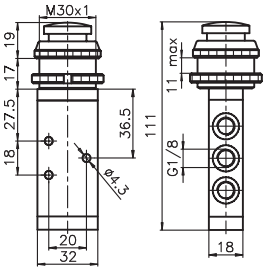



Weight 148 g

228.32.7.1/Ⓒ

***5/2 ways***






Weight 168 g

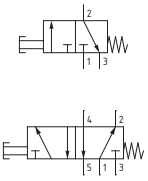
228.52.7.1/Ⓒ

## Push button - Spring

**Coding:** 228.Ⓣ.8.1/Ⓒ

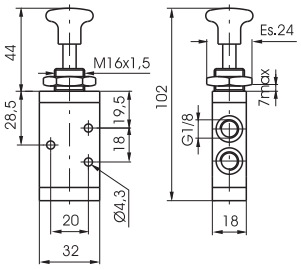
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



***3/2 ways***



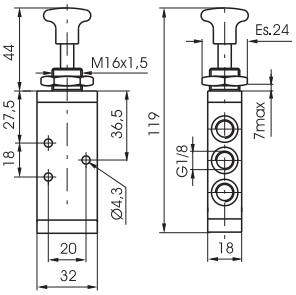



Weight 120 g

228.32.8.1/Ⓒ

***5/2 ways***






Weight 140 g

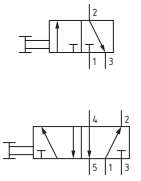
228.52.8.1/Ⓒ

## Push button 2 positions

**Coding:** 228.Ⓣ.8/Ⓒ

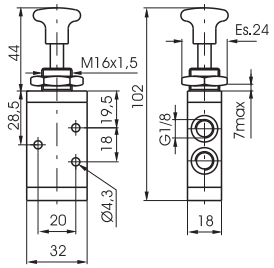
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



***3/2 ways***



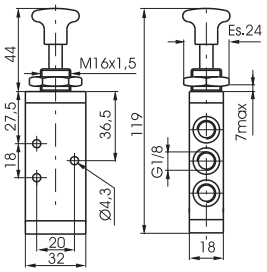



Weight 120 g

228.32.8/Ⓒ

***5/2 ways***






Weight 140 g

228.52.8/Ⓒ



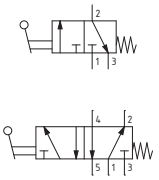
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Lever lateral - Spring

**Coding:** 228.Ⓣ.9.1/Ⓒ

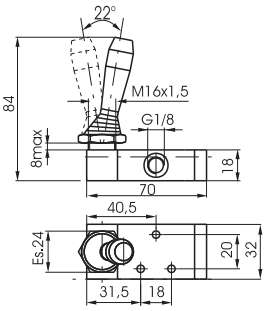
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| | LEVER COLOR |
| Ⓒ | **1** = Red |
| | **2** = Black |
| | **3** = Green |



***3/2 ways***



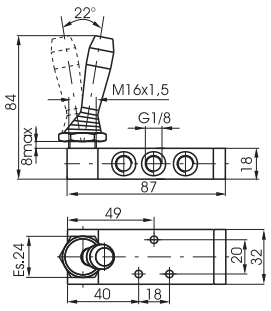



Weight 140 g

228.32.9.1/Ⓒ

***5/2 ways***






Weight 160 g

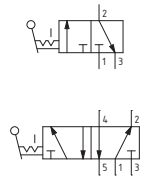
228.52.9.1/Ⓒ

## Lever lateral 2 positions

**Coding:** 228.Ⓣ.9/Ⓒ

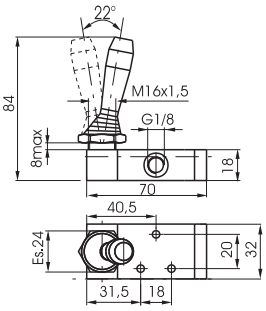
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| | LEVER COLOR |
| Ⓒ | **1** = Red |
| | **2** = Black |
| | **3** = Green |



***3/2 ways***



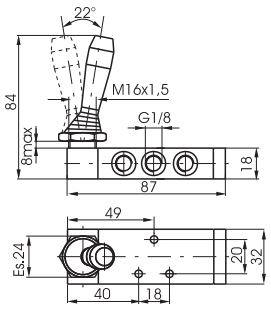



Weight 140 g

228.32.9/Ⓒ

***5/2 ways***






Weight 160 g

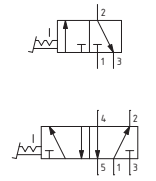
228.52.9/Ⓒ

## Pedal aluminium 2 positions

**Coding:** 228.Ⓣ.10

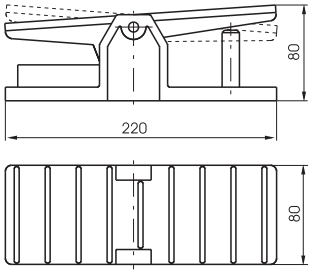
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



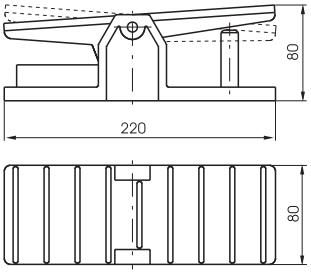



Weight 790 g

228.32.10

***5/2 ways***






Weight 810 g

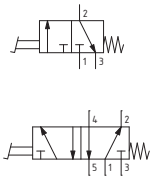
228.52.10

## Pedal aluminium - Spring

**Coding:** 228.Ⓣ.10.1

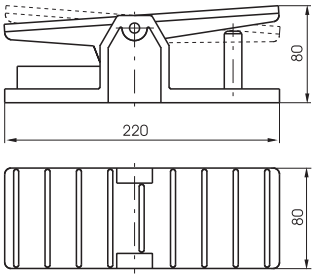
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



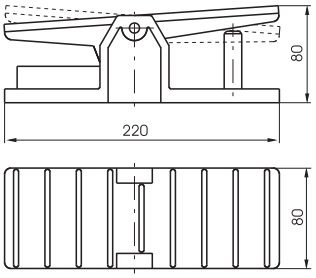



Weight 790 g

228.32.10.1

***5/2 ways***






Weight 810 g

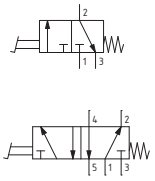
228.52.10.1

## Pedal protected - Spring

**Coding:** 228.Ⓣ.10.Ⓥ

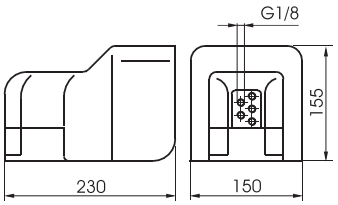
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| | VERSION |
| Ⓥ | **1/1** = Standard version |
| | **2/1** = without safety device |



***3/2 ways***



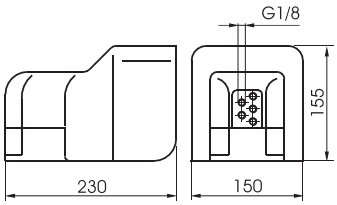



Weight 1120 g

228.32.10.Ⓥ

***5/2 ways***






Weight 1120 g

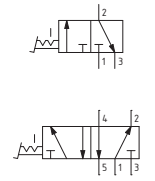
228.52.10.Ⓥ

## Pedal protected 2 positions

**Coding:** 228.Ⓣ.10/1

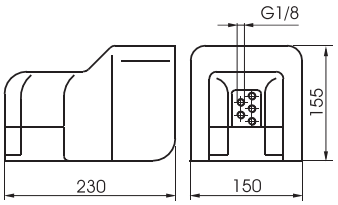
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



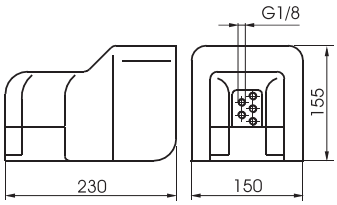



Weight 1120 g

228.32.10/1

***5/2 ways***






Weight 1120 g

228.52.10/1



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

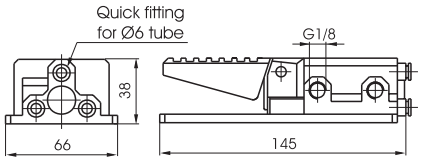
## Pedal plastic miniaturized - Spring

**Coding:** 228.52.10.Ⓕ

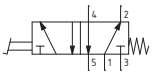
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | |
|---|---|
| Ⓕ | FUNCTION |
| | **1P** = Standard version |
| | **1PX** = Stainless steel spool |






Weight 230 g



## Lever lateral spring centre 3 positions

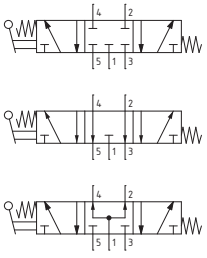
**Coding:** 228.53.Ⓕ.9.1/Ⓒ

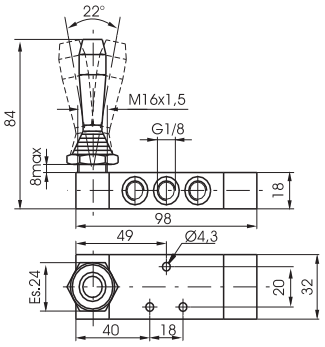
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | |
|---|---|
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓒ | LEVER COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



Weight 190 g






## Lever lateral 3 positions detent

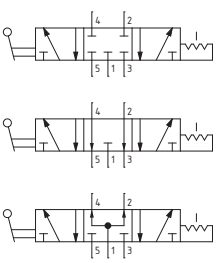
**Coding:** 228.53.Ⓕ.9/Ⓒ

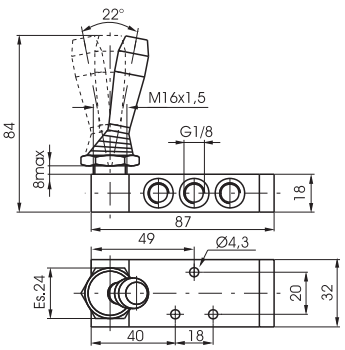
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | |
|---|---|
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓒ | LEVER COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



Weight 160 g





## Lever central (spring 3 pos.) Operator, Levar, Spole in Technopolymer

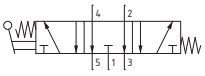
**Coding:** 228.53.32.99P/©

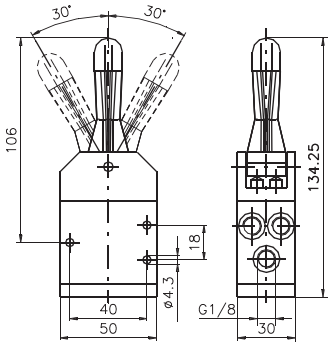
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 410 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| © | LEVER COLOR |
|---|---|
| | **1** = Red |
| | **2** = Black |



Weight 140 g






## Lever central (spring 3 pos.) Levar in Technopolymer

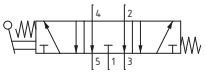
**Coding:** 228.53.32.99/©

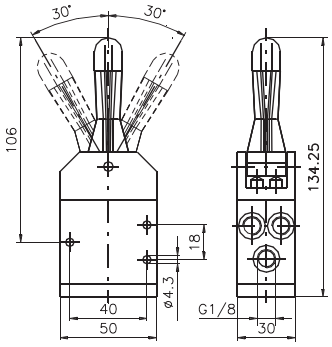
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 410 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| © | LEVER COLOR |
|---|---|
| | **1** = Red |
| | **2** = Black |



Weight 140 g






## Lever central Metal (spring 3 pos.) One position stable

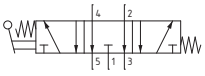
**Coding:** 228.53.32.99/©.S

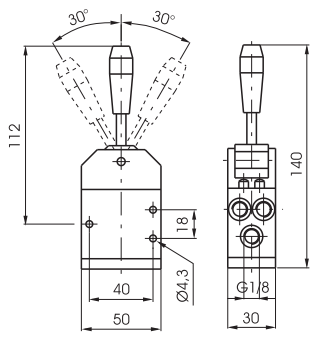
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 410 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| © | LEVER COLOR |
|---|---|
| | **1** = Red |
| | **2** = Black |



Weight 140 g








Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

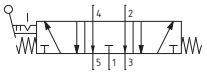
## Lever central Metal

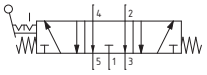
**Coding:** 228.53.32.99.Ⓕ/Ⓒ

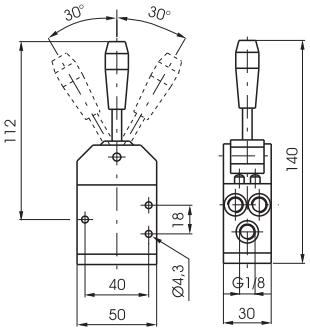
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 410 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | |
|---|---|
| Ⓕ | FUNCTION |
| | **2** = 2 stable positions |
| | **3** = 3 stable positions |
| Ⓒ | LEVER COLOR |
| | **1** = Red |
| | **2** = Black |










Weight 140 g

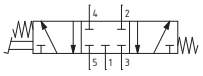
## Pedal - Spring 3 positions

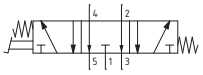
**Coding:** 228.53.Ⓕ.10.1

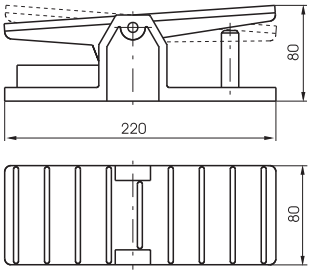
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 410 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | |
|---|---|
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |









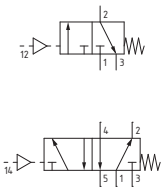

Weight 810 g

## Pneumatic - Spring

**Coding:** 228.Ⓣ.11.1

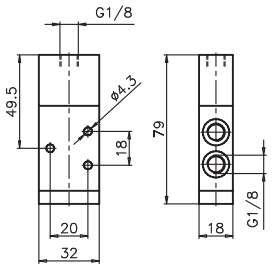
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |
| Pilot ports size | G1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



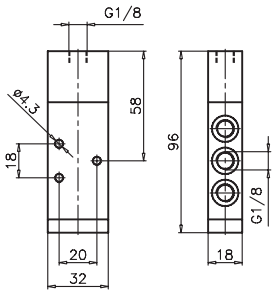



Weight 110 g
Minimum pilot pressure 2,5 bar

228.32.11.1

***5/2 ways***






Weight 130 g
Minimum pilot pressure 2,5 bar

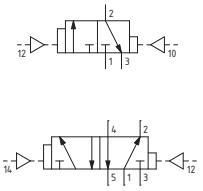
228.52.11.1

## Pneumatic - Differential

**Coding:** 228.Ⓣ.11.12

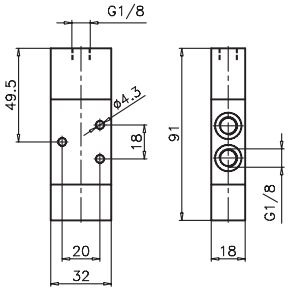
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |
| Pilot ports size | G1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



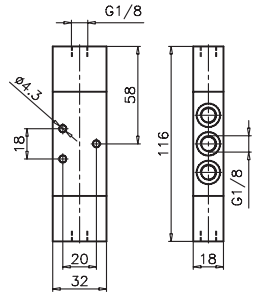



Weight 140 g
Minimum pilot pressure 2,5 bar

228.32.11.12

***5/2 ways***






Weight 160 g
Minimum pilot pressure 2,5 bar

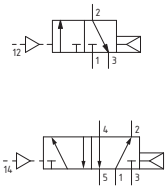
228.52.11.12

## Pneumatic-Differential (Self feeding)

**Coding:** 228.Ⓣ.11.12/1

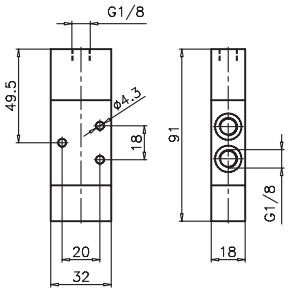
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |
| Pilot ports size | G1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



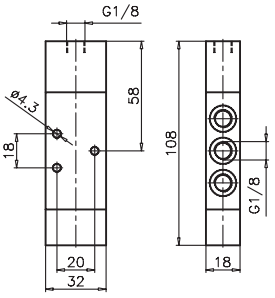



Weight 130 g
Minimum pilot pressure 2,5 bar

228.32.11.12/1

***5/2 ways***






Weight 150 g
Minimum pilot pressure 2,5 bar

228.52.11.12/1



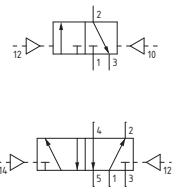
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pneumatic-Pneumatic

**Coding:** 228.Ⓣ.11.11

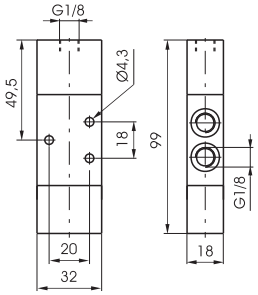
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |
| Pilot ports size | G1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



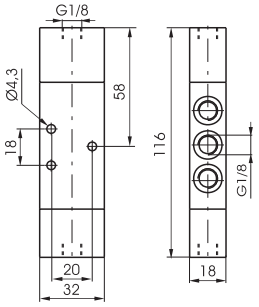



Weight 140 g
Minimum pilot pressure 2 bar

228.32.11.11

***5/2 ways***






Weight 160 g
Minimum pilot pressure 2 bar

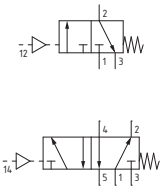
228.52.11.11

## Amplified pneumatic - Spring

**Coding:** 228.Ⓣ.13.1

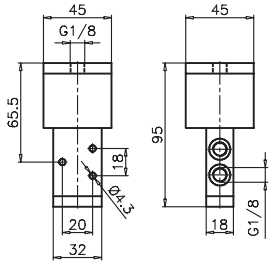
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |
| Pilot ports size | G1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



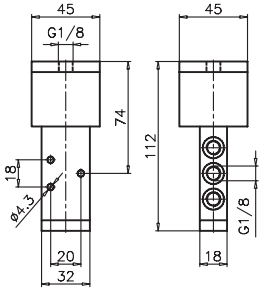



Weight 260 g
Minimum pilot pressure 0,5 bar

228.32.13.1

***5/2 ways***






Weight 290 g
Minimum pilot pressure 0,5 bar

228.52.13.1

## Pneumatic-Pneumatic 5/3

**Coding:** 228.53.Ⓕ.11.11

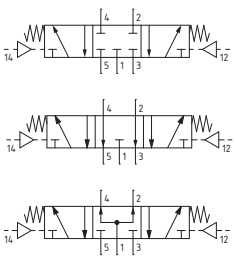
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 410 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |
| Pilot ports size | G1/8" |

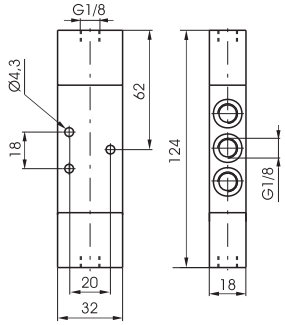
| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |



Weight 180 g
Minimum pilot pressure 3 bar

228.53.Ⓕ.11.11



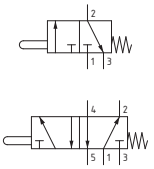


## Tappet panel - Spring

**Coding:** 224.Ⓣ.1.1

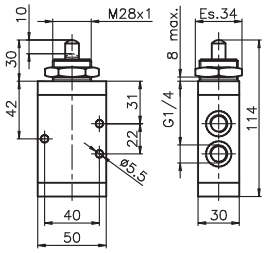
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



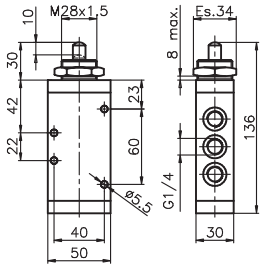



Weight 370 g
Operating force 71,5 N

224.32.1.1

***5/2 ways***






Weight 455 g
Operating force 71,5 N

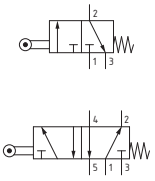
224.52.1.1

## Lever roller - Spring

**Coding:** 224.Ⓣ.2.1

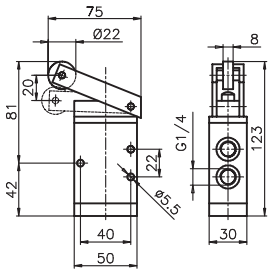
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



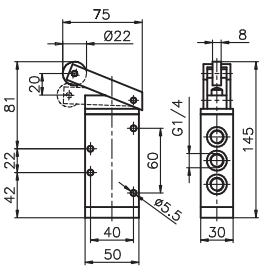



Weight 510 g
Operating force 35 N

224.32.2.1

***5/2 ways***






Weight 595 g
Operating force 35 N

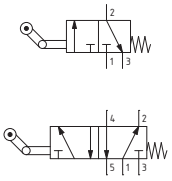
224.52.2.1

## Lever roller unidirectional - Spring

**Coding:** 224.Ⓣ.3.1

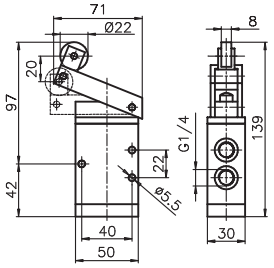
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



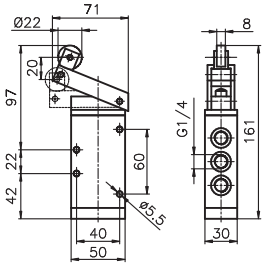



Weight 525 g
Operating force 35 N

224.32.3.1

***5/2 ways***






Weight 610 g
Operating force 35 N

224.52.3.1



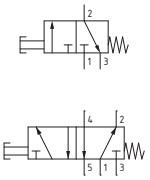
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Push button - Spring

**Coding:** 224.Ⓣ.8.1

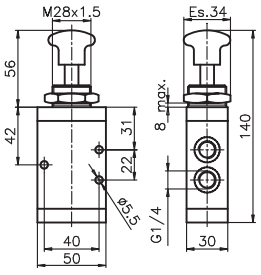
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



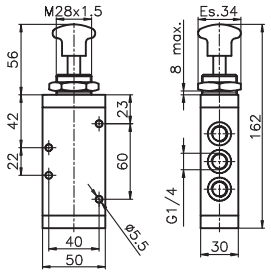



Weight 395 g
Operating force 71,5 N

224.32.8.1

***5/2 ways***






Weight 480 g
Operating force 71,5 N

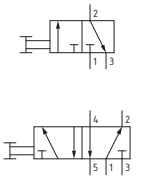
224.52.8.1

## Push button 2 positions

**Coding:** 224.Ⓣ.8

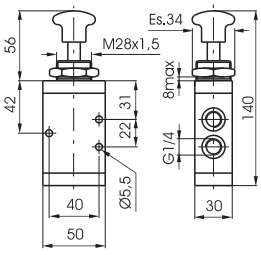
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



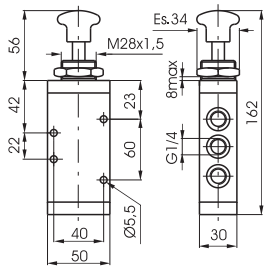



Weight 385 g
Operating force 13 N

224.32.8

***5/2 ways***






Weight 470 g
Operating force 13 N

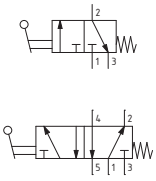
224.52.8

## Lever lateral - Spring

**Coding:** 224.Ⓣ.9.1/Ⓒ

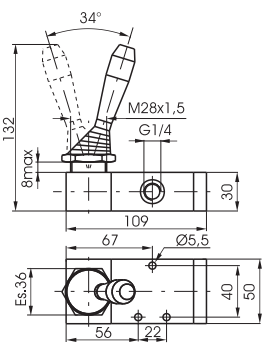
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| | LEVER COLOR |
| Ⓒ | **1** = Red |
| | **2** = Black |
| | **3** = Green |



***3/2 ways***



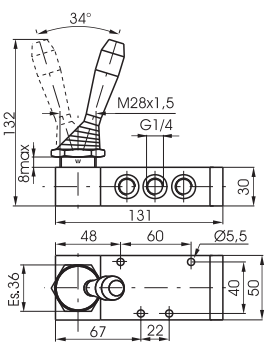



Weight 520 g

224.32.9.1/Ⓒ

***5/2 ways***






Weight 605 g

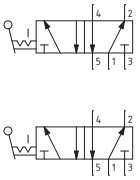
224.52.9.1/Ⓒ

## Lever lateral 2 positions

**Coding:** 224.Ⓣ.9/Ⓒ

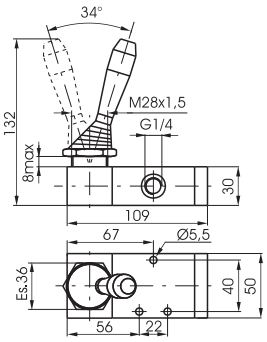
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | LEVER COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



***3/2 ways***



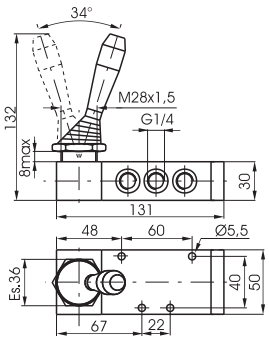



Weight 510 g

224.32.9/Ⓒ

***5/2 ways***






Weight 595 g

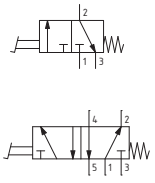
224.52.9/Ⓒ

## Pedal aluminium - Spring

**Coding:** 224.Ⓣ.10.1

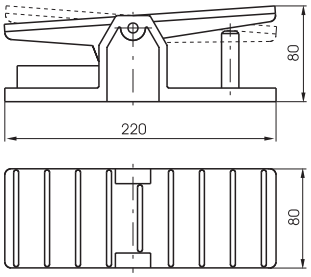
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



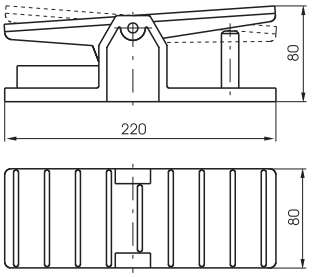



Weight 1070 g

224.32.10.1

***5/2 ways***






Weight 1155 g

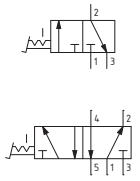
224.52.10.1

## Pedal aluminium 2 positions

**Coding:** 224.Ⓣ.10

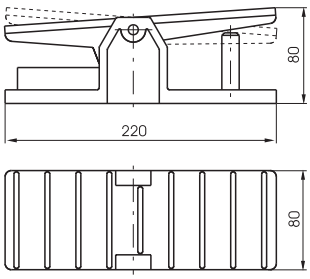
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



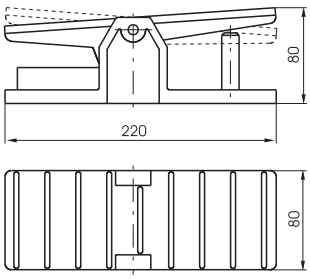



Weight 1060 g

224.32.10

***5/2 ways***






Weight 1145 g

224.52.10



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Lateral Lever spring - 3 positions

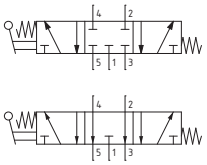
**Coding:** 224.53.Ⓕ.9.1/Ⓒ

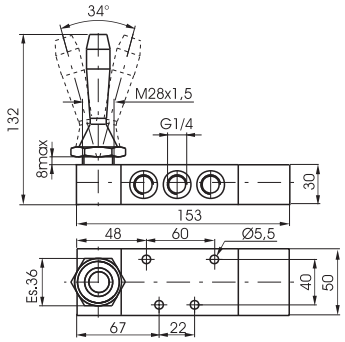
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1280 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |

| | |
|---|---|
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| Ⓒ | LEVER COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



Weight 745 g






## Lever lateral 3 positions detent

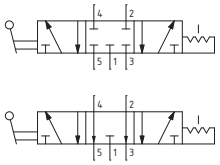
**Coding:** 224.53.Ⓕ.9/Ⓒ

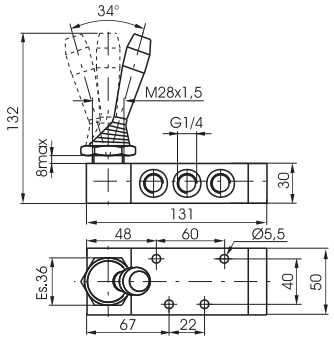
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1280 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |

| | |
|---|---|
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| Ⓒ | LEVER COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



Weight 605 g





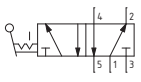

## Lever lateral with locking device - 2 positions

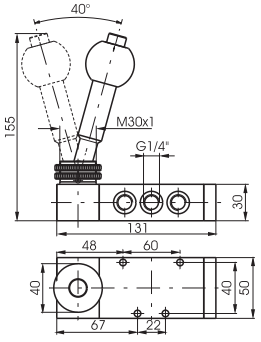
**Coding:** 224.52.9.2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1020 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |



Weight 825 g





## Lever lateral with locking device - Spring 3 positions

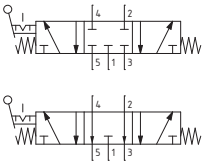
**Coding:** 224.53.Ⓕ.9.2

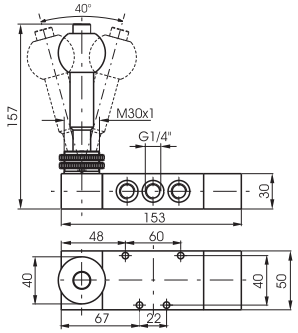
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1020 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |

| | FUNCTION |
|---|---|
| Ⓕ | **31** = Closed centres |
| | **32** = Open centres |



Weight 965 g






## Pedal - Spring 3 positions

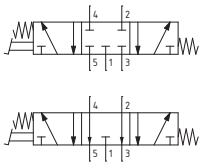
**Coding:** 224.53.Ⓕ.10.1

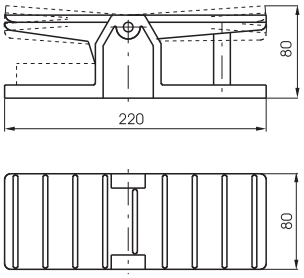
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1280 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |

| | FUNCTION |
|---|---|
| Ⓕ | **31** = Closed centres |
| | **32** = Open centres |



Weight 1285 g






## Pedal 3 positions

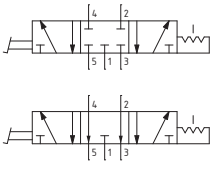
**Coding:** 224.53.Ⓕ.10

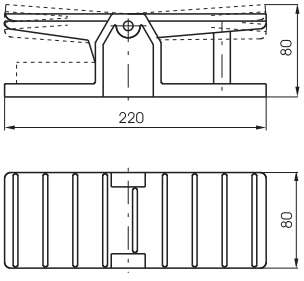
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1280 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |

| | FUNCTION |
|---|---|
| Ⓕ | **31** = Closed centres |
| | **32** = Open centres |



Weight 1145 g







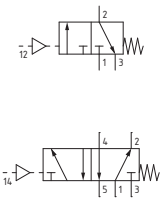

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pneumatic - Spring

**Coding:** 224.Ⓣ.11.1

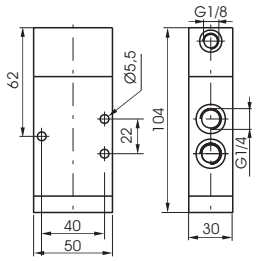
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |
| Pilot ports size | G1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



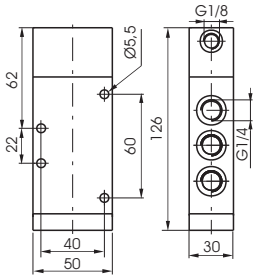



Weight 370 g
Minimum pilot pressure 2,5 bar

224.32.11.1

***5/2 ways***






Weight 450 g
Minimum pilot pressure 2,5 bar

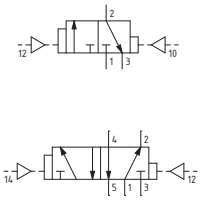
224.52.11.1

## Pneumatic - Differential

**Coding:** 224.Ⓣ.11.12

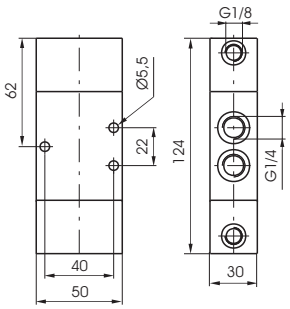
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |
| Pilot ports size | G1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



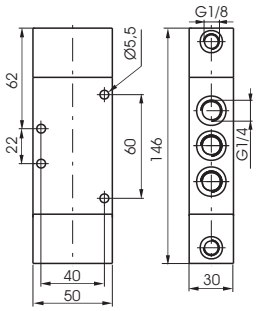



Weight 480 g
Minimum pilot pressure 2,5 bar

224.32.11.12

***5/2 ways***






Weight 550 g
Minimum pilot pressure 2,5 bar

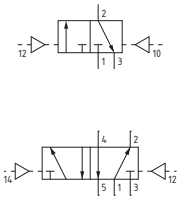
224.52.11.12

## Pneumatic-Pneumatic

**Coding:** 224.Ⓣ.11.11

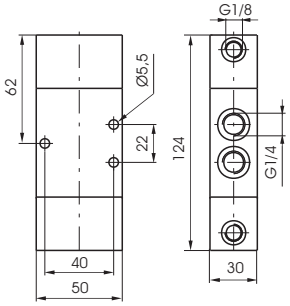
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |
| Pilot ports size | G1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



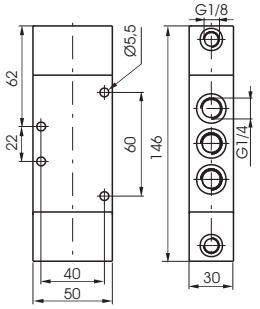



Weight 470 g
Minimum pilot pressure 2 bar

224.32.11.11

***5/2 ways***






Weight 540 g
Minimum pilot pressure 2 bar

224.52.11.11

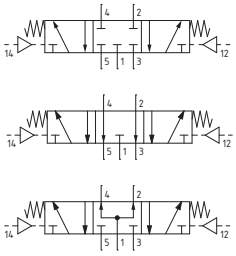
## Pneumatic-Pneumatic 5/3

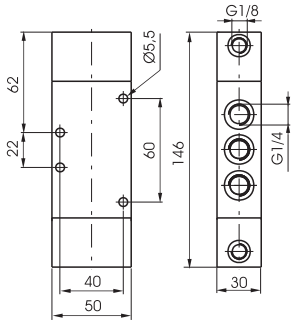
**Coding:** 224.53.Ⓕ.11.11

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1280 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |
| Pilot ports size | G1/8" |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |






Weight 550 g
Minimum pilot pressure 3 bar



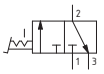
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

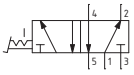
## Pedal protected 2 positions

**Coding:** 214.Ⓣ.10/1

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |

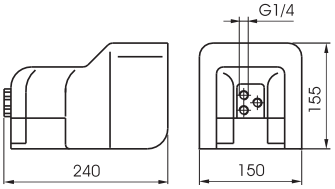
| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |





***3/2 ways***



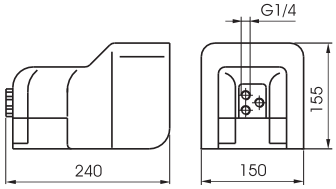



Weight 1730 g

214.32.10/1

***5/2 ways***






Weight 1730 g

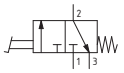
214.52.10/1

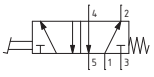
## Pedal protected - Spring

**Coding:** 214.Ⓣ.10.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G1/4" |

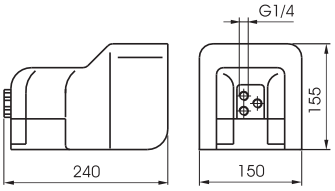
| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| | VERSION |
| Ⓥ | **1/1** = Standard version |
| | **2/1** = without safety device |





***3/2 ways***



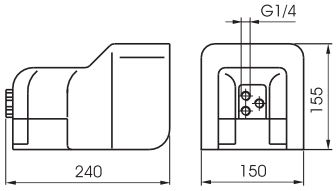



Weight 1730 g

214.32.10.Ⓥ

***5/2 ways***






Weight 1730 g

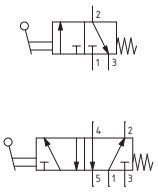
214.52.10.Ⓥ

## Lever lateral - Spring

**Coding:** 212.Ⓣ.9.1

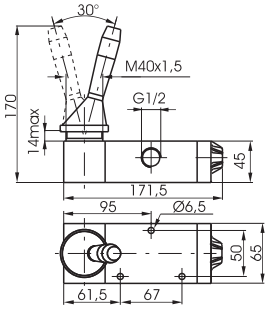
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3500 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



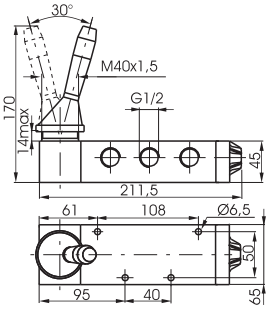



Weight 1480 g

212.32.9.1

***5/2 ways***






Weight 1765 g

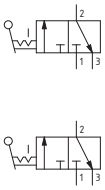
212.52.9.1

## Lever lateral 2 positions

**Coding:** 212.Ⓣ.9

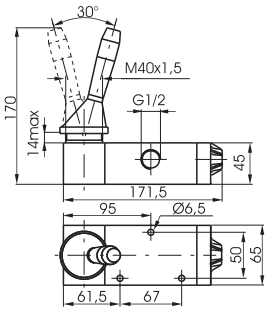
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3500 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



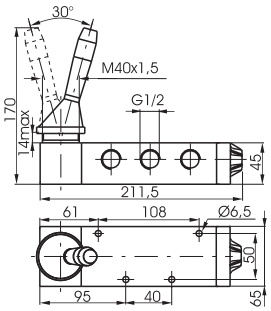



Weight 1460 g

212.32.9

***5/2 ways***






Weight 1745 g

212.52.9

## Lever lateral spring centre 3 positions

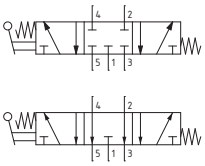
**Coding:** 212.53.Ⓕ.9.1

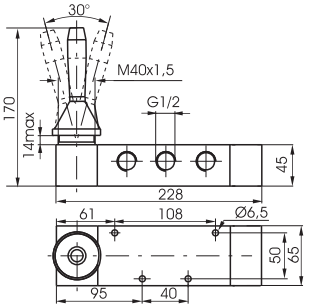
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3000 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |



Weight 2100 g








Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

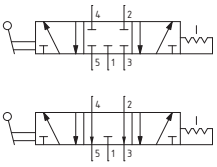
## Lever lateral 3 positions detent

**Coding:** 212.53.Ⓕ.9

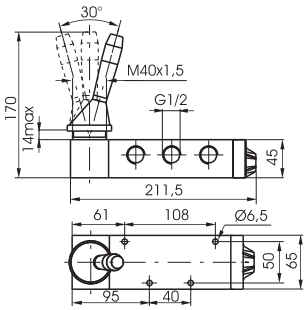
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3000 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |









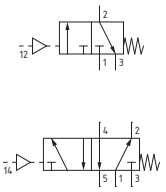

Weight 1765 g

## Pneumatic - Spring

**Coding:** 212.Ⓣ.11.1

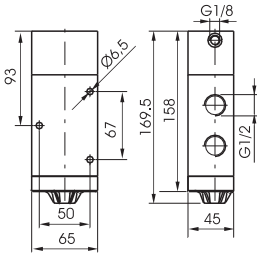
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3500 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



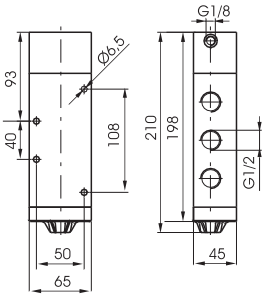



Weight 1110 g
Minimum pilot pressure 2,5 bar

212.32.11.1

***5/2 ways***






Weight 1390 g
Minimum pilot pressure 2,5 bar

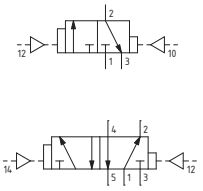
212.52.11.1

## Pneumatic - Differential

**Coding:** 212.Ⓣ.11.12

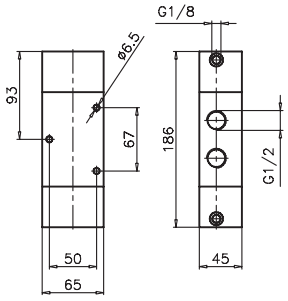
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3500 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



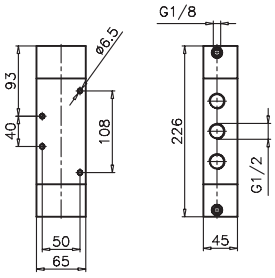



Weight 1380 g
Minimum pilot pressure 2,5 bar

212.32.11.12

***5/2 ways***






Weight 1660 g
Minimum pilot pressure 2,5 bar

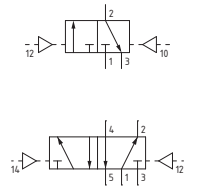
212.52.11.12

## Pneumatic-Pneumatic

**Coding:** 212.Ⓣ.11.11

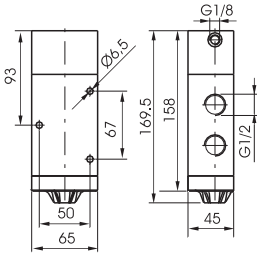
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3500 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



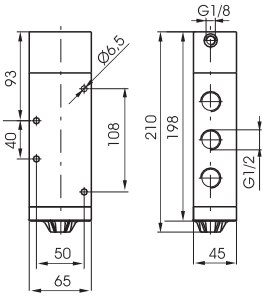



Weight 1350 g
Minimum pilot pressure 2 bar

212.32.11.11

***5/2 ways***






Weight 1630 g
Minimum pilot pressure 2 bar

212.52.11.11



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

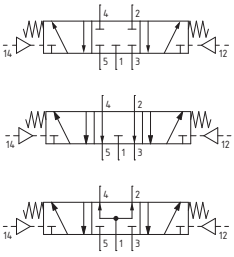
## Pneumatic-Pneumatic 5/3

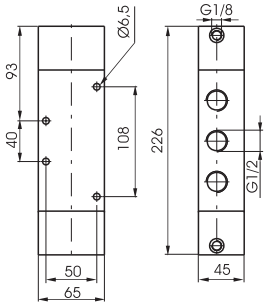
**Coding:** 212.53.Ⓕ.11.11

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3000 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |







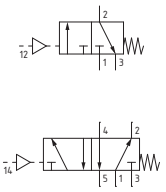

Weight 1650 g
Minimum pilot pressure 3 bar

## Pneumatic - Spring

**Coding:** 212/2.Ⓣ.11.1

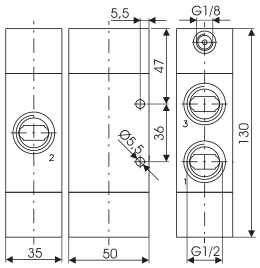
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3600 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



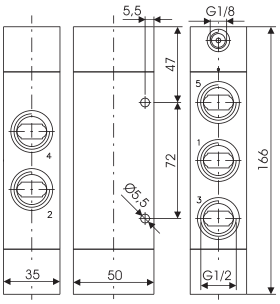



Weight 524 g
Minimum pilot pressure 2,5 bar

212/2.32.11.1

***5/2 ways***






Weight 644 g
Minimum pilot pressure 2,5 bar

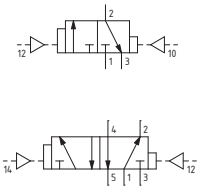
212/2.52.11.1

## Pneumatic - Differential

**Coding:** 212/2.Ⓣ.11.12

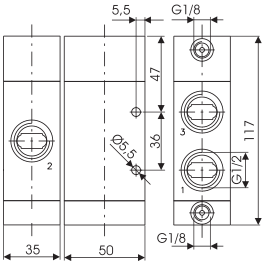
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3600 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



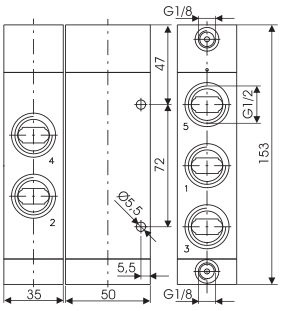



Weight 464 g
Minimum pilot pressure 2,5 bar

212/2.32.11.12

***5/2 ways***






Weight 586 g
Minimum pilot pressure 2,5 bar

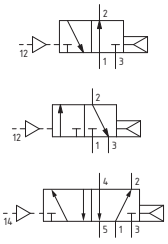
212/2.52.11.12

## Pneumatic-Differential (Self feeding)

**Coding:** 212/2.Ⓣ.11.12/Ⓕ

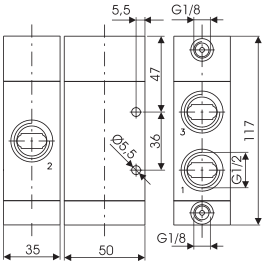
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3600 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓕ | FUNCTION |
| | **1.C** = Normally closed (only for 3 ways) |
| | **1.A** = Normally open (only for 3 ways) |
| | **1** = Self feeding (only for 5 ways) |



***3/2 ways***



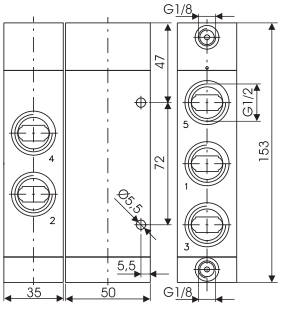



Weight 466 g
Minimum pilot pressure 2,5 bar

212/2.32.11.12/Ⓕ

***5/2 ways***






Weight 588 g
Minimum pilot pressure 2,5 bar

212/2.52.11.12/1



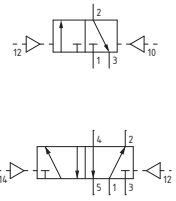
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pneumatic-Pneumatic

**Coding:** 212/2.Ⓣ.11.11

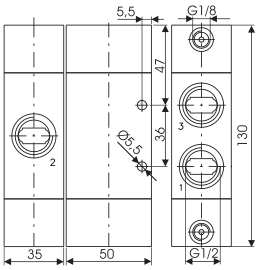
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3600 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



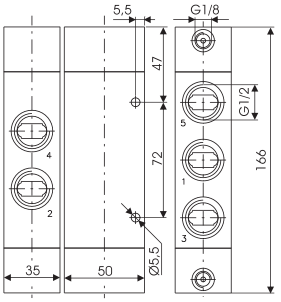



Weight 518 g
Minimum pilot pressure 2,5 bar

212/2.32.11.11

***5/2 ways***






Weight 640 g
Minimum pilot pressure 2,5 bar

212/2.52.11.11

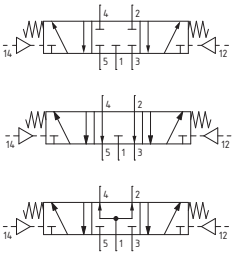
## Pneumatic-Pneumatic 5/3

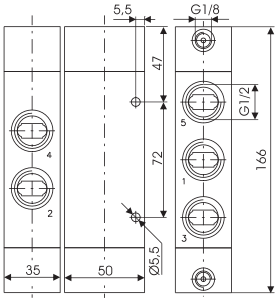
**Coding:** 212/2.53.Ⓕ.11.11

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3300 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |







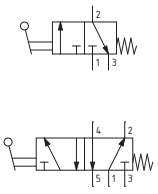

Weight 684 g
Minimum pilot pressure 3 bar

## Lever lateral - Spring

**Coding:** 211.Ⓣ.9.1

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 6500 |
| Orifice size (mm) | 20 |
| Working ports size | G1" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

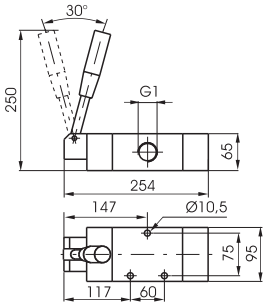


***3/2 ways***



Weight 4300 g

211.32.9.1

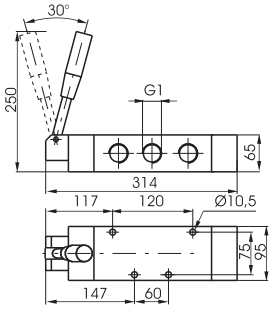



***5/2 ways***



Weight 4900 g

211.52.9.1

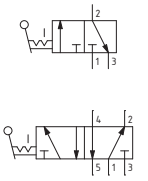



## Lever lateral 2 positions

**Coding:** 211.Ⓣ.9

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 6500 |
| Orifice size (mm) | 20 |
| Working ports size | G1" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

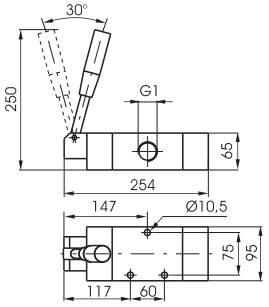


***3/2 ways***



Weight 4300 g

211.32.9

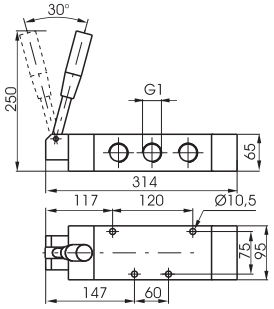



***5/2 ways***



Weight 4900 g

211.52.9




## Lever lateral spring centre 3 positions

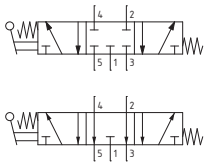
**Coding:** 211.53.Ⓕ.9.1

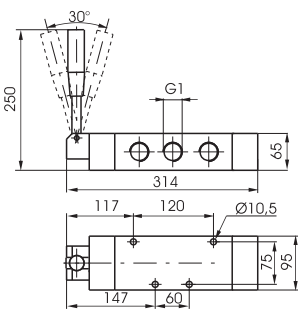
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 6500 |
| Orifice size (mm) | 20 |
| Working ports size | G1" |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |



Weight 5000 g








Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

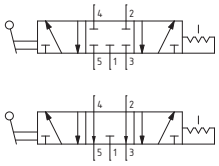
## Lever lateral 3 positions detent

**Coding:** 211.53.Ⓕ.9

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 6500 |
| Orifice size (mm) | 20 |
| Working ports size | G1" |

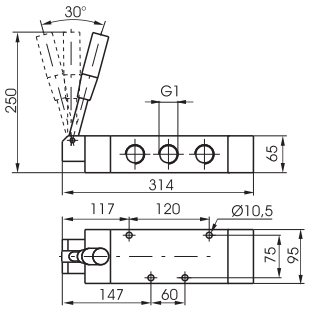
| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |











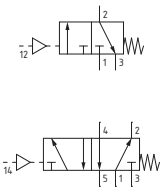

Weight 5000 g

## Pneumatic - Spring

**Coding:** 211.Ⓣ.11.1

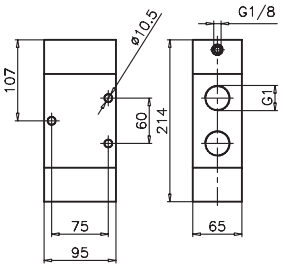
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 6500 |
| Orifice size (mm) | 20 |
| Working ports size | G1" |
| Pilot ports size | G1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



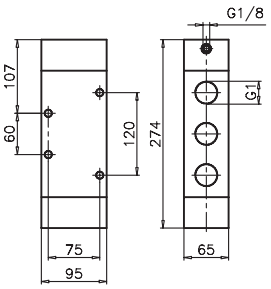



Weight 3330 g
Minimum pilot pressure 2,5 bar

211.32.11.1

***5/2 ways***






Weight 4200 g
Minimum pilot pressure 2,5 bar

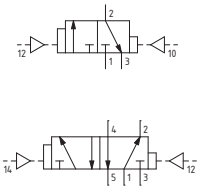
211.52.11.1

## Pneumatic - Differential

**Coding:** 211.Ⓣ.11.12

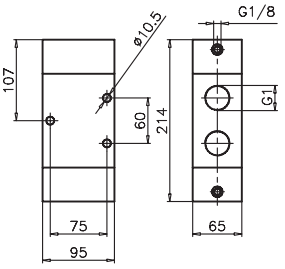
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 6500 |
| Orifice size (mm) | 20 |
| Working ports size | G1" |
| Pilot ports size | G1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



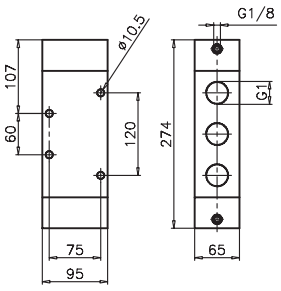



Weight 3330 g
Minimum pilot pressure 2,5 bar

211.32.11.12

***5/2 ways***






Weight 4200 g
Minimum pilot pressure 2,5 bar

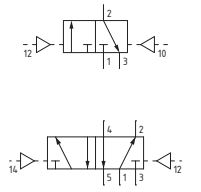
211.52.11.12

## Pneumatic-Pneumatic

**Coding:** 211.Ⓣ.11.11

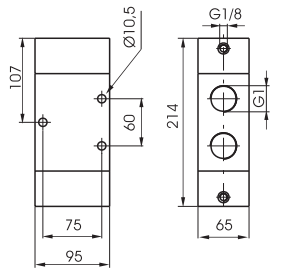
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 6500 |
| Orifice size (mm) | 20 |
| Working ports size | G1" |
| Pilot ports size | G1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



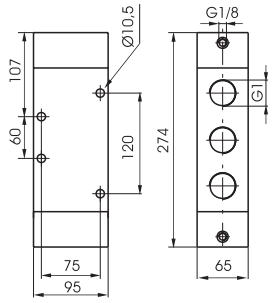



Weight 3330 g
Minimum pilot pressure 2 bar

211.32.11.11

***5/2 ways***






Weight 4200 g
Minimum pilot pressure 2 bar

211.52.11.11



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

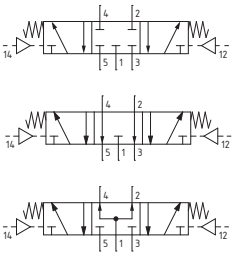
## Pneumatic-Pneumatic 5/3

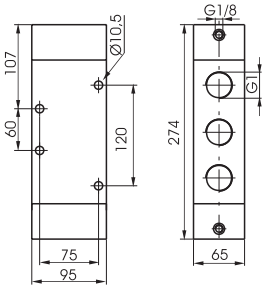
**Coding:** 211.53.Ⓕ.11.11

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 6500 |
| Orifice size (mm) | 20 |
| Working ports size | G1" |
| Pilot ports size | G1/8" |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |






Weight 4200 g
Minimum pilot pressure 3 bar

## Series T200

The **T200** series, consist of a broad range of valves with various type of actuation. The connections for this series are from G 1/8" to G 1/4". The main components constituting the valves of the Tecno228 series are manufactured with high performance technopolymer.
The use of technopolymer has resulted in a light weight product which can be offered to the market at very interesting prices.
The **T228** valves, are manufactured with G1/8" connections, 3 and 5 ways function, mechanical or pneumatically operated, monostable spring or pneumatic return, bistable and in 5 ways 3 positions version with closed, open and pressured centres.
This series is completely interchangable with the standard 228 series (with alluminium body).
The **T224** valves, are manufactured with G 1/4" connections, 3/2, 5/2 and 5/3 ways function, (monostable or bistable), depending on version and actuation (manual, pneumatic, or electrical), and self aligning (pneumatic, electric or spring).



**Maximum fitting torque**

| Thread | Maximum torque (Nm) |
|---|---|
| G 1/8" | 4 |
| G1/4" | 9 |

**Construction characteristics**

| | **G 1/8" (T228) and G 1/4" (T224)** |
|---|---|
| Body | Technopolymer |
| Operators | Technopolymer |
| Seals | NBR |
| Spacers | Technopolymer |
| Spools | Technopolymer<br>Stainless steel only for the versions<br>Push button-Spring and Lever lateral |
| Springs | Spring steel |
| Pistons | Technopolymer |

**Use and maintenance**

This valves have an average life of 15 million cycles depending on the application and air quality.
Filtered and lubricated air using specified lubricants will reduce the wear of the seals and ensures long and trouble free operation.
Please ensure that the valve is being used according with the manufacturers specification, such as air pressure and temperature.
The exhaust port of the distributor has to be protected in a dusty and dirty environment.
Repair kits including the spool complete with seals are available for overhauling the valves.
However, although this is a simple operation it should be carried out by a competent person.

**ATTENTION:** use hydraulic oil class H for lubrication such as CASTROL MAGNA SW32.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

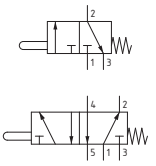
## Tappet - Spring

**Coding:** T228.Ⓣ.0.1

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

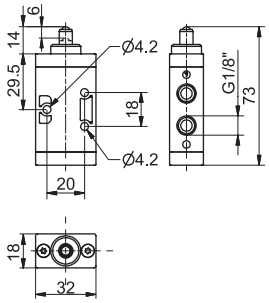
| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

Operating force 33 N



***3/2 ways***



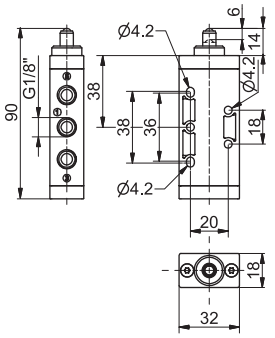



Weight 60 g

T228.32.0.1

***5/2 ways***






Weight 72 g

T228.52.0.1

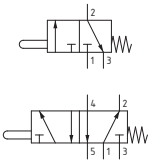
## Tappet panel - Spring

**Coding:** T228.Ⓣ.1.1

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

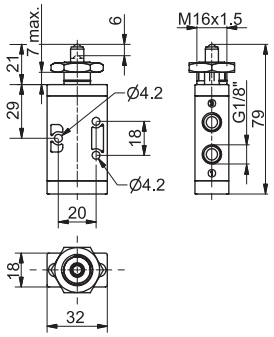
| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

Operating force 33 N



***3/2 ways***



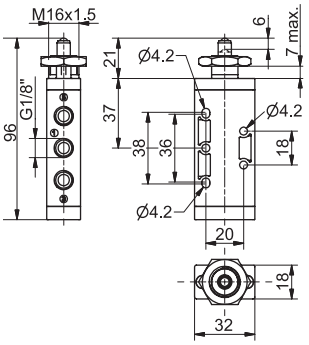



Weight 77 g

T228.32.1.1

***5/2 ways***






Weight 90 g

T228.52.1.1

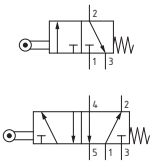
## Lever roller-Spring

**Coding:** T228.Ⓣ.2.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

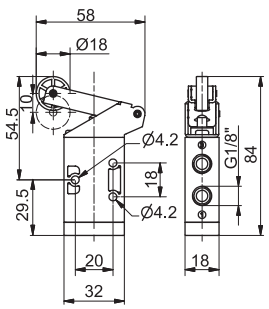
| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VERSION |
| | **1** = Plastic roller |
| | **1/1** = ball bearing |
| | **1/2** = Metal roller |

Operating force 15 N



***3/2 ways***



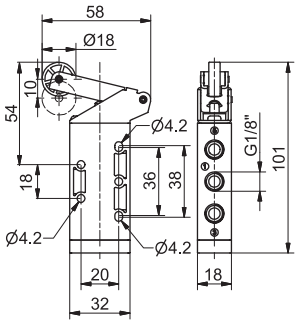



Weight 90 g

T228.32.2.Ⓥ

***5/2 ways***






Weight 102 g

T228.52.2.Ⓥ

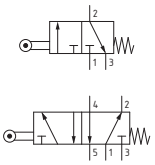
## Lever roller ball bearing - Spring

**Coding:** T228.Ⓣ.2.1/1

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

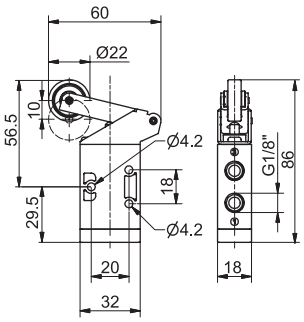
| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

Operating force 15 N



***3/2 ways***



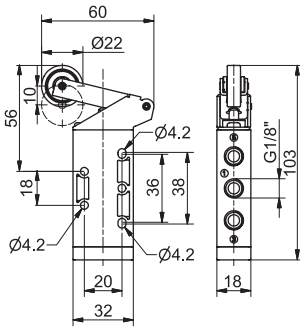



Weight 105 g

T228.32.2.1/1

***5/2 ways***






Weight 117 g

T228.52.2.1/1

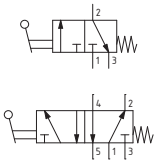
## Lever button - Spring

**Coding:** T228.Ⓣ.2.6/Ⓒ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

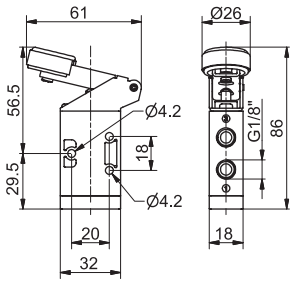
| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| | LEVER COLOR |
| Ⓒ | **1** = Red |
| | **2** = Black |
| | **3** = Green |

Operating force 15 N



***3/2 ways***



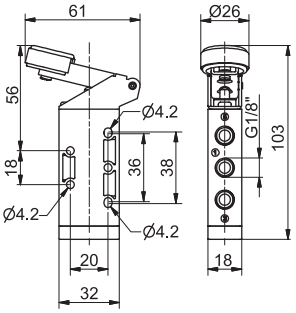



Weight 95 g

T228.32.2.6/Ⓒ

***5/2 ways***






Weight 87 g

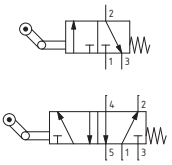
T228.52.2.6/Ⓒ

## Lever roller unidirectional - Spring

**Coding:** T228.Ⓣ.3.Ⓥ

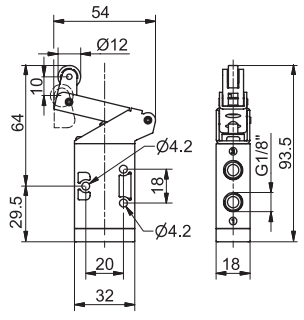
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| | VERSION |
| Ⓥ | **1** = Plastic roller |
| | **1/2** = Metal roller |



***3/2 ways***



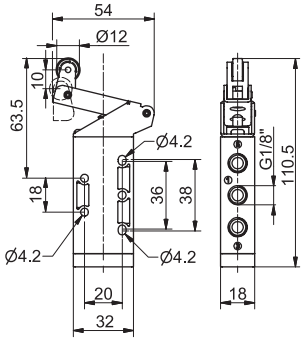



Weight 85 g

T228.32.3.Ⓥ

***5/2 ways***






Weight 97 g

T228.52.3.Ⓥ



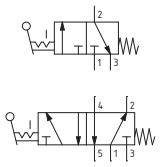
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Lever panel Ø30 - 2 positions

**Coding:** T228.Ⓣ.5/Ⓒ

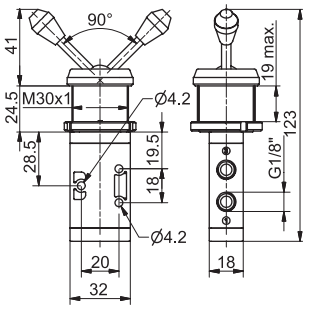
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | LEVER COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



***3/2 ways***



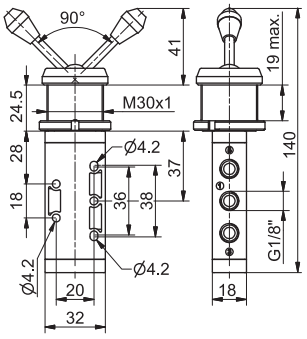



Weight 168 g

T228.32.5/Ⓒ

***5/2 ways***






Weight 180 g

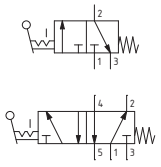
T228.52.5/Ⓒ

## Lever lateral 2 positions

**Coding:** T228.Ⓣ.55/Ⓒ

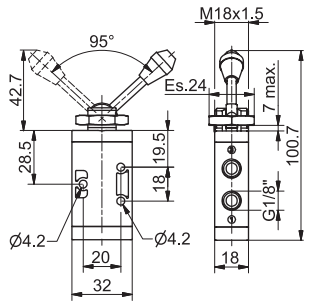
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | LEVER COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



***3/2 ways***



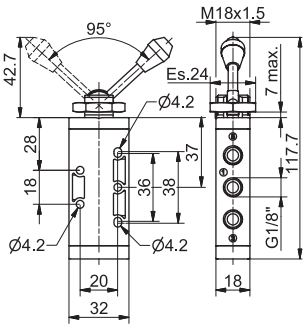



Weight 84 g

T228.32.55/Ⓒ

***5/2 ways***






Weight 96 g

T228.52.55/Ⓒ

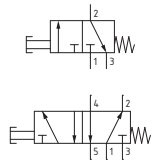
## Push button Ø30 - spring

**Coding:** T228.Ⓣ.6.1/Ⓒ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

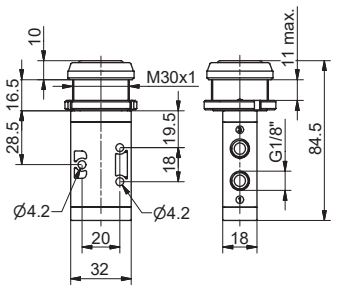
| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |

Operating force 33 N



***3/2 ways***



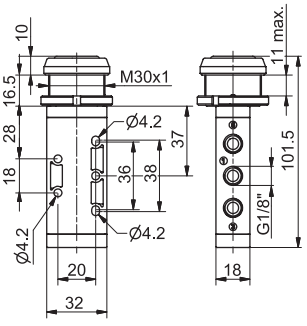



Weight 125 g

T228.32.6.1/Ⓒ

***5/2 ways***






Weight 137 g

T228.52.6.1/Ⓒ

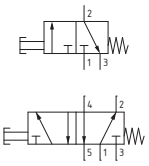
## Push button - Spring

**Coding:** T228.Ⓣ.6.22/Ⓒ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

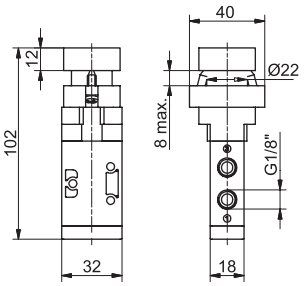
| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| | BUTTON COLOR |
| Ⓒ | **1** = Red |
| | **2** = Black |
| | **3** = Green |
| | **4** = Yellow |

Operating force 33 N



***3/2 ways***



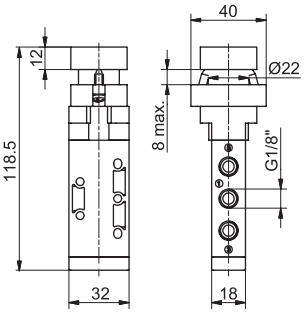



Weight 200 g

T228.32.6.22/Ⓒ

***5/2 ways***






Weight 212 g

T228.52.6.22/Ⓒ

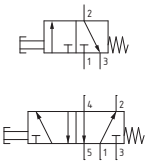
## Raised push button Ø22 - Spring

**Coding:** T228.Ⓣ.6.23/Ⓒ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

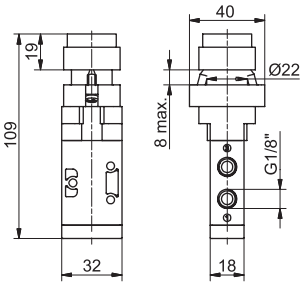
| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| | BUTTON COLOR |
| Ⓒ | **1** = Red |
| | **2** = Black |
| | **3** = Green |
| | **4** = Yellow |

Operating force 33 N



***3/2 ways***



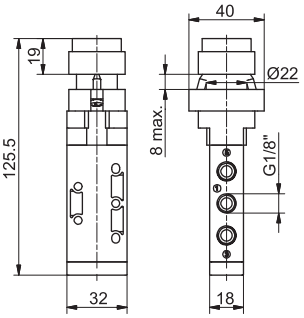



Weight 205 g

T228.32.6.23/Ⓒ

***5/2 ways***






Weight 217 g

T228.52.6.23/Ⓒ

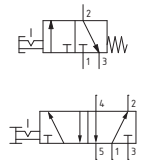
## Push button Ø22 - 2 positions

**Coding:** T228.Ⓣ.6.25

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

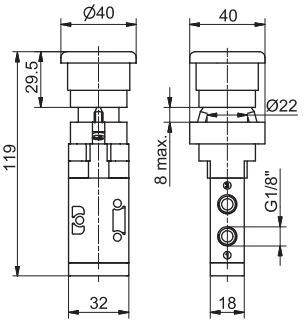
| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

Operating force 33 N



***3/2 ways***



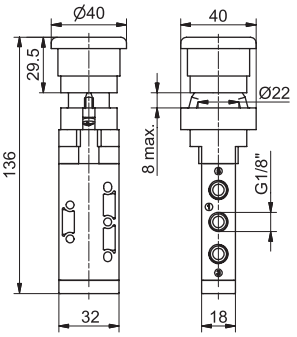



Weight 210 g

T228.32.6.25

***5/2 ways***






Weight 202 g

T228.52.6.25



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

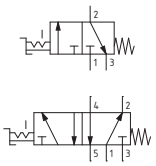
## Switch 2 positions

**Coding:** T228.Ⓣ.6.27

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

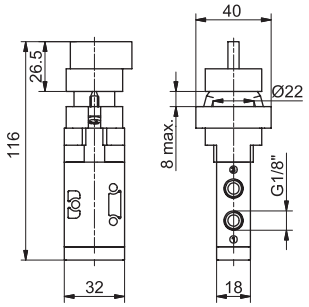
| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

Operating force 33 N



***3/2 ways***



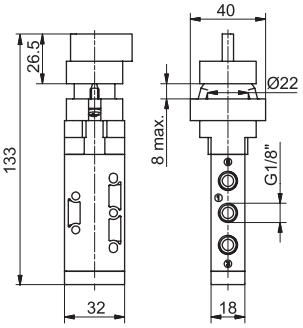



Weight 205 g

T228.32.6.27

***5/2 ways***






Weight 217 g

T228.52.6.27

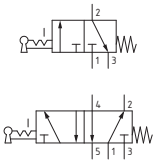
## Key switch 2 positions

**Coding:** T228.Ⓣ.6.28

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

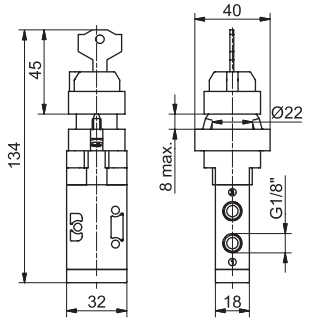
| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

Operating force 33 N



***3/2 ways***



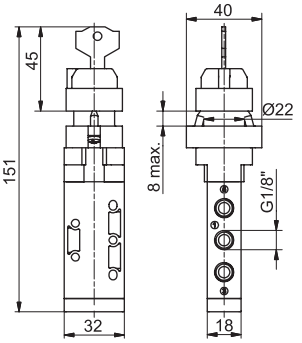



Weight 205 g

T228.32.6.28

***5/2 ways***






Weight 217 g

T228.52.6.28

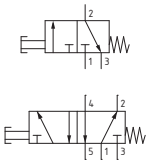
## Palm push button Ø30 2 positions

**Coding:** T228.Ⓣ.7.1/Ⓒ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

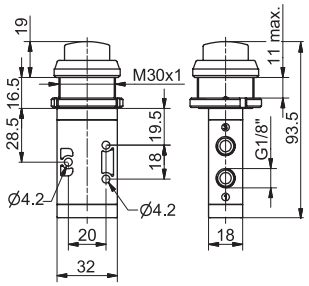
| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| | BUTTON COLOR |
| Ⓒ | **1** = Red |
| | **2** = Black |
| | **3** = Green |

Operating force 33 N



***3/2 ways***



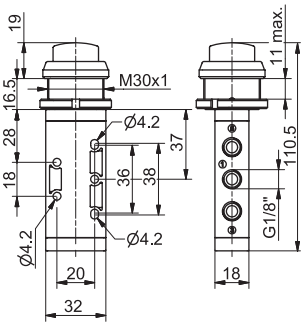



Weight 118 g

T228.32.7.1/Ⓒ

***5/2 ways***






Weight 130 g

T228.52.7.1/Ⓒ

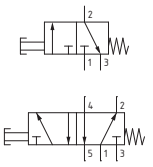
## Push button - Spring

**Coding:** T228.Ⓣ.8.1/Ⓒ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

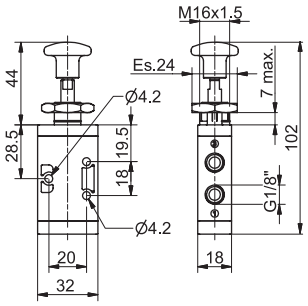
| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |

Operating force 33 N



*3/2 ways*



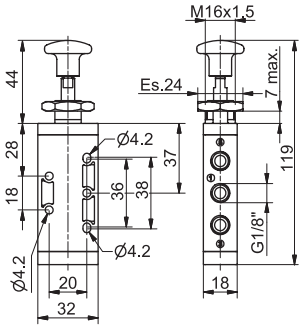



Weight 95 g

T228.32.8.1/Ⓒ

*5/2 ways*






Weight 107 g

T228.52.8.1/Ⓒ

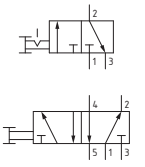
## Push button 2 positions

**Coding:** T228.Ⓣ.8/Ⓒ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

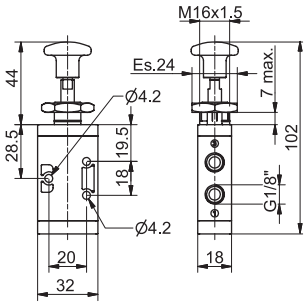
| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | BUTTON COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |

Operating force 10 N



*3/2 ways*



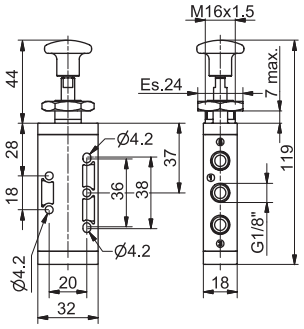



Weight 95 g

T228.32.8/Ⓒ

*5/2 ways*






Weight 107 g

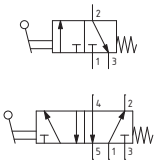
T228.52.8/Ⓒ

## Lever lateral - Spring

**Coding:** T228.Ⓣ.9.1/Ⓒ

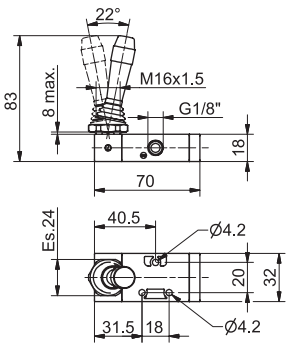
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | LEVER COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



*3/2 ways*



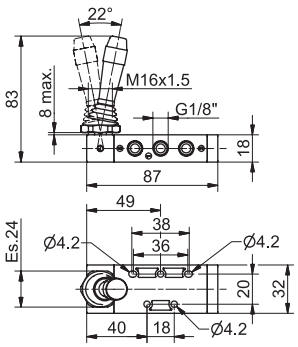



Weight 100 g

T228.32.9.1/Ⓒ

*5/2 ways*






Weight 110 g

T228.52.9.1/Ⓒ



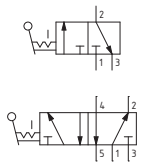
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Lever lateral 2 positions

**Coding:** T228.Ⓣ.9/Ⓒ

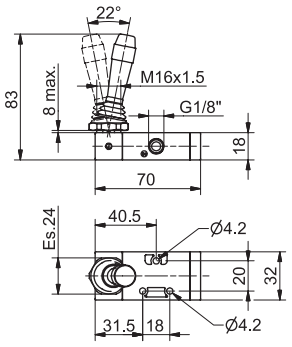
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| | LEVER COLOR |
| Ⓒ | **1** = Red |
| | **2** = Black |
| | **3** = Green |



*3/2 ways*



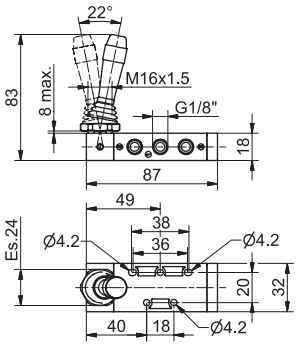



Weight 100 g

T228.32.9/Ⓒ

*5/2 ways*






Weight 110 g

T228.52.9/Ⓒ

## Lever lateral-Spring 3 positions

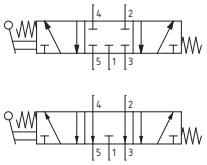
**Coding:** T228.53.Ⓕ.9.1/Ⓒ

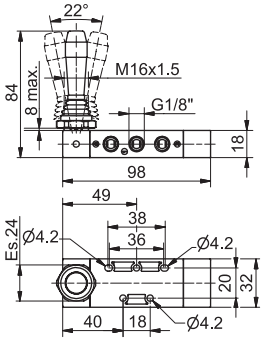
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 410 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | FUNCTION |
|---|---|
| Ⓕ | **31** = Closed centres |
| | **32** = Open centres |
| | LEVER COLOR |
| Ⓒ | **1** = Red |
| | **2** = Black |
| | **3** = Green |



Weight 140 g






## Lateral lever - 3 positions detent

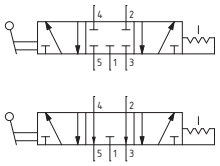
**Coding:** T228.53.Ⓕ.9/Ⓒ

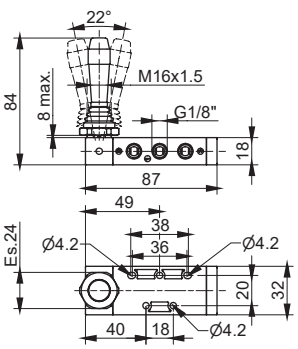
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 410 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

| | FUNCTION |
|---|---|
| Ⓕ | **31** = Closed centres |
| | **32** = Open centres |
| | LEVER COLOR |
| Ⓒ | **1** = Red |
| | **2** = Black |
| | **3** = Green |



Weight 110 g





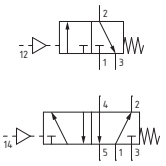
## Pneumatic - Spring

**Coding:** T228.Ⓣ.11.1

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |
| Pilot ports size | G1/8" |

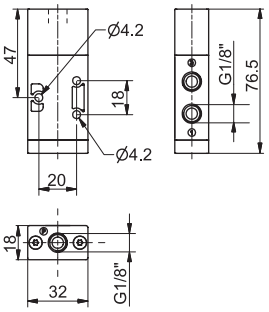
| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

Minimum pilot pressure 2,5 bar



***3/2 ways***



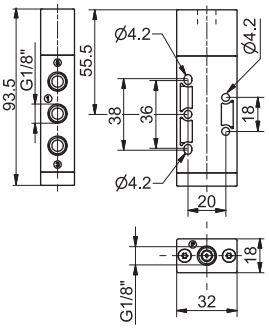



Weight 65 g

T228.32.11.1

***5/2 ways***






Weight 78 g

T228.52.11.1

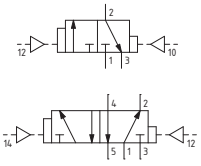
## Pneumatic - Differential

**Coding:** T228.Ⓣ.11.12

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |
| Pilot ports size | G1/8" |

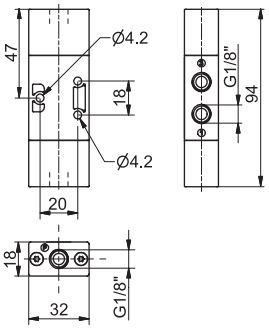
| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

Minimum pilot pressure 2,5 bar



***3/2 ways***



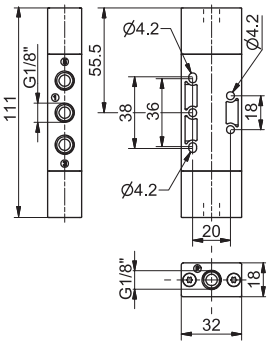



Weight 74 g

T228.32.11.12

***5/2 ways***






Weight 86 g

T228.52.11.12

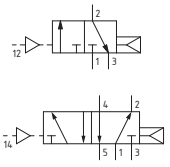
## Pneumatic-Differential (Self feeding)

**Coding:** T228.Ⓣ.11.12/1

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |
| Pilot ports size | G1/8" |

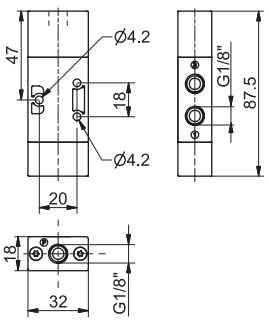
| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

Minimum pilot pressure 2,5 bar



***3/2 ways***



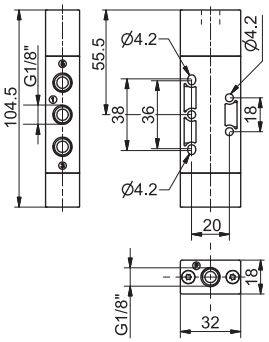



Weight 70 g

T228.32.11.12/1

***5/2 ways***






Weight 82 g

T228.52.11.12/1



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

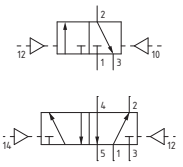
## Pneumatic-Pneumatic

**Coding:** T228.Ⓣ.11.11

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |
| Pilot ports size | G1/8" |

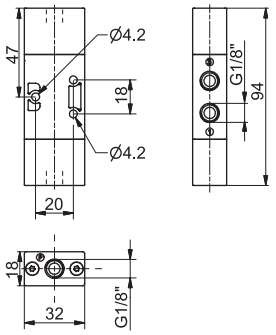
| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

Minimum pilot pressure 2 bar



***3/2 ways***



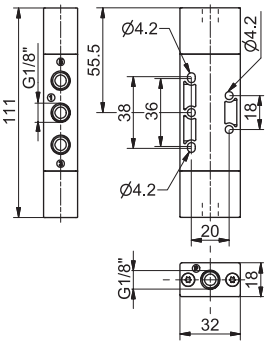



Weight 77 g

T228.32.11.11

***5/2 ways***






Weight 90 g

T228.52.11.11

## Pneumatic - Pneumatic 3 positions

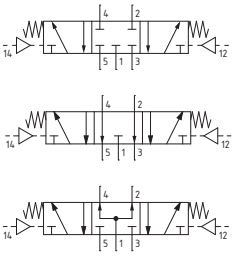
**Coding:** T228.53.Ⓕ.11.11

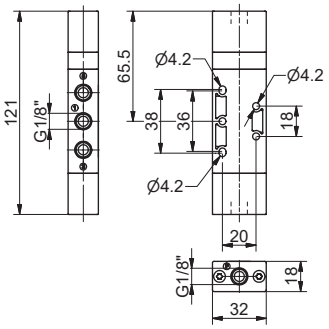
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 410 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |
| Pilot ports size | G1/8" |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |

Minimum pilot pressure 3 bar








Weight 110 g

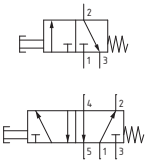
## Push button - Spring

**Coding:** T224.Ⓣ.8.1

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1050 |
| Orifice size (mm) | 8.5 |
| Working ports size | G1/4" |

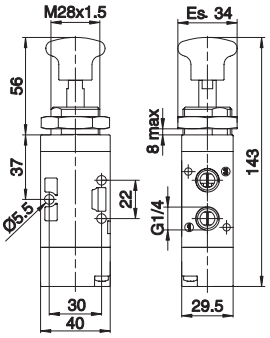
| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

Operating force 50 N



*3/2 ways*



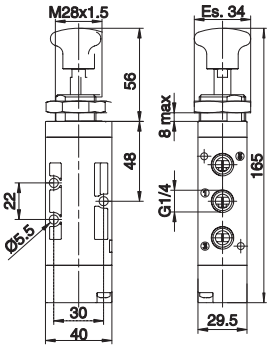



Weight 170 g

T224.32.8.1

*5/2 ways*






Weight 200 g

T224.52.8.1

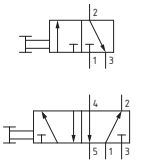
## Push button 2 positions

**Coding:** T224.Ⓣ.8

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1050 |
| Orifice size (mm) | 8.5 |
| Working ports size | G1/4" |

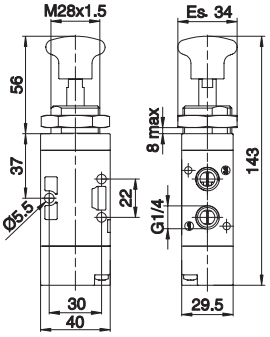
| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

Operating force 13 N



*3/2 ways*



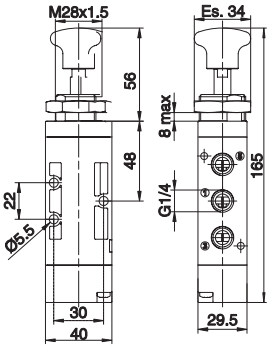



Weight 170 g

T224.32.8

*5/2 ways*






Weight 200 g

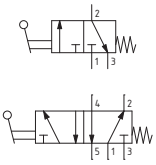
T224.52.8

## Lever lateral - Spring

**Coding:** T224.Ⓣ.9.1/Ⓒ

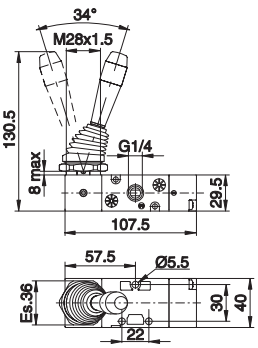
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1050 |
| Orifice size (mm) | 8.5 |
| Working ports size | G1/4" |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | LEVER COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



*3/2 ways*



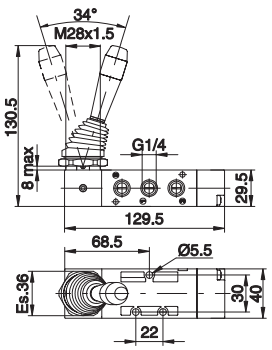



Weight 220 g

T224.32.9.1/Ⓒ

*5/2 ways*






Weight 250 g

T224.52.9.1/Ⓒ



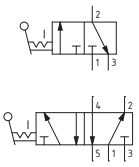
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Lever lateral 2 positions

**Coding:** T224.Ⓣ.9/Ⓒ

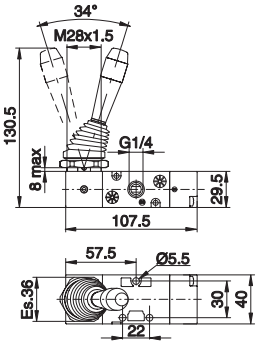
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1050 |
| Orifice size (mm) | 8.5 |
| Working ports size | G1/4" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓒ | LEVER COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



*3/2 ways*



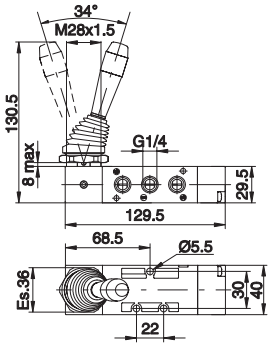



Weight 220 g

T224.32.9/Ⓒ

*5/2 ways*






Weight 250 g

T224.52.9/Ⓒ

## Lever lateral-Spring 3 positions

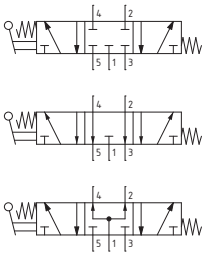
**Coding:** T224.53.Ⓕ.9.1/Ⓒ

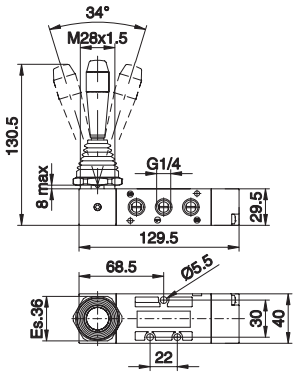
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 900 |
| Orifice size (mm) | 8.5 |
| Working ports size | G1/4" |

| | |
|---|---|
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓒ | LEVER COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



Weight 270 g






## Lateral lever - 3 positions detent

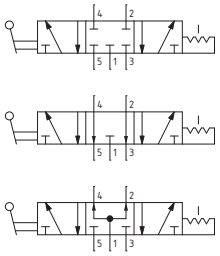
**Coding:** T224.53.Ⓕ.9/Ⓒ

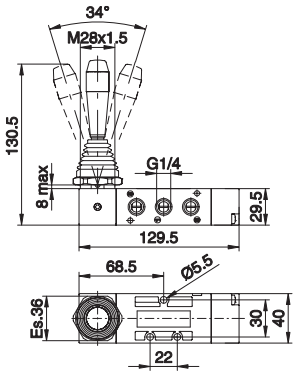
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 900 |
| Orifice size (mm) | 8.5 |
| Working ports size | G1/4" |

| | |
|---|---|
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓒ | LEVER COLOR |
| | **1** = Red |
| | **2** = Black |
| | **3** = Green |



Weight 270 g





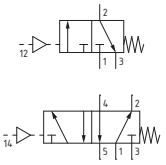
## Pneumatic - Spring

**Coding:** T224.Ⓣ.11.1

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1050 |
| Orifice size (mm) | 8.5 |
| Working ports size | G1/4" |
| Pilot ports size | G1/8" |

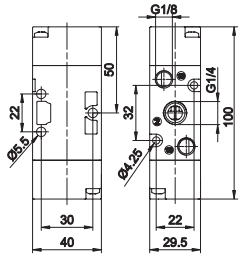
| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

Minimum pilot pressure 2,5 bar



***3/2 ways***



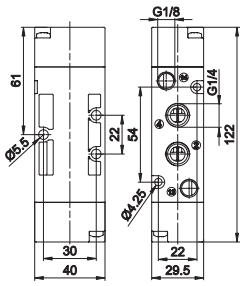



Weight 110 g

T224.32.11.1

***5/2 ways***






Weight 140 g

T224.52.11.1

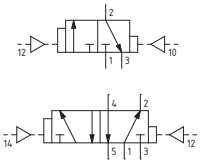
## Pneumatic - Differential

**Coding:** T224.Ⓣ.11.12

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1050 |
| Orifice size (mm) | 8.5 |
| Working ports size | G1/4" |
| Pilot ports size | G1/8" |

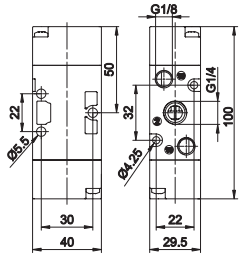
| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

Minimum pilot pressure 2 bar



***3/2 ways***



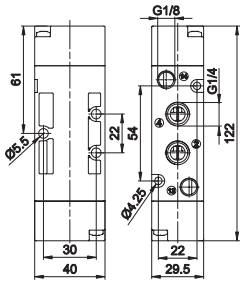



Weight 110 g

T224.32.11.12

***5/2 ways***






Weight 140 g

T224.52.11.12

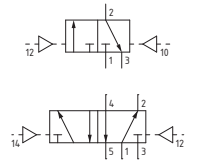
## Pneumatic-Pneumatic

**Coding:** T224.Ⓣ.11.11

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1050 |
| Orifice size (mm) | 8.5 |
| Working ports size | G1/4" |
| Pilot ports size | G1/8" |

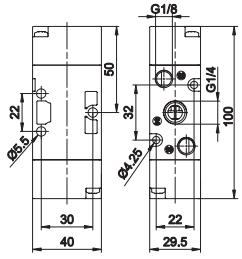
| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

Minimum pilot pressure 2 bar



***3/2 ways***



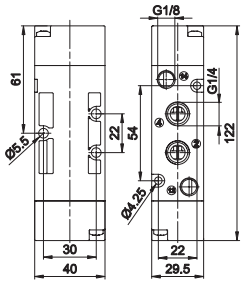



Weight 110 g

T224.32.11.11

***5/2 ways***






Weight 140 g

T224.52.11.11



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

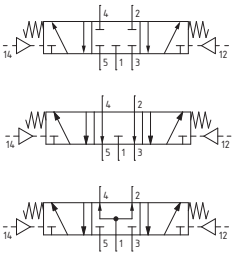
## Pneumatic - Pneumatic 3 positions

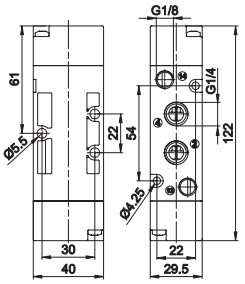
**Coding:** T224.53.Ⓕ.11.11

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 900 |
| Orifice size (mm) | 8.5 |
| Working ports size | G1/4" |
| Pilot ports size | G1/8" |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |






Weight 160 g
Minimum pilot pressure 3 bar

## Series 800

The trend towards the miniaturization of components has been consolidated. The use of new technologies makes it possible to manufacture components with high flow rates but extremely compact sizes.
Electric piloting is by means of low-absorption miniature solenoids which are easily connected to the electronic control systems of machines (PLC).
Another object of study have been manifolds and multiple bases for ganged assembly of valves or solenoid valves with option for having outlets 2 and 4 either on the valve body or on the base through threaded holes or integrated quick connections provided.
Versions 3/2 and 5/2 are fitted with pneumatic and electropneumatic controls with resetting by mechanically or pneumatically operated spring, or by pneumatic or electropneumatic operation on the bistable versions.
The basic difference between this type of distributors and the others we produce, based on the spool system, lies in the fact that the seals rest on the spool and are dynamic, instead of being locked intoo spool the valve body by means of spacers; by this means a compact size is obtained and the distributors can be slotted into bases and manifolds by means of two screws.

### Construction characteristics

| | |
|---|---|
| Body | Aluminium |
| Seals | HNBR |
| Springs | Stainless steel |
| Operators | Aluminium |
| Pistons | Aluminium |
| Spools | Aluminium |

### Use and maintenance

These valves have an average life of 15 million cycles depending on the application and air quality.
Filtered and lubricated air using specified lubricants will reduce the wear of the seals and ensures long and trouble free operation.
Please ensure that the valve is being used according with the manufacturers specification, such as air pressure and temperature.
The exhaust port of the distributor has to be protected in a dusty and dirty environment.
Repair kits including the spool complete with seals are available for overhauling the valves.
However, although this is a simple operation it should be carried out by a competent person.

**ATTENTION:** use hydraulic oil class H for lubrication such as CASTROL MAGNA SW32.

### How to order the solenoid valves

Example:
**805.52.0.1.01** Solenoid valves with miniature solenoid 12 V D.C.
List of codes for tensions:

01 = miniature solenoid 12 VDC

02 = miniature solenoid 24 VDC

05 = miniature solenoid 24 VAC

06 = miniature solenoid 110 VAC

07 = miniature solenoid 220 VAC

The electropilot utilized is a 15 mm 3/2 N.C. miniature solenoid with faston and 1.1 mm orifice
Miniature solenoid homologated are available c UL us (see series 300)

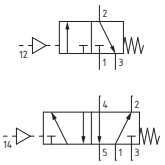

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pneumatic - Spring

**Coding:** 805.Ⓣ.11.1

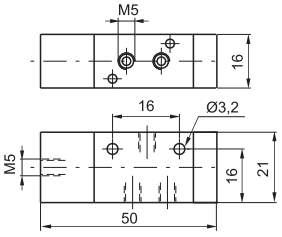
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 160 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |
| Pilot ports size | M5 |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



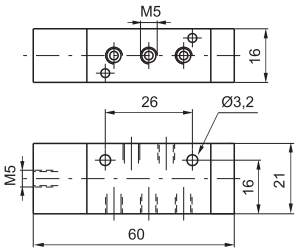



Weight 45 g
Minimum pilot pressure 2 bar

805.32.11.1

***5/2 ways***






Weight 50 g
Minimum pilot pressure 2 bar

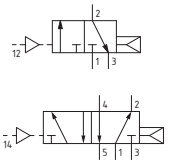
805.52.11.1

## Pneumatic - Differential

**Coding:** 805.Ⓣ.11.12

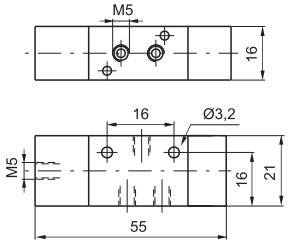
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 160 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |
| Pilot ports size | M5 |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



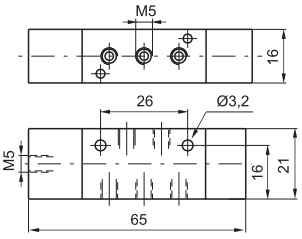



Weight 50 g
Minimum pilot pressure 2 bar

805.32.11.12

***5/2 ways***






Weight 55 g
Minimum pilot pressure 2 bar

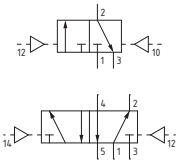
805.52.11.12

## Pneumatic-Pneumatic

**Coding:** 805.Ⓣ.11.11

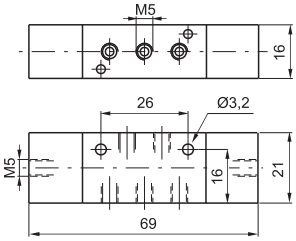
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 160 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |
| Pilot ports size | M5 |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



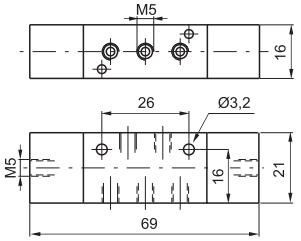



Weight 55 g
Minimum pilot pressure 1,5 bar

805.32.11.11

***5/2 ways***






Weight 60 g
Minimum pilot pressure 1,5 bar

805.52.11.11

## Solenoid - Spring

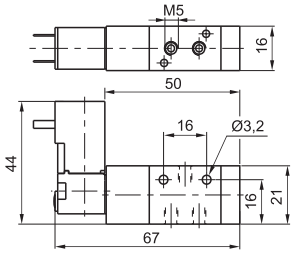
**Coding:** 805.Ⓣ.0.1.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 160 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **01** = 12V D.C. |
| | **02** = 24V D.C. |
| | **05** = 24V A.C. |
| | **06** = 110V A.C. |
| | **07** = 230 V A.C. |

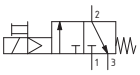
***3/2 ways***





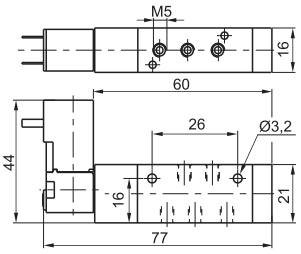

Weight 80 g
Minimum working pressure 2 bar

805.32.0.1.Ⓥ



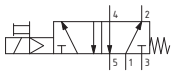
***5/2 ways***






Weight 85 g
Minimum working pressure 2 bar

805.52.0.1.Ⓥ



## Solenoid - Differential

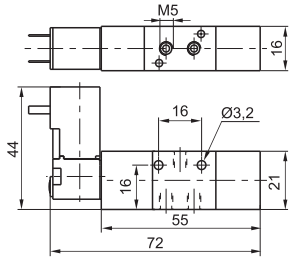
**Coding:** 805.Ⓣ.0.12.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 160 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **01** = 12V D.C. |
| | **02** = 24V D.C. |
| | **05** = 24V A.C. |
| | **06** = 110V A.C. |
| | **07** = 230 V A.C. |

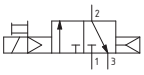
***3/2 ways***





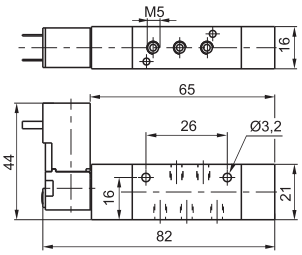

Weight 85 g
Minimum working pressure 2 bar

805.32.0.12.Ⓥ



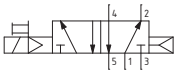
***5/2 ways***






Weight 90 g
Minimum working pressure 2 bar

805.52.0.12.Ⓥ



## Solenoid - Solenoid

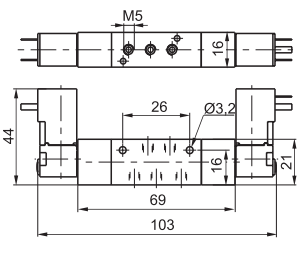
**Coding:** 805.Ⓣ.0.0.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 160 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | TYPE |
|---|---|
| Ⓣ | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **01** = 12V D.C. |
| | **02** = 24V D.C. |
| | **05** = 24V A.C. |
| | **06** = 110V A.C. |
| | **07** = 230 V A.C. |

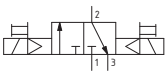
***3/2 ways***





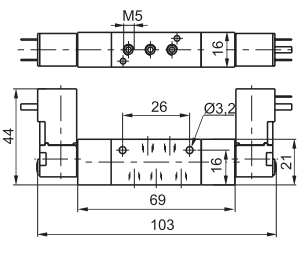

Weight 120 g
Minimum working pressure 1,5 bar

805.32.0.0.Ⓥ



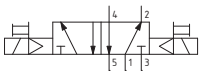
***5/2 ways***






Weight 125 g
Minimum working pressure 1,5 bar

805.52.0.0.Ⓥ





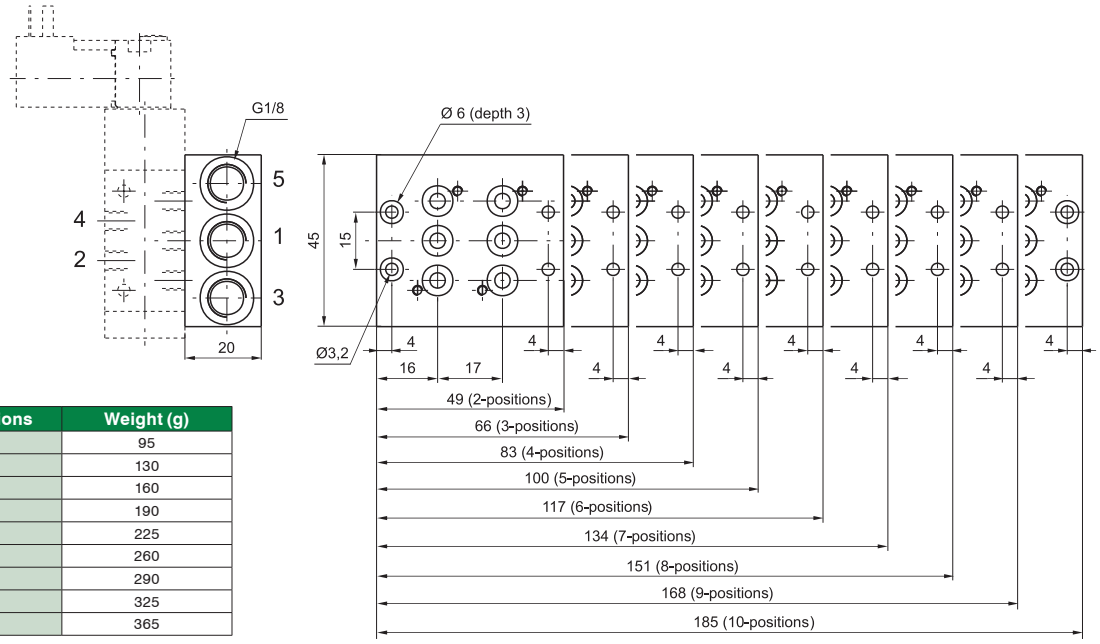
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Collectors



**Coding:** 805.Ⓝ

| Ⓝ | NO. POSITIONS |
|---|---|
| | **02** = 2 positions |
| | **03** = 3 positions |
| | **04** = 4 positions |
| | **05** = 5 positions |
| | **06** = 6 positions |
| | **07** = 7 positions |
| | **08** = 8 positions |
| | **09** = 9 positions |
| | **10** = 10 positions |

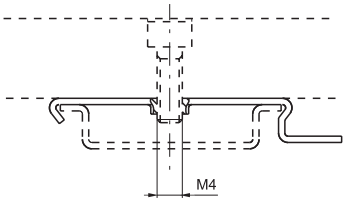



| No. positions | Weight (g) |
|---|---|
| 02 | 95 |
| 03 | 130 |
| 04 | 160 |
| 05 | 190 |
| 06 | 225 |
| 07 | 260 |
| 08 | 290 |
| 09 | 325 |
| 10 | 365 |

## Clip

**Coding:** 800.00



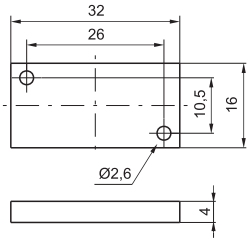



Weight 5 g
(for mounting the distributors groups on guide DIN 46277/3)

## Closing plate

**Coding:** 805.00





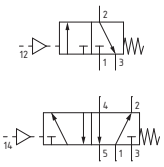

Weight 15 g

## Pneumatic - Spring

**Coding:** 808.Ⓣ.11.1

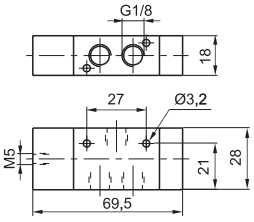
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 520 |
| Orifice size (mm) | 4 |
| Working ports size | G1/8" |
| Pilot ports size | M5 |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



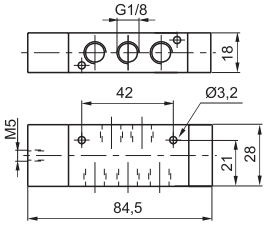



Weight 95 g
Minimum pilot pressure 2 bar

808.32.11.1

***5/2 ways***






Weight 100 g
Minimum pilot pressure 2 bar

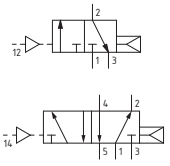
808.52.11.1

## Pneumatic - Differential

**Coding:** 808.Ⓣ.11.12

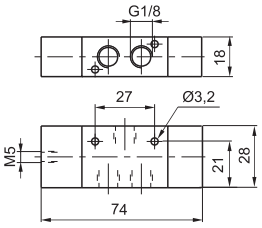
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 520 |
| Orifice size (mm) | 4 |
| Working ports size | G1/8" |
| Pilot ports size | M5 |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



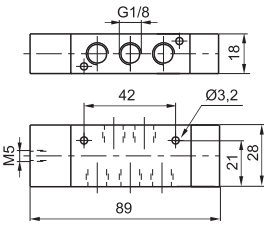



Weight 105 g
Minimum pilot pressure 2 bar

808.32.11.12

***5/2 ways***






Weight 110 g
Minimum pilot pressure 2 bar

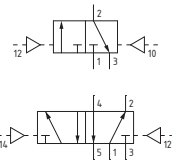
808.52.11.12

## Pneumatic-Pneumatic

**Coding:** 808.Ⓣ.11.11

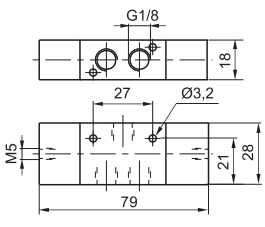
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 520 |
| Orifice size (mm) | 4 |
| Working ports size | G1/8" |
| Pilot ports size | M5 |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



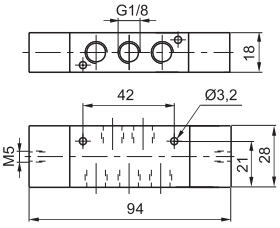



Weight 115 g
Minimum pilot pressure 1,5 bar

808.32.11.11

***5/2 ways***






Weight 120 g
Minimum pilot pressure 1,5 bar

808.52.11.11



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pneumatic-Pneumatic 5/3

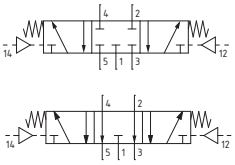
**Coding:** 808.53.Ⓕ.11.11

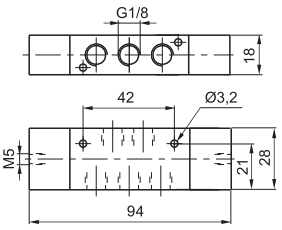
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 520 |
| Orifice size (mm) | 4 |
| Working ports size | G 1/8" |
| Pilot ports size | M5 |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |



Weight 125 g
Minimum pilot pressure 3 bar



## Solenoid - Spring

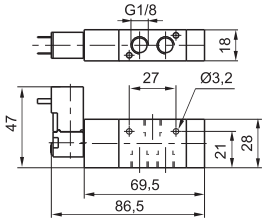
**Coding:** 808.Ⓣ.0.1.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 520 |
| Orifice size (mm) | 4 |
| Working ports size | G 1/8" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **01** = 12V D.C. |
| | **02** = 24V D.C. |
| | **05** = 24V A.C. |
| | **06** = 110V A.C. |
| | **07** = 230 V A.C. |

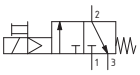
***3/2 ways***





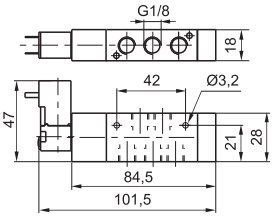

Weight 130 g
Minimum working pressure 2 bar

808.32.0.1.Ⓥ



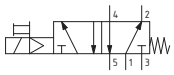
***5/2 ways***






Weight 135 g
Minimum working pressure 2 bar

808.52.0.1.Ⓥ



## Solenoid - Differential

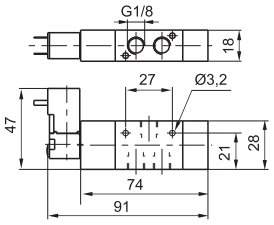
**Coding:** 808.Ⓣ.0.12.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 520 |
| Orifice size (mm) | 4 |
| Working ports size | G 1/8" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **01** = 12V D.C. |
| | **02** = 24V D.C. |
| | **05** = 24V A.C. |
| | **06** = 110V A.C. |
| | **07** = 230 V A.C. |

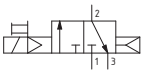
***3/2 ways***





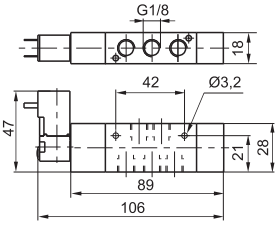

Weight 140 g
Minimum working pressure 2 bar

808.32.0.12.Ⓥ



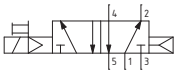
***5/2 ways***






Weight 145 g
Minimum working pressure 2 bar

808.52.0.12.Ⓥ



## Solenoid - Solenoid

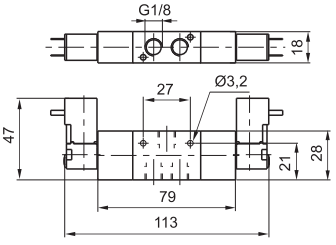
**Coding:** 808.Ⓣ.0.0.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 520 |
| Orifice size (mm) | 4 |
| Working ports size | G 1/8" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **01** = 12V D.C. |
| | **02** = 24V D.C. |
| | **05** = 24V A.C. |
| | **06** = 110V A.C. |
| | **07** = 230 V A.C. |

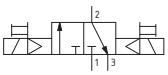
***3/2 ways***





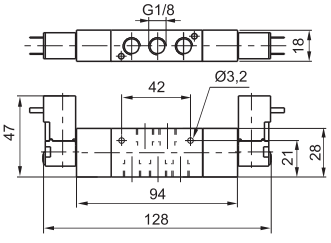

Weight 185 g
Minimum working pressure 1,5 bar

808.32.0.0.Ⓥ



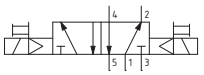
***5/2 ways***






Weight 190 g
Minimum working pressure 1,5 bar

808.52.0.0.Ⓥ





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid - Solenoid 5/3

**Coding:** 808.53.Ⓕ.0.0.Ⓥ

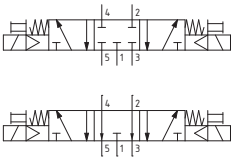
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 520 |
| Orifice size (mm) | 4 |
| Working ports size | G 1/8" |

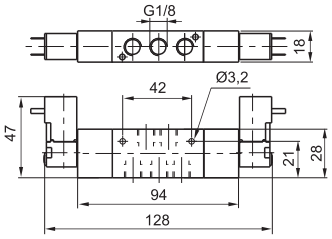
| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |

| Ⓥ | VOLTAGE |
|---|---|
| | **01** = 12V D.C. |
| | **02** = 24V D.C. |
| | **05** = 24V A.C. |
| | **06** = 110V A.C. |
| | **07** = 230 V A.C. |



Weight 190 g
Minimum working pressure 3 bar



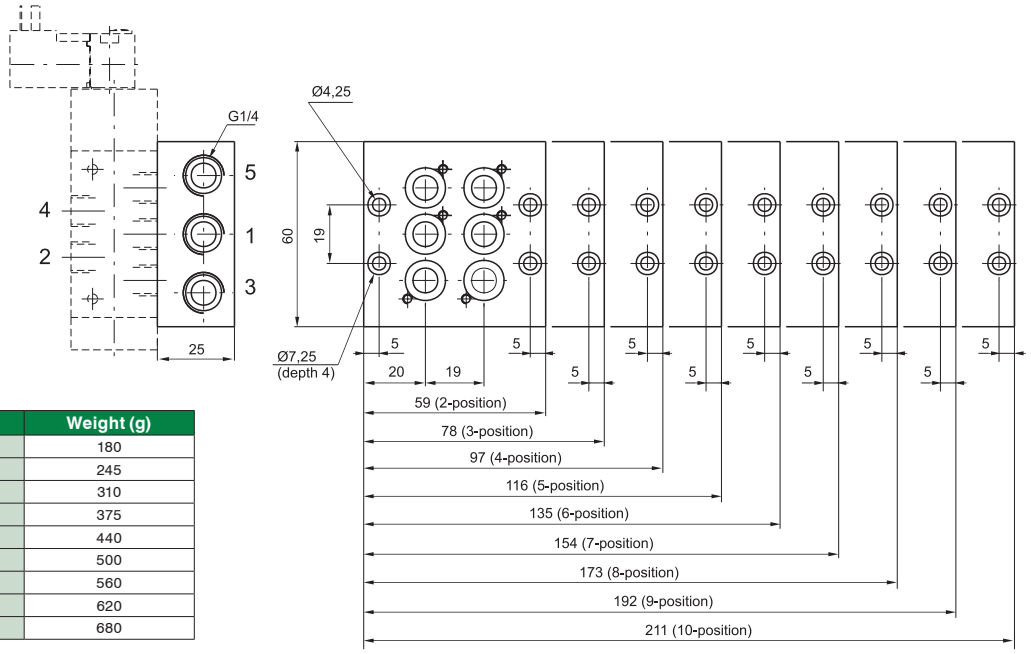



## Collectors



**Coding:** 808.Ⓝ

| Ⓝ | NO. POSITIONS |
|---|---|
| | **02** = 2 positions |
| | **03** = 3 positions |
| | **04** = 4 positions |
| | **05** = 5 positions |
| | **06** = 6 positions |
| | **07** = 7 positions |
| | **08** = 8 positions |
| | **09** = 9 positions |
| | **10** = 10 positions |

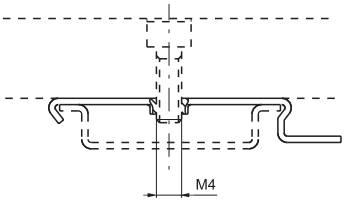



| No. positions | Weight (g) |
|---|---|
| 02 | 180 |
| 03 | 245 |
| 04 | 310 |
| 05 | 375 |
| 06 | 440 |
| 07 | 500 |
| 08 | 560 |
| 09 | 620 |
| 10 | 680 |

## Clip

**Coding:** 800.00



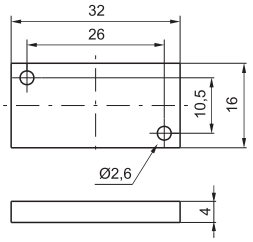



Weight 5 g
(for mounting the distributors groups on guide DIN 46277/3)

## Closing plate

**Coding:** 808.00






Weight 65 g



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 888

Competitively priced, good performance and versatility combined with a compact design are the main characteristics of this new series of valves.
The aluminium valve body and spool/seal arrangement optimize both the flow rate and the valve switching time.
This series of valves are available with G1/8" and G1/4" ports in 3/2, 5/2 and 5/3 versions.
Monostable or bistable versions are available and include an integrated technopolymer solenoid operator with 9mm stem and built in manual override.
**Solenoid valves series 888 are available in point-to-point and serial configurations.**
**For serial system specifications, see Optyma-F series.**
The valves can be supplied with or without the solenoid coil, however, if the solenoid coil is required please refer to the following table:



| Voltages | | Coil Code | Voltage Code |
|---|---|---|---|
| Direct current DC | 12V (3,5W) | MF4 | F04 |
| | 24V (3,5W) | MF5 | F05 |
| Alternating current AC 50 - 60 Hz | 24V (3,7W) | MF56 | F56 |
| | 110V (3,7W) | MF57 | F57 |
| | 230V (3,7W) | MF58 | F58 |

| Connectors Coding | | |
|---|---|---|
| Voltages | | Kit 100 pieces |
| DC/AC | 24V | 888.11.01L-K |
| Alternating current AC 50 - 60 Hz | 110V | 888.11.02L-K |
| | 230V | 888.11.03L-K |

**Construction characteristics**

| | |
|---|---|
| Body | Aluminium |
| Seals | NBR |
| Springs | Spring steel |
| Operators | Technopolymer<br>Aluminium for spring bottom plates |
| Pistons | Technopolymer |
| Spools | Aluminium |

**Use and maintenance**

These valves have an average life of 15 million cycles
depending on the application and air quality, filtered and lubricated air using specified lubricants will dramatically reduce the wear of the seals and ensures long and trouble free operation.
Please ensure that the valve is being used according with the manufacturers specification, such as air pressure and temperature.
The exhaust ports 3 and 5 must be protected against the possible ingress of dirt or debris.
Repair kits including the spool complete with seals are available for overhauling the valves; however, although this is a simple operation it should be carried out by a competent person.

## Solenoid - Spring - 3/2 (Self feeding)

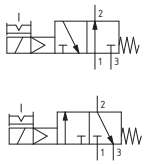
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 8 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 790 |
| Orifice size (mm) | 5.8 |
| Working ports size | G 1/8" |

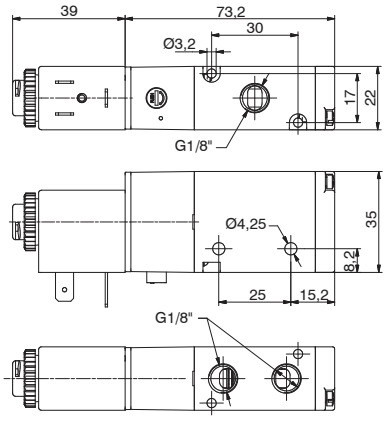
**Coding:** 8880.32.Ⓕ.39.Ⓥ

| Ⓕ | FUNCTION |
|---|---|
| | **A** = Normally Open |
| | **C** = Normally Closed |

| Ⓥ | VOLTAGE |
|---|---|
| | **F04** = 12 V DC |
| | **F05** = 24 V DC |
| | **F56** = 24 V (50-60 Hz) |
| | **F57** = 110 V (50-60 Hz) |
| | **F58** = 230 V (50-60 Hz) |
| | **F00** = Without coil |








Weight 210 g
Minimum working pressure 2 bar

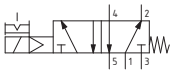
## Solenoid - Spring - 5/2 (Self feeding)

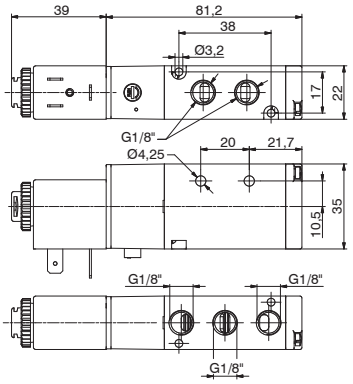
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 8 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 790 |
| Orifice size (mm) | 5.8 |
| Working ports size | G 1/8" |

**Coding:** 8880.52.00.39.Ⓥ

| Ⓥ | VOLTAGE |
|---|---|
| | **F04** = 12 V DC |
| | **F05** = 24 V DC |
| | **F56** = 24 V (50-60 Hz) |
| | **F57** = 110 V (50-60 Hz) |
| | **F58** = 230 V (50-60 Hz) |
| | **F00** = Without coil |








Weight 220 g
Minimum working pressure 2 bar

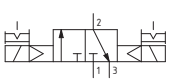
## Solenoid - Solenoid - 3/2 (Self feeding)

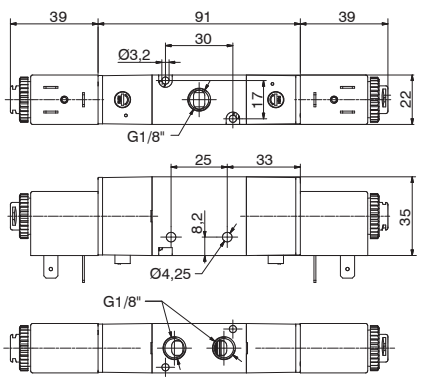
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 8 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 790 |
| Orifice size (mm) | 5.8 |
| Working ports size | G 1/8" |

**Coding:** 8880.32.00.35.Ⓥ

| Ⓥ | VOLTAGE |
|---|---|
| | **F04** = 12 V DC |
| | **F05** = 24 V DC |
| | **F56** = 24 V (50-60 Hz) |
| | **F57** = 110 V (50-60 Hz) |
| | **F58** = 230 V (50-60 Hz) |
| | **F00** = Without coil |








Weight 310 g
Minimum working pressure 2 bar



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

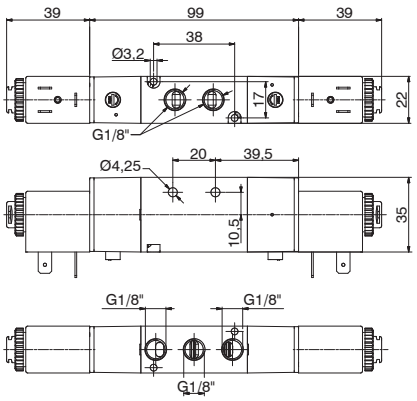
## Solenoid - Solenoid - 5/2 (Self feeding)

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 8 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 790 |
| Orifice size (mm) | 5.8 |
| Working ports size | G 1/8" |

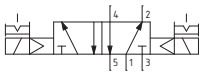
**Coding:** 8880.52.00.35.Ⓥ

| | |
|---|---|
| Ⓥ | VOLTAGE |
| | **F04** = 12 V DC |
| | **F05** = 24 V DC |
| | **F56** = 24 V (50-60 Hz) |
| | **F57** = 110 V (50-60 Hz) |
| | **F58** = 230 V (50-60 Hz) |
| | **F00** = Without coil |






Weight 320 g
Minimum working pressure 2 bar



## Solenoid - Solenoid - 5/3 (Self feeding)

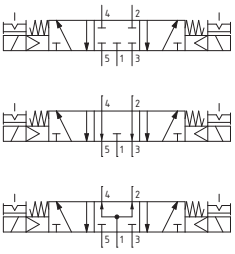
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 8 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 440 |
| Orifice size (mm) | 5.8 |
| Working ports size | G 1/8" |

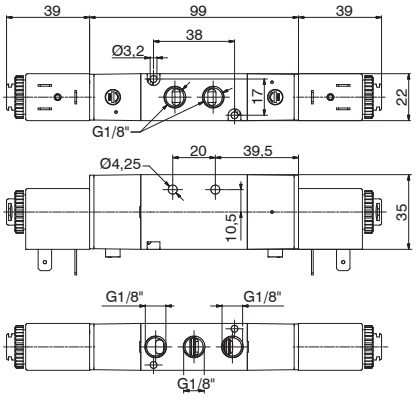
**Coding:** 8880.53.Ⓕ.35.Ⓥ

| | |
|---|---|
| Ⓕ | FUNCTION |
| | **31** = Closed Centres |
| | **32** = Open Centres |
| | **33** = Pressured centres |

| | |
|---|---|
| Ⓥ | VOLTAGE |
| | **F04** = 12 V DC |
| | **F05** = 24 V DC |
| | **F56** = 24 V (50-60 Hz) |
| | **F57** = 110 V (50-60 Hz) |
| | **F58** = 230 V (50-60 Hz) |
| | **F00** = Without coil |








Weight 330 g
Minimum working pressure 2,5 bar

## Solenoid - Spring - 3/2 (External feeding)

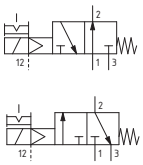
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 8 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 790 |
| Orifice size (mm) | 5.8 |
| Working ports size | G 1/8" |

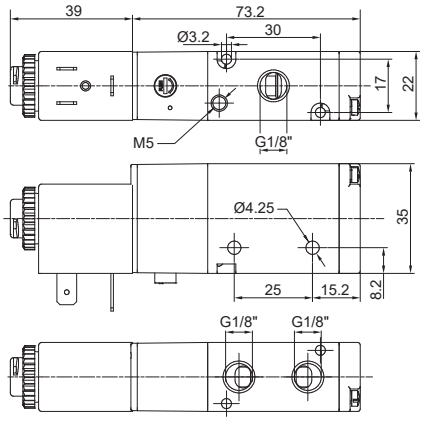
**Coding:** 8880E.32.Ⓕ.39.Ⓥ

| | |
|---|---|
| Ⓕ | FUNCTION |
| | **A** = Normally open |
| | **C** = Normally Closed |

| | |
|---|---|
| Ⓥ | VOLTAGE |
| | **F04** = 12 V DC |
| | **F05** = 24 V DC |
| | **F56** = 24 V (50-60 Hz) |
| | **F57** = 110 V (50-60 Hz) |
| | **F58** = 230 V (50-60 Hz) |
| | **F00** = Without coil |








Weight 210 g
Minimum working pressure 2 bar

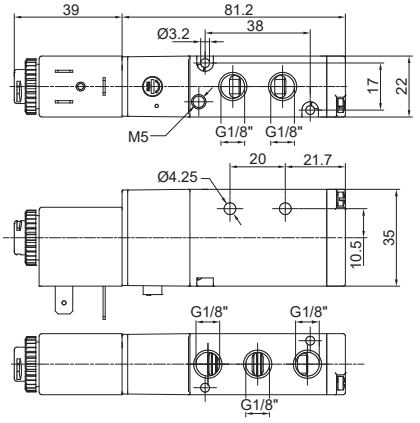
## Solenoid - Spring - 5/2 (External feeding)

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 8 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 790 |
| Orifice size (mm) | 5.8 |
| Working ports size | G 1/8" |

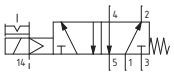
**Coding:** 8880E.52.00.39.Ⓥ

| Ⓥ | VOLTAGE |
|---|---|
| | **F04** = 12 V DC |
| | **F05** = 24 V DC |
| | **F56** = 24 V (50-60 Hz) |
| | **F57** = 110 V (50-60 Hz) |
| | **F58** = 230 V (50-60 Hz) |
| | **F00** = Without coil |






Weight 220 g
Minimum working pressure 2 bar



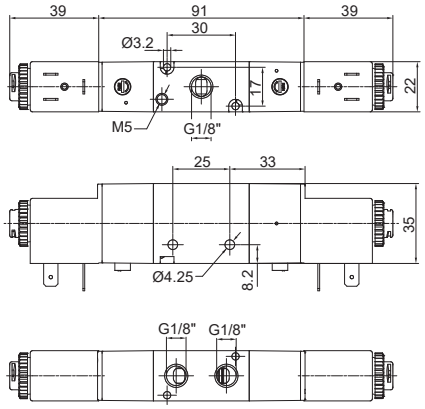
## Solenoid - Solenoid - 3/2 (External feeding)

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 8 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 790 |
| Orifice size (mm) | 5.8 |
| Working ports size | G 1/8" |

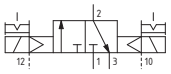
**Coding:** 8880E.32.00.35.Ⓥ

| Ⓥ | VOLTAGE |
|---|---|
| | **F04** = 12 V DC |
| | **F05** = 24 V DC |
| | **F56** = 24 V (50-60 Hz) |
| | **F57** = 110 V (50-60 Hz) |
| | **F58** = 230 V (50-60 Hz) |
| | **F00** = Without coil |






Weight 310 g
Minimum working pressure 2 bar



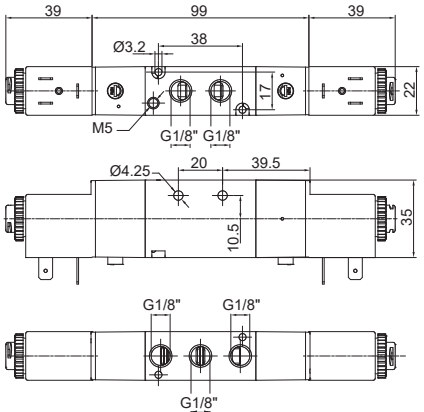
## Solenoid - Solenoid - 5/2 (External feeding)

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 8 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 790 |
| Orifice size (mm) | 5.8 |
| Working ports size | G 1/8" |

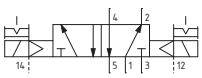
**Coding:** 8880E.52.00.35.Ⓥ

| Ⓥ | VOLTAGE |
|---|---|
| | **F04** = 12 V DC |
| | **F05** = 24 V DC |
| | **F56** = 24 V (50-60 Hz) |
| | **F57** = 110 V (50-60 Hz) |
| | **F58** = 230 V (50-60 Hz) |
| | **F00** = Without coil |






Weight 320 g
Minimum working pressure 2 bar





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid - Solenoid - 5/3 (External feeding)

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 8 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 440 |
| Orifice size (mm) | 5.8 |
| Working ports size | G 1/8" |

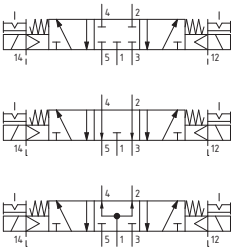
**Coding:** 8880E.53.Ⓕ.35.Ⓥ

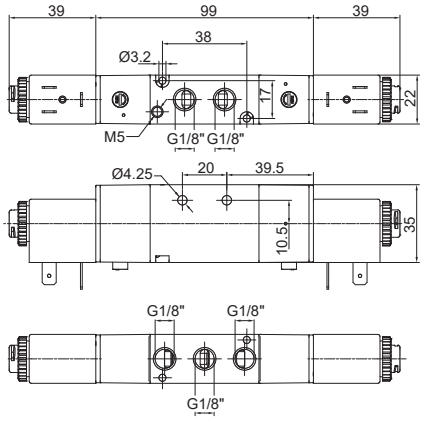
| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed Centres |
| | **32** = Open Centres |
| | **33** = Pressured centres |

| Ⓥ | VOLTAGE |
|---|---|
| | **F04** = 12 V DC |
| | **F05** = 24 V DC |
| | **F56** = 24 V (50-60 Hz) |
| | **F57** = 110 V (50-60 Hz) |
| | **F58** = 230 V (50-60 Hz) |
| | **F00** = Without coil |



Weight 330 g
Minimum working pressure 2,5 bar



## Solenoid - Spring - 3/2 (Self feeding)

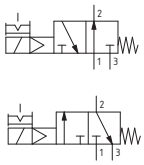
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 8 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 890 |
| Orifice size (mm) | 6.5 |
| Working ports size | G 1/4" |

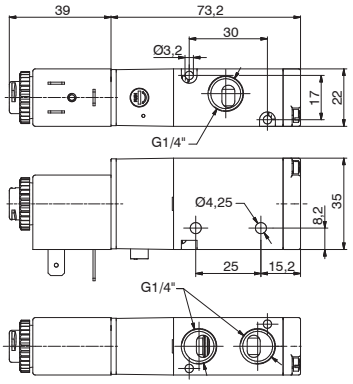
**Coding:** 8884.32.Ⓕ.39.Ⓥ

| Ⓕ | FUNCTION |
|---|---|
| | **A** = Normally open |
| | **C** = Normally Closed |

| Ⓥ | VOLTAGE |
|---|---|
| | **F04** = 12 V DC |
| | **F05** = 24 V DC |
| | **F56** = 24 V (50-60 Hz) |
| | **F57** = 110 V (50-60 Hz) |
| | **F58** = 230 V (50-60 Hz) |
| | **F00** = Without coil |








Weight 210 g
Minimum working pressure 2 bar

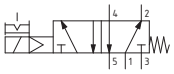
## Solenoid - Spring - 5/2 (Self feeding)

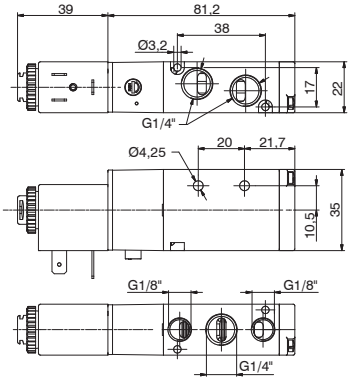
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 8 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 890 |
| Orifice size (mm) | 6.5 |
| Working ports size | G 1/4" |

**Coding:** 8884.52.00.39.Ⓥ

| Ⓥ | VOLTAGE |
|---|---|
| | **F04** = 12 V DC |
| | **F05** = 24 V DC |
| | **F56** = 24 V (50-60 Hz) |
| | **F57** = 110 V (50-60 Hz) |
| | **F58** = 230 V (50-60 Hz) |
| | **F00** = Without coil |








Weight 220 g
Minimum working pressure 2 bar

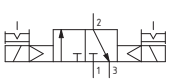
## Solenoid - Solenoid - 3/2 (Self feeding)

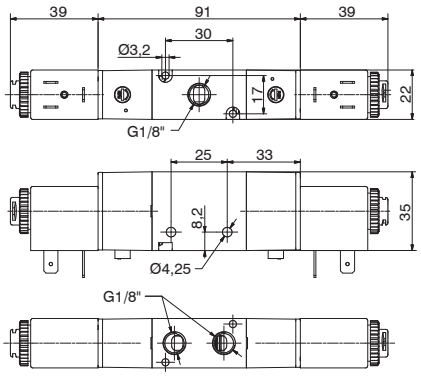
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 8 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 890 |
| Orifice size (mm) | 6.5 |
| Working ports size | G 1/4" |

**Coding:** 8884.32.00.35.Ⓥ

| Ⓥ | VOLTAGE |
|---|---|
| | **F04** = 12 V DC |
| | **F05** = 24 V DC |
| | **F56** = 24 V (50-60 Hz) |
| | **F57** = 110 V (50-60 Hz) |
| | **F58** = 230 V (50-60 Hz) |
| | **F00** = Without coil |








Weight 310 g
Minimum working pressure 2 bar



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

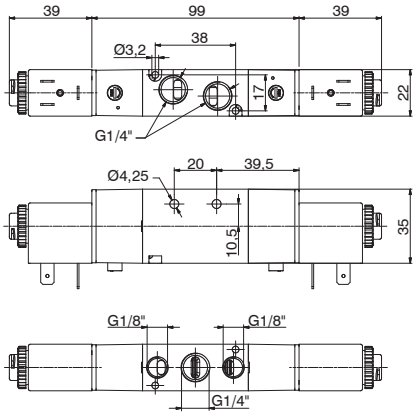
## Solenoid - Solenoid - 5/2 (Self feeding)

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 8 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 890 |
| Orifice size (mm) | 6.5 |
| Working ports size | G 1/4" |

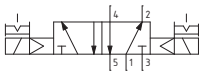
**Coding:** 8884.52.00.35.Ⓥ

| | |
|---|---|
| Ⓥ | VOLTAGE |
| | **F04** = 12 V DC |
| | **F05** = 24 V DC |
| | **F56** = 24 V (50-60 Hz) |
| | **F57** = 110 V (50-60 Hz) |
| | **F58** = 230 V (50-60 Hz) |
| | **F00** = Without coil |






Weight 320 g
Minimum working pressure 2 bar



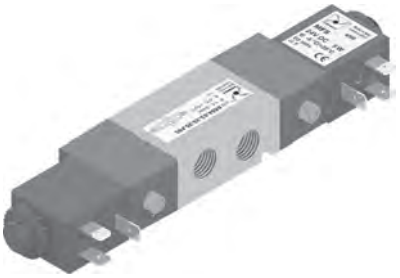
## Solenoid - Solenoid - 5/3 (Self feeding)

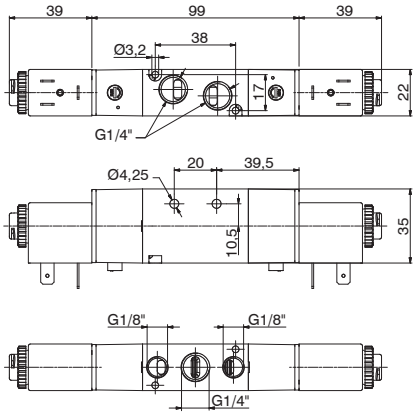
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 8 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6.5 |
| Working ports size | G 1/4" |

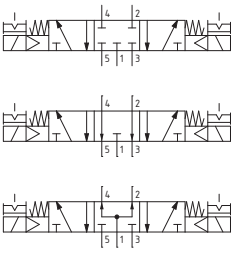
**Coding:** 8884.53.Ⓕ.35.Ⓥ

| | |
|---|---|
| Ⓕ | FUNCTION |
| | **31** = Closed Centres |
| | **32** = Open Centres |
| | **33** = Pressured centres |

| | |
|---|---|
| Ⓥ | VOLTAGE |
| | **F04** = 12 V DC |
| | **F05** = 24 V DC |
| | **F56** = 24 V (50-60 Hz) |
| | **F57** = 110 V (50-60 Hz) |
| | **F58** = 230 V (50-60 Hz) |
| | **F00** = Without coil |





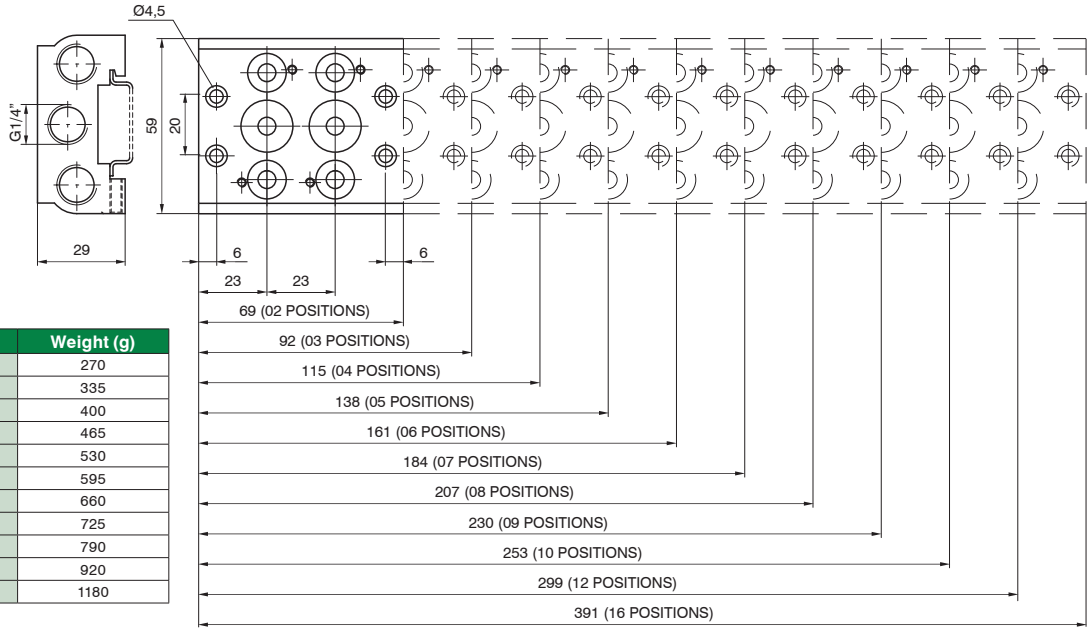
Weight 330 g
Minimum working pressure 2,5 bar

## Manifold (Valves 5/2 - 5/3)



**Coding:** 888.Ⓝ

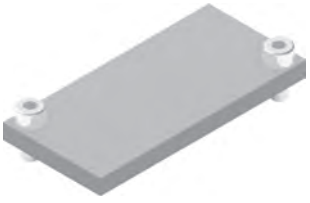
| Ⓝ | NO. POSITIONS |
|---|---|
| | **02** = 2 positions |
| | **03** = 3 positions |
| | **04** = 4 positions |
| | **05** = 5 positions |
| | **06** = 6 positions |
| | **07** = 7 positions |
| | **08** = 8 positions |
| | **09** = 9 positions |
| | **10** = 10 positions |
| | **12** = 12 positions |
| | **16** = 16 positions |

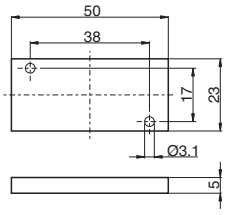



| No. positions | Weight (g) |
|---|---|
| 02 | 270 |
| 03 | 335 |
| 04 | 400 |
| 05 | 465 |
| 06 | 530 |
| 07 | 595 |
| 08 | 660 |
| 09 | 725 |
| 10 | 790 |
| 12 | 920 |
| 16 | 1180 |

## Closing plate

**Coding:** 888.00






Weight 18 g
Closing plate supplied complete with 2 fixing screws to the manifold and 2 fixing screws to the multi-pin base



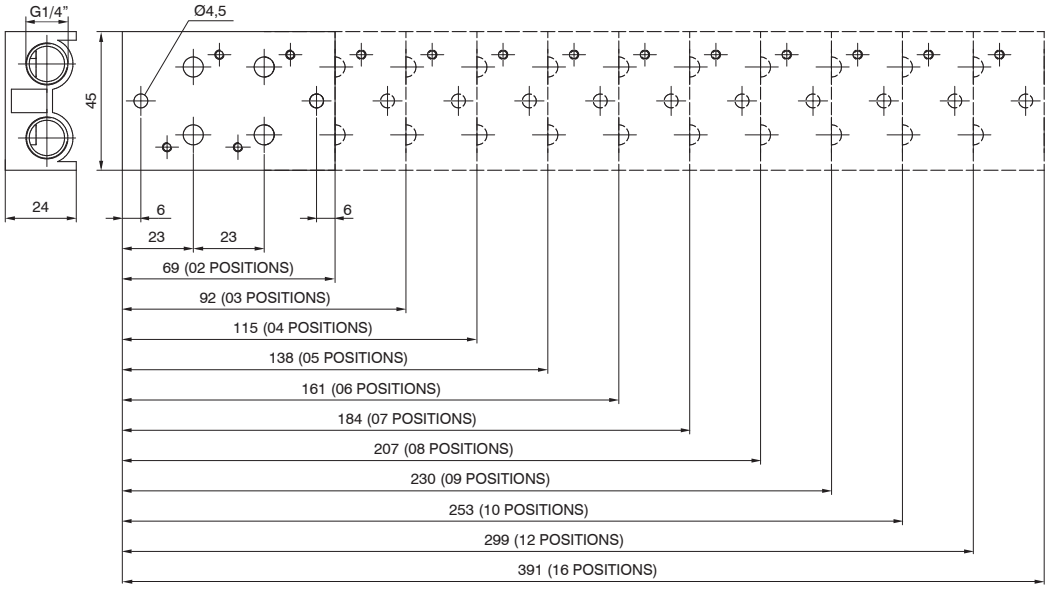
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Manifold (Valves 3/2)



**Coding:** 8883.Ⓝ

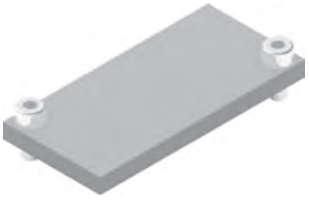
| Ⓝ | NO. POSITIONS |
|---|---|
| | **02** = 2 positions |
| | **03** = 3 positions |
| | **04** = 4 positions |
| | **05** = 5 positions |
| | **06** = 6 positions |
| | **07** = 7 positions |
| | **08** = 8 positions |
| | **09** = 9 positions |
| | **10** = 10 positions |
| | **12** = 12 positions |
| | **16** = 16 positions |

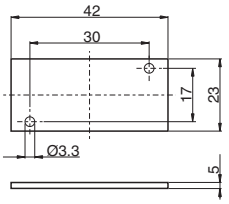



| No. positions | Weight (g) |
|---|---|
| 02 | 270 |
| 03 | 335 |
| 04 | 400 |
| 05 | 465 |
| 06 | 530 |
| 07 | 595 |
| 08 | 660 |
| 09 | 725 |
| 10 | 790 |
| 12 | 920 |
| 16 | 1180 |

## Closing plate (Valves 3/2)

**Coding:** 8883.00





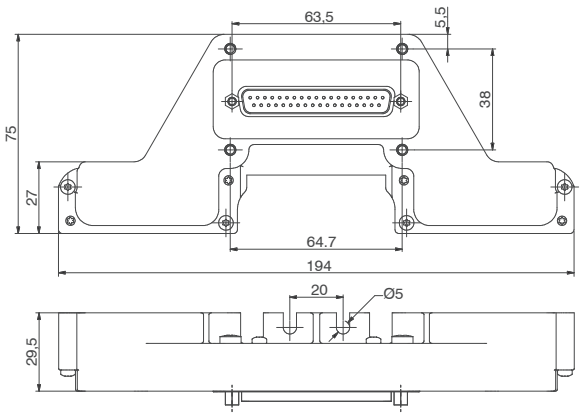

Weight 10 g
Closing plate supplied complete with 2 fixing screws to the manifold

## Endplate, 37 Poles IP65

**Coding:** 888M.37.10



Weight 186 g
The IP65 protection is obtained by IP65 Pneumax cable.
Code complete with assembled endplate and 4 manifold fixing screws, previously mounted on the Manifold.

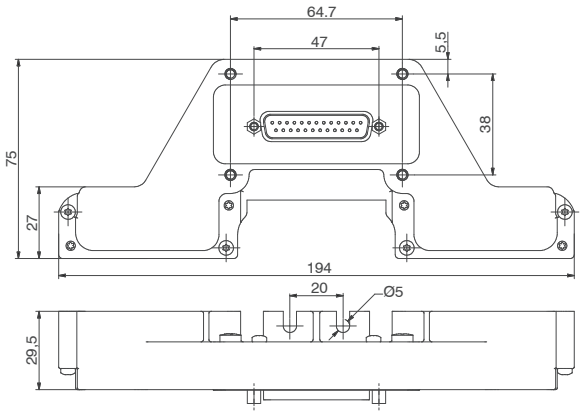



## Endplate, 25 Poles IP65

**Coding:** 888M.25.10



Weight 181 g
The IP65 protection is obtained by IP65 Pneumax cable.
Code complete with assembled endplate and 4 manifold fixing screws, previously mounted on the Manifold.

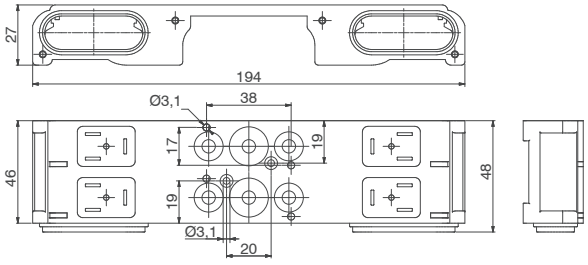



## Modular base, 2 positions IP65

**Coding:** 888M.02.BM



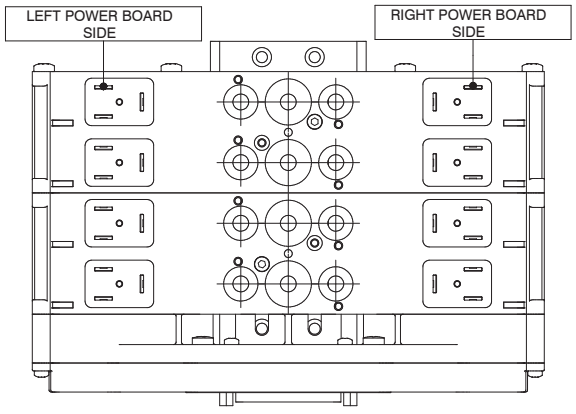
Weight 220 g
Complete with seals and fixing screws
Usable only for 5/2 and 5/3 Distributors




## Left and Right Power board PNP 24 VDC

**Coding:** 888M.Ⓝ.Ⓣ






| | |
|---|---|
| Ⓝ | NO. POSITIONS |
| | **04** = 4 positions |
| | **08** = 8 positions |
| | **12** = 12 positions |
| | **16** = 16 positions |
| Ⓣ | TYPE |
| | **00** = Left |
| | **01** = Right |

| No. positions | Weight (g) |
|---|---|
| 04 | 11.2 |
| 08 | 22.4 |
| 12 | 33.6 |
| 16 | 44.8 |

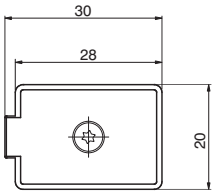


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Closing plate

**Coding:** 888M.22.PC



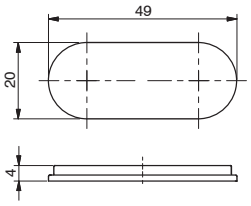



Weight 3 g
Closing plate supplied complete with 1 Seal and fixing screw with O ring
Maximum fixing torque for fittings: 0,35Nm

## Multi-pin base plug

**Coding:** 888M.T



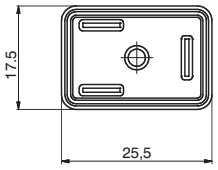



Weight 2,6 g
Complete with: Nr. 1 Plug, Nr. 2 Fixing screws

## Seals

**Coding:** 888M.22.G






Weight 0,52 g

## In line cable complete with connector, IP40

**Coding:** 2400.Ⓒ.Ⓛ.00



| | |
|---|---|
| Ⓒ | CONNECTOR |
| | **25** = 25 poles |
| | **37** = 37 poles |
| Ⓛ | CABLE LENGTH |
| | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |

## Cable complete with connector, 25 Poles, IP65

**Coding:** 2300.25.Ⓛ.Ⓒ



| | |
|---|---|
| Ⓛ | CABLE LENGTH |
| | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |
| Ⓒ | CONNECTOR |
| | **10** = Stand alone |
| | **90** = 90° Angle |

## Cable complete with connector, 37 Poles, IP65

**Coding:** 2400.37.Ⓛ.Ⓒ



| | |
|---|---|
| Ⓛ | CABLE LENGTH |
| | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |
| Ⓒ | CONNECTOR |
| | **10** = Stand alone |
| | **90** = 90° Angle |

## Manifold layout Configuration Point to Point

### 3/2 valves

**V22** | **P (point to point)** | **–** | **–** | **...**

Nr. POSITIONS:

A= 02 positions
B= 03 positions
C= 04 positions
D= 05 positions
E= 06 positions
F= 07 positions
G= 08 positions
H= 09 positions
I= 10 positions
M= 12 positions
Q= 16 positions

VOLTAGE:

A= 12 V DC
B= 24 V DC
C= 24 V (50-60 Hz)
D= 110 V (50-60 Hz)
E= 230 V (50-60 Hz)
Z= without coil

SHORT CODE FUNCTION / CONNECTION :

G1= EV 3/2 SOL.-SPRING G1/8" N.O.
G2= EV 3/2 SOL.-SPRING G1/4" N.O.
H1= EV 3/2 SOL.-SPRING G1/8" N.C.
H2= EV 3/2 SOL.-SPRING G1/4" N.C.

L1= EV 3/2 SOL.-SPRING G1/8" N.O. EXT. FEED.
M1= EV 3/2 SOL.-SPRING G1/8" N.C. EXT. FEED.

N1= EV 3/2 SOL.-SOL. G1/8"
N2= EV 3/2 SOL.-SOL. G1/4"
P1= EV 3/2 SOL.-SOL. G1/8" EXT. FEEDING

T4= VALVE SPACE PLUG 3/2

### 5/2 valves

**V22** | **P (point to point)** | **–** | **–** | **...**

Nr. POSITIONS:

A= 02 positions
B= 03 positions
C= 04 positions
D= 05 positions
E= 06 positions
F= 07 positions
G= 08 positions
H= 09 positions
I= 10 positions
M= 12 positions
Q= 16 positions

VOLTAGE:

A= 12 V DC
B= 24 V DC
C= 24 V (50-60 Hz)
D= 110 V (50-60 Hz)
E= 230 V (50-60 Hz)
Z= without coil

SHORT CODE FUNCTION / CONNECTION :

A1= S.V. 5/2 SOL.-SPRING G1/8"
A2= S.V. 5/2 SOL.-SPRING G1/4"
D1= S.V. 5/2 SOL.-SPRING G1/8" EXT. FEED.
B1= S.V. 5/2 SOL.-SOL. G1/8"
B2= S.V. 5/2 SOL.-SOL. G1/4"
E1= S.V. 5/2 SOL.-SOL. G1/8" EXT. FEED.
C1= S.V. 5/3 CC SOL.-SOL. G1/8"
C2= S.V. 5/3 CC SOL.-SOL. G1/4"
F1= S.V. 5/3 CC SOL.-SOL. G1/8" EXT. FEED.
C3= S.V. 5/3 OC SOL.-SOL. G1/8"
C4= S.V. 5/3 OC SOL.-SOL. G1/4"
F3= S.V. 5/3 OC SOL.-SOL. G1/8" EXT. FEED.
C5= S.V. 5/3 PC SOL.-SOL. G1/8"
C6= S.V. 5/3 PC SOL.-SOL. G1/4"
F5= S.V. 5/3 PC SOL.-SOL. G1/8" EXT. FEED.
T3= VALVE SPACE PLUG

## Manifold layout Configuration Multi-pole

**V22** | **M (Multi-pole)** | **– –** | **–** | **–** | **...**

LEFT ENDPLATES

P2= 25 poles (max. 11 S.E.)
P3= 37 poles (max. 16 S.E.)

LEFT BOARD SIGNALS

C= 04 positions
G= 08 positions
M= 12 positions
Q= 16 positions

RIGHT BOARD SIGNALS

C= 04 positions
G= 08 positions
M= 12 positions
Q= 16 positions
00= no board

SHORT CODE FUNCTION / CONNECTION :

A1= S.V. 5/2 SOL.-SPRING G1/8"
A2= S.V. 5/2 SOL.-SPRING G1/4"
D1= S.V. 5/2 SOL.-SPRING G1/8" EXT. FEEDING
B1= S.V. 5/2 SOL.-SOL. G1/8"
B2= S.V. 5/2 SOL.-SOL. G1/4"
E1= S.V. 5/2 SOL.-SOL. G1/8" EXT. FEEDING
C1= S.V. 5/3 CC SOL.-SOL. G1/8"
C2= S.V. 5/3 CC SOL.-SOL. G1/4"
F1= S.V. 5/3 CC SOL.-SOL. G1/8" EXT. FEEDING
C3= S.V. 5/3 OC SOL.-SOL. G1/8"
C4= S.V. 5/3 OC SOL.-SOL. G1/4"
F3= S.V. 5/3 OC SOL.-SOL. G1/8" EXT. FEEDING
C5= S.V. 5/3 PC SOL.-SOL. G1/8"
C6= S.V. 5/3 PC SOL.-SOL. G1/4"
F5= S.V. 5/3 PC SOL.-SOL. G1/8" EXT. FEEDING
T1= VALVE SPACE PLUG
+ Nr. 2 ELECTRICAL SPACE PLUGS

## Serial manifold layout (for the serial system node, see the Optyma-F Series)

**V22** | **S (Serial)** | **– –** | **–** | **– –** | **–** | **–** | **...**

INPUT MODULE

A= None
D1= 8IN DIGITAL MODULE M8
D2= 16IN DIGITAL MODULE D-SUB 25 P
T1= 2IN ANALOG MODULE 0-5V
T2= 2IN ANALOG MODULE 0-10V
C1= 2IN ANALOG MODULE 0-20mA
C1= 2IN ANALOG MODULE 4-20mA

SERIAL NODE

C3= CANopen® 32 OUT
D3= DeviceNet 32 OUT
P3= PROFIBUS DP 32 OUT
A3= EtherCAT® 32 OUT
I3= EtherNet/IP 32 OUT
N3= PROFINET IO RT 32 OUT

LEFT BOARD SIGNALS

C= 04 positions
G= 08 positions
M= 12 positions
Q= 16 positions

RIGHT BOARD SIGNALS

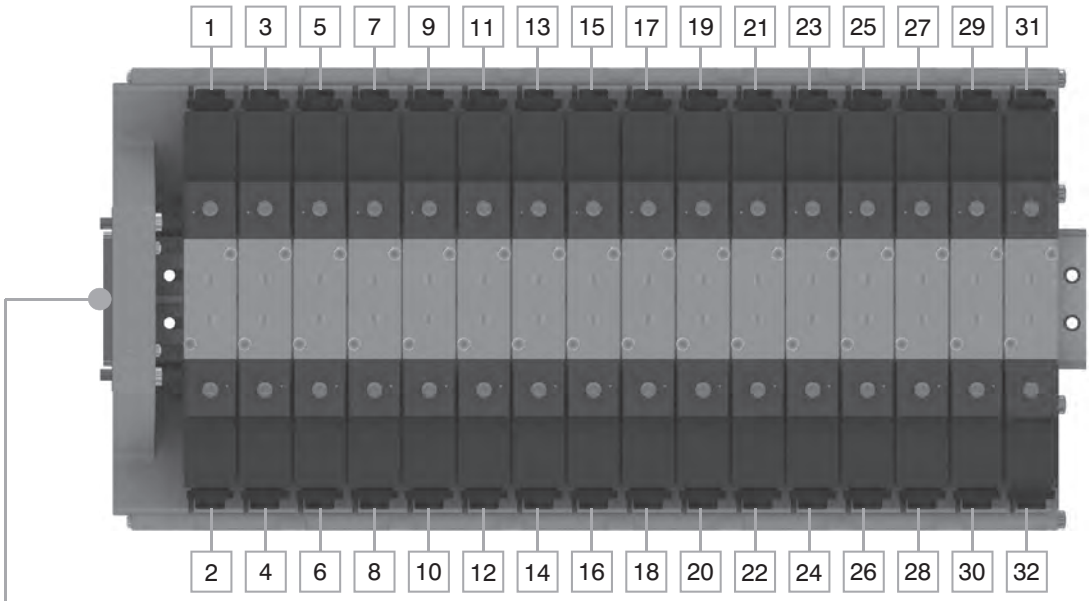
C= 04 positions
G= 08 positions
M= 12 positions
Q= 16 positions
00= no board

SHORT CODE FUNCTION / CONNECTION :

A1= S.V. 5/2 SOL.-SPRING G1/8"
A2= S.V. 5/2 SOL.-SPRING G1/4"
D1= S.V. 5/2 SOL.-SPRING G1/8" EXT. FEED.
B1= S.V. 5/2 SOL.-SOL. G1/8"
B2= S.V. 5/2 SOL.-SOL. G1/4"
E1= S.V. 5/2 SOL.-SOL. G1/8" EXT. FEED.
C1= S.V. 5/3 CC SOL.-SOL. G1/8"
C2= S.V. 5/3 CC SOL.-SOL. G1/4"
F1= S.V. 5/3 CC SOL.-SOL. G1/8" EXT. FEED.
C3= S.V. 5/3 OC SOL.-SOL. G1/8"
C4= S.V. 5/3 OC SOL.-SOL. G1/4"
F3= S.V. 5/3 OC SOL.-SOL. G1/8" EXT. FEED.
C5= S.V. 5/3 PC SOL.-SOL. G1/8"
C6= S.V. 5/3 PC SOL.-SOL. G1/4"
F5= S.V. 5/3 PC SOL.-SOL. G1/8" EXT. FEED.
T1= VALVE SPACE PLUG
+ Nr. 2 ELECTRICAL SPACE PLUGS

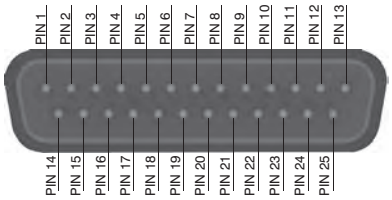
**NOTE:**
When constructing the configuration, please consider that the maximum number of valves that can be mounted on the manifold is 16, regardless of the valve type.
Any valve position presents two electrical connections: in case of use of monostable valves( A1-A2) it will be necessary to assemble a plug to protect the unused electrical connection.
The correspondence between the electrical signal and its location on the manifold is showed in the following diagrams.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice




Connector 25 Poles from 1 to 11
Positions E.V. Bistable / Monostable

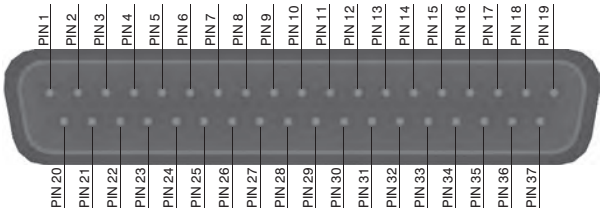





1 - 22 = SIGNALS
23 - 24 = GND
25 = NC

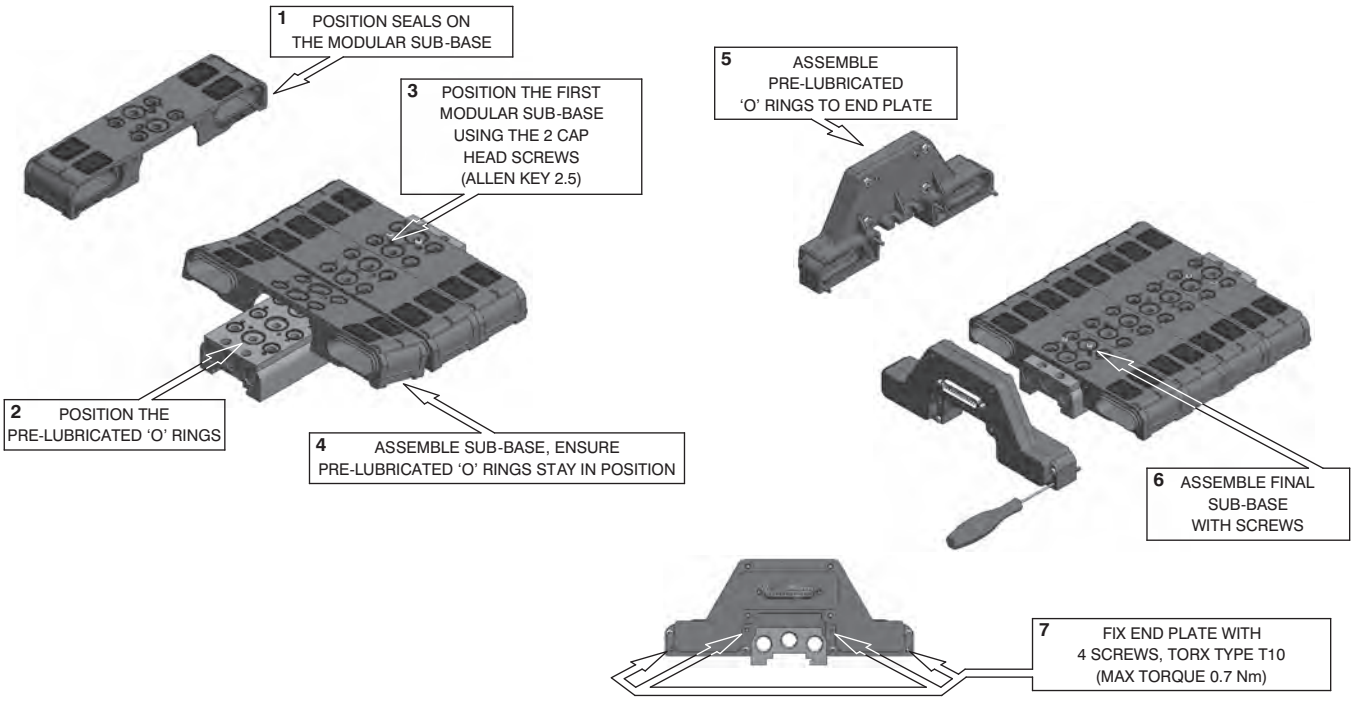
Connector 37 Poles from 1 to 16
Positions E.V. Bistable / Monostable

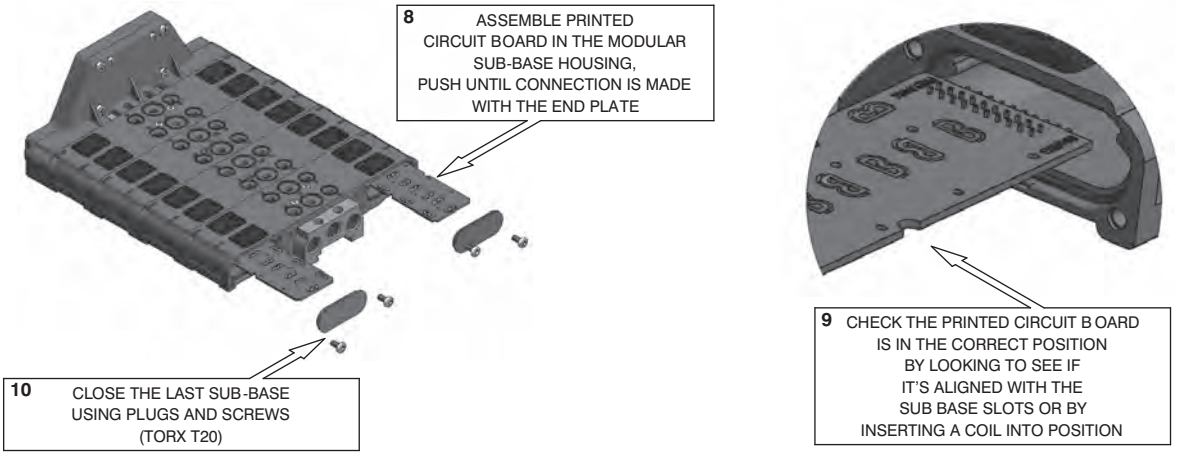


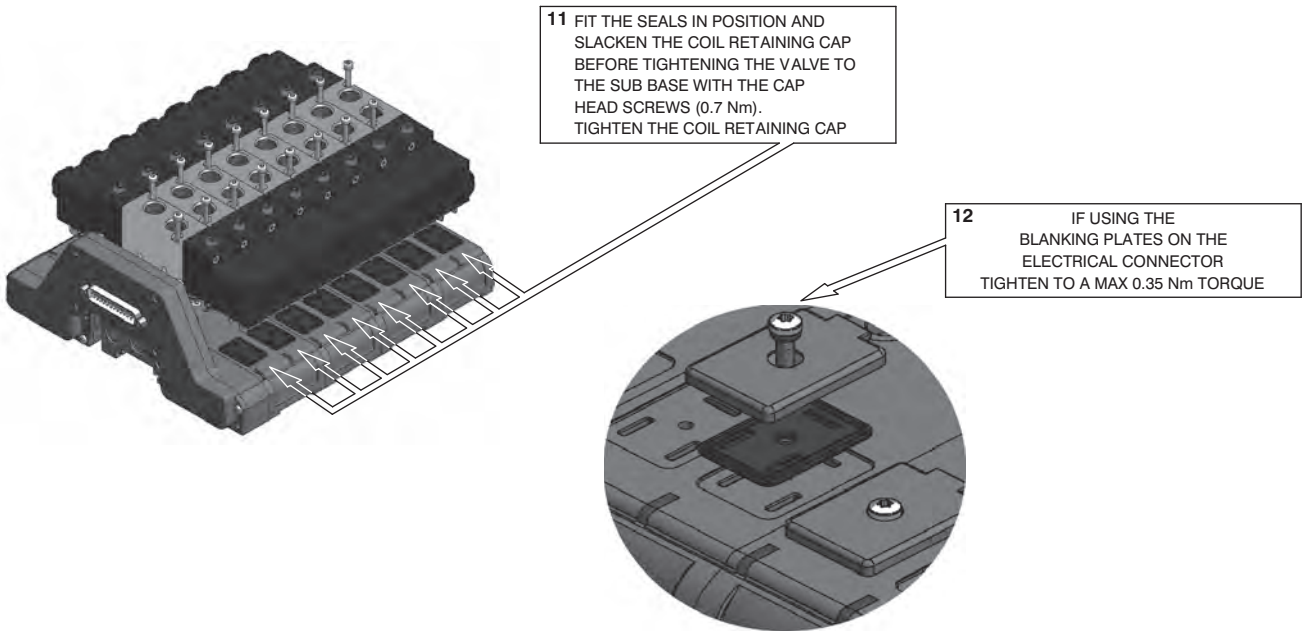



1 - 32 = SIGNALS
33 - 35 = GND
36 - 37 = NC

## Assembly sequence





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 400

These are 2 stage valves actuated electro-pneumatically. A serie 300 directly operated solenoid valve actuates pneumatically the principal power distributor.
This integrated system allows configurations of systems requiring very little space.
The pilot air is normally taken from the inlet port (autofeed) and the only actuating signal is electric.
The range of the solenoid valves, as far as dimensions and mechanical construction, is similar to series 200.
We have therefore solenoid valves G 1/8", G 1/4", G 1/2" and G 1" with identical pneumatic characteristics that are, however, actuated electrically.
They have a balanced spool, insentive to presence or absence of pressure. They are constructed in 3 and 5 way with 1 solenoid (monostable) or 2 solenoids (bistable) and also 5 ways 3 positions with closed centres, open centres and pressured centres.
If should be noted that the autofeed of the electric pilot requires always inlet through port 1 and if a 3 ways normally open configuration is desired, it is necessary to switch the operators.
Please note that while the microsolenoid can be mounted in any direction, standard solenoid requires mounting as inticated in the photographs and diagrams.

**The order codes pertain only to the solenoid valve with mechanical actuator "M2" or solenoid "S*" already assembled.**
**M2 coils are not included and have to be ordered separately (see Series 300).**
**Coils for M2 and solenoids "S" homologated are available (see Series 300).**

The solenoid valves **G1/8" (488)**, are supplied complete with coil (see Series 300) so that the tension has to be added to the solenoid valve code:

**M9** = coil 24 V D.C. (rating power 2 Watt)
**M11** = coil 24 V D.C. (rating power 3.8 watt)
**M56** = coil 24 V 50/60 Hz (rating power 9 VA)
**M57** = coil 110 V 50/60 Hz (rating power 9 VA)
**M58** = coil 230 V 50/60 Hz (rating power 9 VA)

"Shifting time of pneumatic directional control valves or moving parts, logic devices were measured in accordance to ISO 12238:2001"

**Construction characteristics**

| | |
|---|---|
| Body | Aluminium |
| Spacers | Technopolymer (aluminium for G1") |
| Seals | NBR<br>Polyurethane compound for oil free applications (G 1/8", G 1/4" and G 1/2") |
| Springs | Stainless steel or spring steel |
| Operators | Aluminium<br>Technopolymer for spring botton plate G 1/8", G1/4", G 1/2"<br>and aluminium for G 1" |
| Spools | Steel |

**Use and maintenance**

This valves have an average life of 15 million cycles depending on the application and air quality.
Filtered and lubricated air using specified lubricants will reduce the wear of the seals and ensures long and trouble free operation.
Please ensure that the valve is being used according with the manufacturers specification, such as air pressure and temperature.
The exhaust port of the distributor has to be protected in a dusty and dirty environment.
Repair kits including the spool complete with seals are available for overhauling the valves.
However, although this is a simple operation it should be carried out by a competent person.

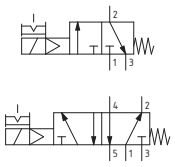
**ATTENTION:** use hydraulic oil class H for lubrication such as CASTROL MAGNA SW32.

## Solenoid - Spring

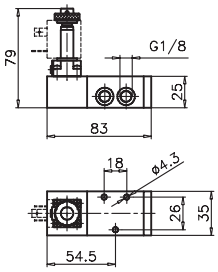
**Coding:** 468.Ⓣ.0.1.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



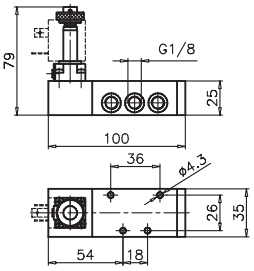





Weight 240 g
Minimum working pressure 2,5 bar

468.32.0.1.M2






Weight 240 g
Minimum working pressure 2,5 bar

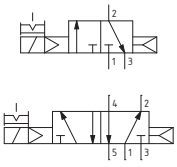
468.52.0.1.M2

## Solenoid - Differential

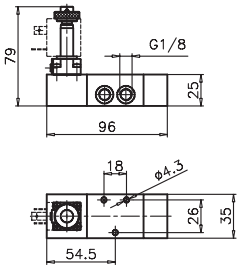
**Coding:** 468.Ⓣ.0.12.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



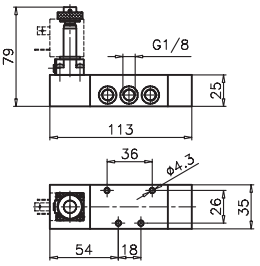





Weight 280 g
Minimum working pressure 2,5 bar

468.32.0.12.M2






Weight 320 g
Minimum working pressure 2,5 bar

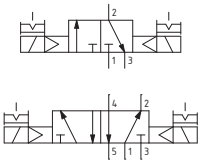
468.52.0.12.M2

## Solenoid - Solenoid

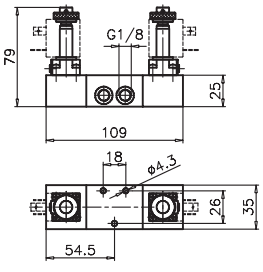
**Coding:** 468.Ⓣ.0.0.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



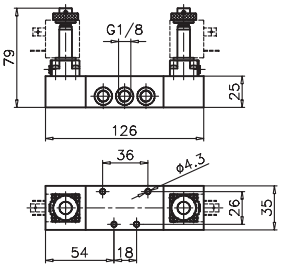





Weight 370 g
Minimum working pressure 2 bar

468.32.0.0.M2






Weight 410 g
Minimum working pressure 2 bar

468.52.0.0.M2



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

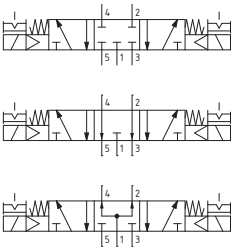
## Solenoid - Solenoid - 5/3

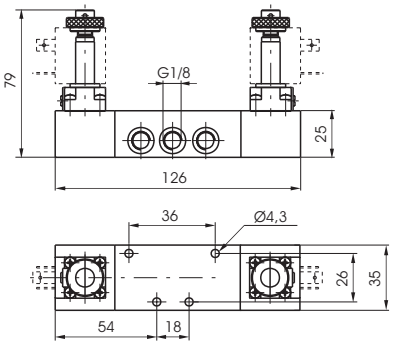
**Coding:** 468.53.Ⓕ.0.0.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 410 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |







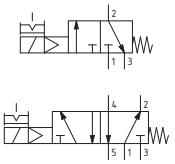

Weight 420 g
Minimum working pressure 3 bar

## Solenoid - Spring

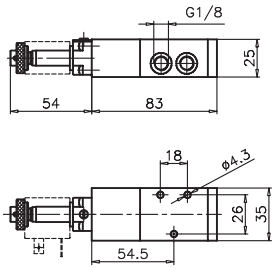
**Coding:** 468/1.Ⓣ.0.1.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



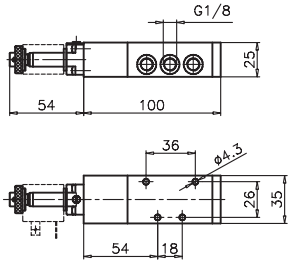





Weight 240 g
Minimum working pressure 2,5 bar

468/1.32.0.1.M2






Weight 280 g
Minimum working pressure 2,5 bar

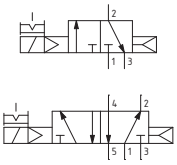
468/1.52.0.1.M2

## Solenoid - Differential

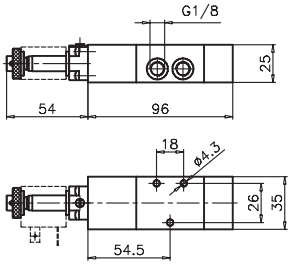
**Coding:** 468/1.Ⓣ.0.12.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



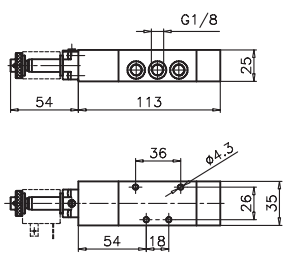





Weight 280 g
Minimum working pressure 2,5 bar

468/1.32.0.12.M2






Weight 320 g
Minimum working pressure 2,5 bar

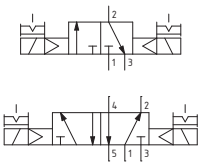
468/1.52.0.12.M2

## Solenoid - Solenoid

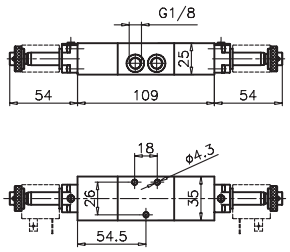
**Coding:** 468/1.❶.0.0.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |

| ❶ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



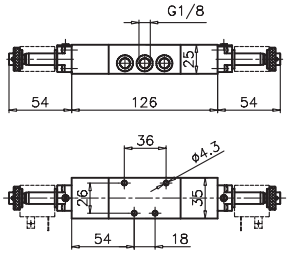





Weight 370 g
Minimum working pressure 2 bar

468/1.32.0.0.M2






Weight 410 g
Minimum working pressure 2 bar

468/1.52.0.0.M2

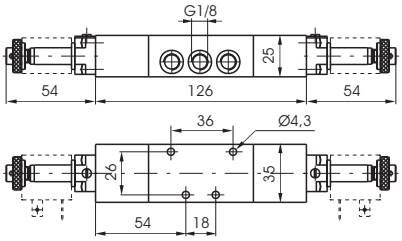
## Solenoid - Solenoid - 5/3

**Coding:** 468/1.53.❶.0.0.M2

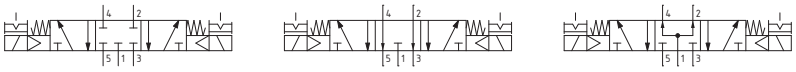
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 410 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |

| ❶ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |






Weight 420 g
Minimum working pressure 3 bar





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid - Spring

**Coding:** 488.Ⓣ.0.1.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |
| Response time according to ISO 12238, activation time (ms) | 20,3 (3 ways)<br>22,5 (5 ways) |
| Response time according to ISO 12238, deactivation time (ms) | 44,5 (3 ways)<br>47,0 (5 ways) |

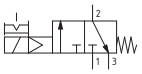
| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

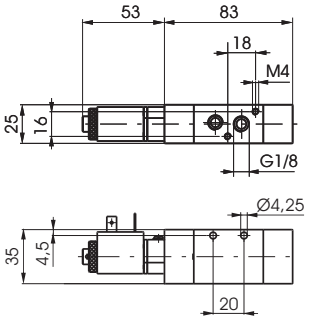
| Ⓥ | VOLTAGE |
|---|---|
| | **M9** = 24 V D.C. |
| | **M11** = 24 V D.C. |
| | **M56** = 24 V 50/60 Hz |
| | **M57** = 110 V 50/60 Hz |
| | **M58** = 230 V 50/60 Hz |



Weight 220 g
Minimum working pressure 2,5 bar

488.32.0.1.Ⓥ

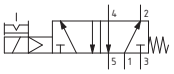


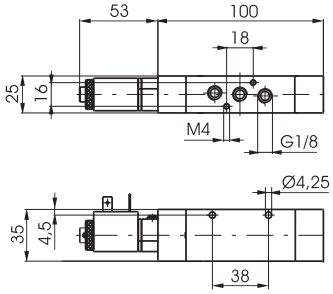





Weight 260 g
Minimum working pressure 2,5 bar

488.52.0.1.Ⓥ






## Solenoid - Differential

**Coding:** 488.Ⓣ.0.12.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |
| Response time according to ISO 12238, activation time (ms) | 28,0 (3 ways)<br>28,3 (5 ways) |
| Response time according to ISO 12238, deactivation time (ms) | 34,5 (3 ways)<br>35,5 (5 ways) |

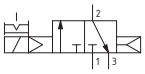
| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

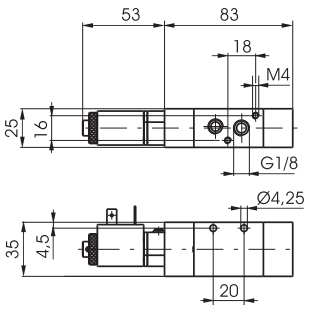
| Ⓥ | VOLTAGE |
|---|---|
| | **M9** = 24 V D.C. |
| | **M11** = 24 V D.C. |
| | **M56** = 24 V 50/60 Hz |
| | **M57** = 110 V 50/60 Hz |
| | **M58** = 230 V 50/60 Hz |



Weight 220 g
Minimum working pressure 2,5 bar

488.32.0.12.Ⓥ

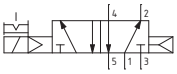


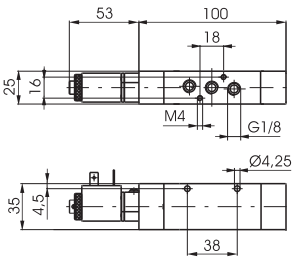





Weight 260 g
Minimum working pressure 2,5 bar

488.52.0.12.Ⓥ






## Solenoid - Solenoid

**Coding:** 488.Ⓣ.0.0.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 410 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |
| Response time according to ISO 12238, activation time (ms) | 19,0 (3 ways)<br>18,2 (5 ways) |
| Response time according to ISO 12238, deactivation time (ms) | 21,1 (3 ways)<br>18,5 (5 ways) |

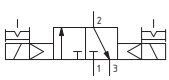
| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

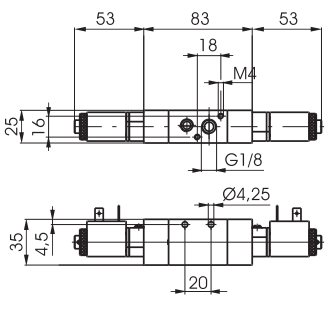
| Ⓥ | VOLTAGE |
|---|---|
| | **M9** = 24 V D.C. |
| | **M11** = 24 V D.C. |
| | **M56** = 24 V 50/60 Hz |
| | **M57** = 110 V 50/60 Hz |
| | **M58** = 230 V 50/60 Hz |



Weight 320 g
Minimum working pressure 2 bar

488.32.0.0.Ⓥ

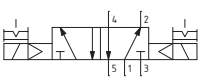


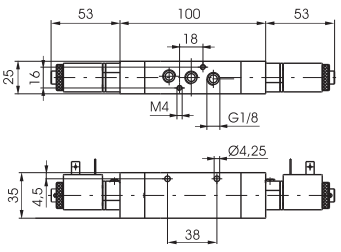





Weight 360 g
Minimum working pressure 2 bar

488.52.0.0.Ⓥ





## Solenoid - Solenoid - 5/3

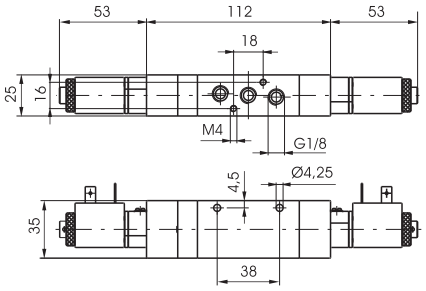
**Coding:** 488.53.Ⓕ.0.0.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 410 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |
| Response time according to ISO 12238, activation time (ms) | 23,0 (closed centres)<br>21,5 (open centres)<br>18,9 (pressured centres) |
| Response time according to ISO 12238, deactivation time (ms) | 41,0 (closed centres)<br>38,0 (open centres)<br>40,2 (pressured centres) |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |

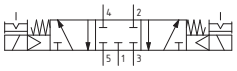
| Ⓥ | VOLTAGE |
|---|---|
| | **M9** = 24 V D.C. |
| | **M11** = 24 V D.C. |
| | **M56** = 24 V 50/60 Hz |
| | **M57** = 110 V 50/60 Hz |
| | **M58** = 230 V 50/60 Hz |



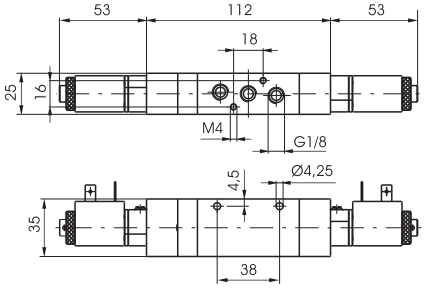



Weight 400 g
Minimum working pressure 3 bar

488.53.31.0.0.Ⓥ

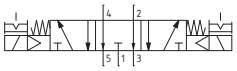




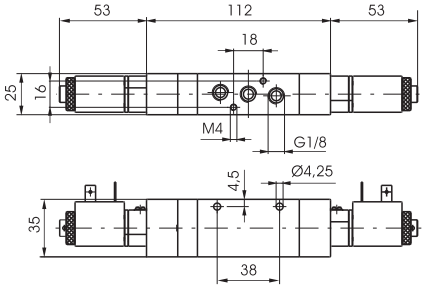




Weight 400 g
Minimum working pressure 3 bar

488.53.32.0.0.Ⓥ

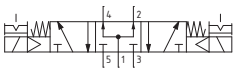





Weight 400 g
Minimum working pressure 3 bar

488.53.33.0.0.Ⓥ





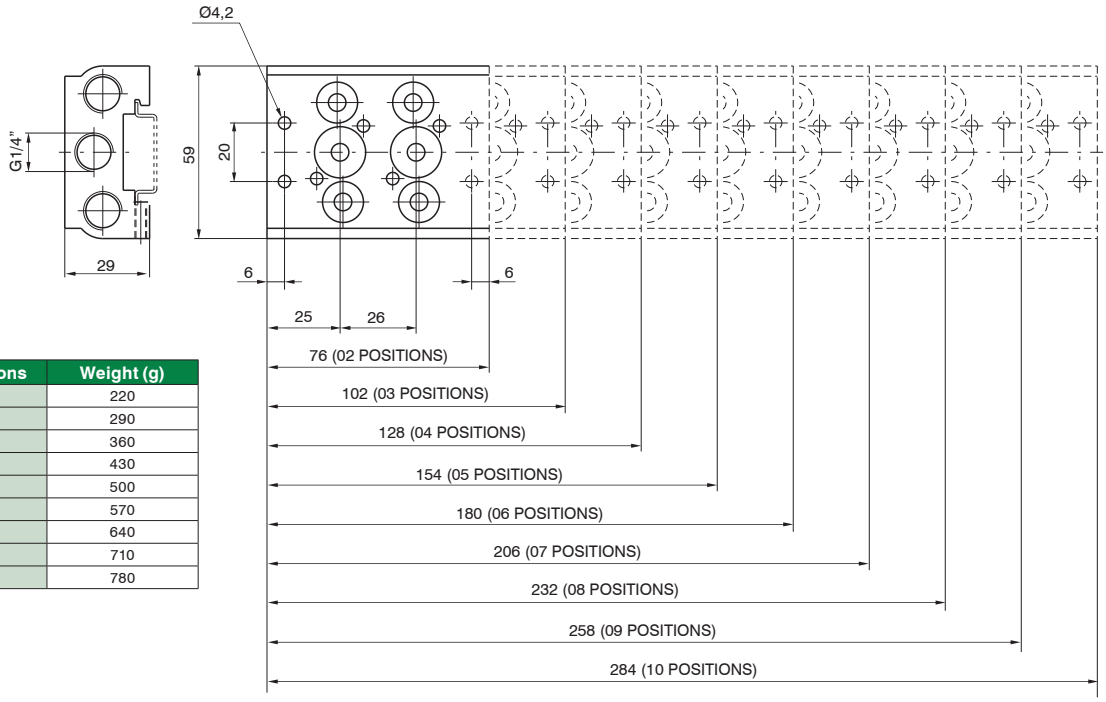

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Collectors



**Coding:** 488.Ⓝ

| Ⓝ | NO. POSITIONS |
|---|---|
| | **02** = 2 positions |
| | **03** = 3 positions |
| | **04** = 4 positions |
| | **05** = 5 positions |
| | **06** = 6 positions |
| | **07** = 7 positions |
| | **08** = 8 positions |
| | **09** = 9 positions |
| | **10** = 10 positions |

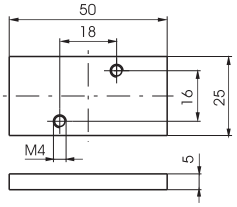



| No. positions | Weight (g) |
|---|---|
| 02 | 220 |
| 03 | 290 |
| 04 | 360 |
| 05 | 430 |
| 06 | 500 |
| 07 | 570 |
| 08 | 640 |
| 09 | 710 |
| 10 | 780 |

## Closing plate

**Coding:** 488.00





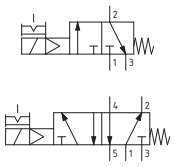

Weight 25 g

## Solenoid - Spring

**Coding:** 464.Ⓣ.0.1.M2

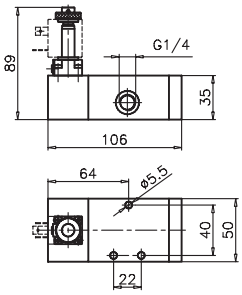
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



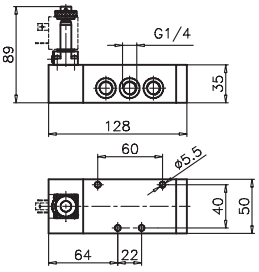



Weight 530 g
Minimum working pressure 2,5 bar

464.32.0.1.M2

***5/2 ways***






Weight 625 g
Minimum working pressure 2,5 bar

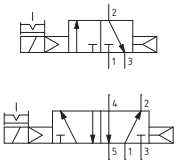
464.52.0.1.M2

## Solenoid - Differential

**Coding:** 464.Ⓣ.0.12.M2

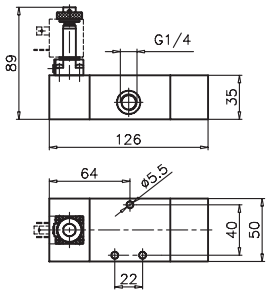
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



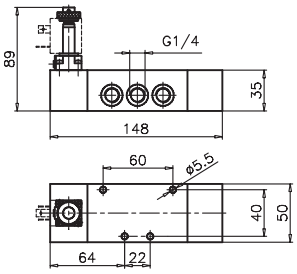



Weight 650 g
Minimum working pressure 2,5 bar

464.32.0.12.M2

***5/2 ways***






Weight 740 g
Minimum working pressure 2,5 bar

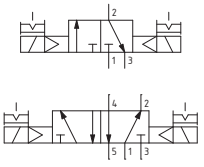
464.52.0.12.M2

## Solenoid - Solenoid

**Coding:** 464.Ⓣ.0.0.M2

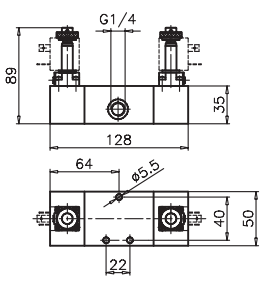
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



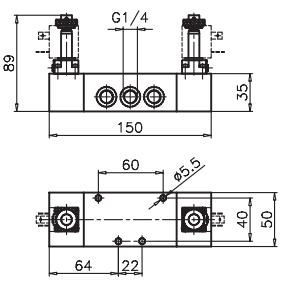



Weight 730 g
Minimum working pressure 2 bar

464.32.0.0.M2

***5/2 ways***






Weight 820 g
Minimum working pressure 2 bar

464.52.0.0.M2



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

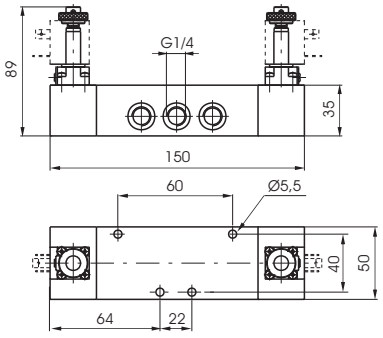
## Solenoid - Solenoid - 5/3

**Coding:** 464.53.Ⓕ.0.0.M2

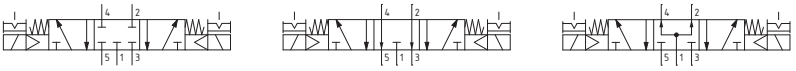
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1280 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |






Weight 820 g
Minimum working pressure 3 bar

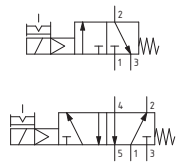


## Solenoid - Spring

**Coding:** 464/1.❶.0.1.M2

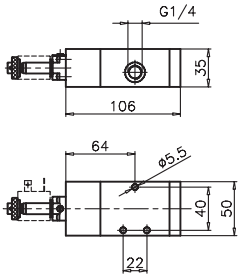
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" |

| ❶ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



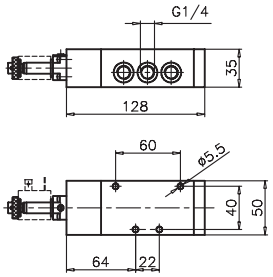



Weight 530 g
Minimum working pressure 2,5 bar

464/1.32.0.1.M2

***5/2 ways***






Weight 625 g
Minimum working pressure 2,5 bar

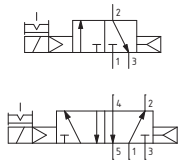
464/1.52.0.1.M2

## Solenoid - Differential

**Coding:** 464/1.❶.0.12.M2

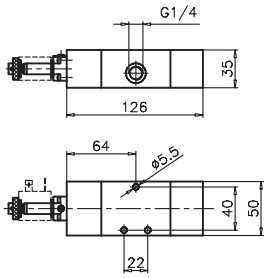
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" |

| ❶ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



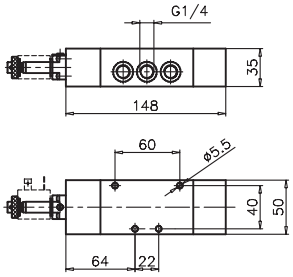



Weight 650 g
Minimum working pressure 2,5 bar

464/1.32.0.12.M2

***5/2 ways***






Weight 740 g
Minimum working pressure 2,5 bar

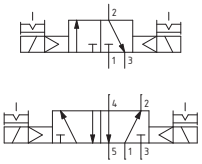
464/1.52.0.12.M2

## Solenoid - Solenoid

**Coding:** 464/1.❶.0.0.M2

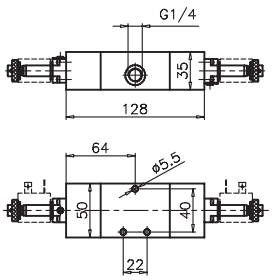
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1360 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" |

| ❶ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



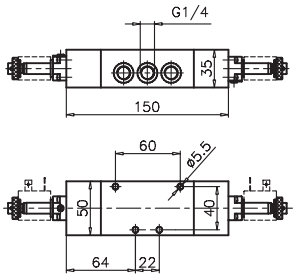



Weight 730 g
Minimum working pressure 2 bar

464/1.32.0.0.M2

***5/2 ways***






Weight 820 g
Minimum working pressure 2 bar

464/1.52.0.0.M2



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

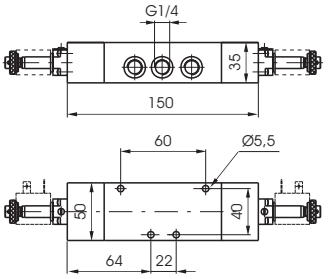
## Solenoid - Solenoid - 5/3

**Coding:** 464/1.53.Ⓕ.0.0.M2

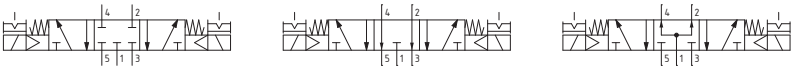
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1280 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |






Weight 820 g
Minimum working pressure 3 bar



## Solenoid - Spring

**Coding:** 452.Ⓣ.0.1.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3500 |
| Orifice size (mm) | 15 |
| Working ports size | G 1/2" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



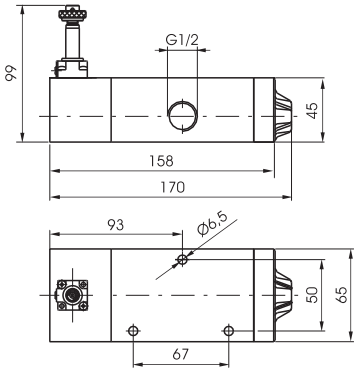
Weight 1152 g
Minimum working pressure 2,5 bar

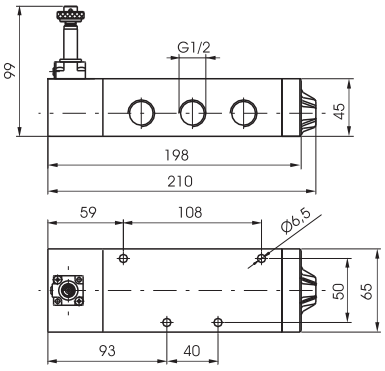
452.32.0.1.M2

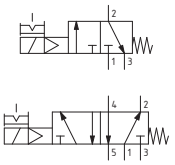


Weight 1422 g
Minimum working pressure 2,5 bar

452.52.0.1.M2



## Solenoid - Differential

**Coding:** 452.Ⓣ.0.12.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3500 |
| Orifice size (mm) | 15 |
| Working ports size | G 1/2" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



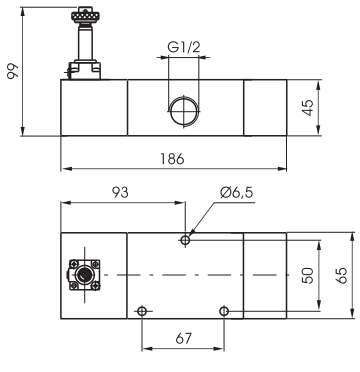
Weight 1422 g
Minimum working pressure 2,5 bar

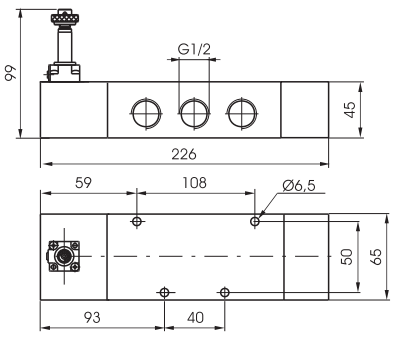
452.32.0.12.M2

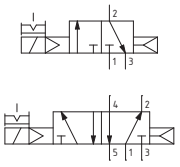


Weight 1692 g
Minimum working pressure 2 bar

452.52.0.12.M2





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid - Solenoid

**Coding:** 452.Ⓣ.0.0.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3500 |
| Orifice size (mm) | 15 |
| Working ports size | G 1/2" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



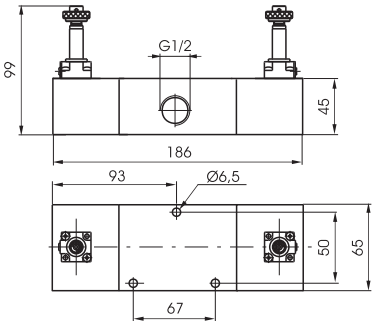
Weight 1474 g
Minimum working pressure 2 bar

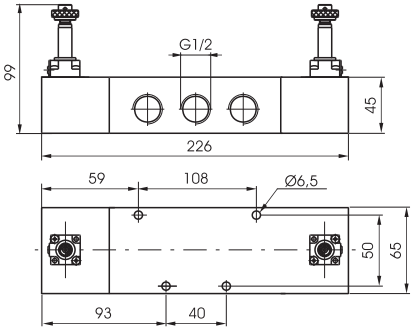
452.32.0.0.M2

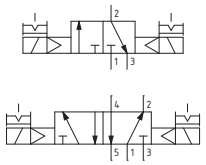


Weight 1744 g
Minimum working pressure 2 bar

452.52.0.0.M2



## Solenoid - Solenoid - 5/3

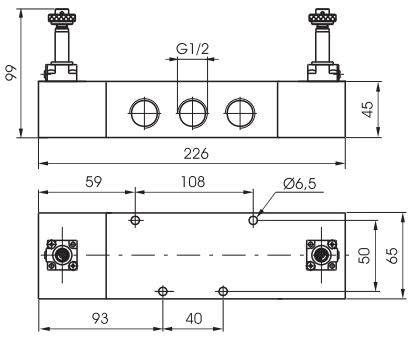
**Coding:** 452.53.Ⓕ.0.0.M2

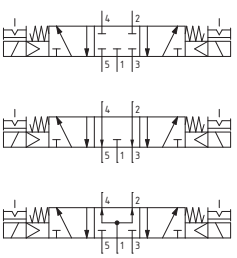
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3500 |
| Orifice size (mm) | 15 |
| Working ports size | G 1/2" |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |



Weight 1744 g
Minimum working pressure 3 bar



## Solenoid - Spring

**Coding:** 452/1.Ⓣ.0.1.M2

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3500 |
| Orifice size (mm) | 15 |
| Working ports size | G 1/2" |



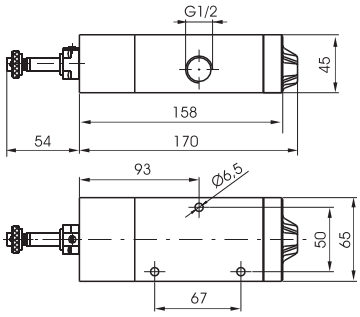
Weight 1330 g
Minimum working pressure 2,5 bar

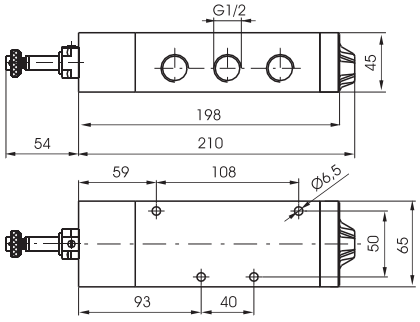
452/1.32.0.1.M2

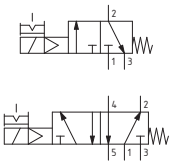


Weight 1600 g
Minimum working pressure 2,5 bar

452/1.52.0.1.M2



## Solenoid - Differential

**Coding:** 452/1.Ⓣ.0.12.M2

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3500 |
| Orifice size (mm) | 15 |
| Working ports size | G 1/2" |



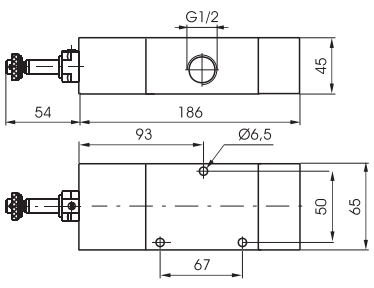
Weight 1600 g
Minimum working pressure 2,5 bar

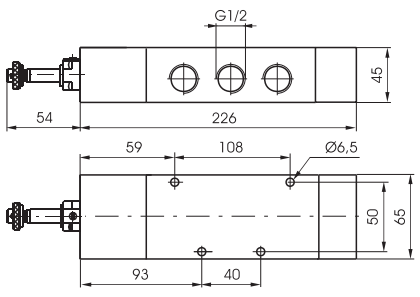
452/1.32.0.12.M2

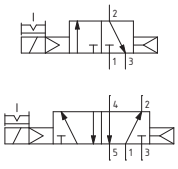


Weight 1870 g
Minimum working pressure 2 bar

452/1.52.0.12.M2





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid - Solenoid

**Coding:** 452/1.Ⓣ.0.0.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3500 |
| Orifice size (mm) | 15 |
| Working ports size | G 1/2" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



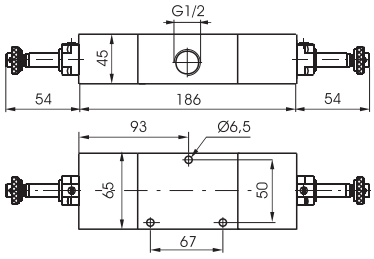
Weight 1830 g
Minimum working pressure 2 bar

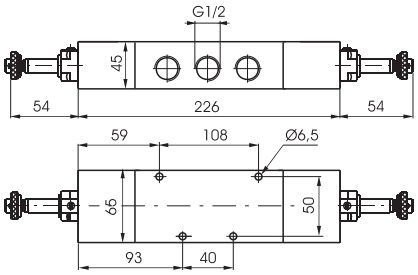
452/1.32.0.0.M2

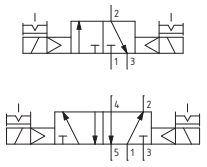


Weight 2100 g
Minimum working pressure 2 bar

452/1.52.0.0.M2



## Solenoid - Solenoid - 5/3

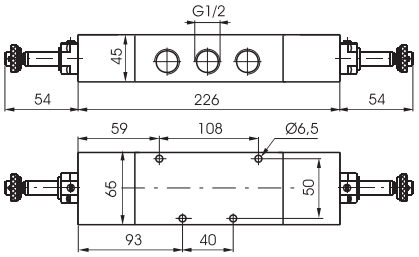
**Coding:** 452/1.53.Ⓕ.0.0.M2

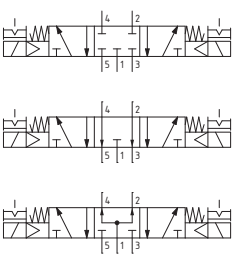
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3500 |
| Orifice size (mm) | 15 |
| Working ports size | G 1/2" |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |



Weight 2100 g
Minimum working pressure 3 bar



## Solenoid - Spring

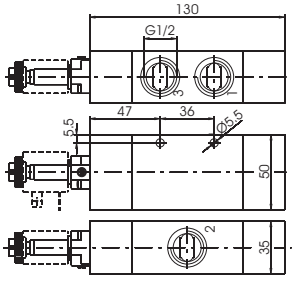
**Coding:** 412/2.Ⓣ.0.1.Ⓕ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3600 |
| Orifice size (mm) | 15 |
| Working ports size | G 1/2" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓕ | FUNCTION |
| | **C.M2** = 3/2 ways Normally Closed |
| | **A.M2** = 3/2 ways Normally Open |
| | **M2** = 5/2 ways |

***3/2 ways***







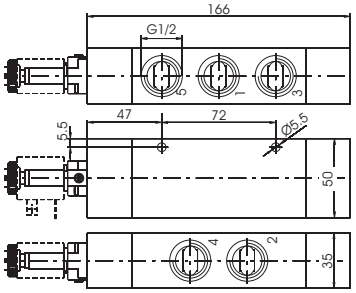

Weight 578 g
Minimum working pressure 2,5 bar

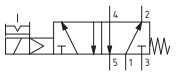
412/2.32.0.1.C.M2

412/2.32.0.1.A.M2

***5/2 ways***





Weight 700 g
Minimum working pressure 2,5 bar

412/2.52.0.1.M2

## Solenoid - Differential

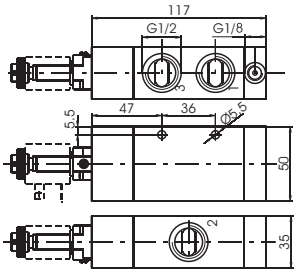
**Coding:** 412/2.Ⓣ.0.12.Ⓕ

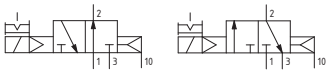
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3600 |
| Orifice size (mm) | 15 |
| Working ports size | G 1/2" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓕ | FUNCTION |
| | **C.M2** = 3/2 ways Normally Closed |
| | **A.M2** = 3/2 ways Normally Open |
| | **M2** = 5/2 ways |

***3/2 ways***





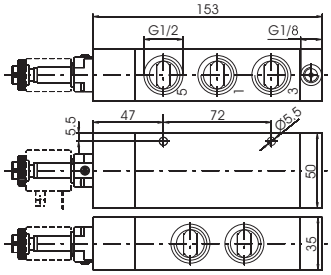
Weight 522 g
Minimum working pressure 2,5 bar

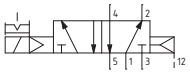
412/2.32.0.12.C.M2

412/2.32.0.12.A.M2

***5/2 ways***





Weight 644 g
Minimum working pressure 2,5 bar

412/2.52.0.12.M2

## Solenoid - Differential (Self feeding)

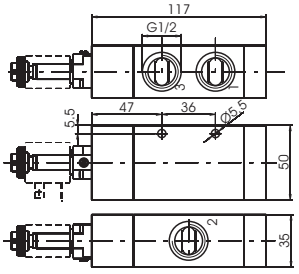
**Coding:** 412/2.Ⓣ.0.12/1.Ⓕ

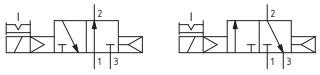
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3600 |
| Orifice size (mm) | 15 |
| Working ports size | G 1/2" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓕ | FUNCTION |
| | **C.M2** = 3/2 ways Normally Closed |
| | **A.M2** = 3/2 ways Normally Open |
| | **M2** = 5/2 ways |

***3/2 ways***





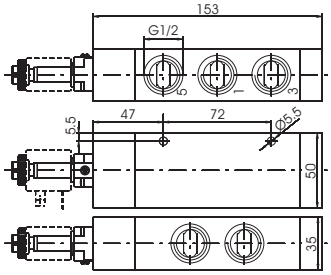
Weight 526 g
Minimum working pressure 2,5 bar

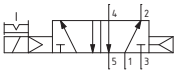
412/2.32.0.12/1.C.M2

412/2.32.0.12/1.A.M2

***5/2 ways***





Weight 648 g
Minimum working pressure 2,5 bar

412/2.52.0.12/1.M2



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid - Solenoid

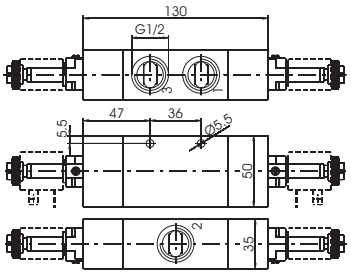
**Coding:** 412/2.Ⓣ.0.0.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3600 |
| Orifice size (mm) | 15 |
| Working ports size | G 1/2" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

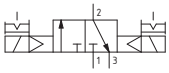
***3/2 ways***





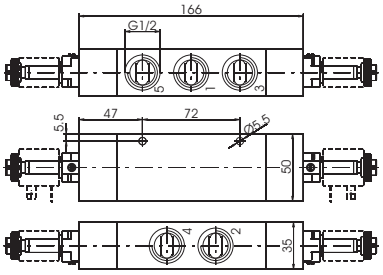

Weight 612 g
Minimum working pressure 2 bar

412/2.32.0.0.M2



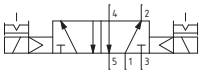
***5/2 ways***






Weight 732 g
Minimum working pressure 2 bar

412/2.52.0.0.M2



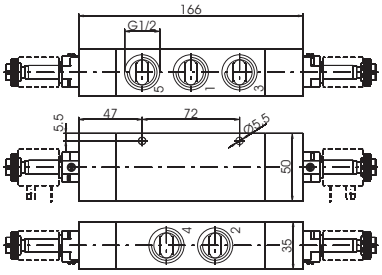
## Solenoid - Solenoid - 5/3

**Coding:** 412/2.53.Ⓕ.0.0.M2

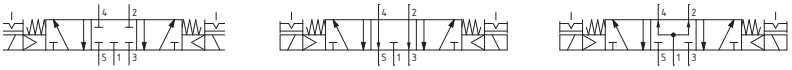
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3300 |
| Orifice size (mm) | 15 |
| Working ports size | G 1/2" |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |






Weight 794 g
Minimum working pressure 3 bar



## Solenoid - Spring

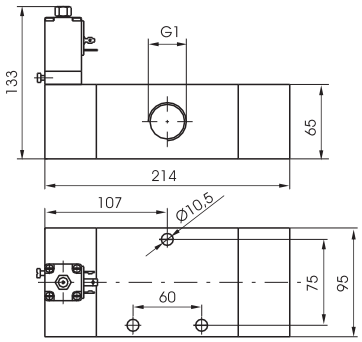
**Coding:** 411.Ⓣ.0.1.Ⓢ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 6500 |
| Orifice size (mm) | 20 |
| Working ports size | G 1" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓢ | SOLENOID |
| | **SEE SOLENOID VALVES "S" TYPE, SERIES 300** |

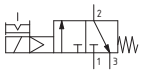
***3/2 ways***





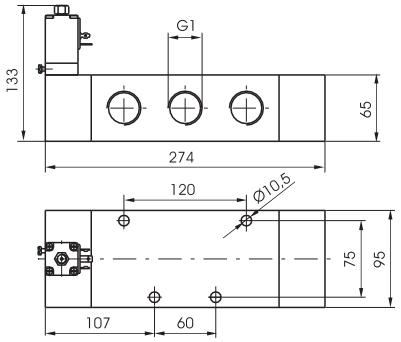

Weight 3400 g
Minimum working pressure 2,5 bar

411.32.0.1.Ⓢ



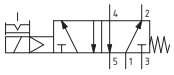
***5/2 ways***






Weight 4300 g
Minimum working pressure 2,5 bar

411.52.0.1.Ⓢ



## Solenoid - Differential

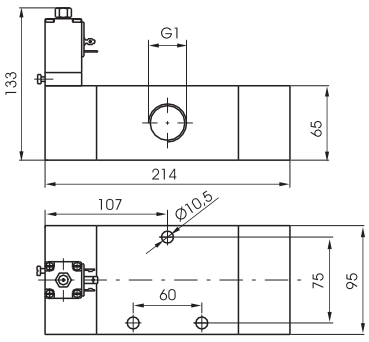
**Coding:** 411.Ⓣ.0.12.Ⓢ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 6500 |
| Orifice size (mm) | 20 |
| Working ports size | G 1" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓢ | SOLENOID |
| | **SEE SOLENOID VALVES "S" TYPE, SERIES 300** |

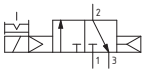
***3/2 ways***





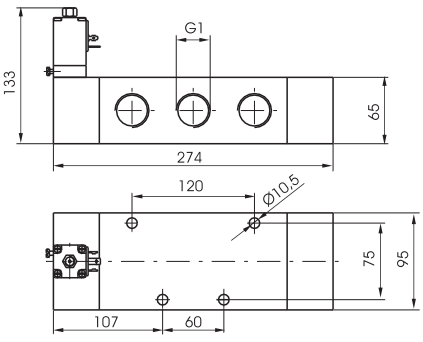

Weight 3400 g
Minimum working pressure 2,5 bar

411.32.0.12.Ⓢ



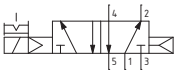
***5/2 ways***






Weight 4300 g
Minimum working pressure 2,5 bar

411.52.0.12.Ⓢ





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid - Solenoid

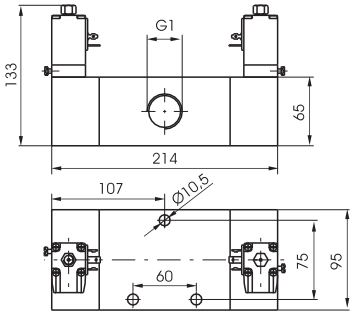
**Coding:** 411.Ⓣ.0.0.Ⓢ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 6500 |
| Orifice size (mm) | 20 |
| Working ports size | G 1" |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓢ | SOLENOID |
| | **SEE SOLENOID VALVES "S" TYPE, SERIES 300** |

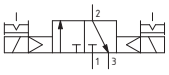
***3/2 ways***





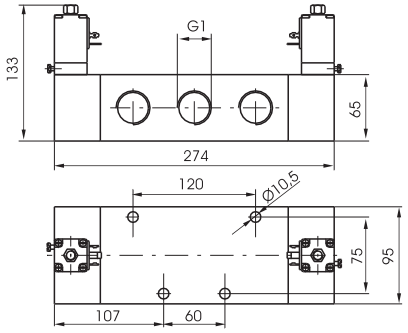

Weight 3700 g
Minimum working pressure 2 bar

411.32.0.0.Ⓢ



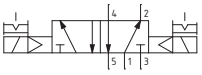
***5/2 ways***






Weight 4600 g
Minimum working pressure 2 bar

411.52.0.0.Ⓢ



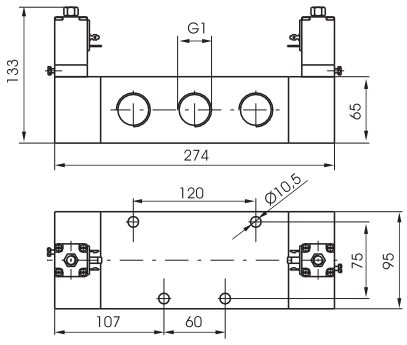
## Solenoid - Solenoid - 5/3

**Coding:** 411.53.Ⓕ.0.0.Ⓢ

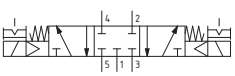
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 6500 |
| Orifice size (mm) | 20 |
| Working ports size | G 1" |

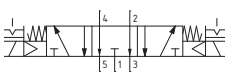
| | |
|---|---|
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓢ | SOLENOID |
| | **SEE SOLENOID VALVES "S" TYPE, SERIES 300** |

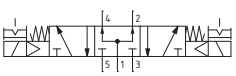





Weight 4700 g
Minimum working pressure 3 bar







## Series T400

The Series **T400** involves a wide range of valves and solenoid valves, with several type of acting, with connections from **G1/8" (T488)** and **G1/4" (T424)**, are manufactured with high performance technopolimer.
The use of technopolymer has resulted in a light weight product which can be offered to the market at very interesting prices.
The gang mounted solenoid valves are available with the traditional manifold obtained from bored square bar of series 600 and with the extruded aluminium base allowing a unic inlet port conveying the exhausts. The base is also prearranged to be fixed on DIN 46277/3 guide.

The Valves and Solenoid valves **G1/8" (T488)** are: 5 ways function, pneumatically operated, single solenoid (monostable) mechanical or pneumatic spring return, spring or pneumatic return, with 2 coils (bistable) and in 5 ways 3 positions version with closed, open and pressured centres.
The solenoid valves are supplied complete with coil (see Series 300) so that the tension has to be added to the solenoid valve code:

**M9** = coil 24 V D.C. (rating power 2 Watt)
**M11** = coil 24 V D.C. (rating power 3.8 watt)
**M56** = coil 24 V 50/60 Hz (rating power 9 VA)
**M57** = coil 110 V 50/60 Hz (rating power 9 VA)
**M58** = coil 230 V 50/60 Hz (rating power 9 VA)

The Solenoid valves **G1/4" (T424)**, are manufactured, depending on version and actuation (manual, pneumatic, or electrical), and self aligning (pneumatic-electric or spring) 3/2, 5/2 and 5/3 ways function, (monostable), (bistable).
The solenoid valves are supplied complete with coil so that the tension has to be added to the solenoid valve code.

**B04** = coil 12 V D.C.
**B05** = coil 24 V D.C.
**B09** = coil 24 V (2W) D.C.
**B56** = coil 24 V 50/60 Hz
**B57** = coil 110 V 50/60 Hz
**B58** = coil 230 V 50/60 Hz

"Shifting time of pneumatic directional control valves or moving parts, logic devices were measured in accordance to ISO 12238:2001"

**Construction characteristics**

| | |
|---|---|
| Body | Technopolymer |
| Spacers | Technopolymer |
| Seals | NBR |
| Pistons seal | NBR |
| Springs | AISI 302 stainless steel |
| Operators | Technopolymer |
| Pistons | Technopolymer |
| Spools | Nickel - plated steel / Technopolymer |

**Maximum fitting torque**

| Thread | Maximum torque (Nm) |
|---|---|
| G 1/8" | 4 |
| G1/4" | 9 |

**Use and maintenance**

This valves have an average life of 15 million cycles depending on the application and air quality.
Filtered and lubricated air using specified lubricants will reduce the wear of the seals and ensures long and trouble free operation.
Please ensure that the valve is being used according with the manufacturers specification, such as air pressure and temperature.
The exhaust port of the distributor has to be protected in a dusty and dirty environment.
Repair kits including the spool complete with seals are available for overhauling the valves.
However, although this is a simple operation it should be carried out by a competent person.

**ATTENTION:** use hydraulic oil class H for lubrication such as CASTROL MAGNA SW32.

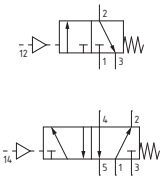

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pneumatic - Spring

**Coding:** T488.Ⓣ.11.1

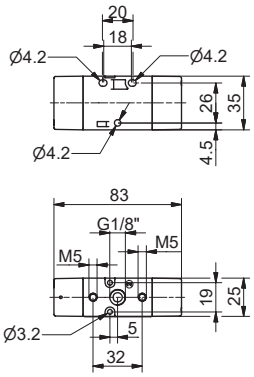
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



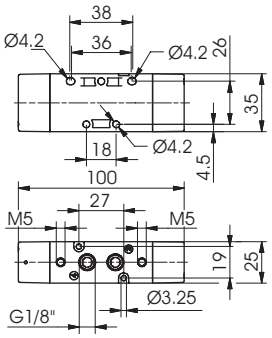



Weight 69 g
Minimum working pressure 2,5 bar

T488.32.11.1

***5/2 ways***






Weight 83 g
Minimum working pressure 2,5 bar

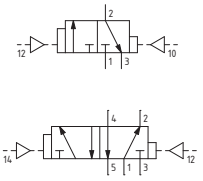
T488.52.11.1

## Pneumatic-Differential

**Coding:** T488.Ⓣ.11.12

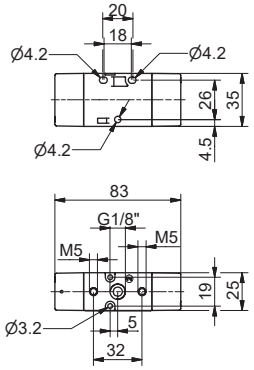
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



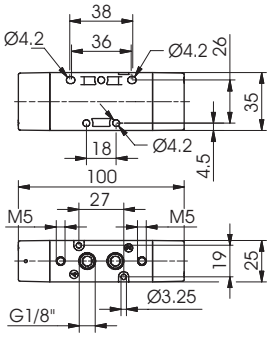



Weight 69 g

T488.32.11.12

***5/2 ways***






Weight 83 g

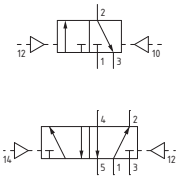
T488.52.11.12

## Pneumatic - Pneumatic

**Coding:** T488.Ⓣ.11.11

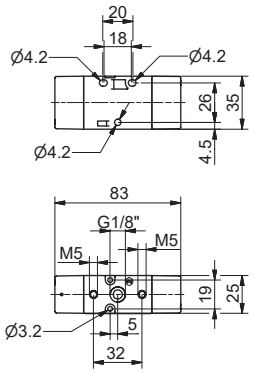
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |



***3/2 ways***



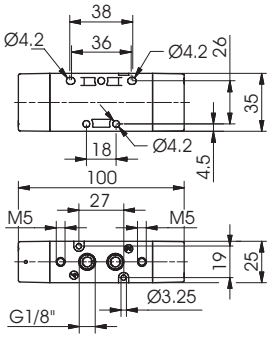



Weight 68 g
Minimum working pressure 2 bar

T488.32.11.11

***5/2 ways***






Weight 83 g
Minimum working pressure 2 bar

T488.52.11.11

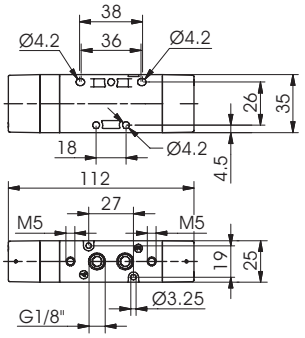
## Pneumatic-Pneumatic 5/3

**Coding:** T488.53.Ⓕ.11.11

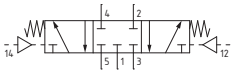
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 410 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |

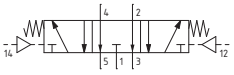
| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |

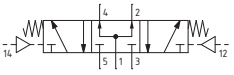





Weight 140 g
Minimum working pressure 3 bar






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Spring (Self feeding)

**Coding:** T488.Ⓣ.0.1.Ⓥ

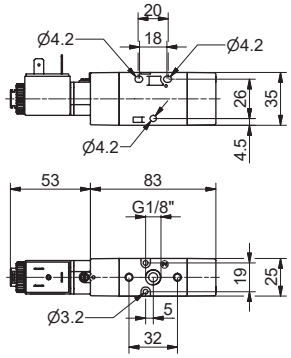
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |
| Response time according to ISO 12238, activation time (ms) | 23,4 (3 ways)<br>22,8 (5 ways) |
| Response time according to ISO 12238, deactivation time (ms) | 41,0 (3 ways)<br>44,5 (5 ways) |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **M9** = 24 V D.C. |
| | **M11** = 24 V D.C. |
| | **M56** = 24 V 50/60 Hz |
| | **M57** = 110 V 50/60 Hz |
| | **M58** = 230 V 50/60 Hz |



Weight 160 g
Minimum working pressure 2,5 bar

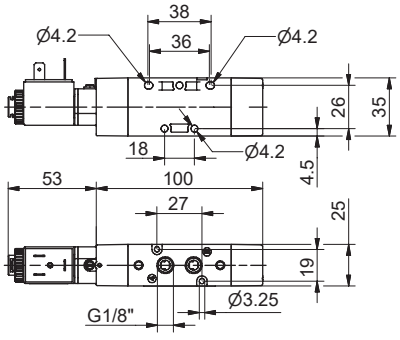
T488.32.0.1.Ⓥ

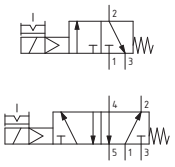





Weight 190 g
Minimum working pressure 2,5 bar

T488.52.0.1.Ⓥ



## Solenoid-Spring (External feeding)

**Coding:** T488.Ⓣ.0.1E.Ⓥ

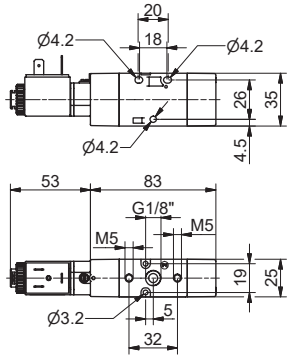
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |
| Response time according to ISO 12238, activation time (ms) | 23,4 (3 ways)<br>22,8 (5 ways) |
| Response time according to ISO 12238, deactivation time (ms) | 41,0 (3 ways)<br>44,5 (5 ways) |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **M9** = 24 V D.C. |
| | **M11** = 24 V D.C. |
| | **M56** = 24 V 50/60 Hz |
| | **M57** = 110 V 50/60 Hz |
| | **M58** = 230 V 50/60 Hz |



Weight 160 g
Minimum working pressure 2,5 bar

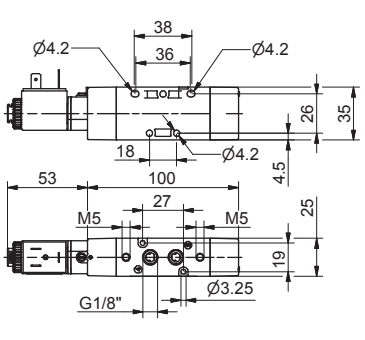
T488.32.0.1E.Ⓥ

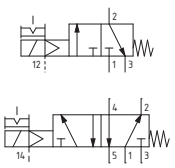





Weight 190 g
Minimum working pressure 2,5 bar

T488.52.0.1E.Ⓥ



## Solenoid-Differential (Self feeding)

**Coding:** T488.Ⓣ.0.12.Ⓥ

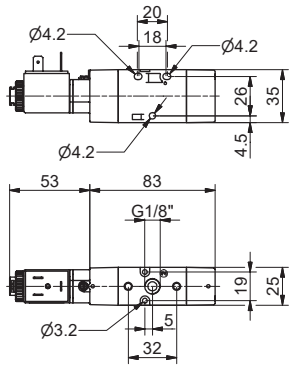
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |
| Response time according to ISO 12238, activation time (ms) | 31,1 (3 ways)<br>27,9 (5 ways) |
| Response time according to ISO 12238, deactivation time (ms) | 35,0 (3 ways)<br>34,5 (5 ways) |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **M9** = 24 V D.C. |
| | **M11** = 24 V D.C. |
| | **M56** = 24 V 50/60 Hz |
| | **M57** = 110 V 50/60 Hz |
| | **M58** = 230 V 50/60 Hz |



Weight 160 g
Minimum working pressure 2,5 bar

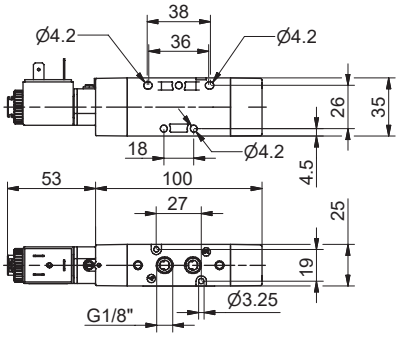
T488.32.0.12.Ⓥ

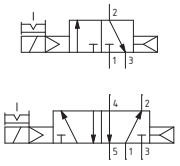





Weight 190 g
Minimum working pressure 2,5 bar

T488.52.0.12.Ⓥ



## Solenoid-Differential (External feeding)

**Coding:** T488.Ⓣ.0.12E.Ⓥ

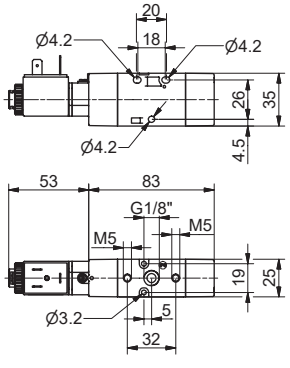
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |
| Response time according to ISO 12238, activation time (ms) | 31,1 (3 ways)<br>27,9 (5 ways) |
| Response time according to ISO 12238, deactivation time (ms) | 35,0 (3 ways)<br>34,5 (5 ways) |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **M9** = 24 V D.C. |
| | **M11** = 24 V D.C. |
| | **M56** = 24 V 50/60 Hz |
| | **M57** = 110 V 50/60 Hz |
| | **M58** = 230 V 50/60 Hz |



Weight 160 g
Minimum working pressure 2,5 bar

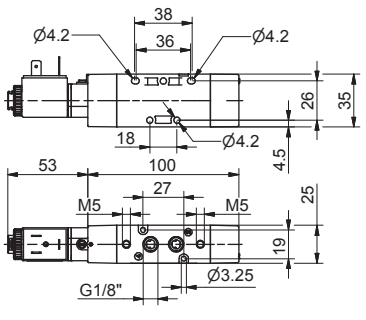
T488.32.0.12E.Ⓥ

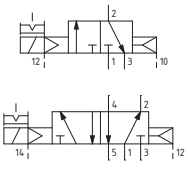





Weight 190 g
Minimum working pressure 2,5 bar

T488.52.0.12E.Ⓥ





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Solenoid (Self feeding)

**Coding:** T488.Ⓣ.0.0.Ⓥ

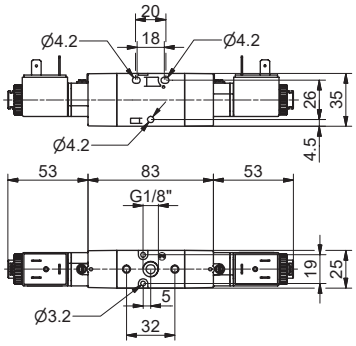
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |
| Response time according to ISO 12238, activation time (ms) | 18,8 (3 ways)<br>18,0 (5 ways) |
| Response time according to ISO 12238, deactivation time (ms) | 18,0 (3 ways)<br>19,1 (5 ways) |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **M9** = 24 V D.C. |
| | **M11** = 24 V D.C. |
| | **M56** = 24 V 50/60 Hz |
| | **M57** = 110 V 50/60 Hz |
| | **M58** = 230 V 50/60 Hz |



Weight 250 g
Minimum working pressure 2 bar

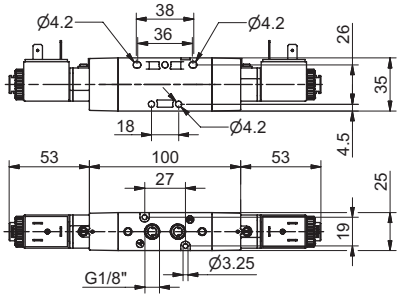
T488.32.0.0.Ⓥ

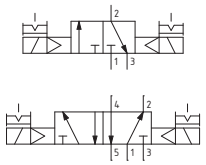





Weight 290 g
Minimum working pressure 2 bar

T488.52.0.0.Ⓥ



## Solenoid-Solenoid (External feeding)

**Coding:** T488.Ⓣ.0.0E.Ⓥ

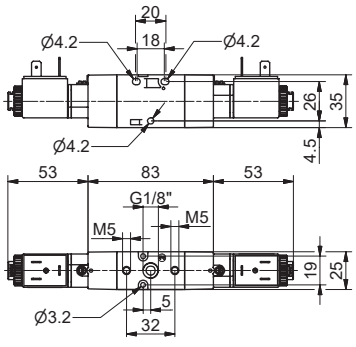
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 620 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |
| Response time according to ISO 12238, activation time (ms) | 18,8 (3 ways)<br>18,0 (5 ways) |
| Response time according to ISO 12238, deactivation time (ms) | 18,0 (3 ways)<br>19,1 (5 ways) |

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **M9** = 24 V D.C. |
| | **M11** = 24 V D.C. |
| | **M56** = 24 V 50/60 Hz |
| | **M57** = 110 V 50/60 Hz |
| | **M58** = 230 V 50/60 Hz |



Weight 250 g
Minimum working pressure 2 bar

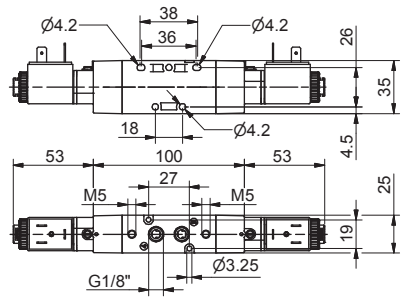
T488.32.0.0E.Ⓥ

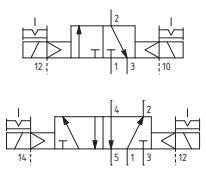





Weight 290 g
Minimum working pressure 2 bar

T488.52.0.0E.Ⓥ



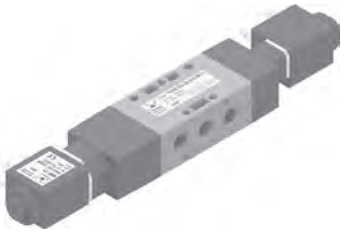
## Solenoid-Solenoid 5/3 (Self feeding)

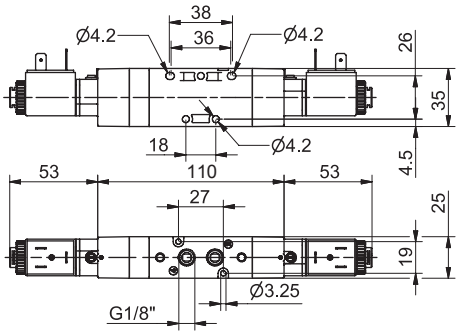
**Coding:** T488.53.Ⓕ.0.0.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 410 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |
| Response time according to ISO 12238, activation time (ms) | 21,3 (closed centres)<br>21,5 (open centres)<br>19,5 (pressured centres) |
| Response time according to ISO 12238, deactivation time (ms) | 37,0 (closed centres)<br>34,5 (open centres)<br>37,3 (pressured centres) |

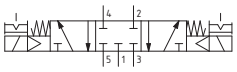
| | |
|---|---|
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓥ | VOLTAGE |
| | **M9** = 24 V D.C. |
| | **M11** = 24 V D.C. |
| | **M56** = 24 V 50/60 Hz |
| | **M57** = 110 V 50/60 Hz |
| | **M58** = 230 V 50/60 Hz |

Minimum working pressure 3 bar
Weight 330 g

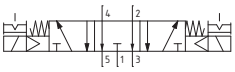




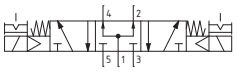

T488.53.31.0.0.Ⓥ



T488.53.32.0.0.Ⓥ



T488.53.33.0.0.Ⓥ



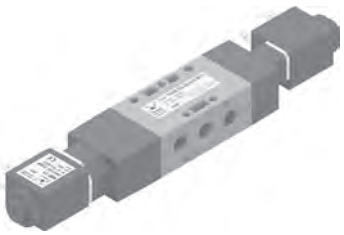
## Solenoid-Solenoid 5/3 (External feeding)

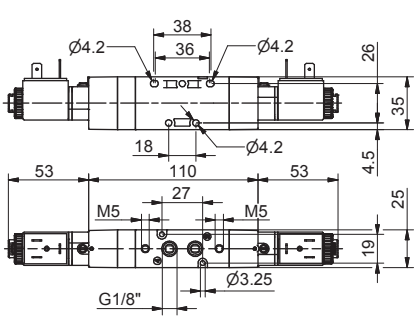
**Coding:** T488.53.Ⓕ.0.0E.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 410 |
| Orifice size (mm) | 6 |
| Working ports size | G 1/8" |
| Response time according to ISO 12238, activation time (ms) | 21,3 (closed centres)<br>21,5 (open centres)<br>19,5 (pressured centres) |
| Response time according to ISO 12238, deactivation time (ms) | 37,0 (closed centres)<br>34,5 (open centres)<br>37,3 (pressured centres) |

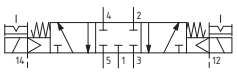
| | |
|---|---|
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓥ | VOLTAGE |
| | **M9** = 24 V D.C. |
| | **M11** = 24 V D.C. |
| | **M56** = 24 V 50/60 Hz |
| | **M57** = 110 V 50/60 Hz |
| | **M58** = 230 V 50/60 Hz |

Minimum working pressure 3 bar
Weight 330 g

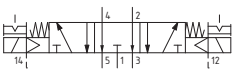




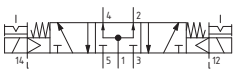

T488.53.31.0.0E.Ⓥ



T488.53.32.0.0E.Ⓥ



T488.53.33.0.0E.Ⓥ





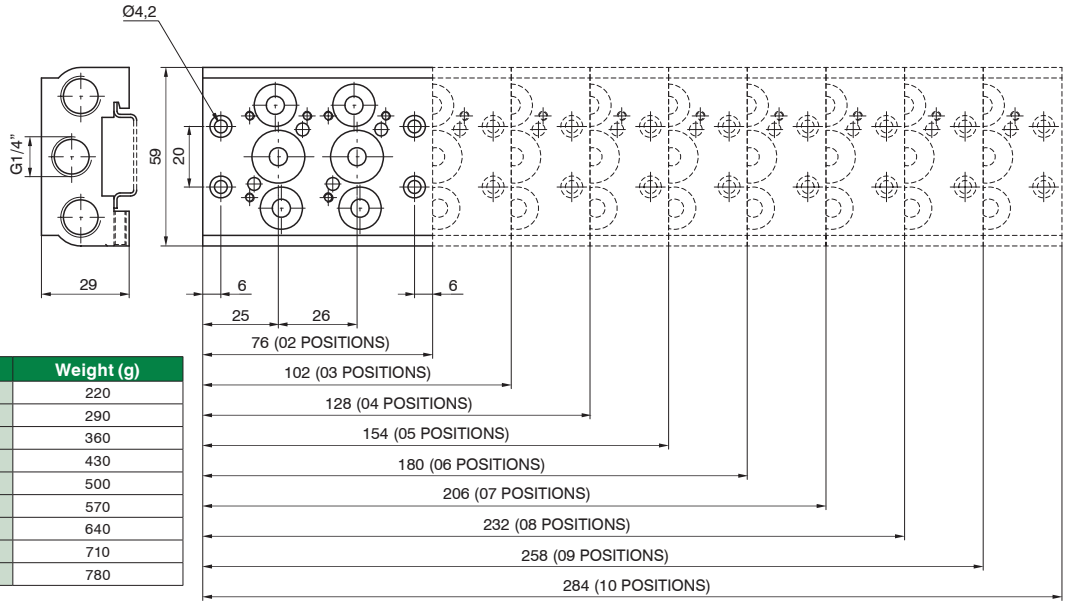
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Collectors



**Coding:** T488.Ⓝ

| Ⓝ | NO. POSITIONS |
|---|---|
| | **02** = 2 positions |
| | **03** = 3 positions |
| | **04** = 4 positions |
| | **05** = 5 positions |
| | **06** = 6 positions |
| | **07** = 7 positions |
| | **08** = 8 positions |
| | **09** = 9 positions |
| | **10** = 10 positions |




| No. positions | Weight (g) |
|---|---|
| 02 | 220 |
| 03 | 290 |
| 04 | 360 |
| 05 | 430 |
| 06 | 500 |
| 07 | 570 |
| 08 | 640 |
| 09 | 710 |
| 10 | 780 |

## Modular base



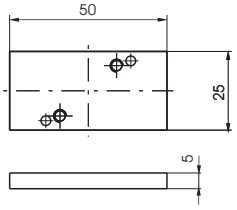
**Coding:** T488.Ⓣ

| Ⓣ | TYPE |
|---|---|
| | **01** = Single complete base |
| | **01K** = Complete modular bases (batches of 20 pieces) |
| | **30K** = Hollow bush, complete with O-rings (No. 50 pieces) |
| | **31K** = Blank bush, complete with O-rings (No. 50 pieces) |
| | **32K** = Intermediate air intake with screw (No. 5 pieces) |
| | **33** = Screw to suite solenoid valves (No. 50 pieces) |
| | **34** = Screw for joning bases (No. 50 pieces) |
| | **35** = Washer for screw for joning bases (No. 50 pieces) |
| | **36** = OR (No. 50 pieces) |

## Closing plate

**Coding:** T488.00






Weight 25 g

## Solenoid-Spring (Self feeding)

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1050 |
| Orifice size (mm) | 8.5 |
| Working ports size | G 1/4" |

**Coding:** T424.Ⓣ.0.1.Ⓥ

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **B04** = 12 V DC |
| | **B05** = 24 V DC |
| | **B09** = 24 V DC (2 W) |
| | **B56** = 24 V 50-60 Hz |
| | **B57** = 110 V 50-60 Hz |
| | **B58** = 230 V 50-60 Hz |

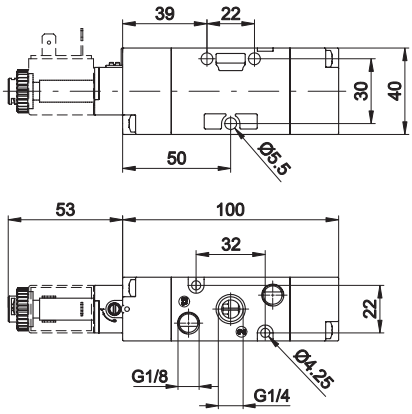


Weight 205 g
Minimum pilot pressure 2,5 bar

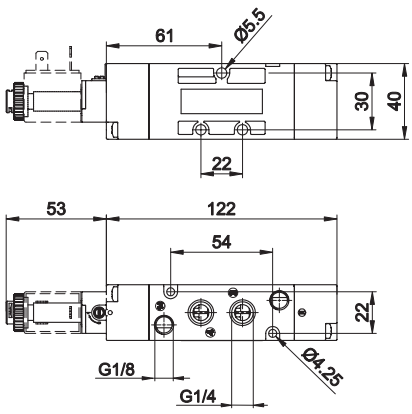


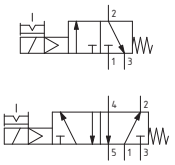
Weight 235 g
Minimum pilot pressure 2,5 bar

T424.32.0.1.Ⓥ




T424.52.0.1.Ⓥ



## Solenoid-Spring (External feeding)

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1050 |
| Orifice size (mm) | 8.5 |
| Working ports size | G 1/4" |
| Pilot ports size | G 1/8" |

**Coding:** T424.Ⓣ.0.1.E.Ⓥ

| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **B04** = 12 V DC |
| | **B05** = 24 V DC |
| | **B09** = 24 V DC (2 W) |
| | **B56** = 24 V 50-60 Hz |
| | **B57** = 110 V 50-60 Hz |
| | **B58** = 230 V 50-60 Hz |

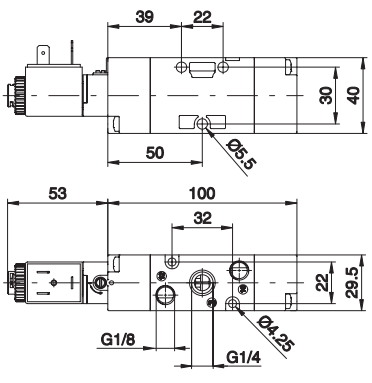


Weight 205 g
Minimum pilot pressure 2,5 bar

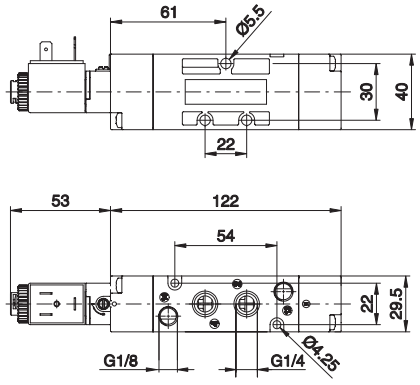


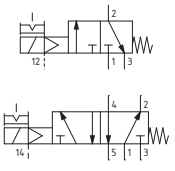
Weight 235 g
Minimum pilot pressure 2,5 bar

T424.32.0.1.E.Ⓥ




T424.52.0.1.E.Ⓥ





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Differential (Self feeding)

Coding: T424.Ⓣ.0.12.Ⓥ

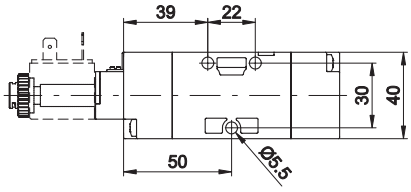
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1050 |
| Orifice size (mm) | 8.5 |
| Working ports size | G 1/4" |

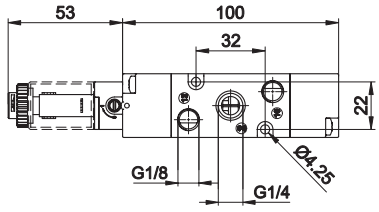
| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **B04** = 12 V DC |
| | **B05** = 24 V DC |
| | **B09** = 24 V DC (2 W) |
| | **B56** = 24 V 50-60 Hz |
| | **B57** = 110 V 50-60 Hz |
| | **B58** = 230 V 50-60 Hz |



Weight 205 g
Minimum pilot pressure 2 bar

T424.32.0.12.Ⓥ

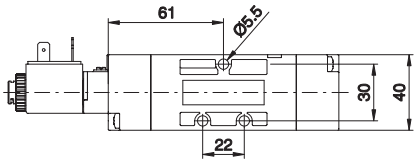


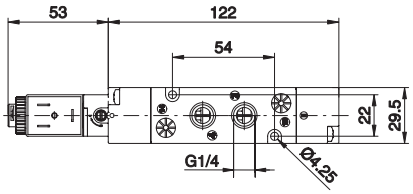



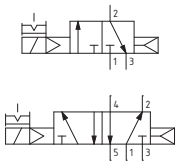



Weight 235 g
Minimum pilot pressure 2 bar

T424.52.0.12.Ⓥ



## Solenoid-Differential (External feeding)

Coding: T424.Ⓣ.0.12.E.Ⓥ

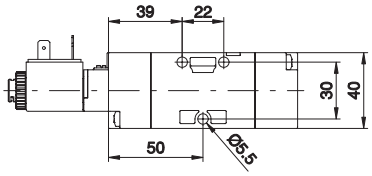
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1050 |
| Orifice size (mm) | 8.5 |
| Working ports size | G 1/4" |
| Pilot ports size | G 1/8" |

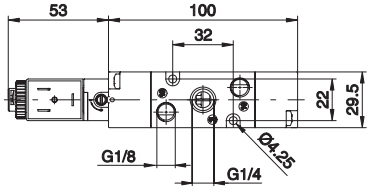
| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **B04** = 12 V DC |
| | **B05** = 24 V DC |
| | **B09** = 24 V DC (2 W) |
| | **B56** = 24 V 50-60 Hz |
| | **B57** = 110 V 50-60 Hz |
| | **B58** = 230 V 50-60 Hz |



Weight 205 g
Minimum pilot pressure 2 bar

T424.32.0.12.E.Ⓥ

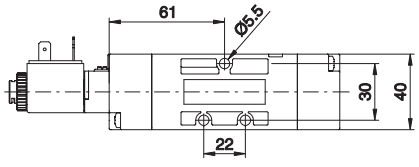


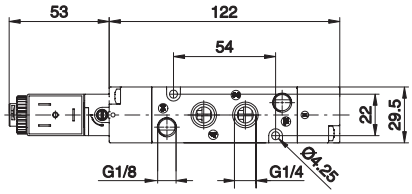



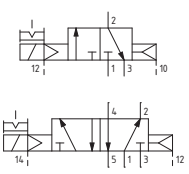



Weight 235 g
Minimum pilot pressure 2 bar

T424.52.0.12.E.Ⓥ



## Solenoid-Solenoid (Self feeding)

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1050 |
| Orifice size (mm) | 8.5 |
| Working ports size | G 1/4" |

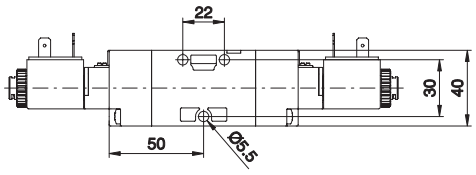
**Coding:** T424.Ⓣ.0.0.Ⓥ

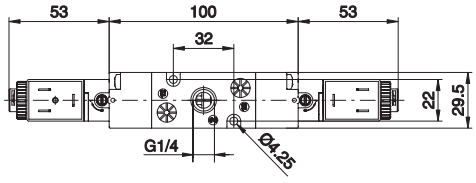
| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **B04** = 12 V DC |
| | **B05** = 24 V DC |
| | **B09** = 24 V DC (2 W) |
| | **B56** = 24 V 50-60 Hz |
| | **B57** = 110 V 50-60 Hz |
| | **B58** = 230 V 50-60 Hz |



Weight 240 g
Minimum pilot pressure 2 bar

T424.32.0.0.Ⓥ

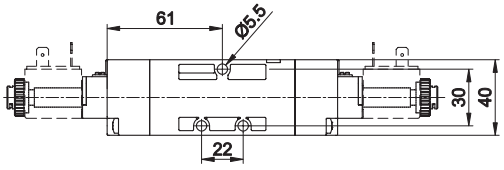


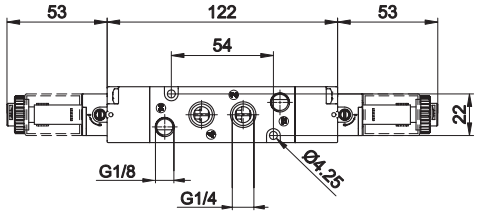



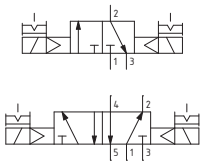



Weight 270 g
Minimum pilot pressure 2 bar

T424.52.0.0.Ⓥ



## Solenoid-Solenoid (External feeding)

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1050 |
| Orifice size (mm) | 8.5 |
| Working ports size | G 1/4" |
| Pilot ports size | G 1/8" |

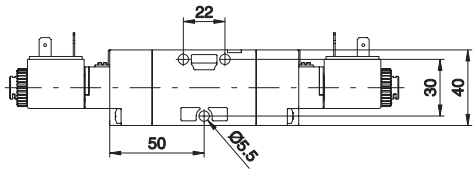
**Coding:** T424.Ⓣ.0.0.E.Ⓥ

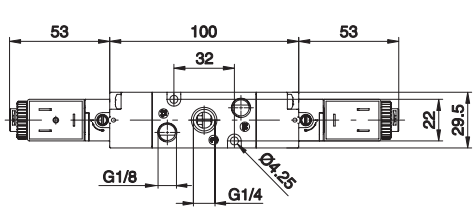
| | |
|---|---|
| Ⓣ | TYPE |
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **B04** = 12 V DC |
| | **B05** = 24 V DC |
| | **B09** = 24 V DC (2 W) |
| | **B56** = 24 V 50-60 Hz |
| | **B57** = 110 V 50-60 Hz |
| | **B58** = 230 V 50-60 Hz |



Weight 240 g
Minimum pilot pressure 2 bar

T424.32.0.0.E.Ⓥ

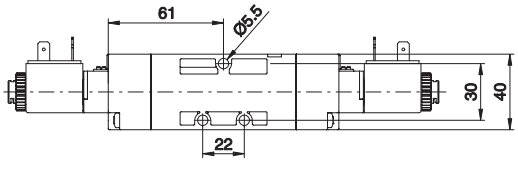


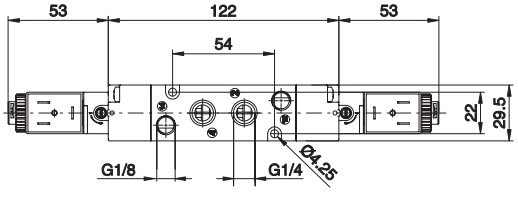



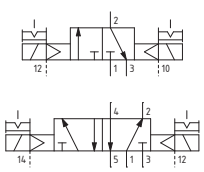



Weight 270 g
Minimum pilot pressure 2 bar

T424.52.0.0.E.Ⓥ





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Solenoid (Self feeding)

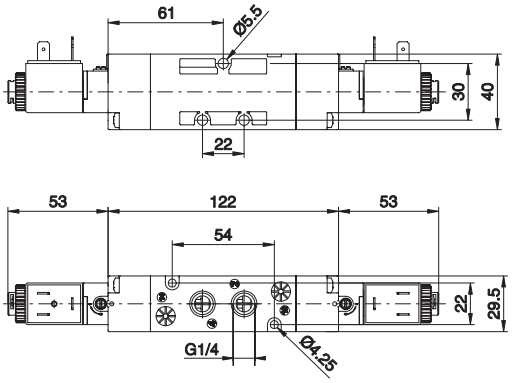
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 900 |
| Orifice size (mm) | 8.5 |
| Working ports size | G 1/4" |

**Coding:** T424.53.Ⓕ.0.0.Ⓥ

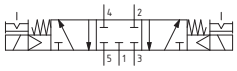
| | |
|---|---|
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓥ | VOLTAGE |
| | **B04** = 12 V DC |
| | **B05** = 24 V DC |
| | **B09** = 24 V DC (2 W) |
| | **B56** = 24 V 50-60 Hz |
| | **B57** = 110 V 50-60 Hz |
| | **B58** = 230 V 50-60 Hz |

Weight 295 g
Minimum pilot pressure 3 bar

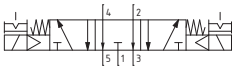




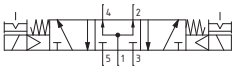

T424.53.31.0.0.Ⓥ



T424.53.32.0.0.Ⓥ



T424.53.33.0.0.Ⓥ



## Solenoid-Solenoid (External feeding)

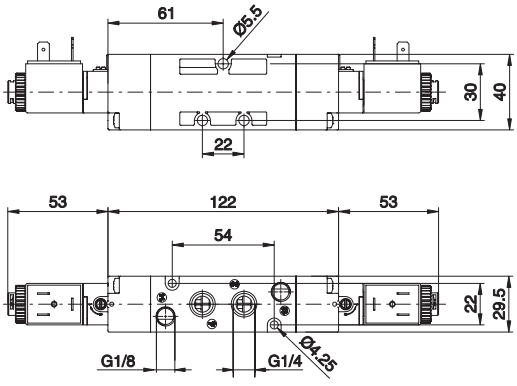
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 900 |
| Orifice size (mm) | 8.5 |
| Working ports size | G 1/4" |
| Pilot ports size | G 1/8" |

**Coding:** T424.53.Ⓕ.0.0.E.Ⓥ

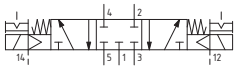
| | |
|---|---|
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓥ | VOLTAGE |
| | **B04** = 12 V DC |
| | **B05** = 24 V DC |
| | **B09** = 24 V DC (2 W) |
| | **B56** = 24 V 50-60 Hz |
| | **B57** = 110 V 50-60 Hz |
| | **B58** = 230 V 50-60 Hz |

Weight 295 g
Minimum pilot pressure 3 bar

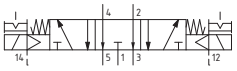




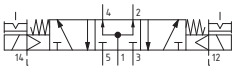

T424.53.31.0.0.E.Ⓥ



T424.53.32.0.0.E.Ⓥ



T424.53.33.0.0.E.Ⓥ

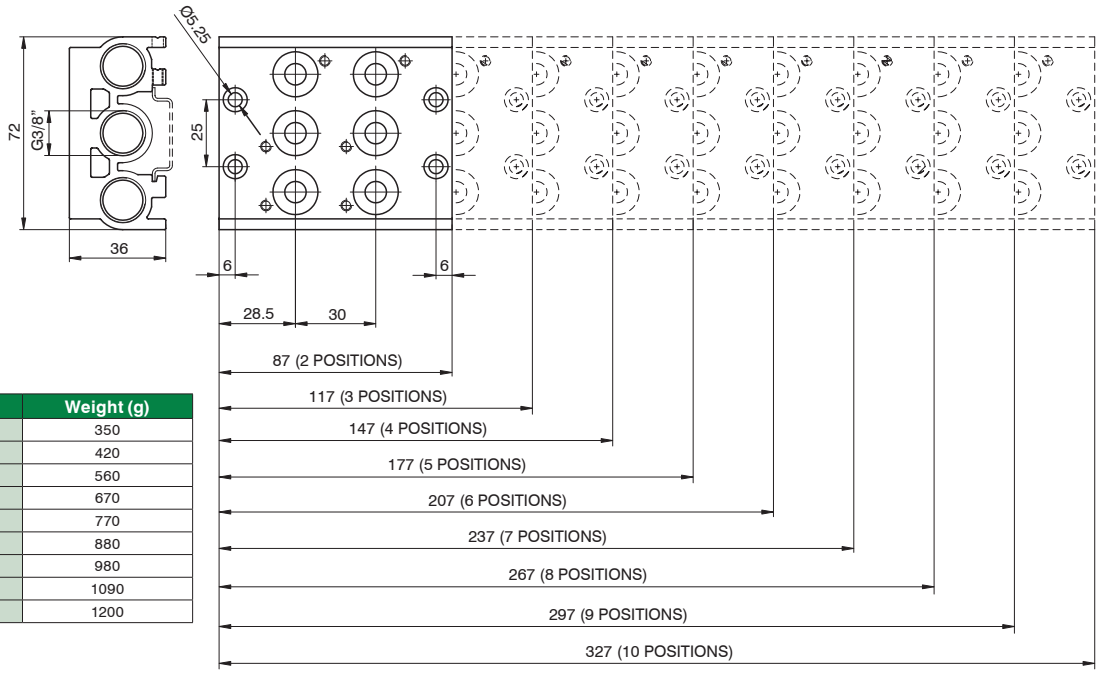


## Collectors



**Coding:** T424.Ⓝ

| Ⓝ | NO. POSITIONS |
|---|---|
| | **02** = 2 positions |
| | **03** = 3 positions |
| | **04** = 4 positions |
| | **05** = 5 positions |
| | **06** = 6 positions |
| | **07** = 7 positions |
| | **08** = 8 positions |
| | **09** = 9 positions |
| | **10** = 10 positions |




| No. positions | Weight (g) |
|---|---|
| 02 | 350 |
| 03 | 420 |
| 04 | 560 |
| 05 | 670 |
| 06 | 770 |
| 07 | 880 |
| 08 | 980 |
| 09 | 1090 |
| 10 | 1200 |

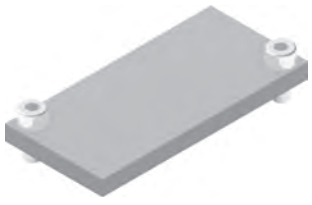
## Modular base



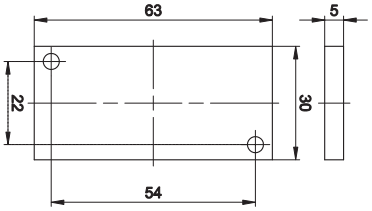
**Coding:** T424.Ⓣ

| Ⓣ | TYPE |
|---|---|
| | **01** = Single complete base |
| | **01K** = Complete modular bases (batches of 15 pieces) |
| | **30K** = Hollow bush, complete with O-rings (No. 50 pieces) |
| | **31K** = Blank bush, complete with O-rings (No. 50 pieces) |
| | **32K** = Intermediate air intake with screw (No. 5 pieces) |
| | **33** = Screw to suite solenoid valves (No. 50 pieces) |
| | **34** = Screw for joning bases (No. 50 pieces) |
| | **35** = Washer for screw for joning bases (No. 50 pieces) |
| | **36** = OR (No. 50 pieces) |

## Closing plate



**Coding:** T424.00




Weight 25 g



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 2100 - 2400 - 2600

This solenoid valves series have been developed to meet requirements for electronically controlled pneumatic systems and / or serial control systems already used in all manufacturing sectors.
They have been designed to be easily assembled into groups or manifolds and include integral electrical connection (2100 and 2400), to facilitate simple and speedy integration into a control system.
The series comprises a range of products classified according to type, size and performance.
There are tree main sizes, 10mm., 18 mm. and 26 mm.,
with each size further divided into 3 types " LINE ", " FLAT " and " VDMA " or " BASE".
The 10 mm and 18 mm 24 VDC range of valves includes a range of accessories for the production of manifolded valve assemblies with integral electrical connections.
Modules are available in two or four station variants for flexibility and are supplied to IP40 or alternatively IP65 environmental protection.



### Construction characteristics

| | Series 2100 | Series 2400 | Series 2600 |
|---|---|---|---|
| Central body | Extruded aluminium bar with chemical nickel treatment and PTFE (polytetrafleurethylene) | Extruded aluminium bar with chemical nickel treatment and PTFE (polytetrafleurethylene) | Extruded aluminium bar with chemical nickel treatment and PTFE (polytetrafleurethylene) |
| Connection plates | Technopolymer | Zincalloy | Die-cast aluminium |
| Pistons seal | Oil resistant nitrile rubber-NBR | Oil resistant nitrile rubber-NBR | Oil resistant nitrile rubber-NBR |
| Spool seals | Oil resistant nitrile rubber-HNBR | Oil resistant nitrile rubber-HNBR | Oil resistant nitrile rubber-HNBR |
| Springs | AISI 302 stainless steel | AISI 302 stainless steel | AISI 302 stainless steel |
| Operators | Technopolymer | Technopolymer | Technopolymer |
| Pistons | Aluminium 2011 | Technopolymer | Technopolymer |
| Spools | Aluminium 2011 | Aluminium 2011 | Aluminium 2011 |

### Use and maintenance

The average life of the valve exceeds 50.000.000 cycles when used under optimum conditions.
Adequate lubrication reduces seals wear, just as proper filtering of supply air prevents the build-up of dirt that can cause malfunction.
Ensure the valve is used within our recommended criteria for pressure and temperature.
In dirty or dusty environments, the exhaust ports should be protected.
Seals kits are available for repairs.
Repairs must be made exclusively by specialized personnel.

## Series 2100

This solenoid valves series has been developed to meet requirements for electronically controlled pneumatic systems and / or serial control systems already used in all manufacturing sectors.
They have been designed to be easily assembled into groups or manifolds and include integral electrical connection to facilitate simple and speedy integration into a control system.
The 2100 series comprises a range of products classified according to the body size of 10 mm divided into 3 types "LINE", "FLAT" and "BASE".
The 10mm. and 18 mm. 24 VDC range of valves includes a range of accessories for the production of manifolded valve assemblies with integral electrical connections.
Modules are available in two or four station variants for flexibility and are supplied to IP40 or alternatively IP65 environmental protection.



### Construction characteristics

| | |
|---|---|
| Central body | Extruded aluminium bar with chemical nickel treatment and PTFE (polytetrafleurethylene) |
| Connection plates | Technopolymer |
| Spool seals | Oil resistant nitrile rubber-HNBR |
| Springs | AISI 302 stainless steel |
| Operators | Technopolymer |
| Pistons | Aluminium 2011 |
| Spools | Aluminium 2011 |

### Ordering codes for minature solenoid valves

The 10 mm. miniature solenoid valve with 0,7 mm. orifice has been selected for piloting this series of valves (see Series 300).
This results in low response times and reduced power consumption.
The valve can be supplied with the coil upward or downward depending on the application.

Codes are as follows:

**Coil upward code**

01 = miniature sol. + 12 V DC 90°conn. with LED
21 = miniature sol. + 12 V DC line conn. with LED
02 = miniature sol. + 24 V DC 90°conn. with LED
22 = miniature sol. + 24 V DC line conn. with LED

**Coil downward code**

11 = miniature sol. + 12 V DC 90°conn. with LED
31 = miniature sol. + 12 V DC line conn. with LED
12 = miniature sol. + 24 V DC 90°conn. with LED
32 = miniature sol. + 24 V DC line conn. with LED
91 = miniature sol. + 12 V DC for integral electrical connections
92 = miniature sol. + 24 V DC for integral electrical connections

**Miniature solenoid c UL us homologated are available (see Series 300).**

### Use and maintenance

The average life of the solenoid valve exceeds 50.000.000 cycles when used under optimum conditions.
Adequate lubrication reduces seals wear, just as proper filtering of supply air prevents the build-up of dirt that can cause malfunction.
Ensure the valve is used within our recommended criteria for pressure and temperature.
In dirty or dusty environments, the exhaust ports should be protected.
Seals kits are available for repairs.
Repairs must be made exclusively by specialized personnel.

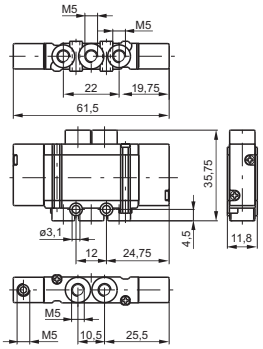

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pneumatic - Spring

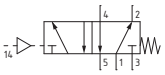
**Coding:** 2115.52.00.19

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |






Weight 30 g
Minimum pilot pressure 2 bar

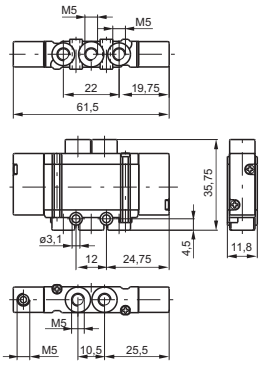



## Pneumatic-Differential

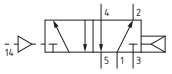
**Coding:** 2115.52.00.16

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |






Weight 28 g
Minimum pilot pressure 2 bar

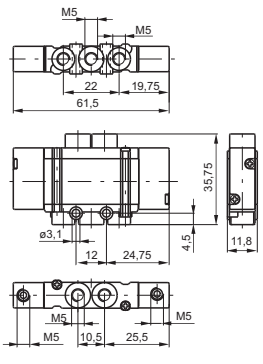



## Pneumatic - Pneumatic

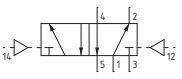
**Coding:** 2115.52.00.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |






Weight 30 g
Minimum pilot pressure 2 bar



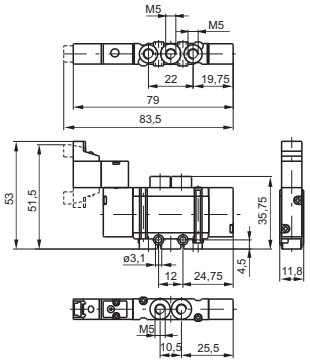
## Solenoid - Spring

**Coding:** 2115.52.00.39.Ⓣ

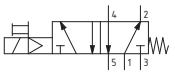
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | VOLTAGE |
|---|---|
| Ⓣ | **01** = + 12 V DC 90° conn. with LED |
| | **21** = + 12 V DC line conn. with LED |
| | **02** = + 24 V DC 90° conn. with LED |
| | **22** = + 24 V DC line conn. with LED |
| | **11** = + 12 V DC 90° conn. with LED downward |
| | **31** = + 12 V DC line conn. with LED downward |
| | **12** = + 24 V DC 90° conn. with LED downward |
| | **32** = + 24 V DC line conn. with LED downward |






Weight 42 g
Minimum pilot pressure 2 bar



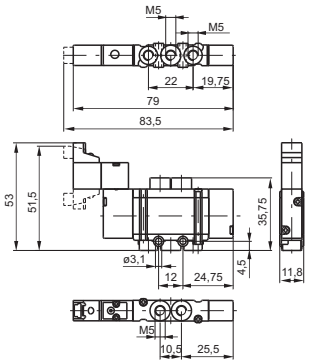

## Solenoid - Differential

**Coding:** 2115.52.00.36.Ⓣ

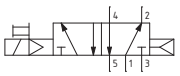
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | VOLTAGE |
|---|---|
| Ⓣ | **01** = + 12 V DC 90° conn. with LED |
| | **21** = + 12 V DC line conn. with LED |
| | **02** = + 24 V DC 90° conn. with LED |
| | **22** = + 24 V DC line conn. with LED |
| | **11** = + 12 V DC 90° conn. with LED downward |
| | **31** = + 12 V DC line conn. with LED downward |
| | **12** = + 24 V DC 90° conn. with LED downward |
| | **32** = + 24 V DC line conn. with LED downward |






Weight 42 g
Minimum pilot pressure 2 bar



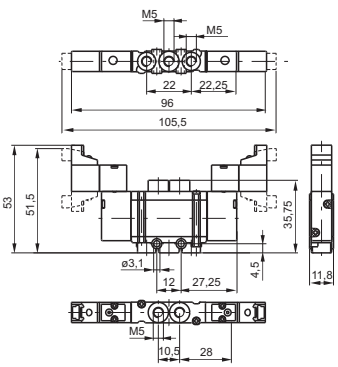

## Solenoid - Solenoid

**Coding:** 2115.52.00.35.Ⓣ

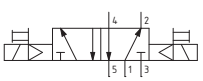
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | VOLTAGE |
|---|---|
| Ⓣ | **01** = + 12 V DC 90° conn. with LED |
| | **21** = + 12 V DC line conn. with LED |
| | **02** = + 24 V DC 90° conn. with LED |
| | **22** = + 24 V DC line conn. with LED |
| | **11** = + 12 V DC 90° conn. with LED downward |
| | **31** = + 12 V DC line conn. with LED downward |
| | **12** = + 24 V DC 90° conn. with LED downward |
| | **32** = + 24 V DC line conn. with LED downward |






Weight 52 g
Minimum pilot pressure 2 bar






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

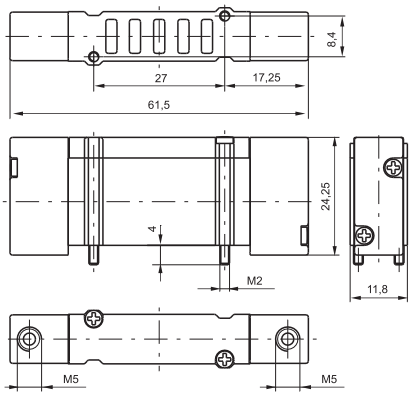
## Pneumatic - Pneumatic 5/3

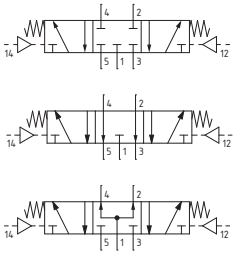
**Coding:** 2115.53.Ⓕ.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 180 (Pressured centres)<br>130 (Closed centres)<br>140 (Open centres) |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | FUNCTION |
|---|---|
| Ⓕ | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |





Weight 32 g
Minimum pilot pressure 2,5 bar

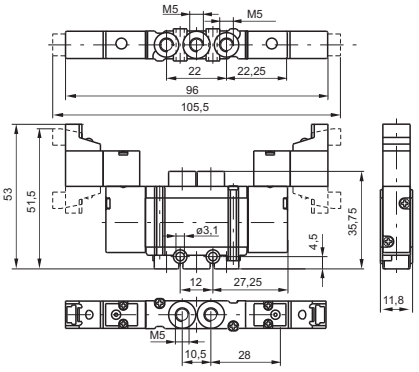
## Solenoid - Solenoid 5/3

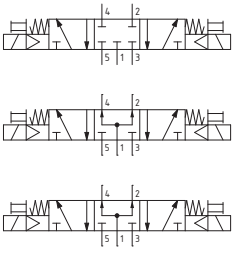
**Coding:** 2115.53.Ⓕ.35.Ⓣ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 180 (Pressured centres)<br>130 (Closed centres)<br>140 (Open centres) |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | FUNCTION |
|---|---|
| Ⓕ | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC 90° conn. with LED |
| | **21** = + 12 V DC line conn. with LED |
| | **02** = + 24 V DC 90° conn. with LED |
| | **22** = + 24 V DC line conn. with LED |
| | **11** = + 12 V DC 90° conn. with LED downward |
| | **31** = + 12 V DC line conn. with LED downward |
| | **12** = + 24 V DC 90° conn. with LED downward |
| | **32** = + 24 V DC line conn. with LED downward |





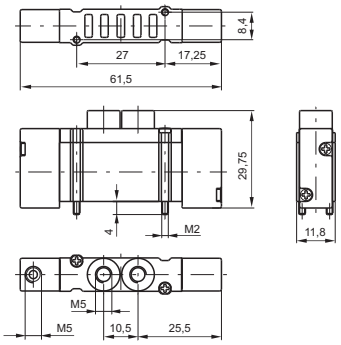
Weight 54 g
Minimum pilot pressure 2,5 bar

## Pneumatic - Spring

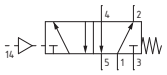
**Coding:** 2135.52.00.19

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |






Weight 32 g
Minimum pilot pressure 2 bar

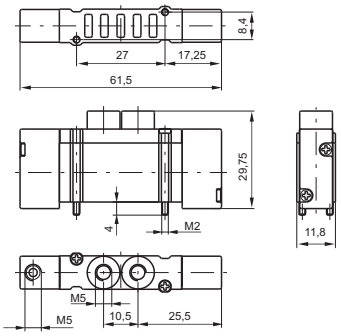



## Pneumatic-Differential

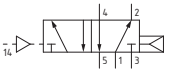
**Coding:** 2135.52.00.16

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |






Weight 30 g
Minimum pilot pressure 2 bar

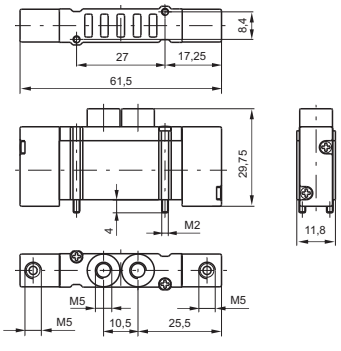



## Pneumatic - Pneumatic

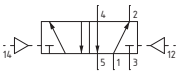
**Coding:** 2135.52.00.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |






Weight 32 g
Minimum pilot pressure 2 bar






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

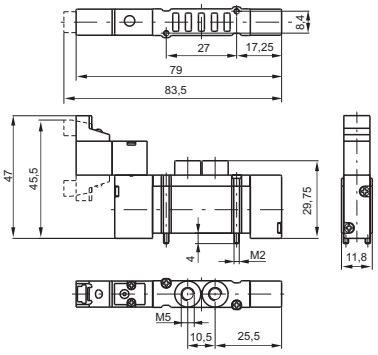
## Solenoid - Spring

**Coding:** 2135.52.00.39.T

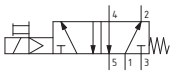
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | VOLTAGE |
|---|---|
| T | **01** = + 12 V DC 90° conn. with LED |
| | **21** = + 12 V DC line conn. with LED |
| | **02** = + 24 V DC 90° conn. with LED |
| | **22** = + 24 V DC line conn. with LED |
| | **11** = + 12 V DC 90° conn. with LED downward |
| | **31** = + 12 V DC line conn. with LED downward |
| | **12** = + 24 V DC 90° conn. with LED downward |
| | **32** = + 24 V DC line conn. with LED downward |
| | **91** = + 12 V DC for integral electrical connections downward |
| | **92** = + 24 V DC for integral electrical connections downward |






Weight 38 g
Minimum pilot pressure 2 bar



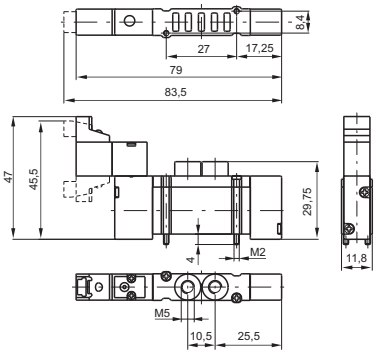

## Solenoid - Differential

**Coding:** 2135.52.00.36.T

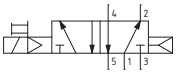
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | VOLTAGE |
|---|---|
| T | **01** = + 12 V DC 90° conn. with LED |
| | **21** = + 12 V DC line conn. with LED |
| | **02** = + 24 V DC 90° conn. with LED |
| | **22** = + 24 V DC line conn. with LED |
| | **11** = + 12 V DC 90° conn. with LED downward |
| | **31** = + 12 V DC line conn. with LED downward |
| | **12** = + 24 V DC 90° conn. with LED downward |
| | **32** = + 24 V DC line conn. with LED downward |
| | **91** = + 12 V DC for integral electrical connections downward |
| | **92** = + 24 V DC for integral electrical connections downward |






Weight 38 g
Minimum pilot pressure 2 bar



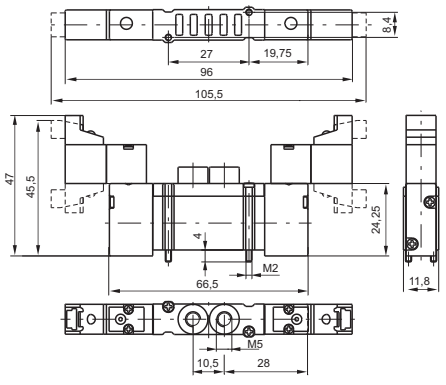

## Solenoid - Solenoid

**Coding:** 2135.52.00.35.T

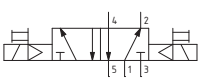
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | VOLTAGE |
|---|---|
| T | **01** = + 12 V DC 90° conn. with LED |
| | **21** = + 12 V DC line conn. with LED |
| | **02** = + 24 V DC 90° conn. with LED |
| | **22** = + 24 V DC line conn. with LED |
| | **11** = + 12 V DC 90° conn. with LED downward |
| | **31** = + 12 V DC line conn. with LED downward |
| | **12** = + 24 V DC 90° conn. with LED downward |
| | **32** = + 24 V DC line conn. with LED downward |
| | **91** = + 12 V DC for integral electrical connections downward |
| | **92** = + 24 V DC for integral electrical connections downward |






Weight 50 g
Minimum pilot pressure 1,5 bar



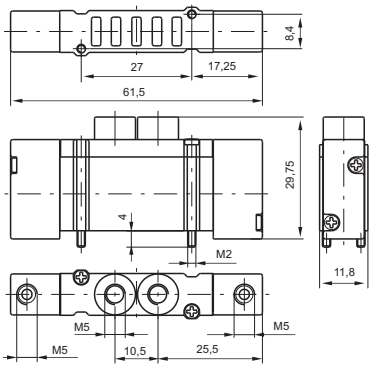
## Pneumatic - Pneumatic 5/3

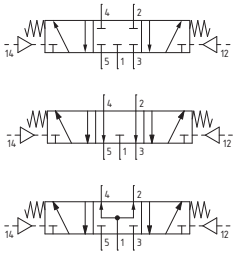
**Coding:** 2135.53.Ⓕ.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 180 (Pressured centres)<br>130 (Closed centres)<br>140 (Open centres) |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | FUNCTION |
|---|---|
| Ⓕ | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |





Weight 28 g
Minimum pilot pressure 2 bar

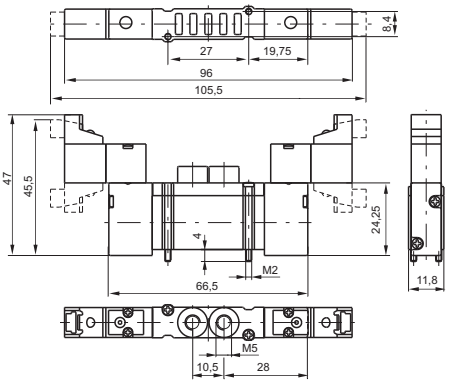
## Solenoid - Solenoid 5/3

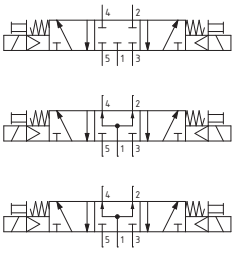
**Coding:** 2135.53.Ⓕ.35.Ⓣ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 180 (Pressured centres)<br>130 (Closed centres)<br>140 (Open centres) |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | |
|---|---|
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC 90° conn. with LED |
| | **21** = + 12 V DC line conn. with LED |
| | **02** = + 24 V DC 90° conn. with LED |
| | **22** = + 24 V DC line conn. with LED |
| | **11** = + 12 V DC 90° conn. with LED downward |
| | **31** = + 12 V DC line conn. with LED downward |
| | **12** = + 24 V DC 90° conn. with LED downward |
| | **32** = + 24 V DC line conn. with LED downward |
| | **91** = + 12 V DC for integral electrical connections downward |
| | **92** = + 24 V DC for integral electrical connections downward |





Weight 52 g
Minimum pilot pressure 2,5 bar



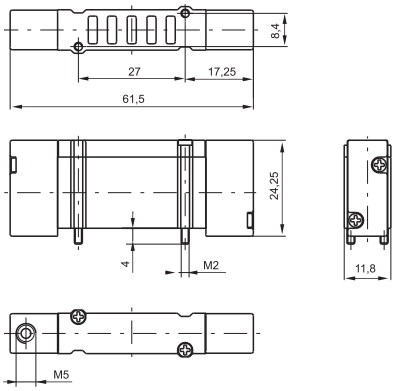
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pneumatic - Spring

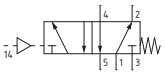
**Coding:** 2141.52.00.19

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |






Weight 24 g
Minimum pilot pressure 2 bar

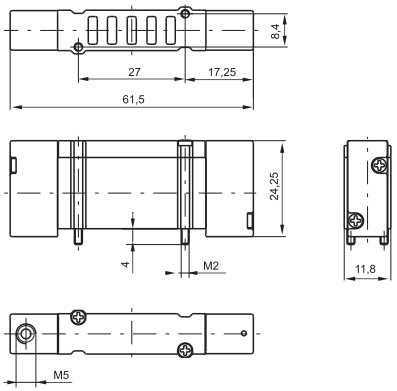



## Pneumatic-Differential

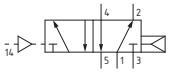
**Coding:** 2141.52.00.16

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |






Weight 22 g
Minimum pilot pressure 2 bar

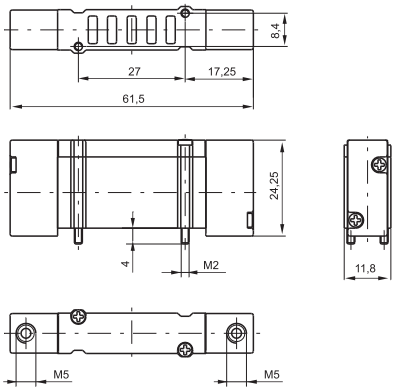



## Pneumatic - Pneumatic

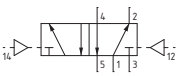
**Coding:** 2141.52.00.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |






Weight 26 g
Minimum pilot pressure 1,5 bar



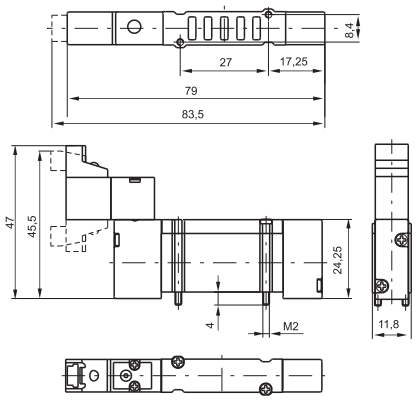
## Solenoid - Spring

**Coding:** 2141.52.00.39.Ⓣ

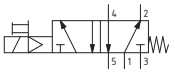
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| Ⓣ | VOLTAGE |
|---|---|
| | **01** = + 12 V DC 90° conn. with LED |
| | **21** = + 12 V DC line conn. with LED |
| | **02** = + 24 V DC 90° conn. with LED |
| | **22** = + 24 V DC line conn. with LED |
| | **11** = + 12 V DC 90° conn. with LED downward |
| | **31** = + 12 V DC line conn. with LED downward |
| | **12** = + 24 V DC 90° conn. with LED downward |
| | **32** = + 24 V DC line conn. with LED downward |
| | **91** = + 12 V DC for integral electrical connections downward |
| | **92** = + 24 V DC for integral electrical connections downward |






Weight 38 g
Minimum pilot pressure 2 bar



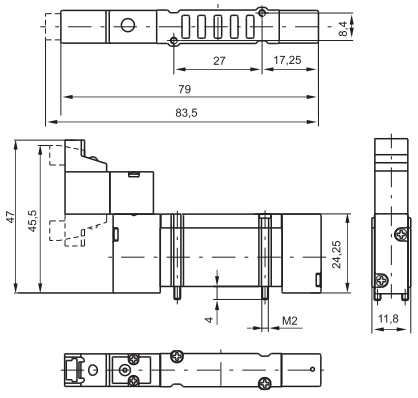
## Solenoid - Differential

**Coding:** 2141.52.00.36.Ⓣ

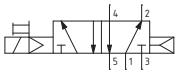
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| Ⓣ | VOLTAGE |
|---|---|
| | **01** = + 12 V DC 90° conn. with LED |
| | **21** = + 12 V DC line conn. with LED |
| | **02** = + 24 V DC 90° conn. with LED |
| | **22** = + 24 V DC line conn. with LED |
| | **11** = + 12 V DC 90° conn. with LED downward |
| | **31** = + 12 V DC line conn. with LED downward |
| | **12** = + 24 V DC 90° conn. with LED downward |
| | **32** = + 24 V DC line conn. with LED downward |
| | **91** = + 12 V DC for integral electrical connections downward |
| | **92** = + 24 V DC for integral electrical connections downward |






Weight 38 g
Minimum pilot pressure 2 bar



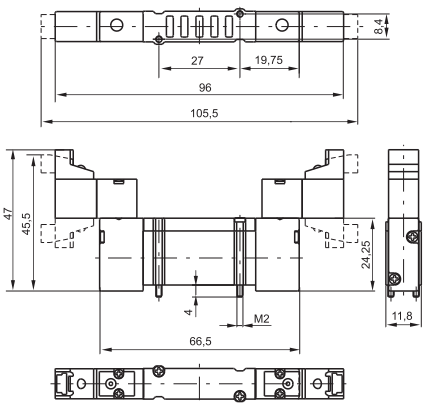
## Solenoid - Solenoid

**Coding:** 2141.52.00.35.Ⓣ

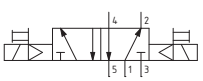
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| Ⓣ | VOLTAGE |
|---|---|
| | **01** = + 12 V DC 90° conn. with LED |
| | **21** = + 12 V DC line conn. with LED |
| | **02** = + 24 V DC 90° conn. with LED |
| | **22** = + 24 V DC line conn. with LED |
| | **11** = + 12 V DC 90° conn. with LED downward |
| | **31** = + 12 V DC line conn. with LED downward |
| | **12** = + 24 V DC 90° conn. with LED downward |
| | **32** = + 24 V DC line conn. with LED downward |
| | **91** = + 12 V DC for integral electrical connections downward |
| | **92** = + 24 V DC for integral electrical connections downward |






Weight 48 g
Minimum pilot pressure 1,5 bar





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

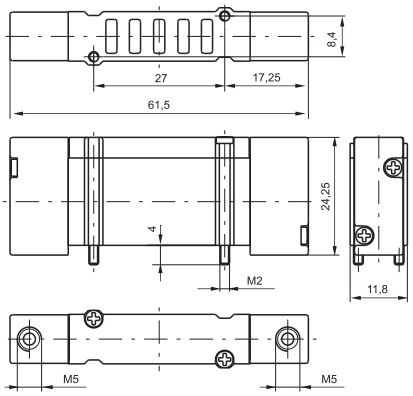
## Pneumatic - Pneumatic 5/3

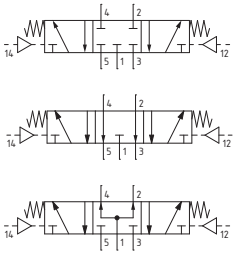
**Coding:** 2141.53.Ⓕ.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 180 (Pressured centres)<br>130 (Closed centres)<br>140 (Open centres) |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | FUNCTION |
|---|---|
| Ⓕ | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |





Weight 28 g
Minimum pilot pressure 2,5 bar

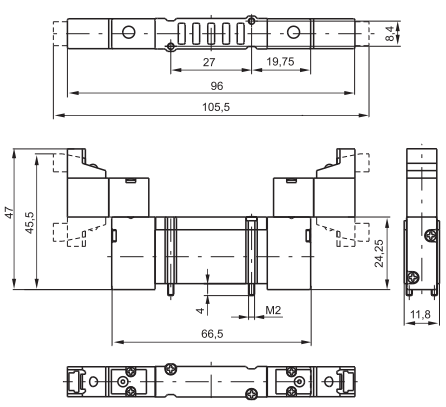
## Solenoid - Solenoid 5/3

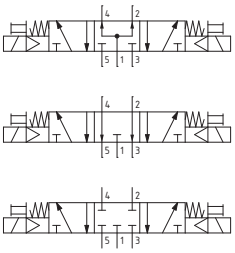
**Coding:** 2141.53.Ⓕ.35.Ⓣ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 180 (Pressured centres)<br>130 (Closed centres)<br>140 (Open centres) |
| Orifice size (mm) | 2.5 |
| Working ports size | M5 |

| | FUNCTION |
|---|---|
| Ⓕ | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC 90° conn. with LED |
| | **21** = + 12 V DC line conn. with LED |
| | **02** = + 24 V DC 90° conn. with LED |
| | **22** = + 24 V DC line conn. with LED |
| | **11** = + 12 V DC 90° conn. with LED downward |
| | **31** = + 12 V DC line conn. with LED downward |
| | **12** = + 24 V DC 90° conn. with LED downward |
| | **32** = + 24 V DC line conn. with LED downward |
| | **91** = + 12 V DC for integral electrical connections downward |
| | **92** = + 24 V DC for integral electrical connections downward |





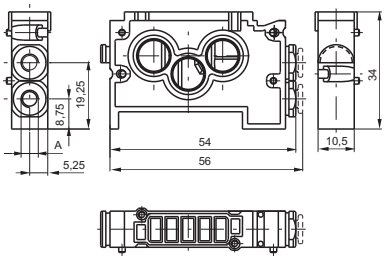
Weight 52 g
Minimum pilot pressure 2,5 bar

## Modular base for "BASE" version

**Coding:** 214Ⓥ.01

| Ⓥ | VERSION |
|---|---|
| | **0** = modular BASE without cartridges |
| | **4** = modular base c/w with 4mm tube cartridges |
| | **5** = modular base c/w with M5 cartridges |
| | **7** = modular base c/w with M7x1 cartridges |



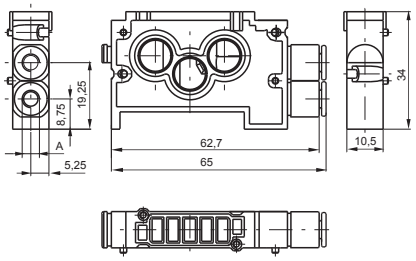



Weight 22 g

## Modular BASE c/w with 6mm tube cartridges

**Coding:** 2146.01



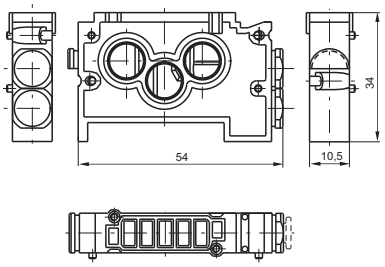



Weight 22 g

## Modular base for "FLAT" version

**Coding:** 2130.01



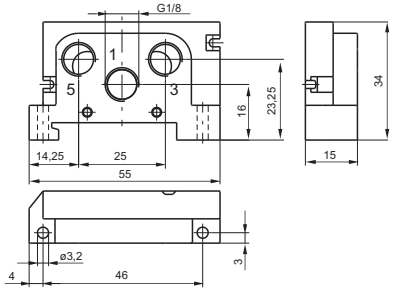



Weight 28 g

## Right inlet base

**Coding:** 2140.02



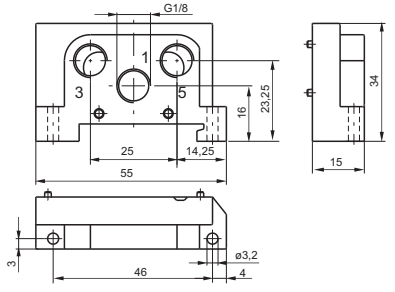



Weight 18 g

## Left inlet base

**Coding:** 2140.03






Weight 18 g

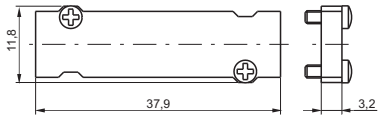


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Closing plate

**Coding:** 2130.00



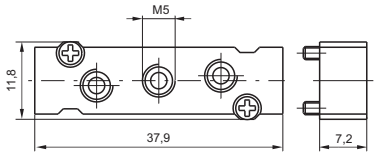



Weight 7 g

## Intermediate air intake

**Coding:** 2130.10



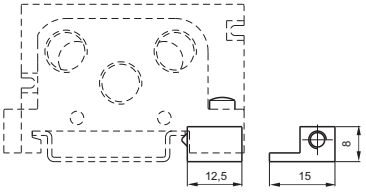



Weight 12 g
to be assembled instead of a valve

## DIN rail adapter

**Coding:** 2130.16






Weight 6 g

## Modular base cartridge

**Coding:** 2100.Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **031M** = Ø4 tube cartridge |
| | **033M** = M5 cartridges |
| | **034M** = M7x1 cartridges |
| | **035M** = lock cartridge |
| | **036M** = Ø4 tube cartridge |



Weight 5 g

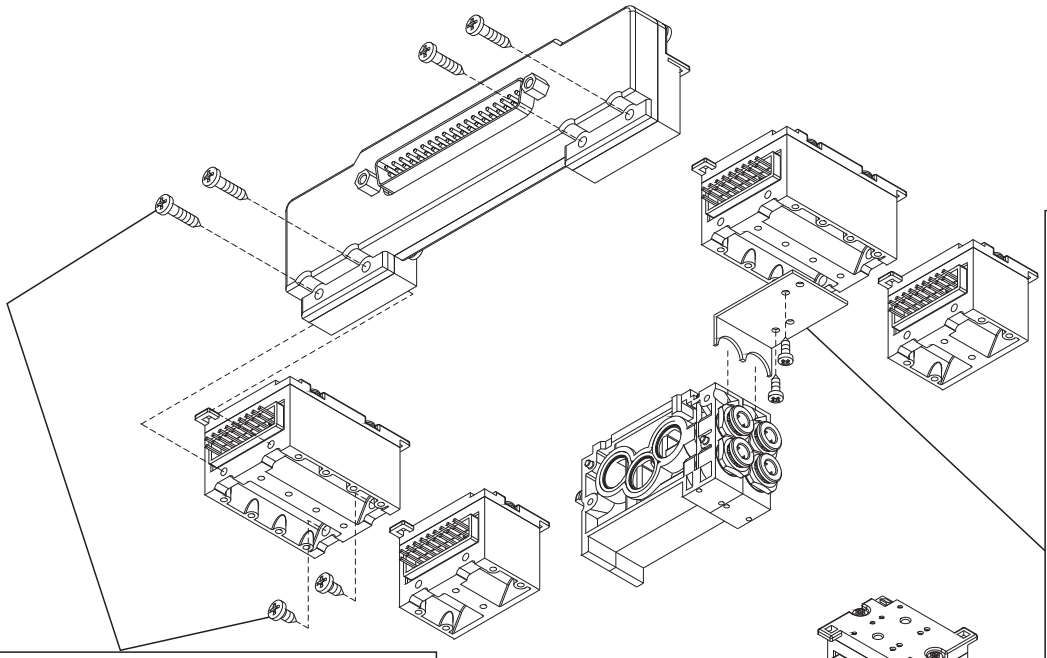
## Diaphragm plug

**Coding:** 2130.17



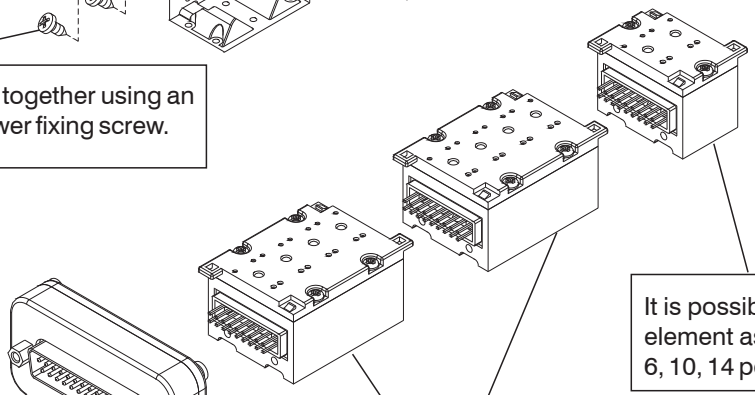
Weight 6 g

The integral electrical design for the series 2100 valve is extremely flexible, allowing the production of pre-wired solenoid valve manifolds, the configuration of which can be determined at the point of assembly. The 24 VDC, 12 VDC (equivalent PNP) modules are available with 2 or 4 positions. The system assembled is designed for an IP40 - IP65 protection.
Coil type 91 or 92 is required for the multipin electrical connection (see valve ordering codes).

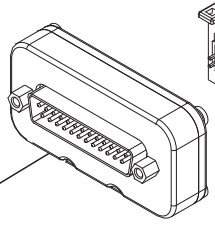


Support plates are supplied to mount the electrical connection elements to the manifold modules. Individual valves can still be removed from the manifold even after assembly is complete. One support plate is required per element.

The elements connect together using an upper coupling and lower fixing screw.

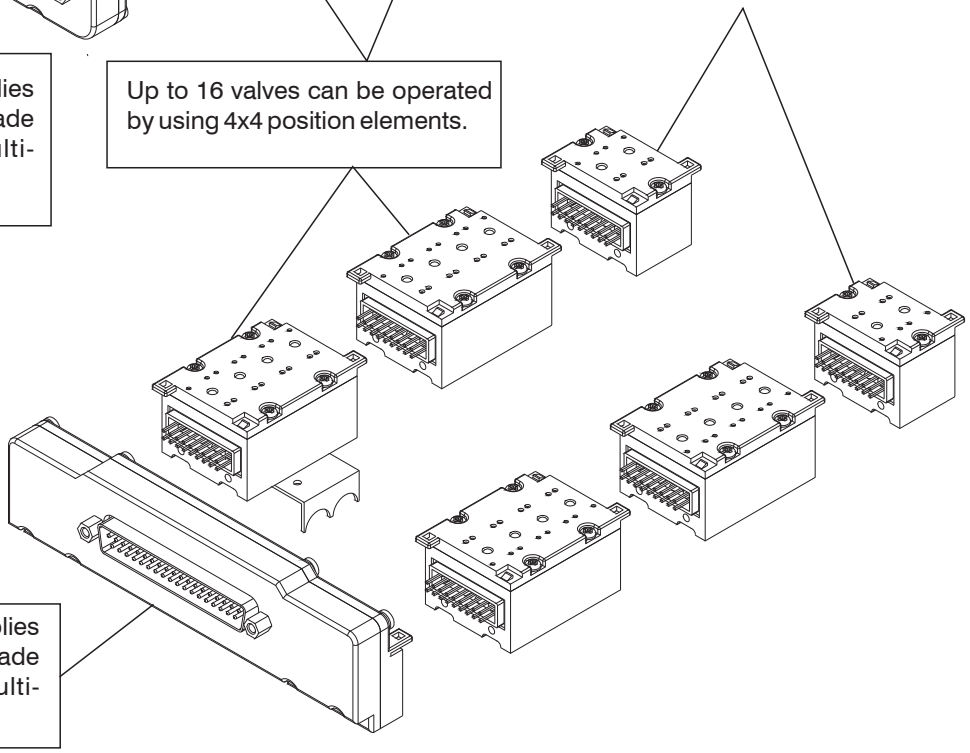


It is possible to use the 2 position element as the first terminal on 2, 6, 10, 14 position assemblies.



On single solenoid assemblies electrical connection is made using an D-SUB 25 multi-connector.

Up to 16 valves can be operated by using 4x4 position elements.



On double solenoid assemblies electrical connection is made usinfg an D-SUB 37 multi-connector.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Module for connections, 2 positions

**Coding:** 2100.02.Ⓥ




| | VERSION |
|---|---|
| Ⓥ | **00** = Left IP40-PNP |
| | **02** = Left IP40-PNP with protection diode |
| | **10** = Left IP65-PNP |
| | **12** = Left IP65-PNP with protection diode |
| | **01** = Right IP40-PNP |
| | **03** = Right IP40-PNP with protection diode |
| | **11** = Right IP65-PNP |
| | **13** = Right IP65-PNP with protection diode |

Weight 35 g
**Note:** with protection diode only direct current (V DC) is available

## Module for connections, 4 positions

**Coding:** 2100.04.Ⓥ




| | VERSION |
|---|---|
| Ⓥ | **00** = Left IP40-PNP |
| | **02** = Left IP40-PNP with protection diode |
| | **10** = Left IP65-PNP |
| | **12** = Left IP65-PNP with protection diode |
| | **01** = Right IP40-PNP |
| | **03** = Right IP40-PNP with protection diode |
| | **11** = Right IP65-PNP |
| | **13** = Right IP65-PNP with protection diode |

Weight 35 g
**Note:** with protection diode only direct current (V DC) is available

## Connectors 25 poles

**Coding:** 2100.25.10



Weight 40 g
The IP65 protection is obtained by IP65 Pneumax cable

## Connectors 37 poles

**Coding:** 2100.37.10



Weight 120 g
The IP65 protection is obtained by IP65 Pneumax cable

## Plug

**Coding:** 2100.00



Weight 4 g

## FLAT support plate

**Coding:** 2130.50



Weight 5 g

## In line cable complete with connector, IP40

**Coding:** 2400.Ⓒ.Ⓛ.00



| | CONNECTOR |
|---|---|
| Ⓒ | **25** = 25 poles |
| | **37** = 37 poles |
| | CABLE LENGTH |
| Ⓛ | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |

## Cable complete with connector, 25 Poles, IP65

**Coding:** 2300.25.Ⓛ.Ⓒ



| | CABLE LENGTH |
|---|---|
| Ⓛ | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |
| | CONNECTOR |
| Ⓒ | **10** = Stand alone |
| | **90** = 90° Angle |

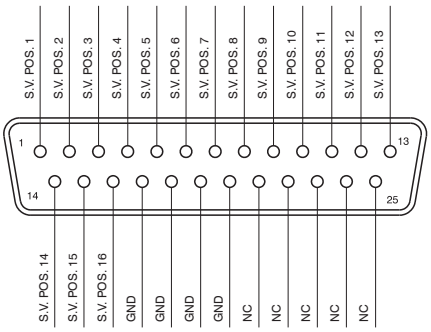
## Cable complete with connector, 37 Poles, IP65

**Coding:** 2400.37.Ⓛ.Ⓒ

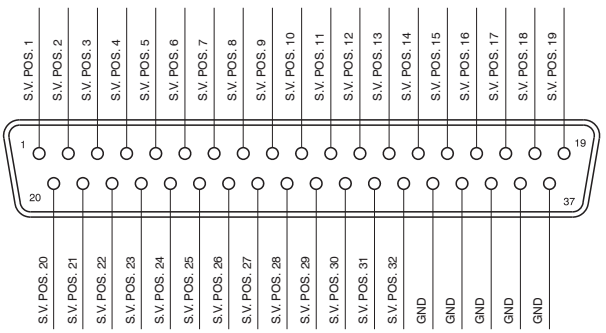


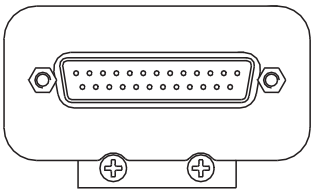
| | CABLE LENGTH |
|---|---|
| Ⓛ | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |
| | CONNECTOR |
| Ⓒ | **10** = Stand alone |
| | **90** = 90° Angle |

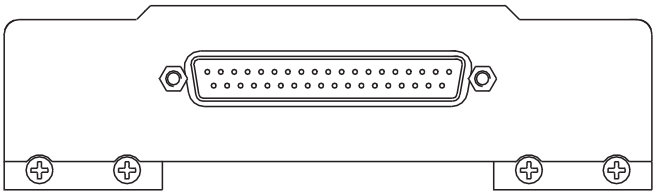
**SUB-D 25 POLES CONNECTOR**

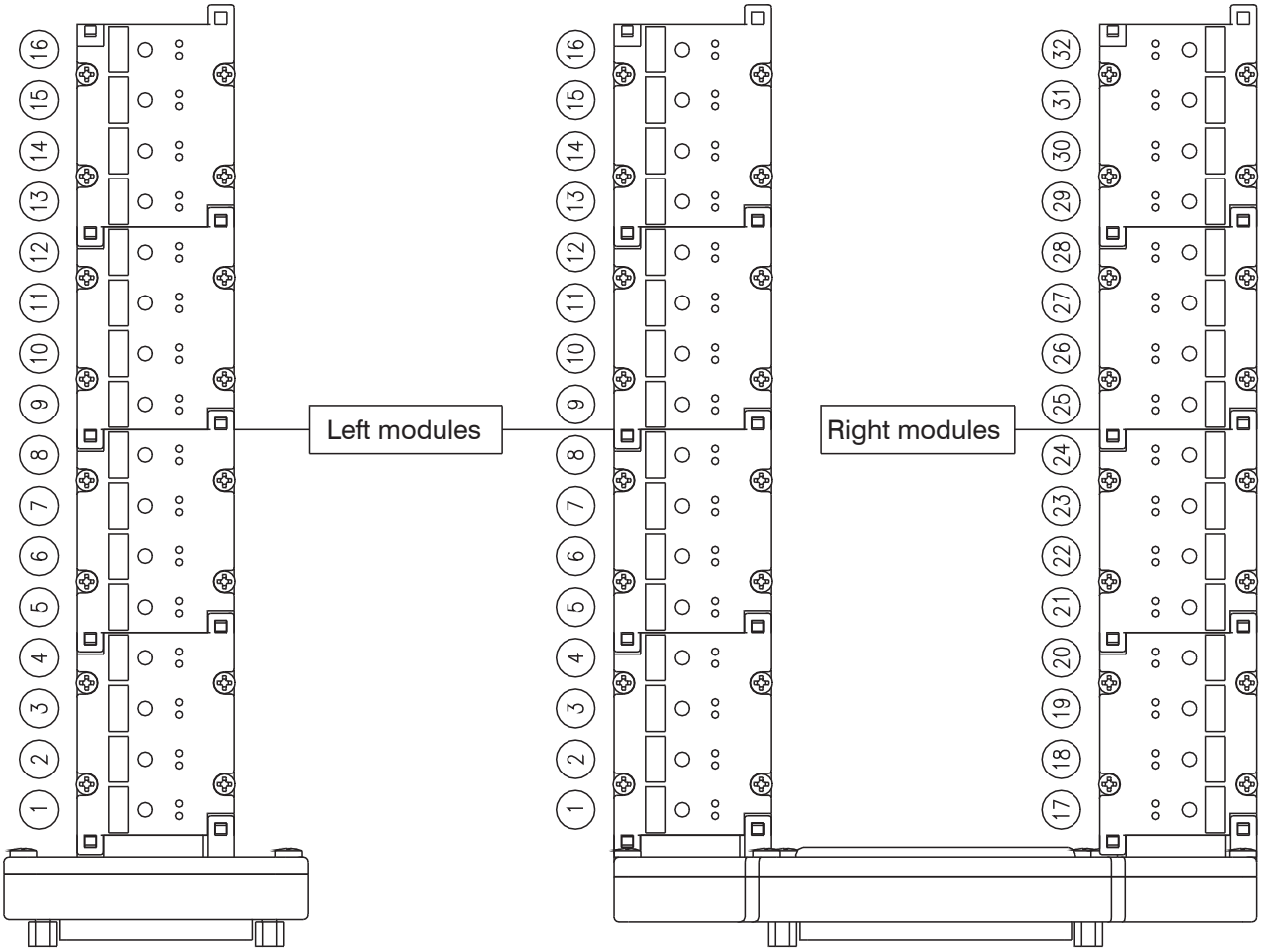



**SUB-D 37 POLES CONNECTOR**










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## Series 2400

This solenoid valves series has been developed to meet requirements for electronically controlled pneumatic systems and / or serial control systems already used in all manufacturing sectors.
They have been designed to be easily assembled into groups or manifolds and include integral electrical connection to facilitate simple and speedy integration into a control system.
The 2400 series comprises a range of products classified according to the body size of 18 mm divided into 3 types "LINE", "FLAT" and "VDMA".
The 10mm. and 18 mm. 24 VDC range of valves includes a range of accessories for the production of manifolded valve assemblies with integral electrical connections.
Modules are available in two or four station variants for flexibility and are supplied to IP40 or alternatively IP65 environmental protection.



### Construction characteristics

| | |
|---|---|
| Central body | Extruded aluminium bar with chemical nickel treatment and PTFE (polytetrafleurethylene) |
| Connection plates | Zinc alloy |
| Spool seals | Oil resistant nitrile rubber-HNBR |
| Springs | AISI 302 stainless steel |
| Operators | Technopolymer |
| Pistons | Technopolymer |
| Spools | Aluminium 2011 |

### Use and maintenance

The average life of the solenoid valve exceeds 50.000.000 cycles when used under optimum conditions.
Adequate lubrication reduces seals wear, just as proper filtering of supply air prevents the build-up of dirt that can cause malfunction.
Ensure the valve is used within our recommended criteria for pressure and temperature.
In dirty or dusty environments, the exhaust ports should be protected.
Seals kits are available for repairs.
Repairs must be made exclusively by specialized personnel.

### Ordering codes for minature solenoid valves

The 15 mm. miniature solenoid valve with 1,1 mm. orifice has been selected for piloting this series of valves (see Series 300).
This results in low response times and reduced power consumption.
The valve can be supplied with the coil upward or downward (multipolar connections) depending on the application.

Codes are as follows:

**Coil upward code**

01 = miniature sol. + 12 V DC
02 = miniature sol. + 24 V DC
05 = miniature sol. + 24 V AC
06 = miniature sol. 110 V AC
07 = miniature sol. 230 V AC
08 = miniature sol. + 24 V DC 1W
09 = miniature sol. + 24 V DC Earth faston

**Coil downward code**

11 = miniature sol. + 12 V DC
12 = miniature sol. + 24 V DC
15 = miniature sol. + 24 V AC
16 = miniature sol. 110 V AC
17 = miniature sol. 230 V AC
18 = miniature sol. + 24 V DC 1W
19 = miniature sol. + 24 V DC Earth faston

| | | |
|---|---|---|
| | **Well-tried component** | - The product is a well-tried product for a safety-related application according to ISO 13849-1.<br>- The relevant basic and well-tried safety principles according ISO 13849-2 for this product are fulfilled.<br>- The suitability of the product for a precise application must be verified and confirmed by the user. |
| $B_{10d}$ | 50.000.000 | |

**Miniature solenoid homologated are available (see Series 300).**

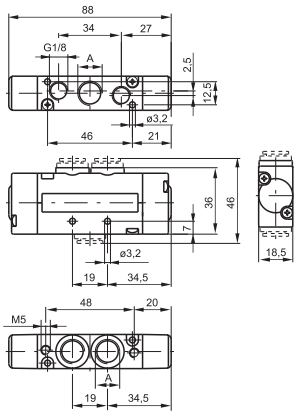
## Pneumatic - Spring

**Coding:** 241Ⓐ.52.00.19

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 800 |
| Orifice size (mm) | 7 |
| Pilot ports size | M5 |

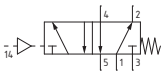
| | CONNECTION A |
|---|---|
| Ⓐ | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |




Weight 155 g

For dimension "A" see ordering code



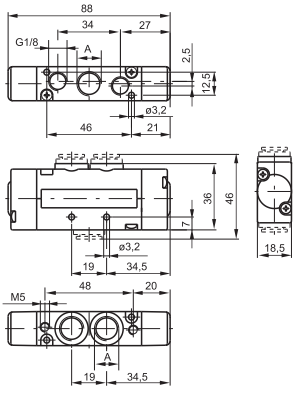

## Pneumatic-Differential

**Coding:** 241Ⓐ.52.00.16

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 800 |
| Orifice size (mm) | 7 |
| Pilot ports size | M5 |

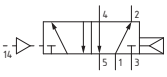
| | CONNECTION A |
|---|---|
| Ⓐ | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |




Weight 155 g

For dimension "A" see ordering code






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

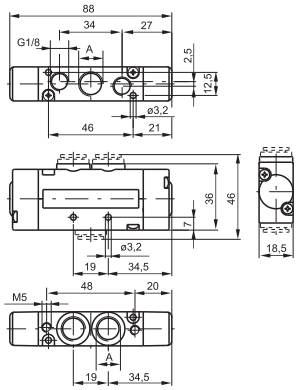
## Pneumatic - Differential (External)

**Coding:** 241Ⓐ.52.00.17

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 800 |
| Orifice size (mm) | 7 |
| Pilot ports size | M5 |

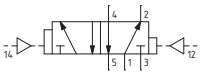
| | CONNECTION A |
|---|---|
| Ⓐ | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |




Weight 155 g

For dimension "A" see ordering code



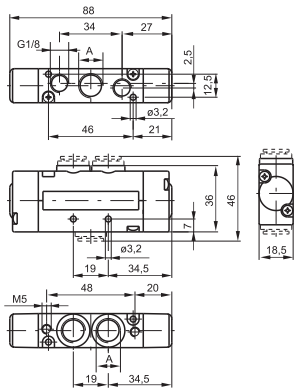

## Pneumatic - Pneumatic

**Coding:** 241Ⓐ.52.00.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 1.5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 800 |
| Orifice size (mm) | 7 |
| Pilot ports size | M5 |

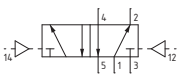
| | CONNECTION A |
|---|---|
| Ⓐ | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |




Weight 155 g

For dimension "A" see ordering code



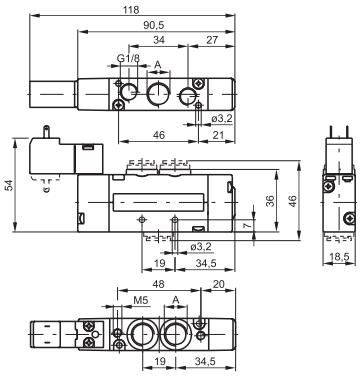
## Solenoid-Spring/Differerential

**Coding:** 241Ⓐ.52.00.Ⓥ.Ⓣ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 800 |
| Orifice size (mm) | 7 |
| Pilot ports size | M5 |

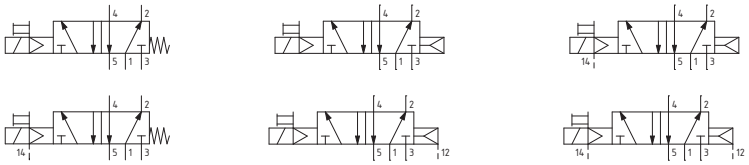
| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |
| Ⓥ | VERSION |
| | **39** = Solenoid-Spring |
| | **29** = Solenoid external-Spring |
| | **36** = Solenoid-Differential |
| | **37** = Solenoid-Differerential external |
| | **26** = Solenoid external-Differerential |
| | **27** = Solenoid external-Differerential external |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |






For dimension "A" see ordering code

Weight 195 g



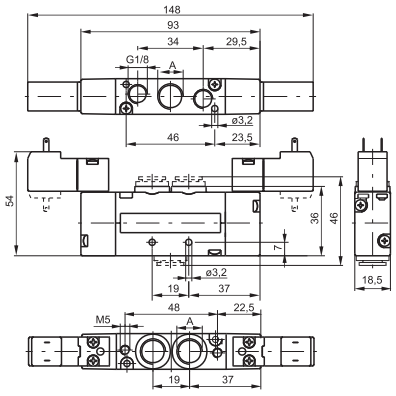
## Solenoid - Solenoid

**Coding:** 241Ⓐ.52.00.Ⓥ.Ⓣ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 1.5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 800 |
| Orifice size (mm) | 7 |
| Pilot ports size | M5 |

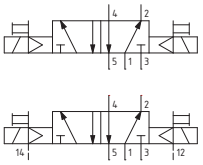
| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |
| Ⓥ | VERSION |
| | **35** = Solenoid-Solenoid |
| | **24** = Solenoid external-Solenoid external |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |






Weight 225 g

For dimension "A" see ordering code





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

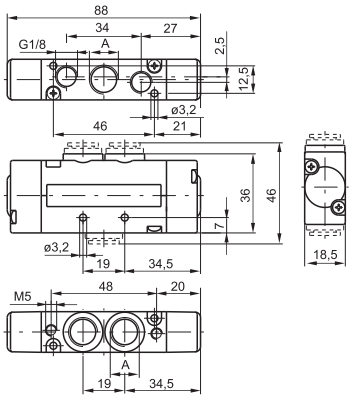
## Pneumatic-Pneumatic 5/3

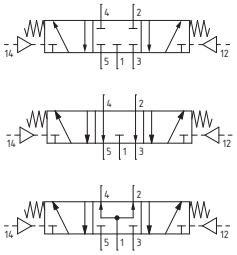
**Coding:** 241Ⓐ.53.Ⓕ.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 3 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 650 |
| Orifice size (mm) | 7 |
| Pilot ports size | M5 |

| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |





Weight 165 g

For dimension "A" see ordering code

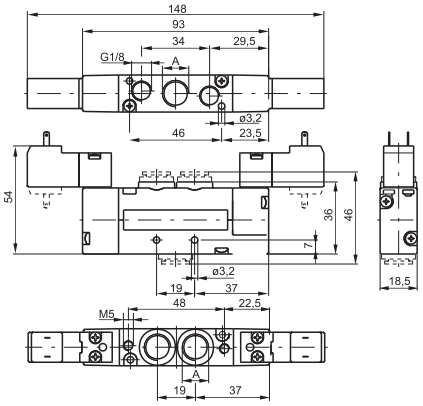
## Solenoid - Solenoid 5/3

**Coding:** 241Ⓐ.53.Ⓕ.Ⓥ.Ⓣ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 3 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 650 |
| Orifice size (mm) | 7 |
| Pilot ports size | M5 |

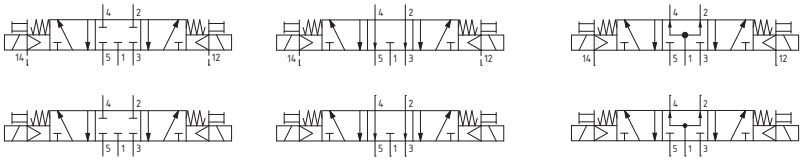
| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓥ | VERSION |
| | **24** = Solenoid external-Solenoid external |
| | **35** = Solenoid-Solenoid |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |






Weight 235 g

For dimension "A" see ordering code



## Pneumatic-Pneumatic 2 x 3/2

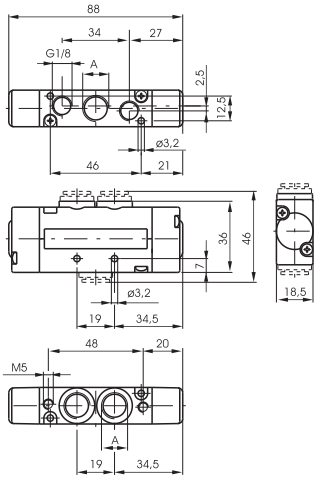
**Coding:** 241Ⓐ.62.Ⓕ.18

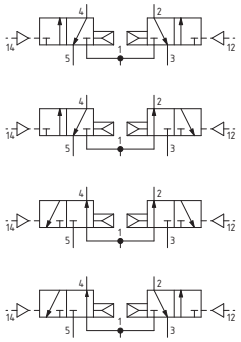
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | ≥1,5+(0,2xInlet pressure) |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 450 |
| Orifice size (mm) | 7 |

| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |
| Ⓕ | FUNCTION |
| | **44** = 2 Coils 3/2 NC |
| | **45** = 1 Coil 3/2 NC (14) + 1 Coil 3/2 NO (12) |
| | **55** = 2 Coils 3/2 NO |
| | **54** = 1 Coil 3/2 NO (14) + 1 Coil 3/2 NC (12) |

*"Example: if inlet pressure is set at 5bar then pilot pressure must be at least Pp=1,5+(0.2*5)=2,5bar"*





Weight 170 g

For dimension "A" see ordering code

## Solenoid-Solenoid 2 x 3/2

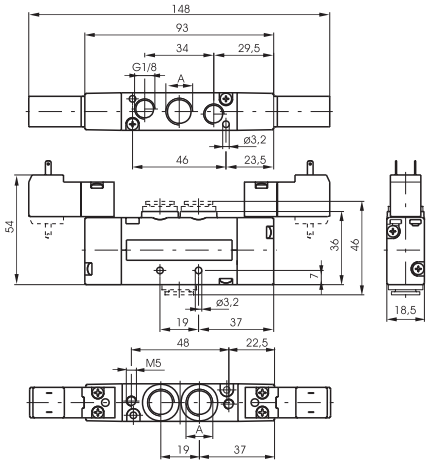
**Coding:** 241Ⓐ.62.Ⓕ.35.Ⓣ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | ≥1,5+(0,2xInlet pressure) |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 450 |
| Orifice size (mm) | 7 |

| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |
| Ⓕ | FUNCTION |
| | **44** = 2 Coils 3/2 NC |
| | **45** = 1 Coil 3/2 NC (14) + 1 Coil 3/2 NO (12) |
| | **55** = 2 Coils 3/2 NO |
| | **54** = 1 Coil 3/2 NO (14) + 1 Coil 3/2 NC (12) |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |

*"Example: if inlet pressure is set at 5bar then pilot pressure must be at least Pp=1,5+(0.2*5)=2,5bar"*






Weight 250 g

For dimension "A" see ordering code





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

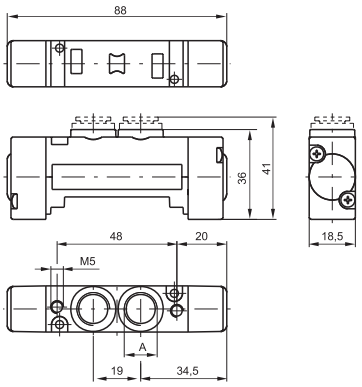
## Pneumatic - Spring

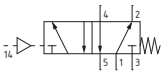
**Coding:** 243Ⓐ.52.00.19

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 800 |
| Orifice size (mm) | 7 |
| Pilot ports size | M5 |

| | CONNECTION A |
|---|---|
| Ⓐ | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |






Weight 105 g

For dimension "A" see ordering code

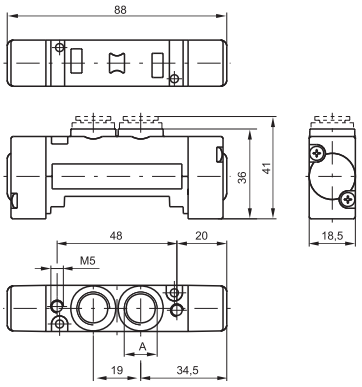
## Pneumatic-Differential

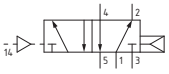
**Coding:** 243Ⓐ.52.00.16

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 800 |
| Orifice size (mm) | 7 |
| Pilot ports size | M5 |

| | CONNECTION A |
|---|---|
| Ⓐ | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |






Weight 105 g

For dimension "A" see ordering code

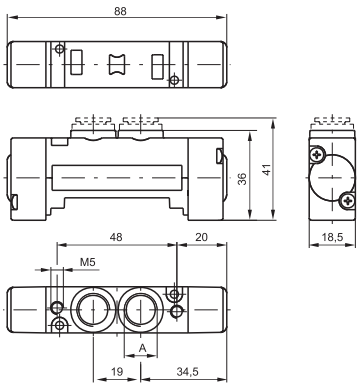
## Pneumatic - Differential (External)

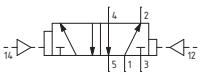
**Coding:** 243Ⓐ.52.00.17

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 800 |
| Orifice size (mm) | 7 |
| Pilot ports size | M5 |

| | CONNECTION A |
|---|---|
| Ⓐ | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |






Weight 105 g

For dimension "A" see ordering code

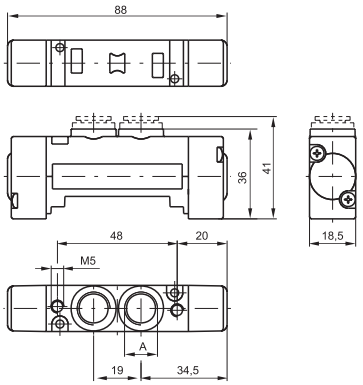
## Pneumatic - Pneumatic

**Coding:** 243Ⓐ.52.00.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 1.5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 800 |
| Orifice size (mm) | 7 |
| Pilot ports size | M5 |

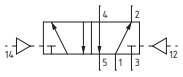
| | CONNECTION A |
|---|---|
| Ⓐ | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |






Weight 105 g

For dimension "A" see ordering code



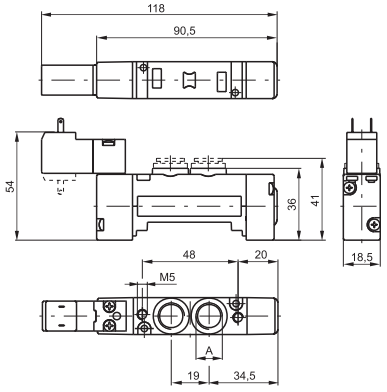
## Solenoid-Spring/Differerential

**Coding:** 243Ⓐ.52.00.Ⓥ.Ⓣ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 800 |
| Orifice size (mm) | 7 |
| Pilot ports size | M5 |

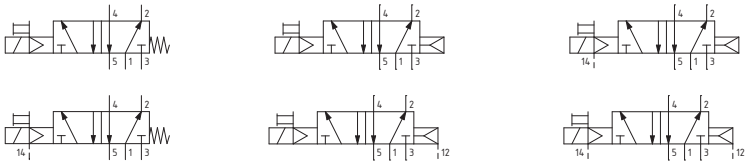
| | CONNECTION A |
|---|---|
| Ⓐ | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |
| Ⓥ | VERSION |
| | **39** = Solenoid-Spring |
| | **29** = Solenoid external-Spring |
| | **36** = Solenoid-Differential |
| | **37** = Solenoid-Differerential external |
| | **26** = Solenoid external-Differerential |
| | **27** = Solenoid external-Differerential external |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |






Weight 140 g

For dimension "A" see ordering code





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

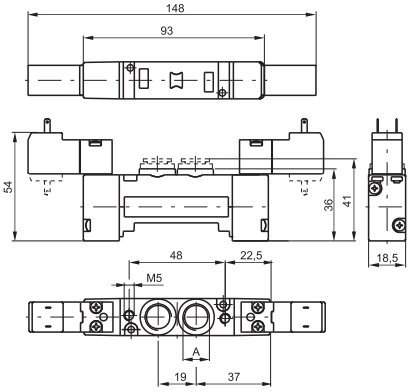
## Solenoid - Solenoid

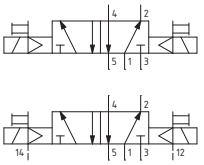
**Coding:** 243Ⓐ.52.00.Ⓥ.Ⓣ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 1.5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 800 |
| Orifice size (mm) | 7 |
| Pilot ports size | M5 |

| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |
| Ⓥ | VERSION |
| | **35** = Solenoid-Solenoid |
| | **24** = Solenoid external-Solenoid external |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |






Weight 175 g

For dimension "A" see ordering code

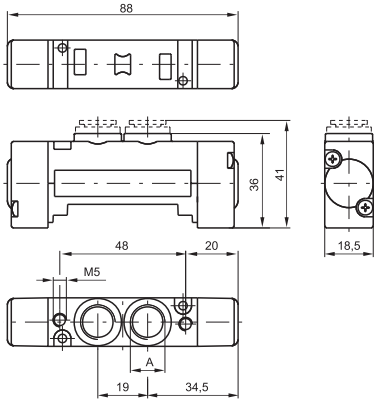
## Pneumatic-Pneumatic 5/3

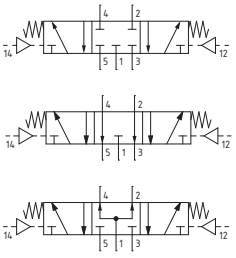
**Coding:** 243Ⓐ.53.Ⓕ.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 3 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 650 |
| Orifice size (mm) | 7 |
| Pilot ports size | M5 |

| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |






Weight 115 g

For dimension "A" see ordering code

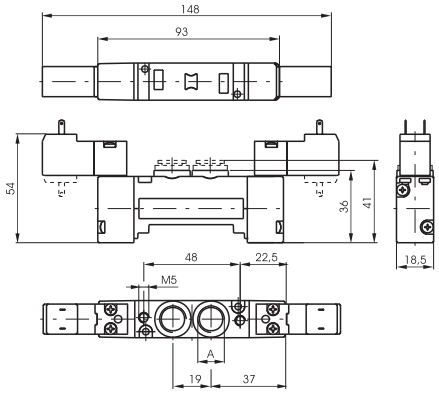
## Solenoid - Solenoid 5/3

**Coding:** 243Ⓐ.53.Ⓕ.Ⓥ.Ⓣ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 3 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 650 |
| Orifice size (mm) | 7 |
| Pilot ports size | M5 |

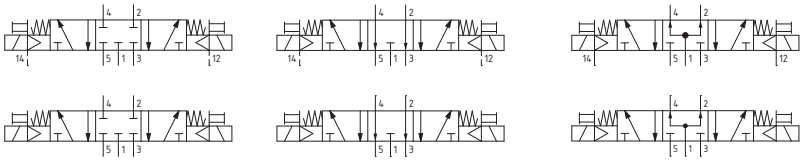
| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓥ | VERSION |
| | **24** = Solenoid external-Solenoid external |
| | **35** = Solenoid-Solenoid |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |






Weight 185 g

For dimension "A" see ordering code



## Pneumatic-Pneumatic 2 x 3/2

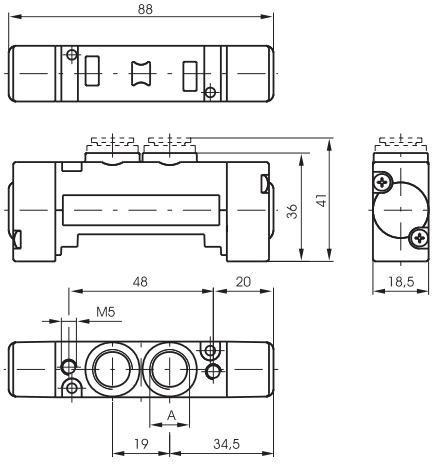
**Coding:** 243Ⓐ.62.Ⓕ.18

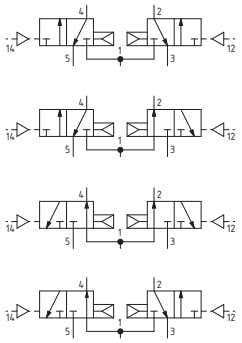
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | ≥1,5+(0,2xInlet pressure) |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 450 |
| Orifice size (mm) | 7 |

*"Example: if inlet pressure is set at 5bar then pilot pressure must be at least Pp=1,5+(0.2*5)=2,5bar"*

| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |
| Ⓕ | FUNCTION |
| | **44** = 2 Coils 3/2 NC |
| | **45** = 1 Coil 3/2 NC (14) + 1 Coil 3/2 NO (12) |
| | **55** = 2 Coils 3/2 NO |
| | **54** = 1 Coil 3/2 NO (14) + 1 Coil 3/2 NC (12) |





Weight 110 g

For dimension "A" see ordering code



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Solenoid 2 x 3/2

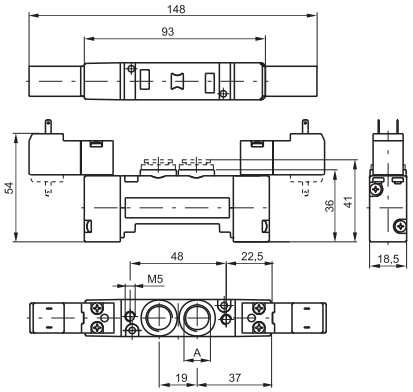
**Coding:** 243Ⓐ.62.Ⓕ.35.Ⓣ

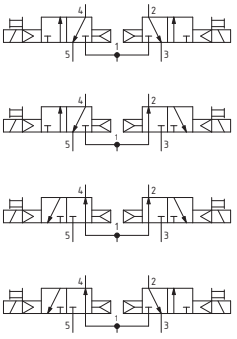
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | ≥1,5+(0,2xInlet pressure) |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 450 |
| Orifice size (mm) | 7 |

*"Example: if inlet pressure is set at 5bar then pilot pressure must be at least Pp=1,5+(0.2*5)=2,5bar"*

| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G1/4" |
| | **5** = G1/8" |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |
| Ⓕ | FUNCTION |
| | **44** = 2 Coils 3/2 NC |
| | **45** = 1 Coil 3/2 NC (14) + 1 Coil 3/2 NO (12) |
| | **55** = 2 Coils 3/2 NO |
| | **54** = 1 Coil 3/2 NO (14) + 1 Coil 3/2 NC (12) |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |





Weight 190 g

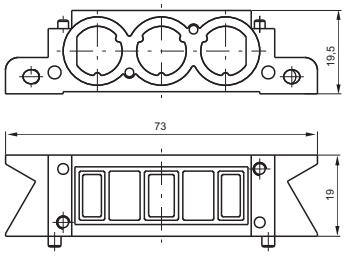
For dimension "A" see ordering code

## Modular base

**Coding:** 2430.Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **01** = Modular base |
| | **06** = Supply and exhaust closed |
| | **07** = Supply closed |
| | **08** = Exhaust closed |





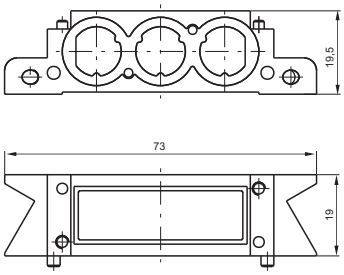

Weight 85 g

2430.Ⓥ

## Blanck base

**Coding:** 2430.05



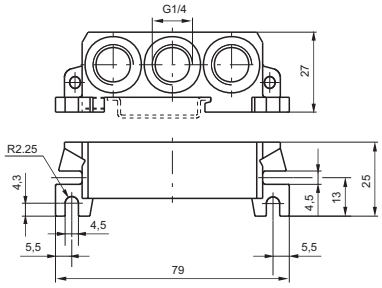



Weight 85 g

## Right inlet base

**Coding:** 2430.02



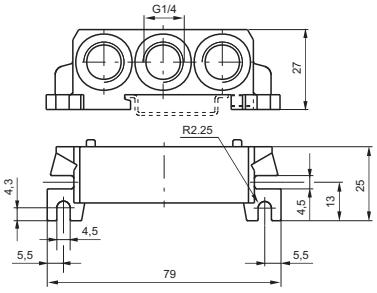



Weight 120 g

## Left inlet base

**Coding:** 2430.03





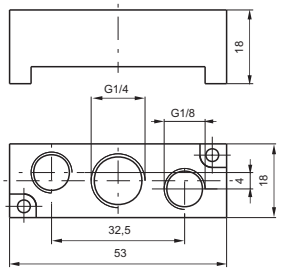

Weight 125 g

## Intermediate air intake

**Coding:** 2430.10



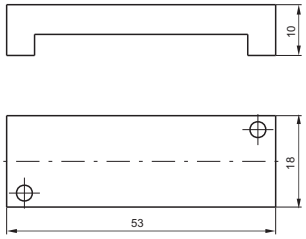
Weight 30 g
to be assembled instead of a valve




## Closing plate

**Coding:** 2430.00






Weight 20 g

## Diaphragm plug

**Coding:** 2430.17



Weight 5 g



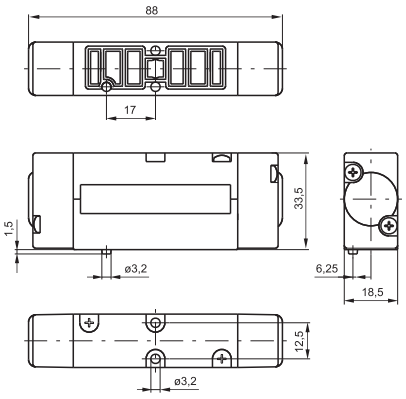
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pneumatic - Spring

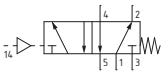
**Coding:** 2445.52.00.19

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 550 |
| Orifice size (mm) | 5 |






Weight 155 g

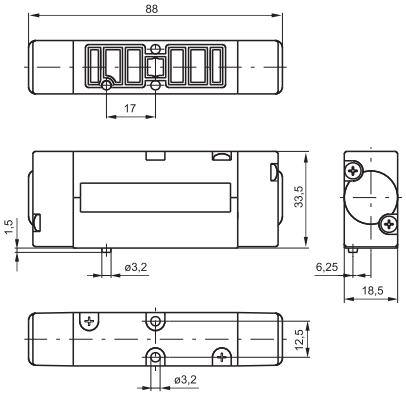


## Pneumatic-Differential

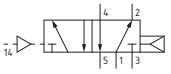
**Coding:** 2445.52.00.16

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 550 |
| Orifice size (mm) | 5 |






Weight 155 g

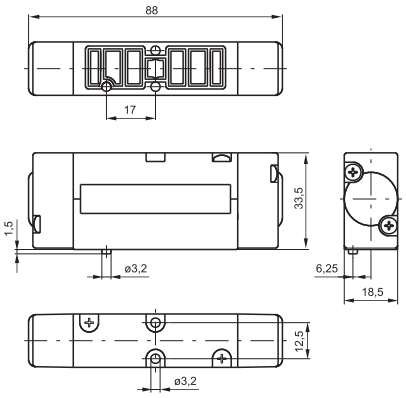


## Pneumatic - Differential (External)

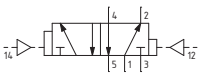
**Coding:** 2445.52.00.17

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 550 |
| Orifice size (mm) | 5 |






Weight 155 g

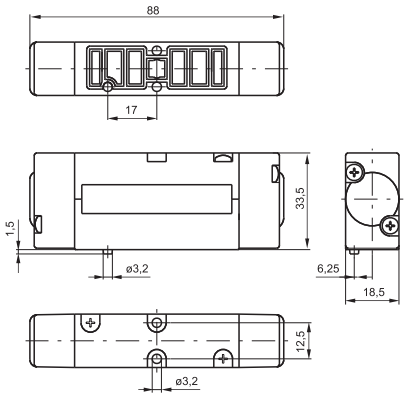


## Pneumatic - Pneumatic

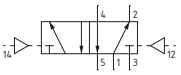
**Coding:** 2445.52.00.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 1.5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 550 |
| Orifice size (mm) | 5 |






Weight 155 g






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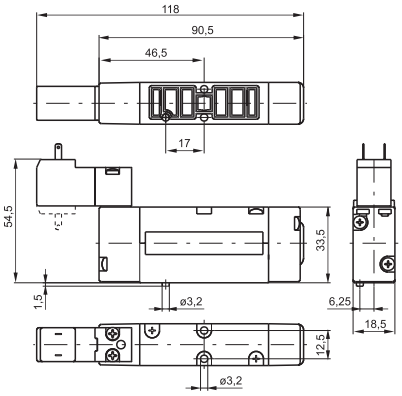
## Solenoid-Spring/Differerential

**Coding:** 244Ⓒ.52.00.Ⓥ.Ⓣ

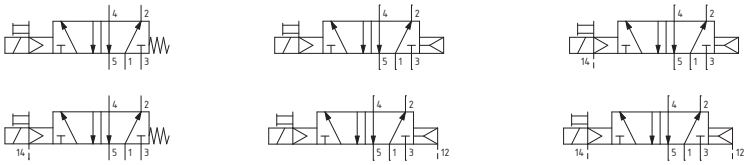
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 550 |
| Orifice size (mm) | 5 |

| | |
|---|---|
| Ⓒ | TYPE ELECTROPILOT EXHAUST |
| | **1** = on base (only for self feeding valves) |
| | **5** = on pilot (for all version) |
| Ⓥ | VERSION |
| | **39** = Solenoid-Spring |
| | **29** = Solenoid external-Spring |
| | **36** = Solenoid-Differential |
| | **37** = Solenoid-Differerential external |
| | **26** = Solenoid external-Differerential |
| | **27** = Solenoid external-Differerential external |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |






Weight 190 g



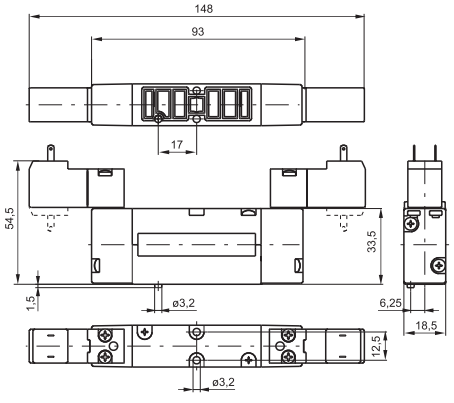
## Solenoid - Solenoid

**Coding:** 244Ⓒ.52.00.Ⓥ.Ⓣ

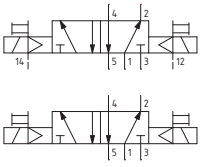
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 1.5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 550 |
| Orifice size (mm) | 5 |

| | |
|---|---|
| Ⓒ | TYPE ELECTROPILOT EXHAUST |
| | **1** = on base (only for self feeding valves) |
| | **5** = on pilot (for all version) |
| Ⓥ | VERSION |
| | **24** = Solenoid external-Solenoid external |
| | **35** = Solenoid-Solenoid |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |






Weight 225 g



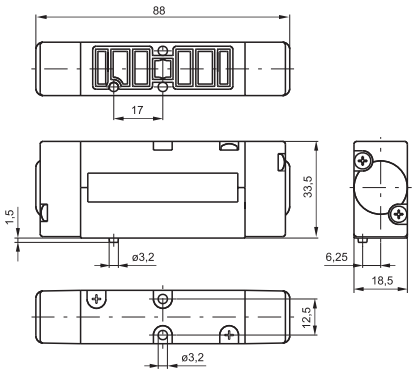
## Pneumatic-Pneumatic 5/3

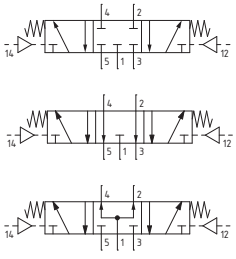
**Coding:** 244Ⓒ.53.Ⓕ.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 3 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 550 |
| Orifice size (mm) | 5 |

| | |
|---|---|
| Ⓒ | TYPE ELECTROPILOT EXHAUST |
| | **1** = on base (only for self feeding valves) |
| | **5** = on pilot (for all version) |
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |





Weight 165 g

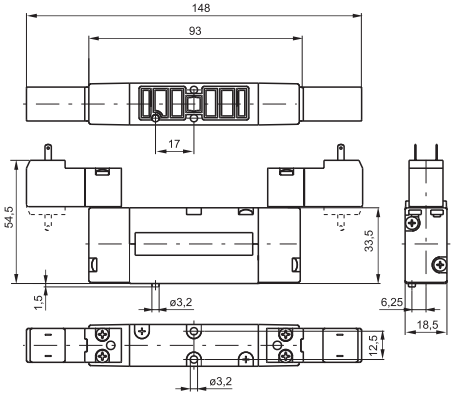
## Solenoid - Solenoid 5/3

**Coding:** 244Ⓒ.53.Ⓕ.Ⓥ.Ⓣ

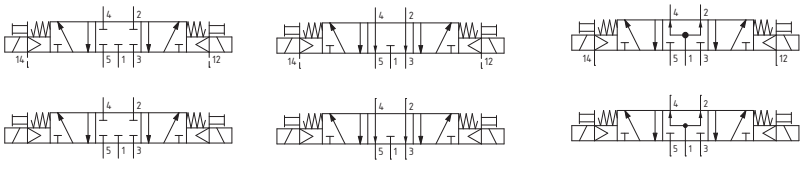
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 3 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 550 |
| Orifice size (mm) | 5 |

| | |
|---|---|
| Ⓒ | TYPE ELECTROPILOT EXHAUST |
| | **1** = on base (only for self feeding valves) |
| | **5** = on pilot (for all version) |
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓥ | VERSION |
| | **24** = Solenoid external-Solenoid external |
| | **35** = Solenoid-Solenoid |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |






Weight 235 g





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pneumatic-Pneumatic 2 x 3/2

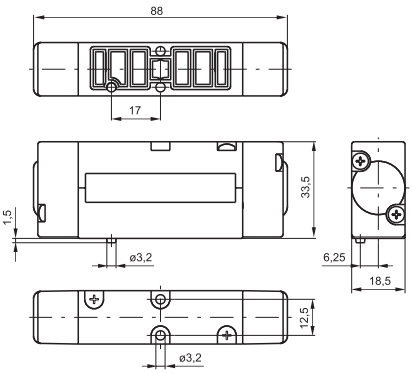
**Coding:** 2445.62.Ⓕ.18

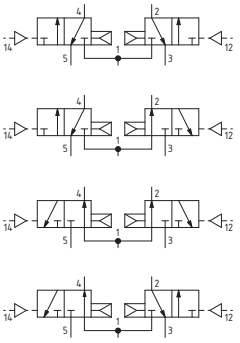
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | ≥1,5+(0,2xInlet pressure) |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 450 |
| Orifice size (mm) | 5 |

| | FUNCTION |
|---|---|
| Ⓕ | **44** = 2 Coils 3/2 NC |
| | **45** = 1 Coil 3/2 NC (14) + 1 Coil 3/2 NO (12) |
| | **55** = 2 Coils 3/2 NO |
| | **54** = 1 Coil 3/2 NO (14) + 1 Coil 3/2 NC (12) |

*"Example: if inlet pressure is set at 5bar then pilot pressure must be at least Pp=1,5+(0.2*5)=2,5bar"*



Weight 170 g

## Solenoid-Solenoid 2 x 3/2

**Coding:** 2445.62.Ⓕ.35.Ⓣ

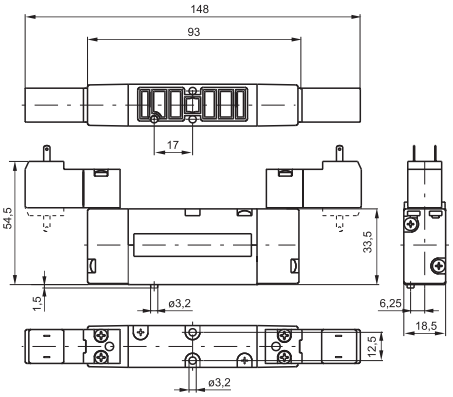
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | ≥1,5+(0,2xInlet pressure) |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 450 |
| Orifice size (mm) | 5 |

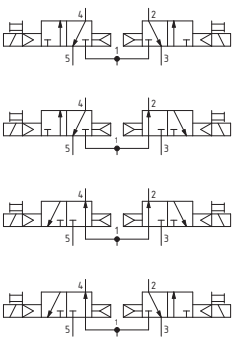
| | FUNCTION |
|---|---|
| Ⓕ | **44** = 2 Coils 3/2 NC |
| | **45** = 1 Coil 3/2 NC (14) + 1 Coil 3/2 NO (12) |
| | **55** = 2 Coils 3/2 NO |
| | **54** = 1 Coil 3/2 NO (14) + 1 Coil 3/2 NC (12) |

| | VOLTAGE |
|---|---|
| Ⓣ | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |

*"Example: if inlet pressure is set at 5bar then pilot pressure must be at least Pp=1,5+(0.2*5)=2,5bar"*



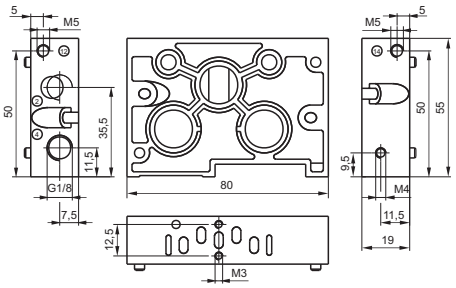



Weight 250 g

## Modular base



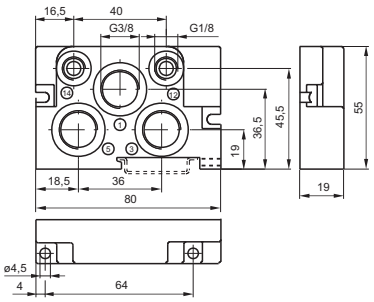



**Coding:** 2440.Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **01** = Modular base |
| | **06** = Supply and exhaust closed |
| | **07** = Supply closed |
| | **08** = Exhaust closed |

## Right inlet base



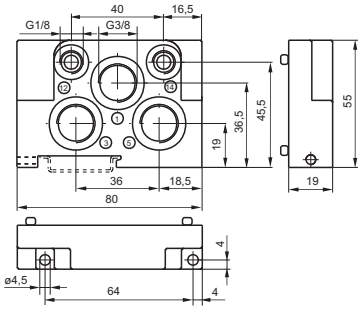



**Coding:** 2440.02

Weight 110 g

## Left inlet base



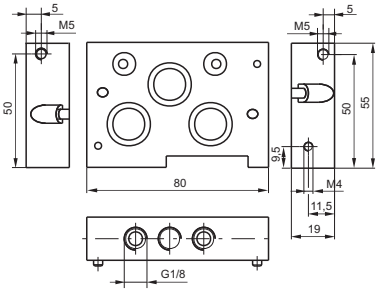



**Coding:** 2440.03

Weight 110 g

## Intermediate air intake



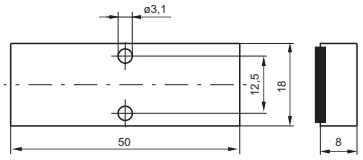



**Coding:** 2440.10

Weight 185 g

## Closing plate






**Coding:** 2440.00

Weight 25 g

## Diaphragm plug



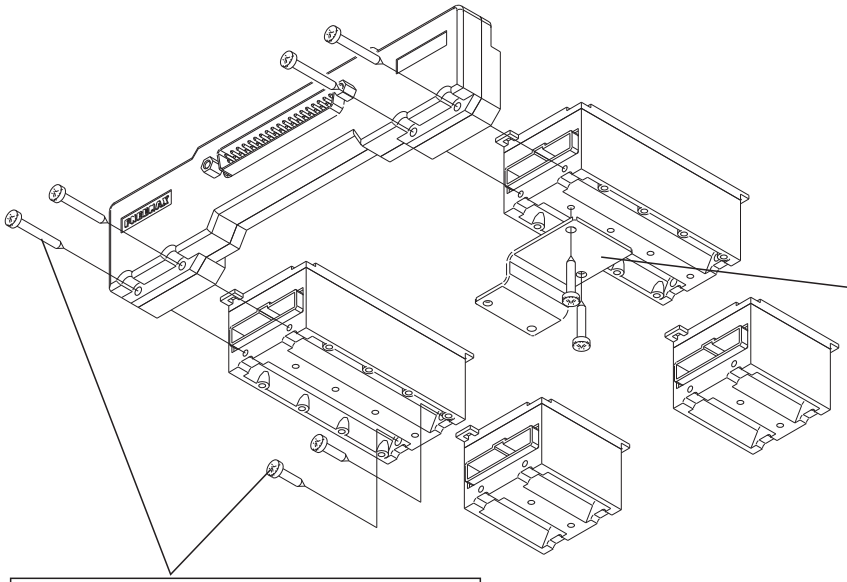
**Coding:** 2440.17



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

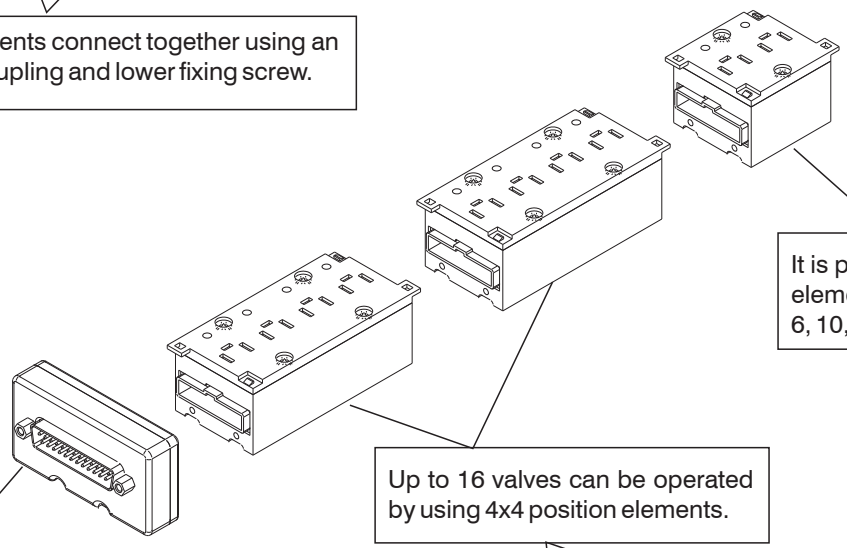
The integral electrical design for the series 2400 valve is extremely flexible, allowing the production of pre-wired solenoid valve manifolds, the configuration of which can be determined at the point of assembly. The 24 VDC, 12 VDC (equivalent PNP) and 24 VAC* modules are available with 2 or 4 positions. The system assembled is designed for an IP40 protection. IP65 is available on request.

* Attention : If the working tension is 24 VAC DO NOT using modules with protection diode



Support plates are supplied to mount the electrical connection elements to the manifold modules. Individual valves can still be removed from the manifold even after assembly is complete. One support plate is required per element.

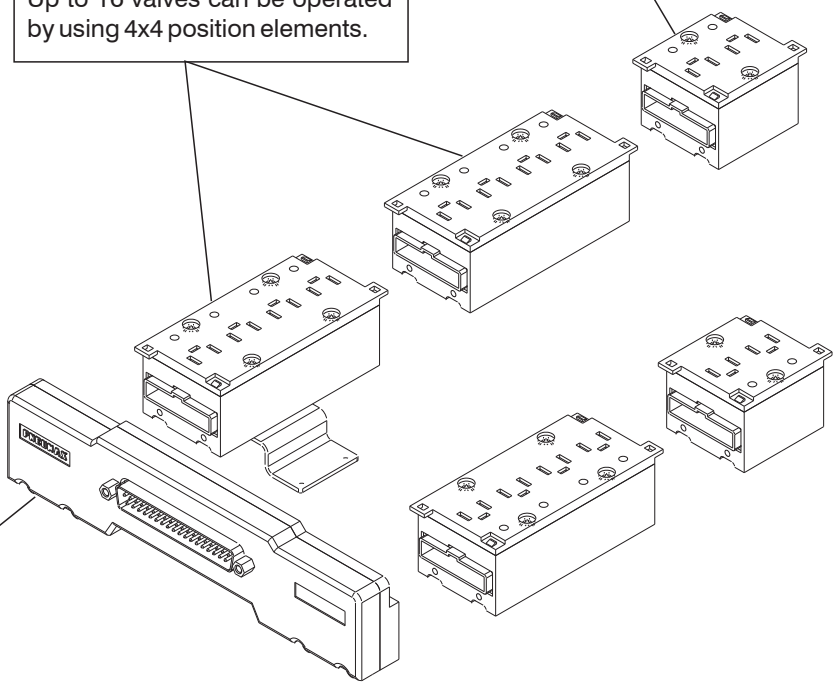
The elements connect together using an upper coupling and lower fixing screw.



It is possible to use the 2 position element as the first terminal on 2, 6, 10, 14 position assemblies..

Up to 16 valves can be operated by using 4x4 position elements.

On single solenoid assemblies electrical connection is made using an D-SUB 25 multi-connector.



On double solenoid assemblies electrical connection is made usinfg an D-SUB 37 multi-connector.

## Module for connections, 2 positions

**Coding:** 2400.02.Ⓥ



| | VERSION |
|---|---|
| Ⓥ | **00** = Left IP40-PNP |
| | **02** = Left IP40-PNP with protection diode |
| | **10** = Left IP65-PNP |
| | **12** = Left IP65-PNP with protection diode |
| | **01** = Right IP40-PNP |
| | **03** = Right IP40-PNP with protection diode |
| | **11** = Right IP65-PNP |
| | **13** = Right IP65-PNP with protection diode |

Weight 30 g
**Note:** with protection diode only direct current (V DC) is available

## Module for connections, 4 positions

**Coding:** 2400.04.Ⓥ



| | VERSION |
|---|---|
| Ⓥ | **00** = Left IP40-PNP |
| | **02** = Left IP40-PNP with protection diode |
| | **10** = Left IP65-PNP |
| | **12** = Left IP65-PNP with protection diode |
| | **01** = Right IP40-PNP |
| | **03** = Right IP40-PNP with protection diode |
| | **11** = Right IP65-PNP |
| | **13** = Right IP65-PNP with protection diode |

Weight 50 g
**Note:** with protection diode only direct current (V DC) is available

## Connectors 25 poles

**Coding:** 2400.25.10



Weight 40 g
The IP65 protection is obtained by IP65 Pneumax cable

## Connectors 37 poles

**Coding:** 2400.37.10



Weight 120 g
The IP65 protection is obtained by IP65 Pneumax cable

## Plug

**Coding:** 2400.00



Weight 5 g

## Closing plate electrical positions

**Coding:** 2400.15.00



Weight 2 g

## VDMA support plate

**Coding:** 2440.50



Weight 20 g

## FLAT support plate

**Coding:** 2430.50



Weight 20 g

## 4 positions box with 25 contacts connector

**Coding:** 2400.04.25



Weight 65 g

## 15mm male connector with 2 metres cable

**Coding:** 2400.15.02



Weight 98 g

## In line cable complete with connector, IP40

**Coding:** 2400.Ⓒ.Ⓛ.00



| | CONNECTOR |
|---|---|
| Ⓒ | **25** = 25 poles |
| | **37** = 37 poles |
| | CABLE LENGTH |
| Ⓛ | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |

## Cable complete with connector, 25 Poles, IP65

**Coding:** 2300.25.Ⓛ.Ⓒ



| | CABLE LENGTH |
|---|---|
| Ⓛ | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |
| | CONNECTOR |
| Ⓒ | **10** = Stand alone |
| | **90** = 90° Angle |

## Cable complete with connector, 37 Poles, IP65

**Coding:** 2400.37.Ⓛ.Ⓒ

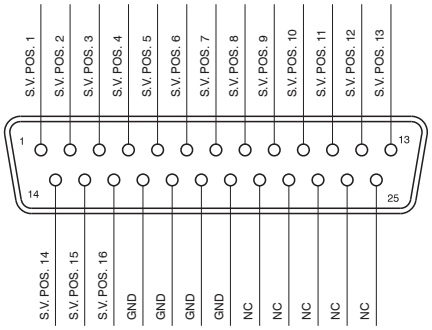


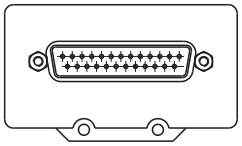
| | CABLE LENGTH |
|---|---|
| Ⓛ | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |
| | CONNECTOR |
| Ⓒ | **10** = Stand alone |
| | **90** = 90° Angle |



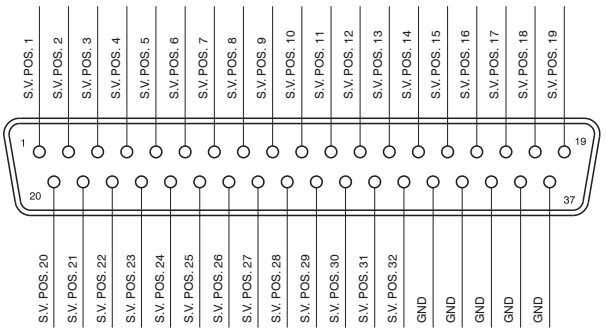
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

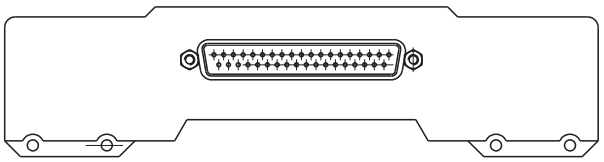
**SUB-D 25 POLES CONNECTOR**

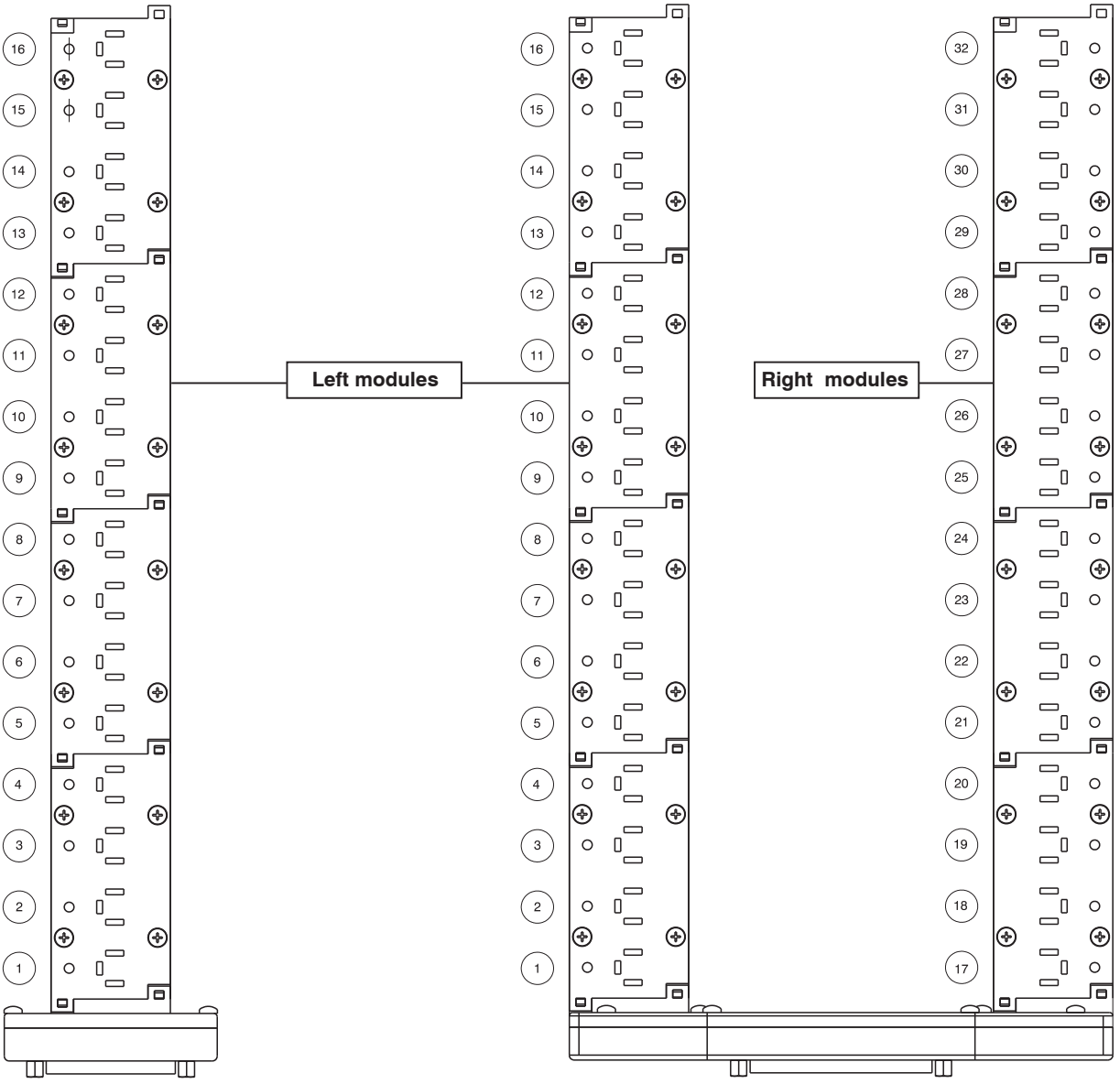


**SUB-D 37 POLES CONNECTOR**





## Series 2600

They have been designed to be easily assembled into groups or manifolds.
The 2600 series comprises a range of products classified according to the body size of 26mm divided into 3 types "LINE", "FLAT" and "VDMA".
Is not included the integral electrical connection



### Construction characteristics

| | |
|---|---|
| Central body | Extruded aluminium bar with chemical nickel treatment and PTFE (polytetrafleurethylene) |
| Connection plates | Die-cast aluminium |
| Spool seals | Oil resistant nitrile rubber-HNBR |
| Springs | AISI 302 stainless steel |
| Operators | Technopolymer |
| Pistons | Technopolymer |
| Spools | Aluminium 2011 |

### Ordering codes for minature solenoid valves

The 15 mm. miniature solenoid valve with 1,1 mm. orifice has been selected for piloting this series of valves (see Series 300).
This results in low response times and reduced power consumption.
The valve can be supplied with the coil upward or downward (multipolar connections) depending on the application.
Codes are as follows:

**Coil upward code**

01 = miniature sol. + 12 V DC
02 = miniature sol. + 24 V DC
05 = miniature sol. + 24 V AC
06 = miniature sol. 110 V AC
07 = miniature sol. 230 V AC
08 = miniature sol. + 24 V DC 1W
09 = miniature sol. + 24 V DC Earth faston

**Coil downward code**

11 = miniature sol. + 12 V DC
12 = miniature sol. + 24 V DC
15 = miniature sol. + 24 V AC
16 = miniature sol. 110 V AC
17 = miniature sol. 230 V AC
18 = miniature sol. + 24 V DC 1W
19 = miniature sol. + 24 V DC Earth faston

**Miniature solenoid c UL us homologated are available (see Series 300).**

### Use and maintenance

The average life of the solenoid valve exceeds 50.000.000 cycles when used under optimum conditions.
Adequate lubrication reduces seals wear, just as proper filtering of supply air prevents the build-up of dirt that can cause malfunction.
Ensure the valve is used within our recommended criteria for pressure and temperature.
In dirty or dusty environments, the exhaust ports should be protected.
Seals kits are available for repairs.
Repairs must be made exclusively by specialized personnel.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

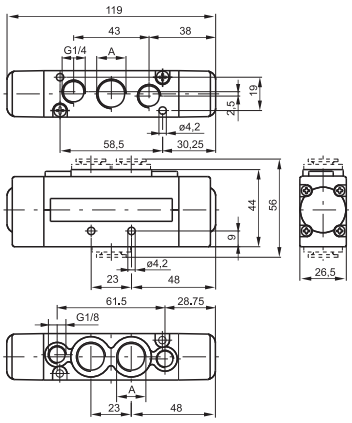
## Pneumatic - Spring

**Coding:** 261Ⓐ.52.00.19

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1500 |
| Orifice size (mm) | 9 |
| Pilot ports size | G1/8" |

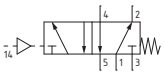
| | CONNECTION A |
|---|---|
| Ⓐ | **1** = G3/8" |
| | **5** = G1/4" |
| | **8** = Quick fitting tube Ø10 |






Weight 235 g
Minimum pilot pressure 2 bar

For dimension "A" see ordering code



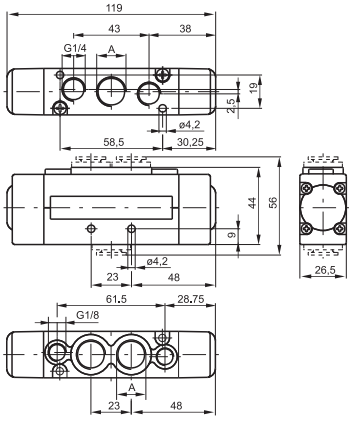

## Pneumatic-Differential

**Coding:** 261Ⓐ.52.00.16

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1500 |
| Orifice size (mm) | 9 |
| Pilot ports size | G1/8" |

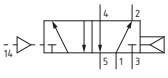
| | CONNECTION A |
|---|---|
| Ⓐ | **1** = G3/8" |
| | **5** = G1/4" |
| | **8** = Quick fitting tube Ø10 |






Weight 235 g
Minimum pilot pressure 2 bar

For dimension "A" see ordering code



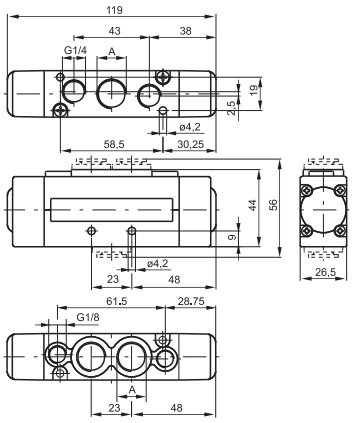
## Pneumatic - Differential (External)

**Coding:** 261Ⓐ.52.00.17

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1500 |
| Orifice size (mm) | 9 |
| Pilot ports size | G1/8" |

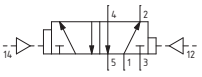
| Ⓐ | CONNECTION A |
|---|---|
| | **1** = G3/8" |
| | **5** = G1/4" |
| | **8** = Quick fitting tube Ø10 |






Weight 235 g
Minimum pilot pressure 2 bar

For dimension "A" see ordering code



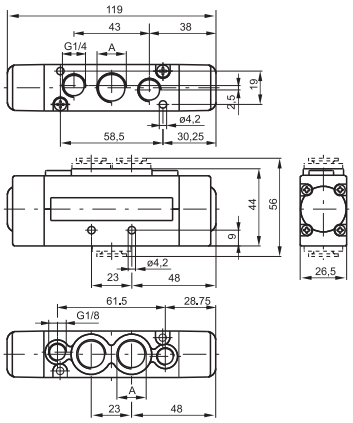

## Pneumatic - Pneumatic

**Coding:** 261Ⓐ.52.00.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1500 |
| Orifice size (mm) | 9 |
| Pilot ports size | G1/8" |

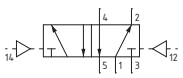
| Ⓐ | CONNECTION A |
|---|---|
| | **1** = G3/8" |
| | **5** = G1/4" |
| | **8** = Quick fitting tube Ø10 |






Weight 235 g
Minimum pilot pressure 1,5 bar

For dimension "A" see ordering code






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

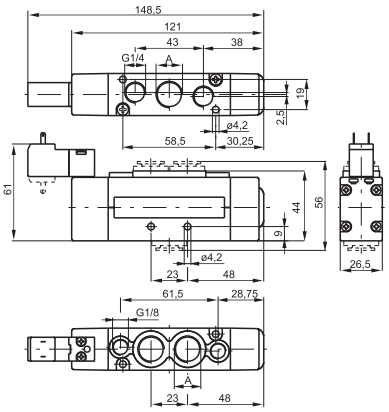
## Solenoid-Spring/Differerential

**Coding:** 261Ⓐ.52.00.Ⓥ.Ⓣ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1500 |
| Orifice size (mm) | 9 |

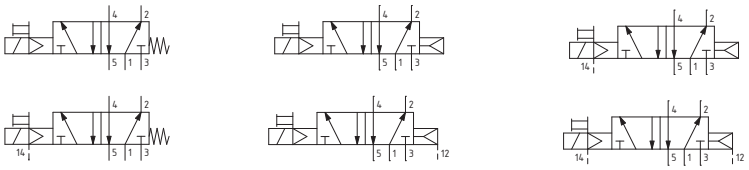
| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G3/8" |
| | **5** = G1/4" |
| | **8** = Quick fitting tube Ø10 |
| Ⓥ | VERSION |
| | **39** = Solenoid-Spring |
| | **29** = Solenoid external-Spring |
| | **36** = Solenoid-Differential |
| | **37** = Solenoid-Differerential external |
| | **26** = Solenoid external-Differerential |
| | **27** = Solenoid external-Differerential external |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |






For dimension "A" see ordering code

Weight 275 g
Minimum pilot pressure 2 bar



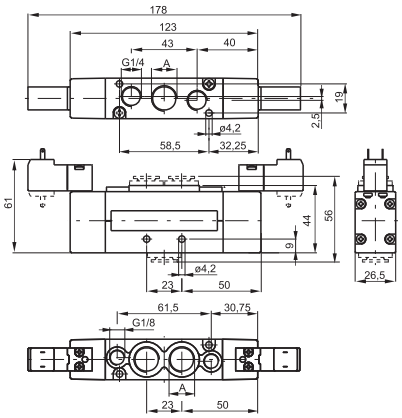
## Solenoid - Solenoid

**Coding:** 261Ⓐ.52.00.Ⓥ.Ⓣ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1500 |
| Orifice size (mm) | 9 |

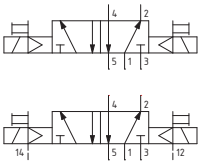
| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G3/8" |
| | **5** = G1/4" |
| | **8** = Quick fitting tube Ø10 |
| Ⓥ | VERSION |
| | **35** = Solenoid-Solenoid |
| | **24** = Solenoid external-Solenoid external |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |






For dimension "A" see ordering code

Weight 295 g
Minimum pilot pressure 1,5 bar



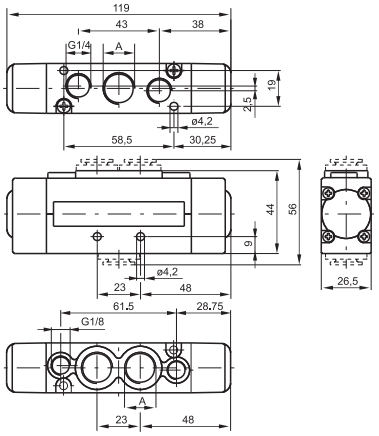
## Pneumatic-Pneumatic 5/3

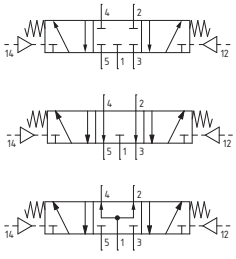
**Coding:** 261Ⓐ.53.Ⓕ.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1350 |
| Orifice size (mm) | 9 |
| Pilot ports size | M5 |

| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G3/8" |
| | **5** = G1/4" |
| | **8** = Quick fitting tube Ø10 |
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |





Weight 245 g
Minimum pilot pressure 3 bar

For dimension "A" see ordering code

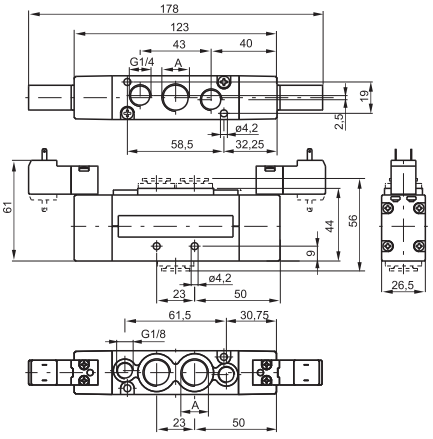
## Solenoid - Solenoid 5/3

**Coding:** 261Ⓐ.53.Ⓕ.Ⓥ.Ⓣ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1350 |
| Orifice size (mm) | 9 |

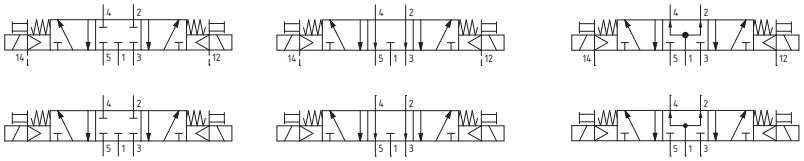
| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G3/8" |
| | **5** = G1/4" |
| | **8** = Quick fitting tube Ø10 |
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓥ | VERSION |
| | **24** = Solenoid external-Solenoid external |
| | **35** = Solenoid-Solenoid |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |






Weight 245 g
Minimum pilot pressure 3 bar

For dimension "A" see ordering code





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

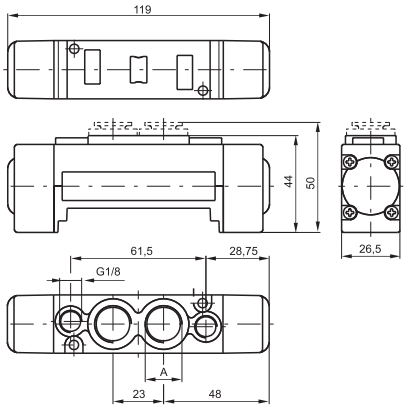
## Pneumatic - Spring

**Coding:** 263Ⓐ.52.00.19

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1500 |
| Orifice size (mm) | 9 |
| Pilot ports size | M5 |

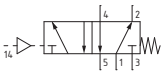
| Ⓐ | CONNECTION A |
|---|---|
| | **1** = G3/8" |
| | **5** = G1/4" |
| | **8** = Quick fitting tube Ø10 |






Weight 185 g
Minimum pilot pressure 2 bar

For dimension "A" see ordering code



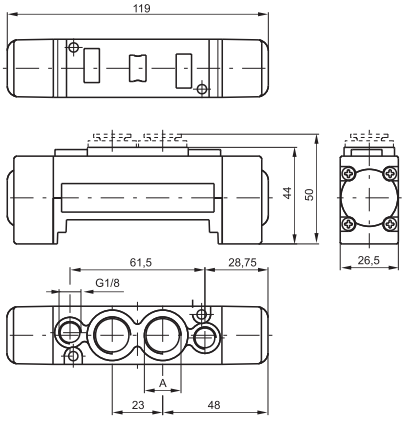

## Pneumatic-Differential

**Coding:** 263Ⓐ.52.00.16

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1500 |
| Orifice size (mm) | 9 |
| Pilot ports size | M5 |

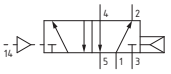
| Ⓐ | CONNECTION A |
|---|---|
| | **1** = G3/8" |
| | **5** = G1/4" |
| | **8** = Quick fitting tube Ø10 |






Weight 185 g
Minimum pilot pressure 2 bar

For dimension "A" see ordering code



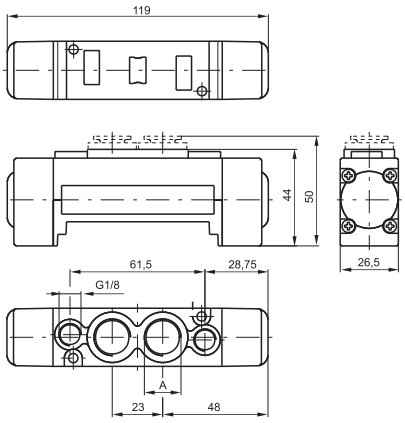

## Pneumatic - Differential (External)

**Coding:** 263Ⓐ.52.00.17

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1500 |
| Orifice size (mm) | 9 |
| Pilot ports size | M5 |

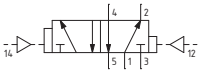
| Ⓐ | CONNECTION A |
|---|---|
| | **1** = G3/8" |
| | **5** = G1/4" |
| | **8** = Quick fitting tube Ø10 |






Weight 185 g
Minimum pilot pressure 2 bar

For dimension "A" see ordering code



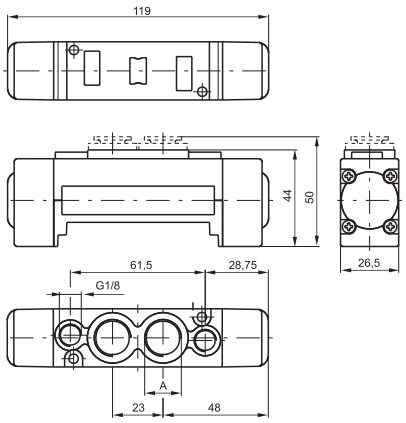
## Pneumatic - Pneumatic

**Coding:** 263Ⓐ.52.00.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1500 |
| Orifice size (mm) | 9 |
| Pilot ports size | M5 |

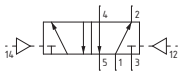
| Ⓐ | CONNECTION A |
|---|---|
| | **1** = G3/8" |
| | **5** = G1/4" |
| | **8** = Quick fitting tube Ø10 |






Weight 185 g
Minimum pilot pressure 1,5 bar

For dimension "A" see ordering code






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

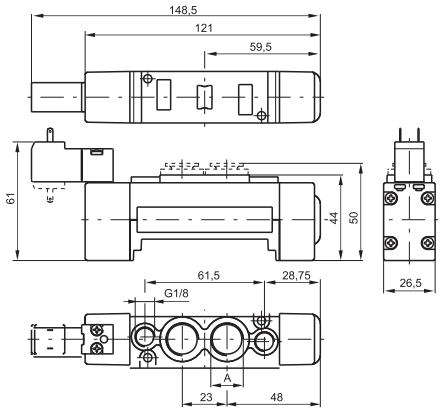
## Solenoid-Spring/Differerential

**Coding:** 263Ⓐ.52.00.Ⓥ.Ⓣ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1500 |
| Orifice size (mm) | 9 |

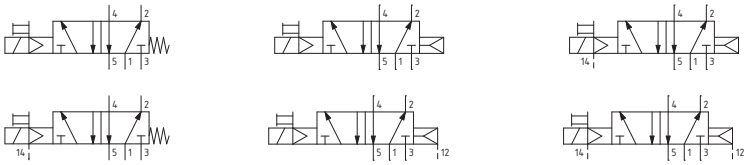
| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G3/8" |
| | **5** = G1/4" |
| | **8** = Quick fitting tube Ø10 |
| Ⓥ | VERSION |
| | **39** = Solenoid-Spring |
| | **29** = Solenoid external-Spring |
| | **36** = Solenoid-Differential |
| | **37** = Solenoid-Differerential external |
| | **26** = Solenoid external-Differerential |
| | **27** = Solenoid external-Differerential external |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |






For dimension "A" see ordering code

Weight 220 g
Minimum pilot pressure 2 bar



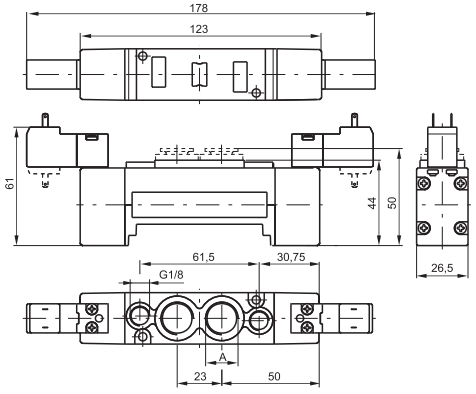
## Solenoid - Solenoid

**Coding:** 263Ⓐ.52.00.Ⓥ.Ⓣ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1500 |
| Orifice size (mm) | 9 |

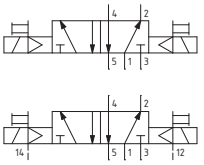
| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G3/8" |
| | **5** = G1/4" |
| | **8** = Quick fitting tube Ø10 |
| Ⓥ | VERSION |
| | **35** = Solenoid-Solenoid |
| | **24** = Solenoid external-Solenoid external |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |






For dimension "A" see ordering code

Weight 250 g
Minimum pilot pressure 1,5 bar



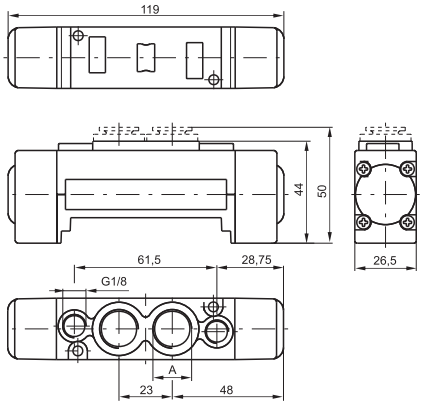
## Pneumatic-Pneumatic 5/3

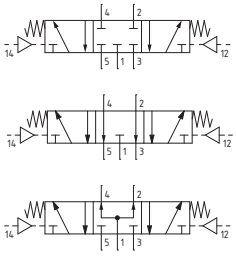
**Coding:** 263Ⓐ.53.Ⓕ.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1350 |
| Orifice size (mm) | 9 |
| Pilot ports size | M5 |

| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G3/8" |
| | **5** = G1/4" |
| | **8** = Quick fitting tube Ø10 |
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |





Weight 195 g
Minimum pilot pressure 3 bar

For dimension "A" see ordering code

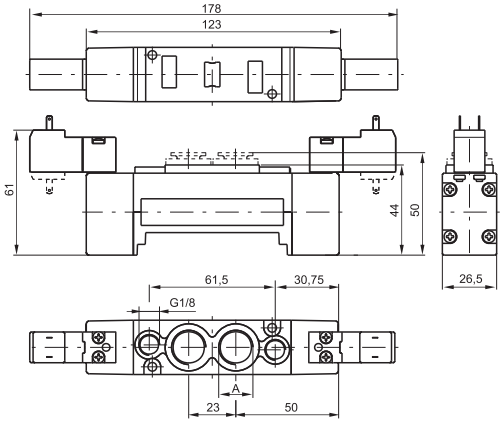
## Solenoid - Solenoid 5/3

**Coding:** 263Ⓐ.53.Ⓕ.Ⓥ.Ⓣ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1350 |
| Orifice size (mm) | 9 |

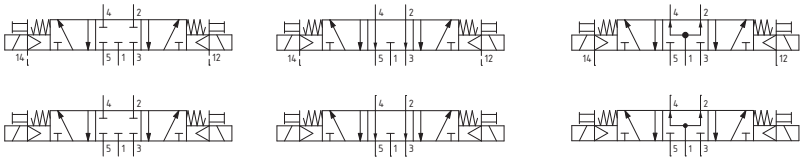
| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **1** = G3/8" |
| | **5** = G1/4" |
| | **8** = Quick fitting tube Ø10 |
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓥ | VERSION |
| | **24** = Solenoid external-Solenoid external |
| | **35** = Solenoid-Solenoid |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |






Weight 270 g
Minimum pilot pressure 3 bar

For dimension "A" see ordering code



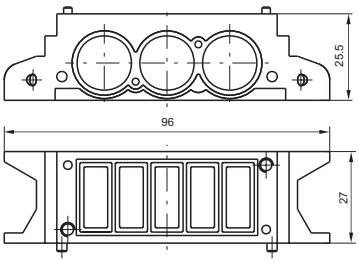


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Modular base

**Coding:** 2630.01



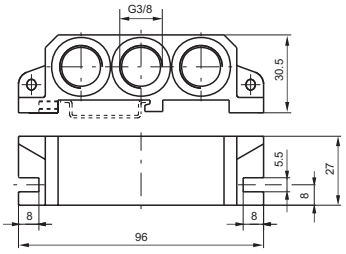



Weight 80 g

## Right inlet base

**Coding:** 2630.02



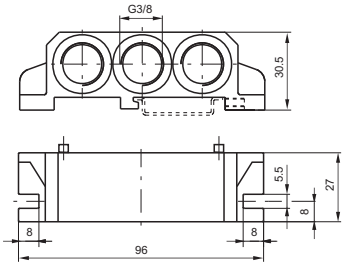



Weight 80 g

## Left inlet base

**Coding:** 2630.03



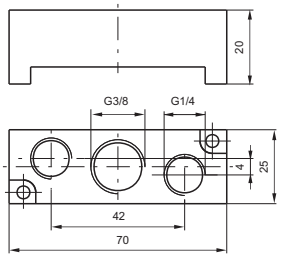



Weight 100 g

## Intermediate air intake

**Coding:** 2630.10



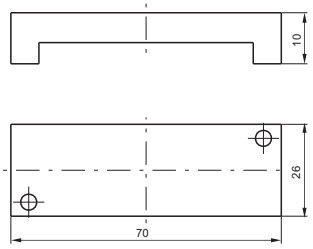



Weight 60 g
to be assembled instead of a valve

## Closing plate

**Coding:** 2630.00






Weight 20 g

## Diaphragm plug

**Coding:** 2630.17



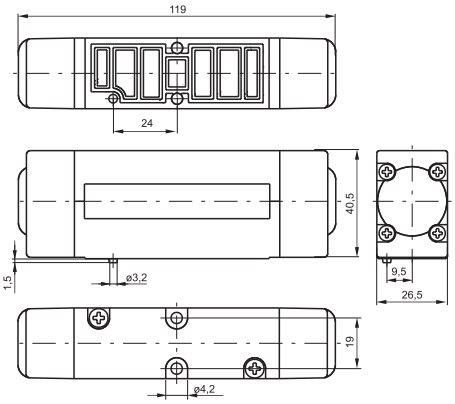
Weight 5 g

## Pneumatic - Spring

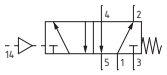
**Coding:** 2645.52.00.19

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 7.5 |






Weight 235 g
Minimum pilot pressure 2 bar

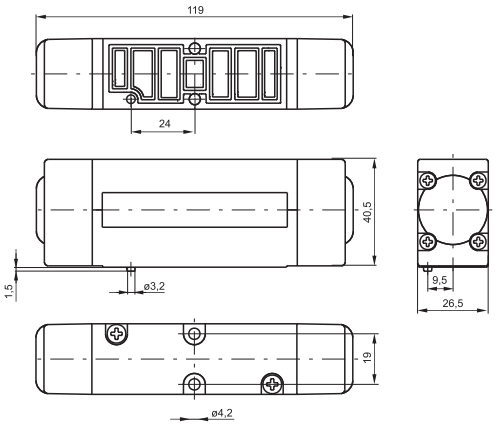



## Pneumatic-Differential

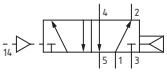
**Coding:** 2645.52.00.16

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 7.5 |






Weight 235 g
Minimum pilot pressure 2 bar

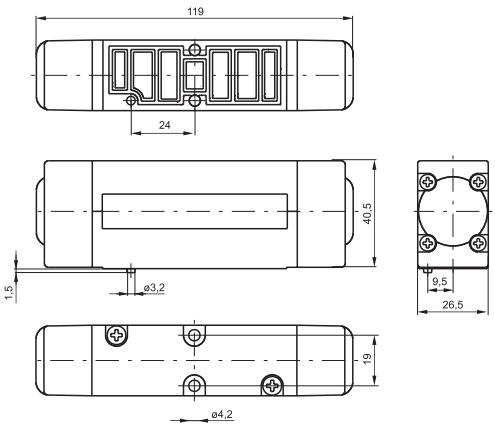



## Pneumatic - Differential (External)

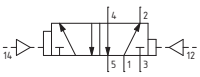
**Coding:** 2645.52.00.17

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 7.5 |






Weight 235 g
Minimum pilot pressure 2 bar





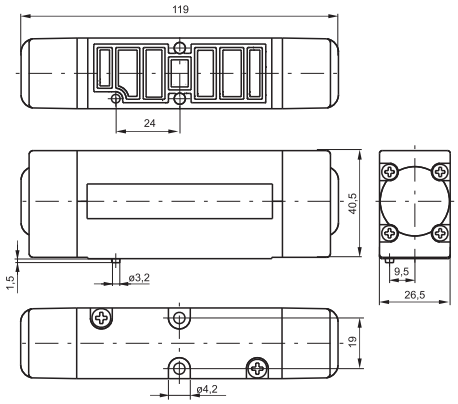

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pneumatic - Pneumatic

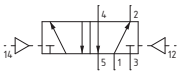
**Coding:** 2645.52.00.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 7.5 |






Weight 255 g
Minimum pilot pressure 1,5 bar



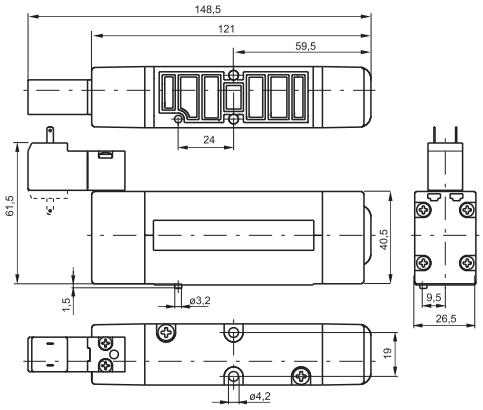
## Solenoid-Spring/Differerential

**Coding:** 264Ⓒ.52.00.Ⓥ.Ⓣ

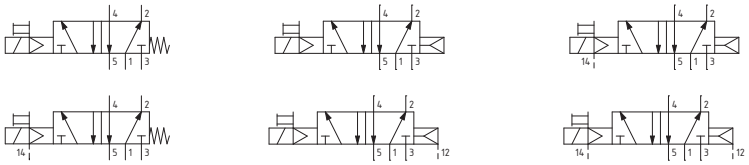
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 7.5 |

| | |
|---|---|
| Ⓒ | TYPE ELECTROPILOT EXHAUST |
| | **1** = on base (only for self feeding valves) |
| | **5** = on pilot (for all version) |
| Ⓥ | VERSION |
| | **39** = Solenoid-Spring |
| | **29** = Solenoid external-Spring |
| | **36** = Solenoid-Differential |
| | **37** = Solenoid-Differerential external |
| | **26** = Solenoid external-Differerential |
| | **27** = Solenoid external-Differerential external |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |






Weight 270 g
Minimum pilot pressure 2 bar



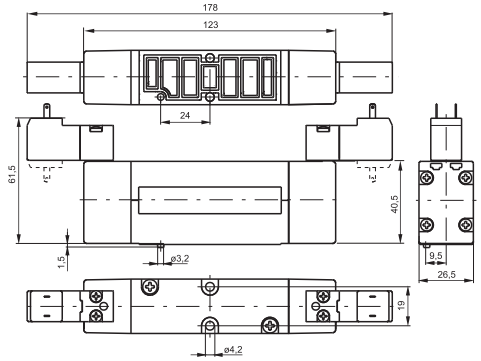
## Solenoid - Solenoid

**Coding:** 264Ⓒ.52.00.Ⓥ.Ⓣ

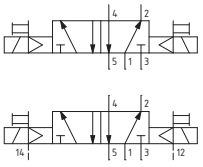
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 7.5 |

| | |
|---|---|
| Ⓒ | TYPE ELECTROPILOT EXHAUST |
| | **1** = on base (only for self feeding valves) |
| | **5** = on pilot (for all version) |
| Ⓥ | VERSION |
| | **24** = Solenoid external-Solenoid external |
| | **35** = Solenoid-Solenoid |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |






Weight 305 g
Minimum pilot pressure 1,5 bar





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

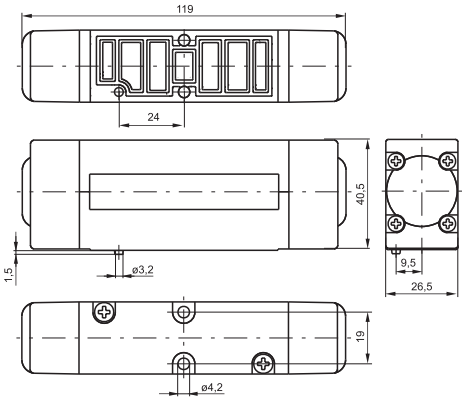
## Pneumatic-Pneumatic 5/3

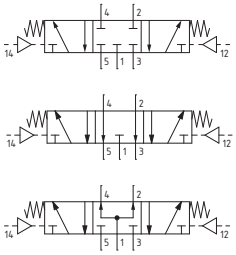
**Coding:** 264Ⓒ.53.Ⓕ.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1000 |
| Orifice size (mm) | 7.5 |

| | |
|---|---|
| Ⓒ | TYPE ELECTROPILOT EXHAUST |
| | **1** = on base (only for self feeding valves) |
| | **5** = on pilot (for all version) |
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |





Weight 245 g
Minimum pilot pressure 3 bar

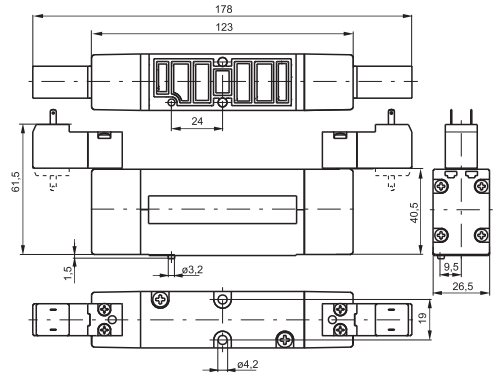
## Solenoid - Solenoid 5/3

**Coding:** 264Ⓒ.53.Ⓕ.Ⓥ.Ⓣ

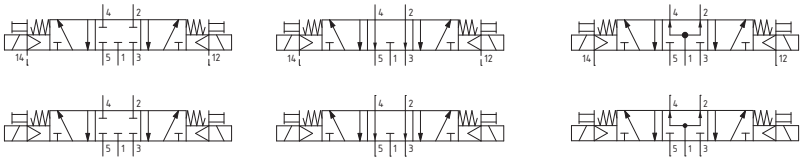
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1000 |
| Orifice size (mm) | 5 |

| | |
|---|---|
| Ⓒ | TYPE ELECTROPILOT EXHAUST |
| | **1** = on base (only for self feeding valves) |
| | **5** = on pilot (for all version) |
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓥ | VERSION |
| | **24** = Solenoid external-Solenoid external |
| | **35** = Solenoid-Solenoid |
| Ⓣ | VOLTAGE |
| | **01** = + 12 V DC |
| | **02** = + 24 V DC |
| | **05** = + 24 V AC |
| | **06** = 110 V AC |
| | **07** = 230 V AC |
| | **08** = + 24 V DC 1W |
| | **09** = + 24 V DC Earth faston |
| | **11** = + 12 V DC downward |
| | **12** = + 24 V DC downward |
| | **15** = + 24 V AC downward |
| | **16** = 110 V AC downward |
| | **17** = 230 V AC downward |
| | **18** = + 24 V DC 1W downward |
| | **19** = + 24 V DC Earth faston downward |






Weight 315 g
Minimum pilot pressure 3 bar

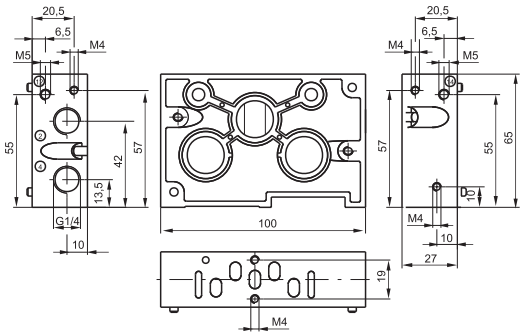


## Modular base

**Coding:** 2640.Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **01** = Modular base |
| | **11** = Base for single separate inlet |



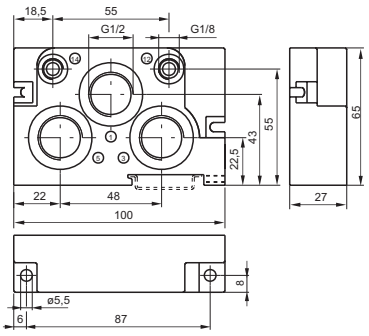



Weight 220 g

## Right inlet base

**Coding:** 2640.02



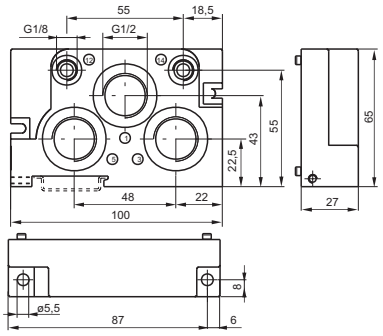



Weight 200 g

## Left inlet base

**Coding:** 2640.03



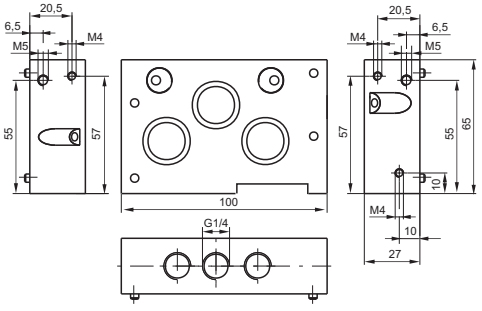



Weight 200 g

## Intermediate air intake

**Coding:** 2640.10



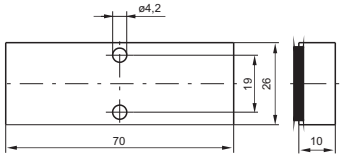



Weight 380 g

## Closing plate

**Coding:** 2640.00






Weight 50 g

## Diaphragm plug

**Coding:** 2640.17



Weight 10 g



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 300

The direct operated solenoid valve is the interface between pneumatic and electronic. In fact, it is actuated by an electrical signal and in turn gives a pneumatic signal directly available for small users or for actuating bigger pneumatic distributors.

A wide range of valves are needed for satisfying various applications. For this need we have available miniature components with very low volume and electrical impute as well as solenoid valves with large flow rate and power for heavy duty operations. These solenoid valves are usually 3/2, normally closed or normally open, but there are available the 2/2, closed or open, for vacuum and others.

Note that the direct operated valves can only be used with bases, individual or multiple with M5 or G 1/8" thread or with connections.

Some PNEUMAX solenoid valves are c UL us homologated valid for USA and Canada (file n. VAIU2.E206325, VAIU8.E206325). For more details, refer to the coding, in the following pages.

The 10mm and 15mm solenoid valves are certified by UL in compliance with both Canadian and USA safety requirements as recognized component and included in the **UL file E206325** and bear the “UL Recognized Component” marking.

The 10mm and 15mm solenoid valves, since they are devices for “class 2 circuits”, according with UL standard UL 429/CSA C22.2 N°139, are not considered dangerous for electric shock or fire and thus a
**UL certification is not required for cables and connectors.**

Some solenoid valves, since they are devices for “class 2 circuits”, according with UL standard UL 429/CSA C22.2 N°139, are not considered dangerous for electric shock or fire and thus a **UL certification is not required for cables and connectors.**

**Use and maintenance**

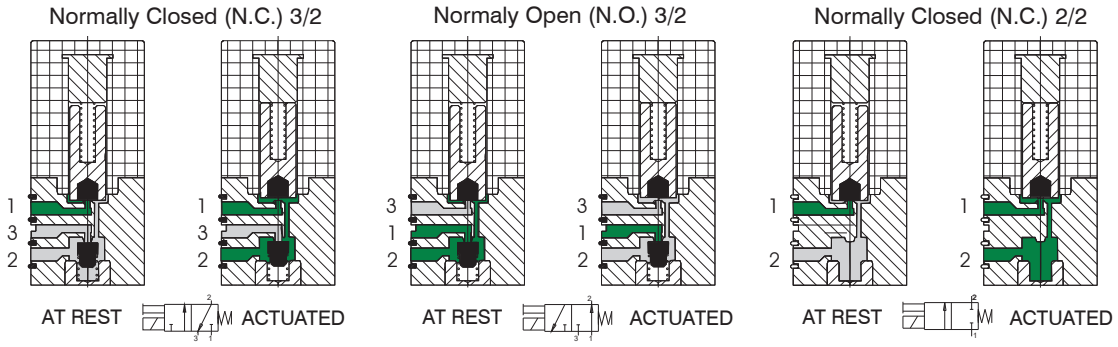
Maintenance is normally not required for these components therefore the spare parts list is not provided.

Their construction complexity and low cost do not make repair economically viable. It's easier and more economic to replace the complete valve in case of malfunction.
For proper lubrication use only hydraulic oil class H such as Castrol type MAGNA GC 32.

This series of directly operated vales is characterized by its reduced dimensions. They are designed to be mounted individually or on manifold. The high operating speed and high flow rate in consideration of the reduced dimensions, in combination with the high compatibility of the material used to manufacture them ensure a high variety of possible application fields.
All valves have manual override as standard and are available in 3/2 configuration N.O. and N.C. as well as 2/2 N.C. both 12 or 24 V DC or AC. Electrical connection can be via co moulded cables or via connector, in this configuration a LED indicates the coil status. Ensure that the fixing screws are tightened with 0.15Nm maximum.
The 10mm Speed-up version are built in accordance to the ISO 15218-2003 standard with a flow rate of 24Nl/min. The coil integrates a dedicated circuit board which enables to contain the power consumption to 0.35W in case of the high flow rate version and to 0.1W in case of the standard flow rate version.

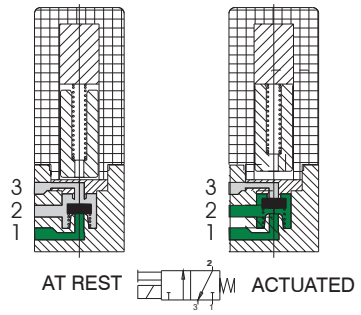
**Functional schematics for standard version**

1 = SUPPLY PORT
2 = OUTLET PORT
3 = EXHAUST PORT




**Functional schematics for Speed-up version**

1 = SUPPLY PORT
2 = OUTLET PORT
3 = EXHAUST PORT




Normally Closed
(N.C.) 3/2

**Construction characteristics:**

***Electrical part:***
Miniature solenoid consisting of a coil made of copper wire of different diameters depending on voltage,isolated according to "F" class standard, with injection-moulded nylon-glass application. All parts forming the cladding, the electrical connections and the pole pieces are protected against corrosion.

***Mechanical part:***
Stainless steel 430F armatures FPM poppets body in thermoplastic material and manual override and plug in nickel plated brass. Valves must be mounted on single or multiple manifold to be used.

| Technical characteristics | | Standard Version | Speed-Up Version |
|---|---|---|---|
| **Pneumatic** | Working pressure | 0 ... 7 bar | |
| | Orifice size | 0,7 mm | 1,1 mm |
| | Temperature | -5° ... +50°C | |
| | Flow rate at 6 bar with Δp=1 bar | 14 Nl/min | 24 Nl/min |
| | Exhaust flow rate | 22 Nl/min | 29 Nl/min |
| | Life expectancy, number of cycles per minute | 50 million | |
| | Compressed air, purity class according to ISO 8573-1:2010 | 5:4:4 | |
| **Electric** | Voltages | 12 ... 24 Volt D.C. | |
| | Power | 1,3 Watt | 0,35 Watt (1) |
| | Voltage tollerance | -5% ... +10% | |
| | Response time when energized * | 8 ms | |
| | Response time when de-energized * | 10 ms | |
| | Copper wire isolation class | F (155°C) | |
| | Protection degree | IP65 (with cables)<br>IP40 (with connectors)<br>IP00 (with Faston) | |

(*) "Response time of pneumatic directional control valves or moving parts, logic devices were measured in accordance to ISO 12238:2001, Pneumatic fluid power - Directional control valves - Measurement of shifting time"

(1) = consumption wrapping in opening phase 3, 5W (10 ms), consumption wrapping in maintenance phase 0.35 W.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## 10 mm Standard miniature solenoid ordering codes

**N3** ___ . ___

- **6** = 2/2 N.C.
- **7** = 3/2 N.C.
- **8** = 3/2 N.O.

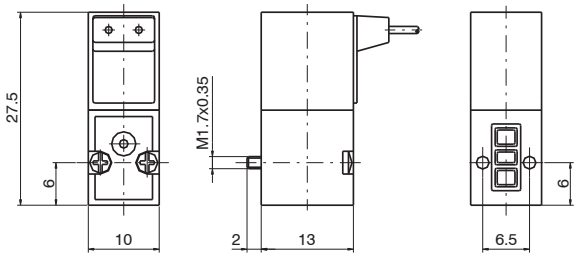
- **1** = 24 V D.C.
- **2** = 12 V D.C.
- **4** = 6 V D.C.*

- **1** = 90° Connector with LED
- **2** = Cable 300 mm. - IP65 (embedded cable)*
- **3** = Line Connector with LED
- **4** = 90° Connector without LED
- **5** = Line Connector without LED

* = The c UL us directive does not apply to these versions

### Miniature solenoid valve with cable

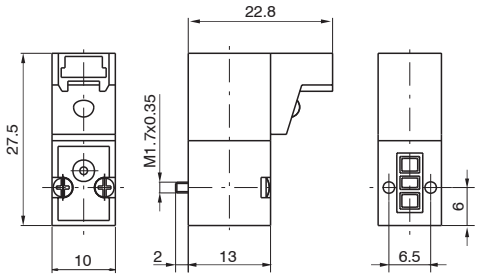





Weight 12 g

### Miniature solenoid valve with 90° connector

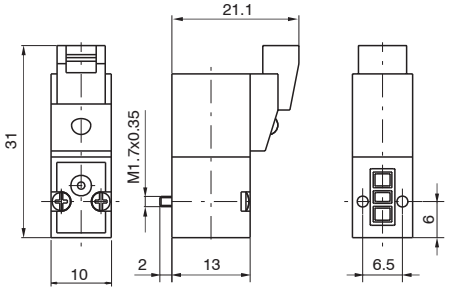



Weight 12 g

### Miniature solenoid valve with line connector




Weight 12 g

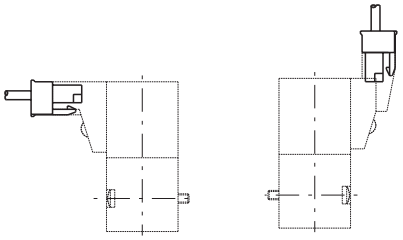
### Connector

Ordering codes

**371 .** ___

- **300 :** Cable L = 300 mm
- **600 :** Cable L = 600 mm
- **1000 :** Cable L = 1000 mm





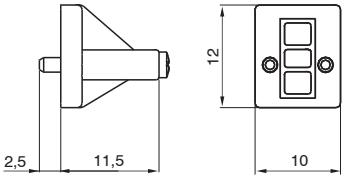
Weight 3 g

### Closing plate

Ordering codes

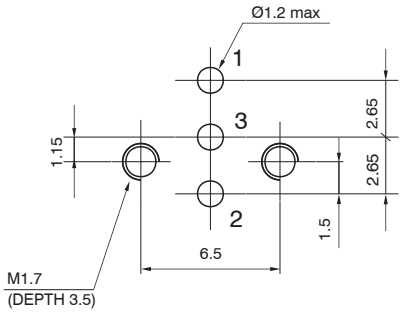
**395.00**






Weight 5 g

### Interfaces dimensions



## 10 mm - ISO 15218-2003 miniature solenoid ordering codes

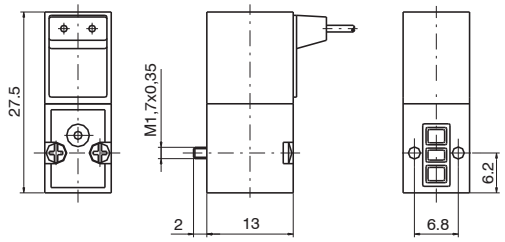
The versions are not contemplated by the c UL us directive

**P3 _ _ . _**

- **7** = 3/2 N.C.
- **1** = 24 V D.C.
- **2** = 12 V D.C.
- **4** = 6 V D.C.
- **1** = 90° Connector with LED
- **2** = Cable 300 mm. - IP65 (embedded cable)
- **3** = Line Connector with LED
- **4** = 90° Connector without LED
- **5** = Line Connector without LED

### Miniature solenoid valve with cable

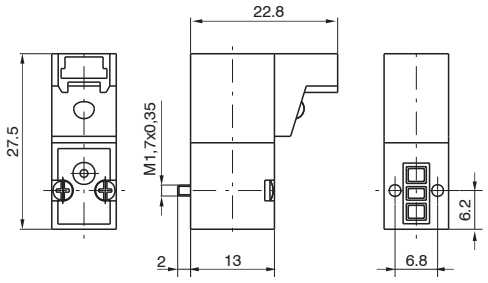





Weight 12 g

### Miniature solenoid valve with 90° connector

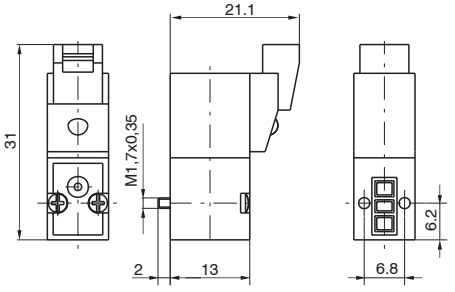



Weight 12 g

### Miniature solenoid valve with line connector




Weight 12 g

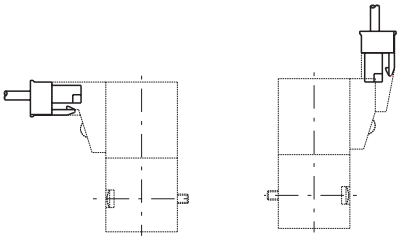
### Connector

Ordering codes

**371 . _**

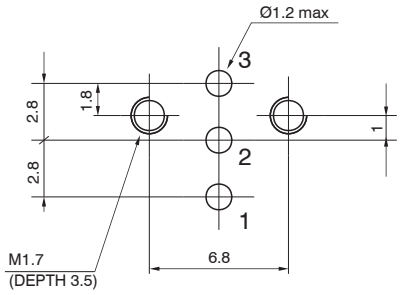
- **300 :** Cable L = 300 mm
- **600 :** Cable L = 600 mm
- **1000 :** Cable L = 1000 mm





Weight 3 g

### Interfaces dimensions 10 mm - ISO 15218





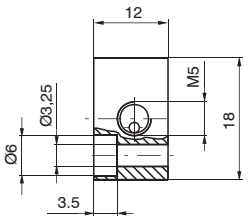

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

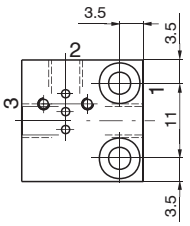
## Standard version
## Individual base

Ordering code

**395.01**





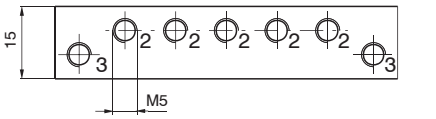

Weight 10 g

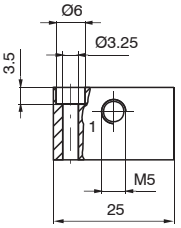
## Standard version
## multiple bases

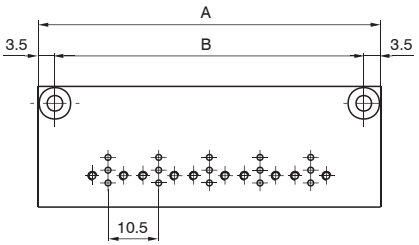
Ordering code

**395 .** ___
└ No. Positions





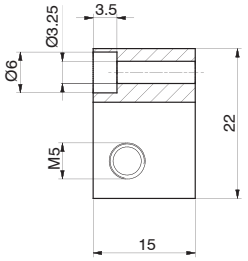

| No. Positions | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| A | 39.5 | 50 | 60.5 | 71 | 81.5 | 92 | 102.5 | 113 | 123.5 |
| B | 32.5 | 43 | 53.5 | 64 | 74.5 | 85 | 95.5 | 106 | 116.5 |
| Weight (g) | 43 | 54 | 65 | 76 | 87 | 98 | 109 | 120 | 131 |

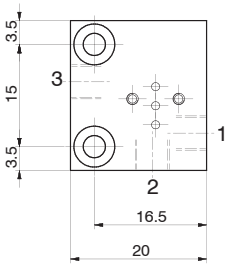
## Individual base for
## ISO 15218-2003 version

Ordering code

**P395.01**





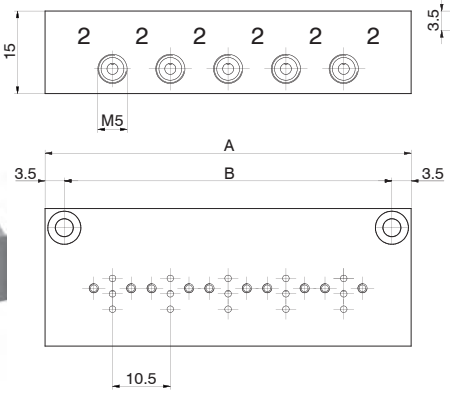

Weight 10 g

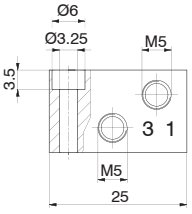
## Multiple base for
## ISO 15218-2003 version

Ordering code

**P395 .** ___
└ No. Positions






| No. Positions | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| A | 35 | 45.5 | 56 | 66.5 | 77 | 87.5 | 98 | 108.5 | 119 |
| B | 28 | 38.5 | 49 | 59.5 | 70 | 80.5 | 91 | 101.5 | 112 |
| Weight (g) | 43 | 54 | 65 | 76 | 87 | 98 | 109 | 120 | 131 |

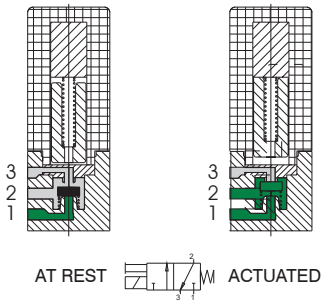
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

This direct operated solenoid valve has minimum overall dimensions (15 mm wide). Its construction method is same as 10 mm valve, of course.
It is suitable to be single or gang mounted or as electro-operator for larger air flow distributors.
Can be utilized with compressed air and other fluids compatible with material used to build the solenoid valve.
The available versions, all equipped with manual overide, are 3 ways, normally closed and normally open with DC and AC 50/60 Hz.
It's possible to install the N.O. valve on N.C. interface by using the registered reverse system included in the valve body.
The electrical connection is made with cables (300 mm.), FASTON or with connector.
This type of miniature solenoid valve is interchangeable with most of the same products available on the market.
Coil be can also positioned at 180° to get the electrical connection located on the opposite side than override.
Make sure that the fastening screews are tightened with maximum torque of 0,75 Nm.

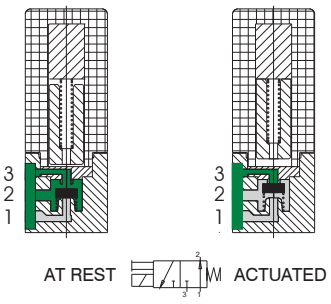
## Functional schematics

1 = SUPPLY PORT
2 = OUTLET PORT
3 = EXHAUST PORT

Normally Closed (N.C.) 3/2




Normaly Open (N.O.) 3/2




## Construction characteristics

**Electrical part**
Miniature solenoid consisting of a coil made of copper wire of different diameters depending on voltage,isolated according to "F" class standard, with injection-moulded nylon-glass application. All parts forming the cladding, the electrical connections and the pole pieces are protected against corrosion.
**Mechanical part**
AISI 430F cores, AISI 302 return springs, FPM poppets, thermoplastic polyester body.

## Technical characteristics

| **Pneumatics** | | | |
|---|---|---|---|
| Orifice size | 0,8 mm | 1,1 mm | 1,5 mm (only D.C.) |
| Flow rate at 6 bar with Δp=1 bar | 20 Nl/min | 30 Nl/min | 50 Nl/min |
| Working pressure for N.C. | 0 ... 10 bar | | 0 ... 7 bar |
| Working pressure for N.O. | / | 0 ... 8 bar | 0 ... 5 bar |
| Temperature | -5° ... +50°C | | |
| Max number of cycles per minute | 50 million cycles (with standard working conditions) | | |
| Compressed air, purity class according to ISO 8573-1:2010 | 5:4:4 | | |
| **Electrical** | | | |
| Voltage D.C. | 24 V DC | 12-24 V DC | |
| Voltage A.C. | / | 24-110-230 Volt 50/60 Hz | / |
| Power consumption D.C. | 1 Watt | 2,3 Watt | |
| Power consumption A.C. | / | 2,8 VA (at starting) 2,5 VA (at speed) | / |
| Voltage tollerance | -5% ... +10% | | |
| Response time* | 10 ... 12 ms | | |
| Isolating class | F (155°C) | | |
| Protection degree | IP65 (with cables)<br>IP40 (with connectors)<br>IP00 (with faston) | | |

(*) "Response time of pneumatic directional control valves or moving parts, logic devices were measured in accordance to ISO 12238:2001, Pneumatic fluid power - Directional control valves - Measurement of shifting time"


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## 15 mm miniature solenoid ordering codes

**N3 ___ . ___ ___ ___**

- **3** = 3/2 N.C.
- **4** = 3/2 N.O. (only Ø1,1 and Ø1,5)

- **1** = 24 V DC
- **2** = 12 V DC
- **5** = 24 V 50-60 Hz
- **6** = 110 V 50-60 Hz
- **7** = 230 V 50-60 Hz
- **8** = 24V D.C. 1 W** (only Ø0,8)
- **9** = Faston ground

- **A** = Ø1,1
- **B** = Ø1,5
- **E** = Ø0,8

- **0** = Faston
- **1** = Faston EN17301-803 (Ex DIN 43650)
- **2** = Cables* (300 mm)**

- = Straight
- **R** = Downward

- = PUSH (Standard Version)
- **2** = Without Manual override
- **8** = Manual override 2 positions

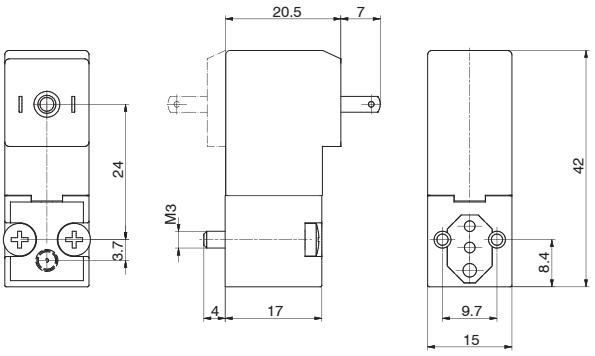
** = The cULus Directive does not apply to these versions

* = On request and for large quantity only *(only 24 V D.C., 2.3 W)*

**See previous page for available versions**

### With Faston

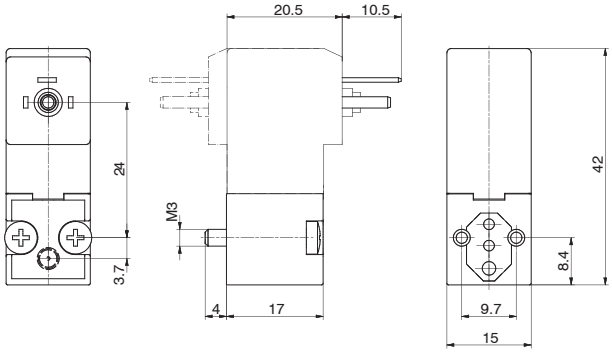





Weight 36 g

### With Faston EN17301-803 (Ex DIN 43650)

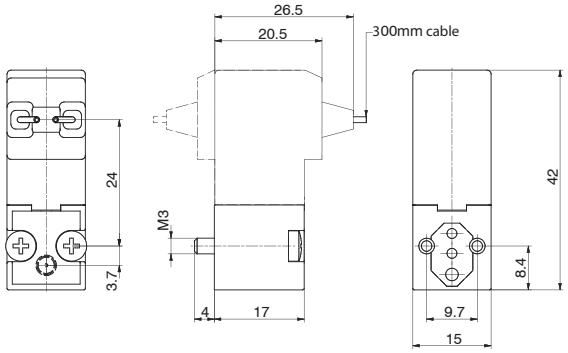





Weight 36 g

### With Cables (300 mm)

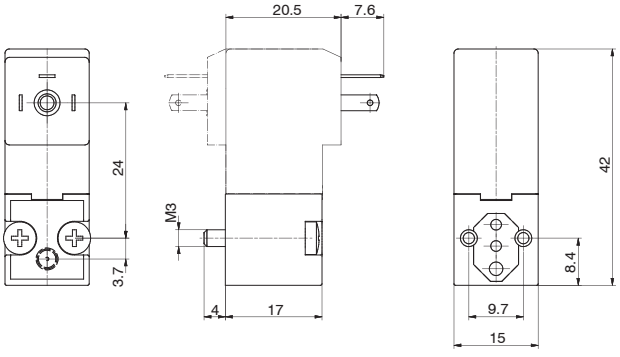





Weight 38 g

### With Faston ground





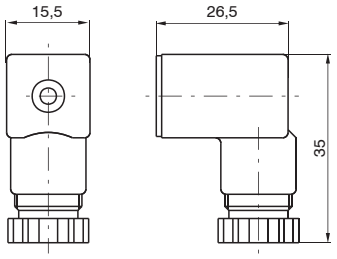

Weight 38 g

## Connector

| Ordering code | |
|---|---|
| **315.11.00** | Standard |
| **315.12.00** | for faston EN17301-803 (Ex DIN 43650) |
| **315.11.0_L** | Led |
| | 1 = 24 V D.C. / A.C. |
| | 2 = 110 V 50/60 Hz |
| | 3 = 230 V 50/60 Hz |
| **315.12.0_L** | for faston EN17301-803 (Ex DIN 43650) with LED |
| | 1 = 24 V D.C. / A.C. |
| | 2 = 110 V 50/60 Hz |
| | 3 = 230 V 50/60 Hz |



Weight 13 g

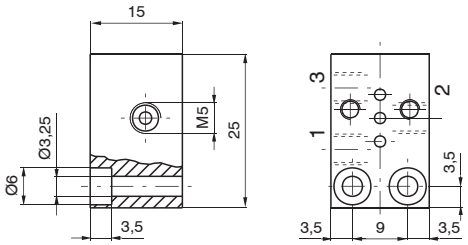



## Single use base

| Ordering code |
|---|
| **355.01** |



Weight 18 g



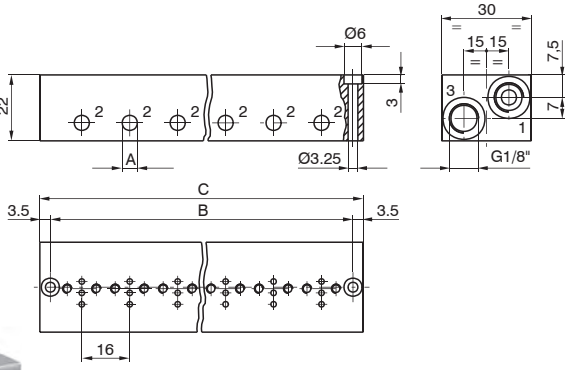

## Multiple bases

| Ordering code |
|---|

A = Orifice M5 — **355 .** — No. Positions

A = Pipe fitting Ø4 — **354 .** — No. Positions





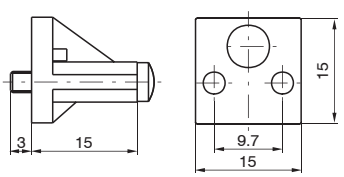

| No. Positions | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| B | 37 | 53 | 69 | 85 | 101 | 117 | 133 | 149 | 165 |
| C | 44 | 60 | 76 | 92 | 108 | 124 | 140 | 156 | 172 |
| Weight (g) | 66 | 92 | 116 | 141 | 165 | 190 | 216 | 242 | 266 |

## Closing plate

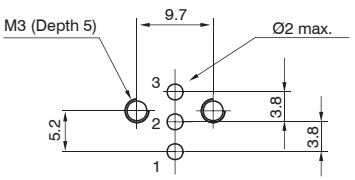
| Ordering code |
|---|
| **355.00** |



Weight 6 g




## Interface dimensions






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## 15mm Solenoid valves Manifold with electric multipoint connection

Also for this 15mm solenoid valves series we have realized the possibility of the assembling on the base with multipoint connection, this for making faster the connection and the harness of them.
Realized from a shaped outline, it results compact because it uses a relevant multipoint connection available only with a 37 poles connector from 10 to 32 solenoid valves (with steps of 2), available in line or at 90° and IP40 protection. On the base it is possible to put some threaded cartridges with push-in fittings for Ø3 – Ø3,17 Ø4 tube or M5 threaded.
The application field of these new configurations is the standard of 3/2 valves, where it is needed to realize groups or Manifolds provided with integrated electric connection to make easier and faster the connection and the harness of them (control of single acting cylinders with small dimensions, pilot system of valves with bigger dimensions etc..).

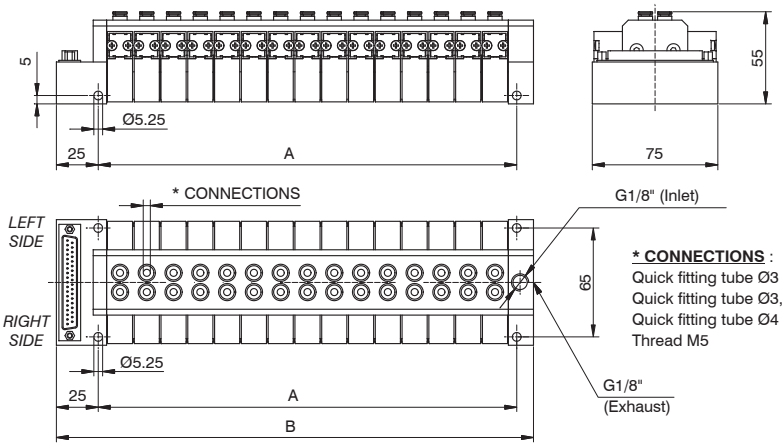
## Constructive characteristics:

### Constructive principle:

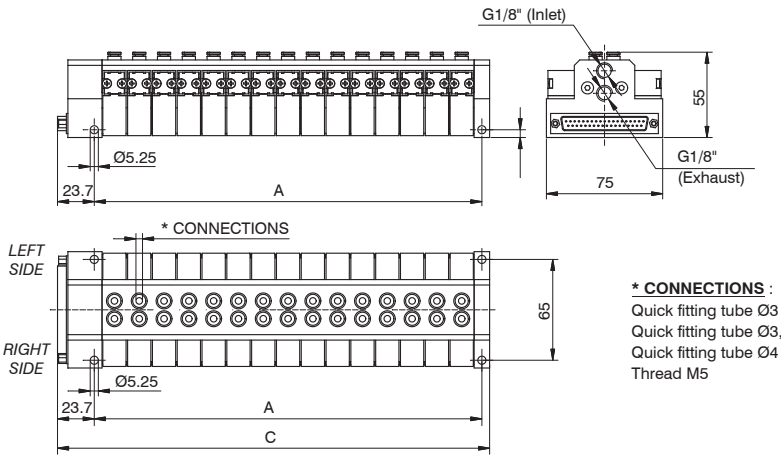
From 10 up to 32 solenoid valves (with steps of 2)
Extremely compact solution
IP40 protection (without visualisation led)
Possibility of having different working connections ( Ø3, Ø3,17, Ø4 tubes, M5)
The new coding key requires the use of the same type of solenoid valves (there aren't codes for groups with a mixed configuration).

## Overall dimensions



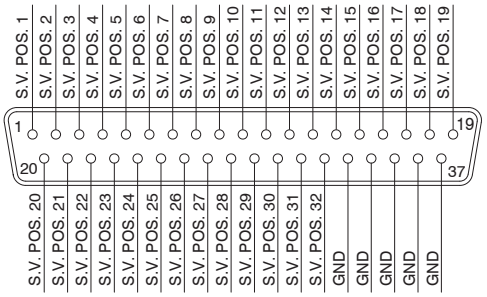




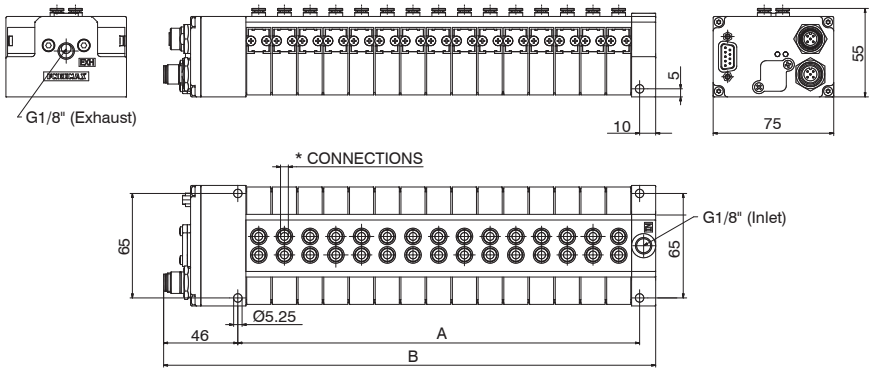

| No. Positions | A | B | C |
|---|---|---|---|
| 10 | 90 | 125 | 118,7 |
| 12 | 106 | 141 | 134,7 |
| 14 | 122 | 157 | 150,7 |
| 16 | 138 | 173 | 166,7 |
| 18 | 154 | 189 | 182,7 |
| 20 | 170 | 205 | 198,7 |
| 22 | 186 | 221 | 214,7 |
| 24 | 202 | 237 | 230,7 |
| 26 | 218 | 253 | 246,7 |
| 28 | 234 | 269 | 262,7 |
| 30 | 250 | 285 | 278,7 |
| 32 | 266 | 301 | 294.7 |

### SUB-D 37 POLES CONNECTORS



## Overall dimensions
## Manifold with CANopen® node






| No. positions | A | B |
|---|---|---|
| 10 | 90 | 146 |
| 12 | 106 | 162 |
| 14 | 122 | 178 |
| 16 | 138 | 194 |
| 18 | 154 | 210 |
| 20 | 170 | 226 |
| 22 | 186 | 242 |
| 24 | 202 | 258 |
| 26 | 218 | 274 |
| 28 | 234 | 290 |
| 30 | 250 | 306 |
| 32 | 266 | 322 |

## Manifold layout configuration

Connector type
**0** = in line connector
**9** = 90° connector
**C** = with CANopen® node

Connections size and type
**3** = quick fitting tube Ø3
**C** = quick fitting tube Ø3.17
**4** = quick fitting tube Ø4
**A** = M5 thread

**35M . NW . _ _ . 0 _ . _ _ _**

No. positions
**A** = 10 positions
**B** = 12 positions
**C** = 14 positions
**D** = 16 positions
**E** = 18 positions
**F** = 20 positions
**G** = 22 positions
**H** = 24 positions
**L** = 26 positions
**M** = 28 positions
**N** = 30 positions
**P** = 32 positions

No. positions plugged side left
**0** = 00 positions
**1** = 01 positions
**2** = 02 positions
**3** = 03 positions
**4** = 04 positions
**5** = 05 positions
**6** = 06 positions
**7** = 07 positions
**8** = 08 positions
**9** = 09 positions
**A** = 10 positions
**B** = 11 positions
**C** = 12 positions
**D** = 13 positions
**E** = 14 positions
**F** = 15 positions
**G** = 16 positions

No. positions plugged side right
**0** = 00 positions
**1** = 01 positions
**2** = 02 positions
**3** = 03 positions
**4** = 04 positions
**5** = 05 positions
**6** = 06 positions
**7** = 07 positions
**8** = 08 positions
**9** = 09 positions
**A** = 10 positions
**B** = 11 positions
**C** = 12 positions
**D** = 13 positions
**E** = 14 positions
**F** = 15 positions
**G** = 16 positions

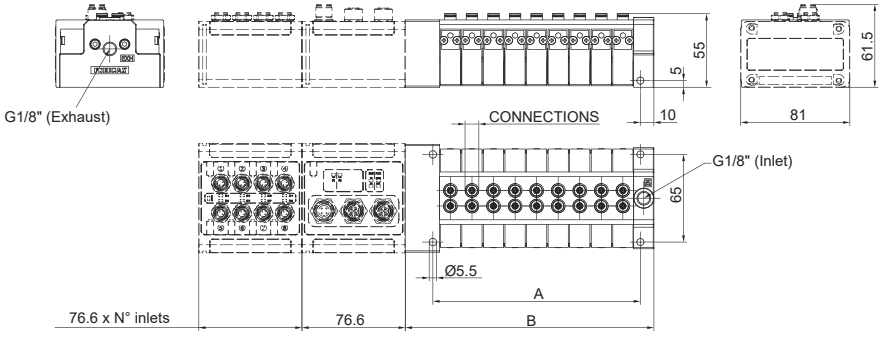
Valve type
**A** = N331.R0A (S.V. 3/2 NC 24VDC d.1,1)
**B** = N331.R0B (S.V. 3/2 NC 24VDC d.1,5)
**C** = N338.R0E (S.V. 3/2 NC 24VDC 1W d.0,8)
**D** = N341.R0A (S.V. 3/2 NO 24VDC d.1,1)
**E** = N341.R0B (S.V. 3/2 NO 24VDC d.1,5)
**F** = N335.R0A (S.V. 3/2 NC 24VAC d.1,1)

**NOTE:**
The "R" letter indicates that the coil is mounted upside-down (faces down). For prices and technical features of these valves please refer to the correspondent standard version (not R) included in the price list and catalogue.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Overall dimensions
## Manifold with Optyma-F serial system (slave + input modules)






| No. positions | A | B |
|---|---|---|
| 10 | 90 | 120,50 |
| 12 | 106 | 136,50 |
| 14 | 122 | 152,50 |
| 16 | 138 | 168,50 |
| 18 | 154 | 184,50 |
| 20 | 170 | 200,50 |
| 22 | 186 | 216,50 |
| 24 | 202 | 232,50 |
| 26 | 218 | 248,50 |
| 28 | 234 | 264,50 |
| 30 | 250 | 280,50 |
| 32 | 266 | 296,50 |

## Manifold layout configuration with Optyma-F serial system (slave + input modules)

**32 OUT VERSION**
C3=CANopen® 32OUT
D3=DeviceNet 32OUT
P3=PROFIBUS 32OUT
A3=EtherCAT® 32OUT (Serie 5700)
I3=EtherNet/IP 32OUT
N3=PROFINET IO RT 32OUT

**INPUT MODULES**
A = No module
D1= 8 M8 digital inputs modules
D3= 16IN digital inputs (SUB-D 25P) module
T1= 2 analogue inputs 0-5V module
T2= 2 analogue inputs 0-10V module
C1= 2 analogue inputs 0-20mA module
C2= 2 analogue inputs 4-20mA module

Connections size and type
**3** = quick fitting tube Ø3
**C** = quick fitting tube Ø3.17
**4** = quick fitting tube Ø4
**A** = M5 thread

| 35S | . | _ | _ | . | _ | _ | . | 0 | _ | . | _ | _ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

No. positions
**A** = 10 positions
**B** = 12 positions
**C** = 14 positions
**D** = 16 positions
**E** = 18 positions
**F** = 20 positions
**G** = 22 positions
**H** = 24 positions
**L** = 26 positions
**M** = 28 positions
**N** = 30 positions
**P** = 32 positions

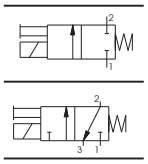
No. positions plugged side left
**0** = 00 positions
**1** = 01 positions
**2** = 02 positions
**3** = 03 positions
**4** = 04 positions
**5** = 05 positions
**6** = 06 positions
**7** = 07 positions
**8** = 08 positions
**9** = 09 positions
**A** = 10 positions
**B** = 11 positions
**C** = 12 positions
**D** = 13 positions
**E** = 14 positions
**F** = 15 positions
**G** = 16 positions

No. positions plugged side right
**0** = 00 positions
**1** = 01 positions
**2** = 02 positions
**3** = 03 positions
**4** = 04 positions
**5** = 05 positions
**6** = 06 positions
**7** = 07 positions
**8** = 08 positions
**9** = 09 positions
**A** = 10 positions
**B** = 11 positions
**C** = 12 positions
**D** = 13 positions
**E** = 14 positions
**F** = 15 positions
**G** = 16 positions

Valve type
**A** = N331.R0A (S.V. 3/2 NC 24VDC d.1,1)
**B** = N331.R0B (S.V. 3/2 NC 24VDC d.1,5)
**C** = N338.R0E (S.V. 3/2 NC 24VDC 1W d.0,8)
**D** = N341.R0A (S.V. 3/2 NO 24VDC d.1,1)
**E** = N341.R0B (S.V. 3/2 NO 24VDC d.1,5)
**G** = N321.R0A (S.V. 2/2 NC 24VDC d.1,1)
**H** = N321.R0B (S.V. 2/2 NC 24VDC d.1,5)

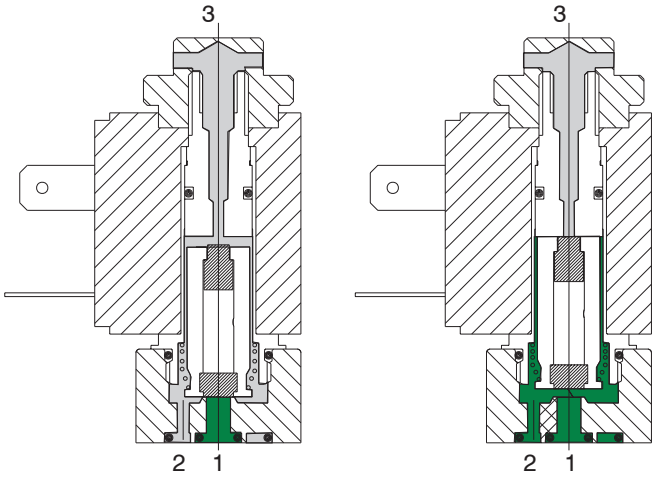
**NOTE:**
The “R”letter indicates that the coil is mounted upside-down (faces down). For prices and technical features of these valves please refer to the correspondent standard version (not R) included in the price list and catalogue.

## Functional schematics

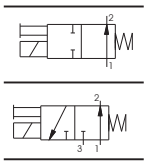


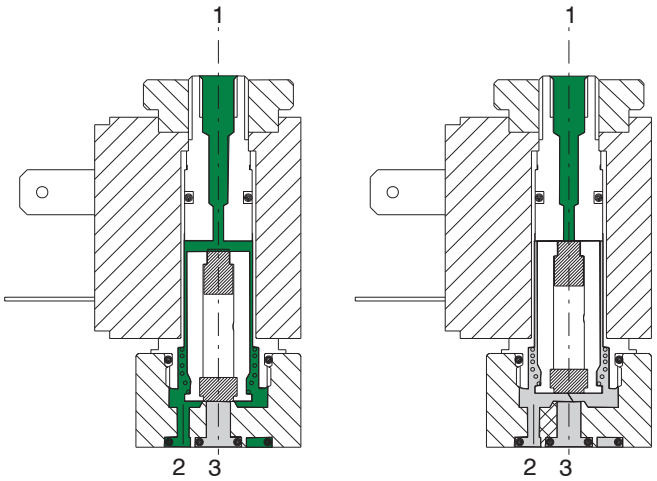
1 = INLET PORT
2 = OUTLET PORT
3 = EXHAUST PORT
(Plugged if 2/2)

Normally Closed (N.C.) 3/2 or 2/2




Normally Open (N.O.) 3/2 or 2/2






## Construction characteristics

*Electrical parts:* Solenoids: the solenoid consist of coils having different diameter copper wire windings insulated according standards "H"; they are encased in a nylon-glass compound. All parts are corrosion resistant.

*Mechanical parts:* Nickel plated brass tube nitrile viton seals stainless steel plunger (AISI 430F), stainless steel adjusted springs, viton poppet seals, tropicalized zinc alloy interface plate, nickeled brass manual override, nickel steel coil lock nut, zinc steel mounting screw. To be usable, the solenoids and microsolenoids have to be attached either to a base or directly to the distributor's operators by means of connectors M5 or G 1/8". These solenoids are available in all voltages and frequences used in the world. The following are the technical characteristics of the solenoid.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Technical characteristics

| | | | |
|---|---|---|---|
| **Pneumatic** | Working pressure | 0 ... 10 bar | |
| | Orifice size | 1,3 mm | (0,9 mm for 2 W) |
| | Maximum fluid temperature | 50°C | |
| | Maximum ambient temperature | -40°C ... +50°C | |
| | Maximum flow rate at 6 bar with Δp 1 bar | 53 Nl/min | (20Nl/min. for 2 W) |
| | Cycles/minute | 700 | |
| | Fluids | Air-vacuum-inert gases | |
| | Lubrication | non required | |
| | Life | 45 to 50 million cycles | |
| **Electrical** | Power consumption holding - D.C | 5 W | (2.5 W) low consumption |
| | Power consumption holding - A.C | 9 VA | (6 VA) low consumption |
| | Operating voltage tolerance | ±10% | |
| | Response time opening * | 8 ms | |
| | Response time closing * | 6 ms | |
| | Insulation of the copper wire | H | |
| | Insulation of the coil | F | |
| | Connector protection | IP 65 | |
| | Cable protection | DIN 43650 INDUSTRIAL FORM | |

(*) "Shifting time of pneumatic directional control valves or moving parts, logic devices were measured in accordance to ISO 12238:2001, Pneumatic fluid power - Directional control valves - Measurement of shifting time"

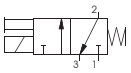
## Maintenance and replacement parts

Maintenance practices for these valves are similar to those already detailed for other products-replacement of the plunger or poppet is not advisable since the new replacement would not provide the best fit with the rest of the already used valve. Special care should be taken that no dirt is accumulated between the working surface of fixed core and the plunger which would result in vibrations and overheating of the solenoid. In the case of microsolenoid it must be assured that the alternate current coil is not charged when the machanical part is not mounted to avoid destruction of the coil. The electrical connections have to be perfect, especially where low currents are used (12-24V). Oxidation of contacts between the connector and the coil can lead to intermittent malfunctions which are difficult to trace. Oxidation of contacts due to humidity or corrosive atmosphere are one of the most common causes of false alarms. Clean the contacts with appropriate spray.

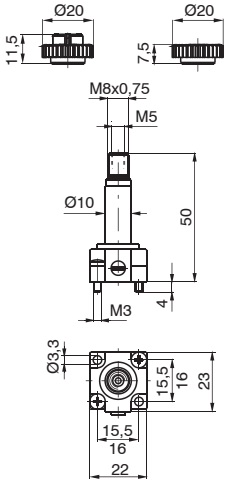
## Mechanical actuator for miniature solenoid valve

Ordering code

**M 2** Normally Closed (N.C.)
**M 2P** Normally Closed (N.C.) threaded lock nut
**M 2/9** Normally Closed (N.C.) 2 W 24 VDC

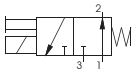




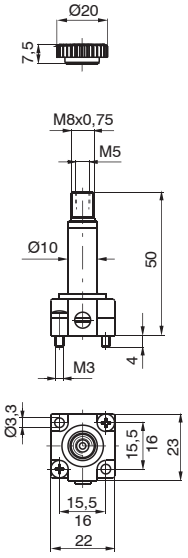



Weight 51 g

**M 2/1** Normally Open (N.O.) air feeding through fix flunger



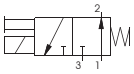





Weight 48 g

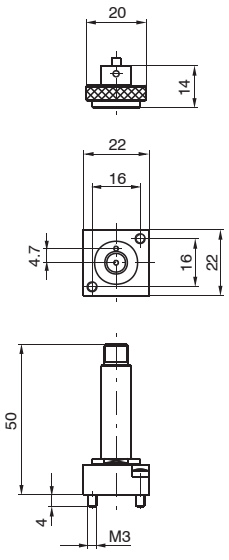
Normally Open (N.O.) air feeding through base

**MM 7**





Weight 46 g



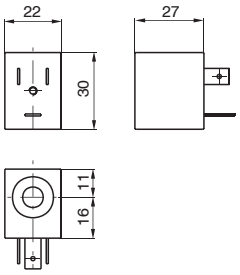

| Ordering code<br>N.O. | Available voltages<br>Coil | |
|---|---|---|
| **MB10/1** | 24 D.C. (8 Watt) | Direct current |
| **MB17/1**<br>**MB21/1**<br>**MB22/1**<br>**MB24/1** | 24/50<br>48/50<br>110/50<br>230/50 | Alternating current 50 Hz |
| **MB37/1**<br>**MB39/1**<br>**MB41/1** | 24/60<br>110/60<br>230/60 | Alternating current 60 Hz |
| **MB56/1**<br>**MB57/1**<br>**MB58/1** | 24/50-60<br>110/50-60<br>230/50-60 | Alternating current 50/60 Hz |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Coil



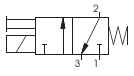



Weight 54 g

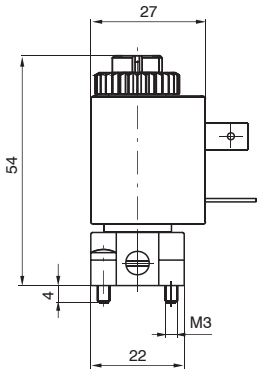
* Use only with M2/9

| Ordering code | Available voltages Coils |
|---|---|
| **MB 4**<br>**MB 5**<br>**MB 6** | 12 D.C.<br>24 D.C.<br>48 D.C. — Direct current |
| **MB 9*** | 24 D.C. (2 Watt) (Direct current, low consumption) |
| **MB 17**<br>**MB 21**<br>**MB 22**<br>**MB 24** | 24/50<br>48/50<br>110/50<br>230/50 — Alternating current 50 Hz |
| **MB 37**<br>**MB 39**<br>**MB 41** | 24/60<br>110/60<br>230/60 — Alternating current 60 Hz |
| **MB 56**<br>**MB 57**<br>**MB 58** | 24/50-60<br>110/50-60<br>230/50-60 — Alternating current 50/60 Hz |
| **MB 66**<br>**MB 67**<br>**MB 68** | 24/50-60<br>110/50-60<br>230/50-60 — Alternating current (low consumption) 50/60 Hz |

## Miniature solenoid valve Normally Closed (N.C.)



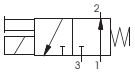




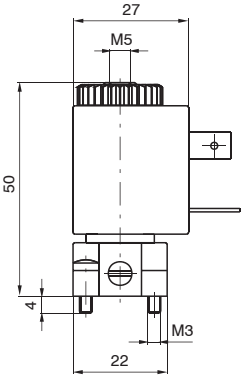

Weight 100 g

| Ordering code | Available voltages Miniature solenoid valve N.C. |
|---|---|
| **M 2.4**<br>**M 2.5**<br>**M 2.6**<br>**M 2.9** | 12 D.C.<br>24 D.C.<br>48 D.C.<br>24 D.C. (2 Watt) — Direct current |
| **M 2.17**<br>**M 2.21**<br>**M 2.22**<br>**M 2.24** | 24/50<br>48/50<br>110/50<br>230/50 — Alternating current 50 Hz |
| **M 2.37**<br>**M 2.39**<br>**M 2.41** | 24/60<br>110/60<br>230/60 — Alternating current 60 Hz |
| **M 2.56**<br>**M 2.57**<br>**M 2.58** | 24/50-60<br>110/50-60<br>230/50-60 — Alternating current 50/60 Hz |
| **M 2.66**<br>**M 2.67**<br>**M 2.68** | 24/50-60<br>110/50-60<br>230/50-60 — Alternating current (low consumption) 50/60 Hz |

## Miniature solenoid valve Normally Open (N.O.)








Weight 103 g

| Ordering code | Available voltages Miniature solenoid valve N.O. |
|---|---|
| **M 2/1.4**<br>**M 2/1.5**<br>**M 2/1.6**<br>**M 2/1.9** | 12 D.C.<br>24 D.C.<br>48 D.C.<br>24 D.C. (2 Watt) — Direct current |
| **M 2/1.17**<br>**M 2/1.21**<br>**M 2/1.22**<br>**M 2/1.24** | 24/50<br>48/50<br>110/50<br>230/50 — Alternating current 50 Hz |
| **M 2/1.37**<br>**M 2/1.39**<br>**M 2/1.41** | 24/60<br>110/60<br>230/60 — Alternating current 60 Hz |
| **M 2/1.56**<br>**M 2/1.57**<br>**M 2/1.58** | 24/50-60<br>110/50-60<br>230/50-60 — Alternating current 50/60 Hz |

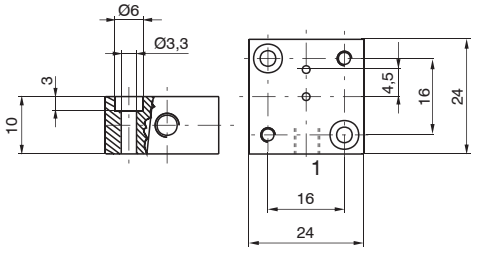
## External feeding base

Use with solenoid valves for piloting pressure different from the using pressure

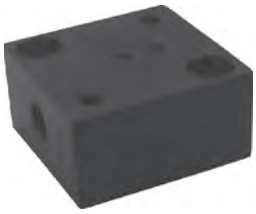
| Ordering code |
|---|
| **305.10.05** |

Weight 18 g



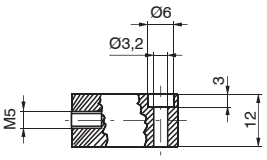


## Individual base

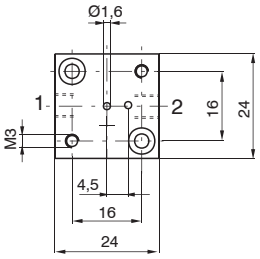


In line ports - thread M5

1 = INLET PORT (N.C.)
2 = OUTLET PORT




With a N.O. miniature solenoid valve
1 = EXHAUST
2 = OUTLET PORT




Ordering code

**305.00.00**

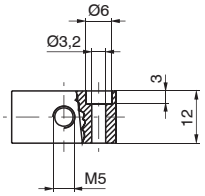
Weight 56 g

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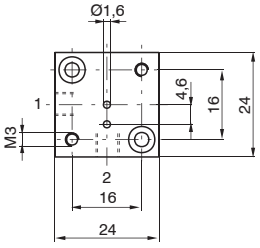


90° Port - thread M5

1 = INLET PORT (N.C.)
2 = OUTLET PORT (N.C)




With a N.O, miniature solenoid valve
1 = EXHAUST
2 = OUTLET PORT




Ordering code

**305.90.00**

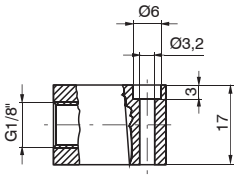
Weight 56 g

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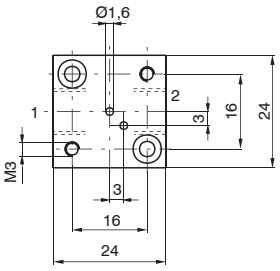


In line ports - thread G 1/8"

1 = INLET PORT (N.C.)
2 = OUTLET PORT (N.C)




With a N.O. miniature solenoid valve
1 = EXHAUST
2 = OUTLET PORT




Ordering code

**305.00.18**

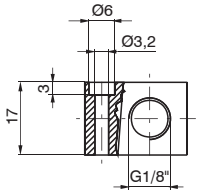
Weight 75 g

---

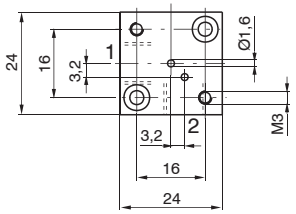


90° Port - thread G 1/8"

1 = INLET PORT (N.C.)
2 = OUTLET PORT (N.C.)




With a N.O. miniature solenoid valve
1 = EXHAUST
2 = OUTLET PORT




Ordering code

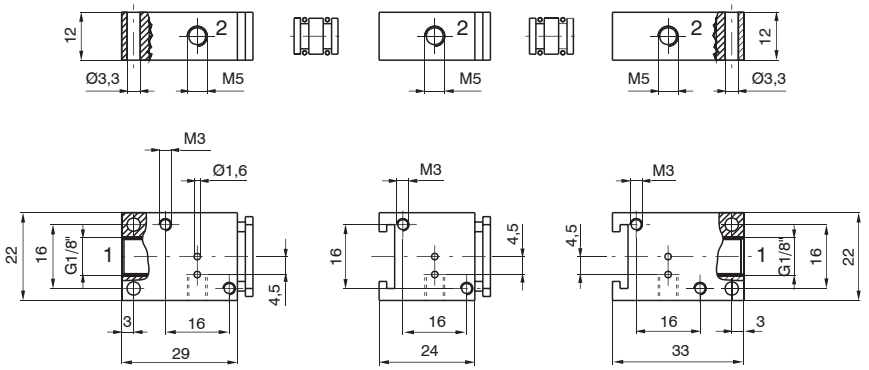
**305.90.18**

Weight 75 g



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Modular bases for series mounting




*Initial base* *Intermediate base* *Last base*

Ordering code

*Initial base*
**305.05.00**
Weight 57 g

*Intermediate base*
**305.06.00**
Weight 44 g

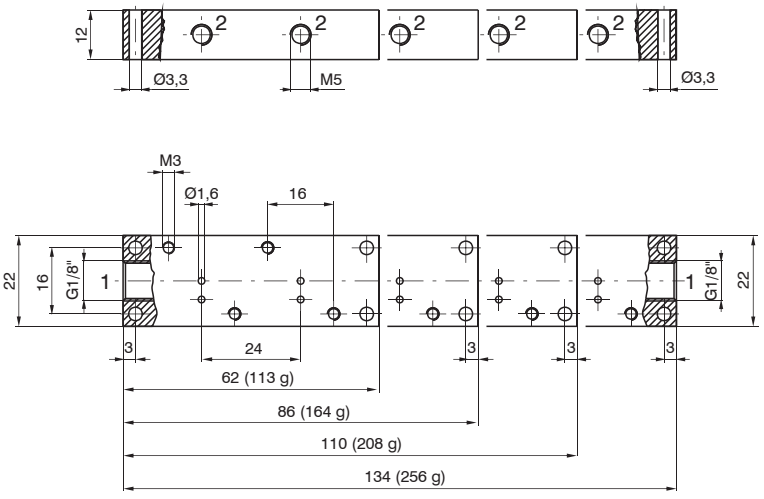
*Last base*
**305.07.00**
Weight 53 g

*Bored spacer*
**305.05.01**
Weight 3 g

*Solid spacer*
**305.05.02**
Weight 4 g



## Multiple integral bases for series mounting

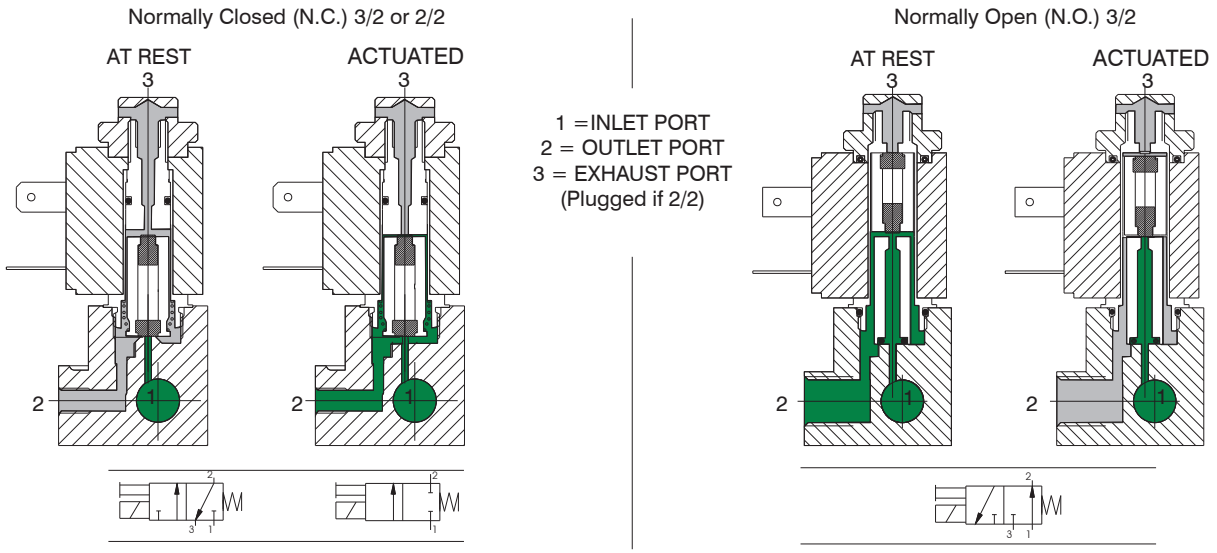



Ordering code

**305.08.02** **2** positions
**305.08.03** **3** positions
**305.08.04** **4** positions
**305.08.05** **5** positions



## Functional schematic




## Construction characteristics

*Electrical parts:* Solenoids: the solenoid consist of coils having different diameter copper wire windings insulated according standards "H"; they are encased in a nylon-glass compound. All parts are corrosion resistant.

*Mechanical parts:* Nickel plated brass tube nitrile (NBR) stainless steel plunger (AISI 430F), stainless steel adjusted springs, viton poppet seals, tropicalized zinc alloy interface plate, nickeled brass manual override, Technopolymer coil lock nut, zinc steel mounting screws. Electrical connectors are standard.

## Technical characteristics

| | | | |
|---|---|---|---|
| **Pneumatic** | Working pressure | 0 ... 10 bar | |
| | Orifice size | 1,3 mm | (1,1 mm for 2 W) |
| | Maximum fluid temperature | 50°C | |
| | Maximum ambient temperature | 50°C | |
| | Maximum flow rate at 6 bar with Δp = 1 | 53 Nl/min | (35 Nl/min. for 2 W) |
| | Cycles/minute | 700 | |
| | Fluids | Air-Vacuum-Inert gases | |
| | Lubrication | Non needed | |
| | Life | 40 to 50 million cycles | |
| **Electrical** | Power consumption holding - D.C | 5 W | (2 W) low consumption |
| | Power consumption holding - A.C | 8 VA | (6 VA) low consumption |
| | Operating voltage tolerance | ±10% | |
| | Response time opening * | 8 ms | |
| | Response time closing * | 6 ms | |
| | Insulation of the copper wire | H | |
| | Insulation of the coil | F | |
| | Connector protection | IP 65 | |
| | Cable protection | DIN 43650 INDUSTRIAL FORM | |

(*) "Shifting time of pneumatic directional control valves or moving parts, logic devices were measured in accordance to ISO 12238:2001, Pneumatic fluid power - Directional control valves - Measurement of shifting time"

## Maintenance and replacement parts

Maintenace practices for these valves are similar to those already detailed for other products - replacement of the plunger or poppet is not advisable since the new replacement would not provide the best fit with the rest of the already used valve.

Special care should be taken that no dirt is accumulated between the working surface of fixed core and the plunger which would result in vibrations and overheating of the solenoid. In the case of microsolenoid it must be assured that the alternate current coil is not charged when the machanical part is not mounted to avoid destruction of the coil.

The electrical connections have to be perfect, especially where low currents are used (12-24 V). Oxidation of contacts between the connector and the coil can lead to intermittent malfunctions which are difficult to trace. Oxidation of contacts due to humidity or corrosive atmosphere are one of the most common causes of false alarms. Clean the contacts with appropriate spray.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

**Mechanical actuator for Normally Closed (N.C.)**
**Miniature solenoid valve**

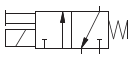
Normally Closed (N.C.)

Ordering code

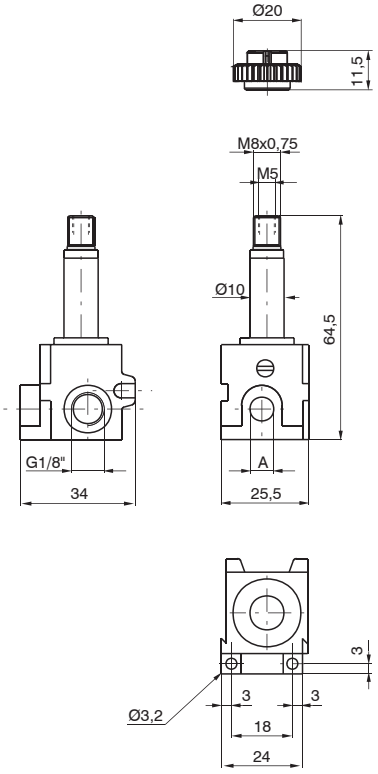
**305.M1** **A** = G 1/8"
**355.M1** **A** = M5
**345.M1** **A** = Push in fitting for 4 mm tube

**305.M1/9** **A** = G 1/8"
**355.M1/9** **A** = M5
**345.M1/9** **A** = Push in fitting for 4 mm tube

2 W
24 DC





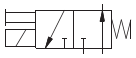



Weight 95 g

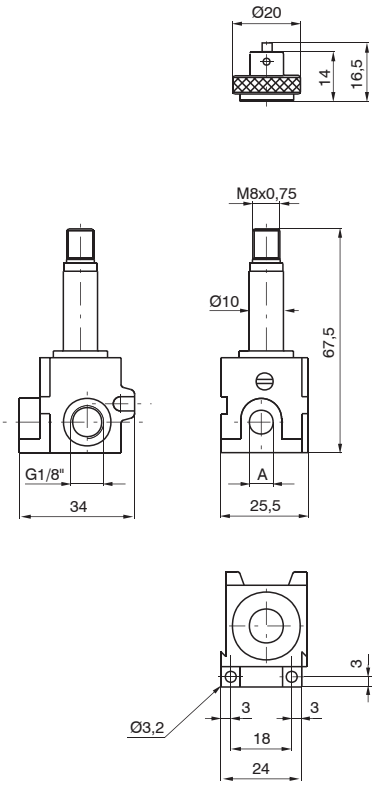
Normally Open (N.O.)

Ordering code

**305.M1/1** **A** = G 1/8"
**355.M1/1** **A** = M 5
**345.M1/1** **A** = Push in fitting for 4 mm tube



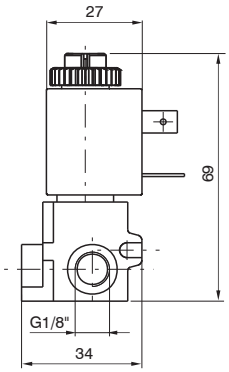





Weight 106 g

## Miniature solenoid valve

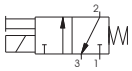


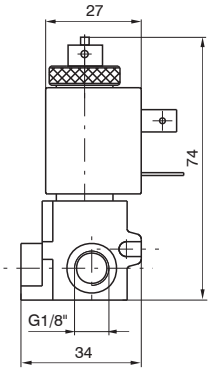

Normally Closed (N.C.)

| Ordering code | | | Available voltage miniature solenoid | |
|---|---|---|---|---|
| G 1/8" | M5 | TUBE Ø4 mm | | |
| **305.M4**<br>**305.M5**<br>**305.M6**<br>**305.M9** | **355.M4**<br>**355.M5**<br>**355.M6**<br>**355.M9** | **345.M4**<br>**345.M5**<br>**345.M6**<br>**345.M9** | 12 D.C.<br>24 D.C.<br>48 D.C.<br>24 D.C. (2 Watt) | Direct current |
| **305.M17**<br>**305.M21**<br>**305.M22**<br>**305.M24** | **355.M17**<br>**355.M21**<br>**355.M22**<br>**355.M24** | **345.M17**<br>**345.M21**<br>**345.M22**<br>**345.M24** | 24/50<br>48/50<br>110/50<br>230/50 | Alternating current<br>50 Hz |
| **305.M37**<br>**305.M39**<br>**305.M41** | **355.M37**<br>**355.M39**<br>**355.M41** | **345.M37**<br>**345.M39**<br>**345.M41** | 24/60<br>110/60<br>230/60 | Alternating current<br>60 Hz |
| **305.M56**<br>**305.M57**<br>**305 M58** | **355.M56**<br>**355.M57**<br>**355.M58** | **345.M56**<br>**345 M57**<br>**345 M58** | 24/50-60<br>110/50-60<br>230/50-60 | Alternating current<br>50/60 Hz |
| **305.M66**<br>**305.M67**<br>**305 M68** | **355.M66**<br>**355.M67**<br>**355.M68** | **345.M66**<br>**345 M67**<br>**345 M68** | 24/50-60<br>110/50-60<br>230/50-60 | Alternating current<br>low consumption<br>50/60 Hz |

Weight 149 g



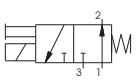



Normally Open (N.O.)

| Ordering code | | | Available voltages miniature solenoid | |
|---|---|---|---|---|
| G 1/8" | M5 | TUBE Ø4 mm | | |
| **305.M10/1** | **355.M10/1** | **345.M10/1** | 24 D.C. (8 Watt) | Direct current |
| **305.M17/1**<br>**305.M21/1**<br>**305.M22/1**<br>**305.M24/1** | **355.M17/1**<br>**355.M21/1**<br>**355.M22/1**<br>**355.M24/1** | **345.M17/1**<br>**345.M21/1**<br>**345.M22/1**<br>**345.M24/1** | 24/50<br>48/50<br>110/50<br>230/50 | Alternating current<br>50 Hz |
| **305.M37/1**<br>**305.M39/1**<br>**305.M41/1** | **355.M37/1**<br>**355.M39/1**<br>**355.M41/1** | **345.M37/1**<br>**345.M39/1**<br>**345.M41/1** | 24/60<br>110/60<br>230/60 | Alternating current<br>60 Hz |
| **305. M56/1**<br>**305. M57/1**<br>**305. M58/1** | **355.M56/1**<br>**355.M57/1**<br>**355.M58/1** | **345.M56/1**<br>**345.M57/1**<br>**345.M58/1** | 24/50-60<br>110/50-60<br>230/50-60 | Alternating current<br>50/60 Hz |

Weight 165 g



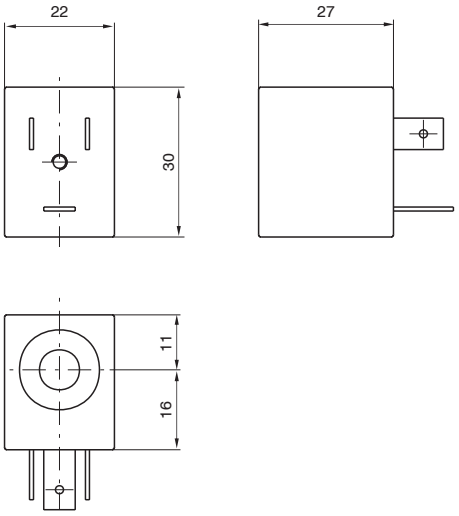


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Coil




Weight 54 g

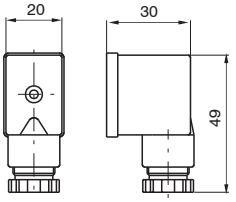



| Ordering code | | Available voltages Coil | |
|---|---|---|---|
| N.C. | N.O. | | |
| **MB4**<br>**MB5**<br>**MB6**<br>**MB9** | <br><br><br><br>**MB10/1** | 12 D.C.<br>24 D.C.<br>48 D.C.<br>24 D.C. (2 Watt)<br>24 D.C. (8 Watt) | Direct current |
| **MB17**<br>**MB21**<br>**MB22**<br>**MB24** | **MB17/1**<br>**MB21/1**<br>**MB22/1**<br>**MB24/1** | 24/50<br>48/50<br>110/50<br>230/50 | Alternating current 50 Hz |
| **MB37**<br>**MB39**<br>**MB41** | **MB37/1**<br>**MB39/1**<br>**MB41/1** | 24/60<br>110/60<br>230/60 | Alternating current 60 Hz |
| **MB56**<br>**MB57**<br>**MB58** | **MB56/1**<br>**MB57/1**<br>**MB58/1** | 24/50-60<br>110/50-60<br>230/50-60 | Alternating current 50/60 Hz |
| **MB66**<br>**MB67**<br>**MB68** | / | 24/50-60<br>110/50-60<br>230/50-60 | Alternating current (low consumption) 50/60 Hz |

## Electrical connector

| Ordering code | |
|---|---|
| **305.11.00** | Normal |
| **305.11.0_L** | with Led<br>1 = 24 V D.C. / A.C.<br>2 = 110 V 50/60 Hz<br>3 = 230 V 50/60 Hz |






Weight 19 g

## BISTABLE

The most interesting aspects of this bistable miniature solenoid valve operating with D.C. only, is that it can be commuted with a simple electric impulse and stay commuted till an inverted polarity impulse deactivates it. It means that the valve is not automatically deactivated if current fail as happens with normal solenoid valves.

The applications differ but are all based on above mentioned feature.

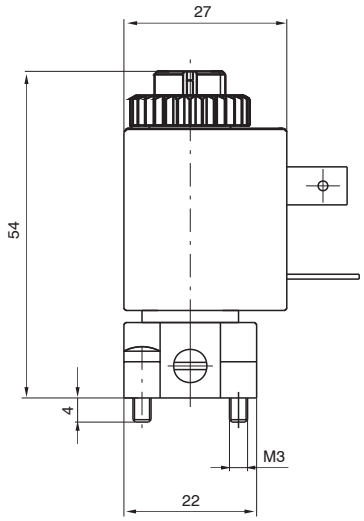
The internal construction is relatively special. The fix plunger is equipped with a permanent magnet that hold or release the mobile plunger according to the magnetic field generated by the coil.

A specific coil is used for this application and it cannot be replaced by the standard ones.

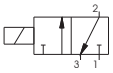
Ordering code is **MBB5**.

### Miniature solenoid valve for distributors and bases



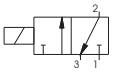




| Ordering code |
|---|
| **M5/B** |

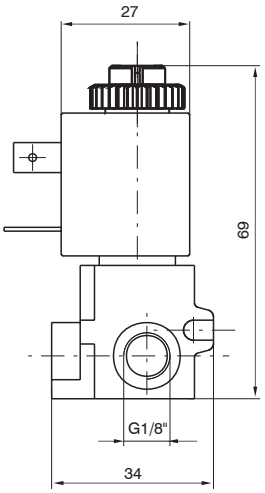


### Miniature solenoid valve with inseries mounting base

| Ordering code |
|---|
| **305.M5/B** = G 1/8" |
| **355.M5/B** = M5 |
| **345.M5/B** = Fitting for 4 mm tube |








Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

**Electric pilot CNOMO (coil not included)**

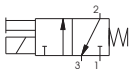
Mechanics with base for solenoid to be used where an electric pilot system is required.
May be used on all sizes and is standardized as an interface on the distributor.
The base is fitted with a manual control which is pulse actuated, without check, or with two stable positions, actuated by means of a screwdriver (pressing down and turning clockwise by 90°). Two different types of solenoids can be mounted on the stem, one in conformity with ISO standard size 30x38 and ISO 4400 (DIN 43650) electrical connection, and a compact one size 22x27, having the same performance but at lower price. The technical characteristics of the latter are described in the catalogue, series 300, and refer to MB solenoids. The base is fitted with screws (M4x30) for fastening to the distributor.

Ordering code

**M** | | |

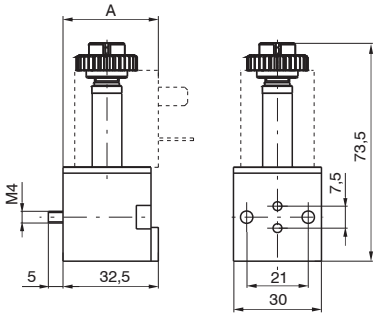
**P** = Manual 1 position
**R** = Manual 2 positions

**3** = Mechanics CNOMO
**4** = 2 W Mechanics CNOMO





Weight 49 g




**A = 33** (with MB solenoid)
**A = 38** (with MC solenoid)

**General characteristics**

| | | | |
|---|---|---|---|
| **Structural** | Body | Thermoplastic polyester | |
| | Stem | Nickel-platted brass | |
| | Cores | AISI 430F stainless steel | |
| | Springs | AISI 302 stainless steel | |
| | Shutters | FPM | |
| | Other seals | NBR | |
| | Manual control | Nickel-platted brass | |
| **Pneumatic** | Fluid | Air, Neutral gases | |
| | Working pressure | 0 ... 10 bar | |
| | Fluid ambient temperature | -5°C ... +50°C | |
| | Flow rate at 6 bar with Δp 1 bar | 53 Nl/min | (20 Nl/min for 2 W) |
| | Nominal flow cross section | 1,3 mm | (0,9 mm for 2 W) |
| **Electric** | Power consumption (inrush) - A.C. | 13 VA | |
| | Power consumption holding - D.C. | 4 W | (2 W) |
| | Power consumption holding - A.C. | 8,5 VA | |
| | Operating voltage tolerance | ±10% | |
| | Response time opening * | 13 ms | |
| | Response time closing * | 5 ms | |
| | Insulation of the copper wire | H | |
| | Insulation of the coil | F | |
| | Connector protection | IP 65 | |
| | Cable protection | DIN 43650 “A” FORM | |

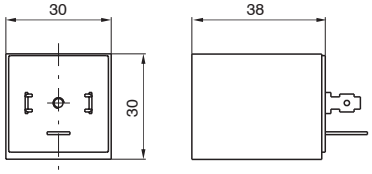
(*) "Shifting time of pneumatic directional control valves or moving parts, logic devices were measured in accordance to ISO 12238:2001, Pneumatic fluid power - Directional control valves - Measurement of shifting time"

**Coil**

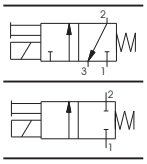
| Ordering code | Available voltages |
|---|---|
| | Coil |
| **MC5**<br>**MC9**<br>**MC56**<br>**MC57**<br>**MC58** | 24 D.C.<br>24 D.C. (2 Watt)<br>24/50-60 Hz<br>110/50-60 Hz<br>230/50-60 Hz |



Weight 110 g

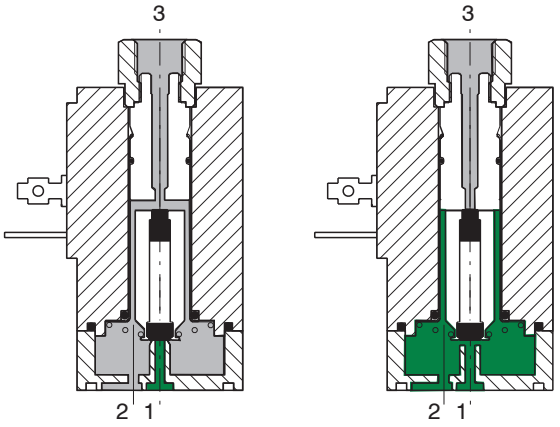


## Functional schematic



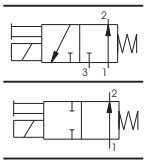
1 = INLET PORT
2 = OUTLET PORT
3 = EXHAUST PORT
(Plugged if 2/2)

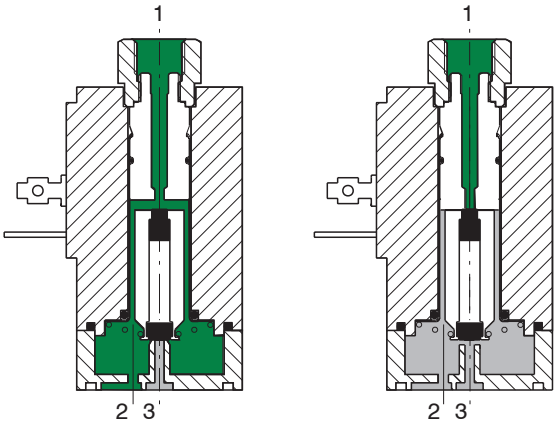
Normally Closed (N.C.) 3/2 or 2/2




AT REST ACTUATED

Normally Open (N.O.) 3/2 or 2/2






AT REST ACTUATED

## Construction characteristics

*Electrical parts:*

Solenoids: the solenoid consists of coils having different diameter copper wire windings insulated according standards "H"; they are encased in a nylon-glass compound. All parts are corrosion resistant.

*Mechanical parts:*

Stainless steel tube and plunger (AISI 430F), stainless steel adjusted springs, viton poppet seals, tropicalized zinc alloy interface plate, nitrile (NBR) seal nickeled brass manual override, nickel steel coil lock nut, zinc steel mounting screws. To be usable, the solenoids have to be attached either to a base or directly to the distributor's operators by means of connectors G 1/8".Electrical connectors are standard. These solenoid are available in all voltages and frequences used in the world. The following are the technical characteristics of the solenoid.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Technical characteristics

| | | |
|---|---|---|
| **Pneumatic** | Working pressure | 0 ... 10 bar |
| | Orifice size | 1,8 mm |
| | Maximum fluid temperature | 50°C |
| | Maximum ambient temperature | 50°C |
| | Maximum flow rate at 6 bar with $\Delta p = 1$ | 80 Nl/min |
| | Cycles/minute | 700 |
| | Fluids | Air-Vacuum-Inert gases |
| | Lubrication | Not required |
| | Life | 40 to 50 millions |
| **Electric** | Power consumption (inrush) - D.C. | - |
| | Power consumption (inrush) - A.C. | 19,5 VA |
| | Power consumption holding - D.C. | 8,2 W |
| | Power consumption holding - A.C. | 9 VA |
| | Operating voltage tolerance | ±10% |
| | Response time opening * | 15 ms |
| | Response time closing * | 30 ms |
| | Insulation of the copper wire | H |
| | Insulation of the coil | F |
| | Connector protection | IP 65 |
| | Cable protection | DIN 43650 “A” FORM |

(*) "Shifting time of pneumatic directional control valves or moving parts, logic devices were measured in accordance to ISO 12238:2001, Pneumatic fluid power - Directional control valves - Measurement of shifting time"

## Maintenance and replacement parts

Maintenance practices for these valves are similar to those already detailed for other products - replacement of the plunger or poppet is not advisable since the new replacement would not provide the best fit with the rest of the already used valve.

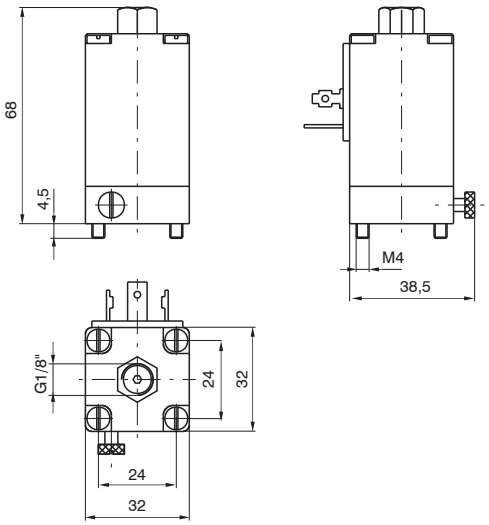
Special care should be taken that no dirt is accumulated between the working surface of fixed cores 3 and the plunger 2 which would result in vibrations and overheating of the solenoid. In the case of microsolenoid it must be assured that the alternate current coil is not charged when the mechanical part is not mounted to avoid destruction of the coil.

The electrical connections have to be perfect, especially where low currents are used (12-24 V). Oxidation of contacts between the connector and the coil can lead to intermittent malfunctions which are difficult to trace. Oxidation of contacts due to humidity or corrosive atmosphere are one of the most common causes of false alarms. Clean the contacts with appropriate spray.

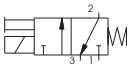
## Solenoid valve S and S/1



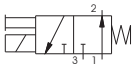
Weight 220 g




Normally Closed
(N.C.) - **S**



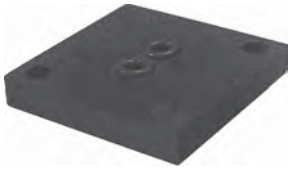
Normally Open
(N.O.) - **S/1**



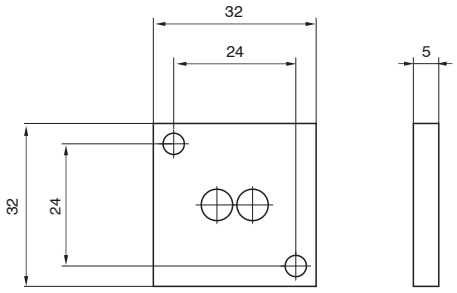
| Ordering code | | Available voltages Coil | |
|---|---|---|---|
| **S 2**<br>**S 4**<br>**S 5**<br>**S 6** | **S 2/1**<br>**S 4/1**<br>**S 5/1**<br>**S 6/1** | 6 D.C.<br>12 D.C.<br>24 D.C.<br>48 D.C. | Direct current |
| **S 16**<br>**S 17**<br>**S 19**<br>**S 20**<br>**S 21**<br>**S 22**<br>**S 23**<br>**S 24** | **S 16/1**<br>**S 17/1**<br>**S 19/1**<br>**S 20/1**<br>**S 21/1**<br>**S 22/1**<br>**S 23/1**<br>**S 24/1** | 12/50<br>24/50<br>32/50<br>42/50<br>48/50<br>110/50<br>115/50<br>230/50 | Alternating current<br>50 Hz |
| **S 36**<br>**S 37**<br>**S 38**<br>**S 39**<br>**S 40**<br>**S 41** | **S 36/1**<br>**S 37/1**<br>**S 38/1**<br>**S 39/1**<br>**S 40/1**<br>**S 41/1** | 12/60<br>24/60<br>48/60<br>110/60<br>115/60<br>230/60 | Alternating current<br>60 Hz |
| **S 56**<br>**S 57**<br>**S 58** | **S 56/1**<br>**S 57/1**<br>**S 58/1** | 24/50-60<br>110/50-60<br>230/50-60 | Alternating current<br>50/60 Hz |

## Closing plate

| Ordering code |
|---|
| **300.12.00** |



Weight 14 g



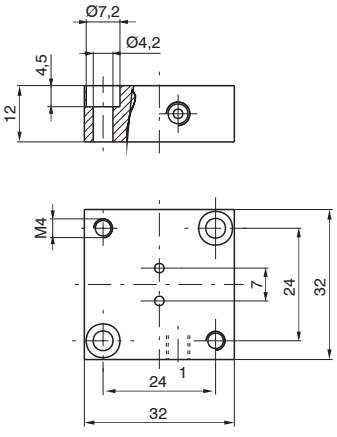

## External feeding base

To be used with electrodistributeurs to get a different piloting pressure from the line one.

| Ordering code |
|---|
| **300.10.05** |



Weight 35 g

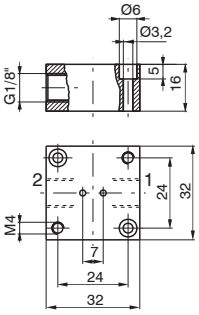





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## Individual base



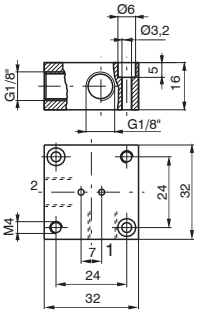



Weight 40 g

In line port - thread G 1/8"
1 = INLET PORT (N.C.)
2 = OUTLET PORT (N.C.)
With solenoid valve N.O.
1 = EXHAUST PORT
2 = OUTLET PORT

| Ordering code |
|---|
| **300.04.00** |





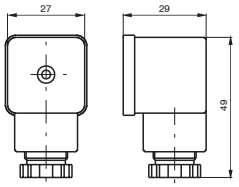

Weight 40 g

90° Port - thread G 1/8"
1= INLET PORT (N.C.)
2 = OUTLET PORT (N.C)
With solenoid valve N.O.
1 = EXHAUST PORT
2 = OUTLET PORT

| Ordering code |
|---|
| **300.04.90** |

## Electrical connector



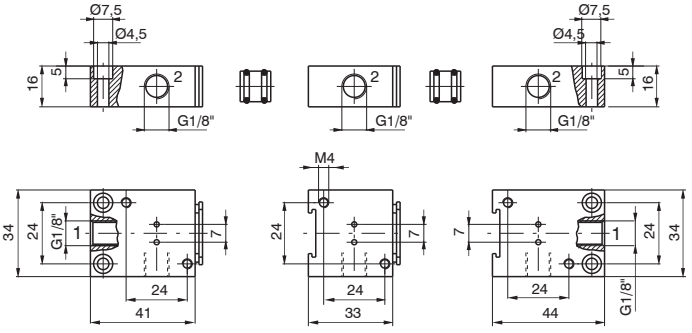



Weight 25 g

| Ordering code | |
|---|---|
| **300.11.00** | Standard |
| **300.11.0_L** | Led |
| | 1 = 24 V D.C. / A.C. |
| | 2 = 110 V 50/60 Hz |
| | 3 = 230 V 50/60 Hz |

## Modular bases for series mounting

| Ordering code |
|---|
| *Initial base* **300.05.00** |
| *Intermediate base* **300.06.00** |
| *Last base* **300.07.00** |
| *Bored specer* **300.05.01** Weight 5 g |
| *Solid space* **300.05.02** Weight 6 g |



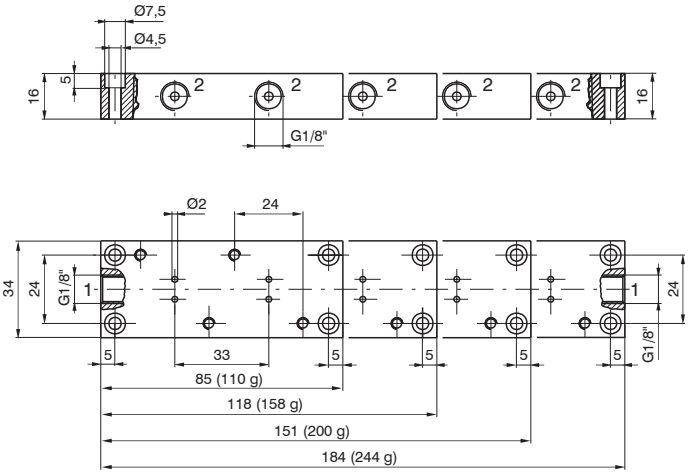

Initial base | Intermediate base | Last base



Weight 52 g | Weight 40 g | Weight 52 g

## Multiple integral bases for series mounting






| Ordering code | |
|---|---|
| **300.08.02** | **2** positions |
| **300.08.03** | **3** positions |
| **300.08.04** | **4** positions |
| **300.08.05** | **5** positions |

The series c UL us homologated solenoid valves (valid for USA and Canada file n. E206325-VAIU2, VAIU8) are different from the standard ones for microsolenoid made with an injected RYNITE embedded copper wire (they are included in class "F" insulation).

Refer to standard versions as for as other details and accessories to be used with solenoid valves.



## Miniature solenoid valve 10 mm

Ordering code

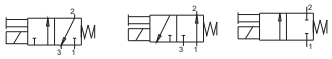
**UN3 _ _ . _**

- **6** = 2/2 N.C.
- **7** = 3/2 N.C.
- **8** = 3/2 N.O.

- **1** = 24 V D.C.
- **2** = 12 V D.C.

- **1** = 90° connector with LED
- **3** = Line connector with LED
- **4** = 90° connector without LED
- **5** = Line connector without LED





## Miniature solenoid valve 15 mm

Ordering code

**UN3 _ _ . _ _ _ _**

- **3** = 3/2 N.C.
- **4** = 3/2 N.O.

- **1** = 24 V D.C.
- **2** = 12 V D.C.
- **5** = 24 V 50/60 Hz
- **6** = 110 ... 120 V 50/60 Hz
- **7** = 230V 50/60 Hz

- = PUSH (Standard version)
- **2** = Without manual override
- **8** = Manual override 2 positions

- **A** = Orifice Ø1,1
- **B** = Orifice Ø1,5

- **0** = Faston
- **1** = Faston EN17301-803 (Ex DIN 43650)

- = Straight
- **R** = Downward





## Miniature solenoid valve 22 mm

Ordering code

| | | |
|---|---|---|
| Coil | **UMB** | |
| Miniature solenoid valve N.C. | **UM2 .** | **4** = 12V D.C.<br>**5** = 24V D.C.<br>**56** = 24V 50/60 Hz |
| Miniature solenoid valve N.O. | **UM2/1.** | **57** = 110 ...120 V 50/60 Hz<br>**58** = 230V 50/60 Hz |








Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Miniature solenoid valve 22 mm for series mounting

Ordering code



Coil N.C. **UMB** __
- **4** = 12 V D.C.
- **5** = 24 V D.C.
- **56** = 24 V 50/60 Hz
- **57** = 110 ... 120 V 50/60 Hz
- **58** = 230 V 50/60 Hz



Coil N.O. **UMB** __**/1**
- **10** = 24 V D.C. 8W
- **56** = 24 V 50/60 Hz
- **57** = 110 ... 120 V 50/60 Hz
- **58** = 230 V 50/60 Hz



Solenoid valve N.C. **U3** __ **5.M** __
- **4** = 12 V D.C.
- **5** = 24 V D.C.
- **56** = 24 V 50/60 Hz
- **57** = 110 ... 120 V 50/60 Hz
- **58** = 230 V 50/60 Hz

- **0** = G1/8"
- **5** = M5
- **4** = fitting for 4mm tube





Solenoid valve N.O. **U3** __ **5.M** __ **/1**
- **10** = 24 V D.C. 8W
- **56** = 24 V 50/60 Hz
- **57** = 110 ... 120 V 50/60 Hz
- **58** = 230 V 50/60 Hz

- **0** = G1/8"
- **5** = M5
- **4** = fitting for 4mm tube

## Bi-stable miniature solenoid valve 22mm

Ordering code





Coil **UMBB5**

Miniature solenoid valve for distributors and bases (N.C.) **UM5/B**

Miniature solenoid valve with inseries mounting base (N.C.) **U3** __ **5.M5/B**
- **0** = G1/8"
- **5** = M5
- **4** = fitting for 4mm tube



## Solenoid valve 30 mm (for mechanics M3 and M4)

Ordering code



- **UMC5** = 24 V D.C.
- **UMC56** = 24 V 50/60 Hz
- **UMC57** = 110 ... 120 V 50/60 Hz
- **UMC58** = 230 V 50/60 Hz

## Solenoid valve 32 mm

Ordering code



Solenoid valve N.C. **US** __

Solenoid valve N.O. **US** __ **/1**
- **4** = 12 V D.C.
- **5** = 24 V D.C.
- **56** = 24 V 50/60 Hz
- **57** = 110 ... 120 V 50/60 Hz
- **58** = 230 V 50/60 Hz





## Series 700 - for compressed air and vacuum

The large flow valves and solenoid poppet valves for compressed air and vacuum.
Are manufactured for 3/2 and 2/2 versions only, either normally close and normally open.
For the compressed air oparation, the application is similar to the equivalent spool valves while for the vacuum operation a particular attention should be paid to the valve selected and its connection to the pump.
For the electric pilot it is used a normal miniature solenoid M2 with pneumatic actuator and the special miniature solenoid M2/V with vacuum.
**The ordering code are referring to the solenoid valves with mechanics "M2" or "M2/V" assembled.**
**Coil are not included and have to be ordored separately (see Series 300).**
**Coil c UL us homologated are available (see 300 Series).**



### Construction characteristics

| | G 3/8" |
|---|---|
| Body | Aluminium |
| Actuators rod | Stainless steel |
| Bottom plates | Aluminium |
| Piston seals | NBR |
| Springs | Stainless steel |
| Poppets | NBR |
| Pistons | Aluminium |

### Use and maintenance

These valves have a mean life of 10 to 15 million cycles under normal operating conditions.
Lubrication is not required for good operation but we recommend good filtration to avoid dirty deposit causing malfunction.
Please ensure that the valve is being used according with the manufacturers specification, such as air pressure and temperature.
The exhaust port of the distributor has to be protected in a dusty and dirty environment.
For these products, according to the construction technique and special application, is not required any maintenance with parts replacement.
When necessary it is sufficient to clean the internal parts.
When it is used the solenoid valves with internal pilot, either for air or vacuum, inlet flow rate must be equal or higher that the required consumption flow rate.
Otherwise is better choose the external pilot version.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

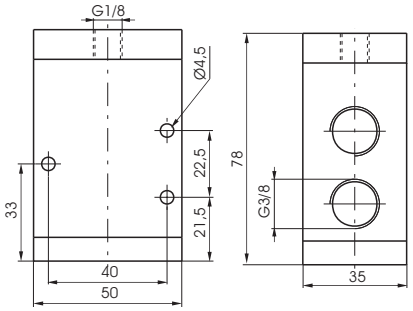
## Pneumatic - Spring

**Coding:** 779.32.11.Ⓕ

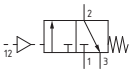
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -10 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1800 |
| Orifice size (mm) | 10 |
| Working ports size | G3/8" |
| Pilot ports size | G1/8" |

| Ⓕ | FUNCTION |
|---|---|
| | **1C** = Normally Closed |
| | **1A** = Normally Open |

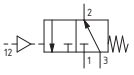





**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



Weight 360 g
Attention: for the Normally open version, connect the inlet port to the exhaust port No "3".

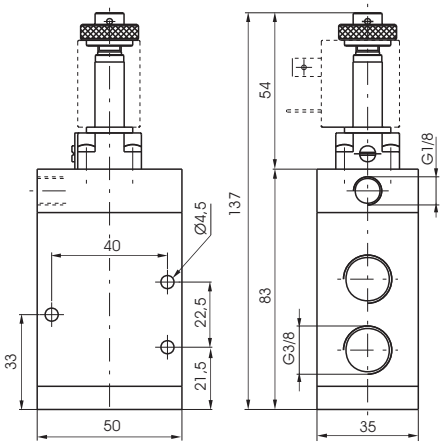
## Solenoid-Spring

**Coding:** 779.32.0.Ⓕ.M2

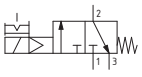
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2,5 (external feeding version)<br>3 (self feeding version) |
| Temperature °C | -10 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1800 |
| Orifice size (mm) | 10 |
| Working ports size | G3/8" |
| Pilot ports size | G1/8" |

| Ⓕ | FUNCTION |
|---|---|
| | **1AC** = Self feeding-normally closed |
| | **1C** = External feeding-normally closed |
| | **1AA** = Self feeding-normally open |
| | **1A** = External feeding-normally open |

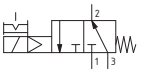




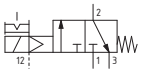

**Self feeding - N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



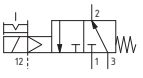
**Self feeding - N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



**External feeding - N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**External feeding - N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



Weight 420 g

## Pneumatic - Spring

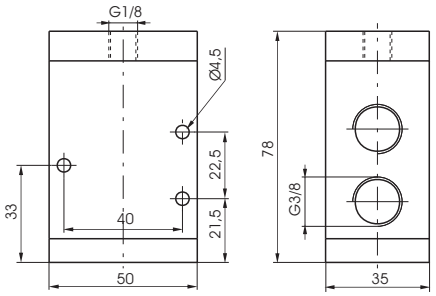
**Coding:** 779/V.32.11.Ⓕ

| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -10 ... +70 |
| Orifice size (mm) | 10 |
| Working ports size | G3/8" |
| Pilot ports size | G1/8" |

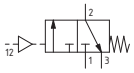
| Ⓕ | FUNCTION |
|---|---|
| | **1C** = Normally Closed |
| | **1A** = Normally Open |



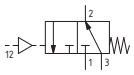
Weight 360 g




**N.O.**
Exhaust port 1
Outlet port 2
Pump 3



**N.C.**
Exhaust port 3
Outlet port 2
Pump 1



## Solenoid-Spring-Internal pilot

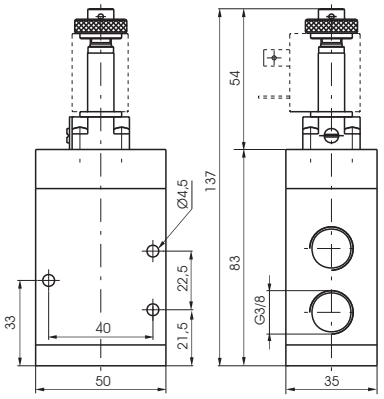
**Coding:** 779/V.32.0.Ⓕ.M2/V

| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Temperature °C | -10 ... +50 |
| Orifice size (mm) | 10 |
| Working ports size | G3/8" |
| Pilot ports size | G1/8" |

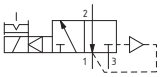
| Ⓕ | FUNCTION |
|---|---|
| | **1AA** = Normally Open |
| | **1AC** = Normally Closed |



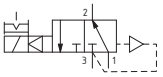
Weight 420 g




**N.O.**
Exhaust port 3
Outlet port 2
Pump 1



**N.C.**
Exhaust port 1
Outlet port 2
Pump 3



## Solenoid-Spring-External pilot

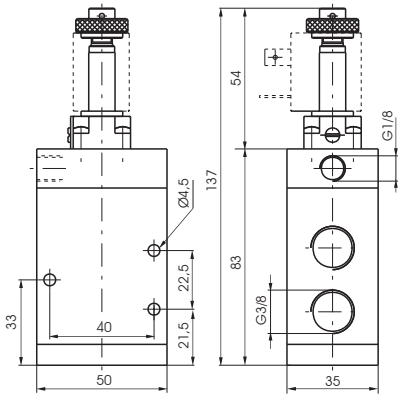
**Coding:** 779/V.32.0.Ⓕ.M2

| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -10 ... +50 |
| Orifice size (mm) | 10 |
| Working ports size | G3/8" |
| Pilot ports size | G1/8" |

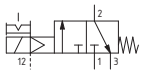
| Ⓕ | FUNCTION |
|---|---|
| | **1A** = Normally Open |
| | **1C** = Normally Closed |



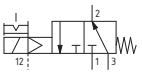
Weight 420 g




**N.O.**
Exhaust port 1
Outlet port 2
Pump 3



**N.C.**
Exhaust port 3
Outlet port 2
Pump 1





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series PG - for compressed air and vacuum



The large flow valves and solenoid poppet valves for compressed air and vacuum.
Are manufactured for 3/2 and 2/2 versions only, either normally close and normally open.

### Construction characteristics

| | G 1/2" - 1/2" NPT | G 3/4" - 3/4" NPT | G 1" - 1" NPT | G 1 1/2" - 1 1/2" NPT |
|---|---|---|---|---|
| Body, operator and end cover | Aluminium | | | |
| Actuators rod | Steel | | | |
| Bottom plates | Aluminium | | | |
| Seals and poppets | NBR | | | |
| Springs | Stainless steel | | | |
| Pin guide | Stainless steel | | | |
| Pistons | Acetal resin | | | |

### Use and maintenance

These valves have a mean life of 10 to 15 million cycles under normal operating conditions.
Lubrication is not required for good operation but we recommend good filtration to avoid dirty deposit causing malfunction.
Please ensure that the valve is being used according with the manufacturers specification, such as air pressure and temperature.
The exhaust port of the distributor has to be protected in a dusty and dirty environment.
For these products, according to the construction technique and special application, is not required any maintenance with parts replacement.
When necessary it is sufficient to clean the internal parts.
When it is used the solenoid valves with internal pilot, either for air or vacuum, inlet flow rate must be equal or higher that the required consumption flow rate.
Otherwise is better choose the external pilot version.

## Pneumatic - Spring

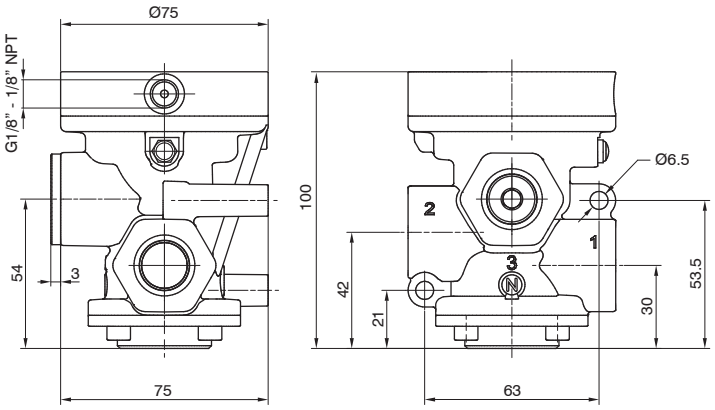
**Coding:** P©2A®11E℗00000

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 4800 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" - 1/2" NPT |
| Pilot ports size | G1/8" - 1/8" NPT |

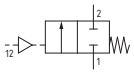
| | |
|---|---|
| © | CONNECTIONS |
| | **G** = Gas thread |
| | **N** = NPT thread |
| ® | WAYS NUMBER |
| | **2** = 2 ways, 2 positions |
| | **3** = 3 ways, 2 positions |
| ℗ | FUNCTION |
| | **A** = Normally Open (only for 3 ways) |
| | **C** = Normally Closed |

**2/2**






**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3 (closed)

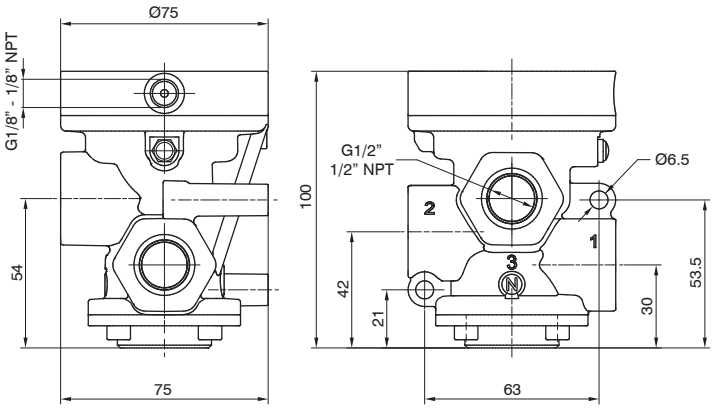


Weight 675 g

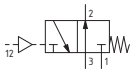
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**3/2**

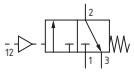





**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



Weight 648,5 g

P©2A311E℗00000



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Spring

**Coding:** P C 2A N 01 V F T

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 4800 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" - 1/2" NPT |
| Pilot ports size | G1/8" - 1/8" NPT |
| Response time according to ISO 12238, activation time (ms) | 21 (self feeding version) |
| Response time according to ISO 12238, deactivation time (ms) | 83 (self feeding version) |

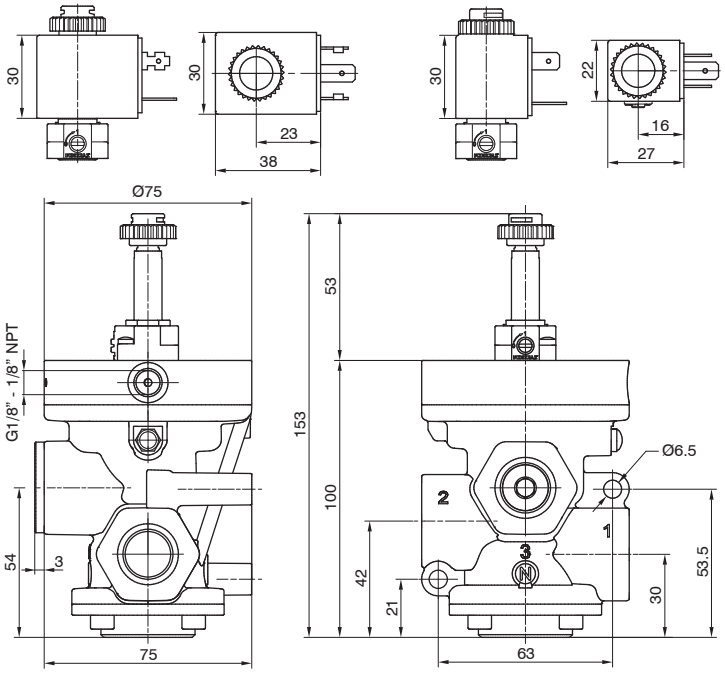
| | |
|---|---|
| C | CONNECTIONS |
| | **G** = Gas thread |
| | **N** = NPT thread |
| N | WAYS NUMBER |
| | **2** = 2 ways, 2 positions |
| | **3** = 3 ways, 2 positions |
| V | VERSION |
| | **A** = Self feeding |
| | **E** = External feeding |
| F | FUNCTION |
| | **A** = Normally Open (only for 3 ways) |
| | **C** = Normally Closed |
| T | VOLTAGE (22 MM SOLENOID COIL) |
| | **S40B0** = 12 VDC |
| | **S50B0** = 24 VDC |
| | **S60B0** = 24 V 50/60 Hz |
| | **S70B0** = 110 V 50/60 Hz |
| | **S80B0** = 230 V 50/60 Hz |
| | **10000** = Without solenoid coil |
| T | VOLTAGE (30 MM SOLENOID COIL) |
| | **S40C0** = 12 VDC |
| | **S50C0** = 24 VDC |
| | **S60C0** = 24 V 50/60 Hz |
| | **S70C0** = 110 V 50/60 Hz |
| | **S80C0** = 230 V 50/60 Hz |
| | **10000** = Without solenoid coil |

*2/2*

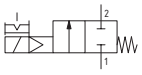


30 mm SOLENOID COIL
Connection: DIN 43650 "A" SHAPE

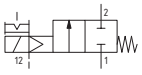
22 mm SOLENOID COIL
Connection: DIN 43650 INDUSTRIAL "B" SHAPE




**Self feeding - N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3 (closed)



**External feeding - N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3 (closed)



Weight 720,5 g

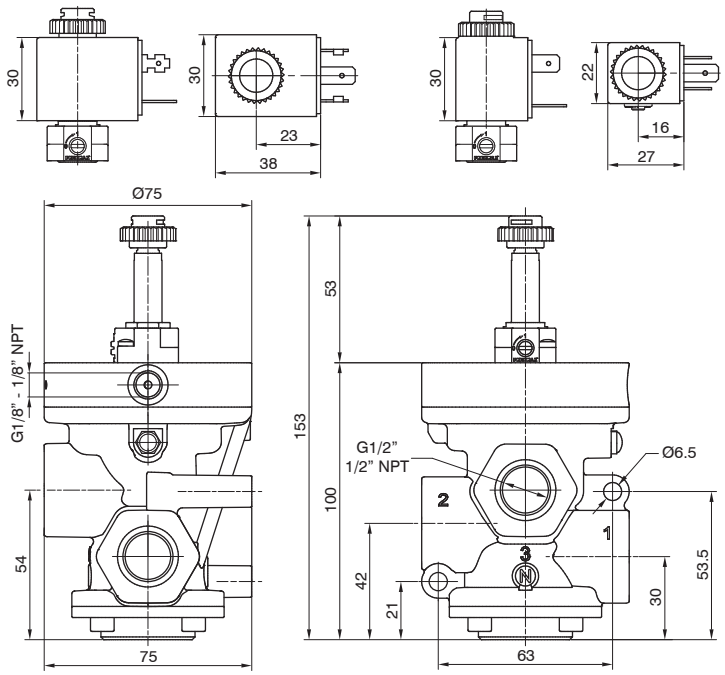
P C 2A 2 01 V F T

*3/2*

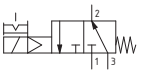


30 mm SOLENOID COIL
Connection: DIN 43650 "A" SHAPE

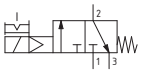
22 mm SOLENOID COIL
Connection: DIN 43650 INDUSTRIAL "B" SHAPE



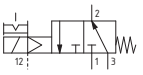

**Self feeding - N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



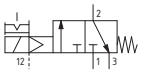
**Self feeding - N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**External feeding - N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



**External feeding - N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



Weight 693,5 g

P C 2A 3 01 V F T

## Pneumatic - Spring

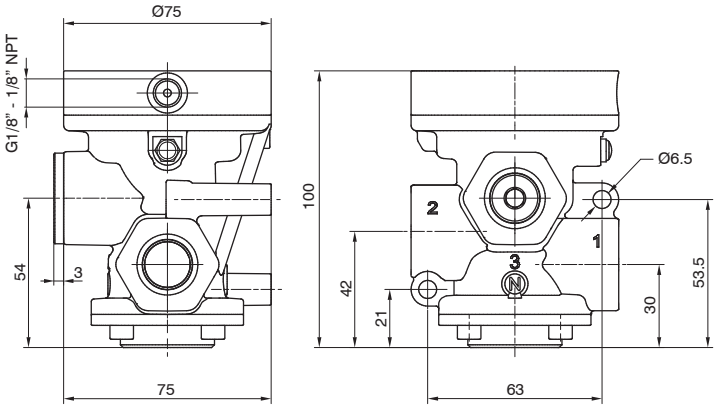
**Coding:** P©2V®11E℗00000

| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" - 1/2" NPT |
| Pilot ports size | G1/8" - 1/8" NPT |
| Max. vacuum (mmHg) | 758,5 |

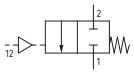
| | |
|---|---|
| © | CONNECTIONS |
| | **G** = Gas thread |
| | **N** = NPT thread |
| ® | WAYS NUMBER |
| | **2** = 2 ways, 2 positions |
| | **3** = 3 ways, 2 positions |
| ℗ | FUNCTION |
| | **A** = Normally Open (only for 3 ways) |
| | **C** = Normally Closed |

**2/2**






**N.C.**
Pump 1
Outlet port 2
Exhaust port 3 (closed)

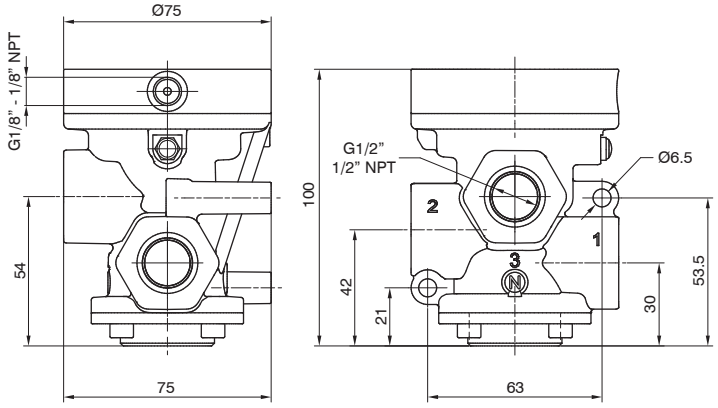


Weight 675,5 g

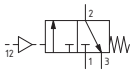
P©2V211E℗00000

**3/2**

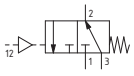





**N.O.**
Pump 3
Outlet port 2
Exhaust port 1



**N.C.**
Pump 1
Outlet port 2
Exhaust port 3



Weight 648,5 g

P©2V311E℗00000



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Spring

| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2 (external feeding version) |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" - 1/2" NPT |
| Pilot ports size | G1/8" - G1/8" NPT |
| Max. vacuum (mmHg) | 758,5 |
| Minimum operating vacuum (mmHg) | 250 (self feeding version) |

**Coding:** P©2V(N)01(V)(F)(T)

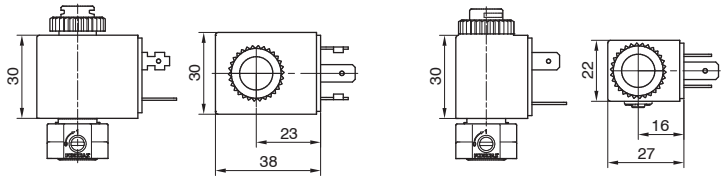
| | |
|---|---|
| © | CONNECTIONS |
| | **G** = Gas thread |
| | **N** = NPT thread |
| (N) | WAYS NUMBER |
| | **2** = 2 ways, 2 positions |
| | **3** = 3 ways, 2 positions |
| (V) | VERSION |
| | **A** = Self feeding |
| | **E** = External feeding |
| (F) | FUNCTION |
| | **A** = Normally Open (only for 3 ways) |
| | **C** = Normally Closed |
| (T) | VOLTAGE (22 MM SOLENOID COIL) |
| | **S40B0** = 12 VDC |
| | **S50B0** = 24 VDC |
| | **S60B0** = 24 V 50/60 Hz |
| | **S70B0** = 110 V 50/60 Hz |
| | **S80B0** = 230 V 50/60 Hz |
| | **10000** = Without solenoid coil |
| (T) | VOLTAGE (30 MM SOLENOID COIL) |
| | **S40C0** = 12 VDC |
| | **S50C0** = 24 VDC |
| | **S60C0** = 24 V 50/60 Hz |
| | **S70C0** = 110 V 50/60 Hz |
| | **S80C0** = 230 V 50/60 Hz |
| | **10000** = Without solenoid coil |

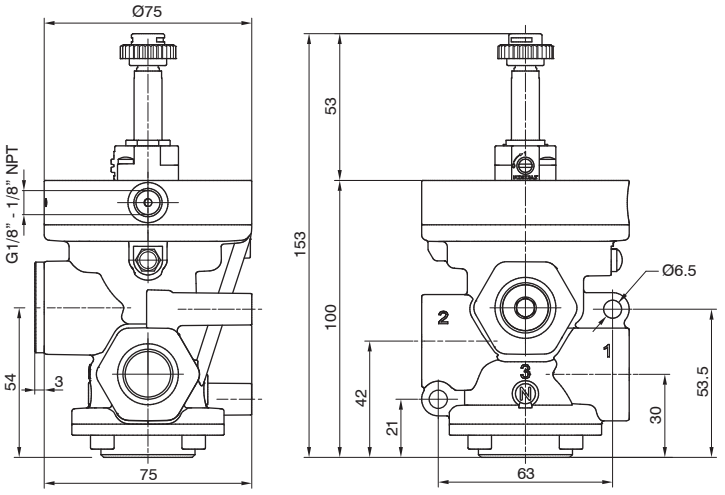
2/2



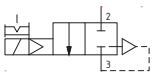
30 mm SOLENOID COIL
Connection: DIN 43650 "A" SHAPE

22 mm SOLENOID COIL
Connection: DIN 43650 INDUSTRIAL "B" SHAPE

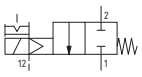



**Self feeding - N.C.**
Pump 3
Outlet port 2
Exhaust port 1 (closed)



**External feeding - N.C.**
Pump 1
Outlet port 2
Exhaust port 3 (closed)



Weight 720,5 g

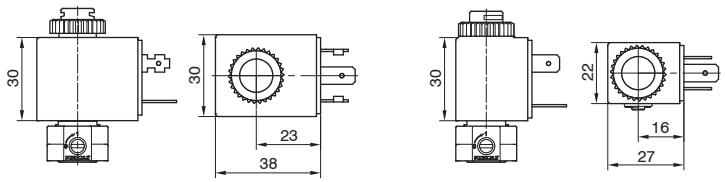
P©2V201(V)(F)(T)

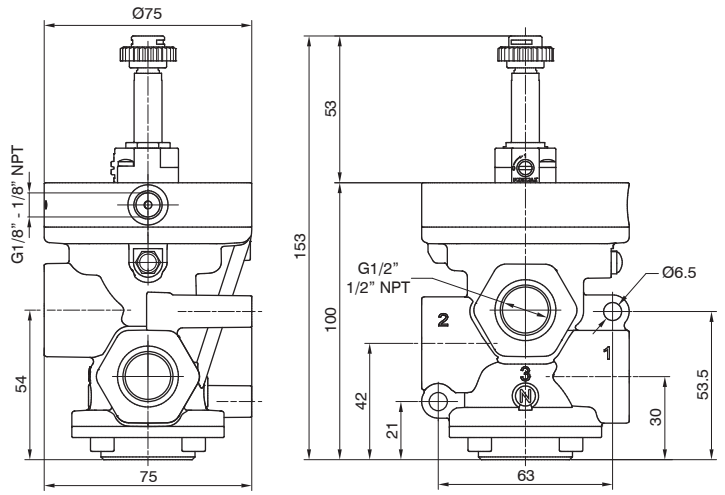
3/2



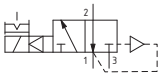
30 mm SOLENOID COIL
Connection: DIN 43650 "A" SHAPE

22 mm SOLENOID COIL
Connection: DIN 43650 INDUSTRIAL "B" SHAPE

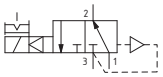


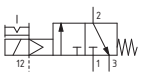

**Self feeding - N.O.**
Pump 1
Outlet port 2
Exhaust port 3



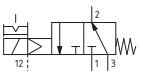
**Self feeding - N.C.**
Pump 3
Outlet port 2
Exhaust port 1



**External feeding - N.O.**
Pump 3
Outlet port 2
Exhaust port 1



**External feeding - N.C.**
Pump 1
Outlet port 2
Exhaust port 3



Weight 693,5 g

P©2V301(V)(F)(T)

## Pneumatic - Spring

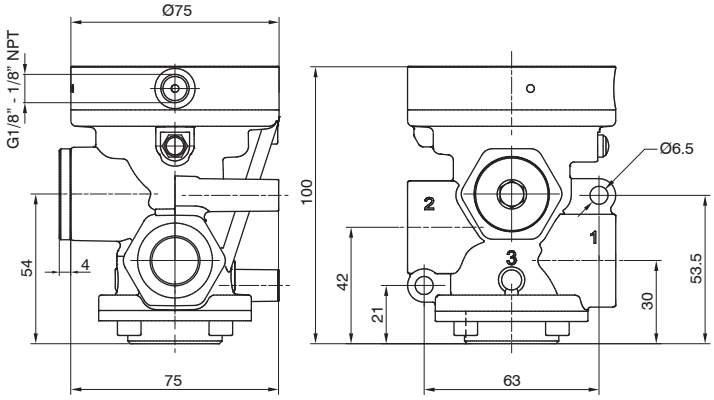
**Coding:** P©3A®11E℗00000

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 6100 |
| Orifice size (mm) | 20 |
| Working ports size | G3/4" - 3/4" NPT |
| Pilot ports size | G1/8" - 1/8" NPT |

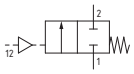
| | |
|---|---|
| © | CONNECTIONS |
| | **G** = Gas thread |
| | **N** = NPT thread |
| ® | WAYS NUMBER |
| | **2** = 2 ways, 2 positions |
| | **3** = 3 ways, 2 positions |
| ℗ | FUNCTION |
| | **A** = Normally Open (only for 3 ways) |
| | **C** = Normally Closed |

2/2





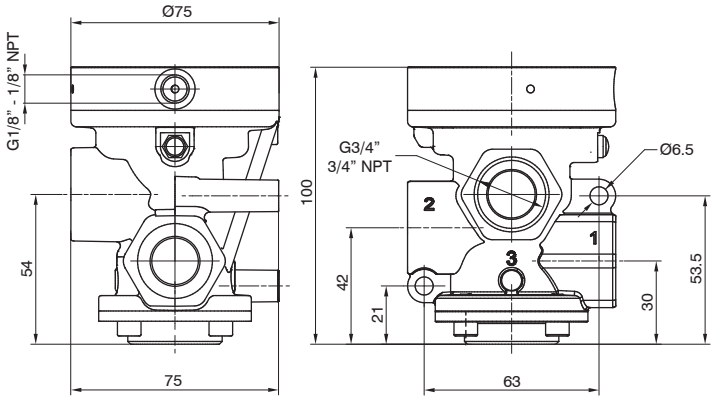

**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3 (closed)



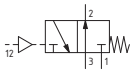
Weight 576,5 g

P©3A211E℗00000

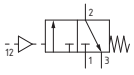





**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



Weight 522,5 g

P©3A311E℗00000



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Spring

**Coding:** P(C)3A(N)01(V)(F)(T)

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 6100 |
| Orifice size (mm) | 20 |
| Working ports size | G3/4" - 3/4" NPT |
| Pilot ports size | G1/8" - 1/8" NPT |
| Response time according to ISO 12238, activation time (ms) | 22 (self feeding version) |
| Response time according to ISO 12238, deactivation time (ms) | 81 (self feeding version) |

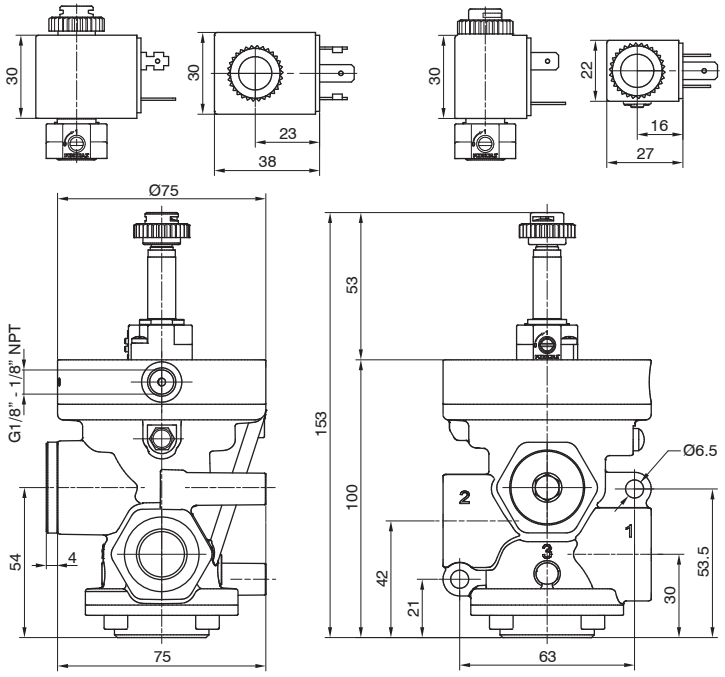
| | |
|---|---|
| (C) | CONNECTIONS |
| | **G** = Gas thread |
| | **N** = NPT thread |
| (N) | WAYS NUMBER |
| | **2** = 2 ways, 2 positions |
| | **3** = 3 ways, 2 positions |
| (V) | VERSION |
| | **A** = Self feeding |
| | **E** = External feeding |
| (F) | FUNCTION |
| | **A** = Normally Open (only for 3 ways) |
| | **C** = Normally Closed |
| (T) | VOLTAGE (22 MM SOLENOID COIL) |
| | **S40B0** = 12 VDC |
| | **S50B0** = 24 VDC |
| | **S60B0** = 24 V 50/60 Hz |
| | **S70B0** = 110 V 50/60 Hz |
| | **S80B0** = 230 V 50/60 Hz |
| | **10000** = Without solenoid coil |
| (T) | VOLTAGE (30 MM SOLENOID COIL) |
| | **S40C0** = 12 VDC |
| | **S50C0** = 24 VDC |
| | **S60C0** = 24 V 50/60 Hz |
| | **S70C0** = 110 V 50/60 Hz |
| | **S80C0** = 230 V 50/60 Hz |
| | **10000** = Without solenoid coil |

*2/2*

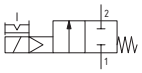


30 mm SOLENOID COIL
Connection: DIN 43650 "A" SHAPE

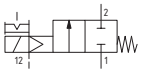
22 mm SOLENOID COIL
Connection: DIN 43650 INDUSTRIAL "B" SHAPE




**Self feeding - N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3 (closed)



**External feeding - N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3 (closed)



Weight 621,5 g

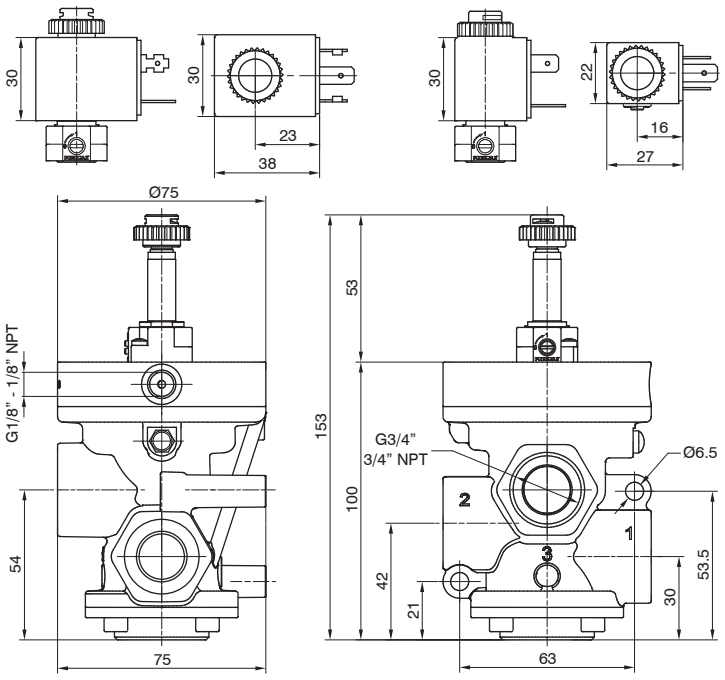
P(C)3A201(V)(F)(T)

*3/2*

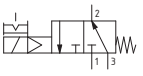


30 mm SOLENOID COIL
Connection: DIN 43650 "A" SHAPE

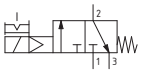
22 mm SOLENOID COIL
Connection: DIN 43650 INDUSTRIAL "B" SHAPE



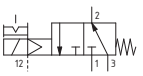

**Self feeding - N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



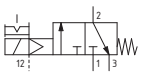
**Self feeding - N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**External feeding - N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



**External feeding - N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



Weight 567,5 g

P(C)3A301(V)(F)(T)

## Pneumatic - Spring

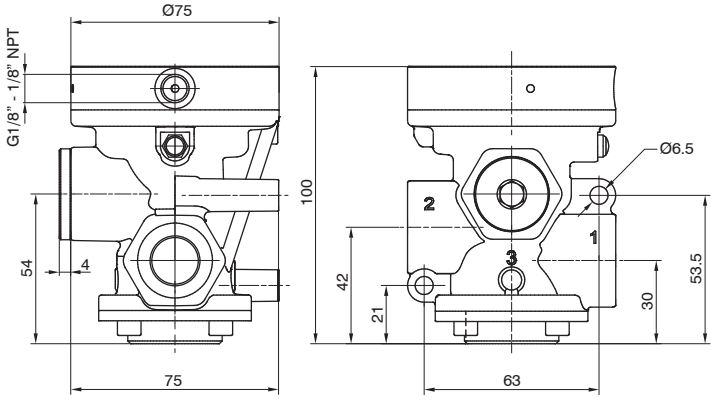
**Coding:** P©3V®11E©00000

| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 20 |
| Working ports size | G3/4" - 3/4" NPT |
| Pilot ports size | G1/8" - 1/8" NPT |
| Max. vacuum (mmHg) | 758,5 |

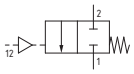
| | |
|---|---|
| © | CONNECTIONS |
| | **G** = Gas thread |
| | **N** = NPT thread |
| ® | WAYS NUMBER |
| | **2** = 2 ways, 2 positions |
| | **3** = 3 ways, 2 positions |
| © | FUNCTION |
| | **A** = Normally Open (only for 3 ways) |
| | **C** = Normally Closed |

**2/2**






**N.C.**
Pump 1
Outlet port 2
Exhaust port 3 (closed)

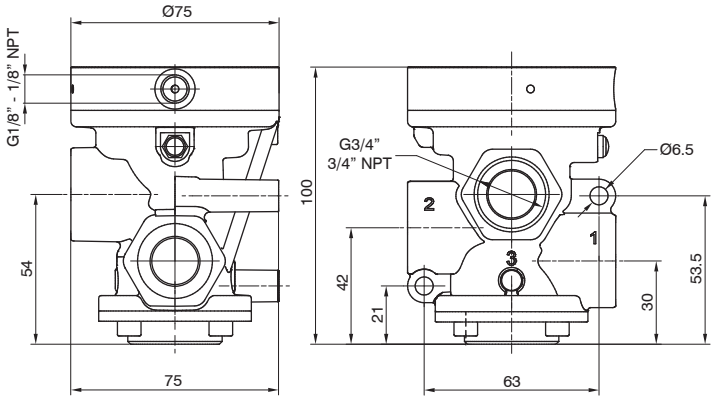


Weight 576,5 g

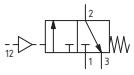
P©3V211E©00000

**3/2**

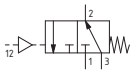





**N.O.**
Pump 3
Outlet port 2
Exhaust port 1



**N.C.**
Pump 1
Outlet port 2
Exhaust port 3



Weight 522,5 g

P©3V311E©00000



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Spring

**Coding:** P©3V(N)01(V)(F)(T)

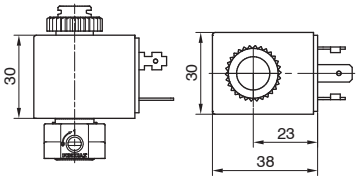
| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2 (external feeding version) |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 20 |
| Working ports size | G3/4" - 3/4" NPT |
| Pilot ports size | G1/8" - 1/8" NPT |
| Max. vacuum (mmHg) | 758,5 |
| Minimum operating vacuum (mmHg) | 250 (self feeding version) |

| | |
|---|---|
| © | CONNECTIONS |
| | **G** = Gas thread |
| | **N** = NPT thread |
| (N) | WAYS NUMBER |
| | **2** = 2 ways, 2 positions |
| | **3** = 3 ways, 2 positions |
| (V) | VERSION |
| | **A** = Self feeding |
| | **E** = External feeding |
| (F) | FUNCTION |
| | **A** = Normally Open (only for 3 ways) |
| | **C** = Normally Closed |
| (T) | VOLTAGE (22 MM SOLENOID COIL) |
| | **S40B0** = 12 VDC |
| | **S50B0** = 24 VDC |
| | **S60B0** = 24 V 50/60 Hz |
| | **S70B0** = 110 V 50/60 Hz |
| | **S80B0** = 230 V 50/60 Hz |
| | **10000** = Without solenoid coil |
| (T) | VOLTAGE (30 MM SOLENOID COIL) |
| | **S40C0** = 12 VDC |
| | **S50C0** = 24 VDC |
| | **S60C0** = 24 V 50/60 Hz |
| | **S70C0** = 110 V 50/60 Hz |
| | **S80C0** = 230 V 50/60 Hz |
| | **10000** = Without solenoid coil |

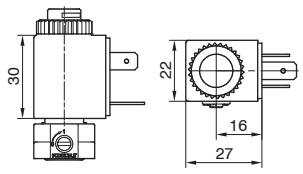
2/2

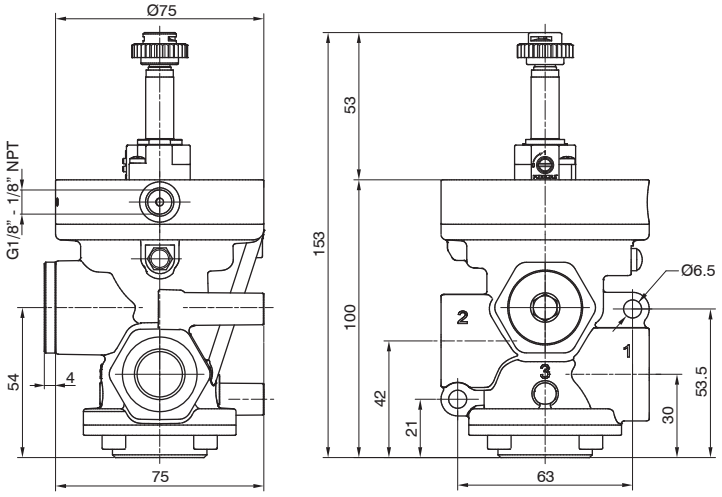


30 mm SOLENOID COIL
Connection: DIN 43650 "A" SHAPE

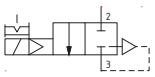



22 mm SOLENOID COIL
Connection: DIN 43650 INDUSTRIAL "B" SHAPE

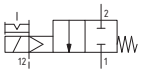



**Self feeding - N.C.**
Pump 3
Outlet port 2
Exhaust port 1 (closed)



**External feeding - N.C.**
Pump 1
Outlet port 2
Exhaust port 3 (closed)



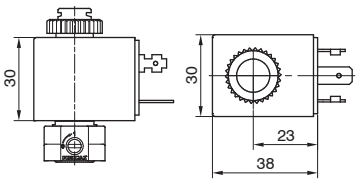
Weight 621,5 g

P©3V201(V)(F)(T)

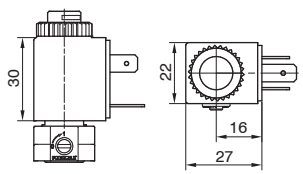
3/2

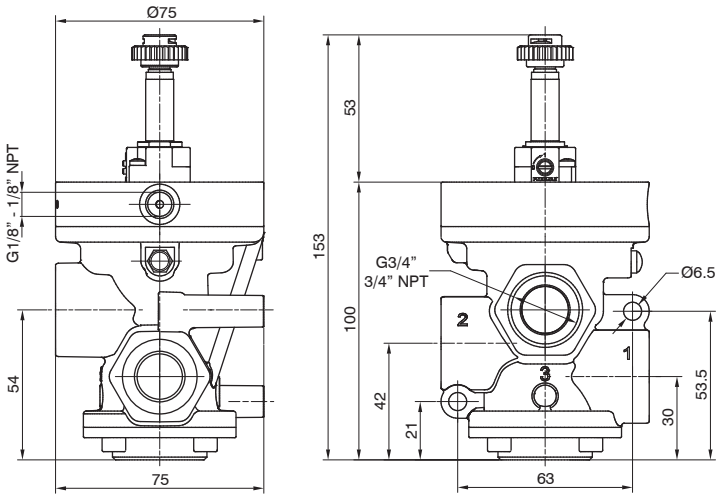


30 mm SOLENOID COIL
Connection: DIN 43650 "A" SHAPE

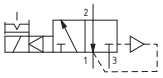



22 mm SOLENOID COIL
Connection: DIN 43650 INDUSTRIAL "B" SHAPE

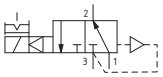


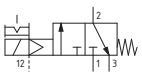

**Self feeding - N.O.**
Pump 1
Outlet port 2
Exhaust port 3



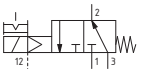
**Self feeding - N.C.**
Pump 3
Outlet port 2
Exhaust port 1



**External feeding - N.O.**
Pump 3
Outlet port 2
Exhaust port 1



**External feeding - N.C.**
Pump 1
Outlet port 2
Exhaust port 3



Weight 567,5 g

P©3V301(V)(F)(T)

## Pneumatic - Spring

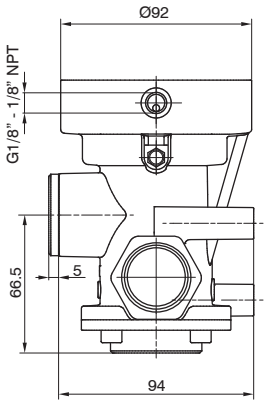
**Coding:** P©1A©11E©00000

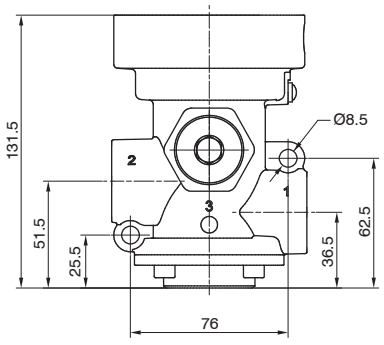
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 12500 |
| Orifice size (mm) | 25 |
| Working ports size | G1" - 1" NPT |
| Pilot ports size | G1/8" - 1/8" NPT |

| | |
|---|---|
| © | CONNECTIONS |
| | **G** = Gas thread |
| | **N** = NPT thread |
| © | WAYS NUMBER |
| | **2** = 2 ways, 2 positions |
| | **3** = 3 ways, 2 positions |
| © | FUNCTION |
| | **A** = Normally Open (only for 3 ways) |
| | **C** = Normally Closed |

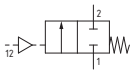
**2/2**






**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3 (closed)

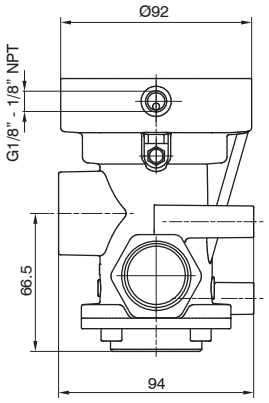


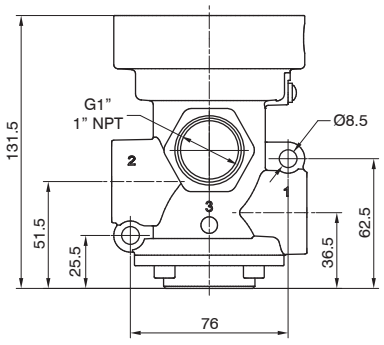
Weight 1231,5 g

P©1A211E©00000

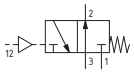
**3/2**



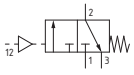



**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



Weight 1139,5 g

P©1A311E©00000



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Spring

**Coding:** P C 1A N 01 V F T

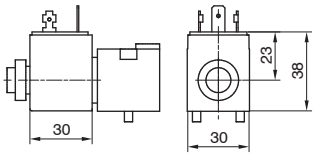
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 12500 |
| Orifice size (mm) | 25 |
| Working ports size | G1" - 1" NPT |
| Pilot ports size | G1/8" - 1/8" NPT |
| Response time according to ISO 12238, activation time (ms) | 27 (self feeding version) |
| Response time according to ISO 12238, deactivation time (ms) | 88 (self feeding version) |

| | |
|---|---|
| C | CONNECTIONS |
| | **G** = Gas thread |
| | **N** = NPT thread |
| N | WAYS NUMBER |
| | **2** = 2 ways, 2 positions |
| | **3** = 3 ways, 2 positions |
| V | VERSION |
| | **A** = Self feeding |
| | **E** = External feeding |
| F | FUNCTION |
| | **A** = Normally Open (only for 3 ways) |
| | **C** = Normally Closed |
| T | VOLTAGE (22 MM SOLENOID COIL) |
| | **S40B0** = 12 VDC |
| | **S50B0** = 24 VDC |
| | **S60B0** = 24 V 50/60 Hz |
| | **S70B0** = 110 V 50/60 Hz |
| | **S80B0** = 230 V 50/60 Hz |
| | **10000** = Without solenoid coil |
| T | VOLTAGE (30 MM SOLENOID COIL) |
| | **S40C0** = 12 VDC |
| | **S50C0** = 24 VDC |
| | **S60C0** = 24 V 50/60 Hz |
| | **S70C0** = 110 V 50/60 Hz |
| | **S80C0** = 230 V 50/60 Hz |
| | **10000** = Without solenoid coil |

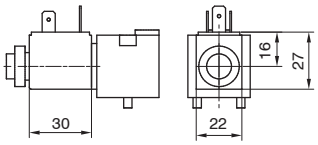
2/2

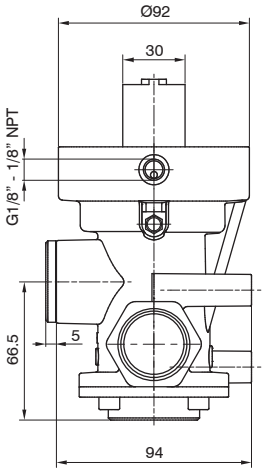


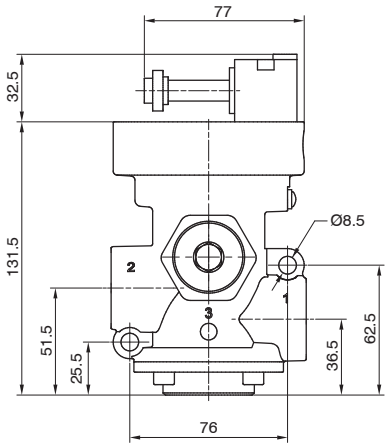
30 mm SOLENOID COIL
Connection: DIN 43650 "A" SHAPE



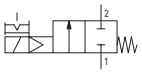

22 mm SOLENOID COIL
Connection: DIN 43650 INDUSTRIAL "B" SHAPE



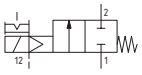




**Self feeding - N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3 (closed)



**External feeding - N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3 (closed)



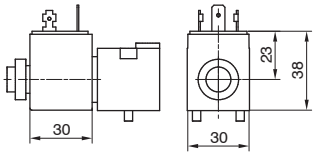
Weight 1290 g

P C 1A 2 01 V F T

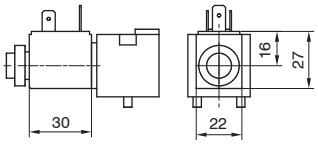
3/2

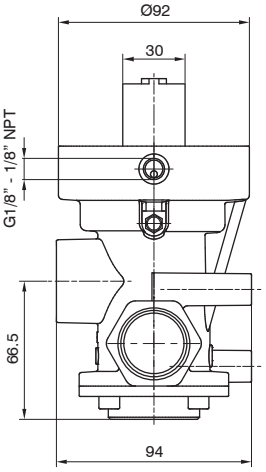


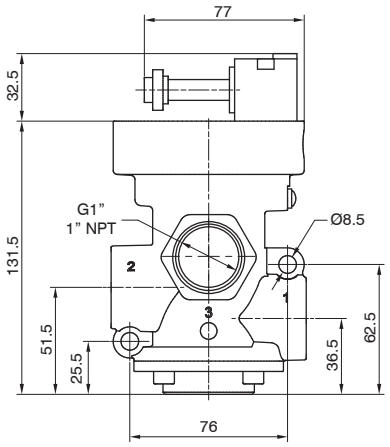
30 mm SOLENOID COIL
Connection: DIN 43650 "A" SHAPE



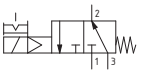

22 mm SOLENOID COIL
Connection: DIN 43650 INDUSTRIAL "B" SHAPE



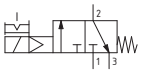



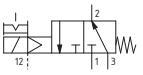

**Self feeding - N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



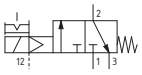
**Self feeding - N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**External feeding - N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



**External feeding - N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



Weight 1198 g

P C 1A 3 01 V F T

## Pneumatic - Spring

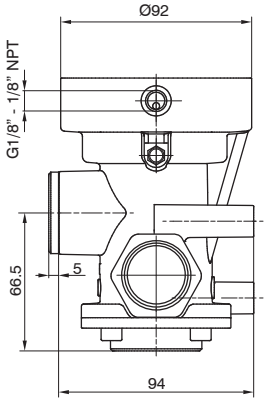
**Coding:** P©1V®11E℗00000

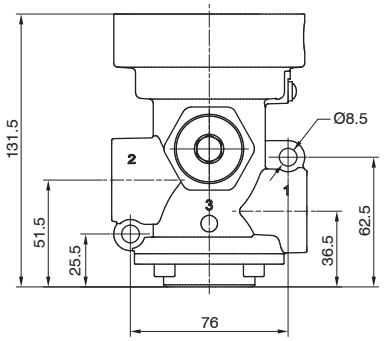
| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 25 |
| Working ports size | G1" - 1" NPT |
| Pilot ports size | G1/8" - 1/8" NPT |
| Max. vacuum (mmHg) | 758,5 |

| | |
|---|---|
| © | CONNECTIONS |
| | **G** = Gas thread |
| | **N** = NPT thread |
| ® | WAYS NUMBER |
| | **2** = 2 ways, 2 positions |
| | **3** = 3 ways, 2 positions |
| ℗ | FUNCTION |
| | **A** = Normally Open (only for 3 ways) |
| | **C** = Normally Closed |

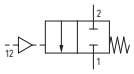
**2/2**






**N.C.**
Pump 1
Outlet port 2
Exhaust port 3 (closed)

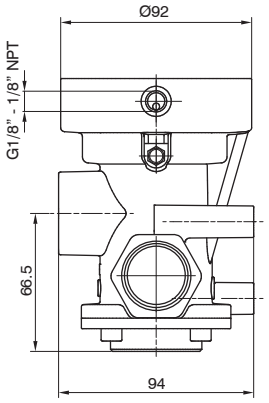


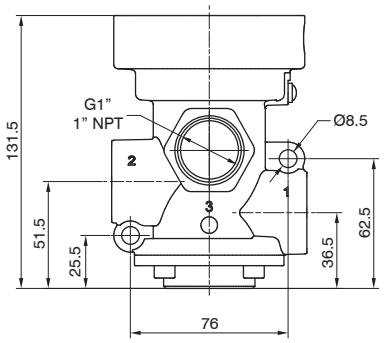
Weight 1231,5 g

P©1V211E℗00000

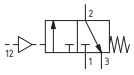
**3/2**



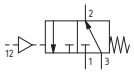



**N.O.**
Pump 3
Outlet port 2
Exhaust port 1



**N.C.**
Pump 1
Outlet port 2
Exhaust port 3



Weight 1139,5 g

P©1V311E℗00000



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Spring

**Coding:** P©1V(N)01(V)(F)(T)

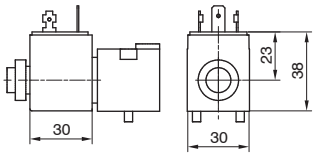
| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2 (external feeding version) |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 25 |
| Working ports size | G1" - 1" NPT |
| Pilot ports size | G1/8" - 1/8" NPT |
| Max. vacuum (mmHg) | 758,5 |
| Minimum operating vacuum (mmHg) | 250 (self feeding version) |

| | |
|---|---|
| © | CONNECTIONS |
| | **G** = Gas thread |
| | **N** = NPT thread |
| (N) | WAYS NUMBER |
| | **2** = 2 ways, 2 positions |
| | **3** = 3 ways, 2 positions |
| (V) | VERSION |
| | **A** = Self feeding |
| | **E** = External feeding |
| (F) | FUNCTION |
| | **A** = Normally Open (only for 3 ways) |
| | **C** = Normally Closed |
| (T) | VOLTAGE (22 MM SOLENOID COIL) |
| | **S40B0** = 12 VDC |
| | **S50B0** = 24 VDC |
| | **S60B0** = 24 V 50/60 Hz |
| | **S70B0** = 110 V 50/60 Hz |
| | **S80B0** = 230 V 50/60 Hz |
| | **10000** = Without solenoid coil |
| (T) | VOLTAGE (30 MM SOLENOID COIL) |
| | **S40C0** = 12 VDC |
| | **S50C0** = 24 VDC |
| | **S60C0** = 24 V 50/60 Hz |
| | **S70C0** = 110 V 50/60 Hz |
| | **S80C0** = 230 V 50/60 Hz |
| | **10000** = Without solenoid coil |

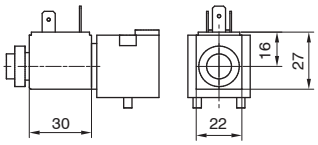
**2/2**

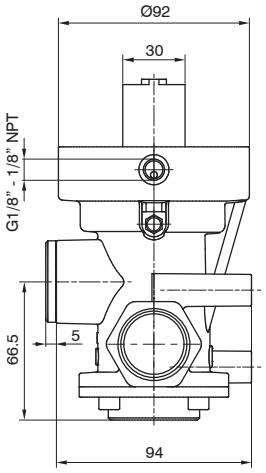


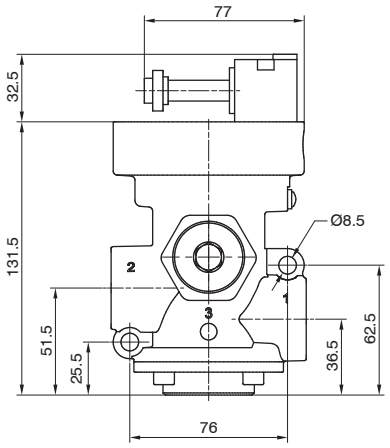
30 mm SOLENOID COIL
Connection: DIN 43650 "A" SHAPE



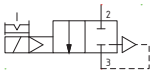

22 mm SOLENOID COIL
Connection: DIN 43650 INDUSTRIAL "B" SHAPE



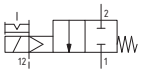




**Self feeding - N.C.**
Pump 3
Outlet port 2
Exhaust port 1 (closed)



**External feeding - N.C.**
Pump 1
Outlet port 2
Exhaust port 3 (closed)



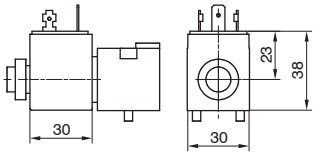
Weight 1290 g

P©1V201(V)(F)(T)

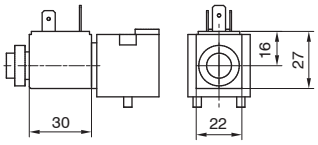
**3/2**

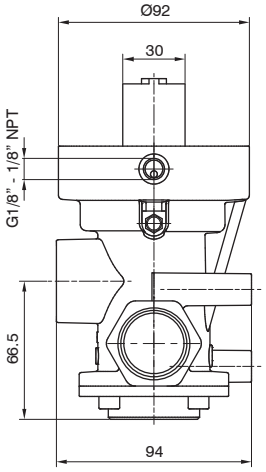


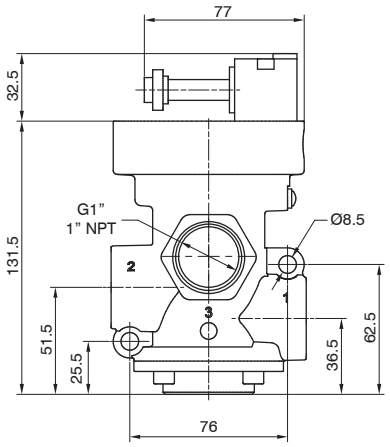
30 mm SOLENOID COIL
Connection: DIN 43650 "A" SHAPE



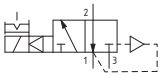

22 mm SOLENOID COIL
Connection: DIN 43650 INDUSTRIAL "B" SHAPE



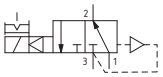



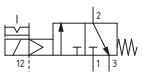

**Self feeding - N.O.**
Pump 1
Outlet port 2
Exhaust port 3



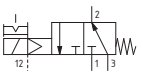
**Self feeding - N.C.**
Pump 3
Outlet port 2
Exhaust port 1



**External feeding - N.O.**
Pump 3
Outlet port 2
Exhaust port 1



**External feeding - N.C.**
Pump 1
Outlet port 2
Exhaust port 3



Weight 1198 g

P©1V301(V)(F)(T)

## Pneumatic - Spring

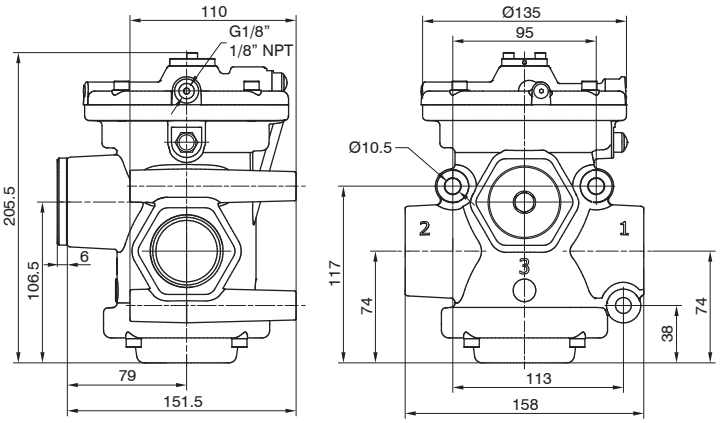
**Coding:** P C 6A N 11E F 00000

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 3 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 33500 |
| Orifice size (mm) | 38 |
| Working ports size | G1 1/2" - 1 1/2" NPT |
| Pilot ports size | G1/8" - 1/8" NPT |

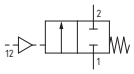
| | |
|---|---|
| C | CONNECTIONS |
| | **G** = Gas thread |
| | **N** = NPT thread |
| N | WAYS NUMBER |
| | **2** = 2 ways, 2 positions |
| | **3** = 3 ways, 2 positions |
| F | FUNCTION |
| | **A** = Normally Open (only for 3 ways) |
| | **C** = Normally Closed |

*2/2*






**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3 (closed)

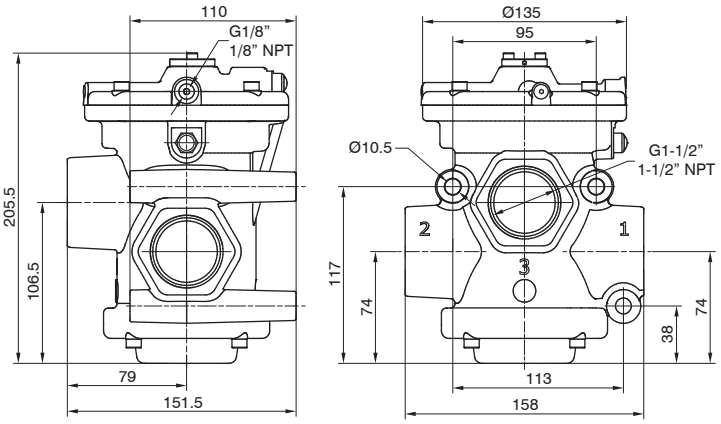


Weight 3417 g

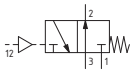
P C 6A 2 11E F 00000

*3/2*

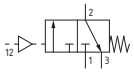





**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



Weight 3168 g

P C 6A 3 11E F 00000



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Spring

**Coding:** P Ⓒ 6A Ⓝ 01 Ⓥ Ⓕ Ⓣ

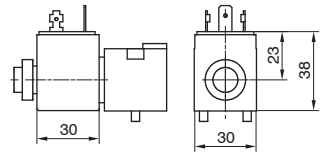
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 3 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 33500 |
| Orifice size (mm) | 38 |
| Working ports size | G1 1/2" - 1 1/2" NPT |
| Pilot ports size | G1/8" - 1/8" NPT |
| Response time according to ISO 12238, activation time (ms) | 182 (self feeding version) |
| Response time according to ISO 12238, deactivation time (ms) | 78 (self feeding version) |

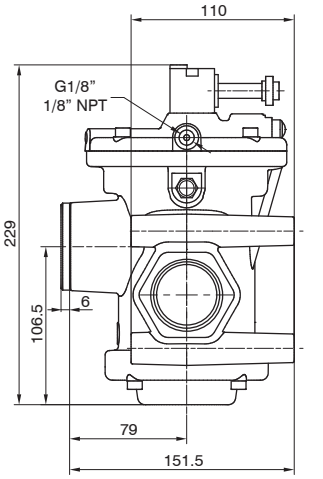
| | |
|---|---|
| Ⓒ | CONNECTIONS |
| | **G** = Gas thread |
| | **N** = NPT thread |
| Ⓝ | WAYS NUMBER |
| | **2** = 2 ways, 2 positions |
| | **3** = 3 ways, 2 positions |
| Ⓥ | VERSION |
| | **A** = Self feeding |
| | **E** = External feeding |
| Ⓕ | FUNCTION |
| | **A** = Normally Open (only for 3 ways) |
| | **C** = Normally Closed |
| Ⓣ | VOLTAGE (22 MM SOLENOID COIL) |
| | **S40B0** = 12 VDC |
| | **S50B0** = 24 VDC |
| | **S60B0** = 24 V 50/60 Hz |
| | **S70B0** = 110 V 50/60 Hz |
| | **S80B0** = 230 V 50/60 Hz |
| | **10000** = Without solenoid coil |
| Ⓣ | VOLTAGE (30 MM SOLENOID COIL) |
| | **S40C0** = 12 VDC |
| | **S50C0** = 24 VDC |
| | **S60C0** = 24 V 50/60 Hz |
| | **S70C0** = 110 V 50/60 Hz |
| | **S80C0** = 230 V 50/60 Hz |
| | **10000** = Without solenoid coil |

*2/2*

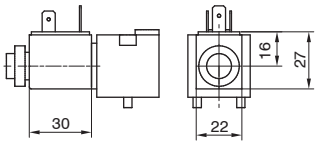


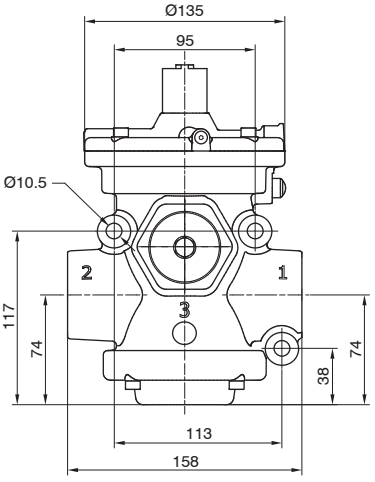
30 mm SOLENOID COIL
Connection: DIN 43650 "A" SHAPE



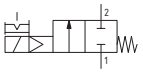




22 mm SOLENOID COIL
Connection: DIN 43650 INDUSTRIAL "B" SHAPE

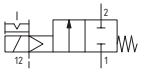



**Self feeding - N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3 (closed)



**External feeding - N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3 (closed)



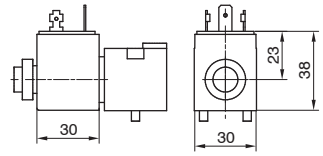
Weight 3491,5 g

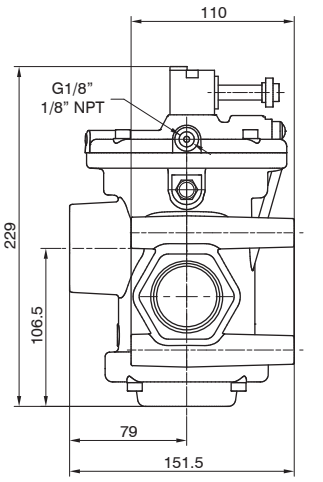
P Ⓒ 6A 201 Ⓥ Ⓕ Ⓣ

*3/2*

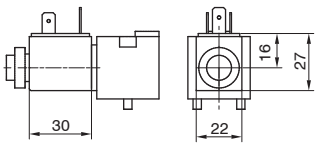


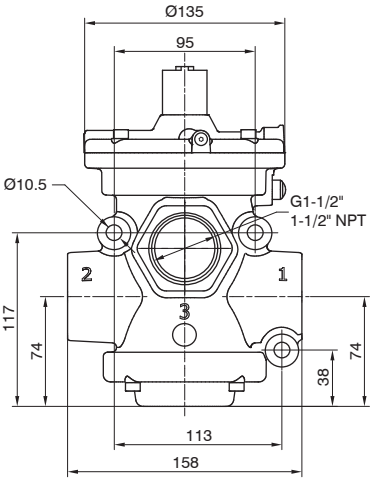
30 mm SOLENOID COIL
Connection: DIN 43650 "A" SHAPE



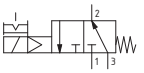




22 mm SOLENOID COIL
Connection: DIN 43650 INDUSTRIAL "B" SHAPE

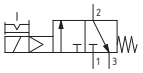


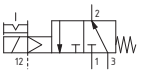

**Self feeding - N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



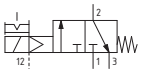
**Self feeding - N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**External feeding - N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



**External feeding - N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



Weight 3242,5 g

P Ⓒ 6A 301 Ⓥ Ⓕ Ⓣ

## Pneumatic - Spring

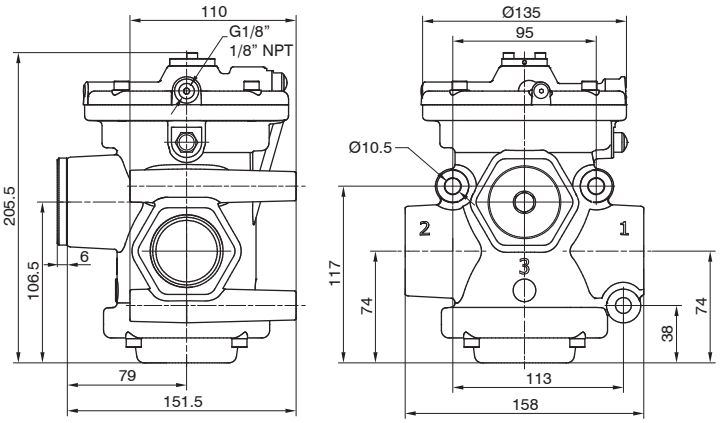
**Coding:** P©6V©11E©00000

| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 38 |
| Working ports size | G1 1/2" - 1 1/2" NPT |
| Pilot ports size | G1/8" - 1/8" NPT |
| Max. vacuum (mmHg) | 758,5 |

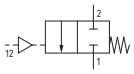
| | |
|---|---|
| © | CONNECTIONS |
| | **G** = Gas thread |
| | **N** = NPT thread |
| © | WAYS NUMBER |
| | **2** = 2 ways, 2 positions |
| | **3** = 3 ways, 2 positions |
| © | FUNCTION |
| | **A** = Normally Open (only for 3 ways) |
| | **C** = Normally Closed |

*2/2*






**N.C.**
Pump 1
Outlet port 2
Exhaust port 3 (closed)

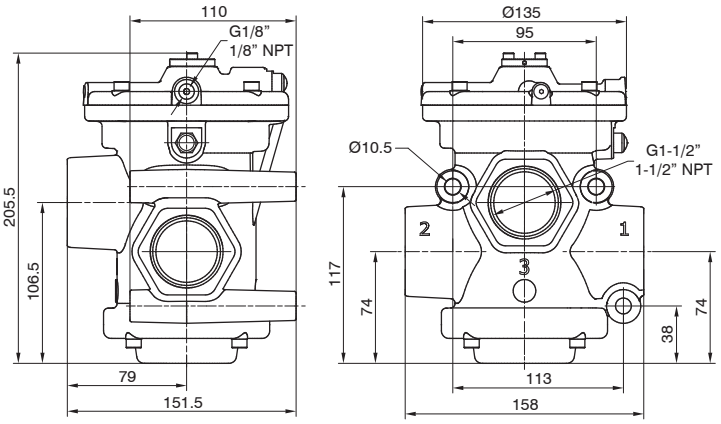


Weight 3417 g

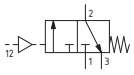
P©6V211E©00000

*3/2*

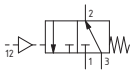





**N.O.**
Pump 3
Outlet port 2
Exhaust port 1



**N.C.**
Pump 1
Outlet port 2
Exhaust port 3



Weight 3168 g

P©6V311E©00000



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Spring

**Coding:** PⒸ6VⓃ01ⓋⒻⓉ

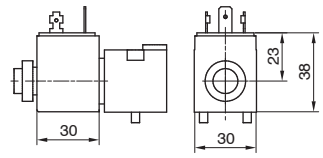
| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2 (external feeding version) |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 38 |
| Working ports size | G1 1/2" - 1 1/2" NPT |
| Pilot ports size | G1/8" - 1/8" NPT |
| Max. vacuum (mmHg) | 758,5 |
| Minimum operating vacuum (mmHg) | 250 (self feeding version) |

| | |
|---|---|
| Ⓒ | CONNECTIONS |
| | **G** = Gas thread |
| | **N** = NPT thread |
| Ⓝ | WAYS NUMBER |
| | **2** = 2 ways, 2 positions |
| | **3** = 3 ways, 2 positions |
| Ⓥ | VERSION |
| | **A** = Self feeding |
| | **E** = External feeding |
| Ⓕ | FUNCTION |
| | **A** = Normally Open (only for 3 ways) |
| | **C** = Normally Closed |
| Ⓣ | VOLTAGE (22 MM SOLENOID COIL) |
| | **S40B0** = 12 VDC |
| | **S50B0** = 24 VDC |
| | **S60B0** = 24 V 50/60 Hz |
| | **S70B0** = 110 V 50/60 Hz |
| | **S80B0** = 230 V 50/60 Hz |
| | **10000** = Without solenoid coil |
| Ⓣ | VOLTAGE (30 MM SOLENOID COIL) |
| | **S40C0** = 12 VDC |
| | **S50C0** = 24 VDC |
| | **S60C0** = 24 V 50/60 Hz |
| | **S70C0** = 110 V 50/60 Hz |
| | **S80C0** = 230 V 50/60 Hz |
| | **10000** = Without solenoid coil |

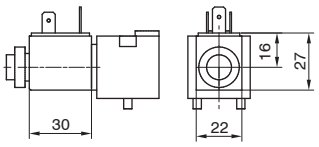
2/2

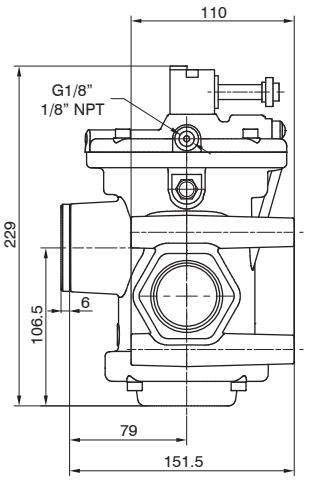


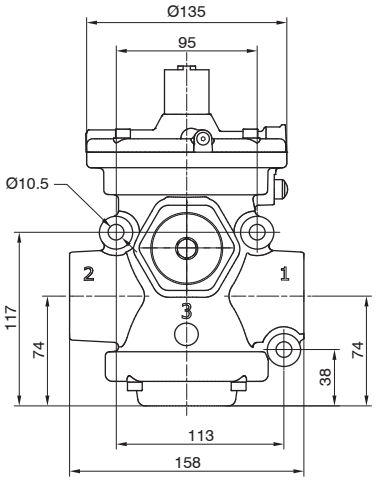
30 mm SOLENOID COIL
Connection: DIN 43650 "A" SHAPE



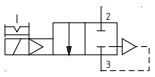

22 mm SOLENOID COIL
Connection: DIN 43650 INDUSTRIAL "B" SHAPE



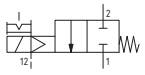




**Self feeding - N.C.**
Pump 3
Outlet port 2
Exhaust port 1 (closed)



**External feeding - N.C.**
Pump 1
Outlet port 2
Exhaust port 3 (closed)



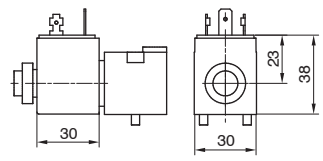
Weight 3491,5 g

PⒸ6V201ⓋⒻⓉ

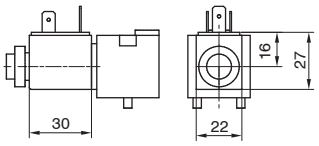
3/2

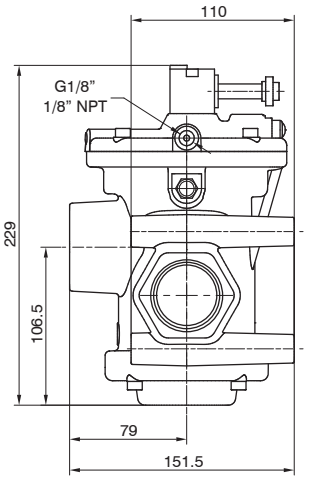


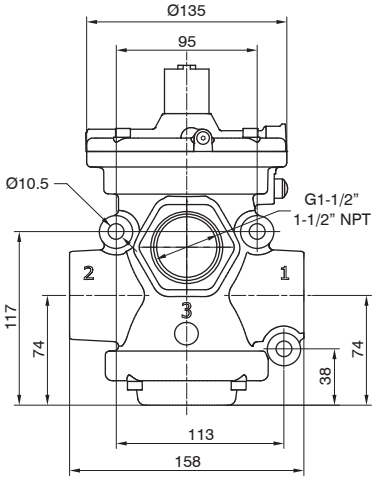
30 mm SOLENOID COIL
Connection: DIN 43650 "A" SHAPE



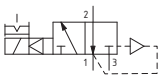

22 mm SOLENOID COIL
Connection: DIN 43650 INDUSTRIAL "B" SHAPE



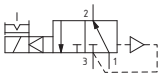



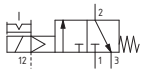

**Self feeding - N.O.**
Pump 1
Outlet port 2
Exhaust port 3



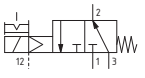
**Self feeding - N.C.**
Pump 3
Outlet port 2
Exhaust port 1



**External feeding - N.O.**
Pump 3
Outlet port 2
Exhaust port 1



**External feeding - N.C.**
Pump 1
Outlet port 2
Exhaust port 3



Weight 3242,5 g

PⒸ6V301ⓋⒻⓉ

## Series T772-773 - for compressed air and vacuum in technopolymer - G1/2" and G3/4"

The range of G1/2" and G3/4" pilot and solenoid operated poppet valves are manufactured with high impact resistant thermoplastic.
The use of this materiel results in a versatile, lightweight and economical valve.
The traditional piston lip seal has been replaced with a rolling diaphragm, thereby eliminating frictional wear and tear to this seal.
The valves (with the exception of certain vacuum models) also features a seal, which separates port 3 from the piston head. The inclusion of this seal has enhanced the valve's performance and allows the valve to be used as normally open (a configuration not possible in the Zama series).
Solenoid operated valves (both internal and external pilot versions) are fitted with a quick exhaust unit, which reduces the return stroke operating time by 60%.
The bulk of the valves in this series use the MP type operator, the exception being internally piloted vacuum models, which use the MV operator.
These operators differ from the M2 type in that they have self-tapping mounting screws for use in plastics.
**The ordering code are referring to the solenoid valves with mechanics "MP" or "MV" assembled.**
**Coils are not included and have to be ordered separately (series 300, Section 1, General Catalogue), with the exception of the bistable versions which already include 24V DC Coils (N331.0A).**
**Coils c UL us homologated are also available. (See series 300).**

### Construction characteristics

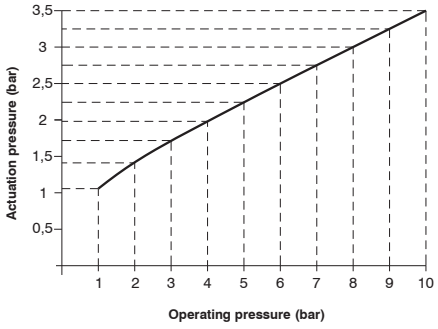
| | |
|---|---|
| Body, operator and end cover | High impact resistant thermoplastic |
| Seals and poppets | NBR |
| Diaphragm | Oil resistant rubber (NBR) |
| Springs | AISI 302 stainless steel |
| Piston and shaft | Acetal resin |

### Use and maintenance

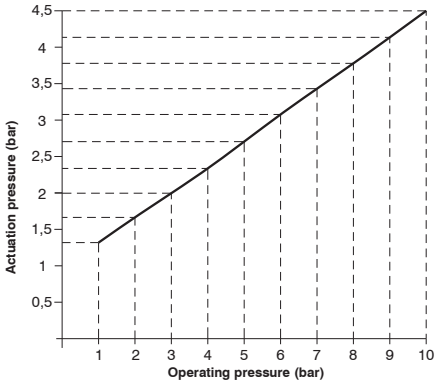
These valves have a mean life of 10 to 15 million cycles under normal operating conditions.
Lubrication is not required for good operation but we recommend good filtration to avoid dirty deposit causing malfunction.
Please ensure that the valve is being used according with the manufacturers specification, such as air pressure and temperature.
The exhaust port of the distributor has to be protected in a dusty and dirty environment.
For these products, according to the construction technique and special application, is not required any maintenance with parts replacement.
When necessary it is sufficient to clean the internal parts.
When it is used the solenoid valves with internal pilot, either for air or vacuum, inlet flow rate must be equal or higher that the required consumption flow rate.
Otherwise is better choose the external pilot version.

### MINIMUM PILOTING PRESSURE DIAGRAM (Valves for compressed air)
### PNEUMATIC/SPRING AND EXTERNAL SOLENOID PILOT VERSION

**Normally closed valve**




**Normally open valve**





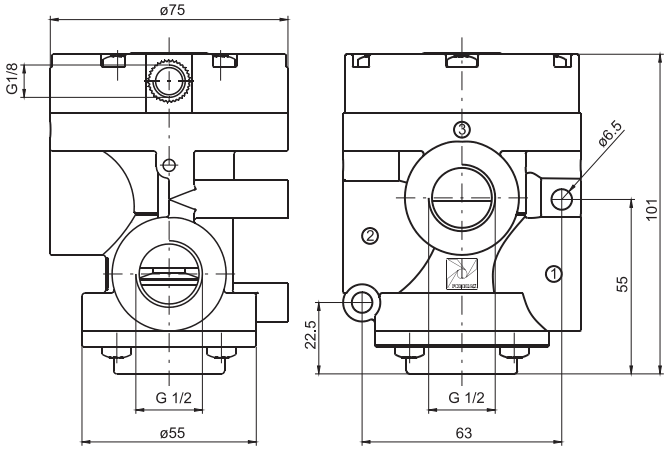
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pneumatic - Spring

**Coding:** T772.32.11.1

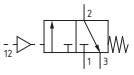
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | See diagram at general page |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 4100 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |



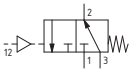



Weight 350 g

**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



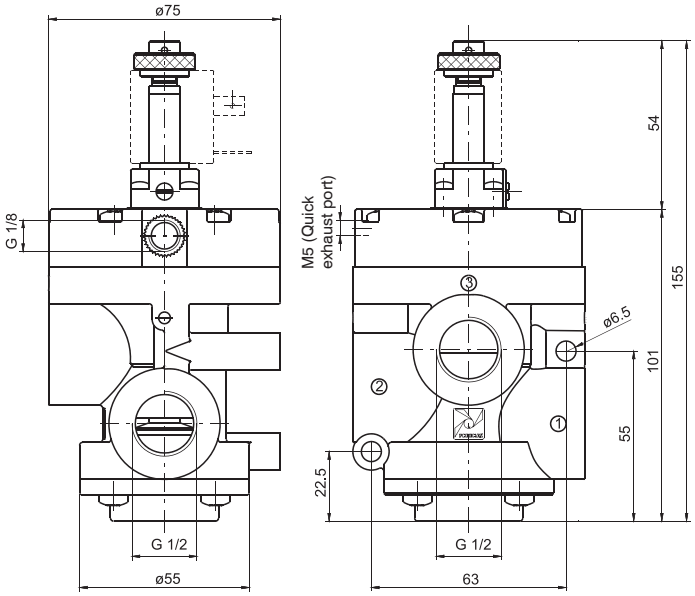
## Solenoid-Spring-Internal pilot

**Coding:** T772.32.0.Ⓕ.MP

| Ⓕ | FUNCTION |
|---|---|
| | **1AA** = Normally Open |
| | **1AC** = Normally Closed |

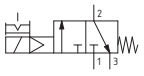
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 4100 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |



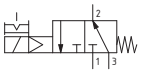



Weight 390 g

**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1

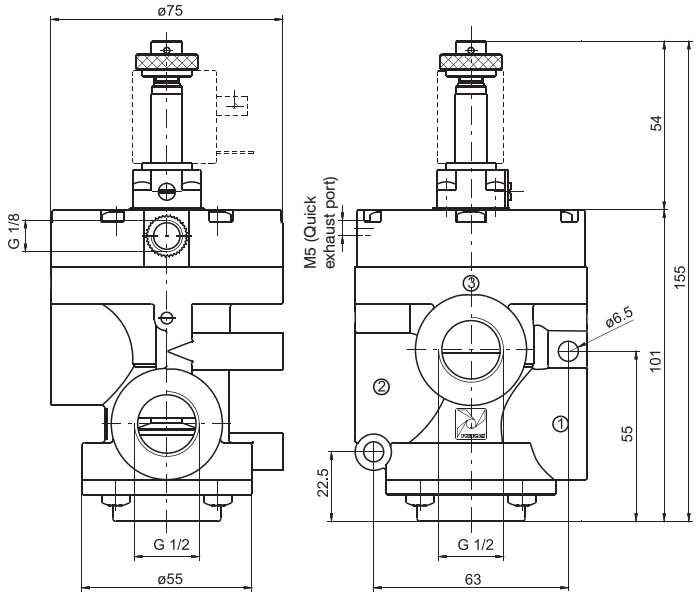


## Solenoid-Spring-External pilot

**Coding:** T772.32.0.1.MP

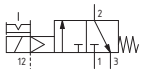
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | See diagram at general page |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 4100 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |



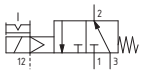



Weight 390 g

**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



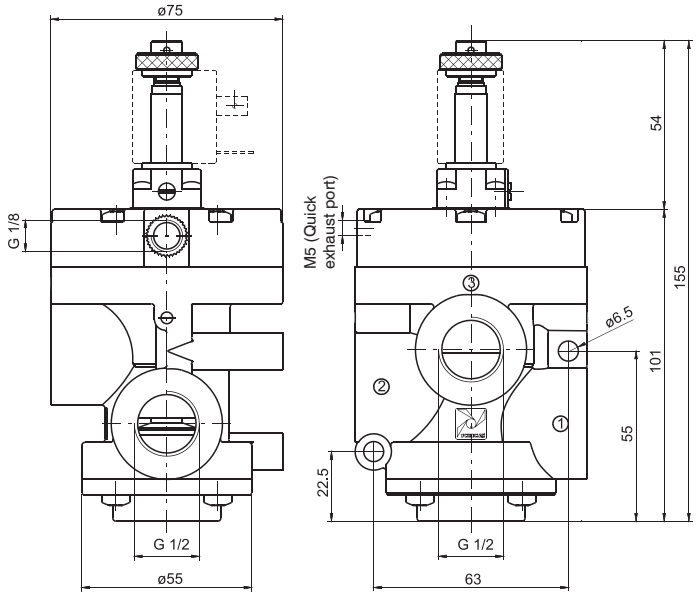
## Solenoid-Spring - Internal pilot with quick exhaust

**Coding:** T772S.32.0.Ⓕ.MP

| Ⓕ | FUNCTION |
|---|---|
| | **1AA** = Normally Open |
| | **1AC** = Normally Closed |

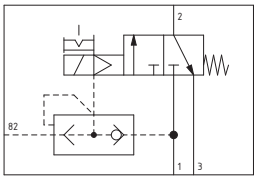
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 4100 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |



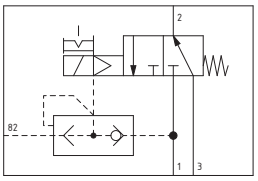



Weight 390 g

**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

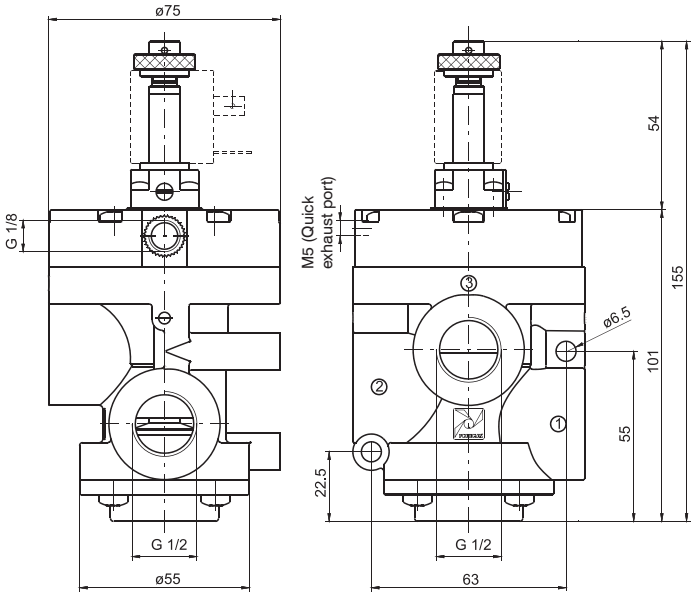
## Solenoid-Spring - External pilot with quick exhaust

**Coding:** T772S.32.0.1.MP

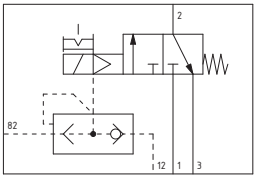
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | See diagram at general page |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 4100 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |



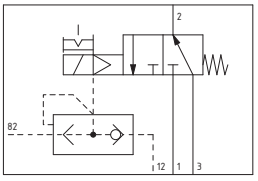
Weight 390 g




**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3




**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1

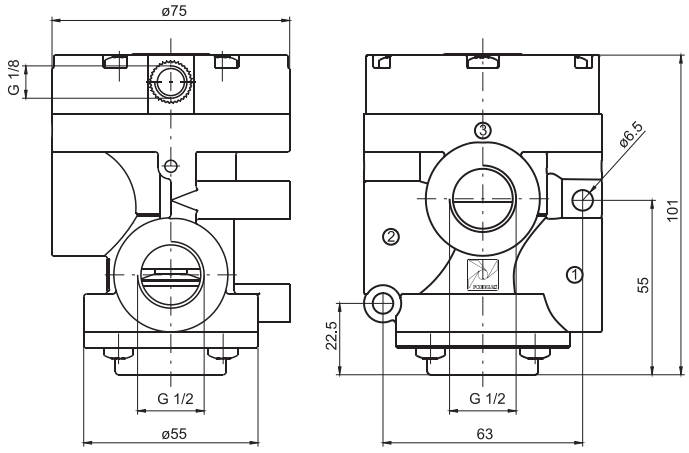


## Pneumatic - Spring

**Coding:** T772/V.32.11.1

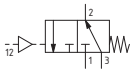
| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |
| Response time according to ISO 12238, activation time (ms) | N.C. = 50 - N.O. = 27 |
| Response time according to ISO 12238, deactivation time (ms) | N.C. = 150 - N.O. = 195 |



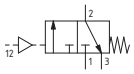



Weight 350 g

**N.C.**
Exhaust port 3
Outlet port 2
Pump 1



**N.O.**
Exhaust port 1
Outlet port 2
Pump 3



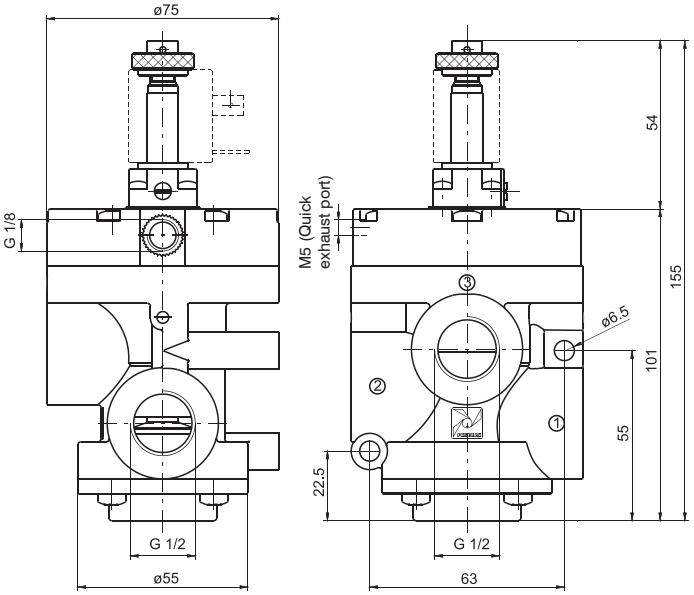
## Solenoid-Spring-Internal pilot

**Coding:** T772/V.32.0.Ⓕ.MV

| Ⓕ | FUNCTION |
|---|---|
| | **1AA** = Normally Open |
| | **1AC** = Normally Closed |

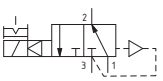
| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |
| Response time according to ISO 12238, activation time (ms) | 1AC = 55 - 1AA = 33 |
| Response time according to ISO 12238, deactivation time (ms) | 1AC = 30 - 1AA = 38 |



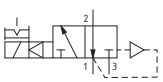



Weight 390 g

**N.C.**
Exhaust port 1
Outlet port 2
Pump 3



**N.O.**
Exhaust port 3
Outlet port 2
Pump 1





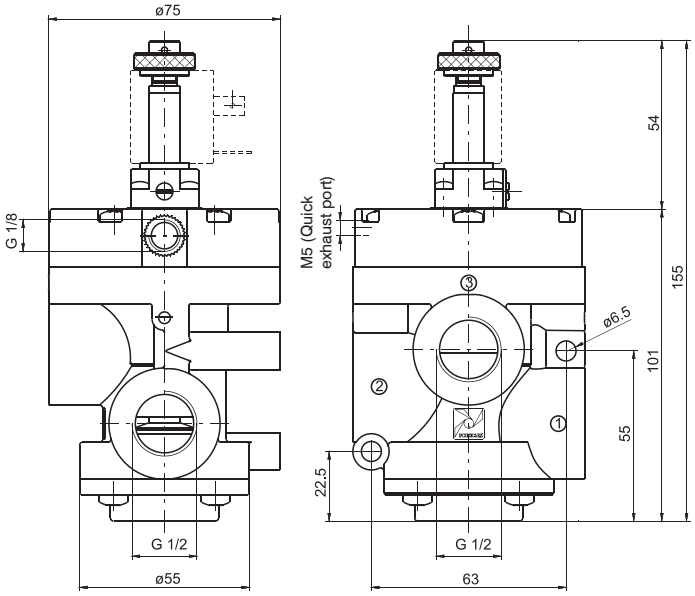
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Spring-External pilot

**Coding:** T772/V.32.0.1.MP

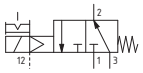
| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |
| Response time according to ISO 12238, activation time (ms) | N.C. = 42 - N.O. = 22 |
| Response time according to ISO 12238, deactivation time (ms) | N.C. = 135 - N.O. = 175 |



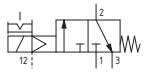



Weight 390 g

**N.C.**
Exhaust port 3
Outlet port 2
Pump 1



**N.O.**
Exhaust port 1
Outlet port 2
Pump 3

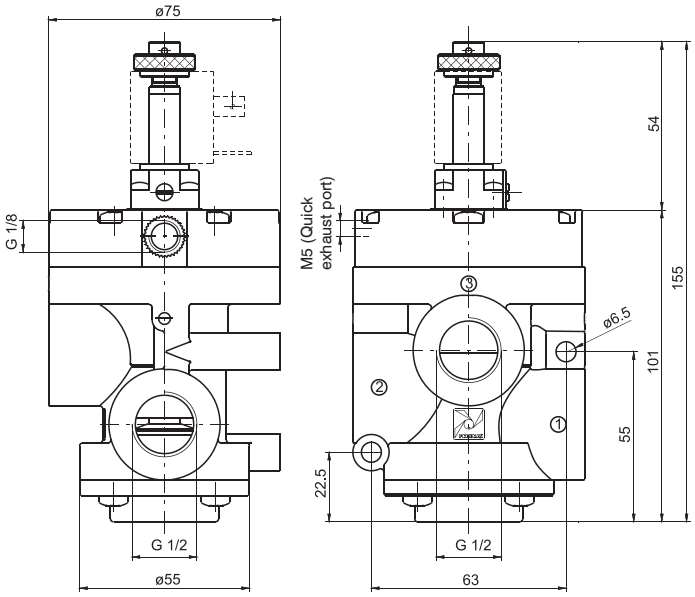


## Solenoid-Spring - External pilot with quick exhaust

**Coding:** T772/VS.32.0.1.MP

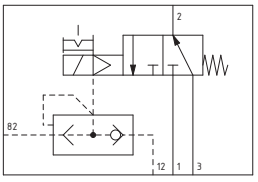
| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |
| Response time according to ISO 12238, activation time (ms) | N.C. = 43 - N.O. = 25 |
| Response time according to ISO 12238, deactivation time (ms) | N.C. = 37 - N.O. = 42 |



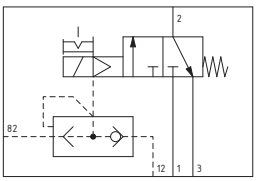



Weight 390 g

**N.C.**
Exhaust port 3
Outlet port 2
Pump 1



**N.O.**
Exhaust port 1
Outlet port 2
Pump 3

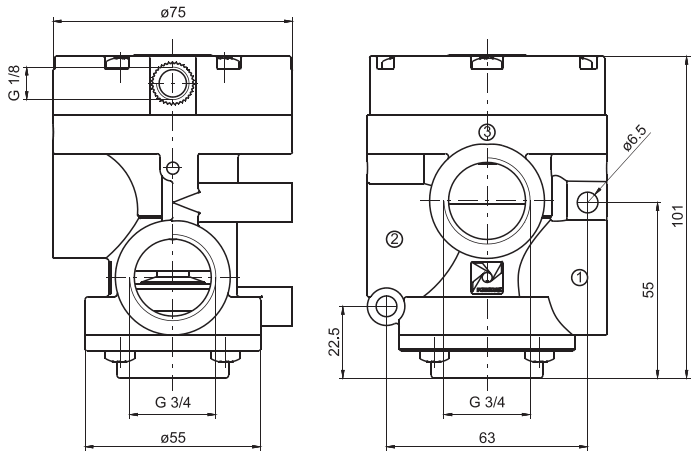


## Pneumatic - Spring

**Coding:** T773.32.11.1

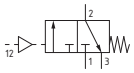
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | See diagram at general page |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 7500 |
| Orifice size (mm) | 20 |
| Working ports size | G3/4" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |



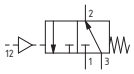



Weight 330 g

**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



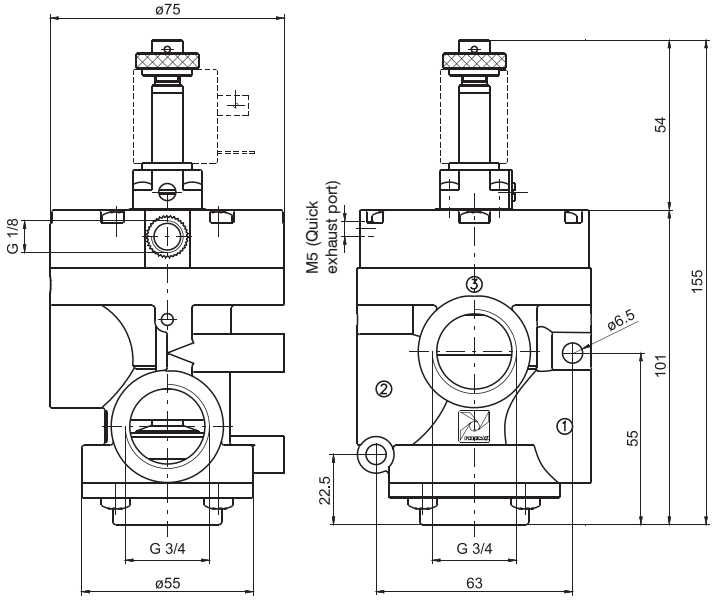
## Solenoid-Spring-Internal pilot

**Coding:** T773.32.0.Ⓕ.MP

| Ⓕ | FUNCTION |
|---|---|
| | **1AA** = Normally Open |
| | **1AC** = Normally Closed |

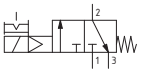
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 7500 |
| Orifice size (mm) | 20 |
| Working ports size | G3/4" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |



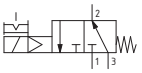



Weight 370 g

**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



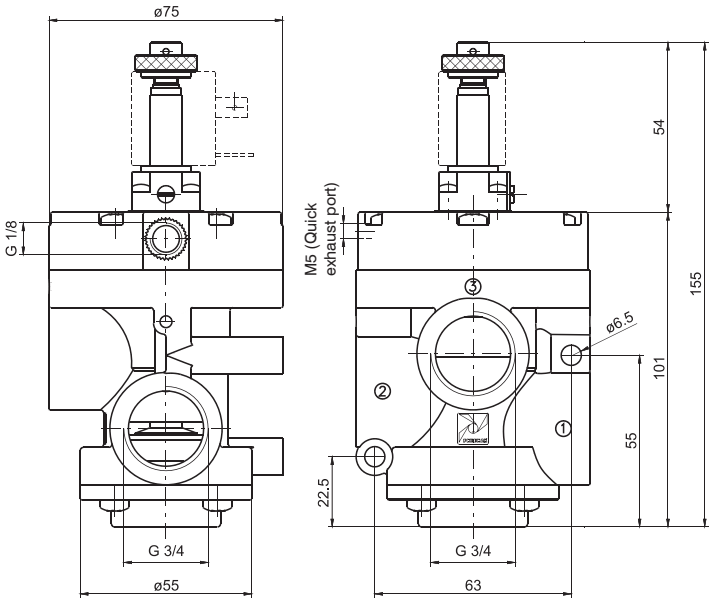

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Spring-External pilot

**Coding:** T773.32.0.1.MP

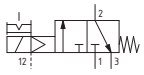
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | See diagram at general page |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 7500 |
| Orifice size (mm) | 20 |
| Working ports size | G3/4" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |



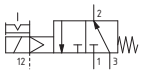



Weight 370 g

**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



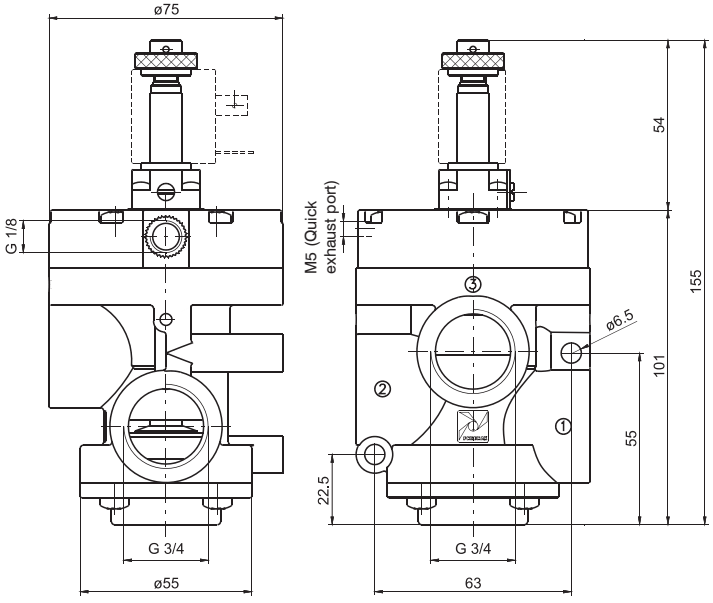
## Solenoid-Spring - Internal pilot with quick exhaust

**Coding:** T773S.32.0.Ⓕ.MP

| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 7500 |
| Orifice size (mm) | 20 |
| Working ports size | G3/4" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |

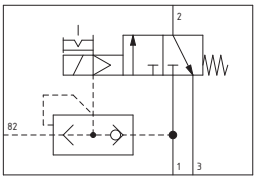
| Ⓕ | FUNCTION |
|---|---|
| | **1AA** = Normally Open |
| | **1AC** = Normally Closed |



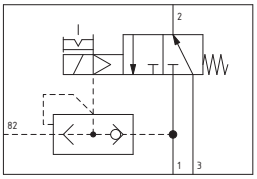



Weight 370 g

**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



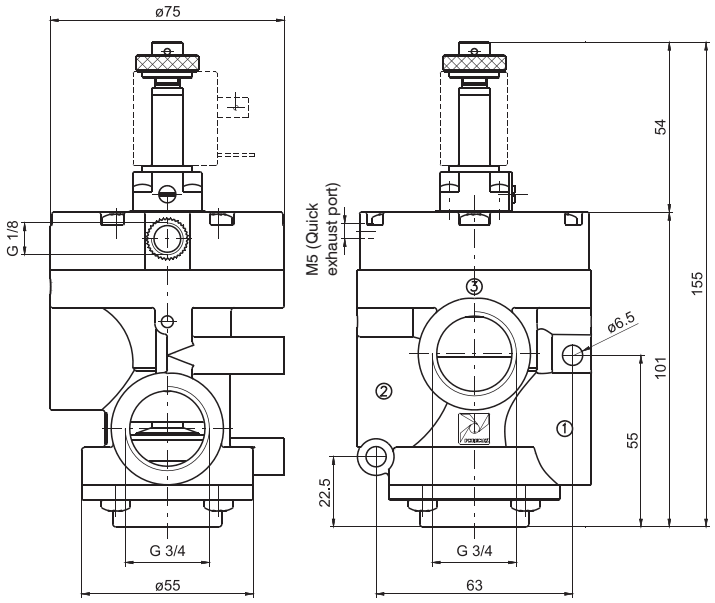
## Solenoid-Spring - External pilot with quick exhaust

**Coding:** T773S.32.0.1.MP

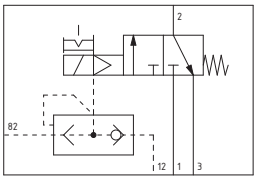
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | See diagram at general page |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 7500 |
| Orifice size (mm) | 20 |
| Working ports size | G3/4" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |



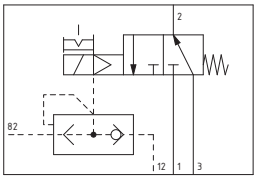
Weight 370 g




**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3




**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1





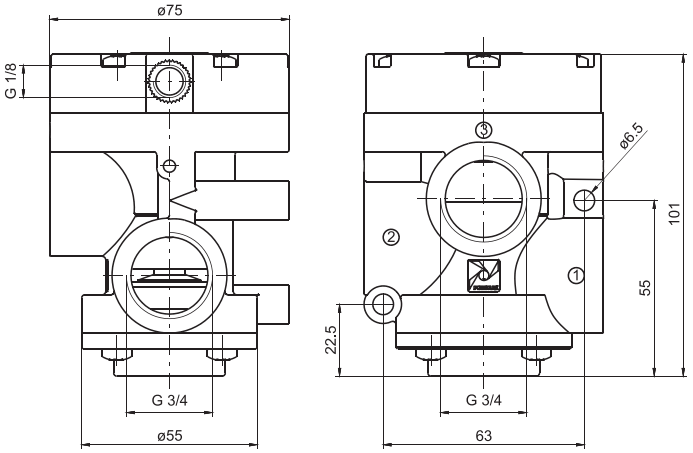

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pneumatic - Spring

**Coding:** T773/V.32.11.1

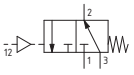
| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 20 |
| Working ports size | G3/4" |
| Pilot ports size | G1/8" |
| Response time according to ISO 12238, activation time (ms) | N.C. = 28 - N.O. = 50 |
| Response time according to ISO 12238, deactivation time (ms) | N.C. = 190 - N.O. = 150 |



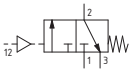



Weight 330 g

**N.C.**
Exhaust port 3
Outlet port 2
Pump 1



**N.O.**
Exhaust port 1
Outlet port 2
Pump 3



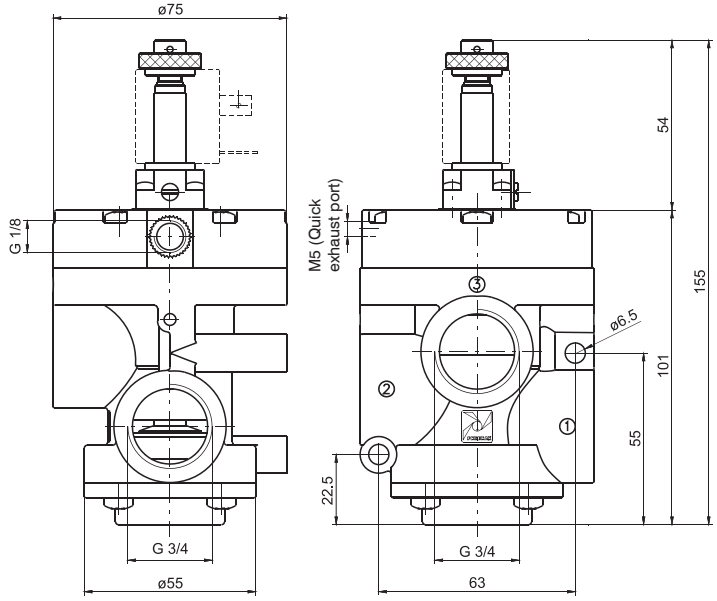
## Solenoid-Spring-Internal pilot

**Coding:** T773/V.32.0.Ⓕ.MV

| Ⓕ | FUNCTION |
|---|---|
| | **1AA** = Normally Open |
| | **1AC** = Normally Closed |

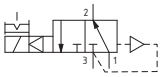
| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 20 |
| Working ports size | G3/4" |
| Pilot ports size | G1/8" |
| Response time according to ISO 12238, activation time (ms) | 1AC = 35 - 1AA = 32 |
| Response time according to ISO 12238, deactivation time (ms) | 1AC = 30 - 1AA = 80 |



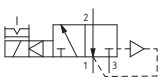



Weight 370 g

**N.C.**
Exhaust port 1
Outlet port 2
Pump 3



**N.O.**
Exhaust port 3
Outlet port 2
Pump 1

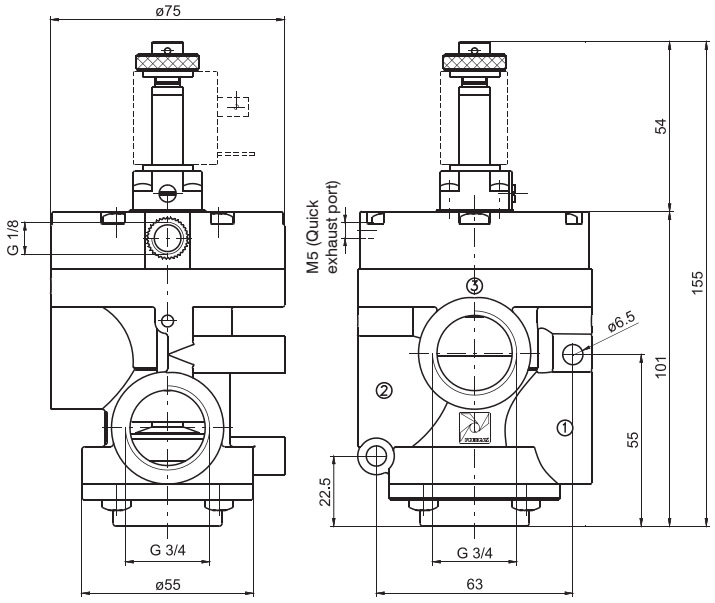


## Solenoid-Spring-External pilot

**Coding:** T773/V.32.0.1.MP

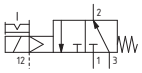
| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 20 |
| Working ports size | G3/4" |
| Pilot ports size | G1/8" |
| Response time according to ISO 12238, activation time (ms) | N.C. = 25 - N.O. = 40 |
| Response time according to ISO 12238, deactivation time (ms) | N.C. = 175 - N.O. = 145 |



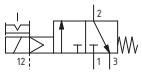



Weight 350 g

**N.C.**
Exhaust port 3
Outlet port 2
Pump 1



**N.O.**
Exhaust port 1
Outlet port 2
Pump 3

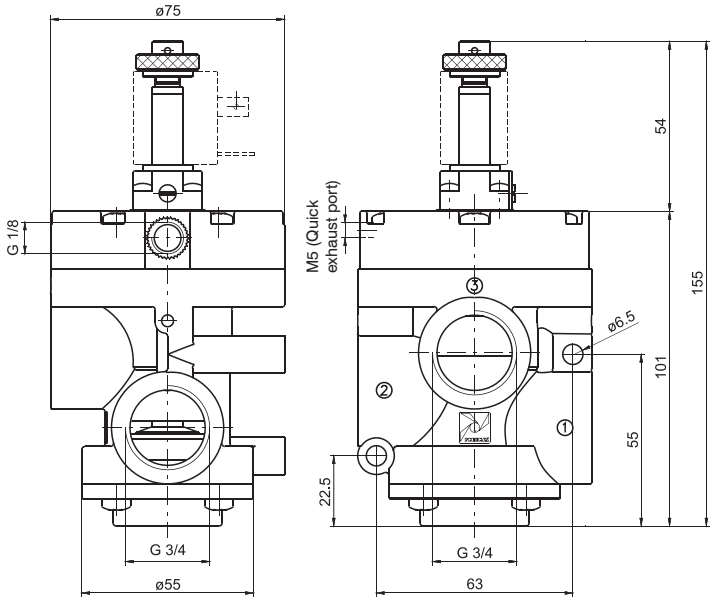


## Solenoid-Spring - External pilot with quick exhaust

**Coding:** T773/VS.32.0.1.MP

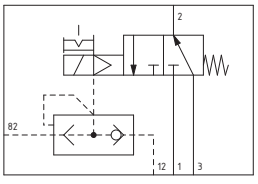
| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 20 |
| Working ports size | G3/4" |
| Pilot ports size | G1/8" |
| Response time according to ISO 12238, activation time (ms) | N.C. = 25 - N.O. = 42 |
| Response time according to ISO 12238, deactivation time (ms) | N.C. = 40 - N.O. = 38 |



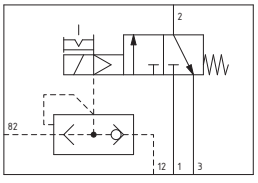



Weight 350 g

**N.C.**
Exhaust port 3
Outlet port 2
Pump 1



**N.O.**
Exhaust port 1
Outlet port 2
Pump 3





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

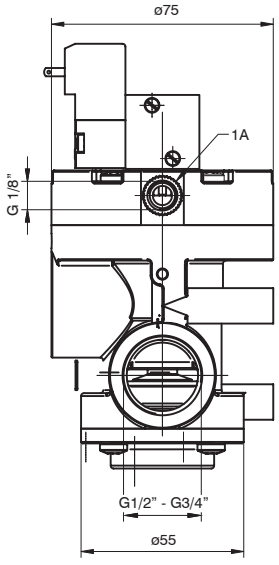
## Bistable for compressed air - G1/2"

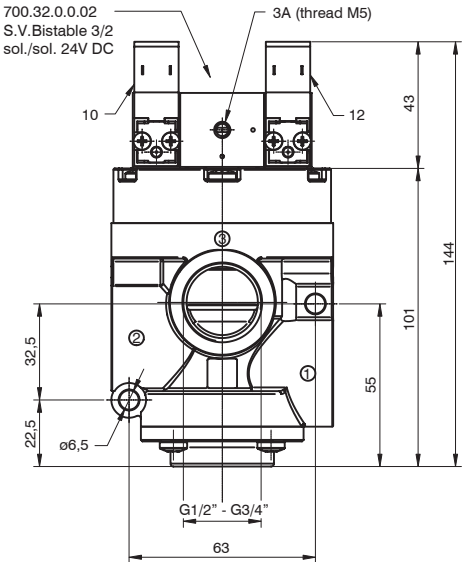
**Coding:** T772.32.0.1.BP

| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 4100 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |

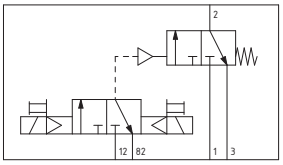


Weight 550 g

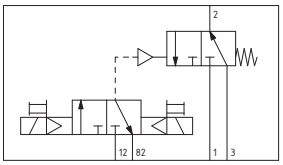



**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



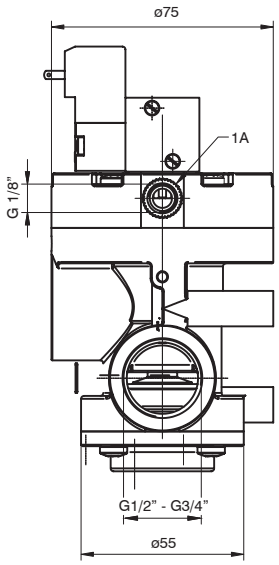
## Bistable for compressed air - G3/4"

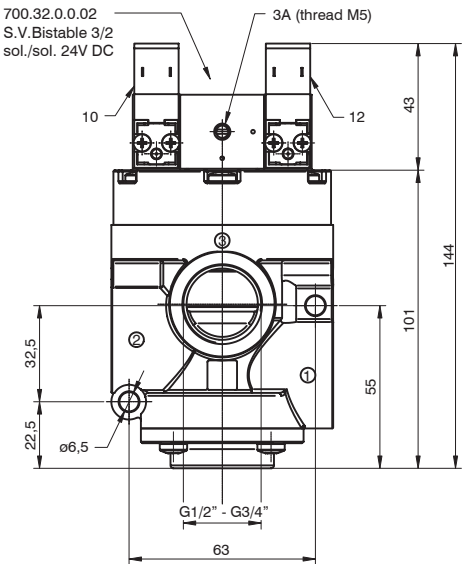
**Coding:** T773.32.0.1.BP

| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 7500 |
| Orifice size (mm) | 15 |
| Working ports size | G3/4" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |

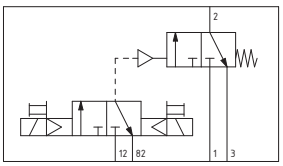


Weight 550 g

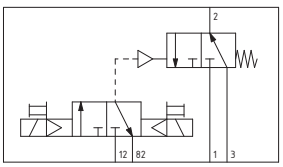



**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1

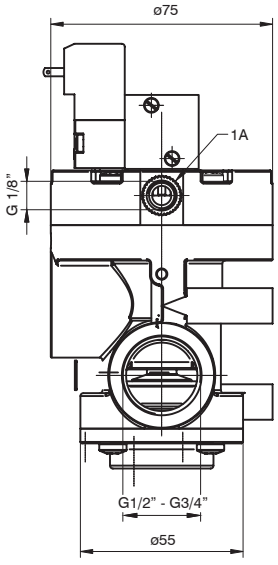


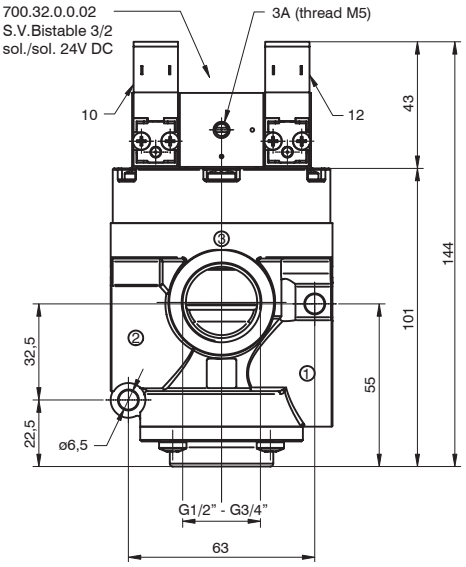
## Bistable for compressed air with quick exhaust - G1/2"

**Coding:** T772S.32.0.1.BP

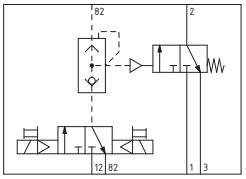
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 4100 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |



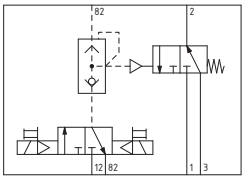



**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



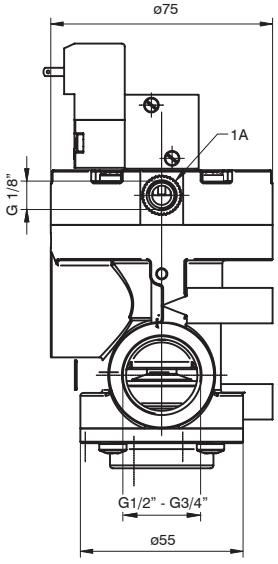
Weight 550 g

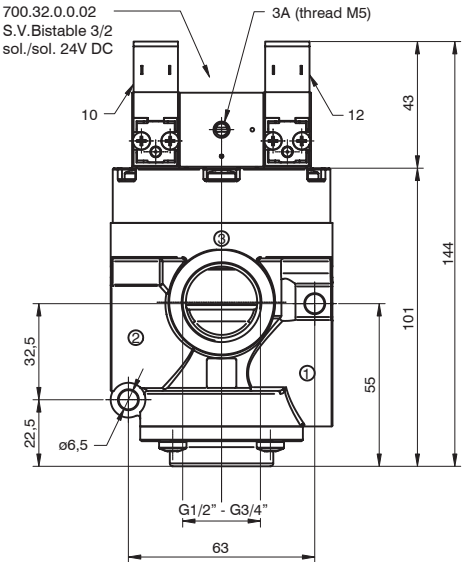
## Bistable for compressed air with quick exhaust G3/4"

**Coding:** T773S.32.0.1.BP

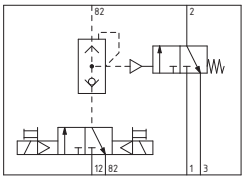
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 7500 |
| Orifice size (mm) | 15 |
| Working ports size | G3/4" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |



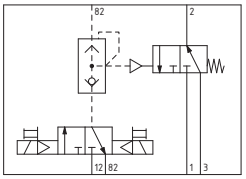



**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



Weight 550 g



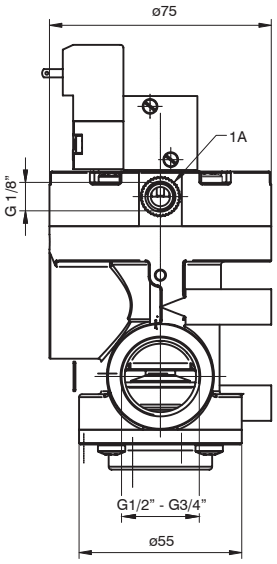
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

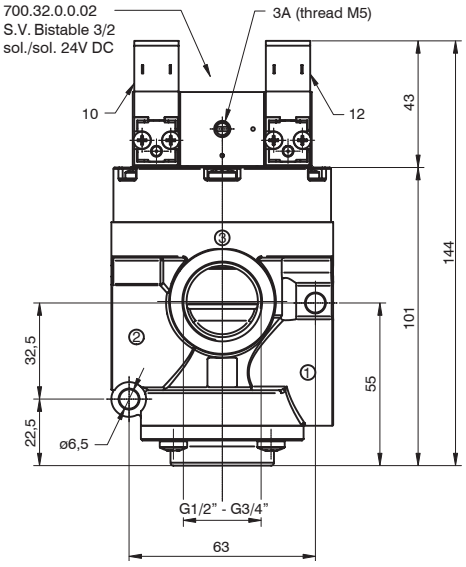
## Bistable for vacuum - G1/2"

**Coding:** T772/V.32.0.1.BP

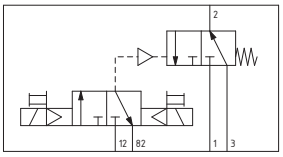
| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |



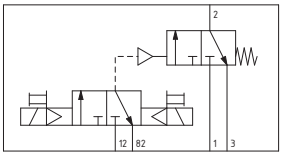



**N.C.**
Pump 1
Outlet port 2
Exhaust port 3



**N.O.**
Pump 3
Outlet port 2
Exhaust port 1



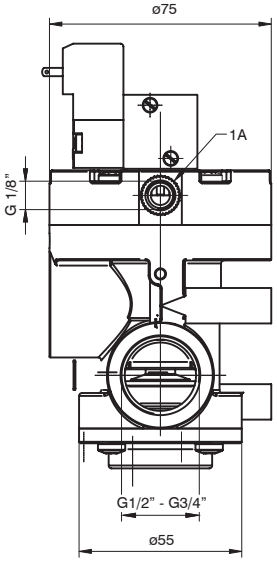
Weight 550 g

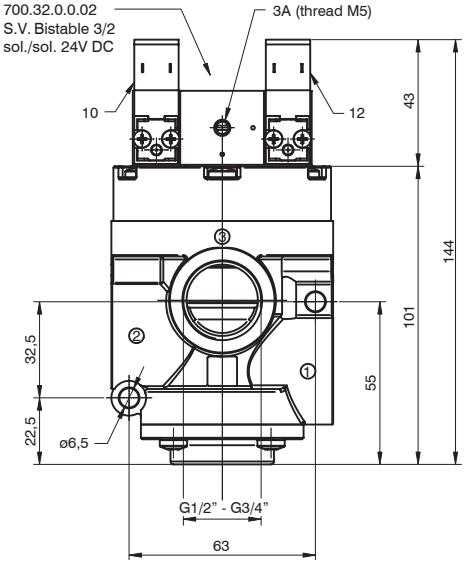
## Bistable for vacuum - G3/4"

**Coding:** T773/V.32.0.1.BP

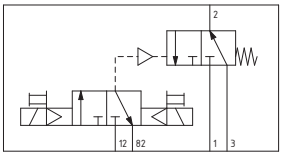
| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 15 |
| Working ports size | G3/4" |
| Pilot ports size | G1/8" |



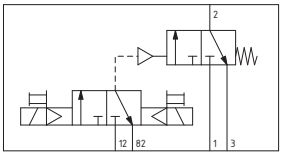



**N.C.**
Pump 1
Outlet port 2
Exhaust port 3



**N.O.**
Pump 3
Outlet port 2
Exhaust port 1



Weight 550 g

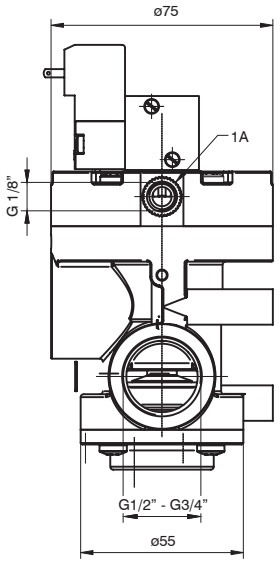
## Bistable for vacuum with quick exhaust - G1/2"

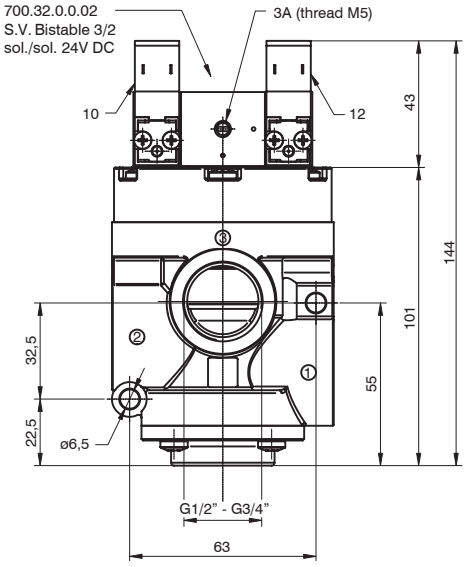
**Coding:** T772/VS.32.0.1.BP

| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 15 |
| Working ports size | G1/2" |
| Pilot ports size | G1/8" |

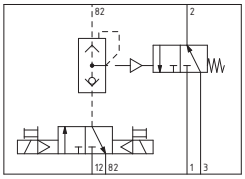


Weight 550 g

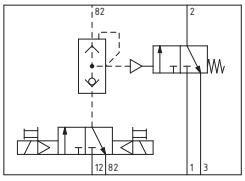



**N.C.**
Pump 1
Outlet port 2
Exhaust port 3



**N.O.**
Pump 3
Outlet port 2
Exhaust port 1



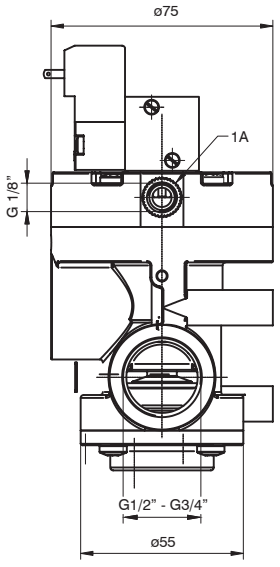
## Bistable for vacuum with quick exhaust - G3/4"

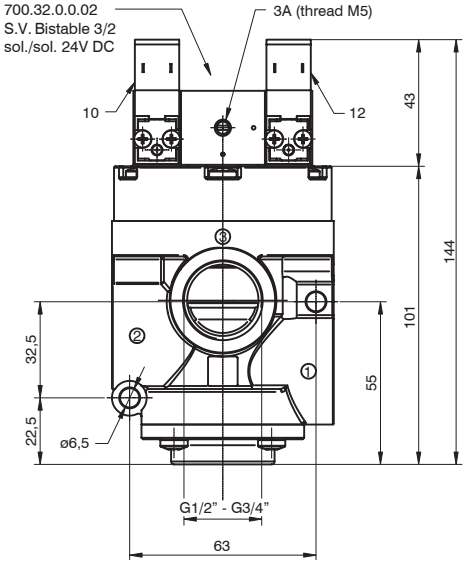
**Coding:** T773/VS.32.0.1.BP

| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 15 |
| Working ports size | G3/4" |
| Pilot ports size | G1/8" |

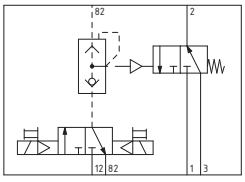


Weight 550 g

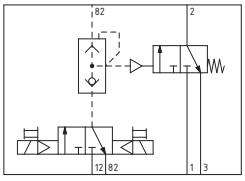



**N.C.**
Pump 1
Outlet port 2
Exhaust port 3



**N.O.**
Pump 3
Outlet port 2
Exhaust port 1





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series T771 - for compressed air and vacuum in technopolymer - G1"

The range of G1" pilot and solenoid operated poppet valves represents an evolution of the current popular Zama series and of the Series T772-T773 (G1/2"-3/4").
Also for this series the main feature is the technopolimer material used to mould most of its components.
The use of this materiel results in a versatile, lightweight and economical valve.
This series also has other technical and functional enhancements over the existing range. Firstly, the traditional piston lip seal has been replaced with a rolling diaphragm, thereby eliminating frictional wear and tear to this seal.
This series (with the exception of certain vacuum models) also features a seal, which separates port 3 from the piston head. The inclusion of this seal has enhanced the valve's performance and allows the valve to be used as normally open (a configuration not possible in the Zama series).
Solenoid operated valves (both internal and external pilot versions) are fitted with a quick exhaust unit, which reduces the return stroke operating time by 80%.
The bulk of the valves in this series use the MP type operator, the exception being internally piloted vacuum models, which use the MV operator. These operators differ from the M2 type in that they have self-tapping mounting screws for use in plastics.
Bistable versions are also available, both for air or for vacuum. These valves are fitted with a 3/2 sol-sol valve (instead of the standard pilot valve) fitted with two 15mm 24V Dc microvalves (N331.0A).
**The ordering code are referring to the solenoid valves with mechanics "MP" or "MV" assembled.**
**Coils are not included and have to be ordered separately (series 300, Section 1, General Catalogue), with the exception of the bistable versions which already include 24V Dc Coils (N331.0A).**
**Coil c UL us homologated are available (see 300 Series).**

### Construction characteristics

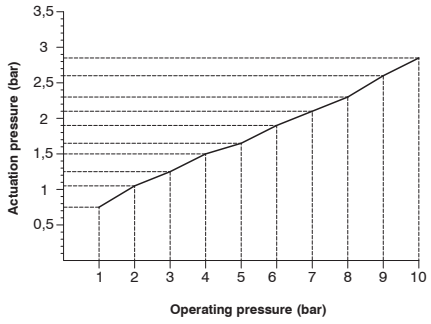
| | |
|---|---|
| Body, operator and end cover | High impact resistant thermoplastic |
| Seals and poppets | NBR |
| Diaphragm | Oil resistant rubber (NBR) |
| Springs | AISI 302 stainless steel |
| Piston and shaft | Acetal resin |

### Use and maintenance

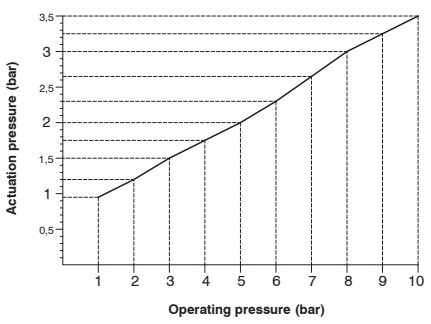
These valves have a mean life of 10 to 15 million cycles under normal operating conditions.
Lubrication is not required for good operation but we recommend good filtration to avoid dirty deposit causing malfunction.
Please ensure that the valve is being used according with the manufacturers specification, such as air pressure and temperature.
The exhaust port of the distributor has to be protected in a dusty and dirty environment.
For these products, according to the construction technique and special application, is not required any maintenance with parts replacement.
When necessary it is sufficient to clean the internal parts.
When it is used the solenoid valves with internal pilot, either for air or vacuum, inlet flow rate must be equal or higher that the required consumption flow rate.
Otherwise is better choose the external pilot version.

### MINIMUM PILOTING PRESSURE DIAGRAM (Valves for compressed air)
### PNEUMATIC/SPRING AND EXTERNAL SOLENOID PILOT VERSION

**Normally closed valve**




**Normally open valve**

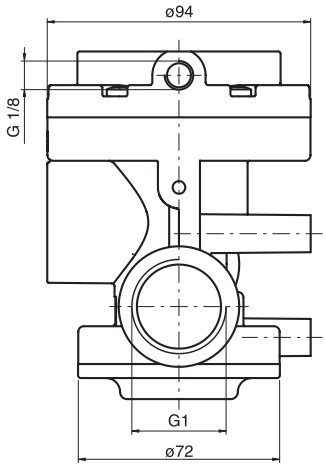


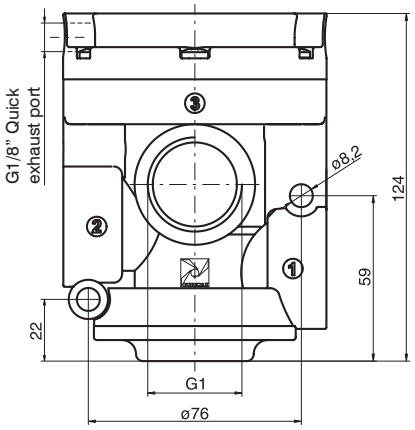
## Pneumatic - Spring

**Coding:** T771.32.11.1

| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | See diagram at general page |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 12500 |
| Orifice size (mm) | 25 |
| Working ports size | G1" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |

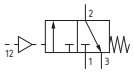




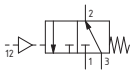




Weight 480 g

**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



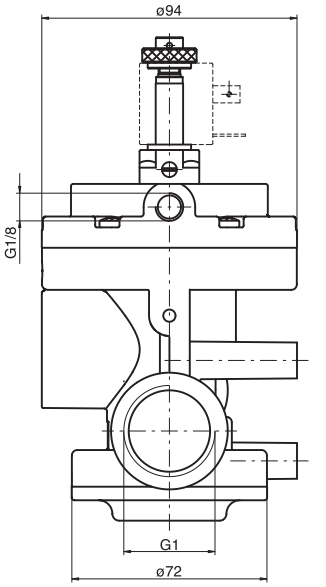
## Solenoid-Spring-Internal pilot

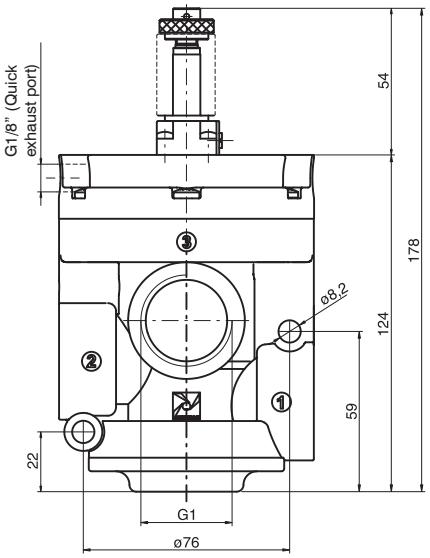
**Coding:** T771.32.0.Ⓕ.MP

| Ⓕ | FUNCTION |
|---|---|
| | **1AC** = Normally Closed |
| | **1AA** = Normally Open |

| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 12500 |
| Orifice size (mm) | 25 |
| Working ports size | G1" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |

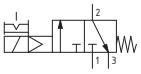




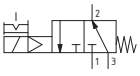




Weight 520 g

**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1





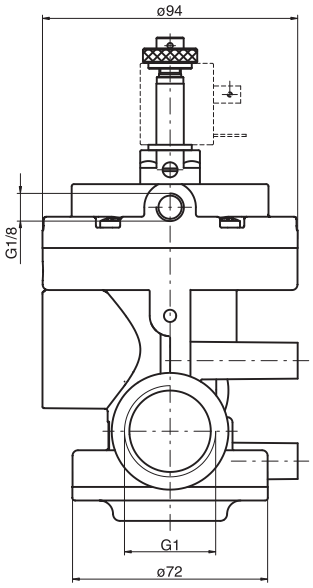
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

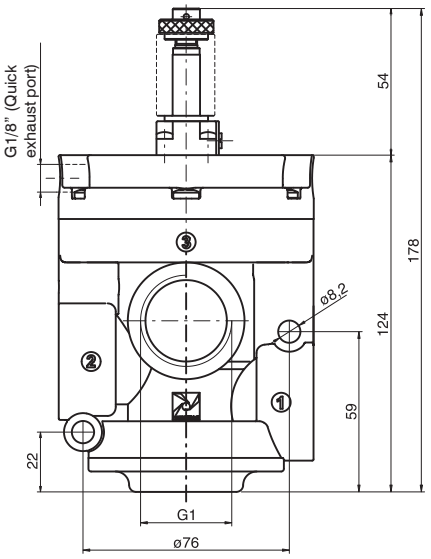
## Solenoid-Spring-External pilot

**Coding:** T771.32.0.1.MP

| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | See diagram at general page |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 12500 |
| Orifice size (mm) | 25 |
| Working ports size | G1" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |

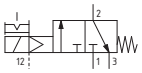




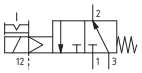




Weight 520 g

**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3




**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



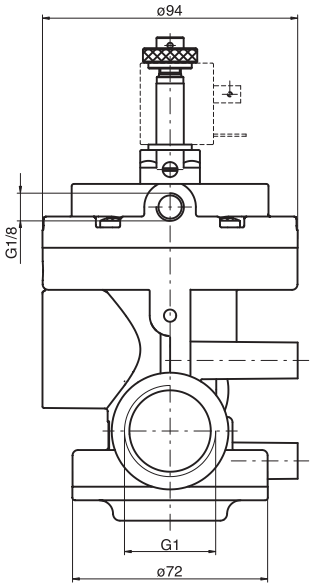

## Solenoid-Spring - Internal pilot with quick exhaust

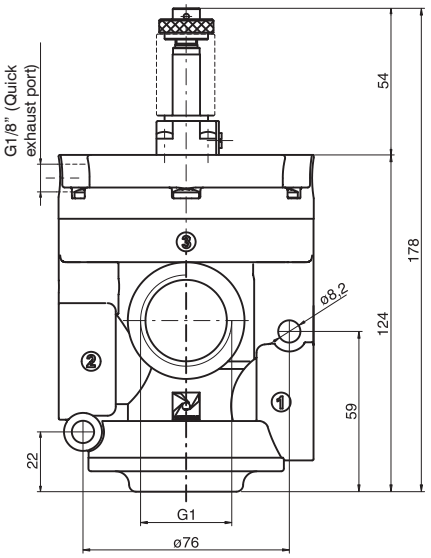
**Coding:** T771S.32.0.Ⓕ.MP

| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 12500 |
| Orifice size (mm) | 25 |
| Working ports size | G1" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |

| Ⓕ | FUNCTION |
|---|---|
| | **1AC** = Normally Closed |
| | **1AA** = Normally Open |

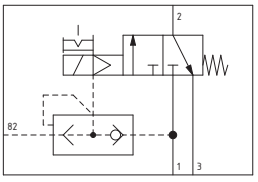




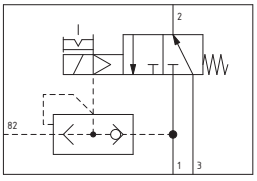




Weight 520 g

**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3




**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



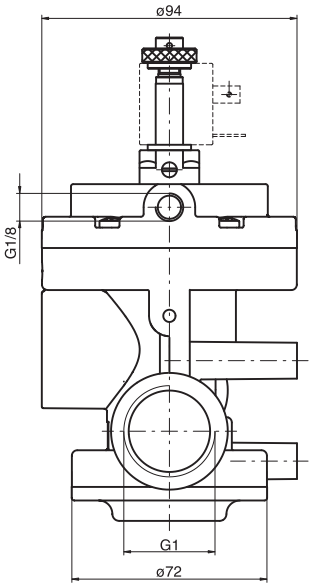
## Solenoid-Spring - External pilot with quick exhaust

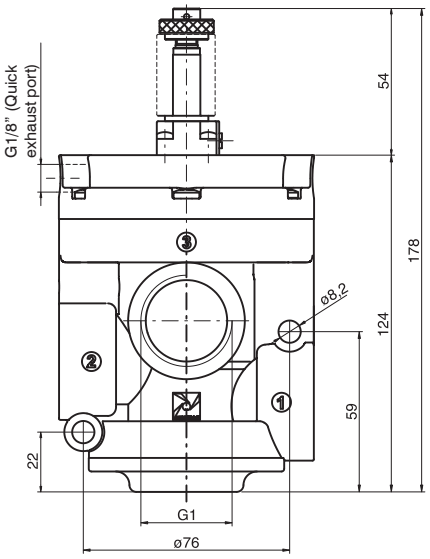
**Coding:** T771S.32.0.1.MP

| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | See diagram at general page |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 12500 |
| Orifice size (mm) | 25 |
| Working ports size | G1" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |

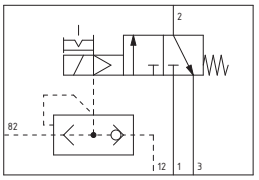


Weight 520 g

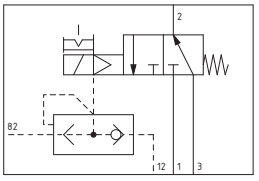



**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3




**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1





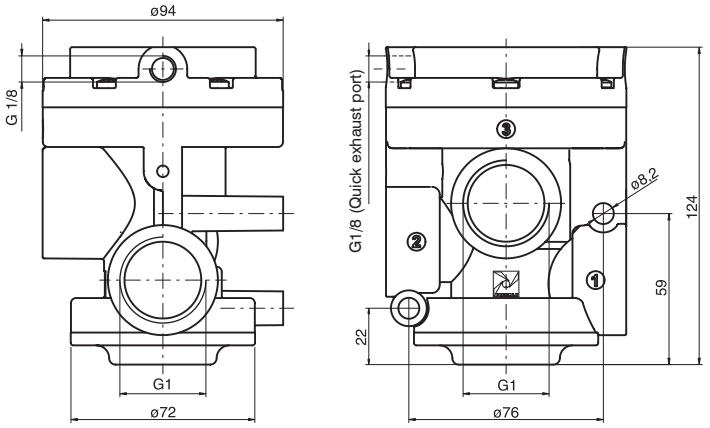

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pneumatic - Spring

**Coding:** T771/V.32.11.1

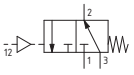
| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 25 |
| Working ports size | G1" |
| Pilot ports size | G1/8" |
| Response time according to ISO 12238, activation time (ms) | N.C. = 55 - N.O. = 19 |
| Response time according to ISO 12238, deactivation time (ms) | N.C. = 320 - N.O. = 450 |



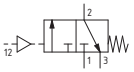



Weight 480 g

**N.C.**
Exhaust port 3
Outlet port 2
Pump 1



**N.O.**
Exhaust port 1
Outlet port 2
Pump 3



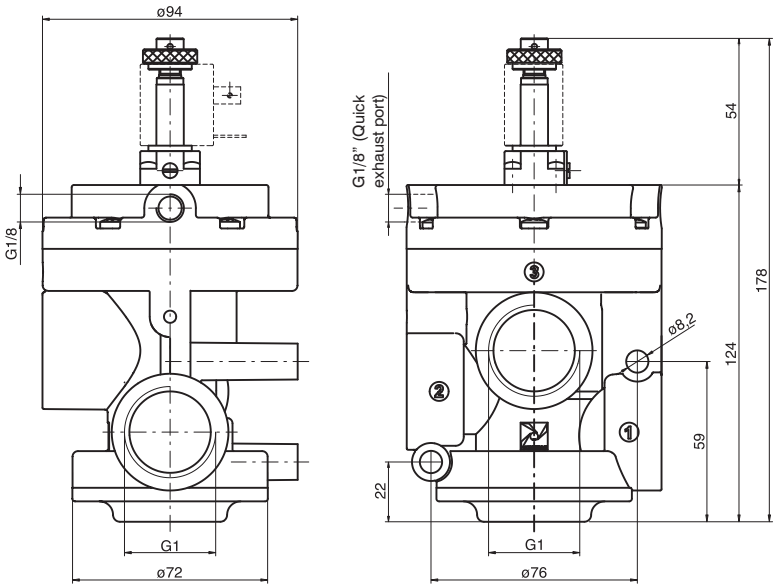
## Solenoid-Spring-Internal pilot

**Coding:** T771/V.32.0.Ⓕ.MV

| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 25 |
| Working ports size | G1" |
| Pilot ports size | G1/8" |
| Response time according to ISO 12238, activation time (ms) | 1AC = 100 - 1AA = 80 |
| Response time according to ISO 12238, deactivation time (ms) | 1AC = 60 - 1AA = 60 |

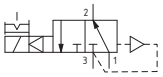
| Ⓕ | FUNCTION |
|---|---|
| | **1AC** = Normally Closed |
| | **1AA** = Normally Open |



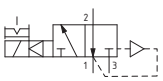



Weight 520 g

**N.C.**
Exhaust port 1
Outlet port 2
Pump 3



**N.O.**
Exhaust port 3
Outlet port 2
Pump 1

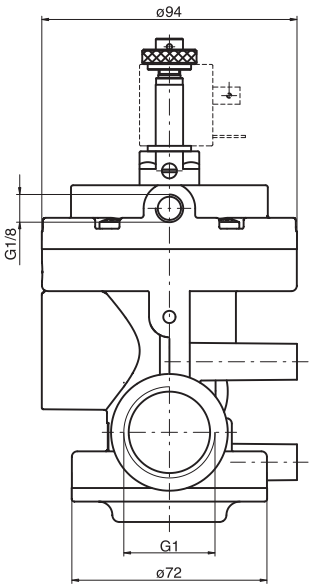


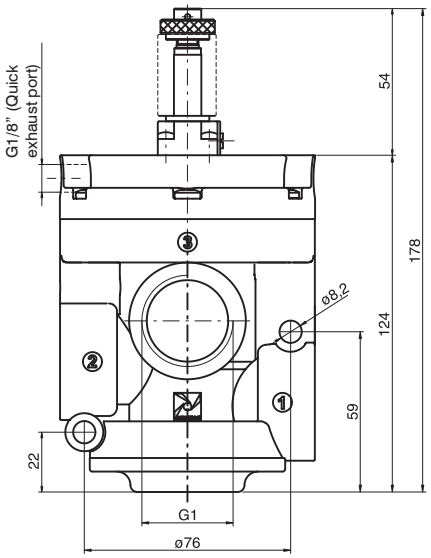
## Solenoid-Spring-External pilot

**Coding:** T771/V.32.0.1.MP

| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 25 |
| Working ports size | G1" |
| Pilot ports size | G1/8" |
| Response time according to ISO 12238, activation time (ms) | N.C. = 50 - N.O. = 19 |
| Response time according to ISO 12238, deactivation time (ms) | N.C. = 315 - N.O. = 450 |

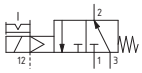




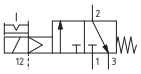




Weight 520 g

**N.C.**
Pump 1
Outlet port 2
Exhaust port 3



**N.O.**
Pump 3
Outlet port 2
Exhaust port 1

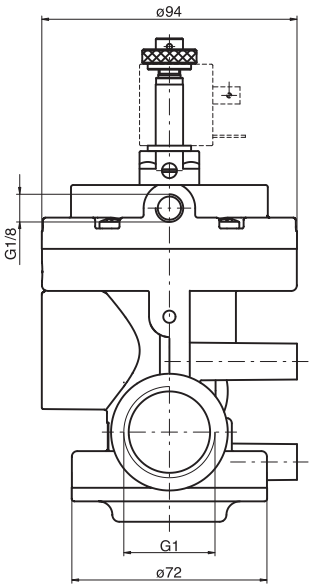


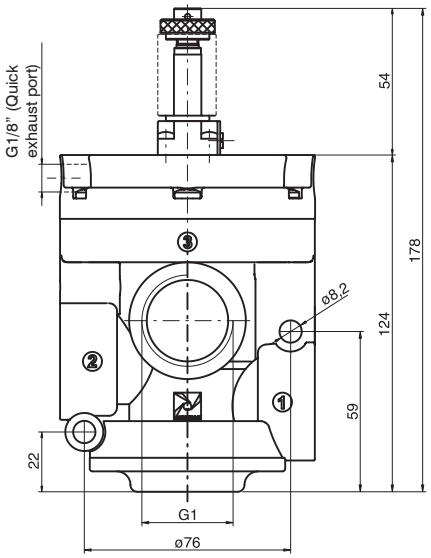
## Solenoid-Spring - External pilot with quick exhaust

**Coding:** T771/VS.32.0.1.MP

| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 25 |
| Working ports size | G1" |
| Pilot ports size | G1/8" |
| Response time according to ISO 12238, activation time (ms) | N.C. = 50 - N.O. = 19 |
| Response time according to ISO 12238, deactivation time (ms) | N.C. = 50 - N.O. = 70 |

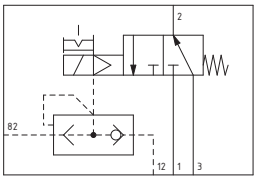




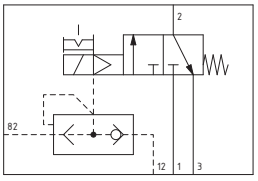




Weight 520 g

**N.C.**
Pump 1
Outlet port 2
Exhaust port 3



**N.O.**
Pump 3
Outlet port 2
Exhaust port 1





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

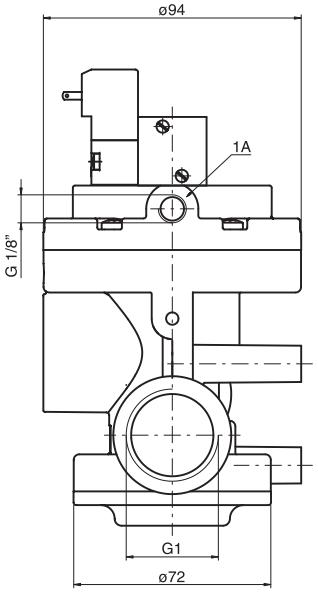
## Bistable for compressed air - G1"

**Coding:** T771.32.0.1.BP

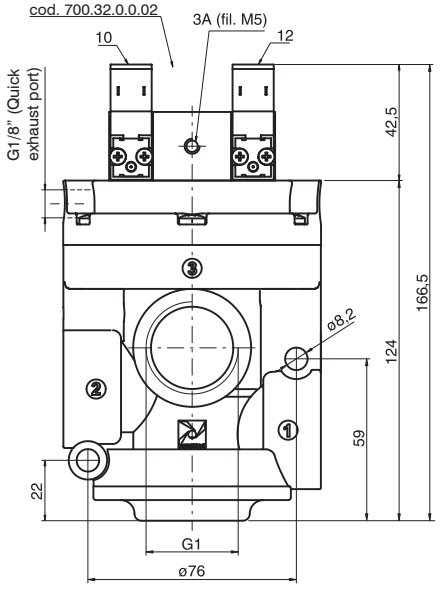
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2.5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 12500 |
| Orifice size (mm) | 25 |
| Working ports size | G1" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |



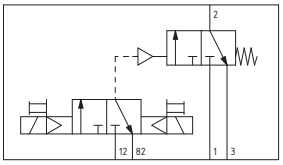
Weight 680 g



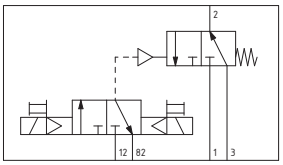

S.V. Bistable 3/2 sol./sol. 24V DC
cod. 700.32.0.0.02




**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1



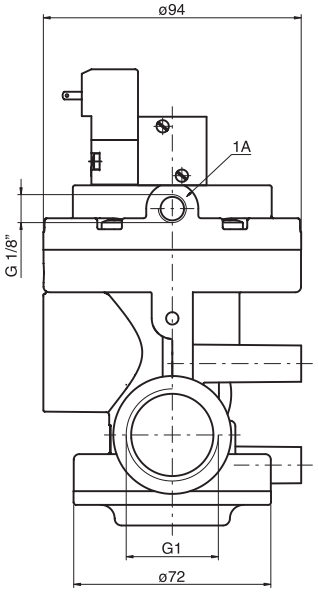
## Bistable for compressed air with quick exhaust - G1"

**Coding:** T771S.32.0.1.BP

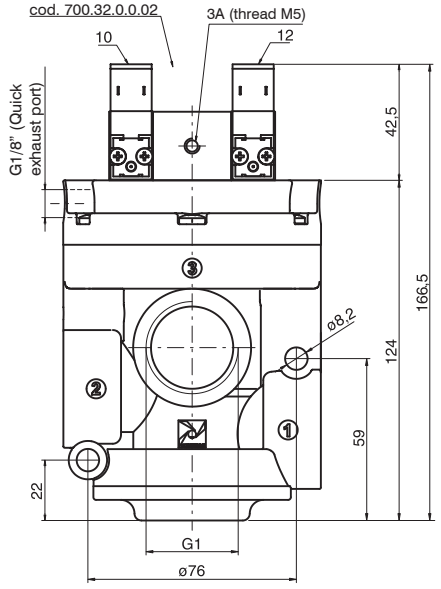
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2.5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 12500 |
| Orifice size (mm) | 25 |
| Working ports size | G1" |
| Pilot ports size | G1/8" |
| Compressed air, purity class according to ISO 8573-1:2010 | 7:4:4 |



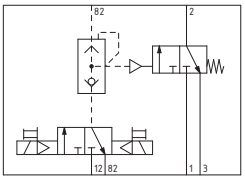
Weight 680 g



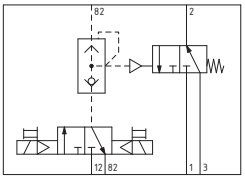

S.V. Bistable 3/2 sol./sol. 24V DC
cod. 700.32.0.0.02




**N.C.**
Inlet port 1
Outlet port 2
Exhaust port 3



**N.O.**
Inlet port 3
Outlet port 2
Exhaust port 1

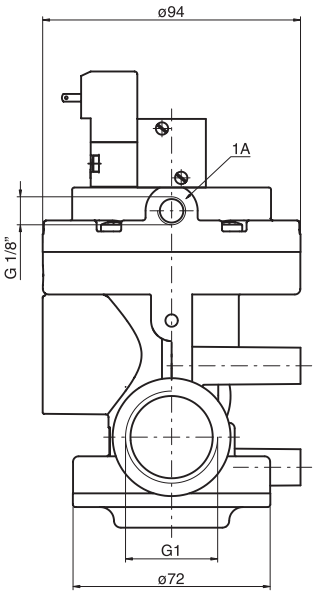


## Bistable for vacuum - G1"

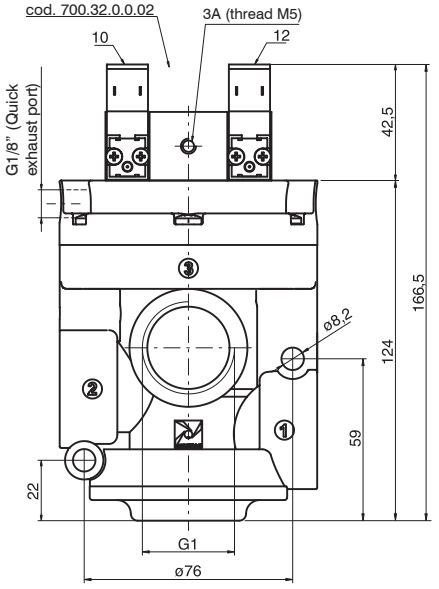
**Coding:** T771/V.32.0.1.BP

| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 25 |
| Working ports size | G1" |
| Pilot ports size | G1/8" |

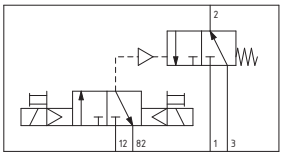




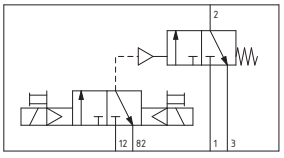

S.V. Bistable 3/2 sol./sol. 24V DC
cod. 700.32.0.0.02




**N.C.**
Pump 1
Outlet port 2
Exhaust port 3




**N.O.**
Pump 3
Outlet port 2
Exhaust port 1



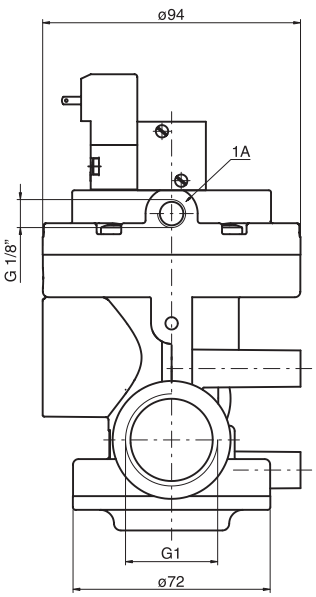

Weight 680 g

## Bistable for vacuum with quick exhaust - G1"

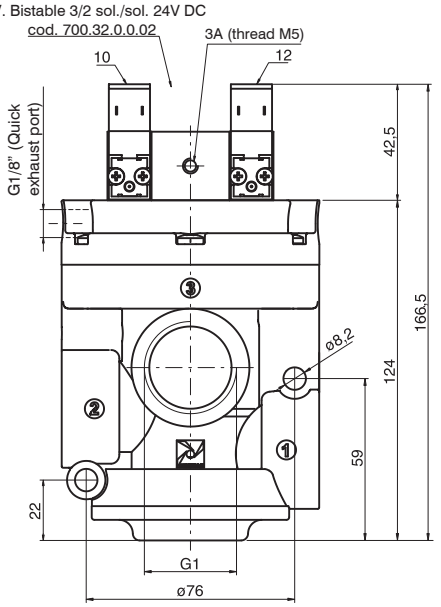
**Coding:** T771/VS.32.0.1.BP

| Operational characteristics | |
|---|---|
| Fluid | Vacuum |
| Minimum pilot pressure (bar) | 2,5 |
| Temperature °C | -5 ... +50 |
| Orifice size (mm) | 25 |
| Working ports size | G1" |
| Pilot ports size | G1/8" |

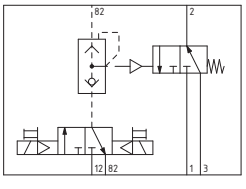




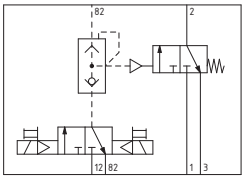

S.V. Bistable 3/2 sol./sol. 24V DC
cod. 700.32.0.0.02




**N.C.**
Pump 1
Outlet port 2
Exhaust port 3




**N.O.**
Pump 3
Outlet port 2
Exhaust port 1




Weight 680 g



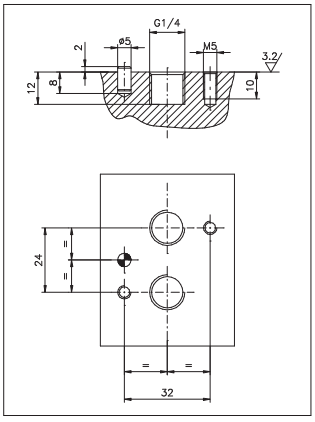
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 514/N

The **514**/**N** Solenoid valves, are 2 stage valves actuated electro-pneumatically. A series 300 directly operated solenoid valve actuates pneumatically the principal power distributor.
Everything is well integrated in a practical configuration that also permits applications where there is limited space. Used primarily to operate rotary actuators and wherever there is a **NAMUR** standard installation plan.
The pilot air is normally taken from the inlet port (autofeed) and the only actuating signal is electric.
The range of the solenoid valves, as far as dimensions and mechanical construction, is similar to series 200. We have therefore solenoid valves G 1/4" with identical pneumatic characteristics that are, however, actuated electrically. They have a balanced spool, insentive to presence or absence of pressure. They are constructed in 3 and 5 way with 1 solenoid (monostable) or 2 solenoids (bistable).



**"NAMUR" interface dimensions:
according to standard (VDI/VDE 3847 July 2003)**




**Construction characteristics**

| | |
|---|---|
| Body | Aluminium |
| Spacers | Technopolymer |
| Seals | NBR |
| Springs | Spring steel |
| Operators | Aluminium |
| Spools | Nickel plated steel |
| Screws | Zinc plated steel |

**Use and maintenance**

This valves have an average life of 15 million cycles depending on the application and air quality.
Filtered and lubricated air using specified lubricants will reduce the wear of the seals and ensures long and trouble free operation.
Please ensure that the valve is being used according with the manufacturers specification, such as air pressure and temperature.
The exhaust port of the distributor has to be protected in a dusty and dirty environment.
Repair kits including the spool complete with seals are available for overhauling the valves.
However, although this is a simple operation it should be carried out by a competent person.

**ATTENTION:** use hydraulic oil class H for lubrication such as CASTROL MAGNA SW32.

## Solenoid-Spring

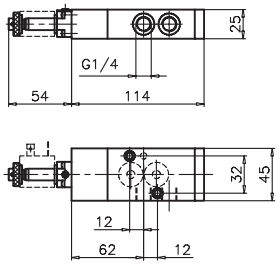
**Coding:** 514/N.Ⓣ.0.1.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -10 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1030 |
| Orifice size (mm) | 7 |
| Working ports size | G 1/4" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

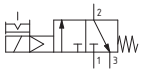
***3/2 ways***





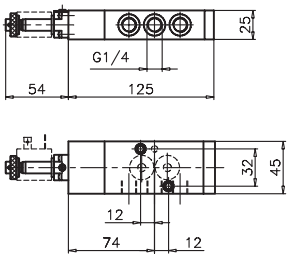

Weight 390 g
Minimum working pressure 2,5 bar

514/N.32.0.1.M2



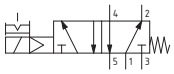
***5/2 ways***






Weight 450 g
Minimum working pressure 2,5 bar

514/N.52.0.1.M2



## Solenoid-Differential

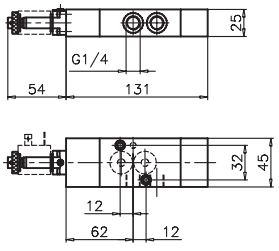
**Coding:** 514/N.Ⓣ.0.12.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -10 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1030 |
| Orifice size (mm) | 7 |
| Working ports size | G 1/4" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

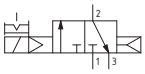
***3/2 ways***





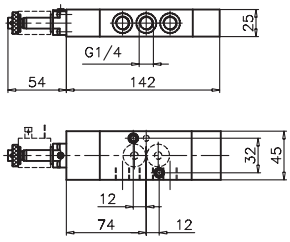

Weight 390 g
Minimum working pressure 2,5 bar

514/N.32.0.12.M2



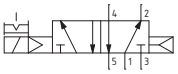
***5/2 ways***






Weight 450 g
Minimum working pressure 2,5 bar

514/N.52.0.12.M2



## Solenoid-Solenoid

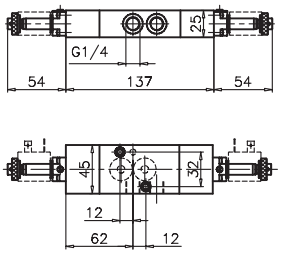
**Coding:** 514/N.Ⓣ.0.0.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -10 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1030 |
| Orifice size (mm) | 7 |
| Working ports size | G 1/4" |

| Ⓣ | TYPE |
|---|---|
| | **32** = 3 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

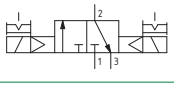
***3/2 ways***





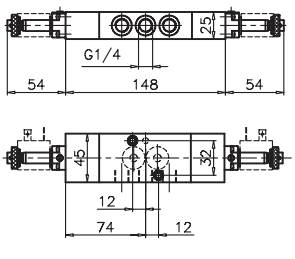

Weight 390 g
Minimum working pressure 2,5 bar

514/N.32.0.0.M2



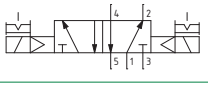
***5/2 ways***






Weight 450 g
Minimum working pressure 2,5 bar

514/N.52.0.0.M2





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series T514

**TECNO-NAMUR** are 5/2 and 4/2 valves are solenoid valves pneumatically or electrically actuated. They are used in industrial automation applications or whenever a **NAMUR** mounting plane is available.
Is available in 5/2, 4/2 and all-purposes versions. The final user can switch from one version to another by simply changing interface plate and adding/removing a plug.
**TECNO-NAMUR** valves are produced using the most up to date technical features, granting flexible design and elevated characteristics over standard products. Superior performance is further enhanced by the use of innovative materials of construction.

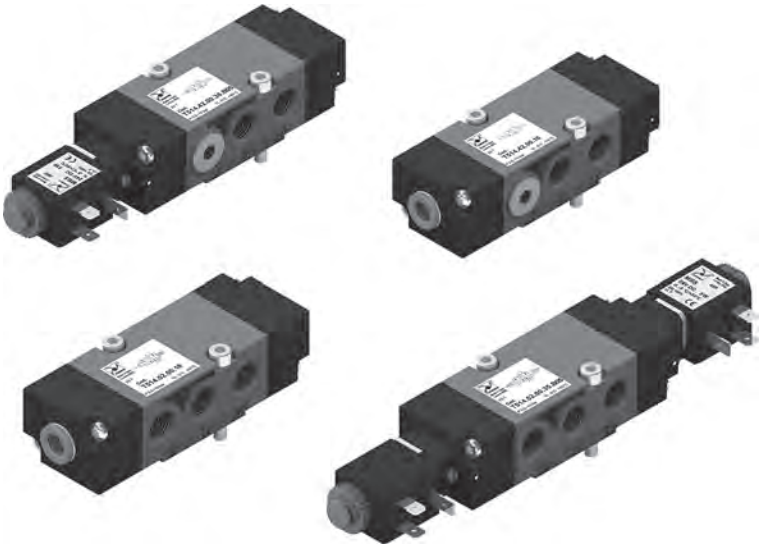


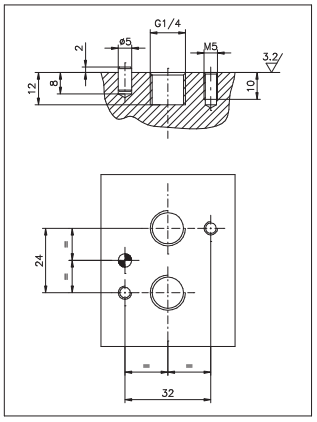
**Construction characteristics**

| | |
|---|---|
| Body | Technopolymer |
| Spacers | Technopolymer |
| Seals | Nitrile rubber |
| Springs | Stainless Steel |
| Operators | Technopolymer |
| Spools | Nickel plated steel |
| Screws | Zinc plated steel |

**Note:**
**"Although accurately described, the 4/2 valve actually functions as a 3/2 normally closed valve and should be used as such."**

**"NAMUR" interface dimensions:**
**according to standard (VDI/VDE 3847 July 2003)**





## Pneumatic - Differential

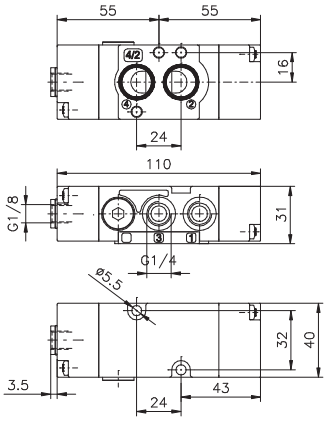
**Coding:** T514.Ⓣ.00.16

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -10 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" |

| Ⓣ | TYPE |
|---|---|
| | **42** = 4 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

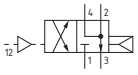
***4/2 ways***





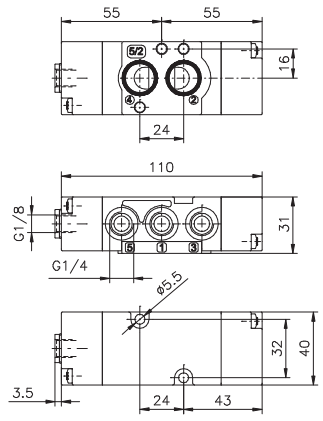

Weight 140 g
Minimum working pressure 2,5 bar
Maximum fitting torque 9 N/m

T514.42.00.16



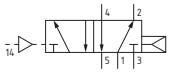
***5/2 ways***






Weight 140 g
Minimum working pressure 2,5 bar
Maximum fitting torque 9 N/m

T514.52.00.16



## Pneumatic-Pneumatic

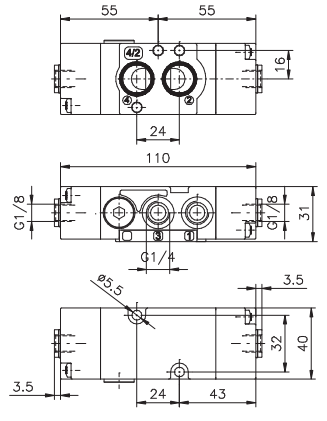
**Coding:** T514.Ⓣ.00.18

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -10 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" |

| Ⓣ | TYPE |
|---|---|
| | **42** = 4 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

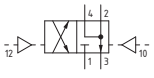
***4/2 ways***





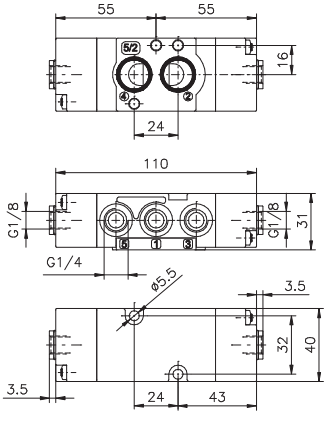

Weight 140 g
Minimum working pressure 2,5 bar
Maximum fitting torque 9 N/m

T514.42.00.18



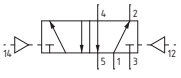
***5/2 ways***






Weight 140 g
Minimum working pressure 2,5 bar
Maximum fitting torque 9 N/m

T514.52.00.18





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pneumatic - Spring

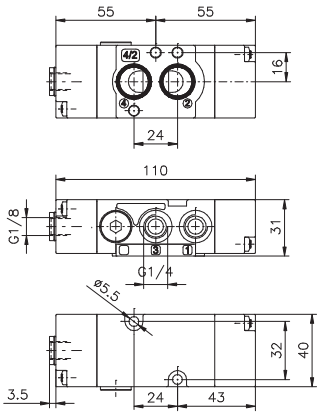
**Coding:** T514.Ⓣ.00.19

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -10 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" |

| | TYPE |
|---|---|
| Ⓣ | **42** = 4 ways, 2 positions |
| | **52** = 5 ways, 2 positions |

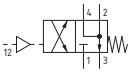
***4/2 ways***





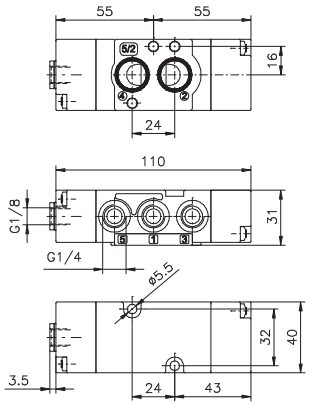

Weight 140 g
Minimum working pressure 2,5 bar
Maximum fitting torque 9 N/m

T514.42.00.19



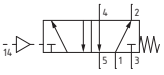

***5/2 ways***






Weight 140 g
Minimum working pressure 2,5 bar
Maximum fitting torque 9 N/m

T514.52.00.19




## Solenoid-Solenoid

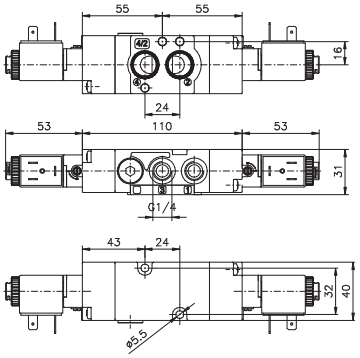
**Coding:** T514.Ⓣ.00.35.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -10 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" |

| | TYPE |
|---|---|
| Ⓣ | **42** = 4 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **B04** = 12 VDC |
| | **B05** = 24 VDC |
| | **B09** = 24 VDC (2W) |
| | **B56** = 24V (50-60 Hz) |
| | **B57** = 110V (50-60 Hz) |
| | **B58** = 230 V (50-60 Hz) |

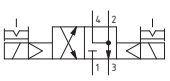
***4/2 ways***





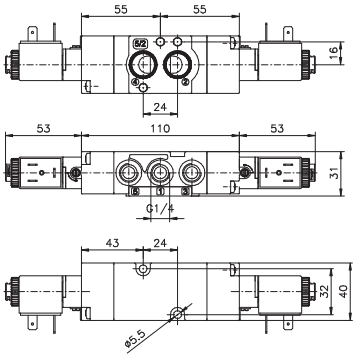

Weight 250 g
Minimum working pressure 2,5 bar
Maximum fitting torque 9 N/m

T514.42.00.35.Ⓥ



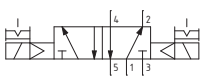

***5/2 ways***






Weight 250 g
Minimum working pressure 2,5 bar
Maximum fitting torque 9 N/m

T514.52.00.35.Ⓥ



## Solenoid-Differential

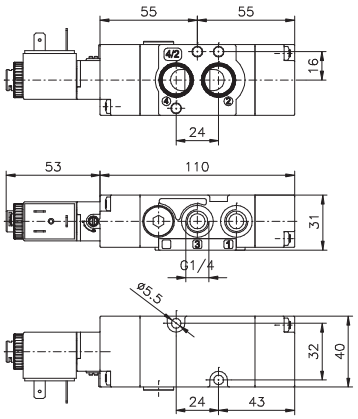
**Coding:** T514.Ⓣ.00.36.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -10 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" |

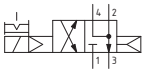
| | |
|---|---|
| Ⓣ | TYPE |
| | **42** = 4 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **B04** = 12 VDC |
| | **B05** = 24 VDC |
| | **B09** = 24 VDC (2W) |
| | **B56** = 24V (50-60 Hz) |
| | **B57** = 110V (50-60 Hz) |
| | **B58** = 230 V (50-60 Hz) |

***4/2 ways***





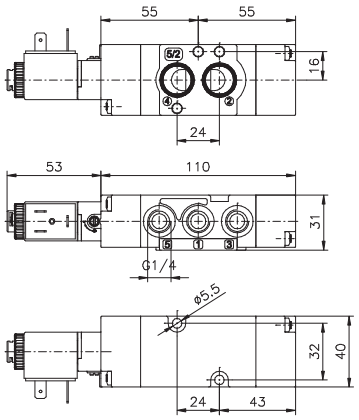

Weight 200 g
Minimum working pressure 2,5 bar
Maximum fitting torque 9 N/m



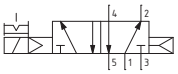
T514.42.00.36.Ⓥ

***5/2 ways***






Weight 200 g
Minimum working pressure 2,5 bar
Maximum fitting torque 9 N/m



T514.52.00.36.Ⓥ

## Solenoid-Spring

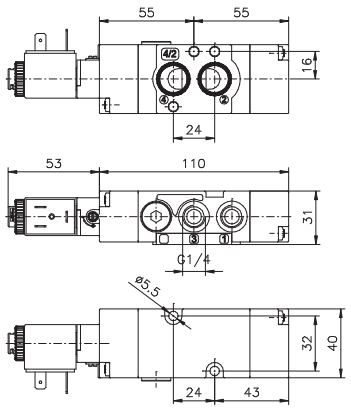
**Coding:** T514.Ⓣ.00.39.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -10 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" |

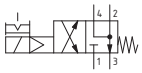
| | |
|---|---|
| Ⓣ | TYPE |
| | **42** = 4 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **B04** = 12 VDC |
| | **B05** = 24 VDC |
| | **B09** = 24 VDC (2W) |
| | **B56** = 24V (50-60 Hz) |
| | **B57** = 110V (50-60 Hz) |
| | **B58** = 230 V (50-60 Hz) |

***4/2 ways***





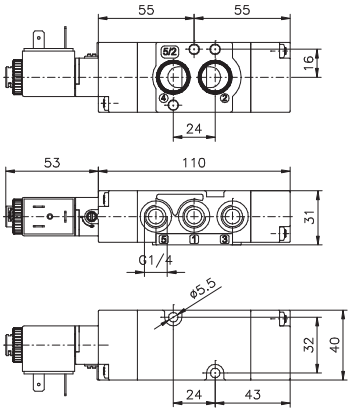

Weight 200 g
Minimum working pressure 2,5 bar
Maximum fitting torque 9 N/m



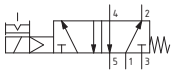
T514.42.00.39.Ⓥ

***5/2 ways***






Weight 200 g
Minimum working pressure 2,5 bar
Maximum fitting torque 9 N/m



T514.52.00.39.Ⓥ



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Universal kit

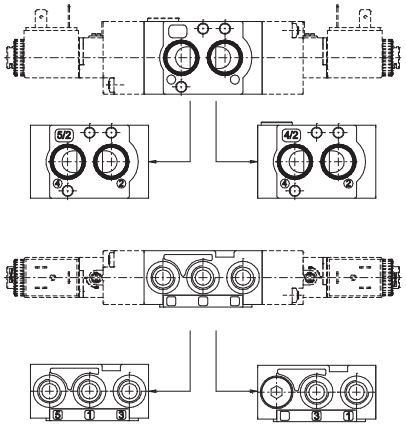
**Coding:** T514.92.00.Ⓥ.Ⓣ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -10 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" |

| Ⓥ | VERSION |
|---|---|
| | **16** = Pneumatic-Differential |
| | **18** = Pneumatic - Pneumatic |
| | **19** = Pneumatic - Spring |
| | **35** = Solenoid - Solenoid |
| | **36** = Solenoid - Differential |
| | **39** = Solenoid - Spring |

| Ⓣ | VOLTAGE |
|---|---|
| | **B04** = 12 VDC |
| | **B05** = 24 VDC |
| | **B09** = 24 VDC (2W) |
| | **B56** = 24V (50-60 Hz) |
| | **B57** = 110V (50-60 Hz) |
| | **B58** = 230 V (50-60 Hz) |





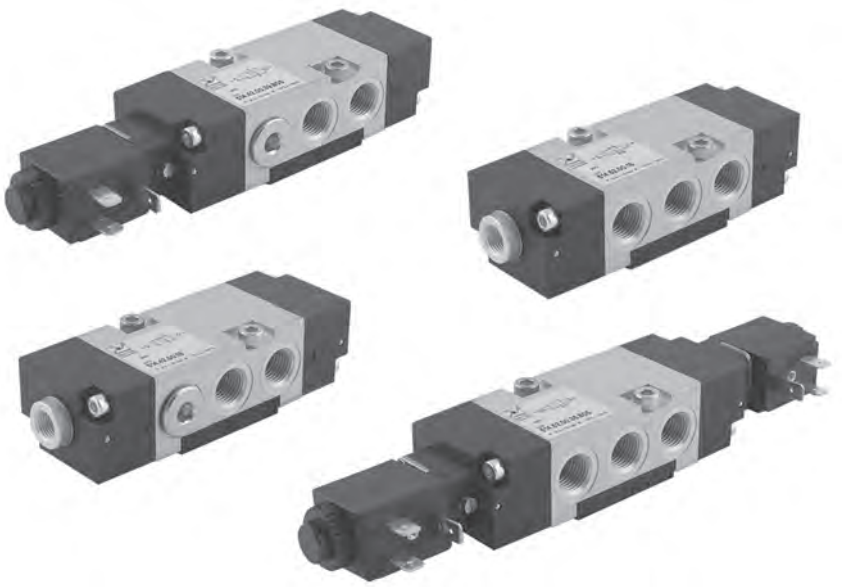



Weight 170 g
Minimum working pressure 2,5 bar
Maximum fitting torque 9 N/m

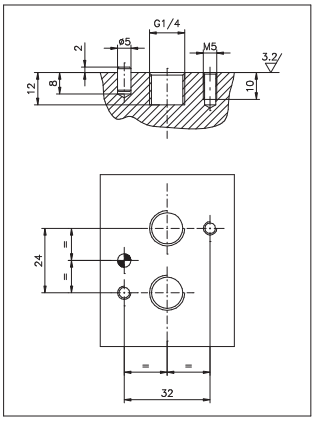
## Series 514 High Performance

**NAMUR** valves are 5/2 and 4/2 valves and electrovalves, piloted electrically or pneumatically, utilised primarily to operate rotary actuators and wherever there is a NAMUR standard installation plan.
The product is classified for use in potentially explosive atmospheres (Directive 2014/34/EU).
**NAMUR** valves have been developed using the latest, technical design solutions which guarantee flexibility and an increased flow rate capacity exceeding that of traditional, spool valves.
Innovative materials guarantee high performances also in critical environment conditions.
Available NPT and BSPT connections.
The solenoid valves are available with protection classes for zones 2-22, 1-21 solenoids Ex ec, Ex mb, Ex ia, international approvals IECEx, FM and CSA.

**Note:**
**"Although accurately described, the 4/2 valve actually functions as a 3/2 normally closed valve and should be used as such."**



**"NAMUR" interface dimensions:**
**according to standard (VDI/VDE 3847 July 2003)**




**Construction characteristics**

| | |
|---|---|
| Body | Aluminium |
| Spacers | Technopolymer |
| Seals | Nitrile rubber |
| Springs | Stainless Steel |
| Operators | Technopolymer |
| Spools | Steel |
| Screws | Zinc coated Steel / Stainless steel |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Order codes

[ ] 51 [4] . [52.00.39] . [B04] [ ]

| Model |
|---|
| : Standard valve |
| **X** : ATEX valve<br>(-20°C ... +40°C) - only with solenoid coils "B##","C##" e "X##"<br>(-30°C ... +50°C) - only with solenoid coils "MHC","MH#" |

| Connections |
|---|
| **4** : G1/4" - supplied with plate |
| **6** : 1/4" NPT - supplied with plate |

| Function and version |
|---|
| **42.00.16**: 4 ways - Pneumatic-Differential |
| **42.00.18**: 4 ways - Pneumatic-Pneumatic |
| **42.00.19**: 4 ways - Pneumatic-Spring |
| **42.00.35**: 4 ways - Solenoid-Solenoid |
| **42.00.36**: 4 ways - Solenoid-Differential |
| **42.00.39**: 4 ways - Solenoid-Spring |
| **52.00.16**: 5 ways - Pneumatic-Differential |
| **52.00.18**: 5 ways - Pneumatic-Pneumatic |
| **52.00.19**: 5 ways - Pneumatic-Spring |
| **52.00.35**: 5 ways - Solenoid-Solenoid |
| **52.00.36**: 5 ways - Solenoid-Differential |
| **52.00.39**: 5 ways - Solenoid-Spring |
| **92.00.16**: Universal kit - Pneumatic-Differential |
| **92.00.18**: Universal kit - Pneumatic-Pneumatic |
| **92.00.19**: Universal kit - Pneumatic-Spring |
| **92.00.35**: Universal kit - Solenoid-Solenoid |
| **92.00.36**: Universal kit - Solenoid-Differential |
| **92.00.39**: Universal kit - Solenoid-Spring |

| Voltages | Valve marking with ATEX solenoid coil | Protection method of the ATEX solenoid coil |
|---|---|---|
| **B00**: Ø10 stem without solenoid coil<br>to be used with the following solenoid coils | : II 2G Ex h IIC T5 Gb X<br>II 2D Ex h IIIC T96°C Db X | / |
| **B04**: 12 VDC - for all models<br>**B05**: 24 VDC - for all models<br>**B09**: 24 VDC (2W) - only for standard model<br>**B56**: 24 VAC (50-60 Hz) - for all models<br>**B57**: 110 VAC (50-60 Hz) - for all models<br>**B58**: 230 VAC (50-60 Hz) - for all models<br>**C04**: 12 VDC - for all models<br>**C05**: 24 VDC - for all models<br>**C09**: 24 VDC (2W) - only for standard model<br>**C56**: 24 VAC (50-60 Hz) - for all models<br>**C57**: 110 VAC (50-60 Hz) - for all models<br>**C58**: 230 VAC (50-60 Hz) - for all models | : II 3G Ex h IIC T4 Gc X<br>II 3D Ex h IIIC T120°C Dc X IP65 | Ex ec<br>Ex tc |
| **F00**: Ø9 stem without solenoid coil<br>to be used with the following solenoid coils | : II 2G Ex h IIC T5 Gb X<br>II 2D Ex h IIIC T96°C Db X | / |
| **X05**: 24 VDC - only for ATEX model<br>**X56**: 24 VAC (50-60 Hz) - only for ATEX model<br>**X57**: 110 VAC (50-60 Hz) - only for ATEX model<br>**X58**: 230 VAC (50-60 Hz) - only for ATEX model | : II 2G Ex h IIC T4 Gb X<br>II 2D Ex h IIIC T135°C Db X IP65 | Ex mb |
| **MHC**: 32 VDC T6 - only for ATEX model<br>complete with connector | : II 2G Ex h IIB/IIC T4 Gb X<br>II 2D Ex h IIIC T130°C Db X IP65 | Ex ia |
| **MH4**: 32 VDC T4 - only for ATEX model<br>**MH6**: 32 VDC T6 - only for ATEX model | : II 2G Ex h IIB/IIC T4 Gb X | Ex ia |

| Voltages | Valve marking with FM solenoid coil |
|---|---|
| **L04**: 12 VDC - only for FM APPROVED model<br>**L05**: 24 VDC - only for FM APPROVED model<br>**L39**: 120 VAC - only for FM APPROVED model<br>**L41**: 240 VAC - only for FM APPROVED model | FM APPROVED |
| FM APPROVED valve (-20°C ... +50°C) - only with solenoid coils "L##" | |

| Temperature options |
|---|
| : Standard valve (-10°C ... +50°C) |
| **LT** : Low temperature (-30°C ... +50°C) |

**Example : 514.52.00.39.B04** : Standard valve, G1/4" connections supplied with plate, solenoid-spring 5 ways, 12 VDC solenoid coil

## Pneumatic - Differential

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | See order codes page |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" - 1/4" NPT |
| Cv | 1,11 |
| kv | 16,66 |

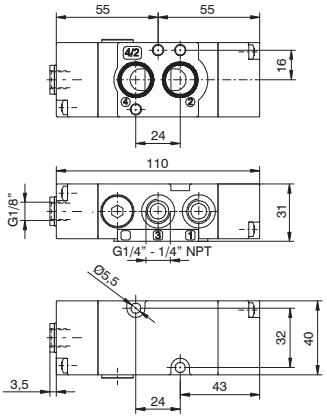
**Coding:** Ⓜ51Ⓒ.Ⓣ.00.16Ⓞ

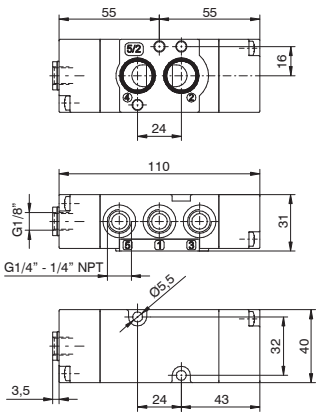
| | |
|---|---|
| Ⓜ | MODEL |
| | = Standard valve |
| | **X** = ATEX valve |
| Ⓒ | CONNECTIONS |
| | **4** = G1/4" |
| | **6** = 1/4" NPT |
| Ⓣ | TYPE |
| | **42** = 4 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓞ | TEMPERATURE OPTION |
| | **SEE ORDER CODES PAGE** |

Minimum pilot pressure 2,5 bar
Maximum fitting torque 9 N/m

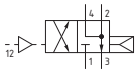




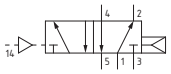



Ⓜ51Ⓒ.42.00.16Ⓞ Weight 240 g



Ⓜ51Ⓒ.52.00.16Ⓞ Weight 235 g



## Pneumatic-Pneumatic

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | See order codes page |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" - 1/4" NPT |
| Cv | 1,11 |
| kv | 16,66 |

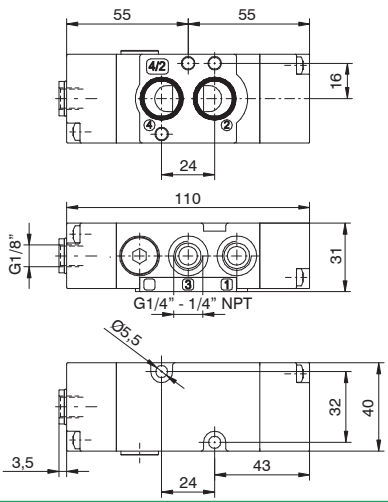
**Coding:** Ⓜ51Ⓒ.Ⓣ.00.18Ⓞ

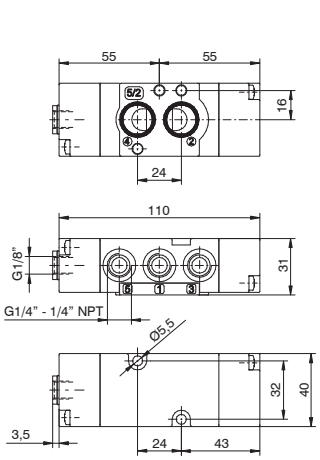
| | |
|---|---|
| Ⓜ | MODEL |
| | = Standard valve |
| | **X** = ATEX valve |
| Ⓒ | CONNECTIONS |
| | **4** = G1/4" |
| | **6** = 1/4" NPT |
| Ⓣ | TYPE |
| | **42** = 4 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓞ | TEMPERATURE OPTION |
| | **SEE ORDER CODES PAGE** |

Minimum pilot pressure 2,5 bar
Maximum fitting torque 9 N/m

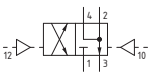




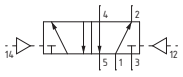



Ⓜ51Ⓒ.42.00.18Ⓞ Weight 240 g



Ⓜ51Ⓒ.52.00.18Ⓞ Weight 235 g





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pneumatic - Spring

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | See order codes page |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" - 1/4" NPT |
| Cv | 1,11 |
| kv | 16,66 |

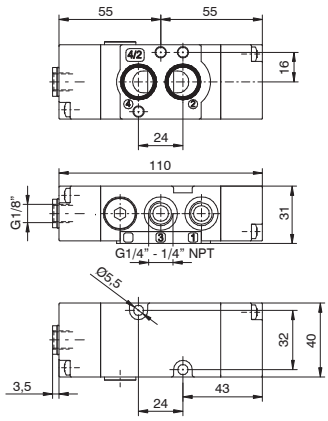
**Coding:** Ⓜ51Ⓒ.Ⓣ.00.19Ⓞ

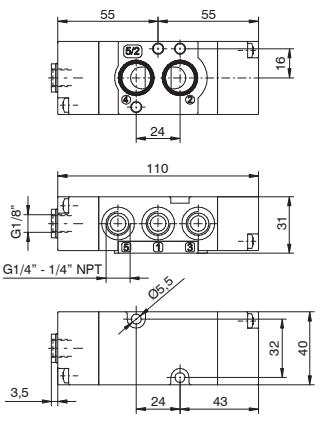
| | |
|---|---|
| Ⓜ | MODEL |
| | = Standard valve |
| | **X** = ATEX valve |
| Ⓒ | CONNECTIONS |
| | **4** = G1/4" |
| | **6** = 1/4" NPT |
| Ⓣ | TYPE |
| | **42** = 4 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓞ | TEMPERATURE OPTION |
| | **SEE ORDER CODES PAGE** |

Minimum pilot pressure 2,5 bar
Maximum fitting torque 9 N/m

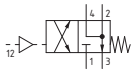




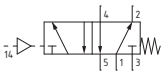



Ⓜ51Ⓒ.42.00.19Ⓞ Weight 240 g



Ⓜ51Ⓒ.52.00.19Ⓞ Weight 235 g



## Solenoid-Solenoid

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | See order codes page |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" - 1/4" NPT |
| Cv | 1,11 |
| kv | 16,66 |

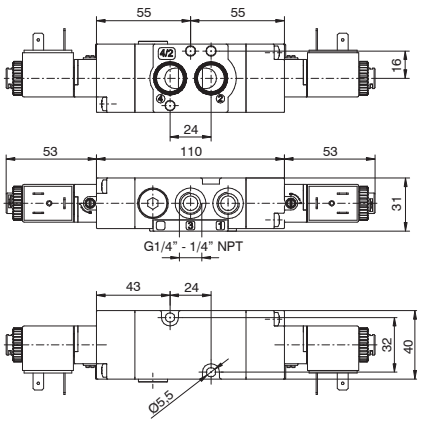
**Coding:** Ⓜ51Ⓒ.Ⓣ.00.35.ⓋⓄ

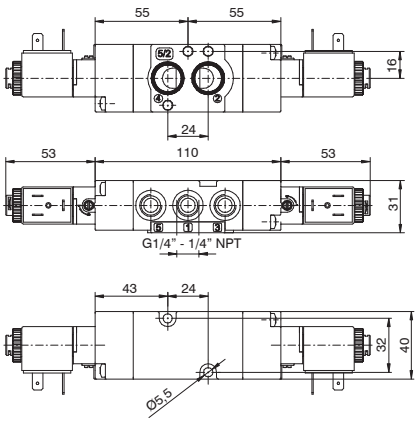
| | |
|---|---|
| Ⓜ | MODEL |
| | = Standard valve |
| | **X** = ATEX valve |
| Ⓒ | CONNECTIONS |
| | **4** = G1/4" |
| | **6** = 1/4" NPT |
| Ⓣ | TYPE |
| | **42** = 4 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **SEE ORDER CODES PAGE** |
| Ⓞ | TEMPERATURE OPTION |
| | **SEE ORDER CODES PAGE** |

Minimum pilot pressure 2,5 bar
Maximum fitting torque 9 N/m

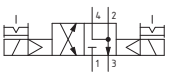




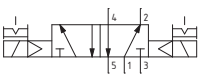



Ⓜ51Ⓒ.42.00.35.ⓋⓄ Weight 410 g



Ⓜ51Ⓒ.52.00.35.ⓋⓄ Weight 405 g



## Solenoid-Differential

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | See order codes page |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" - 1/4" NPT |
| Cv | 1,11 |
| kv | 16,66 |

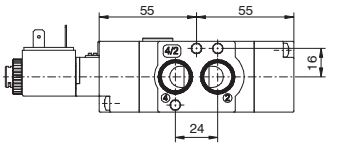
**Coding: Ⓜ51Ⓒ.Ⓣ.00.36.ⓋⓄ**

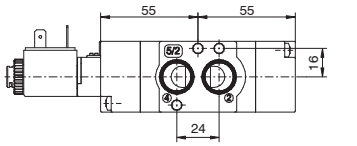
| | |
|---|---|
| Ⓜ | MODEL |
| | = Standard valve |
| | **X** = ATEX valve |
| Ⓒ | CONNECTIONS |
| | **4** = G1/4" |
| | **6** = 1/4" NPT |
| Ⓣ | TYPE |
| | **42** = 4 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **SEE ORDER CODES PAGE** |
| Ⓞ | TEMPERATURE OPTION |
| | **SEE ORDER CODES PAGE** |

Minimum pilot pressure 2,5 bar
Maximum fitting torque 9 N/m

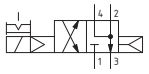




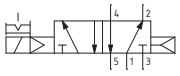



Ⓜ51Ⓒ.42.00.36.ⓋⓄ Weight 330 g



Ⓜ51Ⓒ.52.00.36.ⓋⓄ Weight 325 g



## Solenoid-Spring

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | See order codes page |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" - 1/4" NPT |
| Cv | 1,11 |
| kv | 16,66 |

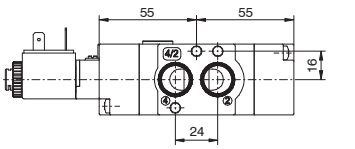
**Coding: Ⓜ51Ⓒ.Ⓣ.00.39.ⓋⓄ**

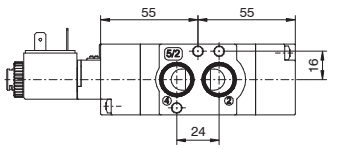
| | |
|---|---|
| Ⓜ | MODEL |
| | = Standard valve |
| | **X** = ATEX valve |
| Ⓒ | CONNECTIONS |
| | **4** = G1/4" |
| | **6** = 1/4" NPT |
| Ⓣ | TYPE |
| | **42** = 4 ways, 2 positions |
| | **52** = 5 ways, 2 positions |
| Ⓥ | VOLTAGE |
| | **SEE ORDER CODES PAGE** |
| Ⓞ | TEMPERATURE OPTION |
| | **SEE ORDER CODES PAGE** |

Minimum pilot pressure 2,5 bar
Maximum fitting torque 9 N/m

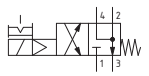




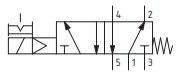



Ⓜ51Ⓒ.42.00.39.ⓋⓄ Weight 330 g



Ⓜ51Ⓒ.52.00.39.ⓋⓄ Weight 325 g



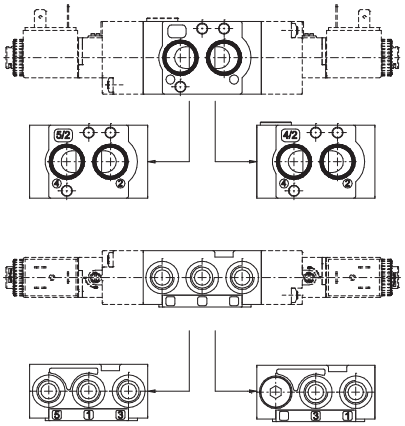


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Universal kit

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | See order codes page |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" - 1/4" NPT |
| Cv | 1,11 |
| kv | 16,66 |



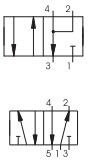



**Coding:** Ⓜ51Ⓒ.92.00.Ⓥ.ⓉⓄ

| | |
|---|---|
| Ⓜ | MODEL |
| | = Standard valve |
| | **X** = ATEX valve |
| Ⓒ | CONNECTIONS |
| | **4** = G1/4" |
| | **6** = 1/4" NPT |
| Ⓥ | VERSION |
| | **16** = Pneumatic-Differential |
| | **18** = Pneumatic - Pneumatic |
| | **19** = Pneumatic - Spring |
| | **35** = Solenoid - Solenoid |
| | **36** = Solenoid - Differential |
| | **39** = Solenoid - Spring |
| Ⓣ | VOLTAGE |
| | **SEE ORDER CODES PAGE** |
| Ⓞ | TEMPERATURE OPTION |
| | **SEE ORDER CODES PAGE** |

Minimum pilot pressure 2,5 bar
Maximum fitting torque 9 N/m
To change a 5/2 valve into a 4/2: Simply replace the bottom plate with the one included in the universal kit (cod. 514.92...) and by plugging port 5

Ⓜ51Ⓒ.92.00.Ⓥ.ⓉⓄ Weight 405 g



## Series 515 High Performance

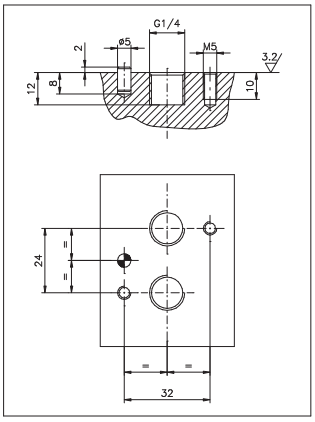
**NAMUR** valves are 5/2 valves and electrovalves, piloted electrically or pneumatically, utilised primarily to operate rotary actuators and wherever there is a **NAMUR** standard installation plan.
The product is classified for use in potentially explosive atmospheres (Directive 2014/34/EU).
**NAMUR** valves have been developed using the latest, technical design solutions which guarantee flexibility and an increased flow rate capacity exceeding that of traditional, spool valves.
In addition, they have been produced with innovative materials which guarantee increased performance.
**IMPORTANT:**

Differs from version 514 because it is supplied without a plate.



**"NAMUR" interface dimensions:
according to standard (VDI/VDE 3847 July 2003)**






**Construction characteristics**

| | |
|---|---|
| Body | Aluminium |
| Spacers | Technopolymer |
| Seals | Nitrile rubber |
| Springs | Stainless Steel |
| Operators | Technopolymer |
| Spools | Steel |
| Screws | Zinc coated Steel / Stainless steel |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Order codes

[ ] 51 [5] . [52.00.39] . [B04] [ ]

| Model |
|---|
| : Standard valve |
| **X** : ATEX valve<br>(-20°C ... +40°C) - only with solenoid coils "B##","C##" e "X##"<br>(-30°C ... +50°C) - only with solenoid coils "MHC","MH#" |

| Connections |
|---|
| **5** : G1/4" - supplied without plate |
| **7** : 1/4" NPT - supplied without plate |

| Function and version |
|---|
| **52.00.16**: 5 ways - Pneumatic-Differential |
| **52.00.18**: 5 ways - Pneumatic-Pneumatic |
| **52.00.19**: 5 ways - Pneumatic-Spring |
| **52.00.35**: 5 ways - Solenoid-Solenoid |
| **52.00.36**: 5 ways - Solenoid-Differential |
| **52.00.39**: 5 ways - Solenoid-Spring |

| Voltages | Valve marking with ATEX solenoid coil | Protection method of the ATEX solenoid coil |
|---|---|---|
| **B00**: Ø10 stem without solenoid coil<br>to be used with the following solenoid coils | : CE UKCA Ex **II 2G Ex h IIC T5 Gb X**<br>CE UKCA Ex **II 2D Ex h IIIC T96°C Db X** | / |
| **B04**: 12 VDC - for all models<br>**B05**: 24 VDC - for all models<br>**B09**: 24 VDC (2W) - only for standard model<br>**B56**: 24 VAC (50-60 Hz) - for all models<br>**B57**: 110 VAC (50-60 Hz) - for all models<br>**B58**: 230 VAC (50-60 Hz) - for all models<br>**C04**: 12 VDC - for all models<br>**C05**: 24 VDC - for all models<br>**C09**: 24 VDC (2W) - only for standard model<br>**C56**: 24 VAC (50-60 Hz) - for all models<br>**C57**: 110 VAC (50-60 Hz) - for all models<br>**C58**: 230 VAC (50-60 Hz) - for all models | : CE UKCA Ex **II 3G Ex h IIC T4 Gc X**<br>CE UKCA Ex **II 3D Ex h IIIC T120°C Dc X IP65** | **Ex ec**<br>**Ex tc** |
| **F00**: Ø9 stem without solenoid coil<br>to be used with the following solenoid coils | : CE UKCA Ex **II 2G Ex h IIC T5 Gb X**<br>CE UKCA Ex **II 2D Ex h IIIC T96°C Db X** | / |
| **X05**: 24 VDC - only for ATEX model<br>**X56**: 24 VAC (50-60 Hz) - only for ATEX model<br>**X57**: 110 VAC (50-60 Hz) - only for ATEX model<br>**X58**: 230 VAC (50-60 Hz) - only for ATEX model | : CE UKCA Ex **II 2G Ex h IIC T4 Gb X**<br>CE UKCA Ex **II 2D Ex h IIIC T135°C Db X IP65** | **Ex mb** |
| **MHC**: 32 VDC T6 - only for ATEX model<br>complete with connector | : CE UKCA Ex **II 2G Ex h IIB/IIC T4 Gb X**<br>CE UKCA Ex **II 2D Ex h IIIC T130°C Db X IP65** | **Ex ia** |
| **MH4**: 32 VDC T4 - only for ATEX model<br>**MH6**: 32 VDC T6 - only for ATEX model | : CE UKCA Ex **II 2G Ex h IIB/IIC T4 Gb X** | **Ex ia** |

| Voltages | Valve marking with FM solenoid coil |
|---|---|
| **L04**: 12 VDC - only for FM APPROVED model<br>**L05**: 24 VDC - only for FM APPROVED model<br>**L39**: 120 VAC - only for FM APPROVED model<br>**L41**: 240 VAC - only for FM APPROVED model | FM C US APPROVED |
| FM APPROVED valve (-20°C ... +50°C) - only with solenoid coils "L##" | |

| Temperature options |
|---|
| : Standard valve (-10°C ... +50°C) |
| **LT** : Low temperature (-30°C ... +50°C) |

**Example : 515.52.00.39.B04** : Standard valve, G1/4" connections supplied without plate, solenoid-spring 5 ways, 12 VDC solenoid coil

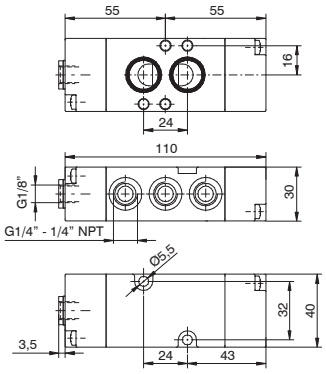
## Pneumatic - Differential

**Coding:** Ⓜ51Ⓒ.52.00.16Ⓞ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | See order codes page |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" - 1/4" NPT |
| Cv | 1,11 |
| kv | 16,66 |

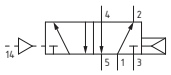
| | |
|---|---|
| Ⓜ | MODEL |
| | = Standard valve |
| | **X** = ATEX valve |
| Ⓒ | CONNECTIONS |
| | **5** = G1/4" |
| | **7** = 1/4" NPT |
| Ⓞ | TEMPERATURE OPTION |
| | **SEE ORDER CODES PAGE** |






Weight 245 g
Minimum pilot pressure 2,5 bar
Maximum fitting torque 9 N/m

Ⓜ51Ⓒ.52.00.16Ⓞ



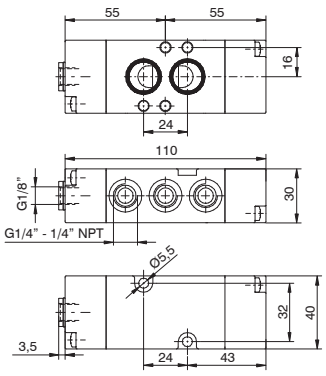

## Pneumatic-Pneumatic

**Coding:** Ⓜ51Ⓒ.52.00.18Ⓞ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | See order codes page |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" - 1/4" NPT |
| Cv | 1,11 |
| kv | 16,66 |

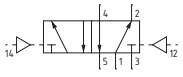
| | |
|---|---|
| Ⓜ | MODEL |
| | = Standard valve |
| | **X** = ATEX valve |
| Ⓒ | CONNECTIONS |
| | **5** = G1/4" |
| | **7** = 1/4" NPT |
| Ⓞ | TEMPERATURE OPTION |
| | **SEE ORDER CODES PAGE** |






Weight 245 g
Minimum pilot pressure 2,5 bar
Maximum fitting torque 9 N/m

Ⓜ51Ⓒ.52.00.18Ⓞ



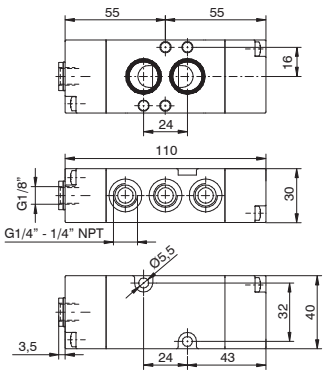

## Pneumatic - Spring

**Coding:** Ⓜ51Ⓒ.52.00.19Ⓞ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | See order codes page |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" - 1/4" NPT |
| Cv | 1,11 |
| kv | 16,66 |

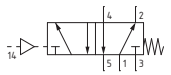
| | |
|---|---|
| Ⓜ | MODEL |
| | = Standard valve |
| | **X** = ATEX valve |
| Ⓒ | CONNECTIONS |
| | **5** = G1/4" |
| | **7** = 1/4" NPT |
| Ⓞ | TEMPERATURE OPTION |
| | **SEE ORDER CODES PAGE** |






Weight 245 g
Minimum pilot pressure 2,5 bar
Maximum fitting torque 9 N/m

Ⓜ51Ⓒ.52.00.19Ⓞ






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

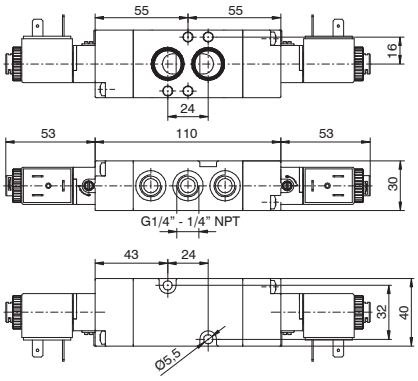
## Solenoid-Solenoid

**Coding:** Ⓜ51Ⓒ.52.00.35.ⓋⓄ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | See order codes page |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" - 1/4" NPT |
| Cv | 1,11 |
| kv | 16,66 |

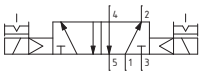
| | |
|---|---|
| Ⓜ | MODEL |
| | = Standard valve |
| | **X** = ATEX valve |
| Ⓒ | CONNECTIONS |
| | **5** = G1/4" |
| | **7** = 1/4" NPT |
| Ⓥ | VOLTAGE |
| | **SEE ORDER CODES PAGE** |
| Ⓞ | TEMPERATURE OPTION |
| | **SEE ORDER CODES PAGE** |






Weight 415 g
Minimum pilot pressure 2,5 bar
Maximum fitting torque 9 N/m

Ⓜ51Ⓒ.52.00.35.ⓋⓄ



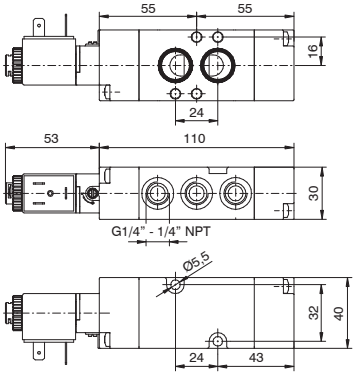
## Solenoid-Differential

**Coding:** Ⓜ51Ⓒ.52.00.36.ⓋⓄ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | See order codes page |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" - 1/4" NPT |
| Cv | 1,11 |
| kv | 16,66 |

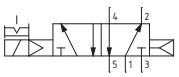
| | |
|---|---|
| Ⓜ | MODEL |
| | = Standard valve |
| | **X** = ATEX valve |
| Ⓒ | CONNECTIONS |
| | **5** = G1/4" |
| | **7** = 1/4" NPT |
| Ⓥ | VOLTAGE |
| | **SEE ORDER CODES PAGE** |
| Ⓞ | TEMPERATURE OPTION |
| | **SEE ORDER CODES PAGE** |






Weight 330 g
Minimum pilot pressure 2,5 bar
Maximum fitting torque 9 N/m

Ⓜ51Ⓒ.52.00.36.ⓉⓄ



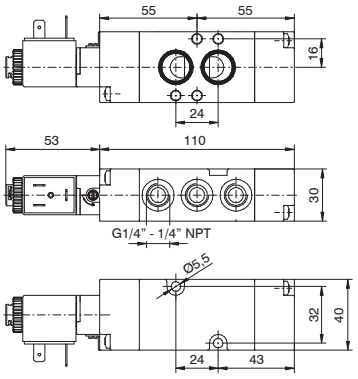
## Solenoid-Spring

**Coding:** Ⓜ51Ⓒ.52.00.39.ⓉⓄ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | See order codes page |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1100 |
| Orifice size (mm) | 8 |
| Working ports size | G 1/4" - 1/4" NPT |
| Cv | 1,11 |
| kv | 16,66 |

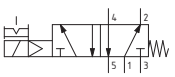
| | |
|---|---|
| Ⓜ | MODEL |
| | = Standard valve |
| | **X** = ATEX valve |
| Ⓒ | CONNECTIONS |
| | **5** = G1/4" |
| | **7** = 1/4" NPT |
| Ⓣ | VOLTAGE |
| | **SEE ORDER CODES PAGE** |
| Ⓞ | TEMPERATURE OPTION |
| | **SEE ORDER CODES PAGE** |






Weight 330 g
Minimum pilot pressure 2,5 bar
Maximum fitting torque 9 N/m

Ⓜ51Ⓒ.52.00.39.ⓉⓄ



## Series 1000 - Size 1, 2 and 3

5 ways 2 or 3 positions distributors and electric distributors can be used mounted on individual or ganged bases.
These standards are ISO 5599/1, according to which certain dimensions are mandatory, namely, the mounting surface, the pitch of the fastening screws, the characteristic of the electric pilot, the flow rate, the pneumatic connections, and so on.
The design is based on the balanced spool principle with pneumatic or electropneumatic actuators and resetting by mechanically or pneumatically operated spring.
The 3 position closed centres, are obtained by spring operation.
The feed to the actuators on the distributors can be provided either by pressure intake from inlet 1(autofeed) or through the base from inlets 12 and 14 (external feed); there are two separate types of these distributors: one is the Series 1000 and the other is the Series 1010.
The Series 1000 includes size 1 and 2 and are built of die-cast aluminium. The selection is made by turning a seal fitted between body and operator by 180°, so to utilize external-feed pilot or with internal feed.
**Ordering codes are referring to distributors with "M2" mechanics or solenoid valves "S" mounted.**
**Coil are not included and have to be ordored separately (see Series 300).**
**"S" homologated c UL us solenoid coil are available (see Series 300).**



### Use and maintenance

This valves have an average life of 15 million cycles depending on the application and air quality.
Filtered and lubricated air using specified lubricants will reduce the wear of the seals and ensures long and trouble free operation.
Make sure that the conditions of use comply with the pressure, temperature etc. limits indicated and that the fastening screws are tightened with the following maximum torques on distributors Series 1010.
**Size 1 = 4 Nm**
**Size 2 = 5 Nm**
**Size 3 = 8 Nm**
Repair kits including the spool complete with seals are available for overhauling the valves.
However, although this is a simple operation it should be carried out by a competent person.

**ATTENTION:** use hydraulic oil class H for lubrication such as CASTROL MAGNA SW32.

### Construction characteristics

| Series 1000 | **Size 1** | **Size 2** |
|---|---|---|
| Body | Zinc alloy | Aluminium |
| Operators | Zinc alloy | Aluminium |
| Spools | Steel | Steel |
| Seals | NBR | NBR |
| Spacers | Technopolymer | Aluminium |
| Springs | Spring steel | Spring steel |
| Selectors | NBR | NBR |

| Series 1010 | **Size 1** | **Size 2** | **Size 3** |
|---|---|---|---|
| Body | Technopolymer | Technopolymer | Aluminium |
| Operators | Technopolymer | Technopolymer | Aluminium |
| Spools | Steel | Steel | Steel |
| Seals | NBR | NBR | NBR |
| Spacers | Technopolymer | Technopolymer | Technopolymer |
| Pistons | Aluminium | Aluminium | Aluminium |
| Springs | Spring steel | Spring steel | Spring steel |

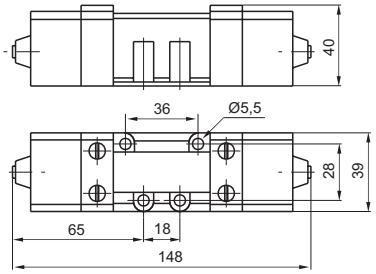

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

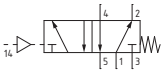
## Pneumatic - Spring

**Coding:** 1001.52.1.9

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 840 |





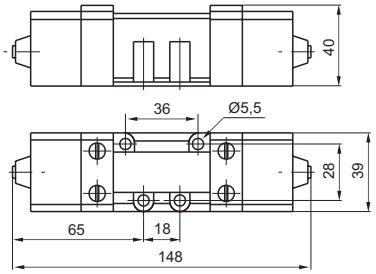
Weight 780 g
Minimum pilot pressure 2,5 bar

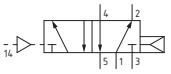
## Pneumatic - Differential

**Coding:** 1001.52.1.6

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 840 |





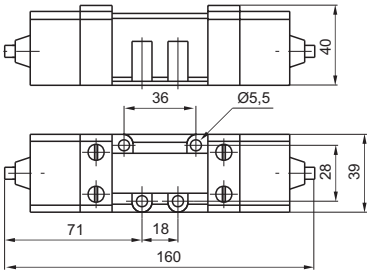
Weight 790 g
Minimum pilot pressure 2 bar

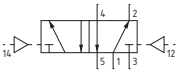
## Pneumatic-Pneumatic 5/2

**Coding:** 1001.52.1.8

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 840 |





Weight 800 g
Minimum pilot pressure 1,5 bar

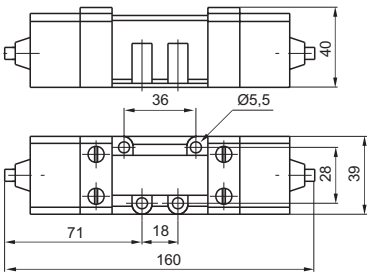
## Pneumatic-Pneumatic 5/3

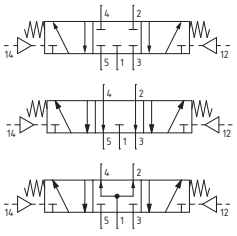
**Coding:** 1001.53.Ⓕ.1.8

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 720 |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |





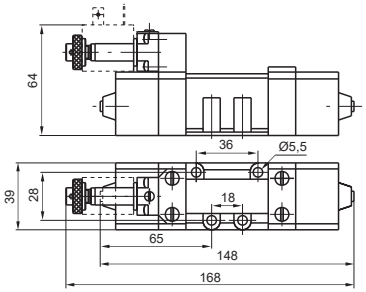
Weight 800 g
Minimum pilot pressure 3 bar

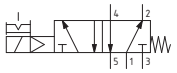
## Solenoid-Spring

**Coding:** 1051.52.3.9.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 840 |





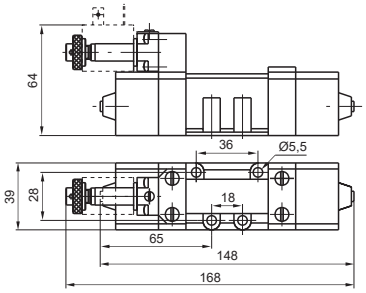
Weight 890 g
Minimum pilot pressure 2,5 bar

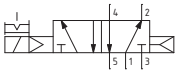
## Solenoid-Differential

**Coding:** 1051.52.3.6.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 840 |





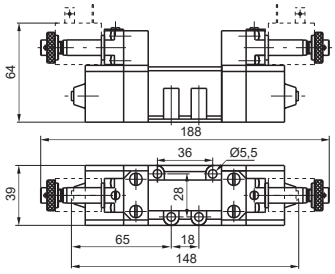
Weight 900 g
Minimum pilot pressure 2 bar

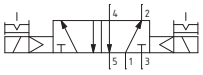
## Solenoid-Solenoid 5/2

**Coding:** 1051.52.3.5.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 840 |





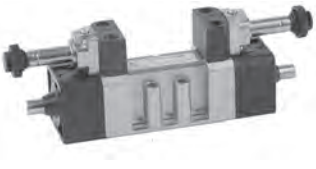
Weight 1040 g
Minimum pilot pressure 1,5 bar

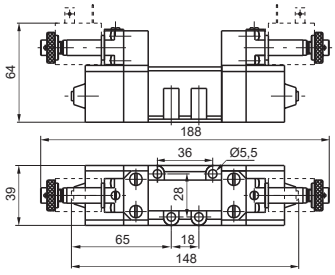
## Solenoid-Solenoid 5/3

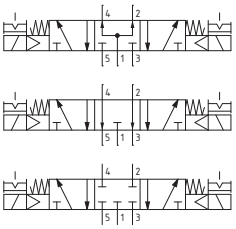
**Coding:** 1051.53.Ⓕ.3.5.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 720 |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |





Weight 1040 g
Minimum pilot pressure 3 bar



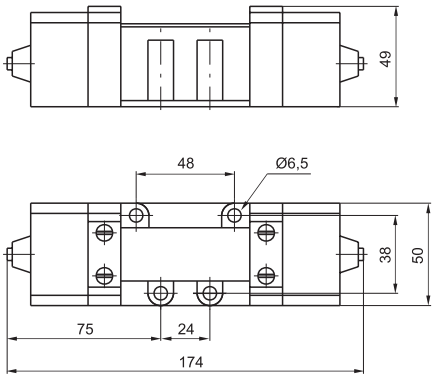
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

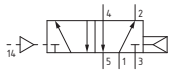
## Pneumatic - Differential

**Coding:** 1002.52.1.6

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1700 |





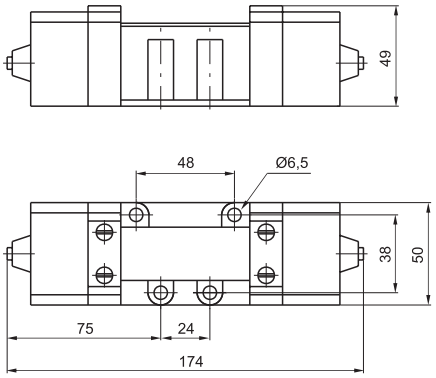

Weight 730 g
Minimum pilot pressure 2 bar

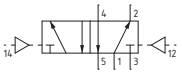
## Pneumatic-Pneumatic 5/2

**Coding:** 1002.52.1.8

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1700 |






Weight 800 g
Minimum pilot pressure 1,5 bar

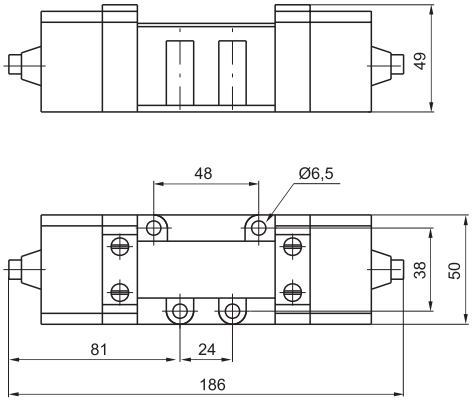
## Pneumatic-Pneumatic 5/3

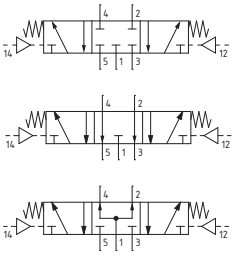
**Coding:** 1002.53.Ⓕ.1.8

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1700 |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |





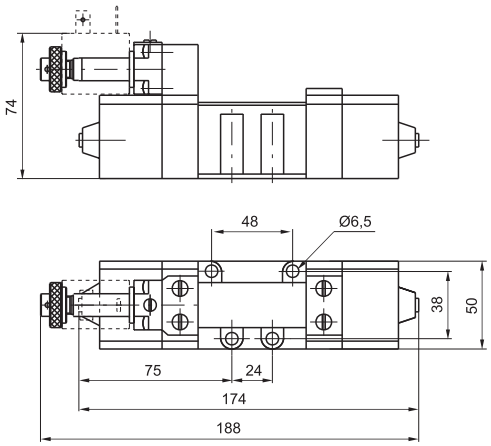

Weight 740 g
Minimum pilot pressure 3 bar

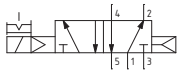
## Solenoid-Differential

**Coding:** 1052.52.3.6.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1700 |





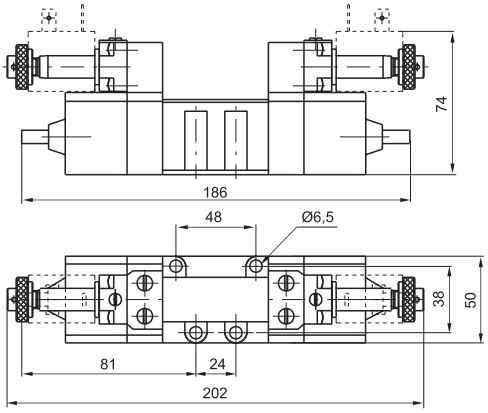
Weight 850 g
Minimum pilot pressure 2 bar

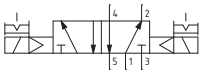
## Solenoid-Solenoid 5/2

**Coding:** 1052.52.3.5.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1700 |





Weight 980 g
Minimum pilot pressure 1,5 bar

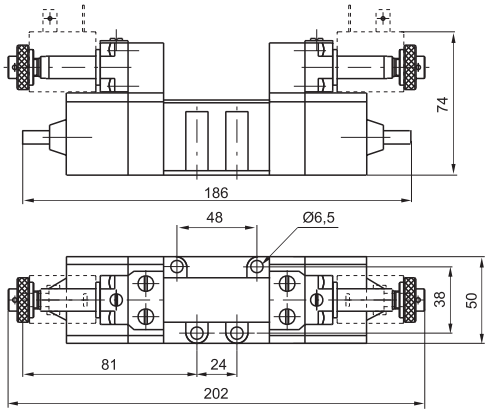
## Solenoid-Solenoid 5/3

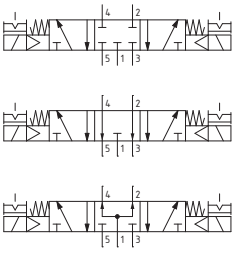
**Coding:** 1052.53.Ⓕ.3.5.M2

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1700 |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |





Weight 980 g
Minimum pilot pressure 3 bar

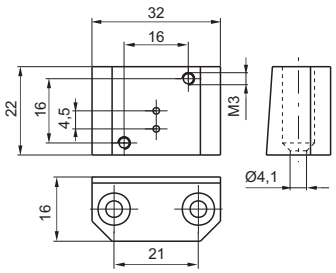


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Base for 32 mm Solenoid valve

**Coding:** 1001.05

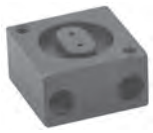


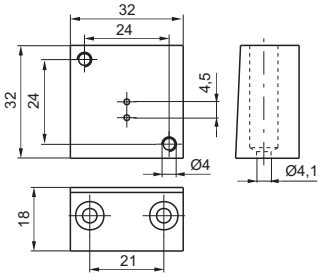



Weight 60 g

## Base CNOMO for 32 mm Solenoid valve

**Coding:** 1001.04



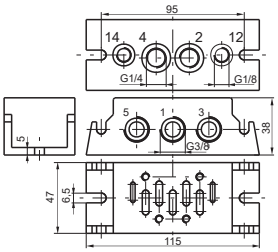



Weight 90 g

## Base with bottom connections size 1

**Coding:** 1001.00



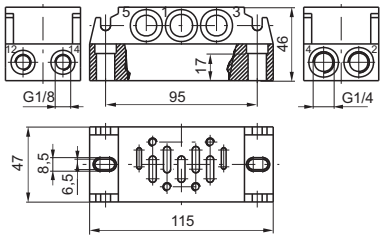



Weight 320 g
1=INLET PORT, 2-4=OUTLET PORTS, 3-5=EXHAUST PORTS, 12-14=PILOT PORTS

## Base with side connections size 1

**Coding:** 1001.01



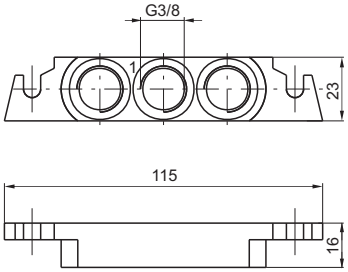



Weight 445 g
1=INLET PORT, 2-4=OUTLET PORTS, 3-5=EXHAUST PORTS, 12-14=PILOT PORTS

## Inlet blocks

**Coding:** 1001.02



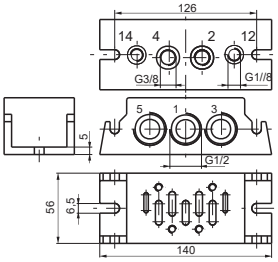



Weight 55 g

## Base with bottom connections size 2

**Coding:** 1002.00






Weight 520 g
1=INLET PORT, 2-4=OUTLET PORTS, 3-5=EXHAUST PORTS, 12-14=PILOT PORTS

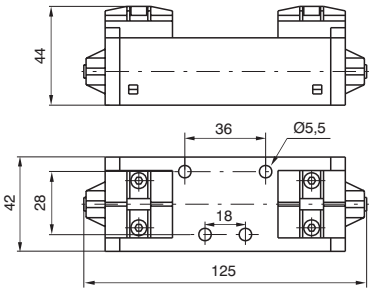
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

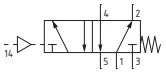
## Pneumatic - Spring

**Coding:** 1011.52.1.9

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 900 |





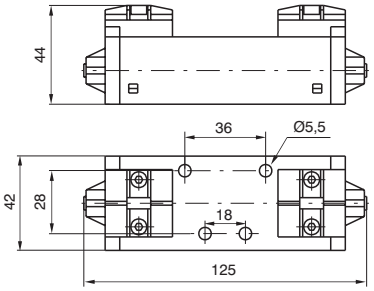
Weight 230 g
Minimum pilot pressure 2,5 bar

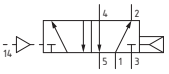
## Pneumatic - Differential

**Coding:** 1011.52.1.6

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 900 |





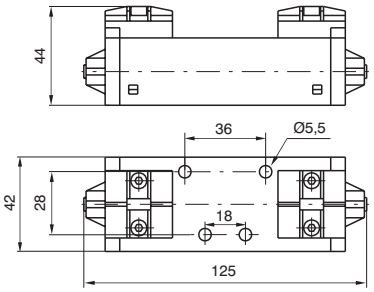
Weight 240 g
Minimum pilot pressure 2 bar

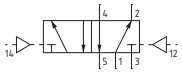
## Pneumatic-Pneumatic 5/2

**Coding:** 1011.52.1.8

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 900 |





Weight 240 g
Minimum pilot pressure 1,5 bar

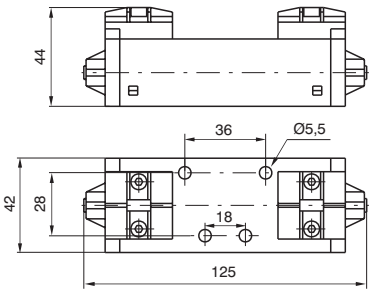
## Pneumatic-Pneumatic 5/3

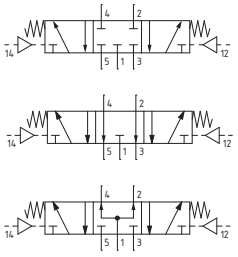
**Coding:** 1011.53.Ⓕ1.8

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 900 |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |





Weight 240 g
Minimum pilot pressure 3 bar



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

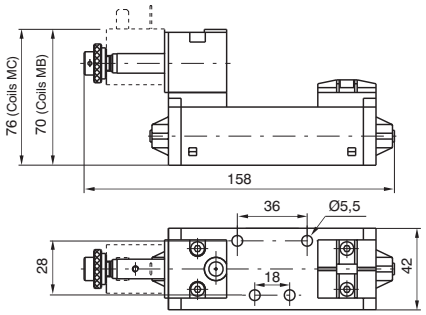
## Solenoid-Spring

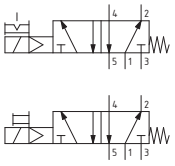
**Coding:** 1011.52.3.9.Ⓜ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 900 |

| Ⓜ | MECHANIC |
|---|---|
| | **SEE VALVES SERIES 300 CNOMO** |





Weight 290 g
Minimum pilot pressure 2,5 bar

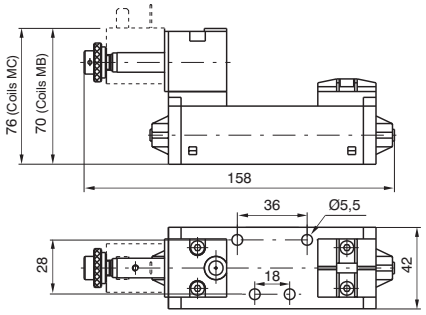
## Solenoid-Differential

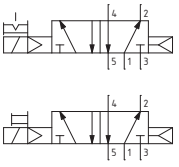
**Coding:** 1011.52.3.6.Ⓜ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 900 |

| Ⓜ | MECHANIC |
|---|---|
| | **SEE VALVES SERIES 300 CNOMO** |





Weight 290 g
Minimum pilot pressure 2 bar

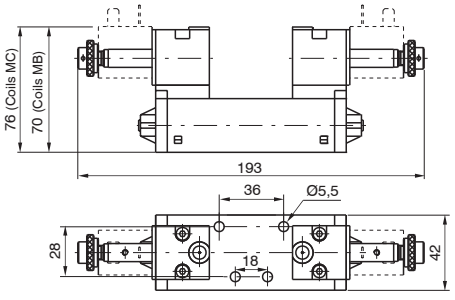
## Solenoid-Solenoid 5/2

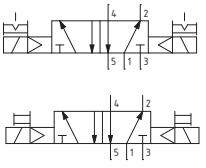
**Coding:** 1011.52.3.5.Ⓜ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 900 |

| Ⓜ | MECHANIC |
|---|---|
| | **SEE VALVES SERIES 300 CNOMO** |





Weight 350 g
Minimum pilot pressure 1,5 bar

## Solenoid-Solenoid 5/3

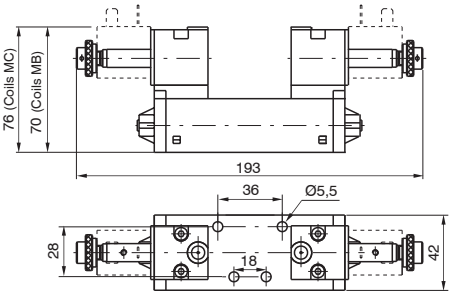
**Coding:** 1011.53.Ⓕ.3.5.Ⓜ

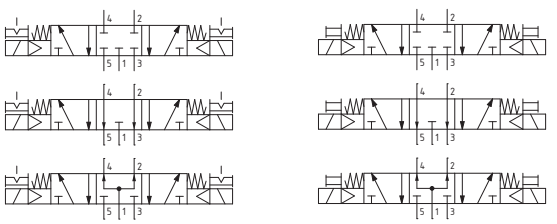
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 900 |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓜ | MECHANIC |
| | **SEE VALVES SERIES 300 CNOMO** |

Weight 350 g
Minimum pilot pressure 3 bar





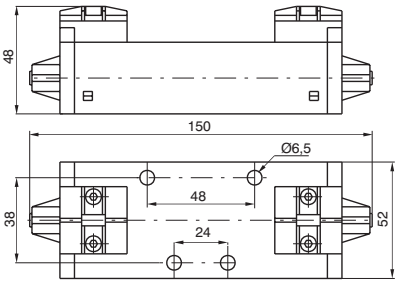



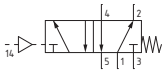
## Pneumatic - Spring

**Coding:** 1012.52.1.9

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1600 |





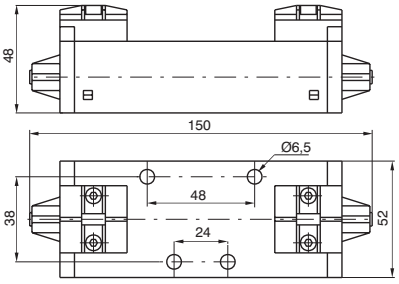

Weight 300 g
Minimum pilot pressure 2,5 bar

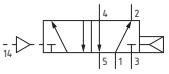
## Pneumatic - Differential

**Coding:** 1012.52.1.6

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1600 |





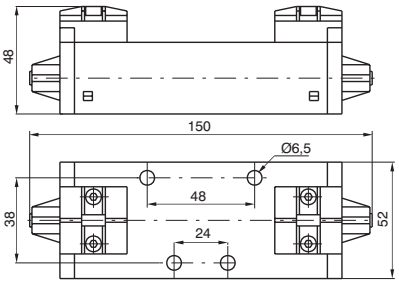

Weight 310 g
Minimum pilot pressure 2 bar

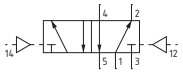
## Pneumatic-Pneumatic 5/2

**Coding:** 1012.52.1.8

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1600 |






Weight 310 g
Minimum pilot pressure 1,5 bar

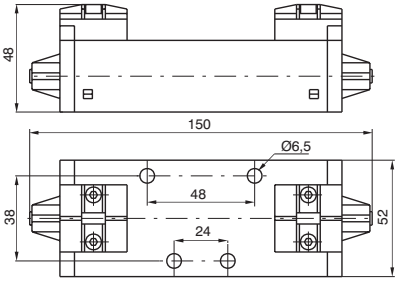
## Pneumatic-Pneumatic 5/3

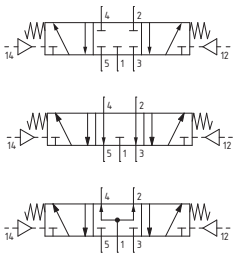
**Coding:** 1012.53.Ⓕ.1.8

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1600 |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |






Weight 310 g
Minimum pilot pressure 3 bar

1012.53.Ⓕ.1.8



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

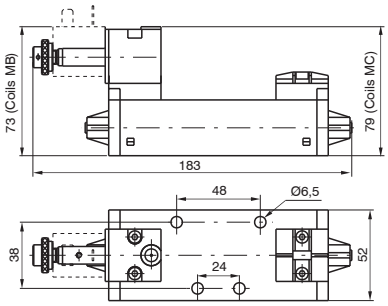
## Solenoid-Spring

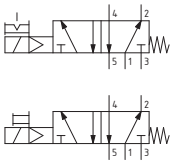
**Coding:** 1012.52.3.9.Ⓜ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1600 |

| Ⓜ | MECHANIC |
|---|---|
| | **SEE VALVES SERIES 300 CNOMO** |





Weight 360 g
Minimum pilot pressure 2,5 bar

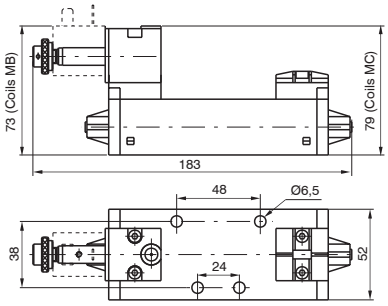
## Solenoid-Differential

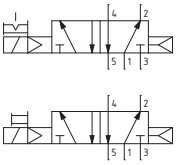
**Coding:** 1012.52.3.6.Ⓜ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1600 |

| Ⓜ | MECHANIC |
|---|---|
| | **SEE VALVES SERIES 300 CNOMO** |





Weight 360 g
Minimum pilot pressure 2 bar

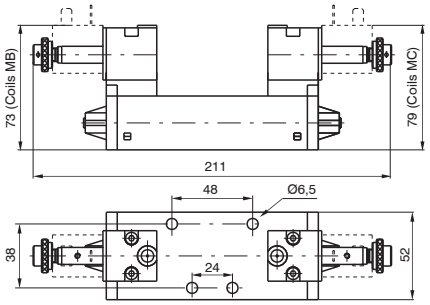
## Solenoid-Solenoid 5/2

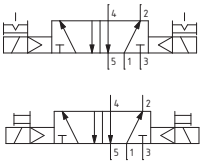
**Coding:** 1012.52.3.5.Ⓜ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1600 |

| Ⓜ | MECHANIC |
|---|---|
| | **SEE VALVES SERIES 300 CNOMO** |





Weight 420 g
Minimum pilot pressure 1,5 bar

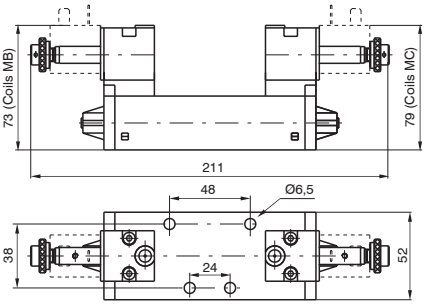
## Solenoid-Solenoid 5/3

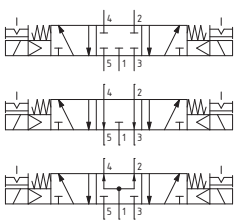
**Coding:** 1012.53.Ⓕ.3.5.Ⓜ

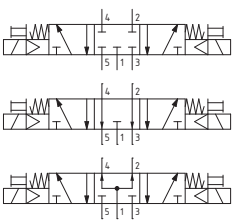
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1600 |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓜ | MECHANIC |
| | **SEE VALVES SERIES 300 CNOMO** |





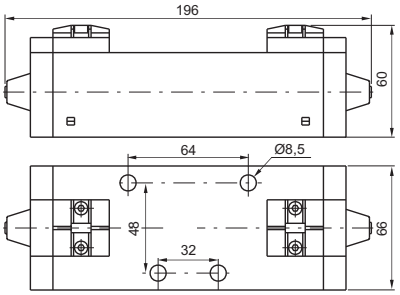


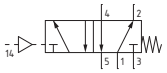
## Pneumatic - Spring

**Coding:** 1013.52.1.9

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3600 |





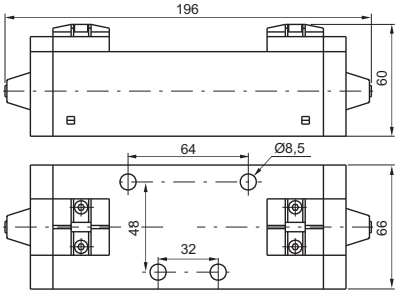

Weight 1000 g
Minimum pilot pressure 2,5 bar

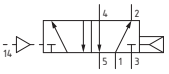
## Pneumatic - Differential

**Coding:** 1013.52.1.6

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3600 |





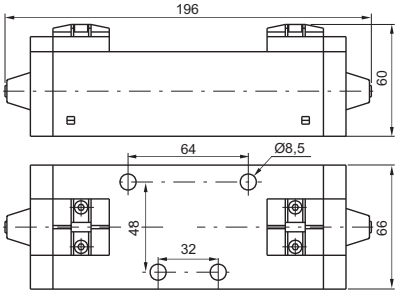

Weight 1020 g
Minimum pilot pressure 2 bar

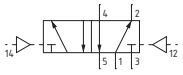
## Pneumatic-Pneumatic 5/2

**Coding:** 1013.52.1.8

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3600 |






Weight 1050 g
Minimum pilot pressure 1,5 bar

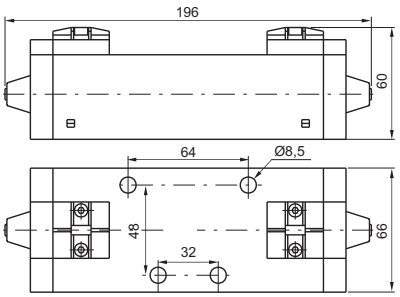
## Pneumatic-Pneumatic 5/3

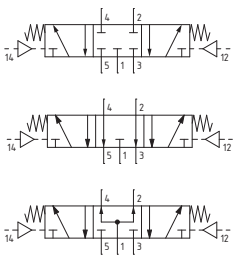
**Coding:** 1013.53.**F**.1.8

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3000 |

| **F** | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |






Weight 1050 g
Minimum pilot pressure 3 bar



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

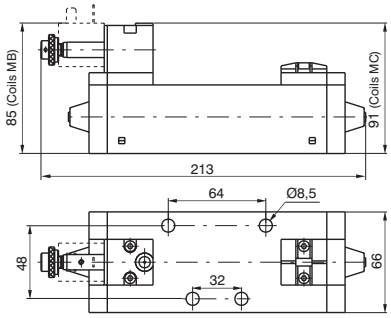
## Solenoid-Spring

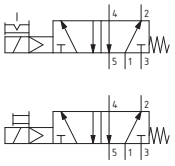
**Coding:** 1013.52.3.9.Ⓜ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3600 |

| Ⓜ | MECHANIC |
|---|---|
| | **SEE VALVES SERIES 300 CNOMO** |





Weight 1060 g
Minimum pilot pressure 2,5 bar

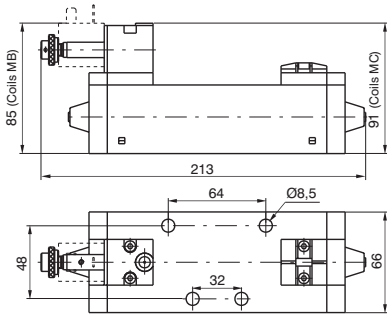
## Solenoid-Differential

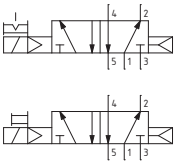
**Coding:** 1013.52.3.6.Ⓜ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3600 |

| Ⓜ | MECHANIC |
|---|---|
| | **SEE VALVES SERIES 300 CNOMO** |





Weight 1080 g
Minimum pilot pressure 2 bar

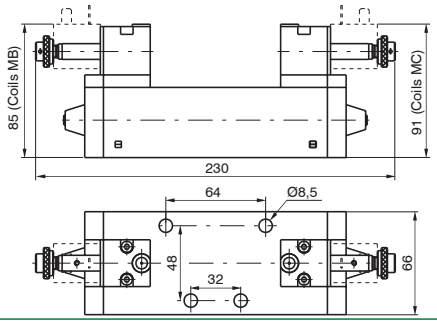
## Solenoid-Solenoid 5/2

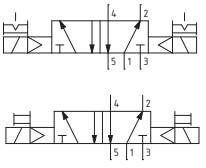
**Coding:** 1013.52.3.5.Ⓜ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3600 |

| Ⓜ | MECHANIC |
|---|---|
| | **SEE VALVES SERIES 300 CNOMO** |





Weight 1170 g
Minimum pilot pressure 1,5 bar

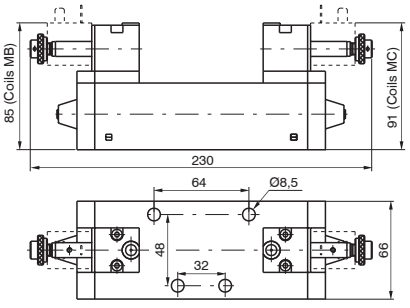
## Solenoid-Solenoid 5/3

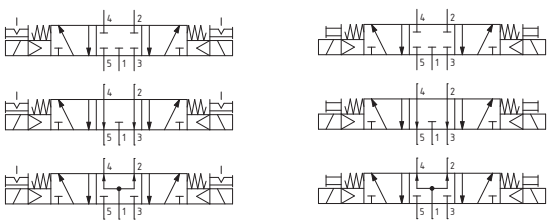
**Coding:** 1013.53.Ⓕ.3.5.Ⓜ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3000 |

| Ⓕ | FUNCTION |
|---|---|
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓜ | MECHANIC |
| | **SEE VALVES SERIES 300 CNOMO** |





## Series 1100 - Modular bases with side and bottom connections

These bases are manufactured with the outlet and pilot ports on both the sides and the bottom faces giving the option for use with any application.
Unused ports must be blanked off using threaded plugs which are not included in the part number or price.
To isolate bases from each other for use with different supply pressures ports 1, 3 & 5 should be plugged underneath the seal.
The codes are:
**1101.17 (size 1)-1102.17 (size 2)-1103.17 (size 3)**




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Modular bases

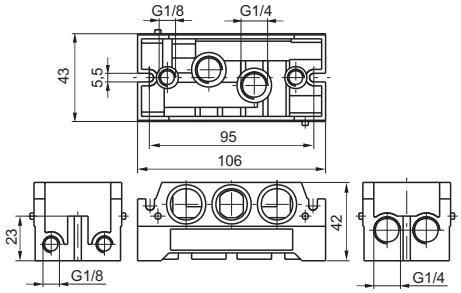
**Coding:** 110Ⓣ.00

| Ⓣ | SIZE |
|---|---|
| | **1** = Size 1 |
| | **2** = Size 2 |
| | **3** = Size 3 |



Weight 240 g

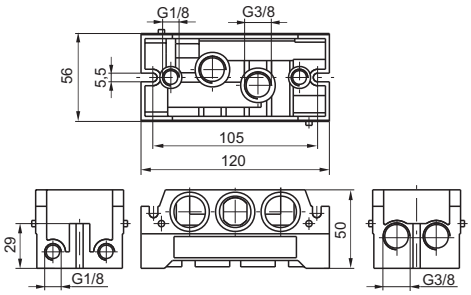
1101.00






Weight 340 g

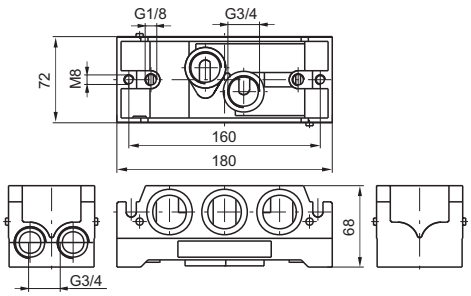
1102.00






Weight 950 g

1103.00

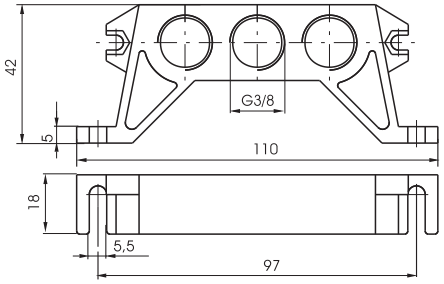



## Inlet blocks, Size 1

**Coding:** 1101.09



Weight 100 g

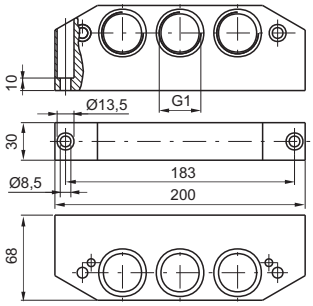



## Inlet blocks, Size 3

**Coding:** 1103.11



Weight 840 g



## Inlet blocks

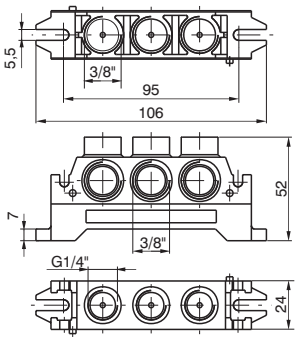
**Coding:** 110Ⓣ.Ⓝ

| | |
|---|---|
| Ⓣ | SIZE |
| | **1** = Size 1 |
| | **2** = Size 2 |
| Ⓝ | CONNECTIONS |
| | **10** = Universal |
| | **11** = Stand alone |
| | **12** = Top connections |
| | **13** = Bottom connections |



Weight 160 g

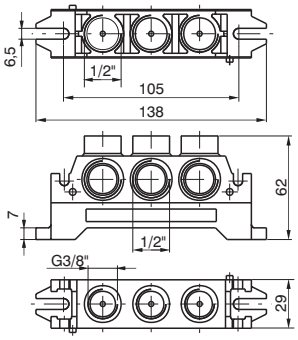
1101.Ⓝ






Weight 230 g

1102.Ⓝ






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## Single use bases

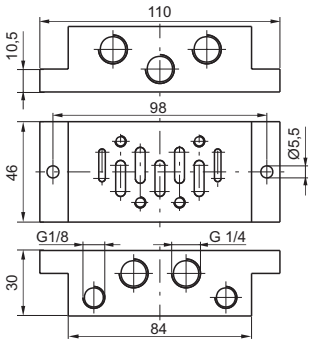
**Coding:** 110Ⓣ.Ⓕ

| | |
|---|---|
| Ⓣ | SIZE |
| | **1** = Size 1 |
| | **2** = Size 2 |
| | **3** = Size 3 |
| Ⓕ | SHAPE |
| | **14** = Shape A |
| | **15** = Shape B (only for sizes 1 & 2) |



Weight 160 g

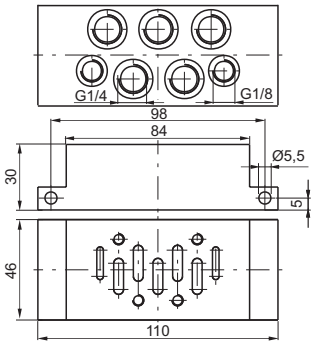
1101.14






Weight 190 g

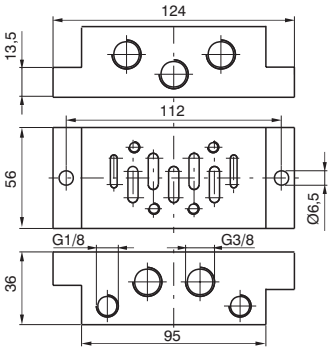
1101.15






Weight 190 g

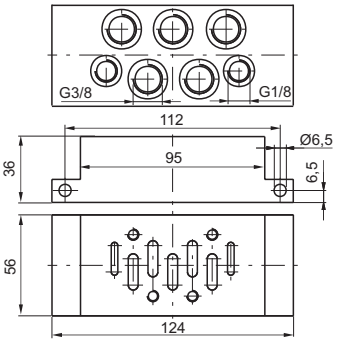
1102.14

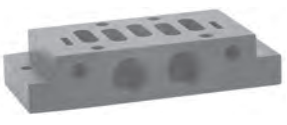





Weight 220 g

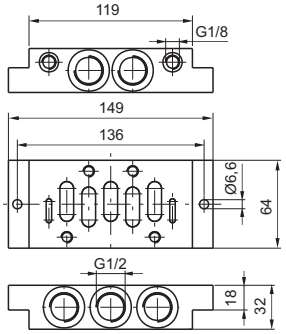
1102.15



Weight 600 g

1103.14



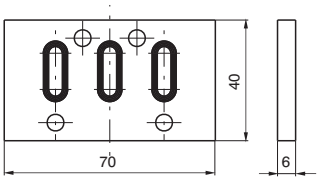
## Closing plate

**Coding:** 110Ⓣ.16

| Ⓣ | SIZE |
|---|---|
| | **1** = Size 1 |
| | **2** = Size 2 |
| | **3** = Size 3 |

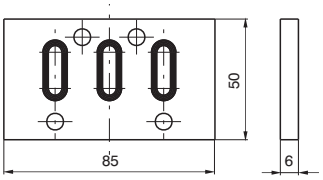


1101.16



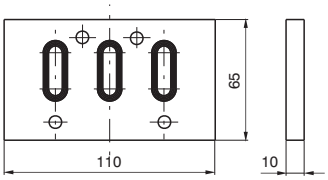



1102.16






1103.16




## Base adaptor

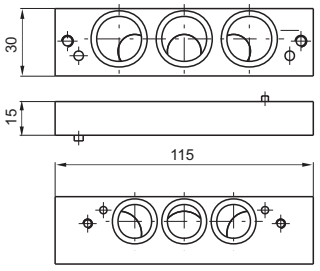
**Coding:** 1100.Ⓣ

| Ⓣ | SIZE |
|---|---|
| | **2-1** = Sizes 1 and 2 |
| | **3-2** = Sizes 2 and 3 |



Weight 110 g

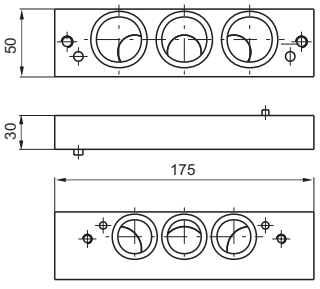
1100.2-1






Weight 590 g

1100.3-2






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 1000 M12 - Size 1, 2 and 3

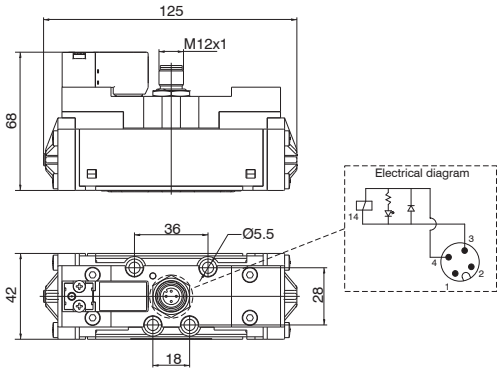
The ISO 5599/1 Solenoid valves Series 1000 M12 are available in three sizes with flow rates from 900 Nl/min for size 1 up to the 3600 Nl/min for size 3.
The standard features of the ISO valves are still included, however, they are now combined with a M12 electrical connector located in the middle of the valve to manage the electrical signals.
Versions are available to suit valves with both single and double 24VDC solenoids complete with IP65 protection.
All version are supplied with LED indicators
**"Shifting time of pneumatic directional control valves or moving parts, logic devices were measured in accordance to ISO 12238:2001"**



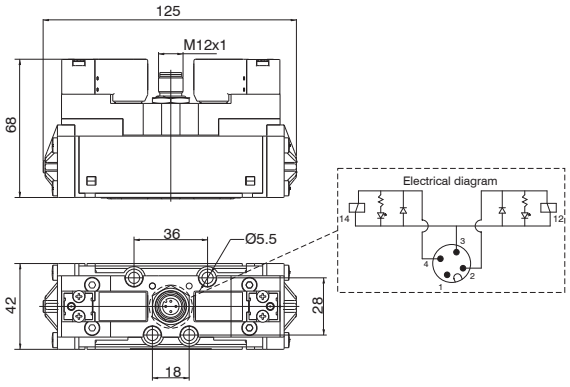
### Electrical characteristics

Electrical connector M12x1
Protection degree IP65
Input voltage 24VDC
Nominal power 2,3W
LED indentification

### Monostable version




### Bistable version



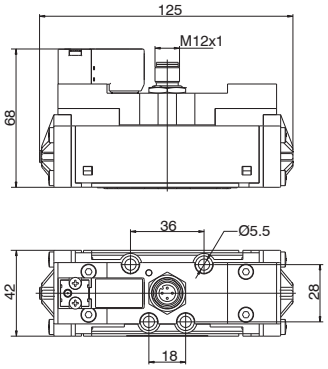
## Solenoid-Spring

**Coding:** 1111.52.3.9.Ⓣ

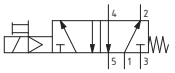
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2.5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 900 |
| Response time according to ISO 12238, activation time (ms) | 16 |
| Response time according to ISO 12238, deactivation time (ms) | 122 |

| Ⓣ | VOLTAGE |
|---|---|
| | **12P** = 24VDC |






Weight 350 g



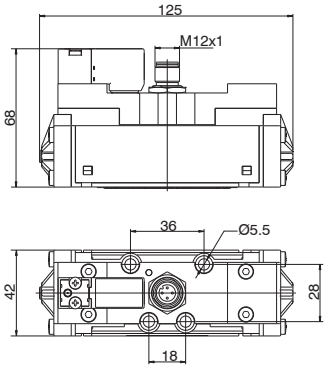

## Solenoid-Differential

**Coding:** 1111.52.3.6.Ⓣ

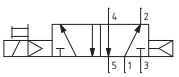
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 900 |
| Response time according to ISO 12238, activation time (ms) | 32 |
| Response time according to ISO 12238, deactivation time (ms) | 51 |

| Ⓣ | VOLTAGE |
|---|---|
| | **12P** = 24VDC |






Weight 356 g






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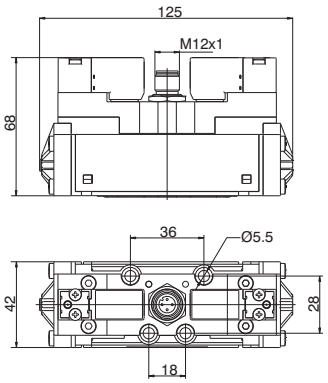
## Solenoid-Solenoid 5/2

**Coding:** 1111.52.3.5.Ⓣ

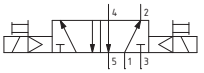
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 1.5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 900 |
| Response time according to ISO 12238, activation time (ms) | 13 |
| Response time according to ISO 12238, deactivation time (ms) | 14 |

| | |
|---|---|
| Ⓣ | VOLTAGE |
| | **12P** = 24VDC |






Weight 390 g



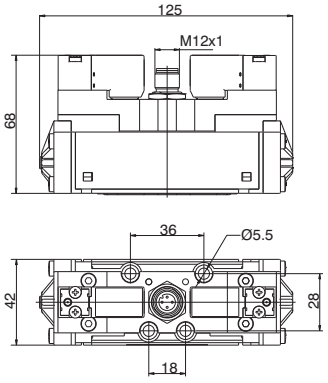
## Solenoid-Solenoid 5/3

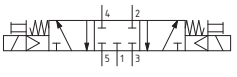
**Coding:** 1111.53.Ⓕ.3.5.Ⓣ

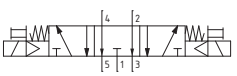
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 3 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 900 |
| Response time according to ISO 12238, activation time (ms) | 18 (Closed centres)<br>18 (Open centres)<br>19 (Pressured centres) |
| Response time according to ISO 12238, deactivation time (ms) | 19 (Closed centres)<br>20 (Open centres)<br>18 (Pressured centres) |

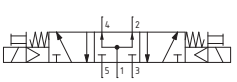
| | |
|---|---|
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓣ | VOLTAGE |
| | **12P** = 24VDC |









Weight 392 g

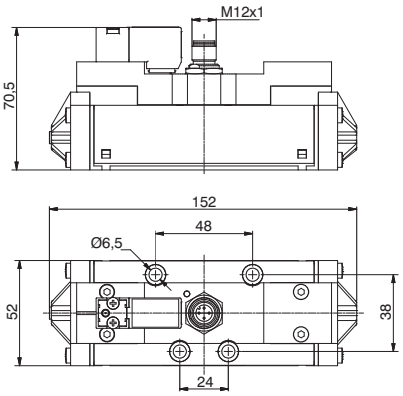
## Solenoid-Spring

**Coding:** 1112.52.3.9.Ⓣ

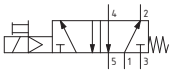
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2.5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1600 |
| Response time according to ISO 12238, activation time (ms) | 24 |
| Response time according to ISO 12238, deactivation time (ms) | 124 |

| Ⓣ | VOLTAGE |
|---|---|
| | **12P** = 24VDC |






Weight 510 g



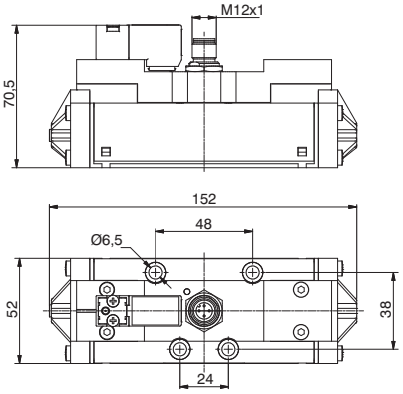

## Solenoid-Differential

**Coding:** 1112.52.3.6.Ⓣ

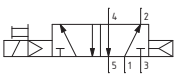
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1600 |
| Response time according to ISO 12238, activation time (ms) | 37 |
| Response time according to ISO 12238, deactivation time (ms) | 90 |

| Ⓣ | VOLTAGE |
|---|---|
| | **12P** = 24VDC |






Weight 515 g






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

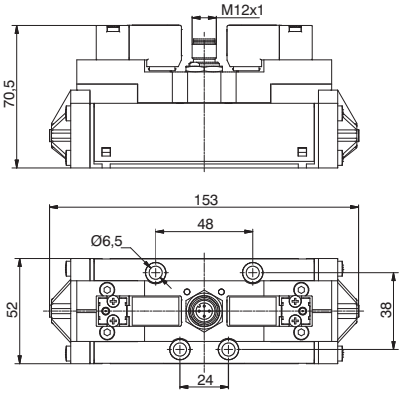
## Solenoid-Solenoid 5/2

**Coding:** 1112.52.3.5.Ⓣ

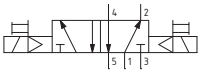
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 1.5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1600 |
| Response time according to ISO 12238, activation time (ms) | 17 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |

| | |
|---|---|
| Ⓣ | VOLTAGE |
| | **12P** = 24VDC |






Weight 550 g



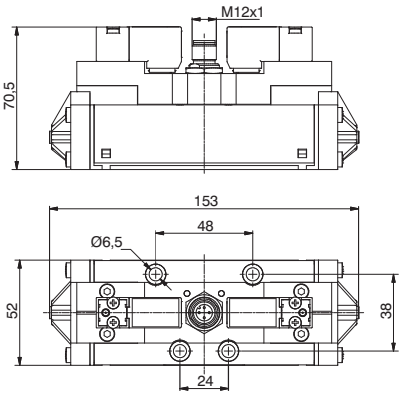
## Solenoid-Solenoid 5/3

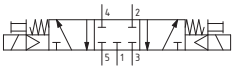
**Coding:** 1112.53.Ⓕ.3.5.Ⓣ

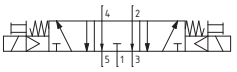
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 3 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1600 |
| Response time according to ISO 12238, activation time (ms) | 18 (Closed centres)<br>18 (Open centres)<br>20 (Pressured centres) |
| Response time according to ISO 12238, deactivation time (ms) | 112 (Closed centres)<br>106 (Open centres)<br>118 (Pressured centres) |

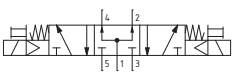
| | |
|---|---|
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓣ | VOLTAGE |
| | **12P** = 24VDC |









Weight 560 g

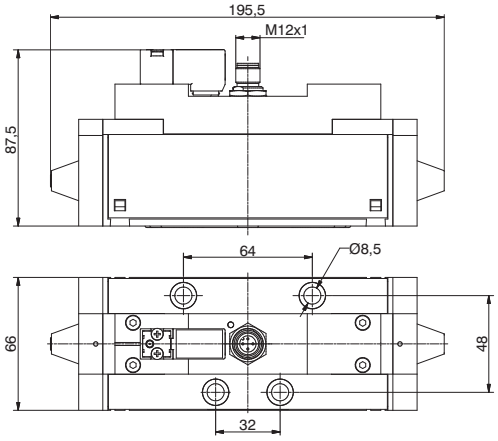
## Solenoid-Spring

**Coding:** 1113.52.3.9.Ⓣ

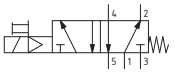
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2.5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3600 |
| Response time according to ISO 12238, activation time (ms) | 46 |
| Response time according to ISO 12238, deactivation time (ms) | 254 |

| Ⓣ | VOLTAGE |
|---|---|
| | **12P** = 24VDC |






Weight 1360 g



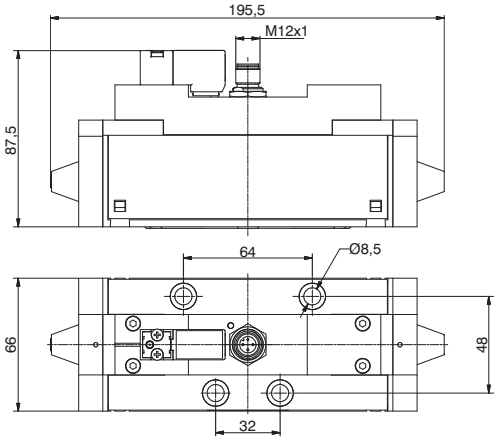
## Solenoid-Differential

**Coding:** 1113.52.3.6.Ⓣ

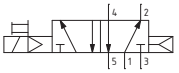
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3600 |
| Response time according to ISO 12238, activation time (ms) | 78 |
| Response time according to ISO 12238, deactivation time (ms) | 180 |

| Ⓣ | VOLTAGE |
|---|---|
| | **12P** = 24VDC |






Weight 1360 g





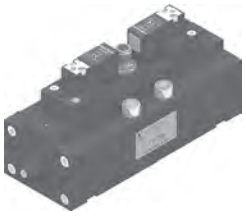
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

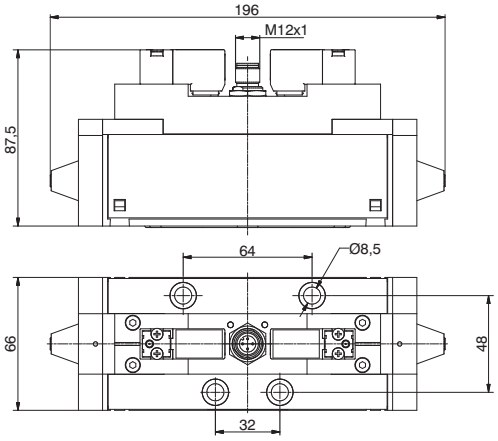
## Solenoid-Solenoid 5/2

**Coding:** 1113.52.3.5.Ⓣ

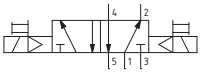
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 1.5 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3600 |
| Response time according to ISO 12238, activation time (ms) | 32 |
| Response time according to ISO 12238, deactivation time (ms) | 37 |

| | |
|---|---|
| Ⓣ | VOLTAGE |
| | **12P** = 24VDC |






Weight 1370 g

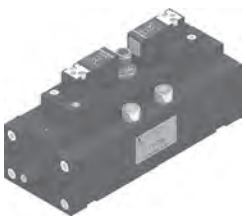


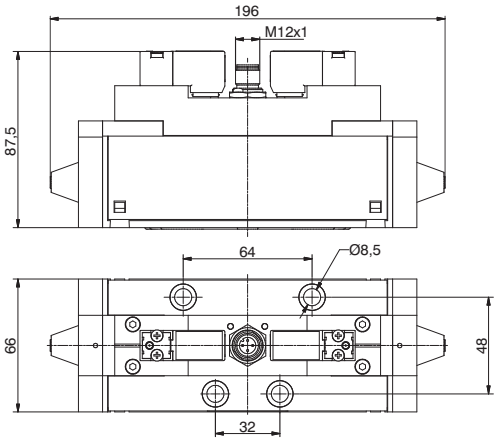
## Solenoid-Solenoid 5/3

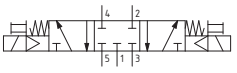
**Coding:** 1113.53.Ⓕ.3.5.Ⓣ

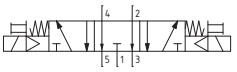
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Max. working pressure (bar) | 10 |
| Minimum pilot pressure (bar) | 3 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 3600 |
| Response time according to ISO 12238, activation time (ms) | 30 (Closed centres)<br>30 (Open centres)<br>32 (Pressured centres) |
| Response time according to ISO 12238, deactivation time (ms) | 305 (Closed centres)<br>230 (Open centres)<br>270 (Pressured centres) |

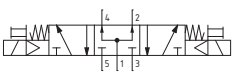
| | |
|---|---|
| Ⓕ | FUNCTION |
| | **31** = Closed centres |
| | **32** = Open centres |
| | **33** = Pressured centres |
| Ⓣ | VOLTAGE |
| | **12P** = 24VDC |









Weight 1380 g

## Series 600 - M5 - G1"

These accessories are a range of devices for completing a pneumatic circuit. These valves, with their special functions, are inserted between two valves, between a valve and a cylinder, or following a cylinder.
One of the particular characteristic of these accessories is that they are automatically actuated without the need for external commands. Usually, operation and idle are controlled by the presence or absence of pressure as, for example, in the case of quick exhaust valves which pilots itself as a selector, changing the flow direction as the signal goes off and on.
On the other hand, other components are inert. That is, they do not have any internal variable function which is sensitive to pressure. Among these components are silencers, manifolds and flow regulators.
There are also the flow regulators, which like electronic components, can be defined as variable resistences. They are fundamental in regulating the flow rate, provide precise timings and regulate the cylinders' speed.
The selector valves, with "AND" and "OR" functions, are logic functions components which often are an essential element. Furthermore, they are built to allow high flow rate which cannot be obtained by classic pneumatic logic.
The block valves lock the cylinder in a position, avoiding unexpected depressurization of the cylinder's chamber due to lack of compressed air at the inlet port. Practically, it is a piloted unidirectional valve that blocks the exhaust port when there is no air in the pilot circuit.
Finally the economizer valves are in fact a pressure reducer valves installed between valve and cylinder for reducing the air consumption. For example this is applicable on the cylinder return stroke without penalizing the exhaust as happens with FRL pressure regulator.



### Construction characteristics

We have not listed all different materials used for the construction of these components because the list would be too the long. We use corrosion proof material, brass or anodized aluminium and the most appropriate specific mixture for seals.
If more information is required please contact our technical department.

### Use and maintenance

In operation pay attention to the minimum and maximum criteria for temperature and pressure, and ensure good quality compressed air. In a dirty environment, protect the exhaust ports.
In this case, maintenance is minimal and is necessary only if the air is particularly dirty.
The components most subject to damage by the accumulation of dirt are flow regulators with fine regulation and silencers. As for regulators, follow the normal procedure for disassembling, washing with non-chemical cleaning agents and remounting. The silencers need only to be rinsed in petrol or solvent and blown dry with compressed air.
The number of requests for spare seals for flow regulators and shuttle valves are statistically irrelevant. More often, it is necessary to replace the lining of the quick exhaust because of the wear it undergoes due to the particular conditions of operating.

**ATTENTION:** use hydraulic oil class H for lubrication such as CASTROL MAGNA SW32.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## MIniature flow control valve M5-Ø3 tube

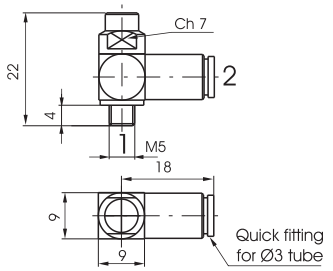
**Coding:** 6.01.305.F

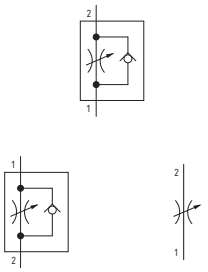
| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 1.5 |

| F | FUNCTION |
|---|---|
| | **1.2** = Unidirectional (from 1 to 2) |
| | **2.1** = Unidirectional (from 2 to 1) |
| | **1.1** = Bidirectional (on both sides) |

Weight 14 g





## MIniature flow control valve M5-Ø3 tube, with adjustement knob

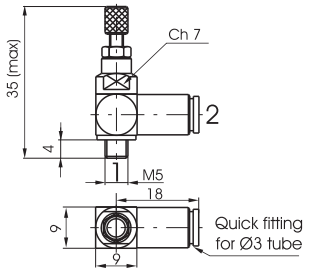
**Coding:** 6.01.305.FP

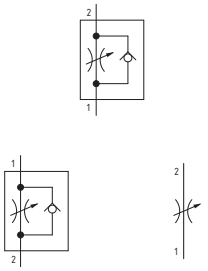
| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 1.5 |

| F | FUNCTION |
|---|---|
| | **1.2** = Unidirectional (from 1 to 2) |
| | **2.1** = Unidirectional (from 2 to 1) |
| | **1.1** = Bidirectional (on both sides) |

Weight 16 g





## MIniature flow control valve M5-Ø3,17 tube

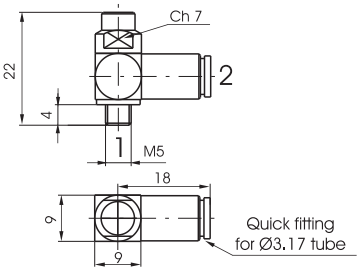
**Coding:** 6.01.315.F

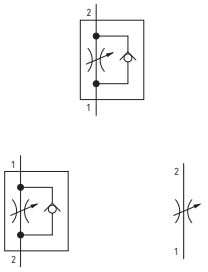
| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 1.5 |

| F | FUNCTION |
|---|---|
| | **1.2** = Unidirectional (from 1 to 2) |
| | **2.1** = Unidirectional (from 2 to 1) |
| | **1.1** = Bidirectional (on both sides) |

Weight 14 g





## MIniature flow control valve M5-Ø3,17 tube, with adjustement knob

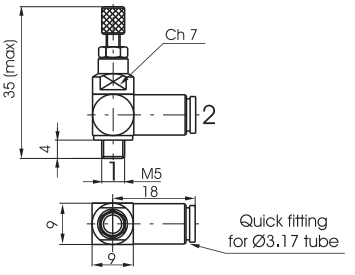
**Coding:** 6.01.315.FP

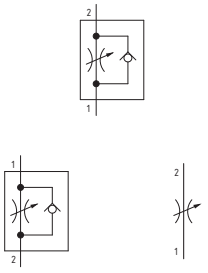
| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 1.5 |

| F | FUNCTION |
|---|---|
| | **1.2** = Unidirectional (from 1 to 2) |
| | **2.1** = Unidirectional (from 2 to 1) |
| | **1.1** = Bidirectional (on both sides) |

Weight 16 g





## MIniature flow control valve M5-Ø4 tube

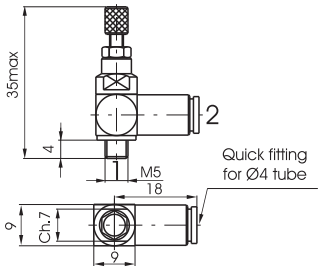
**Coding:** 6.01.45.F

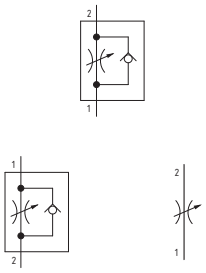
| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 1.5 |

| F | FUNCTION |
|---|---|
| | **1.2** = Unidirectional (from 1 to 2) |
| | **2.1** = Unidirectional (from 2 to 1) |
| | **1.1** = Bidirectional (on both sides) |

Weight 14 g





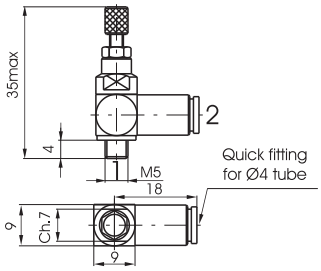
## MIniature flow control valve M5-Ø4 tube, with adjustement knob

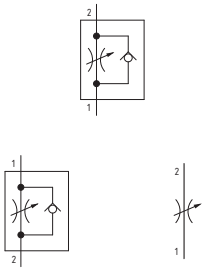
**Coding:** 6.01.45.FP

| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 1.5 |

| F | FUNCTION |
|---|---|
| | **1.2** = Unidirectional (from 1 to 2) |
| | **2.1** = Unidirectional (from 2 to 1) |
| | **1.1** = Bidirectional (on both sides) |





## Flow control valve M5-in line ports

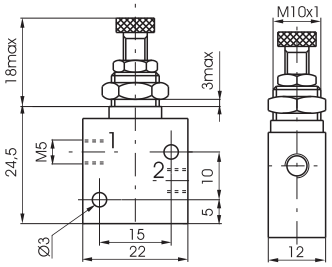
**Coding:** 6.01.F

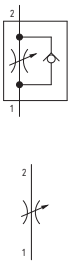
| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 2 |

| F | FUNCTION |
|---|---|
| | **05** = Unidirectional |
| | **05/2** = Bidirectional |

Weight 48 g





## Flow control valve M5-port at 90°

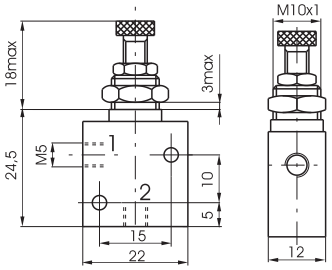
**Coding:** 6.01.05.F

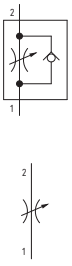
| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 2 |

| F | FUNCTION |
|---|---|
| | **90** = Unidirectional |
| | **90/2** = Bidirectional |

Weight 48 g







Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Flow control valve M5-with a through bolt

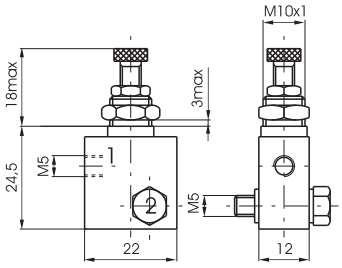
**Coding:** 6.01.05.F

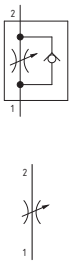
| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 2 |

| F | FUNCTION |
|---|---|
| | **180** = Unidirectional |
| | **180/2** = Bidirectional |

Weight 52 g





## Flow control valve G1/8"-ultrasensitive

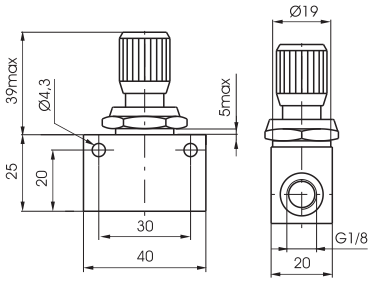
**Coding:** 6.01.18/F

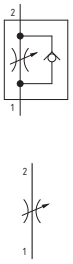
| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 3 |

| F | FUNCTION |
|---|---|
| | **4** = Unidirectional |
| | **5** = Bidirectional |

Weight 100 g





## Flow control valve G1/8"-ultrasensitive with lock nut

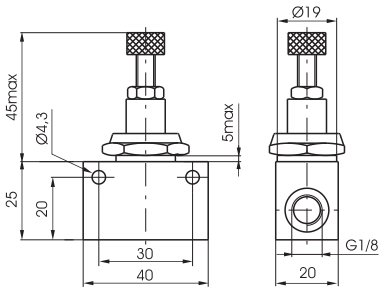
**Coding:** 6.01.18/F

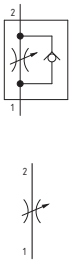
| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 3 |

| F | FUNCTION |
|---|---|
| | **6** = Unidirectional |
| | **7** = Bidirectional |

Weight 105 g





## Flow control valve G1/8"

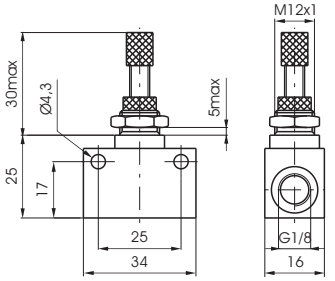
**Coding:** 6.01.F

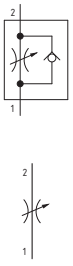
| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 4 |

| F | FUNCTION |
|---|---|
| | **18N** = Unidirectional |
| | **18NE** = Unidirectional ECO |
| | **18/1N** = Bidirectional |
| | **18/1NE** = Bidirectional ECO |

Weight 50 g





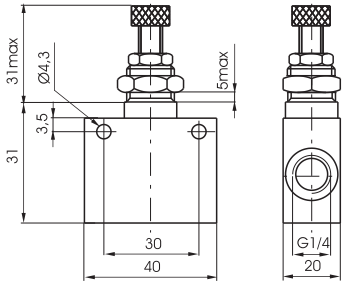
## Flow control valve G1/4"- compact type-unidirectional

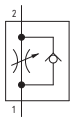
**Coding:** 6.01.14/1

Weight 100 g

| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 5.5 |






## Flow control valve G1/4"

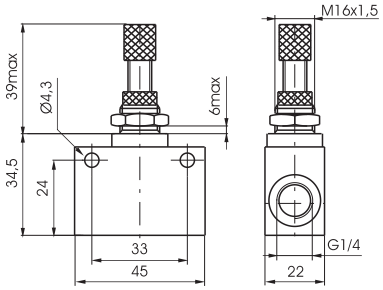
**Coding:** 6.01.Ⓕ

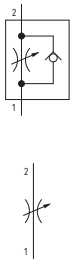
| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 7 |

| Ⓕ | FUNCTION |
|---|---|
| | **14N** = Unidirectional |
| | **14/1N** = Bidirectional |

Weight 105 g






## Flow control valve G1/2"

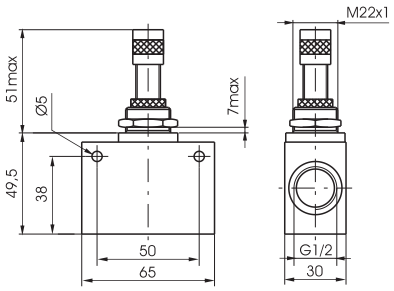
**Coding:** 6.01.Ⓕ

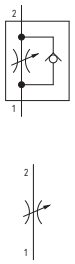
| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 12 |

| Ⓕ | FUNCTION |
|---|---|
| | **12N** = Unidirectional |
| | **12/1N** = Bidirectional |

Weight 290 g





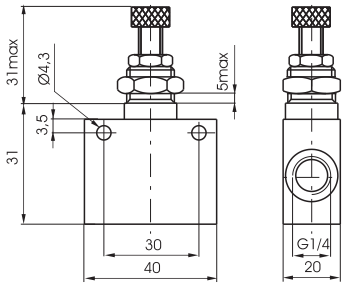

## Flow control valve G3/4"-unidirectional

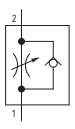
**Coding:** 6.01.34

Weight 500 g

| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Orifice size (mm) | 12 |








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## Quick exhaust valve

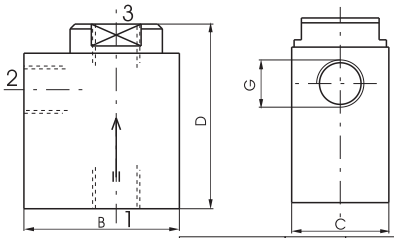
**Coding:** 6.02.❶

| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Working pressure (bar) | 0.5 ... 10 |
| Temperature °C | -5 ... +70 |

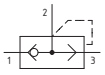
| | CONNECTION (IN) |
|---|---|
| ❶ | **05** = M5 |
| | **18** = G1/8" |
| | **14** = G1/4" |
| | **12** = G1/2" |

Weight "see table"






| G | M5 | 1/8" | 1/4" | 1/2" |
|---|---|---|---|---|
| B | 22 | 32 | 35 | 52 |
| C | 12 | 20 | 25 | 37 |
| D | 28 | 38 | 50 | 62 |
| Weight g | 50 | 62 | 112 | 310 |
| Flow rate Nl/min at 6 bar with Δ p = 1 from 1 to 2 | 120 | 480 | 960 | 3300 |
| Flow rate Nl/min at 6 bar on free exhaust from 2 to 3 | 220 | 1100 | 1930 | 6500 |




## Quick exhaust in line valve

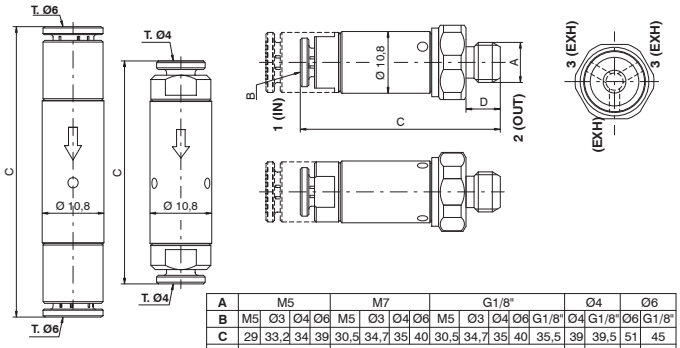
**Coding:** 6.02.❶.Ⓒ.L

| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |

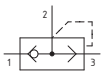
| | CONNECTION (IN) |
|---|---|
| ❶ | **M5** = M5 |
| | **03** = tube Ø3 |
| | **04** = tube Ø4 |
| | **06** = tube Ø6 |
| Ⓒ | WORKING PORTS SIZE |
| | **M5** = M5 |
| | **M7** = M7 |
| | **18** = G1/8" |
| | **04** = tube Ø4 |
| | **06** = tube Ø6 |

Weight "see table"






| A | M5 | | | | M7 | | | | G1/8" | | | | | Ø4 | | Ø6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B | M5 | Ø3 | Ø4 | Ø6 | M5 | Ø3 | Ø4 | Ø6 | M5 | Ø3 | Ø4 | Ø6 | G1/8" | Ø4 | G1/8" | Ø6 | G1/8" |
| C | 29 | 33,2 | 34 | 39 | 30,5 | 34,7 | 35 | 40 | 30,5 | 34,7 | 35 | 40 | 35,5 | 39 | 39,5 | 51 | 45 |
| D | 4,5 | | | | 6 | | | | | | | | | - | 5,5 | - | 5,5 |
| Weight (g) | 17 | | | | 18 | | | | | | | | | 17 | | 20 | 18 |
| Flow rate Nl/min at 6 bar with Δp=1 (from 1 to 2) | 90 | | | | 110 | | | | | | | | | 90 | | 110 | |
| Flow rate Nl/min at 6 bar on free exhaust (from 2 to 3) | 240 | | | | 350 | | | | | | | | | 240 | | 350 | |




## Exhaust flow control

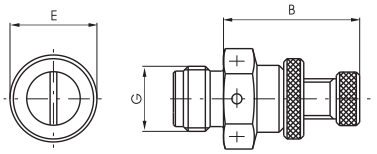
**Coding:** 6.03.❶

| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |

| | CONNECTION (IN) |
|---|---|
| ❶ | **05** = M5 |
| | **18** = G1/8" |
| | **14** = G1/4" |
| | **12** = G1/2" |

Weight "see table"






| G | M5 | 1/8" | 1/4" | 1/2" |
|---|---|---|---|---|
| B | 21 | 18 | 22 | 39 |
| E | 9 | 13 | 16 | 25 |
| Weight g | 10 | 18 | 32 | 155 |



## Shuttle valve "OR"

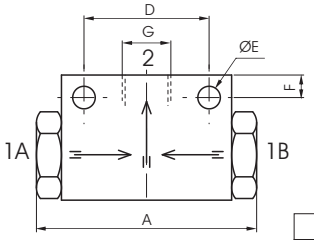
**Coding:** 6.04.❶

| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |

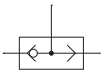
| ❶ | CONNECTION (IN) |
|---|---|
| | **05** = M5 |
| | **18** = G1/8" |
| | **14** = G1/4" |

Weight "see table"






| G | M5 | 1/8" | 1/4" |
|---|---|---|---|
| A | 27 | 44 | 62 |
| B | 12 | 16 | 22 |
| C | 17 | 25 | 30 |
| D | 15 | 25 | 35 |
| E | 3,5 | 4,5 | 5,5 |
| F | 3,5 | 4,5 | 5,5 |
| Weight g | 33 | 50 | 110 |
| Flow rate at 6 bar with Δp = 1 | Nl/min. | 110 | 700 | 2200 |



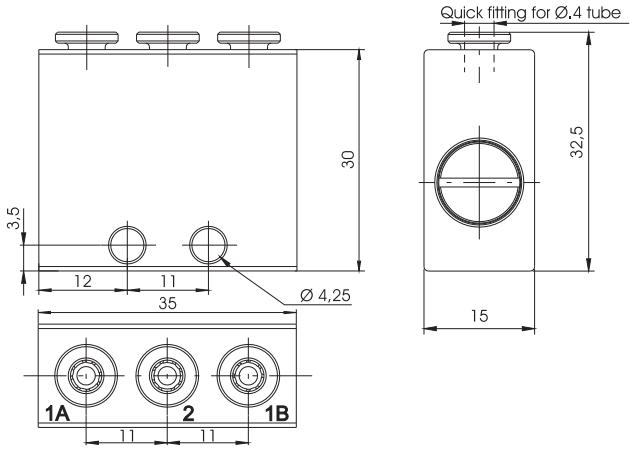
## Shuttle valve "OR"-T=4

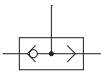
**Coding:** 6.04.04

Weight 50 g

| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 105 |
| Orifice size (mm) | 2.5 |
| Working ports size | Fitting T=4 |





## Shuttle valve "AND"-M5 - G1/8"

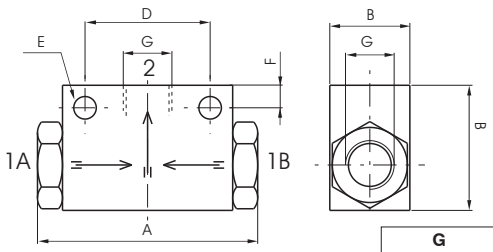
**Coding:** 6.04.❶/1

| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |

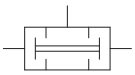
| ❶ | CONNECTION (IN) |
|---|---|
| | **05** = M5 |
| | **18** = G1/8" |

Weight "see table"






| G | M5 | 1/8" |
|---|---|---|
| A | 36 | 44 |
| B | 12 | 16 |
| C | 22 | 45 |
| D | 20 | 25 |
| E | 3,2 | 4,5 |
| F | 3,5 | 4,5 |
| Weight g | 30 | 50 |
| Flow rate at 6 bar with Δp = 1 | Nl/min. | 100 | 480 |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

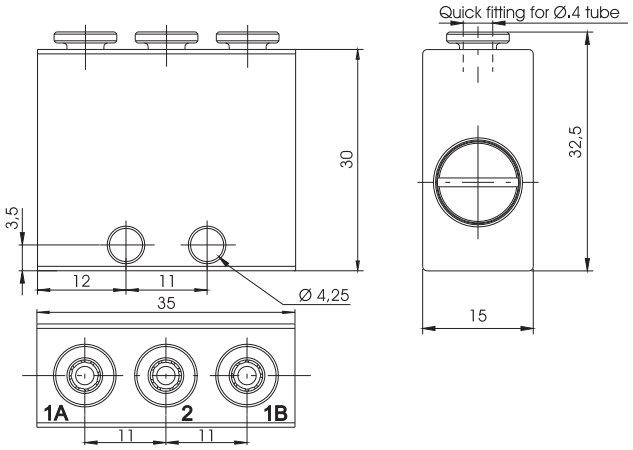
## Shuttle valve "AND"-T=4

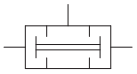
**Coding:** 6.04.04/1

Weight 50 g

| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 105 |
| Orifice size (mm) | 2.5 |
| Working ports size | Fitting T=4 |





## Silencers steel wool

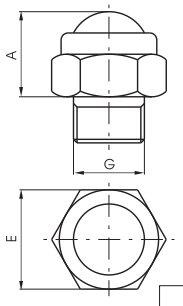
**Coding:** 6.05.❶

| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |

| ❶ | CONNECTION (IN) |
|---|---|
| | **18** = G1/8" |
| | **14** = G1/4" |
| | **38** = G3/8" |
| | **12** = G1/2" |

Weight "see table"






| G | 1/8" | 1/4" | 3/8" | 1/2" |
|---|---|---|---|---|
| A | 12 | 13 | 15 | 17 |
| E | 14 | 17 | 22 | 27 |
| Weight g | 8 | 16 | 32 | 44 |



## Silencers brass

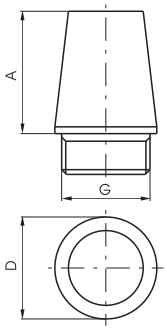
**Coding:** 6.06.❶

| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |

| ❶ | CONNECTION (IN) |
|---|---|
| | **05** = M5 |
| | **18** = G1/8" |
| | **14** = G1/4" |
| | **38** = G3/8" |
| | **12** = G1/2" |
| | **34** = G3/4" |
| | **01** = G1" |

Weight "see table"






| G | M5 | 1/8" | 1/4" | 3/8" | 1/2" | 3/4" | 1" |
|---|---|---|---|---|---|---|---|
| A | 17 | 15 | 18 | 28 | 32 | 40 | 50 |
| D | 8 | 12 | 15 | 19 | 23 | 29 | 38 |
| Weight g | 4 | 8 | 15 | 35 | 50 | 92 | 182 |



## G 1/8" compact check valves

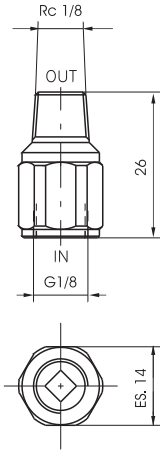
**Coding:** 6.07.18.G

| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Working pressure (bar) | 2,5 ... 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 100 |

| G | SEALS |
|---|---|
| | **R** = NBR |
| | **VR** = FPM |

Weight 50 g









## Non return valve

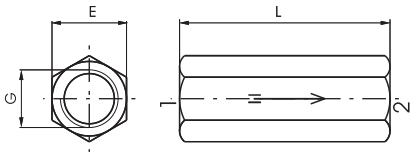
**Coding:** 6.07.T

| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 (+150°C FPM) |

| T | POPPET |
|---|---|
| | **05** = NBR-M5 |
| | **18** = NBR-G1/8" |
| | **14** = NBR-G1/4" |
| | **38** = NBR-G3/8" |
| | **12** = NBR-G1/2" |
| | **18V** = FPM-G1/8" |
| | **14V** = FPM-G1/4" |
| | **38V** = FPM-G3/8" |
| | **12V** = FPM-G1/2" |

Weight "see table"






| G | M5 | 1/8" | 1/4" | 3/8" | 1/2" |
|---|---|---|---|---|---|
| E | 10 | 14 | 17 | 21 | 25 |
| L | 21 | 37 | 48 | 50 | 60 |
| Weight g | 14 | 35 | 60 | 85 | 136 |
| Flow rate at 6 bar with Δp = 1 | Nl/min. | 160 | 650 | 1150 | 2600 | 3500 |




## Manifold 4 ports

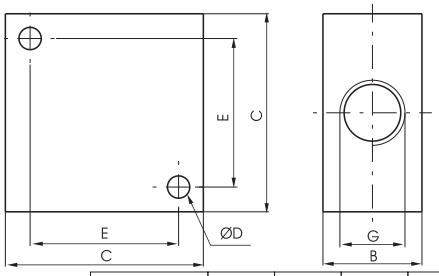
**Coding:** 6.08.C/4

| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 20 |
| Temperature °C | -5 ... +70 |

| C | WORKING PORTS SIZE |
|---|---|
| | **05** = M5 |
| | **18** = G1/8" |
| | **14** = G1/4" |
| | **38** = G3/8" |
| | **12** = G1/2" |

Weight "see table"






| G | M5 | 1/8" | 1/4" | 3/8" | 1/2" |
|---|---|---|---|---|---|
| B | 10 | 16 | 20 | 20 | 30 |
| C | 20 | 32 | 40 | 40 | 50 |
| D | 3,3 | 4,5 | 4,5 | 5,5 | 6,5 |
| E | 14 | 22 | 30 | 30 | 38 |
| Weight g | 28 | 38 | 68 | 54 | 135 |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Manifold 10 ports

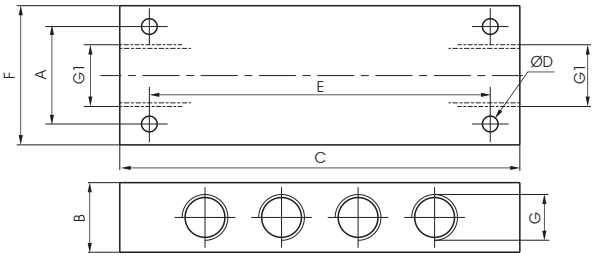
**Coding:** 6.08.Ⓒ/8

| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Max. working pressure (bar) | 20 |
| Temperature °C | -5 ... +70 |

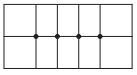
| Ⓒ | WORKING PORTS SIZE |
|---|---|
| | **05** = M5 |
| | **18** = G1/8" |
| | **14** = G1/4" |
| | **38** = G3/8" |
| | **12** = G1/2" |

Weight "see table"






| G | M5 | 1/8" | 1/4" | 3/8" | 1/2" |
|---|---|---|---|---|---|
| G1 | G1/8" | 1/8" | 1/4" | 3/8" | 1/2" |
| A | 16 | 20 | 28 | 28 | 36 |
| B | 12 | 18 | 20 | 20 | 30 |
| C | 60 | 90 | 115 | 130 | 170 |
| ØD | 3,3 | 4,5 | 4,5 | 5,5 | 5,5 |
| E | 50 | 75 | 98 | 112 | 150 |
| F | 22 | 32 | 40 | 40 | 50 |
| Weight g | 92 | 110 | 185 | 165 | 460 |



## Block valve G1/4"

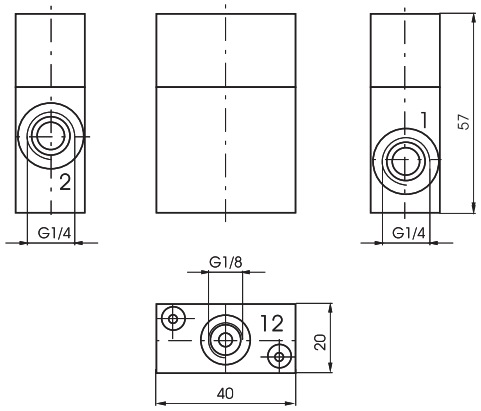
**Coding:** 6.09.14.Ⓕ

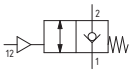
| Operational characteristics | |
|---|---|
| Fluid | Filtered and lubricated air |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 4 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 700 |
| Orifice size (mm) | 7 |

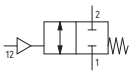
| Ⓕ | FUNCTION |
|---|---|
| | **UN** = Unidirectional |
| | **BN** = Bidirectional |

Weight 122 g







## Block valve G1/2"

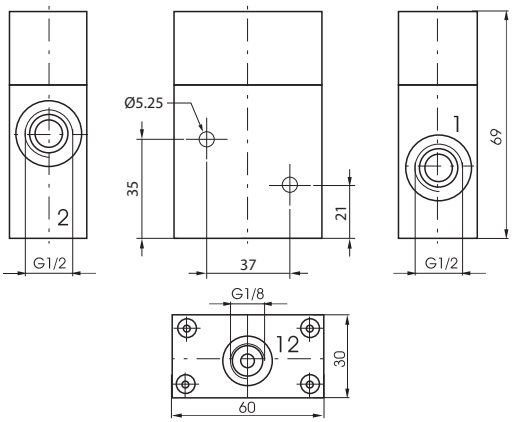
**Coding:** 6.09.12.Ⓕ

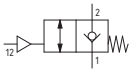
| Operational characteristics | |
|---|---|
| Fluid | Filtered and lubricated air |
| Max. working pressure (bar) | 10 |
| Pilot pressure (bar) | 4 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 2000 |
| Orifice size (mm) | 12 |

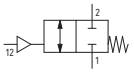
| Ⓕ | FUNCTION |
|---|---|
| | **UN** = Unidirectional |
| | **BN** = Bidirectional |

Weight 305 g







## Economizer

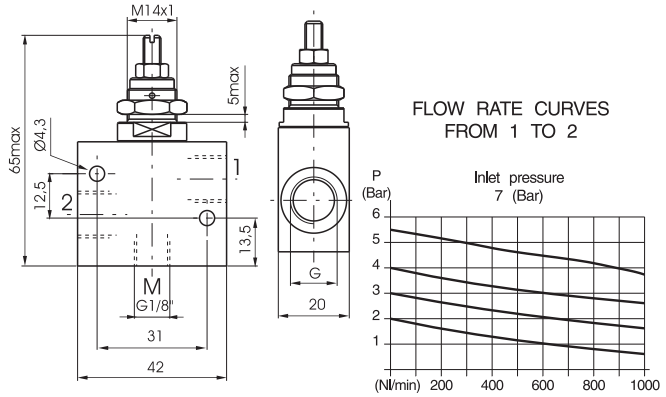
**Coding:** 6.11.Ⓒ

| Operational characteristics | |
|---|---|
| Fluid | Filtered and lubricated air |
| Max. working pressure (bar) | 10 |
| Pressure range (bar) | 0 ... 5,5 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 860 |
| Orifice size (mm) | 6 |

| Ⓒ | WORKING PORTS SIZE |
|---|---|
| | **18** = G1/8" |
| | **14** = G1/4" |

Weight 85 g









## Pneumatic panel-mounted indicator G1/4"

**Coding:** 6.14.14.Ⓒ

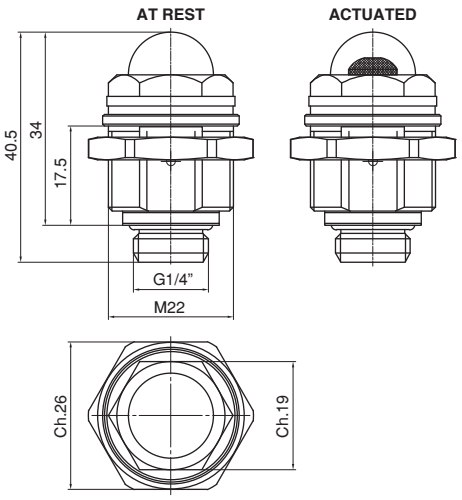
| Operational characteristics | |
|---|---|
| Fluid | Filtered air |
| Working pressure (bar) | 2 ... 10 |
| Temperature °C | -5 ... +60 |

| Ⓒ | INDICATOR COLOUR |
|---|---|
| | **00** = Green |
| | **01** = Red |
| | **02** = Blue |
| | **03** = Yellow |

Weight 56 g

*It's recommended using the device with non-pulsating pressure*








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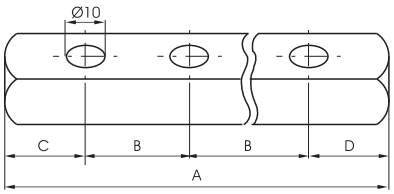
## Gang mounting manifold for valves and solenoid valves G1/8"

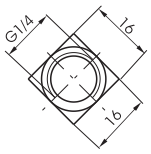
**Coding:** 6.10.18.Ⓢ/Ⓟ

| | |
|---|---|
| Ⓢ | VALVE SIZE |
| | **18** = 18 mm |
| | **25** = 25 mm |
| | **26** = 26 mm |
| | **30** = 30 mm |
| | **32** = 32 mm |
| | **35** = 35 mm |
| Ⓟ | NO. POSITIONS |
| | **2** = No. 2 positions |
| | **3** = No. 3 positions |
| | **4** = No. 4 positions |
| | **5** = No. 5 positions |
| | **6** = No. 6 positions |
| | **7** = No. 7 positions |
| | **8** = No. 8 positions |
| | **9** = No. 9 positions |
| | **10** = No. 10 positions |

Weight "see table"






6.10.18.18/Ⓟ

| | NO. POSITIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| A | 58 | 76 | 94 | 112 | 130 | 148 | 166 | 184 | 202 |
| B | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 |
| C | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| D | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Weight g | 55 | 80 | 105 | 130 | 155 | 180 | 205 | 230 | 255 |

6.10.18.25/Ⓟ

| | NO. POSITIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| A | 70 | 95 | 120 | 145 | 170 | 195 | 220 | 245 | 270 |
| B | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| C | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| D | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Weight g | 80 | 115 | 150 | 185 | 220 | 255 | 290 | 325 | 360 |

6.10.18.26/Ⓟ

| | NO. POSITIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| A | 66 | 92 | 118 | 144 | 170 | 196 | 222 | 248 | 274 |
| B | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| C | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| D | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Weight g | 70 | 110 | 145 | 185 | 220 | 260 | 300 | 340 | 375 |

6.10.18.30/Ⓟ

| | NO. POSITIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| A | 80 | 110 | 140 | 170 | 200 | 230 | 260 | 290 | 320 |
| B | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| C | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| D | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Weight g | 100 | 140 | 180 | 220 | 260 | 300 | 340 | 380 | 420 |

6.10.18.32/Ⓟ

| | NO. POSITIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| A | 82 | 114 | 146 | 178 | 210 | 242 | 274 | 306 | 338 |
| B | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| C | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| D | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Weight g | 100 | 145 | 190 | 235 | 280 | 325 | 370 | 415 | 460 |

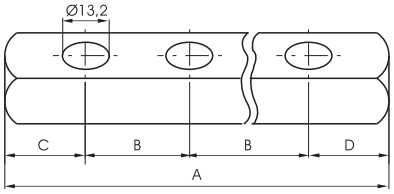
6.10.18.35/Ⓟ

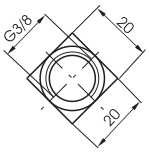
| | NO. POSITIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| A | 89 | 124 | 159 | 194 | 229 | 264 | 299 | 334 | 369 |
| B | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 |
| C | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 |
| D | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 |
| Weight g | 110 | 160 | 210 | 260 | 310 | 360 | 410 | 460 | 510 |

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Gang mounting manifold for valves and solenoid valves G1/4"






**Coding:** 6.10.14.Ⓢ/Ⓟ

| | |
|---|---|
| Ⓢ | VALVE SIZE |
| | **20** = 20 mm |
| | **25** = 25 mm |
| | **30** = 30 mm |
| | **35** = 35 mm |
| | **45** = 45 mm |
| Ⓟ | NO. POSITIONS |
| | **2** = No. 2 positions |
| | **3** = No. 3 positions |
| | **4** = No. 4 positions |
| | **5** = No. 5 positions |
| | **6** = No. 6 positions |
| | **7** = No. 7 positions |
| | **8** = No. 8 positions |
| | **9** = No. 9 positions |
| | **10** = No. 10 positions |

Weight "see table"

6.10.14.20/Ⓟ

| | NO. POSITIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| A | 65 | 85 | 105 | 125 | 145 | 165 | 185 | 205 | 225 |
| B | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| C | 22,5 | 22,5 | 22,5 | 22,5 | 22,5 | 22,5 | 22,5 | 22,5 | 22,5 |
| D | 22,5 | 22,5 | 22,5 | 22,5 | 22,5 | 22,5 | 22,5 | 22,5 | 22,5 |
| Weight g | 130 | 150 | 190 | 190 | 210 | 230 | 250 | 270 | 290 |

6.10.14.25/Ⓟ

| | NO. POSITIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| A | 75 | 100 | 125 | 150 | 175 | 200 | 225 | 250 | 275 |
| B | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| C | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| D | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Weight g | 140 | 170 | 200 | 230 | 260 | 290 | 320 | 350 | 380 |

6.10.14.30/Ⓟ

| | NO. POSITIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| A | 80 | 110 | 140 | 170 | 200 | 230 | 260 | 290 | 320 |
| B | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| C | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| D | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Weight g | 150 | 190 | 230 | 270 | 310 | 350 | 390 | 430 | 470 |

6.10.14.35/Ⓟ

| | NO. POSITIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| A | 85 | 120 | 155 | 190 | 225 | 260 | 295 | 335 | 365 |
| B | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 |
| C | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| D | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Weight g | 160 | 210 | 260 | 310 | 360 | 410 | 460 | 510 | 560 |

6.10.14.45/Ⓟ

| | NO. POSITIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| A | 115 | 160 | 205 | 250 | 295 | 340 | 385 | 430 | 475 |
| B | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 |
| C | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 |
| D | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 |
| Weight g | 200 | 275 | 350 | 425 | 500 | 575 | 650 | 725 | 800 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Spry valves

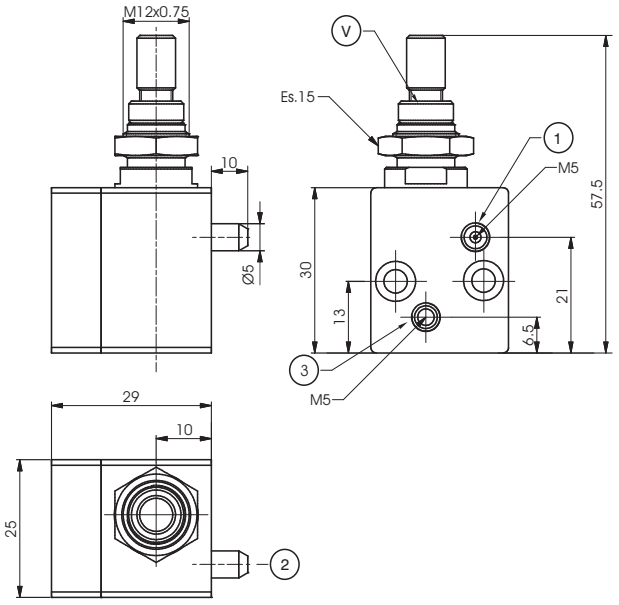
**Coding:** 6.13.00

### Construction characteristics

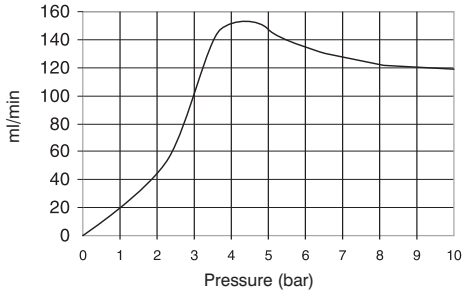
- This valve, is based on the Venturi principle, and it is used to spray and nebulize a liquid.
- Useful in all applications where is needed a continuous lubrication and / or refrigeration.
- Incoming air (connection 1) sucks the liquid through the venturi principle (connection 3) to obtain a continuous spray output (connection 2).

| Technical characteristics | |
|---|---|
| Fluid | filtered and lubricated air |
| Liquid | Water and oil<br>(Liquid viscosity 3°E* ... 5°E*)<br>*E = Engler Degrees |
| Working pressure (bar) | 3 ... 10 |
| Temperature °C | -5 ... +70 |
| Weight (g) | 85 |



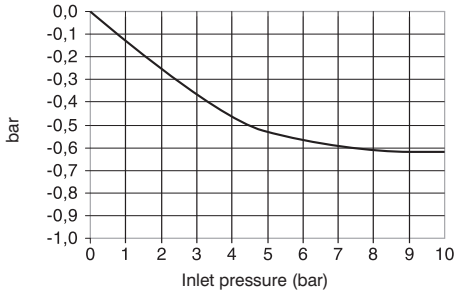



### Liquid consumption diagram

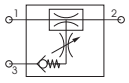



Volume of aspirated fluid in function of pressure power with the adjuster screw "V" totally open

### Vacuum diagram




Volume of vacuum generated in function of supply pressure




Supply air : Connection 1
Output (air and nebulized liquid) : Connection 2
Supply liquid : Connection 3

## Series 900

The 900 series consist of the following components:

- Pressure switch, which transforms a pneumatic signal into an electric one.
- Impulse generator, which transforms a permanent pneumatic signal into an adjustable impulse from 0 to 10 seconds.
- Pneumatic timer (N.C. or N.O.), which cuts or releases a pneumatic signal within an adjustable time.
- Two hands safety valve, which allows a safety use of two hands pneumatic controls (for example two push-button 3/2 N.C. to a certain distance) excluding false signals in case of push-button or valve malfunction.
- Flip-Flop: 5/2 ways valve, single signal actuated, commutes the outlet from 2 to 4 and vice versa at each puls.
- For a correct functioning it's important that inlet pressure be the same or lower than pilot pressure.
- Oscillator valve, 5/2 - G 1/8" with two logic functions "NOT" mounted on board, switches when the pressure in the connected cylinder exhaust chamber is reaching the threshold of "NOT".
- Signal amplifier, 3/2 - G 1/8" N.C. valve actuated by weak signals but higher than 0.05 bar.
- Progressive start-up valve, which is a device that is fitted in between valve or solenoid valve and cylinder allows a gradual filling of the chamber providing a low power cylinder movement. The progressive start-up valve is made of a flow control valve and a 2/2 N.C. valve with 6 mm nominal orifice. The valve is totally open when the pressure in the cylinder reaches 50% of inlet pressure.
- High-low pressure devices, located in the pneumatic circuit between valve and cylinder, allow the function of the cylinder with two different pressures. Example: in case of a locking action, it is possible to approach the required position at a low pressure, then increase to its maximum value in the circuit with the use of an electric signal. They are practically made of a piloted pressure regulator without relieving.

### Construction characteristics

We use corrosion proof material, brass or anodized aluminium and the most appropriate specific mixture for seals.
If more information is required please contact our technical department.

### Use and maintenance

In use pay attention to the minimum and maximum criteria for temperature and pressure, checking and ensure good quality compressed air. In a dirty environment, protect the exhaust ports. In this case, maintenance is minimal and is necessary only if the air is particularly dirty.
This simple operation it should be carried out by a competent person.

**ATTENTION:** use hydraulic oil class H for lubrication such as CASTROL MAGNA SW32.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pressure switch G 1/8"-screw connections

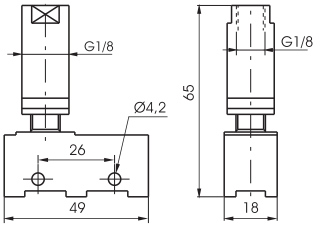
**Coding:** 900.18.1-Ⓟ

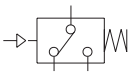
| Operational characteristics | |
|---|---|
| Fluid | Filtered and lubricated air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate microswitch | 13 (3) A to 220V~ |
| Pilot ports size | G1/8" |

| Ⓟ | PRESSURE |
|---|---|
| | **1** = Min. switch pressure 1 bar |
| | **4** = Min. switch pressure 4 bar |

Weight 75 g





## Pressure switch G 1/8"-spade connections

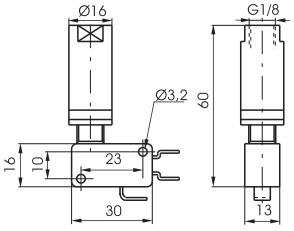
**Coding:** 900.18.1/Ⓟ

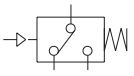
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate microswitch | 16 (5) A to 220V~ |
| Pilot ports size | G1/8" |

| Ⓟ | PRESSURE |
|---|---|
| | **1-1** = Min. switch pressure 1 bar |
| | **1-4** = Min. switch pressure 4 bar |

Weight 60 g





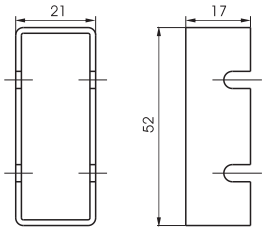



## Switch protection

**Coding:** 900.18.0

Weight 6 g



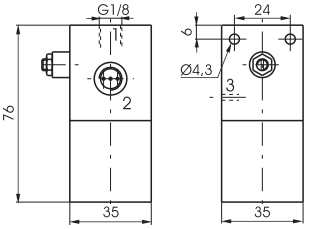


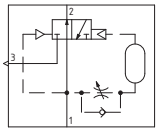

## Impulse generator

**Coding:** 900.18.2N

Weight 325 g





## Pneumatic timer N.C. - G 1/8"

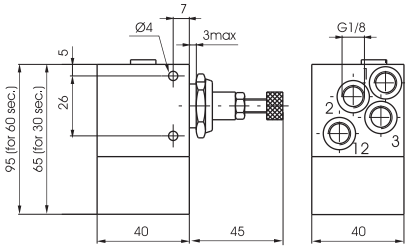
**Coding:** 900.18.T

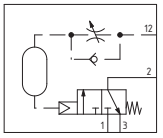
| Operational characteristics | |
|---|---|
| Fluid | Filtered and lubricated air |
| Working pressure (bar) | 3 ... 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 130 |
| Orifice size (mm) | 2.5 |

| T | TIME |
|---|---|
| | **3** = 0 ... 30 sec. |
| | **3.60** = 0 ... 60 sec. |

Weight 290 g (30 sec.)
Weight 350 g (60 sec.)






## Pneumatic timer N.O. - G 1/8"

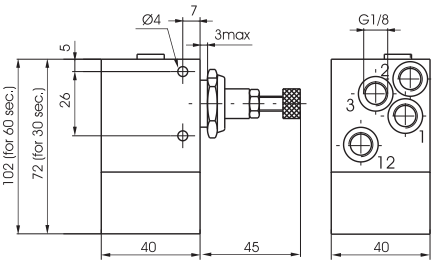
**Coding:** 900.18.T

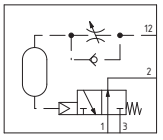
| Operational characteristics | |
|---|---|
| Fluid | Filtered and lubricated air |
| Working pressure (bar) | 4 ... 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 130 |
| Orifice size (mm) | 2.5 |

| T | TIME |
|---|---|
| | **4** = 0 ... 30 sec. |
| | **4.60** = 0 ... 60 sec. |

Weight 320 g (30 sec.)
Weight 380 g (60 sec.)





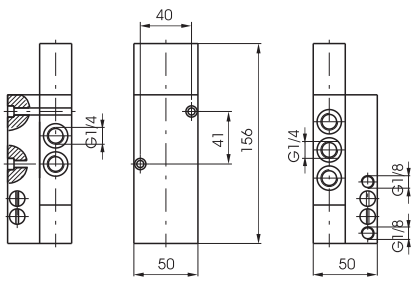

## Two hands safety valve G 1/4"

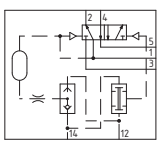
**Coding:** 900.52.1.1

Weight 780 g

| Operational characteristics | |
|---|---|
| Fluid | Filtered and lubricated air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1030 |
| Orifice size (mm) | 7 |
| Working ports size | G1/4" |
| Pilot ports size | G1/8" |






Attention : This version is not certified to any safety standard



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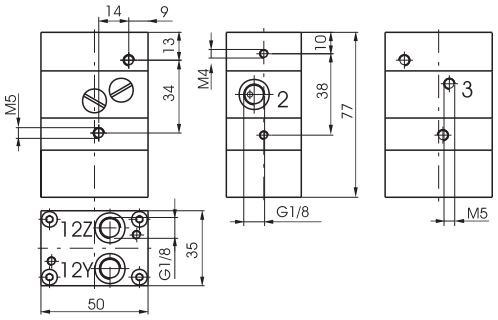
## Two hands safety valve ISO 13851: TYPE IIIA

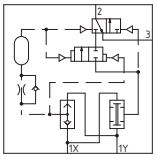
**Coding:** 900.18.9

Weight 340 g

| Operational characteristics | |
|---|---|
| Fluid | Filtered and lubricated air |
| Working pressure (bar) | 3 ... 8 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 40 |
| Orifice size (mm) | 2.5 |
| Working ports size | G1/8" |
| Pilot ports size | G1/8" |





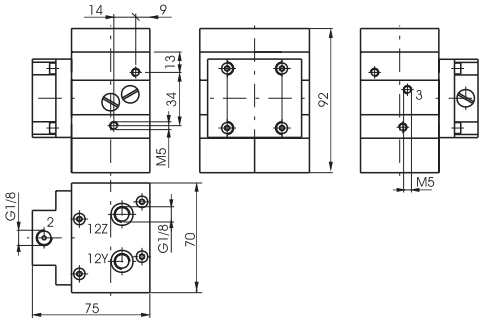

## Two hands safety valve ISO 13851: TYPE IIIB

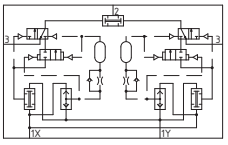
**Coding:** 900.18.10

Weight 980 g

| Operational characteristics | |
|---|---|
| Fluid | Filtered and lubricated air |
| Working pressure (bar) | 3 ... 8 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 40 |
| Orifice size (mm) | 2.5 |
| Working ports size | G1/8" |
| Pilot ports size | G1/8" |





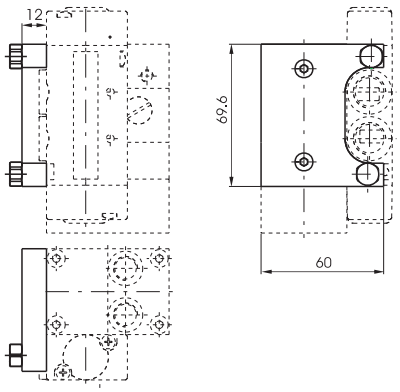




## Power valve adaptor (Series 2400)

**Coding:** 900.18.11

Weight 75 g





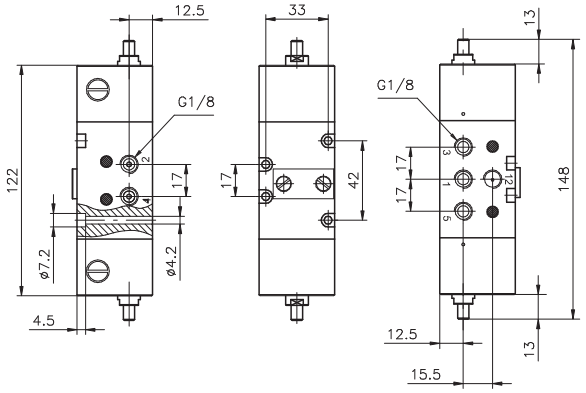
## Flip-flop valve G 1/8"-Pneumatic command

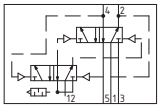
**Coding:** 900.52.1.3

Weight 550 g

| Operational characteristics | |
|---|---|
| Fluid | Filtered and lubricated air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |





Attention : Pressure of signal "12" must be the same or higher than device inlet pressure. The maximum distance between the pilot valve and the device must not exceed 1Mtr. ( see pneumatic scheme). Should be necessary to work at a greater distance it is advisable to use a pneumatic-spring shut-off valve positioned at the recommended distance.

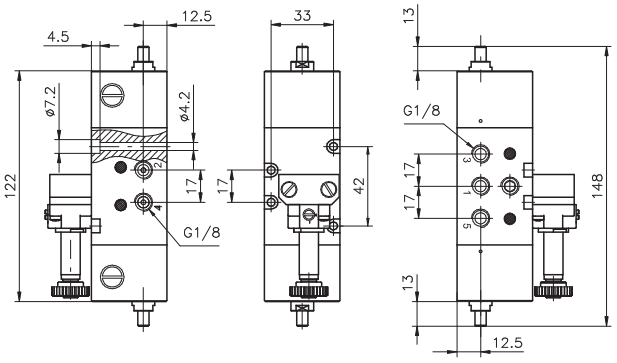
## Flip-flop valve-Electric command with M2 mechanic

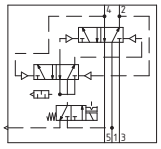
**Coding:** 900.52.1.4

Weight 660 g

| Operational characteristics | |
|---|---|
| Fluid | Filtered and lubricated air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |





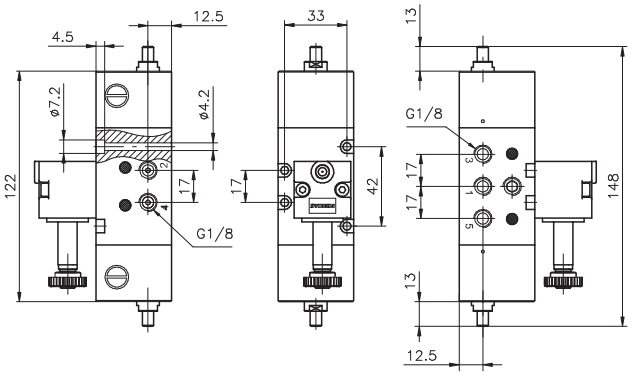
## Flip-flop valve-Electric command with M3P CNOMO

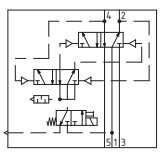
**Coding:** 900.52.1.5

Weight 600 g

| Operational characteristics | |
|---|---|
| Fluid | Filtered and lubricated air |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |







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## Oscillator valve G 1/8"

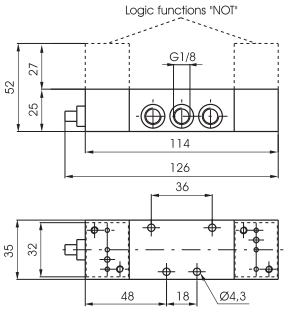
**Coding:** 900.52.Ⓕ

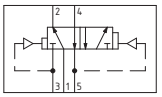
| Operational characteristics | |
|---|---|
| Fluid | Filtered and lubricated air |
| Max. working pressure (bar) | 8 |
| Min. working pressure (bar) | 2 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 540 |
| Orifice size (mm) | 6 |
| Working ports size | G1/8" |

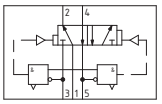
| Ⓕ | FUNCTION |
|---|---|
| | **5** = without logic functions NOT |
| | **5C** = with logic functions NOT |

Weight 600 g







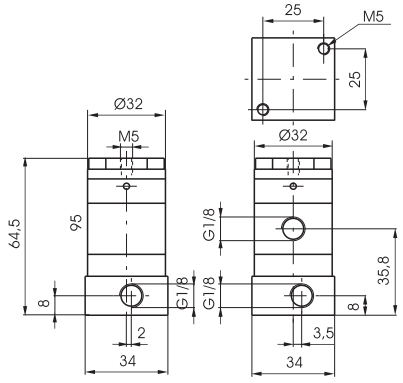
## Signal amplifier G 1/8"

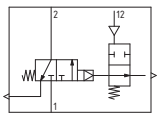
**Coding:** 900.32.6

| Operational characteristics | |
|---|---|
| Fluid | Filtered and lubricated air |
| Max. working pressure (bar) | 10 |
| Min. working pressure (bar) | 0.05 |
| Temperature °C | -5 ... +70 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 130 |
| Orifice size (mm) | 3 |
| Working ports size | G1/8" |

Weight 170 g





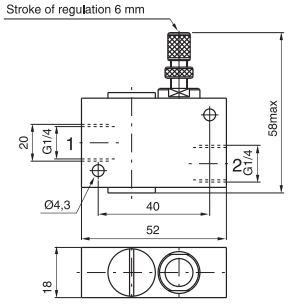
## Progressive start-up valve G 1/4"

**Coding:** 900.14.7

| Operational characteristics | |
|---|---|
| Fluid | Filtered and lubricated air |
| Working pressure (bar) | 2,5 ... 10 |
| Temperature °C | -5 ... +70 |
| Flow rate from 1 to 2 (Nl/min) | 760 |
| Flow rate from 2 to 1 (Nl/min) | 900 |
| Orifice size (mm) | 6 |

Weight 100 g
Flow rate needle fully open from port 1 to 2 (Nl/min.) = 200







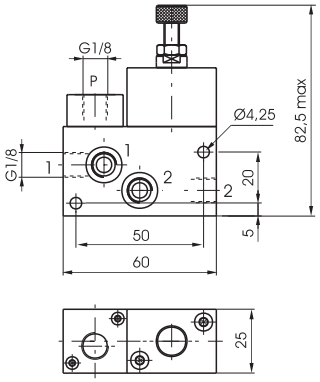

## High-low pressure device

**Coding:** 900.18.8.P

Weight 240 g
with pneumatic pilot

| Operational characteristics | |
|---|---|
| Fluid | Filtered and lubricated air |
| Max. working pressure (bar) | 10 |
| Pressure range (bar) | 1 ... 4 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 650 |
| Working ports size | G1/8" |







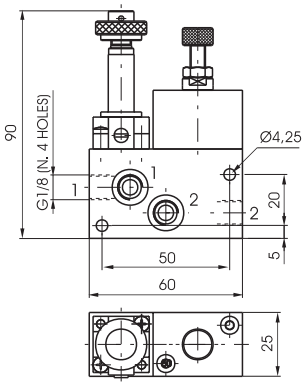

## High-low pressure device

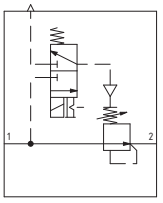
**Coding:** 900.18.8.E

Weight 280 g
with M2 mechanic

| Operational characteristics | |
|---|---|
| Fluid | Filtered and lubricated air |
| Max. working pressure (bar) | 10 |
| Pressure range (bar) | 1 ... 4 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 650 |
| Working ports size | G1/8" |





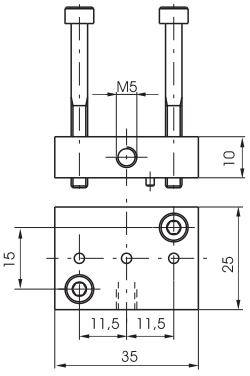



## External feeding base "NOT" logical element

**Coding:** 900.005

Weight 35 g





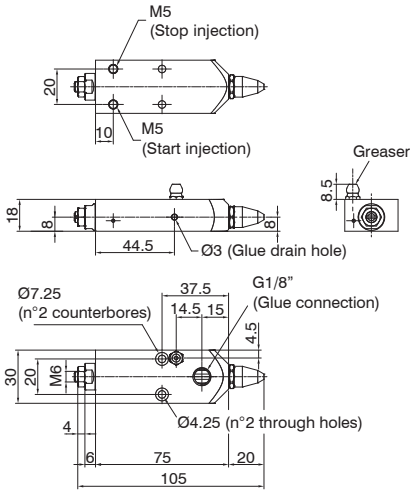



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pneumatic glue injector

**Coding:** 900.19.01






### Construction characteristics

- External components: nickel-plated brass / stainless steel
- Piloting connections: M5
- Glue connection: G1/8"
- Glue Seal: special PTFE
- Pneumatic seals: NBR
- Grease nipple: Stainless steel
- Spray intensity adjustment screw: Stainless steel

| Technical characteristics | |
|---|---|
| Injection fluid | Vinyl glue |
| Pressure Glue (bar) | 7 |
| Pneumatic fluid piloting | Filtered air. No lubrication needed, if applied it shall be continuous |
| Opening pilot (bar) | 3 ... 6 |
| Closing pilot (bar) | 3 ... 6 (or spring) |
| Temperature °C | -5 ... +70 |
| Weight (g) | 285 |

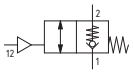
## Series 50-T50

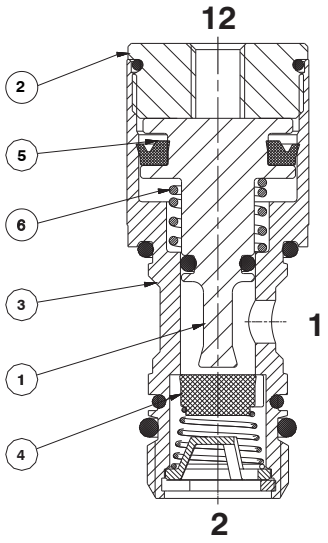
The blocking valves are used to maintain pressure in the downstream part of the pneumatic circuit even when the pressure supply is shut down.
Blocking valves are normally assembled directly on cylinders ports in order to maintain the position even in cases of accidental loss of the pilot pressure by preventing a sudden loss of pressure in the cylinder chambers.
Unidirectional and bidirectional version are both available.
The unidirectional version allows free air to flow in one direction while requires a pneumatic signal to allow air flow in the opposite direction.
The bidirectional version requires a pressure signal to allow air flow in both of the two directions.
**The blocking valve cannot be used as safety device.**



### Constructive features

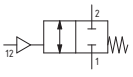
**UNIDIRECTIONAL VERSION**

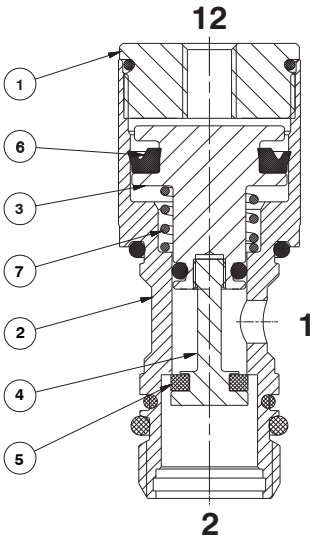



1 - Aluminium piston
2 - Brass plug
3 - Brass body
4 - FPM poppet (1/8" and 1/4" version) PUR poppet
5 - NBR seal
6 - Steel spring

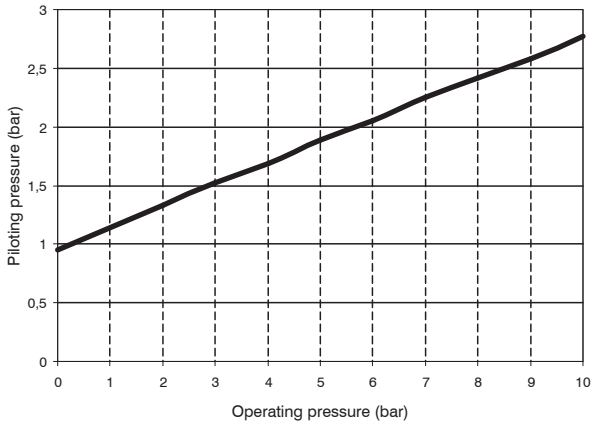
**BIDIRECTIONAL VERSION**




1 - Brass plug
2 - Brass body
3 - Aluminium piston
4 - Steel piston extension
5 - PUR poppet
6 - NBR seal
7 - Steel spring

### Working curves





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

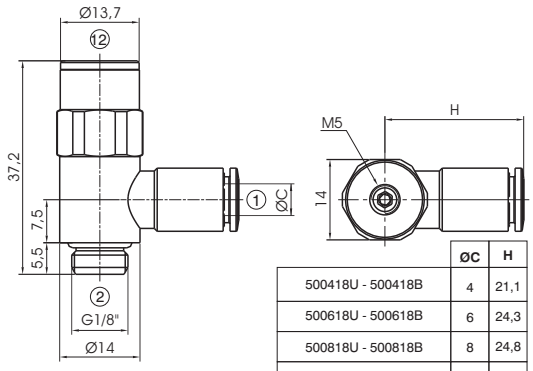
## Blocking valves metal type-Size 1/8"

**Coding:** 50Ⓣ18Ⓥ

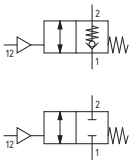
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working pressure (bar) | 0,5 ... 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 285 |
| Flow rate with free exhaust (Nl/min) | 450 |

| | |
|---|---|
| Ⓣ | TYPE |
| | **A** = Banjo only |
| | **04** = Banjo Ø4 |
| | **06** = Banjo Ø6 |
| | **08** = Banjo Ø8 |
| | **18** = Banjo G1/8" |
| Ⓥ | VERSION |
| | **U** = Unidirectional |
| | **B** = Bidirectional |






| | ØC | H |
|---|---|---|
| 500418U - 500418B | 4 | 21,1 |
| 500618U - 500618B | 6 | 24,3 |
| 500818U - 500818B | 8 | 24,8 |
| 501818U - 501818B | G1/8" | 20 |



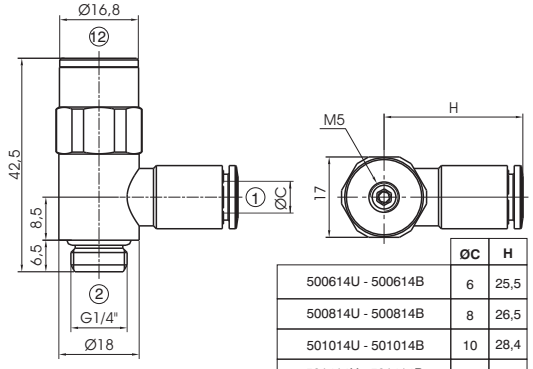
## Blocking valves metal type-Size 1/4"

**Coding:** 50Ⓣ14Ⓥ

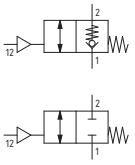
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working pressure (bar) | 0,5 ... 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 530 |
| Flow rate with free exhaust (Nl/min) | 800 |

| | |
|---|---|
| Ⓣ | TYPE |
| | **A** = Banjo only |
| | **06** = Banjo Ø6 |
| | **08** = Banjo Ø8 |
| | **10** = Banjo Ø10 |
| | **14** = Banjo G1/4" |
| Ⓥ | VERSION |
| | **U** = Unidirectional |
| | **B** = Bidirectional |






| | ØC | H |
|---|---|---|
| 500614U - 500614B | 6 | 25,5 |
| 500814U - 500814B | 8 | 26,5 |
| 501014U - 501014B | 10 | 28,4 |
| 501414U - 501414B | G1/4" | 24 |



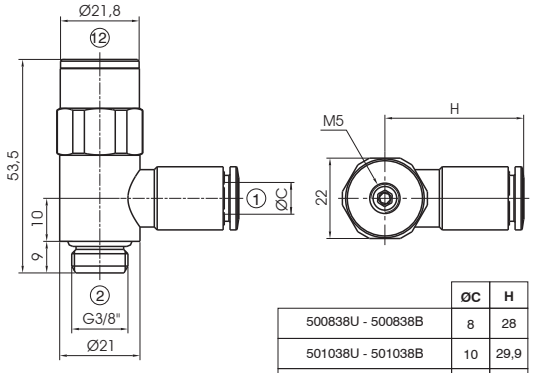
## Blocking valves metal type-Size3/8"

**Coding:** 50Ⓣ38Ⓥ

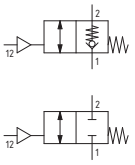
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working pressure (bar) | 0,5 ... 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1000 |
| Flow rate with free exhaust (Nl/min) | 1600 |

| | |
|---|---|
| Ⓣ | TYPE |
| | **A** = Banjo only |
| | **08** = Banjo Ø8 |
| | **10** = Banjo Ø10 |
| | **12** = Banjo Ø12 |
| | **38** = Banjo G3/8" |
| Ⓥ | VERSION |
| | **U** = Unidirectional |
| | **B** = Bidirectional |






| | ØC | H |
|---|---|---|
| 500838U - 500838B | 8 | 28 |
| 501038U - 501038B | 10 | 29,9 |
| 501238U - 501238B | 12 | 31,4 |
| 503838U - 503838B | G3/8" | 28,5 |



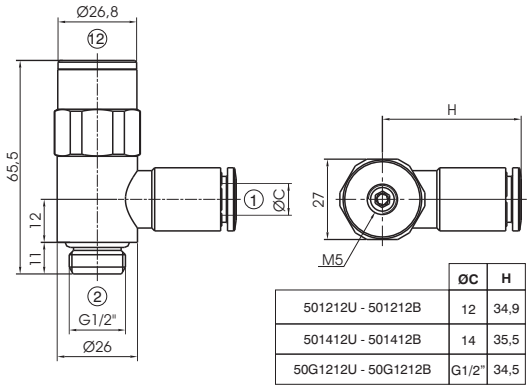
## Blocking valves metal type-Size1/2"

**Coding:** 50 Ⓣ 12 Ⓥ

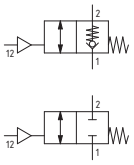
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working pressure (bar) | 0,5 ... 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1300 |
| Flow rate with free exhaust (Nl/min) | 2600 |

| | |
|---|---|
| Ⓣ | TYPE |
| | **A** = Banjo only |
| | **12** = Banjo Ø12 |
| | **G12** = Banjo G1/2" |
| Ⓥ | VERSION |
| | **U** = Unidirectional |
| | **B** = Bidirectional |






| | ØC | H |
|---|---|---|
| 501212U - 501212B | 12 | 34,9 |
| 501412U - 501412B | 14 | 35,5 |
| 50G1212U - 50G1212B | G1/2" | 34,5 |






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

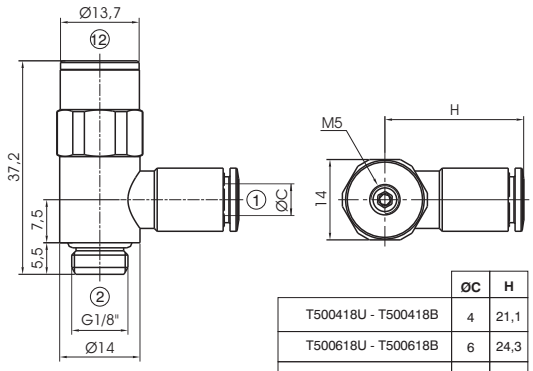
## Blocking valves technopolymer type-Size 1/8"

**Coding:** T50❶18❷

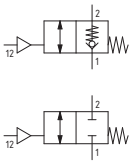
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working pressure (bar) | 0,5 ... 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 285 |
| Flow rate with free exhaust (Nl/min) | 450 |

| | |
|---|---|
| ❶ | TYPE |
| | **A** = Banjo only |
| | **04** = Banjo Ø4 |
| | **06** = Banjo Ø6 |
| | **08** = Banjo Ø8 |
| ❷ | VERSION |
| | **U** = Unidirectional |
| | **B** = Bidirectional |






| | ØC | H |
|---|---|---|
| T500418U - T500418B | 4 | 21,1 |
| T500618U - T500618B | 6 | 24,3 |
| T500818U - T500818B | 8 | 24,8 |



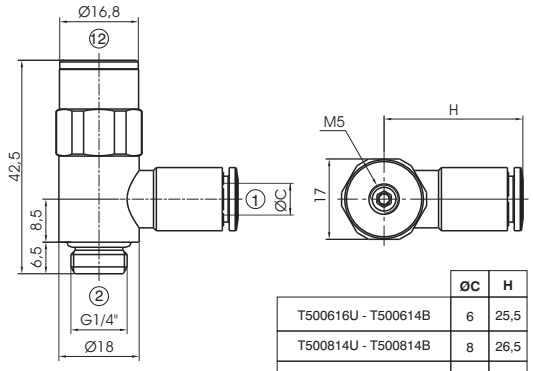
## Blocking valves technopolymer type-Size 1/4"

**Coding:** T50❶14❷

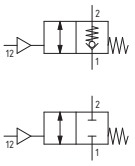
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working pressure (bar) | 0,5 ... 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 530 |
| Flow rate with free exhaust (Nl/min) | 800 |

| | |
|---|---|
| ❶ | TYPE |
| | **A** = Banjo only |
| | **06** = Banjo Ø6 |
| | **08** = Banjo Ø8 |
| | **10** = Banjo Ø10 |
| ❷ | VERSION |
| | **U** = Unidirectional |
| | **B** = Bidirectional |






| | ØC | H |
|---|---|---|
| T500616U - T500614B | 6 | 25,5 |
| T500814U - T500814B | 8 | 26,5 |
| T501014U - T501014B | 10 | 28,4 |



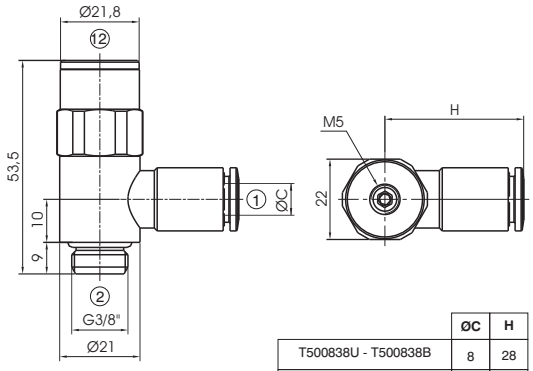
## Blocking valves technopolymer type-Size 3/8"

**Coding:** T50❶38❷

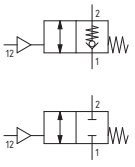
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working pressure (bar) | 0,5 ... 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1000 |
| Flow rate with free exhaust (Nl/min) | 1600 |

| | |
|---|---|
| ❶ | TYPE |
| | **A** = Banjo only |
| | **08** = Banjo Ø8 |
| | **10** = Banjo Ø10 |
| | **12** = Banjo Ø12 |
| ❷ | VERSION |
| | **U** = Unidirectional |
| | **B** = Bidirectional |






| | ØC | H |
|---|---|---|
| T500838U - T500838B | 8 | 28 |
| T501038U - T501038B | 10 | 29,9 |
| T501238U - T501238B | 12 | 31,4 |



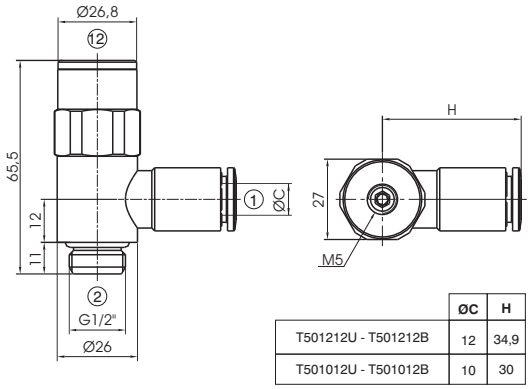
## Blocking valves technopolymer type-Size 1/2"

**Coding:** T50Ⓣ12Ⓥ

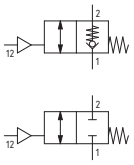
| Operational characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working pressure (bar) | 0,5 ... 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1300 |
| Flow rate with free exhaust (Nl/min) | 2600 |

| | |
|---|---|
| Ⓣ | TYPE |
| | **A** = Banjo only |
| | **10** = Banjo Ø10 |
| | **12** = Banjo Ø12 |
| Ⓥ | VERSION |
| | **U** = Unidirectional |
| | **B** = Bidirectional |






| | ØC | H |
|---|---|---|
| T501212U - T501212B | 12 | 34,9 |
| T501012U - T501012B | 10 | 30 |






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 55 Tecno-FUN

This line of different logic functions that can be used in any place of the secondary pneumatic circuit, developed to be installed directly onto the main pneumatic components (distributors or cylinders).
Thanks to the modular design it is possible to easily join together multiple logic functions without the need of using pipes to connect them; it is also possible to choose the type and style of each connection. The connections available are the following: straight cartridge; Banjo PL cartridge; male cartridge threaded 1/8" or 1/4" and female cartridge threaded 1/8".
Function fittings can also be assembled side by side in order to be assembled on the DIN EN 50022 rail (using the relevant kit).





### Other characteristics:

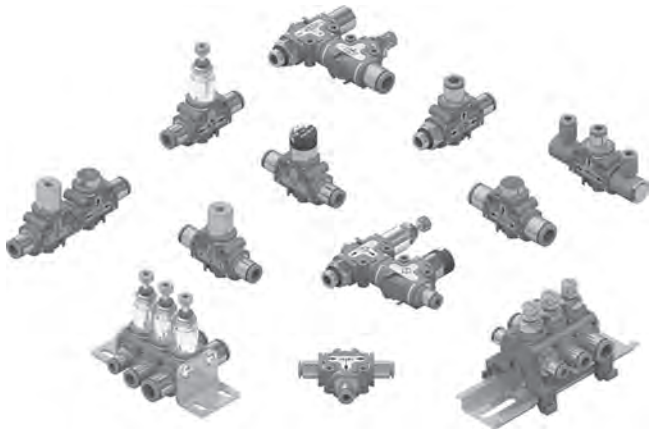
Technopolymer body version
Input/output connection directly integrated into the body
In line or 90° connection
Possibility to build a manifold -parallel mounting-
Different connection options:
Tube Ø4 Ø6 Ø8 (elbow version as well)
G1/8" G1/4" male straight cartridge
G1/8" female cartridge, in line or 90°

### Different mounting options:

- Wall fixing through the holes in the body
- By means of the fixing bracket
- Panel mounting (for those function that include such possibility)
- On DIN rail EN 50022 (using the DIN rail adapter kit)

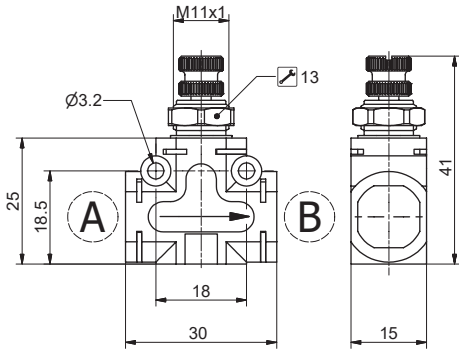
### Available functions

- Flow control valve
- Pressure regulator
- Block valve
- Quick exhaust valve
- OR gate
- AND gate
- Pressure gauge
- Progressive start-up valve
- Pressure regulator + pressure gauge
- Block valve + Flow control valve
- Block valve + quick exhaust valve



## Flow regulator

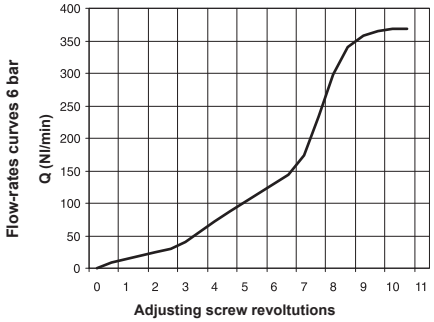


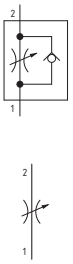



**Coding:** 551.11Ⓣ.Ⓐ.Ⓑ.XX

| | |
|---|---|
| Ⓣ | TYPE |
| | **1** = Unidirectional |
| | **2** = Bidirectional |
| Ⓐ | CONNECTION A |
| | **SEE CONNECTIONS LIST** |
| Ⓑ | CONNECTION B |
| | **SEE CONNECTIONS LIST** |
| | CONNECTIONS LIST |
| | **00** = None |
| | **D4** = Straight Ø4 |
| | **D6** = Straight Ø6 |
| | **D8** = Straight Ø8 |
| | **L1** = Female banjo G1/8" |
| | **G4** = Rotating banjo Ø4 |
| | **G6** = Rotating banjo Ø6 |
| | **G8** = Rotating banjo Ø8 |
| | **M1** = G1/8" male |
| | **M2** = G1/4" male |
| | **F1** = G1/8" female |

Example: 551.111.D6.D6.XX
Flow control valve unidirectional, CONNECTIONS "A" and "B" Tube Ø6
NOTE : For the dimension including cartridges see page "Accessories-Function fittings"




### Technical characteristics

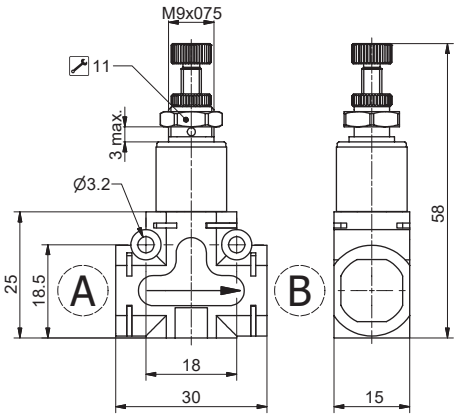
- The flow control valve is normally used to regulate the air flow and, as a consequence, for example, the speed of a cylinder. Two types of flow control valves are available: unidirectional and bidirectional.
- In the unidirectional valve the flow is regulated only in one direction while is free to move in the opposite direction; in the bidirectional valve the flow is regulated in both directions.
- Panel mounting using the lock nut supplied as standard
- on DIN rail using the relevant adaptor kit (see accessories)
- With 90° bracket (see accessories)
- directly on the support plate thanks to two through holes on the body

| Technical characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working ports size | See CONNECTIONS LIST |
| Max working pressure (bar) | 10 |
| Orifice size (mm) | Ø3 |
| Free exhaust flow rate in the opposite side of the regulation | 800 (for unidirectional version) |
| Temperature °C | -5 ... +50 |
| Weight (g) | 26 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## In line pressure regulator






**Coding:** 551.12Ⓣ.Ⓐ.Ⓑ.XX

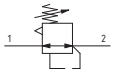
| | |
|---|---|
| Ⓣ | TYPE |
| | **2** = 0-2 bar |
| | **4** = 0-4 bar |
| | **8** = 0-8 bar |
| Ⓐ | CONNECTION A |
| | **SEE CONNECTIONS LIST** |
| Ⓑ | CONNECTION B |
| | **SEE CONNECTIONS LIST** |
| | CONNECTIONS LIST |
| | **00** = None |
| | **D4** = Straight Ø4 |
| | **D6** = Straight Ø6 |
| | **D8** = Straight Ø8 |
| | **L1** = Female banjo G1/8" |
| | **G4** = Rotating banjo Ø4 |
| | **G6** = Rotating banjo Ø6 |
| | **G8** = Rotating banjo Ø8 |
| | **M1** = G1/8" male |
| | **M2** = G1/4" male |
| | **F1** = G1/8" female |

Example: 551.128.D8.D8.XX
In line pressure regulator, pressure range (bar) 0-8 bar. Connections "A" and "B" Tube Ø6
NOTE : For the dimension including cartridges see page "Accessories-Function fittings"

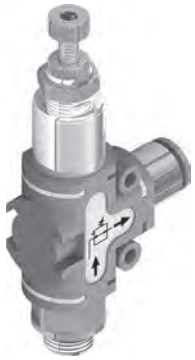
### Technical characteristics

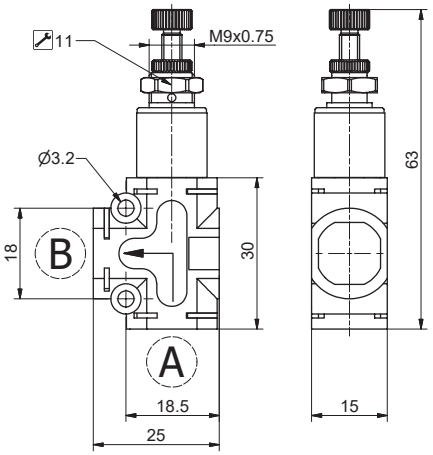
- The pressure regulator is a device which is used to reduce, regulate and stabilize the air pressure in a conduit in order to adapt it to the needs of the equipments to be supplied. The pressure regulator incorporates the relieving function.
- Panel mounting using the lock nut supplied as standard
- on DIN rail using the relevant adaptor kit (see accessories)
- With 90° bracket (see accessories)
- directly on the support plate thanks to two through holes on the body

| Technical characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working ports size | See CONNECTIONS LIST |
| Max working pressure (bar) | 10 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 180 |
| Pressure range (bar) | 0...2 / 0...4 / 0...8 |
| Temperature °C | -5 ... +50 |
| Weight (g) | 31 |




## 90° pressure regulator






**Coding:** 551.22Ⓣ.Ⓐ.Ⓑ.XX

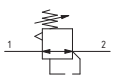
| | |
|---|---|
| Ⓣ | TYPE |
| | **2** = 0-4 bar |
| | **4** = 0-2 bar |
| | **8** = 0-8 bar |
| Ⓐ | CONNECTION A |
| | **SEE CONNECTIONS LIST** |
| Ⓑ | CONNECTION B |
| | **SEE CONNECTIONS LIST** |
| | CONNECTIONS LIST |
| | **00** = None |
| | **D4** = Straight Ø4 |
| | **D6** = Straight Ø6 |
| | **D8** = Straight Ø8 |
| | **L1** = Female banjo G1/8" |
| | **G4** = Rotating banjo Ø4 |
| | **G6** = Rotating banjo Ø6 |
| | **G8** = Rotating banjo Ø8 |
| | **M1** = G1/8" male |
| | **M2** = G1/4" male |
| | **F1** = G1/8" female |

Example: 551.224.M1.D6.XX
90° pressure regulator, pressure range (bar) 0-4 bar. Connections "A" Male G1/8 and "B" Tube Ø6
NOTE : For the dimension including cartridges see page "Accessories-Function fittings"

### Technical characteristics

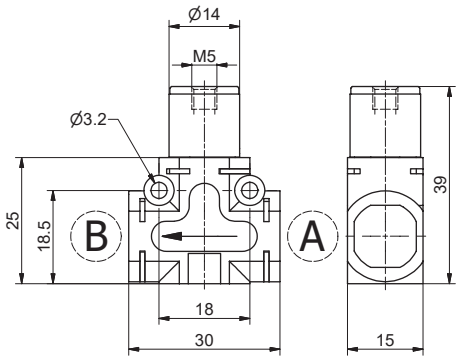
- The pressure regulator is a device which is used to reduce, regulate and stabilize the air pressure in a conduit in order to adapt it to the needs of the equipments to be supplied. The pressure regulator incorporates the relieving function.
- Panel mounting using the lock nut supplied as standard
- on DIN rail using the relevant adaptor kit (see accessories)
- With 90° bracket (see accessories)
- directly on the support plate thanks to two through holes on the body

| Technical characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working ports size | See CONNECTIONS LIST |
| Max working pressure (bar) | 10 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 180 |
| Pressure range (bar) | 0...2 / 0...4 / 0...8 |
| Temperature °C | -5 ... +50 |
| Weight (g) | 31 |



## Blocking valve

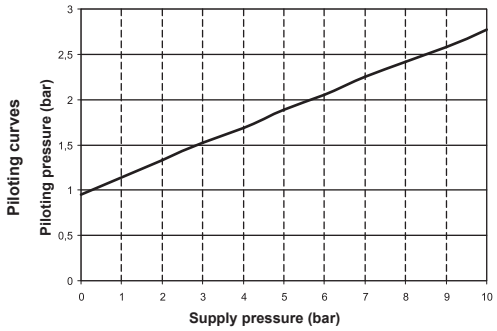


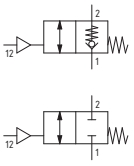



**Coding:** 551.13Ⓣ.Ⓐ.Ⓑ.XX

| | |
|---|---|
| Ⓣ | TYPE |
| | **1** = Unidirectional |
| | **2** = Bidirectional |
| Ⓐ | CONNECTION A |
| | **SEE CONNECTIONS LIST** |
| Ⓑ | CONNECTION B |
| | **SEE CONNECTIONS LIST** |
| | CONNECTIONS LIST |
| | **00** = None |
| | **D4** = Straight Ø4 |
| | **D6** = Straight Ø6 |
| | **D8** = Straight Ø8 |
| | **L1** = Female banjo G1/8" |
| | **G4** = Rotating banjo Ø4 |
| | **G6** = Rotating banjo Ø6 |
| | **G8** = Rotating banjo Ø8 |
| | **M1** = G1/8" male |
| | **M2** = G1/4" male |
| | **F1** = G1/8" female |

Example: 551.131.D4.D4.XX
In line blocking valve, unidirectional. Connections "A" and "B" Tube Ø4
NOTE : For the dimension including cartridges see page "Accessories-Function fittings"




## Technical characteristics

- The blocking valve function is to maintain the circuit downstream pressure in the event of loss of supply pressure. It is normally fitted directly onto the cylinder connections ports in order to ensure that, in case of accidental loss of the supply pressure, the units positions is maintained. This is achieved as the blocking valve preserves the pressure inside the pressurised chamber. Blocking valves can be unidirectional or bidirectional.
- In the unidirectional version the air flow is free in one direction while in order to allow the flow in the opposite direction is necessary to send a pneumatic signal to the unit connection 12.
- The bidirectional version requires a pneumatic signal on connection 12 to allow the flow in any of the two directions.
- on DIN rail using the relevant adaptor kit (see accessories)
- With 90° bracket (see accessories)
- directly on the support plate thanks to two through holes on the body

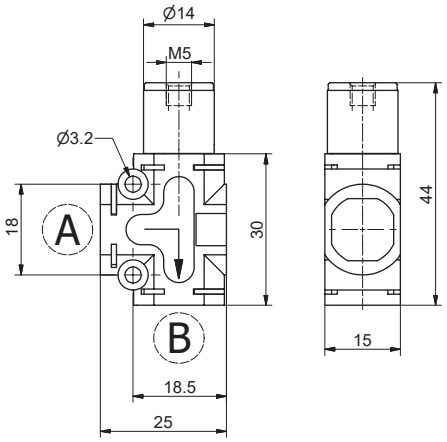
| Technical characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working ports size | See CONNECTIONS LIST |
| Working pressure (bar) | 0,5 ... 10 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 285 |
| Flow rate at 6 bar with free exhaust (Nl/min) | 450 |
| Temperature °C | -5 ... +50 |
| Weight (g) | 26 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## 90° blocking valve

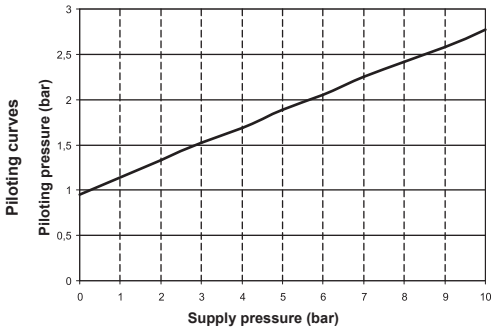
**Coding:** 551.23Ⓣ.Ⓐ.Ⓑ.XX

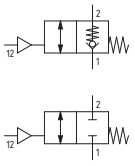





| | |
|---|---|
| Ⓣ | TYPE |
| | **1** = Unidirectional |
| | **2** = Bidirectional |
| Ⓐ | CONNECTION A |
| | **SEE CONNECTIONS LIST** |
| Ⓑ | CONNECTION B |
| | **SEE CONNECTIONS LIST** |
| | CONNECTIONS LIST |
| | **00** = None |
| | **D4** = Straight Ø4 |
| | **D6** = Straight Ø6 |
| | **D8** = Straight Ø8 |
| | **L1** = Female banjo G1/8" |
| | **G4** = Rotating banjo Ø4 |
| | **G6** = Rotating banjo Ø6 |
| | **G8** = Rotating banjo Ø8 |
| | **M1** = G1/8" male |
| | **M2** = G1/4" male |
| | **F1** = G1/8" female |

Example: 551.231.D6.M1.XX
90° blocking valve. Connections "A" Male G1/8 and "B" Tube Ø6
NOTE : For the dimension including cartridges see page "Accessories-Function fittings"




## Technical characteristics

- The blocking valve function is to maintain the circuit downstream pressure in the event of loss of supply pressure. It is normally fitted directly onto the cylinder connections ports in order to ensure that, in case of accidental loss of the supply pressure, the units positions is maintained. This is achieved as the blocking valve preserves the pressure inside the pressurised chamber.
- Unidirectional and bidirectional version are both available.
- In the unidirectional version the air flow is free in one direction while in order to allow the flow in the opposite direction is necessary to send a pneumatic signal to the unit connection 12.
- The bidirectional version requires a pneumatic signal on connection 12 to allow the flow in any of the two directions.
- on DIN rail using the relevant adaptor kit (see accessories)
- With 90° bracket (see accessories)
- directly on the support plate thanks to two through holes on the body

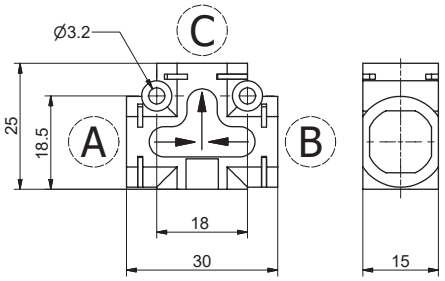
| Technical characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working ports size | See CONNECTIONS LIST |
| Working pressure (bar) | 0,5 ... 10 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 285 |
| Flow rate at 6 bar with free exhaust (Nl/min) | 450 |
| Temperature °C | -5 ... +50 |
| Weight (g) | 26 |

## Circuit selector valve-OR

**Coding:** 551.141.Ⓐ.Ⓑ.Ⓒ

| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **SEE CONNECTIONS LIST** |
| Ⓑ | CONNECTION B |
| | **SEE CONNECTIONS LIST** |
| Ⓒ | CONNECTION C |
| | **SEE CONNECTIONS LIST** |
| | CONNECTIONS LIST |
| | **00** = None |
| | **D4** = Straight Ø4 |
| | **D6** = Straight Ø6 |
| | **D8** = Straight Ø8 |
| | **L1** = Female banjo G1/8" |
| | **G4** = Rotating banjo Ø4 |
| | **G6** = Rotating banjo Ø6 |
| | **G8** = Rotating banjo Ø8 |
| | **M1** = G1/8" male |
| | **M2** = G1/4" male |
| | **F1** = G1/8" female |



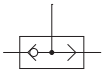



Example: 551.141.D8.D8.D8
Circuit selector valve-OR. Connections "A", "B" and "C" Tube Ø8
NOTE : For the dimension including cartridges see page "Accessories-Function fittings"

### Technical characteristics

- These valves have two inlets and one output connection and are normally called high pressure selector valves as, when receiving two separate pressure supply, only allow the passage of the highest pressure. The most common application is to operate a component from two separate positions.
- on DIN rail using the relevant adaptor kit (see accessories)
- With 90° bracket (see accessories)
- directly on the support plate thanks to two through holes on the body

| Technical characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working ports size | See CONNECTIONS LIST |
| Max working pressure (bar) | 10 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 600 |
| Temperature °C | -5 ... +50 |
| Weight (g) | 10 |

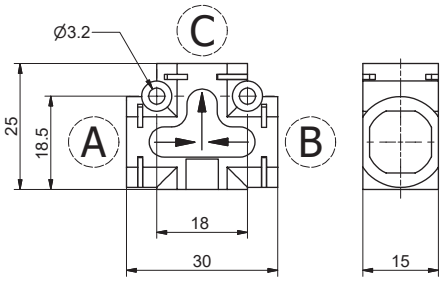


## Circuit selector valve-AND

**Coding:** 551.151.Ⓐ.Ⓑ.Ⓒ

| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **SEE CONNECTIONS LIST** |
| Ⓑ | CONNECTION B |
| | **SEE CONNECTIONS LIST** |
| Ⓒ | CONNECTION C |
| | **SEE CONNECTIONS LIST** |
| | CONNECTIONS LIST |
| | **00** = None |
| | **D4** = Straight Ø4 |
| | **D6** = Straight Ø6 |
| | **D8** = Straight Ø8 |
| | **L1** = Female banjo G1/8" |
| | **G4** = Rotating banjo Ø4 |
| | **G6** = Rotating banjo Ø6 |
| | **G8** = Rotating banjo Ø8 |
| | **M1** = G1/8" male |
| | **M2** = G1/4" male |
| | **F1** = G1/8" female |



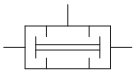



Example: 551.151.D6.D6.D6
Circuit selector valve AND. Connections "A", "B" and "C" Tube Ø6
NOTE : For the dimension including cartridges see page "Accessories-Function fittings"

### Technical characteristics

- These valves have two inlets and one output connection and are normally called low pressure selector valves as, when receiving two separate pressure supply, only allow the passage of the lowest pressure. The most common application is to operate a component from two separate positions.
- on DIN rail using the relevant adaptor kit (see accessories)
- With 90° bracket (see accessories)
- directly on the support plate thanks to two through holes on the body

| Technical characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working ports size | See CONNECTIONS LIST |
| Max working pressure (bar) | 10 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 550 |
| Temperature °C | -5 ... +50 |
| Weight (g) | 10 |

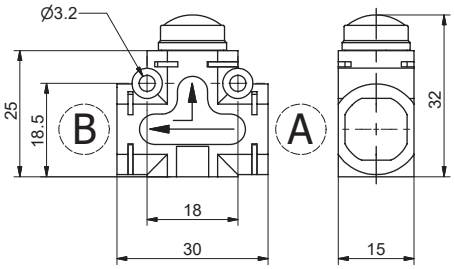




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Quick exhaust valve






**Coding:** 551.161.Ⓐ.Ⓑ.XX

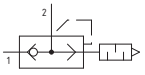
| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **SEE CONNECTIONS LIST** |
| Ⓑ | CONNECTION B |
| | **SEE CONNECTIONS LIST** |
| | CONNECTIONS LIST |
| | **00** = None |
| | **D4** = Straight Ø4 |
| | **D6** = Straight Ø6 |
| | **D8** = Straight Ø8 |
| | **L1** = Female banjo G1/8" |
| | **G4** = Rotating banjo Ø4 |
| | **G6** = Rotating banjo Ø6 |
| | **G8** = Rotating banjo Ø8 |
| | **M1** = G1/8" male |
| | **M2** = G1/4" male |
| | **F1** = G1/8" female |

Example: 551.161.D8.D8.XX
Quick exhaust valve. Connections "A" and "B" Tube Ø6
NOTE : For the dimension including cartridges see page "Accessories-Function fittings"

### Technical characteristics

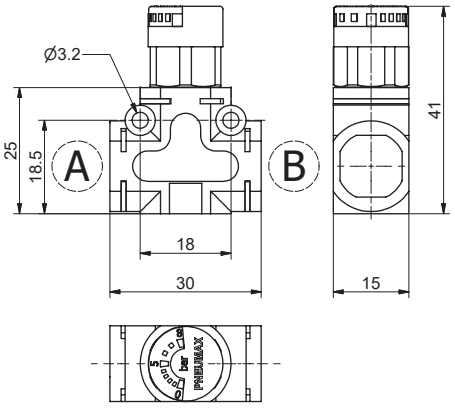
- These are 3 ways, two positions valves which can be directly mounted onto the actuator or between the actuator and the control valve. Their function is to discharge the air directly into the atmosphere without going through the pneumatic circuit enabling the actuator to reach the maximum speed.
- on DIN rail using the relevant adaptor kit (see accessories)
- With 90° bracket (see accessories)
- directly on the support plate thanks to two through holes on the body

| Technical characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working ports size | See CONNECTIONS LIST |
| Max working pressure (bar) | 10 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 250 |
| Flow rate at 6 bar with free exhaust (Nl/min) | 500 |
| Temperature °C | -5 ... +50 |
| Weight (g) | 15 |




## Pressure indicator






**Coding:** 551.178.Ⓐ.Ⓑ.XX

| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **SEE CONNECTIONS LIST** |
| Ⓑ | CONNECTION B |
| | **SEE CONNECTIONS LIST** |
| | CONNECTIONS LIST |
| | **00** = None |
| | **D4** = Straight Ø4 |
| | **D6** = Straight Ø6 |
| | **D8** = Straight Ø8 |
| | **L1** = Female banjo G1/8" |
| | **G4** = Rotating banjo Ø4 |
| | **G6** = Rotating banjo Ø6 |
| | **G8** = Rotating banjo Ø8 |
| | **M1** = G1/8" male |
| | **M2** = G1/4" male |
| | **F1** = G1/8" female |

Example: 551.178.D6.D4.XX
Pressure indicator. Connections "A" Tube Ø6, "B" Tube Ø4
NOTE : For the dimension including cartridges see page "Accessories-Function fittings"

### Technical characteristics

- The pressure visual indicator is a device which measures the pressure inside a pneumatic circuit. The 0 to 8 bar visual indicator makes very easy to monitor the pressure state inside the circuit. It can be use on its own or can be coupled with another device.
- It can be use on its own or can be coupled with another device.
- on DIN rail using the relevant adaptor kit (see accessories)
- With 90° bracket (see accessories)
- directly on the support plate thanks to two through holes on the body

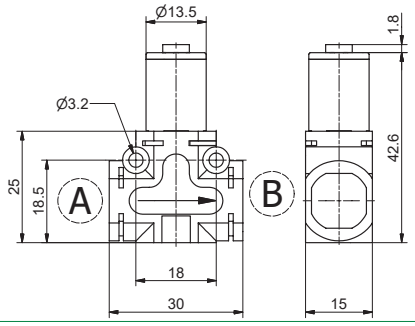
| Technical characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working ports size | See CONNECTIONS LIST |
| Max working pressure (bar) | 8 |
| Visualization scale (bar) | 0 ... 8 |
| Temperature °C | -5 ... +50 |
| Weight (g) | 20.5 |



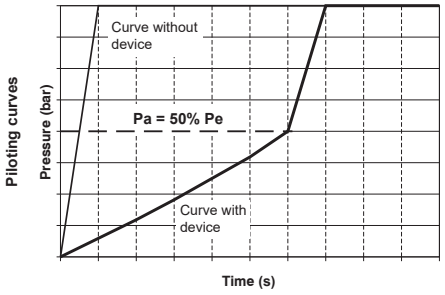
## In line progressive start-up valve

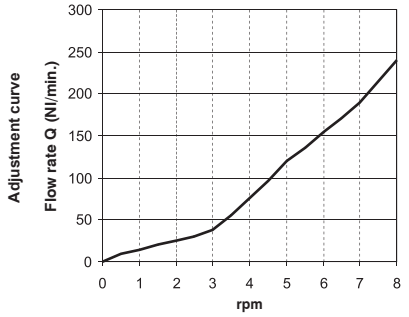
**Coding:** 551.181.Ⓐ.Ⓑ.XX






| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **SEE CONNECTIONS LIST** |
| Ⓑ | CONNECTION B |
| | **SEE CONNECTIONS LIST** |
| | CONNECTIONS LIST |
| | **00** = None |
| | **D4** = Straight Ø4 |
| | **D6** = Straight Ø6 |
| | **D8** = Straight Ø8 |
| | **L1** = Female banjo G1/8" |
| | **G4** = Rotating banjo Ø4 |
| | **G6** = Rotating banjo Ø6 |
| | **G8** = Rotating banjo Ø8 |
| | **M1** = G1/8" male |
| | **M2** = G1/4" male |
| | **F1** = G1/8" female |







Example: 551.181.D6.D4.XX = In line progressive start-up valve. Connections "A" Tube Ø6, "B" Tube Ø4
NOTE : For the dimension including cartridges see page "Accessories-Function fittings"

### Technical characteristics

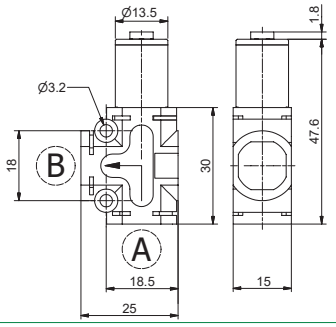
- The soft start valve is a device designed to gradually pressurise the downstream circuit until 50% of the upstream pressure value is reached.
- Once the 50% of the upstream pressure value is reached in the down stream circuit the valve fully opens allowing full air passage.
- The filling time can be adjusted thanks to the built in flow regulator.
- This device is used in order to ensure that during the pneumatic circuit start up the cylinders will return to theirs home position slowly avoiding collisions or sudden movements.

| Technical characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working ports size | See CONNECTIONS LIST |
| Opening pressure (Pa) | 50% of the inlet pressure (Pi) |
| Flow rate at 6 bar with free exhaust (Nl/min) from 1 to 2 with opening ciruit | 350 |
| Flow rate at 6 bar with Δp=1 from 1 to 2 with opening ciruit | 600 |
| Flow rate at 6 bar with Δp=1 from 2 to 1 with opening pin | 650 |
| Temperature °C | -5 ... +50 |
| Weight (g) | 31 |

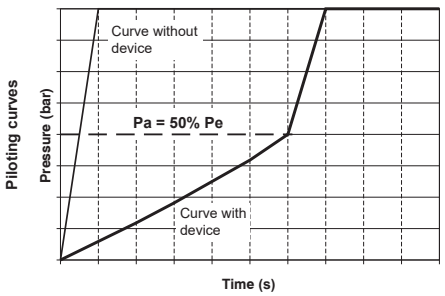
## 90° progressive start-up valve

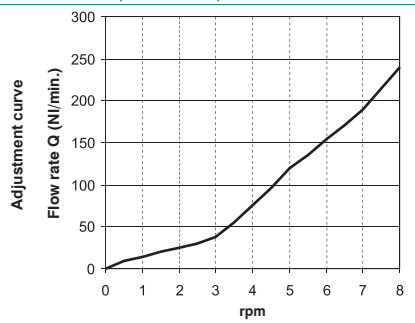
**Coding:** 551.281.Ⓐ.Ⓑ.XX






| | |
|---|---|
| Ⓐ | CONNECTION A |
| | **SEE CONNECTIONS LIST** |
| Ⓑ | CONNECTION B |
| | **SEE CONNECTIONS LIST** |
| | CONNECTIONS LIST |
| | **00** = None |
| | **D4** = Straight Ø4 |
| | **D6** = Straight Ø6 |
| | **D8** = Straight Ø8 |
| | **L1** = Female banjo G1/8" |
| | **G4** = Rotating banjo Ø4 |
| | **G6** = Rotating banjo Ø6 |
| | **G8** = Rotating banjo Ø8 |
| | **M1** = G1/8" male |
| | **M2** = G1/4" male |
| | **F1** = G1/8" female |







Example: 551.281.M1.D4.XX = 90° progressive start-up valve. connections "A" Male G1/8", "B" Tube Ø4
NOTE : For the dimension including cartridges see page "Accessories-Function fittings"

### Technical characteristics

- The soft start valve is a device designed to gradually pressurise the downstream circuit until 50% of the upstream pressure value is reached.
- Once the 50% of the upstream pressure value is reached in the down stream circuit the valve fully opens allowing full air passage.
- The filling time can be adjusted thanks to the built in flow regulator.
- This device is used in order to ensure that during the pneumatic circuit start up the cylinders will return to theirs home position slowly avoiding collisions or sudden movements.

| Technical characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working ports size | See CONNECTIONS LIST |
| Opening pressure (Pa) | 50% of the inlet pressure (Pi) |
| Flow rate at 6 bar with free exhaust (Nl/min) from 1 to 2 with opening ciruit | 350 |
| Flow rate at 6 bar with Δp=1 from 1 to 2 with opening ciruit | 600 |
| Flow rate at 6 bar with Δp=1 from 2 to 1 with opening pin | 650 |
| Temperature °C | -5 ... +50 |
| Weight (g) | 31 |

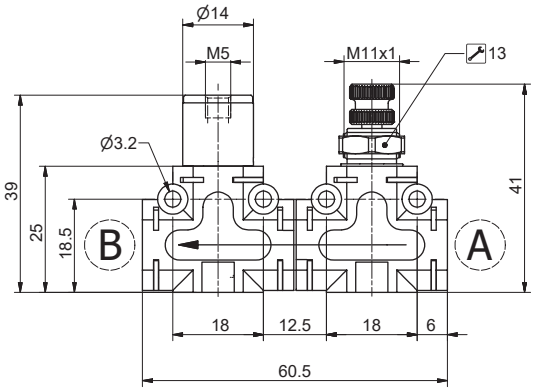


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## In line blocking valve with flow control valve

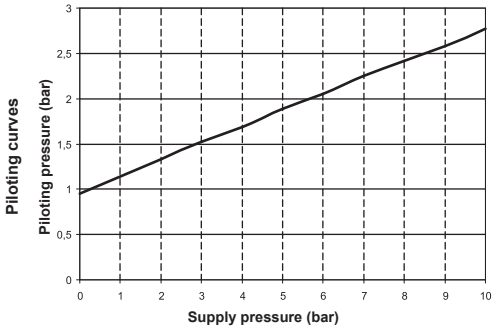
**Coding:** 551.1F Ⓣ.Ⓐ.Ⓑ.XX

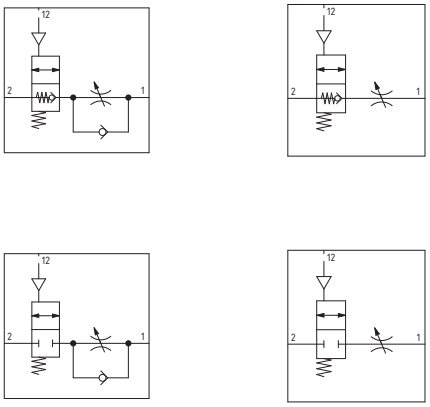





| | |
|---|---|
| Ⓣ | TYPE |
| | **1** = Unidirectional blocking valve + unidirectional flow control valve |
| | **2** = Bidirectional blocking valve + bidirectional flow control valve |
| | **3** = Unidirectional blocking valve + bidirectional flow control valve |
| | **4** = Bidirectional blocking valve + unidirectional flow control valve |
| Ⓐ | CONNECTION A |
| | **SEE CONNECTIONS LIST** |
| Ⓑ | CONNECTION B |
| | **SEE CONNECTIONS LIST** |
| | CONNECTIONS LIST |
| | **00** = None |
| | **D4** = Straight Ø4 |
| | **D6** = Straight Ø6 |
| | **D8** = Straight Ø8 |
| | **L1** = Female banjo G1/8" |
| | **G4** = Rotating banjo Ø4 |
| | **G6** = Rotating banjo Ø6 |
| | **G8** = Rotating banjo Ø8 |
| | **M1** = G1/8" male |
| | **M2** = G1/4" male |
| | **F1** = G1/8" female |

Example: 551.1F1.00.00.XX
In line blocking valve + flow control valve. Without connections "A" and "B"
NOTE : For the dimension including cartridges see page "Accessories-Function fittings"




## Technical characteristics

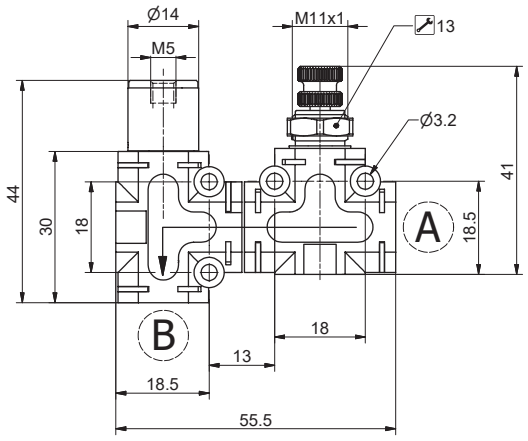
- The combination of this two functions ensures that the downstream pressure is maintained in case of accidental loss of supply pressure and at the same time grants the possibility to regulate the circuit flow rate. A typical application of this combination is close to or directly assembled onto the actuator connection ports. This allows to keep pressurised the cylinder chamber in case of accidental loss of supply pressure and to regulate the exhaust flow rate when the blocking valve is actuated.
- The possible combinations are the following:
- Unidirectional blocking valve + unidirectional flow control valve
- Bidirectional blocking valve + bidirectional flow control valve
- Bidirectional blocking valve + unidirectional flow control valve
- Unidirectional blocking valve + bidirectional flow control valve

| Technical characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working ports size | See CONNECTIONS LIST |
| Working pressure (bar) | 0,5 ... 10 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 285 |
| Orifice size (mm) | Ø3 |
| Temperature °C | -5 ... +50 |
| Weight (g) | 62 |

## 90° blocking valve + flow control valve

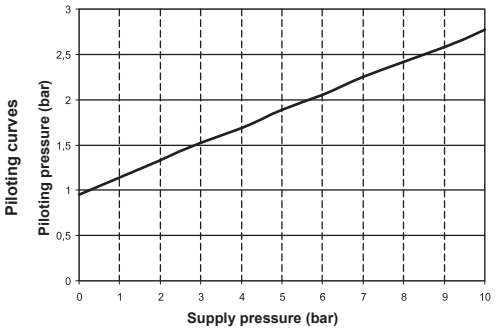
**Coding:** 551.2F(T).(A).(B).XX

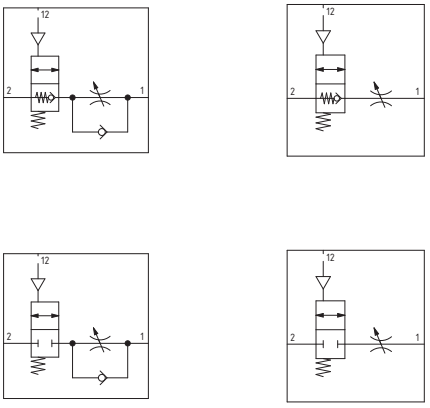





| | |
|---|---|
| (T) | TYPE |
| | **1** = 90° unidirectional blocking valve + unidirectional flow control valve |
| | **2** = 90° bidirectional blocking valve + bidirectional flow control valve |
| | **3** = 90° unidirectional blocking valve + bidirectional flow control valve |
| | **4** = 90° bidirectional blocking valve + unidirectional flow control valve |
| (A) | CONNECTION A |
| | **SEE CONNECTIONS LIST** |
| (B) | CONNECTION B |
| | **SEE CONNECTIONS LIST** |
| | CONNECTIONS LIST |
| | **00** = None |
| | **D4** = Straight Ø4 |
| | **D6** = Straight Ø6 |
| | **D8** = Straight Ø8 |
| | **L1** = Female banjo G1/8" |
| | **G4** = Rotating banjo Ø4 |
| | **G6** = Rotating banjo Ø6 |
| | **G8** = Rotating banjo Ø8 |
| | **M1** = G1/8" male |
| | **M2** = G1/4" male |
| | **F1** = G1/8" female |

Example: 5512F1.00.00.XX
90° blocking valve + flow control valve. Without connections "A" and "B"
NOTE : For the dimension including cartridges see page "Accessories-Function fittings"




## Technical characteristics

- The combination of this two functions ensures that the downstream pressure is maintained in case of accidental loss of supply pressure and at the same time grants the possibility to regulate the circuit flow rate. A typical application of this combination is close to or directly assembled onto the actuator connection ports. This allows to keep pressurised the cylinder chamber in case of accidental loss of supply pressure and to regulate the exhaust flow rate when the blocking valve is actuated.
- The possible combinations are the following:
- 90° unidirectional blocking valve + unidirectional flow control valve
- 90° bidirectional blocking valve + bidirectional flow control valve
- 90° bidirectional blocking valve + unidirectional flow control valve
- 90° unidirectional blocking valve + bidirectional flow control valve

| Technical characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working ports size | See CONNECTIONS LIST |
| Working pressure (bar) | 0,5 ... 10 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 285 |
| Orifice size (mm) | Ø3 |
| Temperature °C | -5 ... +50 |
| Weight (g) | 62 |

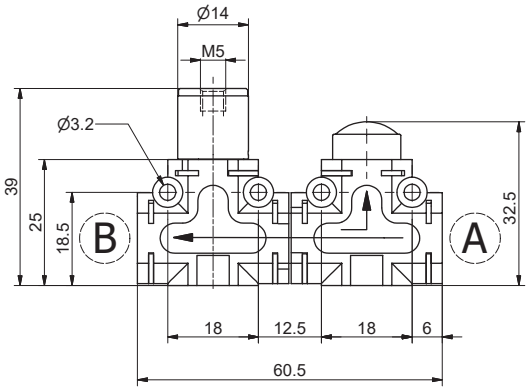


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## In line blocking valve + quick exhaust valve

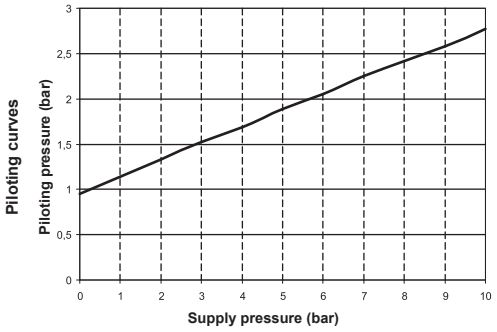
**Coding:** 551.1G Ⓣ.Ⓐ.Ⓑ.XX

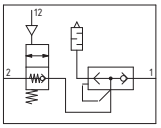


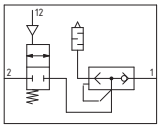



| | |
|---|---|
| Ⓣ | TYPE |
| | **1** = Unidirectional blocking valve + quick exhaust valve |
| | **2** = Bidirectional blocking valve + quick exhaust valve |
| Ⓐ | CONNECTION A |
| | **SEE CONNECTIONS LIST** |
| Ⓑ | CONNECTION B |
| | **SEE CONNECTIONS LIST** |
| | CONNECTIONS LIST |
| | **00** = None |
| | **D4** = Straight Ø4 |
| | **D6** = Straight Ø6 |
| | **D8** = Straight Ø8 |
| | **L1** = Female banjo G1/8" |
| | **G4** = Rotating banjo Ø4 |
| | **G6** = Rotating banjo Ø6 |
| | **G8** = Rotating banjo Ø8 |
| | **M1** = G1/8" male |
| | **M2** = G1/4" male |
| | **F1** = G1/8" female |

Example: 5511G1.00.00.XX
In line blocking valve + quick exhaust valve. Without connections "A" and "B"
NOTE : For the dimension including cartridges see page "Accessories-Function fittings"




### Technical characteristics

- The combination of this two functions ensures that the downstream pressure is maintained in case of accidental loss of supply pressure and at the same time allows for the air to be directly discharged into the atmosphere without going through the pneumatic circuit. A typical application of this combination is close to or directly assembled onto the actuator connection ports. This allows to keep pressurised the cylinder chamber in case of accidental loss of supply pressure and to quickly discharge the same chamber when the blocking valve is actuated.
- The possible combinations are the following:
- Unidirectional blocking valve + quick exhaust valve
- Bidirectional blocking valve + quick exhaust valve

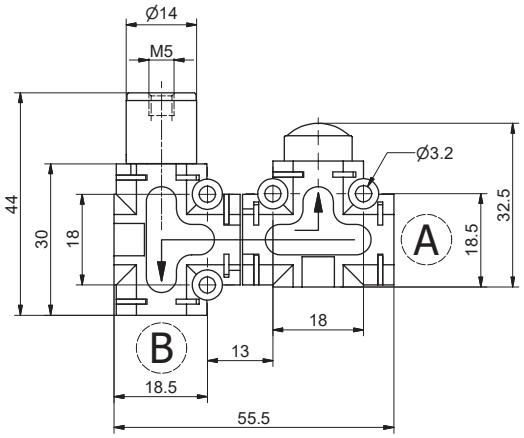
| Technical characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working ports size | See CONNECTIONS LIST |
| Working pressure (bar) | 0.5 ... 10 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 285 |
| Temperature °C | -5 ... +50 |
| Weight (g) | 51 |

## 90° blocking valve + quick exhaust valve

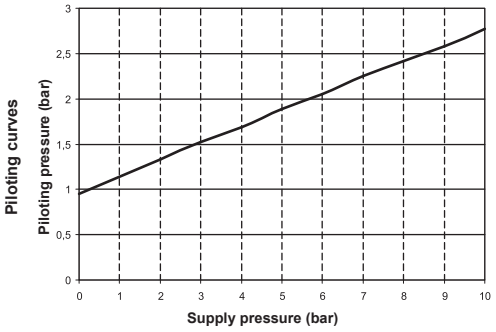
**Coding:** 551.2GⓉ.Ⓐ.Ⓑ.XX

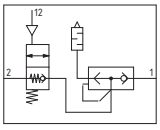
| | |
|---|---|
| Ⓣ | TYPE |
| | **1** = 90° unidirectional blocking valve + quick exhaust valve |
| | **2** = 90° bidirectional blocking valve + quick exhaust valve |
| Ⓐ | CONNECTION A |
| | **SEE CONNECTIONS LIST** |
| Ⓑ | CONNECTION B |
| | **SEE CONNECTIONS LIST** |
| | CONNECTIONS LIST |
| | **00** = None |
| | **D4** = Straight Ø4 |
| | **D6** = Straight Ø6 |
| | **D8** = Straight Ø8 |
| | **L1** = Female banjo G1/8" |
| | **G4** = Rotating banjo Ø4 |
| | **G6** = Rotating banjo Ø6 |
| | **G8** = Rotating banjo Ø8 |
| | **M1** = G1/8" male |
| | **M2** = G1/4" male |
| | **F1** = G1/8" female |

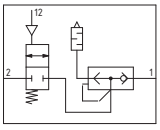





Example: 551.2G1.00.00.XX
90° bidirectional blocking valve + quick exhaust valve. Without connections "A" and "B"
NOTE : For the dimension including cartridges see page "Accessories-Function fittings"




## Technical characteristics

- The combination of this two functions ensures that the downstream pressure is maintained in case of accidental loss of supply pressure and at the same time allows for the air to be directly discharged into the atmosphere without going through the pneumatic circuit. A typical application of this combination is close to or directly assembled onto the actuator connection ports. This allows to keep pressurised the cylinder chamber in case of accidental loss of supply pressure and to quickly discharge the same chamber when the blocking valve is actuated.
- The possible combinations are the following:
- 90° unidirectional blocking valve + quick exhaust valve
- 90° bidirectional blocking valve + quick exhaust valve

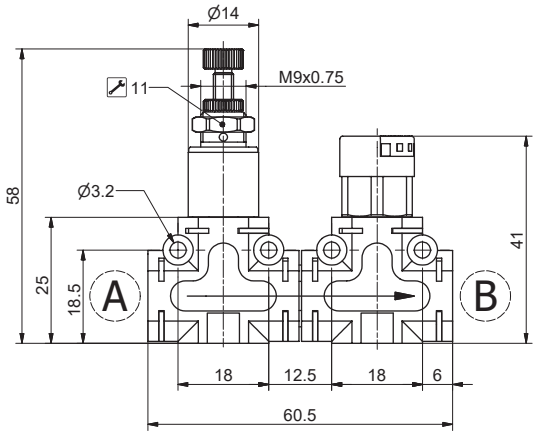
| Technical characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working ports size | See CONNECTIONS LIST |
| Working pressure (bar) | 0,5 ... 10 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 285 |
| Temperature °C | -5 ... +50 |
| Weight (g) | 51 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## In line pressure regulator + pressure indicator

**Coding:** 551.1HⓉ.Ⓐ.Ⓑ.XX





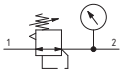

| | |
|---|---|
| Ⓣ | TYPE |
| | **2** = 0-2 bar |
| | **4** = 0-4 bar |
| | **8** = 0-8 bar |
| Ⓐ | CONNECTION A |
| | **SEE CONNECTIONS LIST** |
| Ⓑ | CONNECTION B |
| | **SEE CONNECTIONS LIST** |
| | CONNECTIONS LIST |
| | **00** = None |
| | **D4** = Straight Ø4 |
| | **D6** = Straight Ø6 |
| | **D8** = Straight Ø8 |
| | **L1** = Female banjo G1/8" |
| | **G4** = Rotating banjo Ø4 |
| | **G6** = Rotating banjo Ø6 |
| | **G8** = Rotating banjo Ø8 |
| | **M1** = G1/8" male |
| | **M2** = G1/4" male |
| | **F1** = G1/8" female |

Example: 551.1H2.M1.D4.XX
In line pressure regulator, adjusting range 0-2 bar + pressure indicator. Connections "A" Male G 1/8 and "B" Tube Ø4
NOTE : For the dimension including cartridges see page "Accessories-Function fittings"

### Technical characteristics

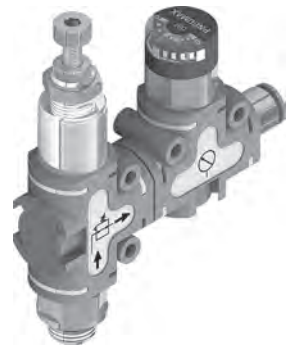
- The combination of this two functions ensures the possibility to regulate the downstream pressure while directly visualising the adjusted pressure value.
- The possible combinations are the following:
- 0 to 2 bar pressure regulator + pressure visual indicator
- 0 to 4 bar pressure regulator + pressure visual indicator
- 0 to 8 bar pressure regulator + pressure visual indicator
- The visual indicator Pressure range (bar) is always 0 to 8 bar

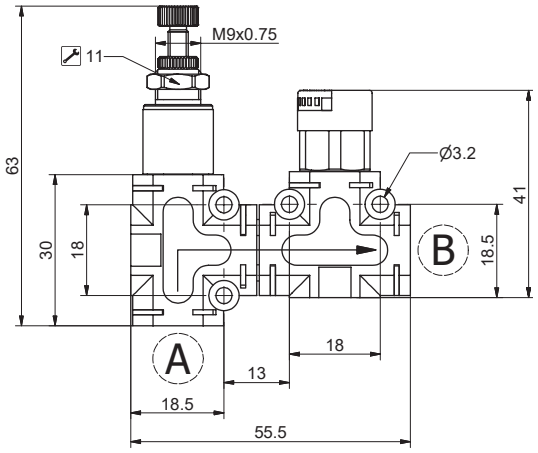
| Technical characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working ports size | See CONNECTIONS LIST |
| Max working pressure (bar) | 8 |
| Visualization scale (bar) | 0 ... 8 |
| Pressure range (bar) | 0 ... 2<br>0 ... 4<br>0 ... 8 |
| Temperature °C | -5 ... +50 |
| Weight (g) | 62 |




## 90° pressure regulator + pressure indicator

**Coding:** 551.2HⓉ.Ⓐ.Ⓑ.XX





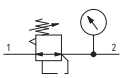

| | |
|---|---|
| Ⓣ | TYPE |
| | **2** = 0-2 bar |
| | **4** = 0-4 bar |
| | **8** = 0-8 bar |
| Ⓐ | CONNECTION A |
| | **SEE CONNECTIONS LIST** |
| Ⓑ | CONNECTION B |
| | **SEE CONNECTIONS LIST** |
| | CONNECTIONS LIST |
| | **00** = None |
| | **D4** = Straight Ø4 |
| | **D6** = Straight Ø6 |
| | **D8** = Straight Ø8 |
| | **L1** = Female banjo G1/8" |
| | **G4** = Rotating banjo Ø4 |
| | **G6** = Rotating banjo Ø6 |
| | **G8** = Rotating banjo Ø8 |
| | **M1** = G1/8" male |
| | **M2** = G1/4" male |
| | **F1** = G1/8" female |

Example: 551.2H2.M1.D4.XX
90° pressure regulator, adjusting range 0-2 bar + pressure indicator. Connections "A" Male G 1/8 and "B" Tube Ø4
NOTE : For the dimension including cartridges see page "Accessories-Function fittings"

### Technical characteristics

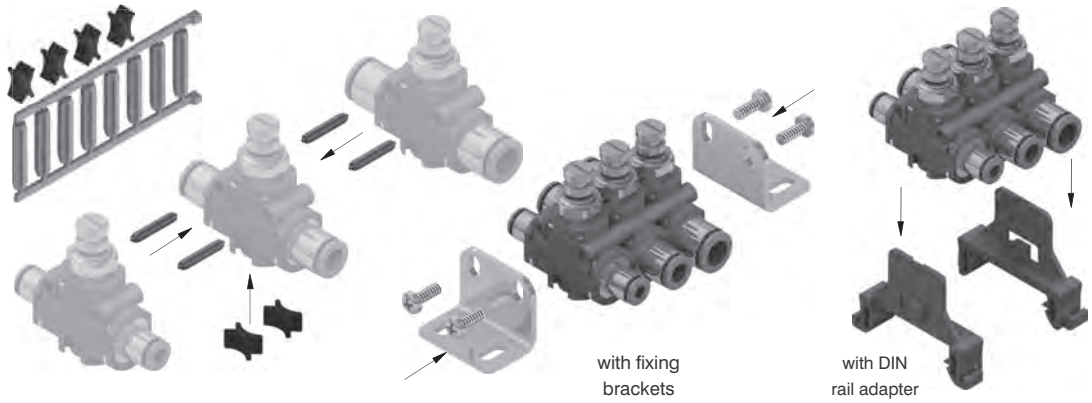
- The combination of this two functions ensures the possibility to regulate the downstream pressure while directly visualising the adjusted pressure value.
- The possible combinations are the following:
- 0 to 2 bar pressure regulator + pressure visual indicator
- 0 to 4 bar pressure regulator + pressure visual indicator
- 0 to 8 bar pressure regulator + pressure visual indicator
- The visual indicator Pressure range (bar) is always 0 to 8 bar

| Technical characteristics | |
|---|---|
| Fluid | filtered and lubricated air or non |
| Working ports size | See CONNECTIONS LIST |
| Max working pressure (bar) | 8 |
| Visualization scale (bar) | 0 ... 8 |
| Pressure range (bar) | 0 ... 2<br>0 ... 4<br>0 ... 8 |
| Temperature °C | -5 ... +50 |
| Weight (g) | 62 |



## Coupling kit (pins and forks)

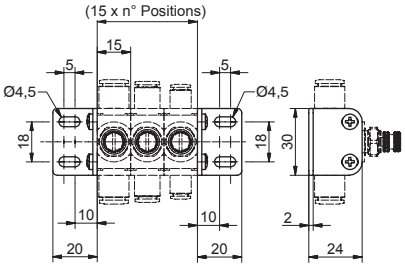
**Coding:** 55160




- Weight 2,5 g
- The kit, which includes a series of pins and forks, enables to join together in a fast and safe way the function fittings. The pins, once inserted in the front holes, ensure resistance against forces applied perpendicularly and sideway (for example the insertion of the tube in the cartridges).
- The forks, once located in the profiled housing ensures that the parts are held together tightly.
- The kit allows for 5 function fittings to be mounted together.

## Fixing brackets



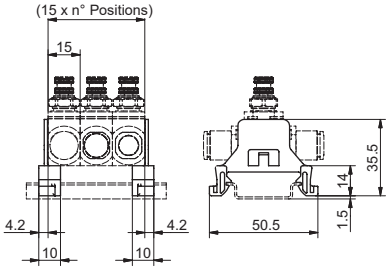



**Coding:** 55150

Weight 18 g
The kit comprises two fixing brackets and the screws

## DIN rail adapter






**Coding:** 55116

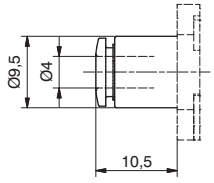
Weight 4 g
The kit comprises two adapters

## Ø4, Ø6 & Ø8 straight cartridge

**Coding:** 551KD©

| © | CONNECTIONS |
|---|---|
| | **4** = tube Ø4 |
| | **6** = tube Ø6 |
| | **8** = tube Ø8 |

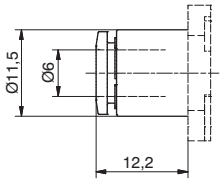





Weight 7,5 g

551KD4

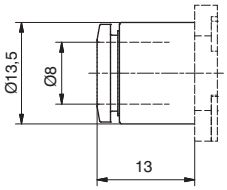





Weight 7,3 g

551KD6






Weight 7 g

551KD8



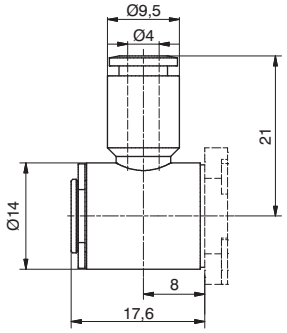
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Ø4, Ø6 & Ø8 banjo PL cartridge

**Coding:** 551KG©

| © | CONNECTIONS |
|---|---|
| | **4** = tube Ø4 |
| | **6** = tube Ø6 |
| | **8** = tube Ø8 |

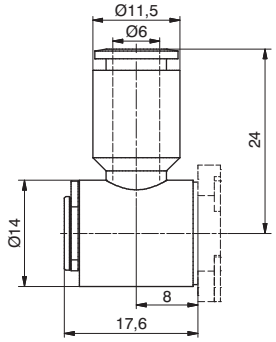





Weight 13,6 g

551KG4

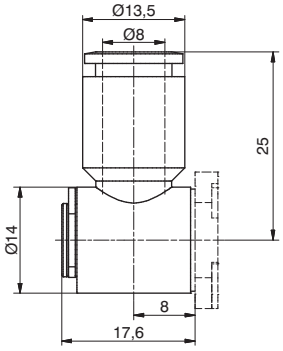





Weight 14 g

551KG6






Weight 14,3 g

551KG8

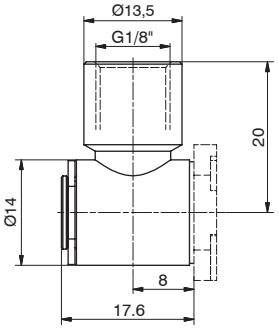
## G1/8" banjo artridge

**Coding:** 551KL©

| © | CONNECTIONS |
|---|---|
| | **1** = G1/8" |



Weight 30 g




551KL1

## Connection for multiple function



**Coding:** 551KUU

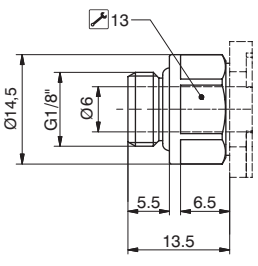
Weight 14 g

## Cartridge

**Coding:** 551K©

| © | CONNECTIONS |
|---|---|
| | **M1** = G1/8" male straight cartridge |
| | **M2** = G1/4" male straight cartridge |
| | **F1** = G1/8" female straight cartridge |

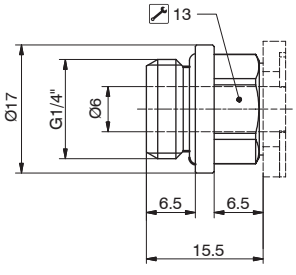





Weight 14 g
***G1/8" male straight cartridge***

551KM1

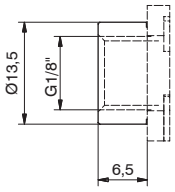





Weight 20 g
***G1/4" male straight cartridge***

551KM2






Weight 9 g
***G1/8" female straight cartridge***

551KF1

## Series 1750-1760

This type of miniaturised pressure regulators are mostly indicated for the use on the secondary level of the pneumatic circuits.
Thanks to the contained dimensions are particularly indicated to be used very closely or directly mounted onto the consumption.
Three versions are available.





Version rod G1/8" swivel ring with female thread G 1/8" and G 1/4" or push-in fitting for tube Ø4, Ø6 and Ø8



Model with body in technopolymer integrated gauge and quick coupling fittings for tube Ø4 and Ø6

G/1/8" model to be directly mounted onto the valve

Compact design to be directly mounted onto the valves uses standard swivel rings with G1/8" female thread (ref 41218) or quick coupling fittings for tube sizes. It is also possible to supply the regulating shaft without the swivel ring.

Model with body in technopolymer and integrated gauge

is the more complete solution, comprises a movable gauge which enables to check the regulated pressure.

Is manufactured using the same regulating unit as the base model fitted into a technopolymer body on which are inserted two quick coupling cartridges, 4mm or 6mm tube for inlet and outlet connections; two side plates lock the cartridges and gauge in position.

It is possible to join together more than one regulator by means of a dedicated adaptor made of technopolymer which must be inserted in the appropriate slot. ( the air must be supplied independently to each regulator.)

Several mounting solutions are available: wall mounting via two mounting holes, on DIN rail using the specific accessories or on panels.

### Mounting solutions

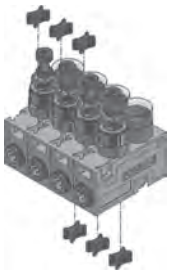
**G/1/8" model to be directly mounted into the valve: directly mounted into the valves threaded connections (consumptions)**



**Model with body in technopolymer and integrated gauge: panel mounting via the locking nut**



**Model with body in technopolymer and integrated gauge: wall mounting via the mounting holes on the body**



**Model with body in technopolymer and integrated gauge: on DIN rail using the specific accessories**



**Model with body in technopolymer and integrated gauge: panel mounting via the locking nut**




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Miniaturised pressure regulators-with technopolymer body

**Coding:** 17522A**C**.**G**

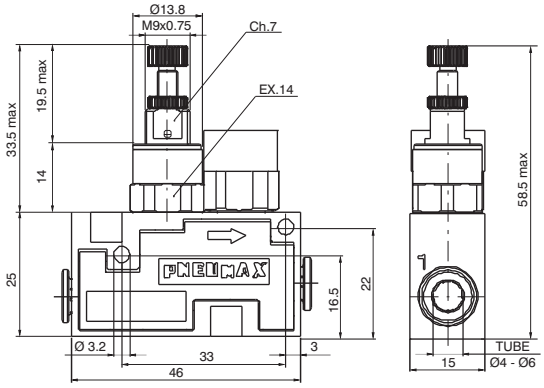
### Construction characteristics

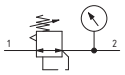
- Regulating cartridge = Nickel-plated brass
- Regulator body = Technopolymer
- Seals = Oil resistant nitrilic rubber (NBR)
- Plunger spring = AISI 302
- Regulating spring = Spring suitable steel
- Plunger = Oil resistant nitrilic rubber (NBR)
- Other parts = Brass

| Operational characteristics | |
|---|---|
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Working ports size | Ø4-Ø6 |
| Inlet connections sizes | Ø4-Ø6 |
| Assembly positions | Any |

| | |
|---|---|
| **C** | CONNECTIONS |
| | **4** = Tube Ø4 |
| | **6** = Tube Ø6 |
| **G** | PRESSURE RANGE |
| | **C** = 0...8 bar |
| | **B** = 0...4 bar |
| | **A** = 0...2 bar |





## Miniaturised pressure regulators, rod G1/8"

**Coding:** 17602A**A**.**G**

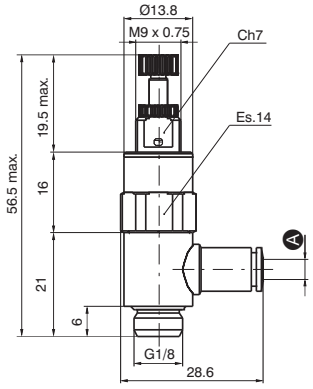
### Construction characteristics

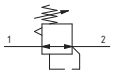
- Regulating cartridge = Nickel-plated brass
- Regulator body = Nickel-plated brass
- Seals = Oil resistant nitrilic rubber (NBR)
- Plunger spring = AISI 302
- Regulating spring = Spring suitable steel
- Plunger = Oil resistant nitrilic rubber (NBR)
- Other parts = Brass

| Operational characteristics | |
|---|---|
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Working ports size | G1/8" |
| Inlet connections sizes | G1/8"-Ø4-Ø6-Ø8 |
| Assembly positions | Any |

| | |
|---|---|
| **A** | SWIVEL RING |
| | **0** = None |
| | **1** = Swivel ring G1/8" female |
| | **4** = Tube Ø4 |
| | **6** = Tube Ø6 |
| | **8** = Tube Ø8 |
| **G** | PRESSURE RANGE |
| | **C** = 0...8 bar |
| | **B** = 0...4 bar |
| | **A** = 0...2 bar |





## Miniaturised pressure regulators, rod G1/4"

**Coding:** 17602B**A**.**G**

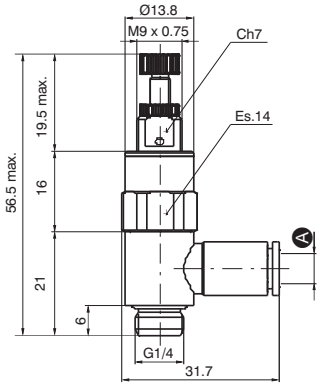
### Construction characteristics

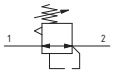
- Regulating cartridge = Nickel-plated brass
- Regulator body = Nickel-plated brass
- Seals = Oil resistant nitrilic rubber (NBR)
- Plunger spring = AISI 302
- Regulating spring = Spring suitable steel
- Plunger = Oil resistant nitrilic rubber (NBR)
- Other parts = Brass

| Operational characteristics | |
|---|---|
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 120 |
| Working ports size | G1/4" |
| Inlet connections sizes | G1/4"-Ø4-Ø6-Ø8 |
| Assembly positions | Any |

| | |
|---|---|
| **A** | SWIVEL RING |
| | **0** = None |
| | **1** = Swivel ring G1/4" female |
| | **6** = Tube Ø6 |
| | **8** = Tube Ø8 |
| **G** | PRESSURE RANGE |
| | **C** = 0...8 bar |
| | **B** = 0...4 bar |
| | **A** = 0...2 bar |





## Series Mini-RAP

**Technical data**

Working temperature: -20°C +70°C
Maximum working pressure: 10 bar
Fluid: Compressed air (others fluids on requests)
Nichel-plated brass body, Brass grip, Silicone free NBR gaskets
Thread: Cylindrical with O-Ring
Maximum fixing torque for fittings
Thread: M3: 0,4 Nm
Thread: M6 and M6x0,75: 1,3 Nm



**Main characteristics**

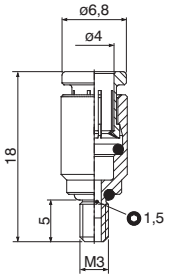
1. Can be inserted and extracted with one hand
2. Suitable for tube Rilsan, Polyurethane, Nylon, Polyethylene
3. Supercompact
4. Extremely lightweight yet sturdy
5. O-Ring provided with his own seat to ensure seal with polished surface
6. Suitable for vacuum applicatio


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## RDR Straight male adaptor (parallel)

**Coding:** RDR3.40-MH05



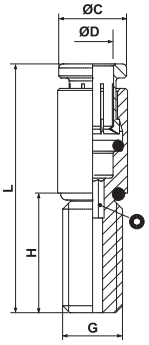



## RDR Straight male adaptor (parallel)

**Coding:** RDR6.40-Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **MH12** = M6, H=12mm |
| | **FH12** = M6x0,75, H=12mm |



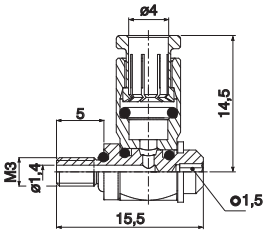



| CODE | ØD | G | ØC | H | L | O |
|---|---|---|---|---|---|---|
| RDR6.40-MH12 | 4 | M6 | 6,8 | 12 | 25 | 2 |
| RDR6.40-FH12 | 4 | M6x0,75 | 6,8 | 12 | 25 | 2 |

## RGR Complete single banjo with stem

**Coding:** RGR3.40-MH05



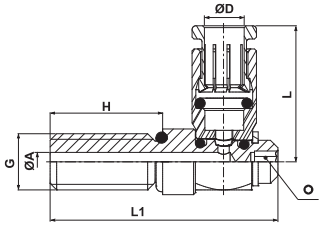



## RGR Complete single banjo with stem

**Coding:** RGR6.40-Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **MH12** = M6, H=12mm |
| | **FH12** = M6x0,75, H=12mm |






| CODE | ØD | G | ØA | H | L1 | L | O |
|---|---|---|---|---|---|---|---|
| RGR6.40-MH12 | 4 | M6 | 2 | 12 | 24,3 | 14,5 | 2 |
| RGR6.40-FH12 | 4 | M6x0,75 | 2 | 12 | 24,3 | 14,5 | 2 |

## Series PX





### SERIES PX MODULAR ELECTRONIC SYSTEM

- **Maximum flexibility**
- **Digital and analogue I/O modules**
- **Stand alone solution connectable via SUB-D cable to all manifolds**
- **Manufactured in technopolymer**
- **Wide range of communication protocols**

### FLEXIBILITY IN A COMPACT SPACE

Series PX modular electronic system has been designed to offer control and acquisition hardware for pneumatic and electric devices; it supports the most diffused communication protocols and can be configured with I/O modules, both digital and analog.
Series PX in stand alone version can be connected to every solenoid valves battery by using SUB-D connector, on the other hand Series PX can be directly connected to the following Pneumax solenoid valves series:

- Optyma S
- Optyma F
- Optyma T
- 2700
- 3000

Technopolymer bodies and sub-base and compact design has been studied to optimise room taken by the whole system, they make Series PX extremely light and guarantee maximum flexibility.
The ability to quickly and easily configure the system, the range of modules and accessories available meet at the best the specific application needs of many industrial sectors.

**Configurable on Cadenas platform**



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Configurator

PX 3 P - - - - ...

| Version | |
|---|---|
| 3 | For 3000 EVO, Optyma S-F-T EVO and 2700 EVO |

| Type | |
|---|---|
| P | Technopolymer |

| Endplates accessories | |
|---|---|
| | Without DIN rail adapter |
| G | With DIN rail adapter |

| Electric connection | |
|---|---|
| C3 | CANopen® node 64 IN - 64 OUT (32 fixed) |
| C4 | CANopen® node 64 IN - 64 OUT (48 fixed) |
| P3 | PROFIBUS DP node 64 IN - 64 OUT (32 fixed) |
| P4 | PROFIBUS DP node 64 IN - 64 OUT (48 fixed) |
| I4 | EtherNet/IP node 128 IN - 128 OUT (48 fixed) |
| A4 | EtherCAT® node 128 IN - 128 OUT (48 fixed) |
| N4 | PROFINET IO RT node 128 IN - 128 OUT (48 fixed) |
| G4 | CC-Link IE Field Basic node 128 IN - 128 OUT (48 fixed) |
| K3 | IO-Link protocol interface 64 IN - 64 OUT (32 fixed) |
| K4 | IO-Link protocol interface 64 IN - 64 OUT (48 fixed) |

| Electric connection accessories | |
|---|---|
| | Without DIN rail adapter |
| G | With DIN rail adapter |

SINGLE MODULE CONFIGURATION

| Number of repetitions per module | |
|---|---|
| | Indicate the number of repetitions of the same module (no value for a single module) |

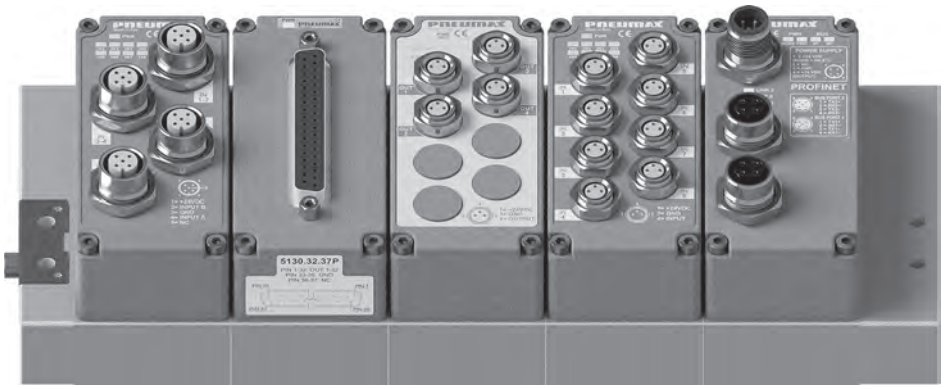
| Inputs module - Analogue / Digital | |
|---|---|
| D8 | 8 M8 digital inputs module |
| D12 | 8 M12 digital inputs module |
| D3 | 32 digital inputs SUB-D 37 poles |
| T1 | 2 analogue inputs 0-5V module (voltage signal) |
| T2 | 2 analogue inputs 0-10V module (voltage signal) |
| T3 | 4 analogue inputs 0-5V module (voltage signal) |
| T4 | 4 analogue inputs 0-10V module (voltage signal) |
| C1 | 2 analogue inputs 0-20mA module (current signal) |
| C2 | 2 analogue inputs 4-20mA module (current signal) |
| C3 | 4 analogue inputs 0-20mA module (current signal) |
| C4 | 4 analogue inputs 4-20mA module (current signal) |
| P1 | 2 Pt100 2 wires inputs module |
| P2 | 2 Pt100 3 wires inputs module |
| P3 | 2 Pt100 4 wires inputs module |
| P4 | 4 Pt100 2 wires inputs module |
| P5 | 4 Pt100 3 wires inputs module |
| P6 | 4 Pt100 4 wires inputs module |
| **Outputs module - Analogue / Digital** | |
| M8 | 8 M8 digital outputs module |
| M12 | 8 M12 digital outputs module |
| M3 | 32 digital outputs SUB-D 37 poles |
| V1 | 2 analogue outputs 0-5V module (voltage signal) |
| V2 | 2 analogue outputs 0-10V module (voltage signal) |
| V3 | 4 analogue outputs 0-5V module (voltage signal) |
| V4 | 4 analogue outputs 0-10V module (voltage signal) |
| L1 | 2 analogue outputs 0-20mA module (current signal) |
| L2 | 2 analogue outputs 4-20mA module (current signal) |
| L3 | 4 analogue outputs 0-20mA module (current signal) |
| L4 | 4 analogue outputs 4-20mA module (current signal) |

| Additional modules (Optional) | |
|---|---|
| P12 | M12 additional power supply module |

| Module accessories | |
|---|---|
| | Without DIN rail adapter |
| G | With DIN rail adapter |

**Refer to the current limits indicated in the pages relating to the nodes / IO-Link interface**

## Configuration examples

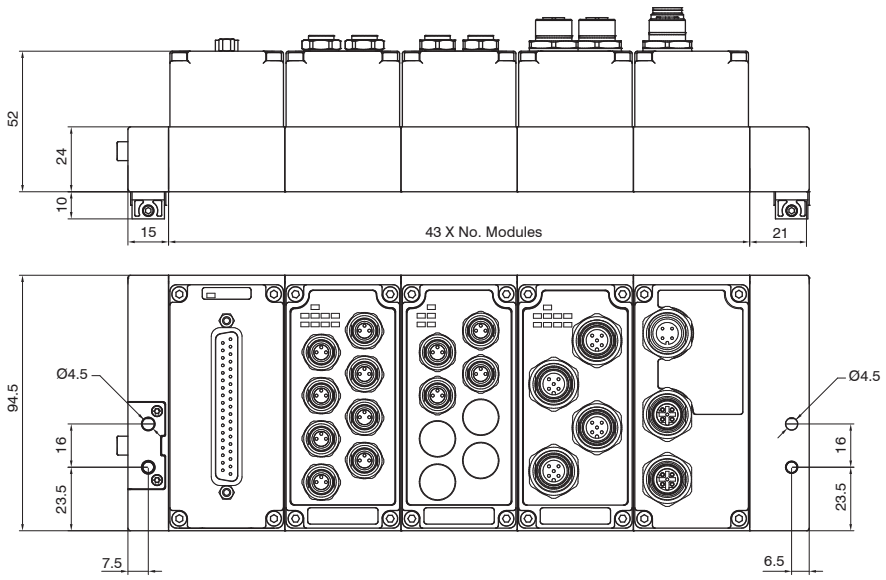



**Example shown: PX3-P-N4-D8-V4-M3-D12**
Multiprotocol module with PROFINET IO RT protocol node, M8 digital input module, M8 analogue output module, 37 pin (SUB-D) digital output module and M12 digital input module.



**Example shown: PX3-P-G-A4-3D8-2M12**
Multiprotocol module with EtherCAT® protocol node, 3 M8 digital input modules and 2 M12 digital output modules; also includes DIN rail adaptors.

## Overall dimensions



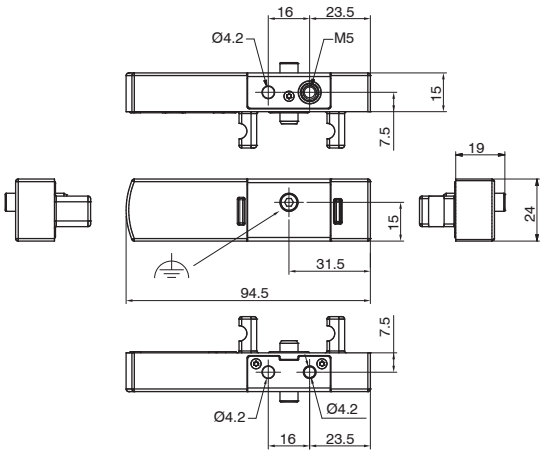


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Left endplate kit

**Coding:** 3100.KT.00



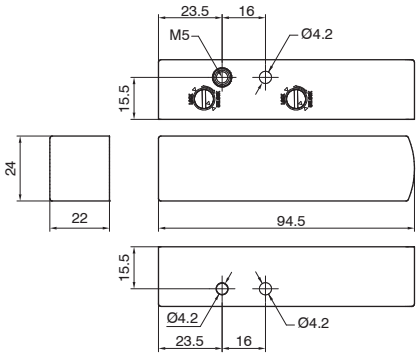



Weight 52 g

## Right endplate kit

**Coding:** 3100.KT.03



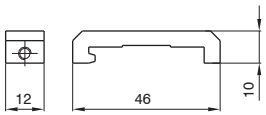



Weight 51 g

## DIN rail adapter

**Coding:** 3100.16






Weight 12 g

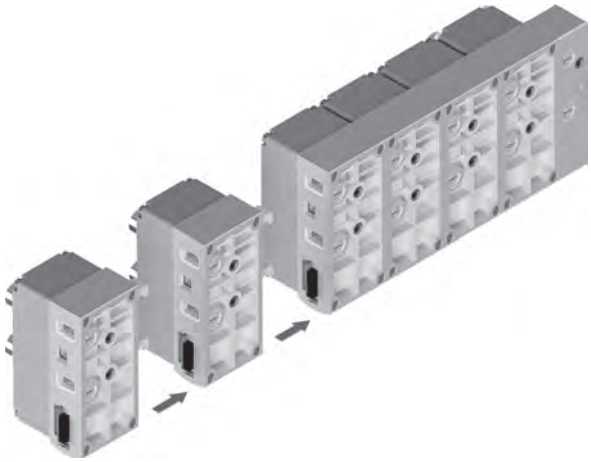
## Cable complete with connector, male 37 poles, IP65

**Coding:** 2400.37.M.Ⓛ.Ⓒ

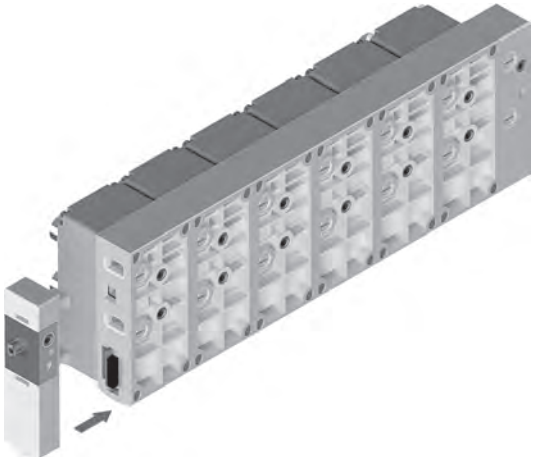
| | |
|---|---|
| Ⓛ | CABLE LENGTH |
| | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |
| Ⓒ | CONNECTOR |
| | **10** = Stand alone |
| | **90** = 90° Angle |



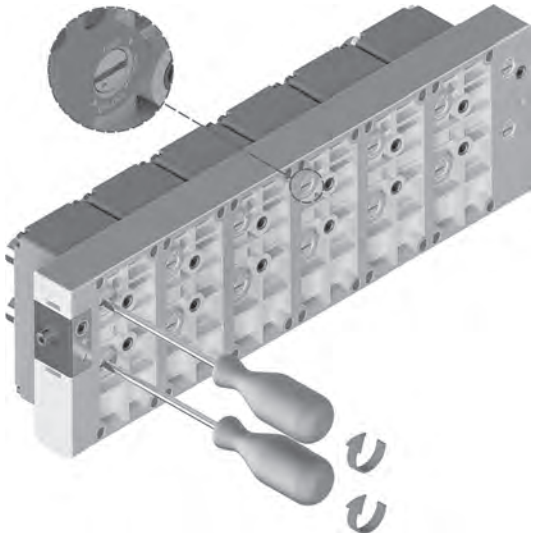
**1.** Assemble the required modules starting with 3100.KT.03 right endplate kit.



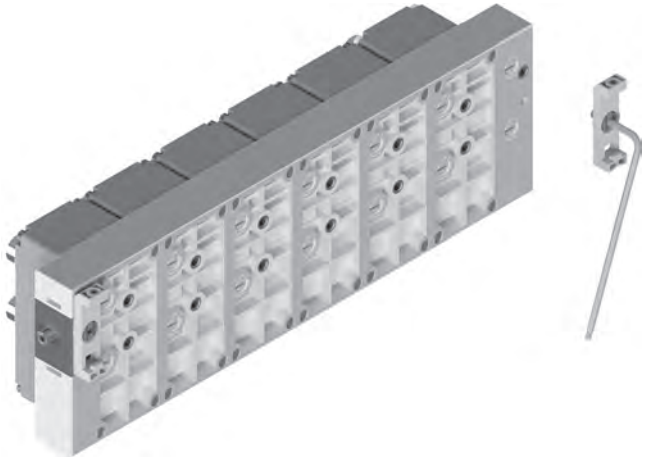
**2.** Complete the assembly with the 3100.KT.00 left endplate kit.



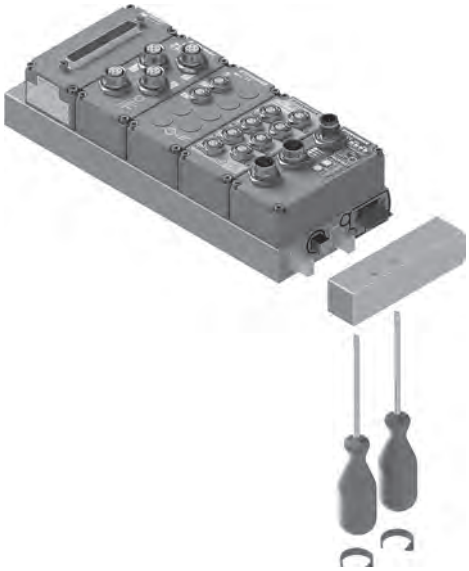
**3.** To lock: rotate anticlockwise (in the direction of the LOCK print on the case).
To unlock: rotate clockwise (in the direction of the UNLOCK print on the case).
The same procedure shall be used to add or remove any module.



**4.** If required, assemble the DIN rail adapter using an 3 mm allen key.

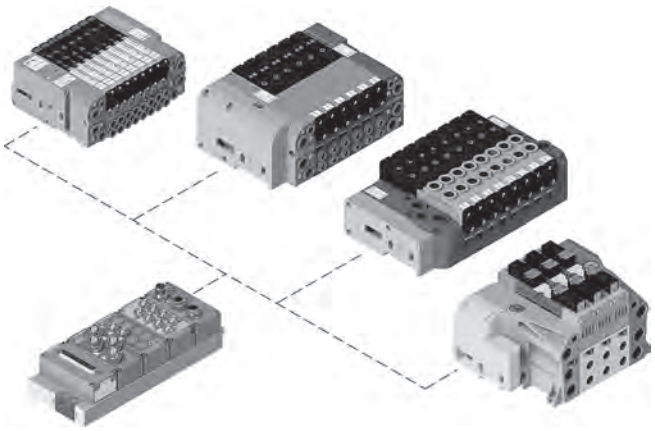


**A.** For integration with a manifold it is necessary to remove the 3100.KT.03 right endplate kit.



**B.** Series PX modular electronic system can be integrated with the following valve manifold series:

- Optyma S
- Optyma F
- Optyma T
- 2700



The Series 3000 manifolds already integrates with the PX Series modules with dedicated fixing options.
Please refer to www.pneumaxspa.com for more details.



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## CANopen® protocol node kit

CANopen® node manages 64 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Connection to CANopen® fieldbus is made via two M12, male and female, 5 pins, type A circular connectors, in parallel between them; connectors pinout is compliant to CiA Draft recommendation 303-1 (V. 1.3 : 30 December 2004).
Transmission speed and address, as well as termination resistor activation are set via DIP-switches.
CANopen® node is available in two versions with 32 or 48 outputs allocated to solenoid valves on the manifold directly connected to the node.
Such outputs correspond to least significant bytes and their allocation is independent of how many solenoid valves are installed.
Remaining outputs can be used to control the modules.
Byte allocation to additional modules is fully automatic.

**Coding:** K5530.64.ⓋCO

| | |
|---|---|
| Ⓥ | VERSION |
| | **32** = 32 output bits available for valve connections |
| | **48** = 48 output bits available for valve connections |



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by OUTPUTS + 24 V DC (pin 4).

To compute the maximum current on the OUTPUTS + 24 V DC, please use the following formula:

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules
$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)
$m$ = number of installed solenoid pilots
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 2200 "Optyma S" | 36 mA |
| 2500 "Optyma F" | 54 mA |
| 2500 "Optyma T" | 54 mA |
| Series 2700 | 24 mA (1 W version) / 100 mA (2,3 W version) |

For each fieldbus node, maximum deliverable current by OUTPUTS + 24 V DC supply is 4 A, moreover the sum of the currents on OUTPUTS + 24 V DC and INPUTS + 24 V DC must not exceed 4 A.

$$I_{24\,V\,DC\,out} + I_{24\,V\,DC\,in} < 4A$$

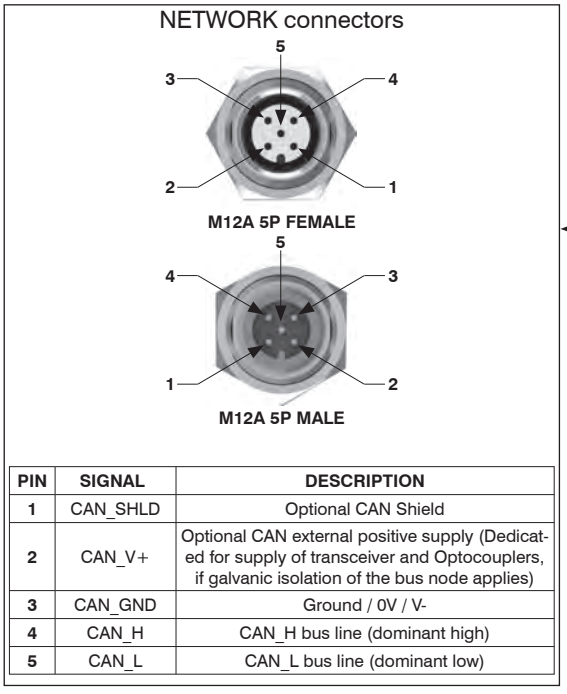
Where:

$$I_{24\,V\,DC\,in} = \sum_{i=1}^{n} I_{in,i}$$

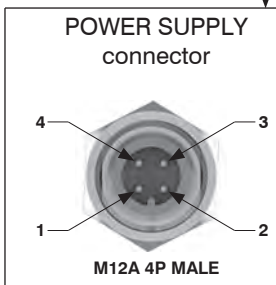
$n$ = number of installed modules
$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

⚠ In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

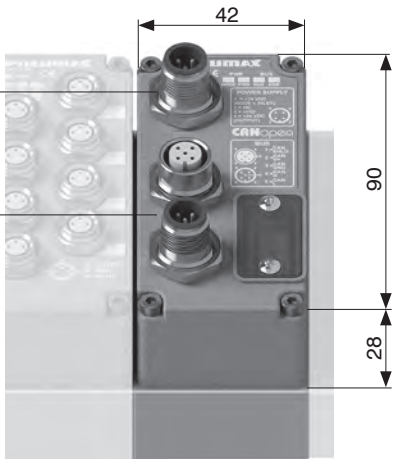
### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | CAN_SHLD | Optional CAN Shield |
| 2 | CAN_V+ | Optional CAN external positive supply (Dedicated for supply of transceiver and Optocouplers, if galvanic isolation of the bus node applies) |
| 3 | CAN_GND | Ground / 0V / V- |
| 4 | CAN_H | CAN_H bus line (dominant high) |
| 5 | CAN_L | CAN_L bus line (dominant low) |




| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |




| Technical characteristics | | |
|---|---|---|
| Specifications | | CiA Draft Standard Proposal 301 V 4.10 (15 August 2006) |
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC ± 10% |
| | Node only current consumption on + 24 V DC inputs | 40 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | 2 M12 5 pins male-female connectors type A (IEC 60947-5-2) |
| | Baud rate | 10 - 20 - 50 - 125 - 250 - 500 - 800 - 1000 Kbit/s |
| | Addresses possible numbers | From 1 to 63 |
| | Maximum nodes number in network | 64 (slave + master) |
| | Bus maximum recommended length | 100 m at 500 Kbit/s |
| | Bus diagnosis | Green / red status LED |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |

## PROFIBUS DP protocol node kit

PROFIBUS DP node manages 64 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Connection to PROFIBUS DP fieldbus is made via two M12, male and female, 5 pins, type B circular connectors, in parallel between them; connectors pinout is PROFIBUS Interconnection Technology specifications compliant (Version 1.1, August 2001).
Address as well as termination resistor activation are set via DIP-switches.
PROFIBUS DP node is available in two versions with 32 or 48 outputs allocated to solenoid valves on the manifold directly connected to the node.
Such outputs correspond to least significant bytes and their allocation is independent of how many solenoid valves are installed.
Remaining outputs can be used to control the modules.
Byte allocation to additional modules is fully automatic.

**Coding:** K5330.64.Ⓥ PB

| | VERSION |
|---|---|
| Ⓥ | **32** = 32 output bits available for valve connections |
| | **48** = 48 output bits available for valve connections |



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by OUTPUTS + 24 V DC (pin 4).

To compute the maximum current on the OUTPUTS + 24 V DC, please use the following formula:

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules
$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)
$m$ = number of installed solenoid pilots
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 2200 "Optyma S" | 36 mA |
| 2500 "Optyma F" | 54 mA |
| 2500 "Optyma T" | 54 mA |
| Series 2700 | 24 mA (1 W version) / 100 mA (2,3 W version) |

For each fieldbus node, maximum deliverable current by OUTPUTS + 24 V DC supply is 4 A, moreover the sum of the currents on OUTPUTS + 24 V DC and INPUTS + 24 V DC must not exceed 4 A.

$$I_{24\,V\,DC\,out} + I_{24\,V\,DC\,in} < 4A$$

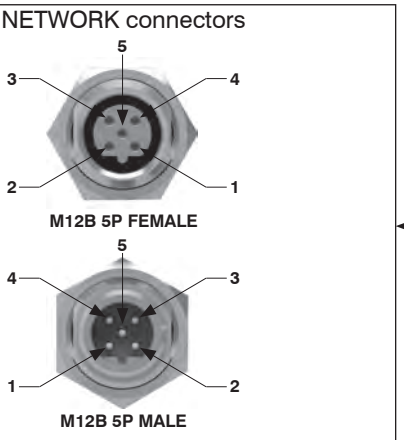
Where:

$$I_{24\,V\,DC\,in} = \sum_{i=1}^{n} I_{in,i}$$

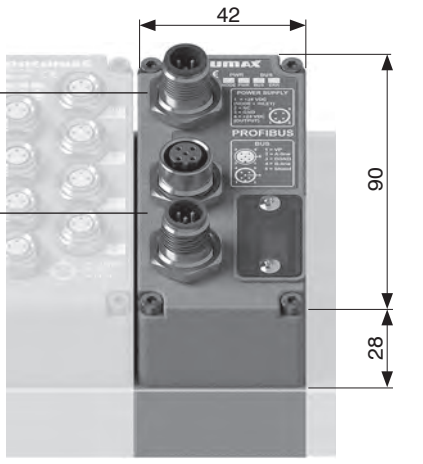
$n$ = number of installed modules
$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

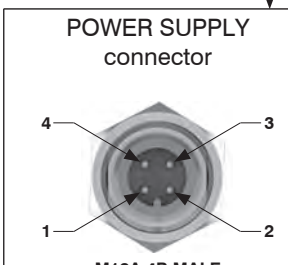
⚠ In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | VP | Optional Power supply plus, (P5V) |
| 2 | A-line | Receive / Transmit data -N, A-line |
| 3 | DGND | Data Ground (reference potential to VP) |
| 4 | B-line | Receive / Transmit data -P, B-line |
| 5 | SHIELD | Shield or PE |




| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

| Technical characteristics | | |
|---|---|---|
| Specifications | | PROFIBUS DP |
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC ± 10% |
| | Node only current consumption on + 24 V DC inputs | 70 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | 2 M12 5 pins male-female connectors type B |
| | Baud rate | 9,6 - 19,2 - 93,75 - 187,5 - 500 - 1500 - 3000 - 6000 - 12000 Kbit/s |
| | Addresses possible numbers | From 1 to 99 |
| | Maximum nodes number in network | 100 (slave + master) |
| | Bus maximum recommended length | 100 m at 12 Mbit/s - 1200 m at 9,6 Kbit/s |
| | Bus diagnosis | Green / red status LED |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## EtherNet/IP protocol node kit

EtherNet/IP node manages 128 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Network connection is made via 2 M12 female, type D, 4 pins, circular connectors.
Code K5730.128.48EI provides first 48 outputs, corresponding to least significant 6 bytes, are allocated to the solenoid valve positions, regardless how many they are and how many valves are installed on the manifold directly connected to the node.
Remaining 80 outputs can be used to manage output modules; bytes allocation to additional modules is fully automatic.

**Coding:** K5730.128.48EI



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by OUTPUTS + 24 V DC (pin 4).

To compute the maximum current on the OUTPUTS + 24 V DC, please use the following formula:

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules
$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)
$m$ = number of installed solenoid pilots
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 2200 "Optyma S" | 36 mA |
| 2500 "Optyma F" | 54 mA |
| 2500 "Optyma T" | 54 mA |
| Series 2700 | 24 mA (1 W version) / 100 mA (2,3 W version) |

For each fieldbus node, maximum deliverable current by OUTPUTS + 24 V DC supply is 4 A, moreover the sum of the currents on OUTPUTS + 24 V DC and INPUTS + 24 V DC must not exceed 4 A.

$$I_{24\,V\,DC\,out} + I_{24\,V\,DC\,in} < 4A$$

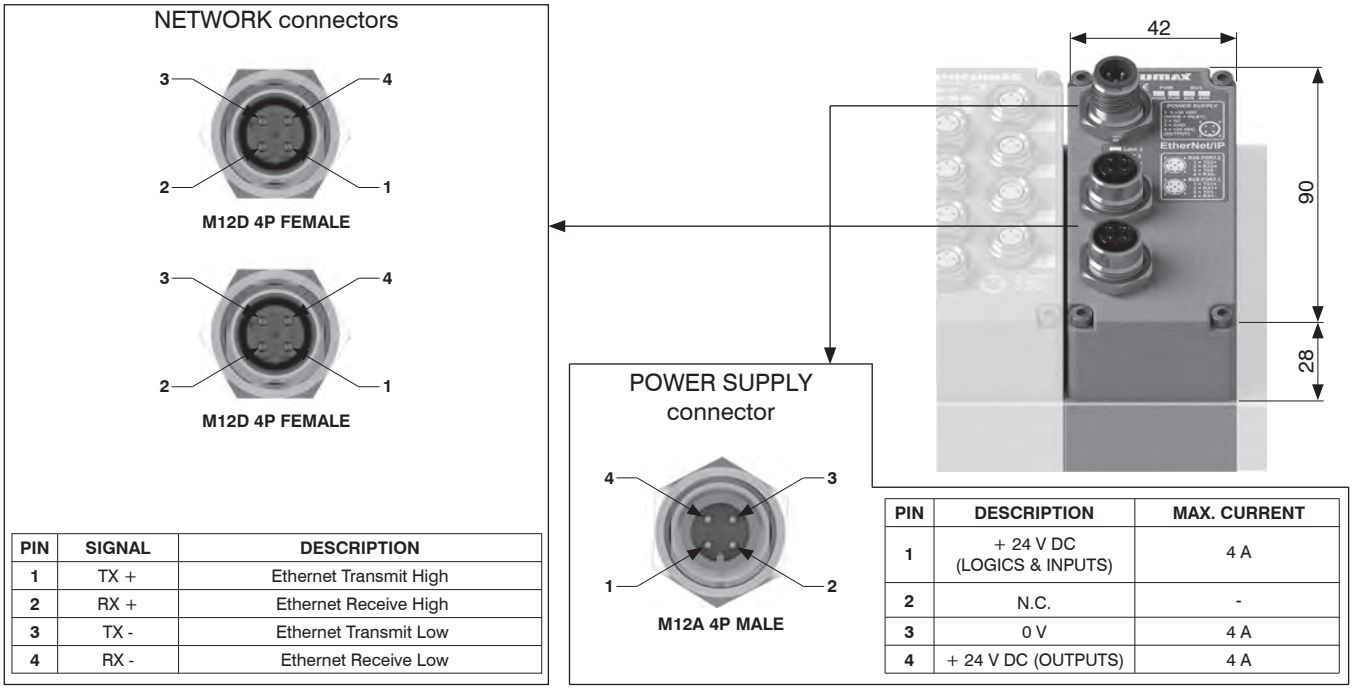
Where:

$$I_{24\,V\,DC\,in} = \sum_{i=1}^{n} I_{in,i}$$

$n$ = number of installed modules
$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | TX + | Ethernet Transmit High |
| 2 | RX + | Ethernet Receive High |
| 3 | TX - | Ethernet Transmit Low |
| 4 | RX - | Ethernet Receive Low |

| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

| Technical characteristics | | |
|---|---|---|
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC ± 10% |
| | Node only current consumption on + 24 V DC inputs | 65 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | 2 M12 4 pins male-female connectors type D (IEC 61076-2-101) |
| | Baud rate | 100 Mbit/s |
| | Maximum distance between 2 nodes | 100 m |
| | Bus diagnosis | Green / red status LED |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |

## EtherCAT® protocol node kit

EtherCAT® node manages 128 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Network connection is made via 2 M12 female, type D, 4 pins, circular connectors.
Code K5730.128.48EC provides first 48 outputs, corresponding to least significant 6 bytes, are allocated to the solenoid valve positions, regardless how many they are and how many valves are installed on the manifold directly connected to the node.
Remaining 80 outputs can be used to manage output modules; bytes allocation to additional modules is fully automatic.

**Coding:** K5730.128.48EC



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by OUTPUTS + 24 V DC (pin 4).

To compute the maximum current on the OUTPUTS + 24 V DC, please use the following formula:

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules
$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)
$m$ = number of installed solenoid pilots
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 2200 "Optyma S" | 36 mA |
| 2500 "Optyma F" | 54 mA |
| 2500 "Optyma T" | 54 mA |
| Series 2700 | 24 mA (1 W version) / 100 mA (2,3 W version) |

For each fieldbus node, maximum deliverable current by OUTPUTS + 24 V DC supply is 4 A, moreover the sum of the currents on OUTPUTS + 24 V DC and INPUTS + 24 V DC must not exceed 4 A.

$$I_{24\,V\,DC\,out} + I_{24\,V\,DC\,in} < 4A$$

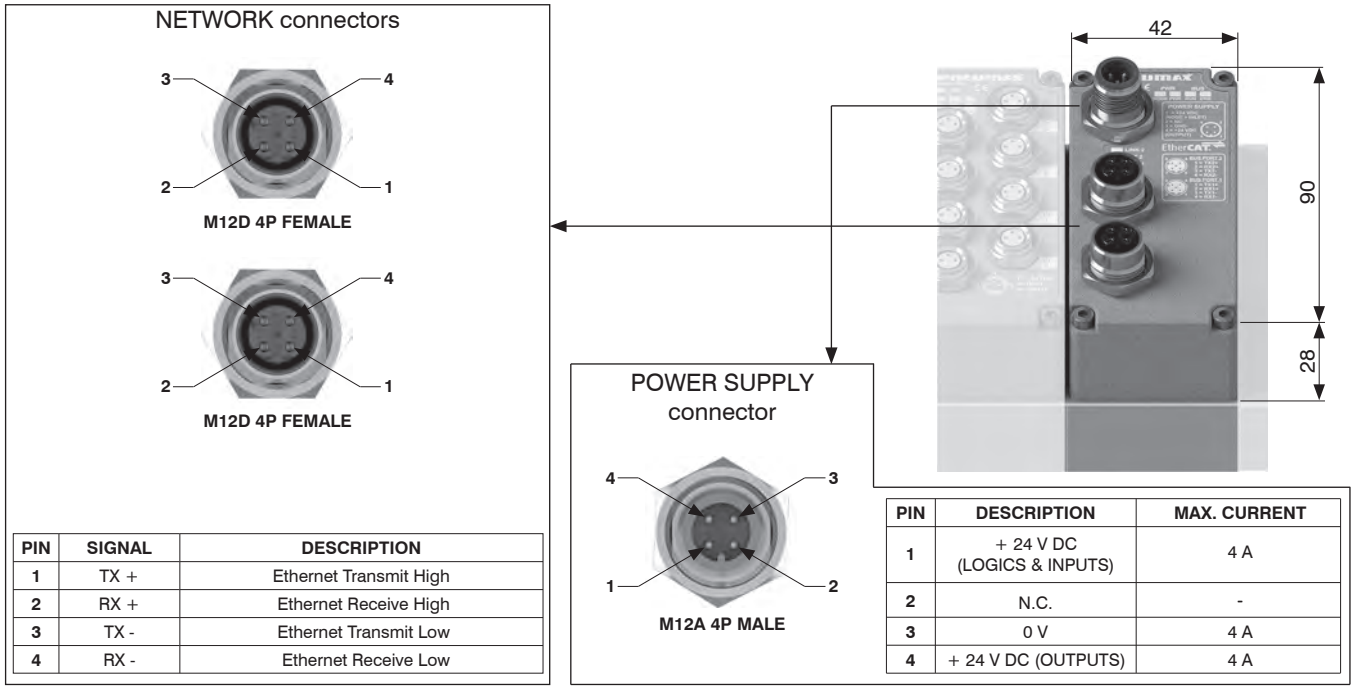
Where:

$$I_{24\,V\,DC\,in} = \sum_{i=1}^{n} I_{in,i}$$

$n$ = number of installed modules
$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | TX + | Ethernet Transmit High |
| 2 | RX + | Ethernet Receive High |
| 3 | TX - | Ethernet Transmit Low |
| 4 | RX - | Ethernet Receive Low |

| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

| Technical characteristics | | |
|---|---|---|
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC ± 10% |
| | Node only current consumption on + 24 V DC inputs | 65 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | 2 M12 4 pins male-female connectors type D (IEC 61076-2-101) |
| | Baud rate | 100 Mbit/s |
| | Maximum distance between 2 nodes | 100 m |
| | Bus diagnosis | Green / red status LED |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## PROFINET IO RT protocol node kit

PROFINET IO RT node manages 128 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Network connection is made via 2 M12 female, type D, 4 pins, circular connectors.
Code K5730.128.48PN provides first 48 outputs, corresponding to least significant 6 bytes, are allocated to the solenoid valve positions, regardless how many they are and how many valves are installed on the manifold directly connected to the node.
Remaining 80 outputs can be used to manage output modules; bytes allocation to additional modules is fully automatic.

**Coding:** K5730.128.48PN



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by OUTPUTS + 24 V DC (pin 4).

To compute the maximum current on the OUTPUTS + 24 V DC, please use the following formula:

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules
$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)
$m$ = number of installed solenoid pilots
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 2200 "Optyma S" | 36 mA |
| 2500 "Optyma F" | 54 mA |
| 2500 "Optyma T" | 54 mA |
| Series 2700 | 24 mA (1 W version) / 100 mA (2,3 W version) |

For each fieldbus node, maximum deliverable current by OUTPUTS + 24 V DC supply is 4 A, moreover the sum of the currents on OUTPUTS + 24 V DC and INPUTS + 24 V DC must not exceed 4 A.

$$I_{24\,V\,DC\,out} + I_{24\,V\,DC\,in} < 4A$$

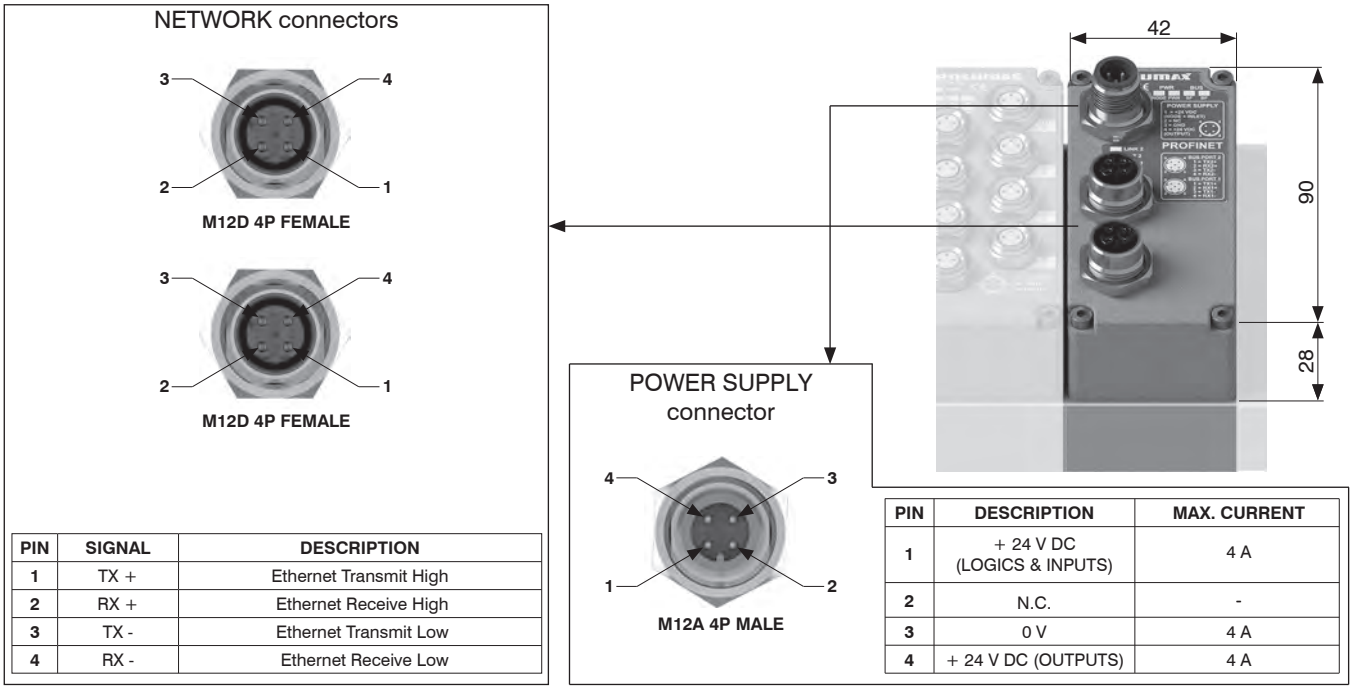
Where:

$$I_{24\,V\,DC\,in} = \sum_{i=1}^{n} I_{in,i}$$

$n$ = number of installed modules
$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | TX + | Ethernet Transmit High |
| 2 | RX + | Ethernet Receive High |
| 3 | TX - | Ethernet Transmit Low |
| 4 | RX - | Ethernet Receive Low |

| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

| Technical characteristics | | |
|---|---|---|
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC ± 10% |
| | Node only current consumption on + 24 V DC inputs | 65 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | 2 M12 4 pins male-female connectors type D (IEC 61076-2-101) |
| | Baud rate | 100 Mbit/s |
| | Maximum distance between 2 nodes | 100 m |
| | Bus diagnosis | Green / red status LED |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |

## CC-Link IE Field Basic protocol node kit

CC-Link IE Field Basic node manages 128 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Network connection is made via 2 M12 female, type D, 4 pins, circular connectors.
Code K5730.128.48CL provides first 48 outputs, corresponding to least significant 6 bytes, are allocated to the solenoid valve positions, regardless how many they are and how many valves are installed on the manifold directly connected to the node.
Remaining 80 outputs can be used to manage output modules; bytes allocation to additional modules is fully automatic.

**Coding:** K5730.128.48CL



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by OUTPUTS + 24 V DC (pin 4).

To compute the maximum current on the OUTPUTS + 24 V DC, please use the following formula:

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules
$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)
$m$ = number of installed solenoid pilots
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 2200 "Optyma S" | 36 mA |
| 2500 "Optyma F" | 54 mA |
| 2500 "Optyma T" | 54 mA |
| Series 2700 | 24 mA (1 W version) / 100 mA (2,3 W version) |

For each fieldbus node, maximum deliverable current by OUTPUTS + 24 V DC supply is 4 A, moreover the sum of the currents on OUTPUTS + 24 V DC and INPUTS + 24 V DC must not exceed 4 A.

$$I_{24\,V\,DC\,out} + I_{24\,V\,DC\,in} < 4A$$

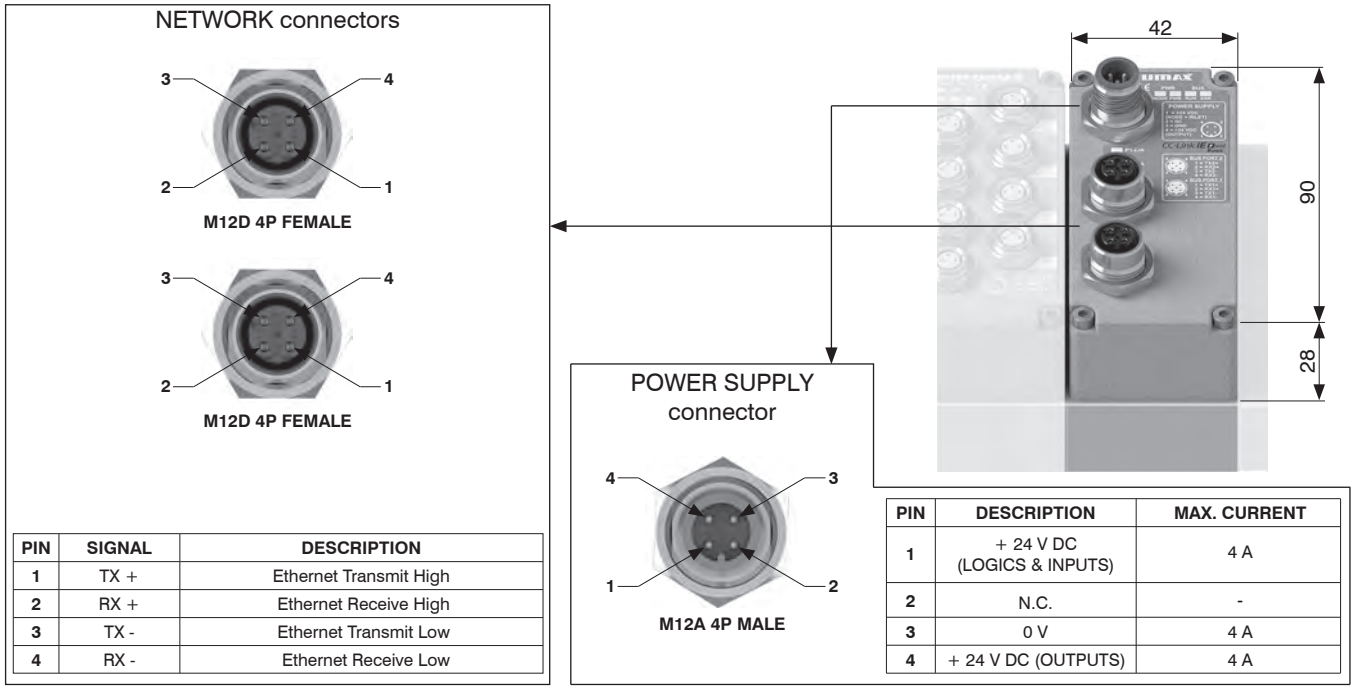
Where:

$$I_{24\,V\,DC\,in} = \sum_{i=1}^{n} I_{in,i}$$

$n$ = number of installed numbers
$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | TX + | Ethernet Transmit High |
| 2 | RX + | Ethernet Receive High |
| 3 | TX - | Ethernet Transmit Low |
| 4 | RX - | Ethernet Receive Low |

| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

| Technical characteristics | | |
|---|---|---|
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC ± 10% |
| | Node only current consumption on + 24 V DC inputs | 65 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | 2 M12 4 pins male-female connectors type D (IEC 61076-2-101) |
| | Baud rate | 100 Mbit/s |
| | Maximum distance between 2 nodes | 100 m |
| | Bus diagnosis | 1 Green LED and 1 red status LED + 2 link and activity LEDs' |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## IO-Link protocol interface kit

IO-Link interface manages 64 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Electric power supply and IO-Link connection to the Master are made via M12, male, 5 pins, type A, circular connector, "CLASS B", according to IO-Link specifications.
Electric rails L+/L- supply interface only, while P24/N24 rails supply additional modules and solenoid valves.
Either power supplies are galvanically isolated in the IO-Link interfaces.
IO-Link interface is available in two versions with 32 or 48 outputs allocated to solenoid valves on the manifold directly connected to the node.
Such outputs correspond to least significant bytes and their allocation is independent of how many solenoid valves are installed.
Remaining outputs can be used to control the modules.
Byte allocation to additional modules is fully automatic.

**Coding:** K5830.64.Ⓥ IK

| | VERSION |
|---|---|
| Ⓥ | **32** = 32 output bits available for valve connections |
| | **48** = 48 output bits available for valve connections |



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by pin 2 and pin 5 (P24 / N24).

To compute the maximum current on the P24 / N24 supply, please use the following formula::

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules

$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)

$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

$m$ = number of installed solenoid pilots

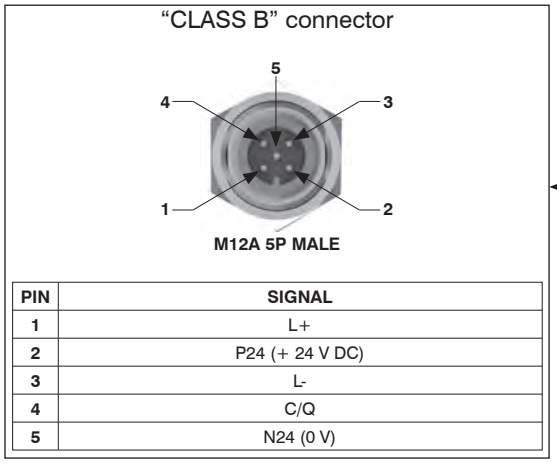
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 2200 "Optyma S" | 36 mA |
| 2500 "Optyma F" | 54 mA |
| 2500 "Optyma T" | 54 mA |
| Series 2700 | 24 mA (1 W version) / 100 mA (2,3 W version) |

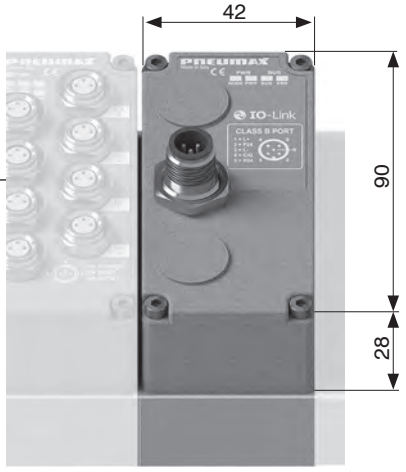
= maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL |
|---|---|
| 1 | L+ |
| 2 | P24 (+ 24 V DC) |
| 3 | L- |
| 4 | C/Q |
| 5 | N24 (0 V) |




| Technical characteristics | | |
|---|---|---|
| Specifications | | IO-Link Specification v1.1 |
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC +/- 10% |
| | Interface current consumption on + 24 V DC (L+ / L-) | 25 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | "Class B" port |
| | Communication speed | 38.4 kbaud/s |
| | Maximum distance from Master | 20 m |
| | Bus diagnosis | Green / red status LED |
| | Vendor ID / Device ID | 1257 (hex 0x04E9) / 3000 (hex 0x0BB8) |
| Configurations file IODD | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |

## 8 digital inputs module kit M8

M8 digital inputs module provides 8 M8, 3 pins, female connectors.
Inputs have PNP logic, + 24 V DC ± 10%.
It is possible to connect 2 wires devices (e.g. switches, magnetic limit switches, pressure switches, etc.) as well as 3 wires devices (e.g. proximity sensors, photocells, electronic magnetic limit switches, etc.).
Inputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pin M12 power connector, pin 1) or by K5030.M12 additional power supply module, in case it were installed upstream of the inputs module.

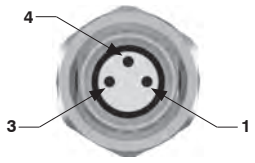
**Coding:** K5230.08.M8



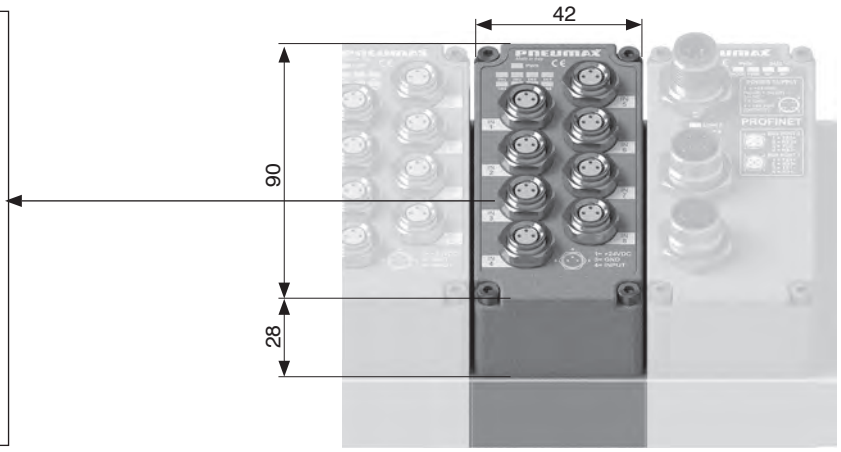
| Technical characteristics | |
|---|---|
| Maximum current per module | 300 mA |
| Protection | Overcurrent (auto-resettable fuse)<br>Reverse polarity |
| Input impedence | 3 kΩ |
| Maximum cable length | < 30 m |
| Input data allocation | 8 bit |
| INPUTS + 24 V DC current consumption of the module only | 5 mA |

### Scheme / Overall dimensions and I/O layout

M8 3P female connector




| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (INPUTS) |
| 3 | 0 V |
| 4 | INPUT |




## 8 digital inputs module kit M12

M12 digital inputs module provides 4 M12, 5 pins, female connectors.
Inputs have PNP logic, + 24 V DC ± 10%.
Every connector takes two input channels.
It is possible to connect 2 wires devices (e.g. switches, magnetic limit switches, pressure switches, etc.) as well as 3 wires devices (e.g. proximity sensors, photocells, electronic magnetic limit switches, etc.).
Inputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pin M12 power connector, pin 1) or by K5030.M12 additional power supply module, in case it were installed upstream of the inputs module.

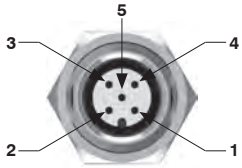
**Coding:** K5230.08.M12



| Technical characteristics | |
|---|---|
| Maximum current per module | 300 mA |
| Protection | Overcurrent (auto-resettable fuse)<br>Reverse polarity |
| Input impedence | 3kΩ |
| Maximum cable length | < 30 m |
| Input data allocation | 8 bit |
| INPUTS + 24 V DC current consumption of the module only | 5 mA |

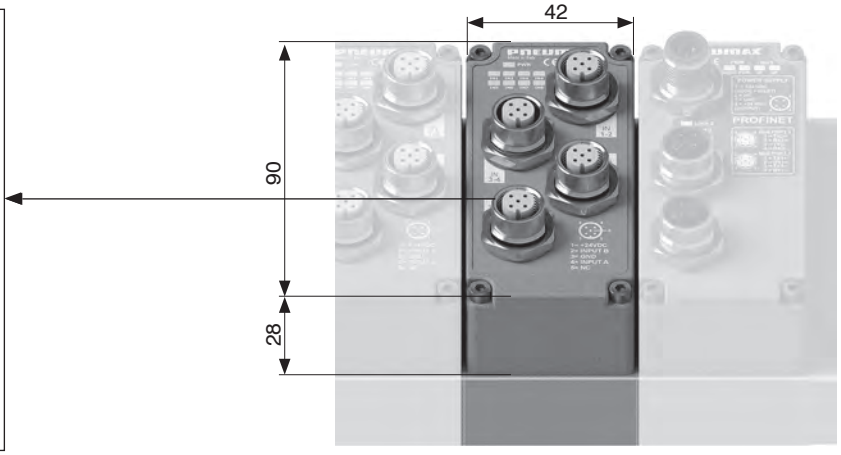
### Scheme / Overall dimensions and I/O layout

M12 5P female connector




M12A 5P FEMALE

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (INPUTS) |
| 2 | INPUT B |
| 3 | 0 V |
| 4 | INPUT A |
| 5 | N.C. |






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## 8 digital outputs module kit M8

M8 digital inputs module provides 8 M8, 3 pins, female connectors.
Outputs have PNP logic, + 24 V DC ± 10%.
Outputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pins M12 power connector, pin 4) or by K5030.M12 additional power supply module, in case it were installed upstream of the outputs module.
Power supply presence is displayed by "PWR OUT" green LED light-on.
Each output has a LED indicator associated which lights up when output's signal status is high.

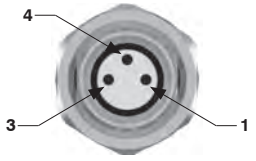
**Coding:** K5130.08.M8



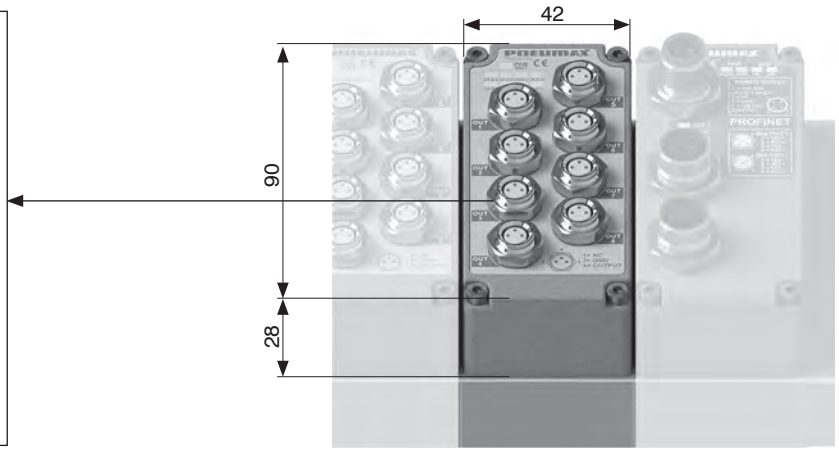
| Technical characteristics | |
|---|---|
| Maximum current per output | 100 mA |
| Protection | Short circuit (electronic), trigger at 2.8A |
| Maximum cable length | < 30 m |
| Output data allocation | 8 bit |
| OUTPUTS + 24 V DC current consumption of the module only | 15 mA |

### Scheme / Overall dimensions and I/O layout

M8 3P female connector




| PIN | DESCRIPTION |
|---|---|
| 1 | N.C. |
| 3 | 0 V |
| 4 | OUTPUT |




## 8 digital outputs module kit M12

M12 digital inputs module provides 4 M12, 5 pins, female connectors.
Outputs have PNP logic, + 24 V DC ± 10%.
Outputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pins M12 power connector, pin 4) or by K5030.M12 additional power supply module, in case it were installed upstream of the outputs module.
Power supply presence is displayed by "PWR OUT" green LED light-on.
Each output has a LED indicator associated which lights up when output's signal status is high.

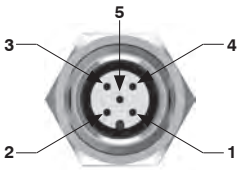
**Coding:** K5130.08.M12



| Technical characteristics | |
|---|---|
| Maximum current per output | 100 mA |
| Protection | Short circuit (electronic), trigger at 2.8A |
| Maximum cable length | < 30 m |
| Output data allocation | 8 bit |
| OUTPUTS + 24 V DC current consumption of the module only | 15 mA |

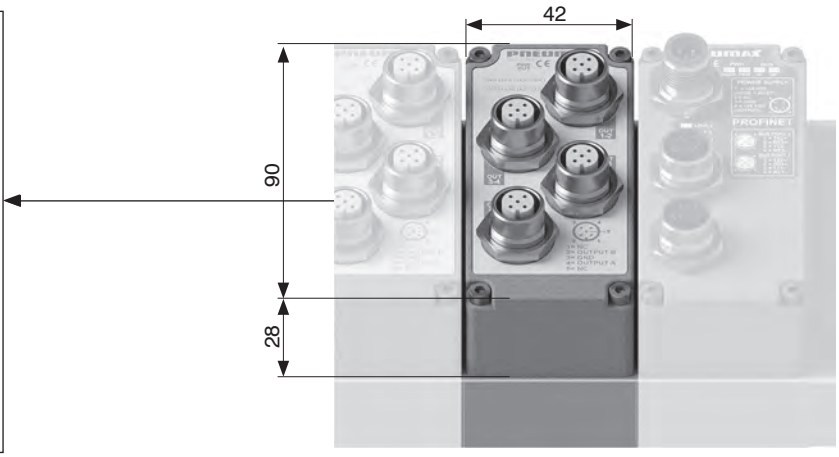
### Scheme / Overall dimensions and I/O layout

M12 5P female connector




M12A 5P FEMALE

| PIN | DESCRIPTION |
|---|---|
| 1 | N.C. |
| 2 | OUTPUT B |
| 3 | 0 V |
| 4 | OUTPUT A |
| 5 | N.C. |



## 32 digital inputs module kit (37 pins SUB-D connector)

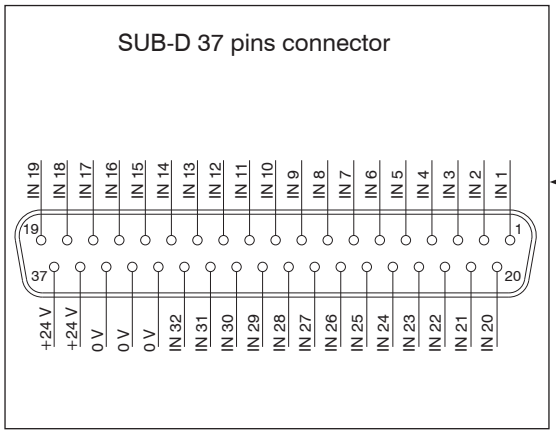
The module provides a SUB-D 37 pins female connector.
Inputs have PNP logic, + 24 V DC ± 10%.
It is possible to connect 2 wires devices (e.g. switches, magnetic limit switches, pressure switches, etc.) as well as 3 wires devices (e.g. proximity sensors, photocells, electronic magnetic limit switches, etc.).
Inputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pin M12 power connector, pin 1) or by K5030.M12 additional power supply module, in case it were installed upstream of the inputs module.

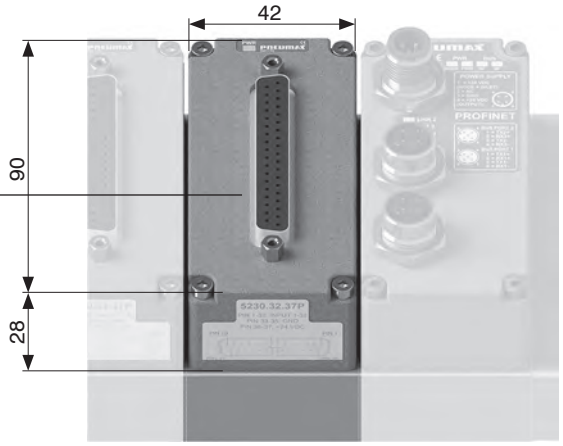
**Coding:** K5230.32.37P



| Technical characteristics | |
|---|---|
| Maximum current per module | 1 A |
| Protection | Overcurrent (auto-resettable fuse)<br>Reverse polarity |
| Input impedence | 3 kΩ |
| Maximum cable length | < 30 m |
| Input data allocation | 32 bit |
| INPUTS + 24 V DC current consumption of the module only | 10 mA |

### Scheme / Overall dimensions and I/O layout




## 32 digital outputs module kit (37 pins SUB-D connector)

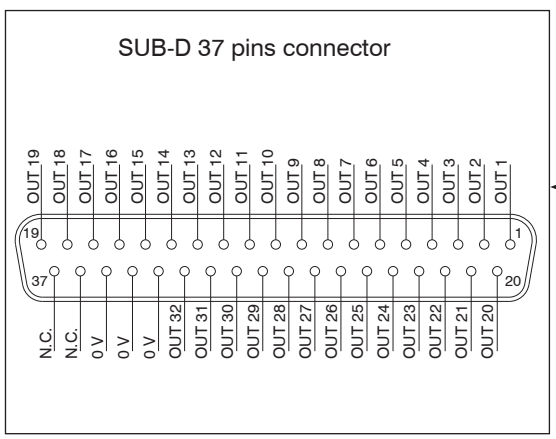
The module provides a SUB-D 37 pins female connector.
Outputs have PNP logic, + 24 V DC ± 10%.
Outputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pins M12 power connector, pin 4) or by K5030.M12 additional power supply module, in case it were installed upstream of the outputs module.
Power supply presence is displayed by "PWR OUT" green LED light-on.

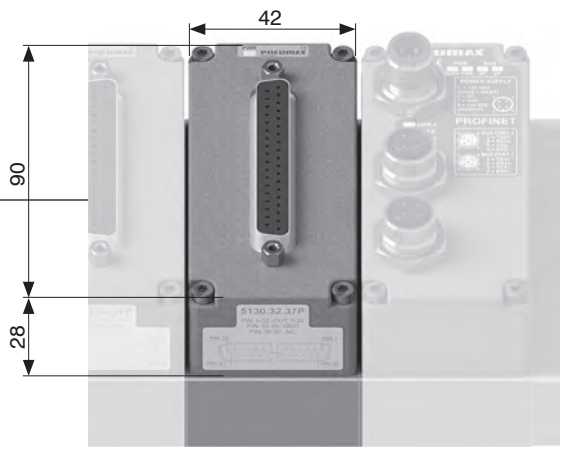
**Coding:** K5130.32.37P



| Technical characteristics | |
|---|---|
| Maximum current per output | 100 mA |
| Protection | Short circuit (electronic), trigger at 2.8A |
| Maximum cable length | < 30 m |
| Output data allocation | 32 bit |
| OUTPUTS + 24 V DC current consumption of the module only | 15 mA |

### Scheme / Overall dimensions and I/O layout






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Analogue inputs module kit M8

M8 analogue inputs module converts analogue signals into digital signals and transfers acquired data to field bus, via network node.
Inputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pin M12 power connector, pin 1) or by K5030.M12 additional power supply module, in case it were installed upstream of the inputs module.

**Coding:** K5230.Ⓒ Ⓢ

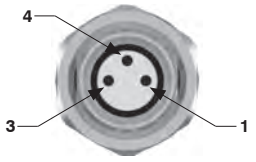
| | |
|---|---|
| Ⓒ | CHANNELS |
| | **2** = 2 channels |
| | **4** = 4 channels |
| Ⓢ | SIGNAL |
| | **T.00** = VOLTAGE (0-10 V) |
| | **T.01** = VOLTAGE (0-5 V) |
| | **C.00** = CURRENT (4-20 mA) |
| | **C.01** = CURRENT (0-20 mA) |

| Technical characteristics | |
|---|---|
| Protection (pin 1) | Overcurrent (auto-resettable fuse) |
| Input impedance (voltage inputs) | 33 kΩ |
| Digital conversion resolution | 12 bit |
| Maximum cable length | < 30 m |
| Input data allocation | 16 bit per channel |
| Diagnostic LED | Input signal overcurrent or overvoltage |
| Accuracy | 0,3% F.S. |
| Overall maximum current 2 channels (pin 1) | 300 mA |
| Overall maximum current 4 channels (pin 1) | 750 mA (375 mA for each pair of channels) |
| INPUTS + 24 V DC current consumption of the module only | 15 mA |

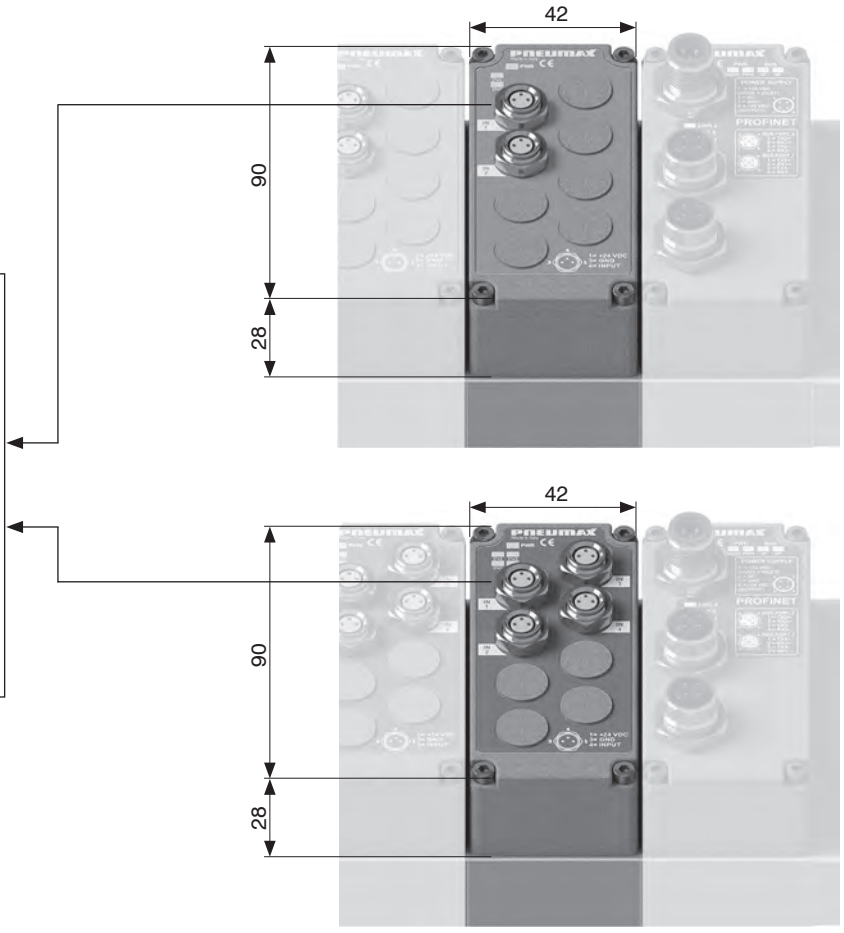


### Scheme / Overall dimensions and I/O layout

M8 3P female connector




| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (INPUTS) |
| 3 | 0 V |
| 4 | INPUT |



## Analogue outputs module kit M8

M8 analogue outputs module converts output data, received from field bus via network node, into analogue signal.
Outputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pins M12 power connector, pin 4) or by K5030.M12 additional power supply module, in case it were installed upstream of the outputs module.

**Coding:** K5130.Ⓒ Ⓢ

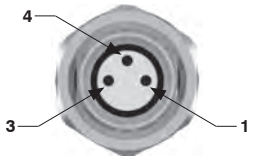
| | |
|---|---|
| Ⓒ | CHANNELS |
| | **2** = 2 channels |
| | **4** = 4 channels |
| Ⓢ | SIGNAL |
| | **T.00** = VOLTAGE (0-10 V) |
| | **T.01** = VOLTAGE (0-5 V) |
| | **C.00** = CURRENT (4-20 mA) |
| | **C.01** = CURRENT (0-20 mA) |

| Technical characteristics | |
|---|---|
| Protection (pin 1) | Overcurrent (auto-resettable fuse) |
| Protection (pin 4) | Overcurrent (auto-resettable fuse) |
| Digital conversion resolution | 12 bit |
| Maximum cable length | < 30 m |
| Output data allocation | 16 bit per channel |
| Diagnostic LED | Output signal overcurrent |
| Accuracy | 0,3% F.S. |
| Overall maximum current 2 channels (pin 1) | 300 mA |
| Overall maximum current 4 channels (pin 1) | 750 mA (375 mA for each pair of channels) |
| INPUTS + 24 V DC current consumption of the module only | 15 mA |
| OUTPUTS + 24 V DC current consumption of the module only (2 channels) | 35 mA |
| OUTPUTS + 24 V DC current consumption of the module only (4 channels) | 70 mA |

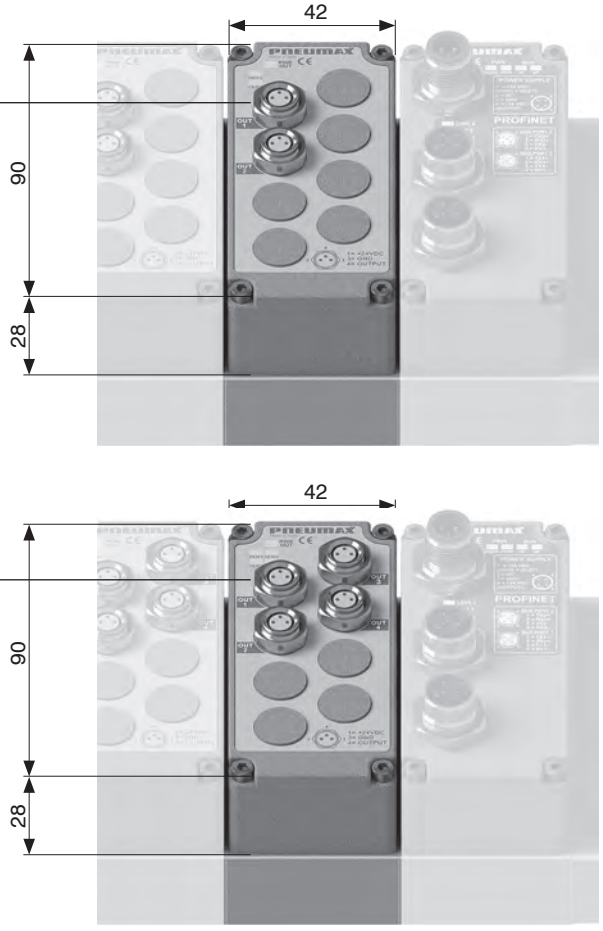


### Scheme / Overall dimensions and I/O layout

M8 3P female connector




| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (OUTPUTS) |
| 3 | 0 V |
| 4 | OUTPUT |






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pt100 inputs module kit

Pt100 inputs module digitizes signals from Pt100 probes and transfers acquired data to field bus, via network node.
It is possible to connect two, three or four wires probes.
Inputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pin M12 power connector, pin 1) or by K5030.M12 additional power supply module, in case it were installed upstream of the inputs module.

**Coding:** K5230.ⒸP.0Ⓣ

| | |
|---|---|
| Ⓒ | CHANNELS |
| | **2** = 2 channels |
| | **4** = 4 channels |
| Ⓣ | TYPE |
| | **0** = Pt100 2 wires |
| | **1** = Pt100 3 wires |
| | **2** = Pt100 4 wires |

| Technical characteristics | |
|---|---|
| Digital conversion resolution | 12 bit |
| Maximum cable length | < 30 m |
| Input data allocation | 16 bit per channel |
| Diagnostic LED | Probe presence<br>Temperature out of range |
| Accuracy | ±0,2°C |
| Probe temperature range | -100°C ... +300°C |
| INPUTS + 24 V DC current consumption of the module only (2 channels) | 25 mA |
| INPUTS + 24 V DC current consumption of the module only (4 channels) | 35 mA |

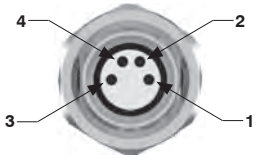


### Conversion formula (°C)

$$\text{Temperature (°C)} = \left(\frac{\text{Points}}{4095} \times 400\right) - 100$$

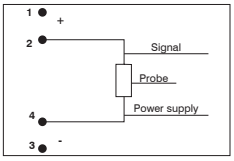
### Scheme / Overall dimensions and I/O layout

M8 4P female connector



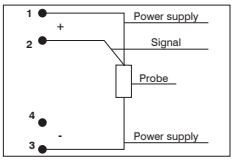

Connection scheme 2 wires probe

| PIN | DESCRIPTION |
|---|---|
| 1 | N.C. |
| 2 | SENSOR + |
| 3 | POWER SUPPLY - |
| 4 | N.C. |



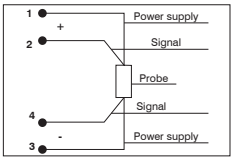

Connection scheme 3 wires probe

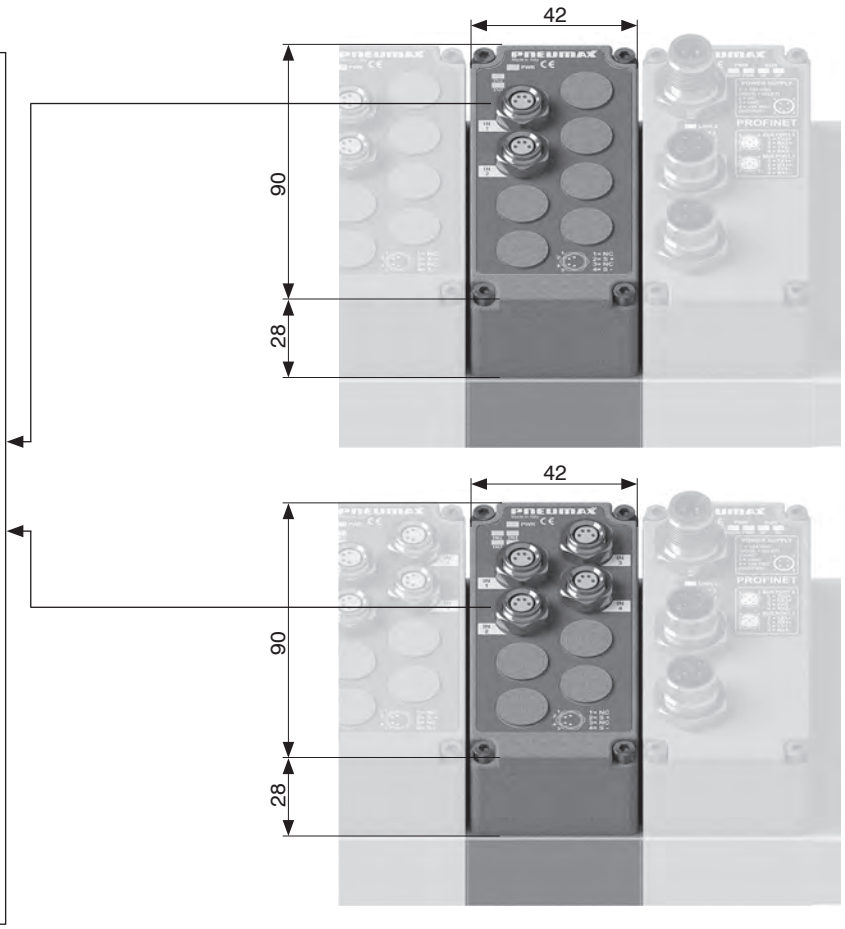
| PIN | DESCRIPTION |
|---|---|
| 1 | POWER SUPPLY + |
| 2 | SENSOR + |
| 3 | POWER SUPPLY - |
| 4 | N.C. |




Connection scheme 4 wires probe

| PIN | DESCRIPTION |
|---|---|
| 1 | POWER SUPPLY + |
| 2 | SENSOR + |
| 3 | POWER SUPPLY - |
| 4 | SENSOR - |



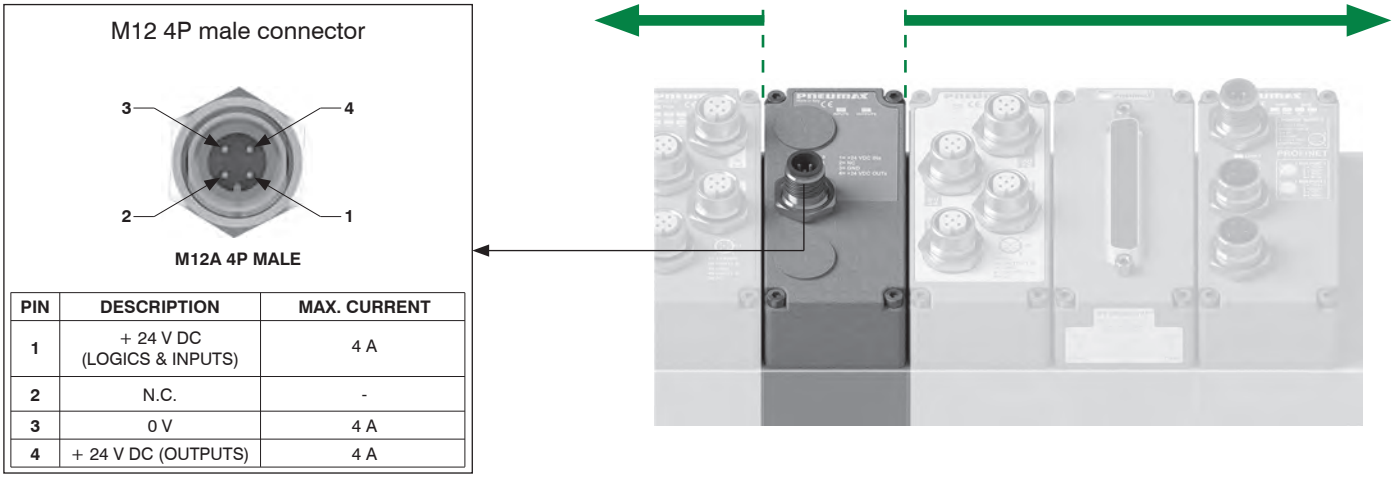
## Additional power supply module kit

Additional power supply module supplies additional electric power for downstream optional modules, where “downstream” means farther from serial node, **resetting the current limits of the network node / IO-Link interface**.
Electric connection of the module to external power supply unit occurs via an M12 4 pins type A male connector.
M12 connector has two different pins to power up logics and inputs (Pin 1) and outputs (Pin 4).
Presence of each power supply rail is indicated by corresponding green LED.
When using IO-Link interface, the additional power supply module is useful for separating the module power supplies of input from the output modules placed downstream.

**Coding:** K5030.M12



### Scheme / Overall dimensions and I/O layout

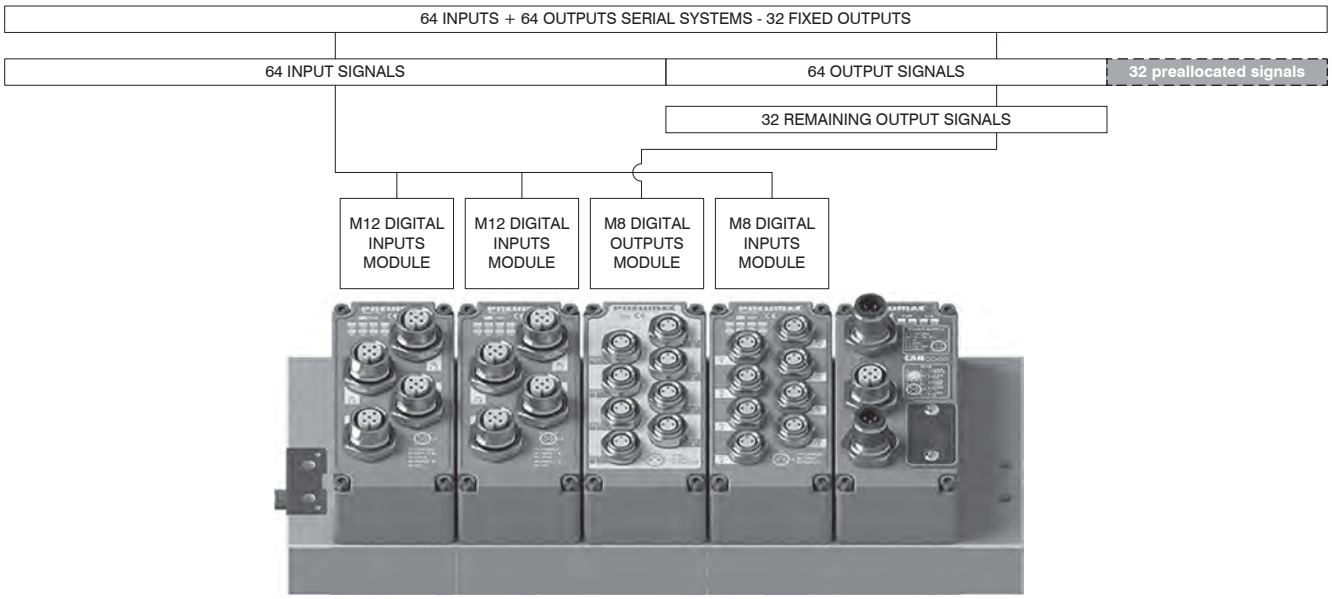



| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

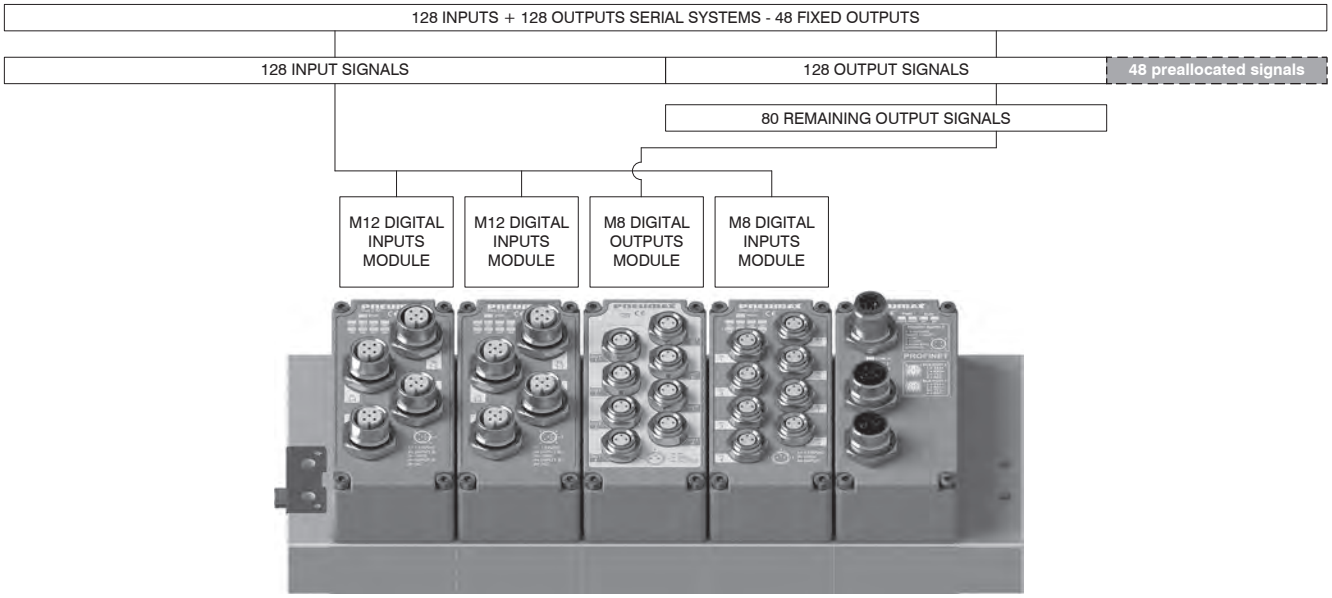

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Signal management

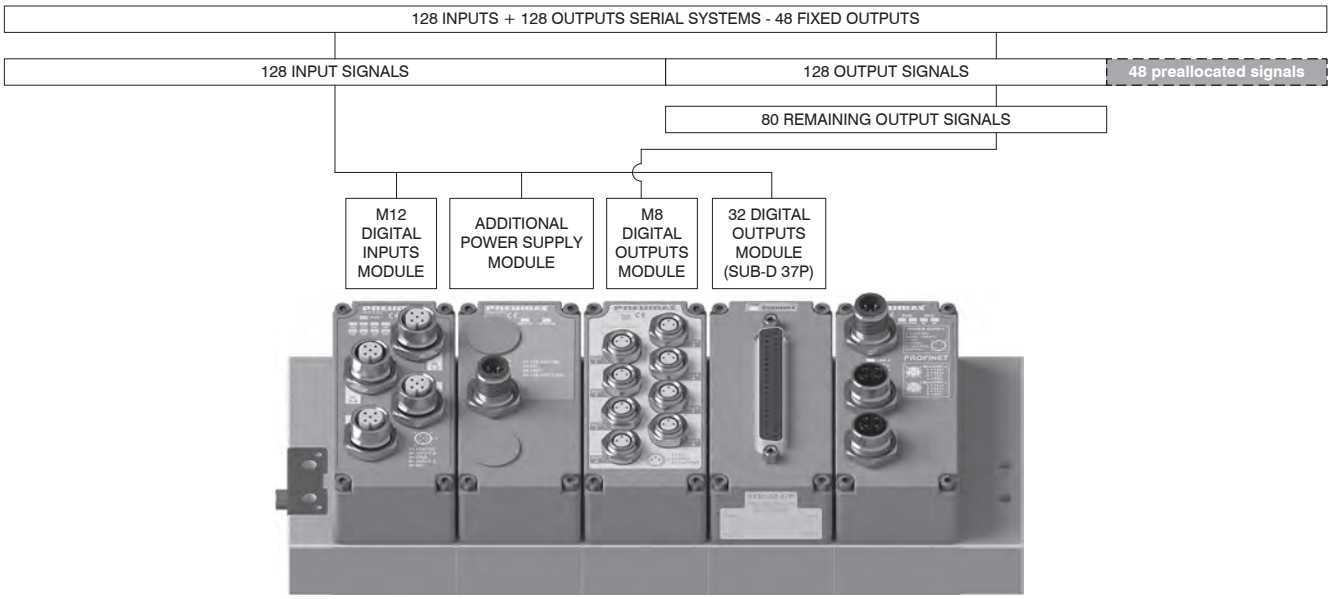
### 64 INPUT + 64 OUTPUT serial systems - 32 fixed OUTPUT (Ex. PROFIBUS DP and CANopen®)




### 128 INPUT + 128 OUTPUT serial systems - 48 fixed OUTPUT (Ex. EtherNet/IP - EtherCAT® - PROFINET IO RT)




### 128 INPUT + 128 OUTPUT serial systems - 48 fixed OUTPUT (Ex. EtherNet/IP - EtherCAT® - PROFINET IO RT)



## POWER SUPPLY connectors

### Straight connector M12A 4P female

**Coding:** 5312A.F04.00






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (LOGICS AND INPUTS) |
| 2 | N.C. |
| 3 | 0 V |
| 4 | + 24 V DC (OUTPUTS) |

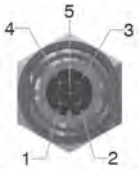
Power supply socket

## NETWORK connectors

### Straight connector M12A 5P female

**Coding:** 5312A.F05.00






Upper view slave connector

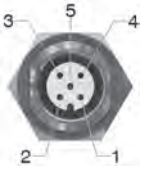
| PIN | DESCRIPTION |
|---|---|
| 1 | (CAN_SHIELD) |
| 2 | (CAN_V+) |
| 3 | CAN_GND |
| 4 | CAN_H |
| 5 | CAN_L |

Socket for bus CANopen® and IO-Link

### Straight connector M12A 5P male

**Coding:** 5312A.M05.00






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | (CAN_SHIELD) |
| 2 | (CAN_V+) |
| 3 | CAN_GND |
| 4 | CAN_H |
| 5 | CAN_L |

Plug for bus CANopen®

### Straight connector M12D 4P male

**Coding:** 5312D.M04.00






Upper view slave connector

| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | TX+ | EtherNet Transmit High |
| 2 | RX+ | EtherNet Receive High |
| 3 | TX- | EtherNet Transmit Low |
| 4 | RX- | EtherNet Receive Low |

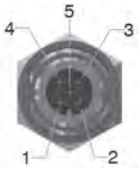
Plug for bus EtherCAT®, PROFINET IO RT and EtherNet/IP

**Trademarks**: EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

### Straight connector M12B 5P female

**Coding:** 5312B.F05.00






Upper view slave connector

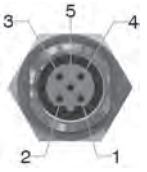
| PIN | DESCRIPTION |
|---|---|
| 1 | Power Supply |
| 2 | A-Line |
| 3 | DGND |
| 4 | B-Line |
| 5 | SHIELD |

Socket for bus PROFIBUS DP

### Straight connector M12B 5P male

**Coding:** 5312B.M05.00






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | Power Supply |
| 2 | A-Line |
| 3 | DGND |
| 4 | B-Line |
| 5 | SHIELD |

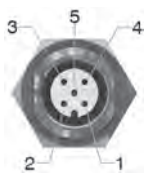
Socket for bus PROFIBUS DP

## INPUTS connectors

### Straight connector M12A 5P male

**Coding:** 5312A.M05.00






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC |
| 2 | INPUT B |
| 3 | 0 V |
| 4 | INPUT A |
| 5 | N.C. |

Plug for inputs modules

### Straight connector M8 3P male

**Coding:** 5308A.M03.00






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC |
| 4 | INPUT |
| 3 | 0 V |

Plug for inputs modules

## Plugs

### M12 plug

**Coding:** 5300.T12



### M8 plug

**Coding:** 5300.T08





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 3000 EVO



- **Version 3100 (10 mm) and 3400 (15,5 mm)**
- **Nominal flow rate up to 200 Nl/min (Version 3100)**
- **Nominal flow rate up to 600 Nl/min (Version 3400)**
- **Stand alone or manifold mounted versions**
- **Valve replacement without disconnecting the tubes**
- **Available with a wide range of serial system protocols**
- **Wide range of accessories**
- **Available sub-base mounted or with M5 threaded ports (Version 3100) and G1/8" (Version 3400)**
- **Possibility to use different pressures along the manifold (including vacuum)**
- **Certified**

Pneumax valves and solenoid valves are designed to guarantee versatility and maximum reliability in the control of integrated pneumatic circuits.
The Pneumax 3000 EVO series of solenoid valves is a very flexible solution that can be easily configured to optimize the efficiency of the whole system through a constant interface and communication with the machine.
The Pneumax 3000 EVO series is available in stand alone and manifold mounted versions.

Both versions include a wide range of functions, capable of working with positive pressures up to 10 bar or vacuum.
The valves have aluminum bodies with integrated electrical connections, manual override and a LED that indicates when the valve is actuated.
3000 EVO series is another addition to the extensive range of solenoid valve systems designed for applications in very demanding industrial sectors such as assembly and robotics, packaging or automotive.

### Construction characteristics

| | |
|---|---|
| Body | Aluminium |
| Seals | NBR |
| Piston seals | NBR |
| Springs | AISI 302 stainless steel |
| Operators | Technopolymer |
| Pistons | Aluminium / Technopolymer |
| Spools | Aluminium |

### Operational characteristics

| | |
|---|---|
| Supply voltage | + 24 V DC ±10% |
| Pilot consumption | 1,3W nominal in energy saving mode 0,25W |
| Pilot working pressure [12-14] | from 2,5 to 7 bar max. |
| Valve working pressure [1] | from vacuum to 10 bar max. |
| Operating temperature | from -5°C to +50°C |
| Protection degree | IP65 |
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |

CANopen PROFIBUS PROFINET EtherCAT EtherNet/IP IO-Link CC-Link IE Field Basic

## Series 3000 EVO - STAND ALONE





The range of series 3000 EVO solenoid valves version 3100 (10mm) and 3400 (15,5mm), are available in STAND ALONE self feeding or external feeding versions and realised with M8 point to point and 90° H connection with an integrated snap-on fitting.

### Main characteristics

10 and 15,5 mm size.
Multi-position sub-bases in different lengths.

### Functions

S.V. 5/2 Monostable Solenoid-Spring
S.V. 5/2 Monostable Solenoid-Differential (only self feeding)
S.V. 5/2 Bistable Solenoid-Solenoid
S.V. 5/3 C.C. Solenoid-Solenoid
S.V. 2x3/2 N.C.-N.C. (= 5/3 O.C.) Solenoid-Solenoid
S.V. 2x3/2 N.O.-N.O. (= 5/3 P.C.) Solenoid-Solenoid
S.V. 2x3/2 N.C.-N.O. Solenoid-Solenoid
S.V. 2x3/2 N.O.-N.C. Solenoid-Solenoid

### Solenoid valve ordering code

3 | 1 | 15. | 52.00 | . | 39 | . | 82

| Size | |
|---|---|
| 1 | Version 3100 (10mm) |
| 4 | Version 3400 (15,5mm) |

| Function | |
|---|---|
| 52.00 | S.V. 5/2 |
| 53.31 | S.V. 5/3 |
| 62.44 | 2x3/2 N.C.-N.C. |
| 62.55 | 2x3/2 N.O.-N.O. |
| 62.45 | 2x3/2 N.C.-N.O. |
| 62.54 | 2x3/2 N.O.-N.C. |

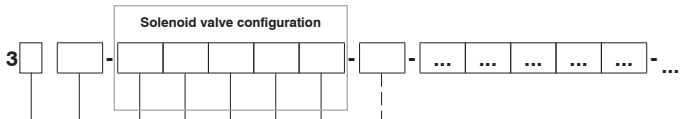
| Valves type | |
|---|---|
| 36 | Solenoid-Differential self feeding |
| 39 | Solenoid-Spring self feeding |
| 35 | Solenoid-Solenoid self feeding |
| 29 | Solenoid-Spring external feeding |
| 25 | Solenoid-Solenoid external feeding |

| Connection | |
|---|---|
| 02 | H 90° SPEED-UP connector |
| 82 | M8 SPEED-UP connector |

**Example in the table: 3115.52.00.39.82**: Solenoid valve size 10mm 5/2 solenoid-spring self feeding with M8 SPEED-UP connector


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Configurator




| Size | |
|---|---|
| 1 | Version 3100 (10mm) |
| 4 | Version 3400 (15,5mm) |

| Number of collector positions | |
|---|---|
| 02 | 2 positions collector |
| 03 | 3 positions collector |
| 04 | 4 positions collector |
| 05 | 5 positions collector |
| 06 | 6 positions collector |
| 07 | 7 positions collector |
| 08 | 8 positions collector |
| 09 | 9 positions collector |
| 10 | 10 positions collector |

| Valve type | |
|---|---|
| A | S.V. 5/2 Solenoid-Spring |
| B | S.V. 5/2 Solenoid-Differential (only self feeding) |
| C | S.V. 5/2 Solenoid-Solenoid |
| E | S.V. 5/3 C.C. Solenoid-Solenoid |
| F | S.V. 2x3/2 N.C.-N.C. (=5/3 O.C.) Solenoid-Solenoid |
| G | S.V. 2x3/2 N.O.-N.O. (=5/3 P.C.) Solenoid-Solenoid |
| H | S.V. 2x3/2 N.C.-N.O. Solenoid-Solenoid |
| I | S.V. 2x3/2 N.O.-N.C. Solenoid-Solenoid |

| Power supply | |
|---|---|
| 2 | External feeding |
| 3 | Self feeding |

| Connector type | |
|---|---|
| H | H 90° SPEED-UP connector |
| M | M8 SPEED-UP connector |

| Voltage | |
|---|---|
| 1 | + 24 V DC |

| Connections | |
|---|---|
| 5 | M5 - only for version 3100 (10 mm) |
| 8 | G1/8" - only for version 3400 (15,5 mm) |

| Accessories (optional) | |
|---|---|
| T | Free valve space plug |

| Accessories (optional) | no valve position occupied on the manifold |
|---|---|
| 0X0 | Diaphragm plug on conduit 1 |
| 00Y | Diaphragm plug on conduit 3 |
| Z00 | Diaphragm plug on conduit 5 |
| 0XY | Diaphragm plugs on conduits 1 and 3 |
| ZX0 | Diaphragm plugs on conduits 5 and 1 |
| Z0Y | Diaphragm plugs on conduits 5 and 3 |
| ZXY | Diaphragm plugs on conduits 5, 1 and 3 |

**Example in the table : 3104-C2M15-T-0X0-A3M15-F3M15**
Four position manifold Version 3100 (10mm) composed of:
- Solenoid valve 5/2 solenoid-solenoid external feeding, + 24 V DC
- Free valve space plug
- Diaphragm plug on pipe 1
- Solenoid valve 5/2 solenoid-spring self feeding, + 24 V DC
- Solenoid valve 2x3/2 N.C.-N.C. (=5/3 O.C.) solenoid-solenoid, + 24 V DC

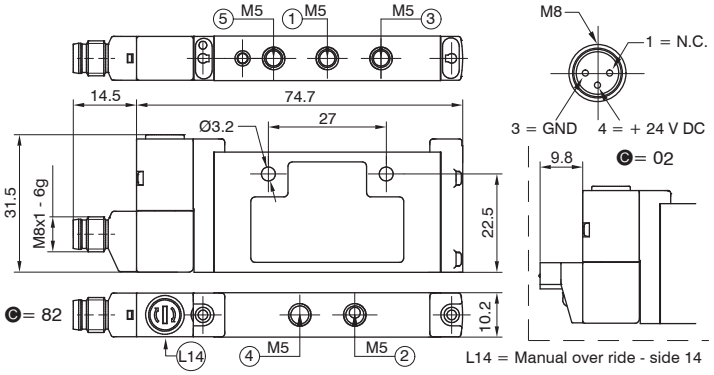
## Solenoid-Spring (Self feeding)

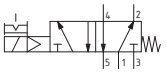
**Coding:** 3115.52.00.39.Ⓒ

| Ⓒ | ELECTRICAL CONNECTION |
|---|---|
| | **02** = H 90° SPEED-UP connector + 24 V DC |
| | **82** = M8 SPEED-UP connector + 24 V DC |

Weight 49 g
SHORT FUNCTION CODE "A"





| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 160 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |
| Working pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

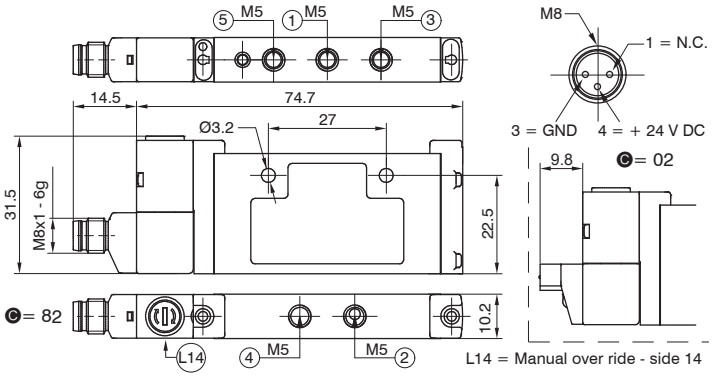
## Solenoid-Differential (Self feeding)

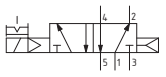
**Coding:** 3115.52.00.36.Ⓒ

| Ⓒ | ELECTRICAL CONNECTION |
|---|---|
| | **02** = H 90° SPEED-UP connector + 24 V DC |
| | **82** = M8 SPEED-UP connector + 24 V DC |

Weight 49 g
SHORT FUNCTION CODE "B"





| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 160 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 15 |
| Working pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

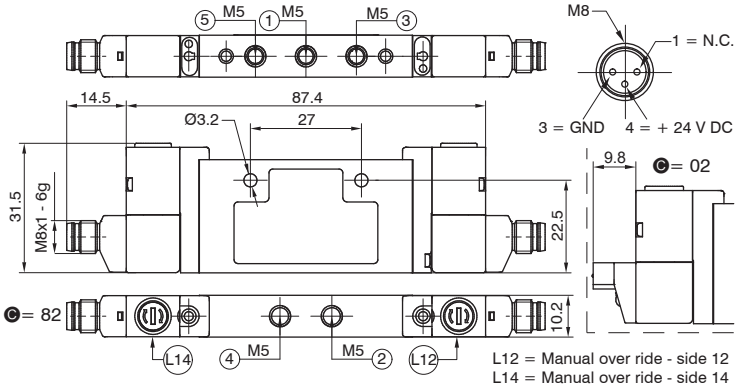
## Solenoid-Solenoid (Self feeding)

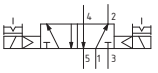
**Coding:** 3115.52.00.35.Ⓒ

| Ⓒ | ELECTRICAL CONNECTION |
|---|---|
| | **02** = H 90° SPEED-UP connector + 24 V DC |
| | **82** = M8 SPEED-UP connector + 24 V DC |

Weight 59 g
SHORT FUNCTION CODE "C"





| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 160 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |
| Working pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

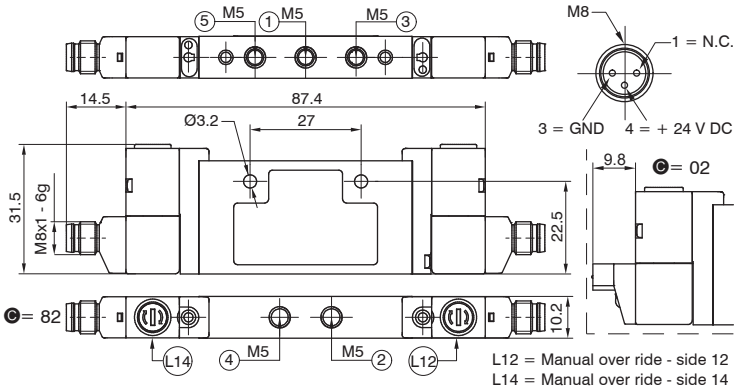
## Solenoid-Solenoid 5/3 (Closed centres) (Self feeding)

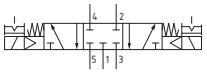
**Coding:** 3115.53.31.35.C

| | ELECTRICAL CONNECTION |
|---|---|
| C | **02** = H 90° SPEED-UP connector + 24 V DC |
| | **82** = M8 SPEED-UP connector + 24 V DC |

Weight 59 g
SHORT FUNCTION CODE "E"





| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |
| Working pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

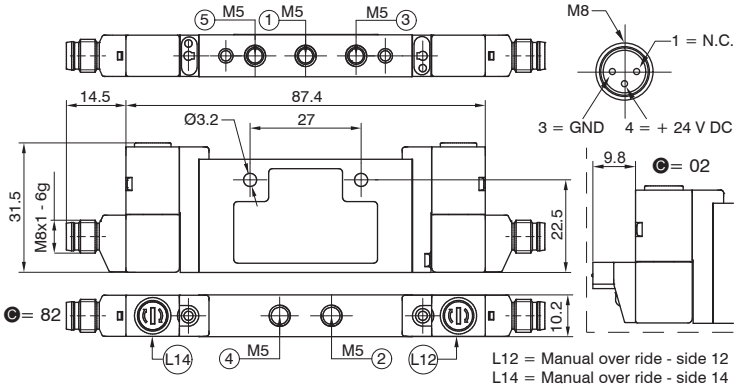
## Solenoid-Solenoid 2x3/2 (Self feeding)

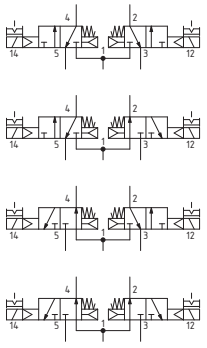
**Coding:** 3115.62.F.35.C

| | FUNCTION |
|---|---|
| F | **44** = N.C.-N.C. (5/3 Open centres) |
| | **45** = N.C.-N.O. |
| | **54** = N.O.-N.C. |
| | **55** = N.O.-N.O. (5/3 Pressured centres) |
| | ELECTRICAL CONNECTION |
| C | **02** = H 90° SPEED-UP connector + 24 V DC |
| | **82** = M8 SPEED-UP connector + 24 V DC |

Weight 59,4 g
SHORT FUNCTION CODE:
N.C.-N.C. (5/3 Open centres) = "F"
N.O.-N.O. (5/3 Pressured centres) = "G"
N.C.-N.O. = "H"
N.O.-N.C. = "I"





| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 15 |
| Working pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

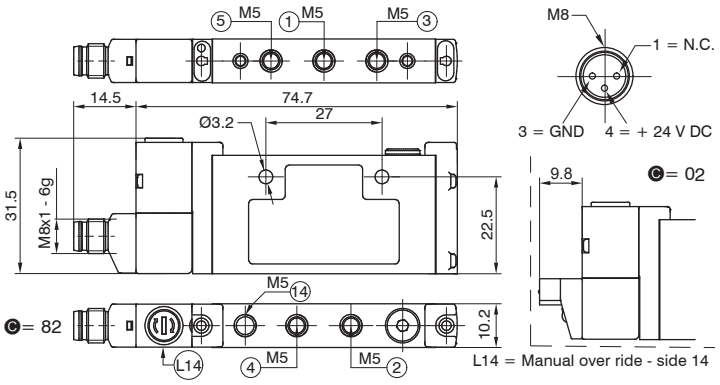
## Solenoid-Spring (External feeding)

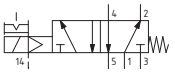
**Coding:** 3115.52.00.29.©

| | ELECTRICAL CONNECTION |
|---|---|
| © | **02** = H 90° SPEED-UP connector + 24 V DC |
| | **82** = M8 SPEED-UP connector + 24 V DC |

Weight 49 g
SHORT FUNCTION CODE "A"





| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 160 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

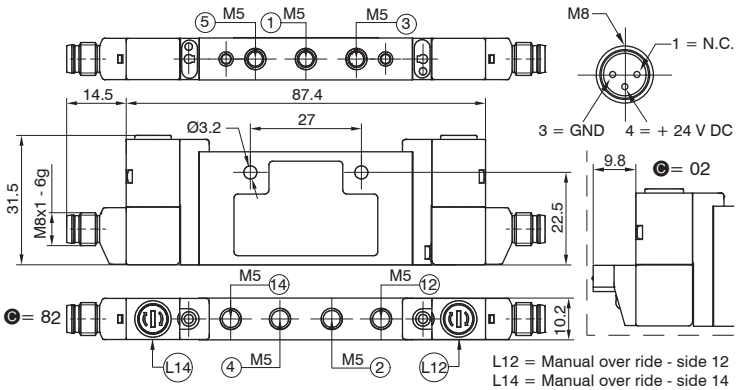
## Solenoid-Solenoid (External feeding)

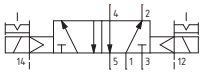
**Coding:** 3115.52.00.25.©

| | ELECTRICAL CONNECTION |
|---|---|
| © | **02** = H 90° SPEED-UP connector + 24 V DC |
| | **82** = M8 SPEED-UP connector + 24 V DC |

Weight 59 g
SHORT FUNCTION CODE "C"





| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 160 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 10 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

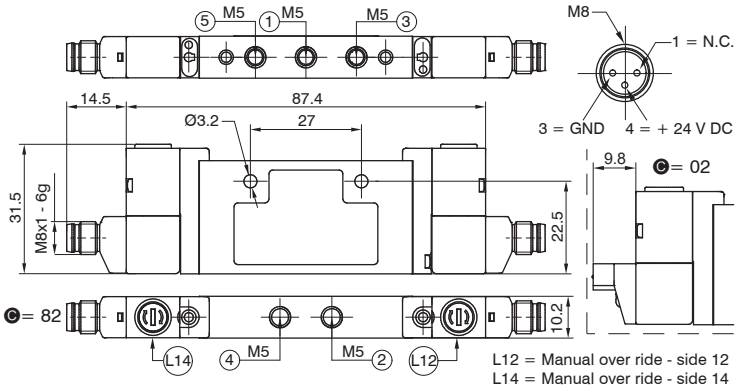
## Solenoid-Solenoid 5/3 (Closed centres) (External feeding)

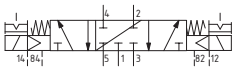
**Coding:** 3115.53.31.25.©

| | ELECTRICAL CONNECTION |
|---|---|
| © | **02** = H 90° SPEED-UP connector + 24 V DC |
| | **82** = M8 SPEED-UP connector + 24 V DC |

Weight 59 g
SHORT FUNCTION CODE "E"





| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |



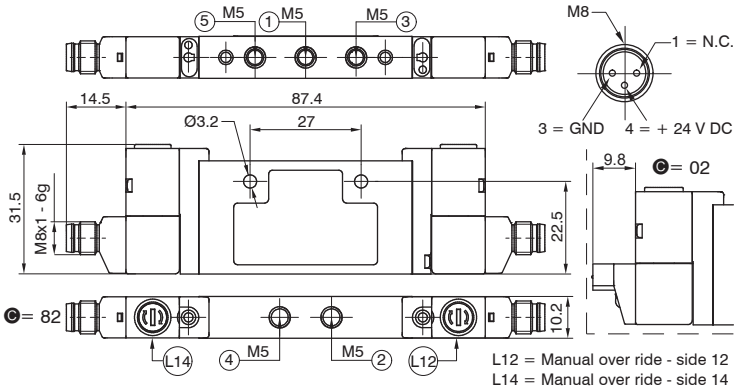
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Solenoid 2x3/2 (External feeding)

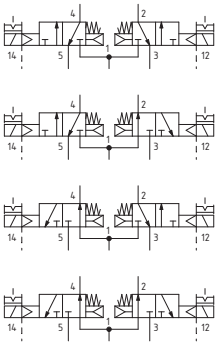
**Coding:** 3115.62.Ⓕ.25.Ⓒ

| | |
|---|---|
| Ⓕ | FUNCTION |
| | **44** = N.C.-N.C. (5/3 Open centres) |
| | **45** = N.C.-N.O. |
| | **54** = N.O.-N.C. |
| | **55** = N.O.-N.O. (5/3 Pressured centres) |
| Ⓒ | ELECTRICAL CONNECTION |
| | **02** = H 90° SPEED-UP connector + 24 V DC |
| | **82** = M8 SPEED-UP connector + 24 V DC |





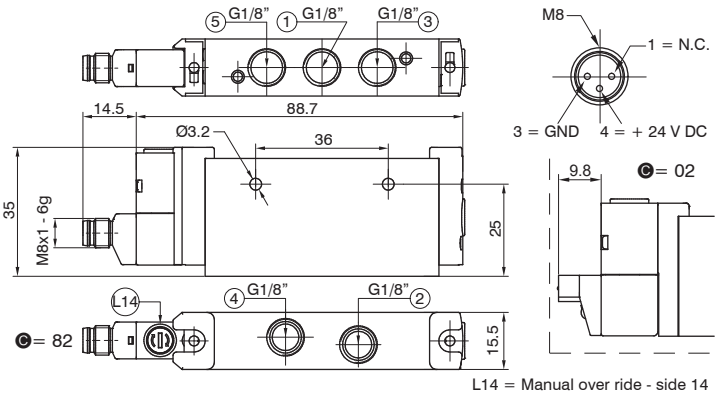

Weight 59,4 g
SHORT FUNCTION CODE:
N.C.-N.C. (5/3 Open centres) = "F"
N.O.-N.O. (5/3 Pressured centres) = "G"
N.C.-N.O. = "H"
N.O.-N.C. = "I"



| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 150 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 15 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | ≥3+(02 x Inlet pressure) |
| Temperature °C | -5 ... +50 |

## Solenoid-Spring (Self feeding)



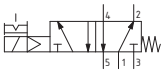



L14 = Manual over ride - side 14

**Coding:** 3415.52.00.39.C

| C | ELECTRICAL CONNECTION |
|---|---|
| | **02** = H 90° SPEED-UP connector + 24 V DC |
| | **82** = M8 SPEED-UP connector + 24 V DC |

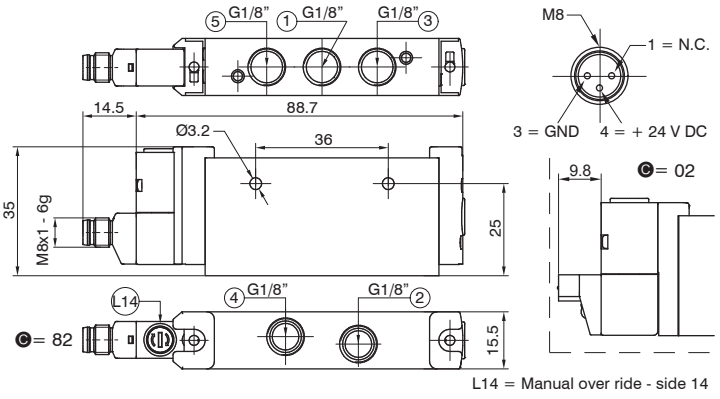
Weight 90 g
SHORT FUNCTION CODE "A"



| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 600 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |
| Working pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

## Solenoid-Differential (Self feeding)



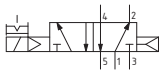



L14 = Manual over ride - side 14

**Coding:** 3415.52.00.36.C

| C | ELECTRICAL CONNECTION |
|---|---|
| | **02** = H 90° SPEED-UP connector + 24 V DC |
| | **82** = M8 SPEED-UP connector + 24 V DC |

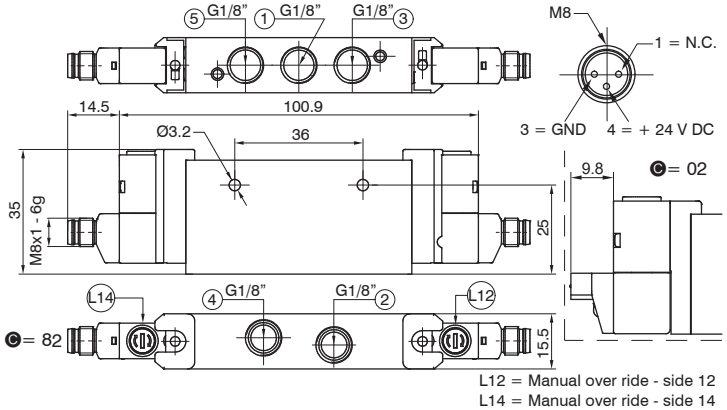
Weight 90 g
SHORT FUNCTION CODE "B"



| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 600 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 15 |
| Working pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

## Solenoid-Solenoid (Self feeding)



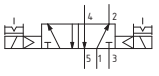



L12 = Manual over ride - side 12
L14 = Manual over ride - side 14

**Coding:** 3415.52.00.35.C

| C | ELECTRICAL CONNECTION |
|---|---|
| | **02** = H 90° SPEED-UP connector + 24 V DC |
| | **82** = M8 SPEED-UP connector + 24 V DC |

Weight 100 g
SHORT FUNCTION CODE "C"



| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 600 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 10 |
| Working pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

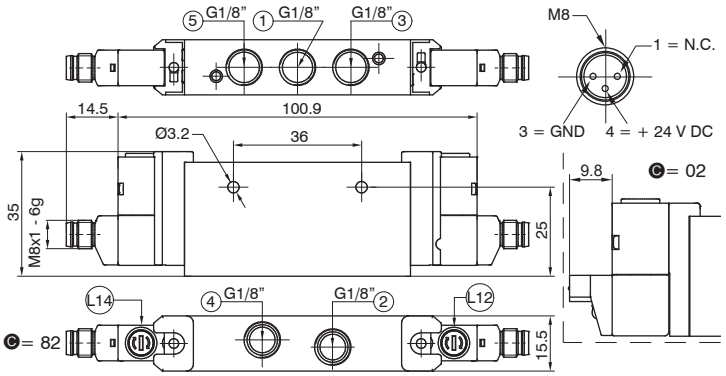
## Solenoid-Solenoid 5/3 (Closed centres) (Self feeding)

**Coding:** 3415.53.31.35.C

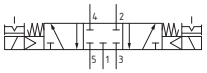
| | |
|---|---|
| C | ELECTRICAL CONNECTION |
| | **02** = H 90° SPEED-UP connector + 24 V DC |
| | **82** = M8 SPEED-UP connector + 24 V DC |

Weight 100 g
SHORT FUNCTION CODE "E"






L12 = Manual over ride - side 12
L14 = Manual over ride - side 14



| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 500 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |
| Working pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

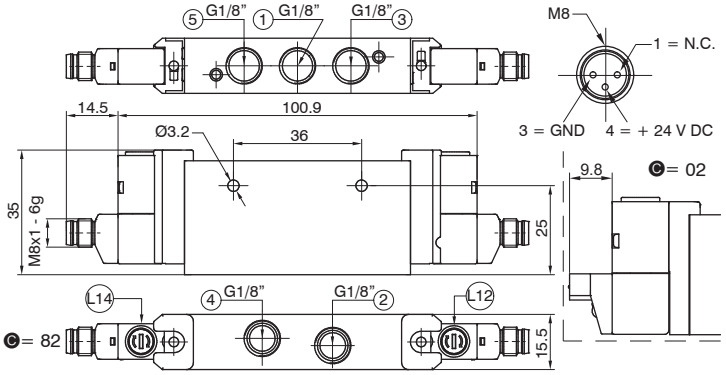
## Solenoid-Solenoid 2x3/2 (Self feeding)

**Coding:** 3415.62.F.35.C

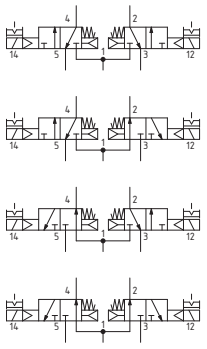
| | |
|---|---|
| F | FUNCTION |
| | **44** = N.C.-N.C. (5/3 Open centres) |
| | **45** = N.C.-N.O. |
| | **54** = N.O.-N.C. |
| | **55** = N.O.-N.O. (5/3 Pressured centres) |
| C | ELECTRICAL CONNECTION |
| | **02** = H 90° SPEED-UP connector + 24 V DC |
| | **82** = M8 SPEED-UP connector + 24 V DC |

Weight 100 g
SHORT FUNCTION CODE:
N.C.-N.C. (5/3 Open centres) = "F"
N.O.-N.O. (5/3 Pressured centres) = "G"
N.C.-N.O. = "H"
N.O.-N.C. = "I"






L12 = Manual over ride - side 12
L14 = Manual over ride - side 14

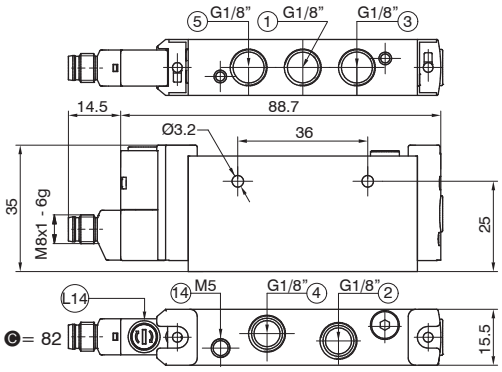


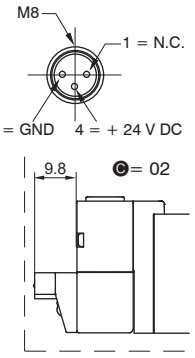
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 500 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 15 |
| Working pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

## Solenoid-Spring (External feeding)

**Coding:** 3415.52.00.29.C



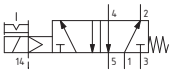



L14 = Manual over ride - side 14

| | ELECTRICAL CONNECTION |
|---|---|
| C | **02** = H 90° SPEED-UP connector + 24 V DC |
| | **82** = M8 SPEED-UP connector + 24 V DC |

Weight 90 g
SHORT FUNCTION CODE "A"

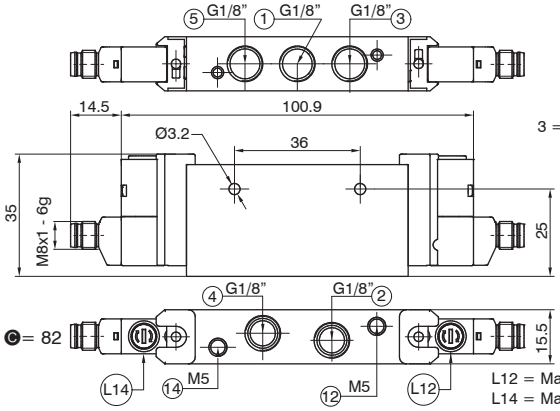


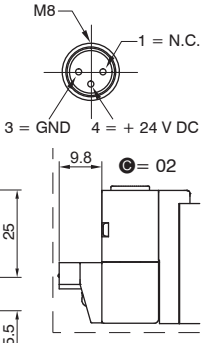
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 600 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

## Solenoid-Solenoid (External feeding)

**Coding:** 3415.52.00.25.C



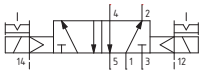



L12 = Manual over ride - side 12
L14 = Manual over ride - side 14

| | ELECTRICAL CONNECTION |
|---|---|
| C | **02** = H 90° SPEED-UP connector + 24 V DC |
| | **82** = M8 SPEED-UP connector + 24 V DC |

Weight 100 g
SHORT FUNCTION CODE "C"

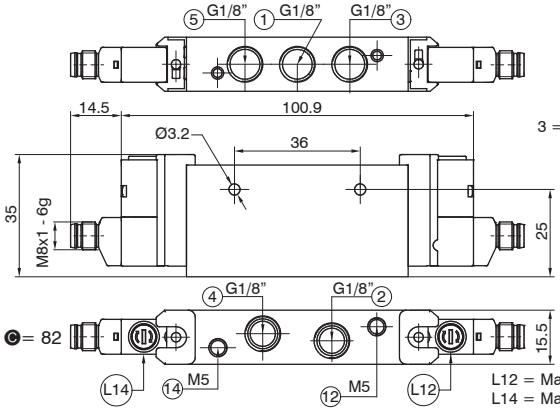


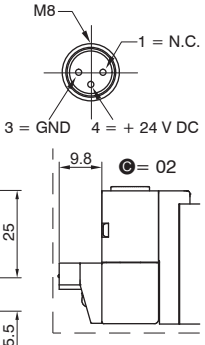
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 600 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 10 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

## Solenoid-Solenoid 5/3 (Closed centres) (External feeding)

**Coding:** 3415.53.31.25.C



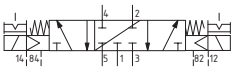



L12 = Manual over ride - side 12
L14 = Manual over ride - side 14

| | ELECTRICAL CONNECTION |
|---|---|
| C | **02** = H 90° SPEED-UP connector + 24 V DC |
| | **82** = M8 SPEED-UP connector + 24 V DC |

Weight 100 g
SHORT FUNCTION CODE "E"



| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 500 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |



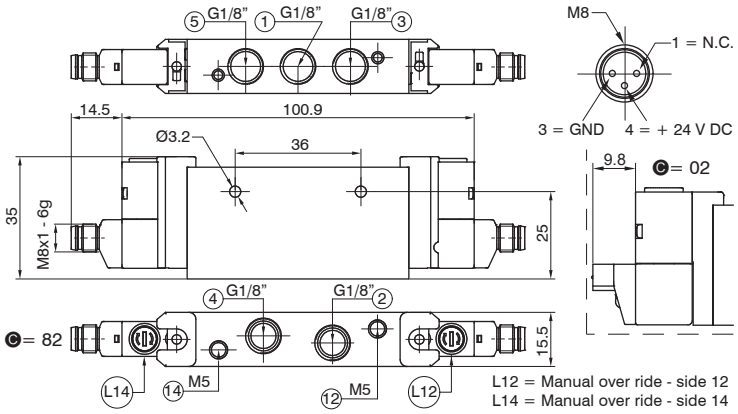
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Solenoid 2x3/2 (External feeding)

**Coding:** 3415.62.Ⓕ.25.Ⓒ

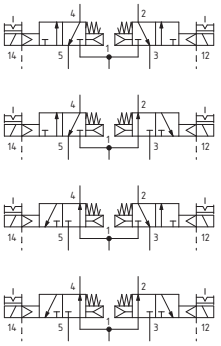
| | |
|---|---|
| Ⓕ | FUNCTION |
| | **44** = N.C.-N.C. (5/3 Open centres) |
| | **45** = N.C.-N.O. |
| | **54** = N.O.-N.C. |
| | **55** = N.O.-N.O. (5/3 Pressured centres) |
| Ⓒ | ELECTRICAL CONNECTION |
| | **02** = H 90° SPEED-UP connector + 24 V DC |
| | **82** = M8 SPEED-UP connector + 24 V DC |






L12 = Manual over ride - side 12
L14 = Manual over ride - side 14

Weight 100 g
SHORT FUNCTION CODE:
N.C.-N.C. (5/3 Open centres) = "F"
N.O.-N.O. (5/3 Pressured centres) = "G"
N.C.-N.O. = "H"
N.O.-N.C. = "I"



| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 500 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 15 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | ≥3+(02 x Inlet pressure) |
| Temperature °C | -5 ... +50 |

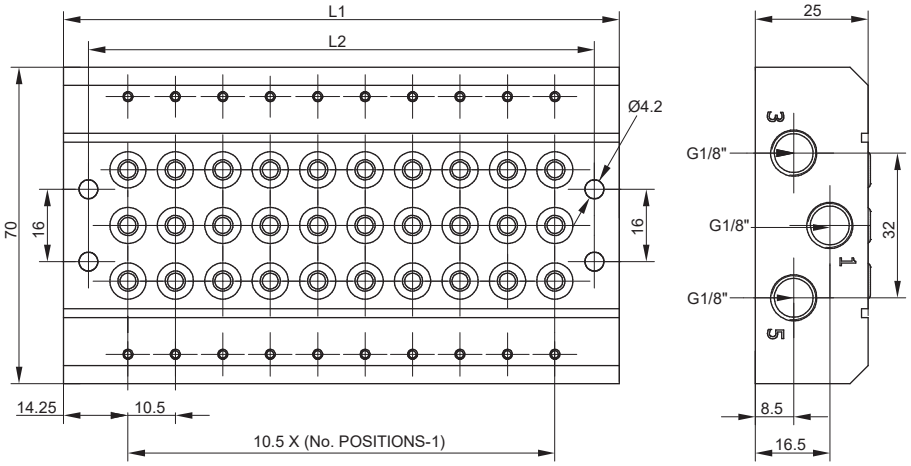
## Manifold



**Coding:** 3115.Ⓝ

| Ⓝ | NO. POSITIONS |
|---|---|
| | **02** = No. 2 positions |
| | **03** = No. 3 positions |
| | **04** = No. 4 positions |
| | **05** = No. 5 positions |
| | **06** = No. 6 positions |
| | **07** = No. 7 positions |
| | **08** = No. 8 positions |
| | **09** = No. 9 positions |
| | **10** = No. 10 positions |

Weight "see table"




| | No. POSITIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| L1 | 39 | 49,5 | 60 | 70,5 | 81 | 91,5 | 102 | 112,5 | 123 |
| L2 | 29 | 39,5 | 50 | 60,5 | 71 | 81,5 | 92 | 102,5 | 113 |
| Weight (g) | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 |

## Assembling kit

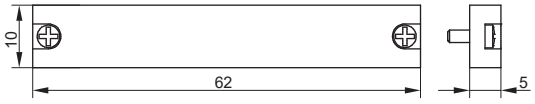


**Coding:** 3115.KV

Weight 2 g

## Closing plate






**Coding:** 3115.00

Weight 10 g

## Diaphragm plug



**Coding:** 3130.17

Weight 1,5 g



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

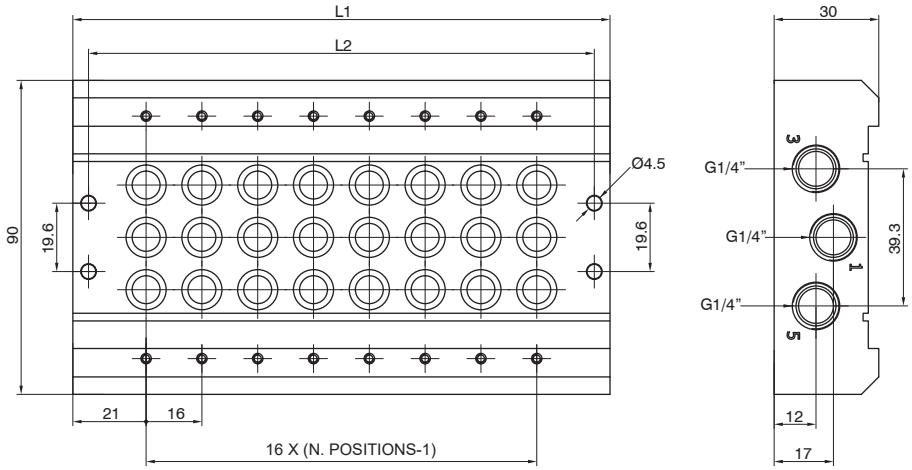
## Manifold



**Coding:** 3415.Ⓝ

| Ⓝ | NO. POSITIONS |
|---|---|
| | **02** = No. 2 positions |
| | **03** = No. 3 positions |
| | **04** = No. 4 positions |
| | **05** = No. 5 positions |
| | **06** = No. 6 positions |
| | **07** = No. 7 positions |
| | **08** = No. 8 positions |
| | **09** = No. 9 positions |
| | **10** = No. 10 positions |

Weight "see table"




| | N. POSITIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| L1 | 58 | 74 | 90 | 106 | 122 | 138 | 154 | 170 | 186 |
| L2 | 49 | 65 | 81 | 97 | 113 | 129 | 145 | 161 | 177 |
| Weight (g) | 350 | 440 | 530 | 620 | 710 | 800 | 890 | 980 | 1070 |

## Assembling kit

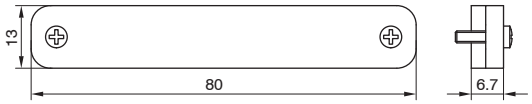


**Coding:** 3415.KV

Weight 3 g

## Closing plate






**Coding:** 3415.00

Weight 25 g

## Diaphragm plug

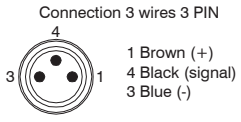


**Coding:** 3430.17

Weight 3 g

## M8 connector with 3 wires cable



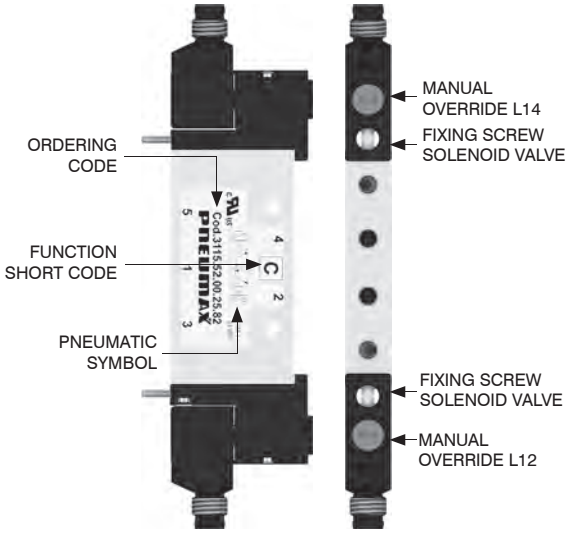



**Coding:** MCHⓁ

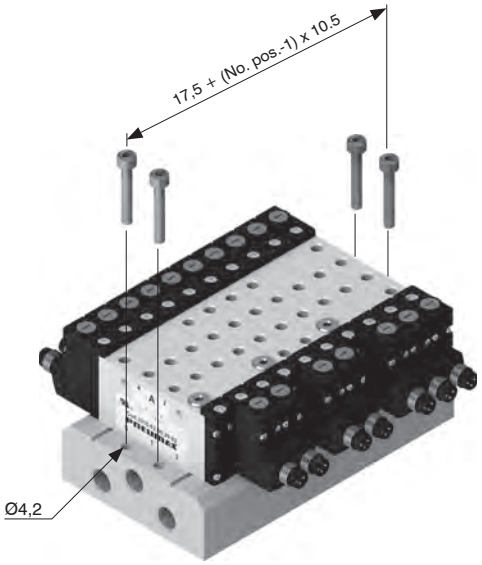
| Ⓛ | CABLE LENGTH |
|---|---|
| | **1** = 2,5 meters |
| | **2** = 5 meters |
| | **3** = 10 meters |

PUR Ø2,6 mm 3x0,15 mm²

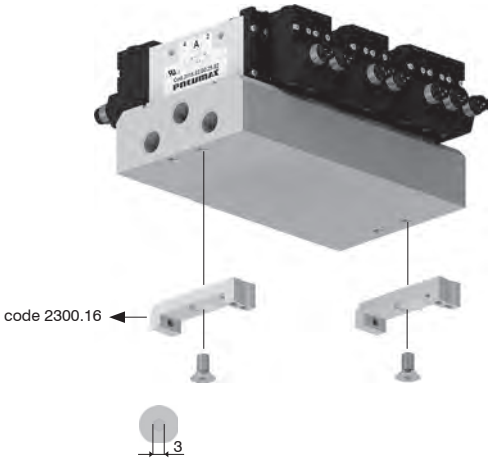
## Solenoid valve description

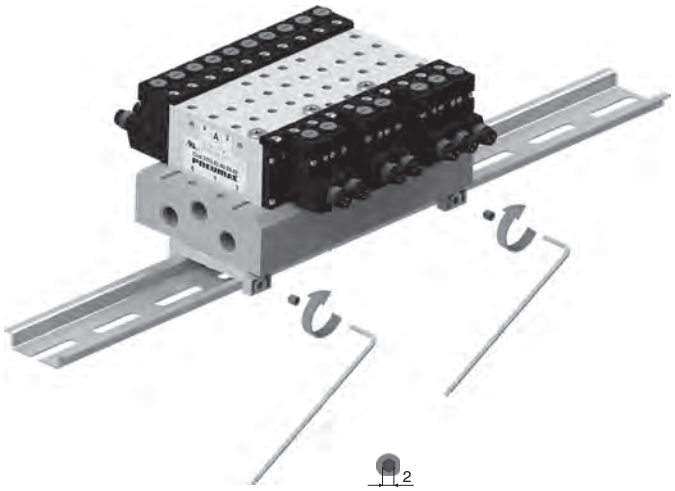



## From the top

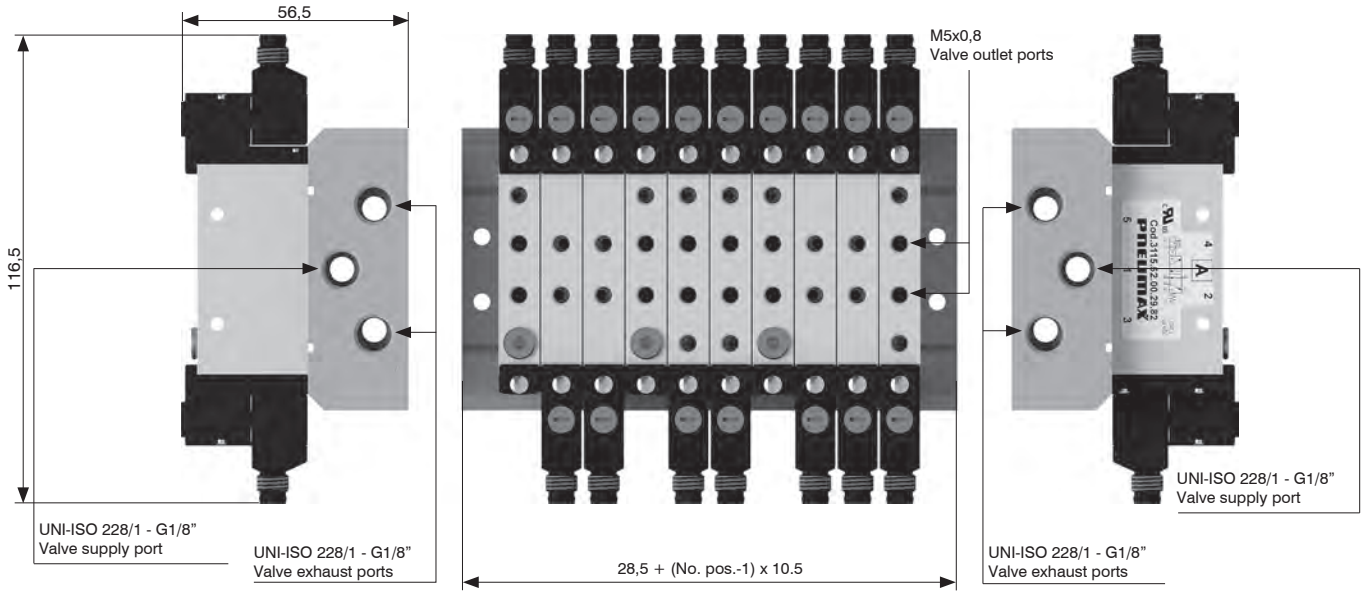



## DIN rail fixing




## Supply ports and maximum possible size according to valves used






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

**Manual override actuation**



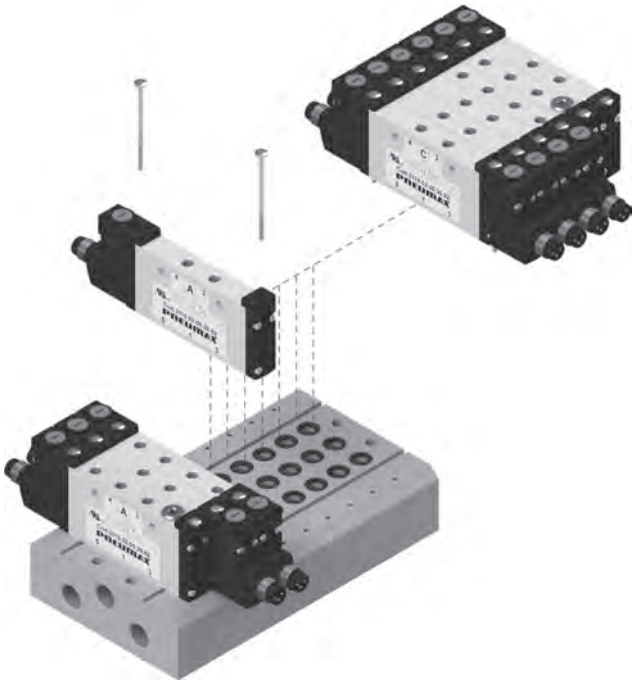
**Instable function:**
Push to actuate
(when released it moves back to the original position)



**Bistable function:**
Push and turn to get the bistable function

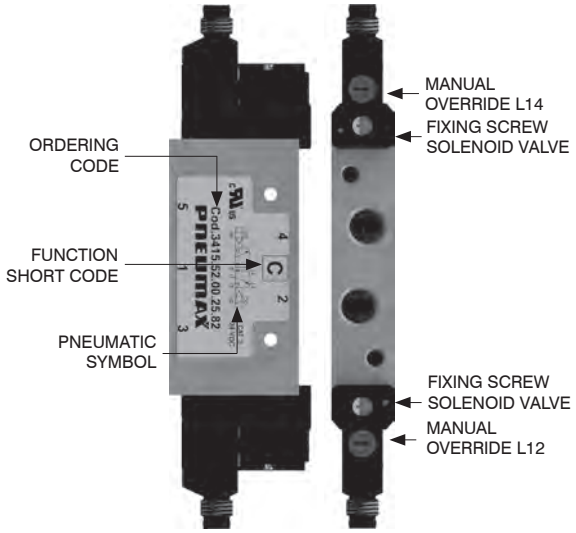
**Note**: we recommend the manual override is returned to it's original position when not in use

**Solenoid valves installation**

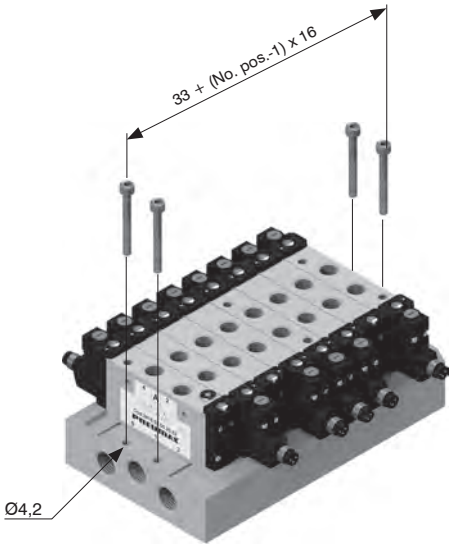


**Maximum fixing torque for fittings**: 0,2 Nm

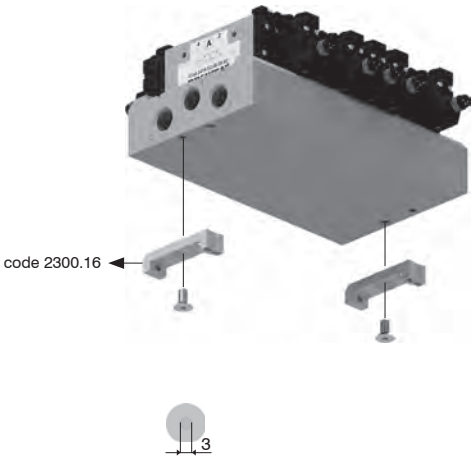
## Solenoid valve description

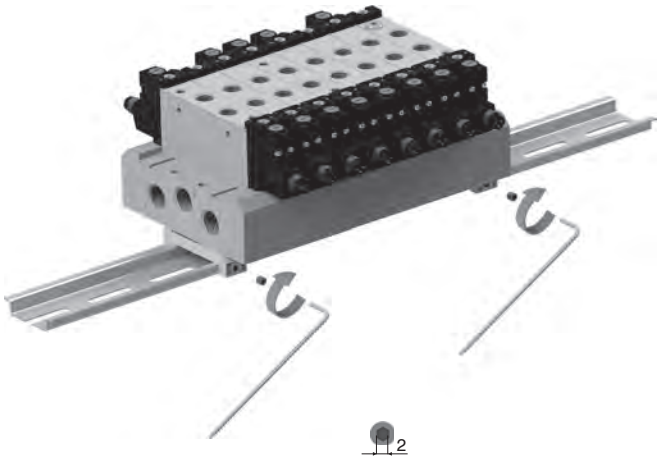



## From the top

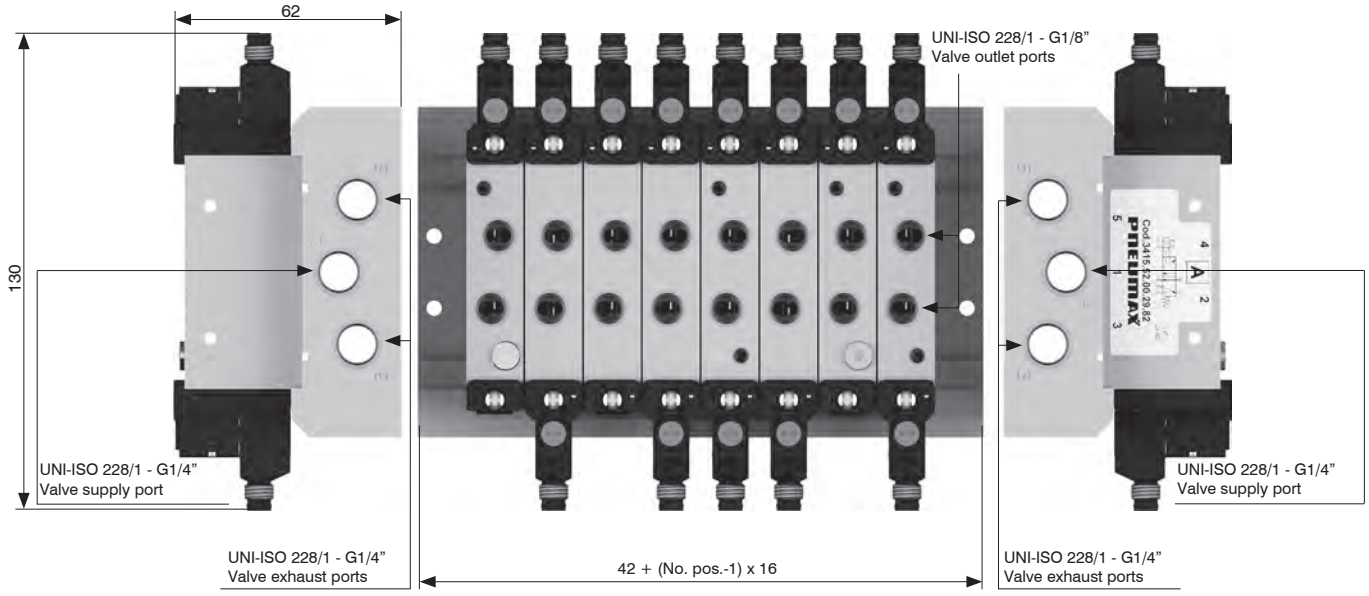



## DIN rail fixing



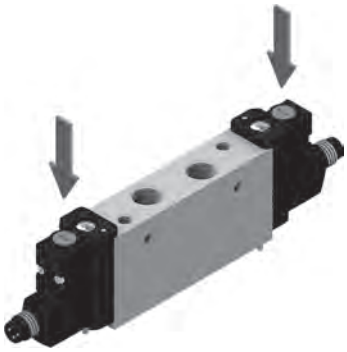

## Supply ports and maximum possible size according to valves used



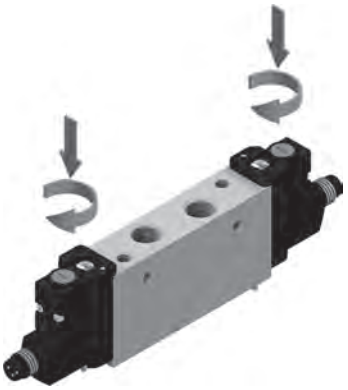



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

**Manual override actuation**



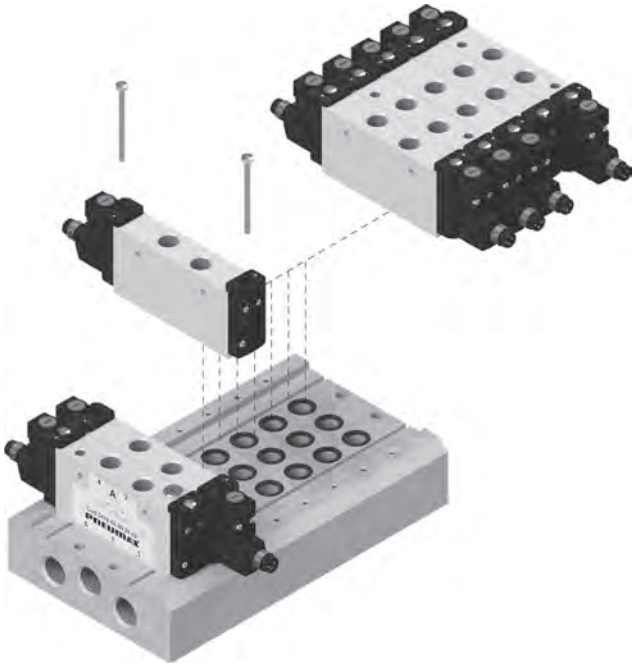
**Instable function:**
Push to actuate
(when released it moves back to the original position)



**Bistable function:**
Push and turn to get the bistable function

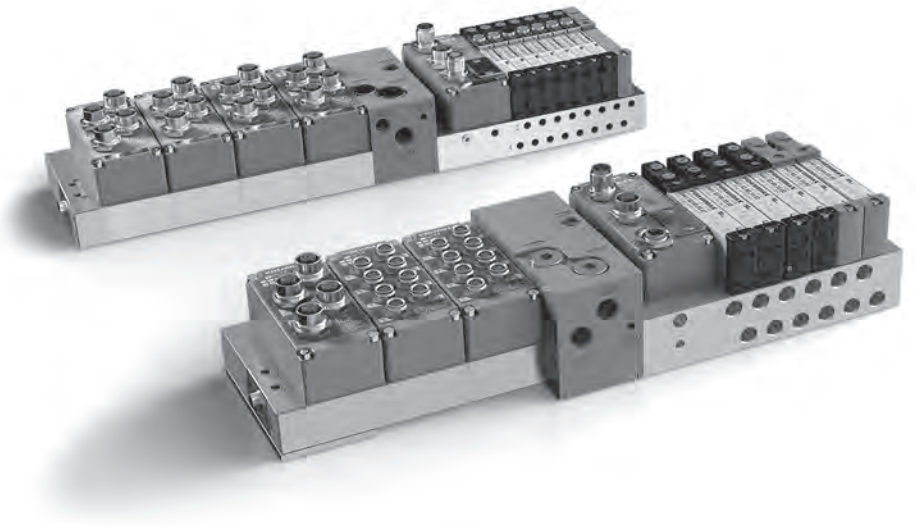
**Note**: we recommend the manual override is returned to it's original position when not in use

**Solenoid valves installation**



**Maximum fixing torque for fittings**: 0,2 Nm

## Series 3000 EVO - MANIFOLD



The range of solenoid valves to be assembled in pre-configured manifold, is available in multi-pin and serial versions, with a vast choice of connectors and analogue and digital input and output accessories.
The compact and clean design of both the valve body and the manifold, each one produced in aluminum, allows their use in applications requiring space optimization and weight reduction without sacrificing reliability and the prerogatives of aluminum.
The multi-pin connection version is available in three different types of connections:

- SUB-D 25 poles equipped with 24 outputs and configurable in different lengths up to 12 bistable valve positions on the manifold
- SUB-D 37 poles equipped with 32 outputs and configurable in different lengths up to 16 bistable valve positions on the manifold
- SUB-D 44 poles HD equipped with 40 outputs and configurable in different lengths up 20 bistable valve positions on the manifold

Every one of these options covers the wide range of application requirements and provides electronic management by default capable of energy saving on individual coils and managing PNP and NPN connections automatically without any difference in installation for the end user.
Precisely in order to guarantee maximum integration versatility in different machines and applications, the 3000 EVO series valves in the serial version are designed to interface with all main communication protocols: CANopen®, PROFIBUS DP, EtherNet/IP, EtherCAT®, PROFINET IO RT, CC-Link IE Field Basic and IO-Link.
Each implemented protocol has been provided to guarantee the best expandibility and inputs/outputs management.
In particular it has been provided protocols to manage up to 64 inputs and 64 outputs (PROFIBUS DP, CANopen® and IO-Link) and other protocols to manage up to 128 inputs and 128 outputs (EtherCAT®, EtherNet/IP, CC-Link IE Field Basic and PROFINET IO RT).
Taking advantage of the output signals it is possible to connect components to manage, for example, proportional pressure regulator or to control other solenoid valves.
The 3000 EVO series allows the use of modules dedicated to managing input signals up to the maximum number of inputs manageable by the specific serial node used.
Input modules with different interfaces and different technologies have been provided: modules with eight digital inputs with M8 or M12 connection, analogue or voltage input modules with M8 connection interface and others.
One of the strengths of this system is the possibility to freely configure the series of input and output modules, giving the advantage of installation flexibility.

### Main characteristics

10 and 15,5 mm size.
Multi-position sub-bases in different lengths.
Integrated and optimized electrical connection system.

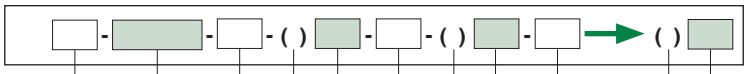
### Functions

S.V. 5/2 Monostable Solenoid-Spring
S.V. 5/2 Monostable Solenoid-Differential
S.V. 5/2 Bistable Solenoid-Solenoid
S.V. 5/3 C.C. Solenoid-Solenoid
S.V. 2x3/2 N.C.-N.C. (= 5/3 O.C.) Solenoid-Solenoid
S.V. 2x3/2 N.O.-N.O. (= 5/3 P.C.) Solenoid-Solenoid
S.V. 2x3/2 N.C.-N.O. Solenoid-Solenoid
S.V. 2x3/2 N.O.-N.C. Solenoid-Solenoid


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Rules and configuration scheme

CONFIGURATION CODE




| Version | |
|---|---|
| 31 | 3100 version |
| 34 | 3400 version |

| Electric parts | |
|---|---|
| ...-... | See page “Electronic components configurator in technopolymer” |

| Manifold version | |
|---|---|
| A | Self feeding |
| E | External feeding |

| Repeating numbers of the module | |
|---|---|
| _ | Indicate the number of repeats of the same module (no value for a single module) |

| Module 1 | |
|---|---|
| ...-... | See page ‘Pneumatic module configurator’ |

| Accessory diaphragm plug (Optional) | |
|---|---|
| X | Diaphragm plug on port 1 |
| Y | Diaphragm plug on port 3 |
| Z | Diaphragm plug on port 5 |

| Repeating numbers of the module | |
|---|---|
| _ | Indicate the number of repeats of the same module (no value for a single module) |

| Module 2 | |
|---|---|
| ...-... | See page ‘Pneumatic module configurator’ |

| Accessory diaphragm plug (Optional) | |
|---|---|
| X | Diaphragm plug on port 1 |
| Y | Diaphragm plug on port 3 |
| Z | Diaphragm plug on port 5 |

| Repeating numbers of the module | |
|---|---|
| _ | Indicate the number of repeats of the same module (no value for a single module) |

| Module n | |
|---|---|
| ...-... | See page ‘Single pneumatic module configurator’ |

**Check the number of available solenoid valve positions**

| Number of available solenoid valve positions (standard) | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4 | 6 | 8 | 10 | 12 | 16 | 20 | 24 |

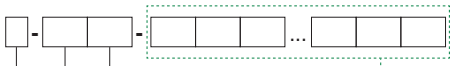
**Configurable on Cadenas platform**

CADENAS

**Note:**
When composing the configuration, always bear in mind that the maximum number of electrical signals available is:
- 48 if a serial node or IO-Link interface is used.
- 40 if a 44-pole multi-pin is used.
- 32 if a 37-pole multi-pin module is used.
- 24 if a 25-pole multi-pin module is used.

Each position on the manifold occupies two electrical signals; if a monostable valve is used, an electrical signal is lost.
However, this makes it possible to replace the monostable valve with a bistable valve in the same position.
Diaphragm plugs are used to interrupt ports 1, 3 and 5 of the sub-base.
If it is necessary to interrupt more than one port at the same time, put the letters that identify their position in sequence (e.g.: if it is necessary to intercept the ports 3 and 5 you must put the letters YZ).
If one or more ports must be interrupted more than once, the addition of the intermediate supply/discharge module is necessary.

## Electronic components configurator in technopolymer



| Type | |
|---|---|
| P | Technopolymer |

| Multi-pin electrical connection | | |
|---|---|---|
| MP | 2 | Multi-pin, PNP 24 V DC 25 poles |
| | 3 | Multi-pin, PNP 24 V DC 37 poles |
| | 4 | Multi-pin, PNP 24 V DC 44 poles |

| Electrical connection | |
|---|---|
| C3 | CANopen® node 64 IN - 64 OUT (32 fixed) |
| C4 | CANopen® node 64 IN - 64 OUT (48 fixed) |
| P3 | PROFIBUS DP node 64 IN - 64 OUT (32 fixed) |
| P4 | PROFIBUS DP node 64 IN - 64 OUT (48 fixed) |
| I4 | EtherNet/IP node 128 IN - 128 OUT (48 fixed) |
| A4 | EtherCAT® node 128 IN - 128 OUT (48 fixed) |
| N4 | PROFINET IO RT node 128 IN - 128 OUT (48 fixed) |
| G4 | CC-Link IE Field Basic node 128 IN - 128 OUT (48 fixed) |
| K3 | IO-Link interface 64 IN - 64 OUT (32 fixed) |
| K4 | IO-Link interface 64 IN - 64 OUT (48 fixed) |

| Manifold accessories ( 2 pieces) | |
|---|---|
| | Without DIN rail fixing |
| G | With DIN rail fixing |

| Repeating numbers of the module | |
|---|---|
| | Indicate the number of repeats of the same module (no value for a single module) |

**SINGLE ELECTRIC MODULE CONFIGURATION**

| Inputs module - Analog / Digital (EXCLUDED WITH MP) | |
|---|---|
| D8 | 8 M8 digital inputs module |
| D12 | 8 M12 digital inputs module |
| D3 | 32 digital inputs SUB-D 37 poles |
| T1 | 2 analogue inputs 0-5V module (voltage signal) |
| T2 | 2 analogue inputs 0-10V module (voltage signal) |
| T3 | 4 analogue inputs 0-5V module (voltage signal) |
| T4 | 4 analogue inputs 0-10V module (voltage signal) |
| C1 | 2 analogue inputs 0-20mA module (current signal) |
| C2 | 2 analogue inputs 4-20mA module (current signal) |
| C3 | 4 analogue inputs 0-20mA module (current signal) |
| C4 | 4 analogue inputs 4-20mA module (current signal) |
| P1 | 2 Pt100 2 wires inputs module |
| P2 | 2 Pt100 3 wires inputs module |
| P3 | 2 Pt100 4 wires inputs module |
| P4 | 4 Pt100 2 wires inputs module |
| P5 | 4 Pt100 3 wires inputs module |
| P6 | 4 Pt100 4 wires inputs module |
| **Outputs module - Analog / Digital** | |
| M8 | 8 M8 digital outputs module |
| M12 | 8 M12 digital outputs module |
| M3 | 32 digital outputs SUB-D 37 poles |
| V1 | 2 analogue outputs 0-5V module (voltage signal) |
| V2 | 2 analogue outputs 0-10V module (voltage signal) |
| V3 | 4 analogue outputs 0-5V module (voltage signal) |
| V4 | 4 analogue outputs 0-10V module (voltage signal) |
| L1 | 2 analogue outputs 0-20mA module (current signal) |
| L2 | 2 analogue outputs 4-20mA module (current signal) |
| L3 | 4 analogue outputs 0-20mA module (current signal) |
| L4 | 4 analogue outputs 4-20mA module (current signal) |
| **Additional modules (Optional)** | |
| P12 | M12 additional power supply module |

| Module accessories | |
|---|---|
| | Without DIN rail fixing |
| G | With DIN rail fixing |

**Refer to the current limits indicated in the pages relating to the nodes / IO-Link interface**



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Modules configuration

**Module configurator**

S.V.

—

| Valve type | |
|---|---|
| A | S.V. 5/2 SOLENOID-SPRING |
| B | S.V. 5/2 SOLENOID-DIFFERENTIAL |
| C | S.V. 5/2 SOLENOID-SOLENOID |
| E | S.V. 5/3 CC SOLENOID-SOLENOID |
| F | S.V. 2x3/2 NC-NC (5/3 O.C.) SOLENOID-SOLENOID |
| G | S.V. 2x3/2 NO-NO (5/3 P.C.) SOLENOID-SOLENOID |
| H | S.V. 2x3/2 NC-NO SOLENOID-SOLENOID |
| I | S.V. 2x3/2 NO-NC SOLENOID-SOLENOID |
| T | Plug |

**Module configurator**

Accessories

—

| Module type | |
|---|---|
| W | Intermediate Inlet/Exhaust module |

**N°2 valve seats occupied in the 3100 version**

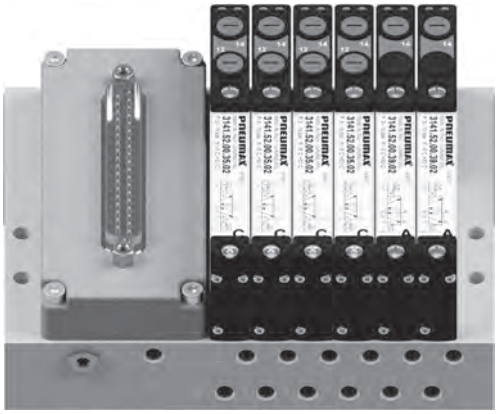
**Configuration example of complete group:**

- Version 3400 (34)
- Technopolymer PX3 serial system (P-N4-D8-M8)
- Manifold in external supply version (E)
- Solenoid valves 5/2 Solenoid-Spring (A)
- Solenoid valves 5/2 Solenoid-Solenoid (C)
- Solenoid valves 2X3/2 NC-NC Solenoid-Solenoid (F)
- Solenoid valves 2X3/2 NC-NC Solenoid-Solenoid (F)

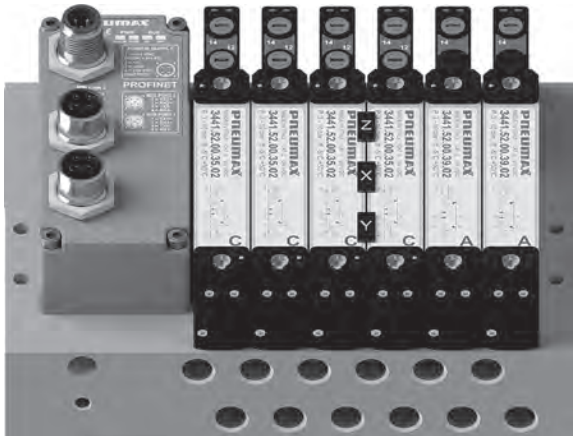


**34-P-N4-D8-M8-E-A-C-(2)F**

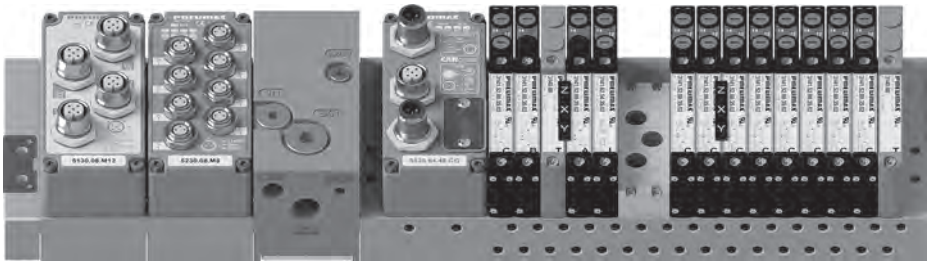
## Configuration examples



**Example shown**: **31-P-MP3-E-(4)C-(2)A**
Manifold with external feeding, multi-pin 37 poles connection and solenoid valves.



**Example shown**: **34-P-N4-E-(3)C-XYZ-C-(2)A**
Manifold with external feeding, serial node, solenoid valves and diaphragm plugs.



**Example shown**: **31-P-C4-D8-M12-E-C-B-T-XYZ-A-I-W-(2)C-XYZ-(6)C-T**
Manifold with external feeding, serial node, M8 input module, M12 output module; solenoid valves, multi-position diaphragm plugs, additional power supply module.

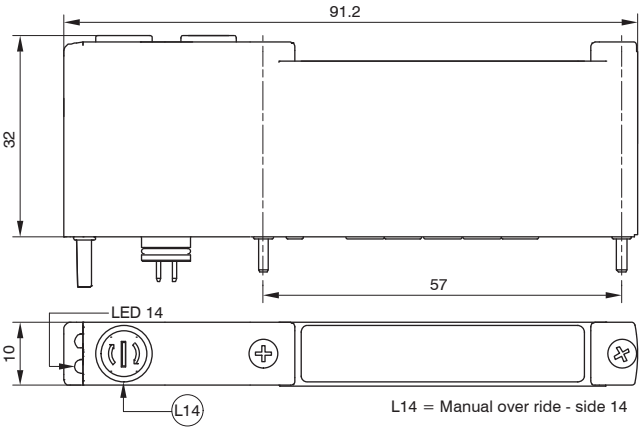



**Example shown**: **31-P-C4-(2)D8-M12-A-C-B-(2)I-(2)T**
Self feeding manifold with serial node, M8 input module, M12 output module, solenoid valves.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Spring



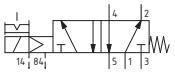



L14 = Manual over ride - side 14

**Coding:** 3141.52.00.39.©

| © | ELECTRICAL CONNECTION |
|---|---|
| | **02** = + 24 V DC |

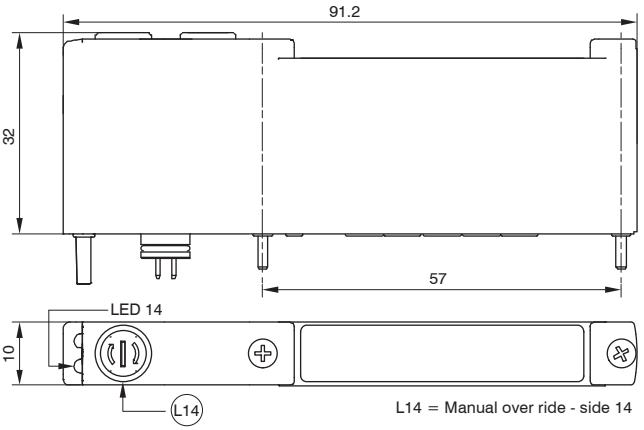
Weight 55,7 g
SHORT FUNCTION CODE "A"



| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 200 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

## Solenoid-Differential



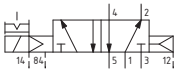



L14 = Manual over ride - side 14

**Coding:** 3141.52.00.36.©

| © | ELECTRICAL CONNECTION |
|---|---|
| | **02** = + 24 V DC |

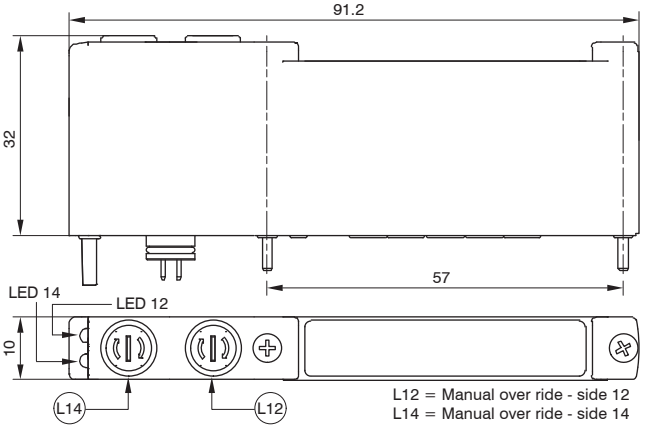
Weight 55,7 g
SHORT FUNCTION CODE "B"



| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 200 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

## Solenoid-Solenoid



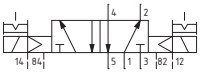



L12 = Manual over ride - side 12
L14 = Manual over ride - side 14

**Coding:** 3141.52.00.35.©

| © | ELECTRICAL CONNECTION |
|---|---|
| | **02** = + 24 V DC |

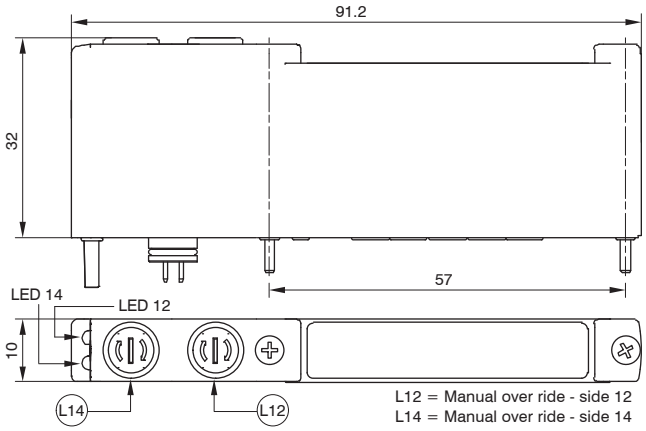
Weight 55,7 g
SHORT FUNCTION CODE "C"



| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 200 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 10 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

## Solenoid-Solenoid 5/3 (Closed centres)

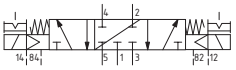





**Coding:** 3141.53.31.35.C

| | |
|---|---|
| C | ELECTRICAL CONNECTION |
| | **02** = + 24 V DC |

Weight 60,3 g
SHORT FUNCTION CODE "E"



| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 170 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

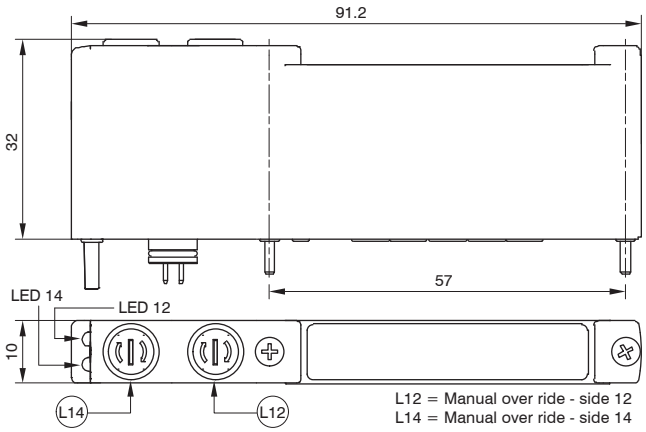
## Solenoid-Solenoid 2x3/2

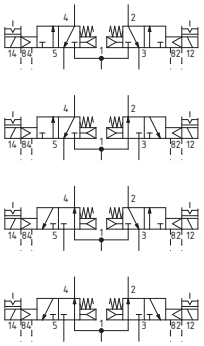
**Coding:** 3141.62.F.35.C

| | |
|---|---|
| F | FUNCTION |
| | **44** = N.C.-N.C. (5/3 Open centres) |
| | **45** = N.C.-N.O. |
| | **54** = N.O.-N.C. |
| | **55** = N.O.-N.O. (5/3 Pressured centres) |
| C | ELECTRICAL CONNECTION |
| | **02** = + 24 V DC |

Weight 60,7 g
SHORT FUNCTION CODE:
N.C.-N.C. (5/3 Open centres) = "F"
N.O.-N.O. (5/3 Pressured centres) = "G"
N.C.-N.O. = "H"
N.O.-N.C. = "I"





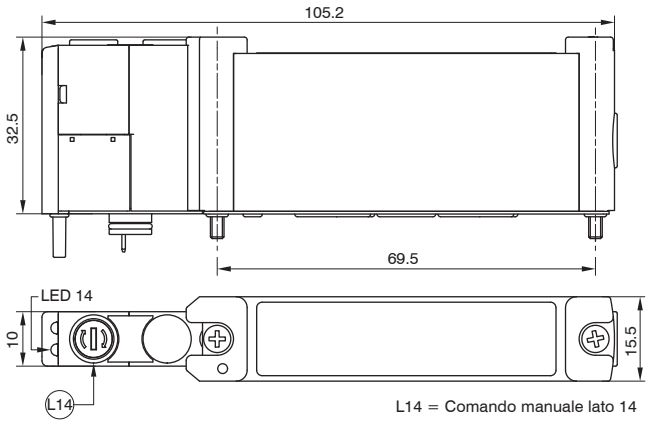
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 170 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 15 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | ≥3+(02 x Inlet pressure) |
| Temperature °C | -5 ... +50 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Spring



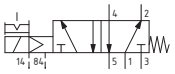



L14 = Comando manuale lato 14

**Coding:** 3441.52.00.39.C

| C | ELECTRICAL CONNECTION |
|---|---|
| | **02** = + 24 V DC |

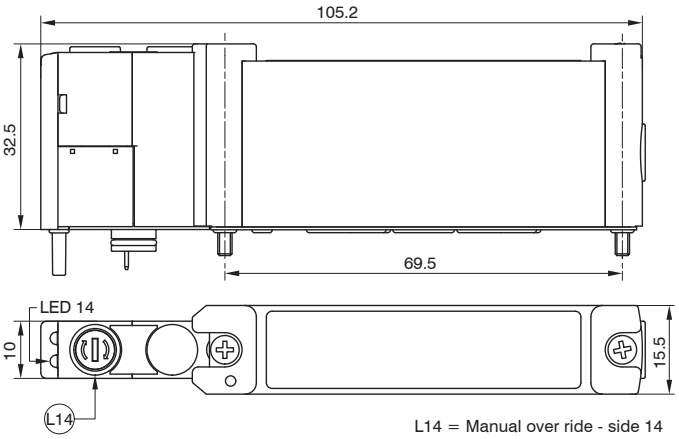
Weight 92 g
SHORT FUNCTION CODE "A"



| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 600 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

## Solenoid-Differential



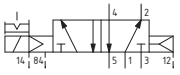



L14 = Manual over ride - side 14

**Coding:** 3441.52.00.36.C

| C | ELECTRICAL CONNECTION |
|---|---|
| | **02** = + 24 V DC |

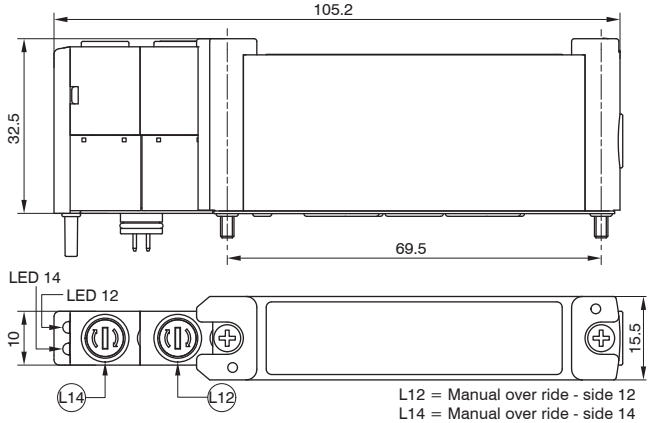
Weight 92 g
SHORT FUNCTION CODE "B"



| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 600 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

## Solenoid-Solenoid



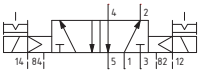



L12 = Manual over ride - side 12
L14 = Manual over ride - side 14

**Coding:** 3441.52.00.35.C

| C | ELECTRICAL CONNECTION |
|---|---|
| | **02** = + 24 V DC |

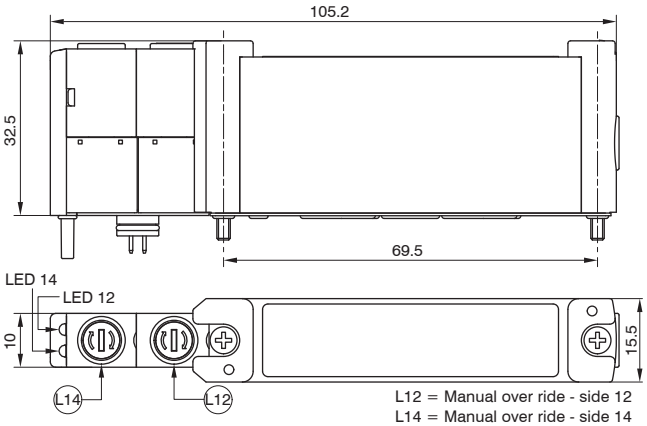
Weight 99 g
SHORT FUNCTION CODE "C"



| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 600 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 10 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

## Solenoid-Solenoid 5/3 (Closed centres)



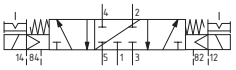



L12 = Manual over ride - side 12
L14 = Manual over ride - side 14

**Coding:** 3441.53.31.35.Ⓒ

| | |
|---|---|
| Ⓒ | ELECTRICAL CONNECTION |
| | **02** = + 24 V DC |

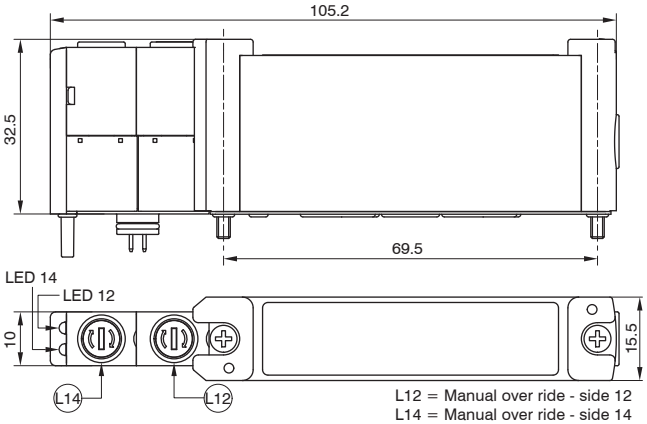
Weight 99 g
SHORT FUNCTION CODE "E"



| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 500 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

## Solenoid-Solenoid 2x3/2



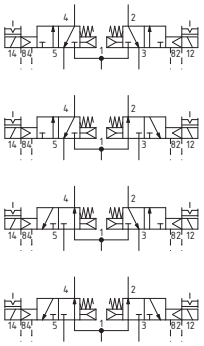



L12 = Manual over ride - side 12
L14 = Manual over ride - side 14

**Coding:** 3441.62.Ⓕ.35.Ⓒ

| | |
|---|---|
| Ⓕ | FUNCTION |
| | **44** = N.C.-N.C. (5/3 Open centres) |
| | **45** = N.C.-N.O. |
| | **54** = N.O.-N.C. |
| | **55** = N.O.-N.O. (5/3 Pressured centres) |
| Ⓒ | ELECTRICAL CONNECTION |
| | **02** = + 24 V DC |

Weight 99 g
SHORT FUNCTION CODE:
N.C.-N.C. (5/3 Open centres) = "F"
N.O.-N.O. (5/3 Pressured centres) = "G"
N.C.-N.O. = "H"
N.O.-N.C. = "I"



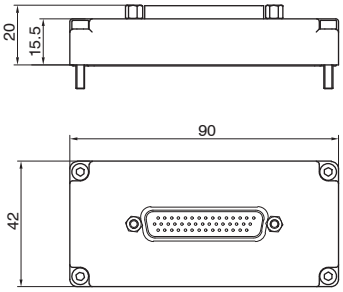
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 500 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | ≥3+(02 x Inlet pressure) |
| Temperature °C | -5 ... +50 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Multi-pin module



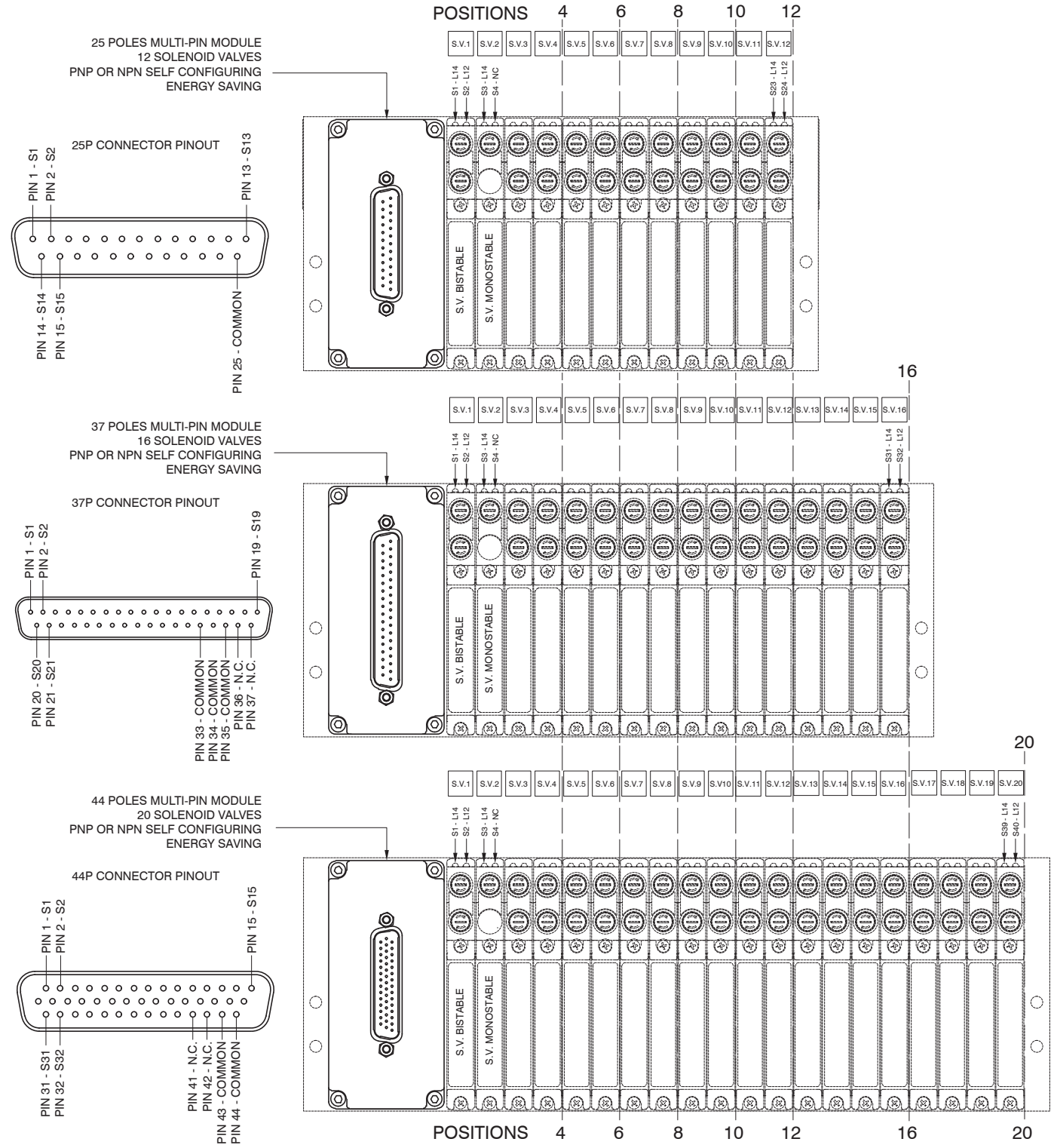



**Coding:** 3140.00.Ⓒ

| | ELECTRICAL CONNECTION |
|---|---|
| Ⓒ | **25P** = Connectors 25 poles |
| | **37P** = Connector 37 poles |
| | **44P** = Connector 44 poles |

| Technical characteristics | | | |
|---|---|---|---|
| Coding example | 3140.00.25P (25 poles) | 3140.00.37P (37 poles) | 3140.00.44P (44 poles) |
| Weight (g) | 47,4 | 51,3 | 49,1 |
| Temperature °C | -5 ... +50 | | |

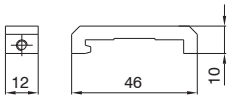
### Multi-pin connections linking scheme



## DIN rail adapter

**Coding:** 3100.16



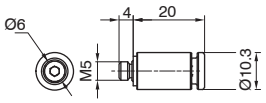



Weight 12 g

## Fitting M5 Ø6

**Coding:** RDR560



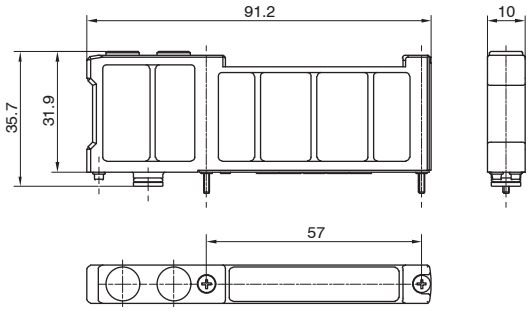



Weight 7 g

## Free valve space plug

**Coding:** 3140.00



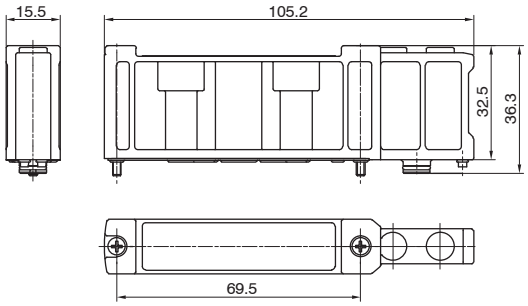



Weight 21 g

## Free valve space plug

**Coding:** 3440.00






Weight 38 g

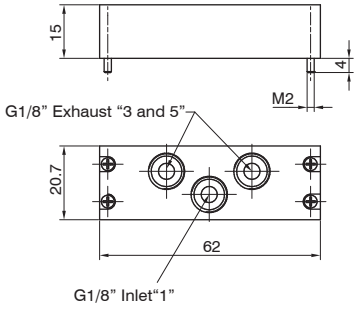


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Inlet/Exhaust module

**Coding:** 3140.10



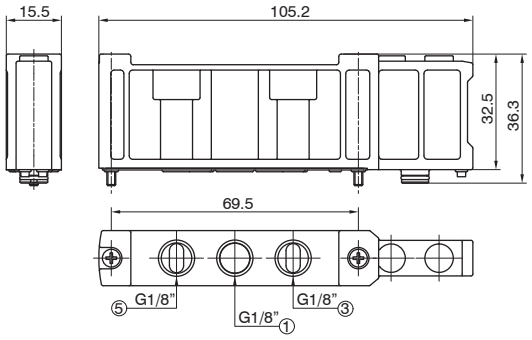



Weight 50 g

## Inlet/Exhaust module

**Coding:** 3440.10






Weight 37 g

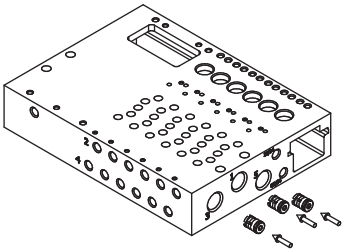
## Diaphragm plug

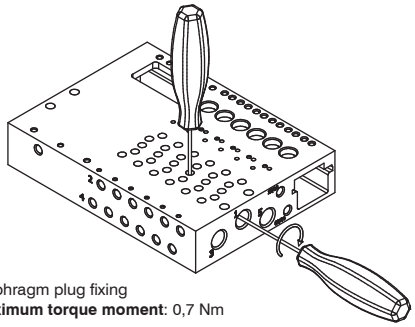
**Coding:** 3130.17



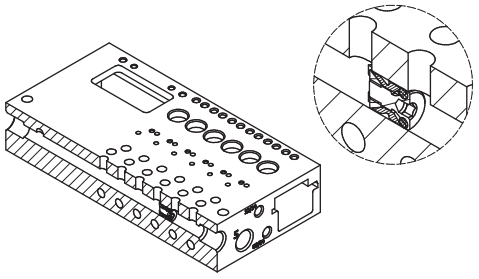
Weight 1,5 g

Diaphragm plug instalation





Diaphragm plug fixing
**Maximum torque moment**: 0,7 Nm



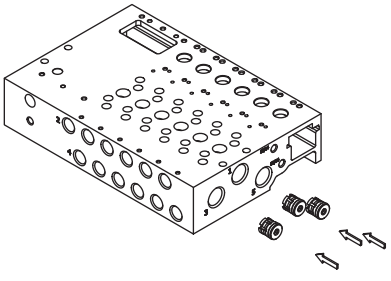
## Diaphragm plug

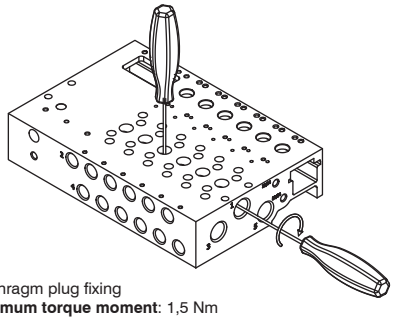
**Coding:** 3430.17



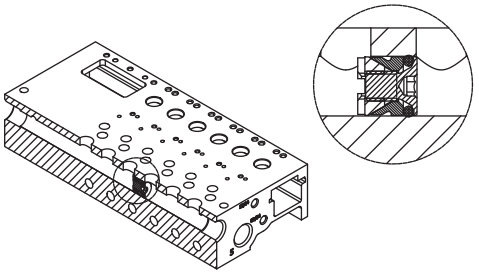
Weight 3 g

Diaphragm plug instalation



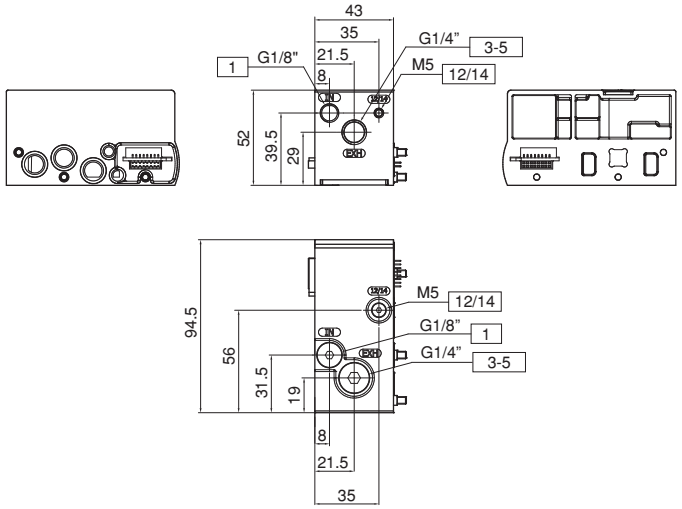


Diaphragm plug fixing
**Maximum torque moment**: 1,5 Nm



## Module adapter kit





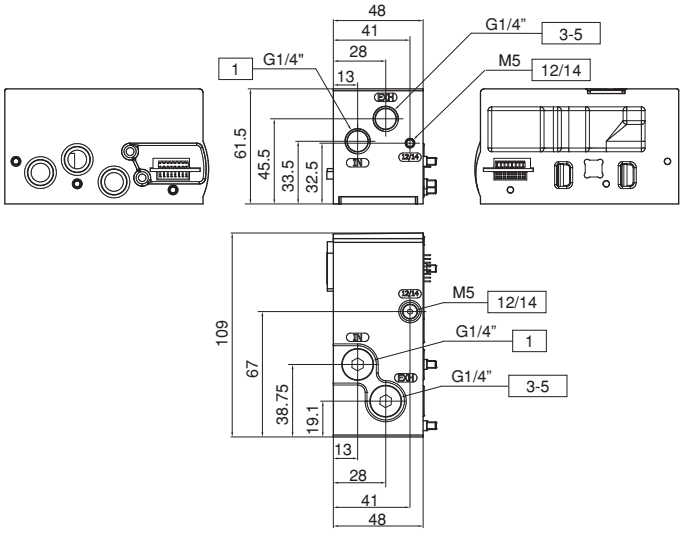

**Coding:** 3100.KA.Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **02** = External feeding |
| | **12** = Self feeding |

Weight 354 g

## Module adapter kit





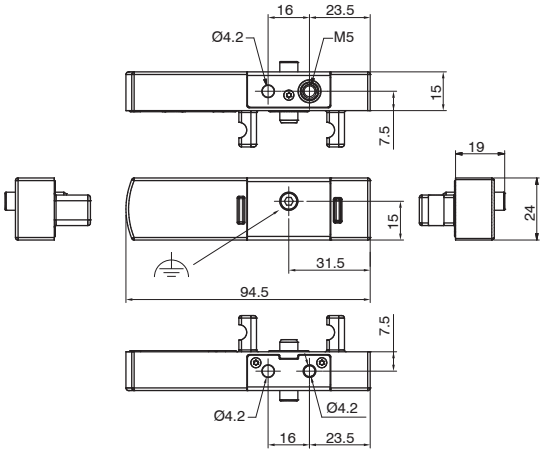

**Coding:** 3400.KA.Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **02** = External feeding |
| | **12** = Self feeding |

Weight 566 g

## Left endplate kit



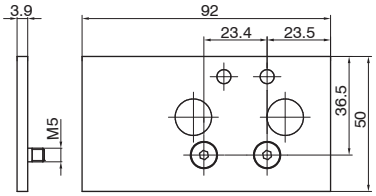



**Coding:** 3100.KT.00

Weight 52 g

## Offset compensation plate






**Coding:** 3400.P0

Weight 46 g

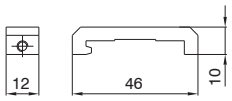


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## DIN rail adapter

**Coding:** 3400.16



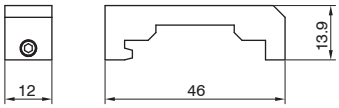



Weight 12 g

## DIN rail extension adapter

**Coding:** 3400.16P






Weight 15 g

**Note**: For use if an additional DIN rail mount is required, assembled on a single I/O module.

## Cable complete with connector, 25 Poles, IP65

**Coding:** 2300.25.Ⓛ.Ⓒ



| | |
|---|---|
| Ⓛ | CABLE LENGTH |
| | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |
| Ⓒ | CONNECTOR |
| | **10** = Stand alone |
| | **90** = 90° Angle |

## Cable complete with connector, 37 Poles, IP65

**Coding:** 2400.37.Ⓛ.Ⓒ



| | |
|---|---|
| Ⓛ | CABLE LENGTH |
| | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |
| Ⓒ | CONNECTOR |
| | **10** = Stand alone |
| | **90** = 90° Angle |

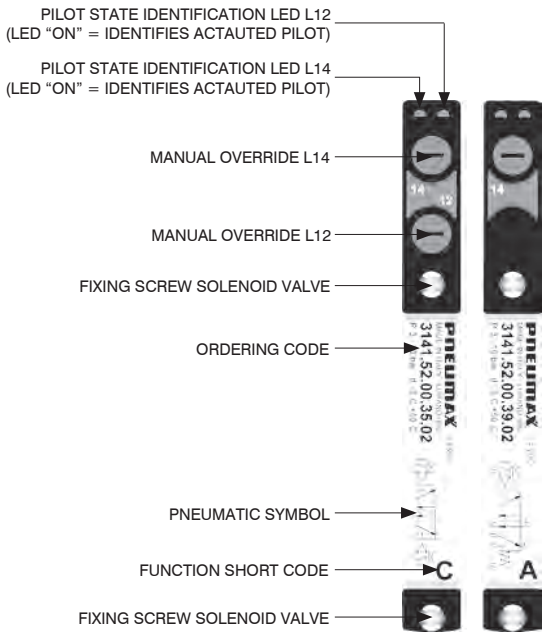
## Cable complete with connector, 44 Poles, IP65

**Coding:** 2300.44.Ⓛ.Ⓒ

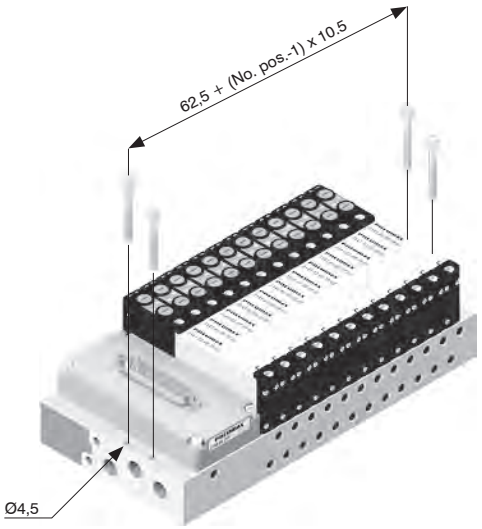


| | |
|---|---|
| Ⓛ | CABLE LENGTH |
| | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |
| Ⓒ | CONNECTOR |
| | **10** = Stand alone |
| | **90** = 90° Angle |

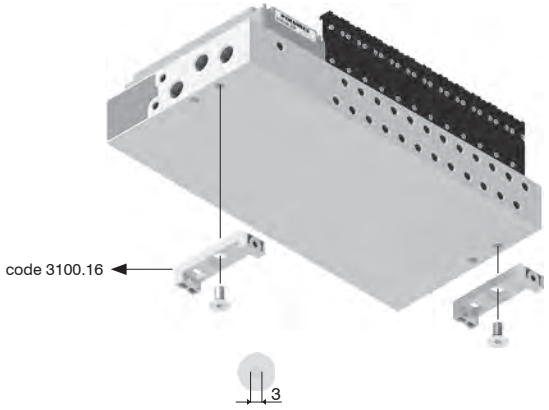
## Solenoid valve description

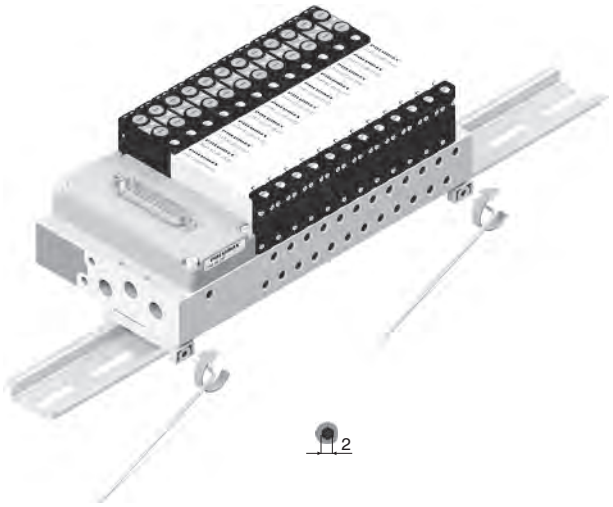



## From the top

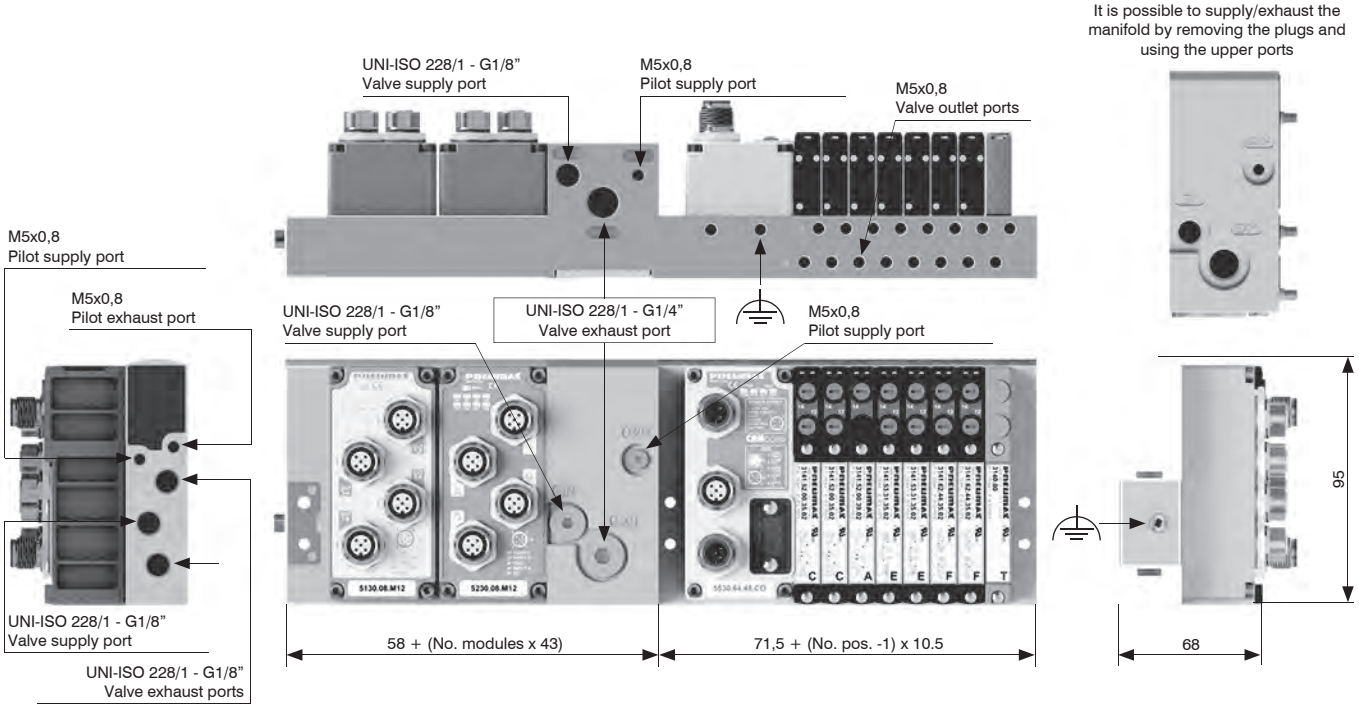



## DIN rail fixing




## Supply ports and maximum possible size according to valves used






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

**Manual override actuation**



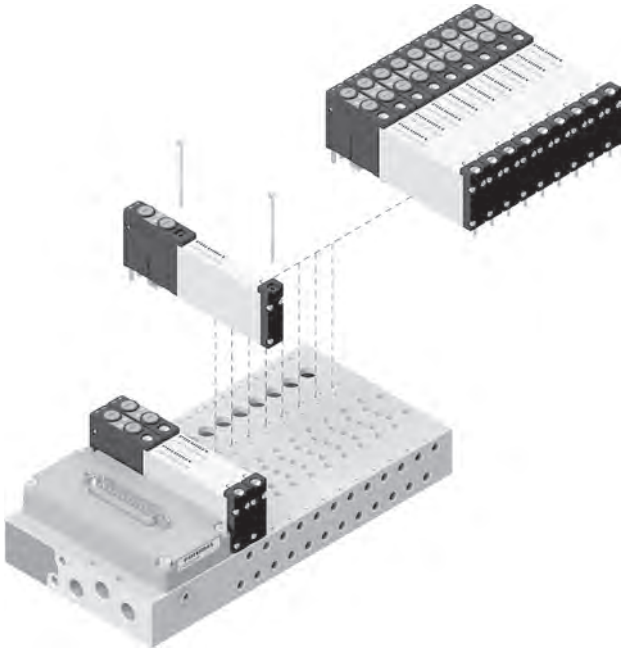
**Instable function:**
Push to actuate
(when released it moves back to the original position)



**Bistable function:**
Push and turn to get the bistable function

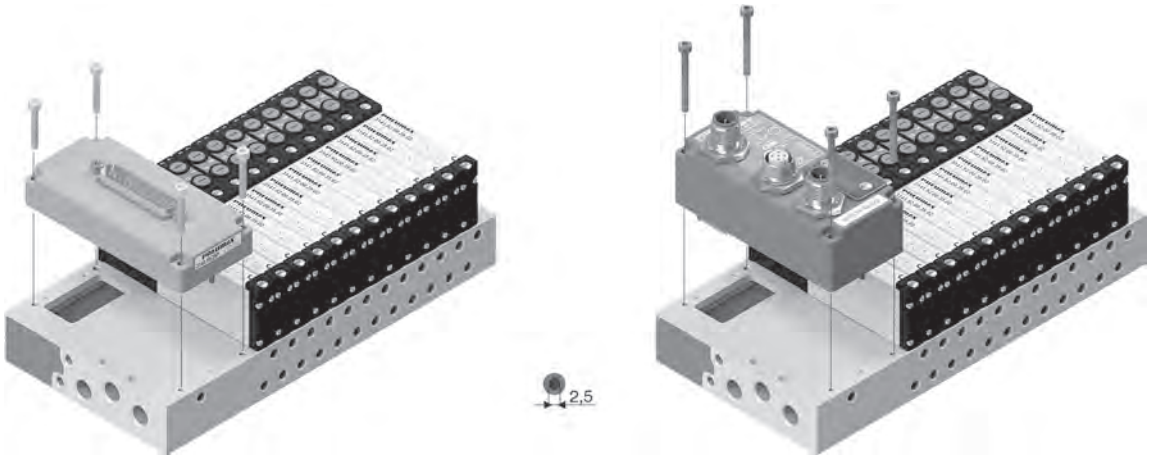
**Note**: we recommend the manual override is returned to it's original position when not in use

**Solenoid valves installation**

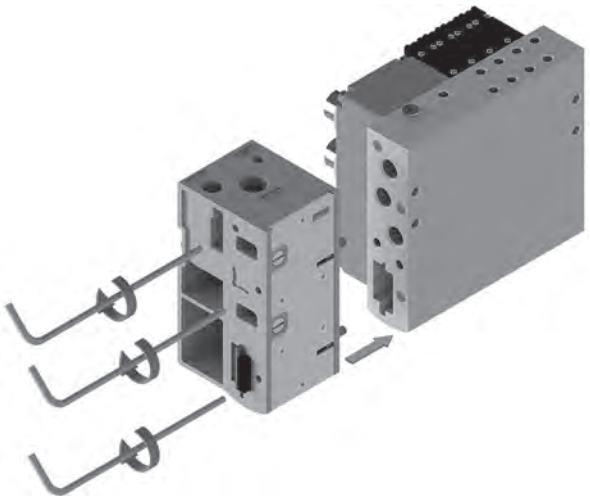


**Maximum fixing torque for fittings**: 0,2 Nm

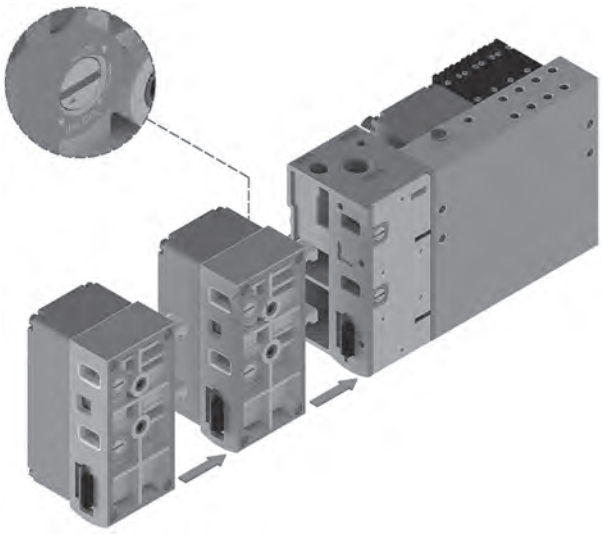
**Serial systems and multi-pin modules installation**



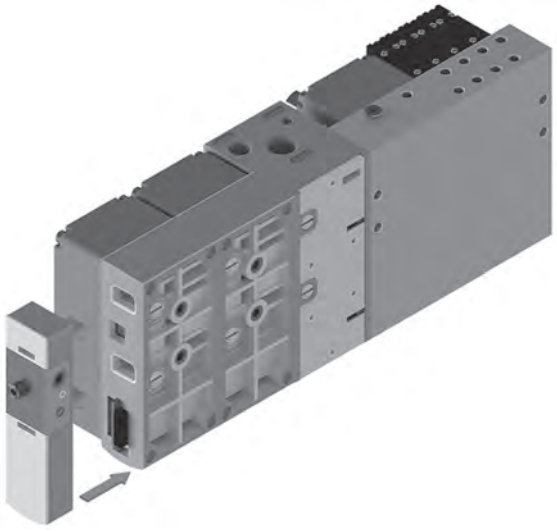
**1.** Fix the dedicated adapter (code 3100.KA.Ⓥ) to the manifold.



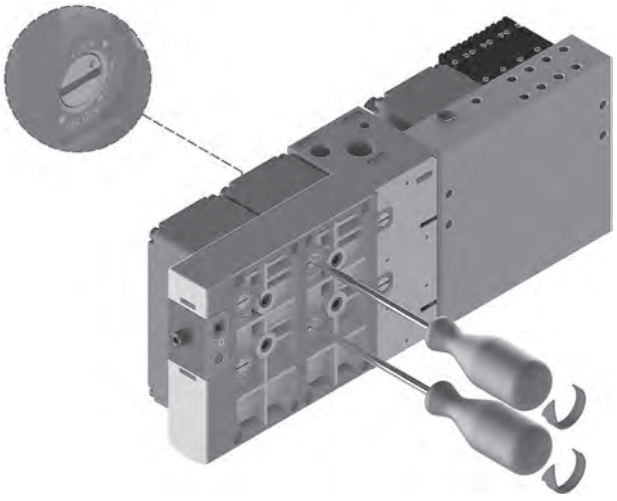
**2.** Assemble the required modules.



**3.** Complete the assembly with the 3100.KT.00 left endplate kit.

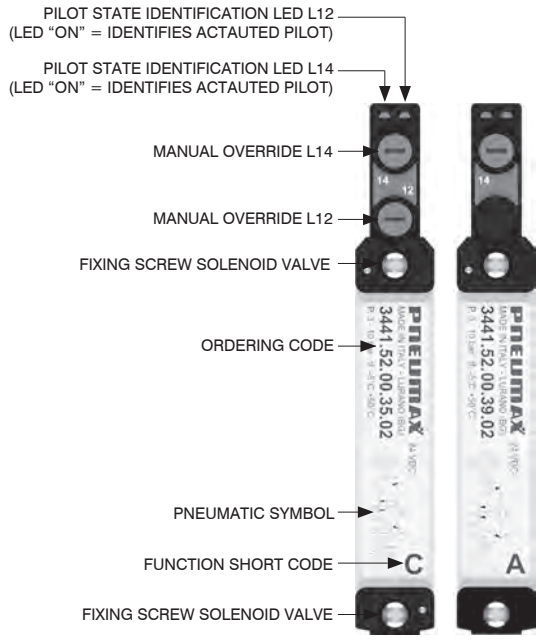


**4.** To lock: rotate anticlockwise (in the direction of the LOCK print on the case).
To unlock: rotate clockwise (in the direction of the UNLOCK print on the case).
The same procedure shall be used to add or remove any module.

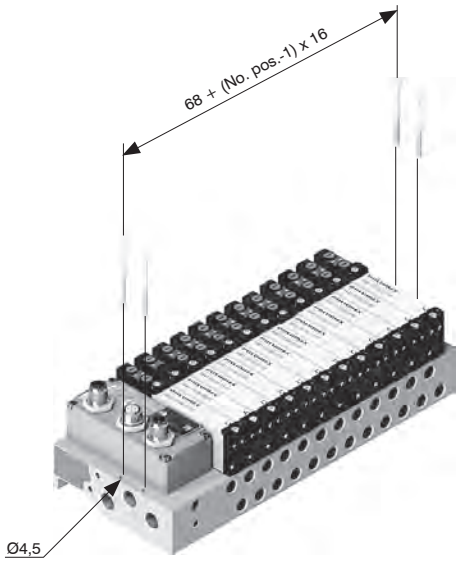



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

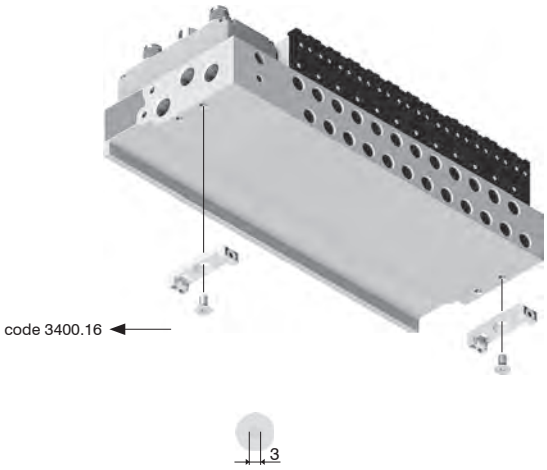
## Solenoid valve description

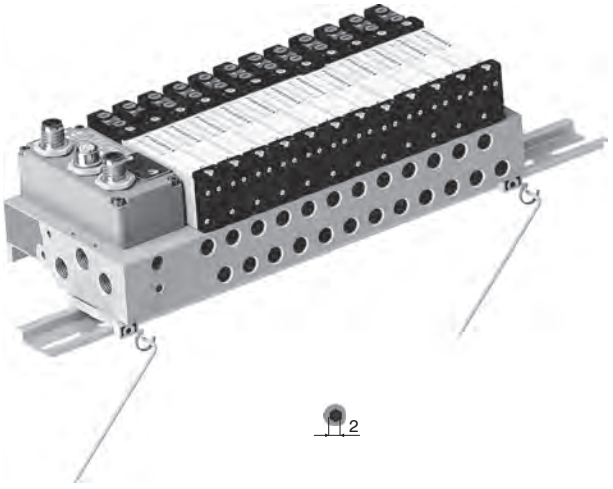



## From the top

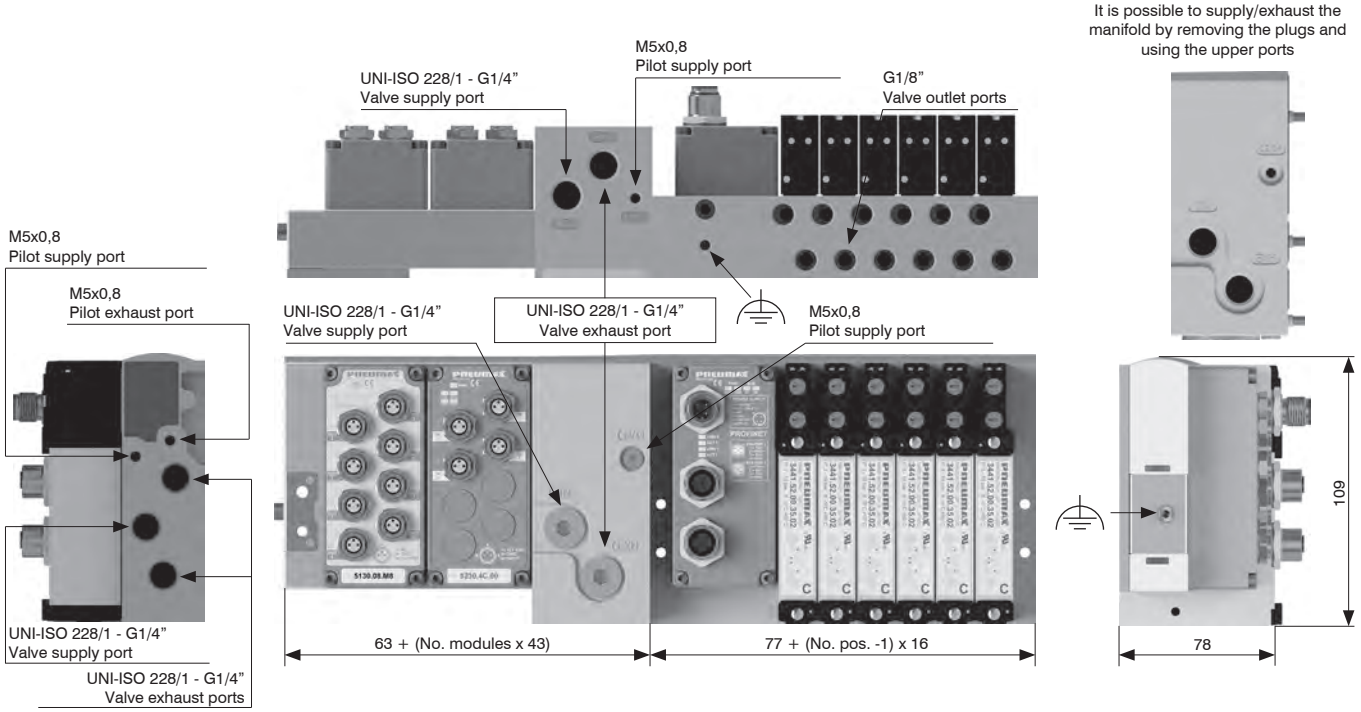



## DIN rail fixing

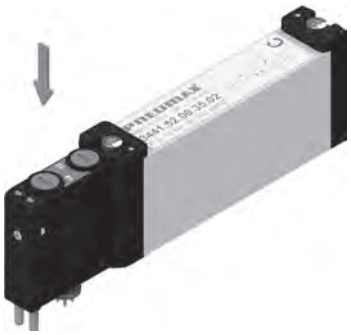


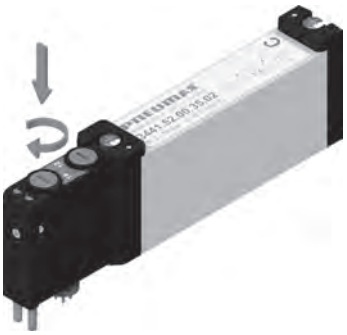

## Supply ports and maximum possible size according to valves used



**Manual override actuation**



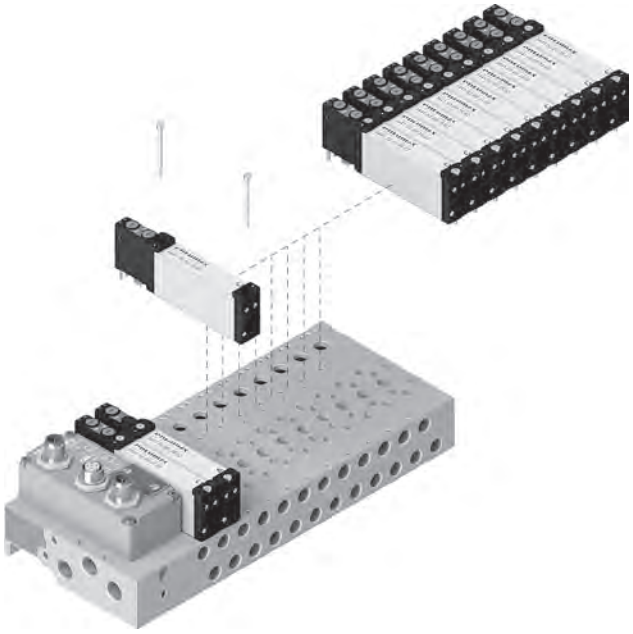
**Instable function:**
Push to actuate
(when released it moves back to the original position)



**Bistable function:**
Push and turn to get the bistable function

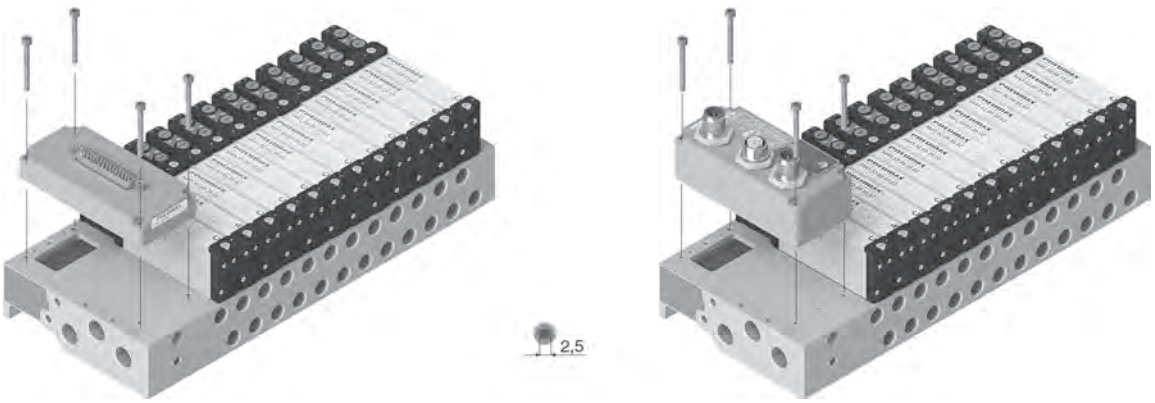
**Note**: we recommend the manual override is returned to it's original position when not in use

**Solenoid valves installation**



**Maximum fixing torque for fittings**: 0,2 Nm

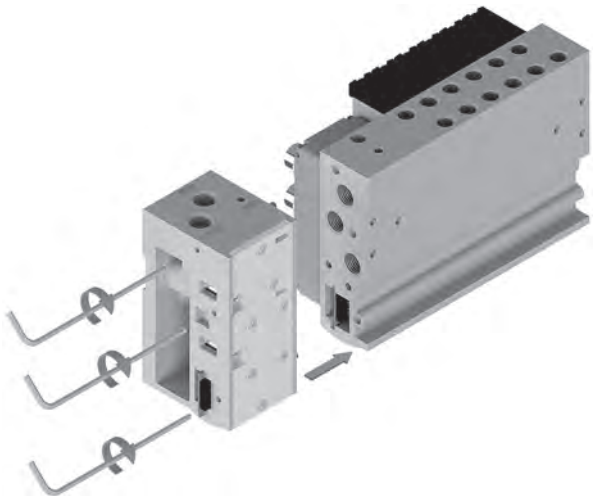
**Serial systems and multi-pin modules installation**



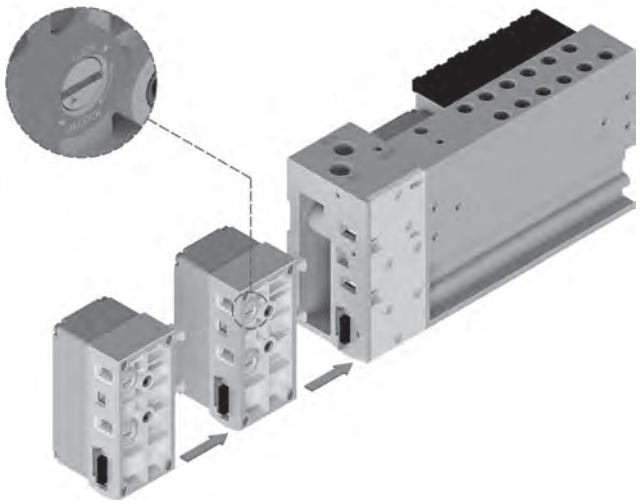


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

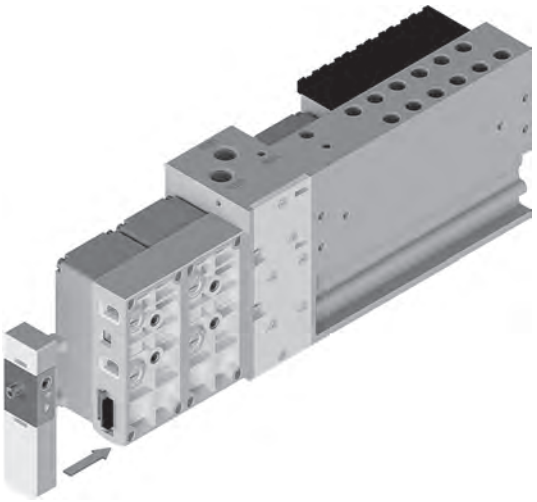
**1.** Fix the dedicated adapter (code 3400.KA.Ⓥ) to the manifold.



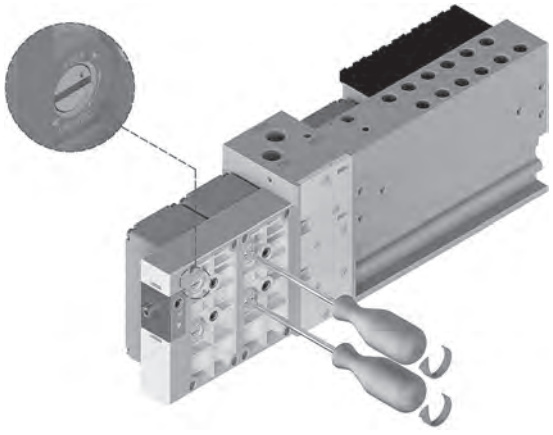
**2.** Assemble the required modules.



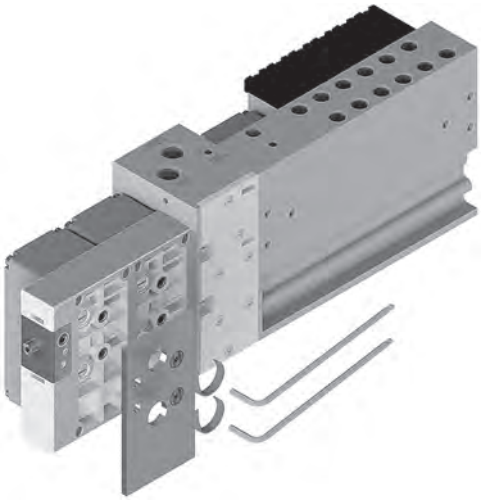
**3.** Complete the assembly with the 3100.KT.00 left endplate kit.



**4.** To lock: rotate anticlockwise (in the direction of the LOCK print on the case).
To unlock: rotate clockwise (in the direction of the UNLOCK print on the case).
The same procedure shall be used to add or remove any module.



**5.** Fix the offset compensation plate 3400.P0 to the last single module.



## CANopen® protocol node

CANopen® node manages 64 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Connection to CANopen® fieldbus is made via two M12, male and female, 5 pins, type A circular connectors, in parallel between them; connectors pinout is compliant to CiA Draft recommendation 303-1 (V. 1.3 : 30 December 2004).
Transmission speed and address, as well as termination resistor activation are set via DIP-switches.
CANopen® node is available in two versions with 32 or 48 outputs allocated to solenoid valves on the manifold directly connected to the node.
Such outputs correspond to least significant bytes and their allocation is independent of how many solenoid valves are installed.
Remaining outputs can be used to control the modules.
Byte allocation to additional modules is fully automatic.

**Coding:** 5530.64.Ⓥ CO

| Ⓥ | VERSION |
|---|---|
| | **32** = 32 output bits available for valve connections |
| | **48** = 48 output bits available for valve connections |



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by OUTPUTS + 24 V DC (pin 4).

To compute the maximum current on the OUTPUTS + 24 V DC, please use the following formula:

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules
$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)
$m$ = number of installed solenoid pilots
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 3000 | 36 mA |

For each fieldbus node, maximum deliverable current by OUTPUTS + 24 V DC supply is 4 A, moreover the sum of the currents on OUTPUTS + 24 V DC and INPUTS + 24 V DC must not exceed 4 A.

$$I_{24\,V\,DC\,out} + I_{24\,V\,DC\,in} < 4A$$

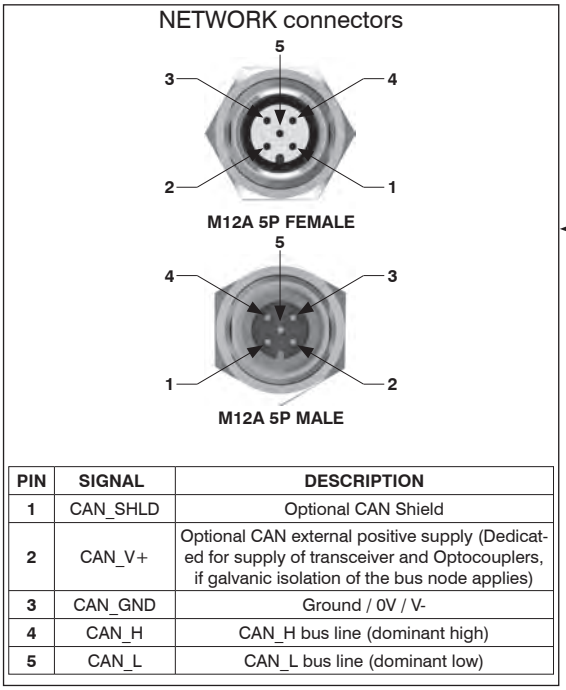
Where:

$$I_{24\,V\,DC\,in} = \sum_{i=1}^{n} I_{in,i}$$

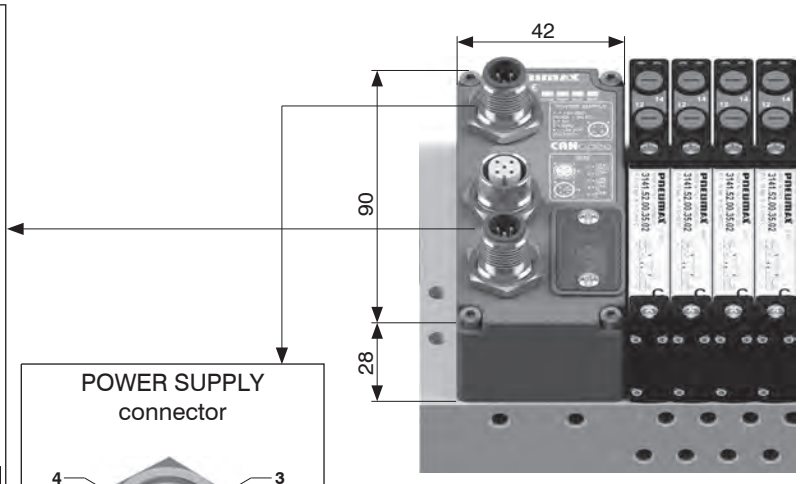
$n$ = number of installed modules
$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

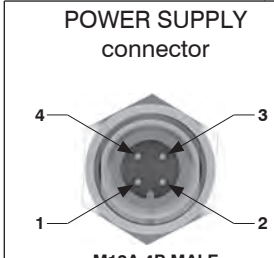
⚠ In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | CAN_SHLD | Optional CAN Shield |
| 2 | CAN_V+ | Optional CAN external positive supply (Dedicated for supply of transceiver and Optocouplers, if galvanic isolation of the bus node applies) |
| 3 | CAN_GND | Ground / 0V / V- |
| 4 | CAN_H | CAN_H bus line (dominant high) |
| 5 | CAN_L | CAN_L bus line (dominant low) |




| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

| Technical characteristics | | |
|---|---|---|
| Specifications | | CiA Draft Standard Proposal 301 V 4.10 (15 August 2006) |
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC ± 10% |
| | Node only current consumption on + 24 V DC inputs | 40 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | 2 M12 5 pins male-female connectors type A (IEC 60947-5-2) |
| | Baud rate | 10 - 20 - 50 - 125 - 250 - 500 - 800 - 1000 Kbit/s |
| | Addresses possible numbers | From 1 to 63 |
| | Maximum nodes number in network | 64 (slave + master) |
| | Bus maximum recommended length | 100 m at 500 Kbit/s |
| | Bus diagnosis | Green / red status LED |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## PROFIBUS DP protocol node

PROFIBUS DP node manages 64 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Connection to PROFIBUS DP fieldbus is made via two M12, male and female, 5 pins, type B circular connectors, in parallel between them; connectors pinout is PROFIBUS Interconnection Technology specifications compliant (Version 1.1, August 2001).
Address as well as termination resistor activation are set via DIP-switches.
PROFIBUS DP node is available in two versions with 32 or 48 outputs allocated to solenoid valves on the manifold directly connected to the node.
Such outputs correspond to least significant bytes and their allocation is independent of how many solenoid valves are installed.
Remaining outputs can be used to control the modules.
Byte allocation to additional modules is fully automatic.

**Coding:** 5330.64.Ⓥ PB

| | VERSION |
|---|---|
| Ⓥ | **32** = 32 output bits available for valve connections |
| | **48** = 48 output bits available for valve connections |



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by OUTPUTS + 24 V DC (pin 4).

To compute the maximum current on the OUTPUTS + 24 V DC, please use the following formula:

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules
$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)
$m$ = number of installed solenoid pilots
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 3000 | 36 mA |

For each fieldbus node, maximum deliverable current by OUTPUTS + 24 V DC supply is 4 A, moreover the sum of the currents on OUTPUTS + 24 V DC and INPUTS + 24 V DC must not exceed 4 A.

$$I_{24\,V\,DC\,out} + I_{24\,V\,DC\,in} < 4A$$

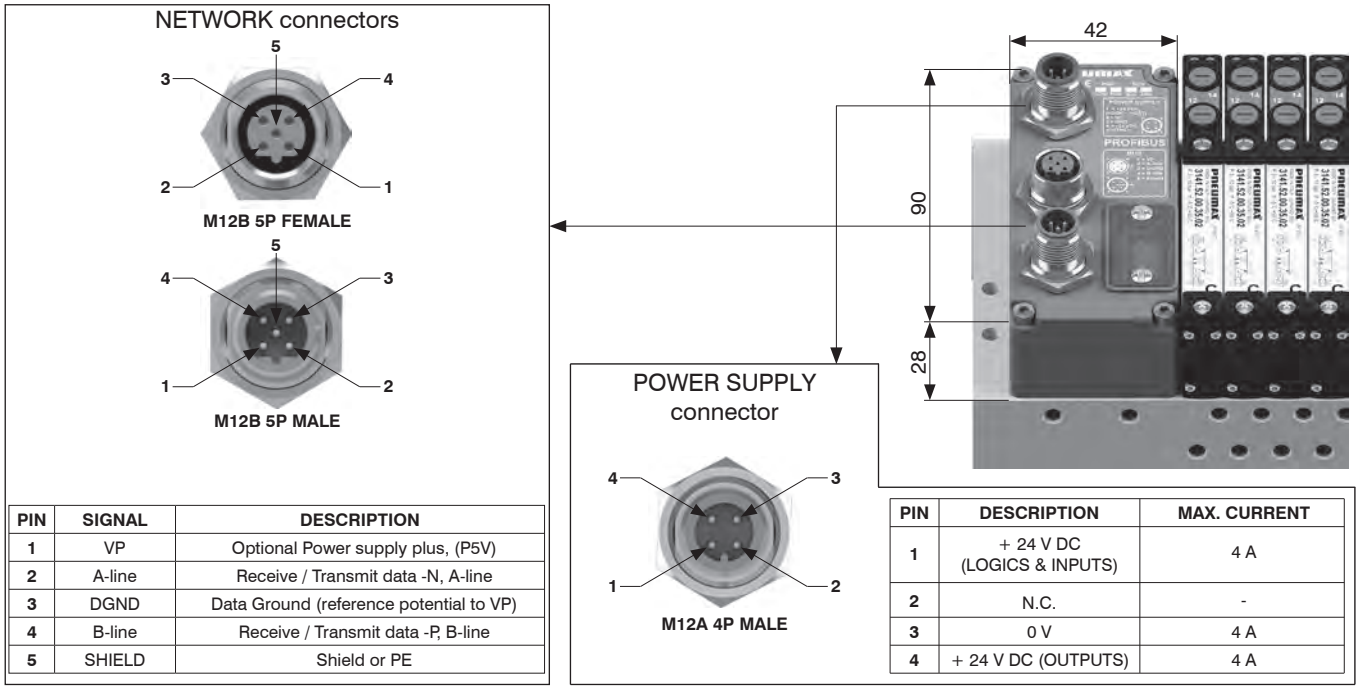
Where:

$$I_{24\,V\,DC\,in} = \sum_{i=1}^{n} I_{in,i}$$

$n$ = number of installed modules
$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | VP | Optional Power supply plus, (P5V) |
| 2 | A-line | Receive / Transmit data -N, A-line |
| 3 | DGND | Data Ground (reference potential to VP) |
| 4 | B-line | Receive / Transmit data -P, B-line |
| 5 | SHIELD | Shield or PE |

| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

| Technical characteristics | | |
|---|---|---|
| Specifications | | PROFIBUS DP |
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC ± 10% |
| | Node only current consumption on + 24 V DC inputs | 70 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | 2 M12 5 pins male-female connectors type B |
| | Baud rate | 9,6 - 19,2 - 93,75 - 187,5 - 500 - 1500 - 3000 - 6000 - 12000 Kbit/s |
| | Addresses possible numbers | From 1 to 99 |
| | Maximum nodes number in network | 100 (slave + master) |
| | Bus maximum recommended length | 100 m at 12 Mbit/s - 1200 m at 9,6 Kbit/s |
| | Bus diagnosis | Green / red status LED |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## EtherNet/IP protocol node

EtherNet/IP node manages 128 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Network connection is made via 2 M12 female, type D, 4 pins, circular connectors.
Code 5730.128.48EI provides first 48 outputs, corresponding to least significant 6 bytes, are allocated to the solenoid valve positions, regardless how many they are and how many valves are installed on the manifold directly connected to the node.
Remaining 80 outputs can be used to manage output modules; bytes allocation to additional modules is fully automatic.

**Coding:** 5730.128.48EI



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by OUTPUTS + 24 V DC (pin 4).

To compute the maximum current on the OUTPUTS + 24 V DC, please use the following formula:

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules

$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)

$m$ = number of installed solenoid pilots

$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 3000 | 36 mA |

For each fieldbus node, maximum deliverable current by OUTPUTS + 24 V DC supply is 4 A, moreover the sum of the currents on OUTPUTS + 24 V DC and INPUTS + 24 V DC must not exceed 4 A.

$$I_{24\,V\,DC\,out} + I_{24\,V\,DC\,in} < 4A$$

Where:

$$I_{24\,V\,DC\,in} = \sum_{i=1}^{n} I_{in,i}$$

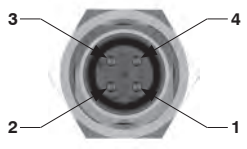
$n$ = number of installed modules

$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

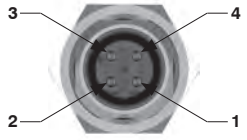
In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout

NETWORK connectors

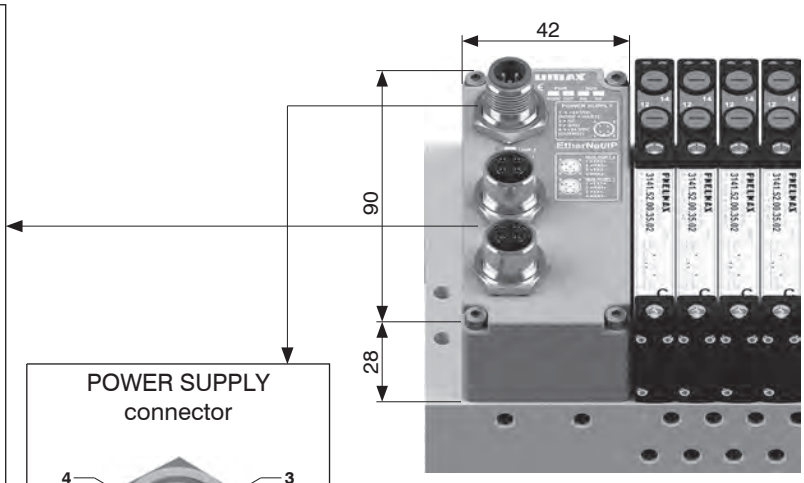



M12D 4P FEMALE

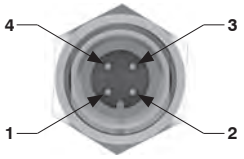



M12D 4P FEMALE

| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | TX + | Ethernet Transmit High |
| 2 | RX + | Ethernet Receive High |
| 3 | TX - | Ethernet Transmit Low |
| 4 | RX - | Ethernet Receive Low |




POWER SUPPLY connector




M12A 4P MALE

| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

| Technical characteristics | | |
|---|---|---|
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC ± 10% |
| | Node only current consumption on + 24 V DC inputs | 65 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | 2 M12 4 pins male-female connectors type D (IEC 61076-2-101) |
| | Baud rate | 100 Mbit/s |
| | Maximum distance between 2 nodes | 100 m |
| | Bus diagnosis | Green / red status LED |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## EtherCAT® protocol node

EtherCAT® node manages 128 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Network connection is made via 2 M12 female, type D, 4 pins, circular connectors.
Code 5730.128.48EC provides first 48 outputs, corresponding to least significant 6 bytes, are allocated to the solenoid valve positions, regardless how many they are and how many valves are installed on the manifold directly connected to the node.
Remaining 80 outputs can be used to manage output modules; bytes allocation to additional modules is fully automatic.

**Coding:** 5730.128.48EC



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by OUTPUTS + 24 V DC (pin 4).

To compute the maximum current on the OUTPUTS + 24 V DC, please use the following formula:

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules
$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)
$m$ = number of installed solenoid pilots
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 3000 | 36 mA |

For each fieldbus node, maximum deliverable current by OUTPUTS + 24 V DC supply is 4 A, moreover the sum of the currents on OUTPUTS + 24 V DC and INPUTS + 24 V DC must not exceed 4 A.

$$I_{24\,V\,DC\,out} + I_{24\,V\,DC\,in} < 4A$$

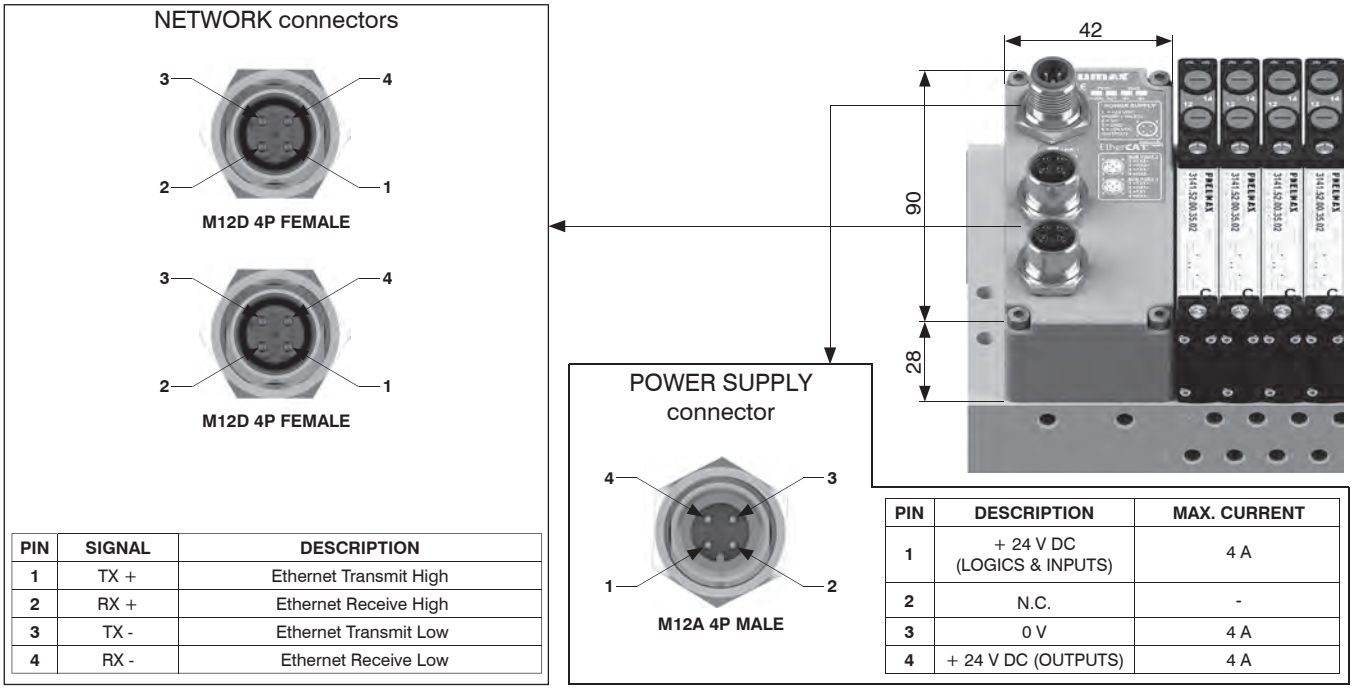
Where:

$$I_{24\,V\,DC\,in} = \sum_{i=1}^{n} I_{in,i}$$

$n$ = number of installed modules
$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | TX + | Ethernet Transmit High |
| 2 | RX + | Ethernet Receive High |
| 3 | TX - | Ethernet Transmit Low |
| 4 | RX - | Ethernet Receive Low |

| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

| Technical characteristics | | |
|---|---|---|
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC ± 10% |
| | Node only current consumption on + 24 V DC inputs | 65 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | 2 M12 4 pins male-female connectors type D (IEC 61076-2-101) |
| | Baud rate | 100 Mbit/s |
| | Maximum distance between 2 nodes | 100 m |
| | Bus diagnosis | Green / red status LED |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |

## PROFINET IO RT protocol node

PROFINET IO RT node manages 128 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Network connection is made via 2 M12 female, type D, 4 pins, circular connectors.
Code 5730.128.48PN provides first 48 outputs, corresponding to least significant 6 bytes, are allocated to the solenoid valve positions, regardless how many they are and how many valves are installed on the manifold directly connected to the node.
Remaining 80 outputs can be used to manage output modules; bytes allocation to additional modules is fully automatic.

**Coding:** 5730.128.48PN



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by OUTPUTS + 24 V DC (pin 4).

To compute the maximum current on the OUTPUTS + 24 V DC, please use the following formula:

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules

$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)

$m$ = number of installed solenoid pilots

$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 3000 | 36 mA |

For each fieldbus node, maximum deliverable current by OUTPUTS + 24 V DC supply is 4 A, moreover the sum of the currents on OUTPUTS + 24 V DC and INPUTS + 24 V DC must not exceed 4 A.

$$I_{24\,V\,DC\,out} + I_{24\,V\,DC\,in} < 4A$$

Where:

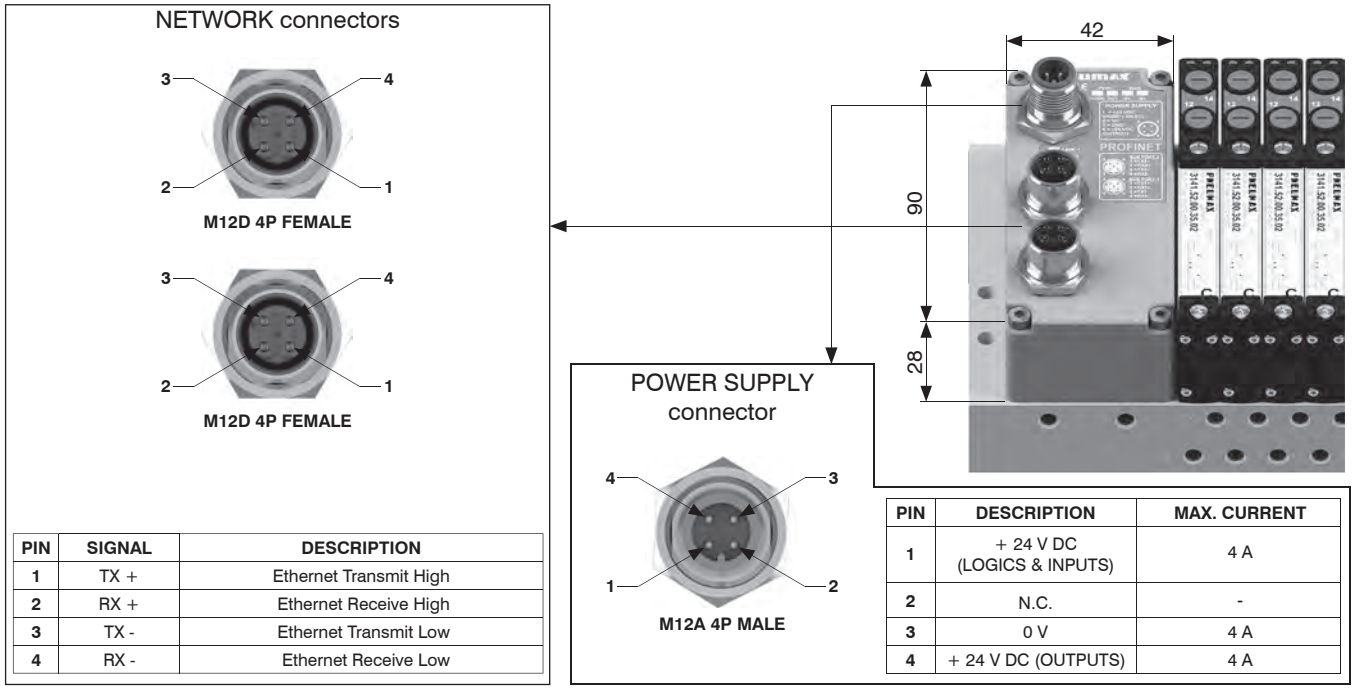
$$I_{24\,V\,DC\,in} = \sum_{i=1}^{n} I_{in,i}$$

$n$ = number of installed modules

$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

⚠ In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | TX + | Ethernet Transmit High |
| 2 | RX + | Ethernet Receive High |
| 3 | TX - | Ethernet Transmit Low |
| 4 | RX - | Ethernet Receive Low |

| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

| Technical characteristics | | |
|---|---|---|
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC ± 10% |
| | Node only current consumption on + 24 V DC inputs | 65 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | 2 M12 4 pins male-female connectors type D (IEC 61076-2-101) |
| | Baud rate | 100 Mbit/s |
| | Maximum distance between 2 nodes | 100 m |
| | Bus diagnosis | Green / red status LED |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## CC-Link IE Field Basic protocol node

CC-Link IE Field Basic node manages 128 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Network connection is made via 2 M12 female, type D, 4 pins, circular connectors.
Code 5730.128.48CL provides first 48 outputs, corresponding to least significant 6 bytes, are allocated to the solenoid valve positions, regardless how many they are and how many valves are installed on the manifold directly connected to the node.
Remaining 80 outputs can be used to manage output modules; bytes allocation to additional modules is fully automatic.

**Coding:** 5730.128.48CL



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by OUTPUTS + 24 V DC (pin 4).

To compute the maximum current on the OUTPUTS + 24 V DC, please use the following formula:

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules
$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)
$m$ = number of installed solenoid pilots
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 3000 | 36 mA |

For each fieldbus node, maximum deliverable current by OUTPUTS + 24 V DC supply is 4 A, moreover the sum of the currents on OUTPUTS + 24 V DC and INPUTS + 24 V DC must not exceed 4 A.

$$I_{24\,V\,DC\,out} + I_{24\,V\,DC\,in} < 4A$$

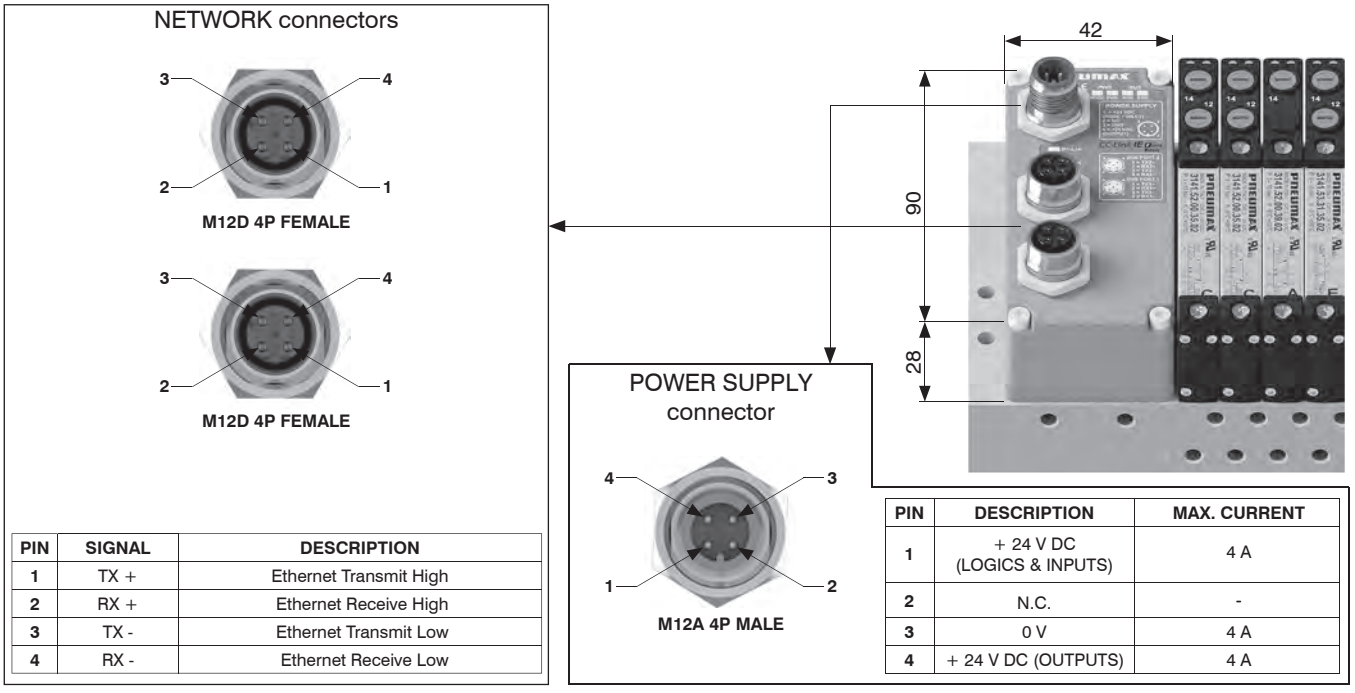
Where:

$$I_{24\,V\,DC\,in} = \sum_{i=1}^{n} I_{in,i}$$

$n$ = number of installed modules
$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | TX + | Ethernet Transmit High |
| 2 | RX + | Ethernet Receive High |
| 3 | TX - | Ethernet Transmit Low |
| 4 | RX - | Ethernet Receive Low |

| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

| Technical characteristics | | |
|---|---|---|
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC ± 10% |
| | Node only current consumption on + 24 V DC inputs | 65 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | 2 M12 4 pins male-female connectors type D (IEC 61076-2-101) |
| | Baud rate | 100 Mbit/s |
| | Maximum distance between 2 nodes | 100 m |
| | Bus diagnosis | 1 Green LED and 1 red status LED + 2 link and activity LEDs' |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |

## IO-Link protocol interface

IO-Link interface manages 64 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Electric power supply and IO-Link connection to the Master are made via M12, male, 5 pins, type A, circular connector, "CLASS B", according to IO-Link specifications.
Electric rails L+/L- supply interface only, while P24/N24 rails supply additional modules and solenoid valves.
Either power supplies are galvanically isolated in the IO-Link interfaces.
IO-Link interface is available in two versions with 32 or 48 outputs allocated to solenoid valves on the manifold directly connected to the node.
Such outputs correspond to least significant bytes and their allocation is independent of how many solenoid valves are installed.
Remaining outputs can be used to control the modules.
Byte allocation to additional modules is fully automatic.

**Coding:** 5830.64.Ⓥ IK

| | VERSION |
|---|---|
| Ⓥ | **32** = 32 output bits available for valve connections |
| | **48** = 48 output bits available for valve connections |



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by pin 2 and pin 5 (P24 / N24).

To compute the maximum current on the P24 / N24 supply, please use the following formula::

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules

$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)

$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

$m$ = number of installed solenoid pilots

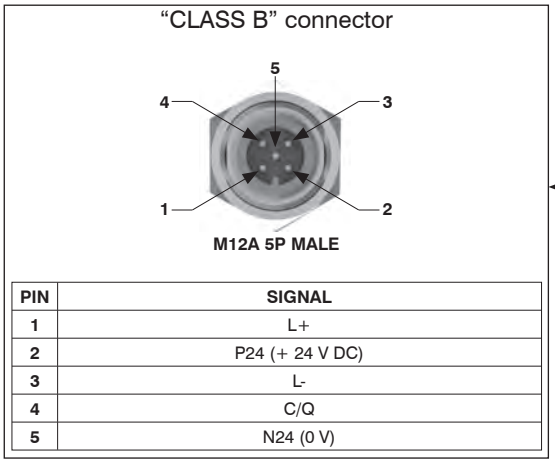
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 3000 | 36 mA |

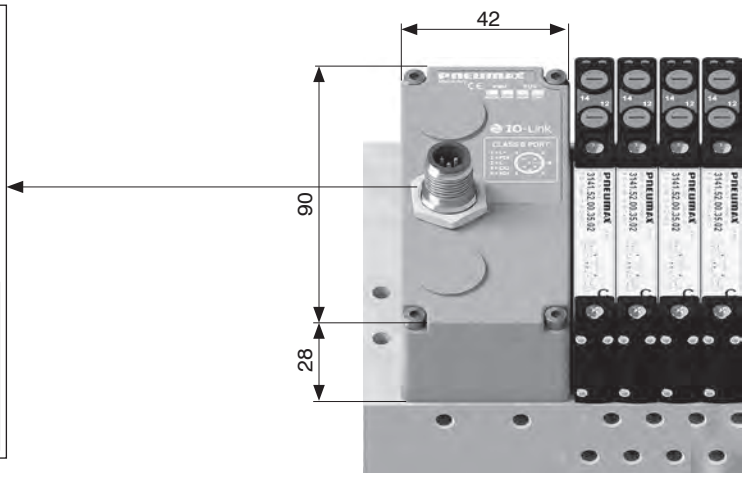
= maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL |
|---|---|
| 1 | L+ |
| 2 | P24 (+ 24 V DC) |
| 3 | L- |
| 4 | C/Q |
| 5 | N24 (0 V) |




| Technical characteristics | | |
|---|---|---|
| Specifications | | IO-Link Specification v1.1 |
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC +/- 10% |
| | Interface current consumption on + 24 V DC (L+ / L-) | 25 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | "Class B" port |
| | Communication speed | 38.4 kbaud/s |
| | Maximum distance from Master | 20 m |
| | Bus diagnosis | Green / red status LED |
| | Vendor ID / Device ID | 1257 (hex 0x04E9) / 3000 (hex 0x0BB8) |
| Configurations file IODD | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## 8 digital inputs module kit M8

M8 digital inputs module provides 8 M8, 3 pins, female connectors.
Inputs have PNP logic, + 24 V DC ± 10%.
It is possible to connect 2 wires devices (e.g. switches, magnetic limit switches, pressure switches, etc.) as well as 3 wires devices (e.g. proximity sensors, photocells, electronic magnetic limit switches, etc.).
Inputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pin M12 power connector, pin 1) or by K5030.M12 additional power supply module, in case it were installed upstream of the inputs module.

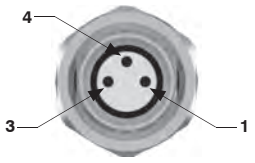
**Coding:** K5230.08.M8



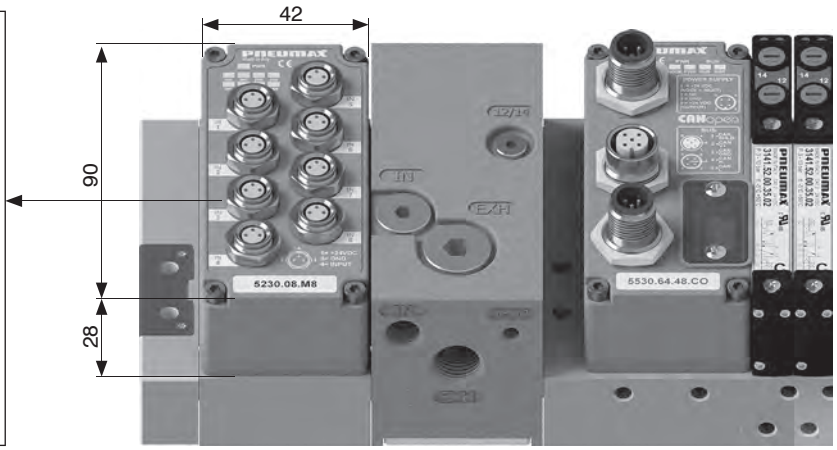
| Technical characteristics | |
|---|---|
| Maximum current per module | 300 mA |
| Protection | Overcurrent (auto-resettable fuse)<br>Reverse polarity |
| Input impedence | 3 kΩ |
| Maximum cable length | < 30 m |
| Input data allocation | 8 bit |
| INPUTS + 24 V DC current consumption of the module only | 5 mA |

### Scheme / Overall dimensions and I/O layout

M8 3P female connector




| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (INPUTS) |
| 3 | 0 V |
| 4 | INPUT |




## 8 digital inputs module kit M12

M12 digital inputs module provides 4 M12, 5 pins, female connectors.
Inputs have PNP logic, + 24 V DC ± 10%.
Every connector takes two input channels.
It is possible to connect 2 wires devices (e.g. switches, magnetic limit switches, pressure switches, etc.) as well as 3 wires devices (e.g. proximity sensors, photocells, electronic magnetic limit switches, etc.).
Inputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pin M12 power connector, pin 1) or by K5030.M12 additional power supply module, in case it were installed upstream of the inputs module.

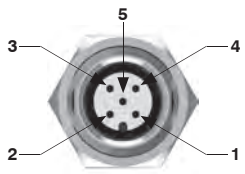
**Coding:** K5230.08.M12



| Technical characteristics | |
|---|---|
| Maximum current per module | 300 mA |
| Protection | Overcurrent (auto-resettable fuse)<br>Reverse polarity |
| Input impedence | 3kΩ |
| Maximum cable length | < 30 m |
| Input data allocation | 8 bit |
| INPUTS + 24 V DC current consumption of the module only | 5 mA |

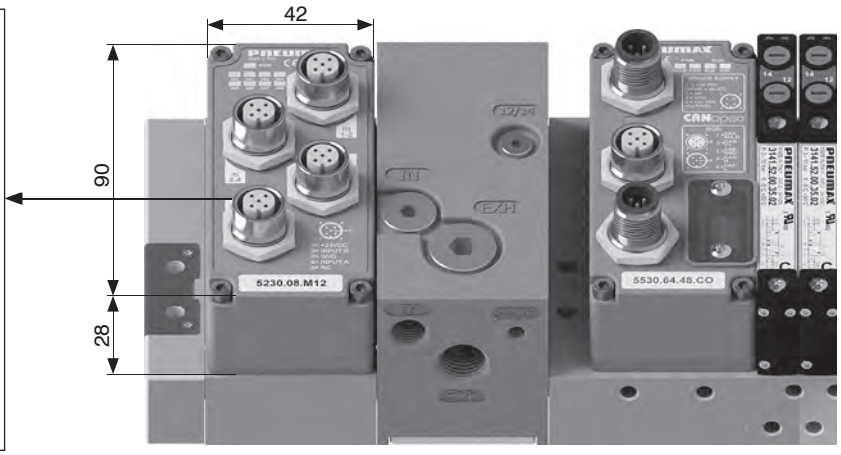
### Scheme / Overall dimensions and I/O layout

M12 5P female connector




M12A 5P FEMALE

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (INPUTS) |
| 2 | INPUT B |
| 3 | 0 V |
| 4 | INPUT A |
| 5 | N.C. |



## 8 digital outputs module kit M8

M8 digital inputs module provides 8 M8, 3 pins, female connectors.
Outputs have PNP logic, + 24 V DC ± 10%.
Outputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pins M12 power connector, pin 4) or by K5030.M12 additional power supply module, in case it were installed upstream of the outputs module.
Power supply presence is displayed by "PWR OUT" green LED light-on.
Each output has a LED indicator associated which lights up when output's signal status is high.

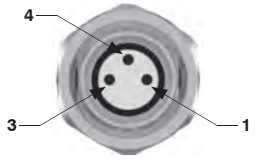
**Coding:** K5130.08.M8



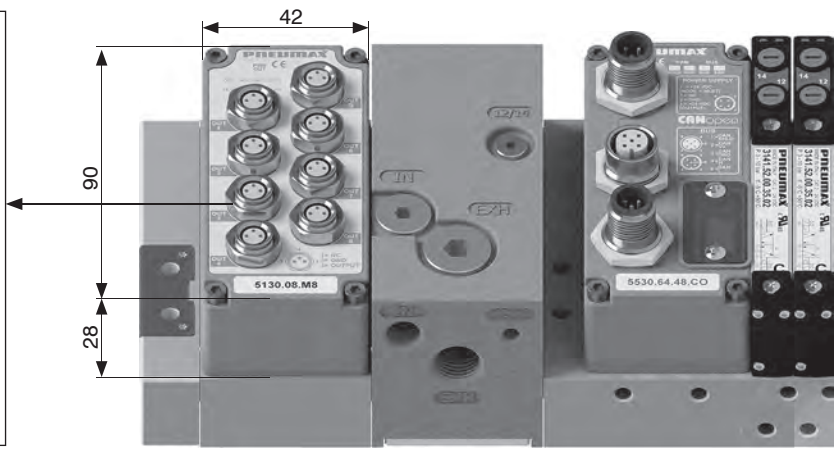
| Technical characteristics | |
|---|---|
| Maximum current per output | 100 mA |
| Protection | Short circuit (electronic), trigger at 2.8A |
| Maximum cable length | < 30 m |
| Output data allocation | 8 bit |
| OUTPUTS + 24 V DC current consumption of the module only | 15 mA |

### Scheme / Overall dimensions and I/O layout

M8 3P female connector




| PIN | DESCRIPTION |
|---|---|
| 1 | N.C. |
| 3 | 0 V |
| 4 | OUTPUT |




## 8 digital outputs module kit M12

M12 digital inputs module provides 4 M12, 5 pins, female connectors.
Outputs have PNP logic, + 24 V DC ± 10%.
Outputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pins M12 power connector, pin 4) or by K5030.M12 additional power supply module, in case it were installed upstream of the outputs module.
Power supply presence is displayed by "PWR OUT" green LED light-on.
Each output has a LED indicator associated which lights up when output's signal status is high.

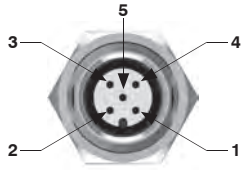
**Coding:** K5130.08.M12



| Technical characteristics | |
|---|---|
| Maximum current per output | 100 mA |
| Protection | Short circuit (electronic), trigger at 2.8A |
| Maximum cable length | < 30 m |
| Output data allocation | 8 bit |
| OUTPUTS + 24 V DC current consumption of the module only | 15 mA |

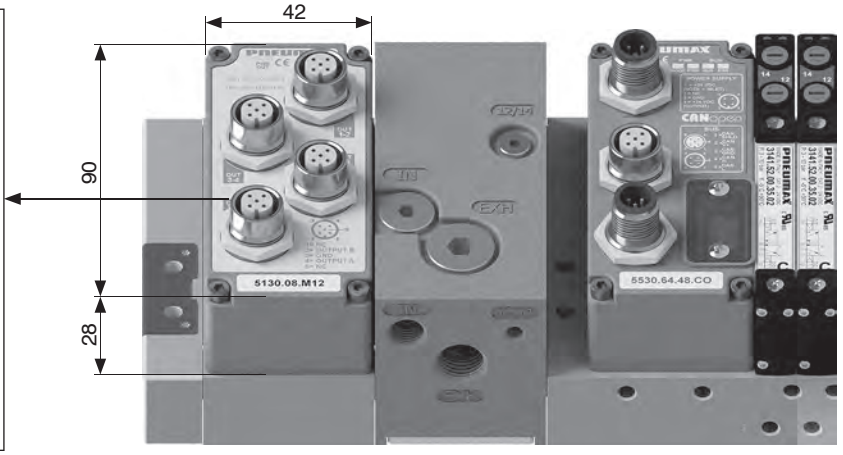
### Scheme / Overall dimensions and I/O layout

M12 5P female connector




M12A 5P FEMALE

| PIN | DESCRIPTION |
|---|---|
| 1 | N.C. |
| 2 | OUTPUT B |
| 3 | 0 V |
| 4 | OUTPUT A |
| 5 | N.C. |






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## 32 digital inputs module kit (37 pins SUB-D connector)

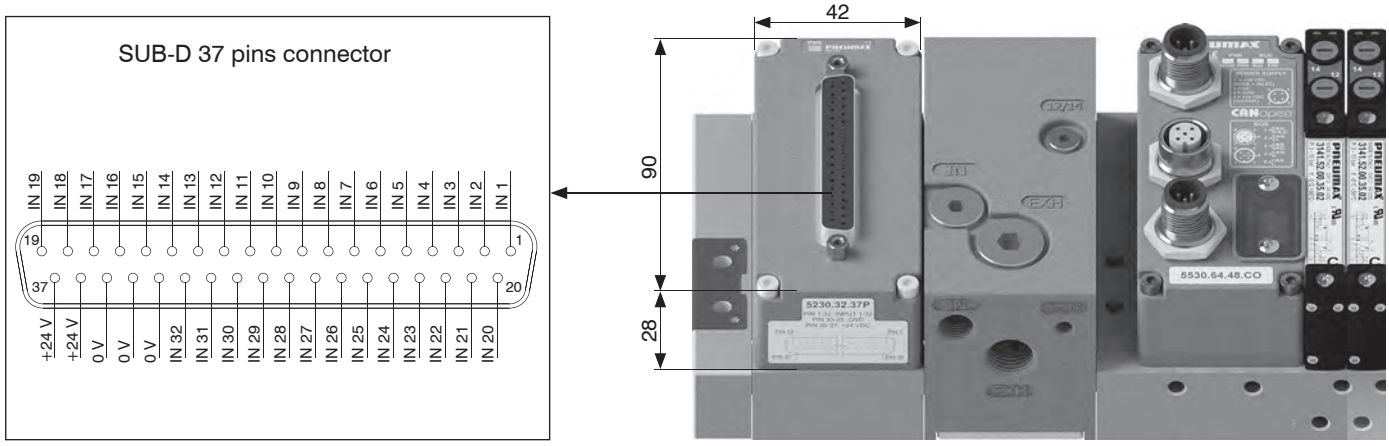
The module provides a SUB-D 37 pins female connector.
Inputs have PNP logic, + 24 V DC ± 10%.
It is possible to connect 2 wires devices (e.g. switches, magnetic limit switches, pressure switches, etc.) as well as 3 wires devices (e.g. proximity sensors, photocells, electronic magnetic limit switches, etc.).
Inputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pin M12 power connector, pin 1) or by K5030.M12 additional power supply module, in case it were installed upstream of the inputs module.

**Coding:** K5230.32.37P



| Technical characteristics | |
|---|---|
| Maximum current per module | 1 A |
| Protection | Overcurrent (auto-resettable fuse)<br>Reverse polarity |
| Input impedence | 3 kΩ |
| Maximum cable length | < 30 m |
| Input data allocation | 32 bit |
| INPUTS + 24 V DC current consumption of the module only | 10 mA |

### Scheme / Overall dimensions and I/O layout




## 32 digital outputs module kit (37 pins SUB-D connector)

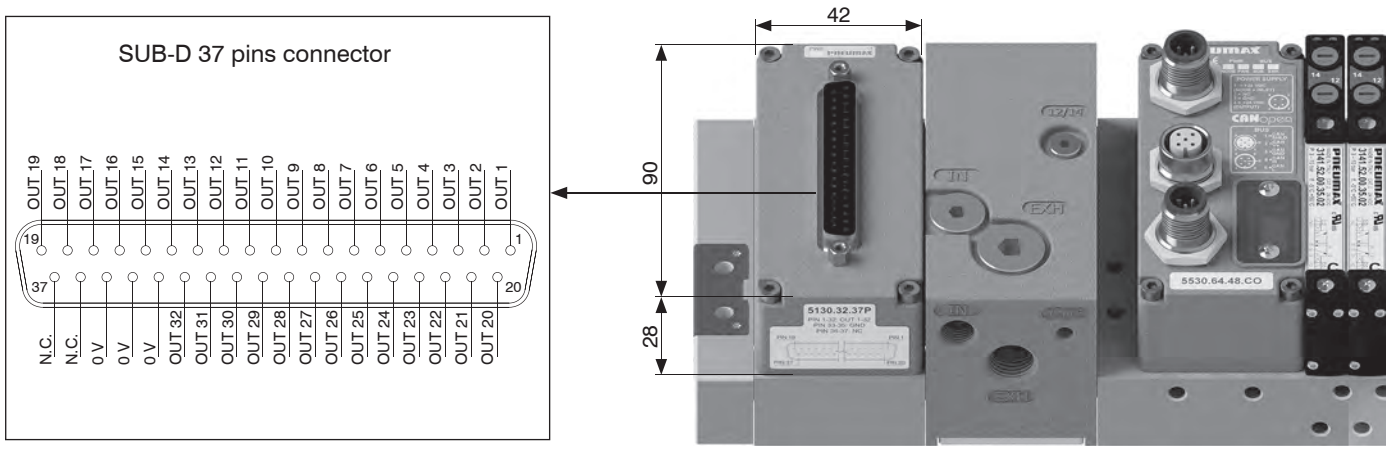
The module provides a SUB-D 37 pins female connector.
Outputs have PNP logic, + 24 V DC ± 10%.
Outputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pins M12 power connector, pin 4) or by K5030.M12 additional power supply module, in case it were installed upstream of the outputs module.
Power supply presence is displayed by "PWR OUT" green LED light-on.

**Coding:** K5130.32.37P



| Technical characteristics | |
|---|---|
| Maximum current per output | 100 mA |
| Protection | Short circuit (electronic), trigger at 2.8A |
| Maximum cable length | < 30 m |
| Output data allocation | 32 bit |
| OUTPUTS + 24 V DC current consumption of the module only | 15 mA |

### Scheme / Overall dimensions and I/O layout



## Analogue inputs module kit M8

M8 analogue inputs module converts analogue signals into digital signals and transfers acquired data to field bus, via network node.
Inputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pin M12 power connector, pin 1) or by K5030.M12 additional power supply module, in case it were installed upstream of the inputs module.

**Coding:** K5230.ⓒⓢ

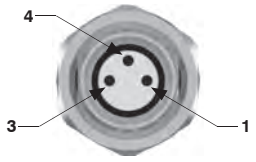
| | |
|---|---|
| ⓒ | CHANNELS |
| | **2** = 2 channels |
| | **4** = 4 channels |
| ⓢ | SIGNAL |
| | **T.00** = VOLTAGE (0-10 V) |
| | **T.01** = VOLTAGE (0-5 V) |
| | **C.00** = CURRENT (4-20 mA) |
| | **C.01** = CURRENT (0-20 mA) |

| Technical characteristics | |
|---|---|
| Protection (pin 1) | Overcurrent (auto-resettable fuse) |
| Input impedance (voltage inputs) | 33 kΩ |
| Digital conversion resolution | 12 bit |
| Maximum cable length | < 30 m |
| Input data allocation | 16 bit per channel |
| Diagnostic LED | Input signal overcurrent or overvoltage |
| Accuracy | 0,3% F.S. |
| Overall maximum current 2 channels (pin 1) | 300 mA |
| Overall maximum current 4 channels (pin 1) | 750 mA (375 mA for each pair of channels) |
| INPUTS + 24 V DC current consumption of the module only | 15 mA |

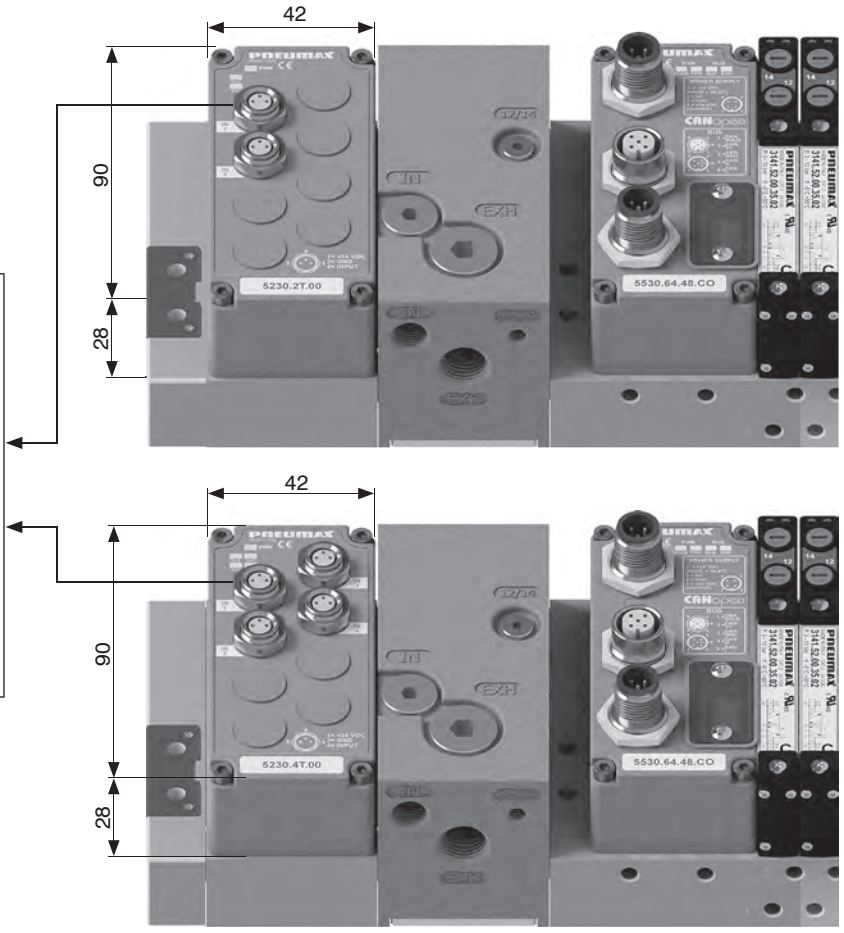


### Scheme / Overall dimensions and I/O layout

M8 3P female connector




| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (INPUTS) |
| 3 | 0 V |
| 4 | INPUT |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Analogue outputs module kit M8

M8 analogue outputs module converts output data, received from field bus via network node, into analogue signal.
Outputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pins M12 power connector, pin 4) or by K5030.M12 additional power supply module, in case it were installed upstream of the outputs module.

**Coding:** K5130.ⓒⓢ

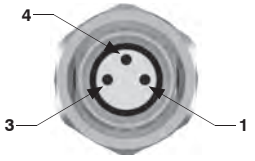
| | |
|---|---|
| | CHANNELS |
| ⓒ | **2** = 2 channels |
| | **4** = 4 channels |
| | SIGNAL |
| | **T.00** = VOLTAGE (0-10 V) |
| ⓢ | **T.01** = VOLTAGE (0-5 V) |
| | **C.00** = CURRENT (4-20 mA) |
| | **C.01** = CURRENT (0-20 mA) |

| Technical characteristics | |
|---|---|
| Protection (pin 1) | Overcurrent (auto-resettable fuse) |
| Protection (pin 4) | Overcurrent (auto-resettable fuse) |
| Digital conversion resolution | 12 bit |
| Maximum cable length | < 30 m |
| Output data allocation | 16 bit per channel |
| Diagnostic LED | Output signal overcurrent |
| Accuracy | 0,3% F.S. |
| Overall maximum current 2 channels (pin 1) | 1 A |
| Overall maximum current 4 channels (pin 1) | 2 A (1 A for each pair of channels) |
| INPUTS + 24 V DC current consumption of the module only | 15 mA |
| OUTPUTS + 24 V DC current consumption of the module only (2 channels) | 35 mA |
| OUTPUTS + 24 V DC current consumption of the module only (4 channels) | 70 mA |

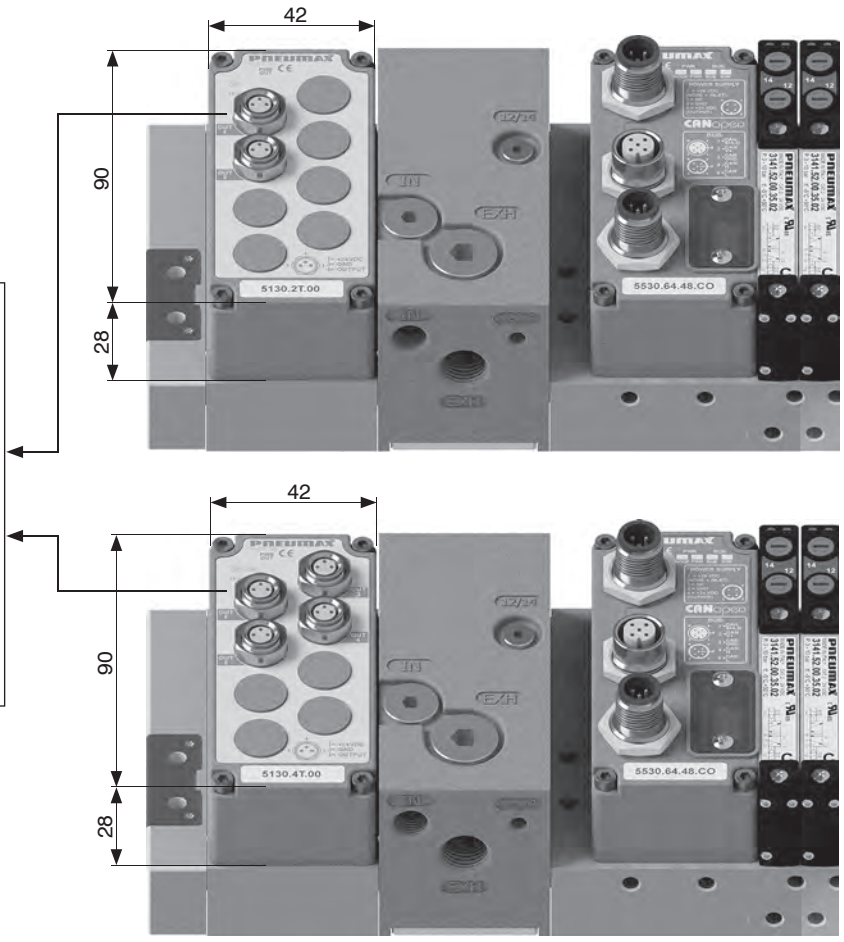


### Scheme / Overall dimensions and I/O layout

M8 3P female connector




| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (OUTPUTS) |
| 3 | 0 V |
| 4 | OUTPUT |



## Pt100 inputs module kit

Pt100 inputs module digitizes signals from Pt100 probes and transfers acquired data to field bus, via network node.
It is possible to connect two, three or four wires probes.
Inputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pin M12 power connector, pin 1) or by K5030.M12 additional power supply module, in case it were installed upstream of the inputs module.

**Coding:** K5230.ⓒP.0Ⓣ

| | |
|---|---|
| ⓒ | CHANNELS |
| | **2** = 2 channels |
| | **4** = 4 channels |
| Ⓣ | TYPE |
| | **0** = Pt100 2 wires |
| | **1** = Pt100 3 wires |
| | **2** = Pt100 4 wires |

| Technical characteristics | |
|---|---|
| Digital conversion resolution | 12 bit |
| Maximum cable length | < 30 m |
| Input data allocation | 16 bit per channel |
| Diagnostic LED | Probe presence<br>Temperature out of range |
| Accuracy | ±0,2°C |
| Probe temperature range | -100°C ... +300°C |
| INPUTS + 24 V DC current consumption of the module only (2 channels) | 25 mA |
| INPUTS + 24 V DC current consumption of the module only (4 channels) | 35 mA |

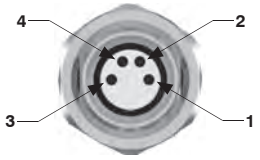


### Conversion formula (°C)

$$\text{Temperature (°C)} = \left(\frac{\text{Points}}{4095} \times 400\right) - 100$$

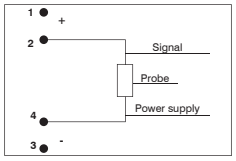
### Scheme / Overall dimensions and I/O layout

M8 4P female connector



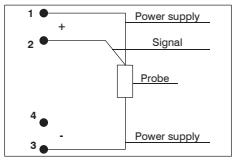

Connection scheme 2 wires probe

| PIN | DESCRIPTION |
|---|---|
| 1 | N.C. |
| 2 | SENSOR + |
| 3 | POWER SUPPLY - |
| 4 | N.C. |



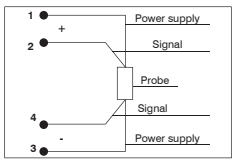

Connection scheme 3 wires probe

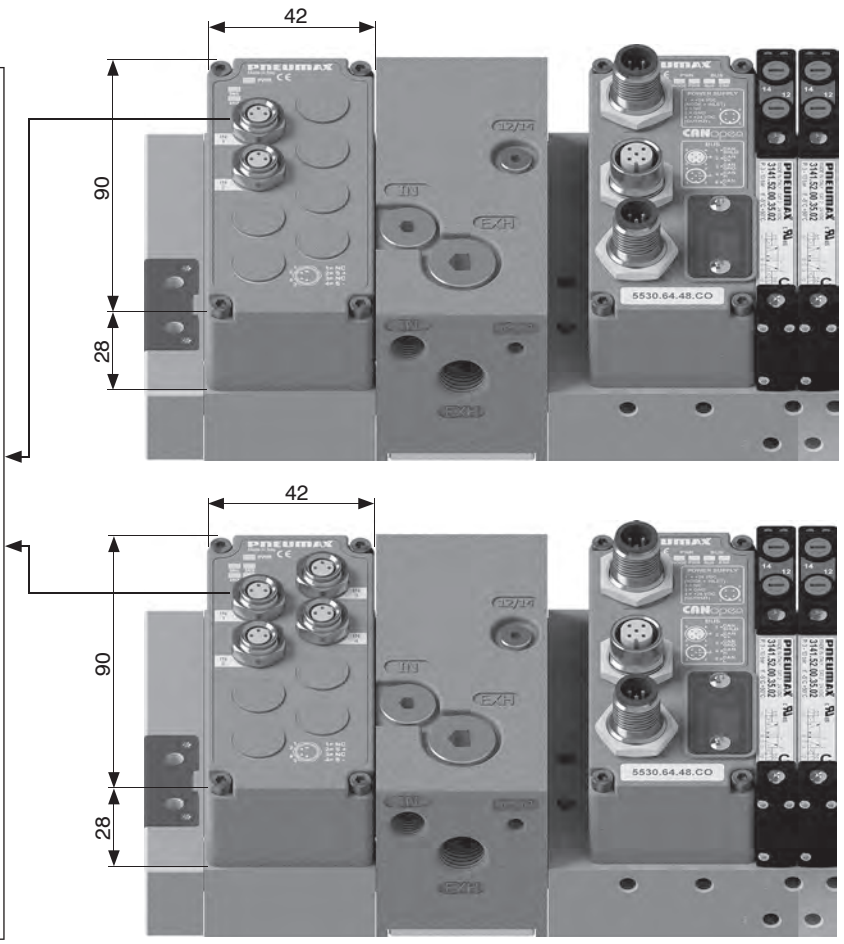
| PIN | DESCRIPTION |
|---|---|
| 1 | POWER SUPPLY + |
| 2 | SENSOR + |
| 3 | POWER SUPPLY - |
| 4 | N.C. |




Connection scheme 4 wires probe

| PIN | DESCRIPTION |
|---|---|
| 1 | POWER SUPPLY + |
| 2 | SENSOR + |
| 3 | POWER SUPPLY - |
| 4 | SENSOR - |






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

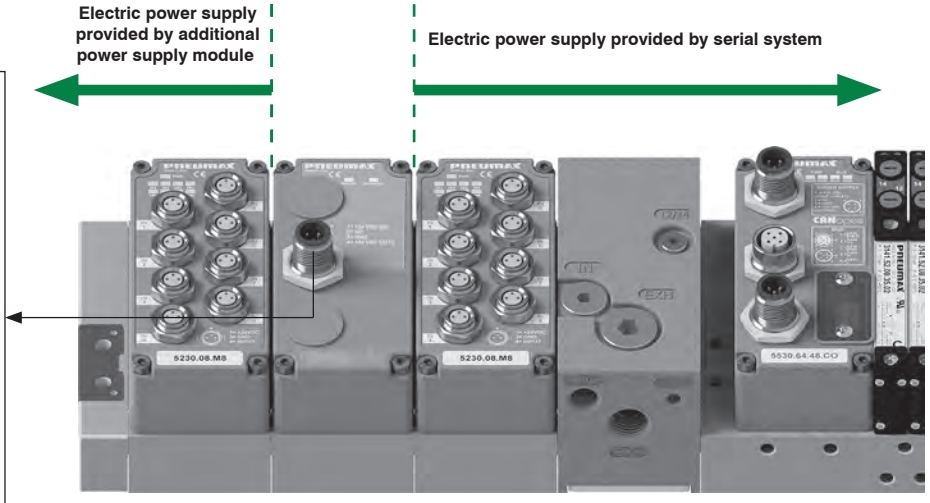
## Additional power supply module kit

Additional power supply module supplies additional electric power for downstream optional modules, where “downstream” means farther from serial node, **resetting the current limits of the network node / IO-Link interface**.
Electric connection of the module to external power supply unit occurs via an M12 4 pins type A male connector.
M12 connector has two different pins to power up logics and inputs (Pin 1) and outputs (Pin 4).
Presence of each power supply rail is indicated by corresponding green LED.
When using IO-Link interface, the additional power supply module is useful for separating the module power supplies of input from the output modules placed downstream.

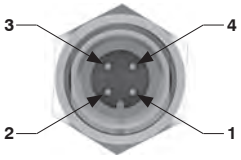
**Coding:** K5030.M12



### Scheme / Overall dimensions and I/O layout




M12 4P male connector

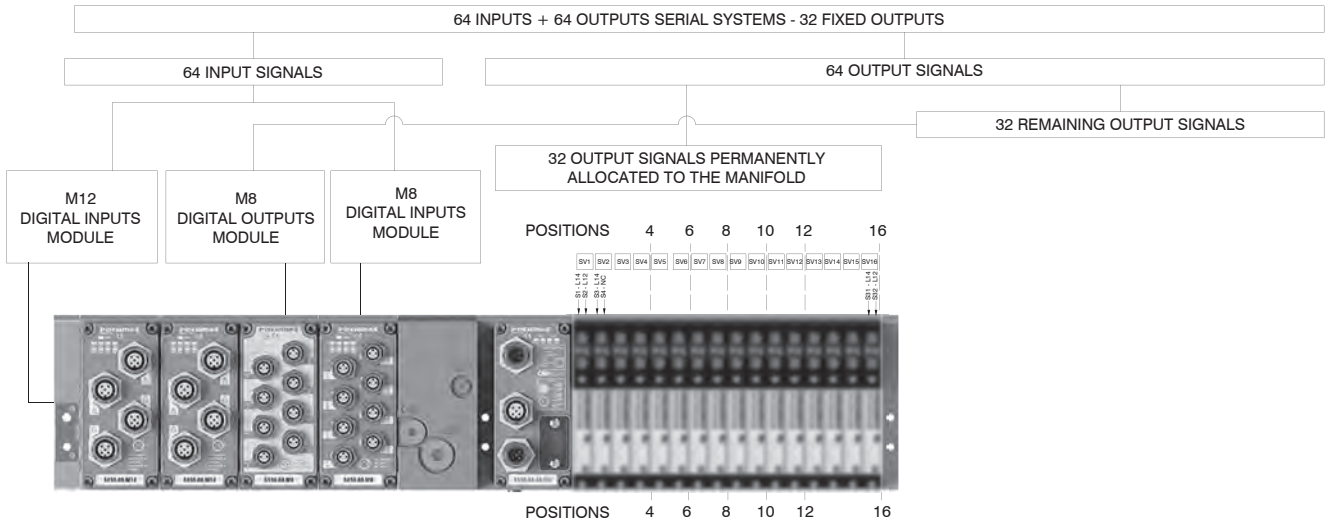



**M12A 4P MALE**

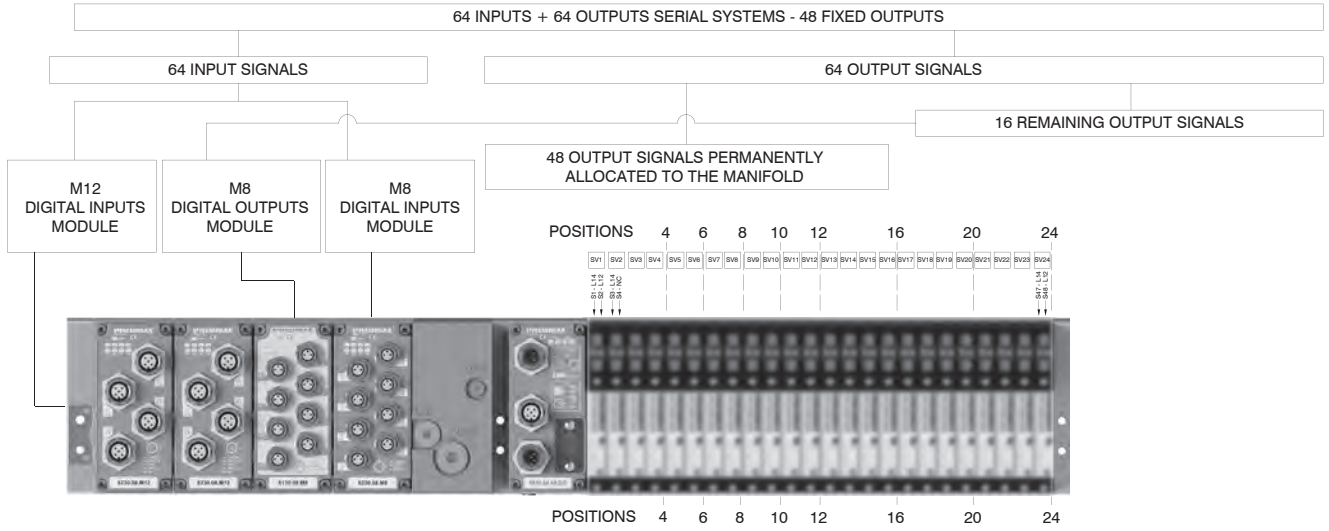
| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

## Signal management

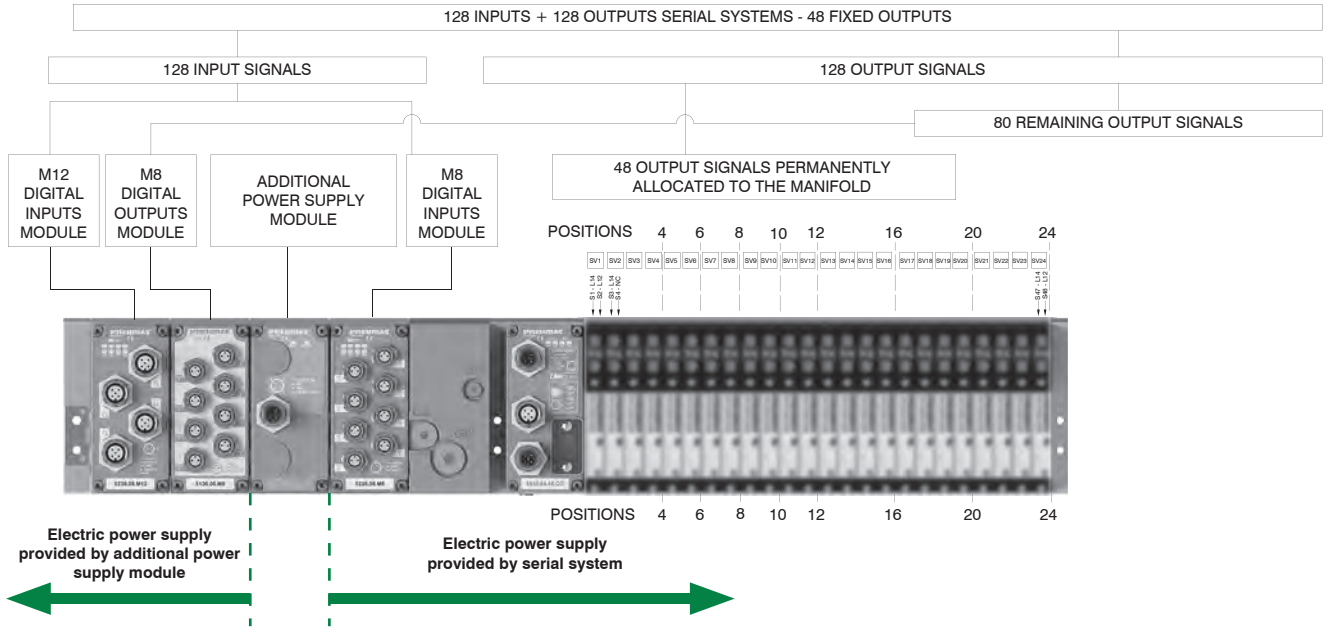
### 64 INPUT + 64 OUTPUT serial systems - 32 fixed OUTPUT (Ex. PROFIBUS DP and CANopen®)




### 64 INPUT + 64 OUTPUT serial systems - 48 fixed OUTPUT (Ex. PROFIBUS DP and CANopen®)




### 128 INPUT + 128 OUTPUT serial systems - 48 fixed OUTPUT (Ex. EtherNet/IP - EtherCAT® - PROFINET IO RT)





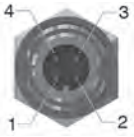
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## POWER SUPPLY connectors

### Straight connector M12A 4P female

**Coding:** 5312A.F04.00






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (LOGICS AND INPUTS) |
| 2 | N.C. |
| 3 | 0 V |
| 4 | + 24 V DC (OUTPUTS) |

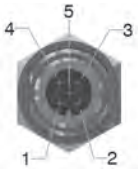
Power supply socket

## NETWORK connectors

### Straight connector M12A 5P female

**Coding:** 5312A.F05.00






Upper view slave connector

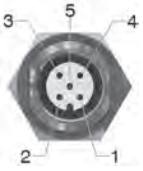
| PIN | DESCRIPTION |
|---|---|
| 1 | (CAN_SHIELD) |
| 2 | (CAN_V+) |
| 3 | CAN_GND |
| 4 | CAN_H |
| 5 | CAN_L |

Socket for bus CANopen® and IO-Link

### Straight connector M12A 5P male

**Coding:** 5312A.M05.00






Upper view slave connector

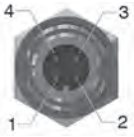
| PIN | DESCRIPTION |
|---|---|
| 1 | (CAN_SHIELD) |
| 2 | (CAN_V+) |
| 3 | CAN_GND |
| 4 | CAN_H |
| 5 | CAN_L |

Plug for bus CANopen®

### Straight connector M12D 4P male

**Coding:** 5312D.M04.00






Upper view slave connector

| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | TX+ | EtherNet Transmit High |
| 2 | RX+ | EtherNet Receive High |
| 3 | TX- | EtherNet Transmit Low |
| 4 | RX- | EtherNet Receive Low |

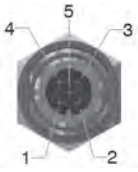
Plug for bus EtherCAT®, PROFINET IO RT and EtherNet/IP

**Trademarks**: EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

### Straight connector M12B 5P female

**Coding:** 5312B.F05.00






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | Power Supply |
| 2 | A-Line |
| 3 | DGND |
| 4 | B-Line |
| 5 | SHIELD |

Socket for bus PROFIBUS DP

### Straight connector M12B 5P male

**Coding:** 5312B.M05.00






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | Power Supply |
| 2 | A-Line |
| 3 | DGND |
| 4 | B-Line |
| 5 | SHIELD |

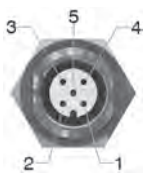
Socket for bus PROFIBUS DP

## INPUTS connectors

### Straight connector M12A 5P male

**Coding:** 5312A.M05.00






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC |
| 2 | INPUT B |
| 3 | 0 V |
| 4 | INPUT A |
| 5 | N.C. |

Plug for inputs modules

### Straight connector M8 3P male

**Coding:** 5308A.M03.00






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC |
| 4 | INPUT |
| 3 | 0 V |

Plug for inputs modules

## Plugs

### M12 plug

**Coding:** 5300.T12



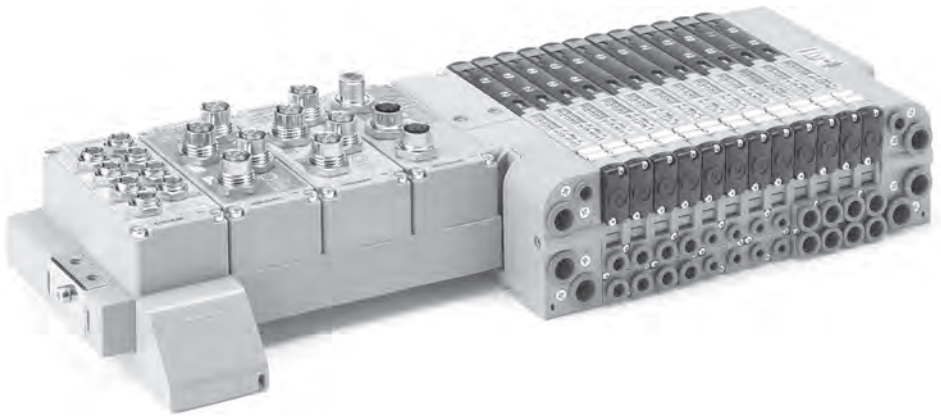
### M8 plug

**Coding:** 5300.T08



## Series 2200 Optyma-S EVO





### 2200 SERIES Optyma-S EVO SOLENOID VALVES MANIFOLD

- **Increased flexibility**
- **Digital and analogue I/O modules**
- **Manufactured in technopolymer**
- **Wide range of communication protocols**

### WE SPEAK EVO

The Optyma-S series becomes EVO and interfaces with the new PX series modular electronic system while still retaining all of its technical advantages. This is enriched with new features that further extend the flexibility of the product:

- Controls up to 48 electrical signals
- Manifold mounted proportional regulators
- Electro-pneumatic shut-off module

### Construction characteristics

| | |
|---|---|
| Body | Technopolymer |
| Seals | NBR |
| Piston seals | NBR |
| Springs | Stainless Steel |
| Operators | Technopolymer |
| Pistons | Technopolymer |
| Spools | Stainless Steel |

### Operational characteristics

| | |
|---|---|
| Supply voltage | + 24 V DC ±10% |
| Pilot consumption | 1,3W nominal in energy saving mode |
| Pilot working pressure (12-14) | from 2,5 to 7 bar max. |
| Valve working pressure [1] | from vacuum to 10 bar max. |
| Operating temperature | from -5°C to +50°C |
| Protection degree | IP65 |
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Rules and configuration scheme

CONFIGURATION CODE ← SE - [ ] - [ ] - ( ) [ ] - [ ] - ( ) [ ] - [ ] → ( ) [ ] - U0

| Electronic components | |
|---|---|
| ...-... | See page 'Electronic components configurator in technopolymer' |

| Left endplates | |
|---|---|
| A | Self feeding |
| E | External feeding |

| Repeating numbers of the module | |
|---|---|
| _ | Indicate the number of repeats of the same module (no value for a single module) |

| Module 1 | |
|---|---|
| ...-... | See page 'Single pneumatic module configurator' |

| Accessory diaphragm plug (Optional) | |
|---|---|
| X | Diaphragm plug on port 1 |
| Y | Diaphragm plug on port 3 |
| Z | Diaphragm plug on port 5 |

| Repeating numbers of the module | |
|---|---|
| _ | Indicate the number of repeats of the same module (no value for a single module) |

| Module 2 | |
|---|---|
| ...-... | See page 'Single pneumatic module configurator' |

| Accessory diaphragm plug (Optional) | |
|---|---|
| X | Diaphragm plug on port 1 |
| Y | Diaphragm plug on port 3 |
| Z | Diaphragm plug on port 5 |

↓

| Repeating numbers of the module | |
|---|---|
| _ | Indicate the number of repeats of the same module (no value for a single module) |

| Module n | |
|---|---|
| ...-... | See page 'Single pneumatic module configurator' |

| Right endplates | |
|---|---|
| U0 | Endplates closed |

**Configurable on Cadenas platform**

CADENAS

**Note:**
When composing the configuration, always bear in mind that the maximum number of electrical signals available is:
- 48 if a serial node or IO-Link interface is used.
- 40 if a 44-pole multi-pin is used.
- 32 if a 37-pole multi-pin module is used.
- 24 if a 25-pole multi-pin module is used.

If a monostable valve is used on a bistable type base (2 electrical signals occupied), an electrical signal is lost.
However, this makes it possible to replace the monostable valve with a bistable valve in the same position.
Diaphragm plugs are used to interrupt ports 1, 3 and 5 of the sub-base.
If it is necessary to interrupt more than one port at the same time, put the letters that identify their position in sequence (e.g.: if it is necessary to intercept the ports 3 and 5 you must put the letters YZ).
If one or more ports must be interrupted more than once, the addition of the intermediate supply/discharge module is necessary.

## Electronic components configurator in technopolymer

- - - ...

| Type | |
|---|---|
| P | Technopolymer |

| Multi-pin electrical connection | | |
|---|---|---|
| MP | 2 | Multi-pin, PNP 24 V DC 25 poles |
| | 3 | Multi-pin, PNP 24 V DC 37 poles |
| | 4 | Multi-pin, PNP 24 V DC 44 poles |
| MN | 2 | Multi-pin, NPN 24 V DC 25 poles |
| | 3 | Multi-pin, NPN 24 V DC 37 poles |
| | 4 | Multi-pin, NPN 24 V DC 44 poles |
| MA | 2 | Multi-pin, 24 V AC 25 poles |
| | 3 | Multi-pin, 24 V AC 37 poles |
| | 4 | Multi-pin, 24 V AC 44 poles |

| Electrical connection | |
|---|---|
| C3 | CANopen® node 64 IN - 64 OUT (32 fixed) |
| C4 | CANopen® node 64 IN - 64 OUT (48 fixed) |
| P3 | PROFIBUS DP node 64 IN - 64 OUT (32 fixed) |
| P4 | PROFIBUS DP node 64 IN - 64 OUT (48 fixed) |
| I4 | EtherNet/IP node 128 IN - 128 OUT (48 fixed) |
| A4 | EtherCAT® node 128 IN - 128 OUT (48 fixed) |
| N4 | PROFINET IO RT node 128 IN - 128 OUT (48 fixed) |
| G4 | CC-Link IE Field Basic node 128 IN - 128 OUT (48 fixed) |
| K3 | IO-Link interface 64 IN - 64 OUT (32 fixed) |
| K4 | IO-Link interface 64 IN - 64 OUT (48 fixed) |

| Electrical connection accessories | |
|---|---|
| | Without DIN rail fixing |
| G | With DIN rail fixing |

| Repeating numbers of the module | |
|---|---|
| | Indicate the number of repeats of the same module (no value for a single module) |

| Inputs module - Analog / Digital (EXCLUDED WITH MP) | |
|---|---|
| D8 | 8 M8 digital inputs module |
| D12 | 8 M12 digital inputs module |
| D3 | 32 digital inputs SUB-D 37 poles |
| T1 | 2 analogue inputs 0-5V module (voltage signal) |
| T2 | 2 analogue inputs 0-10V module (voltage signal) |
| T3 | 4 analogue inputs 0-5V module (voltage signal) |
| T4 | 4 analogue inputs 0-10V module (voltage signal) |
| C1 | 2 analogue inputs 0-20mA module (current signal) |
| C2 | 2 analogue inputs 4-20mA module (current signal) |
| C3 | 4 analogue inputs 0-20mA module (current signal) |
| C4 | 4 analogue inputs 4-20mA module (current signal) |
| P1 | 2 Pt100 2 wires inputs module |
| P2 | 2 Pt100 3 wires inputs module |
| P3 | 2 Pt100 4 wires inputs module |
| P4 | 4 Pt100 2 wires inputs module |
| P5 | 4 Pt100 3 wires inputs module |
| P6 | 4 Pt100 4 wires inputs module |

| Outputs module - Analog / Digital | |
|---|---|
| M8 | 8 M8 digital outputs module |
| M12 | 8 M12 digital outputs module |
| M3 | 32 digital outputs SUB-D 37 poles |
| V1 | 2 analogue outputs 0-5V module (voltage signal) |
| V2 | 2 analogue outputs 0-10V module (voltage signal) |
| V3 | 4 analogue outputs 0-5V module (voltage signal) |
| V4 | 4 analogue outputs 0-10V module (voltage signal) |
| L1 | 2 analogue outputs 0-20mA module (current signal) |
| L2 | 2 analogue outputs 4-20mA module (current signal) |
| L3 | 4 analogue outputs 0-20mA module (current signal) |
| L4 | 4 analogue outputs 4-20mA module (current signal) |

| Additional modules (Optional) | |
|---|---|
| P12 | M12 additional power supply module |

| Module accessories | |
|---|---|
| | Without DIN rail fixing |
| G | With DIN rail fixing |

**SINGLE ELECTRIC MODULE CONFIGURATION**

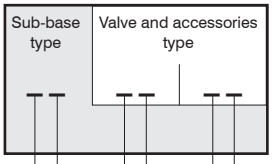
**Refer to the current limits indicated in the pages relating to the nodes / IO-Link interface**



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## 2 positions base module configurator

### Module configurator




| Base | |
|---|---|
| 1 | Ø10 Monostable base |
| 2 | Ø10 Bistable base |
| 3 | Ø4 Monostable base |
| 4 | Ø4 Bistable base |
| 5 | Ø6 Monostable base |
| 6 | Ø6 Bistable base |
| 7 | Ø8 Monostable base |
| 8 | Ø8 Bistable base |

| Base version (optional) | |
|---|---|
| | 5-1-3 free (standard sub-base) |
| 3 | Intermediate Diaphragm plug on ports 1 and 5 |
| 4 | Intermediate Diaphragm plug on ports 1 and 3 |
| 5 | Intermediate Diaphragm plug on port 5 |
| 6 | Intermediate Diaphragm plug on ports 1, 3, 5 |
| 7 | Intermediate Diaphragm plug on port 1 |
| 8 | Intermediate Diaphragm plug on ports 3 and 5 |
| 9 | Intermediate Diaphragm plug on port 3 |

Note: version not available with Ø10 base

| Solenoid valve position 1 | |
|---|---|
| A | S.V. 5/2 SOLENOID-SPRING |
| B | S.V. 5/2 SOLENOID-DIFFERENTIAL |
| C | S.V. 5/2 SOLENOID-SOLENOID |
| E | S.V. 5/3 CC SOLENOID-SOLENOID |
| F | S.V. 2x3/2 NC-NC |
| G | S.V. 2x3/2 NO-NO |
| H | S.V. 2x3/2 NC-NO |
| I | S.V. 2x3/2 NO-NC |
| T | Plug |

| S.V. 1 Accessory (optional) | |
|---|---|
| 5 | Separated exhausts |
| 6 | Separated air supply |

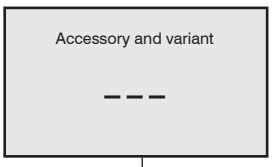
| S.V. 2 Accessory (optional) | |
|---|---|
| 5 | Separated exhausts |
| 6 | Separated air supply |

| Solenoid valve position 2 | |
|---|---|
| A | S.V. 5/2 SOL.-SPRING |
| B | S.V. 5/2 SOL.-DIF. |
| C | S.V. 5/2 SOL.-SOL. |
| E | S.V. 5/3 CC SOL.-SOL. |
| F | S.V. 2x3/2 NC-NC |
| G | S.V. 2x3/2 NO-NO |
| H | S.V. 2x3/2 NC-NO |
| I | S.V. 2x3/2 NO-NC |
| T | Plug |

Note: with base Ø10 the solenoid valve must be the same as the one chosen as position 1

## Accessory module configurator

### Module configurator




| Intermediate Inlet/Exhaust module with separate piloting | | |
|---|---|---|
| K | A<br>C | 12/14 through<br>12/14 closed downstream |

| Intermediate electropneumatic shut-off module with separate piloting | | | | | | |
|---|---|---|---|---|---|---|
| K | A<br>C | 12/14 through<br>12/14 closed downstream | 2<br>4<br>6<br>8 | 2 positions<br>4 positions<br>6 positions<br>8 positions | M8<br>M12 | M8 Connector<br>M12 Connector |

| Proportional regulator module (base + proportional) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R | 0<br>1 | Exhaust closed<br>Ø10 Conveyed discharges | D | Standard proportional regulator | C<br>T | Current signal<br>Voltage signal | / | | 1<br>5<br>9 | 0-1 bar pressure<br>0-5 bar pressure<br>0-9 bar pressure | - | Standard version |
| | | | N | Standard proportional regulator M12 | | | F<br>G<br>H | Analogue voltage output<br>Analogue current output<br>Digital output | | | | |
| | | | SC | CANopen protocol | / | | / | | 9 | 0-9 bar pressure | A | Discharge circuit without power supply |
| | | | MC | CANopen M12 protocol | | | | | | | | |
| | | | IB | IO-Link protocol | | | | | | | | |
| | | | EC | EtherCAT protocol | | | | | | | | |
| | | | PN | Profinet protocol | | | | | | | | |

**Configuration example of single pneumatic module:**

Ø6 Bistable base, intermediate diaphragm on ports 1,3 and 5, 2x3/2 NC-NC Solenoid valve with individual exhaust accessory, 5/2 Solenoid-Solenoid valve

**6 6 F 5 C**

| Base | |
|---|---|
| 1 | Ø10 Monostable base |
| 2 | Ø10 Bistable base |
| 3 | Ø4 Monostable base |
| 4 | Ø4 Bistable base |
| 5 | Ø6 Monostable base |
| (6) | Ø6 Bistable base |
| 7 | Ø8 Monostable base |
| 8 | Ø8 Bistable base |

| S.V. position 2 | |
|---|---|
| A | S.V. 5/2 SOLENOID-SPRING |
| B | S.V. 5/2 SOLENOID-DIFFERENTIAL |
| (C) | S.V. 5/2 SOLENOID-SOLENOID |
| E | S.V. 5/3 CC SOLENOID-SOLENOID |
| F | S.V. 2x3/2 NC-NC |
| G | S.V. 2x3/2 NO-NO |
| H | S.V. 2x3/2 NC-NO |
| I | S.V. 2x3/2 NO-NC |

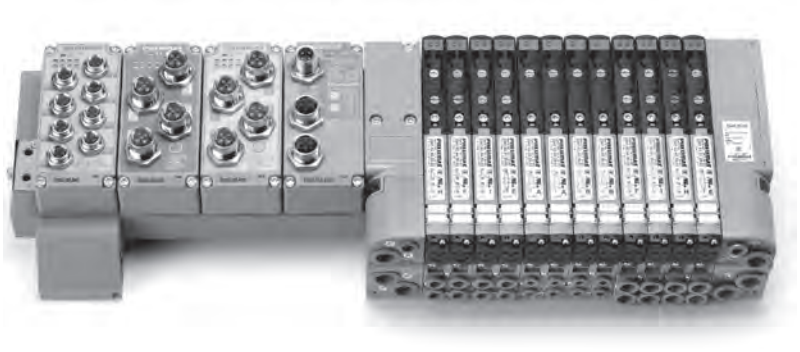
| S.V. 1 Accessory (optional) | |
|---|---|
| (5) | Separated exhausts |
| 6 | Separated air supply |

| Base version (optional) | |
|---|---|
| | 5-1-3 free (standard sub-base) |
| 3 | Intermediate Diaphragm plug on ports 1 and 5 |
| 4 | Intermediate Diaphragm plug on ports 1 and 3 |
| 5 | Intermediate Diaphragm plug on port 5 |
| (6) | Intermediate Diaphragm plug on ports 1, 3, 5 |
| 7 | Intermediate Diaphragm plug on port 1 |
| 8 | Intermediate Diaphragm plug on ports 3 and 5 |
| 9 | Intermediate Diaphragm plug on port 3 |

| Solenoid valve position 1 | |
|---|---|
| A | Solenoid valve 5/2 SOLENOID-SPRING |
| B | Solenoid valve 5/2 SOLENOID-DIFFERENTIAL |
| C | Solenoid valve 5/2 SOLENOID-SOLENOID |
| E | Solenoid valve 5/3 CC SOLENOID-SOLENOID |
| (F) | Solenoid valve 2x3/2 NC-NC |
| G | Solenoid valve 2x3/2 NO-NO |
| H | Solenoid valve 2x3/2 NC-NO |
| I | Solenoid valve 2x3/2 NO-NC |

**Configuration example of complete group:**

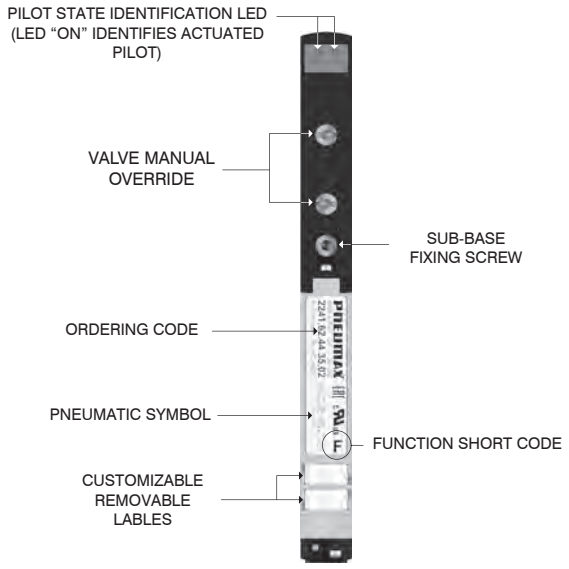
- Technopolymer PX3 serial system (P-I4-D12-M12-D8G)
- Left endplates - External feeding (E)
- Ø6 Bistable base with (6HF) Solenoid valve
- Ø6 Bistable base with (6IE) Solenoid valve
- Ø4 Monostable base with (3AA) Solenoid valve
- Ø4 Monostable base with (3BB) Solenoid valve
- Ø8 Bistable base with (8FI) Solenoid valve
- Ø8 Bistable base with (8HE) Solenoid valve
- Right endplate closed (U0)



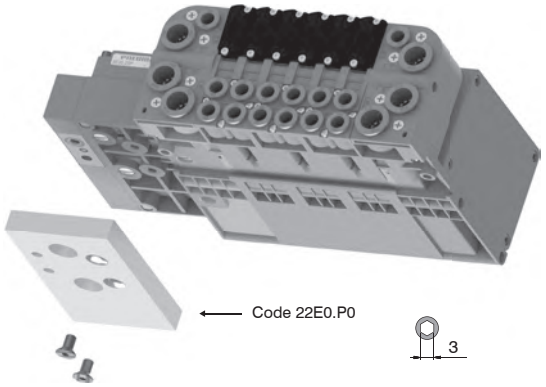
**SE-P-I4-D12-M12-D8G-E-6HF-6IE-3AA-3BB-8FI-8HE-U0**



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

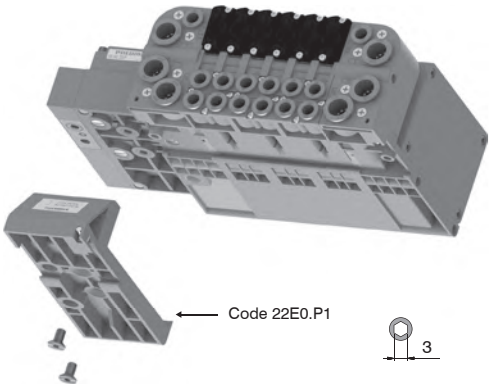



### Offset compensation plate



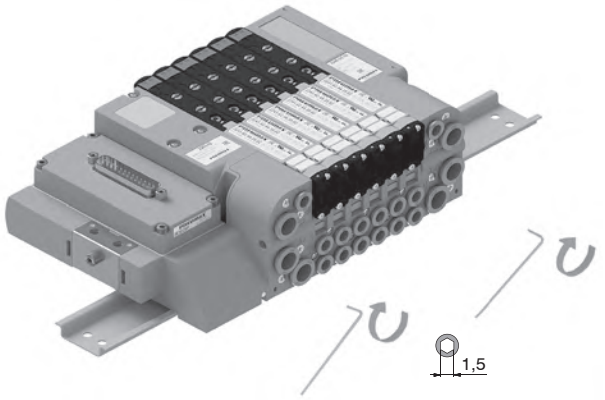

**Attention**: This accessory is supplied on the manifold unless otherwise stated. This is not compatible for DIN rail mounting.

### DIN rail mounting support plate



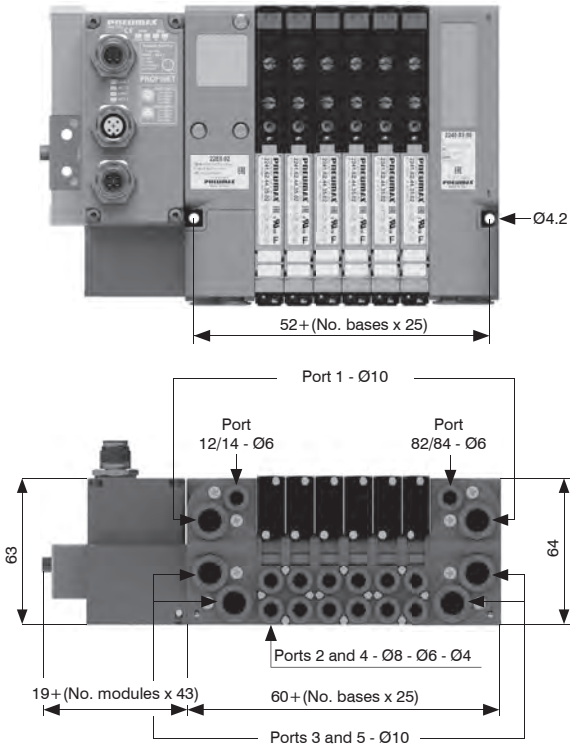

**Attention**: This must be included when creating the manifold configuration. Exclude the offset compensation plate.

### DIN rail fixing

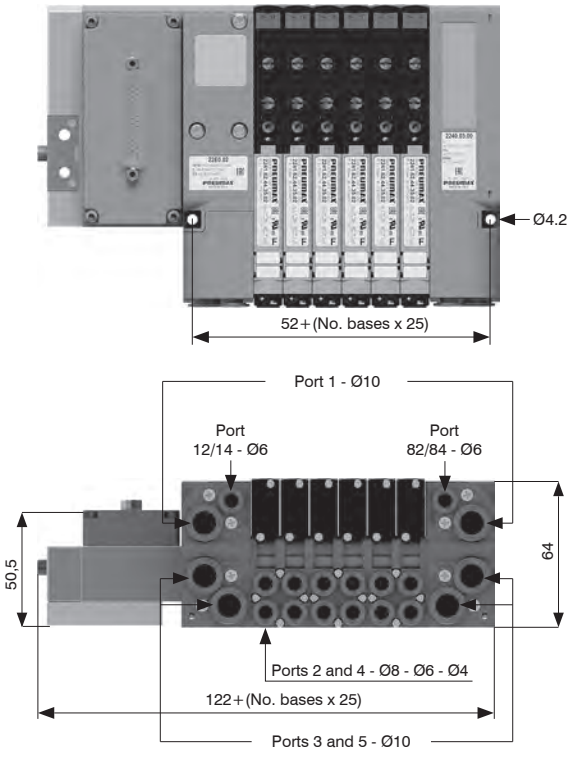



### Supply ports and maximum possible size according to valves used

Serial system node version




Multi-pin version



**Manual override actuation**

**Instable function:**
Push to actuate
(when released it moves back to the original position)

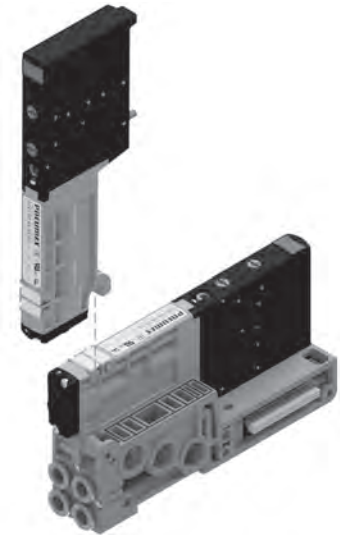


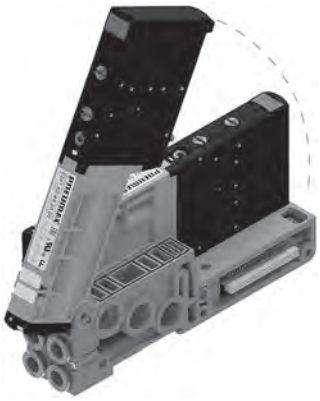
**Bistable function:**
Push and turn to get the bistable function

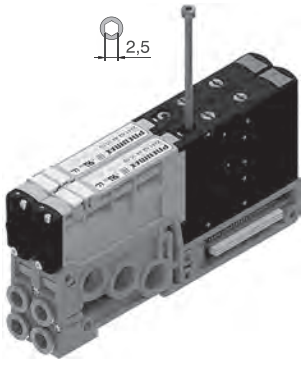


**Note**: we recommend the manual override is returned to it's original position when not in use

**Solenoid valves installation**

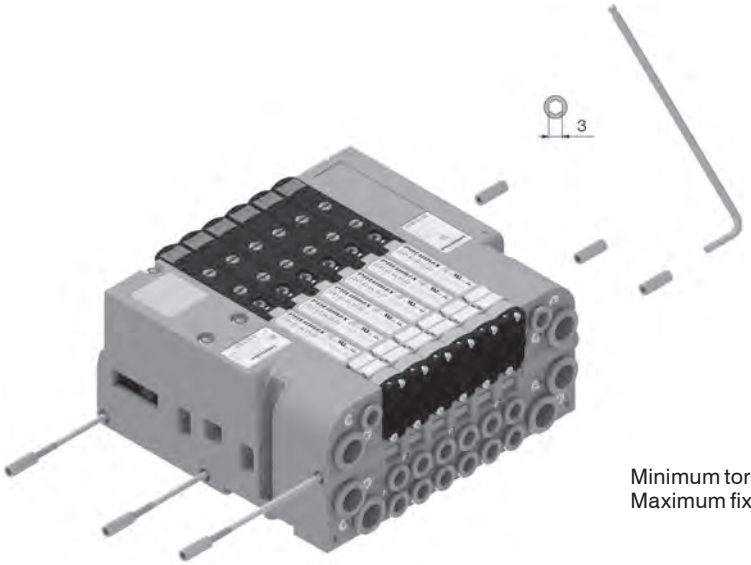







**Note**: Torque moment 0,8 Nm

**Sub-base assembly**




Minimum torque moment: 2 Nm
Maximum fixing torque for fittings: 2,5 Nm


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

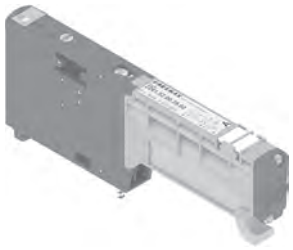
## Solenoid-Spring

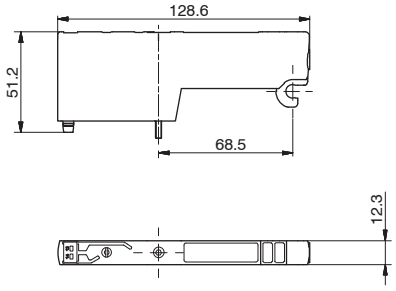
**Coding:** 2241.52.00.39.Ⓥ

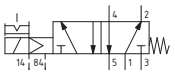
| Technical characteristics | | |
|---|---|---|
| Fluid | | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | | From vacuum to 10 |
| Pilot pressure (bar) | | 2,5 ... 7 |
| Temperature °C | | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | with modular base, tube ø4 | 140 |
| | with modular base, tube ø6 | 400 |
| | with modular base, tube ø8 | 550 |
| | with high flow rate modular base (2 places) ø10 | 900 |
| Response time according to ISO 12238, activation time (ms) | | 15 |
| Response time according to ISO 12238, deactivation time (ms) | | 20 |

| Ⓥ | VOLTAGE |
|---|---|
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

SHORT FUNCTION CODE "A"
Weight 67 g





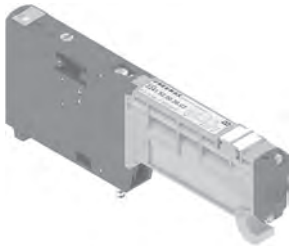
## Solenoid-Differential

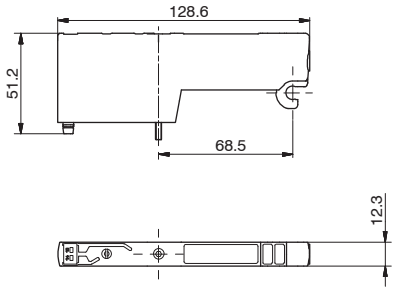
**Coding:** 2241.52.00.36.Ⓥ

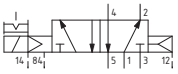
| Technical characteristics | | |
|---|---|---|
| Fluid | | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | | From vacuum to 10 |
| Pilot pressure (bar) | | 2,5 ... 7 |
| Temperature °C | | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | with modular base, tube ø4 | 140 |
| | with modular base, tube ø6 | 400 |
| | with modular base, tube ø8 | 550 |
| | with high flow rate modular base (2 places) ø10 | 850 |
| Response time according to ISO 12238, activation time (ms) | | 20 |
| Response time according to ISO 12238, deactivation time (ms) | | 25 |

| Ⓥ | VOLTAGE |
|---|---|
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

SHORT FUNCTION CODE "B"
Weight 67 g





## Solenoid-Solenoid

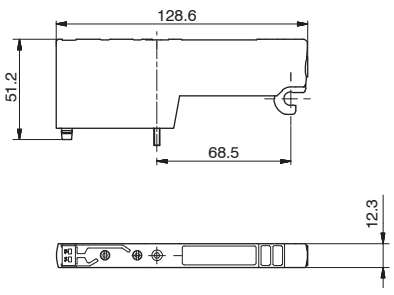
**Coding:** 2241.52.00.35.Ⓥ

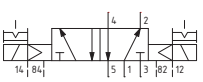
| Technical characteristics | | |
|---|---|---|
| Fluid | | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | | From vacuum to 10 |
| Pilot pressure (bar) | | 2,5 ... 7 |
| Temperature °C | | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | with modular base, tube ø4 | 140 |
| | with modular base, tube ø6 | 400 |
| | with modular base, tube ø8 | 550 |
| | with high flow rate modular base (2 places) ø10 | 900 |
| Response time according to ISO 12238, activation time (ms) | | 10 |
| Response time according to ISO 12238, deactivation time (ms) | | 10 |

| Ⓥ | VOLTAGE |
|---|---|
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

SHORT FUNCTION CODE "C"
Weight 67 g





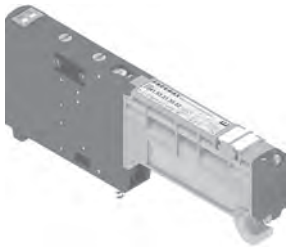
## Solenoid-Solenoid 5/3 (Closed centres)

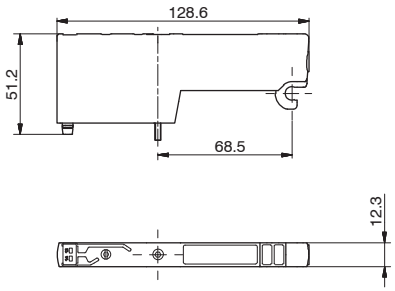
**Coding:** 2241.53.31.35.Ⓥ

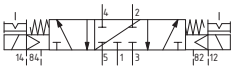
| Technical characteristics | | |
|---|---|---|
| Fluid | | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | | From vacuum to 10 |
| Pilot pressure (bar) | | 2,5 ... 7 |
| Temperature °C | | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | with modular base, tube ø4 | 140 |
| | with modular base, tube ø6 | 300 |
| | with modular base, tube ø8 | 400 |
| | with high flow rate modular base (2 places) ø10 | 600 |
| Response time according to ISO 12238, activation time (ms) | | 15 |
| Response time according to ISO 12238, deactivation time (ms) | | 20 |

| Ⓥ | VOLTAGE |
|---|---|
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

SHORT FUNCTION CODE "E"
Weight 83 g





## Solenoid-Solenoid 2x3/2

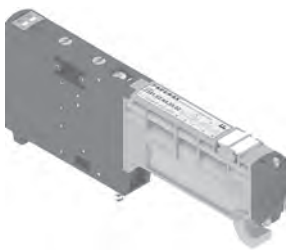
**Coding:** 2241.62.Ⓕ.35.Ⓥ

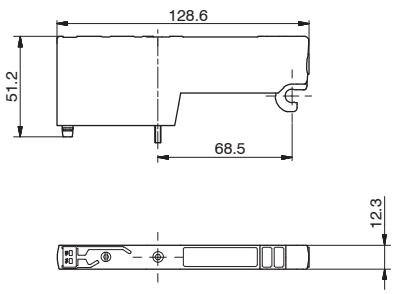
| Technical characteristics | | |
|---|---|---|
| Fluid | | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | | From vacuum to 10 |
| Pilot pressure (bar) | | ≥3+(0,2xInlet pressure) |
| Temperature °C | | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | with modular base, tube ø4 | 140 |
| | with modular base, tube ø6 | 360 |
| | with modular base, tube ø8 | 420 |
| | with high flow rate modular base (2 places) ø10 | 650 |
| Response time according to ISO 12238, activation time (ms) | | 15 |
| Response time according to ISO 12238, deactivation time (ms) | | 25 |

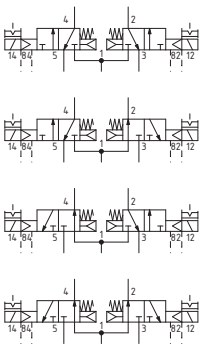
| Ⓕ | FUNCTION |
|---|---|
| | **44** = NC-NC (5/3 Open centres) |
| | **45** = NC-NO (normally closed-normally open) |
| | **54** = NO-NC (normally open-normally closed) |
| | **55** = NO-NO (5/3 Pressured centres) |
| Ⓥ | VOLTAGE |
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

SHORT FUNCTION CODE:
NC-NC (5/3 Open centres) = "F"
N.O. - N.O. (5/3 Pressured centres) = "G"
N.C.-N.O.="H"
N.O.-N.C.="I"
Weight 75 g

Example: If inlet pressure is set at 5 bar then pilot pressure must be at least Pp=3+(0,2*5)=4 bar







Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

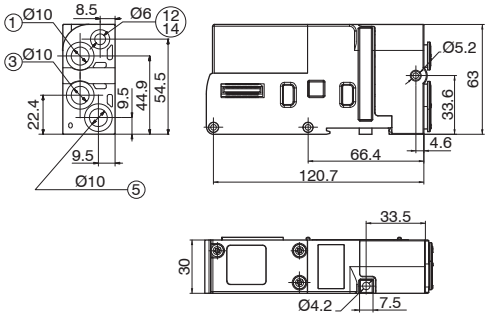
## Left Endplate

**Coding:** 22E0.Ⓥ.S

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 (External pilot base)<br>2,5-7 (Self-feeding base) |
| Pilot pressure (bar) | 2,5 ... 7 (External pilot base) |
| Temperature °C | -5 ... +50 |

| Ⓥ | VERSION |
|---|---|
| | **02** = External feeding |
| | **12** = Self-feeding |

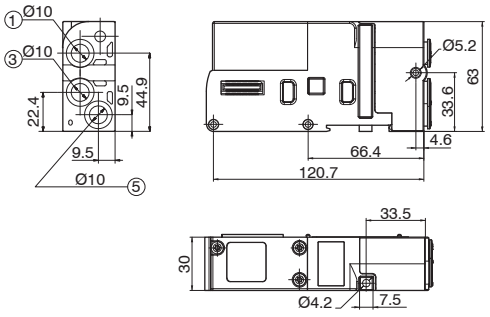





12/14 SEPARATED FROM PORT 1
Weight 199 g

22E0.02.S






12/14 CONNECTED TO PORT 1
Weight 199 g

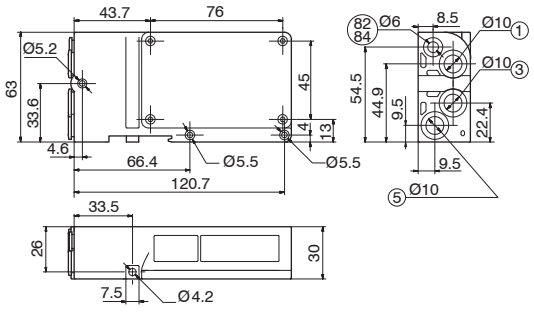
22E0.12.S

## Right Endplate

**Coding:** 2240.03.00

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Temperature °C | -5 ... +50 |






PORT 82/84= DO NOT PRESSURIZE, SOLENOID PILOTS EXHAUST
Weight 148 g

2240.03.00

## Modular base (2 places)

**Coding:** 22E©.Ⓕ Ⓥ

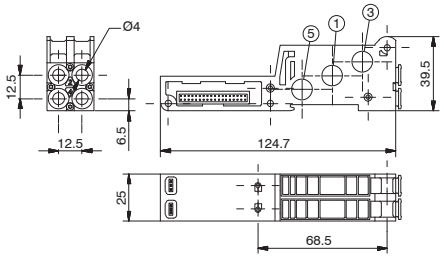
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Temperature °C | -5 ... +50 |

| | |
|---|---|
| © | TUBE DIAMETER |
| | **4** = Ø4 |
| | **6** = Ø6 |
| | **8** = Ø8 |
| Ⓕ | FUNCTION |
| | **01** = Opened ports |
| | **03** = Ports 1-5 separated |
| | **04** = Ports 1-3 separated |
| | **05** = Port 5 separated |
| | **06** = Separated ports |
| | **07** = Port 1 separated |
| | **08** = Ports 3-5 separated |
| | **09** = Port 3 separated |
| Ⓥ | VERSION |
| | **M** = for monostable S.V. |
| | **B** = for bistable S.V. |



Weight 75 g

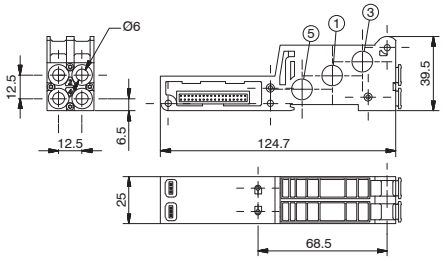
22E4.ⒻⓋ






Weight 75 g

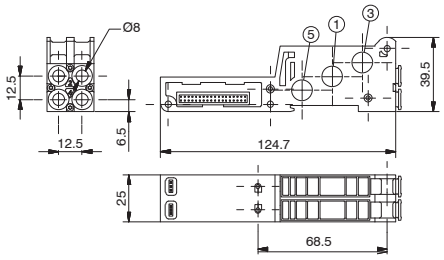
22E6.ⒻⓋ






Weight 75 g

22E8.ⒻⓋ




## High flow rate modular base (2 places)

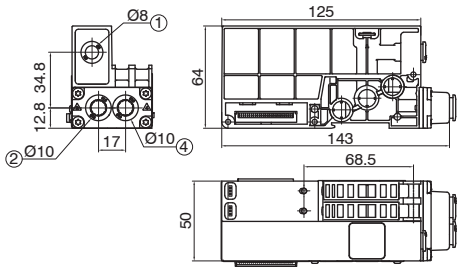
**Coding:** 22E1.01Ⓥ

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Temperature °C | -5 ... +50 |

| | |
|---|---|
| Ⓥ | VERSION |
| | **M** = for monostable S.V. |
| | **B** = for bistable S.V. |

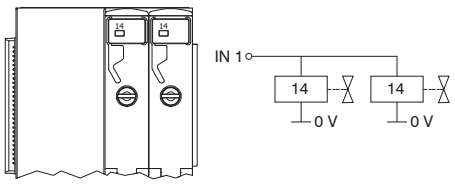


Weight 200 g



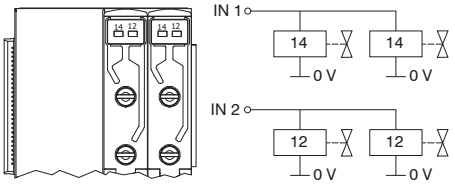

the two solenoid valves mounted on the high-flow base are pneumatically and electrically in parallel.
**Attention**: the mounted solenoid valves must always be two and of the same type.
**Attention**: the additional supply is necessary to guarantee the declared flow values, the port (1), if not supplied, it must be plugged.

### Monostable configuration




the monostable base consumes only one electrical signal and can only mount monostable solenoid valves.

### Bistable configuration




the bistable base consumes two electrical signals and can mount both bistable and monostable solenoid valves; in the latter case one electrical signal will be lost.



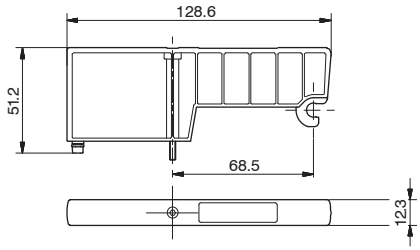
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Closing plate

**Coding:** 2240.00

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Temperature °C | -5 ... +50 |






SHORT FUNCTION CODE "T"
Weight 30 g

## Individual supply or exhaust module

**Coding:** 22E0.Ⓥ.06

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10<br>3 ... 7 (piloting 12/14) |
| Temperature °C | -5 ... +50 |

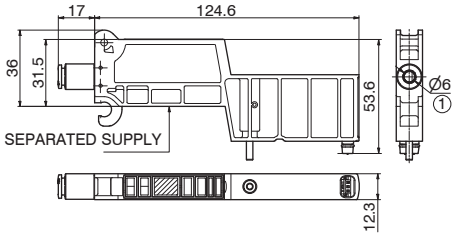
| Ⓥ | VERSION |
|---|---|
| | **01** = Port 1 separated |
| | **35** = Ports 3-5 separated |

*The flow rate of the solenoid valve will be reduced compared to that shown in the general catalogue*



Weight 44 g

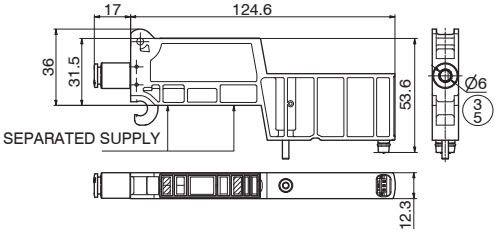
22E0.01.06






Weight 44 g

22E0.35.06




## Proportional regulator base

**Coding:** 22E0.Ⓒ.RP

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Temperature °C | -5 ... +50 |

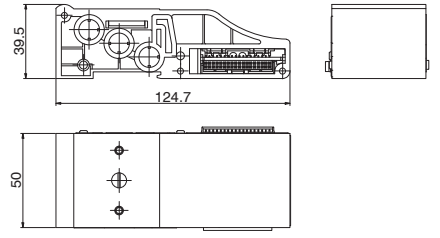
| Ⓒ | CONNECTION |
|---|---|
| | **00** = Closed |
| | **10** = Ø10 |

3D PRINTING



Weight 120 g

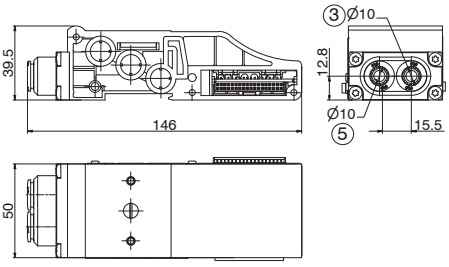
22E0.00.RP






Weight 120 g
3/5 = Exhaust connections

22E0.10.RP



## Proportional regulator installation on its base



Proportional pressure regulators can be integrated into an Optyma-S EVO solenoid valve manifold, allowing the assembly to be fully or partially supplied. The regulator electronic control is independent of the node.

## Technical characteristics

| Pneumatic characteristics | |
|---|---|
| Fluid | Air filtered at 5 micron and dehumidified |
| Minimum inlet pressure | Desired outlet pressure + 1 bar |
| Maximum inlet pressure | 10 bar |
| Outlet pressure | 0 ... 9 bar |
| Nominal flow rate from 1 to 2 (6 bar ΔP 1 bar) | 1100 Nl/min |
| Discharge flow rate (6 bar with 1 bar overpressure) | 1300 Nl/min |
| Air consumption | < 1 Nl/min |
| Supply connection | G 1/4" |
| Operating connection | G 1/4" |
| Exhaust connection | G 1/8" |
| Maximum fitting tightening | 15 Nm |

| Electrical characteristics | | |
|---|---|---|
| Supply voltage | | 24VDC ± 10% (stabilized with ripple<1%) |
| Standby current consumption | | 70mA |
| Current consumption with solenoid valves on | | 400mA |
| **Reference Signal | Voltage | *0 ... 10 V<br>*0 ... 5 V<br>*1 ... 5 V |
| | Current | *4 ... 20 mA<br>*0 ... 20 mA |
| **Input Impedance | Voltage | 10 kΩ |
| | Current | 250 Ω |
| **Digital inputs | | 24 VDC ± 10% |
| **Digital output | | 24 VDC PNP (max current 50 mA) |

| Functional characteristics | |
|---|---|
| Linearity | ± Insensitivity |
| Hysteresis | ± Insensitivity |
| Repeatability | ± Insensitivity |
| Sensitivity | 0,01 bar |
| Assembly position | Indifferent |
| Protection grade | IP65 (with casing fitted) |
| Ambient temperature | -5°... 50° / 23°F ... 122°F |

| Construction characteristics | |
|---|---|
| Body | Anodized aluminum |
| Shutters | Brass with vulcanized NBR |
| Diaphragm | Cloth-covered rubber |
| Seals | NBR |
| Cover for electrical part | Technopolymer |
| Springs | AISI 302 |
| Weight | 360 g |

* Selectable by keyboard or by RS-232
** Valid only for devices with analog input


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Installation/Operation

### PNEUMATIC CONNECTION

The compressed air is connected by G 1/4" threaded holes on the body. Before making the connections, eliminate any impurities in the connecting pipes to prevent chippings or dust entering the unit. Do not supply the circuit with more than 10 bar pressure and make sure that the compressed air is dried (excessive condensate could cause the appliance to malfunction) and filtered at 5 micron. The supply pressure to the regulator must always be at least 1 bar greater than the desired outlet pressure. If a silencer is applied to the discharge path the unit response time may change; periodically check that the silencer is not blocked and replace it if necessary.

### ELECTRICAL CONNECTION

For the electrical connection a SUB-D 15-pole female or a M12 connector is used (accordingly to the model, to be ordered separately). Wire in accordance with the wiring diagram shown below. **Warning: INCORRECT CONNECTIONS MAY DAMAGE THE DEVICE**

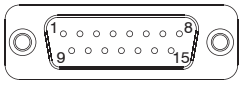
### NOTES ON OPERATION

If the electric supply is interrupted, the outlet pressure is maintained at the set value. However, maintaining the exact value cannot be ensured as it is impossible to operate the solenoid valves. In order to discharge the circuit downstream, zero the reference, make sure that the display shows a pressure value equal to zero and then disconnect the electric power supply. A version of the device is available that exhausts the downstream circuit when the power supply is removed (Option "A" at the end of the ordering code). If the compressed-air supply is suspended and the electric power supply is maintained a whirring will be heard that is due to the solenoid valves; an operating parameter can be activated (P18) that triggers the regulator protection whenever the requested pressure is not reached within 4 seconds of the reference signal being sent. In this case the system will intervene to interrupt the control of the solenoid valves. Every twenty seconds, the unit will start the reset procedure until standard operating conditions have been restored.

### Proportional regulator, standard version with D-SUB connector



TOP VIEW OF THE REGULATOR CONNECTOR

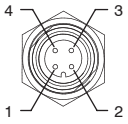



CONNECTOR PINOUT:
1 = DIGITAL INPUT 1
2 = DIGITAL INPUT 2
3 = DIGITAL INPUT 3
4 = DIGITAL INPUT 4
5 = DIGITAL INPUT 5
6 = DIGITAL INPUT 6
7 = DIGITAL INPUT 7
8 = ANALOG INPUT / DIGITAL INPUT 8

9 = SUPPLY (24 VDC)
10 = DIGITAL OUTPUT (24 VDC PNP)
11 = ANALOG OUTPUT (CURRENT)
12 =ANALOG OUTPUT (VOLTAGE)
13 = Rx RS-232
14 = Tx RS-232
15 = GND

### Proportional regulator, M12 standard version





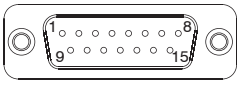

M12 4P
MALE

**M12 Standard version**
CONNECTOR PINOUT:
1 = POWER SUPPLY (24 VDC)
2 = ANALOG OUTPUT (depending on the model)
3 = GND
4 = ANALOG INPUT

### Proportional regulator, CANopen® version with D-SUB connector



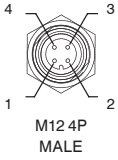
TOP VIEW OF THE REGULATOR CONNECTOR




CONNECTOR PINOUT:
1 = CAN_SHIELD
2 = CAN_V+
3 = CAN_GND
4 = CAN_H
5 = CAN_L
6 = NC
7 = NC
8 = NC
9 = SUPPLY (+24 VDC)
10 = CAN_SHIELD
11 = CAN_V+
12 = CAN_GND
13 = CAN_H
14 = CAN_L
15 = GND

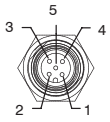
### Proportional regulator, CANopen® version with M12 connector






M12 4P
MALE

| PIN | DESCRIPTION |
|---|---|
| 1 | +24 VDC (NODE AND INPUTS) |
| 2 | NC |
| 3 | GND |
| 4 | +24 VDC (OUTPUTS) |

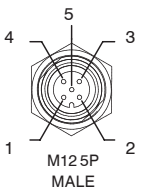



M12 5P
FEMALE

| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | CAN_SHIELD | Optional Can Shield |
| 2 | CAN_V+ | Optional Can external positive supply (Dedicated for supply of transceiver and Optocouplers, if galvanic isolation of the bus node applies) |
| 3 | CAN_GND | Ground / 0V / V- |
| 4 | CAN_H | CAN_H bus line (Dominant high) |
| 5 | CAN_L | CAN_L bus line (Dominant low) |

### Proportional regulator, IO-Link version



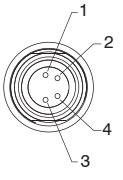



M12 5P
MALE

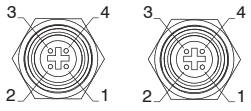
CONNECTOR PINOUT:
1 = L+
2 = +24 VDC (P24)
3 = L-
4 = C/Q
5 = GND (N24)

### Proportional regulator, EtherCAT®, PROFINET IO RT and EtherNet/IP version






M8 4P
MALE



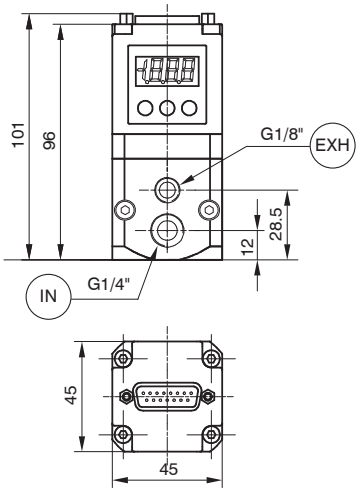

M12D 4P
FEMALE

CONNECTOR PINOUT:
1 = Device logic power supply
2 = NC
3 = GND
4 = Solenoid valves power supply

CONNECTOR PINOUT:
1 = TX Signal + (Ethernet Transmit High)
2 = RX Signal + (Ethernet Receive High)
3 = TX Signal - (Ethernet Transmit Low)
4 = RX Signal - (Ethernet Receive Low)

## Proportional regulator, standard version with D-SUB connector






**Coding:** 221E2N.Ⓣ.D.Ⓟ.Ⓥ

| | |
|---|---|
| Ⓣ | TYPE |
| | **C** = Current signal (4-20 mA / 0-20 mA) |
| | **T** = Voltage signal (0-10 V / 0-5 V / 1-5 V) |
| Ⓟ | PRESSURE RANGE |
| | **0001** = from 0 to 1 bar |
| | **0005** = from 0 to 5 bar |
| | **0009** = from 0 to 9 bar |
| Ⓥ | VARIANT |
| | = Standard version |
| | **A** = Exhaust downstream pressure when power supply is removed |

### Accessories

## Model with SUB-D 15 poles connector



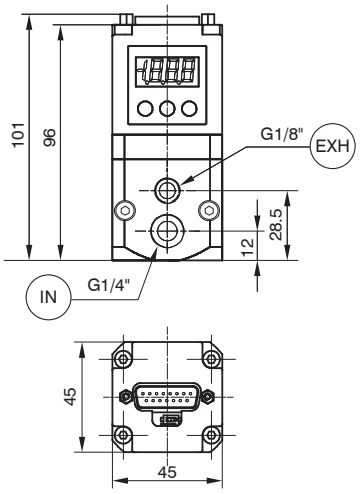
**Coding:** 5300.F15.Ⓒ.Ⓥ

| | |
|---|---|
| Ⓒ | CONNECTOR |
| | **00** = straight connector |
| | **90** = 90° connector |
| Ⓥ | VARIANT |
| | **00** = casing IP65* |
| | **03** = cable 3 meters |
| | **05** = cable 5 meters |

*without cable

## Proportional regulator, CANopen® version with D-SUB connector






**Coding:** 221E2N.S.C.Ⓟ.Ⓥ

| | |
|---|---|
| Ⓟ | PRESSURE RANGE |
| | **0001** = from 0 to 1 bar |
| | **0005** = from 0 to 5 bar |
| | **0009** = froma 0 to 9 bar |
| Ⓥ | VARIANT |
| | = Standard version |
| | **A** = Exhaust downstream pressure when power supply is removed |

### Accessories

## Model with SUB-D 15 poles connector



**Coding:** 5300.F15.Ⓒ.Ⓥ

| | |
|---|---|
| Ⓒ | CONNECTOR |
| | **00** = straight connector |
| | **90** = 90° connector |
| Ⓥ | VARIANT |
| | **00** = casing IP65* |
| | **03** = cable 3 meters |
| | **05** = cable 5 meters |

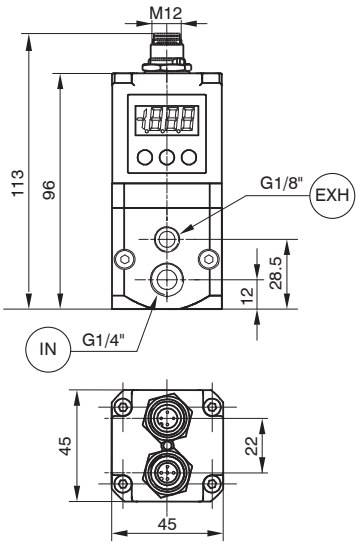
*without cable



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Proportional regulator, CANopen® version with M12 connector






**Coding:** 221E2N.M.C.Ⓟ.Ⓥ

| | |
|---|---|
| Ⓟ | PRESSURE RANGE |
| | **0001** = from 0 to 1 bar |
| | **0005** = from 0 to 5 bar |
| | **0009** = from 0 to 9 bar |
| Ⓥ | VARIANT |
| | = Standard Version |
| | **A** = Exhaust downstream pressure when power supply is removed |

**Note**: This model doesn't include the terminating resistor

### Accessories

Power supply connector

### Female straight connector M12A 4P



**Coding:** 5312A.F04.00

Network connector

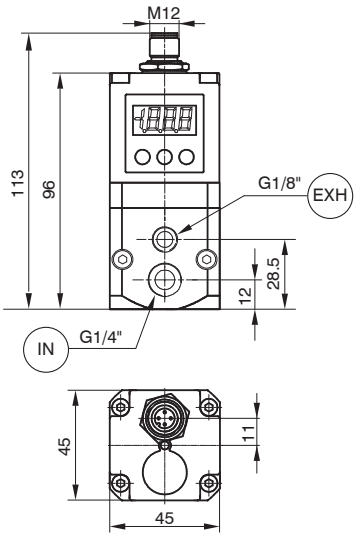
### Male straight connector M12A 5P



**Coding:** 5312A.M05.00

## Proportional regulator, M12 standard version






**Coding:** 221E2N.Ⓣ.Ⓤ.Ⓟ.Ⓥ

| | |
|---|---|
| Ⓣ | TYPE |
| | **C** = Current signal (4-20 mA) |
| | **T** = Voltage signal (0-10 V) |
| Ⓤ | OUTPUT |
| | **F** = Voltage analogue output |
| | **G** = Current analogue output |
| | **H** = Digital output |
| Ⓟ | PRESSURE RANGE |
| | **0001** = from 0 to 1 bar |
| | **0005** = from 0 to 5 bar |
| | **0009** = from 0 to 9 bar |
| Ⓥ | VARIANT |
| | = Standard Version |
| | **A** = Exhaust downstream pressure when power supply is removed |

### Accessories

Power supply connector

### Female straight connector M12A 4P



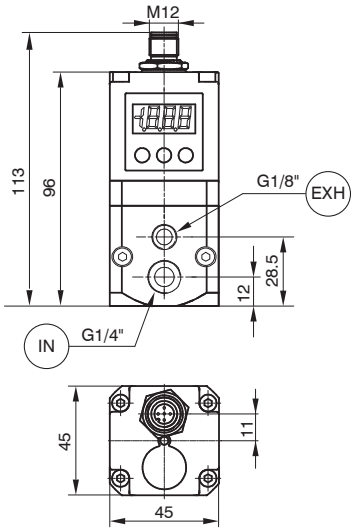
**Coding:** 5312A.F04.00

## Proportional regulator, IO-Link version

**Coding:** 221E2N.I.B.009.Ⓥ

| | |
|---|---|
| Ⓥ | VARIANT |
| | = Standard Version |
| | **A** = Exhaust downstream pressure when power supply is removed |






### Accessories

Power supply connector

## Female straight connector M12A 4P

**Coding:** 5312A.F05.00

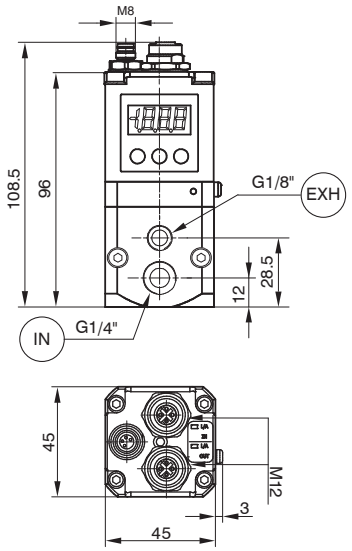


## Proportional regulator, EtherCAT®, PROFINET IO RT and EtherNet/IP version

**Coding:** 221E2N.Ⓣ.0009.Ⓥ

| | |
|---|---|
| Ⓣ | TYPE |
| | **EC** = EtherCAT |
| | **PN** = PROFINET IO RT |
| | **EI** = EtherNet/IP |
| Ⓥ | VARIANT |
| | = Standard Version |
| | **A** = Exhaust downstream pressure when power supply is removed |






### Accessories

Power supply connector

## Male straight connector M12D 4P

**Coding:** 5312D.M04.00





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Intermediate electro-pneumatic shut-off module 2/4/6/8 positions

**Coding:** 22E0.Ⓜ.Ⓣ.Ⓒ

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10<br>3 ... 7 (piloting 12/14) |
| Temperature °C | -5 ... +50 |
| Feeding | + 24 V DC ±10% |
| Protection | Inverted polarity protection |
| Maximum load | 100 mA |
| Indicators | + 24 V DC presence LED |
| Series modules maximum number | 3 |

| | |
|---|---|
| Ⓜ | MODULE |
| | **10** = 12-14 open |
| | **11** = 12-14 closed |
| Ⓣ | SHUT-OFF |
| | **2A** = 2 Signals |
| | **4A** = 4 Signals |
| | **6A** = 6 Signals |
| | **8A** = 8 Signals |
| Ⓒ | CONNECTION |
| | **M8** = M8 |
| | **M12** = M12 |



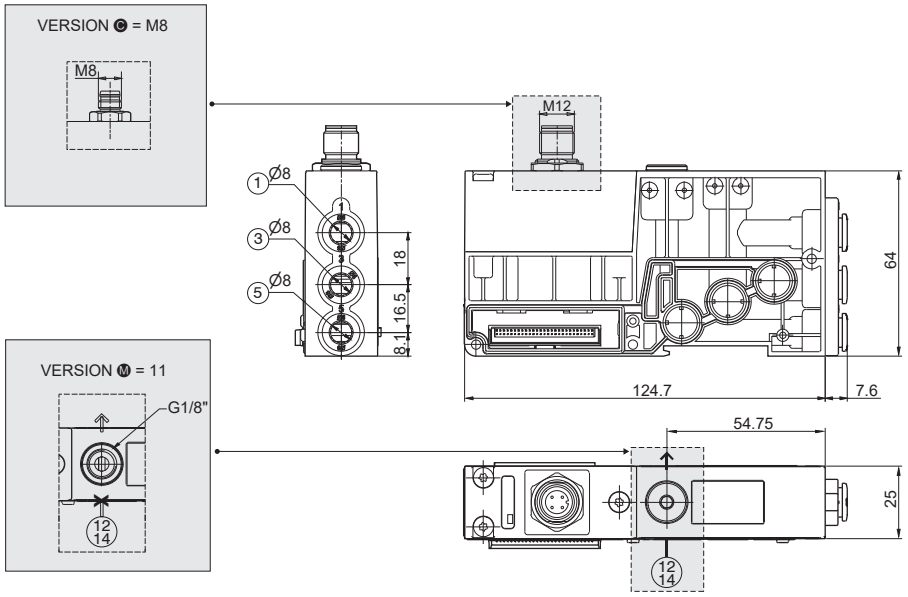
Weight 120 g

22E0.Ⓜ.Ⓣ.M12



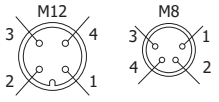
Weight 120 g

22E0.Ⓜ.Ⓣ.M8

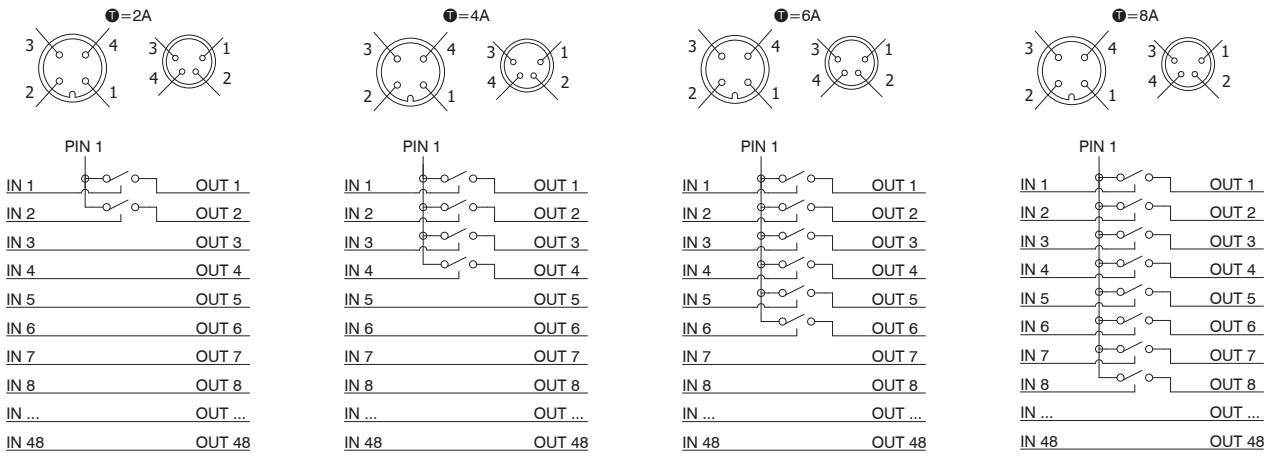



## WORKING PRINCIPLE / SIMPLIFIED FUNCTIONAL DIAGRAM

Intermediate electro-pneumatic shut-off module allows you to interrupt at the same time the first 2, 4, 6 or 8 available command signals for the valves after the module itself.
When the shut-off module is present, the controlled output logic signal values are equal to the input logic signal values which came from the serial node or the multi-pin module.
If the supply input signal is absent, the controlled output logic signal values are all equal to zero.
This module is particularly useful when control signals are used to block the valves; it is also effective both with serial management and multi-pin connection of the manifolds.
It is possible to use more modules to interrupt every command signals simply by inserting them before the signals to be interrupted.




| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC |
| 2 | NOT CONNECTED |
| 3 | GND |
| 4 | NOT CONNECTED |



**Usage examples**

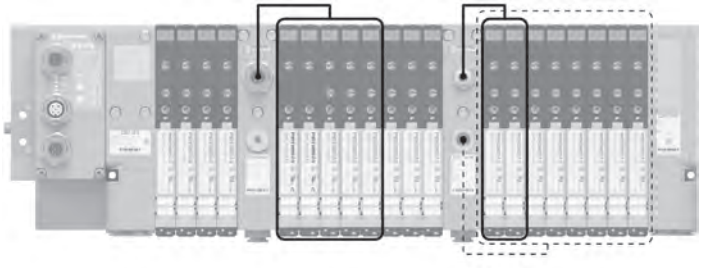
EXAMPLE 1
Manifold of 10 solenoid valves on which you want to interrupt signals 9 and 10.
Assembly:
- 4 bistable solenoid valves (not interruptible because before the module)
- 1 intermediate electro-pneumatic shut-off module, 2 signals M8 with conduit 12/14 closed
- 2 monostable solenoid valves (interruptible)
- 4 bistable solenoid valves (managed directly by the corresponding command signal)



EXAMPLE 2
Manifold of 10 solenoid valves on which you want to interrupt signals 9 and 12.
Assembly:
- 4 bistable solenoid valves (not interruptible because before the module)
- 1 intermediate electro-pneumatic shut-off module, 4 signals M8 with conduit 12/14 closed
- 2 monostable solenoid valves (interruptible)
- 4 bistable solenoid valves (the first one is interruptible, the others are managed directly by the corresponding command signal)



EXAMPLE 3
Manifold of 20 solenoid valves on which you want to interrupt signals from 9 to 16 and 23 to 26.
Assembly:
- 4 bistable solenoid valves (not interruptible because before the module)
- 1 intermediate electro-pneumatic shut-off module, 8 signals M12 with conduit 12/14 open
- 2 monostable solenoid valves (interruptible)
- 6 bistable solenoid valves (the first three are interruptible, the others are managed directly by the corresponding command signal)
- 1 intermediate electro-pneumatic shut-off module, 4 signals M8 with conduit 12/14 closed
- 8 bistable solenoid valves (the first two are interruptible, the others are managed directly by the corresponding command signal)



**Key**
S.V. electrically managed by the shut-off module: ——————
S.V. pneumatically managed (12/14) by the shut-off module: - - - - - - - -


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

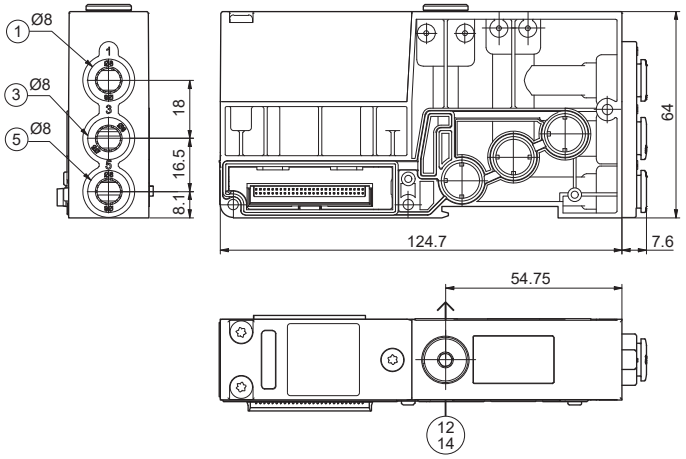
## Intermediate inlet/Exhaust module with external pilot

**Coding:** 22E0.Ⓜ

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10<br>3 ... 7 (piloting 12/14) |
| Temperature °C | -5 ... +50 |

| | MODULE |
|---|---|
| Ⓜ | **10** = 12-14 open |
| | **11** = 12-14 closed |

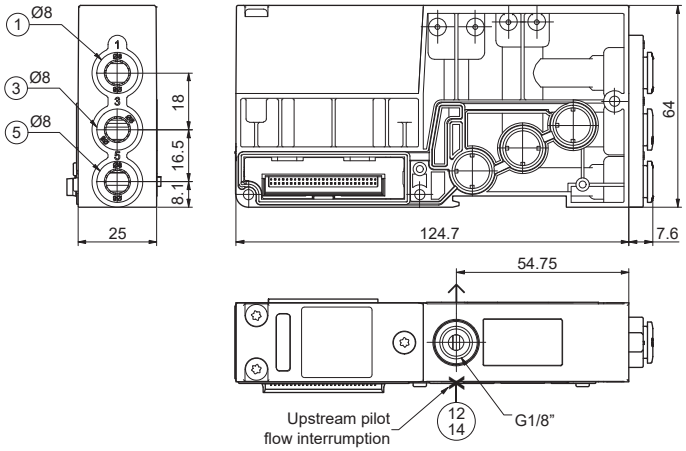





Weight 111 g

22E0.10






Weight 111 g

22E0.11



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## Polyethylene Silencer Series SPL-R

**Coding:** SPLR.Ⓓ

| Ⓓ | TUBE DIAMETER |
|---|---|
| | **6** = 6 mm |
| | **10** = 10 mm |



## Diaphragm plug

**Coding:** 2230.17



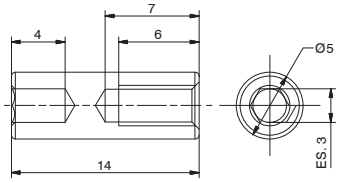
Weight 1,3 g

## M3 nuts kit

**Coding:** 2240.KD.00



The Kit includes 6 pieces



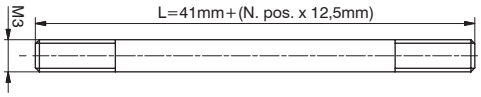

## Tie-rod M3

**Coding:** 2240.KT.Ⓟ

| Ⓟ | NO. POSITIONS |
|---|---|
| | **02** = Nr. 2 Positions |
| | **04** = Nr. 4 Positions |
| | **06** = Nr. 6 Positions |
| | **08** = Nr. 8 Positions |
| | **10** = Nr. 10 Positions |
| | **12** = Nr. 12 Positions |
| | **14** = Nr. 14 Positions |
| | **16** = Nr. 16 Positions |
| | **18** = Nr. 18 Positions |
| | **20** = Nr. 20 Positions |
| | **22** = Nr. 22 Positions |
| | **24** = Nr. 24 Positions |
| | **26** = Nr. 26 Positions |
| | **28** = Nr. 28 Positions |
| | ... |
| | **48** = Nr. 48 Positions |



The Kit includes 3 pieces

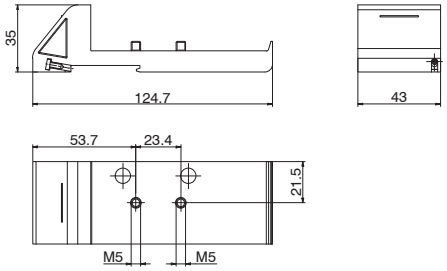



## DIN rail adapter

**Coding:** 22E0.P1



Weight 55 g

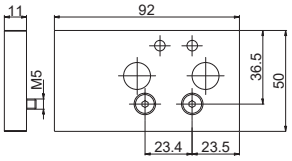



## Offset compensation plate

**Coding:** 22E0.P0



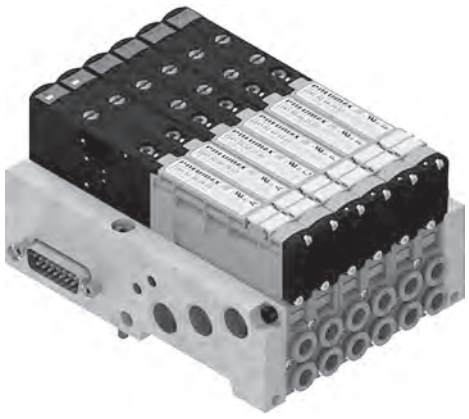
Weight 116 g






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 2200 "Optyma-Sc"



Optyma solenoid valves series comes completed by "Compact" version, useful when a limited number of solenoid valves is needed without managing input and output signals.
Standard base blocks provide 4 or 6 solenoid valves positions. Standard base blocks can be individually sold even without solenoid valves to allow maximum configuration flexibility. Solenoid valves can be chosen from whole Opytma-S range.
Manifolds made in this way allow great room and weight saving against corrispondent pneumatic group from Optyma-S series.

- Flow rate: up to 550[Nl/min], using the modular base with Ø8 quick fitting tube.
- Modular base available with Ø4, Ø6, Ø8 quick fitting tube.
- The solenoid pilots are low consumption and fitted on the same side of the valve.
- Mono and bistable valves have the same dimension.
- Easy and fast assembly on the sub base thanks to the “one screw” mounting solution.
- Possibility to replace a valve without the need of disconnecting the pneumatic pipes.
- Electrical and pneumatic connections positioned on the same side.
- Possibility to operate with different pressures and vacuum.
- 4 or 6 electric signals management (two signals per position, indipendently of the mounted solenoid valve).
- The electrical connection is achieved thanks to a 9 or 15 poles connector.
- The protection grade is IP65 directly integrated in the manifold components.

**“Shifting time of pneumatic directional control valves or moving parts, logic devices were measured in accordance to ISO 12238:2001”**

### Construction characteristics

| | |
|---|---|
| Body | Technopolymer |
| Seals | NBR |
| Piston seals | NBR |
| Springs | Stainless Steel |
| Operators | Technopolymer |
| Pistons | Technopolymer |
| Spools | Stainless Steel |

### Operational characteristics

| | |
|---|---|
| Supply voltage | 24V DC ±10% |
| Pilot consumption | 1,3W nominal in energy saving mode |
| Pilot working pressure (12-14) | from 2,5 to 7 bar max. |
| Valve working pressure [1] | from 0 to 10 bar max. |
| Operating temperature | from -5°C to +50°C |
| Protection degree | IP40 |
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |

## Rules and configuration scheme

CONFIGURATION CODE ← C - [ ] - E - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ]

| Electrical connection | | |
|---|---|---|
| MP | 9 | Multi-pin 9 poles PNP connector |
| | 1 | Multi-pin 15 poles PNP connector |
| MN | 9 | Multi-pin 9 poles NPN connector |
| | 1 | Multi-pin 15 poles NPN connector |
| MA | 9 | Multi-pin 9 poles AC connector |
| | 1 | Multi-pin 15 poles AC connector |

| Left endplates | |
|---|---|
| E | External feeding |

| Module 1 | |
|---|---|
| ...-... | See “single pneumatic module configurator” |

| Diaphragm plug (optional) | |
|---|---|
| X | Diaphragm plug on port 1 |
| Y | Diaphragm plug on port 3 |
| Z | Diaphragm plug on port 5 |

| Module 2 | |
|---|---|
| ...-... | See “single pneumatic module configurator” |

| Diaphragm plug (optional) only for 15 poles connector | |
|---|---|
| X | Diaphragm plug on port 1 |
| Y | Diaphragm plug on port 3 |
| Z | Diaphragm plug on port 5 |

| Module 3 only for 15 poles connector | |
|---|---|
| ...-... | See “single pneumatic module configurator” |

| Right endplates | |
|---|---|
| P0 | Endplate closed |
| P1 | Endplate with connection ports |

## Single pneumatic module configurator

Module configurator - [ ] [ ] [ ] [ ] [ ] [ ] -

| Base type | |
|---|---|
| 4 | Bistable two-position base Ø4 |
| 6 | Bistable two-position base Ø6 |
| 8 | Bistable two-position base Ø8 |

| Base version | |
|---|---|
| | 5-1-3 free (standard sub-base) |
| 3 | Intermediate diaphragm plug on ports 1 and 5 |
| 4 | Intermediate diaphragm plug on ports 1 and 3 |
| 5 | Intermediate diaphragm plug on port 5 |
| 6 | Intermediate diaphragm plug on ports 1, 3, 5 |
| 7 | Intermediate diaphragm plug on port 1 |
| 8 | Intermediate diaphragm plug on ports 3 and 5 |
| 9 | Intermediate diaphragm plug on port 3 |

| Solenoid valve version | |
|---|---|
| A | S.V. 5/2 solenoid-spring |
| B | S.V. 5/2 solenoid-differential |
| C | S.V. 5/2 solenoid-solenoid |
| E | S.V. 5/3 solenoid-solenoid |
| F | S.V. 2x3/2 NC-NC |
| G | S.V. 2x3/2 NO-NO |
| H | S.V. 2x3/2 NO-NC |
| I | S.V. 2x3/2 NC-NO |
| T | Plug |

| Only bases manifold version | |
|---|---|
| V | No valve |

| S.V. accessories (optional) | |
|---|---|
| 5 | Separed exhaust |
| 6 | Separed air supply |

**Accessories not available for only bases manifold**

**It’s possible to order an only base manifold by select the field V as described.
This selection MUST be done for every place into the manifold.
It’s NOT possible to configure manifolds with positions both filled with S.V. and free.**

**Configurable on Cadenas platform**

CADENAS

**Note:**

When composing the configuration, always bear in mind that the maximum number of electrical signals available is:

- 8 for multi-pin 9 poles connector (MP9)
- 12 for multi-pin 15 poles connector (MP1)

Consider that every base uses 4 signals and the number of avaliable signals depends on the electrical connection type, so the number of bases you can use is related to the electrical connection you chose. You can order a “bases only” manifold by selecting “V” option in the solenoid valves dedicated field.
If a monostable valve is used on a bistable type base (2 electrical signals occupied), an electrical signal is lost.
However, this makes it possible to replace the monostable valve with a bistable valve in the same position.
Diaphragm plugs are used to interrupt ports 1, 3 and 5 of the sub-base.
If it is necessary to interrupt more than one port at the same time, put the letters that identify their position in sequence (e.g.: if it is necessary to intercept the ports 3 and 5 you must put the letters YZ).


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

**Only base configuration example: C-MP1-E-6VV-6VV-6VV-P0**

- 15 poles multi-pin connection
- Standard left endplate
- Bistable standard base Ø6 without solenoid valves (6VV)
- Bistable standard base Ø6 without solenoid valves (6VV)
- Bistable standard base Ø6 without solenoid valves (6VV)
- Right Endplates closed

**Attention**: Complete with solenoid valves before use.

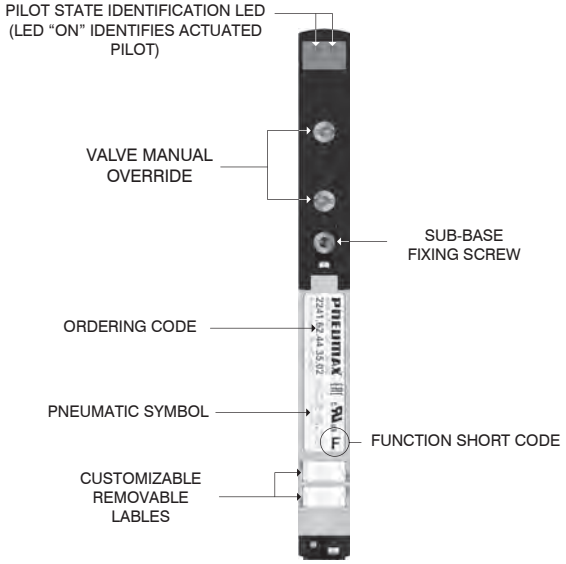


**Standard configuration example: C-MP1-E-6AA-6CF-6FF-P1**

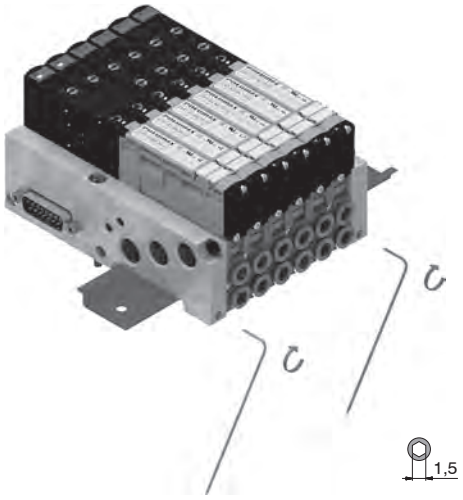
- 15 poles multi-pin connection
- Standard left endplate
- Bistable standard base Ø6 with AA type solenoid valves (6AA)
- Bistable standard base Ø6 with CF type solenoid valves (6CF)
- Bistable standard base Ø6 with FF type solenoid valves (6FF)
- Right endplate with supply and exhaust ports

**Attention**: The signal allocation is 2 signals for every positions, regardless of solenoid valve type.



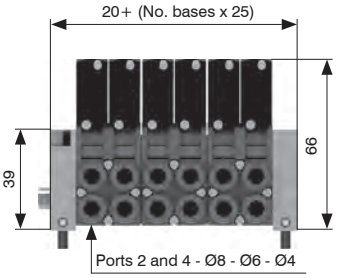


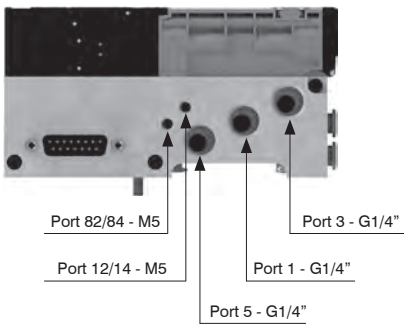

**DIN rail fixing**



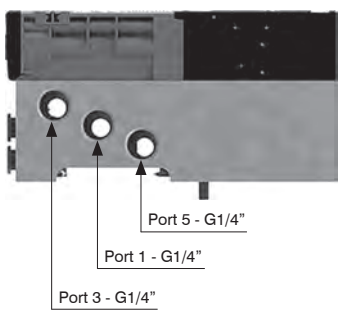

**Supply ports and maximum possible size according to valves used**

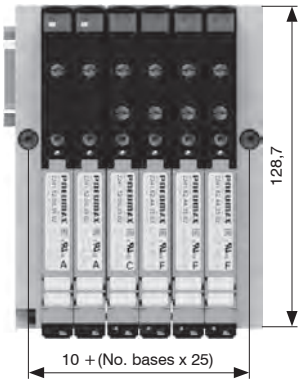





**Right endplate with supply and exhaust ports (P1)**



**Manual override actuation**

**Instable function:**
Push to actuate
(when released it moves back to the original position)

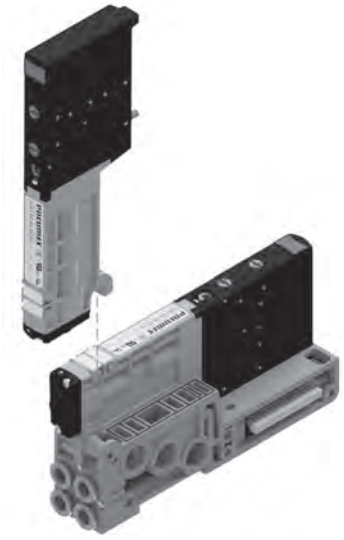


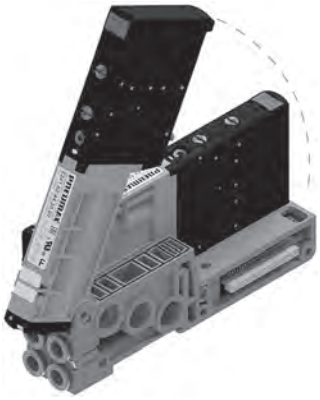
**Bistable function:**
Push and turn to get the bistable function

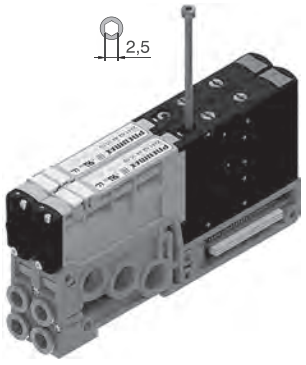


**Note**: we recommend the manual override is returned to it's original position when not in use

**Solenoid valves installation**

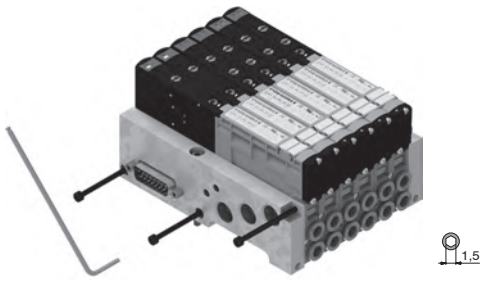







**Note**: Torque moment 0,8 Nm

**Sub-base assembly**




Minimum torque moment: 2 Nm
Maximum fixing torque for fittings: 2,5 Nm


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

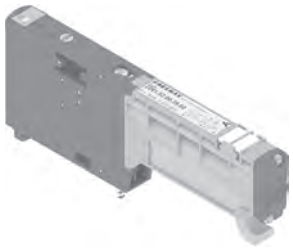
## Solenoid-Spring

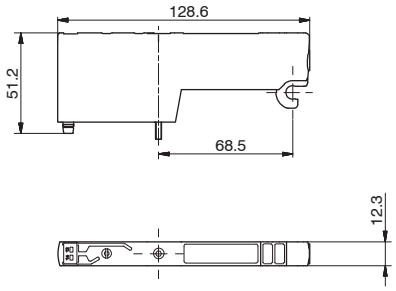
**Coding:** 2241.52.00.39.Ⓥ

| Technical characteristics | | |
|---|---|---|
| Fluid | | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | | From vacuum to 10 |
| Pilot pressure (bar) | | 2,5 ... 7 |
| Temperature °C | | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | with modular base, tube ø4 | 140 |
| | with modular base, tube ø6 | 300 |
| | with modular base, tube ø8 | 400 |
| Response time according to ISO 12238, activation time (ms) | | 15 |
| Response time according to ISO 12238, deactivation time (ms) | | 20 |

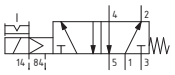
| Ⓥ | VOLTAGE |
|---|---|
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

SHORT FUNCTION CODE "A"






Weight 67 g



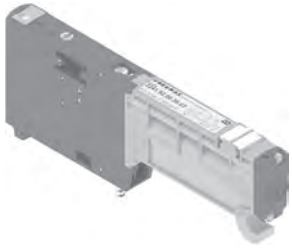
## Solenoid-Differential

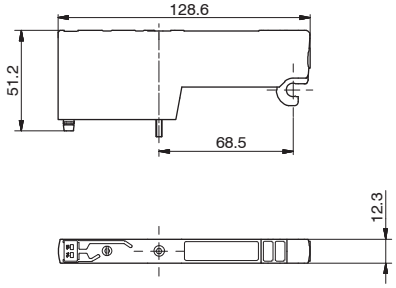
**Coding:** 2241.52.00.36.Ⓥ

| Technical characteristics | | |
|---|---|---|
| Fluid | | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | | From vacuum to 10 |
| Pilot pressure (bar) | | 2,5 ... 7 |
| Temperature °C | | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | with modular base, tube ø4 | 140 |
| | with modular base, tube ø6 | 400 |
| | with modular base, tube ø8 | 550 |
| Response time according to ISO 12238, activation time (ms) | | 20 |
| Response time according to ISO 12238, deactivation time (ms) | | 25 |

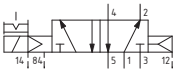
| Ⓥ | VOLTAGE |
|---|---|
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

SHORT FUNCTION CODE "B"






Weight 67 g



## Solenoid-Solenoid

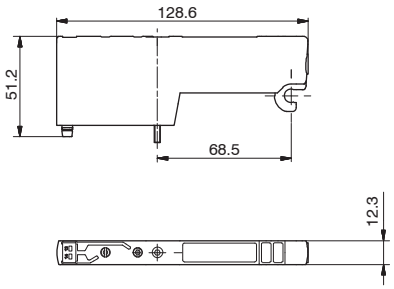
**Coding:** 2241.52.00.35.Ⓥ

| Technical characteristics | | |
|---|---|---|
| Fluid | | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | | From vacuum to 10 |
| Pilot pressure (bar) | | 2,5 ... 7 |
| Temperature °C | | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | with modular base, tube ø4 | 140 |
| | with modular base, tube ø6 | 400 |
| | with modular base, tube ø8 | 550 |
| Response time according to ISO 12238, activation time (ms) | | 10 |
| Response time according to ISO 12238, deactivation time (ms) | | 10 |

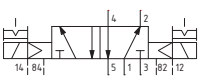
| Ⓥ | VOLTAGE |
|---|---|
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

SHORT FUNCTION CODE "C"






Weight 67 g



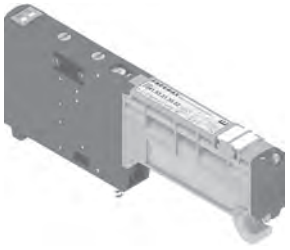
## Solenoid-Solenoid 5/3 (Closed centres)

**Coding:** 2241.53.31.35.Ⓥ

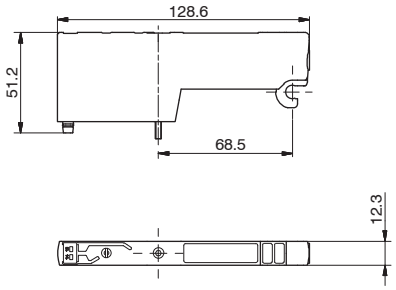
| Technical characteristics | | |
|---|---|---|
| Fluid | | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | | From vacuum to 10 |
| Pilot pressure (bar) | | 2,5 ... 7 |
| Temperature °C | | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | with modular base, tube ø4 | 140 |
| | with modular base, tube ø6 | 300 |
| | with modular base, tube ø8 | 400 |
| Response time according to ISO 12238, activation time (ms) | | 15 |
| Response time according to ISO 12238, deactivation time (ms) | | 20 |

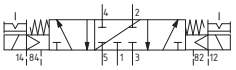
| | VOLTAGE |
|---|---|
| Ⓥ | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

SHORT FUNCTION CODE "E"



Weight 83 g



## Solenoid-Solenoid 2x3/2

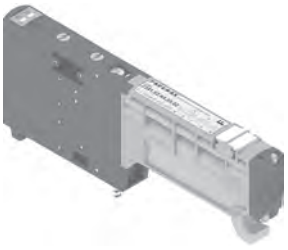
**Coding:** 2241.62.Ⓕ.35.Ⓥ

| Technical characteristics | | |
|---|---|---|
| Fluid | | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | | From vacuum to 10 |
| Pilot pressure (bar) | | ≥3+(0,2xInlet pressure) |
| Temperature °C | | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | with modular base, tube ø4 | 140 |
| | with modular base, tube ø6 | 360 |
| | with modular base, tube ø8 | 420 |
| Response time according to ISO 12238, activation time (ms) | | 15 |
| Response time according to ISO 12238, deactivation time (ms) | | 25 |

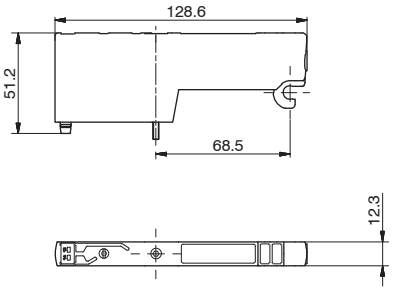
| | FUNCTION |
|---|---|
| Ⓕ | **44** = NC-NC (5/3 Open centres) |
| | **45** = NC-NO (normally closed-normally open) |
| | **54** = NO-NC (normally open-normally closed) |
| | **55** = NO-NO (5/3 Pressured centres) |
| | VOLTAGE |
| Ⓥ | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

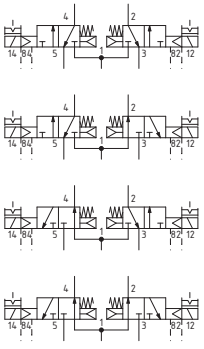
SHORT FUNCTION CODE:
NC-NC (5/3 Open centres) = "F"
N.O. - N.O. (5/3 Pressured centres) = "G"
N.C.-N.O. = "H"
N.O.-N.C. = "I"

Example: If inlet pressure is set at 5 bar then pilot pressure must be at least Pp=3+(0,2*5)=4 bar



Weight 75 g



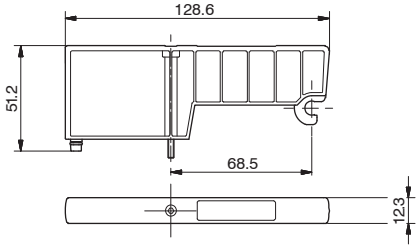
## Closing plate

**Coding:** 2240.00

| Technical characteristics | | |
|---|---|---|
| Fluid | | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | | From vacuum to 10 |
| Pilot pressure (bar) | | 2,5 ... 7 |
| Temperature °C | | -5 ... +50 |



Weight 30 g




SHORT FUNCTION CODE "T"



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Left Endplate

**Coding:** 22C0.Ⓥ.S

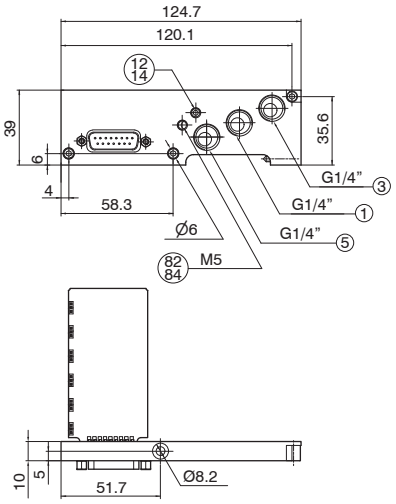
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

| Ⓥ | VERSION |
|---|---|
| | **15** = 15 poles multi-pin connection |
| | **09** = 9 poles multi-pin connection |



PORT 12/14 SEPARED FROM PORT 1.
DO NOT PRESSURIZE PORT 82/84.
PILOTS EXHAUST.
Weight 199 g

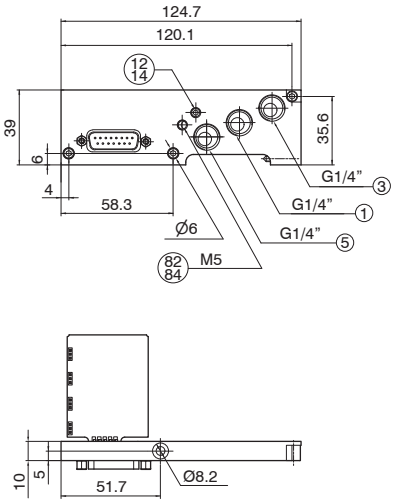
22C0.15.S






PORT 12/14 SEPARED FROM PORT 1.
DO NOT PRESSURIZE PORT 82/84.
PILOTS EXHAUST.
Weight 199 g

22C0.09.S




## Right Endplate

**Coding:** 22C0.Ⓥ

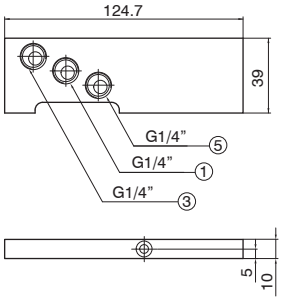
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

| Ⓥ | VERSION |
|---|---|
| | **00** = Blind plate |
| | **03** = With alimentation/exhaust ports |



PORT 12/14 SEPARED FROM PORT 1.
DO NOT PRESSURIZE PORT 82/84.
PILOTS EXHAUST.
Weight 148g

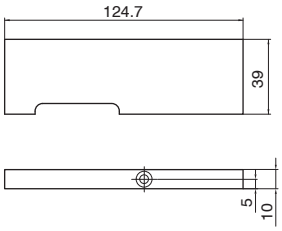
22C0.03






Weight 148g

22C0.00



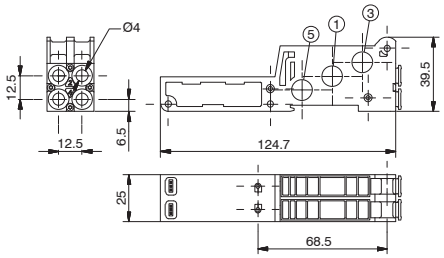
## Modular base (2 places)

**Coding:** 224Ⓒ.ⒻC

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Temperature °C | -5 ... +50 |

| | |
|---|---|
| Ⓒ | TUBE DIAMETER |
| | **4** = Ø4 |
| | **6** = Ø6 |
| | **8** = Ø8 |
| Ⓕ | FUNCTION |
| | **01** = Opened ports |
| | **03** = Ports 1-5 separated |
| | **04** = Ports 1-3 separated |
| | **05** = Port 5 separated |
| | **06** = Separated ports |
| | **07** = Port 1 separated |
| | **08** = Ports 3-5 separated |
| | **09** = Port 3 separated |

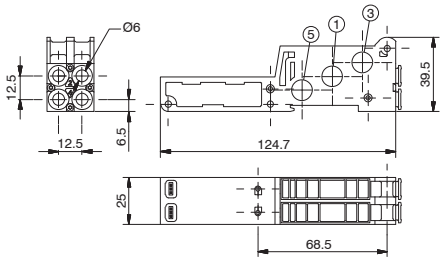





Weight 75 g

2244.ⒻC

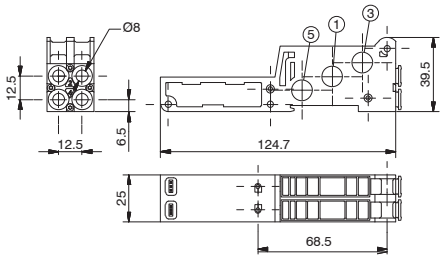





Weight 75 g

2246.ⒻC






Weight 75 g

2248.ⒻC

## Individual supply or exhaust module

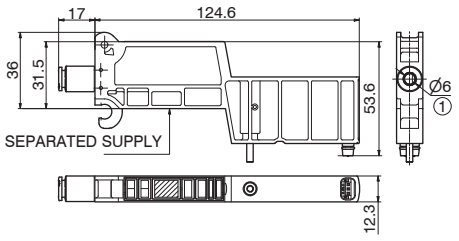
**Coding:** 22E0.Ⓥ.06

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10<br>3 ... 7 (piloting 12/14) |
| Temperature °C | -5 ... +50 |

| | |
|---|---|
| Ⓥ | VERSION |
| | **01** = Port 1 separated |
| | **35** = Ports 3-5 separated |

*The flow rate of the solenoid valve will be reduced compared to that shown in the general catalogue*

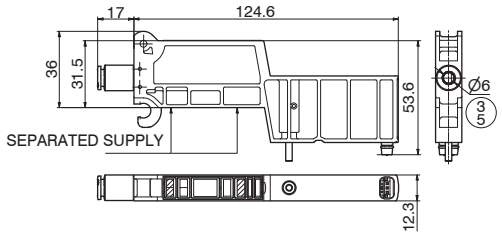





Weight 44 g

22E0.01.06






Weight 44 g

22E0.35.06



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## SEP type silencer

**Coding:** SEP14



Weight 2 g

## Diaphragm plug

**Coding:** 2230.17



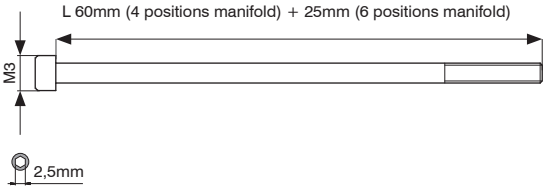
Weight 1,3 g

## TCEI M3 screw kit

**Coding:** 22C0.KV.Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **04** = L 60mm (4 positions manifold) |
| | **06** = L 60mm (6 positions manifold) |






The Kit includes 3 pieces

## Cable complete with connector, 9 Poles, IP40

**Coding:** 2400.09.Ⓛ.00

| Ⓛ | CABLE LENGTH |
|---|---|
| | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |



## Cable complete with connector, 15 Poles, IP40

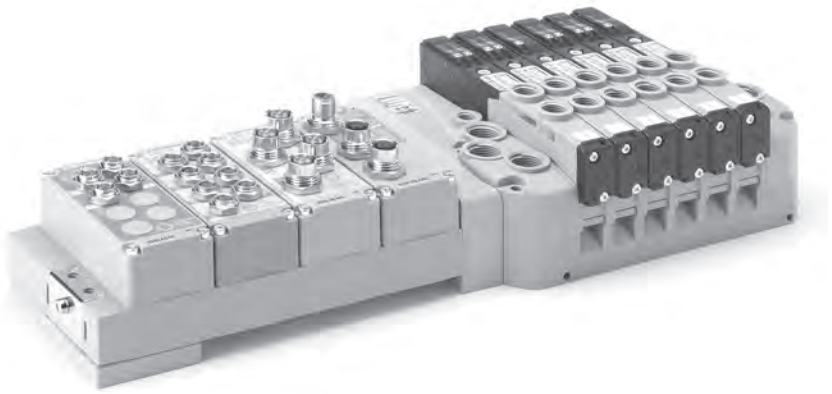
**Coding:** 2400.15.Ⓛ.00

| Ⓛ | CABLE LENGTH |
|---|---|
| | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |



## Series 2500 Optyma-F EVO





### 2500 SERIES Optyma-F EVO SOLENOID VALVES MANIFOLD

- **Increased flexibility**
- **Digital and analogue I/O modules**
- **Manufactured in technopolymer**
- **Wide range of communication protocols**

### WE SPEAK EVO

The Optyma-F series becomes EVO and interfaces with the new PX series modular electronic system while still retaining all of its technical advantages. This is enriched with new features that further extend the flexibility of the product:

- Flow rate of 1000 Nl/min
- Quick assembly using rotating pins
- Operating using different pressures and vacuum

### Construction characteristics

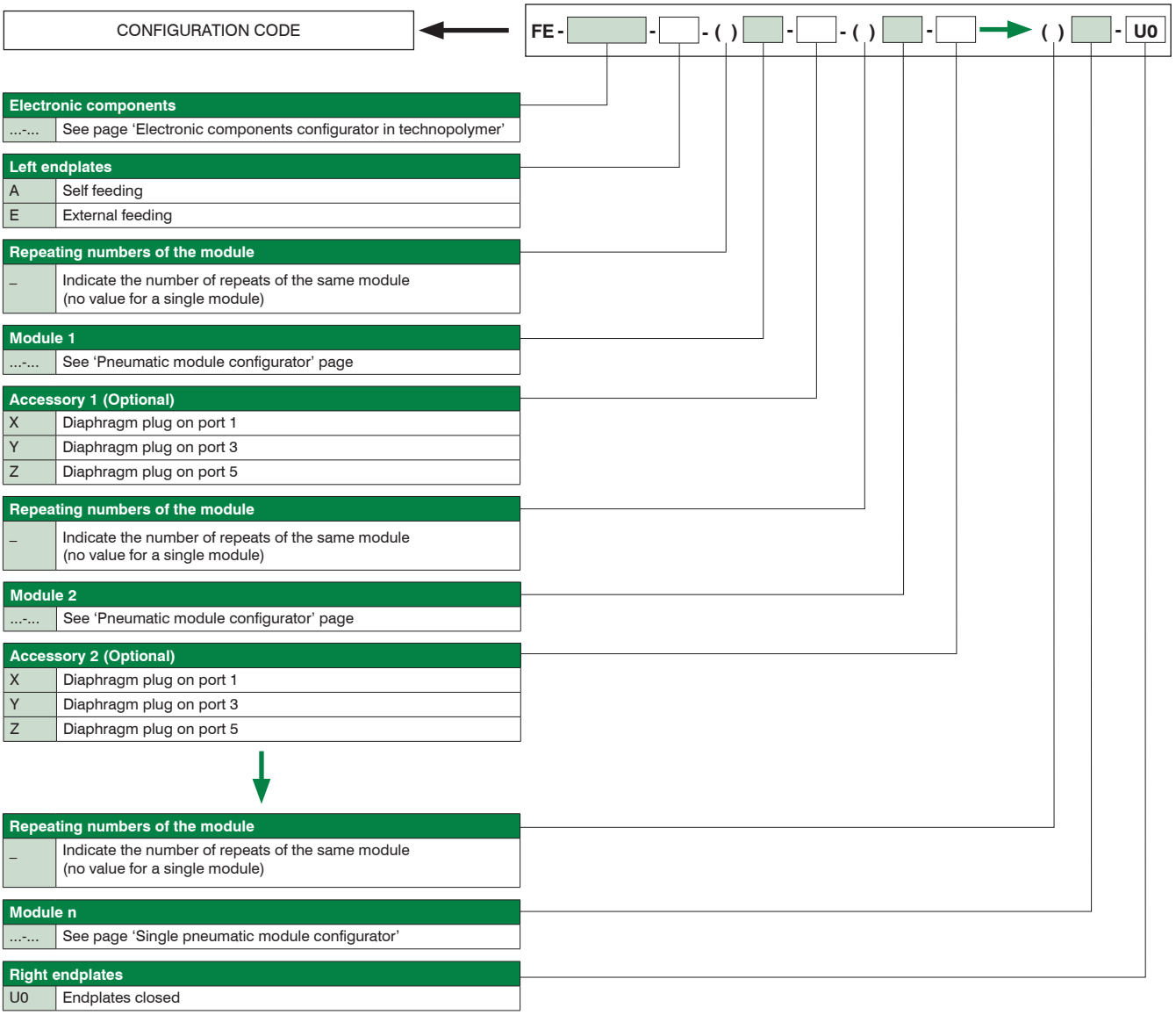
| | |
|---|---|
| Body | Technopolymer |
| Seals | NBR |
| Piston seals | NBR |
| Springs | Stainless Steel |
| Operators | Technopolymer |
| Pistons | Technopolymer |
| Spools | Technopolymer |

### Operational characteristics

| | |
|---|---|
| Supply voltage | + 24 V DC ±10% |
| Pilot consumption | 1,3W |
| Pilot working pressure (12-14) | from 3 up to 7 bar max. |
| Valve working pressure [1] | from vacuum to 10 bar max. |
| Operating temperature | from -5°C to +50°C |
| Protection degree | IP65 |
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Rules and configuration scheme




| Electronic components | |
|---|---|
| ...-... | See page 'Electronic components configurator in technopolymer' |

| Left endplates | |
|---|---|
| A | Self feeding |
| E | External feeding |

| Repeating numbers of the module | |
|---|---|
| _ | Indicate the number of repeats of the same module (no value for a single module) |

| Module 1 | |
|---|---|
| ...-... | See 'Pneumatic module configurator' page |

| Accessory 1 (Optional) | |
|---|---|
| X | Diaphragm plug on port 1 |
| Y | Diaphragm plug on port 3 |
| Z | Diaphragm plug on port 5 |

| Repeating numbers of the module | |
|---|---|
| _ | Indicate the number of repeats of the same module (no value for a single module) |

| Module 2 | |
|---|---|
| ...-... | See 'Pneumatic module configurator' page |

| Accessory 2 (Optional) | |
|---|---|
| X | Diaphragm plug on port 1 |
| Y | Diaphragm plug on port 3 |
| Z | Diaphragm plug on port 5 |

| Repeating numbers of the module | |
|---|---|
| _ | Indicate the number of repeats of the same module (no value for a single module) |

| Module n | |
|---|---|
| ...-... | See page 'Single pneumatic module configurator' |

| Right endplates | |
|---|---|
| U0 | Endplates closed |

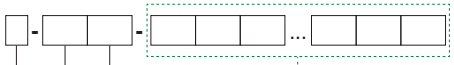
**Configurable on Cadenas platform**

CADENAS

**Note:**
When composing the configuration, always bear in mind that the maximum number of electrical signals available is:
- 32 if a 37-pole multi-pin module, a serial node or IO-Link interface are used.
- 24 if a 25-pole multi-pin module is used.

If a monostable valve is used on a bistable type base (2 electrical signals occupied), an electrical signal is lost.
However, this makes it possible to replace the monostable valve with a bistable valve in the same position.
Diaphragm plugs are used to interrupt ports 1, 3 and 5 of the sub-base.
If it is necessary to interrupt more than one port at the same time, put the letters that identify their position in sequence (e.g.: if it is necessary to intercept the ports 3 and 5 you must put the letters YZ).
If one or more ports must be interrupted more than once, the addition of the intermediate supply/discharge module is necessary.

## Electronic components configurator in technopolymer



| Type | |
|---|---|
| P | Technopolymer |

| Multi-pin electrical connection | | |
|---|---|---|
| MP | 2 | Multi-pin, PNP 24 V DC 25 poles |
| | 3 | Multi-pin, PNP 24 V DC 37 poles |
| MN | 2 | Multi-pin, NPN 24 V DC 25 poles |
| | 3 | Multi-pin, NPN 24 V DC 37 poles |
| MA | 2 | Multi-pin, 24 V AC 25 poles |
| | 3 | Multi-pin, 24 V AC 37 poles |

| Electrical connection | |
|---|---|
| C3 | CANopen® node 64 IN - 64 OUT (32 fixed) |
| P3 | PROFIBUS DP node 64 IN - 64 OUT (32 fixed) |
| I4 | EtherNet/IP node 128 IN - 128 OUT (48 fixed) |
| A4 | EtherCAT® node 128 IN - 128 OUT (48 fixed) |
| N4 | PROFINET IO RT node 128 IN - 128 OUT (48 fixed) |
| G4 | CC-Link IE Field Basic node 128 IN - 128 OUT (48 fixed) |
| K3 | IO-Link interface 64 IN - 64 OUT (32 fixed) |

| Electrical connection accessories | |
|---|---|
| | Without DIN rail fixing |
| G | With DIN rail fixing |

**SINGLE ELECTRIC MODULE CONFIGURATION**

| Repeating numbers of the module | |
|---|---|
| | Indicate the number of repeats of the same module (no value for a single module) |

| Inputs module - Analog / Digital (EXCLUDED WITH MP) | |
|---|---|
| D8 | 8 M8 digital inputs module |
| D12 | 8 M12 digital inputs module |
| D3 | 32 digital inputs SUB-D 37 poles |
| T1 | 2 analogue inputs 0-5V module (voltage signal) |
| T2 | 2 analogue inputs 0-10V module (voltage signal) |
| T3 | 4 analogue inputs 0-5V module (voltage signal) |
| T4 | 4 analogue inputs 0-10V module (voltage signal) |
| C1 | 2 analogue inputs 0-20mA module (current signal) |
| C2 | 2 analogue inputs 4-20mA module (current signal) |
| C3 | 4 analogue inputs 0-20mA module (current signal) |
| C4 | 4 analogue inputs 4-20mA module (current signal) |
| P1 | 2 Pt100 2 wires inputs module |
| P2 | 2 Pt100 3 wires inputs module |
| P3 | 2 Pt100 4 wires inputs module |
| P4 | 4 Pt100 2 wires inputs module |
| P5 | 4 Pt100 3 wires inputs module |
| P6 | 4 Pt100 4 wires inputs module |
| **Outputs module - Analog / Digital** | |
| M8 | 8 M8 digital outputs module |
| M12 | 8 M12 digital outputs module |
| M3 | 32 digital outputs SUB-D 37 poles |
| V1 | 2 analogue outputs 0-5V module (voltage signal) |
| V2 | 2 analogue outputs 0-10V module (voltage signal) |
| V3 | 4 analogue outputs 0-5V module (voltage signal) |
| V4 | 4 analogue outputs 0-10V module (voltage signal) |
| L1 | 2 analogue outputs 0-20mA module (current signal) |
| L2 | 2 analogue outputs 4-20mA module (current signal) |
| L3 | 4 analogue outputs 0-20mA module (current signal) |
| L4 | 4 analogue outputs 4-20mA module (current signal) |
| **Additional modules (Optional)** | |
| P12 | M12 additional power supply module |

| Module accessories | |
|---|---|
| | Without DIN rail fixing |
| G | With DIN rail fixing |

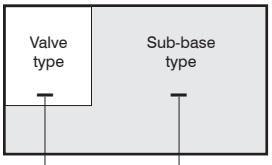
**Refer to the current limits indicated in the pages relating to the nodes / IO-Link interface**



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Modules configurator

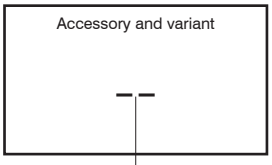
### Base module configurator with Solenoid valve




| Solenoid valve position | |
|---|---|
| A | S.V. 5/2 SOL.-SPRING |
| B | S.V. 5/2 SOL.-DIF. |
| C | S.V. 5/2 SOL.-SOL. |
| E | S.V. 5/3 CC SOL.-SOL. |
| F | S.V. 2x3/2 NC-NC |
| G | S.V. 2x3/2 NO-NO |
| H | S.V. 2x3/2 NC-NO |
| I | S.V. 2x3/2 NO-NC |
| T | PLUG |

| Base | |
|---|---|
| 1 | Monostable base |
| 2 | Bistable base |

### Accessory module configurator

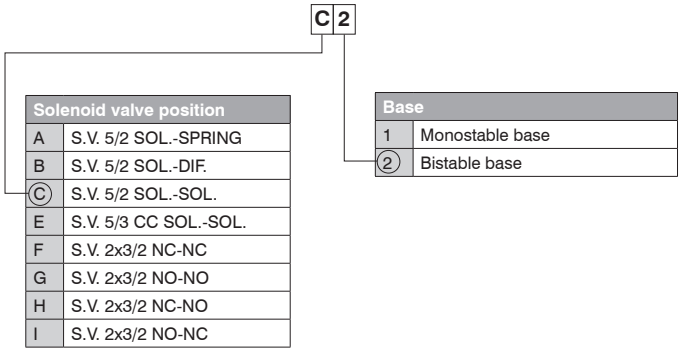



| Intermediate inlet/Exhaust module | |
|---|---|
| W | Separated air supply and exhaust |

| Intermediate electropneumatic shut-off module | | | |
|---|---|---|---|
| U | Separated supply (air/electric) and exhaust | 2 | 2 positions |
| | | 4 | 4 positions |
| | | 6 | 6 positions |
| | | 8 | 8 positions |
| K | Separated supply (air/electric), exhaust and 12/14 piloting | 2 | 2 positions |
| | | 4 | 4 positions |
| | | 6 | 6 positions |
| | | 8 | 8 positions |

### Configuration example of single module:

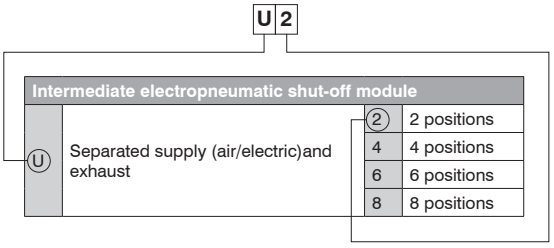
Bistable base, 5/2 Solenoid-Solenoid valve




| Solenoid valve position | |
|---|---|
| A | S.V. 5/2 SOL.-SPRING |
| B | S.V. 5/2 SOL.-DIF. |
| C | S.V. 5/2 SOL.-SOL. |
| E | S.V. 5/3 CC SOL.-SOL. |
| F | S.V. 2x3/2 NC-NC |
| G | S.V. 2x3/2 NO-NO |
| H | S.V. 2x3/2 NC-NO |
| I | S.V. 2x3/2 NO-NC |

| Base | |
|---|---|
| 1 | Monostable base |
| 2 | Bistable base |

Intermediate electropneumatic shut-off module 2 positions



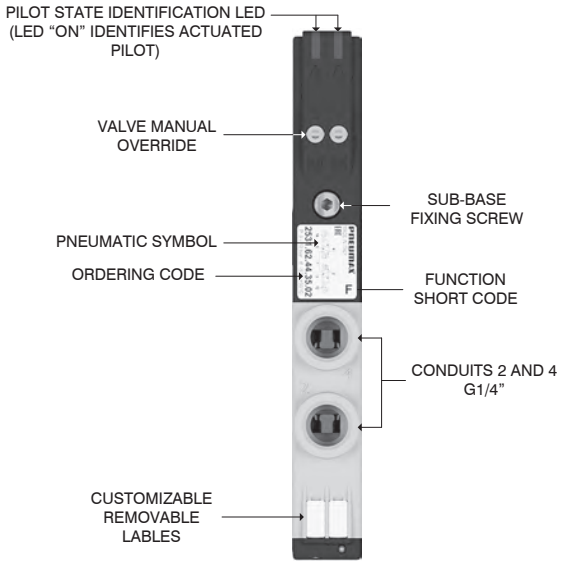

| Intermediate electropneumatic shut-off module | | |
|---|---|---|
| U | Separated supply (air/electric)and exhaust | 2 2 positions |
| | | 4 4 positions |
| | | 6 6 positions |
| | | 8 8 positions |

### Configuration example of complete group:

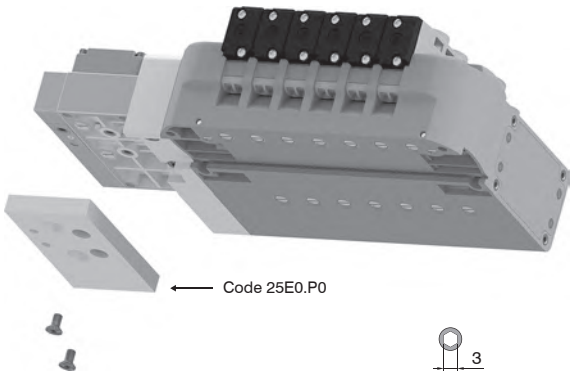
- Technopolymer PX3 serial system (P-A4-M12-M8-P4)
- Left endplates - External feeding (E)
- Bistable base with (F2) Solenoid valve
- Bistable base with (C2) Solenoid valve
- Monostable base with (A1) Solenoid valve
- Bistable base with (E2) Solenoid valve
- Bistable base with (C2) Solenoid valve
- Monostable base with (B1) Solenoid valve
- Right endplates closed (U0)



**FE-P-A4-M12-M8-P4-E-F2-C2-A1-E2-C2-B1-U0**

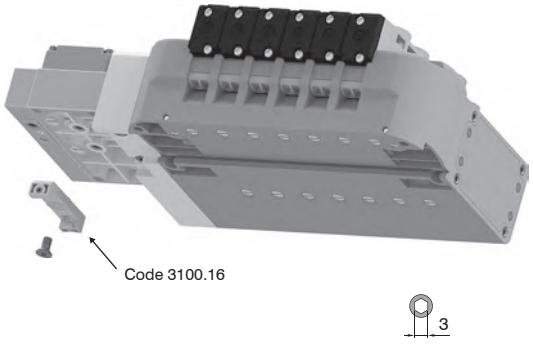



### Offset compensation plate



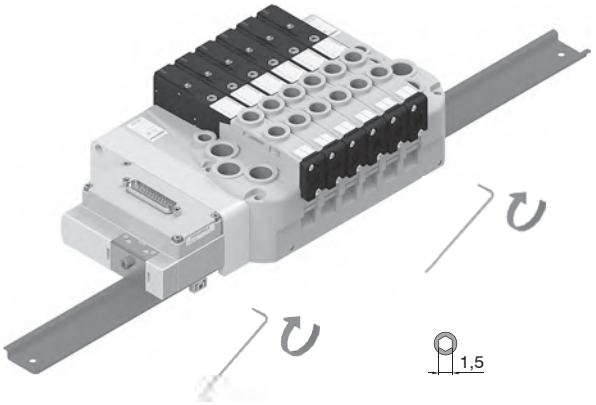

**Attention**: This accessory is supplied on the manifold unless otherwise stated. This is not compatible for DIN rail mounting.

### DIN rail mounting support plate



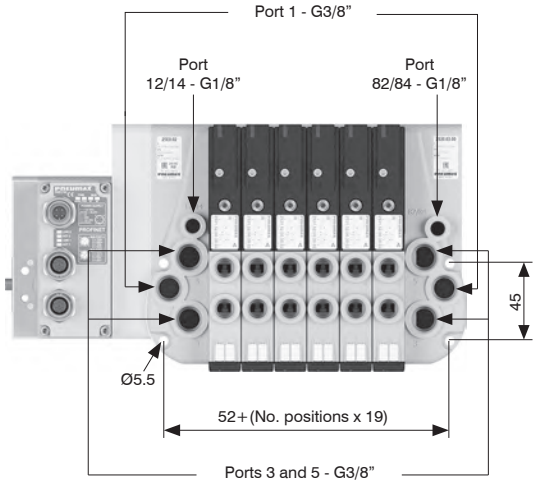

**Attention**: This must be included when creating the manifold configuration. Exclude the offset compensation plate.

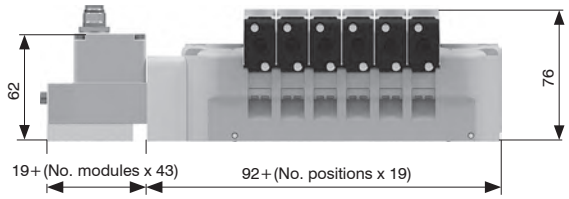
### DIN rail fixing



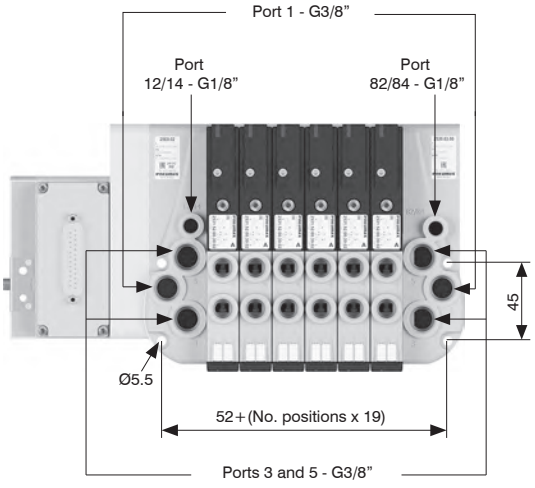

### Supply ports and maximum possible size according to valves used

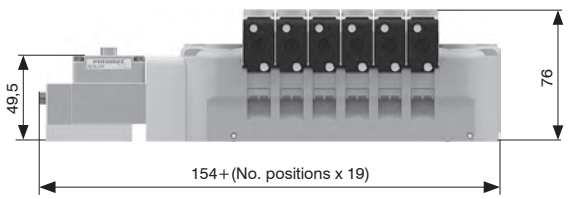
Serial system node version




Multi-pin version





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

**Manual override actuation**

**Instable function:**
Push to actuate
(when released it moves back to the original position)

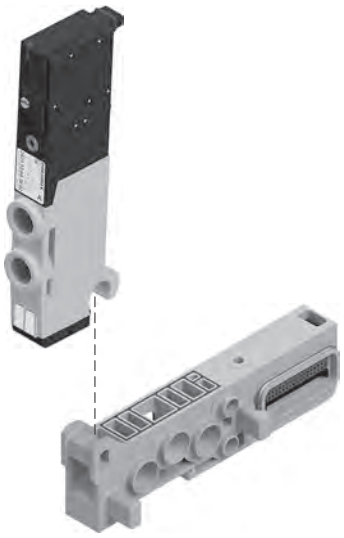


**Bistable function:**
Push and turn to get the bistable function



**Note**: we recommend the manual override is returned to it's original position when not in use

**Solenoid valves installation**

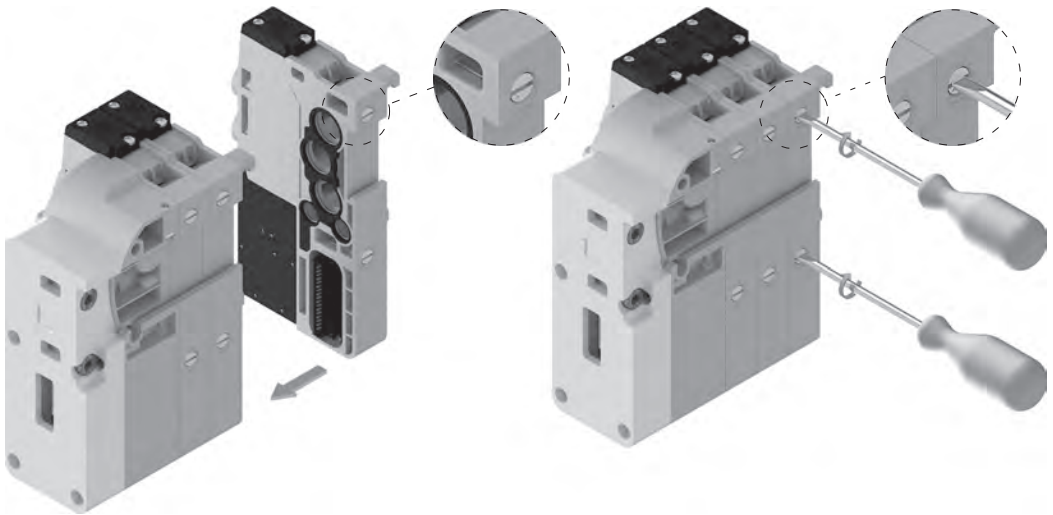







**Note**: Torque moment 1 Nm

**Sub-base assembly**



## Solenoid-Spring

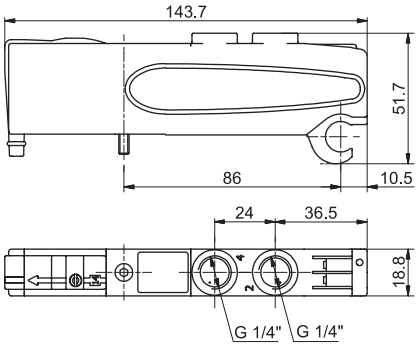
**Coding:** 2531.52.00.39.Ⓥ

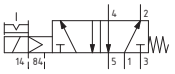
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 3 ... 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1000 |
| Response time according to ISO 12238, activation time (ms) | 14 |
| Response time according to ISO 12238, deactivation time (ms) | 40 |

| Ⓥ | VOLTAGE |
|---|---|
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

SHORT FUNCTION CODE "A"
Weight 123 g





## Solenoid-Differential

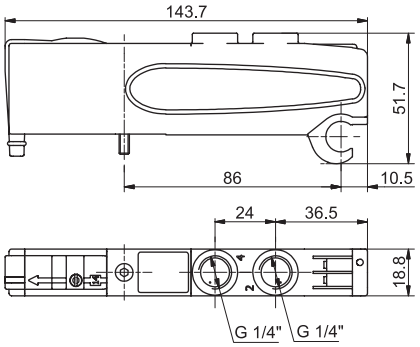
**Coding:** 2531.52.00.36.Ⓥ

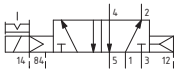
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 3 ... 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1000 |
| Response time according to ISO 12238, activation time (ms) | 20 |
| Response time according to ISO 12238, deactivation time (ms) | 29 |

| Ⓥ | VOLTAGE |
|---|---|
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

SHORT FUNCTION CODE "B"
Weight 120 g





## Solenoid-Solenoid

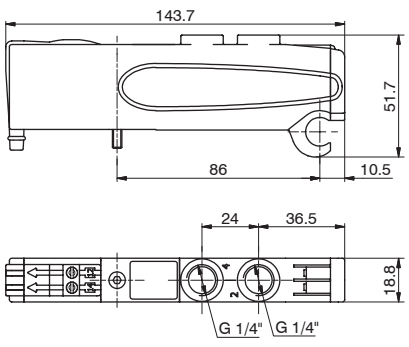
**Coding:** 2531.52.00.35.Ⓥ

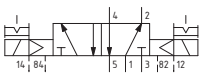
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 3 ... 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1000 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 14 |

| Ⓥ | VOLTAGE |
|---|---|
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

SHORT FUNCTION CODE "C"
Weight 128 g







Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Solenoid 5/3

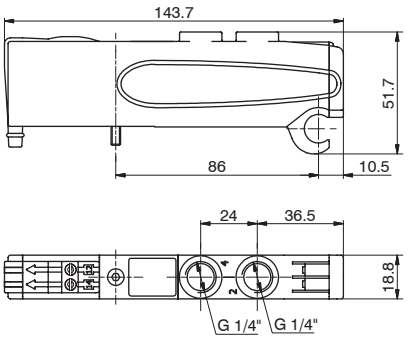
**Coding:** 2531.53.31.35.Ⓥ

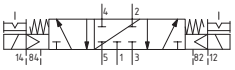
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 600 |
| Response time according to ISO 12238, activation time (ms) | 15 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |

| | VOLTAGE |
|---|---|
| Ⓥ | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

SHORT FUNCTION CODE "E"
Weight 126 g





## Solenoid-Solenoid 2x3/2

**Coding:** 2531.62.Ⓕ.35.Ⓥ

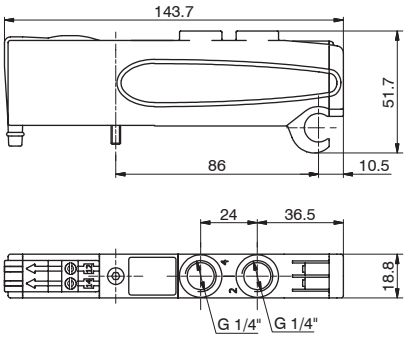
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | ≥3+(0,2xInlet pressure) |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 700 |
| Response time according to ISO 12238, activation time (ms) | 15 |
| Response time according to ISO 12238, deactivation time (ms) | 25 |

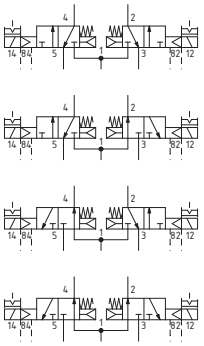
Example: If inlet pressure is set at 5 bar then pilot pressure must be at least Pp=2,5+(0,2*5)=3,5 bar

| | FUNCTION |
|---|---|
| Ⓕ | **44** = NC-NC (5/3 Open centres) |
| | **45** = NC-NO (normally closed-normally open) |
| | **54** = NO-NC (normally open-normally closed) |
| | **55** = NO-NO (5/3 Pressured centres) |
| | VOLTAGE |
| Ⓥ | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

SHORT FUNCTION CODE:
NC-NC (5/3 Open centres)="F"
N.O.-N.O. (5/3 Pressured centres)="G"
N.C.-N.O.="H"
N.O.-N.C.="I"
Weight 115,5 g





## Left Endplate

**Coding:** 25E0.Ⓥ.F

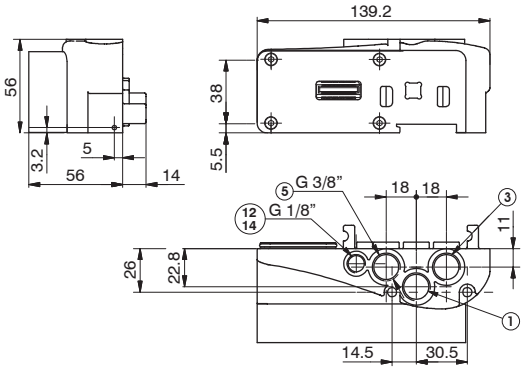
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 (external feeding)<br>3 ... 7 (self feeding) |
| Pilot pressure (bar) | 3 ... 7 (external feeding) |
| Temperature °C | -5 ... +50 |

| Ⓥ | VERSION |
|---|---|
| | **02** = External feeding |
| | **12** = Self-feeding |



12/14 SEPARATED FROM PORT 1
Weight 206 g

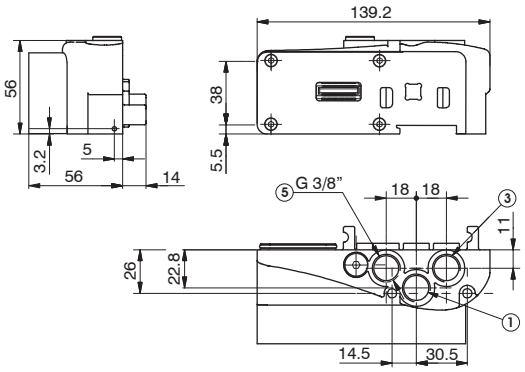
25E0.02.F






12/14 CONNECTED TO PORT 1
Weight 206 g

25E0.12.F




## Right Endplate

**Coding:** 2530.03.Ⓒ

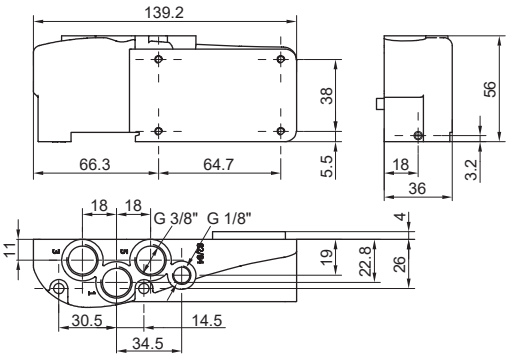
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Temperature °C | -5 ... +50 |

| Ⓒ | ELECTRICAL CONNECTION |
|---|---|
| | **00** = Electrical connection |



PORT 82/84= DO NOT PRESSURIZE, SOLENOID PILOTS EXHAUST
Weight 181,5 g

2530.03.00




## Modular base

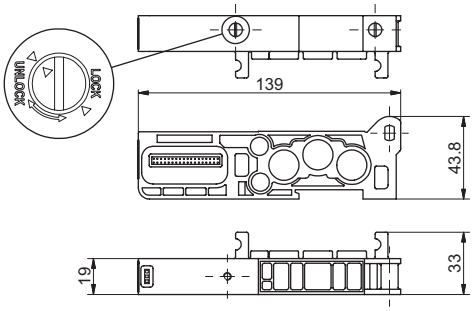
**Coding:** 2530.01Ⓥ

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Temperature °C | -5 ... +50 |

| Ⓥ | VERSION |
|---|---|
| | **M** = for monostable S.V. |
| | **B** = for bistable S.V. |



SHORT CODE "1" (for monostable S.V.)
SHORT CODE "2" (for bistable S.V.)
Weight 91,5 g





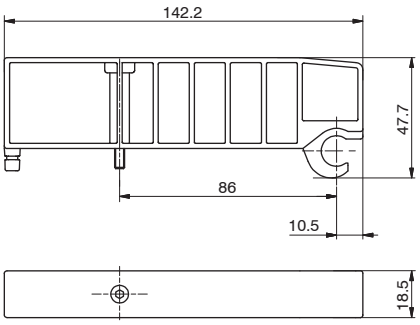

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Closing plate

**Coding:** 2530.00

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Temperature °C | -5 ... +50 |





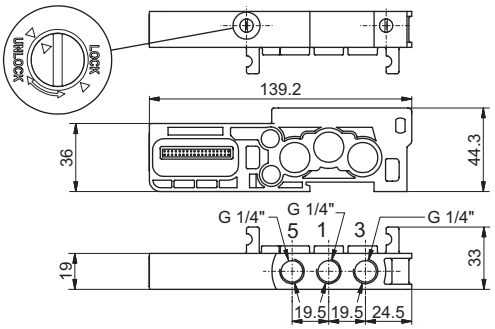

SHORT FUNCTION CODE "T"
Weight 53.5 g

## Intermediate Inlet/Exhaust module

**Coding:** 2530.10

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Temperature °C | -5 ... +50 |





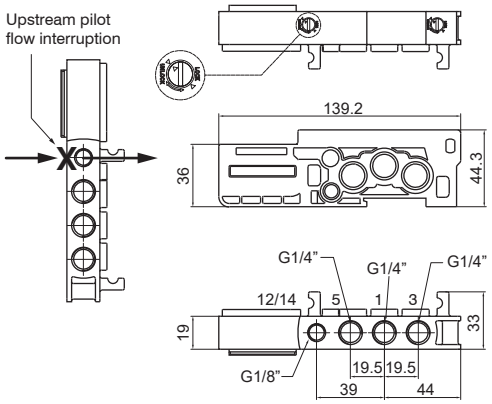

SHORT FUNCTION CODE "W"
Weight 110 g

## Intermediate inlet/Exhaust module with external pilot

**Coding:** 2530.11

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 3 ... 7 |
| Temperature °C | -5 ... +50 |






SHORT CODE "K"
Weight 162 g

## Intermediate electro-pneumatic shut-off module 2/4/6/8 positions

**Coding:** 2530.Ⓜ.Ⓣ

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10<br>3 ... 7 (piloting 12/14) |
| Temperature °C | -5 ... +50 |
| Feeding | + 24 V DC ±10% |
| Protection | Inverted polarity protection |
| Maximum load | 100 mA |
| Indicators | + 24 V DC presence LED |
| Series modules maximum number | 3 |

| | |
|---|---|
| Ⓜ | MODULE |
| | **10** = Supply and exhaust |
| | **11** = Supply and exhaust with separate pilot |
| Ⓣ | SHUT-OFF |
| | **2A** = 2 Signals |
| | **4A** = 4 Signals |
| | **6A** = 6 Signals |
| | **8A** = 8 Signals |



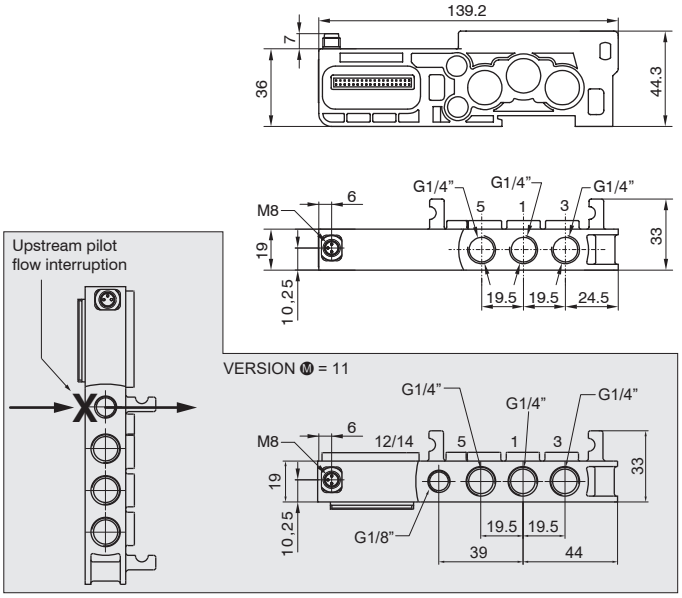
Weight 157 g

2530.10.Ⓣ



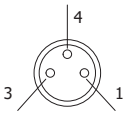
Weight 163 g

2530.11.Ⓣ

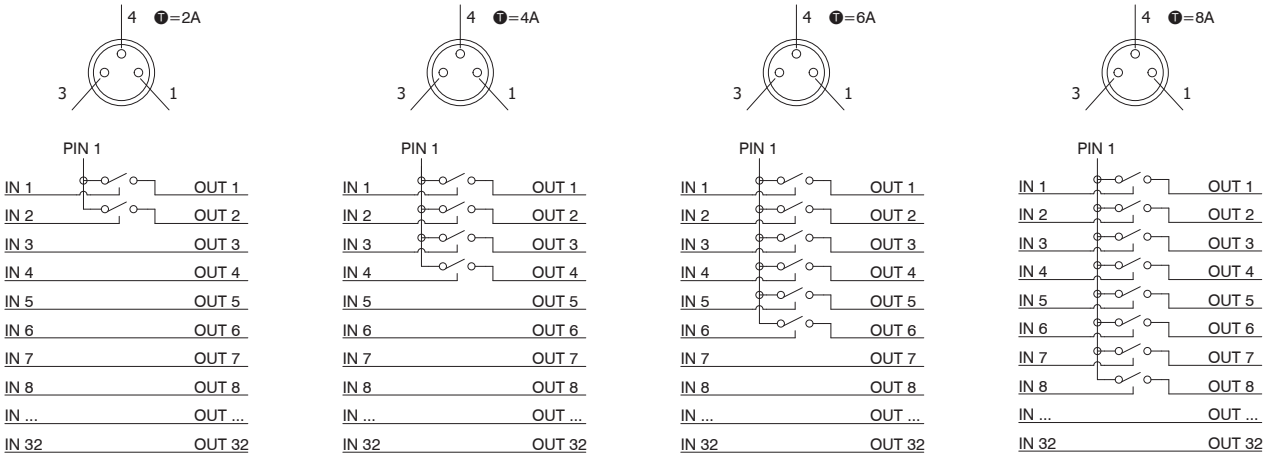



## WORKING PRINCIPLE / SIMPLIFIED FUNCTIONAL DIAGRAM

Intermediate electro-pneumatic shut-off module allows you to interrupt at the same time the first 2, 4, 6 or 8 available command signals for the valves after the module itself.
When the shut-off module is present, the controlled output logic signal values are equal to the input logic signal values which came from the serial node or the multi-pin module.
If the supply input signal is absent, the controlled output logic signal values are all equal to zero.
This module is particularly useful when control signals are used to block the valves; it is also effective both with serial management and multi-pin connection of the manifolds.
It is possible to use more modules to interrupt every command signals simply by inserting them before the signals to be interrupted.




| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC |
| 4 | NOT CONNECTED |
| 3 | GND |



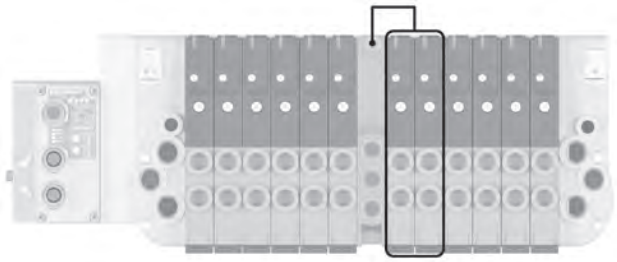



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

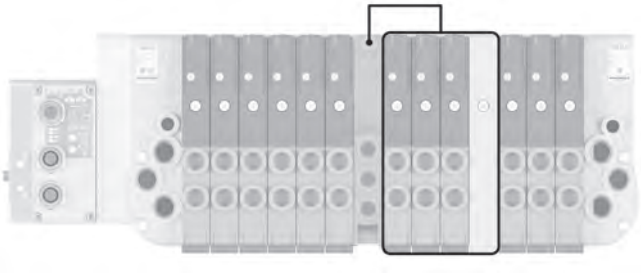
**Usage examples**

EXAMPLE 1
Manifold of 12 monostable solenoid valves on which you want to interrupt signals 7-8.
Assembly:
- 6 monostable solenoid valves (not interruptible because before the module)
- 1 additional power supply module
- 6 monostable solenoid valves

**Note**: the first 2 of these 6 monostable solenoid valves are interruptible by the module, while the following 4 will work correctly managed directly by the corresponding command signals.



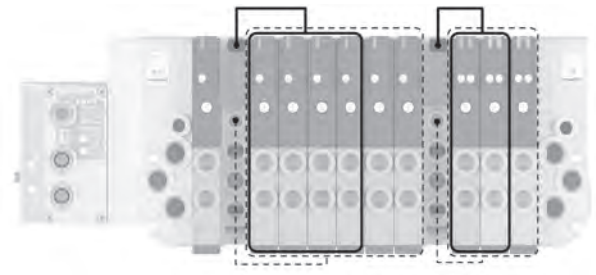
EXAMPLE 2
Manifold of 12 monostable solenoid valves on which you want to interrupt signals 7-8-9.
Assembly:
- 6 monostable solenoid valves (not interruptible because before the module)
- 1 additional power supply module
- 3 monostable solenoid valves (interruptible)
- 1 closing plate mounted on a monostable base
- 3 monostable solenoid valves (work correctly managed directly by the corresponding command signals)



EXAMPLE 3
Manifold of 7 monostable and 3 bistable solenoid valves in which you want to interrupt signals 2-3-4-5 and 8-9-10-11.
Assembly:
- 1 monostable solenoid valve (not interruptible because before the module)
- 1 additional electro-pneumatic shut-off module
- 6 monostable solenoid valves

**Note**: the first 4 of these 6 monostable solenoid valves are interruptible by the module, while the following 2 will work correctly managed directly by the corresponding command signals.
**Note no. 2**: The pilots of the 6 solenoid valves downstream of the intermediate electro-pneumatic shut-off module are pneumatically powered by the module itself.
- 1 additional electro-pneumatic shut-off module
- 3 bistable solenoid valves

**Note no. 3**: the first 2 of these 3 bistable solenoid valves are interruptible by the module, while the following will work correctly and are managed directly by the corresponding command signals.
**Note no. 4**: The pilots of the 3 solenoid valves downstream of the intermediate electro-pneumatic shut-off module are pneumatically powered by the module itself.

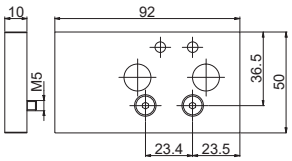


**Key**
S.V. electrically managed by the shut-off module: ——————
S.V. pneumatically managed (12/14) by the shut-off module: - - - - - - - -

## Offset compensation plate

**Coding:** 25E0.P0



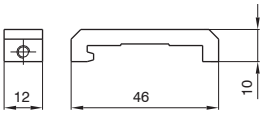



Weight 116 g

## DIN rail adapter

**Coding:** 3100.16






Weight 12 g

## Polyethylene Silencer Series SPL-P

**Coding:** SPLP.Ⓓ

| Ⓓ | TUBE DIAMETER |
|---|---|
| | **18** = 1/8" |
| | **14** = 1/4" |
| | **38** = 3/8" |



## Diaphragm plug

**Coding:** 2530.17

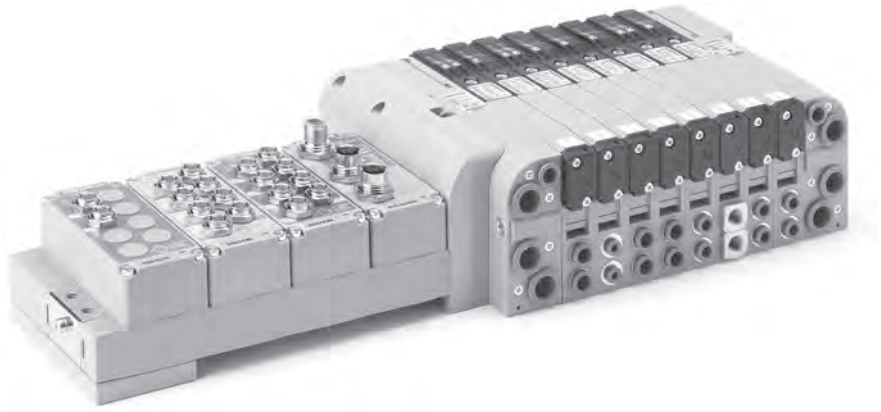


Weight 2,3 g



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 2500 Optyma-T EVO





### 2500 SERIES Optyma-T EVO SOLENOID VALVES MANIFOLD

- **Increased flexibility**
- **Digital and analogue I/O modules**
- **Manufactured in technopolymer**
- **Wide range of communication protocols**

### WE SPEAK EVO

The Optyma-T series becomes EVO and interfaces with the new PX series modular electronic system while still retaining all of its technical advantages. This is enriched with new features that further extend the flexibility of the product:

- Flow rate of 750 Nl/min
- Assembly with tie rods kit
- Operating using different pressures and vacuum
- Electro-pneumatic shut-off module

### Construction characteristics

| | |
|---|---|
| Body | Technopolymer |
| Seals | NBR |
| Piston seals | NBR |
| Springs | Stainless Steel |
| Operators | Technopolymer |
| Pistons | Technopolymer |
| Spools | Technopolymer |

### Operational characteristics

| | |
|---|---|
| Supply voltage | + 24 V DC ±10% |
| Pilot consumption | 1,3W |
| Pilot working pressure (12-14) | from 3 up to 7 bar max. |
| Valve working pressure [1] | from vacuum to 10 bar max. |
| Operating temperature | from -5°C to +50°C |
| Protection degree | IP65 |
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |

## Rules and configuration scheme

CONFIGURATION CODE

TE - [ ] - [ ] - ( ) [ ] - [ ] - ( ) [ ] - [ ] ( ) [ ] - U0

| Electronic components | |
|---|---|
| ...-... | See page 'Electronic components configurator in technopolymer' |

| Left endplates | |
|---|---|
| A | Self feeding |
| E | External feeding |

| Repeating numbers of the module | |
|---|---|
| _ | Indicate the number of repeats of the same module (no value for a single module) |

| Module 1 | |
|---|---|
| ...-... | See page 'Pneumatic module configurator' |

| Accessory 1 (Optional) | |
|---|---|
| X | Diaphragm plug on port 1 |
| Y | Diaphragm plug on port 3 |
| Z | Diaphragm plug on port 5 |

| Repeating numbers of the module | |
|---|---|
| _ | Indicate the number of repeats of the same module (no value for a single module) |

| Module 2 | |
|---|---|
| ...-... | See page 'Pneumatic module configurator' |

| Accessory 2 (Optional) | |
|---|---|
| X | Diaphragm plug on port 1 |
| Y | Diaphragm plug on port 3 |
| Z | Diaphragm plug on port 5 |

| Repeating numbers of the module | |
|---|---|
| _ | Indicate the number of repeats of the same module (no value for a single module) |

| Module n | |
|---|---|
| ...-... | See page 'Single pneumatic module configurator' |

| Right endplates | |
|---|---|
| U0 | Endplates closed |

**Configurable on Cadenas platform**

CADENAS

**Note:**
When composing the configuration, always bear in mind that the maximum number of electrical signals available is:
- 32 if a 37-pole multi-pin module, a serial node or IO-Link interface are used.
- 24 if a 25-pole multi-pin module is used.

If a monostable valve is used on a bistable type base (2 electrical signals occupied), an electrical signal is lost.
However, this makes it possible to replace the monostable valve with a bistable valve in the same position.
Diaphragm plugs are used to interrupt ports 1, 3 and 5 of the sub-base.
If it is necessary to interrupt more than one port at the same time, put the letters that identify their position in sequence (e.g.: if it is necessary to intercept the ports 3 and 5 you must put the letters YZ).
If one or more ports must be interrupted more than once, the addition of the intermediate supply/discharge module is necessary.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Electronic components configurator in technopolymer



| Type | |
|---|---|
| P | Technopolymer |

| Multi-pin electrical connection | | |
|---|---|---|
| MP | 2 | Multi-pin, PNP 24 V DC 25 poles |
| | 3 | Multi-pin, PNP 24 V DC 37 poles |
| MN | 2 | Multi-pin, NPN 24 V DC 25 poles |
| | 3 | Multi-pin, NPN 24 V DC 37 poles |
| MA | 2 | Multi-pin, 24 V AC 25 poles |
| | 3 | Multi-pin, 24 V AC 37 poles |

| Electrical connection | |
|---|---|
| C3 | CANopen® node 64 IN - 64 OUT (32 fixed) |
| P3 | PROFIBUS DP node 64 IN - 64 OUT (32 fixed) |
| I4 | EtherNet/IP node 128 IN - 128 OUT (48 fixed) |
| A4 | EtherCAT® node 128 IN - 128 OUT (48 fixed) |
| N4 | PROFINET IO RT node 128 IN - 128 OUT (48 fixed) |
| G4 | CC-Link IE Field Basic node 128 IN - 128 OUT (48 fixed) |
| K3 | IO-Link interface 64 IN - 64 OUT (32 fixed) |

| Electrical connection accessories | |
|---|---|
| | Without DIN rail fixing |
| G | With DIN rail fixing |

| Repeating numbers of the module | |
|---|---|
| | Indicate the number of repeats of the same module (no value for a single module) |

**SINGLE ELECTRIC MODULE CONFIGURATION**

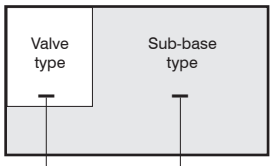
| Inputs module - Analog / Digital | |
|---|---|
| D8 | 8 M8 digital inputs module |
| D12 | 8 M12 digital inputs module |
| D3 | 32 digital inputs SUB-D 37 poles |
| T1 | 2 analogue inputs 0-5V module (voltage signal) |
| T2 | 2 analogue inputs 0-10V module (voltage signal) |
| T3 | 4 analogue inputs 0-5V module (voltage signal) |
| T4 | 4 analogue inputs 0-10V module (voltage signal) |
| C1 | 2 analogue inputs 0-20mA module (current signal) |
| C2 | 2 analogue inputs 4-20mA module (current signal) |
| C3 | 4 analogue inputs 0-20mA module (current signal) |
| C4 | 4 analogue inputs 4-20mA module (current signal) |
| P1 | 2 Pt100 2 wires inputs module |
| P2 | 2 Pt100 3 wires inputs module |
| P3 | 2 Pt100 4 wires inputs module |
| P4 | 4 Pt100 2 wires inputs module |
| P5 | 4 Pt100 3 wires inputs module |
| P6 | 4 Pt100 4 wires inputs module |
| **Outputs module - Analog / Digital** | |
| M8 | 8 M8 digital outputs module |
| M12 | 8 M12 digital outputs module |
| M3 | 32 digital outputs SUB-D 37 poles |
| V1 | 2 analogue outputs 0-5V module (voltage signal) |
| V2 | 2 analogue outputs 0-10V module (voltage signal) |
| V3 | 4 analogue outputs 0-5V module (voltage signal) |
| V4 | 4 analogue outputs 0-10V module (voltage signal) |
| L1 | 2 analogue outputs 0-20mA module (current signal) |
| L2 | 2 analogue outputs 4-20mA module (current signal) |
| L3 | 4 analogue outputs 0-20mA module (current signal) |
| L4 | 4 analogue outputs 4-20mA module (current signal) |
| **Additional modules (Optional)** | |
| P12 | M12 additional power supply module |

| Module accessories | |
|---|---|
| | Without DIN rail fixing |
| G | With DIN rail fixing |

**Refer to the current limits indicated in the pages relating to the nodes / IO-Link interface**

## Modules configurator

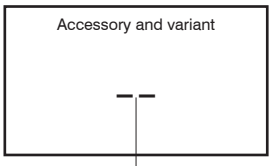
### Base module configurator with Solenoid valve




| Solenoid valve position | |
|---|---|
| A | S.V. 5/2 SOL.-SPRING |
| B | S.V. 5/2 SOL.-DIF. |
| C | S.V. 5/2 SOL.-SOL. |
| E | S.V. 5/3 CC SOL.-SOL. |
| F | S.V. 2x3/2 NC-NC |
| G | S.V. 2x3/2 NO-NO |
| H | S.V. 2x3/2 NC-NO |
| I | S.V. 2x3/2 NO-NC |
| T | Plug |

| Base | |
|---|---|
| 1 | Monostable base G1/8 GAS |
| 2 | Bistable base G1/8 GAS |
| 3 | Monostable base Ø4 |
| 4 | Bistable base Ø4 |
| 5 | Monostable base Ø6 |
| 6 | Bistable base Ø6 |
| 7 | Monostable base Ø8 |
| 8 | Bistable base Ø8 |

### Accessory module configurator




| Intermediate inlet/Exhaust module | |
|---|---|
| W | Separated air supply and exhaust |

| Intermediate electropneumatic shut-off module | | | |
|---|---|---|---|
| U | Separated supply (air/electric) and exhaust | 2 | 2 positions |
| | | 4 | 4 positions |
| | | 6 | 6 positions |
| | | 8 | 8 positions |
| K | Separated supply (air/electric), exhaust and 12/14 piloting | 2 | 2 positions |
| | | 4 | 4 positions |
| | | 6 | 6 positions |
| | | 8 | 8 positions |

### Configuration example of single module:

Bistable base, 5/2 Solenoid-Solenoid valve

C 6

| Solenoid valve position | |
|---|---|
| A | S.V. 5/2 SOL.-SPRING |
| B | S.V. 5/2 SOL.-DIF. |
| Ⓒ | S.V. 5/2 SOL.-SOL. |
| E | S.V. 5/3 CC SOL.-SOL. |
| F | S.V. 2x3/2 NC-NC |
| G | S.V. 2x3/2 NO-NO |
| H | S.V. 2x3/2 NC-NO |
| I | S.V. 2x3/2 NO-NC |

| Base | |
|---|---|
| 1 | Monostable base G1/8 GAS |
| 2 | Bistable base G1/8 GAS |
| 3 | Monostable base Ø4 |
| 4 | Bistable base Ø4 |
| 5 | Monostable base Ø6 |
| Ⓒ | Bistable base Ø6 |
| 7 | Monostable base Ø8 |
| 8 | Bistable base Ø8 |

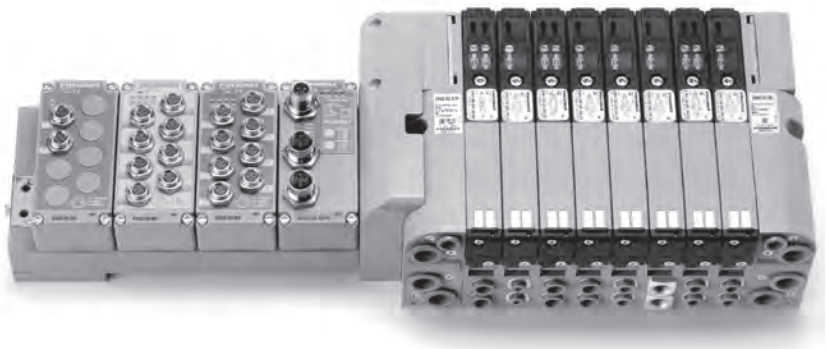
Intermediate electropneumatic shut-off module 2 positions

U 2

| Intermediate electropneumatic shut-off module | | | |
|---|---|---|---|
| Ⓤ | Separated supply (air/electric) and exhaust | Ⓒ | 2 positions |
| | | 4 | 4 positions |
| | | 6 | 6 positions |
| | | 8 | 8 positions |

### Configuration example of complete group:

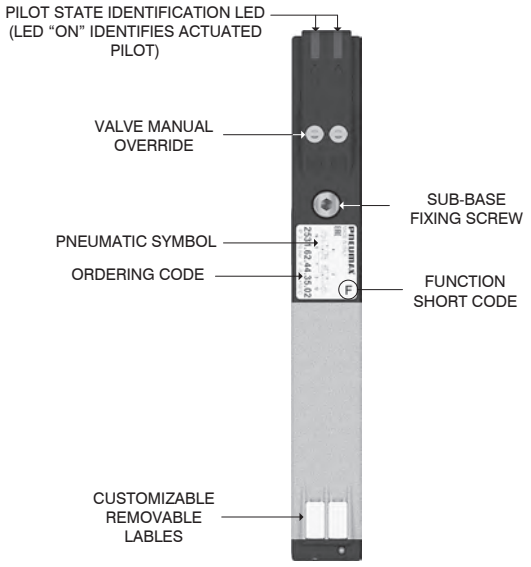
- Technopolymer PX3 serial system (P-N4-D8-M8-C1)
- Left endplates - External feeding (E)
- Bistable base with (F6) Solenoid valve
- Monostable base with (B3) Solenoid valve
- Bistable base with (E6) Solenoid valve
- Monostable base with (A5) Solenoid valve
- Monostable base with (A3) Solenoid valve
- Monostable base with (B1) Solenoid valve
- Bistable base with (C4) Solenoid valve
- Monostable base with (B3) Solenoid valve
- Right endplates closed (U0)



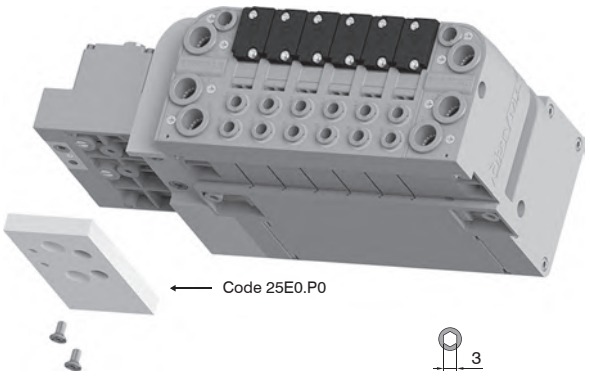
**TE-P-N4-D8-M8-C1-E-F6-B3-E6-A5-A3-B1-C4-B3-U0**



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

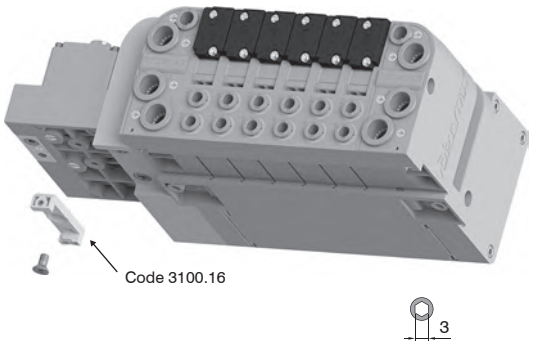



### Offset compensation plate



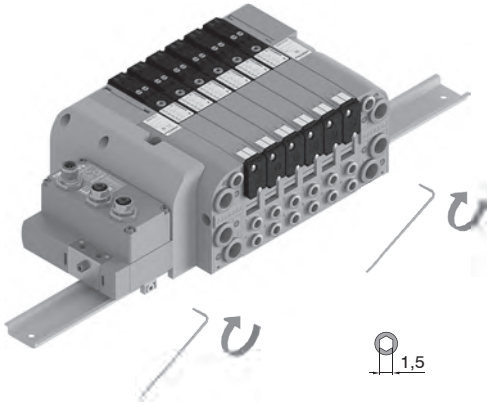

**Attention**: This accessory is supplied on the manifold unless otherwise stated. This is not compatible for DIN rail mounting.

### DIN rail mounting support plate



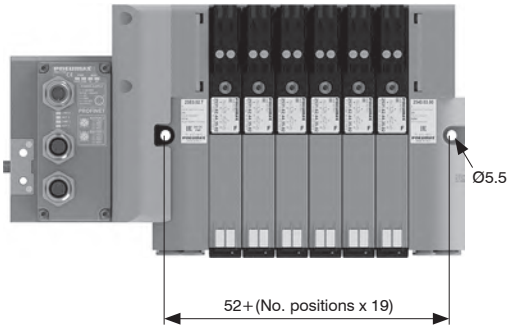

**Attention**: This must be included when creating the manifold configuration. Exclude the offset compensation plate.

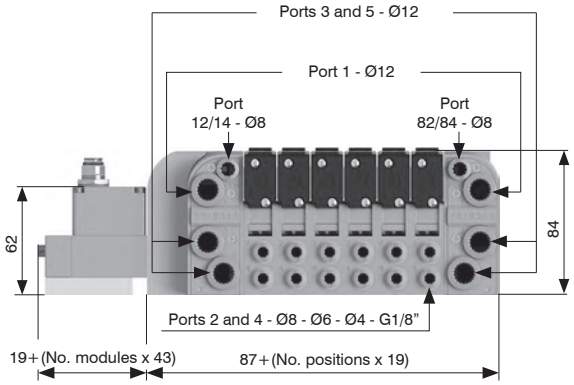
### DIN rail fixing



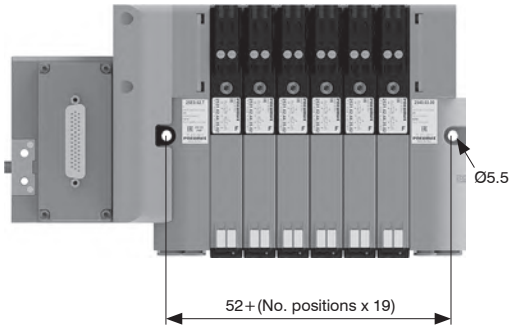

### Supply ports and maximum possible size according to valves used

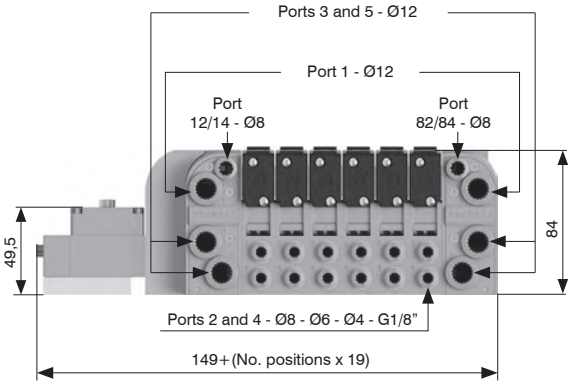
Serial system node version




Multi-pin version



**Manual override actuation**

**Instable function:**
Push to actuate
(when released it moves back to the original position)

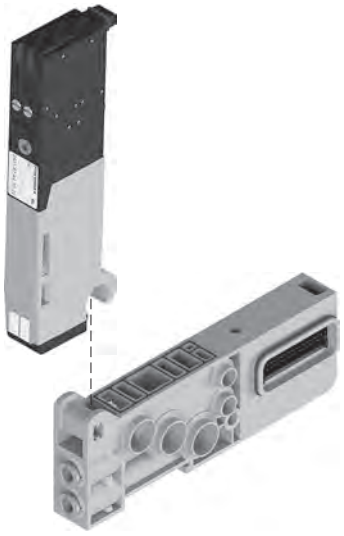


**Bistable function:**
Push and turn to get the bistable function

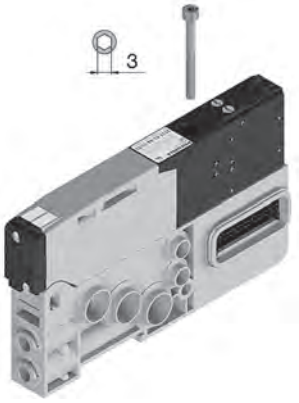


**Note**: we recommend the manual override is returned to it's original position when not in use

**Solenoid valves installation**

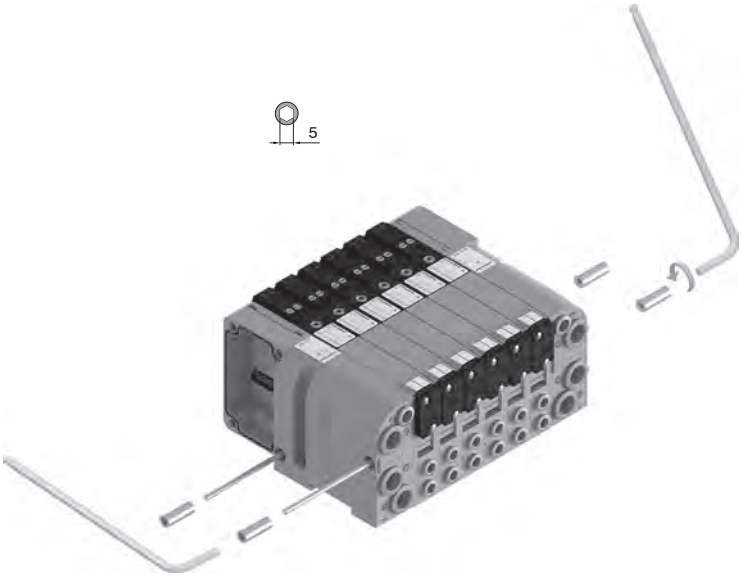







**Note**: Torque moment 1 Nm

**Sub-base assembly**




Minimum torque moment: 2,5 Nm
Maximum fixing torque for fittings: 3 Nm


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Spring

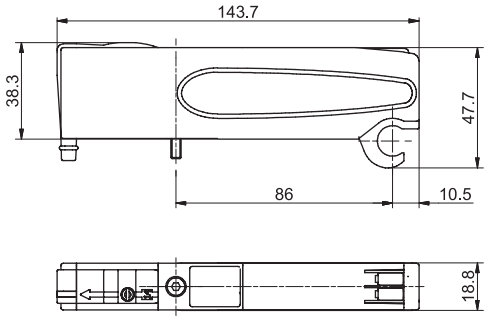
**Coding:** 2541.52.00.39.Ⓥ

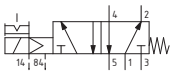
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 3 ... 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 750 |
| Response time according to ISO 12238, activation time (ms) | 14 |
| Response time according to ISO 12238, deactivation time (ms) | 40 |

| Ⓥ | VOLTAGE |
|---|---|
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

SHORT FUNCTION CODE "A"
Weight 129 g





## Solenoid-Differential

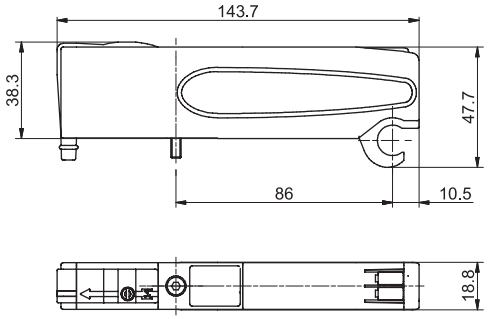
**Coding:** 2541.52.00.36.Ⓥ

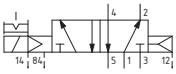
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 3 ... 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 750 |
| Response time according to ISO 12238, activation time (ms) | 20 |
| Response time according to ISO 12238, deactivation time (ms) | 29 |

| Ⓥ | VOLTAGE |
|---|---|
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

SHORT FUNCTION CODE "B"
Weight 126 g





## Solenoid-Solenoid

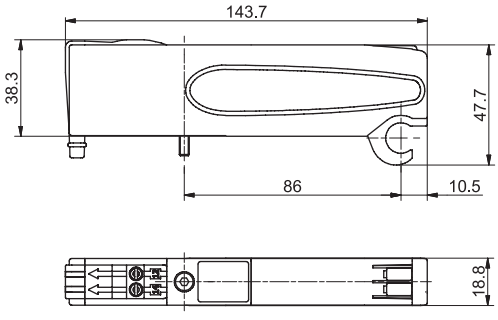
**Coding:** 2541.52.00.35.Ⓥ

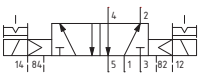
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 3 ... 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 750 |
| Response time according to ISO 12238, activation time (ms) | 10 |
| Response time according to ISO 12238, deactivation time (ms) | 14 |

| Ⓥ | VOLTAGE |
|---|---|
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

SHORT FUNCTION CODE "C"
Weight 134 g





## Solenoid-Solenoid 5/3

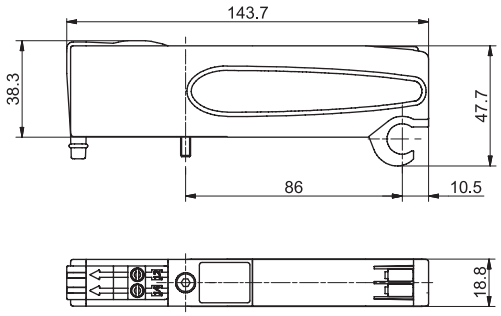
**Coding:** 2541.53.31.35.Ⓥ

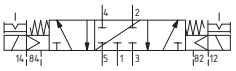
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 600 |
| Response time according to ISO 12238, activation time (ms) | 15 |
| Response time according to ISO 12238, deactivation time (ms) | 20 |

| | |
|---|---|
| Ⓥ | VOLTAGE |
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

SHORT FUNCTION CODE "E"
Weight 132 g





## Solenoid-Solenoid 2x3/2

**Coding:** 2541.62.Ⓕ.35.Ⓥ

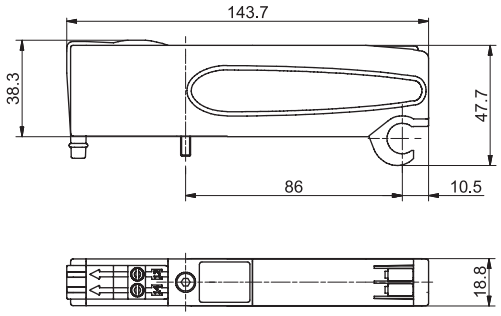
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | ≥3+(0,2xInlet pressure) |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 700 |
| Response time according to ISO 12238, activation time (ms) | 15 |
| Response time according to ISO 12238, deactivation time (ms) | 25 |

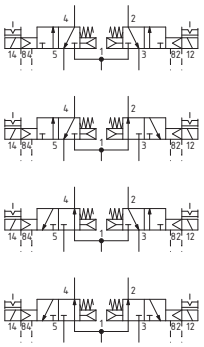
Example: If inlet pressure is set at 5 bar then pilot pressure must be at least Pp=2,5+(0,2*5)=3,5 bar

| | |
|---|---|
| Ⓕ | FUNCTION |
| | **44** = NC-NC (5/3 Open centres) |
| | **45** = NC-NO (normally closed-normally open) |
| | **54** = NO-NC (normally open-normally closed) |
| | **55** = NO-NO (5/3 Pressured centres) |
| Ⓥ | VOLTAGE |
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |
| | **05** = 24 VAC |

Weight 122 g







Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

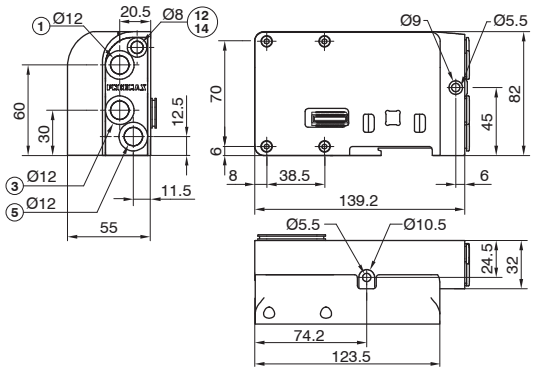
## Left Endplate

**Coding:** 25E0.Ⓥ.T

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 (external feeding)<br>3 ... 7 (self feeding) |
| Pilot pressure (bar) | 3 ... 7 (external feeding) |
| Temperature °C | -5 ... +50 |

| Ⓥ | VERSION |
|---|---|
| | **02** = External feeding |
| | **12** = Self-feeding |

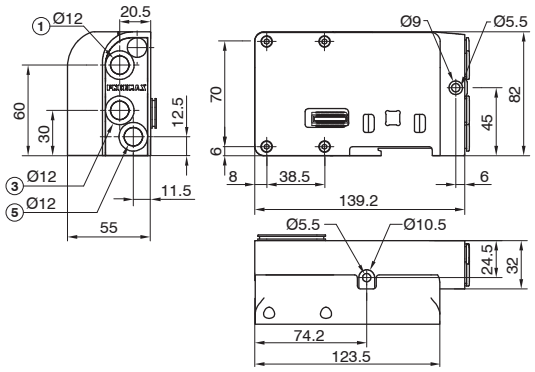





12/14 SEPARATED FROM PORT 1
Weight 300 g

25E0.02.T






12/14 CONNECTED TO PORT 1
Weight 300 g

25E0.12.T

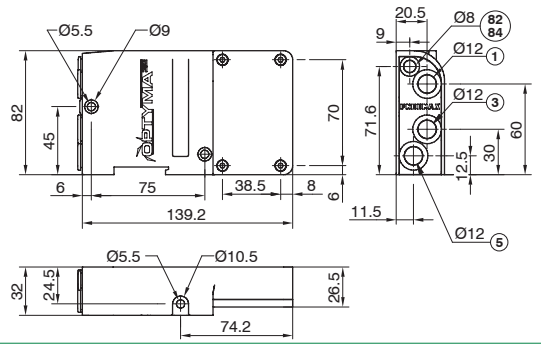
## Right Endplate

**Coding:** 2540.03.Ⓒ

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Temperature °C | -5 ... +50 |

| Ⓒ | ELECTRICAL CONNECTION |
|---|---|
| | **00** = Electrical connection |






PORT 82/84= DO NOT PRESSURIZE, SOLENOID PILOTS EXHAUST
Weight 274 g

2540.03.Ⓒ

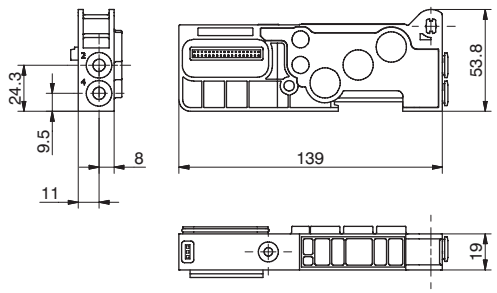
## Modular base

**Coding:** 254Ⓒ.01Ⓥ

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Temperature °C | -5 ... +50 |

| Ⓒ | WORKING PORTS SIZE |
|---|---|
| | **1** = G1/8" female straight cartridge |
| | **4** = Cartridge Ø4 |
| | **6** = Quick fitting tube Ø6 |
| | **8** = Quick fitting tube Ø8 |
| Ⓥ | VERSION |
| | **M** = for monostable S.V. |
| | **B** = for bistable S.V. |





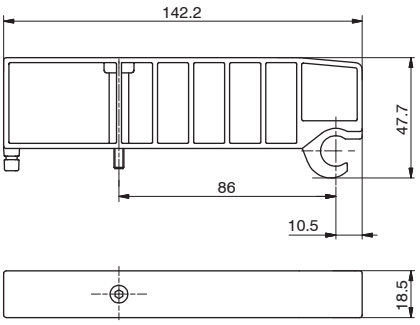

Weight 96,5 g

## Closing plate

**Coding:** 2530.00

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Temperature °C | -5 ... +50 |





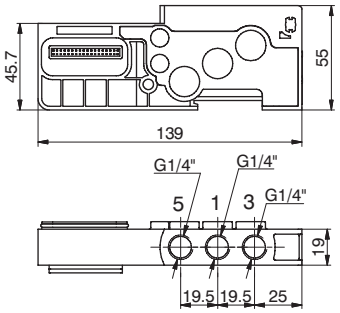

SHORT FUNCTION CODE "T"
Weight 53.5 g

## Intermediate Inlet/Exhaust module

**Coding:** 2540.10

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Temperature °C | -5 ... +50 |





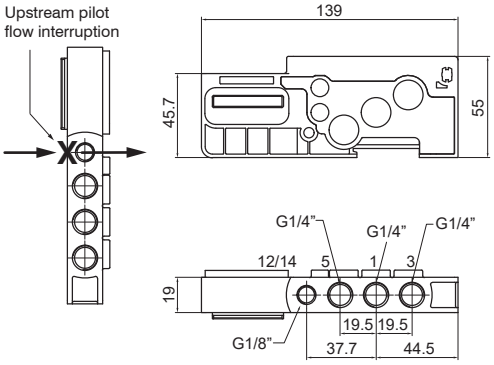

SHORT FUNCTION CODE "W"
Weight 115 g

## Intermediate inlet/Exhaust module with external pilot

**Coding:** 2540.11

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 3 ... 7 |
| Temperature °C | -5 ... +50 |






SHORT CODE "K"
Weight 173 g



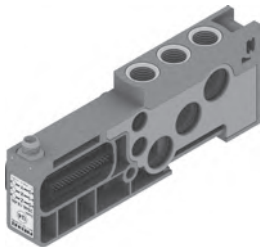
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Intermediate electro-pneumatic shut-off module 2/4/6/8 positions

**Coding:** 2540.Ⓜ.Ⓣ

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10<br>3 ... 7 (piloting 12/14) |
| Temperature °C | -5 ... +50 |
| Feeding | + 24 V DC ±10% |
| Protection | Inverted polarity protection |
| Maximum load | 100 mA |
| Indicators | + 24 V DC presence LED |
| Series modules maximum number | 3 |

| | |
|---|---|
| Ⓜ | MODULE |
| | **10** = Supply and exhaust |
| | **11** = Supply and exhaust with separate pilot |
| Ⓣ | SHUT-OFF |
| | **2A** = 2 Signals |
| | **4A** = 4 Signals |
| | **6A** = 6 Signals |
| | **8A** = 8 Signals |



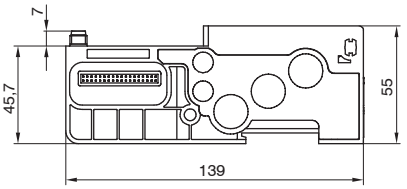
Weight 168 g

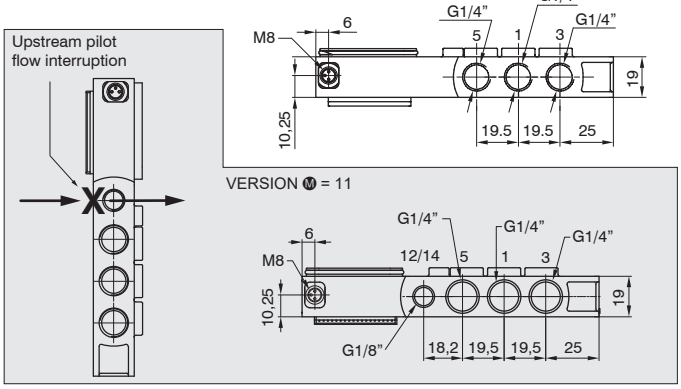
2540.10.Ⓜ



Weight 174 g

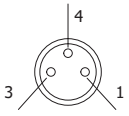
2540.11.Ⓜ



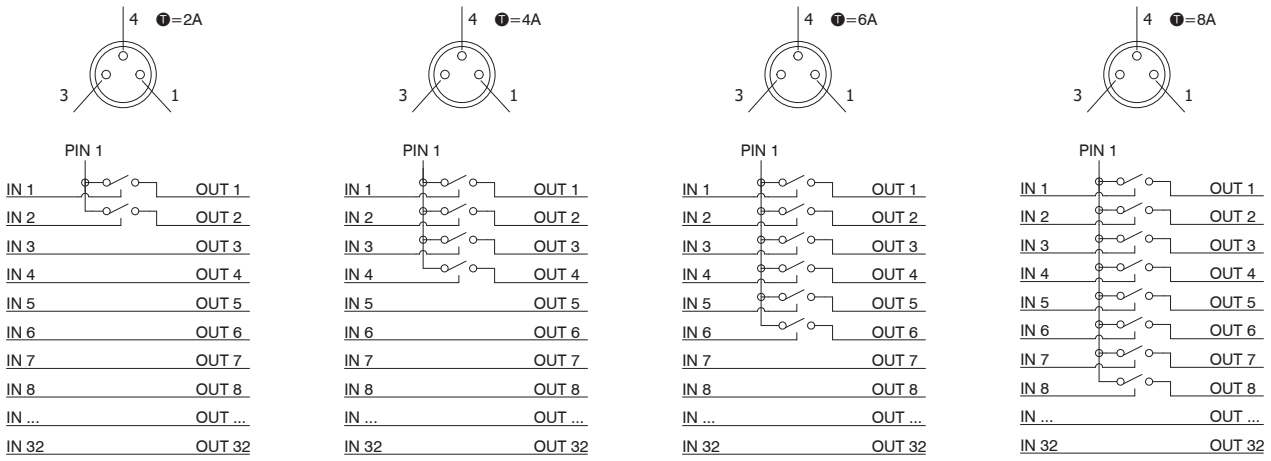




## WORKING PRINCIPLE / SIMPLIFIED FUNCTIONAL DIAGRAM

Intermediate electro-pneumatic shut-off module allows you to interrupt at the same time the first 2, 4, 6 or 8 available command signals for the valves after the module itself.
When the shut-off module is present, the controlled output logic signal values are equal to the input logic signal values which came from the serial node or the multi-pin module.
If the supply input signal is absent, the controlled output logic signal values are all equal to zero.
This module is particularly useful when control signals are used to block the valves; it is also effective both with serial management and multi-pin connection of the manifolds.
It is possible to use more modules to interrupt every command signals simply by inserting them before the signals to be interrupted.




| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC |
| 4 | NOT CONNECTED |
| 3 | GND |



**Usage examples**

EXAMPLE 1
Manifold of 12 monostable solenoid valves on which you want to interrupt signals 7-8.
Assembly:
- 6 monostable solenoid valves (not interruptible because before the module)
- 1 additional power supply module
- 6 monostable solenoid valves

**Note**: the first 2 of these 6 monostable solenoid valves are interruptible by the module, while the following 4 will work correctly managed directly by the corresponding command signals.



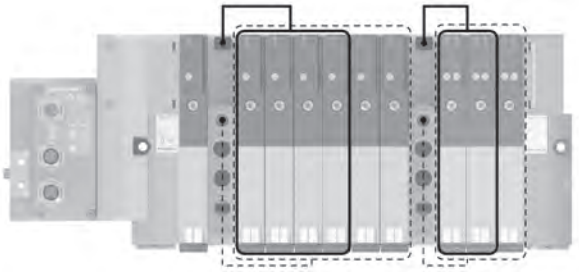
EXAMPLE 2
Manifold of 12 monostable solenoid valves on which you want to interrupt signals 7-8-9.
Assembly:
- 6 monostable solenoid valves (not interruptible because before the module)
- 1 additional power supply module
- 3 monostable solenoid valves (interruptible)
- 1 closing plate mounted on a monostable base
- 3 monostable solenoid valves (work correctly managed directly by the corresponding command signals)



EXAMPLE 3
Manifold of 7 monostable and 3 bistable solenoid valves in which you want to interrupt signals 2-3-4-5 and 8-9-10-11.
Assembly:
- 1 monostable solenoid valve (not interruptible because before the module)
- 1 additional electro-pneumatic shut-off module
- 6 monostable solenoid valves

**Note**: the first 4 of these 6 monostable solenoid valves are interruptible by the module, while the following 2 will work correctly managed directly by the corresponding command signals.
**Note no. 2**: The pilots of the 6 solenoid valves downstream of the intermediate electro-pneumatic shut-off module are pneumatically powered by the module itself.
- 1 additional electro-pneumatic shut-off module
- 3 bistable solenoid valves

**Note no. 3**: the first 2 of these 3 bistable solenoid valves are interruptible by the module, while the following will work correctly and are managed directly by the corresponding command signals.
**Note no. 4**: The pilots of the 3 solenoid valves downstream of the intermediate electro-pneumatic shut-off module are pneumatically powered by the module itself.



**Key**
S.V. electrically managed by the shut-off module: ———
S.V. pneumatically managed (12/14) by the shut-off module: - - - - - - - -

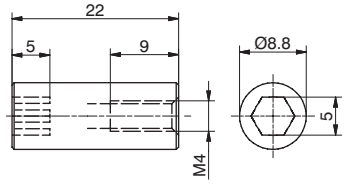

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Nut

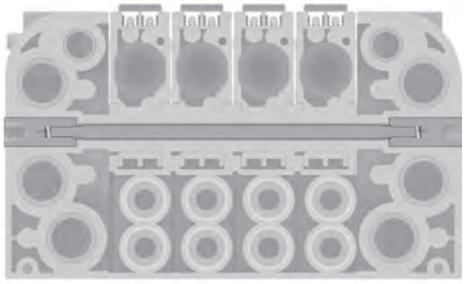
**Coding:** 2540.KD.00

The Kit includes 4 pieces
Weight 10 g







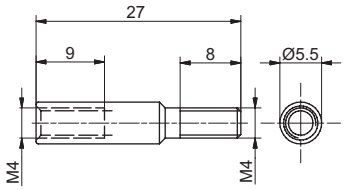



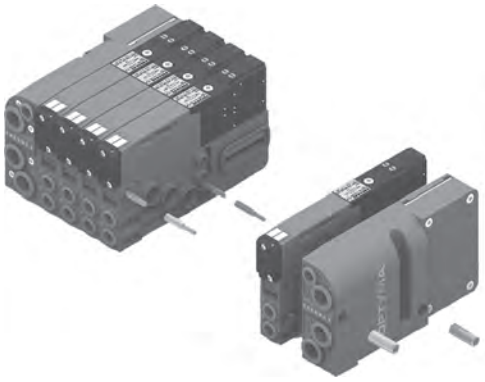
## Extension (1 Position)

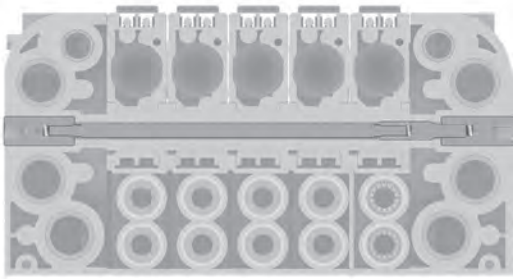
**Coding:** 2540.KP.01

The Kit includes 2 pieces
Weight 3,5 g





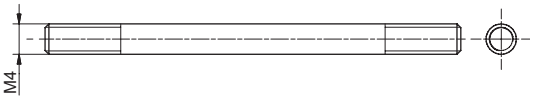





## Tie-rod M4

**Coding:** 2540.KT.Ⓟ



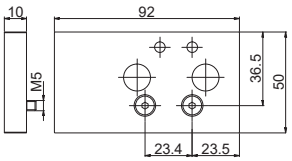



| Ⓟ | NO. POSITIONS |
|---|---|
| | **01** = Nr. 1 Position |
| | **02** = Nr. 2 Positions |
| | **03** = Nr. 3 positions |
| | **04** = Nr. 4 Positions |
| | **05** = Nr. 5 positions |
| | **06** = Nr. 6 Positions |
| | **07** = Nr. 7 positions |
| | **08** = Nr. 8 Positions |
| | **09** = Nr. 9 positions |
| | **10** = Nr. 10 Positions |
| | **11** = Nr. 11 positions |
| | **12** = Nr. 12 Positions |
| | **13** = Nr. 13 positions |
| | **14** = Nr. 14 Positions |
| | ... |
| | **32** = Nr. 32 Positions |

## Offset compensation plate

**Coding:** 25E0.P0



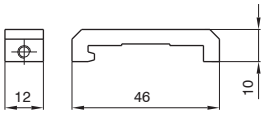



Weight 116 g

## DIN rail adapter

**Coding:** 3100.16






Weight 12 g

## Polyethylene Silencer Series SPL-R

**Coding:** SPLR.Ⓓ

| Ⓓ | TUBE DIAMETER |
|---|---|
| | **8** = 8 mm |
| | **12** = 12 mm |



## Diaphragm plug

**Coding:** 2530.17

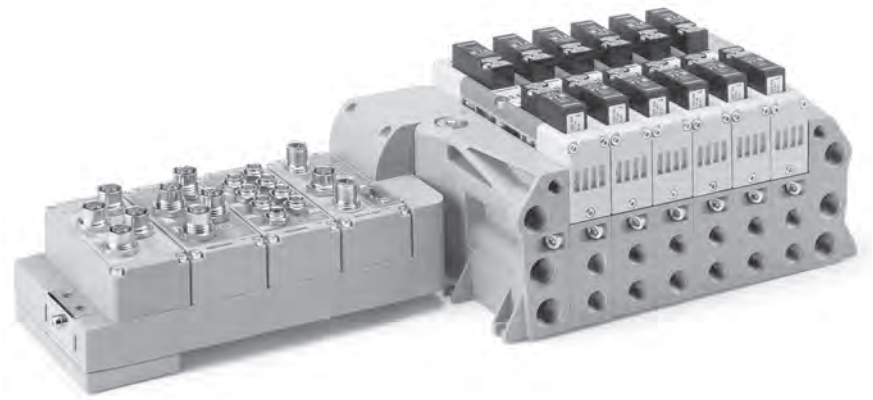


Weight 2,3 g



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 2700 EVO





### 2700 SERIES EVO SOLENOID VALVES MANIFOLD

- **Increased flexibility**
- **Digital and analogue I/O modules**
- **Manufactured according to ISO 15407-2**
- **Wide range of communication protocols**

### WE SPEAK EVO

The 2700 series becomes EVO and interfaces with the new PX series modular electronic system while still retaining all of its technical advantages. This is enriched with new features that further extend the flexibility of the product:
- Size 26 mm with nominal flow rate up to 1000 Nl/min
- Compliant to directive 2014/30/UE
- Monitored solenoid valves
- Vertical configuration

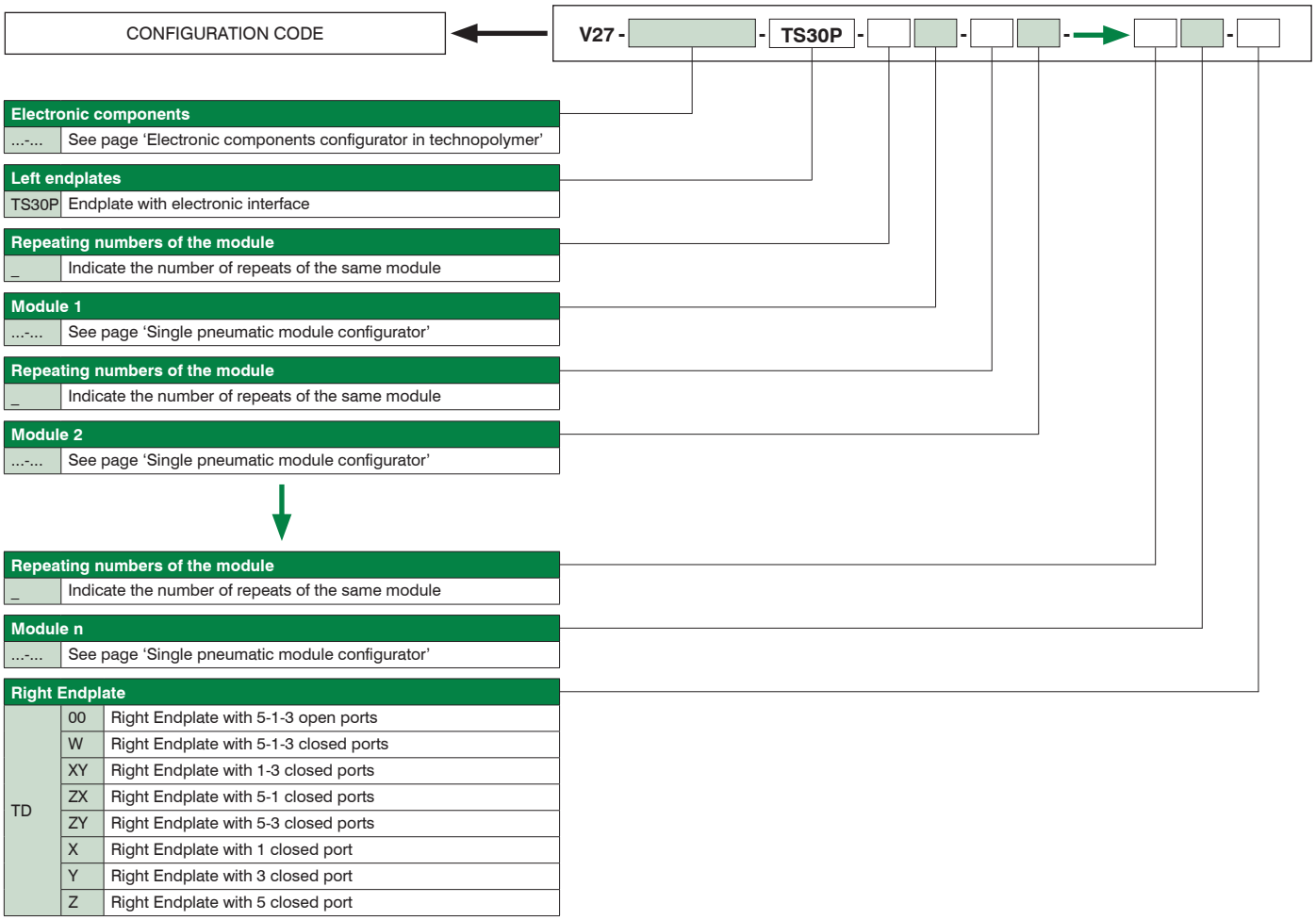
### Construction characteristics

| | |
|---|---|
| Body | Die-cast aluminium |
| Springs | Stainless Steel |
| Operators | Technopolymer |
| Pistons | Technopolymer |
| Spools | Aluminium |

### Operational characteristics

| | |
|---|---|
| Supply voltage | + 24 V DC ±10% PNP |
| Pilot consumption | 1W - 2.3W |
| Valve working pressure [1] | from vacuum to 10 bar max. |
| Operating temperature | from -5°C to +50°C (serial system node version)<br>from -10°C to +50°C (multi-pin version) |
| Protection degree | IP65 |
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |

## Rules and configuration scheme




| Electronic components | |
|---|---|
| ...-... | See page 'Electronic components configurator in technopolymer' |

| Left endplates | |
|---|---|
| TS30P | Endplate with electronic interface |

| Repeating numbers of the module | |
|---|---|
| _ | Indicate the number of repeats of the same module |

| Module 1 | |
|---|---|
| ...-... | See page 'Single pneumatic module configurator' |

| Repeating numbers of the module | |
|---|---|
| _ | Indicate the number of repeats of the same module |

| Module 2 | |
|---|---|
| ...-... | See page 'Single pneumatic module configurator' |

| Repeating numbers of the module | |
|---|---|
| _ | Indicate the number of repeats of the same module |

| Module n | |
|---|---|
| ...-... | See page 'Single pneumatic module configurator' |

| Right Endplate | | |
|---|---|---|
| TD | 00 | Right Endplate with 5-1-3 open ports |
| | W | Right Endplate with 5-1-3 closed ports |
| | XY | Right Endplate with 1-3 closed ports |
| | ZX | Right Endplate with 5-1 closed ports |
| | ZY | Right Endplate with 5-3 closed ports |
| | X | Right Endplate with 1 closed port |
| | Y | Right Endplate with 3 closed port |
| | Z | Right Endplate with 5 closed port |

**Configurable on Cadenas platform**

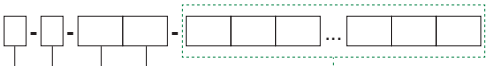
CADENAS

**Note:**
When composing the configuration, always bear in mind that the maximum number of electrical signals available is:
- 32 if a 37-pole multi-pin module is used, if a node or IO-Link interface is used.
- 24 if a 25-pole multi-pin module is used.

If a monostable valve is used on a bistable type base (2 electrical signals occupied), an electrical signal is lost.
However, this makes it possible to replace the monostable valve with a bistable valve in the same position.
Use bases with dedicated closed ports to interrupt ducts 1, 3 and 5.
If one or more ports must be interrupted more than once, the addition of the intermediate supply/discharge module is necessary.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Electronic components configurator in technopolymer



| Type | |
|---|---|
| P | Technopolymer |

| Left endplate accessory | |
|---|---|
| | Offset compensation plate |
| G | DIN rail fixing accessory |

| Multi-pin electrical connection | |
|---|---|
| MP2 | Module 25 poles + 24 V DC |
| MP3 | Module 37 poles + 24 V DC |

| Electrical connection | |
|---|---|
| C3 | CANopen® node 64 IN - 64 OUT (32 fixed) |
| P3 | PROFIBUS DP node 64 IN - 64 OUT (32 fixed) |
| I4 | EtherNet/IP node 128 IN - 128 OUT (48 fixed) |
| A4 | EtherCAT® node 128 IN - 128 OUT (48 fixed) |
| N4 | PROFINET IO RT node 128 IN - 128 OUT (48 fixed) |
| G4 | CC-Link IE Field Basic node 128 IN - 128 OUT (48 fixed) |
| K3 | IO-Link interface 64 IN - 64 OUT (32 fixed) |

| Electrical connection accessories | |
|---|---|
| | Without DIN rail fixing |
| G | With DIN rail fixing |

**SINGLE ELECTRIC MODULE CONFIGURATION**

| Repeating numbers of the module | |
|---|---|
| | Indicate the number of repeats of the same module (no value for a single module) |

| Inputs module - Analogue / Digital (EXCLUDED WITH MP) | |
|---|---|
| D8 | 8 M8 digital inputs module |
| D12 | 8 M12 digital inputs module |
| D3 | 32 digital inputs SUB-D 37 poles |
| T1 | 2 analogue inputs 0-5V module (voltage signal) |
| T2 | 2 analogue inputs 0-10V module (voltage signal) |
| T3 | 4 analogue inputs 0-5V module (voltage signal) |
| T4 | 4 analogue inputs 0-10V module (voltage signal) |
| C1 | 2 analogue inputs 0-20mA module (current signal) |
| C2 | 2 analogue inputs 4-20mA module (current signal) |
| C3 | 4 analogue inputs 0-20mA module (current signal) |
| C4 | 4 analogue inputs 4-20mA module (current signal) |
| P1 | 2 Pt100 2 wires inputs module |
| P2 | 2 Pt100 3 wires inputs module |
| P3 | 2 Pt100 4 wires inputs module |
| P4 | 4 Pt100 2 wires inputs module |
| P5 | 4 Pt100 3 wires inputs module |
| P6 | 4 Pt100 4 wires inputs module |
| **Outputs module - Analogue / Digital** | |
| M8 | 8 M8 digital outputs module |
| M12 | 8 M12 digital outputs module |
| M3 | 32 digital outputs SUB-D 37 poles |
| V1 | 2 analogue outputs 0-5V module (voltage signal) |
| V2 | 2 analogue outputs 0-10V module (voltage signal) |
| V3 | 4 analogue outputs 0-5V module (voltage signal) |
| V4 | 4 analogue outputs 0-10V module (voltage signal) |
| L1 | 2 analogue outputs 0-20mA module (current signal) |
| L2 | 2 analogue outputs 4-20mA module (current signal) |
| L3 | 4 analogue outputs 0-20mA module (current signal) |
| L4 | 4 analogue outputs 4-20mA module (current signal) |
| **Additional module (Optional)** | |
| P12 | M12 additional power supply module |

| Module accessories | |
|---|---|
| | Without DIN rail fixing |
| G | With DIN rail fixing |

**Refer to the current limits indicated in the pages relating to the nodes / IO-Link interface**

## Modules configurator:

### 1) Complete module configurator

**Intermediate Inlet/Exhaust module**

| | | | | | | |
|---|---|---|---|---|---|---|
| W | U | 5-3 Common | _ | 5-1-3 open | _ | 14-12 open |
| | S | 5-3 Separated | W | 5-1-3 closed | 2 | 12 closed |
| | | | XY | 1-3 closed | 4 | 14 closed |
| | | | ZX | 5-1 closed | | |
| | | | ZY | 5-3 closed | | |
| | | | X | 1 closed | | |
| | | | Y | 3 closed | | |
| | | | Z | 5 closed | | |

**Monitored 3/2 Sol-Spring pilot 14 control solenoid valve**

| | | | | | | |
|---|---|---|---|---|---|---|
| P | A | Internal Supply | M8 | Proximity M8x1 | 02 | 24 V DC |
| | E | External Supply | M12 | Proximity M12x1 | 08 | 24 V DC 1W |

**Monitored redundant 5/2 Sol-Spring solenoid valve**

| | | | | | | |
|---|---|---|---|---|---|---|
| V2S | A | Internal Supply | M8 | Proximity M8x1 | 02 | 24 V DC |
| | E | External Supply | M12 | Proximity M12x1 | 08 | 24 V DC 1W |

**Solenoid valve for progressive start**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| EP | M8 | Proximity M8x1 | 01 | 12 V DC | W | 5-1-3 closed | 4 | 14 closed | - | Standard |
| | M12 | Proximity M12x1 | 02 | 24 V DC | | | | | M | Machinery directive |
| | | | 08 | 24 V DC 1W | | | | | | |

### 2) Modular module configurator

**Base**

| | | | | | | |
|---|---|---|---|---|---|---|
| B | M | Monostable | _ | 5-1-3 open | _ | 14-12 open |
| | B | Bistable | W | 5-1-3 closed | 2 | 12 closed |
| | P | Pass-through | XY | 1-3 closed | 4 | 14 closed |
| | | | ZX | 5-1 closed | | |
| | | | ZY | 5-3 closed | | |
| | | | X | 1 closed | | |
| | | | Y | 3 closed | | |
| | | | Z | 5 closed | | |

**External supply valve**

| | | |
|---|---|---|
| AS | 11 | External Supply |
| | 14 | External Supply with piloting 14 |

**Shut-off valve**

| | | | | |
|---|---|---|---|---|
| VL | 141 | 1-14 Exhaust | _ | Not lockable |
| | | | K | Lockable |

**Flow regulator**

| | | |
|---|---|---|
| RF | 35 | Exhaust flow regulator |

**Solenoid valves**

| | | | | | |
|---|---|---|---|---|---|
| A | S.V. 5/2 SOL-SPRING | A | Self Supply | 12 | 24 V DC |
| B | S.V. 5/2 SOL-DIFFERENTIAL | E | External Supply | 18 | 24 V DC 1W |
| C | S.V. 5/2 SOL-SOL | | | | |
| E | S.V. 5/3 CC SOL-SOL | | | | |
| F | S.V. 2x3/2 NC-NC | | | | |
| G | S.V. 2x3/2 NO-NO | | | | |
| H | S.V. 2x3/2 NC-NO | | | | |
| I | S.V. 2x3/2 NO-NC | | | | |
| T00 | Free valve space plug | | | | |

**Monitored 5/2 Sol-Spring solenoid valve**

| | | | | | | |
|---|---|---|---|---|---|---|
| VS | A | Self Supply | M8 | Proximity M8x1 | 02 | 24 V DC |
| | E | External Supply | M12 | Proximity M12x1 | 08 | 24 V DC 1W |

**5/3 Solenoid valve with self-retention**

| | | | | | | |
|---|---|---|---|---|---|---|
| D | 1 | Closed centres | A | Self Supply | 12 | 24 V DC |
| | 2 | Open centres | E | External Supply | 18 | 24 V DC 1W |
| | 3 | Pressured centres | | | | |

**Pressure regulator**

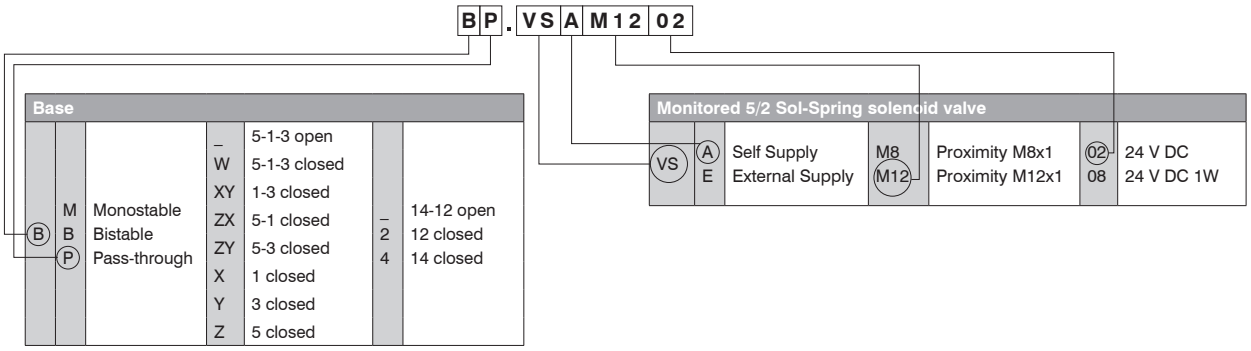
| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R | C | Compact | D | Downstream | 2 | Single L12 | A | 0-2 Bar | A | With relieving | V | RAL6032 green | _ | Adjustable gauge |
| | P | Extended | U | Upstream | 4 | Single L14 | B | 0-4 Bar | | | G | RAL7004 gray | M | Fixed gauge |
| | | | | | 24 | Double L12-L14 | C | 0-8 Bar | | | | | | |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

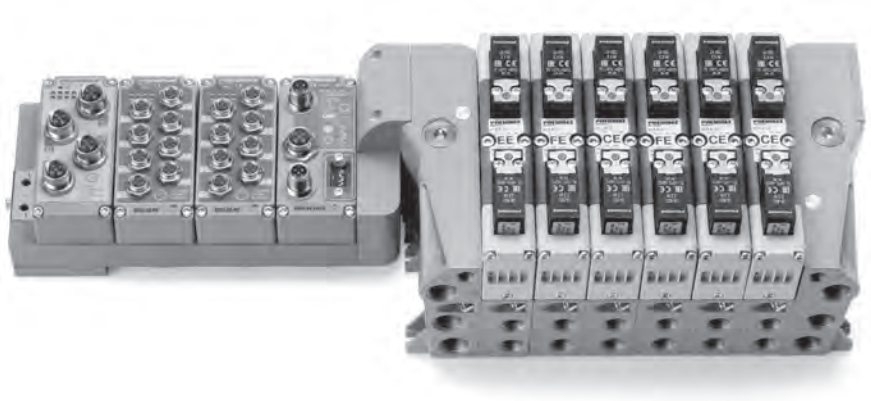
**Configuration example of single module:**

Signal pass-through base, ports 5-1-3 open, ports 14-12 open with monitored S.V. internal supply, M12 connector, 24 V DC is identified as:



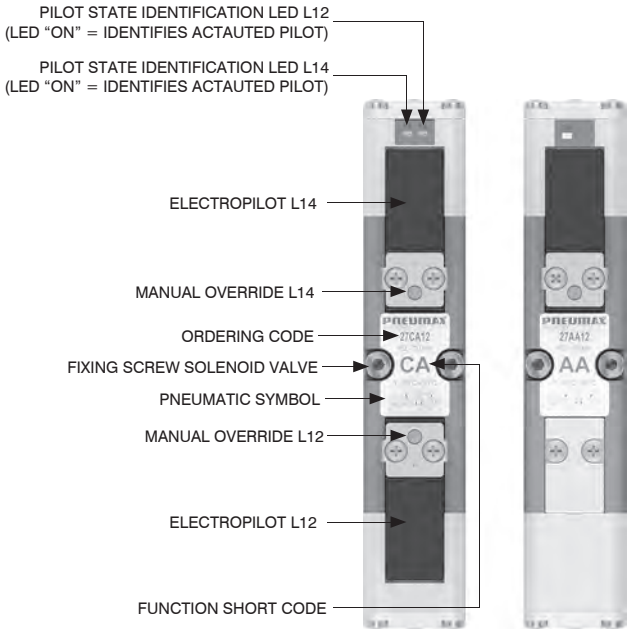

**Configuration example of complete group:**

- Technopolymer PX3 serial system (P-C3-2M8-D12)
- Left endplate with interface (TS30P)
- Bistable base with S.V. 5/3 CC Sol-Sol (BB.EE12)
- Bistable base with S.V. 2X3/2 NC-NC (BB.FE12)
- Bistable base with S.V. 5/2 Sol-Sol (BB.CE12)
- Bistable base with S.V. 2X3/2 NC-NC (BB.FE12)
- N°2 bistable bases with S.V. 5/2 Sol-Sol (2BB.CE12)
- Right endplate with open ports 1 - 3 - 5 (TD00)

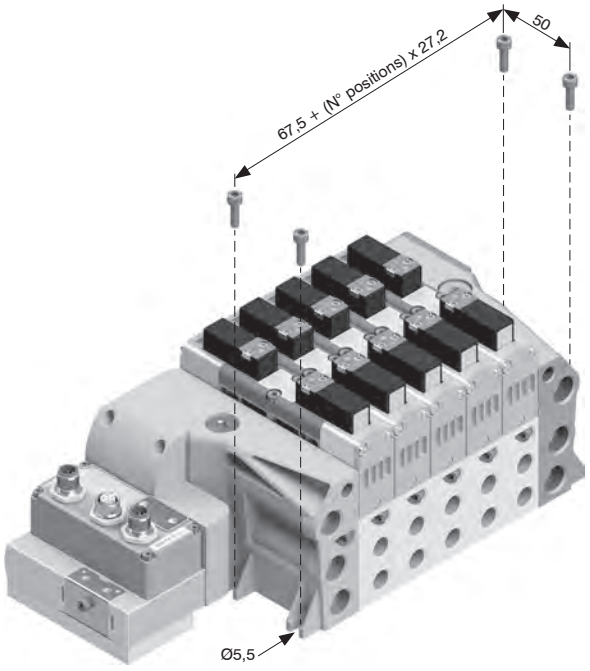


**V27-P-C3-2M8-D12-TS30P-BB.EE12-BB.FE12-BB.CE12-BB.FE12-2BB.CE12-TD00**

## Solenoid valve description

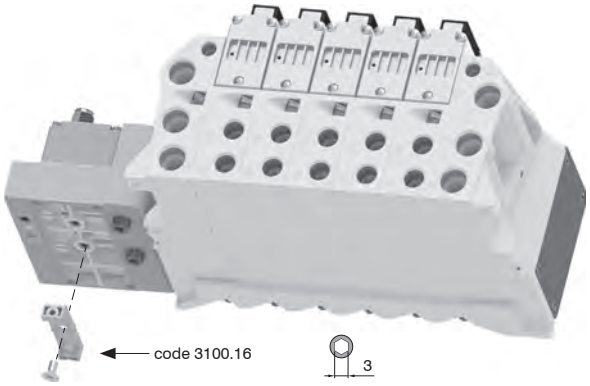



## From the top



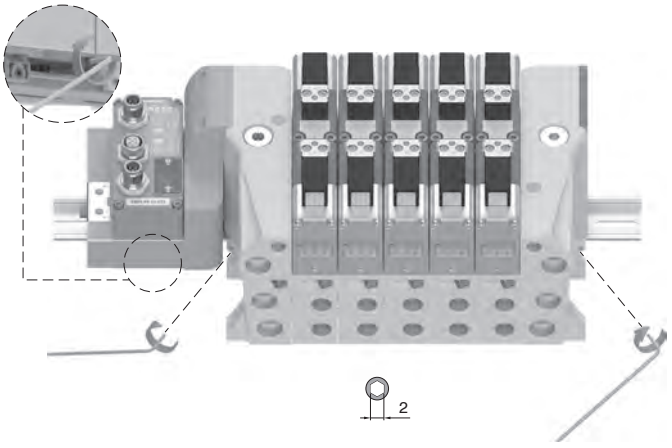

**Attention**: The overall dimensions shown refer to the modular (valve) sub-bases, and may differ when manifold accessories are included.

## DIN rail mounting support plate

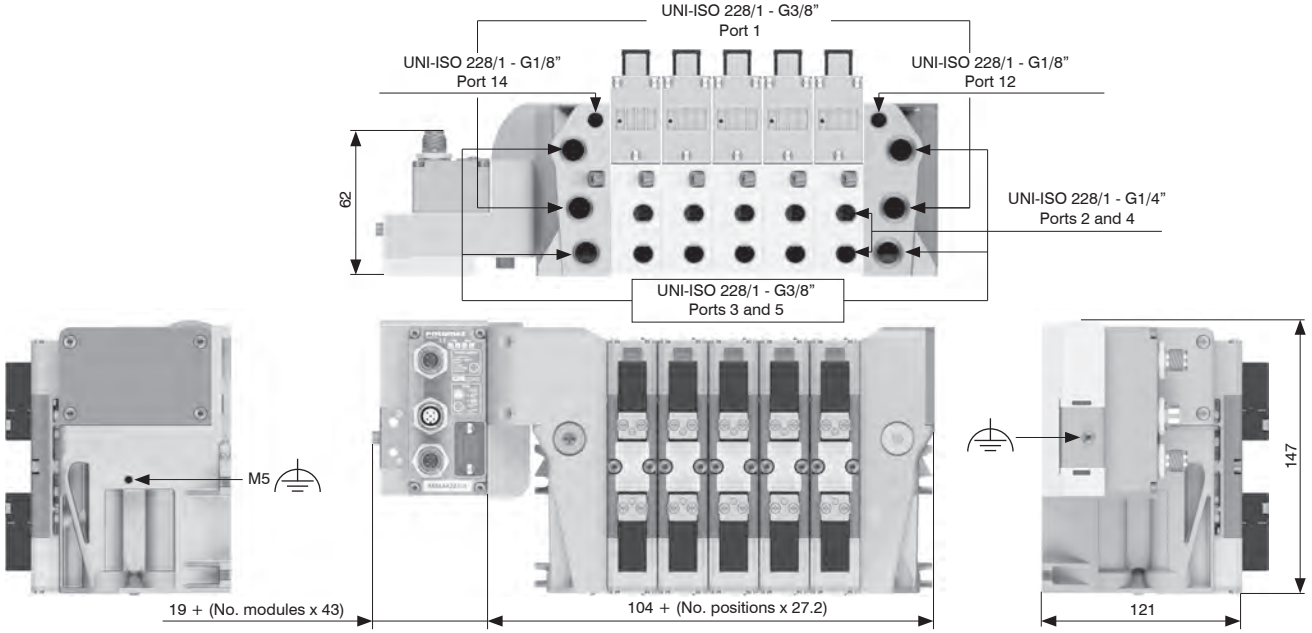



**Attention**: This must be included when creating the manifold configuration. Exclude the offset compensation plate.

## DIN rail fixing




## Supply ports and maximum possible size according to valves used

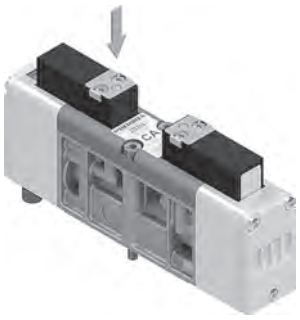



**Attention**: The overall dimensions shown refer to the modular (valve) sub-bases, and may differ when manifold accessories are included.

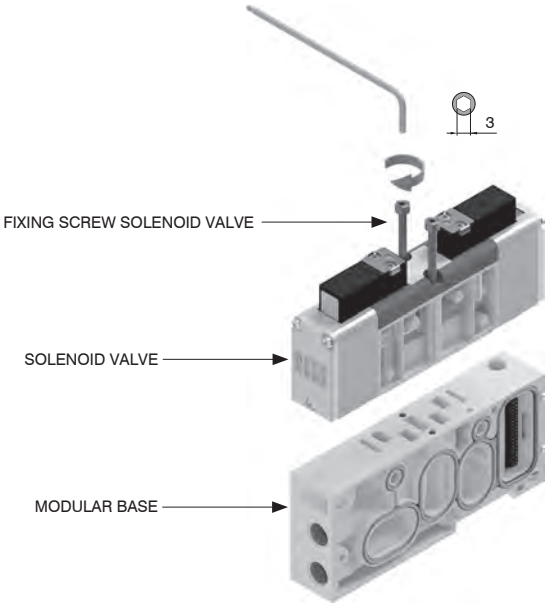

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

### Manual override actuation

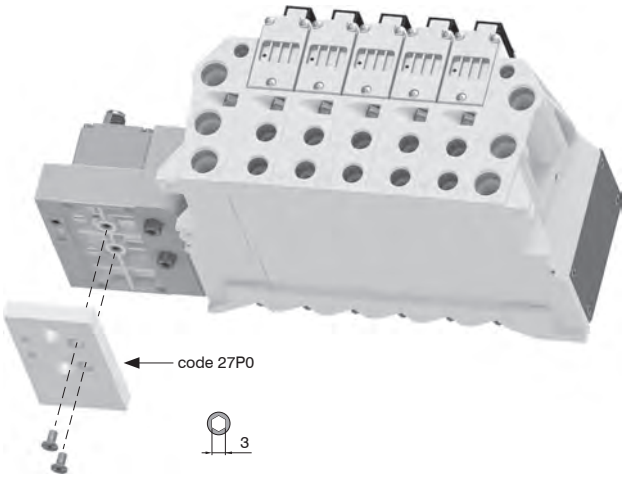
**Instable function:**
Push to actuate
(when released it moves back to the original position)



### Solenoid valves installation

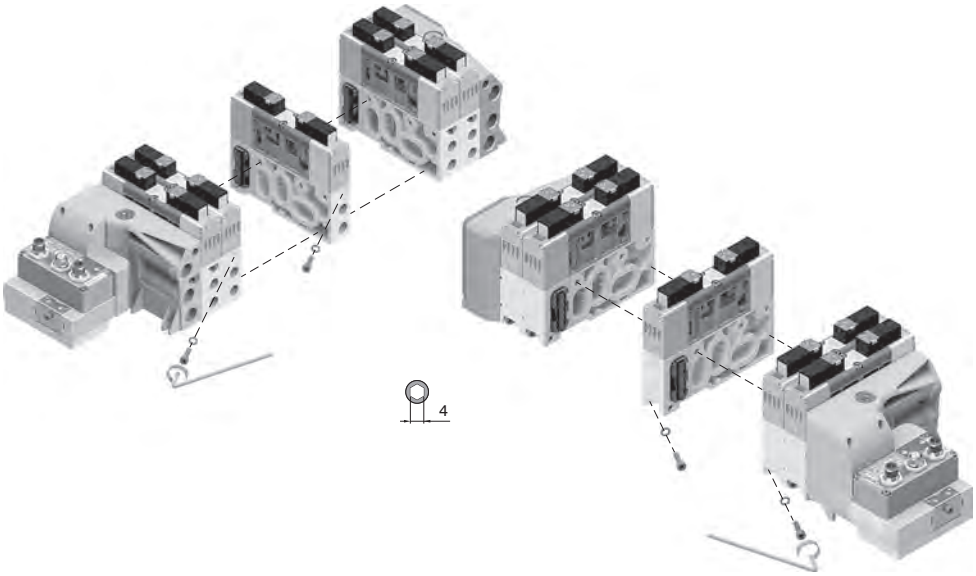



### Offset compensation plate



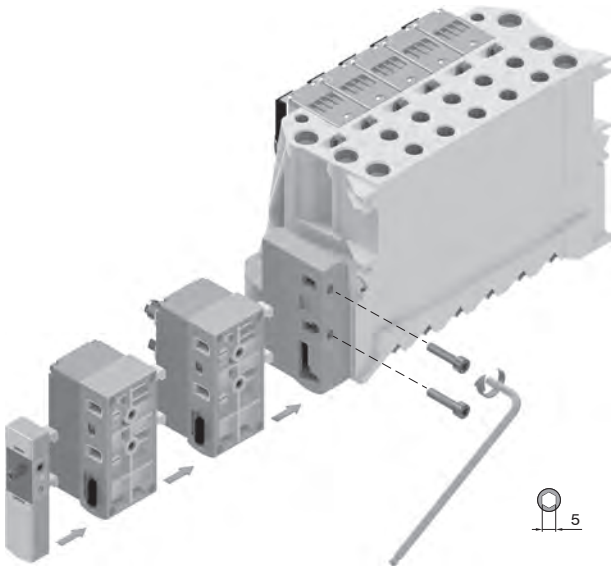

**Attention**: This accessory is supplied on the manifold unless otherwise stated. This is not compatible for DIN rail mounting.

### Sub-base assembly

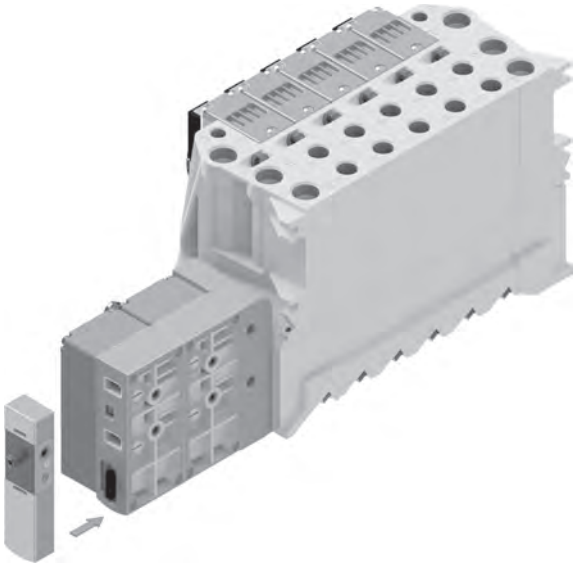



**Note**: Torque moment 4 Nm
**Attention**: Ensure the washer is mounted on the screw before tightening

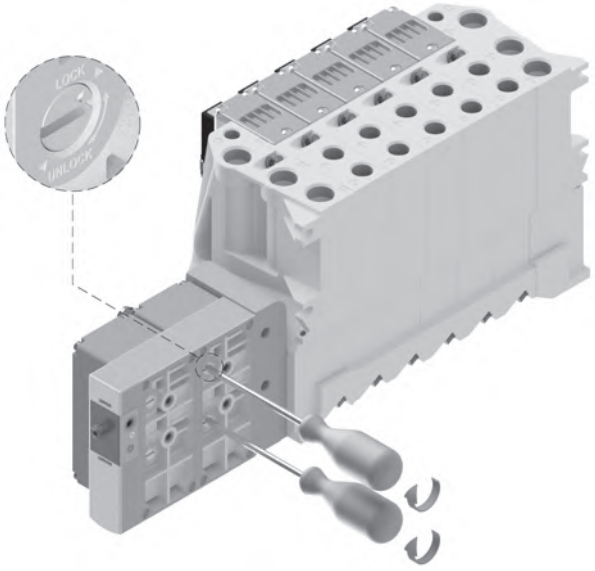
**1.** Assemble the desired modules and tighten the fixing screws as shown in the figure below.



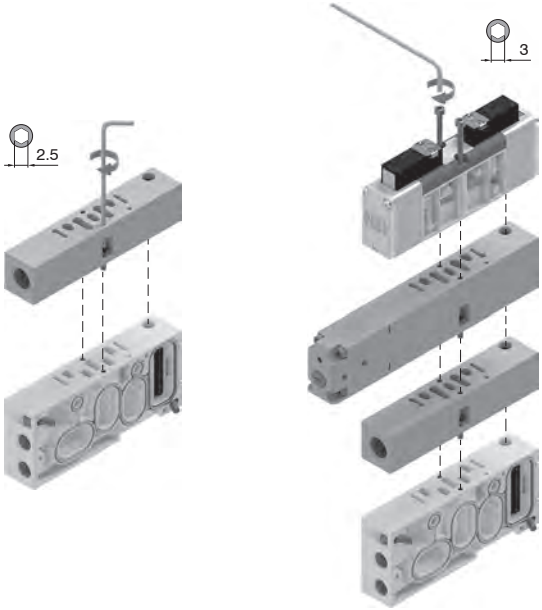

**2.** Complete the assembly with the 3100.KT.00 left endplate kit.



**3.** To lock: rotate anticlockwise (in the direction of the LOCK print on the case).
To unlock: rotate clockwise (in the direction of the UNLOCK print on the case).
The same procedure shall be used to add or remove any module.




**Modules assembled for vertical configuration**




Modules for vertical configuration are as follows:
- Single external supply module
- Flow regulator module
- Shut-off and exhaust module
- Pressure regulator

**Attention**: The flow rate of the solenoid valve will be reduced compared to that shown in the general catalogue


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Spring 5/2

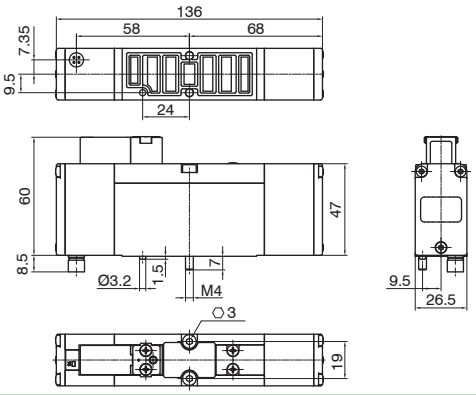
**Coding:** 27APT

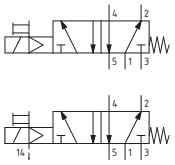
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Working pressure (bar) | From vacuum to 10 (external feeding version)<br>2 ... 10 (self feeding version) |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -10 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1000 |
| Response time according to ISO 12238, activation time (ms) | 20 |
| Response time according to ISO 12238, deactivation time (ms) | 38 |

| | |
|---|---|
| P | PILOTING |
| | **A** = Self feeding |
| | **E** = External feeding |
| T | VOLTAGE |
| | **12** = 24 V DC |
| | **18** = 24 V DC 1 W |

Weight 309 g





The "Activations time" values, are valid only for the 24 V DC 2,3W versions

## Solenoid-Differential 5/2

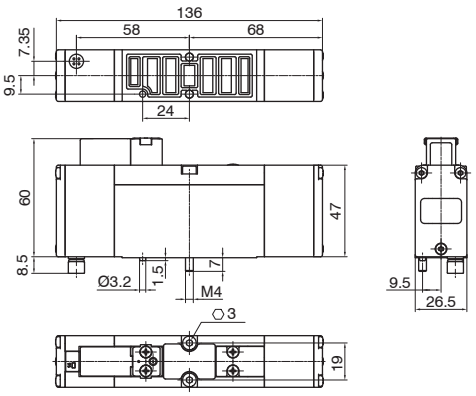
**Coding:** 27BPT

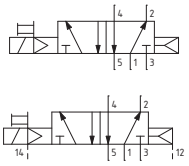
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Working pressure (bar) | From vacuum to 10 (external feeding version)<br>2 ... 10 (self feeding version) |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -10 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1000 |
| Response time according to ISO 12238, activation time (ms) | 20 |
| Response time according to ISO 12238, deactivation time (ms) | 38 |

| | |
|---|---|
| P | PILOTING |
| | **A** = Self feeding |
| | **E** = External feeding |
| T | VOLTAGE |
| | **12** = 24 V DC |
| | **18** = 24 V DC 1 W |

Weight 274 g





The "Activations time" values, are valid only for the 24 V DC 2,3W versions

## Solenoid-Solenoid 5/2

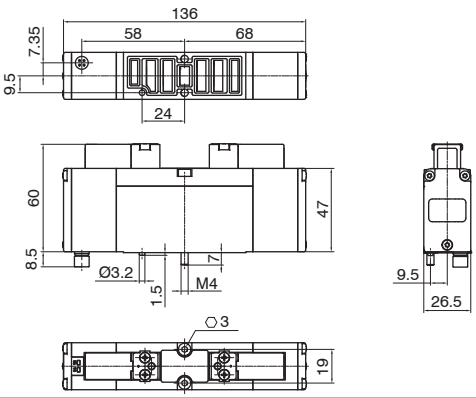
**Coding:** 27CPT

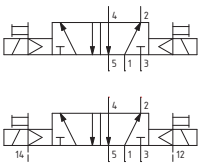
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Working pressure (bar) | From vacuum to 10 (external feeding version)<br>2 ... 10 (self feeding version) |
| Minimum pilot pressure (bar) | 2 |
| Temperature °C | -10 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 1000 |
| Response time according to ISO 12238, activation time (ms) | 12 |
| Response time according to ISO 12238, deactivation time (ms) | 14 |

| | |
|---|---|
| P | PILOTING |
| | **A** = Self feeding |
| | **E** = External feeding |
| T | VOLTAGE |
| | **12** = 24 V DC |
| | **18** = 24 V DC 1 W |

Weight 309 g





The "Activations time" values, are valid only for the 24 V DC 2,3W versions

## Solenoid-Solenoid 5/3

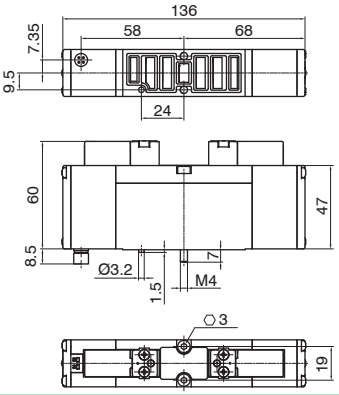
**Coding:** 27E(P)(T)

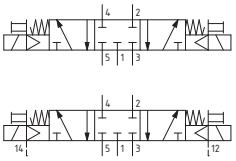
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Working pressure (bar) | From vacuum to 10 (external feeding version)<br>3 ... 10 (self feeding version) |
| Minimum pilot pressure (bar) | 3 |
| Temperature °C | -10 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 660 |
| Response time according to ISO 12238, activation time (ms) | 12 |
| Response time according to ISO 12238, deactivation time (ms) | 60 |

| | |
|---|---|
| (P) | PILOTING |
| | **A** = Self feeding |
| | **E** = External feeding |
| (T) | VOLTAGE |
| | **12** = 24 V DC |
| | **18** = 24 V DC 1 W |

Weight 309 g





The "Activations time" values, are valid only for the 24 V DC 2,3W versions

## Solenoid-Solenoid 5/3 with auto-retaining function

**Coding:** 27D(F)(P)(T)

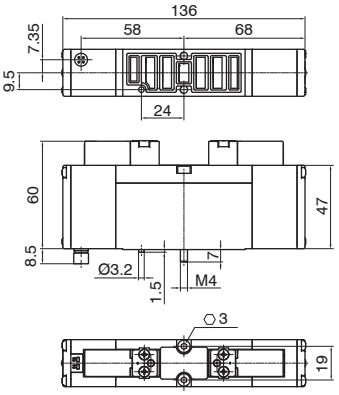
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Working pressure (bar) | From vacuum to 10 (external feeding version)<br>3 ... 10 (self feeding version) |
| Minimum pilot pressure (bar) | 3 |
| Temperature °C | -10 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 700 |
| Response time according to ISO 12238, activation time (ms) | 15 |
| Response time according to ISO 12238, deactivation time (ms) | 80 |

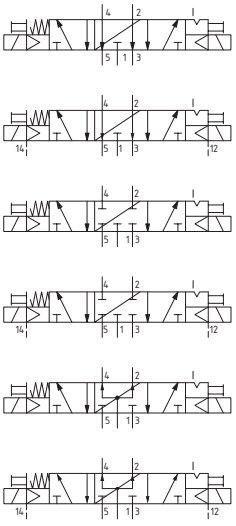
| | |
|---|---|
| (F) | FUNCTION |
| | **1** = S.V. 5/3 C.C. |
| | **2** = S.V. 5/3 O.C. |
| | **3** = S.V. 5/3 P.C. |
| (P) | PILOTING |
| | **A** = Self feeding |
| | **E** = External feeding |
| (T) | VOLTAGE |
| | **12** = 24 V DC |
| | **18** = 24 V DC 1 W |

Weight 309 g

- Maintains the valve state without an electric or pneumatic signal after the activation of L14 (self-retention).
- Valve state changes by activating L12.
- Mechanical spring return.





The "Activations time" values, are valid only for the 24 V DC 2,3W versions



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Spring 2x3/2

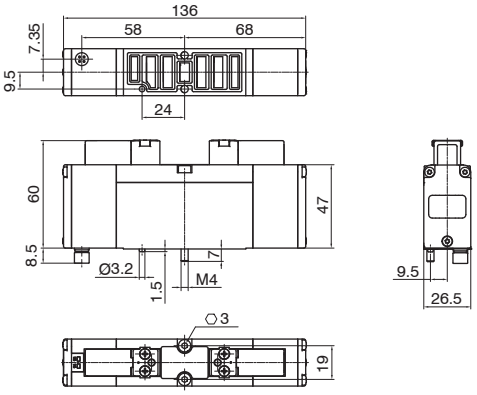
**Coding:** 27 Ⓕ Ⓟ Ⓣ

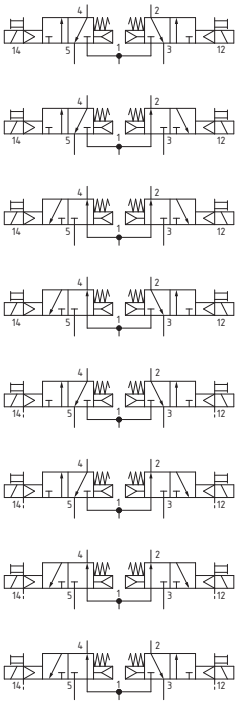
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Working pressure (bar) | From vacuum to 10 (external feeding version)<br>3,5 ... 10 (self feeding version) |
| Minimum pilot pressure (bar) | ≥2+(0.3 x Inlet pressure) |
| Temperature °C | -10 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 550 |
| Response time according to ISO 12238, activation time (ms) | 12 (external feeding version)<br>15 (self feeding version) |
| Response time according to ISO 12238, deactivation time (ms) | 60 (external feeding version)<br>15 (self feeding version) |

| | |
|---|---|
| Ⓕ | FUNCTION |
| | **F** = NC-NC (5/3 Open centres) |
| | **G** = NO-NO (5/3 Pressured centres) |
| | **H** = NC-NO |
| | **I** = NO-NC |
| Ⓟ | PILOTING |
| | **A** = Self feeding |
| | **E** = External feeding |
| Ⓣ | VOLTAGE |
| | **12** = 24 V DC |
| | **18** = 24 V DC 1 W |

Weight 309 g





The "Activations time" values, are valid only for the 24 V DC 2,3W versions
Example: If inlet pressure is set at 5 bar then pilot pressure must be at least
Pp=2+(0,3*5)=3,5 bar

## Solenoid-Spring monitored (VS)

**Coding:** 27VS(P)(S)(T)

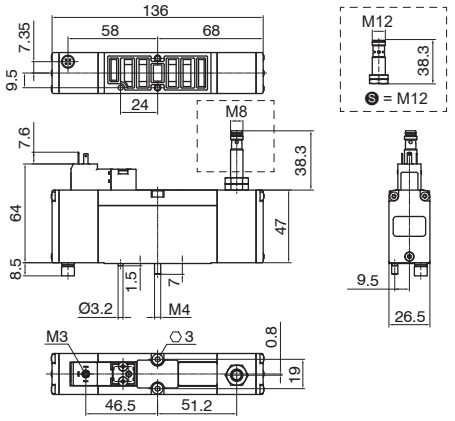
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Response time according to ISO 12238, deactivation time (ms) | 70 |
| Response time according to ISO 12238, activation time (ms) | 15 |
| Flow rate from 1 to 2 at 6 bar with Δp=1 (Nl/min) | 1000 |
| Flow rate from 1 to 4 at 6 bar with Δp=1 (Nl/min) | 1000 |
| Flow rate from 2 to 3 at 6 bar with Δp=1 (Nl/min) | 1000 |
| Flow rate from 4 to 5 at 6 bar with Δp=1 (Nl/min) | 1000 |
| Flow rate from 2 to 3 at 6 bar with free exhaust (Nl/min) | 1700 |
| Flow rate from 4 to 5 at 6 bar with free exhaust (Nl/min) | 1700 |
| Temperature °C | -10 ... +50 |
| Working pressure (bar) | From vacuum to 10 (external feeding version)<br>2 ... 10 (self feeding version) |
| Minimum pilot pressure (bar) | 2 |
| Function | 5/2 N.C. Monostable |
| Noise level (dB) | 75 |

| | |
|---|---|
| (P) | PILOTING |
| | **A** = Self feeding |
| | **E** = External feeding |
| (S) | SENSOR |
| | **M8** = M8x1 Proximity Sensor |
| | **M12** = M12x1 Proximity Sensor |
| (T) | VOLTAGE |
| | **02** = 24 V DC |
| | **08** = 24 V DC 1 W |

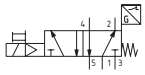
Weight 312 g

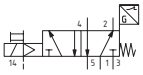
-Monostable with mechanical spring return and proximity sensor
-Safety component according to annex V of 2006/42/EC directive
-Diagnostic system that monitors the state of the valve:
Sensor ON: Valve at rest
Sensor OFF: Valve activated

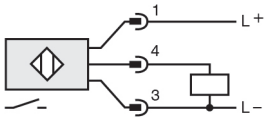





The "Activations time" values, are valid only for the 24 V DC 2,3W versions
**Note**: Overall noise level depends on the final application of the device
**Note**: The noise level indicated on the table is obtained without using silencers





| Sensor | Out | Pin-out | Wiring diagram |
|---|---|---|---|
| M8 Male 3P type A | N.O. |  |  |
| M12 Male 3P type A | N.O. |  | |

Pin 1= Brown - Pin 4= Black - Pin 3= Blue

| Electrical characteristics: Electropilot | |
|---|---|
| Electropilot | Series 300 Size 15 mm |
| Electrical connection | Earth Faston / Series 300 connectors |
| Solenoid coils features | 24 V DC 2.3 W<br>24 V DC 1 W |
| Supply voltage allowance | -5% ... 10% |
| Manual override Integrated | Yes |
| Protection degree | IP65 (with mounted connector) |

**Note**: Refer to the Pneumax general catalogue for detailed information regarding the electropilot

| Electrical characteristics: Proximity sensor | | |
|---|---|---|
| Type | Single channel | Single channel |
| Thread | M8X1 | M12X1 |
| Electrical design | PNP | PNP |
| Output function | N.O. | N.O. |
| Operating voltage | 10 ... 30 VDC | 10 ... 30 VDC |
| Current consumption (mA) | < 20 | < 20 |
| Isolating class | III | III |
| Display | Switching status 4x90° Yellow LEDs | Switching status 4x90° Yellow LEDs |
| Protection degree | IP65 (with mounted connector) | IP65 (with mounted connector) |

**Note**: Manufacturer and model of proximity sensors could be changed at the discretion of Pneumax S.p.A.

| Safety characteristics | | |
|---|---|---|
| Standards compliancies | EN ISO 13849-1:2015 | |
| | EN ISO 13849-2:2012 | |
| Performed Safety Function | Interruption of supply and discharge of a pneumatic circuit connected to port 4 | |
| Sensor feedback | Valve at REST | ON |
| | Valve ACTIVATED | OFF |
| MTTFd Sensor | Single Channel M8 | 1088 years |
| | Single Channel M12 | 932 years |
| Performance Level (PL) | Up to PL=d | |
| Category | Up to 2 | |
| B10d | 630.000 cycles | |

**Note B10d**:
General Procedures for assessing pneumatic component reliability by testing performed in accordance with ISO 19973-1, Pneumatic fluid power - Assessment of component reliability by testing - Part 1: General Procedures.
Reliability and lifetime of pneumatic valves assessed in accordance with ISO 19973-2: Pneumatic fluid power – Assessment of component reliability by testing – Part 2: Directional control valves.

Activities regarding the identification of the safety function, the estimation of the required reliability level (e.g. estimation of the PLr according to EN ISO 13849-1), the design and the production of the related safety circuit, its verification and validation are responsibilities of the operator who uses the device in its final application.
The choice of the category and the satisfaction of its requirements according to EN ISO 13849-1 is in charge of the end-user who integrates the device in its final application while considering the final configuration of the safety circuit.
The diagnostic coverage value guaranteed by the sensor must be calculated by the end-user in function of the final configuration of the safety circuit (e.g. in function of the PLC for safety design which controls the solenoid valve and acquires the state of the sensor).
The estimation of the diagnostic coverage must satisfy the requirements of EN ISO 13849-1.
According to EN ISO 13849-1, T10D value must be calculated by the enduser in function of the annual operation number in which the device will be subjected to; in any case, the device must be substituted every 20 years.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Spring monitored redundant (V2S)

**Coding:** 27V2S(P)(S)(T)

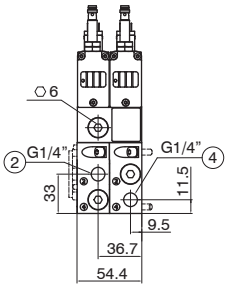
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Response time according to ISO 12238, deactivation time (ms) | 70 |
| Response time according to ISO 12238, activation time (ms) | 25 |
| Flow rate from 1 to 2 at 6 bar with Δp=1 (Nl/min) | 1000 |
| Flow rate from 1 to 4 at 6 bar with Δp=1 (Nl/min) | 500 |
| Flow rate from 2 to 3 at 6 bar with Δp=1 (Nl/min) | 500 |
| Flow rate from 4 to 5 at 6 bar with Δp=1 (Nl/min) | 1000 |
| Flow rate from 2 to 3 at 6 bar with free exhaust (Nl/min) | 900 |
| Flow rate from 4 to 5 at 6 bar with free exhaust (Nl/min) | 1700 |
| Temperature °C | -10 ... +50 |
| Working pressure (bar) | From vacuum to 10 (external feeding version)<br>2 ... 10 (self feeding version) |
| Minimum pilot pressure (bar) | 2 |
| Function | 5/2 N.C. Monostable |
| Noise level (dB) | 75 |

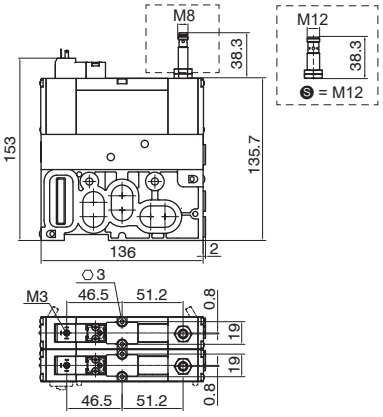
| | |
|---|---|
| (P) | PILOTING |
| | **A** = Self feeding |
| | **E** = External feeding |
| (S) | SENSOR |
| | **M8** = M8x1 Proximity Sensor |
| | **M12** = M12x1 Proximity Sensor |
| (T) | VOLTAGE |
| | **02** = 24 V DC |
| | **08** = 24 V DC 1 W |

Weight 1786 g

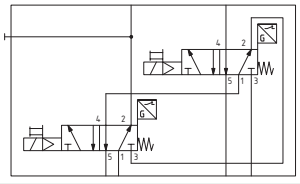
-Double monostable with mechanical spring return and proximity sensor
-Double redundant channel which guarantees that a pneumatic circuit is safely exhausted in case of failure of one of the valves
-Safety component according to annex V of 2006/42/EC directive
-Diagnostic system that monitors the state of the valve:
Sensor ON: Valve at rest
Sensor OFF: Valve activated

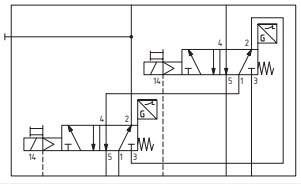


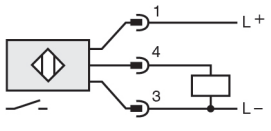



The "Activations time" values, are valid only for the 24 V DC 2,3W versions
**Note**: Overall noise level depends on the final application of the device
**Note**: The noise level indicated on the table is obtained without using silencers





| Sensor | Out | Pin-out | Wiring diagram |
|---|---|---|---|
| M8 Male 3P type A | N.O. |  |  |
| M12 Male 3P type A | N.O. |  | |



Pin 1= Brown - Pin 4= Black - Pin 3= Blue

| Electrical characteristics: Electropilot | |
|---|---|
| Electropilot | Series 300 Size 15 mm |
| Electrical connection | Earth Faston / Series 300 connectors |
| Solenoid coils features | 24 V DC 2.3 W<br>24 V DC 1 W |
| Supply voltage allowance | -5% ... 10% |
| Manual override Integrated | Yes |
| Protection degree | IP65 (with mounted connector) |

**Note**: Refer to the Pneumax general catalogue for detailed information regarding the electropilot

| Electrical characteristics: Proximity sensor | | |
|---|---|---|
| Type | Single channel | Single channel |
| Thread | M8X1 | M12X1 |
| Electrical design | PNP | PNP |
| Output function | N.O. | N.O. |
| Operating voltage | 10 ... 30 VDC | 10 ... 30 VDC |
| Current consumption (mA) | < 20 | < 20 |
| Isolating class | III | III |
| Display | Switching status 4x90° Yellow LEDs | Switching status 4x90° Yellow LEDs |
| Protection degree | IP65 (with mounted connector) | IP65 (with mounted connector) |

**Note**: Manufacturer and model of proximity sensors could be changed at the discretion of Pneumax S.p.A.

| Safety characteristics | | |
|---|---|---|
| Standards compliancies | EN ISO 13849-1:2015 | |
| | EN ISO 13849-2:2012 | |
| Performed Safety Function | Interruption of supply and discharge of a pneumatic circuit connected to port 4 | |
| Sensor feedback | Valve at REST | ON |
| | Valve ACTIVATED | OFF |
| MTTFd Sensor | Single Channel M8 | 1088 years |
| | Single Channel M12 | 932 years |
| Performance Level (PL) | Up to PL=e | |
| Category | Up to 4 | |
| B10d | 630.000 cycles (referred to a single valve) | |

**Note B10d**:
General Procedures for assessing pneumatic component reliability by testing performed in accordance with ISO 19973-1, Pneumatic fluid power - Assessment of component reliability by testing - Part 1: General Procedures.
Reliability and lifetime of pneumatic valves assessed in accordance with ISO 19973-2: Pneumatic fluid power – Assessment of component reliability by testing – Part 2: Directional control valves.

Activities regarding the identification of the safety function, the estimation of the required reliability level (e.g. estimation of the PLr according to EN ISO 13849-1), the design and the production of the related safety circuit, its verification and validation are responsibilities of the operator who uses the device in its final application.
The choice of the category and the satisfaction of its requirements according to EN ISO 13849-1 is in charge of the end-user who integrates the device in its final application while considering the final configuration of the safety circuit.
The diagnostic coverage value guaranteed by the sensor must be calculated by the end-user in function of the final configuration of the safety circuit (e.g. in function of the PLC for safety design which controls the solenoid valve and acquires the state of the sensor).
The estimation of the diagnostic coverage must satisfy the requirements of EN ISO 13849-1.
According to EN ISO 13849-1, T10D value must be calculated by the enduser in function of the annual operation number in which the device will be subjected to; in any case, the device must be substituted every 20 years.

## Solenoid-Spring monitored for pilot control 14 (P)

**Coding:** 27PⓅⓈⓉ

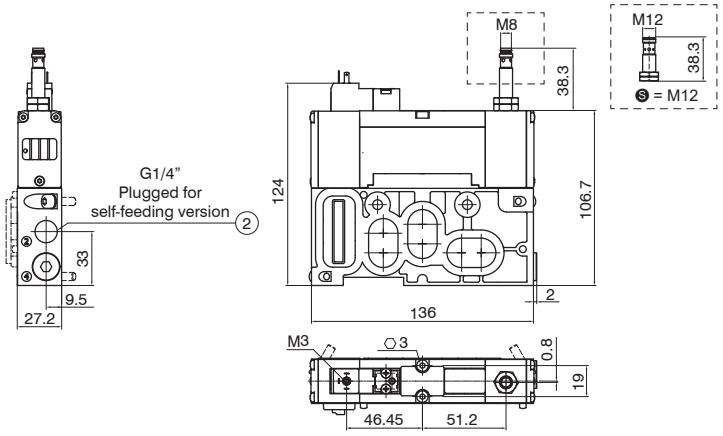
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Response time according to ISO 12238, deactivation time (ms) | 70 |
| Response time according to ISO 12238, activation time (ms) | 15 |
| Flow rate from 1 to 2(14) at 6 bar with Δp=1 (Nl/min) | 250 |
| Flow rate from 2(14) to 3(5) at 6 bar with Δp=1 (Nl/min) | 250 |
| Flow rate from 2(14) to 3(5) at 6 bar with free exhaust (Nl/min) | 500 |
| Temperature °C | -10 ... +50 |
| Working pressure (bar) | 2 ... 10 (external feeding version)<br>2 ... 10 (self feeding version) |
| Minimum pilot pressure (bar) | 2 |
| Function | 3/2 N.C. Monostable |

| | |
|---|---|
| Ⓟ | PILOTING |
| | **A** = Self feeding |
| | **E** = External feeding |
| Ⓢ | SENSOR |
| | **M8** = M8x1 Proximity Sensor |
| | **M12** = M12x1 Proximity Sensor |
| Ⓣ | VOLTAGE |
| | **02** = 24 V DC |
| | **08** = 24 V DC 1 W |

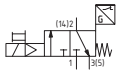
Weight 615 g

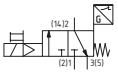
-Monostable with mechanical spring return and proximity sensor
-Control of downstream pressure in pilot channel 14
-Safety component according to annex V of 2006/42/EC directive
-Diagnostic system that monitors the state of the valve:
Sensor ON: Valve at rest
Sensor OFF: Valve activated

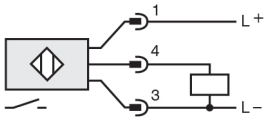





The "Activations time" values, are valid only for the 24 V DC 2,3W versions
**Note**: Overall noise level depends on the final application of the device





| Sensor | Out | Pin-out | Wiring diagram |
|---|---|---|---|
| M8 Male 3P type A | N.O. |  |  |
| M12 Male 3P type A | N.O. |  | |

Pin 1= Brown - Pin 4= Black - Pin 3= Blue

| Electrical characteristics: Electropilot | |
|---|---|
| Electropilot | Series 300 Size 15 mm |
| Electrical connection | Earth Faston / Series 300 connectors |
| Solenoid coils features | 24 V DC 2.3 W<br>24 V DC 1 W |
| Supply voltage allowance | -5% ... 10% |
| Manual override Integrated | Yes |
| Protection degree | IP65 (with mounted connector) |

**Note**: Refer to the Pneumax general catalogue for detailed information regarding the electropilot

| Electrical characteristics: Proximity sensor | | |
|---|---|---|
| Type | Single channel | Single channel |
| Thread | M8X1 | M12X1 |
| Electrical design | PNP | PNP |
| Output function | N.O. | N.O. |
| Operating voltage | 10 ... 30 VDC | 10 ... 30 VDC |
| Current consumption (mA) | < 20 | < 20 |
| Isolating class | III | III |
| Display | Switching status 4x90° Yellow LEDs | Switching status 4x90° Yellow LEDs |
| Protection degree | IP65 (with mounted connector) | IP65 (with mounted connector) |

**Note**: Manufacturer and model of proximity sensors could be changed at the discretion of Pneumax S.p.A.

| Safety characteristics | | |
|---|---|---|
| Standards compliancies | EN ISO 13849-1:2015 | |
| | EN ISO 13849-2:2012 | |
| Performed Safety Function | Interruption of supply and exhaust of a pneumatic channel to port 2 (14) | |
| Sensor feedback | Valve at REST | ON |
| | Valve ACTIVATED | OFF |
| MTTFd Sensor | Single Channel M8 | 1088 years |
| | Single Channel M12 | 932 years |
| Performance Level (PL) | Up to PL=d | |
| Category | Up to 2 | |
| B10d | 1.100.000 cycles | |

**Note B10d**:
General Procedures for assessing pneumatic component reliability by testing performed in accordance with ISO 19973-1, Pneumatic fluid power - Assessment of component reliability by testing - Part 1: General Procedures.
Reliability and lifetime of pneumatic valves assessed in accordance with ISO 19973-2: Pneumatic fluid power – Assessment of component reliability by testing – Part 2: Directional control valves.

Activities regarding the identification of the safety function, the estimation of the required reliability level (e.g. estimation of the PLr according to EN ISO 13849-1), the design and the production of the related safety circuit, its verification and validation are responsibilities of the operator who uses the device in its final application.
The choice of the category and the satisfaction of its requirements according to EN ISO 13849-1 is in charge of the end-user who integrates the device in its final application while considering the final configuration of the safety circuit.
The diagnostic coverage value guaranteed by the sensor must be calculated by the end-user in function of the final configuration of the safety circuit (e.g. in function of the PLC for safety design which controls the solenoid valve and acquires the state of the sensor).
The estimation of the diagnostic coverage must satisfy the requirements of EN ISO 13849-1.
According to EN ISO 13849-1, T10D value must be calculated by the enduser in function of the annual operation number in which the device will be subjected to; in any case, the device must be substituted every 20 years.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid valve for progressive start (EP)

**Coding:** 27EP(S)(T)(C)(P)(V)

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Response time according to ISO 12238, deactivation time (ms) | 70 |
| Response time according to ISO 12238, activation time (ms) | 15 |
| Flow rate from 1 to 2(1) at 6 bar with Δp=1 (Nl/min) | 2200 |
| Flow rate from 2(1) to 3 at 6 bar with Δp=1 (Nl/min) | 2000 |
| Flow rate from 2(1) to 3 at 6 bar with free exhaust (Nl/min) | 4000 |
| Temperature °C | -10 ... +50 |
| Preset switchover pressure (bar) | ~ 4 |
| Working pressure (bar) | 2 ... 10 |
| Function | 5/2 N.C. Monostable |
| Noise level (dB) | 75 |

| | |
|---|---|
| (S) | SENSOR |
| | **M8** = M8x1 Proximity Sensor |
| | **M12** = M12x1 Proximity Sensor |
| (T) | VOLTAGE |
| | **02** = 24 V DC |
| | **08** = 24 V DC 1 W |
| (C) | SUPPLY AND EXHAUST PORTS |
| | **W** = Ports 5, 1 and 3 closed |
| (P) | PILOT PORTS |
| | **4** = Port 14 closed |
| (V) | VERSION |
| | = Standard |
| | **M** = Machinery directive |

-It allow slow and gradual increase in pressure to the supply port and rapid exhaust
-Available version as a safety component according to annex V of 2006/42/EC directive
-Pressure zone exhaust ports 3 and 5 available
-Diagnostic system that monitors the state of the valve:
Sensor ON: Valve activated
Sensor OFF: Valve at rest



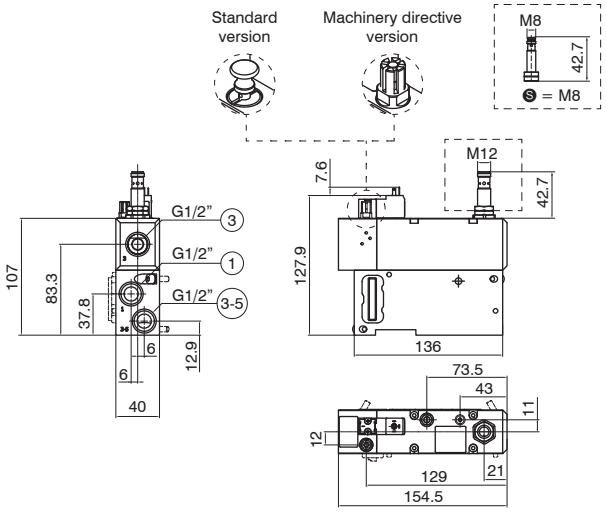
Weight 1360 g

27EP(S)(T)(C)(P)

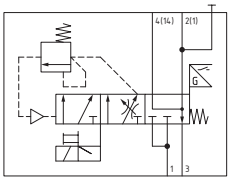


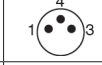
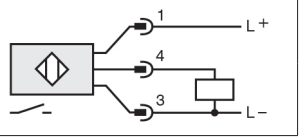
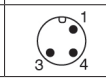
Weight 1360 g

27EP(S)(T)(C)(P)M




The "Activations time" values, are valid only for the 24 V DC 2,3W versions
**Note**: Overall noise level depends on the final application of the device
**Note**: The noise level indicated on the table is obtained without using silencers



| Sensor | Out | Pin-out | Wiring diagram |
|---|---|---|---|
| M8 Male 3P type A | N.O. |  |  |
| M12 Male 3P type A | N.O. |  | |



Pin 1= Brown - Pin 4= Black - Pin 3= Blue

| Electrical characteristics: Electropilot | |
|---|---|
| Electropilot | Series 300 Size 15 mm |
| Electrical connection | Earth Faston / Series 300 connectors |
| Solenoid coils features | 24 V DC 2.3 W<br>24 V DC 1 W |
| Supply voltage allowance | -5% ... 10% |
| Manual override Integrated | No (separated from the electropilot) |
| Protection degree | IP65 (with mounted connector) |

**Note**: Refer to the Pneumax general catalogue for detailed information regarding the electropilot

| Electrical characteristics: Proximity sensor | | |
|---|---|---|
| Type | Single channel | Single channel |
| Thread | M8X1 | M12X1 |
| Electrical design | PNP | PNP |
| Output function | N.O. | N.O. |
| Operating voltage | 10 ... 30 VDC | 10 ... 30 VDC |
| Current consumption (mA) | < 20 | < 20 |
| Isolating class | III | III |
| Display | Switching status 4x90° Yellow LEDs | Switching status 4x90° Yellow LEDs |
| Protection degree | IP65 (with mounted connector) | IP65 (with mounted connector) |

**Note**: Manufacturer and model of proximity sensors could be changed at the discretion of Pneumax S.p.A.

| Safety characteristics | | |
|---|---|---|
| Standards compliancies | EN ISO 13849-1:2015 | |
| | EN ISO 13849-2:2012 | |
| Performed Safety Function | Interruption of supply and exhaust of pneumatic channels connected to port 2 (1) and port 4 (14) | |
| Sensor feedback | Valve at REST | OFF |
| | Valve ACTIVATED | ON |
| MTTFd Sensor | Single Channel M8 | 1088 years |
| | Single Channel M12 | 932 years |
| Performance Level (PL) | Up to PL=d | |
| Category | Up to 2 | |
| B10d | 2.000.000 cycles | |

**Note B10d**:
General Procedures for assessing pneumatic component reliability by testing performed in accordance with ISO 19973-1, Pneumatic fluid power - Assessment of component reliability by testing - Part 1: General Procedures.
Reliability and lifetime of pneumatic valves assessed in accordance with ISO 19973-2: Pneumatic fluid power – Assessment of component reliability by testing – Part 2: Directional control valves.

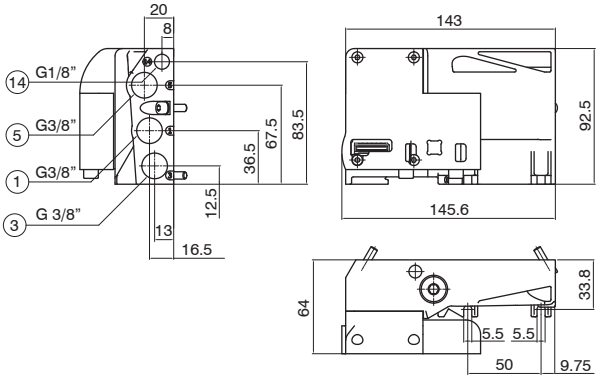
Activities regarding the identification of the safety function, the estimation of the required reliability level (e.g. estimation of the PLr according to EN ISO 13849-1), the design and the production of the related safety circuit, its verification and validation are responsibilities of the operator who uses the device in its final application.
The choice of the category and the satisfaction of its requirements according to EN ISO 13849-1 is in charge of the end-user who integrates the device in its final application while considering the final configuration of the safety circuit.
The diagnostic coverage value guaranteed by the sensor must be calculated by the end-user in function of the final configuration of the safety circuit (e.g. in function of the PLC for safety design which controls the solenoid valve and acquires the state of the sensor).
The estimation of the diagnostic coverage must satisfy the requirements of EN ISO 13849-1.
According to EN ISO 13849-1, T10D value must be calculated by the enduser in function of the annual operation number in which the device will be subjected to; in any case, the device must be substituted every 20 years.

## Left Endplate

**Coding:** 27TS30P

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Temperature °C | -10 ... +50 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure port 14 (bar) | 3 ... 7 |






Weight 815 g

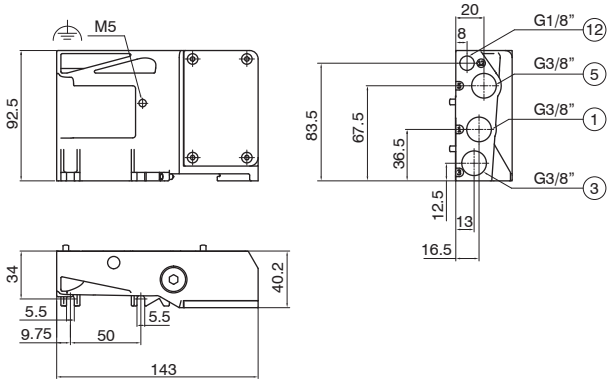
## Right Endplate

**Coding:** 27TDⓒ

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Temperature °C | -10 ... +50 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure port 12 (bar) | 3 ... 7 |

| | |
|---|---|
| ⓒ | SUPPLY AND EXHAUST PORTS |
| | **00** = Ports 5, 1 and 3 open |
| | **W** = Ports 5, 1 and 3 closed |
| | **XY** = Ports 1-3 closed |
| | **ZX** = Ports 5-1 closed |
| | **ZY** = Ports 5-3 closed |
| | **X** = Port 1 closed |
| | **Y** = Port 3 closed |
| | **Z** = Port 5 closed |






Weight 560 g

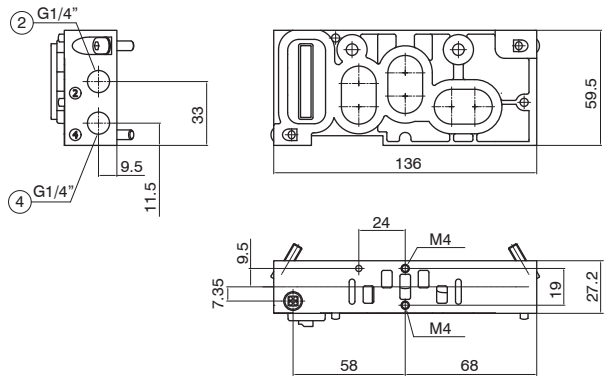
## Modular base

**Coding:** 27BⓋⓒⓅ

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Temperature °C | -10 ... +50 |
| Working pressure (bar) | 3 ... 10 |

| | |
|---|---|
| Ⓥ | VERSION |
| | **M** = Monostable |
| | **B** = Bistable |
| | **P** = Pass-through signal |
| ⓒ | SUPPLY AND EXHAUST PORTS |
| | = Ports 5, 1 and 3 open |
| | **W** = Ports 5, 1 and 3 closed |
| | **XY** = Ports 1-3 closed |
| | **ZX** = Ports 5-1 closed |
| | **ZY** = Ports 5-3 closed |
| | **X** = Port 1 closed |
| | **Y** = Port 3 closed |
| | **Z** = Port 5 closed |
| Ⓟ | PILOT PORTS |
| | = Ports 14-12 open |
| | **4** = Port 14 closed |
| | **2** = Port 12 closed |






Weight 298 g



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

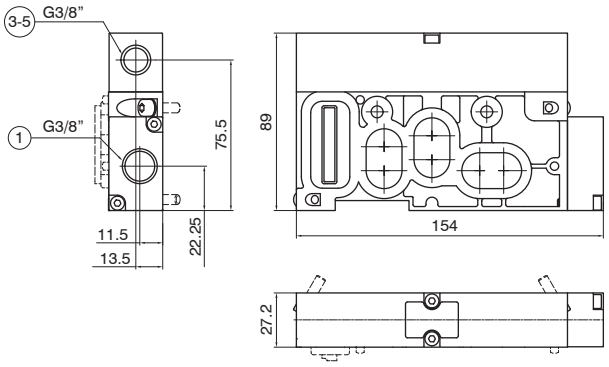
## Intermediate Inlet/Exhaust module

**Coding:** 27WⓋⒸⓅ

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Temperature °C | -10 ... +50 |
| Working pressure (bar) | From vacuum to 10 |

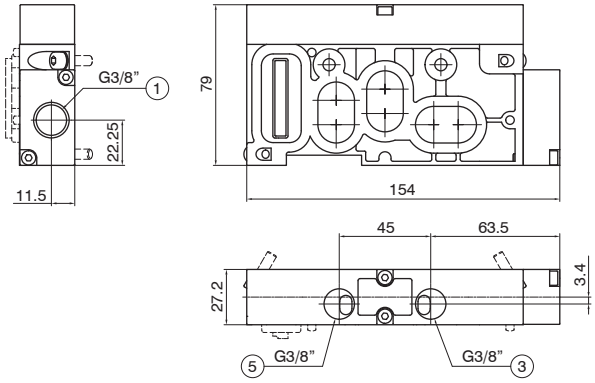
| | |
|---|---|
| Ⓥ | VERSION |
| | **U** = Conveyed exhausts |
| | **S** = Separated exhausts |
| Ⓒ | SUPPLY AND EXHAUST PORTS |
| | = Ports 5, 1 and 3 open |
| | **W** = Ports 5, 1 and 3 closed |
| | **XY** = Ports 1-3 closed |
| | **ZX** = Ports 5-1 closed |
| | **ZY** = Ports 5-3 closed |
| | **X** = Port 1 closed |
| | **Y** = Port 3 closed |
| | **Z** = Port 5 closed |
| Ⓟ | PILOT PORTS |
| | = Ports 14-12 open |
| | **4** = Port 14 closed |
| | **2** = Port 12 closed |






Weight 606 g





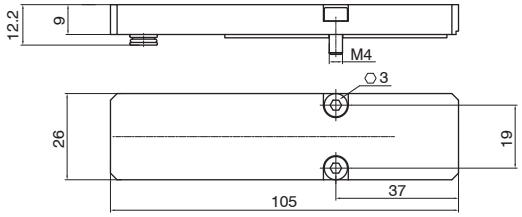

Weight 524 g

## Free valve space plug

**Coding:** 27T00

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Temperature °C | -10 ... +50 |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure port 14 (bar) | 3 ... 7 |






Weight 70 g

## Single external power supply module

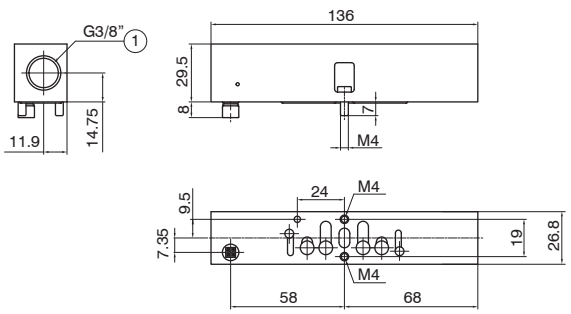
**Coding:** 27ASⓋ

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Temperature °C | -10 ... +50 |
| Working pressure (bar) | 2 ... 10 (version 14)<br>From vacuum to 10 (version 11) |

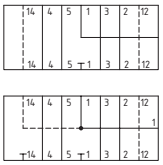
| | |
|---|---|
| Ⓥ | VERSION |
| | **11** = External supply of port 1 |
| | **14** = External supply of ports 1 and 14 |

Weight 246 g






-Suitable module for vertical configuration
-It allows to externally supply a single valve with pressure different from the manifold.



## Flow regulator module

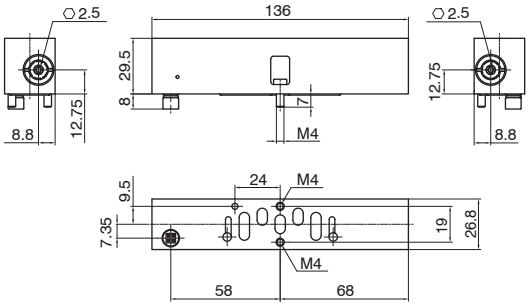
**Coding:** 27RF(V)

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Temperature °C | -10 ... +50 |

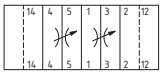
| | VERSION |
|---|---|
| (V) | **35** = Exhaust flow regulator |

Weight 283 g






-Suitable module for vertical configuration
-It allows the flow regulation of ports 3 and 5
-Regualtion through two needles independent of each other
-It is designed to control the speed of an actuator



## Shut-off and exhaust module

**Coding:** 27VL(V)(T)

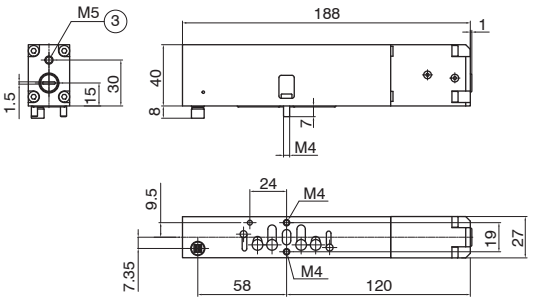
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Temperature °C | -10 ... +50 |

| | VERSION |
|---|---|
| (V) | **141** = Shut-off and exhaust of ports 1-14 |
| (T) | TYPE |
| | = Non lockable |
| | **K** = Lockable |



Weight 504 g

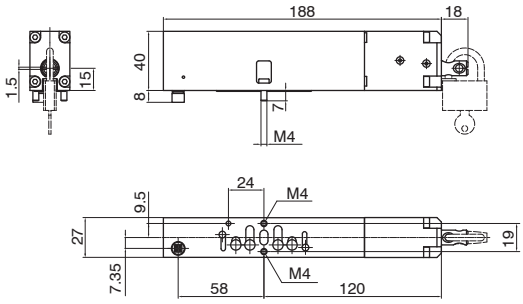
27VL(V)



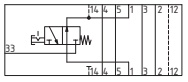


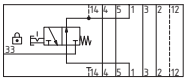

Weight 550 g

27VL(V)K




-Suitable module for vertical configuration
-It allows you to shut-off and exhaust the supply port 1 and pilot port 14 or other modules mounted on it







Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pressure regulator (compact version)

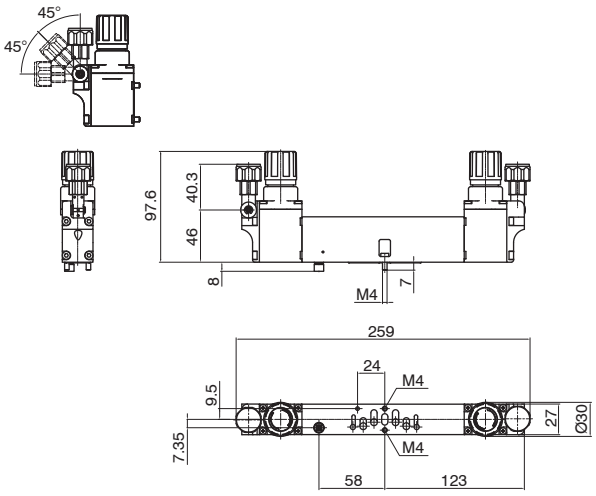
**Coding:** 27RC®Ⓛ©©©

| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Temperature °C | -10 ... +50 |
| Working pressure (bar) | 0,5 ... 10 |

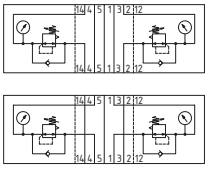
| | |
|---|---|
| ® | REGULATION TYPE |
| | **D** = Downstream |
| | **U** = Upstream |
| Ⓛ | REGULATION SIDE |
| | **2** = Single L12 |
| | **4** = Single L14 |
| | **24** = Double L12-L14 |
| © | PRESSURE RANGE |
| | **A** = 0 - 2 bar |
| | **B** = 0 - 4 bar |
| | **C** = 0 - 8 bar |
| © | RELIEVING OPTIONS |
| | **A** = With reliving |
| © | KNOB COLOUR |
| | **V** = Green (RAL 6032) |
| | **G** = Grey (RAL 7004) |

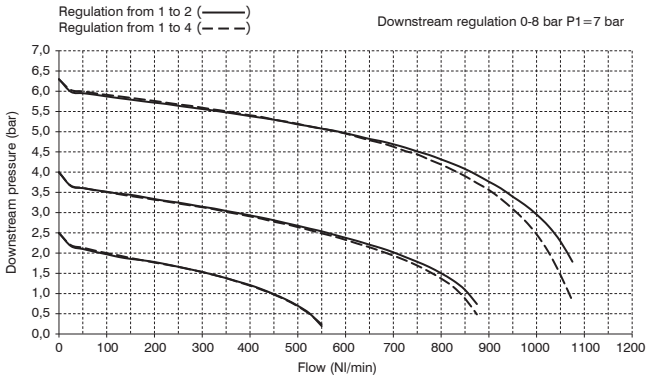
Weight 600 g



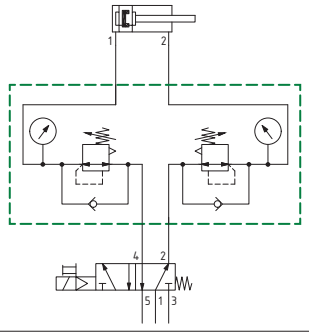


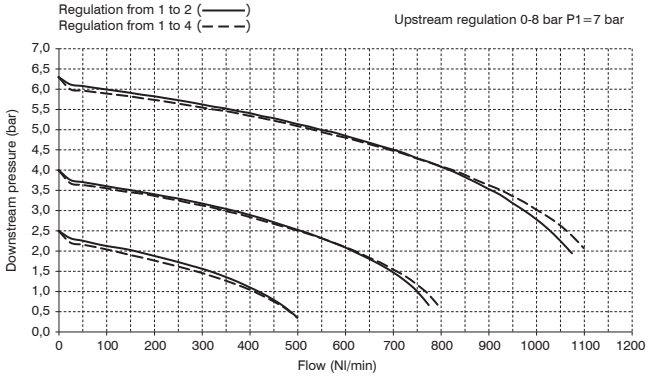

-Suitable module for vertical configuration
-It allows the regulation of output pressure to actuators
-Actuator pressure regulation:
 -with regulator upstream of the solenoid valve (faster exhaust phase of the actuator)
 -with regulator downstream of the solenoid valve
-Possible installation of pressure regulators in succession (available on request)
-Pressure gauges adjustable in 3 positions



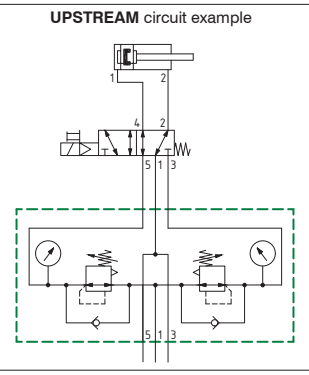



**DOWNSTREAM** circuit example






**UPSTREAM** circuit example



**Note**:
Pressure must be set upwards.
For greater accuracy and sensitivity, it is recommended using a regulator with a pressure rating as close as possible to the desired pressure.

## Pressure regulator (extended version)

**Coding:** 27RP Ⓡ Ⓛ Ⓖ Ⓞ Ⓒ Ⓥ

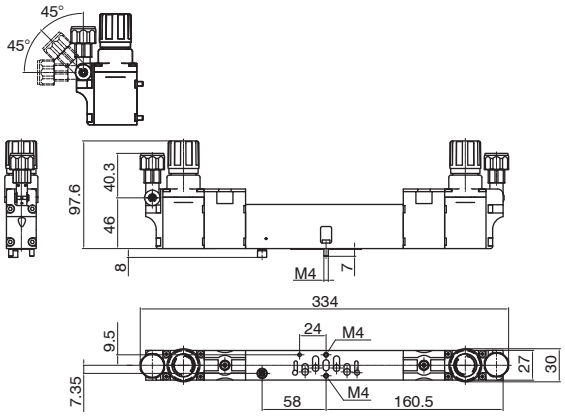
| Technical characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Recommended purity class [5:4:4] according to ISO 8573-1:2010 |
| Temperature °C | -10 ... +50 |
| Working pressure (bar) | 0,5 ... 10 |

| | |
|---|---|
| Ⓡ | REGULATION TYPE |
| | **D** = Downstream |
| | **U** = Upstream |
| Ⓛ | REGULATION SIDE |
| | **2** = Single L12 |
| | **4** = Single L14 |
| | **24** = Double L12-L14 |
| Ⓖ | PRESSURE RANGE |
| | **A** = 0 - 2 bar |
| | **B** = 0 - 4 bar |
| | **C** = 0 - 8 bar |
| Ⓞ | RELIEVING OPTIONS |
| | **A** = With reliving |
| Ⓒ | KNOB COLOUR |
| | **V** = Green (RAL 6032) |
| | **G** = Grey (RAL 7004) |
| Ⓥ | VERSION |
| | = Adjustable pressure gauge |
| | **M** = Fixed pressure gauge |



Weight 760 g

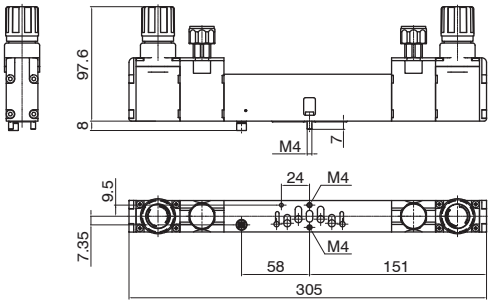
27RP Ⓡ Ⓛ Ⓖ Ⓞ Ⓒ



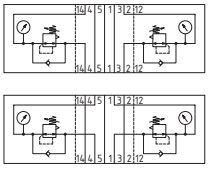


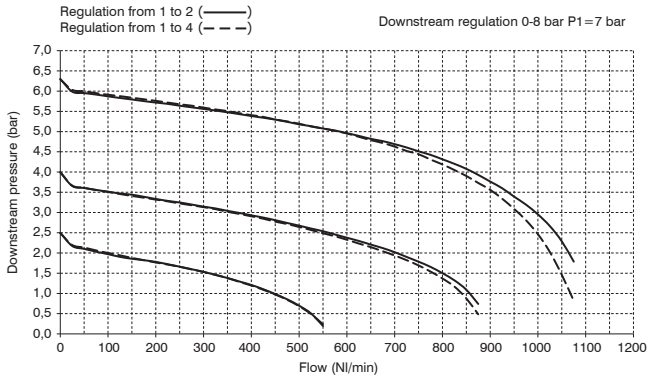

Weight 760 g

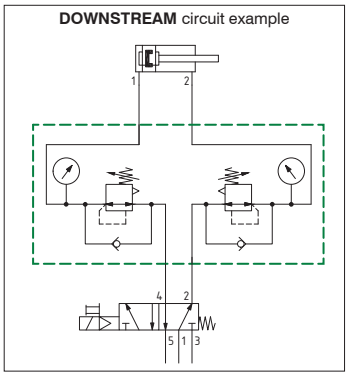
27RP Ⓡ Ⓛ Ⓖ Ⓞ Ⓒ M

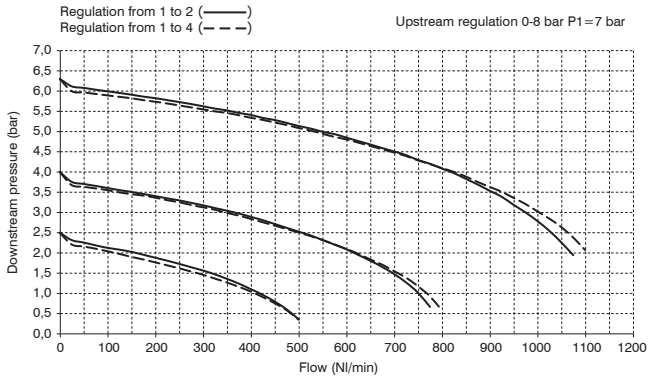


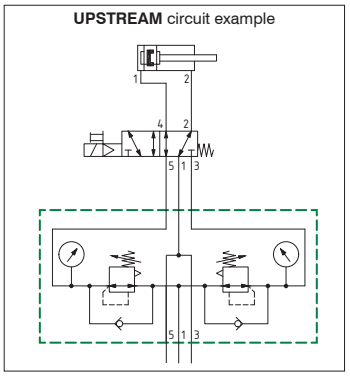

-Suitable module for vertical configuration
-It allows the regulation of output pressure to actuators
-Actuator pressure regulation:
 -with regulator upstream of the solenoid valve (faster exhaust phase of the actuator)
 -with regulator downstream of the solenoid valve
-Possible installation of pressure regulators in succession (available on request)
-Pressure gauges adjustable in 3 positions or fixed






**Note**:
Pressure must be set upwards.
For greater accuracy and sensitivity, it is recommended using a regulator with a pressure rating as close as possible to the desired pressure.

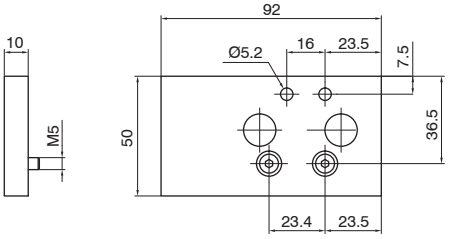

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Offset compensation plate

**Coding:** 27P0



Weight 118 g

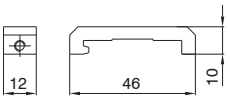



## DIN rail adapter

**Coding:** 3100.16



Weight 12 g



## EVO Electronics





### A UNIQUE CONTROL SYSTEM, A WIDE RANGE OF SOLUTIONS

The PX Series multiserial module can be integrated into all Optyma S-F-T and 2700 series solenoid valves manifolds in EVO versions. The solenoid valves manifolds can be configured by implementing all major communication protocols on the same electronics, ensuring maximum flexibility and reliability in any application context.

| MULTI-PIN MODULE | | | | |
|---|---|---|---|---|
| | Optyma-S | Optyma-F | Optyma-T | Series 2700 |
| 25 poles | • | • | • | • |
| 37 poles | • | • | • | • |
| 44 poles | • | | | |
| **SERIAL SYSTEMS** | | | | |
| | Optyma-S | Optyma-F | Optyma-T | Series 2700 |
| CANopen® 32 bit protocol node kit | • | • | • | • |
| CANopen® 48 bit protocol node kit | • | | | |
| PROFIBUS DP 32 bit protocol node kit | • | • | • | • |
| PROFIBUS DP 48 bit protocol node kit | • | | | |
| EtherNet/IP protocol node kit | • | • | • | • |
| EtherCAT® protocol node kit | • | • | • | • |
| PROFINET IO RT protocol node kit | • | • | • | • |
| CC-Link IE Field Basic protocol node kit | • | • | • | • |
| IO-Link 32 bit protocol interface kit | • | • | • | • |
| IO-Link 48 bit protocol interface kit | • | | | |
| **INPUTS AND OUTPUTS MODULES** | | | | |
| | Optyma-S | Optyma-F | Optyma-T | Series 2700 |
| 8 M8 & M12 digital inputs module kits | • | • | • | • |
| 8 M8 & M12 digital outputs module kits | • | • | • | • |
| 32 digital inputs & outputs module kits (37 pin SUB-D connector) | • | • | • | • |
| Analogue inputs module kit M8 | • | • | • | • |
| Analogue outputs module kit M8 | • | • | • | • |
| Pt100 inputs module kit | • | • | • | • |
| **ADDITIONAL MODULES** | | | | |
| | Optyma-S | Optyma-F | Optyma-T | Series 2700 |
| Additional power supply module kit | • | • | • | • |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Multi-pin module

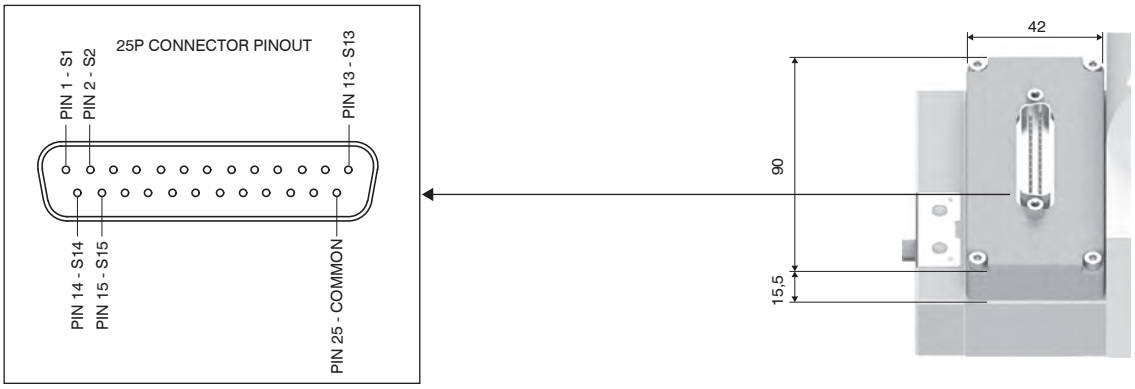
**Coding:** 5E30.©

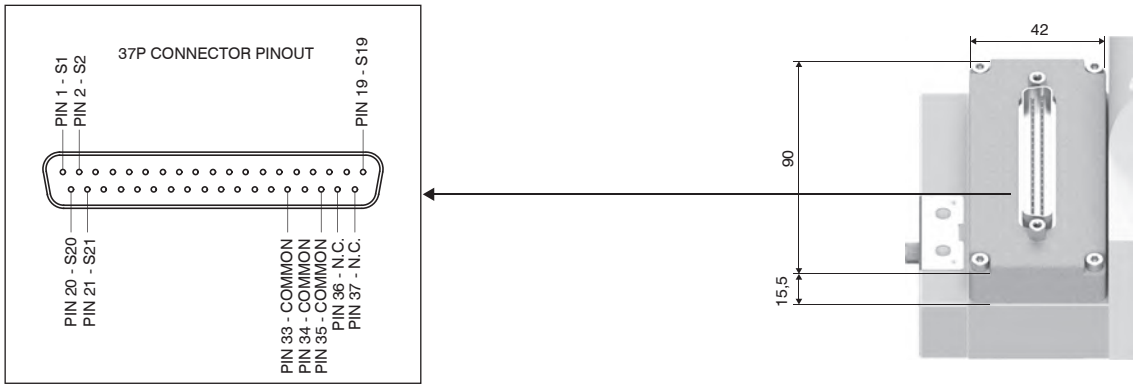
| Technical characteristics | | |
|---|---|---|
| Maximum current per module | | 300mA |
| Protection | | Overcurrent (auto-resettable fuse)<br>Reverse polarity |
| Input impedence | | 3kΩ |
| Maximum cable length | | < 30 m |
| Input data allocation | | 8 bit |
| INPUTS + 24 V DC current consumption of the module only | | 5mA |
| Maximum number of handled signals | 25 Poles | 24 |
| | 37 poles | 32 |
| | 44 Poles | 40 |

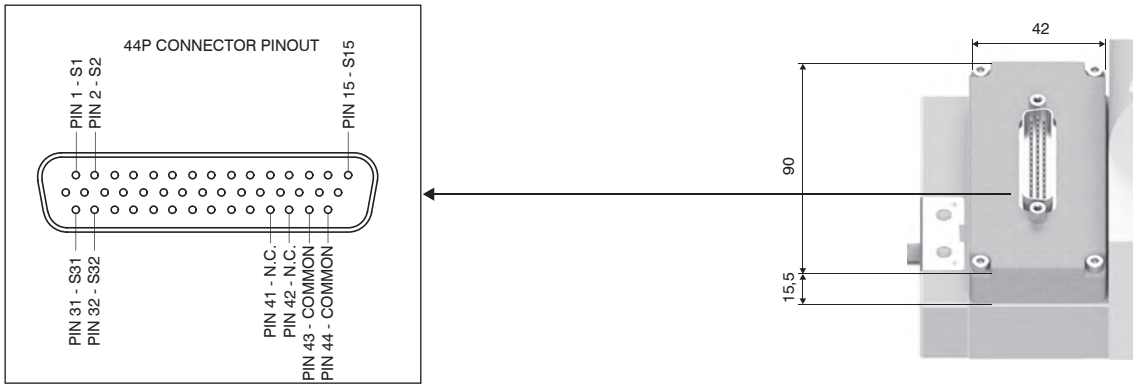
| © | ELECTRICAL CONNECTION |
|---|---|
| | **25P** = Connector 25 poles PNP |
| | **37P** = Connector 37 poles PNP |
| | **44P** = Connector 44 poles PNP |
| | **25N** = Connector 25 poles NPN |
| | **37N** = Connector 37 poles NPN |
| | **44N** = Connector 44 poles NPN |
| | **25A** = Connector 25 poles AC |
| | **37A** = Connector 37 poles AC |
| | **44A** = Connector 44 poles PNP |



### Scheme / Overall dimensions and I/O layout



## CANopen® protocol node kit

CANopen® node manages 64 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Connection to CANopen® fieldbus is made via two M12, male and female, 5 pins, type A circular connectors, in parallel between them; connectors pinout is compliant to CiA Draft recommendation 303-1 (V. 1.3 : 30 December 2004).
Transmission speed and address, as well as termination resistor activation are set via DIP-switches.
CANopen® node is available in two versions with 32 or 48 outputs allocated to solenoid valves on the manifold directly connected to the node.
Such outputs correspond to least significant bytes and their allocation is independent of how many solenoid valves are installed.
Remaining outputs can be used to control the modules.
Byte allocation to additional modules is fully automatic.

**Coding:** K5530.64.Ⓥ CO

| | VERSION |
|---|---|
| Ⓥ | **32** = 32 output bits available for valve connections |
| | **48** = 48 output bits available for valve connections |



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by OUTPUTS + 24 V DC (pin 4).

To compute the maximum current on the OUTPUTS + 24 V DC, please use the following formula:

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules
$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)
$m$ = number of installed solenoid pilots
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 2200 "Optyma S" | 36 mA |
| 2500 "Optyma F" | 54 mA |
| 2500 "Optyma T" | 54 mA |
| Series 2700 | 24 mA (1 W version) / 100 mA (2,3 W version) |

For each fieldbus node, maximum deliverable current by OUTPUTS + 24 V DC supply is 4 A, moreover the sum of the currents on OUTPUTS + 24 V DC and INPUTS + 24 V DC must not exceed 4 A.

$$I_{24\,V\,DC\,out} + I_{24\,V\,DC\,in} < 4A$$

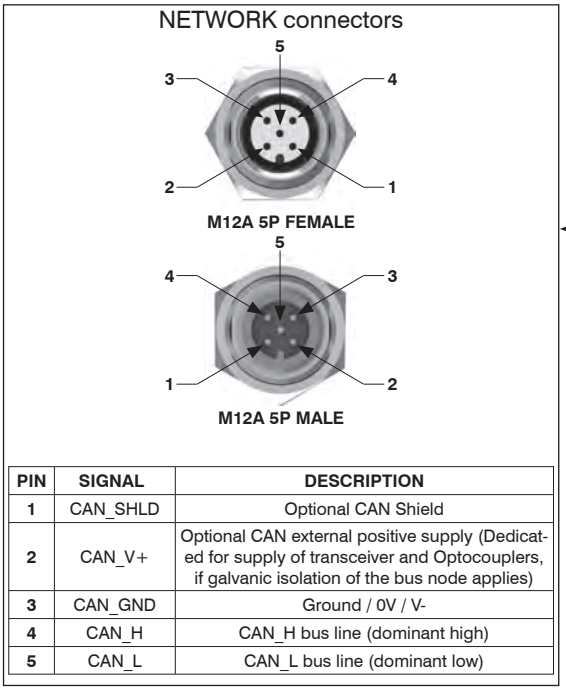
Where:

$$I_{24\,V\,DC\,in} = \sum_{i=1}^{n} I_{in,i}$$

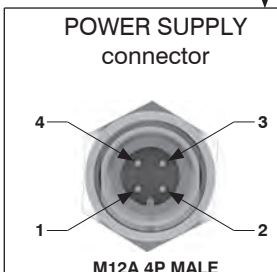
$n$ = number of installed modules
$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

⚠ In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

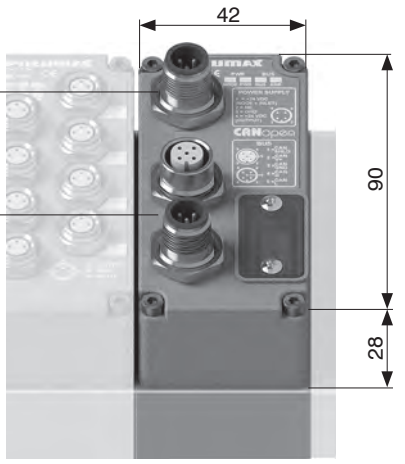
### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | CAN_SHLD | Optional CAN Shield |
| 2 | CAN_V+ | Optional CAN external positive supply (Dedicated for supply of transceiver and Optocouplers, if galvanic isolation of the bus node applies) |
| 3 | CAN_GND | Ground / 0V / V- |
| 4 | CAN_H | CAN_H bus line (dominant high) |
| 5 | CAN_L | CAN_L bus line (dominant low) |




| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |




| Technical characteristics | | |
|---|---|---|
| Specifications | | CiA Draft Standard Proposal 301 V 4.10 (15 August 2006) |
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC ± 10% |
| | Node only current consumption on + 24 V DC inputs | 40 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | 2 M12 5 pins male-female connectors type A (IEC 60947-5-2) |
| | Baud rate | 10 - 20 - 50 - 125 - 250 - 500 - 800 - 1000 Kbit/s |
| | Addresses possible numbers | From 1 to 63 |
| | Maximum nodes number in network | 64 (slave + master) |
| | Bus maximum recommended length | 100 m at 500 Kbit/s |
| | Bus diagnosis | Green / red status LED |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## PROFIBUS DP protocol node kit

PROFIBUS DP node manages 64 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Connection to PROFIBUS DP fieldbus is made via two M12, male and female, 5 pins, type B circular connectors, in parallel between them; connectors pinout is PROFIBUS Interconnection Technology specifications compliant (Version 1.1, August 2001).
Address as well as termination resistor activation are set via DIP-switches.
PROFIBUS DP node is available in two versions with 32 or 48 outputs allocated to solenoid valves on the manifold directly connected to the node.
Such outputs correspond to least significant bytes and their allocation is independent of how many solenoid valves are installed.
Remaining outputs can be used to control the modules.
Byte allocation to additional modules is fully automatic.

**Coding:** K5330.64.Ⓥ PB

| Ⓥ | VERSION |
|---|---|
| | **32** = 32 output bits available for valve connections |
| | **48** = 48 output bits available for valve connections |



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by OUTPUTS + 24 V DC (pin 4).

To compute the maximum current on the OUTPUTS + 24 V DC, please use the following formula:

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules
$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)
$m$ = number of installed solenoid pilots
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 2200 "Optyma S" | 36 mA |
| 2500 "Optyma F" | 54 mA |
| 2500 "Optyma T" | 54 mA |
| Series 2700 | 24 mA (1 W version) / 100 mA (2,3 W version) |

For each fieldbus node, maximum deliverable current by OUTPUTS + 24 V DC supply is 4 A, moreover the sum of the currents on OUTPUTS + 24 V DC and INPUTS + 24 V DC must not exceed 4 A.

$$I_{24\,V\,DC\,out} + I_{24\,V\,DC\,in} < 4A$$

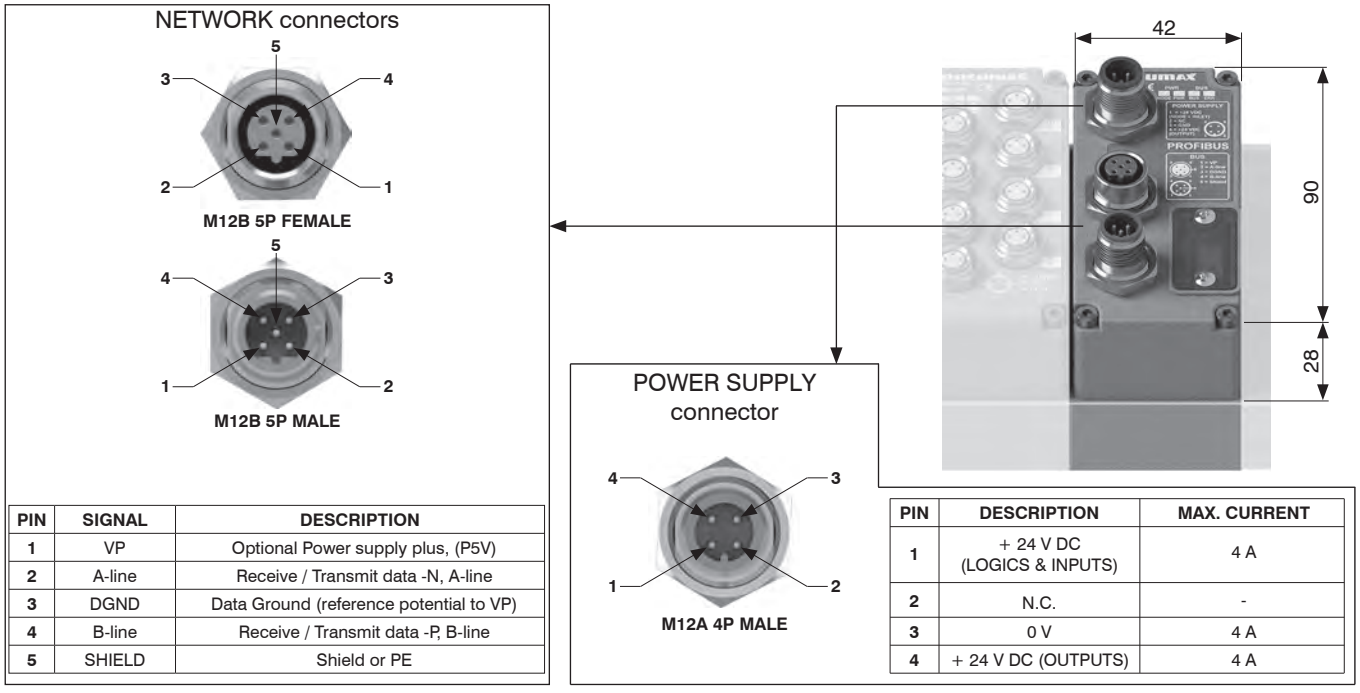
Where:

$$I_{24\,V\,DC\,in} = \sum_{i=1}^{n} I_{in,i}$$

$n$ = number of installed modules
$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

⚠ In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | VP | Optional Power supply plus, (P5V) |
| 2 | A-line | Receive / Transmit data -N, A-line |
| 3 | DGND | Data Ground (reference potential to VP) |
| 4 | B-line | Receive / Transmit data -P, B-line |
| 5 | SHIELD | Shield or PE |

| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

| Technical characteristics | | |
|---|---|---|
| Specifications | | PROFIBUS DP |
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC ± 10% |
| | Node only current consumption on + 24 V DC inputs | 70 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | 2 M12 5 pins male-female connectors type B |
| | Baud rate | 9,6 - 19,2 - 93,75 - 187,5 - 500 - 1500 - 3000 - 6000 - 12000 Kbit/s |
| | Addresses possible numbers | From 1 to 99 |
| | Maximum nodes number in network | 100 (slave + master) |
| | Bus maximum recommended length | 100 m at 12 Mbit/s - 1200 m at 9,6 Kbit/s |
| | Bus diagnosis | Green / red status LED |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |

## EtherNet/IP protocol node kit

EtherNet/IP node manages 128 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Network connection is made via 2 M12 female, type D, 4 pins, circular connectors.
Code K5730.128.48EI provides first 48 outputs, corresponding to least significant 6 bytes, are allocated to the solenoid valve positions, regardless how many they are and how many valves are installed on the manifold directly connected to the node.
Remaining 80 outputs can be used to manage output modules; bytes allocation to additional modules is fully automatic.

**Coding:** K5730.128.48EI



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by OUTPUTS + 24 V DC (pin 4).

To compute the maximum current on the OUTPUTS + 24 V DC, please use the following formula:

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules
$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)
$m$ = number of installed solenoid pilots
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 2200 "Optyma S" | 36 mA |
| 2500 "Optyma F" | 54 mA |
| 2500 "Optyma T" | 54 mA |
| Series 2700 | 24 mA (1 W version) / 100 mA (2,3 W version) |

For each fieldbus node, maximum deliverable current by OUTPUTS + 24 V DC supply is 4 A, moreover the sum of the currents on OUTPUTS + 24 V DC and INPUTS + 24 V DC must not exceed 4 A.

$$I_{24\,V\,DC\,out} + I_{24\,V\,DC\,in} < 4A$$

Where:

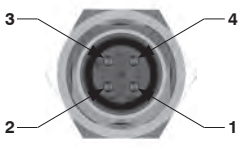
$$I_{24\,V\,DC\,in} = \sum_{i=1}^{n} I_{in,i}$$

$n$ = number of installed modules
$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

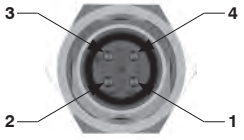
In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout

NETWORK connectors

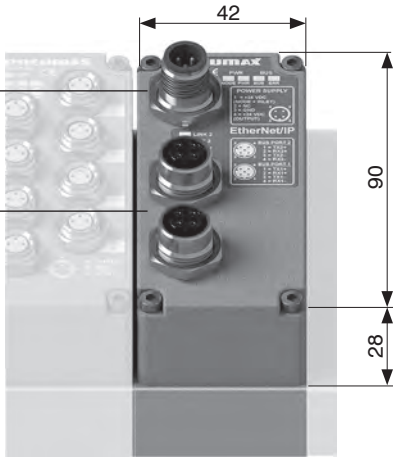



M12D 4P FEMALE

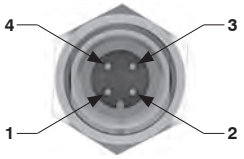



M12D 4P FEMALE

| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | TX + | Ethernet Transmit High |
| 2 | RX + | Ethernet Receive High |
| 3 | TX - | Ethernet Transmit Low |
| 4 | RX - | Ethernet Receive Low |




POWER SUPPLY connector




M12A 4P MALE

| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

| Technical characteristics | | |
|---|---|---|
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC ± 10% |
| | Node only current consumption on + 24 V DC inputs | 65 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | 2 M12 4 pins male-female connectors type D (IEC 61076-2-101) |
| | Baud rate | 100 Mbit/s |
| | Maximum distance between 2 nodes | 100 m |
| | Bus diagnosis | Green / red status LED |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## EtherCAT® protocol node kit

EtherCAT® node manages 128 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Network connection is made via 2 M12 female, type D, 4 pins, circular connectors.
Code K5730.128.48EC provides first 48 outputs, corresponding to least significant 6 bytes, are allocated to the solenoid valve positions, regardless how many they are and how many valves are installed on the manifold directly connected to the node.
Remaining 80 outputs can be used to manage output modules; bytes allocation to additional modules is fully automatic.

**Coding:** K5730.128.48EC



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by OUTPUTS + 24 V DC (pin 4).

To compute the maximum current on the OUTPUTS + 24 V DC, please use the following formula:

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules
$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)
$m$ = number of installed solenoid pilots
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 2200 "Optyma S" | 36 mA |
| 2500 "Optyma F" | 54 mA |
| 2500 "Optyma T" | 54 mA |
| Series 2700 | 24 mA (1 W version) / 100 mA (2,3 W version) |

For each fieldbus node, maximum deliverable current by OUTPUTS + 24 V DC supply is 4 A, moreover the sum of the currents on OUTPUTS + 24 V DC and INPUTS + 24 V DC must not exceed 4 A.

$$I_{24\,V\,DC\,out} + I_{24\,V\,DC\,in} < 4A$$

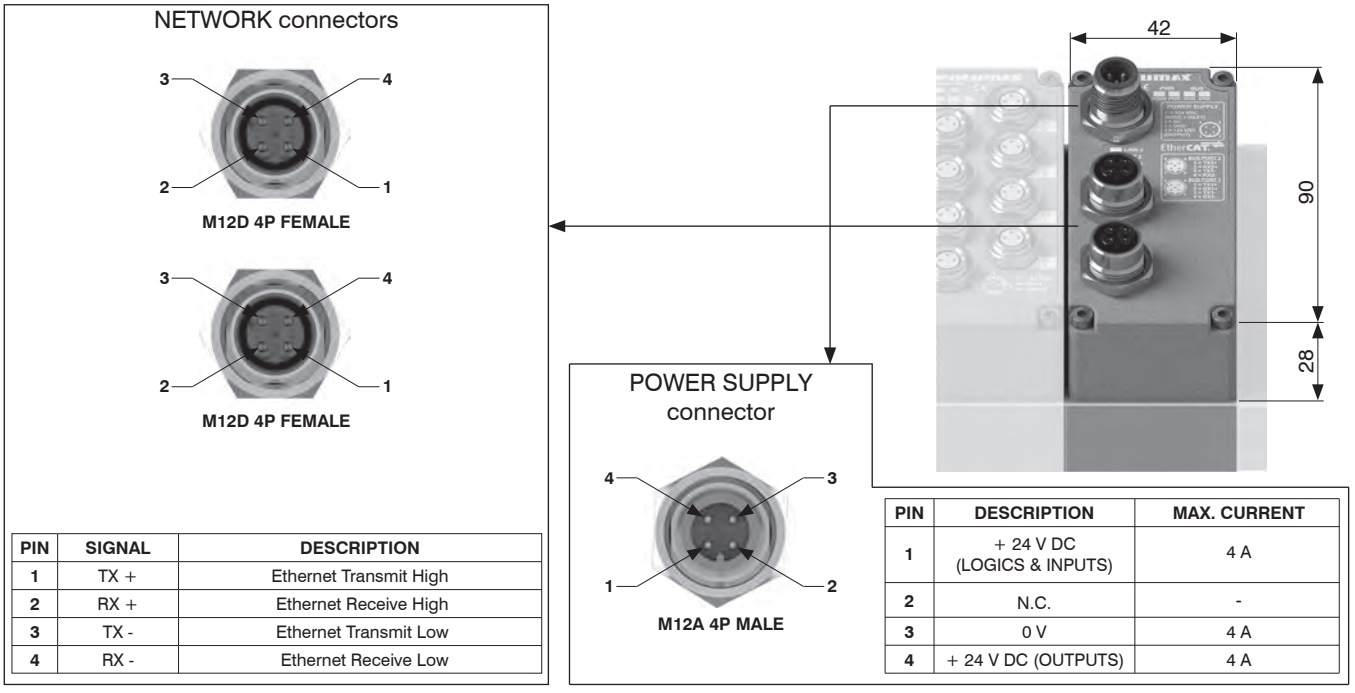
Where:

$$I_{24\,V\,DC\,in} = \sum_{i=1}^{n} I_{in,i}$$

$n$ = number of installed modules
$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | TX + | Ethernet Transmit High |
| 2 | RX + | Ethernet Receive High |
| 3 | TX - | Ethernet Transmit Low |
| 4 | RX - | Ethernet Receive Low |

| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

| Technical characteristics | | |
|---|---|---|
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC ± 10% |
| | Node only current consumption on + 24 V DC inputs | 65 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | 2 M12 4 pins male-female connectors type D (IEC 61076-2-101) |
| | Baud rate | 100 Mbit/s |
| | Maximum distance between 2 nodes | 100 m |
| | Bus diagnosis | Green / red status LED |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |

## PROFINET IO RT protocol node kit

PROFINET IO RT node manages 128 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Network connection is made via 2 M12 female, type D, 4 pins, circular connectors.
Code K5730.128.48PN provides first 48 outputs, corresponding to least significant 6 bytes, are allocated to the solenoid valve positions, regardless how many they are and how many valves are installed on the manifold directly connected to the node.
Remaining 80 outputs can be used to manage output modules; bytes allocation to additional modules is fully automatic.

**Coding:** K5730.128.48PN



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by OUTPUTS + 24 V DC (pin 4).

To compute the maximum current on the OUTPUTS + 24 V DC, please use the following formula:

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules
$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)
$m$ = number of installed solenoid pilots
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 2200 "Optyma S" | 36 mA |
| 2500 "Optyma F" | 54 mA |
| 2500 "Optyma T" | 54 mA |
| Series 2700 | 24 mA (1 W version) / 100 mA (2,3 W version) |

For each fieldbus node, maximum deliverable current by OUTPUTS + 24 V DC supply is 4 A, moreover the sum of the currents on OUTPUTS + 24 V DC and INPUTS + 24 V DC must not exceed 4 A.

$$I_{24\,V\,DC\,out} + I_{24\,V\,DC\,in} < 4A$$

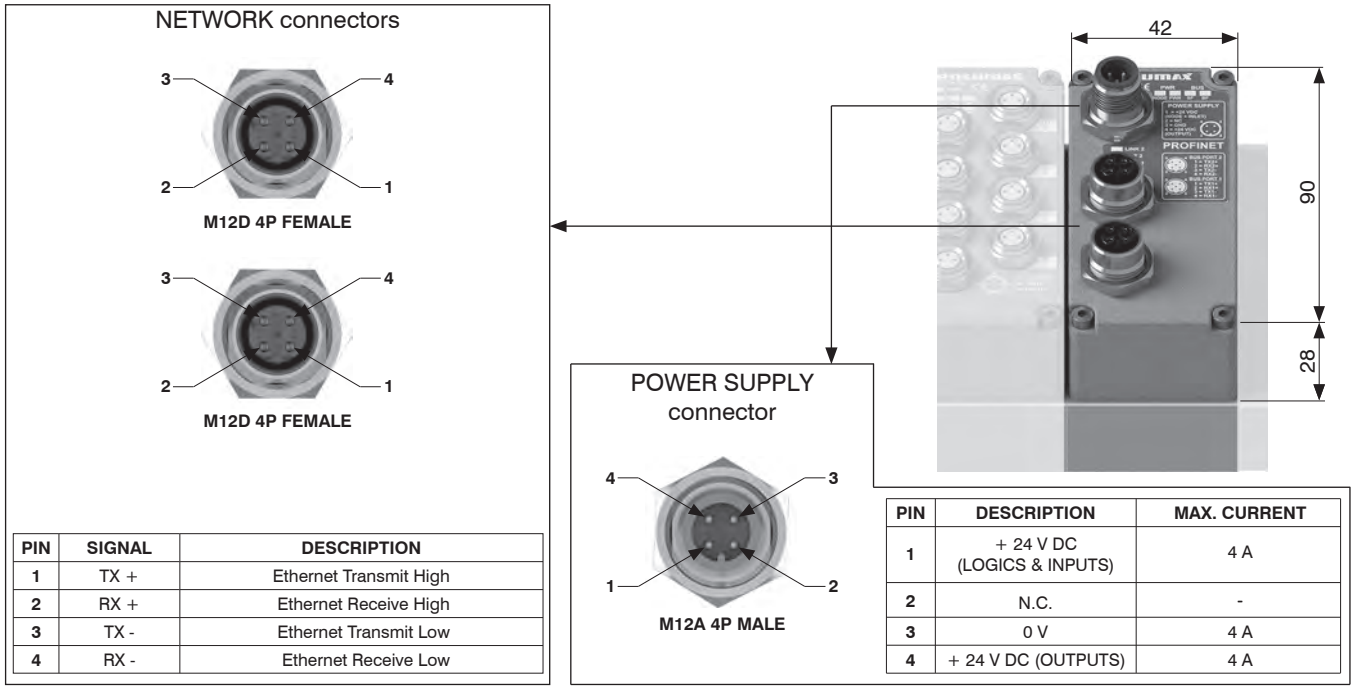
Where:

$$I_{24\,V\,DC\,in} = \sum_{i=1}^{n} I_{in,i}$$

$n$ = number of installed numbers
$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | TX + | Ethernet Transmit High |
| 2 | RX + | Ethernet Receive High |
| 3 | TX - | Ethernet Transmit Low |
| 4 | RX - | Ethernet Receive Low |

| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

| Technical characteristics | | |
|---|---|---|
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC ± 10% |
| | Node only current consumption on + 24 V DC inputs | 65 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | 2 M12 4 pins male-female connectors type D (IEC 61076-2-101) |
| | Baud rate | 100 Mbit/s |
| | Maximum distance between 2 nodes | 100 m |
| | Bus diagnosis | Green / red status LED |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## CC-Link IE Field Basic protocol node kit

CC-Link IE Field Basic node manages 128 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Network connection is made via 2 M12 female, type D, 4 pins, circular connectors.
Code K5730.128.48CL provides first 48 outputs, corresponding to least significant 6 bytes, are allocated to the solenoid valve positions, regardless how many they are and how many valves are installed on the manifold directly connected to the node.
Remaining 80 outputs can be used to manage output modules; bytes allocation to additional modules is fully automatic.

**Coding:** K5730.128.48CL



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by OUTPUTS + 24 V DC (pin 4).

To compute the maximum current on the OUTPUTS + 24 V DC, please use the following formula:

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules
$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)
$m$ = number of installed solenoid pilots
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 2200 "Optyma S" | 36 mA |
| 2500 "Optyma F" | 54 mA |
| 2500 "Optyma T" | 54 mA |
| Series 2700 | 24 mA (1 W version) / 100 mA (2,3 W version) |

For each fieldbus node, maximum deliverable current by OUTPUTS + 24 V DC supply is 4 A, moreover the sum of the currents on OUTPUTS + 24 V DC and INPUTS + 24 V DC must not exceed 4 A.

$$I_{24\,V\,DC\,out} + I_{24\,V\,DC\,in} < 4A$$

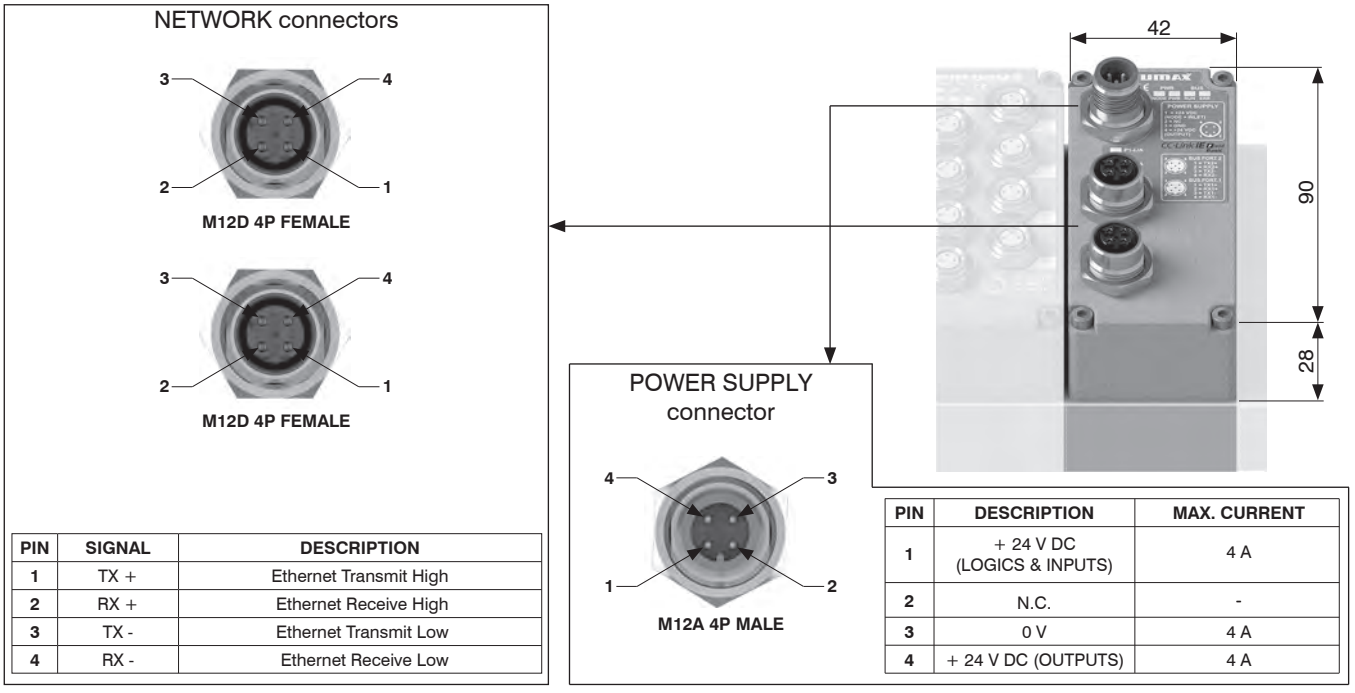
Where:

$$I_{24\,V\,DC\,in} = \sum_{i=1}^{n} I_{in,i}$$

$n$ = number of installed modules
$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | TX + | Ethernet Transmit High |
| 2 | RX + | Ethernet Receive High |
| 3 | TX - | Ethernet Transmit Low |
| 4 | RX - | Ethernet Receive Low |

| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

| Technical characteristics | | |
|---|---|---|
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC ± 10% |
| | Node only current consumption on + 24 V DC inputs | 65 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | 2 M12 4 pins male-female connectors type D (IEC 61076-2-101) |
| | Baud rate | 100 Mbit/s |
| | Maximum distance between 2 nodes | 100 m |
| | Bus diagnosis | 1 Green LED and 1 red status LED + 2 link and activity LEDs' |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |

## IO-Link protocol interface kit

IO-Link interface manages 64 inputs and outputs.
Accessory modules can be connected in whatever order and configuration.
Electric power supply and IO-Link connection to the Master are made via M12, male, 5 pins, type A, circular connector, "CLASS B", according to IO-Link specifications.
Electric rails L+/L- supply interface only, while P24/N24 rails supply additional modules and solenoid valves.
Either power supplies are galvanically isolated in the IO-Link interfaces.
IO-Link interface is available in two versions with 32 or 48 outputs allocated to solenoid valves on the manifold directly connected to the node.
Such outputs correspond to least significant bytes and their allocation is independent of how many solenoid valves are installed.
Remaining outputs can be used to control the modules.
Byte allocation to additional modules is fully automatic.

**Coding:** K5830.64.Ⓥ IK

| | VERSION |
|---|---|
| Ⓥ | **32** = 32 output bits available for valve connections |
| | **48** = 48 output bits available for valve connections |



### Current limitations

Both stand alone and integrated components must operate within the current limits of the fieldbus node; please note: the solenoid valves are supplied by pin 2 and pin 5 (P24 / N24).

To compute the maximum current on the P24 / N24 supply, please use the following formula::

$$I_{24\,V\,DC\,out} = \sum_{i=1}^{n} I_{out,i} + m\,i_{EV}$$

$n$ = number of installed modules

$I_{out,i}$ = maximum total current absorbed by the i-th module on the OUTPUTS + 24 V DC supply rail (please see specifications of the single module)

$I_{in,i}$ = maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

$m$ = number of installed solenoid pilots

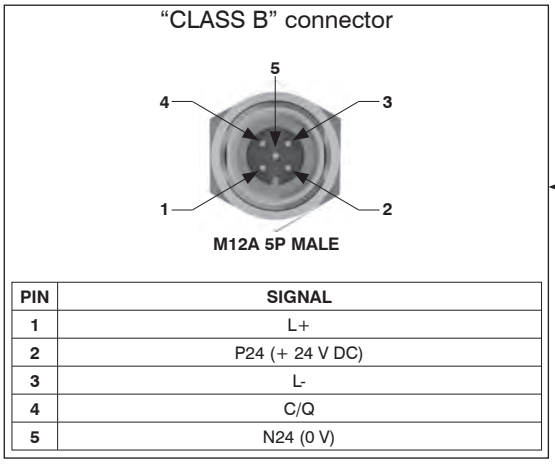
$i_{EV}$ = mean absorbed current per solenoid pilot (please see table below)

| Series | i_EV |
|---|---|
| 2200 "Optyma S" | 36 mA |
| 2500 "Optyma F" | 54 mA |
| 2500 "Optyma T" | 54 mA |
| Series 2700 | 24 mA (1 W version) / 100 mA (2,3 W version) |

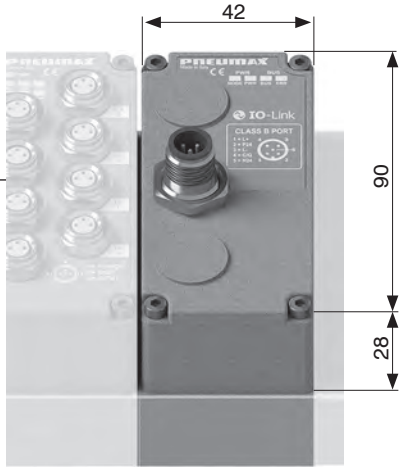
= maximum total current absorbed by the i-th module on the INPUTS + 24 V DC supply rail (please see specifications of the single module)

⚠ In case total current is more than 4 A, it is mandatory to supply modules exceeding current limit with power supply module K5030.M12.

### Scheme / Overall dimensions and I/O layout




| PIN | SIGNAL |
|---|---|
| 1 | L+ |
| 2 | P24 (+ 24 V DC) |
| 3 | L- |
| 4 | C/Q |
| 5 | N24 (0 V) |




| Technical characteristics | | |
|---|---|---|
| Specifications | | IO-Link Specification v1.1 |
| Case | | Reinforced technopolymer |
| Power supply | Voltage | + 24 V DC +/- 10% |
| | Interface current consumption on + 24 V DC (L+ / L-) | 25 mA |
| | Power supply diagnosis | Green LED PWR NODE / Green LED PWR OUT |
| Communication | Connection | "Class B" port |
| | Communication speed | 38.4 kbaud/s |
| | Maximum distance from Master | 20 m |
| | Bus diagnosis | Green / red status LED |
| | Vendor ID / Device ID | 1257 (hex 0x04E9) / 3000 (hex 0x0BB8) |
| Configurations file IODD | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature °C | | -5 ... +50 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## 8 digital inputs module kit M8

M8 digital inputs module provides 8 M8, 3 pins, female connectors.
Inputs have PNP logic, + 24 V DC ± 10%.
It is possible to connect 2 wires devices (e.g. switches, magnetic limit switches, pressure switches, etc.) as well as 3 wires devices (e.g. proximity sensors, photocells, electronic magnetic limit switches, etc.).
Inputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pin M12 power connector, pin 1) or by K5030.M12 additional power supply module, in case it were installed upstream of the inputs module.

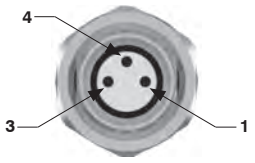
**Coding:** K5230.08.M8



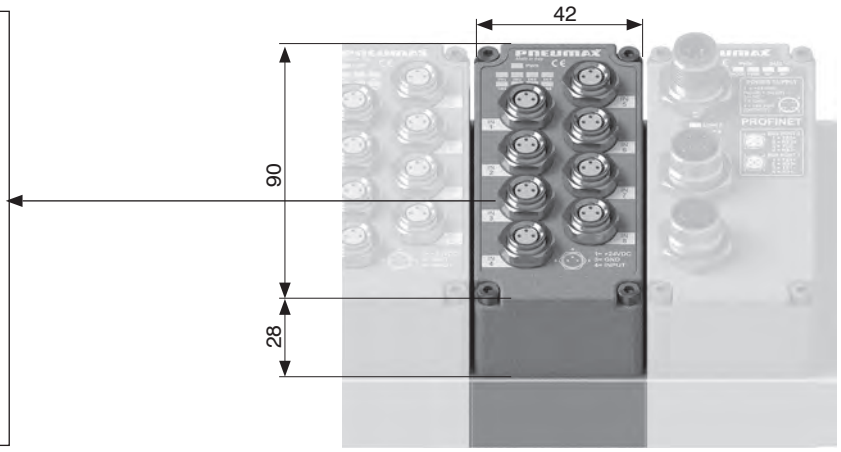
| Technical characteristics | |
|---|---|
| Maximum current per module | 300 mA |
| Protection | Overcurrent (auto-resettable fuse)<br>Reverse polarity |
| Input impedence | 3 kΩ |
| Maximum cable length | < 30 m |
| Input data allocation | 8 bit |
| INPUTS + 24 V DC current consumption of the module only | 5 mA |

### Scheme / Overall dimensions and I/O layout

M8 3P female connector




| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (INPUTS) |
| 3 | 0 V |
| 4 | INPUT |




## 8 digital inputs module kit M12

M12 digital inputs module provides 4 M12, 5 pins, female connectors.
Inputs have PNP logic, + 24 V DC ± 10%.
Every connector takes two input channels.
It is possible to connect 2 wires devices (e.g. switches, magnetic limit switches, pressure switches, etc.) as well as 3 wires devices (e.g. proximity sensors, photocells, electronic magnetic limit switches, etc.).
Inputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pin M12 power connector, pin 1) or by K5030.M12 additional power supply module, in case it were installed upstream of the inputs module.

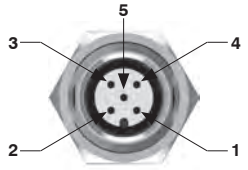
**Coding:** K5230.08.M12



| Technical characteristics | |
|---|---|
| Maximum current per module | 300 mA |
| Protection | Overcurrent (auto-resettable fuse)<br>Reverse polarity |
| Input impedence | 3kΩ |
| Maximum cable length | < 30 m |
| Input data allocation | 8 bit |
| INPUTS + 24 V DC current consumption of the module only | 5 mA |

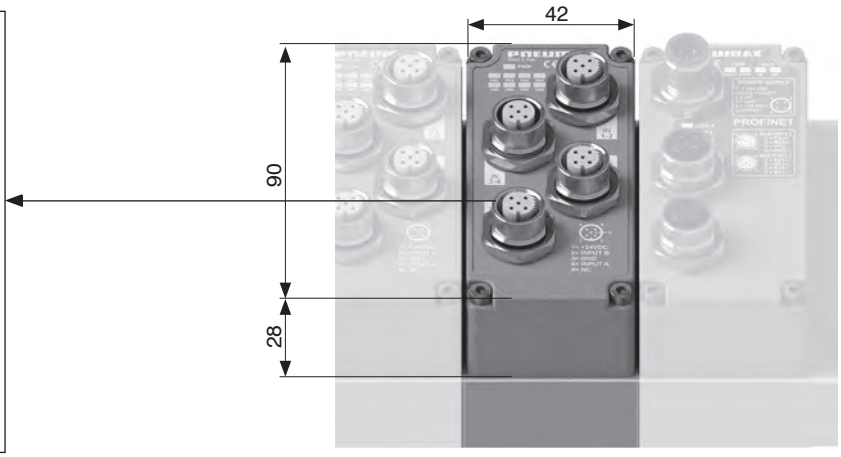
### Scheme / Overall dimensions and I/O layout

M12 5P female connector




M12A 5P FEMALE

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (INPUTS) |
| 2 | INPUT B |
| 3 | 0 V |
| 4 | INPUT A |
| 5 | N.C. |



## 8 digital outputs module kit M8

M8 digital inputs module provides 8 M8, 3 pins, female connectors.
Outputs have PNP logic, + 24 V DC ± 10%.
Outputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pins M12 power connector, pin 4) or by K5030.M12 additional power supply module, in case it were installed upstream of the outputs module.
Power supply presence is displayed by "PWR OUT" green LED light-on.
Each output has a LED indicator associated which lights up when output's signal status is high.

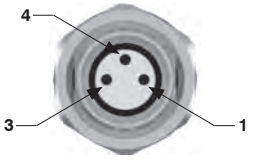
**Coding:** K5130.08.M8



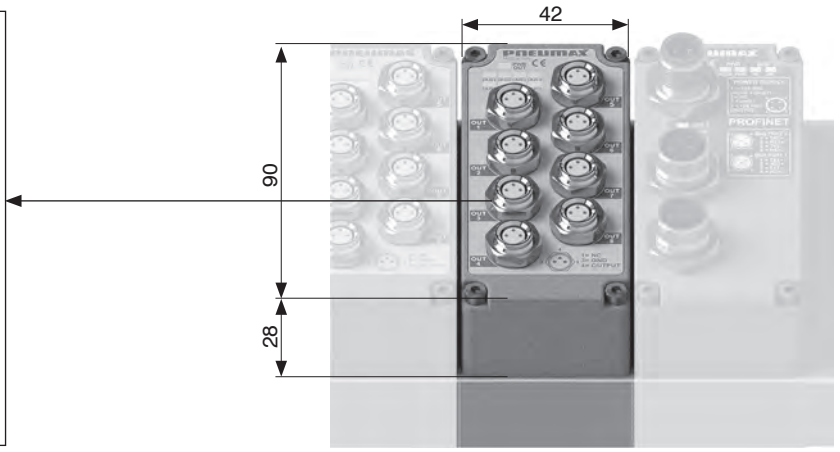
| Technical characteristics | |
|---|---|
| Maximum current per output | 100 mA |
| Protection | Short circuit (electronic), trigger at 2.8A |
| Maximum cable length | < 30 m |
| Output data allocation | 8 bit |
| OUTPUTS + 24 V DC current consumption of the module only | 15 mA |

### Scheme / Overall dimensions and I/O layout

M8 3P female connector




| PIN | DESCRIPTION |
|---|---|
| 1 | N.C. |
| 3 | 0 V |
| 4 | OUTPUT |




## 8 digital outputs module kit M12

M12 digital inputs module provides 4 M12, 5 pins, female connectors.
Outputs have PNP logic, + 24 V DC ± 10%.
Outputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pins M12 power connector, pin 4) or by K5030.M12 additional power supply module, in case it were installed upstream of the outputs module.
Power supply presence is displayed by "PWR OUT" green LED light-on.
Each output has a LED indicator associated which lights up when output's signal status is high.

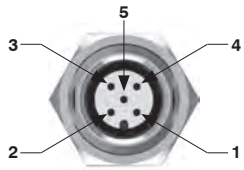
**Coding:** K5130.08.M12



| Technical characteristics | |
|---|---|
| Maximum current per output | 100 mA |
| Protection | Short circuit (electronic), trigger at 2.8A |
| Maximum cable length | < 30 m |
| Output data allocation | 8 bit |
| OUTPUTS + 24 V DC current consumption of the module only | 15 mA |

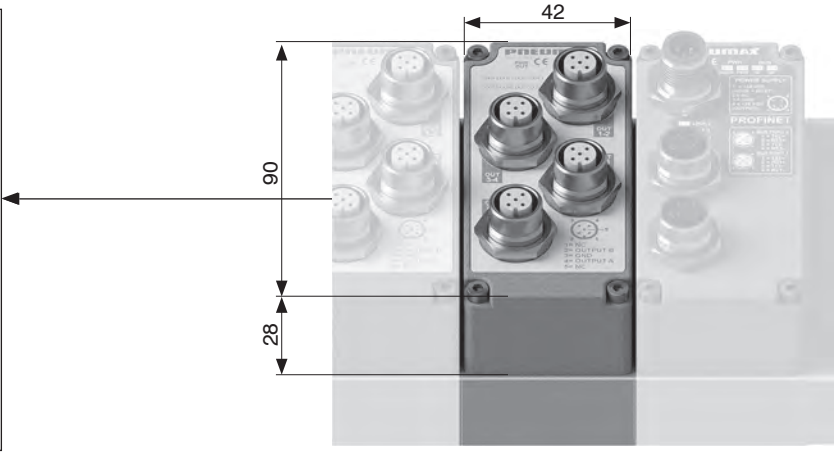
### Scheme / Overall dimensions and I/O layout

M12 5P female connector




M12A 5P FEMALE

| PIN | DESCRIPTION |
|---|---|
| 1 | N.C. |
| 2 | OUTPUT B |
| 3 | 0 V |
| 4 | OUTPUT A |
| 5 | N.C. |






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## 32 digital inputs module kit (37 pins SUB-D connector)

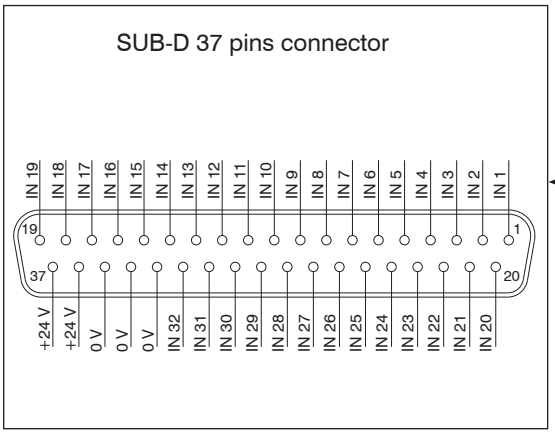
The module provides a SUB-D 37 pins female connector.
Inputs have PNP logic, + 24 V DC ± 10%.
It is possible to connect 2 wires devices (e.g. switches, magnetic limit switches, pressure switches, etc.) as well as 3 wires devices (e.g. proximity sensors, photocells, electronic magnetic limit switches, etc.).
Inputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pin M12 power connector, pin 1) or by K5030.M12 additional power supply module, in case it were installed upstream of the inputs module.

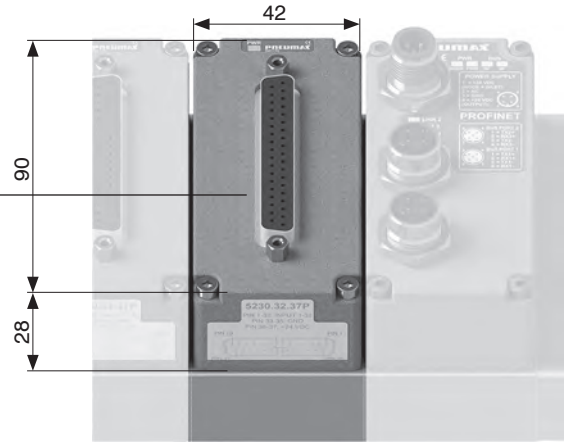
**Coding:** K5230.32.37P



| Technical characteristics | |
|---|---|
| Maximum current per module | 1 A |
| Protection | Overcurrent (auto-resettable fuse)<br>Reverse polarity |
| Input impedence | 3 kΩ |
| Maximum cable length | < 30 m |
| Input data allocation | 32 bit |
| INPUTS + 24 V DC current consumption of the module only | 10 mA |

### Scheme / Overall dimensions and I/O layout




## 32 digital outputs module kit (37 pins SUB-D connector)

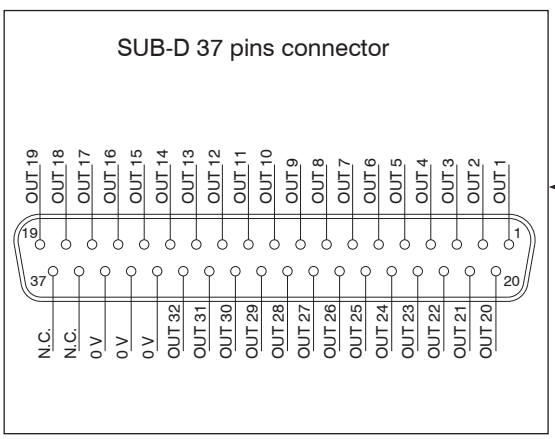
The module provides a SUB-D 37 pins female connector.
Outputs have PNP logic, + 24 V DC ± 10%.
Outputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pins M12 power connector, pin 4) or by K5030.M12 additional power supply module, in case it were installed upstream of the outputs module.
Power supply presence is displayed by "PWR OUT" green LED light-on.

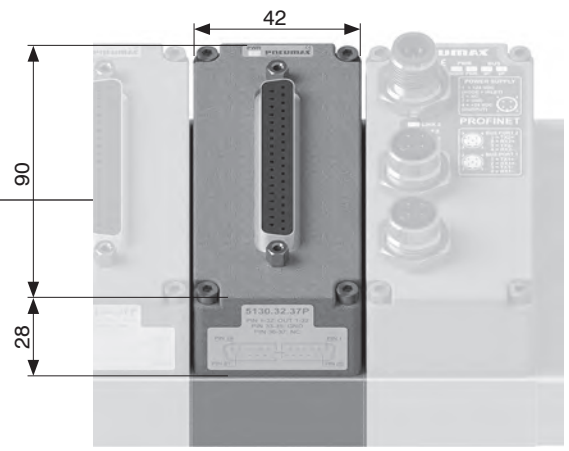
**Coding:** K5130.32.37P



| Technical characteristics | |
|---|---|
| Maximum current per output | 100 mA |
| Protection | Short circuit (electronic), trigger at 2.8A |
| Maximum cable length | < 30 m |
| Output data allocation | 32 bit |
| OUTPUTS + 24 V DC current consumption of the module only | 15 mA |

### Scheme / Overall dimensions and I/O layout



## Analogue inputs module kit M8

M8 analogue inputs module converts analogue signals into digital signals and transfers acquired data to field bus, via network node.
Inputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pin M12 power connector, pin 1) or by K5030.M12 additional power supply module, in case it were installed upstream of the inputs module.

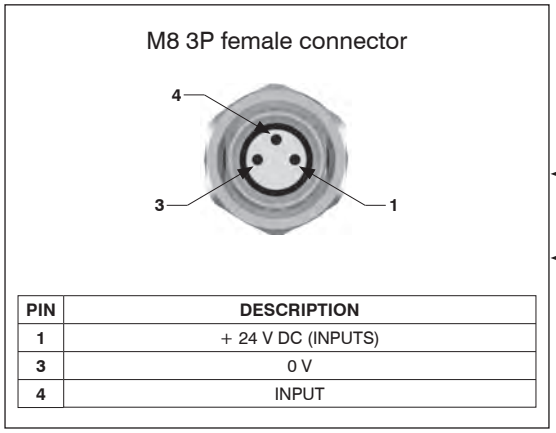
| Technical characteristics | |
|---|---|
| Protection (pin 1) | Overcurrent (auto-resettable fuse) |
| Input impedance (voltage inputs) | 33 kΩ |
| Digital conversion resolution | 12 bit |
| Maximum cable length | < 30 m |
| Input data allocation | 16 bit per channel |
| Diagnostic LED | Input signal overcurrent or overvoltage |
| Accuracy | 0,3% F.S. |
| Overall maximum current 2 channels (pin 1) | 300 mA |
| Overall maximum current 4 channels (pin 1) | 750 mA (375 mA for each pair of channels) |
| INPUTS + 24 V DC current consumption of the module only | 15 mA |

**Coding:** K5230.ⓒⓢ

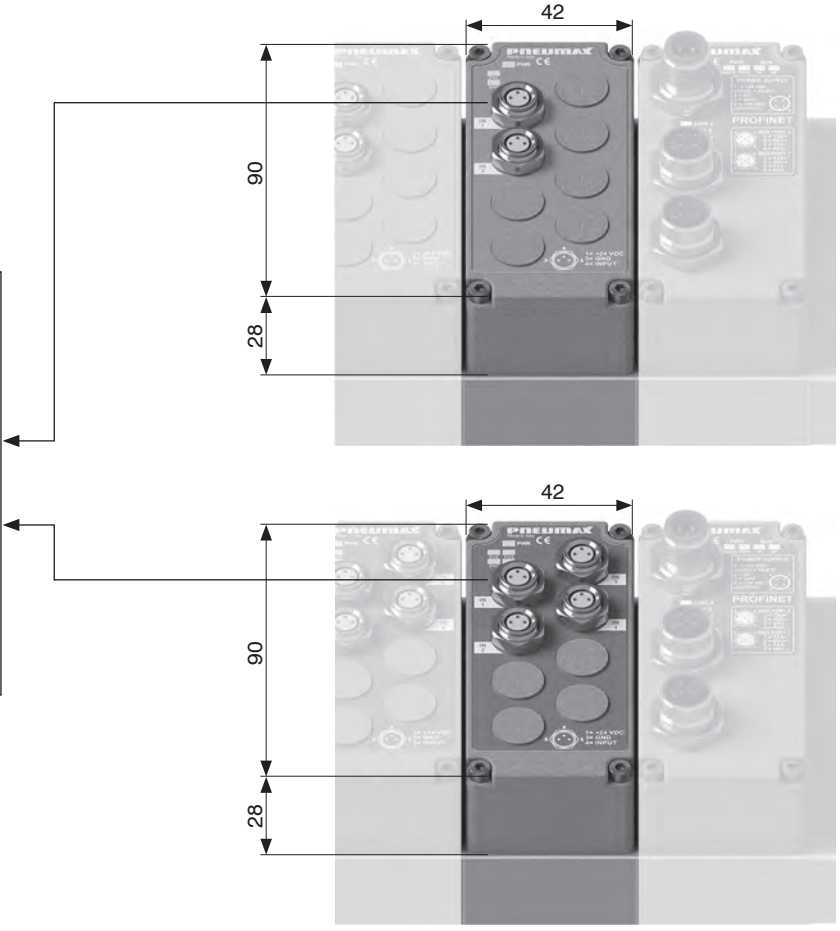
| | |
|---|---|
| ⓒ | CHANNELS |
| | **2** = 2 channels |
| | **4** = 4 channels |
| ⓢ | SIGNAL |
| | **T.00** = VOLTAGE (0-10 V) |
| | **T.01** = VOLTAGE (0-5 V) |
| | **C.00** = CURRENT (4-20 mA) |
| | **C.01** = CURRENT (0-20 mA) |



### Scheme / Overall dimensions and I/O layout




| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (INPUTS) |
| 3 | 0 V |
| 4 | INPUT |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Analogue outputs module kit M8

M8 analogue outputs module converts output data, received from field bus via network node, into analogue signal.
Outputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pins M12 power connector, pin 4) or by K5030.M12 additional power supply module, in case it were installed upstream of the outputs module.

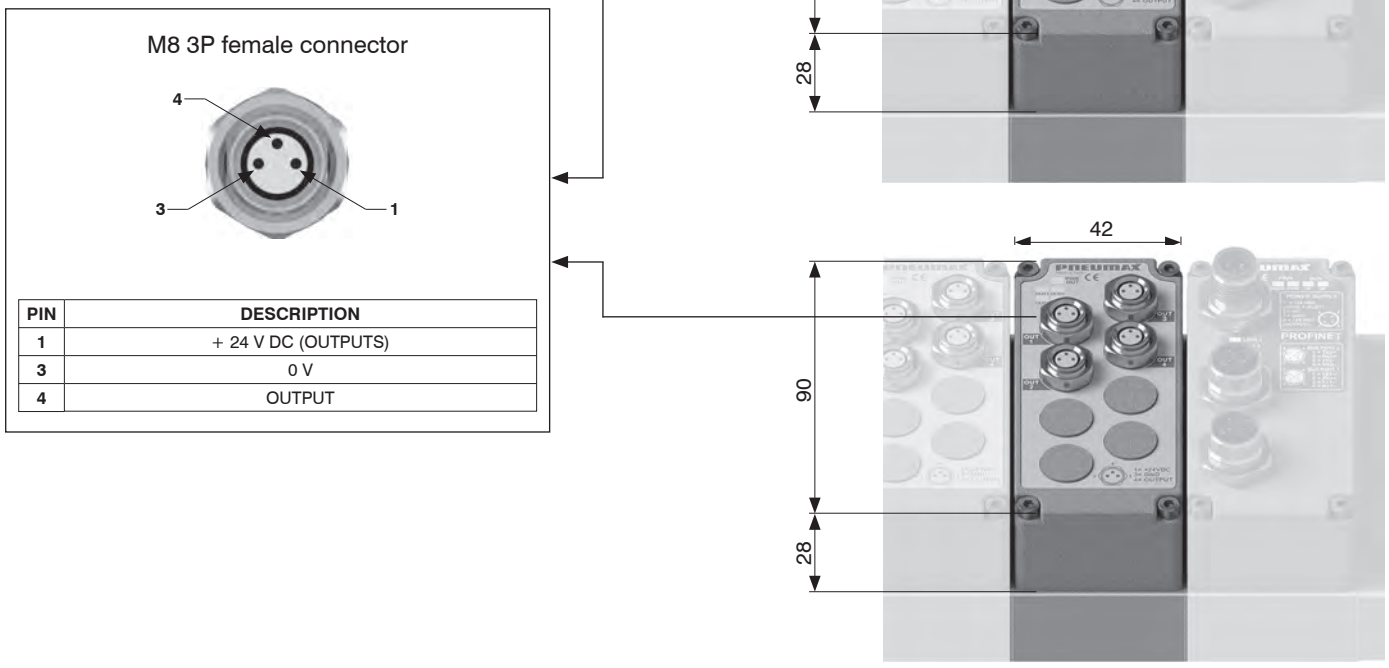
**Coding:** K5130.Ⓒ Ⓢ

| | |
|---|---|
| Ⓒ | CHANNELS |
| | **2** = 2 channels |
| | **4** = 4 channels |
| Ⓢ | SIGNAL |
| | **T.00** = VOLTAGE (0-10 V) |
| | **T.01** = VOLTAGE (0-5 V) |
| | **C.00** = CURRENT (4-20 mA) |
| | **C.01** = CURRENT (0-20 mA) |

| Technical characteristics | |
|---|---|
| Protection (pin 1) | Overcurrent (auto-resettable fuse) |
| Protection (pin 4) | Overcurrent (auto-resettable fuse) |
| Digital conversion resolution | 12 bit |
| Maximum cable length | < 30 m |
| Output data allocation | 16 bit per channel |
| Diagnostic LED | Output signal overcurrent |
| Accuracy | 0,3% F.S. |
| Overall maximum current 2 channels (pin 1) | 300 mA |
| Overall maximum current 4 channels (pin 1) | 750 mA (375 mA for each pair of channels) |
| INPUTS + 24 V DC current consumption of the module only | 15 mA |
| OUTPUTS + 24 V DC current consumption of the module only (2 channels) | 35 mA |
| OUTPUTS + 24 V DC current consumption of the module only (4 channels) | 70 mA |



### Scheme / Overall dimensions and I/O layout




| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (OUTPUTS) |
| 3 | 0 V |
| 4 | OUTPUT |

## Pt100 inputs module kit

Pt100 inputs module digitizes signals from Pt100 probes and transfers acquired data to field bus, via network node.
It is possible to connect two, three or four wires probes.
Inputs module power supply is provided by + 24 V DC power input on the serial system (type A, 4 pin M12 power connector, pin 1) or by K5030.M12 additional power supply module, in case it were installed upstream of the inputs module.

**Coding:** K5230.ⓒP.0Ⓣ

| | |
|---|---|
| ⓒ | CHANNELS |
| | **2** = 2 channels |
| | **4** = 4 channels |
| Ⓣ | TYPE |
| | **0** = Pt100 2 wires |
| | **1** = Pt100 3 wires |
| | **2** = Pt100 4 wires |

| Technical characteristics | |
|---|---|
| Digital conversion resolution | 12 bit |
| Maximum cable length | < 30 m |
| Input data allocation | 16 bit per channel |
| Diagnostic LED | Probe presence<br>Temperature out of range |
| Accuracy | ±0,2°C |
| Probe temperature range | -100°C ... +300°C |
| INPUTS + 24 V DC current consumption of the module only (2 channels) | 25 mA |
| INPUTS + 24 V DC current consumption of the module only (4 channels) | 35 mA |

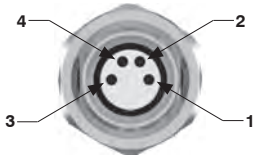


### Conversion formula (°C)

$$\text{Temperature (°C)} = \left(\frac{\text{Points}}{4095} \times 400\right) - 100$$

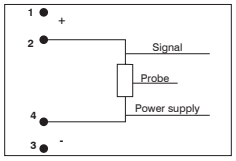
### Scheme / Overall dimensions and I/O layout

M8 4P female connector



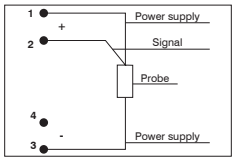

Connection scheme 2 wires probe

| PIN | DESCRIPTION |
|---|---|
| 1 | N.C. |
| 2 | SENSOR + |
| 3 | POWER SUPPLY - |
| 4 | N.C. |



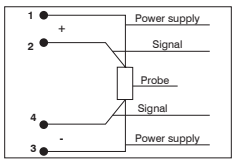

Connection scheme 3 wires probe

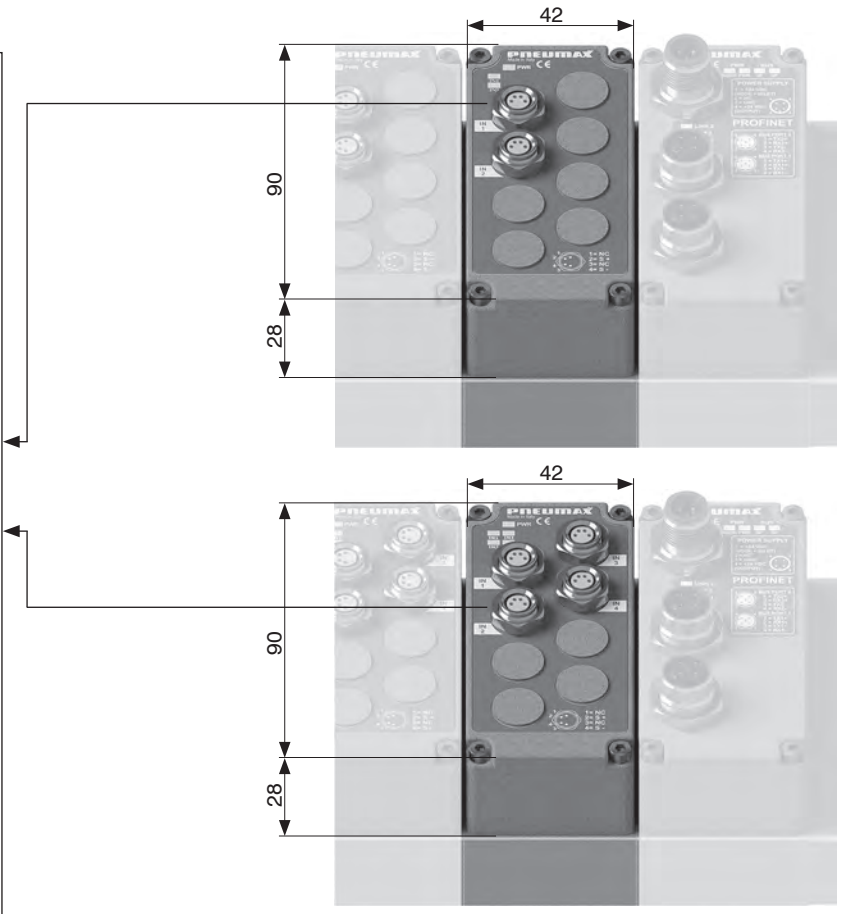
| PIN | DESCRIPTION |
|---|---|
| 1 | POWER SUPPLY + |
| 2 | SENSOR + |
| 3 | POWER SUPPLY - |
| 4 | N.C. |




Connection scheme 4 wires probe

| PIN | DESCRIPTION |
|---|---|
| 1 | POWER SUPPLY + |
| 2 | SENSOR + |
| 3 | POWER SUPPLY - |
| 4 | SENSOR - |






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Additional power supply module kit

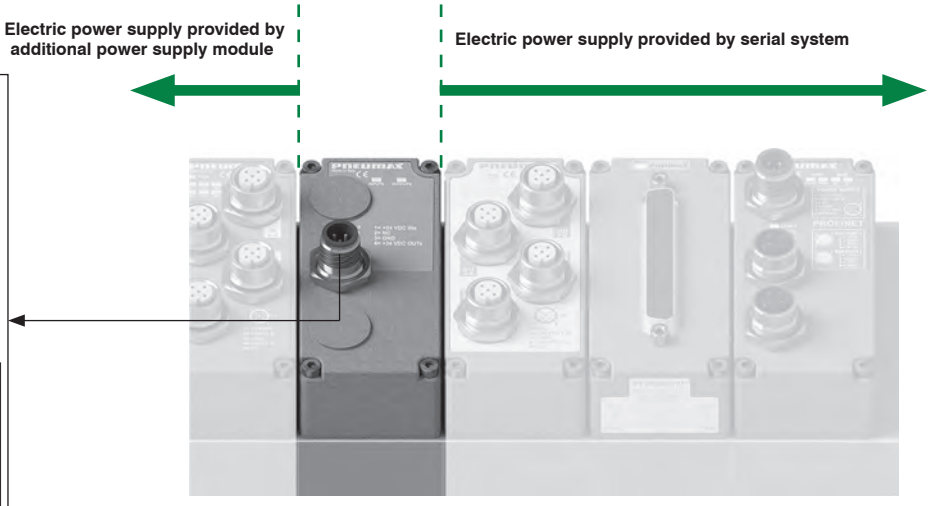
Additional power supply module supplies additional electric power for downstream optional modules, where “downstream” means farther from serial node, **resetting the current limits of the network node / IO-Link interface**.
Electric connection of the module to external power supply unit occurs via an M12 4 pins type A male connector.
M12 connector has two different pins to power up logics and inputs (Pin 1) and outputs (Pin 4).
Presence of each power supply rail is indicated by corresponding green LED.
When using IO-Link interface, the additional power supply module is useful for separating the module power supplies of input from the output modules placed downstream.

**Coding:** K5030.M12

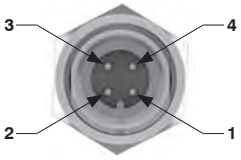




### Scheme / Overall dimensions and I/O layout




M12 4P male connector




**M12A 4P MALE**

| PIN | DESCRIPTION | MAX. CURRENT |
|---|---|---|
| 1 | + 24 V DC (LOGICS & INPUTS) | 4 A |
| 2 | N.C. | - |
| 3 | 0 V | 4 A |
| 4 | + 24 V DC (OUTPUTS) | 4 A |

## POWER SUPPLY connectors

### Straight connector M12A 4P female

**Coding:** 5312A.F04.00






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (LOGICS AND INPUTS) |
| 2 | N.C. |
| 3 | 0 V |
| 4 | + 24 V DC (OUTPUTS) |

Power supply socket

## NETWORK connectors

### Straight connector M12A 5P female

**Coding:** 5312A.F05.00






Upper view slave connector

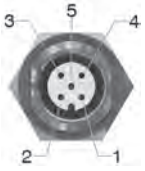
| PIN | DESCRIPTION |
|---|---|
| 1 | (CAN_SHIELD) |
| 2 | (CAN_V+) |
| 3 | CAN_GND |
| 4 | CAN_H |
| 5 | CAN_L |

Socket for bus CANopen® and IO-Link

### Straight connector M12A 5P male

**Coding:** 5312A.M05.00






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | (CAN_SHIELD) |
| 2 | (CAN_V+) |
| 3 | CAN_GND |
| 4 | CAN_H |
| 5 | CAN_L |

Plug for bus CANopen®

### Straight connector M12D 4P male

**Coding:** 5312D.M04.00






Upper view slave connector

| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | TX+ | EtherNet Transmit High |
| 2 | RX+ | EtherNet Receive High |
| 3 | TX- | EtherNet Transmit Low |
| 4 | RX- | EtherNet Receive Low |

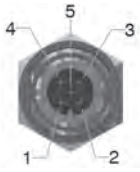
Plug for bus EtherCAT®, PROFINET IO RT and EtherNet/IP

**Trademarks**: EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

### Straight connector M12B 5P female

**Coding:** 5312B.F05.00






Upper view slave connector

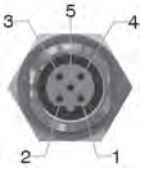
| PIN | DESCRIPTION |
|---|---|
| 1 | Power Supply |
| 2 | A-Line |
| 3 | DGND |
| 4 | B-Line |
| 5 | SHIELD |

Socket for bus PROFIBUS DP

### Straight connector M12B 5P male

**Coding:** 5312B.M05.00






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | Power Supply |
| 2 | A-Line |
| 3 | DGND |
| 4 | B-Line |
| 5 | SHIELD |

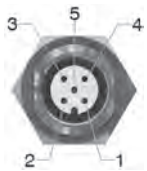
Socket for bus PROFIBUS DP

## INPUTS connectors

### Straight connector M12A 5P male

**Coding:** 5312A.M05.00






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC |
| 2 | INPUT B |
| 3 | 0 V |
| 4 | INPUT A |
| 5 | N.C. |

Plug for inputs modules

### Straight connector M8 3P male

**Coding:** 5308A.M03.00






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC |
| 4 | INPUT |
| 3 | 0 V |

Plug for inputs modules

## Plugs

### M12 plug

**Coding:** 5300.T12



### M8 plug

**Coding:** 5300.T08





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Cable complete with connector, 25 Poles, IP65



**Coding:** 2300.25.Ⓛ.Ⓒ

| | |
|---|---|
| Ⓛ | CABLE LENGTH |
| | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |
| Ⓒ | CONNECTOR |
| | **10** = Stand alone |
| | **90** = 90° Angle |

## Cable complete with connector, 37 Poles, IP65



**Coding:** 2400.37.Ⓛ.Ⓒ

| | |
|---|---|
| Ⓛ | CABLE LENGTH |
| | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |
| Ⓒ | CONNECTOR |
| | **10** = Stand alone |
| | **90** = 90° Angle |

## Cable complete with connector, 44 Poles, IP65



**Coding:** 2300.44.Ⓛ.Ⓒ

| | |
|---|---|
| Ⓛ | CABLE LENGTH |
| | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |
| Ⓒ | CONNECTOR |
| | **10** = Stand alone |
| | **90** = 90° Angle |

## Cable complete with connector, 25 Poles, IP65



**Coding:** 2400.25.Ⓛ.25

| | |
|---|---|
| Ⓛ | CABLE LENGTH |
| | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |

## Cable complete with connector, 37 Poles, IP65



**Coding:** 2400.37.Ⓛ.37

| | |
|---|---|
| Ⓛ | CABLE LENGTH |
| | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |

## Series 2300 ENOVA®

Technical innovation, rational design, high performance and extremely compact size: these are the main features the ENOVA® series bring to the market.
Each valve comprises all the necessary pneumatic and electrical functions needed to produce a solenoid valve assembly.
There are no limits to the configuration of the solenoid valve island, as full priority has been given to the end user's needs; the addition or removal of modules is a simple operation that can be swiftly and easily achieved.
The management of the electrical signals through the valves is optimized through a patented dedicated connector in each valve.
Electrical connections are made via a twenty-five pin connector, which is capable of controlling up to twenty-two solenoids.
Electrical and pneumatic connections are located on the same module at one end of the assembly.
Serial bus nodes compatible with most common protocols are easily integrated.
Most widely used and known communication protocols, such as PROFIBUS DP, CANopen®, DeviceNet, AS-Interface can be directly integrated with the valve manifold by simply plugging the necessary module onto the electrical connection, maintaining IP65 environmental protection.
The management of inputs has also been foreseen, and can be achieved by adding one or more expansion modules directly to the serial module.

**"Shifting time of pneumatic directional control valves or moving parts, logic devices were measured in accordance to ISO 12238:2001"**

### Main characteristics

- Clean profile prevents accumulation of dirt
- Compact size: modules of 12.5 mm
- Connections available: 4 , 6 , 8 mm
- IP65 protection grade
- Optimized electrical connection system
- Electrical and pneumatic line connections on one side
- Quick coupling connection system with visual indicator: locked/unlocked
- Freedom of configuration

### Functions

- 5/2 monostable
- 5/2 bistable
- 5/3 closed centres
- 2x3/2 N.C. - N.C. (5/3 open centres)
- 2x3/2 N.O. - N.O. (5/3 pressured centres)
- 2x3/2 N.C. - N.O.
- 2x2/2 N.C. - N.C.
- 2x2/2 N.O. - N.O.
- 2x2/2 N.C. - N.O.

### Construction characteristics

| | |
|---|---|
| Central body | Reinforced technopolymer |
| External casing | Reinforced technopolymer |
| Spool seals | PUR |
| Springs | Spring steel with protective coating |
| Operators | Reinforced technopolymer |
| Spools | Aluminium 2011 |

### Operational characteristics

| | |
|---|---|
| Supply voltage | 24 VDC ± 10% PNP (NPN on request) |
| Pilot consumption | 0,9 Watt |
| Valve working pressure (1-11) | from vacuum to 10 bar max. |
| Pilot working pressure (12-14) | from 2,5 to 7 bar max. |
| Operating temperature | -5°C ... +50°C |
| Protection degree | IP65 |
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |

**Attention:** dry air must be used for applications below 0°C"


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Differential (Monostable)

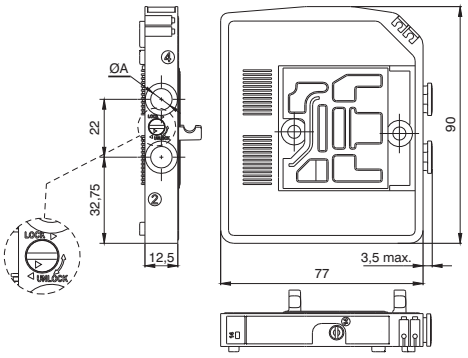
**Coding:** 23ⒺⒸ.52.00.36.Ⓥ

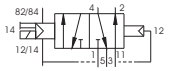
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 700 |
| Response time according to ISO 12238, activation time (ms) | 12 |
| Response time according to ISO 12238, deactivation time (ms) | 15 |

| | |
|---|---|
| Ⓔ | ELECTRICAL CONTACT |
| | **0** = Standard (only one electric signal) |
| | **1** = CEB (Bistable Electrical contacts)-(two electrical signals) |
| Ⓒ | CONNECTION ØA |
| | **4** = Quick connection for tube Ø4 |
| | **6** = Quick connection for tube Ø6 |
| | **8** = Quick connection for tube Ø8 |
| Ⓥ | VOLTAGE |
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |

SHORT CODE B4
SHORT CODE B6
SHORT CODE B8
SHORT CODE R4 (CEB)
SHORT CODE R6 (CEB)
SHORT CODE R8 (CEB)






Weight 115 g

## Solenoid-Spring (Monostable)

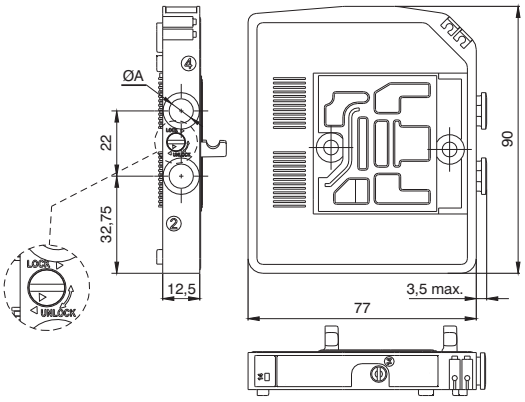
**Coding:** 23ⒺⒸ.52.00.39.Ⓥ

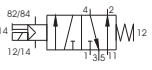
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 700 |
| Response time according to ISO 12238, activation time (ms) | 9 |
| Response time according to ISO 12238, deactivation time (ms) | 30 |

| | |
|---|---|
| Ⓔ | ELECTRICAL CONTACT |
| | **0** = Standard (only one electric signal) |
| | **1** = CEB (Bistable Electrical contacts)-(two electrical signals) |
| Ⓒ | CONNECTION ØA |
| | **4** = Quick connection for tube Ø4 |
| | **6** = Quick connection for tube Ø6 |
| | **8** = Quick connection for tube Ø8 |
| Ⓥ | VOLTAGE |
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |

SHORT CODE A4
SHORT CODE A6
SHORT CODE A8
SHORT CODE P4 (CEB)
SHORT CODE P6 (CEB)
SHORT CODE P8 (CEB)






Weight 115 g

## Solenoid-Solenoid (Bistable)

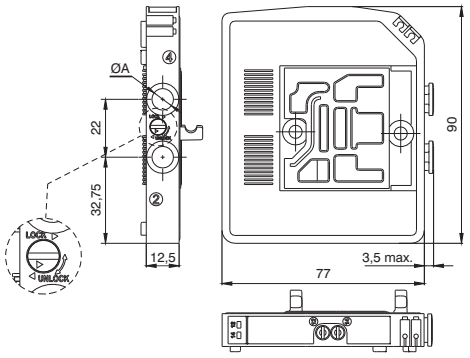
**Coding:** 230Ⓒ.52.00.35.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 700 |
| Response time according to ISO 12238, activation time (ms) | 7 |
| Response time according to ISO 12238, deactivation time (ms) | 7 |

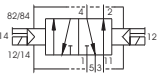
| | |
|---|---|
| Ⓒ | CONNECTION ØA |
| | **4** = Quick connection for tube Ø4 |
| | **6** = Quick connection for tube Ø6 |
| | **8** = Quick connection for tube Ø8 |
| Ⓥ | VOLTAGE |
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |

SHORT CODE C4
SHORT CODE C6
SHORT CODE C8






Weight 115 g




## Solenoid-Solenoid (Bistable-Closed centres)

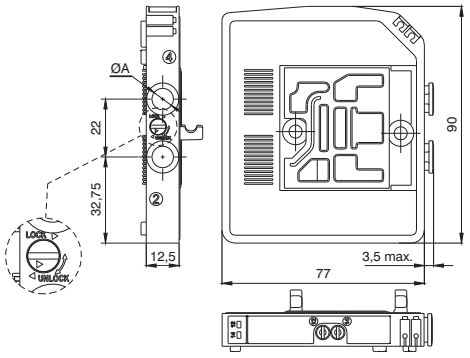
**Coding:** 230Ⓒ.53.31.35.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 550 |
| Response time according to ISO 12238, activation time (ms) | 15 |
| Response time according to ISO 12238, deactivation time (ms) | 15 |

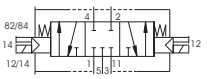
| | |
|---|---|
| Ⓒ | CONNECTION ØA |
| | **4** = Quick connection for tube Ø4 |
| | **6** = Quick connection for tube Ø6 |
| | **8** = Quick connection for tube Ø8 |
| Ⓥ | VOLTAGE |
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |

SHORT CODE E4
SHORT CODE E6
SHORT CODE E8






Weight 130 g






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Solenoid-Solenoid 2x3/2 Bistable-N.C. - N.C. (=5/3 Open centres)

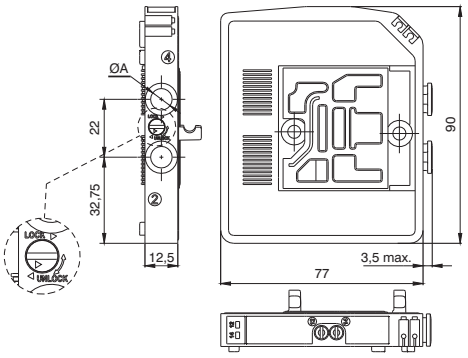
**Coding:** 230Ⓒ.62.44.35.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 700 |
| Response time according to ISO 12238, activation time (ms) | 9 |
| Response time according to ISO 12238, deactivation time (ms) | 30 |

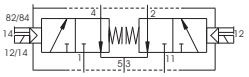
| | |
|---|---|
| Ⓒ | CONNECTION ØA |
| | **4** = Quick connection for tube Ø4 |
| | **6** = Quick connection for tube Ø6 |
| | **8** = Quick connection for tube Ø8 |
| Ⓥ | VOLTAGE |
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |

SHORT CODE F4
SHORT CODE F6
SHORT CODE F8






Weight 130 g
5/3 Open Centres: Use the Solenoid valves with 2x3/2 N.C. - N.C. function
5/3 Pressured Centres: Use the Solenoid valves with 2x3/2 N.O. - N.O. function



## Solenoid-Solenoid 2x3/2 Bistable-N.C. - N.O.

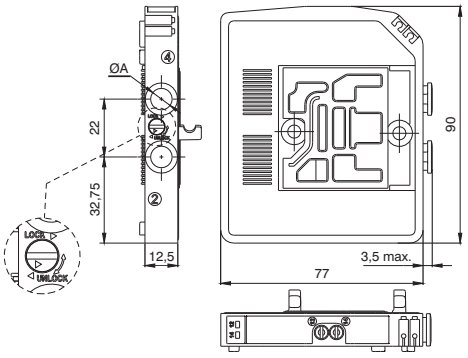
**Coding:** 230Ⓒ.62.45.35.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 700 |
| Response time according to ISO 12238, activation time (ms) | 9 |
| Response time according to ISO 12238, deactivation time (ms) | 30 |

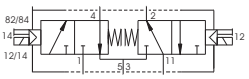
| | |
|---|---|
| Ⓒ | CONNECTION ØA |
| | **4** = Quick connection for tube Ø4 |
| | **6** = Quick connection for tube Ø6 |
| | **8** = Quick connection for tube Ø8 |
| Ⓥ | VOLTAGE |
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |

SHORT CODE H4
SHORT CODE H6
SHORT CODE H8






Weight 130 g
5/3 Open Centres: Use the Solenoid valves with 2x3/2 N.C. - N.C. function
5/3 Pressured Centres: Use the Solenoid valves with 2x3/2 N.O. - N.O. function



## Solenoid-Solenoid 2x3/2 Bistable-N.O. - N.O. (=5/3 Pressured centres)

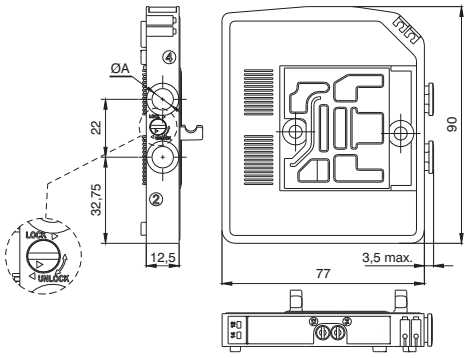
**Coding:** 230Ⓒ.62.55.35.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 700 |
| Response time according to ISO 12238, activation time (ms) | 9 |
| Response time according to ISO 12238, deactivation time (ms) | 30 |

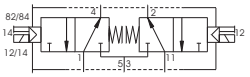
| | |
|---|---|
| Ⓒ | CONNECTION ØA |
| | **4** = Quick connection for tube Ø4 |
| | **6** = Quick connection for tube Ø6 |
| | **8** = Quick connection for tube Ø8 |
| Ⓥ | VOLTAGE |
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |

SHORT CODE G4
SHORT CODE G6
SHORT CODE G8






Weight 130 g
5/3 Open Centres: Use the Solenoid valves with 2x3/2 N.C. - N.C. function
5/3 Pressured Centres: Use the Solenoid valves with 2x3/2 N.O. - N.O. function



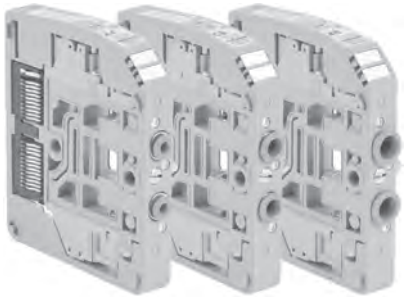

## Solenoid-Solenoid 2x2/2 Bistable-N.C. - N.C.

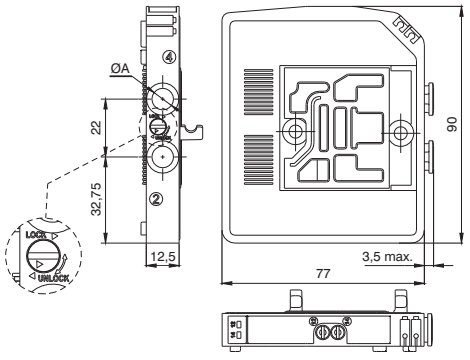
**Coding:** 230Ⓒ.42.44.35.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 700 |
| Response time according to ISO 12238, activation time (ms) | 9 |
| Response time according to ISO 12238, deactivation time (ms) | 30 |

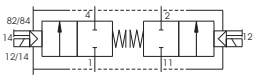
| | |
|---|---|
| Ⓒ | CONNECTION ØA |
| | **4** = Quick connection for tube Ø4 |
| | **6** = Quick connection for tube Ø6 |
| | **8** = Quick connection for tube Ø8 |
| Ⓥ | VOLTAGE |
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |

SHORT CODE L4
SHORT CODE L6
SHORT CODE L8






Weight 130 g





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

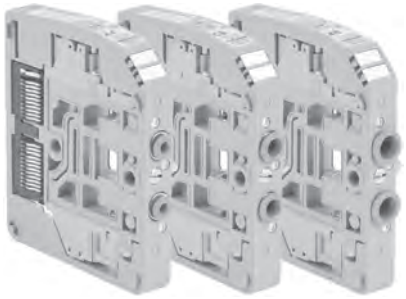
## Solenoid-Solenoid 2x2/2 Bistable-N.C. - N.O.

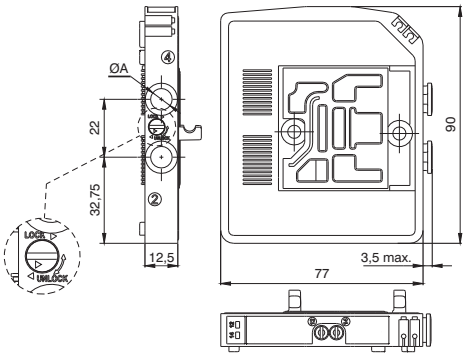
**Coding:** 230Ⓒ.42.45.35.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 700 |
| Response time according to ISO 12238, activation time (ms) | 9 |
| Response time according to ISO 12238, deactivation time (ms) | 30 |

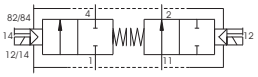
| | |
|---|---|
| Ⓒ | CONNECTION ØA |
| | **4** = Quick connection for tube Ø4 |
| | **6** = Quick connection for tube Ø6 |
| | **8** = Quick connection for tube Ø8 |
| Ⓥ | VOLTAGE |
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |

SHORT CODE N4
SHORT CODE N6
SHORT CODE N8






Weight 130 g



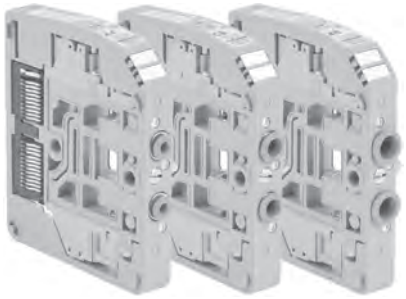

## Solenoid-Solenoid 2x2/2 Bistable-N.O. - N.O.

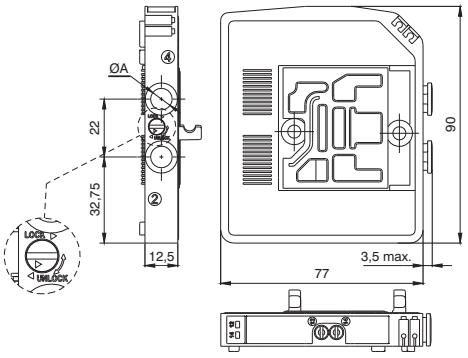
**Coding:** 230Ⓒ.42.55.35.Ⓥ

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |
| Flow rate at 6 bar with Δp=1 (Nl/min) | 700 |
| Response time according to ISO 12238, activation time (ms) | 9 |
| Response time according to ISO 12238, deactivation time (ms) | 30 |

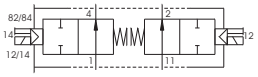
| | |
|---|---|
| Ⓒ | CONNECTION ØA |
| | **4** = Quick connection for tube Ø4 |
| | **6** = Quick connection for tube Ø6 |
| | **8** = Quick connection for tube Ø8 |
| Ⓥ | VOLTAGE |
| | **02** = 24 VDC PNP |
| | **12** = 24 VDC NPN |

SHORT CODE M4
SHORT CODE M6
SHORT CODE M8






Weight 130 g



## Left Endplate

**Coding:** 2311.BC

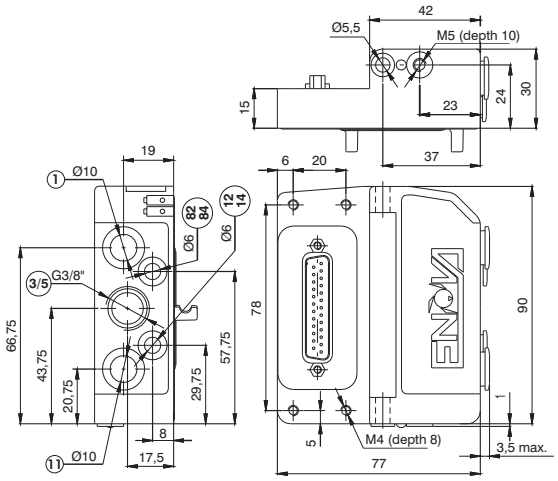
| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working pressure (bar) | From vacuum to 10 |
| Pilot pressure (bar) | 2,5 ... 7 |
| Temperature °C | -5 ... +50 |

| | |
|---|---|
| B | PORTS |
| | **05** = 5 ports |
| | **03** = 3 ports |
| C | CONNECTIONS |
| | **P** = Electrical connection PNP |
| | **N** = Electrical connection NPN |



Weight 190 g
1/11 Conduit (tube ø10): Main Solenoid valve feeding (pressure from vacuum to 10 bar maximum)
3/5 Conduit (G 3/8"): Main Solenoid valve exhaust
12/14 Conduit (tube ø6): Pilot feeding (pressure from 2,5 to 7 bar)
82/84 Conduit (tube ø6): Pilot exhaust

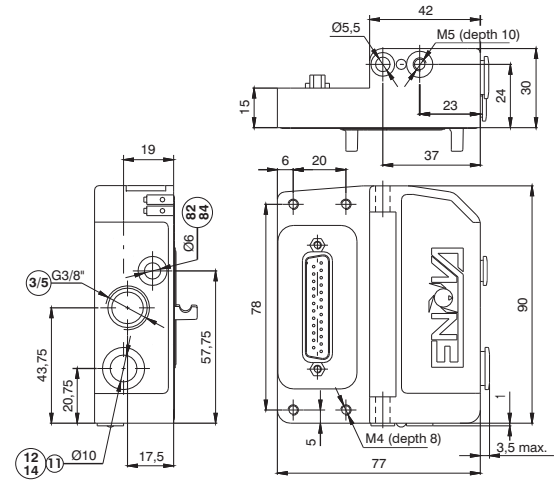
2311.05C






Weight 185 g
1/11-12/14 Conduit (tube ø10): Main Solenoid valve and pilot feeding (pressure from 2,5bar to 7 bar)
3/5 Conduit (G 3/8"): Main Solenoid valve exhaust
82/84 Conduit (tube ø6): Pilot exhaust

2311.03C

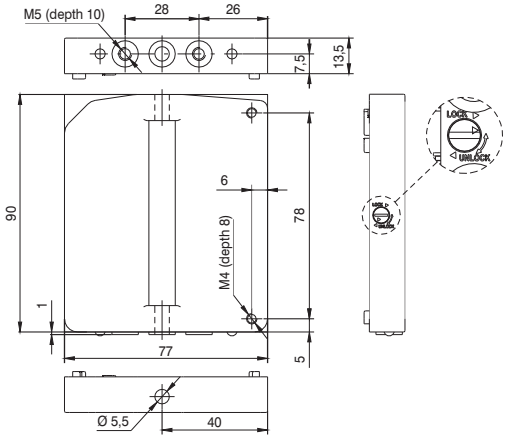



## Right Endplates closed

**Coding:** 2312.00



Weight 100 g

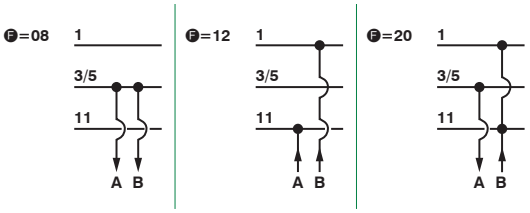


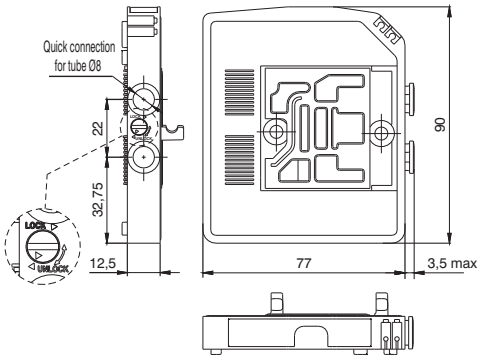



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Intermediate Inlet/Exhaust module






**Coding:** 2308.Ⓕ

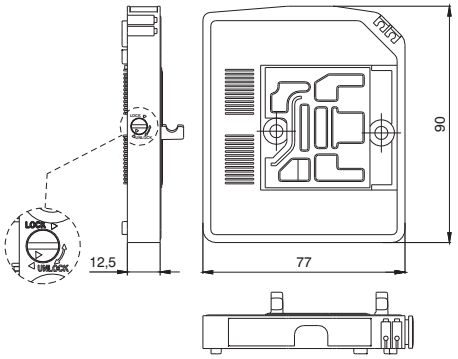
| Ⓕ | FUNCTION |
|---|---|
| | **08** = Exhaust module |
| | **12** = Inlet module |
| | **20** = Inlet-Exhaust module |

SHORT CODE J
SHORT CODE K
SHORT CODE W

Weight 5 g

## Through module






**Coding:** 2300.Ⓕ

| Ⓕ | FUNCTION |
|---|---|
| | **01** = 1 electric signal module |
| | **02** = 2 electric signals module |

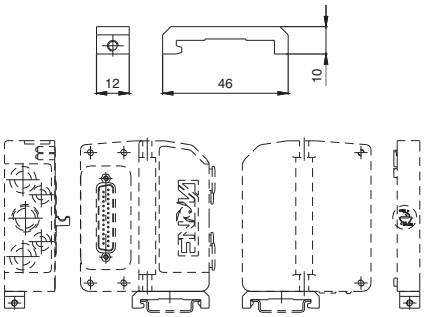
SHORT CODE T1
SHORT CODE T2

Weight 90 g

## DIN rail adapter

**Coding:** 2300.16



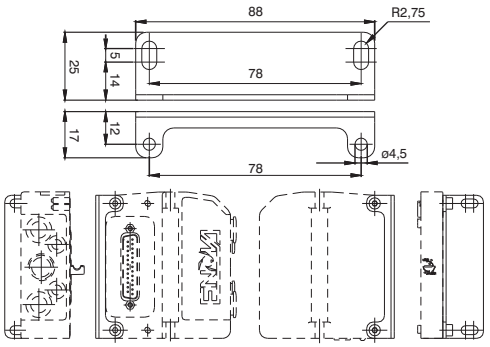



Weight 12 g

## Fixing brackets

**Coding:** 2300.50






Weight 45 g
for fixing dimensions see the Left endplates 3 and 5 ports

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Exhaust Diaphragm

**Coding:** 2317.08



Weight 5 g
SHORT CODE Y

## Inlet/Exhaust Diaphragm

**Coding:** 2317.20



Weight 5 g
SHORT CODE Z

## Inlet Diaphragm

**Coding:** 2317.12



Weight 5 g
SHORT CODE X

## Cable complete with connector, 25 Poles, IP65

**Coding:** 2300.25.Ⓛ.Ⓒ

| | |
|---|---|
| Ⓛ | CABLE LENGTH |
| | **03** = 3 meters |
| | **05** = 5 meters |
| | **10** = 10 meters |
| Ⓒ | CONNECTOR |
| | **10** = Stand alone |
| | **90** = 90° Angle |

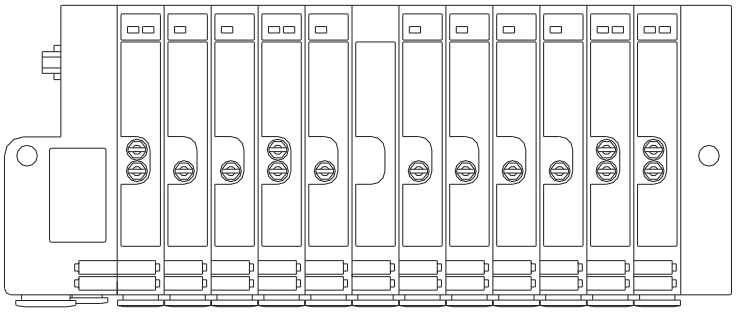


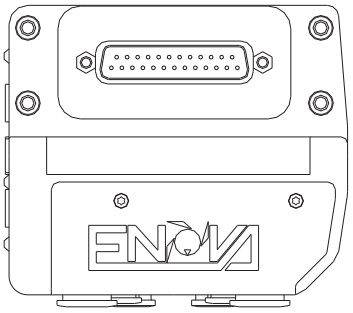


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

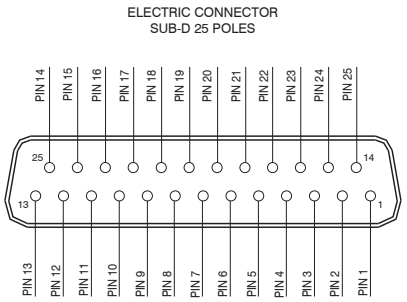
The electrical connection is achieved via a 25 pin connector and can manage up to 22 solenoid pilots.
The management and distribution of the electrical signals between each valve is obtained thanks to a patented electrical connector which receives the signals from the previous module, uses one, two or none depending on the type, and carries forward to the next module the remaining.
Bistable valves, 5/3, 2X3/2 and 2X2/2 valves which have two solenoid pilots built in, use two signals.
The first is directed to the pilot side 14 the second to the pilot side 12.
Monostable valves can be fitted with two type of electrical connector; one that uses only one signal (connected to the pilot side 14) and carries forward the remaining.
The second one called CEB ( Electrical contact for bistable) which uses two signals, one is needed for the valve the other is not used.
This second solution (CEB) allows the modification of the manifold (replacement of monostable valves with bistable for example) without the need of reconfiguring the PLC outputs layout.
On the other hand this solution limits the maximum number of valves to 11 (two signals for each position).
Intermediate supply / exhaust modules are fitted with a dedicated electrical connector which carries forward all electric signals without using any.
This allows the use of intermediate modules in any position of the manifold.

Example of manifold samples with the corresponding pin layout.



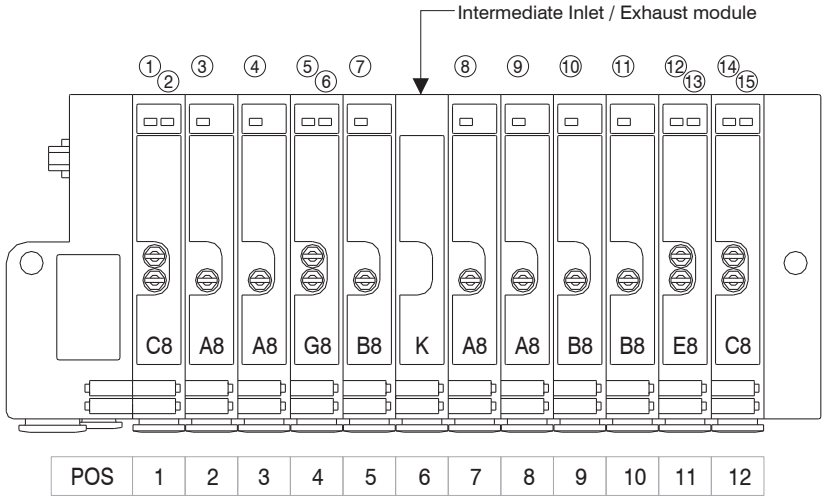


## ELECTRICAL INPUT CONNECTIONS



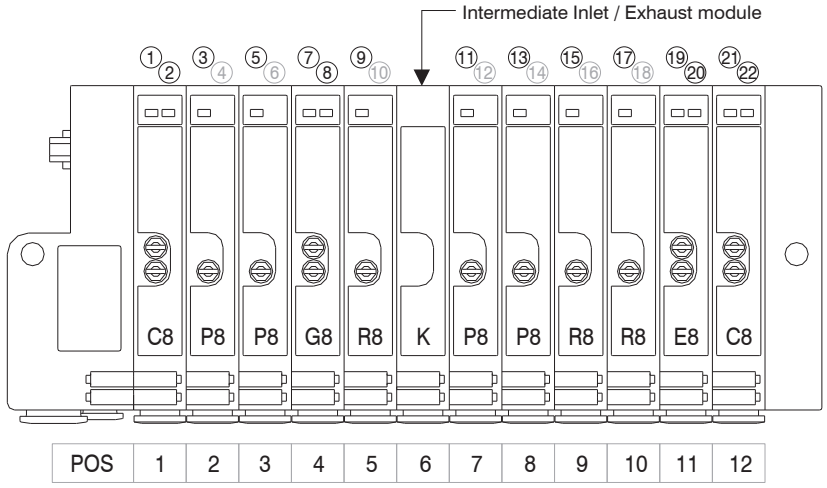

1 - 22 = SIGNALS
23 - 24 - 25 = COMMON

## 25 PIN connector correspondence for bistable, 2x3/2, 5/3 and standard monostable valves manifold



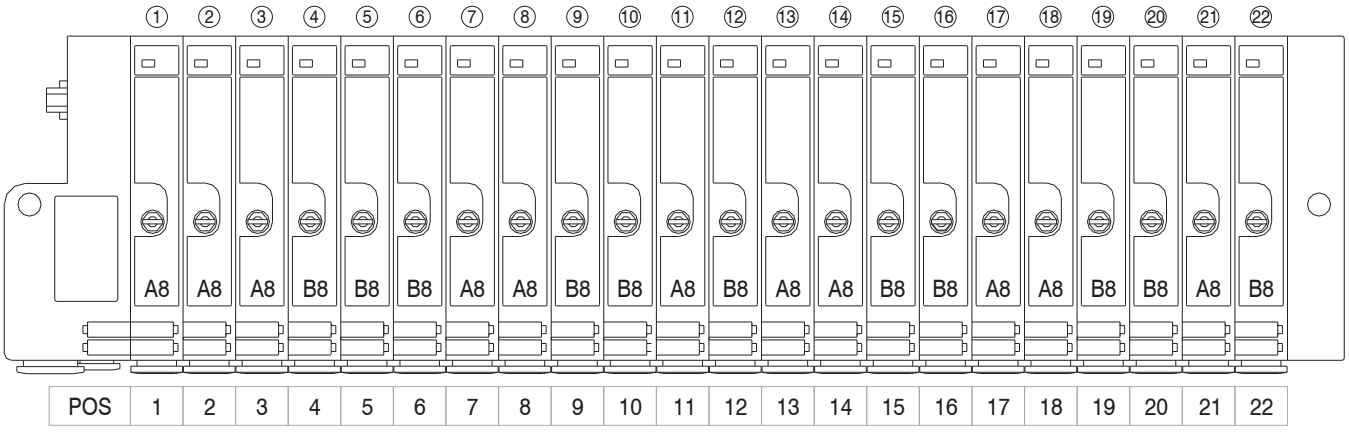

PIN 1 = PILOT 14 S.V. POS.1
PIN 2 = PILOT 14 S.V. POS.1
PIN 3 = PILOT 14 S.V. POS.2
PIN 4 = PILOT 14 S.V. POS.3
PIN 5 = PILOT 14 S.V. POS.4
PIN 6 = PILOT 14 S.V. POS.5
PIN 7 = PILOT 14 S.V. POS.6
PIN 8 = PILOT 14 S.V. POS.7
PIN 9 = PILOT 14 S.V. POS.8
PIN 10 = PILOT 14 S.V. POS.9
PIN 11 = PILOT 14 S.V. POS.10
PIN 12 = PILOT 14 S.V. POS.11
PIN 13 = PILOT 14 S.V. POS.11
PIN 14 = PILOT 14 S.V. POS.12
PIN 15 = PILOT 14 S.V. POS.12

## 25 PIN connector correspondence for bistable, 2x3/2, 5/3 manifold and CEB monostable valves (electrical contact for bistable)




PIN 1 = PILOT 14 S.V. POS.1
PIN 2 = PILOT 12 S.V. POS.1
PIN 3 = PILOT 14 S.V. POS.2
PIN 4 = NOT CONNECTED
PIN 5 = PILOT 14 S.V. POS.3
PIN 6 = NOT CONNECTED
PIN 7 = PILOT 14 S.V. POS.4
PIN 8 = PILOT 12 S.V. POS.4
PIN 9 = PILOT 14 S.V. POS.5
PIN 10 = NOT CONNECTED
PIN 11 = PILOT 14 S.V. POS.7
PIN 12 = NOT CONNECTED
PIN 13 = PILOT 14 S.V. POS.8
PIN 14 = NOT CONNECTED
PIN 15 = PILOT 14 S.V. POS.9
PIN 16 = NOT CONNECTED
PIN 17 = PILOT 14 S.V. POS.10
PIN 18 = NOT CONNECTED
PIN 19 = PILOT 14 S.V. POS.11
PIN 20 = PILOT 12 S.V. POS.11
PIN 21 = PILOT 14 S.V. POS.12
PIN 22 = PILOT 12 S.V. POS.12

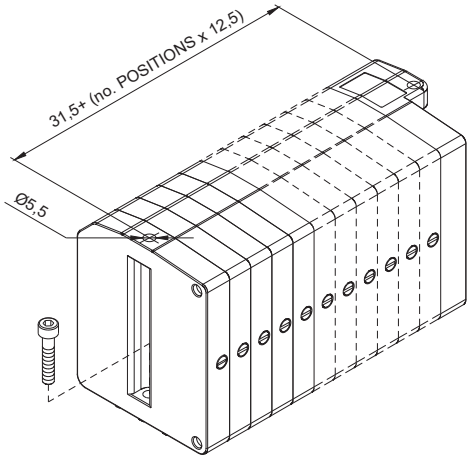
## 25 PIN connector correspondence for manifold for 22 position manifold with standard monostable valves

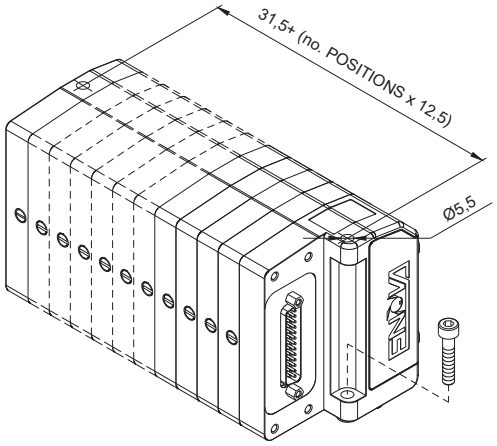




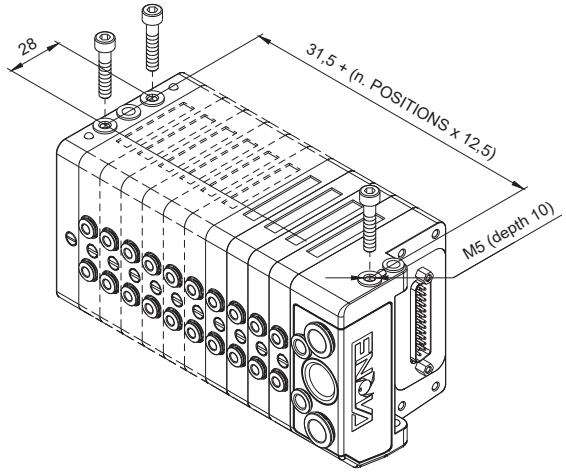
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

**From the top**

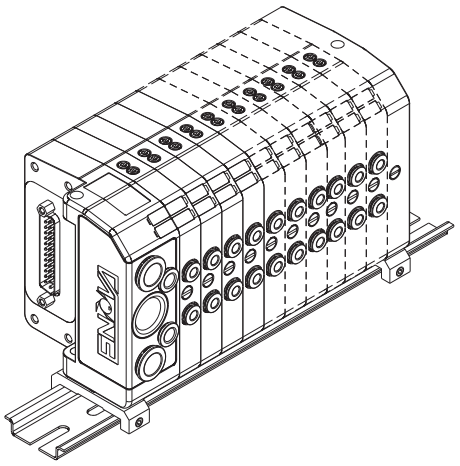


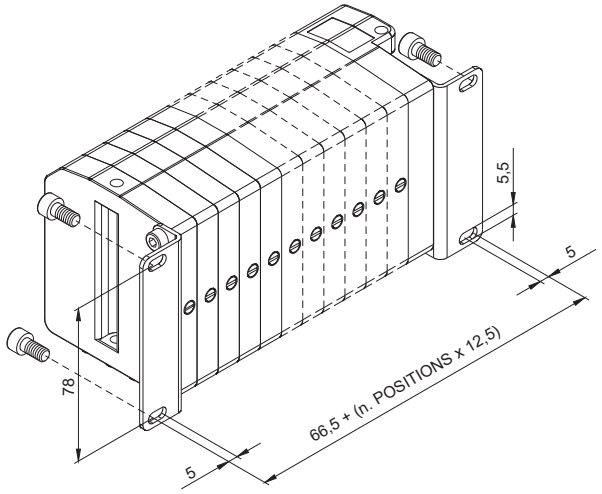

**From the bottom**



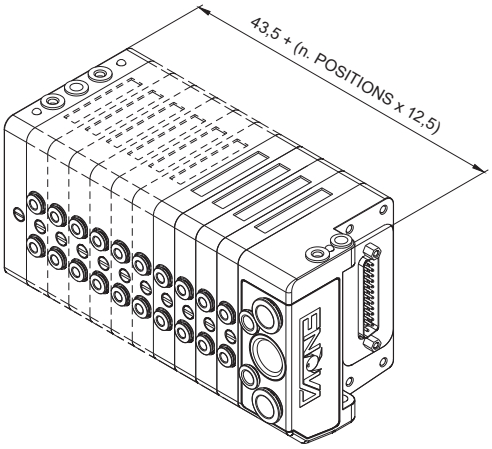

**DIN rail fixing**

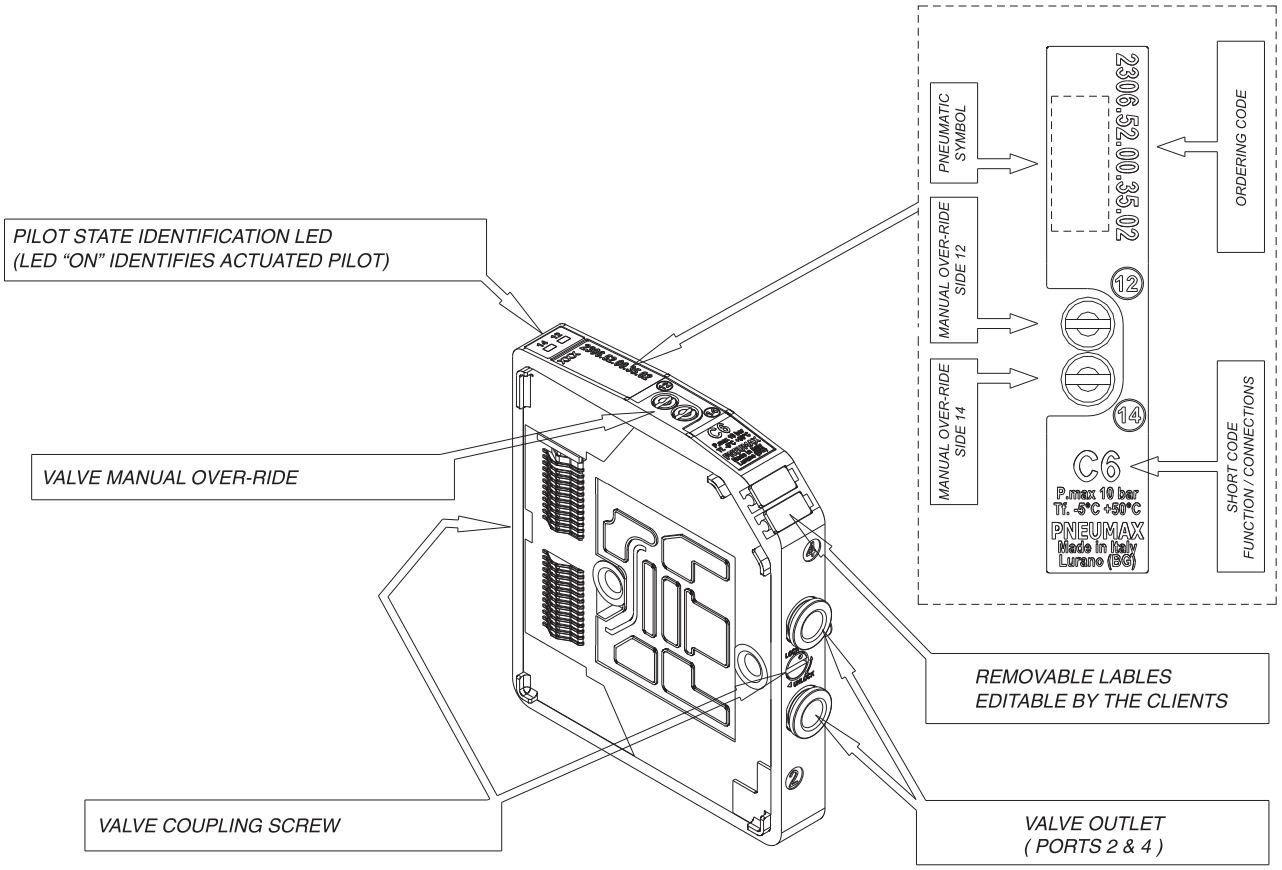


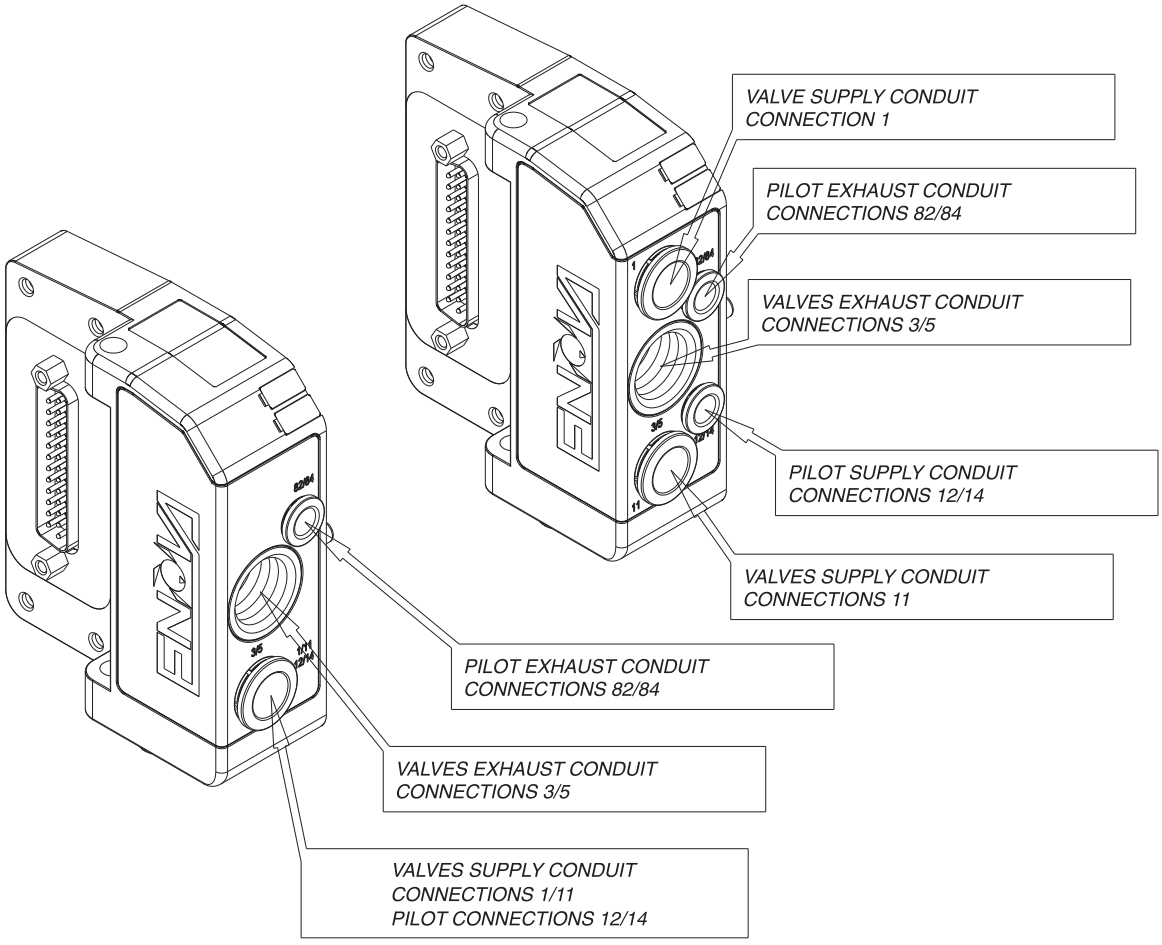
**Fixing with 90° bracket**




**Maximum possible size according to valves used**



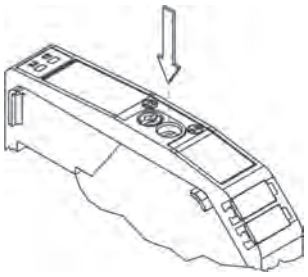


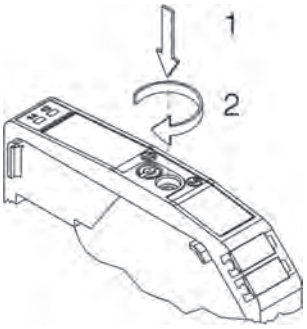


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

**Manual override actuation**



**Instable function:**
Push to actuate
(when released it moves back to the original position)

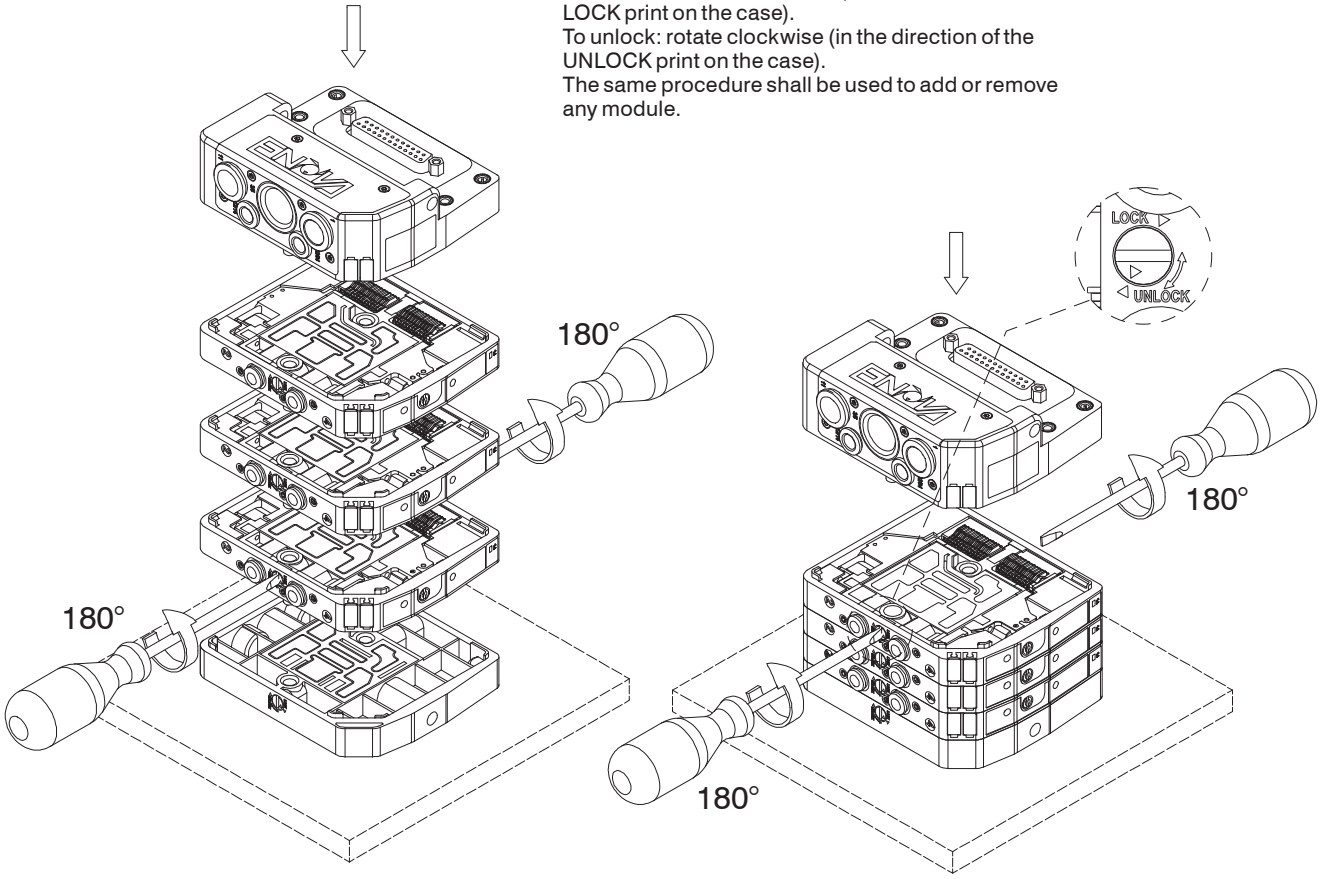



**Bistable function:**
Push and turn to get the bistable function

**Note**: we recommend the manual override is returned to it's original position when not in use

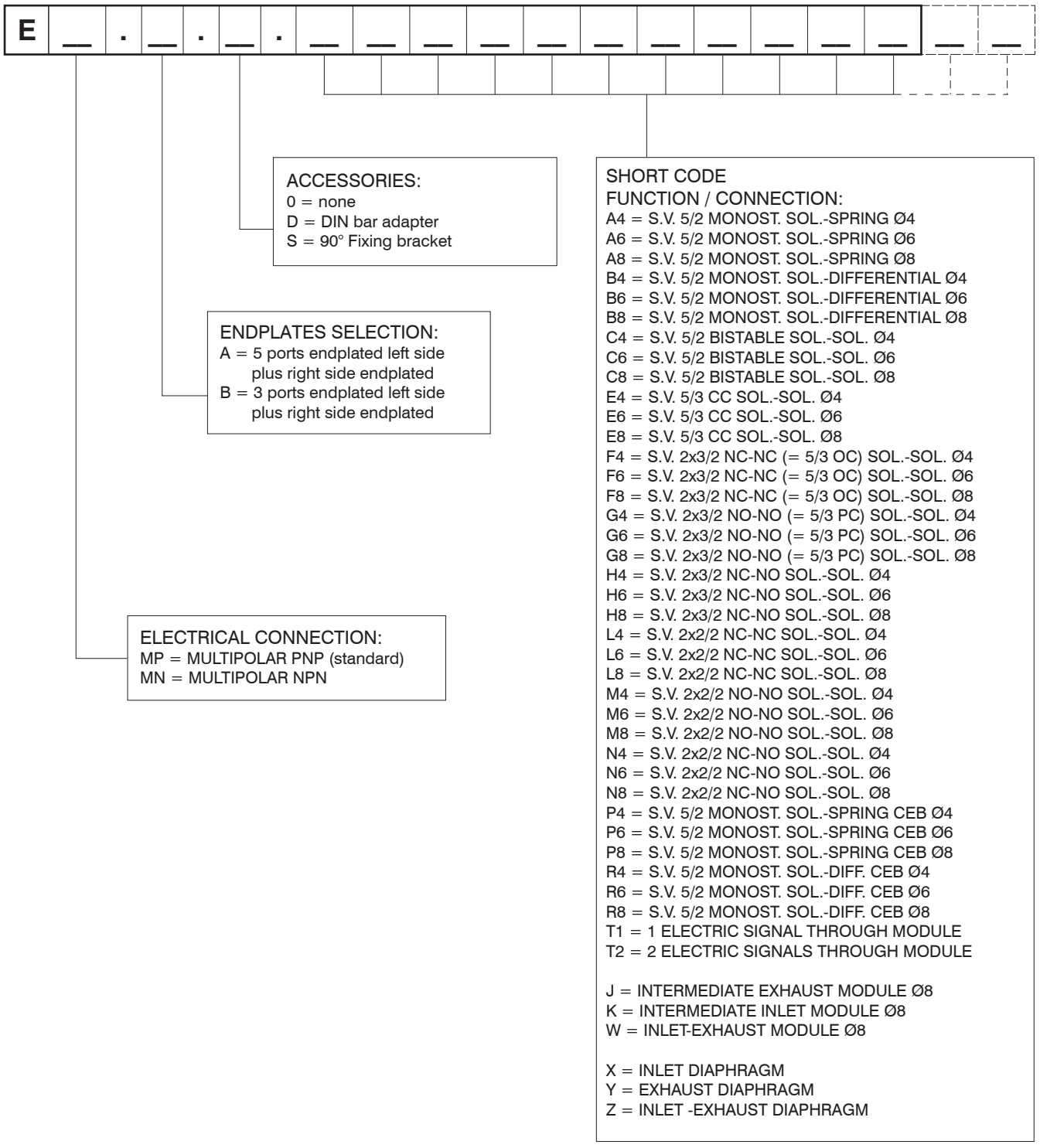
**Manifold assembly**
The assembly procedure should start from the end-plate which should be positioned on a flat surface.
Add the requested modules by simply rotating by 180° the fastening pins by means of a 1x5.5 flat screw driver.
The last module to be assembles shall be the inlet module.

Fastening pins rotation direction:
To lock: rotate anticlockwise (in the direction of the LOCK print on the case).
To unlock: rotate clockwise (in the direction of the UNLOCK print on the case).
The same procedure shall be used to add or remove any module.



Manifold layout Configuration






**Note**:
While configuring the manifold always bear in mind that the maximum number of electrical signals available is 22.
N.B. CEB = Electrical connector for bistable valves ( uses two electric signals).
Intermediate supply / exhaust modules require the same space as a valve but do not use any electric signals (as the electric connector carries forward all signals received from the module immediately before).
The separation diaphragms are positioned between two modules and replace the standard seal therefore do not increase the dimension of the assembly.
When using a separation diaphragm of any type, it is necessary to add, in any position between diaphragm and the manifold and plate, an extra air supply / exhaust module depending on the type of diaphragm used.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## CANopen® protocol node

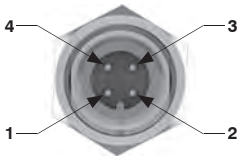
CANopen® node is directly integrated on Enova® solenoid valves manifold via a 25 poles connector, normally used for multi-pin cable connection.
Enova® solenoid valves connected to node must be PNP equivalent (final 02 in ordering code).
The node can be easily installed also on solenoid valves manifold already mounted on equipment.
Node can manage up to 22 solenoid valves, and, in the same time, a max number of 3 Input modules 5200.08.
CANopen® node recognizes automatically the presence of the Input modules on power on.
Regardless of the number of Input modules connected, the managable solenoid valves are 22.
Node power supply is made by a M12 4P male circular connector.
The separation between node 24 V DC Power supply and outputs 24 V DC allows to switch off the outputs maintaning powered the node and inputs, if present.
Connection to Bus CANopen® is possible via 2 M12 5P male - female circular connectors; these two are connected in parallel and according to CiA Draft Standard Proposal 301 V 4.10 (15 August 2006).
Transmission speed can be set by 3 dip-switches.
The node address can be set by 6 dip-switches using BCD numeration.
The node includes an internal terminating resistance that can be activated by a dip-switch.

**Coding:** 5523.22



### Scheme / Overall dimensions and I/O layout

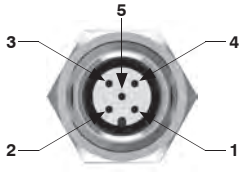
POWER SUPPLY connector



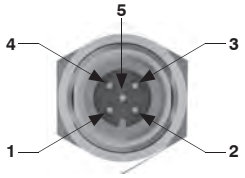

M12A 4P MALE

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (LOGICS AND INPUTS) |
| 2 | N.C. |
| 3 | 0 V |
| 4 | + 24 V DC (OUTPUTS) |

NETWORK connectors

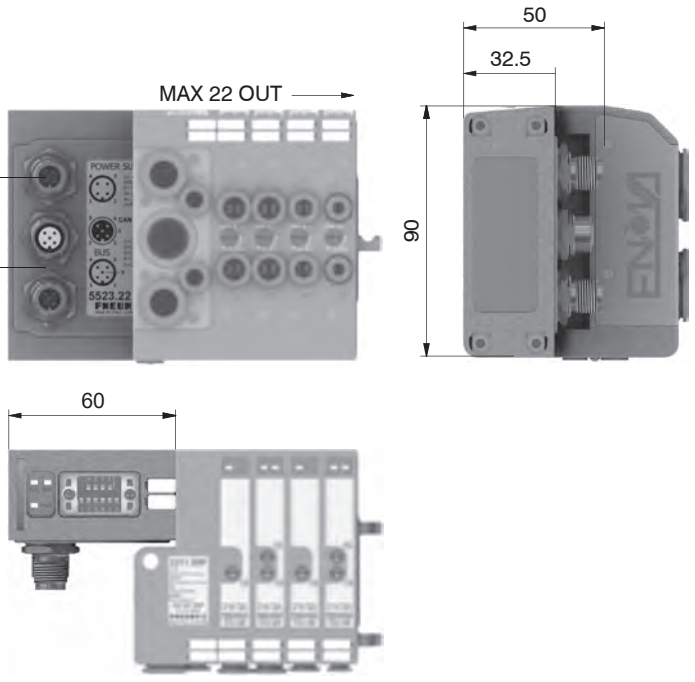



M12A 5P FEMALE




M12A 5P MALE

| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | CAN_SHLD | Optional CAN Shield |
| 2 | CAN_V+ | Optional CAN external positive supply (Dedicated for supply of transceiver and Optocouplers, if galvanic isolation of the bus node applies) |
| 3 | CAN_GND | Ground / 0V / V- |
| 4 | CAN_H | CAN_H bus line (dominant high) |
| 5 | CAN_L | CAN_L bus line (dominant low) |




| Technical characteristics | | |
|---|---|---|
| Model | | 5523.22 |
| Specifications | | CiA Draft Standard Proposal 301 V 4.10 (15 August 2006) |
| Case | | Reinforced technopolymer |
| Power supply | Power supply connection | M12 4P male connector (IEC 60947-5-2) |
| | Power supply voltage | +24 VDC +/- 10% |
| | Node consumption (without inputs) | 25 mA |
| | Power supply diagnosis | Green LED PWR |
| Outputs | PNP equivalent outputs | +24 VDC +/- 10% |
| | Max. current for output | 100 mA |
| | Maximum output number | 22 |
| | Max. output simultaneously actuated | 22 |
| Network | Network connectors | 2 M12 5P connectors male-female (IEC 60947-5-2) |
| | Baud rate | 10 - 20 - 50 - 125 - 250 - 500 - 800 - 1000 Kbit/s |
| | Addresses possible numbers | From 1 to 63 |
| | Maximum nodes number in network | 64 (slave + master) |
| | Bus maximum recommended length | 100 m at 500 Kbit/s |
| | Bus diagnosis | Green LED + red LED |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature range | | From 0 °C to +50 °C |

## DeviceNet protocol node

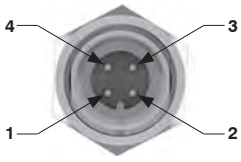
DeviceNet node is directly integrated on Enova® solenoid valves manifold via a 25 poles connector, normally used for multi-pin cable connection.
Enova® solenoid valves connected to node must be PNP equivalent (final 02 in ordering code).
The node can be easily installed also on solenoid valves manifold already mounted on equipment.
Node can manage up to 22 solenoid valves, and, in the same time, a max number of 3 Input modules 5200.08.
DeviceNet node recognizes automatically the presence of the Input modules on power on.
Regardless of the number of Input modules connected, the managable solenoid valves are 22.
Node power supply is made by a M12 4P male circular connector.
The separation between node 24 V DC Power supply and outputs 24 V DC allows to switch off the outputs maintaning powered the node and inputs, if present.
Connection to Bus DeviceNet is possible via 2 M12 5P male - female circular connectors; these two are connected in parallel and according to DeviceNet Specifications Volume I, release 2.0.
Transmission speed can be set by 3 dip-switches.
The node address can be set by 6 dip-switches using BCD numeration.
The node includes an internal terminating resistance that can be activated by a dip-switch.

**Coding:** 5423.22



### Scheme / Overall dimensions and I/O layout

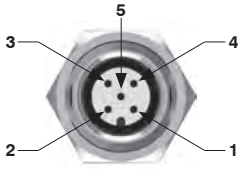
POWER SUPPLY connector



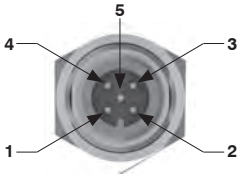

M12A 4P MALE

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (LOGICS AND INPUTS) |
| 2 | N.C. |
| 3 | 0 V |
| 4 | + 24 V DC (OUTPUTS) |

NETWORK connectors

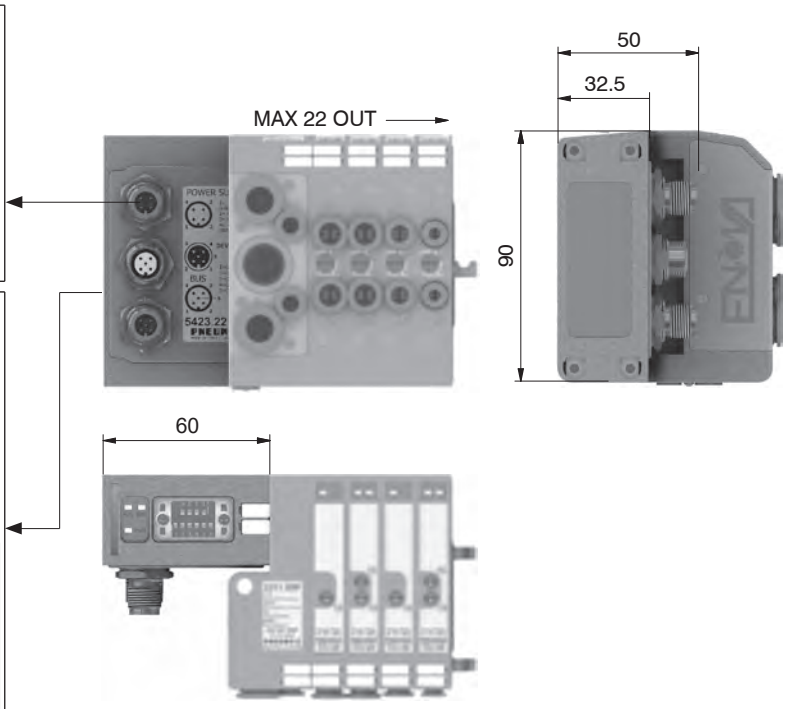



M12A 5P FEMALE




M12A 5P MALE

| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | CAN_SHLD | Optional CAN Shield |
| 2 | CAN_V+ | Optional CAN external positive supply (Dedicated for supply of transceiver and Optocouplers, if galvanic isolation of the bus node applies) |
| 3 | CAN_GND | Ground / 0V / V- |
| 4 | CAN_H | CAN_H bus line (dominant high) |
| 5 | CAN_L | CAN_L bus line (dominant low) |




| Technical characteristics | | |
|---|---|---|
| Model | | 5423.22 |
| Specifications | | DeviceNet Specifications Volume I, release 2.0. |
| Case | | Reinforced technopolymer |
| Power supply | Power supply connection | M12 4P male connector (IEC 60947-5-2) |
| | Power supply voltage | +24 VDC +/- 10% |
| | Node consumption (without inputs) | 25 mA |
| | Power supply diagnosis | Green LED PWR |
| Outputs | PNP equivalent outputs | +24 VDC +/- 10% |
| | Max. current for output | 100 mA |
| | Maximum output number | 22 |
| | Max. output simultaneously actuated | 22 |
| Network | Network connectors | 2 M12 5P connectors male-female (IEC 60947-5-2) |
| | Baud rate | 125 - 250 - 500 Kbit/s |
| | Addresses possible numbers | From 1 to 63 |
| | Maximum nodes number in network | 64 (slave + master) |
| | Bus maximum recommended length | 100 m at 500 Kbit/s |
| | Bus diagnosis | Green LED + red LED |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature range | | From 0 °C to +50 °C |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## PROFIBUS DP protocol node

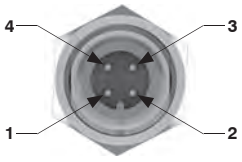
PROFIBUS DP node is directly integrated on Enova® solenoid valves manifold via a 25 poles connector, normally used for multi-pin cable connection.
Enova® solenoid valves connected to node must be PNP equivalent (final 02 in ordering code).
The node can be easily installed also on solenoid valves manifold already mounted on equipment.
Node can manage up to 22 solenoid valves, when is connected 0 or 1 INPUT modules, or 16 if node is fitted with 2 INPUT modules. The max number of INPUT modules 5200.08, is 2.
PROFIBUS DP node recognizes automatically the presence of the Input modules on power on.
Node power supply is made by a M12 4P male circular connector.
The separation between node 24 V DC Power supply and outputs 24 V DC allows to switch off the outputs maintaning powered the node and inputs, if present.
Connection to Bus PROFIBUS DP is possible via 2 M12 type B 5P male - female circular connectors; these two are connected in parallel and according to PROFIBUS Interconnection Technology (Version 1.1 : August 2001).
The node address can be set using BCD numeration: 4 dip-switches for the units and 4 dip-switches for the tens.
The node includes an internal terminating resistance that can be activated by a dip-switch.

**Coding:** 5323.22



### Scheme / Overall dimensions and I/O layout

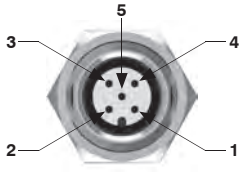
POWER SUPPLY connector



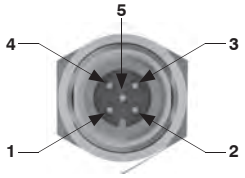

M12A 4P MALE

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (LOGICS AND INPUTS) |
| 2 | N.C. |
| 3 | 0 V |
| 4 | + 24 V DC (OUTPUTS) |

NETWORK connectors

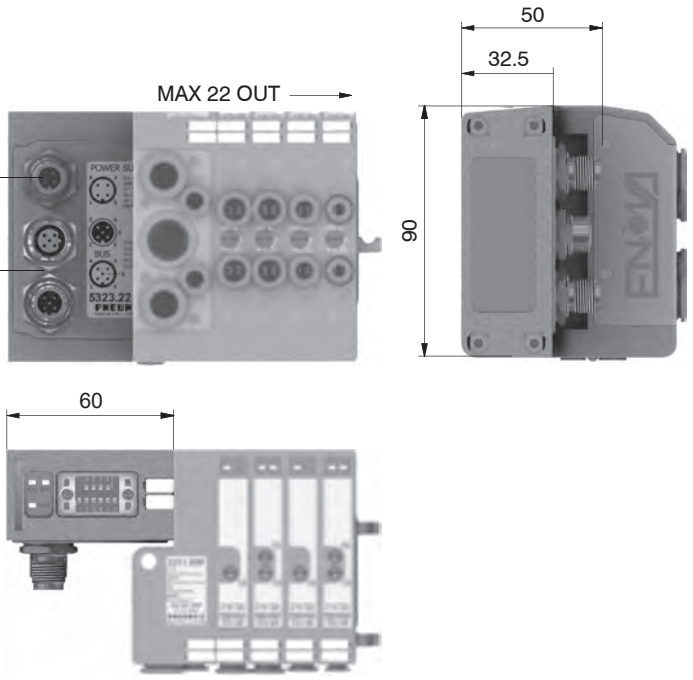



M12A 5P FEMALE




M12A 5P MALE

| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | VP | Power supply plus, (P5V) |
| 2 | A-line | Receive / Transmit data -N, A-line |
| 3 | DGND | Data Ground (reference potential to VP) |
| 4 | B-line | Receive / Transmit data -plus, B-line |
| 5 | SHIELD | Shield or PE |




| Technical characteristics | | |
|---|---|---|
| Model | | 5323.22 |
| Specifications | | PROFIBUS DP |
| Case | | Reinforced technopolymer |
| Power supply | Power supply connection | M12 4P male connector (IEC 60947-5-2) |
| | Power supply voltage | +24 VDC +/- 10% |
| | Node consumption (without inputs) | 50 mA |
| | Power supply diagnosis | Green LED PWR |
| Outputs | PNP equivalent outputs | +24 VDC +/- 10% |
| | Max. current for output | 100 mA |
| | Maximum output number | 22 or 16 if node is fitted with 2 input modules |
| | Max. output simultaneously actuated | 22 |
| Network | Network connectors | 2 M12 5P connectors male-female (IEC 60947-5-2) |
| | Baud rate | 125 - 250 - 500 Kbit/s |
| | Addresses possible numbers | From 1 to 63 |
| | Maximum nodes number in network | 64 (slave + master) |
| | Bus maximum recommended length | 100 m at 500 Kbit/s |
| | Bus diagnosis | Green LED + red LED |
| Configuration file | | Available from our web site http://www.pneumaxspa.com |
| Protection degree | | IP65 when assembled |
| Temperature range | | From 0 °C to +50 °C |

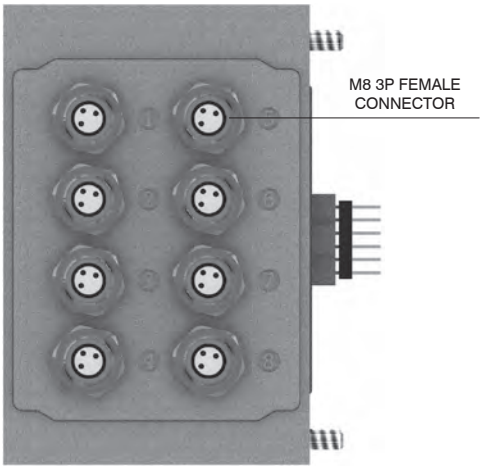
## 8 input module

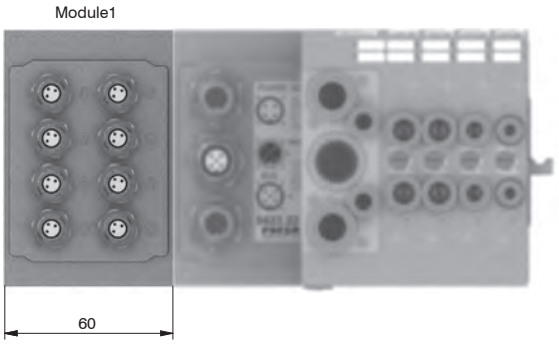
M8 digital inputs module provides 8 M8, 3 pins, female connectors.
Inputs have PNP logic, + 24 V DC ± 10%.
It is possible to connect 2 wires devices (e.g. switches, magnetic limit switches, pressure switches, etc.) as well as 3 wires devices (e.g. proximity sensors, photocells, electronic magnetic limit switches, etc.).
The maximum current available for all 8 onputs is 200 mA.
Each module includes a 200 mA resettable fuse. If a short circuit or a overcharge (overall current >200 mA) occur the safety device acts cutting the 24 VDC power supply to all M8 connectors on the module and switching off the green LED PWR.
Any other input module connected to the node will remain powered and will function correctly.
Once the cause of the fault disappears the green led PWR light up indicating the ON state and the node will re-start to operate.
The maximum number of Input modules supported is 3 for CANopen® and DeviceNet, 2 for PROFIBUS DP.

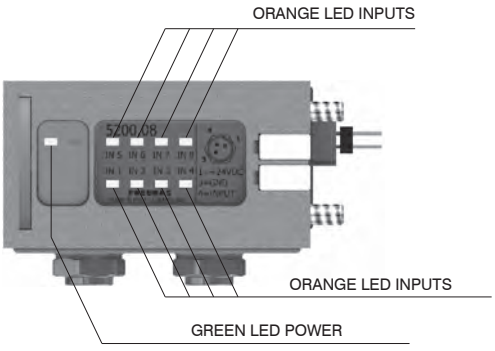
**Coding:** 5200.08

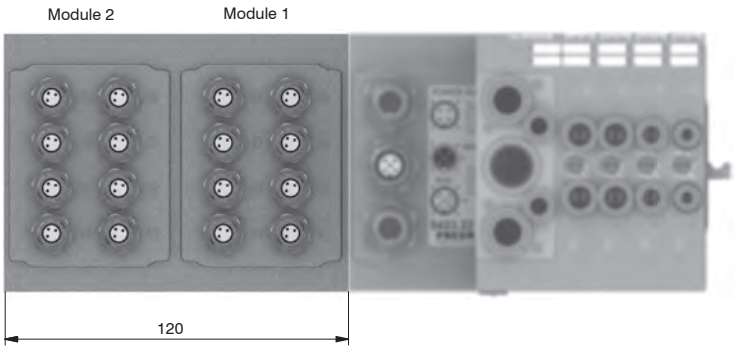


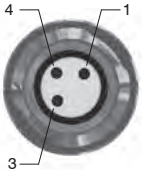
### Scheme / Overall dimensions and I/O layout



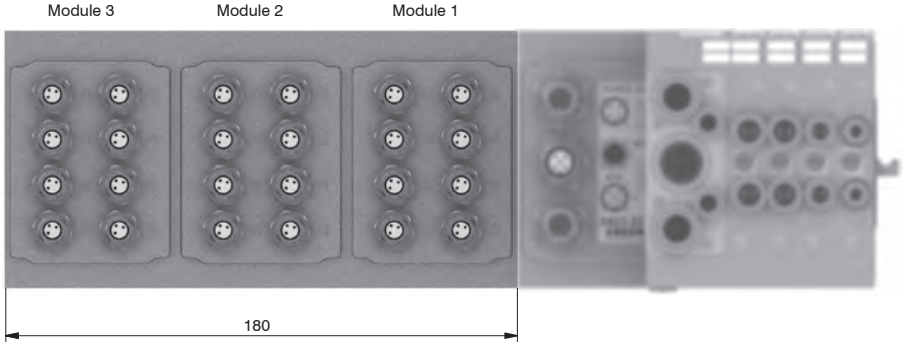




| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC |
| 4 | ENTRÉE |
| 3 | 0 V |





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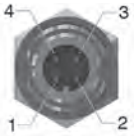
## POWER SUPPLY connectors

### Straight connector M12A 4P female

**Coding:** 5312A.F04.00

Power supply socket






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (LOGICS AND INPUTS) |
| 2 | N.C. |
| 3 | 0 V |
| 4 | + 24 V DC (OUTPUTS) |

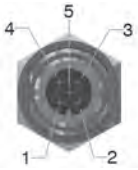
## NETWORK connectors

### Straight connector M12A 5P female

**Coding:** 5312A.F05.00

Socket for bus CANopen® and DeviceNet






Upper view slave connector

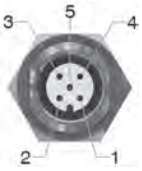
| PIN | DESCRIPTION |
|---|---|
| 1 | (CAN_SHIELD) |
| 2 | (CAN_V+) |
| 3 | CAN_GND |
| 4 | CAN_H |
| 5 | CAN_L |

### Straight connector M12A 5P male

**Coding:** 5312A.M05.00

Plug for bus CANopen® and DeviceNet






Upper view slave connector

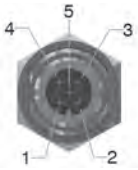
| PIN | DESCRIPTION |
|---|---|
| 1 | (CAN_SHIELD) |
| 2 | (CAN_V+) |
| 3 | CAN_GND |
| 4 | CAN_H |
| 5 | CAN_L |

### Straight connector M12B 5P female

**Coding:** 5312B.F05.00

Socket for bus PROFIBUS DP






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | Power Supply |
| 2 | A-Line |
| 3 | DGND |
| 4 | B-Line |
| 5 | SHIELD |

### Straight connector M12B 5P male

**Coding:** 5312B.M05.00

Socket for bus PROFIBUS DP






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | Power Supply |
| 2 | A-Line |
| 3 | DGND |
| 4 | B-Line |
| 5 | SHIELD |

## INPUTS connectors

### Straight connector M8 3P male

**Coding:** 5308A.M03.00

Plug for inputs modules






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC |
| 4 | INPUT |
| 3 | 0 V |

## Plugs

### M12 plug

**Coding:** 5300.T12



### M8 plug

**Coding:** 5300.T08





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

Manifold layout configuration complete with serial systems

E __ . __ . __ . __ __ __ __ __ __ __ __ __ __ __ __ __

ACCESSORIES :
0= none
D= DIN bar adapter
S= 90° Fixing bracket

ENDPLATES SELECTION :
A= 5 ports endplated left side
plus right side endplated
B= 3 ports endplated left side
plus right side endplated

BUS CONFIGURATION :
CA= CANopen® 22 OUT
CB= CANopen® 22 OUT + 8 INPUTS
CC= CANopen® 22 OUT + 16 INPUTS
CD= CANopen® 22 OUT + 24 INPUTS
DA= DeviceNet 22 OUT
DB= DeviceNet 22 OUT + 8 INPUTS
DC= DeviceNet 22 OUT + 16 INPUTS
DD= DeviceNet 22 OUT + 24 INPUTS
PA= PROFIBUS 22 OUT
PB= PROFIBUS 22 OUT + 8 INPUTS
PC= PROFIBUS 16 OUT + 16 INPUTS

SHORT CODE
FUNCTION / CONNECTION:
A4 = S.V. 5/2 MONOST. SOL.-SPRING Ø4
A6 = S.V. 5/2 MONOST. SOL.-SPRING Ø6
A8 = S.V. 5/2 MONOST. SOL.-SPRING Ø8
B4 = S.V. 5/2 MONOST. SOL.-DIFFERENTIAL Ø4
B6 = S.V. 5/2 MONOST. SOL.-DIFFERENTIAL Ø6
B8 = S.V. 5/2 MONOST. SOL.-DIFFERENTIAL Ø8
C4 = S.V. 5/2 BISTABLE SOL.-SOL. Ø4
C6 = S.V. 5/2 BISTABLE SOL.-SOL. Ø6
C8 = S.V. 5/2 BISTABLE SOL.-SOL. Ø8
E4 = S.V. 5/3 CC SOL.-SOL. Ø4
E6 = S.V. 5/3 CC SOL.-SOL. Ø6
E8 = S.V. 5/3 CC SOL.-SOL. Ø8
F4 = S.V. 2x3/2 NC-NC (= 5/3 CA) SOL.-SOL. Ø4
F6 = S.V. 2x3/2 NC-NC (= 5/3 CA) SOL.-SOL. Ø6
F8 = S.V. 2x3/2 NC-NC (= 5/3 CA) SOL.-SOL. Ø8
G4 = S.V. 2x3/2 NO-NO (= 5/3 CP) SOL.-SOL. Ø4
G6 = S.V. 2x3/2 NO-NO (= 5/3 CP) SOL.-SOL. Ø6
G8 = S.V. 2x3/2 NO-NO (= 5/3 CP) SOL.-SOL. Ø8
H4 = S.V. 2x3/2 NC-NO SOL.-SOL. Ø4
H6 = S.V. 2x3/2 NC-NO SOL.-SOL. Ø6
H8 = S.V. 2x3/2 NC-NO SOL.-SOL. Ø8
L4 = S.V. 2x2/2 NC-NC SOL.-SOL. Ø4
L6 = S.V. 2x2/2 NC-NC SOL.-SOL. Ø6
L8 = S.V. 2x2/2 NC-NC SOL.-SOL. Ø8
M4 = S.V. 2x2/2 NO-NO SOL.-SOL. Ø4
M6 = S.V. 2x2/2 NO-NO SOL.-SOL. Ø6
M8 = S.V. 2x2/2 NO-NO SOL.-SOL. Ø8
N4 = S.V. 2x2/2 NC-NO SOL.-SOL. Ø4
N6 = S.V. 2x2/2 NC-NO SOL.-SOL. Ø6
N8 = S.V. 2x2/2 NC-NO SOL.-SOL. Ø8
P4 = S.V. 5/2 MONOST. SOL.-SPRING CEB Ø4
P6 = S.V. 5/2 MONOST. SOL.-SPRING CEB Ø6
P8 = S.V. 5/2 MONOST. SOL.-SPRING CEB Ø8
R4 = S.V. 5/2 MONOST. SOL.-DIFF. CEB Ø4
R6 = S.V. 5/2 MONOST. SOL.-DIFF. CEB Ø6
R8 = S.V. 5/2 MONOST. SOL.-DIFF. CEB Ø8

T1 = 1 ELECTRIC SIGNAL THROUGH MODULE
T2 = 2 ELECTRIC SIGNALS THROUGH MODULE

J= INTERMEDIATE EXHAUST MODULE Ø8
K= INTERMEDIATE INLET MODULE Ø8
W = INLET-EXHAUST MODULE Ø8

X= INLET DIAPHRAGM
Y= EXHAUST DIAPHRAGM
Z= INLET -EXHAUST DIAPHRAGM

**Note**:
While configuring the manifold always bear in mind that the maximum number of electrical signals available is 22.
N.B. CEB = Electrical connector for bistable valves ( uses two electric signals).
Intermediate supply / exhaust modules require the same space as a valve but do not use any electric signals (as the electric connector carries forward all signals received from the module immediately before).
The separation diaphragms are positioned between two modules and replace the standard seal therefore do not increase the dimension of the assembly.
When using a separation diaphragm of any type, it is necessary to add, in any position between diaphragm and the manifold and plate, an extra air supply / exhaust module depending on the type of diaphragm used.

Section 02

# Air treatment

## Components for compressed air treatment

### Air service units

Wide range of components for compressed air treatment, are available in aluminium, technopolymer and steel, in several sizes with connections from 1/8" to 1" and fl ow rates up to 8000 Nl/min.



**Air quality** 2.1



**Series AIRPLUS** 2.2

| | | | | | |
|---|---|---|---|---|---|
| Product overview | 2.4 | **Pressure regulators for manifold** | 2.40 | **Safeline valves** | 2.65 |
| **Filter** | 2.6 | **Manifold pressure regulators** | 2.44 | **Manifold unit** | 2.72 |
| **Coalescing filter** | 2.10 | **Accessories** | 2.46 | **Accessories** | 2.77 |
| **Oil removal filters** | 2.14 | **Lubricators** | 2.48 | **Panel mounted pressure regulators** | 2.78 |
| **Carbon filters** | 2.18 | **Shut off valves** | 2.52 | **Panel mounted pressure regulator with pressure gauge built into the adjusting knob** | 2.81 |
| **Filter regulators** | 2.22 | **Progressive start-up valve** | 2.55 | | |
| **Accessories** | 2.29 | **Air intake** | 2.57 | **Accessories** | 2.84 |
| **Regulators** | 2.30 | **Pressure switch** | 2.59 | | |
| **Piloted pressure regulators** | 2.35 | **Air intake with pressure gauge or digital pressure switch integrated** | 2.61 | | |



**Series 1700** 2.85

| | | | | | |
|---|---|---|---|---|---|
| Product overview | 2.86 | **Lubricators** | 2.118 | **Panel mounting pressure regulator including pressure gauge** | 2.146 |
| **Filter** | 2.87 | **Shut-off valve** | 2.122 | **High sensitive air pressure regulators with high flow rate relieving** | 2.148 |
| **Coalescing filter** | 2.91 | **Electric shut-off valve** | 2.124 | | |
| **Dynamic drier** | 2.95 | **Pneumatic shut-off valve** | 2.126 | **High sensitive pressure regulator with pneumatic pilot** | 2.151 |
| **Filter regulators** | 2.97 | **Progressive start-up valve** | 1.128 | | |
| **Regulators** | 2.101 | **Air Intake** | 2.130 | **High sensitive pressure regulator for manipulation applications** | 2.153 |
| **Regulators with integrated pressure gauge** | 2.106 | **Air Intake - "H" profile** | 2.132 | | |
| | | **Pressure switch complete with adapter** | 2.134 | **Accessories** | 2.156 |
| **Piloted pressure regulators** | 2.109 | **Filter pressure regulator + Lubricator** | 2.136 | | |
| **Pressure regulators for manifold** | 2.113 | **Filter + Pressure regulator + Lubricator** | 2.140 | | |
| **Manifold pressure regulators** | 2.115 | **Panel mounting pressure regulator** | 2.144 | | |



**Series 1700 Steel line** 2.159

| | | | |
|---|---|---|---|
| **Filter** | 2.161 | **Filter regulators** | 2.169 |
| **Regulators** | 2.165 | **Accessories** | 2.174 |

### Proportional technology

The proportional pressure regulators range includes 3 product series: 1700 standard, 1700 miniaturised and WPR (Wide Pressure Regulators).



**Series 1700 standard** 2.176



**Series 1700 miniaturised** 2.192



**Series WPR** 2. 208

### Measuring devices

Digital pressure switches and pressure gauges, panel mounting or manifold versions.



**Pressure switches Series DS** 2.215



**Pressure gauges Series DS** 2.217

### Pressure booster

3 sizes aluminium pressure boosters available or technopolymer with 2:1 compression ratio.



**Series 1700** 2.219



**Series P+** 2.224


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## Air quality

Compressed air is a fundamental element for the operation of various modern industrial machines.
Different compressed air purity classes are required depending on its application and the industrial sector in which it is used.
Generally, it must be free of pollutants (dusts, water and oil) in order to maintain the characteristics of the final product and guarantee safety.
Standard ISO 8573-1:2010 specifies the permissible level of pollution for every cubic meter of compressed air.
The pollutants that have been analysed are grouped in three macro-families:

- Dusts / Solid particles

Each cubic meter of compressed air could contain a maximum quantity of particles in function of its dimension.

- Water

It could be present in liquid or gaseous state.

- Oil

Each cubic meter of compressed air can contain a maximum oil quantity in any of its form: liquid, aerosol, or vapour.

To uniquely determine the purity of compressed air, it is necessary to identify a numeric value for each of the three groups of pollutants illustrated above.
In general, industrial machines require compressed air with purity class of ISO 8573-1:2010 [1:4:1] of which:

- the first number (1) refers to solid particles with maximum concentration in proportion to their size but still less than 0.1 mg/m³
- the second number (4) refers to dried air with dewpoint temperature less than +3°C
- The third number (1) refers to residual oil content less than 0.01 mg/m³

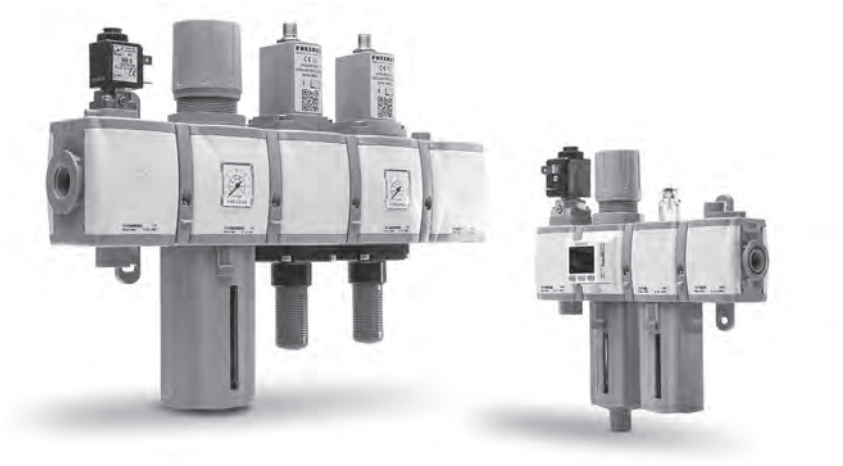
For a correct operation of our devices, we require compressed air with purity class of ISO 8573-1:2010 [7:4:4] unless otherwise indicated.
For example, our proportional regulators require compressed air with a purity class of ISO 8573-1:2010 [1:4:1].
According to standard ISO 8573-1:2010 pollutant levels could be summarized in the following table:

**Compressed air purity classes according to ISO 8573-1:2010**

| Class | Particles | | | | Humidity and Liquid Water | | Oil |
|---|---|---|---|---|---|---|---|
| | Maximum number of particles per cubic meter as a function of particle size d[b] | | | Mass Concentration[b] $C_p$ [mg/m³] | Pressure Dewpoint [°C] | Concentration of liquid water[b] $C_w$ [g/m³] | Concentration of total oil[b] (liquid, aereosol and vapour) [mg/m³] |
| | 0,1 µm < d ≤ 0,5 µm | 0,5 µm < d ≤ 1,0 µm | 1,0 µm < d ≤ 5,0 µm | | | | |
| 0 | As specified by the equipement user or supplier and more stringent than class 1 | | | | | | |
| 1 | ≤ 20000 | ≤ 400 | ≤ 10 | / | ≤ -70 | / | ≤ 0,01 |
| 2 | ≤ 400000 | ≤ 6000 | ≤ 100 | / | ≤ -40 | / | ≤ 0,1 |
| 3 | / | ≤ 90000 | ≤ 1000 | / | ≤ -20 | / | ≤ 1 |
| 4 | / | / | ≤ 10000 | / | ≤ +3 | / | ≤ 5 |
| 5 | / | / | ≤ 100000 | / | ≤ 100000 | / | / |
| 6 | / | | | $0 < C_p \leq 5$ | ≤ +10 | / | / |
| 7 | / | | | $5 < C_p \leq 10$ | / | $C_w \leq 0,5$ | / |
| 8 | / | | | / | / | $0,5 < C_w \leq 5$ | / |
| 9 | / | | | / | / | $5 < C_w \leq 10$ | / |
| X | / | | | $C_p > 10$ | / | $C_w > 10$ | >5 |

[b] At reference condition:
- air temperature 20°C
- absolute air pressure 100 kPa = [1 bar] (a)
- relative water vapour pressure 0

## Series Airplus





- **Modular system**
- **Compact and linear design**
- **Maximum flexibility and reliability**
- **Plug-n-play connection thru couplig flanges**
- **Integral safety elements in assembled group**
- **Available in 4 sizes with connections from 1/8" to 1"**
- **ATEX certification (II 2GD or II 3GD)**

### Construction and working characteristics

Pneumax AIRPLUS air treatment units have been designed and developed to increase reliability, modularity and user-friendly operation and installation. Thanks to a wide range of modules with different functions and characteristics, together with a wide choice of materials selection, make the Pneumax AIRPLUS air treatment units a robust, reliable and extremely flexible modular system, adaptable to many applications.
AIRPLUS units correctly assembled are modular with unlimited configurations and solutions, capable of fulfilling all functions of compressed air treatment such as filtration, regulation, lubrication, interception and distribution.
Filters, including coalescing and active carbon elements as well as oil separators provide adequate media filtration. Precise and reliable pressureregulation is provided by the regulators or filter-regulators which are also available with a built in pressure gauge or integral digital pressure switch. The lubricators provide oil mist lubrication in proportion to air being consumed whilst the shut-off valves, which can be operated pneumatic, electro-pneumatic or manually will effectively manage the supply and exhaust of the compressed air system. The range is completed by a series of complementary modules, such as pneumatic connection by-pass, pressure switch and progressive start-up. The complete assembly is built up using the individual modules connected together via quick coupling flanges which provide a 'plug & play' assembly. This provides quick and easy installation or replacement. Pneumax Airplus air treatment units can be integrated with safety elements that comply with EN-ISO 13849-1 and CE marking according to EU Machinery Directive, Annex V.
AIRPLUS air treatment units are available in 4 different sizes, with connections from 1/8 "to 1" and flow rates performances up to 8000Nl/min.

### Instructions for installation and use

The FRL unit should be installed as close as possible to the 'point of use'. The air flow direction should follow the direction indicated on the individual modules, following threaded connections (IN and OUT). Units fitted with a with bowl should be mounted vertically with the bowl facing down. All units should be operated in accordance to the specified pressure and temperature ranges and should never exceed 0.2 Hz max frequency whether pulsing inlet pressure occur.
Fittings shall be mounted according to the maximum torque specified.

### Maintenance

To carry out maintenance which involves the removal of the caps or supports above the body and where the retaining screws are present, it is necessary to remove the cover plates beforehand. If you attempt to dis-assemble the caps or supports without removing the cover plates and retaining screws, the integrity and function of the device could be compromised.
Bowls, plugs and supports are assembled with a bayonet type mechanism. In order to remove them, rotate anti-clockwise until the mechanical stop is reached and then remove from the body (for the bowls firstly press down the green safety button). Bowls and transparent parts can be cleaned with water and neutral soap. Do not use solvents or alcohol. Filtering elements (present in filters and filter regulators) made of HDPE can be regenerated by washing and blowing them. In order to remove them it is necessary to remove the bowl unscrew the filter element and replace it with a new one or clean it. Lubricator oil recharge might be performed during normal operation (apart size 1) depressurizing the bowl thru dedicated plug. Pneumax suggest refilling oil directly into the bowl. No others maintenance operation shall be carried out by client itself, due to complexity of the assembly and Pneumax dedicated post-maintenance testing activities.


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## FILTRATION



Filter pore sizes from 50 $\mu$m to 5 $\mu$m

Coalescing filter with retention efficiency of 99,97% particle removal down to 0,01 $\mu$m

Coalescing/oil removal filter with oil residual up to 0,01 ppm

Carbon filter with oil residual up to < 0,003 ppm

## REGULATION

Regulators and filter regulators

Pressure regulation range up to 12 bar

Available with integrated pressure gauge, pressure switch or G1/8" connection



## LUBRICATION



Manual adjustment of oil quantity complete with visual indicator

Oil refilled with pressurized circuit

Oil mist lubrication

## SHUT OFF

Manual, pneumatic or electropneumatic operation availability

Manual version lockable up to 3 padlock



## COMPLEMENTARY MODULES



Pressure switch

Air intake

Progressive start-up valve

## SAFETY

Integrated diagnostic system

Single version CAT.2 in accordance with ISO EN 13849 up to PL=C

Double version CAT.4 in accordance with ISO EN 13849 up to PL=E

In accordance with EU Machynery directive, annex V





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## Product overview

| PRODUCT | VERSION | SIZE | | | | MAX. PRESSURE | | AMBIENT TEMPERATURE | | | ATEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | Technopolymer body or bowl | Metal body and bowl | Technopolymer body or bowl | Metal body and bowl | Automatic drain | |
| FILTER (F) | T : Technopolymer body and thread | ● | ● | ● | | 13 bar - 10 bar (automatic drain) | / | -5 °C ... +50 °C | / | -5 °C ... +50 °C | ● |
| | N : Technopolymer body and metal inserts | ● | ● | ● | | | | | | | |
| | P : Aluminum body | | ● | ● | ● | | 20 bar - 16 bar (automatic drain) | | -30 °C ... +80 °C | | |
| | L : Aluminum body, low temperature | | ● | ● | ● | | | | -40 °C ... +80 °C | | |
| COALESCING FILTER (DA) | T : Technopolymer body and thread | ● | ● | ● | | 13 bar - 10 bar (automatic drain) | / | -5 °C ... +50 °C | / | -5 °C ... +50 °C | ● |
| | N : Technopolymer body and metal inserts | ● | ● | ● | | | | | | | |
| | P : Aluminum body | | ● | ● | ● | | 20 bar - 16 bar (automatic drain) | | -30 °C ... +80 °C | | |
| | L : Aluminum body, low temperature | | ● | ● | ● | | | | -40 °C ... +80 °C | | |
| OIL REMOVAL FILTER (DBV) (DCV) (DAV) | T : Technopolymer body and thread | | | ● | | 10 bar | | -5 °C ... +50 °C | | | ● |
| | N : Technopolymer body and metal inserts | | | ● | | | | | | | |
| | P : Aluminum body | | | ● | ● | | | | | | |
| | L : Aluminum body, low temperature | | | | | / | | / | | | |
| CARBON FILTER (DD) | T : Technopolymer body and thread | | | ● | | 13 bar | / | -5 °C ... +50 °C | / | -5 °C ... +50 °C | ● |
| | N : Technopolymer body and metal inserts | | | ● | | | | | | | |
| | P : Aluminum body | | | ● | ● | | 20 bar | | -30 °C ... +80 °C | | |
| | L : Aluminum body, low temperature | | | ● | ● | | | | -40 °C ... +80 °C | | |
| REGULATOR (R) (RM) (RW) | T : Technopolymer body and thread | ● | ● | ● | | 13 bar | 20 bar | -5 °C ... +50 °C | / | / | ● |
| | N : Technopolymer body and metal inserts | ● | ● | ● | | | | | | | |
| | P : Aluminum body | | ● | ● | ● | | | | -30 °C ... +80 °C | | |
| | L : Aluminum body, low temperature | | ● | ● | ● | | | | -40 °C ... +80 °C | | |
| PANEL REGULATOR (RPB) (RPBM) | T : Technopolymer body and thread | | | | | 13 bar | / | -10 °C ... +50 °C | / | / | ● |
| | N : Technopolymer body and metal inserts | | | | | | | | | | |
| | P : Aluminum body | ● | | | | | | | | | |
| | L : Aluminum body, low temperature | | | | | | | | | | |
| PRESSURE REGULATORS FOR MANIFOLD (B) (M) | T : Technopolymer body and thread | ● | | | | 13 bar | / | -5 °C ... +50 °C | / | / | ● |
| | N : Technopolymer body and metal inserts | ● | | | | | | | | | |
| | P : Aluminum body | | | | | | | / | | | |
| | L : Aluminum body, low temperature | | | | | / | | / | | | |
| PRESSURE REGULATORS FOR MANIFOLD WITH DIGITAL PRESSURE SWITCH (P) | T : Technopolymer body and thread | ● | | | | 13 bar | / | 0 °C ... +50 °C | / | / | |
| | N : Technopolymer body and metal inserts | ● | | | | | | | | | |
| | P : Aluminum body | | | | | | | / | | | |
| | L : Aluminum body, low temperature | | | | | / | | / | | | |
| PILOTED PRESSURE REGULATORS (RP) (RMP) (RPP) | T : Technopolymer body and thread | | | | | / | / | / | / | / | ● |
| | N : Technopolymer body and metal inserts | | | | | | | | | | |
| | P : Aluminum body | | | | ● | / | 20 bar | / | -30 °C ... +80 °C | | |
| | L : Aluminum body, low temperature | | | | | / | | / | | | |
| PILOTED PRESSURE REGULATORS WITH DIGITAL PRESSURE SWITCH (RPP) (RPZ) | T : Technopolymer body and thread | | | | | / | / | / | / | / | |
| | N : Technopolymer body and metal inserts | | | | | | | | | | |
| | P : Aluminum body | | | | ● | / | 20 bar | / | 0 °C ... +50 °C | | |
| | L : Aluminum body, low temperature | | | | | / | | / | | | |
| FILTER REGULATOR (E) (EM) (EW) | T : Technopolymer body and thread | ● | ● | ● | | 13 bar - 10 bar (automatic drain) | 20 bar - 16 bar (automatic drain) | -5 °C ... +50 °C | / | -5 °C ... +50 °C | ● |
| | N : Technopolymer body and metal inserts | ● | ● | ● | | | | | | | |
| | P : Aluminum body | | ● | ● | ● | | | | -30 °C ... +80 °C | | |
| | L : Aluminum body, low temperature | | ● | ● | ● | | | | -40 °C ... +80 °C | | |
| REGULATOR WITH DIGITAL PRESSURE SWITCH (RP) (RZ) | T : Technopolymer body and thread | ● | ● | ● | | 13 bar | 20 bar | 0 °C ... +50 °C | | / | |
| | N : Technopolymer body and metal inserts | ● | ● | ● | | | | | | | |
| | P : Aluminum body | | ● | ● | ● | | | | | | |
| | L : Aluminum body, low temperature | | ● | ● | ● | | | | | | |





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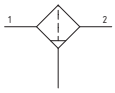
| PRODUCT | VERSION | SIZE | | | | MAX. PRESSURE | | AMBIENT TEMPERATURE | | | ATEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | Technopolymer body or bowl | Metal body and bowl | Technopolymer body or bowl | Metal body and bowl | Automatic drain | |
| FILTER REGULATOR WITH DIGITAL PRESSURE SWITCH (E) (EP) (EZ) | T : Technopolymer body and thread | ● | ● | ● | | 13 bar - 10 bar (automatic drain) | 20 bar - 16 bar (automatic drain) | 0 °C ... +50 °C | | -5 °C ... +50 °C | |
| | N : Technopolymer body and metal inserts | ● | ● | ● | | | | | | | |
| | P : Aluminum body | | ● | ● | ● | | | | | | |
| | L : Aluminum body, low temperature | | ● | ● | ● | | | | | | |
| LUBRICATOR (L) | T : Technopolymer body and thread | ● | ● | ● | | 13 bar | | -5 °C ... +50 °C | | / | ● |
| | N : Technopolymer body and metal inserts | ● | ● | ● | | | | | | | |
| | P : Aluminum body | | ● | ● | ● | | | | | | |
| | L : Aluminum body, low temperature | | | | | / | | / | | | |
| LUBRICATOR WITH ELECTRICAL MINIMUM LEVEL SENSOR (LA) (LC) | T : Technopolymer body and thread | ● | ● | ● | | 13 bar | | -5 °C ... +50 °C | | / | |
| | N : Technopolymer body and metal inserts | ● | ● | ● | | | | | | | |
| | P : Aluminum body | | ● | ● | ● | | | | | | |
| | L : Aluminum body, low temperature | | | | | / | | / | | | |
| SHUT OFF VALVE (VL) | T : Technopolymer body and thread | ● | ● | ● | | 13 bar - 10 bar (for size 4) | | -5 °C ... +50 °C | / | / | ● |
| | N : Technopolymer body and metal inserts | ● | ● | ● | | | | | | | |
| | P : Aluminum body | | ● | ● | ● | | | | -30 °C ... +80 °C | | |
| | L : Aluminum body, low temperature | | ● | ● | ● | | | | -40 °C ... +80 °C | | |
| PNEUMATIC SHUT OFF VALVE (VP) | T : Technopolymer body and thread | ● | ● | ● | | 13 bar | 20 bar | -5 °C ... +50 °C | / | / | ● |
| | N : Technopolymer body and metal inserts | ● | ● | ● | | | | | | | |
| | P : Aluminum body | | ● | ● | ● | | | | -30 °C ... +80 °C | | |
| | L : Aluminum body, low temperature | | ● | ● | ● | | | | -40 °C ... +80 °C | | |
| ELECTRIC SHUT OFF VALVE (VE) | T : Technopolymer body and thread | ● | ● | ● | | 10 bar | | -5 °C ... +50 °C | | / | ● |
| | N : Technopolymer body and metal inserts | ● | ● | ● | | | | | | | |
| | P : Aluminum body | | ● | ● | ● | | | | | | |
| | L : Aluminum body, low temperature | | | | | / | | / | | | |
| PROGRESSIVE START-UP VALVE (AP) | T : Technopolymer body and thread | ● | ● | ● | | 13 bar - 10 bar (for size 4) | | -5 °C ... +50 °C | | / | ● |
| | N : Technopolymer body and metal inserts | ● | ● | ● | | | | | | | |
| | P : Aluminum body | | ● | ● | ● | | | | | | |
| | L : Aluminum body, low temperature | | ● | ● | ● | | | | | | |
| AIR INTAKE (PA) | T : Technopolymer body and thread | ● | ● | ● | | 13 bar | 20 bar | 0 °C ... +50 °C | / | / | ● |
| | N : Technopolymer body and metal inserts | ● | ● | ● | | | | | | | |
| | P : Aluminum body | | ● | ● | ● | | | | -30 °C ... +80 °C | | |
| | L : Aluminum body, low temperature | | | | | / | | / | | | |
| PRESSURE SWITCH (PP) | T : Technopolymer body and thread | ● | ● | ● | | 13 bar | 20 bar | -5 °C ... +50 °C | | / | |
| | N : Technopolymer body and metal inserts | ● | ● | ● | | | | | | | |
| | P : Aluminum body | | ● | ● | ● | | | | | | |
| | L : Aluminum body, low temperature | | | | | / | | / | | | |
| AIR INTAKE WITH INTEGRATED PRESSURE GAUGE (PM-PW) | T : Technopolymer body and thread | ● | ● | ● | | 13 bar | | 0 °C ... +50 °C | / | / | ● |
| | N : Technopolymer body and metal inserts | ● | ● | ● | | | | | | | |
| | P : Aluminum body | | ● | ● | ● | | | | -30 °C ... +80 °C | | |
| | L : Aluminum body, low temperature | | | | | / | | / | | | |
| AIR INTAKE WITH INTEGRATED DIGITAL PRESSURE SWITCH (PP-PZ) | T : Technopolymer body and thread | ● | ● | ● | | 13 bar | | 0 °C ... +50 °C | | / | |
| | N : Technopolymer body and metal inserts | ● | ● | ● | | | | | | | |
| | P : Aluminum body | | ● | ● | ● | | | | | | |
| | L : Aluminum body, low temperature | | | | | / | | / | | | |

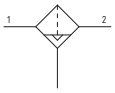
## Filters (F)



- Double filter action: air flow centrifugation and filter element
- Available in 4 sizes with flow rates up to 14000 Nl/min and connections from 1/8" to 1"
- Filtering cartridge made of HDPE available in three different filtration grades (5$\mu$m, 20$\mu$m, 50$\mu$m)
- Filter cartridge can be regenerated by washing / blowing it or replaced
- Bowl assembly via bayonet type quick coupling mechanism with safety button
- Semi-automatic or automatic drain
- Atex certification (II 2GD or II 3GD)
- Inlet pressures up to 20 bar






### Note

In order to ensure that any fluid discharged by the auto drain assembly is adequately drained away, it is recommended you use a 6mm fitting and tube.

| Technical characteristics | | | | | | |
|---|---|---|---|---|---|---|
| **Size** | | Size 1 | Size 2 | Size 3 | Size 4 | |
| Body and connections type | | Technopolymer body, integrated technopolymer connections (T version) | | | / | |
| | | Technopolymer body, metal connections (N version) | | | | |
| | | / | Aluminium body, integrated aluminium connections (P - L versions) | | | |
| Protection and bowl type | | Technopolymer protection - PA bowl | | | | |
| | | Technopolymer protection - PC bowl | | | | |
| | | / | Metal protection - PA bowl | | | |
| | | | Metal protection - PC bowl | | | |
| | | | Metal bowl (blind metal bowl) | | | |
| IN / OUT connections | T version | G1/4" | G3/8" | G1/2" | not available | |
| | N version | G1/8" - G1/4" - 1/4 NPT | G3/8" - G1/4" - 3/8 NPT | G3/8" - G1/2" - 1/2 NPT | | |
| | P and L versions | not available | G3/8" - 1/4 NPT | G1/2" - 1/2 NPT | G1" - 1 NPT | |
| Assembly configuration | | Stand alone | | | | |
| | | / | | | Panel mounted | |
| Assembly positions | | Vertical ±5° | | | | |
| Filter pore size | | 5 $\mu$m | | | | |
| | | 20 $\mu$m | | | | |
| | | 50 $\mu$m | | | | |
| Bowl capacity | | 18 cm$^3$ | 34 cm$^3$ | 68 cm$^3$ | 90 cm$^3$ | |
| Condensation drain | | Semi-automatic | | | | |
| | | Automatic | | | | |
| Max. fittings torque IN / OUT connections | G1" metal | / | | / | 35Nm | |
| | G1/2" metal | | | 30Nm | / | |
| | G1/4" metal | 20Nm | | / | | |
| | G1/8" metal | 15Nm | / | | | |
| | G3/8" metal | / | 25Nm | | | |
| | G1/2" technopolymer | | / | 22Nm | | |
| | G1/4" technopolymer | 9Nm | | / | | |
| | G3/8" technopolymer | / | 16Nm | | | |

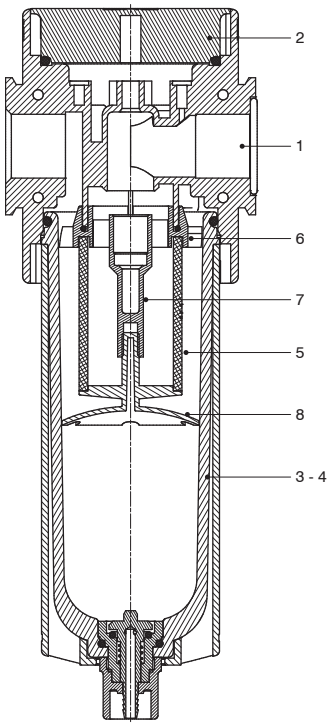
| Operational characteristics | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 | Size 1 | Size 2 | Size 3 | Size 4 |
| Condensation drain | Semi-automatic | | | | Automatic | | | |
| Maximum working pressure | 13 bar | | | | 10 bar | | | |
| | / | 20 bar (only with body and metal bowl) | | | | 16 bar (only with body and metal bowl) | | |
| Minimum working pressure | 0,5 bar | | | | | | | |
| Working temperature | -5°C...+50°C | | | | -5°C...+50°C | | | |
| | / | -30 °C ... +80 °C (only for P version and metal bowl)<br>-40 °C ... +80 °C (only for L version and metal bowl) | | | | | | |

| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Fully technopolymer version | 129 g | 226 g | 355 g | / |
| Technopolymer body version, aluminium bowl protection and technopolymer bowl | / | 257 g | 393 g | / |
| Technopolymer body version, aluminium bowl | / | 301 g | 465 g | / |
| Aluminium body version, technopolymer protection and bowl | / | 314 g | 477 g | 1163 g |
| Aluminium body version, aluminium bowl protection and technopolymer bow | / | 344 g | 514 g | 1306 g |
| Aluminium body version and aluminium bowl | / | 389 g | 587 g | 1330 g |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Materials

### Exploded sectioned

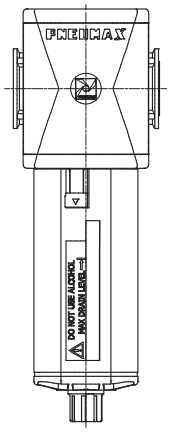



| Filter | | |
|---|---|---|
| 1 | Body | Polyamide<br>Die-cast aluminium |
| 2 | Plug | Polyamide |
| 3 | Technopolymer bowl | Polycarbonate<br>Polyamide |
| 4 | Metal bowl<br>Bowl protection | Die-cast aluminium<br>Polyamide - Die-cast aluminium |
| 5 | Filtering element | Polyethylene |
| 6 | Baffle | Acetal resin |
| 7 | Spool support | Acetal resin |
| 8 | Filtering element support | Acetal resin |

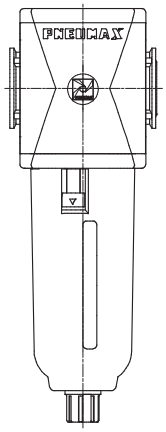


## Design

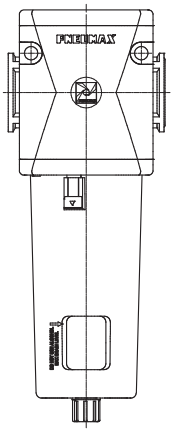
Size 1 - Size 2 - Size 3
Technopolymer protection




Size 1 - Size 2 - Size 3
Protection / Metal bowl




Size 4
All versions




**Coding:** Ⓥ17ⓉFⓈⒸⓄ

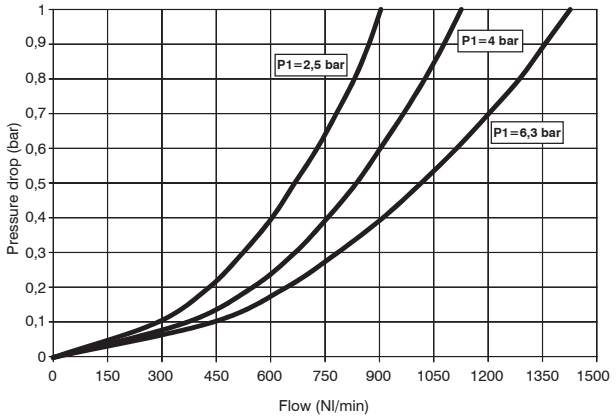
| | |
|---|---|
| Ⓥ | VERSION |
| | **N** = Technopolymer body and metal inserts (not available for size 4) |
| | **T** = Technopolymer body and thread (not available for size 4) |
| | **P** = Aluminum body (not available for size 1) |
| | **L** = Aluminum body, low temperature (not available for size 1) |
| Ⓣ | SIZE AND CONNECTIONS |
| | **1A** = Size 1 - G1/8" only for N version |
| | **1B** = Size 1 - G1/4" only for T - N versions |
| | **1C** = Size 1 - 1/4" NPT only for N version |
| | **2A** = Size 2 - G1/4" only for N version |
| | **2B** = Size 2 - G3/8" for all versions |
| | **2C** = Size 2 - 3/8" NPT only for N version - 1/4" NPT only for P - L versions |
| | **3A** = Size 3 - G3/8" only for N version |
| | **3B** = Size 3 - G1/2" for all versions |
| | **3C** = Size 3 - 1/2" NPT only for N - P - L versions |
| | **4B** = Size 4 - G1" only for P - L versions |
| | **4C** = Size 4 - 1" NPT only for P - L versions |

| | |
|---|---|
| Ⓢ | FILTER PORE SIZE |
| | **A** = 5 $\mu$m |
| | **B** = 20 $\mu$m |
| | **C** = 50 $\mu$m |
| Ⓒ | CONDENSATION DRAIN |
| | = Semi-automatic drain |
| | **S** = Automatic drain |
| Ⓞ | BOWL OPTIONS |
| | = Technopolymer protection - PC bowl |
| | **N** = Technopolymer protection - PA bowl |
| | **P** = Metal protection - PC bowl (not available for size 1) |
| | **R** = Metal protection - PA bowl (not available for size 1) |
| | **T** = Metal bowl (not available for size 1) |

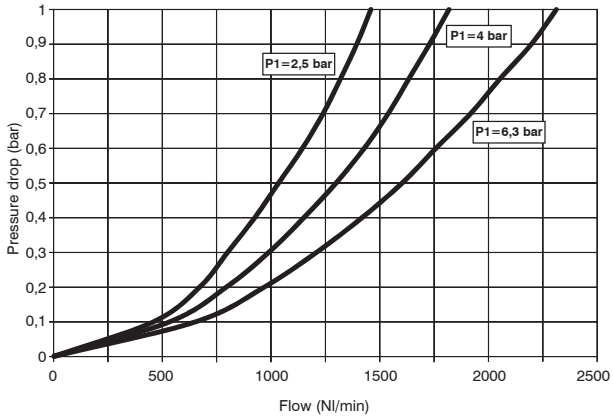
**Example**: **T173BFBST**: Size 3 filter G1/2" 20 $\mu$m, automatic drain and metal bowl

## Characteristic curves

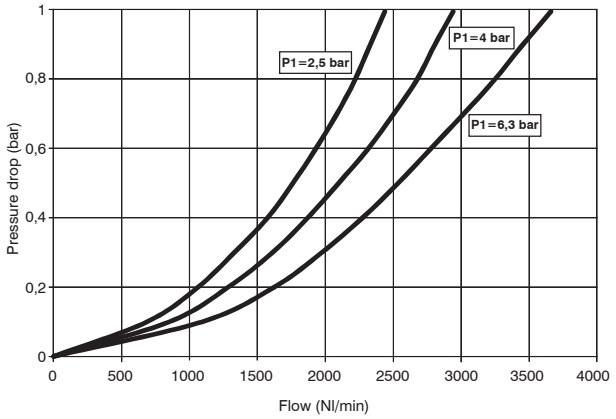
Flow rate curves, Size 1



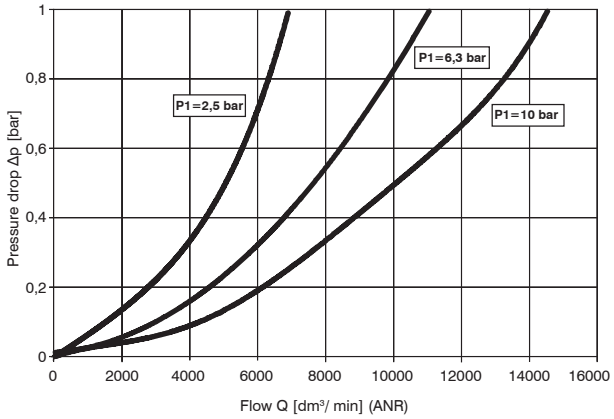

Flow rate curves, Size 2




Flow rate curves, Size 3

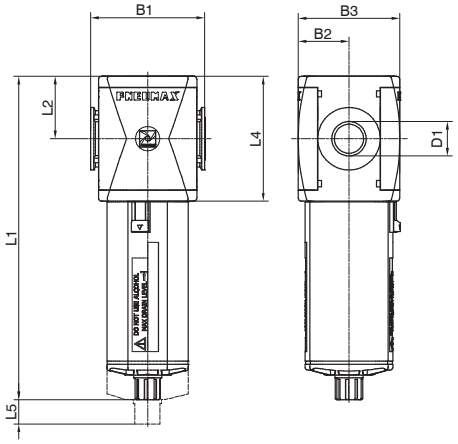



Flow rate curves, Size 4

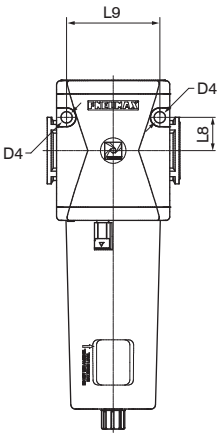



## Dimensions

Semi-automatic drain version




Fixing holes dimension detail
(only for size 4)



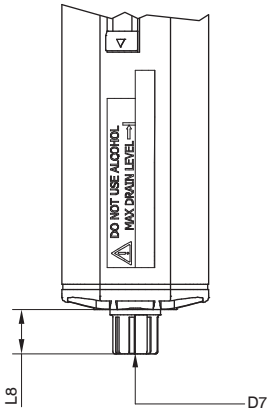

| Model | B1 | B2 | B3 | D1 | D4 | L1 - Bowl material | | L2 | L4 | L5 | L8 | L9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Technopolymer | Metal | | | | | |
| #171.. | 48 | 21 | 42 | G1/8"<br>G1/4"<br>1/4 NPT | / | 148 | / | 27,5 | 55 | 40 | / | / |
| #172.. | 62 | 28.5 | 57 | G1/4"<br>G3/8"<br>1/4 NPT<br>3/8 NPT | / | 169.1 | 171.5 | 34 | 68 | 50 | / | / |
| #173.. | 73 | 32.5 | 65 | G3/8"<br>G1/2"<br>1/2 NPT | / | 207.2 | 209.5 | 40 | 80 | 65 | / | / |
| #174.. | 99 | 44 | 88 | G1"<br>1 NPT | 8.5 | 262 | 264.5 | 52.5 | 105 | 103 | 25 | 70 |



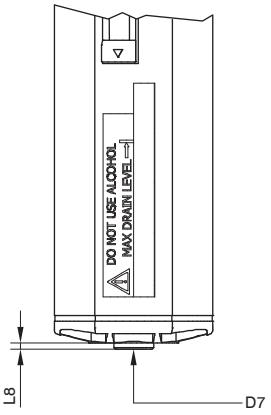
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Variable dimensions

Semi-automatic drain version




Automatic drain version

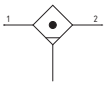


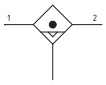

| Model | L8 - Bowl material | | D7 |
|---|---|---|---|
| | Technopolymer | Metal | |
| Semi-automatic drain | 15,7 | 18 | Plastic hose connector Ø6 |
| Automatic drain | 2 | 4,5 | G1/8" |

## Coalescing filters (DA)



- Coalescing filter
- Available in 4 sizes with flow rates up to 8000 Nl/min and connections from 1/8" to 1"
- Filtering cartridge with filtration grade of 0,01 $\mu$m
- Filtering performances 99.97% (particles up to 0.01 $\mu$m)
- Bowl assembly via bayonet type quick coupling mechanism with safety button
- Semi-automatic or automatic drain
- Atex certification (II 2GD or II 3GD)
- Inlet pressures up to 20 bar





### Note

In order to ensure the high level of filtration, it is recommended that a 5$\mu$ filter is installed before the coalescing filter. In order to ensure that any fluid discharged by the auto drain assembly is adequately drained away, it is recommended you use a 6mm fitting and tube



| Technical characteristics | | | | | |
|---|---|---|---|---|---|
| **Size** | | Size 1 | Size 2 | Size 3 | Size 4 |
| Body and connections type | | Technopolymer body, integrated technopolymer connections (T version) | | | / |
| | | Technopolymer body, metal connections (N version) | | | |
| | | / | Aluminium body, integrated aluminium connections (P - L versions) | | |
| Protection and bowl type | | Technopolymer protection - PA bowl | | | |
| | | Technopolymer protection - PC bowl | | | |
| | | / | Metal protection - PA bowl | | |
| | | | Metal protection - PC bowl | | |
| | | | Metal bowl (blind metal bowl) | | |
| IN / OUT connections | T version | G1/4" | G3/8" | G1/2" | not available |
| | N version | G1/8" - G1/4" - 1/4 NPT | G3/8" - G1/4" - 3/8 NPT | G3/8" - G1/2" - 1/2 NPT | |
| | P and L versions | not available | G3/8" | G1/2" | G1" |
| Assembly configuration | | Stand alone | | | |
| | | / | | | Panel mounted |
| Assembly positions | | Vertical ±5° | | | |
| Filter pore size | | 0.01 $\mu$m, 99.97% efficiency | | | |
| Bowl capacity | | 18 cm³ | 34 cm³ | 68 cm³ | 90 cm³ |
| Condensation drain | | Semi-automatic | | | |
| | | Automatic | | | |
| Max. fittings torque IN / OUT connections | G1" metal | / | | / | 35 Nm |
| | G1/2" metal | | | 30 Nm | / |
| | G1/4" metal | 20 Nm | | / | |
| | G1/8" metal | 15 Nm | / | | |
| | G3/8" metal | / | 25 Nm | | |
| | G1/2" technopolymer | | / | 22 Nm | |
| | G1/4" technopolymer | 9 Nm | | / | |
| | G3/8" technopolymer | / | 16 Nm | | |

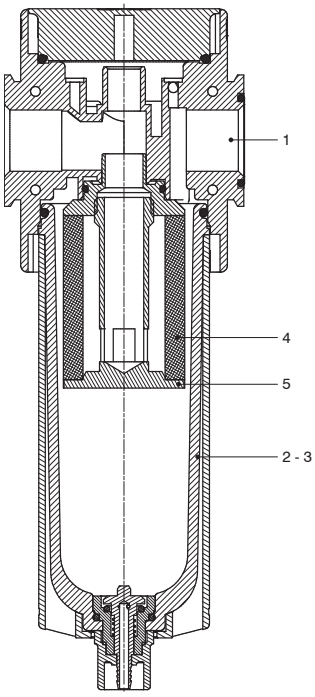
| Operational characteristics | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 | Size 1 | Size 2 | Size 3 | Size 4 |
| Condensation drain | Semi-automatic | | | | Automatic | | | |
| Maximum working pressure | 13 bar | | | | 10 bar | | | |
| | / | 20 bar (only with body and metal bowl) | | | | 16 bar (only with body and metal bowl) | | |
| Minimum working pressure | 0,5 bar | | | | | | | |
| Working temperature | -5°C...+50°C | | | | -5°C...+50°C | | | |
| | / | -30 °C ... +80 °C (only for P version and metal bowl)<br>-40 °C ... +80 °C (only for L version and metal bowl) | | | | | | |

| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Fully technopolymer version | 130 g | 224 g | 366 g | / |
| Technopolymer body version, aluminium bowl protection and technopolymer bowl | / | 251 g | 402 g | / |
| Technopolymer body version, aluminium bowl | / | 293 g | 475 g | / |
| Aluminium body version, technopolymer protection and bowl | / | 309 g | 493 g | 1197 g |
| Aluminium body version, aluminium bowl protection and technopolymer bow | / | 337 g | 529 g | 1340 g |
| Aluminium body version and aluminium bowl | / | 378 g | 603 g | 1365 g |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Materials

### Exploded sectioned

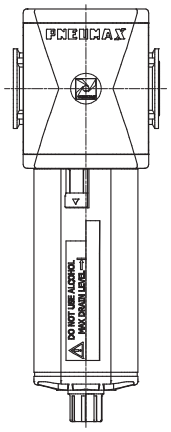



| Coalescing filter | | |
|---|---|---|
| 1 | Body | Polyamide<br>Die-cast aluminium |
| 2 | Technopolymer bowl | Polycarbonate<br>Polyamide |
| 3 | Metal bowl<br>Bowl protection | Die-cast aluminium<br>Polyamide - Die-cast aluminium |
| 4 | Filtering element | Borosilicate glass fiber |
| 5 | Filtering element support | Aluminium |

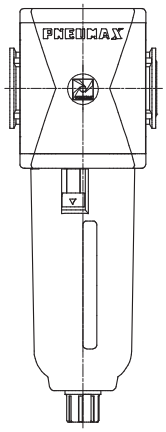


## Design

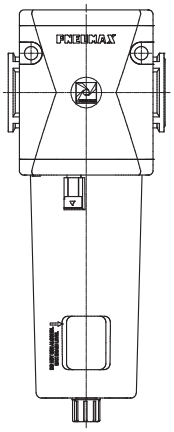
Size 1 - Size 2 - Size 3
Technopolymer protection




Size 1 - Size 2 - Size 3
Protection / Metal bowl




Size 4
All versions




**Coding:** ⓋⓉⒹⒸⓄ

| | |
|---|---|
| Ⓥ | VERSION |
| | **N** = Technopolymer body and metal inserts (not available for size 4) |
| | **T** = Technopolymer body and thread (not available for size 4) |
| | **P** = Aluminum body (not available for size 1) |
| | **L** = Aluminum body, low temperature (not available for size 1) |
| Ⓣ | SIZE AND CONNECTIONS |
| | **1A** = Size 1 - G1/8" only for N version |
| | **1B** = Size 1 - G1/4" only for T - N versions |
| | **1C** = Size 1 - 1/4" NPT only for N version |
| | **2A** = Size 2 - G1/4" only for N version |
| | **2B** = Size 2 - G3/8" for all versions |
| | **2C** = Size 2 - 3/8" NPT only for N version |
| | **3A** = Size 3 - G3/8" only for N version |
| | **3B** = Size 3 - G1/2" for all versions |
| | **3C** = Size 3 - 1/2" NPT only for N version |
| | **4B** = Size 4 - G1" only for P - L versions |

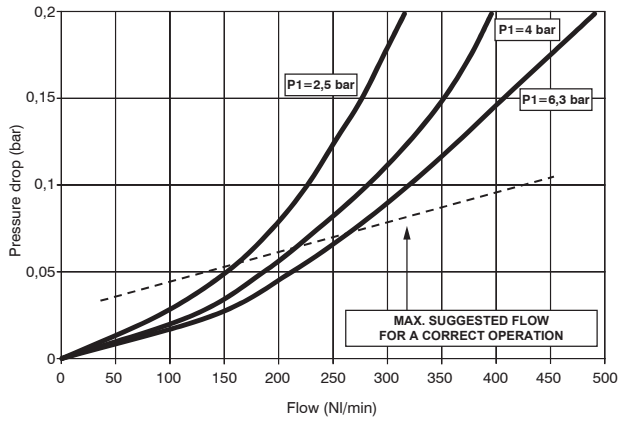
| | |
|---|---|
| Ⓒ | CONDENSATION DRAIN |
| | = Semi-automatic drain |
| | **S** = Automatic drain |
| Ⓞ | BOWL OPTIONS |
| | = Technopolymer protection - PC bowl |
| | **N** = Technopolymer protection - PA bowl |
| | **P** = Metal protection - PC bowl (not available for size 1) |
| | **R** = Metal protection - PA bowl (not available for size 1) |
| | **T** = Metal bowl (not available for size 1) |

**Example**: **T173BDAST**: Size 3 coalescing filter G1/2" 0,01 $\mu$m, automatic drain and metal bowl

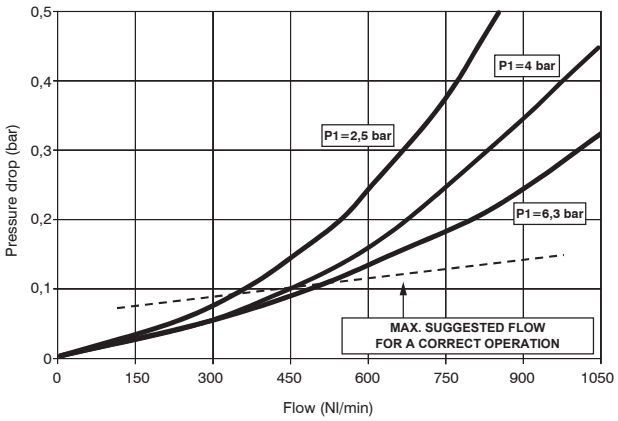
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Characteristic curves

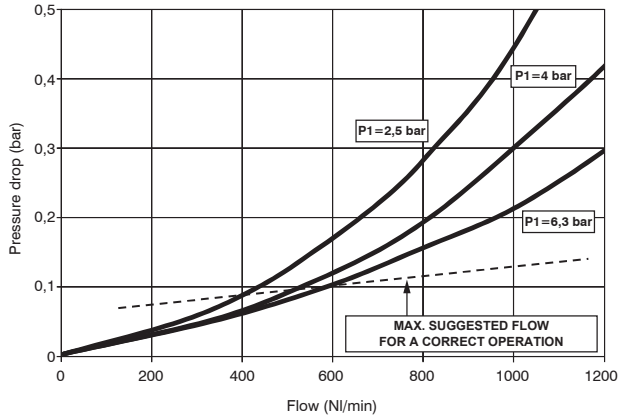
Flow rate curves, Size 1



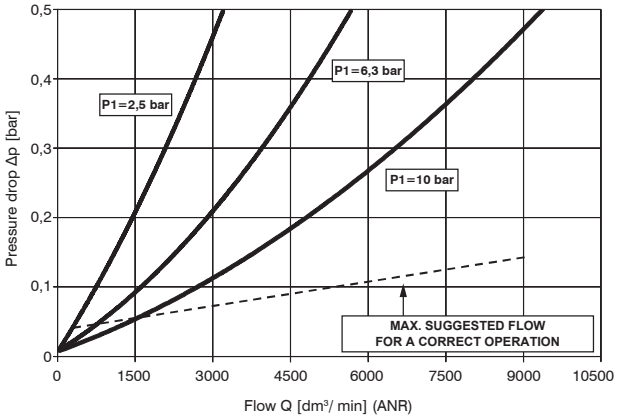

Flow rate curves, Size 2




Flow rate curves, Size 3

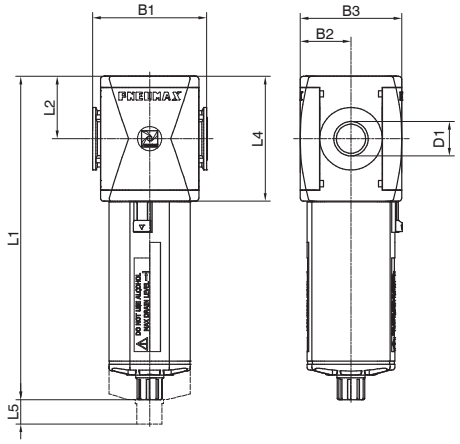



Flow rate curves, Size 4

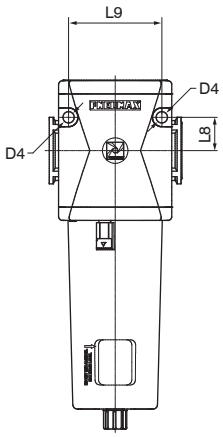



## Dimensions

Semi-automatic drain version




Fixing holes dimension detail
(only for size 4)




| Model | B1 | B2 | B3 | D1 | D4 | L1 - Bowl material | | L2 | L4 | L5 | L8 | L9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Technopolymer | Metal | | | | | |
| #171.. | 48 | 21 | 42 | G1/8"<br>G1/4"<br>1/4 NPT | / | 148 | / | 27,5 | 55 | 40 | / | / |
| #172.. | 62 | 28.5 | 57 | G1/4"<br>G3/8"<br>1/4 NPT<br>3/8 NPT | / | 169.1 | 171.5 | 34 | 68 | 50 | / | / |
| #173.. | 73 | 32.5 | 65 | G3/8"<br>G1/2"<br>1/2 NPT | / | 207.2 | 209.5 | 40 | 80 | 65 | / | / |
| #174.. | 99 | 44 | 88 | G1"<br>1 NPT | 8.5 | 262 | 264.5 | 52.5 | 105 | 103 | 25 | 70 |

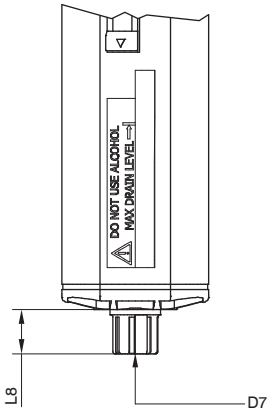




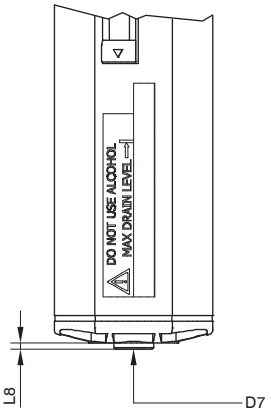
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Variable dimensions

Semi-automatic drain version




Automatic drain version

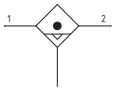



| Model | L8 - Bowl material | | D7 |
|---|---|---|---|
| | Technopolymer | Metal | |
| Semi-automatic drain | 15,7 | 18 | Plastic hose connector Ø6 |
| Automatic drain | 2 | 4,5 | G1/8" |

## Oil removal filters (DBV - DCV - DAV)



- Oil removal filter with coalescing filter element
- Available in 2 sizes with connections from 3/8" to 1"
- Particle removal up to 0,01 $\mu$m
- Oil residual 0,01 ppm
- Cartridge clogging level display:
  - green color - ok
  - red color - warning ($\Delta$p>0,5 bar)
- Bowl assembly via bayonet type quick coupling mechanism with safety button
- Automatic drain mounted as standard
- Atex certification (II 2GD or II 3GD)




### Note

In order to ensure the high level of filtration, it is recommended that a 5$\mu$ filter is installed before the coalescing filter. In order to ensure that any fluid discharged by the auto drain assembly is adequately drained away, it is recommended you use a 6mm fitting and tube



| Technical characteristics | | | |
|---|---|---|---|
| **Size** | | Size 3 | Size 4 |
| Body and connections type | | Aluminium body, integrated aluminium connections (P version) | |
| | | Technopolymer body, integrated technopolymer connections (T version) | / |
| | | Technopolymer body, metal connections (N version) | |
| Protection and bowl type | | Technopolymer protection - PA bowl | |
| | | Technopolymer protection - PC bowl | |
| | | Metal protection - PA bowl | |
| | | Metal protection - PC bowl | |
| | | Metal bowl (blind metal bowl) | |
| IN / OUT connections | T version | G1/2" | not available |
| | N version | G3/8" - G1/2" - 1/2 NPT | |
| | P version | G1/2" | G1" |
| Assembly configuration | | Stand alone | |
| | | / | Panel mounted |
| Assembly positions | | Vertical ±5° | |
| Filter pore size | | Particle removal up to 0,01 $\mu$m | |
| | | Outgoing oil residual 0,01 ppm | |
| Bowl capacity | | 30 cm³ | 90 cm³ |
| Condensation drain | | Automatic | |
| Max. fittings torque IN / OUT connections | G1" metal | / | 35Nm |
| | G1/2" metal | 30Nm | / |
| | G3/8" metal | 25Nm | |
| | G1/2" technopolymer | 22Nm | |

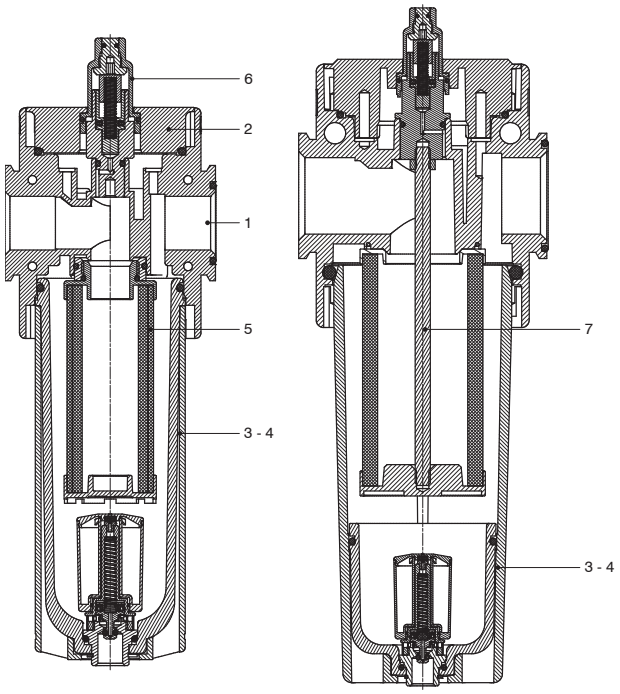
| Operational characteristics | | |
|---|---|---|
| **Size** | Size 3 | Size 4 |
| Condensation drain | Automatic | |
| Maximum working pressure | 10 bar | |
| Minimum working pressure | 0,5 bar | |
| Working temperature | -5 °C ... +50 °C | |

| Weights | | | |
|---|---|---|---|
| **Size** | Size 3<br>Standard cartridge | Size 3<br>Oversize cartridge | Size 4 |
| Fully technopolymer version | 416 g | 634 g | / |
| Technopolymer body version, aluminium bowl protection and technopolymer bowl | 453 g | 671 g | / |
| Technopolymer body version, aluminium bowl | 526 g | 742 g | / |
| Aluminium body version, technopolymer protection and bowl | 538 g | 661 g | 1230 g |
| Aluminium body version, aluminium bowl protection and technopolymer bow | 575 g | 698 g | 1374 g |
| Aluminium body version and aluminium bowl | 647 g | 769 g | 1398 g |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Materials

### Exploded sectioned

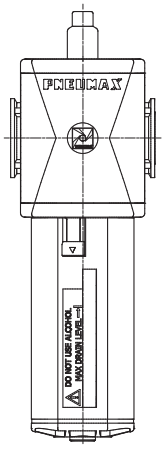



| Oil removal filter | | |
|---|---|---|
| 1 | Body | Polyamide<br>Die-cast aluminium |
| 2 | Upper plug | Polyamide |
| 3 | Technopolymer bowl | Polycarbonate<br>Polyamide |
| 4 | Metal bowl<br>Bowl protection | Die-cast aluminium<br>Polyamide - Die-cast aluminium |
| 5 | Filtering element | / |
| 6 | Visual indicator | Polycarbonate |
| 7 | Tie rod | Steel (only for size 4) |
| 8 | Automatic drain | / |

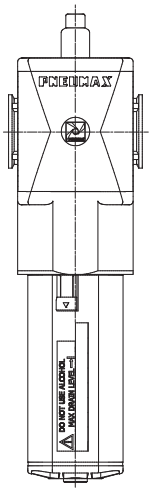


## Design

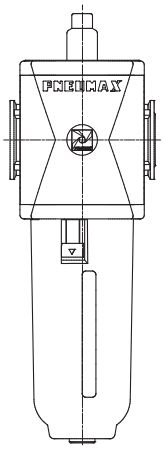
Size 3
Technopolymer protection



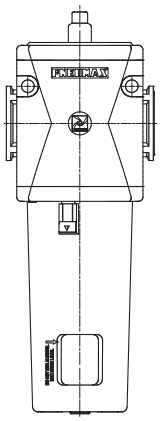
Size 3 - Oversize cartridge
Technopolymer protection



Size 3
Protection / Metal bowl



Size 4
All versions



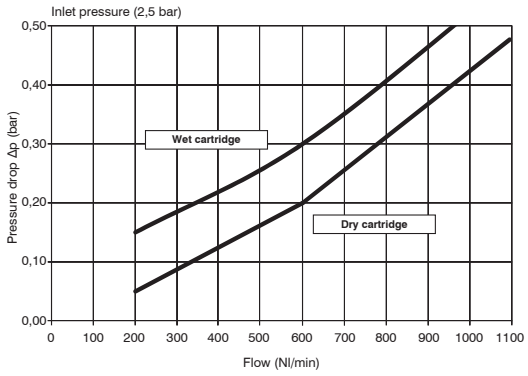
**Coding:** ⓥ17ⓉⓄ

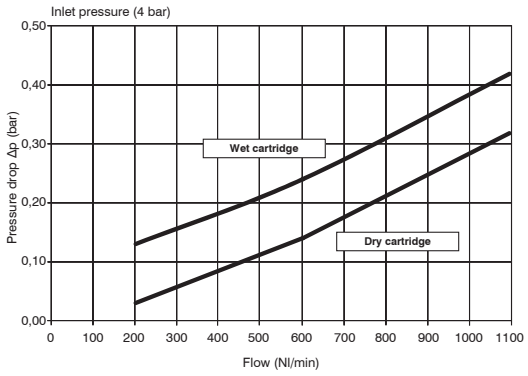
| | |
|---|---|
| ⓥ | VERSION |
| | **N** = Technopolymer body and metal inserts (not available for size 4) |
| | **T** = Technopolymer body and thread (not available for size 4) |
| | **P** = Aluminium body version |
| Ⓣ | SIZE AND CONNECTIONS |
| | **3ADBV** = Size 3 - G3/8" standard cartridge only for N version |
| | **3BDBV** = Size 3 - G1/2" standard cartridge for all versions |
| | **3CDBV** = Size 3 - 1/2" NPT standard cartridge only for N version |
| | **3BDCV** = Size 3 - G1/2" oversize cartridge only for P version |
| | **4BDAV** = Size 4 - G1" standard cartridge only for P version |
| Ⓞ | BOWL OPTIONS |
| | = Technopolymer protection - PC bowl |
| | **N** = Technopolymer protection - PA bowl |
| | **P** = Metal protection - PC bowl |
| | **R** = Metal protection - PA bowl |
| | **T** = Metal bowl |

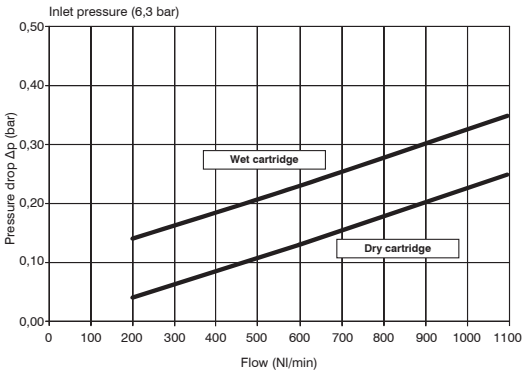
**Example**: **T173BDBVT**: Size 3 oil removal filter G1/2", standard cartridge, metal bowl

## Characteristic curves

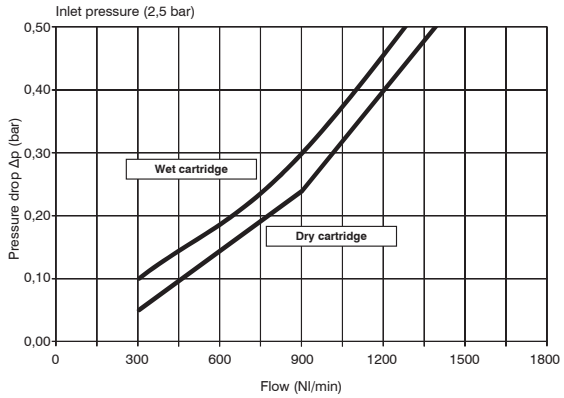
### Size 3 - Standard cartridge

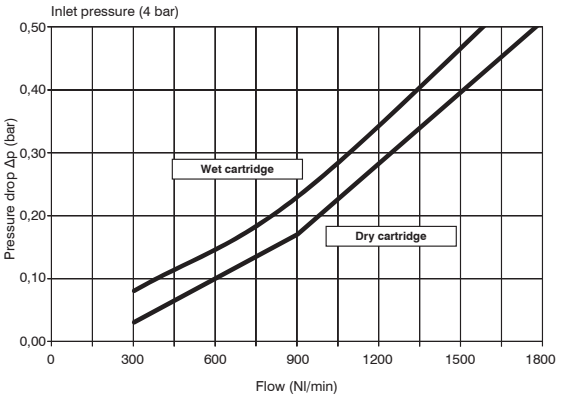


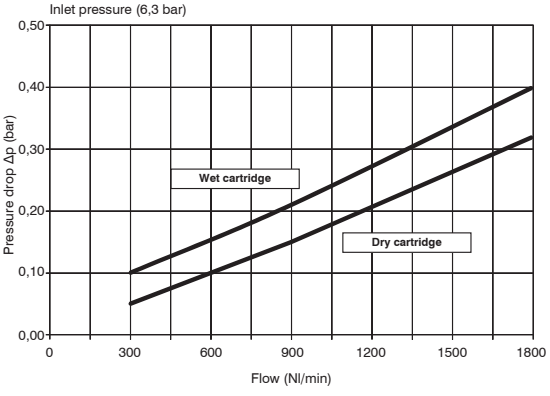




### Size 3 - Oversize cartridge



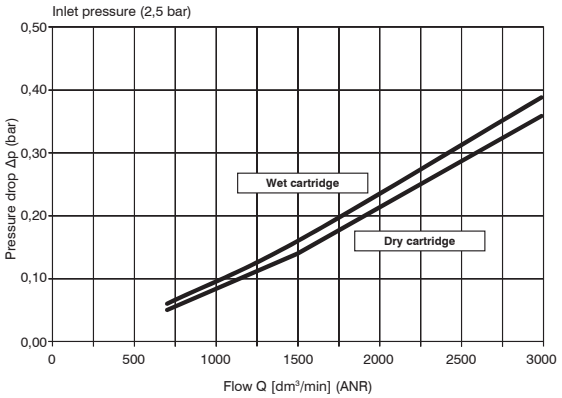



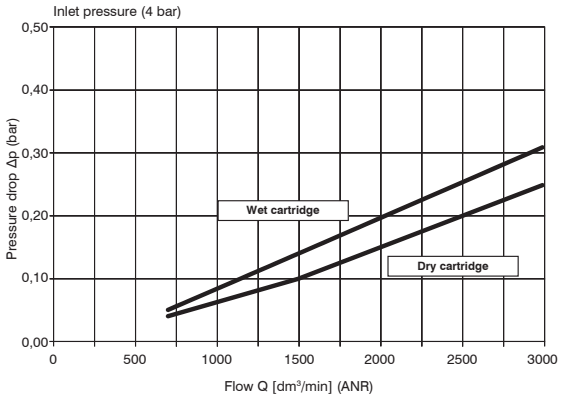


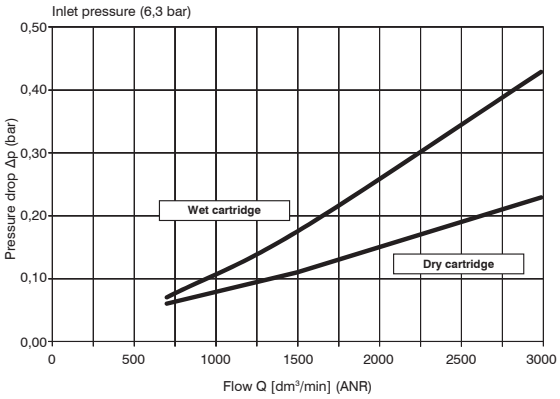


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

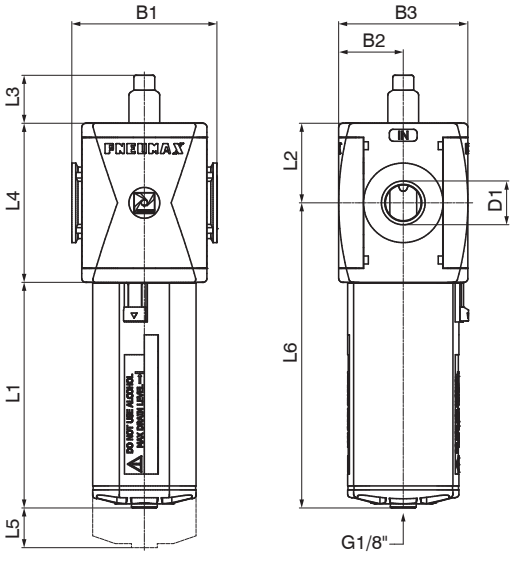
## Size 4 - Standard cartridge



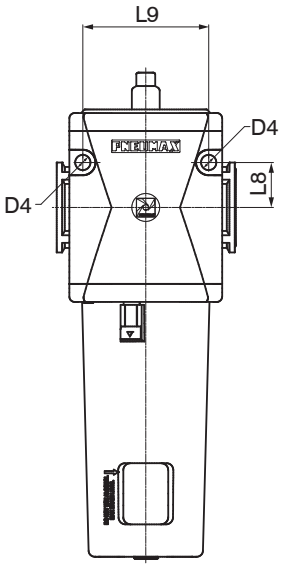




## Dimensions




Fixing holes dimension detail
(only for size 4)

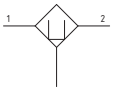



| Model | B1 | B2 | B3 | D1 | | L1 - Bowl material | | L3 | L4 | | L5 | L8 | L9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Standard cartridge | Oversize cartridge | Technopolymer | Metal | | Standard cartridge | Oversize cartridge | | | |
| #173.. | 73 | 32.5 | 65 | G3/8" G1/2" 1/2 NPT | G1/2" | 113.5 | 116 | 24.1 | 80 | 118 | 65 | / | / |
| #174.. | 99 | 44 | 88 | G1" | / | 143 | 145.5 | 22.5 | 105 | / | 103 | 25 | 70 |

## Carbon filters (DD)



- Carbon filter
- Available in 2 sizes with connections from 3/8" to 1"
- Active carbon cartridge with built in particulate filter
- Used to remove oil vapours, hydrocarbons, odours and particles
- Oil residue up to <0,003 ppm (max imput aereosol 0.01 ppm)
- High absorption capacity, with low differential pressure
- Filtering performances 99.97% (particles up to 0.01 $\mu$m)
- Bowl assembly via bayonet type quick coupling mechanism with safety button
- Semi-automatic drain
- Atex certification (II 2GD or II 3GD)
- Inlet pressures up to 20 bar




### Note

A 5$\mu$ filter, coalescing filter and oil removing filter must be installed prior to the carbon filter, this is to ensure that the carbon filter operates correctly and safe guard the life of the active carbon element. It may also be necessary to replace the carbon element at fixed intervals.



| Technical characteristics | | | |
|---|---|---|---|
| **Size** | | Size 3 | Size 4 |
| Body and connections type | | Technopolymer body, integrated technopolymer connections (T version) | / |
| | | Technopolymer body, metal connections (N version) | |
| | | Aluminium body, integrated aluminium connections (P - L versions) | |
| Protection and bowl type | | Technopolymer protection - PA bowl | |
| | | Technopolymer protection - PC bowl | |
| | | Metal protection - PA bowl | |
| | | Metal protection - PC bowl | |
| | | Metal bowl (blind metal bowl) | |
| IN / OUT connections | T version | G1/2" | not available |
| | N version | G3/8" - G1/2" - 1/2 NPT | |
| | P and L versions | G1/2" | G1" |
| Assembly configuration | | Stand alone | Panel mounted |
| Assembly positions | | Vertical ±5° | |
| Oil residue | | < 0,003 ppm (max imput aereosol 0.01 ppm) | |
| Bowl capacity | | 68 cm³ | 90 cm³ |
| Condensation drain | | Semi-automatic | |
| Max. fittings torque IN / OUT connections | G1" metal | / | 35Nm |
| | G1/2" metal | 30Nm | / |
| | G3/8" metal | 25Nm | |
| | G1/2" technopolymer | 22Nm | |

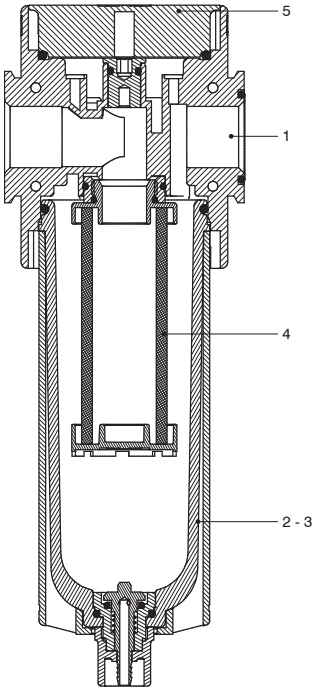
| Operational characteristics | |
|---|---|
| **Size** | Size 3 / Size 4 |
| Condensation drain | Semi-automatic |
| Maximum working pressure | 13 bar |
| | 20 bar (only with body and metal bowl) |
| Minimum working pressure | 0,5 bar |
| Working temperature | -5°C...+50°C |
| | -40°C...+80°C (only for L version and metal bowl) |
| | -30 °C ... +80 °C (only for P version and metal bowl) |
| Cartridge life | 2000 hours |

| Weights | | |
|---|---|---|
| **Size** | Size 3 | Size 4 |
| Fully technopolymer version | 395 g | / |
| Technopolymer body version, aluminium bowl protection and technopolymer bowl | 432 g | / |
| Technopolymer body version, aluminium bowl | 505 g | / |
| Aluminium body version, technopolymer protection and bowl | 518 g | 1201 g |
| Aluminium body version, aluminium bowl protection and technopolymer bow | 554 g | 1344 g |
| Aluminium body version and aluminium bowl | 628 g | 1368 g |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Materials

### Exploded sectioned

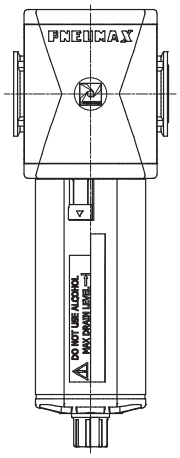



| Carbon filter | | |
|---|---|---|
| 1 | Body | Polyamide<br>Die-cast aluminium |
| 2 | Technopolymer bowl | Polycarbonate<br>Polyamide |
| 3 | Metal bowl<br>Bowl protection | Die-cast aluminium<br>Polyamide - Die-cast aluminium |
| 4 | Filtering element | Activated carbon |
| 5 | Plug | Polyamide<br>Die-cast aluminium |

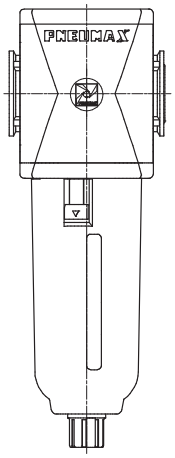


## Design

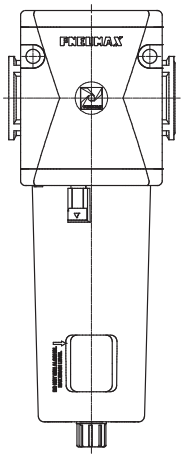
Size 3
Technopolymer protection




Size 3
Protection / Metal bowl




Size 4
All versions



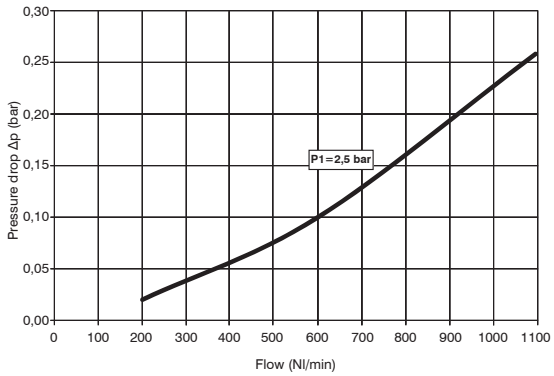

**Coding:** ⓥ17ⓉDDⓄ

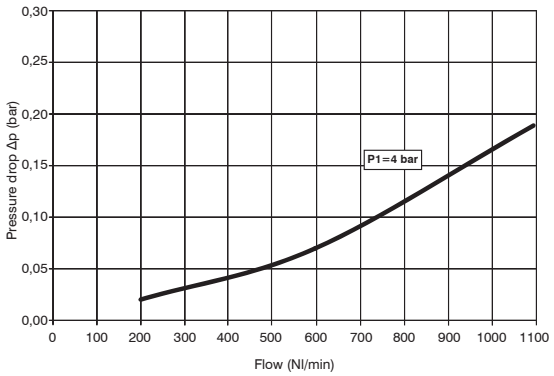
| | |
|---|---|
| ⓥ | VERSION |
| | **N** = Technopolymer body and metal inserts (not available for size 4) |
| | **T** = Technopolymer body and thread (not available for size 4) |
| | **P** = Aluminium body version |
| | **L** = Aluminium body, low temperature |
| Ⓣ | SIZE AND CONNECTIONS |
| | **3A** = Size 3 - G3/8" only for N version |
| | **3B** = Size 3 - G1/2" for all versions |
| | **3C** = Size 3 - 1/2" NPT only for N version |
| | **4B** = Size 4 - G1" only for P - L versions |
| Ⓞ | BOWL OPTIONS |
| | = Technopolymer protection - PC bowl |
| | **N** = Technopolymer protection - PA bowl |
| | **P** = Metal protection - PC bowl |
| | **R** = Metal protection - PA bowl |
| | **T** = Metal bowl |

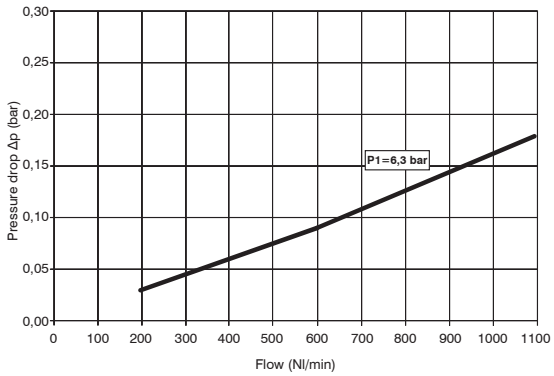
**Example**: **T173BDDT**: Size 3 carbon filter G1/2" metal bowl

## Characteristic curves

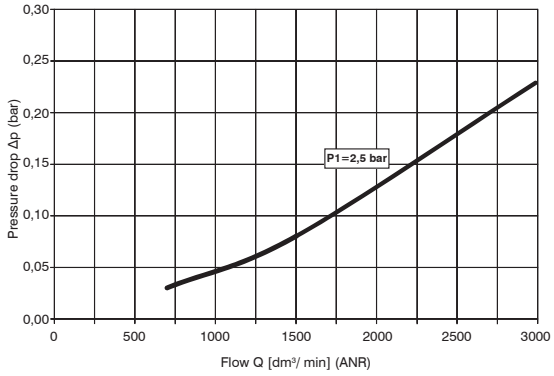
### Efficiency curves - Size 3

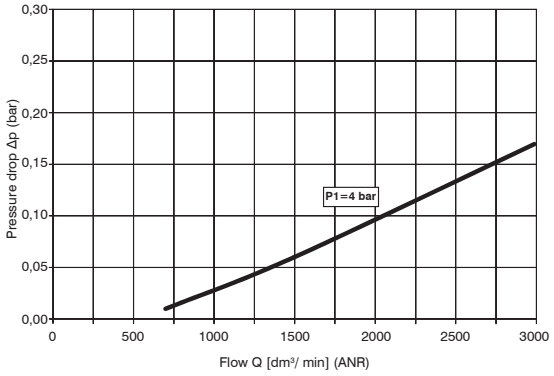


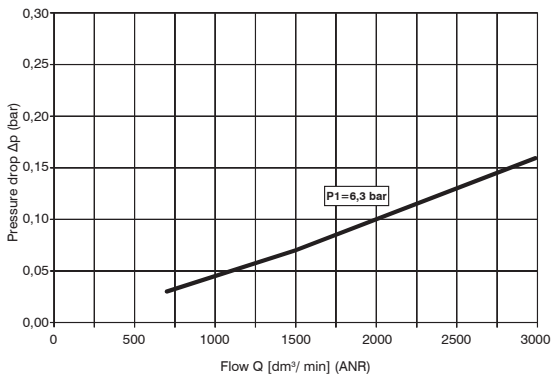




### Efficiency curves - Size 4



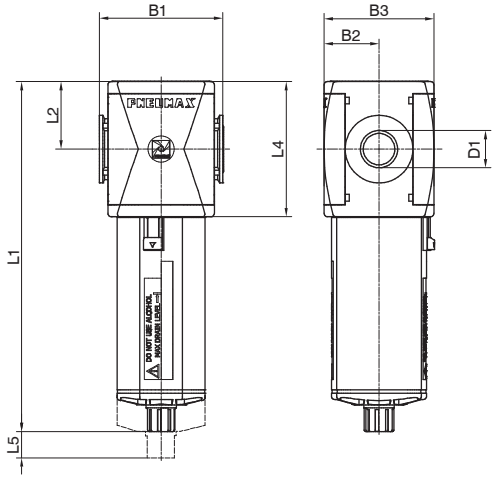





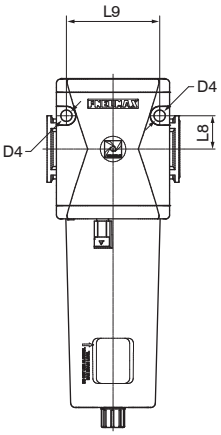
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Dimensions

Semi-automatic drain version



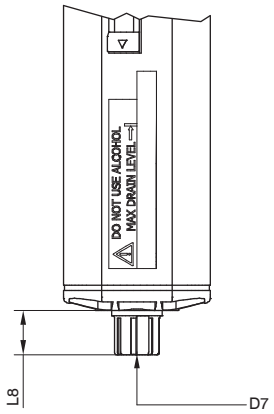

Fixing holes dimension detail
(only for size 4)




| Model | B1 | B2 | B3 | D1 | D4 | L1 - Bowl material | | L2 | L4 | L5 | L8 | L9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Technopolymer | Metal | | | | | |
| #173.. | 73 | 32,5 | 65 | G3/8"<br>G1/2"<br>1/2 NPT | / | 207,2 | 209,5 | 40 | 80 | 65 | / | / |
| #174.. | 99 | 44 | 88 | G1"<br>1 NPT | 8,5 | 262 | 264,5 | 52,5 | 105 | 103 | 25 | 70 |

## Variable dimensions

Semi-automatic drain version

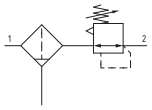


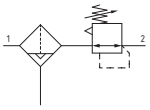

| Model | L8 - Bowl material | | D7 |
|---|---|---|---|
| | Technopolymer | Metal | |
| Semi-automatic drain | 15,7 | 18 | Plastic hose connector Ø6 |

## Filter regulators (E - EM - EW - EP - EZ)



- Filter - diaphragm pressure regulator with relieving
- Available in 4 sizes with flow rates up to 8000 Nl/min and connections from 1/8" to 1"
- Low histeresis rolling diaphragm and balanced spool
- Filtering element made of HDPE available in 3 different filtration grades (5$\mu$m, 20$\mu$m and 50$\mu$m)
- Bowl assembly via bayonet type quick coupling mechanism with safety button
- Semi-automatic or automatic drain
- Available in four pressure ranges up to 12 bar
- Fitted with panel mounting locking ring
- Available with pressure gauge or digital pressure switch integrated
- Atex certification (II 2GD or II 3GD)
- Inlet pressures up to 20 bar





### Note

For installations where a more accurate and constant pressure is required, the unit should be installed as close as possible to the point of use. In order to ensure that any fluid discharged by the auto drain assembly is adequately drained away, it is recommended you use a 6mm fitting and tube.

**Technical characteristics**

| Size | | Size 1 | Size 2 | Size 3 | Size 4 |
|---|---|---|---|---|---|
| Body and connections type | | Technopolymer body, integrated technopolymer connections (T version) | | | / |
| | | Technopolymer body, metal connections (N version) | | | |
| | | / | Aluminium body, integrated aluminium connections (P - L versions) | | |
| Protection and bowl type | | Technopolymer protection - PA bowl | | | |
| | | Technopolymer protection - PC bowl | | | |
| | | / | Metal protection - PA bowl | | |
| | | | Metal protection - PC bowl | | |
| | | | Metal bowl (blind metal bowl) | | |
| IN / OUT connections | T version | G1/4" | G3/8" | G1/2" | not available |
| | N version | G1/8" - G1/4" - 1/4 NPT | G3/8" - G1/4" - 3/8 NPT | G3/8" - G1/2" - 1/2 NPT | |
| | P and L versions | not available | G3/8" - 1/4 NPT | G1/2" - 1/2 NPT | G1" - 1 NPT |
| Assembly configuration | | Stand alone | | | |
| | | Panel mounted | | | |
| | | With fixing bracket | | | |
| | | / | | | Panel mounted |
| Assembly positions | | Vertical ±5° | | | |
| Filter pore size | | 5 $\mu$m | | | |
| | | 20 $\mu$m | | | |
| | | 50 $\mu$m | | | |
| Bowl capacity | | 18 cm$^3$ | 34 cm$^3$ | 68 cm$^3$ | 90 cm$^3$ |
| Condensation drain | | Semi-automatic | | | |
| | | Automatic | | | |
| Pressure range | | 0-2 bar | | | |
| | | 0-4 bar | | | |
| | | 0-8 bar | | | |
| | | 0-12 bar (P2 max 10 Bar in case of digital pressure switch selection) | | | |
| Regulation | | Manul push and lock with pressure | | | |
| | | Manual lockable with accessories | | | |
| Pressure measurement | | G1/8" - 1/8" NPT pressure gauge connection port (only for versions with IN / OUT NPT connections) | | | |
| | | Integrated pressure gauge (optional) | | | |
| | | Digital pressure switch (optional) | | | |
| Max. fittings torque IN / OUT connections | G1" metal | / | | / | 35Nm |
| | G1/2" metal | | | 30Nm | / |
| | G1/4" metal | 20Nm | | / | |
| | G1/8" metal | 15Nm | / | | |
| | G3/8" metal | / | 25Nm | | |
| | G1/2" technopolymer | | / | 22Nm | |
| | G1/4" technopolymer | 9Nm | | / | |
| | G3/8" technopolymer | / | 16Nm | | |
| Max.fitting torque pressure gauge connection port | | G1/8" metal: 15Nm | | | |
| | | G1/8" technopolymer: 4Nm | | | |

**Operational characteristics**

| Size | Size 1 | Size 2 | Size 3 | Size 4 | Size 1 | Size 2 | Size 3 | Size 4 |
|---|---|---|---|---|---|---|---|---|
| Condensation drain | Semi-automatic | | | | Automatic | | | |
| Maximum working pressure | 13 bar | | | | 10 bar | | | |
| | / | 20 bar (only with body and metal bowl) | | | / | 16 bar (only with body and metal bowl) | | |
| Minimum working pressure | 0,5 bar | | | | 0,5 bar | | | |
| Working temperature | -5 °C ... +50 °C | | | | -5 °C ... +50 °C | | | |
| | / | -30°C ... +80°C (only for P version and metal bowl) | | | | | | |
| | | -40°C ... +80°C (only for L version and metal bowl) | | | | | | |
| Working temperature with digital pressure switch | 0 °C ... +50 °C | | | | | | | |

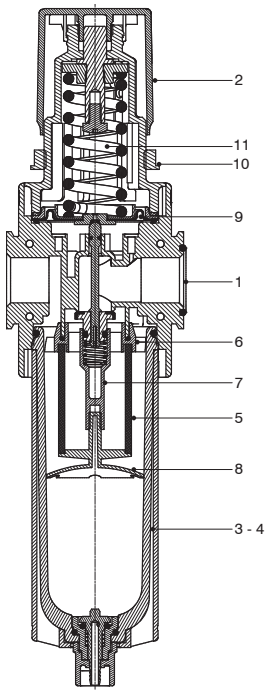


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Fully technopolymer version | 210 g | 410 g | 500 g | / |
| Technopolymer body version, aluminium bowl protection and technopolymer bowl | / | 440 g | 600 g | / |
| Technopolymer body version, aluminium bowl | / | 460 g | 660 g | / |
| Aluminium body version, technopolymer protection and bowl | / | 480 g | 710 g | 1460 g |
| Aluminium body version, aluminium bowl protection and technopolymer bow | / | 510 g | 730 g | 1600 g |
| Aluminium body version and aluminium bowl | / | 560 g | 790 g | 1620 g |

## Materials

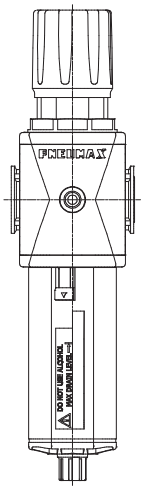
### Exploded sectioned



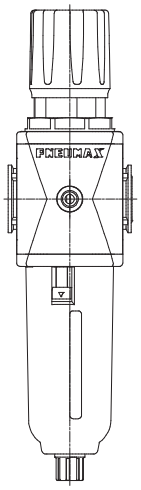

| Filter regulator | | |
|---|---|---|
| 1 | Body | Polyamide<br>Die-cast aluminium |
| 2 | Adjusting knob | Polyamide |
| 3 | Technopolymer bowl | Polycarbonate<br>Polyamide |
| 4 | Metal bowl<br>Bowl protection | Die-cast aluminium<br>Polyamide - Die-cast aluminium |
| 5 | Filtering element | Polyethylene |
| 6 | Baffle | Acetal resin |
| 7 | Spool support | Acetal resin |
| 8 | Filtering element support | Acetal resin |
| 9 | Diaphragm | NBR |
| 10 | Panel mounting locking ring | Polyamide |
| 11 | Adjusting spring | Steel |

## Design

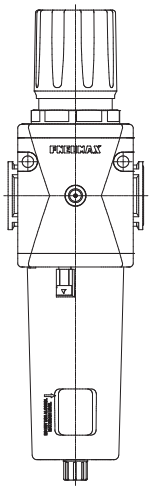
Size 1 - Size 2 - Size 3
Technopolymer protection



Size 1 - Size 2 - Size 3
Protection / Metal bowl



Size 4
All versions



**Coding:** ⓋⓉⒺⓄ[1]ⓈⓇⒸⓄ[2]Ⓞ[3]Ⓞ[4]Ⓞ[5]

| | |
|---|---|
| Ⓥ | VERSION |
| | **N** = Technopolymer body and metal inserts (not available for size 4) |
| | **T** = Technopolymer body and thread (not available for size 4) |
| | **P** = Aluminum body (not available for size 1) |
| | **L** = Aluminum body, low temperature (not available for size 1) |
| Ⓣ | SIZE AND CONNECTIONS |
| | **1A** = Size 1 - G1/8" only for N version |
| | **1B** = Size 1 - G1/4" only for T - N versions |
| | **1C** = Size 1 - 1/4" NPT only for N version |
| | **2A** = Size 2 - G1/4" only for N version |
| | **2B** = Size 2 - G3/8" for all versions |
| | **2C** = Size 2 - 3/8" NPT only for N version - 1/4" NPT only for P - L versions |
| | **3A** = Size 3 - G3/8" only for N version |
| | **3B** = Size 3 - G1/2" for all versions |
| | **3C** = Size 3 - 1/2" NPT only for N - P - L versions |
| | **4B** = Size 4 - G1" only for P - L versions |
| | **4C** = Size 4 - 1" NPT only for P - L versions |
| Ⓞ[1] | PRESSURE MEASUREMENT OPTIONS |
| | = G1/8" - 1/8" NPT thread (Only for P - L versions with metal body and NPT thread) |
| | **M** = Integrated pressure gauge (not available on NPT, size 2 and size 3 aluminum body) |
| | **W** = Integrated pressure gauge Right - Left (not available on NPT, size 2 and size 3 aluminum body) |
| | **P** = Digital pressure switch (not available on NPT, size 2 and size 3 aluminum body) |
| | **Z** = Digital pressure switch Right - Left (not available on NPT, size 2 and size 3 aluminum body) |
| Ⓢ | FILTER PORE SIZE |
| | **A** = 5 $\mu$m |
| | **B** = 20 $\mu$m |
| | **C** = 50 $\mu$m |
| Ⓡ | PRESSURE RANGE |
| | **A** = 0 - 2 bar |
| | **B** = 0 - 4 bar |
| | **C** = 0 - 8 bar |
| | **D** = 0 - 12 bar |
| Ⓒ | CONDENSATION DRAIN |
| | = Semi-automatic drain |
| | **S** = Automatic drain |
| Ⓞ[2] | RELIEVING OPTIONS |
| | = With reliving |
| | **L** = Without relieving |
| Ⓞ[3] | KNOB OPTIONS |
| | = Non-lockable version |
| | **K** = Lockable version |
| | **U** = Lockable version with universal key |
| Ⓞ[4] | DIGITAL PRESSURE SWITCH OPTIONS |
| | **A** = Cable 150 mm + M8 PNP |
| | **B** = Cable 150 mm + M8 NPN |
| | **C** = Cable 2 m PNP |
| | **D** = Cable 2 m NPN |
| Ⓞ[5] | BOWL OPTIONS |
| | = Technopolymer protection - PC bowl |
| | **N** = Technopolymer protection - PA bowl |
| | **P** = Metal protection - PC bowl (not available for size 1) |
| | **R** = Metal protection - PA bowl (not available for size 1) |
| | **T** = Metal bowl (not available for size 1) |

**Example**: **T173BEMBDST**: Size 3 filter regulator G1/2" 20 $\mu$m 0 - 12 bar, automatic drain and metal bowl

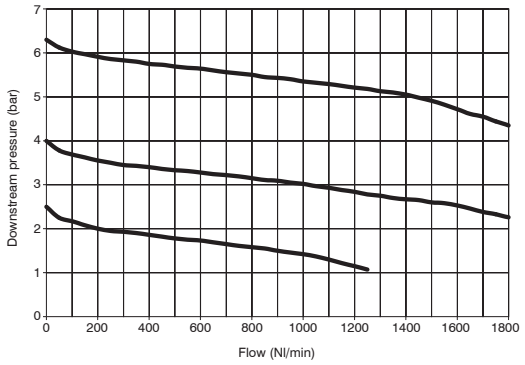


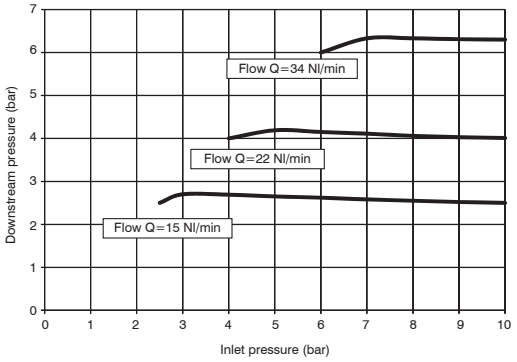

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## Characteristic curves

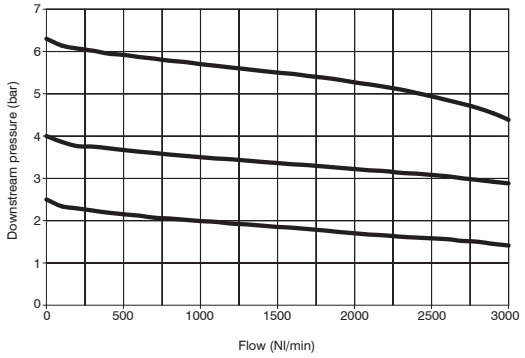
| Flow rate curves | Adjustment characteristic |
|---|---|

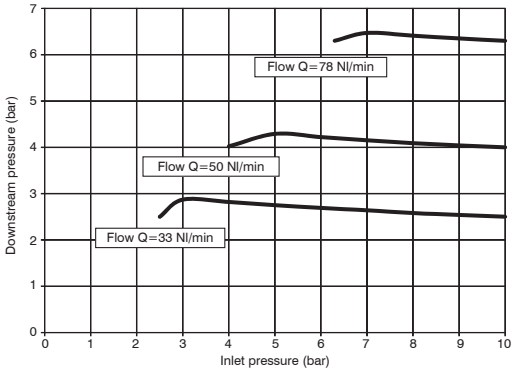
### Size 1 - G1/4", 0-8 bar, P1=7 bar



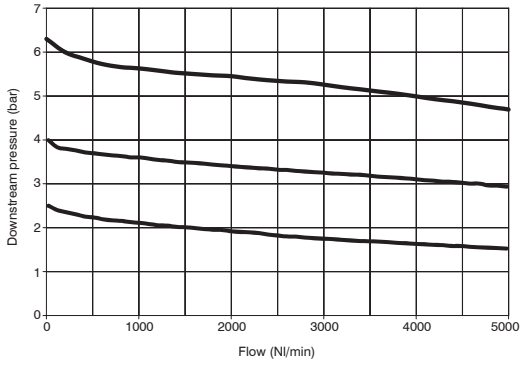



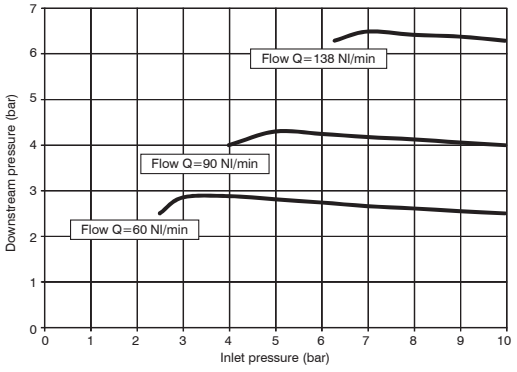

### Size 2 - G3/8", 0-8 bar, P1=7 bar



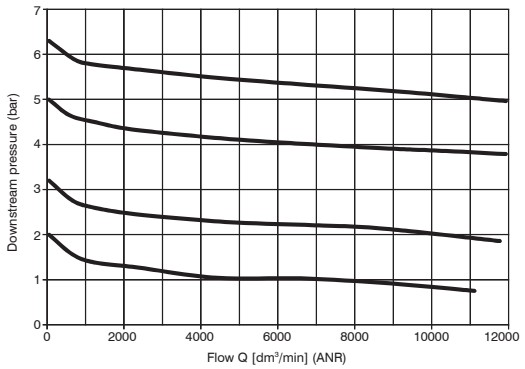



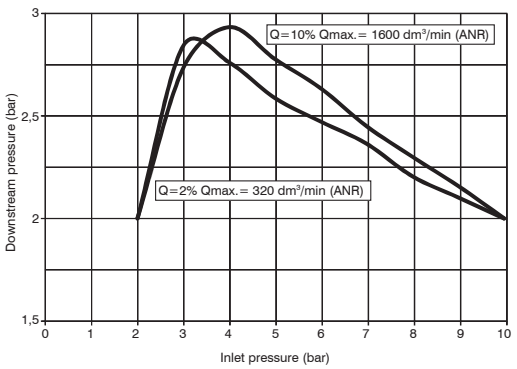

### Size 3 - G1/2", 0-8 bar, P1=7 bar



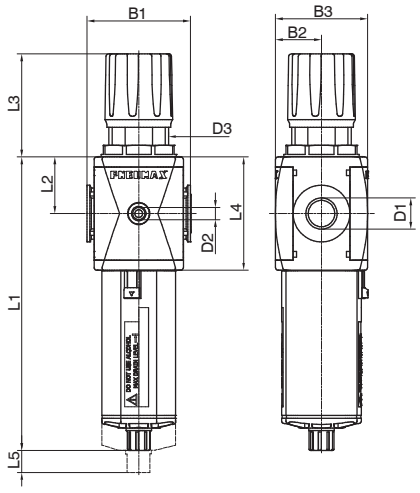

### Size 4 - G1", 0-8 bar, P1=10 bar



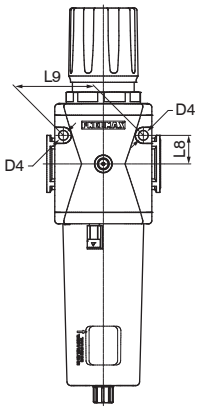



## Dimensions

Pressure gauge connection port and semi-automatic drain version




Fixing holes dimension detail (only for size 4)

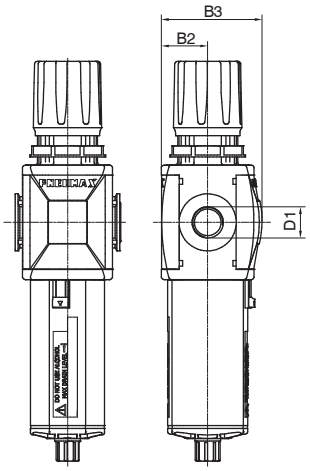



| Model | B1 | B2 | B3 | D1 | D2 | D3 | D4 | L1 - Bowl material | | L2 | L3 | L4 | L5 | L8 | L9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Technopolymer | Metal | | | | | | |
| #171... | 48 | 21 | 42 | G1/8"<br>G1/4"<br>1/4" NPT | G1/8"<br>1/8" NPT* | M30x1,5 | / | 148 | / | 27,5 | 54 | 55 | 40 | / | / |
| #172... | 62 | 28,5 | 57 | G1/4"<br>G3/8"<br>1/4" NPT<br>3/8" NPT | G1/8"<br>1/8" NPT* | M42x1,5 | / | 169.1 | 171,5 | 34 | 71,8 | 68 | 50 | / | / |
| #173... | 73 | 32,5 | 65 | G3/8"<br>G1/2"<br>1/2" NPT | G1/8"<br>1/8" NPT* | M42x1,5 | / | 207,2 | 209,5 | 40 | 72,8 | 80 | 65 | / | / |
| #174... | 99 | 44 | 88 | G1"<br>1" NPT | G1/8"<br>1/8" NPT* | M54x1,5 | 8,5 | 262 | 264,5 | 52,5 | 87,5 | 105 | 103 | 25 | 70 |

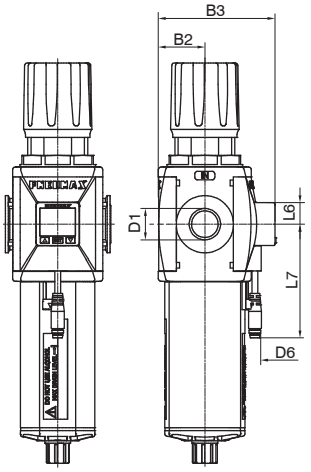
*(only for P - L versions and NPT connections)

## Variable dimensions

Integrated pressure gauge version




Integrated digital pressure switch version



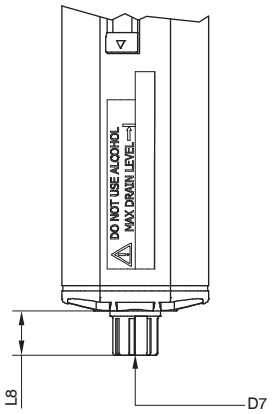

| Model | B2 | B3 | | D1 | D6 - Type of digital pressure switch | | L6 | L7 - Type of digital pressure switch | |
|---|---|---|---|---|---|---|---|---|---|
| | | With pressure gauge | With digital pressure switch | | A - B | C - D | | A - B | C - D |
| #171.. | 21 | 48,5 | 60 | G1/8"<br>G1/4"<br>1/4" NPT | M8 - 3 PIN | 3 x 0,129 mm, Ø 4 mm | 15 | 150 | 2000 |
| #172.. | 28,5 | 62,5 | 73,5 | G1/4"<br>G3/8"<br>1/4" NPT<br>3/8" NPT | | | | | |
| #173.. | 32,5 | 70,5 | 81,5 | G3/8"<br>G1/2"<br>1/2" NPT | | | | | |
| #174.. | 44 | 90,5 | 101,5 | G1"<br>1" NPT | | | | | |



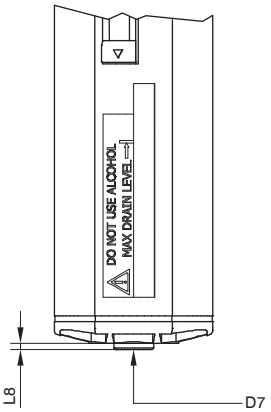
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Variable dimensions

Semi-automatic drain version




Automatic drain version




| Model | L8 - Bowl material | | D7 |
|---|---|---|---|
| | Technopolymer | Metal | |
| Semi-automatic drain | 15,7 | 18 | Plastic hose connector Ø6 |
| Automatic drain | 2 | 4,5 | G1/8" |

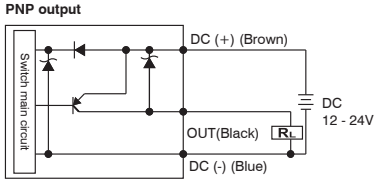
## Digital pressure switch

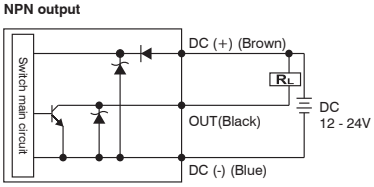


- 3 color digital LCD display, easy readout
- 4 units of measurement for pressure indication
- Optional PNP or NPN digital output
- N.O. and N.C. output contact selection directly on the digital pressure switch
- Available with M8-3PIN connector or 3 wire cable length 2 m

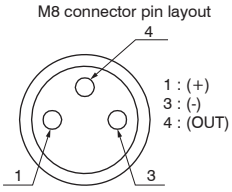


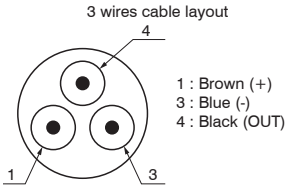
### Output circuit wiring diagrams




### Digital pressure switch layout




### Cable ordering code

**MCH1**: cable 3 wires l=2,5m with M8 connector
**MCH2**: cable 3 wires l=5m with M8 connector
**MCH3**: cable 3 wires l=10m with M8 connector




| Technical characteristics | |
|---|---|
| Pressure range and display | 0 ... 10 bar |
| Max. inlet pressure | 15 bar |
| Fluid | 40$\mu$m filtered and dehumidified air |
| Display unit of measurement | MPa - kgf/cm$^2$ - bar - psi |
| Supply voltage | 12 ... 24 VDC |
| Current consumption | ≤40mA (without load) |
| Digital output type | PNP - NPN |
| Type of contact output | Normally Open - Normally Closed |
| Max. load current | 125 mA |
| Digital output activation mode | single threshold with fixed hysteresis - window with fixed hysteresis - window without hysteresis |
| Digital output activation time | 0.05s - 0.25s - 0.5s - 1s - 2s - 3s (selections for chattering-proof options) |
| Display characteristics | Double 3 1/2 digit display<br>Digital output status indication<br>Three-pushbuttons touchpad |
| Indicator accuracy | ≤±2% full scale value ± 1 digit |
| Protection degree | IP40 |
| Working temperature | 0 °C ... 50 °C |
| Cable section | 3 x 0,129 mm$^2$, Ø4 mm, PVC |

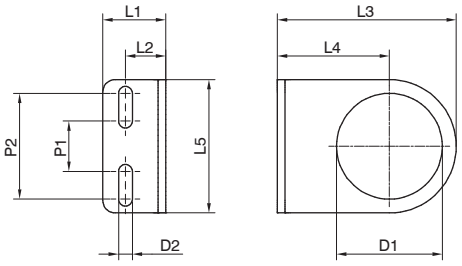

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Fixing bracket

**Coding:** Ⓣ50

| | |
|---|---|
| Ⓣ | SIZE |
| | **T171** = Size 1 |
| | **T172** = Size 2 - Size 3 |





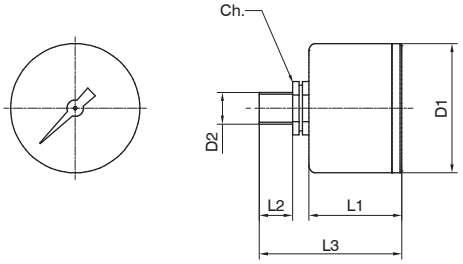

| Model | D1 | D2 | L1 | L2 | L3 | L4 | L5 | P1 | P2 |
|---|---|---|---|---|---|---|---|---|---|
| T17150 | 30 | 5.5 | 20 | 13 | 50 | 30 | 40 | 20 | 30 |
| T17250 | 42 | 5.5 | 25 | 16 | 71 | 44.5 | 53 | 20 | 42 |

## Pressure gauge

**Coding:** 17070ⓋⓈ

| | |
|---|---|
| Ⓥ | VERSION |
| | **A** = Dial Ø40 |
| | **B** = Dial Ø50 |
| Ⓢ | SCALE |
| | **A** = 0 - 4 bar |
| | **B** = 0 - 6 bar |
| | **C** = 0 - 12 bar |



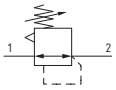



| Model | D1 | D2 | L1 | L2 | L3 | Ch |
|---|---|---|---|---|---|---|
| 17070A... | 41 | Gc - 1/8" | 26 | 10 | 44 | 14 |
| 17070B... | 49 | Gc - 1/8" | 27 | 10 | 45 | 14 |

## Regulators (R - RM - RW - RP - RZ)



- Diaphragm pressure regulator with relieving
- Available in 4 sizes with flow rates up to 8000 Nl/min and connections from 1/8" to 1"
- Low histeresis rolling diaphragm and balanced spool
- Available in four pressure ranges up to 12 bar
- Fitted with panel mounting locking ring
- Available with pressure gauge or digital pressure switch integrated
- Atex certification (II 2GD or II 3GD)
- Inlet pressures up to 20 bar




### Note

For installations where a more accurate and constant pressure is required, the unit should be installed as close as possible to the point of use.



| Technical characteristics | | | | | |
|---|---|---|---|---|---|
| **Size** | | Size 1 | Size 2 | Size 3 | Size 4 |
| Body and connections type | | Technopolymer body, integrated technopolymer connections (T version) | | | / |
| | | Technopolymer body, metal connections (N version) | | | |
| | | / | Aluminium body, integrated aluminium connections (P - L versions) | | |
| IN / OUT connections | T version | G1/4" | G3/8" | G1/2" | not available |
| | N version | G1/8" - G1/4" - 1/4 NPT | G3/8" - G1/4" - 3/8 NPT | G3/8" - G1/2" - 1/2 NPT | |
| | P and L versions | not available | G3/8" - 1/4 NPT | G1/2" - 1/2 NPT | G1" - 1 NPT |
| Assembly configuration | | Stand alone | | | |
| | | Panel mounted | | | |
| | | With fixing bracket | | | Panel mounted |
| Assembly positions | | Indifferent | | | |
| Pressure range | | 0-2 bar | | | |
| | | 0-4 bar | | | |
| | | 0-8 bar | | | |
| | | 0-12 bar (P2 max 10 Bar in case of digital pressure switch selection) | | | |
| Regulation | | Manul push and lock with pressure | | | |
| | | Manual lockable with accessories | | | |
| Pressure measurement | | G1/8" - 1/8" NPT pressure gauge connection port (only for versions with IN / OUT NPT connections) | | | |
| | | Integrated pressure gauge (optional) | | | |
| | | Digital pressure switch (optional) | | | |
| Max. fittings torque IN / OUT connections | G1" metal | / | | / | 35Nm |
| | G1/2" metal | | | 30Nm | / |
| | G1/4" metal | 20Nm | | / | |
| | G1/8" metal | 15Nm | / | | |
| | G3/8" metal | / | 25Nm | | |
| | G1/2" technopolymer | | / | 22Nm | |
| | G1/4" technopolymer | 9Nm | | / | |
| | G3/8" technopolymer | / | 16Nm | | |
| Max.fitting torque pressure gauge connection port | | 15Nm | | | |
| | | 4Nm | | | |

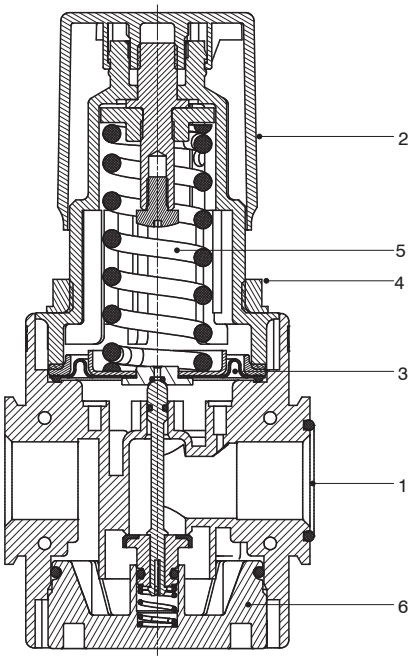
| Operational characteristics | | | | | |
|---|---|---|---|---|---|
| **Size** | | Size 1 | Size 2 | Size 3 | Size 4 |
| Maximum working pressure | | 13 bar | | | |
| | | / | 20 bar (only for P - L versions) | | |
| Minimum working pressure | | 0,5 bar | | | |
| Working temperature | | -5°C...+50°C | | | |
| | | / | -30°C ... +80°C (only for P version) | | |
| | | / | -40°C ... +80°C (only for L version) | | |
| Working temperature with digital pressure switch | | 0°C...+50°C | | | |

| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Technopolymer body version | 150 g | 310 g | 390 g | / |
| Aluminium body version | / | 400 g | 560 g | 1260 g |


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## Materials

### Exploded sectioned

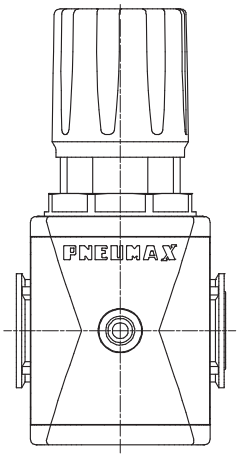



| Regulator | | |
|---|---|---|
| 1 | Body | Polyamide<br>Die-cast aluminium |
| 2 | Adjusting knob | Polyamide |
| 3 | Diaphragm | NBR |
| 4 | Panel mounting locking ring | Polyamide |
| 5 | Adjusting spring | Steel |
| 6 | Rear end cap | Polyamide<br>Die-cast aluminium |

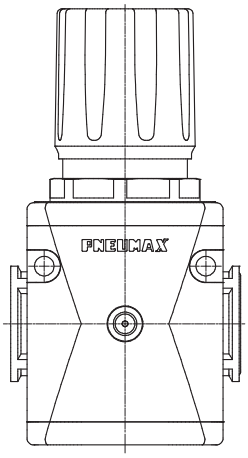


## Design

Size 1 - Size 2 - Size 3




All versions
Size 4




**Coding:** ⓋⓋ17ⓉⓇⓄ¹ⓇⓄ²Ⓞ³Ⓞ⁴

| | |
|---|---|
| Ⓥ | VERSION |
| | **N** = Technopolymer body and metal inserts (not available for size 4) |
| | **T** = Technopolymer body and thread (not available for size 4) |
| | **P** = Aluminum body (not available for size 1) |
| | **L** = Aluminum body, low temperature (not available for size 1) |
| Ⓣ | SIZE AND CONNECTIONS |
| | **1A** = Size 1 - G1/8" only for N version |
| | **1B** = Size 1 - G1/4" only for T - N versions |
| | **1C** = Size 1 - 1/4" NPT only for N version |
| | **2A** = Size 2 - G1/4" only for N version |
| | **2B** = Size 2 - G3/8" for all versions |
| | **2C** = Size 2 - 3/8" NPT only for N version - 1/4" NPT only for P - L versions |
| | **3A** = Size 3 - G3/8" only for N version |
| | **3B** = Size 3 - G1/2" for all versions |
| | **3C** = Size 3 - 1/2" NPT only for N - P - L versions |
| | **4B** = Size 4 - G1" only for P - L versions |
| | **4C** = Size 4 - 1" NPT only for P - L versions |
| Ⓞ¹ | PRESSURE MEASUREMENT OPTIONS |
| | = G1/8" - 1/8" NPT thread (Only for P - L versions with metal body and NPT thread) |
| | **M** = Integrated pressure gauge (not available on NPT, size 2 and size 3 aluminum body) |
| | **W** = Integrated pressure gauge Right - Left (not available on NPT, size 2 and size 3 aluminum body) |
| | **P** = Digital pressure switch (not available on NPT, size 2 and size 3 aluminum body) |
| | **Z** = Digital pressure switch Right - Left (not available on NPT, size 2 and size 3 aluminum body) |

| | |
|---|---|
| Ⓡ | PRESSURE RANGE |
| | **A** = 0 - 2 bar |
| | **B** = 0 - 4 bar |
| | **C** = 0 - 8 bar |
| | **D** = 0 - 12 bar |
| Ⓞ² | RELIEVING OPTIONS |
| | = With reliving |
| | **F** = Controlled refiel and improved relieving (not available for size 4) |
| | **L** = Without relieving |
| | **R** = Improved relieving |
| Ⓞ³ | KNOB OPTIONS |
| | = Non-lockable version |
| | **K** = Lockable version |
| | **U** = Lockable version with universal key |
| Ⓞ⁴ | DIGITAL PRESSURE SWITCH OPTIONS |
| | **A** = Cable 150 mm + M8 PNP |
| | **B** = Cable 150 mm + M8 NPN |
| | **C** = Cable 2 m PNP |
| | **D** = Cable 2 m NPN |

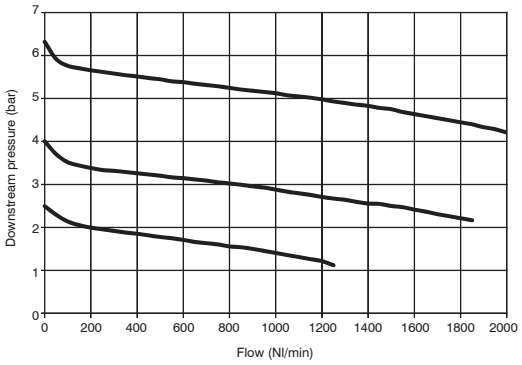
**Example**: **T173BRMD**: Size 3 regulator G1/2" 0 - 12 bar

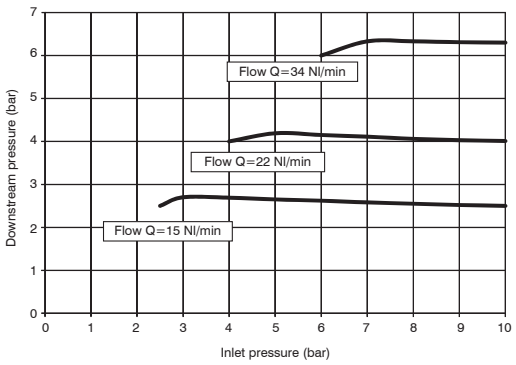
## Characteristic curves

### Flow rate curves

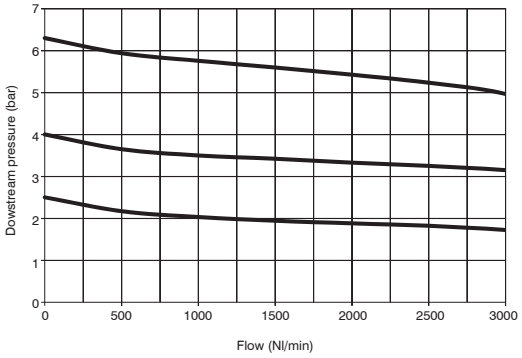
### Adjustment characteristic

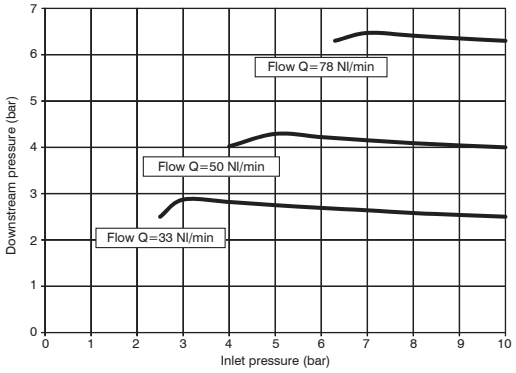
#### Size 1 - G1/4", 0-8 bar, P1=7 bar



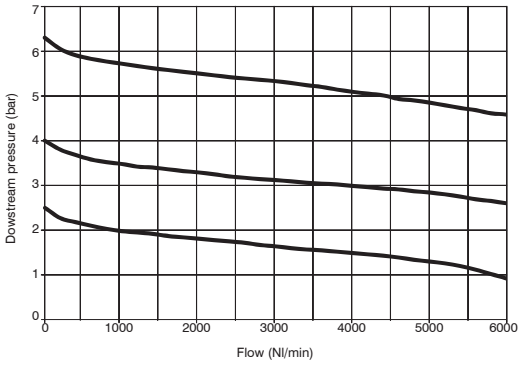



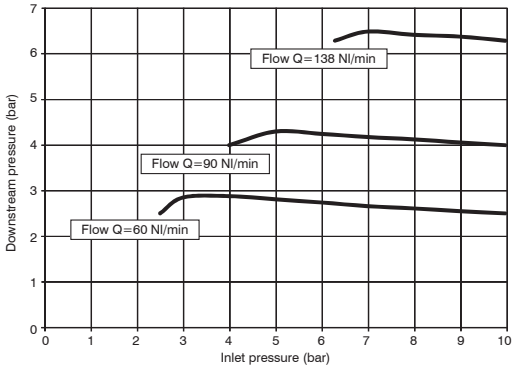

#### Size 2 - G3/8", 0-8 bar, P1=7 bar



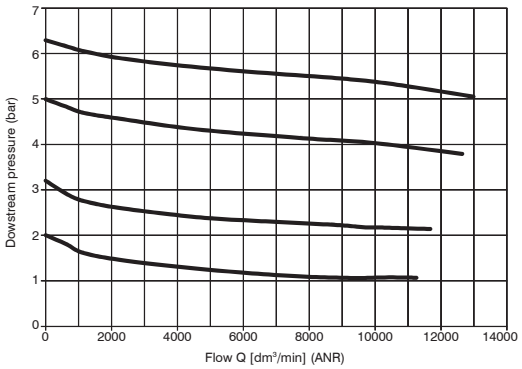



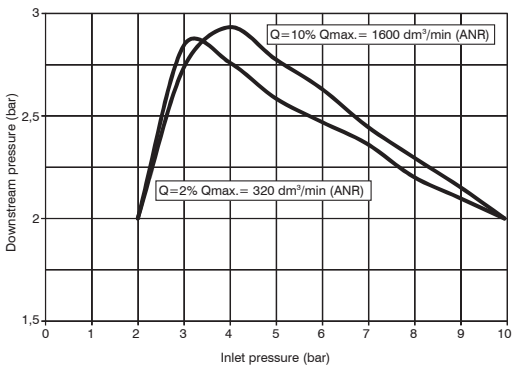

#### Size 3 - G1/2", 0-8 bar, P1=7 bar




#### Size 4 - G1", 0-8 bar, P1=10 bar



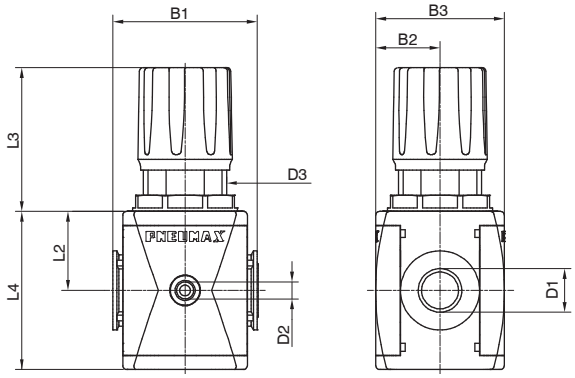





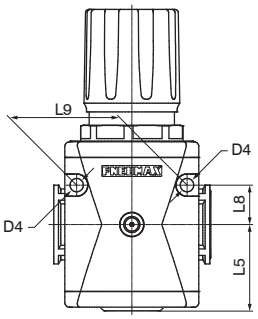

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## Dimensions

Pressure gauge connection port version




Fixing holes dimension detail
(only for size 4)

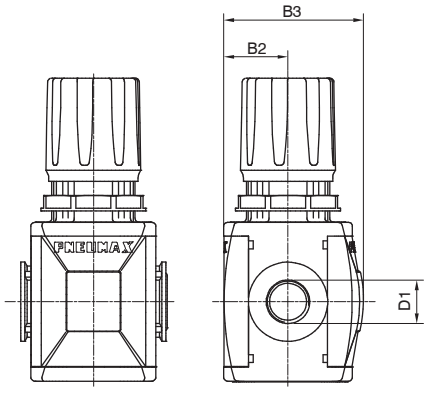



| Model | B1 | B2 | B3 | D1 | D2 | D3 | D4 | L2 | L3 | L4 | L5 | L8 | L9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #171.. | 48 | 21 | 42 | G1/8"<br>G1/4"<br>1/4 NPT | G1/8"<br>1/8 NPT * | M30x1,5 | / | 27,5 | 54 | 55 | / | / | / |
| #172.. | 62 | 28.5 | 57 | G1/4"<br>G3/8"<br>1/4 NPT<br>3/8 NPT | G1/8"<br>1/8 NPT * | M42x1,5 | / | 34 | 71.8 | 68 | / | / | / |
| #173.. | 73 | 32.5 | 65 | G3/8"<br>G1/2"<br>1/2 NPT | G1/8"<br>1/8 NPT * | M42x1,5 | / | 40 | 72.8 | 80 | / | / | / |
| #174.. | 99 | 44 | 88 | G1"<br>1 NPT | G1/8"<br>1/8 NPT * | M54x1,5 | 8.5 | 52.5 | 87.5 | 105 | 54.5 | 25 | 70 |

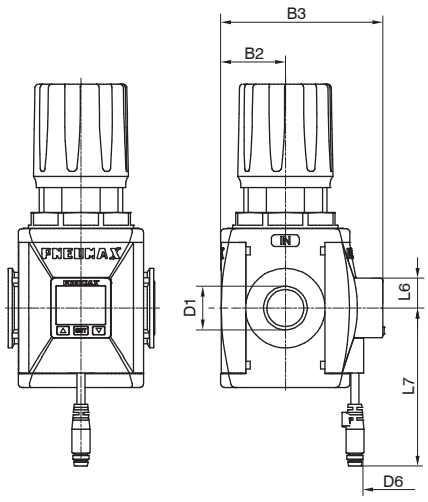
*(only for P - L versions and NPT connections)

## Variable dimensions

Integrated pressure gauge version




Integrated digital pressure switch version




| Model | B2 | B3 | | D1 | D6 - Type of digital pressure switch | | L6 | L7 - Type of digital pressure switch | |
|---|---|---|---|---|---|---|---|---|---|
| | | With pressure gauge | With digital pressure switch | | A - B | C - D | | A - B | C - D |
| #171.. | 21 | 48,5 | 60 | G1/8"<br>G1/4"<br>1/4" NPT | M8 - 3 PIN | 3 x 0,129 mm, Ø 4 mm | 15 | 150 | 2000 |
| #172.. | 28,5 | 62,5 | 73,5 | G1/4"<br>G3/8"<br>1/4" NPT<br>3/8" NPT | | | | | |
| #173.. | 32,5 | 70,5 | 81,5 | G3/8"<br>G1/2"<br>1/2" NPT | | | | | |
| #174.. | 44 | 90,5 | 101,5 | G1"<br>1" NPT | | | | | |



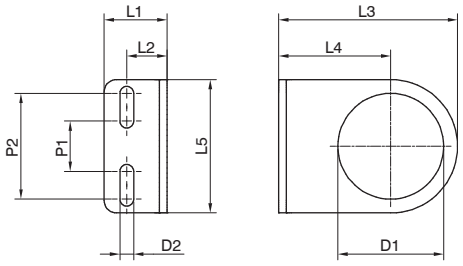
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Fixing bracket

**Coding:** Ⓣ50

| | |
|---|---|
| Ⓣ | SIZE |
| | **T171** = Size 1 |
| | **T172** = Size 2 - Size 3 |





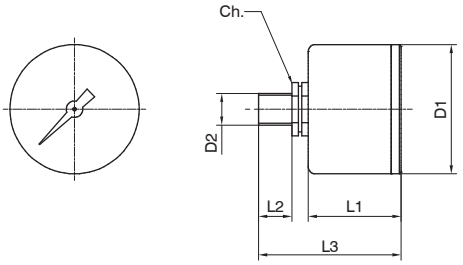

| Model | D1 | D2 | L1 | L2 | L3 | L4 | L5 | P1 | P2 |
|---|---|---|---|---|---|---|---|---|---|
| T17150 | 30 | 5.5 | 20 | 13 | 50 | 30 | 40 | 20 | 30 |
| T17250 | 42 | 5.5 | 25 | 16 | 71 | 44.5 | 53 | 20 | 42 |

## Pressure gauge

**Coding:** 17070ⓋⓈ

| | |
|---|---|
| Ⓥ | VERSION |
| | **A** = Dial Ø40 |
| | **B** = Dial Ø50 |
| Ⓢ | SCALE |
| | **A** = 0 - 4 bar |
| | **B** = 0 - 6 bar |
| | **C** = 0 - 12 bar |






| Model | D1 | D2 | L1 | L2 | L3 | Ch |
|---|---|---|---|---|---|---|
| 17070A... | 41 | Gc - 1/8" | 26 | 10 | 44 | 14 |
| 17070B... | 49 | Gc - 1/8" | 27 | 10 | 45 | 14 |

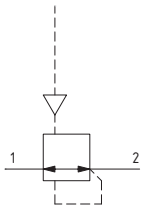


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Piloted pressure regulators (RP - RMP - RPP)



- Piston piloted pressure regulator
- Available with pressure gauge or digital pressure switch integrated
- Atex certification (II 2GD or II 3GD)
- Inlet pressures up to 20 bar




**Note**
Always regulate the rising pressure.

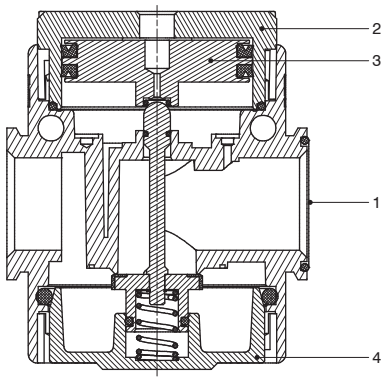
| Technical characteristics | |
|---|---|
| **Size** | Size 4 |
| Body and connections type | Aluminium body, integrated aluminium connections |
| IN / OUT connections | G1" - 1 NPT |
| Assembly configuration | Stand alone |
| | Panel mounted |
| Assembly positions | Indifferent |
| Pressure range | 0,5...10 bar |
| Regulation | Pneumatic piloting |
| Pressure measurement | G1/8" - 1/8" NPT pressure gauge connection port (only for versions with IN / OUT NPT connections) |
| | Integrated pressure gauge (optional) |
| | Digital pressure switch (optional) |
| Max. fittings torque IN / OUT connections | G1"metal: 35Nm |
| Max.fitting torque pressure gauge connection port | G1/8" metal: 15Nm |

| Operational characteristics | |
|---|---|
| **Size** | Size 4 |
| Maximum working pressure | 20 bar |
| Minimum working pressure | 0,5 bar |
| Pilot pressure range | 0,5...10 bar |
| Working temperature | -30°C...+80°C |
| Working temperature with digital pressure switch | 0°C...+50°C |

| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Pneumatic pilot aluminum body version | / | / | / | 1190 g |

## Materials

### Exploded sectioned

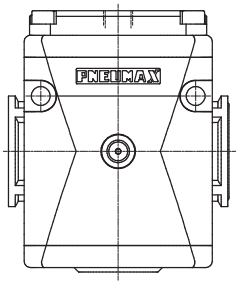



| Piloted pressure regulator | | |
|---|---|---|
| 1 | Body | Die-cast aluminium |
| 2 | Piloting operator | Aluminium |
| 3 | Piston | Aluminium |
| 4 | Rear end cap | Die-cast aluminium |

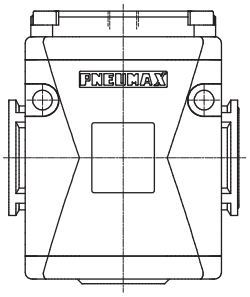


## Design

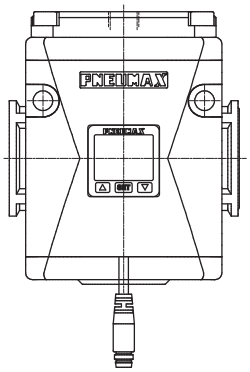
Version with
G1/8" pressure gauge



Version with
Integrated digital pressure switch



Version with
Integrated pressure gauge



**Coding:** ⓥ17ⓉRⓄ¹Ⓞ²P

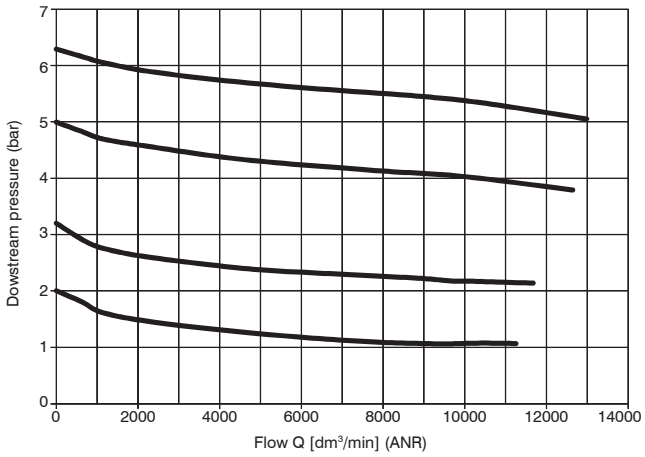
| | |
|---|---|
| ⓥ | VERSION |
| | **P** = Aluminium body version |
| Ⓣ | SIZE AND CONNECTIONS |
| | **4B** = Size 4 - G1” |
| | **4C** = Size 4 - 1 NPT |
| Ⓞ¹ | PRESSURE MEASUREMENT OPTIONS |
| | = G1/8” - 1/8 NPT thread (Only for version with NPT thread) |
| | **M** = Integrated pressure gauge |
| | **W** = Integrated pressure gauge Right - Left |
| | **P** = Digital pressure switch |
| | **Z** = Digital pressure switch Right - Left |
| Ⓞ² | DIGITAL PRESSURE SWITCH OPTIONS |
| | **A** = Cable 150 mm + M8 PNP |
| | **B** = Cable 150 mm + M8 NPN |
| | **C** = Cable 2 m PNP |
| | **D** = Cable 2 m NPN |

**Example**: **P174BRMP**: Size 4 piloted pressure regulator G1”, integrated pressure gauge


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

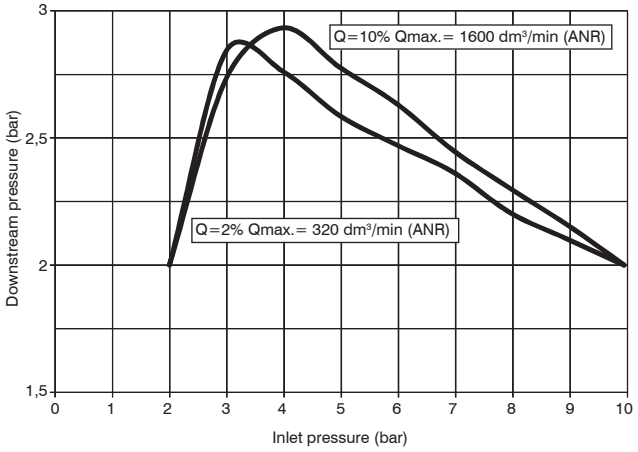
## Characteristic curves

### Flow rate curves

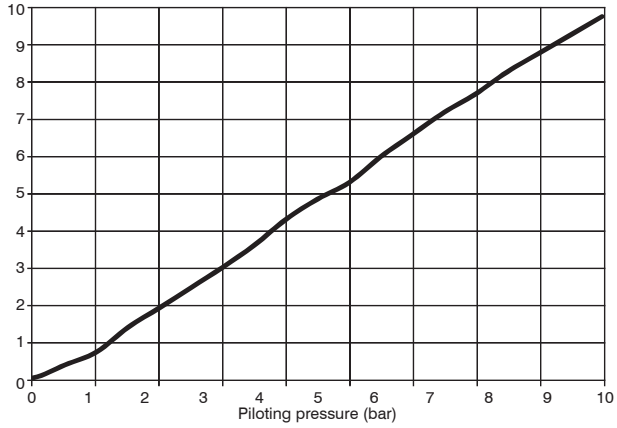



### Adjustment characteristic

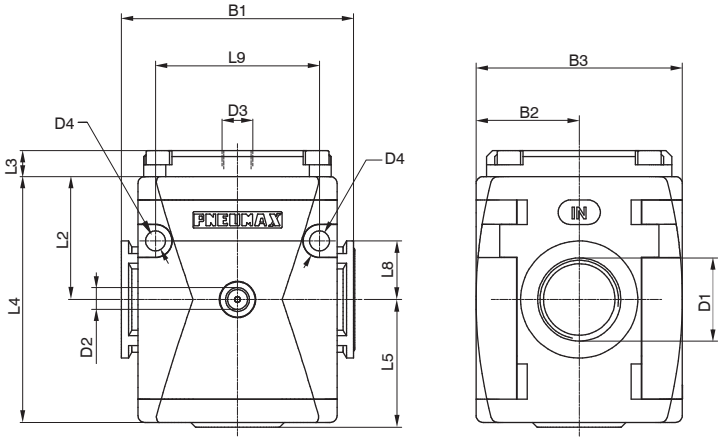
**Size 4 - G1", P1=10 bar**




## Piloting curves



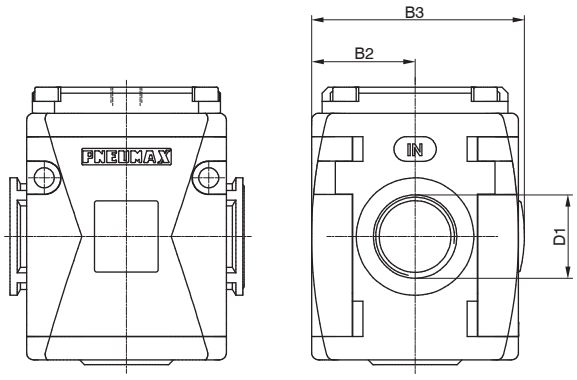

## Dimensions



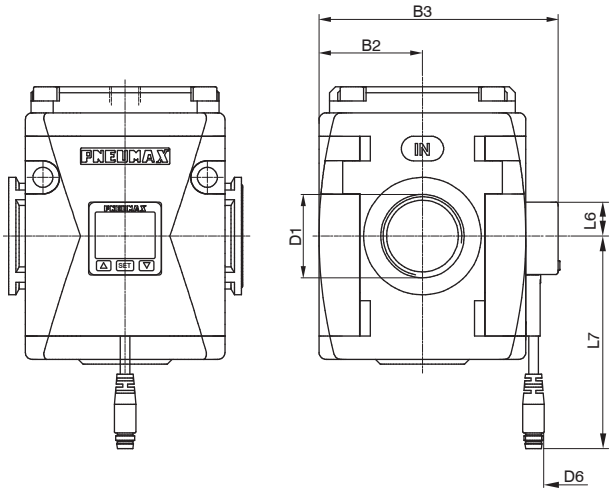

| Model | B1 | B2 | B3 | D1 | D2 | D3 | D4 | L2 | L3 | L4 | L5 | L8 | L9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #174.. | 99 | 44 | 90 | G1" 1 NPT | G1/8" 1/8 NPT | G1/4" | 8.5 | 52.5 | 11 | 105 | 54.5 | 25 | 70 |

## Variable dimensions

Integrated pressure gauge version




Integrated digital pressure switch version




| Model | B2 | B3 | | D1 | D6 - Type of digital pressure switch | | L6 | L7 - Type of digital pressure switch | |
|---|---|---|---|---|---|---|---|---|---|
| | | With pressure gauge | With digital pressure switch | | A-B | C-D | | A-B | C-D |
| #174.. | 44 | 90 | 101,5 | G1" 1 NPT | M8 - 3 PIN | 3 x 0,129 mm, Ø4 mm | 15 | 150 | 2000 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

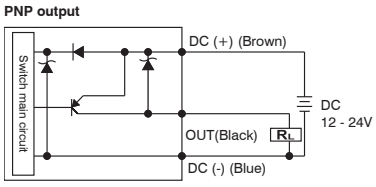
## Digital pressure switch

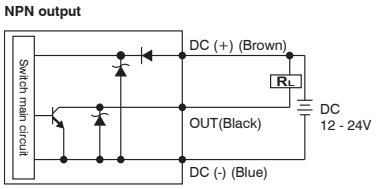


- 3 color digital LCD display, easy readout
- 4 units of measurement for pressure indication
- Optional PNP or NPN digital output
- N.O. and N.C. output contact selection directly on the digital pressure switch
- Available with M8-3PIN connector or 3 wire cable length 2 m

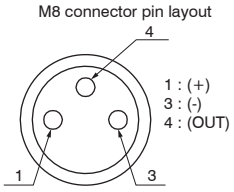


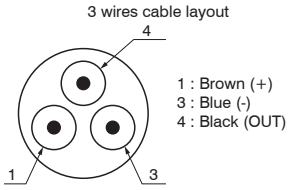
### Output circuit wiring diagrams




### Digital pressure switch layout




### Cable ordering code

**MCH1**: cable 3 wires l=2,5m with M8 connector
**MCH2**: cable 3 wires l=5m with M8 connector
**MCH3**: cable 3 wires l=10m with M8 connector

Connector

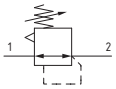



| Technical characteristics | |
|---|---|
| Pressure range and display | 0 ... 10 bar |
| Max. inlet pressure | 15 bar |
| Fluid | 40$\mu$m filtered and dehumidified air |
| Display unit of measurement | MPa - kgf/cm$^2$ - bar - psi |
| Supply voltage | 12 ... 24 VDC |
| Current consumption | ≤40mA (without load) |
| Digital output type | PNP - NPN |
| Type of contact output | Normally Open - Normally Closed |
| Max. load current | 125 mA |
| Digital output activation mode | single threshold with fixed hysteresis - window with fixed hysteresis - window without hysteresis |
| Digital output activation time | 0.05s - 0.25s - 0.5s - 1s - 2s - 3s (selections for chattering-proof options) |
| Display characteristics | Double 3 1/2 digit display<br>Digital output status indication<br>Three-pushbuttons touchpad |
| Indicator accuracy | ≤±2% full scale value ± 1 digit |
| Protection degree | IP40 |
| Working temperature | 0 °C ... 50 °C |
| Cable section | 3 x 0,129 mm$^2$, Ø4 mm, PVC |

## Pressure regulators for manifold (B - M - P)



- Diaphragm pressure regulator with relieving
- Available with 2 front outputs connections G1/8 " or with 1 front output and integrated pressure gauge on the opposite side
- Low histeresis rolling diaphragm and balanced spool
- Available in four pressure ranges up to 12 bar
- Fitted with panel mounting locking ring
- Available with integrated pressure gauge or digital pressure switch
- Air supply can be applied by both directions (Right or Left)
- Max. 6 off pressure regulators in manifold configuration
- Atex certification (II 3GD)




**Note**

For installations where a more accurate and constant pressure is required, the unit should be installed as close as possible to the point of use.

| Technical characteristics | | |
|---|---|---|
| **Size** | | Size 1 |
| Body and connections type | | Technopolymer body, integrated technopolymer connections (T version)<br>Technopolymer body, metal connections (N version) |
| IN connections | T version | G1/4" |
| | N version | G1/8" - G1/4" - 1/4" NPT |
| OUT connections | | G1/8" |
| Assembly configuration | | Stand alone |
| | | Panel mounted |
| | | With fixing bracket |
| Assembly positions | | Indifferent |
| Pressure range | | 0-2 bar |
| | | 0-4 bar |
| | | 0-8 bar |
| | | 0-12 bar |
| Regulation | | Manul push and lock with pressure |
| | | Manual lockable with accessories |
| Pressure measurement | | G1/8" pressure gauge connection port |
| | | Integrated pressure gauge (optional) |
| | | Digital pressure switch (optional) |
| Max. fittings torque IN / OUT connections | | G1/8" metal: 15Nm<br>G1/4" metal: 20Nm<br>G1/4" technopolymer: 9Nm |
| Max.fitting torque pressure gauge connection port | | G1/8" technopolymer: 4 Nm<br>G1/8" metal: 15Nm |

| Operational characteristics | |
|---|---|
| **Size** | Size 1 |
| Maximum working pressure | 13 bar |
| Minimum working pressure | 0,5 bar |
| Working temperature | -5°C...+50°C |
| Working temperature with digital pressure switch | 0°C...+50°C |

| Weights | |
|---|---|
| **Size** | Size 1 |
| Technopolymer body version | 140 g |

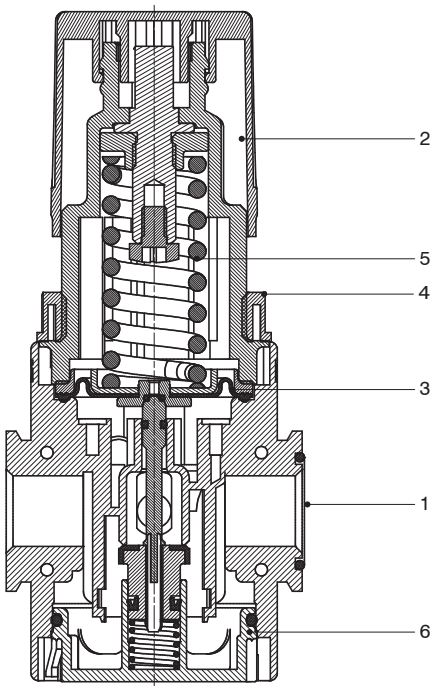




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Materials

### Exploded sectioned

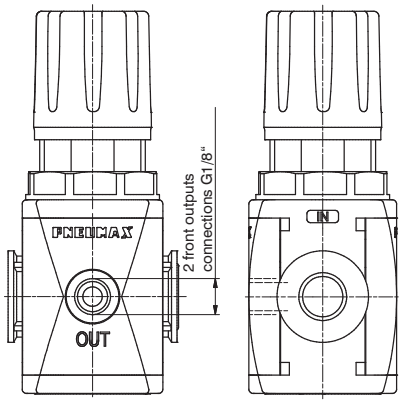



| Pressure regulator for manifold | | |
|---|---|---|
| 1 | Body | Polyamide<br>Die-cast aluminium |
| 2 | Adjusting knob | Polyamide |
| 3 | Diaphragm | NBR |
| 4 | Panel mounting locking ring | Polyamide |
| 5 | Adjusting spring | Steel |
| 6 | Rear end cap | Polyamide<br>Die-cast aluminium |

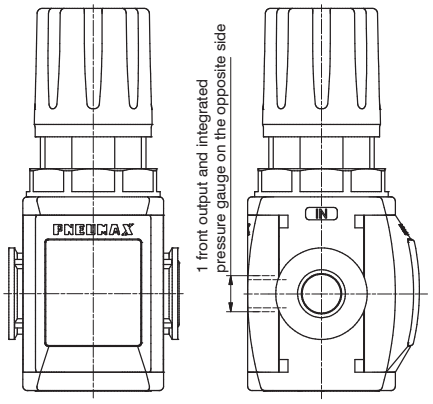


## Design

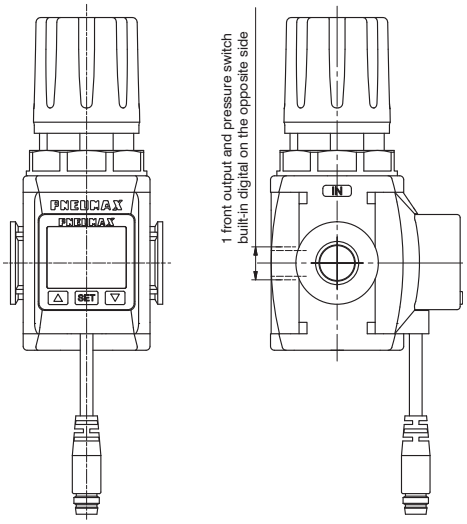
Pressure gauge version




Integrated pressure gauge version




Integrated digital pressure switch version



**Coding:** Ⓥ17ⓉⓄ¹ⓇⓄ²Ⓞ³Ⓞ⁴

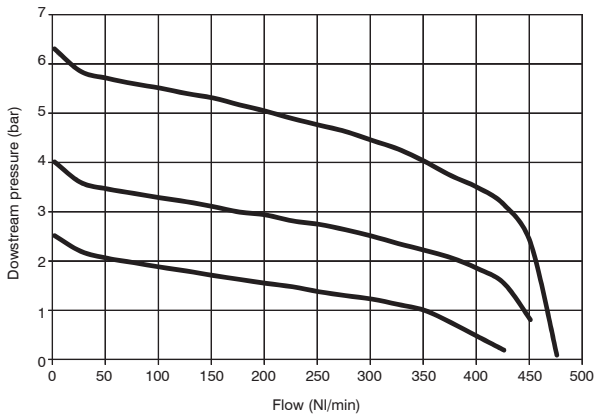
| | |
|---|---|
| Ⓥ | VERSION |
| | **N** = Technopolymer body and metal inserts |
| | **T** = Technopolymer body and thread |
| Ⓣ | SIZE AND CONNECTIONS |
| | **1A** = Size 1 - G1/8" |
| | **1B** = Size 1 - G1/4" |
| | **1C** = Size 1 - 1/4" NPT only for N version |
| Ⓞ¹ | PRESSURE MEASUREMENT OPTIONS |
| | **B** = G1/8" Thread |
| | **M** = Integrated pressure gauge |
| | **P** = Digital pressure switch |
| Ⓡ | PRESSURE RANGE |
| | **A** = 0 - 2 bar |
| | **B** = 0 - 4 bar |
| | **C** = 0 - 8 bar |
| | **D** = 0 - 12 bar |
| Ⓞ² | RELIEVING OPTIONS |
| | = With reliving |
| | **F** = Controlled refiel and improved relieving |
| | **L** = Without relieving |
| | **R** = Improved relieving |
| Ⓞ³ | KNOB OPTIONS |
| | = Non-lockable version |
| | **K** = Lockable version |
| | **U** = Lockable version with universal key |
| Ⓞ⁴ | DIGITAL PRESSURE SWITCH OPTIONS |
| | **A** = Cable 150 mm + M8 PNP |
| | **B** = Cable 150 mm + M8 NPN |
| | **C** = Cable 2 m PNP |
| | **D** = Cable 2 m NPN |

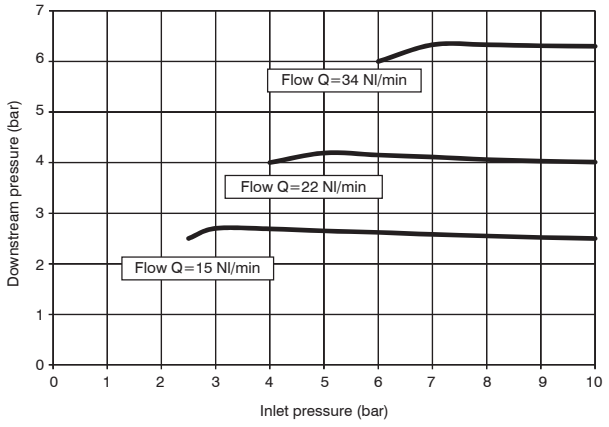
**Example**: **T171BBD**: Size 1 pressure regulator for manifold G1/4", 0 - 12 bar

## Characteristic curves

| Flow rate curves | Adjustment characteristic |
|---|---|

**Size 1 - G1/4", 0-8 bar, P1=7 bar**



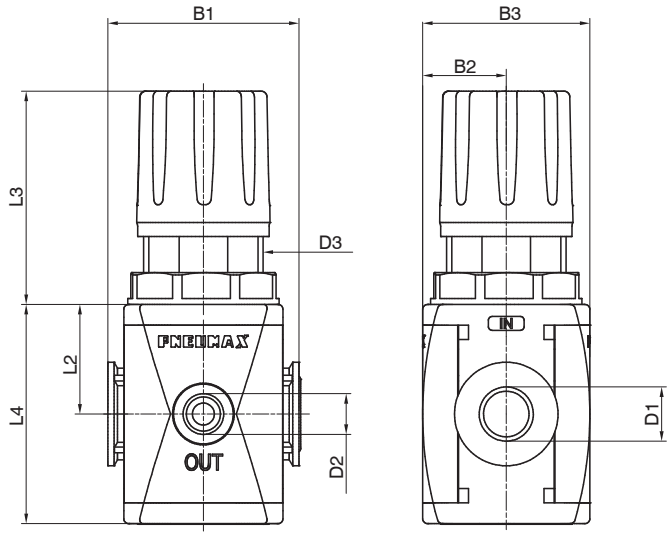




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

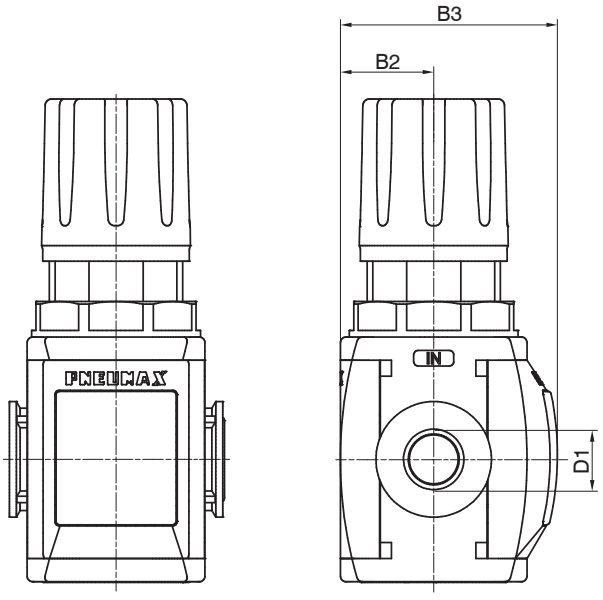
## Dimensions

Pressure gauge connection port version (B)

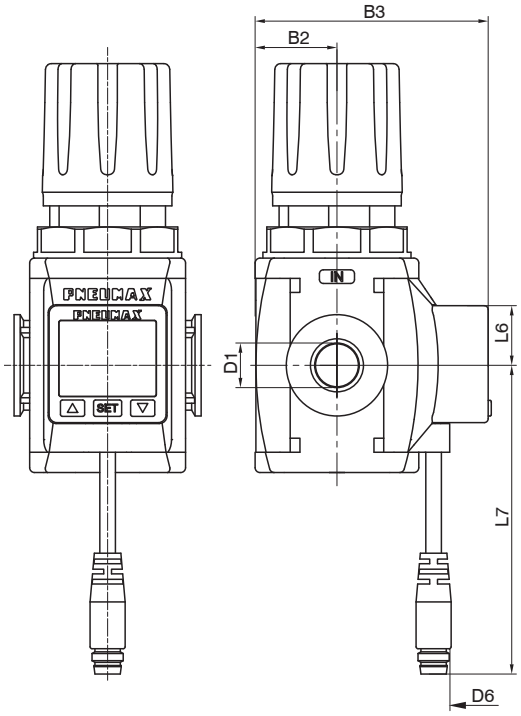



| Model | B1 | B2 | B3 | D1 | D2 | D3 | L2 | L3 | L4 |
|---|---|---|---|---|---|---|---|---|---|
| #171.. | 48 | 21 | 42 | G1/4"<br>G1/8"<br>1/4" NPT | G1/8" | M30x1,5 | 27,5 | 54 | 55 |

Integrated pressure gauge version (M)




Integrated digital pressure switch version




| Model | B2 | B3 | | D1 | D6 - Type of digital pressure switch | | L6 | L7 - Type of digital pressure switch | |
|---|---|---|---|---|---|---|---|---|---|
| | | with pressure gauge | With digital pressure switch | | A - B | C - D | | A - B | C - D |
| #171.. | 21 | 48.5 | 60 | G1/8"<br>G1/4"<br>1/4" NPT | M8 - 3 PIN | 3 x 0,129 mm,<br>Ø4 mm | 15 | 150 | 2000 |

## Manifold pressure regulators



- Manifold pressure regulators
- Available in four pressure ranges up to 12 bar
- Inlet pressure common for the whole manifold of pressure regulator
- A maximum of 6 pressure regulators can be mounted
- Atex certification (II 3GD)
- Assembly with X or Y flanges



| Technical characteristics | | |
|---|---|---|
| **Size** | | Size 1 |
| Body and connections type | | Technopolymer body, integrated technopolymer connections (T version) |
| | | Technopolymer body, metal connections (N version) |
| IN connections | T version | G1/4" |
| | N version | G1/8" - G1/4" - 1/4 NPT |
| OUT connections | | G1/8" |
| Assembly configuration | | Stand alone |
| | | Panel mounted |
| | | With fixing bracket |
| Assembly positions | | Indifferent |
| Pressure range | | 0-2 bar |
| | | 0-4 bar |
| | | 0-8 bar |
| | | 0-12 bar |
| Regulation | | Manul push and lock with pressure |
| | | Manual lockable with accessories |
| Pressure measurement | | G1/8" pressure gauge connection port |
| | | Integrated pressure gauge (optional) |
| Max. fittings torque IN / OUT connections | | G1/8" metal: 15Nm |
| | | G1/4" metal: 20Nm |
| | | G1/4" technopolymer: 9Nm |
| Max.fitting torque pressure gauge connection port | | G1/8" metal: 15Nm |
| | | G1/8" technopolymer: 4Nm |

| Operational characteristics | |
|---|---|
| **Size** | Size 1 |
| Maximum working pressure | 13 bar |
| Minimum working pressure | 0,5 bar |
| Working temperature | -5°C...+50°C |

**Coding:** G(V)17(T)(O)[1](N)(R)[1](R)[2](R)[3](R)[4](R)[5](R)[6]

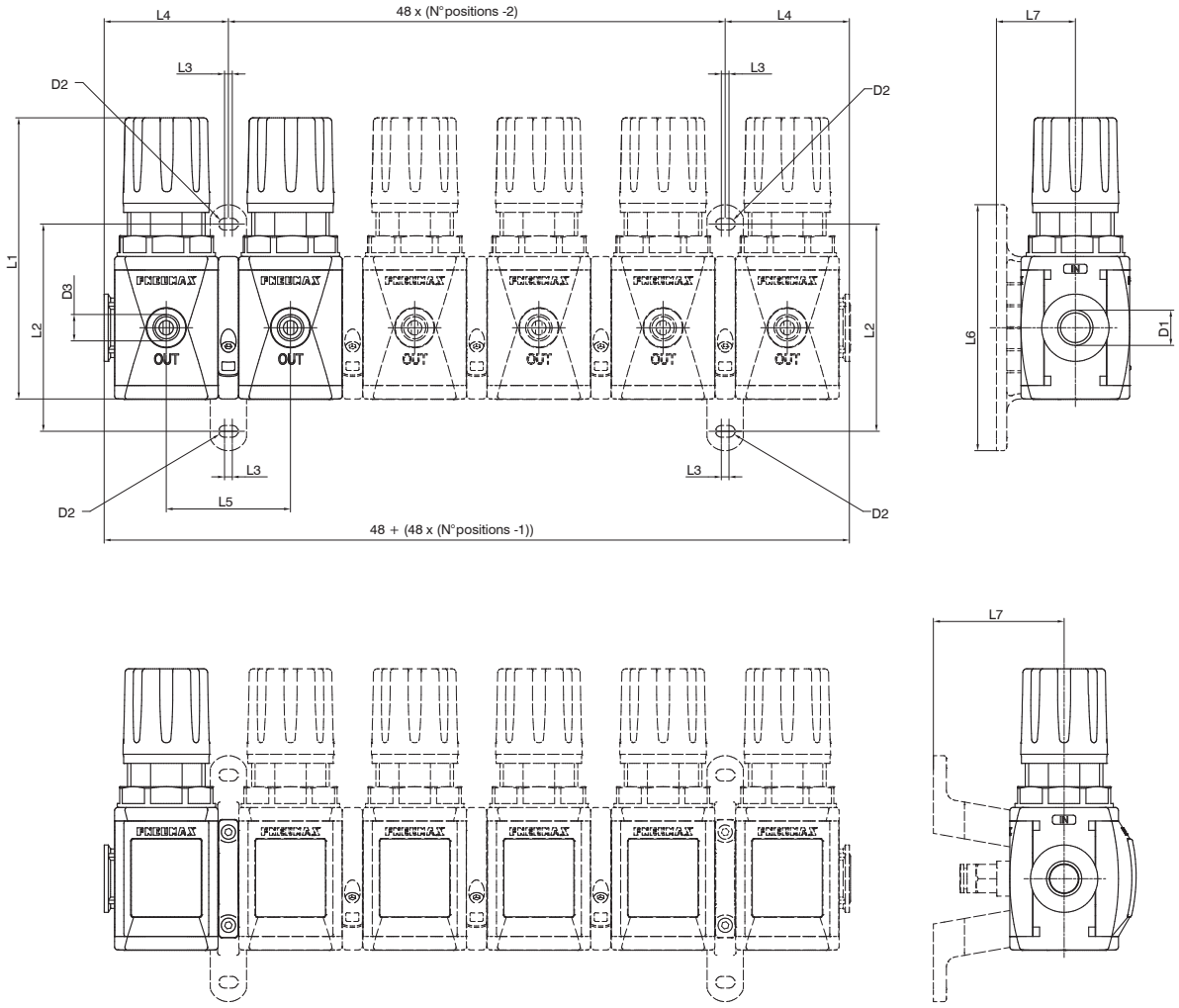
| | |
|---|---|
| (V) | VERSION |
| | **N** = Technopolymer body and metal inserts |
| | **T** = Technopolymer body and thread |
| (T) | SIZE AND CONNECTIONS |
| | **1A** = Size 1 - G1/8" |
| | **1B** = Size 1 - G1/4" |
| | **1C** = Size 1 - 1/4" NPT only for N version |
| (O)[1] | PRESSURE MEASUREMENT OPTIONS |
| | **B** = G1/8" thread with flanges X |
| | **M** = Integrated pressure gauge with flanges X |
| | **P** = G1/8" thread with extended flanges Y |
| | **R** = Integrated pressure gauge with extended flanges Y |
| | **W** = G1/8" thread with flanges Y |
| | **Z** = Integrated pressure gauge with flanges Y |
| (N) | NUMBER OF REGULATORS |
| | **2** = n. 2 regulators |
| | **3** = n. 3 regulators |
| | **4** = n. 4 regulators |
| | **5** = n. 5 regulators |
| | **6** = n. 6 regulators |
| (R)[1] | PRESSURE RANGE |
| | **A** = 0 - 2 bar |
| | **B** = 0 - 4 bar |
| | **C** = 0 - 8 bar |
| | **D** = 0 - 12 bar |

| | |
|---|---|
| (R)[2] | PRESSURE RANGE |
| | **A** = 0 - 2 bar |
| | **B** = 0 - 4 bar |
| | **C** = 0 - 8 bar |
| | **D** = 0 - 12 bar |
| (R)[3] | PRESSURE RANGE |
| | **A** = 0 - 2 bar |
| | **B** = 0 - 4 bar |
| | **C** = 0 - 8 bar |
| | **D** = 0 - 12 bar |
| (R)[4] | PRESSURE RANGE |
| | **A** = 0 - 2 bar |
| | **B** = 0 - 4 bar |
| | **C** = 0 - 8 bar |
| | **D** = 0 - 12 bar |
| (R)[5] | PRESSURE RANGE |
| | **A** = 0 - 2 bar |
| | **B** = 0 - 4 bar |
| | **C** = 0 - 8 bar |
| | **D** = 0 - 12 bar |
| (R)[6] | PRESSURE RANGE |
| | **A** = 0 - 2 bar |
| | **B** = 0 - 4 bar |
| | **C** = 0 - 8 bar |
| | **D** = 0 - 12 bar |

**Example**: **T171BM6CCCCCC**: Size 1 manifold pressure regulators
G1/4", 0 - 8 bar, integrated pressure gauge


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Dimensions

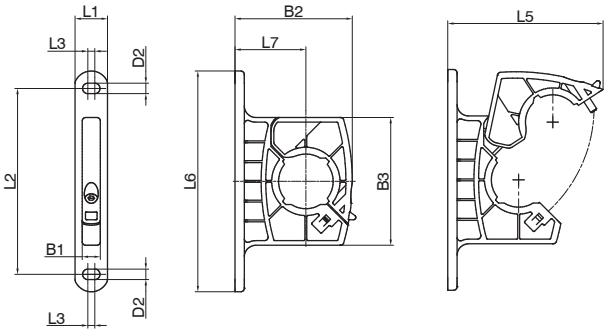



| Model | D1 | D2 | D3 | L1 | L2 | L3 | L4 | L5 | L6 | L7 |
|---|---|---|---|---|---|---|---|---|---|---|
| #171..with flanges X | G1/4" G1/8" 1/4" NPT | / | G1/8" | 109 | / | / | 48 | 48 | / | / |
| #171..with flanges Y | | Ø 4,5 | | | 80 | 3 | | | 105 | 30,5 |
| #171..with extended flanges Y | | | | | | | | | | 50,5 |

## Manifold mounting flanges

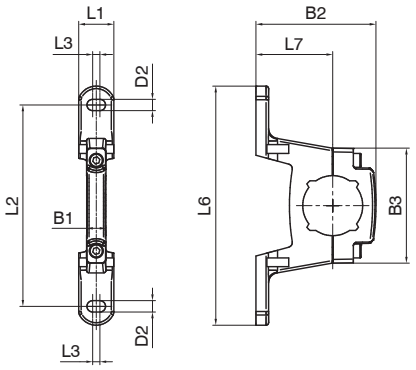
### Flange Y





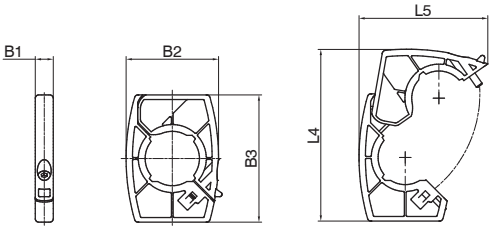

### Extended flange Y






### Flange X






| Model | B1 | B2 | B3 | D2 | L1 | L2 | L3 | L4 | L5 | L6 | L7 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T171Y | 7,8 | 50,5 | 55 | Ø 4,5 | 14 | 80 | 3 | / | 66 | 95 | 30,5 |
| N171YP | | 67.7 | 45.7 | Ø 4,5 | 14 | 80 | 3 | / | 66 | | 50.5 |
| T171X | | 40 | 55 | / | / | / | / | 74.5 | 55,5 | / | / |

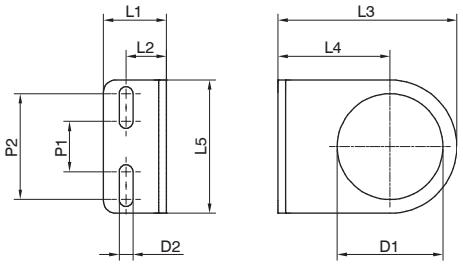


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Fixing bracket

**Coding:** 17150





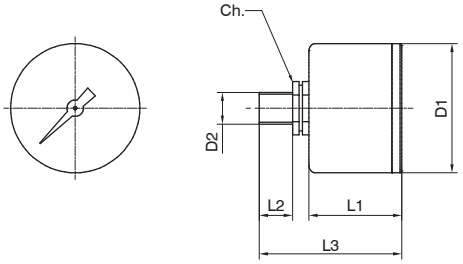

| Model | L1 | L2 | L3 | L4 | L5 | D1 | D2 | P1 | P2 |
|---|---|---|---|---|---|---|---|---|---|
| 17150 | 20 | 13 | 50 | 30 | 40 | 30 | 5,5 | 20 | 30 |

## Pressure gauge

**Coding:** 17070ⓋⓈ

| | |
|---|---|
| Ⓥ | VERSION |
| | **A** = Dial Ø40 |
| | **B** = Dial Ø50 |
| Ⓢ | SCALE |
| | **A** = 0 - 4 bar |
| | **B** = 0 - 6 bar |
| | **C** = 0 - 12 bar |






| Model | D1 | D2 | L1 | L2 | L3 | Ch |
|---|---|---|---|---|---|---|
| 17070A... | 41 | Gc - 1/8" | 26 | 10 | 44 | 14 |
| 17070B... | 49 | Gc - 1/8" | 27 | 10 | 45 | 14 |

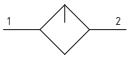


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Lubricators (L)



- Oil mist lubricator
- Available in 4 sizes with flow rates up to 16000 Nl/min and connections from 1/8" to 1"
- Bowl assembly via bayonet type quick coupling mechanism with safety button
- Variable orifice size in function of the flow rate
- Oil quantity regulation mechanism and oil quantity visualization dome made of polycarbonate (PC)
- Oil refill plug
- Lubricator oil recharge with pressurized system
- Available with low level electrical sensor NO and NC
- Atex certification (II 2GD or II 3GD)






| Technical characteristics | | | | | |
|---|---|---|---|---|---|
| **Size** | | Size 1 | Size 2 | Size 3 | Size 4 |
| Body and connections type | | Technopolymer body, integrated technopolymer connections (T version) | | | / |
| | | Technopolymer body, metal connections (N version) | | | |
| | | / | Aluminium body, integrated aluminium connections (P - L versions) | | |
| Protection and bowl type | | Technopolymer protection - PA bowl | | | |
| | | Technopolymer protection - PC bowl | | | |
| | | / | Metal protection - PA bowl | | |
| | | | Metal protection - PC bowl | | |
| | | | Metal bowl (Blind metal bowl or with display) | | |
| IN / OUT connections | T version | G1/4" | G3/8" | G1/2" | not available |
| | N version | G1/8" - G1/4" - 1/4 NPT | G3/8" - G1/4" - 3/8 NPT | G3/8" - G1/2" - 1/2 NPT | |
| | P and L versions | not available | G3/8" | G1/2" | G1" |
| Assembly configuration | | Stand alone | | | |
| | | / | | | Panel mounted |
| Assembly positions | | Vertical ±5° | | | |
| Bowl capacity | | 36 cm³ | 70 cm³ | 136 cm³ | 360 cm³ |
| Lubrication type | | Oil mist lubrication | | | |
| Oil level regulation | | Manual, complete with visual indicator | | | |
| Max. fittings torque IN / OUT connections | G1" metal | / | | / | 35Nm |
| | G1/2" metal | | | 30Nm | / |
| | G1/4" metal | 20Nm | | / | |
| | G1/8" metal | 15Nm | / | | |
| | G3/8" metal | / | 25Nm | | |
| | G1/2" technopolymer | | / | 22Nm | |
| | G1/4" technopolymer | 9Nm | | / | |
| | G3/8" technopolymer | / | 16Nm | | |

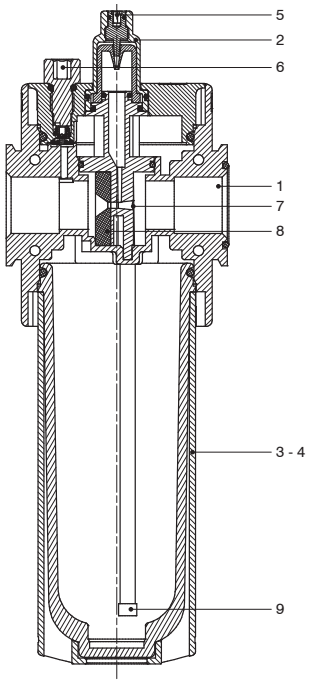
| Operational characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Maximum working pressure | 13 bar | | | |
| Minimum working pressure | 0,5 bar | | | |
| Min. operational flow at 6,3 bar | 40 Nl/min | 70 Nl/min | 100 Nl/min | |
| Indicative oil drop rate | 1 drope every 300/600 Nl/min | | | |
| Oil type | FD22 - HG32 | | | |
| Working temperature | -5°C...+50°C | | | |
| | / | -30°C...+80°C (body and metal bowl versions P) | | |
| | | -40°C...+80°C (body and L metal bowl versions) | | |

| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Fully technopolymer version | 121 g | 215 g | 347 g | / |
| Technopolymer body version, aluminium bowl protection and technopolymer bowl | / | 245 g | 383 g | / |
| Aluminium body version, technopolymer protection and bowl | / | 315 g | 477 g | 1032 g |
| Aluminium body version, aluminium bowl protection and technopolymer bow | / | 345 g | 513 g | 1077 g |
| Metal body and bowl | / | 380 g | 580 g | 1137 g |


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## Materials

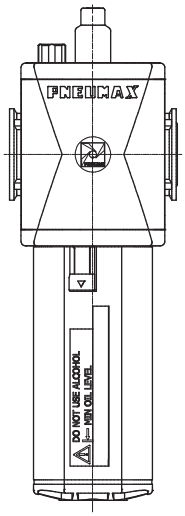
### Exploded sectioned



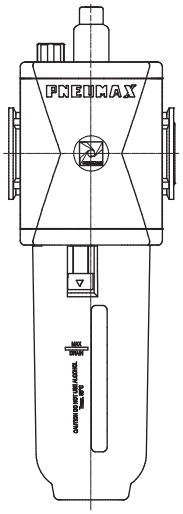

| Lubricator | | |
|---|---|---|
| 1 | Body | Polyamide<br>Die-cast aluminium |
| 2 | Visual indicator | Polyamide |
| 3 | Bowl | Polycarbonate<br>Polyamide<br>Die-cast aluminium |
| 4 | Bowl protection | Polyamide<br>Die-cast aluminium |
| 5 | Oil regulation needle | Brass |
| 6 | Recharge plug | Acetal resin |
| 7 | Diaphragm support | Acetal resin |
| 8 | Diaphragm | NBR |
| 9 | Filter | Sintered brass |

## Design

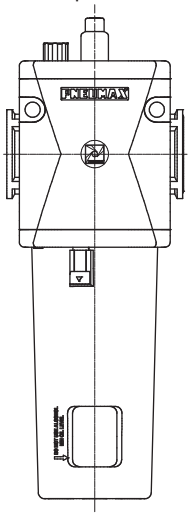
**Size 1 - Size 2 - Size 3**
Technopolymer protection



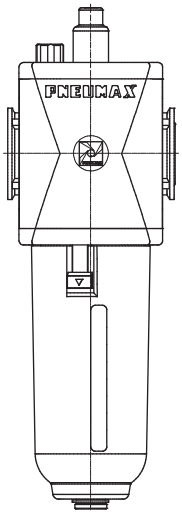

**Size 1 - Size 2 - Size 3**
Metal protection



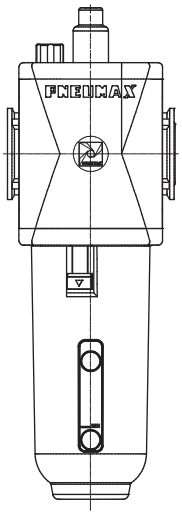

**Size 4**
Technopolymer protection and metal protection



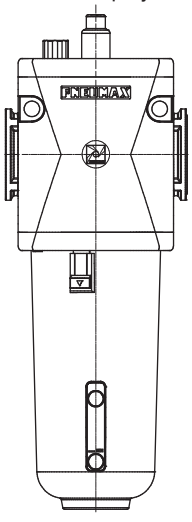

**Size 2 - Size 3**
Body and metal bowl



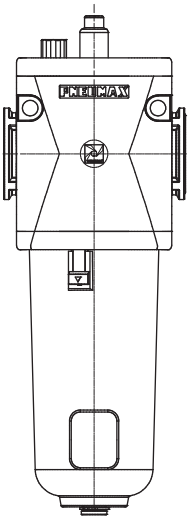

**Size 2 - Size 3**
Body and metal bowl with display




**Size 4**
Body and metal bowl with display




**Size 4**
Body and metal bowl



**Coding:** Ⓥ17ⓉLⓄ[1]Ⓞ[2]

| | |
|---|---|
| Ⓥ | VERSION |
| | **N** = Technopolymer body and metal inserts (not available for size 4) |
| | **T** = Technopolymer body and thread (not available for size 4) |
| | **P** = Aluminum body (not available for size 1) |
| | **L** = Aluminum body, low temperature (not available for size 1) |
| Ⓣ | SIZE AND CONNECTIONS |
| | **1A** = Size 1 - G1/8" only for N version |
| | **1B** = Size 1 - G1/4" only for T - N versions |
| | **1C** = Size 1 - 1/4" NPT only for N version |
| | **2A** = Size 2 - G1/4" only for N version |
| | **2B** = Size 2 - G3/8" for all versions |
| | **2C** = Size 2 - 3/8" NPT only for N version |
| | **3A** = Size 3 - G3/8" only for N version |
| | **3B** = Size 3 - G1/2" for all versions |
| | **3C** = Size 3 - 1/2" NPT only for N version |
| | **4B** = Size 4 - G1" only for P-L version |

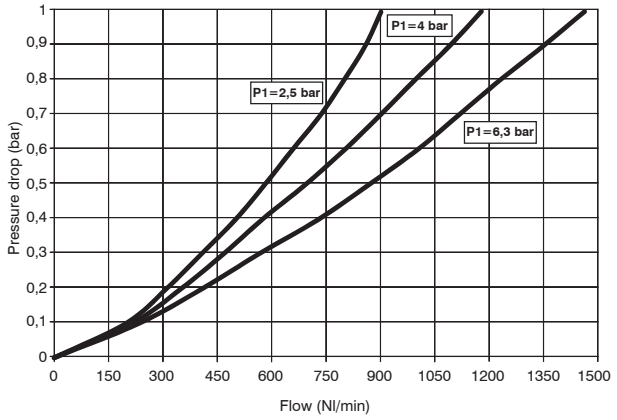
| | |
|---|---|
| Ⓞ[1] | OPTIONS |
| | = No electric level sensor device |
| | **A** = Electrical minimum level sensor NO (not available for size 1) |
| | **C** = Electrical minimum level sensor NC (not available for size 1) |
| Ⓞ[2] | BOWL OPTIONS |
| | = Technopolymer protection - PC bowl |
| | **N** = Technopolymer protection - PA bowl |
| | **P** = Metal protection - PC bowl (not available for size 1) |
| | **R** = Metal protection - PA bowl (not available for size 1) |
| | **T** = Metal bowl without oil level indicator (not available for Size 1) |
| | **VT** = Metal bowl with oil level display (not available for Size 1) |

**Example**: **T173BLAN**: Size 3 lubricator G1/2", normally open low level electrical sensor, PA bowl with technopolymer protection

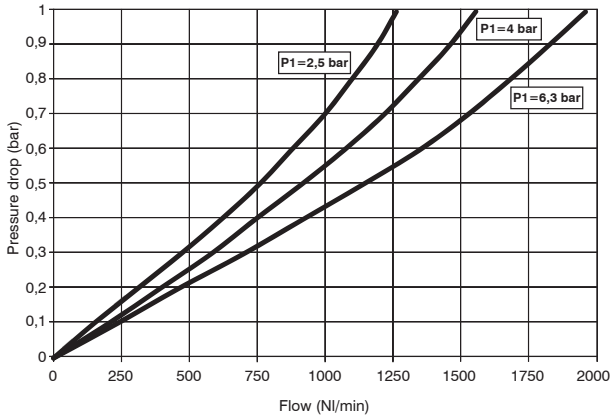


## Characteristic curves

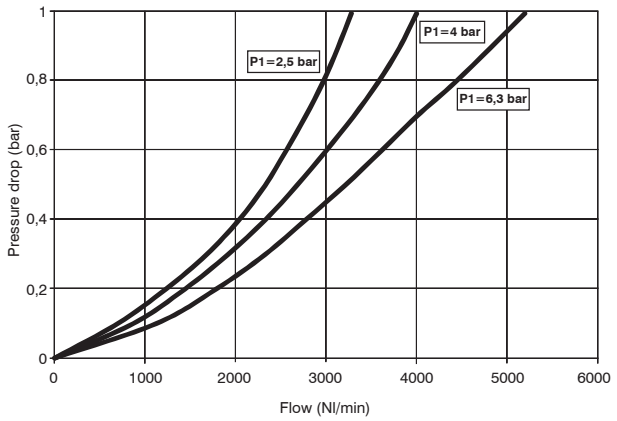
Flow rate curves, Size 1



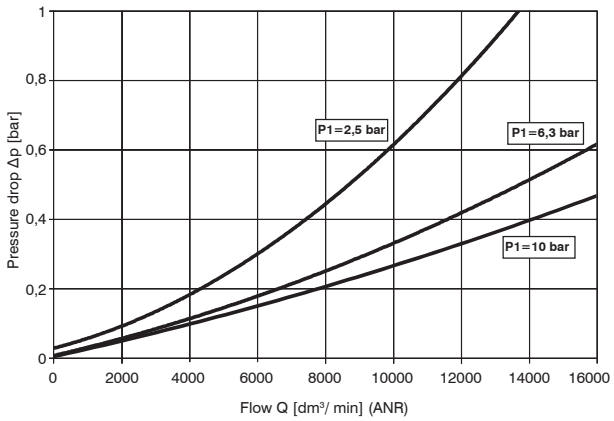

Flow rate curves, Size 2




Flow rate curves, Size 3



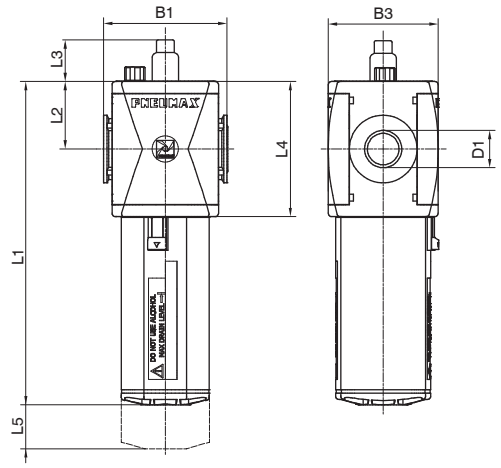

Flow rate curves, Size 4



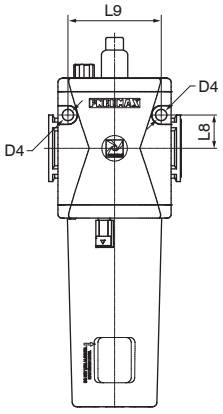


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Dimensions




Fixing holes dimension detail
(only for size 4)

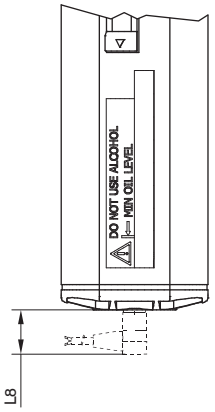



| Model | B1 | B3 | D1 | D4 | L1 | L2 | L3 | L4 | L5 | L8 | L9 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| #171.. | 48 | 42 | G1/8"<br>G1/4"<br>1/4" NPT | / | 131 | 27,5 | 24 | 55 | 70 | / | / |
| #172.. | 62 | 57 | G1/4"<br>G3/8"<br>3/8" NPT | / | 152,7 | 34 | 24 | 68 | 90 | / | / |
| #173.. | 73 | 65 | G3/8"<br>G1/2"<br>1/2" NPT | / | 191,4 | 40 | 24 | 80 | 120 | / | / |
| #174.. | 99 | 88 | G1" | 8,5 | 247 | 52,5 | 24 | 105 | 145 | 25 | 70 |

## Variable dimensions

| Model | L8 | Electrical connection details |
|---|---|---|
| Electrical minimum level sensor NO | 16 | C1 - C2 - C3 (see sensors section of general catalog |
| Electrical minimum level sensor NC | | |

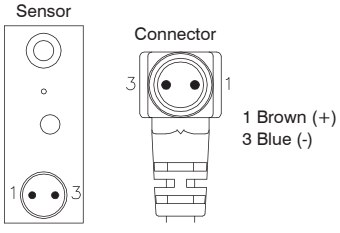
Connector for electrical minimum level sensor




## Accessories

### Connectors for minimum electrical level

**C1:** connector with 2,5 m cable 2 wires (PVC Ø3,5 mm 2x0,25mm²)
**C2:** connector with 5 m cable 2 wires (PVC Ø3,5 mm 2x0,25mm²)
**C3:** connector with 10 m cable 2 wires (PVC Ø3,5 mm 2x0,25mm²)

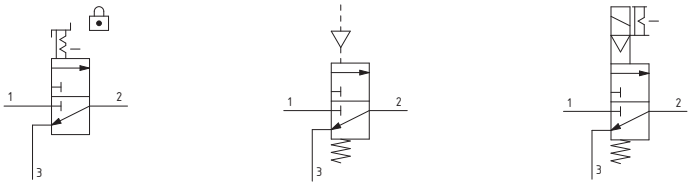



| SNAP code connectors | |
|---|---|
| C1 | Ø 3,5 mm |
| C2 | PVC |
| C3 | 2x 0,25 mm² |

## Shut off valves (VL - VP - VE)



- 3/2 N.C. shut off valve
- Suitable for system downstream pneumatic feeding or exhaust
- Manual, pneumatic and electropneumatic operation available
- Up to 3 off manual operation lockable device available (closed position)
- Atex certification (II 2GD or II 3GD)





| Technical characteristics | | | | | |
|---|---|---|---|---|---|
| **Size** | | Size 1 | Size 2 | Size 3 | Size 4 |
| Body and connections type | | Technopolymer body, integrated technopolymer connections (T version) | | | / |
| | | Technopolymer body, metal connections (N version) | | | |
| | | / | Aluminium body, integrated aluminium connections (P version) | | |
| Operated type | | Manual | | | |
| | | Pneumatic | | | |
| | | Electropneumatic | | | |
| IN / OUT connections | T version | G1/4" | G3/8" | G1/2" | not available |
| | N version | G1/8" - G1/4" - 1/4" NPT | G3/8" - G1/4" - 3/8" NPT | G3/8" - G1/2" - 1/2" NPT | |
| | P and L versions | not available | G3/8" | G1/2" | G1" |
| Pilot ports size | | G1/8 | | | |
| Exhaust connection | | G1/4" | G3/8" | | G1/2" |
| Assembly configuration | | Stand alone | | | |
| | | / | | | Panel mounted |
| Assembly positions | | Indifferent | | | |
| Max. fittings torque IN / OUT connections | G1" metal | / | | / | 35Nm |
| | G1/2" metal | | | 30Nm | |
| | G1/4" metal | 20Nm | | / | / |
| | G1/8" metal | 15Nm | / | | |
| | G3/8" metal | / | 25Nm | | |
| | G1/2" technopolymer | | / | 22Nm | |
| | G1/4" technopolymer | 9Nm | | / | |
| | G3/8" technopolymer | / | 16Nm | | |

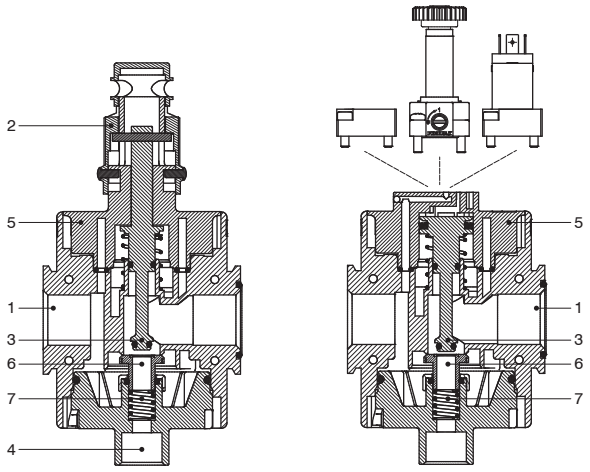
| Operational characteristics | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 | Size 1 | Size 2 | Size 3 | Size 4 |
| Operator | Manual | | | | Pneumatic / Solenoid | | | |
| Maximum working pressure | 13 bar | | | 10 bar | 10 bar | | | |
| Minimum working pressure | 0,5 bar | | | | 2,5 bar | | | |
| Working temperature | -5 °C ... +50 °C | | | | -5 °C ... +50 °C | | | |
| | / | 30°C ... +80°C (only for P version)<br>-40°C ... +80°C (only for L version) | | | / | -30°C ... +80°C (only with metal body and pneumatic version)<br>-40°C ... +80°C (only with metal body and pneumatic version) | | |
| Nominal flow rate at 6 bar with Δp=1 (from 1 to 2) | 1400 Nl/min | 2200 Nl/min | 3600 Nl/min | 15000 Nl/min | 1400 Nl/min | 2200 Nl/min | 3600 Nl/min | 15000 Nl/min |
| Exhaust nominal flow rate at 6 bar with Δp=1 (from 2 to 3) | 550 Nl/min | 1500 Nl/min | | 3600 Nl/min | 550 Nl/min | 1500 Nl/min | | 3600 Nl/min |
| Un-conveyed exhaust nominal flow rate (from 2 to 3) | 1000 Nl/min | 2500 Nl/min | | 5000 Nl/min | 1000 Nl/min | 2500 Nl/min | | 5000 Nl/min |

| Weights | | | | | | |
|---|---|---|---|---|---|---|
| Size | | | Size 1 | Size 2 | Size 3 | Size 4 |
| Operator | Manual | Technopolymer body version | 110 g | 190 g | 250 g | / |
| | | Aluminium body version | / | 270 g | 400 g | 1100 g |
| | Electropneumatic | Technopolymer body version | 99 g | 181 g | 270 g | / |
| | | Aluminium body version | / | 265 g | 398 g | 1135 g |
| | Solenoid M2 actuator | Technopolymer body version | 140 g | 210 g | 310 g | / |
| | | Aluminium body version | / | 298 g | 429 g | 1170 g |
| | Solenoid 15mm coil | Technopolymer body version | 140 g | 216 g | 310 g | / |
| | | Aluminium body version | / | 301 g | 432 g | 1180 g |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Materials

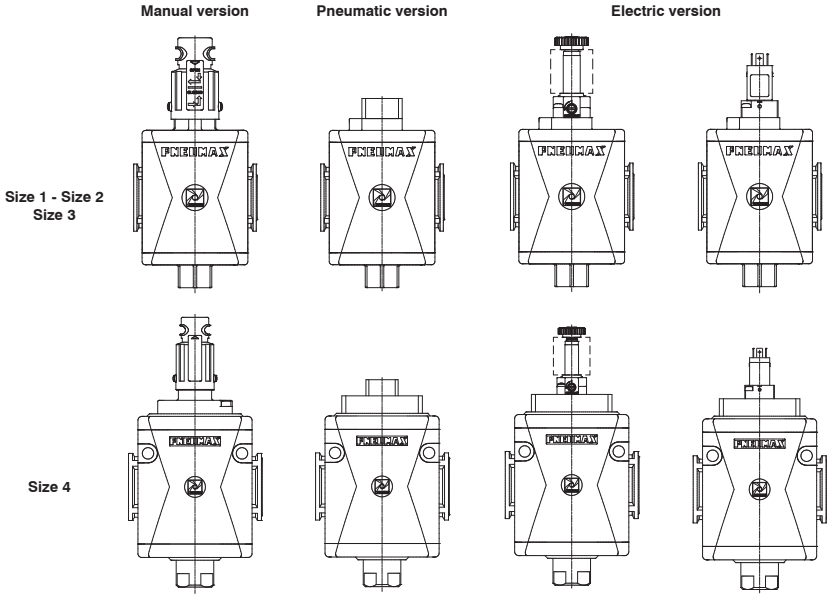
### Exploded sectioned




| Shut off valve | | |
|---|---|---|
| 1 | Body | Polyamide<br>Die-cast aluminium |
| 2 | Manual override | Polyamide |
| 3 | Drive pin<br>Piston | Aluminium |
| 4 | Exhaust plug | Polyamide |
| 5 | Central support | Polyamide |
| 6 | Poppet | Brass + NBR |
| 7 | Repositioning spring | Steel |



## Design




**Coding:** ⓥ17ⓉVⒶⓄ

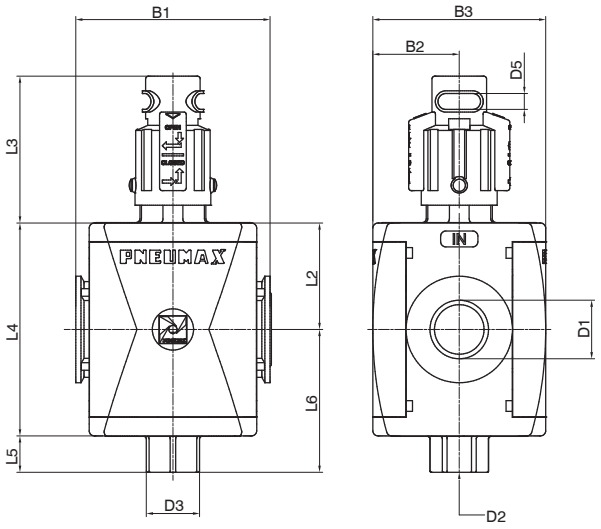
| | |
|---|---|
| ⓥ | VERSION |
| | **N** = Technopolymer body and metal inserts (not available for size 4) |
| | **T** = Technopolymer body and thread (not available for size 4) |
| | **P** = Aluminum body (not available for size 1) |
| | **L** = Aluminium body, low temperature (not available for solenoid version and size 1) |
| Ⓣ | SIZE AND CONNECTIONS |
| | **1A** = Size 1 - G1/8" only for N version |
| | **1B** = Size 1 - G1/4" only for T - N versions |
| | **1C** = Size 1 - 1/4" NPT only for N version |
| | **2A** = Size 2 - G1/4" only for N version |
| | **2B** = Size 2 - G3/8" for all versions |
| | **2C** = Size 2 - 3/8" NPT only for N version |
| | **3A** = Size 3 - G3/8" only for N version |
| | **3B** = Size 3 - G1/2" for all versions |
| | **3C** = Size 3 - 1/2" NPT only for N version |
| | **4B** = Size 4 - G1" only for P - L versions |
| Ⓐ | OPERATOR |
| | **L** = Manual |
| | **P** = Pneumatic |
| | **E** = Solenoid |

| | |
|---|---|
| Ⓞ | COIL OPTIONS |
| | **15 mm coil** |
| | **A4** = 12 VDC |
| | **A5** = 24 VDC |
| | **A6** = 24 VAC (50-60 Hz) |
| | **A7** = 110 VAC (50-60 Hz) |
| | **A8** = 230 VAC (50-60 Hz) |
| | **A9** = 24 VDC (1 Watt) |
| | **22 mm coil** |
| | **B2** = Mechanical M2, without coil |
| | **B4** = 12 VDC |
| | **B5** = 24 VDC |
| | **B6** = 24 VAC (50-60 Hz) |
| | **B7** = 110 VAC (50-60 Hz) |
| | **B8** = 230 VAC (50-60 Hz) |
| | **B9** = 24 V DC (2 Watt) (Atex certification not available) |
| | **30 mm coil** |
| | **C5** = 24 VDC |
| | **C6** = 24 VAC (50-60 Hz) |
| | **C7** = 110 VAC (50-60 Hz) |
| | **C8** = 230 VAC (50-60 Hz) |
| | **C9** = 24 V DC (2 Watt) (Atex certification not available) |

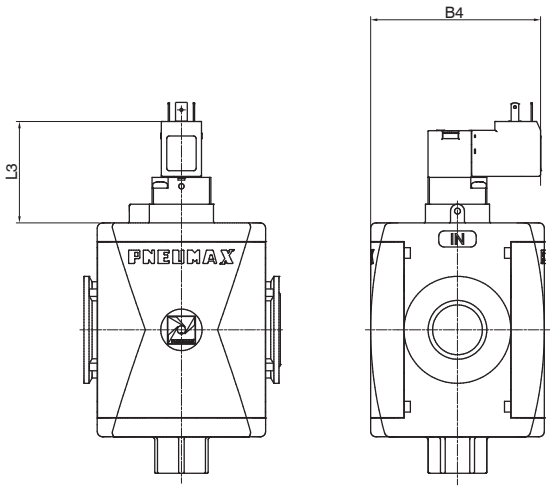
**Example**: **T173BVEA5**: Size 3 electric shut off valve G1/2", 15 mm coil, 24VDC

## Dimensions

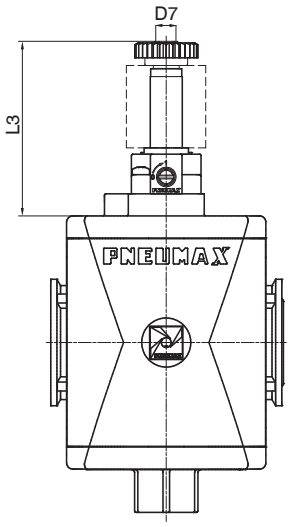
Manual operated version



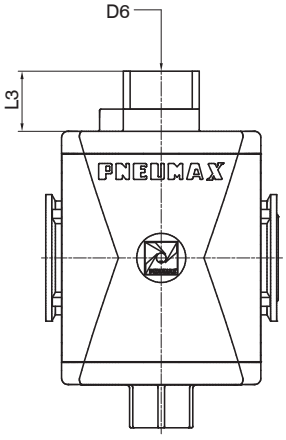

Solenoid operated version (15 mm coil)



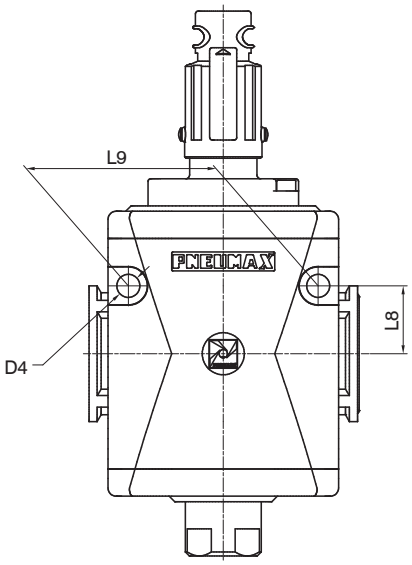

Solenoid operated version
(22 / 30 mm coil)




Pneumatic operated version




Fixing holes dimension detail
(only for size 4)




| Model | B1 | B2 | B3 | B4 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | L2 | L3 Manual | L3 Pneumatic | L3 Solenoid coil 22 or 30mm | L3 Solenoid 15mm coil | L4 | L5 | L6 | L8 | L9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #171.. | 48 | 21 | 42 | 52 | G1/8" G1/4" 1/4 NPT | G1/4" | Ch.17 | / | 6 | G1/8" | M5 | 27,5 | 55 | 19 | 57 | 37.5 | 55 | 11 | 38.5 | / | / |
| #172.. | 62 | 28.5 | 57 | 59.6 | G1/4" G3/8" 3/8 NPT | G3/8" | Ch.20 | / | 6 | G1/8" | M5 | 34 | 54.2 | 22 | 60 | 40.3 | 68 | 14 | 48 | / | / |
| #173.. | 73 | 32.5 | 65 | 63.6 | G3/8" G1/2" 1/2 NPT | G3/8" | Ch.20 | / | 6 | G1/8" | M5 | 40 | 55 | 19 | 57 | 37.4 | 80 | 14 | 54 | / | / |
| #174.. | 99 | 44 | 88 | 75 | G1" | G1/2" | Ch.25 | 8.5 | 6 | G1/8" | M5 | 52.5 | 71.5 | 27 | 67 | 45.5 | 105 | 22 | 74.5 | 25 | 70 |

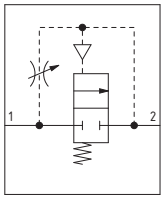


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Progressive start-up valve (AP - APW)



- Progressive start-up valve
- Available in 4 sizes with flow rates up to 15000 Nl/min and connections from 1/8" to 1"
- Suitable for downstream system gradual pressurization
- Downstream circuit filling time regulated via a built in flow regulator
- Full pressure is allowed once the down stream circuit pressure reaches 50% of the inlet pressure
- Atex certification (II 2GD or II 3GD)





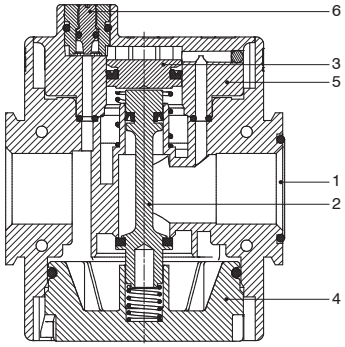

| Technical characteristics | | | | | |
|---|---|---|---|---|---|
| **Size** | | Size 1 | Size 2 | Size 3 | Size 4 |
| Body and connections type | | / | Aluminium body, integrated aluminium connections (P version) | | |
| | | Technopolymer body, integrated technopolymer connections (T version) | | | / |
| | | Technopolymer body, metal connections (N version) | | | |
| IN / OUT connections | T version | G1/4" | G3/8" | G1/2" | not available |
| | N version | G1/8" - G1/4" - 1/4 NPT | G3/8" - G1/4" - 3/8 NPT | G3/8" - G1/2" - 1/2 NPT | |
| | P version | not available | G3/8" | G1/2" | G1" |
| Assembly configuration | | Stand alone | | | |
| | | / | | | Panel mounted |
| Assembly positions | | Indifferent | | | |
| Max. fittings torque IN / OUT connections | G1" metal | / | | / | 35Nm |
| | G1/2" metal | | | 30Nm | / |
| | G1/4" metal | 20Nm | | / | |
| | G1/8" metal | 15Nm | / | | |
| | G3/8" metal | / | 25Nm | | |
| | G1/2" technopolymer | | / | 22Nm | |
| | G1/4" technopolymer | 9Nm | | / | |
| | G3/8" technopolymer | / | 16Nm | | |

| Operational characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Maximum working pressure | 13 bar | | | 10 bar |
| Minimum working pressure | 2,5 bar | | | |
| Working temperature | -5°C...+50°C | | | |
| Nominal flow rate at 6 bar with Δp=1 (from 1 to 2) | 1400 Nl/min | 2200 Nl/min | 3600 Nl/min | 15000 Nl/min |
| Fully open flow control device maximum flow rate | 75 Nl/min | 200 Nl/min | | 1000 Nl/min |

| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Technopolymer body version | 80 g | 150 g | 240 g | / |
| Aluminium body version | / | 235 g | 370 g | 1100 g |

## Materials

### Exploded sectioned

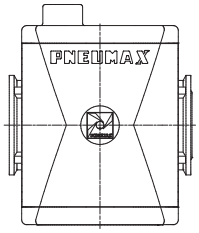



| Progressive start-up valve | | |
|---|---|---|
| 1 | Body | Polyamide<br>Die-cast aluminium |
| 2 | Drive pin | Aluminium |
| 3 | Piston | Aluminium |
| 4 | Rear end cap | Polyamide / Die-cast aluminium |
| 5 | Central support | Polyamide / Aluminium |
| 6 | Modulating needle | Brass |

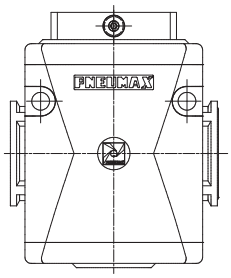


## Design

**Size 1 - Size 2 - Size 3**




**Size 4**

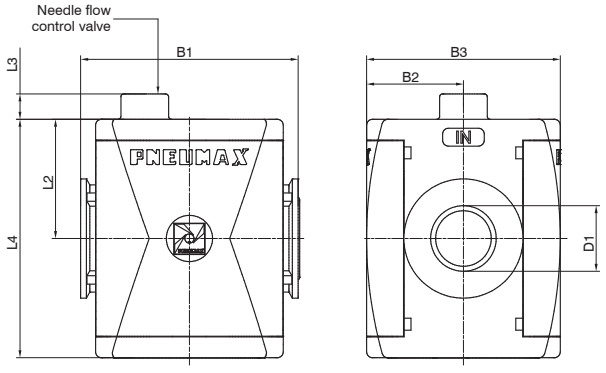


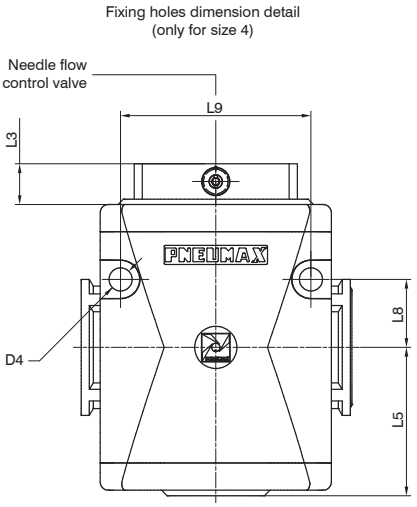

**Coding:** ⓥ17ⓉAPⒻ

| | |
|---|---|
| ⓥ | VERSION |
| | **N** = Technopolymer body and metal inserts (not available for size 4) |
| | **T** = Technopolymer body and thread (not available for size 4) |
| | **P** = Aluminum body (not available for size 1) |
| Ⓣ | SIZE AND CONNECTIONS |
| | **1A** = Size 1 - G1/8" only for N version |
| | **1B** = Size 1 - G1/4" only for T - N versions |
| | **1C** = Size 1 - 1/4" NPT only for N version |
| | **2A** = Size 2 - G1/4" only for N version |
| | **2B** = Size 2 - G3/8" for all versions |
| | **2C** = Size 2 - 3/8" NPT only for N version |
| | **3A** = Size 3 - G3/8" only for N version |
| | **3B** = Size 3 - G1/2" for all versions |
| | **3C** = Size 3 - 1/2" NPT only for N version |
| | **4B** = Size 4 - G1" only for P version |
| Ⓕ | FLOW DIRECTION (ONLY FOR SIZE 4) |
| | = From left to right |
| | **W** = From right to left |

**Example**: **T173BAP**: Size 3 progressive start-up valve G1/2"

## Dimensions




| Model | B1 | B2 | B3 | D1 | D4 | L2 | L3 | L4 | L5 | L8 | L9 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| #171.. | 48 | 21 | 42 | G1/8"<br>G1/4" | / | 27,5 | 12 | 55 | / | / | / |
| #172.. | 62 | 28.5 | 57 | G1/4"<br>G3/8" | | 34 | 9.2 | 68 | | | |
| #173.. | 73 | 32.5 | 65 | G3/8"<br>G1/2" | | 40 | 8.7 | 80 | | | |
| #174.. | 99 | 44 | 88 | G1" | 8.5 | 52.5 | 13 | 105 | 54.5 | 25 | 70 |

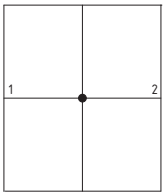


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Air intake (PA)



- Pneumatic by-pass
- Available with 2 threaded connections
- Atex certification (II 2GD or II 3GD)





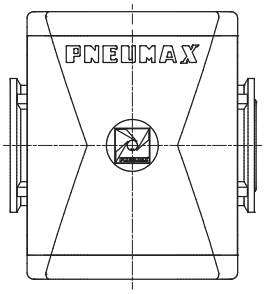

| Technical characteristics | | | | | | |
|---|---|---|---|---|---|---|
| **Size** | | Size 1 | Size 2 | Size 3 | Size 4 | |
| Body and connections type | | / | Aluminium body, integrated aluminium connections (P version) | | | |
| | | Technopolymer body, integrated technopolymer connections (T version) | | | / | |
| | | Technopolymer body, metal connections (N version) | | | | |
| IN / OUT / INTAKE connections | T version | G1/4" | G3/8" | G1/2" | not available | |
| | N version | G1/8" - G1/4" - 1/4 NPT | G3/8" - G1/4" - 3/8 NPT | G3/8" - G1/2" - 1/2 NPT | | |
| | P version | not available | G3/8" | G1/2" | G1" | |
| Assembly configuration | | Stand alone | | | | |
| | | / | | | Panel mounted | |
| Assembly positions | | Indifferent | | | | |
| Max. fittings torque IN / OUT / INTAKE connections | G1" metal | / | | / | 35Nm | |
| | G1/2" metal | | | 30Nm | / | |
| | G1/4" metal | 20Nm | | / | | |
| | G1/8" metal | 15Nm | / | | | |
| | G3/8" metal | / | 25Nm | | | |
| | G1/2" technopolymer | | / | 22Nm | | |
| | G1/4" technopolymer | 9Nm | | / | | |
| | G3/8" technopolymer | / | 16Nm | | | |

| Operational characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Maximum working pressure | 13 bar | | | 20 bar |
| Working temperature | -5°C...+50°C | | | - |
| | - | | | -30°C ... +80°C (only for P version) |

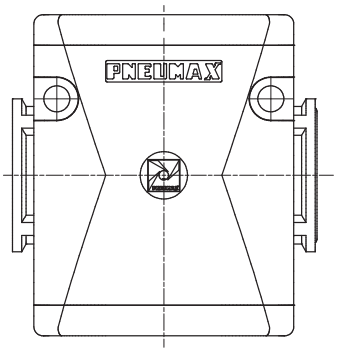
| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Technopolymer body version | 52 g | 95,5 g | 151 g | / |
| Aluminium body version | / | 248 g | 370 g | 720 g |

### Design

**Size 1 - Size 2 - Size 3**




**Size 4**




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

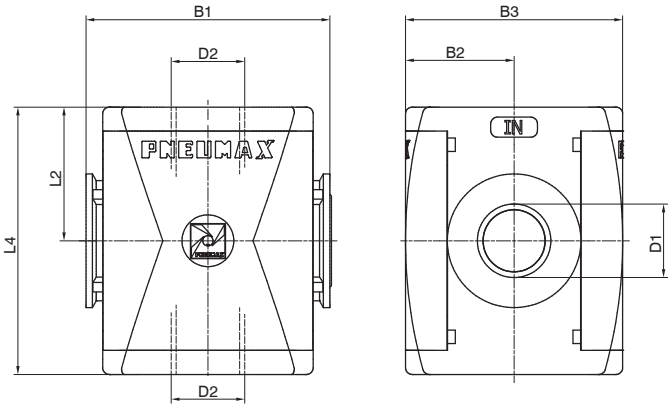
**Coding:** Ⓥ17ⓉPA

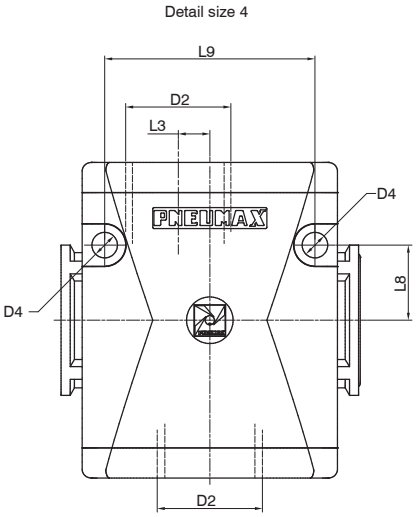
| | |
|---|---|
| Ⓥ | VERSION |
| | **N** = Technopolymer body and metal inserts (not available for size 4) |
| | **T** = Technopolymer body and thread (not available for size 4) |
| | **P** = Aluminum body (not available for size 1) |
| Ⓣ | SIZE AND CONNECTIONS |
| | **1A** = Size 1 - G1/8" only for N version |
| | **1B** = Size 1 - G1/4" only for T - N versions |
| | **1C** = Size 1 - 1/4" NPT only for N version |
| | **2A** = Size 2 - G1/4" only for N version |
| | **2B** = Size 2 - G3/8" for all versions |
| | **2C** = Size 2 - 3/8" NPT only for N version |
| | **3A** = Size 3 - G3/8" only for N version |
| | **3B** = Size 3 - G1/2" for all versions |
| | **3C** = Size 3 - 1/2" NPT only for N version |
| | **4B** = Size 4 - G1" only for P version |

**Example**: **T173BPA**: Size 3 air intake G1/2"

2 AIR TREATMENT

## Dimensions



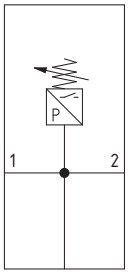

| Model | B1 | B2 | B3 | D1 | D2 | D4 | L2 | L3 | L4 | L8 | L9 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| #171.. | 48 | 21 | 42 | G1/8"<br>G1/4"<br>1/4 NPT | | | 27,5 | | 55 | | |
| #172.. | 62 | 28.5 | 57 | G3/8"<br>G1/4"<br>3/8 NPT | | / | 34 | / | 68 | / | / |
| #173.. | 73 | 32.5 | 65 | G3/8"<br>G1/2"<br>1/2 NPT | | | 40 | | 80 | | |
| #174.. | 99 | 44 | 88 | G1" | | 8.5 | 52.5 | 10.5 | 105 | 25 | 70 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pressure switch (PP)



- 2 to 10 bar adjustable pressure switch with electrical connection
- The electrical connection is made by mean of a 15 mm connector (DIN 43650 type C)
- The microswitch contact could be normally closed or open (change overswitch)





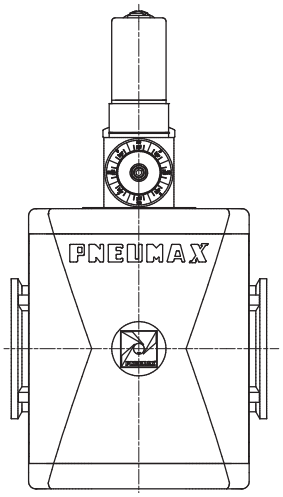

| Technical characteristics | | | | | |
|---|---|---|---|---|---|
| **Size** | | Size 1 | Size 2 | Size 3 | Size 4 |
| Body and connections type | | / | Aluminium body, integrated aluminium connections (P version) | | |
| | | Technopolymer body, integrated technopolymer connections (T version) | | | / |
| | | Technopolymer body, metal connections (N version) | | | |
| IN / OUT / INTAKE connections | T version | G1/4" | G3/8" | G1/2" | not available |
| | N version | G1/8" - G1/4" - 1/4" NPT | G3/8" - G1/4" - 3/8" NPT | G3/8" - G1/2" - 1/2" NPT | |
| | P version | not available | G3/8" | G1/2" | G1" |
| Assembly configuration | | Stand alone | | | |
| | | / | | | Panel mounted |
| Assembly positions | | Indifferent | | | |
| Microswitch capacity | | 1A | | | |
| Microswitch maximum tension | | 250 VAC | | | |
| Microswitch IP Rating | | IP65 (with mounted connector) | | | |
| Max. fittings torque IN / OUT / INTAKE connections | G1" metal | / | | / | 35Nm |
| | G1/2" metal | | | 30Nm | / |
| | G1/4" metal | 20Nm | | / | |
| | G1/8" metal | 15Nm | / | | |
| | G3/8" metal | / | 25Nm | | |
| | G1/2" technopolymer | | / | 22Nm | |
| | G1/4" technopolymer | 9Nm | | / | |
| | G3/8" technopolymer | / | 16Nm | | |

| Operational characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Maximum working pressure | 13 bar | | | |
| Working temperature | -5°C...+50°C | | | |
| Operating pressure range | 2 - 10 bar | | | |

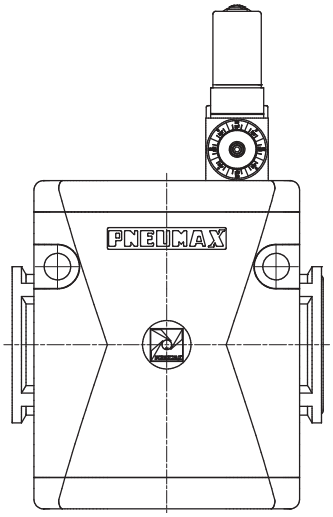
| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Technopolymer body version | 138 g | 179 g | 235 g | / |
| Aluminium body version | / | 330 g | 780 g | 800 g |

## Design

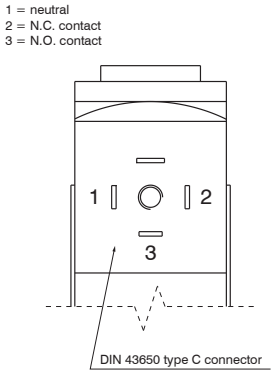
Size 1 - Size 2 - Size 3




Size 4




## Electrical connection

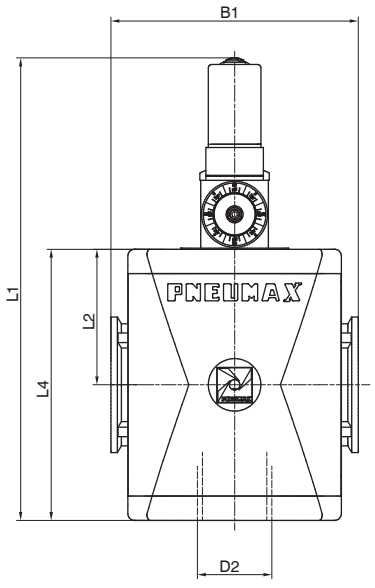


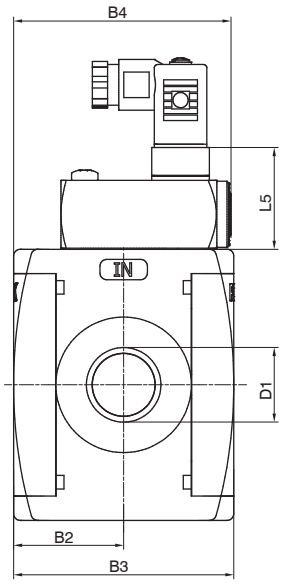

## Coding: Ⓥ17ⓉPPⒻ

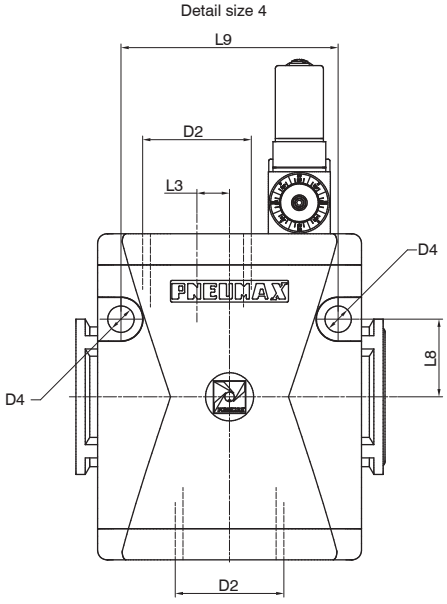
| | |
|---|---|
| Ⓥ | VERSION |
| | **N** = Technopolymer body and metal inserts (not available for size 4) |
| | **T** = Technopolymer body and thread (not available for size 4) |
| | **P** = Aluminum body (not available for size 1) |
| Ⓣ | SIZE AND CONNECTIONS |
| | **1A** = Size 1 - G1/8" only for N version |
| | **1B** = Size 1 - G1/4" only for T - N versions |
| | **1C** = Size 1 - 1/4" NPT only for N version |
| | **2A** = Size 2 - G1/4" only for N version |
| | **2B** = Size 2 - G3/8" for all versions |
| | **2C** = Size 2 - 3/8" NPT only for N version |
| | **3A** = Size 3 - G3/8" only for N version |
| | **3B** = Size 3 - G1/2" for all versions |
| | **3C** = Size 3 - 1/2" NPT only for N version |
| | **4B** = Size 4 - G1" only for P version |
| Ⓕ | FLOW DIRECTION (ONLY FOR SIZE 4) |
| | = From left to right |
| | **W** = From right to left |

**Example**: **T173BPP**: Size 3 pressure switch G1/2"

## Dimensions



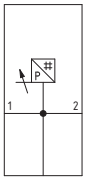

| Model | B1 | B2 | B3 | D1 D2 | D4 | L1 | L2 | L3 | L4 | L5 | L8 | L9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #171.. | 48 | 21 | 42 | G1/8" G1/4" 1/4 NPT | / | 114.7 | 27,5 | / | 55 | 32.7 | / | / |
| #172.. | 62 | 28.5 | 57 | G3/8" G1/4" 3/8 NPT | | 125 | 34 | | 68 | 30 | | |
| #173.. | 73 | 32.5 | 65 | G3/8" G1/2" 1/2 NPT | | 137 | 40 | | 80 | | | |
| #174.. | 99 | 44 | 88 | G1" | 8.5 | 162 | 52.5 | 10.5 | 105 | | 25 | 70 |

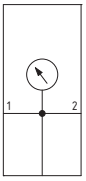


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Air intake with pressure gauge or digital pressure switch integrated (PM-PW-PP-PZ)






- Available with pressure gauge or digital pressure switch integrated
- Air intake connection device available
- Material and version wide selection
- Available in 4 sizes with connections from 1/8" to 1"
- Atex certification (II 2GD or II 3GD) for Integrated pressure gauge version



| Technical characteristics | | | | | |
|---|---|---|---|---|---|
| **Size** | | Size 1 | Size 2 | Size 3 | Size 4 |
| Body and connections type | | / | Aluminium body, integrated aluminium connections (P version) | | |
| | | Technopolymer body, integrated technopolymer connections (T version) | | | / |
| | | Technopolymer body, metal connections (N version) | | | |
| IN / OUT connections | T version | G1/4" | G3/8" | G1/2" | not available |
| | N version | G1/8" - G1/4" - 1/4" NPT | G3/8" - G1/4" - 3/8" NPT | G3/8" - G1/2" - 1/2" NPT | |
| | P version | not available | G3/8" | G1/2" | G1" |
| Air intake connection | | G1/4" | G3/8" | G3/8" | G1" |
| Assembly configuration | | Stand alone | | | |
| | | / | | | Panel mounted |
| Assembly positions | | Indifferent | | | |
| Pressure measurement | | Integrated pressure gauge | | | |
| | | Digital pressure switch | | | |
| Max. fittings torque IN / OUT connections | G1" metal | / | | / | 35Nm |
| | G1/2" metal | | | 30Nm | / |
| | G1/4" metal | 20Nm | | / | |
| | G1/8" metal | 15Nm | / | | |
| | G3/8" metal | / | 25Nm | | |
| | G1/2" technopolymer | | / | 22Nm | |
| | G1/4" technopolymer | 9Nm | | / | |
| | G3/8" technopolymer | / | 16Nm | | |

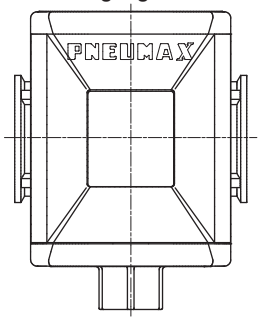
| Operational characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Maximum working pressure | 13 bar | | | |
| Working temperature with integrated pressure gauge | -5 °C ... +50 °C | | | |
| | / | -30°C ... +80°C (only with metal body) | | |
| Working temperature with digital pressure switch | 0 °C ... +50 °C | | | |

| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Technopolymer body and integrated gauge | 83 g | 161 g | 249 g | / |
| Working temperature with digital pressure switch | 111 g | 189 g | 277 g | / |
| Technopolymer body version with Integrated pressure gauge | / | 245 g | 373 g | 770 g |
| Technopolymer body version with integrated digital pressure switch | / | 273 g | 401 g | 787 g |

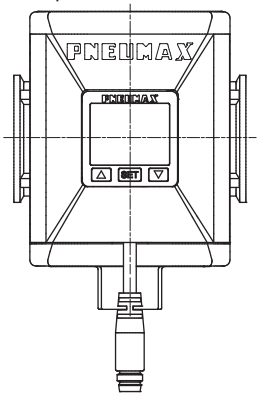
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Design

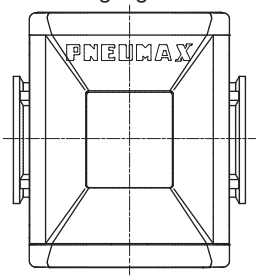
**Size 1 - Size 2 - Size 3**
Technopolymer body and integrated pressure gauge



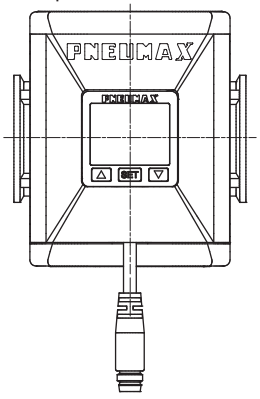

**Size 1 - Size 2 - Size 3**
Technopolymer body and integrated digital pressure switch



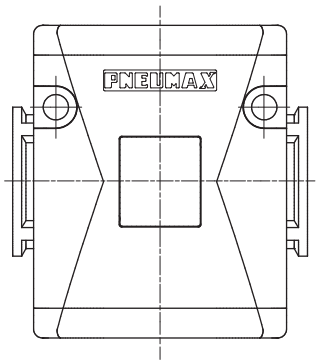

**Size 2 - Size 3**
Aluminium body and integrated pressure gauge



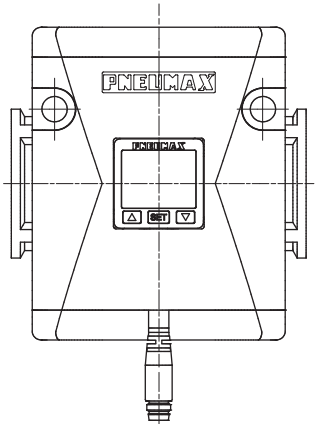

**Size 2 - Size 3**
Aluminium body and integrated digital pressure switch




**Size 4**
Integrated pressure gauge version




**Size 4**
Integrated digital pressure switch version




**Coding:** Ⓥ17ⓉPⓄ[1]Ⓞ[2]

| | |
|---|---|
| Ⓥ | VERSION |
| | **N** = Technopolymer body and metal inserts (not available for size 4) |
| | **T** = Technopolymer body and thread (not available for size 4) |
| | **P** = Aluminum body (not available for size 1) |
| Ⓣ | SIZE AND CONNECTIONS |
| | **1A** = Size 1 - G1/8" only for N version |
| | **1B** = Size 1 - G1/4" only for T - N versions |
| | **1C** = Size 1 - 1/4" NPT only for N version |
| | **2A** = Size 2 - G1/4" only for N version |
| | **2B** = Size 2 - G3/8" for all versions |
| | **2C** = Size 2 - 3/8" NPT only for N version |
| | **3A** = Size 3 - G3/8" only for N version |
| | **3B** = Size 3 - G1/2" for all versions |
| | **3C** = Size 3 - 1/2" NPT only for N version |
| | **4B** = Size 4 - G1" only for P version |

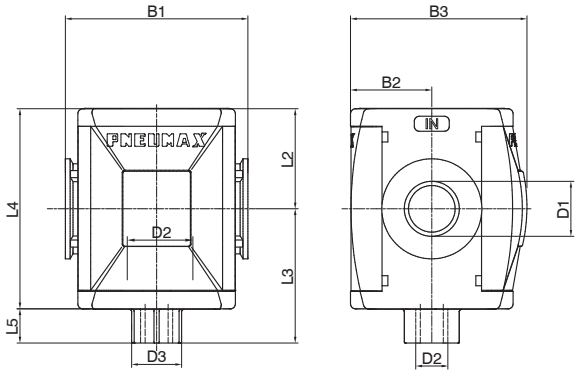
| | |
|---|---|
| Ⓞ[1] | PRESSURE MEASUREMENT OPTIONS |
| | **M** = Integrated pressure gauge |
| | **W** = Integrated pressure gauge Right - Left |
| | **P** = Digital pressure switch |
| | **Z** = Digital pressure switch Right - Left |
| Ⓞ[2] | DIGITAL PRESSURE SWITCH OPTIONS |
| | **A** = Cable 150 mm + M8 PNP |
| | **B** = Cable 150 mm + M8 NPN |
| | **C** = Cable 2 m PNP |
| | **D** = Cable 2 m NPN |

**Example**: **T173BPPA**: Digital pressure switch with cable 150 mm + M8 PNP, size 3 G1/2"

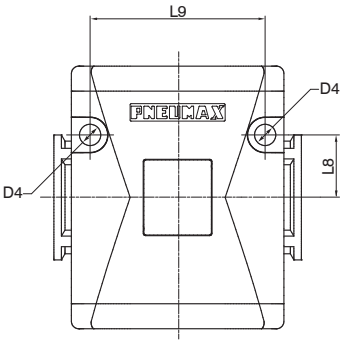

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Dimensions - Integrated pressure gauge version

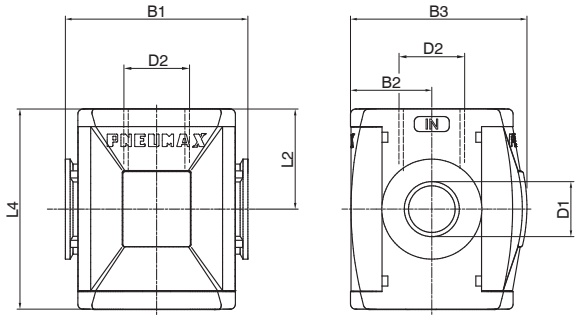
Technopolymer body version




Fixing holes dimension detail (only for size 4)

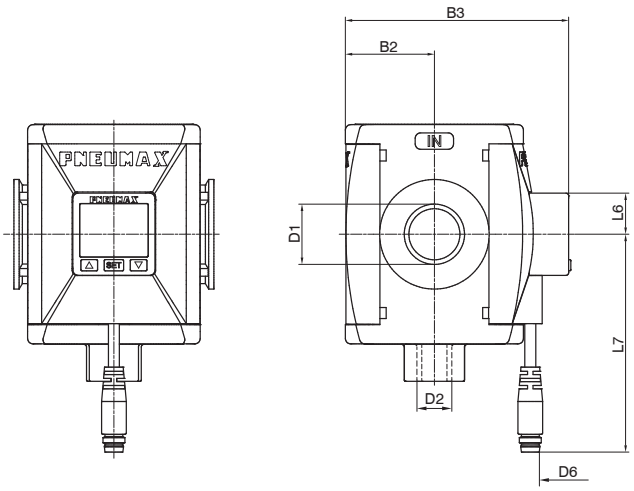



Aluminum body version (Size 2 - Size 3 - Size 4)




| Model | B1 | B2 | B3 | D1 | D2 | D3 | D4 | L2 | L3 | L4 | L5 | L8 | L9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #171... | 48 | 21 | 48,5 | G1/8" G1/4" 1/4 NPT | G1/4" | Ch. 17 | / | 27,5 | 38,5 | 55 | 11 | / | / |
| #172... | 62 | 28,5 | 62,5 | G1/4" G3/8" 3/8" NPT | G3/8" | Ch. 20 | / | 34 | 48 | 68 | 14 | / | / |
| #173... | 73 | 32,5 | 70,5 | G3/8" G1/2" 1/2 NPT | G3/8" | Ch. 20 | / | 40 | 54 | 80 | 14 | / | / |
| #174... | 99 | 44 | 90,5 | G1" | G1" | / | 8,5 | 52,5 | 52.5 | 105 | / | 25 | 70 |

## Variable dimensions - Digital pressure switch version




| Model | B2 | B3 | D1 | D2 | D6 - Type of digital pressure switch | | L6 | L7 - Type of digital pressure switch | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | A - B | C - D | | A - B | C - D |
| #171... | 21 | 60 | G1/8" G1/4" 1/4 NPT | G1/4" | M8 - 3 PIN | 3 x 0,129 mm, Ø 4 mm | 15 | 150 | 2000 |
| #172... | 28,5 | 73,5 | G1/4" G3/8" 3/8" NPT | G3/8" | | | | | |
| #173... | 32,5 | 81,5 | G3/8" G1/2" 1/2 NPT | G3/8" | | | | | |
| #174... | 44 | 101,5 | G1" | G1/2" | | | | | |



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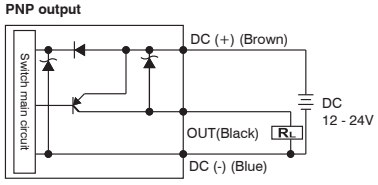
## Digital pressure switch

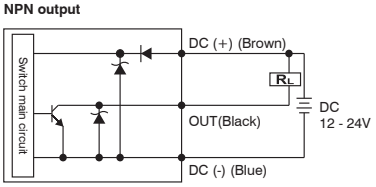


- 3 color digital LCD display, easy readout
- 4 units of measurement for pressure indication
- Optional PNP or NPN digital output
- N.O. and N.C. output contact selection directly on the digital pressure switch
- Available with M8-3PIN connector or 3 wire cable length 2 m

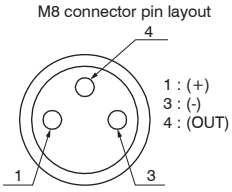


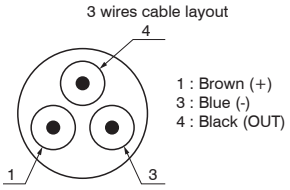
### Output circuit wiring diagrams




### Digital pressure switch layout




### Cable ordering code

**MCH1**: cable 3 wires l=2,5m with M8 connector
**MCH2**: cable 3 wires l=5m with M8 connector
**MCH3**: cable 3 wires l=10m with M8 connector

Connector




| Technical characteristics | |
|---|---|
| Pressure range and display | 0 ... 10 bar |
| Max. inlet pressure | 15 bar |
| Fluid | 40$\mu$m filtered and dehumidified air |
| Display unit of measurement | MPa - kgf/cm$^2$ - bar - psi |
| Supply voltage | 12 ... 24 VDC |
| Current consumption | ≤40mA (without load) |
| Digital output type | PNP - NPN |
| Type of contact output | Normally Open - Normally Closed |
| Max. load current | 125 mA |
| Digital output activation mode | single threshold with fixed hysteresis - window with fixed hysteresis - window without hysteresis |
| Digital output activation time | 0.05s - 0.25s - 0.5s - 1s - 2s - 3s (selections for chattering-proof options) |
| Display characteristics | Double 3 1/2 digit display<br>Digital output status indication<br>Three-pushbuttons touchpad |
| Indicator accuracy | ≤±2% full scale value ± 1 digit |
| Protection degree | IP40 |
| Working temperature | 0 °C ... 50 °C |
| Cable section | 3 x 0,129 mm$^2$, Ø4 mm, PVC |


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## Supply and discharge valves SAFELINE



Upon implementation of the AIRPLUS size 3 series, air-treatment units, PNEUMAX develops a supply and discharge valve, with an electropneumatic control and spring-return, fitted with a diagnostic system regarding the state of the valve, with the possibility of creating a double channel to determine the system's redundancy.
The valve, as a safety feature, provides the interruption of the air supply and the exhaust of the air circuit it is connected to. The version with one single channel emphasises the features of an EV 3/2 NC, monostable with electropneumatic control and spring-return, whose operation involves:
- condition of the VALVE AT REST, with a DE-ENERGISED coil; Port 1 (air supply) is not been connected to Port 2 (downstream air circuit). Port 2 is discharged out of Port 3;
- condition of the VALVE ACTIVATED, with an ENERGISED coil; Port 1 (air supply) is connected to Port 2 (downstream air circuit), with Port 3 (Discharge) closed. By de-energising the coil, the system resets the condition of VALVE AT REST by means of the return spring, which repositions the spool. Once again Port 2 (downstream air circuit), discharges via Port 3.

The state of the valve is constantly monitored by a diagnostic system, using a Hall effect sensor, which reads the position of the spool and consequently takes note of the valve's position.
The sensor is in the ON position when the valve is at rest (DE-ENERGISED coil), while it is in the OFF position when the valve is activated (ENERGISED coil).
The sensor is in the OFF position under conditions of an activated valve (DE-ENERGISED coil), indicating a possible problem.
**The SAFELINE supply and discharge valve in the single version is a classified component in CATEGORY 2 according to ISO EN 13849 and is appropriate for use in safety circuits until PL=C.**
The version with a double redundant channel is made using two single solenoid valves 3/2 NC provided with diagnostics, mounted in series so that the Port 2 of the first solenoid valve is linked to the Port 1 of the second solenoid valve.
It is sufficient that only one of the EV is de-energised to guarantee the discharge of the air circuit.
If one of the two EV must remain blocked due to a malfunction, the other one ensures the discharge function of the pneumatic installation. Even in this case, the diagnostic system of both solenoid valves constantly monitors the state of the 2 single EV.
**The SAFELINE supply and discharge valve in the double version is a classified component in CATEGORY 4 according to ISO EN 13849 and is appropriate for use in safety circuits until PL=E.**
Both single and double solenoid valves are provided with the following certifications released by BUREAU VERITAS:
- TYPE APPROVAL certificate according to the EN ISO 13849 regulations
- certification of examination of compliance in accordance to the machinery directive 2006/42/CE

**The AIRPLUS SAFELINE are solenoid valves marked as ATEX** → **II 3G Ex nA IIC T6 Gc (X)**
**II 3D Ex tc IIIC T=80°C Dc (X) IP65**

| Construction characteristics | |
|---|---|
| Body | Aluminium |
| Solenoid Operator | Technopolymer |
| Rear end cap | Aluminium |
| Spool | Aluminium |
| Spool seals | Polyurethane |
| Piston | Aluminium |
| Spring | EN 10270-1 DH steel |
| Electrical Interface | Male MP12 4 PIN TYPE A connector |

| Operational characteristics | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Working temperature | -10°C ... +50°C |
| Minimum working pressure | 2,5 bar |
| Maximum working pressure | 10 bar |



**Instructions for installation and use**

Undertake the installation respecting the safety requirements with regards to the system and components for hydraulic and pneumatic transmissions. Install the device as close as possible to the point of use. Its assembly is possible in any position. Pay attention to the flow direction, indicated on the main body with the labels IN and OUT. During the components discharge, high levels of noise occur.
The use of a silencer on the discharge port is recommended. Ensure there is sufficient space for assembly during the installation process. Please ensure that the discharge area is always clear, and in case a silencer is used, periodically verify that it is not obstructed.
It is possible to integrate and install the device in an existing AIRPLUS group or in a new installation, or else to use the device individually attaching it by aligning the assembled unit with the relevant fastening flange for the supply and discharge valve, or to use the device individually attaching it by aligning the assembled unit with the type “Y” fastening flange for the double supply and discharge valve



**WARNING!**

**Pay particular attention to external factors such as the nearness of live wires, magnetic fields, metallic objects providing magnetic conduction very close to the device, which may influence and disturb the diagnostic system.**



**WARNING!**

**The electrical connection must be made exclusively by specialized personnel, using components that have no voltage present. Only use power supplies which can guarantee a safe electrical isolation of the working voltage in accordance to IEC/EN 60204-1. Additionally, observe the requirements anticipated by the PELV circuits in accordance to IEC/EN 60204-1.**

**Care and maintenance**



**WARNING!**

**Do not connect or disconnect the device when energised! Do not open and/or disassemble the parts that are included in the energised valve. Once the power supply is disconnected, wait for a few minutes before opening or disassembling parts of the valve that result in its disassembly.**

Before carrying out any operation, it is essential to remove the pneumatic and power supply to the device and wait for the residual pressure to be completely discharged.
Please ensure that the discharge is always clear, and in case a silencer is used, periodically verify that it is not obstructed.
Periodically remove any dust deposits from the valve using a damp cloth.
Use soapy water to clean the device.
Do not use corrosive or alcohol-based products.
For maintenance operations on internal components, please consult with PNEUMAX SPA.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Supply and discharge valve single (VS)

| Electrical characteristics | |
|---|---|
| Electrical connection | Male M12 4 PIN TYPE A connector |
| Coil Features | 24 VDC, 1 Watt |
| Suppressor diode for coil reverse voltage spike | Present |
| Supply voltage allowance | -5% ... +10% |

| Electrical characteristics of sensor | |
|---|---|
| Sensor characteristics | 10 ... 30 VDC |
| Operating principle | Hall effect |
| Contact type | N.O. |
| Output type | PNP |
| Permanent maximum current | 100 mA |
| Permanent maximum power | 3 Watt |
| Voltage drop max. | 2 V |

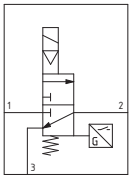
| Safety characteristics | |
|---|---|
| Regulatory compliance | EN ISO 13849-1 |
| Safety function fulfiled | Interruption of supply and unloading of the downstream pneumatic circuit |
| Performance Level (PL) | c |
| UNI EN 13849 category | 2 |
| Safety Integrity Level (SIL) | 1 |
| PFHd | $1,7*10^{-6}$ |
| CE marking | In accordance with the EU Machinery Directive, annex V |

| Technical characteristics | |
|---|---|
| Connections | G1/2" UNI-ISO 228/1 |
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Function | 3/2 N.C. monostable |
| Minimum working pressure | 2,5 bar |
| Maximum working pressure | 10 bar |
| Working temperature | -10°C ... +50°C |
| Flow rate at 6bar Δp (from 1 to 2) | 3500 NL/min |
| Flow rate at 6bar Δp (from 2 to 3) | 2000 NL/min |
| Flow rate at 6bar (from 2 to 3) with free discharge | 3800 NL/min |
| Type of installation | Stand alone |
| Assembly positions | Indifferent |
| Noise level | 90 dB |
| Response time ON ISO 12238 | 36 ms |
| Response time OFF ISO 12238 | 76 ms |
| Protection degree | IP65 (with mounted connector) |

### Electrical connection




| PIN | Description |
|---|---|
| 1 | +24 VDC (Sensor) |
| 2 | +24 VDC (EV) |
| 3 | GND (Sensor+EV) |
| 4 | SENSOR OUTPUT |




**ATEX** CE Ex
**II 3G Ex nA IIC T6 Gc (X)**
**II 3D Ex tc IIIC T=80°C Dc (X) IP65**

**Coding:** N173BVS(V)(F)

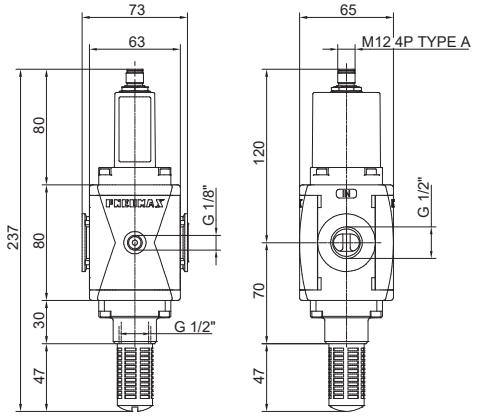
| | |
|---|---|
| (V) | VERSIONS |
| | = Standard* |
| | **M** = Integrated pressure gauge |
| | **W** = Integrated pressure gauge (Right-Left) |
| | **G** = G1/8" pressure gauge connection |
| (F) | FIXING |
| | = Without fixing* |
| | **01** = Fixing bracket mounted (Left-Right) |
| | **02** = Fixing bracket mounted (Right-Left) |

**Example: N173BVSM01** : Size 3 single safety valve G1/2", Built-in pressure gauge and fixing bracket mounted (Left-Right)

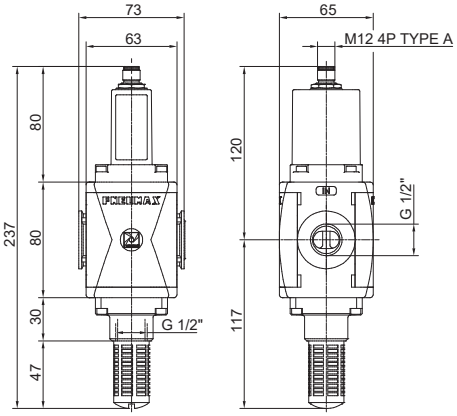
* no additional letter required.

### Dimensions

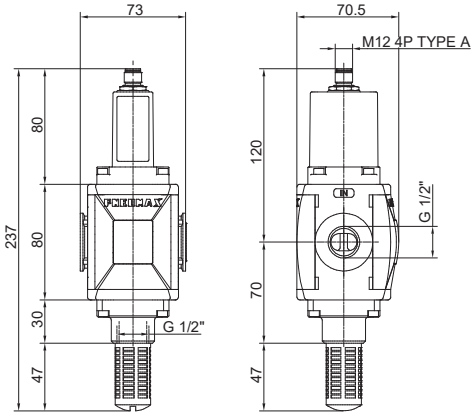


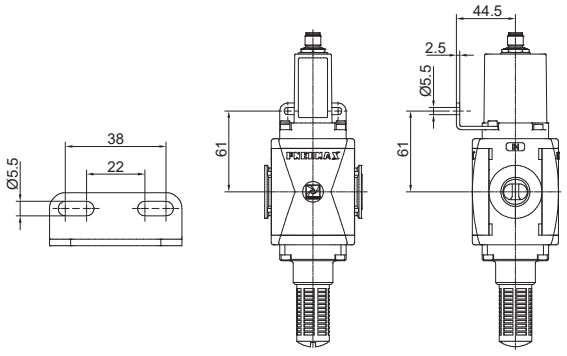






**Installation tip of a safety system by means of a single valve.**

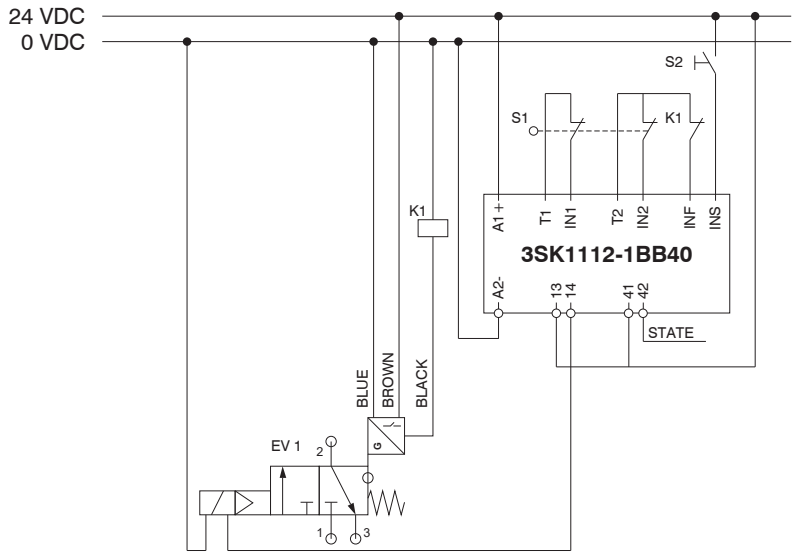
**Please note: the safety valve is not sufficient alone to guarantee the safety function.**
**Its setup requires the use of a monitoring device.**
In this setup, the SIEMENS® 3SK1112-1BB40 monitoring device has been indicated, activated by an S2 start / reset pushbutton, blocked by an S1 emergency shutdown key.
Said monitoring device, by means of the readings of the sensor placed inside the valve (reading made by means of the K1 relay), operates the activation of the valve itself.
The monitoring device transmits the safety status as an output.
The preliminary estimate and the final verification of the achieved PL are the responsibility of the designer of the part of the system dedicated to providing the safety function.
**Note: with a single valve, it is not possible to obtain a PL greater than "c".**



**Setup suggestions**

- The double stop pushbutton is connected to clamps T1-IN1 and T2-IN2 of 3SK1112-1BB40.
- The start / reset pushbutton is connected between +24 V and the INS clamp of 3SK1112-1BB40.
- The valve is supplied between 0 V (Pin 3 of the supply connector) and the 14 clamp of 3SK1112-1BB40 (Pin 2 of the supply connector).
- The HALL effect sensor is supplied between 0 V (Pin 3 of the supply connector) and 24 V (Pin 1 of the supply connector).
- The HALL effect sensor drives (Pin 4 of the supply connector) the K1 relay, whose N.O. contact will be connected between the monitoring device's clamp T2 and INF.

The circuit diagram of the **suggested** configuration is provided, along with the configuration of 3SK1112-1BB40.




**3SK1112-1BB40 Configuration**

| | |
|---|---|
| 1 Autostart / Monitored Start | |
| 2 Cross fault detection OFF / ON | |
| 3 2 single-ch. sensors / 1 double-ch. sensor | |
| 4 Startup test YES / NO | |

**Analysis of malfunctions**

The diagnostic system (monitoring device plus sensor) has the purpose of verifying the appearance of malfunctions within the valve that undermine the safety function. In particular, (with 3SK1112-1BB40 configured as in the illustration), the K1 relay prevents resetting the system by means of S2 when the coil is de-energised, but the sensor remains in the OFF position (K1 remains de-energised).


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Supply and discharge valve double (V2S)

| Electrical characteristics | |
|---|---|
| Electrical connection | 2 Male M12 4 PIN TYPE A connectors |
| Coil Features | 24 VDC, 1 Watt + 1 Watt |
| Suppressor diode for coil reverse voltage spike | Present |
| Supply voltage allowance | -5% ... +10% |

| Electrical characteristics of sensor | |
|---|---|
| Sensor characteristics | 10 ... 30 VDC |
| Operating principle | Hall effect |
| Contact type | N.O. |
| Output type | PNP |
| Permanent maximum current | 100 mA + 100 mA |
| Permanent maximum power | 3 Watt + 3 Watt |
| Voltage drop max. | 2 V + 2 V |

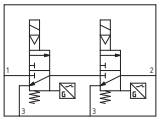
| Safety characteristics | |
|---|---|
| Regulatory compliance | EN ISO 13849-1 |
| Safety function fulfiled | Interruption of supply and unloading of the downstream pneumatic circuit |
| Performance Level (PL) | e |
| UNI EN 13849 category | 4 |
| Safety Integrity Level (SIL) | 3 |
| PFHd | $4{,}7*10^{-6}$ |
| CE marking | In accordance with the EU Machinery Directive, annex V |

| Technical characteristics | |
|---|---|
| Connections | G1/2" UNI-ISO 228/1 |
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Function | 3/2 N.C. monostable |
| Minimum working pressure | 2,5 bar |
| Maximum working pressure | 10 bar |
| Working temperature | -10°C ... +50°C |
| Flow rate at 6bar Δp (from 1 to 2) | 2500 NL/min |
| Flow rate at 6bar Δp (from 2 to 3) | 2000 NL/min |
| Flow rate at 6bar (from 2 to 3) with free discharge | 3800 NL/min |
| Type of installation | Stand alone |
| Assembly positions | Indifferent |
| Noise level | 90 dB |
| Response time ON ISO 12238 | 68 ms |
| Response time OFF ISO 12238 | 79 ms |
| Protection degree | IP65 (with mounted connector) |

### Electrical connection




| PIN | Description |
|---|---|
| 1 | +24 VDC (Sensor) |
| 2 | +24 VDC (EV) |
| 3 | GND (Sensor+EV) |
| 4 | SENSOR OUTPUT |



**ATEX CE Ex**
**II 3G Ex nA IIC T6 Gc (X)**
**II 3D Ex tc IIIC T=80°C Dc (X) IP65**

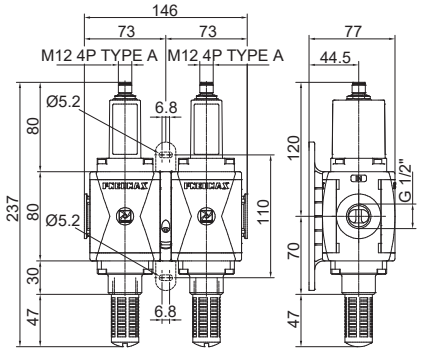
**Coding:** N173BV2S(V)(F)(D)

| | |
|---|---|
| (V) | VERSIONS |
| | = Standard |
| | **M** = Integrated pressure gauge |
| | **G** = G1/8" pressure gauge connection |
| (F) | FIXING |
| | **X** = Flange X |
| | **Y** = Flange Y |
| | **K** = Aluminium flange Y |
| | **Z** = Aluminium flange X |
| (D) | FLOW RATE DIRECTION |
| | = Standard (Left-Right) |
| | **W** = (Right-Left) |

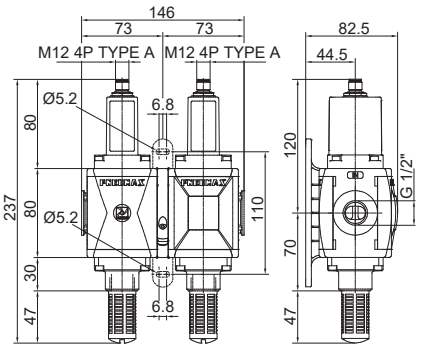
**Example: N173BV2SMK** : Size 3 double safety valve G1/2", Built-in pressure gauge and Y aluminum flange

### Dimensions

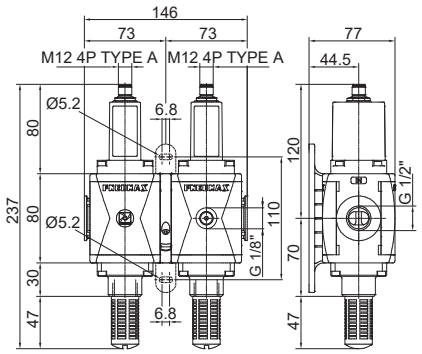








**Installation tip of a safety system by means of a double valve**

**Please note: the safety valve is not sufficient alone to guarantee the safety function.**
**Its setup requires the use of a monitoring device.**
In this setup, the SIEMENS® 3SK2112 monitoring device has been indicated, activated by an S2 start / reset pushbutton, blocked by an S1 emergency shutdown key. Said monitoring device, by means of the readings of the sensors placed inside the double valve, operates the activation of the valve itself. The preliminary estimate and the final verification of the achieved PL are the responsibility of the designer of the part of the system dedicated to providin the safety function.

**Setup suggestions**

- The double stop pushbutton is connected to clamps T1-F-IN1 and T2-F-IN2 of 3SK2112.
- The start /reset pushbutton is connected between +24 V and the F-IN10 clamp of 3SK2112.

The double valve, for notation simplicity, is indicated as consisting of 2 valves: S.V.1 and S.V.2

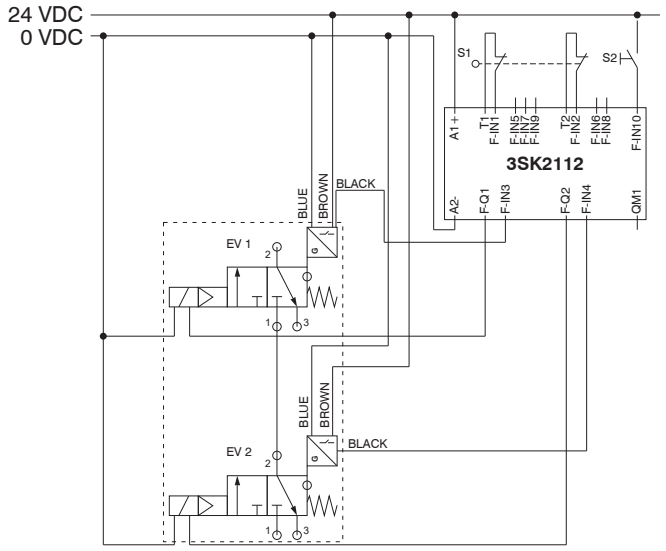
**S.V.1**

- The valve is supplied between 0 V (Pin 3 of the supply connector) and the F-Q1 clamp of 3SK2112 (Pin 2 of the supply connector).
- The HALL effect sensor is supplied between 0 V (Pin 3 of the supply connector) and 24 V (Pin 1 of the supply connector).
- The HALL effect sensor is attached (Pin 4 of the supply connector) to the monitoring device's F-IN3 clamp.

**S.V.2**

- The valve is supplied between 0 V (Pin 3 of the supply connector) and the F-Q2 clamp of 3SK2112 (Pin 2 of the supply connector).
- The HALL effect sensor is supplied between 0 V (Pin 3 of the supply connector) and 24 V (Pin 1 of the supply connector).
- The HALL effect sensor is attached (Pin 4 of the supply connector) to the monitoring device's F-IN4 clamp.

The circuit diagram of the **suggested** configuration is provided.

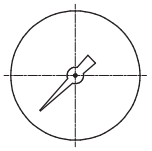


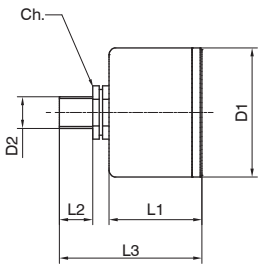

**Analysis of malfunctions**

The diagnostic system (monitoring device plus sensors) has the purpose of verifying the appearance of malfunctions within the valves, which undermine the safety function. In particular, the monitoring device must be appropriately programmed to avoid the system's reset by means of S2 when both coils are de-energised and at least one sensor remains in an OFF position.

## Pressure gauge








**Coding:** 17070 (V) (S)

| | |
|---|---|
| (V) | VERSION |
| | **A** = Dial Ø40 |
| | **B** = Dial Ø50 |
| (S) | SCALE |
| | **A** = 0 - 4 bar |
| | **B** = 0 - 6 bar |
| | **C** = 0 - 12 bar |

| Model | D1 | D2 | L1 | L2 | L3 | Ch |
|---|---|---|---|---|---|---|
| 17070A... | 41 | Gc - 1/8" | 26 | 10 | 44 | 14 |
| 17070B... | 49 | Gc - 1/8" | 27 | 10 | 45 | 14 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

**Regulatory Framework**

The purpose of the EU's Machinery Directive is to define the health and safety requirements in the framework of designing and constructing machinery.
Since 2009, the new Machinery Directive has become effective in the European Union.
Member countries of the EU are required to implement this standard.
The manufacturers of machinery can comply with the Machinery Directive applying the harmonised standards listed in the Official Journal of the European Union.

The design and manufacture of safety controls are developed in compliance with one of the two important harmonised standards:

| UNI EN ISO 13849-1 |
|---|
| Safety of machinery<br>Safety-related parts of control systems<br>Part 1: General design principles |

| EN 62061 |
|---|
| Safety of machinery<br>Functional safety of electrical, electronic and programmable<br>control systems regarding safety |

The UNI EN ISO 13849-1 standard is one of the most important harmonised standards, which has been widely used; it is intended to provide a guide to principles for design and integration of safety-related parts of the control system.

Each safety-related control system must be designed and constructed in accordance with the principles of ISO 12100 and ISO 14121 by which the possible risks are considered and assessed, in view of the intended uses and the reasonably anticipated incorrect uses.

The parts of a machinery's control system are called "Safety-related parts of control systems". Their capacity to perform a safety function under predictable conditions is assigned by means of five possible levels called **"performance levels" (PL)**. These levels are defined in terms of probability of dangerous malfunction per hour.

| PL - Performance Level | Average probability of dangerous malfunction per hour (1/h) |
|---|---|
| a | $\geq 10^{-5}$ up to $< 10^{-4}$ |
| b | $\geq 3x10^{-6}$ up to $< 10^{-4}$ |
| c | $\geq 10^{-6}$ up to $< 3x10^{-6}$ |
| d | $\geq 10^{-7}$ up to $< 10^{-6}$ |
| e | $\geq 10^{-8}$ up to $< 10^{-10}$ |

The calculated PL must be greater or equal to the necessary value, which arises from the calculation of the risk correlated to one single function and to the need to reduce it to an acceptable level.

| Calculated risk assessment | | | |
|---|---|---|---|
| S1 - Slight danger | F1 - Occasional danger and brief exposure | P1 - possibly avoidable danger | PL= a<br>PL= b |
| | | P2 - largely unavoidable danger | |
| | F2 - Frequent danger and long exposure | P1 - possibly avoidable danger | |
| | | P2 - largely unavoidable danger | PL= c<br>PL= d |
| S2 - Serious danger | F1 - Occasional danger and brief exposure | P1 - possibly avoidable danger | |
| | | P2 - largely unavoidable danger | |
| | F2 - Frequent danger and long exposure | P1 - possibly avoidable danger | |
| | | P2 - largely unavoidable danger | PL= e |

## Manifold unit



- Modular system
- Compact and linear design
- Maximum flexibility and reliability
- Up to 10 items assembly with unlimited configuration
- Plug-n-play connection thru couplig flanges
- Maintenance possible without completely disassembling the group
- Integral safety elements in assembled group
- Material and version wide selection
- Available in 4 sizes with connections from 1/8" to 1"
- Atex certification (II 2GD or II 3GD)



| Operational characteristics | | | | | |
|---|---|---|---|---|---|
| **Size** | | Size 1 | Size 2 | Size 3 | Size 4 |
| Maximum working pressure * | | 10 bar / 13 bar / 16 bar / 20 bar | | | |
| Minimum working pressure * | | 0,5 bar / 2,5 bar | | | |
| Working temperature * | | -5 °C ... +50 °C / -30 °C ... +80 °C / -40 °C ... +80 °C | | | |
| IN / OUT connections | T version | G1/4" | G3/8" | G1/2" | not available |
| | N version | G1/8" - G1/4" - 1/4" NPT | G3/8" - G1/4" - 3/8" NPT | G3/8" - G1/2" - 1/2" NPT | |
| | P and L versions | not available | G3/8" - 1/4" NPT | G1/2" - 1/2" NPT | G1" - 1" NPT |
| Assembly configuration | | Stand alone | | | |
| | | Panel mounted thru fixing elements | | | |
| Assembly positions | | Vertical ±5° with no restriction in case of elements without bowl | | | |
| Max. fittings torque IN / OUT connections | G1" metal | / | | / | 35Nm |
| | G1/2" metal | | | 30Nm | / |
| | G1/4" metal | 20Nm | | / | |
| | G1/8" metal | 15Nm | / | | |
| | G3/8" metal | / | 25Nm | | |
| | G1/2" technopolymer | | / | 22Nm | |
| | G1/4" technopolymer | 9Nm | | / | |
| | G3/8" technopolymer | / | 16Nm | | |
| Max. fittings torque G1/8" pressure gauge connection | | G1/8" metal: 15Nm | | | |
| | | G1/8" technopolymer: 4 Nm | | | |

* Module configuration shall be identified according to individual technical details of each items included in applicable manifold.

**Manifold assembly**

The assembly operation of selected items (module) is carried out thru dedicated quick connection flanges.
Both aluminum and techno polymer materials selection available, with fixing holes in case of panel mounting configuration.
Due to its design, Pneumax connection flanges allow user-friendly maintenance activities with no need of entire manifold disassembling procedure.



Thanks to a wide range of modules with different functions and characteristics, together with a wide choice of materials selection, make the Pneumax AIRPLUS air treatment units a robust, reliable and extremely flexible modular system, adaptable to different applications.
AIRPLUS units properly assembled are modular with unlimited configurations and solutions and capable to satisfy and fulfill all their functions of compressed air treatment. Pneumax Airplus air treatment units can be integrated with safety elements that comply with EN-ISO 13849-1 and CE marking according to EU Machinery Directive, Annex V. Simple instruction provides an easy manifold configuration.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

**Configuration instructions**
Manifold configuration as per following instructions.
As a result, a dedicated code will be provided, and the two main parameters will be identified, as follow:
- Features applicable to all items included in manifold (i.e. version, size, connection, flow direction).
- Assembly sequence of the single item + coupling flanges.
Note: Max 10 items for each manifold.

The group can be configured by consulting the Pneumax catalog here:
http://pneumax.partcommunity.com/3d-cad-models/
also reachable through a special link available on the home page of the Pneumax website




**Coding**

Initial code that identifies the main characteristics of the group such as:
- version
- size and connections
- flow direction
These will be the same for all the modules included in manifold, in accordance with the characteristics of the individual items available.

Code that identifies the succession of individual modules and related coupling flanges included in manifold from module 1 to 10.

**COMPLETE APPLICABLE ORDER CODE** ← G 17 - - - →

| Version | |
|---|---|
| N | Technopolymer body and metal inserts (not available for size 4) |
| T | Technopolymer body and thread (not available for size 4) |
| P | Aluminum body (not available for size 1) |
| L | Aluminum body, low temperature (not available for size 1) |

| Size and connections | |
|---|---|
| 1A | Size 1 - G1/8" only for N version |
| 1B | Size 1 - G1/4" only for T - N versions |
| 1C | Size 1 - 1/4" NPT only for N version |
| 2A | Size 2 - G1/4" only for N version |
| 2B | Size 2 - G3/8" for all versions |
| 2C | Size 2 - 3/8" NPT only for N version - 1/4" NPT only for P - L versions |
| 3A | Size 3 - G3/8" only for N version |
| 3B | Size 3 - G1/2" for all versions |
| 3C | Size 3 - 1/2" NPT only for N - P - L versions |
| 4B | Size 4 - G1" only for P - L versions |
| 4C | Size 4 - 1" NPT only for P - L versions |

| Flow direction | |
|---|---|
| | From left to right |
| W | From right to left |

| Module 1 |
|---|
| See list of modules |

| Mounting hardware 1 | |
|---|---|
| X | Technopolymer flange X |
| Y | Technopolymer flange Y |
| K | Aluminium flange X |
| T | Aluminium flange Y |

| Module 2 |
|---|
| See list of modules |

| Mounting hardware 2 | |
|---|---|
| X | Technopolymer flange X |
| Y | Technopolymer flange Y |
| K | Aluminium flange X |
| T | Aluminium flange Y |

| Module 10 |
|---|
| See list of modules |

2 AIR TREATMENT

## List of modules

Below the list of modules available for assembly of the manifold

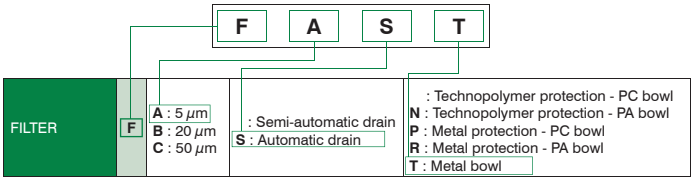
| | | | | |
|---|---|---|---|---|
| FILTER | F | **A** : 5 µm<br>**B** : 20 µm<br>**C** : 50 µm | : Semi-automatic drain<br>**S** : Automatic drain | : Technopolymer protection - PC bowl<br>**N** : Technopolymer protection - PA bowl<br>**P** : Metal protection - PC bowl<br>**R** : Metal protection - PA bowl<br>**T** : Metal bowl |
| COALESCING FILTER | DA | : Semi-automatic drain<br>**S** : Automatic drain | : Technopolymer protection - PC bowl<br>**N** : Technopolymer protection - PA bowl<br>**P** : Metal protection - PC bowl<br>**R** : Metal protection - PA bowl<br>**T** : Metal bowl | |
| OIL REMOVAL FILTER | D | **AV** : Size 4<br>**BV** : Size 3<br>**CV** : Size 3 oversize cartridge | : Semi-automatic drain<br>**S** : Automatic drain | : Technopolymer protection - PC bowl<br>**N** : Technopolymer protection - PA bowl<br>**P** : Metal protection - PC bowl<br>**R** : Metal protection - PA bowl<br>**T** : Metal bowl |
| CARBON FILTER | DD | : Technopolymer protection - PC bowl<br>**N** : Technopolymer protection - PA bowl<br>**P** : Metal protection - PC bowl<br>**R** : Metal protection - PA bowl<br>**T** : Metal bowl | | |
| REGULATOR | R | : G1/8" connection<br>**M** : Integrated pressure gauge<br>**W** : Integrated pressure gauge Right - Left<br>**P** : Digital pressure switch<br>**Z** : Digital pressure switch Right - Left | **A** : 0-2 bar<br>**B** : 0-4 bar<br>**C** : 0-8 bar<br>**D** : 0-12 bar | : With relieving<br>**F** : Controlled refiel and improved relieving<br>**L** : Without relieving<br>**R** : Improved relieving |
| | | : Standard knob<br>**K** : Lockable knob | **A** : Cable 150 mm M8 PNP<br>**B** : Cable 150 mm M8 NPN<br>**C** : Cable 2 m PNP<br>**D** : Cable 2 m NPN | |
| FILTER REGULATOR | E | : G1/8" connection<br>**M** : Integrated pressure gauge<br>**W** : Integrated pressure gauge Right - Left<br>**P** : Digital pressure switch<br>**Z** : Digital pressure switch Right - Left | **A** : 5 µm<br>**B** : 20 µm<br>**C** : 50 µm | **A** : 0-2 bar<br>**B** : 0-4 bar<br>**C** : 0-8 bar<br>**D** : 0-12 bar |
| | | : Semi-automatic drain<br>**S** : Automatic drain | : With relieving<br>**L** : Without relieving | : Standard knob<br>**K** : Lockable knob |
| | | **A** : Cable 150 mm M8 PNP<br>**B** : Cable 150 mm M8 NPN<br>**C** : Cable 2 m PNP<br>**D** : Cable 2 m NPN | : Technopolymer protection - PC bowl<br>**N** : Technopolymer protection - PA bowl<br>**P** : Metal protection - PC bowl<br>**R** : Metal protection - PA bowl<br>**T** : Metal bowl | |
| LUBRICATOR | L | : No electric level sensor device<br>**A** : Electrical minimum level sensor NO (Normally open)<br>**C** : Electrical minimum level sensor NC (Normally closed) | : Technopolymer protection - PC bowl<br>**N** : Technopolymer protection - PA bowl<br>**P** : Metal protection - PC bowl<br>**R** : Metal protection - PA bowl | |

| SHUT OFF VALVE | V | | 15 mm coil | 22 mm coil | 30 mm coil |
|---|---|---|---|---|---|
| | | **L** : Manual<br>**P** : Pneumatic<br>**E** : Solenoid | **A4** : 12 VDC<br>**A5** : 24 VDC<br>**A6** : 24 VAC (50-60 Hz)<br>**A7** : 110 VAC (50-60 Hz)<br>**A8** : 230 VAC (50-60 Hz)<br>**A9** : 24 VDC (1 Watt) | **B2** : Mechanical M2, without coil<br>**B4** : 12 VDC<br>**B5** : 24 VDC<br>**B6** : 24 VAC (50-60 Hz)<br>**B7** : 110 VAC (50-60 Hz)<br>**B8** : 230 VAC (50-60 Hz)<br>**B9** : 24 VDC (2 Watt) | **C5** : 24 VDC<br>**C6** : 24 VAC (50-60 Hz)<br>**C7** : 110 VAC (50-60 Hz)<br>**C8** : 230 VAC (50-60 Hz)<br>**C9** : 24 VDC (2 Watt) |

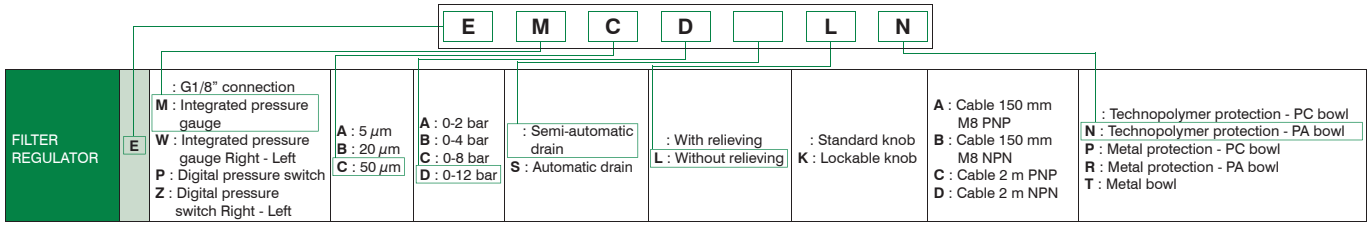
| SAFETY VALVE | V | | | | |
|---|---|---|---|---|---|
| | | **S** : Single | : Without connection<br>**M** : Integrated pressure gauge<br>**W** : Integrated pressure gauge (Right - Left)<br>**G** : G1/8" pressure gauge connection | | |
| | | **2S** : Double | : Without connection<br>**M** : Integrated pressure gauge<br>**G** : G1/8" pressure gauge connection | **X** = Flange X<br>**Y** = Flange Y<br>**K** = Aluminium flange Y<br>**Z** = Aluminium flange X | : Standard (Right - Left)<br>**W** : Integrated pressure gauge (Right - Left) |

| | | | |
|---|---|---|---|
| PROGRESSIVE START-UP VALVE | AP | : Size 1 - Size 2 - Size 3<br>**W** : Size 4 - flow direction Right - Left | |
| AIR INTAKE | PA | | |
| AIR INTAKE WITH PRESSURE GAUGE OR DIGITAL PRESSURE SWITCH INTEGRATED | P | **M** : Integrated pressure gauge<br>**W** : Integrated pressure gauge (Right - Left)<br>**P** : Integrated digital pressure switch<br>**Z** : Integrated digital pressure switch (Right - Left) | **A** : Cable 150 mm M8 PNP<br>**B** : Cable 150 mm M8 NPN<br>**C** : Cable 2 m PNP<br>**D** : Cable 2 m NPN |
| PRESSURE SWITCH | PP | : Size 1 - Size 2 - Size 3<br>**W** : Size 4 - flow direction Right - Left | |

Examples of module identification: 5 µm filter, automatic drain, metal bowl is identified as: **F A S T**




- Filter regulator with pressure gauge 50 µm, 0-12 bar semi-automatic drain, without relieving, technopolymer bowl protection, PA bowl, is identified as: **E M C D L N**

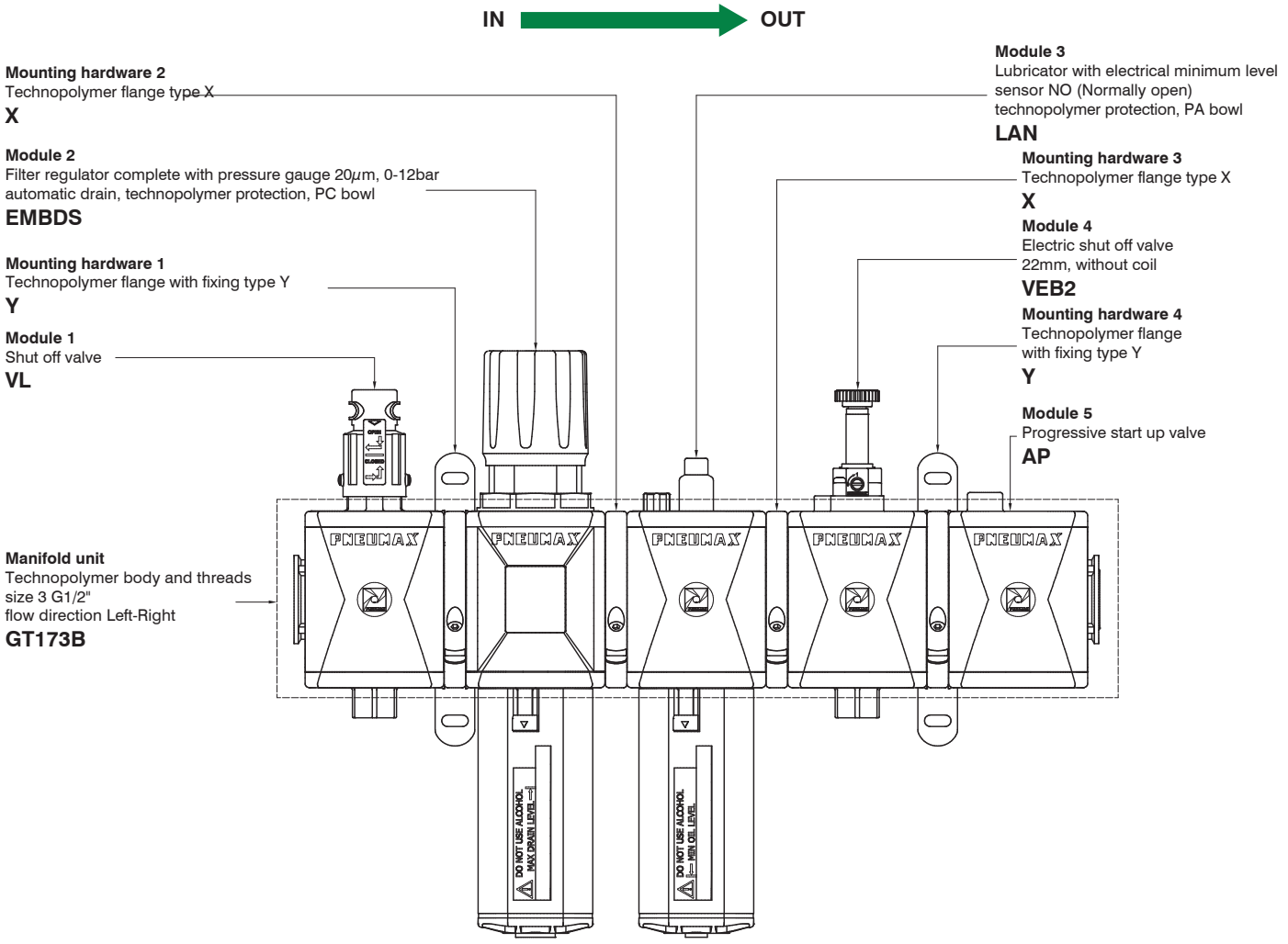





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

**AIRPLUS assembled groups configuration**

Configuration example of a Size 3, G1/2" technopolymer group SX - DX composed of:
- Shut off valve
- Filter regulator, 20$\mu$m, 0-12bar, automatic drain
- Lubricator with electrical minimum level sensor NO
- Electric shut off valve, 22mm, without coil
- Progressive start-up valve




Applicable order code:

Initial code that identifies the main characteristics of the group such as:
- version
- size and connections
- flow direction

These will be the same for all the modules included in manifold, in accordance with the characteristics of the individual items available.

Code that identifies the succession of individual modules and related coupling flanges included in manifold from module 1 to 10.

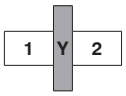
| G | T | 17 | 3B | | - | VL | - | Y | - | EMBDS | - | X | - | LAN | - | X | - | VEB2 | - | Y | - | AP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**GT173 - VL - Y - EMBDS - X - LAN - X - VEB2 - Y - AP**

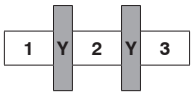
**Flanges positioning schematic**

Here below some indications related to flanges positioning according to the number of seats.
Pneumax recommend configuration in compliance with the following schematic.

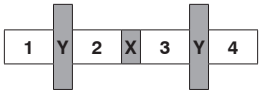
Group 2 seats



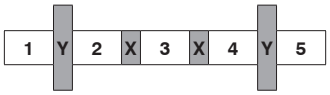

Group 3 seats



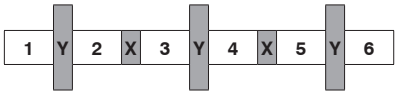

Group 4 seats



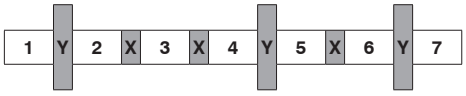

Group 5 seats



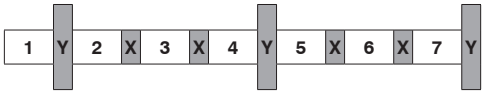

Group 7 seats



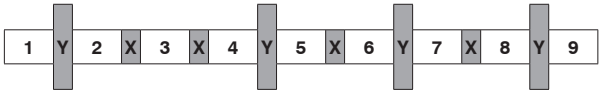

Group 9 seats



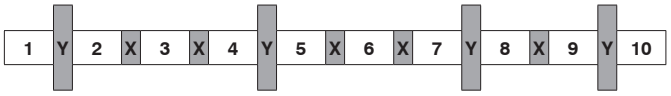

Group 6 seats




Group 8 seats




Group 10 seats




**Y**: Y type flange (Aluminium or technopolymer)
**X**: X type flange (Aluminium or technopolymer)
**1...10**: AIRPLUS modules

**Quick coupling flanges**

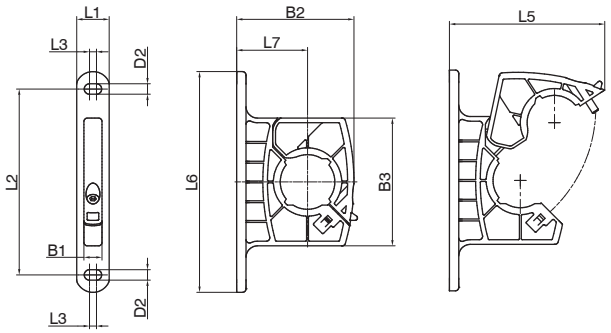
Pneumax Airplus quick coupling flanges series allow both module rapid fixing and panel mounted configuration. Due to its design, Pneumax connection flanges allow user-friendly maintenance activities with no need of entire manifold disassembling procedure. Two types of flange are available: X type flange for assembling the modules together, and Y type flange suitable for panel mounted also.
Both types are made of technopolymer or die-cast aluminum.


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## Technopolymer flanges

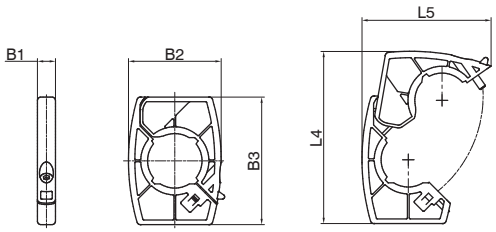
### Flange Y






### Flange X



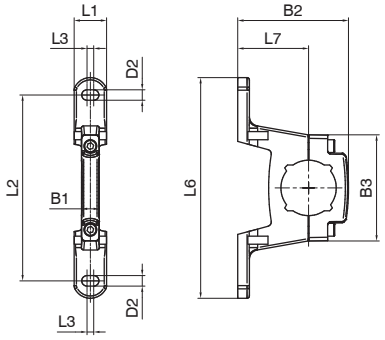



| Model | B1 | B2 | B3 | D2 | L1 | L2 | L3 | L4 | L5 | L6 | L7 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T171Y | 7,8 | 50,5 | 55 | Ø 4,5 | 14 | 80 | 3 | / | 66 | 95 | 30,5 |
| T171X | | 40 | | / | / | / | / | 74,5 | 55,5 | / | / |
| T172Y | 9,7 | 67,6 | 68 | Ø 5,2 | 18 | 95 | 6,8 | / | 86,5 | 117,9 | 40,5 |
| T172X | | 53,6 | | / | / | / | / | 96,5 | 72,5 | / | / |
| T173Y | 9,7 | 75,5 | 80 | Ø 5,2 | 18 | 110 | 6,8 | / | 98,3 | 133 | 44,5 |
| T173X | | 62 | | / | / | / | / | 112,8 | 85 | / | / |
| T174Y | 13,7 | 106,5 | 105 | Ø 8,5 | 25 | 148 | 6,5 | / | 133,5 | 175 | 64 |
| T174X | | 85 | | / | / | / | / | 153,5 | 112 | / | / |

## Aluminium flanges

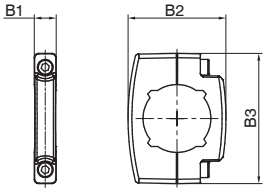
### Flange Y






### Flange X



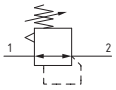



| Model | B1 | B2 | B3 | D2 | L1 | L2 | L3 | L6 | L7 |
|---|---|---|---|---|---|---|---|---|---|
| N171Y | 7,8 | 47,7 | 45,7 | Ø 4,5 | 14 | 80 | 3 | 95 | 30,5 |
| N171X | | 34,4 | | / | / | / | / | / | / |
| N172Y | 9,7 | 64,6 | 55,6 | Ø 5,2 | 18 | 95 | 6,8 | 117,9 | 40,5 |
| N172X | | 55,6 | | / | / | / | / | / | / |
| N173Y | 9,7 | 75,5 | 56 | Ø 5,2 | 18 | 110 | 6,8 | 133 | 44,5 |
| N173X | | 62 | | / | / | / | / | / | / |
| N174Y | 13,7 | 106,5 | 102 | Ø 8,5 | 25 | 148 | 6,5 | 175 | 64 |
| N174X | | 85 | | / | / | / | / | / | / |

## Panel mounted pressure regulators (RP)



- Diaphragm pressure regulator with relieving
- Aluminium body version
- High flow rates with low pressure drops
- Available with 1/8" and 1/4" connections
- Low hysteresis rolling diaphragm and balanced spool
- Available in four pressure ranges up to 12 bar
- Fitted with panel mounting locking ring
- Atex certification Atex II 2GD




### Note

For installations where a more accurate and constant pressure is required, the unit should be installed as close as possible to the point of use.

| Technical characteristics | |
|---|---|
| **Size** | Size 1 |
| Body and connections type | Aluminium body version |
| IN / OUT connections | G1/8" - G1/4" |
| Assembly configuration | Stand alone |
| Assembly configuration | Panel mounted |
| Assembly configuration | With fixing bracket |
| Assembly positions | Indifferent |
| Pressure range | 0-2 bar |
| | 0-4 bar |
| | 0-8 bar |
| | 0-12 bar |
| Regulation | Manul push and lock with pressure |
| Pressure measurement | G1/8" pressure gauge connection port |
| Max. fittings torque IN / OUT connections | G1/8" metal: 15Nm |
| | G1/4" metal: 20Nm |
| Max.fitting torque pressure gauge connection port | G1/8" metal: 15Nm |

| Operational characteristics | |
|---|---|
| **Size** | Size 1 |
| Maximum working pressure | 13 bar |
| Minimum working pressure | 0,5 bar |
| Working temperature | -10 °C ... +50 °C |

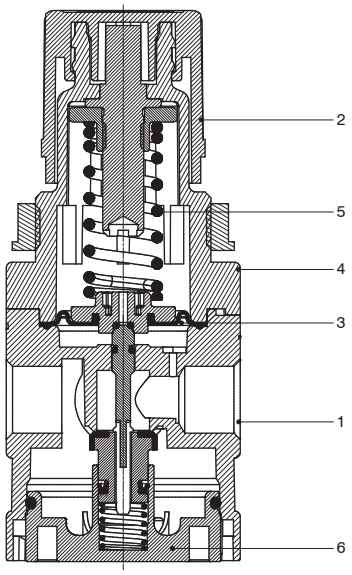
| Weights | |
|---|---|
| **Size** | Size 1 |
| Aluminium body version | 130 g |




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Materials

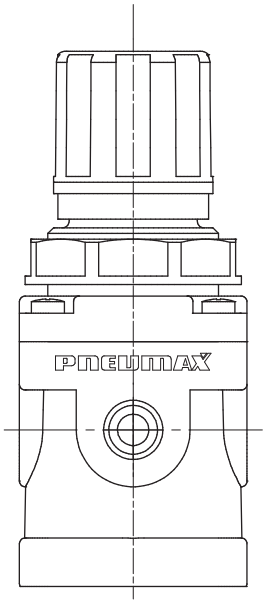
### Exploded sectioned




| Panel mounted pressure regulator | | |
|---|---|---|
| 1 | Body | Die-cast aluminium |
| 2 | Adjusting knob | Polyamide |
| 3 | Diaphragm | NBR |
| 4 | Adjustment support | Polyamide |
| 5 | Adjusting spring | Steel |
| 6 | Rear end cap | Polyamide |



## Design




**Coding:** RP17ⓉBⓇⓄ¹ⒸⓄ²

| | |
|---|---|
| Ⓣ | SIZE AND CONNECTIONS |
| | **1A** = Size 1 - G1/8" |
| | **1B** = Size 1 - G1/4" |
| Ⓡ | PRESSURE RANGE |
| | **A** = 0 - 2 bar |
| | **B** = 0 - 4 bar |
| | **C** = 0 - 8 bar |
| | **D** = 0 - 12 bar |
| Ⓞ¹ | RELIEVING OPTIONS |
| | **A** = With reliving |
| | **F** = Controlled refiel and improved relieving |
| | **L** = Without relieving |

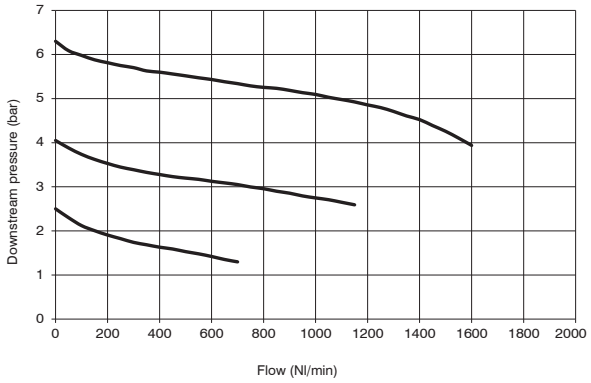
| | |
|---|---|
| Ⓒ | KNOB COLOUR |
| | **V** = Green knob (RAL6032) |
| | **G** = Grey knob (RAL7004) |
| Ⓞ² | KNOB OPTIONS |
| | = Non-lockable version |
| | **K** = Lockable version |
| | **U** = Lockable version with universal key |

**Table example RP171ABAAV** : Size 1 G1/8" Panel mounted pressure regulator, 0 - 2 bar, with relieving and green knob.

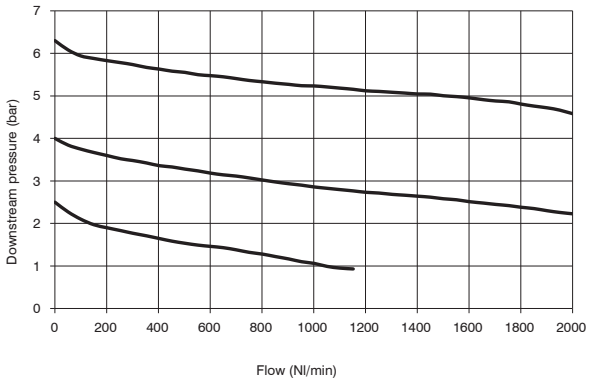
## Characteristic curves

### Flow rate curves

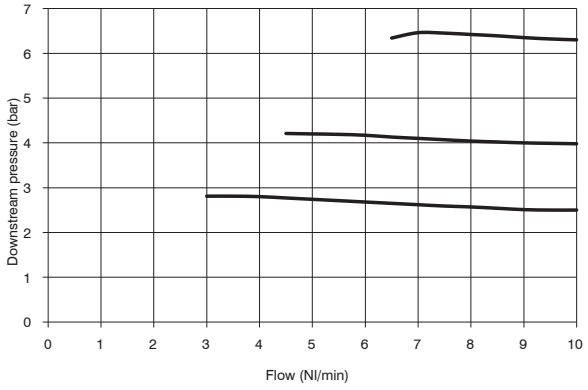
#### G1/8" 0-8 bar P1= 7 bar

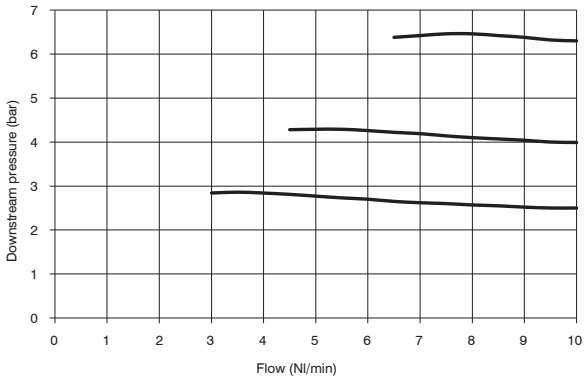



#### G1/4" 0-8 bar P1= 7 bar

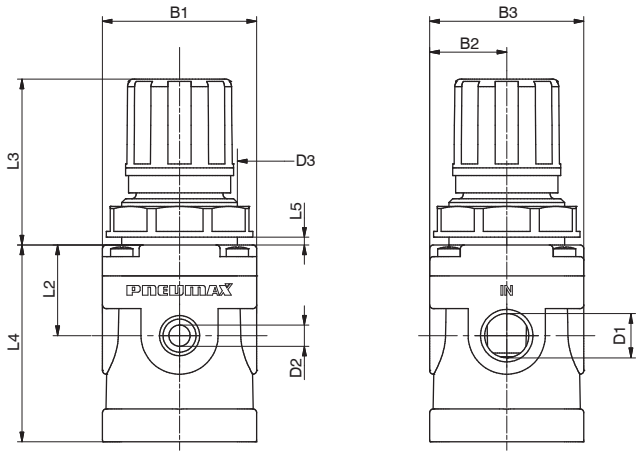



### Adjustment characteristic




## Dimensions




| Model | B1 | B2 | B3 | D1 | D2 | D3 | L2 | L3 | L4 | L5 |
|---|---|---|---|---|---|---|---|---|---|---|
| RP171A... | 40 | 20 | 40 | G1/8" | G1/8" | M30x1,5 | 23.5 | 43 | 51 | 4 max |
| RP171B... | 40 | 20 | 40 | G1/4" | G1/8" | M30x1,5 | 23.5 | 43 | 51 | 4 max |

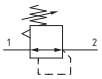


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## Panel mounted pressure regulator with pressure gauge built into the adjusting knob (RP)



- Diaphragm pressure regulator with relieving
- Aluminium body version
- High flow rates with low pressure drops
- Available with G1/8" and G1/4" connections
- Low hysteresis rolling diaphragm and balanced spool
- Available in four pressure ranges up to 12 bar
- Fitted with panel mounting locking ring
- Atex certification Atex II 2GD
- Ø 24,5 pressure gauge built into adjusting knob
- Pressure gauge with 4 mounting positions relative to IN connection (0°-90°-180°-270°)
- Class 4 pressure gauge (±4% full scale)




**Note**

For installations where a more accurate and constant pressure is required, the unit should be installed as close as possible to the point of use.

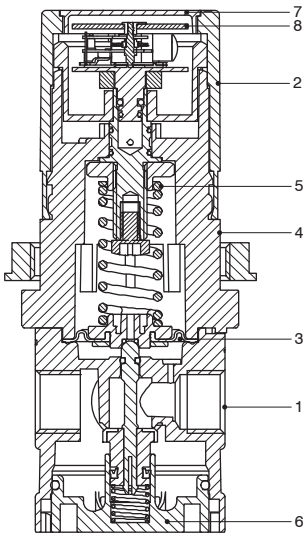
| Technical characteristics | |
|---|---|
| **Size** | Size 1 |
| Body and connections type | Aluminium body version |
| IN / OUT connections | G1/8" - G1/4" |
| Assembly configuration | Stand alone |
| | Panel mounted |
| | With fixing bracket |
| Assembly positions | Indifferent |
| Pressure range | 0-2 bar |
| | 0-4 bar |
| | 0-8 bar |
| | 0-12 bar |
| Regulation | Manul push and lock with pressure |
| Pressure measurement | Pressure gauge built into knob |
| Max. fittings torque IN / OUT connections | G1/8" metal: 15Nm |
| | G1/4" metal: 20Nm |
| Max.fitting torque pressure gauge connection port | G1/8" metal: 15Nm |

| Operational characteristics | |
|---|---|
| **Size** | Size 1 |
| Maximum working pressure | 13 bar |
| Minimum working pressure | 0,5 bar |
| Working temperature | -10 °C ... +50 °C |

| Weights | |
|---|---|
| **Size** | Size 1 |
| Aluminium body version | 190 g |

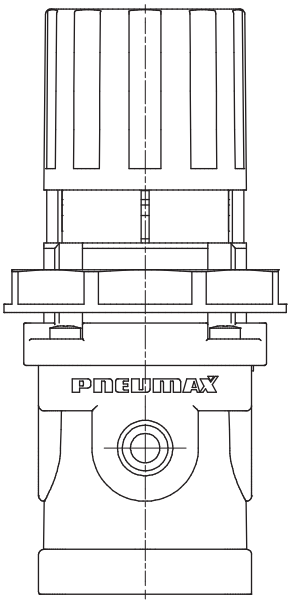
## Materials

### Exploded sectioned




| Panel mounted pressure regulator | | |
|---|---|---|
| 1 | Body | Die-cast aluminium |
| 2 | Adjusting knob | Polyamide |
| 3 | Diaphragm | NBR |
| 4 | Adjustment support | Polyamide |
| 5 | Adjusting spring | Steel |
| 6 | Rear end cap | Polyamide |
| 7 | Lens | Polycarbonate |
| 8 | Pressure gauge | Brass/ABS |

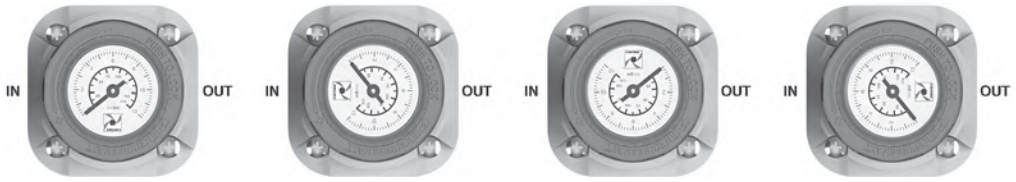
## Design




**Coding:** RP17ⓒBMⓇⓄ¹⓪²⓪³

| | | | |
|---|---|---|---|
| ⓒ | CONNECTIONS | ⓪³ | KNOB OPTIONS |
| | **1A** = G1/8" | | **V** = Green knob (RAL6032) |
| | **1B** = G1/4" | | **G** = Grey knob (RAL7004) |
| Ⓡ | PRESSURE RANGE | | |
| | **A** =0 - 2 bar | | |
| | **B** =0 - 4 bar | | |
| | **C** =0 - 8 bar | | |
| | **D** =0 - 12 bar | | |
| ⓪¹ | RELIEVING OPTIONS | | |
| | **A** =With reliving | | |
| | **F** =Controlled refiel and improved relieving | | |
| | **L** =Without relieving | | |
| ⓪² | PRESSURE GAUGE ORIENTATION | | |
| | **A** = 0° | | |
| | **B** = 90° | | |
| | **C** = 180° | | |
| | **D** = 270° | | |

### Pressure gauge orientation




**A**: 0° **B**: 90° **C**: 180° **D**: 270°

**Example**: **RP171ABMAAV** Panel mounted pressure regulator with pressure gauge G1/8", 0 - 2 bar, pressure gauge orientation at 0°, with relieving and green knob.

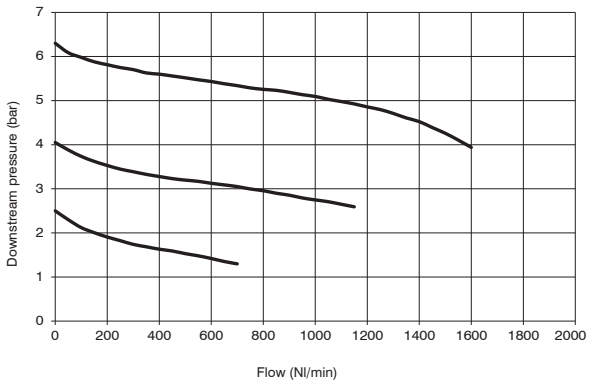


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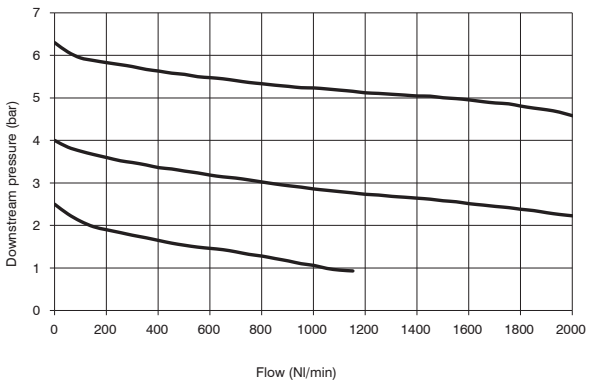
## Characteristic curves

### Flow rate curves

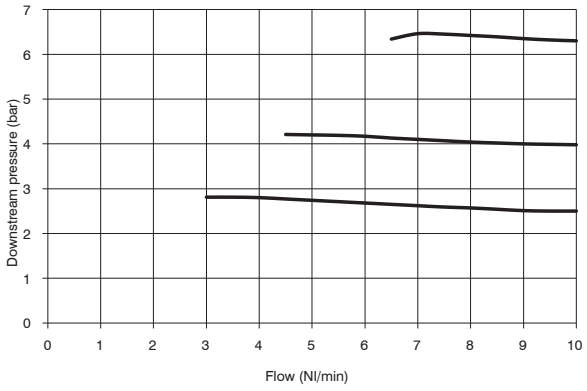
#### G1/8" 0-8 bar P1= 7 bar

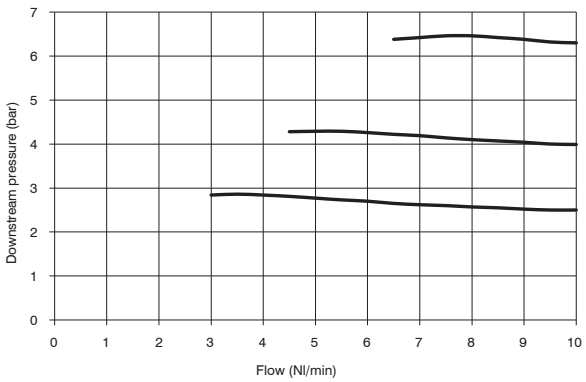



#### G1/4" 0-8 bar P1= 7 bar

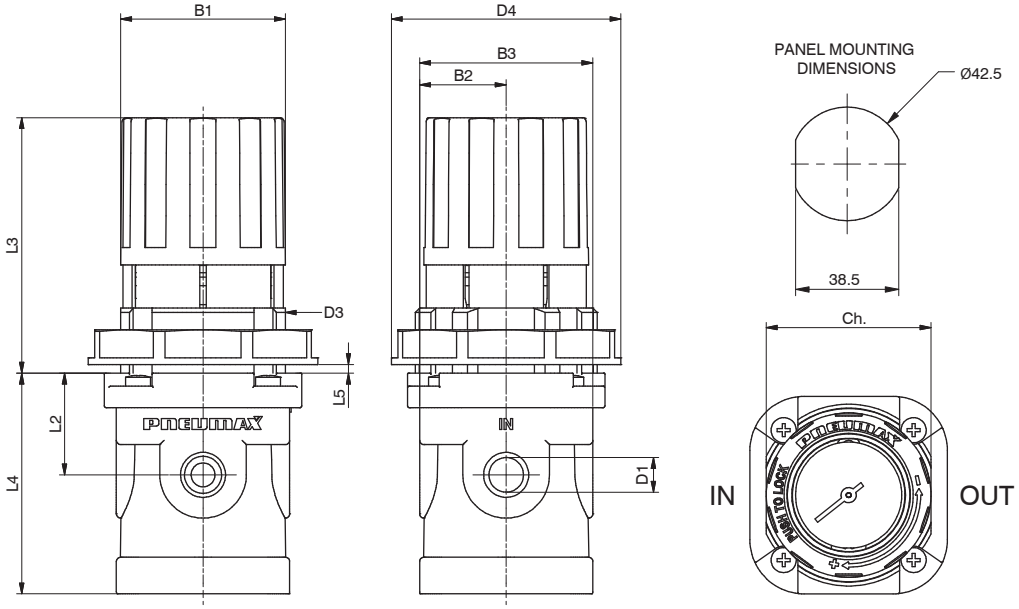



### Adjustment characteristic




## Dimensions



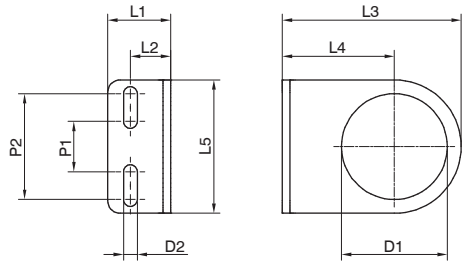

| Model | B1 | B2 | B3 | D1 | D2 | D3 | D4 | L2 | L3 | L4 | L5 | CH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RP171ABM... | 38 | 20 | 40 | G1/8" | G1/8" | M42x1,5 | 53 | 23.5 | 59 | 51 | 4 max | 38 |
| RP171BBM... | 38 | 20 | 40 | G1/4" | G1/8" | M42x1,5 | 53 | 23.5 | 59 | 51 | 4 max | 38 |

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## Fixing bracket

**Coding:** 17150





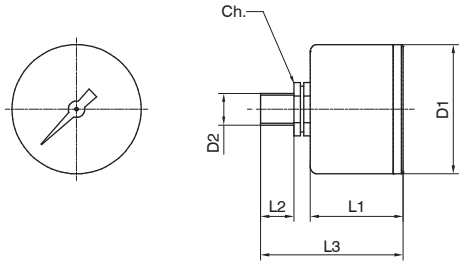

| Model | L1 | L2 | L3 | L4 | L5 | D1 | D2 | P1 | P2 |
|---|---|---|---|---|---|---|---|---|---|
| 17150 | 20 | 13 | 50 | 30 | 40 | 30 | 5,5 | 20 | 30 |

## Pressure gauge

**Coding:** 17070ⓋⓈ

| | |
|---|---|
| Ⓥ | VERSION |
| | **A** = Dial Ø40 |
| | **B** = Dial Ø50 |
| Ⓢ | SCALE |
| | **A** = 0 - 4 bar |
| | **B** = 0 - 6 bar |
| | **C** = 0 - 12 bar |






| Model | D1 | D2 | L1 | L2 | L3 | Ch |
|---|---|---|---|---|---|---|
| 17070A... | 41 | Gc - 1/8" | 26 | 10 | 44 | 14 |
| 17070B... | 49 | Gc - 1/8" | 27 | 10 | 45 | 14 |



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## Series 1700

- **Modular sistem**
- **Available for 4 sizes with connections from 1/8” to 1”**
- **ATEX certification (II 2GD o II 3GD) on request**



**Construction and working characteristics**
1700 air treatment series includes a wide range of elements for individual use or modular assembling.
Available in 4 sizes e connections from 1/8” to 1”.
The bowls are made in zinc alloy body with zinc alloy integrated connections, technopolymer with integrated metal connections for size 1 and aluminium with integrated aluminium connections for sizes 2, 3 and 4.
The bowls are in Nylon, with technopolymer protection for sizes 1, 2, 3 (also available for size 1 without protection). The bowls are in metal with condensation drain display for size 4.
Filters can be equipped with manual or semiautomatic condensation drain; furthermore it’s possible to install the automatic draining device inside the bowl.
Wall mounting by means of screws directly through the body and hidden by protective covers.
The pressure regulator handle is lockable in the desired position, the shut-off valves are lockable with a maximum of three pad-locks to prevent accidents or damages due to unauthorized operation.
The lubricator oil flow is adjustable with proper handle and it is visibly checked through the sight dome.
The progressive start-up valve, pneumatically or electropneumatically controlled, allows air supply to the circuit progressively and with adjustable time. The accessories like panel mounted brackets, pressure gauges with different scales and diameters and the air intake blocks are completing the range. They are assembled between the elements to get filtered or filtered non-lubricated air in the system.

**Instruction for installation and operation**
Pay attention to install a group or a single component with air flow direction according to the arrows and to the following sequence: filter, pressure regulator, lubricator and with bowls downwards. The group can be fixed to the wall by removing the covers, which can be installed again after fixing for covering the screws. Do not exceed the recommended torque while assembling the connectors.
Do not exceed the recommended air pressure and temperature limits. The moisture should not exceed the level marked on the bowl and it can be drawn off and carried by a flexible tube of Ø 6/4 directly connected to the discharge valve handle.
The pressure should be set from minimum to maximum, rotating the adjusting handle clockwise.
As lubricant, we suggest to use oil class FD22 or HG32. Verify that the lubricator is not fed with a flow lower than the minimum operational.
To set the oil flow rotate the proper adjusting handle in order to get one drop of oil every 300-600 liters of air.
The oil flow will be kept automatically and proportionally to the air flow. The oil can be refilled by mean of proper plug or directly into the bowl after having de-pressurized the system. Do not exceed the maximum level indicated on the bowl. For opening the shut-off valve push and rotate clockwise the operating handle. For closing it and consequently discharging the down stream line, rotate the handle counter-clockwise.

**Maintenance**
Clean the bowls with water and detergent. Do not use alcohol.
The filter element made with HPDE is reusable by blowing and cleaning it with proper detergent. For replacing or cleaning it, remove the bowl and unscrew the baffle spins.
Replace the pressure regulator diaphragm whenever the operation is not correct or there is a continuos air leaking through the relieving (over pressure discharge); reinstall the adjusting mechanism support, locking it with about 8 Nm torque. In case it is necessary to replace the lubricator transparent dome, tight it at 5 Nm torque maximum.

## Product overview

| PRODUCT | BODY MATERIAL | SIZES AND CONNECTIONS | | | |
|---|---|---|---|---|---|
| | | SIZE 1 | SIZE 2 | SIZE 3 | SIZE 4 |
| FILTER | Zinc alloy | G1/8" - G1/4" | / | / | / |
| | Technopolymer | G1/8" - G1/4" | / | / | / |
| | Aluminum | / | G1/4" - G3/8" | G3/8" - G1/2" - G 3/4" | G1" |
| DYNAMIC DRIER | Aluminum | / | / | / | G1" |
| FILTER REGULATORS | Zinc alloy | G1/8" - G1/4" | / | / | / |
| | Technopolymer | G1/8" - G1/4" | / | / | / |
| | Aluminum | | G1/4" - G3/8" | G3/8" - G1/2" - G 3/4" | / |
| REGULATORS | Zinc alloy | G1/8" - G1/4" | / | / | / |
| | Technopolymer | G1/8" - G1/4" | / | / | / |
| | Aluminum | | G1/4" - G3/8" | G3/8" - G1/2" - G 3/4" | G1" |
| REGULATORS WITH INTEGRATED PRESSURE GAUGE | Zinc alloy | G1/8" - G1/4" | / | / | / |
| | Technopolymer | G1/8" - G1/4" | / | / | / |
| | Aluminum | / | G1/4" - G3/8" | G3/8" - G1/2" | / |
| HIGH SENSITIVE AIR PRESSURE REGULATORS WITH HIGH FLOW RATE RELIEVING | Aluminum | G1/4" | | G1/2" | / |
| HIGH SENSITIVE PRESSURE REGULATOR WITH PNEUMATIC PILOT | Aluminum | / | / | G1/2" | / |
| PILOTED PRESSURE REGULATORS | Aluminum | / | G1/4" - G3/8" | G3/8" - G1/2" | G1" |
| PANEL MOUNTING PRESSURE REGULATOR | Technopolymer | G1/8" - G1/4" | / | / | / |
| PRESSURE REGULATORS FOR MANIFOLD | Zinc alloy | G1/8" - G1/4" | / | / | / |
| MANIFOLD PRESSURE REGULATORS | Zinc alloy | G1/8" - G1/4" | / | / | / |
| LUBRICATORS | Zinc alloy | G1/8" - G1/4" | / | / | / |
| | Technopolymer | G1/8" - G1/4" | / | / | / |
| | Aluminum | / | G1/4" - G3/8" | G3/8" - G1/2" - G 3/4" | G1" |
| SHUT-OFF VALVE | Zinc alloy | G1/4" | / | / | / |
| | Technopolymer | G1/4" | / | / | / |
| | Aluminum | / | G3/8" | G1/2" | G1" |
| ELECTRIC SHUT-OFF VALVE | Zinc alloy | G1/4" | / | / | / |
| | Technopolymer | G1/4" | / | / | / |
| | Aluminum | / | G3/8" | G1/2" | / |
| PNEUMATIC SHUT-OFF VALVE | Zinc alloy | G1/4" | / | / | / |
| | Technopolymer | G1/4" | / | / | / |
| | Aluminum | / | G3/8" | G1/2" | / |
| PROGRESSIVE START-UP VALVE | Aluminum | G1/4" | G3/8" | G1/2" | G1" |
| AIR INTAKE | Aluminum | G1/4" | G3/8" | G1/2" | G1" |
| AIR INTAKE -"H" PROFILE | Aluminum | G1/4" | G3/8" | G1/2" | / |
| PRESSURE SWITCH COMPLETE WITH ADAPTER | Aluminum | G1/8" | G3/8" | G1/2" | Ø36 |

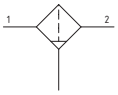


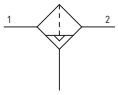

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## Filters



- Double filter action: air flow centrifugation and filter element
- Available in 4 sizes with flow rates up to 10000 Nl/min and connections from 1/8" to 1"
- Filtering cartridge made of HDPE available in three different filtration grades (5$\mu$m, 20$\mu$m, 50$\mu$m)
- Filter cartridge can be regenerated by washing / blowing it or replaced
- Bowls screwed to the body (Size 1)
- Bowl assembly via bayonet type quick coupling mechanism with safety button (Size 2 - Size 3 - Size 4)
- Semi-automatic or automatic condensation drain
- Atex certification (II 2GD o II 3GD) on request




**Note**
In order to ensure that any fluid discharged by the auto drain assembly is adequately drained away, it is recommended you to use a 6mm fitting and tube

| Technical characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Body and connections type | Zinc alloy body, Zinc alloy integrated connections Technopolymer body, metal connections | Aluminium body, integrated aluminium connections | | |
| Protection and bowl type | Technopolymer protection - PA bowl (Size 1 available without protection) | | | Metal bowl with blind metal bowl |
| IN / OUT connections | G1/8" - G1/4" | G1/4" - G3/8" | G3/8" - G1/2", G3/4" | G1" |
| Assembly configuration | Stand alone Panel mounted with M4 screws | Stand alone Panel mounted with M5 screws | Stand alone Panel mounted with M6 screws | Stand alone Panel mounted with M8 screws |
| Assembly position | Vertical ±5° | | | |
| Filter pore size ($\mu$m) | 5 / 20 / 50 | | | |
| Bowl capacity (cm$^3$) | 20 | 30 | 48 | 178 |
| Condensation drain | Semi-automatic Automatic | | | |
| Max. fittings torque IN / OUT connections | G1/8" metal: 15 G1/4" metal: 20 | G1/4" metal: 20 G3/8" metal: 25 | G3/8" metal: 25 G1/2" metal: 30 G3/4" metal: 35 | G1"metal: 35 |

| Operational characteristics | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 | Size 1 | Size 2 | Size 3 | Size 4 |
| Condensation drain | Semi-automatic condensation drain | | | | Automatic condensation drain | | | |
| Maximum working pressure (bar) | 13 | | | | 10 | | | |
| Minimum working pressure (bar) | 0,5 | | | | | | | |
| Working temperature (°C) | -5 ... +50 | | | | | | | |

| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Zinc alloy body version (g) | 218 | / | / | / |
| Technopolymer body version (g) | 103 | / | / | / |
| Aluminium body version (g) | / | 255 | 405 | 1700 |

## Order codes

17 | 301A | . | A | . | S

| Size, body and connections | |
|---|---|
| 001A | Zinc alloy body, connections G1/8" (only for size 1) |
| 001B | Zinc alloy body, connections G1/4" (only for size 1) |
| 101A | Technopolymer body, connections G1/8" (only for size 1) |
| 101B | Technopolymer body, connections G1/4" (only for size 1) |
| 201A | Aluminium body, connections G1/4" (only for size 2) |
| 201B | Aluminium body, connections G3/8" (only for size 2) |
| 301A | Aluminium body, connections G3/8" (only for size 3) |
| 301B | Aluminium body, connections G1/2" (only for size 3) |
| 301E | Aluminium body, connections G3/4" (only for size 3) |
| 401B | Aluminium body, connections G1" (only for size 4) |

| Filter pore size | |
|---|---|
| A | 5 $\mu$m |
| B | 20 $\mu$m |
| C | 50 $\mu$m |

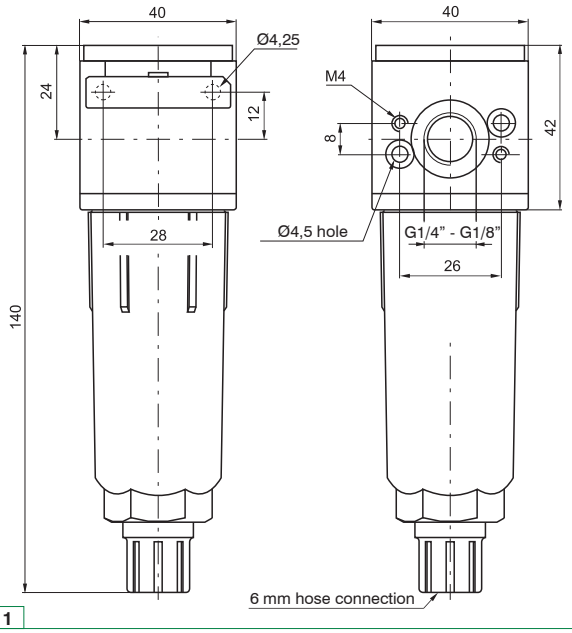
| Type | |
|---|---|
| P | Bowl protection (only for size 1) |
| S | Automatic drain (for all sizes) |
| PS | Bowl protection and automatic drain (only for size 1) |

**Example: 17301A.A.S**
Size 3 filter, aluminium body, G3/8" connections, filter pore size5 $\mu$m, automatic drain

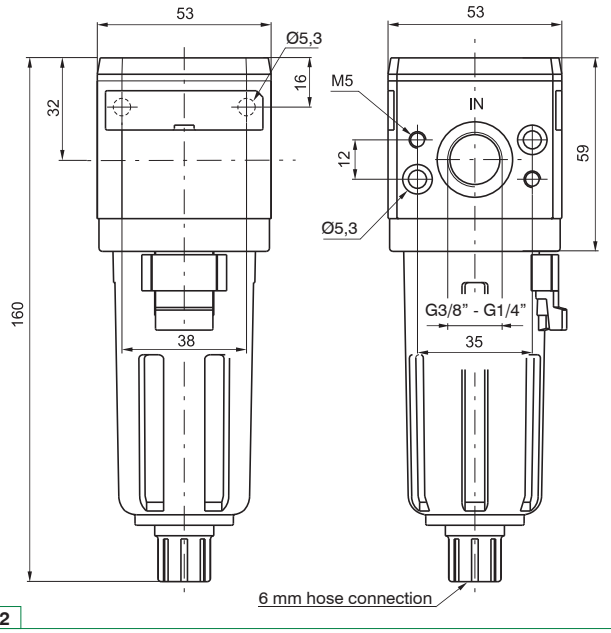



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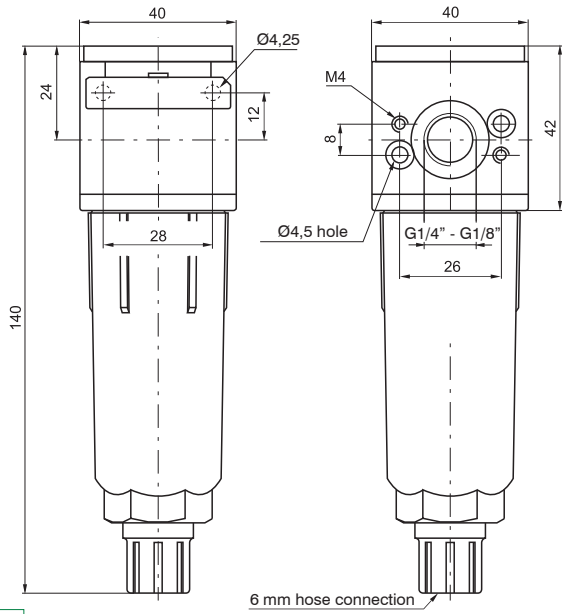
## Dimensions



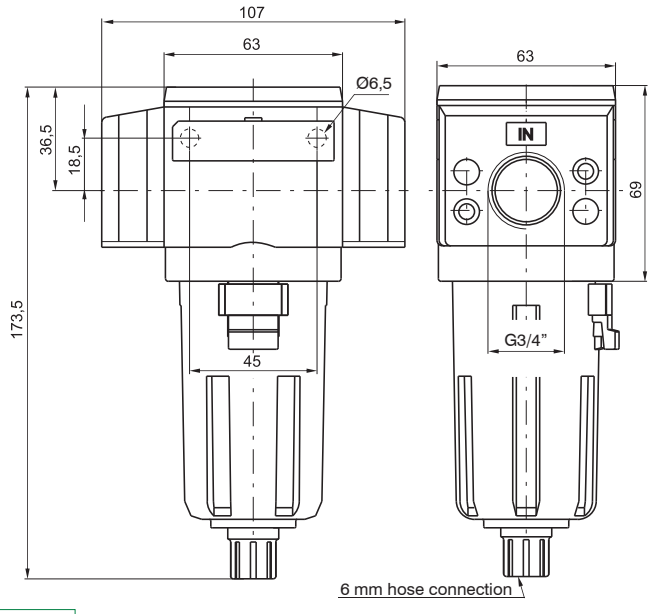

Size 1



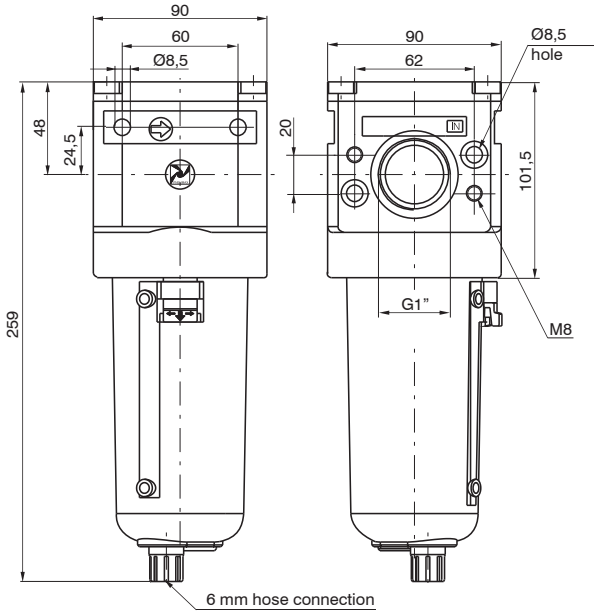

Size 2




Size 3



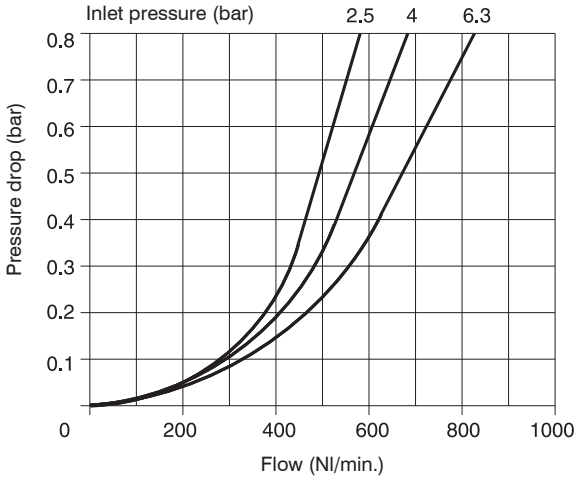

Size 3 3/4"




Size 4

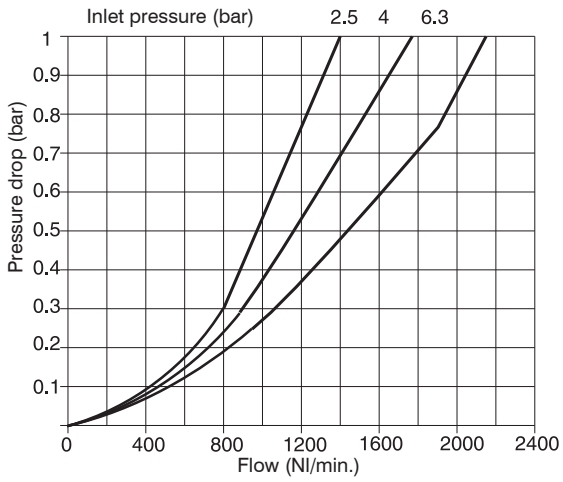
## Characteristic curves

Flow rate curves



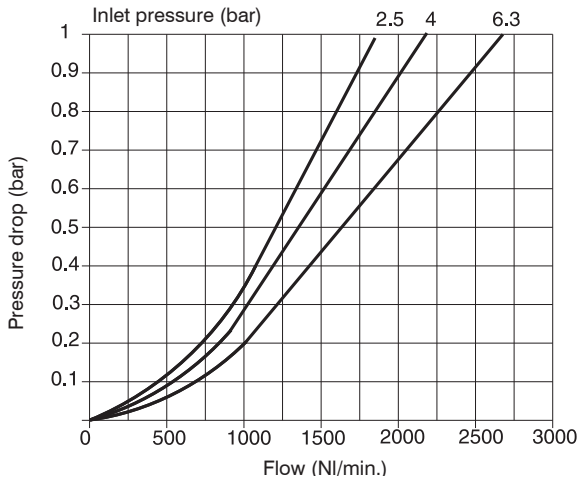

Size 1

Flow rate curves



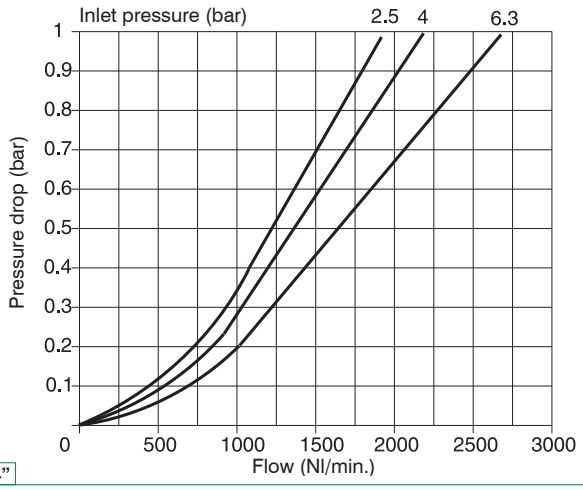

Size 2

Flow rate curves



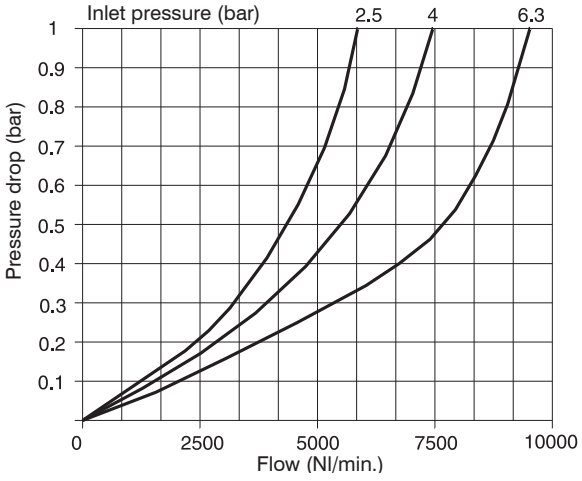

Size 3

Flow rate curves




Size 3 3/4"

Flow rate curves




Size 4

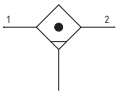


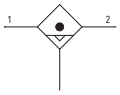
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## Coalescing filters



- Coalescing filter
- Available in 4 sizes with flow rates up to 3000 Nl/min and connections from 1/8" to 1"
- Filtering cartridge with filtration grade of 0,01 $\mu$m
- Filtering performances 99.97% (particles up to 0.01 $\mu$m)
- Bowls screwed to the body (Size 1)
- Bowl assembly via bayonet type quick coupling mechanism with safety button (Size 2 - Size 3 - Size 4)
- Semi-automatic or automatic drain
- Atex certification (II 2GD o II 3GD) on request




**Note**
In order to ensure the high level of filtration, it is recommended that a 5$\mu$ filter is installed before the coalescing filter. In order to ensure that any fluid discharged by the auto drain assembly is adequately drained away, it is recommended you use a 6mm fitting and tube.

| Technical characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Body and connections type | Zinc alloy body, Zinc alloy integrated connections Technopolymer body, metal connections | Aluminium body, integrated aluminium connections | | |
| Protection and bowl type | Technopolymer protection - PA bowl (Size 1 available without protection) | | | Metal bowl with blind metal bowl |
| IN / OUT connections | G1/8" - G1/4" | G1/4" - G3/8" | G3/8" - G1/2", G3/4" | G1" |
| Assembly configuration | Stand alone Panel mounted with M4 screws | Stand alone Panel mounted with M5 screws | Stand alone Panel mounted with M6 screws | Stand alone Panel mounted with M8 screws |
| Assembly position | Vertical ±5° | | | |
| Filter pore size ($\mu$m) | 0,01 efficiency of 99,97% | | | |
| Bowl capacity (cm$^3$) | 20 | 30 | 48 | 178 |
| Condensation drain | Semi-automatic Automatic | | | |
| Max. fittings torque IN / OUT connections | G1/8" metal: 15 G1/4" metal: 20 | G1/4" metal: 20 G3/8" metal: 25 | G3/8" metal: 25 G1/2" metal: 30 G3/4" metal: 35 | G1"metal: 35 |

| Operational characteristics | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 | Size 1 | Size 2 | Size 3 | Size 4 |
| Condensation drain | Semi-automatic condensation drain | | | | Automatic condensation drain | | | |
| Maximum working pressure (bar) | 13 | | | | 10 | | | |
| Minimum working pressure (bar) | 0,5 | | | | | | | |
| Working temperature (°C) | -5 ... +50 | | | | | | | |

| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Zinc alloy body version (g) | 225 | / | / | / |
| Technopolymer body version (g) | 110 | / | / | / |
| Aluminium body version (g) | / | 255 | 405 | 1700 |

## Order codes




| Size, body and connections | |
|---|---|
| 008A | Zinc alloy body, connections G1/8” (only for size 1) |
| 008B | Zinc alloy body, connections G1/4” (only for size 1) |
| 108A | Technopolymer body, connections G1/8” (only for size 1) |
| 108B | Technopolymer body, connections G1/4” (only for size 1) |
| 208A | Aluminium body, connections G1/4” (only for size 2) |
| 208B | Aluminium body, connections G3/8” (only for size 2) |
| 308A | Aluminium body, connections G3/8” (only for size 3) |
| 308B | Aluminium body, connections G1/2” (only for size 3) |
| 308E | Aluminium body, connections G3/4” (only for size 3) |
| 408B | Aluminium body, connections G1” (only for size 4) |

| Filter efficiency | |
|---|---|
| E | 0,01 $\mu$m, efficiency of 99,97% |

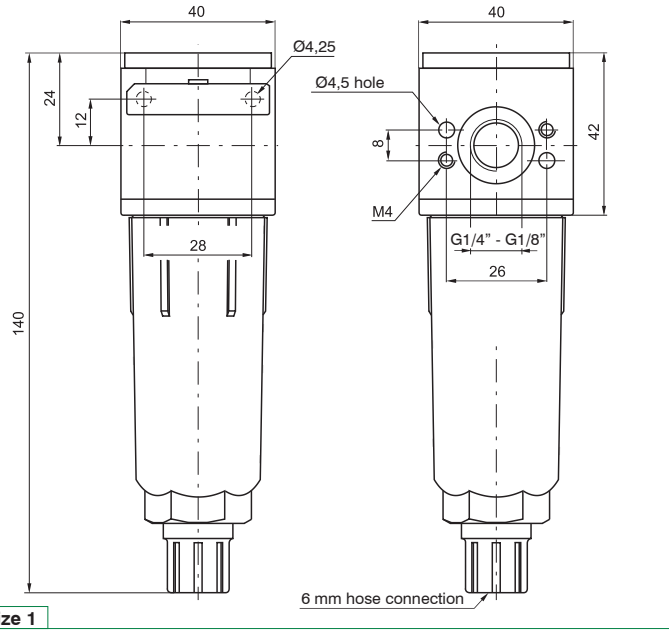
| Type | |
|---|---|
| P | Bowl protection (only for size 1) |
| S | Automatic drain (for all sizes) |
| PS | Bowl protection and automatic drain (only for size 1) |

**Example: 17308A.E.S**
Size 3 coalescing filter, aluminium body, G3/8” connections, filter efficiency of 99,97%, automatic drain

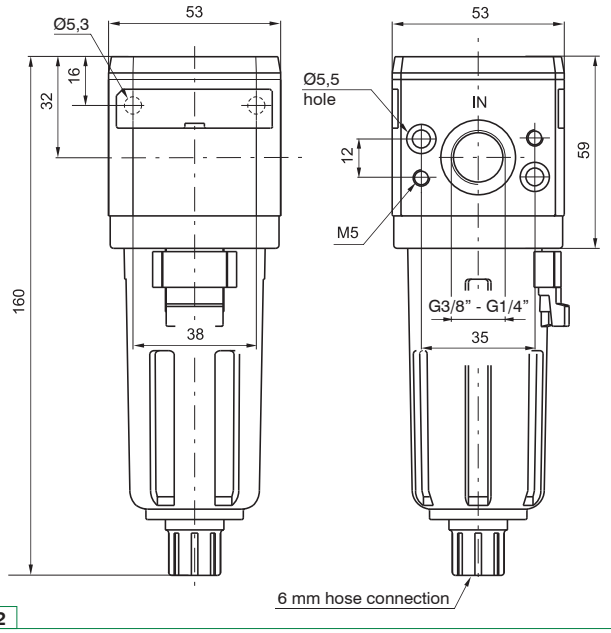



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

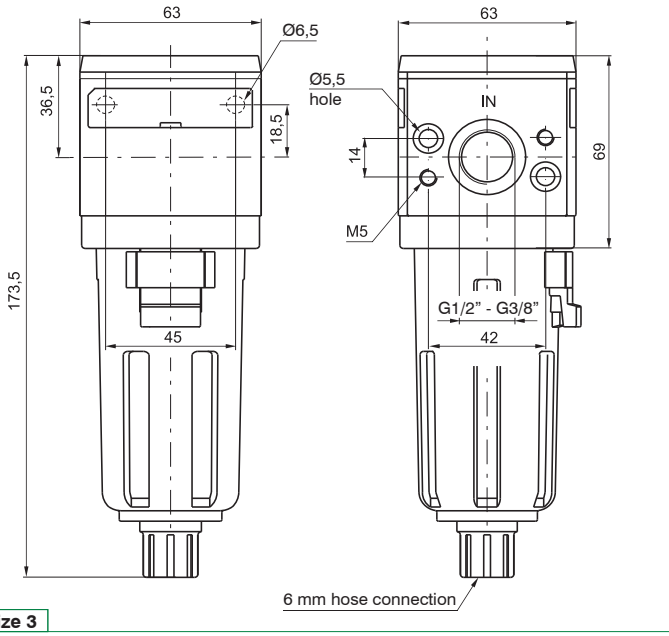
## Dimensions



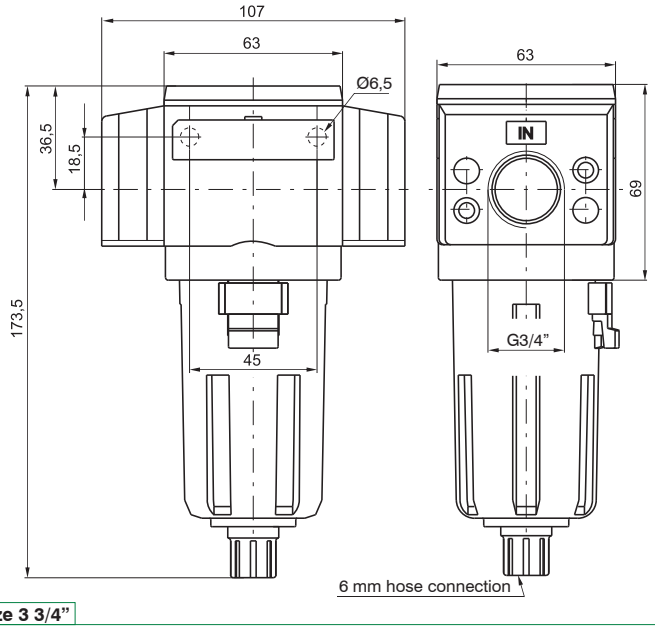

Size 1



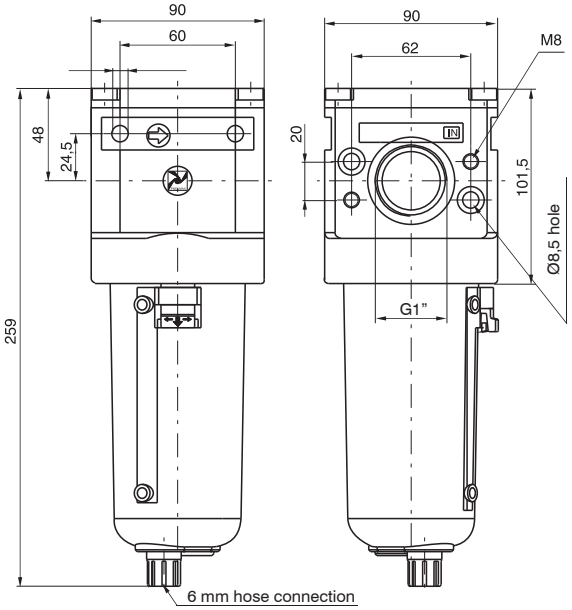

Size 2




Size 3



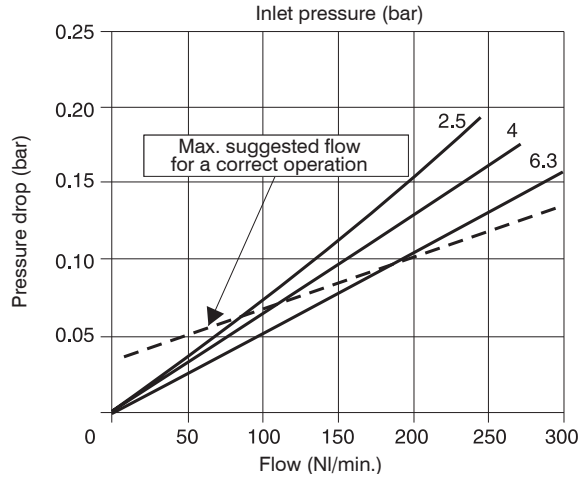

Size 3 3/4"




Size 4

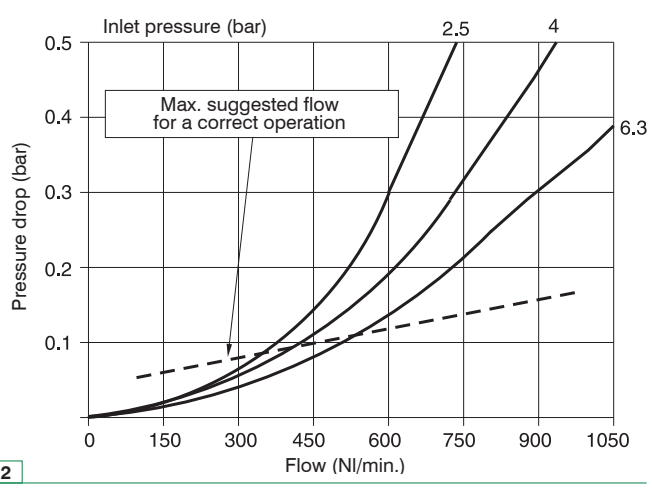
## Characteristic curves

Flow rate curves



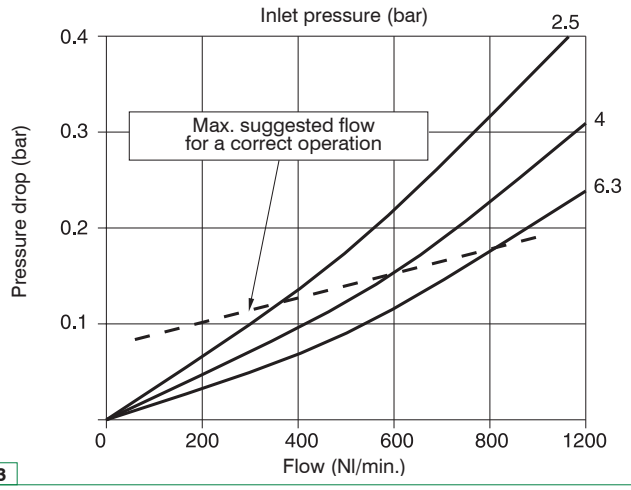

Size 1

Flow rate curves



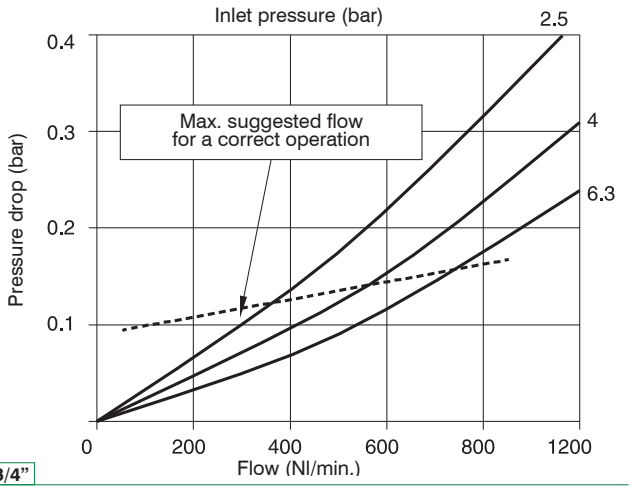

Size 2

Flow rate curves



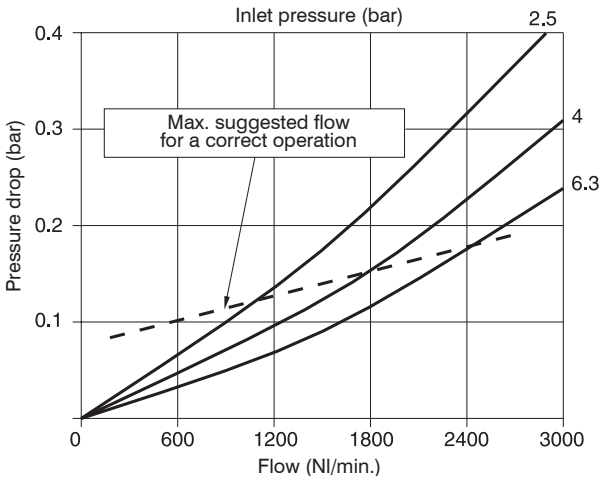

Size 3

Flow rate curves




Size 3 3/4"

Flow rate curves




Size 4



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## Dynamic drier



- Aluminium body
- Wall mounting possibility with M8 screws
- Filtering cartridge made of HDPE available in three different filtration grades (5µm, 20µm, 50µm)
- Filter cartridge can be regenerated by washing / blowing it or replaced
- With blind metal bowl
- Bowl assembly via bayonet type quick coupling mechanism with safety button
- Automatic condensation drain



| Technical characteristics | |
|---|---|
| **Size** | Size 4 |
| Body and connections type | Aluminium body with integrated aluminium connections |
| Protection and bowl type | Metal bowl<br>with blind metal bowl |
| IN / OUT connections | G1" |
| Assembly configuration | Stand alone<br>Panel mounted with M8 screws |
| Assembly position | Vertical ±5° |
| Filter pore size (µm) | 5 / 20 / 50 |
| Filter efficiency at flow rate 1500 Nl/min | 96,00% |
| Bowl capacity ($cm^3$) | 160 |
| Condensation drain | Automatic |
| Max. fittings torque IN / OUT connections | G1"metal: 35 |

| Operational characteristics | |
|---|---|
| **Size** | Size 4 |
| Condensation drain | Automatic condensation drain |
| Maximum working pressure (bar) | 13 |
| Minimum working pressure (bar) | 0,5 |
| Nominal flow rate at 6 bar with Δp=1 (Nl/min) | 2500 |
| Working temperature (°C) | -5 ... +50 |

| Weights | |
|---|---|
| **Size** | Size 4 |
| Aluminium body version (g) | 1700 |

## Order codes

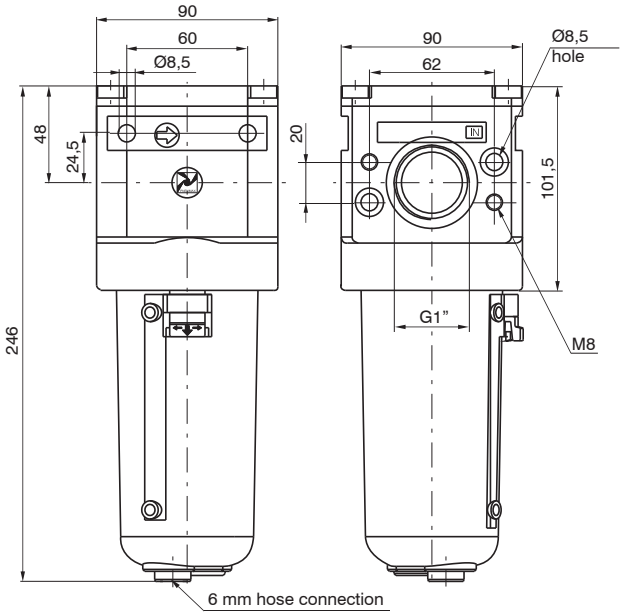
17 | 40EB | . | A | . S

| Size, body and connections | |
|---|---|
| 40EB | Aluminium body, connections G1" (only for size 4) |

| Filter pore size | |
|---|---|
| A | 5 $\mu$m |
| B | 20 $\mu$m |
| C | 50 $\mu$m |

**Example: 1740EB.A.S**
Dynamic direr Size 4, aluminium body, G1" connections, filter pore size 5 $\mu$m

## Dimensions




Size 4

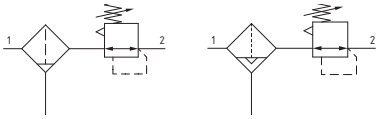



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Filter regulators



- Filter - diaphragm pressure regulator with relieving
- Available in 3 sizes with flow rates up to 3500 Nl/min and connections from 1/8" to 3/4"
- Low histeresis rolling diaphragm and balanced spool
- Filtering element made of HDPE available in 3 different filtration grades (5µm, 20µm and 50µm)
- Bowls screwed to the body (Size 1)
- Bowl assembly via bayonet type quick coupling mechanism with safety button (Size 2 - Size 3)
- Semi-automatic or automatic drain
- Available in four pressure ranges up to 12 bar
- Fitted with panel mounting locking ring
- Atex certification (II 2GD o II 3GD) on request




**Note**
For installations where a more accurate and constant pressure is required, the unit should be installed as close as possible to the point of use. In order to ensure that any fluid discharged by the auto drain assembly is adequately drained away, it is recommended you to use a 6mm fitting and tube.

| Technical characteristics | | | |
|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 |
| Body and connections type | Zinc alloy body,<br>Zinc alloy integrated connections<br>Technopolymer body,<br>metal connections | Aluminium body,<br>integrated aluminium connections | |
| Protection and bowl type | Technopolymer protection - PA bowl<br>(Size 1 available without protection) | | |
| IN / OUT connections | G1/8" - G1/4" | G1/4" - G3/8" | G3/8" - G1/2", G3/4" |
| Assembly configuration | Stand alone<br>Panel mounting<br>Panel mounted with M4 screws<br>With fixing bracket | Stand alone<br>Panel mounting<br>Panel mounted with M5 screws<br>With fixing bracket | Stand alone<br>Panel mounting<br>Panel mounted with M6 screws<br>With fixing bracket |
| Assembly position | Vertical ±5° | | |
| Filter pore size (µm) | 5 / 20 / 50 | | |
| Pressure range (bar) | 0 - 2 / 0 - 4 / 0 - 8 / 0 - 12 | | |
| Bowl capacity ($cm^3$) | 20 | 30 | 48 |
| Condensation drain | Semi-automatic<br>Automatic | | |
| Regulation | Manual push and lock with pressure<br>Manual lockable with accessories | | |
| Pressure measurement | G1/8" Pressure gauge connection port | | |
| Max. fittings torque<br>IN / OUT connections | G1/8" metal: 15<br>G1/4" metal: 20 | G1/4" metal: 20<br>G3/8" metal: 25 | G3/8" metal: 25<br>G1/2" metal: 30<br>G3/4" metal: 35 |

| Operational characteristics | | | | | | |
|---|---|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 1 | Size 2 | Size 3 |
| Condensation drain | Semi-automatic condensation drain | | | Automatic condensation drain | | |
| Maximum<br>working pressure (bar) | 13 | | | 10 | | |
| Minimum<br>working pressure (bar) | 0,5 | | | | | |
| Working<br>temperature (°C) | -5 ... +50 | | | | | |

| Weights | | | |
|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 |
| Zinc alloy body version (g) | 295 | / | / |
| Technopolymer body version (g) | 180 | / | / |
| Aluminium body version (g) | / | 450 | 645 |

## Order codes




| Size, body and connections | |
|---|---|
| 004A | Zinc alloy body, connections G1/8" (only for size 1) |
| 004B | Zinc alloy body, connections G1/4" (only for size 1) |
| 104A | Technopolymer body, connections G1/8" (only for size 1) |
| 104B | Technopolymer body, connections G1/4" (only for size 1) |
| 204A | Aluminium body, connections G1/4" (only for size 2) |
| 204B | Aluminium body, connections G3/8" (only for size 2) |
| 304A | Aluminium body, connections G3/8" (only for size 3) |
| 304B | Aluminium body, connections G1/2" (only for size 3) |
| 304E | Aluminium body, connections G3/4" (only for size 3) |

| Filter pore size | |
|---|---|
| A | 5 $\mu$m |
| B | 20 $\mu$m |
| C | 50 $\mu$m |

| Pressure range | |
|---|---|
| A | 0 - 2 bar |
| B | 0 - 4 bar |
| C | 0 - 8 bar |
| D | 0 - 12 bar |

| Type | |
|---|---|
| P | Bowl protection (only for size 1) |
| S | Automatic drain (for all sizes) |
| PS | Bowl protection and automatic drain (only for size 1) |

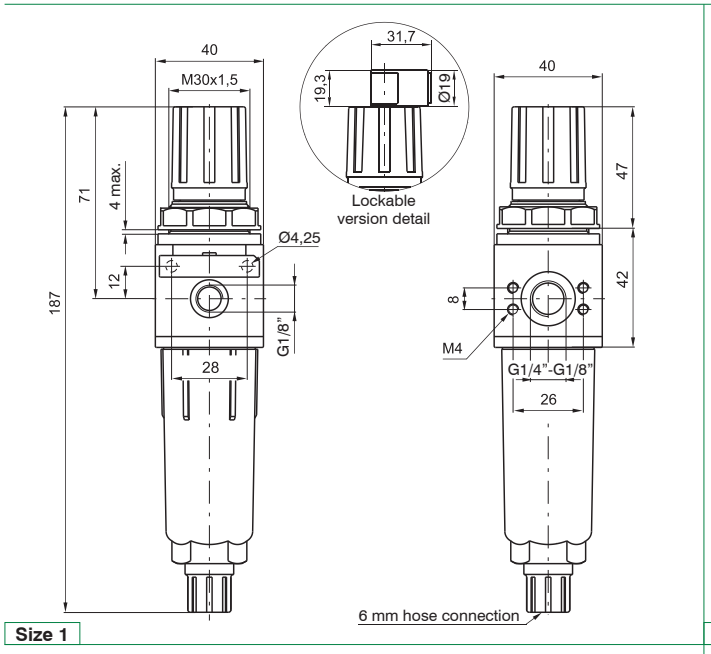
| Options | |
|---|---|
| | Standard |
| K | Lockable version |
| KF | Lockable version with universal key |

**Example: 17304A.B.D.S.K**
Filter regulator size 3, aluminium body, G3/8" connections, filter pore size 20 $\mu$m 0 - 12 bar, automatic drain lockable version

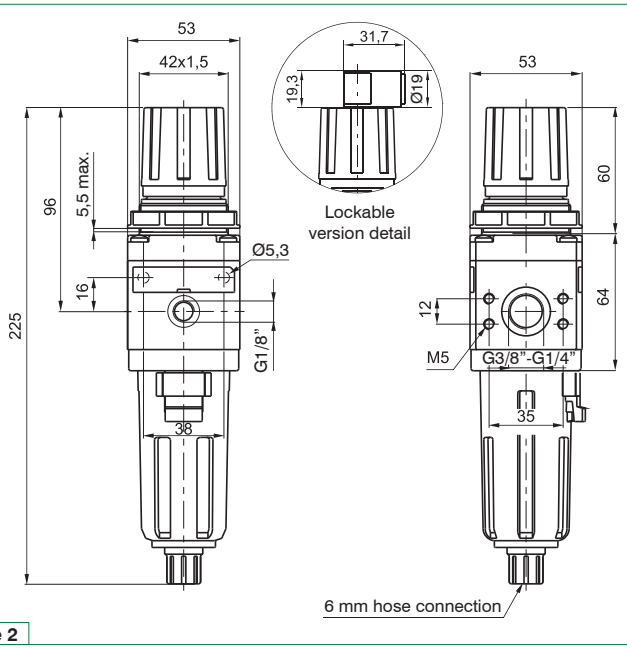



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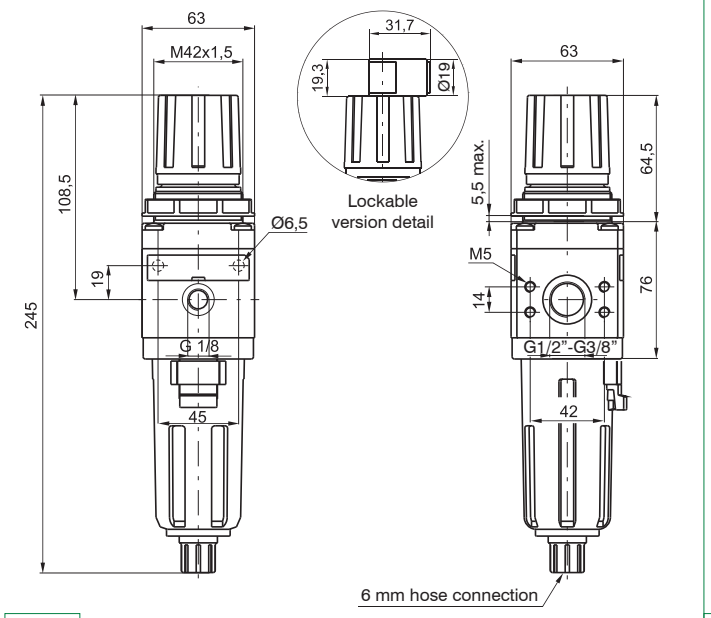
## Dimensions



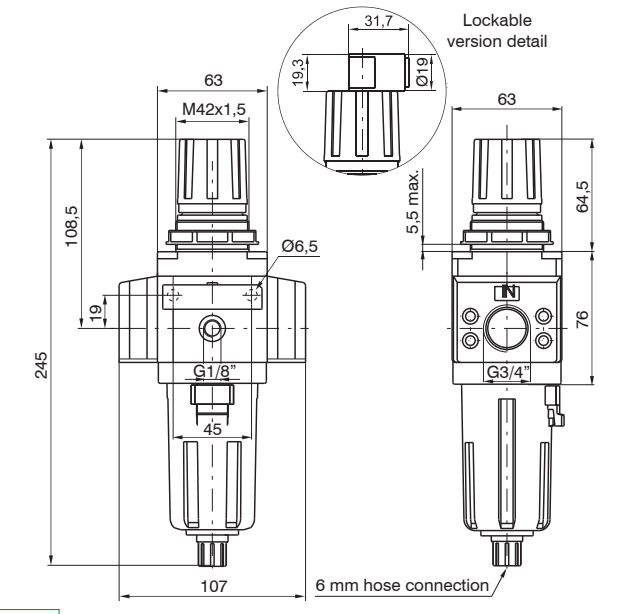

Size 1




Size 2



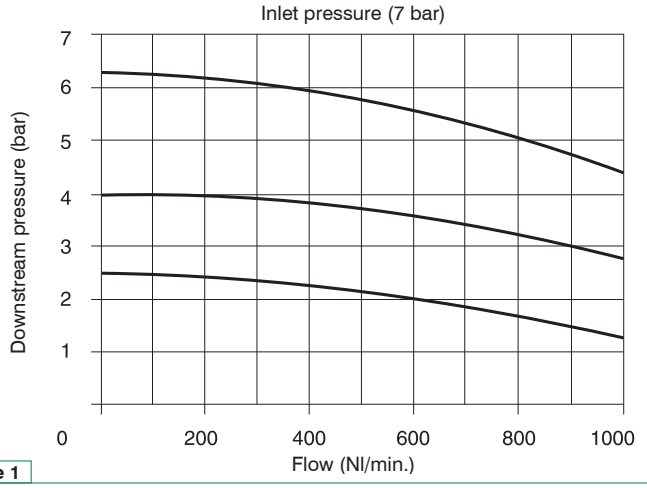

Size 3




Size 3 3/4"

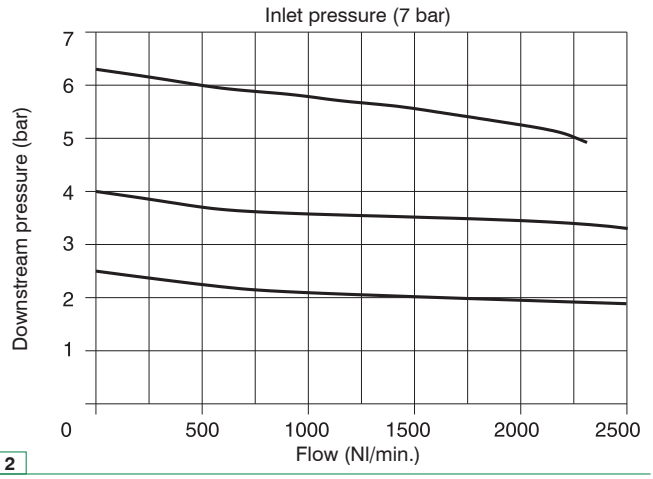
## Characteristic curves

Flow rate curves



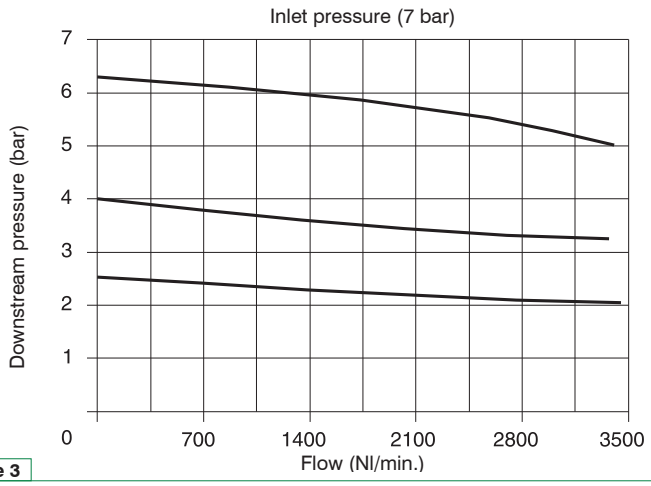

Size 1

Flow rate curves



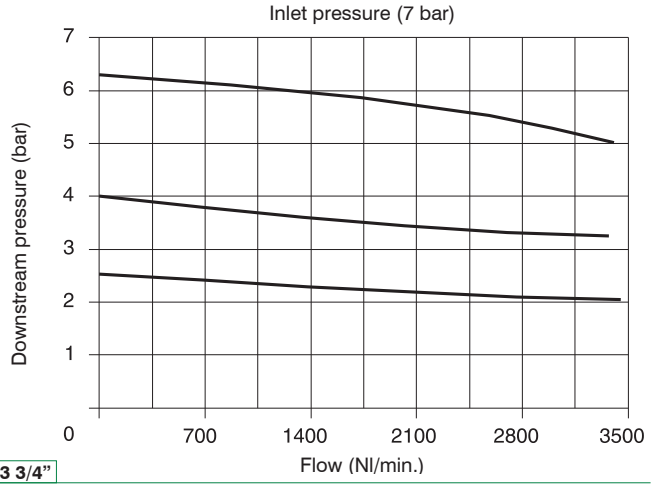

Size 2

Flow rate curves



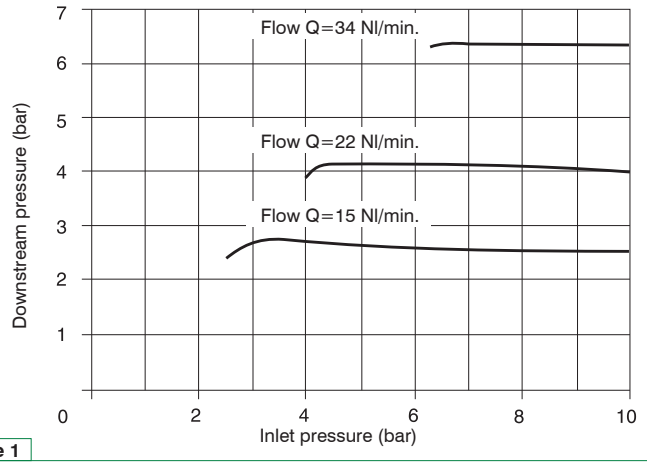

Size 3

Flow rate curves



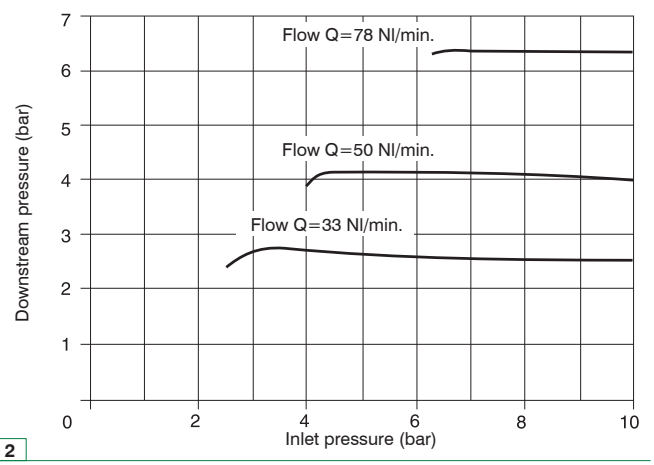

Size 3 3/4"

Adjustment characteristic



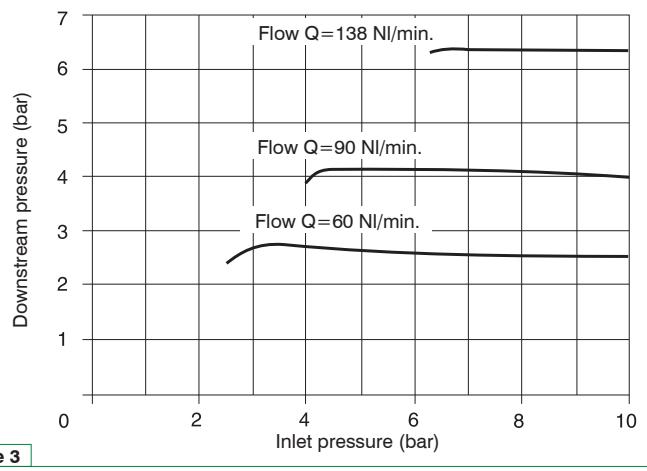

Size 1

Adjustment characteristic



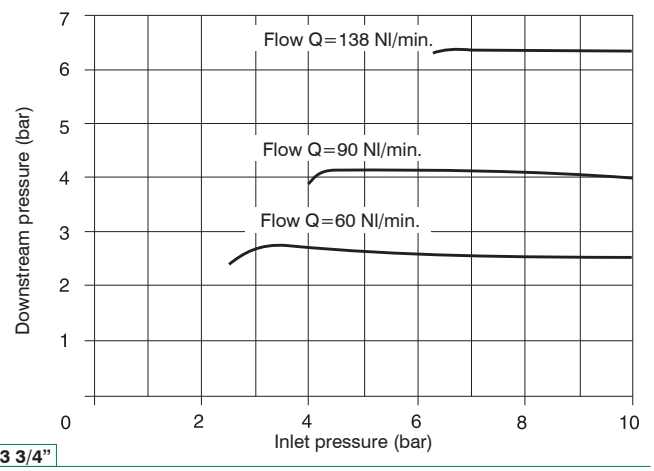

Size 2

Adjustment characteristic




Size 3

Adjustment characteristic




Size 3 3/4"

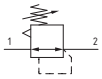


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## Regulators



- Diaphragm pressure regulator with relieving
- Available in 4 sizes with flow rates up to 8000 Nl/min and connections from 1/8” to 1”
- Low histeresis rolling diaphragm and balanced spool
- Available in four pressure ranges up to 12 bar
- Fitted with panel mounting locking ring
- High flow rate of the discharge valve for the dowstream overpressure (Size 4)
- Atex certification (II 2GD o II 3GD) on request




**Note**
For installations where a more accurate and constant pressure is required, the unit should be installed as close as possible to the point of use.

| Technical characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Body and connections type | Zinc alloy body,<br>Zinc alloy integrated connections<br>Technopolymer body,<br>metal connections | Aluminium body,<br>integrated aluminium connections | | |
| IN / OUT connections | G1/8” - G1/4” | G1/4” - G3/8” | G3/8” - G1/2”, G3/4” | G1” |
| Assembly configuration | Stand alone<br>Panel mounting<br>Panel mounted with M4 screws<br>With fixing bracket | Stand alone<br>Panel mounting<br>Panel mounted with M5 screws<br>With fixing bracket | Stand alone<br>Panel mounting<br>Panel mounted with M6 screws<br>With fixing bracket | Stand alone<br>Panel mounting<br>Panel mounted with M8 screws |
| Assembly position | Indifferent | | | |
| Pressure range (bar) | 0 - 2 / 0 - 4 / 0 - 8 / 0 - 12 | | | |
| Regulation | Manual push and lock with pressure<br>Manual lockable with accessories | | | |
| Pressure measurement | G1/8” Pressure gauge connection port | | | |
| Max. fittings torque<br>IN / OUT connections | G1/8” metal: 15<br>G1/4” metal: 20 | G1/4” metal: 20<br>G3/8” metal: 25 | G3/8” metal: 25<br>G1/2” metal: 30<br>G3/4” metal: 35 | G1” metal: 35 |

| Operational characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Maximum<br>working pressure (bar) | 13 | | | |
| Minimum<br>working pressure (bar) | 0,5 | | | |
| Working<br>temperature (°C) | -5 ... +50 | | | |

| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Zinc alloy body version (g) | 250 | / | / | / |
| Technopolymer body version (g) | 135 | / | / | / |
| Aluminium body version (g) | / | 390 | 550 | 1900 |

## Order codes

17 | 302A | . | D | . | L | . | K

| Size, body and connections | |
|---|---|
| 002A | Zinc alloy body, connections G1/8" (only for size 1) |
| 002B | Zinc alloy body, connections G1/4" (only for size 1) |
| 102A | Technopolymer body, connections G1/8" (only for size 1) |
| 102B | Technopolymer body, connections G1/4" (only for size 1) |
| 202A | Aluminium body, connections G1/4" (only for size 2) |
| 202B | Aluminium body, connections G3/8" (only for size 2) |
| 302A | Aluminium body, connections G3/8" (only for size 3) |
| 302B | Aluminium body, connections G1/2" (only for size 3) |
| 302E | Aluminium body, connections G3/4" (only for size 3) |
| 402NB | Aluminium body, connections G1" (only for size 4) |

| Pressure range | |
|---|---|
| A | 0 - 2 bar |
| B | 0 - 4 bar |
| C | 0 - 8 bar |
| D | 0 - 12 bar |

| Type | |
|---|---|
| L | Without relieving |
| SM | Improved relieving (not available for Size 4) |

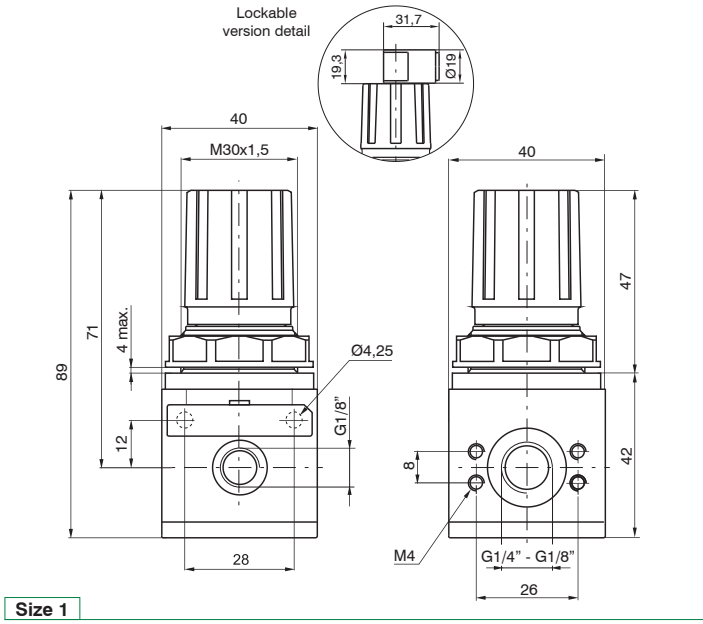
| Options | |
|---|---|
| | Standard |
| K | Lockable version |
| KF | Lockable version with universal key |

**Example: 17302A.D.L.K**
Regulator size 3, body in light aluminium alloy, G3/8"connections, 0 - 12 bar, without relieving, lockable version

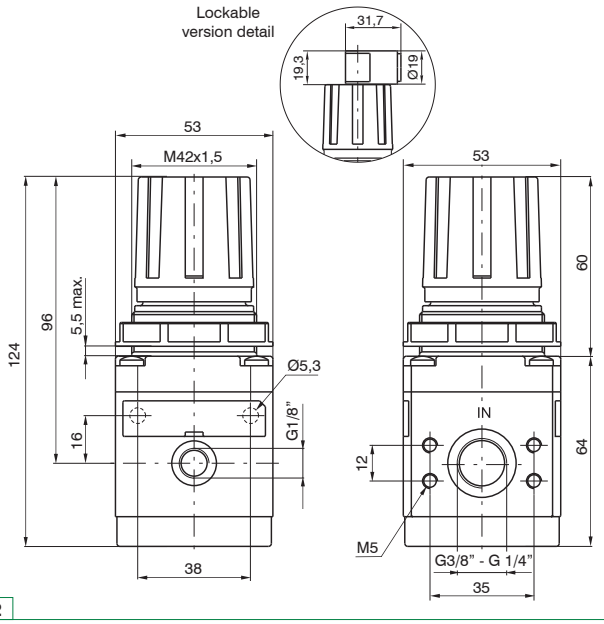



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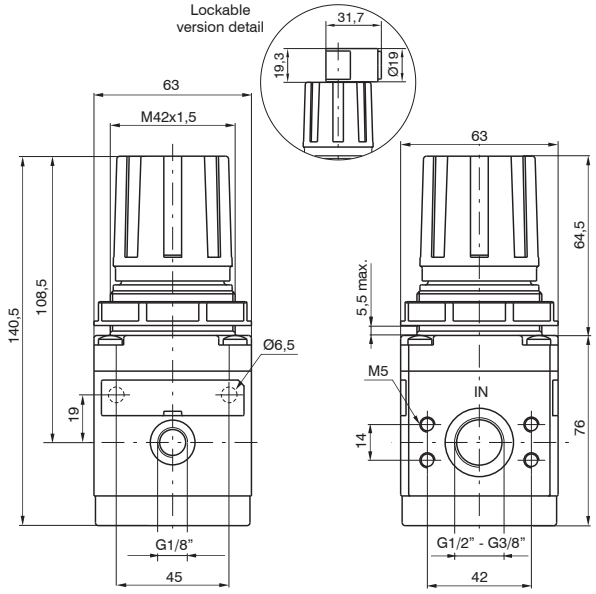
## Dimensions



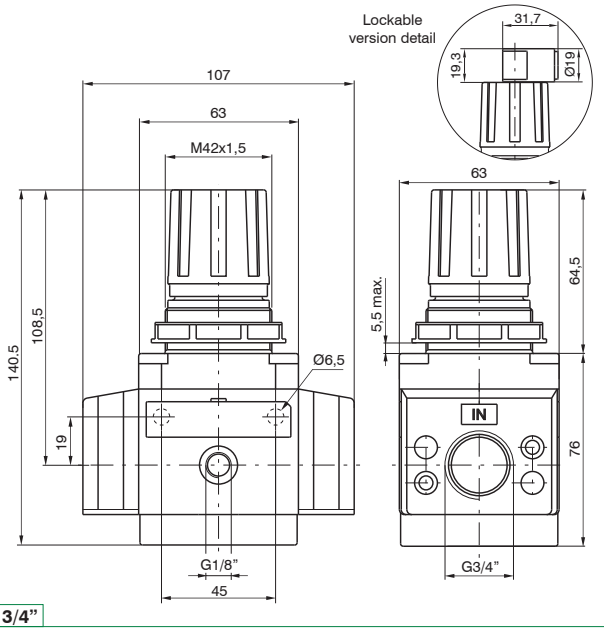

Size 1



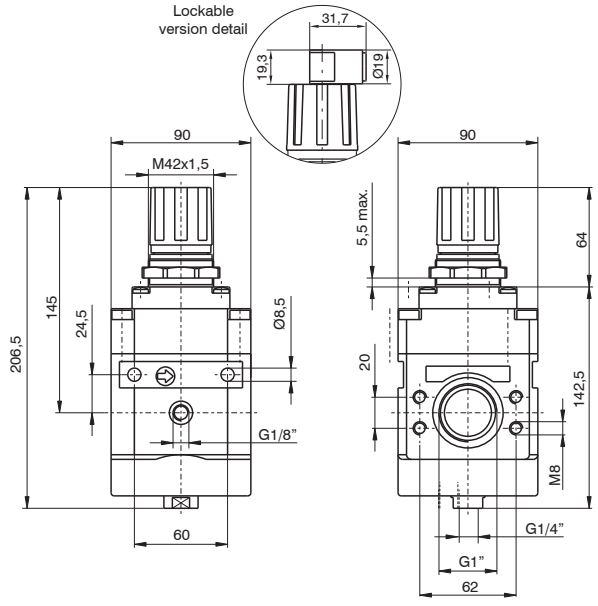

Size 2




Size 3



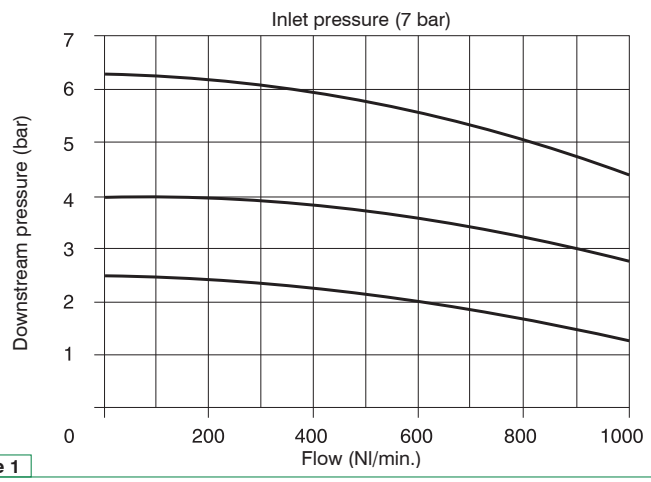

Size 3 3/4"




Size 4

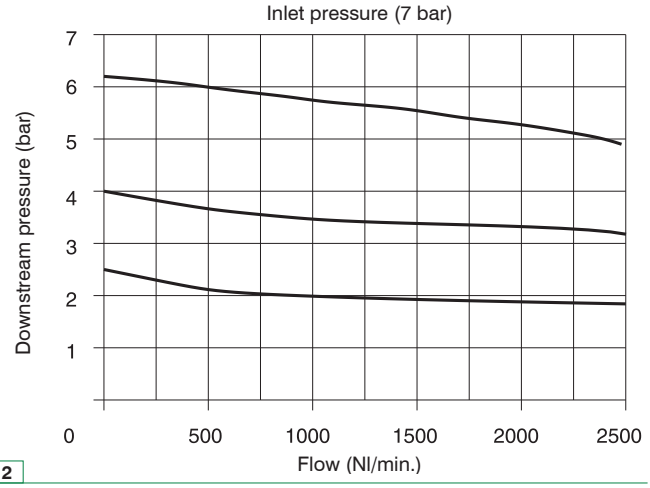
## Characteristic curves

Flow rate curves



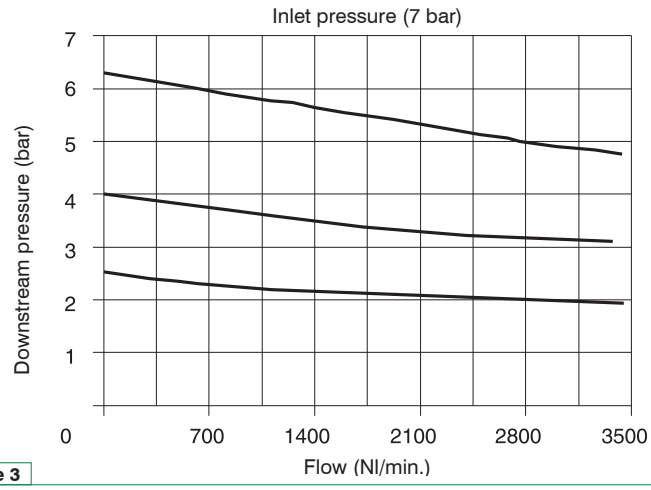

Size 1

Flow rate curves



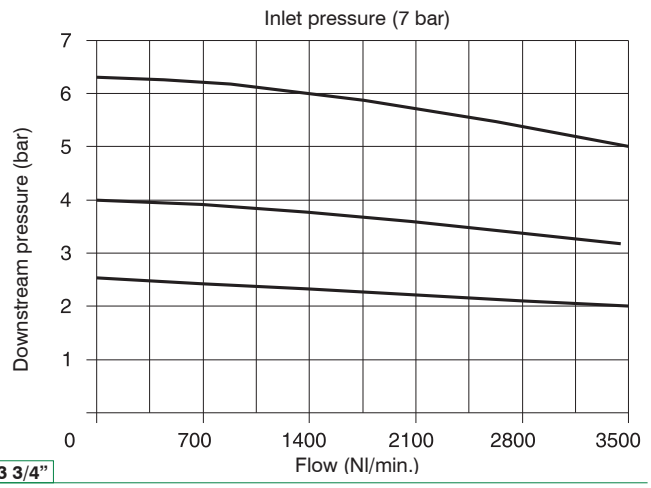

Size 2

Flow rate curves



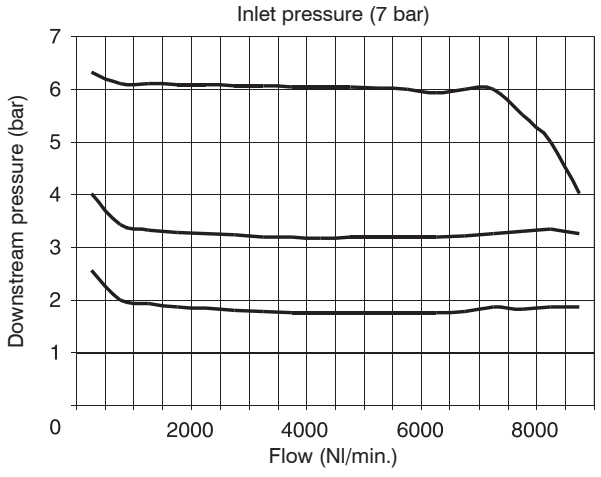

Size 3

Flow rate curves




Size 3 3/4"

Flow rate curves

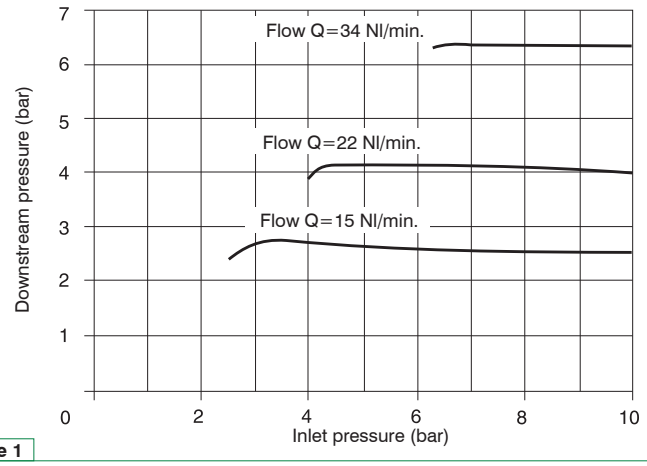



Size 4



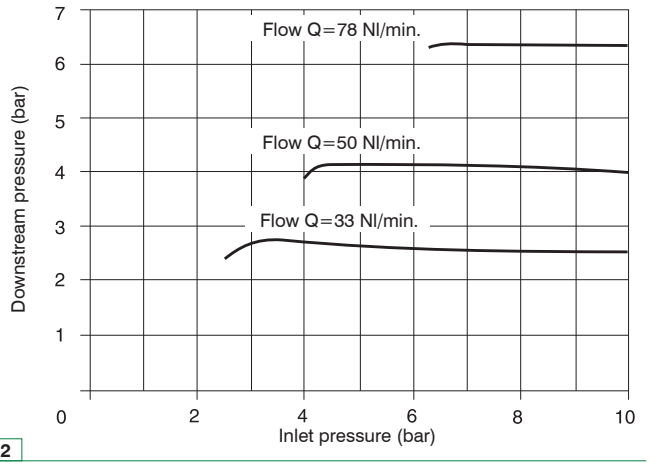
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

Adjustment characteristic



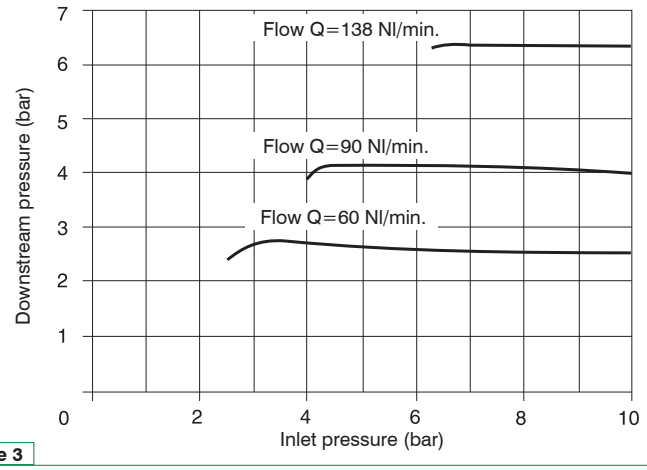

**Size 1**

Adjustment characteristic



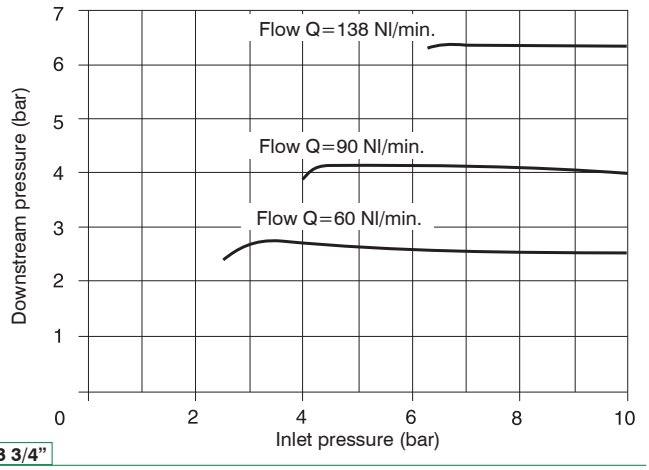

**Size 2**

Adjustment characteristic



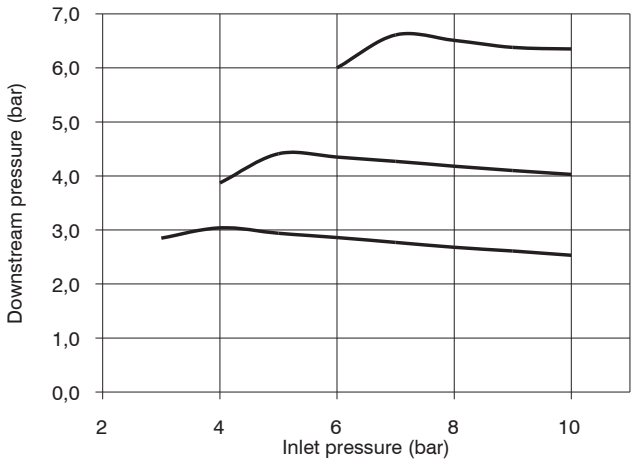

**Size 3**

Adjustment characteristic




**Size 3 3/4”**

Adjustment characteristic

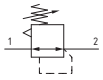



**Size 4**

## Regulators with integrated pressure gauge



- Diaphragm pressure regulator with relieving
- Available in 4 sizes with flow rates up to 3500 Nl/min and connections from 1/8” to 1/2”
- Low histeresis rolling diaphragm and balanced spool
- Available in four pressure ranges up to 12 bar
- Fitted with panel mounting locking ring
- Pressure gauge included on the top of adjusting knob
- Atex certification (II 2GD o II 3GD) on request




**Note**
For installations where a more accurate and constant pressure is required, the unit should be installed as close as possible to the point of use.

| Technical characteristics | | | |
|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 |
| Body and connections type | Zinc alloy body,<br>Zinc alloy integrated connections<br>Technopolymer body,<br>metal connections | Aluminium body,<br>integrated aluminium connections | |
| IN / OUT connections | G1/8” - G1/4” | G1/4” - G3/8” | G3/8” - G1/2” |
| Assembly configuration | Stand alone<br>Panel mounting<br>Panel mounted with M4 screws<br>With fixing bracket | Stand alone<br>Panel mounting<br>Panel mounted with M5 screws<br>With fixing bracket | Stand alone<br>Panel mounting<br>Panel mounted with M6 screws<br>With fixing bracket |
| Assembly position | Indifferent | | |
| Pressure range (bar) | 0 - 2 / 0 - 4 / 0 - 8 / 0 - 12 | | |
| Regulation | Manual push and lock with pressure | | |
| Pressure measurement | G1/8” Pressure gauge connection port is included on the top of adjusting knob | | |
| Max. fittings torque<br>IN / OUT connections | G1/8” metal: 15<br>G1/4” metal: 20 | G1/4” metal: 20<br>G3/8” metal: 25 | G3/8” metal: 25<br>G1/2” metal: 30 |

| Operational characteristics | | | |
|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 |
| Maximum<br>working pressure (bar) | 13 | | |
| Minimum<br>working pressure (bar) | 0,5 | | |
| Working<br>temperature (°C) | -5 ... +50 | | |

| Weights | | | |
|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 |
| Zinc alloy body version (g) | 380 | / | / |
| Technopolymer body version (g) | 250 | / | / |
| Aluminium body version (g) | / | 440 | 600 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Order codes

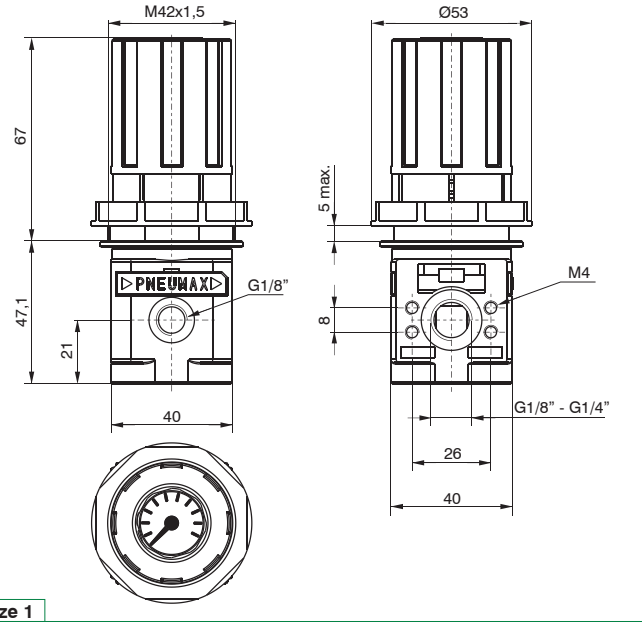
17 | 322A | . | D

| Size, body and connections | |
|---|---|
| 022A | Zinc alloy body, connections G1/8” (only for size 1) |
| 022B | Zinc alloy body, connections G1/4” (only for size 1) |
| 122A | Technopolymer body, connections G1/8” (only for size 1) |
| 122B | Technopolymer body, connections G1/4” (only for size 1) |
| 222A | Aluminium body, connections G1/4” (only for size 2) |
| 222B | Aluminium body, connections G3/8” (only for size 3) |
| 322A | Aluminium body, connections G3/8” (only for size 3) |
| 322B | Aluminium body, connections G1/2” (only for size 3) |

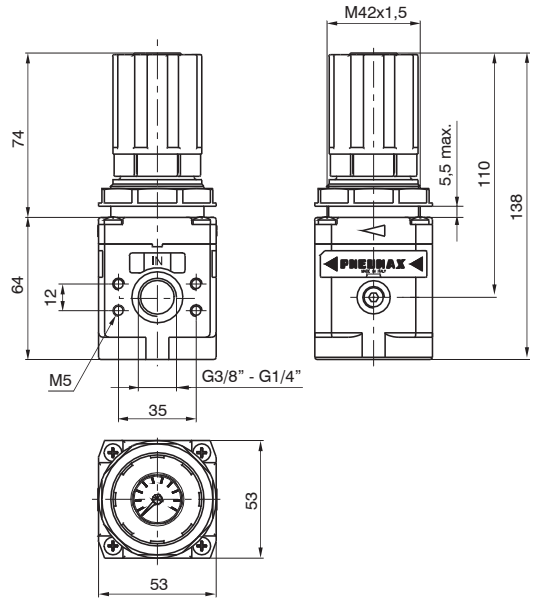
| Pressure range | |
|---|---|
| A | 0 - 2 bar |
| B | 0 - 4 bar |
| C | 0 - 8 bar |
| D | 0 - 12 bar |

**Example: 17322A.D**
Size 3 regulator with integrated pressure gauge, Aluminium body, G3/8” connections, 0 - 12 bar

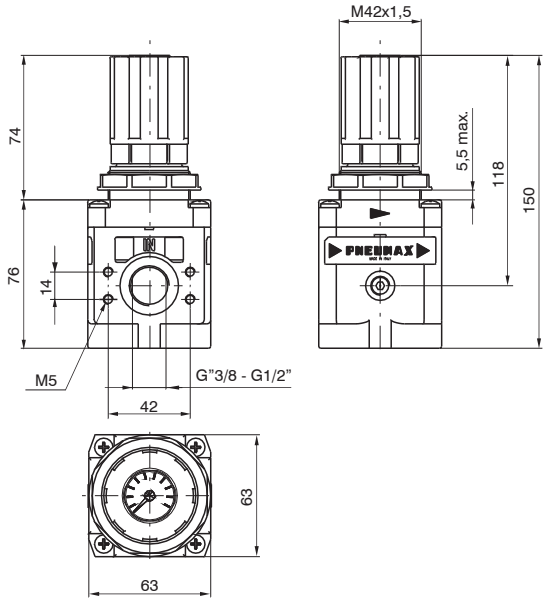
## Dimensions




Size 1



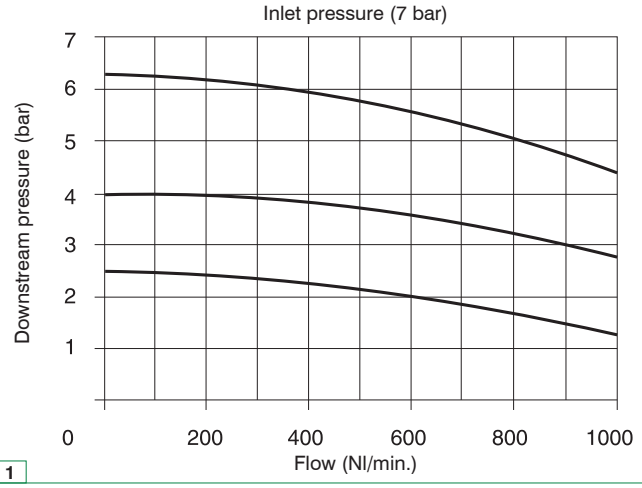

Size 2




Size 3

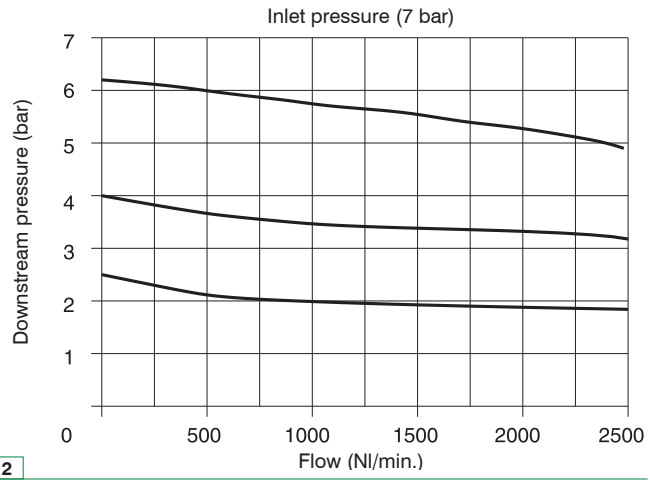
## Characteristic curves

Flow rate curves



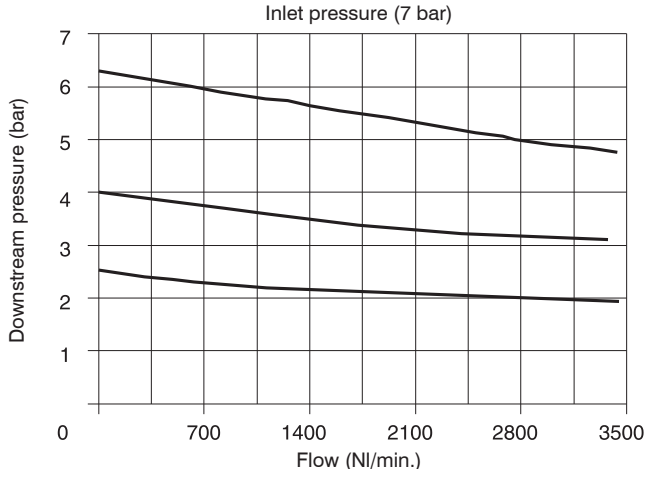

Size 1

Flow rate curves



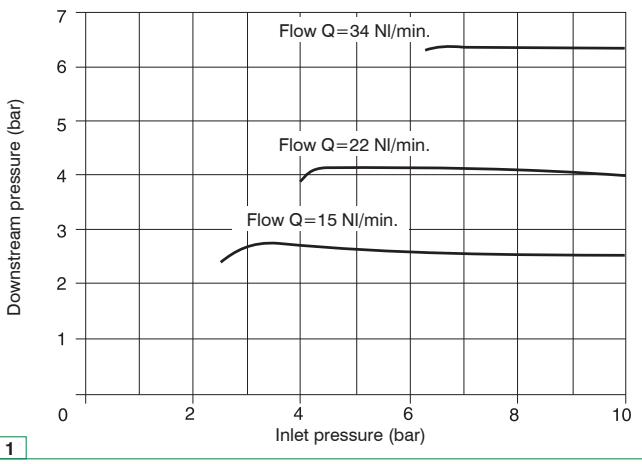

Size 2

Flow rate curves



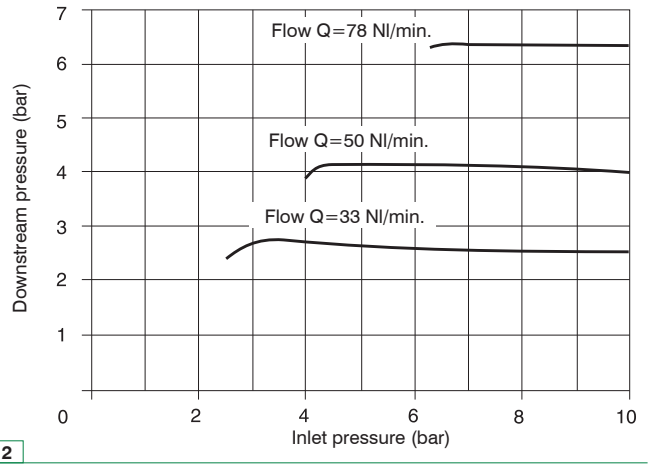

Size 3

Adjustment characteristic



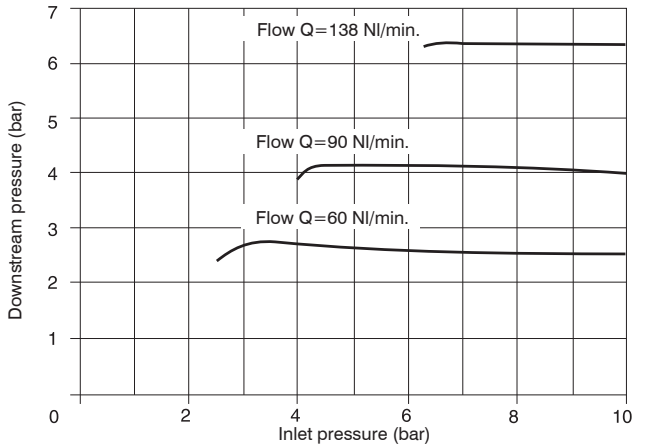

Size 1

Adjustment characteristic




Size 2

Adjustment characteristic




Size 3

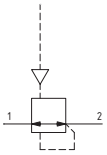


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Piloted pressure regulators



- Diaphragm piloted pressure regulator
- Available in 3 sizes with flow rates up to 3500 Nl/min and connections from 1/4" a 1"
- Atex certification (II 2GD o II 3GD) on request




**Note**
Always regulate the rising pressure.

| Technical characteristics | | | |
|---|---|---|---|
| **Size** | Size 2 | Size 3 | Size 4 |
| Body and connections type | Aluminium body, integrated aluminium connections | | |
| IN / OUT connections | G1/4" - G3/8" | G3/8" - G1/2" | G1" |
| Assembly configuration | Stand alone<br>Panel mounted with M5 screws | Stand alone<br>Panel mounted with M5 screws | Stand alone<br>Panel mounted with M8 screws |
| Assembly position | Indifferent | | |
| Pressure range (bar) | 0,5...10 | | |
| Regulation | Pneumatic piloting | | |
| Pressure measurement | G1/8" Pressure gauge connection port | | |
| Max. fittings torque<br>IN / OUT connections | G1/4" metal: 20<br>G3/8" metal: 25 | G3/8" metal: 25<br>G1/2" metal: 30 | G1" metal: 35 |

| Operational characteristics | | | |
|---|---|---|---|
| **Size** | Size 2 | Size 3 | Size 4 |
| Maximum working pressure (bar) | 13 | | |
| Minimum working pressure (bar) | 0,5 | | |
| Pilot pressure range (bar) | 0,5...10 | | |
| Working temperature (°C) | -5 ... +50 | | |

| Weights | | | |
|---|---|---|---|
| **Size** | Size 2 | Size 3 | Size 4 |
| Aluminium body version (g) | 313 | 510 | 1638 |

## Order codes

17 | 302A | . P . | L

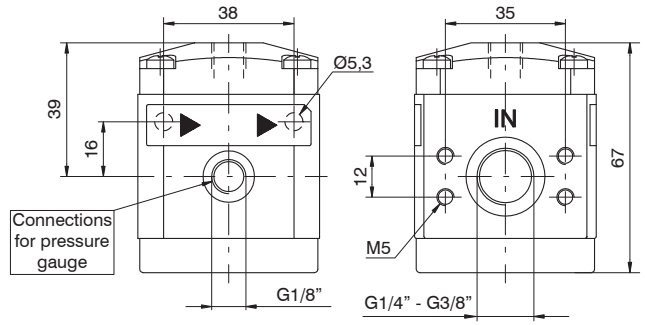
| Size, body and connections | |
|---|---|
| 202A | Aluminium body, connections G1/4" (only for size 2) |
| 202B | Aluminium body, connections G3/8" (only for size 2) |
| 302A | Aluminium body, connections G3/8" (only for size 3) |
| 302B | Aluminium body, connections G1/2" (only for size 3) |
| 402NB | Aluminium body, connections G1" (only for size 4) |

| Options | |
|---|---|
| | Standard |
| L | Without relieving (not available for Size 4) |

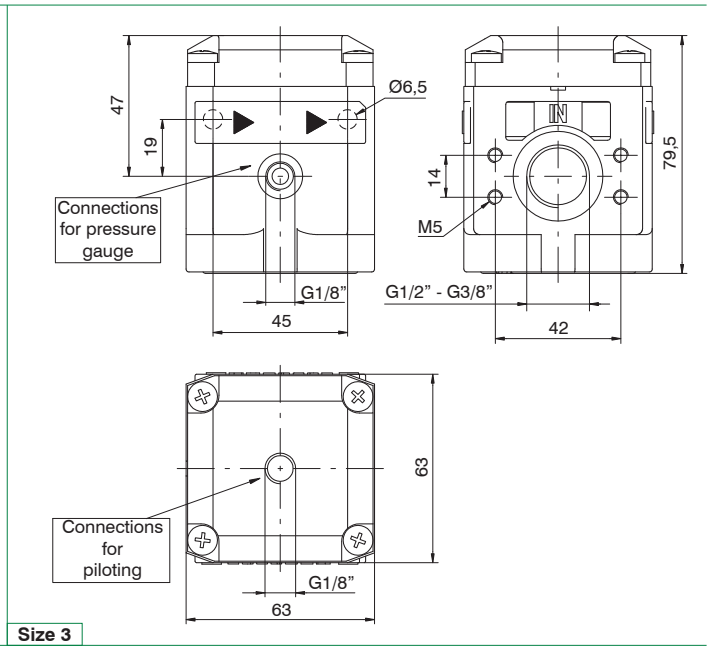
**Example: 17302A.P.L**
Size 3 piloted pressure regulator, aluminium body, G3/8" connections, without relieving



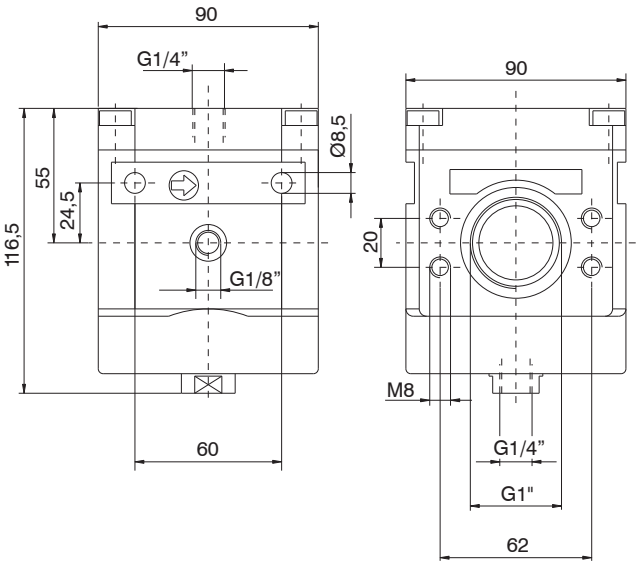
## Dimensions




Size 2




Size 3

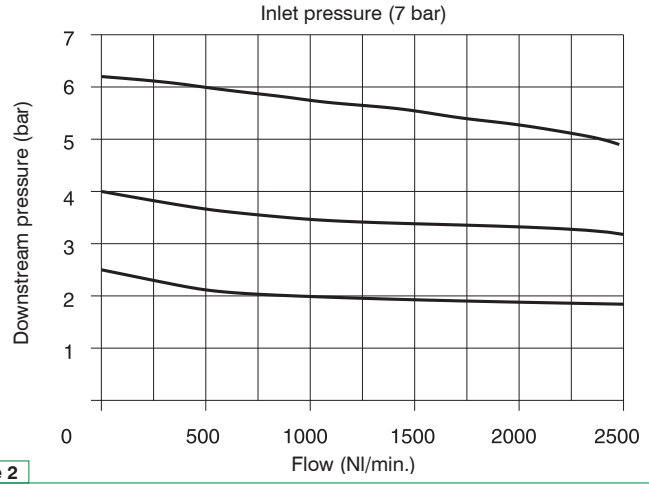



Size 4


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

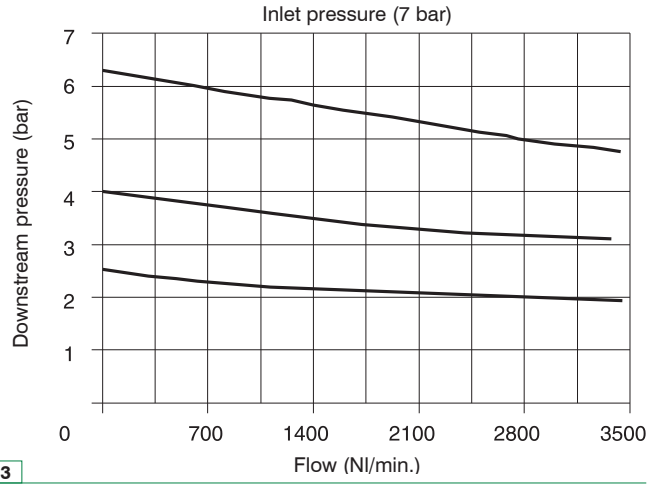
## Characteristic curves

Flow rate curves



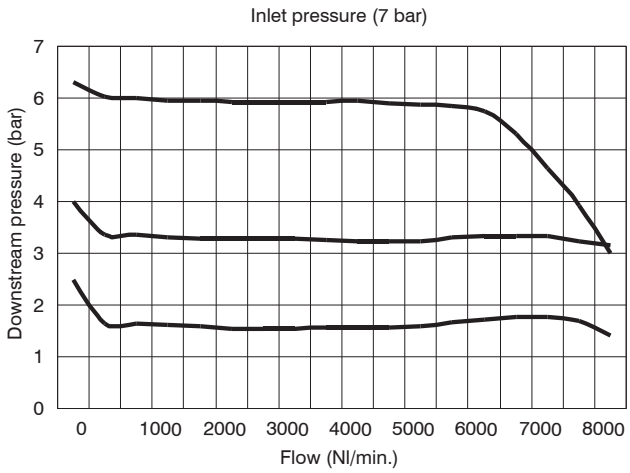

Size 2

Flow rate curves



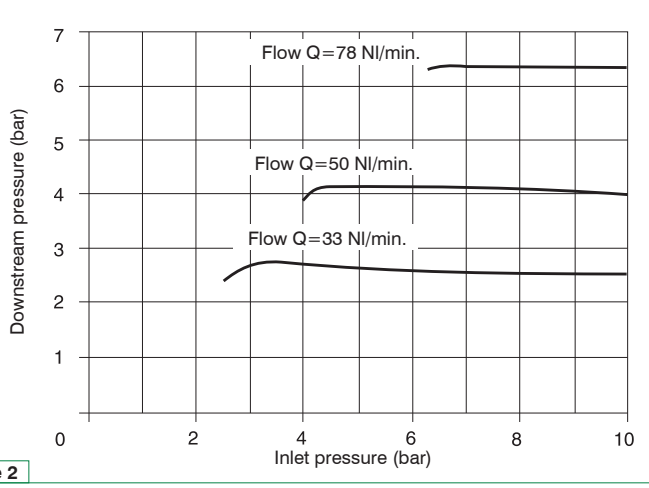

Size 3

Flow rate curves



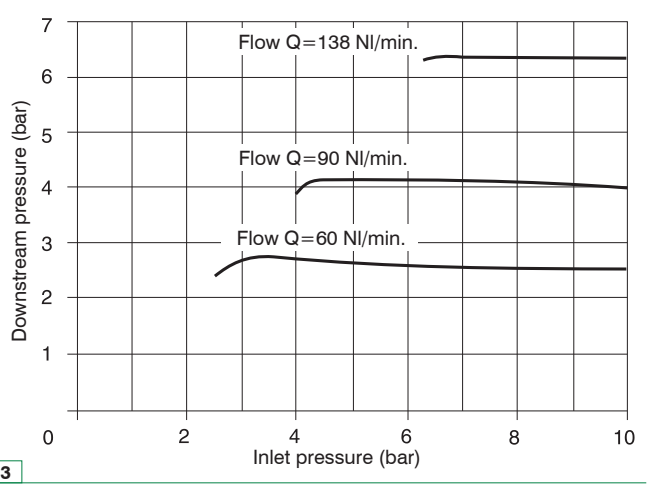

Size 4

Adjustment characteristic



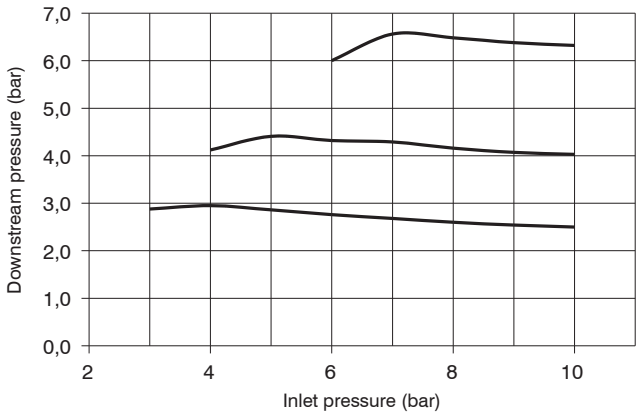

Size 2

Adjustment characteristic



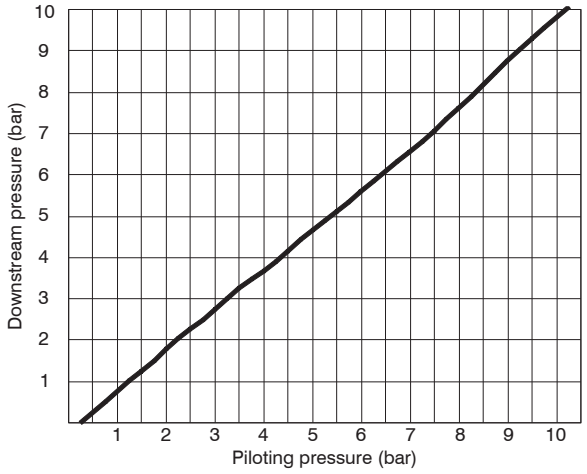

Size 3

Adjustment characteristic



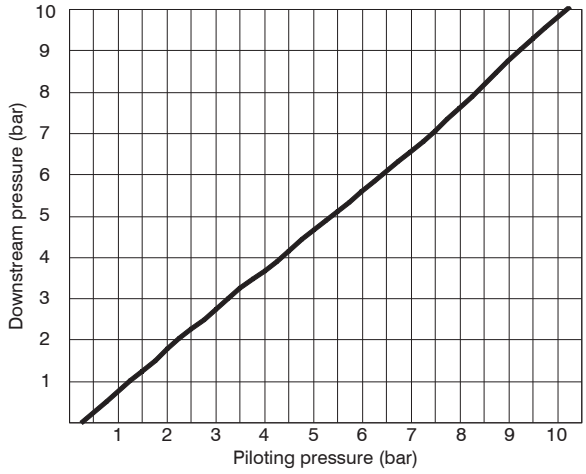

Size 4

**Piloting curves**



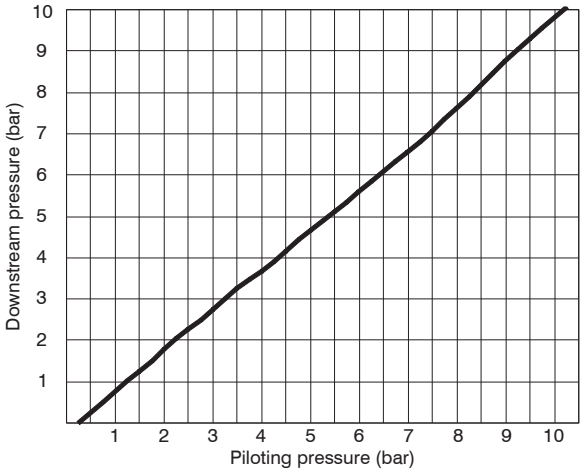

**Size 2**

**Piloting curves**




**Size 3**

**Piloting curves**




**Size 4**

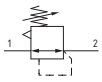


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Pressure regulators for manifold



- Diaphragm pressure regulator with relieving.
- Available with 2 front outputs connections G1/8”
- Available in four pressure ranges up to 12 bar
- Ring nut for panel mounting
- Available with integrated pressure gauge on the top of adjusting knob
- Air supply can be applied by both directions (Right or Left)
- Max. 6 off pressure regulators in manifold configuration
- Atex certification (II 2GD) on request




**Note**
For installations where a more accurate and constant pressure is required, the unit should be installed as close as possible to the point of use.

| Technical characteristics | |
|---|---|
| **Size** | Size 1 |
| Body and connections type | Zinc alloy body,<br>integrated zinc alloy connections |
| IN / OUT connections | G1/8” - G1/4” |
| Assembly configuration | Stand alone<br>Panel mounting<br>Panel mounted with M4 screws<br>With fixing bracket |
| Assembly position | Indifferent |
| Pressure range (bar) | 0 - 2 / 0 - 4 / 0 - 8 / 0 - 12 |
| Regulation | Manual push and lock with pressure<br>Manual lockable with accessories (only for version without pressure gauge) |
| Pressure measurement | Integrated pressure gauge on the top of adjusting knob (optional) |
| Max. fittings torque<br>IN / OUT connections | G1/8” metal: 15<br>G1/4” metal: 20 |

| Operational characteristics | |
|---|---|
| **Size** | Size 1 |
| Maximum<br>working pressure (bar) | 13 |
| Minimum<br>working pressure (bar) | 0,5 |
| Working<br>temperature (°C) | -5 ... +50 |

| Weights | |
|---|---|
| **Size** | Size 1 |
| Zinc alloy body version (g) | 380 |

## Order codes

17 | 0B2A | . | D | . | K

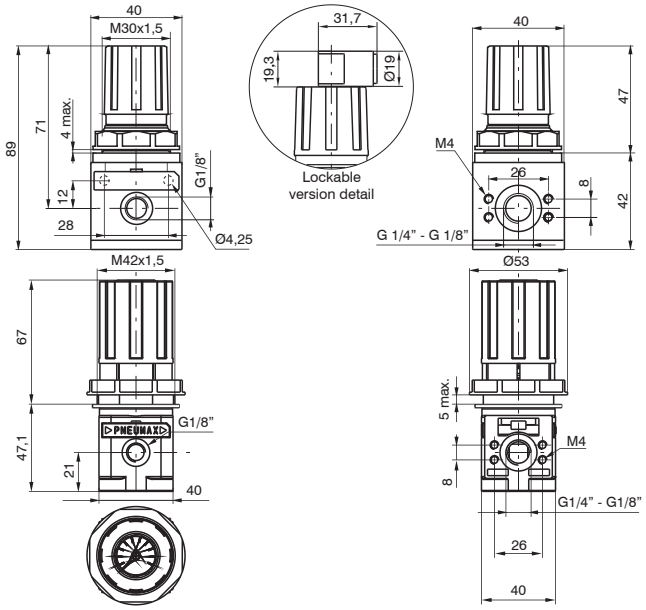
| Size, body and connections | |
|---|---|
| 0B2A | Zinc alloy body, connections G1/8” |
| 0B2B | Zinc alloy body, connections G1/4” |
| 0M2A | Zinc alloy body, connections G1/8” with integrated pressure gauge |
| 0M2B | Zinc alloy body, connections G1/4” with integrated pressure gauge |

| Pressure range | |
|---|---|
| A | 0 - 2 bar |
| B | 0 - 4 bar |
| C | 0 - 8 bar |
| D | 0 - 12 bar |

| Options | |
|---|---|
| | Standard |
| K | Lockable version (only for version without pressure gauge) |
| KF | Lockable version with universal key (only for version without pressure gauge) |

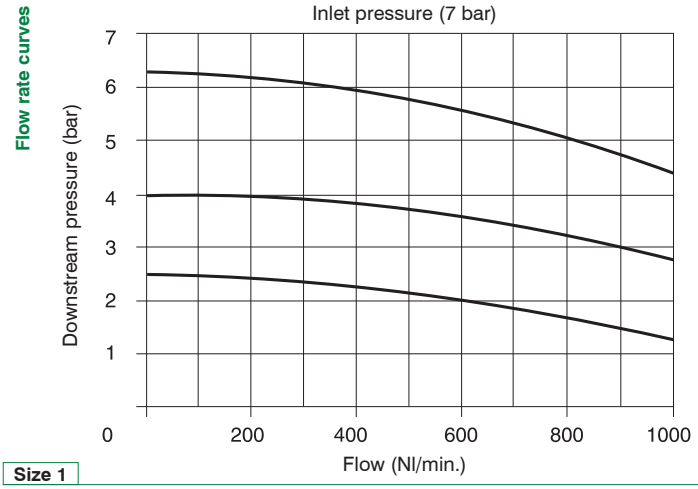
**Example: 170B2A.D.K**
Size 1 pressure regulators for manifold, Zinc alloy body, G1/8” connections, 0 - 12 bar, without pressure gauge, Lockable version

## Dimensions

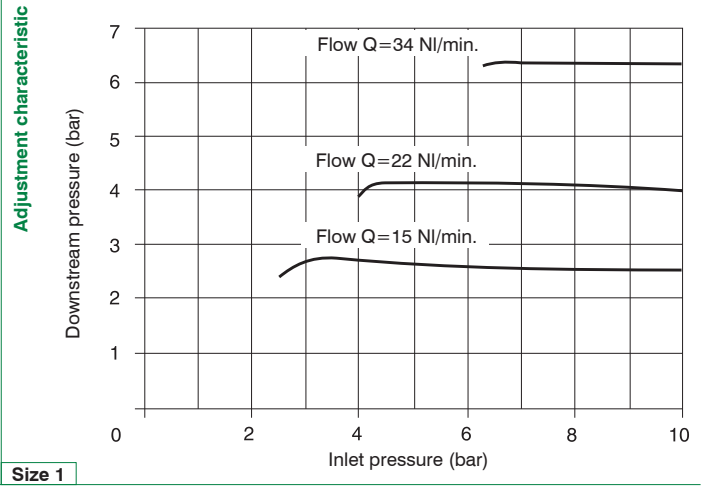



Size 1

## Characteristic curves




Size 1




Size 1


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Manifold pressure regulators



- Manifold pressure regulators
- Available in four pressure ranges up to 12 bar
- Inlet pressure common for the whole manifold of pressure regulator
- A maximum of 6 pressure regulators can be mounted
- Atex certification (II 2GD) on request



| Technical characteristics | |
|---|---|
| **Size** | Size 1 |
| Body and connections type | Zinc alloy body,<br>integrated zin alloy connections |
| IN / OUT connections | G1/8" - G1/4" |
| Assembly configuration | Stand alone<br>Panel mounting<br>Panel mounted with M4 screws<br>With fixing bracket |
| Assembly position | indifferent |
| Pressure range (bar) | 0 - 2 / 0 - 4 / 0 - 8 / 0 - 12 |
| Regulation | Manual push and lock with pressure<br>Manual lockable with accessories (only for version without pressure gauge) |
| Pressure measurement | G1/8" Pressure gauge connection port |
| Max. fittings torque<br>IN / OUT connections | G1/8" metal: 15<br>G1/4" metal: 20 |

| Operational characteristics | |
|---|---|
| **Size** | Size 1 |
| Maximum<br>working pressure (bar) | 13 |
| Minimum<br>working pressure (bar) | 0,5 |
| Working<br>temperature (°C) | -5 ... +50 |

## Order codes




| Size, body and connections | |
|---|---|
| BB2A | Zinc alloy body, connections G1/8” |
| BB2B | Zinc alloy body, connections G1/4” |
| BM2A | Zinc alloy body, connections G1/8” with integrated pressure gauge |
| BM2B | Zinc alloy body, connections G1/4” with integrated pressure gauge |

| Number of regulators | |
|---|---|
| 2 | n. 2 Regulators |
| 3 | n. 3 Regulators |
| 4 | n. 4 Regulators |
| 5 | n. 5 Regulators |
| 6 | n. 6 Regulators |

| Pressure range | |
|---|---|
| A | 0 - 2 bar |
| B | 0 - 4 bar |
| C | 0 - 8 bar |
| D | 0 - 12 bar |

| Pressure range | |
|---|---|
| A | 0 - 2 bar |
| B | 0 - 4 bar |
| C | 0 - 8 bar |
| D | 0 - 12 bar |

| Pressure range | |
|---|---|
| A | 0 - 2 bar |
| B | 0 - 4 bar |
| C | 0 - 8 bar |
| D | 0 - 12 bar |

| Pressure range | |
|---|---|
| A | 0 - 2 bar |
| B | 0 - 4 bar |
| C | 0 - 8 bar |
| D | 0 - 12 bar |

| Pressure range | |
|---|---|
| A | 0 - 2 bar |
| B | 0 - 4 bar |
| C | 0 - 8 bar |
| D | 0 - 12 bar |

| Pressure range | |
|---|---|
| A | 0 - 2 bar |
| B | 0 - 4 bar |
| C | 0 - 8 bar |
| D | 0 - 12 bar |

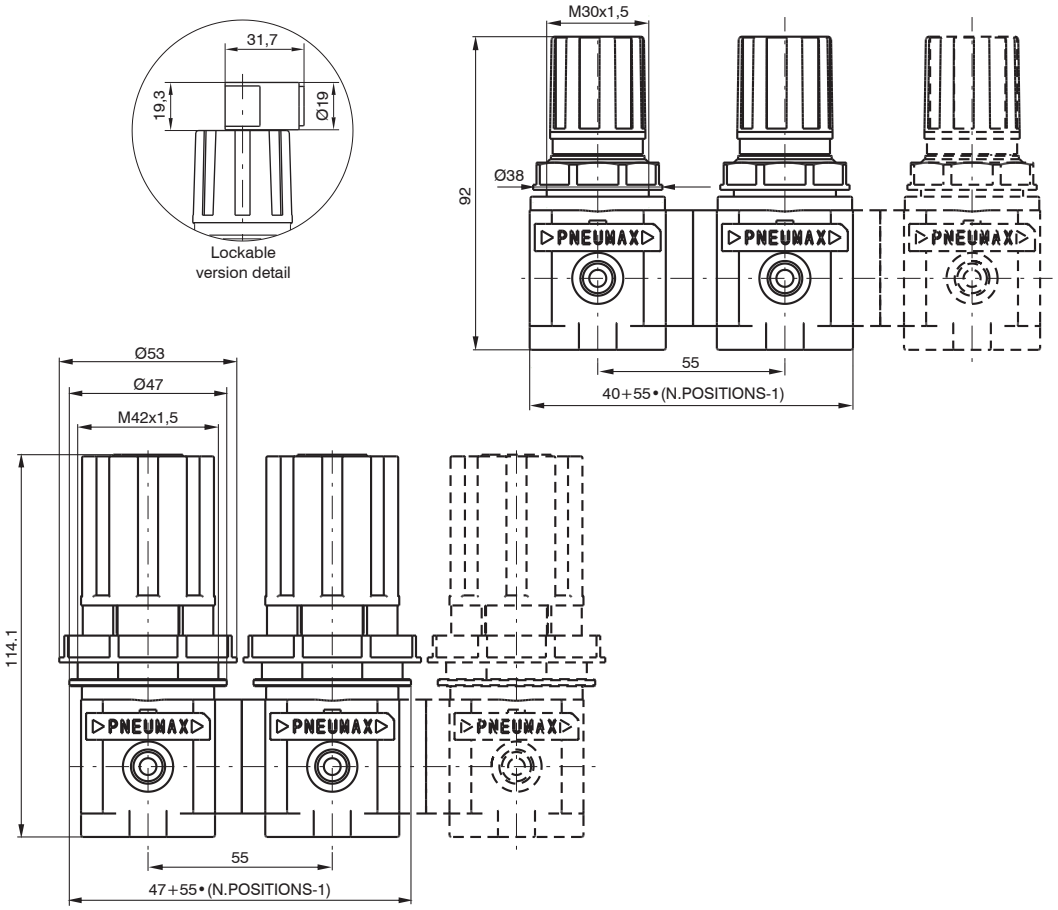
| Options | |
|---|---|
| | Standard |
| K | Lockable version (only for version without pressure gauge) |
| KF | Lockable version with universal key (only for version without pressure gauge) |

**Example : 17BB2A.6.C.C.C.C.C.C.K** : Size 1 manifold pressure regulators G1/8”, 0 - 8 bar, without pressure gauge, Lockable version



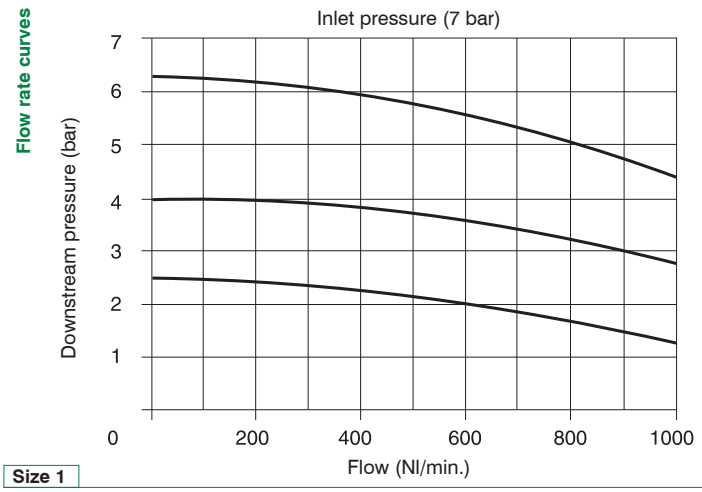

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Dimensions

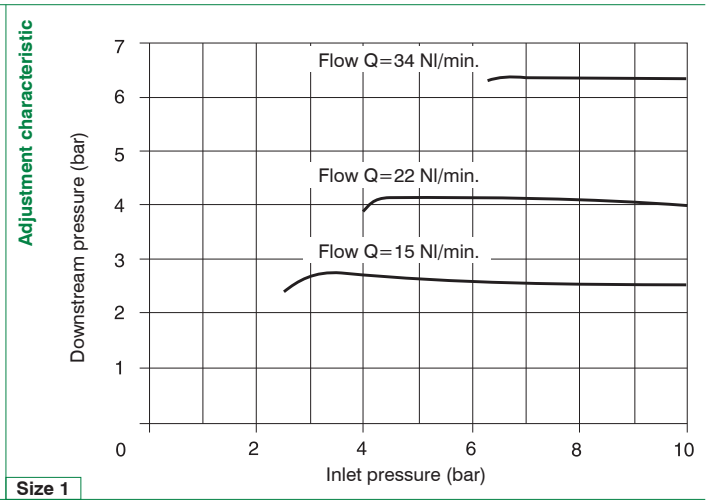



Size 1

## Characteristic curves




Size 1




Size 1

## Lubricators



- Oil mist lubricator
- Available in 4 sizes with flow rates up to 10000 Nl/min and connections from 1/8” to 1”
- Bowls screwed to the body (Size 1)
- Bowl assembly via bayonet type quick coupling mechanism with safety button (Size 2 - Size 3 - Size 4)
- Variable orifice size in function of the flow rate
- Oil quantity regulation mechanism and oil quantity visualization dome made of polycarbonate (PC)
- Oil refill plug
- Available with low level electrical sensor NO and NC
- Atex certification (II 2GD o II 3GD) on request






| Technical characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Body and connections type | Zinc alloy body, Zinc alloy integrated connections Technopolymer body, metal connections | Aluminium body, integrated aluminium connections | | |
| Protection and bowl type | Technopolymer protection - PA bowl (Size 1 available without protection) | | | Metal bowl with blind metal bowl |
| IN / OUT connections | G1/8” - G1/4” | G1/4” - G3/8” | G3/8” - G1/2”, G3/4” | G1” |
| Assembly configuration | Stand alone Panel mounted with M4 screws | Stand alone Panel mounted with M5 screws | Stand alone Panel mounted with M6 screws | Stand alone Panel mounted with M8 screws |
| Assembly position | Vertical ±5° | | | |
| Bowl capacity (cm³) | 36 | 52 | 62 | 300 |
| Lubrication type | Oil mist | | | |
| Oil level regulation | Manual, complete with visual indicator | | | |
| Max. fittings torque IN / OUT connections | G1/8” metal: 15 G1/4” metal: 20 | G1/4” metal: 20 G3/8” metal: 25 | G3/8” metal: 25 G1/2” metal: 30 G3/4” metal: 35 | G1”metal: 35 |

| Operational characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Maximum working pressure (bar) | 13 | | | |
| Minimum working pressure (bar) | 0,5 | | | |
| Min.operational flow at 6,3 bar (Nl/min) | 10 | 20 | | 100 |
| Indicative oil drop rate (Nl/min) | 1 drop every 300/600 | | | |
| Oil type | FD22 - HG32 | | | |
| Working temperature (°C) | -5 ... +50 | | | |

| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Zinc alloy body version (g) | 258 | / | / | / |
| Technopolymer body version (g) | 108 | / | / | / |
| Aluminium body version (g) | / | 280 | 435 | 1500 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Order codes

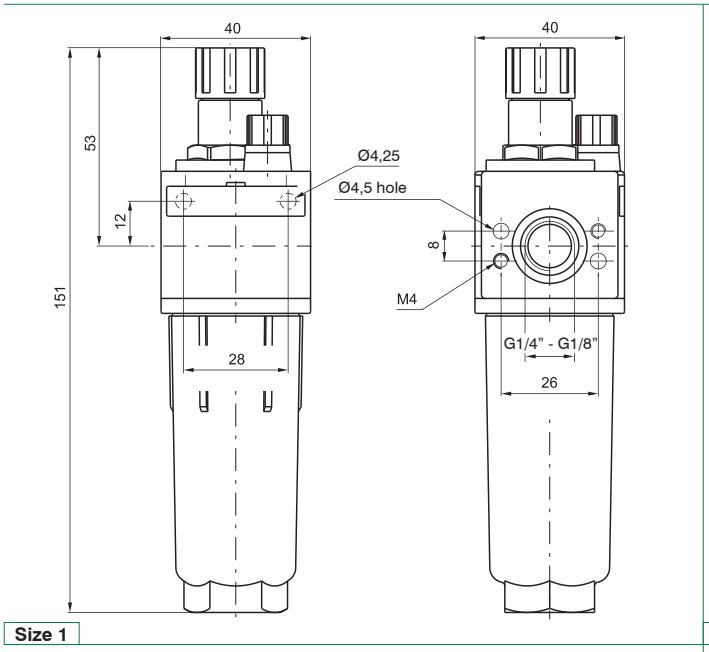
17 | 303A | . | MA

| Size, body and connections | |
|---|---|
| 003A | Zinc alloy body, connections G1/8” (only for size 1) |
| 003B | Zinc alloy body, connections G1/4” (only for size 1) |
| 103A | Technopolymer body, connections G1/8” (only for size 1) |
| 103B | Technopolymer body, connections G1/4” (only for size 1) |
| 203A | Aluminium body, connections G1/4” (only for size 2) |
| 203B | Aluminium body, connections G3/8” (only for size 2) |
| 303A | Aluminium body, connections G3/8” (only for size 3) |
| 303B | Aluminium body, connections G1/2” (only for size 3) |
| 303E | Aluminium body, connections G3/4” (only for size 3) |
| 403B | Aluminium body, connections G1” (only for size 4) |

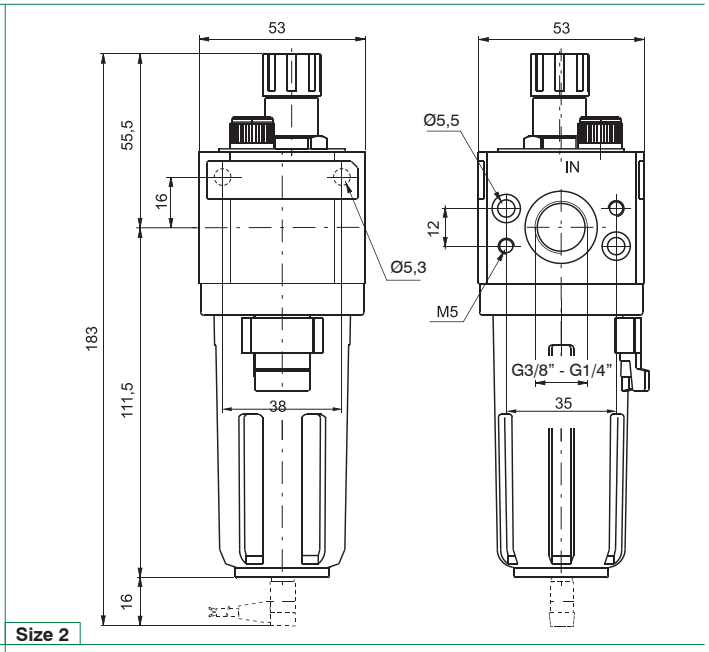
| Type | |
|---|---|
| P | Protected bowl (only for size 1) |
| MA | Electrical minimum level sensor NO (not available for Size 1) |
| MC | Electrical minimum level sensor NC (not available for Size 1) |

**Example: 17303A.MA**
Size 3 Lubricator, Aluminium body, G3/8” connections, normally open low level electrical sensor

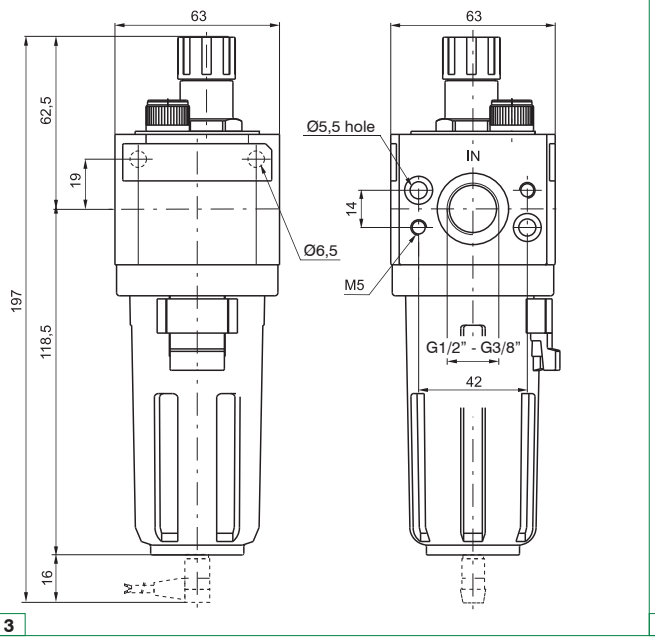
## Dimensions



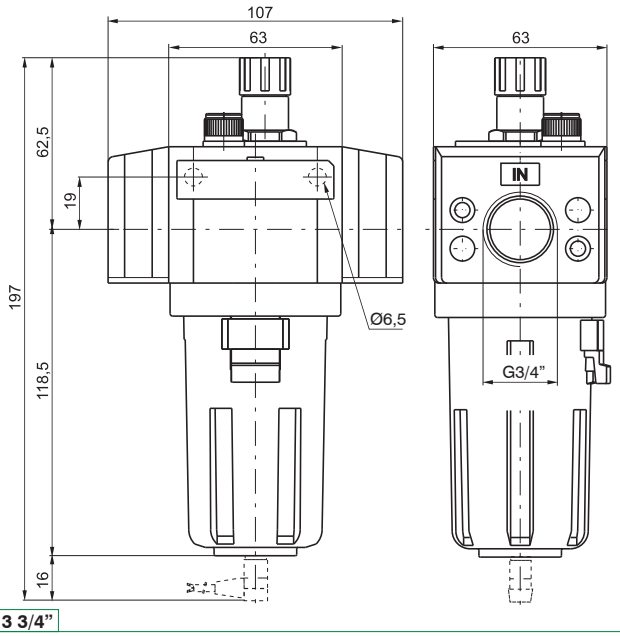

Size 1



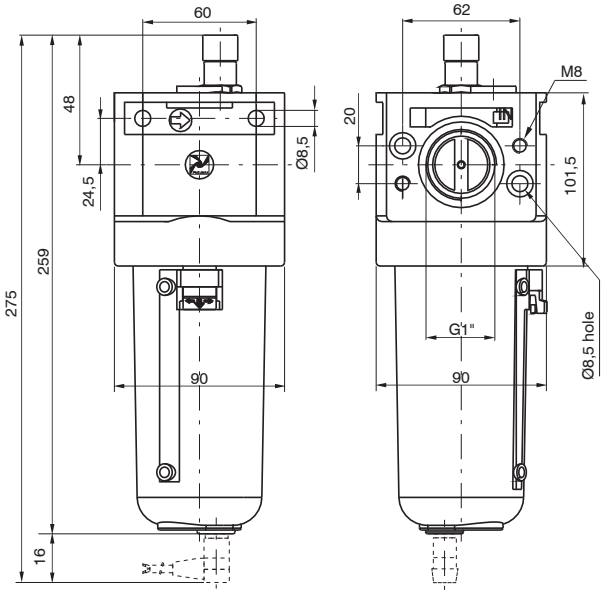

Size 2




Size 3




Size 3 3/4"



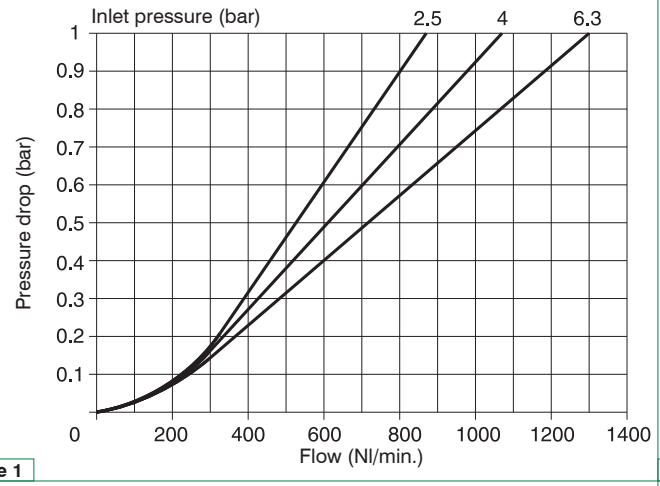

Size 4



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

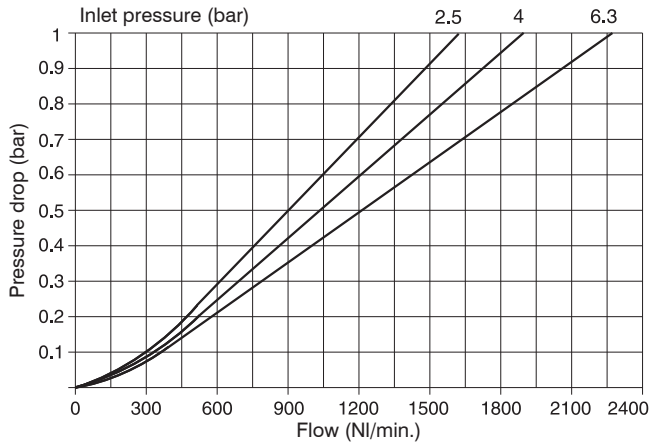
## Characteristic curves

Flow rate curves



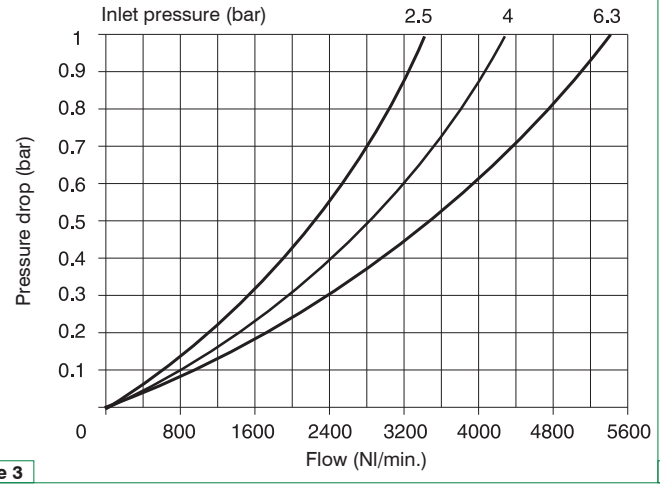

Size 1

Flow rate curves



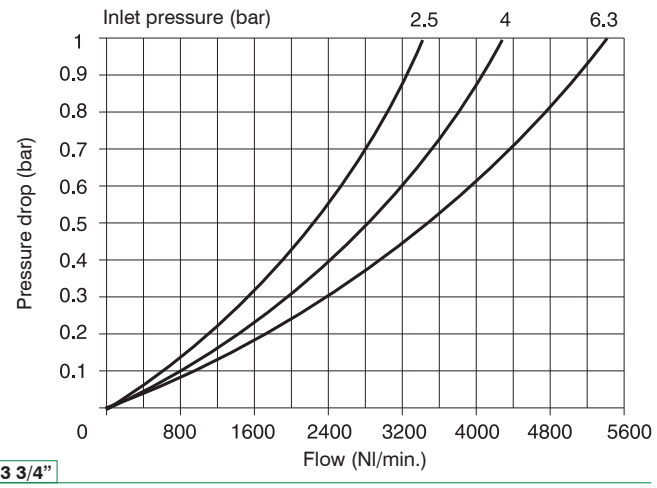

Size 2

Flow rate curves



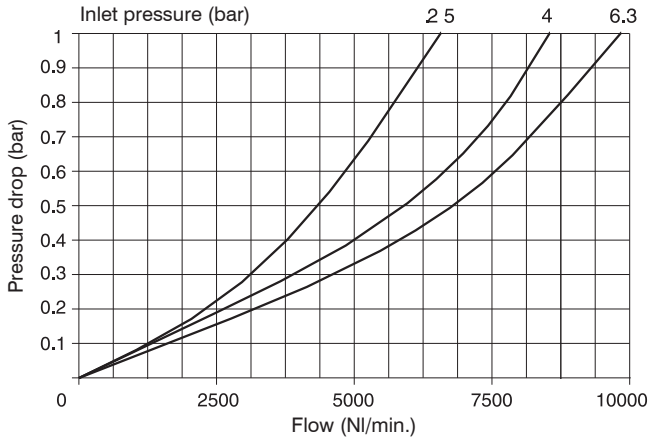

Size 3

Flow rate curves




Size 3 3/4"

Flow rate curves



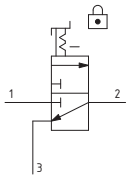

Size 4

2 AIR TREATMENT

## Shut-off valve



- 3/2 N.C. poppet valve for opening and exhausting the circuit
- Allows to pneumatically supply the part of the system downstream of the valve
- Manual adjusting lockable handle (in shut-off position) with a maximum of three pad-locks
- Atex certification (II 2GD o II 3GD) on request






| Technical characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Body and connections type | Zinc alloy body, Zinc alloy integrated connections Technopolymer body, metal connections | Aluminium body, integrated aluminium connections | | |
| Operated type | Manual | | | |
| IN / OUT connections | G1/4” | G3/8” | G1/2” | G1” |
| Discharge connections | G1/8” | G1/4” | G3/8” | G1/4” |
| Assembly configuration | Stand alone Panel mounted with M4 screws | Stand alone Panel mounted with M5 screws | Stand alone Panel mounted with M6 screws | Stand alone Panel mounted with M8 screws |
| Assembly position | Indifferent | | | |
| Max. fittings torque IN / OUT connections | G1/4” metal: 20 | G3/8” metal: 25 | G1/2” metal: 30 | G1”metal: 35 |

| Operational characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Maximum working pressure (bar) | 13 | | | 10 |
| Minimum working pressure (bar) | 0,5 | | | |
| Nominal flow rate at 6 bar with Δp=1 (Nl/min) | 1000 | 2100 | 2500 | 8000 |
| Working temperature (°C) | -5 ... +50 | | | |

| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Zinc alloy body version (g) | 280 | / | / | / |
| Technopolymer body version (g) | 155 | / | / | / |
| Aluminium body version (g) | / | 380 | 550 | 1600 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Order codes

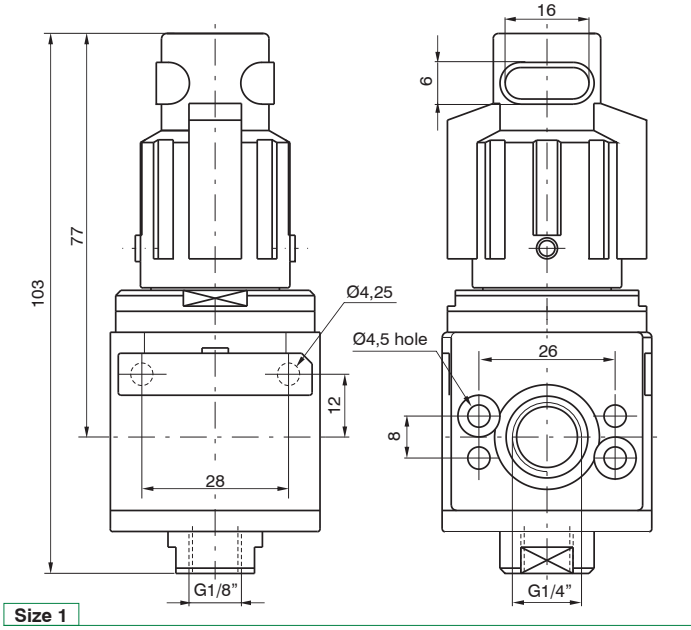
17 | 330 | . | A

| Size, body and connections | |
|---|---|
| 030 | Zinc alloy body, connections G1/4” (only for size 1) |
| 130 | Technopolymer body, connections G1/4” (only for size 1) |
| 230 | Aluminium body, connections G3/8” (only for size 2) |
| 330 | Aluminium body, connections G1/2” (only for size 3) |
| 430 | Aluminium body, connections G1” (only for size 4) |

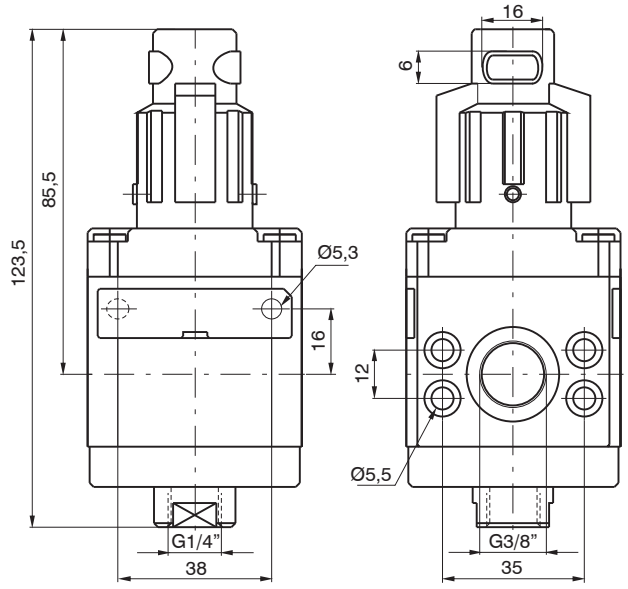
| Type | |
|---|---|
| A | Not lockable handle |
| B | Lockable handle |

**Example: 17330.A**
Shut-off valve Size 3, Aluminium body, G1/2” connections, with not lockable handle

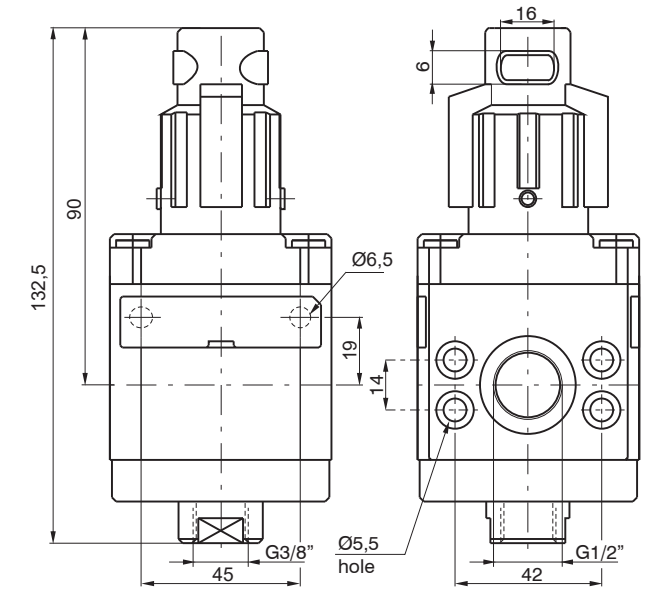
## Dimensions



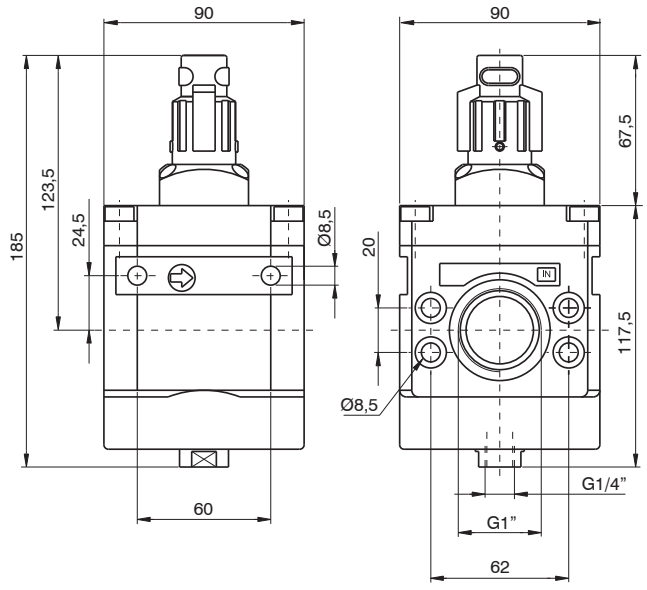

Size 1




Size 2



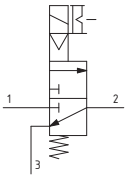

Size 3




Size 4

## Electric shut-off valve






- 3/2 N.C. poppet valve for entering and exhausting the circuit
- It allows to pneumatically supply the part of the system downstream of the valve
- Opening and closing of the valve via solenoid operator
- The supply pressure must be minimum 2 bars or higher
- It is possible to produce the external supplied solenoid version by mounting the 305.10.05 between the valve main body and the solenoid pilot valve.
- The air supply can only be done via port 1
- Ensure that the downstream air consumption will not cause a pressure drop which could result in the pressure falling below the minimum operating values.
- If the pressure inside the valve falls below 2 bars , the valve might shut off.
- Atex certification (II 2GD o II 3GD) on request

| Technical characteristics | | | |
|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 |
| Body and connections type | Zinc alloy body,<br>Zinc alloy integrated connections<br>Technopolymer body,<br>metal connections | Aluminium body,<br>integrated aluminium connections | |
| Operated type | Electric | | |
| IN / OUT connections | G1/4” | G3/8” | G1/2” |
| Discharge connections | G1/8” | G1/4” | G3/8” |
| Assembly configuration | Stand alone<br>Panel mounted with M4 screws | Stand alone<br>Panel mounted with M5 screws | Stand alone<br>Panel mounted with M6 screws |
| Assembly position | Indifferent | | |
| Max. fittings torque<br>IN / OUT connections | G1/4” metal: 20 | G3/8” metal: 25 | G1/2” metal: 30 |

| Operational characteristics | | | |
|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 |
| Maximum<br>working pressure (bar) | 10 | | |
| Minimum<br>working pressure (bar) | 2 | | |
| Nominal flow rate at 6 bar<br>with Δp=1 (Nl/min) | 1000 | 2100 | 3200 |
| Working<br>temperature (°C) | -5 ... +50 | | |

| Weights | | | |
|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 |
| Zinc alloy body version (g) | 345 | / | / |
| Technopolymer body version (g) | 215 | / | / |
| Aluminium body version (g) | / | 440 | 680 |


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## Order codes

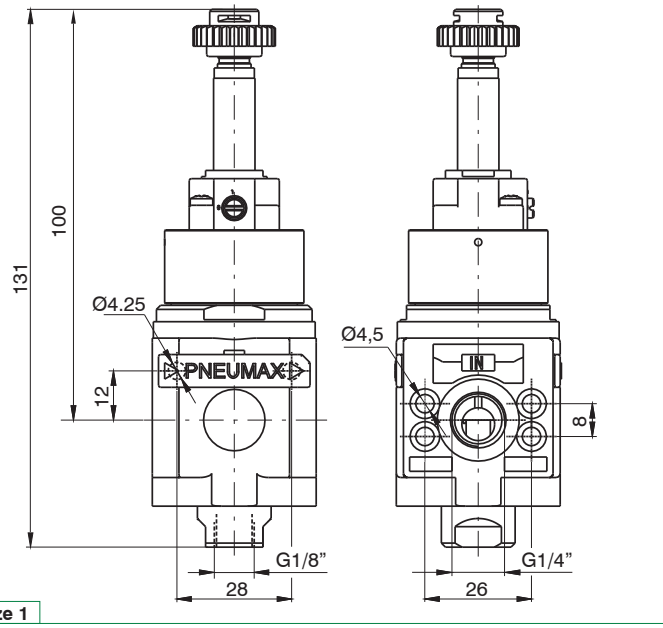
17 | 330 | . | M2

| Size, body and connections | |
|---|---|
| 030 | Zinc alloy body, connections G1/4" (only for size 1) |
| 130 | Technopolymer body, connections G1/4" (only for size 1) |
| 230 | Aluminium body, connections G3/8" (only for size 2) |
| 330 | Aluminium body, connections G1/2" (only for size 3) |

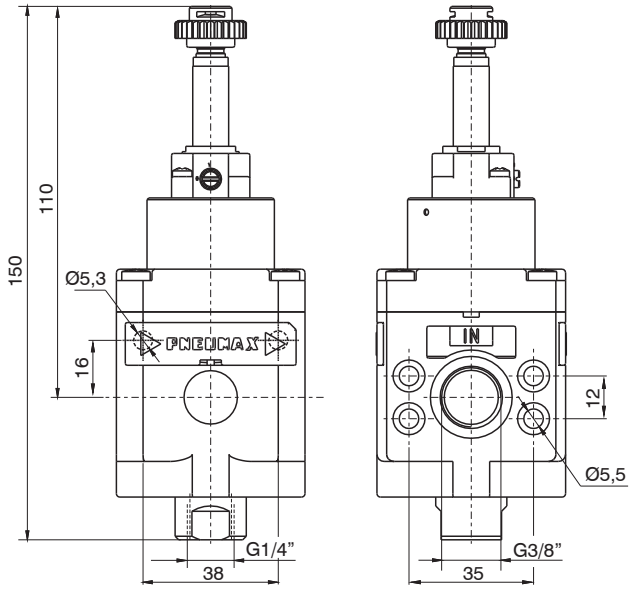
| Type | |
|---|---|
| M2 | Electric with M2 |
| M2/9 | Electric with M2/9 |

**Example: 17330.M2**
Electric shut-off valve Size 3, Aluminium body, G1/2" connections, electric withM2

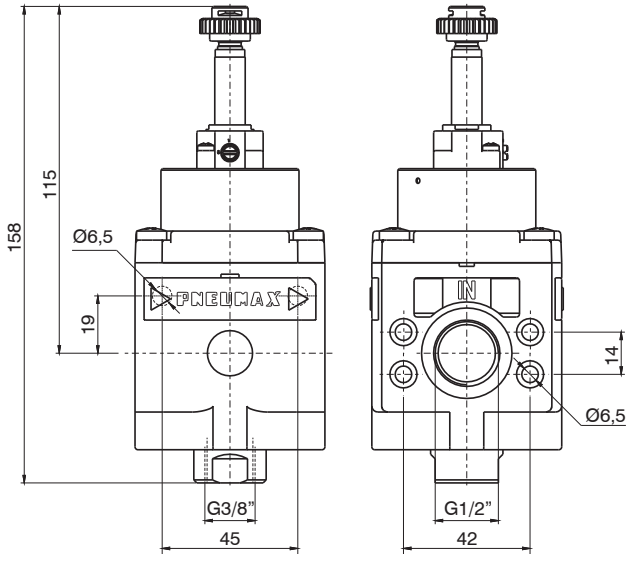
## Dimensions




Size 1




Size 2

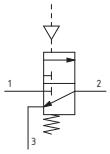



Size 3

## Pneumatic shut-off valve



- 3/2 N.C. poppet valve for entering and exhausting the circuit
- It allows to pneumatically supply the part of the system downstream of the valve
- Opening and closing of the valve via pneumatic operator
- The piloting pressure must be minimum 2 bar or higher
- The air supply can only be done via port 1
- Ensure that the downstream air consumption will not cause a pressure drop which could result in the pressure falling below the minimum operating values
- If the pressure inside the valve falls below 2 bars , the valve might shut off
- Atex certification (II 2GD o II 3GD) on request






| Technical characteristics | | | |
|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 |
| Body and connections type | Zinc alloy body,<br>Zinc alloy integrated connections<br>Technopolymer body,<br>metal connections | Aluminium body,<br>integrated aluminium connections | |
| Operated type | Pneumatic | | |
| IN / OUT connections | G1/4” | G3/8” | G1/2” |
| Discharge connections | G1/8” | G1/4” | G3/8” |
| Pilot connections | G1/8” | | |
| Assembly configuration | Stand alone<br>Panel mounted with M4 screws | Stand alone<br>Panel mounted with M5 screws | Stand alone<br>Panel mounted with M6 screws |
| Assembly position | Indifferent | | |
| Max. fittings torque<br>IN / OUT connections | G1/4” metal: 20 | G3/8” metal: 25 | G1/2” metal: 30 |

| Operational characteristics | | | |
|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 |
| Maximum<br>working pressure (bar) | 13 | | |
| Minimum<br>working pressure (bar) | 2 | | |
| Piloting pressure (bar) | 2 | | |
| Nominal flow rate at 6 bar<br>with Δp=1 (Nl/min) | 1000 | 2100 | 3200 |
| Working<br>temperature (°C) | -5 ... +50 | | |

| Weights | | | |
|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 |
| Zinc alloy body version (g) | 310 | / | / |
| Technopolymer body version (g) | 180 | / | / |
| Aluminium body version (g) | / | 405 | 645 |


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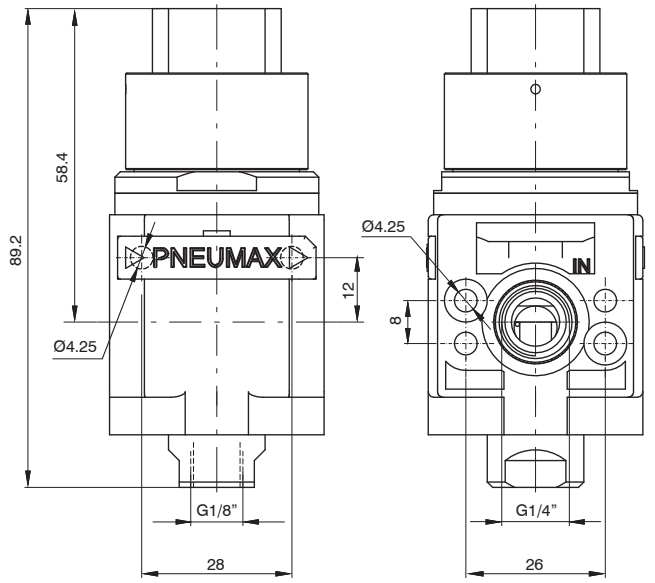
## Order codes

17 **330** . PN

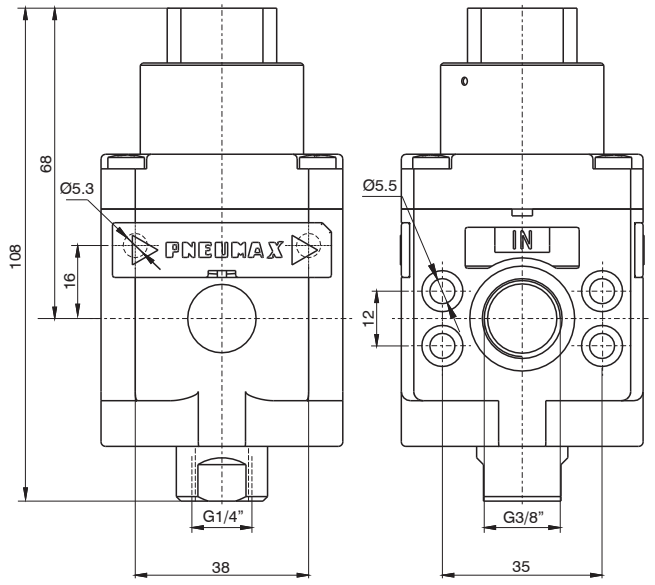
| Size, body and connections | |
|---|---|
| 030 | Zinc alloy body, connections G1/4" (only for size 1) |
| 130 | Technopolymer body, connections G1/4" (only for size 1) |
| 230 | Aluminium body, connections G3/8" (only for size 2) |
| 330 | Aluminium body, connections G1/2" (only for size 3) |

**Example: 17330.PN**
Pneumatic shut-off valve Size 3, Aluminium body, G1/2" connections, with pneumatic pilot

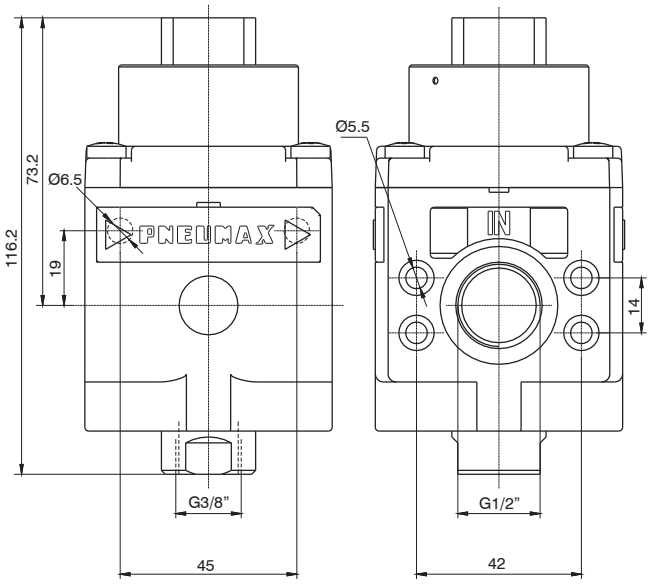
## Dimensions




Size 1




Size 2

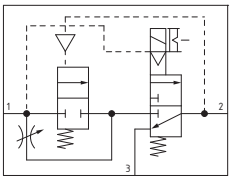


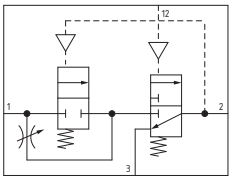

Size 3

## Progressive start-up valve



- 3 way valve with double poppet
- Aluminium body
- Possibility to adjust the down stream circuit filling time by the enclosed adjustable metering screw
- Quick down stream circuit discharge
- Possibility for a pneumatic or electric piloting control
- Atex certification (II 2GD o II 3GD) on request




| Technical characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Body and connections type | Aluminium body, integrated aluminium connections | | | |
| IN / OUT connections | G1/4” | G3/8” | G1/2” | G1” |
| Discharge connections | G1/8” | G1/4” | G3/8” | G3/4” |
| Assembly configuration | Stand alone Panel mounted with M4 screws | Stand alone Panel mounted with M5 screws | Stand alone Panel mounted with M6 screws | Stand alone Panel mounted with M8 screws |
| Assembly position | Indifferent | | | |
| Max. fittings torque IN / OUT connections | G1/4” metal: 20 | G3/8” metal: 25 | G1/2” metal: 30 | G1”metal: 35 |

| Operational characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Maximum working pressure (bar) | 10 | | | |
| Minimum working pressure (bar) | 2,5 | | | |
| Nominal flow rate at 6 bar with Δp=1 (Nl/min) | 1000 | 1700 | 2500 | 8000 |
| Flow with adjustable metering screw fully open (Nl/min) | 150 | 340 | | 3000 |
| Working temperature (°C) | -5 ... +50 | | | |

| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Aluminium body version (g) | 365 | 595 | 1010 | 2300 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Order codes

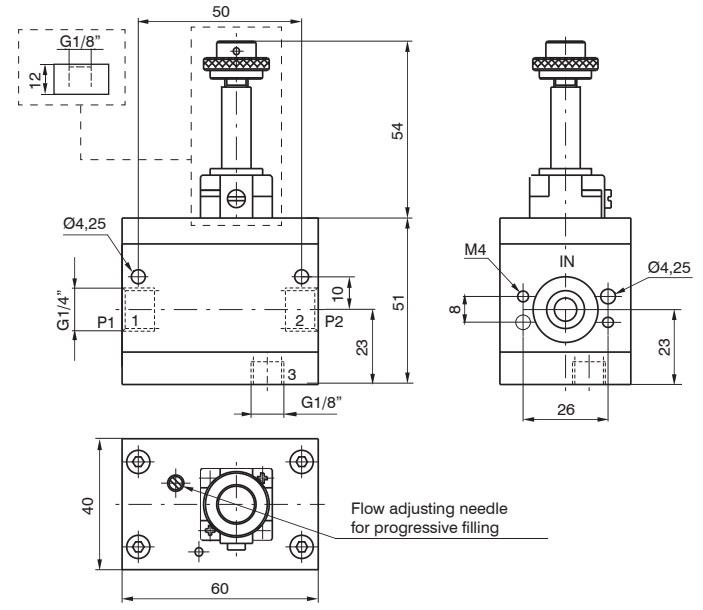
| 17 | 3 | 20 |
|---|---|---|

| Size, body and connections | |
|---|---|
| 1 | Aluminium body, connections G1/4" (only for size 1) |
| 2 | Aluminium body, connections G3/8" (only for size 2) |
| 3 | Aluminium body, connections G1/2" (only for size 3) |
| 4 | Aluminium body, connections G1" (only for size 4) |

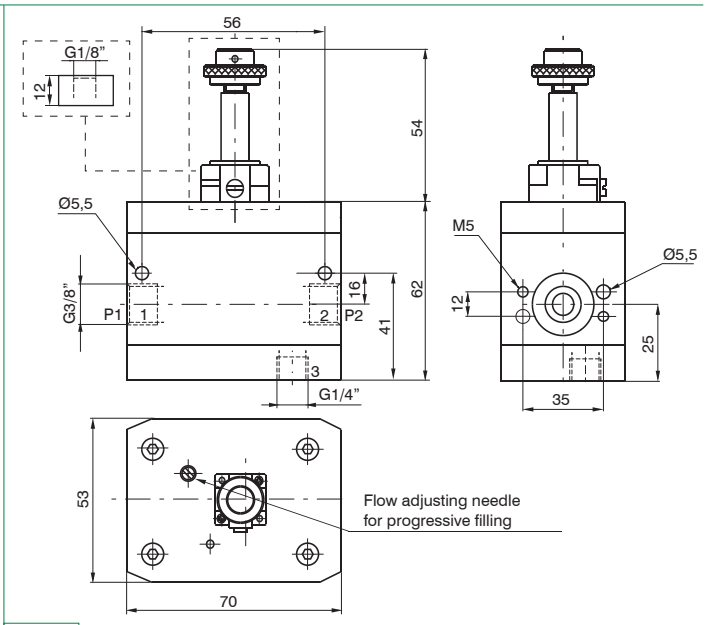
| Type | |
|---|---|
| 10.M2 | Electric control complete wih M2 mechanic |
| 20 | Pneumatic pilot |

**Example: 17320**
Progressive start-up valve Size 3, Aluminium body, G1/2" connections, with pneumatic pilot

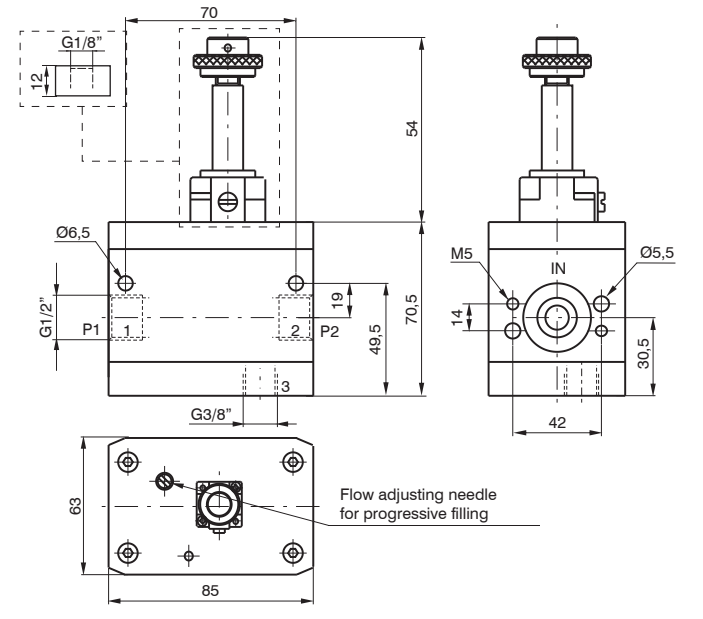
## Dimensions



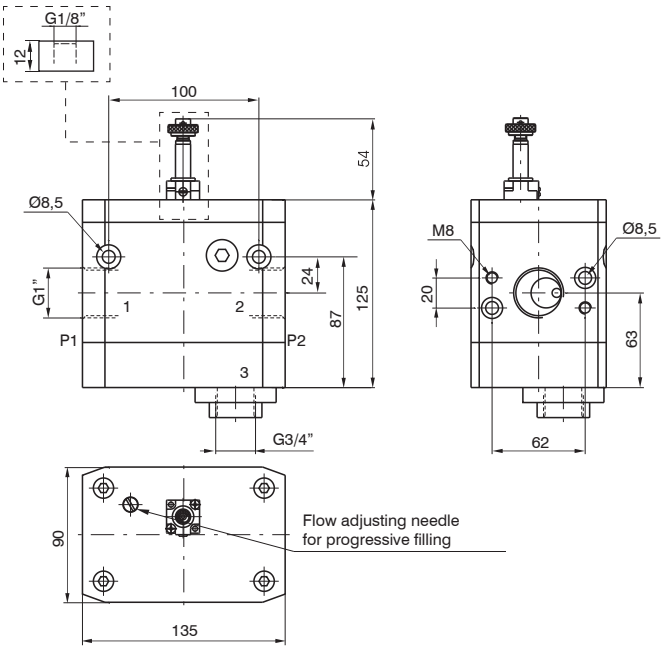

**Size 1**




**Size 2**




**Size 3**

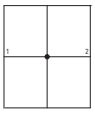



**Size 4**

## Air Intake



- Pneumatic by-pass
- Available with 2 threaded connections





| Technical characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Body and connections type | Aluminium body, integrated aluminium connections | | | |
| IN / OUT Connections | G1/4” | G3/8” | G1/2” | G1” |
| INTAKE connections | G1/8” | G1/4” | G3/8” | G3/4” |
| Assembly configuration | Stand alone | Stand alone | Stand alone | Stand alone |
| Assembly position | Indifferent | | | |
| Max. fittings torque IN / OUT connections | G1/4” metal: 20 | G3/8” metal: 25 | G1/2” metal: 30 | G1”metal: 35 |

| Operational characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Maximum working pressure (bar) | 13 | | | |
| Working temperature (°C) | -5 ... +50 | | | |

| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Aluminium body version (g) | 78 | 159 | 271 | 761 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

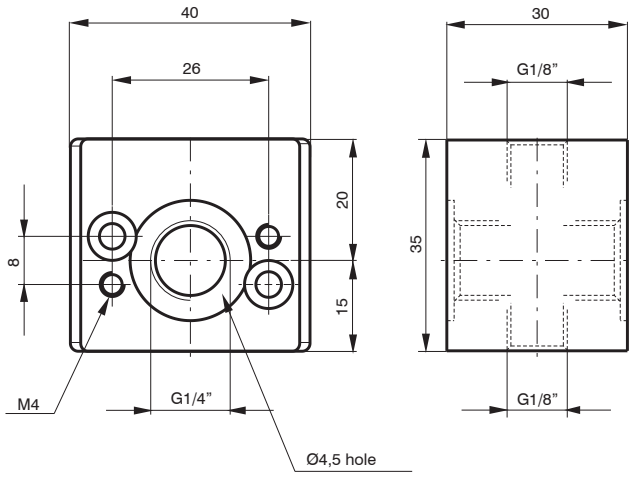
## Order codes

17 | 3 | 40

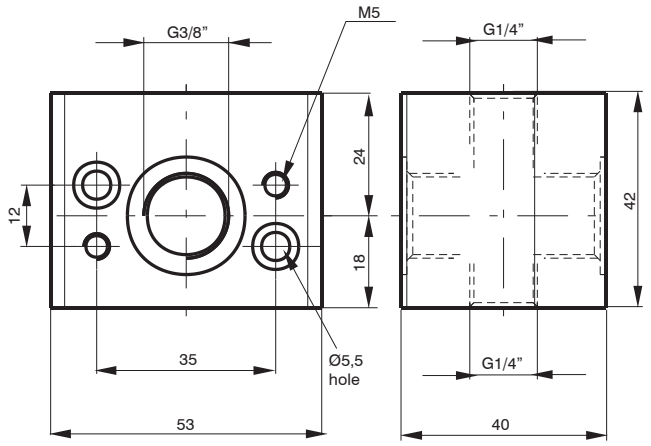
| Size, body and connections | |
|---|---|
| 1 | Aluminium body, connections G1/4" (only for size 1) |
| 2 | Aluminium body, connections G3/8" (only for size 2) |
| 3 | Aluminium body, connections G1/2" (only for size 3) |
| 4 | Aluminium body, connections G1" (only for size 4) |

**Example: 17340**
Air Intake Size 3, Aluminium body, G1/2" connections

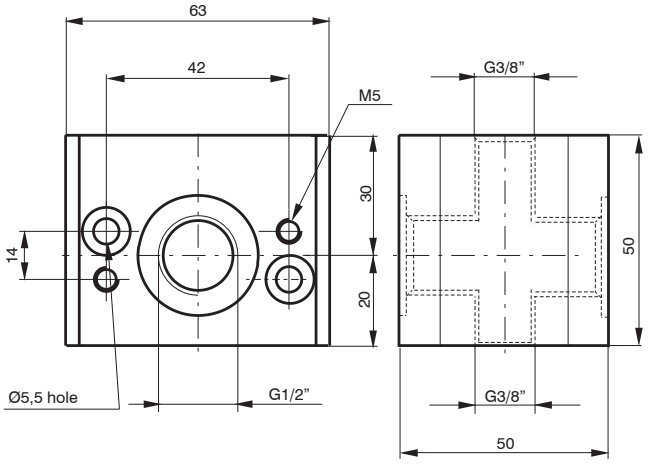
## Dimensions



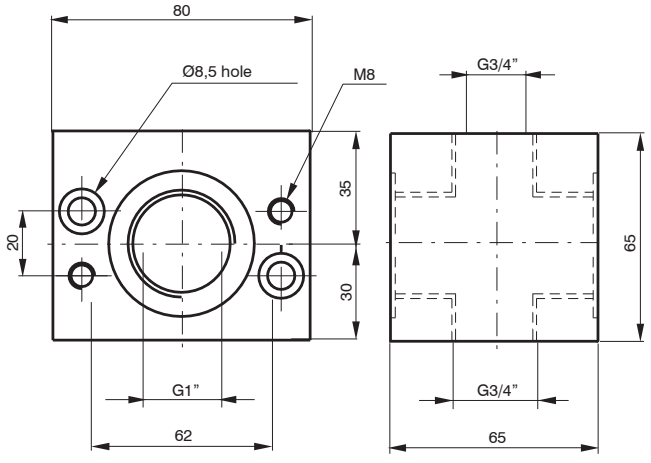

Size 1




Size 2




Size 3

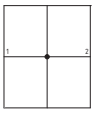



Size 4

## Air Intake -“H” profile



- Pneumatic by-pass
- Available with 2 threaded connections





| Technical characteristics | | | |
|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 |
| Body and connections type | Aluminium body | | |
| IN / OUT Connections | G1/4” | G3/8” | G1/2” |
| INTAKE connections | G1/8” | G1/4” | G3/8” |
| Assembly configuration | Stand alone | Stand alone | Stand alone |
| Assembly position | Indifferent | | |
| Max. fittings torque IN / OUT connections | G1/4” metal: 20 | G3/8” metal: 25 | G1/2” metal: 30 |

| Operational characteristics | | | |
|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 |
| Maximum working pressure (bar) | 13 | | |
| Working temperature (°C) | -5 ... +50 | | |

| Weights | | | |
|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 |
| Aluminium body version (g) | 50 | 116 | 192 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

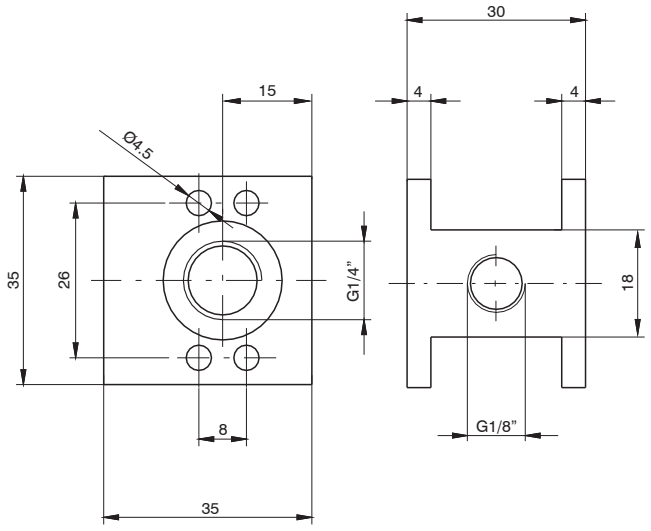
## Order codes

17 | 3 | 40H

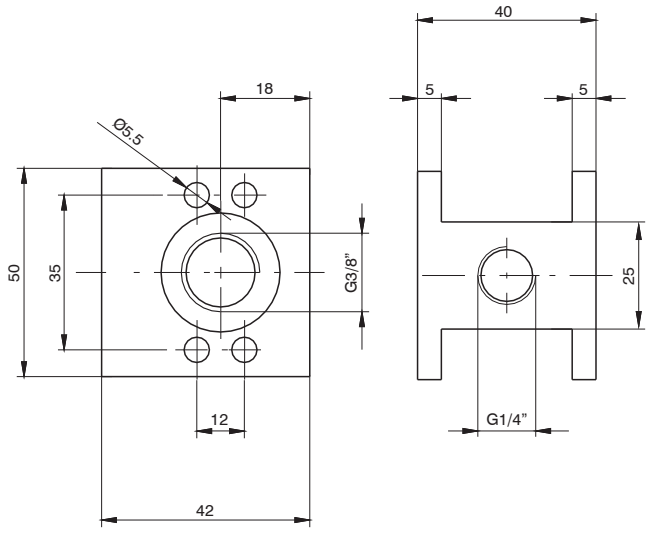
| Size, body and connections | |
|---|---|
| 1 | Aluminium body, connections G1/4” (only for size 1) |
| 2 | Aluminium body, connections G3/8” (only for size 2) |
| 3 | Aluminium body, connections G1/2” (only for size 3) |

**Example: 17340H**
Air Intake -“H” profile Size 3, Aluminium body, G1/2” connections

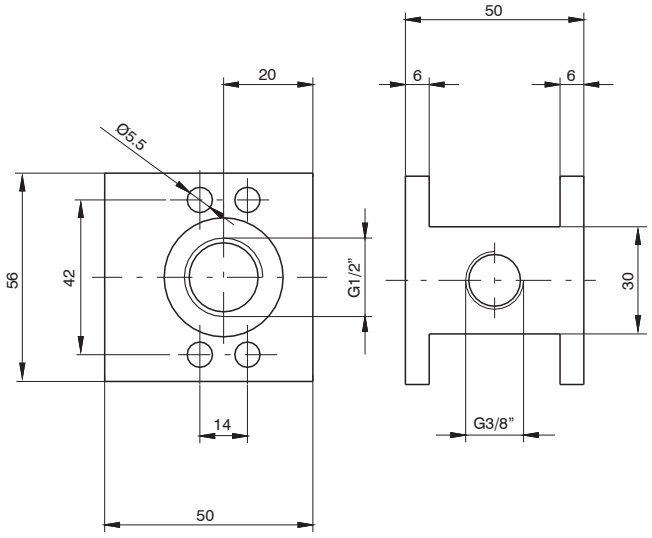
## Dimensions




Size 1




Size 2

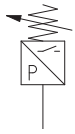



Size 3

## Pressure Switch complete with adapter



- The pressure switch can be set at desired pressure from 2 to 10 bar with electrical connection applied
- The electrical connection is made by mean of a 15 mm connector DIN 43650 type C
- The microswitch contact could be Normally Closed or open (change over switch)






| Technical characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Body and connections type | Aluminium body | | | |
| IN / OUT Connections | G1/8" | G3/8" | G1/2" | Ø36 |
| Assembly configuration | Stand alone | Stand alone | Stand alone | Stand alone |
| Assembly position | Indifferent | | | |
| Microswitch capacity (A) | 1 | | | |
| Microswitch Maximum voltage (VAC) | 250 | | | |
| Grade of protection | IP65 (with connector assembled) | | | |

| Operational characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Maximum working pressure (bar) | 13 | | | |
| Working temperature (°C) | -5 ... +50 | | | |
| Pressure range (bar) | 2 ... 10 | | | |

| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Aluminium body version (g) | 160 | 200 | 220 | 450 |

### Order codes

17 **34C**

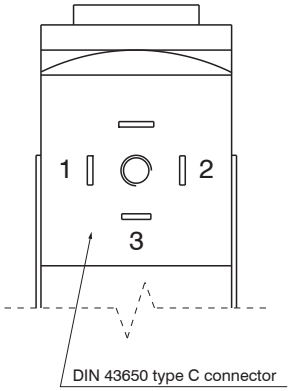
| Type | |
|---|---|
| 14A | Pressure switch adapter (only for size 1) |
| 14B | Pressure switch (for all sizes) |
| 14C | Pressure switch complete with adapter (only for size 1) |
| 24A | Pressure switch adapter (only for size 2) |
| 24C | Pressure switch complete with adapter (only for size 2) |
| 34A | Pressure switch adapter (only for size 3) |
| 34C | Pressure switch complete with adapter (only for size 3) |
| 44A | Pressure switch adapter (only for size 4) |
| 44C | Pressure switch complete with adapter (only for size 4) |

**Example: 1734C**
Pressure switch adapter size 3

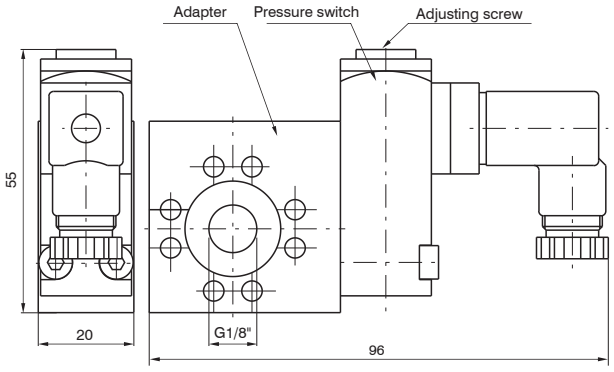

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Electrical connection

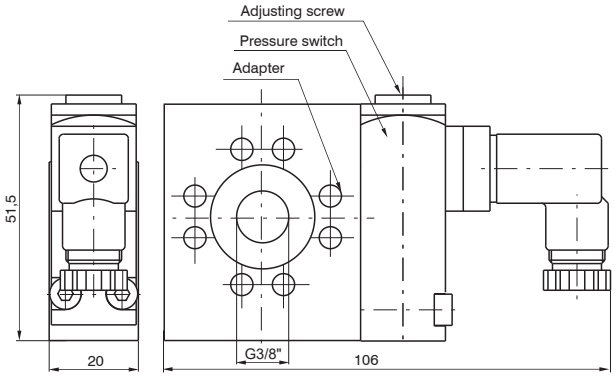
1 = neutral
2 = N.C. contact
3 = N.O. contact



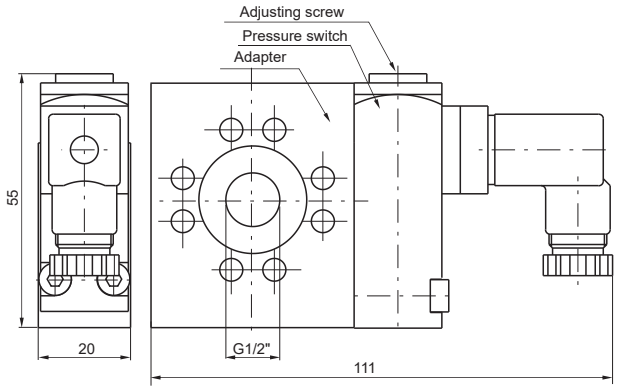

## Dimensions



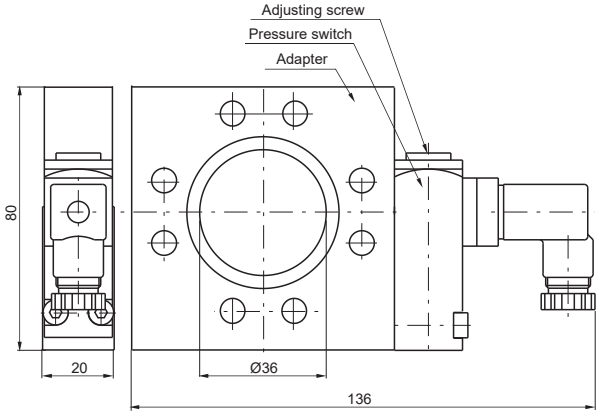

**Size 1**




**Size 2**




**Size 3**




**Size 4**

## Filter pressure regulator + Lubricator



- Filter - diaphragm pressure regulator with relieving
- Low histeresis rolling diaphragm and balanced spool
- Filtering element made of HDPE available in 3 different filtration grades (5$\mu$m, 20$\mu$m, 50$\mu$m)
- Semi-automatic or automatic drain
- Available in four pressure ranges up to 12 bar
- Oil mist lubricator
- Variable orifice size in function of the flow rate
- Oil quantity regulation mechanism and oil quantity visualization dome made of polycarbonate (PC)
- Oil refill plug
- Available with low level electrical sensor NO and NC
- Bowls screwed to the body (Size 1)
- Bowl assembly via bayonet type quick coupling mechanism with safety button (Size 2 - Size 3)
- Atex certification (II 2GD o II 3GD) on request



| Technical characteristics | | | |
|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 |
| Body and connections type | Zinc alloy body,<br>Zinc alloy integrated connections<br>Technopolymer body,<br>metal connections | Aluminium body,<br>integrated aluminium connections | |
| Protection and bowl type | Technopolymer protection - PA bowl<br>(Size 1 available without protection) | | |
| IN / OUT connections | G1/8" - G1/4" | G1/4" - G3/8" | G3/8" - G1/2", G3/4" |
| Assembly configuration | Stand alone<br>Panel mounted with M4 screws | Stand alone<br>Panel mounted with M5 screws | Stand alone<br>Panel mounted with M6 screws |
| Assembly position | Vertical ±5° | | |
| Filter pore size ($\mu$m) | 5 / 20 / 50 | | |
| Pressure range (bar) | 0 - 2 / 0 - 4 / 0 - 8 / 0 - 12 | | |
| Bowl capacity (cm$^3$) | 20 | 30 | 48 |
| Condensation drain | Semi-automatic<br>Automatic | | |
| Regulation | Manual push and lock with pressure<br>Manual lockable with accessories | | |
| Pressure measurement | G1/8" Pressure gauge connection port | | |
| Bowl capacity (cm$^3$) | 36 | 52 | 62 |
| Lubrication type | Oil mist | | |
| Min.operational flow<br>at 6,3 bar (Nl/min) | 10 | 20 | |
| Oil level regulation | Manual, complete with visual indicator | | |
| Max. fittings torque<br>IN / OUT connections | G1/8" metal: 15<br>G1/4" metal: 20 | G1/4" metal: 20<br>G3/8" metal: 25 | G3/8" metal: 25<br>G1/2" metal: 30<br>G3/4" metal: 35 |

| Operational characteristics | | | | | | |
|---|---|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 1 | Size 2 | Size 3 |
| Condensation drain | Semi-automatic condensation drain | | | Automatic condensation drain | | |
| Maximum<br>working pressure (bar) | 13 | | | 10 | | |
| Minimum<br>working pressure (bar) | 0,5 | | | | | |
| Indicative oil drop rate (Nl/min) | 1 drop every 300/600 | | | | | |
| Oil type | FD22 - HG32 | | | | | |
| Working<br>temperature (°C) | -5 ... +50 | | | | | |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

| Weights | | | |
|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 |
| Zinc alloy body version (g) | 560 | / | / |
| Technopolymer body version (g) | 295 | / | / |
| Aluminium body version (g) | / | 750 | 1100 |

**Order codes**

17 **306A** . **B** . **D** . **S** . **K**

| Size, body and connections | |
|---|---|
| 006A | Zinc alloy body, connections G1/8" (only for size 1) |
| 006B | Zinc alloy body, connections G1/4" (only for size 1) |
| 106A | Technopolymer body, connections G1/8" (only for size 1) |
| 106B | Technopolymer body, connections G1/4" (only for size 1) |
| 206A | Aluminium body, connections G1/4" (only for size 2) |
| 206B | Aluminium body, connections G3/8" (only for size 2) |
| 306A | Aluminium body, connections G3/8" (only for size 3) |
| 306B | Aluminium body, connections G1/2" (only for size 3) |
| 306E | Aluminium body, connections G3/4" (only for size 3) |

| Filter pore size | |
|---|---|
| A | 5 $\mu$m |
| B | 20 $\mu$m |
| C | 50 $\mu$m |

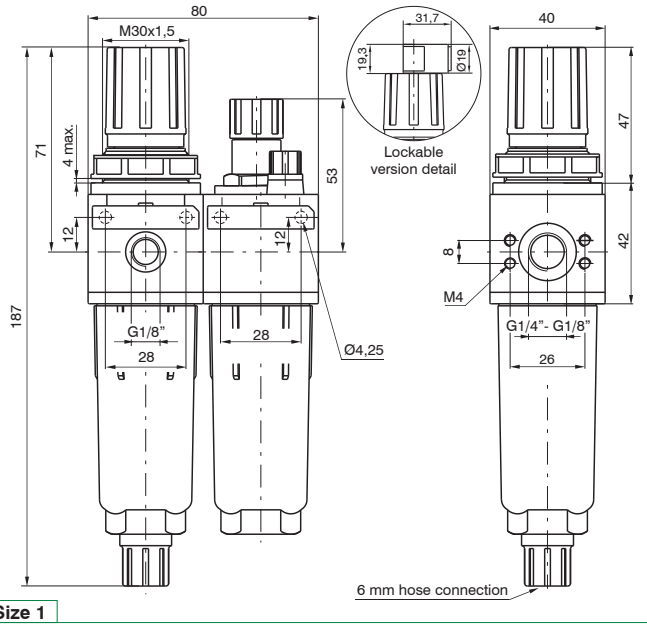
| Pressure range | |
|---|---|
| A | 0 - 2 bar |
| B | 0 - 4 bar |
| C | 0 - 8 bar |
| D | 0 - 12 bar |

| Type | |
|---|---|
| P | Bowl protection (only for size 1) |
| S | Automatic drain (for all sizes) |
| PS | Bowl protection and automatic drain (only for size 1) |

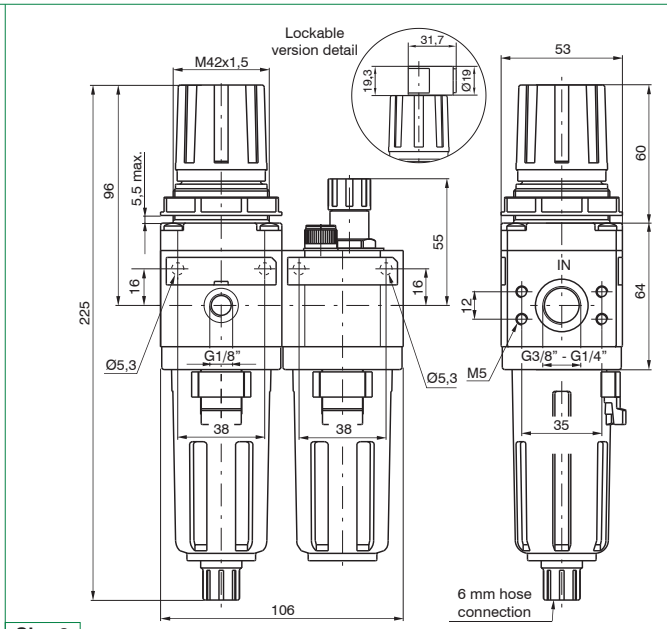
| Options | |
|---|---|
| | Standard |
| K | Lockable version |
| KF | Lockable version with universal key |

**Example: 17306A.B.D.S.K**
Size 3 Filter pressure regulator + Lubricator, aluminium body, G3/8" connections, filter pore size 20 $\mu$m 0 - 12 bar, automatic drain lockable version

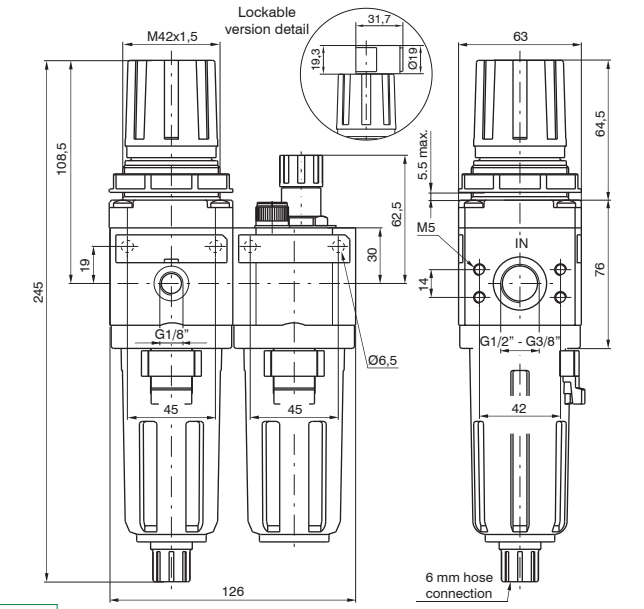
## Dimensions



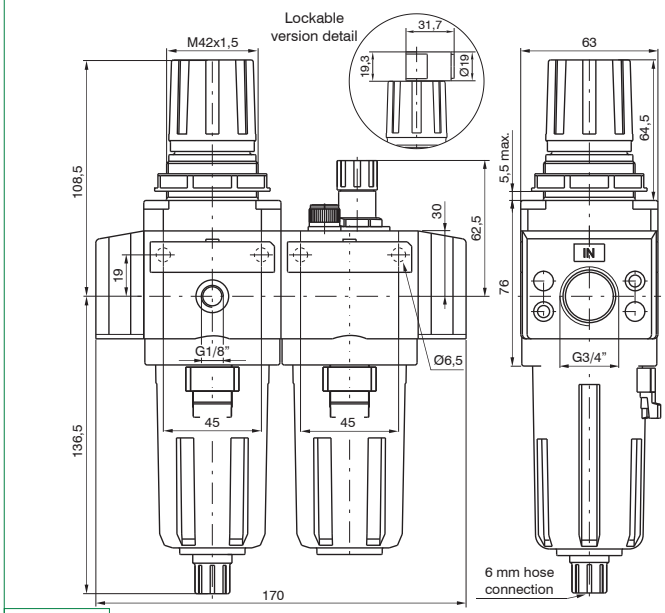

Size 1




Size 2




Size 3



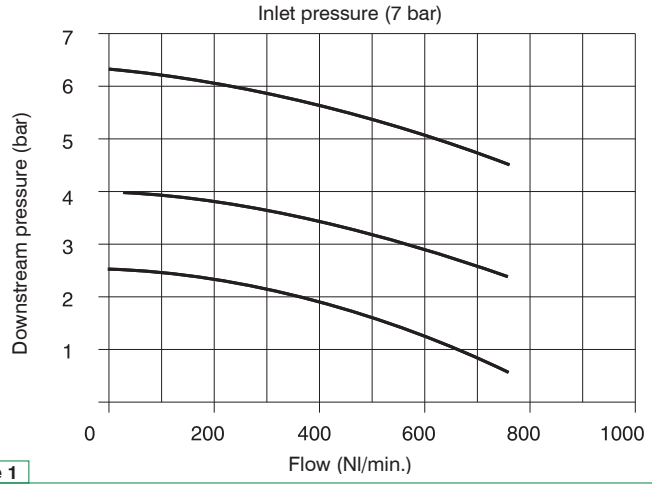

Size 3 3/4"



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

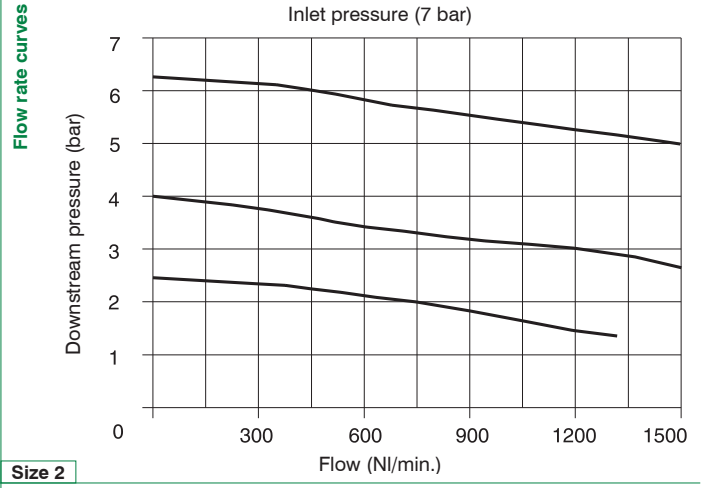
## Characteristic curves

Flow rate curves



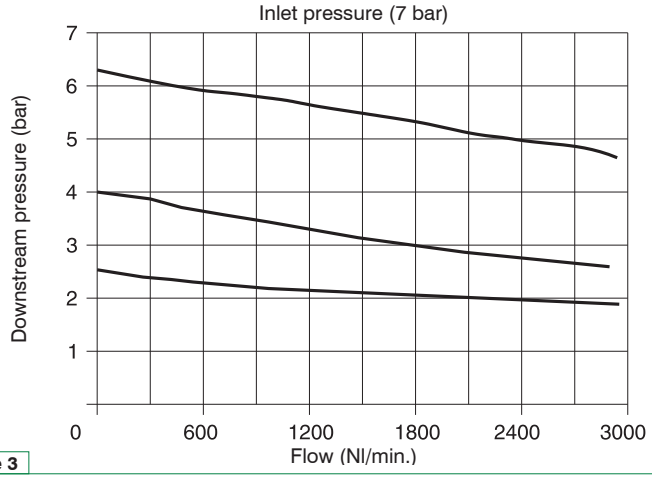

Size 1

Flow rate curves



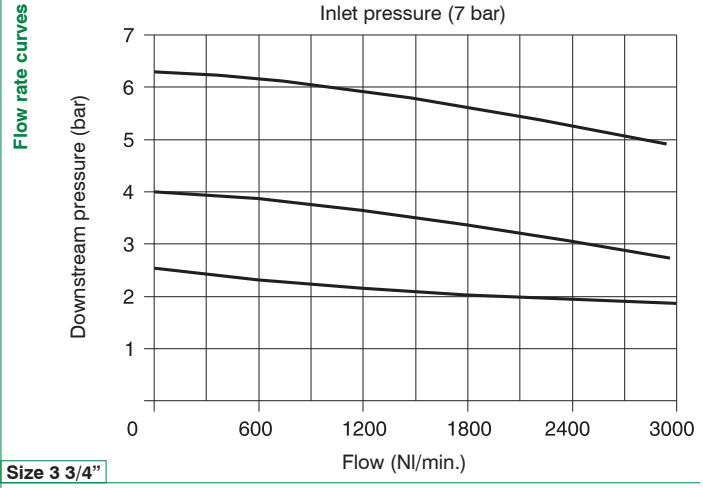

Size 2

Flow rate curves



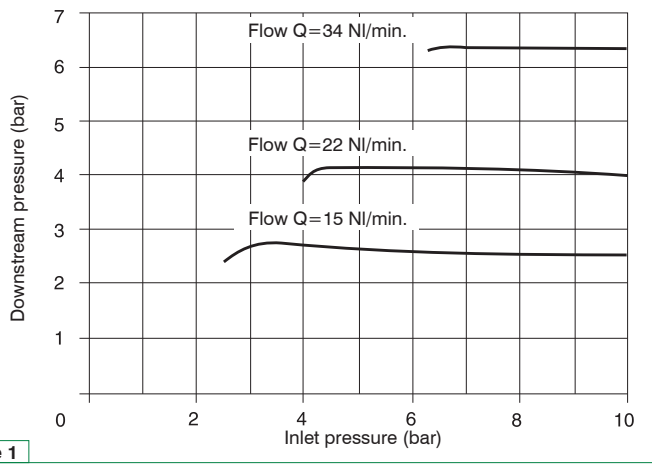

Size 3

Flow rate curves



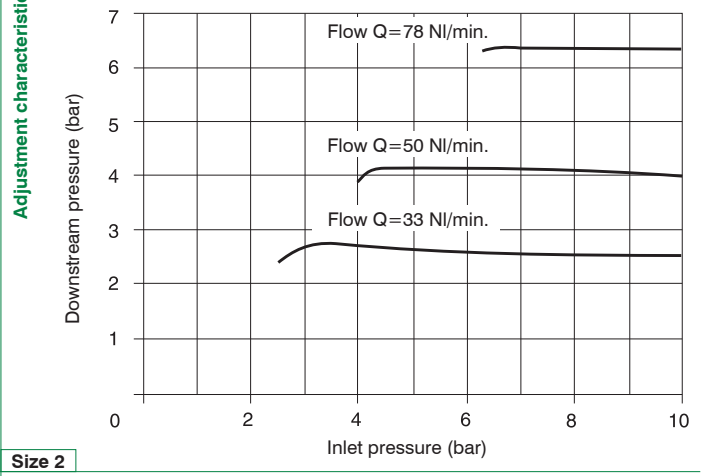

Size 3 3/4"

Adjustment characteristic



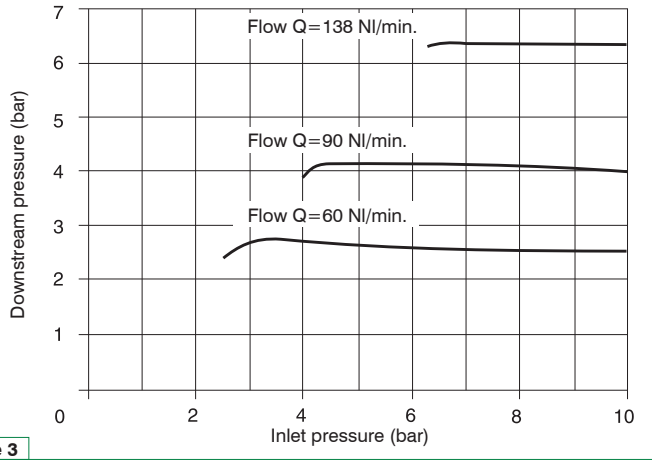

Size 1

Adjustment characteristic



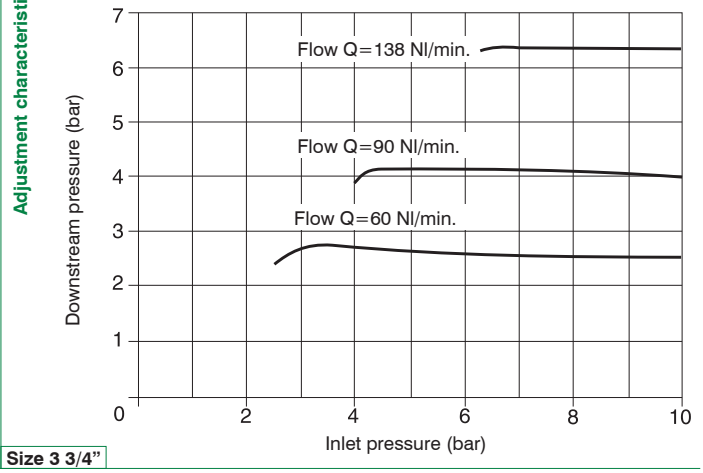

Size 2

Adjustment characteristic




Size 3

Adjustment characteristic




Size 3 3/4"



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Filter + Pressure regulator + Lubricator



- Double filter action: air flow centrifugation and filter element
- Filtering cartridge made of HDPE available in three different filtration grades (5µm, 20µm, 50µm)
- Filter cartridge can be regenerated by washing / blowing it or replaced
- Semi-automatic or automatic drain
- Diaphragm pressure regulator with relieving
- Low histeresis rolling diaphragm and balanced spool
- Available in four pressure ranges up to 12 bar
- Oil mist lubricator
- Variable orifice size in function of the flow rate
- Oil quantity regulation mechanism and oil quantity visualization dome made of polycarbonate (PC)
- Oil refill plug
- Available with low level electrical sensor NO and NC
- Bowls screwed to the body (Size 1)
- Bowl assembly via bayonet type quick coupling mechanism with safety button (Size 2 - Size 3 - Size 4)
- Atex certification (II 2GD o II 3GD) on request



| Technical characteristics | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Body and connections type | Zinc alloy body, Zinc alloy integrated connections Technopolymer body, metal connections | Aluminium body, integrated aluminium connections | | |
| Protection and bowl type | Technopolymer protection - PA bowl (Size 1 available without protection) | | | Metal bowl with blind metal bowl |
| IN / OUT connections | G1/8" - G1/4" | G1/4" - G3/8" | G3/8" - G1/2", G3/4" | G1" |
| Assembly configuration | Stand alone Panel mounted with M4 screws | Stand alone Panel mounted with M5 screws | Stand alone Panel mounted with M6 screws | Stand alone Panel mounted with M6 screws |
| Assembly position | Vertical ±5° | | | |
| Filter pore size (µm) | 5 / 20 / 50 | | | |
| Pressure range (bar) | 0 - 2 / 0 - 4 / 0 - 8 / 0 - 12 | | | |
| Bowl capacity (cm³) | 20 | 30 | 48 | 178 |
| Condensation drain | Semi-automatic Automatic | | | |
| Regulation | Manual push and lock with pressure Manual lockable with accessories | | | |
| Pressure measurement | G1/8" Pressure gauge connection port | | | |
| Bowl capacity (cm³) | 36 | 52 | 62 | 300 |
| Lubrication type | Oil mist | | | |
| Min.operational flow at 6,3 bar (Nl/min) | 10 | 20 | | 100 |
| Oil level regulation | Manual, complete with visual indicator | | | |
| Max. fittings torque IN / OUT connections | G1/8" metal: 15 G1/4" metal: 20 | G1/4" metal: 20 G3/8" metal: 25 | G3/8" metal: 25 G1/2" metal: 30 G3/4" metal: 35 | G1"metal: 35 |

| Operational characteristics | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 | Size 1 | Size 2 | Size 3 | Size 4 |
| Condensation drain | Semi-automatic condensation drain | | | | Automatic condensation drain | | | |
| Maximum working pressure (bar) | 13 | | | | 10 | | | |
| Minimum working pressure (bar) | 0,5 | | | | | | | |
| Indicative oil drop rate (Nl/min) | 1 drop every 300/600 | | | | | | | |
| Oil type | FD22 - HG32 | | | | | | | |
| Working temperature (°C) | -5 ... +50 | | | | | | | |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

| Weights | | | | |
|---|---|---|---|---|
| **Size** | Size 1 | Size 2 | Size 3 | Size 4 |
| Zinc alloy body version (g) | 755 | / | / | / |
| Technopolymer body version (g) | 375 | / | / | / |
| Aluminium body version (g) | / | 960 | 1430 | 5300 |

## Order codes

17 | 307A | . | B | . | D | . | S | . | K

| Size, body and connections | |
|---|---|
| 007A | Zinc alloy body, connections G1/8" (only for size 1) |
| 007B | Zinc alloy body, connections G1/4" (only for size 1) |
| 107A | Technopolymer body, connections G1/8" (only for size 1) |
| 107B | Technopolymer body, connections G1/4" (only for size 1) |
| 207A | Aluminium body, connections G1/4" (only for size 2) |
| 207B | Aluminium body, connections G3/8" (only for size 2) |
| 307A | Aluminium body, connections G3/8" (only for size 3) |
| 307B | Aluminium body, connections G1/2" (only for size 3) |
| 307E | Aluminium body, connections G3/4" (only for size 3) |
| 407NB | Aluminium body, connections G1" (only for size 4) |

| Filter pore size | |
|---|---|
| A | 5 $\mu$m |
| B | 20 $\mu$m |
| C | 50 $\mu$m |

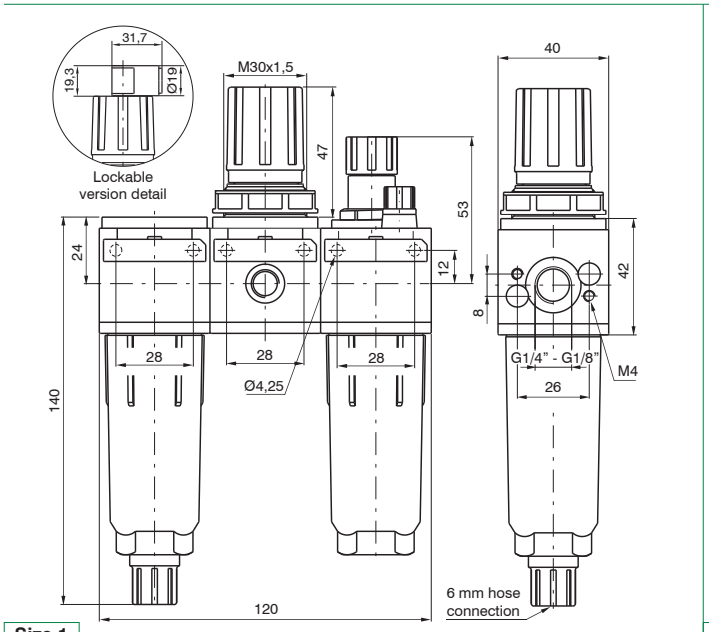
| Pressure range | |
|---|---|
| A | 0 - 2 bar |
| B | 0 - 4 bar |
| C | 0 - 8 bar |
| D | 0 - 12 bar |

| Type | |
|---|---|
| P | Bowl protection (only for size 1) |
| S | Automatic drain (for all sizes) |
| PS | Bowl protection and automatic drain (only for size 1) |

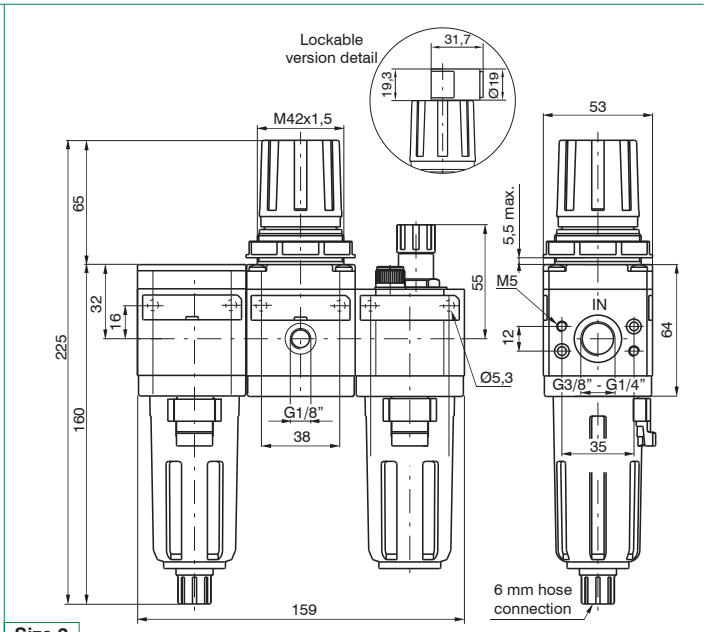
| Options | |
|---|---|
| | Standard |
| K | Lockable version |
| KF | Lockable version with universal key |

**Example: 17307A.B.D.S.K**
Size 3 Filter + Pressure regulator + Lubricator, aluminium body, G3/8" connections, filter pore size 20 $\mu$m 0 - 12 bar, automatic drain lockable version

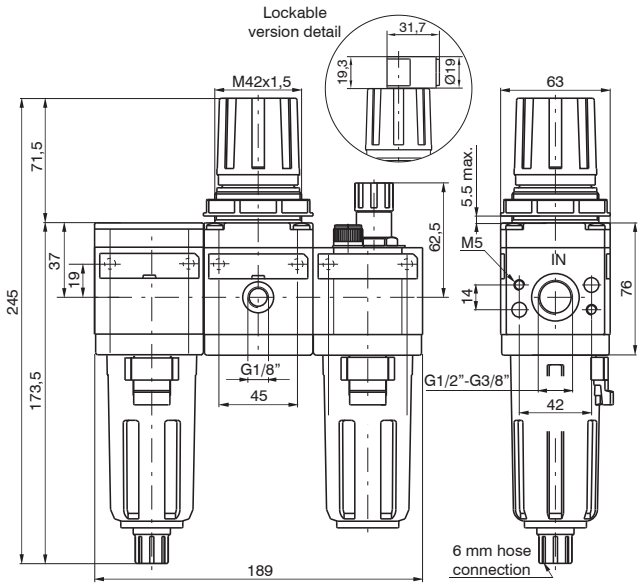
## Dimensions



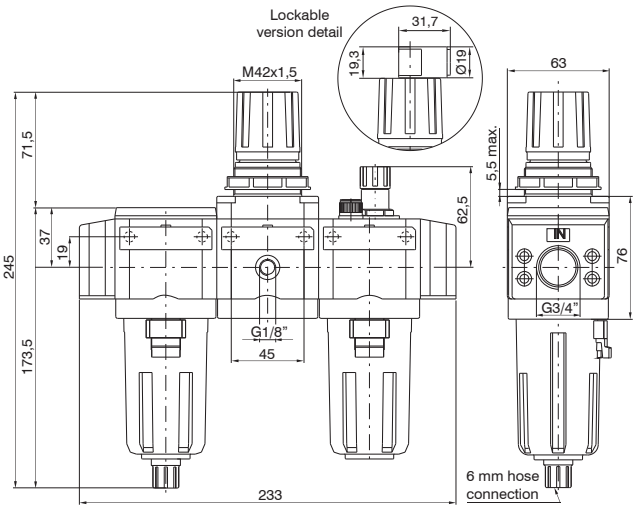

Size 1



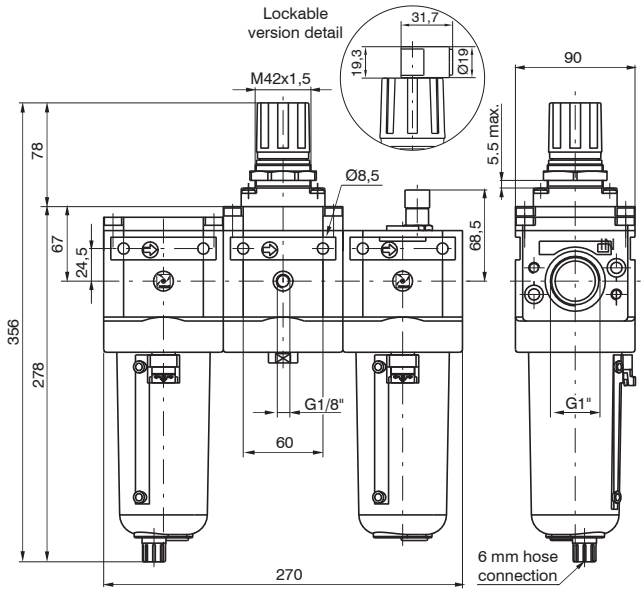

Size 2




Size 3




Size 3 3/4"



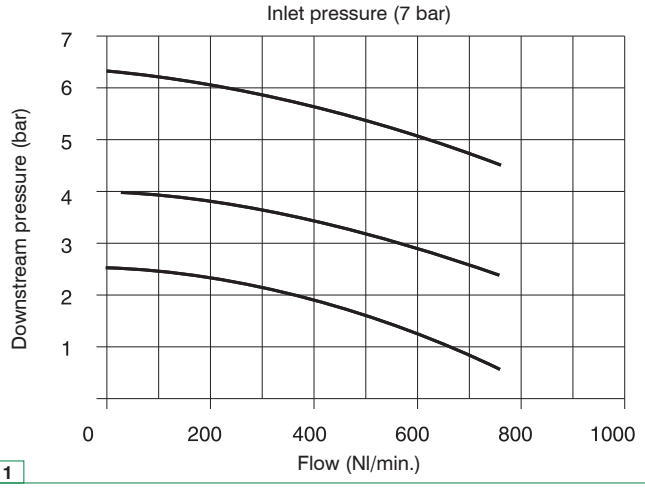

Size 4



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

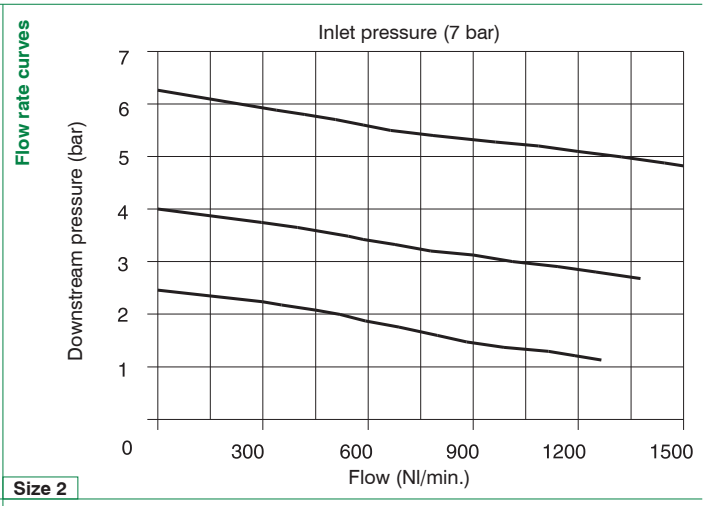
## Characteristic curves

Flow rate curves



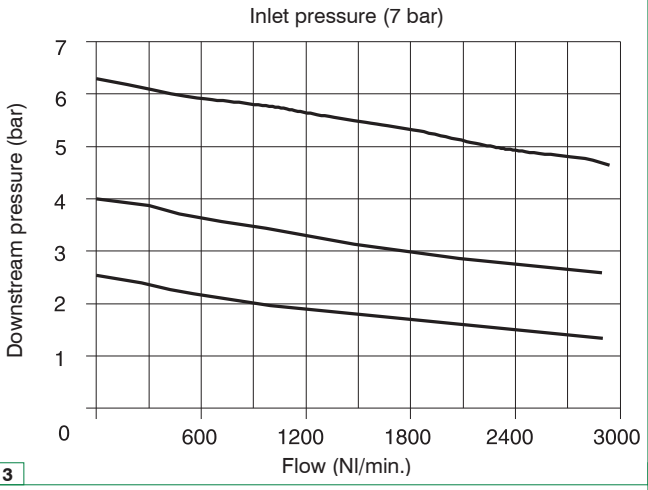

Size 1

Flow rate curves



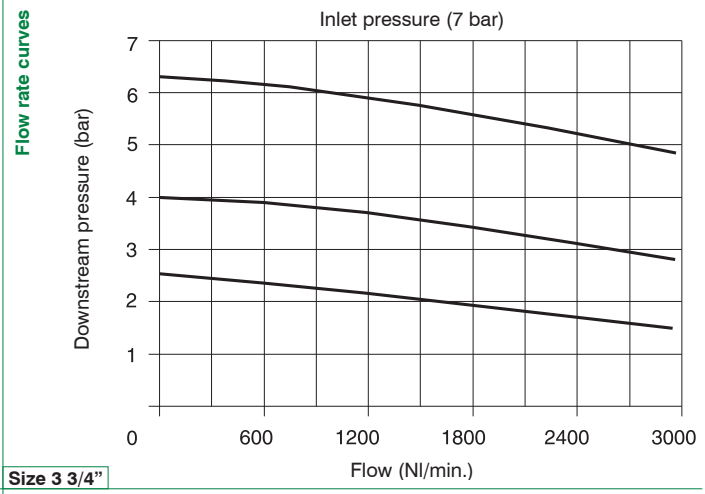

Size 2

Flow rate curves



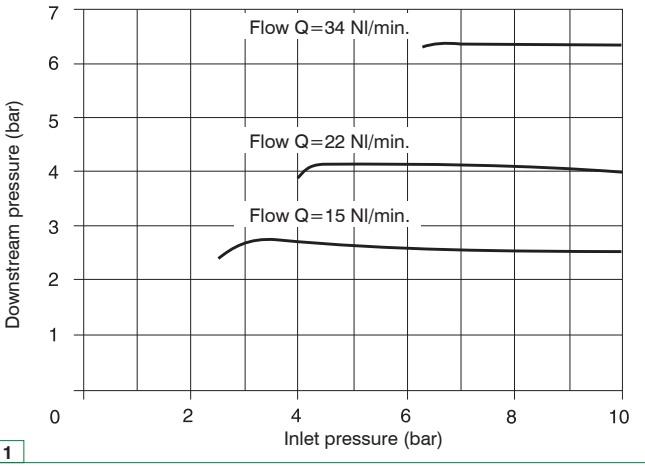

Size 3

Flow rate curves



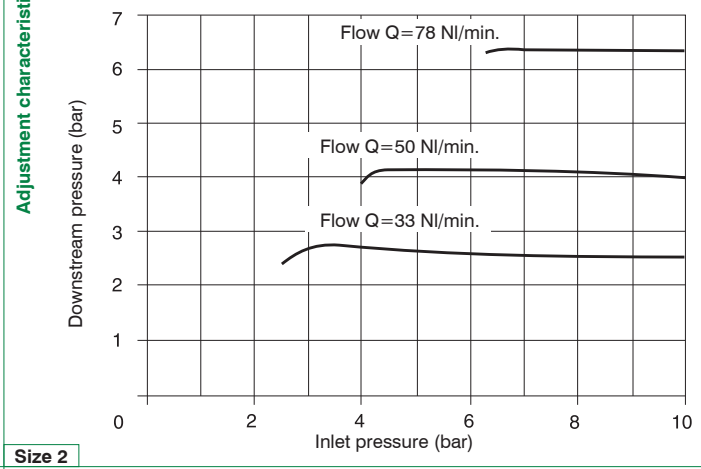

Size 3 3/4"

Adjustment characteristic



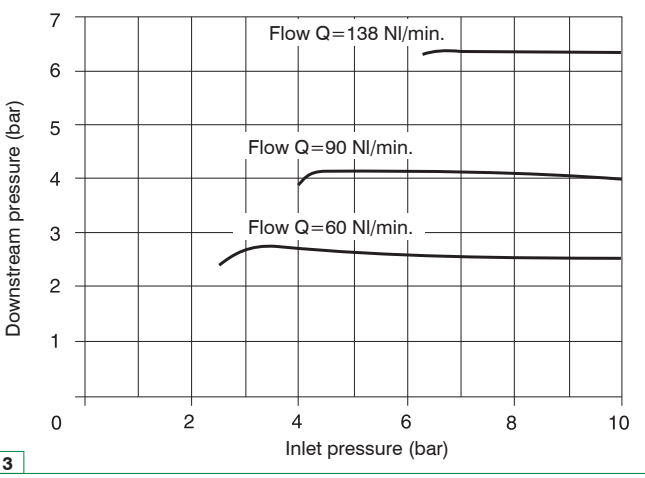

Size 1

Adjustment characteristic



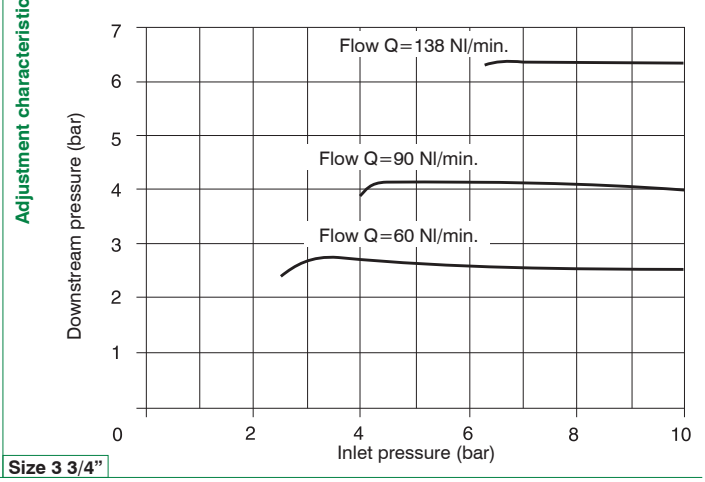

Size 2

Adjustment characteristic




Size 3

Adjustment characteristic




Size 3 3/4"

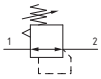


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Panel mounting pressure regulator



- Diaphragm pressure regulator with relieving
- Balanced poppet
- Technopolymer body, metal connections
- Pressure adjusting lockable handle by simply pressing it donwards in the desired position
- Ring nut for panel mounting
- Atex certification (II 3GD) on request






| Technical characteristics | |
|---|---|
| **Size** | Size 1 |
| Body and connections type | Technopolymer body,<br>integrated metal connections |
| IN / OUT connections | G1/8" - G1/4" |
| Assembly configuration | Stand alone<br>Panel mounting<br>With fixing bracket |
| Assembly position | indifferent |
| Pressure range (bar) | 0 - 2 / 0 - 4 / 0 - 8 / 0 - 12 |
| Regulation | Manual push and lock with pressure<br>Manual lockable with accessories |
| Pressure measurement | G1/8" Pressure gauge connection port |
| Max. fittings torque<br>IN / OUT connections | G1/8" metal: 15<br>G1/4" metal: 20 |

| Operational characteristics | |
|---|---|
| **Size** | Size 1 |
| Maximum<br>working pressure (bar) | 13 |
| Minimum<br>working pressure (bar) | 0,5 |
| Working<br>temperature (°C) | -5 ... +50 |

| Weights | |
|---|---|
| **Size** | Size 1 |
| Technopolymer body version (g) | 110 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Order codes

17 | 109A | . | D | . | L | . | K

| Size, body and connections | |
|---|---|
| 109A | Technopolymer body, connections G1/8” |
| 109B | Technopolymer body, connections G1/4” |

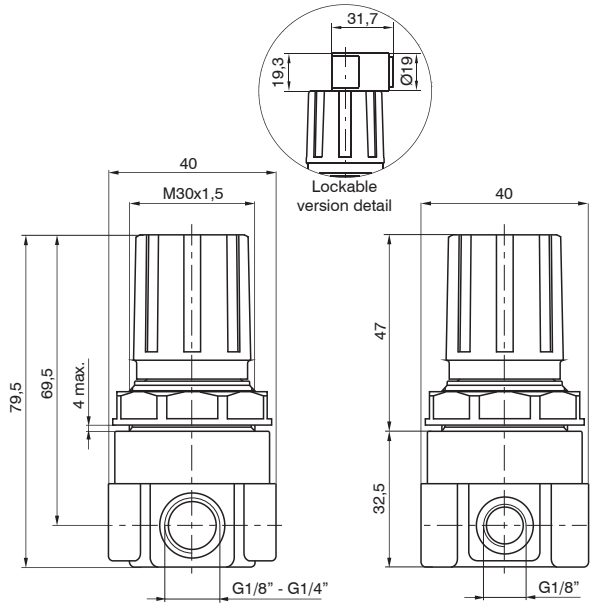
| Pressure range | |
|---|---|
| A | 0 - 2 bar |
| B | 0 - 4 bar |
| C | 0 - 8 bar |
| D | 0 - 12 bar |

| Type | |
|---|---|
| L | Without relieving |
| SM | Improved relieving |
| SR | Quick exhaust (Unbalanced poppet) |
| SRM | Quick exhaust with improved relieving |
| SMF | Improved relieving with controlled relief |

| Options | |
|---|---|
| | Standard |
| K | Lockable version |
| KF | Lockable version with universal key |

**Example: 17109A.D.L.K**
Size 1 Panel mounting pressure regulator, technopolymer body, G1/8” connections, 0 - 12 bar, without relieving, Lockable version

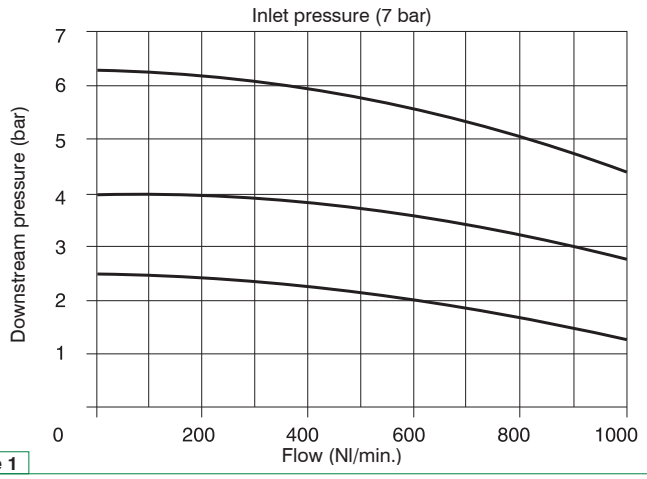
## Dimensions




Size 1

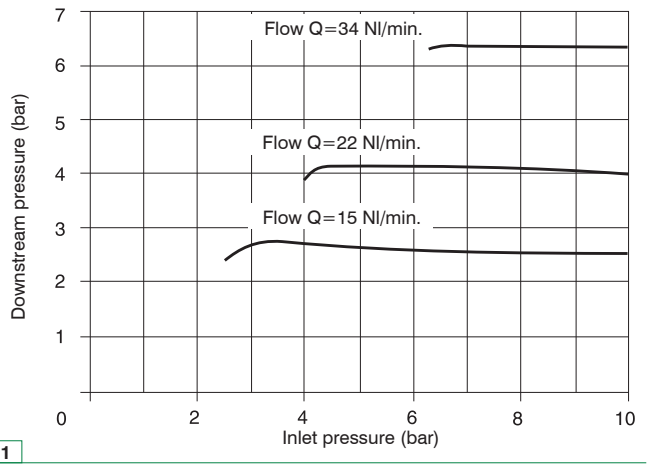
## Characteristic curves

Flow rate curves




Size 1

Adjustment characteristic




Size 1

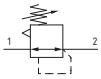


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Panel mounting pressure regulator including pressure gauge



- Diaphragm pressure regulator with relieving
- Balanced poppet
- Technopolymer body with aluminum reinforced threaded connections
- Pressure adjusting lockable handle by simply pressing it donwards in the desired position
- Including pressure gauge integrated on the knob
- Ring nut for panel mounting
- Atex certification (II 3GD) on request






| Technical characteristics | |
|---|---|
| **Size** | Size 1 |
| Body and connections type | Technopolymer body,<br>aluminum reinforced threaded connections |
| IN / OUT connections | G1/8" - G1/4" |
| Assembly configuration | Stand alone<br>Panel mounting<br>With fixing bracket |
| Assembly position | Indifferent |
| Pressure range (bar) | 0 - 2 / 0 - 4 / 0 - 8 / 0 - 12 |
| Regulation | Manual push and lock with pressure |
| Pressure measurement | G1/8" Pressure gauge connection port integrated on the knob |
| Max. fittings torque<br>IN / OUT connections | G1/8" metal: 15<br>G1/4" metal: 20 |

| Operational characteristics | |
|---|---|
| **Size** | Size 1 |
| Maximum<br>working pressure (bar) | 13 |
| Minimum<br>working pressure (bar) | 0,5 |
| Working<br>temperature (°C) | -5 ... +50 |

| Weights | |
|---|---|
| **Size** | Size 1 |
| Technopolymer body version (g) | 250 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Order codes

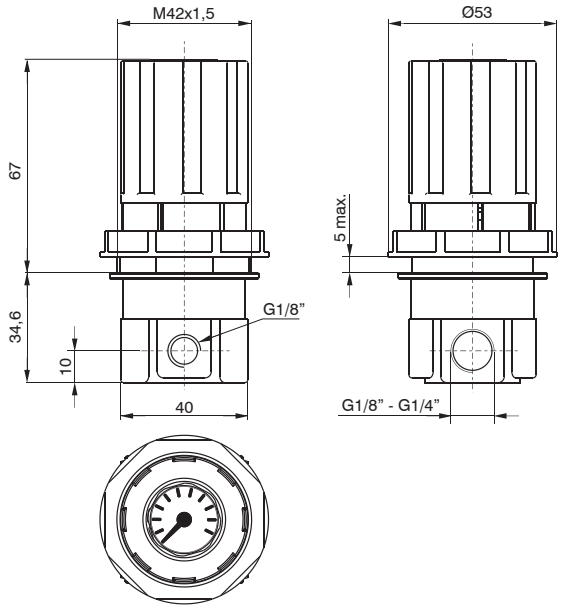
17 | 129A | . | D

| Size, body and connections | |
|---|---|
| 129A | Technopolymer body, connections G1/8” |
| 129B | Technopolymer body, connections G1/4” |

| Pressure range | |
|---|---|
| A | 0 - 2 bar |
| B | 0 - 4 bar |
| C | 0 - 8 bar |
| D | 0 - 12 bar |

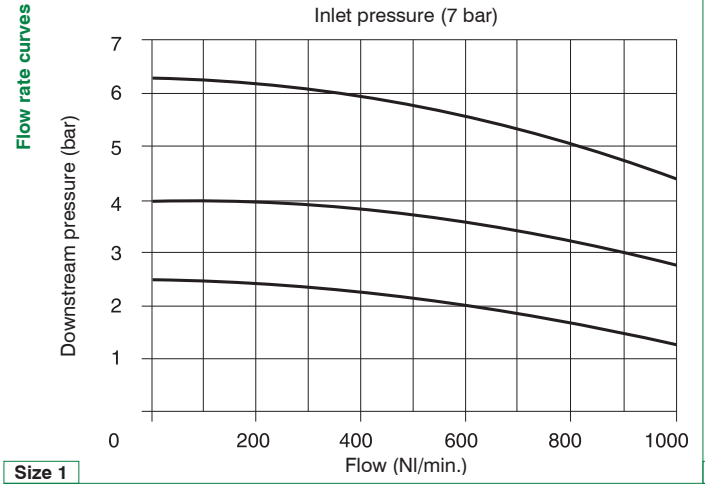
**Example: 17129A.D**
Size 1 panel mounting pressure regulator including pressure gauge, technopolymer body, G1/8” connections, 0 - 12 bar

## Dimensions

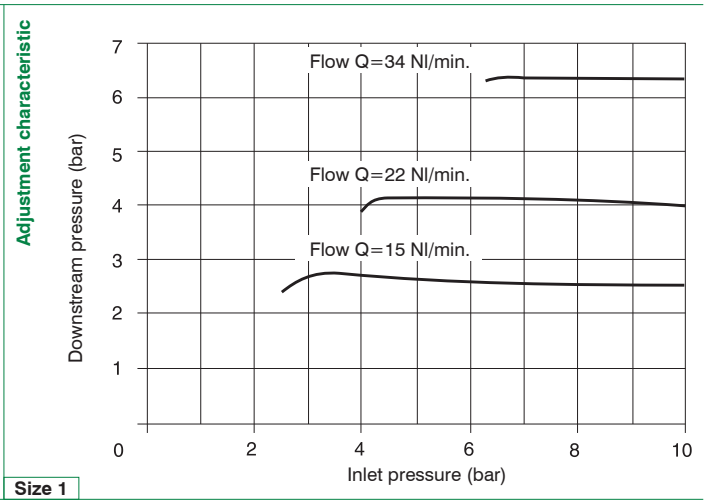



Size 1

## Characteristic curves




Size 1




Size 1

## High sensitive air pressure regulators with high flow rate relieving



- Accurate capacity to maintain set pressure
- Sensitivity combined with high relieving rates
- High flow rate with extremely low pressure drop
- Pressure adjusting lockable handle by simply pressing it donwards in the desired position
- Aluminium body
- Ring nut for panel mounting
- Construction with controlled refiel
- Atex certification (II 2GD) on request



| Technical characteristics | | |
|---|---|---|
| **Size** | Size 1 | Size 3 |
| Body and connections type | Aluminium body,<br>integrated aluminium connections | |
| IN / OUT connections | G1/4” | G1/2” |
| Assembly configuration | Stand alone<br>Panel mounting<br>With fixing bracket | Stand alone<br>Panel mounting<br>With fixing bracket |
| Assembly position | Indifferent | |
| Fluid | 20$\mu$ filtered air and preferably non lubricated | |
| Air flow with inlet pressure 10 bar (Nl/min) | 5 | |
| Pressure range (bar) | 0,1 - 2 / 0,1 - 4 / 0,1 - 7 / 0,1 - 10 | |
| Regulation | Manual push and lock with pressure<br>Manual lockable with accessories | |
| Pressure measurement | G1/8” Pressure gauge connection port | |
| Max. fittings torque IN / OUT connections | G1/4” metal: 20 | G1/2” metal: 30 |

| Operational characteristics | | |
|---|---|---|
| **Size** | Size 1 | Size 3 |
| Maximum working pressure (bar) | 10 | |
| Minimum working pressure (bar) | 0,5 | |
| Working temperature (°C) | -5 ... +50 | |

| Weights | | |
|---|---|---|
| **Size** | Size 1 | Size 3 |
| Aluminium body version (g) | 380 | 970 |


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## Order codes

17 | 3S2B | . | 0010 | . | E | . | K

| Size, body and connections | |
|---|---|
| 1S2B | Aluminium body, connections G1/4" (only for size 1) |
| 3S2B | Aluminium body, connections G1/2" (only for size 3) |

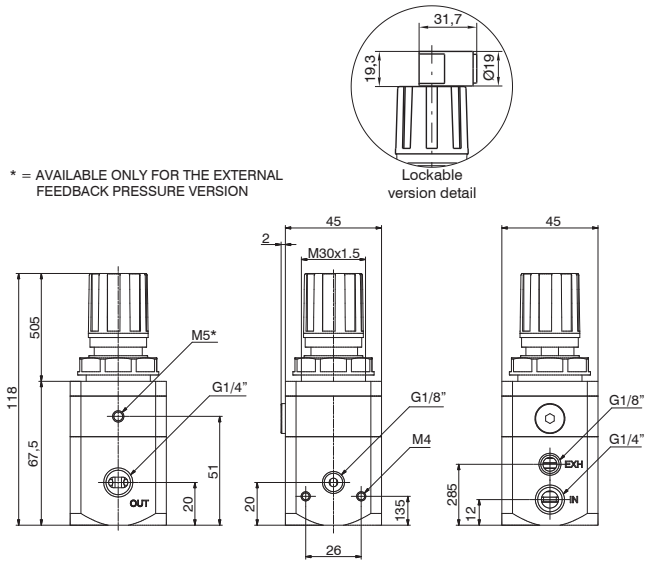
| Pressure range | |
|---|---|
| 0002 | 0,1 - 2 bar |
| 0004 | 0,1 - 4 bar |
| 0007 | 0,1 - 7 bar |
| 0010 | 0,1 - 10 bar |

| Type | |
|---|---|
| | Standard |
| E | External pressure feedback |

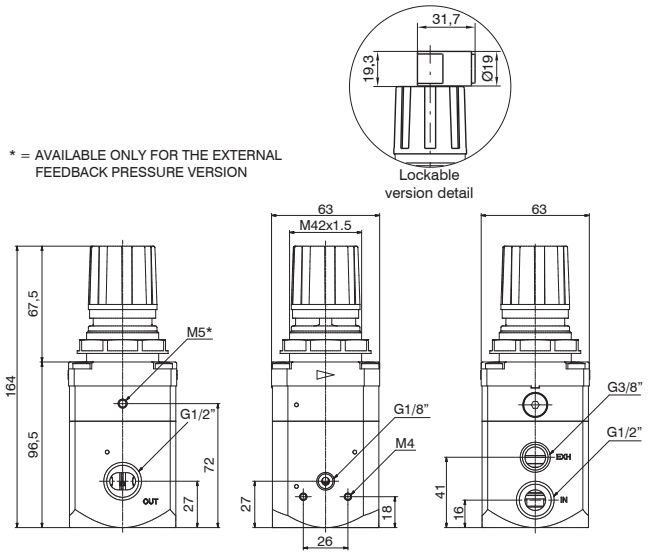
| Options | |
|---|---|
| | Standard |
| K | Lockable version |
| KF | Lockable version with universal key |

**Example: 173S2B.0010.E.K**
Size 3 high sensitive air pressure regulator with high flow rate relieving, aluminium body, G1/2" connections, 0,1 - 10 bar, external pressure feedback, lockable version

## Dimensions



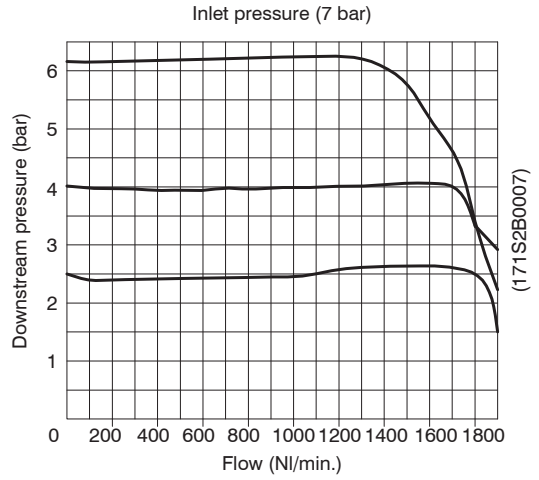

Size 1




Size 3

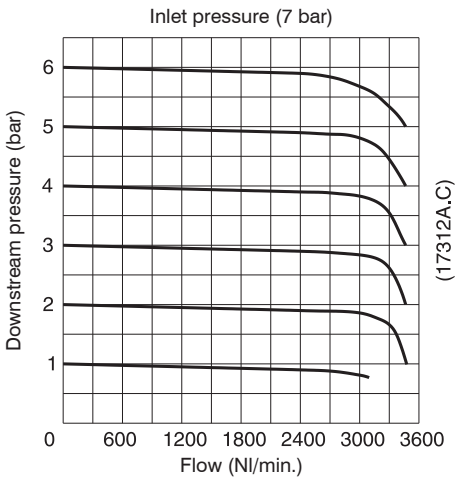
## Characteristic curves

**Flow rate curves**



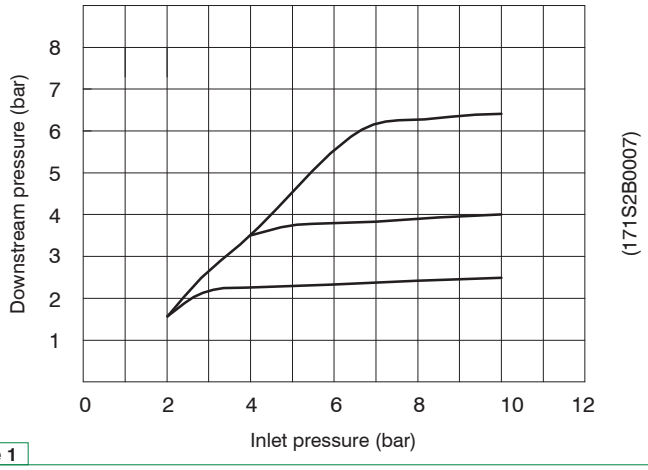

Size 1

**Flow rate curves**



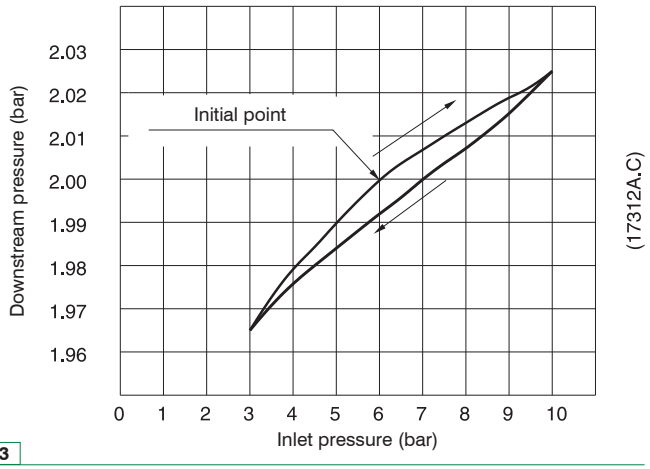

Size 3

**Adjustment characteristic**



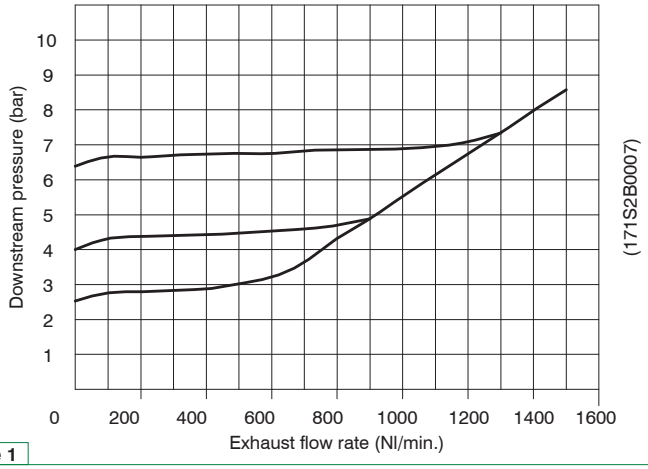

Size 1

**Adjustment characteristic**



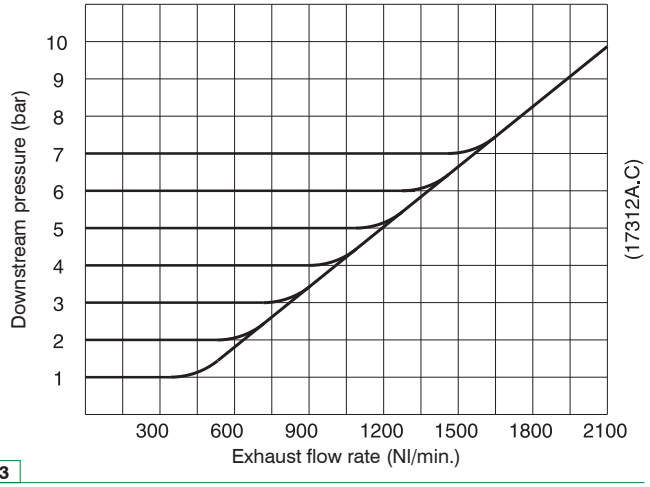

Size 3

**Exhaust flow rate curves**




Size 1

**Exhaust flow rate curves**




Size 3



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## High sensitive pressure regulator with pneumatic pilot




- Accurate capacity to maintain set pressure
- Sensitivity combined with high relieving rates
- High flow rate with extremely low pressure drop
- Aluminium body
- Construction with controlled refiel
- Atex certification (II 2GD) on request

| Technical characteristics | |
|---|---|
| **Size** | Size 3 |
| Body and connections type | Aluminium body,<br>integrated aluminium connections |
| IN / OUT connections | G1/2” |
| Assembly configuration | Stand alone |
| Assembly position | Indifferent |
| Fluid | 20$\mu$ filtered air and preferably non lubricated |
| Air flow with inlet pressure 10 bar (Nl/min) | 5 |
| Pressure measurement | G1/8” Pressure gauge connection port |
| Max. fittings torque<br>IN / OUT connections | G1/2” metal: 30 |

| Operational characteristics | |
|---|---|
| **Size** | Size 3 |
| Maximum<br>working pressure (bar) | 10 |
| Minimum<br>working pressure (bar) | 0,5 |
| Working<br>temperature (°C) | -5 ... +50 |

| Weights | |
|---|---|
| **Size** | Size 3 |
| Aluminium body version (g) | 970 |

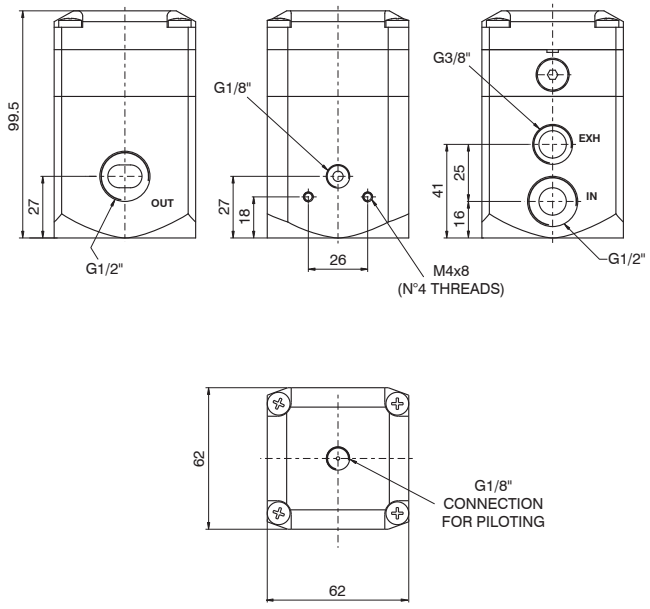
## Order codes

17 | 3P2B | .0010

| Size, body and connections | |
|---|---|
| 3P2B | Aluminium body, connections G1/2" (only for size 3) |

**Example: 173P2B.0010**
Size 3 high sensitive pressure regulator with pneumatic pilot, aluminium body, G1/2" connections

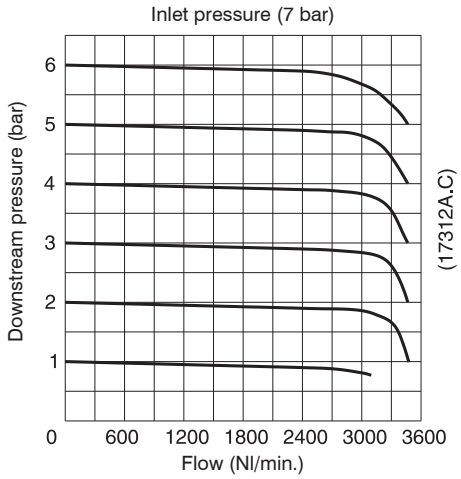
## Dimensions




Size 3

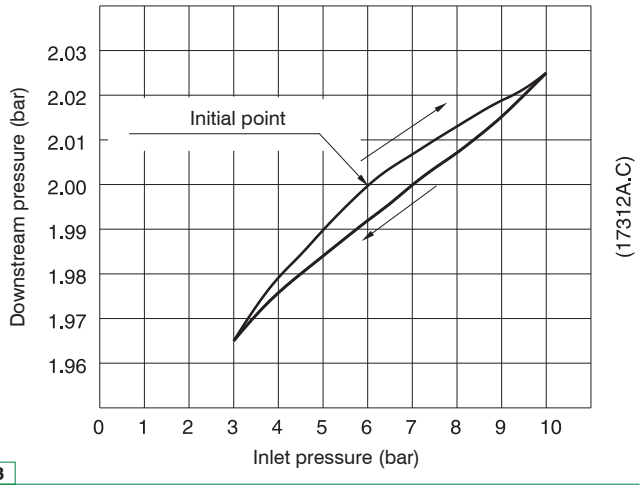
## Characteristic curves

Flow rate curves



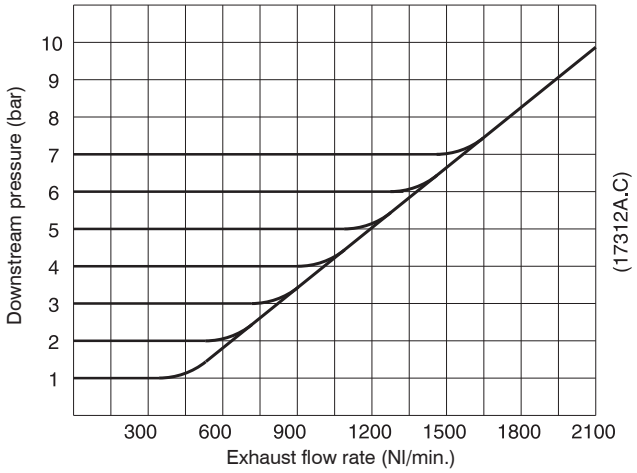

Size 3

Adjustment characteristic




Size 3

Exhaust flow rate curves




Size 3


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## High sensitive pressure regulator for manipulation applications



- Accurate capacity to maintain set pressure
- Sensitivity combined with high relieving rates
- High flow rate with extremely low pressure drop
- Manual and piloted adjustment for structure and load balancing
- Aluminium body
- Construction with controlled refiel
- Manual adjustment: 5 Bar Maximum
- Pilot adjustment: 5 Bar Maximum
- Hysteresis ±0.01bar



| Technical characteristics | |
|---|---|
| **Size** | Size 3 |
| Body and connections type | Aluminium body,<br>integrated aluminium connections |
| IN / OUT / EXH connections | G1/2" (IN and OUT) / G3/8 (EXH) |
| Pilot connection | G1/8 |
| Assembly configuration | Stand alone<br>With fixing bracket |
| Assembly position | Indifferent |
| Fluid | 20$\mu$ filtered air and preferably non lubricated |
| Air flow with inlet pressure 10 bar (Nl/min) | 5 |
| Pressure range (bar) | 0.1 - 5 (max manual adjustment) / 0.1 - 8 (max pilot adjustment) |
| Regulation | Manual (for balancing of the structure)<br>Piloted (for load balancing) |
| Pressure measurement | G1/8" Pressure gauge connection port |
| Max. fittings torque<br>IN / OUT connections | G1/2" metal: 30<br>G3/8" metal: 25 |

| Operational characteristics | |
|---|---|
| **Size** | Size 3 |
| Maximum<br>working pressure (bar) | 10 |
| Minimum<br>working pressure (bar) | OUT pressure + 1 bar |
| Working<br>temperature (°C) | -5 ... +70 |
| Sensitivity | 0.2% F.S |
| Repeatability | ±0.5% F.S |
| Hysteresis | ± 0.01 bar |

| Weights | |
|---|---|
| **Size** | Size 3 |
| Aluminium body version (g) | 1600 |

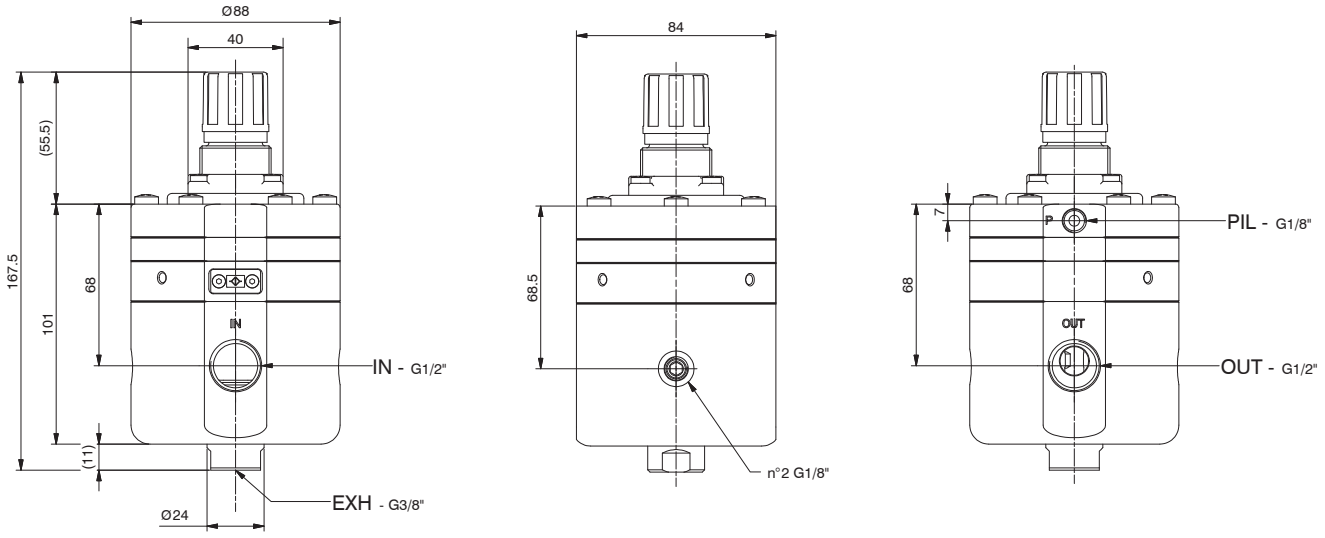
## Order codes

RB17 | 3B | R2C

| Size, body and connections | |
|---|---|
| 3B | Aluminium body, connections G1/2" (only for size 3) |

**Example: RB173BR2C**
Size 3, high sensitive pressure regulator for manipulation applications, aluminium body, G1/2" connections

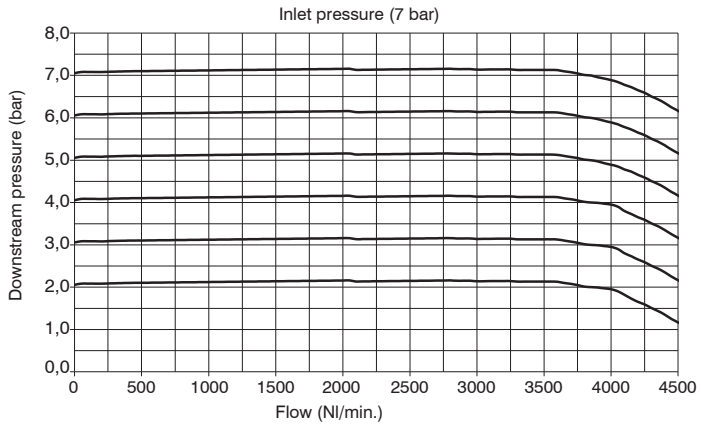
## Dimensions




Size 3

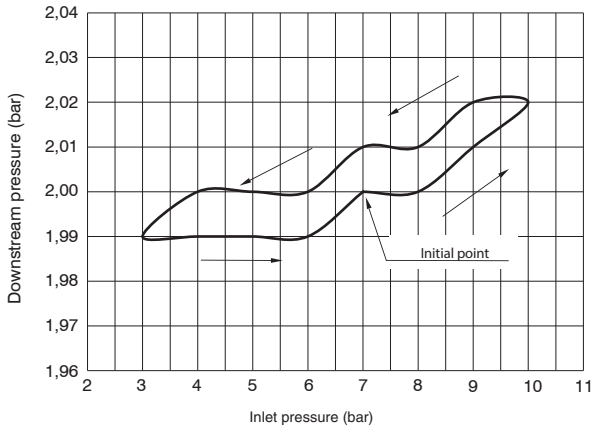
## Characteristic curves

Flow rate curves



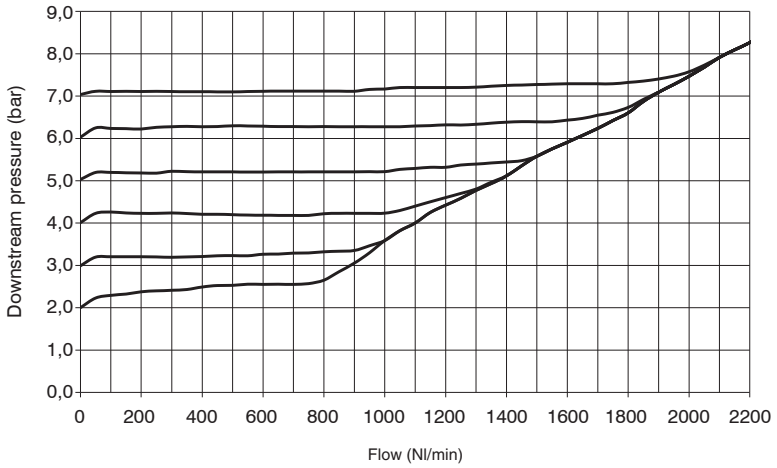

Size 3

Adjustment characteristic




Size 3

Exhaust flow rate curves

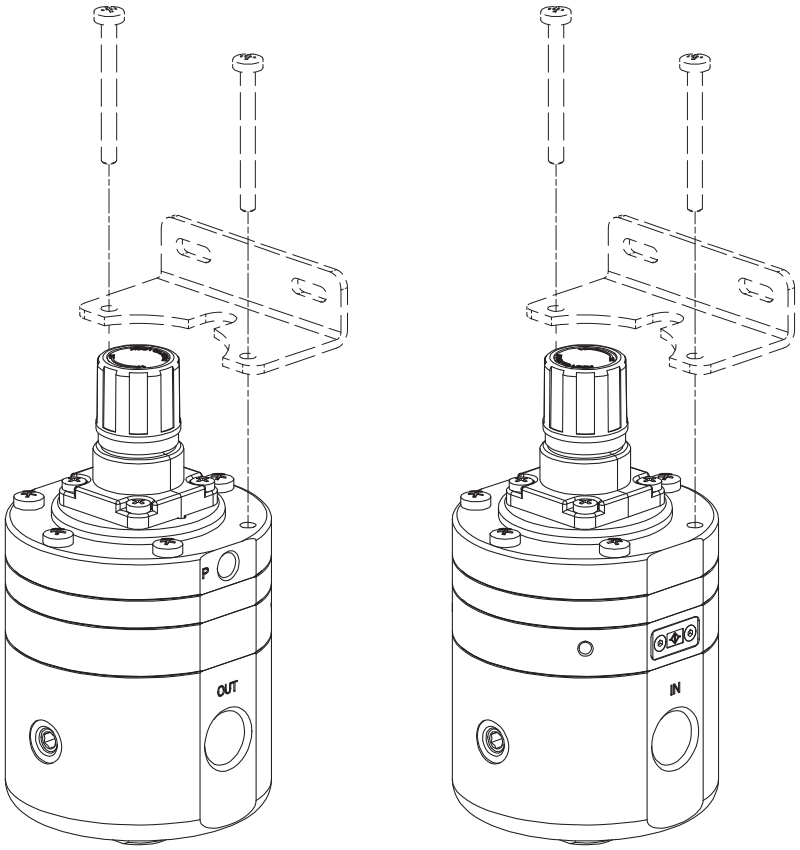



Size 3


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Accessories and fixing

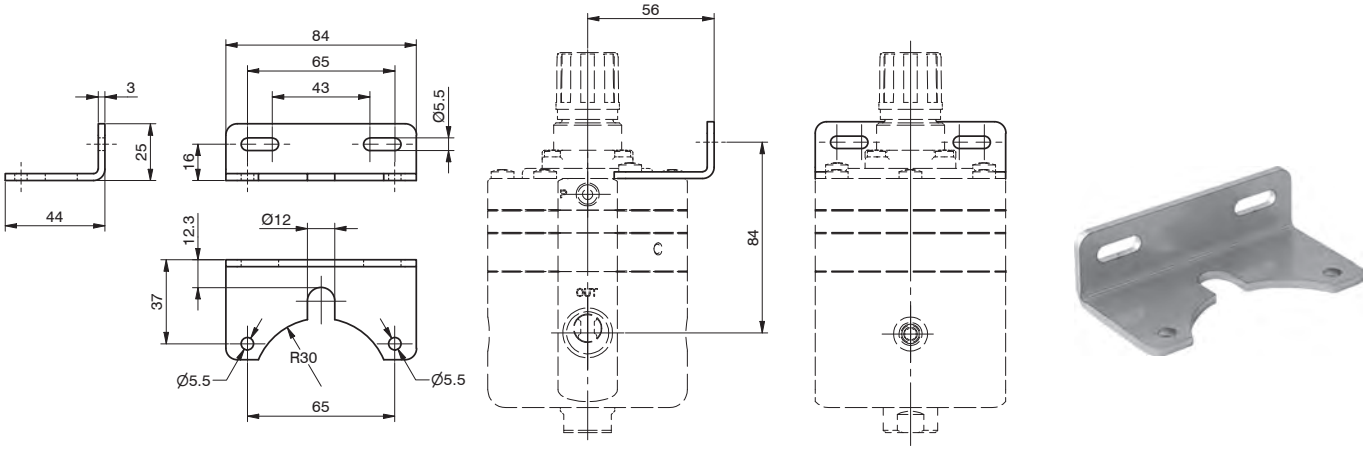
The regulator can be mounted by means of a bracket. To enable fixing, unscrew the two screws indicated and screw them back with the bracket mounted. It is advisable to apply soft thread-locker to the screws before screwing them back in.




### Fixing bracket

RB17350

| Model | |
|---|---|
| RB17350 | Fixing bracket for the high sensitive pressure regulator for manipulation applications |



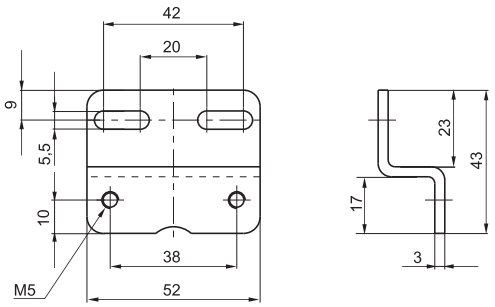
## Fixing bracket for regulators

| 1725 | 0 |
|---|---|

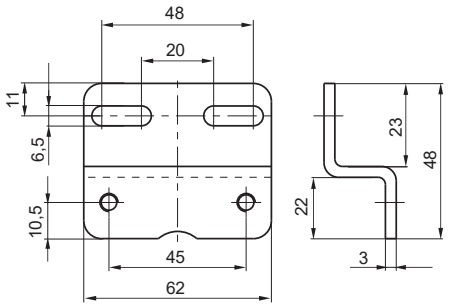
| Size | |
|---|---|
| 1725 | Size 2 |
| 1735 | Size 3 |

| Type | |
|---|---|
| 0 | For standard regulators |
| 2 | For pressure regulators |






Size 2



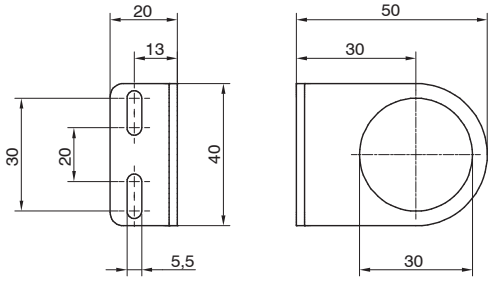

Size 3

## Fixing bracket

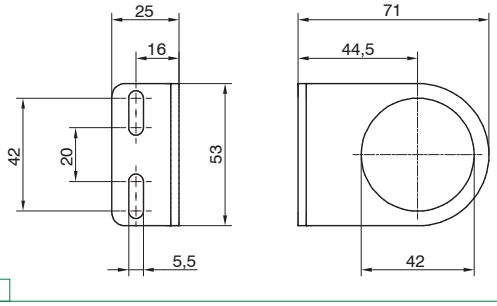
| 171 | 50 |
|---|---|

| Size | |
|---|---|
| 171 | Size 1 |
| T172 | Size 2 - Size 3 |






Size 1



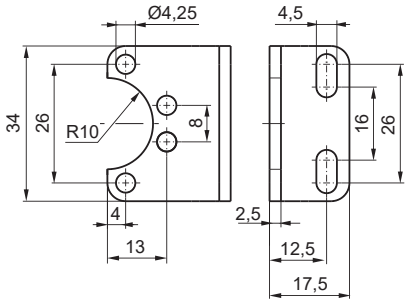

Size 2 - Size 3

## Fixing bracket

| 170 | M5 |
|---|---|

| Size | |
|---|---|
| 170 | Size 1 |






Size 1



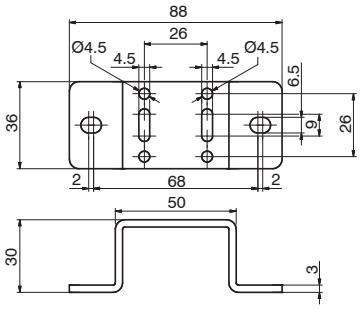
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Fixing bracket for pressure regulator

170 50

| Size | |
|---|---|
| 170 | Size 1 |






Size 1

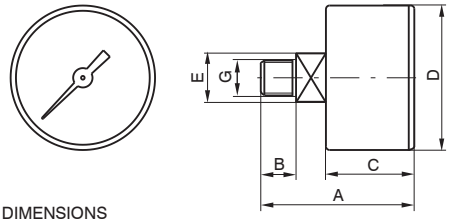
## Pressure gauge

17070 A C

| Version | |
|---|---|
| A | Dial Ø40 |
| B | Dial Ø50 |

| Scale | |
|---|---|
| A | 0 - 4 bar |
| B | 0 - 6 bar |
| C | 0 - 12 bar |






DIMENSIONS

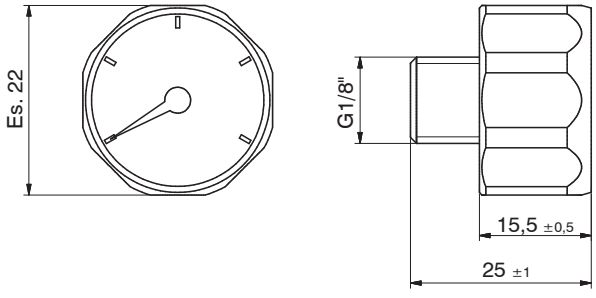
| CODE | A | B | C | D | E | G | Weight g |
|---|---|---|---|---|---|---|---|
| 17070A | 44 | 10 | 26 | 41 | 14 | 1/8" | 60 |
| 17070B | 45 | 10 | 27 | 49 | 14 | 1/8" | 80 |

## Pressure gauge diameter Ø23

17070M A

| Scale | |
|---|---|
| A | 0 - 4 bar |
| B | 0 - 6 bar |
| C | 0 - 12 bar |






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## Assembling kit

| 1726 | 0 |
|---|---|

| Size | |
|---|---|
| 1716 | Size 1 |
| 1726 | Size 2 |
| 1736 | Size 3 |
| 1746 | Size 4 |

| Type | |
|---|---|
| 0 | Standard |
| 5 | For progressive start-up valve |



## Assembling kit for manifold regulators

| 170 | M6 |
|---|---|

| Size | |
|---|---|
| 170 | Size 1 |



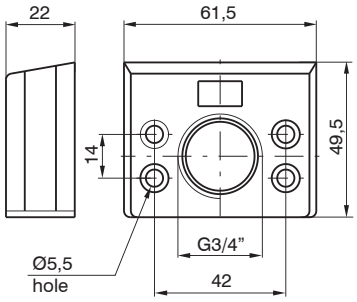
## Flange G3/4”

| 1738 | 1E |
|---|---|

| Size | |
|---|---|
| 1738 | Size 3 |

| Type | |
|---|---|
| 1E | Inlet flange |
| 2E | Output flange |






Size 3





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## Series 1700 Steel line



- **Wide working temperature range**
- **Available in 3 sizes with connections from 1/4" to 1"**
- **ATEX certification (II 2G or II 2D), SIL, EAC**
- **Clean profile versions available**

The stainless steel SS1700 air treatment series has been engineered and developed to approach specifically the OIL & GAS industry and more widely for all the severe service applications that require excellent corrosion resistance due to chemical and/or harsh environmental condition.
**All external and internal parts (except for the automatic drain version) are AISI 316L stainless steel material in compliance with NACE standard MR0175/ISO 15156/1**. The product range includes FILTER, with filtration elements up to 3 filtration degree (5$\mu$m-20 $\mu$m-50 $\mu$m), available in AISI316 stainless steel or HDPE (high density polyethylene), and manual or automatic condensed exhaust; The PRESSURE REGULATOR is supplied with low hysteresis rolling diaphragm and an over-pressure exhaust valve (RELIEVING), available in 4 different adjustment ranges from 0 to 12 bar. As a last the FILTER REGULATOR range, which combines the features of a filter and pressure regulator into a one single device. "CLEAN PROFILE" version is available for all the sizes, featuring a glossy finish on the external surface. The over-pressure exhaust hole (RELIEVING) has a 1/8" NPT threading, and it is protected by an AISI 316 sintered filter series. Note: for CLEAN PROFILE series this is a simple unthread hole.

**Instructions for installation and use**
Product shall be installed reducing the distance from inlet point. Check and install the device following the flow direction (clearly marked with an arrow stamped on the body). Vertical position installation with condensed exhaust tap pointing downward is recommended.
Devices must be used in compliance with pressure and temperature operating range. To set the pressure there is an adjustable knob, located on the top of the device. Pneumax recommend selection of pressure regulator adjusting range option in line with client required performance The condensed exhaust action for the manual drain version shall be performed only in the absence of pressure. To discharge liquid, turn the tap clockwise until the discharge of liquid is triggered, then tighten it all the way.

| Construction and operational characteristics | | | |
|---|---|---|---|
| **Size** | Size 2 | Size 3 | Size 4 |
| Body, bowl and adjustment mechanism | AISI 316L stainless steel | | |
| Caseback regulator | AISI 316L stainless steel | | |
| Adjustment screw, locking nut and fastening screws | AISI 316L stainless steel (stainless steel A4-70) | | |
| Internal components | AISI 316L stainless steel | | |
| Filtering elements | AISI 316L stainless steel or HDPE (High density polyethylene) | | |
| Springs | AISI 316L stainless steel | | |
| Seals | NBR (standard versions and automatic drain)<br>NBR for low temperatures (L versions)<br>FPM - HNBR (H versions)<br>EPDM-FDA (EF versions)<br>Silicone - PU (Z version) | | |
| Automatic drain | Brass, stainless steel AISI 304 and AISI 302, sintered bronze<br>Acetal resin, NBR, FPM | | |



| Operating range | | | |
|---|---|---|---|
| **Size** | Size 2 | Size 3 | Size 4 |
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous<br>Inert gases<br>Natural gases | | |
| Working temperature (°C) | -30 ... +80 (standard version)<br>-50 ... +80 (low temperature L version)<br>-60 ... +80 (low temperature version -60 °C Z)<br>-5 ... +150 (high temperature H version)<br>-35 ... +70 (automatic drain S version and reduced orifice automatic drain SR version)<br>-40 ... +100 (EPDM-FDA version) | | |
| Maximum working pressure (bar) | 20 (standard, low and high temperature versions)<br>16 (automatic drain version)<br>10 (reduced orifice automatic drain version) | | |

### Maintenance

Filtration elements and filter regulator are reusable through blowing and/or washing and is made of stainless steel or HDPE (high density polyethylene). To replace, remove the cup, loosen the set screw of the support and replace the filter element with a new one or refurbished one. Replace the regulator diaphragm whenever the performance is compromised or if there is a continuous discharge from the relieving hole (over-pressure exhaust). Fully discharge the adjustment spring before removing the adjustment mechanism. For other maintenance activities, due to complexity of assembly and requirement for dedicated **PNEUMAX** testing activities, it is strongly recommended to contact the manufacturer.

### Certifications available

**II 2G Ex h IIC Gb**
**II 2D Ex h IIIC Db**

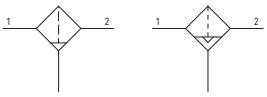
: Suitable up to SIL 3

: CU - TR 012


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## Filter





- Body, bowl and internal components in AISI 316L stainless steel
- A4 (AISI 316) stainless steel fixing screws
- Manual or automatic drain
- ATEX certification (II 2G or II 2D), SIL, EAC
- Filter cartridge available in AISI 316 stainless steel or HDPE
- Clean profile versions available
- Versions with 1/8" NPT pressure gauge connection available



| Technical characteristics | | | |
|---|---|---|---|
| **Size** | Size 2 | Size 3 | Size 4 |
| Type | Rough finishing<br>Clean profile<br>(bowl) | | |
| IN / OUT connections | G1/4"<br>1/4" NPT<br>3/8" NPT | G1/2"<br>1/2" NPT<br>1/4" NPT | G1"<br>1" NPT<br>3/4" NPT |
| Assembly configuration | Stand alone | | |
| Assembly position | Vertical | | |
| Filter pore size (µm) | 5<br>20<br>50 | | |
| Max. bowl capacity (cm³) | 15 | 25 | 78 |
| Condensation drain | Manual<br>Automatic | | |

| Operational characteristics | | | | | | |
|---|---|---|---|---|---|---|
| **Size** | Size 2 | Size 3 | Size 4 | Size 2 | Size 3 | Size 4 |
| Condensation drain | Manual condensation drain | | | Automatic condensation drain | | |
| Maximum working pressure (bar) | 20 (standard version) | | | 16 (automatic drain version)<br>10 (reduced orifice automatic drain version) | | |
| Minimum working pressure (bar) | / | | | 0,5 | | |
| Working temperature (°C) | -30 ... +80 (standard version)<br>-50 ... +80 (low temperature L version)<br>-60 ... +80 (low temperature version -60 °C Z)<br>-5 ... +150 (lhigh temperature H version)<br>-40 ... +100 (EPDM-FDA version) | | | -35 ... +70<br>(automatic drain S version and reduced orifice automatic drain SR version) | | |

| Weights | Size | | |
|---|---|---|---|
| | Size 2 | Size 3 | Size 4 |
| Standard version (g) | 1088 | 1903 | 4655 |
| Automatic drain version / Reduced orifice automatic drain version (g) | 1175 | 2070 | 4692 |

## Order codes

S | S | 17 | 2B | F | B | S | G

| Version | |
|---|---|
| S | Rough finishing |
| F | Clean profile |

| Size and connections | |
|---|---|
| 2A | Size 2 - 1/4" NPT |
| 2B | Size 2 - 3/8" NPT |
| 2C | Size 2 - G1/4" |
| 3A | Size 3 - 1/4" NPT |
| 3B | Size 3 - 1/2" NPT |
| 3D | Size 3 - G1/2" |
| 4A | Size 4 - 3/4" NPT |
| 4B | Size 4 - 1" NPT |
| 4D | Size 4 - G1" |

| Filter pore size | |
|---|---|
| A | 5 $\mu$m - 316 stainless steel |
| B | 20 $\mu$m - 316 stainless steel |
| C | 50 $\mu$m - 316 stainless steel |
| D | 5 $\mu$m - HDPE |
| E | 20 $\mu$m - HDPE |
| F | 50 $\mu$m - HDPE |

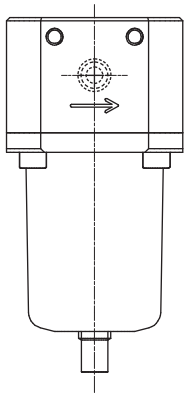
| Options | |
|---|---|
| | Standard |
| L | Low temperature |
| Z | Low temperature (-60 °C) |
| H | High temperature |
| S | Automatic drain |
| SR | Reduced orifice automatic drain version |
| EF | EPDM-FDA |

| Body options | |
|---|---|
| | Standard |
| G | With pressure gauge connection port |

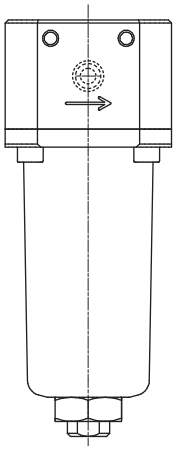
**Example: SS172BFBSG**
Size 2 filter, rough finishing, 3/8" NPT connection, filter pore size 20 $\mu$m - 316 stainless steel, automatic drain with pressure gauge connection port.

## Design

**Size 2 - Size 3 - Size 4**
Manual drain



**Size 2 - Size 3 - Size 4**
Automatic drain

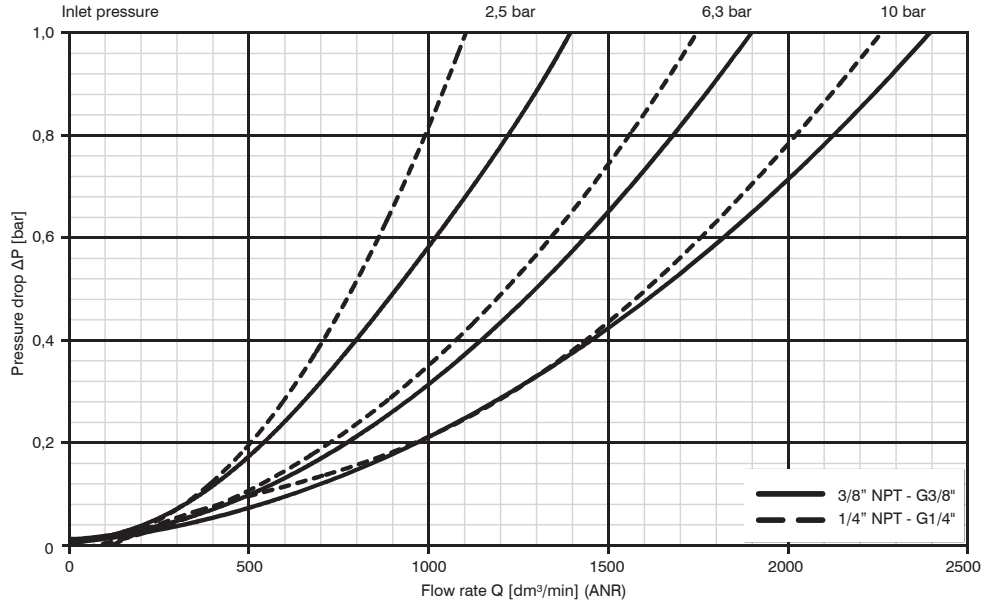




Overall dimensions and technical information are provided solely for informative purpose and may be modified without notice

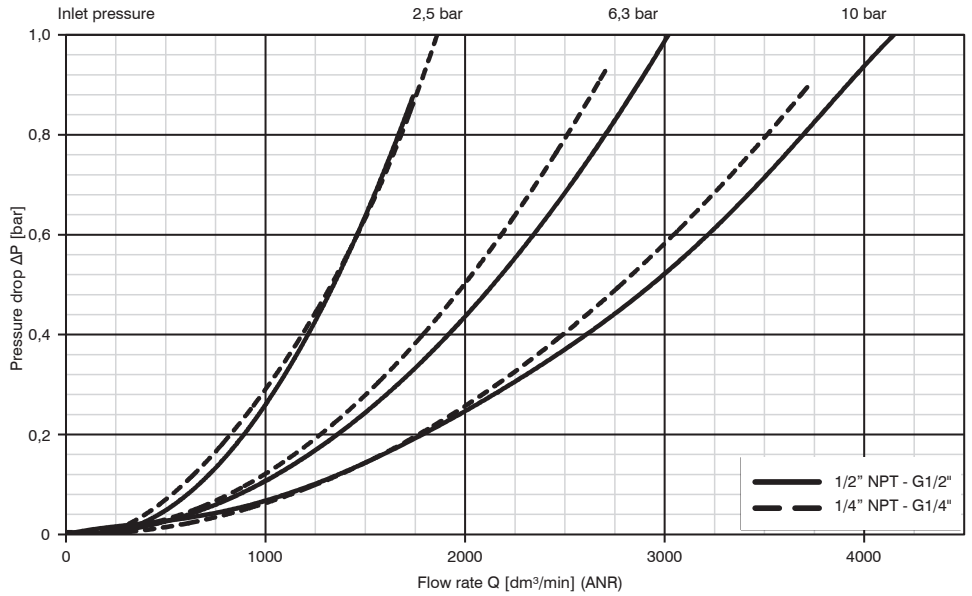
## Characteristic curves

### Flow rate curves



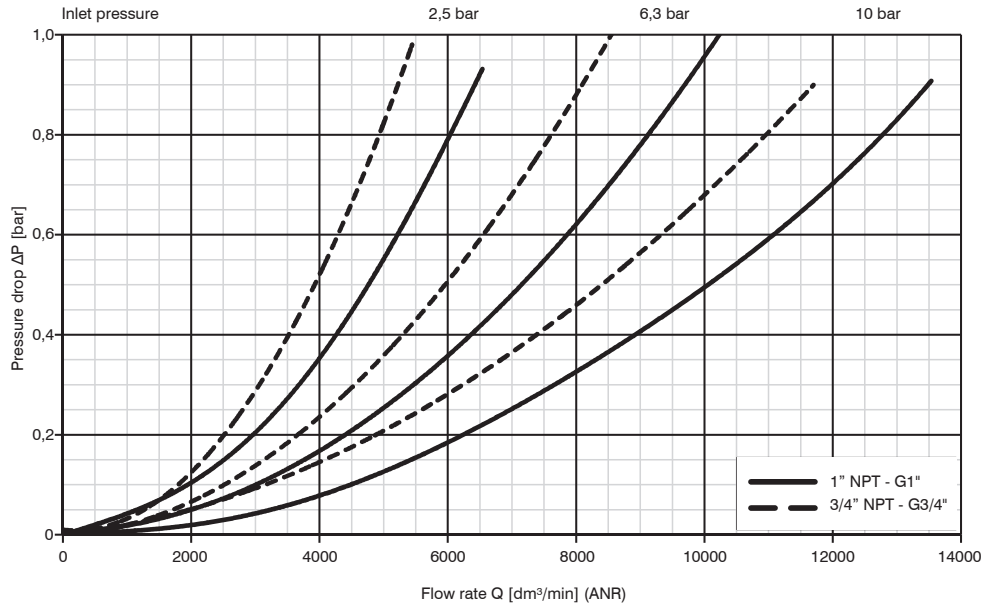

**Size 2**

### Flow rate curves




**Size 3**

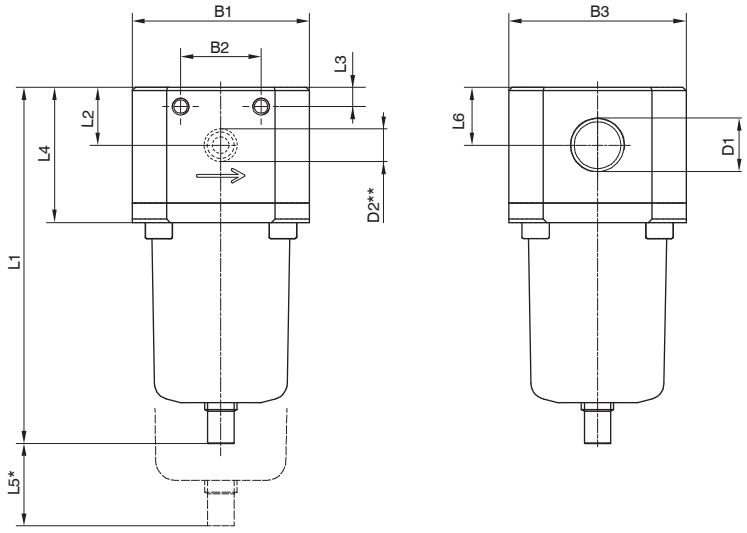
### Flow rate curves




**Size 4**

## Dimensions

Overall manual drain version

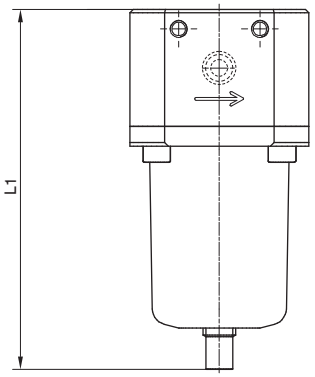



* = BOWL REMOVAL MAXIMUM HEIGHT
** = ONLY FOR VERSION WITH PRESSURE GAUGE CONNECTION PORT

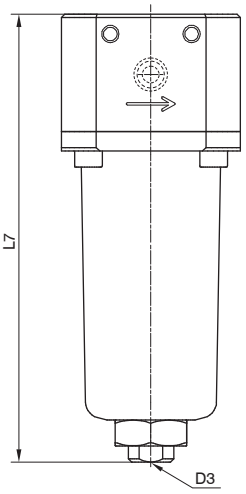
| Model | B1 | B2 | B3 | D1 | D2 | L1 | L2 | L3 | L4 | L5 | L6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| #172... | 55 | 25 | 55 | G1/4"<br>1/4" NPT<br>3/8" NPT | 1/8" NPT | 111 | 18 | 6 | 42 | 45 | 18 |
| #173... | 71 | 22 | 71 | G1/2"<br>1/2" NPT<br>1/4" NPT | 1/8" NPT | 124 | 20 | 5,5 | 48 | 65 | 20 |
| #174... | 92 | 36 | 92 | G1"<br>1" NPT<br>3/4" NPT | 1/8" NPT | 198,5 | 32,5 | 10 | 73,5 | 80 | 32,5 |

## Variable dimensions

Manual drain version




Automatic
drain version (A.D.)



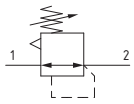

| Model | L1 | L7 | D3 |
|---|---|---|---|
| #172... | 111 | 138 | 1/8" NPT |
| #173... | 124 | 160 | 1/8" NPT |
| #174... | 198,5 | 207,5 | 1/8" NPT |



Overall dimensions and technical information are provided solely for informative purpose and may be modified without notice

## Regulators






- Pressure regulator diaphragm with over-pressure drain (Relieving)
- Body, adjustment mechanism, back plate and caseback internal components in AISI 316L stainless steel
- AISI 316 stainless steel adjustment springs
- Fixing screws, adjustment screw and locking nut in inox A4 (AISI 316)
- Clean profile versions available
- Low hysteresis rolling diaphragm
- Balanced system
- ATEX certification (II 2G or II 2D), SIL, EAC

**Note**
The pressure must be always regulating while increasing. For a more precise regulation and higher sensibility, the use of a regulator with a pressure range as close as possible to the regulated pressure is recommended.



| Technical characteristics | | | |
|---|---|---|---|
| **Size** | Size 2 | Size 3 | Size 4 |
| Type | Rough finishing<br>Clean profile<br>(Back plate and adjustment mechanism) | | |
| IN / OUT connections | 1/4" NPT<br>3/8" NPT<br>G1/4" | 1/4" NPT<br>1/2" NPT<br>G1/2" | 3/4" NPT<br>1" NPT<br>G1" |
| Assembly configuration | Stand alone | | |
| Assembly position | Indifferent | | |
| Pressure range (bar) | 0-2<br>0-4<br>0-8<br>0-12 | | |
| Regulation | Manual | | |
| Pressure measurement | 1/8" NPT pressure gauge connection port | | |

| Operational characteristics | | | |
|---|---|---|---|
| **Size** | Size 2 | Size 3 | Size 4 |
| Maximum working pressure (bar) | 20 | | |
| Minimum working pressure (bar) | 0,5 | | |
| Working temperature (C°) | -30 ... +80 (standard version)<br>-50 ... +80 (low temperature L version)<br>-60 ... +80 (low temperature version -60 °C Z)<br>-5 ... +150 (lhigh temperature H version)<br>-40 ... +100 (EPDM-FDA version) | | |

| Weights | | | |
|---|---|---|---|
| **Size** | Size 2 | Size 3 | Size 4 |
| Weight (g) | 1283 | 2270 | 5400 |

## Order codes

S | S | 17 | 3B | R | B | N | L

| Version | |
|---|---|
| S | Rough finishing |
| F | Clean profile |

| Size and connections | |
|---|---|
| 2A | Size 2 - 1/4" NPT |
| 2B | Size 2 - 3/8" NPT |
| 2C | Size 2 - G1/4" |
| 3A | Size 3 - 1/4" NPT |
| 3B | Size 3 - 1/2" NPT |
| 3D | Size 3 - G1/2" |
| 4A | Size 4 - 3/4" NPT |
| 4B | Size 4 - 1" NPT |
| 4D | Size 4 - G1" |

| Pressure range | |
|---|---|
| A | 0 - 2 bar |
| B | 0 - 4 bar |
| C | 0 - 8 bar (0 - 7 bar for size 4) |
| D | 0 - 12 bar (0 - 10 bar for size 4) |

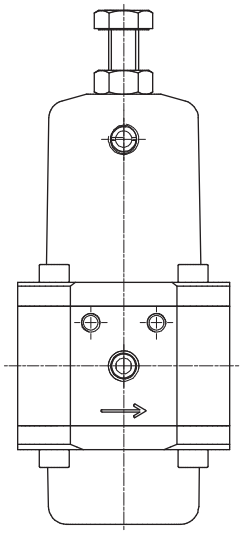
| Type | |
|---|---|
| | Standard |
| N | without relieving |

| Options | |
|---|---|
| | Standard |
| L | Low temperature |
| Z | Low temperature (-60 °C) |
| H | High temperature |
| EF | EPDM-FDA |

**Example: SS173BRBNL**
Size 3 regulator, rough finishing, 1/2" NPT connection, pressure range 0 - 4 bar, without relieving, low temperature version.

## Design

**Size 2 - Size 3 - Size 4**

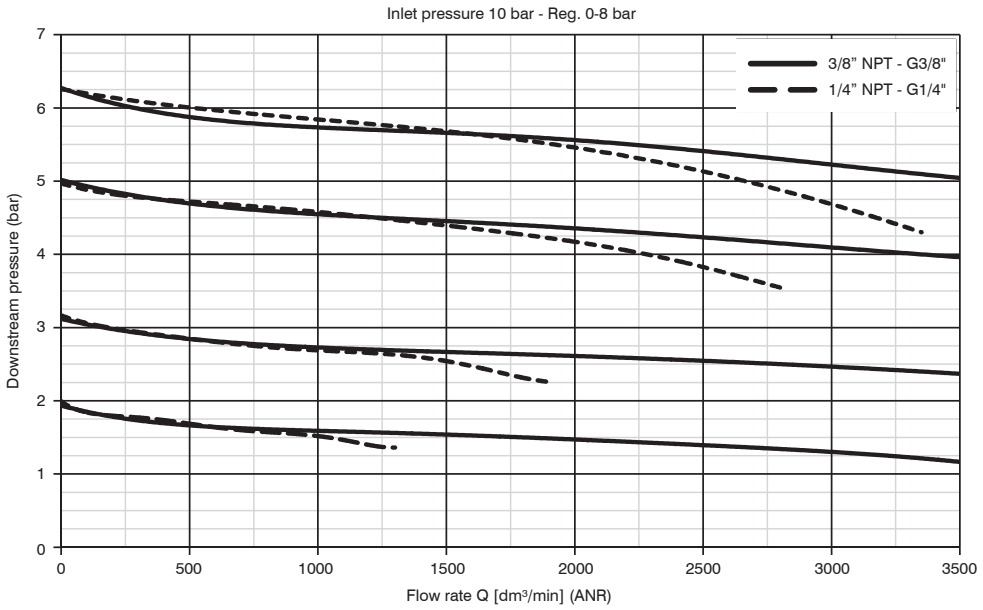





Overall dimensions and technical information are provided solely for informative purpose and may be modified without notice

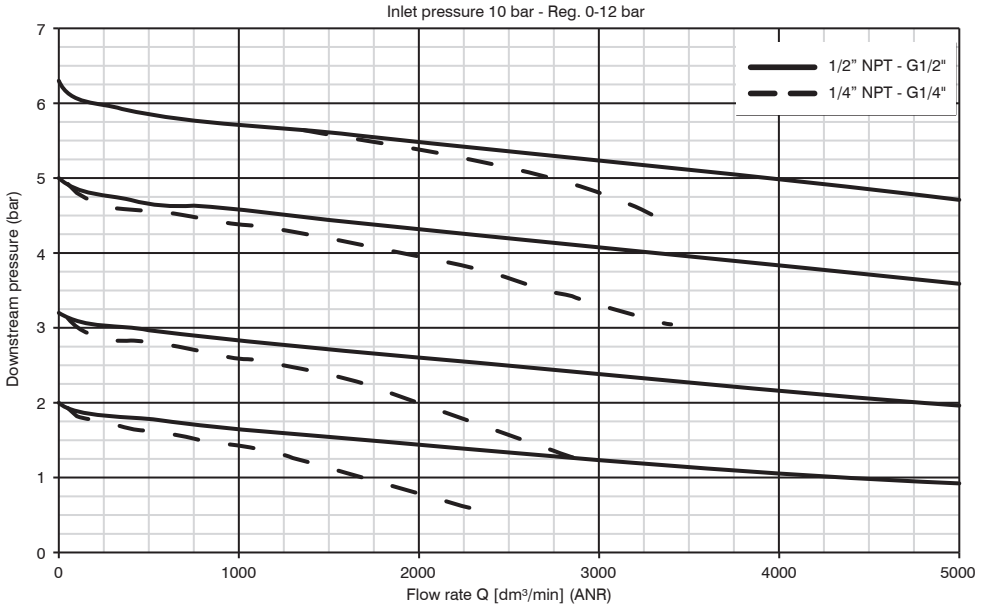
## Characteristic curves

### Flow rate curves



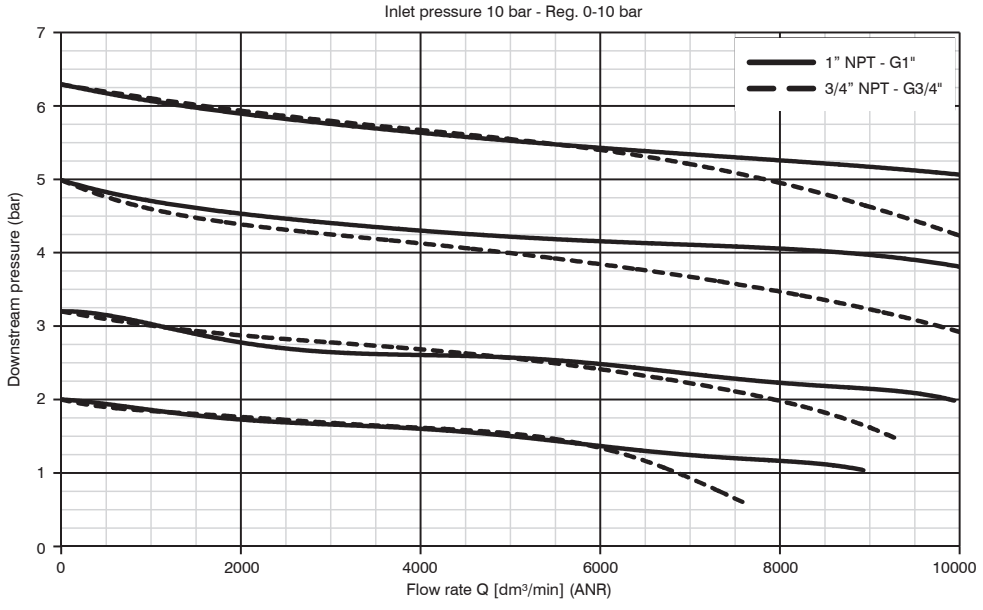

**Size 2**

### Flow rate curves



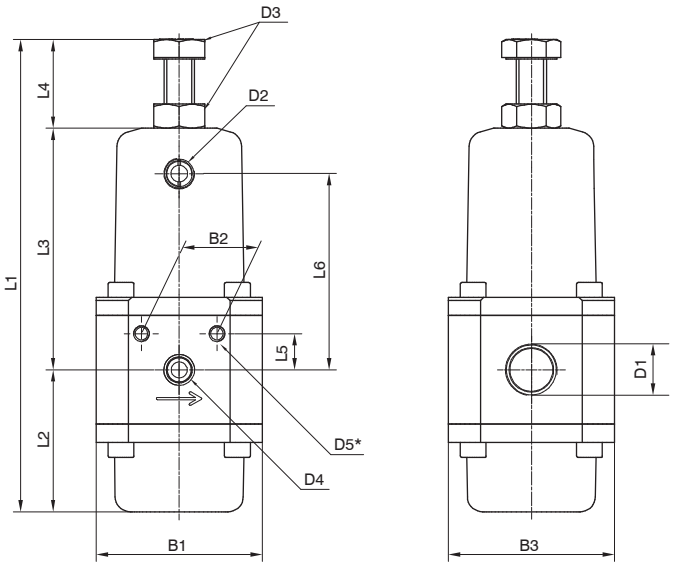

**Size 3**

### Flow rate curves




**Size 4**

## Dimensions




*THREADED HOLES ON BOTH SIDES

| Model | B1 | B2 | B3 | D1 | D2 | D3 | D4 | D5 | L1 | L2 | L3 | L4 | L5 | L6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #172... | 55 | 25 | 55 | 1/4" NPT<br>3/8" NPT<br>G1/4" | 1/8" NPT | Ch.17 | 1/8" NPT | M5<br>2 front holes<br>2 rear holes | 156,5 | 47 | 80 | 29,5 | 12 | 65 |
| #173... | 71 | 22 | 71 | 1/4" NPT<br>1/2" NPT<br>G1/2" | 1/8" NPT | Ch.17 | 1/8" NPT | M6<br>2 front holes<br>2 rear holes | 172,5 | 53 | 91 | 28,5 | 14,5 | 76,5 |
| #174... | 92 | 36 | 92 | 3/4" NPT<br>1" NPT<br>G1" | 1/8" NPT | Ch.19 | 1/8" NPT | M8<br>2 front holes<br>2 rear holes | 260,5 | 74 | 147 | 39,5 | 22,5 | 128 |

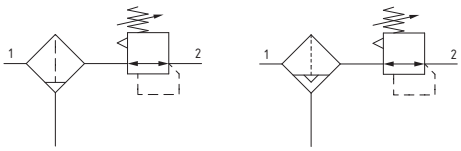


Overall dimensions and technical information are provided solely for informative purpose and may be modified without notice

## Filter regulators



- Filter-pressure regulator diaphragm with over-pressure drain (Relieving)
- Body, adjustment mechanism, back plate and caseback internal components in AISI 316L stainless steel
- AISI 316 stainless steel adjustment springs
- Fixing screws, adjustment screw and locking nut in inox A4 (AISI 316)
- Clean profile versions available
- Filter cartridge available in AISI 316 stainless steel or HDPE
- Low hysteresis rolling diaphragm
- Balanced system
- Manual or automatic drain
- ATEX certification (II 2G or II 2D), SIL, EAC




**Note**
The pressure must be always regulating while increasing. For a more precise regulation and higher sensibility, the use of a regulator with a pressure range as close as possible to the regulated pressure is recommended.



| Technical characteristics | | | |
|---|---|---|---|
| **Size** | Size 2 | Size 3 | Size 4 |
| Type | Rough finishing<br>Clean profile<br>(Bowl and adjustment mechanism) | | |
| IN / OUT connections | 1/4" NPT<br>3/8" NPT<br>G1/4" | 1/4" NPT<br>1/2" NPT<br>G1/2" | 3/4" NPT<br>1" NPT<br>G1" |
| Assembly configuration | Stand alone | | |
| Assembly position | Vertical | | |
| Filter pore size (µm) | 5<br>20<br>50 | | |
| Pressure range (bar) | 0-2<br>0-4<br>0-8<br>0-12 | | 0-2<br>0-4<br>0-7<br>0-10 |
| Max. bowl capacity ($cm^3$) | 34 | 68 | 90 |
| Condensation drain | Manual<br>Automatic | | |
| Regulation | Manual | | |
| Pressure measurement | 1/8" NPT pressure gauge connection port | | |

| Operational characteristics | | | | | | |
|---|---|---|---|---|---|---|
| **Size** | Size 2 | Size 3 | Size 4 | Size 2 | Size 3 | Size 4 |
| Condensation drain | Manual condensation drain | | | Automatic condensation drain | | |
| Maximum working pressure (bar) | 20 (standard version) | | | 16 (automatic drain version)<br>10 (reduced orifice automatic drain version) | | |
| Minimum working pressure (bar) | / | | | 0,5 | | |
| Working temperature (C°) | -30 ... +80 (standard version)<br>-50 ... +80 (low temperature L version)<br>-60 ... +80 (low temperature version -60 °C Z)<br>-5 ... +150 (lhigh temperature H version)<br>-40 ... +100 (EPDM-FDA version) | | | -35 ... +70 (automatic drain S version and reduced orifice automatic drain SR version) | | |

| Weight | | | |
|---|---|---|---|
| **Size** | Size 2 | Size 3 | Size 4 |
| Standard version (g) | 1492 | 2557 | 6253 |
| Automatic drain version / Reduced orifice automatic drain version (g) | 1579 | 2723 | 6290 |

## Order codes

S | S | 17 | 3B | E | B | B | N | L

| Version | |
|---|---|
| S | Rough finishing |
| F | Clean profile |
| M | Modular assembly version (only for size 2 and size 3) |

| Size and connections | |
|---|---|
| 2A | Size 2 - 1/4" NPT |
| 2B | Size 2 - 3/8" NPT |
| 2C | Size 2 - G1/4" |
| 3A | Size 3 - 1/4" NPT |
| 3B | Size 3 - 1/2" NPT |
| 3D | Size 3 - G1/2" |
| 4A | Size 4 - 3/4" NPT |
| 4B | Size 4 - 1" NPT |
| 4D | Size 4 - G1" |

| Filter pore size | |
|---|---|
| A | 5 $\mu$m - 316 stainless steel |
| B | 20 $\mu$m - 316 stainless steel |
| C | 50 $\mu$m - 316 stainless steel |
| D | 5 $\mu$m - HDPE |
| E | 20 $\mu$m - HDPE |
| F | 50 $\mu$m - HDPE |

| Pressure range | |
|---|---|
| A | 0 - 2 bar |
| B | 0 - 4 bar |
| C | 0 - 8 bar (0 - 7 bar for size 4) |
| D | 0 - 12 bar (0 - 10 bar for size 4) |

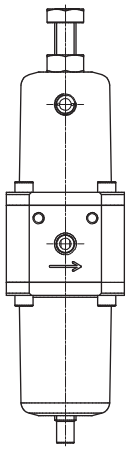
| Type | |
|---|---|
| | Standard |
| N | Without relieving |

| Options | |
|---|---|
| | Standard |
| L | Low temperature |
| Z | Low temperature (-60 °C) |
| H | High temperature |
| S | Automatic drain |
| SR | Reduced orifice automatic drain version |
| EF | EPDM-FDA |

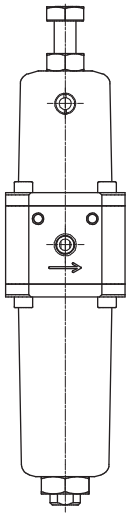
**Example: SS173BEBBNL**
Size 3 filter regulator, rough finishing, 1/2" NPT connection, filter pore size 20 $\mu$m - 316 stainless steel, pressure range 0 - 4 bar, without relieving, low temperature version.

## Design

**Size 2 - Size 3 - Size 4**
Manual drain



**Size 2 - Size 3 - Size 4**
Automatic drain

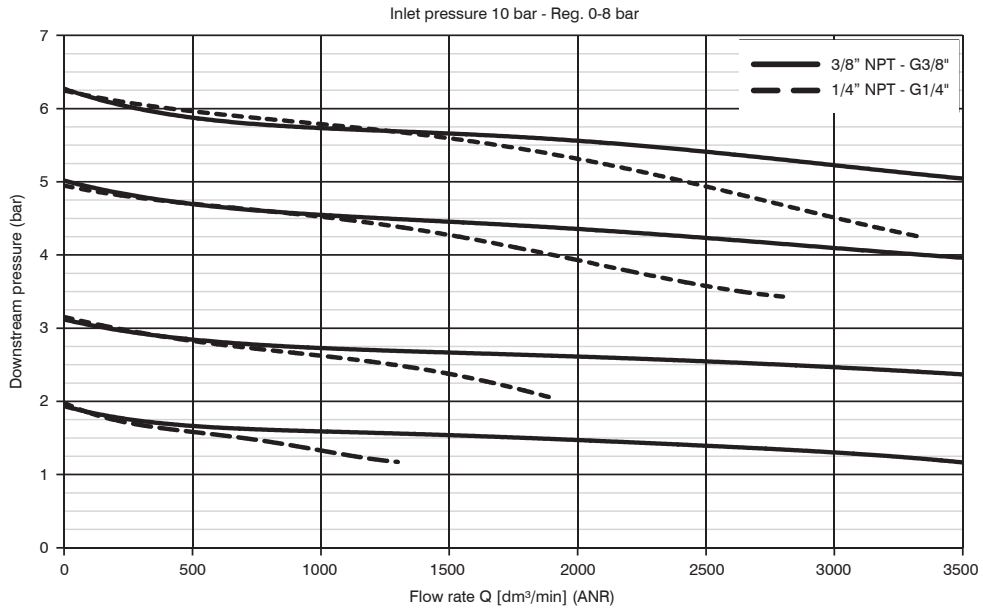




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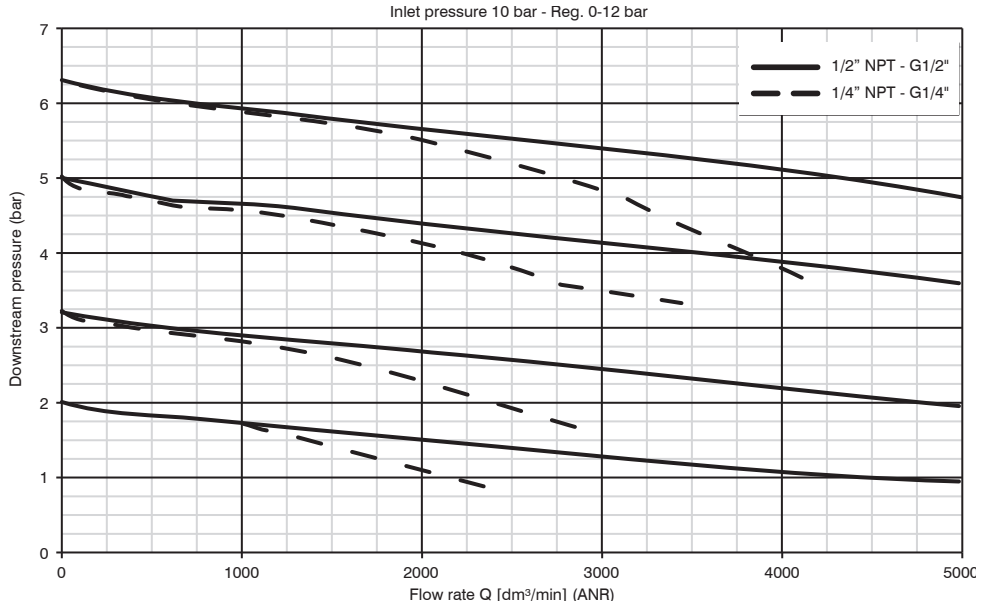
## Characteristic curves

Flow rate curves



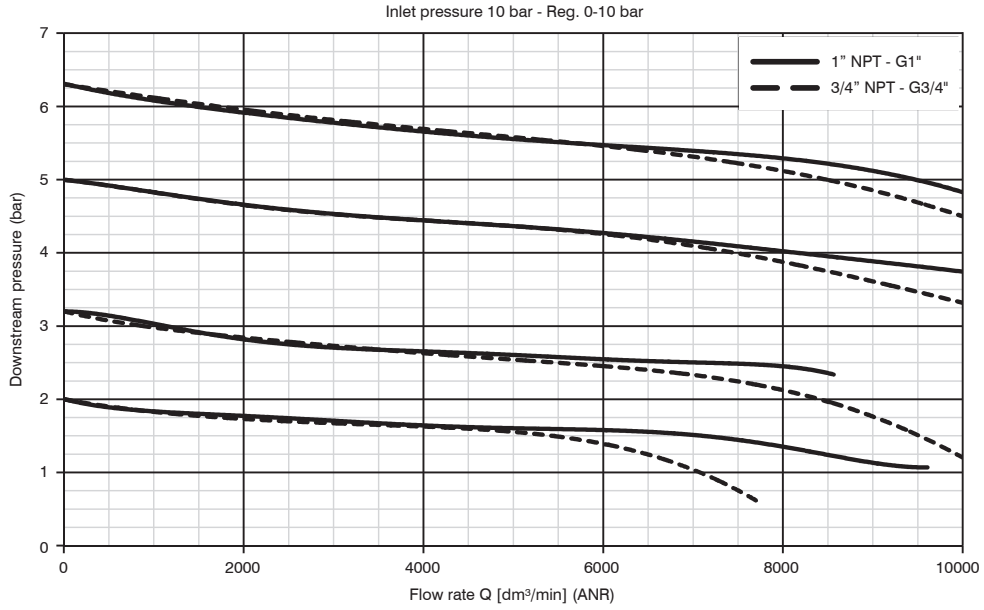

**Size 2**

Flow rate curves




**Size 3**

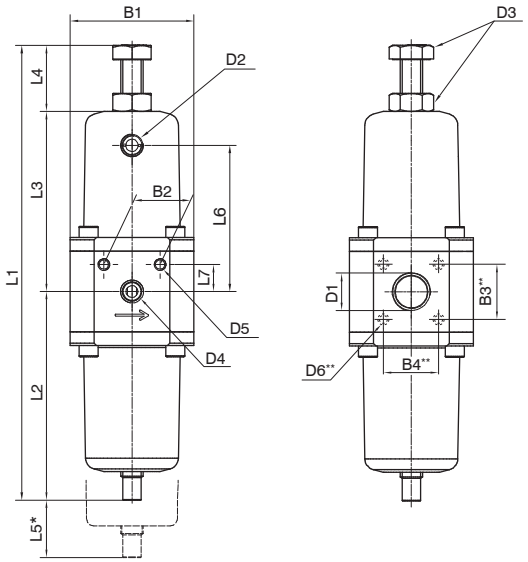
Flow rate curves




**Size 4**

## Dimensions

Overall manual drain version



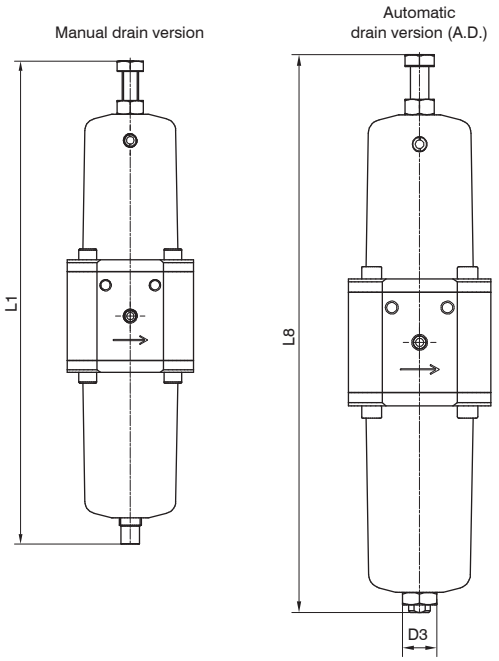

* = BOWL REMOVAL MAXIMUM HEIGHT
** = ONLY FOR M VERSION

| Model | B1 | B2 | B3 | B4 | D1 | D2 | D3 | D4 | D5 | D6 | L1 | L2 | L3 | L4 | L5 | L6 | L7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #172... | 55 | 25 | 25 | 25 | 1/4" NPT<br>3/8" NPT<br>G1/4" | 1/8" NPT | Ch.17 | 1/8" NPT | M5<br>2 front holes<br>2 rear holes | M4<br>4 holes IN side<br>4 holes OUT side | 202,5 | 93 | 80 | 29,5 | 45 | 65 | 12 |
| #173... | 71 | 22 | 31,5 | 31,5 | 1/4" NPT<br>1/2" NPT<br>G1/2" | 1/8" NPT | Ch.17 | 1/8" NPT | M6<br>2 front holes<br>2 rear holes | M5<br>4 holes IN side<br>4 holes OUT side | 223,5 | 104 | 91 | 28,5 | 65 | 76 | 14,5 |
| #174... | 92 | 36 | / | / | 3/4" NPT<br>1" NPT<br>G1" | 1/8" NPT | Ch.19 | 1/8" NPT | M8<br>2 front holes<br>2 rear holes | / | 352,5 | 166 | 147 | 39,5 | 80 | 128 | 22,5 |

## Variable dimensions

Manual drain version

Automatic drain version (A.D.)



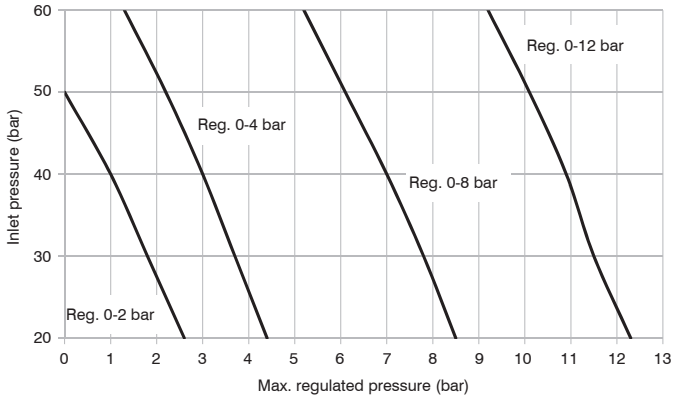

| Model | L1 | L8 | D3 |
|---|---|---|---|
| #172... | 202,5 | 229,5 | 1/8" NPT |
| #173... | 223,5 | 259,5 | 1/8" NPT |
| #174... | 352,5 | 361 | 1/8" NPT |



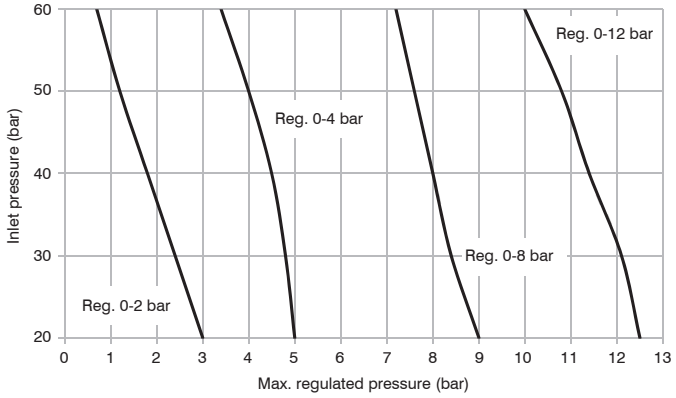
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**Inlet pressure notes**

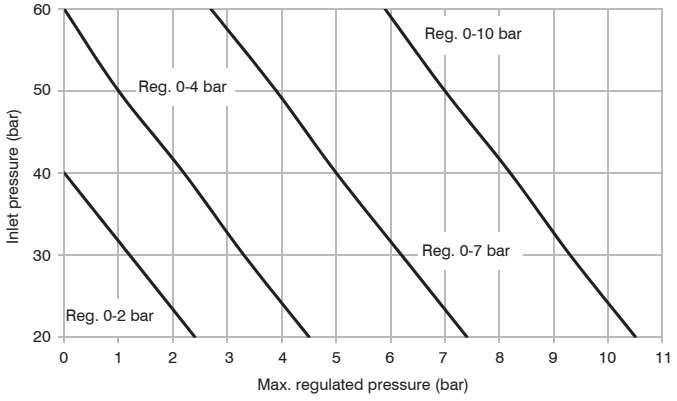
Pressure regulator Stainless steel line have been designed to withstand **a 60 bar** maximum inlet pressure. **Maximum regulated outlet pressure is 20 bar**. For performance details please refer to diagram alongside.




**Size 2**




**Size 3**



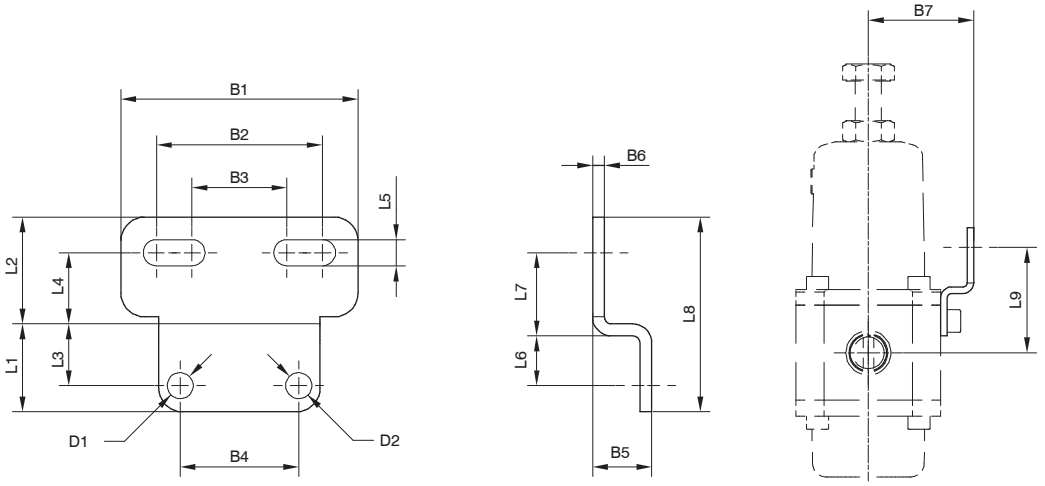

**Size 4**

## Fixing bracket

**SS174** **50**

| Size | |
|---|---|
| SS172 | Size 2 |
| SS173 | Size 3 |
| SS174 | Size 4 |





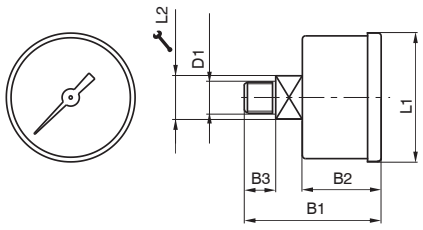

| Model | B1 | B2 | B3 | B4 | B5 | B6 | B7 | D1 | D2 | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 | L9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SS17250 | 50 | 35 | 20 | 25 | 12,5 | 2,5 | 40 | Ø5,5 | Ø5,5 | 18,5 | 22,5 | 13 | 15 | 5,5 | 10,5 | 17,5 | 41 | 40 |
| SS17350 | 60 | 45 | 20 | 22 | 14,5 | 3 | 50 | Ø6,5 | Ø6,5 | 14 | 24,5 | / | 16,5 | 6,5 | 11 | 19,5 | 44,5 | 45 |
| SS17450 | 80 | 60 | 40 | 36 | 16 | 4 | 62 | Ø8,5 | Ø8,5 | 24 | 31 | / | / | 8,5 | 11 | 25 | 55 | 58,5 |

## Pressure gauge

**SS17070A** **A**

| Scale | |
|---|---|
| A | 0 - 4 bar |
| B | 0 - 12 bar |






| Model | B1 | B2 | B3 | D1 | L1 | L2 |
|---|---|---|---|---|---|---|
| SS17070AA<br>SS17070AB | 40 | 25 | 10 | 1/8" NPT | 42,5 | 11 |



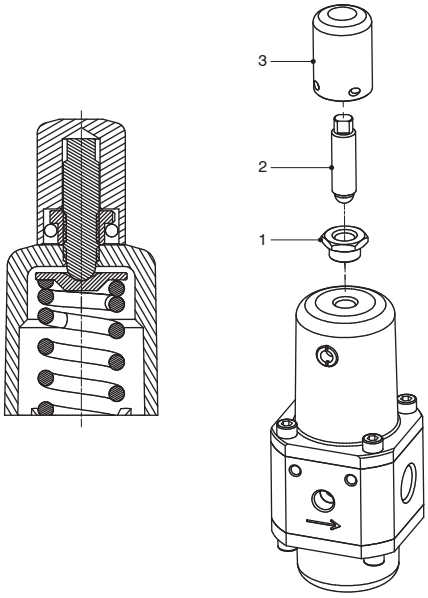
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## Tamper-proof kit

SS174 55

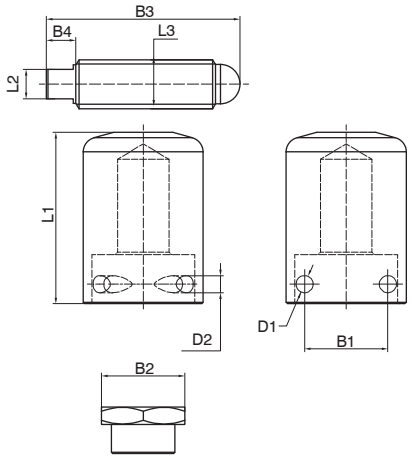
| Size | |
|---|---|
| SS172 | Size 2 - Size 3 |
| SS174 | Size 4 |






To use, replace the standard adjustment screw and nut with the screw and nut supplied in the kit. Assemble the screw and nut as shown (see adjacent drawing), adjust until the desired $P_2$ value is reached, lock the nut and insert the cap that can be locked with wire or padlock.

| Tamper-proof kit | |
|---|---|
| 1 | Adjustment screw |
| 2 | Locking nut |
| 3 | Tamper-proof cap |




| Model | B1 | B2 | B3 | B4 | D1 | D2 | L1 | L2 | L3 |
|---|---|---|---|---|---|---|---|---|---|
| SS17250 | 17 | Ch.17 | 39,5 | 6 | Ø3,5 | Ø3,5 | 35 | Ch. 6 | M10x1,5 |
| SS17450 | 19 | Ch. 20 | 56,5 | 6,5 | Ø3,5 | Ø3,5 | 45 | Ch. 7 | M12x1,75 |



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## Series 1700 - Electronic proportional regulators - Size 0 - 1 - 3

Modern industrial applications require increasingly high performances from their pneumatic components. For example, the speed and thrust of a pneumatic actuator may need to be varied. These parameters often need to be modified dynamically while an operation is running.
This solution can be achieved by means of a regulator that can vary pressure over time.
Pneumax portfolio includes 1700 Series electronic proportional regulator, available in three different sizes with flow rates of 7, 1100, and 4000 Nl/min respectively and supporting Analog/Digital, CANopen® or IO-Link communication interfaces.

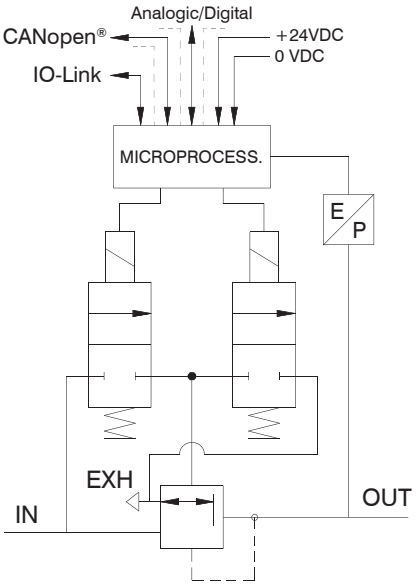
### Application fields

Typical applications will include the necessity to dynamically control the force of the actuator, be it thrust of torque.
Examples include: Closing systems, painting systems, tensioning systems, packaging systems, pneumatic braking systems, force control for welding grippers, thickness compensation systems, balancing systems, laser cutting, pressure transducers for the control of modulating valves, test benches for system testing, force control for buffers on polishers, etc.

### Product presentation

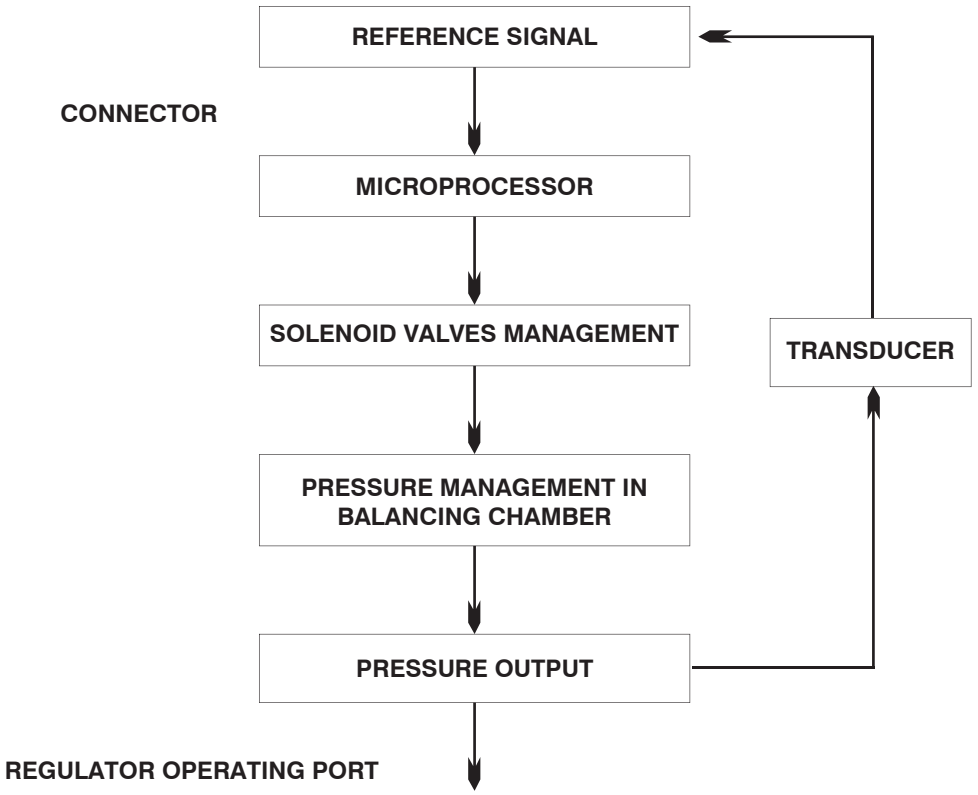
The supply and exhaust connections are on one side of the regulator and the working port is on the opposite side. The two remaining sides carry G 1/8" ports that are blanked off with removable plugs, these can be used to connect a pressure gauge or as an outlet port. If you order the version with the external feedback there is a M5 threaded connection to which connect the feedback pressure (to the pressure transducer). This connection is placed on the outlet connection side. This option allows to take the signal from a remote point instead of directly from the outlet connection; this function is typically used when the regulated pressure is used far away to the regulator. The control solenoid valves, the pressure sensor, and the management electronics are placed in upper part of the regulator. The electronic management system is the same for all the size 0, size 1 and size 3 regulators.

### Functional diagram




### CLOSED LOOP diagram (internal control circuit)

The proportional regulator is known as a CLOSED LOOP regulator because a pressure transducer in the circuit transmits a continuous analog signal to the microprocessor, which compares the reference value and supplies the control solenoid valves accordingly.





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Features

| Pneumatic | | | |
|---|---|---|---|
| Fluid | Air filtered at 5 micron and dehumidified | | |
| Minimum inlet pressure | Desired outlet pressure + 1 bar | | |
| Maximum inlet pressure | 10 bar | | |
| Outlet pressure | 0 ... 9 bar | | |
| Nominal flowrate from 1 to 2 (6 bar ΔP 1 bar) | Size 0 | Size 1 | Size 3 |
| | 7 Nl/min | 1100 Nl/min | 4000 Nl/min |
| Discharge flowrate (a 6 bar with 1 bar overpressure) | 7 Nl/min | 1300 Nl/min | 4500 Nl/min |
| Air consumption | < 1 Nl/min | < 1 Nl/min | < 1 Nl/min |
| Supply connection | M5 | G 1/4" | G 1/2" |
| Operating connection | M5 | G 1/4" | G 1/2" |
| Exhaust connection | Ø1,8 | G 1/8" | G 3/8" |
| Maximum fitting tightening | 3 Nm | 15 Nm | 15 Nm |

| Electric | | |
|---|---|---|
| Supply voltage | | 24VDC ± 10% (stabilized with ripple<1%) |
| Standby current consumption | | 70mA |
| Current consumption with solenoid valves on | | 400mA |
| **Reference Signal | Voltage | *0 ... 10 V<br>*0 ... 5 V<br>*1 ... 5 V |
| | Current | *4 ... 20 mA<br>*0 ... 20 mA |
| **Input Impedance | Voltage | 10 kΩ |
| | Current | 250 Ω |
| **Digital Inputs | | 24VDC ± 10% |
| **Digital Output | | 24 VDC PNP (max current 50 mA) |

| Functional | |
|---|---|
| Linearity | ± Insensitivity |
| Hysteresis | ± Insensitivity |
| Repeatability | ± Insensitivity |
| Sensitivity | 0,01 bar |
| Assembly position | Indifferent |
| Protection grade | IP65 (with casing fitted) |
| Ambient temperature | -5°C ... 50°C / 23°F ... 122°F |

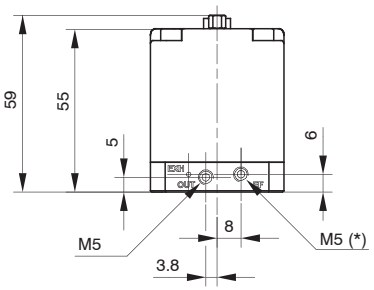
| Constructional | | | |
|---|---|---|---|
| Body | Anodized aluminum | | |
| Shutters | Brass with vulcanized NBR | | |
| Diaphragm | Cloth-covered rubber | | |
| Seals | NBR | | |
| Cover for electrical part | Technopolymer | | |
| Springs | AISI 302 | | |
| Weight | Size 0 | Size 1 | Size 3 |
| | 168 g | 360 g | 850 g |

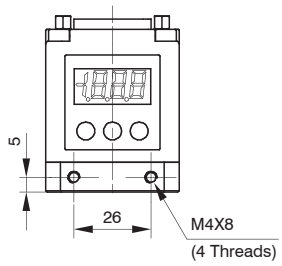
* Selectable by keyboard or by RS-232
** Valid only for devices with analog input

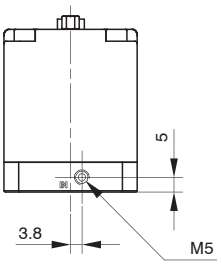
## Overall dimensions ("521" standard version and CANopen® version with SUB-D 15 poles)

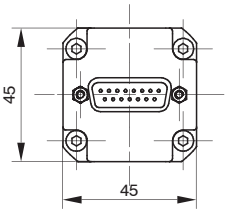
### Size 0





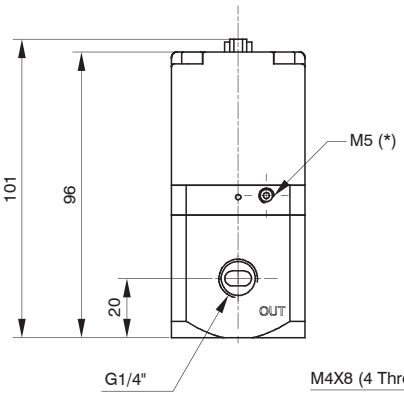



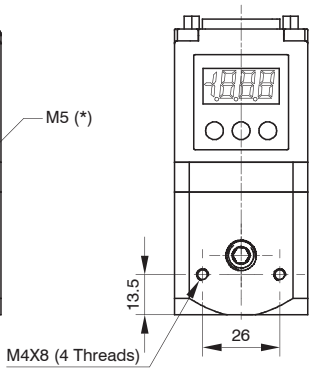



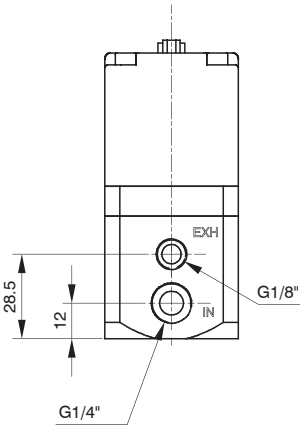

* = EXTERNAL FEEDBACK INPUT CONNECTION
(AVAILABLE ONLY ON THE EXTERNAL FEEDBACK VERSION)

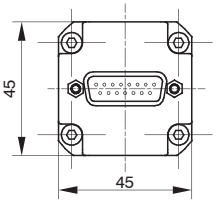
### Size 1





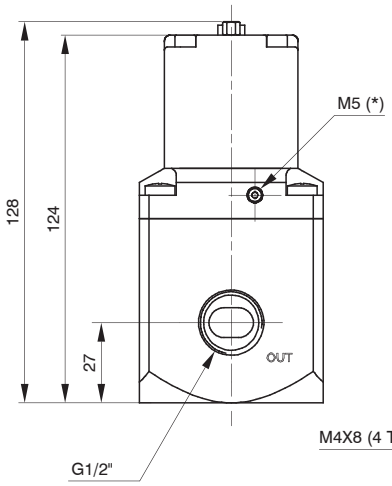



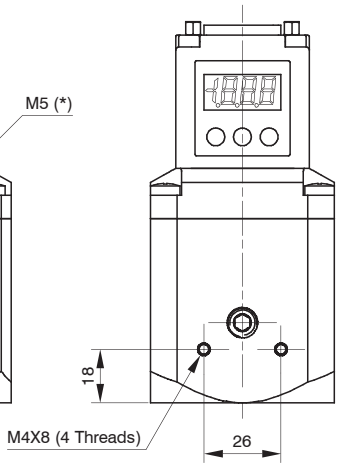



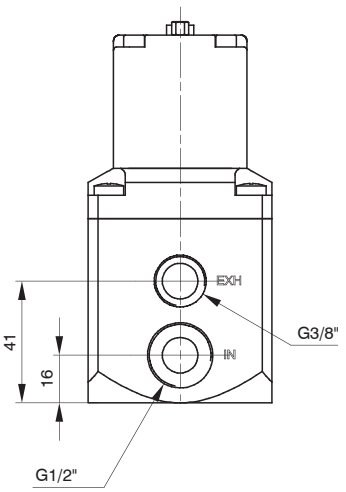

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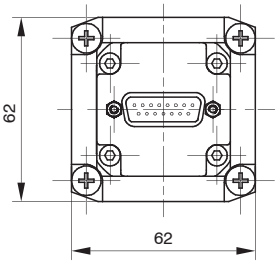
### Size 3





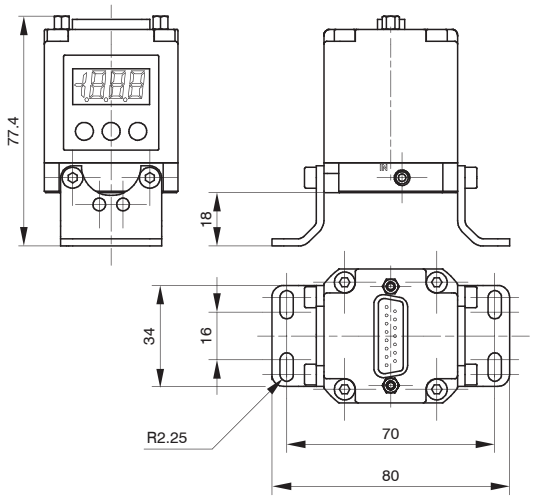

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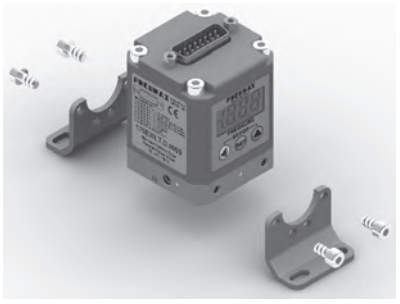

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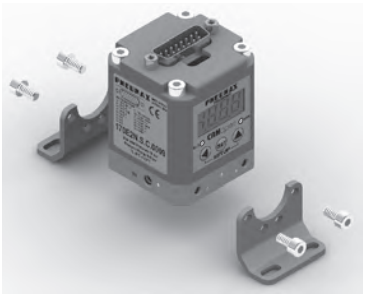
## Mounting options ("521" standard version and CANopen® version with SUB-D 15 poles)

In addition to mounting directly using the M4 tappings on the body, the 170M5 bracket may also be used, as shown below:

### Size 0



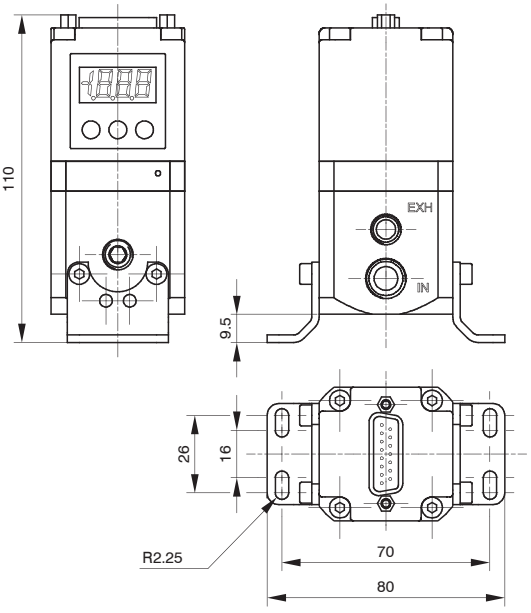





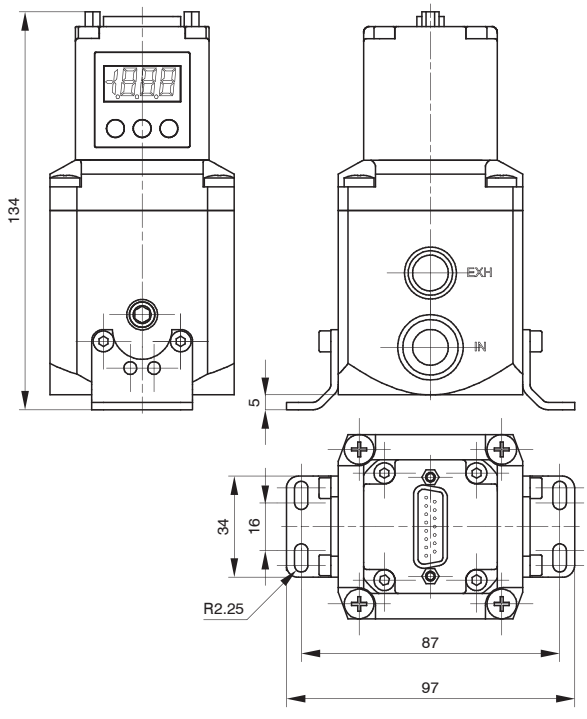
### Size 1

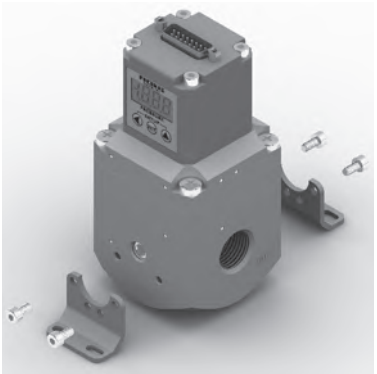


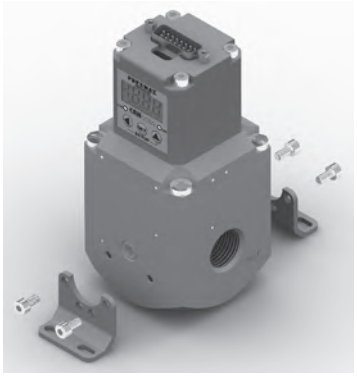





### Size 3



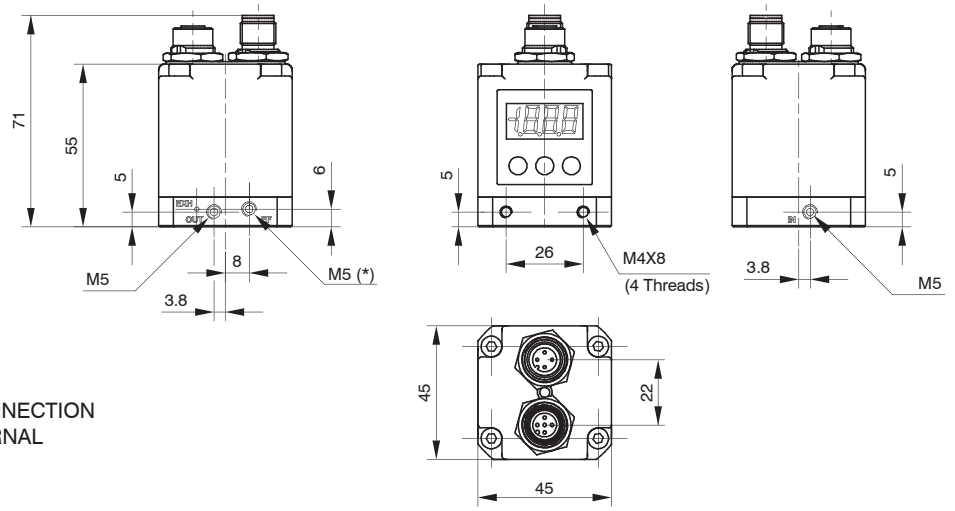





## Overall dimensions ("521 M12 version" - CANopen® version)

### Size 0

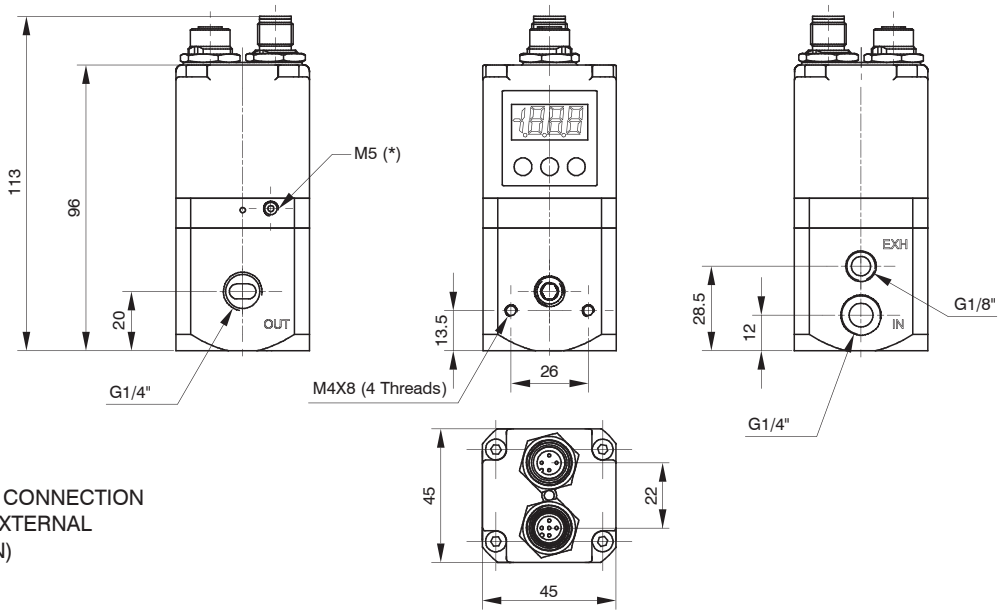





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(AVAILABLE ONLY ON THE EXTERNAL
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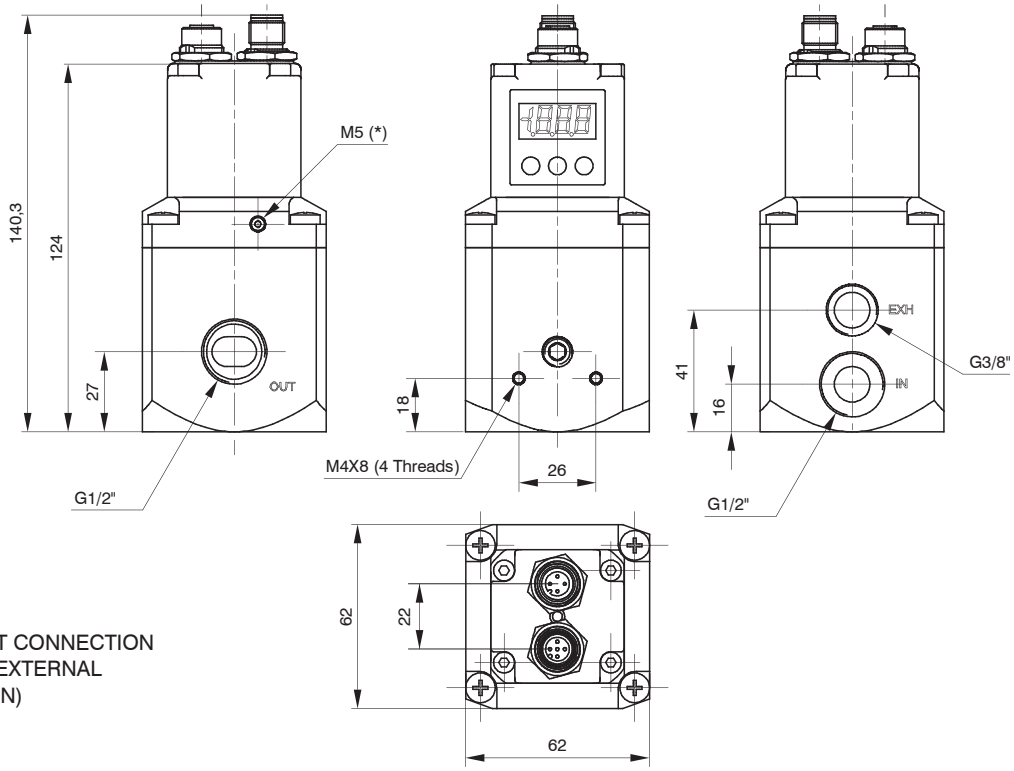





* = EXTERNAL FEEDBACK INPUT CONNECTION
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FEEDBACK VERSION)

### Size 3



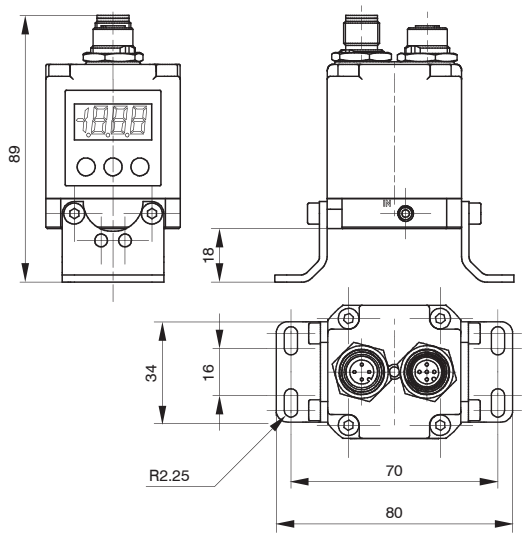



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**Mounting options ("521 M12 version" - CANopen® version)**

In addition to mounting directly using the M4 tappings on the body, the 170M5 bracket may also be used, as shown below:

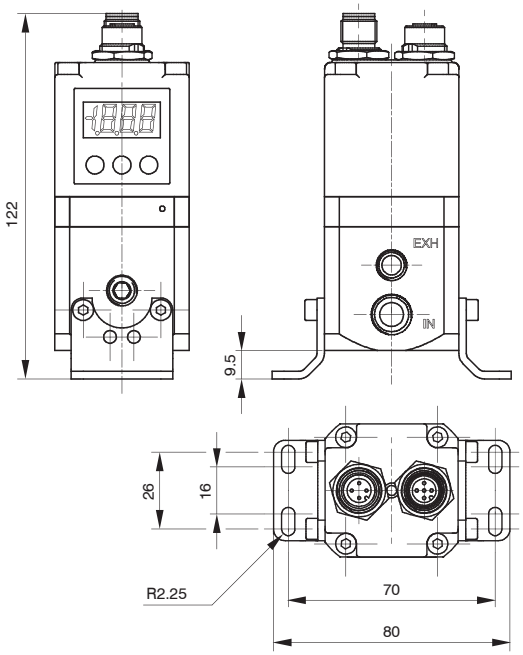


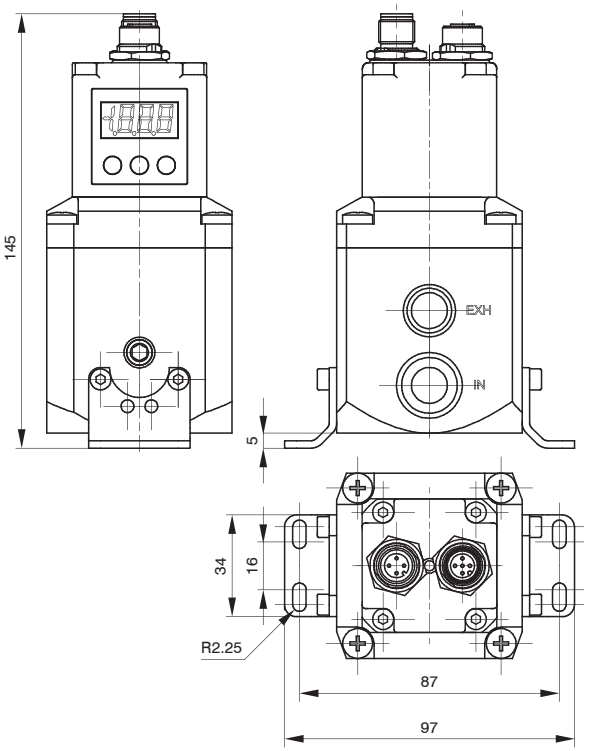

## Size 0



## Size 1





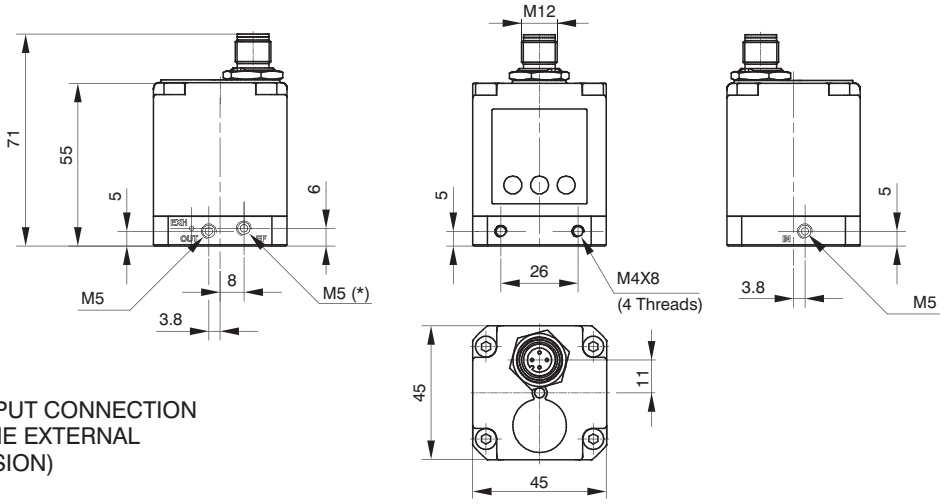

## Size 3



## Overall dimensions ("521 M12 BASIC version")

### Size 0

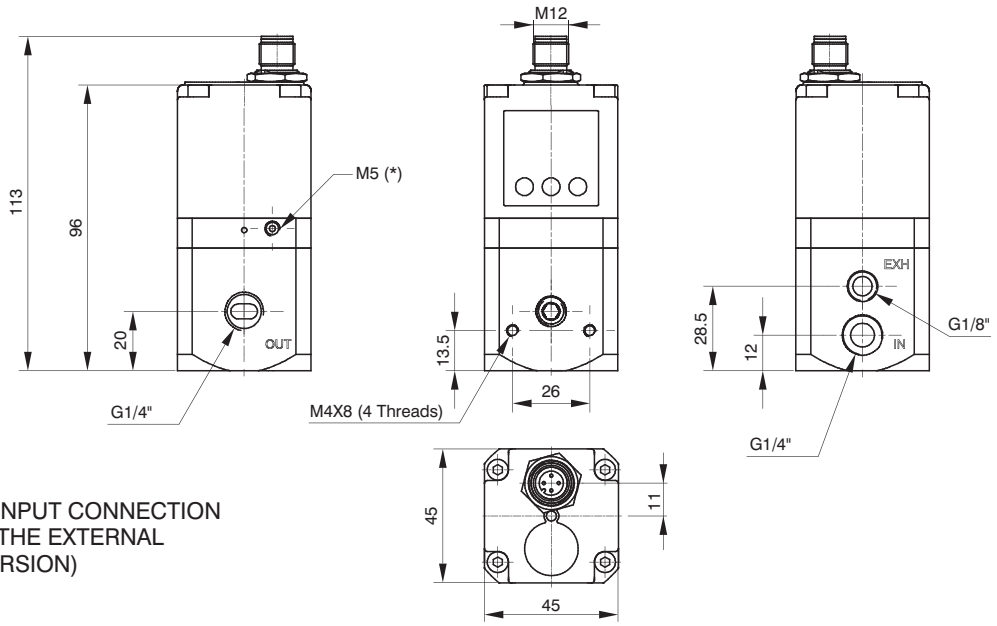





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(AVAILABLE ONLY ON THE EXTERNAL
FEEDBACK VERSION)

### Size 1

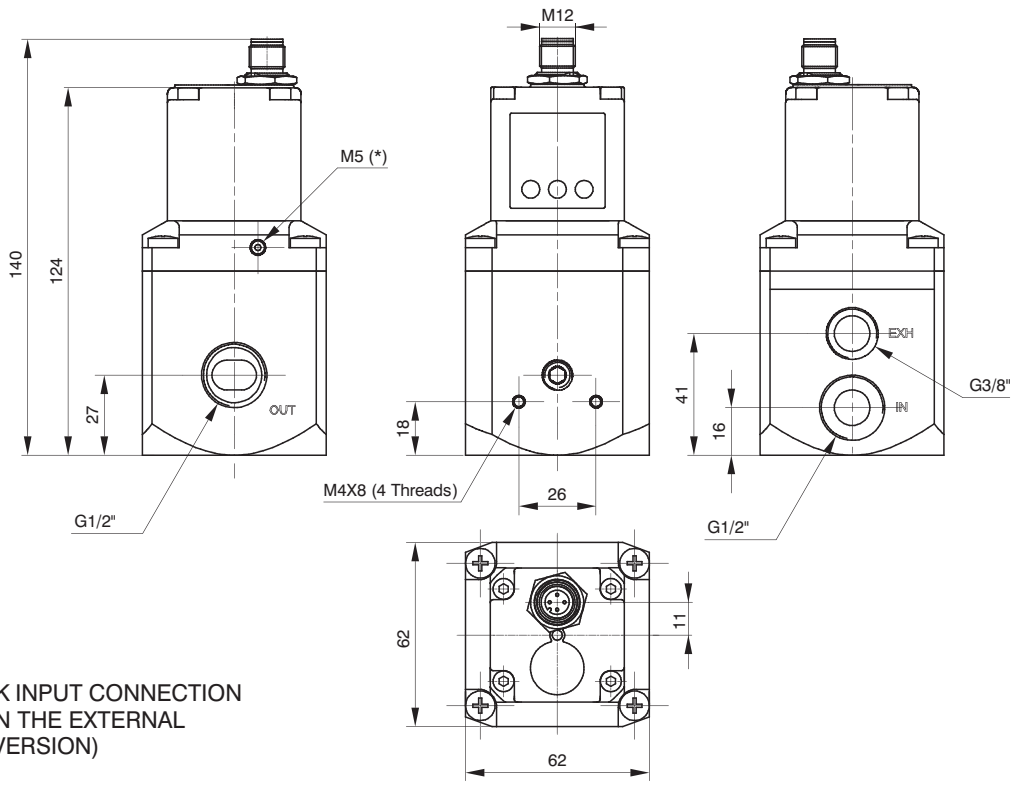





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FEEDBACK VERSION)

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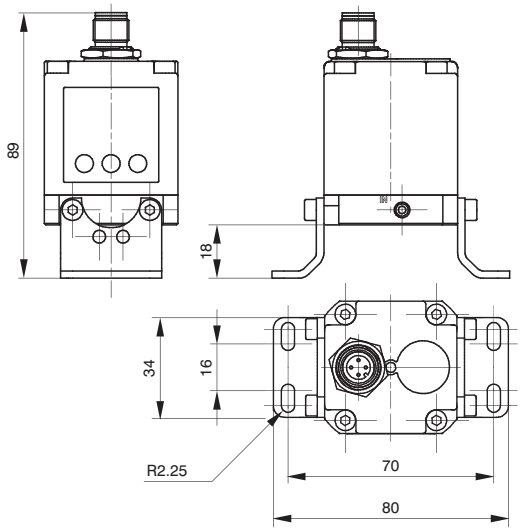



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FEEDBACK VERSION)


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**Mounting options ("521 M12 BASIC version")**

In addition to mounting directly using the M4 tappings on the body, the 170M5 bracket may also be used, as shown below:

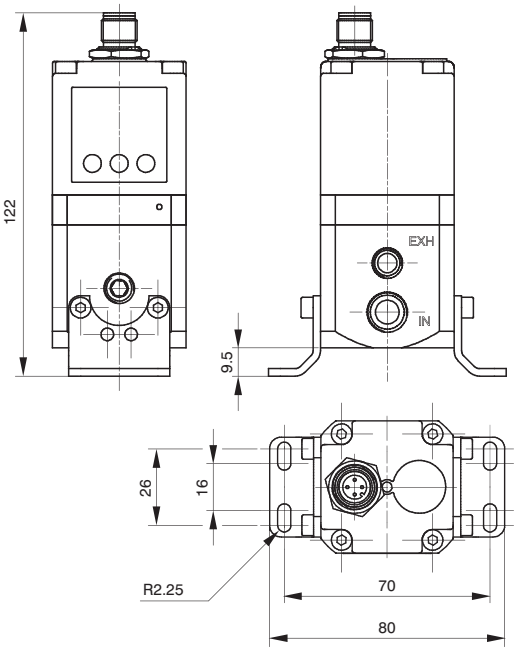


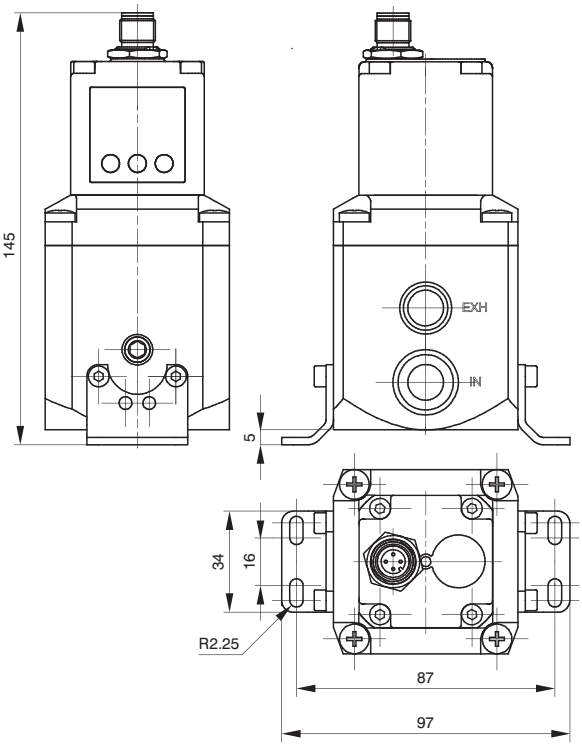

## Size 0



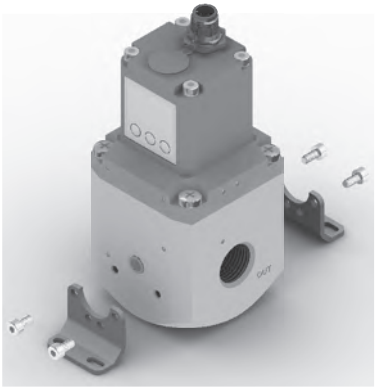
## Size 1





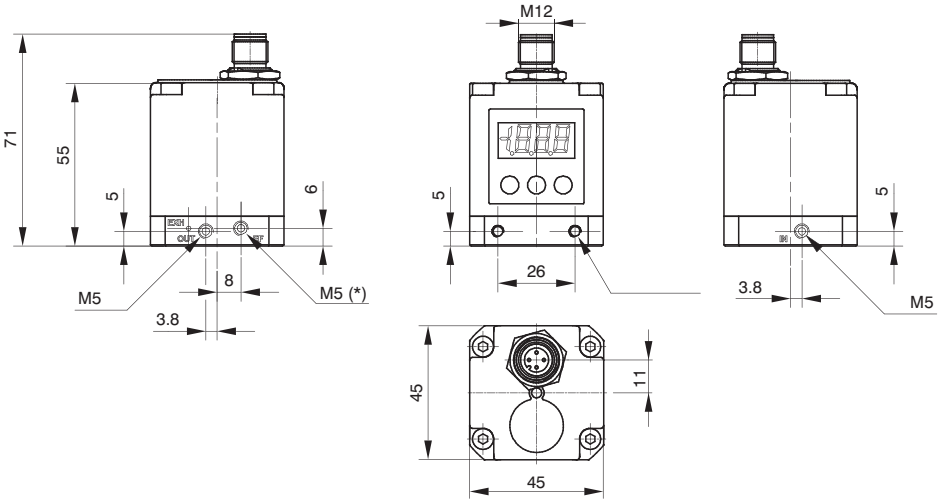

## Size 3



## Overall dimensions ("521 M12 version" - Standard version)

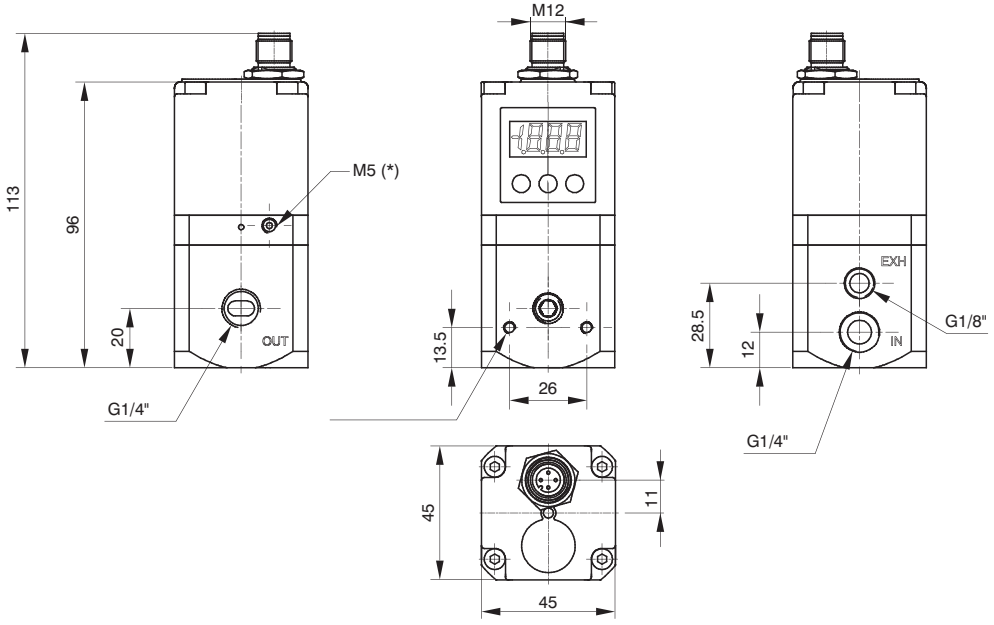
### Size 0





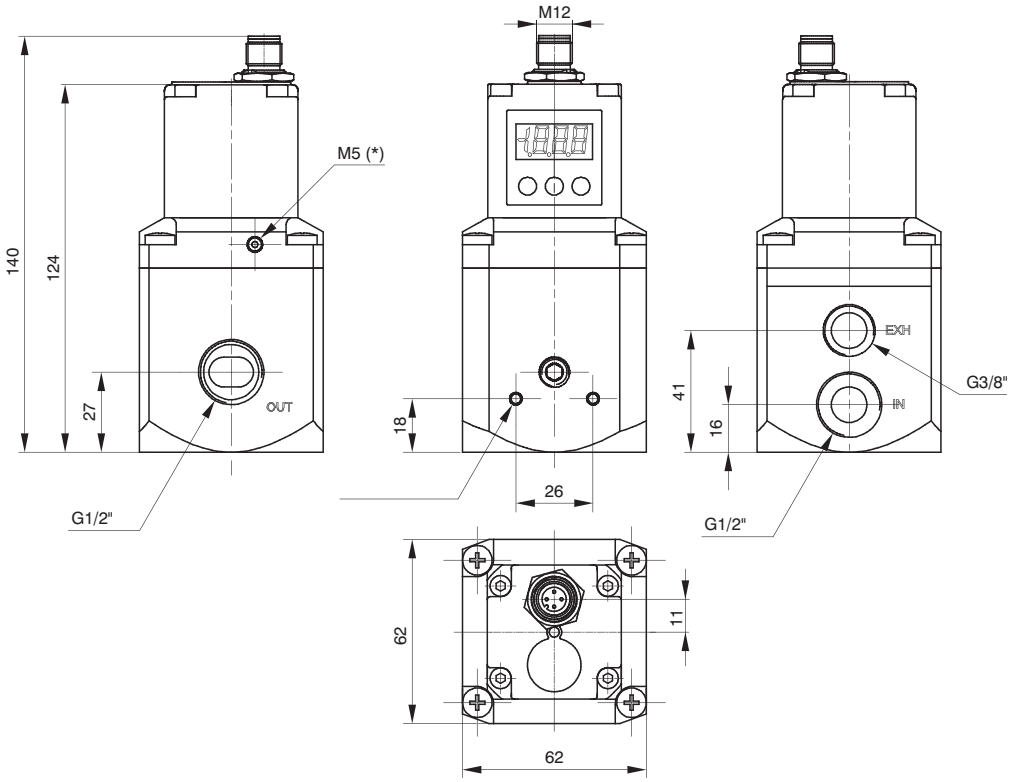

### Size 1






### Size 3





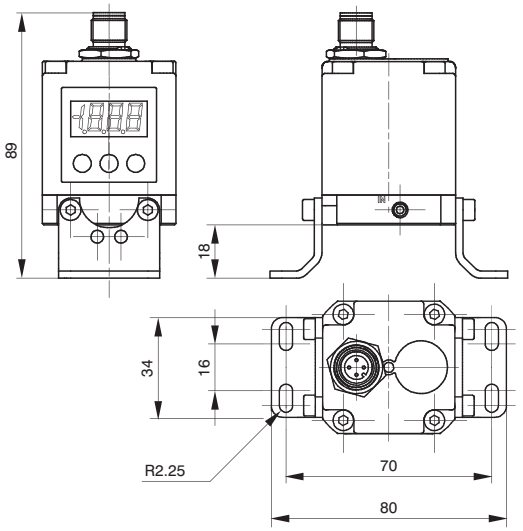



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Mounting options ("521 M12 version" - Standard version)

In addition to mounting directly using the M4 tappings on the body, the 170M5 bracket may also be used, as shown below:

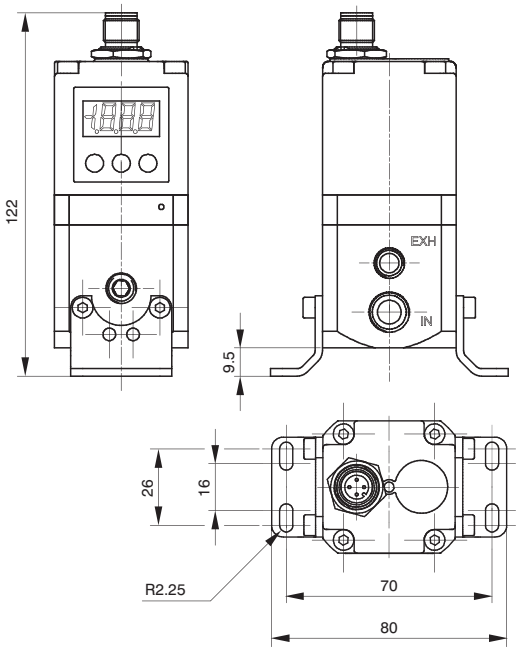
### Size 0

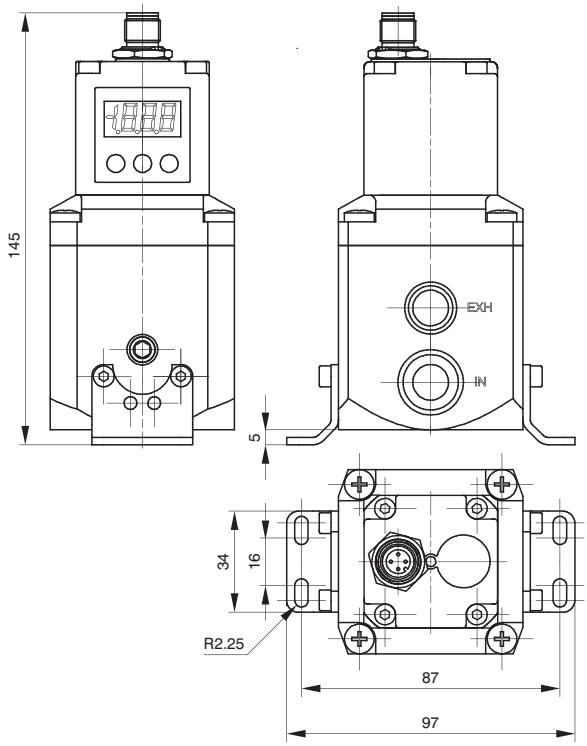




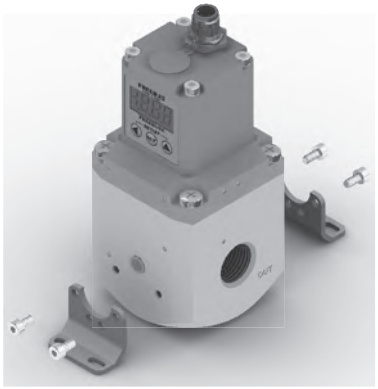

### Size 1





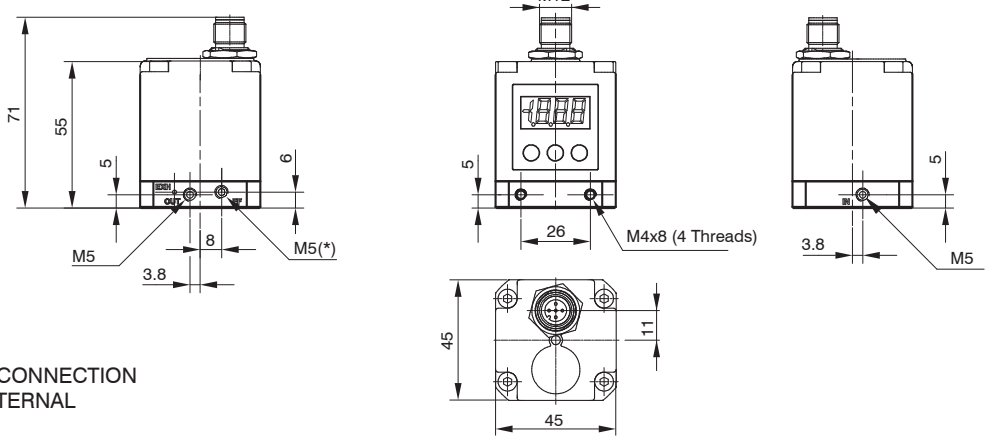

### Size 3



## Overall dimensions ("521 IO-Link version")

### Size 0

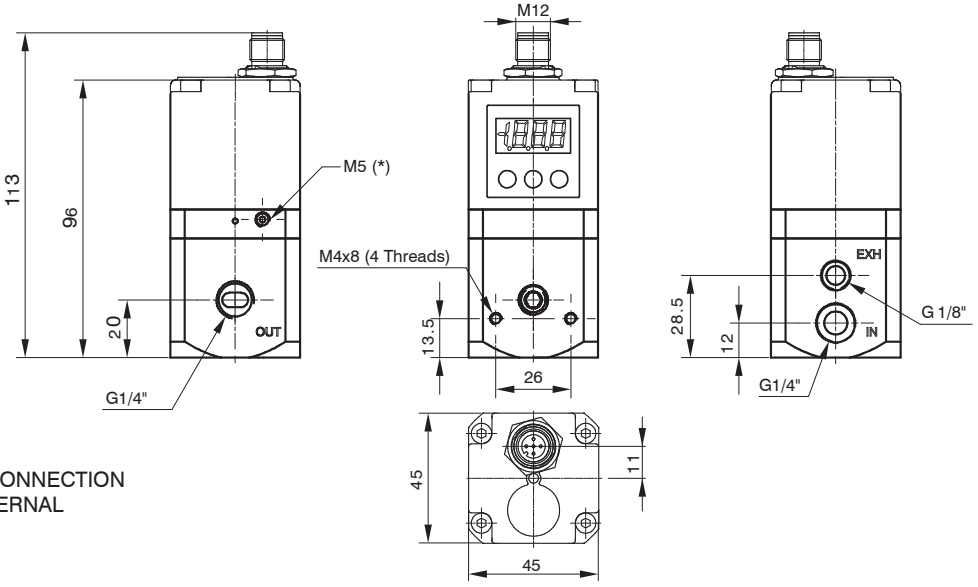





* = EXTERNAL FEEDBACK INPUT CONNECTION
(AVAILABLE ONLY ON THE EXTERNAL
FEEDBACK VERSION)

### Size 1

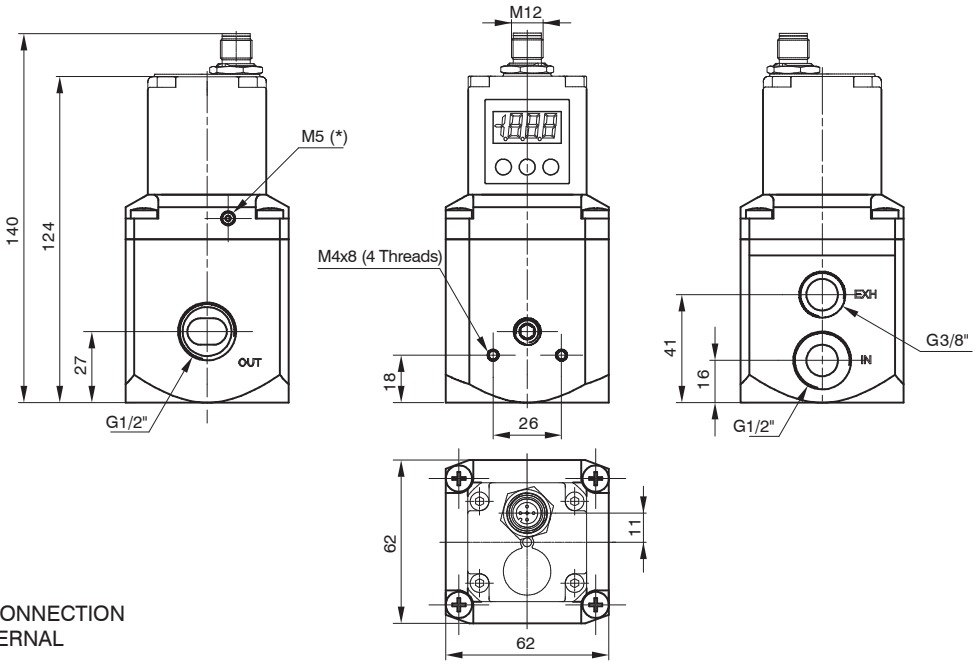





* = EXTERNAL FEEDBACK INPUT CONNECTION
(AVAILABLE ONLY ON THE EXTERNAL
FEEDBACK VERSION)

### Size 3



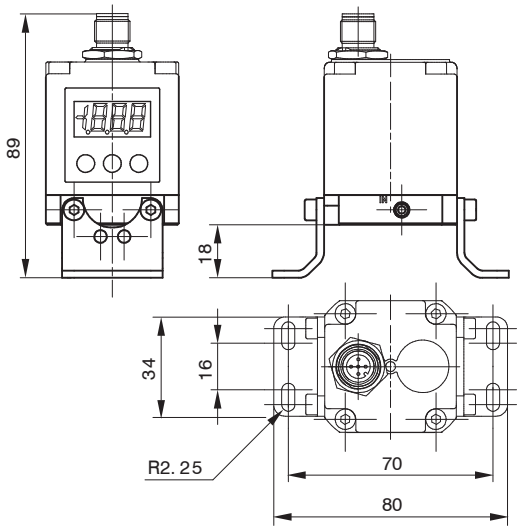



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### Mounting options ("521 IO-Link version")

In addition to mounting directly using the M4 tappings on the body, the 170M5 bracket may also be used, as shown below.

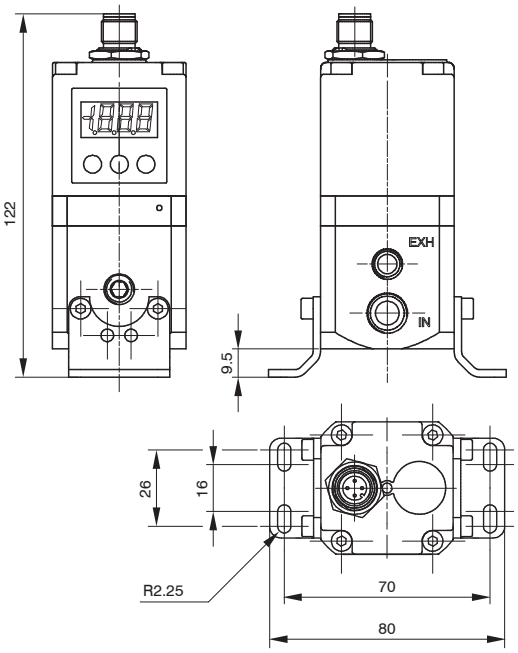


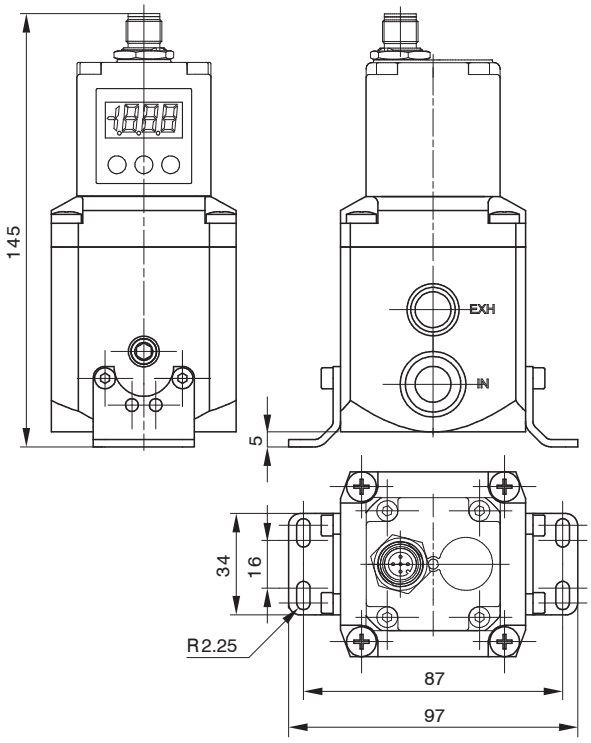

**Size 0**



**Size 1**






**Size 3**



## Installation/Operation

### PNEUMATIC CONNECTION

The compressed air is connected by means of M5 threaded holes (for size 0 regulators), G 1/4" threaded holes (for size 1 regulators) and G 1/2" threaded holes (for size 3 regulators) on the body.
Before making the connections, eliminate any impurities in the connecting pipes to prevent chippings or dust entering the unit. Do not supply the circuit with more than 10 bar pressure and make sure that the compressed air is dried (excessive condensate could cause the appliance to malfunction) and filtered at 5 micron. The supply pressure to the regulator must always be at least 1 bar greater than the desired outlet pressure.
If a silencer is applied to the discharge path the unit response time may change; periodically check that the silencer is not blocked and replace it if necessary.

### ELECTRICAL CONNECTION

For the electrical connection a SUB-D 15-pole female or a M12 connector is used (accordingly to the model, to be ordered separately). Wire in accordance with the wiring diagram shown below.
**Warning: INCORRECT CONNECTIONS MAY DAMAGE THE DEVICE**

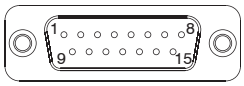
### NOTES ON OPERATION

If the electric supply is interrupted, the outlet pressure is maintained at the set value. However, maintaining the exact value cannot be ensured as it is impossible to operate the solenoid valves.
In order to discharge the circuit downstream, zero the reference, make sure that the display shows a pressure value equal to zero and then disconnect the electric power supply.
A version of the device is available that exhausts the downstream circuit when the power supply is removed. (Option "A" at the end of the ordering code).
If the compressed-air supply is suspended and the electric power supply is maintained a whirring will be heard that is due to the solenoid valves; an operating parameter can be activated (P18) that triggers the regulator protection whenever the requested pressure is not reached within 4 seconds of the reference signal being sent. In this case the system will intervene to interrupt the control of the solenoid valves. Every twenty seconds, the unit will start the reset procedure until standard operating conditions have been restored.

### "521" Standard version with D-SUB connector



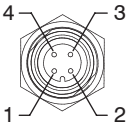
TOP VIEW OF THE REGULATOR CONNECTOR




CONNECTOR PINOUT:
1 = DIGITAL INPUT 1
2 = DIGITAL INPUT 2
3 = DIGITAL INPUT 3
4 = DIGITAL INPUT 4
5 = DIGITAL INPUT 5
6 = DIGITAL INPUT 6
7 = DIGITAL INPUT 7
8 = ANALOG INPUT / DIGITAL INPUT 8
9 = SUPPLY (24 VDC)
10 = DIGITAL OUTPUT (24 VDC PNP)
11 = ANALOG OUTPUT (CURRENT)
12 = ANALOG OUTPUT (VOLTAGE)
13 = Rx RS-232
14 = Tx RS-232
15 = GND

### "521" M12 BASIC and Standard versions






M12 4P
MALE

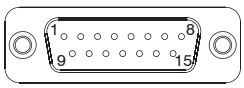
**M12 BASIC version**
CONNECTOR PINOUT:
1 = POWER SUPPLY (24 VDC)
2 = NC
3 = GND
4 = ANALOG INPUT

**M12 Standard version**
CONNECTOR PINOUT:
1 = POWER SUPPLY (24 VDC)
2 = ANALOG OUTPUT (depending on the model)
3 = GND
4 = ANALOG INPUT

### "521" CANopen® version with D-SUB connector



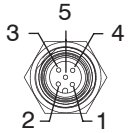
TOP VIEW OF THE REGULATOR CONNECTOR



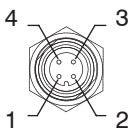

CONNECTOR PINOUT:
1 = CAN_SHIELD
2 = CAN_V+
3 = CAN_GND
4 = CAN_H
5 = CAN_L
6 = NC
7 = NC
8 = NC
9 = SUPPLY (+24 VDC)
10 = CAN_SHIELD
11 = CAN_V+
12 = CAN_GND
13 = CAN_H
14 = CAN_L
15 = GND

### "521" CANopen® version with M12 connector





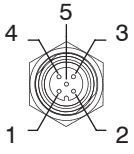

M12 5P
FEMALE




M12 4P
MALE

### "521 IO-Link version"






M12 5P
MALE

CONNECTOR PINOUT:
1 = L+
2 = +24 VDC (P24)
3 = L-
4 = C/Q
5 = GND (N24)


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## ORDERING CODES
### "521" standard version with SUB-D 15 poles



**17_E2N. _ . D . ____ . __**

**VARIANT**
- = Standard Version (no addictional letter required)
- **E** = External pressure feedback
- **A** = Exhaust downstream pressure when power supply is removed
- **AE** = A Variant + E Variant

**PRESSURE RANGE :**
- **0001** = Range 0 - 1 bar
- **0005** = Range 0 - 5 bar
- **0009** = Range 0 - 9 bar

**MANAGEMENT :**
- **C** = Current signal (4-20 mA / 0-20 mA)
- **T** = Voltage signal (0-10 V / 0-5 V / 1-5 V)

**SIZE :**
- **0** = Size 0
- **1** = Size 1
- **3** = Size 3

**WARNING**: Pressure from 0 to 0.1 bar cannot be adjusted.

## ORDERING CODES
### "521" CANopen® version with SUB-D 15 poles



**17_E2N. S . C . ____ . __**

**SIZE :**
- **0** = Size 0
- **1** = Size 1
- **3** = Size 3

**VARIANT**
- = Standard Version (no addictional letter required)
- **E** = External pressure feedback
- **A** = Exhaust downstream pressure when power supply is removed
- **AE** = A Variant + E Variant

**PRESSURE RANGE :**
- **0001** = Range 0 - 1 bar
- **0005** = Range 0 - 5 bar
- **0009** = Range 0 - 9 bar

**WARNING**: Pressure from 0 to 0.1 bar cannot be adjusted.

## Accessories

| Model with SUB-D 15 poles connector | |
|---|---|
|  | **5300.F15.00.00** : Straight connector + Casing IP65 |
| | **5300.F15.00.03** : Straight connector + Cable 3 meters |
| | **5300.F15.00.05** : Straight connector + Cable 5 meters |
| | **5300.F15.90.00** : 90° connector + Casing IP65 |
| | **5300.F15.90.03** : 90° connector + Cable 3 meters |
| | **5300.F15.90.05** : 90° connector + Cable 5 meters |

*** Without cable**

| Fixing bracket |
|---|
| 170M5 |
|  |

## ORDERING CODES
### "521 M12 version" - CANopen® version



**17_E2N. M . C . ____ . __**

**SIZE :**
- **0** = Size 0
- **1** = Size 1
- **3** = Size 3

**VARIANT**
- = Standard Version (no addictional letter required)
- **E** = External pressure feedback
- **A** = Exhaust downstream pressure when power supply is removed
- **AE** = A Variant + E Variant

**PRESSURE RANGE :**
- **0001** = Range 0 - 1 bar
- **0005** = Range 0 - 5 bar
- **0009** = Range 0 - 9 bar

**NOTE:** This model doesn't include the terminating resistor.

**WARNING**: Pressure from 0 to 0.1 bar cannot be adjusted.

### Accessoris

| Model with M12 connector |
|---|
| **POWER SUPPLY connector** |
| Female straight connector M12A 4P |
| **5312A.F04.00** |
|  |

| Model with M12 connector |
|---|
| **NETWORK connector** |
| Male straight connector M12A 5P |
| **5312A.M05.00** |
|  |

| Fixing bracket |
|---|
| **170M5** |
|  |

## ORDERING CODES
### "521 M12 BASIC version"



**17_E2N. _ . M . ____ . __**

**SIZE :**
- **0** = Size 0
- **1** = Size 1
- **3** = Size 3

**MANAGEMENT :**
- **C** = Current signal (4-20 mA)
- **T** = Voltage signal (0-10 V)

**PRESSURE RANGE :**
- **0001** = Range 0 - 1 bar
- **0005** = Range 0 - 5 bar
- **0009** = Range 0 - 9 bar

**VARIANT**
- = Standard Version (no addictional letter required)
- **E** = External pressure feedback
- **A** = Exhaust downstream pressure when power supply is removed
- **AE** = A Variant + E Variant

**NOTE:**
This model doesn't include display a keyboard. Therefore it is not possible to set the parameters. Unless specifically requested it is provided with all parameters set with default values. Personalisations are available.

**WARNING**: Pressure from 0 to 0.1 bar cannot be adjusted.

### Accessories

| Model with M12 connector |
|---|
| **POWER SUPPLY connector** |
| Female straight connector M12A 4P |
| **5312A.F04.00** |
|  |

| Fixing bracket |
|---|
| **170M5** |
|  |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## ORDERING CODES
### "521 M12 version" - Standard version





**17_E2N. _ . _ . ____ . __**

**SIZE**
- **0** = Size 0
- **1** = Size 1
- **3** = Size 3

**MANAGEMENT**
- **C** = Current signal (4-20 mA)
- **T** = Voltage signal (0-10 V)

**OUTPUT**
- **F** = Voltage analogue output
- **G** = Current analogue output
- **H** = Digital output

**PRESSURE RANGE**
- **0001** = Range 0 - 1 bar
- **0005** = Range 0 - 5 bar
- **0009** = Range 0 - 9 bar

**VARIANT**
- = Standard Version (no addictional letter required)
- **E** = External pressure feedback
- **A** = Exhaust downstream pressure when power supply is removed
- **AE** = A Variant + E Variant

**WARNING**: Pressure from 0 to 0.1 bar cannot be adjusted.

### Accessories

| Model with M12 connector |
|---|
| **POWER SUPPLY connector** |
| Female straight connector M12A 4P |
| **5312A.F04.00** |
|  |

| Fixing bracket |
|---|
| **170M5** |
|  |

## ORDERING CODES
### "521 IO-Link version"





**17_E2N. I . B . ____ . __**

**SIZE**
- 0 = Size 0
- 1 = Size 1
- 3 = Size 3

**PRESSURE RANGE:**
- 0009 = Range 0 - 9 bar

**VARIANT:**
- Standard version
- E = External pressure feedback
- A = Exhaust downstream circuit without power supply
- AE = A Variant + E Variant

**WARNING**: Pressure from 0 to 0.1 bar cannot be adjusted.

### Accessories

| Model with M12 connector |
|---|
| **POWER SUPPLY connector** |
| Female straight connector M12A 5P |
| **5312A.F05.00** |
|  |

| Fixing bracket |
|---|
| **170M5** |
|  |

## Series 1700 - Miniaturised proportional pressure regulator - Size 0 - 1 - 3

Modern industrial applications constantly require more sophisticated and better performing pneumatic components.
Flexibility and adaptability are key factor when designing a machine. The possibility to change the application parameter during operation such as for example the speed of a cylinder or the force generated by a rotary actuator are beneficial to the designer.
In the past it was necessary to design complicated pneumatic circuits based on pneumatic logic elements which required a lot of space and complicated set up, today, thanks to the electronic proportional regulators such operations are extremely easy to achieve and offer even more flexibility.
Pneumax miniaturized proportional regulators series integrates all the main features of the 521 series with the exclusion of the display and analogue/digital output.
High precision in pressure regulation, fast response speed, assembling options and reduced dimensions are the main advantages.



| Pneumatic characteristics | | |
|---|---|---|
| Fluid | | Air filtered at 5 micron and dehumidified |
| Minimum inlet pressure | | Desired outlet pressure + 1 bar |
| Maximum inlet pressure | | 10 bar |
| Outlet pressure | Ordering code | 009 |
| | Presure value | 0 ... 9 bar |
| Nominal flowrate from 1 to 2 (6 bar Δp 1 bar) | | 7 Nl /min |
| Discharge flowrate (at 6 bar with 1 bar overpressure) | | 7 Nl /min |
| Air consumption | | M5 / Ø4 |
| Operating connection | | M5 / Ø4 |
| Exhaust connection | | M5 / Ø4 |
| Maximum fitting tightening | | 3 Nm |

| Electrical characteristics | | |
|---|---|---|
| Supply voltage | | 24VDC ± 10% (stabilised with ripple <1%) |
| Standby current consumption | | 55 mA |
| Current consumption with solenoid valves on | | 145 mA |
| Reference signal | Voltage* | 0 ... 10 V |
| | Current* | 4 ... 20 mA |
| Input impedance | Voltage | 10 KΩ |
| | Current | 250 Ω |
| Analog outputs voltage | | 0,2 ... 10 V (10 V to 9 bar) |
| Connector | | M8 4 poles |

| Operational characteristics | |
|---|---|
| Linearity | < ± 0,3 % F.S. |
| Hysteresis | <0,3 % F.S. |
| Repeatability | < ± 0,5 % F.S. |
| Sensitivity | < ± 0,5 % F.S. |
| Assembly position | Indifferent |
| Protection degree | IP65 (with casing fitted) |
| Environment temperature | -5°C ... 50°C / 23°F ... 122°F |

| Construction characteristics | |
|---|---|
| Body | Technopolymer |
| Seals | NBR |
| Cover for electrical part | Technopolymer |
| Weight | 60 g |

*** Request during ordering process**

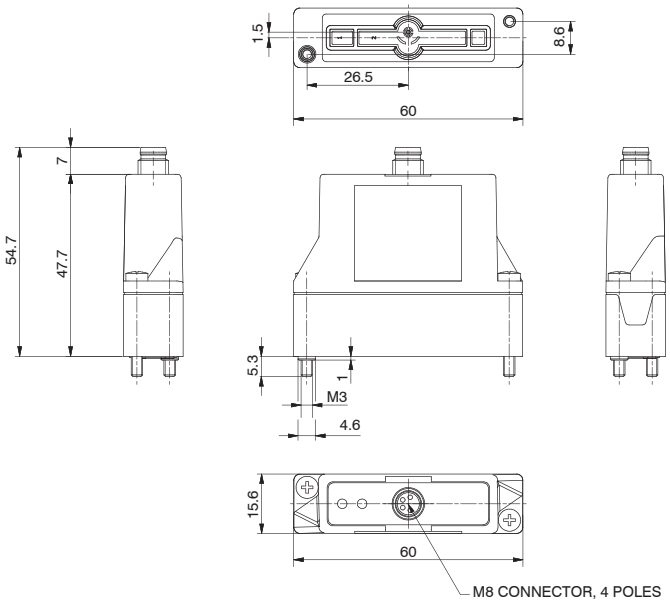
**PARAMETER 18 - Protection mode**

If during operation in “standard” mode the desired pressure cannot be reached (for example, there is no compressed-air supply or it is insufficient) or the discharge conduit is blocked or closed, the regulator continues to work on the solenoid valves to try to reach the desired pressure. This parameter allows the automatic switch-off of the control solenoid valves for up to 20 seconds to be enabled. This function is used to safeguard the solenoid valves over time. The protection is triggered if the desired pressure is not reached and the outlet pressure does not undergo significant variations within a 4-seconds control of the solenoid valves. A significant variation is defined as a variation that is greater than the defined insensitivity value, parameter P1. After the 4 seconds have elapsed in which the regulator attempts to reach the desired pressure, the protection is triggered. This protection switches off the solenoid valves for a maximum of 20 seconds. If the 20 seconds have elapsed or if during the 20 seconds during which the solenoid valves are switched off the required pressure (reference) varies or the outlet pressure varies the regulator will again start to control the solenoid valves for another 4 seconds, trying to reach the desired pressure.
If this does not occur, the protection is reactivated. From this point on 4 seconds of controlling the solenoid valves and 20 seconds of switch-off alternate cyclically.


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

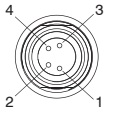
## Proportional pressure regulator



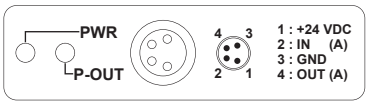



| Ordering code | |
|---|---|
| **170EⓅM.Ⓥ.M.Ⓖ** | |
| Ⓟ | PROTECTION |
| | 0 = Parameter 18 active |
| | 2 = Parameter 18 not active |
| Ⓥ | VERSION |
| | T = Voltage signal |
| | C = Current signal |
| Ⓖ | PRESSURE RANGE |
| | 001= Range 0 ... 1 bar |
| | 005= Range 0 ... 5 bar |
| | 009= Range 0 ... 9 bar |

M8 CONNECTOR, 4 POLES

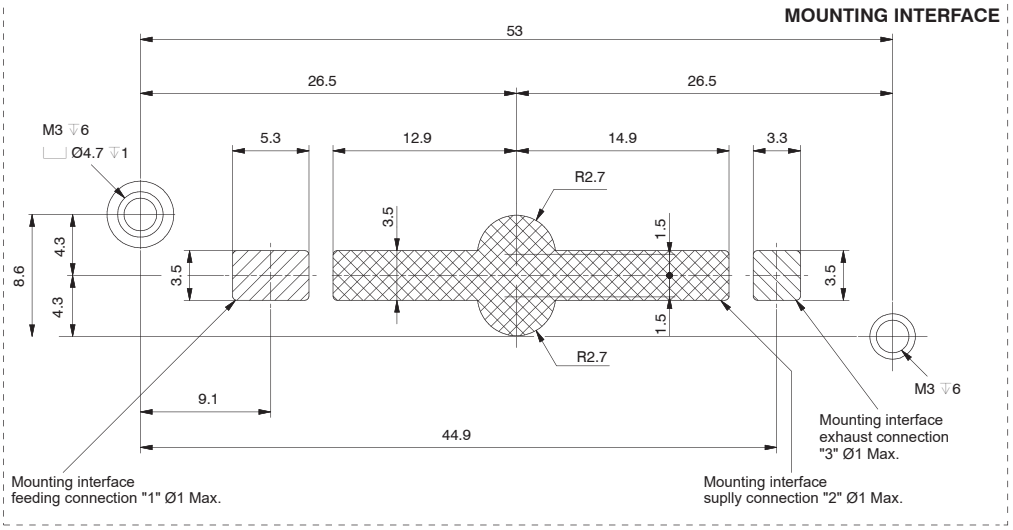



| PIN | DESCRIPTION |
|---|---|
| 1 | +24 VDC |
| 2 | ANALOG INPUT |
| 3 | GND |
| 4 | ANALOG OUTPUT |



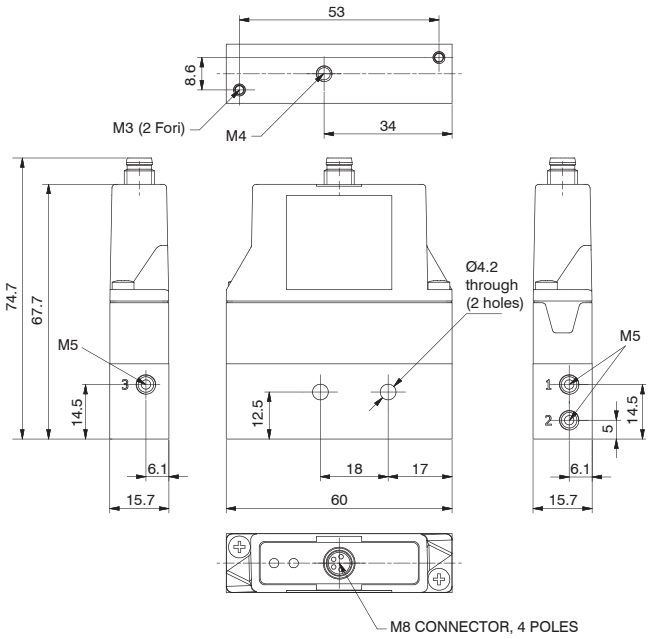

| | |
|---|---|
| **PWR** | Green Led: The regulator is properly powered |
| **P-OUT** | Green Led: lights up when the outlet pressure is higher than the desired pressure minus 0.2 bar and less than the desired pressure more 0.2 bar |

**MOUNTING INTERFACE**



## Proportional Pressure Regulator c/w M5 In-Line Single Base




| Ordering code |
|---|
| **170EⓅM.Ⓥ.M.Ⓖ.FO** |

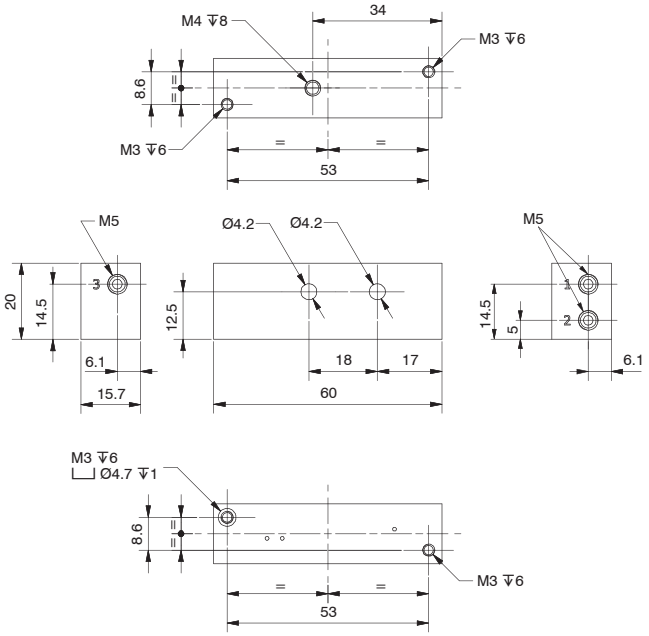
| | |
|---|---|
| | PROTECTION |
| Ⓟ | 0 = Parameter 18 active |
| | 2 = Parameter 18 not active |
| | VERSION |
| Ⓥ | T = Voltage signal |
| | C = Current signal |
| | PRESSURE RANGE |
| Ⓖ | 001= Range 0 ... 1 bar |
| | 005= Range 0 ... 5 bar |
| | 009= Range 0 ... 9 bar |

Weight: 110 g

## M5 In-Line Single Base

| Ordering code |
|---|
| **170M1.FO** |





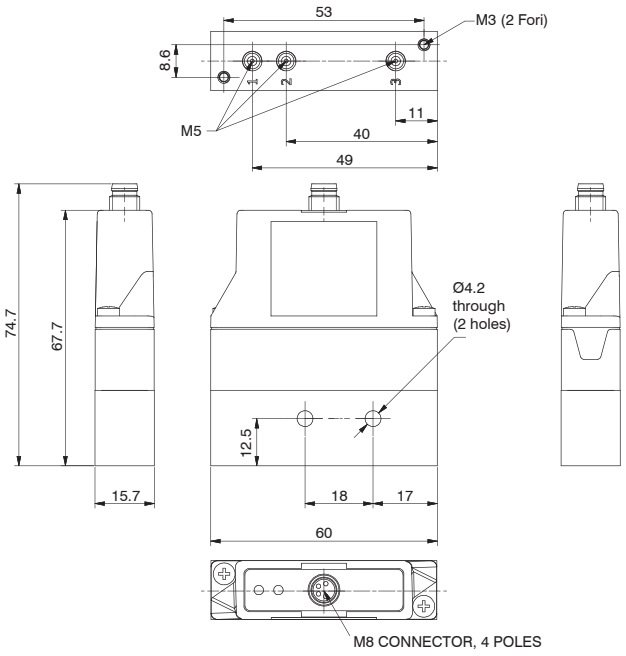

Weight: 50 g



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Proportional Pressure Regulator c/w M5 Bottom Entry Base





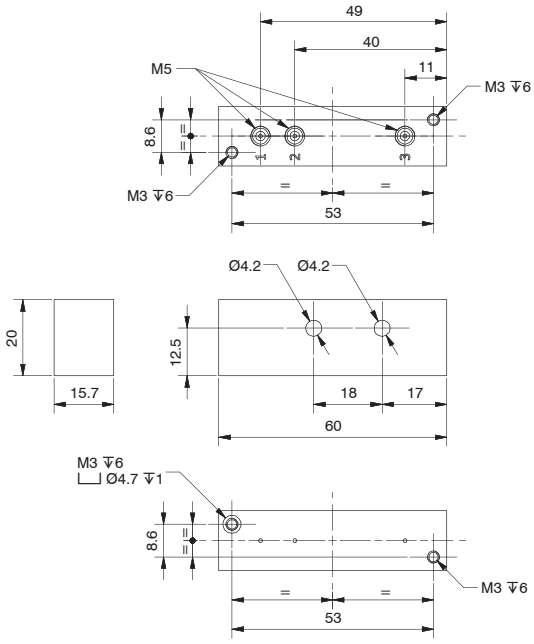

| Ordering code |
|---|
| **170EⓅM.Ⓥ.M.Ⓖ.FV** |

| | |
|---|---|
| Ⓟ | PROTECTION |
| | 0 = Parameter 18 active |
| | 2 = Parameter 18 not active |
| Ⓥ | VERSION |
| | T = Voltage signal |
| | C = Current signal |
| Ⓖ | PRESSURE RANGE |
| | 001= Range 0 ... 1 bar |
| | 005= Range 0 ... 5 bar |
| | 009= Range 0 ... 9 bar |

Weight: 110 g

## M5 Bottom Entry Single Base



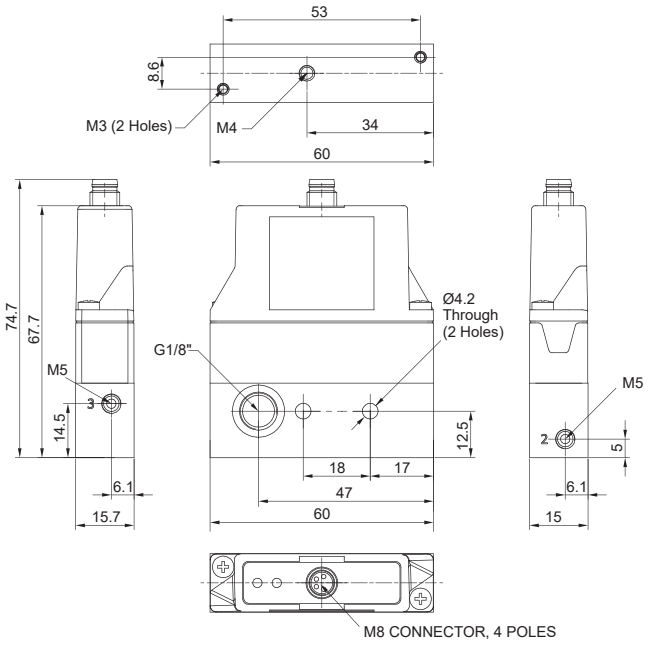



| Ordering code |
|---|
| **170M1.FV** |

Weight: 50 g

## Proportional Pressure Regulator c/w Modular In-Line Base





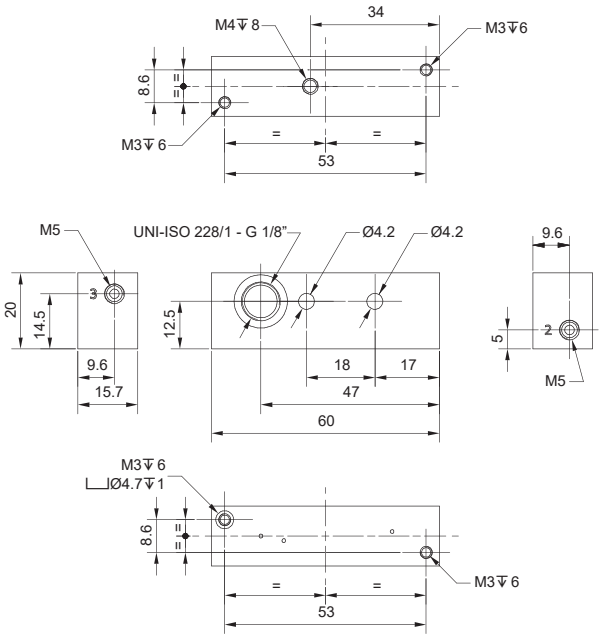

| Ordering code | |
|---|---|
| **170EⓅM.Ⓥ.M.Ⓖ.FP** | |
| Ⓟ | PROTECTION |
| | 0 = Parameter 18 active |
| | 2 = Parameter 18 not active |
| Ⓥ | VERSION |
| | T = Voltage signal |
| | C = Current signal |
| Ⓖ | PRESSURE RANGE |
| | 001= Range 0 ... 1 bar |
| | 005= Range 0 ... 5 bar |
| | 009= Range 0 ... 9 bar |

Weight: 110 g

## Single Modular In-Line Base

| Ordering code |
|---|
| **170M1.FP** |





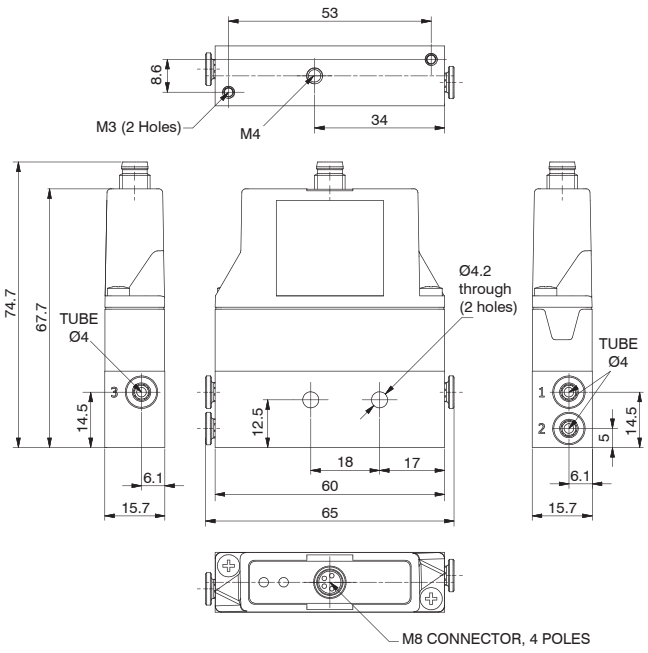

Weight: 50 g



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Proportional Pressure Regulator c/w 4mm In-Line Single base






| Ordering code |
|---|
| **170EⓅM.Ⓥ.M.Ⓖ.TO** |

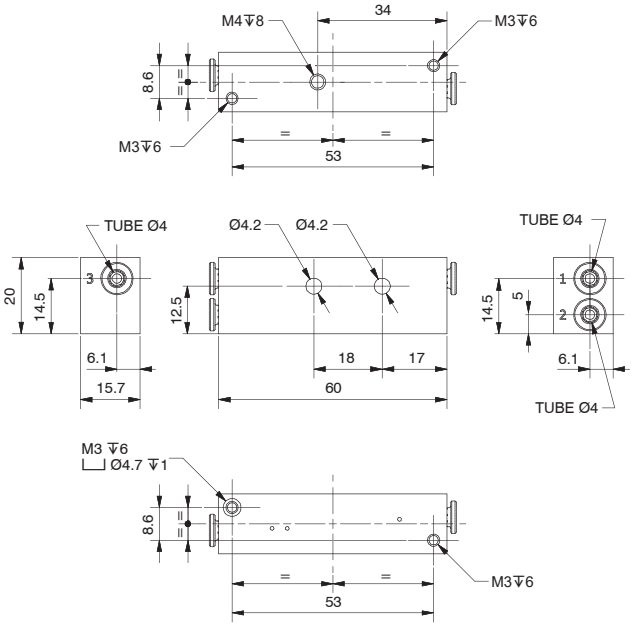
| | |
|---|---|
| Ⓟ | PROTECTION |
| | 0 = Parameter 18 active |
| | 2 = Parameter 18 not active |
| Ⓥ | VERSION |
| | T = Voltage signal |
| | C = Current signal |
| Ⓖ | PRESSURE RANGE |
| | 001= Range 0 ... 1 bar |
| | 005= Range 0 ... 5 bar |
| | 009= Range 0 ... 9 bar |

Weight: 110 g

## Single 4mm In-Line Base

| Ordering code |
|---|
| **170M1.TO** |

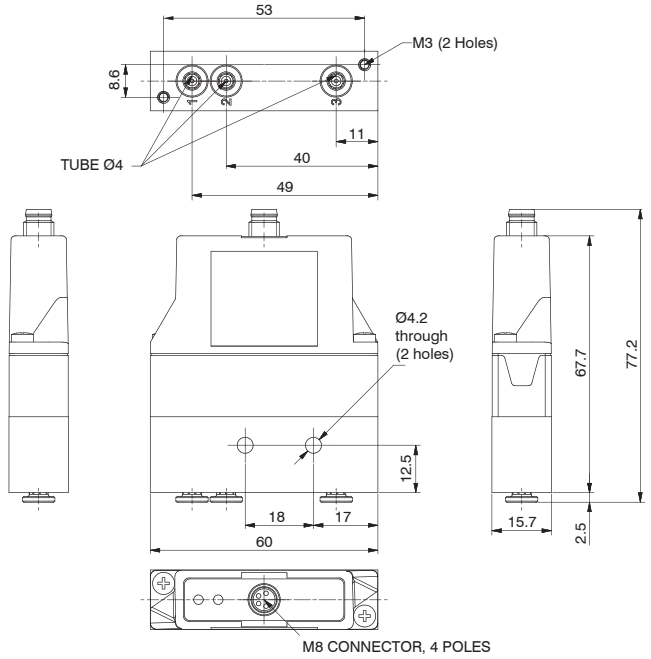





Weight: 50 g

## Proportional Pressure Regulator c/w 4mm Bottom Entry Single Base






| Ordering code |
|---|
| **170EⓅM.Ⓥ.M.Ⓖ.TV** |

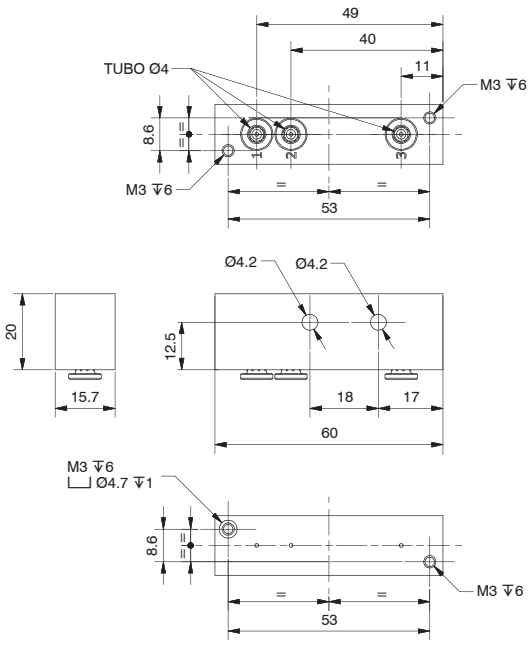
| | |
|---|---|
| Ⓟ | PROTECTION |
| | 0 = Parameter 18 active |
| | 2 = Parameter 18 not active |
| Ⓥ | VERSION |
| | T = Voltage signal |
| | C = Current signal |
| Ⓖ | PRESSURE RANGE |
| | 001= Range 0 ... 1 bar |
| | 005= Range 0 ... 5 bar |
| | 009= Range 0 ... 9 bar |

Weight: 110 g

## Single 4mm Bottom Entry Base

| Ordering code |
|---|
| **170M1.TV** |





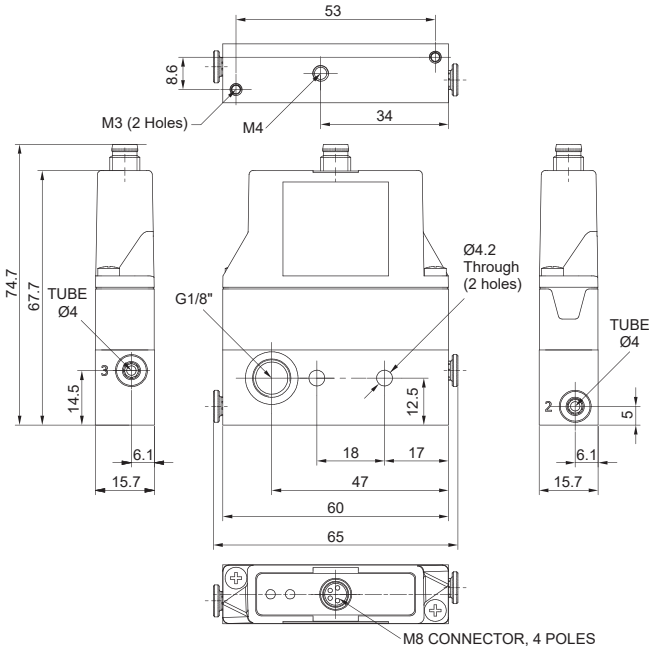

Weight: 50 g



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Proportional Pressure Regulator c/w 4mm In-Line Modular Base






| Ordering code |
|---|
| **170EⓅM.Ⓥ.M.Ⓖ.TP** |

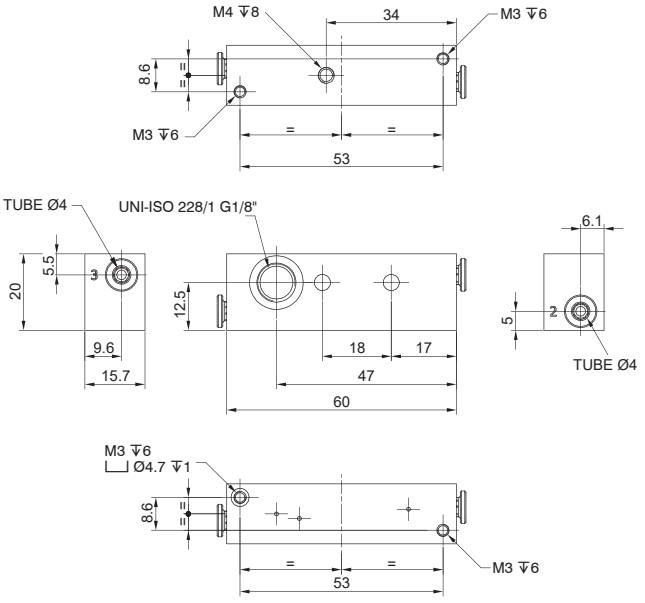
| | |
|---|---|
| Ⓟ | PROTECTION |
| | 0 = Parameter 18 active |
| | 2 = Parameter 18 not active |
| Ⓥ | VERSION |
| | T = Voltage signal |
| | C = Current signal |
| Ⓖ | PRESSURE RANGE |
| | 001= Range 0 ... 1 bar |
| | 005= Range 0 ... 5 bar |
| | 009= Range 0 ... 9 bar |

Weight: 110 g

## Single 4mm In-Line Modular Base

| Ordering code |
|---|
| **170M1.TP** |

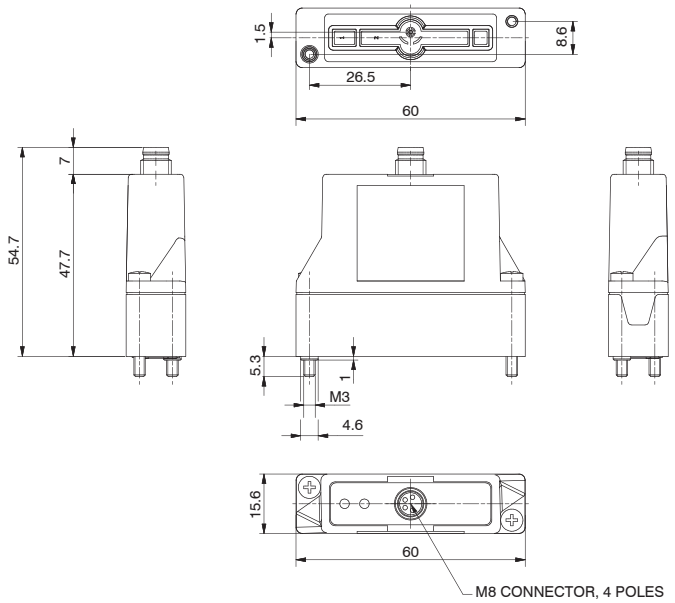





Weight: 50 g

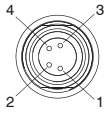
## Proportional pressure regulator with external feedback



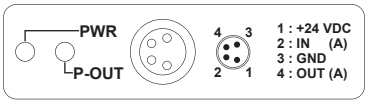



| Ordering code | |
|---|---|
| **170EⓅM.ⓋM.ⒼE** | |
| Ⓟ | PROTECTION |
| | 0 = Parameter 18 active |
| | 2 = Parameter 18 not active |
| Ⓥ | VERSION |
| | T = Voltage signal |
| | C = Current signal |
| Ⓖ | PRESSURE RANGE |
| | 001= Range 0 ... 1 bar |
| | 005= Range 0 ... 5 bar |
| | 009= Range 0 ... 9 bar |

M8 CONNECTOR, 4 POLES

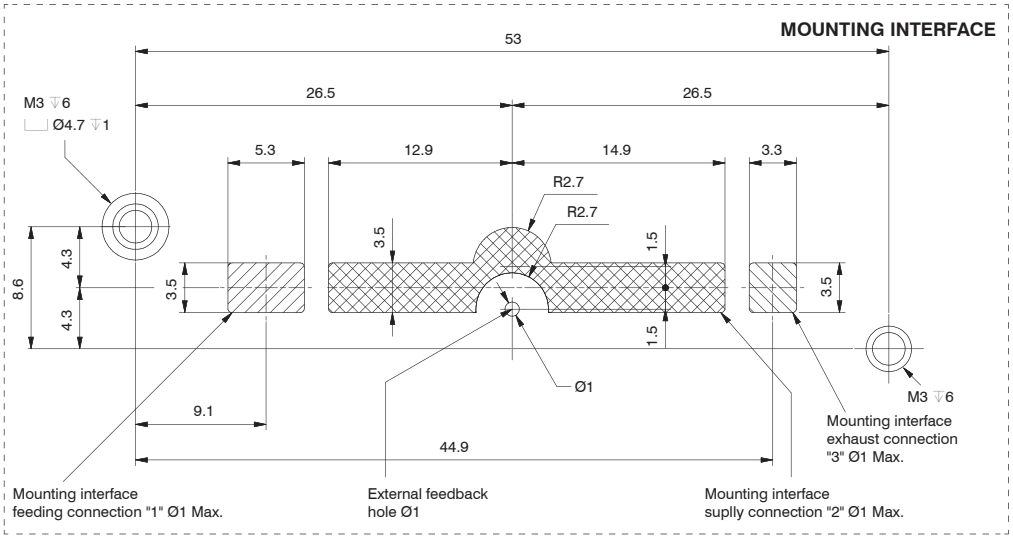



| PIN | DESCRIPTION |
|---|---|
| 1 | +24 VDC |
| 2 | ANALOG INPUT |
| 3 | GND |
| 4 | ANALOG OUTPUT |




| | |
|---|---|
| **PWR** | Green Led: The regulator is properly powered |
| **P-OUT** | Green Led: lights up when the outlet pressure is higher than the desired pressure minus 0.2 bar and less than the desired pressure more 0.2 bar |

**MOUNTING INTERFACE**



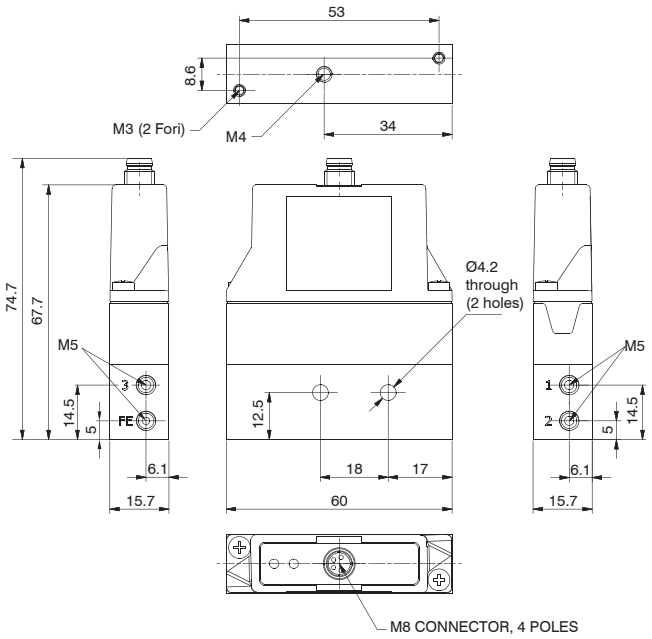




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Proportional Pressure Regulator c/w M5 In-Line Single Base with External Feedback






| Ordering code |
|---|
| **170EⓅM.ⓋM.ⒼEFO** |

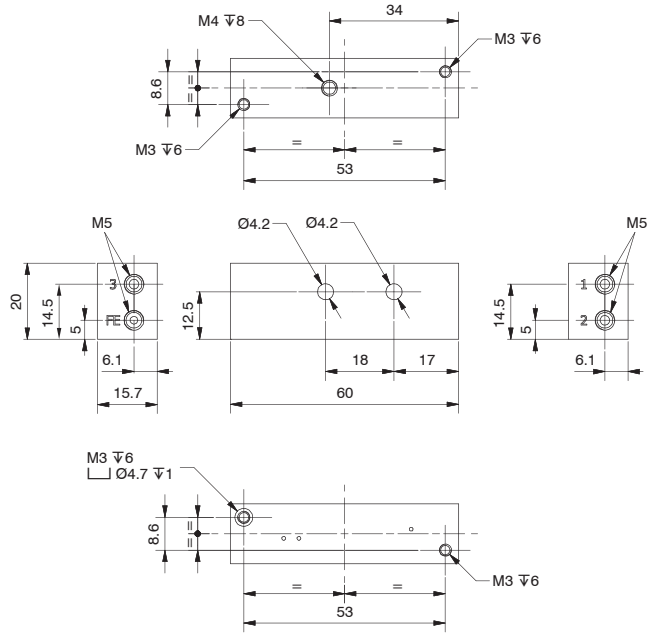
| | |
|---|---|
| Ⓟ | PROTECTION |
| | 0 = Parameter 18 active |
| | 2 = Parameter 18 not active |
| Ⓥ | VERSION |
| | T = Voltage signal |
| | C = Current signal |
| Ⓖ | PRESSURE RANGE |
| | 001= Range 0 ... 1 bar |
| | 005= Range 0 ... 5 bar |
| | 009= Range 0 ... 9 bar |

Weight: 110 g

## Single M5 In-Line Base with External Feedback

| Ordering code |
|---|
| **170M1.EFO** |

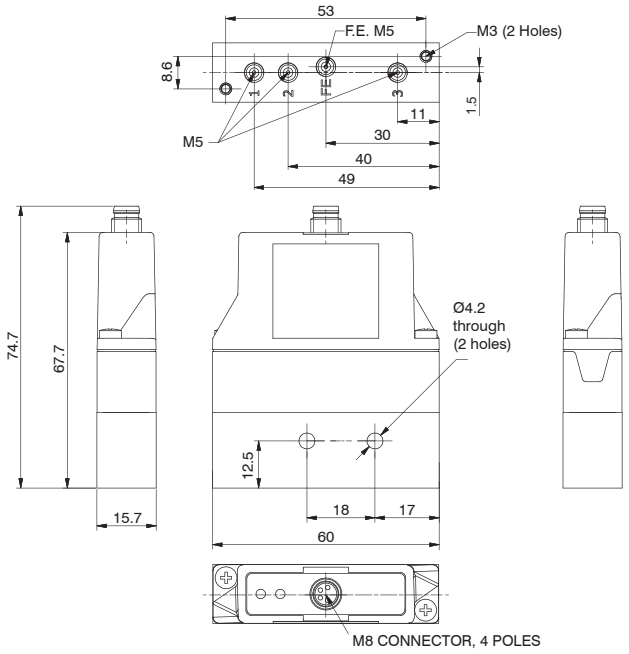





Weight: 50 g

## Proportional Pressure Regulator c/w M5 Bottom Entry Base with External Feedback





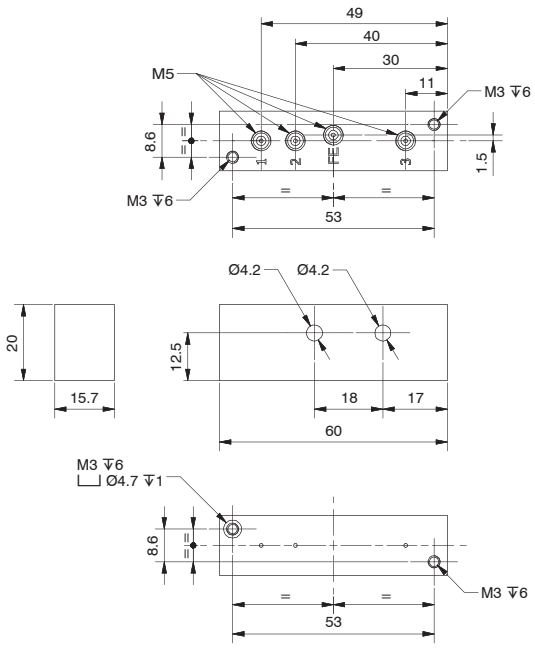

| Ordering code | |
|---|---|
| **170EⓅM.Ⓥ.M.Ⓖ.EFV** | |
| Ⓟ | PROTECTION |
| | 0 = Parameter 18 active |
| | 2 = Parameter 18 not active |
| Ⓥ | VERSION |
| | T = Voltage signal |
| | C = Current signal |
| Ⓖ | PRESSURE RANGE |
| | 001= Range 0 ... 1 bar |
| | 005= Range 0 ... 5 bar |
| | 009= Range 0 ... 9 bar |

Weight: 110 g

## Single M5 Bottom Entry Base with External Feedback

| Ordering code |
|---|
| **170M1.EFV** |





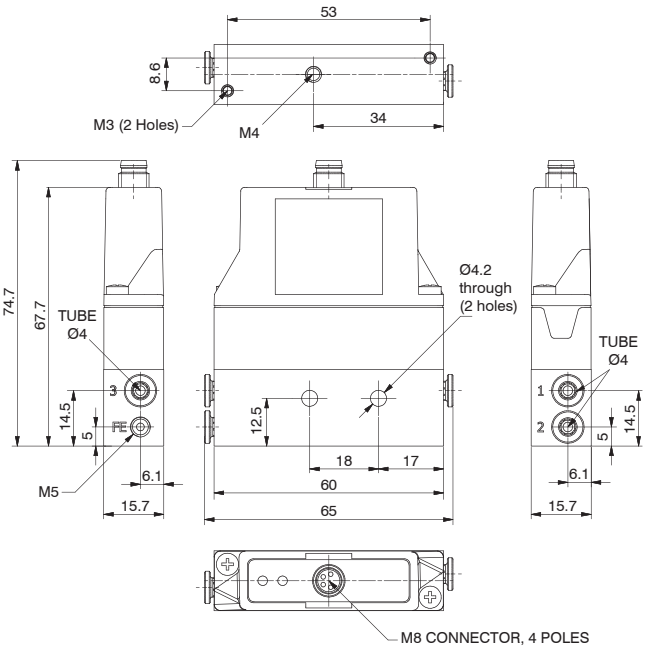

Weight: 50 g



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Proportional Pressure Regulator c/w 4mm In-Line Single Base with External Feedback





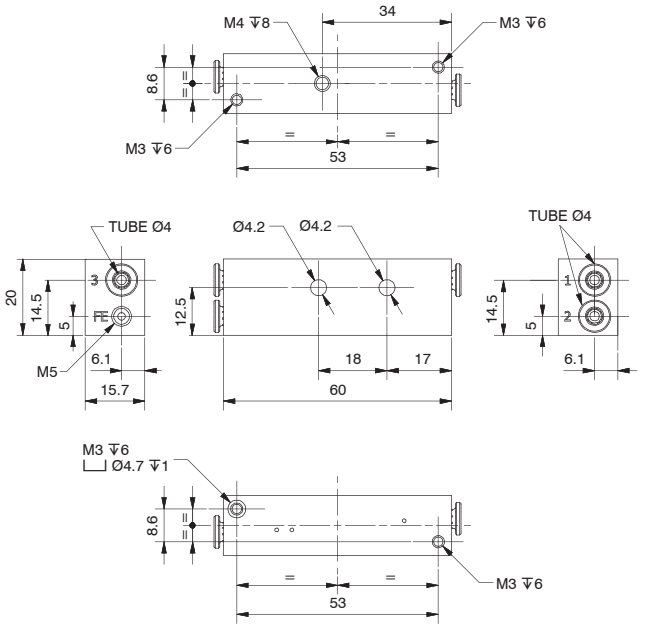

| Ordering code | |
|---|---|
| **170EⓅM.Ⓥ.M.Ⓖ.ETO** | |
| Ⓟ | PROTECTION |
| | 0 = Parameter 18 active |
| | 2 = Parameter 18 not active |
| Ⓥ | VERSION |
| | T = Voltage signal |
| | C = Current signal |
| Ⓖ | PRESSURE RANGE |
| | 001= Range 0 ... 1 bar |
| | 005= Range 0 ... 5 bar |
| | 009= Range 0 ... 9 bar |

Weight: 110 g

## Single 4mm In-Line Base with External Feedback

| Ordering code |
|---|
| **170M1.ETO** |

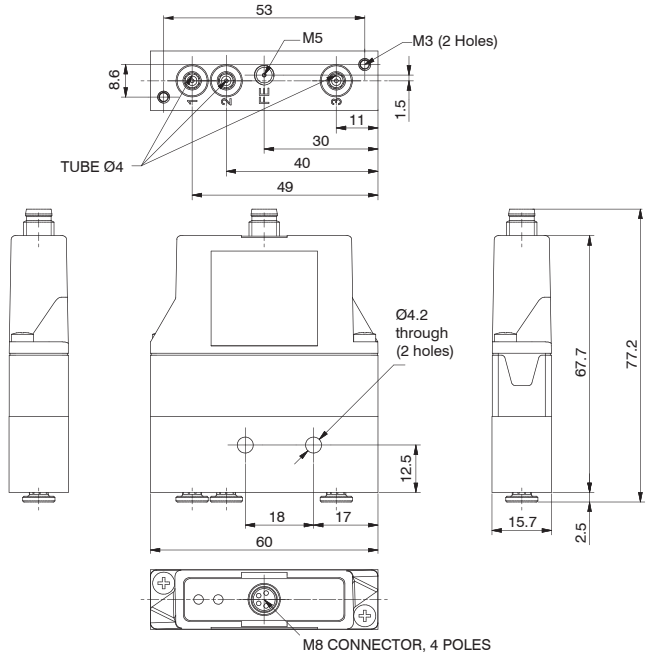





Weight: 50 g

## Proportional Pressure Regulator c/w 4mm Bottom Entry Single Base with External Feedback





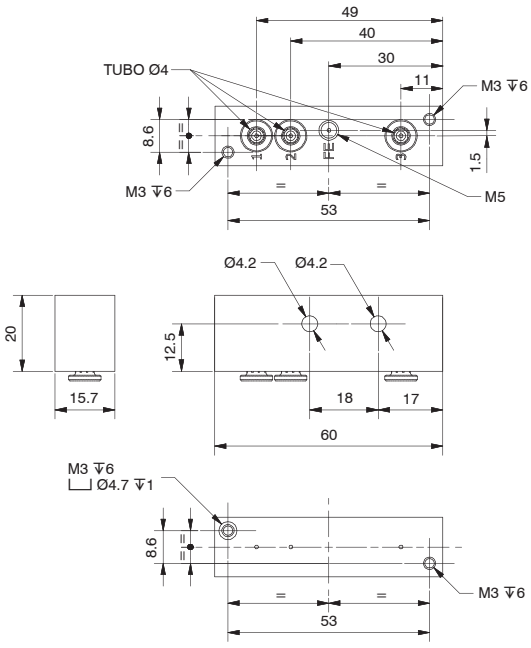

| Ordering code |
|---|
| **170EⓅM.Ⓥ.M.Ⓖ.ETV** |

| | |
|---|---|
| Ⓟ | PROTECTION |
| | 0 = Parameter 18 active |
| | 2 = Parameter 18 not active |
| Ⓥ | VERSION |
| | T = Voltage signal |
| | C = Current signal |
| Ⓖ | PRESSURE RANGE |
| | 001= Range 0 ... 1 bar |
| | 005= Range 0 ... 5 bar |
| | 009= Range 0 ... 9 bar |

Weight: 110 g

## Single 4mm Bottom Entry Base with External Feedback






| Ordering code |
|---|
| **170M1.ETV** |

Weight: 50 g



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

**Coding For Proportional Pressure Regulator Modular Manifold**

It is possible to assemble a manifold of Miniature Proportional Regulators to a maximum of 12 Regulators.
For the coding of the Manifold, refer to the configuration Table below.
The Regulators are feed by a single supply pressure via the G1/8" connection. In the Manifold, the Pressure Regulators operate independently, the output pressure is supplied via the M5 or 4mm output connection depending on the model requested. The electrical signal is controlled via the M8 connector.
There are also configured single bases up to a maximum of 12 positions with power supplies and independent consumptions (See following pages).

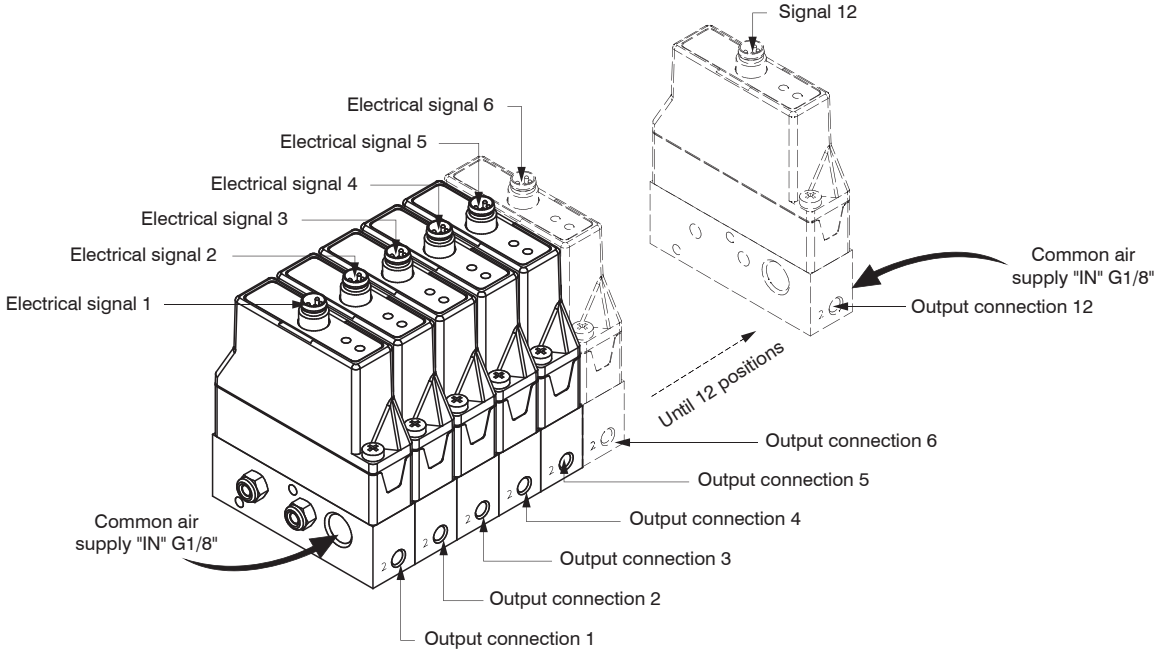
| G | 1 | 7 | 0 | _ | _ | _ | M | _ | _ | _ | _ | P | _ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Group | Series | Size | Parameter 18 | N. Places | Control Type | Electrical connection | Pressure range | Connection | Version | Options |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | **0**=Eco P18 On | **A**=02 | **T**=Voltage | | **001**=0 - 1 bar | **T**=Tube Ø4 | | = Standard * |
| | | | **2**=Eco P18 Off | **B**=03 | **C**=Current | | **005**=0 - 5 bar | **F**=M5 Thread | | **E**= External feedback |
| | | | | **C**=04 | | | **009**=0 - 9 bar | | | * no additional letter required |
| | | | | **D**=05 | | | | | | |
| | | | | **E**=06 | | | | | | |
| | | | | **F**=07 | | | | | | |
| | | | | **G**=08 | | | | | | |
| | | | | **H**=09 | | | | | | |
| | | | | **I**=10 | | | | | | |
| | | | | **L**=11 | | | | | | |
| | | | | **M**=12 | | | | | | |

Example
**Code:** G1700ITM009FP
**Description:** 10 Position Miniature Proportional Pressure Regulator, Voltage controlled with M5 Outputs

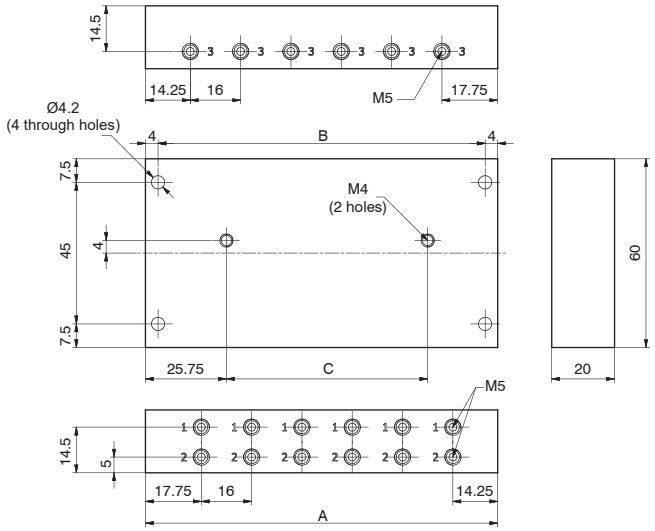






## Multiple M5 In-Line Base





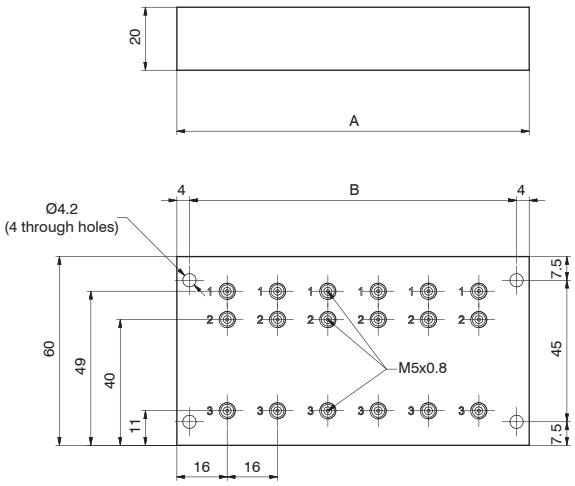

| Ordering code |
|---|
| **170MⓃ.FO** |

| Ⓝ | NO. POSITIONS |
|---|---|
| | 2 = 2 positions (weight 100 g) |
| | 3 = 3 positions (weight 150 g) |
| | 4 = 4 positions (weight 200 g) |
| | 5 = 5 positions (weight 250 g) |
| | 6 = 6 positions (weight 300 g) |
| | 7 = 7 positions (weight 350 g) |
| | 8 = 8 positions (weight 400 g) |
| | 9 = 9 positions (weight 450 g) |
| | 10 = 10 positions (weight 500 g) |

| Dimensions | No. positions | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| A | 48 | 64 | 80 | 96 | 112 | 128 | 144 | 160 | 176 |
| B | 40 | 56 | 72 | 88 | 104 | 120 | 136 | 152 | 168 |
| C | 0 | 16 | 32 | 48 | 64 | 80 | 96 | 112 | 128 |

## Multiple M5 Bottom Entry Base






| Ordering code |
|---|
| **170MⓃ.FV** |

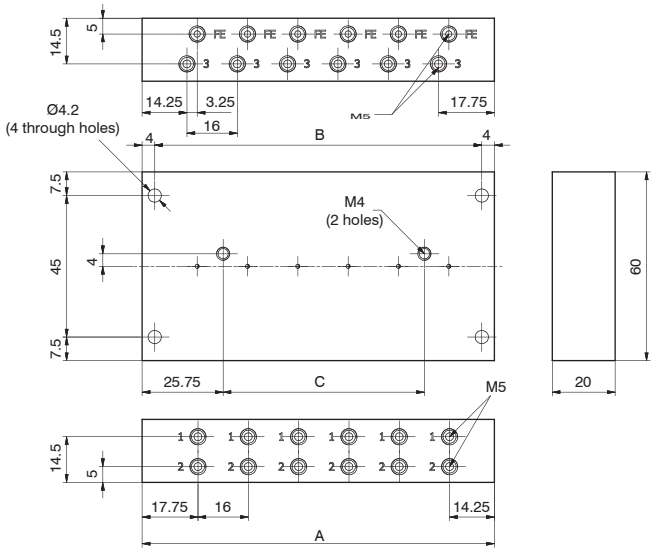
| Ⓝ | NO. POSITIONS |
|---|---|
| | 2 = 2 positions (weight 100 g) |
| | 3 = 3 positions (weight 150 g) |
| | 4 = 4 positions (weight 200 g) |
| | 5 = 5 positions (weight 250 g) |
| | 6 = 6 positions (weight 300 g) |
| | 7 = 7 positions (weight 350 g) |
| | 8 = 8 positions (weight 400 g) |
| | 9 = 9 positions (weight 450 g) |
| | 10 = 10 positions (weight 500 g) |

| Dimensions | No. positions | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| A | 48 | 64 | 80 | 96 | 112 | 128 | 144 | 160 | 176 |
| B | 40 | 56 | 72 | 88 | 104 | 120 | 136 | 152 | 168 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Multiple M5 In-Line Base with External Feedback





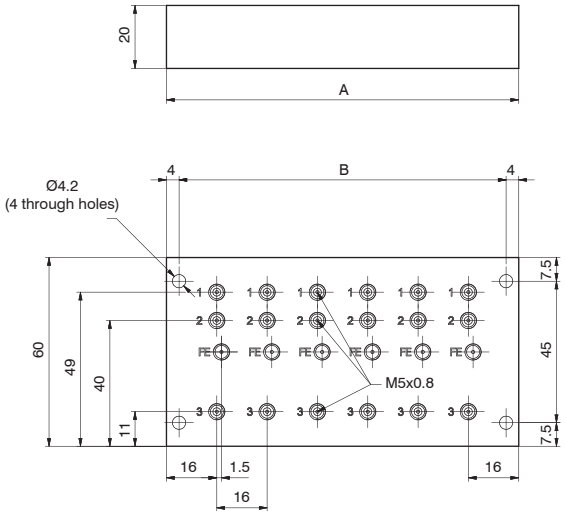

| Ordering code |
|---|
| **170MⓃ.EFO** |

| | NO. POSITIONS |
|---|---|
| Ⓝ | 2 = 2 positions (weight 100 g) |
| | 3 = 3 positions (weight 150 g) |
| | 4 = 4 positions (weight 200 g) |
| | 5 = 5 positions (weight 250 g) |
| | 6 = 6 positions (weight 300 g) |
| | 7 = 7 positions (weight 350 g) |
| | 8 = 8 positions (weight 400 g) |
| | 9 = 9 positions (weight 450 g) |
| | 10 = 10 positions (weight 500 g) |

| Dimensions | No. positions | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| A | 48 | 64 | 80 | 96 | 112 | 128 | 144 | 160 | 176 |
| B | 40 | 56 | 72 | 88 | 104 | 120 | 136 | 152 | 168 |
| C | 0 | 16 | 32 | 48 | 64 | 80 | 96 | 112 | 128 |

## Multiple M5 Bottom Entry Base with External Feedback






| Ordering code |
|---|
| **170MⓃ.EFV** |

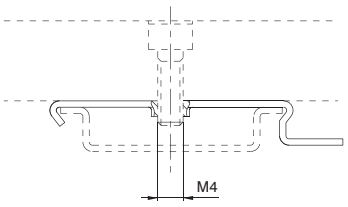
| | NO. POSITIONS |
|---|---|
| Ⓝ | 2 = 2 positions (weight 100 g) |
| | 3 = 3 positions (weight 150 g) |
| | 4 = 4 positions (weight 200 g) |
| | 5 = 5 positions (weight 250 g) |
| | 6 = 6 positions (weight 300 g) |
| | 7 = 7 positions (weight 350 g) |
| | 8 = 8 positions (weight 400 g) |
| | 9 = 9 positions (weight 450 g) |
| | 10 = 10 positions (weight 500 g) |

| Dimensions | No. positions | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| A | 48 | 64 | 80 | 96 | 112 | 128 | 144 | 160 | 176 |
| B | 40 | 56 | 72 | 88 | 104 | 120 | 136 | 152 | 168 |

## Clip

| Ordering code |
|---|
| **800.00** |






Weight g 5



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series WPR





- Output pressure up to 18 bar
- Flow rate up to 4000Nl/min
- There are versions available with or without proportional integration
- Proportional Integrated versions available with Analogue/Digital, CANopen®, IO-Link, EtherCAT®, PROFINET IO RT and EtherNet/IP interface
- IN / OUT connections, main regulator G1/2"
- EXH connection, main regulator G1/4"
- IN connection, pilot regulator M5
- Versions available with external feedback

WPR proportional piloting pressure regulators are designed to be able to provide an output pressure value P2 up to 18 bar and are available with the integrated pilot proportional pressure regulator or with an M5 connection for pneumatic proportional remote piloting.
The main regulator and pilot regulator maintain separate supplies, while the main regulator has a maximum inlet pressure of 20 bar the proportional pilot regulator maintains the inlet pressure of 10 bar.
The ratio of pilot pressure to outlet pressure is between 1:1 and 1:2 depending on the inlet pressure and pilot pressure.
The device is made with G1/2" IN/OUT main connections and provides a nominal flow rate of 4.000 Nl/min.
The device is available with pneumatic, Analog/Digital, CANopen®, IO-Link, EtherCAT®, PROFINET IO RT and EtherNet/IP interfaces
Proportional management refers only to the low-pressure piloting part.
Proportional management refers only to the low-pressure piloting part.

### Product presentation and applications

WPR proportional regulators (Wide Pressure Range) are ideal for all applications where there is a need to use a low-pressure (0-9 bar) reference signal resulting in a high-pressure (0-18 bar) P2 output.
The devices have separate pneumatic supplies for the main regulator and the integrated pilot proportional regulator.
The main regulator features G1/2" IN/OUT connections and a G1/4" EXH drain connection.
The input connection of the integrated pilot proportional regulator is M5 ported.
An external feedback version is available an option that allows the P2 pressure signal to be taken from a remote point rather than directly from the usage connection. This function is usually used when the end user is not near to the devices.
At the top is located the management electronics or the connection for remote piloting.
The fixing takes place through the use of a special fixing bracket.

### Technical characteristics

| | |
|---|---|
| IN/OUT connections | G1/2" |
| EXH connections | G1/4" |
| Max. torque fitting tightening (Nm) IN/OUT/EXH connections | G1/2" Metallic: 30<br>G1/4" Metallic: 20 |
| Fluid | 20$\mu$m filtered and preferably non-lubricated air. For the proportional regulator pilot 5$\mu$m filtered non-lubricated and dehumidified air. |
| Pressure measurement | G1/8" pressure gauge socket |
| Assembly configuration | Stand alone |
| Assembly positions | Indifferent |
| Body and connections type | Aluminum body, integrated aluminum connections |

### Operational characteristics

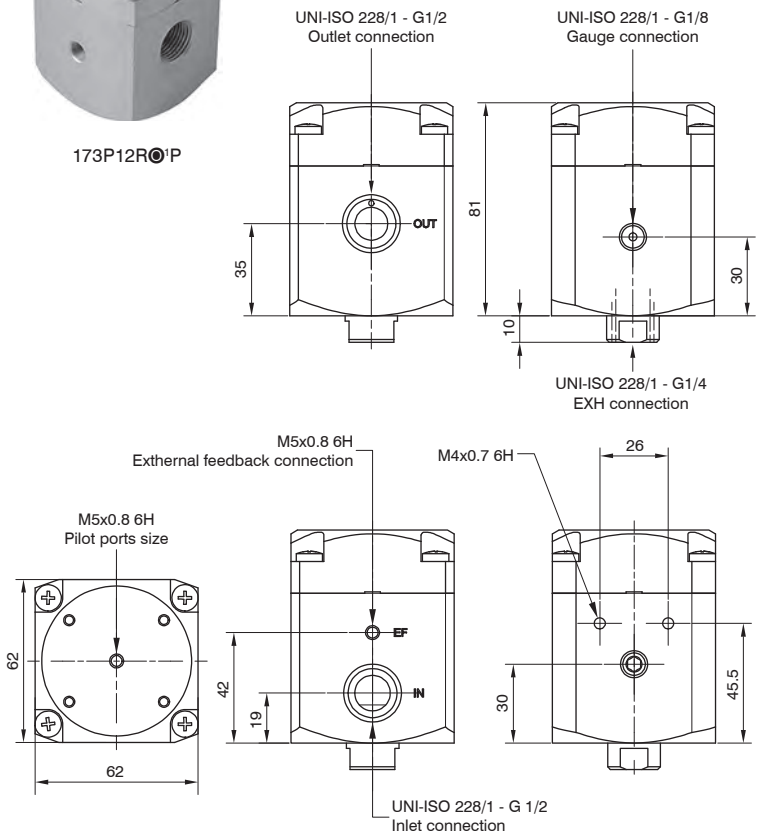
| | |
|---|---|
| Main regulator max inlet pressure (bar) | 20 (the inlet pressure must be at least 1 bar higher than the desired outlet pressure) |
| Pilot regulator max inlet pressure (bar) | 10 (the inlet pressure must be at least 1 bar higher than the desired outlet pressure) |
| Piloting pressure range (bar) | 0 ... 9 |
| Temperature range (°C) | -5 ... +50 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## WPR pressure regulator



173P12R◉¹P

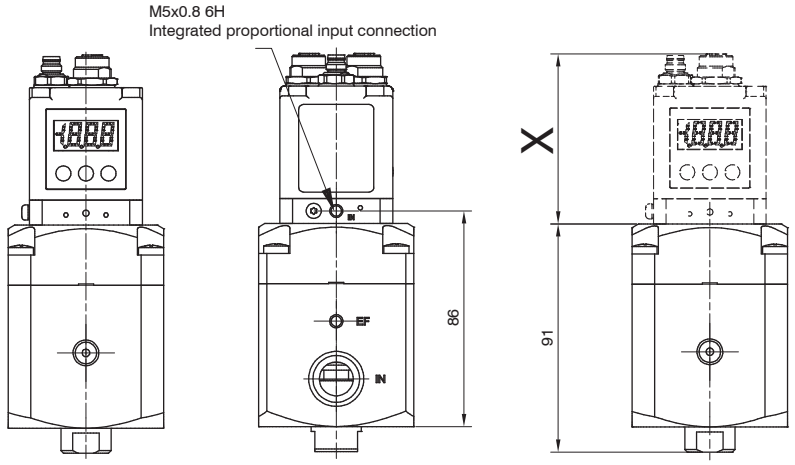



**Coding:** 173P12R◉¹Ⓟ◉²

| | |
|---|---|
| ◉¹ | FEEDBACK OPTIONS |
| | **1** = Internal feedback |
| | **E** = External feedback |
| Ⓟ | PILOTING OPTIONS |
| | **P** = M5 connection |
| | **N** = Integrated pilot proportional regulator |
| ◉² | INTEGRATED PILOT OPTIONS |
| | **DC**=SUB-D 15 poles connector current signal, 0-9 bar |
| | **DCA** =SUB-D 15 poles connector current signal, 0-9 bar, N.O. |
| | **DT**=SUB-D 15 poles connector voltage signal, 0-9 bar |
| | **DTA**=SUB-D 15 poles connector voltage signal, 0-9 bar, N.O. |
| | **SC**=SUB-D 15 poles connector, CANopen®, 0-9 bar |
| | **SCA**=SUB-D 15 poles connector, CANopen®, 0-9 bar, N.O. |
| | **MC**=M12, CANopen®, 0-9 bar |
| | **MCA**=M12, CANopen® 0-9 bar, N.O. |
| | **NCF**=M12, current signal, voltage analogue output, 0-9 bar |
| | **NCFA**=M12, current signal, voltage analogue output, 0-9 bar, N.O. |
| | **NCG**=M12, current signal, current analogue output, 0-9 bar |
| | **NCGA**=M12, current signal, current analogue output, 0-9 bar, N.O. |
| | **NCH**=M12, current signal, digital output, 0-9 bar |
| | **NCHA**=M12, current signal, digital output, 0-9 bar, N.O. |
| | **NTF**=M12, voltage signal, voltage analogue output, 0-9 bar |
| | **NTFA**=M12, voltage signal, voltage analogue output, 0-9 bar, N.O. |
| | **NTG**=M12, voltage signal, current analogue output, 0-9 bar |
| | **NTGA**=M12, voltage signal, current analogue output, 0-9 bar, N.O. |
| | **NTH**=M12, voltage signal, digital output, 0-9 bar |
| | **NTHA**=M12, voltage signal, digital output, 0-9 bar, N.O. |
| | **IB**=IO-Link, 0-9 bar |
| | **IBA**=IO-Link, 0-9 bar, N.O. |
| | **EC**=EtherCAT®, 0-9 bar |
| | **ECA**=EtherCAT®, 0-9 bar, N.O. |
| | **PN**=PROFINET, 0-9 bar |
| | **PNA**=PROFINET, 0-9 bar, N.O. |
| | **EI**=EtherNet/IP, 0-9 bar |
| | **EIA**=EtherNet/IP, 0-9 bar, N.O. |



173P12R◉¹N◉²




| Type | X dimension |
|---|---|
| Standard - Socket connector | 68 |
| CANopen® - Socket connector | 59 |
| CANopen® - M12 connector | 71 |
| Standard - M12 connector | 71 |
| IO-Link | 71 |
| EtherCAT® | 68 |
| PROFINET IO RT | 68 |
| ETHERNET/IP | 68 |

| Pilot regulator construction characteristics | |
|---|---|
| Body | Anodized aluminium |
| Cover for electrical section | Technopolymer |
| Seals | NBR |
| Diaphragm | Cloth-covered rubber |
| Springs | AISI 302 |
| Actuators | Brass with vulcanised NBR |
| Weight | 168 g |

| Pilot regulator functional characteristics | |
|---|---|
| Supply connection | M5 |
| Exhaust connection | Ø1,8 |
| Operating connection | M5 |
| Air consumption | < 1 Nl/min |
| Standby current consumption | 70mA |
| Current consumption with solenoid valves on | 400mA |
| Maximum fittings tightening | 3 Nm |
| Fluid | Air filtered at 5 micron and dehumidified |
| Protection degree | IP65 (with casing fitted) |
| ** Input Impedance - Current | 250 Ω |
| ** Input Impedance - Voltage | 10 kΩ |
| Digital inputs | + 24 V DC ± 10% |
| Hysteresis | ± Insensitivity |
| Linearity | ± Insensitivity |
| Discharge flowrate | 7 Nl/min |
| Nominal flowrate from 1 to 2 (6 bar ΔP 1 bar) | 7 Nl/min |
| Assembly positions | Indifferent |
| Outlet pressure | 0-9 bar |
| Maximum inlet pressure | 10 bar |
| Minimum inlet pressure | Desired outlet pressure + 1 bar |
| Repeatability | ± Insensitivity |
| ** Reference Signal - Current | *4 ... 20 mA<br>*0 ... 20 mA |
| ** Reference Signal - Voltage | *0 ... 10 V<br>*0 ... 5 V<br>*1 ... 5 V |
| Sensitivity | 0,01 bar |
| Environment temperature | -5°C ... 50°C / 23°F ... 122°F |
| Supply voltage | + 24 V DC ± 10% (stabilised with ripple <1%) |
| **Digital output | + 24 V DC PNP (Max. current 50 mA) |

* Selectable by keyboard or by RS-232
** Valid only for devices with analog input

**Installation and operation of the piloting proportional regulator**

**PNEUMATIC CONNECTION**
The compressed air is connected by means of M5 threaded port in the body.
Ensure the compressed air entering the unit is filtered for both water and dust down to 5 microns.
Maximum inlet pressure is 10 Bar.
The supply pressure to the regulator must always be at least 1 bar greater than the required outlet pressure.

**ELECTRICAL CONNECTION**
For the electrical connection a D-SUB 15-pole female connector is used (supplied separately).
Wire in accordance with the wiring diagram shown below.
Warning: INCORRECT CONNECTIONS MAY DAMAGE THE DEVICE.

**OPERATING NOTES**
If the electric supply is interrupted, the outlet pressure is maintained at the set value.
However, maintaining the exact value cannot be ensured as it is impossible to operate the solenoid valves.
In order to discharge the circuit downstream, zero the reference, make sure that the display shows a pressure value equal to zero and then disconnect the electric power supply.
A version of the device is available that exhausts the downstream circuit when the power supply is removed. (Option A at the end of the part number).
If the compressed-air supply is suspended and the electric power supply is maintained a whirring will be heard that is due to the solenoid valves; an operating parameter can be activated (P18) that triggers the regulator protection whenever the requested pressure is not reached within 4 seconds of the reference signal being sent.
In this case the system will intervene to interrupt the control of the solenoid valves. Every twenty seconds, the unit will start the reset procedure until standard operating conditions have been restored.

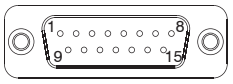



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

### Proportional regulator, standard version with socket connector



CONNECTOR UPPER VIEW



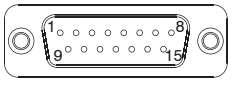

Connector PIN:
1 = DIGITAL INPUT 1
2 = DIGITAL INPUT 2
3 = DIGITAL INPUT 3
4 = DIGITAL INPUT 4
5 = DIGITAL INPUT 5
6 = DIGITAL INPUT 6
7 = DIGITAL INPUT 7
8 = ANALOGUE INPUT / DIGITAL INPUT 8

9 = POWER SUPPLY (+ 24 V DC)
10 = DIGITAL OUTPUT (+ 24 V DC PNP)
11 = ANALOGUE OUTPUT (CURRENT)
12 = ANALOGUE OUTPUT (VOLTAGE)
13 = Rx RS-232
14 = Tx RS-232
15 = GND

### Proportional regulator, CANopen® version with socket connector



CONNECTOR UPPER VIEW

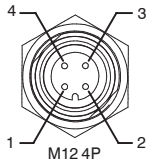



Connector PIN:
1 = CAN_SHIELD
2 = CAN_V+
3 = CAN_GND
4 = CAN_H
5 = CAN_L
6 = NC
7 = NC
8 = NC

9 = POWER SUPPLY (+ 24 V DC)
10 = CAN_SHIELD
11 = CAN_V+
12 = CAN_GND
13 = CAN_H
14 = CAN_L
15 = GND

### Proportional regulator, M12 BASIC and Standard version





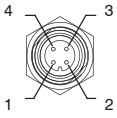

M12 4P
MALE

Connector PIN of the M12 BASIC version:
1 = POWER SUPPLY (+ 24 V DC)
2 = NC
3 = GND
4 = ANALOGUE INPUT

Connector PIN of the M12 Standard version:
1 = POWER SUPPLY (+ 24 V DC)
2 = OUTPUT (depending on model)
3 = GND
4 = ANALOGUE INPUT

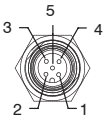
### Proportional regulator, CANopen® version with M12 connector






M12 4P
MALE

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (NODE AND INPUTS) |
| 2 | NC |
| 3 | GND |
| 4 | + 24 V DC (OUTPUTS) |

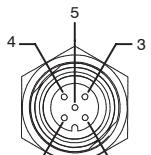



M12 5P
FEMALE

| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | CAN_SHIELD | Optional Can Shield |
| 2 | CAN_V+ | Optional Can external positive supply (Dedicated for supply of transceiver and Optocouplers, if galvanic isolation of the bus node applies) |
| 3 | CAN_GND | Ground / 0V / V- |
| 4 | CAN_H | CAN_H bus line (Dominant high) |
| 5 | CAN_L | CAN_L bus line (Dominant low) |

### Proportional regulator, IO-Link version



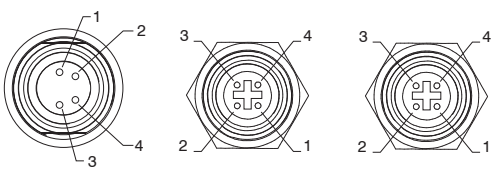



M12 5P
MALE

Connector PIN:
1 = L+
2 = + 24 V DC (P24)
3 = L-
4 = C/Q
5 = GND (N24)

### Proportional regulator, EtherCAT® version, PROFINET IO RT and EtherNet/IP






M8 4P
MALE

M12D 4P
FEMALE

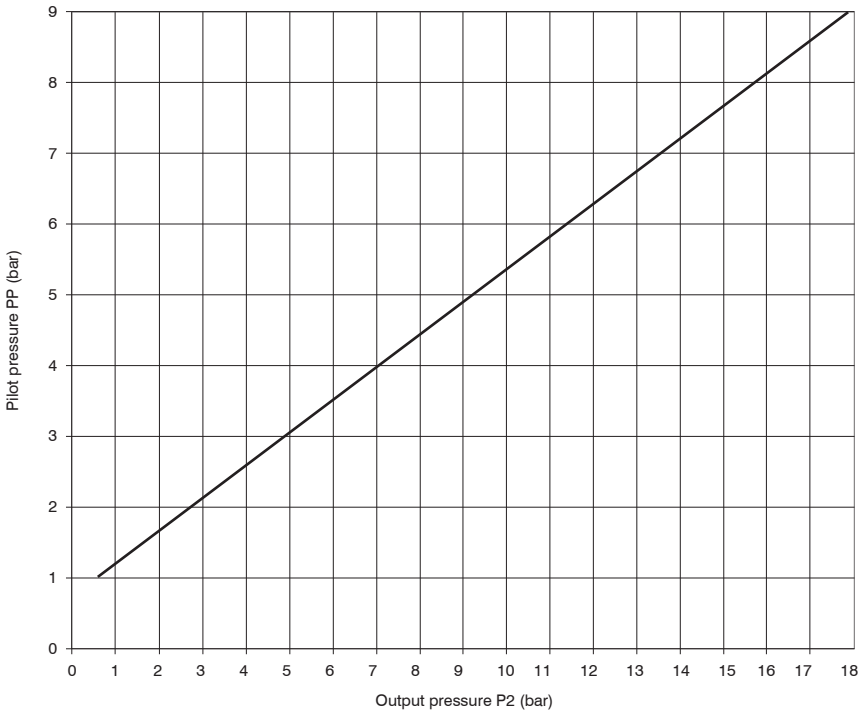
Connector PIN:
1 = Device logical power supply
2 = NC
3 = GND
4 = Solenoid valve power supply

Connector PIN:
1 = Signal TX + (Ethernet Transmit High)
2 = Signal RX + (Ethernet Receive High)
3 = Signal TX - (Ethernet Transmit Low)
4 = Signal RX - (Ethernet Receive Low)



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Piloting curves




| Inlet pressure P1=20bar | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Piloting pressure | 1 | 1.5 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | 5.5 | 6 | 6.5 | 7 | 7.5 | 8 | 8.5 | 9 |
| Output pressure | 0.6 | 1.7 | 2.7 | 3.7 | 4.9 | 5.9 | 7 | 8.2 | 9.7 | 10.5 | 11.6 | 12.7 | 13.7 | 14.8 | 15.8 | 16.9 | 18 |
| P1/P2 | 0.62 | 1.14 | 1.36 | 1.5 | 1.64 | 1.69 | 1.75 | 1.82 | 1.94 | 1.91 | 1.93 | 1.95 | 1.96 | 1.97 | 1.98 | 1.99 | 2 |

## Outlet pressure/Piloting pressure table

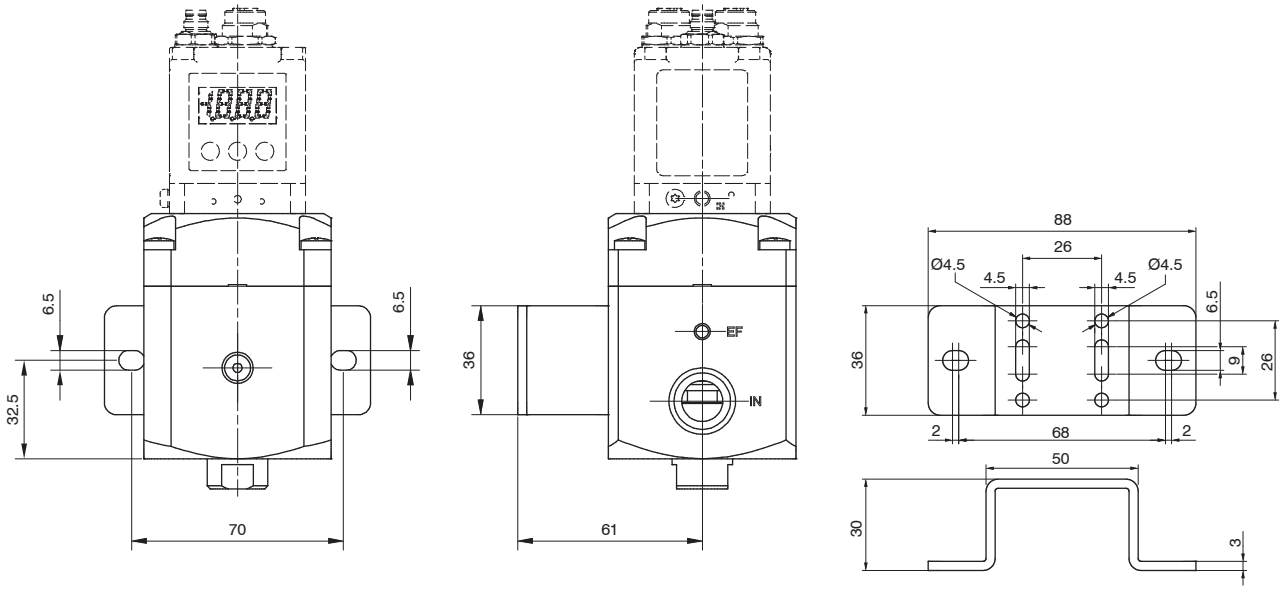
| Inlet pressure Main regulator (bar) | Pilot pressure (bar) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2 | 1.6 | 1 | / | / | / | / | / | / | / | / |
| 3 | 1.6 | 1.5 | 1 | / | / | / | / | / | / | / |
| 4 | 1.6 | 1.8 | 1.3 | 1 | / | / | / | / | / | / |
| 5 | 1.5 | 1.8 | 1.7 | 1.3 | 1 | / | / | / | / | / |
| 6 | 1.4 | 1.8 | 1.9 | 1.5 | 1.2 | 1 | / | / | / | / |
| 7 | 1.4 | 1.7 | 1.8 | 1.8 | 1.4 | 1.2 | 1 | / | / | / |
| 8 | 1.4 | 1.8 | 1.9 | 1.9 | 1.6 | 1.3 | 1.1 | 1 | / | / |
| 9 | 1.3 | 1.7 | 1.8 | 1.9 | 1.8 | 1.5 | 1.3 | 1.1 | 1 | / |
| 10 | 1.3 | 1.7 | 1.8 | 1.9 | 1.9 | 1.7 | 1.4 | 1.3 | 1.1 | 1 |
| 11 | 1.4 | 1.6 | 1.8 | 1.9 | 1.9 | 1.8 | 1.6 | 1.4 | 1.2 | 1.1 |
| 12 | 1.3 | 1.6 | 1.8 | 1.8 | 1.9 | 1.9 | 1.7 | 1.5 | 1.3 | 1.2 |
| 13 | 1.3 | 1.6 | 1.7 | 1.8 | 1.9 | 1.9 | 1.9 | 1.6 | 1.4 | 1.3 |
| 14 | 1.2 | 1.5 | 1.7 | 1.8 | 1.9 | 1.9 | 1.9 | 1.8 | 1.6 | 1.4 |
| 15 | 1 | 1.5 | 1.7 | 1.8 | 1.9 | 1.9 | 1.9 | 1.9 | 1.7 | 1.5 |
| 16 | 1 | 1.5 | 1.7 | 1.8 | 1.8 | 1.9 | 1.9 | 1.9 | 1.8 | 1.6 |
| 17 | / | 1.5 | 1.7 | 1.8 | 1.8 | 1.9 | 1.9 | 1.9 | 1.9 | 1.7 |
| 18 | / | 1.5 | 1.7 | 1.8 | 1.8 | 1.9 | 1.9 | 1.9 | 2 | 1.8 |
| 19 | / | 1.5 | 1.7 | 1.8 | 1.8 | 1.9 | 1.9 | 1.9 | 2 | 1.9 |
| 20 | / | 1.5 | 1.6 | 1.8 | 1.8 | 1.9 | 1.9 | 1.9 | 1.9 | 2 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Fixing bracket

**Coding:** 17050

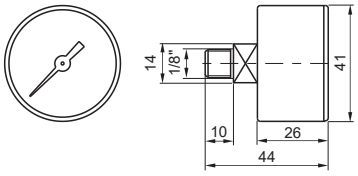





## Pressure gauge

**Coding:** 17070ⓋⓈ






| | |
|---|---|
| Ⓥ | VERSION |
| | **A** = Dial Ø40 |
| Ⓢ | SCALE |
| | **A** = 0 - 4 bar |
| | **B** = 0 - 6 bar |
| | **C** = 0 - 12 bar |
| | **D** = 0 - 16 bar |
| | **E** = 0 - 20 bar |

## POWER SUPPLY and NETWORK connectors

### SUB-D 15 pins female connector



**Coding:** 5300.F15.Ⓒ.Ⓛ

| | |
|---|---|
| Ⓒ | CONNECTOR |
| | **10** = Stand alone |
| | **90** = 90° Angle |
| Ⓛ | CABLE LENGTH |
| | **00** = IP65 with casing, without cable |
| | **03** = 3 meters |
| | **05** = 5 meters |

## POWER SUPPLY connectors

### Straight connector M12A 4P female






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | + 24 V DC (LOGICS AND INPUTS) |
| 2 | N.C. |
| 3 | 0 V |
| 4 | + 24 V DC (OUTPUTS) |

**Coding:** 5312A.F04.00

Connector version for standard and CANopen

### Straight connector M12A 5P female






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | (CAN_SHIELD) |
| 2 | (CAN_V+) |
| 3 | CAN_GND |
| 4 | CAN_H |
| 5 | CAN_L |

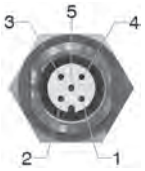
**Coding:** 5312A.F05.00

Connector version for IO-Link

## NETWORK connectors

### Straight connector M12A 5P male






Upper view slave connector

| PIN | DESCRIPTION |
|---|---|
| 1 | (CAN_SHIELD) |
| 2 | (CAN_V+) |
| 3 | CAN_GND |
| 4 | CAN_H |
| 5 | CAN_L |

**Coding:** 5312A.M05.00

Connector version for standard and CANopen

### Straight connector M12D 4P male






Upper view slave connector

| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | TX+ | EtherNet Transmit High |
| 2 | RX+ | EtherNet Receive High |
| 3 | TX- | EtherNet Transmit Low |
| 4 | RX- | EtherNet Receive Low |

**Coding:** 5312D.M04.00

Connector version for EtherCAT, PROFINET and EtherNet/IP

## Plugs

### M12 plug



**Coding:** 5300.T12

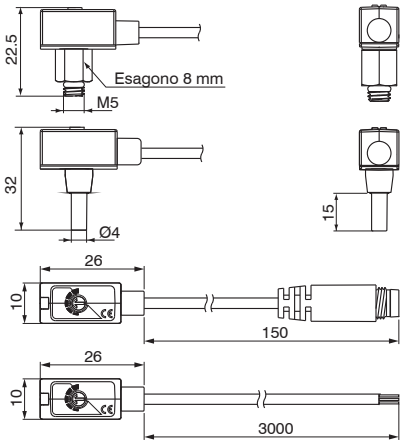




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Mini digital pressure switch





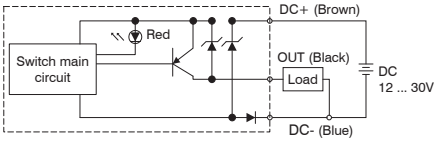

**Coding:** DS.10.P.B.Ⓒ.Ⓛ.Ⓞ

| | |
|---|---|
| Ⓒ | CONNECTION |
| | **F4** = Male M5 |
| | **R4** = Plug-in connection Ø4 |
| Ⓛ | CABLE LENGTH |
| | **A** = 150 mm* |
| | **E** = 3000 mm** |
| Ⓞ | OPTIONS |
| | **0** = Without connector |
| | **1** = With connector M8 male 3 Pin |

*only with M8 connector
**only without connector

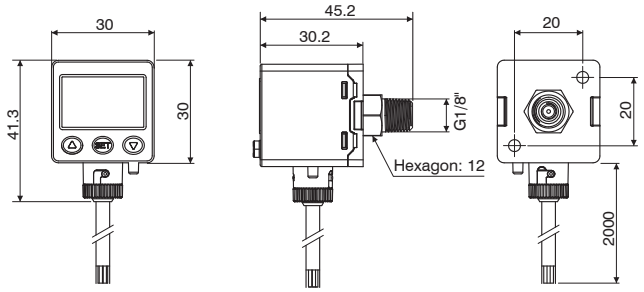
| Technical characteristics | | |
|---|---|---|
| Working pressure range | | 0...0,6 MPa |
| Regulation pressure range | | 0...0,6 MPa |
| Maximum supported pressure | | 1,5 MPa |
| Allowed fluids | | Air, non-corrosive gases, non-combustible gases |
| Supply voltage | | From 12 to 30 VDC ±10% |
| Current consumption | | ≤ 10 mA |
| Digital output | | PNP N.O. 1 outputs<br>Maximum load current: 80mA<br>Maximum supply voltage: 30 VDC<br>Voltage drop: ≤0.8V |
| Repeatability | | ± 1% Full Scale |
| Digital output | Type of hysteresis | fixed |
| | Hysteresis | 3% Full Scale max. |
| Response time | | 1 ms |
| Protection from short circuit at output | | Present |
| Method of setting threshold | | Adjustable, trimmer |
| Indicator | | LED red (output) |
| Ingress protection rating | Protection degree | IP40 |
| | Environment temperature | Operational: 0 - 60°C, Storage: -20 - 70°C (without ice or condensation) |
| | Ambient humidity | Operational/Storage: 35 ... 85% (without condensation) |
| | Vibration | Total amplitude 1.5mm.,10Hz-55Hz-10Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z |
| | Impacts/shocks | 980m/s² (100G), 3 times in each direction of X, Y and Z |
| Temperature characteristics | | ±2% Full Scale in a range between 0 ... 50°C |
| Type of connection | | Male M5x0.8, Plug-in connection Ø4 |
| Electrical cable | | Oilproof cable, 3 wires (0.18 mm), Ø2.6 mm |
| Weight | | Approximately 50 g (with 3 metres of cable) |

### Output circuit wiring diagrams



## Panel-mounted digital pressure switch



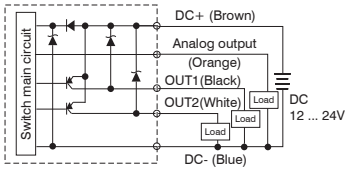


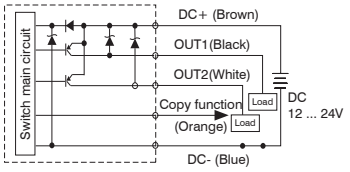

**Coding:** DS.45.P.Ⓤ.F3.D.0

| Ⓤ | OUTPUTS |
|---|---|
| | **E** = 2 PNP outputs + Analog output (4 / 20 mA) |
| | **L** = 2 PNP outputs + copy function |

| Technical characteristics | | |
|---|---|---|
| Working pressure range | | 0,000 ... 1,000 MPa |
| Regulation pressure range | | -0,100 ... 1,000 MPa |
| Maximum supported pressure | | 1,5 MPa |
| Allowed fluids | | Air, non-corrosive gases, non-combustible gases |
| Pressure calibration sensitivity | kPa | 0.1 |
| | kgf/cm² | 0.001 |
| | bar | 0.001 |
| | psi | 0.01 |
| | InHg | 0.1 |
| Supply voltage | | From 12 to 24 VDC |
| Current consumption | | ≤40mA (without load) |
| Digital output | | PNP N.O. 2 outputs<br>Maximum load current: 125mA<br>Maximum supply voltage: 24 VDC<br>Voltage drop: ≤1.5V |
| Repeatability | | ± 0.2% Full Scale ± 1 digit |
| Digital output | Type of hysteresis | Settable |
| | Hysteresis | from 0.001 to 0.008 bar |
| Response time | | ≤2,5 ms (anti-interference function: 25ms, 100ms, 250ms, 500ms, 1000ms and 1500ms selectable) |
| Protection from short circuit at output | | Present |
| Display | | Display with 3 1/2 digits (red/Green) |
| Indicator accuracy | | ±2% FS. ±1 digit |
| Indicator | | LED Orange (output1) LED Orange (output2) |
| Analog output | | Output current: 4 ... 20mA ±2.5% F. S.<br>Linearity: ±1% F. S.<br>Maximum load resistance: 250Ω supply at 12V and 600Ω supply at 24V<br>Minimum load resistance: 50Ω |
| Ingress protection rating | Protection degree | IP65 |
| | Environment temperature | Operational: 0 - 50°C, Storage: -10 ... 60°C (without ice or condensation) |
| | Ambient humidity | Operational/Storage: 35 ... 85% (without condensation) |
| | Supported voltage | 1000VAC in 1min. (between body and cable) |
| | Insulation resistance | 50MΩ (at 500VDC, between body and cable) |
| | Vibration | Total amplitude 1.5mm or 10G,10Hz-55Hz-10Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z |
| | Impacts/shocks | 100m/s² (10G), 3 times in each direction of X, Y and Z |
| Temperature characteristics | | ±2.5% Full Scale in a range between 0 ... 50°C |
| Type of connection | | G1/8" (BSPP), M5 female |
| Electrical cable | | Oil resistant cable (internal 0.15 mm²) |
| Weight | | Approximately 86 g (with 2 metres of cable) |

### Output circuit wiring diagrams

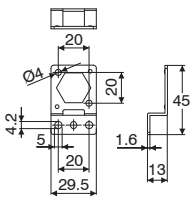



## Accessories

### Fixing bracket

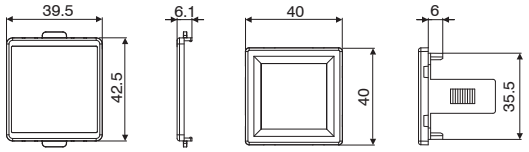





**Coding:** DS.BT10

### Panel mount adapter

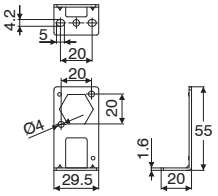





**Coding:** DS.PAE

### Fixing bracket

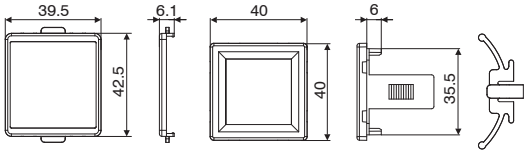





**Coding:** DS.BT11

### Panel mount adapter with screen protection





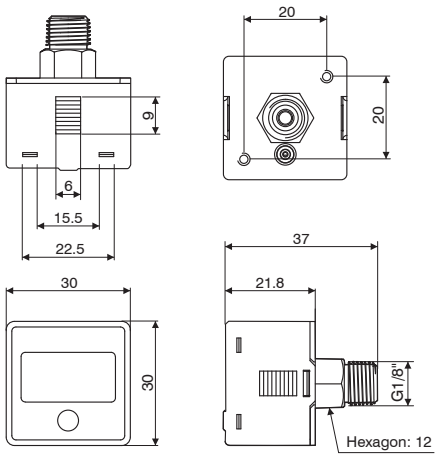

**Coding:** DS.PAF


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Digital battery pressure gauge

**Coding:** DS.60.P.I.F1.F.0



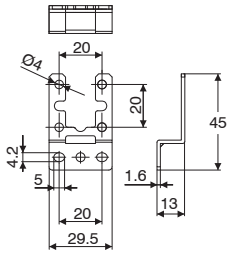




| Technical characteristics | | |
|---|---|---|
| Working pressure range | | 0,000 ... 1,000 MPa |
| Regulation pressure range | | -0,100 ... 1,000 MPa |
| Maximum supported pressure | | 1,5 MPa |
| Allowed fluids | | Air, non-corrosive gases, non-combustible gases |
| Current consumption | kPa | 0.1 |
| | bar | 0.01 |
| | psi | 0.1 |
| | mmHg | 1 |
| Battery | | CR 2032 lithium |
| Backlight | | Not present |
| Battery life | | 3 years (5 power ups a day) |
| Indication of battery level | | Present |
| Battery replaceable | | Yes |
| Display power up time | | Goes off after 60 seconds |
| Sampling frequency | | 2 Hz (2 times per second) |
| Repeatability | | ±1% F. S. ±1 digit |
| Display | | Display with 3 1/2 digits |
| Indicator accuracy | | ±2% F.S. ±1 digit (at ambient temperature of 25°C ±3°C) |
| Ingress protection rating | Protection degree | IP65 (only with connected air pipe) |
| | Environment temperature | Operational: 0 - 50°C, Storage: -10 ... 60°C (without ice or condensation) |
| | Ambient humidity | Operational/Storage: 35 ... 85% (without condensation) |
| | Vibration | Total amplitude 1.5mm or 10G,10Hz-55Hz-10Hz scanning for 1 minute,2 hours in each direction of X,Y and Z |
| | Impacts/shocks | 100m/s² (10G), 3 times in each direction of X, Y and Z |
| Temperature characteristics | | ±2% Full Scale in a range between 0 ... 50°C |
| Type of connection | | R1/8", M5 female |
| Weight | | Approximately 40 g |

## Accessories

### Fixing bracket

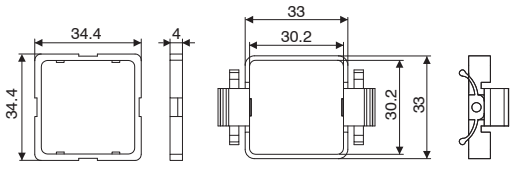





**Coding:** DS.BT5

### Panel mount adapter

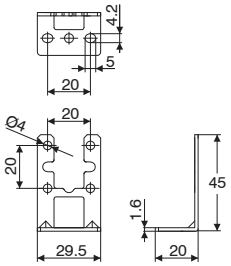





**Coding:** DS.PAC

### Fixing bracket

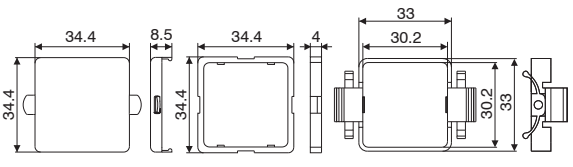





**Coding:** DS.BT6

### Panel mount adapter with screen protection

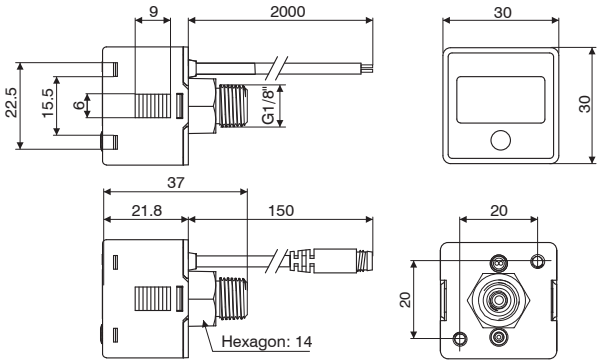





**Coding:** DS.PAD

## Digital pressure gauge




**Coding:** DS.61.P.I.F1.Ⓛ.Ⓞ

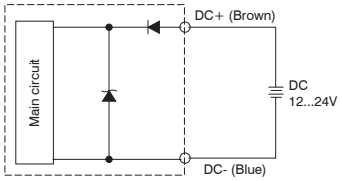
| | |
|---|---|
| Ⓛ | CABLE LENGTH |
| | **A** = 150 mm* |
| | **D** = 2000 mm** |
| Ⓞ | OPTIONS |
| | **O** = Without connector |
| | **2** = With connector M8 male 4 Pin |

*only with M8 connector
**only without connector

2 AIR TREATMENT

| Technical characteristics | | |
|---|---|---|
| Working pressure range | | 0,000 ... 1,000 MPa |
| Regulation pressure range | | -0,100 ... 1,000 MPa |
| Maximum supported pressure | | 1,5 MPa |
| Allowed fluids | | Air, non-corrosive gases, non-combustible gases |
| Pressure calibration sensitivity | kPa | 1 |
| | kgf/cm² | 0.01 |
| | bar | 0.01 |
| | psi | 0.1 |
| Supply voltage | | From 12 to 24 VDC ± 10% |
| Current consumption | | 10 mA |
| Repeatability | | ± 1% Full Scale ±1 digit |
| Display | | Display with 3 1/2 digits (sampling 5 times per sec.) |
| Indicator accuracy | | ±2% F.S. ±1 digit (at ambient temperature of 25°C ±3°C) |
| Ingress protection rating | Protection degree | IP65 (only with connected air pipe) |
| | Environment temperature | Operational: 0 - 50°C, Storage: -10 ... 60°C (without ice or condensation) |
| | Ambient humidity | Operational/Storage: 35 ... 85% (without condensation) |
| | Supported voltage | 1000VAC in 1 min. (between body and cable) |
| | Insulation resistance | 50MΩ (at 500VDC, between body and cable) |
| | Vibration | Total amplitude 1.5mm or 10G,10Hz-55Hz-10Hz scanning for 1 minute, 2 hours in each direction of X, Y and Z |
| | Impacts/shocks | 100m/s² (10G), 3 times in each direction of X, Y and Z |
| Temperature characteristics | | ±2% Full Scale in a range between 0 ... 50°C |
| Type of connection | | R1/8", M5 female |
| Electrical cable | | Oil resistant cable (internal 0.15 mm²) |
| Weight | | Approximately 60 g (with 2 metres of cable) and Approximately 40 g (with M8 4 pin male connector) |

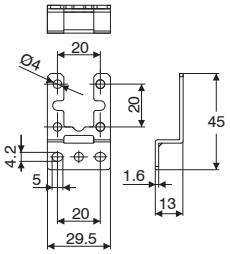
### Output circuit wiring diagrams




## Accessories

### Fixing bracket

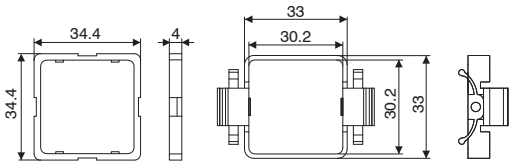





**Coding:** DS.BT5

### Panel mount adapter

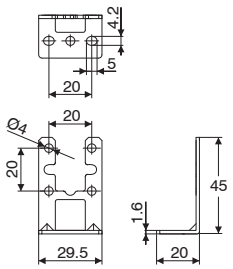





**Coding:** DS.PAC

### Fixing bracket

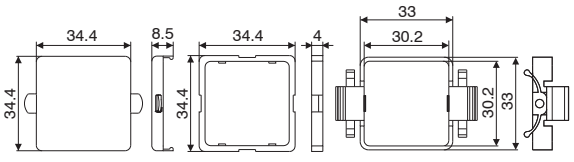





**Coding:** DS.BT6

### Panel mount adapter with screen protection






**Coding:** DS.PAD

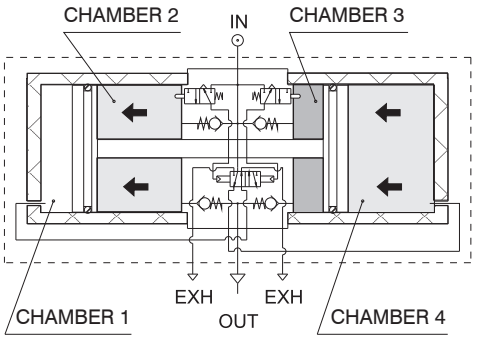

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 1700

It is not unusual that, during some applications the thrust generated by a pneumatic cylinder is not sufficient for the specific purpose it has been designed for.
In order to get over the problem, the working pressure may be increased to a maximum line pressure which normally is 6 - 7 bar; alternatively the problem is solved by an higher bore cylinder that suits the machine.
Three size pressure boosters, with pressure ratio of 2:1, have been designed to avoid these problems.
This device is utilizing the compressed air of the circuit where it is installed.

### Construction and working characteristics

The working method is based on the pump effect of the four chambers cylinder as shown in fig. 1. Two chambers are alternatively compressing the air in the boost one, while the fourth one is discharging.
By means of an internal circuit, the pressure booster keeps on pumping air till the down stream pressure reaches a value double the inlet pressure. In these circumstances there is a balance condition.
When the down stream pressure decreases, the pressure booster starts again its alternating cycle till a new balance condition is restored.
The pressure booster can be furnished complete with pressure regulator installed on the inlet port for getting an accurate outlet pressure value. A wall mounting plate is also available.




### Instructions for installation and use

Do not exceed the indicated pressure and temperature limits.
It is advisable to install a small air tank after the pressure booster to avoid pressure pulsation effects.
Discharge the down stream circuit before any maintenance operation as the inner circuit of the booster does not allow the down stream line discharge even if the inlet pressure drops down.

### Maintenance

Pressure booster has an average life of about 20 millions of valve cycles, depending on working conditions (every back stroke corresponds to one valve cycles ).
A proper lubrication and filtration of air improve the life of pressure booster parts.
It is advisable to protect the exhaust ports in environment.
Replaceable spare seal kits are available.

### How to calculate the required time of pressure booster to increase the air pressure in a tank whose capacity is known.

**Operating Data**

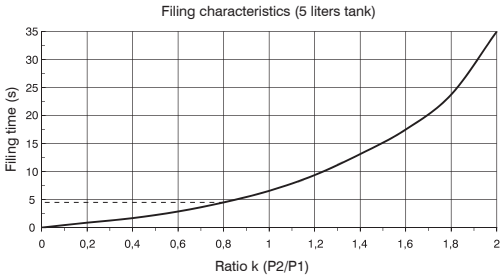
P1 = Inlet pressure
P2' = Tank initial pressure
P2'' = Tank final pressure
V = Tank volume

**Procedure:**

1) Calculate the ratio K' between the initial pressure of the tank and the inlet pressure of the booster ( P2' / P1 ).
2) Calculate the ratio K" between the final pressure of the tank and the inlet pressure of the booster ( P2'' / P1 ).
3) Locate the intersection point between the ratio K' and the curve on filling time diagram related to the specific booster. Trace a vertical line from the above point and read the correspondent time T' (the example shows the ratio K = 0.8 and correspondent time of about 4.8 seconds).
4) Repeat same procedure also for ratio K" to get time T".
5) Use the following formula

$$T = \frac{V}{5} \cdot (T''-T')$$

to obtain the total time required to move the pressure P2' to P2'' of tank volume V.

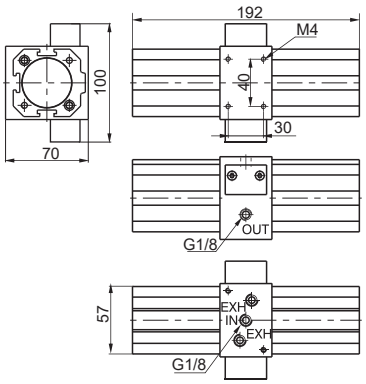



P1 = inlet pressure
P2 = tank pressure

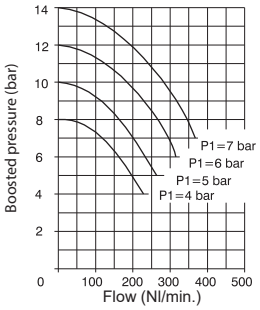
## Pressure booster ø40

**Coding:** 1740.50N



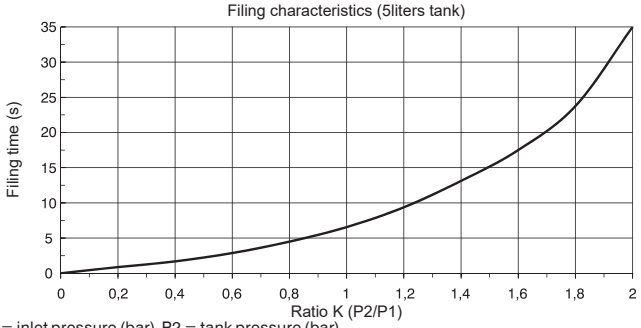



### Flow rate characteristics




P1 = inlet pressure (bar)

### Filling curve



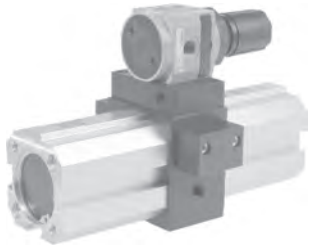

P1 = inlet pressure (bar) P2 = tank pressure (bar)

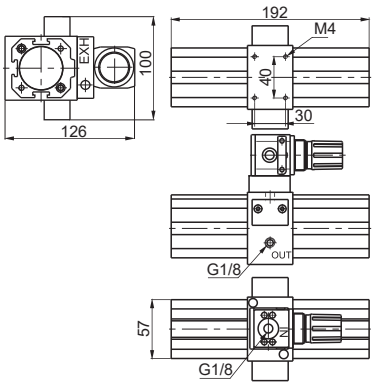
| Construction characteristics |
|---|
| • Self operating pressure booster with pressure ratio of 2:1.<br>• Automatic functioning: to operate the booster just connect it to compressed air line.<br>• Body made with light alloy.<br>• Barrel made of extruded and anodized aluminium.<br>• Downstream circuit pressure is kept under pressure even in absence of inlet pressure. |

| Technical characteristics | |
|---|---|
| Connections | G1/8" |
| Max working pressure (bar) | 2 ... 8 |
| Working temperature °C | -5 ... +50 |
| Orifice size (mm) | 5 |
| Weight (g) | 1500 |
| Assembly positions | Indifferent |
| Max. fittings torque (Nm) | 15 |

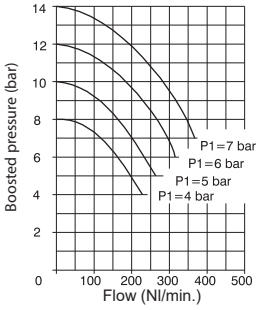
## Pressure booster Ø40 with pressure regulator

**Coding:** 1740.50NR



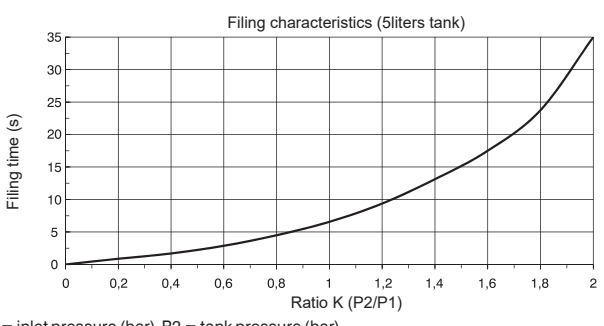



### Flow rate characteristics




P1 = inlet pressure (bar)

### Filling curve




P1 = inlet pressure (bar) P2 = tank pressure (bar)

| Construction characteristics |
|---|
| • Self operating pressure booster with pressure ratio of 2:1.<br>• Automatic functioning: to operate the booster just connect it to compressed air line.<br>• Body made with light alloy.- Barrel made of extruded and anodized aluminium.<br>• Downstream circuit pressure is kept under pressure even in absence of inlet pressure.<br>• Regulation of the inlet pressure (and as a consequence regulation of the outlet pressure). |

| Technical characteristics | |
|---|---|
| Connections | G1/8" |
| Max working pressure (bar) | 2 ... 8 |
| Working temperature °C | -5 ... +50 |
| Orifice size (mm) | 5 |
| Weight (g) | 1600 |
| Assembly positions | Indifferent |
| Max. fittings torque (Nm) | 15 |

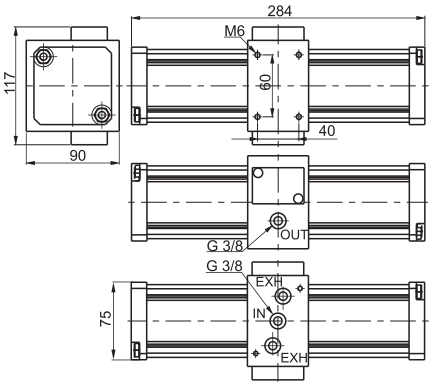


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

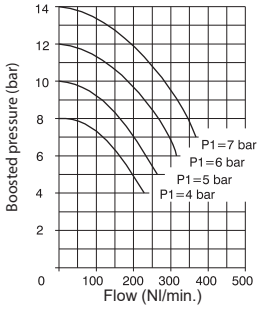
## Pressure booster ø63

**Coding:** 1763.80N



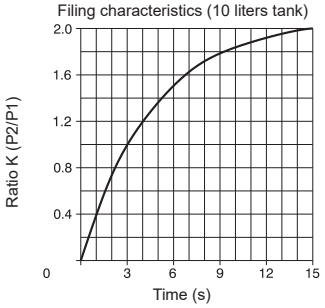



### Flow rate characteristics




P1 = inlet pressure (bar)

### Filling curve



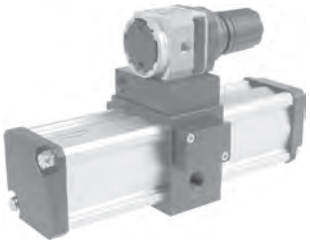

P1 = inlet pressure (bar) P2 = tank pressure (bar)

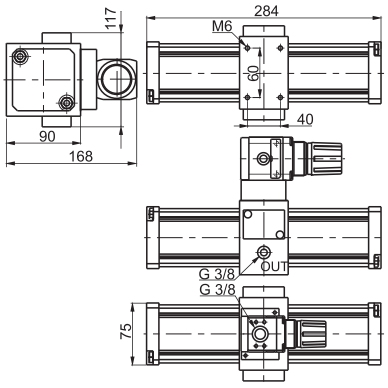
| Construction characteristics |
|---|
| • Self operating pressure booster with pressure ratio of 2:1.<br>• Automatic functioning: to operate the booster just connect it to compressed air line.<br>• Body made with light alloy.<br>• Barrel made of extruded and anodized aluminium.<br>• Downstream circuit pressure is kept under pressure even in absence of inlet pressure. |

| Technical characteristics | |
|---|---|
| Connections | G3/8" |
| Max working pressure (bar) | 2 ... 8 |
| Working temperature °C | -5 ... +50 |
| Orifice size (mm) | 7 |
| Weight (g) | 3000 |
| Assembly positions | Indifferent |
| Max. fittings torque (Nm) | 15 |

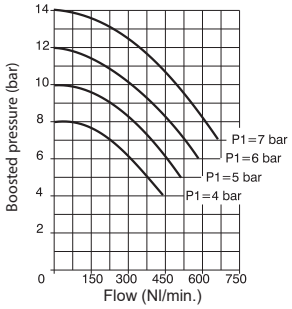
## Pressure booster Ø63 complete with pressure regulator

**Coding:** 1763.80NR



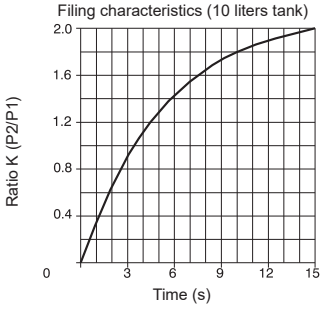



### Flow rate characteristics




P1 = inlet pressure (bar)

### Filling curve




P1 = inlet pressure (bar) P2 = tank pressure (bar)

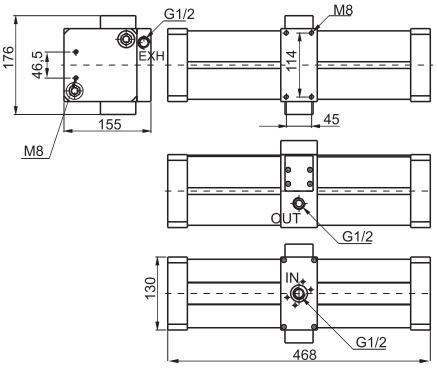
| Construction characteristics |
|---|
| • Self operating pressure booster with pressure ratio of 2:1.<br>• Automatic functioning: to operate the booster just connect it to compressed air line.<br>• Body made with light alloy.- Barrel made of extruded and anodized aluminium.<br>• Downstream circuit pressure is kept under pressure even in absence of inlet pressure.<br>• Regulation of the inlet pressure (and as a consequence regulation of the outlet pressure). |

| Technical characteristics | |
|---|---|
| Connections | G3/8" |
| Max working pressure (bar) | 2 ... 8 |
| Working temperature °C | -5 ... +50 |
| Orifice size (mm) | 5 |
| Weight (g) | 3200 |
| Assembly positions | Indifferent |
| Max. fittings torque (Nm) | 15 |

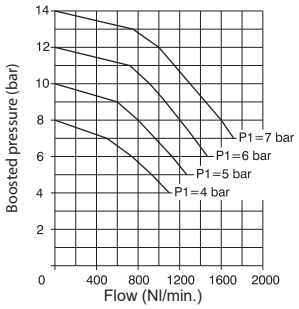
## Pressure booster ø100

**Coding:** 17100.125N



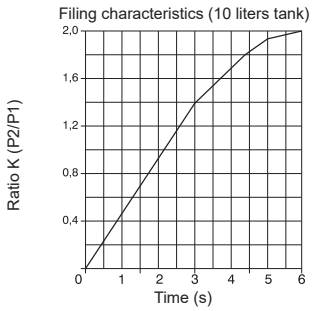



### Flow rate characteristics




P1 = inlet pressure (bar)

### Filling curve




P1 = inlet pressure (bar) P2 = tank pressure (bar)

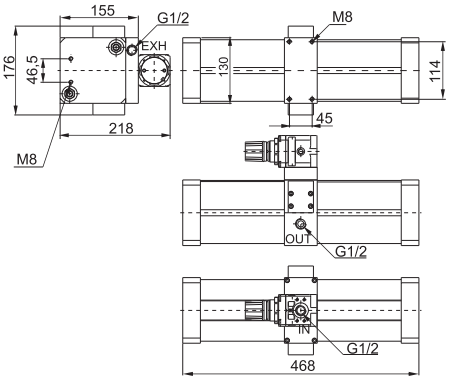
| Construction characteristics |
|---|
| • Self operating pressure booster with pressure ratio of 2:1.<br>• Automatic functioning: to operate the booster just connect it to compressed air line.<br>• Body made with light alloy.<br>• Barrel made of extruded and anodized aluminium.<br>• Downstream circuit pressure is kept under pressure even in absence of inlet pressure. |

| Technical characteristics | |
|---|---|
| Connections | G1/2" |
| Max working pressure (bar) | 2 ... 8 |
| Working temperature °C | -5 ... +50 |
| Orifice size (mm) | 12 |
| Weight (g) | 12000 |
| Assembly positions | Indifferent |
| Max. fittings torque (Nm) | 40 |

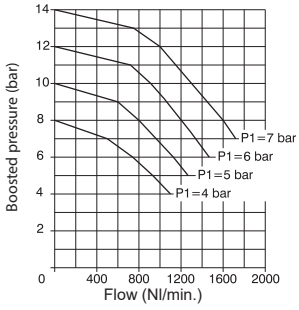
## Pressure booster ø100 complete with pressure regulator

**Coding:** 17100.125NR



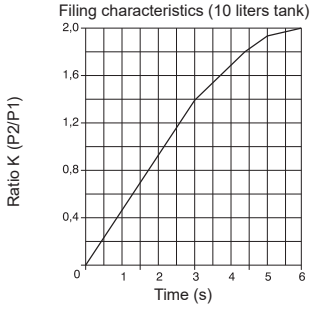



### Flow rate characteristics




P1 = inlet pressure (bar)

### Filling curve




P1 = inlet pressure (bar) P2 = tank pressure (bar)

| Construction characteristics |
|---|
| • Self operating pressure booster with pressure ratio of 2:1.<br>• Automatic functioning: to operate the booster just connect it to compressed air line.<br>• Body made with light alloy.- Barrel made of extruded and anodized aluminium.<br>• Downstream circuit pressure is kept under pressure even in absence of inlet pressure.<br>• Regulation of the inlet pressure (and as a consequence regulation of the outlet pressure). |

| Technical characteristics | |
|---|---|
| Connections | G1/2" |
| Max working pressure (bar) | 2 ... 8 |
| Working temperature °C | -5 ... +50 |
| Orifice size (mm) | 12 |
| Weight (g) | 12600 |
| Assembly positions | Indifferent |
| Max. fittings torque (Nm) | 40 |



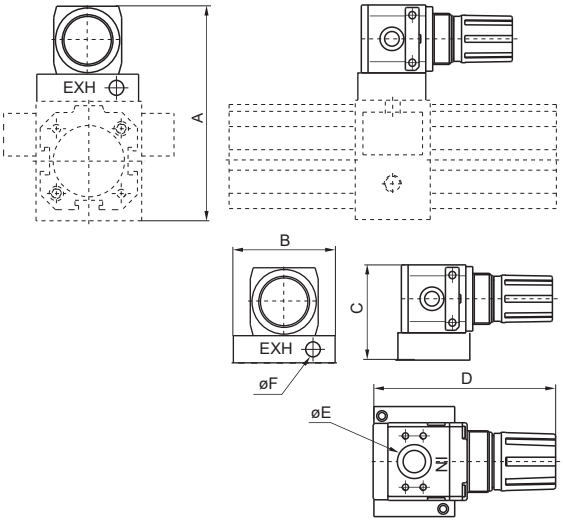
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Base complete with pressure reducer

**Coding:** 17Ⓥ.BR

| Ⓥ | VERSION |
|---|---|
| | **40** = Base complete with pressure reducer for Ø40 booster |
| | **63** = Base complete with pressure reducer for Ø63 booster |

ø100 = Mount directly the pressure reducer Code 17302B.C




| Dimensions | | | | | | |
|---|---|---|---|---|---|---|
| Code | A | B | C | D | E | F |
| 1740.BR | 126 | 60 | 56 | 91 | G1/8'' | G1/8'' |
| 1763.BR | 168 | 75 | 78 | 124 | G3/8'' | G3/8'' |

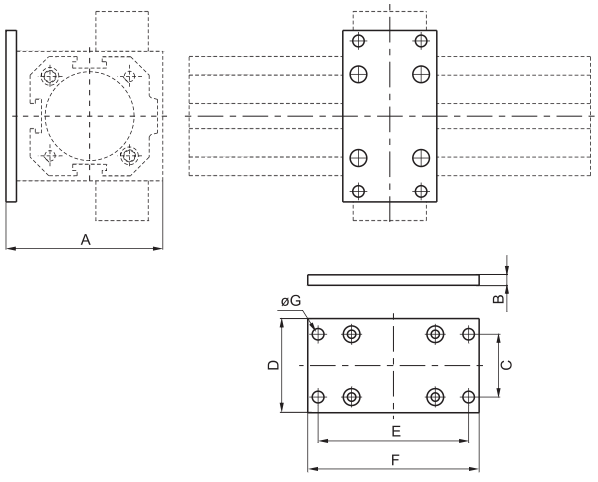
## Booster mounting plate

**Coding:** 17Ⓥ.02

| Ⓥ | VERSION |
|---|---|
| | **40** = Mounting plate for Ø40 booster |
| | **63** = Mounting plate for Ø63 booster |

ø100 = Use short foot bracket code 1320.50.05/1F






| Dimensions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Code | A | B | C | D | E | F | ØG |
| 1740.02 | 75 | 5 | 30 | 45 | 72 | 82 | 5.5 |
| 1763.02 | 100 | 15 | 53 | 70 | 98 | 110 | M8 |

## Series P+

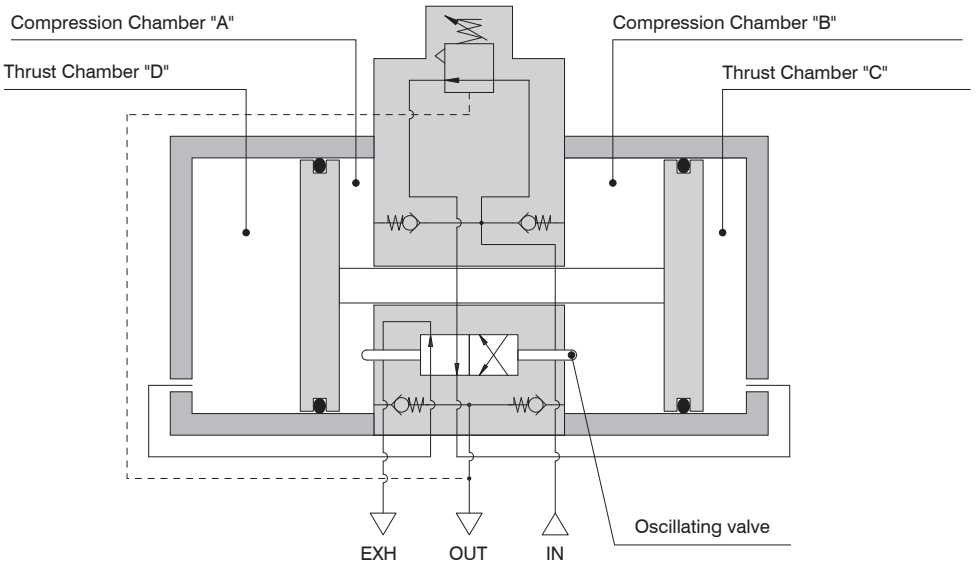
In some cases the force generated by a pneumatic actuator is not sufficient to carry out its required function.
To overcome this problem it is then necessary, where possible, to either increase the working pressure or use a larger bore actuator providing it will fit within the structure of the machine.
If you cannot fit a larger actuator, the solution is to use a pressure booster to increase the air pressure to that portion of the pneumatic circuit.
The booster operates using the same compressed air used by the pneumatic system and does not require an external power supply. It is easy to install and can increase the working pressure in any part of the system where ever its needed, maintaining the normal working pressure in the rest of the system.
The new pressure booster **P+** is lightweight with a new compact and linear design.
**P+** has an integrated pressure regulator that adjusts the setting of the output pressure P2 which is also fitted with a pressure relief valve.
The design of the internal circuit provides high flow rates and fast filling times whilst the two G1/8" manometer connections built into the body of the booster allow monitoring of the input and output pressures.



### Operation

The operating principle of the device is based on a four chamber pump in which with a reciprocating movement, two chambers compress the air in the compression chamber whilst the fourth chamber is in the discharge phase.
The incoming air passes through the non-return valves and supplies the compression chambers "A" and "B" at the same time.
Meanwhile the integrated pressure regulator, via the switching valve, feeds the thrust chamber "C", discharging chamber "D".
The movement of the piston, with the thrust of chamber "C", compresses the air in the multiplication chamber "B", which is pushed through the output Non return valve and then onto the OUT connection.
When the piston reaches the end of stroke the switching valve feeds chamber "D" putting chamber "C" into the discharge position thus reversing the motion of the piston.
The previous process compressing the air in compression chamber "A", pushing it through the non-return valve and out through the outlet connection.
The oscillating motion of the piston allows the pressure booster to pump intensified air into the downstream circuit until the chambers reach a state of equilibrium; this in turn stops the booster.
When the downstream pressure decays the booster restarts oscillating until the state of equilibrium is re-established

### Pneumatic Circuit




The **P+** pressure booster, is certified by ATEX:

**CE Ex II 3GD c T6 T85°C X 5°C≤Ta≤50°C.**


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

### General Warning

It is recommended you follow the instructions below in order to prevent personal injury or damage to the booster.
- The pressure booster is supplied as standard with the regulating spring completely unwand. in this condition it is possible to detect a leak of air from below the regulating knob or through the exhaust port. this conditions is standard for the unit. When the spring is completely unwand the downstream pressure and the inlet pressure are the same. in order to increase the downstream pressure it is necessary to operate th regulation knob increasing the sping compression.
- Please apply the necessary safety measures to ensure that the booster only operates within the specified pressure range. Exceeding the maximum output pressure is dangerous.
- The Booster is fitted with a non-return valve on the output which prevents discharge of the downstream pressure, It is recommended that a 3/2 valve be installed in the OUT connection if it is necessary to rapidly discharge the downstream pressure.
- When the booster is not in use it is recommended that the inlet pressure is removed to let the booster stop, thus avoiding unexpected operation or malfunction.
- If there is not downstream air consumption it is possible to register a leak through the exhaust port of the unit. This condition is normal and is the conseguence of the internal designed aimed at discharging any pressure building up in the unit in the rest condition.

### Use and maintenance

The pressure booster must always be used in accordance with the operating parameters and instruction.
Any improper use may cause injury or malfunction.
The pressure booster is not an alternative to a compressor because continuous uninterrupted operation will greatly reduce the life of the unit.
- The operating life of the device depends mainly on the operational duty cycle. Prolonged uninterrupted use without pause may reduce the operating life of the booster.
- Ensure the unit is supplied with a suitable compressed air supply, please note: appropriate filtration and lubrication may help to increase the durability of the product.
- **The input flow value must be equal or greater than double the output flow value (Q1/Q2>2). Ensure that the value of the output pressure is at least 1bar higher than the input pressure (P2>P1+1).**
- To avoid pulsation of the output pressure during operation, it is recommended that an accumulation tank (reservoir) is installed in the downstream circuit.
- To avoid pulsation of the output pressure during operation, it is recommended that an accumulation tank (reservoir) is installed in the downstream circuit.
- To reduce the noise generated by the unit, install silencers into the exhaust ports.
- Pressure booster has an average life of about 20 millions of valve cycles, depending on working conditions (every back stroke corresponds to one valve cycles ).

### Pressure regulation

The booster is fitted with an internal pressure regulator which allows regulation of the output pressure P2 and is also fitted with pressure relief valve. For correct operation of the booster, please consider the following instructions:
- Air leaking from under the adjusting knob when the spring is decompressed is not a defect but a sign that the device is working correctly.
- In order to increase the regulated pressure, pull the knob upwards to unlock, then rotate the knob in the direction indicated by the arrow (+).
- The rotation of the knob has an upper and lower block beyond which the knob is damaged.
- To lock the knob after the adjustment has been made, push the knob downwards until it detents in the locked position.
- To reduce the output pressure, pull the knob upwards, rotate the knob indicated by the arrow (-), the built in pressure relief valve will discharge the excess pressure from under the adjusting knob.
- Always regulate the rising pressure.




### Method of calculation of the time necessary to increase the pressure in a tank of a given volume using a pressure booster.

DATA:
P1 = Inlet pressure
P2' = Tank initial pressure
P2" = Final tank pressure
V = Tank volume

**Procedure**

1) Calculate the K' ratio between the initial tank pressure and the inlet booster pressure (P2'/ P1).
2) Calculate the K'' ratio between the final tank pressure and the inlet booster pressure (P2''/ P1).
3) Locate, on the chart illustrating, the booster filling time, the intersection point between the K' ratio and the curve, then trace a vertical line from the intersection point to the vertical axis and read the correspondent value T' (in the example chart, to a ratio of 0.8 corresponds a time value of about 3.6 seconds).
4) Repeat the operation for the K'' ratio, obtaining the T'' time.
5) Use the following formula

$$T = \frac{V}{5} \cdot (T''-T')$$

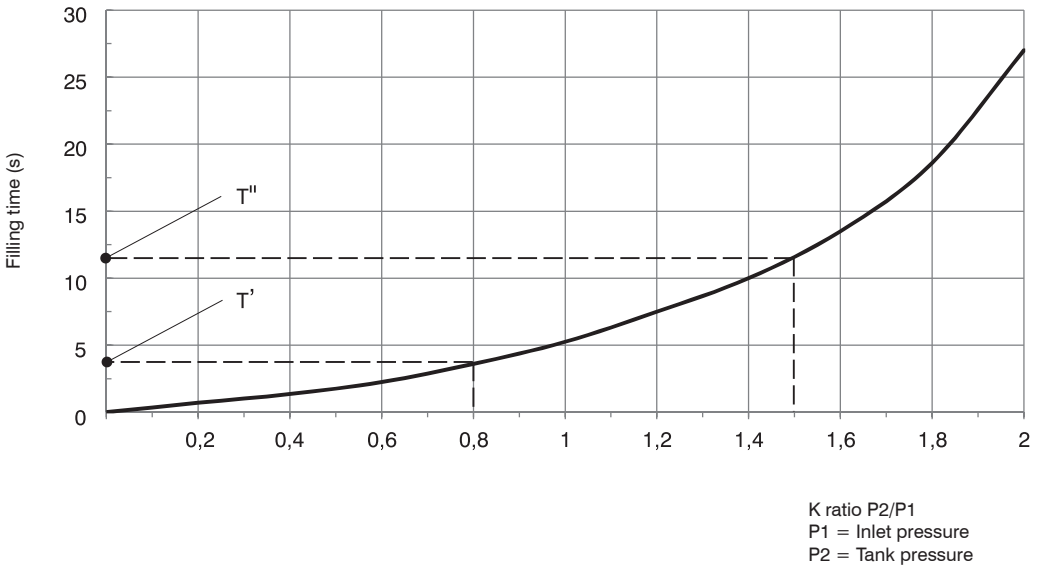
to obtain the total time needed to take the tank of volume V from the pressure value P2' to the pressure value P2'.

Example of calculation of the necessary time to take a 10L tank from the pressure value P2' to the value P2"

K' = 0,8 T' = 3,6 sec. V = 5L.
K'' = 1,5 T'' = 12 sec.

$$T = \frac{5}{5} \cdot (12-3,6) = 8,4 \text{ sec.}$$

**Filling Characteristics (5 litres tank)**




K ratio P2/P1
P1 = Inlet pressure
P2 = Tank pressure




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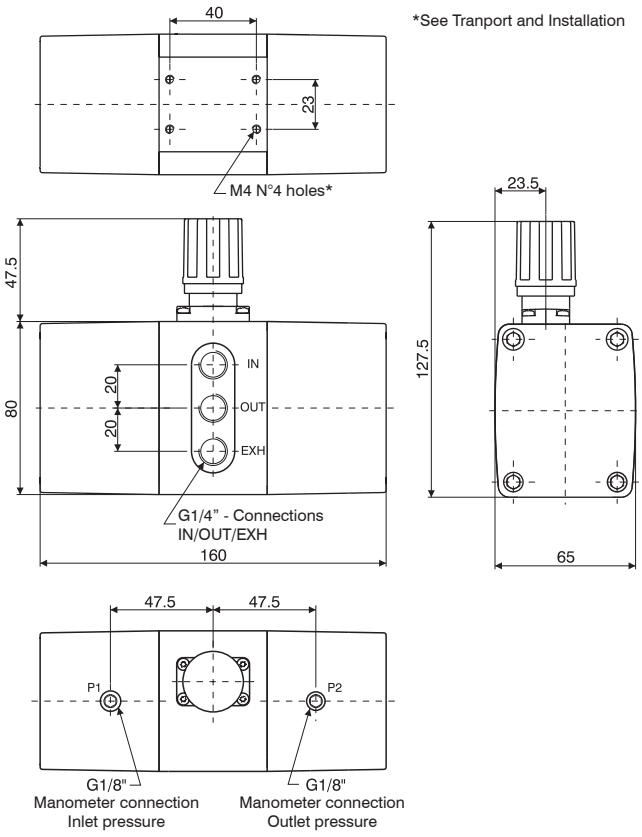
## Pressure booster in technopolymer Ø40

**Coding:** MDPT40.2R.◉

| ◉ | MANOMETER OPTIONS |
|---|---|
| | Standard without manometer |
| | **A** = Manometer P1 0-12 bar<br>Manometer P2 0-20 bar |
| | **B** = Manometer P1 0-12 bar<br>Manometer P2 0-16 ba |
| | **C** = Manometer P1 0-12 bar<br>Manometer P2 0-12 bar |





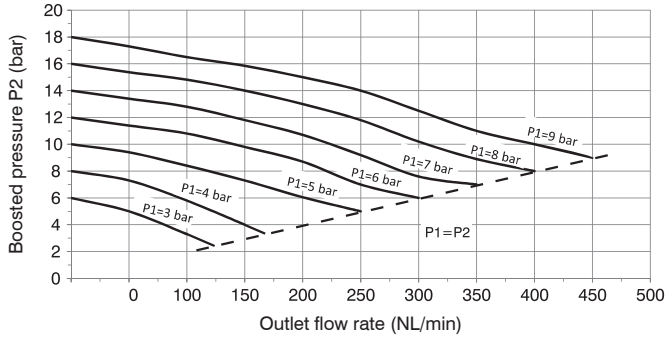



| Construction characteristics |
|---|
| • Pressure Booster with max. 2:1 Compression ratio<br>• Automatic operation for use with compressed air only<br>• Maintains downstream air when the supply pressure fails (Providing the circuit has no leakage)<br>• Integrated regulator for output pressure control, with overpressure relief valve<br>• IN,OUT and EXH connections – G1/4" on the same side<br>• Manometer connections G1/8" to monitor and control the input and output pressures<br>• Body and cover in technopolymer<br>• Connections in technopolymer |

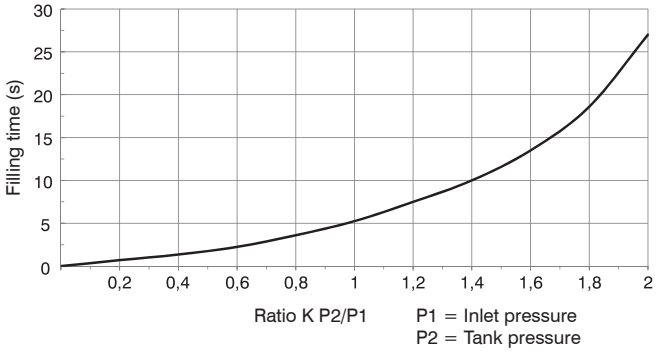
| Technical characteristics | |
|---|---|
| Connections IN / OUT / EXT | G1/4" |
| Manometer connections P1/P2 | G1/8" |
| Max working pressure (bar) | 2,5 ... 10 |
| Working temperature °C | -5 ... +50 |
| Moltiplication ratio max. | 2 : 1 |
| Assembly positions | Indifferent |
| Pressure regulation | Manual with relieving |
| Weight (g) | 905 |
| Max. fittings torque (Nm) | G1/8 = 4<br>G1/4 = 9 |

## Characteristic curves

### Flow rate characteristics




### Filling curve

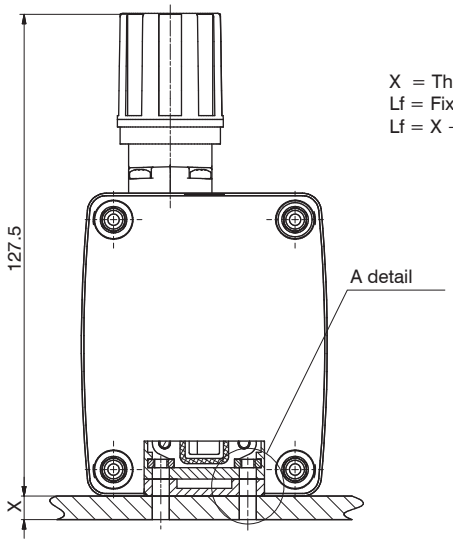


### Transport and Installation

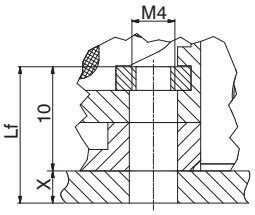
The installation and implementation of the device must be done by skilled personnel. Respecting the safety requirements specified in the **UNI norm UNI EN 983-97 Machinery Safety – Safety Requirements concerning oleo-hydraulic and pneumatic systems** and their components. The following instructions are essential for a correct installation:

- Do not use the green knob to lift and transport the device, because it could rip off causing injuries or damaging objects.
- Install the booster by fixing it through the threaded M4 holes on the body of the machine or using the special accessories (see the “Accessories” chapter).

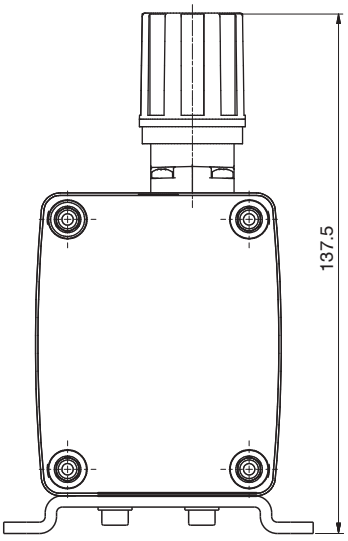
### Direct wall fixing




X = Thickness of the support surface
Lf = Fixing screw thread lenght
Lf = X + 10



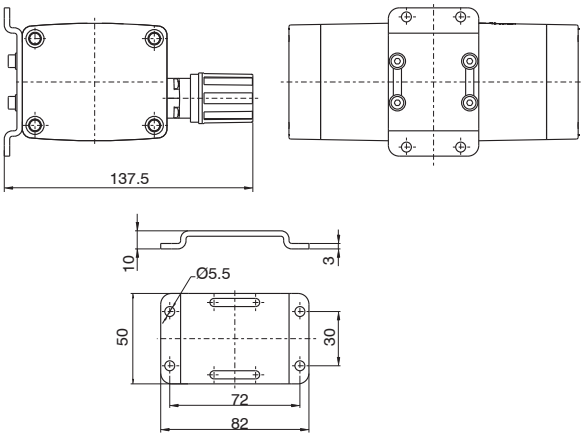

### Fixing with a steel plate fixing clamp




## Bracket

**Coding:** T1740.01





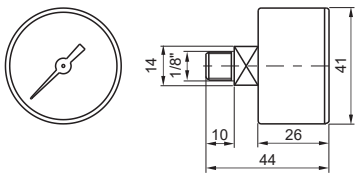

Weight: 94,5
Complete with booster fixing screws

## Pressure gauge

**Coding:** 17070 Ⓥ Ⓢ

| | |
|---|---|
| Ⓥ | VERSION |
| | **A** = Dial Ø40 |
| Ⓢ | SCALE |
| | **A** = 0 - 4 bar |
| | **B** = 0 - 6 bar |
| | **C** = 0 - 12 bar |
| | **D** = 0 - 16 bar |
| | **E** = 0 - 20 bar |








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Section 03

# Pneumatic actuation

Pneumatic cylinders, handling and magnetic sensors

## Cylinders with piston rod according to standard

### ISO 6432 Microbore cylinders

Versions available: with threaded end covers, rolled end covers, aluminium, stainless steel and technopolymer versions



**Series 1200**
**Threaded end covers** **3**.1


**Series 1200, Tecno-MIR** **3**.4

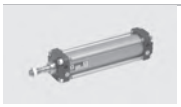

**Series 1200**
**Rolled end covers MIR** **3**.10


**Series 1200**
**Rolled end covers MIR-INOX** **3**.13


**Series 1200, Steel line** **3**.18


### CNOMO-CETOP-ISO cylinders

Cylinders manufactured according to standards CNOMO, CETOP and ISO: standard versions, through rod versions, tandem push with common rod, tandem push with independent rods or opposed tandem with common rod



**Series 1303-1308** **3**.30


### Cylinders according to standard ISO 15552

Cylinders according to ISO 15552 with bores from Ø32 to Ø200 mm and strokes up to 1250 mm.
Available versions: ECOPLUS with aluminium or technopolymer end plates, ECOLIGHT optmized in weight and dimensions, Steel line completely in stainless steel, round tube versions tie rod (Ø250-Ø320 mm)



**Series 1319-1320-1321** **3**.41


**Series 1348-1349-1350**
**Non rotating cylinders** **3**.44


**Series Ecoplus - High-performance** **3**.47


**Series Ecolight**
**1390-1391-1392** **3**.51


**Series Ecolight**
**with protective bellows** **3**.58


**Series 1315**
**Round tube cylinders** **3**.73


**Series Steel line - AISI 316** **3**.77


### Hydro-pneumatic speed control cylinders according to standard ISO 15552

ISO 15552 hydro-pneumatic speed control cylinders with internal hydraulic circuit for movement control



**Series 1450 - 1463 - Ø50 - Ø63** **3**.86

## Compact cylinders according to standard ISO 21287

Compact cylinders according to standard ISO with integrated slots suitable for sensors mounting without adaptors. Bores from Ø20 to Ø100 mm. Versions with end stroke adjustable pneumatic cushioning are also available according to ISO 21287



**Series 1500 Ecompact** **3**.92

## Cylinders with piston rod not according to standard

## Threaded body microbore cylinders

Special performance microbore cylinders with hexagonal or round bodied and either completely threaded or threaded with a plain rod ending



**Series 1200**
**Special performance microbore cylinders** **3**.108

## Profile tube cylinders, non rotating

Non rotating profile tube cylinders twin rod version, available with bores from Ø32 to Ø100 mm, and strokes up to 500 mm



**Series 1325-1326-1345-1347**
**Twin rod cylinders** **3**.110

## Flat profile cylinders

ECOFLAT cylinders available with sizes from Ø25 to Ø63 mm and strokes up to 300 mm. Profiled tube has two “T” slots on the side hosting sensors 1580._, MRS._, MHS._. without adaptors. Two additional connections are also available on rear cover for cylinder feeding



**Series ECOFLAT** **3**.115

## Hydraulic speed control cylinders

Hydraulic speed control cylinders with outward, inward and outward/inward control, with lateral or in-line tank. Available with SKIP valve (accelerating device) and blocking valve (STOP).



**Series 1400 - Ø40 - Ø63** **3**.121

## Compact cylinders

Short stroke and compact cylinders with bores from Ø20 to Ø100 mm, available in single and double acting versions, tandem and through rod with magnetic piston versions. The Europe versions are mainly compliant with the ISO or UNITOP standard (depending on bores), while the Ecompact-S versions have connections and rods according to the ISO 15552 standard



**Series 1500 - Short stroke cylinders** **3**.132



**Series 1500 Europe** **3**.139



**Series 1500 Ecompact-S** **3**.147


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## Cylinders with piston rod not according to standard (following)

### Multimount cylinders

Multimount cylinders available with bores from Ø10 to Ø25 mm, with strokes up to 50 mm and with magnetic piston versions



**Series 6500** **3**.152

### Guided compact cylinders

These cylinders are available in sizes Ø12 to Ø80 mm, and comprise a single compact cylinder with integral guide rods, the rod guide is available in two styles: self-lubricating bronze bushes and bearing bushes



**Series 6100-6101-6110** **3**.154

### Slide cylinders

Slide cylinders manufactured with bores from Ø8 to Ø25 mm, with strokes up to 150 mm. Available with simple and double regulation end stroke and also with front and rear shock absorber



**Series 6600** **3**.168

### Slide units

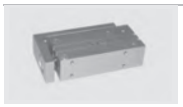
Twin-rod linear guide units with bores from Ø10 to Ø32 mm, and with control unit with bronze bush versions, with control unit with bearing bush versions. Are also available the through twin-rod slide units and the compact slide units



**Series 6200 - Twin-rod slide units** **3**.179



**Series 6210**
**Through twin-rod slide units** **3**.183

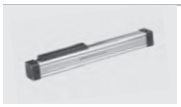


**Series 6700** **3**.188

## Rodless cylinders

### Rodless cylinders - Standard

Rodless cylinders with bore from Ø16 to Ø63 mm, and strokes up to 6000 mm, available also with linear control unit



**Series 1605** **3**.195



**Series 1605 Ø16** **3**.206

## Rotary actuators

### Rack rotary actuators

Double or single rack & pinion rotary actuators


**Series 1330 - 1331 - 1332 - 1333, rotary actuators** **3**.211


**Series 6400 - Double rack rotary actuators with turn table** **3**.215


**Series 6411** **3**.218

### Vane type rotary actuators

Vane type rotary actuators with the shaft that runs into ball bearings, available with sizes from Ø10 to Ø100 mm


**Series 6420** **3**.221

## Handling

### Pneumatic grippers

Pneumatic grippers manufactured with 2 angular fingers (from -10° to +30°), wide opening 180°, or 3 finger parallel style.
Swing clamp cylinders has been developed to meet the need to clamp a workpiece by means of a clamping arm.


**Series 6300** **3**.231


**Series RT** **3**.245

## Sensors

### Magnetic sensors

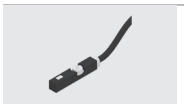
Magnetic sensors with Reed type or Hall effect


**Series SA** **3**.250

### Miniaturised magnetic sensors

Miniaturised magnetic sensors with Reed and Hall style versions, available with rectangular, square, square section UL/CSA approved, and round section versions


**Series SR** **3**.262


**Series SU** **3**.266


**Series SQ** **3**.267


**Series ST** **3**.271

## Accessories and fixing devices

### Piston rod lock

Piston rod lock for cylinders with bores from da Ø12 to Ø125 mm


**Series 1260 - 1320** **3**.279

### Linear guiding units

Linear guiding units series 1200 (Ø20-25 mm) and series 1320 (from Ø32 to Ø80 mm)


**Series 1260 - 1320** **3**.281

### Shock absorbers

Shock absorbers with M8x1-M10x1-M14x1,5-M20x1,5-M27x1,5 threads


**Series 6900** **3**.283


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 1200, Threaded end covers

### Construction characteristics

| | |
|---|---|
| Barrel | anodised aluminium (brass for Ø8 and Ø10) |
| Fixing devices | steel painted in cataphoresis |
| Forks | zinc plated steel |
| Seals | standard: NBR Oil resistant rubber, PUR Piston rod seals<br>(HNBR or FPM seals available upon request) |
| Single-acting springs | Steel for springs and stainless steel |
| Pistons | aluminium |
| Piston rod | non magnetic piston: Ø8 - Ø10: stainless steel / Ø12 ... Ø50: C43 chromed<br>magnetic piston: Ø10 ... 20: stainless steel / Ø25 ... 50: C43 chromed |
| End caps | anodized aluminium |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Cushioning lenght | Ø | 16 | 20 | 25 | 32 | 40 | 50 |
| | mm | 15 | 18 | 18 | 18 | 22 | 22 |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered air, preferably lubricated |
| Max. working pressure | 10 bar |
| Working temperature | -5°C ... +70°C with standard seals magnetic or non magnetic piston<br>-5°C ... +80°C with FPM seals magnetic piston<br>-5°C ... +80°C with HNBR seals magnetic piston<br>-5°C ... +120°C with HNBR seals non magnetic piston<br>-5°C ... +150°C with FPM seals non magnetic piston |

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

### Standard strokes

*Double acting version*

**Ø8 - Ø10:**
15 - 25 - 50 - 75 - 80 - 100 mm
**Ø12 - Ø16:**
15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 mm
**Ø20 - Ø25:**
15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 mm
**Ø32 ... Ø50:**
15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 - 450 - 500 mm

On request are available strokes up to:
**Ø8 - Ø10:** 250 mm
**Ø12 - Ø16:** 700 mm
**Ø20 ... Ø50:** 1000 mm

*Single acting version*

**Ø12 ... Ø50:**
up to stroke 40 mm
On request are available strokes up to 200 mm

### Minimum and maximum springs load for single acting version

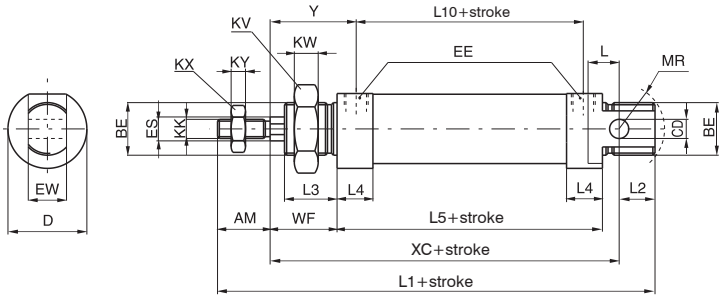
| Bore | Ø12 ... Ø20 | Ø25 | Ø32 | Ø40 - Ø50 |
|---|---|---|---|---|
| Min. load (N) | 10 | 10 | 20 | 40 |
| Max. load (N) | 25 | 50 | 55 | 110 |

## Basic version

**Coding:** 12Ⓣ.Ø.stroke.ⓋⒼ

| | |
|---|---|
| Ⓣ | TYPE |
| | **60** = Double acting version |
| | **71** = front spring from Ø12 (max stroke 40 mm) |
| | **72** = rear spring from Ø12 (max stroke 40 mm) |
| Ø | BORE |
| | **8** = Ø8 |
| | **10** = Ø10 |
| | ... |
| | **50** = Ø50 |
| Ⓥ | VERSION |
| | **A** = Adjustable cushioning (from Ø16) |
| | **M** = Magnetic piston (from Ø10) |
| | **X** = Stainless steel rod |
| | **MA** = Cushioning with magnetic piston |
| | **MAX** = Cushioning, magnetic piston and stainless steel piston rod |
| Ⓖ | SEALS |
| | = NBR |
| | **T** = HNBR |
| | **V** = FPM |





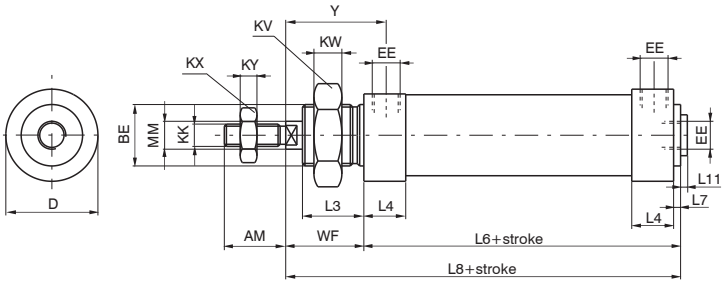

Standard execution, fully complying with ISO standards from ø8 to ø25. Bores 32, 40 and 50 not included in the standard, comply with our own specifications. Can use all available mountings. For single acting type, the maximum stroke is 40 mm., after which overall dimensions increase in length to an extent not proportional to the stroke (and in any case not longer than stroke 100).

## Without rear eye version

**Coding:** 12Ⓣ.Ø.stroke.ⓋⒼ

| | |
|---|---|
| Ⓣ | TYPE |
| | **61** = Double acting version |
| | **73** = front spring from Ø12 (max stroke 40 mm) |
| | **74** = rear spring from Ø12 (max stroke 40 mm) |
| Ø | BORE |
| | **8** = Ø8 |
| | **10** = Ø10 |
| | ... |
| | **50** = Ø50 |
| Ⓥ | VERSION |
| | **A** = Adjustable cushioning (from Ø16) |
| | **E** = version with non-rotating hexagonal rod, non magnetic piston (from Ø12) |
| | **M** = Magnetic piston (from Ø10) |
| | **X** = Stainless steel rod |
| | **AE** = version with non-rotating hexagonal rod, with cushioning (from Ø16) |
| | **MA** = Cushioning with magnetic piston |
| | **ME** = version with non-rotating hexagonal rod, magnetic piston (from Ø12) |
| | **MAE** = version with non-rotating hexagonal rod, with cushioning and magnetic piston (from Ø16) |
| | **MAX** = Cushioning, magnetic piston and stainless steel piston rod |
| | **L** = Air inlet at 90° version |
| Ⓖ | SEALS |
| | = NBR |
| | **T** = HNBR |
| | **V** = FPM |






Version derived from standard execution 1260 and not included in ISO standard. Not having a rear eye it is shorter and the air inlet is from the rear or at 90° like it is on the front. The considerations made for the basic type 1260 apply for all single-acting types.

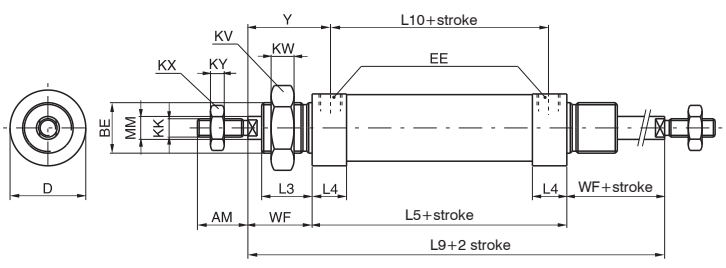
## Through rod cylinder version

**Coding:** 1262.Ø.stroke.ⓋⒼ

| | |
|---|---|
| Ø | BORE |
| | **8** = Ø8 |
| | **10** = Ø10 |
| | ... |
| | **50** = Ø50 |
| Ⓥ | VERSION |
| | **A** = Adjustable cushioning (from Ø16) |
| | **E** = version with non-rotating hexagonal rod, non magnetic piston (from Ø12) |
| | **M** = Magnetic piston (from Ø10) |
| | **X** = Stainless steel rod |
| | **AE** = version with non-rotating hexagonal rod, with cushioning (from Ø16) |
| | **MA** = Cushioning with magnetic piston |
| | **ME** = version with non-rotating hexagonal rod, magnetic piston (from Ø12) |
| | **MAE** = version with non-rotating hexagonal rod, with cushioning and magnetic piston (from Ø16) |
| | **MAX** = Cushioning, magnetic piston and stainless steel piston rod |
| Ⓖ | SEALS |
| | = NBR |
| | **T** = HNBR* |
| | **V** = FPM* |

***Excludes hexagonal rod version**






Execution by rod coming out from both end caps, with overall dimensions. except for the rod, equal to 1260 version. Not available with Ø8 and 10.





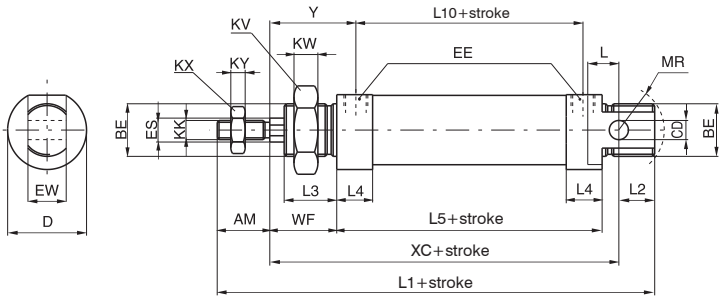
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Non rotating hexagonal piston rod version (from Ø 12)

**Coding:** 12Ⓣ.Ø.stroke.ⓋⒼ

| | |
|---|---|
| Ⓣ | TYPE |
| | **60** = Double acting version |
| | **71** = front spring from Ø12 (max stroke 40 mm) |
| | **72** = rear spring from Ø12 (max stroke 40 mm) |
| Ø | BORE |
| | **8** = Ø8 |
| | **10** = Ø10 |
| | ... |
| | **50** = Ø50 |
| Ⓥ | VERSION |
| | **E** = with non magnetic piston |
| | **AE** = version with non-rotating hexagonal rod, with cushioning (from Ø16) |
| | **ME** = Hexagonal piston rod with magnetic piston (from Ø12) |
| | **MAE** = version with non-rotating hexagonal rod, with cushioning and magnetic piston (from Ø16) |
| Ⓖ | SEALS |
| | = NBR |
| | **T** = HNBR |
| | **V** = FPM |






Similar overall dimensions as 1260 basic type, it differs because of the hexagonal rod (instead of circular) to avoid the rotation. It is particularly suitable when it is used as a guide and support to the linked element. Not for use with high frequencies and long strokes. For which, whenever possible use front spring.



### Table of dimensions

| Bore | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|
| AM (-0,2) | 12 | 12 | 16 | 16 | 20 | 22 | 20 | 25 | 25 |
| BE | M12x1,25 | M12x1,25 | M16x1,5 | M16x1,5 | M22x1,5 | M22x1,5 | M30x1,5 | M40x1,5 | M40x1,5 |
| CD (H9) | 4 | 4 | 6 | 6 | 8 | 8 | 12 | 14 | 14 |
| D (-0,3) | 16 | 17 | 19 | 24 | 28 | 33 | 40 | 48 | 58 |
| EE | M5 | M5 | M5 | M5 | G1/8" | G1/8" | G1/8" | G1/4" | G1/4" |
| ES | - | - | 6 | 6 | 8 | 10 | 12 | 12 | 12 |
| EW (d13) | 8 | 8 | 12 | 12 | 16 | 16 | 26 | 30 | 30 |
| KK (6g) | M4x0,7 | M4x0,7 | M6x1 | M6x1 | M8x1,25 | M10x1,25 | M10x1,25 | M12x1,75 | M12x1,75 |
| KV | 17 | 17 | 22 | 22 | 30 | 30 | 42 | 52 | 52 |
| KW | 5,5 | 5,5 | 6 | 6 | 7 | 7 | 8 | 9 | 9 |
| KX | 7 | 7 | 10 | 10 | 13 | 17 | 17 | 19 | 19 |
| KY | 3 | 3 | 4 | 4 | 5 | 6 | 6 | 7 | 7 |
| L | 6 | 6 | 9 | 9 | 12 | 13 | 13 | 16 | 16 |
| L1(±1) * | 85 | 85 | 105 | 111 | 130 | 141 | 139 | 164 | 167 |
| L2 | 9 | 9 | 14 | 13 | 15 | 15 | 14 | 16 | 16 |
| L3 | 11 | 11 | 17 | 17 | 18 | 22 | 22 | 25 | 25 |
| L4 | 10 | 10 | 9,5 | 10,5 | 15 | 15 | 15 | 18 | 18 |
| L5 (±1) * | 46 | 46 | 50 | 56 | 68 | 69 | 69 | 79 | 82 |
| L6 (±1) * | 48 | 48 | 52 | 58 | 70,5 | 71,5 | 71,5 | 82 | 85 |
| L7 | 2 | 2 | 2 | 2 | 2,5 | 2,5 | 2,5 | 3 | 3 |
| L8 (±1) * | 64 | 64 | 74 | 80 | 94,5 | 99,5 | 99,5 | 117 | 120 |
| L9 (±1,2) * | 78 | 78 | 94 | 100 | 116 | 125 | 125 | 149 | 152 |
| L10 (±1) * | 35 | 35 | 40 | 45 | 52 | 53 | 53 | 60 | 63 |
| L11 | - | - | - | 1,5 | 2 | 2 | 2 | 2 | 2 |
| MM (f7) | 4 | 4 | 6 | 6 | 8 | 10 | 12 | 14 | 14 |
| MR (min.) | 12 | 12 | 16 | 16 | 18 | 19 | 22 | 28 | 28 |
| WF (±1,2) | 16 | 16 | 22 | 22 | 24 | 28 | 28 | 35 | 35 |
| XC (±1) * | 64 | 64 | 75 | 82 | 95 | 104 | 105 | 123 | 126 |
| Y (±1,2) | 21,5 | 21,5 | 27 | 27,5 | 32 | 36 | 36 | 44,5 | 44,5 |

**(*) These dimensions increase of 10 mm for microbore cylinders equipped with magnetic piston and spring return, and of 9 mm for microbore cylinders with 10 mm BORE magnetic piston**

### STROKE TOLERANCE: until stroke 100 mm - 1,5, beyond + 2 mm.

| Weight | Stroke 0 | 55 | 60 | 80 | 100 | 175 | 240 | 365 | 610 | 790 |
|---|---|---|---|---|---|---|---|---|---|---|
| g | every 10mm | 6 | 7 | 5 | 5 | 8 | 11 | 15 | 19 | 21 |

*Without rear eye version*

| Weight | Stroke 0 | 50 | 55 | 75 | 95 | 170 | 230 | 345 | 570 | 750 |
|---|---|---|---|---|---|---|---|---|---|---|
| g | every 10mm | 6 | 7 | 5 | 5 | 8 | 11 | 15 | 19 | 21 |

*Through rod cylinder version*

| Weight | Stroke 0 | 55 | 60 | 95 | 120 | 220 | 310 | 450 | 760 | 950 |
|---|---|---|---|---|---|---|---|---|---|---|
| g | every 10mm | 7 | 8 | 7 | 7 | 12 | 17 | 24 | 31 | 33 |

*Hexagonal rod version*

| Weight | Stroke 0 | - | - | 85 | 105 | 180 | 250 | 370 | 590 | 760 |
|---|---|---|---|---|---|---|---|---|---|---|
| g | every 10mm | - | - | 5 | 6 | 8 | 12 | 16 | 17 | 19 |

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 1200 Tecno-MIR

### Construction characteristics

| | |
|---|---|
| Barrel | nylon 66 reinforced with glass fibres |
| Fixing devices | steel painted / stainless steel AISI 304 |
| Forks | zinc plated steel / stainless steel AISI 304 |
| Piston seals | NBR oil-resistant rubber seal |
| Rod seal | PUR |
| Pistons | aluminium |
| Piston rod | C43 chromed (non magnetic piston version)<br>stainless steel (magnetic piston version) |
| End caps | nylon 66 reinforced with glass fibres |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered air, preferably lubricated |
| Max. working pressure | 8 bar |
| Working temperature | -5 °C ... +50 °C |

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.



### Standard strokes

*Double acting version*

**Ø12:**
15 - 25 - 50 - 75 - 80 - 100 - 125 - 150 - 160 - 200 mm
**Ø16:**
15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 mm
**Ø20 - Ø25:**
15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 mm
On request are available strokes up to:
**Ø12:** 200 mm
**Ø16:** 250 mm
**Ø20 - Ø25:** 300 mm

### Maximum fitting torque

| Bore | Thread | Maximum torque (Nm) |
|---|---|---|
| Ø12 | M5 | 1 |
| Ø16 | M5 | 1 |
| Ø20 | G 1/8" | 4 |
| Ø25 | G 1/8" | 4 |

### Weight charts

| Weight table series TECNO MIR 1230 - 1231 | | | | | |
|---|---|---|---|---|---|
| Bore | | Ø12 | Ø16 | Ø20 | Ø25 |
| Weight (g) | Stroke 0 | 50 | 65 | 120 | 160 |
| | every 10 mm | 3,75 | 4 | 6,5 | 9 |

| Weight table series TECNO MIR 1232 | | | | | |
|---|---|---|---|---|---|
| Bore | | Ø12 | Ø16 | Ø20 | Ø25 |
| Weight (g) | Stroke 0 | 60 | 75 | 180 | 200 |
| | every 10 mm | 7 | 8,5 | 10 | 20 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

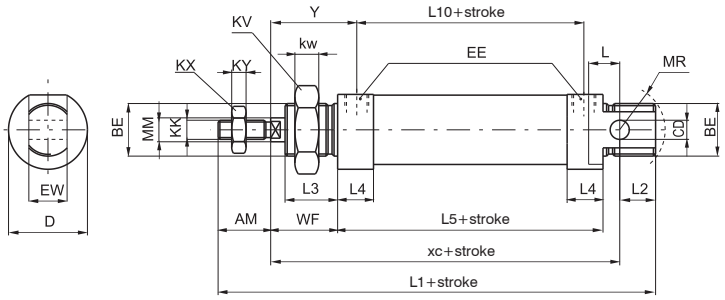
## Basic version

**Coding:** 1230.Ø.stroke.Ⓥ

| | |
|---|---|
| Ø | BORE |
| | **12** = Ø12 |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| Ⓥ | VERSION |
| | = non magnetic piston |
| | **M** = magnetic piston |

Standard version, fully complying with ISO standards. Can use all available mountings.





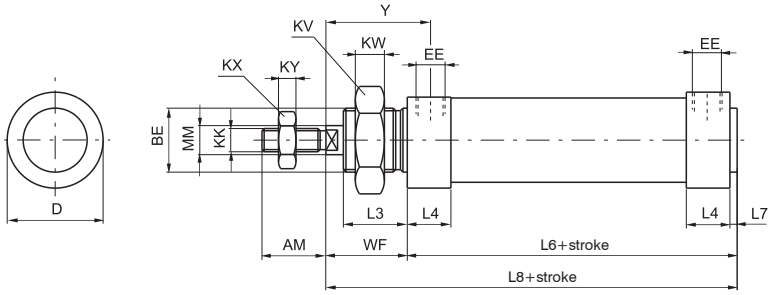

## Without rear eye version

**Coding:** 1231.Ø.stroke.Ⓥ

| | |
|---|---|
| Ø | BORE |
| | **12** = Ø12 |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| Ⓥ | VERSION |
| | = non magnetic piston |
| | **M** = magnetic piston |

This version derived from standard version 1230 and not included in ISO standard.
Not having a rear eye it is shorter.
The inlet connection is lateral on the rear caps (like on the front caps).





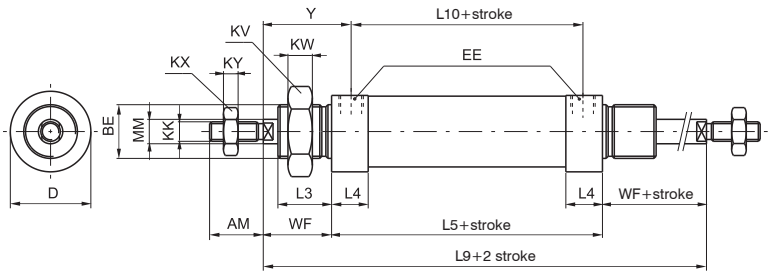

## Through rod cylinder version

**Coding:** 1232.Ø.stroke.Ⓥ

| | |
|---|---|
| Ø | BORE |
| | **12** = Ø12 |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| Ⓥ | VERSION |
| | = non magnetic piston |
| | **M** = magnetic piston |

Through rod model, dimensions as for the 1230 (except the rod).






### Table of dimensions

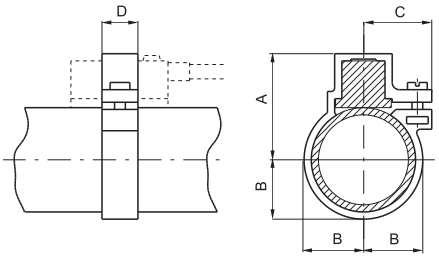
| Bore | AM (-0,2) | BE | CD (H9) | D (h11) | EE | EW (d13) | KK (6g) | KV | KW | KX | KY | L | L1 (±1) | L2 | L3 | L4 | L5 (±1) | L6 | L7 | L8 | L9 (±1,2) | L10 (±1) | MM (f7) | WF (±1,2) | XC (±1) | Y (±1) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 16 | M16X1,5 | 6 | 19 | M5 | 12 | M6X1 | 22 | 6 | 10 | 4 | 9 | 105 | 14 | 17 | 13,5 | 50 | 52 | 2 | 74 | 94 | 41 | 6 | 22 | 75 | 26,5 |
| 16 | 16 | M16X1,5 | 6 | 23 | M5 | 12 | M6X1 | 22 | 6 | 10 | 4 | 9 | 111 | 13 | 17 | 14,5 | 56 | 58 | 2 | 80 | 100 | 45 | 6 | 22 | 82 | 27,5 |
| 20 | 20 | M22X1,5 | 8 | 28,5 | G1/8" | 16 | M8X1,25 | 30 | 7 | 13 | 5 | 12 | 130 | 15 | 18 | 20,5 | 68 | 70,5 | 2,5 | 94,5 | 116 | 52 | 8 | 24 | 95 | 32 |
| 25 | 22 | M22X1,5 | 8 | 31,5 | G1/8" | 16 | M10X1,25 | 30 | 7 | 17 | 6 | 14 | 140 | 14 | 22 | 20 | 68 | 70,5 | 2,5 | 98,5 | 124 | 52 | 10 | 28 | 104 | 36 |

## Sensor clamps - codes 1500._, RS._, HS._

**Coding:** 1260.Ø.F

| | BORE |
|---|---|
| Ø | **10** = Ø10 |
| | **12** = Ø12 |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |






**Sensor for microbore cylinders**

For technical characteristics and ordering codes see the "Magnetic sensors" sections

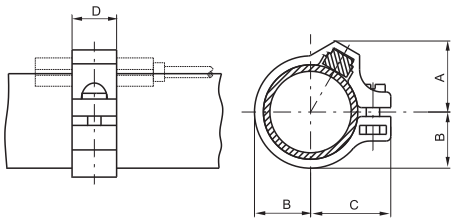
| Bore | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 |
|---|---|---|---|---|---|---|---|---|
| A | 23 | 23 | 25 | 27 | 29,5 | 33 | 37 | 42 |
| B | 10 | 10 | 12 | 14 | 16,5 | 20 | 24 | 29 |
| C | 15 | 15 | 16,5 | 17,5 | 19 | 20 | 22 | 24 |
| D | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Weight (g) | 2 | 2 | 3 | 5 | 7 | 10 | 14 | 16 |

## Sensor clamps - codes 1580._, MRS._, MHS._

**Coding:** 1260.Ø.FS

| | BORE |
|---|---|
| Ø | **10** = Ø10 |
| | **12** = Ø12 |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |






**Sensor for microbore cylinders**

For technical characteristics and ordering codes see the "Magnetic sensors" sections

| Bore | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 |
|---|---|---|---|---|---|---|---|---|
| A | 13 | 14 | 15.4 | 17.2 | 19.3 | 20.5 | 22 | 29 |
| B | 9 | 10 | 12 | 14 | 16.5 | 20 | 24 | 29 |
| C | 16 | 16 | 18 | 19.5 | 22 | 26 | 30 | 35 |
| D | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Weight (g) | 2 | 2 | 3 | 5 | 7 | 8 | 10 | 11 |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

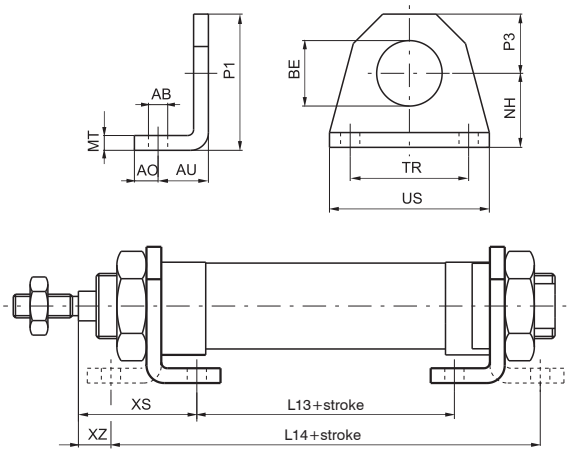
## Foot

**Coding:** 1200.Ø.01

| Ø | BORE |
|---|---|
| | **8** = Ø8 |
| | **10** = Ø10 |
| | **12** = Ø12 |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |

(1 piece)






Used to mount the cylinder on the mounting plane with the rod parallel to said plane. Use one for short strokes and two for long strokes. It is made of stamped steel, made corrosion resistant by cataphoreses treatment. Attached to the end caps by means of nuts (or lock nuts) 05.

Attention: the dimensions of microbore cylinders with threaded end covers (*) increase of 10 mm. for microbore cylinders equipped with magnetic piston and spring return, and of 9 mm. for microbore cylinders with 10 mm. bore magnetic piston.

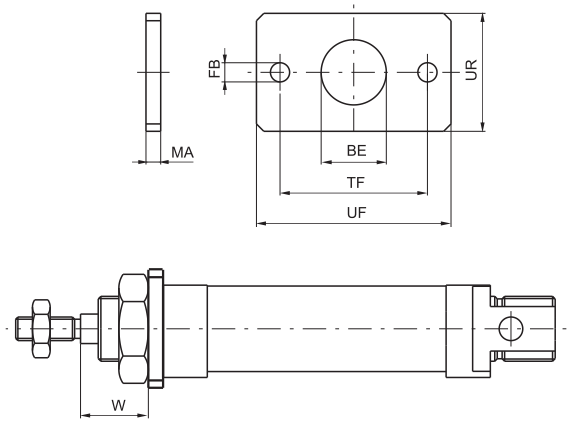
| Bore | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|
| AB (H13) | 4,5 | 4,5 | 5,5 | 5,5 | 6,5 | 6,5 | 6,5 | 8,5 | 8,5 |
| AO | 5 | 5 | 6 | 6 | 8 | 8 | 8 | 10 | 10 |
| AU | 11 | 11 | 14 | 14 | 17 | 17 | 17 | 20 | 20 |
| BE | 12 | 12 | 16 | 16 | 22 | 22 | 30 | 40 | 40 |
| L13 (±1) * | 30 | 30 | 30 | 36 | 44 | 45 | 45 | 49 | 52 |
| L14 (±1) * | 68 | 68 | 78 | 84 | 102 | 103 | 103 | 119 | 122 |
| MT | 3 | 3 | 4 | 4 | 5 | 5 | 5 | 5 | 5 |
| NH (±0,3) | 16 | 16 | 20 | 20 | 25 | 25 | 28 | 40 | 40 |
| P1 | 26 | 26 | 33 | 33 | 45 | 45 | 50 | 70 | 70 |
| P3 | 10 | 10 | 13 | 13 | 20 | 20 | 22 | 30 | 30 |
| TR (JS14) | 25 | 25 | 32 | 32 | 40 | 40 | 52 | 70 | 70 |
| US | 35 | 35 | 42 | 42 | 54 | 54 | 66 | 90 | 90 |
| XS (±1,4) | 24 | 24 | 32 | 32 | 36 | 40 | 40 | 50 | 50 |
| XZ (±1,4) | 5 | 5 | 8 | 8 | 7 | 11 | 11 | 15 | 15 |
| Weight (g) | 22 | 22 | 45 | 45 | 90 | 90 | 110 | 210 | 210 |

## Flange

**Coding:** 1200.Ø.02

| Ø | BORE |
|---|---|
| | **8** = Ø8 |
| | **10** = Ø10 |
| | **12** = Ø12 |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |






Used to mount the microcylinder at a right angle to the mounting plane. Attached to the front (or rear) end cap by a nut (or lock nut) 05. Made of extruded steel, made corrosion resistant by cataphoresis.

| Bore | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|
| BE | 12 | 12 | 16 | 16 | 22 | 22 | 30 | 40 | 40 |
| FB (H13) | 4,5 | 4,5 | 5,5 | 5,5 | 6,5 | 6,5 | 6,5 | 8,5 | 8,5 |
| UF | 40 | 40 | 53 | 53 | 66 | 66 | 68 | 90 | 90 |
| UR | 25 | 25 | 30 | 30 | 40 | 40 | 50 | 60 | 60 |
| MA | 3 | 3 | 4 | 4 | 5 | 5 | 5 | 5 | 5 |
| TF (JS14) | 30 | 30 | 40 | 40 | 50 | 50 | 52 | 70 | 70 |
| W (±1,4) | 13 | 13 | 18 | 18 | 19 | 23 | 23 | 30 | 30 |
| Weight (g) | 20 | 20 | 40 | 40 | 85 | 85 | 100 | 150 | 150 |



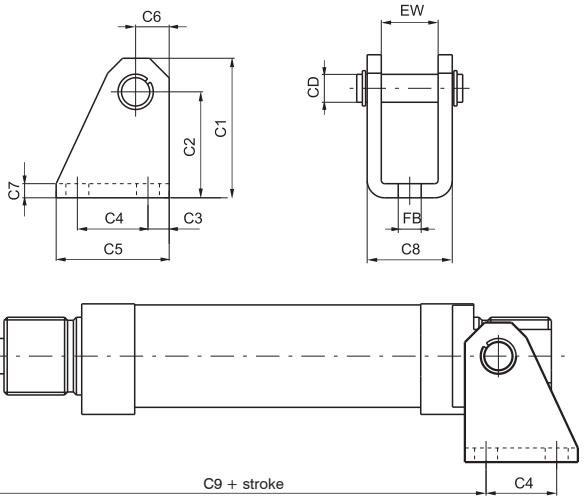
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Rear clevis

**Coding:** 1200.Ø.03

| Ø | BORE |
|---|---|
| | **8** = Ø8 |
| | **10** = Ø10 |
| | **12** = Ø12 |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |






Use with the rear end cover to mount the cylinder either parallel or at a right-angle to the mounting plane. This allows the cylinder to oscillate and self-align with the linked element to the rod. This is necessary when the rod may be subject to lateral during travel.

| Bore | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|
| CD | 4 | 4 | 6 | 6 | 8 | 8 | 12 | 14 | 14 |
| C1 | 28,5 | 28,5 | 33,5 | 33,5 | 39,5 | 39,5 | 44,5 | 53,5 | 53,5 |
| C2 (±0,3) | 24 | 24 | 27 | 27 | 30 | 30 | 33 | 40 | 40 |
| C3 | 3,5 | 3,5 | 5 | 5 | 6 | 6 | 7 | 10 | 10 |
| C4 | 12,5 | 12,5 | 15 | 15 | 20 | 20 | 24 | 28 | 28 |
| C5 | 20 | 20 | 25 | 25 | 32 | 32 | 38 | 45 | 45 |
| C6 | 4,5 | 4,5 | 6,5 | 6,5 | 9,5 | 9,5 | 11,5 | 13,5 | 13,5 |
| C7 | 2,5 | 2,5 | 3 | 3 | 4 | 4 | 4 | 4 | 4 |
| C8 | 13 | 13 | 18 | 18 | 24 | 24 | 34 | 38 | 38 |
| C9 (±0,4) * | 63 | 63 | 73,5 | 80,5 | 91,5 | 100,5 | 100,5 | 119,5 | 122,5 |
| EW | 8,1 | 8,1 | 12,1 | 12,1 | 16,1 | 16,1 | 26,1 | 30,1 | 30,1 |
| FB (H13) | 4,5 | 4,5 | 5,5 | 5,5 | 6,5 | 6,5 | 6,5 | 8,5 | 8,5 |
| Weight (g) | 20 | 20 | 35 | 35 | 75 | 75 | 135 | 180 | 180 |

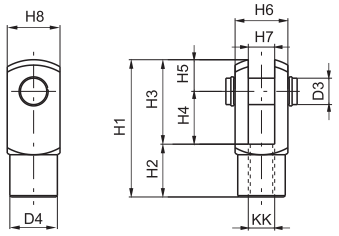
Attention: the dimensions of microbore cylinders with threaded end covers (*) increase of 10 mm. for microbore cylinders equipped with magnetic piston and spring return, and of 9 mm. for microbore cylinders with 10 mm. bore magnetic piston.

## Fork with pin

**Coding:** 1200.Ø.04

| Ø | BORE |
|---|---|
| | **12** = Ø12 |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |






Similar to hinge 03, mounted on the rod thread, assures a regular operation even in the presence of significant forces to the linked element. Made of zinc plated steel.

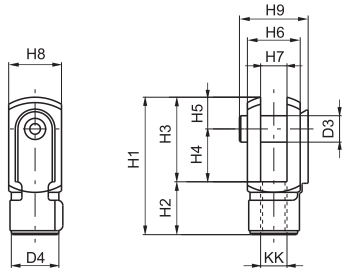
| Bore | D3 | D4 | H1 | H2 | H3 | H4 | H5 | H6 | H7 (B12) | H8 | KK | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 6 | 10 | 31 | 12 | 19 | 12 | 7 | 12 | 6 | 12 | M6x1 | 20 |
| 16 | 6 | 10 | 31 | 12 | 19 | 12 | 7 | 12 | 6 | 12 | M6x1 | 20 |
| 20 | 8 | 14 | 42 | 16 | 26 | 16 | 10 | 16 | 8 | 16 | M8x1,25 | 45 |
| 25 | 10 | 18 | 52 | 20 | 32 | 20 | 12 | 20 | 10 | 20 | M10x1,25 | 90 |
| 32 | 10 | 18 | 52 | 20 | 32 | 20 | 12 | 20 | 10 | 20 | M10x1,25 | 90 |
| 40 | 12 | 20 | 62 | 24 | 38 | 24 | 14 | 24 | 12 | 24 | M12x1,75 | 145 |
| 50 | 12 | 20 | 62 | 24 | 38 | 24 | 14 | 24 | 12 | 24 | M12x1,75 | 145 |

## Fork with clips

**Coding:** 1200.Ø.04/1

| Ø | BORE |
|---|---|
| | **8** = Ø8 |
| | **10** = Ø10 |
| | **12** = Ø12 |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |






Similar to hinge 03, mounted on the rod thread, assures a regular operation even in the presence of significant forces to the linked element. Made of zinc plated steel.

| Bore | D3 | D4 | H1 | H2 | H3 | H4 | H5 | H6 | H7 (B12) | H8 | H9 | KK | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 4 | 8 | 21 | 8 | 13 | 8 | 5 | 8 | 4 | 10 | 11 | M4x0,7 | 12 |
| 10 | 4 | 8 | 21 | 8 | 13 | 8 | 5 | 8 | 4 | 10 | 11 | M4x0,7 | 12 |
| 12 | 6 | 10 | 31 | 12 | 19 | 12 | 7 | 12 | 6 | 12 | 18 | M6x1 | 20 |
| 16 | 6 | 10 | 31 | 12 | 19 | 12 | 7 | 12 | 6 | 12 | 18 | M6x1 | 20 |
| 20 | 8 | 14 | 42 | 16 | 26 | 16 | 10 | 16 | 8 | 16 | 23 | M8x1,25 | 45 |
| 25 | 10 | 18 | 52 | 20 | 32 | 20 | 12 | 20 | 10 | 20 | 27 | M10x1,25 | 90 |
| 32 | 10 | 18 | 52 | 20 | 32 | 20 | 12 | 20 | 10 | 20 | 27 | M10x1,25 | 90 |
| 40 | 12 | 20 | 62 | 24 | 38 | 24 | 14 | 24 | 12 | 24 | 32 | M12x1,75 | 145 |
| 50 | 12 | 20 | 62 | 24 | 38 | 24 | 14 | 24 | 12 | 24 | 32 | M12x1,75 | 145 |



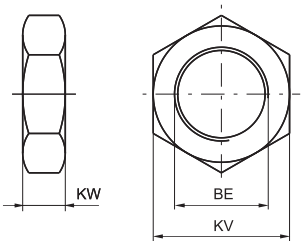
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Nut for the endcap

**Coding:** 1200.Ø.05

| | BORE |
|---|---|
| Ø | **8** = Ø8 |
| | **10** = Ø10 |
| | **12** = Ø12 |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |






Used to fasten flanges or feet to the endcaps of the microcylinder Mounted on diameters from 8 to 25. Supplied as standard (1 piece) with microcylinders.

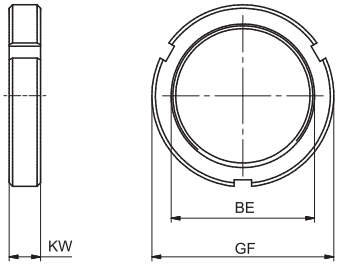
| Bore | BE | KV | KW | Weight (g) |
|---|---|---|---|---|
| 8 | M12x1,25 | 17 | 5.5 | 7 |
| 10 | M12x1,25 | 17 | 5.5 | 7 |
| 12 | M16x1,5 | 22 | 6 | 16 |
| 16 | M16x1,5 | 22 | 6 | 16 |
| 20 | M22x1,5 | 30 | 7 | 25 |
| 25 | M22x1,5 | 30 | 7 | 25 |

## Lock nut for the end cap

**Coding:** 1200.Ø.05

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |






Used to fasten flanges or feet to the endcaps of the microcylinder Mounted on diameters from 32 to 50. Supplied as standard (1 piece) with microcylinders.

| Bore | BE | GF | KW | Weight (g) |
|---|---|---|---|---|
| 32 | M30x1,5 | 42 | 8 | 42 |
| 40 | M40x1,5 | 52 | 9 | 60 |
| 50 | M40x1,5 | 52 | 9 | 60 |

## Series 1200, Rolled end covers MIR

### Construction characteristics

| | |
|---|---|
| Barrel | stainless steel AISI 304 |
| Fixing devices | steel painted in cataphoresis |
| Forks | zinc plated steel |
| Seals | standard: NBR Oil resistant rubber, PUR Piston rod seals (HNBR or FPM seals available upon request) |
| Single-acting springs | C98 zinc plated steel for springs |
| Pistons | brass (Ø8-10-12) aluminium (Ø16-20-25-32) |
| Piston rod | stainless steel |
| End caps | anodized aluminium |

| | | | | | |
|---|---|---|---|---|---|
| Cushioning lenght | Ø | 16 | 20 | 25 | 32 |
| | mm | 15 | 18 | 18 | 18 |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered air, preferably lubricated |
| Max. working pressure | 10 bar |
| Working temperature | -5°C ... +70°C with standard seals magnetic or non magnetic piston<br>-5°C ... +80°C with FPM seals magnetic piston<br>-5°C ... +80°C with HNBR seals magnetic piston<br>-5°C ... +120°C with HNBR seals non magnetic piston<br>-5°C ... +150°C with FPM seals non magnetic piston |

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

### Standard strokes

*Double acting version*

**Ø8 - Ø10:**
15 - 25 - 50 - 75 - 80 - 100 mm
**Ø12 - Ø16:**
15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 mm
**Ø20 - Ø25:**
15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 mm
**Ø32:**
15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 - 450 - 500 mm
On request are available strokes up to:
**Ø8 - Ø10:** 250 mm
**Ø12 - Ø16:** 700 mm
**Ø20 - Ø32:** 1000 mm

*Single acting version*

Front spring **Ø8 - Ø32**: up to stroke 50 mm
Rear spring **Ø16 - Ø32**: up to stroke 50 mm

### Minimum and maximum springs load for single acting version

| Bore | Ø8 | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
|---|---|---|---|---|---|---|---|
| Min. load (N) | 2.2 | 2.2 | 4 | 7.5 | 11 | 16.5 | 23 |
| Max. load (N) | 4.2 | 4.2 | 8.7 | 21 | 22 | 30.7 | 52.5 |




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

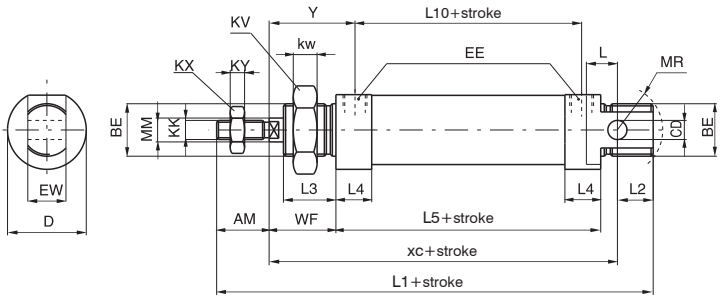
## Basic version

**Coding:** 12Ⓣ.Ø.stroke.ⓋⒼ

| | |
|---|---|
| Ⓣ | TYPE |
| | **80** = Double acting version |
| | **91** = front spring (max stroke 50 mm) |
| | **92** = rear spring from Ø16 (max stroke 50 mm) |
| Ø | BORE |
| | **8** = Ø8 |
| | **10** = Ø10 |
| | ... |
| | **32** = Ø32 |
| Ⓥ | VERSION |
| | **A** = Adjustable cushioning (from Ø16) |
| | **M** = Magnetic piston |
| | **AM** = Cushioning with magnetic piston (from Ø16) |
| Ⓖ | SEALS |
| | = NBR |
| | **T** = HNBR |
| | **V** = FPM |

Standard version, fully compliant with ISO standards. Can use all available mountings. For single acting type, the maximum stroke is 50 mm, after which overall dimensions increase in length to an extent not proportional to the stroke (and in any case not longer than stroke 100).





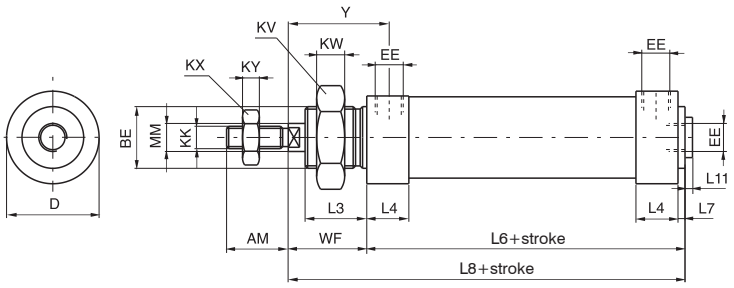

## Without rear eye version

**Coding:** 12Ⓣ.Ø.stroke.ⓋⒼ

| | |
|---|---|
| Ⓣ | TYPE |
| | **81** = Double acting version |
| | **93** = front spring (max stroke 50 mm) |
| | **94** = rear spring from Ø16 (max stroke 50 mm) |
| Ø | BORE |
| | **8** = Ø8 |
| | **10** = Ø10 |
| | ... |
| | **32** = Ø32 |
| Ⓥ | VERSION |
| | **A** = Adjustable cushioning (from Ø16) |
| | **M** = Magnetic piston |
| | **AM** = Cushioning with magnetic piston (from Ø16) |
| Ⓖ | SEALS |
| | = NBR |
| | **T** = HNBR |
| | **V** = FPM |

Version derived from standard version 1260 and not included in ISO standard. Not having a rear eye it is shorter. Rear inlet connection is at 90 like the front one, in line and plugged. The considerations made for the basic type 1280 apply for all single-acting types.





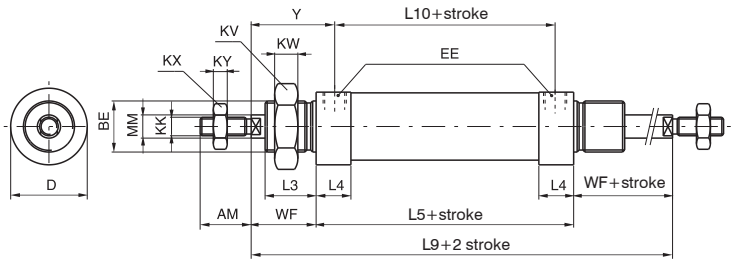

## Through rod cylinder version

**Coding:** 1282.Ø.stroke.ⓋⒼ

| | |
|---|---|
| Ø | BORE |
| | **8** = Ø8 |
| | **10** = Ø10 |
| | ... |
| | **32** = Ø32 |
| Ⓥ | VERSION |
| | = Double acting version |
| | **A** = Adjustable cushioning (from Ø16) |
| | **M** = Magnetic piston |
| | **AM** = Cushioning with magnetic piston (from Ø16) |
| Ⓖ | SEALS |
| | = NBR |
| | **T** = HNBR |
| | **V** = FPM |

This version having rods coming out from both end plates with overall dimensions, except for the rod, equal to 1280 version. This version is not suitable for Ø8 and Ø10 due to difficulty in anchoring the pistons to rods.





## Table of dimensions

| Bore | 8 | 10 | 12 | 16 | 20 | 25 | 32 |
|---|---|---|---|---|---|---|---|
| AM (-0,2) | 12 | 12 | 16 | 16 | 20 | 22 | 20 |
| BE | M12X1,25 | M12X1,25 | M16X1,5 | M16X1,5 | M22X1,5 | M22X1,5 | M30X1,5 |
| CD (H9) | 4 | 4 | 6 | 6 | 8 | 8 | 12 |
| D (h11) | 16 | 16 | 20 | 21 | 27 | 30 | 38 |
| EE | M5 | M5 | M5 | M5 | G1/8" | G1/8" | G1/8" |
| EW (d13) | 8 | 8 | 12 | 12 | 16 | 16 | 26 |
| KK (6g) | M4X0,7 | M4X0,7 | M6X1 | M6X1 | M8X1,25 | M10X1,25 | M10X1,25 |
| KV | 17 | 17 | 22 | 22 | 30 | 30 | 42 |
| KW | 5,5 | 5,5 | 6 | 6 | 7 | 7 | 8 |
| KX | 7 | 7 | 10 | 10 | 13 | 17 | 17 |
| KY | 3 | 3 | 4 | 4 | 5 | 6 | 6 |
| L | 6 | 6 | 9 | 9 | 12 | 13 | 13 |
| L1 (±1) * | 86 | 86 | 105 | 111 | 130 | 141 | 139 |
| L2 | 10 | 10 | 14 | 13 | 15 | 15 | 14 |
| L3 | 12 | 12 | 17 | 17 | 18 | 22 | 22 |
| L4 | 9 | 9 | 9 | 11 | 15,5 | 15 | 14,5 |
| L5 (±1) * | 46 | 46 | 50 | 56 | 68 | 69 | 69 |
| L6 * | 48 | 48 | 52 | 58 | 70,5 | 71,5 | 71,5 |
| L7 | 2 | 2 | 2 | 2 | 2,5 | 2,5 | 2,5 |
| L8 * | 64 | 64 | 74 | 80 | 94,5 | 99,5 | 99,5 |
| L9 (±1,2) * | 78 | 78 | 94 | 100 | 116 | 125 | 125 |
| L10 (±1) * | 37 | 37 | 41 | 45 | 52,5 | 53 | 54,5 |
| L11 | 1,5 | 1,5 | 1,5 | 1,5 | 2 | 2 | 2 |
| MM (f7) | 4 | 4 | 6 | 6 | 8 | 10 | 12 |
| MR | 12 | 12 | 16 | 16 | 18 | 19 | 22 |
| WF (±1,2) | 16 | 16 | 22 | 22 | 24 | 28 | 28 |
| XC (±1) * | 64 | 64 | 75 | 82 | 95 | 104 | 105 |
| Y (±1,2) | 20,5 | 20,5 | 26,5 | 27,5 | 32 | 36 | 35 |

**Dimensions marked with * do not increase proportionally to stroke for rear spring version (over 25 mm stroke)**



## STROKE TOLERANCE: until stroke 100 mm - 1,5, beyond + 2 mm.

| Weight | Stroke 0 | 30 | 35 | 65 | 80 | 160 | 200 | 310 |
|---|---|---|---|---|---|---|---|---|
| g | every 10mm | 2 | 2,5 | 4 | 5 | 7,5 | 11,5 | 18 |

*Without rear eye version*

| Weight | Stroke 0 | 25 | 35 | 60 | 75 | 150 | 185 | 290 |
|---|---|---|---|---|---|---|---|---|
| g | every 10mm | 2 | 2,5 | 4 | 5 | 7,5 | 11,5 | 18 |

*Through rod cylinder version*

| Weight | Stroke 0 | 35 | 40 | 75 | 95 | 200 | 250 | 370 |
|---|---|---|---|---|---|---|---|---|
| g | every 10mm | 2,5 | 3 | 6 | 7 | 10,5 | 15,5 | 24 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 1200 Rolled end covers MIR-INOX

### Construction characteristics

| | |
|---|---|
| Barrel | stainless steel AISI 304 |
| Fixing devices | stainless steel AISI 304 |
| Forks | stainless steel AISI 304 |
| Piston seals | standard: NBR Oil resistant rubber, PUR Piston rod seals<br>(FPM seals available upon request) |
| Pistons | aluminium |
| Piston rod | stainless steel |
| End caps | stainless steel AISI 316 |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered air, preferably lubricated |
| Max. working pressure | 10 bar |
| Working temperature | -5°C ... +70°C with standard seals magnetic or non magnetic piston<br>-5°C ... +80°C with FPM seals magnetic piston<br>-5°C ... +150°C with FPM seals non magnetic piston |

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

### Standard strokes

*Double acting version*

**Ø16:**
15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 mm
**Ø20 - Ø25:**
15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 mm
**Ø32:**
15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 - 450 - 500 mm
On request are available strokes up to:
**Ø16:** 700 mm
**Ø20 - Ø32:** 1000 mm

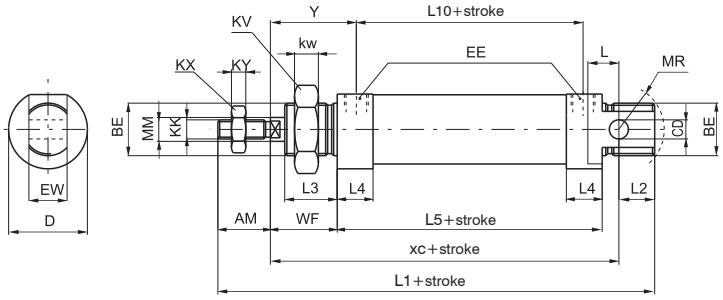
## Basic version

**Coding:** 1280.Ø.stroke.Ⓥ Ⓖ

| | |
|---|---|
| Ø | BORE |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| Ⓥ | VERSION |
| | **X** = non-magnetic |
| | **AX** = non-magnetic version with cushions (non-adjustable cushioning) |
| | **MX** = Stainless steel magnetic version |
| | **AMX** = stainless steel magnetic version with cushions (non-adjustable cushioning) |
| Ⓖ | SEALS |
| | = NBR |
| | **V** = FPM |

Standard version, fully complying with ISO standards. Can use all available mountings.





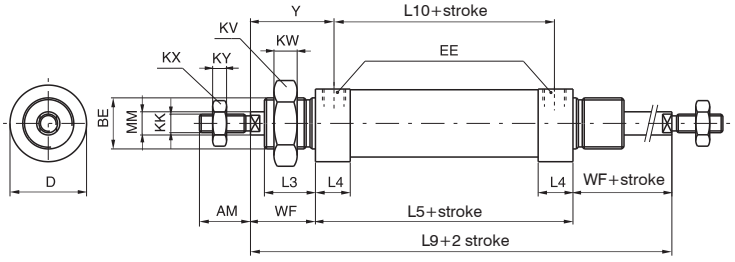

## Through rod cylinder version

**Coding:** 1282.Ø.stroke.Ⓥ Ⓖ

| | |
|---|---|
| Ø | BORE |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| Ⓥ | VERSION |
| | **X** = non-magnetic |
| | **AX** = non-magnetic version with cushions (non-adjustable cushioning) |
| | **MX** = Stainless steel magnetic version |
| | **AMX** = stainless steel magnetic version with cushions (non-adjustable cushioning) |
| Ⓖ | SEALS |
| | = NBR |
| | **V** = FPM |

This version having rods coming out from both end caps, with overall dimensions, except for the rod, equal to 1280 version.






### Table of dimensions

| Bore | AM | BE | CD | D | EE | EW | KK | KV | KW | KX | KY | L | L1 | L2 | L3 | L4 | L5 | L9 | L10 | MM | MR | WF | XC | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 16 | M16X1,5 | 6 | 21 | M5 | 12 | M6X1 | 22 | 6 | 10 | 4 | 9 | 111 | 13 | 17 | 10,5 | 56 | 100 | 45 | 6 | 16 | 22 | 82 | 27,5 |
| 20 | 20 | M22X1,5 | 8 | 27 | G1/8" | 16 | M8X1,25 | 30 | 7 | 13 | 5 | 12 | 130 | 15 | 18 | 10,5 | 68 | 116 | 52,5 | 8 | 18 | 24 | 95 | 32 |
| 25 | 22 | M22X1,5 | 8 | 30 | G1/8" | 16 | M10X1,25 | 30 | 7 | 17 | 6 | 13 | 140 | 15 | 22 | 15,5 | 68 | 125 | 52,5 | 10 | 18 | 28 | 104 | 36 |
| 32 | 20 | M30X1,5 | 12 | 38 | G1/8" | 26 | M10X1,25 | 42 | 8 | 17 | 6 | 13 | 139 | 14 | 22 | 14,5 | 69 | 125 | 54,5 | 12 | 22 | 28 | 105 | 35 |

| Bore | Standard weight (g) | | Weight push-pull version (g) | |
|---|---|---|---|---|
| | Stroke 0 | every 10 mm | Stroke 0 | every 10 mm |
| 16 | 145 | 5 | 180 | 7 |
| 20 | 280 | 8 | 330 | 11 |
| 25 | 370 | 12 | 440 | 16 |
| 32 | 580 | 18 | 660 | 24 |





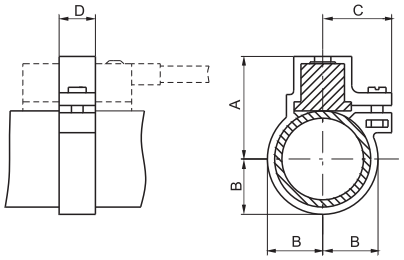
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Sensor clamps - codes 1500._, RS._, HS._

**Coding:** 1280.Ø.Ⓣ

| | |
|---|---|
| Ø | BORE |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| Ⓣ | TYPE |
| | **F** = Cylinders MIR |
| | **FX** = Cylinders MIR-INOX |






**Sensor for microbore cylinders**

For technical characteristics and ordering codes see the "Magnetic sensors" sections

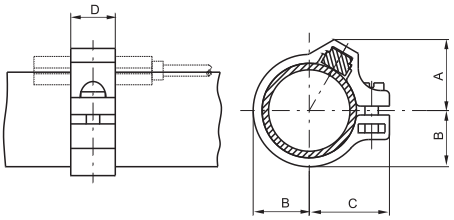
| Bore | Ø16 | Ø20 | Ø25 | Ø32 |
|---|---|---|---|---|
| A | 24 | 25,5 | 28,5 | 31,8 |
| B | 10,5 | 12,5 | 15,5 | 18,8 |
| C | 16,5 | 17,5 | 19 | 20 |
| D | 10 | 10 | 10 | 10 |
| Weight (g) | 3 | 5 | 7 | 10 |

## Sensor clamps - codes 1580._, MRS._, MHS._

**Coding:** 1280.Ø.Ⓣ

| | |
|---|---|
| Ø | BORE |
| | **8** = Ø8 |
| | **10** = Ø10 |
| | **12** = Ø12 |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| Ⓣ | TYPE |
| | **FS** = Cylinders MIR |
| | **FSX** = Cylinders MIR-INOX |






**Sensor for microbore cylinders**

For technical characteristics and ordering codes see the "Magnetic sensors" sections

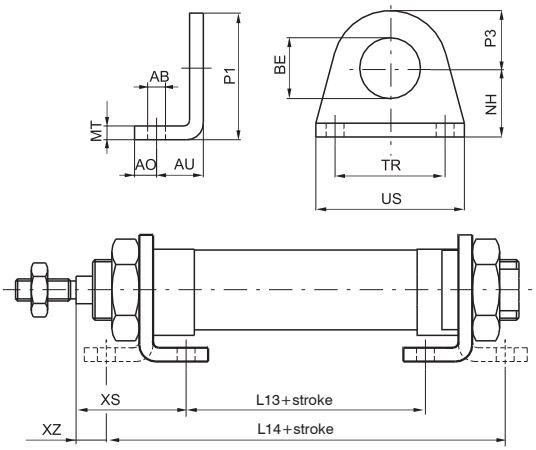
| Bore | Ø8 | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
|---|---|---|---|---|---|---|---|
| A | 11 | 12 | 13 | 14.5 | 16 | 17.5 | 19.5 |
| B | 6.5 | 7.5 | 8.5 | 10.5 | 12.5 | 15.3 | 18.8 |
| C | 12.5 | 13.5 | 15 | 16 | 18 | 20.5 | 24 |
| D | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Weight (g) | 2 | 2 | 2 | 3 | 5 | 7 | 10 |

## Foot

**Coding:** 1200.Ø.01X

| | BORE |
|---|---|
| Ø | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |






| Bore | 16 | 20 | 25 | 32 |
|---|---|---|---|---|
| AB (H13) | 5,5 | 6,5 | 6,5 | 6,5 |
| AO | 6 | 8 | 8 | 8 |
| AU | 14 | 17 | 17 | 17 |
| BE | 16 | 22 | 22 | 30 |
| L13 (±1) | 36 | 44 | 44 | 45 |
| L14 (±1) | 84 | 102 | 102 | 103 |
| MT | 4 | 5 | 5 | 5 |
| NH (±0,3) | 20 | 25 | 25 | 28 |
| P1 | 33 | 45 | 45 | 50 |
| P3 | 13 | 20 | 20 | 22 |
| TR (Js14) | 32 | 40 | 40 | 52 |
| US | 42 | 54 | 54 | 66 |
| XS (±1,4) | 32 | 36 | 40 | 40 |
| XZ (±1,4) | 8 | 7 | 11 | 11 |
| Weight (g) | 45 | 90 | 90 | 110 |

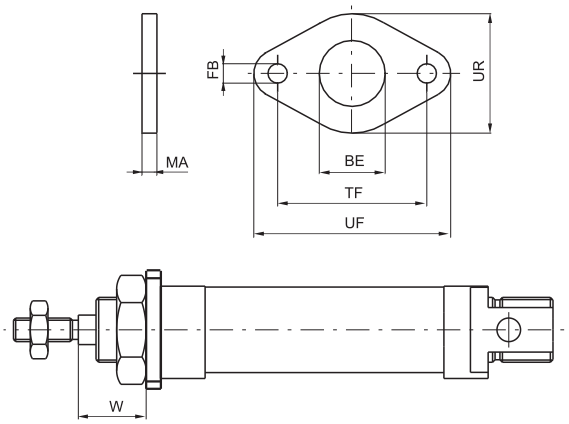
Used to mount the cylinder on the mounting plane with the rod parallel to said plane. Use one for short strokes and two for long strokes. It is made stamped stainless steel AISI 303. Attached to the end caps by means of nuts (or lock nuts) 05X.

## Flange

**Coding:** 1200.Ø.02X

| | BORE |
|---|---|
| Ø | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |






Use to mount the microcylinder at a right angle to the mounting plane. Attached to the front (or rear) end cap by a nut (or lock nut)05X. Made ofstainless steel AISI 303.

| Bore | 16 | 20 | 25 | 32 |
|---|---|---|---|---|
| BE | 16 | 22 | 22 | 30 |
| FB (H13) | 5,5 | 6,5 | 6,5 | 6,5 |
| UF | 53 | 66 | 66 | 68 |
| UR | 30 | 40 | 40 | 50 |
| MA | 4 | 5 | 5 | 5 |
| TF (JS14) | 40 | 50 | 50 | 52 |
| W (±1,4) | 18 | 19 | 23 | 23 |
| Weight (g) | 40 | 85 | 85 | 100 |



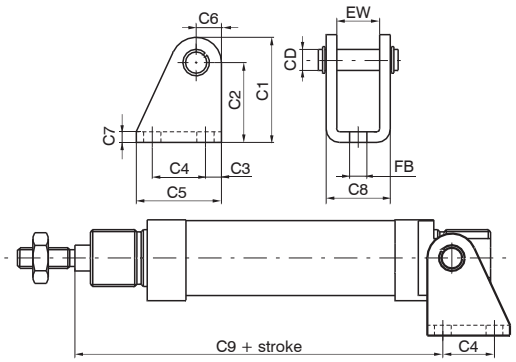

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Rear clevis

**Coding:** 1200.Ø.03X

| | BORE |
|---|---|
| Ø | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |






Used to mount by using the rear end cover to mount either parallel or at a right angle to the mounting plane. Allows the cylinder to oscillate and self-align with the linked element to the rod. Necessary to use when the rod may be subject to lateral forces during travel. Made of stamped stainless steel AISI 303.

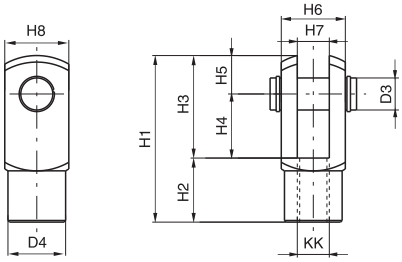
| Bore | 16 | 20 | 25 | 32 |
|---|---|---|---|---|
| CD | 6 | 8 | 8 | 12 |
| C1 | 33,5 | 39,5 | 39,5 | 44,5 |
| C2 (±0,3) | 27 | 30 | 30 | 33 |
| C3 | 5 | 6 | 6 | 7 |
| C4 | 15 | 20 | 20 | 24 |
| C5 | 25 | 32 | 32 | 38 |
| C6 | 6,5 | 9,5 | 9,5 | 11,5 |
| C7 | 3 | 4 | 4 | 4 |
| C8 | 18 | 24 | 24 | 34 |
| C9 (±0,4) | 80,5 | 91,5 | 100,5 | 100,5 |
| EW | 12,1 | 16,1 | 16,1 | 26,1 |
| FB (H13) | 5,5 | 6,5 | 6,5 | 6,5 |
| Weight (g) | 35 | 75 | 75 | 135 |

## Fork with pin

**Coding:** 1200.Ø.04X

| | BORE |
|---|---|
| Ø | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |






Similar to hinge 03X, mounted on the rod thread, assures a regular operation even in the presence of significant forces to the linked element. Made of stainless steel AISI 303.

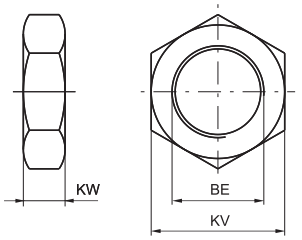
| Bore | D3 | D4 | H1 | H2 | H3 | H4 | H5 | H6 | H7 (B12) | H8 | KK | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 6 | 10 | 31 | 12 | 19 | 12 | 7 | 12 | 6 | 12 | M6X1 | 20 |
| 20 | 8 | 14 | 42 | 16 | 26 | 16 | 10 | 16 | 8 | 16 | M8X1,25 | 45 |
| 25 | 10 | 18 | 52 | 20 | 32 | 20 | 12 | 20 | 10 | 20 | M10X1,25 | 90 |
| 32 | 10 | 18 | 52 | 20 | 32 | 20 | 12 | 20 | 10 | 20 | M10X1,25 | 90 |

## Nut for the endcap

**Coding:** 1200.Ø.05X

| | BORE |
|---|---|
| Ø | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |






Used to fasten flanges or feet to the endcaps of the microcylinder Mounted on diameters from 16 to 25. Supplied as standard (1 piece) with microcylinders. Made of stainless steel AISI 303.

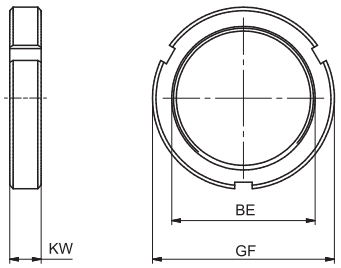
| Bore | BE | KV | KW | Weight (g) |
|---|---|---|---|---|
| 16 | M16X1,5 | 22 | 6 | 16 |
| 20 | M22X1,5 | 30 | 7 | 25 |
| 25 | M22X1,5 | 30 | 7 | 25 |

## Lock nut for the end cap

**Coding:** 1200.32.05X

Used to fasten flanges or feet to the endcaps of the microcylinder Mounted on diameter 32. Supplied as standard (1 piece) with microcylinders. Made of stainless steel AISI 303.






| Bore | BE | GF | KW | Weight (g) |
|---|---|---|---|---|
| 32 | M30X1,5 | 42 | 8 | 42 |

## Series 1200, Steel line

The 12X stainless steel ISO 6432 cylinders Series are designed for corrosion resistance application such as marine, pharmaceutical and food ambiences.
The pre lubrication grease used is NSF H1 certified for food application.
Specific care has been taken during the design stages and the result is a clean profile cylinder easy to clean and free from possible residue build-up areas.
All parts in contact with the external environment are in Stainless steel 316L and the seals are available in three different compounds for different temperature applications:
NBR -5 °C ... +70 °C, PUR -30 °C ... +80 °C, FPM -5 °C ... +150 °C
The range starts from 16 bore up to 63 bore, double acting version standard or with through rod, magnetic or not magnetic piston available. The end caps are crimped onto the barrel for bore sizes 16 to 25 and screwed on the barrel from 32 to 63 bore.
Depending on the type of mounting required it is possible to choose different end caps style.
The piston is aluminium and the sensor bracket, when required is in stainless steel 316 with plastic adaptor or in plastic material. The cylinder can be fixed with the wide range of stainless steel accessories.



### Construction characteristics

| | |
|---|---|
| Barrel | stainless steel AISI 316 |
| Fixing devices | stainless steel AISI 316 / 304 |
| Seals | NBR (PUR piston rod seals)<br>FPM<br>PUR |
| Pistons | Aluminium |
| Piston rod | stainless steel AISI 316 |
| End caps | stainless steel AISI 316 |

### Operational characteristics

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Fluid | | filtered air, preferably lubricated | | | | | | |
| Max. working pressure | | 10 bar | | | | | | |
| Bore | Ø | 16 | 20 | 25 | 32 | 40 | 50 | 63 |
| Cushioning lenght | mm | 15 | 18 | 18 | 18 | 22 | 22 | 25 |

### Working temperature

| Seals | Operating temperature | Piston | | Cushioning | | Bores |
|---|---|---|---|---|---|---|
| | | Magnetic | Non magnetic | Pneumatic adjustable | Pneumatic fix | |
| NBR | -5 °C ... +70 °C | • | • | • | • | Ø16-Ø20-Ø25-Ø32-Ø40-Ø50-Ø63 |
| FPM | -5°C ... +80°C | • | / | • | • | Ø16-Ø20-Ø25-Ø32-Ø40-Ø50-Ø63 |
| | -5°C ... +150°C | / | • | • | • | Ø16-Ø20-Ø25-Ø32-Ø40-Ø50-Ø63 |
| PUR | -5 °C ... +70 °C | • | • | • | / | Ø16-Ø20-Ø25-Ø32 |
| | -30°C ... +80°C | • | • | / | • | Ø16-Ø20-Ø25-Ø32 |
| | | • | • | • | • | Ø40-Ø50-Ø63 |

### Use and maintenance

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

### Standard strokes

**Ø16 :**
15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 mm
**Ø20-Ø25 :**
15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 mm
**Ø 32 ... Ø 63 :**
15 - 25 - 50 - 75 - 80 - 100 - 150 - 160 - 200 - 250 - 300 - 320 - 350 - 400 - 450 - 500 mm


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Coding key

12X . . . . . .

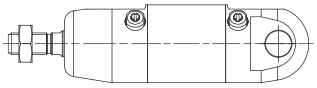
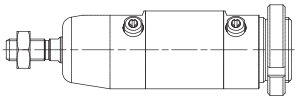
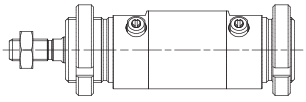
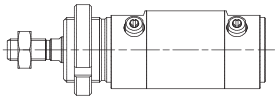
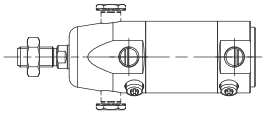
| FUNCTION | |
|---|---|
| A | Double acting |
| B | Double acting cushioned |
| C | Double acting through rod |
| D | Double acting cushioned through rod |

| BORE |
|---|
| 016 |
| 020 |
| 025 |
| 032 |
| 040 |
| 050 |
| 063 |

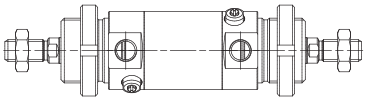
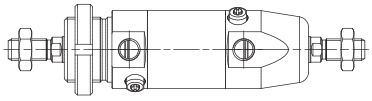
| STROKE |
|---|

| MAGNETIC PISTON VARIANTS | |
|---|---|
| M | Magnetic piston max. temperature +80°C |
| N | Non magnetic piston |

| SEALS | |
|---|---|
| N | NBR |
| V | FPM |
| P | PUR |

| | TYPE | | |
|---|---|---|---|
| | Front end cap | Basic version | Rear end cap |
| A | CLEAN PROFILE |  | WITH INTEGRATED TRUNNION |
| B | CLEAN PROFILE |  | THREADED |
| C | THREADED |  | THREADED |
| D | THREADED |  | SHORT END CAP |
| E* | FOR PIN |  | SHORT END CAP |

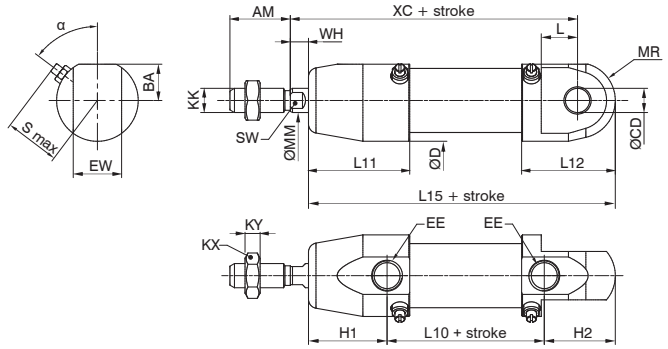
* available only for Ø32 - Ø40 - Ø50 - Ø63

| | END CAP | THROUGH ROD CYLINDER VERSION | END CAP |
|---|---|---|---|
| S | THREADED |  | THREADED |
| T | THREADED |  | CLEAN PROFILE |

## Cylinder type "A"

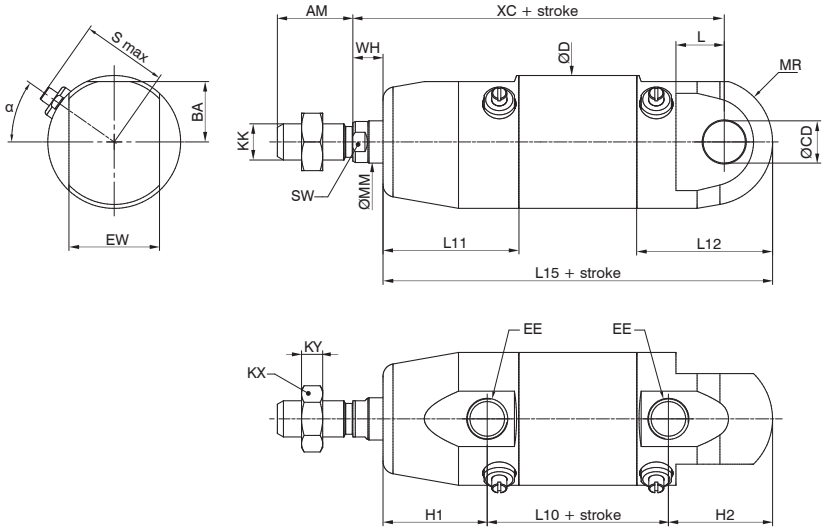


from Ø16 to Ø25





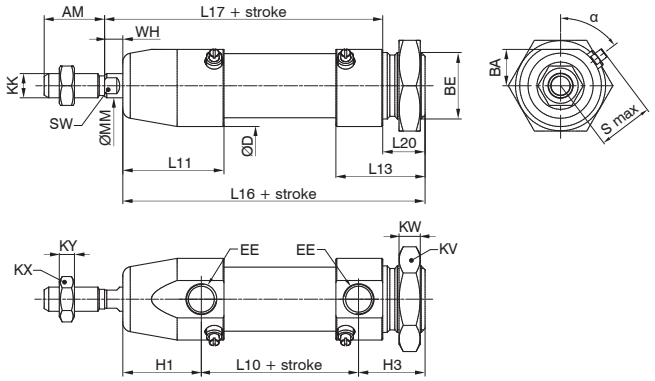

from Ø32 to Ø63




## Cylinder type "B"

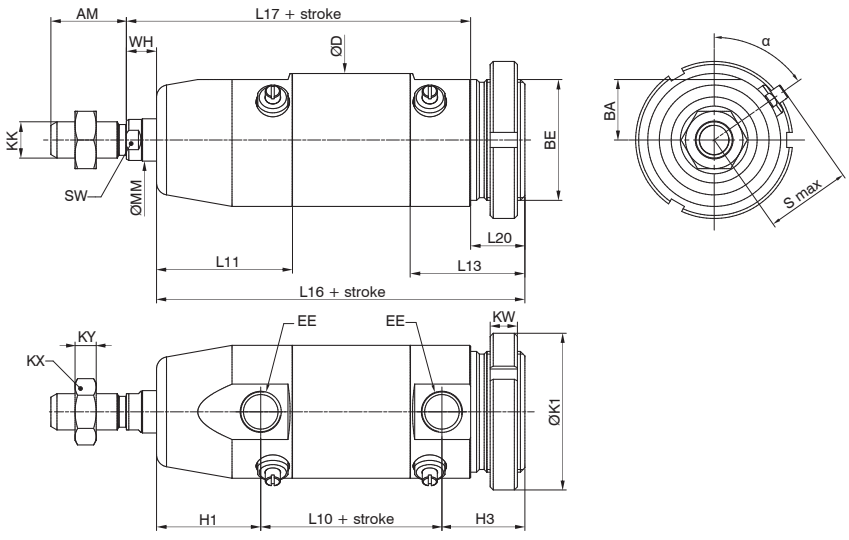


from Ø16 to Ø25






from Ø32 to Ø63



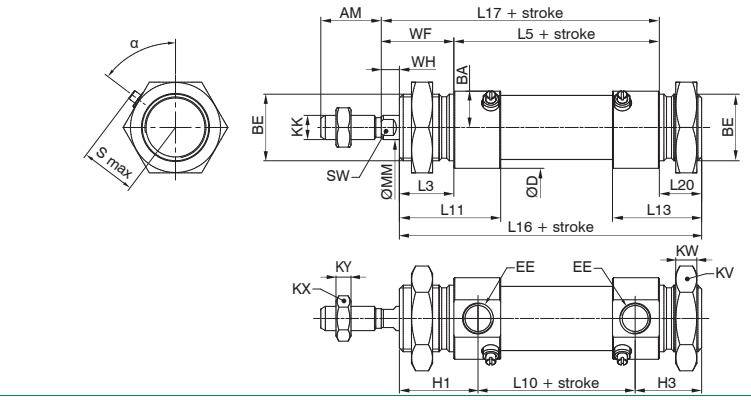



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Cylinder type "C"

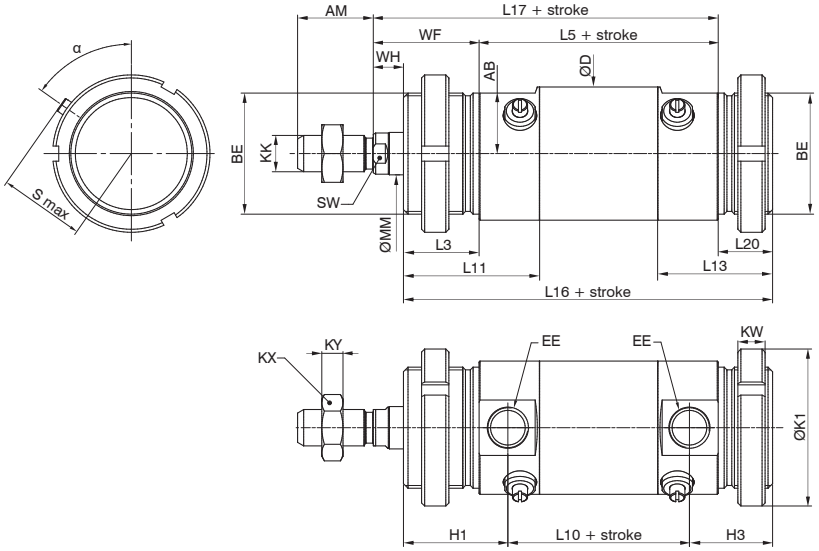


from Ø16 to Ø25





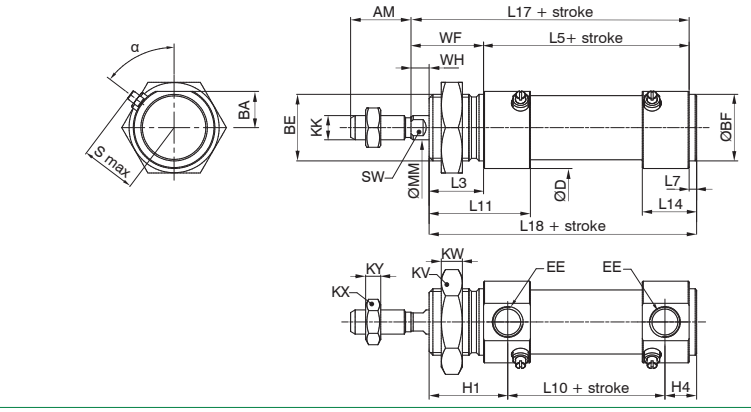

from Ø32 to Ø63




## Cylinder type "D"

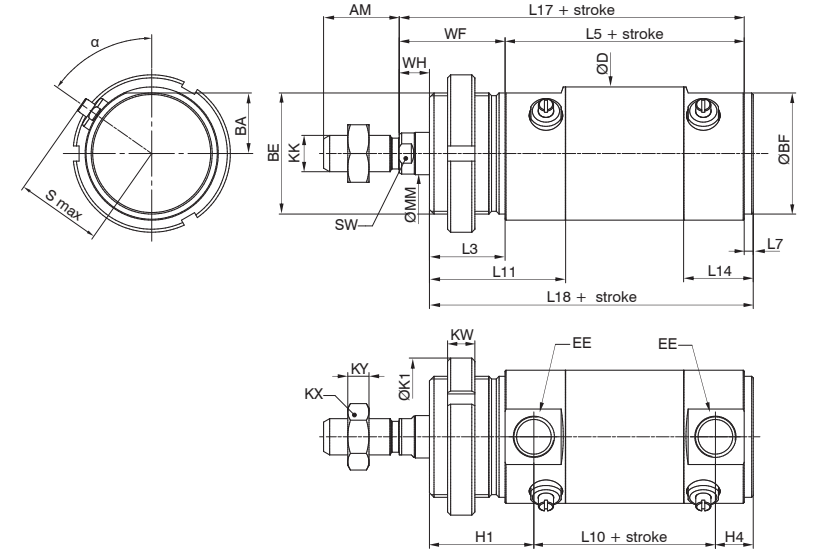


from Ø16 to Ø25



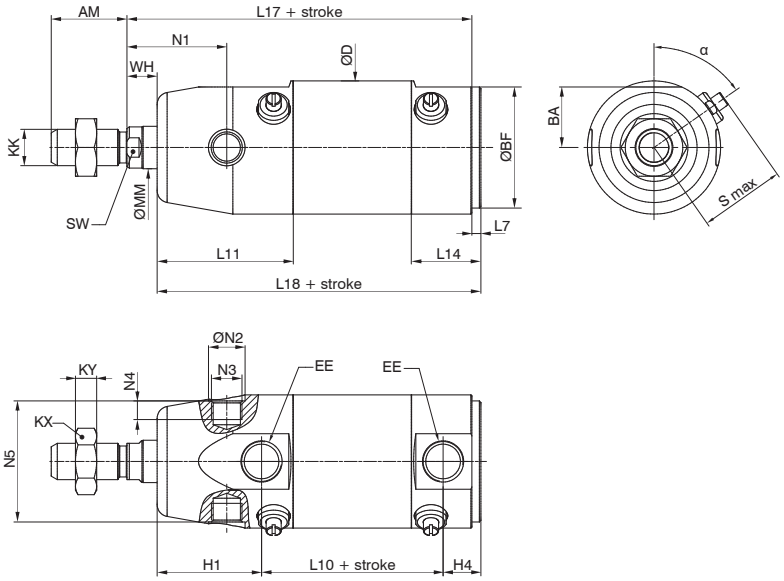



from Ø32 to Ø63



## Cylinder type "E"

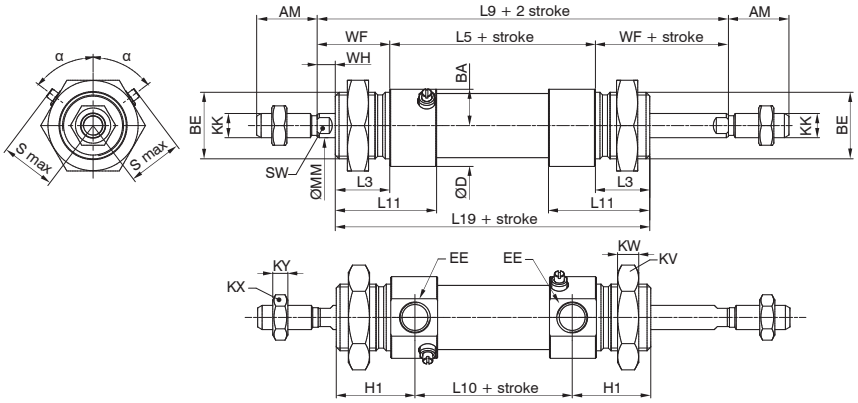





from Ø32 to Ø63

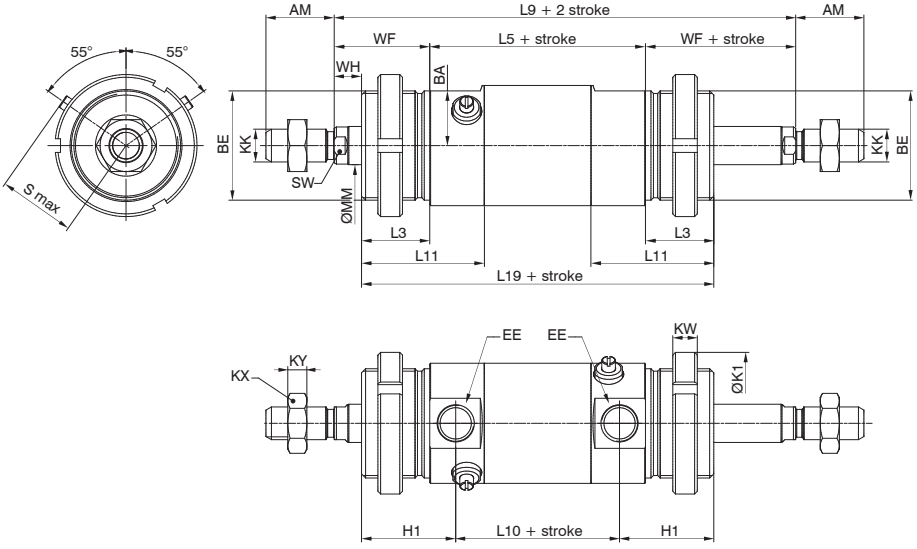
## Cylinder type "S"






from Ø16 to Ø25






from Ø32 to Ø63

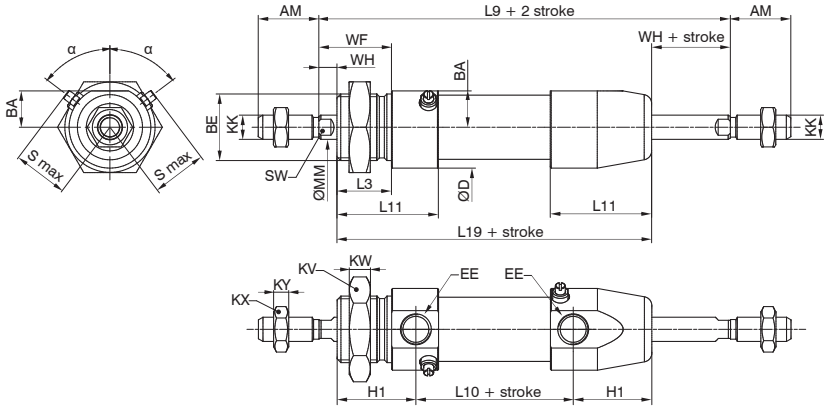




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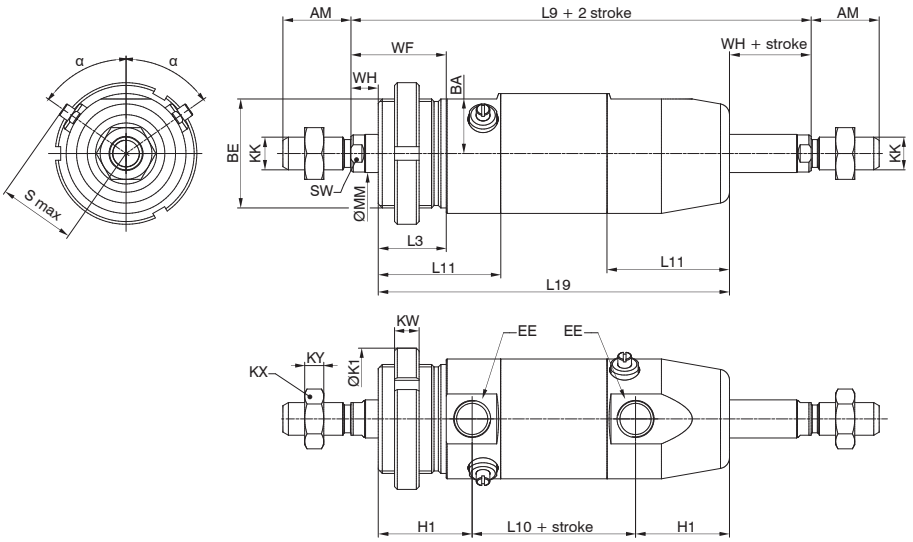
## Cylinder type "T"





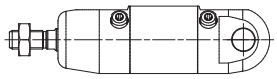
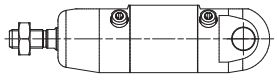
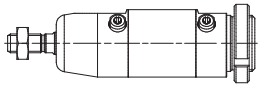
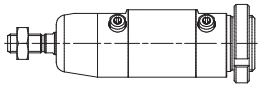
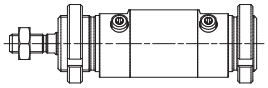

from Ø16 to Ø25



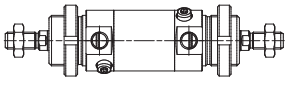
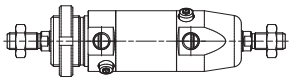



from Ø32 to Ø63

## Weight charts

| Weight (g) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Basic version | | | Ø16 | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 |
| A |  | Stroke 0 | 131 | 264 | 371 | 621 | 1060 | 1600 | 3150 |
| | | every 10mm | 5 | 7 | 11 | 26 | 33 | 42 | 65 |
| B |  | Stroke 0 | 150 | 310 | 410 | 666 | 1160 | 1700 | 3230 |
| | | every 10mm | 5 | 7 | 11 | 26 | 33 | 42 | 65 |
| C |  | Stroke 0 | 153 | 323 | 411 | 688 | 1200 | 1660 | 3060 |
| | | every 10mm | 5 | 7 | 11 | 26 | 33 | 42 | 65 |
| D |  | Stroke 0 | 129 | 267 | 359 | 580 | 1020 | 1460 | 2800 |
| | | every 10mm | 5 | 7 | 11 | 26 | 33 | 42 | 65 |
| E* |  | Stroke 0 | / | / | / | 558 | 960 | 1480 | 2930 |
| | | every 10mm | / | / | / | 26 | 33 | 42 | 65 |

* Available only for Ø32 - Ø40 - Ø50 - Ø63

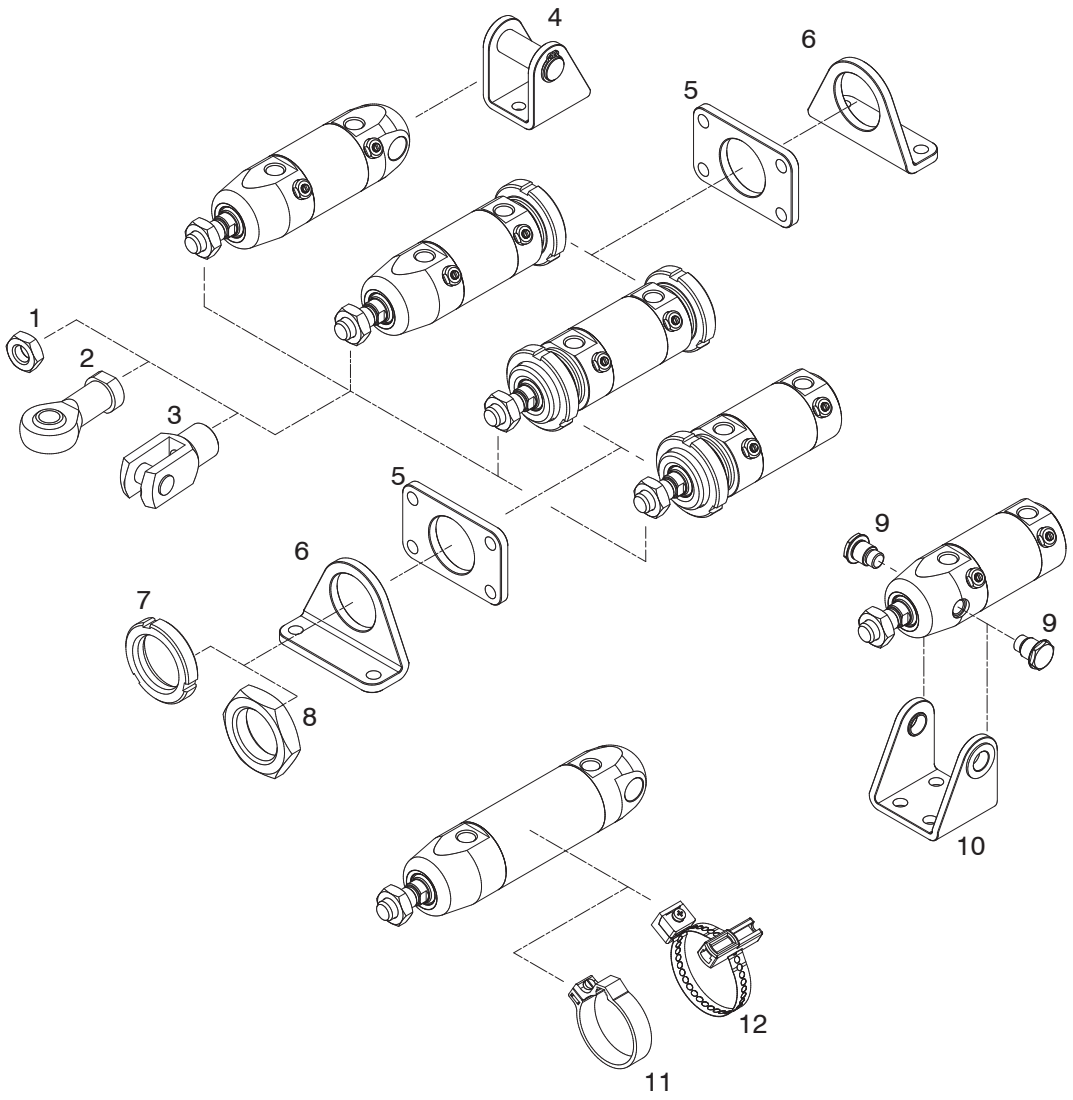
| Weight (g) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Through rod cylinder version | | | Ø16 | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 |
| S |  | Stroke 0 | 172 | 350 | 465 | 745 | 1364 | 1793 | 3318 |
| | | every 10mm | 5 | 7 | 11 | 26 | 33 | 42 | 90 |
| T |  | Stroke 0 | 181 | 336 | 470 | 723 | 1299 | 1832 | 3483 |
| | | every 10mm | 5 | 7 | 11 | 26 | 33 | 42 | 90 |

## Table of dimensions

| Bore | Ø16 | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 |
|---|---|---|---|---|---|---|---|
| α | 53° | 53° | 53° | 55° | 55° | 55° | 55° |
| AM | 16 | 20 | 22 | 20 | 25 | 25 | 32 |
| BA | 9 | 12 | 13,5 | 16 | 20 | 25 | 31 |
| BE | M16x1,5 | M22x1,5 | M22x1,5 | M30x1,5 | M40x1,5 | M40x1,5 | M45x1,5 |
| ØBF | 16 | 22 | 22 | 30 | 40 | 40 | 45 |
| EE | M5 | G1/8 | G1/8 | G1/8 | G1/4 | G1/4 | G3/8 |
| EW | 12 | 16 | 16 | 26 | 30 | 30 | 40 |
| ØCD$^{H9}$ | 6 | 8 | 8 | 12 | 14 | 14 | 16 |
| ØD | 21 | 27 | 30 | 36 | 44 | 54 | 68 |
| H1 | 22,5 | 26 | 30 | 30 | 34,5 | 34,5 | 40 |
| H2 | 17,5 | 23,5 | 27,5 | 30 | 34,5 | 34,5 | 40 |
| H3 | 16,5 | 22 | 22 | 23 | 27,5 | 27,5 | 30 |
| H4 | 7,5 | 10,5 | 10,5 | 10,5 | 12,5 | 12,5 | 16 |
| ØK1 | / | / | / | / | 52 | 52 | 60 |
| KK | M6x1 | M8x1,25 | M10x1,25 | M10x1,25 | M12x1,75 | M12x1,75 | M16x1,5 |
| KX | 10 | 13 | 17 | 17 | 19 | 19 | 24 |
| KY | 4 | 5 | 6 | 6 | 7 | 7 | 8 |
| KV | 22 | 30 | 30 | 42 | / | / | / |
| KW | 6 | 7 | 7 | 8 | 9 | 9 | 10 |
| L | 9 | 12 | 14 | 13 | 16 | 16 | 22 |
| L3 | 17 | 18 | 22 | 22 | 25 | 25 | 28 |
| L5 | 56 | 68 | 69 | 69 | 79 | 82 | 106 |
| L7 | 2 | 2,5 | 2,5 | 2,5 | 3 | 3 | 4 |
| L9 | 100 | 116 | 125 | 125 | 149 | 152 | 180 |
| L10 | 45 | 52 | 53 | 53 | 60 | 63 | 82 |
| L11 | 28 | 33,5 | 37 | 38,5 | 45 | 45 | 54 |
| L12 | 23 | 31 | 34,5 | 38,5 | 45 | 45 | 54 |
| L13 | 22 | 29,5 | 29 | 31,5 | 38 | 38 | 44 |
| L14 | 12,8 | 18 | 17,5 | 19 | 23 | 23 | 30 |
| L15 | 85 | 101,5 | 110,5 | 113 | 129 | 132 | 162 |
| L16 | 84 | 100 | 105 | 106 | 122 | 125 | 152 |
| L17 | 78 | 92 | 97 | 97 | 114 | 117 | 143 |
| L18 | 75 | 88,5 | 93,5 | 93,5 | 107 | 110 | 138 |
| L19 | 90 | 104 | 113 | 113 | 129 | 132 | 162 |
| L20 | 11 | 14 | 14 | 15 | 18 | 18 | 18 |
| ØMM | 6 | 8 | 10 | 12 | 14 | 16 | 20 |
| MR | 8 | 12,5 | 12,5 | 17 | 21 | 26 | 34,5 |
| N1 | / | / | / | 27 | 33 | 40 | 45 |
| ØN2$^{+0/-0,05}$ | / | / | / | 10,1 | 12,1 | 14,1 | 16,1 |
| N3 | / | / | / | M8x0,75 | M10x1 | M12x1 | M14x1 |
| N4 | / | / | / | 5,5 | 6 | 8,7 | 11,7 |
| N5$^{+0,1/-0}$ | / | / | / | 32 | 40 | 50 | 64 |
| S max. | 15,5 | 18,5 | 19,5 | 25 | 28,5 | 33,5 | 40 |
| SW | 5 | 6 | 8 | 10 | 12 | 12 | 17 |
| WF | 22 | 24 | 28 | 28 | 35 | 35 | 37 |
| WH | 5 | 6 | 6 | 6 | 10 | 10 | 9 |
| XC | 82 | 95 | 104 | 105 | 123 | 126 | 154 |




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice




| Position | Description | Coding | Materials |
|---|---|---|---|
| 1 | Rod lock nut | 12X.Ø.11 | Stainless steel AISI 316 |
| 2 | Ball joint | 12X.Ø.10 | Stainless steel |
| 3 | Fork with pin | 12X.Ø.04 | Stainless steel |
| 4 | Rear clevis | 12X.Ø.03 | Stainless steel |
| 5 | Flange | 12X.Ø.02 | Stainless steel AISI 316 |
| 6 | Foot | 12X.Ø.01 | Stainless steel AISI 316 |
| 7 | Lock nut for the end cap (Ø32 ... Ø63) | 12X.Ø.05 | Stainless steel AISI 316 |
| 8 | Nut for the endcap (Ø16 ... Ø25) | 12X.Ø.05 | Stainless steel AISI 316 |
| 9 | Pin for front clevis (Ø32 ... Ø63) | 12X.Ø.09 | Stainless steel AISI 316 |
| 10 | Front clevis (Ø32 ... Ø63) | 12X.Ø.08 | Stainless steel AISI 316 |
| 11 | Sensor clamps cod. 1580._, MRS._, MHS._ (Ø16 ... Ø50) | 12X.Ø.FS | Technopolymer |
| 12 | Sensor clamps cod. 1580._, MRS._, MHS._ (Ø16 ... Ø63) | 12X.Ø.FSX | Stainless steel Technopolymer |



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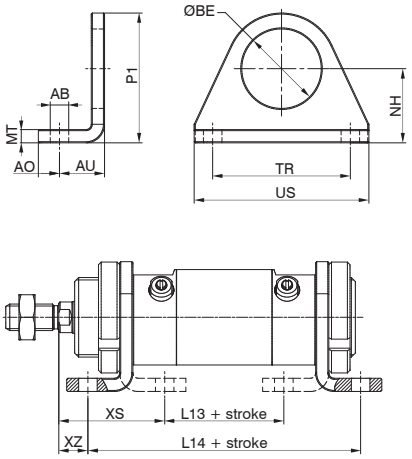
## Foot

**Coding:** 12X.Ø.01

| | BORE |
|---|---|
| Ø | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |

The kit comprises:
n° 1 foot (AISI 304)






Used to mount the cylinder on the mounting plane with the rod parallel to said plane. Use one for short strokes and two for long strokes. It is made stamped stainless steel AISI 316.

| Bore | 16 | 20 | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|---|---|
| AB (H13) | 5,5 | 6,5 | 6,5 | 6,5 | 9 | 9 | 9 |
| AO | 6 | 8 | 8 | 8 | 10 | 10 | 10 |
| AU | 14 | 17 | 17 | 17 | 20 | 20 | 20 |
| ØBE | 16 | 22 | 22 | 30 | 40 | 40 | 45 |
| L13 (±1) | 36 | 44 | 44 | 45 | 49 | 52 | 78 |
| L14 (±1) | 84 | 102 | 102 | 103 | 119 | 122 | 146 |
| MT | 4 | 5 | 5 | 5 | 5 | 5 | 6 |
| NH (±0.3) | 20 | 25 | 25 | 28 | 40 | 40 | 50 |
| P1 | 33 | 45 | 45 | 50 | 66,5 | 66,5 | 80 |
| TR (Js14) | 32 | 40 | 40 | 52 | 70 | 70 | 70 |
| US | 42 | 54 | 54 | 66 | 90 | 90 | 90 |
| XS (±1.4) | 32 | 36 | 40 | 40 | 50 | 50 | 51 |
| XZ (±1.4) | 8 | 7 | 11 | 11 | 15 | 15 | 17 |
| Weight (g) | 45 | 90 | 90 | 110 | 210 | 210 | 262 |

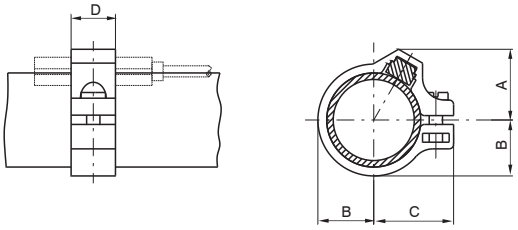
## Sensor clamps cod. 1580._, MRS._, MHS._

**Coding:** 12X.Ø.FS

| | BORE |
|---|---|
| Ø | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |

The kit comprises:
n° 1 clamp (Technopolymer)
n° 1 screw (AISI 304)
n° 1 nut (AISI 304)






| Bore | Ø16 | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 |
|---|---|---|---|---|---|---|
| A | 14,5 | 16 | 17,5 | 20,5 | 22 | 29 |
| B | 10,5 | 12,5 | 15,3 | 20 | 24 | 29 |
| C | 16 | 18 | 20,5 | 26 | 30 | 35 |
| D | 10 | 10 | 10 | 10 | 10 | 10 |
| Weight (g) | 3 | 5 | 7 | 8 | 10 | 11 |

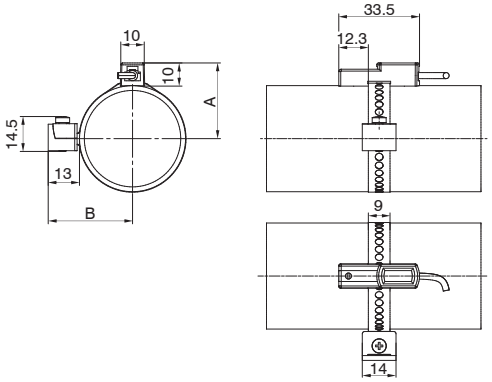
## Sensor clamps cod. 1580._, MRS._, MHS._

**Coding:** 12X.Ø.FSX

| | BORE |
|---|---|
| Ø | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |

The kit comprises:
n° 1 clamp (AISI 304)
n° 1 switch bracket + support (Technopolymer)
n° 1 screw (AISI 304)
n° 1 nut (AISI 304)






| Bore | Ø16 | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 |
|---|---|---|---|---|---|---|---|
| A | 19 | 21 | 23 | 28 | 32 | 37 | 44 |
| B | 22 | 24 | 26 | 31 | 35 | 40 | 47 |




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## Flange

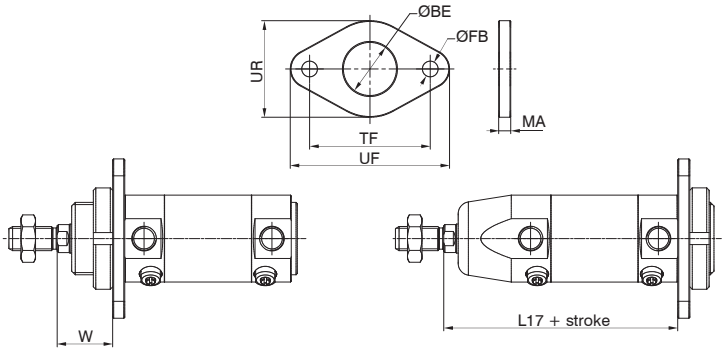
**Coding:** 12X.Ø.02

| | BORE |
|---|---|
| Ø | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |

The kit comprises:
n° 1 flange (AISI 316)

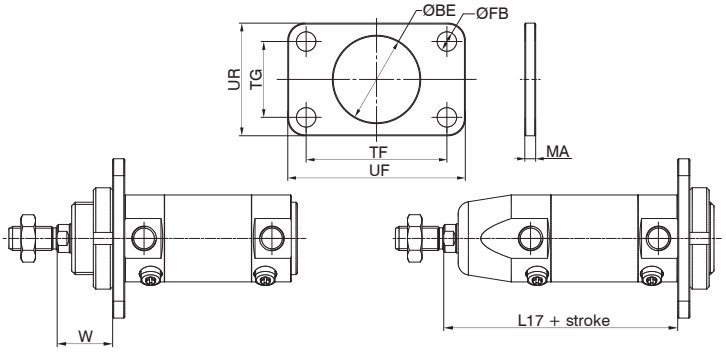


**(For Ø16-Ø20-Ø25)**






**(For Ø32-Ø40-Ø50-Ø63)**




Use to mount the microcylinder at a right angle to the mounting plane. Made of stainless steel AISI 316.

| Bore | 16 | 20 | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|---|---|
| ØBE | 16 | 22 | 22 | 30 | 40 | 40 | 45 |
| ØFB (H13) | 5.5 | 6.5 | 6.5 | 6.5 | 9 | 9 | 9 |
| UF | 53 | 66 | 66 | 66 | 82 | 82 | 96 |
| UR | 30 | 40 | 40 | 42 | 52 | 52 | 70 |
| MA | 4 | 5 | 5 | 5 | 5 | 5 | 6 |
| TF (JS14) | 40 | 50 | 50 | 52 | 65 | 65 | 76 |
| TG | / | / | / | 28 | 35 | 35 | 50 |
| W (±1.4) | 18 | 19 | 23 | 23 | 30 | 30 | 31 |
| L17 | 78 | 92 | 97 | 97 | 114 | 117 | 143 |
| Weight (g) | 40 | 85 | 85 | 100 | 105 | 105 | 225 |

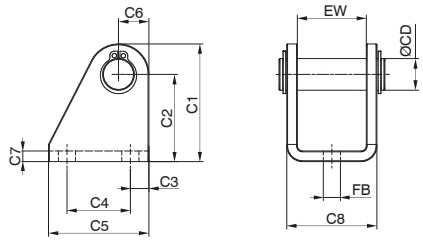
## Rear clevis

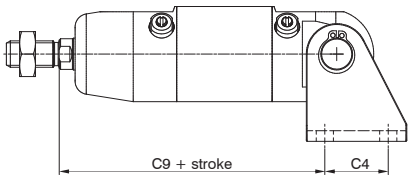
**Coding:** 12X.Ø.03

| | BORE |
|---|---|
| Ø | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |

The kit comprises:
n° 1 clevis (AISI 316)
n° 1 pin (AISI 316)
n° 2 circlips (AISI 420)






Used to mount by using the rear end cover to mount either parallel or at a right angle to the mounting plane. Allows the cylinder to oscillate and self-align with the linked element to the rod. Necessary to use when the rod may be subject to lateral forces during travel. Made of stamped stainless steel.

| Bore | 16 | 20 | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|---|---|
| ØCD | 6 | 8 | 8 | 12 | 14 | 14 | 16 |
| C1 | 33,5 | 39,5 | 39,5 | 44,5 | 53,5 | 53,5 | 64 |
| C2 (±0.3) | 27 | 30 | 30 | 33 | 40 | 40 | 50 |
| C3 | 5 | 6 | 6 | 7 | 10 | 10 | 8 |
| C4 | 15 | 20 | 20 | 24 | 28 | 28 | 34 |
| C5 | 25 | 32 | 32 | 38 | 45 | 45 | 50 |
| C6 | 6,5 | 9,5 | 9,5 | 11,5 | 13,5 | 13,5 | 14 |
| C7 | 3 | 4 | 4 | 4 | 4 | 4 | 6 |
| C8 | 18 | 24 | 24 | 34 | 38 | 38 | 52 |
| C9 (±0.4) | 80,5 | 91,5 | 100,5 | 100,5 | 119,5 | 122,5 | 148 |
| EW | 12,1 | 16,1 | 16,1 | 26,1 | 30,5 | 30,5 | 40,5 |
| FB (H13) | 5,5 | 6,5 | 6,5 | 6,5 | 8,5 | 8,5 | 9 |
| Weight (g) | 35 | 75 | 75 | 135 | 138 | 138 | 284 |



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## Rod lock nut

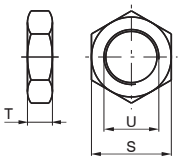
**Coding:** 12X.Ø.11

| Ø | BORE |
|---|---|
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |

The kit comprises:
n° 1 rod lock nut (AISI 316)

Mounted on the rod thread.
Made of stainless steel AISI 316.






| Bore | S | T | U | Weight (g) |
|---|---|---|---|---|
| 16 | 10 | 4 | M6X1 | 3 |
| 20 | 13 | 5 | M8X1,25 | 4 |
| 25 | 17 | 6 | M10X1,25 | 9 |
| 32 | 17 | 6 | M10X1,25 | 9 |
| 40 | 19 | 7 | M12X1,75 | 12 |
| 50 | 19 | 7 | M12X1,75 | 12 |
| 63 | 24 | 8 | M16X1,5 | 21 |

## Nut for the endcap

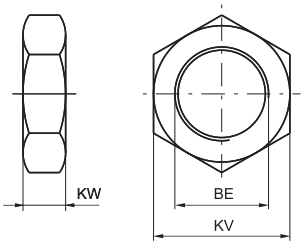
**Coding:** 12X.Ø.05

| Ø | BORE |
|---|---|
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |

The kit comprises:
n° 1 nut for the endcap (AISI 316)

Used to fasten flanges or feet to the endcaps of the microcylinder Mounted on diameters from 16 to 25. Supplied as standard (1 piece) with microcylinders.






| Bore | BE | KV | KW | Weight (g) |
|---|---|---|---|---|
| 16 | M16x1,5 | 22 | 6 | 16 |
| 20 | M22x1,5 | 30 | 7 | 25 |
| 25 | M22x1,5 | 30 | 7 | 25 |

## Lock nut for the end cap

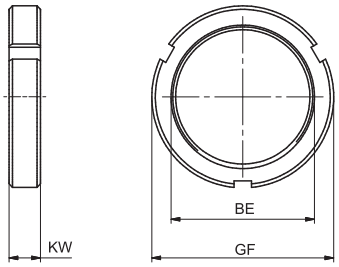
**Coding:** 12X.Ø.05

| Ø | BORE |
|---|---|
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |

The kit comprises:
n° 1 lock nut for the end cap (AISI 316)

Used to fasten flanges or feet to the endcaps of the microcylinder Mounted on diameters from 32 to 63. Supplied as standard (1 piece) with microcylinders.






| Bore | BE | GF | KW | Weight (g) |
|---|---|---|---|---|
| 32 | M30x1,5 | 42 | 8 | 42 |
| 40 | M40x1,5 | 52 | 9 | 62 |
| 50 | M40x1,5 | 52 | 9 | 62 |
| 63 | M45x1,5 | 60 | 10 | 100 |

## Front clevis

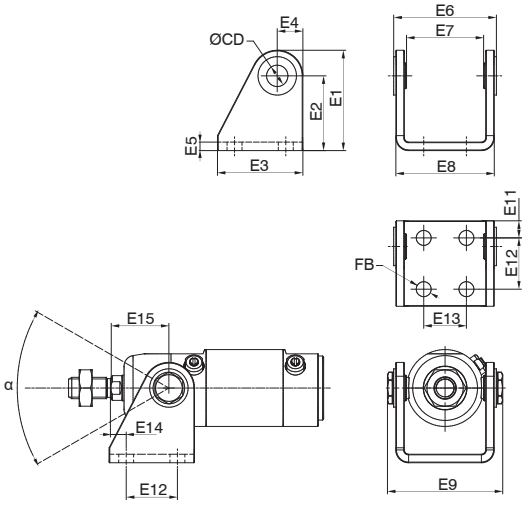
**Coding:** 12X.Ø.08

| Ø | BORE |
|---|---|
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |

The kit comprises:
n° 1 clevis (AISI 316)
n° 2 bushings (Technopolymer)

Used to mount by using the front end cap to mount parallel to the mounting plane. Allows the cylinder to oscillate and self-align with the linked element to the rod. Necessary to use when the rod may be subject to lateral forces during travel. Made of stamped stainless steel AISI 316.






| Bore | E2 (±0,2) | E3 | E4 | E5 | E6 | E7 | E8 | E9 | E11 | E12 | E13 | E14 | E15 | FB (H13) | ØCD | α | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | 35 | 40 | 12 | 4 | 48 | 36 | 46 | 54 | 8 | 24 | 20 | 7 | 27 | 7 | 10 | 50° | 121 |
| 40 | 40 | 50 | 13 | 4 | 60 | 49 | 58 | 68 | 10 | 30 | 28 | 6 | 33 | 9 | 12 | 50° | 175 |
| 50 | 45 | 54 | 14 | 6 | 74 | 54 | 72 | 84 | 10 | 34 | 36 | 10 | 40 | 9 | 14 | 50° | 330 |
| 63 | 50 | 65 | 16 | 6 | 88 | 72 | 86 | 98 | 15 | 35 | 42 | 11 | 45 | 9 | 16 | 40° | 458 |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

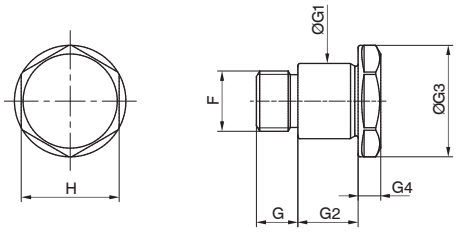
## Pin for front clevis

**Coding:** 12X.Ø.09

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |

The kit comprises:
n° 1 pin (AISI 316)






| Bore | 32 | 40 | 50 | 63 |
|---|---|---|---|---|
| G | 5,5 | 6 | 8,5 | 11 |
| G1 (h7) | 10 | 12 | 14 | 16 |
| G2 | 8 | 10 | 12 | 12 |
| G3 | 15 | 17 | 19 | 24 |
| G4 | 3 | 4 | 5 | 5 |
| F | M8X0,75 | M10X1 | M12X1 | M14X1 |
| H | 13 | 15 | 17 | 21 |

## Ball joint

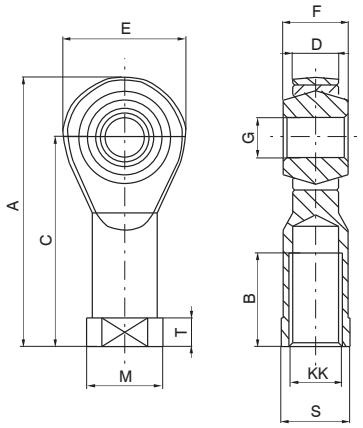
**Coding:** 12X.Ø.10

| | BORE |
|---|---|
| Ø | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |

The kit comprises:
n° 1 ball joint (AISI 304 and 420)

Mounted on the rod thread, assures a regular operation even in the presence of significant forces to the linked element. Made of stainless steel AISI 304 and 420.






| Bore | 16 | 20 | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|---|---|
| A | 40 | 48 | 57 | 57 | 66 | 66 | 85 |
| B | 12 | 16 | 20 | 20 | 22 | 22 | 28 |
| C | 30 | 36 | 43 | 43 | 50 | 50 | 64 |
| D | 6,75 | 9 | 10,5 | 10,5 | 12 | 12 | 15 |
| E | 20 | 24 | 28 | 28 | 32 | 32 | 42 |
| F | 9 | 12 | 14 | 14 | 16 | 16 | 21 |
| G (H 7) | 6 | 8 | 10 | 10 | 12 | 12 | 16 |
| KK | M6 | M8 | M10X1,25 | M10X1,25 | M12X1,75 | M12X1,75 | M16X1,5 |
| M | 13 | 16 | 19 | 19 | 22 | 22 | 27 |
| S | 11 | 14 | 17 | 17 | 19 | 19 | 22 |
| T | 5 | 5 | 6,5 | 6,5 | 6,5 | 6,5 | 8 |
| Weight (g) | 25 | 25 | 75 | 75 | 112 | 112 | 222 |

## Fork with pin

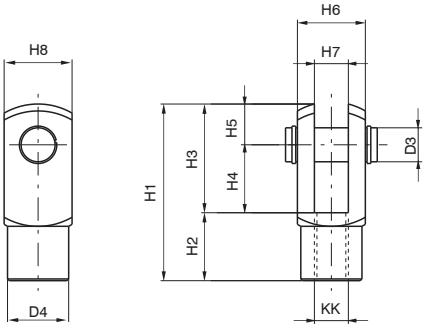
**Coding:** 12X.Ø.04

| | BORE |
|---|---|
| Ø | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |

The kit comprises:
n° 1 fork (AISI 303)
n° 1 pin (AISI 316)
n° 2 circlips (AISI 420)

Mounted on the rod thread, assures a regular operation even in the presence of significant forces to the linked element. Made of stainless steel.






| Bore | D3 | D4 | H1 | H2 | H3 | H4 | H5 | H6 | H7 (B12) | H8 | KK | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 6 | 10 | 31 | 12 | 19 | 12 | 7 | 12 | 6 | 12 | M6X1 | 20 |
| 20 | 8 | 14 | 42 | 16 | 26 | 16 | 10 | 16 | 8 | 16 | M8X1.25 | 45 |
| 25 | 10 | 18 | 52 | 20 | 32 | 20 | 12 | 20 | 10 | 20 | M10X1.25 | 90 |
| 32 | 10 | 18 | 52 | 20 | 32 | 20 | 12 | 20 | 10 | 20 | M10X1.25 | 90 |
| 40 | 12 | 20 | 62 | 18 | 38 | 24 | 14 | 24 | 12 | 24 | M12X1.75 | 121 |
| 50 | 12 | 20 | 62 | 18 | 38 | 24 | 14 | 24 | 12 | 24 | M12X1.75 | 121 |
| 63 | 16 | 26 | 83 | 32 | 51 | 32 | 19 | 32 | 16 | 32 | M16X1.5 | 340 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 1303-1308

They conform to CNOMO standards, fully complying with CETOP and ISO standards, with mounted fixing devices 32 to 100.

### Construction characteristics

| | |
|---|---|
| Cushion bushings | aluminium |
| Piston rod bushings | brass (Ø32, Ø40, Ø50) in aluminium with self-lubricating bearings in sinterized bronze for the remaining bores |
| Barrel | oxidised aluminium |
| Seals | standard: NBR Oil resistant rubber, PUR Piston rod seals (FPM seals available upon request) |
| Pistons | aluminium lathed from bar |
| Piston rod | C43 chromed steel, by thickness or stainless steel |
| End caps | solid aluminium bar up to Ø100, alloy aluminium from Ø125 to Ø200 |
| Tie rods | steel with rolled threads |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered and lubricated air - hydraulic oil (with special bushing) |
| Pressure | max. 12 bar (air) - 20 bar (oil) |
| Working temperature | -5 °C ... +70 °C with 1303 ... 1308 standard seals<br>-5 °C ... +80 °C with FPM seals for 1306 ... 1308 Series (magnetic piston)<br>-5 °C ... +150 °C with FPM seals for 1303 ... 1305 Series (non magnetic piston) |

| Cushioning lenght | Ø | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|---|
| | mm | 20 | 20 | 22 | 24 | 24 | 25 | 27 | 35 | 35 |

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

### Standard strokes

#### Double acting version

From 0 to 150 every 25 mm; from 150 to 500 every 50 mm; from 500 to 1000 every 100 mm. (for all diameters).
On request are available strokes up to: 2800 mm

#### Single acting version

up to stroke 50 mm.

### Minimum and maximum springs load for single acting version

| Bore | Ø32 | Ø40-50 | Ø63 | Ø80 - Ø100 |
|---|---|---|---|---|
| Min. load (N) | 17 | 25 | 50 | 100 |
| Max. load (N) | 50 | 80 | 115 | 200 |




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

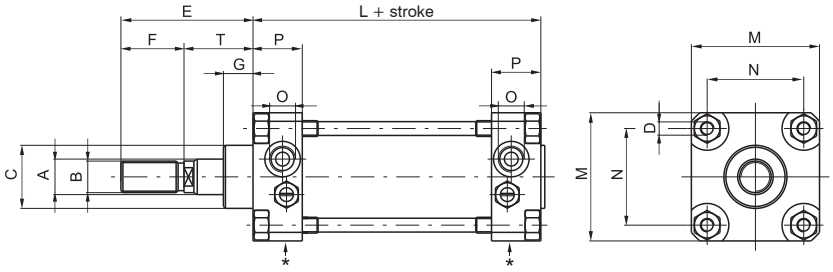
## Basic version

**Coding:** 13Ⓝ.Ø.stroke.01AⒼⓂⓈ

| | |
|---|---|
| Ⓝ | STANDARDS |
| | **03** = CNOMO (Non magnetic rod) |
| | **04** = CETOP (Non magnetic piston) |
| | **05** = ISO (Non magnetic piston) |
| | **06** = CNOMO (Magnetic piston) |
| | **07** = CETOP (Magnetic piston) |
| | **08** = ISO (Magnetic piston) |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |
| Ⓖ | SEALS |
| | = Standard seals |
| | **V** = FPM seals |
| Ⓜ | SPRING |
| | = Double acting |
| | **MA** = Front springs (Ø32 ... Ø125)* |
| | **MP** = Rear springs (Ø32 ... Ø125)* |
| Ⓢ | PISTON ROD |
| | = C43 chromed steel piston rod |
| | **X** = Stainless steel piston rod |

* max. stroke 50



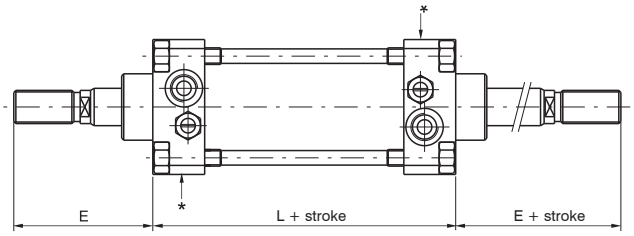



## Through rod cylinder version

**Coding:** 13Ⓝ.Ø.stroke.02AⒼⓈ

| | |
|---|---|
| Ⓝ | STANDARDS |
| | **03** = CNOMO (Non magnetic rod) |
| | **04** = CETOP (Non magnetic piston) |
| | **05** = ISO (Non magnetic piston) |
| | **06** = CNOMO (Magnetic piston) |
| | **07** = CETOP (Magnetic piston) |
| | **08** = ISO (Magnetic piston) |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |
| Ⓖ | SEALS |
| | = Standard seals |
| | **V** = FPM seals |
| Ⓢ | PISTON ROD |
| | = C43 chromed steel piston rod |
| | **X** = Stainless steel piston rod |



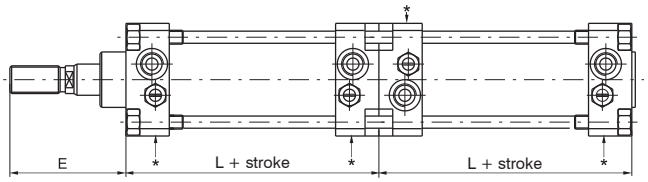



## Tandem push with a common rod

**Coding:** 13Ⓝ.Ø.stroke.H

| | |
|---|---|
| Ⓝ | STANDARDS |
| | **03** = CNOMO (Non magnetic rod) |
| | **04** = CETOP (Non magnetic piston) |
| | **05** = ISO (Non magnetic piston) |
| | **06** = CNOMO (Magnetic piston) |
| | **07** = CETOP (Magnetic piston) |
| | **08** = ISO (Magnetic piston) |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |



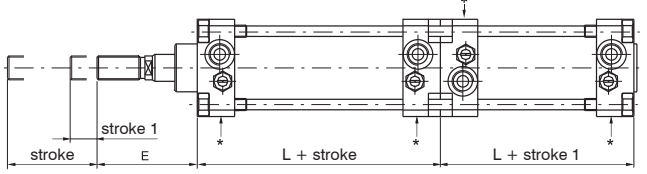



## Tandem push with independent rods

Coding: 13Ⓝ.Ø.stroke.stroke1.N

| | |
|---|---|
| Ⓝ | STANDARDS |
| | **03** = CNOMO (Non magnetic rod) |
| | **04** = CETOP (Non magnetic piston) |
| | **05** = ISO (Non magnetic piston) |
| | **06** = CNOMO (Magnetic piston) |
| | **07** = CETOP (Magnetic piston) |
| | **08** = ISO (Magnetic piston) |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |







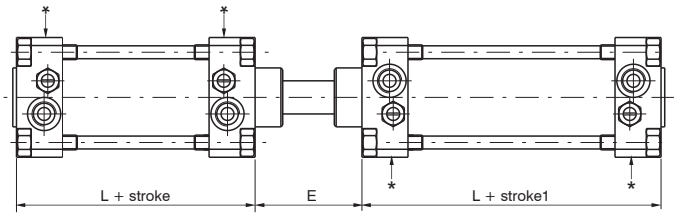

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Opposed tandem with common rods

**Coding:** 13Ⓝ.Ø.stroke.stroke1.R

| | |
|---|---|
| Ⓝ | STANDARDS |
| | **03** = CNOMO (Non magnetic rod) |
| | **04** = CETOP (Non magnetic piston) |
| | **05** = ISO (Non magnetic piston) |
| | **06** = CNOMO (Magnetic piston) |
| | **07** = CETOP (Magnetic piston) |
| | **08** = ISO (Magnetic piston) |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |



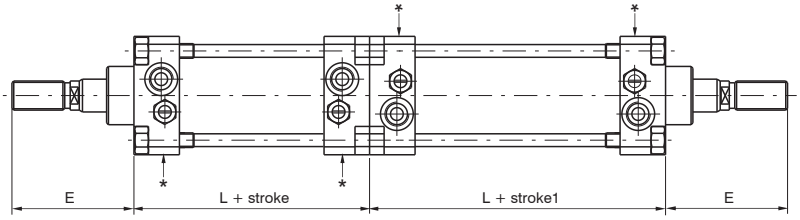



## Tandem with opposed rods

**Coding:** 13Ⓝ.Ø.stroke.stroke1.U

| | |
|---|---|
| Ⓝ | STANDARDS |
| | **03** = CNOMO (Non magnetic rod) |
| | **04** = CETOP (Non magnetic piston) |
| | **05** = ISO (Non magnetic piston) |
| | **06** = CNOMO (Magnetic piston) |
| | **07** = CETOP (Magnetic piston) |
| | **08** = ISO (Magnetic piston) |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |






**Note:** Cushion adjustment (for Ø32, Ø40, Ø125, Ø160 and Ø200) is on the side indicated by * (see drawings).

### Table of dimensions

| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| A (f7) | 12 | 18 | 18 | 22 | 22 | 30 | 30 | 40 | 40 |
| B - CNOMO (6g) | M10x1,5 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 | M27x2 | M27x2 | M36x2 | M36x2 |
| B - CETOP (6g) | M10x1,25 | M12x1,25 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 | M24x2 | M36x2 | M36x2 |
| B - ISO (6g) | M10x1,25 | M12x1,25 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 | M27x2 | M36x2 | M36x2 |
| C (d11) | 25 | 32 | 32 | 45 | 45 | 55 | 55 | 65 | 65 |
| H | 2,5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 |
| D | M6 | M6 | M8 | M8 | M10 | M10 | M12 | M16 | M16 |
| E - CNOMO | 45 | 70 | 70 | 85 | 85 | 110 | 110 | 135 | 135 |
| E - CETOP | 44 | 52 | 67 | 67 | 82 | 87 | 109 | 152 | 162 |
| E - ISO | 46 | 52 | 67 | 67 | 82 | 87 | 115 | 152 | 162 |
| F - CNOMO | 20 | 36 | 36 | 46 | 46 | 63 | 63 | 85 | 85 |
| F - CETOP | 20 | 24 | 32 | 32 | 40 | 40 | 48 | 72 | 72 |
| F - ISO | 22 | 24 | 32 | 32 | 40 | 40 | 54 | 72 | 72 |
| G | 15 | 15 | 15 | 20 | 20 | 20 | 20 | 25 | 25 |
| M | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| N | 33 | 40 | 49 | 59 | 75 | 90 | 110 | 140 | 175 |
| O | G1/8" | G 1/4" | G 1/4" | G 3/8" | G 3/8" | G 1/2" | G 1/2" | G 3/4" | G 3/4" |
| P | 16 | 23 | 25 | 31 | 31 | 35 | 36 | 45 | 45 |
| T - CNOMO | 25 | 34 | 34 | 39 | 39 | 47 | 47 | 50 | 50 |
| T - CETOP-ISO | 24 | 28 | 35 | 35 | 42 | 47 | 61 | 80 | 90 |
| L - CNOMO (±1) | 80 | 110 | 110 | 125 | 125 | 145 | 145 | 180 | 180 |
| L - CETOP-ISO (±1) | 98 | 110 | 110 | 125 | 136 | 145 | 168 | 180 | 190 |

**STROKE TOLERANCE: + 2 mm.**

*WEIGHT IN (g) OF THE CYLINDERS WITH VARIOUS BARRELS (BASIC VERSION)*

| Bore | | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminium | Stroke 0 | 580 | 1010 | 1350 | 2110 | 3350 | 5400 | 7450 | 13300 | 18300 |
| | every 10 mm. | 24 | 38 | 47 | 63 | 75 | 117 | 130 | 235 | 250 |

FOR CYLINDERS IN TANDEM THE WEIGHT IS APPROXIMATELY DOUBLE





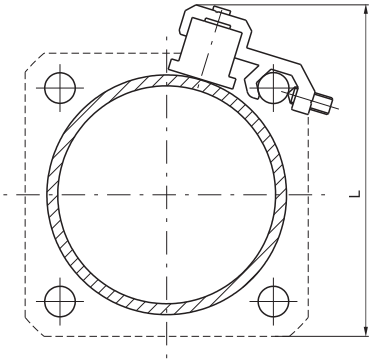
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Sensor brackets codes - 1500._, RS._, HS._

**Coding:** 1306.Ⓣ

| | TYPE |
|---|---|
| Ⓣ | **A** = from Ø32 to Ø63 |
| | **B** = from Ø80 to Ø125 |
| | **C** = Ø160-Ø200 |






**Sensor for microbore cylinders**

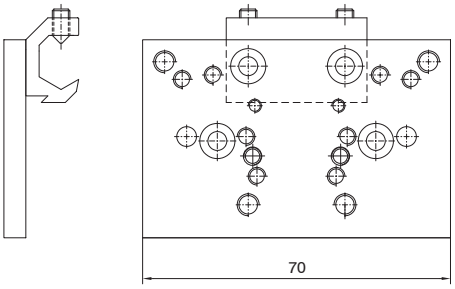
For technical characteristics and ordering codes see the "Magnetic sensors" sections

| Bore | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 | Ø125 | Ø160 | Ø200 |
|---|---|---|---|---|---|---|---|---|---|
| L | 59 | 65 | 76 | 87 | 103 | 121 | 144 | 179 | 215 |

## Support for solenoid valves

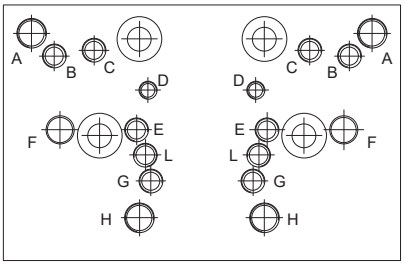
**Coding:** 1306.15
Ø32 ... Ø100






Fixing holes for valves series:

A = 414/2
B = 824
C = 828, T488, 488, 484
D = 2400
E = 2600
F = Bases for ISO solenoid valves
G = 858/2
H = T424
L = 888_



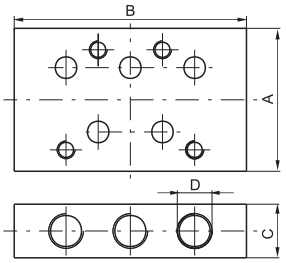

This accessory allows valves or solenoid valves to mount on the side of the cylinder. Support should be anchored to the tie rods and on it either a threaded distributor can be mounted or a base upon which an ISO distributor can be mounted. Once installed the connections must be done with fittings and pipes. All of the threaded holes on the support plate are dedicated to different valves series as per attached drawing.

## Bases for ISO solenoid valves

**Coding:** 1320.Ⓝ

| | STANDARDS |
|---|---|
| Ⓝ | **21** = ISO1 |
| | **22** = ISO2 |



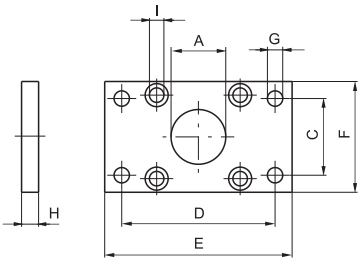


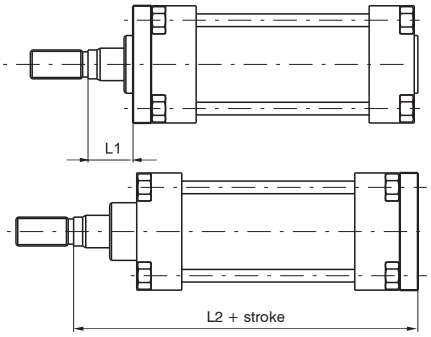

| Dimensions | | | | |
|---|---|---|---|---|
| Bases for solenoid valves | A | B | C | D |
| ISO 1 | 40 | 75 | 15 | G 1/8" |
| ISO 2 | 50 | 95 | 20 | G 1/4" |

## Front and rear flanges

**Coding:** 130Ⓝ.Ø.03F

| | |
|---|---|
| Ⓝ | STANDARDS |
| | **3** = CNOMO |
| | **4** = CETOP - ISO |
| Ø | BORE |
| | **32** = Ø 32 |
| | **40** = Ø 40 |
| | **50** = Ø 50 |
| | **63** = Ø 63 |
| | **80** = Ø 80 |
| | **100** = Ø 100 |
| | **125** = Ø 125 |
| | **160** = Ø 160 |
| | **200** = Ø 200 |





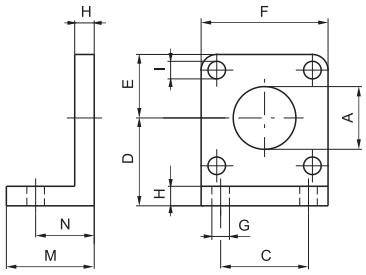

| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| A (H11) | 25 | 32 | 32 | 45 | 45 | 55 | 55 | 65 | 65 |
| C - CNOMO (JS 14) | 33 | 40 | 49 | 59 | 75 | 90 | 110 | 140 | 175 |
| C - CETOP ISO (JS 14) | 32 | 36 | 45 | 50 | 63 | 75 | 90 | 115 | 135 |
| D - CNOMO (JS 14) | 68 | 78 | 94 | 104 | 130 | 150 | 180 | 228 | 268 |
| D - CETOP - ISO (JS 14) | 64 | 72 | 90 | 100 | 126 | 150 | 180 | 230 | 270 |
| E | 80 | 90 | 110 | 120 | 150 | 170 | 205 | 260 | 300 |
| F | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| G - CNOMO (H13) | 9 | 9 | 11 | 11 | 14 | 14 | 18 | 22 | 22 |
| G - CETOP - ISO (H13) | 7 | 9 | 9 | 9 | 12 | 14 | 16 | 18 | 22 |
| H (JS 14) | 8 | 8 | 10 | 10 | 12 | 12 | 16 | 20 | 20 |
| I | 6,5 | 6,5 | 9 | 9 | 10,5 | 10,5 | 13,5 | 16,5 | 16,5 |
| L1 - CNOMO | 17 | 26 | 24 | 29 | 27 | 35 | 31 | 30 | 30 |
| L1 - CETOP - ISO | 16 | 20 | 25 | 25 | 30 | 35 | 45 | 60 | 70 |
| L2 - CNOMO | 113 | 152 | 154 | 174 | 176 | 204 | 208 | 250 | 250 |
| L2 - CETOP - ISO | 130 | 145 | 155 | 170 | 190 | 205 | 245 | 280 | 300 |
| Weight (g) | 165 | 200 | 540 | 1060 | 1460 | 1510 | 3100 | 6400 | 9500 |

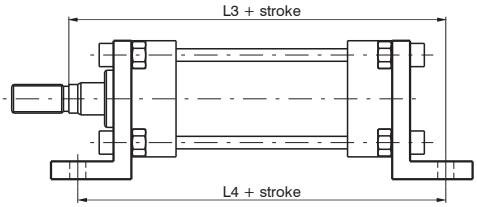
Plate which allows anchorage of the cylinder at a right angle to the plane. It is made of zinc-plated extruded steel.

## Standard feet

**Coding:** 130Ⓝ.Ø.05F

| | |
|---|---|
| Ⓝ | STANDARDS |
| | **3** = CNOMO |
| | **4** = CETOP - ISO |
| Ø | BORE |
| | **32** = Ø 32 |
| | **40** = Ø 40 |
| | **50** = Ø 50 |
| | **63** = Ø 63 |
| | **80** = Ø 80 |
| | **100** = Ø 100 |
| | **125** = Ø 125 |
| | **160** = Ø 160 |
| | **200** = Ø 200 |






| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| A (H11) | 25 | 32 | 32 | 45 | 45 | 55 | 55 | 65 | 65 |
| C - CNOMO (JS 14) | 28 | 36 | 45 | 55 | 70 | 90 | 100 | 130 | 170 |
| C - CETOP ISO (JS 14) | 32 | 36 | 45 | 50 | 63 | 75 | 90 | 115 | 135 |
| D - CNOMO (JS 15) | 32 | 36 | 45 | 50 | 63 | 73 | 91 | 115 | 135 |
| D - CETOP - ISO (JS 15) | 32 | 36 | 45 | 50 | 63 | 71 | 90 | 115 | 135 |
| E | 22 | 26 | 32 | 37 | 47 | 57 | 70 | 90 | 110 |
| F | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| G - CNOMO (H14) | 9 | 9 | 11 | 11 | 14 | 14 | 18 | 22 | 22 |
| G - CETOP (H14) | 7 | 9 | 9 | 9 | 12 | 14 | 16 | 18 | 22 |
| G - ISO (H14) | 7 | 9 | 9 | 9 | 12 | 14 | 16 | 18 | 22 |
| H | 8 | 8 | 10 | 10 | 12 | 12 | 16 | 20 | 20 |
| I | 7 | 7 | 9 | 9 | 11 | 11 | 13 | 17 | 17 |
| M | 35 | 35 | 45 | 45 | 55 | 55 | 68 | 82 | 91 |
| N - CNOMO (±0,2) | 27 | 27 | 35 | 35 | 43 | 43 | 52 | 62 | 62 |
| N - CETOP - ISO (±0,2) | 22 | 25,5 | 30 | 30 | 37 | 37,5 | 41 | 60 | 65 |
| L3 - CNOMO | 132 | 171 | 179 | 199 | 207 | 235 | 244 | 292 | 292 |
| L3 - CETOP - ISO | 144 | 163 | 175 | 190 | 215 | 230 | 270 | 320 | 345 |
| L4 - CNOMO | 134 | 164 | 180 | 195 | 211 | 231 | 249 | 304 | 304 |
| L4 - CETOP - ISO | 142 | 161 | 170 | 185 | 210 | 220 | 250 | 300 | 320 |
| Weight (g) | 55 | 70 | 150 | 175 | 260 | 550 | 920 | 2200 | 3200 |

Elements used to anchor the cylinder parallel to the mounting plane. They are made of cast aluminium, painted black.



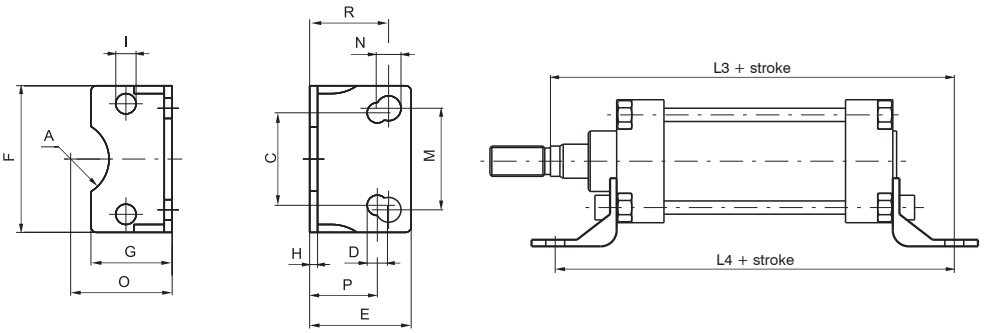


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Short sheet metal feet

**Coding:** 1303.Ø.05/1F

| | BORE |
|---|---|
| Ø | **32** = Ø 32 |
| | **40** = Ø 40 |
| | **50** = Ø 50 |
| | **63** = Ø 63 |
| | **80** = Ø 80 |
| | **100** = Ø 100 |




CNOMO - CETOP - ISO
(1 piece)



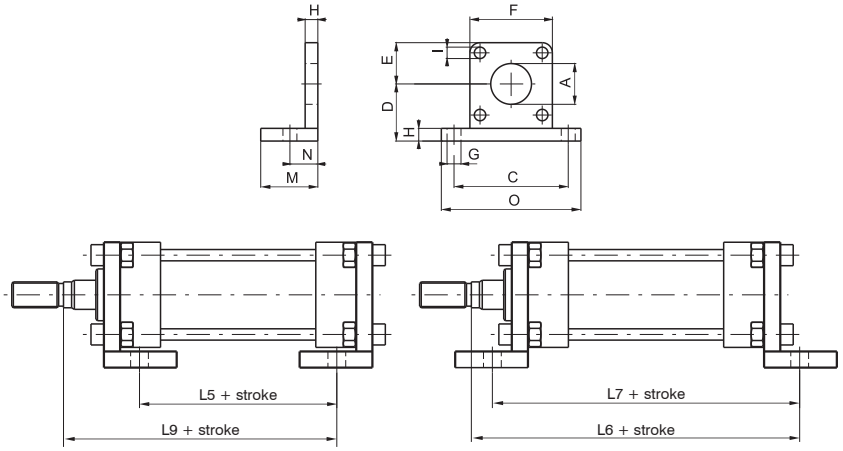
| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| A | 13 | 17 | 17 | 23,5 | 23,5 | - |
| C - CETOP - ISO (JS 14) | 32 | 36 | 45 | 50 | 63 | 75 |
| D - CETOP - ISO (JS 15) | 7 | 9 | 9 | 9 | 12 | 14 |
| E | 35 | 36 | 45 | 45 | 55 | 56 |
| F | 45 | 52 | 65 | 75 | 95 | 115 |
| G | 30 | 30 | 36 | 35 | 45 | 44 |
| H | 3,5 | 3,5 | 3,5 | 4,5 | 5 | 5 |
| I | 7 | 7 | 9 | 9 | 11 | 11 |
| M - CNOMO (JS 14) | 28 | 36 | 45 | 55 | 70 | 90 |
| N - CNOMO (JS 15) | 9 | 9 | 11 | 11 | 13 | 13 |
| O - CNOMO (JS 15) | 32 | 36 | 45 | 50 | 63 | 73 |
| O - CETOP - ISO (JS 15) | 32 | 36 | 45 | 50 | 63 | 71 |
| P - CETOP - ISO (±0,2) | 22 | 25,5 | 30 | 30 | 37 | 37,5 |
| R - CNOMO (±0,2) | 27 | 27 | 35 | 35 | 43 | 43 |
| L3 - CNOMO | 132 | 171 | 179 | 199 | 207 | 235 |
| L3 - CETOP - ISO | 144 | 163 | 175 | 190 | 215 | 230 |
| L4 - CNOMO | 134 | 164 | 180 | 195 | 211 | 231 |
| L4 - CETOP - ISO | 142 | 161 | 170 | 185 | 210 | 220 |
| Weight (g) | 58 | 70 | 118 | 184 | 305 | 385 |

Elements used to anchor the cylinder parallel to the mounting plane. They are made of stamped and pierced sheet metal and painted in black. The mounting holes allow use with CNOMO, CETOP and ISO. Available up to 100 mm bore.

## Large internal and external feet

**Coding:** 1303.Ø.Ⓣ F

| | BORE |
|---|---|
| Ø | **32** = Ø 32 |
| | **40** = Ø 40 |
| | **50** = Ø 50 |
| | **63** = Ø 63 |
| | **80** = Ø 80 |
| | **100** = Ø 100 |
| | **125** = Ø 125 |
| | **160** = Ø 160 |
| | **200** = Ø 200 |
| Ⓣ | TYPE |
| | **06** = Internal CNOMO (1 piece)May be used with CETOP-ISO cylinders but are not specified in the standards |
| | **07** = External CNOMO (1 piece) |





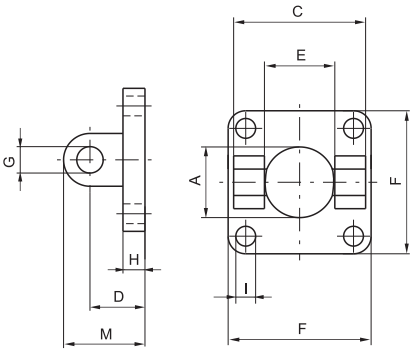

| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| A (H11) | 25 | 32 | 32 | 45 | 45 | 55 | 55 | 65 | 65 |
| C (JS 14) | 65 | 72 | 90 | 100 | 126 | 148 | 180 | 230 | 270 |
| D (JS 15) | 32 | 36 | 45 | 50 | 63 | 73 | 91 | 115 | 135 |
| E | 22 | 26 | 32 | 37 | 47 | 57 | 70 | 90 | 110 |
| F | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| G (H14) | 9 | 9 | 11 | 11 | 14 | 14 | 18 | 22 | 22 |
| H | 8 | 8 | 10 | 10 | 12 | 12 | 16 | 20 | 20 |
| I | 7 | 7 | 9 | 9 | 11 | 11 | 13 | 17 | 17 |
| M | 35 | 35 | 45 | 45 | 55 | 55 | 67 | 80 | 80 |
| N (±0,2) | 18 | 18 | 22 | 22 | 28 | 28 | 32 | 40 | 40 |
| O | 82 | 90 | 110 | 120 | 155 | 180 | 215 | 275 | 315 |
| L5 - CNOMO | 60 | 90 | 86 | 101 | 93 | 113 | 113 | 140 | 140 |
| L5 - CETOP - ISO | 78 | 90 | 86 | 101 | 104 | 113 | 136 | 140 | 150 |
| L6 - CNOMO | 123 | 162 | 166 | 186 | 192 | 220 | 224 | 270 | 270 |
| L6 - CETOP - ISO | 141 | 162 | 166 | 186 | 203 | 220 | 247 | 270 | 280 |
| L7 - CNOMO | 116 | 146 | 154 | 169 | 181 | 201 | 209 | 260 | 260 |
| L7 - CETOP - ISO | 134 | 146 | 154 | 169 | 192 | 201 | 232 | 260 | 270 |
| L9 - CNOMO | 95 | 134 | 132 | 152 | 148 | 176 | 176 | 210 | 210 |
| L9 - CETOP - ISO | 112 | 128 | 133 | 148 | 162 | 176 | 213 | 240 | 250 |
| Weight (g) | 80 | 90 | 190 | 210 | 460 | 600 | 1080 | 2400 | 3100 |

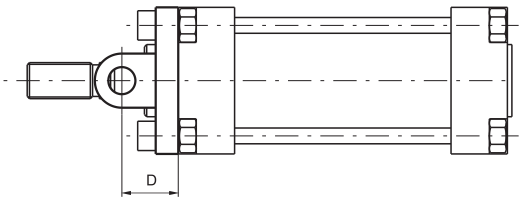
Elements used to anchor the cylinder parallel to the mounting plane. They are made of cast aluminium, painted black.

## Front clevis

**Coding:** 130Ⓝ.Ø.08F

| | |
|---|---|
| Ⓝ | STANDARDS |
| | **3** = CNOMO |
| | **4** = CETOP-ISO |
| Ø | BORE |
| | **32** = Ø 32 |
| | **40** = Ø 40 |
| | **50** = Ø 50 |
| | **63** = Ø 63 |
| | **80** = Ø 80 |
| | **100** = Ø 100 |
| | **125** = Ø 125 |
| | **160** = Ø 160 |
| | **200** = Ø 200 |





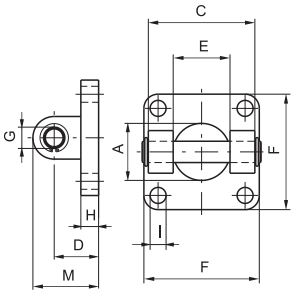

This type of mounting allows anchorage of the cylinder both parallel and at a right angle to the plane; the cylinder rod can oscillate and self-align as necessary. It is made of aluminium alloy and painted black.

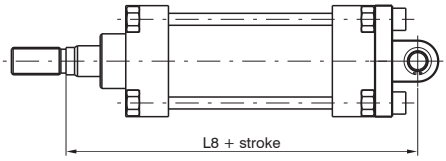
| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| A | 25 | 32 | 32 | 45 | 45 | 55 | 55 | 65 | 65 |
| C - CNOMO (H1) | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| C - CETOP - ISO (H14) | 45 | 52 | 60 | 70 | 90 | 110 | 130 | 170 | 170 |
| D - CNOMO (±0,2) | 18 | 24 | 26 | 30 | 32 | 37 | 41 | 55 | 55 |
| D - CETOP (±0,2) | 20 | 22 | 25 | 30 | 32 | 37 | 46 | 55 | 55 |
| E - CNOMO (H14) | 26 | 33 | 33 | 47 | 47 | 57 | 57 | 72 | 72 |
| E - CETOP (H14) | 26 | 28 | 32 | 40 | 50 | 60 | 70 | 90 | 90 |
| F | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| G - CNOMO (H9) | 8 | 12 | 12 | 16 | 16 | 20 | 20 | 25 | 25 |
| G - CETOP - ISO (H9) | 10 | 12 | 12 | 16 | 16 | 20 | 25 | 30 | 30 |
| H | 8 | 8 | 10 | 10 | 12 | 12 | 16 | 19 | 19 |
| I | 7 | 7 | 9 | 9 | 11 | 11 | 13 | 17 | 17 |
| M - CNOMO | 26 | 36 | 38 | 46 | 48 | 57 | 61 | 80 | 80 |
| M - CETOP - ISO | 30 | 35 | 37 | 46 | 48 | 57 | 71 | 85 | 85 |
| Weight (g) | 55 | 60 | 120 | 145 | 325 | 510 | 900 | 2080 | 3100 |

## Rear clevis complete with pin

**Coding:** 130Ⓝ.Ø.09F

| | |
|---|---|
| Ⓝ | STANDARDS |
| | **3** = CNOMO |
| | **4** = CETOP - ISO |
| Ø | BORE |
| | **32** = Ø 32 |
| | **40** = Ø 40 |
| | **50** = Ø 50 |
| | **63** = Ø 63 |
| | **80** = Ø 80 |
| | **100** = Ø 100 |
| | **125** = Ø 125 |
| | **160** = Ø 160 |
| | **200** = Ø 200 |






This type of mounting allows anchorage of the cylinder both parallel and at a right angle to the plane; the cylinder rod can oscillate and self-align as necessary. It is made of aluminium alloy and painted black.

| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| A | 25 | 32 | 32 | 45 | 45 | 55 | 55 | 65 | 65 |
| C - CNOMO (H1) | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| C - CETOP - ISO (H14) | 45 | 52 | 60 | 70 | 90 | 110 | 130 | 170 | 170 |
| D - CNOMO (±0,2) | 18 | 24 | 26 | 30 | 32 | 37 | 41 | 55 | 55 |
| D - CETOP (±0,2) | 20 | 22 | 25 | 30 | 32 | 37 | 46 | 55 | 55 |
| E - CNOMO (H14) | 26 | 33 | 33 | 47 | 47 | 57 | 57 | 72 | 72 |
| E - CETOP (H14) | 26 | 28 | 32 | 40 | 50 | 60 | 70 | 90 | 90 |
| F | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| G - CNOMO (H9) | 8 | 12 | 12 | 16 | 16 | 20 | 20 | 25 | 25 |
| G - CETOP - ISO (H9) | 10 | 12 | 12 | 16 | 16 | 20 | 25 | 30 | 30 |
| H | 8 | 8 | 10 | 10 | 12 | 12 | 16 | 19 | 19 |
| I | 7 | 7 | 9 | 9 | 11 | 11 | 13 | 17 | 17 |
| M - CNOMO | 26 | 36 | 38 | 46 | 48 | 57 | 61 | 80 | 80 |
| M - CETOP - ISO | 30 | 35 | 37 | 46 | 48 | 57 | 71 | 85 | 85 |
| L8 - CNOMO | 123 | 168 | 170 | 194 | 196 | 229 | 233 | 285 | 285 |
| L8 - CETOP - ISO | 142 | 160 | 170 | 190 | 210 | 230 | 275 | 315 | 335 |
| Weight (g) | 75 | 110 | 190 | 280 | 490 | 820 | 1270 | 2800 | 3900 |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Rear male clevis

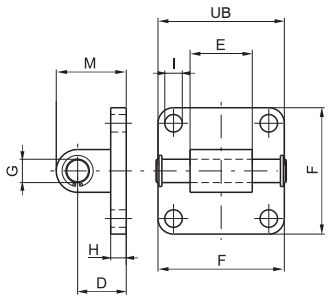
**Coding:** 1304.Ø.09/1F

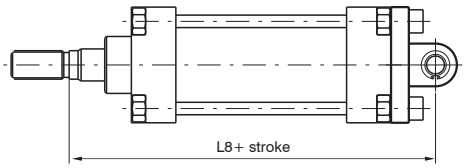
| | BORE |
|---|---|
| Ø | **32** = Ø 32 |
| | **40** = Ø 40 |
| | **50** = Ø 50 |
| | **63** = Ø 63 |
| | **80** = Ø 80 |
| | **100** = Ø 100 |
| | **125** = Ø 125 |
| | **160** = Ø 160 |
| | **200** = Ø 200 |

For CETOP-ISO cylinders May be used with CNOMO cylinders but is not specified in the standards



Similar to 09 clevis except for the connection, which is male rather than female. It can also be used as a counter clevis for type 10 (only CETOP - ISO). Allows mounting of cylinder at right angle to the plane of the cylinder rod.




| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| D (±0,2) | 20 | 22 | 25 | 30 | 32 | 37 | 46 | 55 | 55 |
| E (-0,2/-0,6) | 26 | 28 | 32 | 40 | 50 | 60 | 70 | 90 | 90 |
| F | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| UB | 46 | 53 | 61 | 71 | 91 | 111 | 132 | 172 | 172 |
| G (H 9) | 10 | 12 | 12 | 16 | 16 | 20 | 25 | 30 | 30 |
| H | 8 | 8 | 8 | 10 | 12 | 12 | 16 | 20 | 20 |
| I | 7 | 7 | 9 | 9 | 11 | 11 | 14 | 18 | 18 |
| M | 30 | 35 | 36 | 45 | 47 | 57 | 71 | 80 | 80 |
| L8 - CNOMO | 125 | 166 | 169 | 194 | 196 | 229 | 233 | 285 | 285 |
| L8 - CETOP - ISO | 142 | 160 | 170 | 190 | 210 | 230 | 275 | 315 | 335 |
| Weight (g) | 50 | 80 | 110 | 185 | 325 | 460 | 1300 | 2850 | 3980 |

## Rear clevis bracket

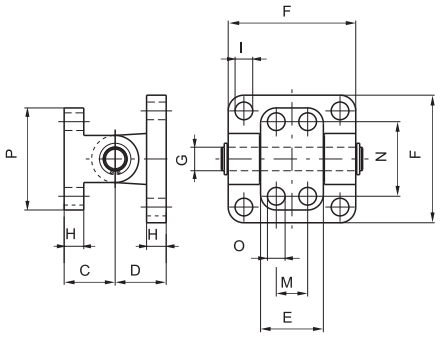
**Coding:** 1303.Ø.10F

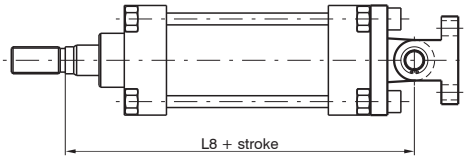
| | BORE |
|---|---|
| Ø | **32** = Ø 32 |
| | **40** = Ø 40 |
| | **50** = Ø 50 |
| | **63** = Ø 63 |
| | **80** = Ø 80 |
| | **100** = Ø 100 |
| | **125** = Ø 125 |
| | **160** = Ø 160 |
| | **200** = Ø 200 |

May be used with CETOP - ISO cylinders but is not specified in the standard



Mounting consists of clevis 09 and counter clevis. Used to mount cylinders at a right angle to the plane to which the counter clevis is attached. Allows selfalignment of the cylinder rod under load with an oscillation of ± 60 degrees




| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| C (±0,2) | 18 | 26 | 26 | 34 | 34 | 41 | 41 | 55 | 55 |
| D (±0,2) | 18 | 24 | 26 | 30 | 32 | 37 | 41 | 55 | 55 |
| E | 25 | 32 | 32 | 46 | 46 | 56 | 56 | 71 | 71 |
| F | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| G (H 9) | 8 | 12 | 12 | 16 | 16 | 20 | 20 | 25 | 25 |
| H | 8 | 10 | 10 | 12 | 12 | 16 | 16 | 20 | 20 |
| I | 7 | 7 | 9 | 9 | 11 | 11 | 13 | 17 | 17 |
| M (JS 14) | - | 16 | 16 | 25 | 25 | 32 | 32 | 43 | 43 |
| N (JS 14) | 28 | 38 | 38 | 54 | 54 | 90 | 90 | 150 | 150 |
| O (H 13) | 7 | 9 | 9 | 11 | 11 | 14 | 14 | 18 | 18 |
| P | 40 | 52 | 52 | 75 | 75 | 115 | 115 | 180 | 180 |
| L8 - CNOMO | 123 | 168 | 170 | 194 | 196 | 229 | 233 | 285 | 285 |
| L8 - CETOP - ISO | 140 | 162 | 171 | 190 | 210 | 229 | 270 | 315 | 335 |
| Weight (g) | 90 | 165 | 240 | 470 | 665 | 1190 | 1660 | 3700 | 4700 |



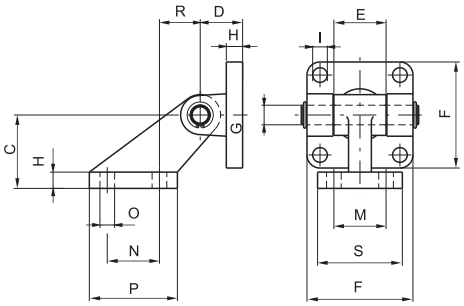
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

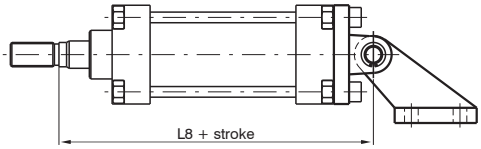
## Trunnion with support bracket

1303.Ø.11F

| Ø | BORE |
|---|---|
| | **32** = Ø 32 |
| | **40** = Ø 40 |
| | **50** = Ø 50 |
| | **63** = Ø 63 |
| | **80** = Ø 80 |
| | **100** = Ø 100 |
| | **125** = Ø 125 |
| | **160** = Ø 160 |
| | **200** = Ø 200 |

CNOMO
May be used with CETOP - ISO cylinders but is not specified in the standard





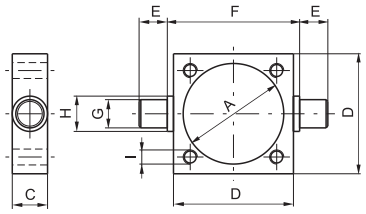

Mounting consists of clevis 09 and right angle counter clevis. Used to mount cylinders parallel to the plane to which the counterclevis is attached. Allows self-alignment of the cylinder rod under load with an oscillation up to 90 degrees from the mounting plane.

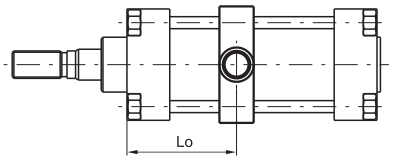
| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| C (JS 15) | 32 | 45 | 45 | 63 | 63 | 90 | 90 | 140 | 140 |
| D (±0,2) | 18 | 24 | 26 | 30 | 32 | 37 | 41 | 55 | 55 |
| E | 25 | 32 | 32 | 46 | 46 | 56 | 56 | 71 | 71 |
| F | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| G (H9) | 8 | 12 | 12 | 16 | 16 | 20 | 20 | 25 | 25 |
| H | 8 | 10 | 10 | 12 | 12 | 16 | 16 | 20 | 20 |
| I | 7 | 7 | 9 | 9 | 11 | 11 | 13 | 17 | 17 |
| M (JS14) | 25 | 32 | 32 | 40 | 40 | 50 | 50 | 63 | 63 |
| N (Js14) | 20 | 32 | 32 | 50 | 50 | 70 | 70 | 110 | 110 |
| O (JS 13) | 7 | 9 | 9 | 11 | 11 | 14 | 14 | 18 | 18 |
| P | 37 | 54 | 54 | 75 | 75 | 102 | 102 | 154 | 154 |
| R | 18 | 25 | 25 | 32 | 32 | 40 | 40 | 50 | 50 |
| S | 41 | 51 | 51 | 62 | 62 | 80 | 80 | 110 | 110 |
| L8 - CNOMO | 123 | 168 | 170 | 194 | 196 | 229 | 233 | 285 | 285 |
| L8 - CETOP - ISO | 140 | 162 | 171 | 190 | 210 | 229 | 270 | 315 | 335 |
| Weight (g) | 125 | 250 | 325 | 600 | 800 | 1570 | 2100 | 4600 | 5700 |

## Intermediate trunnion

**Coding:** 1300.Ø.12F

| Ø | BORE |
|---|---|
| | **32** = Ø 32 |
| | **40** = Ø 40 |
| | **50** = Ø 50 |
| | **63** = Ø 63 |
| | **80** = Ø 80 |
| | **100** = Ø 100 |
| | **125** = Ø 125 |
| | **160** = Ø 160 |
| | **200** = Ø 200 |






Clevis to be mounted between the endcaps of the cylinder allowing rotation at any point along the barrel. One piece construction from zinc-plated stamped steel. Can be mounted in fixed position or attached to adjustable tie rods.
NOTE: Lo max means at stroke 0.

| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| A | 37 | 46 | 56 | 69 | 87 | 107 | 133 | 170 | 211 |
| C | 15 | 20 | 20 | 25 | 25 | 30 | 32 | 40 | 40 |
| D | 46 | 59 | 69 | 84 | 102 | 125 | 155 | 190 | 240 |
| E (h 14) | 12 | 16 | 16 | 20 | 20 | 25 | 25 | 32 | 32 |
| F (h 14) | 50 | 63 | 73 | 90 | 108 | 131 | 160 | 200 | 250 |
| G (e 9) | 12 | 16 | 16 | 20 | 20 | 25 | 25 | 32 | 32 |
| H | 15 | 20 | 20 | 25 | 25 | 30 | 30 | 40 | 40 |
| I | M6 | M6 | M8 | M8 | M10 | M10 | M12 | M16 | M16 |
| Lo min. | 32 | 35 | 40 | 47 | 53 | 55 | 61 | 78 | 79 |
| Lo max. +stroke - CNOMO | 48 | 75 | 70 | 80 | 72 | 90 | 84 | 103 | 102 |
| Lo max. + stroke - CETOP - ISO | 67 | 75 | 70 | 80 | 84 | 90 | 107 | 103 | 112 |
| Weight (g) | 130 | 310 | 370 | 700 | 900 | 1590 | 2600 | 4300 | 7500 |





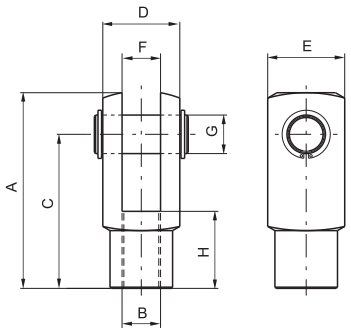
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Fork with pin

**Coding:** 130Ⓝ.Ø.13F

| | |
|---|---|
| Ⓝ | STANDARDS |
| | **0** = CNOMO |
| | **1** = CETOP |
| | **2** = ISO |
| Ø | BORE |
| | **32** = Ø 32 |
| | **40** = Ø 40 |
| | **50** = Ø 50 |
| | **63** = Ø 63 |
| | **80** = Ø 80 |
| | **100** = Ø 100 |
| | **125** = Ø 125 |
| | **160** = Ø 160 |
| | **200** = Ø 200 |





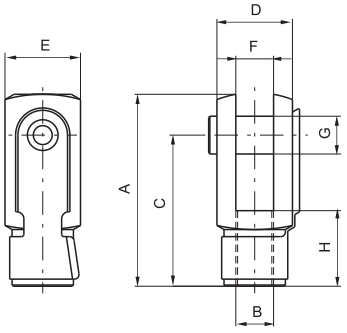

| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| A - CNOMO | 45 | 64 | 64 | 80 | 80 | 105 | 105 | 140 | 140 |
| A - CETOP - ISO | 51 | 62 | 82 | 82 | 105 | 105 | 132/148 | 188 | 188 |
| B - CNOMO (6H) | M10x1,5 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 | M27x2 | M27x2 | M36x2 | M36x2 |
| B - CETOP (6H) | M10x1,25 | M12x1,25 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 | M24x2 | M36x2 | M36x2 |
| B - ISO (6 H) | M10x1,25 | M12x1,25 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 | M27x2 | M36x2 | M36x2 |
| C - CNOMO | 36 | 51 | 51 | 63 | 63 | 85 | 85 | 115 | 115 |
| C - CETOP - ISO | 40 | 48 | 64 | 65 | 80 | 80 | 100/100 | 144 | 144 |
| D - CNOMO | 22 | 36 | 36 | 45 | 45 | 63 | 63 | 80 | 80 |
| D - CETOP - ISO | 20 | 24 | 32 | 32 | 40 | 40 | 50/55 | 70 | 70 |
| E - CNOMO | 22 | 26 | 26 | 34 | 34 | 42 | 42 | 50 | 50 |
| E - CETOP - ISO | 20 | 24 | 32 | 32 | 40 | 40 | 50/55 | 70 | 70 |
| F - CNOMO (H 14) | 11 | 18 | 18 | 22 | 22 | 30 | 30 | 40 | 40 |
| F - CETOP - ISO (B 12) | 10 | 12 | 16 | 16 | 20 | 20 | 25/30 | 35 | 35 |
| G - CNOMO (H 9) | 8 | 12 | 12 | 16 | 16 | 20 | 20 | 25 | 25 |
| G - CETOP - ISO (H 9) | 10 | 12 | 16 | 16 | 20 | 20 | 25/30 | 35 | 35 |
| H - CNOMO | 20 | 26 | 26 | 30 | 30 | 45 | 45 | 75 | 75 |
| H - CETOP - ISO | 20 | 24 | 32 | 32 | 40 | 40 | 50/56 | 72 | 72 |
| Weight (g) | 90 | 150 | 350 | 350 | 680 | 680 | 2500 | 4000 | 4000 |

## Fork with clips

**Coding:** 130Ⓝ.Ø.13/1F

| | |
|---|---|
| Ⓝ | STANDARDS |
| | **0** = CNOMO |
| | **1** = CETOP |
| | **2** = ISO |
| Ø | BORE |
| | **32** = Ø 32 |
| | **40** = Ø 40 |
| | **50** = Ø 50 |
| | **63** = Ø 63 |
| | **80** = Ø 80 |
| | **100** = Ø 100 |






| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| A - CNOMO | 45 | 64 | 64 | 80 | 80 | 105 |
| A - CETOP - ISO | 51 | 62 | 82 | 82 | 105 | 105 |
| B - CNOMO (6H) | M10x1,5 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 | M27x2 |
| B - CETOP (6H) | M10x1,25 | M12x1,25 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 |
| B - ISO (6 H) | M10x1,25 | M12x1,25 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 |
| C - CNOMO | 36 | 51 | 51 | 63 | 63 | 85 |
| C - CETOP - ISO | 40 | 48 | 64 | 65 | 80 | 80 |
| D - CNOMO | 22 | 36 | 36 | 45 | 45 | 63 |
| D - CETOP - ISO | 20 | 24 | 32 | 32 | 40 | 40 |
| E - CNOMO | 22 | 26 | 26 | 34 | 34 | 42 |
| E - CETOP - ISO | 20 | 24 | 32 | 32 | 40 | 40 |
| F - CNOMO (H 14) | 11 | 18 | 18 | 22 | 22 | 30 |
| F - CETOP - ISO (B 12) | 10 | 12 | 16 | 16 | 20 | 20 |
| G - CNOMO (H 9) | 8 | 12 | 12 | 16 | 16 | 20 |
| G - CETOP - ISO (H 9) | 10 | 12 | 16 | 16 | 20 | 20 |
| H - CNOMO | 20 | 26 | 26 | 30 | 30 | 45 |
| H - CETOP - ISO | 20 | 24 | 32 | 32 | 40 | 40 |
| Weight (g) | 90 | 150 | 350 | 350 | 680 | 680 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

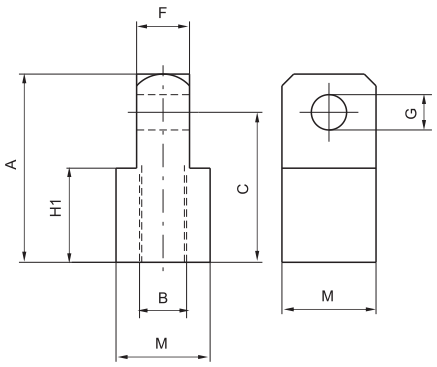
## Male fork

**Coding:** 1300.Ø.14F

| | BORE |
|---|---|
| Ø | **32** = Ø 32 |
| | **40** = Ø 40 |
| | **50** = Ø 50 |
| | **63** = Ø 63 |
| | **80** = Ø 80 |
| | **100** = Ø 100 |
| | **125** = Ø 125 |
| | **160** = Ø 160 |
| | **200** = Ø 200 |

only for CNOMO cylinders





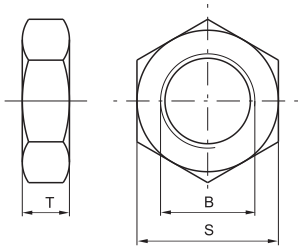

| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| A - CNOMO | 45 | 64 | 64 | 80 | 80 | 105 | 105 | 140 | 140 |
| A - CETOP - ISO | 51 | 62 | 82 | 82 | 105 | 105 | 132/148 | 188 | 188 |
| B - CNOMO (6H) | M10x1,5 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 | M27x2 | M27x2 | M36x2 | M36x2 |
| B - CETOP (6H) | M10x1,25 | M12x1,25 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 | M24x2 | M36x2 | M36x2 |
| B - ISO (6 H) | M10x1,25 | M12x1,25 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 | M27x2 | M36x2 | M36x2 |
| C - CNOMO | 36 | 51 | 51 | 63 | 63 | 85 | 85 | 115 | 115 |
| C - CETOP - ISO | 40 | 48 | 64 | 65 | 80 | 80 | 100/100 | 144 | 144 |
| F - CNOMO (H 14) | 11 | 18 | 18 | 22 | 22 | 30 | 30 | 40 | 40 |
| F - CETOP - ISO (B 12) | 10 | 12 | 16 | 16 | 20 | 20 | 25/30 | 35 | 35 |
| G - CNOMO (H 9) | 8 | 12 | 12 | 16 | 16 | 20 | 20 | 25 | 25 |
| G - CETOP - ISO (H 9) | 10 | 12 | 16 | 16 | 20 | 20 | 25/30 | 35 | 35 |
| H1 - CNOMO | 20 | 32 | 32 | 40 | 40 | 55 | 55 | 75 | 75 |
| M | 22 | 32 | 32 | 36 | 36 | 45 | 45 | 70 | 70 |
| Weight (g) | 113 | 359 | 359 | 500 | 500 | 1300 | 1300 | 3500 | 3500 |

## Rod lock nut

**Coding:** 130Ⓝ.Ø.18F

| | STANDARDS |
|---|---|
| Ⓝ | **0** = CNOMO |
| | **1** = CETOP |
| | **2** = ISO |
| | BORE |
| Ø | **32** = Ø 32 |
| | **40** = Ø 40 |
| | **50** = Ø 50 |
| | **63** = Ø 63 |
| | **80** = Ø 80 |
| | **100** = Ø 100 |
| | **125** = Ø 125 |
| | **160** = Ø 160 |
| | **200** = Ø 200 |






| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| B - CNOMO (6H) | M10x1,5 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 | M27x2 | M27x2 | M36x2 | M36x2 |
| B - CETOP (6H) | M10x1,25 | M12x1,25 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 | M24x2 | M36x2 | M36x2 |
| B - ISO (6 H) | M10x1,25 | M12x1,25 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 | M27x2 | M36x2 | M36x2 |
| S - CNOMO | 17 | 24 | 24 | 30 | 30 | 41 | 41 | 55 | 55 |
| S - CETOP | 17 | 19 | 24 | 24 | 30 | 30 | 36 | 55 | 55 |
| S - ISO | 17 | 19 | 24 | 24 | 30 | 30 | 41 | 55 | 55 |
| T - CNOMO | 6 | 8 | 8 | 9 | 9 | 12 | 12 | 18 | 18 |
| T - CETOP | 6 | 7 | 8 | 8 | 9 | 9 | 10 | 18 | 18 |
| T - ISO | 6 | 7 | 8 | 8 | 9 | 9 | 12 | 18 | 18 |
| Weight (g) | 10 | 20 | 20 | 35 | 35 | 80 | 80 | 210 | 210 |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 1319-1320-1321

This series of pneumatic cylinders is manufactured according to ISO 6431 standards adapted to VDMA 24562 and CNOMO/AFNOR 49003 that guarantee the interchangeability of the cylinders even without mounted anchoring.

### Construction characteristics

| | |
|---|---|
| Cushion bushings | hardened aluminium |
| Piston rod bushings | self-lubricating sintered bronze |
| Barrel | oxidised aluminium |
| Seals | standard: NBR Oil resistant rubber, PUR Piston rod and cushion seals (FPM seals available upon request) |
| Pistons | vulcanized rubber block on steel core with incorporated plastoferrite permanent magnet, or without magnet for non magnetic version (plus rear spacer). |
| Piston rod | stainless steel or C43 chromed steel |
| End caps | from Ø32 to Ø125: UNI 5079 aluminium alloy casting painted black by cataphoresis<br>from Ø160 to Ø200: UNI 3051 aluminium chilled painted black by cataphoresis |
| Cushion adjustment screws | brass |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered and lubricated air |
| Pressure | max. 10 bar |
| Working temperature | -5 °C ... +70 °C with standard seals (magnetic or non magnetic piston)<br>-5 °C ... +80 °C with FPM seals for 1319 and 1320 series (magnetic piston)<br>-5 °C ... +150 °C with FPM seals for 1321 series (non magnetic piston) |

| Cushioning lenght | Ø | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|---|
| | mm | 28 | 32 | 32 | 40 | 44 | 50 | 55 | 55 | 55 |

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

### Standard strokes (for all diameters)

**Double acting version**
from 0 to 150, every 25 mm
over 150 up to 500, every 50 mm
over 500 up to 1000, every 100 mm

On request are available strokes up to: 2800 mm

**Single acting version**
From 32 to 125, up to stroke 50 mm.
On request are available strokes up to: 200 mm

### Stroke tolerance (ISO 15552)

| Bore | Stroke | Tolerance |
|---|---|---|
| 32-40-50 | up to 500 mm | +2<br>0 |
| | over 500 up to 1000 | +3,2<br>0 |
| 63-80-100 | up to 500 mm | +2,5<br>0 |
| | over 500 up to 1000 | +4<br>0 |
| 125-160-200 | up to 500 mm | +4<br>0 |
| | over 500 up to 1000 | +5<br>0 |

### Minimum and maximum springs load (stroke 0 ... 50mm)

| Bore | Ø32 | Ø40 | Ø50 - Ø63 | Ø80 - Ø100 | Ø125 |
|---|---|---|---|---|---|
| Min. load (N) | 15 | 25 | 50 | 100 | 150 |
| Max. load (N) | 40 | 80 | 115 | 200 | 250 |

## Basic version "01"

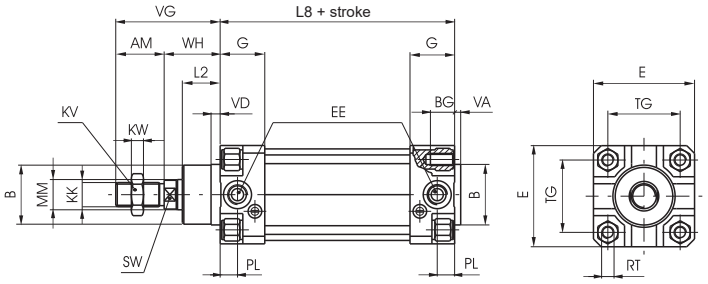
**Coding:** 13Ⓥ.Ø.stroke.01ⒼⓂ

| | |
|---|---|
| Ⓥ | VERSION |
| | **19** = Magnetic chromed rod |
| | **20** = Magnetic stainless steel rod |
| | **21** = Non magnetic chromed rod |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |
| Ⓖ | SEALS |
| | = Standard seals |
| | **V** = FPM seals |
| Ⓜ | SPRING |
| | = Double acting |
| | **MA** = Front springs (Ø32 ... Ø125)* |
| | **MP** = Rear springs (Ø32 ... Ø125)* |

* max. stroke 50

This is the configuration that represents the basic cylinder according to ISO-VDMA standards. It can be directly anchored on machine parts using the four thread on the end cap. For other applications see the following pages where different types of attachments are shown.



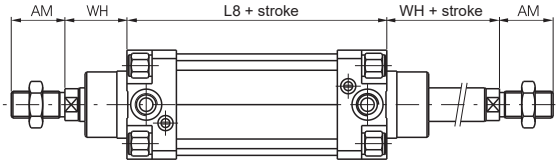



## Through rod cylinder version "02"

**Coding:** 13Ⓥ.Ø.stroke.02Ⓖ

| | |
|---|---|
| Ⓥ | VERSION |
| | **19** = Magnetic chromed rod |
| | **20** = Magnetic stainless steel rod |
| | **21** = Non magnetic chromed rod |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |
| Ⓖ | SEALS |
| | = Standard seals |
| | **V** = FPM seals |



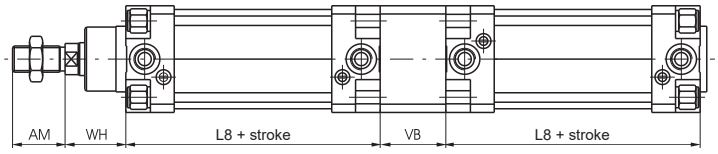



## Tandem push with a common rods “G”

**Coding:** 13Ⓥ.Ø.stroke.G

| | |
|---|---|
| Ⓥ | VERSION |
| | **19** = Magnetic chromed rod |
| | **20** = Magnetic stainless steel rod |
| | **21** = Non magnetic chromed rod |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |



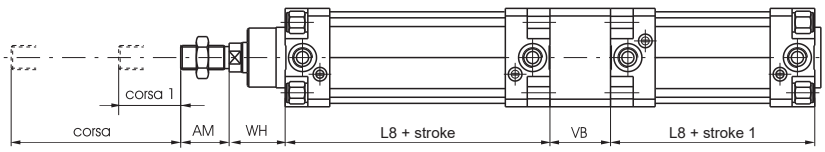



## Tandem push with independent rods”F”

**Coding:** 13Ⓥ.Ø.stroke.stroke1.F

| | |
|---|---|
| Ⓥ | VERSION |
| | **19** = Magnetic chromed rod |
| | **20** = Magnetic stainless steel rod |
| | **21** = Non magnetic chromed rod |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |







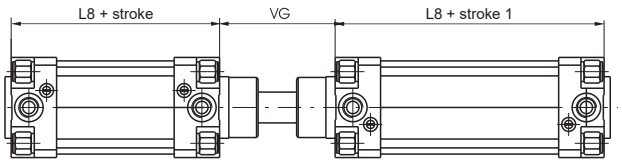

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Opposed tandem with common rod "D"

**Coding:** 13Ⓥ.Ø.stroke.stroke1.D

| | |
|---|---|
| Ⓥ | VERSION |
| | **19** = Magnetic chromed rod |
| | **20** = Magnetic stainless steel rod |
| | **21** = Non magnetic chromed rod |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |



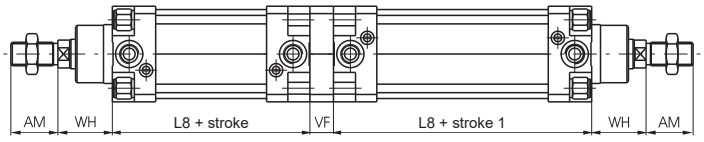



## Tandem with opposed rods "E"

**Coding:** 13Ⓥ.Ø.stroke.stroke1.E

| | |
|---|---|
| Ⓥ | VERSION |
| | **19** = Magnetic chromed rod |
| | **20** = Magnetic stainless steel rod |
| | **21** = Non magnetic chromed rod |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |






### Table of dimensions

| Bore | | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|---|
| AM | | 22 | 24 | 32 | 32 | 40 | 40 | 54 | 72 | 72 |
| B (d 11) | | 30 | 35 | 40 | 45 | 45 | 55 | 60 | 65 | 75 |
| BG | | 14 | 14 | 16 | 16 | 21 | 21 | 23 | 24 | 24 |
| E | | 46 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| EE | | G 1/8" | G 1/4" | G 1/4" | G 3/8" | G 3/8" | G 1/2" | G 1/2" | G 3/4" | G 3/4" |
| G | | 25 | 29 | 29,5 | 36 | 36 | 40 | 45 | 49 | 49 |
| KK | | M10X1,25 | M12X1,25 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 | M27x2 | M36x2 | M36x2 |
| KV | | 17 | 19 | 24 | 24 | 30 | 30 | 41 | 55 | 55 |
| KW | | 6 | 7 | 8 | 8 | 9 | 9 | 12 | 18 | 18 |
| L2 | | 16 | 20 | 25 | 25 | 32 | 35 | 45 | 50 | 60 |
| L8 * | | 94 | 105 | 106 | 121 | 128 | 138 | 160 | 180 | 180 |
| MM | | 12 | 16 | 20 | 20 | 25 | 25 | 32 | 40 | 40 |
| PL | | 9 | 11,5 | 13 | 14 | 16 | 18 | 19 | 24 | 25 |
| RT | | M6 | M6 | M8 | M8 | M10 | M10 | M12 | M16 | M16 |
| SW | | 10 | 13 | 17 | 17 | 22 | 22 | 27 | 32 | 32 |
| TG | | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 | 110 | 140 | 175 |
| VA | | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 5 | 5 |
| VB | | 25 | 30 | 40 | 40 | 50 | 50 | 75 | 70 | 75 |
| VD | | 5 | 6 | 6 | 6 | 10 | 10 | 12 | 10 | 10 |
| VF | | 12 | 12 | 16 | 16 | 20 | 20 | 25 | 30 | 30 |
| VG | | 48 | 54 | 69 | 69 | 86 | 91 | 119 | 152 | 167 |
| WH | | 26 | 30 | 37 | 37 | 46 | 51 | 65 | 80 | 95 |
| Weight g | Stroke 0 | 480 | 730 | 1150 | 1600 | 2800 | 3600 | 7800 | 15000 | 21500 |
| | every 10 mm | 25 | 32 | 56 | 60 | 90 | 100 | 140 | 265 | 325 |

*** For strokes over 50mm, the length does not increase proportionally to the stroke, and allowance must be made for adequate spring allocation (see table of L8 dimensions)**

*"L8" dimensions for "rear spring" and "front spring"*

| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 |
|---|---|---|---|---|---|---|---|
| L8 (stroke 51 ... 100) | 134 | 150 | 151 | 166 | 183 | 193 | 230 |
| L8 (stroke 101 ... 150) | 174 | 195 | 196 | 211 | 238 | 248 | 300 |
| L8 (stroke 151 ... 200) | 214 | 240 | 241 | 256 | 293 | 303 | 370 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 1348-1349-1350, Non rotating cylinders

### Construction characteristics

| | |
|---|---|
| Cushion bushings | 2011 UNI 9002/5 hardened alloy aluminium |
| Barrel | UNI 9006/1 aluminium alloy square section, hardened 30 micron oxidate |
| Piston seals | NBR oil-resistant rubber, PUR Piston rod and cushions |
| Pistons | polyacetal resin, self-lubricated and anti-wear, with plastoferrite rings in magnetic version |
| Piston rod | C43 chromed steel Ra = 0.2 |
| End caps | UNI 5079 aluminium alloy casting painted black by cataphoresis |
| Cushion adjustment screws | brass |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered and lubricated air |
| Pressure | 10 bar |
| Working temperature | -5 °C ... +70 °C |

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.



| Bore | Usable surface (square profile) $cm^2$ | Max couple on the rod (max torque) Nm | Grade precision (rest rod, without load) anti-rotation | Cushion length mm |
|---|---|---|---|---|
| 32 | 8,31 | 0,5 | 12' | 22 |
| 40 | 12,41 | 0,8 | 12' | 27 |
| 50 | 18,41 | 1,1 | 12' | 27 |
| 63 | 29,67 | 1,5 | 12' | 32 |

### Standard strokes (for all diameters)

from 0 to 150, every 25 mm

### Other stroke for these following bores:

**Ø32:** 80 mm
**Ø40:** 80 - 160 mm
**Ø50:** 80 - 160 - 200 - 250 mm
**Ø63:** 80 - 160 - 200 - 300 - 320 mm
On request are available strokes up to: 1000 mm

### Stroke tolerance (ISO 15552)

| Bore | Stroke | Tolerance |
|---|---|---|
| 32 | up to 320 mm | +2 0 |
| 40 | | |
| 50 | | |
| 63 | | |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

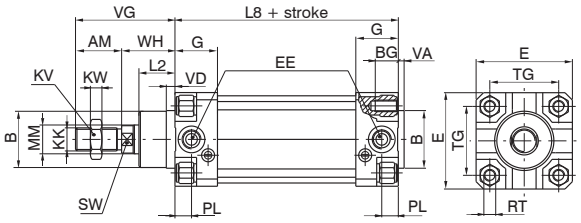
## Basic version

**Coding:** 13Ⓥ.Ø.stroke.01

| | |
|---|---|
| Ⓥ | VERSION |
| | **48** = Magnetic chromed rod |
| | **49** = Magnetic stainless steel rod |
| | **50** = Non magnetic chromed rod |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |

This is the configuartion that represents the basic cylinder according to ISO standards. It can be directly anchored on machine parts using the four threads on the end cap.
For other applications see the following pages where different types of attachments shown.



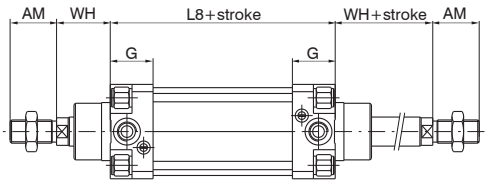



## Through rod cylinder version

**Coding:** 13Ⓥ.Ø.stroke.02

| | |
|---|---|
| Ⓥ | VERSION |
| | **48** = Magnetic chromed rod |
| | **49** = Magnetic stainless steel rod |
| | **50** = Non magnetic chromed rod |
| Ø | BORE |
| | **30** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |






### Table of dimensions

| Bore | | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|
| AM | | 22 | 24 | 32 | 32 |
| B (d 11) | | 30 | 35 | 40 | 45 |
| BG | | 12 | 12 | 16 | 16 |
| E | | 46 | 52 | 65 | 75 |
| EE | | G 1/8" | G 1/4" | G 1/4" | G 3/8" |
| G | | 25 | 29 | 29,5 | 36 |
| KK | | M10x1,25 | M12x1,25 | M16x1,5 | M16x1,5 |
| KV | | 17 | 19 | 24 | 24 |
| KW | | 6 | 7 | 8 | 8 |
| L 2 | | 16 | 20 | 25 | 25 |
| L 8 | | 94 | 105 | 106 | 121 |
| MM | | 12 | 16 | 20 | 20 |
| PL | | 9 | 11,5 | 13 | 14 |
| RT | | M6 | M6 | M8 | M8 |
| SW | | 10 | 13 | 17 | 17 |
| TG | | 32,5 | 38 | 46,5 | 56,5 |
| VA | | 4 | 4 | 4 | 4 |
| VD | | 5 | 6 | 6 | 6 |
| VG | | 48 | 54 | 69 | 69 |
| WH | | 26 | 30 | 37 | 37 |
| Weight g | Stroke 0 | 505 | 705 | 1320 | 1710 |
| | every 10 mm | 24 | 33 | 53 | 58 |



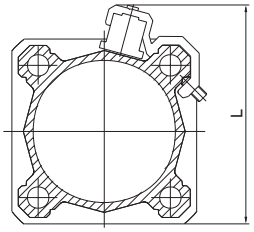
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Sensor brackets codes - 1500._, RS._, HS._

**Coding:** 1320.Ⓣ

| Ⓣ | TYPE |
|---|---|
| | **A** = Ø32-Ø40 |
| | **B** = Ø50-Ø63 |
| | **C** = Ø80-Ø100 |
| | **D** = Ø125 |
| | **E** = Ø160 |
| | **F** = Ø200 |






**Sensor for microbore cylinders**

For technical characteristics and ordering codes see the "Magnetic sensors" sections

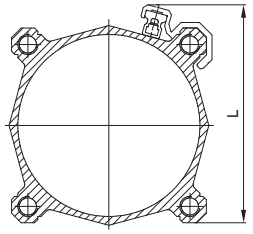
| Bore | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 | Ø125 | Ø160 | Ø200 |
|---|---|---|---|---|---|---|---|---|---|
| L | 60 | 65 | 77 | 87 | 105 | 125 | 145 | 184 | 222 |

## Sensor brackets codes - 1595.HAP

**Coding:** 1320.Ⓣ

| Ⓣ | TYPE |
|---|---|
| | **ASC** = Ø32-Ø40 |
| | **BSC** = Ø50-Ø63 |
| | **CSC** = Ø80-Ø100 |
| | **DSC** = Ø125 |
| | **ESC** = Ø160 |
| | **FSC** = Ø200 |






**Sensor for microbore cylinders**

For technical characteristics and ordering codes see the "Magnetic sensors" sections

| Bore | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 | Ø125 | Ø160 | Ø200 |
|---|---|---|---|---|---|---|---|---|---|
| L | 60 | 65 | 77 | 87 | 105 | 125 | 145 | 184 | 222 |

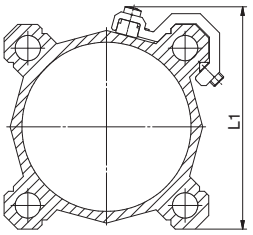
## Sensor brackets codes - 1580._,MRS._,MHS

**Coding:** 1320.Ⓣ

| Ⓣ | TYPE |
|---|---|
| | **AS** = Ø32-Ø40 |
| | **BS** = Ø50-Ø63 |
| | **CS** = Ø80-Ø100 |

For Ø125, Ø160 and Ø200, use sensor bracket 1595.HAP






**Sensor for microbore cylinders**

For technical characteristics and ordering codes see the "Magnetic sensors" sections

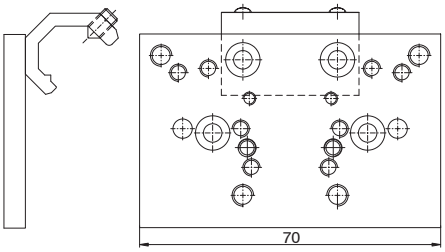
| Bore | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|
| L1 | 48 | 54 | 66 | 76 | 96 | 112 |

## Support for solenoid valves

**Coding:** 1320.Ⓣ

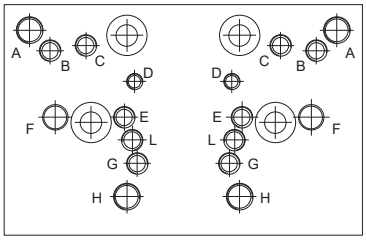
| Ⓣ | SIZE |
|---|---|
| | **15** = Ø32-Ø40 |
| | **16** = Ø50-Ø63 |
| | **17** = Ø80-Ø100 |
| | **18** = Ø125 |
| | **19** = Ø160 |
| | **20** = Ø200 |






Fixing holes for valves series:

A = 414/2
B = 824
C = 828, T488, 488, 484
D = 2400
E = 2600
F = Bases for ISO solenoid valves
G = 858/2
H = T424
L = 888_



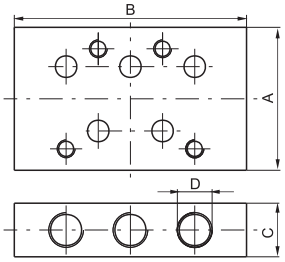

This accessory permits to mount a valve or an electrovalve on a side of the cylinder. The plate can be fitted on the cylinder profiled barrel, and, on it, can be mounted either a threaded distributor or a base on whic can be mounted an ISO distributor. Once installed the connections must be done with fittings and pipes. All of the threaded holes on the support plate are dedicated to different valves series as per attached drawing.

## Bases for ISO solenoid valves

**Coding:** 1320.Ⓝ

| Ⓝ | STANDARDS |
|---|---|
| | **21** = ISO1 |
| | **22** = ISO2 |






| Dimensions | | | | |
|---|---|---|---|---|
| Bases for solenoid valves | A | B | C | D |
| ISO 1 | 40 | 75 | 15 | G 1/8" |
| ISO 2 | 50 | 95 | 20 | G 1/4" |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series Ecoplus - High Performance

Profiled tube has two "T" slots on the three sides hosting sensors 1580._, MRS._, MHS._. without adaptors.

### Construction characteristics

| | |
|---|---|
| Piston rod bushings | self-lubricating sintered bronze |
| Barrel | anodised aluminium alloy |
| Seals | standard: NBR Oil resistant rubber, PUR Piston rod seals (PUR seals available upon request) |
| Pistons | acetal resin, aluminium on request |
| Piston rod | C43 chromed steel or stainless steel |
| End caps | Series 1386 ... 1388: high resistant thermoplastic material<br>Series 1396 ... 1398: Die-cast aluminium |
| Cushion adjustment screws | brass |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered and preferably lubricated air or not (if lubricated the lubrication must be continuous) |
| Pressure | max 10 bar |
| Working temperature | -5°C ... +70°C with standard seals<br>-30°C ... +80°C with PUR seals |

| Bore | Ø | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|
| Cushioning lenght | mm | 27 | 31 | 31 | 37 | 40 | 44 |
| Cushioning lenght "K" and "PK" version | mm | 20 | 20 | 22 | 22 | 32 | 32 |

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

### Standard strokes (for all diameters)

from 0 to 150, every 25 mm
from 150 to 500, every 50 mm
from 500 to 1000, every 100 mm
On request are available strokes up to: 2800 mm

### Stroke tolerance (ISO 15552)

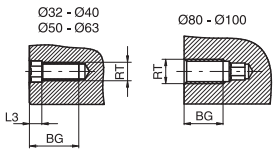
| Bore | Stroke | Tolerance |
|---|---|---|
| 32-40-50 | up to 500 mm | +2<br>0 |
| | over 500 up to 1000 | +3,2<br>0 |
| 63-80-100 | up to 500 mm | +2,5<br>0 |
| | over 500 up to 1000 | +4<br>0 |

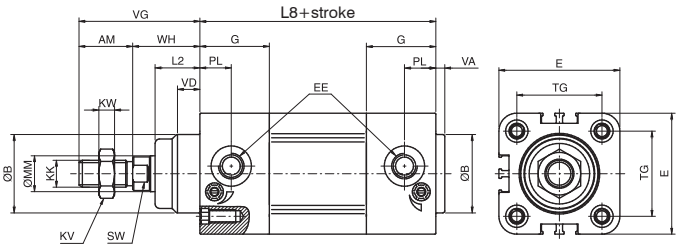
## Basic version "01"

**Coding:** 13Ⓥ.Ø.stroke.01Ⓣ

| | |
|---|---|
| Ⓥ | VERSION |
| | **86** = Magnetic chromed rod (technopolymer covers) |
| | **87** = Magnetic stainless steel rod (technopolymer covers) |
| | **88** = Non magnetic chromed rod (technopolymer covers) |
| | **96** = Magnetic chromed rod (aluminium covers) |
| | **97** = Magnetic stainless steel rod (aluminium covers) |
| | **98** = Non magnetic chromed rod (aluminium covers) |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **100** = Ø100 |
| Ⓣ | TYPE |
| | = Version with NBR seals |
| | **P** = Version with PUR seals |
| | **K** = Version with aluminium piston |
| | **PK** = Version with PUR seals and aluminium piston |





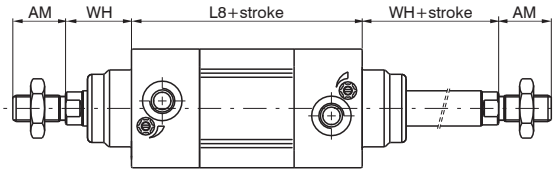




## Through rod cylinder version “02”

**Coding:** 13Ⓥ.Ø.stroke.02Ⓣ

| | |
|---|---|
| Ⓥ | VERSION |
| | **86** = Magnetic chromed rod (technopolymer covers) |
| | **87** = Magnetic stainless steel rod (technopolymer covers) |
| | **88** = Non magnetic chromed rod (technopolymer covers) |
| | **96** = Magnetic chromed rod (aluminium covers) |
| | **97** = Magnetic stainless steel rod (aluminium covers) |
| | **98** = Non magnetic chromed rod (aluminium covers) |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **100** = Ø100 |
| Ⓣ | TYPE |
| | = Version with NBR seals |
| | **P** = Version with PUR seals |
| | **K** = Version with aluminium piston |
| | **PK** = Version with PUR seals and aluminium piston |



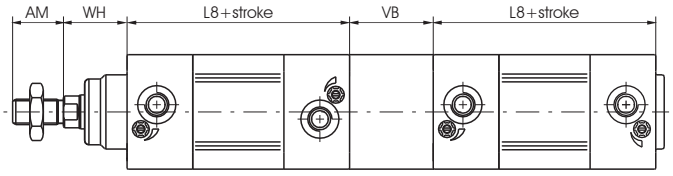



## Tandem push with a common rods “G”

**Coding:** 13Ⓥ.Ø.stroke.GⓉ

| | |
|---|---|
| Ⓥ | VERSION |
| | **86** = Magnetic chromed rod (technopolymer covers) |
| | **87** = Magnetic stainless steel rod (technopolymer covers) |
| | **88** = Non magnetic chromed rod (technopolymer covers) |
| | **96** = Magnetic chromed rod (aluminium covers) |
| | **97** = Magnetic stainless steel rod (aluminium covers) |
| | **98** = Non magnetic chromed rod (aluminium covers) |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **100** = Ø100 |
| Ⓣ | TYPE |
| | = Version with NBR seals |
| | **P** = Version with PUR seals |
| | **K** = Version with aluminium piston |
| | **PK** = Version with PUR seals and aluminium piston |



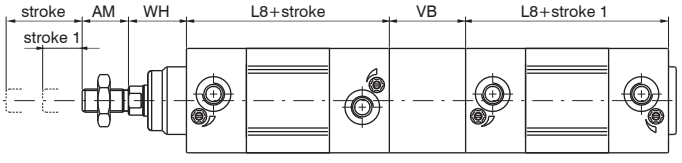



## Tandem push with independent rods”F”

**Coding:**13Ⓥ.Ø.stroke.stroke1.FⓉ

| | |
|---|---|
| Ⓥ | VERSION |
| | **86** = Magnetic chromed rod (technopolymer covers) |
| | **87** = Magnetic stainless steel rod (technopolymer covers) |
| | **88** = Non magnetic chromed rod (technopolymer covers) |
| | **96** = Magnetic chromed rod (aluminium covers) |
| | **97** = Magnetic stainless steel rod (aluminium covers) |
| | **98** = Non magnetic chromed rod (aluminium covers) |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **100** = Ø100 |
| Ⓣ | TYPE |
| | = Version with NBR seals |
| | **P** = Version with PUR seals |
| | **K** = Version with aluminium piston |
| | **PK** = Version with PUR seals and aluminium piston |







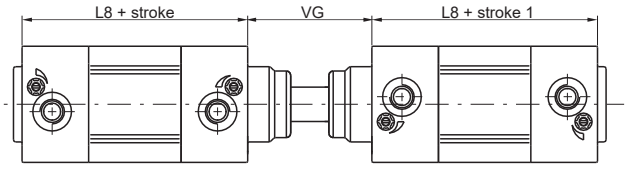

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Opposed tandem with common rod "D"

**Coding:**13Ⓥ.Ø.stroke.stroke1.DⓉ

| | |
|---|---|
| Ⓥ | VERSION |
| | **86** = Magnetic chromed rod (technopolymer covers) |
| | **87** = Magnetic stainless steel rod (technopolymer covers) |
| | **88** = Non magnetic chromed rod (technopolymer covers) |
| | **96** = Magnetic chromed rod (aluminium covers) |
| | **97** = Magnetic stainless steel rod (aluminium covers) |
| | **98** = Non magnetic chromed rod (aluminium covers) |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **100** = Ø100 |
| Ⓣ | TYPE |
| | = Version with NBR seals |
| | **P** = Version with PUR seals |
| | **K** = Version with aluminium piston |
| | **PK** = Version with PUR seals and aluminium piston |



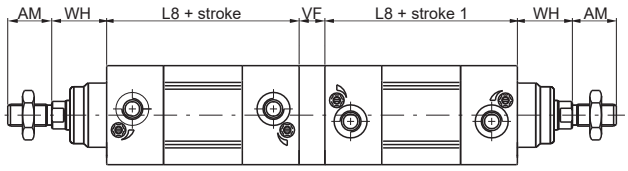



## Tandem with opposed rods "E"

**Coding:**13Ⓥ.Ø.stroke.stroke1.EⓉ

| | |
|---|---|
| Ⓥ | VERSION |
| | **86** = Magnetic chromed rod (technopolymer covers) |
| | **87** = Magnetic stainless steel rod (technopolymer covers) |
| | **88** = Non magnetic chromed rod (technopolymer covers) |
| | **96** = Magnetic chromed rod (aluminium covers) |
| | **97** = Magnetic stainless steel rod (aluminium covers) |
| | **98** = Non magnetic chromed rod (aluminium covers) |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **100** = Ø100 |
| Ⓣ | TYPE |
| | = Version with NBR seals |
| | **P** = Version with PUR seals |
| | **K** = Version with aluminium piston |
| | **PK** = Version with PUR seals and aluminium piston |






### Table of dimensions

| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| AM | 22 | 24 | 32 | 32 | 40 | 40 |
| B (d 11) | 30 | 35 | 40 | 45 | 45 | 55 |
| BG | 16 | 16 | 18 | 18 | 16 | 16 |
| E | 46 | 54 | 65 | 77,5 | 95,5 | 115,5 |
| EE | G 1/8" | G 1/4" | G 1/4" | G 3/8" | G 3/8" | G 1/2" |
| G | 29 | 31 | 33 | 36 | 40 | 44 |
| KK | M10X1,25 | M12X1,25 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 |
| KV | 17 | 19 | 24 | 24 | 30 | 30 |
| KW | 6 | 7 | 8 | 8 | 9 | 9 |
| L2 | 16 | 20 | 25 | 25 | 32 | 35 |
| L3 | 4 | 4 | 5 | 5 | / | / |
| L8 | 94 | 105 | 106 | 121 | 128 | 138 |
| MM | 12 | 16 | 20 | 20 | 25 | 25 |
| PL | 13 | 14 | 14 | 16 | 16 | 18 |
| RT | M6 | M6 | M8 | M8 | M10 | M10 |
| SW | 10 | 13 | 17 | 17 | 22 | 22 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| VA | 4 | 4 | 4 | 4 | 4 | 4 |
| VB | 33 | 41 | 51 | 51 | 65 | 71 |
| VD | 8 | 10 | 12 | 12 | 15 | 16 |
| VF | 12 | 12 | 16 | 16 | 20 | 20 |
| VG | 48 | 54 | 69 | 69 | 86 | 91 |
| WH | 26 | 30 | 37 | 37 | 46 | 51 |

| Aluminium covers | | | | | | | |
|---|---|---|---|---|---|---|---|
| Weight | Stroke 0 | 550 | 690 | 1200 | 1590 | 2500 | 3670 |
| g | every 10 mm | 29 | 40 | 57 | 66 | 96 | 112 |

| Technopolymer covers | | | | | | | |
|---|---|---|---|---|---|---|---|
| Weight | Stroke 0 | 470 | 590 | 1020 | 1320 | 2090 | 3010 |
| g | every 10 mm | 29 | 40 | 57 | 66 | 96 | 112 |

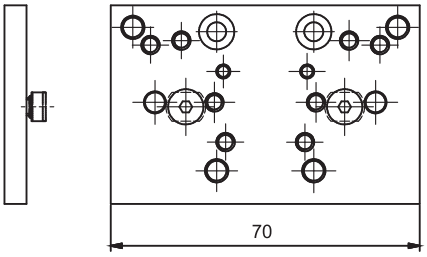


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Support for solenoid valves

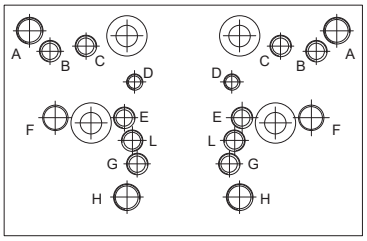
**Coding:** 1386.15
**Attention:** do not use ISO distributor for base mounting






Fixing holes for valves series:

A = 414/2
B = 824
C = 828, T488, 488, 484
D = 2400
E = 2600
= 858/2
H = T424



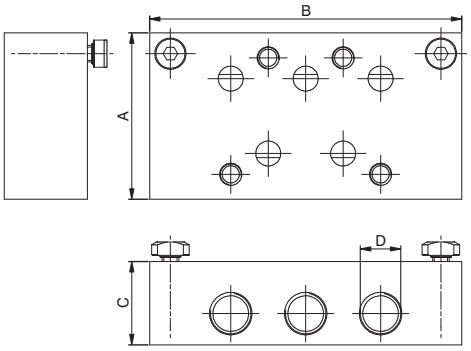

This accessory permits to mount a valve or an electrovalve on a side of the cylinder. The plate can be fitted on the cylinder profiled barrel, and, on it, can be mounted either a threaded distributor or a base on whic can be mounted an ISO distributor. Once installed the connections must be done with fittings and pipes. All of the threaded holes on the support plate are dedicated to different valves series as per attached drawing.

## Bases for ISO solenoid valves

**Coding:** 1320.Ⓝ

| | STANDARDS |
|---|---|
| Ⓝ | **23** = ISO1 |
| | **24** = ISO2 |






| Dimensions | | | | |
|---|---|---|---|---|
| Bases for solenoid valves | A | B | C | D |
| ISO 1 | 40 | 75 | 15 | G 1/8" |
| ISO 2 | 50 | 95 | 20 | G 1/4" |




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series Ecolight

### Construction characteristics

| | |
|---|---|
| Piston rod bushings | spheroid bronze on steel band with P.T.F.E. coat |
| Barrel | anodised aluminium alloy |
| Seals | standard: NBR Oil resistant rubber, PUR Piston rod seals<br>**V** version: FPM<br>**P** version: PUR<br>**Q** version: NBR and PUR with plastic rod scraper with high wear resistance<br>**R** version: PUR with metallic rod scraper<br>**L** version: special PUR |
| Pistons | Ø32 ... Ø100 acetal resin, aluminium on request<br>Ø125 ... Ø200 aluminium<br>V, Q, R, L Version (Ø32 ...Ø100): aluminium |
| Piston rod | C43 chromed steel or stainless steel |
| End caps | die-casting aluminium |
| Cushion adjustment screws | brass |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered and preferably lubricated air or not (if lubricated the lubrication must be continuous)<br>**L version** (for low temperature): dried air, guarantee a dew point lower than the minimum operating temperature |
| Pressure | max 10 bar |
| Working temperature | -5°C ... +70°C with standard seals<br>-30 °C ... +80 °C with PUR seals (**P** version)<br>-5 °C ... +80 °C with FPM seals for 1390 and 1391 series (magnetic piston) (**V** version)<br>-5 °C ... +150 °C with FPM seals for 1392 series (Non magnetic rod) (**V** Version)<br>-20°C ... +80°C (**Q** Version)<br>-10 °C ... +80 °C (**R** Version)<br>-50 °C ... +80 °C (**L** Version) |

| Bore | Ø | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|---|
| Cushioning lenght | mm | 27 | 31 | 31 | 37 | 40 | 44 | 44 | 50 | 55 |
| Cushioning lenght, version with aluminum piston | mm | 20 | 20 | 22 | 22 | 32 | 32 | 44 | 50 | 55 |

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

## VERSIONS WITH ADDITIONAL ROD SCRAPER

**Version with plastic rod scraper (Q)**
The pneumatic seal is manufactured using a special NBR seal material, with the rod scraper that comes in contact with the external environment made of a plastic material with a high wear resistance. The geometric shape with its excellent scraping capacity guarantees additional protection of the piston rod and nose seal against the impurities, liquids, water, and debris.
**Version with metallic rod scraper (R)**
The pneumatic seal is manufactured using a special FPM seal material with its own scraping lip with the additional rod scraper that comes into contact with the external environment made of metal. This combination of scraping lip and metal rod scraper enable these actuators to be used in particularly extreme environments.
Here are some examples:
**Aluminum foundries**: To remove the residues of alumina or fluorine compounds that are deposited on the piston rod during the preparation phase of aluminum casting.
**Automotive**: To prevent debris which has collected on the piston rod damaging the nose seal during operation especially waste produced during the welding process.
**Industrial ovens**: To eliminate cement powders or those produced during the manufacture of bricks/tiles Thanks to the high-performance nose seal and scraper protection of the piston rod, the cylinder will be protected against premature wear that you would normally experience using standard cylinders in these harsh environments.
Thanks to the high-performance nose seal and scraper protection of the piston rod, the cylinder will be protected against premature wear that you would normally experience using standard cylinders in these harsh environments.
**Low temperature version (L)**: The special seals compound allows the use of the cylinders up to a temperature of -50°C. The rod scraper seal is equipped with a metallic scraper which removes ice crystals which might form at minus temperature
**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.



### Standard strokes (for all diameters)

from 0 to 150, every 25 mm
from 150 to 500, every 50 mm
from 500 to 1000, every 100 mm
On request are available strokes up to: 2800 mm

### Stroke tolerance (ISO 15552)

| Bore | Stroke | Tolerance |
|---|---|---|
| 32-40-50 | up to 500 mm | +2<br>0 |
| | over 500 up to 1000 | +3,2<br>0 |
| 63-80-100 | up to 500 mm | +2,5<br>0 |
| | over 500 up to 1000 | +4<br>0 |
| 125-160-200 | up to 500 mm | +4<br>0 |
| | over 500 up to 1000 | +5<br>0 |


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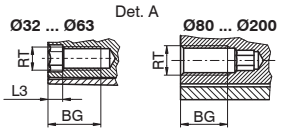
## Basic version "01"

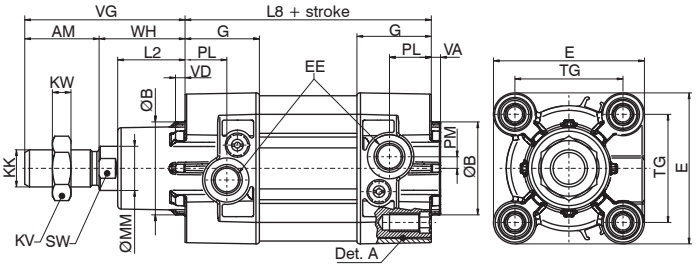
**Coding:**13Ⓥ.Ø.stroke.01Ⓣ

| | |
|---|---|
| Ⓥ | VERSION |
| | **90** = Magnetic chromed rod |
| | **91** = Magnetic stainless steel rod |
| | **92** = Non magnetic chromed rod |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |
| Ⓣ | TYPE |
| | = Version with NBR seals |
| | **P** = Version with PUR seals |
| | **K** = Version with aluminium piston (Ø32 ... Ø100) |
| | **PK** = Version with PUR seals and aluminium piston (Ø32 ... Ø100) |
| | **V** = Version with FPM seals and aluminium piston |
| | **R** = Version with PUR seals, with metallic rod scraper and aluminium piston (Ø32 ... Ø100) |
| | **Q** = Version with PUR seals, with plastic rod scraper and aluminium piston (Ø32 ... Ø100) |
| | **L** = Version for low temperature and aluminium piston (-50°C) (Ø32 ... Ø100) |

This is the configuration representing the basic cylinder according to ISO–VDMA standards. It can be directly anchored on machine parts using the four threads on the end cap screws. For other applications see "Cylinder section" on the General Catalogue, where different types of attachments are shown.





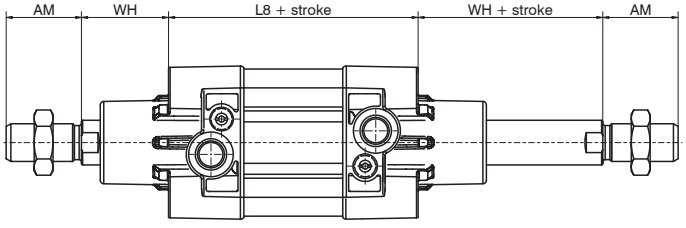




## Through rod cylinder version "02"

**Coding:** 13Ⓥ.Ø.stroke.02Ⓣ

| | |
|---|---|
| Ⓥ | VERSION |
| | **90** = Magnetic chromed rod |
| | **91** = Magnetic stainless steel rod |
| | **92** = Non magnetic chromed rod |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |
| Ⓣ | TYPE |
| | = Version with NBR seals |
| | **P** = Version with PUR seals |
| | **K** = Version with aluminium piston (Ø32 ... Ø100) |
| | **PK** = Version with PUR seals and aluminium piston (Ø32 ... Ø100) |
| | **V** = Version with FPM seals and aluminium piston |
| | **R** = Version with PUR seals, with metallic rod scraper and aluminium piston (Ø32 ... Ø100) |
| | **Q** = Version with PUR seals, with plastic rod scraper and aluminium piston (Ø32 ... Ø100) |
| | **L** = Version for low temperature and aluminium piston (-50°C) (Ø32 ... Ø100) |



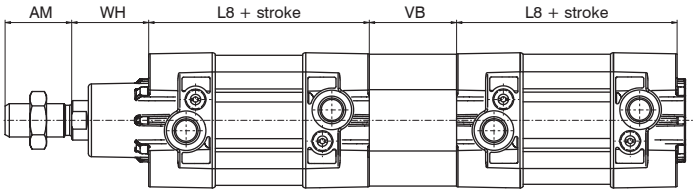


## Tandem push with a common rods “G”

**Coding:** 13Ⓥ.Ø.stroke.GⓉ

| | |
|---|---|
| Ⓥ | VERSION |
| | **90** = Magnetic chromed rod |
| | **91** = Magnetic stainless steel rod |
| | **92** = Non magnetic chromed rod |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |
| ⓉⓉ | TYPE |
| | = Version with NBR seals |
| | **P** = Version with PUR seals |
| | **K** = Version with aluminium piston (Ø32 ... Ø100) |
| | **PK** = Version with PUR seals and aluminium piston (Ø32 ... Ø100) |
| | **V** = Version with FPM seals and aluminium piston |
| | **R** = Version with PUR seals, with metallic rod scraper and aluminium piston (Ø32 ... Ø100) |
| | **Q** = Version with PUR seals, with plastic rod scraper and aluminium piston (Ø32 ... Ø100) |
| | **L** = Version for low temperature and aluminium piston (-50°C) (Ø32 ... Ø100) |



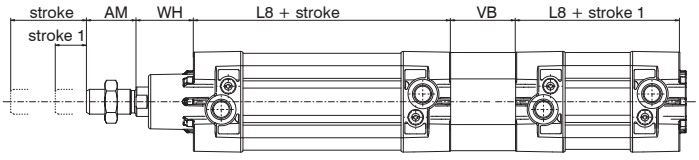



## Tandem push with independent rods”F”

**Coding:** 13Ⓥ.Ø.stroke.stroke1.FⓉ

| | |
|---|---|
| Ⓥ | VERSION |
| | **90** = Magnetic chromed rod |
| | **91** = Magnetic stainless steel rod |
| | **92** = Non magnetic chromed rod |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |
| ⓉⓉ | TYPE |
| | = Version with NBR seals |
| | **P** = Version with PUR seals |
| | **K** = Version with aluminium piston (Ø32 ... Ø100) |
| | **PK** = Version with PUR seals and aluminium piston (Ø32 ... Ø100) |
| | **V** = Version with FPM seals and aluminium piston |
| | **R** = Version with PUR seals, with metallic rod scraper and aluminium piston (Ø32 ... Ø100) |
| | **Q** = Version with PUR seals, with plastic rod scraper and aluminium piston (Ø32 ... Ø100) |
| | **L** = Version for low temperature and aluminium piston (-50°C) (Ø32 ... Ø100) |



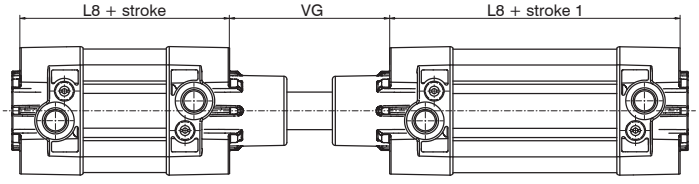



## Opposed tandem with common rod ”D”

**Coding:** 13Ⓥ.Ø.stroke.stroke1.DⓉ

| | |
|---|---|
| Ⓥ | VERSION |
| | **90** = Magnetic chromed rod |
| | **91** = Magnetic stainless steel rod |
| | **92** = Non magnetic chromed rod |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |
| ⓉⓉ | TYPE |
| | = Version with NBR seals |
| | **P** = Version with PUR seals |
| | **K** = Version with aluminium piston (Ø32 ... Ø100) |
| | **PK** = Version with PUR seals and aluminium piston (Ø32 ... Ø100) |
| | **V** = Version with FPM seals and aluminium piston |
| | **R** = Version with PUR seals, with metallic rod scraper and aluminium piston (Ø32 ... Ø100) |
| | **Q** = Version with PUR seals, with plastic rod scraper and aluminium piston (Ø32 ... Ø100) |
| | **L** = Version for low temperature and aluminium piston (-50°C) (Ø32 ... Ø100) |









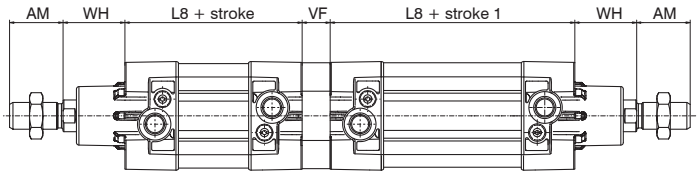
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Tandem with opposed rods "E"

**Coding:** 13Ⓥ.Ø.stroke.stroke1.EⓉ

| | |
|---|---|
| Ⓥ | VERSION |
| | **90** = Magnetic chromed rod |
| | **91** = Magnetic stainless steel rod |
| | **92** = Non magnetic chromed rod |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |
| Ⓣ | TYPE |
| | = Version with NBR seals |
| | **P** = Version with PUR seals |
| | **K** = Version with aluminium piston (Ø32 ... Ø100) |
| | **PK** = Version with PUR seals and aluminium piston (Ø32 ... Ø100) |
| | **V** = Version with FPM seals and aluminium piston |
| | **R** = Version with PUR seals, with metallic rod scraper and aluminium piston (Ø32 ... Ø100) |
| | **Q** = Version with PUR seals, with plastic rod scraper and aluminium piston (Ø32 ... Ø100) |
| | **L** = Version for low temperature and aluminium piston (-50°C) (Ø32 ... Ø100) |





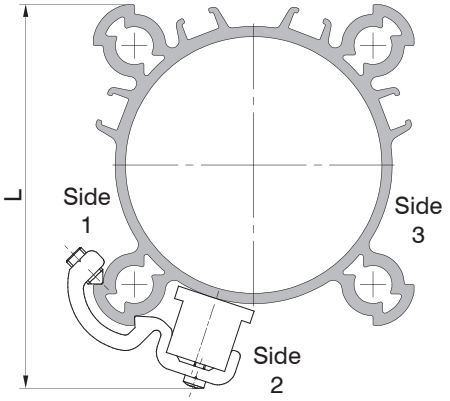

### Table of dimensions

| Bore | | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|---|
| AM | | 22 | 24 | 32 | 32 | 40 | 40 | 54 | 72 | 72 |
| B (d 11) | | 30 | 35 | 40 | 45 | 45 | 55 | 60 | 65 | 75 |
| BG | | 16 | 16 | 18 | 18 | 16 | 16 | 21 | 25 | 25 |
| E | | 47 | 54 | 65 | 76 | 95 | 113 | 138 | 180 | 216 |
| EE | | G 1/8" | G 1/4" | G 1/4" | G 3/8" | G 3/8" | G 1/2" | G 1/2" | G 3/4" | G 3/4" |
| G | | 29.5 | 33 | 32 | 36 | 38.5 | 41.5 | 48 | 49 | 49 |
| KK | | M10X1.25 | M12X1.25 | M16x1.5 | M16x1.5 | M20x1.5 | M20x1.5 | M27x2 | M36x2 | M36x2 |
| KV | | 17 | 19 | 24 | 24 | 30 | 30 | 41 | 55 | 55 |
| KW | | 6 | 7 | 8 | 8 | 9 | 9 | 12 | 18 | 18 |
| L2 | | 19 | 22 | 29 | 29 | 35 | 36 | 45 | 50 | 60 |
| L3 | | 4 | 4 | 5 | 5 | / | / | / | / | / |
| L8 | | 94 | 105 | 106 | 121 | 128 | 138 | 160 | 180 | 180 |
| MM | | 12 | 16 | 20 | 20 | 25 | 25 | 32 | 40 | 40 |
| PL | | 13 | 16 | 18 | 18 | 16 | 18 | 25 | 26 | 25 |
| PM | | 3 | 4 | 5 | 4.5 | 2.5 | 6 | 8 | 11 | 11 |
| RT | | M6 | M6 | M8 | M8 | M10 | M10 | M12 | M16 | M16 |
| SW | | 10 | 13 | 17 | 17 | 22 | 22 | 27 | 36 | 36 |
| TG | | 32.5 | 38 | 46.5 | 56,5 | 72 | 89 | 110 | 140 | 175 |
| VA | | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 6 | 6 |
| VB | | 33 | 41 | 51 | 51 | 65 | 71 | 75 | 70 | 75 |
| VD | | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 6 | 6 |
| VF | | 12 | 12 | 16 | 16 | 20 | 20 | 25 | 30 | 30 |
| VG | | 48 | 54 | 69 | 69 | 86 | 91 | 119 | 152 | 167 |
| WH | | 26 | 30 | 37 | 37 | 46 | 51 | 65 | 80 | 95 |
| Weight g | Stroke 0 | 460 | 650 | 1030 | 1360 | 2180 | 2890 | 5700 | 11200 | 14900 |
| | every 10 mm | 23 | 32 | 45 | 49 | 75 | 81 | 130 | 195 | 245 |

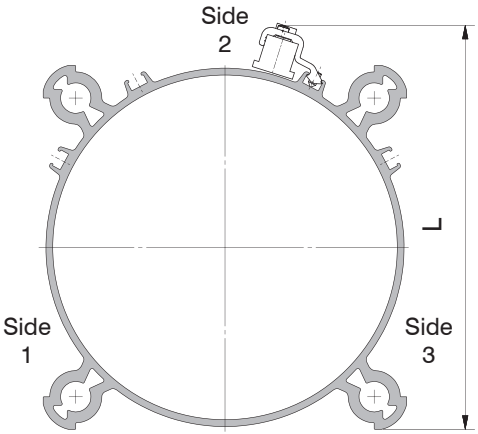
On the ECOLIGHT series it is possible to use three sensor types, according to bore, as indicated below:

Sensors code **1500._**
**RS._**
**HS._**

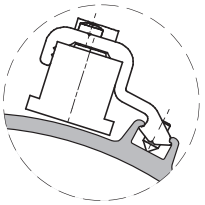





Ø32 ... Ø100 the sensor can be fixed on the three sides as indicated in the drawing, by using suitable bracket (except for Ø32 on side 2)




Ø125 ... Ø200 the sensor can be fixed on the three sides as indicated in the drawing, by using suitable bracket

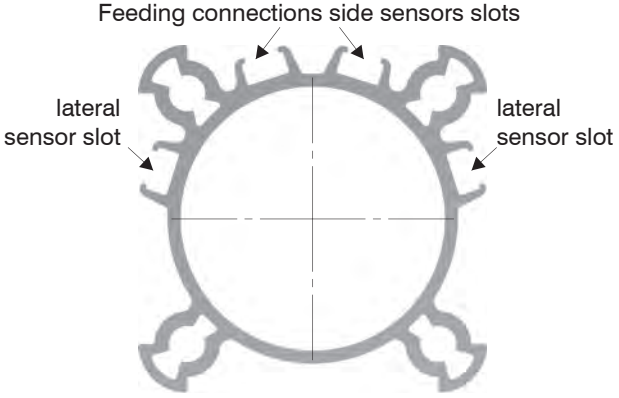


| Code | Bore | L |
|---|---|---|
| 1390.A | Ø32 | 58 |
| | Ø40 | 65 |
| 1390.B | Ø50 | 75 |
| | Ø63 | 86 |
| 1390.C | Ø80 | 105 |
| | Ø100 | 122 |
| 1390.D | Ø125 | 150 |
| | Ø160 | 190 |
| | Ø200 | 225 |

Sensors code **1580._**
**MRS._**
**MHS._**



Feeding connections side sensors slots




Sensors code **1590._**
**LRS._**
**LHS._**



1590 series sensor only

1580 and 1590 series sensors

1580 and 1590 series sensors

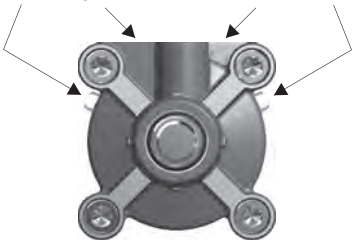


**Ø32 ... Ø63**



**CYLINDERS - BORE SIZES Ø32 ... Ø63**
The two slots on connection side are plugged, therefore only sensor 1590 can be used. Suiable for top housing and once placed by means of is screw,it can be fixed in desired position.

1580 and 1590 series sensors

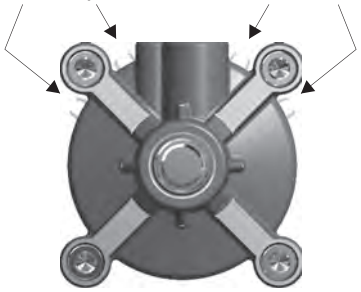


**Ø80**



**CYLINDERS - BORE SIZES Ø80**
The two top housing can be accessed from the front of the unit, once housing can be accessed from the front end cap and opposite housing from the rear end cap. It is therefore possible to use both type of sensor: 1580-1590.

1580 and 1590 series sensors



**Ø100 ... Ø200**



**CYLINDERS - BORE SIZES Ø100 ... Ø200**
All four housings can be accessed from the front of the unit. It is therefore possible to use both type of sensors: 1580-1590.




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

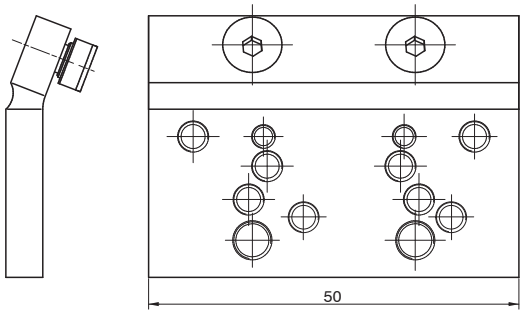
## Support for solenoid valves

**Coding:** 1390.Ⓣ

| | SIZE |
|---|---|
| Ⓣ | **25** = Ø32 |
| | **26** = Ø40 |
| | **27** = Ø50 |
| | **28** = Ø63 |
| | **29** = Ø80 |
| | **30** = Ø100 |

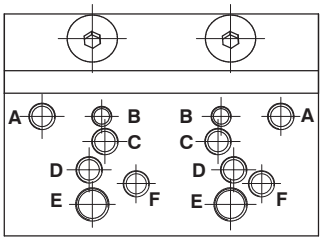
**Attention:** do not use ISO distributor for base mounting






Fixing holes for valves series:

A = 488 / 484
B = 2400
C = T488
D = 2600
E = T424
F = 888_




This accessory permits to mount a valve or an electrovalve on a side of the cylinder. The plate can be fitted on the cylinder profiled barrel. Once installed the connections must be done with fittings and pipes. All of the threaded holes on the support plate are dedicated to different valves series as per attached drawing.

## Series Ecolight - with protective bellows

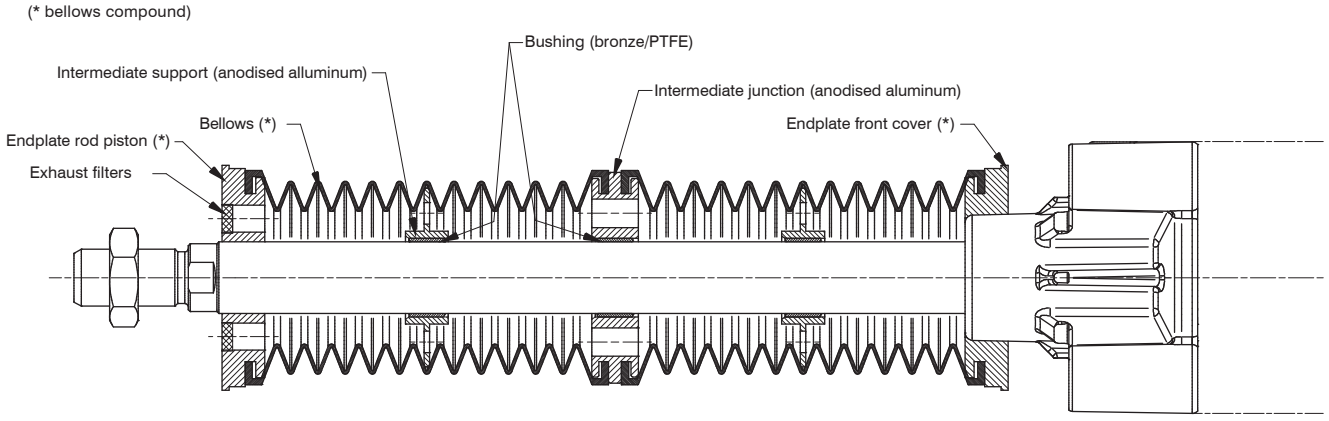
The modular bellows has the function of protecting the piston rod and piston rod nose seal on the Pneumax ECOLIGHT' cylinder range from Ø32 to Ø100 to a maximum stroke length of 1 mtr (all versions excluding cylinders fitted with the Q and R scraper seal).
It is constructed by mounting the bellows in series fixed with end plates mounted on the piston rod and front end cap.
There is also a guide washer with bushing (Sintered bronze/PTFE) placed in the middle of the bellows and guided by the piston rod to prevent the bellows sliding on the rod and to keep the orientation in line with the cylinder.
The bellows can be constructed from three different materials depending on the temperature, application or the possibility of any substance coming into contact with the cylinder.
During operation the bellows extend and retract which means the air contained within the bellows needs to be controlled, this is achieved by;
- NON CONVEYED: a series of breathers/filters on the end plate fitted to the piston rod.
- CONVEYED: a threaded connection on the end cover fitted to the cylinders front end cap.

Assembly is simple and requires a cylinder with extended rod (see ordering codes)

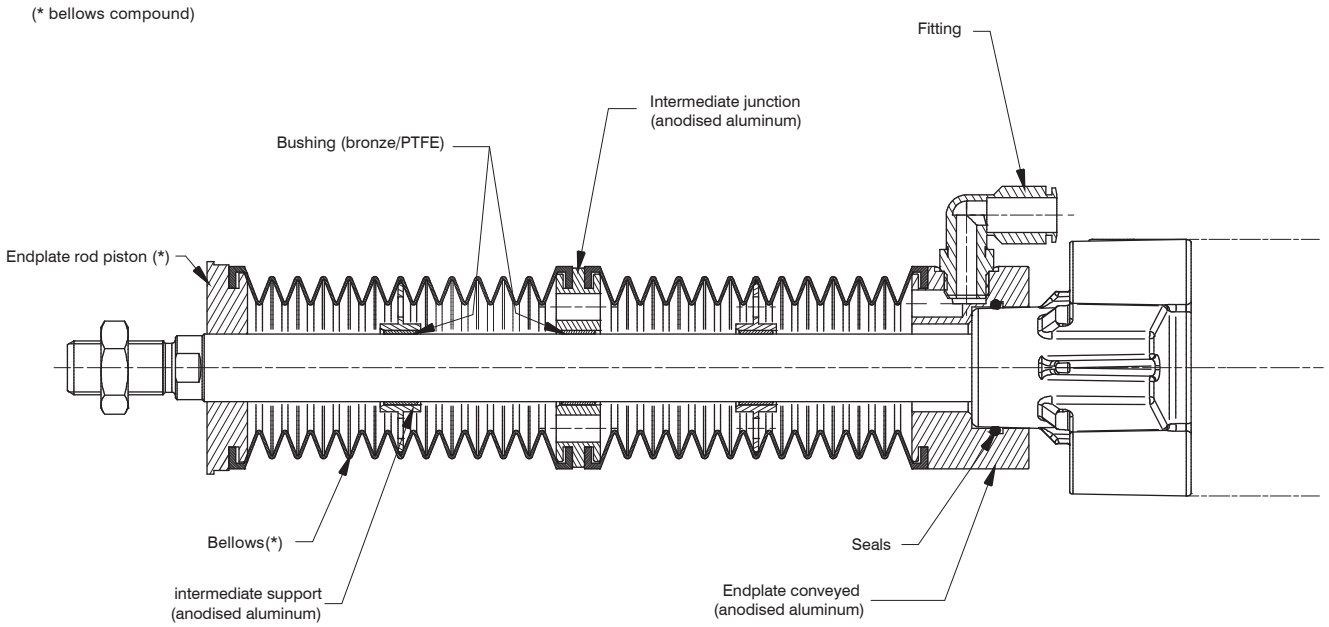
Are available:
-cylinder with bellows
-kit bellows (degrease the surface of the front cover and the piston rod before mounting the bellows terminals by interference).

**Construction characteristics**

**Version with bellows exhaust NOT CONVEYED**




**Version with bellows exhaust CONVEYED**




**Notice: with cylinders Ø32 ... 63, use fitting G1/4 tube Ø10 and Ø12**
**with cylinders Ø80 – 100, use fitting G3/8 tube Ø12 and Ø14**




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Operational characteristics

| | |
|---|---|
| Maximum Speed admissible | 1m/sec |
| Maximum stroke | Ø32 ... Ø63: 980mm – Ø80 ... Ø100: 1140mm |
| Assembly | endplates for interference with piston rod and front cover (in the conveyed exhaust version, endplate front cover fixed with grub screws) |
| cylinder orientation | unconcerned |
| EPDM (black color) | Limit temperatures of using: -40°C/+110°C<br>Ideal for outdoor uses and water applications,<br>Excellent resistance to atmospheric agents, ozone, direct sunlight, water and steam,<br>good resistance to acids and oxygenated solvents,<br>high resistance to permanent deformations,<br>low resistance to oils, mineral greases and hydrocarbons contact. |
| NBR (black color) | Limit temperatures of using: -40°C/+130°C<br>Application include: aerospace, automotive, high temperature, gas and vaccum application,<br>Not adapted for external using,<br>High resistance to oils, grease, hydrocarbons, water and alcohol,<br>good resistance to air and gas impermeability. |
| SILICONE (orange color) | Limit temperatures of using: -60°C / +200°C<br>ideal for applications: food, clean, high temperature, atmospheric agents (ozone, water),<br>Maintenance of flexibility even at low temperatures, good elasticity,<br>excellent electro-insulating characteristics,<br>low resistance to oils, mineral greases and hydrocarbons contact,<br>not recommended for contact with ketones or concentrated acids, benzene,<br>High gas pemeability. |

The temperatures indicated above refer to the material of the bellows. Therefore, the operating temperature of the assembled bellows + cylinder kit will correspond to the minimum values of the temperatures of the two components, ie those of the cylinders.

## Order codes

### Cylinder complete with bellows

_ _ . _ . _ _ _ _ . S . _ _ . _ . _ . _

| Series cylinder | Bore cylinder | Cylinder stroke | Cylinder seals | Cylinder version | Compounds bellows | Bellows exhaust |
|---|---|---|---|---|---|---|
| **FA**= 1390 | **A**= Ø32 | Maximum stroke<br>Ø32 ... Ø63: 980 mm<br>Ø80 ... Ø100: 1140 mm<br>( ATTENTION: for the number of bellows, see the **KIT BELLOWS** order codes ) | **0N**= NBR seals | **1**= BASIC version | **N**= NBR | **0**= not conveyed |
| **FB**= 1391 | **B**= Ø40 | | **0P**= PUR seals | **2**= THROUGH ROD CYLINDER version | **E**= EPDM | **1**= conveyed |
| **FC**= 1392 | **C**= Ø50 | | **0V**=FPM seals for high temperatures | | **S**= SILICONE | |
| | **D**= Ø63 | | **0L**=seals for low temperatures | | | |
| | **E**= Ø80 | | **0K**= NBR seals Aluminum piston | | | |
| | **F**= Ø100 | | **PK**=PUR seals Aluminum piston | | | |

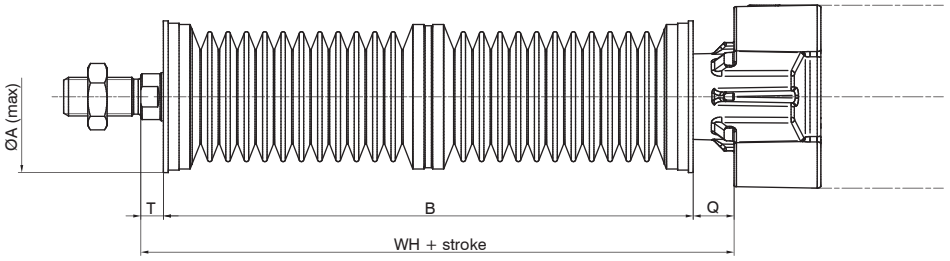
### Kit bellows (without cylinder)

FA . _ . _ _ _ _ . S . 0 . 0 . _ . _

| Cylinder bore | Cylinder stroke | | Bellows compound | Bellows exhaust |
|---|---|---|---|---|
| | cylinders Ø32 ... Ø63 | cylinders Ø80 ... Ø100 | | |
| **A**= Ø32 | **0001**= from 0 to 240mm ( n° 1 bellows ) | **0001**= from 0 to 280mm ( n° 1 bellows ) | **N**= NBR | **0**=not conveyed |
| **B**= Ø40 | **0002**= from 241 to 485mm ( n° 2 bellows ) | **0002**= from 281 to 570mm ( n° 2 bellows ) | **E**= EPDM | **1**= conveyed |
| **C**= Ø50 | **0003**= from 486 to 730mm ( n° 3 bellows ) | **0003**= from 571 to 855mm ( n° 3 bellows ) | **S**= SILICONE | |
| **D**= Ø63 | **0004**= from 731 to 980mm ( n° 4 bellows ) | **0004**= from 856 to 1140mm ( n° 4 bellows ) | | |
| **E**= Ø80 | | | | |
| **F**= Ø100 | | | | |

## Version with bellows exhaust NOT CONVEYED



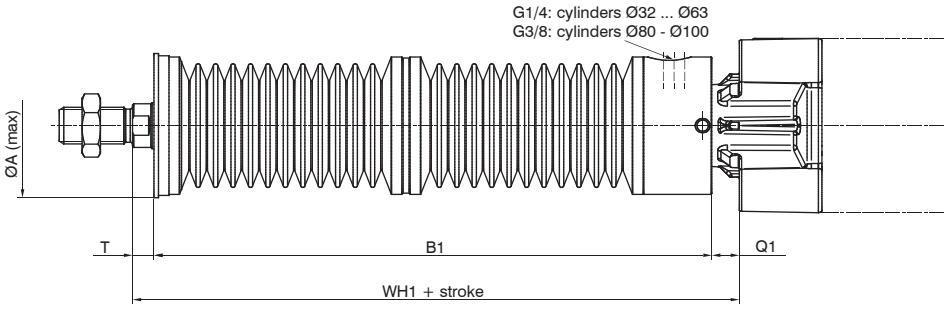



### Table of dimensions

| Bore | ØA | T | B + stroke | | | | Q | WH + stroke | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ø32 | 60 | 10 | 60 | 115 | 170 | 225 | 7 | 77 | 132 | 187 | 242 |
| Ø40 | | 10,5 | 60 | 115 | 170 | 225 | 10 | 80,5 | 135,5 | 190,5 | 245,5 |
| Ø50 | | 12 | 60 | 115 | 170 | 225 | 17 | 89 | 144 | 199 | 254 |
| Ø63 | | 12 | 60 | 115 | 170 | 225 | 17 | 89 | 144 | 199 | 254 |
| strokes | / | / | 0 ... 240 | 241 ... 485 | 486 ... 730 | 731... 980 | / | 0 ... 240 | 241 ... 485 | 486 ... 730 | 731 ... 980 |
| Ø80 | 83 | 14 | 70 | 130 | 195 | 260 | 23 | 107 | 167 | 232 | 297 |
| Ø100 | | 14 | 70 | 130 | 195 | 260 | 24 | 108 | 168 | 233 | 298 |
| strokes | / | / | 0 ... 280 | 281 ... 570 | 271 ... 855 | 856 ... 1140 | / | 0 ... 280 | 281 ... 570 | 571 ... 855 | 856 ... 1140 |

## Version with bellows exhaust CONVEYED






### Table of dimensions

| Bore | ØA | T | B1 + stroke | | | | Q1 | WH1 + stroke | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ø32 | 60 | 10 | 75 | 130 | 185 | 240 | 10 | 95 | 150 | 205 | 260 |
| Ø40 | | 10,5 | 75 | 130 | 185 | 240 | 13 | 98,5 | 153,5 | 208,5 | 263,5 |
| Ø50 | | 12 | 83 | 138 | 193 | 248 | 12 | 107 | 162 | 217 | 272 |
| Ø63 | | 12 | 83 | 138 | 193 | 248 | 12 | 107 | 162 | 217 | 272 |
| strokes | / | / | 0 ... 240 | 241 ... 485 | 286 ... 730 | 731 ... 980 | / | 0 ... 240 | 241 ... 485 | 486 ... 730 | 731 ... 980 |
| Ø80 | 83 | 14 | 94 | 154 | 219 | 284 | 18 | 126 | 186 | 251 | 316 |
| Ø100 | | 14 | 94 | 154 | 219 | 284 | 19 | 127 | 187 | 252 | 317 |
| strokes | / | / | 0 ... 280 | 281 ... 570 | 571 ... 855 | 856 ... 1140 | / | 0 ... 280 | 281 ... 570 | 571 ... 855 | 856 ... 1140 |

## Fixing device

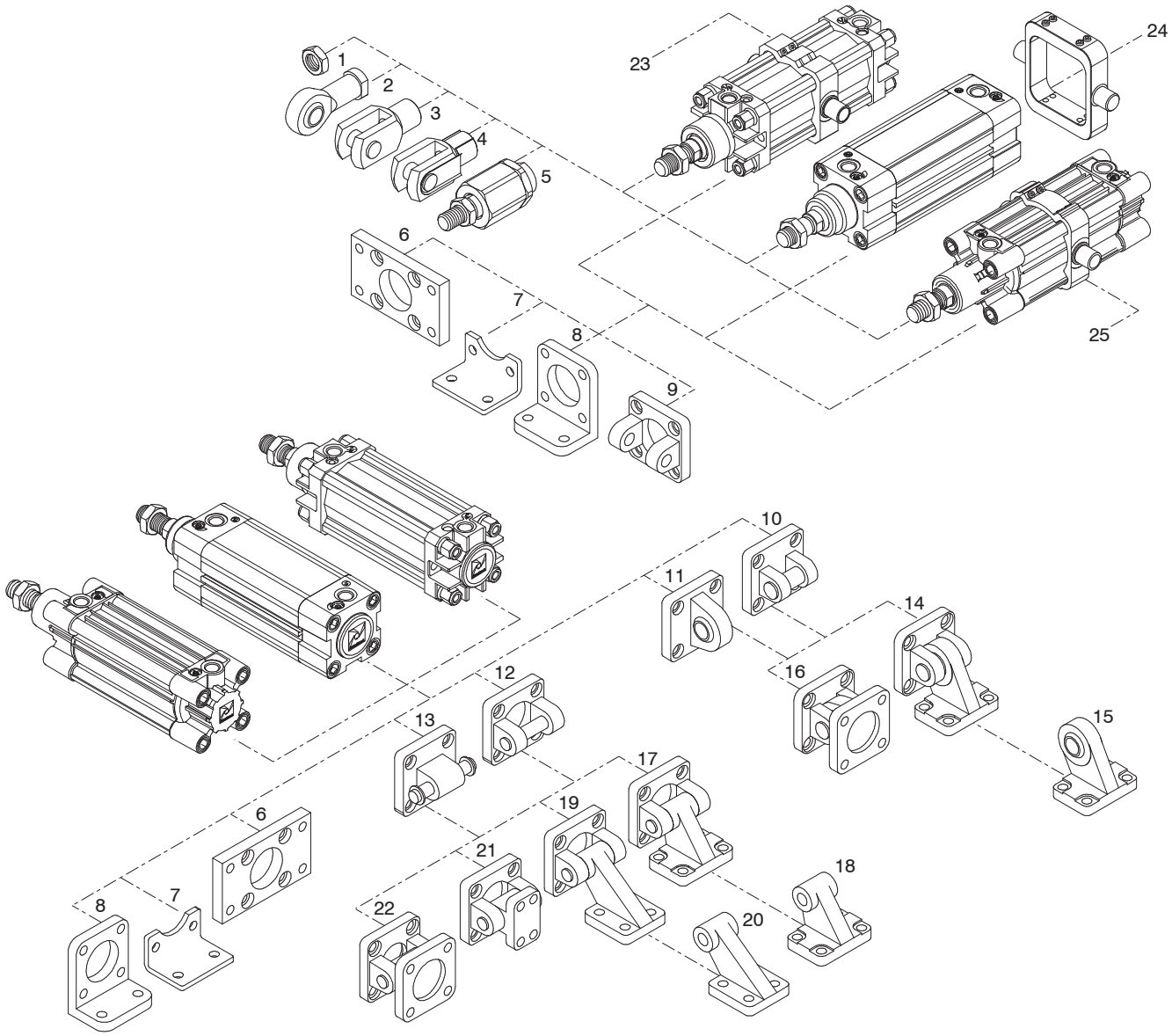
All ISO 15552 series ECOLIGHT cylinder fixing device/accessories and sensors available in the general catalog can be used except to:

- front clevis
- front clevis and normal foot code, not available for Ø32 cylinders in the version with not conveyed exhaust bellows.

in case of cylinder complete of bellows, for the accessories assembly on the front cover is require to take off the bellows kit.
therefore, for the re-assembling, consider the dimension in preceding page about the overall dimensions.




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice




| Position | Description | Aluminium | Steel |
|---|---|---|---|
| 1 | Nuts | / | 1320.Ø.18F |
| 2 | Ball joint | / | 1320.Ø.32F |
| 3 | Fork with pin | / | 1320.Ø.13F |
| 4 | Fork with clips | / | 1320.Ø.13/1F |
| 5 | Self-aligning joint | / | 1320.Ø.33F |
| 6 | Front and rear flange (MF1 - MF2) * | 1390.Ø.03FP | 1380.Ø.03F |
| 7 | Short mounting foot brackets (in sheet metal MS1) | / | 1320.Ø.05/1F |
| 8 | Standard feet * | 1320.Ø.05F | / |
| 9 | Front clevis (not specified by ISO-VDMA standards) ** | 1380.Ø.08F | 1320.Ø.19F |
| 10 | Rear narrow clevis | 1380.Ø.30F | 1320.Ø.29F |
| 11 | Rear male clevis (with jointed head according to DIN 648K standard) | 1380.Ø.15F | 1320.Ø.25F |
| 12 | Rear clevis (MP2) | 1380.Ø.09F | 1320.Ø.20F |
| 13 | Rear male clevis (MP4) | 1380.Ø.09/1F | 1320.Ø.21F |
| 14 | Complete square angle trunnion (with joined head according to DIN 648K standards) (pos.10 + pos.15) | / | 1320.Ø.27F |
| 15 | Simple square counter clevis (pos.14) | / | 1320.Ø.28F |
| 16 | Complete square angle trunnion (with joined head according to DIN 648K standards) (pos.10 + pos.11) | 1380.Ø.36F | 1320.Ø.26F |
| 17 | Square angle trunnion (AB7) (pos.18 + pos.12) | 1380.Ø.35F | 1320.Ø.23F |
| 18 | Simple square counter clevis (pos.17) | 1320.Ø.11/2F | 1320.Ø.24F |
| 19 | Simple rear trunnion with support brackets (not specified by ISO-VDMA standards) (pos.20 + pos.12) | 1380.Ø.11F | / |
| 20 | Simple square counter clevis (pos.19) | 1320.Ø.11/1F | / |
| 21 | Standard trunnion (not specified by ISO-VDMA standards) | 1380.Ø.10F | / |
| 22 | Standard complete trunnion (pos.12 + pos.13) | 1380.Ø.22F | 1320.Ø.22F |
| 23 | 1319 ... 1321 cylinders series Intermediate trunnion | 1320.Ø.12BF | 1320.Ø.12F |
| 24 | 1386 ... 1388 / 1396 - 1398 Ecoplus series Intermediate trunnion | / | 1386.Ø.12F |
| 25 | 1390 ... 1392 Ecolight series Intermediate trunnion | 1390.Ø.12F | / |

* Do not use on Ecolight Series cylinders with bellows Ø32
** Do not use on Ecolight Series cylinders with bellows

## Front and rear flanges (MF1 - MF2)

**Coding:** 13Ⓜ.Ø.Ⓥ

| | |
|---|---|
| Ⓜ | MATERIALS |
| | **80** = Steel |
| | **90** = Aluminium |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | **125** = Ø125 |
| | **160** = Ø160 |
| | **200** = Ø200 |
| Ⓥ | VERSION |
| | **03F** = Steel flange (Ø32 ... Ø200) |
| | **03FP** = Aluminium flange (Ø32 ... Ø100) |



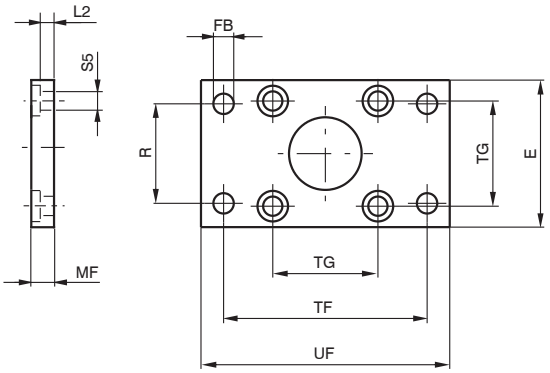
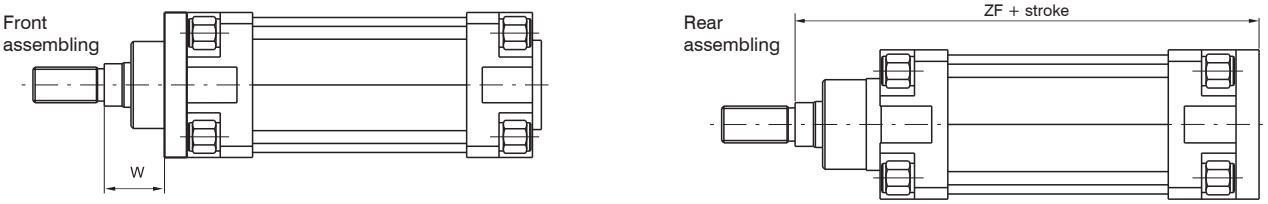



Plate which allows anchorage of the cylinder at a right angle to the plane. It is made of zincplated extruded steel.




| Bore | E | FB (H 13) | MF (JS 14) | R (JS 14) | TF (JS 14) | TG | UF | ZF | W | L2 | S5 | Weight (g) steel | Weight (g) aluminium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | 45 | 7 | 10 | 32 | 64 | 32,5 | 80 | 130 | 16 | 5 | 6,6 | 190 | 60 |
| 40 | 52 | 9 | 10 | 36 | 72 | 38 | 90 | 145 | 20 | 5 | 6,6 | 250 | 69 |
| 50 | 65 | 9 | 12 | 45 | 90 | 46,5 | 110 | 155 | 25 | 6,5 | 9 | 480 | 130 |
| 63 | 75 | 9 | 12 | 50 | 100 | 56,5 | 120 | 170 | 25 | 6,5 | 9 | 620 | 170 |
| 80 | 95 | 12 | 16 | 63 | 126 | 72 | 150 | 190 | 30 | 9 | 11 | 1430 | 345 |
| 100 | 115 | 14 | 16 | 75 | 150 | 89 | 170 | 205 | 35 | 9 | 11 | 1990 | 485 |
| 125 | 140 | 16 | 20 | 90 | 180 | 110 | 205 | 245 | 45 | 10,5 | 14 | 3750 | / |
| 160 | 180 | 18 | 20 | 115 | 230 | 140 | 260 | 280 | 60 | 9,5 | 18 | 6350 | / |
| 200 | 220 | 22 | 25 | 135 | 270 | 175 | 300 | 300 | 70 | 12,5 | 18 | 11350 | / |

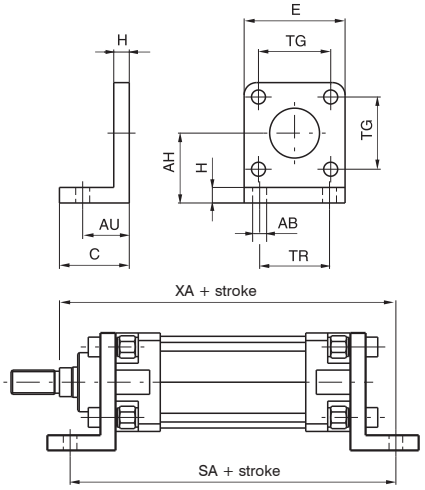
## Standard feet

**Coding:** 1320.Ø.05F

| | |
|---|---|
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | **125** = Ø125 |
| | **160** = Ø160 |
| | **200** = Ø200 |

Aluminium
(1 piece)






| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| AB (H 14) | 7 | 9 | 9 | 9 | 12 | 14 | 16 | 18 | 22 |
| AH (JS 15) | 32 | 36 | 45 | 50 | 63 | 71 | 91 | 115 | 135 |
| AU (±0,2) | 24 | 28 | 32 | 32 | 41 | 41 | 45 | 60 | 70 |
| C | 35 | 35 | 45 | 45 | 55 | 56 | 68 | 82 | 90 |
| E | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| H | 8 | 8 | 10 | 10 | 12 | 12 | 16 | 20 | 20 |
| SA | 142 | 161 | 170 | 185 | 210 | 220 | 250 | 300 | 320 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 | 110 | 140 | 175 |
| TR (JS 14) | 32 | 36 | 45 | 50 | 63 | 75 | 90 | 115 | 135 |
| XA | 144 | 163 | 175 | 190 | 215 | 230 | 270 | 320 | 345 |
| Weight (g) | 45 | 65 | 140 | 175 | 380 | 470 | 920 | 2300 | 3200 |

Elements used to anchor the cylinder parallel to the mounting plane.
They are made of cast aluminium, painted black.





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

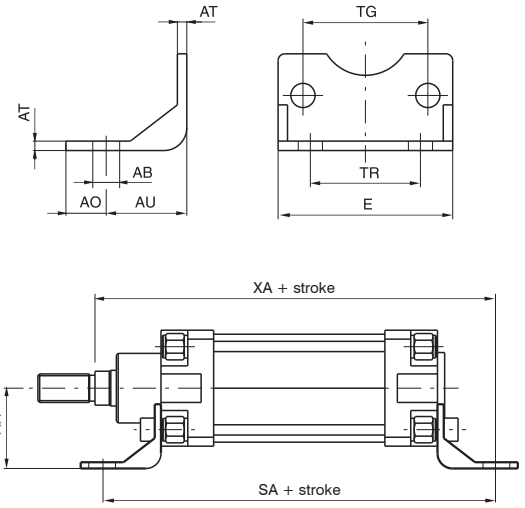
## Short mounting foot brackets (in sheet metal MS1)

**Coding:** 1320.Ø.05/1F

| | |
|---|---|
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | **125** = Ø125 |
| | **160** = Ø160 |
| | **200** = Ø200 |

Steel
(1 piece)






Elements used to anchor the cylinder parallel to the mounting plane.
They are made of steel, and painted black.

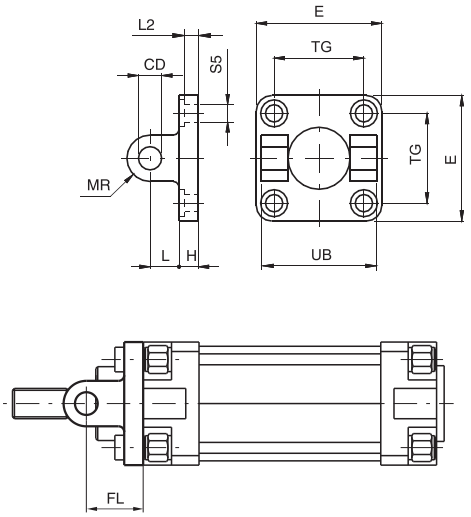
| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| AB (H 14) | 7 | 9 | 9 | 9 | 12 | 14 | 16 | 18 | 22 |
| AH (JS 15) | 32 | 36 | 45 | 50 | 63 | 71 | 90 | 115 | 135 |
| AU (± 0.2) | 24 | 28 | 32 | 32 | 41 | 41 | 45 | 60 | 70 |
| AO (± 0.2) | 11 | 8 | 15 | 13 | 14 | 16 | 25 | 15 | 30 |
| E | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| AT | 4 | 4 | 5 | 5 | 6 | 6 | 8 | 9 | 12 |
| SA | 142 | 161 | 170 | 185 | 210 | 220 | 250 | 300 | 320 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 | 110 | 140 | 175 |
| TR (JS 14) | 32 | 36 | 45 | 50 | 63 | 75 | 90 | 115 | 135 |
| XA | 144 | 163 | 175 | 190 | 215 | 230 | 270 | 320 | 345 |
| Weight (g) | 65 | 80 | 170 | 190 | 380 | 452 | 1090 | 1190 | 3450 |

## Front clevis (not specified by ISO-VDMA standards)

**Coding:** 13Ⓜ.Ø.Ⓥ

| | |
|---|---|
| Ⓜ | MATERIALS |
| | **20** = Steel |
| | **80** = Aluminium |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | **125** = Ø125 |
| | **160** = Ø160 |
| | **200** = Ø200 |
| Ⓥ | VERSION |
| | **08F** = Steel front clevis |
| | **19F** = Aluminium front clevis |






Used to mount the cylinder either parallel or at a right angle to the mounting plane; allows the cylinder to self-align under load.
Made of aluminium alloy or steel (see ordering code) and painted black.

| Bore | | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|---|
| CD (H9) | | 10 | 12 | 12 | 16 | 16 | 20 | 25 | 30 | 30 |
| E | Aluminium | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| | Steel | 45 | 55 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| FL (±0,2) | | 22 | 25 | 27 | 32 | 36 | 41 | 50 | 55 | 60 |
| H | Aluminium | 9 | 9 | 11 | 11 | 14 | 14 | 20 | 20 | 25 |
| | Steel | 10 | 10 | 10 | 12 | 14 | 16 | 20 | 20 | 20 |
| L | Aluminium | 13 | 16 | 16 | 21 | 22 | 27 | 30 | 35 | 35 |
| | Steel | 12 | 15 | 17 | 20 | 22 | 25 | 30 | 35 | 40 |
| MR | | 10 | 12 | 12 | 16 | 16 | 20 | 25 | 25 | 25 |
| TG | | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 | 110 | 140 | 175 |
| UB (h14) | | 45 | 52 | 60 | 70 | 90 | 110 | 130 | 170 | 170 |
| L2(±0,5) | | 5,5 | 5,5 | 6,5 | 6,5 | 10 | 10 | 10 | 10 | 11 |
| S5 (H13) | | 6,6 | 6,6 | 9 | 9 | 11 | 11 | 14 | 18 | 18 |
| Weight (g) | Aluminium | 50 | 75 | 125 | 190 | 380 | 620 | 1180 | 1780 | 2900 |
| | Steel | 150 | 235 | 340 | 550 | 1010 | 1710 | 3360 | 5750 | 8960 |



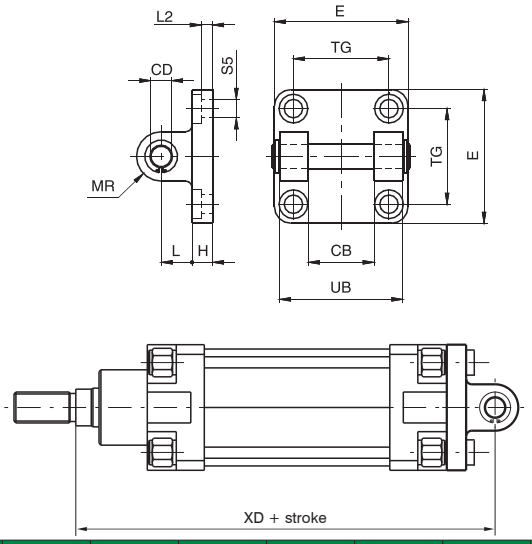
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Rear clevis (MP2)

**Coding:** 13Ⓜ.Ø.Ⓥ

| | |
|---|---|
| Ⓜ | MATERIALS |
| | **20** = Steel |
| | **80** = Aluminium |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | **125** = Ø125 |
| | **160** = Ø160 |
| | **200** = Ø200 |
| Ⓥ | VERSION |
| | **20F** = Steel rear clevis |
| | **09F** = Aluminium rear clevis |






Similar to type 08 but includes a hinge pin.
This type of mounting allows anchorage of the cylinder either parallel or right angle to plane; the cylinder rod can oscillate and self-align as necessary when under load.
Made of aluminium alloy or steel (see ordering code) and painted black.

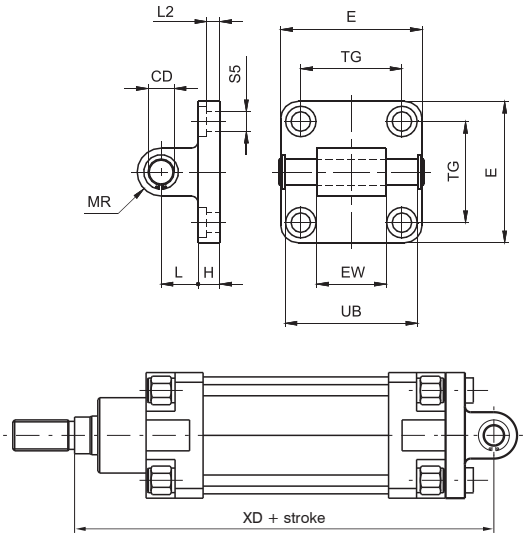
| Bore | | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|---|
| CB (H 14) | | 26 | 28 | 32 | 40 | 50 | 60 | 70 | 90 | 90 |
| CD | | 10 | 12 | 12 | 16 | 16 | 20 | 25 | 30 | 30 |
| E | Aluminium | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| | Steel | 45 | 55 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| H | Aluminium | 9 | 9 | 11 | 11 | 14 | 14 | 20 | 20 | 25 |
| | Steel | 10 | 10 | 10 | 12 | 14 | 16 | 20 | 20 | 20 |
| L | Aluminium | 13 | 16 | 16 | 21 | 22 | 27 | 30 | 35 | 35 |
| | Steel | 12 | 15 | 17 | 20 | 22 | 25 | 30 | 35 | 40 |
| MR | | 10 | 12 | 12 | 16 | 16 | 20 | 25 | 25 | 25 |
| TG | | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 | 110 | 140 | 175 |
| UB (h14) | | 45 | 52 | 60 | 70 | 90 | 110 | 130 | 170 | 170 |
| XD | | 142 | 160 | 170 | 190 | 210 | 230 | 275 | 315 | 335 |
| L2(±0,5) | | 5,5 | 5,5 | 6,5 | 6,5 | 10 | 10 | 10 | 10 | 11 |
| S5 | | 6,6 | 6,6 | 9 | 9 | 11 | 11 | 14 | 18 | 18 |
| Weight (g) | Aluminium | 80 | 130 | 185 | 310 | 530 | 910 | 1710 | 2760 | 3820 |
| | Steel | 180 | 290 | 400 | 670 | 1160 | 2000 | 3890 | 6730 | 9880 |

## Rear male clevis (MP4)

**Coding:** 13Ⓜ.Ø.Ⓥ

| | |
|---|---|
| Ⓜ | MATERIALS |
| | **20** = Steel |
| | **80** = Aluminium |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | **125** = Ø125 |
| | **160** = Ø160 |
| | **200** = Ø200 |
| Ⓥ | VERSION |
| | **21F** = Steel rear male clevis |
| | **09/1F** = Aluminium rear male clevis |






Similar to 09 clevis except for the connection, which is male rather than female.
Used to mount the cylinder either parallel or at a right angle to the plane; the cylinder rod can oscillate and self-align as necessary when under load.
Made of aluminium alloy or steel (see ordering code) and painted black.

| Bore | | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|---|
| CD | | 10 | 12 | 12 | 16 | 16 | 20 | 25 | 30 | 30 |
| E | Aluminium | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| | Steel | 45 | 55 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| EW | | 26 (-0.2/-0.6) | 28 (-0.2/-0.6) | 32 (-0.2/-0.6) | 40 (-0.2/-0.6) | 50 (-0.2/-0.6) | 60 (-0.2/-0.6) | 70 (-0.5/-1.2) | 90 (-0.5/-1.2) | 90 (-0.5/-1.2) |
| H | Aluminium | 9 | 9 | 11 | 11 | 14 | 14 | 20 | 20 | 25 |
| | Steel | 10 | 10 | 10 | 12 | 14 | 16 | 20 | 20 | 20 |
| L | Aluminium | 13 | 16 | 16 | 21 | 22 | 27 | 30 | 35 | 35 |
| | Steel | 12 | 15 | 17 | 20 | 22 | 25 | 30 | 35 | 40 |
| MR | | 10 | 12 | 12 | 16 | 16 | 20 | 25 | 25 | 25 |
| TG | | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 | 110 | 140 | 175 |
| UB (-0.5/-0) | | 46 | 53 | 61 | 71 | 91 | 111 | 132 | 171,5 | 171,5 |
| XD | | 142 | 160 | 170 | 190 | 210 | 230 | 275 | 315 | 335 |
| L2 (±0.5) | | 5,5 | 5,5 | 6,5 | 6,5 | 10 | 10 | 10 | 10 | 11 |
| S5 | | 6,6 | 6,6 | 9 | 9 | 11 | 11 | 14 | 18 | 18 |
| Weight (g) | Aluminium | 90 | 130 | 190 | 340 | 580 | 960 | 1890 | 2830 | 3940 |
| | Steel | 210 | 330 | 430 | 810 | 1350 | 2400 | 4300 | 6880 | 8560 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

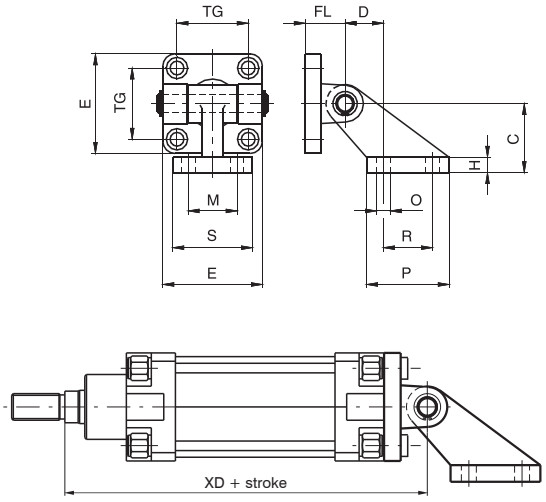
## Simple rear trunnion with support brackets (not specified by ISO-VDMA standards)

**Coding:** 1380.Ø.11F

| | |
|---|---|
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | **125** = Ø125 |
| | **160** = Ø160 |
| | **200** = Ø200 |

Aluminium
Counter clevis can be ordered separately with code1320.Ø.11/1F






| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| C (±0,2) | 32 | 45 | 45 | 63 | 63 | 90 | 90 | 140 | 140 |
| D (±0,5) | 18 | 25 | 25 | 32 | 32 | 40 | 40 | 50 | 50 |
| E | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| H | 8 | 10 | 10 | 12 | 12 | 17 | 17 | 20 | 20 |
| FL | 22 | 25 | 27 | 32 | 36 | 41 | 50 | 55 | 60 |
| M (JS 14) | 25 | 32 | 32 | 40 | 40 | 50 | 50 | 63 | 63 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 | 110 | 140 | 175 |
| O (H 13) | 7 | 9 | 9 | 11 | 11 | 14 | 14 | 18 | 18 |
| P | 37 | 54 | 54 | 75 | 75 | 103 | 103 | 154 | 154 |
| R (JS 14) | 20 | 32 | 32 | 50 | 50 | 70 | 70 | 110 | 110 |
| S | 41 | 52 | 52 | 63 | 63 | 80 | 80 | 110 | 110 |
| XD | 142 | 160 | 170 | 190 | 210 | 230 | 275 | 315 | 335 |
| Weight (g) | 130 | 260 | 330 | 600 | 820 | 1560 | 2530 | 4735 | 5795 |

Used to mount cylinders parallel to the plane to which the counter clevis is attached. Allows selfalignment of the cylinder rod under load with an oscillation up to 90 degrees from the mounting plane.

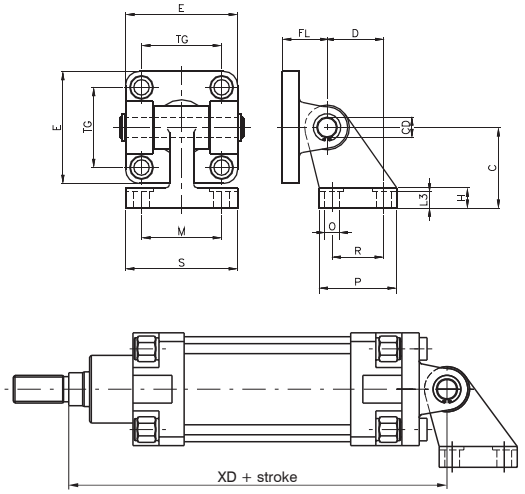
## Square angle trunnion (AB7)

**Coding:** 13Ⓜ.Ø.Ⓥ

| | |
|---|---|
| Ⓜ | MATERIALS |
| | **20** = Steel |
| | **80** = Aluminium |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | **125** = Ø125 |
| | **160** = Ø160 |
| | **200** = Ø200 |
| Ⓥ | VERSION |
| | **23F** = Steel square angle trunnion (Ø32 ... Ø100) |
| | **35F** = Aluminium square angle trunnion |

**Counter clevis**
can be ordered separately with code:
1320.Ø.11/2F (aluminium)
1320.Ø.24F (steel) (Ø32...Ø100)






| Bore | | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|---|
| E | Aluminium | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| | Steel | 45 | 55 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| TG | | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 | 110 | 140 | 175 |
| FL | | 22 | 25 | 27 | 32 | 36 | 41 | 50 | 55 | 60 |
| D (JS14) | | 21 | 24 | 33 | 37 | 47 | 55 | 70 | 97 | 105 |
| CD | | 10 | 12 | 12 | 16 | 16 | 20 | 25 | 30 | 30 |
| C (JS15) | | 32 | 36 | 45 | 50 | 63 | 71 | 90 | 115 | 135 |
| H | Aluminium | 8 | 10 | 12 | 14 | 14 | 17 | 20 | 25 | 30 |
| | Steel | 8 | 10 | 12 | 12 | 14 | 15 | / | / | / |
| L3 | Aluminium | 6,4 | 8,4 | 10,4 | 12,4 | 11,5 | 14,5 | 16,8 | 21 | 26 |
| | Steel | 6,5 | 8,5 | 10,5 | 10,5 | 11,5 | 12,5 | / | / | / |
| R (JS14) | | 18 | 22 | 30 | 35 | 40 | 50 | 60 | 88 | 90 |
| P | | 31 | 35 | 45 | 50 | 60 | 70 | 90 | 126 | 130 |
| O (H13) | | 6,6 | 6,6 | 9 | 9 | 11 | 11 | 14 | 14 | 18 |
| S | | 51 | 54 | 65 | 67 | 86 | 96 | 124 | 156 | 162 |
| M (JS14) | | 38 | 41 | 50 | 52 | 66 | 76 | 94 | 118 | 122 |
| XD | | 142 | 160 | 170 | 190 | 210 | 230 | 275 | 315 | 335 |
| Weight (g) | Aluminium | 120 | 180 | 225 | 435 | 730 | 1220 | 2325 | 3780 | 4950 |
| | Steel | 340 | 500 | 640 | 1250 | 2100 | 3500 | / | / | / |

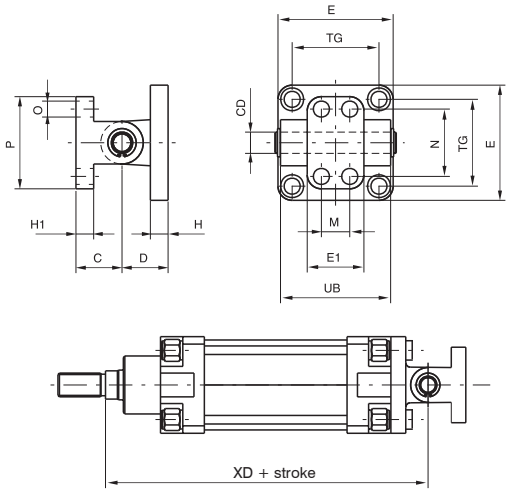
## Standard trunnion (not specified by ISO-VDMA standards)

**Coding:** 1380.Ø.10F

| | |
|---|---|
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | **125** = Ø125 |
| | **160** = Ø160 |
| | **200** = Ø200 |

Aluminium






Mounting consists of clevis 09 and counter clevis.
Used to mount cylinders at a right angle to the plane to which the counter clevis is attached.
Allows self-alignment of the cylinder rod under load with an oscillation of ± 60 degrees.

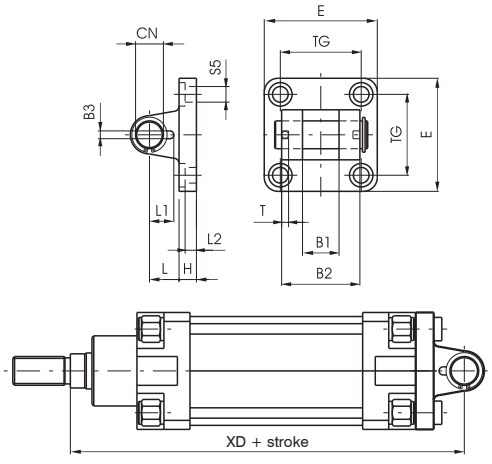
| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| C (±0.2) | 18 | 26 | 26 | 34 | 34 | 41 | 41 | 55 | 55 |
| CD | 10 | 12 | 12 | 16 | 16 | 20 | 25 | 30 | 30 |
| D | 22 | 25 | 27 | 32 | 36 | 41 | 50 | 55 | 60 |
| E | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| E1 | 25 | 32 | 32 | 46 | 46 | 56 | 56 | 71 | 71 |
| H | 10 | 10 | 12 | 12 | 16 | 16 | 20 | 20 | 25 |
| H1 | 8 | 10 | 10 | 12 | 12 | 16 | 16 | 20 | 20 |
| M (±0.2) | - | 16 | 16 | 25 | 25 | 32 | 32 | 43 | 43 |
| N (±0.2) | 28 | 38 | 38 | 54 | 54 | 90 | 90 | 150 | 150 |
| O | 7 | 9 | 9 | 11 | 11 | 14 | 14 | 18 | 18 |
| P | 40 | 52 | 52 | 75 | 75 | 115 | 115 | 180 | 180 |
| TG | 32.5 | 38 | 46.5 | 56.5 | 72 | 89 | 110 | 140 | 175 |
| UB | 45 | 52 | 60 | 70 | 90 | 110 | 130 | 170 | 170 |
| XD | 142 | 160 | 170 | 190 | 210 | 230 | 275 | 315 | 335 |
| Weight (g) | 11 | 190 | 240 | 490 | 710 | 1290 | 2090 | 3690 | 4810 |

## Rear narrow clevis

**Coding:** 13Ⓜ.Ø.Ⓥ

| | |
|---|---|
| Ⓜ | MATERIALS |
| | **20** = Steel |
| | **80** = Aluminium |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | **125** = Ø125 |
| | **160** = Ø160 |
| | **200** = Ø200 |
| Ⓥ | VERSION |
| | **29F** = Steel rear narrow clevis (Ø32 ... Ø125) |
| | **30F** = Aluminium rear narrow clevis |






| Bore | | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|---|
| B1 (H 14) | | 14 | 16 | 21 | 21 | 25 | 25 | 37 | 43 | 43 |
| B2 (d 12) | | 34 | 40 | 45 | 51 | 65 | 75 | 97 | 122 | 122 |
| B3 (+0,2/-0) | | 3,3 | 4,3 | 4,3 | 4,3 | 4,3 | 6,3 | 6,3 | 6,3 | 6,3 |
| CN | | 10 | 12 | 16 | 16 | 20 | 20 | 30 | 35 | 35 |
| E | Aluminium | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| | Steel | 45 | 55 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| H | Aluminium | 9 | 9 | 11 | 11 | 14 | 14 | 20 | 20 | 25 |
| | Steel | 10 | 10 | 10 | 12 | 14 | 16 | 20 | / | / |
| L | Aluminium | 13 | 16 | 16 | 21 | 22 | 27 | 30 | 35 | 35 |
| | Steel | 12 | 15 | 17 | 20 | 22 | 25 | 30 | / | / |
| L1 | | 11,5 | 12 | 14 | 14 | 16 | 16 | 24 | 26,5 | 26,5 |
| L2 (±0,5) | | 5,5 | 5,5 | 6,5 | 6,5 | 10 | 10 | 10 | 10 | 11 |
| S5 | | 6,6 | 6,6 | 9 | 9 | 11 | 11 | 14 | 18 | 18 |
| T | | 3 | 4 | 4 | 4 | 4 | 4 | 6 | 6 | 6 |
| TG | | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 | 110 | 140 | 175 |
| XD | | 142 | 160 | 170 | 190 | 210 | 230 | 275 | 315 | 335 |
| Weight (g) | Aluminium | 70 | 115 | 200 | 290 | 570 | 820 | 1710 | 3010 | 4380 |
| | Steel | 160 | 270 | 370 | 670 | 1110 | 2100 | 4150 | / | / |





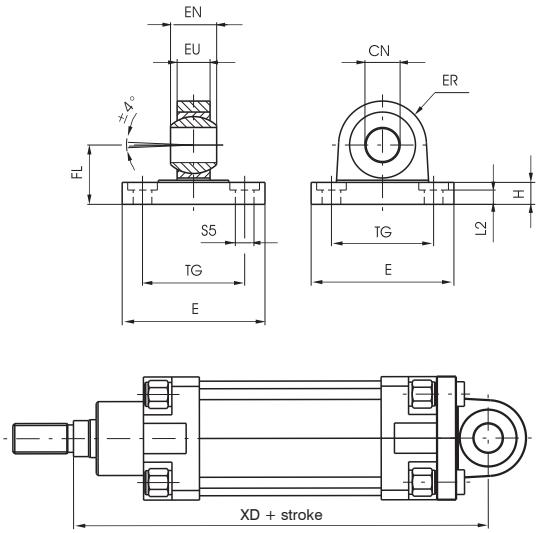
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Rear male clevis (with jointed head according to DIN 648K standard)

**Coding:** 13Ⓜ.Ø.Ⓥ

| | |
|---|---|
| Ⓜ | MATERIALS |
| | **20** = Steel |
| | **80** = Aluminium |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | **125** = Ø125 |
| | **160** = Ø160 |
| | **200** = Ø200 |
| Ⓥ | VERSION |
| | **25F** = Steel rear male clevis (Ø32 ... Ø125) |
| | **15F** = Aluminium rear male clevis |





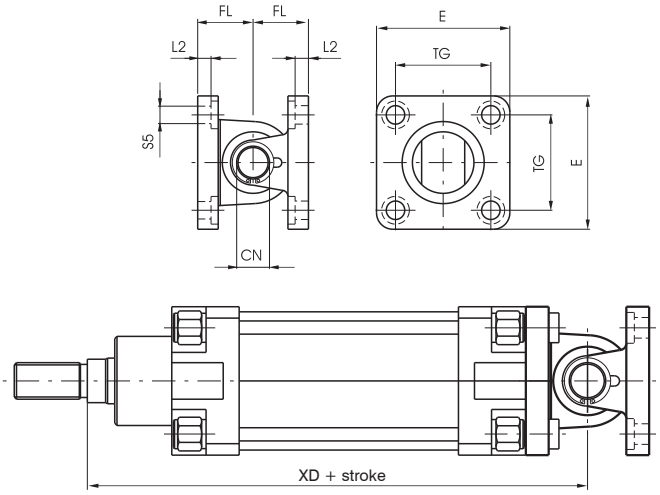

| Bore | | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|---|
| CN (H 7) | | 10 | 12 | 16 | 16 | 20 | 20 | 30 | 35 | 35 |
| E | Aluminium | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| | Steel | 45 | 55 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| EN (-0.1) | | 14 | 16 | 21 | 21 | 25 | 25 | 37 | 43 | 43 |
| ER | Aluminium | 16 | 19 | 21 | 24 | 28.5 | 30 | 40 | 45 | 48 |
| | Steel | 15 | 18 | 20 | 23 | 27 | 30 | 40 | / | / |
| EU | | 10.5 | 12 | 15 | 15 | 18 | 18 | 25 | 28 | 28 |
| FL (JS 15) | | 22 | 25 | 27 | 32 | 36 | 41 | 50 | 55 | 60 |
| H | Aluminium | 9 | 9 | 11 | 11 | 14 | 14 | 20 | 20 | 25 |
| | Steel | 10 | 10 | 10 | 12 | 14 | 16 | 20 | / | / |
| L2 (±0.5) | | 5.5 | 5.5 | 6.5 | 6.5 | 10 | 10 | 10 | 10 | 11 |
| S5 | | 6.6 | 6.6 | 9 | 9 | 11 | 11 | 14 | 18 | 18 |
| TG | | 32.5 | 38 | 46.5 | 56.5 | 72 | 89 | 110 | 140 | 175 |
| XD | | 142 | 160 | 170 | 190 | 210 | 230 | 275 | 315 | 335 |
| Weight (g) | Aluminium | 60 | 100 | 180 | 245 | 480 | 650 | 1410 | 2420 | 3840 |
| | Steel | 210 | 310 | 400 | 710 | 1350 | 2400 | 4000 | / | / |

## Complete standard trunnion (with joined head according to DIN 648K standards)

**Coding:** 13Ⓜ.Ø.Ⓥ

| | |
|---|---|
| Ⓜ | MATERIALS |
| | **20** = Steel |
| | **80** = Aluminium |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | **125** = Ø125 |
| | **160** = Ø160 |
| | **200** = Ø200 |
| Ⓥ | VERSION |
| | **26F** = Steel complete standard trunnion (Ø32 ... Ø125) |
| | **36F** = Aluminium complete standard trunnion |





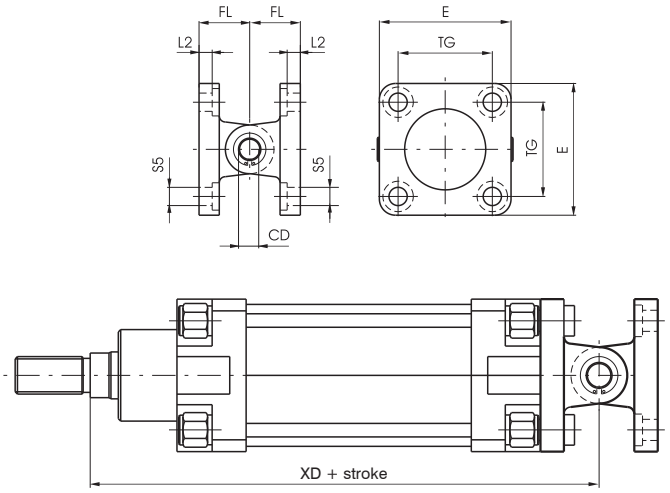

| Bore | | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|---|
| CN | | 10 | 12 | 16 | 16 | 20 | 20 | 30 | 35 | 35 |
| E | Aluminium | 45 | 52 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| | Steel | 45 | 55 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| FL (JS 15) | | 22 | 25 | 27 | 32 | 36 | 41 | 50 | 55 | 60 |
| L2 (±0.5) | | 5.5 | 5.5 | 6.5 | 6.5 | 10 | 10 | 10 | 10 | 11 |
| S5 | | 6.6 | 6.6 | 9 | 9 | 11 | 11 | 14 | 18 | 18 |
| TG | | 32.5 | 38 | 46.5 | 56,5 | 72 | 89 | 110 | 140 | 175 |
| XD | | 142 | 160 | 170 | 190 | 210 | 230 | 275 | 315 | 335 |
| Weight (g) | Aluminium | 130 | 215 | 380 | 535 | 1050 | 1470 | 3120 | 5430 | 8220 |
| | Steel | 380 | 580 | 770 | 1380 | 2460 | 4500 | 8150 | / | / |

## Standard complete trunnion

**Coding:** 13Ⓜ.Ø.22F

| | |
|---|---|
| Ⓜ | MATERIALS |
| | **20** = Steel |
| | **80** = Aluminium |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | **125** = Ø125 |
| | **160** = Ø160 |
| | **200** = Ø200 |






| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| CD | 10 | 12 | 12 | 16 | 16 | 20 | 25 | 30 | 30 |
| E | 45 | 55 | 65 | 75 | 95 | 115 | 140 | 180 | 220 |
| FL | 22 | 25 | 27 | 32 | 36 | 41 | 50 | 55 | 60 |
| L 2 (±0.5) | 5,5 | 5,5 | 6,5 | 6,5 | 10 | 10 | 10 | 10 | 11 |
| S 5 | 6,6 | 6,6 | 9 | 9 | 11 | 11 | 14 | 18 | 18 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 | 110 | 140 | 175 |
| XD | 142 | 160 | 170 | 190 | 210 | 230 | 275 | 315 | 335 |
| Weight (g) | 360 | 580 | 780 | 1370 | 2370 | 4110 | 7670 | 12650 | 17480 |

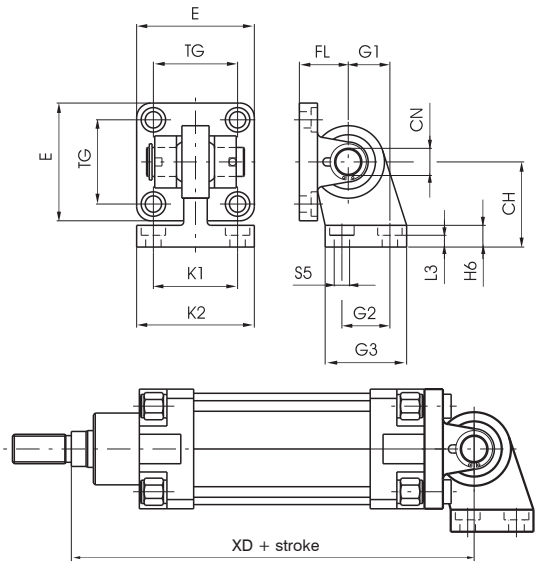
## Complete square angle trunnion (with joined head according to DIN 648K standards)

**Coding:** 1320.Ø.27F

| | |
|---|---|
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | **125** = Ø125 |

Steel
Counter clevis can be ordered separately with code 1320.Ø.28F






| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 |
|---|---|---|---|---|---|---|---|
| CH (JS 15) | 32 | 36 | 45 | 50 | 63 | 71 | 90 |
| CN | 10 | 12 | 16 | 16 | 20 | 20 | 30 |
| E | 45 | 55 | 65 | 75 | 95 | 115 | 140 |
| FL (JS 15) | 22 | 25 | 27 | 32 | 36 | 41 | 50 |
| G1 (JS 15) | 21 | 24 | 33 | 37 | 47 | 55 | 70 |
| G2 (JS 14) | 18 | 22 | 30 | 35 | 40 | 50 | 60 |
| G3 | 31 | 35 | 45 | 50 | 60 | 70 | 90 |
| H6 | 10 | 10 | 12 | 12 | 14 | 15 | 20 |
| K1 (JS 14) | 38 | 41 | 50 | 52 | 66 | 76 | 94 |
| K2 | 51 | 54 | 65 | 67 | 86 | 96 | 124 |
| L3 (+0,5/-0) | 8,5 | 8,5 | 10,5 | 10,5 | 11,5 | 12,5 | 17 |
| S5 | 6,6 | 6,6 | 9 | 9 | 11 | 11 | 14 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 | 110 |
| XD | 142 | 160 | 170 | 190 | 210 | 230 | 275 |
| Weight (g) | 330 | 480 | 830 | 1220 | 2100 | 3580 | 7000 |



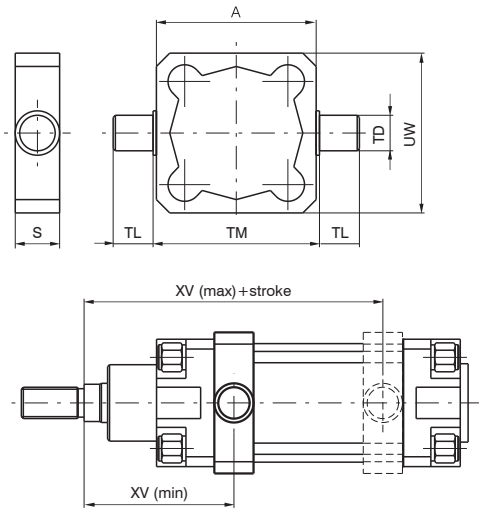
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Intermediate trunnion (Steel)

**Coding:** 1320.Ø.12F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | **125** = Ø125 |
| | **160** = Ø160 |
| | **200** = Ø200 |






Clevis to be mounted on the barrel to have the centre of rotation of the hinge pin at a point between the end caps of the cylinder. It is attached to the barrel by means of eight pointed grains that block in the "V" groove of the four protruding shapes.
In the case of anchorage subject to heavy use, it is recommended to connect the clevis once the right position has been found.
**Attention:** mounting of the clevis with contact to the end caps does not allow the use of the magnetic sensors as the switch limits.

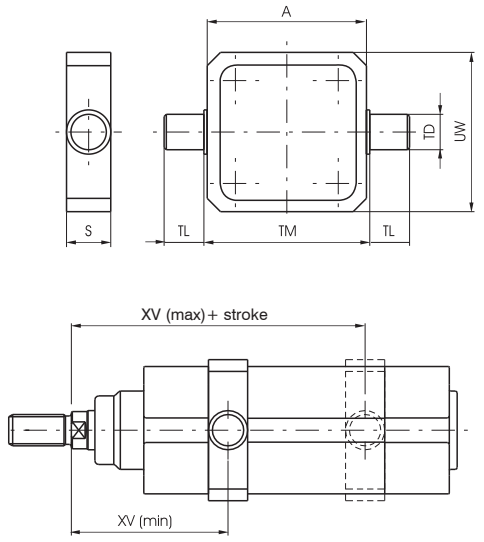
| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| A | 49 | 62 | 73 | 87 | 109 | 130 | 155 | 190 | 240 |
| S | 18 | 21 | 21 | 27 | 27 | 32 | 32 | 40 | 40 |
| TD (e9) | 12 | 16 | 16 | 20 | 20 | 25 | 25 | 32 | 32 |
| TL (h14) | 12 | 16 | 16 | 20 | 20 | 25 | 25 | 32 | 32 |
| TM (h14) | 50 | 63 | 75 | 90 | 110 | 132 | 160 | 200 | 250 |
| UW | 59 | 62 | 73 | 87 | 109 | 130 | 155 | 190 | 240 |
| XV (max.) | 85 | 96 | 102 | 109 | 123.5 | 131.5 | 162 | 193 | 204 |
| XV (min.) | 61 | 69 | 78 | 86 | 96.5 | 108.5 | 128 | 150 | 168 |
| Weight (g) | 180 | 270 | 330 | 650 | 890 | 1550 | 1950 | 3580 | 5850 |

## Intermediate trunnion (Steel)

**Coding:** 1386.Ø.12F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |






Clevis to be mounted on the barrel to have the centre of rotation of the hinge pin at a point between the end caps of the cylinder. It is attached to the barrel by means of eight pointed grains.
In the case of anchorage subject to heavy use, it is recommended to connect the clevis once the right position has been found.
**Attention:** mounting of the clevis with contact to the end caps does not allow the use of the magnetic sensors as the switch limits.

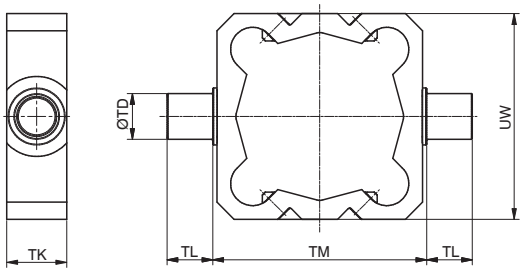
| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| A | 49.8 | 62.6 | 74.1 | 89.1 | 109.1 | 130.1 |
| S | 18 | 21 | 21 | 27 | 27 | 30 |
| TD (e 9) | 12 | 16 | 16 | 20 | 20 | 25 |
| TL (h 14) | 12 | 16 | 16 | 20 | 20 | 25 |
| TM (h 14) | 50 | 63 | 75 | 90 | 110 | 132 |
| UW | 70 | 78 | 91 | 94 | 130 | 145 |
| XV (max.) | 80 | 91.5 | 97.5 | 106.5 | 118.5 | 127 |
| XV (min.) | 66 | 73.5 | 82.5 | 88.5 | 101.5 | 113 |
| Weight (g) | 195 | 350 | 430 | 565 | 1035 | 1450 |

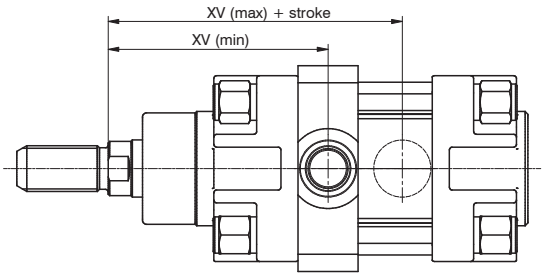
## Intermediate trunnion (Aluminium with steel bushes)

**Coding:** 1320.Ø.12BF

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |






**Aluminium Intermediate Trunnion with steel bushes** to be mounted on the barrel. This solution allows the cylinder to rotate around the hinge which can be mounted in any position between the end caps. It is attached to the barrel by means of 8 grub screws which secure the Trunnion to the extruded barrel
In the case of heavy duty applications it is recommended that the Trunnion is secured using expansion pins. In case off applications with high speed, high load and high pressure please contact our technical office.
**Attention:** mounting of the clevis with contact to the end caps does not allow the use of the magnetic sensors as the switch limits.

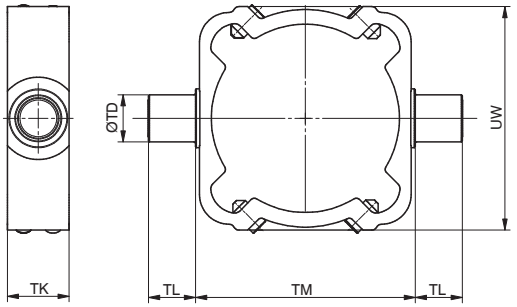
| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| TD | Ø12 | Ø16 | Ø16 | Ø20 | Ø20 | Ø25 |
| TL | 12 | 16 | 16 | 20 | 20 | 25 |
| TM | 50 | 63 | 75 | 90 | 110 | 132 |
| TK | 18 | 21 | 21 | 27 | 27 | 32 |
| UW | 54 | 60 | 72 | 87 | 109 | 130 |
| XV min. | 61 | 69 | 78 | 86 | 96.5 | 108.5 |
| XV max. | 85 | 96 | 102 | 109 | 123.5 | 131.5 |
| Weight (g) | 70 | 110 | 140 | 280 | 370 | 630 |

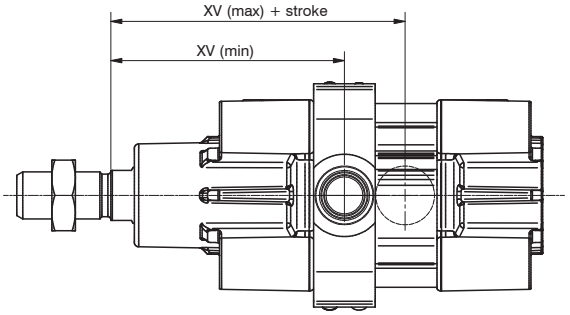
## Intermediate trunnion (Aluminium with steel bushes)

**Coding:** 1390.Ø.12F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |






**Aluminium Intermediate Trunnion with steel bushes** to be mounted on the barrel. This solution allows the cylinder to rotate around the hinge which can be mounted in any position between the end caps. It is attached to the barrel by means of 8 grub screws which secure the Trunnion to the extruded barrel
In the case of heavy duty applications it is recommended that the Trunnion is secured using expansion pins. In case off applications with high speed, high load and high pressure please contact our technical office.
**Attention:** If the Trunnion is mounted in direct contact with the cylinder end cap, it will not be possible to fit magnetic sensors at the end of stroke 1500._, RS._, HS._ series.

| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| TD | Ø12 | Ø16 | Ø16 | Ø20 | Ø20 | Ø25 |
| TL | 12 | 16 | 16 | 20 | 20 | 25 |
| TM | 53* | 63 | 75 | 90 | 110 | 132 |
| TK | 18 | 21 | 21 | 27 | 27 | 32 |
| UW | 56 | 64 | 76 | 92 | 112 | 134 |
| XV min. | 65 | 74 | 80 | 87 | 99 | 109 |
| XV max. | 81 | 91 | 100 | 108 | 121 | 130.5 |
| Weight (g) | 60 | 100 | 125 | 240 | 320 | 540 |

** Ø32, TM: not according to standard ISO 15552*





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

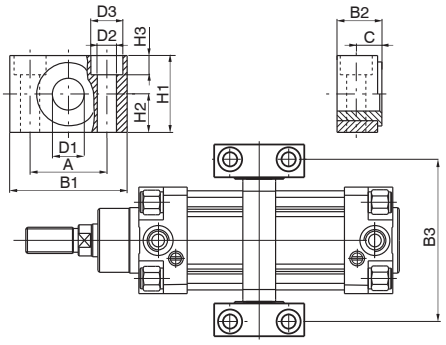
## Support for intermediate trunnion

**Coding:** 1320.Ø.12/1F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |

(1 piece)
Combining two supports to the intermediate trunnion it is possible to fix the cylinder on plane surface.






| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| A (±0.2) | 32 | 36 | 36 | 42 | 42 | 50 | 50 | 60 | 60 |
| B1 | 46 | 55 | 55 | 65 | 65 | 75 | 75 | 92 | 92 |
| B2 | 18 | 21 | 21 | 23 | 23 | 28.5 | 28.5 | 40 | 40 |
| B3 | 71 | 87 | 99 | 116 | 136 | 164 | 192 | 245 | 295 |
| C | 10.5 | 12 | 12 | 13 | 13 | 16 | 16 | 22.5 | 22.5 |
| D1 (F7) | 12 | 16 | 16 | 20 | 20 | 25 | 25 | 32 | 32 |
| D2 | 6.6 | 9 | 9 | 11 | 11 | 14 | 14 | 18 | 18 |
| D3 | 11 | 15 | 15 | 18 | 18 | 20 | 20 | 26 | 26 |
| H1 | 30 | 36 | 36 | 40 | 40 | 50 | 50 | 60 | 60 |
| H2 (±0.1) | 15 | 18 | 18 | 20 | 20 | 25 | 25 | 30 | 30 |
| H3 | 7 | 9 | 9 | 11 | 11 | 13 | 13 | 17 | 17 |
| Weight (g) (1 piece) | 100 | 150 | 150 | 235 | 235 | 435 | 435 | 850 | 850 |

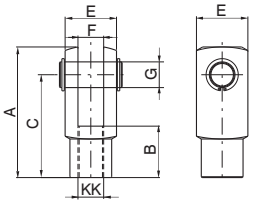
## Fork with pin

**Coding:** 1320.Ø.13F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | **125** = Ø125 |
| | **160** = Ø160 |
| | **200** = Ø200 |

Element that when screwed to the rod consents a regular functioning even when there are significant lateral forces as the connection point. Made of zincplated steel.






| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| A | 52 | 62 | 83 | 83 | 105 | 105 | 148 | 188 | 188 |
| B | 20 | 24 | 32 | 32 | 40 | 40 | 56 | 72 | 72 |
| C | 40 | 48 | 64 | 64 | 80 | 80 | 110 | 144 | 144 |
| E | 20 | 24 | 32 | 32 | 40 | 40 | 55 | 70 | 70 |
| F(B12) | 10 | 12 | 16 | 16 | 20 | 20 | 30 | 35 | 35 |
| G | 10 | 12 | 16 | 16 | 20 | 20 | 30 | 35 | 35 |
| KK | M10X1.25 | M12X1.25 | M16X1.5 | M16X1.5 | M20X1.5 | M20X1.5 | M27X2 | M36X2 | M36X2 |
| Weight (g) | 100 | 140 | 340 | 340 | 680 | 680 | 2500 | 4000 | 4000 |

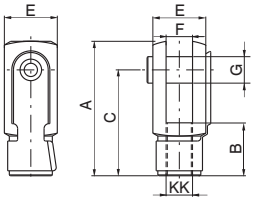
## Fork with clips

**Coding:** 1320.Ø.13/1F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |

Element that when screwed to the rod consents a regular functioning even when there are significant lateral forces as the connection point. Made of zincplated steel.






| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| A | 52 | 62 | 83 | 83 | 105 | 105 |
| B | 20 | 24 | 32 | 32 | 40 | 40 |
| C | 40 | 48 | 64 | 64 | 80 | 80 |
| E | 20 | 24 | 32 | 32 | 40 | 40 |
| F(B12) | 10 | 12 | 16 | 16 | 20 | 20 |
| G | 10 | 12 | 16 | 16 | 20 | 20 |
| KK | M10X1.25 | M12X1.25 | M16X1.5 | M16X1.5 | M20X1.5 | M20X1.5 |
| Weight (g) | 100 | 140 | 340 | 340 | 680 | 680 |

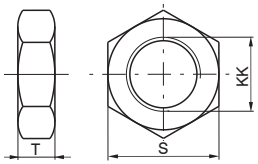
## Nuts

**Coding:** 1320.Ø.18F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | ... |
| | **200** = Ø200 |

Used to block the position of the fork.






| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| S | 17 | 19 | 24 | 24 | 30 | 30 | 41 | 55 | 55 |
| T | 6 | 7 | 8 | 8 | 9 | 9 | 12 | 18 | 18 |
| KK | M10X1.25 | M12X1.25 | M16X1.5 | M16X1.5 | M20X1.5 | M20X1.5 | M27X2 | M36X2 | M36X2 |
| Weight (g) | 15 | 20 | 20 | 20 | 40 | 40 | 100 | 210 | 210 |



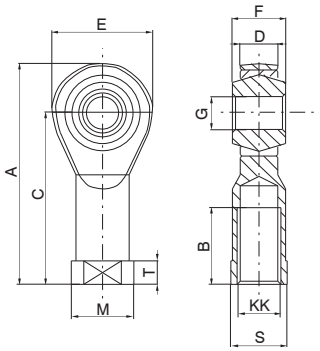
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Ball joint

**Coding:** 1320.Ø.32F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | **125** = Ø125 |
| | **160** = Ø160 |
| | **200** = Ø200 |





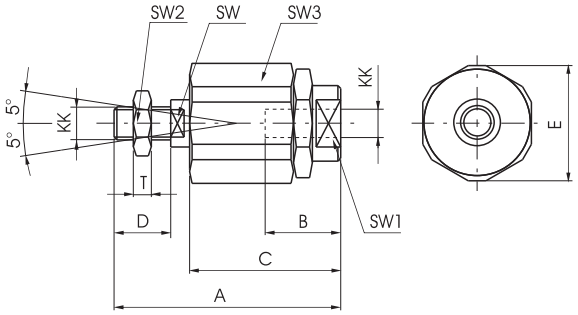

| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 |
|---|---|---|---|---|---|---|---|---|---|
| A | 57 | 66 | 85 | 85 | 102 | 102 | 145 | 165 | 165 |
| B | 20 | 22 | 28 | 28 | 33 | 33 | 51 | 56 | 56 |
| C | 43 | 50 | 64 | 64 | 77 | 77 | 110 | 125 | 125 |
| D (-0.1) | 10.5 | 12 | 15 | 15 | 18 | 18 | 25 | 28 | 28 |
| E | 28 | 32 | 42 | 42 | 50 | 50 | 70 | 80 | 80 |
| F | 14 | 16 | 21 | 21 | 25 | 25 | 37 | 43 | 43 |
| G (H7) | 10 | 12 | 16 | 16 | 20 | 20 | 30 | 35 | 35 |
| KK | M10x1.25 | M12x1.25 | M16x1.5 | M16x1.5 | M20x1.5 | M20x1.5 | M27x2 | M36x2 | M36x2 |
| M | 19 | 22 | 27 | 27 | 34 | 34 | 50 | 58 | 58 |
| S | 17 | 19 | 22 | 22 | 30 | 30 | 41 | 50 | 50 |
| T | 6.5 | 6.5 | 8 | 8 | 10 | 10 | 15 | 17 | 17 |
| Weight (g) | 76 | 110 | 220 | 220 | 410 | 410 | 1200 | 1600 | 1600 |

## Self-aligning joint

**Coding:** 1320.Ø.33F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |






| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| A | 71 | 75 | 103 | 103 | 119 | 119 |
| B | 20 | 20 | 32 | 32 | 40 | 40 |
| C | 46 | 46 | 63 | 63 | 71 | 71 |
| D | 20 | 24 | 32 | 32 | 40 | 40 |
| E | 32 | 32 | 45 | 45 | 45 | 45 |
| KK | M10x1.25 | M12x1.25 | M16x1.5 | M16x1.5 | M20x1.5 | M20x1.5 |
| SW | 12 | 12 | 20 | 20 | 20 | 20 |
| SW1 | 19 | 19 | 27 | 27 | 27 | 27 |
| SW2 | 17 | 19 | 24 | 24 | 30 | 30 |
| SW3 | 30 | 30 | 41 | 41 | 41 | 41 |
| T | 6 | 7 | 8 | 8 | 9 | 9 |
| Weight (g) | 220 | 230 | 660 | 660 | 700 | 700 |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 1315, Round tube cylinders

These cylinders are built according to ISO 15552.

**Construction characteristics**

| | |
|---|---|
| Cushion bushings | aluminium |
| Piston rod bushings | sintered bronze |
| Barrel | oxidised aluminium |
| Seals | standard: NBR Oil resistant rubber, PUR Piston rod seals |
| Pistons | aluminium |
| Piston rod | C43 chromed steel |
| End caps | aluminium alloy casting |
| Tie rods | steel with rolled threads |

**Operational characteristics**

| | |
|---|---|
| Fluid | filtered and lubricated air - hydraulic oil (with special bushing) |
| Pressure | max. 10 bar |
| Working temperature | -5 °C ... +70 °C |
| Cushioning lenght | 50 mm |

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

On request are available strokes up to: 2800 mm

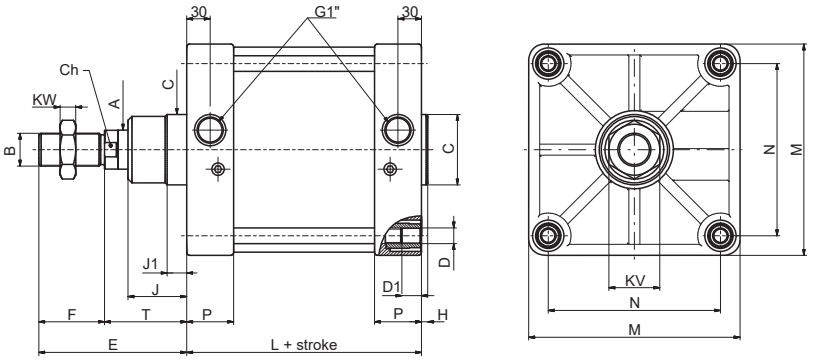
## Basic version "01"

**Coding:** 1315.Ø.stroke.01A

| | |
|---|---|
| Ø | BORE |
| | **250** = 250mm |
| | **320** = 320mm |

magnetic, aluminium barrel





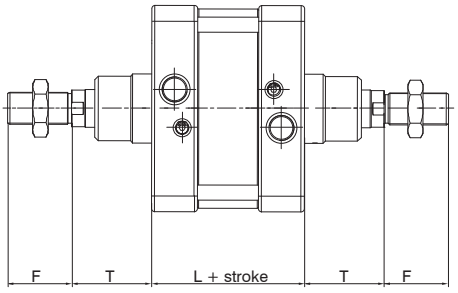

## Through rod cylinder version "02"

**Coding:** 1315.Ø.stroke.02A

| | |
|---|---|
| Ø | BORE |
| | **250** = 250mm |
| | **320** = 320mm |

magnetic, aluminium barrel






### Table of dimensions

| Bore | 250 | 320 |
|---|---|---|
| A | Ø50 | Ø63 |
| B | M42x2 | M48x2 |
| Ch | 46 | 55 |
| C | Ø90 | Ø110 |
| D | M20 | M24 |
| D1 | 25 | 28 |
| E | 189 | 216 |
| F | 84 | 96 |
| J | 75 | 90 |
| J1 | 25 | 25 |
| H | 8 | 10 |
| KW | 21 | 24 |
| KV | Es65 | Es65 |
| L | 200 | 220 |
| M | 270 | 350 |
| N | 220 | 270 |
| P | 60 | 65 |
| T | 105 | 120 |
| Weight (g) | 28.170 (increase of 380 g each 10 mm stroke) | 49.810 (increase of 616 g each 10 mm stroke) |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

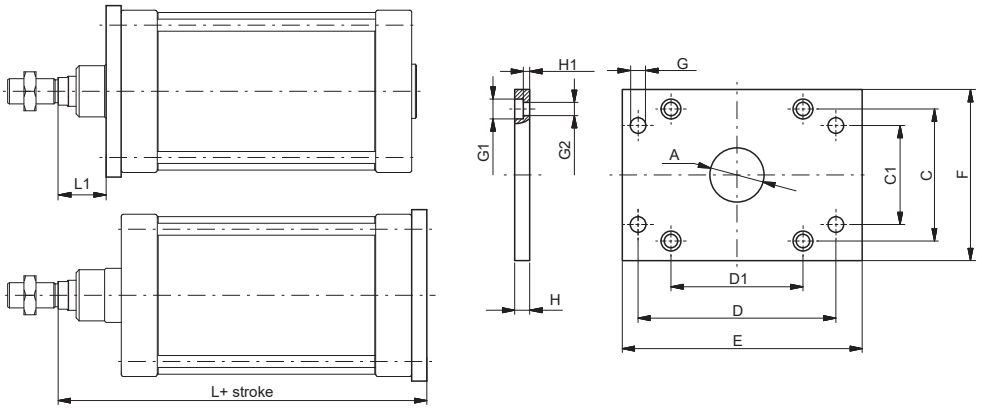
## Front and rear flanges

**Coding:** 1315.Ø.03F

| Ø | BORE |
|---|---|
| | **250** = 250mm |
| | **320** = 320mm |

Steel






| Bore | A(H11) | C | C1 (JS14) | D (JS14) | D1 | E | F | G (H13) | G1 (H13) | G2 (H13) | H (±0,2) | H1 (+0/-0,5) | L | L1 | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 250 | 90 | 220 | 165 | 330 | 220 | 400 | 285 | 26 | 33 | 22 | 25 | 10,5 | 330 | 80 | 20.150 |
| 320 | 110 | 270 | 200 | 400 | 270 | 470 | 350 | 33 | 39 | 26 | 30 | 15 | 370 | 90 | 34.000 |

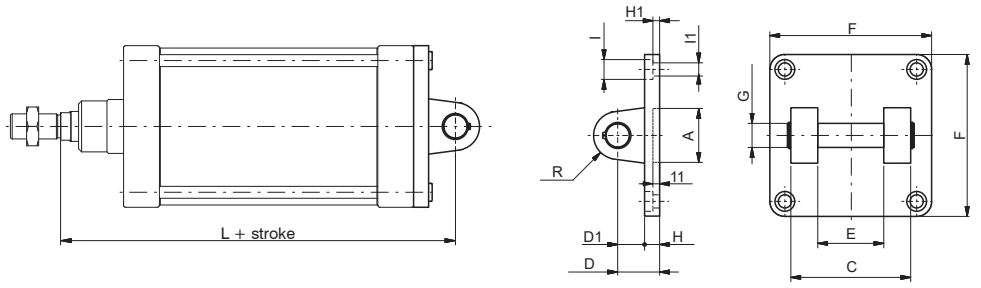
## Rear clevis

**Coding:** 1315.Ø.09F

| Ø | BORE |
|---|---|
| | **250** = 250mm |
| | **320** = 320mm |

Steel






| Bore | A | C (h14) | D (±0,2) | D1 | E (H14) | F | G (H9) | H | H1 | I | I1 | L | R | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 250 | Ø90 | 200 | 70 | 45 | 110 | 270 | 40 | 25 | 11 | 33 | 22 | 375 | 40 | 7.800 |
| 320 | Ø110 | 220 | 80 | 50 | 120 | 350 | 42,5 | 30 | 15 | 39 | 26 | 420 | 45 | 13.000 |

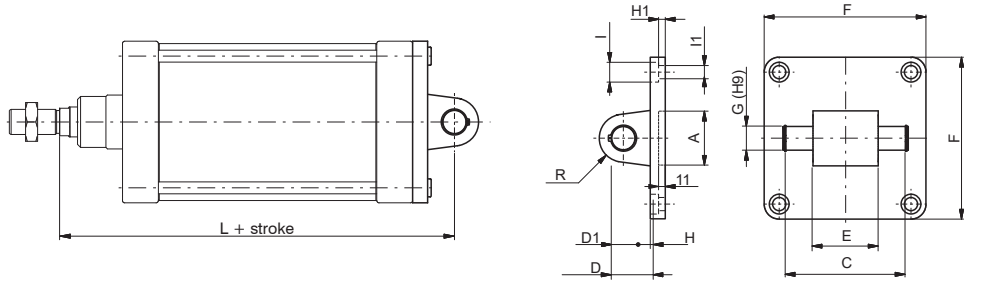
## Rear male clevis

**Coding:** 1315.Ø.09/1F

| Ø | BORE |
|---|---|
| | **250** = 250mm |
| | **320** = 320mm |

Steel






| Bore | A | C (+0,3/-0) | D (±0,2) | D1 | E (-0,5/-1,2) | F | G (H9) | H | H1 | I | I1 | L | R | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 250 | Ø90 | 202 | 70 | 45 | 110 | 270 | 40 | 25 | 11 | 33 | 22 | 375 | 40 | 8300 |
| 320 | Ø110 | 222 | 80 | 50 | 120 | 350 | 42,5 | 30 | 15 | 39 | 26 | 420 | 45 | 13060 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

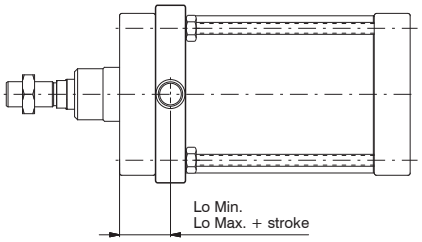
## Intermediate trunnion

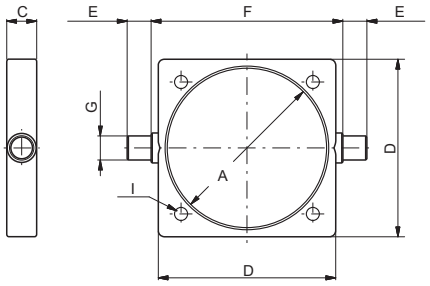
**Coding:** 1315.Ø.12F

| Ø | BORE |
|---|---|
| | **250** = 250mm |
| | **320** = 320mm |

Steel






| Bore | A | C | D | E (h14) | F (h14) | G (e9) | I | Lo Min. | Lo Max. | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|
| 250 | Ø268 | 50 | 295 | 40 | 320 | Ø40 | Ø20,25 | 85 | 115 + stroke | 10.500 |
| 320 | Ø343 | 70 | 370 | 50 | 400 | Ø50 | Ø24,25 | 95 | 125 + stroke | 25.300 |

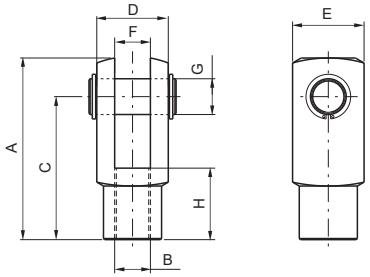
## Fork with pin

**Coding:** 1302.Ø.13F

| Ø | BORE |
|---|---|
| | **250** = 250mm |
| | **320** = 320mm |

Steel






| Bore | A | B | C | D | E | F | G | H | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|
| 250 | 188 | M42x2 (H8) | 144 | 70 | 70 | 35 (B12) | Ø35 (H9) | 72 | 3.700 |
| 320 | 265 | M48x2 | 192 | 96 | 96 | 50 | Ø50 | 96 | 9.700 |

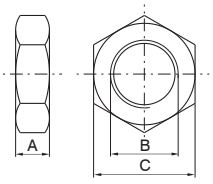
## Rod lock nut

**Coding:** 1302.Ø.18F

| Ø | BORE |
|---|---|
| | **250** = 250mm |
| | **320** = 320mm |

Steel






| Bore | A | B | C | Weight (g) |
|---|---|---|---|---|
| 250 | 21 | M42x2 | 65 | 260 |
| 320 | 24 | M48x2 | 72 | 580 |

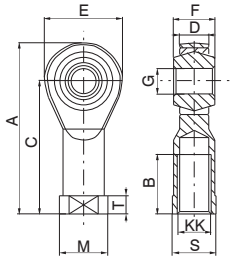
## Ball joint

**Coding:** 1302.Ø.32F

| Ø | BORE |
|---|---|
| | **250** = 250mm |
| | **320** = 320mm |

Steel






| Bore | A | B | C | D (-0.1) | E | F | G (H 7) | KK | M | S | T | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 250 | 187 | 60 | 142 | 33 | 91 | 49 | 40 | M42x2 | 65 | 55 | 19 | 2.400 |
| 320 | 218 | 65 | 162 | 45 | 117 | 60 | 50 | M48x2 | 75 | 65 | 23 | 5.000 |

## Sensor bracket - codes 1500._,RS._,HS._

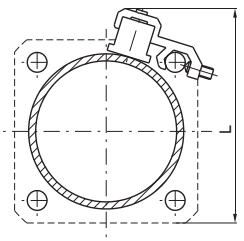
**Coding:** 1306.Ⓣ

| Ⓣ | TYPE |
|---|---|
| | **D** = 250 mm |
| | **E** = 320 mm |

**Sensor for microbore cylinders**

For technical characteristics and ordering codes see the "Magnetic sensors" sections






| Bore | L |
|---|---|
| 250 | 250 |
| 320 | 365 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series Steel line - AISI 316

The 1393-1394 stainless steel ISO 15552 cylinders series are designed for corrosion resistance application such as marine, pharmaceutical and food ambiences.
The pre lubrication grease used is NSF H1 certified for food application.
Specific care has been taken during the design stages and the result is a clean profile cylinder easy to clean and free from possible residue build-up areas.
All parts in contact with the external environment are in Stainless steel 316L and the seals are available in two different compounds for different temperature applications:
PUR -30°C ... +80°C FPM -5°C ... +150°C.
The range starts from 32 bore up to 100 bore , round barrel and tie rods design. Double acting version standard or with through rod, magnetic or not magnetic piston available.
The piston is aluminium and the sensor bracket, when required is in stainless steel 316.
The cylinder can be fixed via the threaded holes in the tie rod nuts or with the wide range of stainless steel accessories.

### Construction characteristics

| | |
|---|---|
| Piston rod bushings | Stainless steel AISI 316 with P.T.F.E. coat |
| Barrel | Stainless steel AISI 316 |
| Lubricating grease | NSF-H1 certified grease for incidental contact with food |
| Seals | PUR or FPM on request |
| Half-pistons | Aluminium |
| Piston rod | Stainless steel AISI 316 |
| End caps | Stainless steel AISI 316 |
| Cushion screws | Stainless steel AISI 316 |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered and preferably lubricated air or not (if lubricated the lubrication must be continuous) |
| Pressure | 10 bar |
| Working temperature | -30° C ... +80°C with PUR seals<br>-5° C ... +150°C with FPM seals and non magnetic piston<br>-5° C ... +80°C with FPM seals and magnetic piston |

### Cushioning lengths

| Bore | Ø | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|
| Cushioning lenght | mm | 20 | 20 | 22 | 22 | 32 | 32 |

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**

### Standard strokes (for all diameters)

from 0 to 150, every 25 mm
from 150 to 500, every 50 mm
from 500 to 1000, every 100 mm
On request are available strokes up to: 2800 mm

### Stroke tolerance (ISO 15552)

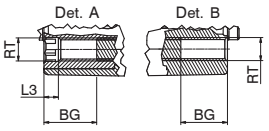
| Bore | Stroke | Tolerance |
|---|---|---|
| 32-40-50 | up to 500 mm | +2<br>0 |
| | over 500 up to 1000 | +3,2<br>0 |
| 63-80-100 | up to 500 mm | +2,5<br>0 |
| | over 500 up to 1000 | +4<br>0 |

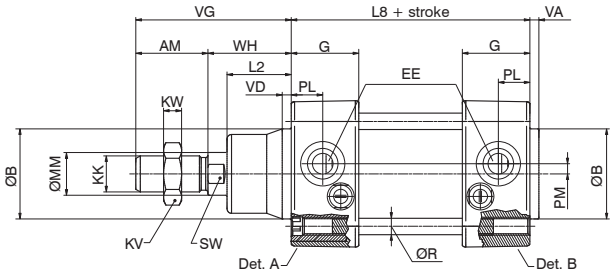
## Basic version "01"

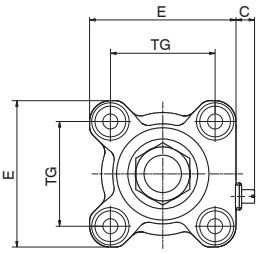
**Coding:** 13Ⓥ.Ø.stroke.01Ⓖ

| | |
|---|---|
| Ⓥ | VERSION |
| | **93** = Magnetic |
| | **94** = Non magnetic |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| Ⓖ | SEALS |
| | = PUR |
| | **V** = FPM |





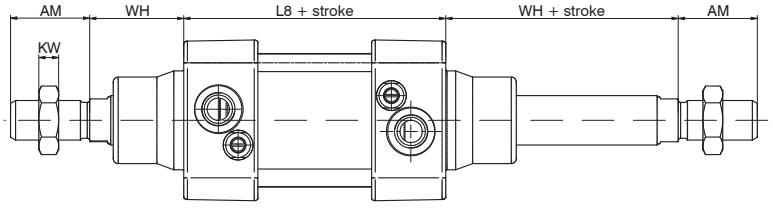




## Through rod cylinder version "02"

**Coding:** 13Ⓥ.Ø.stroke.02Ⓖ

| | |
|---|---|
| Ⓥ | VERSION |
| | **93** = Magnetic |
| | **94** = Non magnetic |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| Ⓖ | SEALS |
| | = PUR |
| | **V** = FPM |





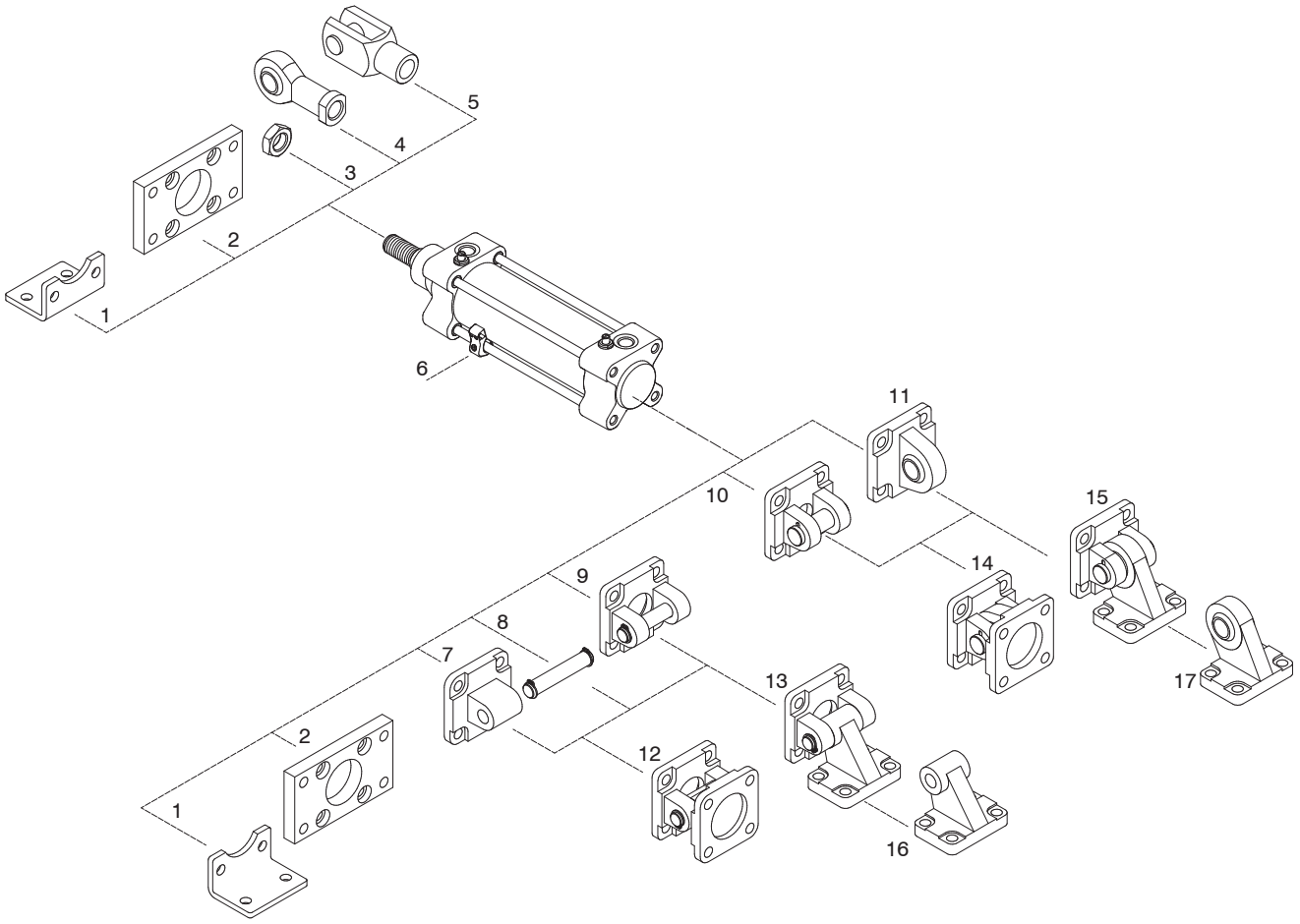

### Table of dimensions

| Bore | | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|
| AM | | 22 | 24 | 32 | 32 | 40 | 40 |
| ØB (d 11) | | 30 | 35 | 40 | 45 | 45 | 55 |
| BG min. | | 16 | 16 | 16 | 16 | 18 | 17 |
| C min. | | 4 | 4 | 4 | 4 | 3,5 | 3,5 |
| C max. | | 7.5 | 7,5 | 8,5 | 8,5 | 9 | 9 |
| E | | 47 | 52 | 65 | 76 | 95 | 113 |
| EE | | G1/8" | G1/4" | G1/4" | G3/8" | G3/8" | G1/2" |
| G | | 29 | 31 | 30 | 34 | 36 | 40,5 |
| KK | | M10X1,25 | M12X1,25 | M16X1,5 | M16X1,5 | M20x1,5 | M20X1,5 |
| KV | | 17 | 19 | 24 | 24 | 30 | 30 |
| KW | | 16 | 7 | 8 | 8 | 9 | 9 |
| L2 | | 20 | 22 | 28,5 | 29 | 35 | 36 |
| L3 | | 4,5 | 4,5 | 5 | 5 | 6 | 6 |
| L8 | | 94 | 105 | 106 | 121 | 128 | 138 |
| ØMM | | 12 | 16 | 20 | 20 | 25 | 25 |
| PL | | 13 | 14 | 14 | 16 | 16 | 18 |
| PM | | 3 | 3,5 | 4,5 | 7 | 8 | 8 |
| ØR | | Ø5,2 | Ø5,2 | Ø7,1 | Ø7,1 | Ø8,9 | Ø8,9 |
| RT | | M6 | M6 | M8 | M8 | M10 | M10 |
| SW | | 10 | 13 | 17 | 17 | 22 | 22 |
| TG | | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| VA | | 4 | 4 | 4 | 4 | 4 | 4 |
| VD | | 4 | 4 | 4 | 4 | 4 | 4 |
| VG | | 48 | 54 | 69 | 69 | 86 | 91 |
| WH | | 26 | 30 | 37 | 37 | 46 | 51 |
| Weight g | Stroke 0 | 1000 | 1430 | 2150 | 3000 | 4400 | 6400 |
| | every 10 mm | 35 | 45 | 63 | 80 | 120 | 135 |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice




| Position | Description | Coding | Materials |
|---|---|---|---|
| 1 | Short mounting foot brackets (MS1) | 1393.Ø.05/1F | Stainless steel AISI 316 |
| 2 | Front and rear flanges (MF1 - MF2) | 1393.Ø.03F | Stainless steel AISI 316 |
| 3 | Nuts | 1393.Ø.18F | Stainless steel AISI 316 |
| 4 | Ball joint | 1393.Ø.32F | Stainless steel |
| 5 | Fork | 1393.Ø.13F | Stainless steel |
| 6 | Sensor brackets codes - 1580._,MRS._,MHS | 1393._ | Stainless steel AISI 316 |
| 7 | Rear male clevis (MP4) | 1393.Ø.09/1F | Stainless steel AISI 316 |
| 8 | Pin with circlips for rear clevis (MP4 and MP2) (pos. 9) | 1393.Ø.37F | Stainless steel AISI 316 |
| 9 | Rear female clevis (MP2) | 1393.Ø.09F | Stainless steel AISI 316 |
| 10 | Rear narrow clevis | 1393.Ø.30F | Stainless steel AISI 316 |
| 11 | Rear male clevis (with jointed head according to DIN 648K standard) | 1393.Ø.15F | Stainless steel AISI 316 |
| 12 | Standard complete trunnion (pos. 7 + pos. 9) | 1393.Ø.22F | Stainless steel AISI 316 |
| 13 | Square angle trunnion (AB7) (pos. 9 + pos. 16) | 1393.Ø.35F | Stainless steel AISI 316 |
| 14 | Complete square angle trunnion (with joined head according to DIN 648K standards) (pos. 10 + pos. 11) | 1393.Ø.36F | Stainless steel AISI 316 |
| 15 | Complete square angle trunnion (with joined head according to DIN 648K standards) (pos. 10 + pos. 17) | 1393.Ø.27F | Stainless steel AISI 316 |
| 16 | Simple square counter clevis (AB7) (pos. 13) | 1393.Ø.11/2F | Stainless steel AISI 316 |
| 17 | Simple square counter clevis (pos. 15) | 1393.Ø.28F | Stainless steel AISI 316 |

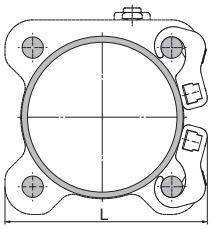
## Sensor brackets codes - 1580._,MRS._,MHS

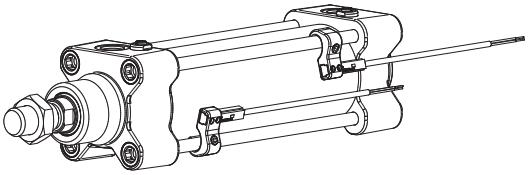
**Coding:** 1393.Ⓣ

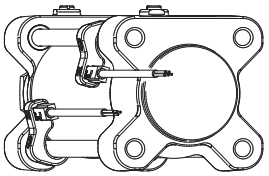
| Ⓣ | TYPE |
|---|---|
| | **A** = Ø32-Ø40 |
| | **B** = Ø50-Ø63 |
| | **C** = Ø80-Ø100 |

Fixing bracket made of stainless steel AISI 316 for sensor mounting on cylinders.







To mount the brackets on the tie rods use the dedicated stainless steel grub screw

| Bore | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|
| L | 51 | 57 | 67 | 79 | 98 | 115 |

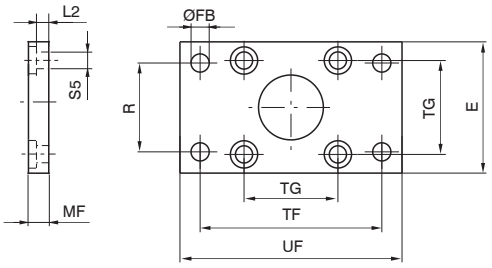
## Front and rear flanges (MF1 - MF2)

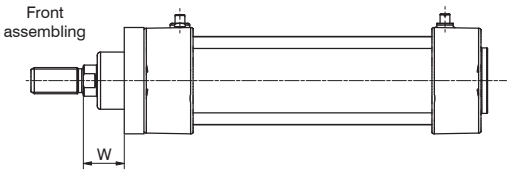
**Coding:** 1393.Ø.03F

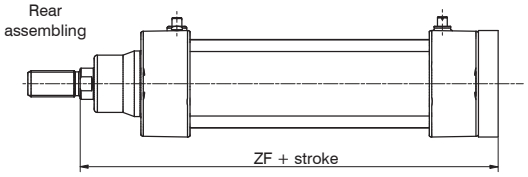
| Ø | BORE |
|---|---|
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |

Plate in stainless steel AISI 316 which allows anchorage of the cylinder at a right angle to the plane.






| Bore | E | ØFB (H 13) | MF (JS 14) | R (JS 14) | TF (JS 14) | TG | UF | ZF | W | L2 | ØS5 | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | 45 | 7 | 10 | 32 | 64 | 32,5 | 80 | 130 | 16 | 5 | 6,6 | 190 |
| 40 | 52 | 9 | 10 | 36 | 72 | 38 | 90 | 145 | 20 | 5 | 6,6 | 250 |
| 50 | 65 | 9 | 12 | 45 | 90 | 46,5 | 110 | 155 | 25 | 6,5 | 9 | 480 |
| 63 | 75 | 9 | 12 | 50 | 100 | 56,5 | 120 | 170 | 25 | 6,5 | 9 | 620 |
| 80 | 95 | 12 | 15 | 63 | 126 | 72 | 150 | 189 | 31 | 7 | 11 | 1430 |
| 100 | 115 | 14 | 15 | 75 | 150 | 89 | 170 | 204 | 36 | 7 | 11 | 1990 |

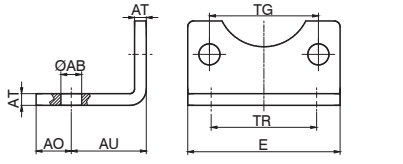
## Short mounting foot brackets (MS1)

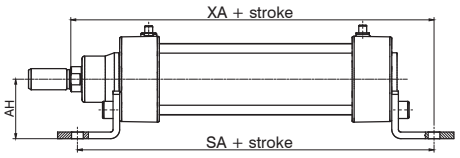
**Coding:** 1393.Ø.05/1F

| Ø | BORE |
|---|---|
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |

Elements used to anchor the cylinder parallel to the mounting plane.
Made of stainless steel AISI 316.






| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| ØAB (H 14) | 7 | 9 | 9 | 9 | 12 | 14 |
| AH | 32 | 36 | 45 | 50 | 63 | 71 |
| AU (± 0.2) | 24 | 28 | 32 | 32 | 41 | 41 |
| AO | 11 | 8 | 15 | 13 | 14 | 16 |
| E | 45 | 52 | 65 | 75 | 95 | 115 |
| AT | 4 | 4 | 5 | 5 | 6 | 6 |
| SA | 142 | 161 | 170 | 185 | 210 | 220 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| TR (JS 14) | 32 | 36 | 45 | 50 | 63 | 75 |
| XA | 144 | 163 | 175 | 190 | 215 | 230 |
| Weight (g) | 60 | 70 | 160 | 180 | 370 | 430 |



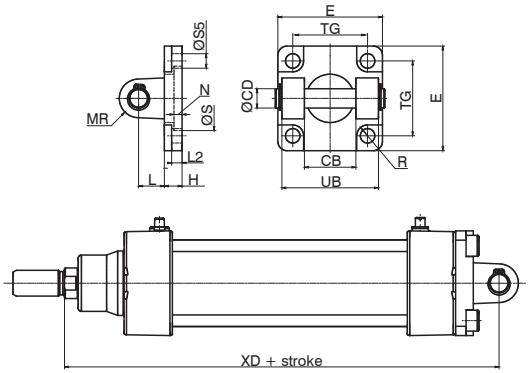
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Rear clevis (MP2)

**Coding:** 1393.Ø.09F

| Ø | BORE |
|---|---|
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |






This type of mounting allows anchorage of the cylinder either parallel or right angle to plane; the cylinder rod can oscillate and self-align as necessary when under load.Made of stainless steel AISI 316.

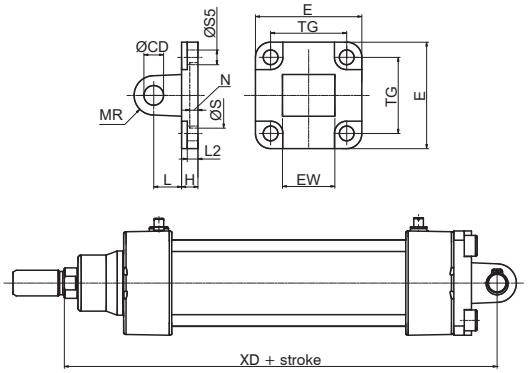
| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| CB (H 14) | 26 | 28 | 32 | 40 | 50 | 60 |
| ØCD | 10 | 12 | 12 | 16 | 16 | 20 |
| E | 45 | 55 | 65 | 75 | 95 | 115 |
| ØS (H11) | 30 | 35 | 40 | 45 | 45 | 55 |
| N | 5 | 5 | 5 | 5 | / | / |
| R (H13) | 5,5 | 5,5 | 7,5 | 7,5 | 9 | 9 |
| H | 10 | 10 | 10 | 12 | 14 | 16 |
| L | 12 | 15 | 17 | 20 | 22 | 25 |
| MR | 10 | 12 | 12 | 16 | 16 | 20 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| UB (h14) | 45 | 52 | 60 | 70 | 90 | 110 |
| XD | 142 | 160 | 170 | 190 | 210 | 230 |
| L2 (±0,5) | 5,5 | 5,5 | 6,5 | 6,5 | 10 | 10 |
| S5 (H13) | 6,6 | 6,6 | 9 | 9 | 11 | 11 |
| Weight (g) | 140 | 230 | 370 | 540 | 1000 | 1700 |

## Rear male clevis (MP4)

**Coding:** 1393.Ø.09/1F

| Ø | BORE |
|---|---|
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |






Similar to 09 clevis except for the connection, which is male rather than female.
Used to mount the cylinder either parallel or at a right angle to the plane; the cylinder rod can oscillate and self-align as necessary when under load.
Made of stainless steel AISI 316.

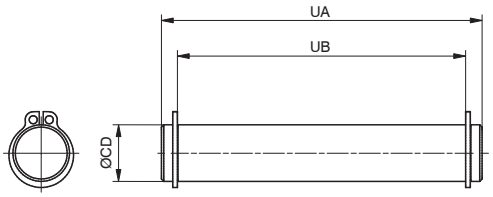
| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| CD (H 9) | 10 | 12 | 12 | 16 | 16 | 20 |
| E | 45 | 55 | 65 | 75 | 95 | 115 |
| EW (-0,2/-0,6) | 26 | 28 | 32 | 40 | 50 | 60 |
| H | 10 | 10 | 10 | 12 | 14 | 16 |
| L | 12 | 15 | 17 | 20 | 22 | 25 |
| ØS (H11) | 30 | 35 | 40 | 45 | 45 | 55 |
| N | 5 | 5 | 5 | 5 | / | / |
| R (H13) | 5,5 | 5,5 | 7,5 | 7,5 | 9 | 9 |
| MR | 10 | 12 | 12 | 16 | 16 | 20 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| XD | 142 | 160 | 170 | 190 | 210 | 230 |
| L2 (±0,5) | 5,5 | 5,5 | 6,5 | 6,5 | 10 | 10 |
| S5 (H13) | 6,6 | 6,6 | 9 | 9 | 11 | 11 |
| Weight (g) | 180 | 280 | 370 | 680 | 1200 | 2100 |

## Pin with circlips for rear clevis (MP4 and MP2)

**Coding:** 1393.Ø.37F

| Ø | BORE |
|---|---|
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |






Stainless steel AISI 316 pin, complete with stainless steel circlips, which can be used with clevis code 1393.Ø.09/1F and 1393.Ø.09F

| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| CD (e8) | 10 | 12 | 12 | 16 | 16 | 20 |
| UA | 53 | 60 | 68 | 78 | 98 | 118 |
| UB (-0,5/-0) | 46 | 53 | 61 | 71 | 91 | 111 |
| Weight (g) | 35 | 50 | 60 | 120 | 150 | 290 |

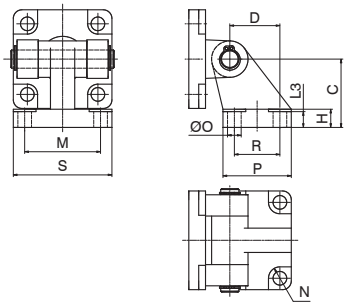
## Square angle trunnion (AB7)

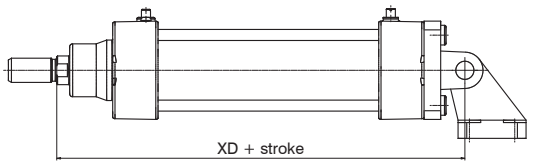
**Coding:** 1393.Ø.35F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |

**Counter clevis**
can be ordered separately with code:
1393.Ø.11/2F






Made of stainless steel AISI 316

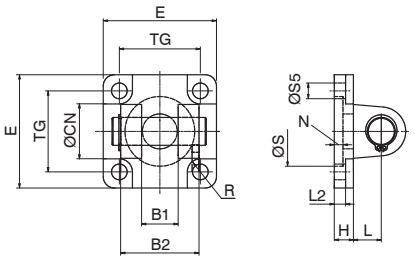
| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| D (JS 15) | 21 | 24 | 33 | 37 | 47 | 55 |
| C (JS 15) | 32 | 36 | 45 | 50 | 63 | 71 |
| H | 8 | 10 | 12 | 12 | 14 | 15 |
| N (H 13) | 5,5 | 5,5 | 7,5 | 7,5 | 9 | 9 |
| L3 | 6,5 | 8,5 | 10,5 | 10,5 | 11,5 | 12,5 |
| R (JS 14) | 18 | 22 | 30 | 35 | 40 | 50 |
| P | 31 | 35 | 45 | 50 | 60 | 70 |
| O (H 13) | 6,6 | 6,6 | 9 | 9 | 11 | 11 |
| S | 51 | 54 | 65 | 67 | 86 | 96 |
| M (JS 14) | 38 | 41 | 50 | 52 | 66 | 76 |
| XD | 142 | 160 | 170 | 190 | 210 | 230 |
| Weight (g) | 330 | 520 | 810 | 1200 | 2200 | 4710 |

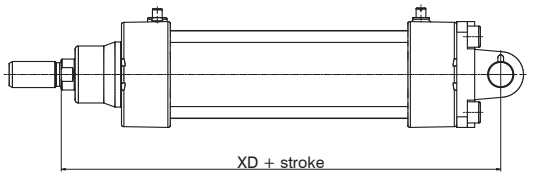
## Rear narrow clevis

**Coding:** 1393.Ø.30F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |






| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| B1 (H 14) | 14 | 16 | 21 | 21 | 25 | 25 |
| B2 (h 14) | 34 | 40 | 45 | 51 | 65 | 75 |
| ØCN | 10 | 12 | 16 | 16 | 20 | 20 |
| E | 45 | 55 | 65 | 75 | 95 | 115 |
| H | 10 | 10 | 10 | 12 | 14 | 16 |
| L | 12 | 15 | 17 | 20 | 22 | 25 |
| L2 (±0,5) | 5,5 | 5,5 | 6,5 | 6,5 | 10 | 10 |
| S5 (H 13) | 6,6 | 6,6 | 9 | 9 | 11 | 11 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| XD | 142 | 160 | 170 | 190 | 210 | 230 |
| ØS (H 12) | 30 | 35 | 40 | 45 | 45 | 55 |
| R (H 13) | 5,5 | 5,5 | 7,5 | 7,5 | 9 | 9 |
| N | 5 | 5 | 5 | 5 | 5 | 5 |
| Weight (g) | 170 | 270 | 420 | 650 | 1380 | 2050 |




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

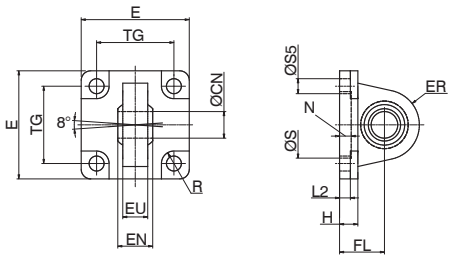
## Rear male clevis (with jointed head according to DIN 648K standard)

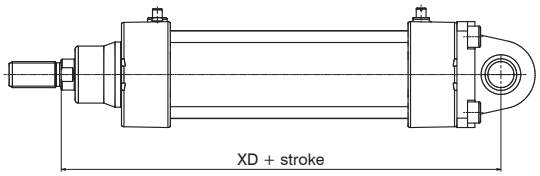
**Coding:** 1393.Ø.15F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |

Made of stainless steel AISI 316






| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| ØCN (H 7) | 10 | 12 | 16 | 16 | 20 | 20 |
| E | 45 | 55 | 65 | 75 | 95 | 115 |
| EN (-0.1) | 14 | 16 | 21 | 21 | 25 | 25 |
| ER | 15 | 18 | 20 | 23 | 27 | 30 |
| EU | 10,5 | 12 | 15 | 15 | 18 | 18 |
| FL (JS 15) | 22 | 25 | 27 | 32 | 36 | 41 |
| H | 10 | 10 | 10 | 12 | 14 | 16 |
| L2 | 5,5 | 5,5 | 6,5 | 6,5 | 10 | 10 |
| S5 (H 13) | 6,6 | 6,6 | 9 | 9 | 11 | 11 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| XD | 142 | 160 | 170 | 190 | 210 | 230 |
| ØS (H 11) | 30 | 35 | 40 | 45 | 45 | 55 |
| R (H 13) | 5,5 | 5,5 | 7,5 | 7,5 | 9 | 9 |
| N | 5 | 5 | 5 | 5 | 5 | 5 |
| Weight (g) | 150 | 260 | 370 | 600 | 1130 | 1800 |

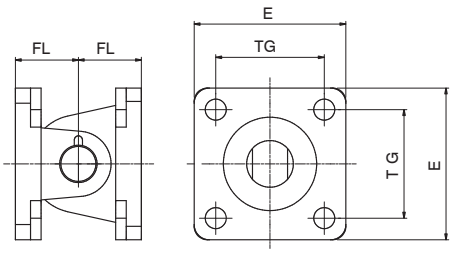
## Complete standard trunnion (with joined head according to DIN 648K standards)

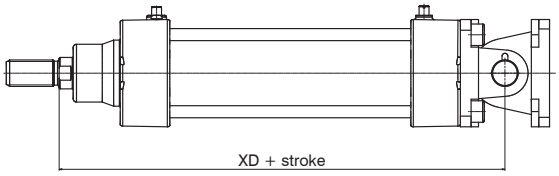
**Coding:** 1393.Ø.36F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |

Made of stainless steel AISI 316






| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| E | 45 | 55 | 65 | 75 | 95 | 115 |
| FL (JS 15) | 22 | 25 | 27 | 32 | 36 | 41 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| XD | 142 | 160 | 170 | 190 | 210 | 230 |
| Weight (g) | 320 | 530 | 790 | 1250 | 2510 | 3850 |

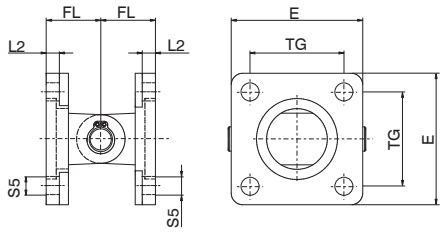
## Standard complete trunnion

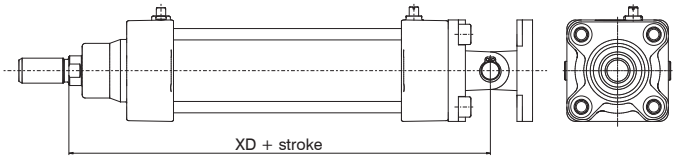
**Coding:** 1393.Ø.22F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |

Made of stainless steel AISI 316






| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| E | 45 | 55 | 65 | 75 | 95 | 115 |
| FL | 22 | 25 | 27 | 32 | 36 | 41 |
| L 2 (±0,5) | 5,5 | 5,5 | 6,5 | 6,5 | 10 | 10 |
| S 5 | 6,6 | 6,6 | 9 | 9 | 11 | 11 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| XD | 142 | 160 | 170 | 190 | 210 | 230 |
| Weight (g) | 360 | 580 | 780 | 1370 | 2370 | 4110 |

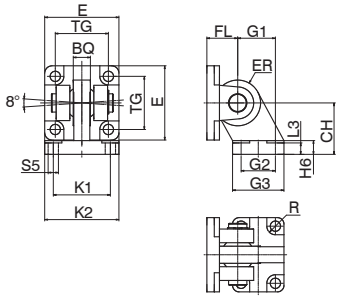
## Complete square angle trunnion (with joined head according to DIN 648K standards)

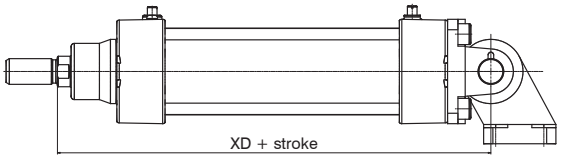
**Coding:** 1393.Ø.27F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |

**Counter clevis**
can be ordered separately with code:
1393.Ø.28F






| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| CH (JS 15) | 32 | 36 | 45 | 50 | 63 | 71 |
| E | 45 | 55 | 65 | 75 | 95 | 115 |
| FL | 22 | 25 | 27 | 32 | 36 | 41 |
| G1 (JS 15) | 21 | 24 | 33 | 37 | 47 | 55 |
| G2 (JS 14) | 18 | 22 | 30 | 35 | 40 | 50 |
| G3 | 31 | 35 | 45 | 50 | 60 | 70 |
| H6 | 10 | 10 | 12 | 12 | 14 | 15 |
| K1 (JS 14) | 38 | 41 | 50 | 52 | 66 | 76 |
| K2 | 51 | 54 | 65 | 67 | 86 | 96 |
| L3 (+0,5/-0) | 8,5 | 8,5 | 10,5 | 10,5 | 11,5 | 12,5 |
| S5 (H13) | 6,6 | 6,6 | 9 | 9 | 11 | 11 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| XD | 142 | 160 | 170 | 190 | 210 | 230 |
| BQ | 10,5 | 12 | 15 | 15 | 18 | 18 |
| ER | 15 | 18 | 20 | 23 | 27 | 30 |
| R (H 13) | 5,5 | 5,5 | 7,5 | 7,5 | 9 | 9 |
| Weight (g) | 350 | 540 | 880 | 1200 | 2350 | 3380 |

Made of stainless steel AISI 316



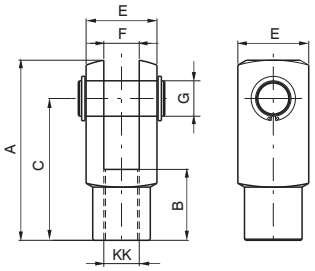

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Fork with pin

**Coding:** 1393.Ø.13F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |






| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| A | 52 | 62 | 83 | 83 | 105 | 105 |
| B | 20 | 24 | 32 | 32 | 40 | 40 |
| C | 40 | 48 | 64 | 64 | 80 | 80 |
| E | 20 | 24 | 32 | 32 | 40 | 40 |
| F(B12) | 10 | 12 | 16 | 16 | 20 | 20 |
| G | 10 | 12 | 16 | 16 | 20 | 20 |
| KK | M10X1.25 | M12X1.25 | M16X1.5 | M16X1.5 | M20X1.5 | M20X1.5 |
| Weight (g) | 100 | 140 | 340 | 340 | 680 | 680 |

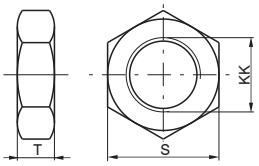
Element that when screwed to the rod consents a regular functioning even when there are significant lateral forces as the connection point.Made of stainless steel AISI 303.

## Nuts

**Coding:** 1393.Ø.18F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |






| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| S | 17 | 19 | 24 | 24 | 30 | 30 |
| T | 6 | 7 | 8 | 8 | 9 | 9 |
| KK | M10X1.25 | M12X1.25 | M16X1.5 | M16X1.5 | M20X1.5 | M20X1.5 |
| Weight (g) | 15 | 20 | 20 | 20 | 40 | 40 |

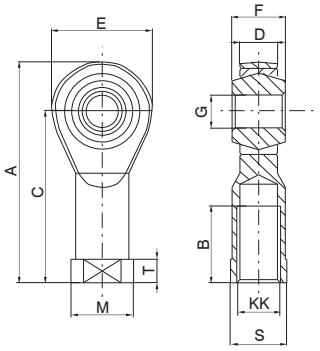
Used to block the position of the fork.Made of stainless steel AISI 316.

## Ball joint

**Coding:** 1393.Ø.32F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |






| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| A | 57 | 66 | 85 | 85 | 102 | 102 |
| B | 20 | 22 | 28 | 28 | 33 | 33 |
| C | 43 | 50 | 64 | 64 | 77 | 77 |
| D | 10,5 | 12 | 15 | 15 | 18 | 18 |
| E | 28 | 32 | 42 | 42 | 50 | 50 |
| F | 14 | 16 | 21 | 21 | 25 | 25 |
| G (H 7) | 10 | 12 | 16 | 16 | 20 | 20 |
| KK | M10x1,25 | M12x1,25 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 |
| M | 19 | 22 | 27 | 27 | 34 | 34 |
| S | 17 | 19 | 22 | 22 | 30 | 30 |
| T | 6,5 | 6,5 | 8 | 8 | 10 | 10 |
| Weight (g) | 75 | 110 | 220 | 220 | 410 | 410 |

Mounted on the rod thread, assures a regular operation even in the presence of significant forces to the linked element.Made of stainless steel AISI 304 and 420.

## Series 1450 - 1463 - Ø50 - Ø63

Pneumatic cylinder ISO 15552 handling and controlling movement by means of internal hydraulic circuit. All ISO fixing devices can be used except for:
- Cylinder Ø63 front clevis code 1463.63.08F
- Cylinder Ø63 front flange code 1463.63.03F
- Cylinder Ø63 foot code 1463.63.05/1F

### Coding

14_.stroke._._ . _

Ø50
Ø63

**Regulation**
A = Regulation on extraction
B = Regulation on compression
D = Double regulation

**STOP function**
0 = None
A = Stop N.C. extraction
B = Stop N.C. compression
C = Double Stop N.C.
D = Stop N.O. extraction
E = Stop N.O. compression
F = Double Stop N.O.

**SKIP function**
0 = None
A = Skip N.C. extraction
B = Skip N.C. compression
C = Double Skip N.C.
D = Skip N.O. extraction
E = Skip N.O. compression
F = Double Skip N.O.

### Construction characteristics

| | |
|---|---|
| Barrel | aluminium alloy anodised |
| Hydraulic piston seal (hydraulic side) | PUR |
| Pneumatic piston seal (pneumatic side) | oil resistant NBR rubber |
| Rod and cushion seal | PUR |
| Magnetic piston | aluminium |
| Oil tank | aluminium |
| Piston rod | steel tube externally chrome plated |
| End caps | aluminium black anodised |
| Cushion adjustment screws | nickel plated steel |

### Operational characteristics

| | |
|---|---|
| Pneumatic media | filtered and lubricated air |
| Hydraulic media | filtered 1$\mu$ hydraulic oil |
| SKIP & STOP valve minimum operating pressure | 3 bar |
| Max. pressure | 8 bar |
| Environment temperature | -5 °C ... +70 °C |
| Minimum regulated speed | 40 mm/min. * |
| Maximum regulated speed | 6000 mm/min. * |
| Speed with SKIP | 150 mm/sec. * |
| Free speed (without regulation) | 300 mm/sec. * |
| Cushioning lenght | 20 mm |
| Standard stroke | from 50 to 450 steps 50 mm** |
| Possibility of rear regulation (on request) | |

*** Attenction:** speed recorded with cylinder on horizontal position fed at 8 bar without load on piston rod.
** Strokes exceeding 450 mm (up to max. 750 mm) are only available after technical evaluation.

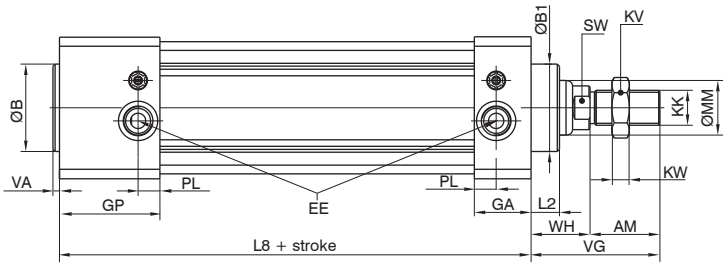
| Bore | Force (N) | Pressure (bar) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 50 | Out | 181,4 | 362,9 | 544,3 | 725,7 | 907,2 | 1088,6 | 1270 | 1451,5 | 1632,9 | 1814,3 |
| | In | 144,4 | 288,8 | 433,2 | 577,6 | 722 | 866,3 | 1010,7 | 1155,1 | 1299,5 | 1443,9 |
| 63 | Out | 294,6 | 589,1 | 883,7 | 1178,2 | 1472,8 | 1767,3 | 2061,9 | 2356,5 | 2651 | 2945,6 |
| | In | 211,3 | 422,6 | 633,9 | 845,2 | 1056,6 | 1267,9 | 1479,2 | 1690,5 | 1901,8 | 2113,1 |

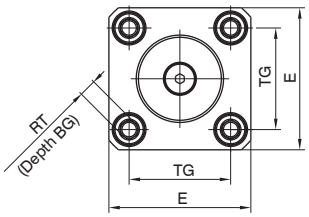



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Base cylinder dimensions



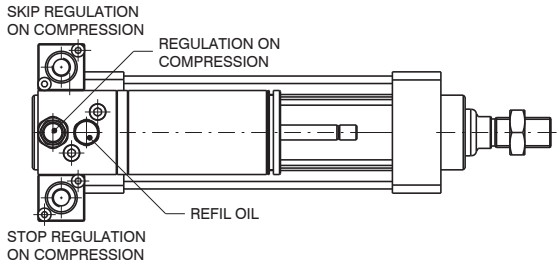


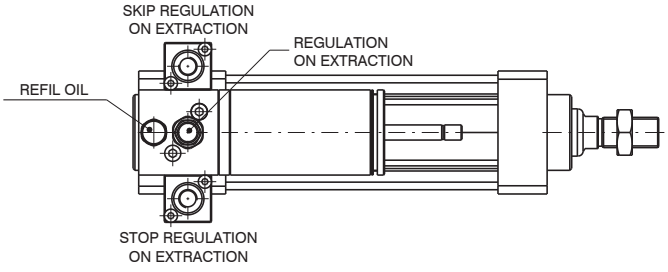

| Bore | AM | B (d 11) | BG | E | EE | GA | GP | KK | KV | KW | L2 | L8 | MM | PL | RT | SW | TG | VA | VG | WH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 32 | 40 | 16 | 65 | G1/4" | 26 | 46 | M16x1,5 | 24 | 8 | 13 | 116 | 25 | 10 | M8 | 17 | 46.5 | 3 | 59 | 27 |
| 63 | | 50 | | 75 | G3/8" | | | | | | 20 | 121 | 35 | 12 | | | 56.5 | 4 | 69 | 37 |

## Function valves and regulators position for the different versions

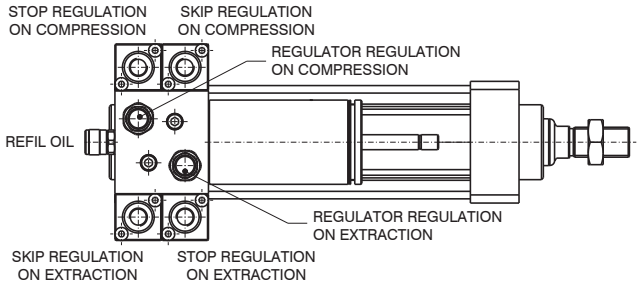
### Compression



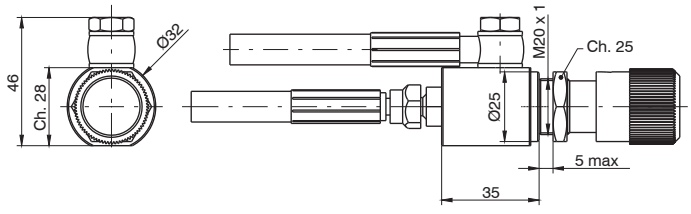

### Extraction



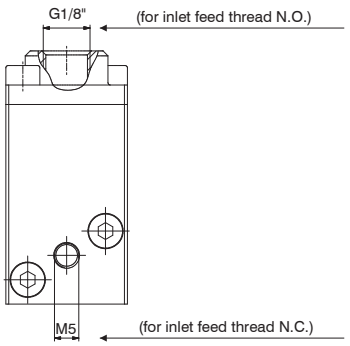

### Double regulation




## Rear regulator dimensions




## SKIP and STOP valves inlet feed position

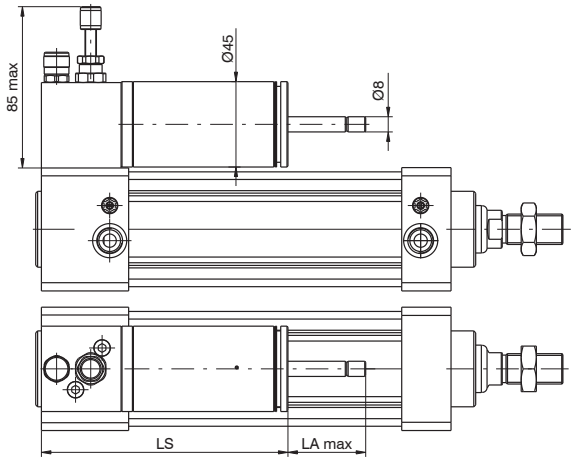


## Regulation on the outward stroke

**Coding:** 14Ø.stroke.A.0.0

| | BORE |
|---|---|
| Ø | **50** = Ø50 |
| | **63** = Ø63 |






Weight
Ø50: 1970 g + 200 g every 50 mm stroke
Ø63: 2591 g + 280 g every 50 mm stroke

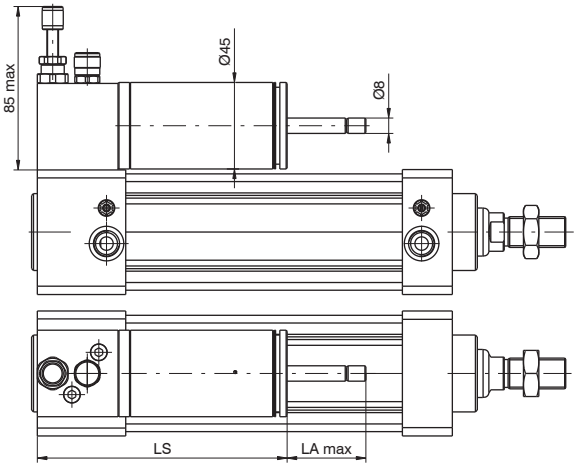
| Strokes | LS | LA max |
|---|---|---|
| 0 ... 150 | 130 | 41 |
| 151 ... 350 | 185 | 66 |
| 351 ... 450 | 255 | 106 |

## Regulation on the inward stroke

**Coding:** 14Ø.stroke.B.0.0

| | BORE |
|---|---|
| Ø | **50** = Ø50 |
| | **63** = Ø63 |






Weight
Ø50: 1970 g + 200 g every 50 mm stroke
Ø63: 2591 g + 280 g every 50 mm stroke

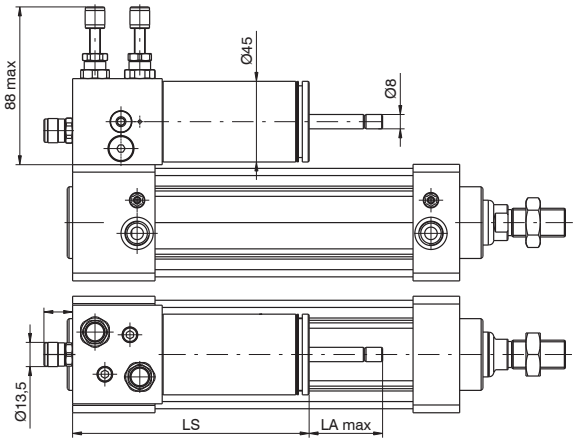
| Strokes | LS | LA max |
|---|---|---|
| 0 ... 150 | 130 | 41 |
| 151 ... 350 | 185 | 66 |
| 351 ... 450 | 255 | 106 |

## Regulation in both directions

**Coding:** 14Ø.stroke.D.0.0

| | BORE |
|---|---|
| Ø | **50** = Ø50 |
| | **63** = Ø63 |






Weight
Ø50: 2128 g + 200 g every 50 mm stroke
Ø63: 2749 g + 280 g every 50 mm stroke

| Strokes | LS | LA max |
|---|---|---|
| 0 ... 150 | 132 | 41 |
| 151 ... 350 | 185 | 66 |
| 351 ... 450 | 255 | 106 |

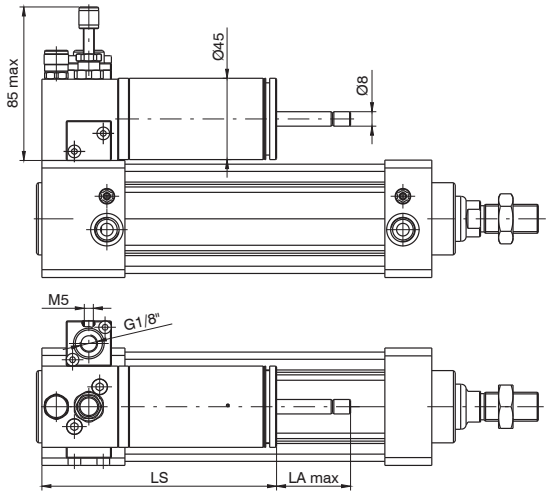

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Regulation on the outward stroke with SKIP N.O.

**Coding:** 14Ø.stroke.A.0.D

| | BORE |
|---|---|
| Ø | **50** = Ø50 |
| | **63** = Ø63 |






Weight
Ø50: 2059 g + 200 g every 50 mm stroke
Ø63: 2928 g + 280 g every 50 mm stroke

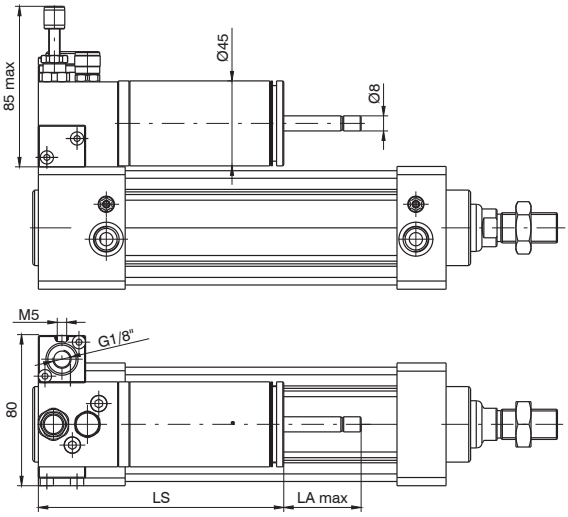
| Strokes | LS | LA max |
|---|---|---|
| 0 ... 150 | 130 | 41 |
| 151 ... 350 | 185 | 66 |
| 351 ... 450 | 255 | 106 |

## Regulation on the inward stroke with SKIP N.O.

**Coding:** 14Ø.stroke.B.0.E

| | BORE |
|---|---|
| Ø | **50** = Ø50 |
| | **63** = Ø63 |






Weight
Ø50: 2059 g + 200 g every 50 mm stroke
Ø63: 2928 g + 280 g every 50 mm stroke

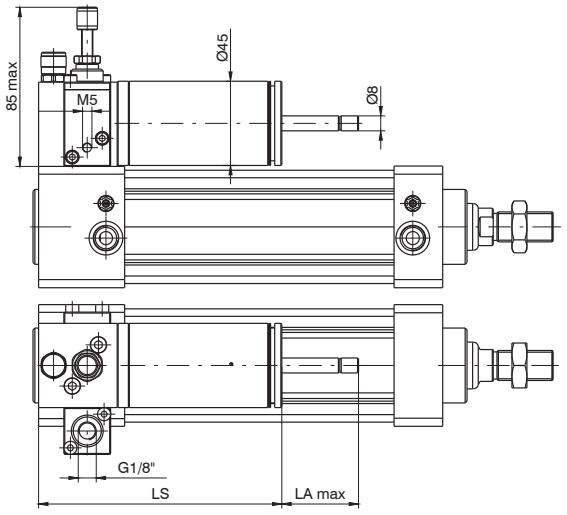
| Strokes | LS | LA max |
|---|---|---|
| 0 ... 150 | 130 | 41 |
| 151 ... 350 | 185 | 66 |
| 351 ... 450 | 255 | 106 |

## Regulation on the outward stroke with STOP N.O.

**Coding:** 14Ø.stroke.A.D.0

| | BORE |
|---|---|
| Ø | **50** = Ø50 |
| | **63** = Ø63 |






Weight
Ø50: 2059 g + 200 g every 50 mm stroke
Ø63: 2928 g + 280 g every 50 mm stroke

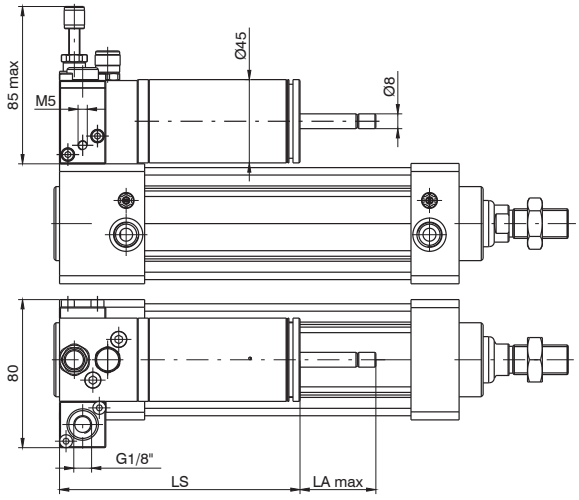
| Strokes | LS | LA max |
|---|---|---|
| 0 ... 150 | 130 | 41 |
| 151 ... 350 | 185 | 66 |
| 351 ... 450 | 255 | 106 |

## Regulation on the inward stroke with STOP N.O.

**Coding:** 14Ø.stroke.B.E.0

| | BORE |
|---|---|
| Ø | **50** = Ø50 |
| | **63** = Ø63 |






Weight
Ø50: 2059 g + 200 g every 50 mm stroke
Ø63: 2928 g + 280 g every 50 mm stroke

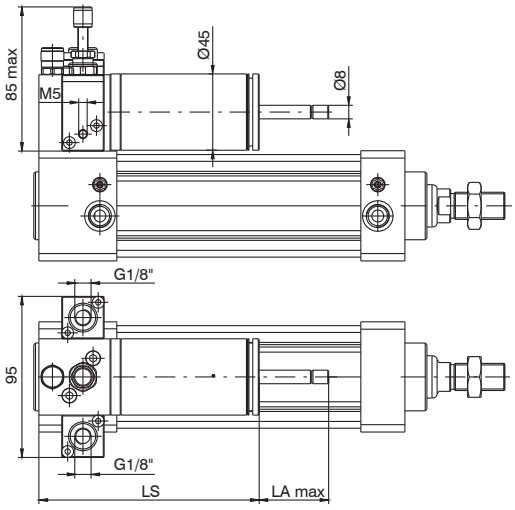
| Strokes | LS | LA max |
|---|---|---|
| 0 ... 150 | 130 | 41 |
| 151 ... 350 | 185 | 66 |
| 351 ... 450 | 255 | 106 |

## Regulation on the outward stroke with SKIP N.O. - STOP N.O.

**Coding:** 14Ø.stroke.A.D.D

| | BORE |
|---|---|
| Ø | **50** = Ø50 |
| | **63** = Ø63 |






Weight
Ø50: 2140 g + 200 g every 50 mm stroke
Ø63: 2761 g + 280 g every 50 mm stroke

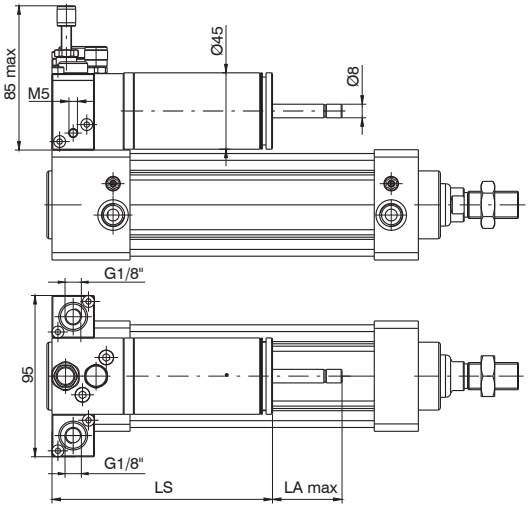
| Strokes | LS | LA max |
|---|---|---|
| 0 ... 150 | 130 | 41 |
| 151 ... 350 | 185 | 66 |
| 351 ... 450 | 255 | 106 |

## Regulation on the inward stroke with SKIP N.O. - STOP N.O.

**Coding:** 14Ø.stroke.B.E.E

| | BORE |
|---|---|
| Ø | **50** = Ø50 |
| | **63** = Ø63 |






Weight
Ø50: 2140 g + 200 g every 50 mm stroke
Ø63: 2761 g + 280 g every 50 mm stroke

| Strokes | LS | LA max |
|---|---|---|
| 0 ... 150 | 130 | 41 |
| 151 ... 350 | 185 | 66 |
| 351 ... 450 | 255 | 106 |



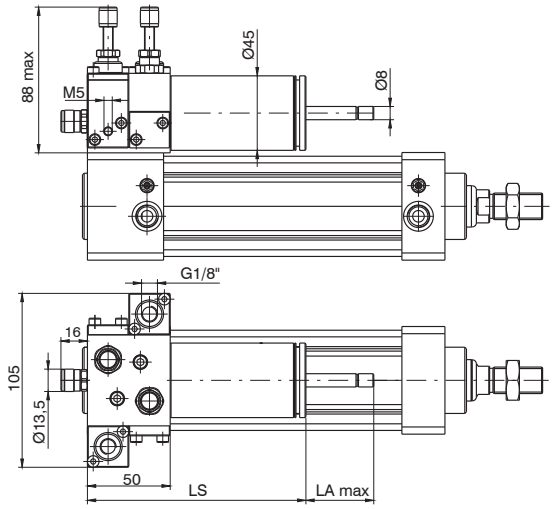
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Regulation and SKIP in both directions (N.O. SKIP valves in both directions)

**Coding:** 14Ø.stroke.D.0.F

| | BORE |
|---|---|
| Ø | **50** = Ø50 |
| | **63** = Ø63 |






Weight
Ø50: 2311 g + 200 g every 50 mm stroke
Ø63: 2932 g + 280 g every 50 mm stroke

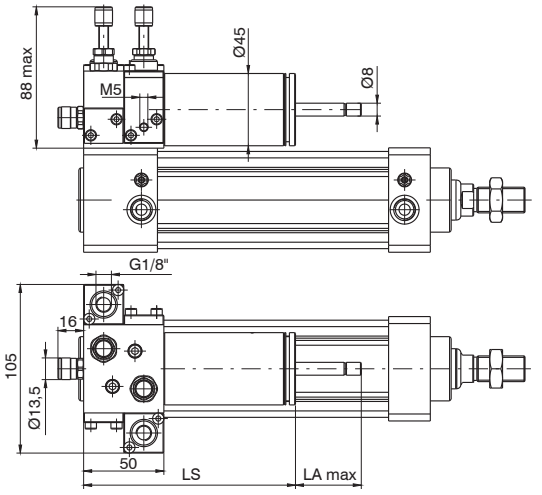
| Strokes | LS | LA max |
|---|---|---|
| 0 ... 150 | 132 | 41 |
| 151 ... 350 | 187 | 66 |
| 351 ... 450 | 257 | 106 |

## Regulation and STOP in both directions (N.O. STOP valves in both directions)

**Coding:** 14Ø.stroke.D.F.0

| | BORE |
|---|---|
| Ø | **50** = Ø50 |
| | **63** = Ø63 |






Weight
Ø50: 2311 g + 200 g every 50 mm stroke
Ø63: 2932 g + 280 g every 50 mm stroke

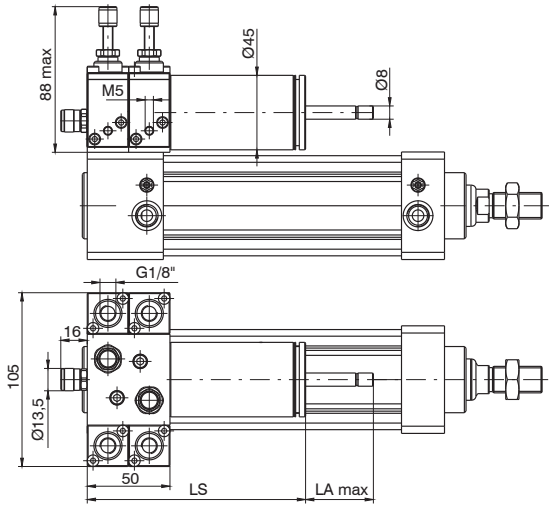
| Strokes | LS | LA max |
|---|---|---|
| 0 ... 150 | 132 | 41 |
| 151 ... 350 | 187 | 66 |
| 351 ... 450 | 257 | 106 |

## Regulation with SKIP and STOP in both directions (N.O. SKIP and STOP valves in both directions)

**Coding:** 14Ø.stroke.D.F.F

| | BORE |
|---|---|
| Ø | **50** = Ø50 |
| | **63** = Ø63 |






Weight
Ø50: 2473 g + 200 g every 50 mm stroke
Ø63: 3094 g + 280 g every 50 mm stroke

| Strokes | LS | LA max |
|---|---|---|
| 0 ... 150 | 132 | 41 |
| 151 ... 350 | 187 | 66 |
| 351 ... 450 | 257 | 106 |

## Series 1500 Ecompact

These cylinders are built according to ISO 21287 standards. New barrel profile has two sensor slots on the three sides (Ø 20 and Ø 25 one slot) suitable for sensors 1580._, MRS._, MHS._ series housing, without need for adaptors.
Versions with end stroke adjustable pneumatic cushioning are also available, allowing adjustments to deceleration and keeping the required overall dimensions according to ISO 21287.
For fixing operation is possible to use the four threaded holes on the end covers, or screws in body holes, alternatively all the fixing devices of UNITOP RU-P/6-P/7 (Ø20 and Ø25) and ISO 15552 (from Ø32 to Ø100) series.

### Construction characteristics

| | |
|---|---|
| Body | anodized aluminium |
| Piston rod bushings | sintered bronze |
| Seals | standard: NBR Oil resistant rubber, PUR Piston rod seals<br>(PUR or FPM on request) |
| Springs | stainless steel |
| Pistons | from Ø20 to Ø40 acetal resin (aluminium on request), Ø50 and Ø100<br>aluminium (with FPM seals, aluminium piston for all standard diameters) |
| Piston rod | from Ø 20 to Ø 25 stainless steel<br>from Ø32 to Ø100 C43 chromed (on request stainless steel) |
| End caps | aluminium alloy casting painted |
| Fixing screws | zinc plated steel |



### Operational characteristics

| | |
|---|---|
| Fluid | filtered and preferably lubricated air or not (if lubricated the lubrication must be continuous) |
| Max. pressure | 10 bar |
| Working temperature | -5°C ... +70°C with standard seals (magnetic or non magnetic piston)<br>-30°C ... +80°C with PUR seals (magnetic or non magnetic piston)<br>-5°C ... +80°C with FPM seals (magnetic piston)<br>-5°C - +150°C with FPM seals (non magnetic piston) |

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

### Stroke tolerance, minimum and maximum spring loads and cushioning length

| Bore (mm) | Stroke tolerance (mm) | Minimum springs load (N) | Maximum springs load (N) | Cushioning length (mm) |
|---|---|---|---|---|
| Ø20 | + 1,5 / 0 mm | 10,8 | 19,6 | / |
| Ø25 | | 16,7 | 22,6 | 5 |
| Ø32 | + 2 / 0 mm | 19,6 | 25,5 | 6,5 |
| Ø40 | | 25,5 | 42,2 | 8 |
| Ø50 | | 44,1 | 96,3 | 7,5 |
| Ø63 | + 2,5 / 0 mm | 44,1 | 96,3 | 7,5 |
| Ø80 | | 63,8 | 100,1 | 8 |
| Ø100 | | 107,9 | 193,3 | 12 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

### Standard strokes

### DOUBLE ACTING BASIC version and THROUGH ROD CYLINDER version

Cylinders with longer strokes than those in the chart are also available.
The end user is responsible for the load applied on the product and for its correct use.
For special applications, please get in touch with our sales rep.

| | Stroke | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 100 | 125 | 150 | 160 | 200 | 250 | 300 | 320 | 350 | 400 | 450 | 500 |
| Bore | WITHOUT CUSHIONING DEVICE | | | | | | | | | | | | | | | | | | | | | | | | | | | Maximum suggested strokes |
| Ø20 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | 450 |
| Ø25 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| Ø32 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | 650 |
| Ø40 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | |
| Ø50 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | |
| Ø63 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | |
| Ø80 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø100 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Bore | WITH CUSHIONING DEVICE | | | | | | | | | | | | | | | | | | | | | | | | | | | Maximum suggested strokes |
| Ø20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 450 |
| Ø25 | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| Ø32 | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | 650 |
| Ø40 | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | |
| Ø50 | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | |
| Ø63 | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | |
| Ø80 | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø100 | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

### DOUBLE ACTING THROUGH ROD CYLINDER BORED version

Cylinders with longer strokes than those in the chart are also available.
The end user is responsible for the load applied on the product and for its correct use.
For special applications, please get in touch with our sales rep.

| | Stroke | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 |
| Bore | WITHOUT CUSHIONING DEVICE | | | | | | | | | | | | | | | | WITH CUSHIONING DEVICE | | | | | | | | | | | Maximum suggested strokes |
| Ø20 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | 110 |
| Ø25 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | ● | ● | ● | ● | ● | ● | | | | | | |
| Ø32 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | ● | ● | ● | ● | ● | ● | | | | | | 125 |
| Ø40 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | ● | ● | ● | ● | ● | ● | | | | | | |
| Ø50 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 150 |
| Ø63 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| Ø80 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø100 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

### DOUBLE ACTING version WITH NON-ROTATING DEVICE

Cylinders with longer strokes than those in the chart are also available, exceptionally for applications without twisting moments and/or radial loads on the anti-rotation device.

| | Stroke | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 |
| Bore | WITHOUT CUSHIONING DEVICE | | | | | | | | | | | | | | | | WITH CUSHIONING DEVICE | | | | | | | | | | | |
| Ø20 | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| Ø25 | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | ● | ● | ● | ● | | | | | | | | |
| Ø32 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø40 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø50 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø63 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø80 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø100 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

### SINGLE ACTING version

Please get in touch with our sales rep. for dimensions over 25 mm stroke.

| | Bore | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Stroke | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
| 5 | ● | ● | ● | ● | ● | ● | ● | ● |
| 10 | ● | ● | ● | ● | ● | ● | ● | ● |
| 15 | ● | ● | ● | ● | ● | ● | ● | ● |
| 20 | ● | ● | ● | ● | ● | ● | ● | ● |
| 25 | ● | ● | ● | ● | ● | ● | ● | ● |
| Maximum suggested strokes | 75 | | | | | | | |

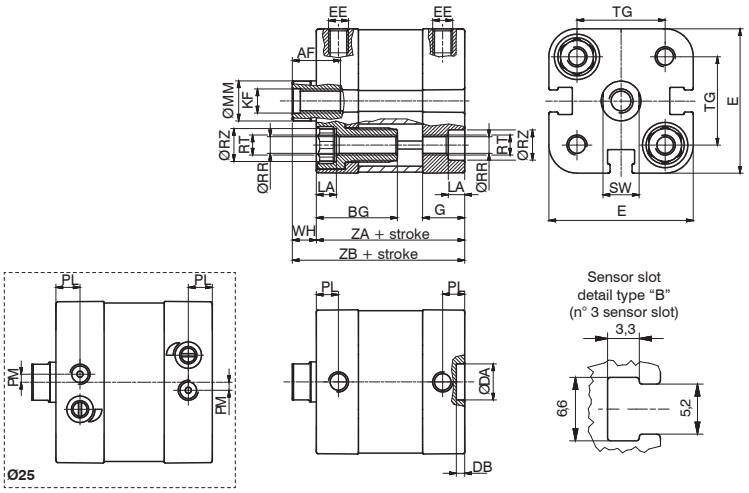



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## BASIC version double and single acting

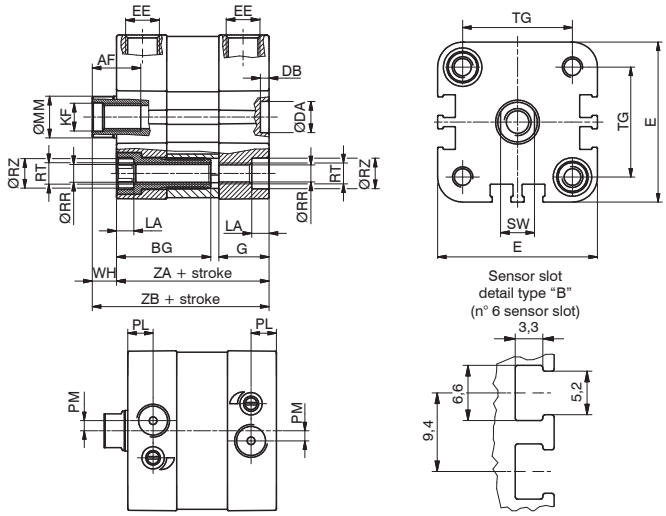


**Ø20 and Ø25**



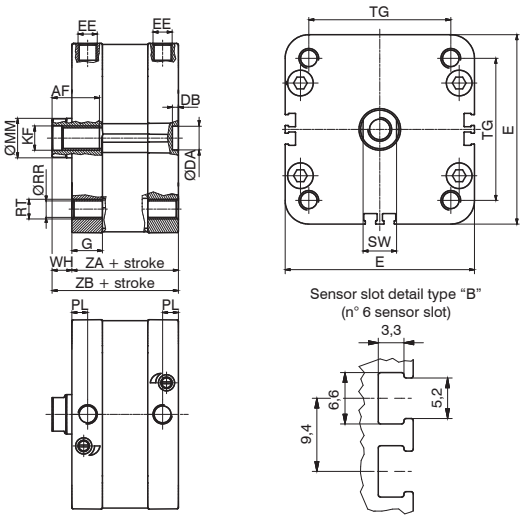



**from Ø32 to Ø63**



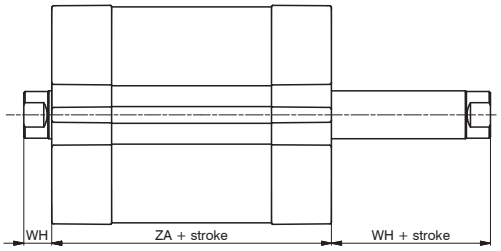



**Ø80 and Ø100**



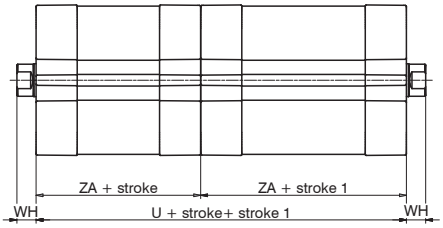

## THROUGH ROD CYLINDER version, double and single acting





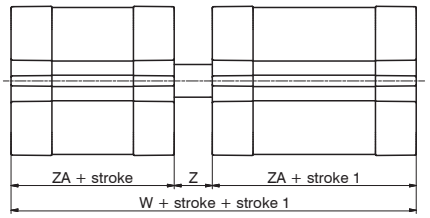
## TANDEM version with opposed rods





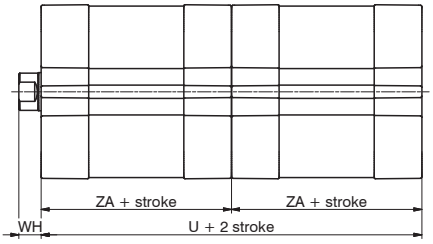

## TANDEM version opposed common rod





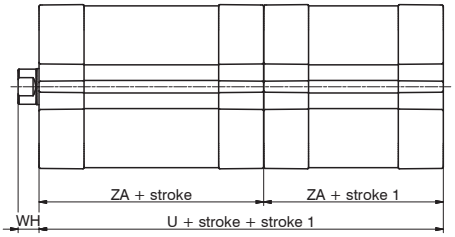

## TANDEM version push with common rods






## TANDEM version push with independent rods






## Ordering code

### Basic and Through rod cylinder version

**15 _ _ .Ø.stroke. _ _ . _**

- **1** = magnetic piston, Double acting
- **2** = magnetic piston, Single acting with front spring
- **3** = magnetic piston, Single acting with rear spring
- **4** = non magnetic piston, Double acting
- **5** = non magnetic piston, Single acting with front spring
- **6** = non magnetic piston, Single acting with rear spring

- **01** = Basic, female threaded rod
- **02** = Basic, male threaded rod
- **03** = through rod, female threaded rod
- **04** = through rod, male threaded rod
- ** **05** = through rod, bored female threaded rod
- **06** = through rod, bored male threaded rod
- **07** = with non-rotating device
- **08** = through rod, female threaded rod, with non-rot. device on one side ***
- **09** = through rod, male threaded rod, with non-rot. device on one side ***

- **0** = NBR seals and C43 chromed plated rod *
- **1** = NBR seals and stainless steel rod (starting from bore Ø32)
- **4** = PUR seals and C43 chromed plated rod *
- **5** = PUR seals and stainless steel rod (starting from bore Ø32)
- **6** = FPM seals and C43 chromed plated rod *
- **7** = FPM seals and stainless steel rod (starting from bore Ø32)

* (Ø20 and Ø25 stainless steel)

- **4** = Non-cushioned versions (mechanical cushioning only)
- **5** = Versions with adjustable end of stroke cushioning system (from Ø25)

** It is possible to order the Ø20, Ø25, Ø32 and Ø40 cylinders with an aluminium piston by replacing the '0' with 'K' in the ordering code.
Example: 1540.20.10.01.1 (Acetyl Resin Piston)
1540.20.10.K1.1 (Aluminium Piston version)

*** for single acting version, the spring is on the anti-rotation side

### TANDEM version (magnetic pistons)

**15 _ _ . Ø .stroke. (stroke 1) . _**

| | |
|---|---|
| **C** = female threaded rod<br>**G** = male threaded rod<br>**H** = with through rod and female threaded rod<br>**R** = with through rod and male threaded rod<br>**N** = with non-rotating device | **Tandem push with common rods** |
| **B** = female threaded rod<br>**F** = male threaded rod<br>**M** = with non-rotating device<br>**P** = with through rod and female threaded rod<br>**Q** = with through rod and male threaded rod | **Tandem push with independent rods** |
| **D** = **Opposed tandem with common rod** | |
| **A** = female threaded rod<br>**E** = male threaded rod<br>**L** = with non-rotating device on both ends | **Tandem with opposite rods** |

- **0** = NBR seals and C43 chromed plated rod *
- **1** = NBR seals and stainless steel rod (starting from bore Ø32)
- **4** = PUR seals and C43 chromed plated rod *
- **5** = PUR seals and stainless steel rod (starting from bore Ø32)
- **6** = FPM seals and C43 chromed plated rod *
- **7** = FPM seals and stainless steel rod (starting from bore Ø32)

* (Ø20 and Ø25 stainless steel)

- **4** = Non-cushioned version (mechanical cushioning only)
- **5** = Versions with adjustable end of stroke cushioning system (from Ø25)

Seals compounds scheme: **NBR** oil resistant nitrilic rubber
**PUR**: polyurethane seals **FPM**: fluoropolymer rubber seals

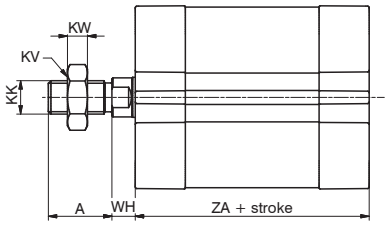
| Bore | | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|---|---|---|
| AF (min) | | 12 | 12 | 14 | 14 | 18 | 18 | 24 | 24 |
| BG | | 20 | 20 | 16 | 16 | 16 | 16 | / | / |
| DA (H9) | | 9 | 9 | 9 | 9 | 12 | 12 | 12 | 12 |
| DB (+0,1/0) | | 2,1 | 2,1 | 2,5 | 2,5 | 2,6 | 2,6 | 3 | 3 |
| E (max) | | 36 | 40,5 | 47,5 | 55 | 66 | 78 | 96 | 116 |
| EE | | M5 | M5 | G1/8 | G1/8 | G1/8 | G1/8 | G1/8 | G1/8 |
| G | | 10,5 | 12 | 14,5 | 15 | 15 | 15 | 15,5 | 18,5 |
| KF | | M6 | M6 | M8 | M8 | M10 | M10 | M12 | M12 |
| LA (0/-0,1) | | 4.1 | 4,1 | 5 | 5 | 5 | 5 | / | / |
| MM (f7) | | 10 | 10 | 12 | 12 | 16 | 16 | 20 | 25 |
| PL (+0,1/0) | | 5,5 | 6 | 7,5 | 8 | 8 | 8 | 8 | 8 |
| PM | | / | 2 | 3 | / | / | / | / | / |
| RR (min) | | 4,1 | 4,1 | 5,1 | 5,1 | 6,6 | 6,6 | 8,4 | 8,4 |
| RT | | M5 | M5 | M6 | M6 | M8 | M8 | M10 | M10 |
| RZ (min) | | 7,5 | 7,5 | 8,5 | 8,5 | 10,5 | 10,5 | / | / |
| SW (0/-0,1) | | 9 | 9 | 10 | 10 | 13 | 13 | 17 | 22 |
| TG (±0,2) | | 22 | 26 | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| U | | 74 | 78 | 88 | 90 | 90 | 98 | 108 | 134 |
| W | | 83 | 89 | 100 | 103 | 105 | 113 | 124 | 154 |
| WH (±1) | | 6 | 6 | 7 | 7 | 8 | 8 | 10 | 10 |
| Z | | 9 | 11 | 12 | 13 | 15 | 15 | 16 | 20 |
| ZA (±0,5) | | 37 | 39 | 44 | 45 | 45 | 49 | 54 | 67 |
| ZB (+1/0) | | 43 | 45 | 51 | 52 | 53 | 57 | 64 | 77 |
| Weight (g) | stroke | 105 | 110 | 200 | 270 | 420 | 550 | 760 | 1400 |
| | every 5mm | 10 | 10,5 | 13 | 17 | 23,5 | 27 | 37 | 51 |



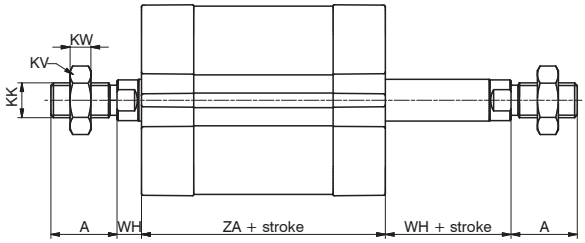


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

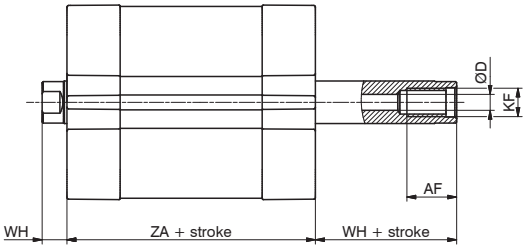
## Basic version male piston rod



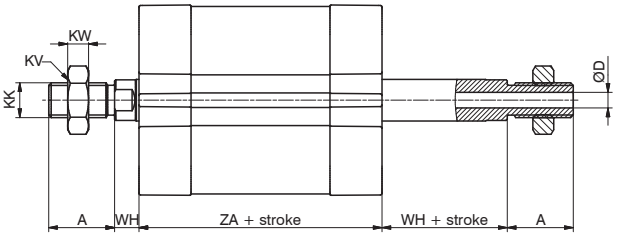

## Through rod cylinder version male rod



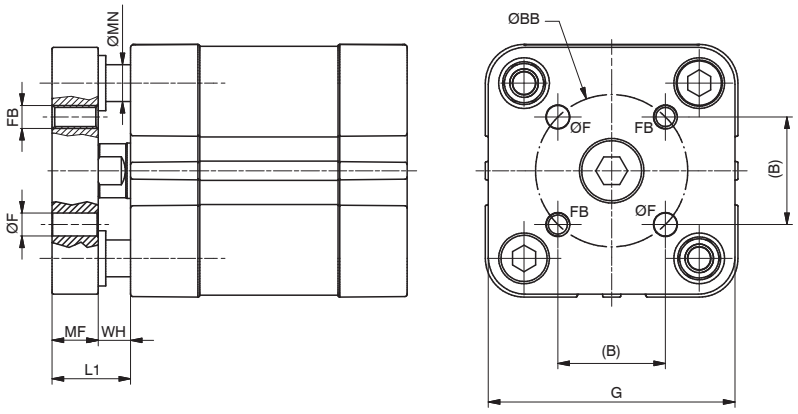

## Through rod cylinder version bored female piston rod




## Through rod cylinder version bored male piston rod



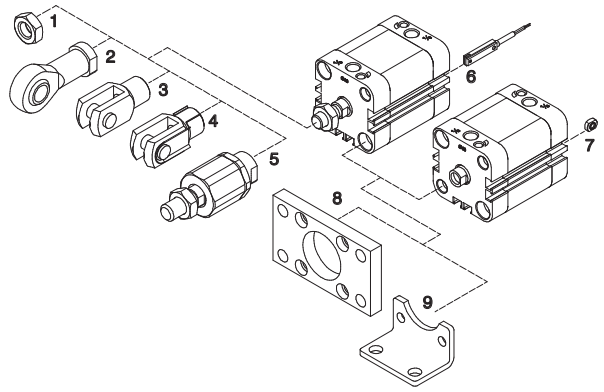

## Non-rotating version




| Bore | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|---|---|
| A (0/-0,5) | 16 | 16 | 19 | 19 | 22 | 22 | 28 | 28 |
| AF (min) | 12 | 12 | 14 | 14 | 18 | 18 | 24 | 24 |
| B | 12 | 15,6 | 19,8 | 23,3 | 29,7 | 35,4 | 46 | 56,6 |
| BB (±0,1) | 17 | 22 | 28 | 33 | 42 | 50 | 65 | 80 |
| D | 3 | 3,8 | 4,5 | 4,5 | 6 | 6 | 8 | 10 |
| F (+0,1/0) | 4 | 5 | 5 | 5 | 6 | 6 | 8 | 10 |
| FB | M4 | M5 | M5 | M5 | M6 | M6 | M8 | M10 |
| G | 35 | 39,5 | 45 | 52 | 65 | 75 | 95 | 115 |
| KF | M6 | M6 | M8 | M8 | M10 | M10 | M12 | M12 |
| KK | M8x1,25 | M8x1,25 | M10x1,25 | M10x1,25 | M12x1,25 | M12x1,25 | M16x1,5 | M16x1,5 |
| KV | 13 | 13 | 17 | 17 | 19 | 19 | 24 | 24 |
| KW | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 |
| L1 | 14 | 14 | 17 | 17 | 20 | 20 | 24 | 24 |
| MF (+0,1/0) | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 |
| MN (f7) | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 |
| WH (±1) | 6 | 6 | 7 | 7 | 8 | 8 | 10 | 10 |
| ZA (±0,5) | 37 | 39 | 44 | 45 | 45 | 49 | 54 | 67 |

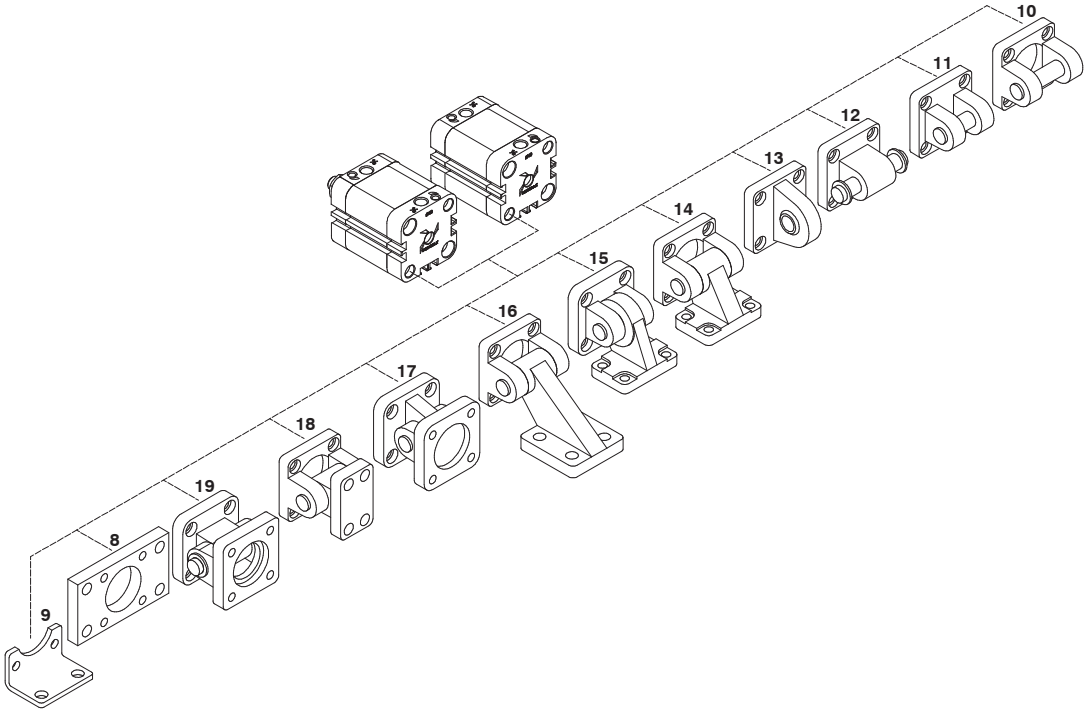


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice




| Position | Description | Coding | |
|---|---|---|---|
| 1 | Nuts | 1200.20.06<br>1320.32.18F<br>1320.40.18F<br>1320.50.18F | (Ø20 and Ø25)<br>(Ø32 and Ø40)<br>(Ø50 and Ø63)<br>(Ø80 and Ø100) |
| 2 | Ball joint | 1200.20.32F<br>1320.32.32F<br>1320.40.32F<br>1320.50.32F | (Ø20 and Ø25)<br>(Ø32 and Ø40)<br>(Ø50 and Ø63)<br>(Ø80 and Ø100) |
| 3 | Fork with pin | 1200.20.04<br>1320.32.13F<br>1320.40.13F<br>1320.50.13F | (Ø20 and Ø25)<br>(Ø32 and Ø40)<br>(Ø50 and Ø63)<br>(Ø80 and Ø100) |
| 4 | Fork with clips | 1200.20.04/1<br>1320.32.13/1F<br>1320.40.13/1F<br>1320.50.13/1F | (Ø20 and Ø25)<br>(Ø32 and Ø40)<br>(Ø50 and Ø63)<br>(Ø80 and Ø100) |
| 5 | Self-aligning joint | 1200.20.33F<br>1320.32.33F<br>1320.40.33F<br>1320.50.33F | (Ø20 and Ø25)<br>(Ø32 and Ø40)<br>(Ø50 and Ø63)<br>(Ø80 and Ø100) |
| 6 | Sensors | (see sensor section) | |
| 7 | Valves direct mounting bolt | 1500.20F | (Ø20, Ø100) |






| Position | Description | Coding | |
|---|---|---|---|
| | | Aluminium | Steel |
| 8 | Front and rear flanges (MF1 - MF2) | / | 1540.Ø.03F (Ø20 and Ø25)<br>1380.Ø.03F (Ø32 ... Ø100) |
| 9 | Short mounting foot brackets (in sheet metal MS1) | / | 1540.Ø.05/1F (Ø32 ... Ø100) |
| 10 | Rear clevis (MP2) | 1380.Ø.09F (Ø32 ... Ø100) | 1320.Ø.20F (Ø32 ... Ø100) |
| 11 | Rear narrow clevis | 1380.Ø.30F (Ø32 ... Ø100) | 1320.Ø.29F (Ø32 ... Ø100) |
| 12 | Rear male clevis (MP4) | 1580.Ø.09/1F (Ø20 and Ø25)<br>1380.Ø.09/1F (Ø32 ... Ø100) | 1580.Ø.09/2F (Ø20 and Ø25)<br>1320.Ø.21F (Ø32 ... Ø100) |
| 13 | Rear male clevis (with jointed head according to DIN 648K standard) | 1380.Ø.15F (Ø32 ... Ø100) | 1320.Ø.25F (Ø32 ... Ø100) |
| 14 | Square angle trunnion (AB7) | 1380.Ø.35F (Ø32 ... Ø100) | 1320.Ø.23F (Ø32 ... Ø100) |
| 15 | Complete square angle trunnion (with joined head according to DIN 648K standards) | / | 1320.Ø.27F (Ø32 ... Ø100) |
| 16 | Square angle trunnion (not specified by ISO 15552) | 1380.Ø.11F (Ø32 ... Ø100) | / |
| 17 | Complete standard trunnion (with joined head according to DIN 648K standards) | 1380.Ø.36F (Ø32 ... Ø100) | 1320.Ø.26F (Ø32 ... Ø100) |
| 18 | Standard trunnion (not specified by ISO 15552) | 1380.Ø.10F (Ø32 ... Ø100) | / |
| 19 | Standard complete trunnion | / | 1320.Ø.22F (Ø32 ... Ø100) |

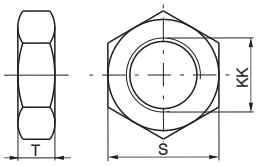

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## Nuts

**Coding: 1Ⓣ.Ø.Ⓜ**

| | |
|---|---|
| Ⓣ | TYPE |
| | **200** = Nut (Ø20 and Ø25) |
| | **320** = Nut (Ø32 ... Ø100) |
| Ø | BORE |
| | **20** = Ø20 and Ø25 |
| | **32** = Ø32 and Ø40 |
| | **40** = Ø50 and Ø63 |
| | **50** = Ø80 and Ø100 |
| Ⓜ | MODEL |
| | **05** = Ø20 and Ø25 |
| | **18F** = Ø32 ... Ø100 |





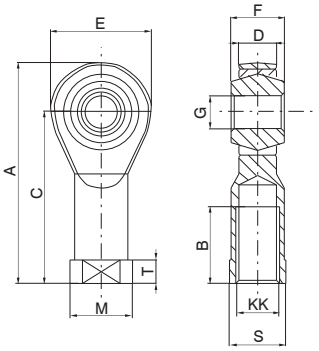

| Bore | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|---|---|
| S | 13 | 13 | 17 | 17 | 19 | 19 | 24 | 24 |
| T | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 |
| KK | M8x1.25 | M8x1.25 | M10x1.25 | M10x1.25 | M12x1.25 | M12x1.25 | M16x1.5 | M16x1.5 |
| Weight (g) | 12 | 12 | 15 | 15 | 20 | 20 | 20 | 20 |

## Ball joint

**Coding: 1Ⓣ.Ø.32F**

| | |
|---|---|
| Ⓣ | TYPE |
| | **200** = Ball joint (Ø20 and Ø25) |
| | **320** = Ball joint (Ø32 ... Ø100) |
| Ø | BORE |
| | **20** = Ø20 and Ø25 |
| | **32** = Ø32 and Ø40 |
| | **40** = Ø50 and Ø63 |
| | **50** = Ø80 and Ø100 |





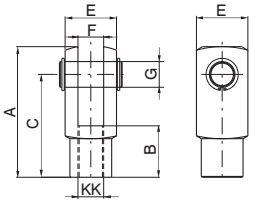

| Bore | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|---|---|
| A | 48 | 48 | 57 | 57 | 66 | 66 | 85 | 85 |
| B | 16 | 16 | 20 | 20 | 22 | 22 | 28 | 28 |
| C | 36 | 36 | 43 | 43 | 50 | 50 | 64 | 64 |
| D (-0,1) | 9 | 9 | 10,5 | 10,5 | 12 | 12 | 15 | 15 |
| E | 24 | 24 | 28 | 28 | 32 | 32 | 42 | 42 |
| F | 12 | 12 | 14 | 14 | 16 | 16 | 21 | 21 |
| G (H7) | 8 | 8 | 10 | 10 | 12 | 12 | 16 | 16 |
| KK | M8x1,25 | M8x1,25 | M10x1,25 | M10x1,25 | M12x1,25 | M12x1,25 | M16x1,5 | M16x1,5 |
| M | 16 | 16 | 19 | 19 | 22 | 22 | 27 | 27 |
| S | 14 | 14 | 17 | 17 | 19 | 19 | 22 | 22 |
| T | 5 | 5 | 6,5 | 6,5 | 6,5 | 6,5 | 8 | 8 |
| Weight (g) | 46 | 46 | 76 | 76 | 110 | 110 | 220 | 220 |

## Fork with pin

**Coding: 1Ⓣ.Ø.Ⓜ**

| | |
|---|---|
| Ⓣ | TYPE |
| | **200** = Fork with pin (Ø20 and Ø25) |
| | **320** = Fork with pin (Ø32 ... Ø100) |
| Ø | BORE |
| | **20** = Ø20 and Ø25 |
| | **32** = Ø32 and Ø40 |
| | **40** = Ø50 and Ø63 |
| | **50** = Ø80 and Ø100 |
| Ⓜ | MODEL |
| | **04** = Ø20 and Ø25 |
| | **13F** = Ø32 ... Ø100 |





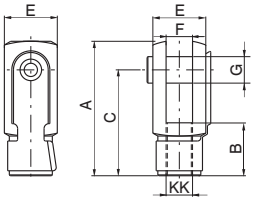

| Bore | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|---|---|
| A | 42 | 42 | 52 | 52 | 62 | 62 | 83 | 83 |
| B | 16 | 16 | 20 | 20 | 24 | 24 | 32 | 32 |
| C | 32 | 32 | 40 | 40 | 48 | 48 | 64 | 64 |
| E | 16 | 16 | 20 | 20 | 24 | 24 | 32 | 32 |
| F (B12) | 8 | 8 | 10 | 10 | 12 | 12 | 16 | 16 |
| G | 8 | 8 | 10 | 10 | 12 | 12 | 16 | 16 |
| KK | M8x1,25 | M8x1,25 | M10x1,25 | M10x1,25 | M12x1,25 | M12x1,25 | M16x1,5 | M16x1,5 |
| Weight (g) | 45 | 45 | 100 | 100 | 140 | 140 | 340 | 340 |

## Fork with clips

**Coding: 1Ⓣ.Ø.Ⓜ**

| | |
|---|---|
| Ⓣ | TYPE |
| | **200** = Fork with clips (Ø20 and Ø25) |
| | **320** = Fork with clips (Ø32 ... Ø100) |
| Ø | BORE |
| | **20** = Ø20 and Ø25 |
| | **32** = Ø32 and Ø40 |
| | **40** = Ø50 and Ø63 |
| | **50** = Ø80 and Ø100 |
| Ⓜ | MODEL |
| | **04/1** = Ø20 and Ø25 |
| | **13/1F** = Ø32 ... Ø100 |





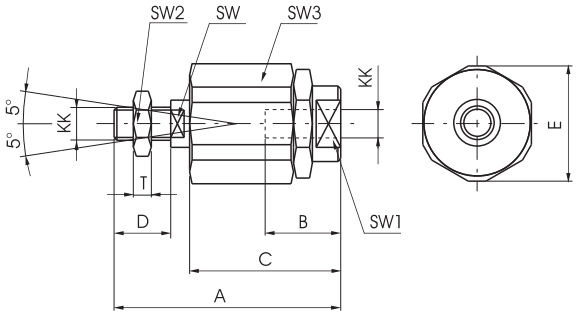

| Bore | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|---|---|
| A | 42 | 42 | 52 | 52 | 62 | 62 | 83 | 83 |
| B | 16 | 16 | 20 | 20 | 24 | 24 | 32 | 32 |
| C | 32 | 32 | 40 | 40 | 48 | 48 | 64 | 64 |
| E | 16 | 16 | 20 | 20 | 24 | 24 | 32 | 32 |
| F (B12) | 8 | 8 | 10 | 10 | 12 | 12 | 16 | 16 |
| G | 8 | 8 | 10 | 10 | 12 | 12 | 16 | 16 |
| KK | M8x1,25 | M8x1,25 | M10x1,25 | M10x1,25 | M12x1,25 | M12x1,25 | M16x1,5 | M16x1,5 |
| Weight (g) | 45 | 45 | 100 | 100 | 140 | 140 | 340 | 340 |

## Self-aligning joint

**Coding:** 1Ⓣ.Ø.33F

| | |
|---|---|
| Ⓣ | TYPE |
| | **200** = Self-aligning joint (Ø20 and Ø25) |
| | **320** = Self-aligning joint (Ø32 ... Ø100) |
| Ø | BORE |
| | **20** = Ø20 and Ø25 |
| | **32** = Ø32 and Ø40 |
| | **40** = Ø50 and Ø63 |
| | **50** = Ø80 and Ø100 |



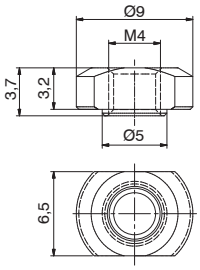



| Bore | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|---|---|
| A | 57 | 57 | 71 | 71 | 75 | 75 | 103 | 103 |
| B | 20 | 20 | 20 | 20 | 20 | 20 | 32 | 32 |
| C | 33 | 33 | 46 | 46 | 46 | 46 | 63 | 63 |
| D | 20 | 20 | 20 | 20 | 24 | 24 | 32 | 32 |
| E | 19 | 19 | 32 | 32 | 32 | 32 | 45 | 45 |
| KK | M8x1,25 | M8x1,25 | M10x1,25 | M10x1,25 | M12x1,25 | M12x1,25 | M16x1,5 | M16x1,5 |
| SW | 7 | 7 | 12 | 12 | 12 | 12 | 20 | 20 |
| SW1 | 11 | 11 | 19 | 19 | 19 | 19 | 27 | 27 |
| SW2 | 13 | 13 | 17 | 17 | 19 | 19 | 24 | 24 |
| SW3 | 17 | 17 | 30 | 30 | 30 | 30 | 41 | 41 |
| T | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 |
| Weight (g) | 60 | 60 | 220 | 220 | 230 | 230 | 660 | 660 |

## Valves direct mounting bolt

**Coding:** 1500.20.F





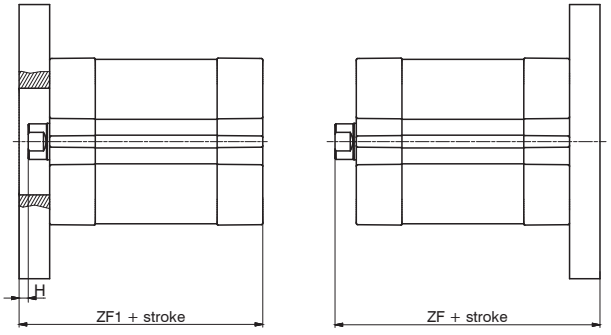

## Front and rear flanges (MF1 - MF2)

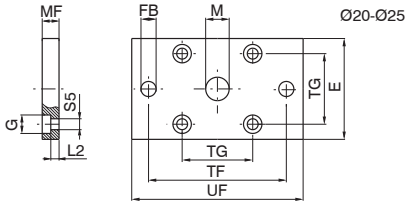
**Coding:** 1Ⓣ.Ø.03F

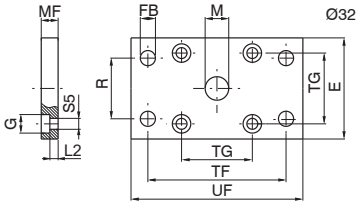
| | |
|---|---|
| Ⓣ | TYPE |
| | **540** = Flange (Ø20 and Ø25) |
| | **380** = Flange (Ø32 ... Ø100) |
| Ø | BORE |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |



The kit comprises:
n° 1 flange (plated zinc steel)
n° 4 screws (plated zinc steel)




| Bore | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|---|---|
| E | 35 | 40 | 45 | 52 | 65 | 75 | 95 | 115 |
| FB (H 13) | 6.6 | 6.6 | 7 | 9 | 9 | 9 | 12 | 14 |
| G | 9.5 | 9.5 | 10.5 | 10.5 | 15 | 15 | 18 | 18 |
| M (H 11) | 16 | 16 | 30 | 35 | 40 | 45 | 45 | 55 |
| MF (JS 14) | 8 | 8 | 10 | 10 | 12 | 12 | 16 | 16 |
| R (JS 14) | / | / | 32 | 36 | 45 | 50 | 63 | 75 |
| TF (JS 14) | 55 | 60 | 64 | 72 | 90 | 100 | 126 | 150 |
| TG | 22 | 26 | 32.5 | 38 | 46.5 | 56.5 | 72 | 89 |
| UF | 70 | 75 | 80 | 90 | 110 | 120 | 150 | 170 |
| ZF | 51 | 53 | 130 | 145 | 155 | 170 | 190 | 205 |
| ZF1 | 45 | 47 | 54 | 55 | 57 | 61 | 70 | 83 |
| H | 2 | 2 | 3 | 3 | 4 | 4 | 6 | 6 |
| L2 | 3 | 3 | 5 | 5 | 6.5 | 6.5 | 8 | 8 |
| S5 | 5.5 | 5.5 | 6.6 | 6.6 | 9 | 9 | 11 | 11 |
| Weight (g) | 125 | 160 | 190 | 250 | 480 | 620 | 1430 | 1990 |



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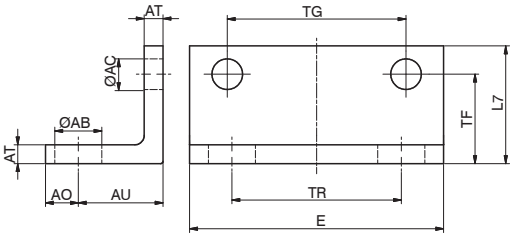
## Short mounting foot brackets (in sheet metal MS1)

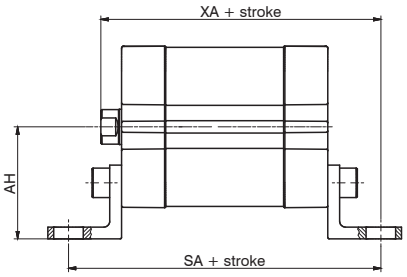
**Coding:** 1540.Ø.05/1F

| | |
|---|---|
| Ø | BORE |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |

The kit comprises:
n° 1 foot (plated zinc steel)
n° 2 screws (plated zinc steel)






| Bore | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|---|---|
| AB (H 14) | 7 | 7 | 7 | 10 | 10 | 10 | 12 | 14.5 |
| AC | 5.5 | 5.5 | 6.5 | 6.5 | 8.5 | 8.5 | 10.5 | 10.5 |
| AH | 27 | 29 | 33.5 | 38 | 45 | 50 | 63 | 74 |
| AO (max) | 7 | 7 | 7 | 7 | 9 | 9 | 11 | 13 |
| AT (±0.5) | 4 | 4 | 4 | 4 | 5 | 5 | 6 | 6 |
| AU (±0.2) | 16 | 16 | 16 | 18 | 21 | 21 | 26 | 27 |
| E (max) | 35.5 | 39.5 | 46.5 | 54 | 65 | 77 | 95 | 115 |
| L7 | 20 | 20 | 25 | 25 | 30 | 30 | 40 | 45 |
| TF (±0.1) | 16 | 16 | 17.25 | 19 | 21.75 | 21.75 | 27 | 29.5 |
| TG (±0.2) | 22 | 26 | 32.5 | 38 | 46.5 | 56.5 | 72 | 89 |
| TR (JS 14) | 22 | 26 | 32 | 36 | 45 | 50 | 63 | 75 |
| SA | 69 | 71 | 76 | 81 | 87 | 91 | 106 | 121 |
| XA | 59 | 61 | 67 | 70 | 74 | 78 | 90 | 104 |
| Weight (g) | 40 | 45 | 60 | 70 | 130 | 160 | 300 | 405 |

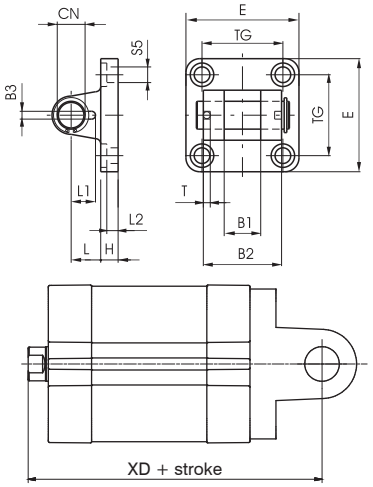
## Rear narrow clevis

**Coding:** 13Ⓜ.Ø.Ⓥ

| | |
|---|---|
| Ⓜ | MATERIALS |
| | **20** = Steel |
| | **80** = Aluminium |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| Ⓥ | VERSION |
| | **29F** = Steel rear narrow clevis |
| | **30F** = Aluminium rear narrow clevis |

The kit comprises:
n° 1 clevis (plated zinc steel or painted)
n° 4 screws (plated zinc steel)
n° 1 pin (plated zinc steel) complete with elastic pin and ring






| Bore | | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|---|
| B1 (H 14) | | 14 | 16 | 21 | 21 | 25 | 25 |
| B2 (d 12) | | 34 | 40 | 45 | 51 | 65 | 75 |
| B3 ( +0,2/-0) | | 3.3 | 4.3 | 4.3 | 4.3 | 4.3 | 6.3 |
| CN | | 10 | 12 | 16 | 16 | 20 | 20 |
| E | Aluminium | 45 | 52 | 65 | 75 | 95 | 115 |
| | Steel | 45 | 55 | 65 | 75 | 95 | 115 |
| H | Aluminium | 9 | 9 | 11 | 11 | 14 | 14 |
| | Steel | 10 | 10 | 10 | 12 | 14 | 16 |
| L | Aluminium | 13 | 16 | 16 | 21 | 22 | 27 |
| | Steel | 12 | 15 | 17 | 20 | 22 | 25 |
| L1 | | 11.5 | 12 | 14 | 14 | 16 | 16 |
| L2 (±0.5) | | 5,5 | 5.5 | 6.5 | 6.5 | 10 | 10 |
| S5 | | 6,6 | 6.6 | 9 | 9 | 11 | 11 |
| T | | 3 | 4 | 4 | 4 | 4 | 4 |
| TG | | 32.5 | 38 | 46.5 | 56.5 | 72 | 89 |
| XD | | 73 | 77 | 80 | 89 | 100 | 118 |
| Weight (g) | Aluminium | 70 | 115 | 200 | 290 | 570 | 820 |
| | Steel | 160 | 270 | 370 | 670 | 1110 | 2100 |

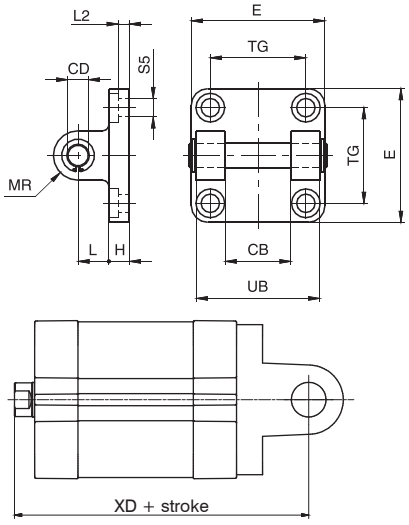
## Rear clevis (MP2)

**Coding:** 13Ⓜ.Ø.Ⓥ

| | |
|---|---|
| Ⓜ | MATERIALS |
| | **20** = Steel |
| | **80** = Aluminium |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| Ⓥ | VERSION |
| | **20F** = Steel rear clevis |
| | **09F** = Aluminium rear clevis |

The kit comprises:
n° 1 clevis (steel or painted aluminium)
n° 4 screws (plated zinc steel)
n° 1 pin (plated zinc steel)
n° 2 circlips (steel)






| Bore | | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|---|
| CB (H14) | | 26 | 28 | 32 | 40 | 50 | 60 |
| CD | | 10 | 12 | 12 | 16 | 16 | 20 |
| E | Aluminium | 45 | 52 | 65 | 75 | 95 | 115 |
| | Steel | 45 | 55 | 65 | 75 | 95 | 115 |
| H | Aluminium | 9 | 9 | 11 | 11 | 14 | 14 |
| | Steel | 10 | 10 | 10 | 12 | 14 | 16 |
| L | Aluminium | 13 | 16 | 16 | 21 | 22 | 27 |
| | Steel | 12 | 15 | 17 | 20 | 22 | 25 |
| MR | | 10 | 12 | 12 | 16 | 16 | 20 |
| TG | | 32.5 | 38 | 46.5 | 56.5 | 72 | 89 |
| UB (h14) | | 45 | 52 | 60 | 70 | 90 | 110 |
| XD | | 73 | 77 | 80 | 83 | 100 | 118 |
| L2(±0.5) | | 5.5 | 5,5 | 6.5 | 6.5 | 10 | 10 |
| S5 | | 6.6 | 6.6 | 9 | 9 | 11 | 11 |
| Weight (g) | Aluminium | 80 | 130 | 185 | 310 | 530 | 910 |
| | Steel | 180 | 290 | 400 | 670 | 1160 | 2000 |

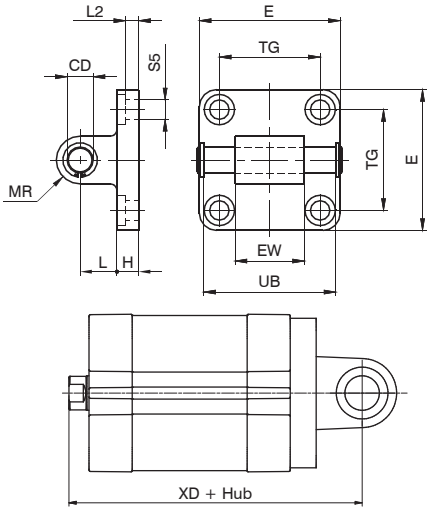
## Rear male clevis (MP4)

**Coding:** 1ⓉⓂ0.Ø.Ⓥ

| | |
|---|---|
| Ⓣ | TYPE |
| | **5** = Rear male clevis (Ø20 and Ø25) |
| | **3** = Rear male clevis (Ø32 ... Ø100) |
| Ⓜ | MATERIALS |
| | **8** = Steel (Ø20 and Ø25) - Aluminium (Ø20 ... Ø100) |
| | **2** = Steel (Ø32 ... Ø100) |
| Ø | BORE |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| Ⓥ | VERSION |
| | **09/1F** = Aluminium rear male clevis (Ø20 ... Ø100) |
| | **09/2F** = Steel rear male clevis (Ø20 and Ø25) |
| | **21F** = Steel rear male clevis (Ø32 ... Ø100) |

The kit comprises:
n° 1 clevis (steel or painted aluminium)
n° 4 screws (plated zinc steel)
n° 1 pin (plated zinc steel) *
n° 2 circlips (steel)






| Bore | | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|---|---|---|
| CD | | 8(H9) | 8(H9) | 10 | 12 | 12 | 16 | 16 | 20 |
| E | Aluminium | 34 | 38 | 45 | 52 | 65 | 75 | 95 | 115 |
| | Steel | 34 | 38 | 45 | 55 | 65 | 75 | 95 | 115 |
| EW | | 16(h14) | 16(h14) | 26 (-0,2/-0,6) | 28 (-0,2/-0,6) | 32 (-0,2/-0,6) | 40 (-0,2/-0,6) | 50 (-0,2/-0,6) | 60 (-0,2/-0,6) |
| H | Aluminium | 6 | 6 | 9 | 9 | 11 | 11 | 14 | 14 |
| | Steel | / | / | 10 | 10 | 10 | 12 | 14 | 16 |
| L | Aluminium | 14 | 14 | 13 | 16 | 16 | 21 | 22 | 27 |
| | Steel | / | / | 12 | 15 | 17 | 20 | 22 | 25 |
| MR | | 8 | 8 | 10 | 12 | 12 | 16 | 16 | 20 |
| TG | | 22 | 26 | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| UB (-0,5/-0) | | / | / | 46 | 53 | 61 | 71 | 91 | 111 |
| XD | | 63 | 65 | 73 | 77 | 80 | 89 | 100 | 118 |
| L2(±0.5) | | 2,6 | 2,6 | 5,5 | 5,5 | 6,5 | 6,5 | 10 | 10 |
| S5 | | 5,5 | 5,5 | 6,6 | 6,6 | 9 | 9 | 11 | 11 |
| Weight (g) | Aluminium | 25 | 28 | 90 | 130 | 190 | 340 | 580 | 960 |
| | Steel | 70 | 80 | 210 | 330 | 430 | 810 | 1350 | 2400 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

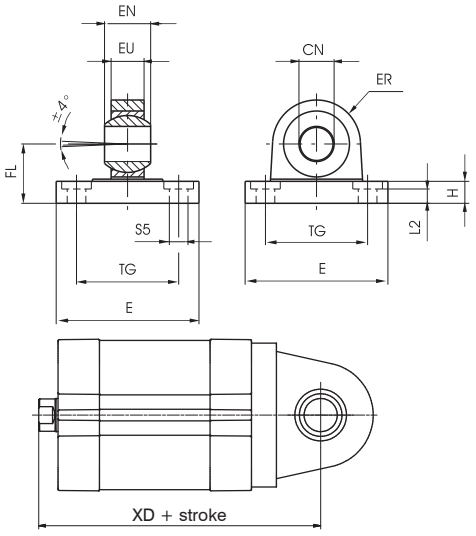
## Rear male clevis (with jointed head according to DIN 648K standard)

**Coding:** 13Ⓜ.Ø.Ⓥ

| | |
|---|---|
| Ⓜ | MATERIALS |
| | **20** = Steel |
| | **80** = Aluminium |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| Ⓥ | VERSION |
| | **25F** = Steel rear male clevis |
| | **15F** = Aluminium rear male clevis |

The kit comprises:
n° 1 clevis (steel or painted aluminium)
n° 4 screws (plated zinc steel)






| Bore | | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|---|
| CN (H 7) | | 10 | 12 | 16 | 16 | 20 | 20 |
| E | Aluminium | 45 | 52 | 65 | 75 | 95 | 115 |
| | Steel | 45 | 55 | 65 | 75 | 95 | 115 |
| EN (-0.1) | | 14 | 16 | 21 | 21 | 25 | 25 |
| ER | Aluminium | 16 | 19 | 21 | 24 | 28.5 | 30 |
| | Steel | 15 | 18 | 20 | 23 | 27 | 30 |
| EU | | 10.5 | 12 | 15 | 15 | 18 | 18 |
| FL (JS 15) | | 22 | 25 | 27 | 32 | 36 | 41 |
| H | Aluminium | 9 | 9 | 11 | 11 | 14 | 14 |
| | Steel | 10 | 10 | 10 | 12 | 14 | 16 |
| L2 (±0.5) | | 5.5 | 5.5 | 6.5 | 6.5 | 10 | 10 |
| S5 | | 6.6 | 6.6 | 9 | 9 | 11 | 11 |
| TG | | 32.5 | 38 | 46.5 | 56.5 | 72 | 89 |
| XD | | 73 | 77 | 80 | 89 | 100 | 118 |
| Weight (g) | Aluminium | 60 | 100 | 180 | 245 | 480 | 650 |
| | Steel | 210 | 310 | 400 | 710 | 1350 | 2400 |

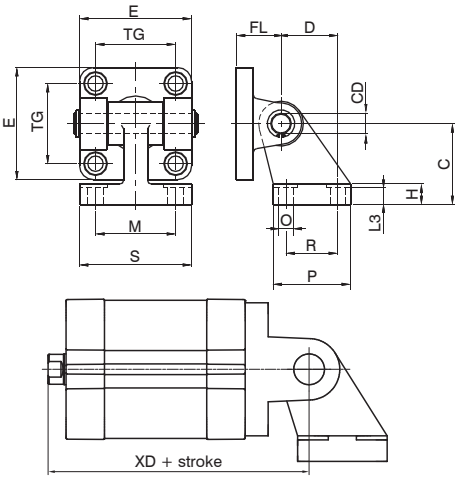
## Square angle trunnion (AB7)

**Coding:** 13Ⓜ.Ø.Ⓥ

| | |
|---|---|
| Ⓜ | MATERIALS |
| | **20** = Steel |
| | **80** = Aluminium |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| Ⓥ | VERSION |
| | **23F** = Steel square angle trunnion |
| | **35F** = Aluminium square angle trunnion |

The kit comprises:
n° 1 clevis (steel or painted aluminium)
n° 1 counter clevis, square (steel or painted aluminium)
n° 4 screws (plated zinc steel)
n° 1 pin (plated zinc steel)
n° 2 circlips (steel)






| Bore | | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|---|
| E | Aluminium | 45 | 52 | 65 | 75 | 95 | 115 |
| | Steel | 45 | 55 | 65 | 75 | 95 | 115 |
| TG | | 32.5 | 38 | 46.5 | 56.5 | 72 | 89 |
| FL | | 22 | 25 | 27 | 32 | 36 | 41 |
| D (JS14) | | 21 | 24 | 33 | 37 | 47 | 55 |
| CD | | 10 | 12 | 12 | 16 | 16 | 20 |
| C (JS15) | | 32 | 36 | 45 | 50 | 63 | 71 |
| H | Aluminium | 8 | 10 | 12 | 14 | 14 | 17 |
| | Steel | 8 | 10 | 12 | 12 | 14 | 15 |
| L3 | Aluminium | 6.4 | 8.4 | 10.4 | 12.4 | 11.5 | 14.5 |
| | Steel | 6.5 | 8.5 | 10.5 | 10.5 | 11.5 | 12.5 |
| R (JS14) | | 18 | 22 | 30 | 35 | 40 | 50 |
| P | | 31 | 35 | 45 | 50 | 60 | 70 |
| O (H13) | | 6.6 | 6.6 | 9 | 9 | 11 | 11 |
| S | | 51 | 54 | 65 | 67 | 86 | 96 |
| M (JS14) | | 38 | 41 | 50 | 52 | 66 | 76 |
| XD | | 73 | 77 | 80 | 89 | 100 | 118 |
| Weight (g) | Aluminium | 120 | 180 | 225 | 435 | 730 | 1220 |
| | Steel | 340 | 500 | 640 | 1250 | 2100 | 3500 |

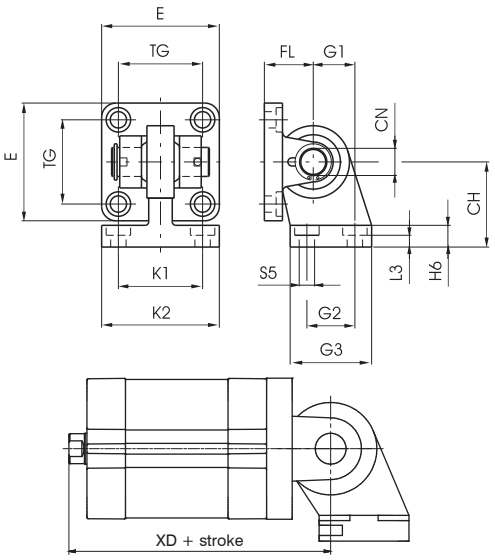
## Complete square angle trunnion (with joined head according to DIN 648K standards)

**Coding:** 1320.Ø.27F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |

Steel
The kit comprises:
n° 1 clevis (painted steel)
n° 1 counter clevis square with joined head (painted steel)
n° 4 screws (plated zinc steel)
n° 1 pin (plated zinc steel)
n° 2 circlips (steel)






| Bore | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|
| CH (JS 15) | 32 | 36 | 45 | 50 | 63 | 71 |
| CN | 10 | 12 | 16 | 16 | 20 | 20 |
| E | 45 | 55 | 65 | 75 | 95 | 115 |
| FL (JS 15) | 22 | 25 | 27 | 32 | 36 | 41 |
| G1 (JS 15) | 21 | 24 | 33 | 37 | 47 | 55 |
| G2 (JS 14) | 18 | 22 | 30 | 35 | 40 | 50 |
| G3 | 31 | 35 | 45 | 50 | 60 | 70 |
| H6 | 10 | 10 | 12 | 12 | 14 | 15 |
| K1 (JS 14) | 38 | 41 | 50 | 52 | 66 | 76 |
| K2 | 51 | 54 | 65 | 67 | 86 | 96 |
| L3 (+0,5/-0) | 8,5 | 8,5 | 10,5 | 10,5 | 11,5 | 12,5 |
| S5 | 6,6 | 6,6 | 9 | 9 | 11 | 11 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| XD | 73 | 77 | 80 | 89 | 100 | 118 |
| Weight (g) | 330 | 480 | 830 | 1220 | 2100 | 3580 |

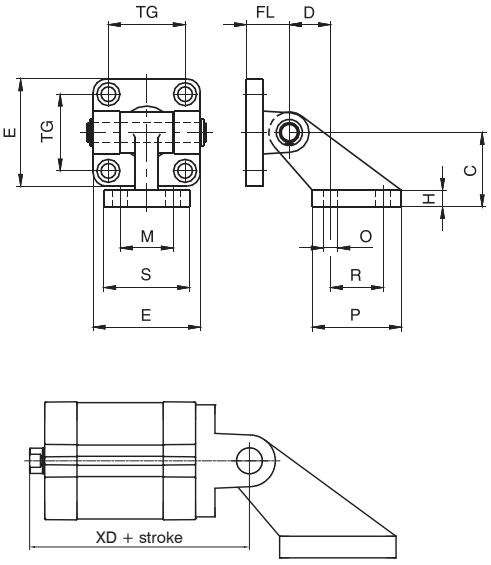
## Square angle trunnion (not specified by ISO 15552)

**Coding:** 1380.Ø.11F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |

Aluminium
The kit comprises:
n° 1 clevis (painted aluminium)
n° 1 counter clevis square (painted aluminium)
n° 4 screws (plated zinc steel)
n° 1 pin (plated zinc steel)
n° 2 circlips (steel)






| Bore | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|
| C (±0,2) | 32 | 45 | 45 | 63 | 63 | 90 |
| D (±0,5) | 18 | 25 | 25 | 32 | 32 | 40 |
| E | 45 | 52 | 65 | 75 | 95 | 115 |
| H | 8 | 10 | 10 | 12 | 12 | 17 |
| FL | 22 | 25 | 27 | 32 | 36 | 41 |
| M (JS 14) | 25 | 32 | 32 | 40 | 40 | 50 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| O (H 13) | 7 | 9 | 9 | 11 | 11 | 14 |
| P | 37 | 54 | 54 | 75 | 75 | 103 |
| R (JS 14) | 20 | 32 | 32 | 50 | 50 | 70 |
| S | 41 | 52 | 52 | 63 | 63 | 80 |
| XD | 73 | 77 | 80 | 89 | 100 | 118 |
| Weight (g) | 130 | 260 | 330 | 600 | 820 | 1560 |




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

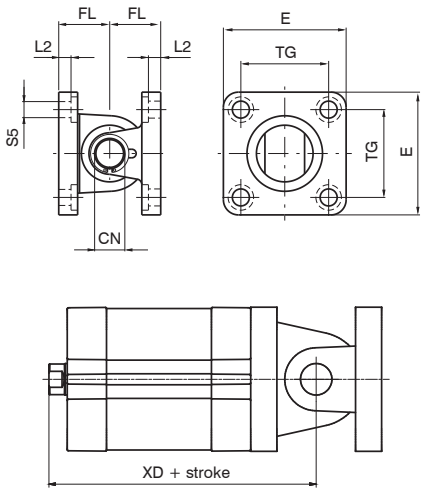
## Complete standard trunnion (with joined head according to DIN 648K standards)

**Coding:** 13Ⓜ.Ø.Ⓥ

| | |
|---|---|
| Ⓜ | MATERIALS |
| | **20** = Steel |
| | **80** = Aluminium |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| Ⓥ | VERSION |
| | **26F** = Steel complete standard trunnion |
| | **36F** = Aluminium complete standard trunnion |

The kit comprises:
n° 1 clevis (steel or painted aluminium)
n° 1 counter clevis with joined head (steel or painted aluminium)
n° 4 screws (plated zinc steel)
n° 1 pin (plated zinc steel) complete with elastic pin and ring






| Bore | | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|---|
| CN | | 10 | 12 | 16 | 16 | 20 | 20 |
| E | Aluminium | 45 | 52 | 65 | 75 | 95 | 115 |
| | Steel | 45 | 55 | 65 | 75 | 95 | 115 |
| FL (JS 15) | | 22 | 25 | 27 | 32 | 36 | 41 |
| L2 (±0.5) | | 5.5 | 5.5 | 6.5 | 6.5 | 10 | 10 |
| S5 | | 6.6 | 6.6 | 9 | 9 | 11 | 11 |
| TG | | 32.5 | 38 | 46.5 | 56.5 | 72 | 89 |
| XD | | 73 | 77 | 80 | 89 | 100 | 118 |
| Weight (g) | Aluminium | 130 | 215 | 380 | 535 | 1050 | 1470 |
| | Steel | 380 | 580 | 770 | 1380 | 2460 | 4500 |

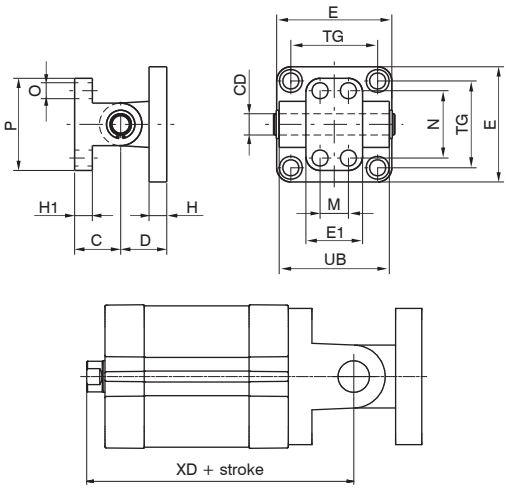
## Standard trunnion (not specified by ISO 15552)

**Coding:** 1380.Ø.10F

| | |
|---|---|
| Ø | BORE |
| | **32** = Ø 32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |

Aluminium
The kit comprises:
n° 1 clevis (painted aluminium)
n° 1 counter clevis (painted aluminium)
n° 4 screws (plated zinc steel)
n° 1 pin (plated zinc steel)
n° 2 circlips (steel)






| Bore | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|
| C (±0,2) | 18 | 26 | 26 | 34 | 34 | 41 |
| CD | 10 | 12 | 12 | 16 | 16 | 20 |
| D | 22 | 25 | 27 | 32 | 36 | 41 |
| E | 45 | 52 | 65 | 75 | 95 | 115 |
| E1 | 25 | 32 | 32 | 46 | 46 | 56 |
| H | 10 | 10 | 12 | 12 | 16 | 16 |
| H1 | 8 | 10 | 10 | 12 | 12 | 16 |
| M (±0,2) | - | 16 | 16 | 25 | 25 | 32 |
| N (±0,2) | 28 | 38 | 38 | 54 | 54 | 90 |
| O | 7 | 9 | 9 | 11 | 11 | 14 |
| P | 40 | 52 | 52 | 75 | 75 | 115 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| UB | 45 | 52 | 60 | 70 | 90 | 110 |
| XD | 73 | 77 | 80 | 89 | 100 | 118 |
| Weight (g) | 110 | 190 | 240 | 490 | 710 | 1290 |

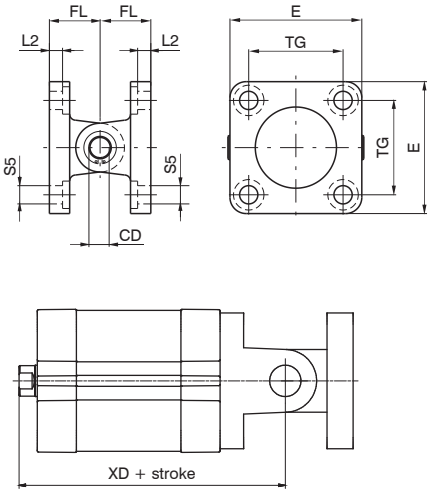
## Standard complete trunnion

**Coding:** 1320.Ø.22F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |

Aluminium
The kit comprises:
n° 1 clevis (painted steel)
n° 1 counter clevis (painted steel)
n° 4 screws (plated zinc steel)
n° 1 pin (plated zinc steel)
n° 2 circlips (steel)



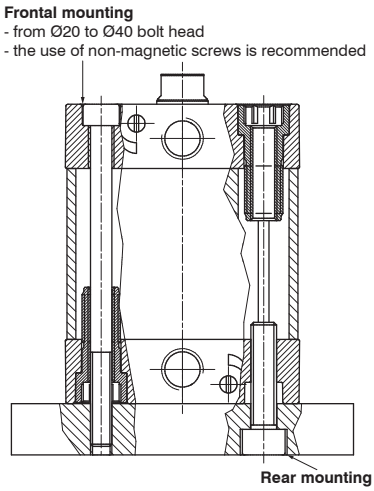



| Bore | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|
| CD | 10 | 12 | 12 | 16 | 16 | 20 |
| E | 45 | 55 | 65 | 75 | 95 | 115 |
| FL | 22 | 25 | 27 | 32 | 36 | 41 |
| L 2 (±0.5) | 5,5 | 5,5 | 6,5 | 6,5 | 10 | 10 |
| S 5 | 6,6 | 6,6 | 9 | 9 | 11 | 11 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| XD | 73 | 77 | 80 | 89 | 100 | 118 |
| Weight (g) | 360 | 580 | 780 | 1370 | 2370 | 4110 |

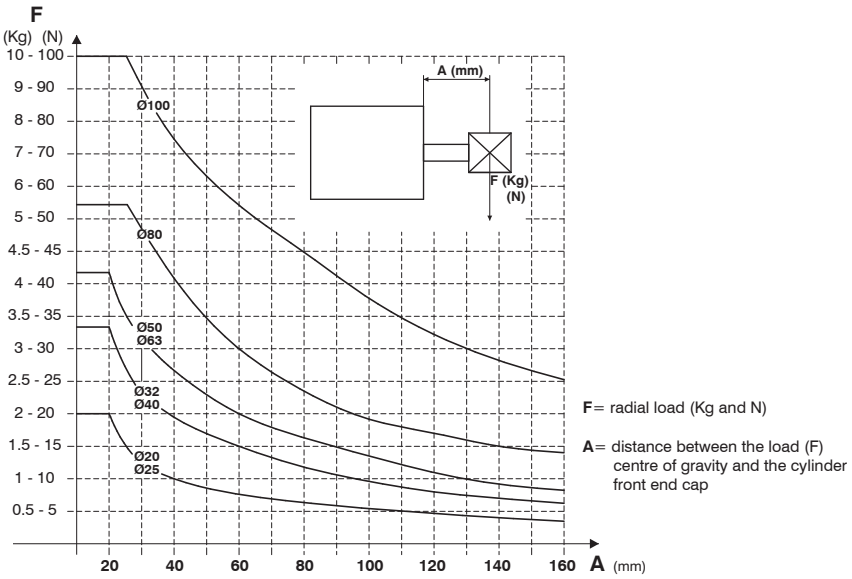



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

### Alternative fixing options




### Admissible maximum radial load diagram

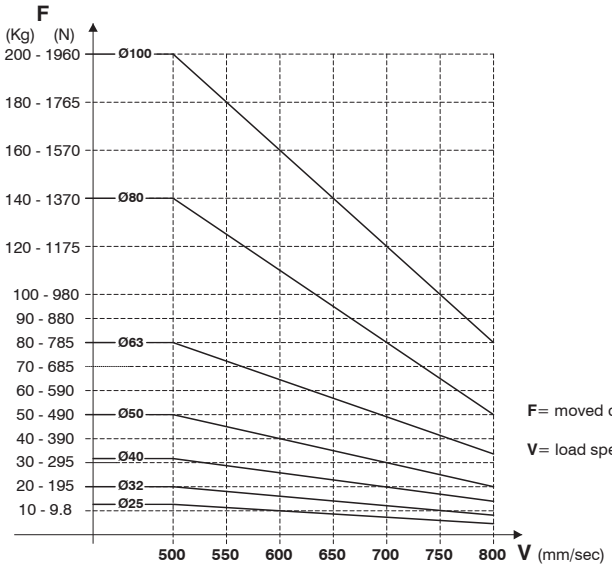



**F**= radial load (Kg and N)

**A**= distance between the load (F) centre of gravity and the cylinder front end cap

The diagram shows the maximum radial load **F** (in Newtons) that can be applied to the cylinder piston rod as a function of the distance **A** (in mm), based upon the standard version cylinder under static conditions.
Important: Do not exceed the recommended values in the table as reduced life or damage to the cylinder may result.

### End of stroke cushioning capacity diagram




**F**= moved cylinder load (Kg and N)

**V**= load speed

The diagram shows, for each diameter, the safety curves relative to the maximum loads which can be moved by the cylinder in function of it's speed **V**.
The data has been calculated under the following test conditions: Cylinder mounted vertically with the rod pointing down, air pressure at 5 bar and with a guided load.
Important: Do not exceed the recommended values in the table as reduced life or damage to the cylinder may result.

## Series 1200 - Special performance microbore cylinders

These microbore cylinders are not subject to a standard; they are single acting with a front spring, can be either hexagonal or round bodied and either completely threaded or threaded with a plain rod ending.
They are available with M5 connections or with incorporated quick fittings.

**Construction characteristics**

| | |
|---|---|
| Body | brass |
| Rod bushing | brass |
| Seals | NBR |
| Springs | stainless steel |
| Rod / piston | stainless steel (AISI 303) |

**Operational characteristics**

| | |
|---|---|
| Fluid | Filtered air. No lubrication needed, if applied it shall be continuous |
| Pressure | 3 ... 7 bar |
| Working temperature | -5 °C ... +70 °C |

Attention: air must be dried for applications with lower temperature.



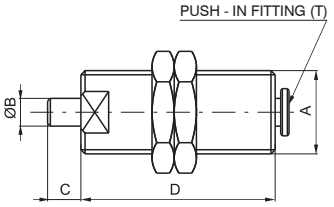

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Threaded body, round execution

**Coding:** 1213.Ø.Ⓒ

| | |
|---|---|
| Ø | BORE |
| | **6** = Ø6 |
| | **8** = Ø8 |
| | **10** = Ø10 |
| Ⓒ | STROKE |
| | **3** = 3 mm stroke (Ø10 only) |
| | **5** = 5 mm stroke (for all diameters) |
| | **10** = 10 mm stroke (Ø6 and Ø10 only) |
| | **20** = 20 mm stroke (Ø6 only) |





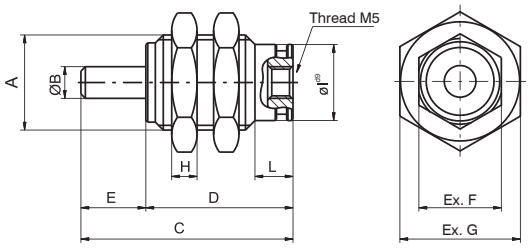

| A | ØB | C | D | T |
|---|---|---|---|---|
| M10x1 | Ø3 | 5 | 30,5 | 4/2 |
| | | | 35,5 | |
| | | | 49,5 | |
| M12x1 | | 6 | 28 | |
| M15x1,5 | Ø5 | 1 | 44 | |
| | | 5 | 40 | |
| | | 12 | 44 | |

## Threaded body, hexagonal execution

**Coding:** 1213.Ø.stroke.Ⓜ

| | |
|---|---|
| Ø | BORE |
| | **6** = Ø6 |
| | **10** = Ø10 |
| | **16** = Ø16 |
| Ⓒ | STROKE |
| | **5** = 5 mm stroke |
| | **10** = 10 mm stroke |
| | **15** = 15 mm stroke |
| Ⓜ | SPRING |
| | **C** = Single acting front spring |
| | **CF** = Single acting front spring threaded body |

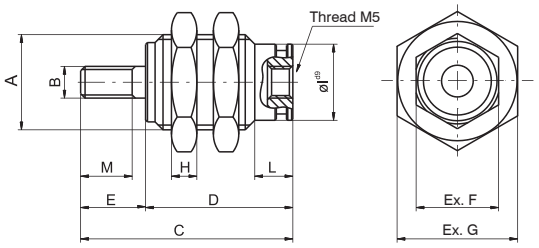





Single acting front spring

Single acting front spring threaded rod



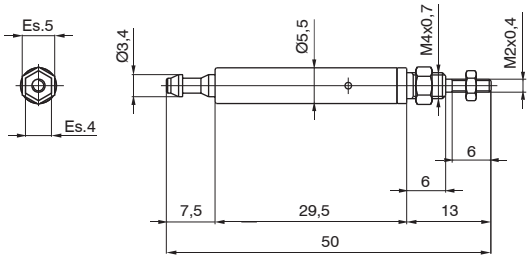



| A | ØB | B | C | D | E | Hex. F | Hex. G | H | ØI | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|
| M10x1 | Ø3 | M3x0.5 | 27,5 | 18,5 | 9 | 9 | 12 | 3 | Ø8,5 | 6 | 7 |
| | | | 34,5 | 25.7 | | | | | | | |
| | | | 41,5 | 32,5 | | | | | | | |
| M15x1.5 | Ø5 | M4x0.7 | 32,5 | 21.5 | 12 | 13 | 19 | 4 | Ø12 | | 10 |
| | | | 39 | 28 | | | | | | | |
| | | | 46 | 34 | | | | | | | |
| M22x1.5 | Ø6 | M5x0.8 | 37,5 | 24.5 | 14 | 20 | 27 | 5 | Ø19 | 7 | 12 |
| | | | 43,5 | 30.5 | | | | | | | |
| | | | 50 | 37 | | | | | | | |

## Front fixing microbore cylinders

**Coding:** 1273.4.10





## Series 1325-1326-1345-1347 - Twin rod cylinders

### Construction characteristics

| | |
|---|---|
| Other seals | NBR 80 shore rubber |
| Cushion bushings | hardened aluminium |
| Barrel | RA=0.3-0.5 anodised aluminium |
| Flange | zinc plated steel |
| Rod seal | PUR |
| Pistons | vulcanized rubber block on steel core with incorporated permanent magnet, or without magnet for non magnetic version (plus spacer). |
| Piston rod | C43 chromed steel or stainless steel |
| Front cap | oxidised aluminium |
| Rear cap | UNI 5079 aluminium alloy casting |
| Cushion adjustment screws | nickel plated steel |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered and lubricated air |
| Pressure | 10 bar |
| Working temperature | -5 °C ... +70 °C |

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.



### Cushioning lengths

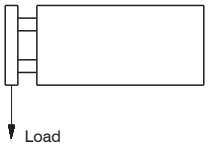
| Bore | Ø | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|
| Front length | mm | 22 | 22 | 24 | 32 | 32 | 32 |
| Rear length | mm | 28 | 32 | 32 | 40 | 44 | 50 |

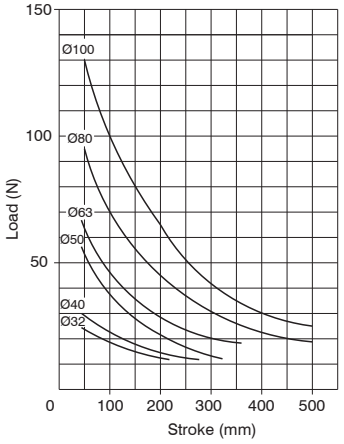
### Standard strokes

**Ø32**: 25 - 50 - 75 - 100 - 150 - 200 mm
**Ø40**: 25 - 50 - 75 - 100 - 150 - 200 - 250 mm
**Ø50**: 25 - 50 - 75 - 100 - 150 - 200 - 250 - 300 mm
**Ø63**: 25 - 50 - 75 - 100 - 150 - 200 - 250 - 300 - 350 mm
**Ø80**: 25 - 50 - 75 - 100 - 150 - 200 - 250 - 300 - 350 - 400 - 500 mm
**Ø100**: 25 - 50 - 75 - 100 - 150 - 200 - 250 - 300 - 350 - 400 - 500 mm
On request are available strokes up to: 1000 mm

### Stroke tolerance (ISO 15552)

| Bore | Stroke | Tolerance |
|---|---|---|
| 32-40-50 | up to 500 mm | +2<br>0 |
| 63-80-100 | | |





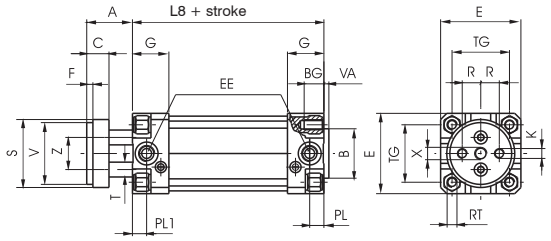
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Basic version

**Coding:** 13Ⓥ.Ø.stroke.Ⓢ

| | |
|---|---|
| Ⓥ | VERSION |
| | **25** = magnetic |
| | **26** = non-magnetic |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| Ⓢ | PISTON ROD |
| | **01** = C43 chromed steel |
| | **01X** = Stainless steel |



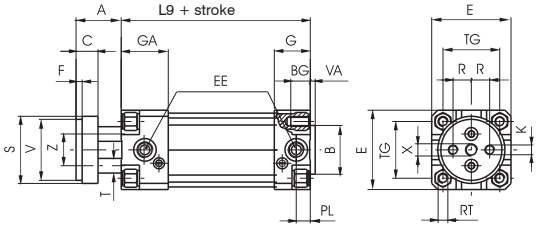



## Extended front cap

**Coding:** 13Ⓥ.Ø.stroke.Ⓢ

| | |
|---|---|
| Ⓥ | VERSION |
| | **45** = magnetic |
| | **47** = non-magnetic |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| Ⓢ | PISTON ROD |
| | **01** = C43 chromed steel |
| | **01X** = Stainless steel |



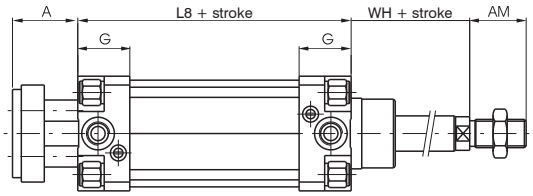



## Through rod cylinder version with ISO standard

**Coding:** 13Ⓥ.Ø.stroke.Ⓢ

| | |
|---|---|
| Ⓥ | VERSION |
| | **25** = magnetic |
| | **26** = non-magnetic |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| Ⓢ | PISTON ROD |
| | **02** = C43 chromed steel |
| | **02X** = Stainless steel |



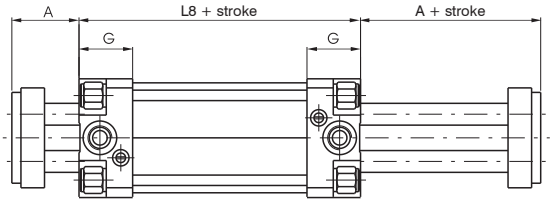


## Through rod twin cylinder version

**Coding:** 13Ⓥ.Ø.stroke.Ⓢ

| | |
|---|---|
| Ⓥ | VERSION |
| | **25** = magnetic |
| | **26** = non-magnetic |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| Ⓢ | PISTON ROD |
| | **06** = C43 chromed steel |
| | **06X** = Stainless steel |








### Table of dimensions

| Bore | | | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|
| A | | | 26 | 30 | 37 | 37 | 46 | 51 |
| AM | | | 22 | 24 | 32 | 32 | 40 | 40 |
| B | | | 30 | 35 | 40 | 45 | 45 | 55 |
| BG | | | 12 | 12 | 16 | 16 | 20 | 20 |
| C | | | 15 | 15 | 18 | 22 | 22 | 22 |
| E | | | 46 | 52 | 65 | 75 | 95 | 115 |
| EE | | | G1/8" | G 1/4" | G 1/4" | G 3/8" | G 3/8" | G 1/2" |
| F | | | 4 | 4 | 5 | 5 | 5 | 5 |
| G | | | 25 | 29 | 29,5 | 36 | 36 | 40 |
| GA | | | 50 | 54 | 54,5 | 61 | 61 | 65 |
| K | | | M6 | M8 | M8 | M10 | M12 | M12 |
| L8 | | | 94 | 105 | 106 | 121 | 128 | 138 |
| L9 | | | 119 | 130 | 131 | 146 | 153 | 163 |
| PL | | | 9 | 11,5 | 13 | 14 | 16 | 18 |
| PL1 | | | 9.5 | 11 | 10,5 | 14 | 13 | 15 |
| R | | | 9.5 | 11,25 | 15 | 19 | 25 | 35 |
| RT | | | M6 | M6 | M8 | M8 | M10 | M10 |
| S | | | 35 | 45 | 55 | 70 | 85 | 105 |
| T | | | 8 | 10 | 12 | 16 | 20 | 20 |
| TG | | | 32.5 | 38 | 46,5 | 56,5 | 72 | 89 |
| V | | | 32 | 40 | 50 | 63 | 80 | 100 |
| VA | | | 4 | 4 | 4 | 4 | 4 | 4 |
| Z | | | 18 | 22 | 26 | 35 | 40 | 50 |
| WH | | | 26 | 30 | 37 | 37 | 46 | 51 |
| X | | | M8 | M10 | M10 | M12 | M14 | M14 |
| Weight (g) | Stroke 0 | Basic version | 560 | 810 | 1380 | 2300 | 3680 | 5740 |
| | | Extended front cap | 650 | 950 | 1500 | 2500 | 4100 | 6300 |
| | every 10 mm | | 20 | 26 | 30 | 40 | 80 | 90 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Sensor brackets codes - 1500._, RS._, HS._

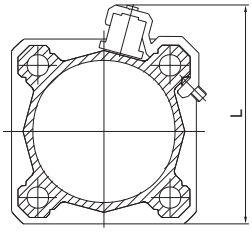
**Coding:** 1320.Ⓣ

| Ⓣ | TYPE |
|---|---|
| | **A** = Ø32-Ø40 |
| | **B** = Ø50-Ø63 |
| | **C** = Ø80-Ø100 |

**Sensor for microbore cylinders**

For technical characteristics and ordering codes see the "Magnetic sensors" sections






| Bore | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|
| L | 60 | 65 | 77 | 87 | 105 | 125 |

## Sensor brackets codes - 1595.HAP

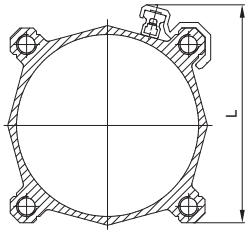
**Coding:** 1320.Ⓣ

| Ⓣ | TYPE |
|---|---|
| | **ASC** = Ø32-Ø40 |
| | **BSC** = Ø50-Ø63 |
| | **CSC** = Ø80-Ø100 |

**Sensor for microbore cylinders**

For technical characteristics and ordering codes see the "Magnetic sensors" sections






| Bore | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|
| L | 60 | 65 | 77 | 87 | 105 | 125 |

## Sensor brackets codes - 1580._,MRS._,MHS

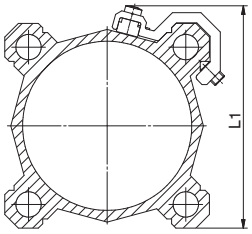
**Coding:** 1320.Ⓣ

| Ⓣ | TYPE |
|---|---|
| | **AS** = Ø32-Ø40 |
| | **BS** = Ø50-Ø63 |
| | **CS** = Ø80-Ø100 |

**Sensor for microbore cylinders**

For technical characteristics and ordering codes see the "Magnetic sensors" sections





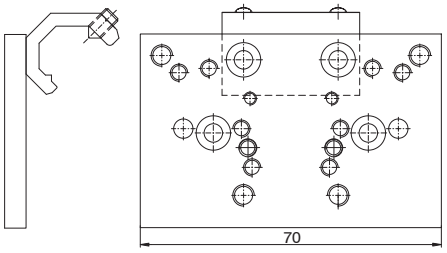

| Bore | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|
| L1 | 48 | 54 | 66 | 76 | 96 | 112 |

## Support for solenoid valves

**Coding:** 1320.Ⓣ

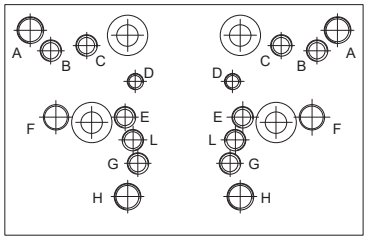
| Ⓣ | SIZE |
|---|---|
| | **15** = Ø32-Ø40 |
| | **16** = Ø50-Ø63 |
| | **17** = Ø80-Ø100 |






Fixing holes for valves series:

A = 414/2
B = 824
C = 828, T488, 488, 484
D = 2400
E = 2600
F = Bases for ISO solenoid valves
G = 858/2
H = T424
L = 888_



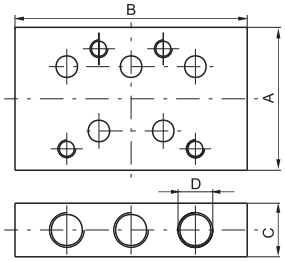

This accessory permits to mount a valve or an electrovalve on a side of the cylinder. The plate can be fitted on the cylinder profiled barrel, and, on it, can be mounted either a threaded distributor or a base on whic can be mounted an ISO distributor. Once installed the connections must be done with fittings and pipes. All of the threaded holes on the support plate are dedicated to different valves series as per attached drawing.

## Bases for ISO solenoid valves

**Coding:** 1320.Ⓝ

| Ⓝ | STANDARDS |
|---|---|
| | **21** = ISO1 |
| | **22** = ISO2 |






| Dimensions | | | | |
|---|---|---|---|---|
| Bases for solenoid valves | A | B | C | D |
| ISO 1 | 40 | 75 | 15 | G 1/8" |
| ISO 2 | 50 | 95 | 20 | G 1/4" |

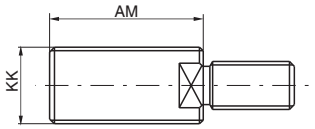
All of the attachments of the ISO 15552 can be mounted, with the exclusion of the front flange and the foot mounting bracket that, although they are part of the same series, need a small adjustment in the exit zone of the rods. For these there is a different code and the dimensions are indicated below.

## Threaded Nipple

**Coding:** 1325.Ø.17F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |





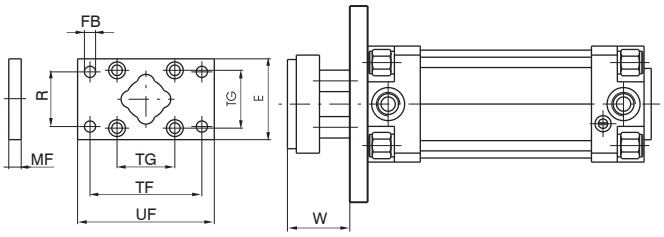

| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| AM | 22 | 24 | 32 | 35 | 40 | 40 |
| KK | M10x1,25 | M12x1,25 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 |
| Weight (g) | 17 | 27 | 63 | 65 | 110 | 110 |

## Front Flange

**Coding:** 1325.Ø.03F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |






| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| E | 45 | 52 | 65 | 75 | 95 | 115 |
| FB (H13) | 7 | 9 | 9 | 9 | 12 | 14 |
| MF (JS 14) | 10 | 10 | 12 | 12 | 16 | 16 |
| R (JS 14) | 32 | 36 | 45 | 50 | 63 | 75 |
| TF (JS 14) | 64 | 72 | 90 | 100 | 126 | 150 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| UF | 80 | 90 | 110 | 120 | 150 | 170 |
| W | 16 | 20 | 25 | 25 | 30 | 35 |
| Weight (g) | 160 | 250 | 480 | 620 | 1430 | 3500 |

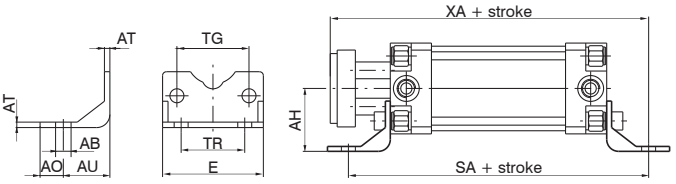
## Front foot mounting bracket (short)

**Coding:** 1325.Ø.05/1F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |

(1 piece)






| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| AB (H14) | 7 | 9 | 9 | 9 | 12 | 14 |
| AH (JS 15) | 32 | 36 | 45 | 50 | 63 | 71 |
| AO (± 0,2) | 11 | 8 | 13 | 13 | 14 | 15 |
| AT | 3,5 | 3,5 | 3,5 | 4,5 | 5 | 5 |
| AU | 24 | 28 | 32 | 32 | 41 | 41 |
| E | 45 | 52 | 65 | 75 | 95 | 115 |
| SA | 142 | 161 | 170 | 185 | 210 | 220 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| TR (JS 14) | 32 | 36 | 45 | 50 | 63 | 75 |
| XA | 144 | 163 | 175 | 190 | 215 | 230 |
| Weight (g) | 50 | 70 | 120 | 180 | 320 | 400 |




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series ECOFLAT

Profiled tube has two "T" slots on the side hosting sensors 1580._, MRS._, MHS._. without adaptors.
Two additional connections are also available on rear cap for cylinder feeding

### Construction characteristics

| | |
|---|---|
| Barrel | aluminium alloy anodised |
| Piston seals | PUR |
| Piston rod seals | PUR (FPM upon request) |
| Shock absorber | NBR |
| Pistons | acetal resin, aluminium on request |
| Piston rod | C43 chromed steel or stainless steel |
| End caps | anodized aluminium |
| Fixing screws | zinc plated steel |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered and lubricated air or not (if lubricated the lubrication must be continuous) |
| Pressure | 10 bar |
| Working temperature | -5 °C ... +70 °C |

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

### Maximum standard strokes

Size 25: 200 mm
Size 32 ... 63: 300 mm
On request are available strokes up to: 500 mm

### Sections ($cm^2$)

| Size | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|
| Out stroke ($cm^2$) | 5,28 | 8,09 | 13,09 | 20,28 | 32,68 |
| In stroke ($cm^2$) | 4,49 | 6,96 | 11,08 | 17,14 | 29,54 |

In order to calculate the theoretical force generated by the unit, both outstroke and instroke, it is necessary to use the following equation:
**FORCE(Kg)** = Surface ($cm^2$) x Pressure(bar)
It is also necessary to remember that the theoretical force must be reduced by 10-15% in order to account for the unit internal friction.

### Maximum rod radial movement (°)

| Size | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|
| rod radial movement | ±0.8 | ±0.7 | ±0.6 | ±0.5 | ±0.4 |

### Maximum torque applicable on the piston rod (Nm)

| Size | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|
| Maximum torque | 0,8 | 1 | 1,3 | 1,8 | 2,1 |

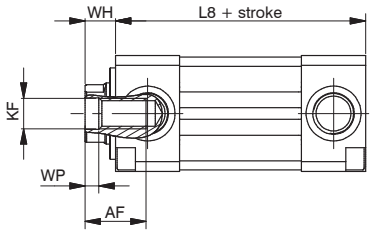
The maximum torque values must also be accounted for while mounting accessories on the piston rod.

## Basic version "1" female rod

**Coding:** 13Ⓥ.Ⓣ.stroke.ⒶⓅ

| | |
|---|---|
| Ⓥ | VERSION |
| | **70** = Magnetic chromed rod |
| | **71** = Magnetic stainless steel rod |
| | **72** = Non magnetic chromed rod |
| | **73** = Non magnetic stainless steel rod |
| Ⓣ | SIZE |
| | **25** = Equivalent Ø25 piston area |
| | **32** = Equivalent Ø32 piston area |
| | **40** = Equivalent Ø40 piston area |
| | **50** = Equivalent Ø50 piston area |
| | **63** = Equivalent Ø63 piston area |
| Ⓐ | FEEDING |
| | **1** = Side connection |
| | **1P**= Rear connection |
| Ⓟ | PISTON |
| | = Standard version |
| | **K** = Version with aluminium piston |



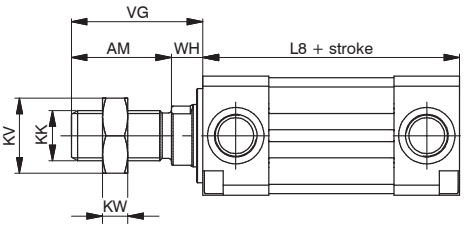



## Basic version "2" male rod

**Coding:** 13Ⓥ.Ⓣ.stroke.ⒶⓅ

| | |
|---|---|
| Ⓥ | VERSION |
| | **70** = Magnetic chromed rod |
| | **71** = Magnetic stainless steel rod |
| | **72** = Non magnetic chromed rod |
| | **73** = Non magnetic stainless steel rod |
| Ⓣ | SIZE |
| | **25** = Equivalent Ø25 piston area |
| | **32** = Equivalent Ø32 piston area |
| | **40** = Equivalent Ø40 piston area |
| | **50** = Equivalent Ø50 piston area |
| | **63** = Equivalent Ø63 piston area |
| Ⓐ | FEEDING |
| | **2** = Side connection |
| | **2P** = Rear connection |
| Ⓟ | PISTON |
| | = Standard version |
| | **K** = Version with aluminium piston |



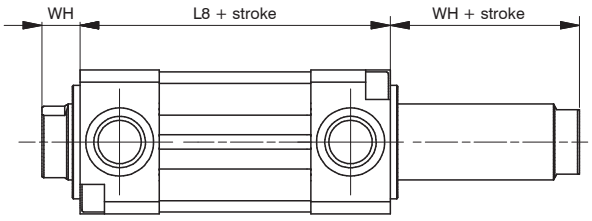



## Female through rod cylinder version "3"

**Coding:** 13Ⓥ.Ⓣ.stroke.3Ⓟ

| | |
|---|---|
| Ⓥ | VERSION |
| | **70** = Magnetic chromed rod |
| | **71** = Magnetic stainless steel rod |
| | **72** = Non magnetic chromed rod |
| | **73** = Non magnetic stainless steel rod |
| Ⓣ | SIZE |
| | **25** = Equivalent Ø25 piston area |
| | **32** = Equivalent Ø32 piston area |
| | **40** = Equivalent Ø40 piston area |
| | **50** = Equivalent Ø50 piston area |
| | **63** = Equivalent Ø63 piston area |
| Ⓟ | PISTON |
| | = Standard version |
| | **K** = Version with aluminium piston |



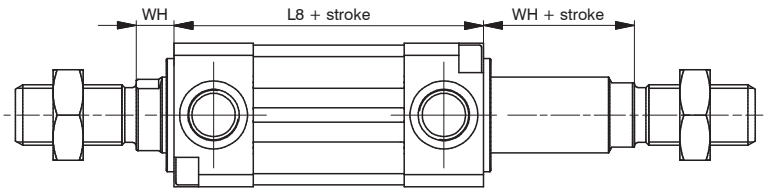



## Male through rod cylinder version "4"

**Coding:** 13Ⓥ.Ⓣ.stroke.4Ⓟ

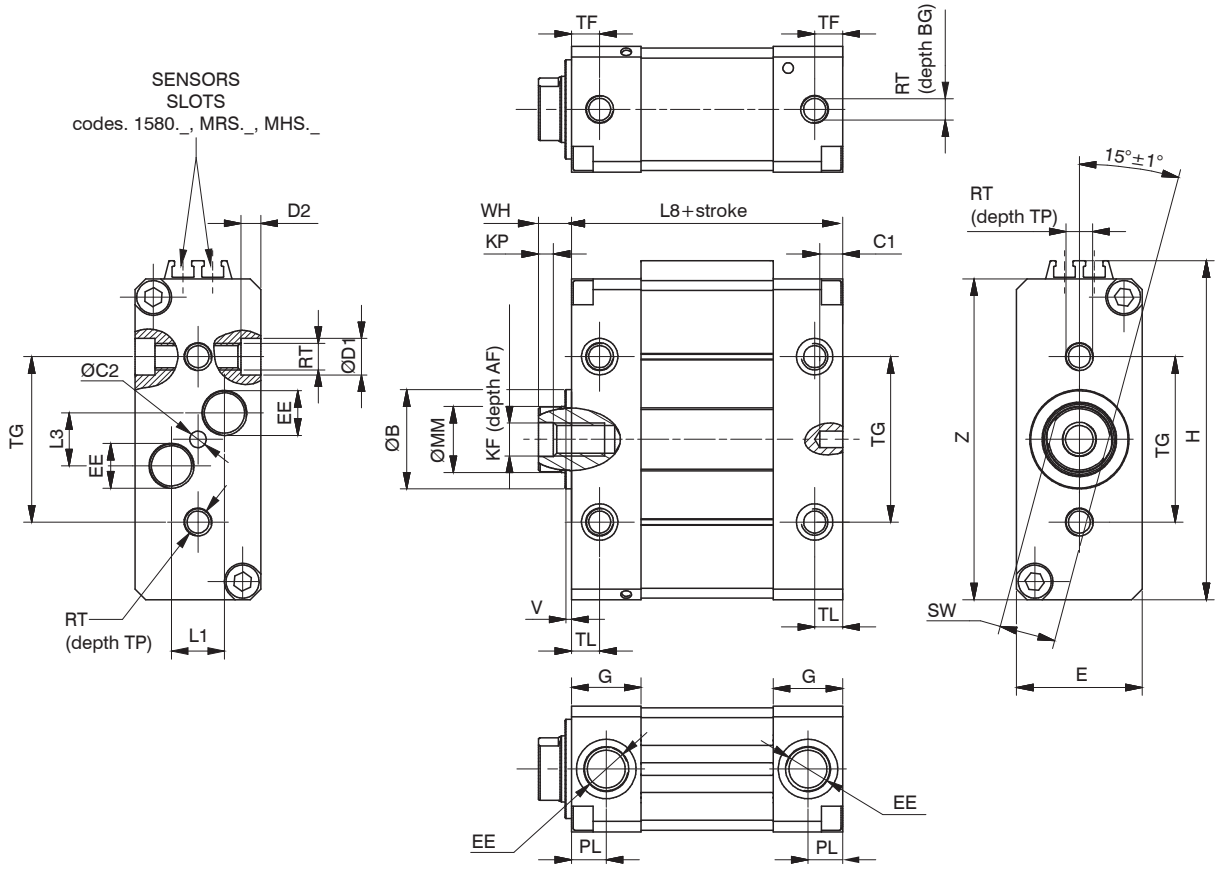
| | |
|---|---|
| Ⓥ | VERSION |
| | **70** = Magnetic chromed rod |
| | **71** = Magnetic stainless steel rod |
| | **72** = Non magnetic chromed rod |
| | **73** = Non magnetic stainless steel rod |
| Ⓣ | SIZE |
| | **25** = Equivalent Ø25 piston area |
| | **32** = Equivalent Ø32 piston area |
| | **40** = Equivalent Ø40 piston area |
| | **50** = Equivalent Ø50 piston area |
| | **63** = Equivalent Ø63 piston area |
| Ⓟ | PISTON |
| | = Standard version |
| | **K** = Version with aluminium piston |








Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice



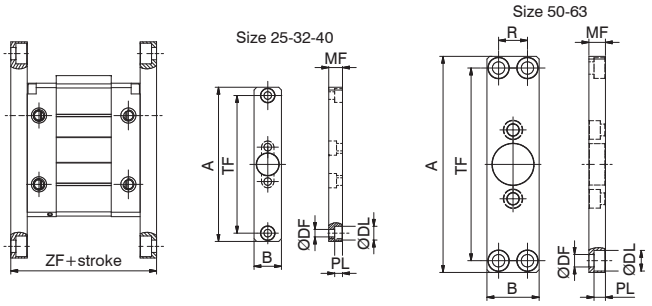

| Size | | | | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|---|---|---|
| AM | | | | 22 | 22 | 24 | 32 | 32 |
| AF | | | | 12 | 14 | 16 | 20 | 20 |
| Ø B (h9) | | | | 16 | 20 | 25 | 30 | 30 |
| BG | | | | 8 | 9 | 9 | 12 | 14 |
| C1 | | | | 7 | 7 | 7 | 7 | 7 |
| C2 (H9) | | | | 4 | 4 | 4 | 5 | 5 |
| Ø D1 | | | | 8 | 10 | 10 | 11 | 15 |
| D2 | | | | 4 | 4 | 5 | 6 | 6 |
| E | | | | 20 | 24 | 30 | 38 | 50 |
| EE | | | | M5 | G1/8" | G1/8" | G1/4" | G1/4" |
| G | | | | 12 | 17 | 17 | 21 | 21 |
| H | | | | 56,5 | 65,5 | 82,5 | 102,5 | 127 |
| KF | | | | M5 | M6 | M8 | M10 | M10 |
| KK | | | | M10x1,25 | M10x1,25 | M12x1,25 | M16x1,5 | M16x1,5 |
| KP | | | | 2 | 2,5 | 3 | 4,5 | 4,5 |
| KV | | | | 17 | 17 | 19 | 24 | 24 |
| KW | | | | 6 | 6 | 7 | 8 | 8 |
| L1 | | | | 6 | 7,5 | 7,5 | 16 | 19 |
| L3 | | | | 10 | 14,5 | 14,5 | 16 | 21 |
| L8 | | | | 62 | 72 | 76 | 82 | 82 |
| Ø MM | | | | 10 | 12 | 16 | 20 | 20 |
| PL | | | | 6,5 | 8,5 | 8,5 | 10,5 | 10,5 |
| RT | | | | M5 | M6 | M6 | M8 | M10 |
| SW (H13) | | | | 8 | 10 | 13 | 17 | 17 |
| TF | | | | 5 | 8,5 | 8,5 | 8,5 | 8,5 |
| TG | | | | 25 | 32 | 40 | 50 | 60 |
| TL | | | | 5 | 8,5 | 8,5 | 8,5 | 8,5 |
| TP | | | | 8 | 9 | 9 | 12 | 14 |
| V | | | | 2 | 2 | 2 | 2 | 2 |
| VG | | | | 30 | 30 | 33 | 42 | 42 |
| WH | | | | 8 | 8 | 9 | 10 | 10 |
| Z | | | | 51 | 60 | 77 | 97 | 1215 |
| Weight (g) | Version | 1 | Stroke 0 | 180 | 285 | 482 | 848 | 1350 |
| | | 2 | Stroke 0 | 203 | 309 | 520 | 929 | 1431 |
| | every 10 mm | | | 22 | 29 | 49 | 79 | 118 |
| Weight (g) | Version | 3 | Stroke 0 | 195 | 314 | 534 | 959 | 1478 |
| | | 4 | Stroke 0 | 242 | 362 | 610 | 1096 | 1615 |
| | every 10 mm | | | 28 | 38 | 65 | 103 | 143 |

## Front and rear flanges

**Coding:** 1370.Ⓣ.03

| Ⓣ | SIZE |
|---|---|
| | **25** = Size 25 |
| | **32** = Size 32 |
| | **40** = Size 40 |
| | **50** = Size 50 |
| | **63** = Size 63 |






Brackets used to anchor the cylinder parallel to the mounting plane. Manufactured from steel with a rust proof protective treatment. Mounted to the cylinder end caps with bolts.

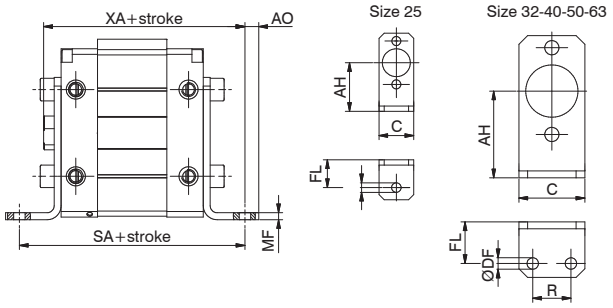
| Size | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|
| A | 112 | 130 | 146 | 157 | 157 |
| B | 20 | 24 | 30 | 38 | 50 |
| ØDF | 5.5 | 6.6 | 6.6 | 9 | 9 |
| ØDL | 10 | 11 | 11 | 15 | 15 |
| PL | 5.7 | 6.5 | 6.3 | 8.3 | 8.3 |
| MF | 10 | 10 | 10 | 12 | 15 |
| R | / | / | / | 21 | 33 |
| TF | 100 | 115 | 132 | 140 | 140 |
| ZF | 82 | 92 | 96 | 106 | 112 |

## Foot

**Coding:** 1370.Ⓣ.05/1F

| Ⓣ | SIZE |
|---|---|
| | **25** = Size 25 |
| | **32** = Size 32 |
| | **40** = Size 40 |
| | **50** = Size 50 |
| | **63** = Size 63 |






Brackets used to anchor the cylinder parallel to the mounting plane. Manufactured from steel with a rust proof protective treatment. Mounted to the cylinder end caps with bolts.

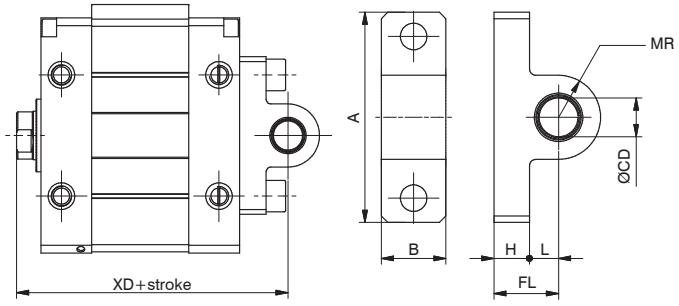
| Size | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|
| AH | 28 | 32 | 40 | 50 | 63 |
| AO | 7 | 5.5 | 7 | 8 | 10 |
| C | 20 | 24 | 30 | 38 | 50 |
| ØDF | 5.5 | 5.5 | 5.5 | 6.6 | 9 |
| FL | 16 | 18 | 20 | 24 | 27 |
| MF | 3 | 3 | 4 | 4 | 4 |
| R | / | 13 | 16 | 22 | 30 |
| SA | 94 | 108 | 116 | 130 | 136 |
| XA | 86 | 98 | 105 | 116 | 119 |

## Rear male clevis

**Coding:** 1370.Ⓣ.09/1F

| Ⓣ | SIZE |
|---|---|
| | **25** = Size 25 |
| | **32** = Size 32 |
| | **40** = Size 40 |
| | **50** = Size 50 |
| | **63** = Size 63 |






This type of mounting allows anchorage of the cylinder either parallel or right angle to plane; the cylinder rod can oscillate and self-align as necessary when under load.

| Size | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|
| A | 37 | 44 | 52 | 65 | 78 |
| B | 9 | 10.5 | 10.5 | 20 | 25 |
| ØCD (H7) | 8 | 10 | 12 | 12 | 16 |
| FL | 14 | 15 | 18 | 20 | 24 |
| H | 6 | 9 | 9 | 11 | 11 |
| L | 8 | 6 | 9 | 9 | 13 |
| MR | 7.5 | 10 | 13 | 13 | 17 |
| XD | 84 | 95 | 103 | 112 | 116 |



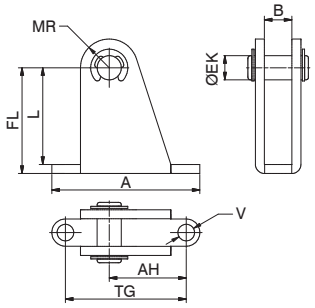
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Rear clevis

**Coding:** 1370.Ⓣ.09F

| Ⓣ | SIZE |
|---|---|
| | **25** = Size 25 |
| | **32** = Size 32 |
| | **40** = Size 40 |
| | **50** = Size 50 |
| | **63** = Size 63 |






To be used in conjunction with 09/1 clevis. Similar to type 08 but includes a hinge pin. This type of mounting allows anchorage of the cylinder either parallel or right angle to plane; the cylinder rod can oscillate and selfalign as necessary when under load. Manufactured from sheet metal with rust proof protective treatment.

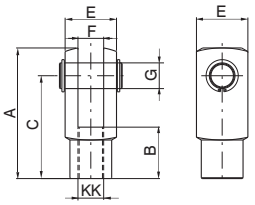
| Size | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|
| A | 49 | 60 | 60 | 46 | 60 |
| AH | 25.5 | 33 | 29.5 | 24 | 32 |
| B | 9.1 | 10.6 | 10.6 | 20.1 | 25.1 |
| ØEK | 8 | 10 | 12 | 12 | 16 |
| FL | 35 | 42 | 51 | 55 | 68 |
| L | 32 | 38 | 47 | 50 | 63 |
| MR | 9.5 | 11 | 14 | 14 | 18 |
| TG | 40 | 50 | 50 | 30 | 40 |
| ØV | 5.5 | 6.6 | 6.6 | 9 | 11 |

## Fork with pin

**Coding:** 1320.Ⓣ.13F

| Ⓣ | SIZE |
|---|---|
| | **32** = Size 25 and 32 |
| | **40** = Size 40 |
| | **50** = Size 50 |
| | **63** = Size 63 |






Element that when screwed to the rod consents a regular functioning even when there are significant lateral forces as the connection point. Made of zincplated steel.

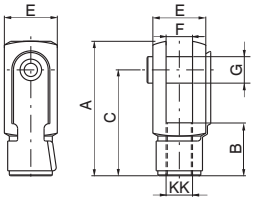
| Bore | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|
| A | 52 | 52 | 62 | 83 | 83 |
| B | 20 | 20 | 24 | 32 | 32 |
| C | 40 | 40 | 48 | 64 | 64 |
| E | 20 | 20 | 24 | 32 | 32 |
| F(B12) | 10 | 10 | 12 | 16 | 16 |
| G | 10 | 10 | 12 | 16 | 16 |
| KK | M10X1.25 | M10X1.25 | M12X1.25 | M16X1.5 | M16X1.5 |
| Weight (g) | 100 | 100 | 140 | 340 | 340 |

## Fork with clips

**Coding:** 1320.Ⓣ.13/1F

| Ⓣ | SIZE |
|---|---|
| | **32** = Size 25 and 32 |
| | **40** = Size 40 |
| | **50** = Size 50 |
| | **63** = Size 63 |






Element that when screwed to the rod consents a regular functioning even when there are significant lateral forces as the connection point. Made of zincplated steel.

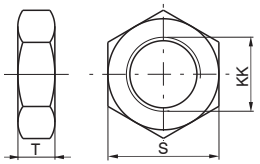
| Bore | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|
| A | 52 | 52 | 62 | 83 | 83 |
| B | 20 | 20 | 24 | 32 | 32 |
| C | 40 | 40 | 48 | 64 | 64 |
| E | 20 | 20 | 24 | 32 | 32 |
| F(B12) | 10 | 10 | 12 | 16 | 16 |
| G | 10 | 10 | 12 | 16 | 16 |
| KK | M10X1.25 | M10X1.25 | M12X1.25 | M16X1.5 | M16X1.5 |
| Weight (g) | 100 | 100 | 140 | 340 | 340 |

## Nuts

**Coding:** 1320.Ⓣ.18F

| Ⓣ | SIZE |
|---|---|
| | **32** = Size 25 and 32 |
| | **40** = Size 40 |
| | **50** = Size 50 |
| | **63** = Size 63 |






Used to block the position of the fork.

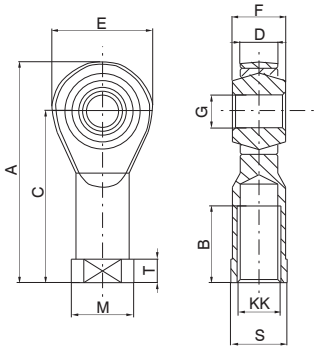
| Bore | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|
| S | 17 | 17 | 19 | 24 | 24 |
| T | 6 | 6 | 7 | 8 | 8 |
| KK | M10X1.25 | M10X1.25 | M12X1.25 | M16X1.5 | M16X1.5 |
| Weight (g) | 15 | 15 | 20 | 20 | 20 |

## Ball joint

**Coding:** 1320.Ⓣ.32F

| | SIZE |
|---|---|
| Ⓣ | **32** = Size 25 and 32 |
| | **40** = Size 40 |
| | **50** = Size 50 |
| | **63** = Size 63 |





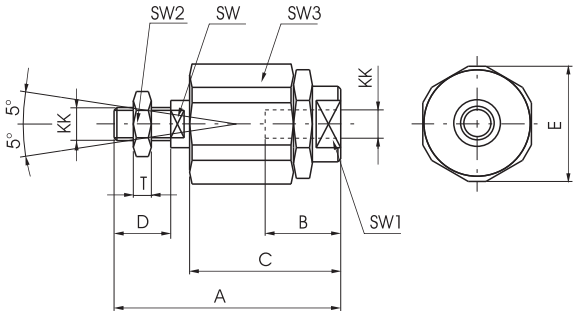

| Bore | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|
| A | 57 | 57 | 66 | 85 | 85 |
| B | 20 | 20 | 22 | 28 | 28 |
| C | 43 | 43 | 50 | 64 | 64 |
| D (-0.1) | 10.5 | 10.5 | 12 | 15 | 15 |
| E | 28 | 28 | 32 | 42 | 42 |
| F | 14 | 14 | 16 | 21 | 21 |
| G (H7) | 10 | 10 | 12 | 16 | 16 |
| KK | M10x1.25 | M10x1.25 | M12x1.25 | M16x1.5 | M16x1.5 |
| M | 19 | 19 | 22 | 27 | 27 |
| S | 17 | 17 | 19 | 22 | 22 |
| T | 6.5 | 6.5 | 6.5 | 8 | 8 |
| Weight (g) | 76 | 76 | 110 | 220 | 220 |

## Self-aligning joint

**Coding:** 1320.Ⓣ.33F

| | SIZE |
|---|---|
| Ⓣ | **32** = Size 25 and 32 |
| | **40** = Size 40 |
| | **50** = Size 50 |
| | **63** = Size 63 |






| Bore | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|
| A | 71 | 71 | 75 | 103 | 103 |
| B | 20 | 20 | 20 | 32 | 32 |
| C | 46 | 46 | 46 | 63 | 63 |
| D | 20 | 20 | 24 | 32 | 32 |
| E | 32 | 32 | 32 | 45 | 45 |
| KK | M10x1.25 | M10x1.25 | M12x1.25 | M16x1.5 | M16x1.5 |
| SW | 12 | 12 | 12 | 20 | 20 |
| SW1 | 19 | 19 | 19 | 27 | 27 |
| SW2 | 17 | 17 | 19 | 24 | 24 |
| SW3 | 30 | 30 | 30 | 41 | 41 |
| T | 6 | 6 | 7 | 8 | 8 |
| Weight (g) | 220 | 220 | 230 | 660 | 660 |





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## Series 1400 - Ø40 - Ø63

The SKIP and STOP valves are pneumatically actuated 2 ways poppet valves.
The SKIP valve (accelerating device) is normally open and is equipped with a supplementary regulator for maximum speed control; it must be activated to obtain speed regulation.
The STOP valve can be normally closed or normally open.

### Construction characteristics

| | |
|---|---|
| Bore | 40 mm and 63 mm diameter |
| Barrel | bright painted drawn steel |
| Regulators group | brass |
| Waterproof seals | NBR rubber |
| Piston seals | FPM |
| Rod seal | PUR |
| Circuit oil | hydraulic with viscosity 2.9° E at 50°C (viscosity index minimum 118) |
| Pistons | aluminium |
| Piston rod | C43 chromed steel |
| End caps | black anodised aluminium |
| Tie rods | zinc plated steel |
| SKIP and STOP valves | black anodised aluminium |

### Operational characteristics

| | |
|---|---|
| Max connecting load | 600 kg (Ø40) -1200 Kg (Ø63) |
| Working temperature | -5 °C ... +70 °C |
| Min. and max. speed | 60 ... 10000 mm/min. |
| Minimum pressure for the actuation of SKIP and STOP valves | 4 bar |

**Attention**: air must be dried for applications with lower temperature.

### Standard strokes

50 - 75 - 100 - 150 - 200 - 250 - 300 - 350 - 400 - 450 - 500 mm
For minimum strokes see different types.
On request are available strokes up to: 1300 mm

### Operation instructions

**Important:** If the hydraulic regulator is mounted parallelly with a pneumatic actuator, to avoid the bending moment on the rod generated when the stroke is adjusted or when the stop is engaged, it is recommended to guide and support the load to be moved.
The limit pressure is indicated below, based on the size of the pneumatic actuator, above which it is recommended to guide and support the load:

| Cylinder | Limit pressure (bar) |
|---|---|
| Ø40 and Ø50 | 10 |
| Ø63 | 5 |
| Ø80 | 2 |
| Over Ø100 | always guide and support the load |

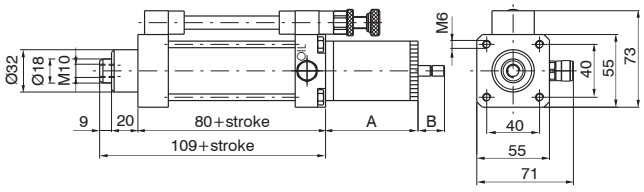
### Maintenance

The speed control check is a closed system and there are no external factors that can adversely affect its function.
Care however, has to be exercised not to allow the hydraulic fluid level to drop below the minimum indicated on the auxiliary tank. Should this occur, cavitation, or worse, an air pocket would result causing erratic control.
Additional fluid should be put in exclusively through a unidirectional valve by means of an appropriate syringe (such as our code number 1400.99.01).
Excess fluid will be expelled through a vent into an appropriate container. It is necessary to completely disassemble the regulator and be sure to bleed the system to eliminate air pockets.
We suggest that you create a vacuum before beginning to refill.
This can be done with a small unidirectional valve turned up and repeatedly loaded with a syringe. The rod must be manually actuated successively releasing air through the valve using a small and pointed instrument.

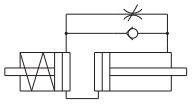
## Regulation on the outward stroke - Tank in line

**Coding:** 1400.40.stroke.01.1






Weight
1450 g + 300 g every 50 mm stroke

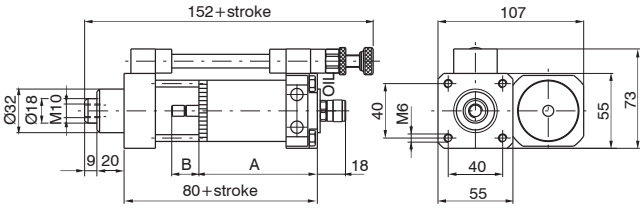


| Strokes | A | B max. |
|---|---|---|
| < 75 | 78 | 30 |
| 75...<150 | 102 | 45 |
| 150...<250 | 127 | 60 |
| 250...<350 | 187 | 90 |
| 350...<500 | 202 | 120 |

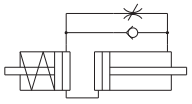
## Regulation on the outward stroke – Lateral tank

**Coding:** 1400.40.stroke.01.2






Weight
1530 g + 300 g every 50 mm stroke

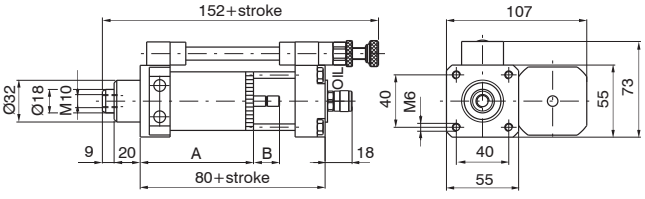


| Strokes | A | B max. |
|---|---|---|
| < 75 | 93 | 30 |
| 75...<150 | 118 | 45 |
| 150...<250 | 143 | 60 |
| 250...<350 | 183 | 90 |
| 350...<500 | 218 | 120 |

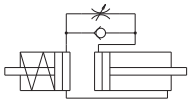
## Regulation on the inward stroke

**Coding:** 1400.40.stroke.02.2






Weight
1530 g + 300 g every 50 mm stroke



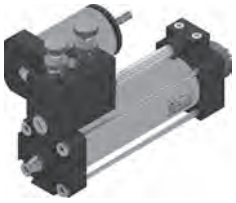
| Strokes | A | B max. |
|---|---|---|
| < 75 | 93 | 30 |
| 75...<150 | 118 | 45 |
| 150...<250 | 143 | 60 |
| 250...<350 | 183 | 90 |
| 350...<500 | 218 | 120 |

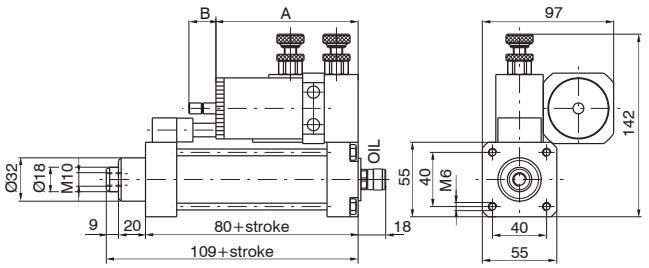



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Regulation in both directions

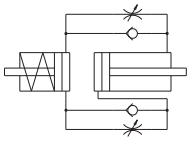
**Coding:** 1400.40.stroke.03.2






Weight
1870 g + 300 g every 50 mm stroke

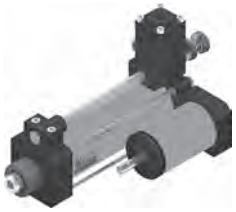
Attention: minimum stroke=150 mm when fitted in tandem (parallel or in-line) with 1319-1320-1321 cylinders series.

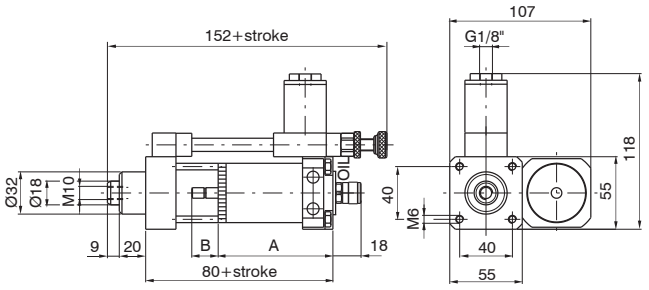


| Strokes | A | B max. |
|---|---|---|
| < 75 | 110 | 30 |
| 75...<150 | 135 | 45 |
| 150...<250 | 160 | 60 |
| 250...<350 | 200 | 90 |
| 350...<500 | 235 | 120 |

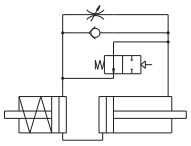
## Regulation on the outward stroke with skip (acceleration valve)

**Coding:** 1400.40.stroke.01.04






Weight
1670 g + 300 g every 50 mm stroke



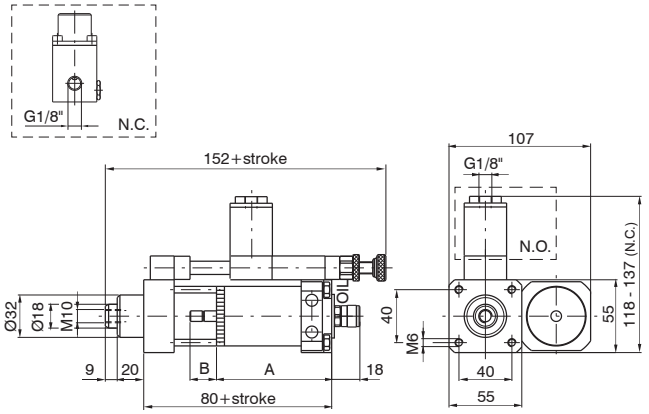
| Strokes | A | B max. |
|---|---|---|
| < 75 | 93 | 30 |
| 75...<150 | 118 | 45 |
| 150...<250 | 143 | 60 |
| 250...<350 | 183 | 90 |
| 350...<500 | 218 | 120 |

## Regulation on the outward stroke with STOP (STOP valve)

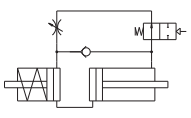
**Coding:** 1400.40.stroke.01.0Ⓥ

| | VERSION |
|---|---|
| Ⓥ | **5** = STOP N.O. |
| | **7** = STOP N.C. |






Weight
1710 g + 300 g every 50 mm stroke



| Strokes | A | B max. |
|---|---|---|
| < 75 | 93 | 30 |
| 75...<150 | 118 | 45 |
| 150...<250 | 143 | 60 |
| 250...<350 | 183 | 90 |
| 350...<500 | 218 | 120 |



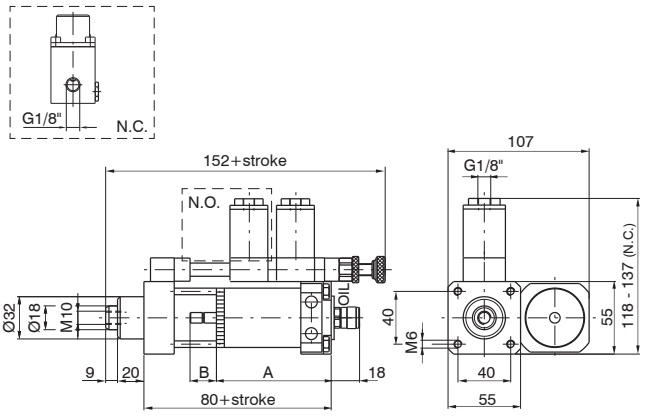
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Regulation on the outward stroke with SKIP and STOP (acceleration and STOP valves)

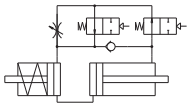
**Coding:** 1400.40.stroke.01.0Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **6** = STOP N.O. |
| | **8** = STOP N.C. |






Weight
1830 g + 300 g every 50 mm stroke

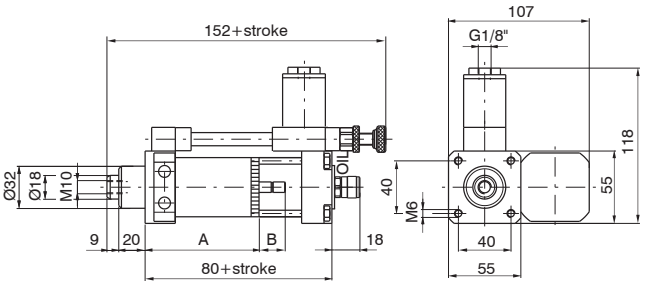


| Strokes | A | B max. |
|---|---|---|
| < 75 | 93 | 30 |
| 75...<150 | 118 | 45 |
| 150...<250 | 143 | 60 |
| 250...<350 | 183 | 90 |
| 350...<500 | 218 | 120 |

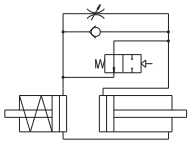
## Regulation on the inward stroke with SKIP (acceleration valve)

**Coding:** 1400.40.stroke.02.04






Weight
1670 g + 300 g every 50 mm stroke



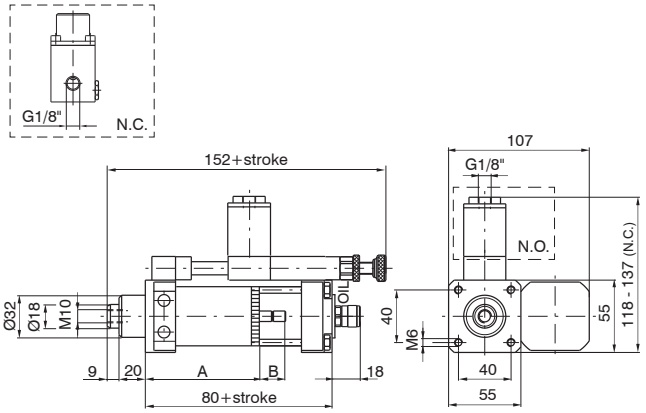
| Strokes | A | B max. |
|---|---|---|
| < 75 | 93 | 30 |
| 75...<150 | 118 | 45 |
| 150...<250 | 143 | 60 |
| 250...<350 | 183 | 90 |
| 350...<500 | 218 | 120 |

## Regulation on the inward stroke with stop (stop valve)

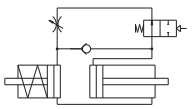
**Coding:** 1400.40.stroke.02.0Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **5** = STOP N.O. |
| | **7** = STOP N.C. |






Weight
1710 g + 300 g every 50 mm stroke



| Strokes | A | B max. |
|---|---|---|
| < 75 | 93 | 30 |
| 75...<150 | 118 | 45 |
| 150...<250 | 143 | 60 |
| 250...<350 | 183 | 90 |
| 350...<500 | 218 | 120 |





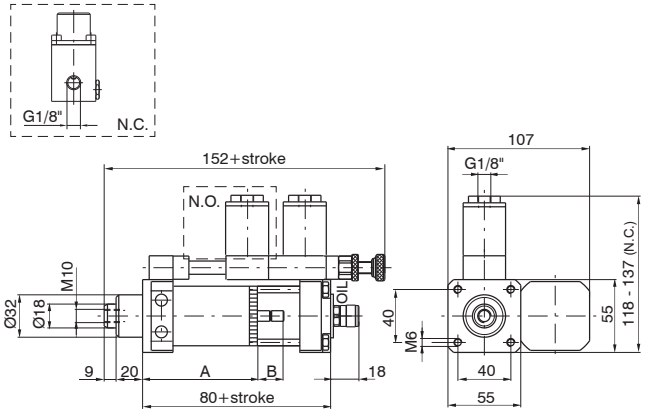
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Regulation on the inward stroke with skip and stop (acceleration and stop valves)

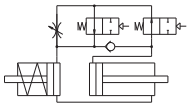
**Coding:** 1400.40.stroke.02.0Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **6** = STOP N.O. |
| | **8** = STOP N.C. |





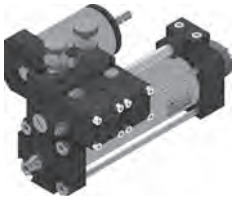

Weight
1830 g + 300 g every 50 mm stroke

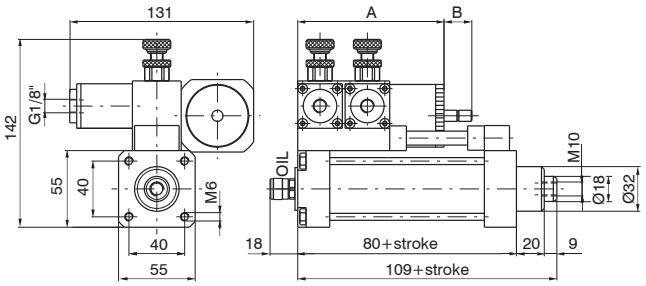


| Strokes | A | B max. |
|---|---|---|
| < 75 | 93 | 30 |
| 75...<150 | 118 | 45 |
| 150...<250 | 143 | 60 |
| 250...<350 | 183 | 90 |
| 350...<500 | 218 | 120 |

## Regulation in both directions with skip (acceleration valves in both directions)

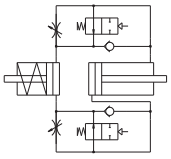
**Coding:** 1400.40.stroke.03.04






Weight
2110 g + 300 g every 50 mm stroke

Attention: minimum stroke=150 mm when fitted in tandem (parallel or in-line) with 1319-1320-1321 cylinders series.

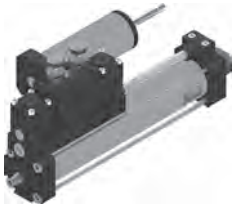


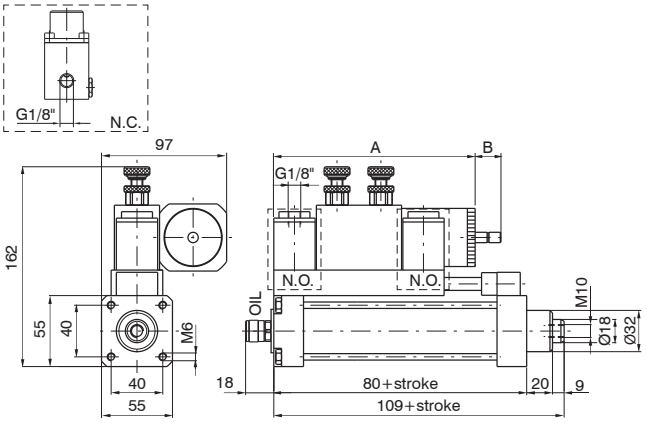
| Strokes | A | B max. |
|---|---|---|
| < 75 | 110 | 30 |
| 75...<150 | 135 | 45 |
| 150...<250 | 160 | 60 |
| 250...<350 | 200 | 90 |
| 350...<500 | 235 | 120 |

## Regulation in both directions with STOP (STOP valves in both directions)

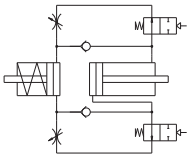
**Coding:** 1400.40.stroke.03.0Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **5** = STOP N.O. |
| | **7** = STOP N.C. |






Min. stroke 150 mm
Weight
2390 g + 300 g every 50 mm stroke

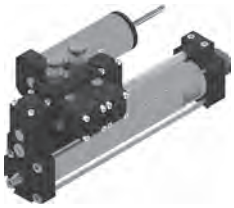


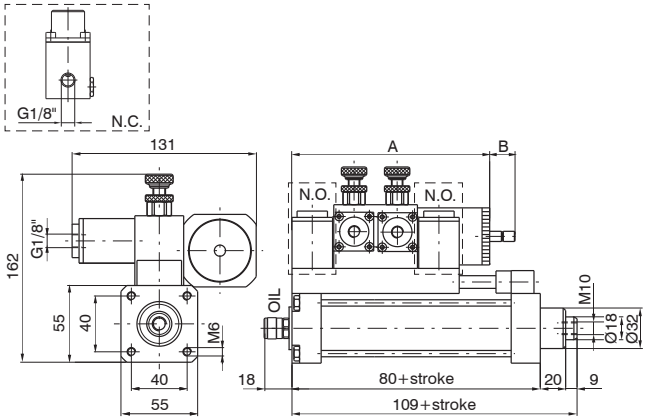
| Strokes | A | B max. |
|---|---|---|
| 150...<250 | 197 | 60 |
| 250...<350 | 237 | 90 |
| 350...<500 | 272 | 120 |

## Regulation in both directions with SKIP and STOP (acceleration and STOP valves in both directions)

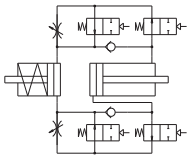
**Coding:** 1400.40.stroke.03.0Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **6** = STOP N.O. |
| | **8** = STOP N.C. |






Min. stroke 150 mm
Weight
2630 g + 300 g every 50 mm stroke



| Strokes | A | B max. |
|---|---|---|
| 150 - < 250 | 197 | 60 |
| 250 - < 350 | 237 | 90 |
| 350 - < 500 | 272 | 120 |

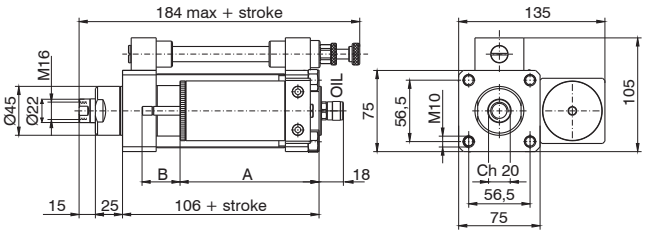



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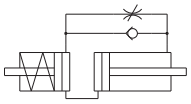
## Regulation on the outward stroke – Lateral tank

**Coding:** 1400.63.stroke.01.2






Min. stroke 75 mm
Weight
2950 g + 850 g every 50 mm stroke

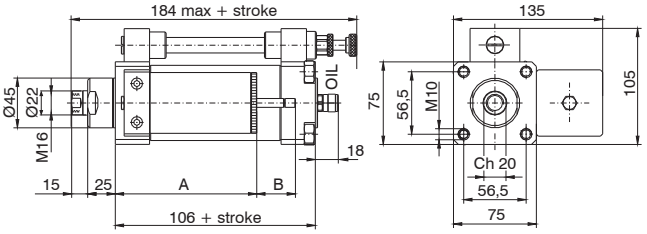


| Strokes | A | B max. |
|---|---|---|
| ≥75 ... <150 | 128 | 50 |
| ≥150 ... <250 | 188 | 80 |
| ≥250 ... <350 | 238 | 100 |
| ≥350 ... <450 | 298 | 130 |
| ≥450 ... <600 | 358 | 160 |

## Regulation on the inward stroke

**Coding:** 1400.63.stroke.02.2






Min. stroke 75 mm
Weight
2950 g + 850 g every 50 mm stroke

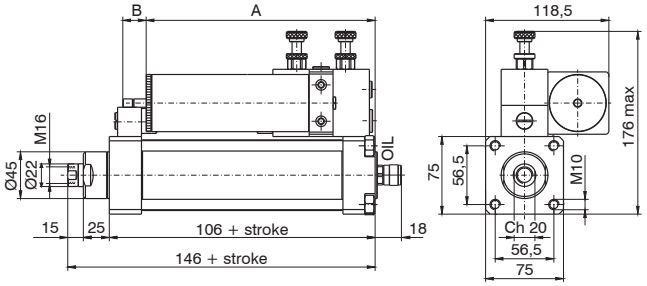


| Strokes | A | B max. |
|---|---|---|
| ≥75 ... <150 | 128 | 50 |
| ≥150 ... <250 | 188 | 80 |
| ≥250 ... <350 | 238 | 100 |
| ≥350 ... <450 | 298 | 130 |
| ≥450 ... <600 | 358 | 160 |

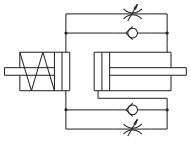
## Regulation in both directions

**Coding:** 1400.63.stroke.03.2






Min. stroke 100 mm
Weight
3600 g + 850 g every 50 mm stroke



| Strokes | A | B max. |
|---|---|---|
| ≥100 ... <150 | 160 | 50 |
| ≥150 ... <250 | 220 | 80 |
| ≥250 ... <350 | 270 | 100 |
| ≥350 ... <450 | 330 | 130 |
| ≥450 ... <600 | 390 | 160 |
| ≥600 ... <700 | 450 | 190 |

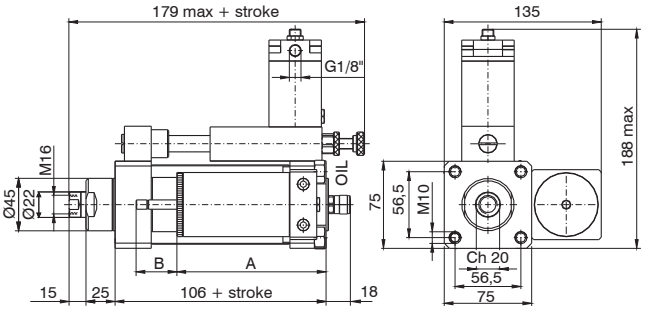


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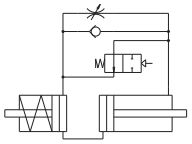
## Regulation on the outward stroke with skip (acceleration valve)

**Coding:** 1400.63.stroke.01.04






Min. stroke 75 mm
Weight
3450 g + 850 g every 50 mm stroke



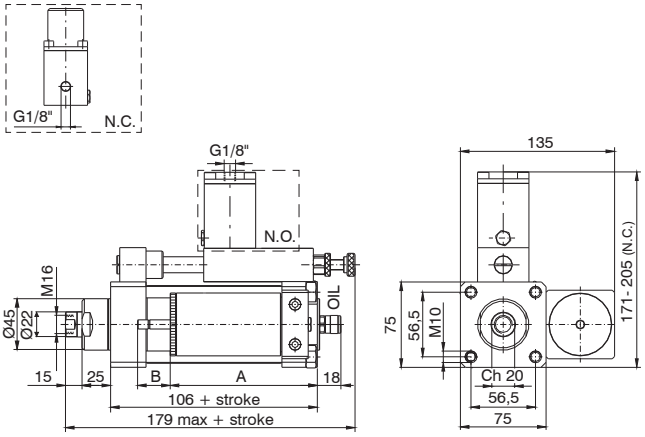
| Strokes | A | B max. |
|---|---|---|
| ≥75 ... <150 | 128 | 50 |
| ≥150 ... <250 | 188 | 80 |
| ≥250 ... <350 | 238 | 100 |
| ≥350 ... <450 | 298 | 130 |
| ≥450 ... <600 | 358 | 160 |

## Regulation on the outward stroke with STOP (STOP valve)

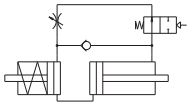
**Coding:** 1400.63.stroke.01.0Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **5** = STOP N.O. |
| | **7** = STOP N.C. |






Min. stroke 75 mm
Weight
3450 g + 850 g every 50 mm stroke



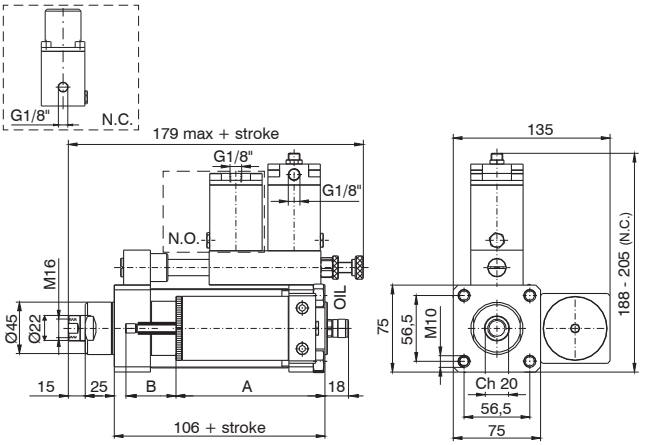
| Strokes | A | B max. |
|---|---|---|
| ≥75 ... <150 | 128 | 50 |
| ≥150 ... <250 | 188 | 80 |
| ≥250 ... <350 | 238 | 100 |
| ≥350 ... <450 | 298 | 130 |
| ≥450 ... <600 | 358 | 160 |

## Regulation on the outward stroke with SKIP and STOP (acceleration and STOP valves)

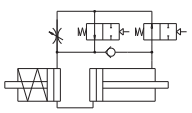
**Coding:** 1400.63.stroke.01.0Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **6** = STOP N.O. |
| | **8** = STOP N.C. |






Min. stroke 75 mm
Weight
3700 g + 850 g every 50 mm stroke



| Strokes | A | B max. |
|---|---|---|
| ≥75 ... <150 | 128 | 50 |
| ≥150 ... <250 | 188 | 80 |
| ≥250 ... <350 | 238 | 100 |
| ≥350 ... <450 | 298 | 130 |
| ≥450 ... <600 | 358 | 160 |

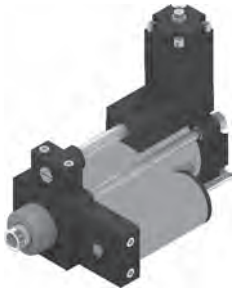


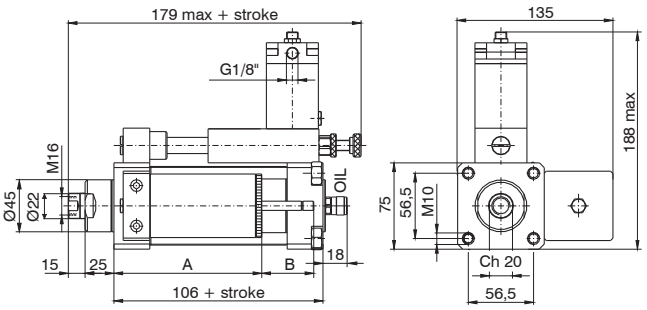


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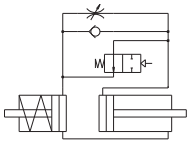
## Regulation on the inward stroke with SKIP (acceleration valve)

**Coding:** 1400.63.stroke.02.04






Min. stroke 75 mm
Weight
3450 g + 850 g every 50 mm stroke

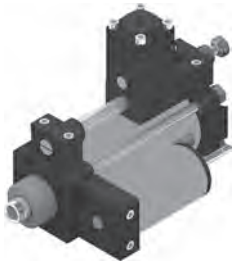


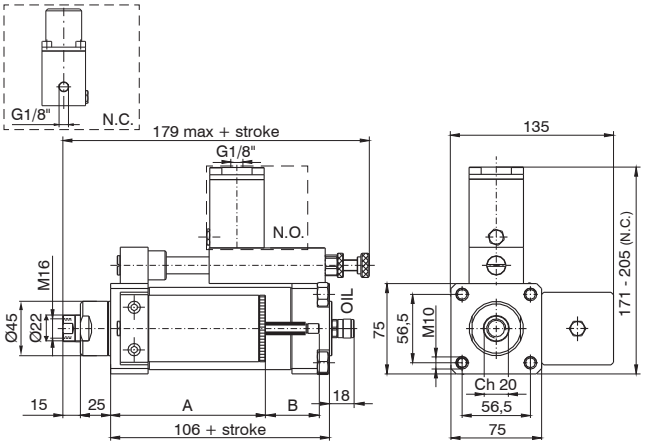
| Strokes | A | B max. |
|---|---|---|
| ≥75 ... <150 | 128 | 50 |
| ≥150 ... <250 | 188 | 80 |
| ≥250 ... <350 | 238 | 100 |
| ≥350 ... <450 | 298 | 130 |
| ≥450 ... <600 | 358 | 160 |

## Regulation on the inward stroke with stop (stop valve)

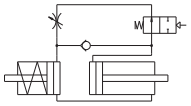
**Coding:** 1400.63.stroke.02.0Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **5** = STOP N.O. |
| | **7** = STOP N.C. |






Min. stroke 75 mm
Weight
3450 g + 850 g every 50 mm stroke

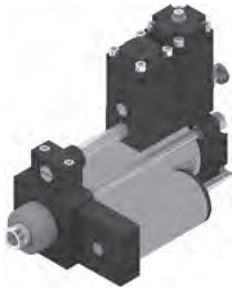


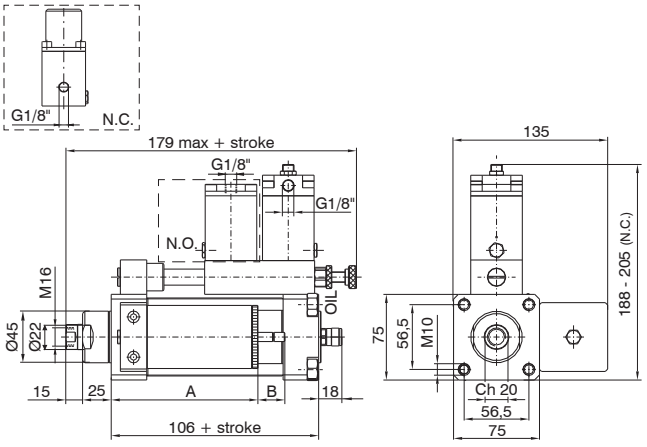
| Strokes | A | B max. |
|---|---|---|
| ≥75 ... <150 | 128 | 50 |
| ≥150 ... <250 | 188 | 80 |
| ≥250 ... <350 | 238 | 100 |
| ≥350 ... <450 | 298 | 130 |
| ≥450 ... <600 | 358 | 160 |

## Regulation on the inward stroke with skip and stop (acceleration and stop valves)

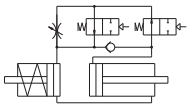
**Coding:** 1400.63.stroke.0Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **6** = STOP N.O. |
| | **8** = STOP N.C. |






Min. stroke 75 mm
Weight
3700 g + 850 g every 50 mm stroke

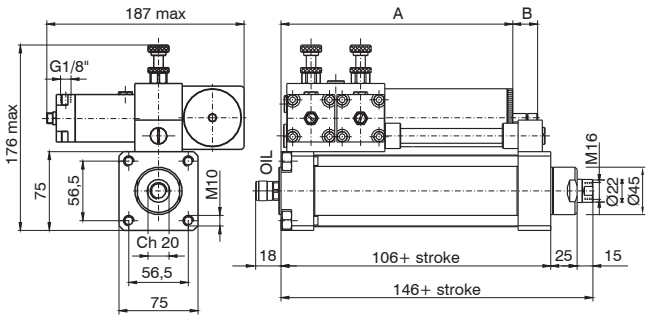


| Strokes | A | B max. |
|---|---|---|
| ≥75 ... <150 | 128 | 50 |
| ≥150 ... <250 | 188 | 80 |
| ≥250 ... <350 | 238 | 100 |
| ≥350 ... <450 | 298 | 130 |
| ≥450 ... <600 | 358 | 160 |

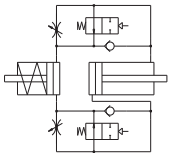
## Regulation in both directions with skip (acceleration valves in both directions)

**Coding:** 1400.63.stroke.03.04






Min. stroke 100 mm
Weight
4100 g + 850 g every 50 mm stroke



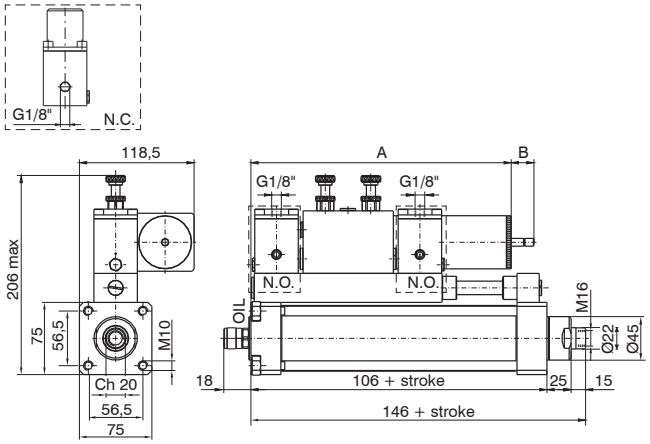
| Strokes | A | B max. |
|---|---|---|
| ≥100 ... <150 | 160 | 50 |
| ≥150 ... <250 | 220 | 80 |
| ≥250 ... <350 | 270 | 100 |
| ≥350 ... <450 | 330 | 130 |
| ≥450 ... <600 | 390 | 160 |
| ≥600 ... <700 | 450 | 190 |

## Regulation in both directions with STOP (STOP valves in both directions)

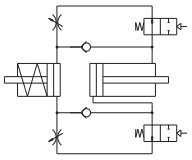
**Coding:** 1400.63.stroke.03.0Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **5** = STOP N.O. |
| | **7** = STOP N.C. |






Min. stroke 200 mm
Weight
4850 g + 850 g every 50 mm stroke

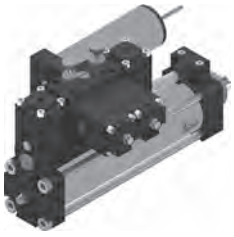


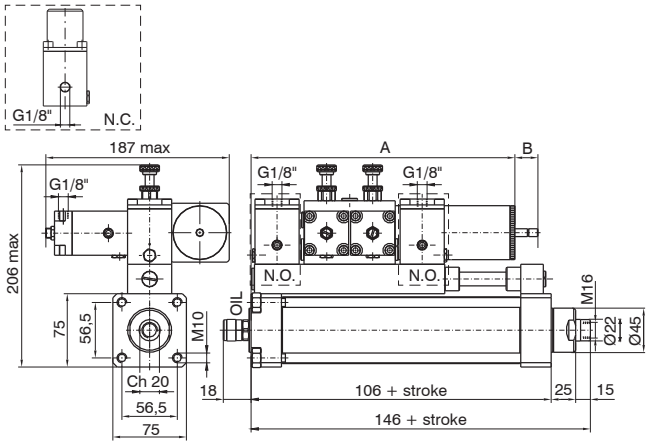
| Strokes | A | B max. |
|---|---|---|
| ≥200 ... <250 | 270 | 50 |
| ≥250 ... <350 | 320 | 100 |
| ≥350 ... <450 | 380 | 130 |
| ≥450 ... <600 | 440 | 160 |
| ≥600 ... <700 | 500 | 190 |

## Regulation in both directions with SKIP and STOP (acceleration and STOP valves in both directions)

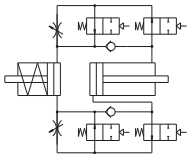
**Coding:** 1400.63.stroke.03.0Ⓥ

| Ⓥ | VERSION |
|---|---|
| | **6** = STOP N.O. |
| | **8** = STOP N.C. |






Min. stroke 200 mm
Weight
5400 g + 850 g every 50 mm stroke



| Strokes | A | B max. |
|---|---|---|
| ≥200 ... <250 | 270 | 50 |
| ≥250 ... <350 | 320 | 100 |
| ≥350 ... <450 | 380 | 130 |
| ≥450 ... <600 | 440 | 160 |
| ≥600 ... <700 | 500 | 190 |



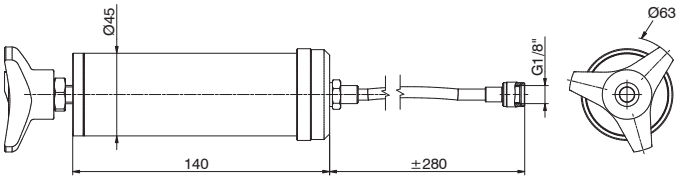


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Hydraulic fluid refill syringe

**Coding:** 1400.99.02






Weight 420 g

## Oil for hydraulic and pneumatic circuits

**Coding:** PNEUM.OIL01



1 L bottle.

This oil is suitable to lubricate pneumatic circuits and also to refill hydraulic speed control tanks. It is completely compatible with our seals.

## Series 1500 - Short stroke cylinders

Profiled tube has three "T" slots on the three sides hosting sensors 1500._, RS._, HS._. without adaptors and with adaptor code 1380.01F codes 1580._, MRS._, MHS._.
A complete range of clamps makes them easy to install under any conditions.
It is interesting to note that as these cylinders (from Ø32 to Ø100) have anchoring holes with the same lead and thread as those of series 1320 ISO 6431, they accept all mountings except for the intermediate trunnion.

### Construction characteristics

| | |
|---|---|
| Body | oxidised aluminium |
| Piston rod bushing | oxidised aluminium |
| Bottom plates | oxidised aluminium |
| Seals | standard: NBR Oil resistant rubber, PUR Piston rod seals<br>(HNBR or FPM seals available upon request) |
| Pistons | aluminium |
| Piston rod | C43 chromed steel (stainless steel for magnetic cylinder Ø20 and Ø25) |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered air, preferably lubricated |
| Pressure | 10 bar |
| Working temperature | -5°C ... +70°C with standard seals magnetic or non magnetic piston<br>-5°C ... +80°C with FPM seals magnetic piston<br>-5°C ... +80°C with HNBR seals magnetic piston<br>-5°C ... +120°C with HNBR seals non magnetic piston<br>-5°C ... +150°C with FPM seals non magnetic piston |



Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

### Standard strokes

**Double acting version**
**Series 1501, 1504, 1511, 1514, 1515, 1516, 1517 and 1518**:
for all bores from 5 to 50 mm every 5 mm.

Maximum suggested strokes:
**Ø20-Ø25**: up to stroke 250 mm
**Ø32-Ø40**: up to stroke 300 mm
**Ø50-Ø63**: up to stroke 350 mm
**Ø80-Ø100**: up to stroke 400 mm
for strokes longer than 50 mm, please get in touch with our area sales rep.

**Single acting version**
**Serie 1502, 1503, 1512 and 1513**:
for all bores from 5 to 10 mm.
for strokes longer than 10 mm, please get in touch with our area sales rep.

**Series with non-rotating device**:
**Ø20-Ø25**: from 5 to 40 mm every 5 mm
**Ø32-Ø40**: from 5 to 50 mm every 5 mm
**Ø50-Ø63**: from 5 to 60 mm every 5 mm
**Ø80-Ø100**: from 5 to 80 mm every 5 mm
For longer strokes, please get in touch with the area sales rep.

### Minimum and maximum springs load for single acting version

| Bore | 20 | 25 | 32 | 40 | 50 | 63 | 80-100 |
|---|---|---|---|---|---|---|---|
| Min. load (N) | 8.5 | 9.5 | 34 | 34 | 49 | 54 | 110 |
| Max. load (N) | 14.5 | 26 | 59.5 | 63.5 | 79 | 85 | 137 |

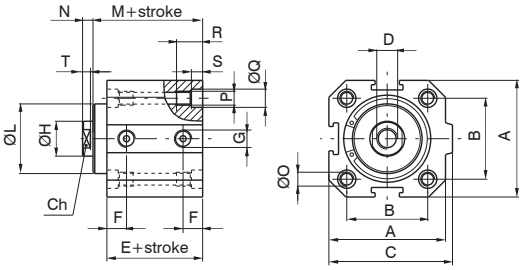

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Double acting version

**Coding:** 15Ⓟ.Ø.stroke.Ⓖ

| | |
|---|---|
| Ⓟ | PISTON |
| | **01** = Non magnetic |
| | **11** = Magnetic |
| Ø | BORE |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | ... |
| | **100** = Ø100 |
| Ⓖ | SEALS |
| | = Standard seals |
| | **V** = FPM seals |
| | **T** = HNBR seals |






| Bore | | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|
| A | | 35 | 41 | 48 | 57 | 67 | 80 | 100 | 120 |
| B | | 26 | 28 | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| C | | 39,5 | 44,5 | 52 | 61 | 71 | 84 | 106 | 126 |
| D | | M4x8 | M5x10 | M6x12 | M10x15 | M12x18 | M12x18 | M16x20 | M16x20 |
| E | Non magnetic | 29 | 30,5 | 32 | 33,5 | 35 | 38 | 44 | 47 |
| | Magnetic | 34 | 35,5 | 37 | 38,5 | 40 | 43 | 49 | 52 |
| F | | 9 | 9,15 | 9,75 | 10,5 | 11 | 11,25 | 13,75 | 15,25 |
| G | | G 1/8" | G 1/8" | G 1/8" | G 1/8" | G 1/8" | G 1/8" | G 3/8" | G 3/8" |
| Ø H | | 8 | 10 | 12 | 16 | 20 | 20 | 25 | 25 |
| Ø L ±0,05 (0/-0,1 for Ø80 and Ø100) | | 17 | 20,5 | 26 | 31 | 39 | 40 | 55 | 55 |
| M | Non magnetic | 32 | 33 | 35,5 | 39,5 | 43 | 46 | 51,5 | 54,5 |
| | Magnetic | 37 | 38 | 40,5 | 44,5 | 48 | 51 | 56,5 | 59,5 |
| N | | 4 | 4 | 4 | 5 | 6 | 6 | 8 | 8 |
| Ø O | | 4,3 | 5,3 | 5,3 | 5,3 | 7 | 7 | 9 | 9 |
| P | | M5 | M6 | M6 | M6 | M8 | M8 | M10 | M10 |
| Ø Q | | 7,5 | 8,5 | 8,5 | 8,5 | 10,5 | 10,5 | 13,5 | 13,5 |
| R | | 15 | 18 | 18 | 18 | 22 | 22 | 30 | 30 |
| S | | 4,5 | 5,5 | 5,5 | 5,5 | 6,5 | 6,5 | 8,5 | 8,5 |
| T | | 3 | 3 | 3 | 4 | 4,5 | 4,5 | 5,5 | 5,5 |
| Ch | | 6 | 8 | 10 | 13 | 17 | 17 | 22 | 22 |

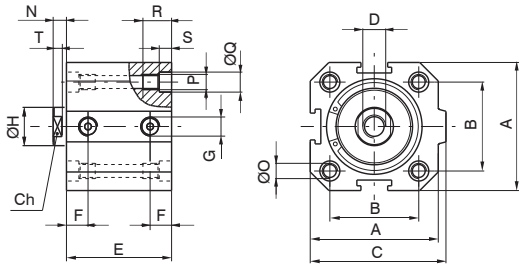
| Weight (g) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Non magnetic | Stroke 0 | 75 | 110 | 170 | 260 | 400 | 600 | 800 | 1500 |
| | every 10 mm | 20 | 30 | 40 | 60 | 80 | 100 | 120 | 145 |
| Magnetic | Stroke 0 | 90 | 130 | 200 | 310 | 460 | 700 | 910 | 1620 |
| | every 10 mm | 20 | 30 | 40 | 60 | 80 | 100 | 120 | 145 |

## Single acting version with front spring

**Coding:** 15Ⓟ.Ø.stroke.Ⓖ

| | |
|---|---|
| Ⓟ | PISTON |
| | **02** = Non magnetic |
| | **12** = Magnetic |
| Ø | BORE |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | ... |
| | **100** = Ø100 |
| Ⓖ | SEALS |
| | = Standard seals |
| | **V** = FPM seals |
| | **T** = HNBR seals |






| Bore | | | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|
| A | | | 35 | 41 | 48 | 57 | 67 | 80 | 100 | 120 |
| B | | | 26 | 28 | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| C | | | 39,5 | 44,5 | 52 | 61 | 71 | 84 | 106 | 126 |
| D | | | M4X8 | M5X10 | M6X12 | M10X15 | M12X18 | M12X18 | M16X20 | M16X20 |
| E | Non magnetic | stroke 5 | 29 | 30,5 | 32 | 33,5 | 35 | 38 | 44 | 47 |
| | | stroke 10 | 34 | 35,5 | 37 | 38,5 | 40 | 43 | 49 | 52 |
| | Magnetic | stroke 5 | 34 | 35,5 | 37 | 38,5 | 40 | 43 | 49 | 52 |
| | | stroke 10 | 39 | 40,5 | 42 | 43,5 | 45 | 48 | 54 | 57 |
| F | | | 9 | 9,15 | 9,75 | 10,5 | 11 | 11,25 | 13,75 | 15,25 |
| G | | | G 1/8" | G 1/8" | G 1/8" | G 1/8" | G 1/8" | G 1/8" | G 3/8" | G 3/8" |
| Ø H | | | 8 | 10 | 12 | 16 | 20 | 20 | 25 | 25 |
| N | | | 4 | 4 | 4 | 5 | 6 | 6 | 8 | 8 |
| Ø O | | | 4,3 | 5,3 | 5,3 | 5,3 | 7 | 7 | 9 | 9 |
| P | | | M5 | M6 | M6 | M6 | M8 | M8 | M10 | M10 |
| Ø Q | | | 7,5 | 8,5 | 8,5 | 8,5 | 10,5 | 10,5 | 13,5 | 13,5 |
| R | | | 15 | 18 | 18 | 18 | 22 | 22 | 30 | 30 |
| S | | | 4,5 | 5,5 | 5,5 | 5,5 | 6,5 | 6,5 | 8,5 | 8,5 |
| T | | | 3 | 3 | 3 | 4 | 4,5 | 4,5 | 5,5 | 5,5 |
| Ch | | | 6 | 8 | 10 | 13 | 17 | 17 | 22 | 22 |

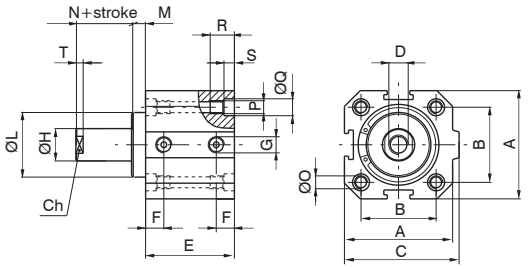
| Weight (g) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Non magnetic | stroke 5 | 70 | 105 | 160 | 250 | 370 | 550 | 750 | 1440 |
| | stroke 10 | 80 | 120 | 180 | 280 | 410 | 600 | 810 | 1500 |
| Magnetic | stroke 5 | 85 | 125 | 190 | 300 | 430 | 650 | 860 | 1560 |
| | stroke 10 | 95 | 140 | 210 | 330 | 470 | 700 | 920 | 1620 |

## Single acting version with rear spring

**Coding:** 15Ⓟ.Ø.stroke.Ⓖ

| | |
|---|---|
| Ⓟ | PISTON |
| | **03** = Non magnetic |
| | **13** = Magnetic |
| Ø | BORE |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | ... |
| | **100** = Ø100 |
| Ⓖ | SEALS |
| | = Standard seals |
| | **V** = FPM seals |
| | **T** = HNBR seals |






| Bore | | | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|
| A | | | 35 | 41 | 48 | 57 | 67 | 80 | 100 | 120 |
| B | | | 26 | 28 | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| C | | | 39,5 | 44,5 | 52 | 61 | 71 | 84 | 106 | 126 |
| D | | | M4X8 | M5X10 | M6X12 | M10X15 | M12X18 | M12X18 | M16X20 | M16X20 |
| E | Non magnetic | stroke 5 | 29 | 30,5 | 32 | 33,5 | 35 | 38 | 44 | 47 |
| | | stroke 10 | 34 | 35,5 | 37 | 38,5 | 40 | 43 | 49 | 52 |
| | Magnetic | stroke 5 | 34 | 35,5 | 37 | 38,5 | 40 | 43 | 49 | 52 |
| | | stroke 10 | 39 | 40,5 | 42 | 43,5 | 45 | 48 | 54 | 57 |
| F | | | 9 | 9,15 | 9,75 | 10,5 | 11 | 11,25 | 13,75 | 15,25 |
| G | | | G 1/8" | G 1/8" | G 1/8" | G 1/8" | G 1/8" | G 1/8" | G 3/8" | G 3/8" |
| Ø H | | | 8 | 10 | 12 | 16 | 20 | 20 | 25 | 25 |
| Ø L ±0,05 (0/-0,1 for Ø80 and Ø100) | | | 17 | 20,5 | 26 | 31 | 39 | 40 | 55 | 55 |
| M | | | 3 | 2,5 | 3,5 | 6 | 8 | 8 | 7,5 | 7,5 |
| N | | | 4 | 4 | 4 | 5 | 6 | 6 | 8 | 8 |
| Ø O | | | 4,3 | 5,3 | 5,3 | 5,3 | 7 | 7 | 9 | 9 |
| P | | | M5 | M6 | M6 | M6 | M8 | M8 | M10 | M10 |
| Ø Q | | | 7,5 | 8,5 | 8,5 | 8,5 | 10,5 | 10,5 | 13,5 | 13,5 |
| R | | | 15 | 18 | 18 | 18 | 22 | 22 | 30 | 30 |
| S | | | 4,5 | 5,5 | 5,5 | 5,5 | 6,5 | 6,5 | 8,5 | 8,5 |
| T | | | 3 | 3 | 3 | 4 | 4,5 | 4,5 | 5,5 | 5,5 |
| Ch | | | 6 | 8 | 10 | 13 | 17 | 17 | 22 | 22 |

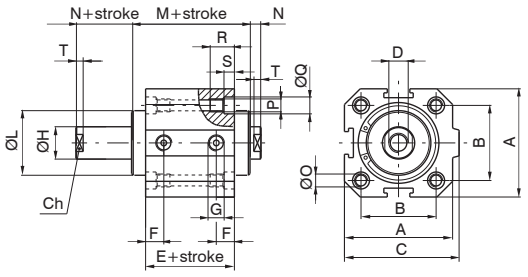
| Weight (g) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Non magnetic | stroke 5 | 70 | 105 | 160 | 250 | 370 | 550 | 750 | 1440 |
| | stroke 10 | 80 | 120 | 180 | 280 | 410 | 600 | 810 | 1500 |
| Magnetic | stroke 5 | 85 | 125 | 190 | 300 | 430 | 650 | 86 | 1560 |
| | stroke 10 | 95 | 40 | 210 | 330 | 470 | 700 | 920 | 1620 |

## Double acting push-pull rod version

**Coding:** 15Ⓟ.Ø.stroke.Ⓖ

| | |
|---|---|
| Ⓟ | PISTON |
| | **04** = Non magnetic |
| | **14** = Magnetic |
| Ø | BORE |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | ... |
| | **100** = Ø100 |
| Ⓖ | SEALS |
| | = Standard seals |
| | **V** = FPM seals |
| | **T** = HNBR seals |






| Bore | | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|
| A | | 35 | 41 | 48 | 57 | 67 | 80 | 100 | 120 |
| B | | 26 | 28 | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| C | | 39,5 | 44,5 | 52 | 61 | 71 | 84 | 106 | 126 |
| D | | M4X8 | M5X10 | M6X12 | M10X15 | M12X18 | M12X18 | M16X20 | M16X20 |
| E | Non magnetic | 29 | 30,5 | 32 | 33,5 | 35 | 38 | 44 | 47 |
| | Magnetic | 34 | 35,5 | 37 | 38,5 | 40 | 43 | 49 | 52 |
| F | | 9 | 9,15 | 9,75 | 10,5 | 11 | 11,25 | 13,75 | 15,25 |
| G | | G 1/8" | G 1/8" | G 1/8" | G 1/8" | G 1/8" | G 1/8" | G 3/8" | G 3/8" |
| Ø H | | 8 | 10 | 12 | 16 | 20 | 20 | 25 | 25 |
| Ø L ±0,05 (0/-0,1 for Ø80 and Ø100) | | 17 | 20,5 | 26 | 31 | 39 | 40 | 55 | 55 |
| M | Non magnetic | 35 | 35,5 | 39 | 45,5 | 51 | 54 | 59 | 62 |
| | Magnetic | 40 | 40,5 | 44 | 50,5 | 56 | 59 | 64 | 67 |
| N | | 4 | 4 | 4 | 5 | 6 | 6 | 8 | 8 |
| Ø O | | 4,3 | 5,3 | 5,3 | 5,3 | 7 | 7 | 9 | 9 |
| P | | M5 | M6 | M6 | M6 | M8 | M8 | M10 | M10 |
| Ø Q | | 7,5 | 8,5 | 8,5 | 8,5 | 10,5 | 10,5 | 13,5 | 13,5 |
| R | | 15 | 18 | 18 | 18 | 22 | 22 | 30 | 30 |
| S | | 4,5 | 5,5 | 5,5 | 5,5 | 6,5 | 6,5 | 8,5 | 8,5 |
| T | | 3 | 3 | 3 | 4 | 4,5 | 4,5 | 5,5 | 5,5 |
| Ch | | 6 | 8 | 10 | 13 | 17 | 17 | 22 | 22 |

| Weight (g) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Non magnetic | Stroke 0 | 90 | 130 | 200 | 320 | 460 | 670 | 1100 | 1680 |
| | every 10 mm | 20 | 35 | 50 | 70 | 90 | 110 | 155 | 185 |
| Magnetic | Stroke 0 | 105 | 160 | 240 | 380 | 530 | 740 | 1210 | 1820 |
| | every 10 mm | 20 | 35 | 50 | 70 | 90 | 110 | 155 | 185 |





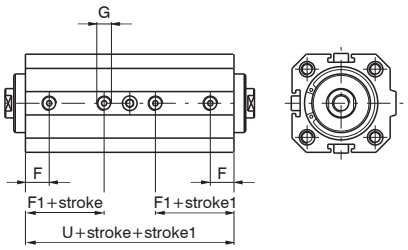
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Tandem with opposed rods

**Coding:** 1515.Ø.stroke.stroke1.Ⓟ Ⓖ

| | |
|---|---|
| Ø | BORE |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | ... |
| | **100** = Ø100 |
| Ⓟ | PISTON |
| | = Non magnetic |
| | **M** = Magnetic |
| Ⓖ | SEALS |
| | = Standard seals |
| | **V** = FPM seals |
| | **T** = HNBR seals |





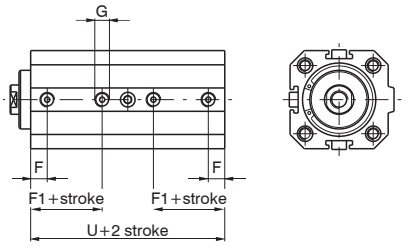

| Bore | | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|
| F | | 9 | 9,15 | 9,75 | 10,5 | 11 | 11,25 | 13,75 | 15,25 |
| F1 | Non magnetic | 17,5 | 18,35 | 19,75 | 20,5 | 21,5 | 24,25 | 24,75 | 26,25 |
| | Magnetic | 22.5 | 23.35 | 24.75 | 25.5 | 26.5 | 29.25 | 29.75 | 31.25 |
| G | | G 1/8" | | | | | | G 3/8" | |
| U | Non magnetic | 59 | 60,5 | 67 | 68,5 | 70 | 78 | 89 | 97 |
| | Magnetic | 69 | 70.5 | 77 | 78.5 | 80 | 88 | 99 | 107 |

## Tandem push with common rods

**Coding:** 1516.Ø.stroke.Ⓟ Ⓖ

| | |
|---|---|
| Ø | BORE |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | ... |
| | **100** = Ø100 |
| Ⓟ | PISTON |
| | = Non magnetic |
| | **M** = Magnetic |
| Ⓖ | SEALS |
| | = Standard seals |
| | **V** = FPM seals |
| | **T** = HNBR seals |





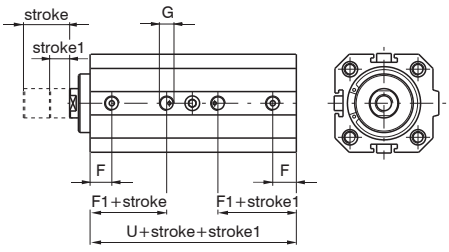

| Bore | | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|
| F | | 9 | 9,15 | 9,75 | 10,5 | 11 | 11,25 | 13,75 | 15,25 |
| F1 | Non magnetic | 17,5 | 18,35 | 19,75 | 20,5 | 21,5 | 24,25 | 24,75 | 26,25 |
| | Magnetic | 22.5 | 23.35 | 24.75 | 25.5 | 26.5 | 29.25 | 29.75 | 31.25 |
| G | | G 1/8" | | | | | | G 3/8" | |
| U | Non magnetic | 59 | 60,5 | 67 | 68,5 | 70 | 78 | 89 | 97 |
| | Magnetic | 69 | 70.5 | 77 | 78.5 | 80 | 88 | 99 | 107 |

## Tandem push with independent rods

**Coding:** 1517.Ø.stroke.stroke1.Ⓟ Ⓖ

| | |
|---|---|
| Ø | BORE |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | ... |
| | **100** = Ø100 |
| Ⓟ | PISTON |
| | = Non magnetic |
| | **M** = Magnetic |
| Ⓖ | SEALS |
| | = Standard seals |
| | **V** = FPM seals |
| | **T** = HNBR seals |





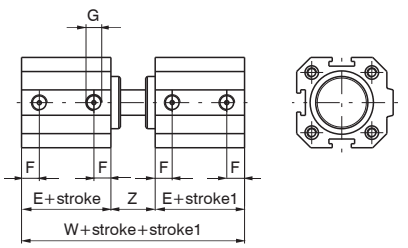

| Bore | | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|
| F | | 9 | 9,15 | 9,75 | 10,5 | 11 | 11,25 | 13,75 | 15,25 |
| F1 | Non magnetic | 17,5 | 18,35 | 19,75 | 20,5 | 21,5 | 24,25 | 24,75 | 26,25 |
| | Magnetic | 22.5 | 23.35 | 24.75 | 25.5 | 26.5 | 29.25 | 29.75 | 31.25 |
| G | | G 1/8" | | | | | | G 3/8" | |
| U | Non magnetic | 59 | 60,5 | 67 | 68,5 | 70 | 78 | 89 | 97 |
| | Magnetic | 69 | 70.5 | 77 | 78.5 | 80 | 88 | 99 | 107 |

## Opposed tandem with common rods

**Coding:** 1518.Ø.stroke.stroke1.Ⓟ Ⓖ

| | |
|---|---|
| Ø | BORE |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | ... |
| | **100** = Ø100 |
| Ⓟ | PISTON |
| | = Non magnetic |
| | **M** = Magnetic |
| Ⓖ | SEALS |
| | = Standard seals |
| | **V** = FPM seals |
| | **T** = HNBR seals |






| Bore | | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|
| E | Non magnetic | 29 | 30.5 | 32 | 33.5 | 35 | 38 | 44 | 47 |
| | Magnetic | 34 | 35.5 | 37 | 38.5 | 40 | 43 | 49 | 52 |
| F | | 9 | 9.15 | 9.75 | 10.5 | 11 | 11.25 | 13.75 | 15.25 |
| G | | G1/8" | | | | | | G3/8" | |
| W | Non magnetic | 72 | 74 | 79 | 89 | 98 | 104 | 119 | 125 |
| | Magnetic | 82 | 84 | 89 | 99 | 108 | 114 | 129 | 135 |



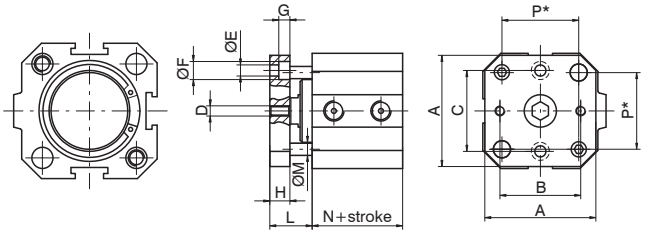
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Double acting version with non-rotating device

**Coding:** 15Ⓟ.Ø.stroke.ARⒼ

| | |
|---|---|
| Ⓟ | PISTON |
| | **01** = Non magnetic |
| | **11** = Magnetic |
| Ø | BORE |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | ... |
| | **100** = Ø100 |
| Ⓖ | SEALS |
| | = Standard seals |
| | **V** = FPM seals |
| | **T** = HNBR seals |






* = distance between rods centres

| Bore | | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|
| A | | 35 | 40 | 45 | 55 | 65 | 80 | 100 | 120 |
| B | | 22 | 26 | 32 | 40 | 50 | 62 | 82 | 103 |
| C | | 22 | 28 | 34 | 40 | 50 | 62 | 82 | 103 |
| D | | M4 | M5 | M5 | M5 | M6 | M6 | M8 | M8 |
| Ø E | | 4,5 | 5,5 | 5,5 | 5,5 | 6,5 | 8,5 | 8,5 | 8,5 |
| Ø F | | 7,5 | 9 | 9 | 9 | 10,5 | 13,5 | 13,5 | 13,5 |
| G | | 4,5 | 5,5 | 5,5 | 5,5 | 6,5 | 8,5 | 8,5 | 8,5 |
| H | | 8 | 8 | 10 | 10 | 12 | 12 | 15 | 15 |
| L | | 15 | 14,5 | 17,5 | 21 | 26 | 26 | 30,5 | 30,5 |
| Ø M | | 6 | 6 | 6 | 6 | 8 | 8 | 10 | 10 |
| N | Non magnetic | 29 | 30,5 | 32 | 33,5 | 35 | 38 | 44 | 47 |
| | Magnetic | 34 | 35,5 | 37 | 38,5 | 40 | 43 | 49 | 52 |
| P | | 26 | 28 | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| Max. suggestion stroke | | 40 | 40 | 50 | 50 | 60 | 60 | 80 | 80 |

| Weight (g) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Non magnetic | Stroke 0 | 115 | 160 | 240 | 350 | 600 | 850 | 1290 | 2150 |
| | every 10 mm | 25 | 35 | 45 | 65 | 90 | 110 | 140 | 165 |
| Magnetic | Stroke 0 | 130 | 180 | 270 | 400 | 660 | 950 | 1400 | 2270 |
| | every 10 mm | 25 | 35 | 45 | 65 | 90 | 110 | 140 | 165 |



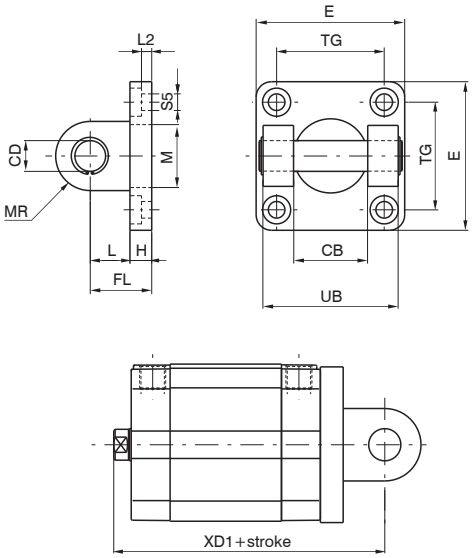

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Rear clevis (MP2)

**Coding:** 1500.Ø.09F

| | BORE |
|---|---|
| Ø | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |






This type of mounting allows anchorage of the cylinder either parallel or right angle to plane; the cylinder rod can oscillate and self-align as necessary when under load.
It is made of aluminium alloy and painted black.

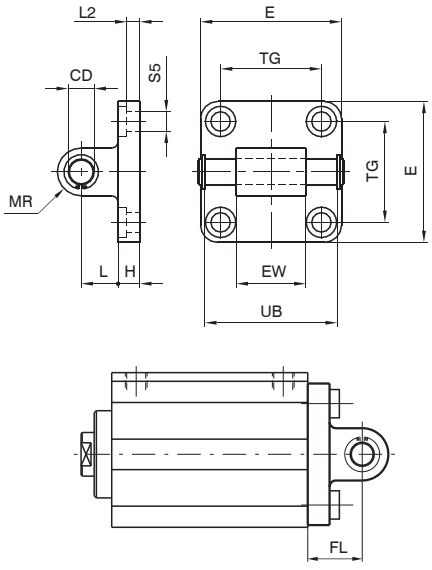
| Bore | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|
| CB (H 9) | 16 | 20 | 26 | 28 | 32 | 40 | 50 | 60 |
| CD (H 9) | 8 | 10 | 10 | 12 | 12 | 16 | 16 | 20 |
| E | 35 | 40 | 45 | 52 | 65 | 75 | 95 | 115 |
| H | 6 | 8 | 9 | 9 | 11 | 11 | 14 | 14 |
| L | 12 | 12 | 13 | 16 | 16 | 21 | 22 | 27 |
| MR | 8 | 9 | 10 | 12 | 12 | 16 | 16 | 20 |
| TG | 26 | 28 | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| UB | 35 | 40 | 45 | 52 | 60 | 70 | 90 | 110 |
| FL | 18 | 20 | 22 | 25 | 27 | 32 | 36 | 41 |
| L2 | / | / | 5,5 | 5,5 | 6,5 | 6,5 | 10 | 10 |
| S5 (H13) | 5,5 | 6,6 | 6,6 | 6,6 | 9 | 9 | 11 | 11 |
| Weight (g) | 45 | 75 | 80 | 130 | 185 | 310 | 530 | 910 |

## Rear male clevis (MP4)

**Coding:** 1500.Ø.09/1F

| | BORE |
|---|---|
| Ø | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |






This type of mounting allows anchorage of the cylinder either parallel or right angle to plane; the cylinder rod can oscillate and self-align as necessary when under load.
It is made of aluminium alloy and painted black.

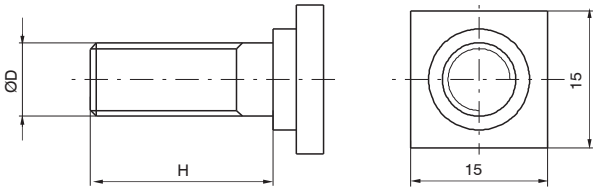
| Bore | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|
| CD (H 9) | 8 | 10 | 10 | 12 | 12 | 16 | 16 | 20 |
| E | 35 | 40 | 45 | 52 | 65 | 75 | 95 | 115 |
| EW | 16 | 20 | 26 | 28 | 32 | 40 | 50 | 60 |
| H | 6 | 8 | 9 | 9 | 11 | 11 | 14 | 14 |
| L | 12 | 12 | 13 | 16 | 16 | 21 | 22 | 27 |
| MR | 8 | 9 | 10 | 12 | 12 | 16 | 16 | 20 |
| TG | 26 | 28 | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| UB | 35 | 40 | 46 | 53 | 61 | 71 | 91 | 111 |
| FL | 18 | 20 | 22 | 25 | 27 | 32 | 36 | 41 |
| L2 | / | / | 5,5 | 5,5 | 6,5 | 6,5 | 10 | 10 |
| S5 (H 13) | 5,5 | 6,6 | 6,6 | 6,6 | 9 | 9 | 11 | 11 |
| Weight (g) | 53 | 85 | 90 | 130 | 190 | 340 | 580 | 960 |

## Slot fixing screws

**Coding:** 1500.1ⓉF

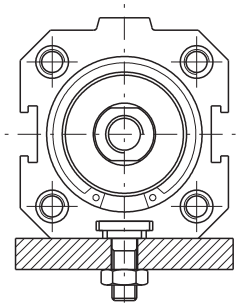
| Ⓣ | SIZE |
|---|---|
| | **5** = from Ø20 to Ø32 |
| | **6** = from Ø40 to Ø63 |
| | **8** = Ø80 and Ø100 |

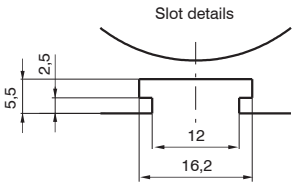





### Example of mounting with square head screws







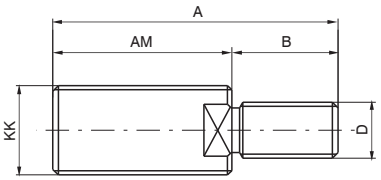

| Bore | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|
| ØD | M6 | M6 | M6 | M8 | M8 | M8 | M10 | M10 |
| H | 15 | 15 | 15 | 20 | 20 | 20 | 25 | 25 |
| Weight (g) | 10 | | | 18 | | | 25 | |

## Nipple with ISO standard thread

**Coding:** 1500.Ø.17F

| Ø | BORE |
|---|---|
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |






| Bore | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|
| KK | M8x1,25 | M10x1,25 | M10x1,25 | M12x1,25 | M16x1,5 | M16x1,5 | M20x1,5 | M20x1,5 |
| AM | 20 | 22 | 22 | 24 | 32 | 32 | 40 | 40 |
| A | 26 | 30 | 32 | 36 | 47 | 47 | 58 | 58 |
| B | 6 | 8 | 10 | 12 | 15 | 15 | 18 | 18 |
| D | M4 | M5 | M6 | M10 | M12 | M12 | M16 | M16 |
| Weight (g) | 8 | 15 | 16 | 27 | 65 | 65 | 110 | 110 |

Fitted on the female thread of the compact cylinders, restore the ISO configurations rod (ISO 6432 for cylinders Ø20 and Ø25; ISO 6431 for cylinders from Ø32 to Ø100).




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 1500 Europe

This series of cylinders is available in two versions with different threaded fixing holes. The first one includes cylinders from Ø32 to Ø100 called "ISO" with fixing holes same as cylinders ISO 6431 - VDMA 24562.
Cylinders from Ø20 to Ø100 called "UNITOP", parts of second series, are mainly according to standard UNITOP RU - P/6 - P/7. Cylinders Ø12 and Ø16 non standard, are interchangeable with similar products available on the market.
The ISO version uses all fixing devices of series 1320 with exception of intermediate trunnion, while for cylinders Ø12, Ø16 and for "UNITOP" version are available fixing devices as flanges, foot, male and female clevis made with aluminium or steel. For use of magnetic sensors see directions on next page.

### Construction characteristics

| | |
|---|---|
| Body | anodized aluminium |
| Piston rod bushings | sintered bronze |
| Seals | PUR (on request HNBR) |
| Springs | zinc plated steel for springs |
| Pistons | from Ø12 to Ø25 brass<br>from Ø32 from Ø100 aluminium alloy 2011 UNI 9002/5 |
| Piston rod | from Ø12 to Ø25 stainless steel<br>froml Ø32 to Ø100 C43 chromed (on request stainless steel for all bores) |
| End caps | from Ø12 to Ø25 aluminium alloy UNI 9006/1 anodised<br>from Ø32 to Ø100 UNI 5076 aluminium die-casting and painted (cataphoresis) |
| Fixing screws | zinc plated steel |

### Operational characteristics

| | |
|---|---|
| Fluid | Filtered and lubricated air or non |
| Max. working pressure | 10 bar |
| Working temperature | -30°C ... +80°C with standard seals (magnetic or non magnetic piston)<br>-5°C ... +80°C with HNBR seals (magnetic piston)<br>-5°C ... +120°C with HNBR seals (non magnetic piston) |

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

### Standard strokes

| VERSION | DOUBLE ACTING | | | | SINGLE ACTING | |
|---|---|---|---|---|---|---|
| Base | ● | | | | ● | |
| Through rod | ● | | | | ● | |
| Bored through rod | | | ● | | ● | |
| Non-rotating device | | | | ● | ● | |
| Through rod and non-rotating device | | | | ● | ● | |
| **BORE** | **Standard strokes** | ***Maximum suggested strokes** | **Max. stroke** | ****Standard strokes** | **Standard strokes** | **Maximum suggested strokes**(please get in touch with our sales rep. for the dimensions) |
| 12 | from 5 to 40 mm every 5 mm | 150 | 65 | 40 | 5 -10 | 20 |
| 16 | | 250 | 100 | | from 5 to 25 mm every 5 mm | 75 |
| 20 | from 5 to 50 mm every 5 mm | 450 | 110 | | | |
| 25 | | | | | | |
| 32 | from 5 to 80 mm every 5 mm | 650 | 125 | 80 | | |
| 40 | | | | | | |
| 50 | | | 150 | | | |
| 63 | | | | | | |
| 80 | | | 200 | | | |
| 100 | | | | | | |

*Cylinders with longer strokes than those in the chart are also available.
The end user is responsible for the load applied on the product and for its correct use.
For special applications, please get in touch with our sales rep.
**Cylinders with longer strokes than those in the chart are also available, exceptionally for applications without twisting moments and/or radial loads on the anti-rotation device.

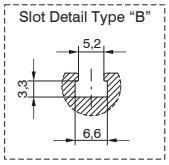
### Minimum and maximum springs load

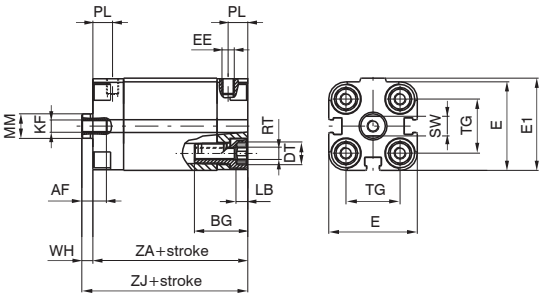
| Bore | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|---|---|---|---|
| Min. load (N) | 3,9 | 7,2 | 7,8 | 9,8 | 12,3 | 16,7 | 27,5 | 37,3 | 59,4 | 101,3 |
| Max. load (N) | 12,7 | 37,2 | 20,6 | 25,5 | 34,3 | 44,1 | 51,0 | 63,8 | 99,4 | 141,9 |

## BASIC version double and single acting



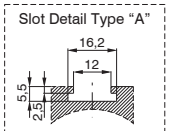
for bores from Ø12 to Ø25 use sensors codes
1580._, MHS._, MRS._ only

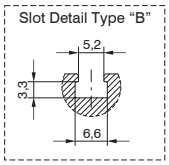


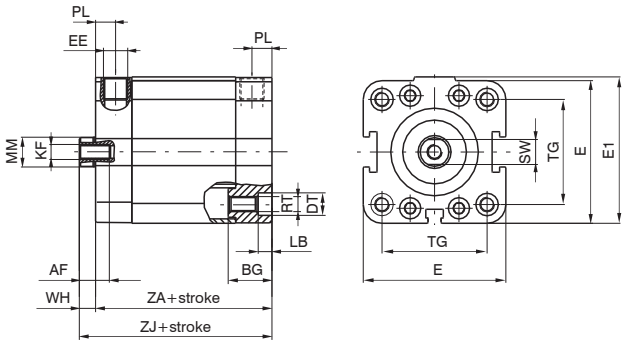






for bores from Ø32 to Ø50 use sensors codes
1500._, RS._, HS._ (slot A) 1580._, MHS._, MRS._
(slot B and slot A with adapter code 1380.01F)

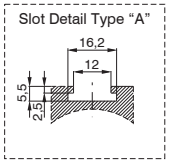


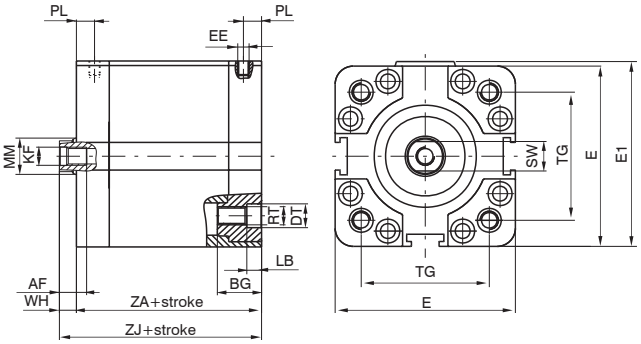





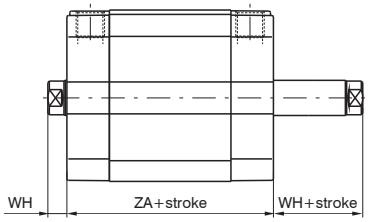

for bores from Ø63 to Ø100 use sensors codes
1500._, RS._, HS._ and 1580._, MHS._, MRS._
(with adapter code 1380.01F)



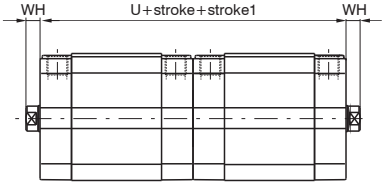

## Through rod cylinder version, double and single acting





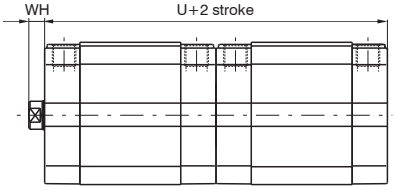

## Tandem with opposed rods






## Tandem push with common rods



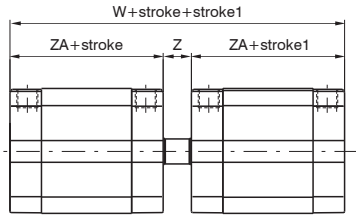





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

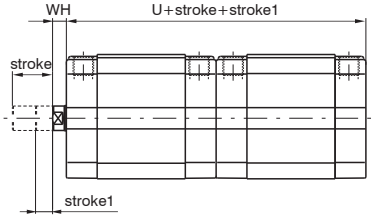
## Opposed tandem with common rods






## Tandem push with independent rods






## Ordering code

### Basic version push/pull

**15_ _. Ø . stroke . _ _ . _**

- **1**= Double acting (magnetic)
- **2**= Front spring (magnetic)
- **3**= Rear spring (magnetic)
- **4**= Double acting (non magnetic)
- **5**= Front spring (non magnetic)
- **6**= Rear spring (non magnetic)

- **01**= Basic version - female piston rod
- **02**= Basic version - male piston rod
- **03**= Push / pull version - female piston rod
- **04**= Push / pull version - male piston rod
- **05**= Push / pull version - bored male piston rod
- **06**= Push / pull version - bored female piston rod
- **07**= Non - rotating version
- **08**= Push / pull version with non rotating device on one side - female piston rod *
- **09**= Push / pull version with non rotating device on one side - male piston rod *

- **1**= Chromed rod C43 (from Ø12 to Ø25 stainless steel)
- **2**= Stainless steel rod (from Ø32 to Ø100)

- **6**= ISO (Ø32 ... Ø100)
- **7**= ISO HNBR (Ø32 ... Ø100)
- **8**= UNITOP (Ø12 ... Ø100)
- **9**= UNITOP HNBR (Ø12 ... Ø100)

* for single acting version, the spring is on the anti-rotation side

### Tandem version

**15_ _. Ø . stroke .(stroke1) . _**

- **A**= Tandem with opposite rods female thread
- **E**= Tandem with opposite rods male thread
- **L**= Tandem opposite rods with non rotating device on both sides
- **C**= Tandem push with common rods female thread
- **G**= Tandem push with common rods male thread
- **H**= Tandem push with common rods, push-pull version rod female threads
- **N**= Tandem push with common rods with non rotating device
- **D**= Opposed tandem with common rod
- **B**= Tandem push with independent rods female thread
- **F**= Tandem push with independent rods male thread
- **M**= Tandem push with independent rods with non rotating device
- **P**= Tandem push/pull with independent rods - female thread
- **Q**= Tandem push/pull with independent rods - male thread

- **1**= Chromed rod C43 (from Ø12 to Ø25 stainless steel)
- **2**= Stainless steel rod (from Ø32 to Ø100)

- **6**= ISO (Ø32 ... Ø100)
- **7**= ISO HNBR (Ø32 ... Ø100)
- **8**= UNITOP (Ø12 ... Ø100)
- **9**= UNITOP HNBR (Ø12 ... Ø100)

### Table of dimensions

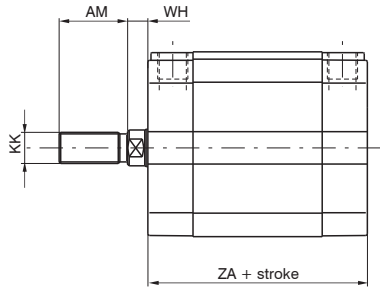
| Bore | | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AF | | 6 | 8 | 10 | 10 | 12 | 12 | 12 | 12 | 16 | 20 |
| BG | | 19 | 19 | 20 | 20 | 17,5 | 17,5 | 19,5 | 19,5 | 23,5 | 24,5 |
| DT | | 6 | 6 | 8 | 8 | 10 | 9 | 10,5 | 10,5 | 14 | 14 |
| E | | 29 | 29 | 36 | 40 | 48 | 57 | 67 | 80 | 102 | 122 |
| E1 | | 30 | 30 | 37,5 | 41,5 | 49,5 | 58,5 | 69 | 82 | 105 | 125 |
| EE | | M 5 | M 5 | M 5 | M 5 | G 1/8" | G 1/8" | G 1/8" | G 1/8" | G 1/8" | G 1/4" |
| KF | | M 3 | M 4 | M 5 | M 5 | M 6 | M 6 | M 8 | M 8 | M 10 | M12 |
| LB | | 3,5 | 3,5 | 4,8 | 4,8 | 5,5 | 5,5 | 6,5 | 6,5 | 8,5 | 8,5 |
| MM | | 6 | 8 | 10 | 10 | 12 | 12 | 16 | 16 | 20 | 25 |
| PL | | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8,5 | 10,5 |
| RT | | M 4 | M 4 | M 5 | M 5 | M 6 | M 6 | M 8 | M 8 | M 10 | M 10 |
| SW | | 5 | 7 | 8 | 8 | 10 | 10 | 13 | 13 | 17 | 22 |
| TG ISO | | / | / | / | / | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 |
| TG UNITOP | | 18 | 18 | 22 | 26 | 32 | 42 | 50 | 62 | 82 | 103 |
| U | | 76 | 76 | 76 | 79 | 89 | 91 | 91 | 100 | 112 | 133 |
| W | | 85 | 85 | 85 | 90 | 101 | 104 | 106 | 115 | 128 | 153 |
| WH | | 4,5 | 4,5 | 4,5 | 5,5 | 6 | 6,5 | 7,5 | 7,5 | 8 | 10 |
| Z | | 9 | 9 | 9 | 11 | 12 | 13 | 15 | 15 | 16 | 20 |
| ZA * | | 38 | 38 | 38 | 39,5 | 44,5 | 45,5 | 45,5 | 50 | 56 | 66,5 |
| ZJ * | | 42,5 | 42,5 | 42,5 | 45 | 50,5 | 52 | 53 | 57,5 | 64 | 76,5 |
| Weight (g) | Stroke 0 | 88 | 90 | 140 | 170 | 210 | 320 | 460 | 690 | 1390 | 2290 |
| | every 5 mm | 8 | 8 | 12 | 13 | 15 | 19 | 25 | 31 | 50 | 66 |

*Dimensions marked with * increase of 10 mm for cylinders Ø12 front spring version*
*Tabular weights above refer to BASIC version; the weights of TANDEM versions are approximately double those shown*

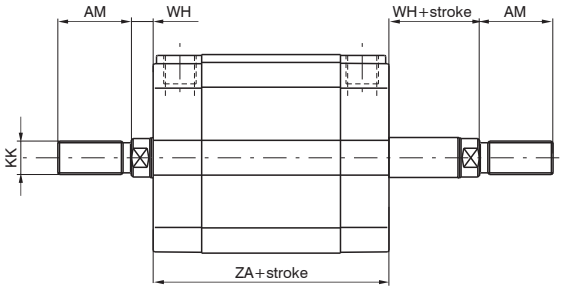


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

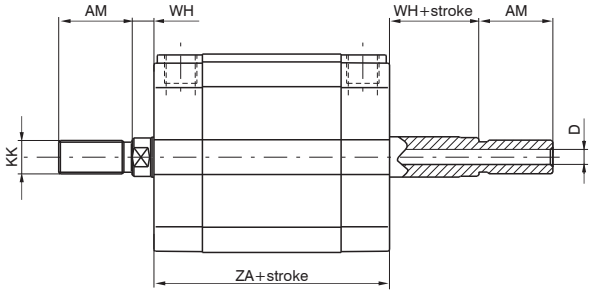
## Basic version male piston rod



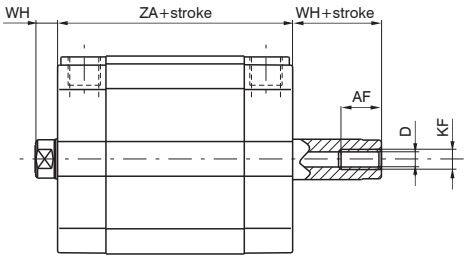

## Through rod cylinder version male rod



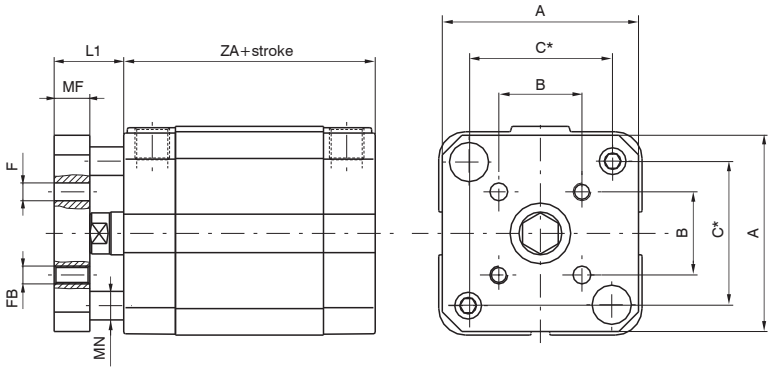

## Through rod cylinder version bored male piston rod




## Through rod cylinder version bored female piston rod




## Non-rotating version




* = distance between rods centres

| Bore | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|
| A | 28,5 | 28,5 | 35,5 | 39,5 | 45 | 55 | 65 | 80 | 100 | 120 |
| AF | 6 | 8 | 10 | 10 | 12 | 12 | 12 | 12 | 16 | 20 |
| AM | 16 | 20 | 22 | 22 | 22 | 22 | 24 | 24 | 32 | 40 |
| B | 9,9 | 9,9 | 12 | 15,6 | 19,8 | 23,3 | 29,7 | 35,4 | 46 | 56,6 |
| C | 18 | 18 | 22 | 26 | 34 | 40,5 | 49 | 59,5 | 77 | 94 |
| D | 2,3 | 3,2 | 3,8 | 3,8 | 4,5 | 4,5 | 6 | 6 | 8 | 10 |
| F | 3 | 3 | 4 | 5 | 5 | 5 | 6 | 6 | 8 | 10 |
| FB | M3 | M3 | M4 | M5 | M5 | M5 | M6 | M6 | M8 | M10 |
| KF | M3 | M4 | M5 | M5 | M6 | M6 | M8 | M8 | M10 | M12 |
| KK | M6X1 | M8X1,25 | M10X1,25 | M10X1,25 | M10X1,25 | M10X1,25 | M12X1,25 | M12X1,25 | M16X1,5 | M20X1,5 |
| L1 | 10,5 | 10,5 | 12,5 | 13,5 | 16 | 16,5 | 19,5 | 19,5 | 22 | 24 |
| MF | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 |
| MN | 5 | 5 | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 |
| WH | 4,5 | 4,5 | 4,5 | 5,5 | 6 | 6,5 | 7,5 | 7,5 | 8 | 10 |
| ZA | 38 | 38 | 38 | 39,5 | 44,5 | 45,5 | 45,5 | 50 | 56 | 66,5 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

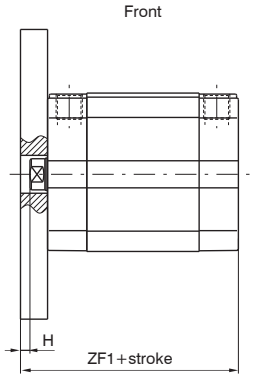
## Front and rear flanges (MF1 - MF2)

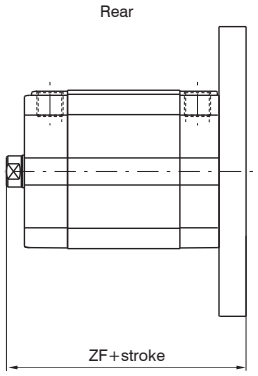
**Coding:** 15Ⓝ.Ø.Ⓜ

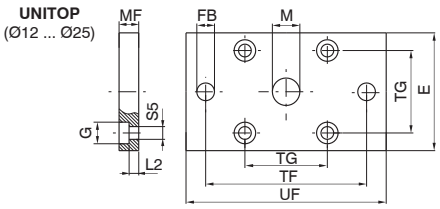
| | |
|---|---|
| Ⓝ | STANDARDS |
| | **00** = ISO |
| | **80** = UNITOP |
| Ø | BORE |
| | **12** = Ø12 (UNITOP) |
| | **16** = Ø16 (UNITOP) |
| | **20** = Ø20 (UNITOP) |
| | **25** = Ø25 (UNITOP) |
| | **32** = Ø32 (ISO / UNITOP) |
| | **40** = Ø40 (ISO / UNITOP) |
| | **50** = Ø50 (ISO / UNITOP) |
| | **63** = Ø63 (ISO / UNITOP) |
| | **80** = Ø80 (ISO / UNITOP) |
| | **100** = Ø100 (ISO / UNITOP) |
| Ⓜ | MATERIALS |
| | **03F** = Steel |
| | **03/1F** = Aluminium (UNITOP) |

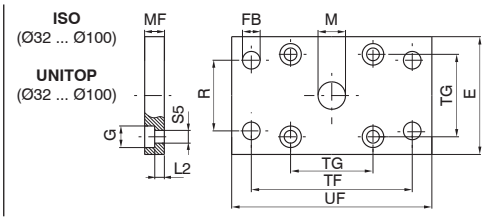


Plate which allows anchorage of the cylinder at a right angle to the plane. It is made with zincplated extruded steel or with aluminium.




| | | ISO Dimensions | | | | | | UNITOP Dimensions | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bore | | 32 | 40 | 50 | 63 | 80 | 100 | 12-16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
| E | | 45 | 52 | 65 | 75 | 95 | 115 | 29 | 36 | 40 | 50 | 60 | 68 | 87 | 107 | 128 |
| S5 (H13) | | 6,6 | 6,6 | 9 | 9 | 11 | 11 | 4,5 | 5,5 | 5,5 | 6,6 | 6,6 | 9 | 9 | 11 | 11 |
| FB(H13) | | 7 | 9 | 9 | 9 | 12 | 14 | 5,5 | 6,6 | 6,6 | 7 | 9 | 9 | 9 | 12 | 14 |
| G | | 10,5 | 11 | 15 | 15 | 18 | 18 | 9 | 10 | 10 | 11 | 11 | 15 | 15 | 18 | 18 |
| H | | 4 | 3,5 | 4,5 | 4,5 | 8 | 6 | 5,5 | 5,5 | 4,5 | 4 | 3,5 | 4,5 | 7,5 | 7 | 5 |
| L2 | | 5 | 5 | 6,5 | 6,5 | 8 | 8 | 4,6 | 4,6 | 4,6 | 3,6 | 3,6 | 3,4 | 6,4 | 4,4 | 4,4 |
| M(H11) | | 30 | 35 | 40 | 45 | 45 | 55 | 10 | 12 | 12 | 14 | 14 | 18 | 18 | 23 | 28 |
| MF(JS14) | | 10 | 10 | 12 | 12 | 16 | 16 | 10 | 10 | 10 | 10 | 10 | 12 | 15 | 15 | 15 |
| R(JS14) | | 32 | 36 | 45 | 50 | 63 | 75 | / | / | / | 32 | 36 | 45 | 50 | 63 | 75 |
| TF(JS14) | | 64 | 72 | 90 | 100 | 126 | 150 | 43 | 55 | 60 | 65 | 82 | 90 | 110 | 135 | 163 |
| TG | | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 | 18 | 22 | 26 | 32 | 42 | 50 | 62 | 82 | 103 |
| UF | | 80 | 90 | 110 | 120 | 150 | 170 | 55 | 70 | 76 | 80 | 102 | 110 | 130 | 160 | 190 |
| ZF | | 60,5 | 62 | 65 | 69,5 | 80 | 92,5 | 52,5 | 52,5 | 55 | 60,5 | 62 | 65 | 72,5 | 79 | 91,5 |
| ZF1 | | 54,5 | 55,5 | 57,5 | 62 | 72 | 82,5 | 48 | 48 | 49,5 | 54,5 | 55,5 | 57,5 | 65 | 71 | 81,5 |
| Weight (g) | Steel | 160 | 250 | 480 | 620 | 1430 | 1970 | 100 | 170 | 210 | 270 | 430 | 600 | 1210 | 1810 | 2610 |
| | Aluminium | / | / | / | / | / | / | 35 | 60 | 70 | 90 | 150 | 210 | 420 | 630 | 900 |

## Foot

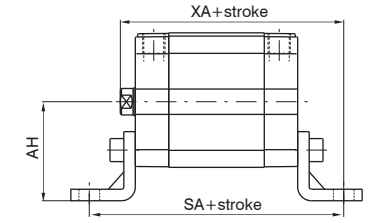
**Coding:** 15Ⓝ.Ø.05/1F

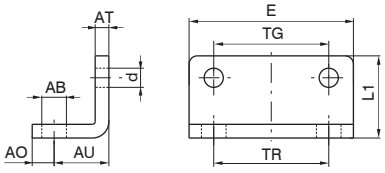
| | |
|---|---|
| Ⓝ | STANDARDS |
| | **00** = ISO |
| | **80** = UNITOP |
| Ø | BORE |
| | **12** = Ø12 (UNITOP) |
| | **16** = Ø16 (UNITOP) |
| | **20** = Ø20 (UNITOP) |
| | **25** = Ø25 (UNITOP) |
| | **32** = Ø32 (ISO / UNITOP) |
| | **40** = Ø40 (ISO / UNITOP) |
| | **50** = Ø50 (ISO / UNITOP) |
| | **63** = Ø63 (ISO / UNITOP) |
| | **80** = Ø80 (ISO / UNITOP) |
| | **100** = Ø100 (ISO / UNITOP) |

(1 piece)



Element used to anchor the cylinder parallel to the mounting plane. They are made with stamped and pierced sheet metal black painted.




| | ISO Dimensions | | | | | | UNITOP Dimensions | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bore | 32 | 40 | 50 | 63 | 80 | 100 | 12-16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
| AB (H14) | 7 | 9 | 9 | 9 | 12 | 14 | 5,5 | 6,6 | 6,6 | 6,6 | 9 | 9 | 11 | 11 | 13,5 |
| AH (JS15) | 32 | 36 | 45 | 50 | 63 | 71 | 22 | 27 | 30 | 32 | 42,5 | 47 | 59,5 | 65,5 | 78 |
| AO (±0,2) | 11 | 8 | 15 | 13 | 14 | 16 | 4,5 | 6 | 6 | 8 | 8 | 8 | 12 | 12 | 12 |
| AT | 4 | 4 | 5 | 5 | 6 | 6 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 8 | 8 |
| AU (±0,2) | 24 | 28 | 32 | 32 | 41 | 41 | 13 | 16 | 16 | 18 | 20 | 24 | 27 | 30 | 33 |
| d | 7 | 7 | 9 | 9 | 11 | 11 | 4,4 | 5,4 | 5,4 | 6,6 | 6,6 | 9 | 9 | 11 | 11 |
| E | 45 | 52 | 65 | 75 | 95 | 115 | 30 | 36 | 40 | 50 | 60 | 68 | 84 | 102 | 123 |
| L1 | 30 | 30 | 36 | 35 | 47 | 53 | 17,5 | 22 | 23 | 24 | 29,5 | 30 | 39 | 36,5 | 38,5 |
| SA | 92,5 | 101,5 | 109,5 | 114 | 138 | 148,5 | 64 | 70 | 71,5 | 80,5 | 85,5 | 93,5 | 104 | 116 | 132,5 |
| TG | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 | 18 | 22 | 26 | 32 | 42 | 50 | 62 | 82 | 103 |
| TR | 32 | 36 | 45 | 50 | 63 | 75 | 18 | 22 | 26 | 32 | 42 | 50 | 62 | 82 | 103 |
| XA | 74,5 | 80 | 85 | 89,5 | 105 | 117,5 | 55,5 | 58,5 | 61 | 68,5 | 72 | 77 | 84,5 | 94 | 109,5 |
| Weight (g) | 50 | 70 | 120 | 180 | 320 | 400 | 20 | 35 | 45 | 75 | 100 | 150 | 250 | 390 | 500 |



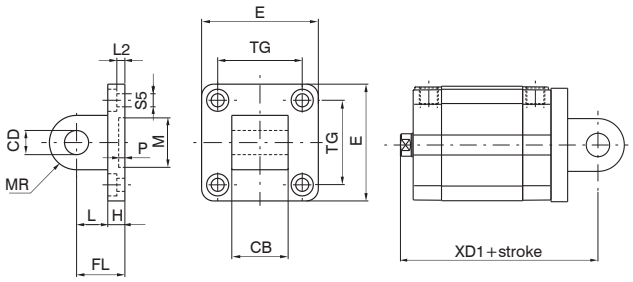
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## UNITOP rear male clevis

**Coding:** 1580.Ø.Ⓜ

| | |
|---|---|
| | BORE |
| | **12** = Ø12 |
| Ø | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | MATERIALS |
| Ⓜ | **09/1F** = Aluminium |
| | **09/2F** = Steel |






This type of mounting allows anchorage of the cylinder both parallel and at the right angle to the plane. The cylinder rod can oscillate and self-align to the connected load. It's made with aluminium alloy black painted or with zinc plated steel (from Ø20).

| Bore | | 12-16 | 20 | 25 |
|---|---|---|---|---|
| CB(H14) | | 12 | 16 | 16 |
| CD (H9) | | 6 | 8 | 8 |
| E (±0,5) | | 27 | 34 | 38 |
| FL | | 16 | 20 | 20 |
| H | | 6 | 6 | 6 |
| L | | 10 | 14 | 14 |
| L2 (±0,5) | | 2,6 | 2,6 | 2,6 |
| M (H11) | | 10 | 12 | 12 |
| MR | | 6 | 8 | 8 |
| P (+0,3) | | 3 | 3 | 3 |
| S5 (H13) | | 4,5 | 5,5 | 5,5 |
| TG (±0,2) | | 18 | 22 | 26 |
| XD1 | | 58,5 | 62,5 | 65 |
| Weight (g) | Steel | / | 70 | 80 |
| | Aluminium | 13 | 25 | 28 |

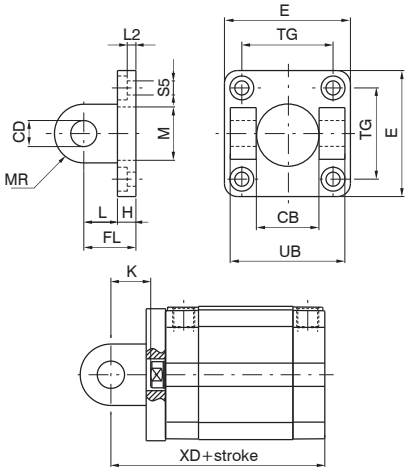
## Front clevis

**Coding:** 15Ⓝ.Ø.Ⓜ

| | |
|---|---|
| | STANDARDS |
| Ⓝ | **00** = ISO |
| | **80** = UNITOP |
| | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| Ø | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | MATERIALS |
| Ⓜ | **08F** = Aluminium (ISO) |
| | **11F** = Aluminium (UNITOP) |
| | **13F** = Steel (UNITOP) |



This type of mounting allows anchorage of the cylinder both parallel and at the right angle to the plane. The cylinder rod can oscillate and self-align to the connected load. It's made with aluminium alloy black painted or with zinc plated steel.




| | | ISO Dimensions | | | | | | UNITOP Dimensions | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bore | | 32 | 40 | 50 | 63 | 80 | 100 | 32 | 40 | 50 | 63 | 80 | 100 |
| CB (H14) | | 26 | 28 | 32 | 40 | 50 | 60 | 26 | 28 | 32 | 40 | 50 | 60 |
| CD (H9) | | 10 | 12 | 12 | 16 | 16 | 20 | 10 | 12 | 12 | 16 | 16 | 20 |
| E | | 45 | 52 | 65 | 75 | 95 | 115 | 48 | 58 | 66 | 83 | 102 | 123 |
| FL | | 22 | 25 | 27 | 32 | 36 | 41 | 22 | 25 | 27 | 32 | 36 | 41 |
| H | | 9 | 9 | 11 | 11 | 14 | 14 | 9 | 9 | 11 | 11 | 13 | 15 |
| K | | 16 | 18,5 | 19,5 | 24,5 | 28 | 31 | 16 | 18,5 | 19,5 | 24,5 | 28 | 31 |
| L | | 13 | 16 | 16 | 21 | 22 | 27 | 13 | 16 | 16 | 21 | 23 | 26 |
| L2 | | 5,5 | 5,5 | 6,5 | 6,5 | 10 | 10 | 5,5 | 5,5 | 6,5 | 6,5 | 10 | 10 |
| M | | 30 | 35 | 40 | 45 | 45 | 55 | 14 | 14 | 18 | 18 | 23 | 28 |
| MR | | 10 | 12 | 12 | 16 | 16 | 20 | 10 | 12,5 | 12,5 | 15 | 15 | 20 |
| S5 | | 6,6 | 6,6 | 9 | 9 | 11 | 11 | 6,6 | 6,6 | 9 | 9 | 11 | 11 |
| TG | | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 | 32 | 42 | 50 | 62 | 82 | 103 |
| UB | | 45 | 52 | 60 | 70 | 90 | 110 | 45 | 52 | 60 | 70 | 90 | 110 |
| XD | | 66,5 | 70,5 | 72,5 | 82 | 92 | 107,5 | 66,5 | 70,5 | 72,5 | 82 | 92 | 107,5 |
| XD1 | | 72,5 | 77 | 80 | 89,5 | 100 | 117,5 | 72,5 | 77 | 80 | 89,5 | 100 | 117,5 |
| Weight (g) | Steel | / | / | / | / | / | / | 180 | 310 | 420 | 700 | 1240 | 2210 |
| | Aluminium | 40 | 70 | 120 | 170 | 360 | 570 | 65 | 110 | 145 | 240 | 430 | 770 |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

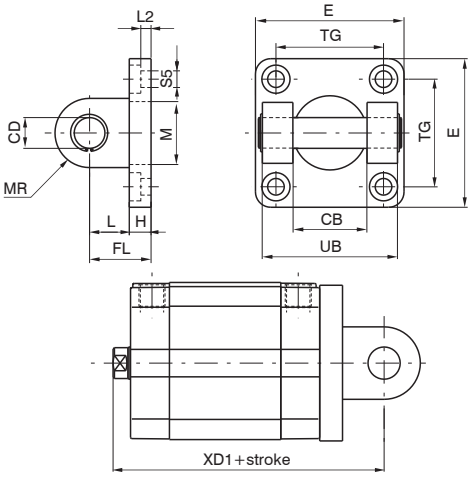
## Rear clevis (MP2)

**Coding:** 15Ⓝ.Ø.Ⓜ

| | |
|---|---|
| Ⓝ | STANDARDS |
| | **00** = ISO |
| | **80** = UNITOP |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| Ⓜ | MATERIALS |
| | **09F** = Aluminium (ISO) |
| | **10F** = Aluminium (UNITOP) |
| | **12F** = Steel (UNITOP) |



This type of mounting allows anchorage of the cylinder both parallel and at the right angle to the plane. The cylinder rod can oscillate and self-align to the connected load. It's made with aluminium alloy black painted or with zinc plated steel.




| | | ISO Dimensions | | | | | | UNITOP Dimensions | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bore | | 32 | 40 | 50 | 63 | 80 | 100 | 32 | 40 | 50 | 63 | 80 | 100 |
| CB (H14) | | 26 | 28 | 32 | 40 | 50 | 60 | 26 | 28 | 32 | 40 | 50 | 60 |
| CD (H9) | | 10 | 12 | 12 | 16 | 16 | 20 | 10 | 12 | 12 | 16 | 16 | 20 |
| E | | 45 | 52 | 65 | 75 | 95 | 115 | 48 | 58 | 66 | 83 | 102 | 123 |
| FL | | 22 | 25 | 27 | 32 | 36 | 41 | 22 | 25 | 27 | 32 | 36 | 41 |
| H | | 9 | 9 | 11 | 11 | 14 | 14 | 9 | 9 | 11 | 11 | 13 | 15 |
| K | | 16 | 18,5 | 19,5 | 24,5 | 28 | 31 | 16 | 18,5 | 19,5 | 24,5 | 28 | 31 |
| L | | 13 | 16 | 16 | 21 | 22 | 27 | 13 | 16 | 16 | 21 | 23 | 26 |
| L2 | | 5,5 | 5,5 | 6,5 | 6,5 | 10 | 10 | 5,5 | 5,5 | 6,5 | 6,5 | 10 | 10 |
| M | | 30 | 35 | 40 | 45 | 45 | 55 | 14 | 14 | 18 | 18 | 23 | 28 |
| MR | | 10 | 12 | 12 | 16 | 16 | 20 | 10 | 12,5 | 12,5 | 15 | 15 | 20 |
| S5 | | 6,6 | 6,6 | 9 | 9 | 11 | 11 | 6,6 | 6,6 | 9 | 9 | 11 | 11 |
| TG | | 32,5 | 38 | 46,5 | 56,5 | 72 | 89 | 32 | 42 | 50 | 62 | 82 | 103 |
| UB | | 45 | 52 | 60 | 70 | 90 | 110 | 45 | 52 | 60 | 70 | 90 | 110 |
| XD | | 66,5 | 70,5 | 72,5 | 82 | 92 | 107,5 | 66,5 | 70,5 | 72,5 | 82 | 92 | 107,5 |
| XD1 | | 72,5 | 77 | 80 | 89,5 | 100 | 117,5 | 72,5 | 77 | 80 | 89,5 | 100 | 117,5 |
| Weight (g) | Steel | / | / | / | / | / | / | 220 | 360 | 480 | 830 | 1390 | 2500 |
| | Aluminium | 80 | 120 | 180 | 300 | 500 | 860 | 80 | 125 | 170 | 290 | 480 | 865 |

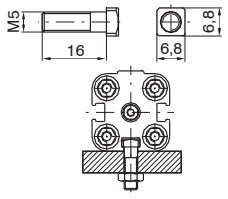
## Slot fixing screws

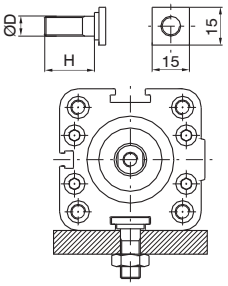
**Coding:** 1500.1ⓉF

| | |
|---|---|
| Ⓣ | SIZE |
| | **7** = Small slot (from Ø12 to Ø50) |
| | **5** = Large slot (Ø32) |
| | **6** = Large slot (from Ø40 to Ø63) |
| | **8** = Large slot (from Ø80 to Ø100) |



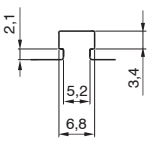




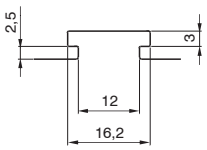




### Example of mounting with square head screws





Small slot detail



Large slot detail

| Bore | 12 ... 50 | 32 | 40 ... 63 | 80 ... 100 |
|---|---|---|---|---|
| ØD | / | M6 | M8 | M10 |
| H | / | 15 | 20 | 25 |
| Weight (g) | 8 | 10 | 18 | 25 |



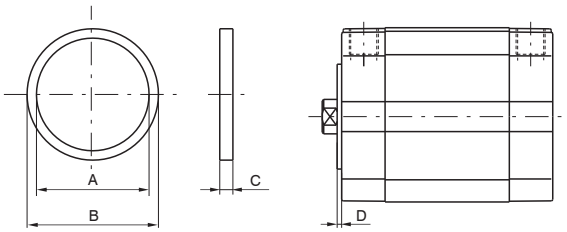
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Centering rings

**Coding:** 1580.Ø.02F

| | BORE |
|---|---|
| Ø | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |





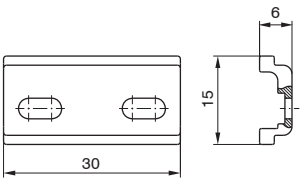

This aluminium ring allows the center assembling of the cylinder.

| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| A | 25 | 30 | 35 | 40 | 40 | 50 |
| B (e11) | 30 | 35 | 40 | 45 | 45 | 55 |
| C | 3,5 | 3,5 | 3,5 | 4,5 | 5,5 | 5,5 |
| D | 1,5 | 1,5 | 1,5 | 2 | 2,5 | 2,5 |
| Weight (g) | 2 | 2 | 3 | 4 | 5 | 6 |

## Sensor adapter (Series SR)

**Coding:** 1380.01F





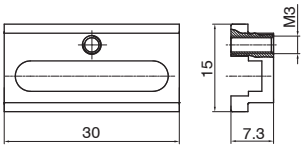

Nylon accessory for sensor mounting 1580._, MRS._, MHS._ in grooves "A" shape.

Weight 1 g

## Sensor adapter (Series SQ-SU)

**Coding:** 1500.22F






Aluminium accessory for sensor mounting square section in grooves "A" shape.

Weight 4 g





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 1500 Ecompact-S

Based on the **ECOMPACT** series with piston rods and centring diameters according to ISO 15552 standard

### Construction characteristics

| | |
|---|---|
| Body | anodized aluminium |
| Piston rod bushings | spheroid bronze on steel band with P.T.F.E. coat |
| Seals | standard: NBR Oil resistant rubber, PUR Piston rod seals<br>(PUR or FPM on request) |
| Springs | stainless steel |
| Pistons | Ø32 and Ø40 acetal resin (aluminium on request)<br>Ø50 and Ø63 aluminium<br>(with FPM seals, aluminium for all of standard diameters) |
| Piston rod | C43 chromed steel (on request stainless steel) |
| End caps | aluminium alloy casting painted with brass centring bearing |
| Fixing screws | zinc plated steel |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered and preferably lubricated air or not (if lubricated the lubrication must be continuous) |
| Max. pressure | 10 bar |
| Working temperature | -5°C ... +70°C with standard seals (magnetic or non magnetic piston)<br>-30°C ... +80°C with PUR seals (magnetic or non magnetic piston)<br>-5°C ... +80°C with FPM seals (magnetic piston)<br>-5°C - +150°C with FPM seals (non magnetic piston) |

### Use and maintenance

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

### Stroke tolerance, minimum and maximum spring loads and cushioning length

| Bore (mm) | Stroke tolerance (mm) | Minimum springs load (N) | Maximum springs load (N) | Cushioning length (mm) |
|---|---|---|---|---|
| Ø32 | + 2 / 0 mm | 19,6 | 25,5 | 6,5 |
| Ø40 | | 25,5 | 42,2 | 8 |
| Ø50 | | 44,1 | 96,3 | 7,5 |
| Ø63 | + 2,5 / 0 mm | 44,1 | 96,3 | 7,5 |

### Standard strokes

### DOUBLE ACTING BASIC version and THROUGH ROD CYLINDER version

Cylinders with longer strokes than those in the chart are also available.
The end user is responsible for the load applied on the product and for its correct use.
For special applications, please get in touch with our sales rep.

| | Stroke | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 100 | 125 | 150 | 160 | 200 | 250 | 300 | 320 | 350 | 400 | 450 | 500 |
| Bore | WITHOUT CUSHIONING DEVICE | | | | | | | | | | | | | | | | | | | | | | | | | | | Maximum suggested strokes |
| Ø32 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | 650 |
| Ø40 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | |
| Ø50 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | |
| Ø63 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | |
| Bore | WITH CUSHIONING DEVICE | | | | | | | | | | | | | | | | | | | | | | | | | | | Maximum suggested strokes |
| Ø32 | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | 650 |
| Ø40 | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | |
| Ø50 | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | |
| Ø63 | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | |

### DOUBLE ACTING THROUGH ROD CYLINDER BORED version

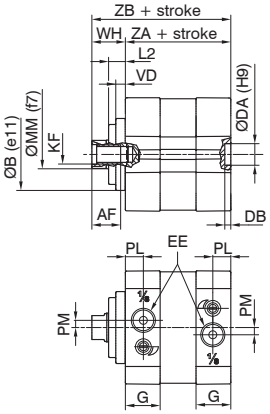
Cylinders with longer strokes than those in the chart are also available.
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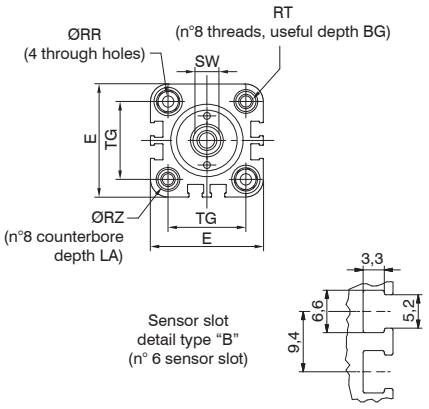
| | Stroke | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 |
| Bore | WITHOUT CUSHIONING DEVICE | | | | | | | | | | | | | | | | WITH CUSHIONING DEVICE | | | | | | | | | | | Maximum suggested strokes |
| Ø32 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | ● | ● | ● | ● | ● | ● | | | | | | 125 |
| Ø40 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | ● | ● | ● | ● | ● | ● | | | | | | |
| Ø50 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 150 |
| Ø63 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | |



## Basic version

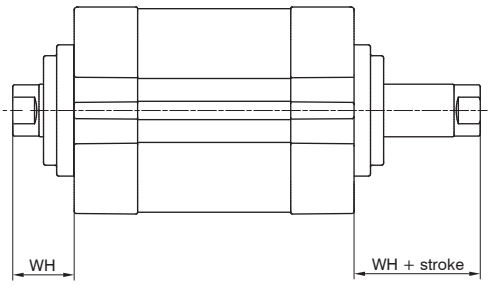





## Through rod cylinder version







Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Ordering codes

**15 _ _.Ø.stroke. _ _ . _**

- **1** = Double acting, magnetic piston
- **4** = Double acting, non magnetic piston

* 
- **10** = Basic, female threaded rod
- **11** = Basic, male threaded rod
- **12** = Through rod, female threaded rods
- **13** = Through rod, male threaded rods
- **14** = Through rod, bored female threaded rods
- **15** = Through rod, bored male threaded rods

* it is possible to order the Ø32 and Ø40 cylinders with an aluminium piston by replacing the '1' with '2' in the ordering code
Example: 1540.32.10.10.1 (acetyl resin piston)
1540.32.10.20.1 (aluminium piston version)

- **0** = NBR seals and C43 chromed plated rod
- **1** = NBR seals and stainless steel rod
- **4** = PUR seals and C43 chromed plated rod
- **5** = PUR seals and stainless steel rod
- **6** = FPM seals and C43 chromed plated rod
- **7** = FPM seals and stainless steel rod

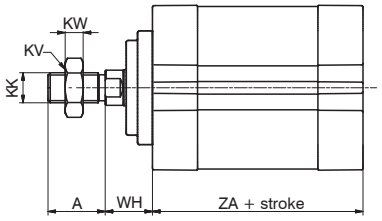
- **4** = Non-cushioned version (mechanical cushioning only)
- **5** = Versions with adjustable end of stroke cushioning system

**Seals compounds scheme**
**NBR:** Oil resistant nitrilic rubber seals
**PUR**: Polyurethane seals
**FPM**: Fluoropolymer rubber seals

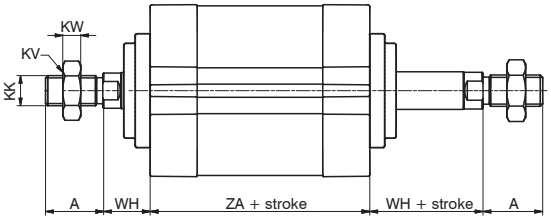
## Table of dimensions

| Bore | | Ø32 | Ø40 | Ø50 | Ø63 |
|---|---|---|---|---|---|
| AF (min) | | 12 | 16 | 20 | 20 |
| ØB (e11) | | 30 | 35 | 40 | 45 |
| BG | | 16 | 16 | 16 | 16 |
| ØDA (H9) | | 9 | 9 | 12 | 12 |
| DB (+0,1/0) | | 2,5 | 2,5 | 2,6 | 2,6 |
| E (max) | | 47,5 | 55 | 66 | 78 |
| EE | | G1/8" | G1/8" | G1/8" | G1/8" |
| G | | 14,5 | 15 | 15 | 15 |
| KF | | M8 | M10 | M12 | M12 |
| LA (0/-0,1) | | 5 | 5 | 5 | 5 |
| L2 | | 7 | 7 | 10 | 10 |
| ØMM (f7) | | 12 | 16 | 20 | 20 |
| PL (+0,1/0) | | 7,5 | 8 | 8 | 8 |
| PM | | 3 | / | / | / |
| ØRR (min) | | 5,1 | 5,1 | 6,6 | 6,6 |
| RT | | M6 | M6 | M8 | M8 |
| ØRZ (min) | | 8,5 | 8,5 | 10,5 | 10,5 |
| SW (0/-0,1) | | 10 | 13 | 17 | 17 |
| TG (±0,2) | | 32,5 | 38 | 46,5 | 56,5 |
| VD | | 4 | 4 | 5 | 5 |
| WH (±1) | | 14 | 14 | 18 | 18 |
| ZA (±0,5) | | 44 | 45 | 45 | 49 |
| ZB (+1/0) | | 58 | 59 | 63 | 67 |
| Weight (g) | stroke | 240 | 330 | 530 | 700 |
| | every 5 mm | 13 | 17 | 24 | 27 |

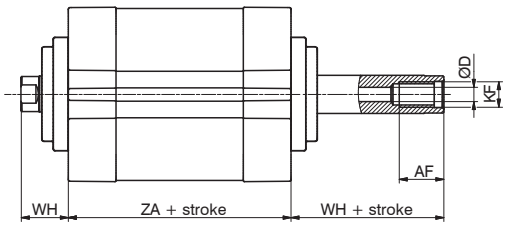
### Basic version male piston rod



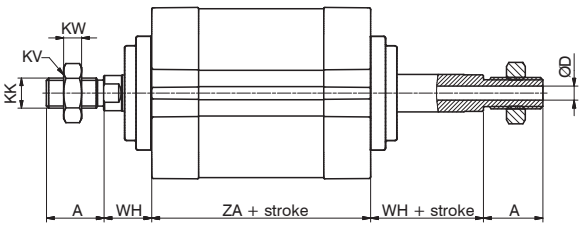

### Through rod cylinder version male rod



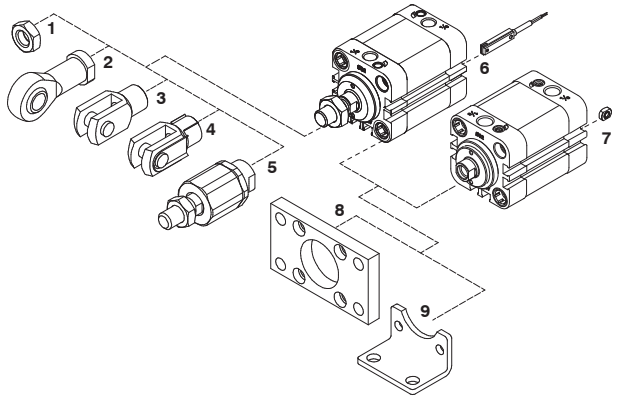

### Through rod cylinder version bored female piston rod



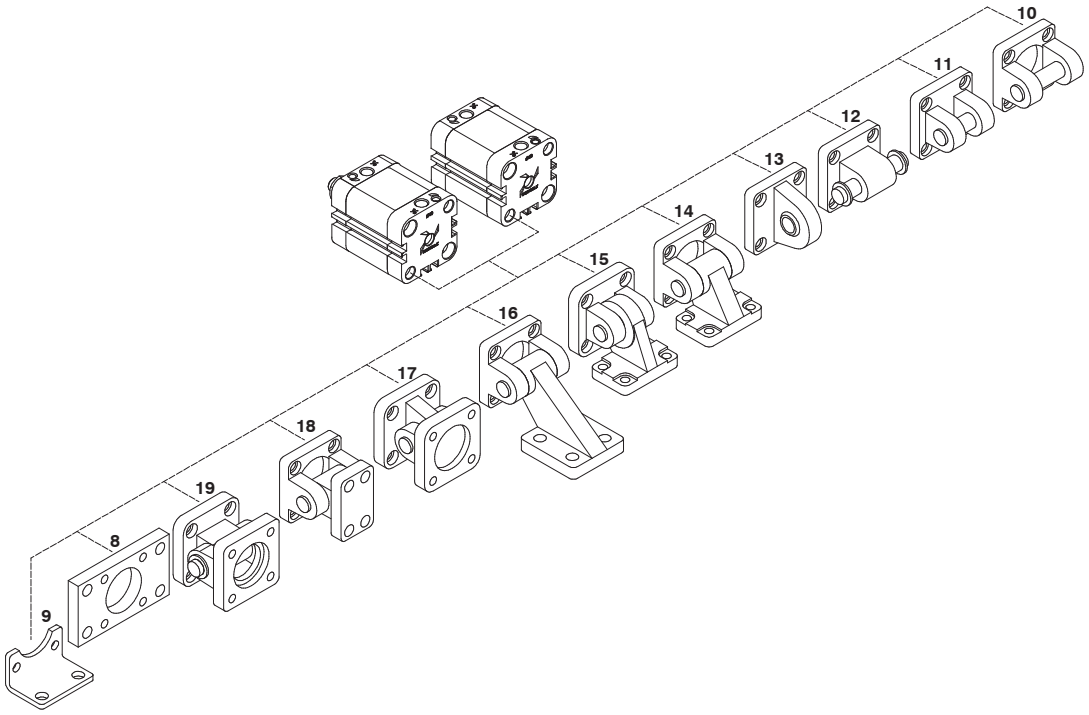

### Through rod cylinder version bored male piston rod




| Bore | A (0/-0,5) | AF (min) | DØ | KF | KK | KV | KW | WH (±1) | ZA (±0,5) |
|---|---|---|---|---|---|---|---|---|---|
| Ø32 | 22 | 14 | 4,5 | M8 | M10x1,25 | 17 | 6 | 14 | 44 |
| Ø40 | 24 | 18 | 4,5 | M10 | M12x1,25 | 19 | 7 | 14 | 45 |
| Ø50 | 32 | 24 | 6 | M12 | M16x1,5 | 24 | 8 | 18 | 45 |
| Ø63 | 32 | 24 | 6 | M12 | M16x1,5 | 24 | 8 | 18 | 49 |




| Position | Description | Coding | |
|---|---|---|---|
| 1 | Nuts | 1320.32.18F<br>1320.40.18F<br>1320.50.18F | (Ø32)<br>(Ø40)<br>(Ø50 and Ø63) |
| 2 | Ball joint | 1320.32.32F<br>1320.40.32F<br>1320.50.32F | (Ø32)<br>(Ø40)<br>(Ø50 and Ø63) |
| 3 | Fork with pin | 1320.32.13F<br>1320.40.13F<br>1320.50.13F | (Ø32)<br>(Ø40)<br>(Ø50 and Ø63) |
| 4 | Fork with clips | 1320.32.13/1F<br>1320.40.13/1F<br>1320.50.13/1F | (Ø32)<br>(Ø40)<br>(Ø50 and Ø63) |
| 5 | Self-aligning joint | 1320.32.33F<br>1320.40.33F<br>1320.50.33F | (Ø32)<br>(Ø40)<br>(Ø50 and Ø63) |
| 6 | Sensors | (see sensor section) | |
| 7 | Valves direct mounting bolt | 1500.20F | (Ø32 ... Ø63) |



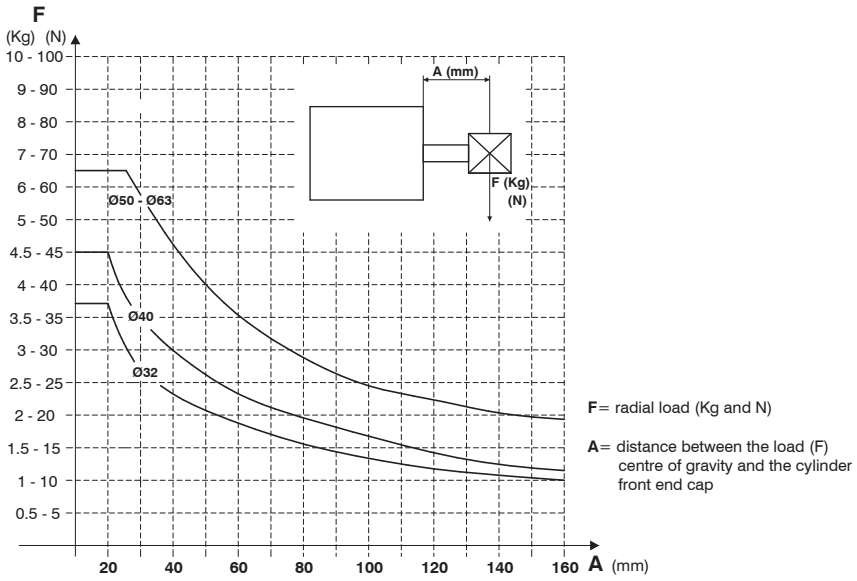

**Note**
For dimensions and characteristics of fixings see ISO 15552 cylinder chapter (for the foot pos. 9, see compact cylinder chapter ISO 21287).

| Position | Description | Coding: | |
|---|---|---|---|
| | | Aluminium | Steel |
| 8 | Front and rear flanges (MF1 - MF2) | 1390.Ø.03FP | 1380.Ø.03F |
| 9 | Short mounting foot brackets (in sheet metal MS1) | / | 1540.Ø.05/1F |
| 10 | Rear clevis (MP2) | 1380.Ø.09F | 1320.Ø.20F |
| 11 | Rear narrow clevis | 1380.Ø.30F | 1320.Ø.29F |
| 12 | Rear male clevis (MP4) | 1380.Ø.09/1F | 1320.Ø.21F |
| 13 | Rear male clevis (with jointed head according to DIN 648K standard) | 1380.Ø.15F | 1320.Ø.25F |
| 14 | Square angle trunnion (AB7) | 1380.Ø.35F | 1320.Ø.23F |
| 15 | Complete square angle trunnion (with joined head according to DIN 648K standards) | / | 1320.Ø.27F |
| 16 | Square angle trunnion (not specified by ISO 15552) | 1380.Ø.11F | / |
| 17 | Complete standard trunnion (with joined head according to DIN 648K standards) | 1380.Ø.36F | 1320.Ø.26F |
| 18 | Standard trunnion (not specified by ISO 15552) | 1380.Ø.10F | / |
| 19 | Standard complete trunnion | 1380.Ø.22F | 1320.Ø.22F |



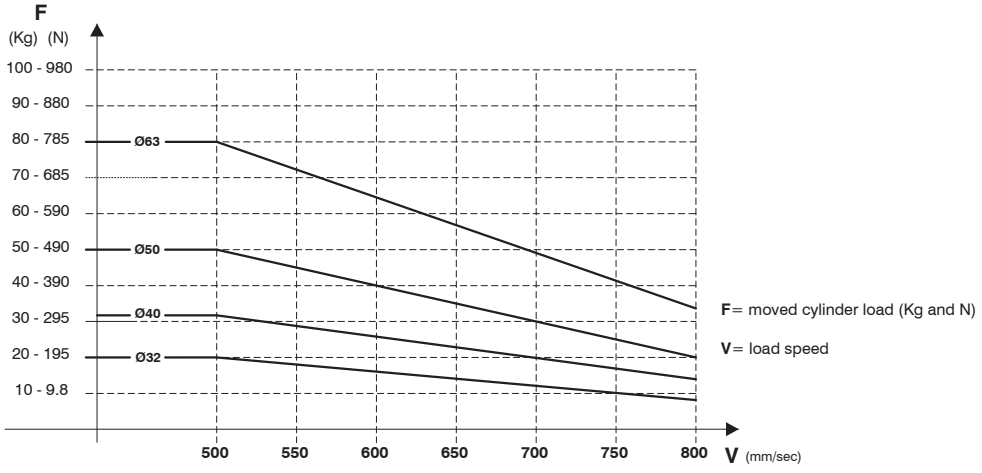

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

**Admissible maximum radial load diagram**




The diagram shows the maximum Radial load **F** (in Newtons) that can be applied to the cylinder piston rod as a function of the distance **A** (in mm); based upon the standard version cylinder under static conditions
Important: Do not exceed the recommended values in the table as reduced life or damage to the cylinder may result.

**End of stroke cushioning capacity diagram**




The diagram shows, for each diameter, the safety curves relative to the maximum loads **F** which can be moved by the cylinder in function of it's speed **V**. The data has been calculated under the following test conditions: Cylinder mounted vertically with the rod pointing down, air pressure at 5 bar and with a guided load.
Important: Do not exceed the recommended values in the table as reduced life or damage to the cylinder may result.

## Series 6500

### Construction characteristics

| | |
|---|---|
| Body | anodized aluminium |
| Piston rod bushings | sintered bronze |
| Rear end cap | anodized aluminium |
| Seals | oil resistant NBR rubber |
| Piston | Brass |
| Cushioning washer | PUR |
| Piston rod | stainless steel |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered and lubricated air or not (if lubricated the lubrication must be continuous) |
| Max. working pressure | 7 bar |
| Working temperature | -5 °C ... +70 °C |
| Minimum working pressure | 0.6 bar (for bore Ø10 - Ø16)<br>0.5 bar (for bore Ø20 - Ø25) |
| Cushioning | with elastic bumper |
| Stroke tolerance | +1 / 0 mm |
| Piston speed | 50 ... 500 mm/s (without load) |



### Standard strokes

| | Stroke | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Bore | 5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 |
| Ø10 | ● | ● | ● | ● | ● | ● | | |
| Ø16 | ● | ● | ● | ● | ● | ● | | |
| Ø20 | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø25 | ● | ● | ● | ● | ● | ● | ● | ● |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

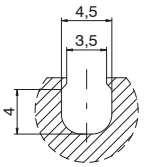
## Multimount cylinders

**Coding:** 6500.Ø.Ⓒ.1.Ⓟ

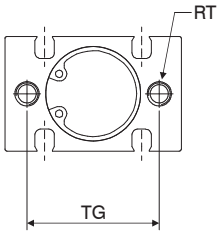
| | |
|---|---|
| | BORE |
| | **10** = Ø10 |
| Ø | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | STROKE |
| | **5** = 5 mm |
| | **10** = 10 mm |
| | **15** = 15 mm |
| Ⓒ | **20** = 20 mm |
| | **25** = 25 mm |
| | **30** = 30 mm |
| | **40** = 40 mm |
| | **50** = 50 mm |
| | PISTON |
| Ⓟ | = non-magnetic |
| | **M** = magnetic |



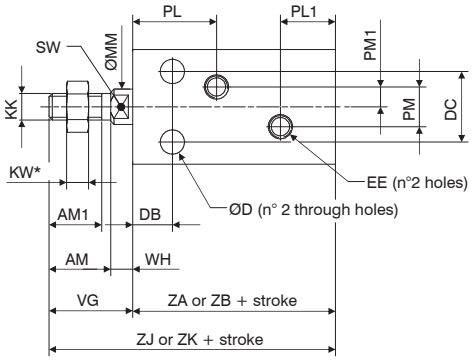
Slot Detail Type "D"

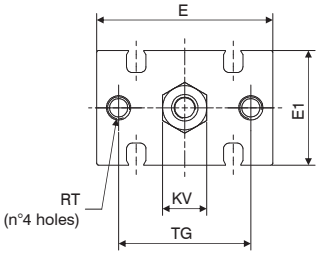


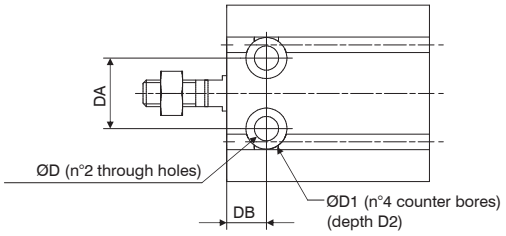

### Overall dimensions




*Ø10: n° 2 piston rod nuts
Ø16: n° 1 piston rod nut



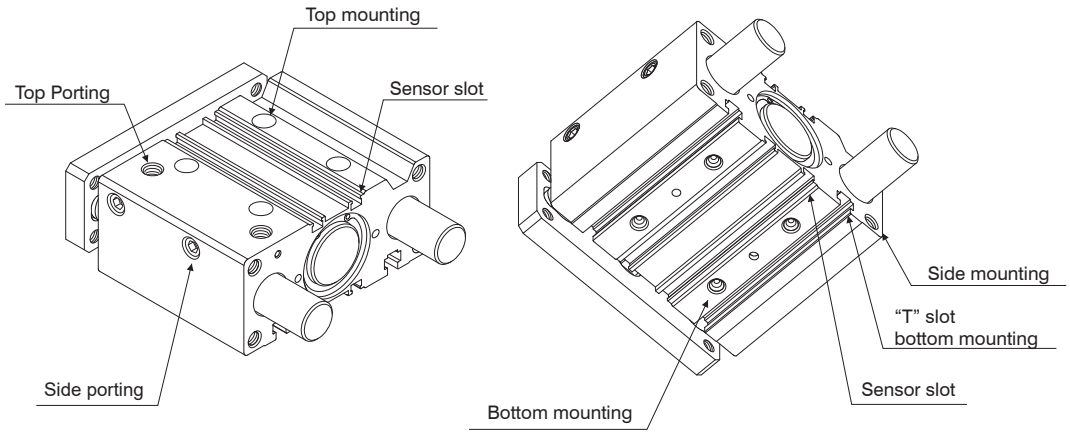

### Table of dimensions

| Bore | | Ø10 | Ø16 | Ø20 | Ø25 |
|---|---|---|---|---|---|
| AM | | / | 12,5 | 14 | 18 |
| AM1 | | 10 | 11 | 12 | 15,5 |
| ØD | | Ø3,2 | Ø4,5 | Ø5,5 | Ø5,5 |
| ØD1 | | Ø6 | Ø7,6 | Ø9,3 | Ø9,3 |
| D2 | | 5 | 6,5 | 8 | 9 |
| DA | | 11 | 14 | 16 | 20 |
| DB | | 7 | 7 | 9 | 10 |
| DC | | 9 | 12 | 16 | 20 |
| E | | 24 | 32 | 40 | 50 |
| E1 | | 15 | 20 | 26 | 32 |
| EE | | M5 | M5 | M5 | M5 |
| KK | | M4 | M5 | M6 | M8 |
| KV | | 7 | 8 | 10 | 13 |
| KW | | 3 | 4 | 5 | 5 |
| ØMM | | Ø4 | Ø6 | Ø8 | Ø10 |
| PL | | 16,5 | 16,5 | 19 | 21,5 |
| PL1 | | 10 | 11,5 | 12,5 | 13 |
| PM | | / | 4 | 9 | 9 |
| PM1 | | / | 2 | 4,5 | 4,5 |
| RT | | M3 (useful depth 5) | M4 (useful depth 6) | M5 (useful depth 8) | M5 (useful depth 8) |
| SW | | / | 5 | 6 | 8 |
| TG | | 18 | 25 | 30 | 38 |
| VG | | 16 | 16 | 19 | 23 |
| WH | | / | 3,5 | 5 | 5 |
| ZA magnetic | | 36 | 40 | 46 | 50 |
| ZB non magnetic | | 36 | 30 | 36 | 40 |
| ZJ magnetic | | 52 | 56 | 65 | 73 |
| ZK non magnetic | | 52 | 46 | 55 | 63 |
| Weight (g) | Stroke 0 | 32 | 44 | 84 | 159 |
| | every 5 mm | 4 | 6 | 11 | 17 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 6100-6101-6110




These guided compact cylinders, characterised by reduced overall dimensions, can be used for the compression, conveyance and manipulation of objects in many industrial sectors.
Similarly they can also be used in pushing, lifting and stopping applications.
These cylinders are available in sizes 32mm to 63 mm diameter, and comprise a single compact cylinder with integral guide rods, making it a true guide cylinder designed with installation flexibility and space saving in mind.
The rod guide is available in two styles:
**Self-lubricating bronze bushes** - useful for absorbing lateral loads and forces, especially as a stopper.
**Bearing bushes** - guaranteeing high precision and uniform movement with low friction characteristics, useful with mis-aligned loads.
Guided compact cylinders are ideal for use in applications requiring a combination of reduced dimensions and anti-rotation features.
Mounting can be achieved on three sides through holes or "T" slots.
When sensors are required, there are special slots in the barrel extrusion where 1580 series miniaturised sensors are easily fitted.



### Construction characteristics

| | |
|---|---|
| Body | anodized aluminium |
| Guide rods | C43 chromed steel (control unit with bronze bush)tempered and chromed steel (control unit with bearing bush) |
| Rods bushing | teflon coated bush |
| Piston rod bushing | bronze or bearing bushing |
| Rear end cap | anodized aluminium |
| Piston seals | oil resistant NBR rubber |
| Piston rod seals | PUR (NBR 12-16) |
| Plate | anodized aluminium |
| Piston | aluminium |
| Wipers | PUR |
| Piston rod | C43 chromed steel or stainless steel |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered and lubricated air or not (if lubricated the lubrication must be continuous) |
| Working pressure | max. 10 bar |
| Function | Double acting |
| Working temperature | -5 °C ... +70 °C |
| Cushioning | elastic bumper on both ends |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Guided compact cylinder

**Coding:** 6100.Ø.Ⓒ.Ⓖ.Ⓚ

| | |
|---|---|
| Ø | BORE |
| | **12** = Ø12 |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| Ⓒ | STROKE |
| | **10** = 10 mm |
| | **20** = 20 mm |
| | **25** = 25 mm |
| | **30** = 30 mm |
| | **40** = 40 mm |
| | **50** = 50 mm |
| | **75** = 75 mm |
| | **100** = 100 mm |
| | **125** = 125 mm |
| | **150** = 150 mm |
| | **175** = 175 mm |
| | **200** = 200 mm |
| | **250** = 250 mm * |
| | **300** = 300 mm * |
| | **350** = 350 mm * |
| | **400** = 400 mm * |
| | **450** = 450 mm * |
| | **500** = 500 mm * |
| Ⓖ | CONTROL UNIT |
| | **B** = Control unit with bronze bush |
| | **C** = Control unit with bearing bushes |
| Ⓚ | CONNECTIONS |
| | = Side supply ports closed |
| | **L** = Top supply ports closed |

**Only for bronze bushings* **B** *version*



### Construction characteristics

| | |
|---|---|
| Body | anodized aluminium |
| Guide rods | C43 chromed steel (control unit with bronze bush) tempered and chromed steel (control unit with bearing bush) |
| Piston | aluminium |
| Piston rod | stainless steel (for bores Ø12, Ø16, Ø20, Ø25) C43 chromed steel (for bores Ø32, Ø40, Ø50, Ø63) |
| Piston rod bushings | bronze or bearing bushing |
| Bottom plates | anodized aluminium |
| Piston seals | oil resistant NBR rubber |
| Rod seal | PUR (NBR 12-16) |
| Wipers | PUR |
| Plate | zinc plated steel |

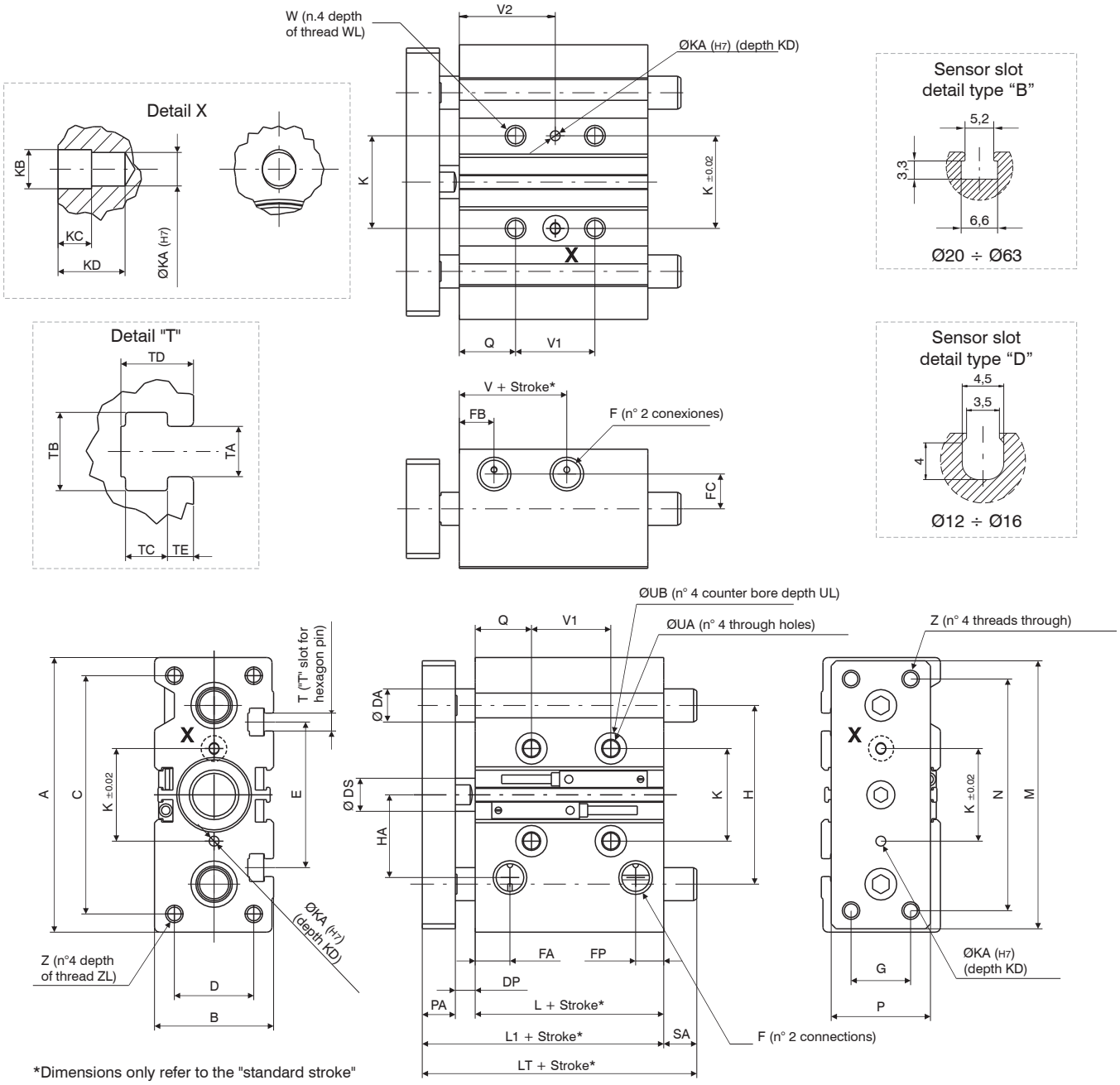
| Operational characteristics | |
|---|---|
| Cushioning | elastic bumper on both ends |
| Fluid | filtered and lubricated air or not (if lubricated the lubrication must be continuous) |
| Function | Double acting |
| Working pressure (bar) | max 10 |
| Temperature °C | -5 ... +70 |

### Standard strokes

| Stroke | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bore | 10 | 20 | 25 | 30 | 40 | 50 | 75 | 100 | 125 | 150 | 175 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| Ø12 | ● | ● | | ● | ● | ● | ● | ● | | | | | | | | | | |
| Ø16 | ● | ● | | ● | ● | ● | ● | ● | | | | | | | | | | |
| Ø20 | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø25 | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø32 | | | ● | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø40 | | | ● | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø50 | | | ● | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø63 | | | ● | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | | | | | | | | | | | | | Only for bronze bushings **B** version | | | | | |

Intermediate strokes can be obtained by adding specific spacers (5, 10, 15, 20 mm).
Example: It is possible to obtain a **6100.32.45.B** cylinder from a **6100.32.50.B** cylinder by adding a 5 mm spacer.
The Intermediate strokes manufactured without the use of spacers are considered special executions.

## Overall dimensions




*Dimensions only refer to the "standard stroke"





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Overall dimensions

| Bore | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 |
|---|---|---|---|---|---|---|---|---|
| A | 58 | 64 | 83 | 93 | 112 | 120 | 148 | 162 |
| B | 26 | 30 | 36 | 42 | 48 | 54 | 64 | 78 |
| C | 40 | 42 | 72 | 82 | 98 | 106 | 130 | 142 |
| D | 18 | 22 | 24 | 30 | 34 | 40 | 46 | 58 |
| DA Control unit with bronze bushes | 8 | 10 | 12 | 16 | 20 | 20 | 25 | 25 |
| DA Control unit with bearing bushes | 6 | 8 | 10 | 14 | 16 | 16 | 20 | 20 |
| DP | 2 | 4 | 5,5 | 5,5 | 9,5 | 10 | 13 | 13 |
| DS | 6 | 8 | 10 | 12 | 16 | 16 | 20 | 20 |
| E | / | / | 44 | 50 | 63 | 72 | 92 | 110 |
| F | M5 | M5 | G1/8" | G1/8" | G1/8" | G1/8" | G1/4" | G1/4" |
| FA | 11 | 11 | 11 | 12 | 13 | 13 | 13 | 14 |
| FB | 11 | 11 | 11 | 12 | 13 | 13 | 13 | 14 |
| FC | 8,5 | 10 | 10,5 | 13,5 | 15 | 18 | 21,5 | 28 |
| FP | 15 | 17 | 9 | 10,5 | 9,5 | 11 | 11 | 12,5 |
| G | 14 | 16 | 18 | 26 | 30 | 30 | 40 | 50 |
| H | 41,5 | 46 | 54 | 64 | 78 | 86 | 110 | 124 |
| HA | 19,5 | 23 | 25 | 28,5 | 34 | 38 | 47 | 55 |
| K | 23 | 24 | 28 | 34 | 42 | 50 | 66 | 80 |
| KA | / | / | 3 | 4 | 4 | 4 | 5 | 5 |
| KB | / | / | 3,5 | 4,5 | 4,5 | 4,5 | 6 | 6 |
| KC | / | / | 3 | 3 | 3 | 3 | 4 | 4 |
| KD | / | / | 6 | 6 | 6 | 6 | 8 | 8 |
| L | 29 | 31 | 38 | 38,5 | 38,5 | 44 | 44 | 49 |
| L1 | 39 | 43 | 53,5 | 54 | 60 | 66 | 72 | 77 |
| LT Control unit with bronze bushes stroke ≤50 | 39 | 43 | 53,5 | 54 | 97 | 97 | 106,5 | 106,5 |
| LT Control unit with bronze bushes stroke ≤50 stroke ≤200 | 57 | 64 | 84,5 | 85 | 102 | 102 | 118 | 118 |
| LT >200 < Stroke ≤ 500 | / | / | 122 | 122 | 140 | 140 | 161 | 161 |
| LT Control unit with bearing bushes | See table 1 | | | | | | | |
| M | 56 | 62 | 81 | 91 | 110 | 118 | 146 | 158 |
| N | 48 | 52 | 70 | 78 | 96 | 104 | 130 | 130 |
| PA | 8 | 8 | 10 | 10 | 12 | 12 | 15 | 15 |
| P | 22 | 25 | 30 | 38 | 44 | 44 | 60 | 70 |
| Q | 5 | 5 | 17,5 | 17,5 | 21,5 | 22 | 24 | 24 |
| SA Control unit with bronze bushes stroke ≤50 | / | / | / | / | 37 | 31 | 34,5 | 29,5 |
| SA Control unit with bronze bushes ≤50 stroke ≤200 | 18 | 21 | 31 | 31 | 42 | 36 | 46 | 41 |
| SA >200 < Stroke ≤ 500 | / | / | 68.5 | 68 | 80 | 74 | 89 | 84 |
| SA Control unit with bearing bushes | See table 1 | | | | | | | |
| T | / | / | M5 | M5 | M6 | M6 | M8 | M10 |
| TA | / | / | 5,4 | 5,4 | 6,5 | 6,5 | 8,5 | 11 |
| TB | / | / | 8,4 | 8,4 | 10,5 | 10,5 | 13,5 | 17,8 |
| TC | / | / | 4,5 | 4,5 | 5,5 | 5,5 | 7,5 | 10 |
| TD | / | / | 7,8 | 8,2 | 9,5 | 11 | 13,5 | 18,5 |
| TE | / | / | 2,8 | 3 | 3,5 | 4 | 4,5 | 7 |
| UA | 4,3 | 4,3 | 5,6 | 5,6 | 6,6 | 6,6 | 8,6 | 8,6 |
| UB | 8 | 8 | 9,5 | 9,5 | 11 | 11 | 14 | 14 |
| UL | 4,5 | 4,5 | 5,5 | 5,5 | 7,5 | 7,5 | 9 | 9 |
| V | 14 | 14 | 13 | 13 | 7,5 | 13 | 9 | 14 |
| V1 | See table 2 | | | | | | | |
| V2 | | | | | | | | |
| W | M5 | M5 | M6x1 | M6x1 | M8x1,25 | M8x1,25 | M10x1,5 | M10x1,5 |
| WL | 10 | 10 | 12 | 12 | 16 | 16 | 20 | 20 |
| Z | M4 | M5 | M5x0,8 | M6x1 | M8x1,25 | M8x1,25 | M10x1,5 | M10x1,5 |
| ZL | 9 | 11 | 13 | 15 | 20 | 20 | 22 | 22 |

**Table 1**

| Bore | LT | | | SA | | |
|---|---|---|---|---|---|---|
| | stroke≤30 | 30<stroke≤100 | 100<stroke≤200 | stroke≤30 | 30<stroke≤100 | 100<stroke≤200 |
| Ø12 | 39 | 53 | 53 | / | 14 | / |
| Ø16 | 43 | 64 | 64 | / | 21 | / |
| Ø20 | 47 | 72 | 72 | / | 18,5 | 49 |
| Ø25 | 49 | 77 | 77 | / | 23 | 48 |
| | stroke <50 | 50≤stroke≤100 | 100<stroke≤200 | stroke <50 | 50≤stroke≤100 | 100<stroke≤200 |
| Ø32 | / | 87 | 117 | / | 27 | 57 |
| Ø40 | / | | | / | 21 | 51 |
| Ø50 | / | 92 | 127 | / | 20 | 55 |
| Ø63 | / | | | / | 15 | 50 |

**Table 2**

| Bore | V1 | | | | V2 | | | |
|---|---|---|---|---|---|---|---|---|
| | stroke≤30 | 30<stroke≤100 | 100<stroke≤200 | 200<stroke≤500 | stroke≤30 | 30<stroke≤100 | 100<stroke≤200 | 200<stroke≤500 |
| Ø12 | 4+stroke | | | / | / | / | / | / |
| Ø16 | | | | | | | | |
| Ø20 | 24 | 44 | 120 | 200 | 29,5 | 39,5 | 77,5 | 124 |
| Ø25 | | | | | | | | |
| | stroke≤25 | 25<stroke≤100 | 100<stroke≤200 | 200<stroke≤500 | stroke≤25 | 25<stroke≤100 | 100<stroke≤200 | 200<stroke≤500 |
| Ø32 | 24 | 48 | 124 | 200 | 33,5 | 45,5 | 83,5 | 124 |
| Ø40 | | | | | 34 | 46 | 84 | |
| Ø50 | | | | | 36 | 48 | 86 | |
| Ø63 | 28 | 52 | 128 | | 38 | 50 | 88 | |

## Weight (g)

| | Bore | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 |
| Stroke | Control unit with bronze bushes | | | | | | | |
| 10 | 240 | 330 | / | / | / | / | / | / |
| 20 | 280 | 380 | 670 | 950 | / | / | / | / |
| 25 | / | / | / | / | 1690 | 1950 | 3360 | 4180 |
| 30 | 310 | 430 | 750 | 1050 | / | / | / | / |
| 40 | 350 | 480 | 830 | 1160 | / | / | / | / |
| 50 | 390 | 530 | 910 | 1270 | 2070 | 2370 | 4000 | 4940 |
| 75 | 500 | 680 | 1170 | 1650 | 2470 | 2830 | 4730 | 5780 |
| 100 | 5903 | 800 | 1370 | 1920 | 2850 | 3250 | 5370 | 6540 |
| 125 | / | / | 1570 | 2190 | 3240 | 3680 | 6010 | 7290 |
| 150 | / | / | 1760 | 2470 | 3620 | 4100 | 6650 | 8050 |
| 175 | / | / | 1960 | 2740 | 4000 | 4530 | 7290 | 8800 |
| 200 | / | / | 2160 | 3010 | 4380 | 4950 | 7930 | 9560 |
| 250 | / | / | 2360 | 3280 | 4760 | 5370 | 8570 | 10320 |
| 300 | / | / | 2560 | 3550 | 5140 | 5790 | 9210 | 11080 |
| 350 | / | / | 2760 | 3820 | 5520 | 6210 | 9850 | 11840 |
| 400 | / | / | 2960 | 4090 | 5900 | 6630 | 10490 | 12600 |
| 450 | / | / | 3160 | 4360 | 6280 | 7050 | 11130 | 13360 |
| 500 | / | / | 3360 | 4630 | 6660 | 7470 | 11770 | 14120 |
| Stroke | Moving parts | | | | | | | |
| 10 | 100 | 155 | / | / | / | / | / | / |
| 20 | 108 | 170 | 330 | 520 | / | / | / | / |
| 25 | / | / | / | / | 1070 | 1140 | 2150 | 2500 |
| 30 | 116 | 185 | 350 | 560 | / | / | / | / |
| 40 | 124 | 200 | 380 | 600 | / | / | / | / |
| 50 | 132 | 215 | 400 | 640 | 1230 | 1300 | 2400 | 2750 |
| 75 | 152 | 250 | 520 | 840 | 1420 | 1490 | 2750 | 3090 |
| 100 | 172 | 285 | 580 | 950 | 1580 | 1650 | 3000 | 3350 |
| 125 | / | / | 640 | 1050 | 1740 | 1810 | 3260 | 3600 |
| 150 | / | / | 700 | 1150 | 1910 | 1980 | 3510 | 3860 |
| 175 | / | / | 760 | 1250 | 2070 | 2140 | 3760 | 4110 |
| 200 | / | / | 820 | 1350 | 2230 | 2300 | 4020 | 4360 |
| 250 | / | / | 880 | 1450 | 2390 | 2460 | 4280 | 4610 |
| 300 | / | / | 940 | 1550 | 2550 | 2620 | 4540 | 4860 |
| 350 | / | / | 1000 | 1650 | 2710 | 2780 | 4800 | 5110 |
| 400 | / | / | 1060 | 1750 | 2870 | 2940 | 5060 | 5360 |
| 450 | / | / | 1120 | 1850 | 3030 | 3100 | 5320 | 5610 |
| 500 | / | / | 1180 | 1950 | 3190 | 3260 | 5580 | 5860 |
| Stroke | Control unit with bearing bushes | | | | | | | |
| 10 | 240 | 340 | / | / | / | / | / | / |
| 20 | 270 | 390 | 700 | 980 | / | / | / | / |
| 25 | / | / | / | / | 1540 | 1790 | 3110 | 3930 |
| 30 | 300 | 430 | 770 | 1070 | / | / | / | / |
| 40 | 350 | 510 | 890 | 1250 | / | / | / | / |
| 50 | 390 | 560 | 970 | 1340 | 1850 | 2150 | 3660 | 4590 |
| 75 | 470 | 670 | 1140 | 1570 | 2300 | 2640 | 4410 | 5460 |
| 100 | 560 | 790 | 1310 | 1810 | 2620 | 300 | 4960 | 6120 |
| 125 | / | / | 1520 | 2080 | 2990 | 3420 | 5600 | 6880 |
| 150 | / | / | 1690 | 2310 | 3310 | 3780 | 6150 | 7540 |
| 175 | / | / | 1870 | 2540 | 3620 | 4140 | 6700 | 8210 |
| 200 | / | / | 2040 | 2770 | 3940 | 4500 | 7250 | 8870 |
| Stroke | Moving parts | | | | | | | |
| 10 | 95 | 145 | / | / | / | / | / | / |
| 20 | 100 | 153 | 310 | 490 | / | / | / | / |
| 25 | / | / | / | / | 820 | 870 | 1770 | 2110 |
| 30 | 105 | 161 | 330 | 520 | / | / | / | / |
| 40 | 110 | 169 | 370 | 580 | / | / | / | / |
| 50 | 120 | 177 | 390 | 610 | 940 | 1010 | 1950 | 2300 |
| 75 | 145 | 197 | 440 | 690 | 1110 | 1180 | 2240 | 2590 |
| 100 | 170 | 217 | 480 | 760 | 1230 | 1300 | 2430 | 2770 |
| 125 | / | / | 560 | 880 | 1410 | 1480 | 2710 | 3050 |
| 150 | / | / | 600 | 950 | 1530 | 1600 | 2890 | 3240 |
| 175 | / | / | 650 | 1020 | 1650 | 1720 | 3080 | 3420 |
| 200 | / | / | 700 | 1100 | 1770 | 1830 | 3270 | 3610 |

## Cylinder theoretic force (N)

| Working pressure | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 bar | 23 | 17 | 40 | 30 | 63 | 47 | 98 | 76 | 161 | 121 | 251 | 211 | 393 | 330 | 623 | 561 |
| 3 bar | 34 | 26 | 60 | 45 | 94 | 71 | 147 | 113 | 241 | 181 | 377 | 317 | 589 | 495 | 935 | 841 |
| 4 bar | 45 | 34 | 80 | 60 | 126 | 94 | 196 | 151 | 322 | 241 | 503 | 422 | 785 | 660 | 1247 | 1121 |
| 5 bar | 57 | 43 | 101 | 76 | 157 | 118 | 246 | 189 | 402 | 302 | 629 | 528 | 982 | 825 | 1559 | 1402 |
| 6 bar | 68 | 51 | 121 | 91 | 188 | 142 | 295 | 227 | 482 | 362 | 754 | 634 | 1178 | 989 | 1870 | 1682 |
| 7 bar | 79 | 60 | 141 | 106 | 220 | 165 | 344 | 265 | 563 | 422 | 880 | 739 | 1374 | 1154 | 2182 | 1962 |
| 8 bar | 90 | 68 | 161 | 121 | 251 | 189 | 393 | 302 | 643 | 482 | 1006 | 845 | 1570 | 1319 | 2494 | 2242 |
| 9 bar | 102 | 77 | 181 | 136 | 283 | 212 | 442 | 340 | 724 | 543 | 1131 | 950 | 1767 | 1484 | 2805 | 2523 |
| 10 bar | 113 | 85 | 201 | 151 | 314 | 236 | 491 | 378 | 804 | 603 | 1257 | 1056 | 1963 | 1649 | 3117 | 2803 |
| Effective area ($mm^2$) | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In |
| | 113 | 85 | 201 | 151 | 314 | 236 | 491 | 378 | 804 | 603 | 1257 | 1056 | 1963 | 1649 | 3117 | 2803 |

## Maximum permissible Momentum

| J | 0,08 | 0,09 | 0,11 | 0,18 | 0,29 | 0,52 | 0,91 | 1,54 |
|---|---|---|---|---|---|---|---|---|

How to calculate the Momentum:$Ec = 1/2\ V^2(J)$
m = Total moving mass: weight of driven object added to weight of cylinder moving parts (kg)
v = V = max. speed: equal to average speed + 40% (m/s)

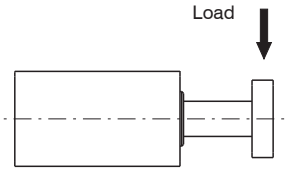


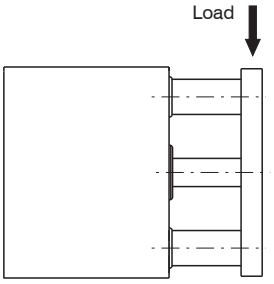

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Operating criteria

### Permissible lateral load

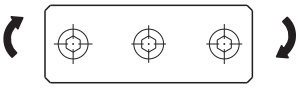
| Version | Stroke | Bore Ø12 | Ø16 | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 |
|---|---|---|---|---|---|---|---|---|---|
| Control unit with bronze bushes | 10 | 30 | 48 | | | | | | |
| | 20 | 23 | 37 | 49 | 69 | | | | |
| | 25 | | | | | 203 | 203 | 296 | 296 |
| | 30 | 19 | 30 | 43 | 60 | | | | |
| | 40 | 16 | 25 | 38 | 54 | | | | |
| | 50 | 14 | 20 | 35 | 49 | 164 | 164 | 245 | 245 |
| | 75 | 12 | 18 | 87 | 116 | 182 | 182 | 273 | 273 |
| | 100 | 10 | 15 | 75 | 100 | 159 | 159 | 241 | 241 |
| | 125 | | | 66 | 88 | 142 | 142 | 216 | 216 |
| | 150 | | | 59 | 79 | 127 | 127 | 195 | 195 |
| | 175 | | | 54 | 71 | 116 | 116 | 179 | 179 |
| | 200 | | | 49 | 65 | 106 | 106 | 164 | 164 |
| Control unit with bearing bushes | 10 | 20 | 35 | | | | | | |
| | 20 | 15 | 28 | 58 | 69 | | | | |
| | 25 | | | | | 191 | 190 | 208 | 206 |
| | 30 | 13 | 22 | 48 | 68 | | | | |
| | 40 | 11 | 18 | 101 | 132 | | | | |
| | 50 | 10 | 16 | 90 | 118 | 157 | 157 | 173 | 171 |
| | 75 | 8 | 14 | 70 | 93 | 164 | 163 | 223 | 221 |
| | 100 | 6 | 11 | 58 | 77 | 144 | 144 | 199 | 196 |
| | 125 | | | 62 | 80 | 203 | 203 | 264 | 262 |
| | 150 | | | 54 | 70 | 186 | 185 | 242 | 240 |
| | 175 | | | 48 | 62 | 171 | 171 | 224 | 221 |
| | 200 | | | 43 | 55 | 158 | 158 | 207 | 205 |



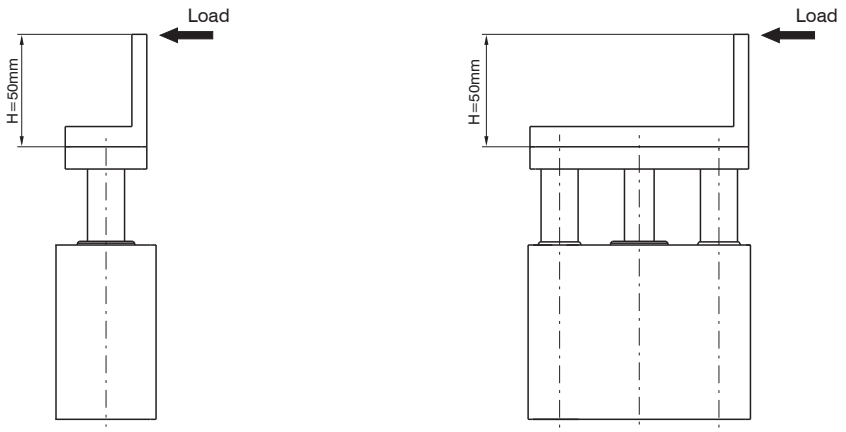

### Recommended torque moments

| Version | Stroke | Bore Ø12 | Ø16 | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 |
|---|---|---|---|---|---|---|---|---|---|
| Control unit with bronze bushes | 10 | 0,40 | 0,70 | | | | | | |
| | 20 | 0,35 | 0,65 | 1,1 | 1,8 | | | | |
| | 25 | | | | | 6,4 | 7 | 13 | 14,7 |
| | 30 | 0,28 | 0,48 | 0,9 | 1,6 | | | | |
| | 40 | 0,25 | 0,45 | 0,8 | 1,4 | | | | |
| | 50 | 0,21 | 0,39 | 0,8 | 1,3 | 5,1 | 5,7 | 10,8 | 12,1 |
| | 75 | 0,42 | 0,68 | 1,9 | 3,0 | 5,7 | 6,3 | 12,0 | 13,5 |
| | 100 | 0,40 | 0,60 | 1,6 | 2,6 | 5,0 | 5,5 | 10,6 | 11,9 |
| | 125 | | | 1,4 | 2,3 | 4,4 | 4,9 | 9,5 | 10,7 |
| | 150 | | | 1,3 | 2,0 | 4,0 | 4,4 | 8,6 | 9,7 |
| | 175 | | | 1,2 | 1,8 | 3,6 | 4,0 | 7,9 | 8,9 |
| | 200 | | | 1,1 | 1,7 | 3,3 | 3,7 | 7,2 | 8,2 |
| Control unit with bearing bushes | 10 | 0,62 | 0,70 | | | | | | |
| | 20 | 0,41 | 0,65 | 1,3 | 2,1 | | | | |
| | 25 | | | | | 6,0 | 6,6 | 9,2 | 10,2 |
| | 30 | 0,33 | 0,48 | 1,0 | 1,8 | | | | |
| | 40 | 0,30 | 0,45 | 2,2 | 3,4 | | | | |
| | 50 | 0,48 | 0,39 | 1,9 | 3,0 | 4,9 | 5,4 | 7,6 | 8,5 |
| | 75 | 0,38 | 0,68 | 1,5 | 2,4 | 5,1 | 5,6 | 9,8 | 11,0 |
| | 100 | 0,32 | 0,60 | 1,3 | 2,0 | 4,5 | 5,0 | 8,7 | 9,7 |
| | 125 | | | 1,3 | 2,1 | 6,3 | 7,0 | 11,6 | 13,0 |
| | 150 | | | 1,2 | 1,8 | 5,8 | 6,4 | 10,7 | 11,9 |
| | 175 | | | 1,0 | 1,6 | 5,3 | 5,9 | 9,8 | 11,0 |
| | 200 | | | 0,9 | 1,4 | 4,9 | 5,4 | 9,1 | 10,2 |



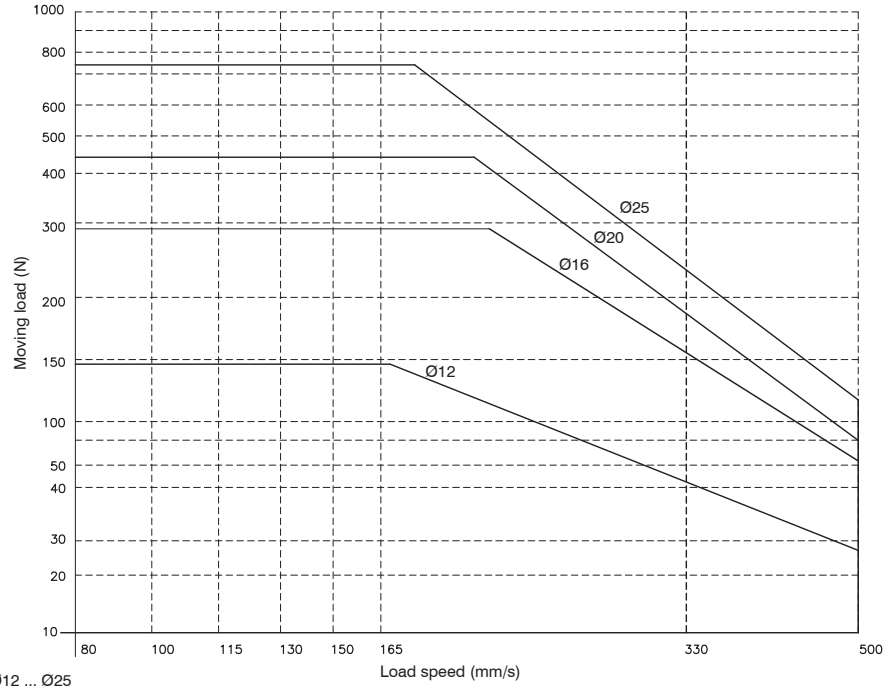
## Operating criteria

### "Stopper" device applications



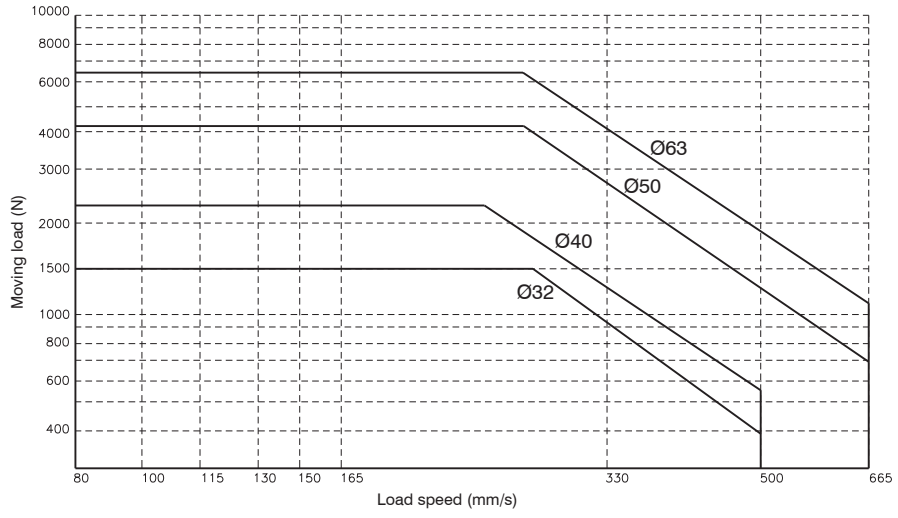

### Control unit with bronze bush

ATTENTION: if H>50 mm use larger bore




Ø12 ... Ø25

ATTENTION: use with stroke ≤ 30 mm




Ø32 ... Ø63

ATTENTION: use with stroke ≤ 50 mm

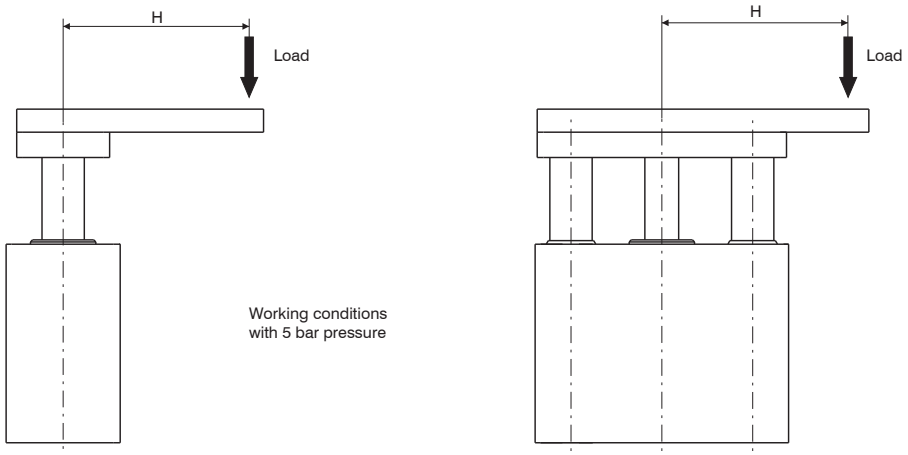




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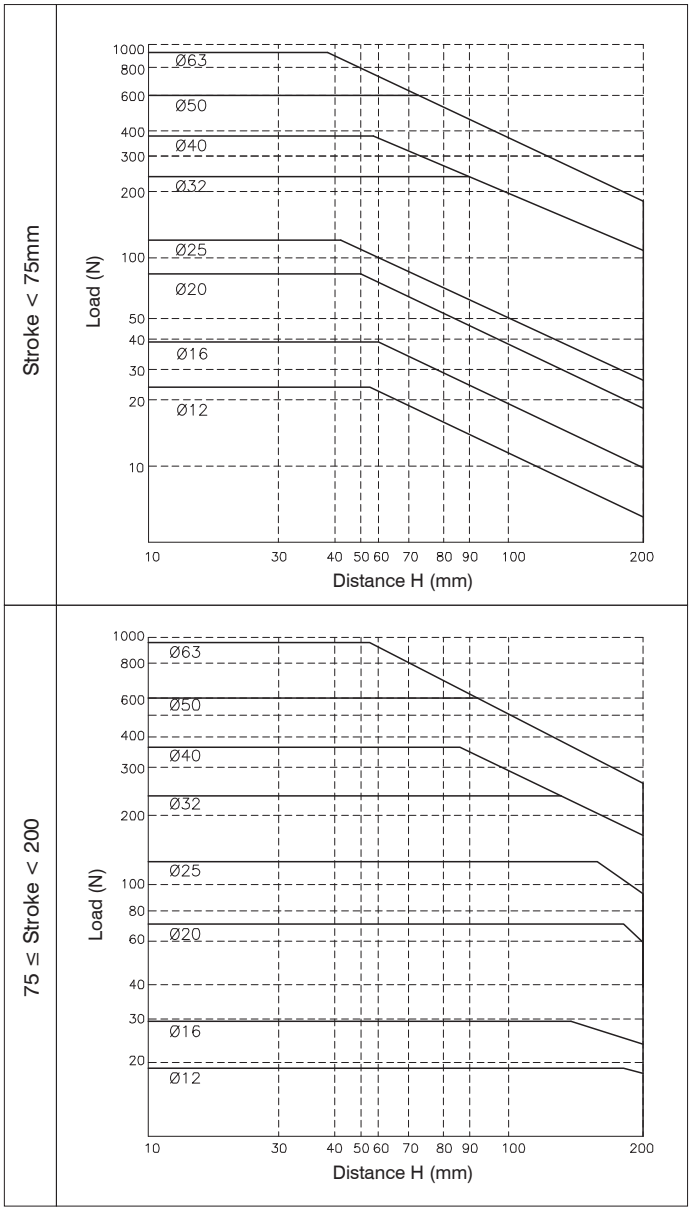
## Operating criteria

### Handling applications




Working conditions
with 5 bar pressure

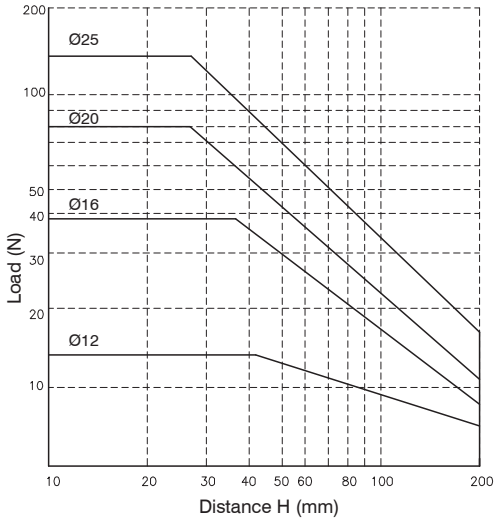
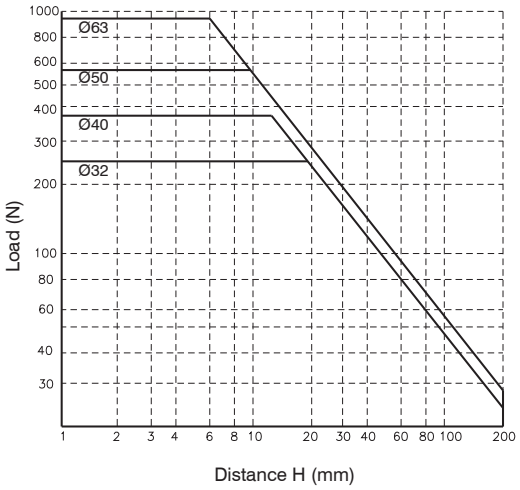
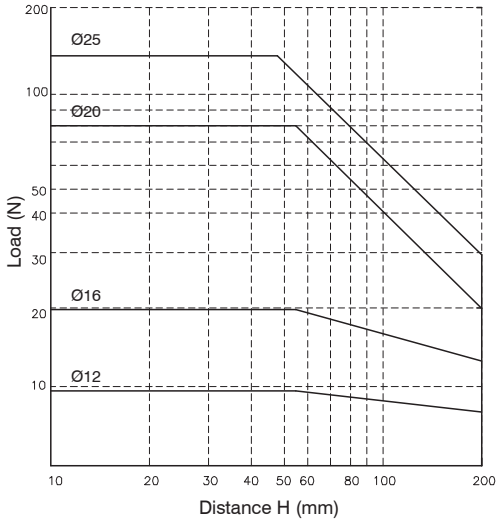
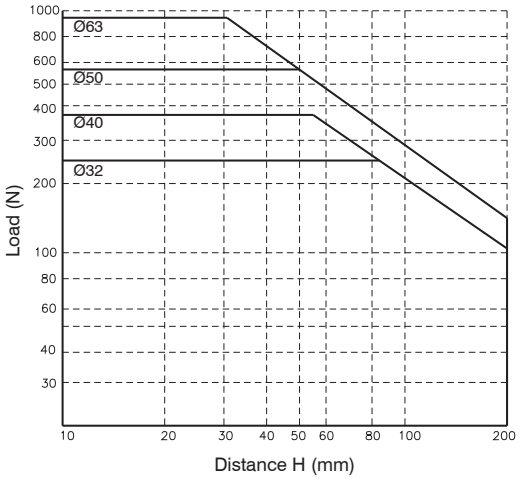
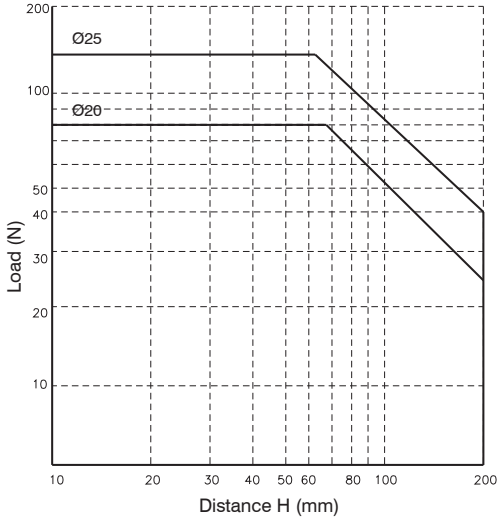
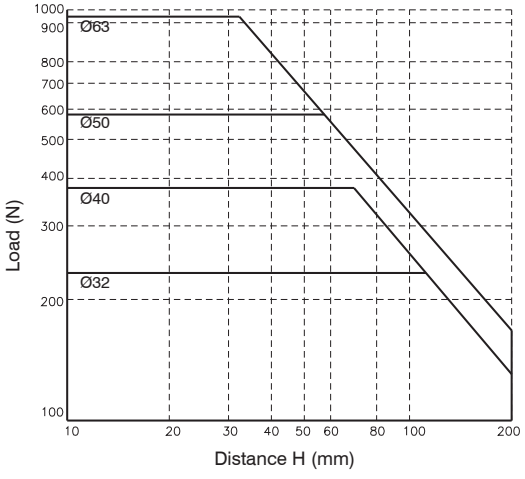
### Control unit with bronze bush



**Operating criteria**

**Handling applications**

### Control unit with bronze bushes

| | Ø20 ... Ø25 | Ø32 ... Ø63 |
|---|---|---|
| Stroke < 40 mm |  |  |
| 40 ≤ Stroke < 125 |  |  |
| 125 ≤ Stroke < 200 |  |  |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Heavy duty guided compact cylinder

**Coding:** 6101.80.Ⓒ.B.Ⓚ

| | |
|---|---|
| | STROKE |
| | **25** = 25 mm |
| | **50** = 50 mm |
| | **75** = 75 mm |
| Ⓒ | **100** = 100 mm |
| | **125** = 125 mm |
| | **150** = 150 mm |
| | **175** = 175 mm |
| | **200** = 200 mm |
| | CONNECTIONS |
| Ⓚ | = Side supply ports closed |
| | **L** = Top supply ports closed |



### Construction characteristics

| | |
|---|---|
| Body | anodized aluminium |
| Guide rods | C43 chromed steel |
| Piston | aluminium |
| Piston rod | C43 chromed steel |
| Piston rod bushing | sintered bronze |
| Rods bushing | teflon coated bush |
| Rear end cap | anodized aluminium |
| Piston seals | oil resistant NBR rubber |
| Piston rod seals | PUR |
| Plate | anodized aluminium |

### Operational characteristics

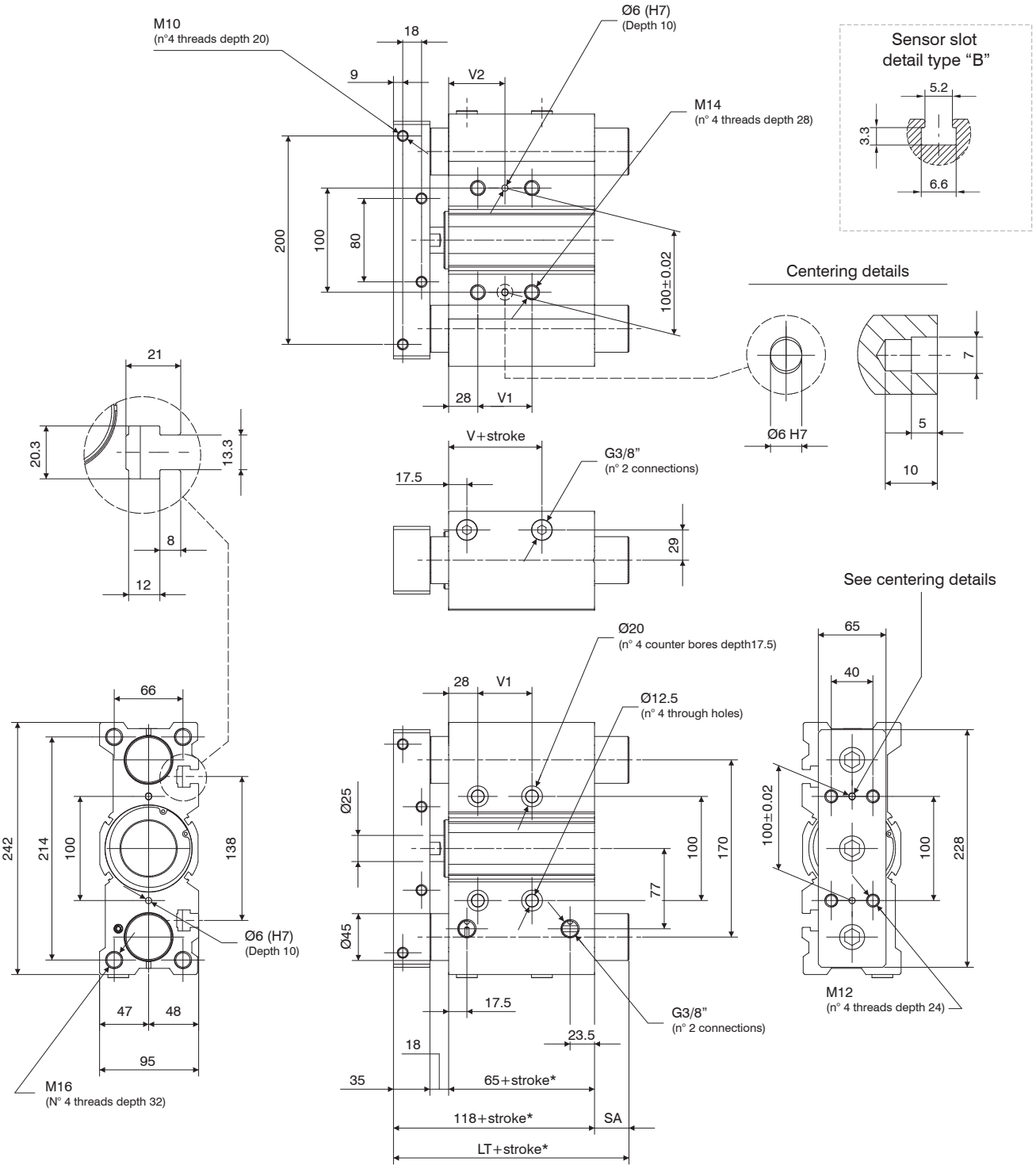
| Operational characteristics | |
|---|---|
| Cushioning | elastic bumper on both ends |
| Fluid | filtered and preferably lubricated air or not (if lubricated the lubrication must be continuous) |
| Function | Double acting |
| Working pressure (bar) | max 10 |
| Temperature °C | -5 ... +70 |

### Standard strokes

| | Stroke | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Bore | 25 | 50 | 75 | 100 | 125 | 150 | 175 | 200 |
| Ø80 | ● | ● | ● | ● | ● | ● | ● | ● |

Intermediate strokes can be obtained by adding specific spacers (5, 10, 15, 20 mm).
Example: It is possible to obtain a **6101.80.45.B** cylinder from a **6101.80.50.B** cylinder by adding a 5 mm spacer.
The Intermediate strokes manufactured without the use of spacers are considered special executions.

## Overall dimensions




*Dimensions only refer to the "standard stroke"

### Table of dimensions

| Strokes | | |
|---|---|---|
| 25 | LT | 118 |
| 50 | | 118 |
| > 50 | | 151 |
| | V | 14,5 |
| 25 | V1 | 28 |
| 50 | | 52 |
| 75 | | 52 |
| 100 | | 52 |
| > 100 | | 128 |
| 25 | V2 | 42 |
| 50 | | 54 |
| 75 | | 54 |
| 100 | | 54 |
| > 100 | | 92 |
| 25 | SA | 0 |
| 50 | | |
| > 50 | | 33 |



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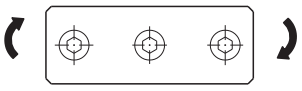
## Cylinder force - Operating criteria

### Cylinder theoretic force (N)

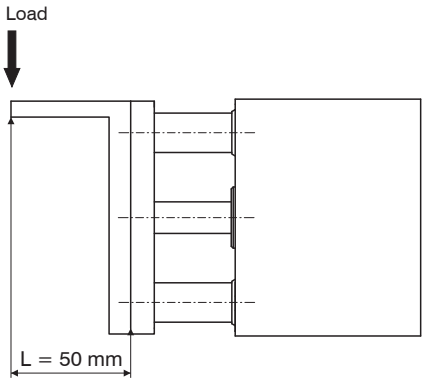
| Working pressure | | |
|---|---|---|
| 2 bar | 1005 | 907 |
| 3 bar | 1508 | 1361 |
| 4 bar | 2011 | 1814 |
| 5 bar | 2513 | 2268 |
| 6 bar | 3016 | 2721 |
| 7 bar | 3519 | 3175 |
| 8 bar | 4021 | 3629 |
| 9 bar | 4524 | 4082 |
| 10 bar | 5027 | 4536 |
| Effective area ($mm^2$) | Out | In |
| | 5027 | 4536 |

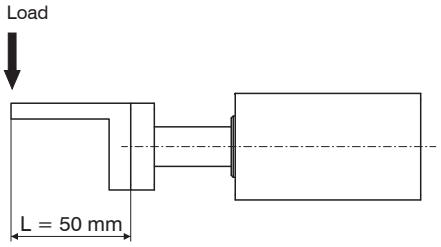
### Recommended torque moments

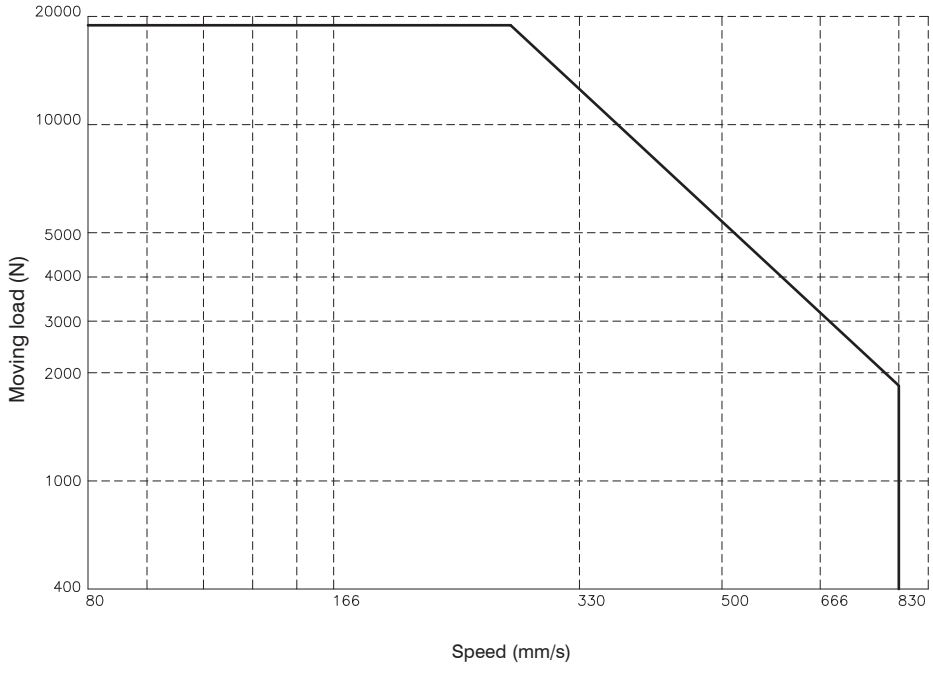
| Stroke | N/m |
|---|---|
| 25 | 49 |
| 50 | 41 |
| 75 | 51 |
| 100 | 45 |
| 125 | 41 |
| 150 | 38 |
| 175 | 35 |
| 200 | 32 |



## "Stopper" device applications



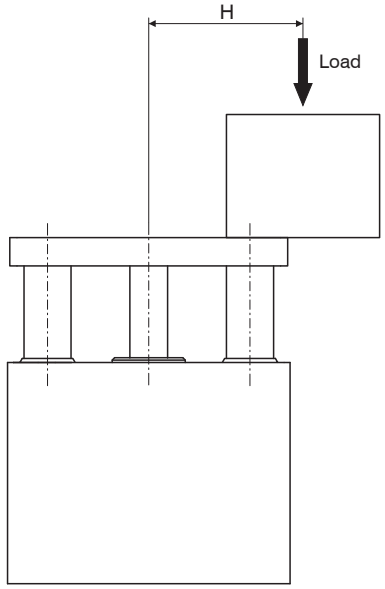




ATTENTION : max stroke 50 mm

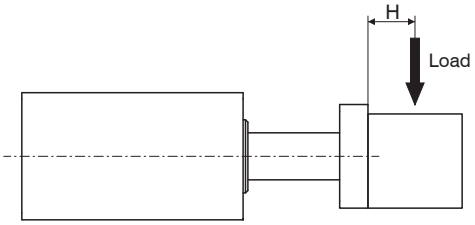
## Operating criteria

## Handling applications

### VERTICAL assembly position

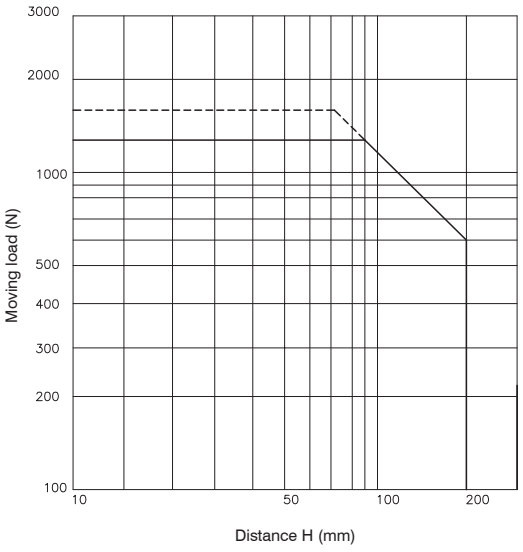



### HORIZONTAL assembly position

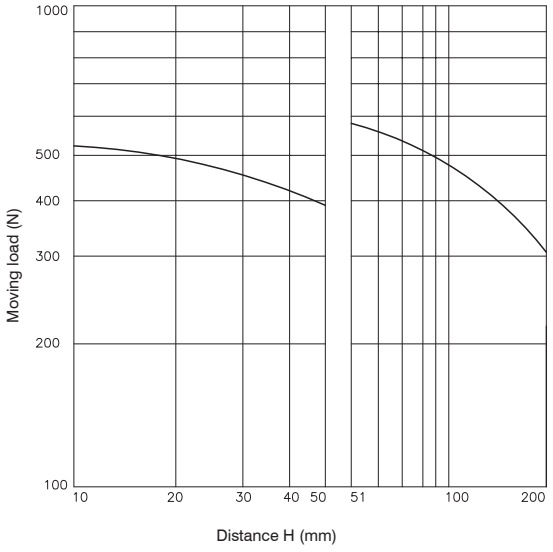




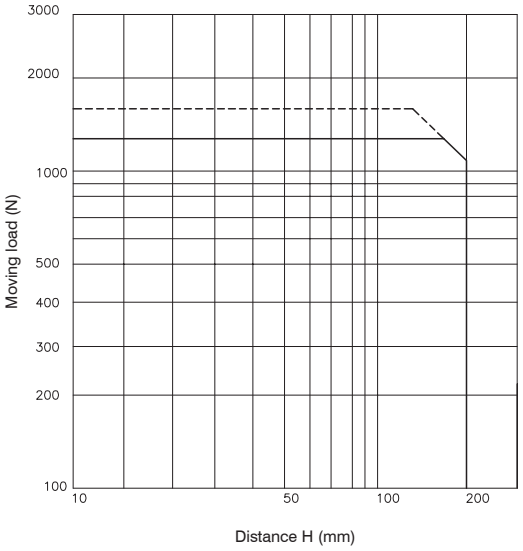

Stroke ≤ 50 mm / V = 200 mm/s



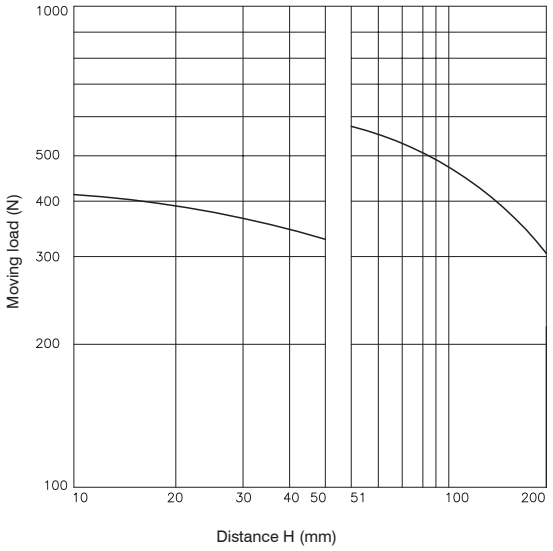

H = 50 mm / V = 200 mm/s




Stroke > 50 mm / V = 200 mm/s




H = 100 mm / V = 200 mm/s




——— Working pressure : 4 bar
- - - - - - - - Working pressure : 5 bar


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Compact guided cylinders with metal rodscrapers

**Coding:** 6110.Ø.Ⓒ.C.Ⓚ

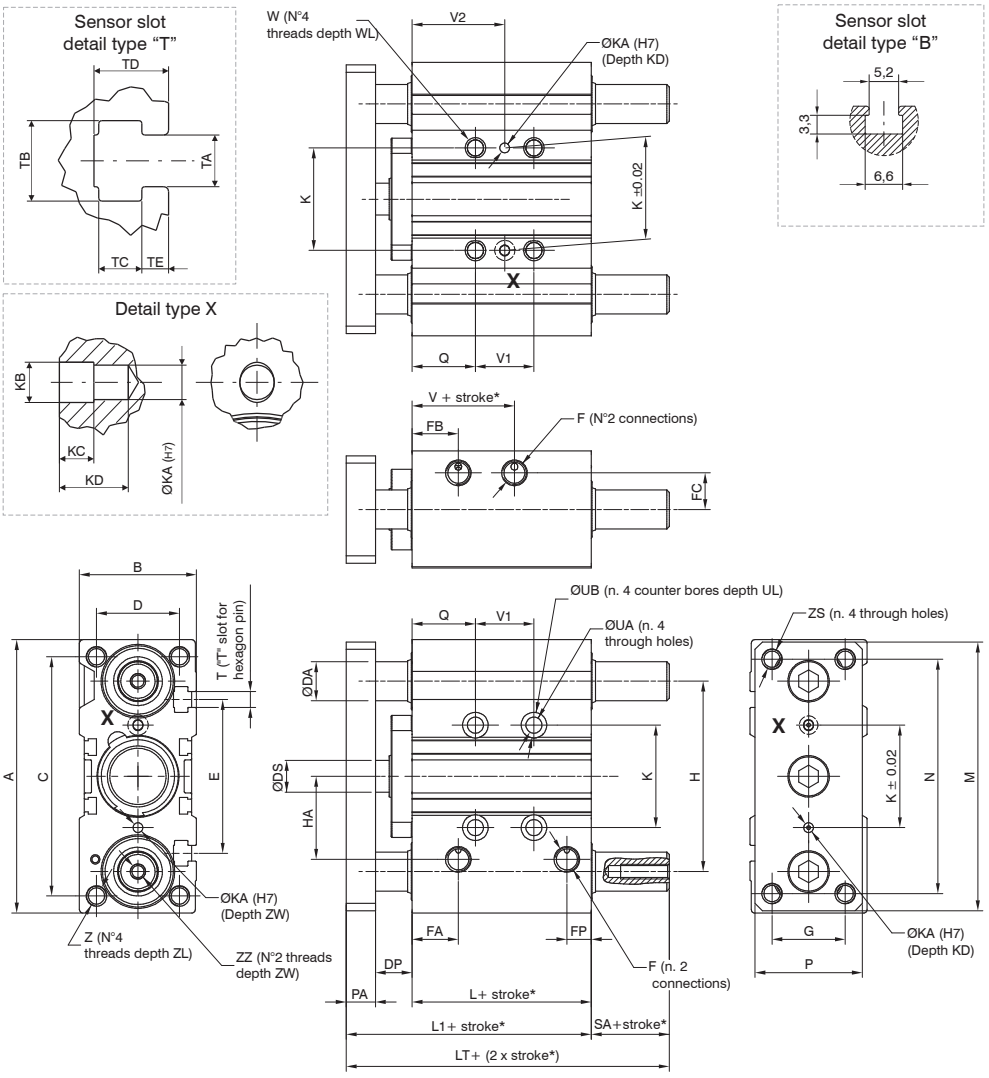
| Ø | BORE |
|---|---|
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |

| Ⓒ | STROKE |
|---|---|
| | **25** = 25 mm |
| | **50** = 50 mm |
| | **75** = 75 mm |
| | **100** = 100 mm |
| | **125** = 125 mm |
| | **150** = 150 mm |
| | **175** = 175 mm |
| | **200** = 200 mm |

| Ⓚ | WORKING PORTS SIZE |
|---|---|
| | = Side supply ports closed |
| | **L** = Top supply ports closed |



### Overall dimensions




### Table of dimensions

| Bore | Ø32 | Ø40 | Ø50 | Ø63 |
|---|---|---|---|---|
| A | 112 | 120 | 148 | 162 |
| B | 48 | 54 | 64 | 78 |
| C | 98 | 106 | 130 | 142 |
| D | 34 | 40 | 46 | 58 |
| DA Control unit with bronze bushes | 16 | 16 | 20 | 20 |
| DP | 15 | 20 | 23 | 23 |
| DS | 16 | 16 | 20 | 20 |
| E | 63 | 72 | 92 | 110 |
| F | G1/8" | G1/8" | G1/4" | G1/4" |
| FA | 19 | 13 | 13 | 14 |
| FB | 19 | 13 | 13 | 14 |
| FC | 15 | 18 | 21,5 | 28 |
| FP | 10 | 11 | 11 | 12,5 |
| G | 30 | 30 | 40 | 50 |
| H | 78 | 86 | 110 | 124 |
| HA | 34 | 38 | 47 | 55 |
| K | 42 | 50 | 66 | 80 |
| KA | 4 | 4 | 5 | 5 |
| KB | 4,5 | 4,5 | 6 | 6 |
| KC | 3 | 3 | 4 | 4 |
| KD | 6 | 6 | 8 | 8 |
| L | 48,5 | 50 | 50 | 55 |
| L1 | 75,5 | 82 | 88 | 93 |
| M | 110 | 118 | 146 | 158 |
| N | 96 | 104 | 130 | 130 |
| PA | 12 | 12 | 15 | 15 |
| P | 44 | 44 | 60 | 70 |
| Q | 26 | 22 | 24 | 24 |
| SA | 7 | 7 | 5 | 7 |
| T | M6 | M6 | M8 | M10 |
| TA | 6,5 | 6,5 | 8,5 | 11 |
| TB | 10,5 | 10,5 | 13,5 | 17,8 |
| TC | 5,5 | 5,5 | 7,5 | 10 |
| TD | 9,5 | 11 | 13,5 | 18,5 |
| TE | 3,5 | 4 | 4,5 | 7 |
| UA | 6,6 | 6,6 | 8,6 | 8,6 |
| UB | 11 | 11 | 14 | 14 |
| UL | 7,5 | 7,5 | 9 | 9 |
| V | 17 | 19 | 15 | 20 |
| V1 | See table 1 | | | |
| V2 | | | | |
| W | M8x1,25 | M8x1,25 | M10x1,5 | M10x1,5 |
| WL | 16 | 16 | 20 | 20 |
| Z | M8x1,25 | M8x1,25 | M10x1,5 | M10x1,5 |
| ZL | 20 | 20 | 22 | 22 |
| ZS | M8x1,25 | M8x1,25 | M10x1,5 | M10x1,5 |
| ZW | 20 | 20 | 25 | 25 |
| ZZ | M6 | M8 | M10 | M10 |

Intermediate strokes can be obtained by adding specific spacers (5, 10, 15, 20 mm).
Example: It is possible to obtain a **6110.32.45.B** cylinder from a **6110.32.50.B** cylinder by adding a 5 mm spacer.
The Intermediate strokes manufactured without the use of spacers are considered special executions.

### Standard strokes

| | Stroke | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Bore | 25 | 50 | 75 | 100 | 125 | 150 | 175 | 200 |
| Ø32 | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø40 | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø50 | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø63 | ● | ● | ● | ● | ● | ● | ● | ● |

| Table 1 | V1 | | | V2 | | |
|---|---|---|---|---|---|---|
| Bore | stroke≤25 | 25<stroke≤100 | 100<stroke≤200 | stroke≤25 | 25<stroke≤100 | 100<stroke≤200 |
| Ø32 | 24 | 48 | 124 | 38 | 50 | 88 |
| Ø40 | | | | 34 | 46 | 84 |
| Ø50 | | | | 36 | 48 | 86 |
| Ø63 | 28 | 52 | 128 | 38 | 50 | 88 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

# Series 6600

## Slide cylinders

**Coding:** 6600.Ø.Ⓒ.Ⓐ

| | BORE |
|---|---|
| Ø | **8** = Ø8 |
| | **12** = Ø12 |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |

| | STROKE |
|---|---|
| Ⓒ | **10** = 10 mm |
| | **20** = 20 mm |
| | **30** = 30 mm |
| | **40** = 40 mm |
| | **50** = 50 mm |
| | **75** = 75 mm |
| | **100** = 100 mm |
| | **125** = 125 mm |
| | **150** = 150 mm |

| | ACCESSORIES |
|---|---|
| Ⓐ | = Without accessories |
| | **A** = Double regulation end stroke |
| | **AU** = Regulation front end stroke |
| | **AR** = Regulation rear end stroke |
| | **D** = Double shock absorber |
| | **DU** = Front shock absorber |
| | **DR** = Rear shock absorber |



### Construction characteristics

| | |
|---|---|
| Body | anodized aluminium |
| Piston rod bushings | sintered bronze |
| Flange | anodized aluminium |
| Rear end cap | anodized aluminium |
| Seals | oil resistant NBR rubber |
| Piston | stainless steel |
| Cushioning washer | PUR |
| Piston rod | stainless steel |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered and preferably lubricated air or not (if lubricated the lubrication must be continuous) |
| Working pressure | 1,5 bar ... 7 bar |
| Working temperature | -5 °C ... +70 °C |
| Cushioning | with elastic bumper |

### Theoretical force

| Bore | Effective area (mm²) | | Force (N) | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ø8 | Out | 101 | 20 | 30 | 40 | 51 | 61 | 71 |
| | In | 75 | 15 | 23 | 30 | 38 | 45 | 53 |
| Ø12 | Out | 226 | 45 | 68 | 90 | 113 | 136 | 158 |
| | In | 170 | 34 | 51 | 68 | 85 | 102 | 119 |
| Ø16 | Out | 402 | 80 | 121 | 161 | 201 | 241 | 281 |
| | In | 302 | 60 | 91 | 121 | 151 | 181 | 211 |
| Ø20 | Out | 628 | 126 | 188 | 251 | 314 | 377 | 440 |
| | In | 471 | 94 | 141 | 188 | 236 | 283 | 330 |
| Ø25 | Out | 982 | 196 | 295 | 393 | 491 | 589 | 687 |
| | In | 756 | 151 | 227 | 302 | 378 | 454 | 529 |
| | | | 2 | 3 | 4 | 5 | 6 | 7 |
| | | | Working pressure (bar) | | | | | |

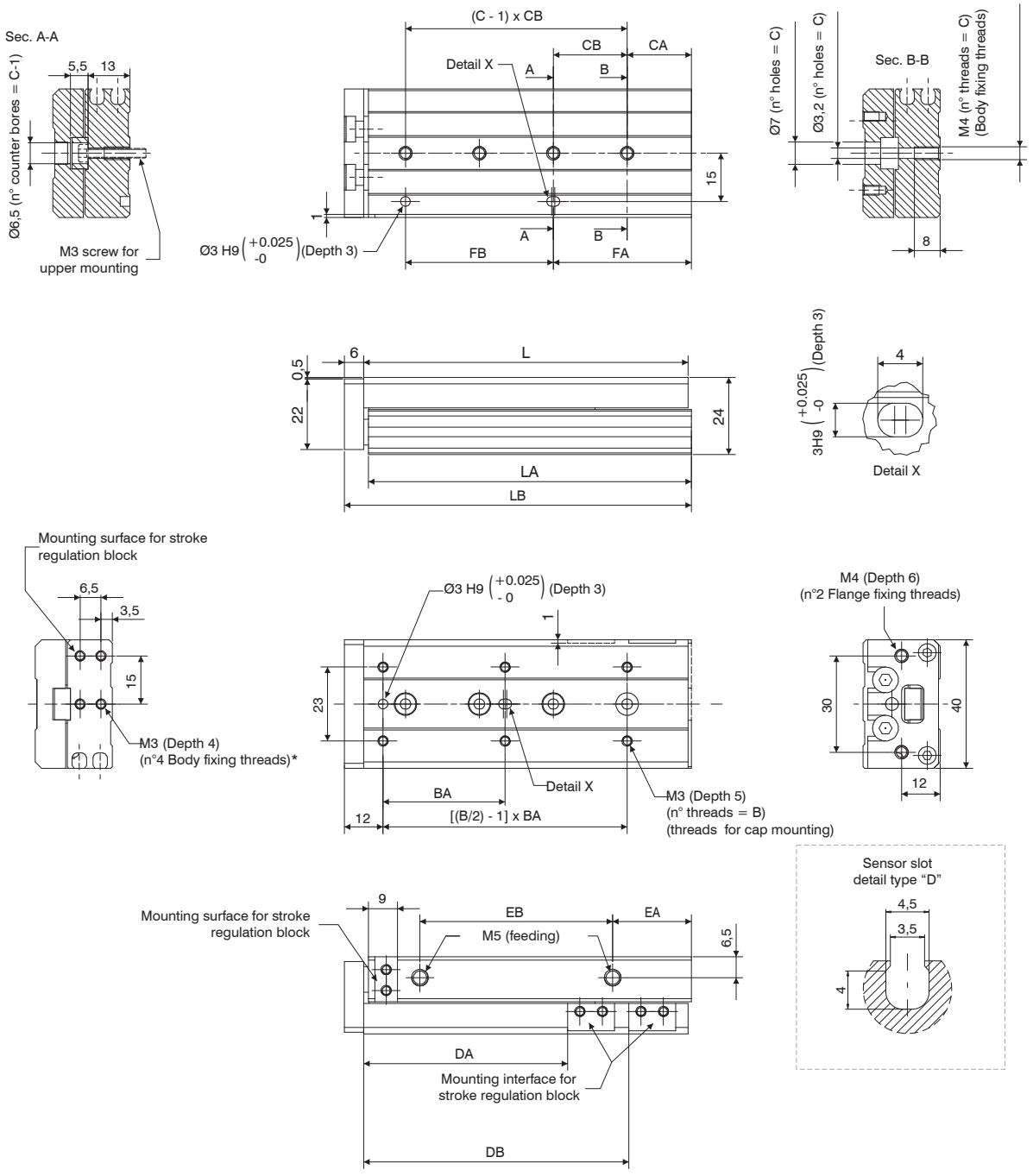
### Standard strokes

| | Stroke | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Bore | 10 | 20 | 30 | 40 | 50 | 75 | 100 | 125 | 150 |
| Ø8 | ● | ● | ● | ● | ● | ● | | | |
| Ø12 | ● | ● | ● | ● | ● | ● | ● | | |
| Ø16 | ● | ● | ● | ● | ● | ● | ● | ● | |
| Ø20 | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø25 | ● | ● | ● | ● | ● | ● | ● | ● | ● |




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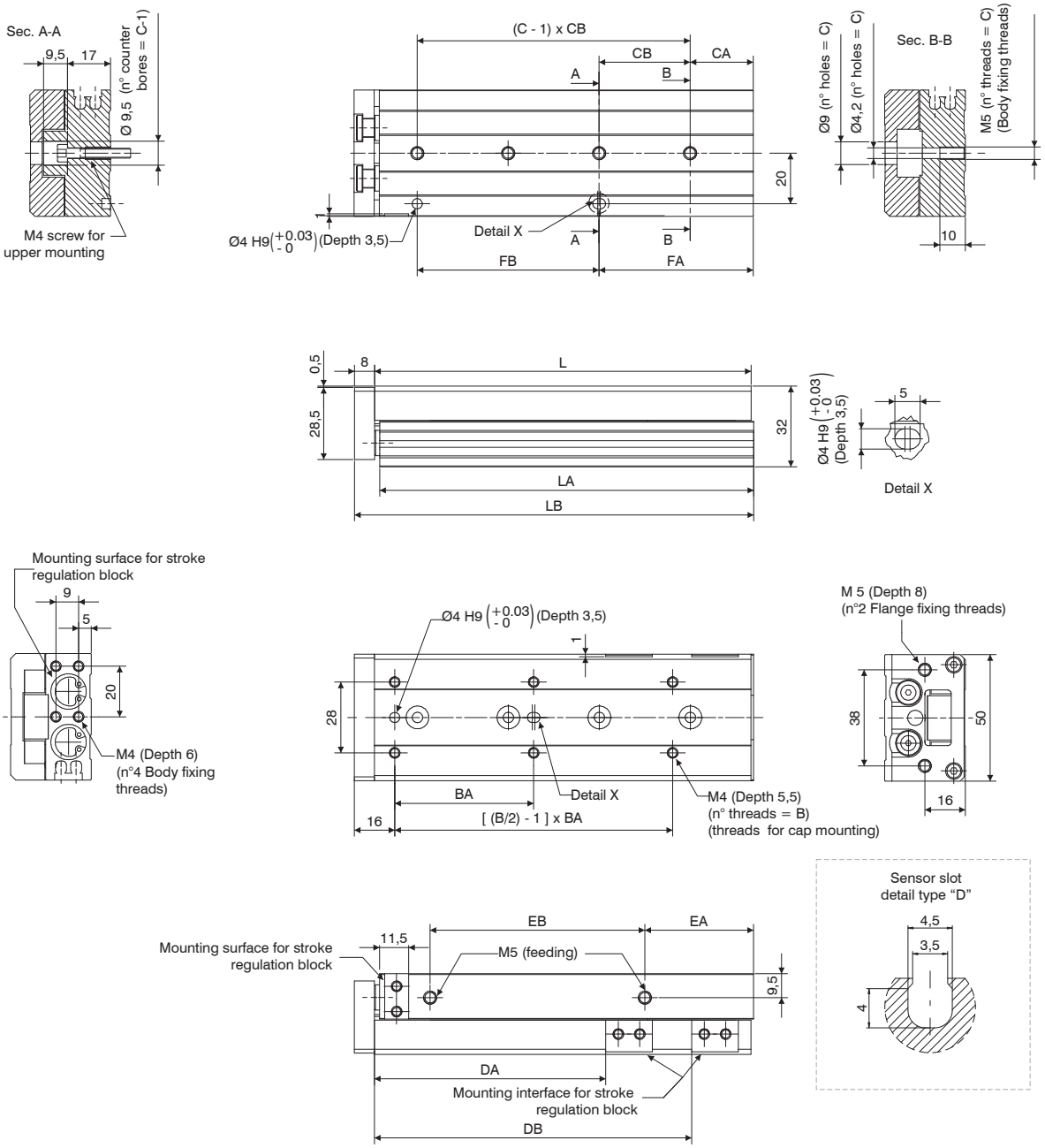
## Overall dimensions - Ø8




## Table of dimensions

| | Standard strokes | | | | | |
|---|---|---|---|---|---|---|
| | 10 | 20 | 30 | 40 | 50 | 75 |
| B | 4 | 4 | 4 | 4 | 6 | 6 |
| BA | 25 | 25 | 40 | 50 | 38 | 50 |
| C | 2 | 2 | 3 | 3 | 4 | 5 |
| CA | 9 | 12 | 13 | 15 | 20 | 27 |
| CB | 28 | 30 | 20 | 28 | 23 | 28 |
| DA | 23,5 | 33,5 | 43,5 | 53,5 | 63,5 | 88,5 |
| DB | / | / | / | / | 82,5 | 132,5 |
| FA | 17 | 12 | 33 | 43 | 43 | 83 |
| FB | 20 | 30 | 20 | 28 | 46 | 56 |
| EA | 13 | 8,5 | 9,5 | 10,5 | 24,5 | 38,5 |
| EB | 19,5 | 29 | 39 | 56 | 60 | 96 |
| L | 49 | 54 | 65 | 83 | 101 | 151 |
| LA | 48,5 | 53,5 | 64,5 | 82,5 | 100,5 | 150,5 |
| LB | 56 | 61 | 72 | 90 | 108 | 158 |
| Weight (g) | 150 | 160 | 190 | 235 | 285 | 410 |

## Overall dimensions - Ø12



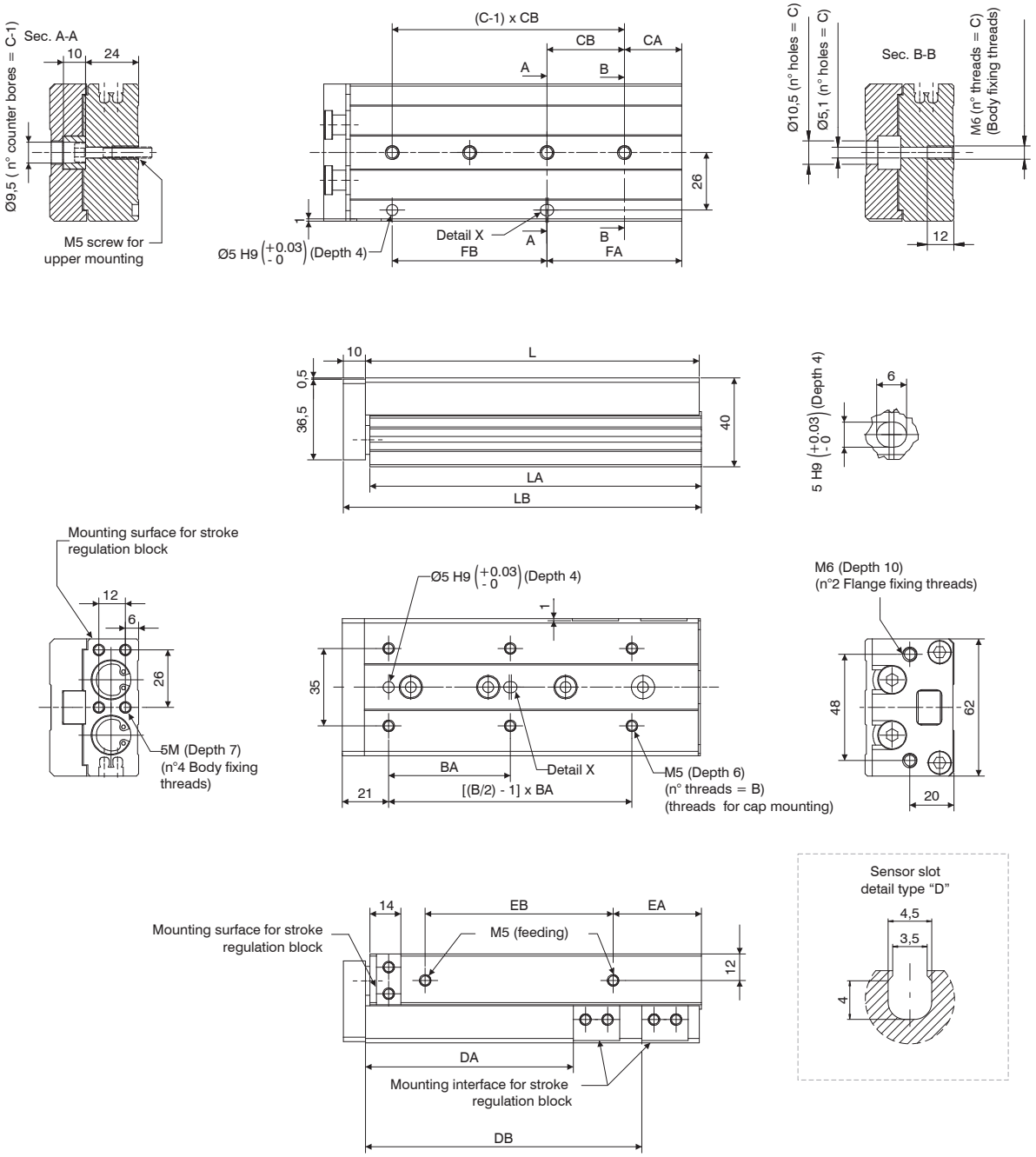

## Table of dimensions

| | Standard strokes | | | | | | |
|---|---|---|---|---|---|---|---|
| | 10 | 20 | 30 | 40 | 50 | 75 | 100 |
| B | 4 | | | | 6 | | |
| BA | | 35 | | 50 | 35 | 55 | 65 |
| C | | 2 | | 3 | 3 | 4 | 5 |
| CA | | 15 | | 17 | 15 | 25 | 35 |
| CB | | 40 | | 25 | 36 | 36 | 38 |
| DA | 26,5 | 36,5 | 46,5 | 56,5 | 66,5 | 91,5 | 116,5 |
| DB | / | / | / | / | / | 125,5 | 179,5 |
| FA | | 15 | | 42 | 51 | 61 | 111 |
| FB | | 40 | | 25 | 36 | 72 | 76 |
| EA | 10 | | | | 22 | 43 | 52 |
| EB | | 40 | | 52 | 60 | 85 | 130 |
| L | | 71 | | 83 | 103 | 149 | 203 |
| LA | | 70 | | 82 | 102 | 148 | 202 |
| LB | | 80 | | 92 | 112 | 158 | 212 |
| Weight (g) | | 325 | | 385 | 480 | 660 | 890 |




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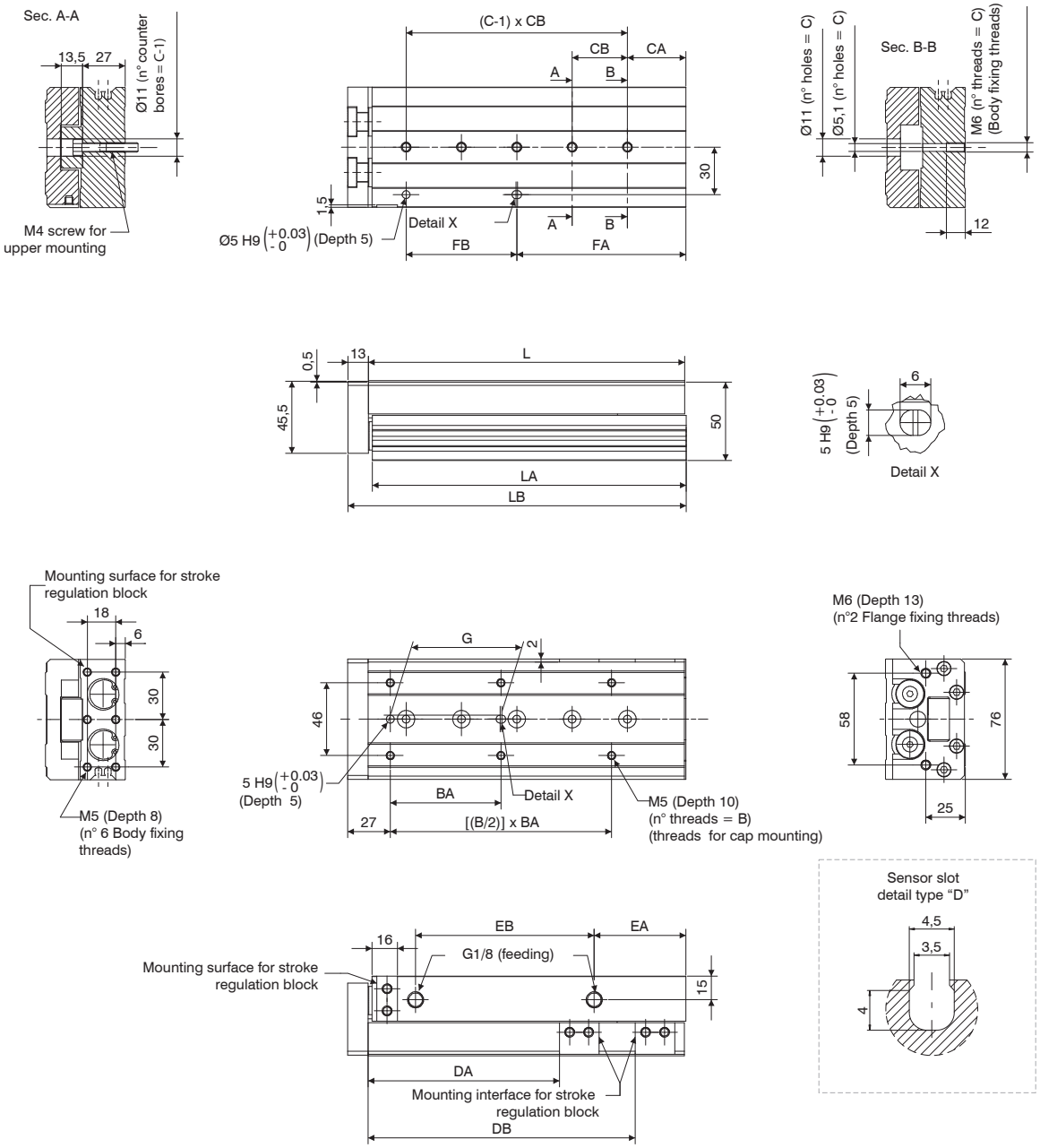
## Overall dimensions - Ø16




## Table of dimensions

| | Standard strokes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 10 | 20 | 30 | 40 | 50 | 75 | 100 | 125 |
| B | 4 | 4 | 4 | 4 | 6 | 6 | 6 | 8 |
| BA | 35 | 35 | 35 | 40 | 30 | 55 | 65 | 70 |
| C | 2 | 2 | 2 | 2 | 3 | 4 | 5 | 7 |
| CA | 16 | 16 | 16 | 16 | 21 | 26 | 39 | 19 |
| CB | 40 | 40 | 40 | 50 | 30 | 35 | 35 | 35 |
| DA | 29 | 39 | 49 | 59 | 69 | 94 | 119 | 144 |
| DB | / | / | / | / | / | 125 | 173 | 223 |
| FA | 16 | 16 | 16 | 16 | 51 | 61 | 109 | 159 |
| FB | 40 | 40 | 40 | 50 | 30 | 70 | 70 | 70 |
| EA | 10 | 10 | 10 | 10 | 15 | 40 | 55 | 68 |
| EB | 40 | 40 | 40 | 50 | 60 | 85 | 118 | 155 |
| L | 76 | 76 | 76 | 86 | 101 | 151 | 199 | 249 |
| LA | 75 | 75 | 75 | 85 | 100 | 150 | 198 | 248 |
| LB | 87 | 87 | 87 | 97 | 112 | 162 | 210 | 260 |
| Weight (g) | 570 | 570 | 580 | 640 | 760 | 1090 | 1370 | 1700 |

## Overall dimensions - Ø20




## Table of dimensions

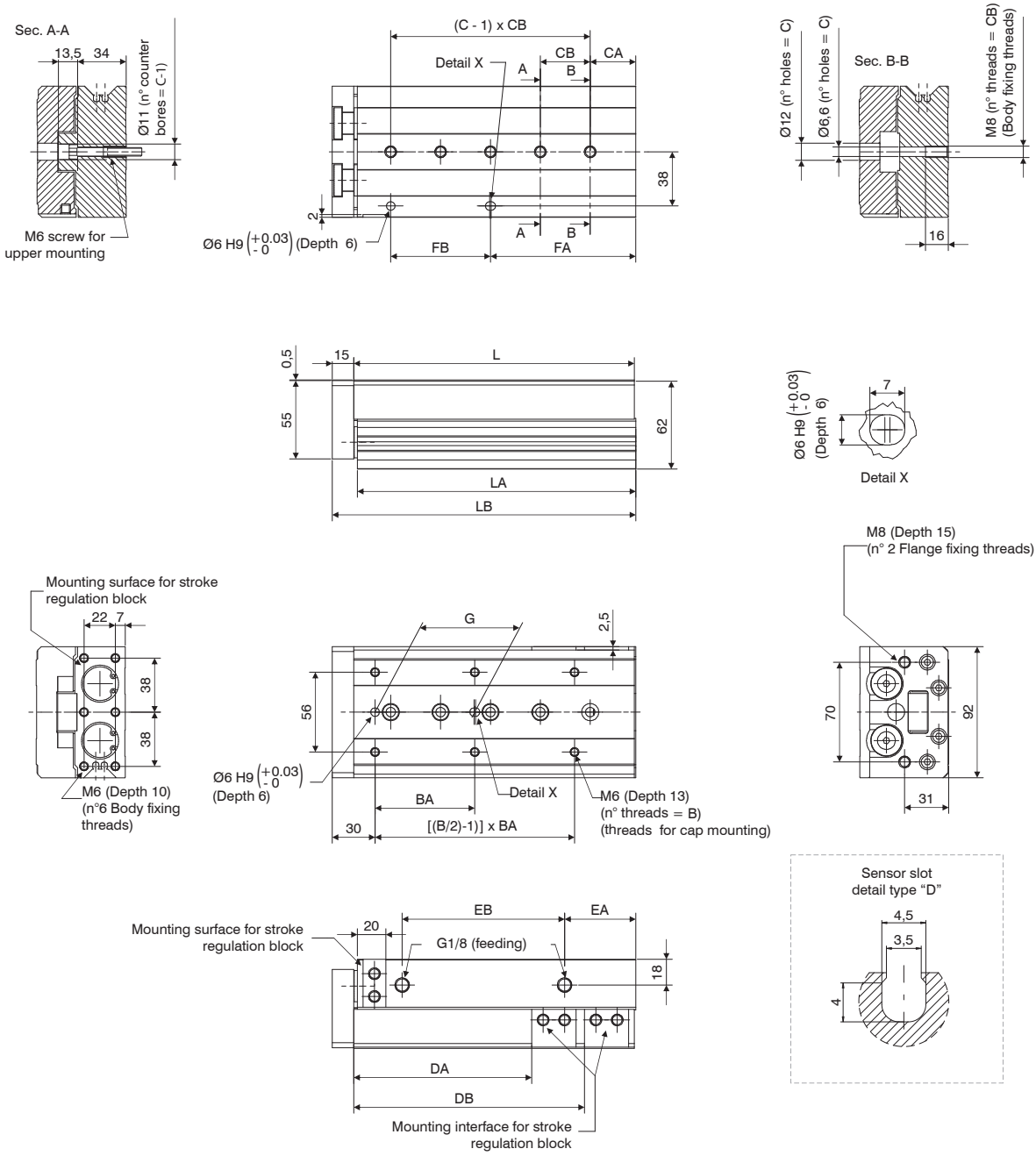
| | Standard strokes | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 10 | 20 | 30 | 40 | 50 | 75 | 100 | 125 | 150 |
| B | 4 | 4 | 4 | 4 | 6 | 6 | 6 | 8 | 8 |
| BA | 50 | 50 | 50 | 60 | 35 | 60 | 70 | 70 | 80 |
| C | 2 | 2 | 2 | 2 | 3 | 4 | 5 | 6 | 7 |
| CA | 15 | 15 | 15 | 15 | 15 | 19 | 37 | 41 | 19 |
| CB | 45 | 45 | 45 | 55 | 35 | 35 | 35 | 38 | 44 |
| DA | 31 | 41 | 51 | 61 | 71 | 96 | 121 | 146 | 171 |
| DB | / | / | / | / | / | / | 169 | 223 | 275 |
| EA | 10 | 10 | 10 | 10 | 10 | 10 | 58 | 70 | 87 |
| EB | 44 | 44 | 44 | 54 | 69 | 108 | 113 | 155 | 190 |
| FA | 25 | 25 | 25 | 35 | 50 | 54 | 107 | 155 | 195 |
| FB | 35 | 35 | 35 | 35 | 35 | 70 | 70 | 76 | 88 |
| G | 40 | 40 | 40 | 50 | 35 | 60 | 70 | 70 | 80 |
| L | 83 | 83 | 83 | 93 | 108 | 147 | 200 | 254 | 306 |
| LA | 81,5 | 81,5 | 81,5 | 91,5 | 106,5 | 145,5 | 198,5 | 252,5 | 304,5 |
| LB | 97 | 97 | 97 | 107 | 122 | 161 | 214 | 268 | 320 |
| Weight (g) | 960 | 980 | 1010 | 1100 | 1250 | 1630 | 2150 | 2670 | 3190 |





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## Overall dimensions - Ø25

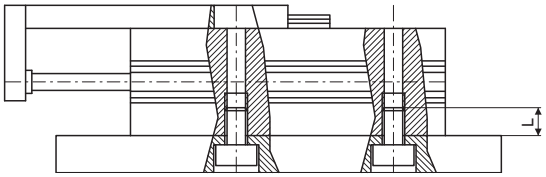



## Table of dimensions

| | Standard strokes | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 10 | 20 | 30 | 40 | 50 | 75 | 100 | 125 | 150 |
| B | 4 | 4 | 4 | 4 | 6 | 6 | 6 | 8 | 8 |
| BA | 50 | 50 | 50 | 60 | 35 | 60 | 70 | 75 | 80 |
| C | 2 | 2 | 2 | 2 | 3 | 4 | 5 | 6 | 7 |
| CA | 22 | 22 | 22 | 22 | 20 | 26 | 32 | 40 | 30 |
| CB | 45 | 45 | 45 | 55 | 35 | 35 | 35 | 38 | 40 |
| DA | 35 | 45 | 55 | 65 | 75 | 100 | 125 | 150 | 175 |
| DB | / | / | / | / | / | / | 162 | 218 | 258 |
| EA | 12 | 12 | 12 | 12 | 12 | 33 | 50 | 67 | 82 |
| EB | 47 | 47 | 47 | 57 | 70 | 90 | 114 | 155 | 180 |
| FA | 22 | 22 | 22 | 22 | 55 | 61 | 102 | 154 | 190 |
| FB | 45 | 45 | 45 | 55 | 35 | 70 | 70 | 76 | 80 |
| G | 40 | 40 | 40 | 50 | 35 | 60 | 70 | 75 | 80 |
| L | 92 | 92 | 92 | 102 | 115 | 156 | 197 | 255 | 295 |
| LA | 90,5 | 90,5 | 90,5 | 100,5 | 113,5 | 154,5 | 195,5 | 253,5 | 293,5 |
| LB | 108 | 108 | 108 | 118 | 131 | 172 | 213 | 271 | 311 |
| Weight (g) | 1660 | 1680 | 1690 | 1840 | 2090 | 2650 | 3270 | 4140 | 4710 |

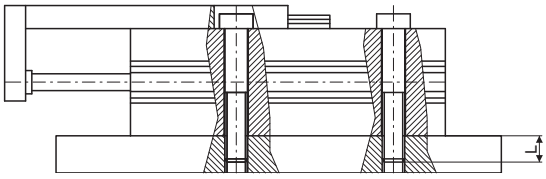
## Assembly configuration

SIDE THREADED HOLES



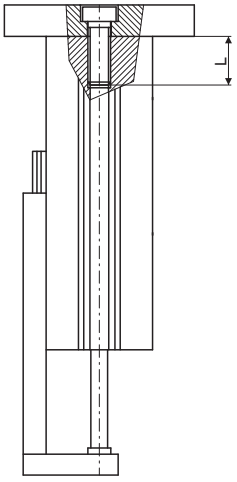
| Bore | Screw | Torque (Nm) | Max. Lenght L (mm) |
|---|---|---|---|
| Ø8 | M3 | 2,1 | 8 |
| Ø12 | M4 | 4,4 | 10 |
| Ø16 | M5 | 7,4 | 12 |
| Ø20 | M5 | 7,4 | 12 |
| Ø25 | M6 | 18 | 16 |

SIDE THROUGH HOLES



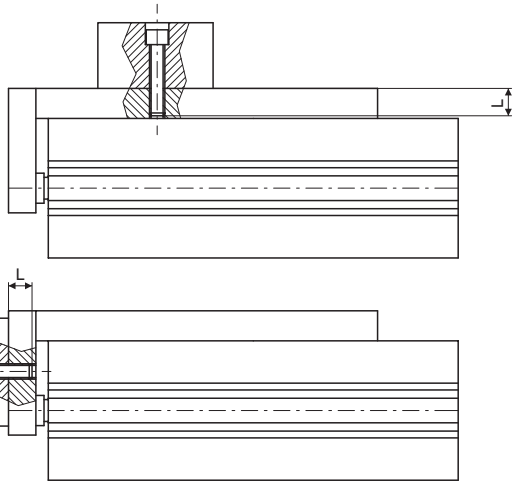
| Bore | Screw | Torque (Nm) | Max. Lenght L (mm) |
|---|---|---|---|
| Ø8 | M3 | 1,2 | 13 |
| Ø12 | M4 | 2,8 | 18,5 |
| Ø16 | M5 | 5,7 | 24 |
| Ø20 | M5 | 5,7 | 29 |
| Ø25 | M6 | 18 | 34 |

AXIAL THREADED HOLES



| Bore | Screw | Torque (Nm) | Max. Lenght L (mm) |
|---|---|---|---|
| Ø8 | M3 | 0,9 | 4 |
| Ø12 | M4 | 2,1 | 6 |
| Ø16 | M5 | 4,4 | 7 |
| Ø20 | M5 | 4,4 | 8 |
| Ø25 | M6 | 7,4 | 10 |

## Mounting load



| Bore | Screw | Torque (Nm) | Max. Lenght L (mm) |
|---|---|---|---|
| Ø8 | M3 | 2,1 | 6 |
| Ø12 | M4 | 4,4 | 8 |
| Ø16 | M5 | 7,4 | 10 |
| Ø20 | M5 | 7,4 | 13 |
| Ø25 | M6 | 18 | 15 |

| Bore | Screw | Torque (Nm) | Max. Lenght L (mm) |
|---|---|---|---|
| Ø8 | M3 | 0,9 | 5 |
| Ø12 | M4 | 2,1 | 5,5 |
| Ø16 | M5 | 4,4 | 6 |
| Ø20 | M5 | 4,4 | 10 |
| Ø25 | M6 | 7,4 | 13 |

## Kinetic energy (J)

| Bore | With elastic bumper | With shock absorbers |
|---|---|---|
| Ø8 | 0,027 | See shock absorbers 6900 |
| Ø12 | 0,055 | |
| Ø16 | 0,11 | |
| Ø20 | 0,16 | |
| Ø25 | 0,24 | |

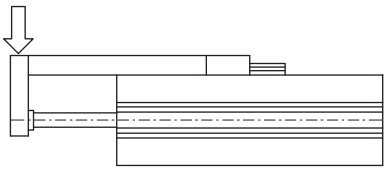


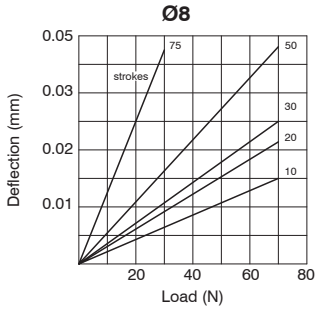


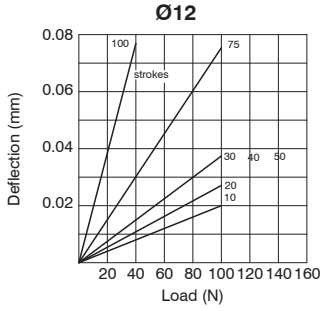
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

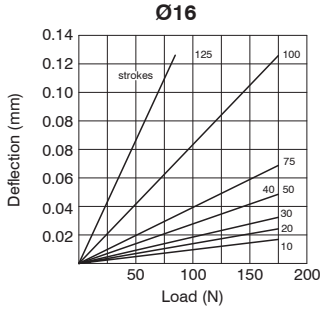
## Plate deflection

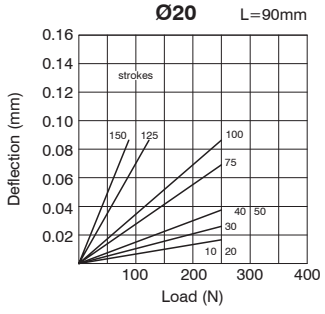
With front moment under static conditions completely extended and with load applied as indicated by the arrows

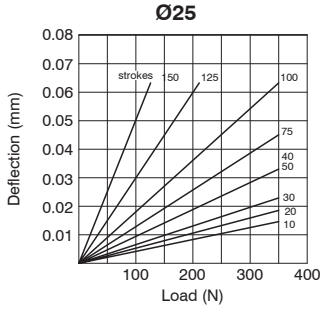




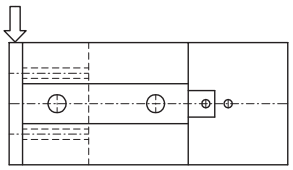



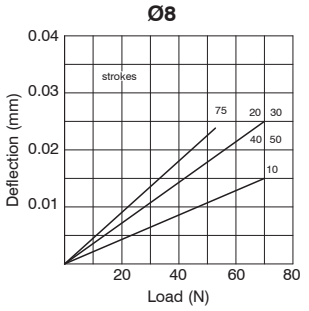



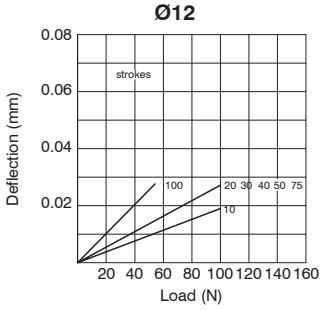



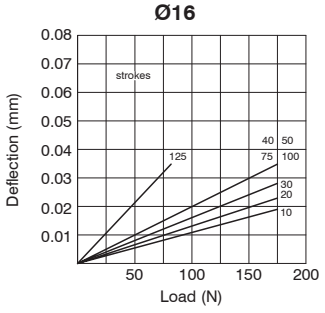



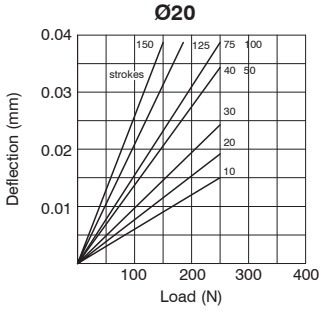

With side moment under static conditions completely extended and with load applied as indicated by the arrow

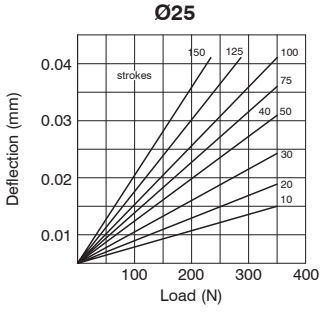




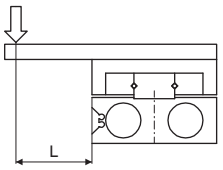



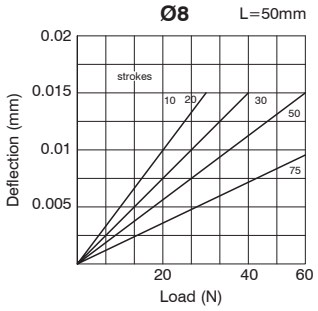



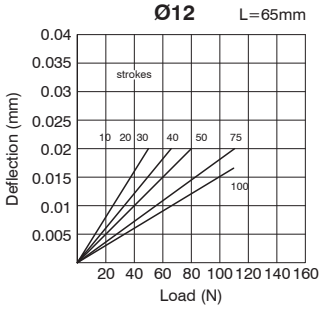



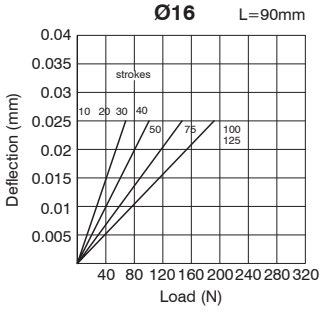



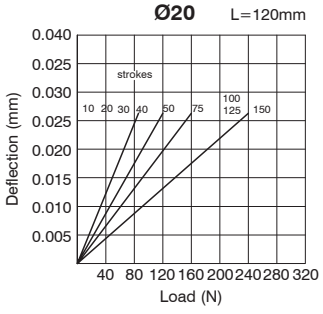

With misaligned side moment with load applied as indicated by the arrow at a distance “L” and with plate completely retracted

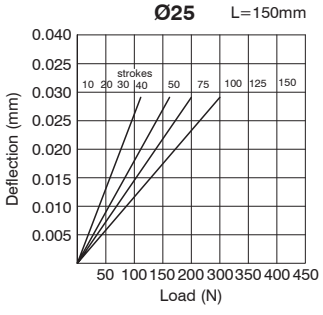


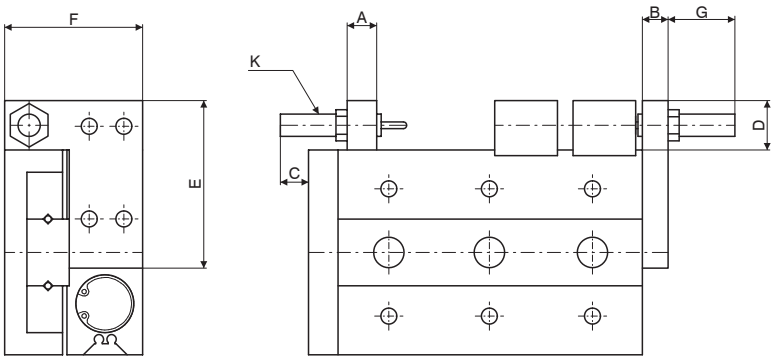



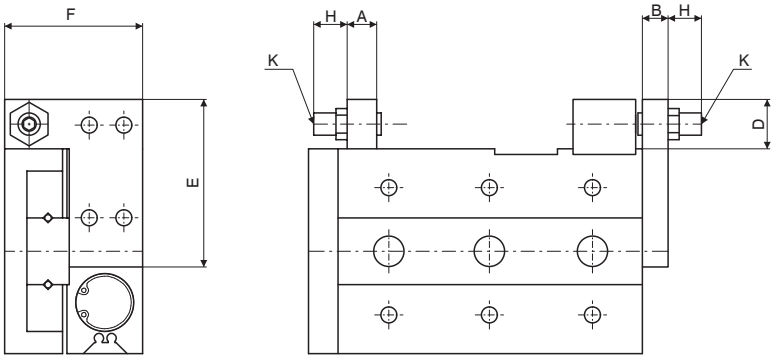
## Accessories - Static moment

### Dimensions with shock absorbers






### Dimensions with adjusting screw



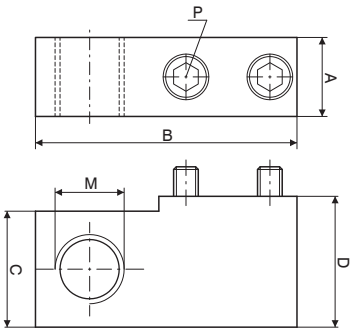

| Bore | A | B | C | D | E | F | G max. | H max. | K |
|---|---|---|---|---|---|---|---|---|---|
| Ø8 | 7 | 8 | 26 | 14,5 | 38,5 | 23 | 25,5 | 28,5 | M8x1 |
| Ø12 | 9,5 | 8 | 21 | 15 | 45 | 31,5 | 24,5 | 32 | M8x1 |
| Ø16 | 11 | 10 | 19 | 18 | 55 | 37,5 | 29 | 34,5 | M10x1 |
| Ø20 | 13 | 12 | 28 | 24,5 | 70 | 47,5 | 42,5 | 35,5 | M14x1,5 |
| Ø25 | 16 | 15 | 34 | 24,5 | 80 | 54,5 | 39,5 | 37,5 | M14x1,5 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Shock absorber mounting block / front stroke adjusting screw

**Coding:** 6600.Ø.SU

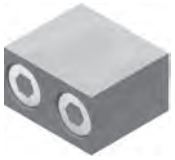


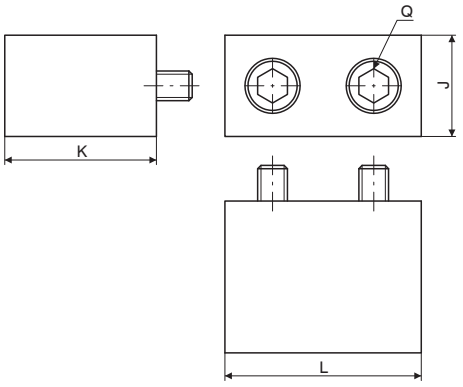



| Bore | A | B | C | D | M | P |
|---|---|---|---|---|---|---|
| Ø8 | 7 | 23 | 14 | 15,5 | M8x1 | M3x16 |
| Ø12 | 9,5 | 31 | 14,5 | 16 | | M4x16 |
| Ø16 | 11 | 37 | 17,5 | 19 | M10x1 | M5x18 |
| Ø20 | 13 | 45,5 | 23,5 | 26 | M14x1,5 | M6x25 |
| Ø25 | 16 | 53,5 | | 26,5 | | M8x25 |

## Reference block

**Coding:** 6600.Ø.SI



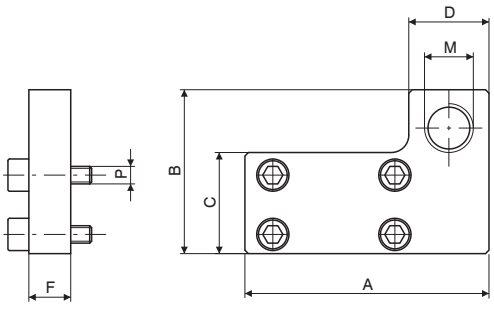



| Bore | J | K | L | Q |
|---|---|---|---|---|
| Ø8 | 7 | 15,5 | 14,6 | M3x16 |
| Ø12 | 10 | 15 | 18,5 | M4x14 |
| Ø16 | 12 | 18,5 | 21 | M5x18 |
| Ø20 | 13 | 25,5 | 25 | M6x25 |
| Ø25 | 17 | | 31 | M8x25 |

## Shock absorber mounting block / rear stroke adjusting screw

**Coding:** 6600.Ø.SR



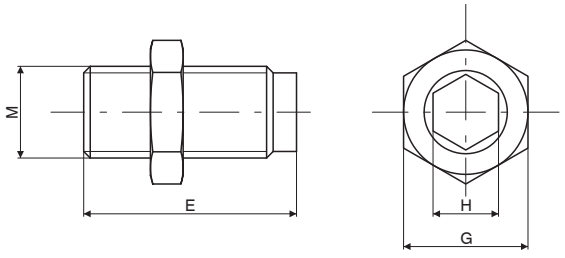



| Bore | A | B | C | D | F | M | P |
|---|---|---|---|---|---|---|---|
| Ø8 | 38 | 23 | 12,5 | 14 | 8 | M8x1 | M3x12 |
| Ø12 | 45 | 31 | 18 | | | | M4x12 |
| Ø16 | 55 | 37 | 23,5 | 16 | 10 | M10x1 | M5x14 |
| Ø20 | 70 | 47 | 29 | 23 | 12 | M14x1,5 | M5x16 |
| Ø25 | 80 | 54 | 35 | | 15 | | M6x20 |

## Adjusting screw

**Coding:** 6600.Ø.VR






| Bore | E | G | H | M |
|---|---|---|---|---|
| Ø8 | 36,5 | 12 | 4 | M8x1 |
| Ø12 | 40 | | | |
| Ø16 | 44,5 | 14 | 5 | M10x1 |
| Ø20 | 47,5 | 19 | 6 | M14x1,5 |
| Ø25 | 52,5 | | | |

## Series 6200 and 6210

TWIN-ROD SLIDE UNITS SERIES 6200 AND 6210

The 6200 series twin-rod linear guide units are wide cylinders used in manipulation applications and are characterised by their high force output thanks to their double piston design.
Bores range from 10mm to 32mm diameter, with sintered bronze bearings for standard applications and linear ball bearings for more rugged applications.
One major characteristic of these cylinders is the precision of their anti-rotational design, with the possibility of regulating the stroke to within 0.5mm.
When using magnetic sensors, the 1580 series sensor sits entirely within the extrusion, resulting in a smooth profile.
The liner guided units range includes , alongside the conventional two rod version with flange series 6200 , also the through rod version with twin flanges series 6210
Thanks to the twin-rod, double yoke design of the 6210 series it is possible to either fix the body and use the ends of the rods, or alternatively to fix the rod ends and use the body as the moving part.
The cylinder can be piped through the body or through the rods depending on the application.
Stroke limiting screws are fitted at either end of the stroke.
The substitution of these screws with shock absorbers makes it possible to use the cylinder on higher velocity applications (up to 500 mm/s).
Slots are provided along the edge of these units to accommodate 1580 series miniature sensors.




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Twin-rod slide units

**Coding:** 6200.Ø.Ⓒ.Ⓖ

| | |
|---|---|
| Ø | BORE |
| | **10** = Ø10 |
| | **15** = Ø15 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| Ⓒ | STROKE |
| | **10** = 10 mm |
| | **15** = 15 mm |
| | **20** = 20 mm |
| | **25** = 25 mm |
| | **30** = 30 mm |
| | **35** = 35 mm |
| | **40** = 40 mm |
| | **45** = 45 mm |
| | **50** = 50 mm |
| | **60** = 60 mm |
| | **70** = 70 mm |
| | **80** = 80 mm |
| | **90** = 90 mm |
| | **100** = 100 mm |
| Ⓖ | CONTROL UNIT |
| | **B** = Control unit with bronze bush |
| | **C** = Control unit with bearing bushes |





### Construction characteristics

| | |
|---|---|
| Body | anodized aluminium |
| Guide rods | C43 chromed steel (control unit with bronze bush)<br>tempered and chromed steel (control unit with bearing bush) |
| Piston | aluminium |
| Piston rod bushing | brass |
| Rear end cap | anodized aluminium |
| Piston seals | oil resistant NBR rubber |
| Piston rod seals | PUR |
| Plate | anodized aluminium |

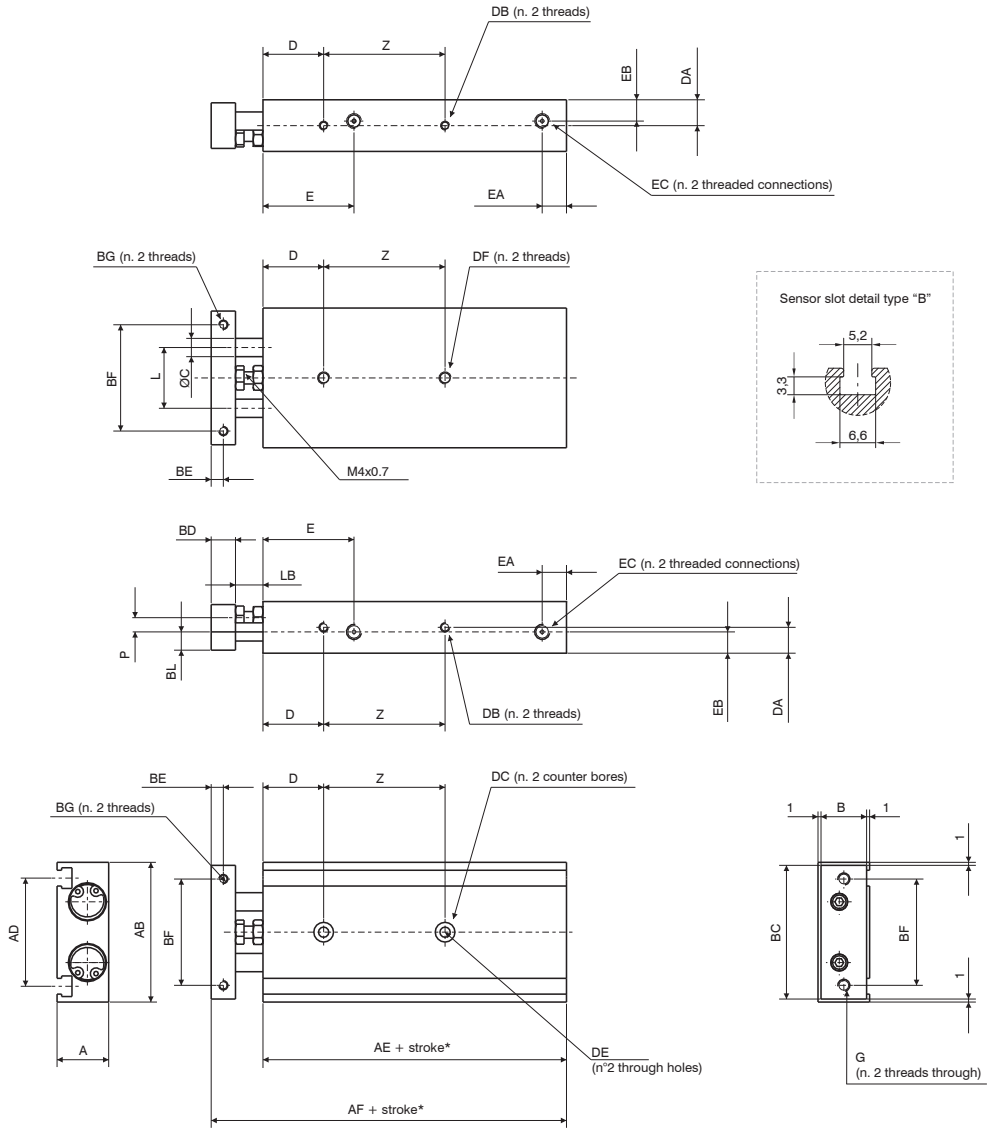
### Operational characteristics

| Operational characteristics | |
|---|---|
| Cushioning | elastic bumper |
| Fluid | filtered and preferably lubricated air or not (if lubricated the lubrication must be continuous) |
| Function | Double acting |
| Max. working pressure (bar) | 7 |
| Temperature °C | -5 ... +70 |

### Standard strokes

| | Stroke | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bore | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70 | 75 | 80 | 90 | 100 |
| Ø10 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | |
| Ø15 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø20 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø25 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø32 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

## Overall dimensions Ø10 - Ø15



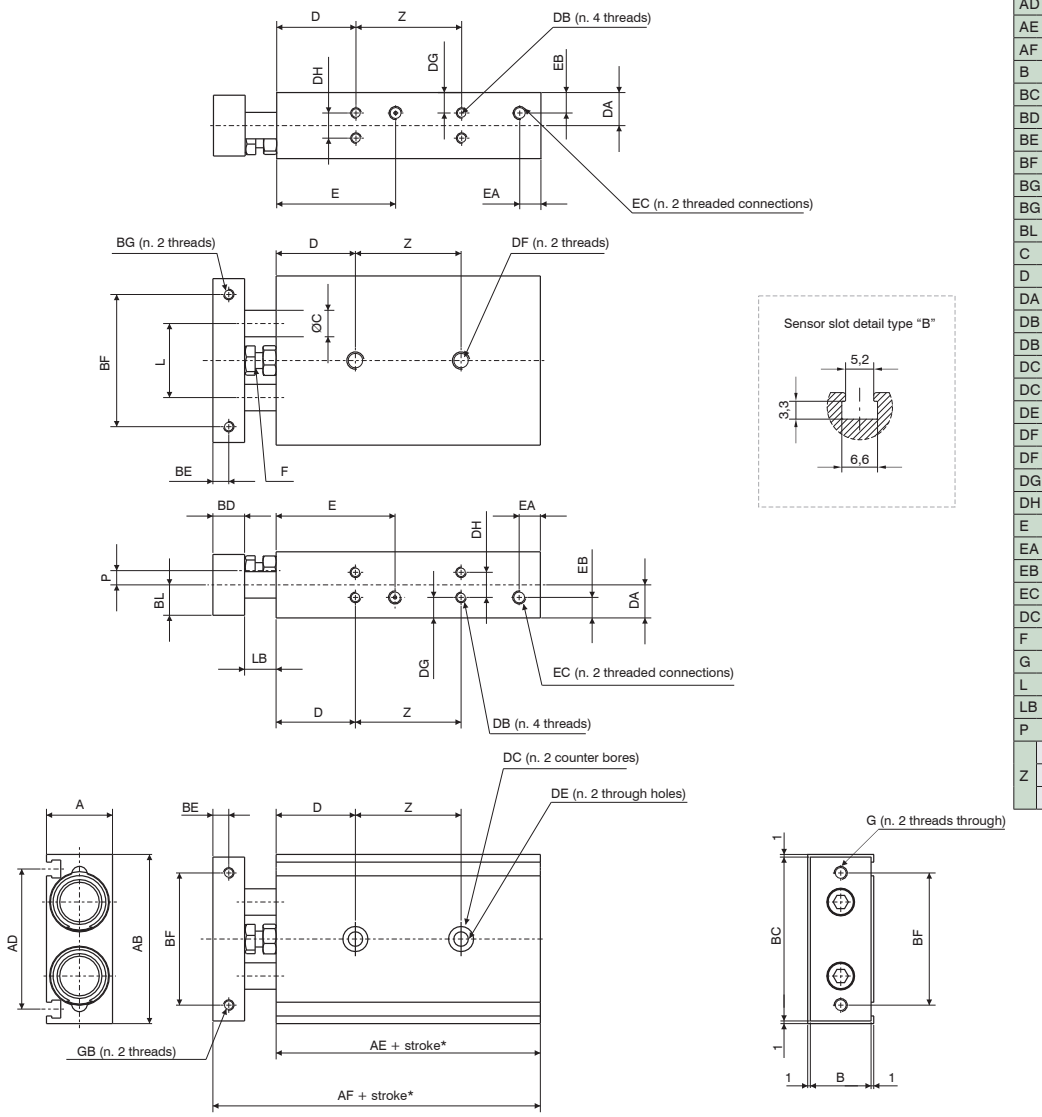

| Bore | | Ø10 | Ø15 |
|---|---|---|---|
| A | | 17 | 20 |
| AB | | 46 | 58 |
| AD | | 35,6 | 48 |
| AE | | 55 | 60 |
| AF | | 72 | 79 |
| B | | 15 | 18 |
| BC | | 44 | 56 |
| BD | | 8 | 10 |
| BE | | 4 | 5 |
| BF | | 35 | 45 |
| BG | | M3x0,5 | M4x0,7 |
| | Useful depth | 5 | 6 |
| BL | | 6 | 9 |
| C | | 6 | 8 |
| D | | 20 | 30 |
| DA | | 8,5 | 10 |
| DB | | M3x0,5 | M4x0,7 |
| | Useful depth | 4,5 | 5 |
| DC | | 6,5 | 8 |
| | Useful depth | 3,3 | 4,4 |
| DE | | 3,4 | 4,3 |
| DF | | M4x0,7 | M5x0,8 |
| | Useful depth | 7 | 8 |
| E | | 30 | 38,5 |
| EA | | 8 | 8 |
| EB | | 7 | 10 |
| EC | | M5x0,8 | M5x0,8 |
| | Useful depth | 4,5 | 4,5 |
| F | | M4x0,7 | M4x0,7 |
| G | | M4x0,7 | M5x0,8 |
| L | | 20 | 25 |
| LB | | 9 | 9 |
| P | | 4,7 | 4,5 |
| Z | stroke 10 … 25 | 30 | 25 |
| | stroke 30 … 50 | 40 | 35 |
| | stroke 60 … 75 | 50 | 45 |
| | stroke 80 | - | 45 |
| | stroke 90-100 | - | 55 |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Overall dimensions Ø20 - Ø25 - Ø32




| Bore | | Ø20 | Ø25 | Ø32 |
|---|---|---|---|---|
| A | | 25 | 30 | 38 |
| AB | | 64 | 80 | 98 |
| AD | | 53 | 64 | 76 |
| AE | | 70 | 72 | 82 |
| AF | | 94 | 96 | 112 |
| B | | 23 | 28 | 36 |
| BC | | 62 | 78 | 96 |
| BD | | 12 | 12 | 16 |
| BE | | 6 | 6 | 8 |
| BF | | 50 | 60 | 75 |
| BG | | M4x0,7 | M5x0,8 | M5x0,8 |
| BG Useful depth | | 6 | 7,5 | 8 |
| BL | | 11,5 | 14 | 18 |
| C | | 10 | 12 | 16 |
| D | | 30 | 30 | 30 |
| DA | | 12,5 | 15 | 19 |
| DB | | M4x0,7 | M5x0,8 | M5x0,8 |
| DB Useful depth | | 6 | 7,5 | 7,5 |
| DC | | 9,5 | 11 | 11 |
| DC Useful depth | | 5,3 | 6,3 | 6,3 |
| DE | | 5,5 | 6,9 | 6,9 |
| DF | | M6x1 | M8x1,25 | M8x1,25 |
| DF Useful depth | | 10 | 12 | 12 |
| DG | | 7,75 | 8,5 | 9 |
| DH | | 9,5 | 13 | 20 |
| E | | 45 | 46 | 56 |
| EA | | 8 | 9 | 10 |
| EB | | 7,75 | 15 | 19 |
| EC | | M5x0,8 | G1/8 | G1/8 |
| DC Useful depth | | 4,5 | 6,5 | 6,5 |
| F | | M6x1 | M6x1 | M6x1 |
| G | | M5x0,8 | M6x1 | M6x1 |
| L | | 28 | 35 | 44 |
| LB | | 12 | 12 | 14 |
| P | | 5,4 | 7,8 | 12 |
| Z | stroke 10 ... 25 | 30 | 30 | 40 |
| | stroke 30 ... 50 | 40 | 40 | 50 |
| | stroke 60 ... 100 | 60 | 60 | 70 |

*Dimensions only refer to the "standard stroke"

## Weight - Theoretical slide force

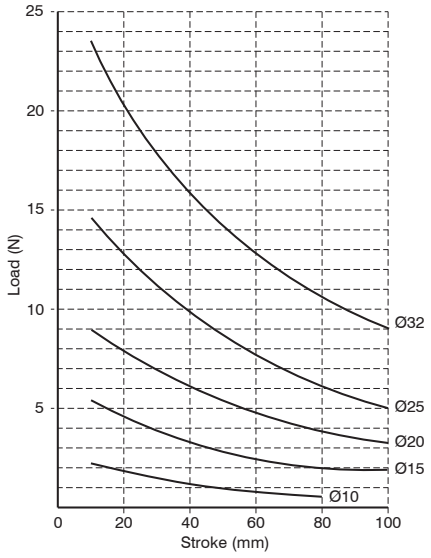
| | Bore | | | | |
|---|---|---|---|---|---|
| | Ø10 | Ø15 | Ø20 | Ø25 | Ø32 |
| Stroke | Control unit with bronze bush | | | | Weight (g) |
| 10 | 150 | 250 | 400 | 610 | 1150 |
| 15 | 160 | 265 | 420 | 635 | 1190 |
| 20 | 170 | 280 | 440 | 660 | 1230 |
| 25 | 180 | 290 | 460 | 690 | 1275 |
| 30 | 190 | 300 | 480 | 720 | 1320 |
| 35 | 200 | 315 | 495 | 745 | 1360 |
| 40 | 210 | 330 | 510 | 770 | 1400 |
| 45 | 220 | 345 | 530 | 800 | 1450 |
| 50 | 230 | 360 | 550 | 830 | 1490 |
| 60 | 250 | 390 | 585 | 890 | 1580 |
| 70 | 270 | 420 | 620 | 950 | 1665 |
| 75 | 280 | 435 | 640 | 970 | 1710 |
| 80 | | 450 | 660 | 995 | 1755 |
| 90 | | 480 | 700 | 1060 | 1840 |
| 100 | | 510 | 740 | 1000 | 1930 |
| Stroke | Control unit with bearing bush | | | | |
| 10 | 160 | 270 | 430 | 620 | 1160 |
| 15 | 165 | 285 | 445 | 645 | 1205 |
| 20 | 170 | 300 | 460 | 670 | 1250 |
| 25 | 180 | 310 | 480 | 700 | 1295 |
| 30 | 190 | 320 | 500 | 730 | 1340 |
| 35 | 200 | 335 | 515 | 755 | 1380 |
| 40 | 210 | 350 | 530 | 780 | 1420 |
| 45 | 220 | 365 | 550 | 810 | 1465 |
| 50 | 230 | 380 | 570 | 840 | 1510 |
| 60 | 250 | 410 | 605 | 895 | 1595 |
| 70 | 270 | 440 | 640 | 955 | 1680 |
| 75 | 280 | 455 | 660 | 980 | 1720 |
| 80 | | 470 | 680 | 1005 | 1765 |
| 90 | | 500 | 715 | 1065 | 1855 |
| 100 | | 530 | 750 | 1110 | 1940 |

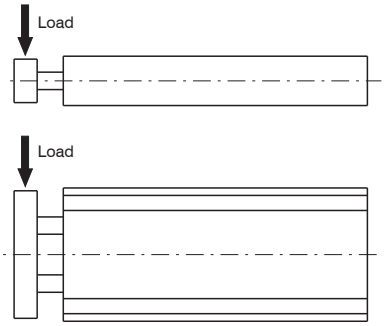
| Working pressure | Theoretical slide force (N) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 bar | 16 | 10 | 35,5 | 25 | 63 | 47 | 98 | 75,5 | 161 | 120,5 |
| 1,5 bar | 23,5 | 15 | 53 | 38 | 94 | 62,5 | 147,5 | 113,5 | 241 | 181 |
| 2 bar | 31,5 | 20,0 | 70,5 | 50,5 | 125,5 | 94 | 196,5 | 151 | 321,5 | 241 |
| 3 bar | 47 | 30 | 106 | 75,5 | 188,5 | 141 | 294,5 | 227 | 482,5 | 362 |
| 4 bar | 63 | 40 | 141 | 101 | 251 | 188 | 393 | 302,5 | 643 | 482,5 |
| 5 bar | 78,5 | 50 | 176,5 | 126 | 314 | 236 | 491 | 378 | 804 | 603 |
| 6 bar | 94 | 60 | 212 | 151 | 377 | 283 | 589 | 453,5 | 965 | 723,5 |
| 7 bar | 110 | 70 | 247 | 176,5 | 440 | 330 | 687,5 | 529 | 1125,6 | 844 |
| | Out | In | Out | In | Out | In | Out | In | Out | In |

## Operating criteria

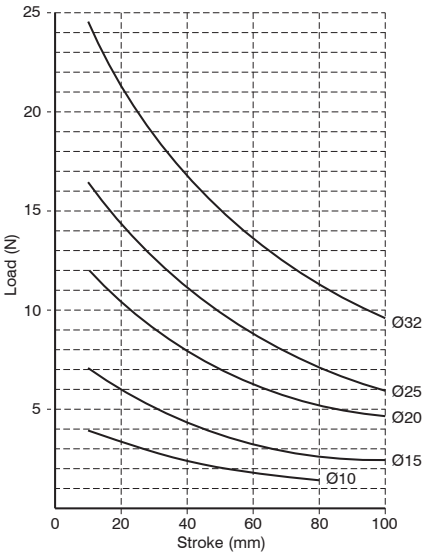
## Permissible Loads

### Control unit with bronze bushes




### Control unit with bearing bush





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Through twin-rod slide units

**Coding:** 6210.Ø.Ⓒ.Ⓥ

| | |
|---|---|
| Ø | BORE |
| | **10** = Ø10 |
| | **15** = Ø15 |
| | **25** = Ø25 |
| Ⓒ | STROKE |
| | **25** = 25 mm |
| | **50** = 50 mm |
| | **75** = 75 mm |
| | **100** = 100 mm |
| | **125** = 125 mm |
| | **150** = 150 mm |
| | **175** = 175 mm |
| | **200** = 200 mm |
| Ⓥ | VERSION |
| | **C** = Fixed body |
| | **P** = Fixed end plates |



### Construction characteristics

| | |
|---|---|
| Body | anodized aluminium |
| Guide rods | stainless steel |
| Piston | aluminium |
| Piston rod bushing | brass |
| Piston seals | oil resistant NBR rubber |
| Piston rod seals | PUR |
| Plate | anodized aluminium |

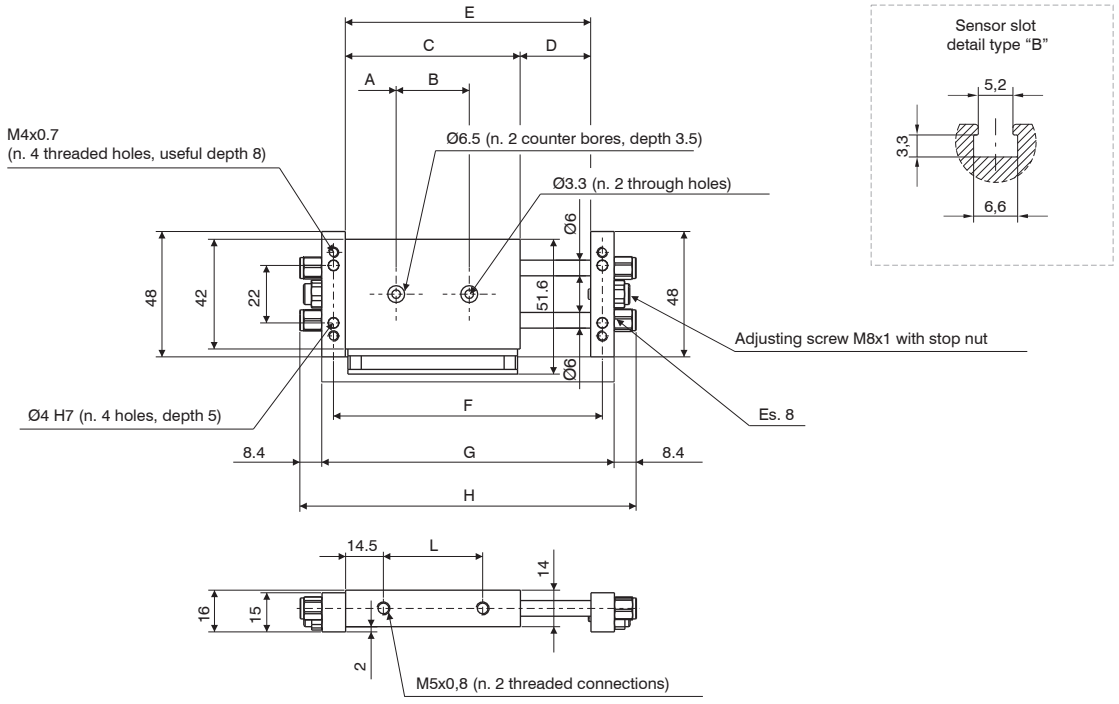
### Operational characteristics

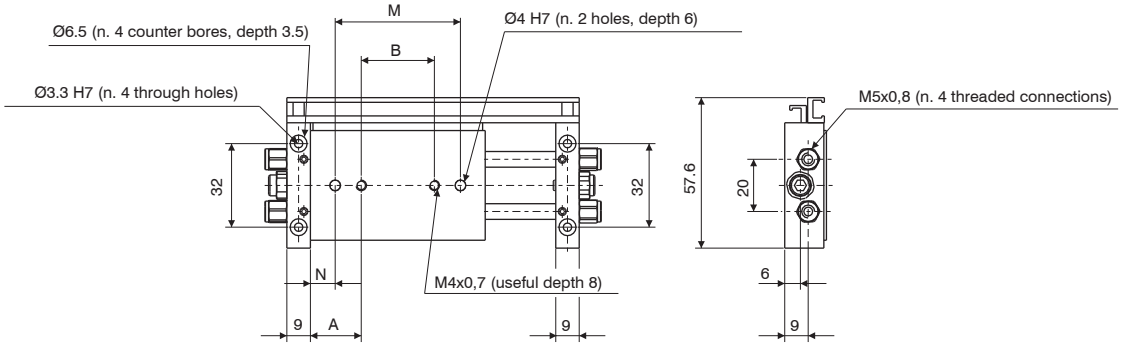
| Operational characteristics | |
|---|---|
| Cushioning | with shock absorbers (available on request) |
| Fluid | filtered and preferably lubricated air or not (if lubricated the lubrication must be continuous) |
| Function | Double acting |
| Max. working pressure (bar) | 10 |
| Temperature °C | -5 ... +70 |

### Standard strokes

| Stroke | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Bore | 25 | 50 | 75 | 100 | 125 | 150 | 175 | 200 |
| Ø10 | ● | ● | ● | ● | | | | |
| Ø15 | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø25 | ● | ● | ● | ● | ● | ● | ● | ● |

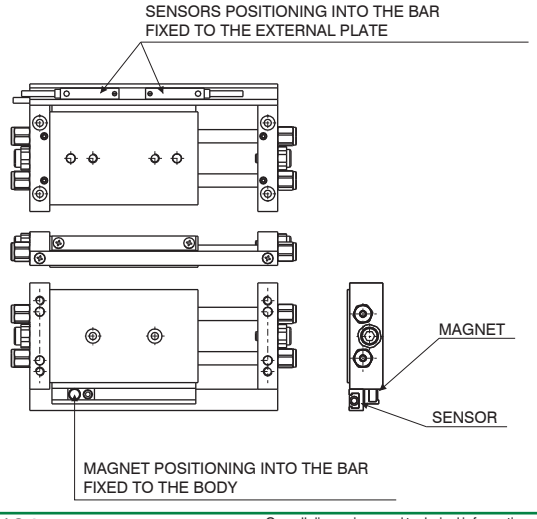
## Overall dimensions - Ø10



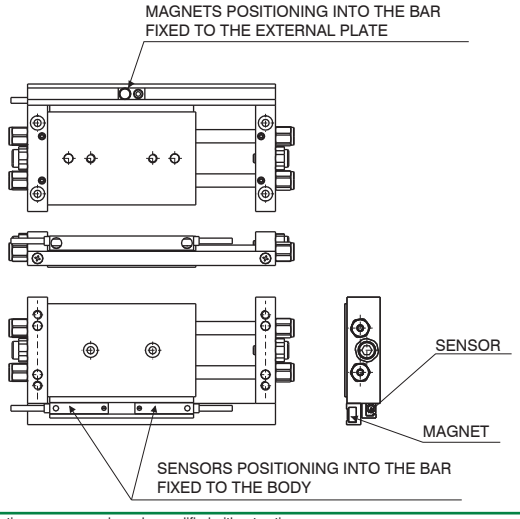




| Stroke | 25 | 50 | 75 | 100 |
|---|---|---|---|---|
| A | 19,5 | 30 | 35 | 35 |
| B | 28 | 32 | 47 | 72 |
| C | 67 | 92 | 117 | 142 |
| D | 27 | 52 | 77 | 102 |
| E | 94 | 144 | 194 | 244 |
| F | 103 | 153 | 203 | 253 |
| G | 112 | 162 | 212 | 262 |
| H | 129 | 179 | 229 | 279 |
| L | 38 | 63 | 88 | 113 |
| M | 48 | 52 | 67 | 92 |
| N | 9,5 | 20 | 25 | 25 |
| Weight | | | | |
| g | 160 | 230 | 280 | 310 |

## MOUNTING WITH FIXED PLATE




## MOUNTING WITH A FIXED BODY

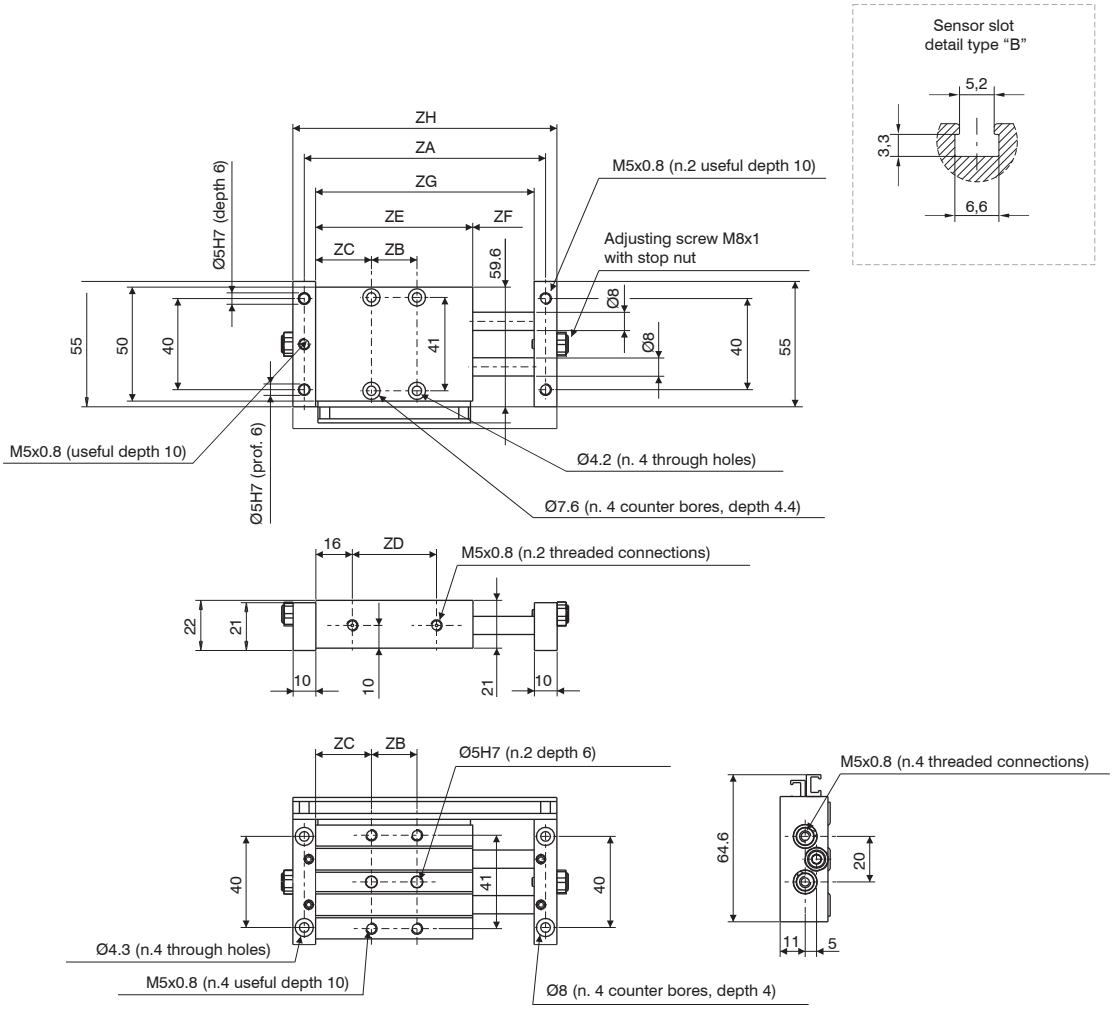






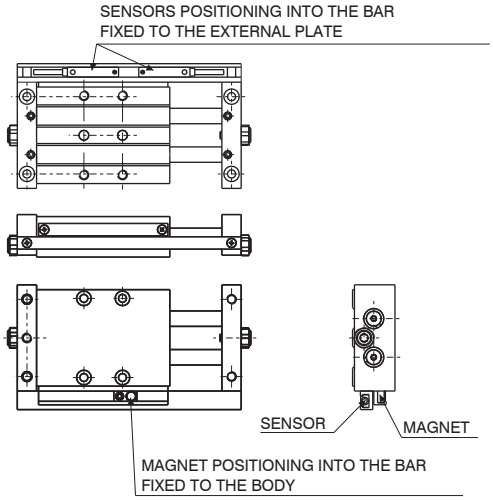
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Overall dimensions - Ø15

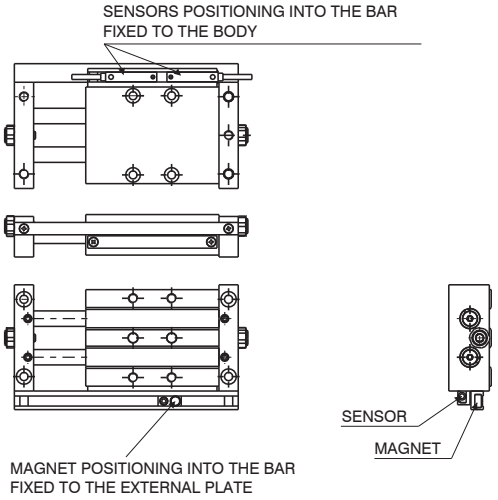



| Stroke | 25 | 50 | 75 | 100 | 125 | 150 | 175 | 200 |
|---|---|---|---|---|---|---|---|---|
| ZA | 106 | 156 | 206 | 256 | 306 | 356 | 406 | 456 |
| ZB | 20 | 45 | 65 | 90 | 90 | 90 | 90 | 90 |
| ZC | 24,5 | 24,5 | 27 | 27 | 39,5 | 52 | 64,5 | 77 |
| ZD | 37 | 62 | 87 | 112 | 137 | 162 | 187 | 212 |
| ZE | 69 | 94 | 119 | 144 | 169 | 194 | 219 | 244 |
| ZF | 27 | 52 | 77 | 102 | 127 | 152 | 177 | 202 |
| ZG | 96 | 146 | 196 | 246 | 296 | 346 | 396 | 446 |
| ZH | 116 | 166 | 216 | 266 | 316 | 366 | 416 | 466 |
| Weight | | | | | | | | |
| g | 240 | 350 | 450 | 550 | 670 | 750 | 900 | 1000 |

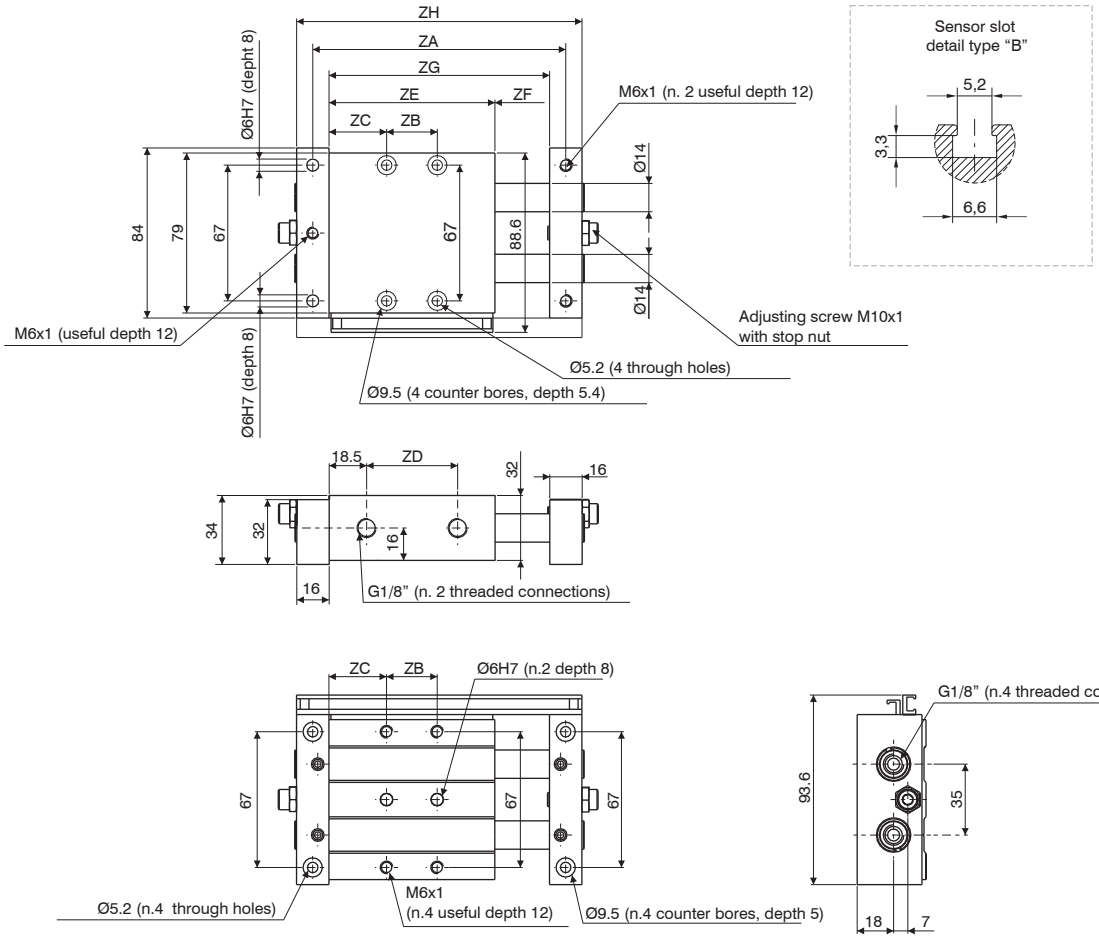
## MOUNTING WITH FIXED PLATE




## MOUNTING WITH A FIXED BODY

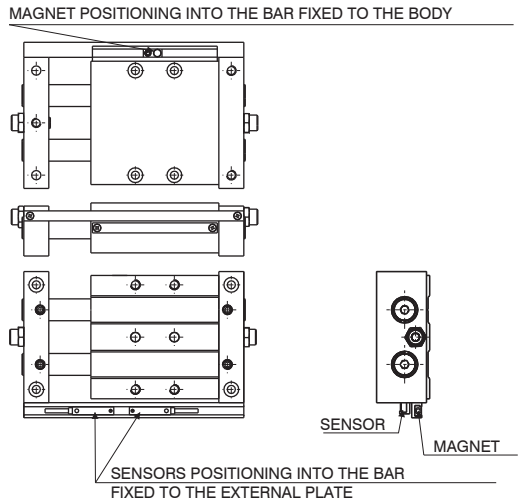


## Overall dimensions - Ø25

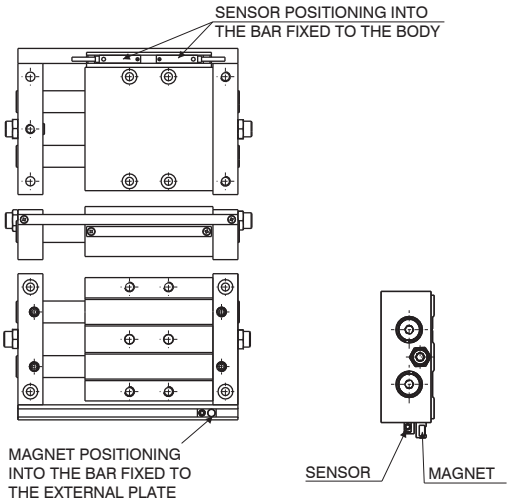



| Stroke | 25 | 50 | 75 | 100 | 125 | 150 | 175 | 200 |
|---|---|---|---|---|---|---|---|---|
| ZA | 125 | 175 | 225 | 275 | 325 | 375 | 425 | 475 |
| ZB | 25 | 45 | 65 | 90 | 90 | 90 | 90 | 90 |
| ZC | 28,5 | 31 | 33,5 | 33,5 | 46 | 58,5 | 71 | 83,5 |
| ZD | 45 | 70 | 95 | 120 | 145 | 170 | 195 | 220 |
| ZE | 82 | 107 | 132 | 157 | 182 | 207 | 232 | 257 |
| ZF | 27 | 52 | 77 | 102 | 127 | 152 | 177 | 202 |
| ZG | 109 | 159 | 209 | 259 | 309 | 359 | 409 | 459 |
| ZH | 141 | 191 | 241 | 291 | 341 | 391 | 441 | 491 |
| Weight | | | | | | | | |
| g | 950 | 1140 | 1350 | 1600 | 1800 | 2000 | 2300 | 2500 |

## MOUNTING WITH FIXED PLATE




## MOUNTING WITH A FIXED BODY







Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Slide force - Operating conditions

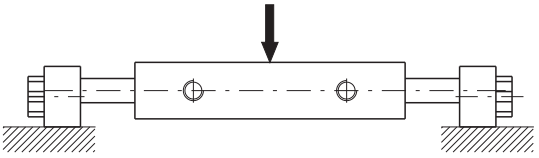
### Theoretical slide force (N)

| | Bore | | |
|---|---|---|---|
| Working pressure | Ø10 | Ø15 | Ø25 |
| 2 bar | 20 | 41 | 119 |
| 3 bar | 30 | 62 | 179 |
| 4 bar | 40 | 83 | 239 |
| 5 bar | 51 | 104 | 299 |
| 6 bar | 61 | 124 | 358 |
| 7 bar | 71 | 145 | 418 |
| 8 bar | 81 | 166 | 478 |
| 9 bar | 91 | 186 | 537 |
| | 101 | 207 | 597 |
| | Effective area (mm²) | | |

## Deflection of piston rods

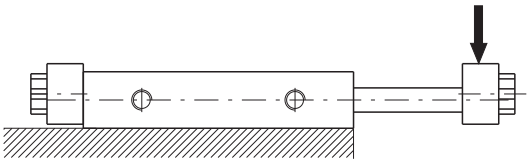
Applied load to body centre

| Bore | Force (N) | Deflection (mm) | |
|---|---|---|---|
| Ø10 | 10 N | 0,07 | / |
| Ø15 | 30 N | 0,08 | 0,28 |
| Ø25 | 60 N | 0,02 | 0,08 |
| | | 100 | 200 |
| | | Stroke | |

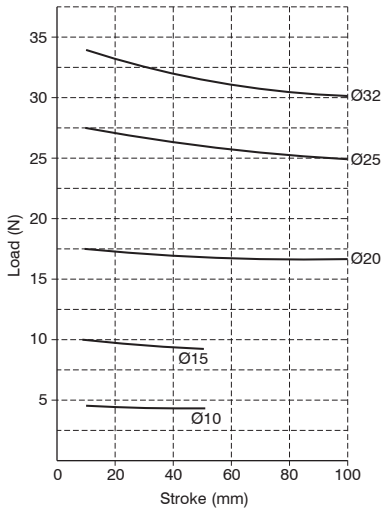


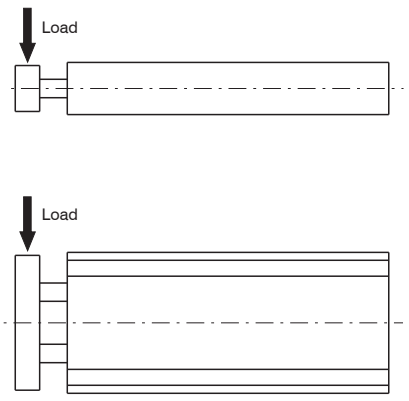
Applied load to body centre

| Bore | Force (N) | Deflection (mm) | | | |
|---|---|---|---|---|---|
| Ø10 | 3 N | 0,06 | 0,3 | / | / |
| Ø15 | 5 N | 0,1 | 0,2 | 0,5 | 1 |
| Ø25 | 10 N | 0,03 | 0,1 | 0,15 | 0,25 |
| | | 50 | 100 | 150 | 200 |
| | | Stroke | | | |



**Control unit with bronze bushes**



# Series 6700

## Guide cylinders

**Coding:** 6700.Ø.©

| Ø | BORE |
|---|---|
| | **10** = Ø10 |
| | **16** = Ø16 |
| | **20** = Ø20 |

| © | STROKE |
|---|---|
| | **5** = 5 mm |
| | **10** = 10 mm |
| | **15** = 15 mm |
| | **25** = 25 mm |
| | **30** = 30 mm |
| | **40** = 40 mm |
| | **50** = 50 mm |
| | **60** = 60 mm |



### Construction characteristics

| | |
|---|---|
| Body | anodized aluminium |
| Piston rod | stainless steel |
| Piston | aluminium |
| Piston rod bushing | aluminium |
| Rear end cap | anodized aluminium |
| Seals | oil resistant NBR rubber |
| Plate | anodized aluminium |

### Standard strokes

| Bore | Stroke | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 |
| Ø10 | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø16 | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Ø20 | ● | ● | ● | ● | ● | ● | ● | ● | ● |

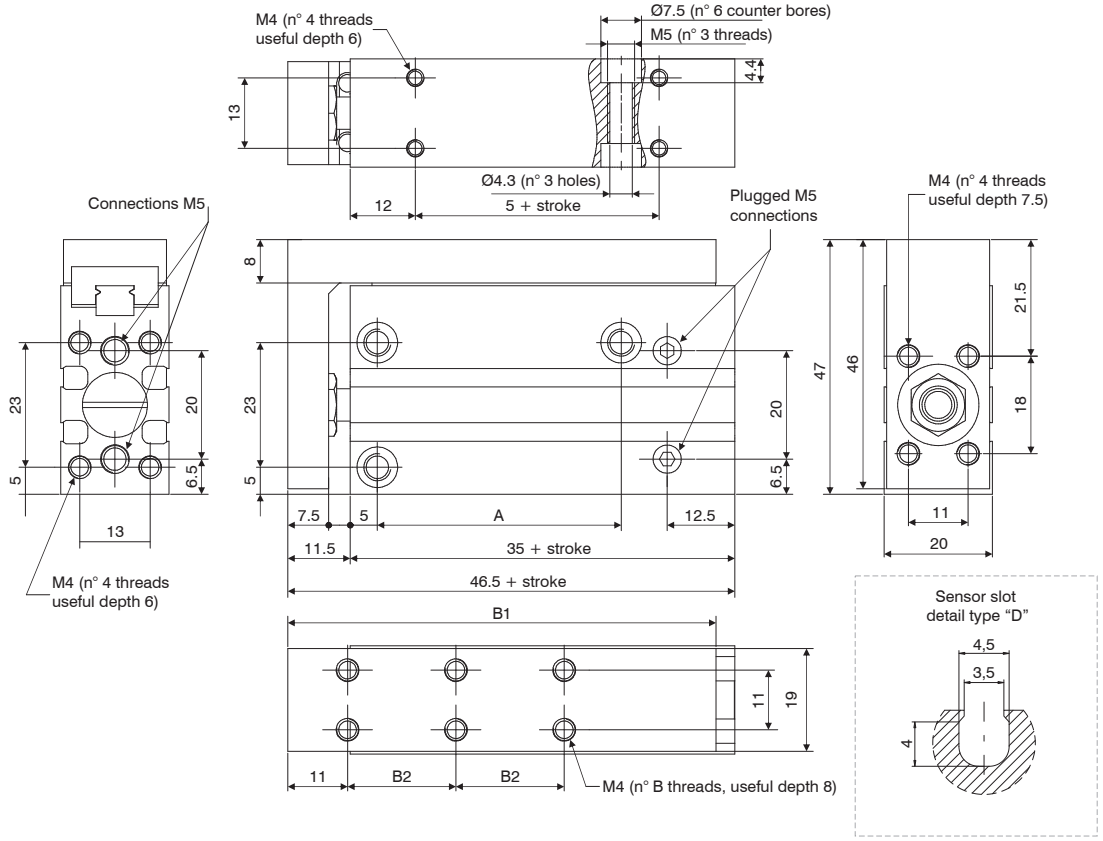
### Operational characteristics

| | |
|---|---|
| Cushioning | with elastic bumper |
| Fluid | filtered and preferably lubricated air or not (if lubricated the lubrication must be continuous) |
| Working pressure (bar) | 1,2 ... 7 |
| Temperature °C | -5 ... +70 |

### Theoretical force

| Bore | Effective area (mm²) | | Force (N) | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ø10 | Out | 28,3 | 5,7 | 8,5 | 11,3 | 14,2 | 17 | 19,8 |
| | In | 21,2 | 4,2 | 6,4 | 8,5 | 10,6 | 12,7 | 14,8 |
| Ø16 | Out | 78,5 | 15,7 | 23,6 | 31,4 | 39,3 | 47,1 | 55 |
| | In | 66 | 13,2 | 19,8 | 26,4 | 33 | 39,6 | 46,2 |
| Ø20 | Out | 314 | 62,8 | 94,2 | 125,6 | 157 | 188,4 | 219,8 |
| | In | 264 | 52,8 | 79,2 | 105,6 | 132 | 158,4 | 184,8 |
| | | | 2 | 3 | 4 | 5 | 6 | 7 |
| | | | Working pressure (bar) | | | | | |

### Overall dimensions - Ø10




### Table of dimensions

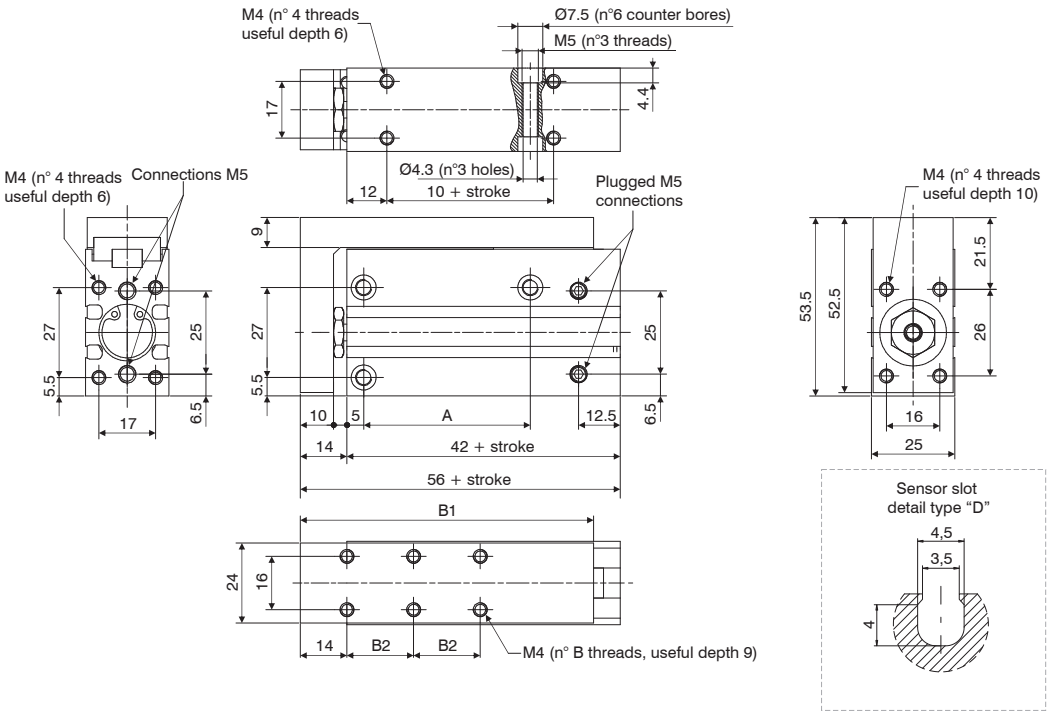
| | Standard strokes | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 |
| A | 14 | | 24 | | 30 | | 45 | 45 | 60 |
| B1 | 49 | | 59 | | 69 | | 79 | 79 | 99 |
| B2 | 10 | | 20 | | 30 | | 20 | 20 | 30 |
| B | 4 | | | | | | 6 | | |
| Weight (g) | 117 | 125 | 140 | 148 | 162 | 170 | 192 | 215 | 238 |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

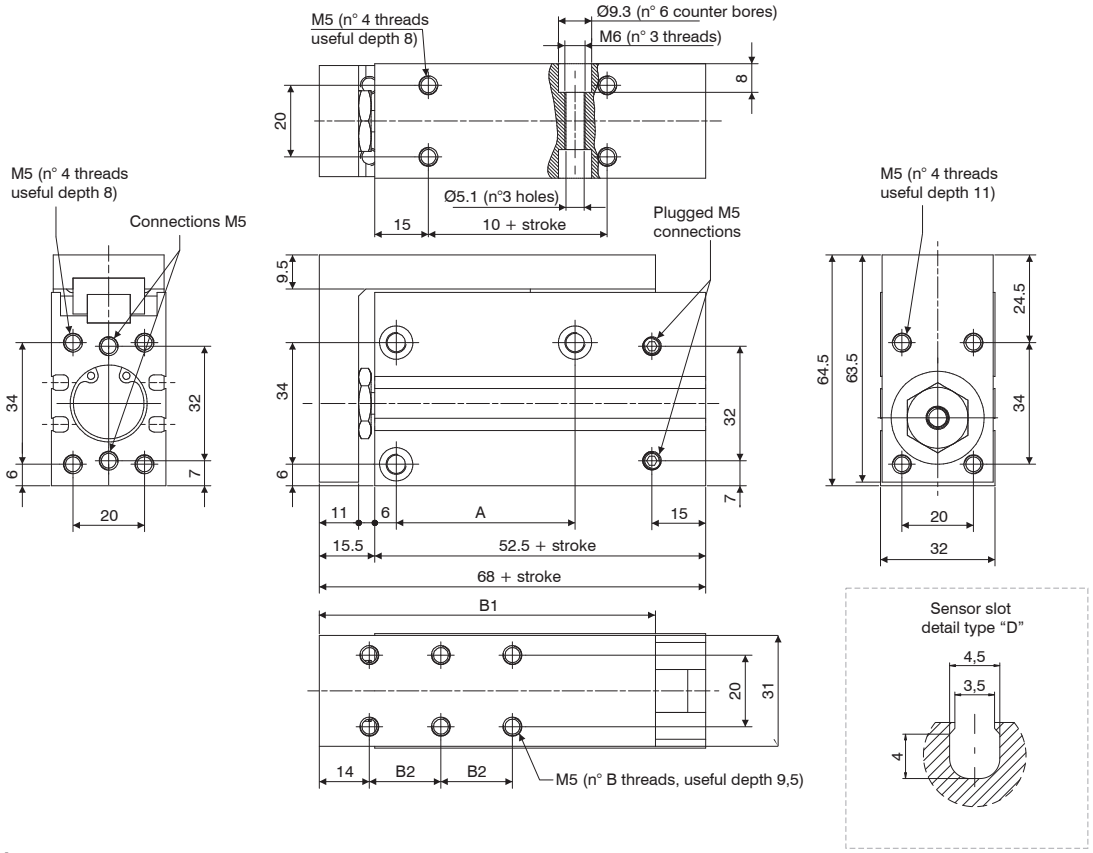
## Overall dimensions - Ø16




## Table of dimensions

| | Standard strokes | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 |
| A | 20 | | 30 | | 40 | | 50 | 60 | |
| B1 | 58 | | 68 | | 78 | | 88 | 98 | 108 |
| B2 | 10 | | 20 | | 30 | | 20 | 25 | 30 |
| B | 4 | | | | | | 6 | | |
| Weight (g) | 215 | 230 | 250 | 260 | 280 | 290 | 325 | 350 | 390 |

## Overall dimensions - Ø20

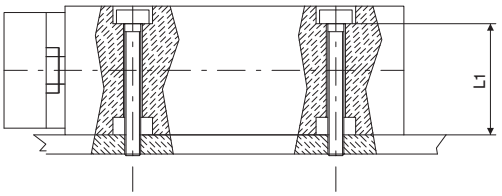



## Table of dimensions

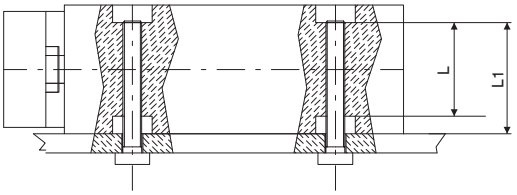
| | Standard strokes | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 |
| A | 20 | | 25 | | 40 | | 50 | 70 | |
| B1 | 64 | | 74 | | 84 | | 94 | 104 | 114 |
| B2 | 10 | | 20 | | 30 | | 20 | 25 | 30 |
| B | 4 | | | | | | 6 | | |
| Weight (g) | 440 | 455 | 490 | 505 | 540 | 560 | 600 | 660 | 700 |

## Fixing - Load

LATERAL (THROUGH SCREW)



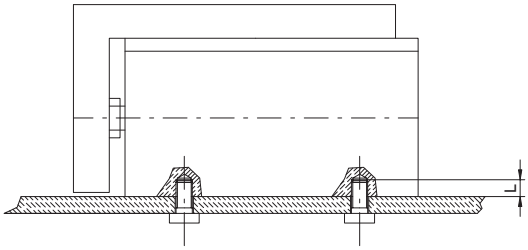

LATERAL (THREADED HOLE)



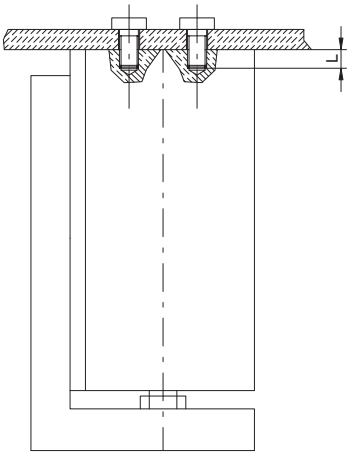

| | Screw | Maximum torque (Nm) | L1 |
|---|---|---|---|
| Ø10 | M4 | 2,5 | 15,6 |
| Ø16 | M4 | 2,5 | 20,6 |
| Ø20 | M5 | 5,1 | 24 |

| | Screw | Maximum torque (Nm) | L1 | L |
|---|---|---|---|---|
| Ø10 | M5 | 5,1 | 15,6 | 11,2 |
| Ø16 | M5 | 5,1 | 20,6 | 16,2 |
| Ø20 | M6 | 8,1 | 24 | 16 |

VERTICAL (THREADED HOLE)




AXIAL (THREADED HOLE)

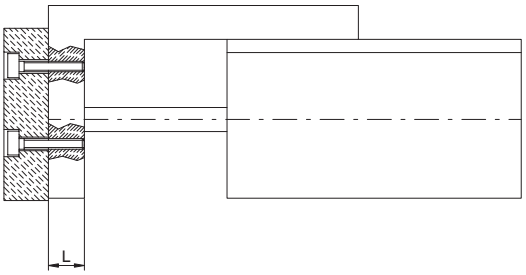



| | Screw | Maximum torque (Nm) | L |
|---|---|---|---|
| Ø10 | M4 | 2,5 | 6 |
| Ø16 | M4 | 2,5 | 6 |
| Ø20 | M5 | 5,1 | 8 |

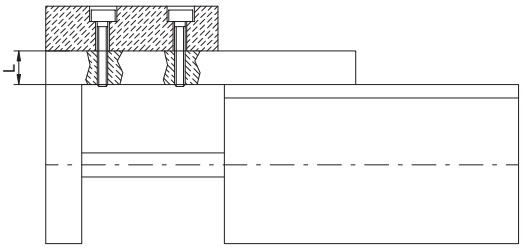
| | Screw | Maximum torque (Nm) | L |
|---|---|---|---|
| Ø10 | M4 | 2,5 | 6 |
| Ø16 | M4 | 2,5 | 6 |
| Ø20 | M5 | 5,1 | 8 |

## Force (N)

FRONTAL MOUNTING




BACK MOUNTING




| | Screw | Maximum torque (Nm) | L |
|---|---|---|---|
| Ø10 | M4 | 2,5 | 7,5 |
| Ø16 | M4 | 2,5 | 10 |
| Ø20 | M5 | 5,1 | 11 |

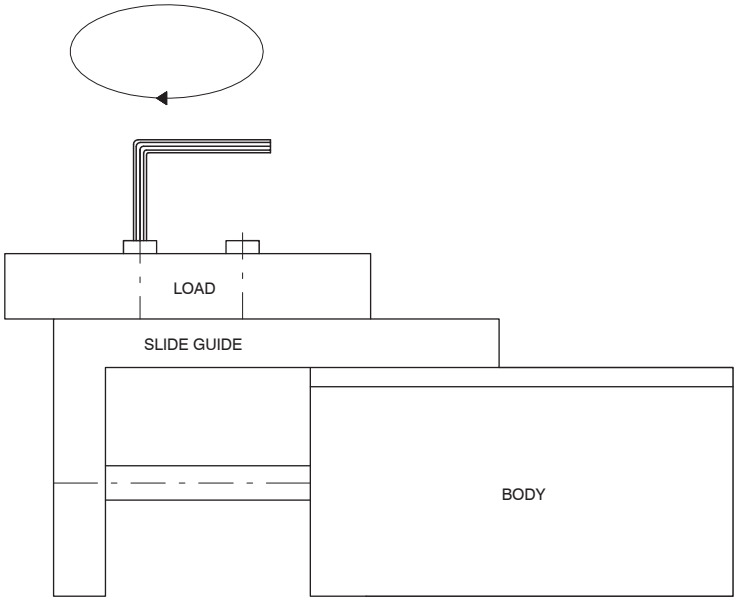
| | Screw | Maximum torque (Nm) | L |
|---|---|---|---|
| Ø10 | M4 | 2,5 | 8 |
| Ø16 | M4 | 2,5 | 9 |
| Ø20 | M5 | 5,1 | 9,5 |





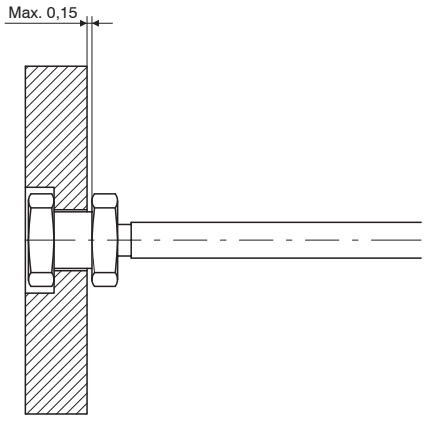
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Fixing - Load




ATTENTION : Slide must be blocked before fixing the load.
This operation shoul not be done by blocking the body as the guide could get damaged.

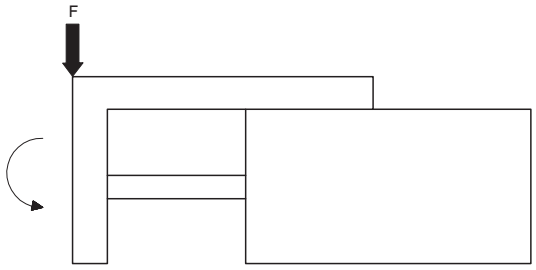
CONNECTION BETWEEN PLATE AND ROD

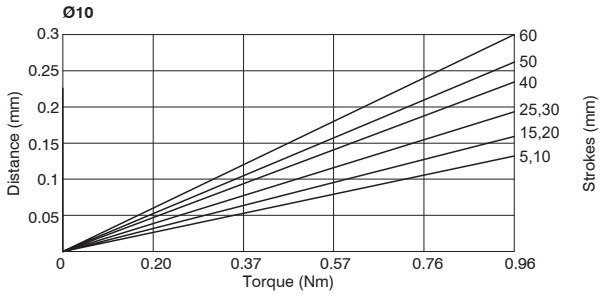


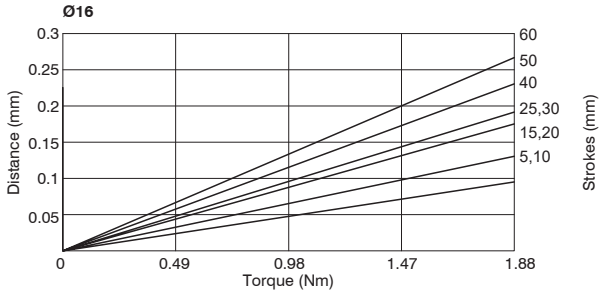

The fluctuating connection, maximum clearence 0.15mm as indicated by the arrow.

## Plate deflection graphs

Plate deviation (arrow) when the load is applied on the spot indicated with the arrow and the unit completely extended



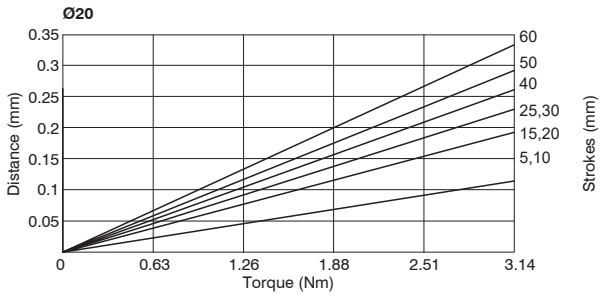
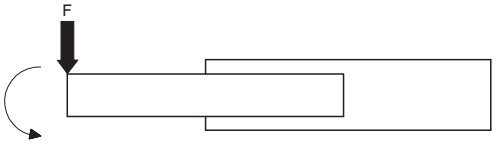
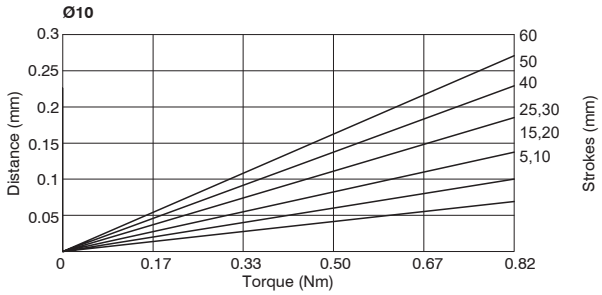
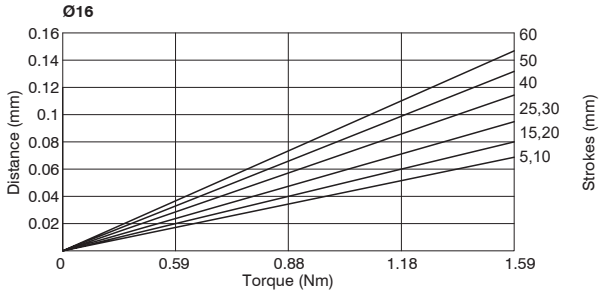
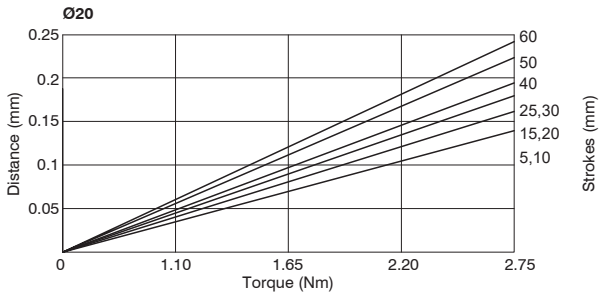




Plate deviation (arrow) when the load is applied on the spot indicated with the arrow and the unit completely extended



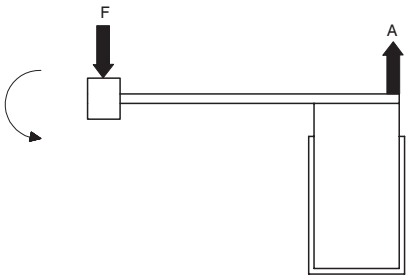


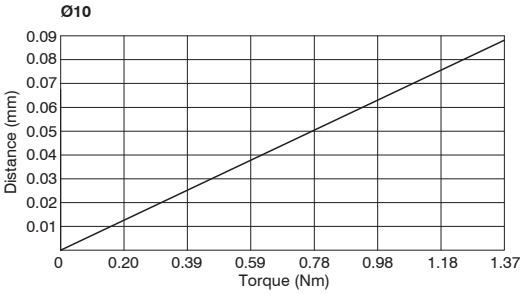


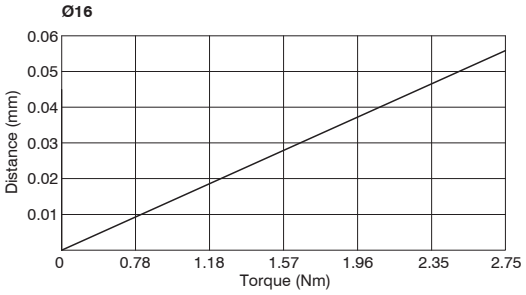

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

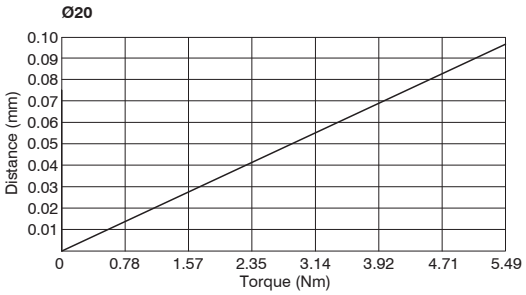
## Plate deflection graphs outer stroke - selection graphs

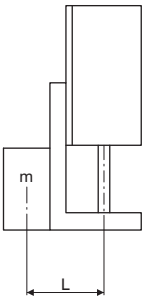
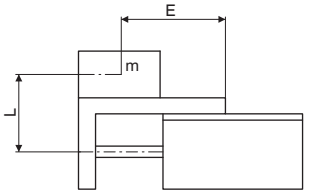
Plate deviation (compared to A) when the load is applied on the spot indicated with the arrow and the unit completely extended



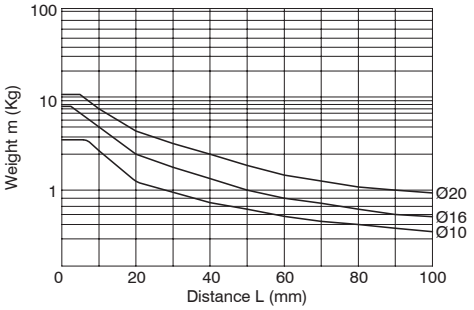



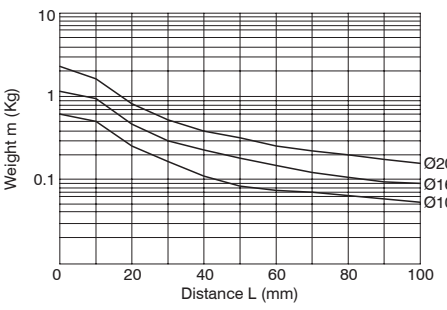

| VERTICAL | | | | HORIZONTAL | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MOUNTING POSITION |   | | |   | | | | | | | | |
| MAX. SPEED (mm/s) | 100 | 200 | 300 | 100 | | | 200 | | | 300 | | |
| Load eccentricity | | | | 50 | 100 | 200 | 50 | 100 | 200 | 50 | 100 | 200 |
| Selection graphs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |

### Selection graphs 1 - 3 (vertical mounting)

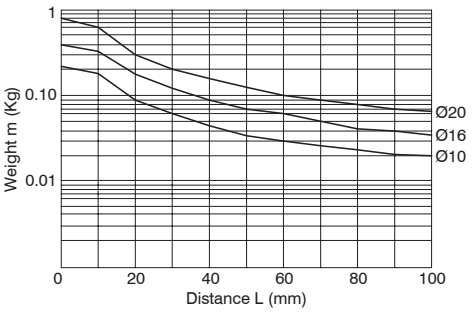
Drawing 1
Maximum speed 100 mm/s or lower




Drawing 2
Maximum speed 300 mm/s or lower



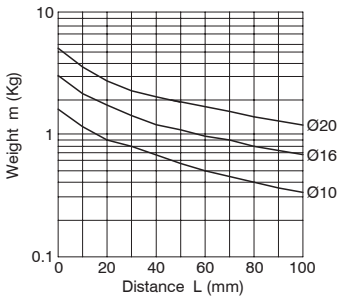

Drawing 3
Maximum speed 500 mm/s or lower



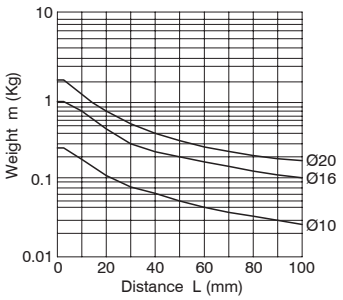
## Selection graphs

**Selection graphs 4 - 12 (horizontal mounting)**

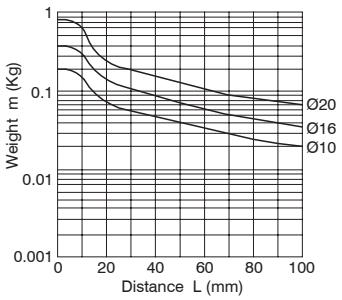
Drawing 4 load eccentricity 50 mm
Maximum speed 100 mm/s or lower



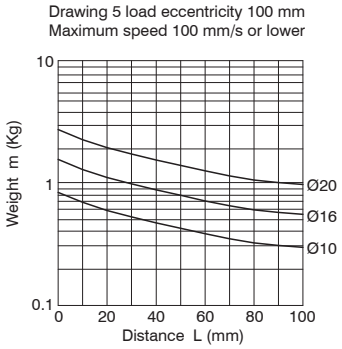

Drawing 7 load eccentricity 50 mm
Maximum speed 300 mm/s or lower



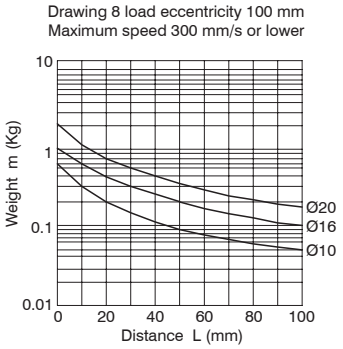

Drawing 10 load eccentricity 50 mm
Maximum speed 500 mm/s or lower



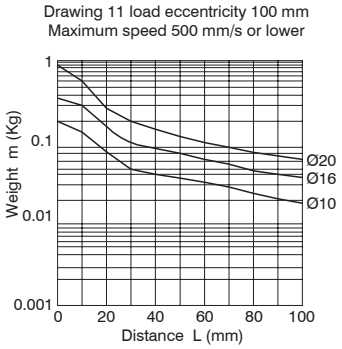

Drawing 5 load eccentricity 100 mm
Maximum speed 100 mm/s or lower



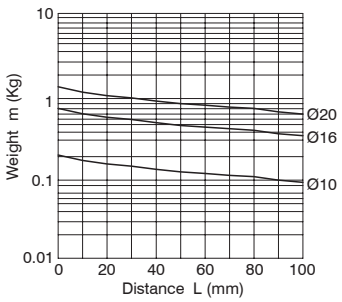

Drawing 8 load eccentricity 100 mm
Maximum speed 300 mm/s or lower



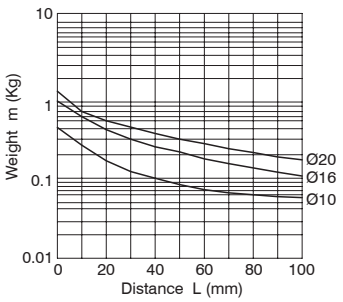

Drawing 11 load eccentricity 100 mm
Maximum speed 500 mm/s or lower



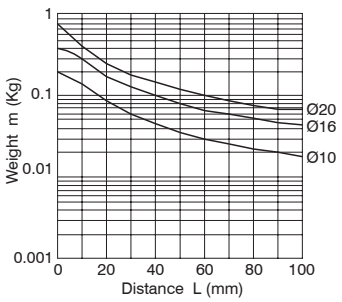

Drawing 6 load eccentricity 200 mm
Maximum speed 100 mm/s or lower




Drawing 9 load eccentricity 200 mm
Maximum speed 300 mm/s or lower




Drawing 12 load eccentricity 200 mm
Maximum speed 500 mm/s or lower








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## Series 1605

The purpose of producing a rodless cylinder is to provide a space saving option over conventional cylinders. On a traditional rod type cylinder, the total space occupied with rod out is more than double the length of the cylinder, while with rodless cylinder it is little more than its stroke. Profiled tube allows mounting of sensors 1500._, RS._, HS._ and 1580._, MRS._, MHS._ on the two sides of carriage, by means of suitable brackets. Standard accessories include foot mounting brackets for installation on cylinder and caps, intermediate mounting brackets to give support to long stroke cylinders under load (over one metre), an oscillating coupling device for installation between the mounting plate and the load and on request, a very precise external movement device.

### Construction characteristics

| | |
|---|---|
| Other seals | oil resistant NBR rubber |
| Bands | tempered stainless steel |
| Cushion bushings | aluminium |
| Barrel | anodized aluminium |
| Mounting place | anodized aluminium |
| Piston seals | special 80 shore nitril mixture, wear resistant |
| Plain bearing guide | acetal resin |
| Piston | acetal resin |
| End caps | anodized aluminium |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered and lubricated air |
| Pressure | 0.5 ... 8 bar |
| Working temperature | -5 °C ... +70 °C |
| Max. speed | 1.5 m/s (normal working conditions) |
| Bores | Ø25 - Ø32 - Ø40 - Ø50 - Ø63 |
| Max. strokes | 6 meters |

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- Please adequately evaluate the load involved and its direction, especially in respect to the moving carriage (also see tables for loads and admitted moments).
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
For applications where a low smooth uniform operations speed is required, you must specify this on your purchase order so that we can use the proper special grease.

### Use and maintenance

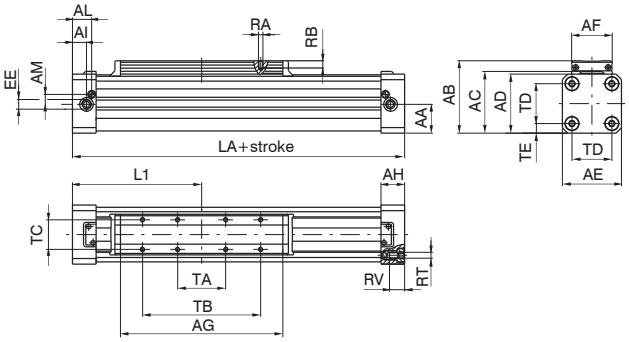
This type of cylinder, due to its characteristics, has to be used within certain criteria. Correct use will give long and troublefree operation. Filtered and lubricated compressed air reduce seal wear. Verify that the load will not produce unforeseen stresses. Never combine high speed with heavy load. Always support the long stroke cylinder with intermediate brackets and never exceed the specified working conditions. If maintenance is required, follow the instructions supplied with the repair kit.

## Basic version

**Coding:** 1605.Ø.stroke.01.M

*(Max. stroke 6 m)*



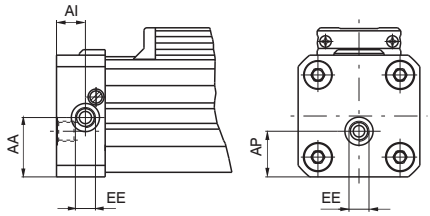



## Left head

**Coding:** 1605.Ø.stroke.02.M

*(Max. stroke 6 m)*

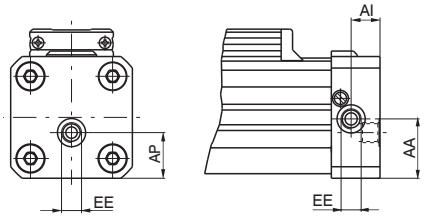
Possibility of a single feed cylinder head




## Right head

**Coding:** 1605.Ø.stroke.03.M

*(Max. stroke 6 m)*



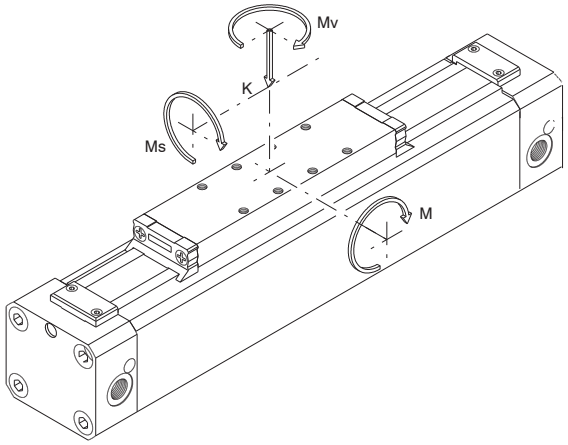

| Bore | | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|---|
| AA | | 19,5 | 25,5 | 31 | 39 | 46,5 |
| AB | | 56 | 70 | 80 | 98 | 113,5 |
| AC | | 48,5 | 60 | 70 | 85 | 100 |
| AD | | 44 | 55 | 65 | 80 | 95 |
| AE | | 40 | 55 | 65 | 80 | 95 |
| AF | | 30 | 40 | 40 | 55 | 55 |
| AG | | 117 | 146 | 186 | 220 | 255 |
| AH | | 23 | 27 | 30 | 32 | 36 |
| AI | | 12,5 | 14,5 | 17,5 | 19 | 23 |
| AL | | 19 | 22,5 | 24,5 | 26 | 30 |
| AM | | 7,5 | 10,5 | 11,5 | 13,5 | 16 |
| AP | | 13 | 15,2 | 23 | 30 | 35,5 |
| EE | | G1/8" | G1/4" | G1/4" | G1/4" | G3/8" |
| L1 | | 100 | 125 | 150 | 175 | 215 |
| LA | | 200 | 250 | 300 | 350 | 430 |
| RA | | M4 | M5 | M5 | M6 | M6 |
| RB | | 7,5 | 9,5 | 9,5 | 11,5 | 11,5 |
| RT | | M5 | M6 | M6 | M8 | M8 |
| RV | | 13,5 | 16,5 | 16,5 | 20,5 | 20,5 |
| TA | | 30 | 40 | 40 | 65 | 65 |
| TB | | 80 | 110 | 110 | 160 | 160 |
| TC | | 23 | 30 | 30 | 40 | 40 |
| TD | | 27 | 36 | 47 | 54 | 68 |
| TE | | 6,5 | 9,5 | 9 | 13 | 13,5 |
| Weight (g) | Stroke 0 | 900 | 1650 | 2650 | 4330 | 8010 |
| | every 100 mm | 225 | 340 | 490 | 725 | 1070 |
| Stroke tolerance: + 2 mm. | | | | | | |

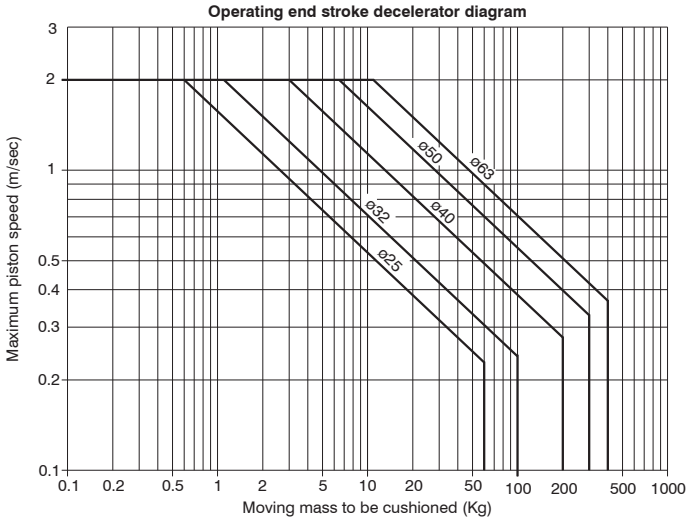




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## Basic version cylinder

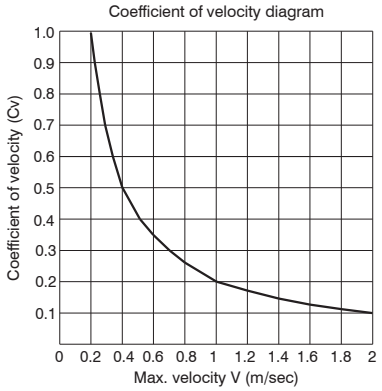



## Recommended loads and moments in static conditions

| Cylinder bore | Decelerating stroke (mm) | Max. recommended load K (N) | Max. recommended bending moment M (Nm) | Max. recommended cross moment Ms (Nm) | Max. recommended twisting moment Mv (Nm) |
|---|---|---|---|---|---|
| 25 | 20 | 300 | 15 | 0,8 | 3 |
| 32 | 25 | 450 | 30 | 2,5 | 5 |
| 40 | 31 | 750 | 60 | 4,5 | 8 |
| 50 | 38 | 1200 | 115 | 7,5 | 15 |
| 63 | 49 | 1600 | 150 | 8,5 | 24 |

*Attention: use guided carriage for heavier loads or precise linear movements (MG or MH versions).*
All reported data are referred to carriage plane and indicates MAX - values in statical conditions. These values should not be exceeded either in dynamic conditions (best speed <1m/sec).
Should the cylinder be utilised at its maximum performances, ensure the proper additional absorbers are used.




**Calculation of permissible load (Kd) in dynamic conditions**
**Kd = K • Cv**

**Loads under combined stressing conditions**

It is important to take into consideration the following formula when there are a combination of forces with torque:

$$\left[\left(2 \times \frac{Ms}{Ms\ max}\right)+\left(1.5 \times \frac{Mv}{Mv\ max}\right)+\frac{M}{M\ max}+\frac{K}{K\ max}\right] \times \frac{100}{Cv} \leq 100$$

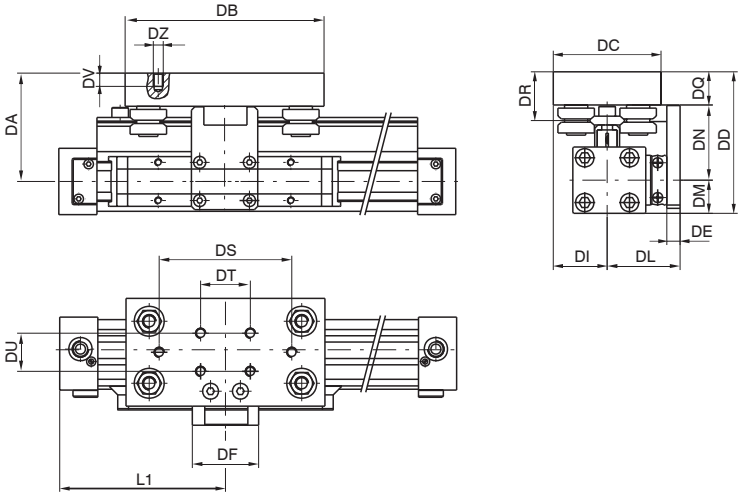
## Cylinder with linear control unit

**Coding:** 1605.Ø.stroke.01.MG

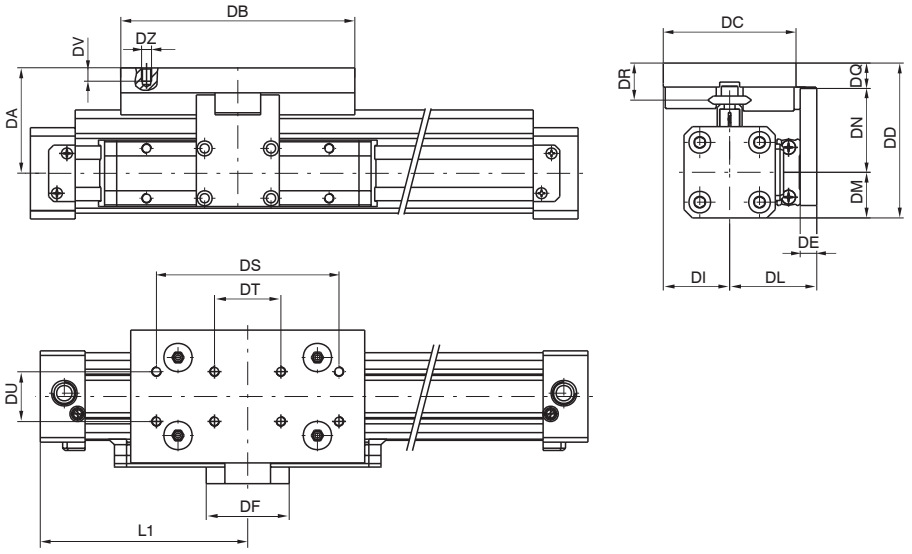
*(Max. stroke 3 m)*



Cylinders Ø25




Cylinders Ø32, Ø40, Ø50




| Bore | DA | DB | DC | DD | DE | DF | DI | DL | DM | DN | DQ | DR | DS | DT | DU | DV | DZ | L1 | Weight (g) | every 100 mm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 65 | 120 | 65 | 85 | 8 | 40 | 32,5 | 44 | 20 | 45,5 | 19,5 | 29 | 80 | 30 | 23 | 8 | M6 | 100 | 850 | 90 g |
| 32 | 63 | 141 | 80 | 90,5 | 10 | 50 | 40 | 52,5 | 27,5 | 48,5 | 14,5 | 21,5 | 110 | 40 | 30 | 8 | M5 | 125 | 950 | |
| 40 | 68,5 | 141 | 80 | 101 | 10 | 50 | 40 | 57,5 | 32,5 | 54 | 14,5 | 21,5 | 110 | 40 | 30 | 8 | M5 | 150 | | |
| 50 | 76 | 141 | 80 | 116 | 12 | 80 | 40 | 70 | 40 | 61,5 | 14,5 | 21,5 | 110 | 40 | 30 | 8 | M5 | 175 | | |

*For cylinders weight refer to base version*

### Construction and working characteristics

| | |
|---|---|
| Rod | carbon steel with hardness higher than 55-60 HRC |
| Bearing with shaft | shielded bearing with shaped ring |
| Carriage plate | anodised aluminium |
| End cap | acetal resin |

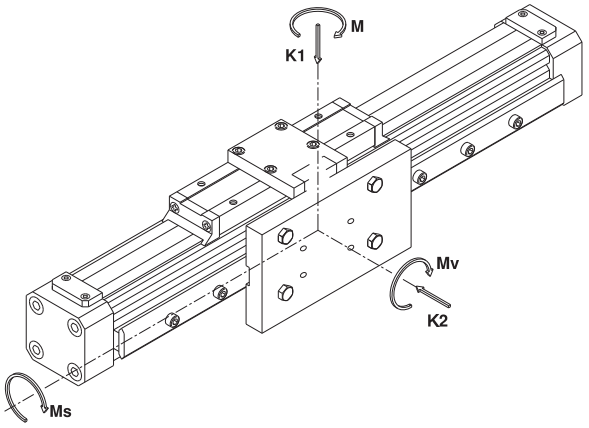


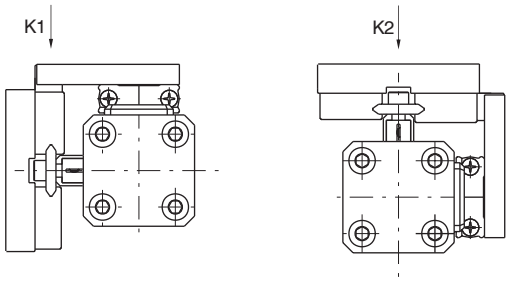


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## Cylinder with linear control unit Ø25, Ø32, Ø40 and Ø50 mm

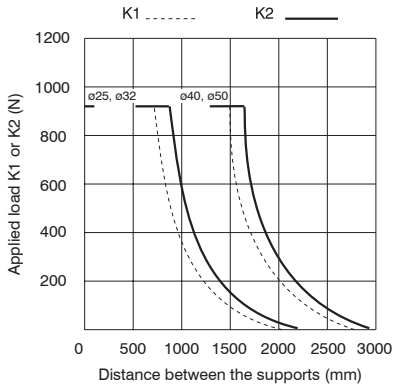
### Max. suggested loads and moments

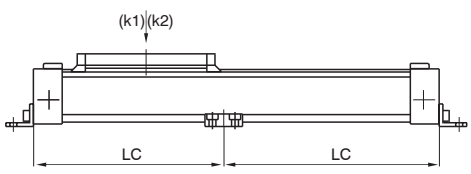



| K1 (N) | K2 (N) | M (Nm) | Ms (Nm) | Mv (Nm) |
|---|---|---|---|---|
| 960 | 960 | 40 | 12 | 40 |

Max. load (K1 o K2) depending on the distance LC between the supports

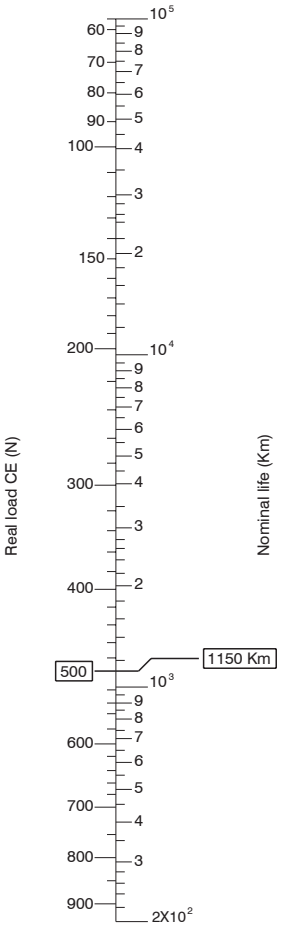



### Real load (CE) under combined stressing conditions

It is important to take into consideration the following formula when there are a combination of forces with torque:
**CE = [K1 + K2 + (24 x M) + (80 x Ms) + (24 x Mv)] ≤ 960**

### Nomograph load / life




All data refers to a linear control unit properly lubricated with linear speed < of 1.5 m/s

**Example to compute the life**

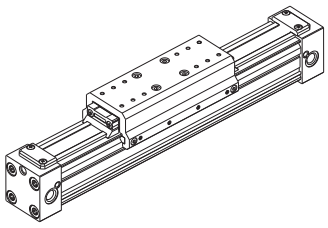
Compute the linear control unit life with a load of 100 N applied 50 mm off its axle.

Ms = 0,05 x 100 = 5 Nm  K1 = 100 N
How to compute the real load using the formula:
CE = [K1 + K2 + (24 x M) + (80 x Ms) + (24 x Mv)]
**CE = [(100 + 0) + (24 x 0) + (80 x 5) + (24 x 0)] = 500N**
After having verified that the CE is lower than 960 N we realise that the life is 1150 Km from the nomograph.

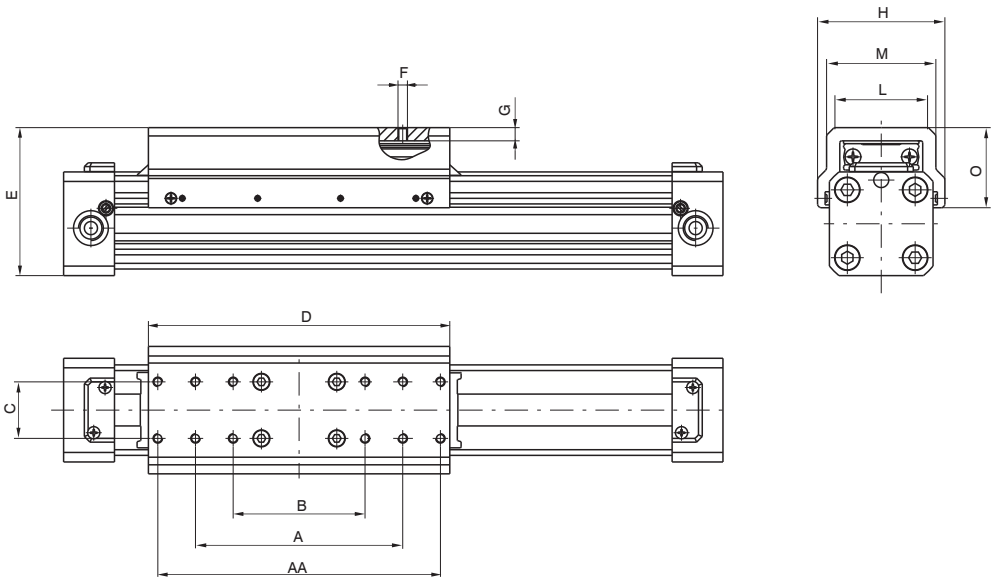
## Cylinder with plain bearing guide

**Coding:** 1605.Ø.stroke.01.MH

*(Max. stroke 6 m)*








| Bore | AA | A | B | C | D | E | F | G | H | L | M | O | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ø25 | / | 80 | 55 | 23 | 130 | 64 ±1 | M4 | 6,5 | 57 | 36 | 42 | 32 | 235 |
| Ø32 | / | 110 | 70 | 30 | 160 | 78,5 ±1 | M5 | 7 | 68 | 50 | 58 | 42,5 | 445 |
| Ø40 | / | 110 | 70 | 30 | 202 | 88,5 ±1 | M5 | 7 | 77 | 52 | 60 | 45,5 | 595 |
| Ø50 | 210 | 160 | 110 | 40 | 235 | 114,5 ±1 | M6 | 14 | 100 | 71 | 83 | 61,5 | 1453 |
| Ø63 | 210 | 160 | 110 | 40 | 270 | 130 ±1 | M6 | 14 | 116 | 76 | 90 | 65,5 | 1810 |

## Complete plain bearing guide

**Coding:** 1600.Ø.05F



### Construction and working characteristics

| | |
|---|---|
| Plain bearing | reinforced carbon fibre nylon |
| Carriage plate | anodised aluminium |

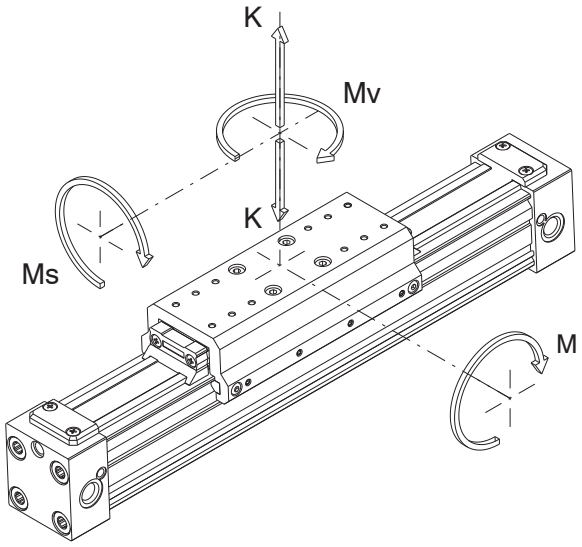




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Cylinder with plain bearing guide ø25, ø32, ø40, ø50 and ø63 mm

**Max. suggested loads and moments**



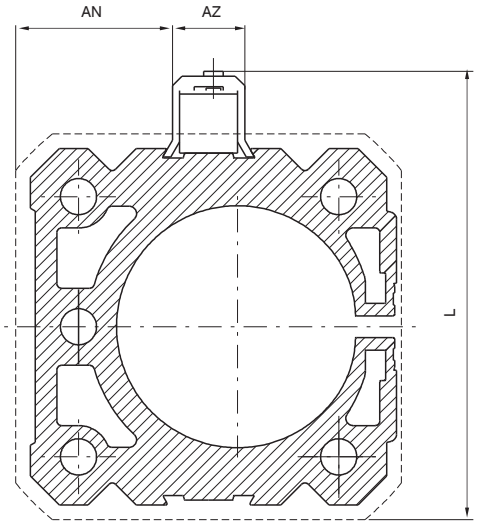

### Recommended loads and moments in static conditions

| Cylinder bore | Max. recommended load K (N) | Max. recommended bending moment M (Nm) | Max. recommended cross moment Ms (Nm) | Max. recommended twisting moment Mv (Nm) |
|---|---|---|---|---|
| Ø25 | 300 | 20 | 1 | 4 |
| Ø32 | 450 | 35 | 3 | 6 |
| Ø40 | 750 | 70 | 5 | 9 |
| Ø50 | 1200 | 120 | 8 | 16 |
| Ø63 | 1600 | 155 | 9 | 25 |

## SA series sensor bracket

**Coding:** 1600.A



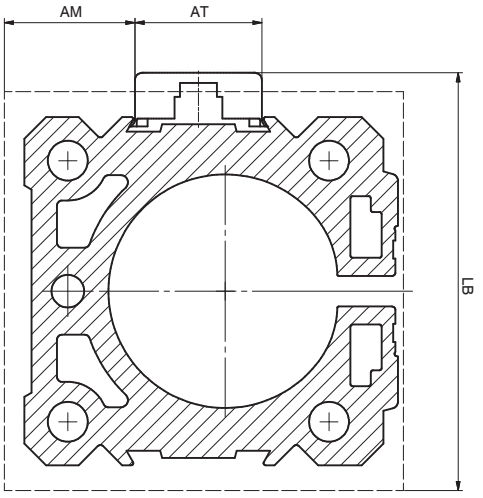



| Bore | | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|---|
| AN | | 12.5 | 20 | 25 | 32.5 | 40 |
| AM | | 11 | 18 | 22 | 30 | 37.5 |
| AZ | | 15 | | | | |
| AT | | 17.5 | | | | |
| L | | 55 | 68 | 79 | 94 | 110 |
| LB | | 45 | 58 | 69 | 84 | 100 |
| Weight (g) | 1600.A | 1 | | | | |
| | 1600.C | 2.5 | | | | |

## Bracket for sensor series SR - SU - SQ

**Coding:** 1600.C






**Sensors**

for technical characteristics and ordering codes see magnetic sensors section



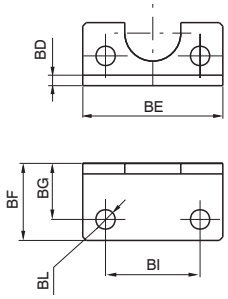


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

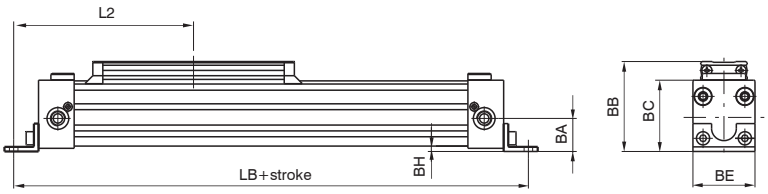
## Foot

**Coding:** 1600.Ø.01F
(1 piece)

**Bore Ø25, Ø32**



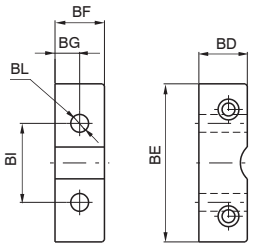


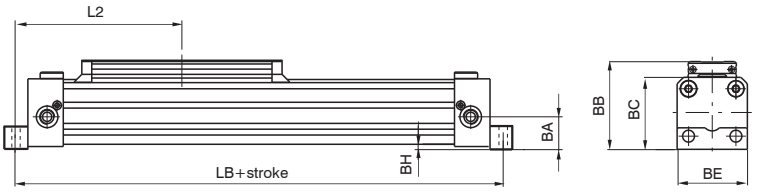




**Bore Ø40, Ø50, Ø63**



| Bore | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|
| BA | 21,5 | 28 | 32,5 | 41 | 49 |
| BB | 58 | 72,5 | 81,5 | 100 | 116 |
| BC | 46 | 57,5 | 66,5 | 82 | 97,5 |
| BD | 3 | 3 | 20 | 25 | 30 |
| BE | 40 | 55 | 65 | 80 | 95 |
| BF | 22 | 25 | 25 | 25 | 30 |
| BG | 16 | 18 | 12,5 | 12,5 | 15 |
| BH | 3,5 | 6 | 4,5 | 5 | 5 |
| BI | 27 | 36 | 30 | 40 | 48 |
| BL | 5,5 | 6,6 | 9 | 9 | 11 |
| L2 | 116 | 143 | 162,5 | 187,5 | 230 |
| LB | 232 | 286 | 32,5 | 375 | 460 |
| Weight (g) | 30 | 45 | 65 | 110 | 190 |

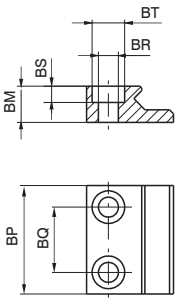


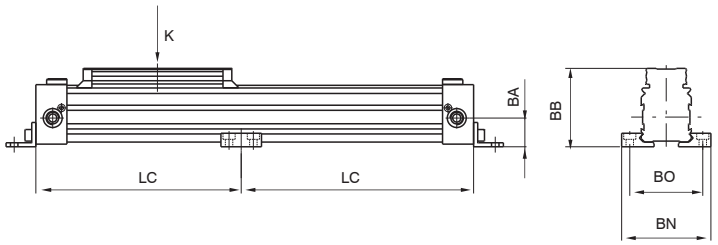
## Intermediate support

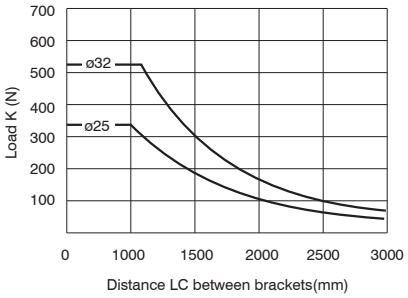
**Coding:** 1600.Ø.02F

**Bore Ø25, Ø32**





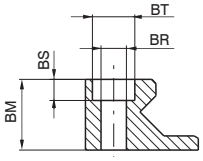



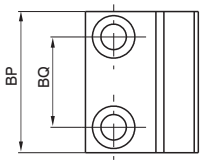



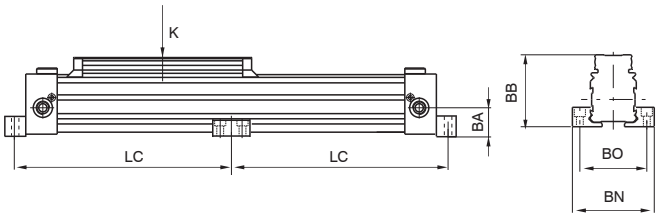

**Bore Ø40, Ø50, Ø63**

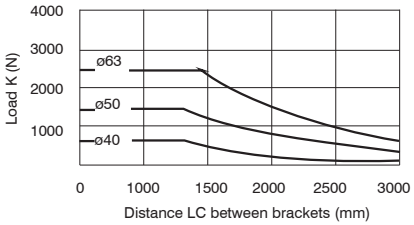


| Bore | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|
| BA | 21,5 | 28 | 32,5 | 41 | 49 |
| BB | 58 | 72,5 | 81,5 | 100 | 116 |
| BM | 10 | 18 | 18 | 25 | 30 |
| BN | 66 | 86 | 96 | 120 | 140 |
| BO | 54 | 70 | 80 | 100 | 120 |
| BP | 30 | 40 | 40 | 50 | 50 |
| BQ | 18 | 25 | 25 | 32 | 32 |
| BR | 5,5 | 6,6 | 6,6 | 9 | 9 |
| BS | 4,5 | 5,5 | 5,5 | 7,5 | 7,5 |
| BT | 9 | 11 | 11 | 15 | 15 |
| Weight (g) | 25 | 80 | 80 | 160 | 215 |







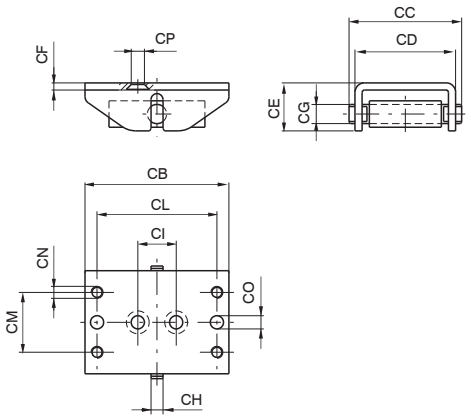
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

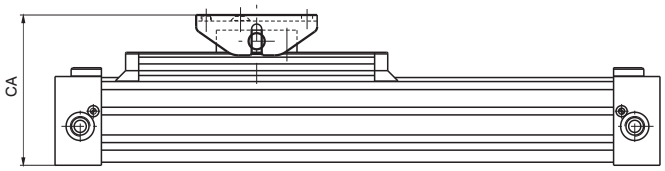
## Oscillating hinge

**Coding:** 1600.Ø.03F

**Bore Ø25, Ø32**



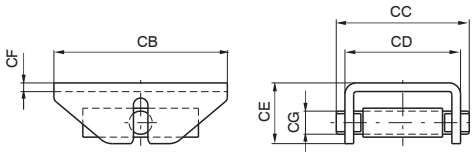


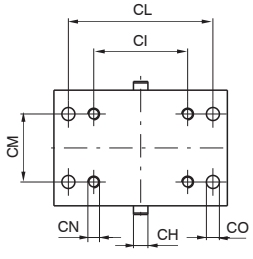



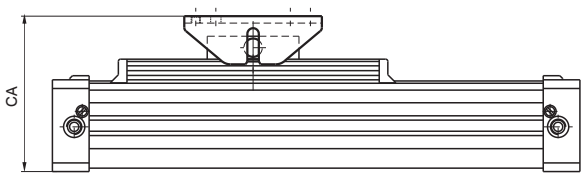

**Bore Ø40, Ø50, Ø63**



| Bore | 25 | 32 | 40 | 50 | 63 |
|---|---|---|---|---|---|
| CA (±5,5) | 76 | 99,5 | 108,5 | 135,5 | 151 |
| CB | 60 | 100 | 100 | 120 | 120 |
| CC | 47 | 64 | 64 | 92 | 92 |
| CD (±5) | 42 | 56 | 56 | 80 | 80 |
| CE | 20 | 30 | 30 | 42 | 42 |
| CF | 3 | 4 | 4 | 6 | 6 |
| CG | 8 | 12 | 2 | 16 | 16 |
| CH | 5 | 8 | 8 | 10 | 10 |
| CI | 16 | 40 | 40 | 65 | 65 |
| CL | 50 | 80 | 80 | 100 | 100 |
| CM | 25 | 30 | 30 | 47 | 47 |
| CN | M5 | M6 | M6 | M8 | M8 |
| CO | 5,5 | 6,5 | 6,5 | 9 | 9 |
| CP | 5,5 | 7 | 7 | - | - |
| Weight (g) | 130 | 380 | 380 | 990 | 990 |



## Series 1605 - Ø16

Mechanically coupled cylinder based on the stainless steel strip sealing technology widely used and tested on bigger bore sizes.
**Available versions:** sliding shoe as standard ("MH"). This system ensures high resistance and long life as the carriage which supports the weight is not tied to the piston and therefore the piston only transfers the movement without bearing any force.
**Air connections:** M5 threaded connections. All air connections on one end cap version available. (side-back-bottom side)
**Mountings:**
- foot brackets and intermediate supports if needed (depending on the stroke)
- oscillating hinge
- Directly in position via the slot on the end caps- in this conditions the air supply can come directly from the mounting plate.

**Magnetic sensors:** sensors series (1590.... , LRS.... and LHS....) can be used directly in the 2 slots on the barrel.

### Construction characteristics

| | |
|---|---|
| End caps | anodized aluminium |
| Barrel | anodized aluminium |
| Bands | stainless steel |
| Mounting place | anodized aluminium |
| Plain bearing guide | special technopolymer |
| Piston | acetal resin |
| Cushion bushings | aluminium |
| Piston seals | special NBR |
| Other seals | NBR |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered and lubricated air |
| Working pressure | 1.5 ... 8 bar |
| Working temperature | -5 °C ... +70 °C |
| Max. speed | 1 m/s (normal working conditions) |
| Max. stroke | 2,5 meters |
| Cushioning lenght | 18 mm |

Please follow the suggestions below to ensure a long life for these cylinders:
• use clean and lubricated air.
• Please adequately evaluate the load involved and its direction, especially in respect to the moving carriage (also see tables for loads and admitted moments).
• avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
• evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).
**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.
For applications where a low smooth uniform operations speed is required, you must specify this on your purchase order so that we can use the proper special grease.

### Use and maintenance

This type of cylinder, due to its characteristics, has to be used within certain criteria. Correct use will give long and troublefree operation.
Filtered and lubricated compressed air reduce seal wear. Verify that the load will not produce unforeseen stresses. Never combine high speed with heavy load. Always support the long stroke cylinder with intermediate brackets and never exceed the specified working conditions. If maintenance is required, follow the instructions supplied with the repair kit.




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

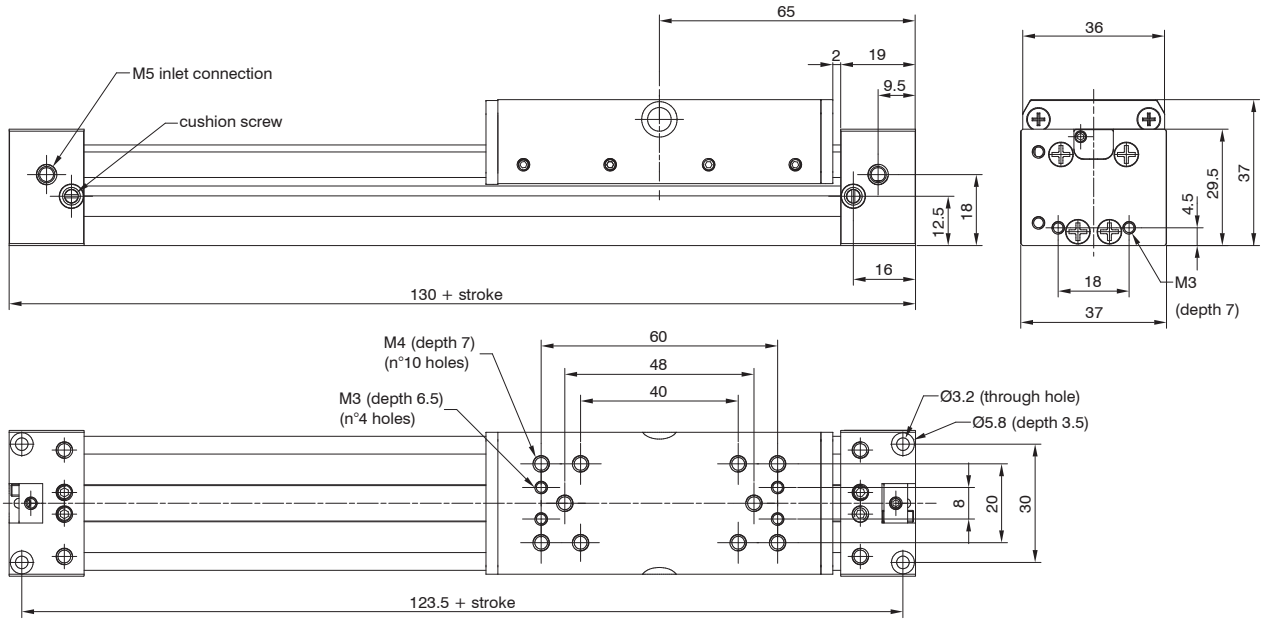
## Basic version (cylinder with plain bearing guide)

**Coding:** 1605.16.stroke.Ⓣ.MH

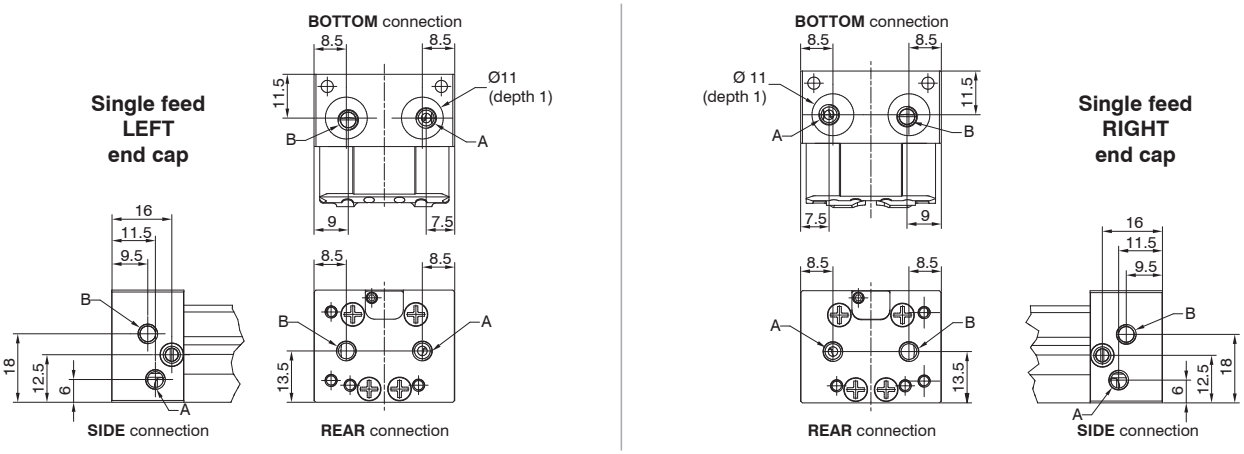
| Ⓣ | END COVERS |
|---|---|
| | **01** = Basic version |
| | **02** = Left end cap-side connection |
| | **03** = Right end cap-side connection |
| | **04** = Left end cap-rear connection* |
| | **05** = Right end cap-rear connection* |
| | **06** = Left end cap-bottom connection |
| | **07** = Right end cap-bottom connection |

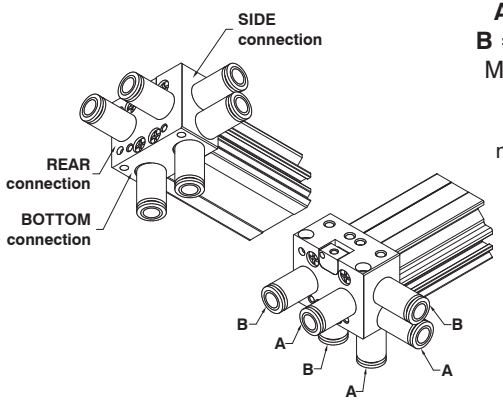
** in case of mounting with 1600.16.01F bracket, use 4mm tube fitting*



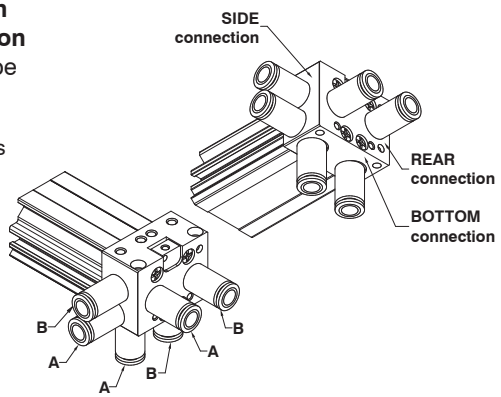



**Possibility of a single feed right or left cylinder head and on 3 different end cap sides**




**A = forward stroke connection**
**B = backwards stroke connection**
M5 tube Ø4 and Ø6 fittings can be used for air connections.
In case of use with 1600.16.01F mounting and REAR air connections use a 4mm pipe fitting.

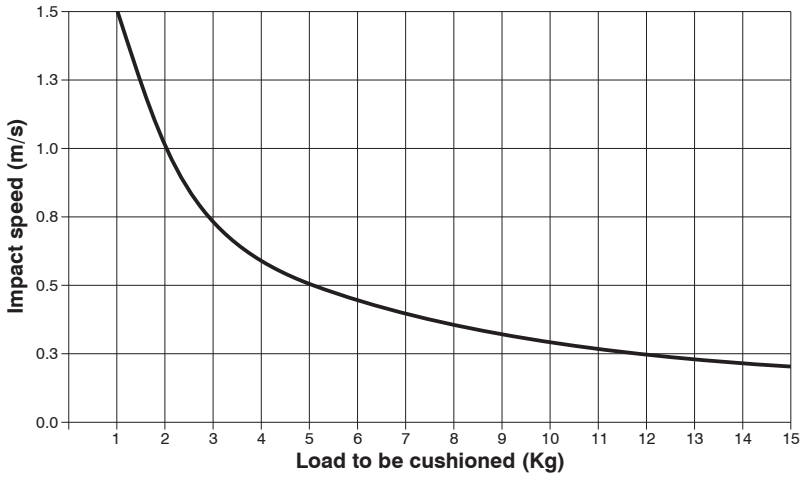





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Operating end stroke decelerator diagram

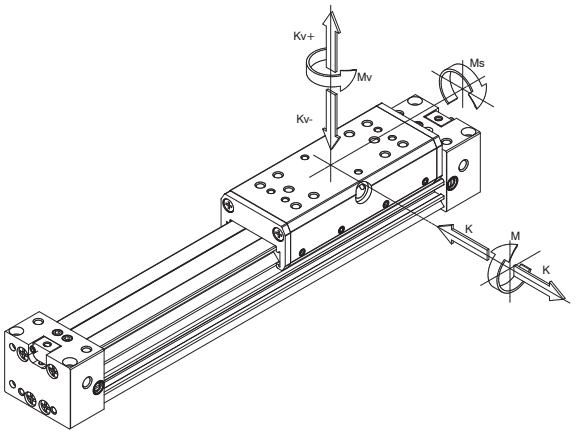
*In case of extreme applications close to the maximum allowed values in the graph it is strongly recommended to add external damping systems.*




## Recommended loads and moments in static conditions

| K1 | K2 | K3 | M | Ms | Mv |
|---|---|---|---|---|---|
| 200 | 250 | 100 | 10 | 2 | 3 |
| (N) | | | (Nm) | | |

*Maximum Load and moments allowed in static or dynamic conditions (max. speed 0,2 m/s)*

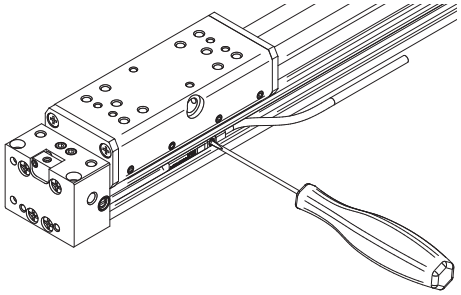



## Magnetic sensors

| Code |
|---|
| 1590... |
| LRS... |
| LHS... |



*The two side slots allow the direct use of 1590....LRS... and LHS... sensors mounted from the top and positioned via the built in screw.*






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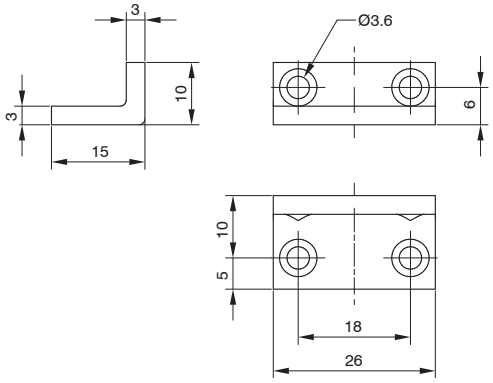
## Foot

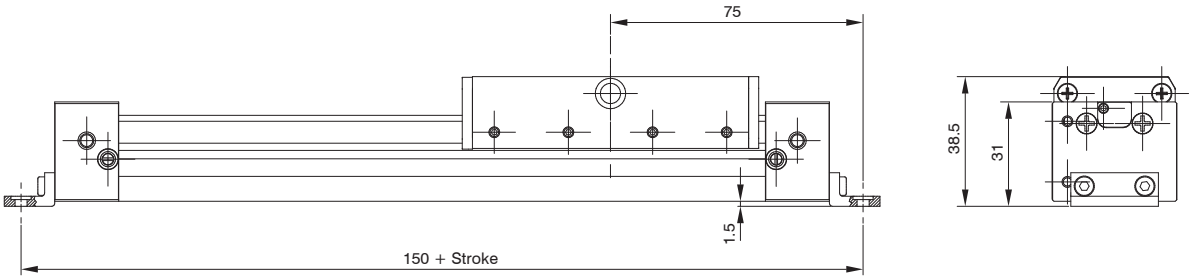
**Coding:** 1600.16.01F
(1 piece)

**Attention:** based on the stroke evaluate the need to use also side mounted supports. (see below)

The kit comprises:
n° 1 foot (plated zinc steel)
n° 2 screws (plated zinc steel)





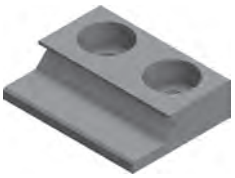


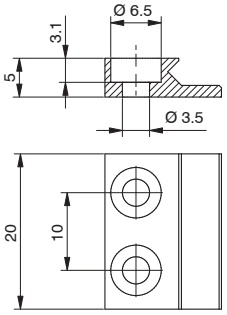


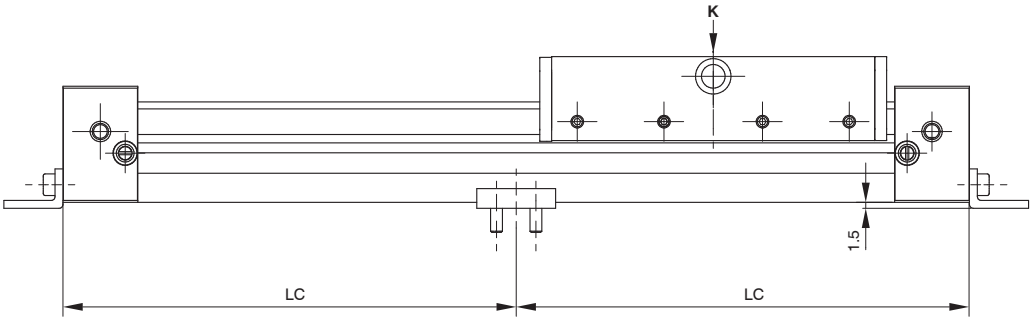
## Intermediate support

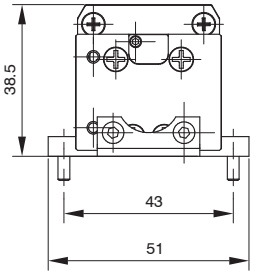
**Coding:** 1600.16.02F
(1 piece)

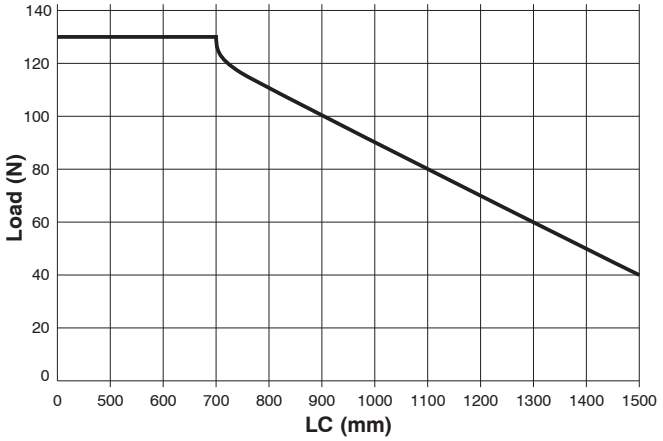
The kit comprises:
n° 1 support (aluminium)
n° 2 screws (plated zinc steel)





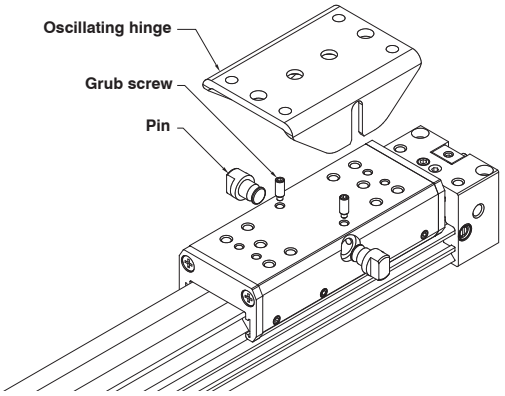

The graph shows the LC limit in conjunction with the applied load K beyond which it is necessaryto mount an intermediate side support in order to prevent the barrel from bending

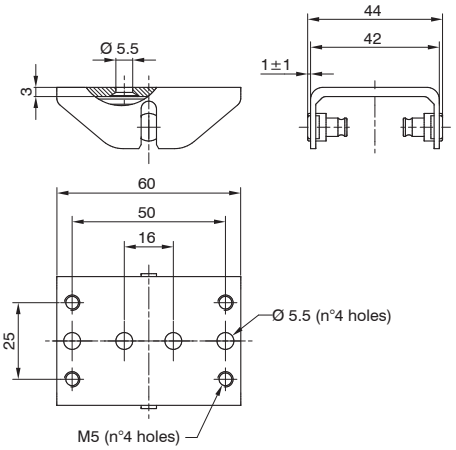
## Oscillating hinge

**Coding:** 1600.16.03F
(1 piece)

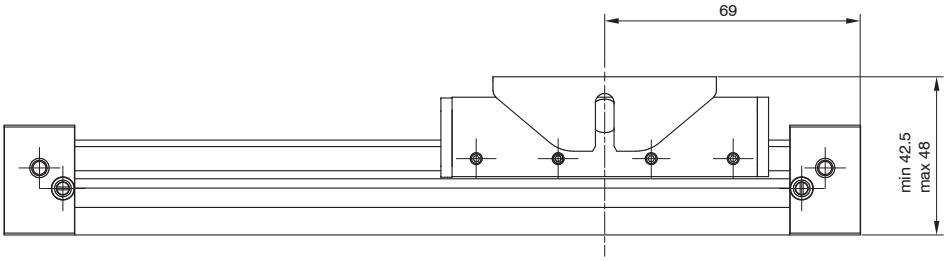
The kit comprises:
n° 2 pins (plated zinc steel)
n° 2 grub screw (steel)
n° 1 oscillating hinge (plated zinc steel)






mounting sequence:
mount the pin into the dedicated housing
tighten the blocking grub screws in the dedicated housing

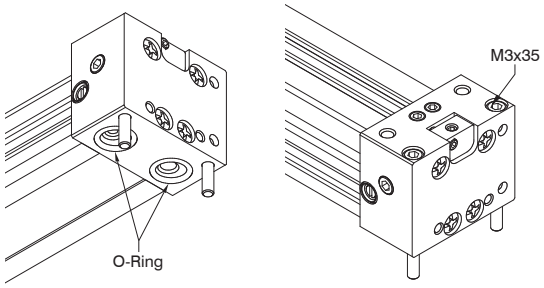



## Direct mounting without brackets

**Coding:** 1600.16.04F
(1 piece)

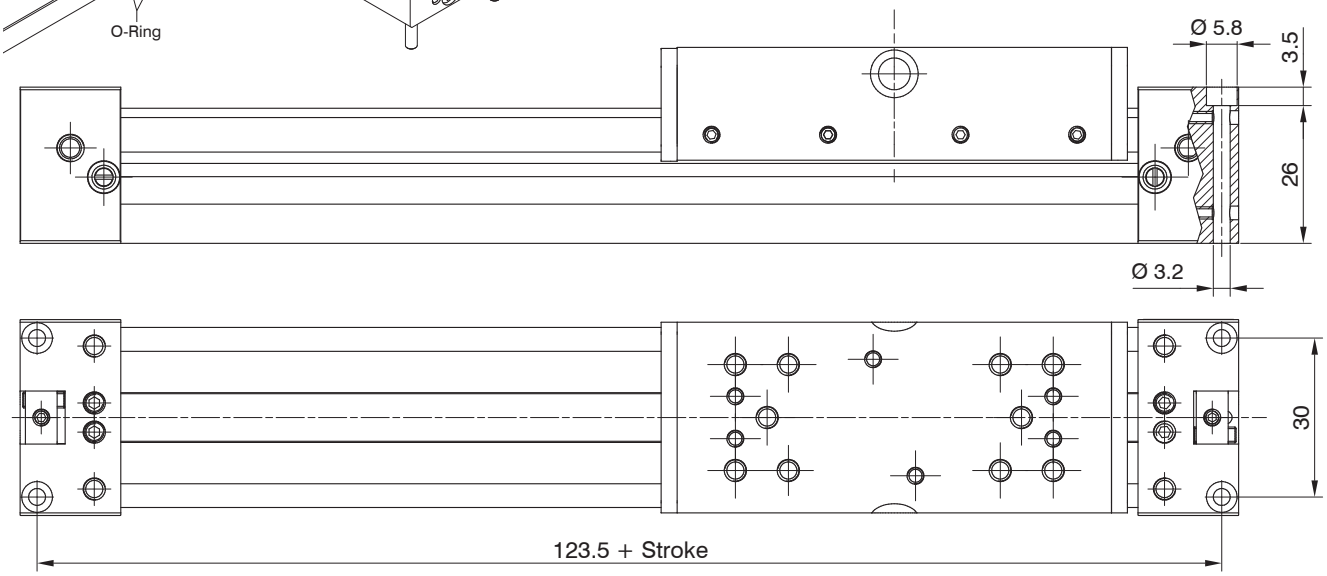
The kit comprises:
n° 4 screws M3x35 (plated zinc steel)
n° 2 O-Rings (NBR)

**Direct mounting without brackets**
Thanks to the mounting holes with counter bores on the end caps it is possible to mount the cylinder directly onto the mounting surface. Having the end caps and barrel flush and in contact with the mounting plate it is not necessary to use any intermediate mounting brackets even in case of long strokes. It is also possible to supply air to the cylinder directly through the mounting plate through the two air connection on the bottom side of the end cap (06.MH and 07.MH) which are machined with counterbores.













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## Series 1330 - 1331 - 1332 - 1333, rotary actuators

### Construction characteristics

| | |
|---|---|
| Central body | oxidised aluminium |
| Cushion bushings | hardened aluminium |
| Barrel | anodised aluminium Ra=0.3-0.5 |
| Rack | C43 |
| Rotating angle adjustment assy | brass |
| Seals | NBR 80 shore rubber |
| Plain bearing guide | acetal resin |
| Pinion | 18 NiCrMo4 cemented and tempered |
| Pistons | vulcanized rubber block on steel core with incorporated permanent magnet or without magnet plus rear spacer for non magnetic version |
| End caps | UNI 5079 aluminium alloy casting |
| Cushion adjustment screws | nickel plated steel |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered air, preferably lubricated |
| Pressure | 10 bar |
| Working temperature | -5 °C ... +70 °C |
| Standard rotation | 90° - 180° - 270° - 360°(+1°) |
| Rotating angle adjustment assy | ±10° (±5° start position, ±5° end position) |

### Use and maintenance

Please follow the suggestions below to ensure a long life for these cylinders:
- use clean and lubricated air.
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

**Please note: air must be dried for applications with lower temperature.**
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

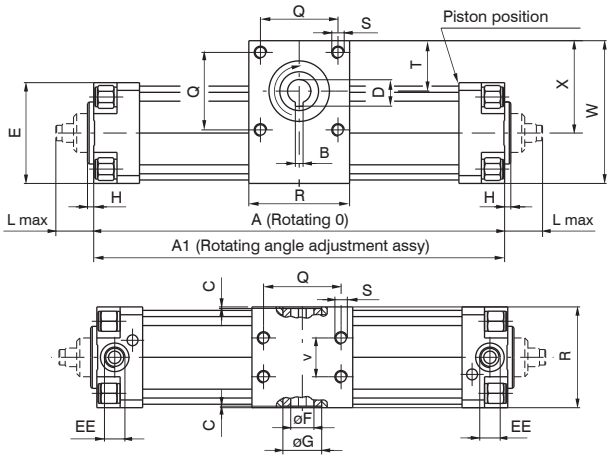
| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|
| Torque moments Nm/bar | 0,9 | 1,7 | 2,9 | 5,55 | 13,2 | 23,8 |
| Axis load max. kg | 8 | 10 | 10 | 12 | 18 | 22 |
| Cushioning angle | 60° | 60° | 50° | 50° | 40° | 40° |

## Female pinion version

**Coding:** 133Ⓥ.Ø.Ⓐ.Ⓡ

| | |
|---|---|
| Ⓥ | VERSION |
| | **0** = magnetic |
| | **1** = non-magnetic |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| Ⓐ | ROTATING ANGLE |
| | **90** = 90° |
| | **180** = 180° |
| | **270** = 270° |
| | **360** = 360° |
| Ⓡ | STANDARD ROTATION |
| | **01** = basic version |
| | **01R** = with rotating adjustment |

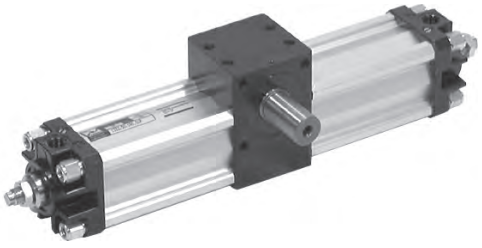


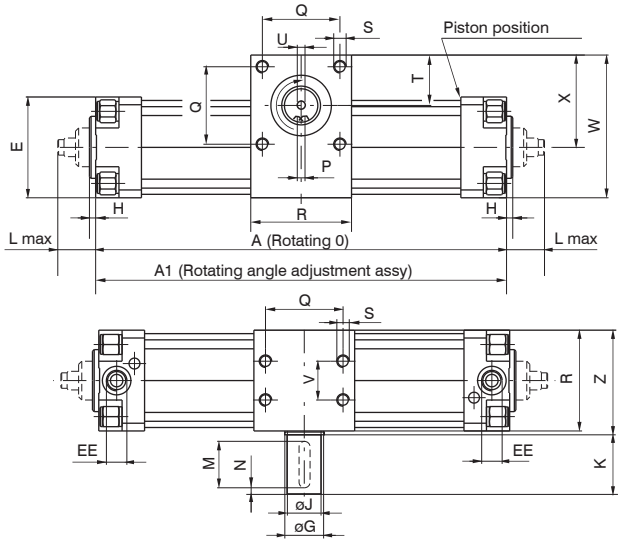



## Male pinion version

**Coding:** 133Ⓥ.Ø.Ⓐ.Ⓡ

| | |
|---|---|
| Ⓥ | VERSION |
| | **2** = magnetic |
| | **3** = non-magnetic |
| Ø | BORE |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| Ⓐ | ROTATING ANGLE |
| | **90** = 90° |
| | **180** = 180° |
| | **270** = 270° |
| | **360** = 360° |
| Ⓡ | STANDARD ROTATION |
| | **01** = basic version |
| | **01R** = with rotating adjustment |








Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Dimensions

| Bore | | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|
| A rot. 0° | | 171 | 195 | 202 | 233 | 268 | 300 |
| A rot. 90° | | 218 | 252 | 265 | 308 | 378 | 427 |
| A rot. 180° | | 265 | 308 | 328 | 382 | 488 | 555 |
| A rot. 270° | | 312 | 364 | 390 | 457 | 598 | 682 |
| A rot. 360° | | 359 | 421 | 453 | 531 | 708 | 809 |
| A1 rot. 0° | | 174 | 198 | 206 | 237 | 274 | 307 |
| A1 rot. 90° | | 221 | 255 | 269 | 312 | 384 | 434 |
| A1 rot. 180° | | 268 | 311 | 332 | 386 | 494 | 562 |
| A1 rot. 270° | | 315 | 367 | 394 | 461 | 604 | 689 |
| A1 rot. 360° | | 362 | 424 | 457 | 535 | 714 | 816 |
| B | | 5 | 5 | 5 | 6 | 6 | 8 |
| C | | 1 | 1 | 1 | 1 | 1 | 1 |
| D | | 17,3 | 17,3 | 17,3 | 20,8 | 22,8 | 28,3 |
| E | | 46 | 52 | 65 | 75 | 95 | 115 |
| Ø F (H 7) | | 15 | 15 | 15 | 18 | 20 | 25 |
| Ø G | | 25 | 25 | 25 | 30 | 40 | 55 |
| H | | 4 | 4 | 4 | 4 | 4 | 4 |
| Ø J (h 7) | | 14 | 14 | 22 | 25 | 30 | 35 |
| K | | 30 | 30 | 40 | 40 | 50 | 50 |
| L max. | | 23 | 23 | 28,5 | 28,5 | 34,5 | 34,5 |
| M | | 25 | 25 | 35 | 35 | 45 | 45 |
| N | | 2,5 | 2,5 | 2,5 | 2,5 | 2,5 | 2,5 |
| P | | 5 | 5 | 6 | 8 | 8 | 10 |
| Q | | 33 | 40 | 50 | 60 | 80 | 80 |
| R | | 50 | 60 | 65 | 75 | 100 | 115 |
| S | | M6 | M6 | M8 | M8 | M10 | M10 |
| T | | 27,5 | 35 | 32,5 | 35,5 | 50 | 54,5 |
| U | | M5 | M5 | M6 | M8 | M8 | M10 |
| V | | 18 | 22 | 25 | 35 | 50 | 60 |
| W | | 71 | 85 | 92 | 105 | 141 | 162 |
| X | | 48 | 59 | 59,5 | 67,5 | 93,5 | 104,5 |
| Z | | 51 | 61 | 66 | 76 | 101 | 116 |
| EE | | G 1/8" | G 1/4" | G 1/4" | G 3/8" | G 3/8" | G 1/2" |
| Piston stroke every 10° of rotation | | 2,61 | 3,14 | 3,49 | 4,14 | 6,11 | 7,07 |
| Female Pinion weight (g) | rot. 90° | 1450 | 2020 | 3050 | 4850 | 10000 | 14900 |
| | rot. 180° | 1600 | 2240 | 3350 | 5350 | 11000 | 16350 |
| | rot. 270° | 1750 | 2460 | 3650 | 5850 | 12000 | 17800 |
| | rot. 360° | 1900 | 2680 | 3950 | 6350 | 13000 | 19250 |
| Male Pinion weight (g) | rot. 90° | 1550 | 2150 | 3280 | 5150 | 10500 | 15700 |
| | rot. 180° | 1700 | 2370 | 3580 | 5650 | 11500 | 17150 |
| | rot. 270° | 1850 | 2590 | 3880 | 6150 | 12500 | 18600 |
| | rot. 360° | 2000 | 2810 | 4180 | 6650 | 13500 | 20050 |

## Sensor brackets codes - 1500._, RS._, HS._

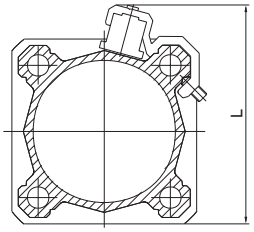
**Coding:** 1320.Ⓣ

| Ⓣ | TYPE |
|---|---|
| | **A** = Ø32-Ø40 |
| | **B** = Ø50-Ø63 |
| | **C** = Ø80-Ø100 |

**Sensor for microbore cylinders**

For technical characteristics and ordering codes see the "Magnetic sensors" sections






| Bore | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|
| L | 60 | 65 | 77 | 87 | 105 | 125 |

## Sensor brackets codes - 1595.HAP

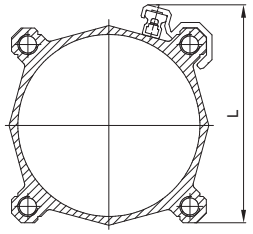
**Coding:** 1320.Ⓣ

| Ⓣ | TYPE |
|---|---|
| | **ASC** = Ø32-Ø40 |
| | **BSC** = Ø50-Ø63 |
| | **CSC** = Ø80-Ø100 |

**Sensor for microbore cylinders**

For technical characteristics and ordering codes see the "Magnetic sensors" sections






| Bore | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|
| L | 60 | 65 | 77 | 87 | 105 | 125 |

## Sensor brackets codes - 1580._,MRS._,MHS

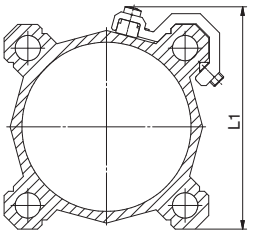
**Coding:** 1320.Ⓣ

| Ⓣ | TYPE |
|---|---|
| | **AS** = Ø32-Ø40 |
| | **BS** = Ø50-Ø63 |
| | **CS** = Ø80-Ø100 |

**Sensor for microbore cylinders**

For technical characteristics and ordering codes see the "Magnetic sensors" sections





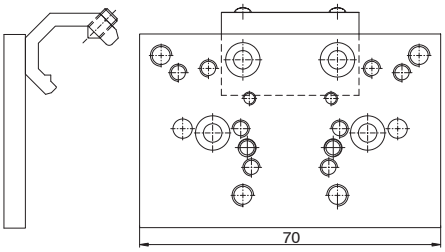

| Bore | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|---|
| L1 | 48 | 54 | 66 | 76 | 96 | 112 |

## Support for solenoid valves

**Coding:** 1320.Ⓣ

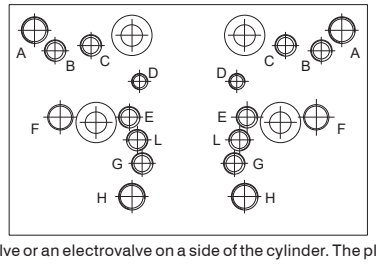
| Ⓣ | SIZE |
|---|---|
| | **15** = Ø32-Ø40 |
| | **16** = Ø50-Ø63 |
| | **17** = Ø80-Ø100 |






Fixing holes for valves series:

A = 414/2
B = 824
C = 828, T488, 488, 484
D = 2400
E = 2600
F = Bases for ISO solenoid valves
G = 858/2
H = T424
L = 888_



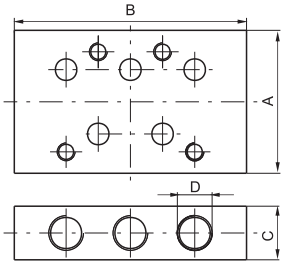

This accessory permits to mount a valve or an electrovalve on a side of the cylinder. The plate can be fitted on the cylinder profiled barrel, and, on it, can be mounted either a threaded distributor or a base on whic can be mounted an ISO distributor. Once installed the connections must be done with fittings and pipes. All of the threaded holes on the support plate are dedicated to different valves series as per attached drawing.

## Bases for ISO solenoid valves

**Coding:** 1320.Ⓝ

| Ⓝ | STANDARDS |
|---|---|
| | **21** = ISO1 |
| | **22** = ISO2 |






| Dimensions | | | | |
|---|---|---|---|---|
| Bases for solenoid valves | A | B | C | D |
| ISO 1 | 40 | 75 | 15 | G 1/8" |
| ISO 2 | 50 | 95 | 20 | G 1/4" |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 6400 - Double rack rotary actuators with turn table

These rotary actuators convert linear motion of a piston into a rotary motion via a rack and pinion device,
using a single pinion-rack system for the 6411 version and a double system on 6400 versions.
The 6410 series actuators have fixed stops at 90 and 180 degrees; while on the 6400 series, rotation can be adjusted between 0 and 190 degrees using variable stops that can also be substituted with hydraulic stoppers (shock absorbers).
These devices are equipped with a rotating table upon which the load is fixed.

| | |
|---|---|
| Body | anodized aluminium |
| Rack | steel |
| Rear end cap | anodized aluminium |
| Piston seals | NBR rubber |
| Pinion | steel |
| Turn table | anodized aluminium |
| Cushioning | elastic bumper (hydraulic damper available on request) |
| End caps | anodized aluminium |

| | |
|---|---|
| Fluid | filtered and preferably lubricated air or not (if lubricated the lubrication must be continuous) |
| Max. working pressure | 10 bar (for type 100 and 200, 6 bar) |
| Temperature °C | -5 ... +70 |
| Rotation angle range | 0...190° |
| Max. rotation | 190° |
| Rotation speed | s/90° (see rotation time table) |

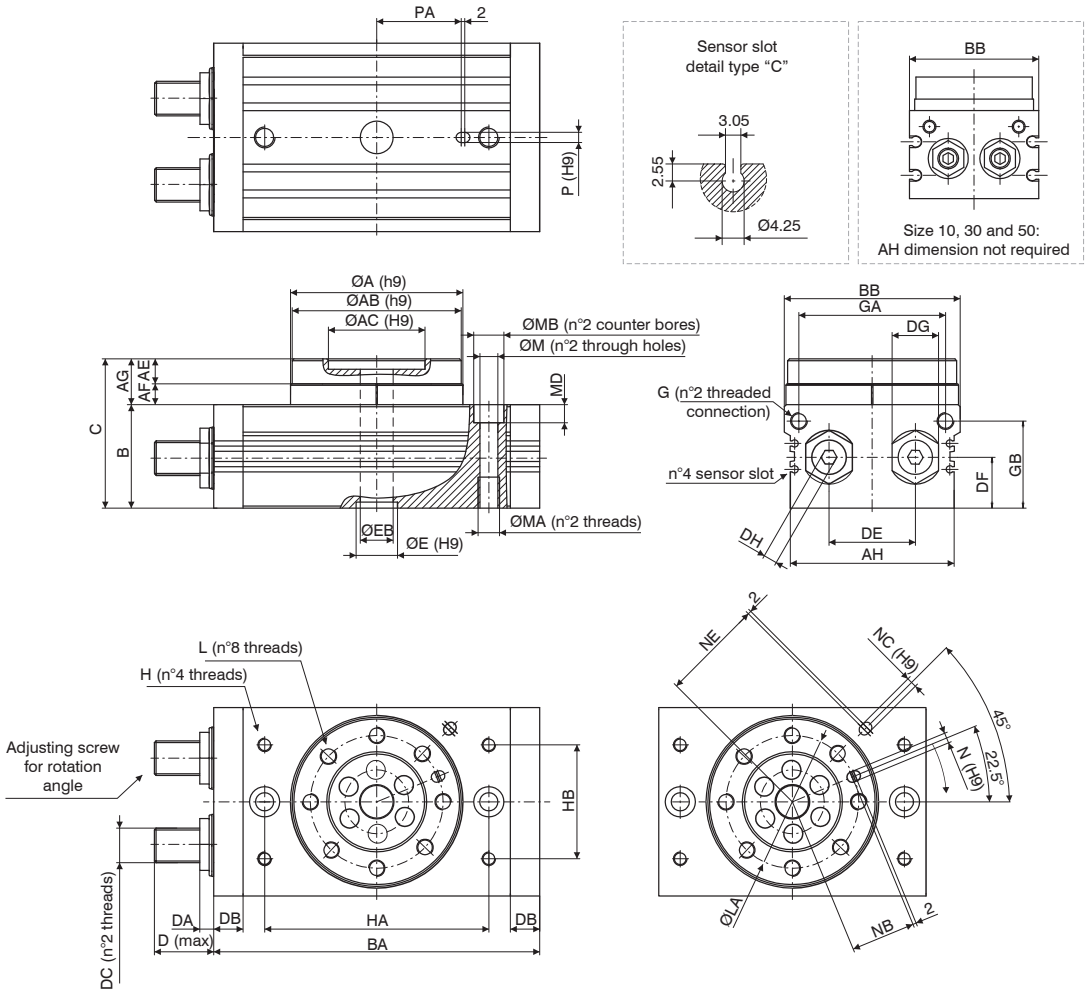
## Double rack rotary actuators with turn table

**Coding:** 6400.Ⓟ.Ⓥ

| | |
|---|---|
| Ⓟ | PISTON |
| | **10** = (piston ø15) |
| | **30** = (piston ø20) |
| | **50** = (piston ø25) |
| | **100** = (piston ø32) |
| | **200** = (piston ø40) |
| Ⓥ | VERSION |
| | **A** = Standard |
| | **R** = Cushioning (Shock absorber) |








| Size | | 10 | 30 | 50 | 100 | 200 |
|---|---|---|---|---|---|---|
| Ø piston | | Ø15 | Ø21 | Ø25 | Ø32 | Ø40 |
| ØA$^{h9}$ | | 46 | 67 | 77 | 100 | 118 |
| ØAB$^{h9}$ | | 45 | 65 | 75 | 98 | 116 |
| ØAC$^{h9}$ | | 20 | 32 | 35 | 56 | 64 |
| | Useful depth | 4 | 4,5 | 5 | 6 | 9 |
| AE | | 8 | 10 | 12 | 14,5 | 16,5 |
| AF | | 5 | 7 | 8 | 12,5 | 15,5 |
| AG | | 13 | 17 | 20 | 27 | 32 |
| AH | | / | / | / | 95 | 114 |
| B$^{+0,5/0}$ | | 34 | 40 | 46 | 59 | 74 |
| BA | | 92 | 127 | 152 | 189 | 240 |
| BB$^{+0,5/0}$ | | 50 | 70 | 80 | 102 | 120 |
| C$^{+0,5/0}$ | | 47 | 57 | 66 | 86 | 106 |
| D | | 17,7 | 25 | 31,4 | 34,3 | 40,2 |
| DA | | 8,6 | 10,6 | 14 | 8 | 20 |
| DB | | 9,5 | 12 | 15,5 | 17 | 24 |
| DC | | M8x1 | M10x1 | M14x1,5 | M20x1,5 | M27x1,5 |
| DE | | 20 | 29 | 38 | 50 | 60 |
| DF | | 15,5 | 18,5 | 22 | 29,5 | 36,5 |
| DG | | 12 | 14 | 19 | 27 | 36 |
| DH | | 4 | 5 | 6 | 8 | 10 |
| ØE$^{H9}$ | | 15 | 22 | 26 | 24 | 32 |
| | Useful depth | 3 | 3 | 3 | 3,5 | 5,5 |
| ØEB | | 5 | 9 | 10 | 19 | 24 |
| G | | M5x0,8 | G1/8 | G1/8 | G1/8 | G1/8 |

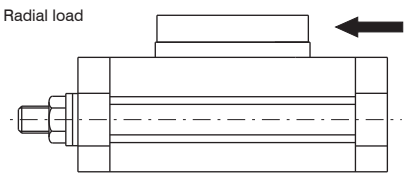
| Size | | 10 | 30 | 50 | 100 | 200 |
|---|---|---|---|---|---|---|
| Ø piston | | Ø15 | Ø21 | Ø25 | Ø32 | Ø40 |
| GA | | 34,5 | 50 | 63 | 85 | 103 |
| GB | | 27,8 | 32 | 37,5 | 50,5 | 65,5 |
| H | | M5x0,8 | M6x1 | M8x1,25 | M8x1,25 | M12x1,75 |
| | Useful depth | 8 | 8 | 8 | 10 | 13 |
| HA | | 60 | 84 | 100 | 130 | 150 |
| HB | | 27 | 37 | 50 | 66 | 80 |
| L | | M5x0,8 | M6x1 | M8x1,25 | M10x1,5 | M12x1,75 |
| | Useful depth | 8 | 10 | 12 | 14,5 | 16,5 |
| LA | | 32 | 48 | 55 | 77 | 90 |
| M | | 6,8 | 8,6 | 10,5 | 10,4 | 14,2 |
| MA | | M8x1,25 | M10x1,5 | M12x1,75 | M12x1,75 | M16x2 |
| | Useful depth | 12 | 15 | 18 | 18 | 25 |
| MB | | 11 | 14 | 18 | 17,5 | 20 |
| MD | | 6,5 | 8,5 | 10,5 | 10,5 | 12,5 |
| N$^{H9}$ | | 3 | 4 | 5 | 6 | 8 |
| | Useful depth | 3,5 | 4,5 | 5,5 | 6,5 | 8,5 |
| NB | | 15 | 23 | 26,5 | 37,5 | 44 |
| NC$^{H9}$ | | / | / | / | 6 | 8 |
| | Useful depth | / | / | / | 4,5 | 4,5 |
| NE | | / | / | / | 59 | 69 |
| P$^{H9}$ | | / | / | / | 6 | 8 |
| | Useful depth | / | / | / | 4,5 | 6,5 |
| PA | | / | / | / | 49 | 54 |
| Weight (g) | | 530 | 1230 | 2080 | 4100 | 7650 |





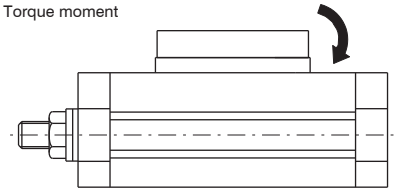
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

| Permissible loads | | | | | | |
|---|---|---|---|---|---|---|
| Size | | 10 | 30 | 50 | 100 | 200 |
| Radial Load (N) | | 80 | 200 | 320 | 400 | 550 |
| Axial Load (N) | Fc | 80 | 370 | 450 | 710 | 1000 |
| | Ft | 75 | 200 | 300 | 500 | 750 |
| Torque Moment (Nm) | | 2,5 | 5,5 | 9,5 | 18 | 25 |

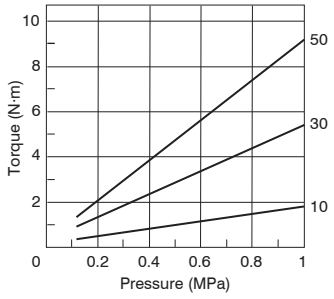


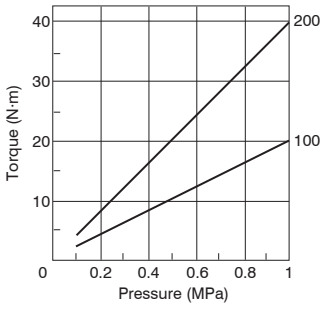







## Torque Diagrams




## Rotation time (sec./90°)

| Dimension | With adjusting screw | With hydraulic decelerator |
|---|---|---|
| 10 - 30 - 50 | 0,2 ... 1 | 0,2 ... 0,7 |
| 100 | 0,2 ... 2 | 0,2 ... 1 |
| 200 | 0,2 ... 2,5 | 0,2 ... 1 |

## Kinetic energy (J)

| Dimension | With adjusting screw | With hydraulic decelerator |
|---|---|---|
| 10 | 0,006 | Please apply to our tech-dpt for info (as general rule expressed valves can be multiplied by 3) |
| 30 | 0,045 | |
| 50 | 0,08 | |
| 100 | 0,30 | |
| 200 | 0,52 | |

# Series 6411

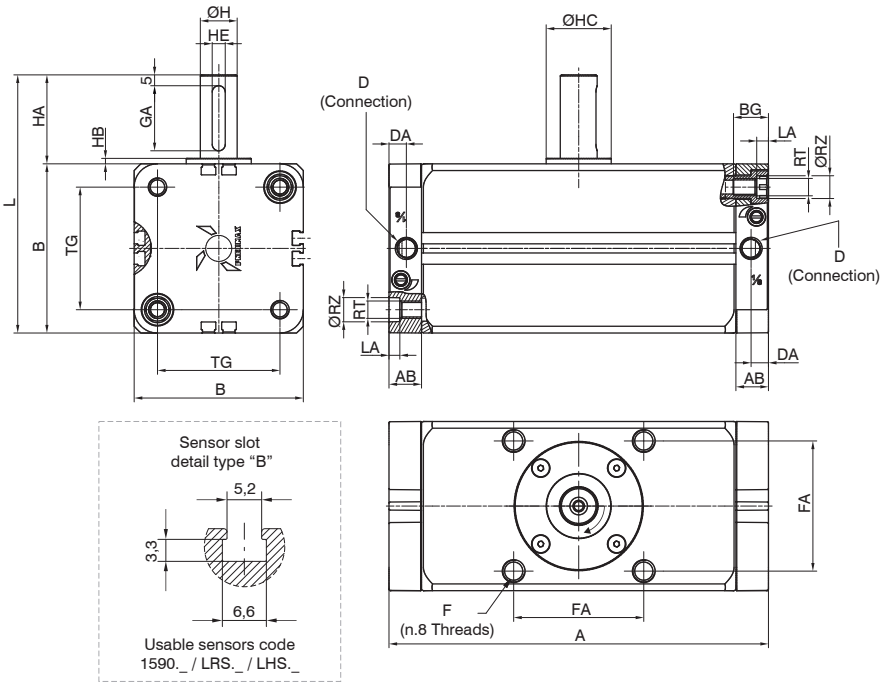
## Single rack rotary actuators

**Coding:** 6411.Ø.Ⓥ

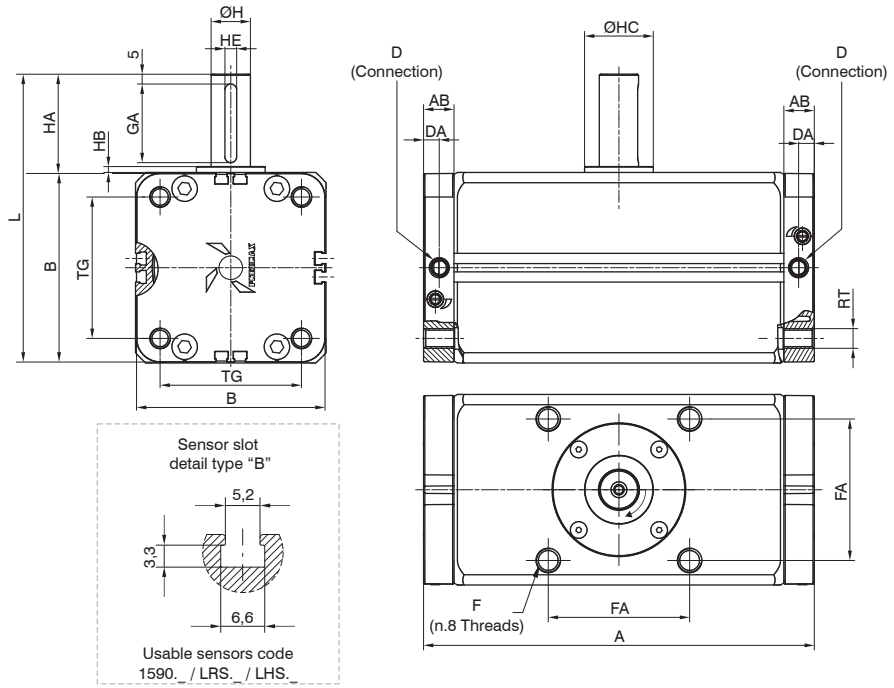
| | |
|---|---|
| Ø | BORE |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| Ⓥ | VERSION |
| | **90** = rotation 90° |
| | **180** = rotation 180° |



### Overall dimensions Ø50 and Ø63




### Overall dimensions Ø80 and Ø100




| Bore | | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|
| A | 90° | 156 | 175 | 199 | 259 |
| | 180° | 189 | 214 | 243 | 325 |
| AB | | 15 | 15 | 15,5 | 18,5 |
| B | | 66 | 78 | 97 | 116 |
| BG | | 16 | 16 | / | / |
| D | | G1/8 | G1/8 | G1/8 | G1/8 |
| DA | | 8 | 8 | 8 | 8 |
| F | | M8x1,25 | M10x1,5 | M12x1,75 | M12x1,75 |
| | Useful depth | 12 | 15 | 15 | 18 |
| FA | | 48 | 60 | 72 | 85 |
| GA | | 25 | 30 | 40 | 45 |
| H | | 15 | 17 | 20 | 25 |
| HA | | 36 | 41 | 50 | 60 |
| HB | | 2,5 | 2,5 | 3 | 4 |
| HC | | 25 | 30 | 35 | 39,5 |
| HEH9 | | 5 | 6 | 6 | 8 |
| L | | 102 | 119 | 147 | 176 |
| LA | | 5 | 5 | / | / |
| RT | | M8 | M8 | M10 | M10 |
| RZ | | 10,5 | 10,5 | / | / |
| TG | | 46,5 | 56,5 | 72 | 89 |
| Weight (g) | 90° | 1575 | 2451 | 4162 | 6989 |
| | 180° | 1815 | 2823 | 4774 | 8329 |

| Construction characteristics | |
|---|---|
| Body | anodized aluminium |
| Rear end cap | anodized aluminium |
| Piston | aluminium |
| Piston seals | NBR rubber |
| Pinion | steel |
| Rack | steel |

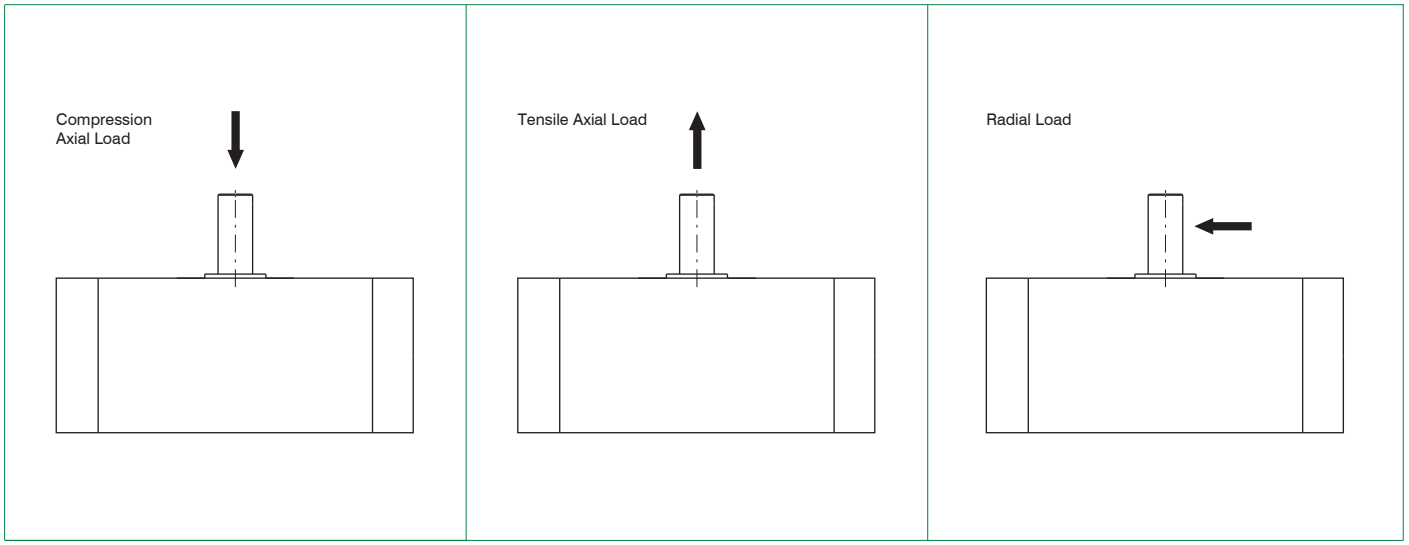
| Operational characteristics | |
|---|---|
| Fluid | filtered and preferably lubricated air or not (if lubricated the lubrication must be continuous) |
| Max working pressure (bar) | 10 bar |
| Temperature °C | -5 °C ... +70 °C |
| Rotation tolerance | 0°...+4° |



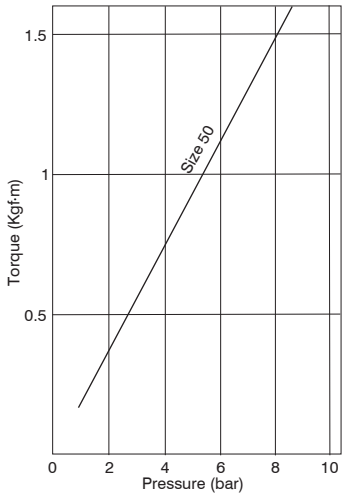


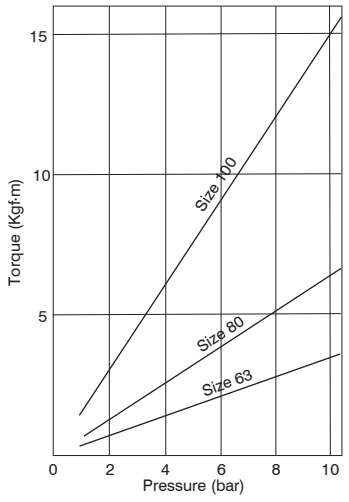
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

| Permissible Loads | | | | |
|---|---|---|---|---|
| Bore | Ø50 | Ø63 | Ø80 | Ø100 |
| Radial Load (N) | 200 | 300 | 400 | 600 |
| Compression Axial Load | 500 | 600 | 900 | 1000 |
| Tensile Axial Load | 200 | | | |




## Torque Diagrams



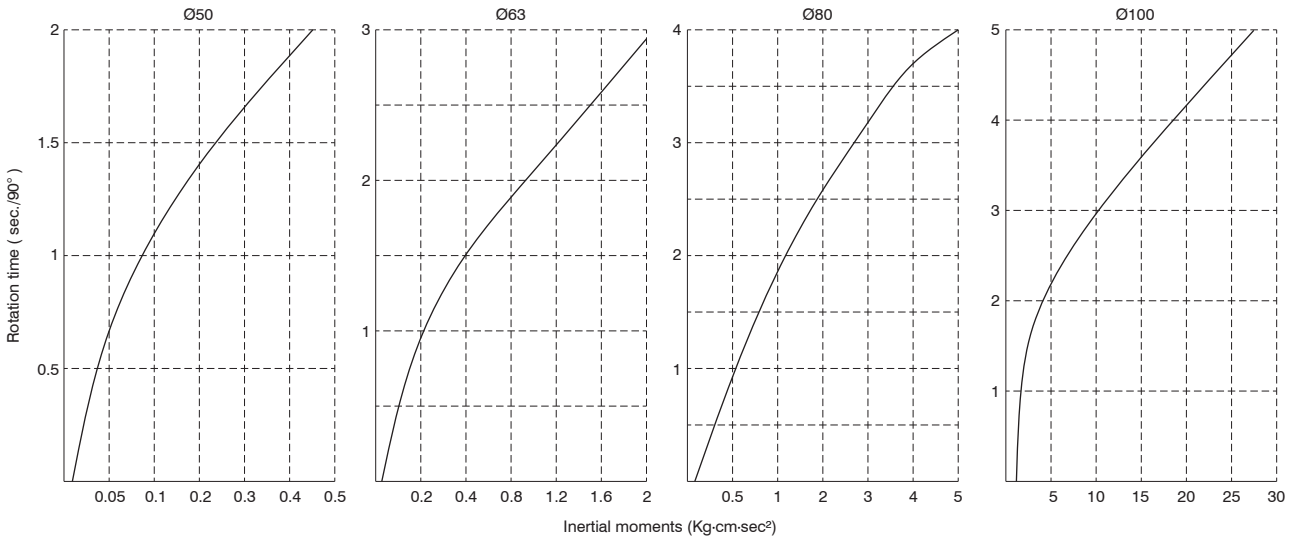




## Max Kinetic energy (Kg·cm)

Kinetic energy (cushioning angle 35°)

| Bore | | | |
|---|---|---|---|
| Ø50 | Ø63 | Ø80 | Ø100 |
| 10 | 15 | 20 | 30 |

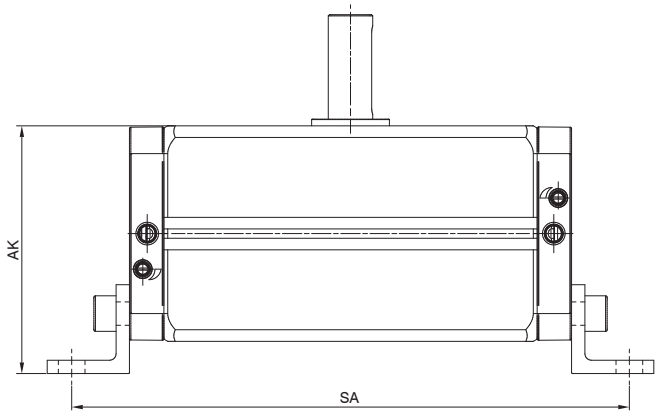
## Rotation time according to inertial moments

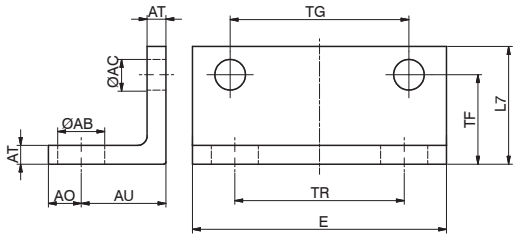


## Short mounting foot brackets (in sheet metal MS1)

**Coding:** 1540.Ø.05/1F
The kit comprises:
n° 1 foot (plated zinc steel)
n° 2 screws (plated zinc steel)






| Bore | | Ø50 | Ø63 | Ø80 | Ø100 |
|---|---|---|---|---|---|
| AK | | 78 | 89 | 111,5 | 132 |
| SA | 90° | 198 | 217 | 251 | 313 |
| | 180° | 231 | 256 | 295 | 379 |




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

# Series 6420

## Vane type rotary actuators

**Coding:** 6420.Ø.Ⓡ.Ⓥ

| | |
|---|---|
| Ø | SIZE |
| | **10** = Ø10 |
| | **15** = Ø15 |
| | **20** = Ø20 |
| | **30** = Ø30 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| Ⓡ | ROTATING ANGLE |
| | **90** = 90° |
| | **180** = 180° |
| | **270** = 270° |
| Ⓥ | VERSION |
| | = Without adjustable rotation angle, and without sensor support |
| | **R** = With adjustable rotation angle |
| | **S** = With sensor supports |
| | **T** = With adjustable rotation angle and sensor supports |

The vane type rotary actuators, 6420 series is designed to operate at 90-180 or 270 deg. in a contained space. Dimensionally are more compact than other types of rotary actuators.
The range includes bore sizes from 10 to 100 in 4 configurations:

- basic
- with adjustable rotation angle
- with sensor supports
- with adjustable rotation angle and sensor supports

The bodies are in aluminium , the shafts in chrome plated steel and the seals in NBR. The sensing support kit enables for the sensors to be positioned in any position. The rotary angle adjustment mechanism enables the adjustment of the complete rotation on bore sizes 10 to 40 while on the others sizes carries as standard hydraulic dampers which enable the adjustment only of the last part of the rotation. The units can be fixed using the thread on the body or the through holes on the body. On bore sizes 50 to 100 the shaft runs into ball bearings which ensure high resistence.

| Construction characteristics | |
|---|---|
| Body | anodized aluminium |
| Piston rod | steel |
| Seals | NBR |
| Vane | vulcanized NBR rubber on steel core |
| Cushioning | elastic bumper; hydraulic dampers<br>from size Ø50 ... Ø100 versions R or T |

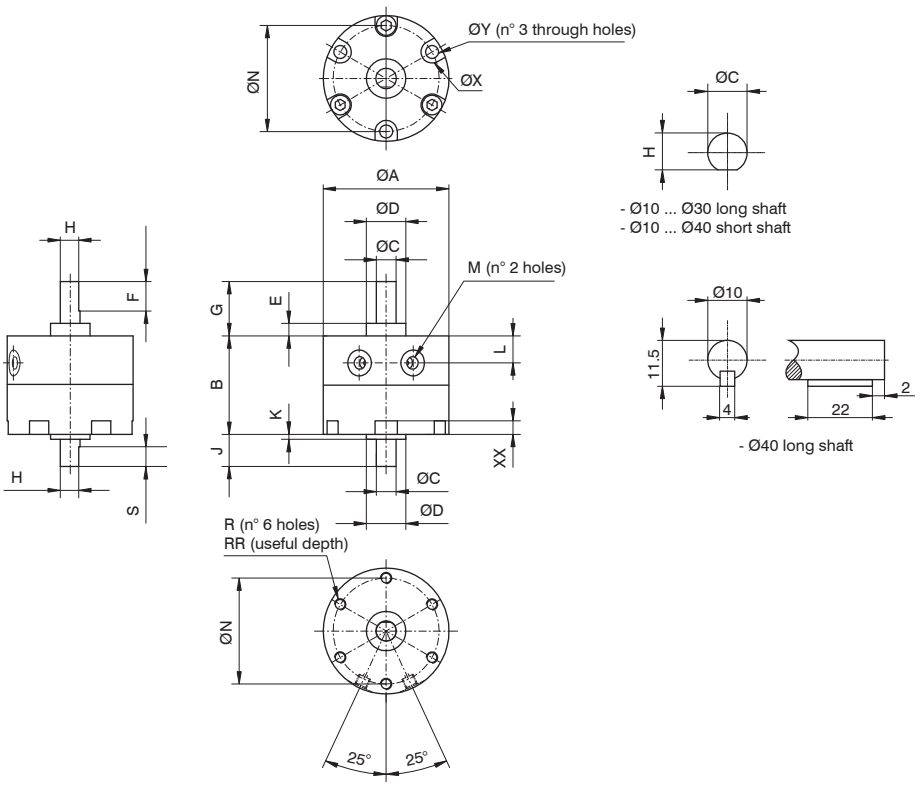
| Operational characteristics | |
|---|---|
| Fluid | filtered air, preferably lubricated |
| Rotation range | 90° - 180° - 270° |
| Working pressure (bar) | 1,5...7 |
| Temperature °C | 0 ... +50 |
| Max. allowed leak | Ø10...Ø40 = 0,3 Nl/min / Ø50...Ø100 = 0,5 Nl/min |

## Overall dimensions Ø10 ... Ø40





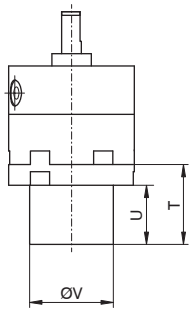




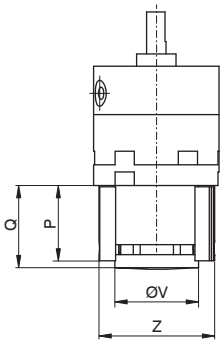

3

PNEUMATIC ACTUATION

### Adjustable rotation angle version




### With sensor support version

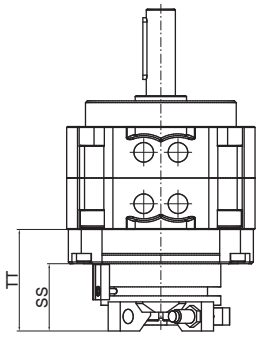



| Bore - Rotation | 10 - 90° / 10 - 180° / 10 - 270° | 15 - 90° / 15 - 180° / 15 - 270° | 20 - 90° / 20 - 180° / 20 - 270° | 30 - 90° / 30 - 180° / 30 - 270° | 40 - 90° / 40 - 180° / 40 - 270° |
|---|---|---|---|---|---|
| ØA | 30 | 35 | 44 | 51 | 64 |
| B | 17 | 20,1 | 29,1 | 40 | 45 |
| ØC | 4 | 5 | 6 | 8 | 10 |
| ØD | 9 | 12 | 14 | 16 | 25 |
| E | 3 | 4 | 4,5 | 5 | 6,5 |
| F | 9 | 10 | 10 | 12 | 22 |
| G | 14 | 18 | 20,3 | 22 | 30 |
| H | 3,5 | 4,5 | 5,5 | 7,5 | 9 |
| J | 8 | 9 | 9,6 | 13 | 15 |
| K | 1 | 1,5 | 1,6 | 2 | 4,5 |
| L | 4,2 | 5 | 8,5 | 11 | 9,5 |
| M | M5x0,8 | M5x0,8 | M5x0,8 | M5x0,8 | M5x0,8 |
| ØN | 24 | 29 | 36 | 43 | 56 |
| P | 23,3 | 28 | 28 | 30,8 | 33 |
| Q | 24 | 29,5 | 30,5 | 34 | 36 |
| R | M3x0,5 | M3x0,5 | M4x0,7 | M5x0,8 | M5x0,8 |
| RR | 3 | 3 | 4,5 | 9 | 9 |
| S | 5 | 6 | 7 | 8 | 9 |
| T | 24 | 28 | 28,5 | 32,5 | 34,5 |
| U | 18 | 22 | 21 | 24 | 26 |
| ØV | 18 | 24 | 30 | 34 | 34 |
| ØX | 6 | 6 | 7,5 | 9 | 9 |
| XX | 3,5 | 3,5 | 4,5 | 5,5 | 5,5 |
| ØY | 2,3 | 2,3 | 3,2 | 4,2 | 4,2 |
| Z | 29 | 34 | 42 | 47 | 47 |
| Weight (g) Base | 28 | 48 | 112 | 200 | 342 |
| Weight (g) With regulation rotation system | 78 | 116 | 240 | 390 | 805 |

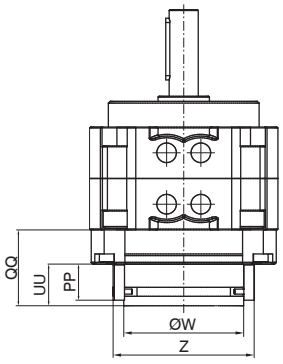


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

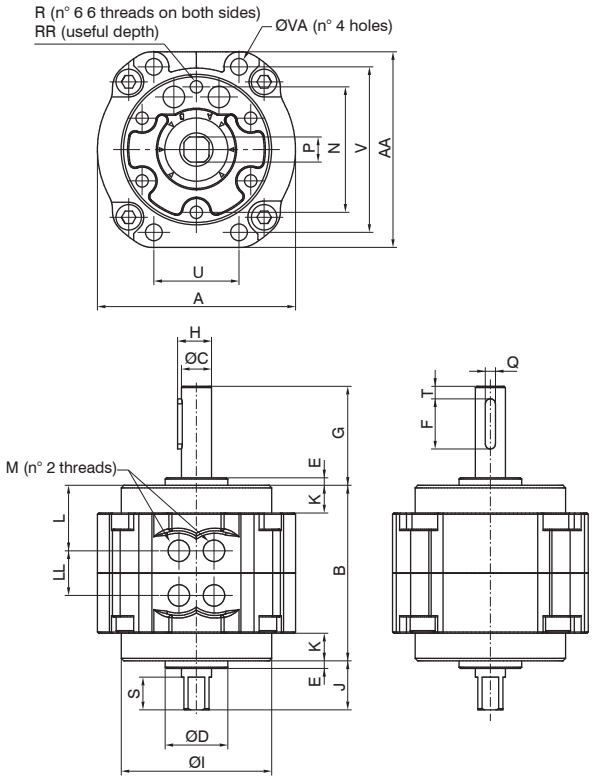
## Adjustable rotation angle version




## With sensor support version



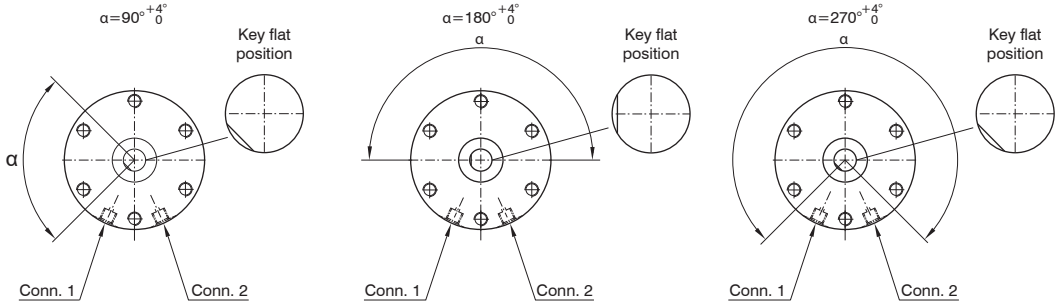

## Overall dimensions Ø50 ... Ø100




| Bore - Rotation | 50 - 90° | 63 - 90° | 80 - 90° | 100 - 90° |
|---|---|---|---|---|
| | 50 - 180° | 63 - 180° | 80 - 180° | 100 - 180° |
| | 50 - 270° | 63 - 270° | 80 - 270° | 100 - 270° |
| A | 79 | 98 | 110 | 140 |
| AA | 78 | 98 | 110 | 140 |
| B | 70 | 80 | 90 | 103 |
| ØC | 12 | 15 | 17 | 25 |
| ØD | 25 | 28 | 30 | 45 |
| E | 3 | 3 | 3 | 4 |
| F | 20 | 25 | 36 | 40 |
| G | 39,5 | 45 | 53,5 | 65 |
| H | 13,5 | 17 | 19 | 29 |
| ØI | 60 | 75 | 88 | 108 |
| J | 19,5 | 21 | 23,5 | 30 |
| K | 11 | 14 | 15 | 11,5 |
| L | 26 | 28,9 | 30 | 35,4 |
| LL | 18 | 22,2 | 30 | 32,2 |
| M | G1/8" | G1/8" | G1/4" | G1/4" |
| N | 50 | 60 | 70 | 80 |
| P | 10 | 12 | 13 | 19 |
| PP | 21 | 21 | 21 | 21 |
| Q | 4 | 5 | 5 | 7 |
| QQ | 39,4 | 43 | 44 | 48,5 |
| R | M6x1 | M8x1,25 | M8x1,25 | M10x1,5 |
| RR | 8 | 10 | 14 | 14 |
| S | 13 | 14 | 16 | 16 |
| SS | 38 | 38 | 39 | 39,5 |
| T | 5 | 7,5 | 5 | 5 |
| TT | 53 | 56,5 | 59 | 63 |
| U | 34 | 39 | 48 | 60 |
| UU | 24,5 | 24,5 | 24,5 | 24,5 |
| V | 66 | 83 | 94 | 120 |
| ØVA | 6,5 | 9 | 9 | 11 |
| ØW | 60 | 60 | 70 | 70 |
| Z | 73 | 73 | 83 | 83 |
| Weight (g) Base | 760 | 1290 | 1920 | 4100 |
| Weight (g) With regulation rotation system | 1100 | 1690 | 2370 | 4840 |

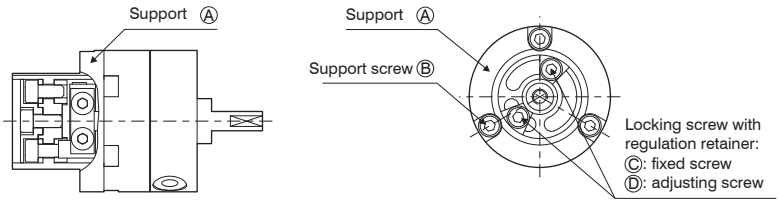
**Spline position and adjustable rotation angle Ø10 ... Ø40**

## ROTATING SHAFT KEY FLAT POSITION




## ROTATION ANGLE SETUP

To regulate the rotation angle (codes 6420..R or T), follow the instructions below

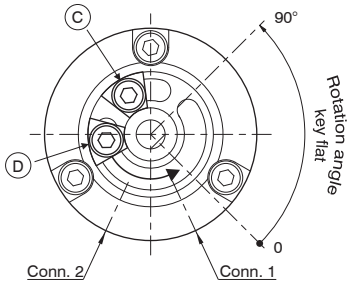



**Phase 1**: choose the regulation configuration based on the following options (consider the actuator base position):
**rotation 90°**, **regulation 0 ... 90°**, **rotation 180°**, **regulation 0 ... 180°**, **rotation 270°**, **regulation 0 ... 175°**

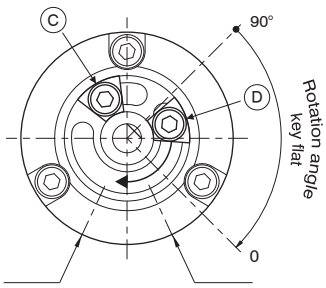
### ROTATION CONFIGURATION

**90°**

**Standard version**
from 0° to 90°



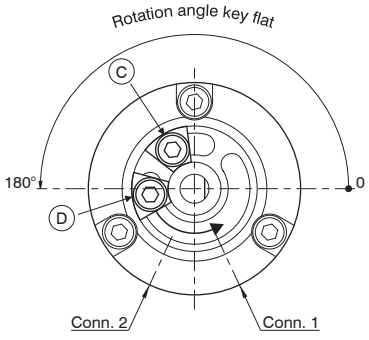

from 90° to 0°



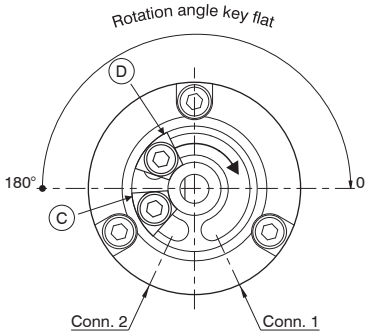

### ROTATION CONFIGURATION

**180°**

**Standard version**
from 0° to 180°




from 180° to 0°







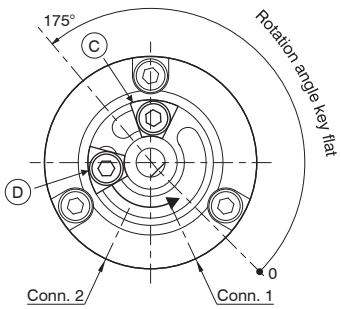
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

**Spline position and adjustable rotation angle Ø10 ... Ø40**

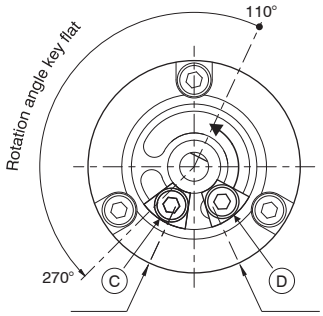
## ROTATION CONFIGURATION

### 270°

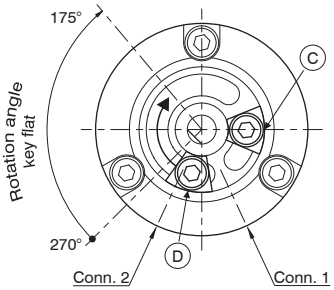
**Standard version**
from 0° to 175°



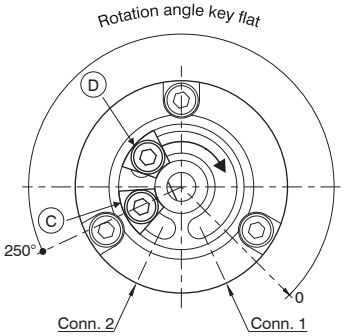

from 110° to 270°




from 270° to 175°




from 250° to 0°

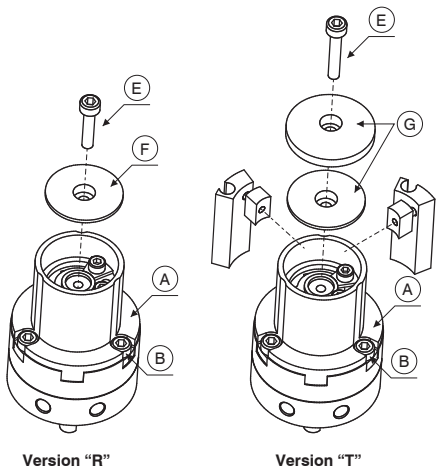



Ⓒ = **Fixed screw** Ⓓ = **Adjusting screw**

**Phase 2**: if the desired settings do not correspond to the basic version settings:

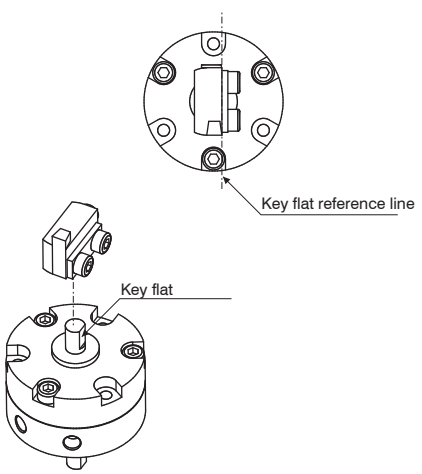
- remove screw Ⓔ and disk Ⓕ or Ⓖ (depending on the version) (see figure 1)
- remove screws Ⓑ, the actuator support Ⓐ (see figure 1) and unlock blocking screws Ⓒ and Ⓓ (see rotation configuration)
- position screws Ⓒ and Ⓓ and the key flat of rotating shaft as indicated in the chosen rotation configuration in order to align the key flat of rotating shaft (see figure 2)
- re-assemble actuator support Ⓐ, tighten screws Ⓑ
- position screws Ⓒ and Ⓓ according to the desired adjustment and tighten the screws
- re-assemble disk Ⓕ or Ⓖ and screw Ⓔ

**Figure 1**




**Version "R"** **Version "T"**

**Figure 2**

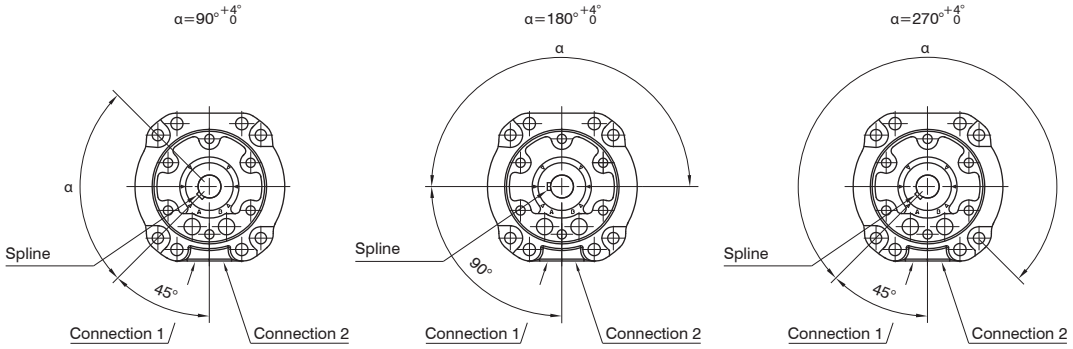





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**Spline position and adjustable rotation angle Ø50 ... Ø100**

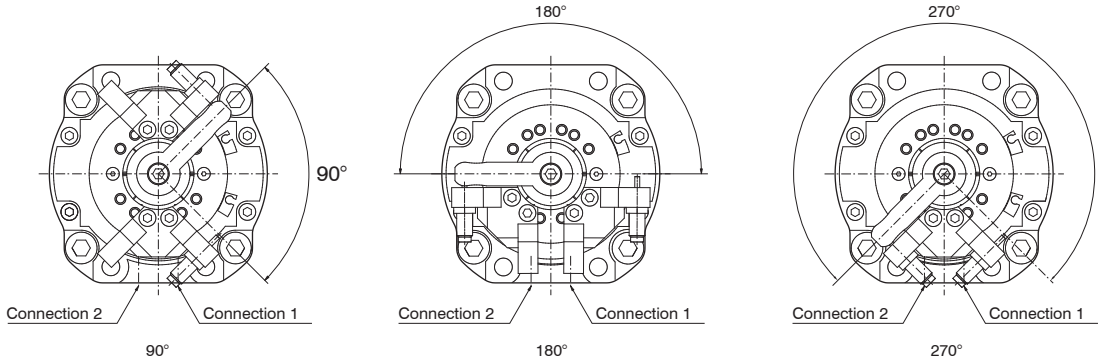
## ROTATING SHAFT SPLINE POSITION




## ROTATION ANGLE SETUP

The version with adjustable rotation angle (cod. 6420..R or T) is available with hydraulic shock absorbers which enable to regulate the rotation angle by 15° and to decelerate moving mass.
Example:

- 90° rotation - 15° for each deceleration = 60°
- 180° rotation - 15° for each deceleration = 150°
- 270° rotation - 15° for each deceleration = 240°



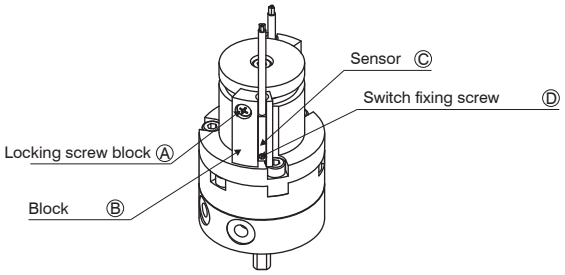


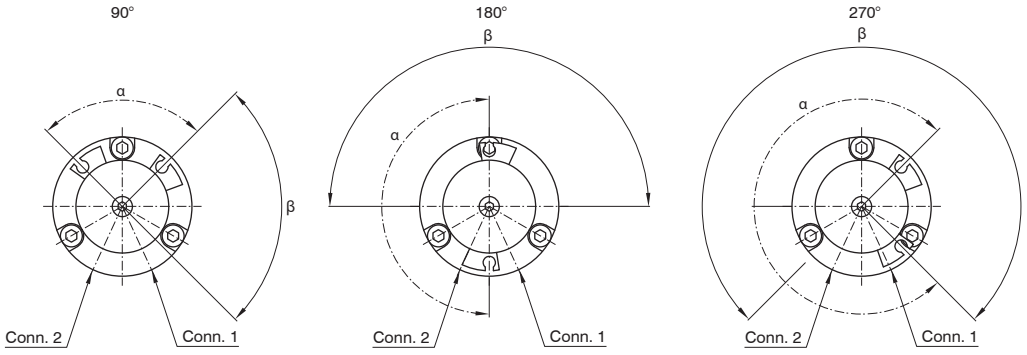


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**Switch positioning instructions Ø10 ... Ø40**

**Phase 1**: unfasten screw Ⓐ
**Phase 2**: assemble the switch Ⓒ into the dedicated housing Ⓑ and lock with screw Ⓓ
**Phase 3**: rotate block Ⓑ in the desired position (see following image)




**α**: magnet rotating angle
**β**: shaft key flat rotating angle
For correct functionality position the switch within angle **α**
**Phase 4**: tighten screw Ⓐ
**Phase 5**: repeat the following phases for the second switch

## AVAILABLE SENSORS



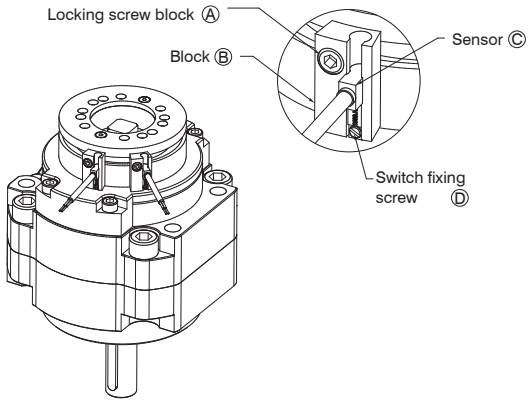
| Code |
|---|
| 1581.U |
| TRS.U |
| 1581.HAP |
| THS.P |

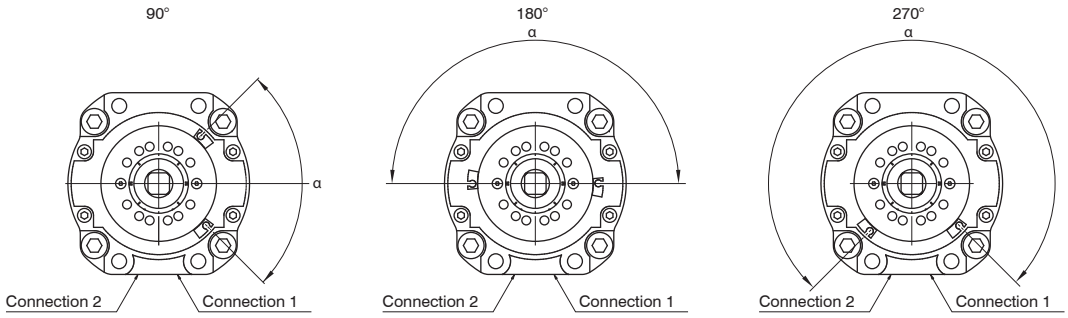


| Code |
|---|
| 1583.DC |
| 1583.HAP |
| THR.P |

**Switch positioning instructions Ø50 ... Ø100**

**Phase 1**: unfasten screw Ⓐ
**Phase 2**: assemble the switch Ⓒ into the dedicated housing Ⓑ and lock with screw Ⓓ
**Phase 3**: rotate block Ⓑ in the desired position (see following image)




**α**: magnet rotating angle (that corresponds to the shaft key flat rotating angle)
For correct functionality position the switch within angle **α**
**Phase 4**: tighten screw Ⓐ
**Phase 5**: repeat the following phases for the second switch

## AVAILABLE SENSORS



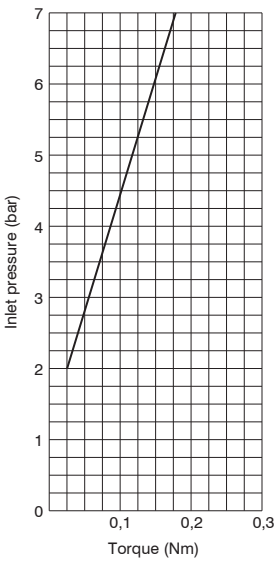
| Code |
|---|
| 1583.DC |
| 1583.HAP |
| THR.P |



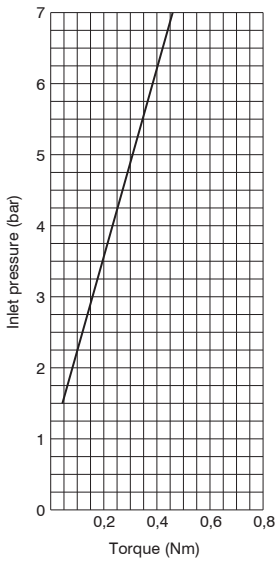

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## Available torques

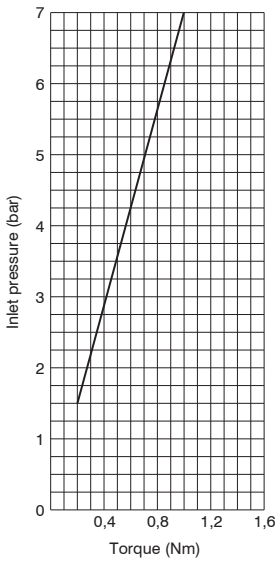
Ø10



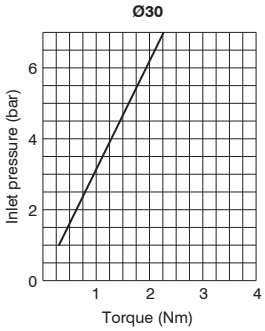

Ø15



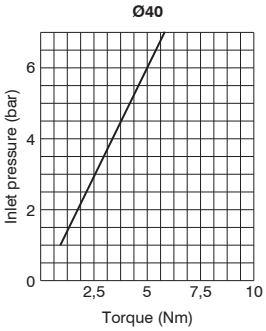

Ø20



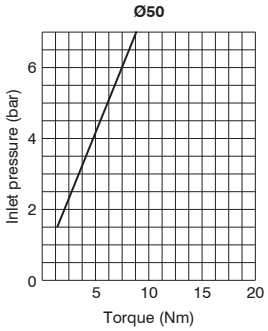

Ø30



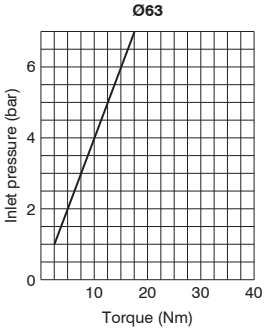

Ø40



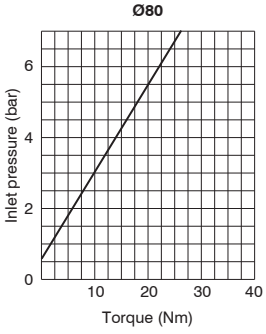

Ø50



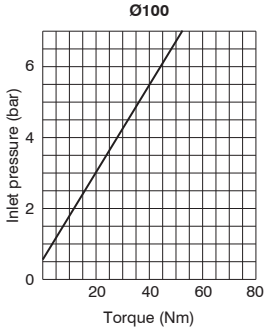

Ø63




Ø80



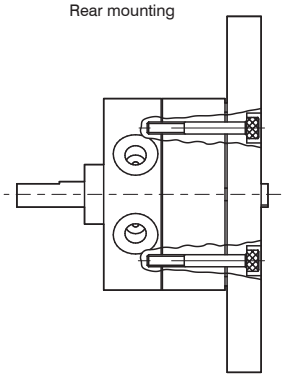

Ø100



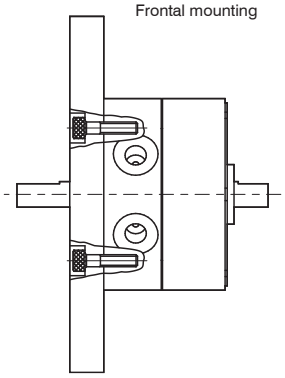
## Direct mounting

### Mounting types

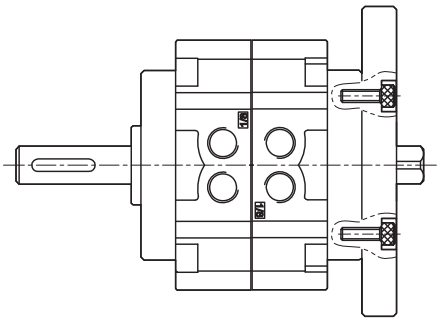
Rear mounting



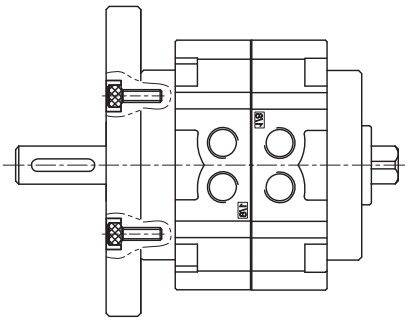
Frontal mounting



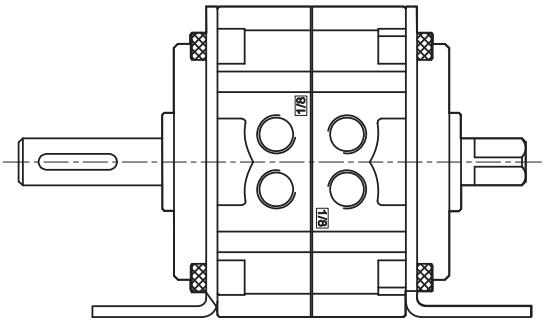
Rear mounting



Frontal mounting



Mounting with flanges







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## Series 6300

Pneumatic grippers from the 6300 series are typically used in complex systems such as assembly machines, robots, manipulators etc. This series covers the wide range requirements of this sector, allowing a variety of applications.
The range includes grippers equipped with holding fingers operating from -10° to +30° degrees, with 180° degree opening, or a parallel guided gripper with great rigidity throughout the stroke.
The parallel grippers cater for larger openings (three different strokes for each diameter) with synchronised operation via a pinion-rack system with high strength thanks to a double piston mechanism.
For the typical application of supplying a piece upon to a machine tool, make provision for an automatic three-pronged movement carried along by a wedge mechanism, containing the elevated force dimensions.
The holding fingers can have a tolerance reference as a precise fixing device for the catching mechanism.
Every type of "hand" offers different functional levels of performance at varying diameters and lengths, secondary to the application by the "fingers".

### Construction characteristics

| | Materials | Series | | | | | |
|---|---|---|---|---|---|---|---|
| Body | Anodized aluminium | 6301 | 6302 | 6303 | 6310 | 6311 | 6312 |
| Piston | AISI 303 stainless steel | 6301 | / | / | / | / | / |
| | Aluminium | / | 6302 | 6303 | / | 6311 | 6312 |
| | Aluminium or stainless steel (based on bore) | / | / | / | 6310 | / | / |
| Fingers | Steel | 6301 | 6302 | 6303 | 6310 | / | 6312 |
| | Anodized aluminium | / | / | / | / | 6311 | / |
| Rear end cap | Anodized aluminium | 6301 | 6302 | 6303 | 6310 | / | / |
| Seals | oil resistant NBR rubber | 6301 | / | / | 6310 | / | / |
| Piston rod | Steel | / | / | / | / | 6311 | / |
| Rack | Steel | / | / | / | / | 6311 | / |
| Pinion | Steel | / | / | / | / | 6311 | / |
| Wedge | Steel | / | / | / | / | / | 6312 |

### Operational characteristics

| | All series |
|---|---|
| Fluid | filtered and preferably lubricated air or not (if lubricated the lubrication must be continuous) |
| Working pressure | 1 ... 6 bar (double acting) - 2.5 ... 6 bar (single acting) |
| Working temperature | -5 °C ... +70 °C |

| | 6301 | 6302 | 6303 | 6310 | 6311 | 6312 |
|---|---|---|---|---|---|---|
| Opening total stroke | -10° ... 30° | -3° ... 180° | -5° ... 180° | / | / | / |
| Maximum operating frequency | from Ø10 to Ø25, 190 cycles/minute | from Ø10 to Ø25, 60 cycles/minute | from Ø20 to Ø25, 60 cycles/minute from Ø32 to Ø50, 30 cycles/minute | from Ø10 to Ø25, 180 cycles/minute | / | from Ø16 to Ø25, 120 cycles/minute from Ø32 to Ø63, 60 cycles/minute from Ø80 to Ø125, 30 cycles/minute |
| Working pressure | / | / | / | / | Ø10: 1.5 … 6 bar Ø16 … Ø40: 1 … 6 bar | 2 … 6 bar (Ø16-Ø20-Ø25) 1 … 6 bar (Ø32 ... Ø125) |
| Function | / | / | / | / | Double acting | Double acting |

| | 6301 | | |
|---|---|---|---|
| | Bore | Double acting | Single acting |
| Holding force (Nm) at 5 bar | Ø10 | 0,1 | 0,07 |
| | Ø16 | 0,4 | 0,30 |
| | Ø20 | 0,7 | 0,55 |
| | Ø25 | 1,35 | 1,08 |

## Pneumatic grippers, angular - Standard version

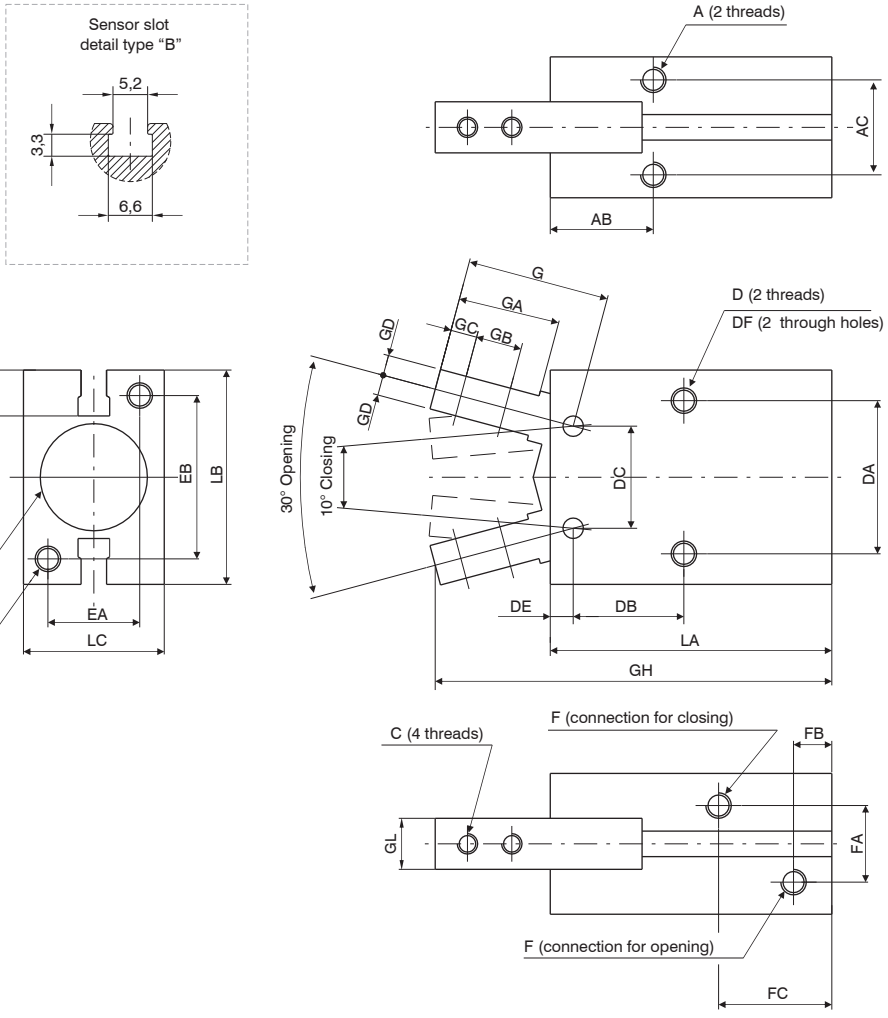
**Coding:** 6301.Ø.Ⓥ

| | |
|---|---|
| Ø | BORE |
| | **10** = Ø10 |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| Ⓥ | VERSION |
| | **D** = Double acting |
| | **S** = Single acting (N.O.) |

### Overall dimensions

| Bore | | Ø10 | Ø16 | Ø20 | Ø25 |
|---|---|---|---|---|---|
| A | | M3x0,5 | M4x0,7 | M5x0,8 | M6 |
| | Useful depth | 6 | 6,5 | 8 | 10 |
| AB | | 11,6 | 14,6 | 20,2 | 23,9 |
| AC | | 11,4 | 16 | 18,6 | 22 |
| C | | M2,5x0,45 | M3x0,5 | M4x0,7 | M5x0,8 |
| D | | M3x0,5 | M4x0,7 | M5x0,8 | M6 |
| | Useful depth | 5 | 8 | 10 | 12 |
| DA | | 16 | 24 | 30 | 36 |
| DB | | 12,8 | 16,2 | 21,7 | 25,8 |
| DC | | 10 | 16 | 20 | 25 |
| DE | | 2,8 | 3,9 | 4,5 | 4,6 |
| DF | | 2,6 | 3,4 | 4,3 | 5,1 |
| E | | M3x0,5 | M4x0,7 | M5x0,8 | M6 |
| | Useful depth | 6 | 8 | 10 | 12 |
| EA | | 12 | 15 | 18 | 22 |
| EB | | 18 | 22 | 32 | 40 |
| F | | M3x0,5 | M5x0,8 | M5x0,8 | M5x0,8 |
| FA | | 11 | 13 | 15 | 20 |
| FB | | 7,2 | 7 | 7,5 | 7,7 |
| FC | | 18,8 | 18,3 | 22,2 | 23,5 |
| G | | 17,2 | 22,6 | 28 | 37,5 |
| GA | | 12 | 16 | 20 | 27 |
| GB | | 5,7 | 7 | 9 | 12 |
| GC | | 3 | 4 | 5,2 | 8 |
| GD | | 2 | 3,5 | 4 | 5 |
| GH | | 52,4 | 62,5 | 78,7 | 92 |
| $GL^{0/-0,1}$ | | 6,4 | 8 | 10 | 12 |
| LA | | 38,6 | 44,6 | 55,2 | 60,4 |
| LB | | 23 | 30,6 | 42 | 52 |
| LC | | 16,4 | 23,6 | 27,6 | 33,6 |
| $M^{H9}$ | | 11 | 17 | 21 | 26 |
| PA | | 5,4 | 5,8 | 9 | 11,5 |
| Weight (g) | | 40 | 90 | 180 | 315 |







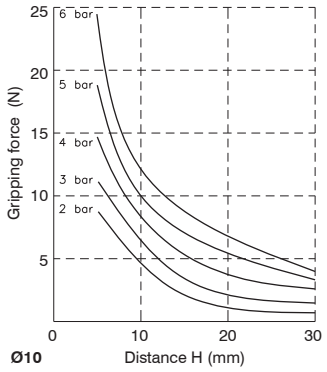

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

### Gripping force 5 bar (Nm)

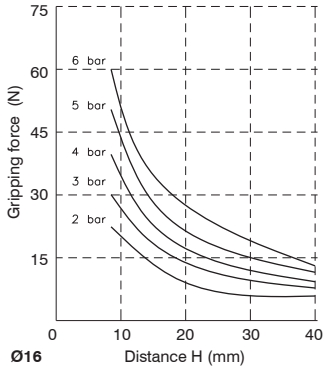
| Bore | Ø10 | Ø16 | Ø20 | Ø25 |
|---|---|---|---|---|
| Double acting (Nm) | 0,1 | 0,4 | 0,7 | 1,35 |
| Single acting (Nm) | 0,07 | 0,3 | 0,55 | 1,08 |

**Note:** Bore selection should be made considering a holding force 10 to 20 times the component weight.
In case of acceleration/deceleration a further margin of safety should be considered.

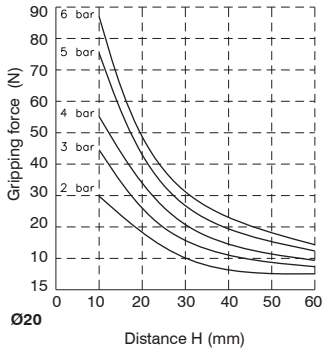
### Double acting



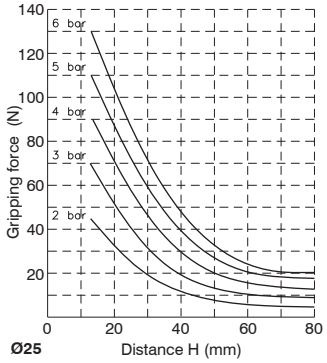
**Ø10**



**Ø16**

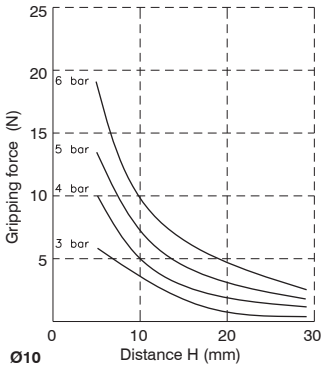


**Ø20**

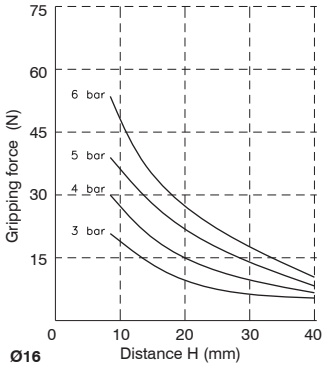


**Ø25**

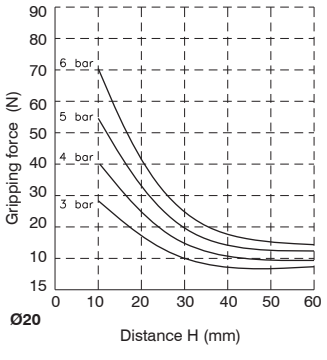
### Single acting



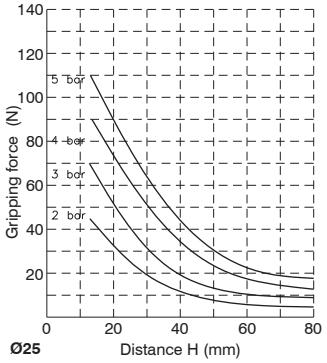
**Ø10**



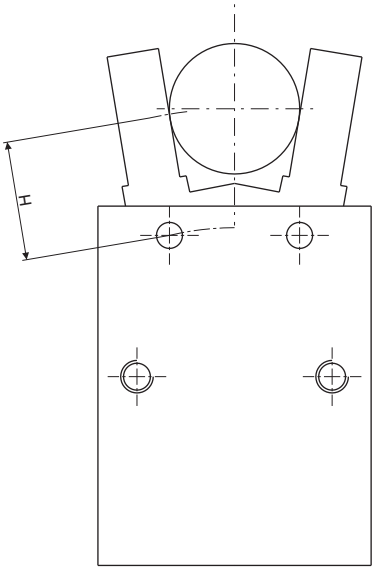
**Ø16**



**Ø20**



**Ø25**



## Pneumatic grippers, 180 °angular

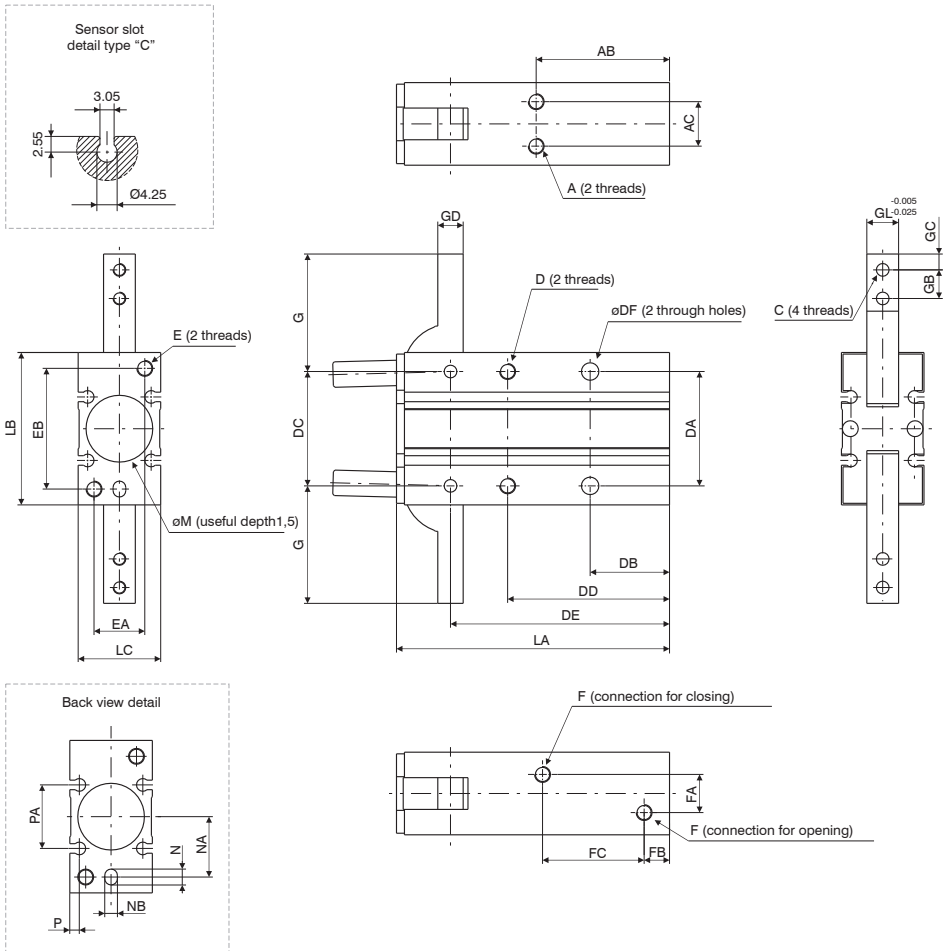
**Coding:** 6302.Ø.D

| | |
|---|---|
| Ø | BORE |
| | **10** = Ø10 |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |



### Overall dimensions

| Bore | | Ø10 | Ø16 | Ø20 | Ø25 |
|---|---|---|---|---|---|
| A | | M3x0,5 | M4x0,7 | M5x0,8 | M6x1 |
| | Useful depth | 4 | 5 | 8 | 10 |
| AB | | 30 | 33 | 42 | 50 |
| AC | | 9 | 12 | 14 | 16 |
| C | | M3x0,5 | M3x0,5 | M4x0,7 | M5x0,8 |
| D | | M3x0,5 | M4x0,7 | M5x0,8 | M6x1 |
| | Useful depth | 6 | 8 | 10 | 12 |
| DA | | 24 | 30 | 36 | 42 |
| DB | | 18 | 20 | 25 | 30 |
| DC | | 22 | 28 | 36 | 45 |
| DD | | 35 | 41 | 50 | 60 |
| DE | | 47,5 | 55,5 | 69 | 86 |
| DF | | 3,4 | 4,5 | 5,5 | 6,6 |
| E | | M3x0,5 | M4x0,7 | M5x0,8 | M6x1 |
| | Useful depth | 6 | 8 | 10 | 12 |
| EA | | 9 | 12 | 16 | 18 |
| EB | | 24 | 30 | 38 | 46 |
| F | | M5x0,8 | M5x0,8 | M5x0,8 | M5x0,8 |
| FA | | 3 | 8 | 12 | 14 |
| FB | | 7 | 7 | 8 | 8 |
| FC | | 23 | 25 | 32 | 42 |
| G | | 23,5 | 28,5 | 37 | 45 |
| GB | | 6 | 7 | 9 | 12 |
| GC | | 3 | 4 | 5 | 6 |
| GD | | 4 | 5 | 8 | 10 |
| GL | | 6 | 8 | 10 | 12 |
| LA | | 58 | 69 | 86 | 107 |
| LB | | 30 | 38 | 48 | 58 |
| LC | | 15 | 20 | 26 | 30 |
| N | | 4 | 4 | 5 | 5 |
| | Useful depth | 3 | 3 | 4 | 4 |
| NO | | 9 | 15 | 19 | 23 |
| ØM$^{H9}$ | | 11 | 17 | 21 | 26 |
| ØNB$^{H9}$ | | 3 | 3 | 4 | 4 |
| P | | 2 | 2,5 | 3 | 3 |
| PA | | 13 | 18 | 20 | 24 |
| Weight (g) | | 70 | 150 | 320 | 550 |



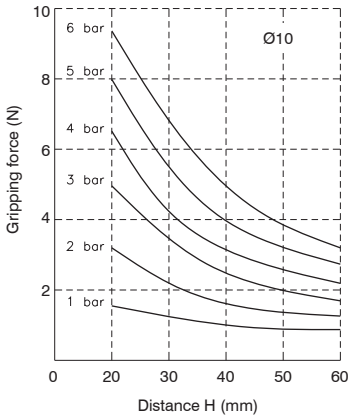


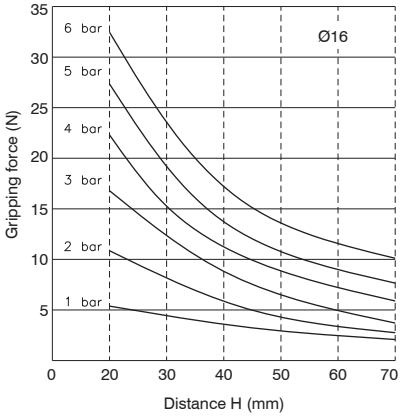


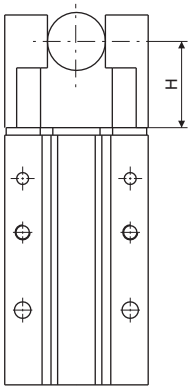

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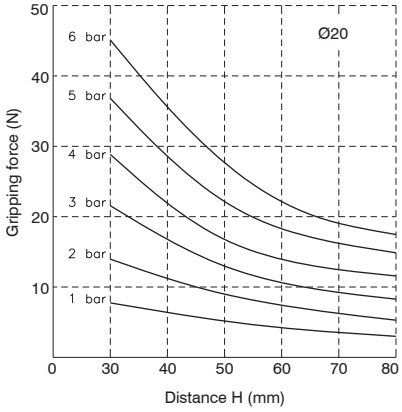
## Gripping force 5 bar (Nm)

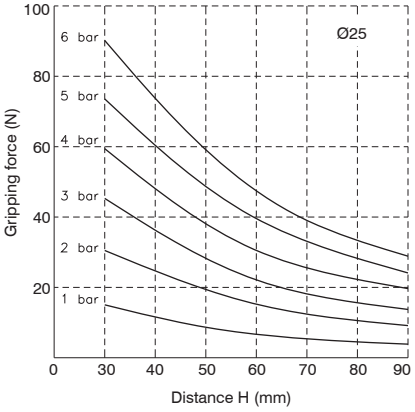
| Bore | Ø10 | Ø16 | Ø20 | Ø25 |
|---|---|---|---|---|
| (Nm) | 0,16 | 0,54 | 1,1 | 2,28 |



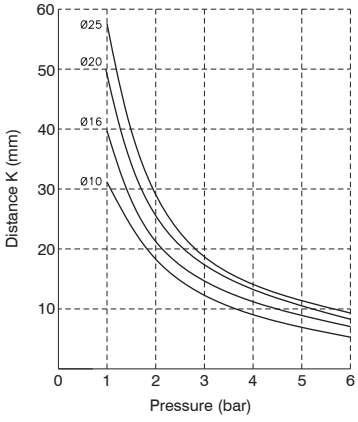



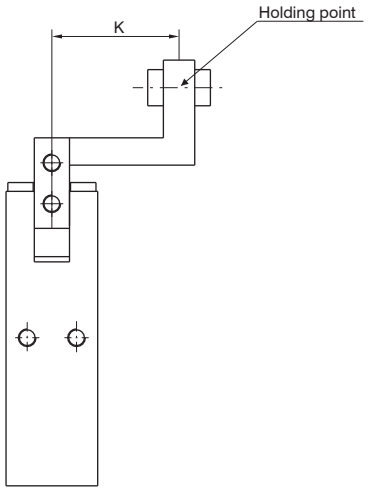




## Confirmation of Holding point




Applications where the holding point is outside the recommended parameters shown on the above graph might affect the product life.

## 180° angular gripper rack & pinion style

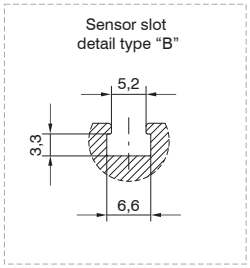
**Coding:** 6303.Ø.D(V)

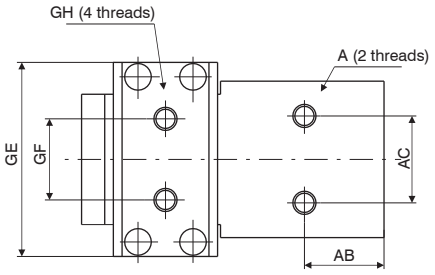
| | |
|---|---|
| Ø | BORE |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| (V) | FINGERS |
| | **F** = Fingers, end fixing |
| | **L** = Fingers, side fixing |

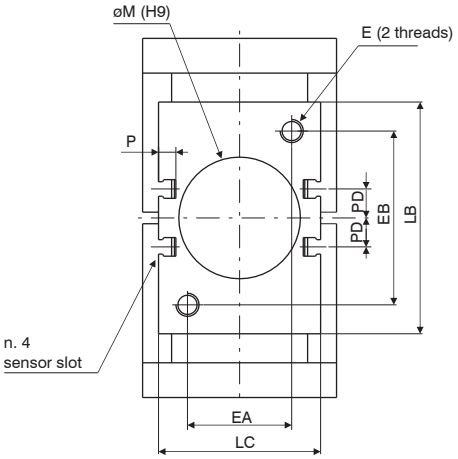


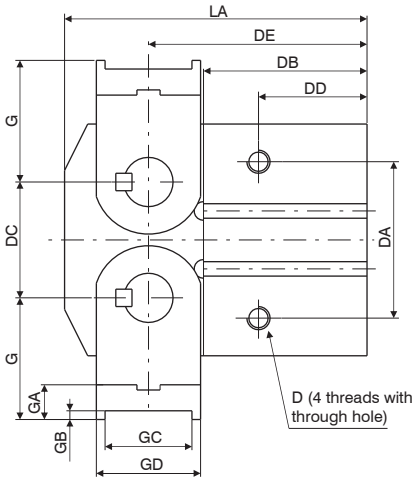
| Bore | | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 |
|---|---|---|---|---|---|---|
| A | | M5 | M6 | M6 | M8 | M10 |
| | Useful depth | 7 | 10 | 10 | 15 | 20 |
| AB | | 17 | 20 | 21 | 27,5 | 36 |
| AC | | 20 | 24 | 24 | 30 | 40 |
| D | | M5 | M6 | M6 | M8 | M10 |
| | Useful depth | 10 | 12 | 12 | 16 | 20 |
| DA | | 27 | 34 | 42 | 54 | 70 |
| DB | | 35 | 40 | 47 | 56,5 | 69 |
| DC | | 18 | 24 | 30 | 40 | 56 |
| DD | | 23 | 27 | 29 | 37,5 | 48 |
| DE | | 45 | 51 | 61,5 | 75,5 | 96 |
| E | | M5 | M6 | M6 | M8 | M10 |
| | Useful depth | 10 | 12 | 12 | 15 | 20 |
| EA | | 26 | 30 | 30 | 36 | 40 |
| EB | | 26 | 30 | 45 | 60 | 80 |
| F | | M5 | M5 | G1/8 | G1/8 | G1/4 |
| FA | | 12 | 16 | 20 | 20 | 30 |
| FB | | 9 | 10 | 13 | 14 | 16 |
| FC | | 20 | 23 | 25 | 33,5 | 44 |
| G | | 23 | 27 | 32 | 42 | 58 |
| GA | | 7 | 8 | 9 | 12 | 17 |
| GB | | 2 | 2 | 2 | 3 | 4 |
| GC | | 12 | 17 | 23 | 30 | 44 |
| GD | | 16 | 21 | 27 | 36 | 52 |
| GE | | 41 | 45 | 51 | 67 | 85 |
| GF | | 18 | 20 | 20 | 28 | 38 |
| GH | | M4 | M5 | M6 | M8 | M10 |
| H | | 5 | 6 | 7 | 9 | 13 |
| HA | | 10 | 12 | 14 | 21 | 24 |
| HB | | 5 | 6 | 7 | 10 | 13 |
| HC | | 28 | 30 | 34 | 44 | 58 |
| HD | | 14 | 16 | 18 | 24 | 30 |
| LA | | 60 | 69 | 83,5 | 104,5 | 136 |
| LB | | 36 | 45 | 58 | 80 | 112 |
| LC | | 36 | 40 | 45 | 56 | 66 |
| ØM H9 | | 21 | 26 | 34 | 42 | 52 |
| | Useful depth | 3 | 3 | 4 | 4 | 5 |
| P | | 6 | 5,5 | 5,5 | 6 | 6 |
| PD | | 4 | 4,5 | 11 | 10 | 13 |
| Weight (g) | | 300 | 500 | 900 | 2100 | 5000 |

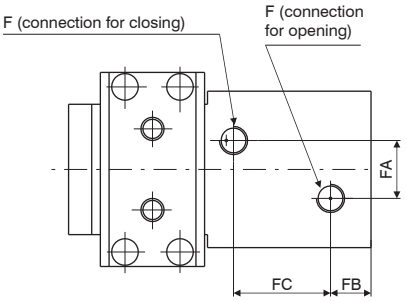
## Overall dimensions



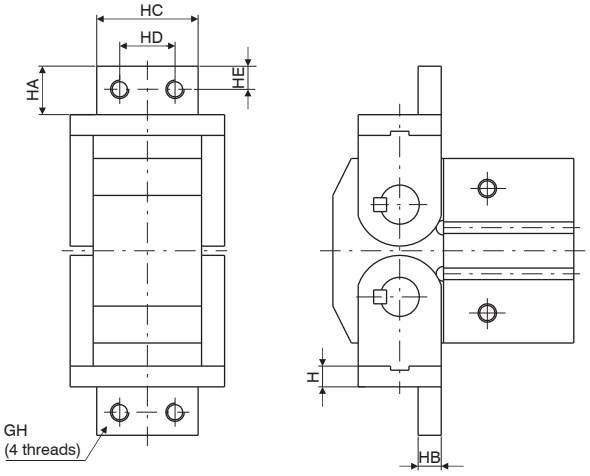




## Fingers, side fixing







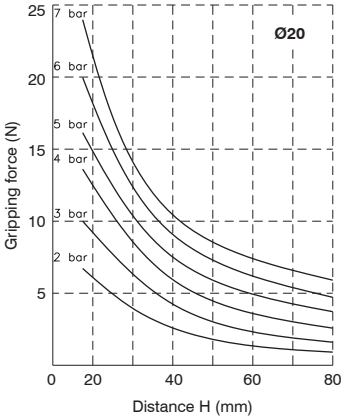

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

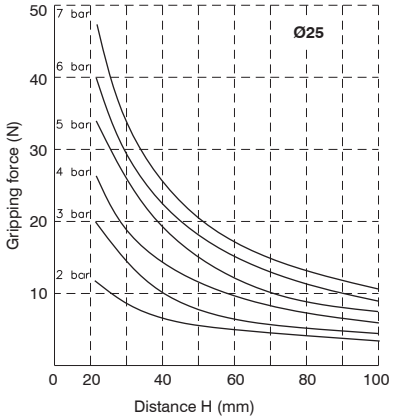
## Operating criteria

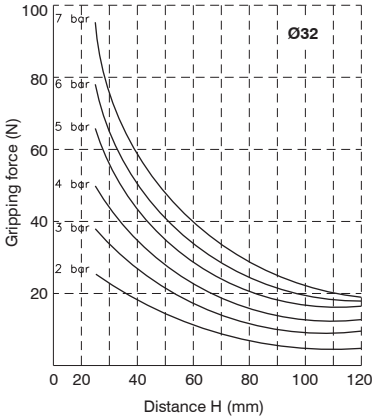
### Gripping force

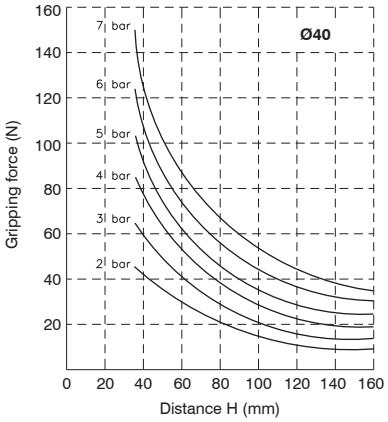
**Note:** Bore selection should be made considering a holding force 10 to 20 times the component weight. In case of acceleration/deceleration a further margin of safety should be considered.

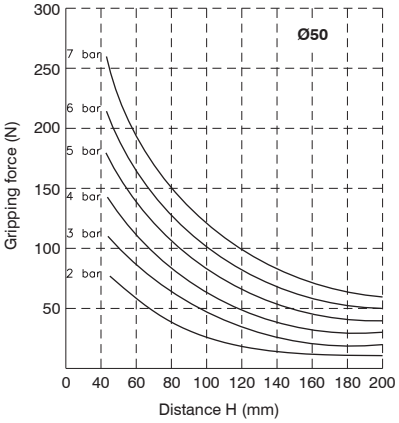
| Bore | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 |
|---|---|---|---|---|---|
| (Nm) | 0,3 | 0,7 | 1,6 | 3,7 | 8,3 |

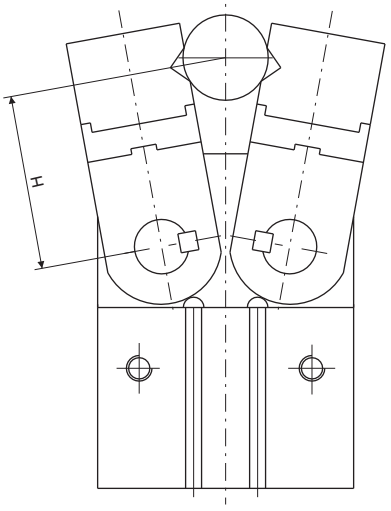


## Parallel style pneumatic grippers - Standard version

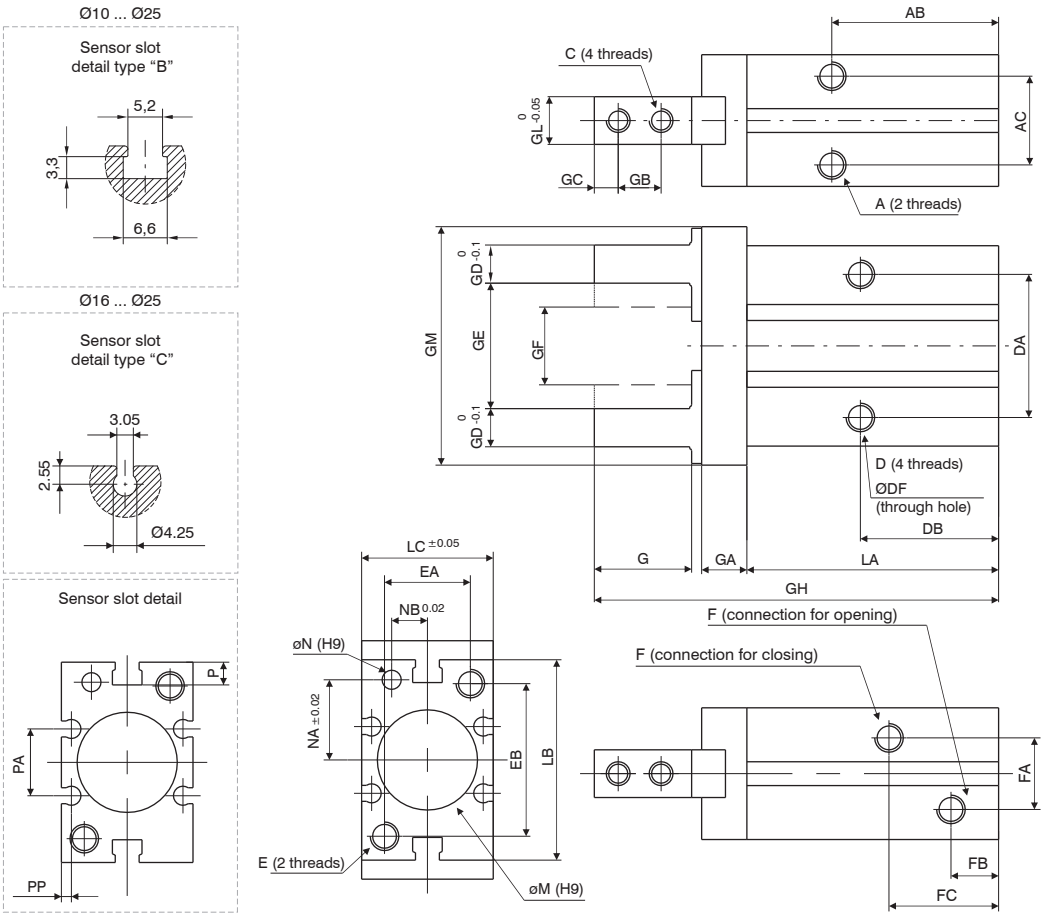
**Coding:** 6310.Ø.Ⓥ

| | |
|---|---|
| Ø | BORE |
| | **10** = Ø10 |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| Ⓥ | VERSION |
| | **D** = Double acting |
| | **NC** = Single acting (N.C.) |
| | **NO** = Single acting (N.O.) |





### Overall dimensions




| Bore | | Ø10 | Ø16 | Ø20 | Ø25 |
|---|---|---|---|---|---|
| A | | M3x0,5 | M4x0,7 | M5x0,8 | M6x1 |
| | Useful depth | 6 | 4,5 | 8 | 10 |
| AB | | 27 | 30 | 35 | 36,5 |
| AC | | 11,4 | 16 | 18,6 | 22 |
| C | | M2,5x0,45 | M3x0,5 | M4x0,7 | M5x0,8 |
| D | | M3x0,5 | M4x0,7 | M5x0,8 | M6x1 |
| | Useful depth | 5,5 | 8 | 10 | 12 |
| DA | | 16 | 24 | 30 | 36 |
| DB | | 23 | 24,5 | 29 | 30 |
| ØDF | | 2,6 | 3,4 | 4,3 | 5,1 |
| E | | M3x0,5 | M4x0,7 | M5x0,8 | M6x1 |
| | Useful depth | 6 | 8 | 10 | 12 |
| EA | | 12 | 15 | 18 | 22 |
| EB | | 18 | 22 | 32 | 40 |
| F | | M3x0,5 | M5x0,8 | M5x0,8 | M5x0,8 |
| FA | | 11 | 13 | 15 | 20 |
| FB | | 9 | 7,5 | 10 | 10,7 |
| FC | | 19 | 19 | 23 | 23,5 |
| G | | 12 | 15,5 | 20 | 25 |
| GA | | 6 | 7,5 | 9,5 | 11 |
| GB | | 5,7 | 7 | 9 | 12 |
| GC | | 3 | 4 | 5 | 6 |
| GD | | 4 | 5 | 8 | 10 |
| GE | | 15,2 | 20,9 | 26,3 | 33,3 |
| GF | | 11,2 | 14,9 | 16,3 | 19,3 |
| GH | | 57 | 67,5 | 84,8 | 102,7 |
| GL | | 5 | 8 | 10 | 12 |
| GM | | 29 | 38 | 50 | 63 |
| LA | | 37,8 | 42,5 | 52,8 | 63,6 |
| LB | | 23 | 30,6 | 42 | 52 |
| LC | | 16,4 | 23,6 | 27,6 | 33,6 |
| ØM H9 | | 11 | 17 | 21 | 26 |
| | Useful depth | 2 | 2 | 3 | 3,5 |
| ØN H9 | | 2 | 3 | 4 | 4 |
| | Useful depth | 3 | 3 | 4 | 4 |
| NO | | 7,6 | 11 | 16,8 | 21,8 |
| NB | | 5,2 | 6,5 | 7,5 | 10 |
| P | | 5,4 | 5,8 | 9 | 11,5 |
| PA | | / | 11,6 | 14 | 19 |
| PP | | / | 2,1 | 2,1 | 3,5 |
| Weight (g) | | 55 | 120 | 230 | 425 |





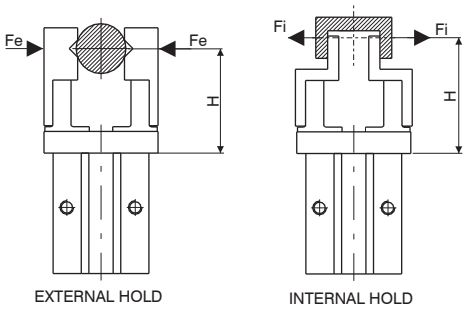
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Operating criteria

### Gripping force (N) (pressure 5 bar, holding point H=20 half stroke)

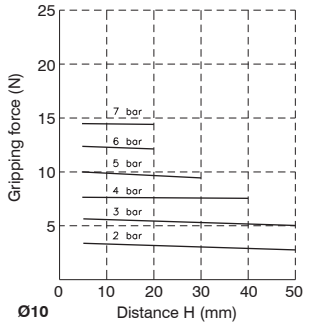
| Version | | Force (N) | Bore Ø10 | Ø16 | Ø20 | Ø25 |
|---|---|---|---|---|---|---|
| Double acting | | Fe | 9,8 | 30 | 42 | 65 |
| | | Fi | 17 | 40 | 66 | 104 |
| Single acting | N.O. | Fe | 6,3 | 24 | 28 | 45 |
| | N.C. | Fi | 12 | 31 | 56 | 83 |

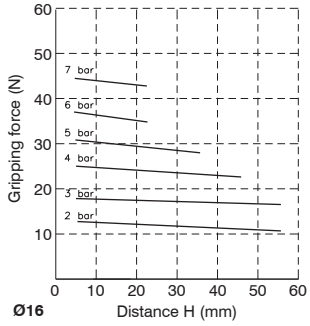
**Fe** = External hold Force **Fi** = Internal hold Force

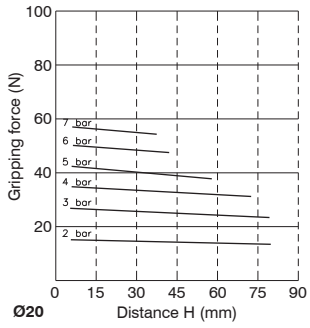


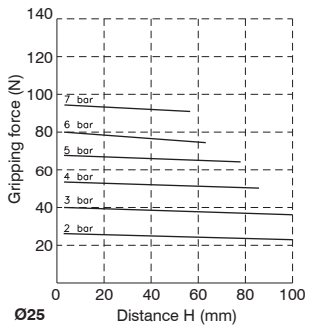

## Double acting

External hold Force

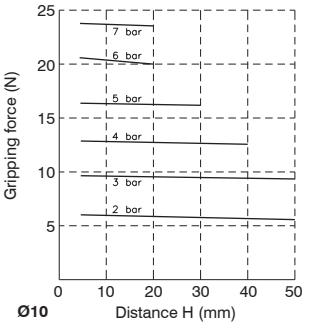


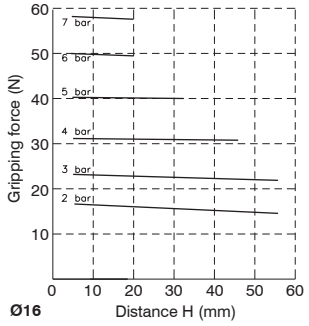



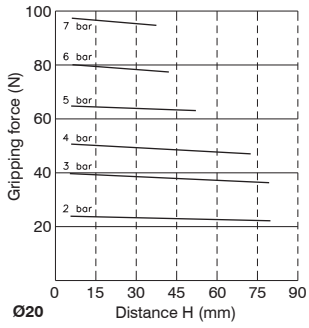



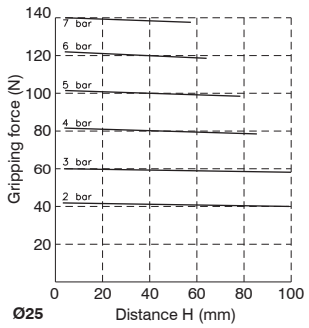




Internal hold Force



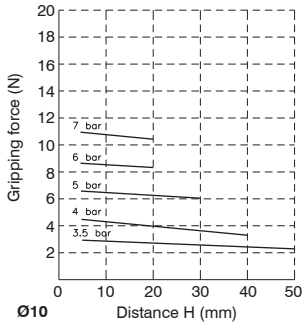



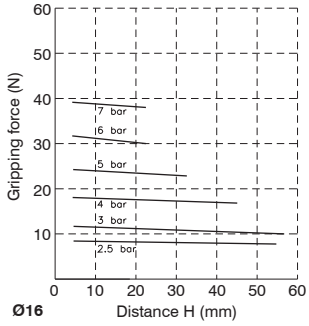



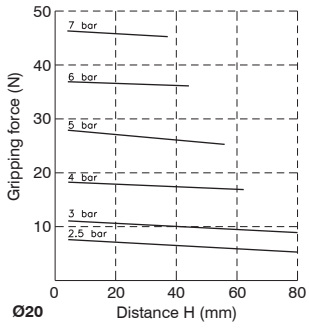



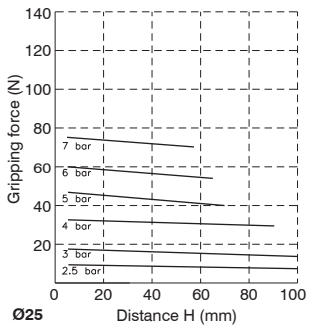

## Single acting

External hold Force

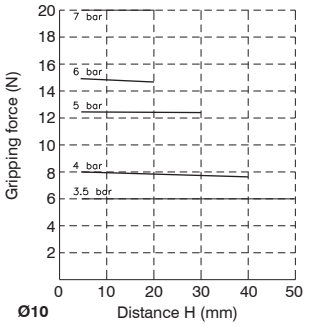


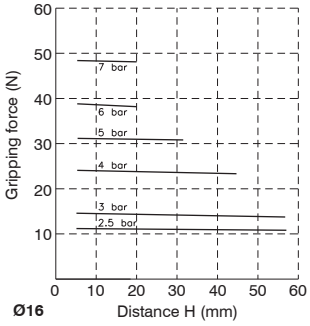



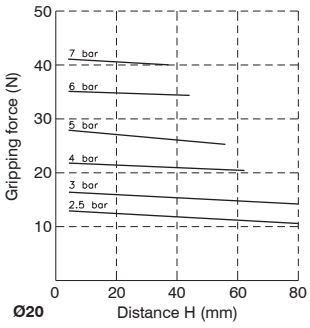



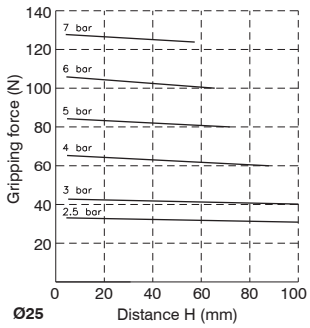




Internal hold Force






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Parallel style pneumatic grippers - Wide opening

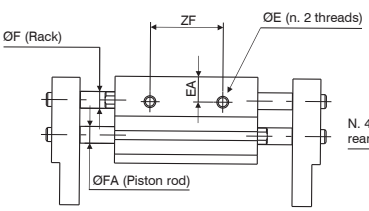
**Coding:** 6311.Ø.D.Ⓒ

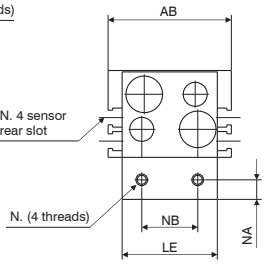
| | |
|---|---|
| Ø | BORE |
| | **10** = Ø10 |
| | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| Ⓒ | STROKE |
| | = 20 mm (Ø10), 30 mm (Ø16), 40 mm (Ø20), 50 mm (Ø25), 70 mm (Ø32), 100 mm (Ø40) |
| | **1** = 40 mm (Ø10), 60 mm (Ø16), 80 mm (Ø20), 100 mm (Ø25), 120 mm (Ø32), 160 mm (Ø40) |
| | **2** = 60 mm (Ø10), 80 mm (Ø16), 100 mm (Ø20), 120 mm (Ø25), 160 mm (Ø32), 200 mm (Ø40) |

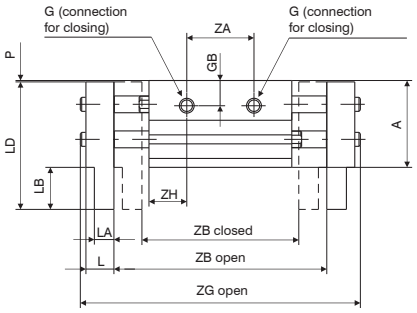
**Coding examples**:
6311.10.D (Stroke 20 mm, Ø10)
6311.10.D.1 (Stroke 40 mm, Ø10)
6311.10.D.2 (Stroke 60 mm, Ø10)

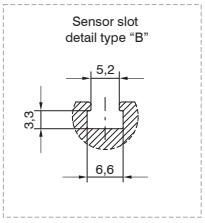


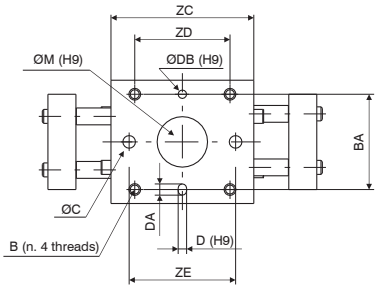
### Overall dimensions




| Bore | | Ø10 | | | Ø16 | | | Ø20 | | | Ø25 | | | Ø32 | | | Ø40 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | | 31 | | | 39 | | | 46 | | | 52 | | | 68 | | | 79 | | |
| AB | | 44 | | | 55 | | | 65 | | | 76 | | | 82 | | | 98 | | |
| B | | M4x0,7 | | | M5x0,8 | | | M6x1 | | | M8x1,25 | | | M8x1.25 | | | M10x1.5 | | |
| | Useful depth | 8 | | | 10 | | | 12 | | | 16 | | | 16 | | | 20 | | |
| BA | | 34 | | | 42 | | | 52 | | | 62 | | | 64 | | | 76 | | |
| ØC | | 4,5 | | | 5,5 | | | 6,6 | | | 9 | | | / | | | / | | |
| $D^{H9}$ | | 3 | | | 3 | | | 4 | | | 4 | | | 6 | | | 6 | | |
| | Useful depth | 3 | | | 3 | | | 4 | | | 4,5 | | | 8 | | | 8 | | |
| DA | | 4 | | | 4 | | | 5 | | | 5 | | | 7 | | | 7 | | |
| $ØDB^{H9}$ | | 3 | | | 3 | | | 4 | | | 4 | | | 6 | | | 6 | | |
| | Useful depth | 3 | | | 3 | | | 4 | | | 4,5 | | | 8 | | | 8 | | |
| E | | M4x0,7 | | | M5x0,8 | | | M6x1 | | | M8x1,25 | | | M8x1.25 | | | M10x1.5 | | |
| | Useful depth | 5 | | | 7 | | | 7 | | | 7 | | | 11 | | | 16 | | |
| EA | | 9 | | | 10 | | | 11 | | | 12,5 | | | 22 | | | 28 | | |
| ØF | | 6 | | | 8 | | | 10 | | | 12 | | | 14 | | | 16 | | |
| FA | | 6 | | | 8 | | | 10 | | | 12 | | | 16 | | | 20 | | |
| G | | M5x0,8 | | | M5x0,8 | | | M5x0,8 | | | M5x0,8 | | | G1/8 | | | G1/8 | | |
| GB | | 9 | | | 10 | | | 11 | | | 16 | | | 16 | | | 18 | | |
| L | | 10 | | | 13 | | | 17 | | | 21 | | | 24 | | | 28 | | |
| LA | | 7 | | | 9 | | | 12,5 | | | 14 | | | 15 | | | 18 | | |
| LB | | 15 | | | 19 | | | 24 | | | 29 | | | 32 | | | 38 | | |
| LD | | 45,5 | | | 57,5 | | | 69 | | | 80 | | | 100 | | | 117 | | |
| LE | | 34 | | | 43 | | | 54 | | | 64 | | | 70 | | | 86 | | |
| $ØM^{H9}$ | | 18 | | | 23 | | | 27 | | | 32 | | | 35 | | | 40 | | |
| | Useful depth | 1,5 | | | 1,5 | | | 1,5 | | | 1,5 | | | 1,5 | | | 1,5 | | |
| N | | M4x0,7 | | | M5x0,8 | | | M6x1 | | | M8x1,25 | | | M10x1,5 | | | M10x1,5 | | |
| NO | | 7 | | | 8 | | | 10 | | | 12 | | | 15 | | | 18 | | |
| NB | | 20 | | | 25 | | | 30 | | | 40 | | | 50 | | | 60 | | |
| P | | 0,5 | | | 0,5 | | | 1 | | | 1 | | | 1 | | | 1 | | |
| ZA | | 24 | 39 | 57 | 26 | 50 | 70 | 32 | 68 | 88 | 38 | 86 | 104 | 54 | 104 | 148 | 72 | 130 | 170 |
| ZB | closed | 56 | 78 | 96 | 68 | 110 | 130 | 82 | 142 | 162 | 100 | 182 | 200 | 150 | 198 | 242 | 188 | 246 | 286 |
| | open | 76 | 118 | 156 | 98 | 170 | 210 | 122 | 222 | 262 | 150 | 282 | 320 | 220 | 318 | 402 | 288 | 406 | 486 |
| ZC | | 51 | 67 | 85 | 60 | 90 | 110 | 71 | 113 | 133 | 88 | 142 | 160 | 110 | 158 | 202 | 148 | 206 | 246 |
| ZD | | 36 | 52 | 70 | 45 | 75 | 95 | 58 | 100 | 120 | 70 | 124 | 142 | 86 | 134 | 178 | 116 | 174 | 214 |
| ZE | | 38 | 54 | 72 | 40 | 70 | 90 | 54 | 96 | 116 | 66 | 120 | 138 | / | / | / | / | / | / |
| ZF | | 26 | 42 | 60 | 28 | 58 | 78 | 38 | 80 | 100 | 48 | 102 | 120 | 60 | 108 | 152 | 80 | 138 | 178 |
| ZG | open | 100 | 142 | 180 | 128 | 200 | 240 | 160 | 260 | 300 | 196 | 328 | 366 | 272 | 370 | 454 | 348 | 466 | 546 |
| ZH | | 13,5 | 14 | 14 | 17 | 20 | 20 | 19,5 | 22,5 | 22,5 | 25 | 28 | 28 | 28 | 27 | | 38 | | |
| Weight (g) | | 280 | 350 | 430 | 600 | 800 | 950 | 1000 | 1500 | 1700 | 1700 | 2500 | 2800 | 2900 | 3800 | 4700 | 5300 | 6850 | 7900 |
| | | 20 | 40 | 60 | 30 | 60 | 80 | 40 | 80 | 100 | 50 | 100 | 120 | 70 | 120 | 160 | 100 | 160 | 200 |
| | | Stroke | | | | | | | | | | | | | | | | | |

| Model | Diameter (mm) | Max. operating frequence cicles/min. |
|---|---|---|
| 6311.10.D | 10 | 60 |
| 6311.10.D.1 | | 40 |
| 6311.10.D.2 | | |
| 6311.16.D | 16 | 60 |
| 6311.16.D.1 | | 40 |
| 6311.16.D.2 | | |
| 6311.20.D | 20 | 60 |
| 6311.20.D.1 | | 40 |
| 6311.20.D.2 | | |
| 6311.25.D | 25 | 60 |
| 6311.25.D.1 | | 40 |
| 6311.25.D.2 | | |
| 6311.32.D | 32 | 30 |
| 6311.32.D.1 | | 20 |
| 6311.32.D.2 | | |
| 6311.40.D | 40 | 30 |
| 6311.40.D.1 | | 20 |
| 6311.40.D.2 | | |



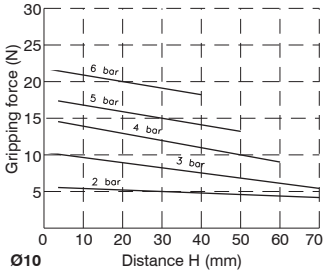


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Operating criteria
## Gripping force

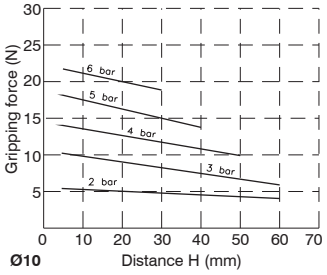
Opening / closing stroke

Basic version



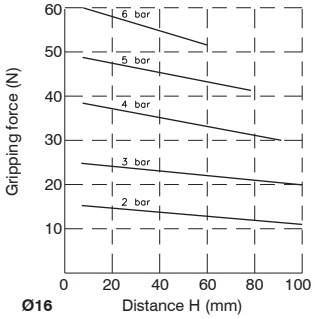

Ø10

Versions 1 and 2



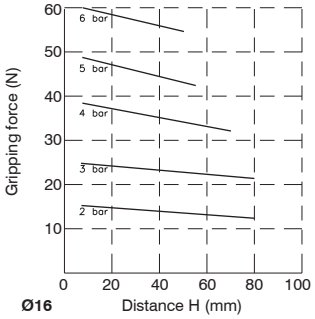

Ø10

Basic version

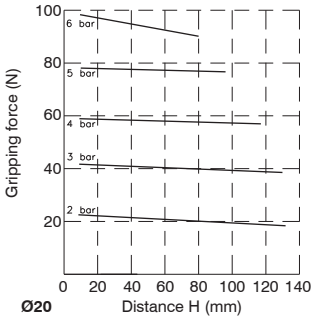



Ø16

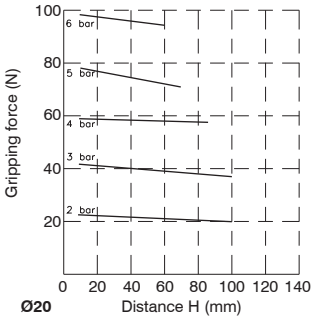
Versions 1 and 2



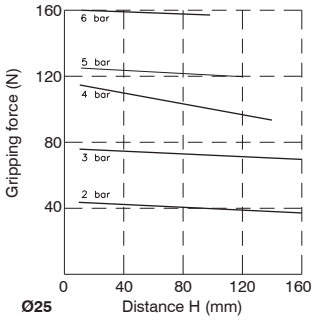

Ø16



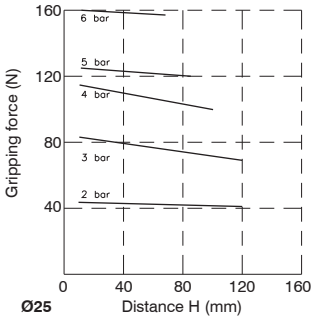

Ø20



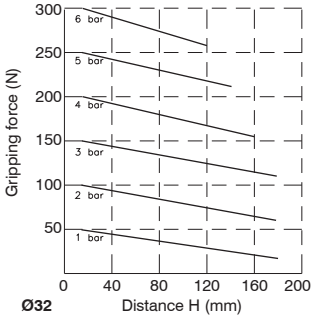

Ø20



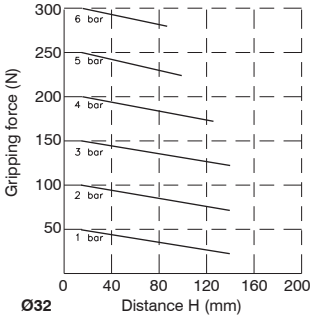

Ø25



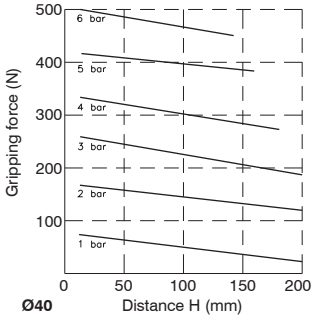

Ø25



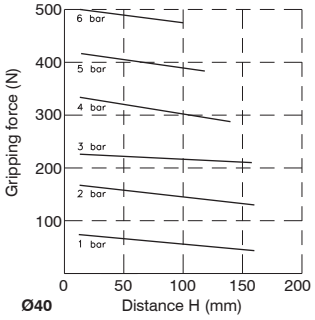

Ø32



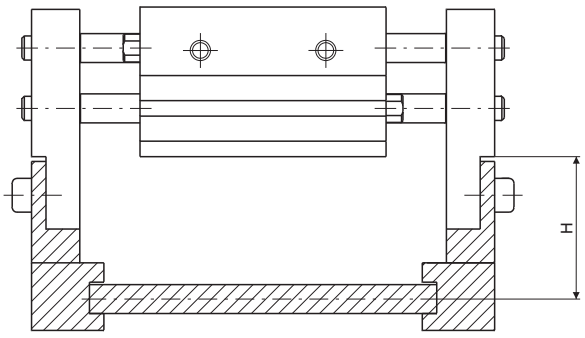

Ø32




Ø40




Ø40



## 3 Finger parallel style pneumatic grippers

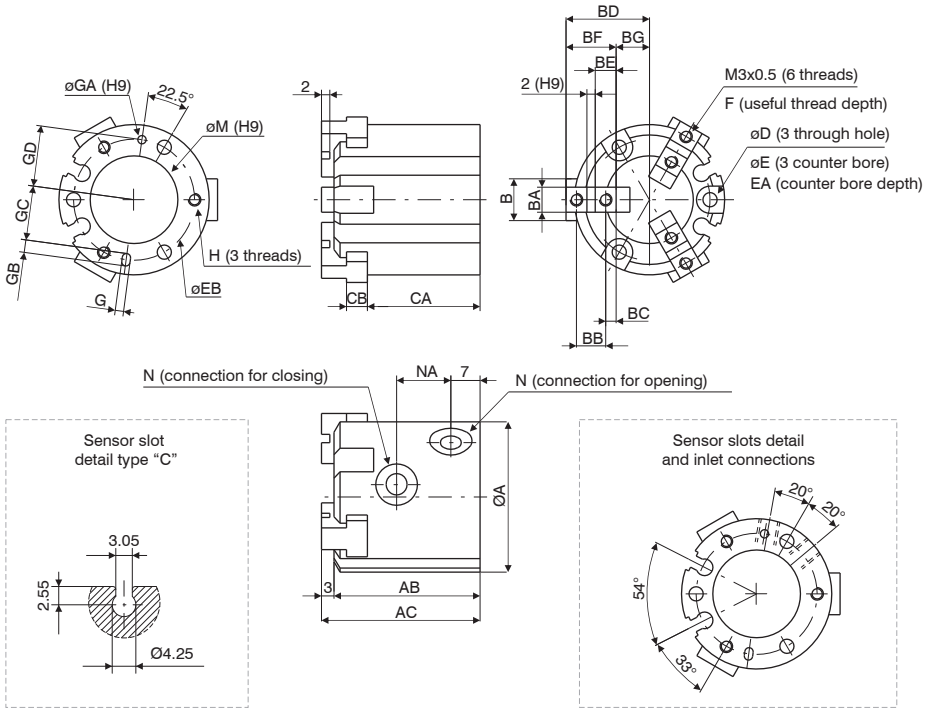
**Coding:** 6312.Ø.D

| | BORE |
|---|---|
| Ø | **16** = Ø16 |
| | **20** = Ø20 |
| | **25** = Ø25 |
| | **32** = Ø32 |
| | **40** = Ø40 |
| | **50** = Ø50 |
| | **63** = Ø63 |
| | **80** = Ø80 |
| | **100** = Ø100 |
| | **125** = Ø125 |



| Bore | | Ø16 | Ø20 | Ø25 |
|---|---|---|---|---|
| ØA | | 30 | 36 | 42 |
| AB | | 32 | 35 | 37 |
| AC | | 35 | 38 | 40 |
| B | | 8 | 10 | 12 |
| BA H9 | | 5 | 6 | 6 |
| BB | | 6 | 7 | 8 |
| BC | | 2 | 2,5 | 3 |
| BD | open | 17 | 20 | 24 |
| | closed | 15 | 18 | 21 |
| BE | | 4 | 5 | 6 |
| BF | | 10 | 12 | 14 |
| BG | open | 7 | 8 | 10 |
| | closed | 5 | 6 | 7 |
| CA | | 25 | 27 | 28 |
| CB | | 4 | 5 | 5 |
| D | | 3,4 | 3,4 | 4,5 |
| E | | 6,5 | 6,5 | 8 |
| EA | | 8 | 9,5 | 10 |
| EB | | 25 | 29 | 34 |
| F | | 5 | 6 | 6 |
| G H9 | | 2 | 2 | 3 |
| | Useful depth | 2 | 2 | 3 |
| ØGA H9 | | 2 | 2 | 3 |
| | Useful depth | 2 | 2 | 3 |
| GB | | 3 | 3 | 5 |
| GC | | 11 | 13 | 14,5 |
| GD | | 12,5 | 14,5 | 17 |
| H | | M3x0,5 | M3x0,5 | M4x0,7 |
| | Useful depth | 4,5 | 6 | 6 |
| ØM H9 | | 17 | 21 | 26 |
| | Useful depth | 1,5 | 1,5 | 1,5 |
| N | | M3x0,5 | M5x0,8 | M5x0,8 |
| NO | | 11 | 13 | 15 |
| Weight (g) | | 62 | 98 | 139 |

### Overall dimensions Ø16 ... Ø25

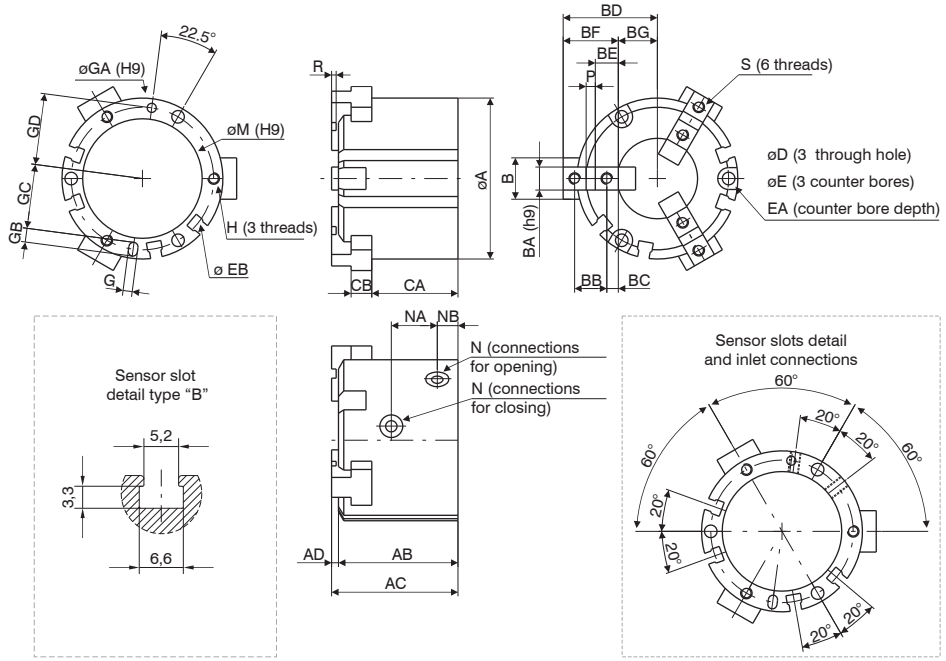






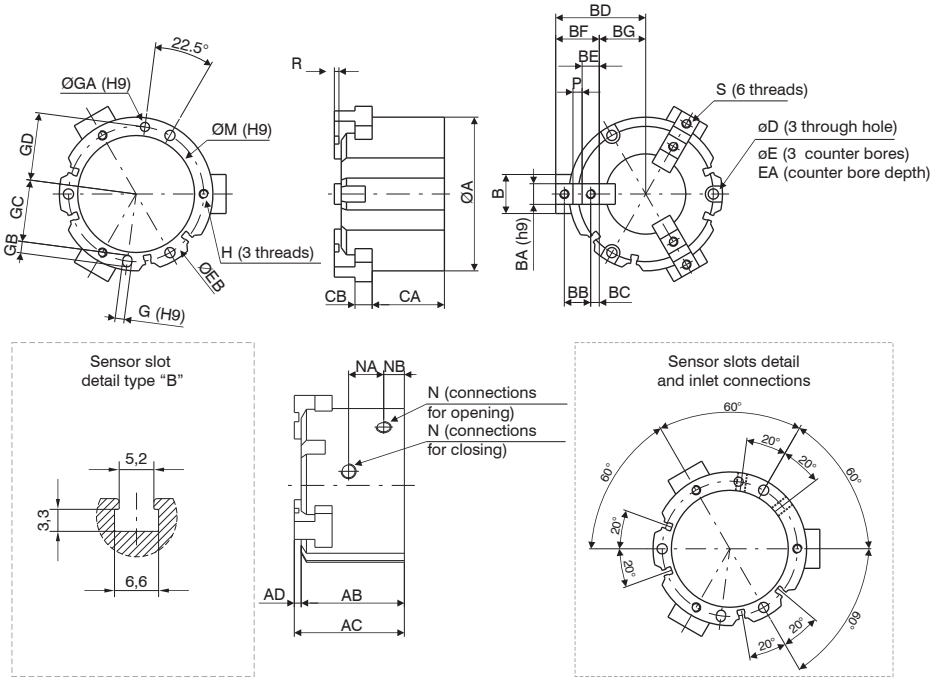

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Overall dimensions Ø32 ... Ø80




| Bore | | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 |
|---|---|---|---|---|---|---|
| ØA | | 52 | 62 | 70 | 86 | 106 |
| AB | | 41 | 44 | 52 | 62 | 77 |
| AC | | 44 | 47 | 55 | 66 | 82 |
| AD | | 3 | 3 | 3 | 4 | 5 |
| B | | 14 | 16 | 18 | 24 | 28 |
| BA H9 | | 8 | 8 | 10 | 12 | 14 |
| BB | | 11 | 12 | 14 | 17 | 20 |
| BC | | 4,5 | 4,5 | 5 | 5,5 | 6 |
| BD | open | 32 | 35 | 41 | 51 | 63,5 |
| | closed | 28 | 31 | 35 | 43 | 53,5 |
| BE | | 9 | 9 | 10 | 11 | 12 |
| BF | | 20 | 21 | 24 | 28 | 32 |
| BG | open | 12 | 14 | 17 | 23 | 31,5 |
| | closed | 8 | 10 | 11 | 15 | 21,5 |
| CA | | 30,5 | 32 | 37,5 | 44 | 56 |
| CB | | 6 | 7 | 9 | 11 | 12 |
| D | | 4,5 | 5,5 | 5,5 | 6,6 | 6,6 |
| E | | 8 | 9,5 | 9,5 | 11 | 11 |
| EA | | 9 | 9 | 12 | 14 | 19 |
| EB | | 44 | 53 | 62 | 76 | 95 |
| H | | M4x0,7 | M5x0,8 | M5x0,8 | M6x1 | M6x1 |
| | Useful depth | 6 | 7,5 | 10 | 9 | 12 |
| G H9 | | 3 | 4 | 4 | 5 | 6 |
| | Useful depth | 3 | 4 | 4 | 5 | 6 |
| ØGA H9 | | 3 | 4 | 4 | 5 | 6 |
| | Useful depth | 3 | 4 | 4 | 5 | 6 |
| GB | | 5 | 6 | 6 | 7 | 8 |
| GC | | 19,5 | 23,5 | 28 | 34,5 | 43,5 |
| GD | | 22 | 26,5 | 31 | 38 | 47,5 |
| N | | M5x0,8 | M5x0,8 | M5x0,8 | M5x0,8 | G1/8 |
| ØM H9 | | 34 | 42 | 52 | 65 | 82 |
| | Useful depth | 2 | 2 | 2 | 2,5 | 3 |
| NO | | 16 | 17 | 20 | 22 | 27 |
| NB | | 8 | 9 | 9 | 12 | 13,5 |
| P H9 | | 2 | 3 | 4 | 6 | 8 |
| R | | 2 | 2 | 2 | 3 | 4 |
| S | | M4x0,7 | M4x0,7 | M5x0,8 | M5x0,8 | M6x1 |
| | Useful depth | 8 | 8 | 10 | 10 | 12 |
| Weight (g) | | 240 | 354 | 542 | 1000 | 1850 |

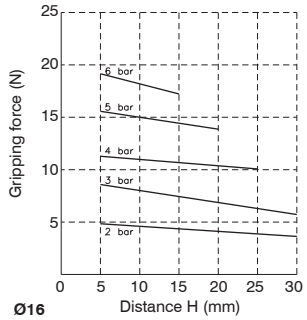
## Overall dimensions Ø100 and Ø125



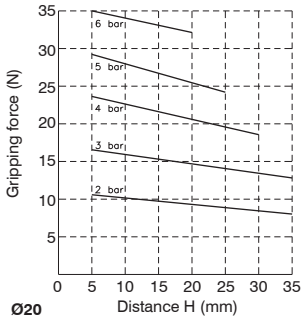

| Bore | | Ø100 | Ø125 |
|---|---|---|---|
| ØA | | 134 | 166 |
| AB | | 90 | 114 |
| AC | | 96 | 122 |
| AD | | 6 | 8 |
| B | | 34 | 40 |
| BA H9 | | 18 | 22 |
| BB | | 23 | 31 |
| BC | | 7,5 | 10,5 |
| BD | open | 78 | 98 |
| | closed | 66 | 82 |
| BE | | 15 | 21 |
| BF | | 38 | 52 |
| BG | open | 40 | 46 |
| | closed | 28 | 30 |
| CA | | 63 | 84 |
| CB | | 15 | 18 |
| ØD | | 9 | 11 |
| ØE | | 14 | 17,5 |
| EA | | 21 | 34 |
| EB | | 118 | 148 |
| G H9 | | 8 | 10 |
| | Useful depth | 6 | 8 |
| ØGA H9 | | 8 | 10 |
| | Useful depth | 6 | 8 |
| GB | | 10 | 12 |
| GC | | 54 | 68 |
| GD | | 59 | 74 |
| H | | M8x1,25 | M10x1,5 |
| | Useful depth | 16 | 20 |
| ØM H9 | | 102 | 130 |
| | Useful depth | 4 | 6 |
| N | | G1/4 | G3/8 |
| NO | | 30,6 | 38 |
| NB | | 18 | 23,5 |
| P H9 | | 8 | 10 |
| R | | 4 | 6 |
| S | | M8x1,25 | M10x1,5 |
| | Useful depth | 16 | 20 |
| Weight (g) | | 3360 | 6430 |

## Operating criteria

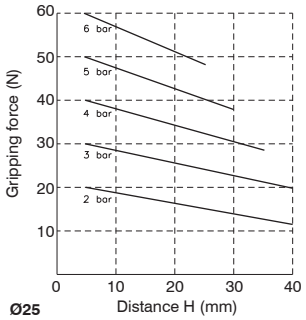
### Gripping force



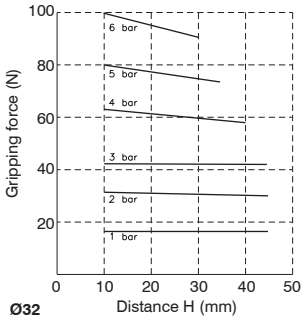

Ø16



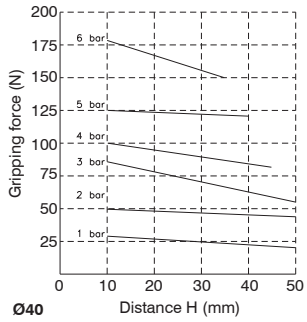

Ø20



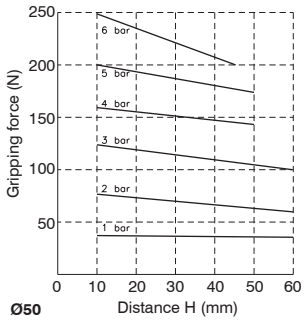

Ø25



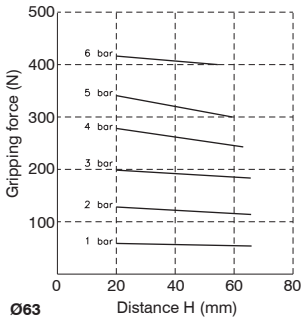

Ø32



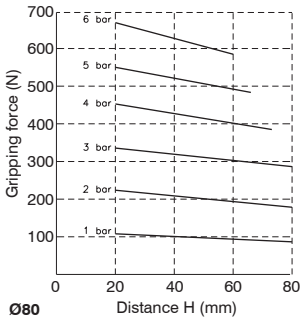

Ø40



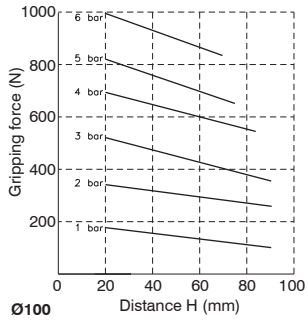

Ø50



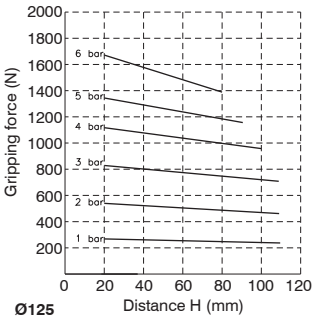

Ø63



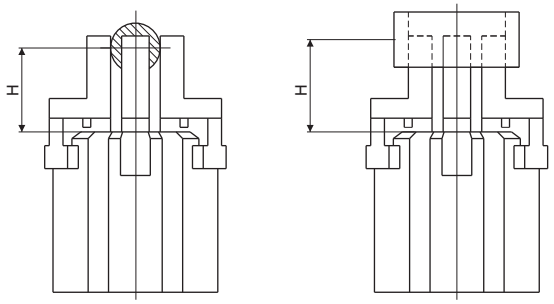

Ø80




Ø100




Ø125








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## Series RT



The swing clamp cylinder has been developed to meet the need to clamp a workpiece by means of a clamping arm which when released would unclamp rotate 90 degrees in order to allow unrestricted access to the workpiece; the stroke of the swing movement is 21mm.
They are supplied in two bore sizes Ø40 and Ø50 in magnetic or non magnetic versions.
The swing clamp cylinder is available with standard clamping stroke lengths of 10, 20, 30 and 50mm with both right (R) or left (L) rotation.
The following accessories are available:

- The clamp bracket can be re-positioned through 360 degree on the piston rod
- Rubber clamping tip
- Front and rear flange for fixing

**Available sensors:**
- SA series mounted directly in the groove
- SR series mounted with adapter 1380.01.F
- SQ and SU series mounted with adapter 1500.22F

(for ordering codes and characteristics see sensors section in the general catalogue)

**Construction characteristics**

| | |
|---|---|
| Seals | **N** Version: PUR piston rod seals, NBR piston seals<br>**P** Version: PUR piston rod seals, PUR piston seals<br>**V** Version: FPM piston rod seals, FPM piston seals |
| Piston | Aluminium |
| Piston rod | C43 chromed steel |
| End caps | Aluminium |

**Operational characteristics**

| | |
|---|---|
| Fluid | filtered and preferably lubricated air or not (if lubricated the lubrication must be continuous) |
| Min. working pressure (bar) | 1 |
| Max. pressure (bar) | 10 |
| Working temperature (°C) | -5 ... +70 **N** Version (magnetic or non magnetic piston)<br>-30 ... +80 **P** Version (magnetic or non magnetic piston)<br>-5 ... +80 **V** Version (magnetic piston)<br>-5 ... +150 **V** Version (non magnetic piston) |
| Stroke of rotation movement R / L 90° (mm) | 21 |
| Standard linear clamping strokes (mm) | 10, 20, 30, 50 |
| Theoretical clamping force at 10 bar (N) | 924 (Ø40) - 1610 (Ø50) |

Please follow the suggestions below to ensure a long life for these cylinders:

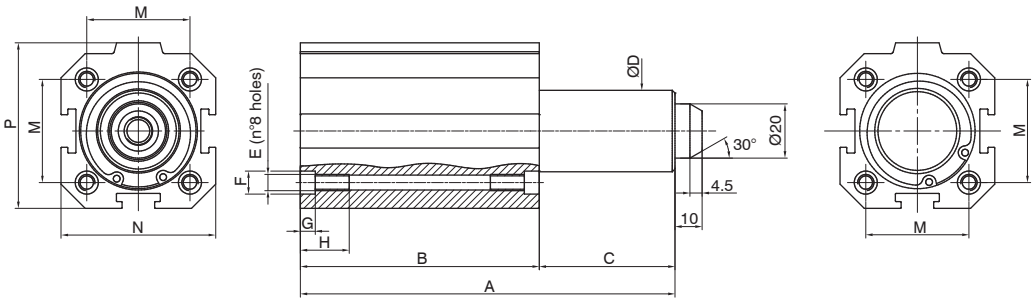
- Use of good air quality
- Observe the application advice carefully
- Operating pressure (see clamping pressure graph)
- Translation speed ≤ 50 mm/sec.

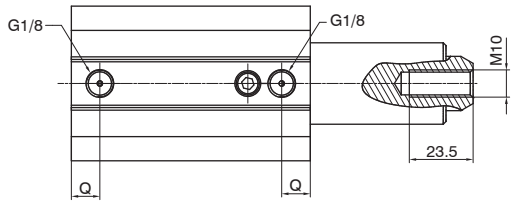
## Swing clamp cylinder

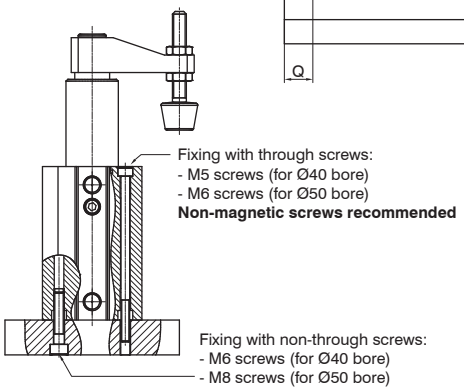
**Coding:** RTAØⓋⓒⓇ090GⒼ00

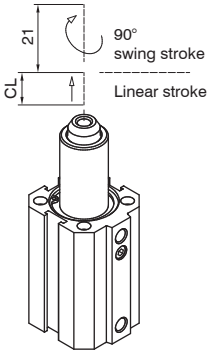
| | |
|---|---|
| Ø | BORE |
| | **040** = Ø40 |
| | **050** = Ø50 |
| Ⓥ | VERSION |
| | **M** = magnetic piston |
| | **N** = non magnetic piston |
| ⓒ | LINEAR CLEARANCE STROKE |
| | **010** = 10 mm |
| | **020** = 20 mm |
| | **030** = 30 mm |
| | **050** = 50 mm |
| Ⓡ | INPUT ROTATION OF THE ROD |
| | **R** = Right (clockwise rotation) |
| | **L** = Left (counter clockwise rotation) |
| Ⓖ | SEALS |
| | **N** = NBR |
| | **P** = PUR |
| | **V** = FPM |

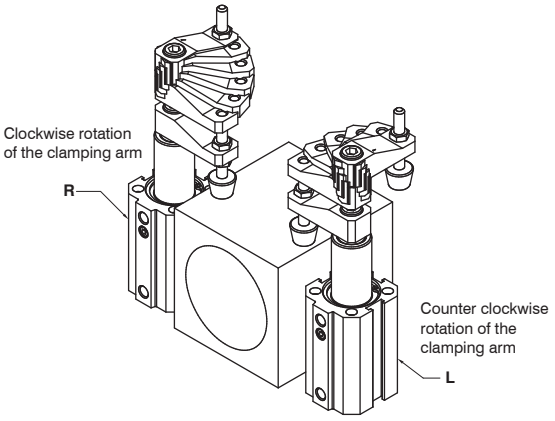




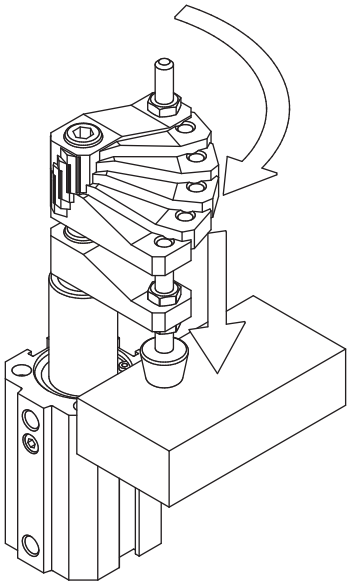

The direction of rotation is defined by the looking at the cylinder from the rod side when it retracts.

| Bore | CL | A | B | C | ØD | E | ØF | G | H | M | N | P | Q | R | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 | 10 | 138 | 88 | 50 | 30 | M6 | 8.5 | 5.5 | 18 | 38 | 57 | 61 | 10.5 | 5.3 | 885 |
| | 20 | 158 | 98 | 60 | | | | | | | | | | | 982 |
| | 30 | 178 | 108 | 70 | | | | | | | | | | | 1080 |
| | 50 | 218 | 128 | 90 | | | | | | | | | | | 1274 |
| 50 | 10 | 138 | 88 | 50 | 39 | M8 | 10.5 | 6.5 | 22 | 46.5 | 67 | 71 | 11 | 7 | 1004 |
| | 20 | 158 | 98 | 60 | | | | | | | | | | | 1114 |
| | 30 | 178 | 108 | 70 | | | | | | | | | | | 1225 |
| | 50 | 218 | 128 | 90 | | | | | | | | | | | 1447 |

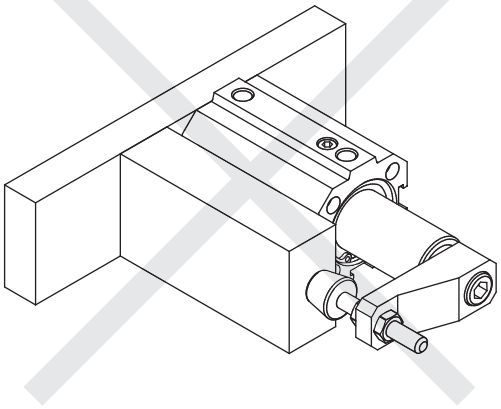




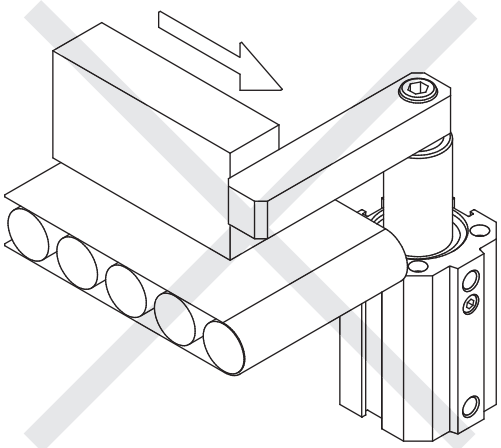
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice



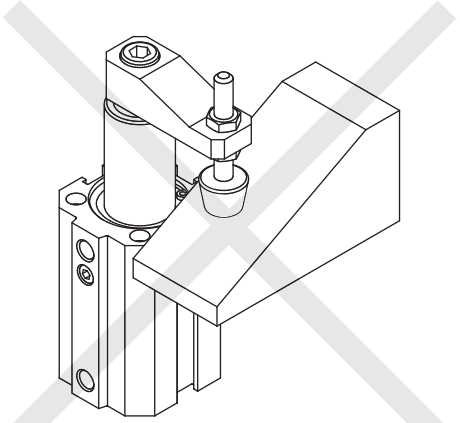
Clamping in linear stroke phase



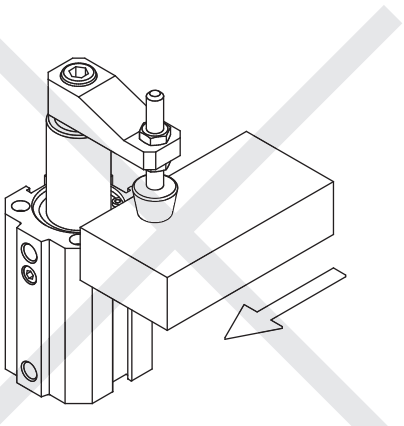
**Don't use** the cylinder in a horizontal position



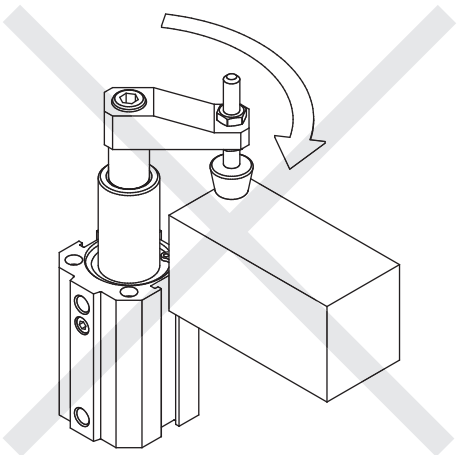
**Don't stress** the cylinder radially



**Don't clamp** on an inclined surface

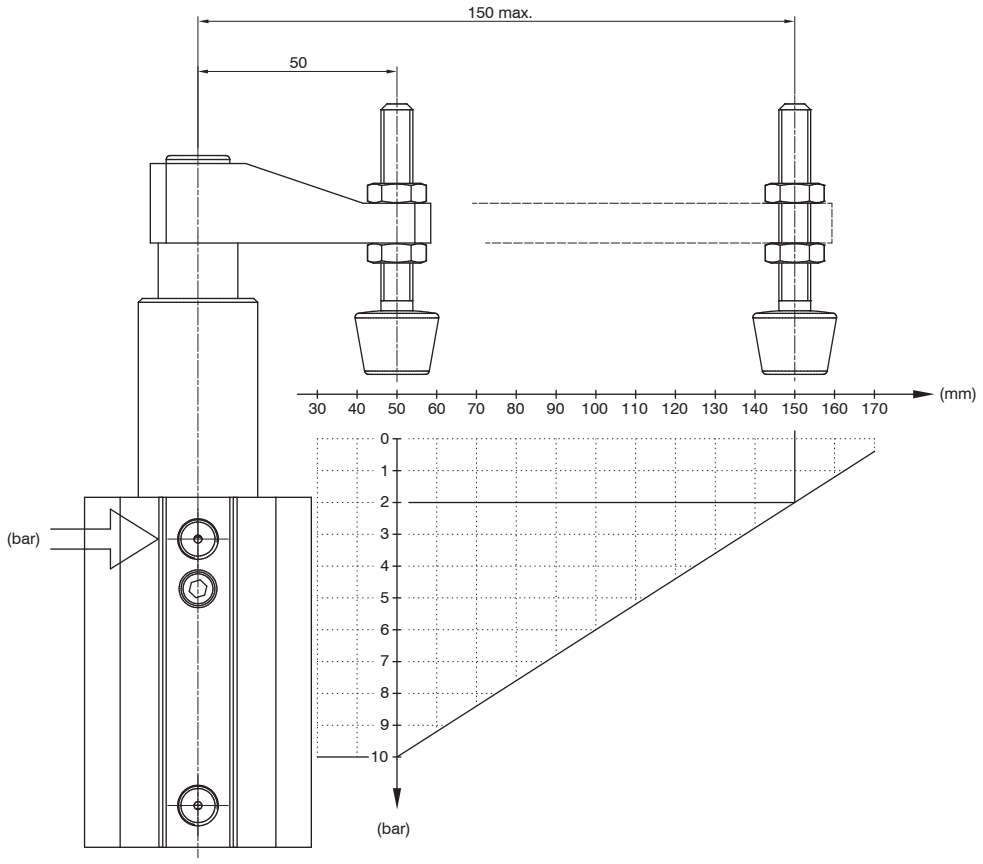


**Don't clamp** moving components

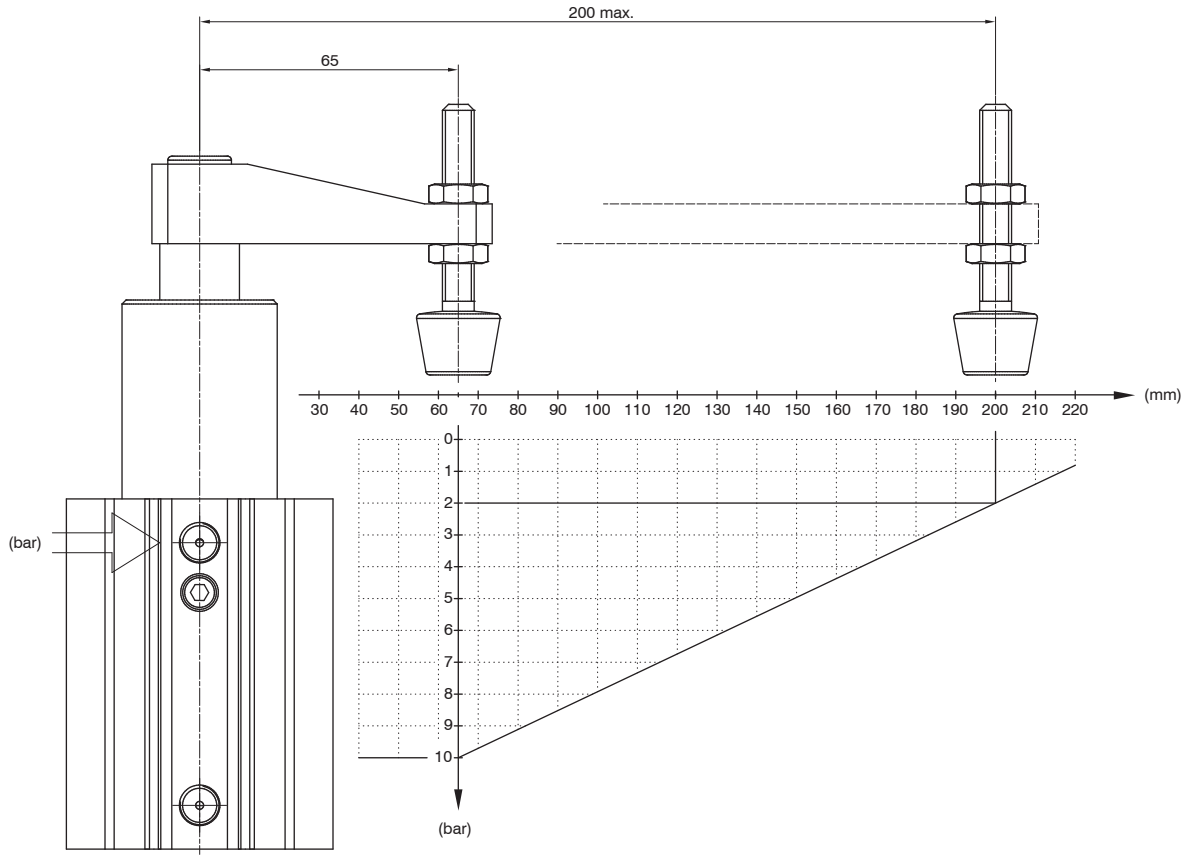


**Don't clamp** during the rotating movement

Clamping pressure (Ø40)




Clamping pressure (Ø50)






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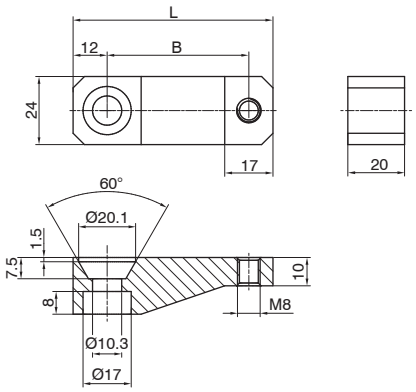
## Bracket

**Coding:** RTØ.01

| Ø | BORE |
|---|---|
| | **040** = Ø40 |
| | **050** = Ø50 |

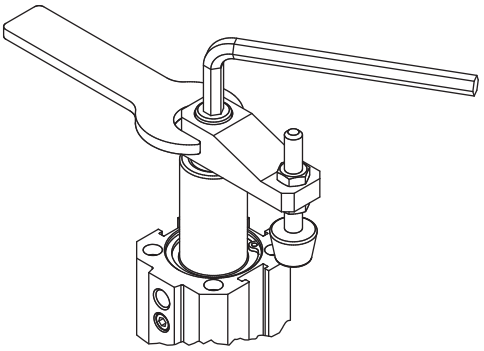
Zinc plated steel
Includes:
n° 1 screw M10x20






| Bore | L | B | Weight (g) |
|---|---|---|---|
| 40 | 70.5 | 50 | 168 |
| 50 | 85.5 | 65 | 211 |

**Bracket mounting**
To avoid damaging the rotation system, act as shown on the drawing below; hold the bracket with a 24mm spanner when tightening the 8mm hexagonal socket screw to a maximum torque of 30 ... 40 Nm

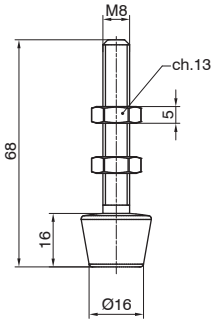


## Rubber clamping tip

**Coding:** RT040.02
Zinc plated steel
Neoprene 85 Shore A tip



Weight 33 g



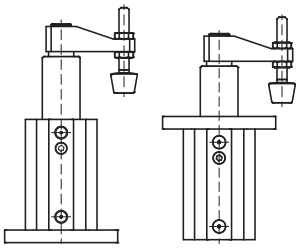

## Steel front and rear flange (MF1 - MF2)

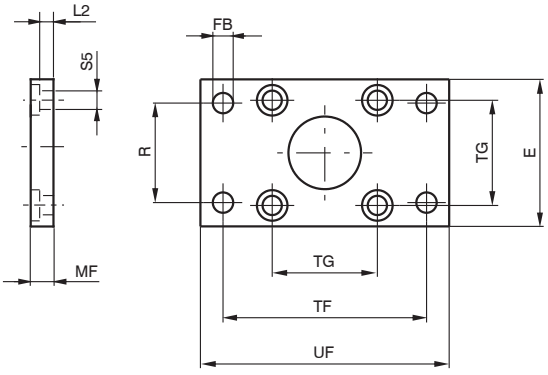
**Coding:** 1380.Ø.03F

| Ø | BORE |
|---|---|
| | **40** = Ø 40 |
| | **50** = Ø 50 |

Plate which allows anchorage of the cylinder at a right angle to the plane. It is made of zincplated extruded steel.








| Bore | E | FB (H 13) | MF (JS 14) | R (JS 14) | TF (JS 14) | TG | UF | L2 | S5 | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|
| 40 | 52 | 9 | 10 | 36 | 72 | 38 | 90 | 5 | 6,6 | 250 |
| 50 | 65 | 9 | 12 | 45 | 90 | 46,5 | 110 | 6,5 | 9 | 480 |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series SA

The limit switches of magnetic sensors must be mounted on cylinders fitted with magnetic pistons.
These, are activated by the magnetic field generated by the magnetic piston as it approaches and closes the circuit sending an electrical signal to either a relay, solenoid valve or converses with the electrical control system of the machine. There are both ampulla or Hall effect magnetic sensors available which are attached to the cylinder using a suitable cylinder clamp/adaptor or mounted in a suitable slot on the cylinder. The switch may also include an activation LED indicator.

Note: The magnetic sensors are in accordance with the **Directive 2014/30/EU** and following amendments

**Instruction on how to use the sensors**

Particular attention needs to be paid to ensure that you do not exceed the operating characteristics shown in the following pages. Its important to note; 2 wire sensors should not be connected to the supply voltage if a load is not connected in series. Failure to do so may result in damage to the sensor. Furthermore, please consider that the 'inrush' (loading) current absorbed by the sensors might be up to 50% higher than rated.
For direct currents (DC), The polarity of the connection must be observed: The brown cable must be connected to the live (+) and the blue wire connected to the negative (-).
For all sensor applications, particular attention must be paid to the external factors such as nearby live cables, electromagnetic fields generated by electric motors as well as nearby metallic bodies as these can affect the magnetic field generated by the magnetic piston which in turn can cause malfunctions.
Electrical cables must be kept below 10mtrs in length to guarantee correct function, however, if a 10 mtr length cable is required, Pneumax suggests the inclusion of an inductor or resistor to the load to reduce the capacitive behaviour of the cable. In this instance, the customer is responsible for the selection of the correct resistive or inductive load required as Pneumax accept no responsibility for any malfunction.
If needed, 10 meters cable length can be exceeded; Pneumax suggests the use of an inductor or resistor in series to the load in order to reduce the capacitive behavior of the cable.
In this case, the customer is responsible for the selection of the inductor or resistor value. Pneumax assume no responsibility in case of malfunction.
When using a 2-wire reed type sensor, always ensure that the correct load is applied in series on any of the two wires.
When using a sensor fitted with a SNAP connector always pay attention to the orientation of the connector because by inverting the connection the circuit will not be damaged, however, the LED will not illuminate. In case 2 or more sensors need to be connected in series, pay attention to the voltage drop generated (approx 3v per sensor), in this instance, use the version designed for series connection.
Hall effect sensors are longer lasting if compare to reed switched as they do not include any moving parts.




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Cable sensor

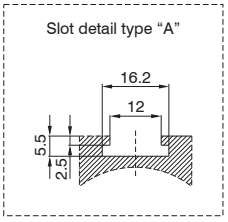
**Coding:** 1❶00.❷

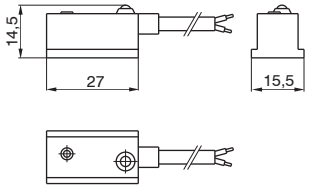
| Technical characteristics | A.C. | D.C. | U | | U/1 | |
|---|---|---|---|---|---|---|
| | | | A.C. | D.C. | A.C. | D.C. |
| Permanent maximum current | 1,5A | 1,2A | 0,5A | | 0,3A | |
| Maximum current (0.5 sec. pulses) | 6A | 1,5A | 1A | | 0,8A | |
| Voltage field | 12 ... 230V | 12 ... 30V | 3 ... 230V | 12 ... 48V | 0 ... 230V | 0 ... 48V |
| Permanent maximum power | 375VA | 32W | 20VA | 15W | 10VA | 8W |
| Working temperature | -20°C ... 70°C | | | | | |
| Maximum voltage drop | 3V max | 2V max | 3V max | | 0V | |
| Cable length | 2m | | | | | |
| Cable colour | Black | | | | | |
| External cable section | Ø4,2mm | | | | | |
| Cover material | PUR | | | | | |
| Number of wires in the cable | 2 | | | | | |
| Wires section | 0,34 mm² | | | | | |
| Connection type | With cable without connector | | | | | |
| Protection degree | IP65 | | | | | |
| Switch-on time | 2 ms | | | | | |
| Switch-off time | 1 ms | | | | | |
| Average working time | $10^7$ cycles | | | | | |
| Repetition of intervention point | ± 0,1 mm | | | | | |
| Contact type | N.O. | | | | | |
| Directive | CE as set out in Directive 2014/30/EU<br>UKCA pursuant to U.K. S.I. Regulation 2016 No. 1091 | | | | | |
| Fixing | With screw | | | | | |
| Weight | 50g | | | | | |
| With LED indication | With LED | | | | Without LED | |
| LED color | Red | | | | / | |

| | |
|---|---|
| ❶ | TYPE |
| | **5** = Cylinders and microcylinders. Slot detail type "A". |
| | **6** = Rodless cylinders |
| ❷ | VERSION |
| | **AC** = For alternating current |
| | **DC** = For continuous current |
| | **U** = Universal |
| | **U/1** = Universal sensor (REED ampulla only) |

***Cylinders and microcylinders***

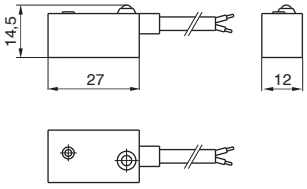




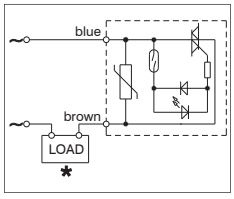

***Rodless cylinders***



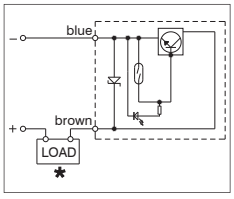



## Diagrams and connections

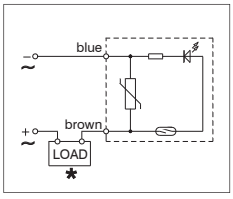
**AC**



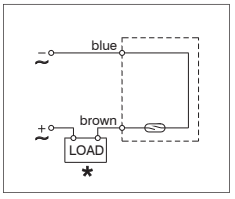

**DC**




**U**




**U/1**




***The load (LOAD) can be connected either to negative or positive pole.**

## Sensor for SNAP connector

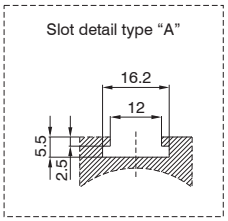
| Technical characteristics | DC | UA | | | UC | | UA/1 | |
|---|---|---|---|---|---|---|---|---|
| | | A.C. | | D.C. | A.C. | D.C. | A.C. | D.C. |
| Contact type | N.O. | | N.C. | N.O. | N.C. | | N.O. | |
| Permanent maximum current | 1.2A | 0.5A | 0.3A | 0.5A | 0.3A | | 0.5A | |
| Maximum current (0.5 sec. pulses) | 1,5A | 1A | 0.8A | 1A | 0.8A | | 1A | |
| Voltage field | 12 ... 30V | 3 ... 250V | 3 ... 110V | 12 ... 48V | 3 ... 110V | 12 ... 48V | 0 ... 250V | 0 ... 48V |
| Permanent maximum power | 32W | 20VA | 10VA | 15W | 8W | 10VA | 8W | 10VA | 8W |
| Working temperature | -20°C ... 70°C | | | | | | | |
| Maximum voltage drop | 2V | <3V | | | | | 0V | |
| Connection type | With cable and connector | | | | | | | |
| Protection degree | IP65 | | | | | | | |
| Switch-on time | 2 ms | | | | | | | |
| Switch-off time | 1 ms | | | | | | | |
| Average working time | $10^7$ cycles | | | | | | | |
| Repetition of intervention point | ± 0,1 mm | | | | | | | |
| Directive | CE as set out in Directive 2014/30/EU<br>UKCA pursuant to U.K. S.I. Regulation 2016 No. 1091 | | | | | | | |
| Fixing | With screw | | | | | | | |
| Weight | 7g | | | | | | | |
| With LED indication | With LED | | | | | | Without LED | |
| LED color | Red | | | | | | | |

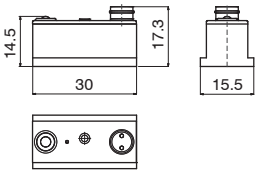
**Coding: ⓉRS.Ⓥ**

| | |
|---|---|
| Ⓣ | TYPE |
| | = Cylinders and microcylinders. Slot detail type "A". |
| | **S** = Rodless cylinders |
| Ⓥ | VERSION |
| | **DC** = For continuous current |
| | **UA** = Universal |
| | **UC** = Universal sensor N.C. |
| | **UA/1** = Universal sensor N.O. |

***Cylinders and microcylinders***

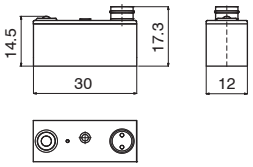




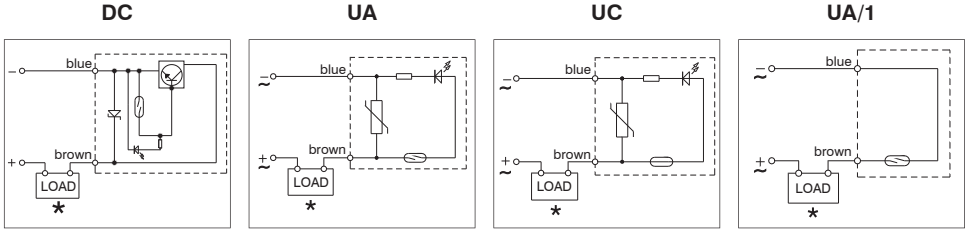




***Rodless cylinders***





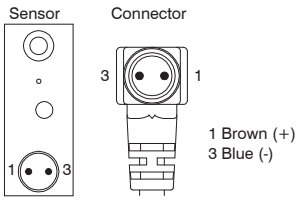

## Diagrams and connections




***The load (LOAD) can be connected either to negative or positive pole.**

## Technical data

**Connection 2 wires 2 PIN**




## Sensor for SNAP connector + Cable with connector



**Coding: ⓉRS.ⓋⓁ**

| | |
|---|---|
| Ⓣ | TYPE |
| | = Cylinders and microcylinders. Slot detail type "A". |
| | **S** = Rodless cylinders |
| Ⓥ | VERSION |
| | **DC** = For continuous current |
| | **UA** = Universal |
| | **UC** = Universal sensor N.C. |
| | **UAC** = Universal sensor N.O. |
| Ⓛ | CABLE LENGTH |
| | **C1** = 2.5m cable |
| | **C2** = 5m cable |
| | **C3** = 10m cable |
| | **1/1** = 2.5m cable for universal sensor N.O. |
| | **2/1** = 5m cable for universal sensor N.O. |
| | **3/1** = 10m cable for universal sensor N.O. |

## 2-wire cable connector



| Technical characteristics | C1 | C2 | C3 |
|---|---|---|---|
| Cable colour | Light grey | | |
| External cable section | Ø3,5mm | | |
| Cover material | PVC | | |
| Number of wires in the cable | 2 wires | | |
| Wires section | 0,25 $mm^2$ | | |

**Coding: CⓁ**

| | |
|---|---|
| Ⓛ | CABLE LENGTH |
| | **1** = 2.5m cable 2 wires |
| | **2** = 5m cable 2 wires |
| | **3** = 10m cable 2 wires |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## 3-pin sensor with SNAP connector for series assembling

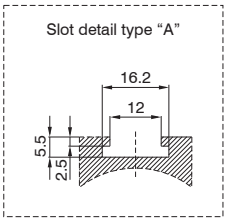
**Coding:** ❶RS.UA/1L

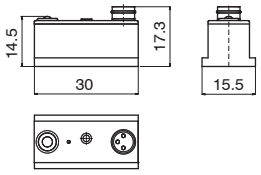
| Technical characteristics | UA/1L | |
|---|---|---|
| | A.C. | D.C. |
| Permanent maximum current | 0.5A | |
| Maximum current (0.5 sec. pulses) | 1A | |
| Voltage field | 24V | |
| Permanent maximum power | 20VA | 15W |
| Working temperature | -20°C ... 70°C | |
| Maximum voltage drop | 0V | |
| Connection type | With cable and connector | |
| Protection degree | IP65 | |
| Switch-on time | 2 ms | |
| Switch-off time | 1 ms | |
| Average working time | $10^7$ cycles | |
| Repetition of intervention point | ± 0,1 mm | |
| Contact type | N.O. | |
| Directive | CE as set out in Directive 2014/30/EU<br>UKCA pursuant to U.K. S.I. Regulation 2016 No. 1091 | |
| Fixing | With screw | |
| Weight | 7g | |
| With LED indication | With LED | |
| LED color | Red | |

| ❶ | TYPE |
|---|---|
| | = Cylinders and microcylinders. Slot detail type "A". |
| | **S** = Rodless cylinders |

***Cylinders and microcylinders***

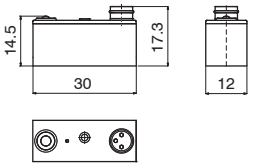




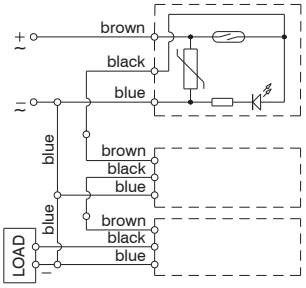

***Rodless cylinders***





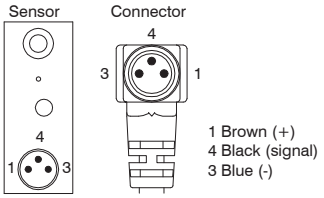

## Diagrams and connections

**UA/1L**




## Technical data

**Connection 3 wires 3 PIN**




## Sensor for series assembling SNAP connector + Connector with cable

**Coding:** ❶RS.UA❷/1L



| ❶ | TYPE |
|---|---|
| | = Cylinders and microcylinders. Slot detail type "A". |
| | **S** = Rodless cylinders |
| ❷ | CABLE LENGTH |
| | **CH1** = 2.5m cable |
| | **CH2** = 5m cable |
| | **CH3** = 10m cable |

## Connector with 3 wires cable

**Coding:** CH❷



| Technical characteristics | CH1 | CH2 | CH3 |
|---|---|---|---|
| Cable colour | Light grey | | |
| External cable section | Ø3,5mm | | |
| Cover material | PVC | | |
| Number of wires in the cable | 3 wires | | |
| Wires section | 0,25 mm² | | |

| ❷ | CABLE LENGTH |
|---|---|
| | **1** = 2.5m cable |
| | **2** = 5m cable |
| | **3** = 10m cable |

## 3 pin sensor in according to IEC 947 directives

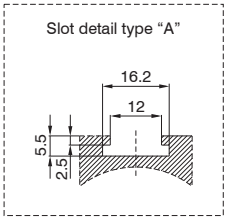
**Coding:** RS.Ⓥ

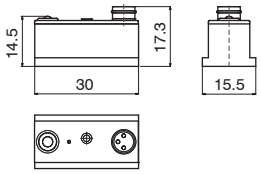
| Technical characteristics | DCNO | UANO | | | |
|---|---|---|---|---|---|
| | DC | A.C. | | D.C. | |
| Contact type | N.O. | | N.C. | N.O. | N.C. |
| Permanent maximum current | 1.2A | 0.5A | 0.3A | 0.5A | 0.3A |
| Maximum current (0.5 sec. pulses) | 1,5A | 1A | 0.8A | 1A | 0.8A |
| Voltage field | 12 ... 30V | 3 ... 250V | 3 ... 110V | 12 ... 48V | |
| Permanent maximum power | 32W | 20VA | 10VA | 15W | 8W |
| Working temperature | -20°C ... 70°C | | | | |
| Maximum voltage drop | 2V | <3V | | | |
| Connection type | With cable and connector | | | | |
| Protection degree | IP65 | | | | |
| Switch-on time | 2 ms | | | | |
| Switch-off time | 1 ms | | | | |
| Average working time | $10^7$ cycles | | | | |
| Repetition of intervention point | ± 0,1 mm | | | | |
| Directive | CE as set out in Directive 2014/30/EU<br>UKCA pursuant to U.K. S.I. Regulation 2016 No. 1091 | | | | |
| Fixing | With screw | | | | |
| Weight | 7g | | | | |
| With LED indication | With LED | | | | |
| LED color | Red | Yellow | | | |

| Ⓥ | VERSION |
|---|---|
| | **DCNO** = Continuous current N.O. |
| | **UANO** = Universal sensor N.O. |

***Cylinders and microcylinders***

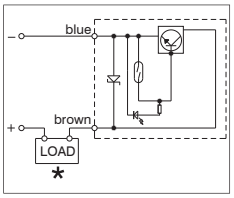




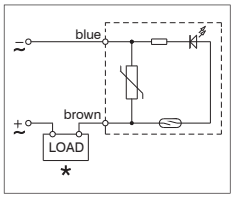




## Diagrams and connections

### DCNO



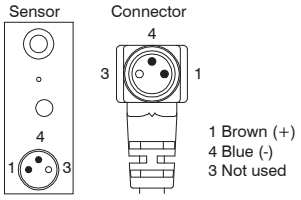

### UANO




***The load (LOAD) can be connected either to negative or positive pole.**

## Technical data

**Connection 2 wires 3 PIN**




## IEC 947 standard connector with cable

**Coding:** CⓁNO

| Ⓛ | CABLE LENGTH |
|---|---|
| | **1** = 2.5m cable |
| | **2** = 5m cable |
| | **3** = 10m cable |



| Technical characteristics | C1NO | C2NO | C3NO |
|---|---|---|---|
| Cable colour | Light grey | | |
| External cable section | Ø3,5mm | | |
| Cover material | PVC | | |
| Number of wires in the cable | 2 wires | | |
| Wires section | 0,25 mm² | | |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## 2 PIN Sensor with M8 connector

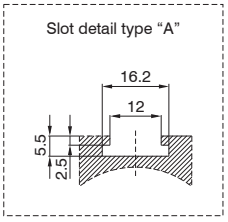
**Coding:** ⓉRS8.Ⓥ

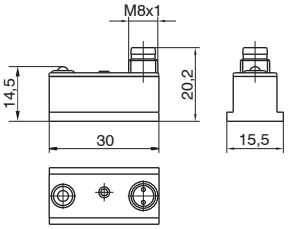
| Technical characteristics | DC | UA | | | UC | |
|---|---|---|---|---|---|---|
| | | A.C. | | D.C. | A.C. | D.C. |
| Contact type | N.O. | | N.C. | N.O. | N.C. | |
| Permanent maximum current | 1,2A | 0,5A | 0,3A | 0,5A | 0,3A | |
| Maximum current (0.5 sec. pulses) | 1,5A | 1A | 0.8A | 1A | 0.8A | |
| Voltage field | 12 ... 30V | 3 ... 250V | 3 ... 110V | 12 ... 48V | 3 ... 110V | 12 ... 48V |
| Permanent maximum power | 32W | 20VA | 10VA | 15W 8W | 10VA | 8W |
| Working temperature | -20°C ... 70°C | | | | | |
| Maximum voltage drop | 2V | < 3V | | | | |
| Connection type | With cable and connector | | | | | |
| Protection degree | IP65 | | | | | |
| Switch-on time | 2 ms | | | | | |
| Switch-off time | 1 ms | | | | | |
| Average working time | $10^7$ cycles | | | | | |
| Repetition of intervention point | ± 0,1 mm | | | | | |
| Directive | CE as set out in Directive 2014/30/EU<br>UKCA pursuant to U.K. S.I. Regulation 2016 No. 1091 | | | | | |
| Fixing | With screw | | | | | |
| Weight | 7g | | | | | |
| With LED indication | With LED | | | | | |
| LED color | Red | | | | | |

| | |
|---|---|
| Ⓣ | TYPE<br>= Cylinders and microcylinders. Slot detail type "A".<br>**S** = Rodless cylinders |
| Ⓥ | VERSION<br>**DC** = For continuous current N.O.<br>**UA** = Universal sensor with led N.O.<br>**UC** = Universal sensor with led N.C. |

***Cylinders and microcylinders***

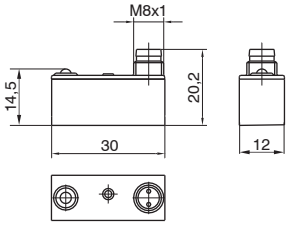




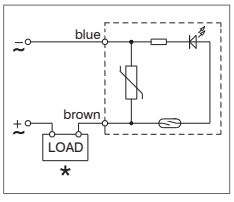

***Rodless cylinders***



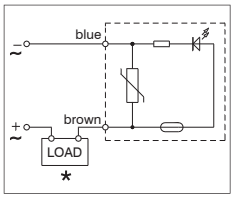



## Diagrams and connections

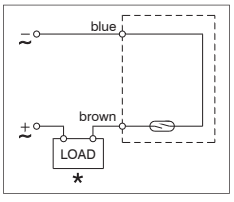
**DC**




**UA**



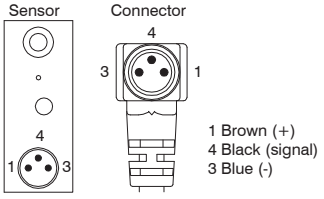

**UC**




***The load (LOAD) can be connected either to negative or positive pole.**

## Technical data

**Connection 3 wires 3 PIN**




## M8 connector with 3 wires cable

**Coding:** MCHⓁ



| Technical characteristics | MCH1 | MCH2 | MCH3 |
|---|---|---|---|
| Cable colour | Light grey | | |
| External cable section | Ø2,6mm | | |
| Cover material | PUR | | |
| Number of wires in the cable | 3 wires | | |
| Wires section | 0,15 mm² | | |

| | |
|---|---|
| Ⓛ | CABLE LENGTH<br>**1** = 2.5m 3-wire cable<br>**2** = 5m 3-wire cable<br>**3** = 10m 3-wire cable |

## 3-pin sensor with M8 connector for series assembling

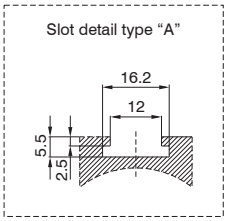
**Coding:** ⓉRS8UA/1L

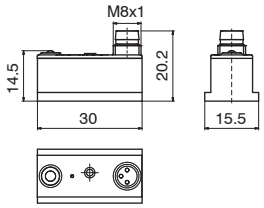
| Technical characteristics | UA/1L | |
|---|---|---|
| | A.C. | D.C. |
| Permanent maximum current | 0.5A | |
| Maximum current (0.5 sec. pulses) | 1A | |
| Voltage field | 24V | |
| Permanent maximum power | 20VA | 15W |
| Working temperature | -20°C ... 70°C | |
| Maximum voltage drop | 0V | |
| Connection type | With cable and connector | |
| Protection degree | IP65 | |
| Switch-on time | 2 ms | |
| Switch-off time | 1 ms | |
| Average working time | $10^7$ cycles | |
| Repetition of intervention point | ± 0,1 mm | |
| Contact type | N.O. | |
| Directive | CE as set out in Directive 2014/30/EU<br>UKCA pursuant to U.K. S.I. Regulation 2016 No. 1091 | |
| Fixing | With screw | |
| Weight | 7g | |
| With LED indication | With LED | |
| LED color | Red | |

| Ⓣ | TYPE |
|---|---|
| | = Cylinders and microcylinders.<br>Slot detail type "A". |
| | **S** = Rodless cylinders |

***Cylinders and microcylinders***

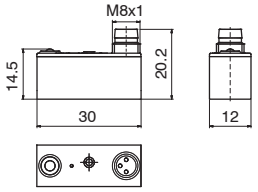




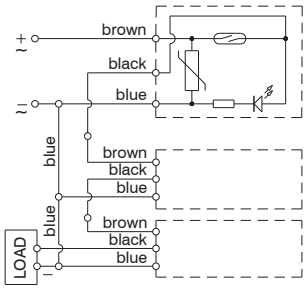




***Rodless cylinders***



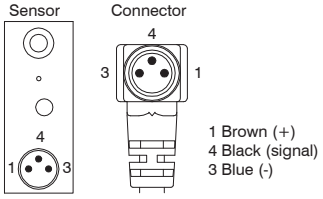



## Diagrams and connections




## Technical data

**Connection 3 wires 3 PIN**




## M8 connector with 3 wires cable

**Coding:** MCHⓁ



| Technical characteristics | MCH1 | MCH2 | MCH3 |
|---|---|---|---|
| Cable colour | Light grey | | |
| External cable section | Ø2,6mm | | |
| Cover material | PUR | | |
| Number of wires in the cable | 3 wires | | |
| Wires section | 0,15 mm² | | |

| Ⓛ | CABLE LENGTH |
|---|---|
| | **1** = 2.5m 3-wire cable |
| | **2** = 5m 3-wire cable |
| | **3** = 10m 3-wire cable |





Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Sensor with 3-wire cable

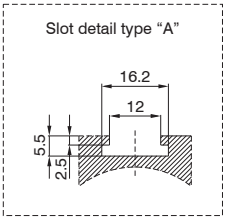
**Coding:** 1Ⓣ00.HAⓋ

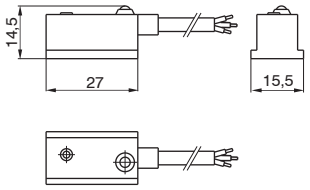
| Technical characteristics | |
|---|---|
| Permanent maximum current | 0,5A |
| Voltage field | 10 ... 30V DC |
| Power (inductive load) | 10W |
| Working temperature | -20°C ... 70°C |
| Voltage drop | 2V |
| Cable length | 3m |
| Cable colour | Black |
| External cable section | Ø4,2mm |
| Cover material | PUR |
| Number of wires in the cable | 3 |
| Wires section | 0,34 mm² |
| Connection type | With cable without connector |
| Protection degree | IP65 |
| Switch-on time | 0,8 µs |
| Switch-off time | 0,3 µs |
| Average working time | $10^9$ cycles |
| Repetition of intervention point | ± 0,1 mm |
| Contact type | N.O. |
| Directive | CE as set out in Directive 2014/30/EU<br>UKCA pursuant to U.K. S.I. Regulation 2016 No. 1091 |
| Fixing | With screw |
| Weight | 70g |
| With LED indication | With LED |
| LED color | Red |

| | |
|---|---|
| Ⓣ | TYPE |
| | **5** = Cylinders and microcylinders. Slot detail type "A". |
| | **6** = Rodless cylinders |
| Ⓥ | VERSION |
| | **P** = PNP |
| | **N** = NPN |

***Cylinders and microcylinders***

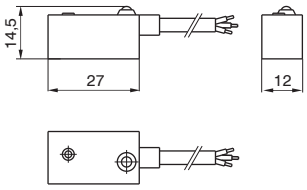




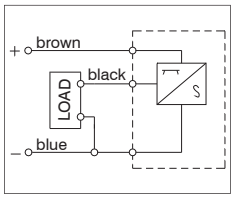

***Rodless cylinders***



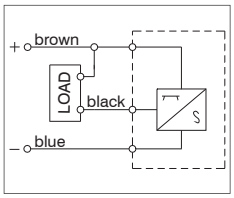



## Diagrams and connections

**PNP**




**NPN**



## 3-pin sensor for SNAP connector

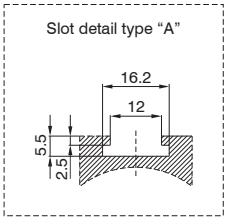
**Coding:** ❶HS.PA

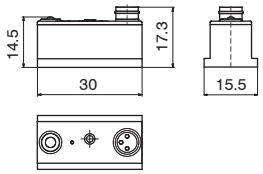
| Technical characteristics | |
|---|---|
| Permanent maximum current | 0,25A |
| Voltage field | 6 ... 30V DC |
| Power (inductive load) | 6W |
| Working temperature | -20°C ... 70°C |
| Voltage drop | 2V |
| Connection type | With cable and connector |
| Protection degree | IP65 |
| Switch-on time | 0,8 µs |
| Switch-off time | 0,3 µs |
| Average working time | $10^9$cycles |
| Repetition of intervention point | ± 0,1 mm |
| Contact type | N.O. |
| Directive | CE as set out in Directive 2014/30/EU<br>UKCA pursuant to U.K. S.I. Regulation 2016 No. 1091 |
| Fixing | With screw |
| Weight | 6g |
| With LED indication | With LED |
| LED color | Red |

| | |
|---|---|
| ❶ | TYPE<br>= Cylinders and microcylinders. Slot detail type "A".<br>**S** = Rodless cylinders |

***Cylinders and microcylinders***

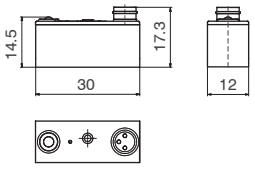




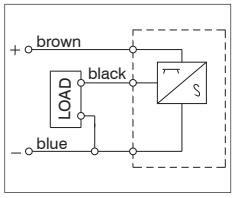




***Rodless cylinders***



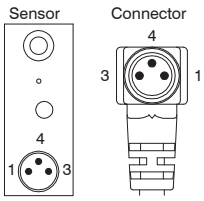



## Diagrams and connections




## Technical data

**Connection 3 wires 3 PIN**




## 3 pin sensor for SNAP connector + Connector with cable

**Coding:** ❶HS.PAC❷



| | |
|---|---|
| ❶ | TYPE<br>= Cylinders and microcylinders. Slot detail type "A".<br>**S** = Rodless cylinders |
| ❷ | CABLE LENGTH<br>**1** = 2.5m cable<br>**2** = 5m cable<br>**3** = 10m cable |

## Connector with 3 wires cable

**Coding:** CH❷



| Technical characteristics | CH1 | CH2 | CH3 |
|---|---|---|---|
| Cable colour | Light grey | | |
| External cable section | Ø3,5mm | | |
| Cover material | PVC | | |
| Number of wires in the cable | 3 wires | | |
| Wires section | 0,25 mm² | | |

| | |
|---|---|
| ❷ | CABLE LENGTH<br>**1** = 2.5m cable<br>**2** = 5m cable<br>**3** = 10m cable |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## 3 PIN sensor for M8 connector

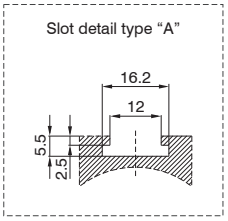
Coding: ❶HS8.❷A

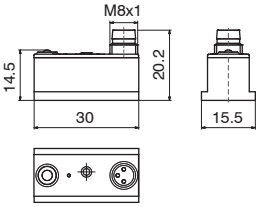
| Technical characteristics | |
|---|---|
| Permanent maximum current | 0,25A |
| Voltage field | 6 ... 30V DC |
| Power (inductive load) | 6W |
| Working temperature | -20°C ... 70°C |
| Voltage drop | 2V |
| Connection type | With cable and connector |
| Protection degree | IP65 |
| Switch-on time | 0,8 $\mu$s |
| Switch-off time | 0,3 $\mu$s |
| Average working time | $10^9$cycles |
| Repetition of intervention point | ± 0,1 mm |
| Contact type | N.O. |
| Directive | CE as set out in Directive 2014/30/EU<br>UKCA pursuant to U.K. S.I. Regulation 2016 No. 1091 |
| Fixing | With screw |
| Weight | 6g |
| With LED indication | With LED |
| LED color | Red |

| | |
|---|---|
| ❶ | TYPE |
| | = Cylinders and microcylinders. Slot detail type "A". |
| | **S** = Rodless cylinders |
| ❷ | VERSION |
| | **P** = PNP |
| | **N** = NPN |

***Cylinders and microcylinders***

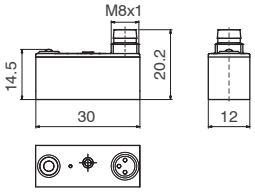




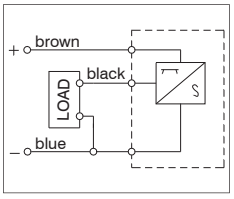

***Rodless cylinders***



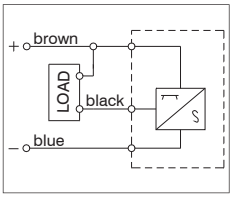



## Diagrams and connections

**PNP**

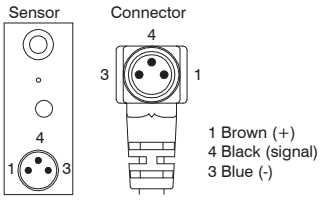



**NPN**




## Technical data

**Connection 3 wires 3 PIN**




## M8 connector with 3 wires cable

Coding: MCH❶



| Technical characteristics | MCH1 | MCH2 | MCH3 |
|---|---|---|---|
| Cable colour | Light grey | | |
| External cable section | Ø2,6mm | | |
| Cover material | PUR | | |
| Number of wires in the cable | 3 wires | | |
| Wires section | 0,15 mm² | | |

| | |
|---|---|
| ❶ | CABLE LENGTH |
| | **1** = 2,5 meters |
| | **2** = 5 meters |
| | **3** = 10 meters |

| Series SA | | |
|---|---|---|
| **Series** | Description | Assembly |
| 1200 | for microbore with threaded end covers and “TECNO-MIR” microbore | with clamps code 1260.Ø.F |
| | for microbore "MIR" with rolled end covers, cylinders from Ø16 to Ø32 | with clamps code 1280.Ø.F |
| | for microbore "MIR-INOX" with rolled end covers | with clamps code 1280.Ø.FX |
| 1306 - 1307 - 1308 | or cylinders from Ø32 to Ø63 | with brackets code 1306.A |
| | for cylinders from Ø80 to Ø125 | with brackets code 1306.B |
| | for cylinders from Ø160 to Ø200 | with brackets code 1306.C |
| 1315 | for cylinders Ø250 and Ø320 (ISO) | with brackets code 1306.D |
| 1319 - 1320 | for cylinders Ø32 and Ø40 | with brackets code 1320.A |
| | for cylinders Ø50 and Ø63 | with brackets code 1320.B |
| | for cylinders Ø80 and Ø100 | with brackets code 1320.C |
| | for cylinders Ø125 | with brackets code 1320.D |
| | for cylinders Ø160 | with brackets code 1320.E |
| | for cylinders Ø200 | with brackets code 1320.F |
| 1390 - 1391 | for cylinders ECOLIGHT Ø32 and Ø40 | with brackets code 1390.A |
| | for cylinders ECOLIGHT Ø50 and Ø63 | with brackets code 1390.B |
| | for cylinders ECOLIGHT Ø80 and Ø100 | with brackets code 1390.C |
| | for cylinders ECOLIGHT Ø125 - Ø200 | with brackets code 1390.D |
| 1500 | Compact cylinders "Europe" (from Ø32) | directly on groove |
| 1605 | Rodless cylinders | with brackets code 1600.A |




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## Series SR - SU - SQ - ST

The limit switches of magnetic sensors must be mounted on cylinders fitted with magnetic pistons.
These, are activated by the magnetic field generated by the magnetic piston as it approaches and closes the circuit sending an electrical signal to either a relay, solenoid valve or converses with the electrical control system of the machine. There are both ampulla or Hall effect magnetic sensors available which are attached to the cylinder using a suitable cylinder clamp/adaptor or mounted in a suitable slot on the cylinder. The switch may also include an activation LED indicator.

Note: The magnetic sensors are in accordance with the **Directive 2014/30/EU** and following amendments

**Instruction on how to use the sensors**

Particular attention needs to be paid to ensure that you do not exceed the operating characteristics shown in the following pages. Its important to note; 2 wire sensors should not be connected to the supply voltage if a load is not connected in series. Failure to do so may result in damage to the sensor. Furthermore, please consider that the 'inrush' (loading) current absorbed by the sensors might be up to 50% higher than rated.
For direct currents (DC), The polarity of the connection must be observed: The brown cable must be connected to the live (+) and the blue wire connected to the negative (-).
For all sensor applications, particular attention must be paid to the external factors such as nearby live cables, electromagnetic fields generated by electric motors as well as nearby metallic bodies as these can affect the magnetic field generated by the magnetic piston which in turn can cause malfunctions.
Electrical cable length must be kept below 10 meters in order to guarantee proper functioning.
If needed, 10 meters cable length can be exceeded; Pneumax suggests the use of an inductor or resistor in series to the load in order to reduce the capacitive behavior of the cable.
In this case, the customer is responsible for the selection of the inductor or resistor value. Pneumax assume no responsibility in case of malfunction.
When using a 2-wire reed type sensor, always ensure that the correct load is applied in series on any of the two wires.
In case two or more sensors need to be connected in series, pay attention to the voltage drop generated (around 3V for each sensor), and, in case, use the version designed for in series connection.
Hall effect sensors are longer lasting if compare to reed switched as they do not include any moving parts.

## Universal sensor with cable

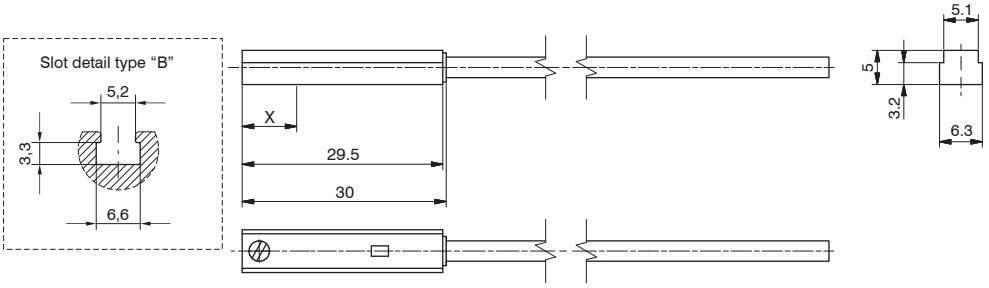
**Coding:** 1580.U(V)

| Technical characteristics | 1580.U | 1580.UAP |
|---|---|---|
| Permanent maximum current | 100mA | 500mA |
| Permanent maximum power | 10W | |
| Output type | / | PNP |
| Voltage field | 5 ... 240V DC/AC | 10 ... 30V DC/AC |
| Working temperature | -10°C ... 70°C | |
| Maximum voltage drop | 3,5V | 0.1V @100mA ** |
| Cable length | 2,5m | |
| Cable colour | Light grey | |
| External cable section | Ø3,3mm | |
| Cover material | PUR | |
| Number of wires in the cable | 2 | 3 |
| Wires section | 0,14 mm² | |
| Connection type | Open end | |
| Protection degree | IP67 | |
| Contact type | N.O. | |
| Directive | CE as set out in Directive 2014/30/EU | |
| Fixing | With screw | |
| Weight | 27g | |
| With LED indication | With LED | |
| LED color | Red | Yellow |

| (V) | VERSION |
|---|---|
| | = 2 wires |
| | **AP** = 3 wires, PNP |

*** Test conditions: 24V DC, ambient temperature 25°C, cable length 2 meters.*

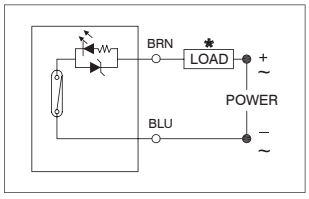




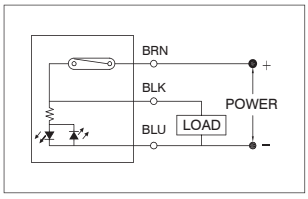

X=15mm, 1580.U point of commutation / X=13mm, 1580.UAP point of commutation

## Diagrams and connections

### With REED bulb, 2 wires




### With REED bulb, 3 wires




***The load (LOAD) can be connected either to negative or positive pole.**




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Universal sensor with M8 connection cable

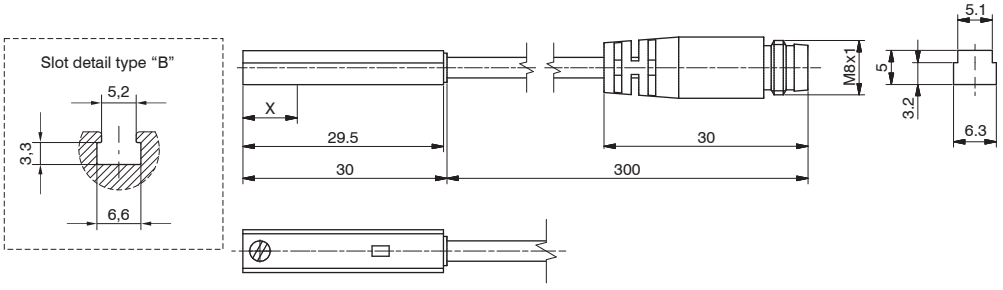
**Coding:** MRS.U(V)

| Technical characteristics | MRS.U | MRS.UAP |
|---|---|---|
| Permanent maximum current | 100mA | 500mA |
| Permanent maximum power | 10W | |
| Output type | / | PNP |
| Voltage field | 5 ... 240V DC/AC | 10 ... 30V DC/AC |
| Working temperature | -10°C ... 70°C | |
| Maximum voltage drop | 3,5V | 0.1V @100mA ** |
| Cable length | 300mm | |
| Cable colour | Light grey | |
| External cable section | Ø3,3mm | |
| Cover material | PUR | |
| Number of wires in the cable | 2 | 3 |
| Wires section | 0,14 mm² | |
| Connection type | With M8 male connector | |
| Protection degree | IP67 | |
| Contact type | N.O. | |
| Directive | CE as set out in Directive 2014/30/EU | |
| Fixing | With screw | |
| Weight | 15g | |
| With LED indication | With LED | |
| LED color | Red | Yellow |

| (V) | VERSION |
|---|---|
| | = 2 wires |
| | **AP** = 3 wires, PNP |

*** Test conditions: 24V DC, ambient temperature 25°C, cable length 2 meters.*

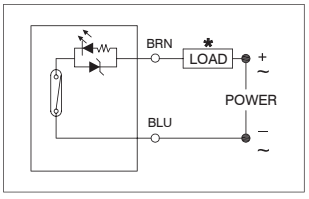




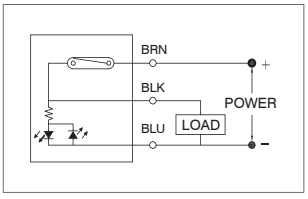

X=15mm, MRS.U point of commutation / X=13mm, MRS.UAP point of commutation

### Diagrams and connections

**With REED bulb, 2 wires**




**With REED bulb, 3 wires**




***The load (LOAD) can be connected either to negative or positive pole.**

### Technical data

**Connection 2 wires**

Connector / Sensor




1 Brown (+)
4 Blue (-)
3 Not used

**Connection 3 wires**

Connector / Sensor




1 Brown (+)
4 Black (signal)
3 Blue (-)

| Connectors to use | | |
|---|---|---|
| Sensor | MRS.U | MRS.UAP |
| Connectors | 2 wires: MC1, MC2,MC3<br>3 wires: MCH1, MCH2, MCH3 | |

## M8 connector with 2 wires cable

**Coding:** MC(L)



| Technical characteristics | MC1 | MC2 | MC3 |
|---|---|---|---|
| Cable colour | Light grey | | |
| External cable section | Ø2,6mm | | |
| Cover material | PUR | | |
| Number of wires in the cable | 2 wires | | |
| Wires section | 0,15 mm² | | |

| (L) | CABLE LENGTH |
|---|---|
| | **1** = 2.5m cable 2 wires |
| | **2** = 5m cable 2 wires |
| | **3** = 10m cable 2 wires |

## M8 connector with 3 wires cable

**Coding:** MCH(L)



| Technical characteristics | MCH1 | MCH2 | MCH3 |
|---|---|---|---|
| Cable colour | Light grey | | |
| External cable section | Ø2,6mm | | |
| Cover material | PUR | | |
| Number of wires in the cable | 3 wires | | |
| Wires section | 0,15 mm² | | |

| (L) | CABLE LENGTH |
|---|---|
| | **1** = 2,5 meters |
| | **2** = 5 meters |
| | **3** = 10 meters |

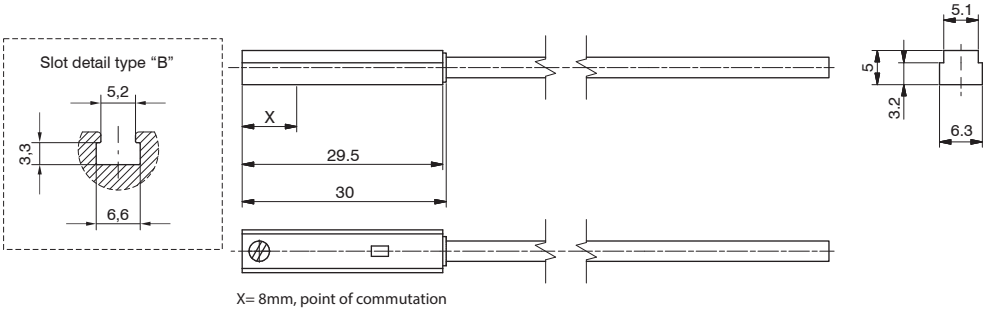
## Cable sensor

**Coding:** 1580.HA(V)

| Technical characteristics | | |
|---|---|---|
| | 1580.HAP | 1580.HAN |
| Permanent maximum current | 100mA | |
| Permanent maximum power | 3W | |
| Output type | PNP | NPN |
| Voltage field | 10 ... 30V DC | |
| Working temperature | -10°C ... 70°C | |
| Maximum voltage drop | 1.5V | |
| Cable length | 2,5m | |
| Cable colour | Light grey | |
| External cable section | Ø3,3mm | |
| Cover material | PUR | |
| Number of wires in the cable | 3 | |
| Wires section | 0,14 mm² | |
| Connection type | Open end | |
| Protection degree | IP67 | |
| Contact type | N.O. | |
| Directive | CE as set out in Directive 2014/30/EU | |
| Fixing | With screw | |
| Weight | 27g | |
| With LED indication | With LED | |
| LED color | Yellow | Red |

| (V) | VERSION |
|---|---|
| | **P** = 3 wires PNP |
| | **N** = 3 wires NPN |

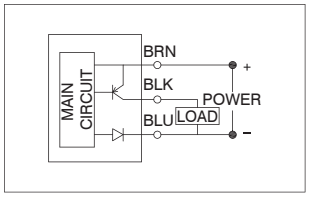




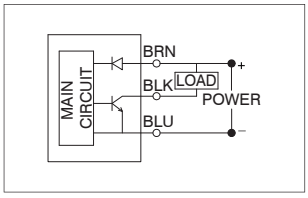

X= 8mm, point of commutation

### Diagrams and connections

**HALL effect-PNP, 3 wire**




**HALL effect-NPN, 3 wire**







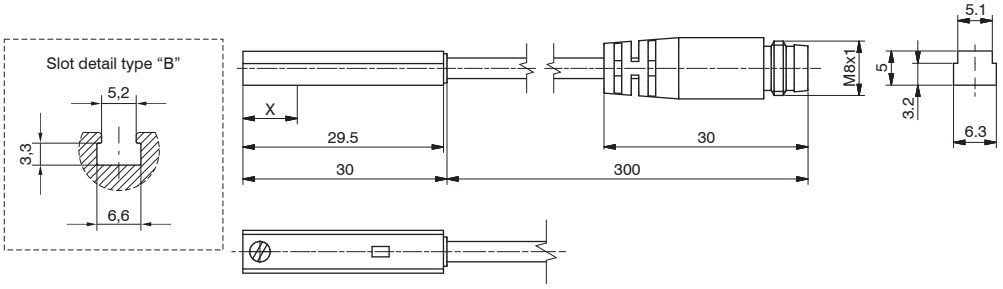

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Sensor with M8 connection cable

**Coding:** MHS.P

| Technical characteristics | |
|---|---|
| Output type | PNP |
| Permanent maximum current | 100mA |
| Permanent maximum power | 3W |
| Voltage field | 10 ... 30V DC |
| Working temperature | -10°C ... 70°C |
| Maximum voltage drop | 1.5V |
| Cable length | 300mm |
| Cable colour | Light grey |
| External cable section | Ø3,3mm |
| Cover material | PUR |
| Number of wires in the cable | 3 |
| Wires section | 0,14 mm² |
| Connection type | With M8 male connector |
| Protection degree | IP67 |
| Contact type | N.O. |
| Directive | CE as set out in Directive 2014/30/EU |
| Fixing | With screw |
| Weight | 15g |
| With LED indication | With LED |
| LED color | Yellow |

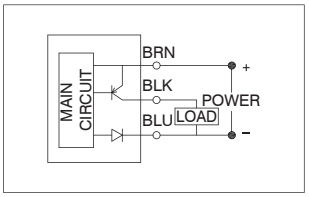





X=8mm, point of commutation

### Diagrams and connections

**HALL effect-PNP, 3 wire**




### Technical data

**Connection 3 wires**




1 Brown (+)
4 Black (signal)
3 Blue (-)

| Connectors to use | |
|---|---|
| Sensor | MHS.P |
| Connectors | MCH1 - MCH2 - MCH3 |

## M8 connector with 3 wires cable

**Coding:** MCH(L)



| Technical characteristics | MCH1 | MCH2 | MCH3 |
|---|---|---|---|
| Cable colour | Light grey | | |
| External cable section | Ø2,6mm | | |
| Cover material | PUR | | |
| Number of wires in the cable | 3 wires | | |
| Wires section | 0,15 mm² | | |

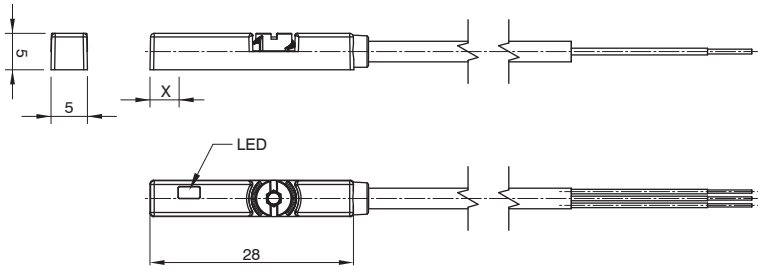
| (L) | CABLE LENGTH |
|---|---|
| | **1** = 2,5 meters |
| | **2** = 5 meters |
| | **3** = 10 meters |

## Cable sensor

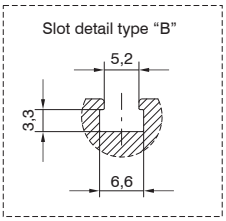
**Coding:** 1595.HAP

| Technical characteristics | |
|---|---|
| Output type | PNP |
| Permanent maximum current | 100mA |
| Permanent maximum power | 3W |
| Voltage field | 10 ... 28V DC |
| Working temperature | -10°C ... 70°C |
| Maximum voltage drop | 1,5V |
| Cable length | 2,5m |
| Cable colour | Black |
| External cable section | Ø2,8mm |
| Cover material | PUR |
| Number of wires in the cable | 3 |
| Wires section | 0,14 mm² |
| Connection type | Open end |
| Protection degree | IP67 |
| Contact type | N.O. |
| Directive | CE as set out in Directive 2014/30/EU |
| Fixing | With screw |
| Weight | 23g |
| With LED indication | With LED |
| LED color | Yellow |

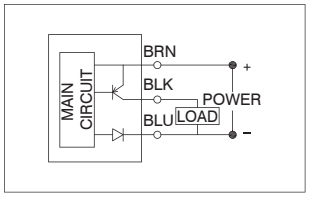





X= 2,3mm, point of commutation




### Diagrams and connections








Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Cable sensor

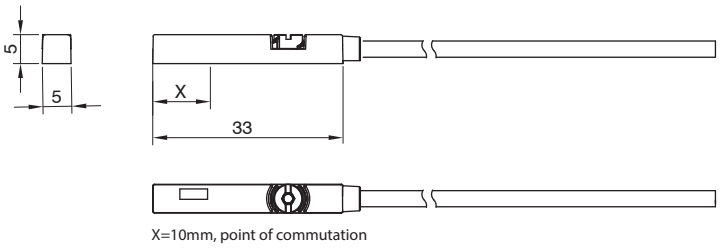
**Coding:** 1590.U(V)

| Technical characteristics | | |
|---|---|---|
| | 1590.U | 1590.UAP |
| Output type | - | PNP |
| Permanent maximum current | 100mA | 500mA |
| Permanent maximum power | 10W | |
| Voltage field | 5 ... 240V DC/AC | 10 ... 30V DC/AC |
| Working temperature | -10°C ... 70°C | |
| Maximum voltage drop | 3V | 0.1V @100mA ** |
| Cable length | 2,5m | |
| Cable colour | Black | |
| External cable section | Ø2,8mm | |
| Cover material | PUR | |
| Number of wires in the cable | 2 | 3 |
| Wires section | 0,14 mm² | |
| Connection type | Open end | |
| Protection degree | IP67 | |
| Contact type | N.O. | |
| Directive | CE as set out in Directive 2014/30/EU | |
| Fixing | With screw | |
| Weight | 27g | |
| With LED indication | With LED | |
| LED color | Red | Yellow |

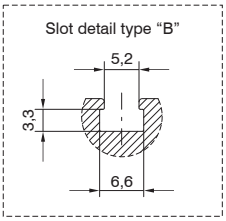
| (V) | VERSION |
|---|---|
| | = 2 wires |
| | **AP** = 3 wires, PNP |

*** Test conditions: 24V DC, ambient temperature 25°C, cable length 2 meters.*



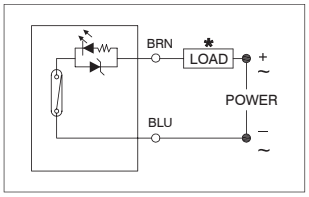



X=10mm, point of commutation

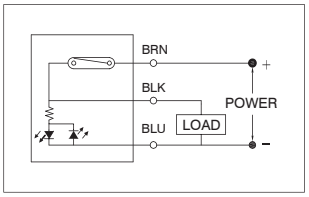



### Diagrams and connections

**With REED bulb, 2 wires**




**With REED bulb, 3 wires**




***The load (LOAD) can be connected either to negative or positive pole.**

## Sensor with M8 connection cable

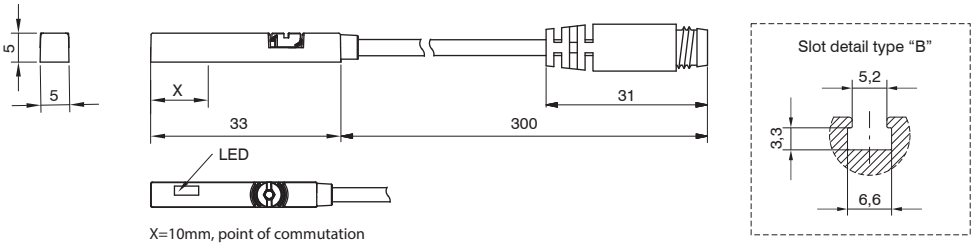
**Coding:** LRS.UⓋ

| Technical characteristics | | |
|---|---|---|
| | LRS.U | LRS.UAP |
| Output type | - | PNP |
| Permanent maximum current | 100mA | 500mA |
| Permanent maximum power | 10W | |
| Voltage field | 5 ... 240V DC/AC | 10 ... 30V DC/AC |
| Working temperature | -10°C ... 70°C | |
| Maximum voltage drop | 3V | 0.1V @100mA ** |
| Cable length | 300mm | |
| Cable colour | Black | |
| External cable section | Ø2,8mm | |
| Cover material | PUR | |
| Number of wires in the cable | 2 | 3 |
| Wires section | 0,14 mm² | |
| Connection type | With M8 male connector | |
| Protection degree | IP67 | |
| Contact type | N.O. | |
| Directive | CE as set out in Directive 2014/30/EU | |
| Fixing | With screw | |
| Weight | 15g | |
| With LED indication | With LED | |
| LED color | Red | Yellow |

| Ⓥ | VERSION |
|---|---|
| | = 2 wires |
| | **AP** = 3 wires, PNP |

*** Test conditions: 24V DC, ambient temperature 25°C, cable length 2 meters.*

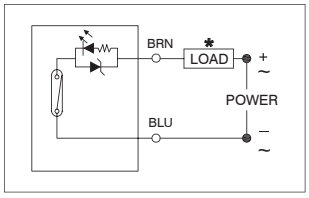




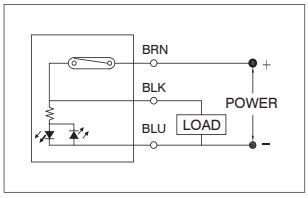

X=10mm, point of commutation

## Diagrams and connections

### With REED bulb, 2 wires




### With REED bulb, 3 wires




***The load (LOAD) can be connected either to negative or positive pole.**

## Technical data

### Connection 2 wires




1 Brown (+)
4 Blue (-)
3 Not used

### Connection 3 wires




1 Brown (+)
4 Black (signal)
3 Blue (-)

| Connectors to use | | |
|---|---|---|
| Sensors | LRS.U | LRS.UAP |
| Connectors | MC1 - MC2 - MC3 | MCH1 - MCH2 - MCH3 |

## M8 connector with 2 wires cable

**Coding:** MCⓁ



| Technical characteristics | MC1 | MC2 | MC3 |
|---|---|---|---|
| Cable colour | Light grey | | |
| External cable section | Ø2,6mm | | |
| Cover material | PUR | | |
| Number of wires in the cable | 2 wires | | |
| Wires section | 0,15 mm² | | |

| Ⓛ | CABLE LENGTH |
|---|---|
| | **1** = 2.5m cable 2 wires |
| | **2** = 5m cable 2 wires |
| | **3** = 10m cable 2 wires |

## M8 connector with 3 wires cable

**Coding:** MCHⓁ



| Technical characteristics | MCH1 | MCH2 | MCH3 |
|---|---|---|---|
| Cable colour | Light grey | | |
| External cable section | Ø2,6mm | | |
| Cover material | PUR | | |
| Number of wires in the cable | 3 wires | | |
| Wires section | 0,15 mm² | | |

| Ⓛ | CABLE LENGTH |
|---|---|
| | **1** = 2.5m 3-wire cable |
| | **2** = 5m 3-wire cable |
| | **3** = 10m 3-wire cable |





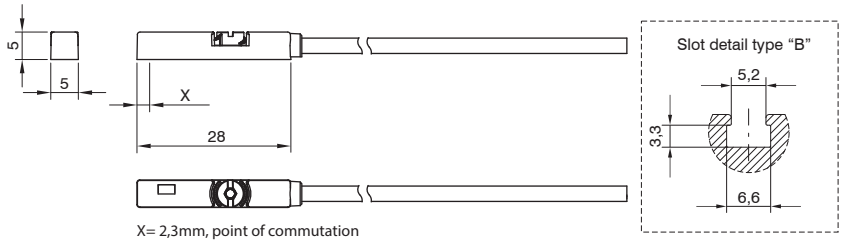
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Cable sensor

**Coding:** 1590.HAP

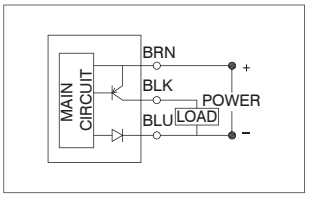
| Technical characteristics | |
|---|---|
| Output type | PNP |
| Permanent maximum current | 200mA |
| Permanent maximum power | 5.5W |
| Voltage field | 10 ... 28V DC |
| Working temperature | -10°C ... 70°C |
| Maximum voltage drop | 1,5V |
| Cable length | 2,5m |
| Cable colour | Black |
| External cable section | Ø2,8mm |
| Cover material | PUR |
| Number of wires in the cable | 3 |
| Wires section | 0,14 mm² |
| Connection type | Open end |
| Protection degree | IP67 |
| Contact type | N.O. |
| Directive | CE as set out in Directive 2014/30/EU |
| Fixing | With screw |
| Weight | 27g |
| With LED indication | With LED |
| LED color | Yellow |






X= 2,3mm, point of commutation

### Diagrams and connections

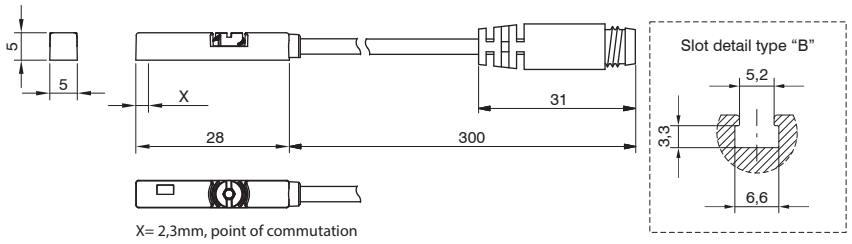


## Sensor with M8 connection cable

**Coding:** LHS.P

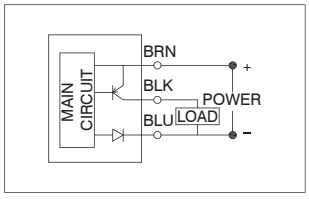
| Technical characteristics | |
|---|---|
| Output type | PNP |
| Permanent maximum current | 200mA |
| Permanent maximum power | 5.5W |
| Voltage field | 10 ... 28V DC |
| Working temperature | -10°C ... 70°C |
| Maximum voltage drop | 1,5V |
| Cable length | 300mm |
| Cable colour | Black |
| External cable section | Ø2,8mm |
| Cover material | PUR |
| Number of wires in the cable | 3 |
| Wires section | 0,14 mm² |
| Connection type | With M8 male connector |
| Protection degree | IP67 |
| Contact type | N.O. |
| Directive | CE as set out in Directive 2014/30/EU |
| Fixing | With screw |
| Weight | 15g |
| With LED indication | With LED |
| LED color | Yellow |






X= 2,3mm, point of commutation

## Diagrams and connections




## Technical data

### Connection 3 wires

Connector Sensor




1 Brown (+)
4 Black (signal)
3 Blue (-)

| Connectors to use | |
|---|---|
| Sensors | LHS.P |
| Connectors | MCH1 - MCH2 - MCH3 |

## M8 connector with 3 wires cable

**Coding:** MCH L

| L | CABLE LENGTH |
|---|---|
| | **1** = 2.5m 3-wire cable |
| | **2** = 5m 3-wire cable |
| | **3** = 10m 3-wire cable |



| Technical characteristics | MCH1 | MCH2 | MCH3 |
|---|---|---|---|
| Cable colour | Light grey | | |
| External cable section | Ø2,6mm | | |
| Cover material | PUR | | |
| Number of wires in the cable | 3 wires | | |
| Wires section | 0,15 mm² | | |





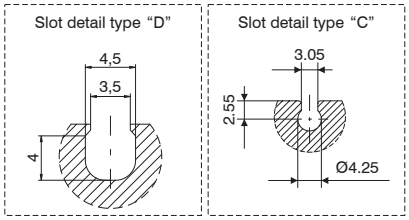
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

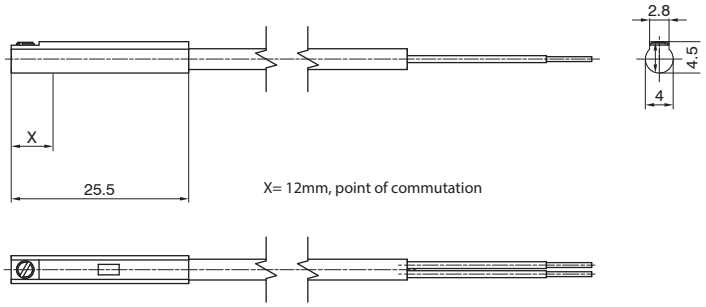
## Universal sensor with cable

**Coding:** 1581.U

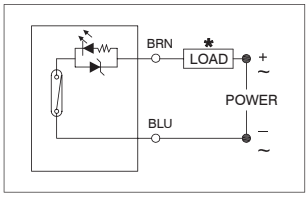
| Technical characteristics | |
|---|---|
| Permanent maximum current | 100mA |
| Permanent maximum power | 10W |
| Voltage field | 5 ... 120V DC/AC |
| Working temperature | -10°C ... 70°C |
| Maximum voltage drop | 3,5V |
| Cable length | 2,5m |
| Cable colour | Light grey |
| External cable section | Ø2,8mm |
| Cover material | PUR |
| Number of wires in the cable | 2 |
| Wires section | 0,14 mm² |
| Connection type | Open end |
| Protection degree | IP67 |
| Contact type | N.O. |
| Directive | CE as set out in Directive 2014/30/EU |
| Fixing | With screw |
| Weight | 27g |
| With LED indication | With LED |
| LED color | Red |






### Diagrams and connections



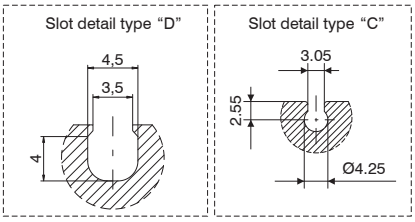

***The load (LOAD) can be connected either to negative or positive pole.**

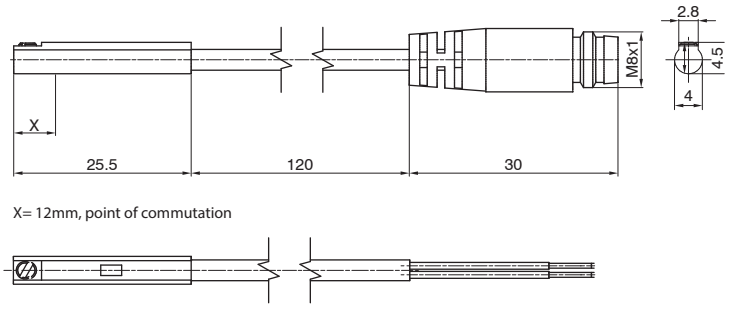
## Universal sensor with M8 connection cable

**Coding:** TRS.U

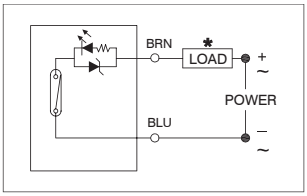
| Technical characteristics | |
|---|---|
| Permanent maximum current | 100mA |
| Permanent maximum power | 10W |
| Voltage field | 5 ... 120V DC/AC |
| Working temperature | -10°C ... 70°C |
| Maximum voltage drop | 3,5V |
| Cable length | 150mm |
| Cable colour | Light grey |
| External cable section | Ø2,8mm |
| Cover material | PUR |
| Number of wires in the cable | 2 |
| Wires section | 0,14 mm² |
| Connection type | With M8 male connector |
| Protection degree | IP67 |
| Contact type | N.O. |
| Directive | CE as set out in Directive 2014/30/EU |
| Fixing | With screw |
| Weight | 10g |
| With LED indication | With LED |
| LED color | Red |






## Diagrams and connections




## Technical data

**Connection 2 wires**

Connector Sensor




1 Brown (+)
4 Blue (-)
3 Not used

| Connectors to use | |
|---|---|
| Sensors | TRS.U |
| Connectors | MC1 - MC2 - MC3 |

## M8 connector with 2 wires cable

**Coding:** MC(L)



| Technical characteristics | MC1 | MC2 | MC3 |
|---|---|---|---|
| Cable colour | Light grey | | |
| External cable section | Ø2,6mm | | |
| Cover material | PUR | | |
| Number of wires in the cable | 2 wires | | |
| Wires section | 0,15 mm² | | |

| (L) | CABLE LENGTH |
|---|---|
| | **1** = 2.5m cable 2 wires |
| | **2** = 5m cable 2 wires |
| | **3** = 10m cable 2 wires |





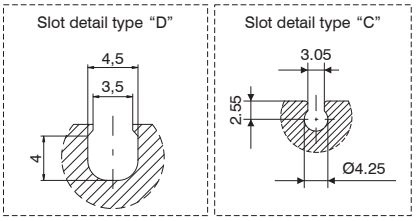
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

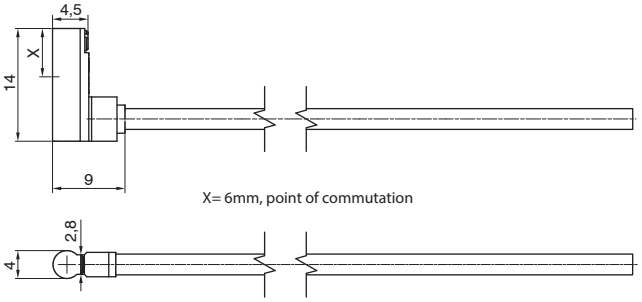
## Sensor with 90° cable

**Coding:** 1583.DC

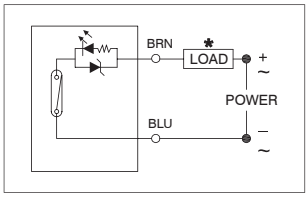
| Technical characteristics | |
|---|---|
| Permanent maximum current | 50mA |
| Permanent maximum power | 1.5W |
| Voltage field | 5 ... 30V DC |
| Working temperature | -10°C ... 70°C |
| Maximum voltage drop | 3,5V |
| Cable length | 2m |
| Cable colour | Black |
| External cable section | Ø2,6mm |
| Cover material | PVC |
| Number of wires in the cable | 2 |
| Wires section | 0,14 mm² |
| Connection type | Open end |
| Protection degree | IP67 |
| Contact type | N.O. |
| Directive | CE as set out in Directive 2014/30/EU |
| Fixing | With screw |
| Weight | 22g |
| With LED indication | With LED |
| LED color | Red |






### Diagrams and connections



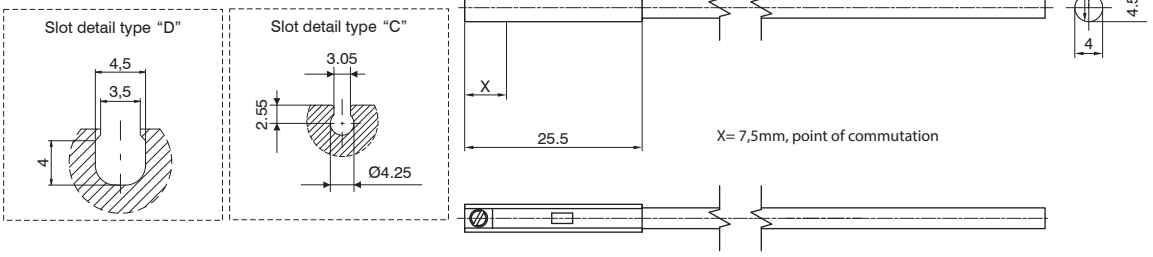
## Cable sensor

**Coding:** 1581.HAP

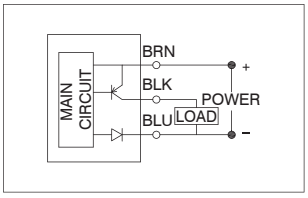
| Technical characteristics | |
|---|---|
| Output type | PNP |
| Permanent maximum current | 200mA |
| Permanent maximum power | 6W |
| Voltage field | 5 ... 30V DC |
| Working temperature | -10°C ... 70°C |
| Maximum voltage drop | 1V @200mA * |
| Cable length | 2,5m |
| Cable colour | Black |
| External cable section | Ø2,8mm |
| Cover material | PUR |
| Number of wires in the cable | 3 |
| Wires section | 0,14 mm² |
| Connection type | Open end |
| Protection degree | IP67 |
| Contact type | N.O. |
| Directive | CE as set out in Directive 2014/30/EU |
| Fixing | With screw |
| Weight | 22g |
| With LED indication | With LED |
| LED color | Green |

** Test conditions: 24V DC, ambient temperature 25°C, cable length 2 meters.*






## Diagrams and connections








Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

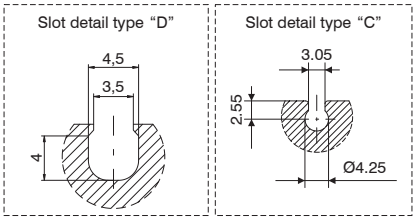
## Sensor with M8 connection cable

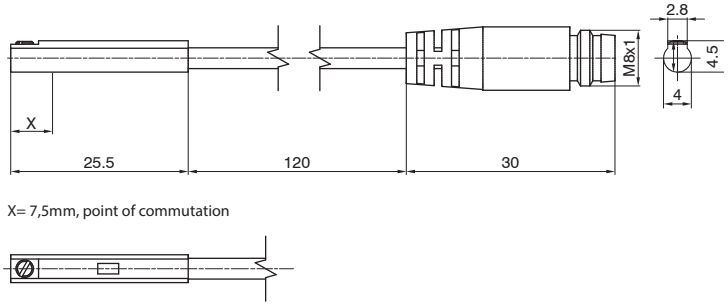
**Coding:** THS.P

| Technical characteristics | |
|---|---|
| Output type | PNP |
| Permanent maximum current | 200mA |
| Permanent maximum power | 6W |
| Voltage field | 5 ... 30V DC |
| Working temperature | -10°C ... 70°C |
| Maximum voltage drop | 1V @200mA * |
| Cable length | 150mm |
| Cable colour | Black |
| External cable section | Ø2,8mm |
| Cover material | PUR |
| Number of wires in the cable | 3 |
| Wires section | 0,14 mm² |
| Connection type | With M8 male connector |
| Protection degree | IP67 |
| Contact type | N.O. |
| Directive | CE as set out in Directive 2014/30/EU |
| Fixing | With screw |
| Weight | 10g |
| With LED indication | With LED |
| LED color | Green |

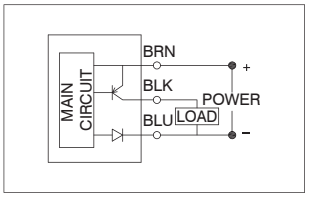
** Test conditions: 24V DC, ambient temperature 25°C, cable length 2 meters.*






### Diagrams and connections




### Technical data

**Connection 3 wires**

Connector




Sensor




1 Brown (+)
4 Black (signal)
3 Blue (-)

| Connectors to use | |
|---|---|
| Sensors | THS.P |
| Connectors | MCH1 - MCH2 - MCH3 |

## M8 connector with 3 wires cable

**Coding:** MCH L



| Technical characteristics | MCH1 | MCH2 | MCH3 |
|---|---|---|---|
| Cable colour | Light grey | | |
| External cable section | Ø2,6mm | | |
| Cover material | PUR | | |
| Number of wires in the cable | 3 wires | | |
| Wires section | 0,15 mm² | | |

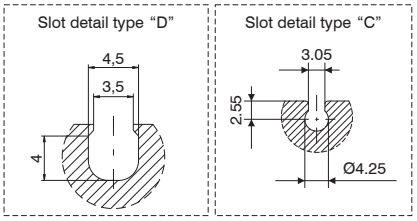
| L | CABLE LENGTH |
|---|---|
| | **1** = 2.5m 3-wire cable |
| | **2** = 5m 3-wire cable |
| | **3** = 10m 3-wire cable |

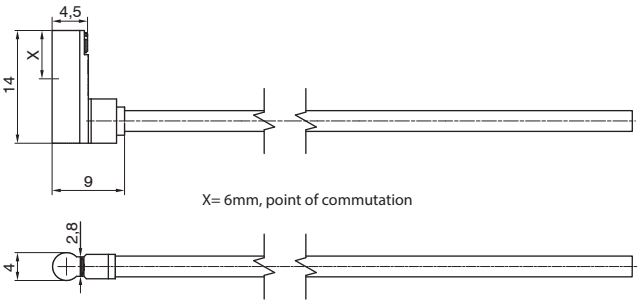
## Sensor with 90° cable

**Coding:** 1583.HAP

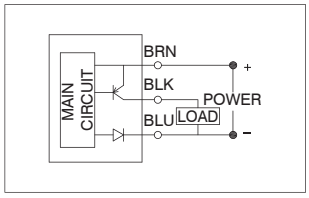
| Technical characteristics | |
|---|---|
| Output type | PNP |
| Permanent maximum current | 50mA |
| Permanent maximum power | 1,5W |
| Voltage field | 4,5 ... 28V DC |
| Working temperature | -10°C ... 70°C |
| Maximum voltage drop | 0,5V |
| Cable length | 3m |
| Cable colour | Black |
| External cable section | Ø2,6mm |
| Cover material | PVC |
| Number of wires in the cable | 3 |
| Wires section | 0,14 mm² |
| Connection type | Open end |
| Protection degree | IP67 |
| Contact type | N.O. |
| Directive | CE as set out in Directive 2014/30/EU |
| Fixing | With screw |
| Weight | 22g |
| With LED indication | With LED |
| LED color | Red |






### Diagrams and connections







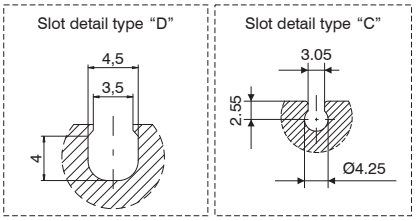

Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

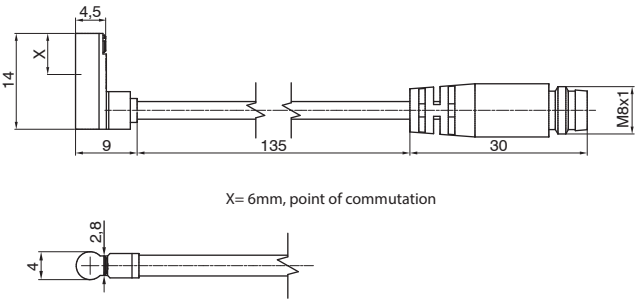
## Sensor with 90° cable and M8 connection

**Coding:** THR.P

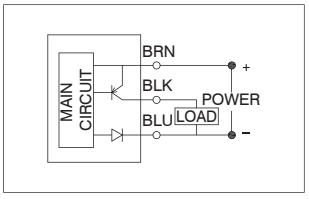
| Technical characteristics | |
|---|---|
| Output type | PNP |
| Permanent maximum current | 50mA |
| Permanent maximum power | 1,5W |
| Voltage field | 4,5 ... 28V DC |
| Working temperature | -10°C ... 70°C |
| Maximum voltage drop | 0,5V |
| Cable length | 100mm |
| Cable colour | Black |
| External cable section | Ø2,6mm |
| Cover material | PVC |
| Number of wires in the cable | 3 |
| Wires section | 0,14 mm² |
| Connection type | With M8 male connector |
| Protection degree | IP67 |
| Contact type | N.O. |
| Directive | CE as set out in Directive 2014/30/EU |
| Fixing | With screw |
| Weight | 10g |
| With LED indication | With LED |
| LED color | Red |






### Diagrams and connections




### Technical data

**Connection 3 wires**

Connector Sensor




1 Brown (+)
4 Black (signal)
3 Blue (-)

| Connectors to use | |
|---|---|
| Sensors | THR.P |
| Connectors | MCH1 - MCH2 - MCH3 |

## M8 connector with 3 wires cable

**Coding:** MCH❶



| Technical characteristics | MCH1 | MCH2 | MCH3 |
|---|---|---|---|
| Cable colour | Light grey | | |
| External cable section | Ø2,6mm | | |
| Cover material | PUR | | |
| Number of wires in the cable | 3 wires | | |
| Wires section | 0,15 mm² | | |

| ❶ | CABLE LENGTH |
|---|---|
| | **1** = 2.5m 3-wire cable |
| | **2** = 5m 3-wire cable |
| | **3** = 10m 3-wire cable |



Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

| SR series, rectangular section version (for "B" type slot) | | |
|---|---|---|
| **Series** | Description | Assembly |
| 1200 | Microbore with threaded end covers and "TECNO-MIR" microbore "MIR" with rolled end covers<br>Microbore "MIR-INOX" with rolled end covers | with clamps code 1260.Ø.FS<br>with clamps code 1280.Ø.FS<br>with clamps code 1280.Ø.FSX |
| 1319 - 1320<br>1325 - 1345<br>1330 - 1332<br>1348 - 1349 | for cylinders Ø32 ... Ø40 | with bracket code 1320.AS |
| | for cylinders Ø50 ... Ø63 | with bracket code 1320.BS |
| | for cylinders Ø80 ... Ø100 | with bracket code 1320.CS |
| | for cylinders Ø125 | with bracket code 1320.DSC |
| | for cylinders Ø160 | with bracket code 1320.ESC |
| | for cylinders Ø200 | with bracket code 1320.FSC |
| 1386-87 /<br>1396-97 | Cylinders according to standard ISO 15552 ECOPLUS | directly on groove |
| 1390 - 1391 | Cylinders according to standard ISO 15552 ECOLIGHT<br><br>Warning: To use only into the lateral slot, from Ø32 to Ø63 cylinders.<br>(do not use into the 2 slots positioned on the side of feeding connection) | directly on groove |
| 1370 ... 1373 | Cylinders ECOFLAT | directly on groove |
| 1500 | Short stroke compact cylinders | with adapter code 1380.01F |
| | Compact cylinders "Europe" | from Ø12 to Ø25: directly on groove |
| | | from Ø32 to Ø50:directly on groove or with adapter 1380.01F |
| | | from Ø63 to Ø100: with adapter cod. 1380.01F |
| | Compact cylinder according to standard ISO 21287 ECOMPACT | directly on groove |
| 1605 | Rodless cylinders | with adapter code 1600.C |
| 6100 | Guided compact cylinder (Ø20 - Ø63) | directly on groove |
| 6101 | Heavy duty guided shortstroke cylinder | directly on groove |
| 6200 | Twin-rod slide units | directly on groove |
| 6210 | Through twin-rod slide units | directly on groove |
| 6301 | Pneumatic grippers, angular standard version | directly on groove |
| 6303 | 180° angular gripper rack & pinion style | directly on groove |
| 6310 | Parallel style pneumatic grippers standard version (Ø10 - Ø25) | directly on groove |
| 6311 | Parallel style pneumatic grippers wide opening | directly on groove |
| 6312 | 3 finger parallel style pneumatic grippers (Ø32 - Ø125) | directly on groove |



| SQ-SU series, square section version (for sensor slot type "B") | | |
|---|---|---|
| **Series** | Description | Assembly |
| 1319 - 1320<br>1325 - 1345<br>1330 - 1332<br>1348 - 1349 | for cylinders Ø32 ... Ø40 | with brackets code 1320.ASC |
| | for cylinders Ø50 ... Ø63 | with brackets code 1320.BSC |
| | for cylinders Ø80 ... Ø100 | with brackets code 1320.CSC |
| | for cylinders Ø125 | with bracket code 1320.DSC |
| | for cylinders Ø160 | with bracket code 1320.ESC |
| | for cylinders Ø200 | with bracket code 1320.FSC |
| 1386-87 /<br>1396-97 | Cylinders according to standard ISO 15552 ECOPLUS | directly on groove |
| 1390 - 1391 | Cylinders according to standard ISO 15552 ECOLIGHT | directly on groove |
| 1370 ... 1373 | Cylinders ECOFLAT | directly on groove |
| 1500 | Short stroke compact cylinders | with adapter code 1380.01F |
| | Compact cylinders "Europe" | from Ø12 to Ø25: directly on groove |
| | | from Ø32 to Ø50: directly on groove |
| | | directly on groove |
| | Compact cylinder according to standard ISO 21287 ECOMPACT | directly on groove |
| 1605 | Rodless cylinders | with adapter code 1600.C |
| 6100 | Guided compact cylinder (Ø20 - Ø63) | directly on groove |
| 6101 | Heavy duty guided shortstroke cylinder | directly on groove |
| 6200 | Twin-rod slide units | directly on groove |
| 6210 | Through twin-rod slide units | directly on groove |
| 6301 | Pneumatic grippers, angular standard version | directly on groove |
| 6303 | 180° angular gripper rack & pinion style | directly on groove |
| 6310 | Parallel style pneumatic grippers standard version (Ø10 - Ø25) | directly on groove |
| 6311 | Parallel style pneumatic grippers wide opening | directly on groove |
| 6312 | 3 finger parallel style pneumatic grippers (Ø32 - Ø125) | directly on groove |
| 6411 | Single rack rotary actuators | directly on groove |



| ST Series, round section version (for sensor slot type "C" and "D") | | |
|---|---|---|
| **Series** | Description | Assembly |
| 6100 | Guided compact cylinder (Ø12 - Ø16) | directly on groove |
| 6302 | Pneumatic grippers, 180 °angular | directly on groove |
| 6310 | Parallel style pneumatic grippers standard version (Ø16 and Ø25) | directly on groove |
| 6312 | 3 finger parallel style pneumatic grippers (Ø16 ... (Ø25) | directly on groove |
| 6400 | Double rack rotary actuators with turn table | directly on groove |
| 6420 | Vane type rotary actuators (from Ø10 to Ø40) | directly on groove |
| 6500 | Multimount cylinders | directly on groove |
| 6600 | Slide cylinders | directly on groove |
| 6700 | Guide cylinders | directly on groove |



| ST Series, 90° round cable section version (for sensor slot type "C" and "D") | | |
|---|---|---|
| **Series** | Description | Assembly |
| 6420 | Vane type rotary actuators | directly on groove |






Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

## Series 1260-1320

The piston rod lock devices are clamping units mounted on the microbore cylinders front head. They allow the piston rod to lock in any position. Piston rod clamping is mechanically obtained by springs actuated purpose-made jaws. This method allows to lock the cylinder in the desired position, should the air pressure drop.
The piston rod lock device is not a safety device.

### Construction characteristics

| | |
|---|---|
| Body | anodized aluminium |
| Clamping jaws | hardened alloy copper |
| Seals | NBR |
| Springs | spring steel |
| Pistons | acetal resin |
| Body | anodized aluminium |

### Operational characteristics

| | |
|---|---|
| Fluid | filtered and lubricated air |
| Working pressure | 3 bar ... 6 bar |
| Function | mechanical double jaws |
| Locking | axial, two-direction (normally locked) |
| Unlocking | pneumatic |
| Working temperature | -5 °C ... +70 °C |

| | | | | | |
|---|---|---|---|---|---|
| Holding force with static load (microbore cylinders) | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
| | 180N | 180N | 350N | 350N | 600N |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Holding force with static load (cylinders) | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 | Ø125 |
| | 600N | 1000N | 1400N | 2000N | 5000N | 5000N | 7000N |

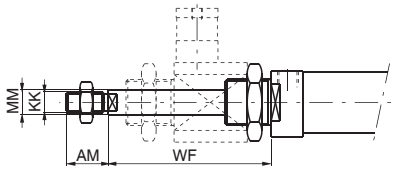
Attention: Dry air must be used for application below 0°C

### Use and maintenance

Operate within the specified technical characteristics.
The piston rod lock does not require maintenance if properly utilised.
The working inlet port has to be pressurised for assembling the piston rod lock device on cylinder. Alternatively adjust the jaws with screw located on connection.
Spare parts are not available.

## Microbore for piston rod lock

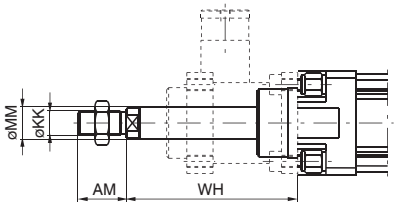
### Threaded end covers version




| Ordering code |
|---|
| **12_ _.Ø.stroke.B** |

Order piston rod lock separately.
Do not use with stainless steel or hexagonal piston rod.

## ISO 15552 cylinders for piston rod lock

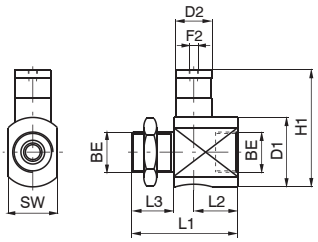



Order piston rod lock separately. Do not use with stainless steel piston rod.

| Ordering code |
|---|
| **13 – –.Ø.stroke.– –.B** |

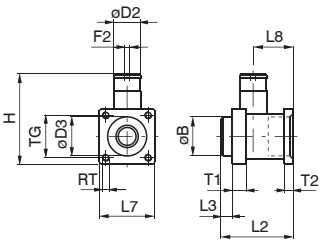
## Piston rod lock complete






Do not use as safety device



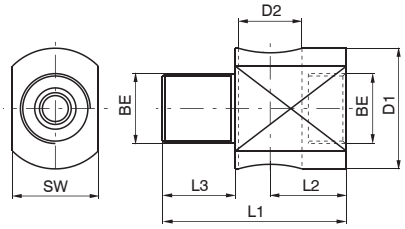



| Ordering code | Ø | 12 | 16 | 20 | 25 | 32 |
|---|---|---|---|---|---|---|
| **1260.Ø.51BS** | Weight (g) | 82 | 82 | 140 | 140 | 188 |

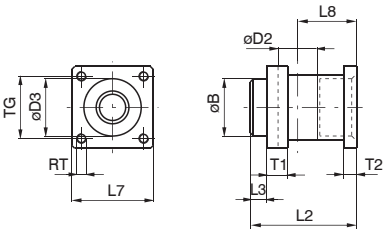
| Ordering code | Ø | 32 | 40 | 50 | 63 | 80 | 100 | 125 |
|---|---|---|---|---|---|---|---|---|
| **1320.Ø.51BS** | Weight (g) | 191 | 276 | 535 | 852 | 1772 | 2412 | 5250 |

## Piston rod lock bracket







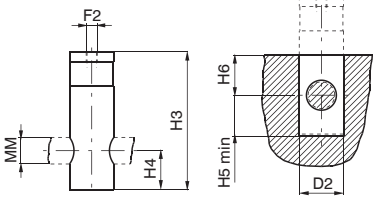




| Ordering code | Ø | 12 | 16 | 20 | 25 | 32 |
|---|---|---|---|---|---|---|
| **1260.Ø.51S** | Weight (g) | 60 | 60 | 85 | 85 | 133 |

| Ordering code | Ø | 32 | 40 | 50 | 63 | 80 | 100 | 125 |
|---|---|---|---|---|---|---|---|---|
| **1320.Ø.51S** | Weight (g) | 142 | 171 | 360 | 486 | 1060 | 1700 | 3500 |

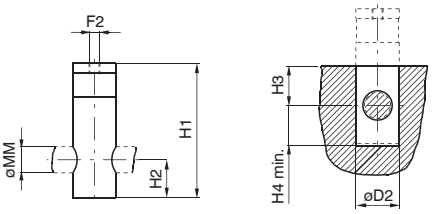
## Piston rod lock and housing






Do not use as safety device






| Ordering code |
|---|
| **1260.Ø.51B** (Ø12...Ø25) |
| **1320.32.51B** (Ø32) |

| Ø | 12 | 16 | 20 | 25 | 32 |
|---|---|---|---|---|---|
| Weight (g) | 22 | 22 | 55 | 55 | 55 |

| Ordering code | Ø | 32 | 40 | 50 | 63 | 80 | 100 | 125 |
|---|---|---|---|---|---|---|---|---|
| **1320.Ø.51B** | Weight (g) | 49 | 105 | 175 | 366 | 712 | 712 | 1750 |

### Table of dimensions (series 1200)

| Bore | AM | BE | D1 | D2 | F2 | H1 | H3 | H4 | H5 | H6 | KK | L1 | L2 | L3 | MM | SW | WF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 16 | M16x1,5 | 20 | 16 | M5 | 35 | 35 | 10 | 11 | 10 | M6x1 | 42 | 21 | 12 | 6 | 20 | 55 |
| 16 | 16 | M16x1,5 | 20 | 16 | M5 | 35 | 35 | 10 | 11 | 10 | M6x1 | 42 | 21 | 12 | 6 | 20 | 55 |
| 20 | 20 | M22x1,5 | 38 | 20 | M5 | 64 | 62 | 17,5 | 19 | 18 | M8x1,25 | 58 | 24 | 23 | 8 | 27 | 73 |
| 25 | 22 | M22x1,5 | 38 | 20 | M5 | 64 | 62 | 17,5 | 19 | 18 | M10x1,25 | 58 | 24 | 23 | 10 | 27 | 77 |
| 32 | 20 | M30x1,5 | 39,5 | 20 | M5 | 64 | 62 | 17,5 | 18,5 | 18 | M10x1,25 | 60 | 26 | 22 | 12 | 35 | 76,5 |

### Table of dimensions (series 1300)

| Bore | AM | B | D2 | D3 | F2 | H | H1 | H2 | H3 | H4 | KK | L2 | L3 | L7 | L8 | MM | RT | T1 | T2 | TG | WH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | 22 | 30 | 20 | 30,5 | M5 | 67 | 62 | 17,5 | 18 | 18,5 | M10x1,25 | 58 | 10 | 45 | 31,5 | 12 | M6 | 13 | 8 | 32,5 | 74 |
| 40 | 24 | 35 | 24 | 35 | G 1/8" | 86 | 83 | 22 | 22 | 23 | M12x1,25 | 65 | 10 | 50 | 36 | 16 | M6 | 13 | 8 | 38 | 85 |
| 50 | 32 | 40 | 30 | 40 | G 1/8" | 105 | 100 | 25 | 25 | 26 | M16x1,5 | 82 | 12 | 60 | 45,5 | 20 | M8 | 16 | 15 | 46,5 | 107 |
| 63 | 32 | 45 | 38 | 45 | G 1/8" | 121 | 116 | 30 | 30 | 31 | M16x1,5 | 82 | 12 | 70 | 49,5 | 20 | M8 | 16 | 15 | 56,5 | 107 |
| 80 | 40 | 45 | 48 | 45 | G 1/8" | 164 | 155 | 36 | 36 | 37 | M20x1,5 | 110 | 20 | 90 | 61 | 25 | M10 | 20 | 18 | 72 | 126 |
| 100 | 40 | 55 | 48 | 55 | G 1/8" | 172 | 155 | 36 | 36 | 37 | M20x1,5 | 115 | 23 | 105 | 65 | 25 | M10 | 20 | 18 | 89 | 143 |
| 125 | 54 | 60 | 65 | 60 | G 1/8" | 210 | 195 | 56 | 55 | 56 | M27x2 | 167 | 45 | 140 | 86,5 | 32 | M12 | 30 | 22 | 110 | 187 |





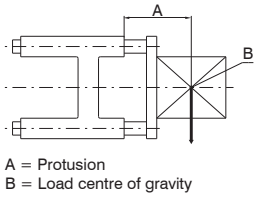
Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

# Series 1260 - 1320 Linear guiding units for ISO 6432 microcylinders and ISO 15552 cylinders

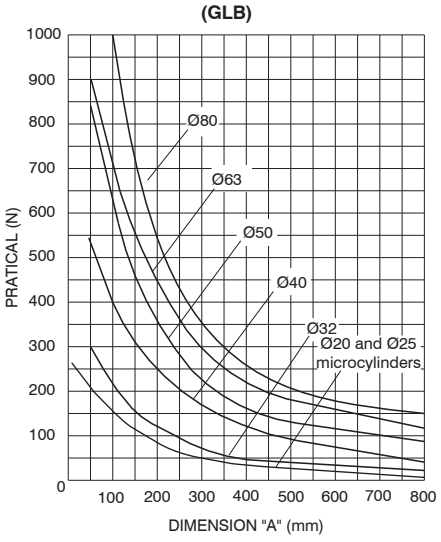
**Construction characteristics**

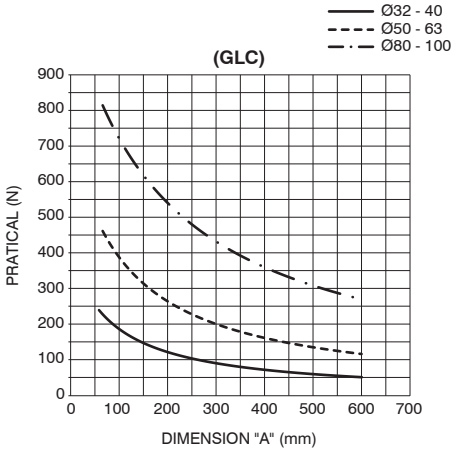
| | |
|---|---|
| Body | sintered bronze bushings : anodised aluminium<br>recirculating ball bearings guides : aluminium alloy black painted |
| Bushings | sintered bronze or recirculating ball bearing guides |
| Wipers | oil resistant NBR rubber |
| Guide rods | sintered bronze bushings : C43 chromed steel<br>recirculating ball bearings guides : tempered and chromed steel |
| Plate | zinc plated steel |
| Mounting block | zinc plated steel |

## Loading diagram based on dimension "A"




A = Protusion
B = Load centre of gravity



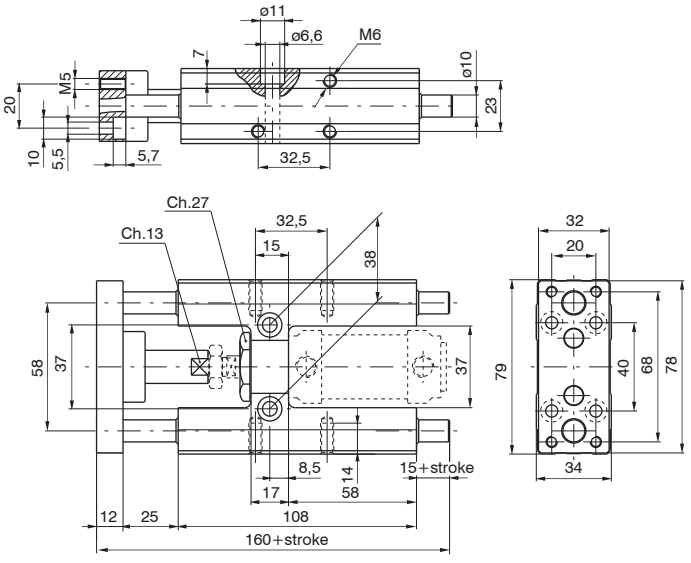

### Use and maintenance

Follow the indication of the above diagram as far as loads are concerned. A large quantity of grease is placed between the two wipers during assembly, therefore the linear control units should not require special maintenance.

## Linear guiding units for ISO 6432 microcylinders with sintered bronze rod bushings

**Coding:** 1260.Ø.stroke.GLB
*(Microbore cylinders ISO 6432 must be ordered separately)*






### Standard strokes

**Ø20** 100 - 150 - 200 mm
**Ø25** 100 - 150 - 200 - 250 mm
On request are available strokes up to: 1000 mm

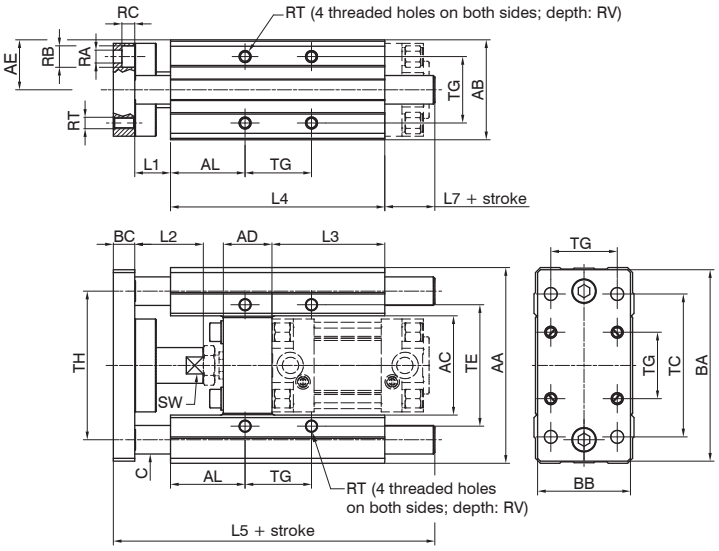
| Weight (g) | |
|---|---|
| stroke 100 | 970 |
| each 50 mm | 60 |

**Sensors and clamps:** standard sensors and clamps are used

## Linear guiding units for ISO 15552 cylinders with sintered bronze rod bushings

**Coding:** 1320.Ø.stroke.GLB
*(Cylinders must be ordered separately)*






### Standard strokes

**Ø32** 100 - 150 - 200 - 250 - 300 mm
**Ø40** 100 - 150 - 200 - 250 - 300 - 350 mm
**Ø50** 100 - 150 - 200 - 250 - 300 - 350 -400 - 450 mm
**Ø63** 100 - 150 - 200 - 250 - 300 - 350 -400 - 450 - 500 mm
**Ø80** 100 - 150 - 200 - 250 - 300 - 350 -400 - 450 - 500 - 550 mm
On request are available strokes up to: 2800 mm

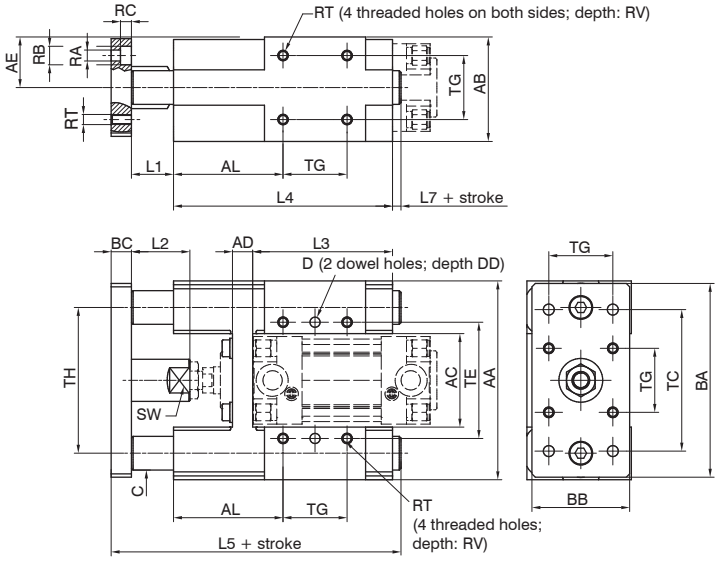
| Weight (g) | | | | | |
|---|---|---|---|---|---|
| Bore | 32 | 40 | 50 | 63 | 80 |
| stroke 100 | 1720 | 2900 | 4700 | 6000 | 11300 |
| each 50mm | 91 | 159 | 159 | 250 | 380 |

**Sensor clamps and brackets for 1319-1320 series:**
Use standard sensors and brackets on the rear and following special brackets on front of cylinders for use sensors codes 1500._, RS._, HS._ which have the following ordering codes:
**1320.AGL** sensor bracket for cylinders Ø32 and Ø40
**1320.BGL** sensor bracket for cylinders Ø50 and Ø63
**1320.CGL** sensor bracket for cylinders Ø80

## Linear guiding units for ISO 15552 cylinders with recirculating ball bearings guides

**Coding:** 1320.Ø.stroke.GLC
*(Cylinders must be ordered separately)*






### Standard strokes

**Ø32** 100 - 150 - 200 - 250 - 300 mm
**Ø40** 100 - 150 - 200 - 250 - 300 - 350 mm
**Ø50** 100 - 150 - 200 - 250 - 300 - 350 -400 - 450 mm
**Ø63** 100 - 150 - 200 - 250 - 300 - 350 -400 - 450 - 500 mm
**Ø80** 100 - 150 - 200 - 250 - 300 - 350 -400 - 450 - 500 - 550 mm

On request are available strokes up to: 2800 mm

| Weight (g) | | | | | | |
|---|---|---|---|---|---|---|
| Bore | 32 | 40 | 50 | 63 | 80 | 100 |
| stroke 100 | 3100 | 3050 | 6350 | 6200 | 15500 | |
| each 50mm | 246 | | 385 | | 455 | |

**Sensor clamps and brackets for 1319-1320 series:**
Use standard sensors and brackets on the rear and following special brackets on front of cylinders for use sensors codes 1500._, RS._, HS._ which have the following ordering codes:
**1320.AGL** sensor bracket for cylinders Ø32 and Ø40
**1320.BGL** sensor bracket for cylinders Ø50 and Ø63
**1320.CGL** sensor bracket for cylinders Ø80

### Table of dimensions

| | Bore | AA | AB | AE | AC | AD | AL | BA | BB | BC | C | ØD | DD | RA | RB | RC | RT | RV | TE | TC | TG | TH | L1 | L2 | L3 | L4 | L5 | L7 | SW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bushings (GLB) | 32 | 97 | 49 | 28,5 | 50 | 24 | 44,7 | 93 | 45 | 12 | 12 | / | / | 6,6 | 11 | 6,5 | M6 | 12 | 61 | 78 | 32,5 | 74 | 25 | 39 | 76 | 125 | 187 | 25 | 15 |
| | 40 | 115 | 58 | 29 | 57,5 | 28 | 48 | 112 | 55 | 12 | 16 | | | 6,6 | 11 | 6,5 | M6 | 14 | 69 | 84 | 38 | 87 | 25 | 44 | 81 | 140 | 207 | 30 | 15 |
| | 50 | 137 | 70 | 35 | 69,5 | 34 | 52,2 | 134 | 65 | 15 | 20 | | | 9 | 15 | 9 | M8 | 16 | 85 | 100 | 46,5 | 104 | 25 | 48 | 79 | 150 | 225 | 35 | 22 |
| | 63 | 152 | 85 | 42,5 | 84,5 | 34 | 55,7 | 149 | 80 | 15 | 20 | | | 9 | 15 | 9 | M8 | 16 | 100 | 105 | 56,5 | 119 | 25 | 48 | 111 | 182 | 242 | 20 | 22 |
| | 80 | 189 | 105 | 52,5 | 106 | 34 | 66 | 180 | 100 | 20 | 25 | | | 11 | 18 | 11 | M10 | 20 | 130 | 130 | 72 | 148 | 25 | 53 | 128 | 215 | 302 | 42 | 27 |
| Bearings (GLC) | 32 | 118 | 62 | 30 | 51 | 12 | 65 | 115 | 58 | 12 | 20 | 6 | 12 | 6,5 | 11 | 6,5 | M6 | 12 | 69 | 84 | 38 | 84 | 25 | 35 | 83 | 130 | 172 | 5 | 20 |
| | 40 | 118 | 62 | 30 | 55,5 | 12 | 65 | 115 | 58 | 12 | 20 | 6 | 12 | 6,5 | 11 | 6,5 | M6 | 12 | 69 | 84 | 38 | 86,5 | 25 | 35 | 83 | 130 | 172 | 5 | 20 |
| | 50 | 155 | 85,5 | 42,5 | 70 | 16 | 80 | 153 | 80 | 15 | 25 | 6 | 12 | 9 | 15 | 9 | M8 | 16 | 100 | 112 | 56,5 | 112 | 25 | 35 | 106,5 | 165 | 210 | 5 | 24 |
| | 63 | 155 | 85,5 | 42,5 | 78 | 16 | 80 | 153 | 80 | 15 | 25 | 6 | 12 | 9 | 15 | 9 | M8 | 16 | 100 | 112 | 56,5 | 116 | 25 | 35 | 106,5 | 165 | 210 | 5 | 24 |
| | 80-100 | 214 | 131 | 66,5 | 122 | 39,5 | 115 | 213 | 130 | 15 | 30 | 8 | 13 | 11 | 17 | 10,5 | M10 | 15 | 176 | 176 | 86 | 168 | 20 | 55 | 160,5 | 260 | 300 | 5 | 24 |




Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

# Series 6900

## Operational characteristics

| Code | Max. power (Nm) | | Return force | Operating temperature | Weight |
|---|---|---|---|---|---|
| | For cycle | For hour | | | |
| 6900.A | 4 | 14400 | 2,5 ... 6 N | -20°C ... 80°C | 10 g |
| 6900.B | 15 | 24000 | 3,6 ... 8 N | | 20 g |
| 6900.C | 30 | 50000 | 13 ... 23 N | | 50 g |
| 6900.D | 100 | 76500 | 12 ... 23 N | | 140 g |
| 6900.E | 390 | 175500 | 14 ... 31 N | | 340 g |

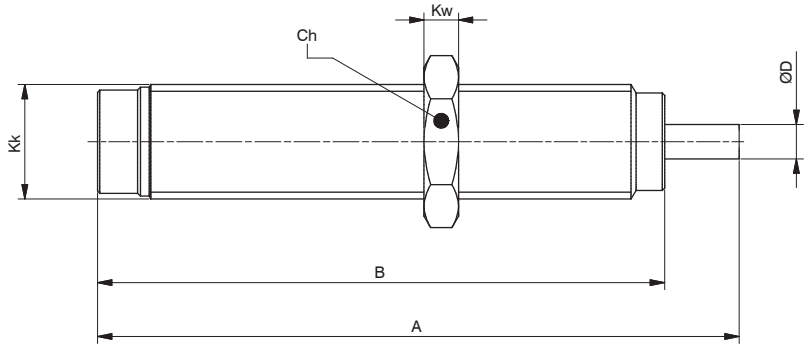
## Shock absorbers

**Coding:** 6900.Ⓕ

| | THREAD |
|---|---|
| Ⓕ | **A** = Thread M8x1 |
| | **B** = Thread M10x1 |
| | **C** = Thread M14x1,5 |
| | **D** = Thread M20x1,5 |
| | **E** = Thread M27x1,5 |



## Overall dimensions




## Table of dimensions

| Code | A | B | Ch | D | Kk | Kw |
|---|---|---|---|---|---|---|
| 6900.A | 51 | 44 | 11 | 2,5 | M8x1 | 3 |
| 6900.B | 56 | 49,5 | 13 | 3 | M10x1 | 3 |
| 6900.C | 79 | 69 | 17 | 4 | M14x1,5 | 5 |
| 6900.D | 107 | 88 | 24 | 6 | M20x1,5 | 6 |
| 6900.E | 126,5 | 108,5 | 30 | 8 | M27x1,5 | 8 |

# Appendix

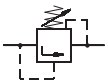
## Pneumatic symbols

### Air treatment

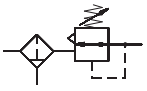
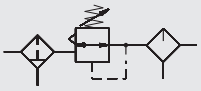
#### Air treatment mechanisms

| | |
|---|---|
| Pneumatic accumulator (capacity) |  |
| Manual air drain |  |
| Automatic air drain |  |
| Lubricator |  |
| Air filter |  |
| Filter - with manual drain |  |
| Filter - with automatic drain |  |

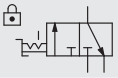
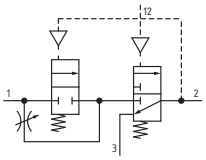
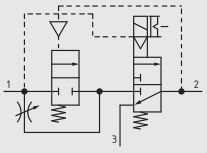
#### Pressure control valves

| | |
|---|---|
| Pressure switch |  |
| Free discharge pressure relief valve |  |
| Free discharge pilot-operated pressure relief valve |  |
| Sequence valve |  |
| Pressure regulator |  |
| Pressure regulator without exhaust valve |  |
| Pilot-operated pressure regulator without exhaust valve |  |
| Pressure regulator without exhaust valve (free) |  |
| Differential pressure regulator |  |

#### Assembled units

| | |
|---|---|
| Filter pressure regulator |  |
| Filter pres. reg. + lubricator<br>Filter + pres. reg. + lubricator |  |

#### Other mechanisms

| | |
|---|---|
| Pressure gauge |  |
| Shut-off valve |  |
| Progressive start-up valve<br>With Electric control |  |
| Progressive start-up valve<br>With Pneumatic control |  |


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## Valves and solenoid valves

**Terms and descriptions**

**The connections** to the inlet and out lets of the valves can be of two types:

| | |
|---|---|
| **Main connections** | - supply connection identified with number 1 |
| | - consumption connection identified with number 2 and 4 |
| | - exhaust connection identified with number 3 and 5 |
| **Pilot connections** | - repositioning connection on 2/2 & 3/2 ways valves identified with number 10 |
| | - switching connection on 2/2 & 3/2 ways valves and repositioning connection on 5/2 & 5/3 ways valves identified with number 12 |
| | - switching connection on 5/2 & 5/3 ways valve identified with number 14 |

**Switching**: is the process that changes the state of a valve from rest position to actuated position and is achieved by means of a mechanical, pneumatic or electric signal.
**Repositioning**: is the process that changes the valve state from actuated back to rest position and is achieved by means of an external mechanical (spring), pneumatic (differential) or electric signal.
**Ways**: indicated the number of connections on the valve body and on the pneumatic diagram.
**Positions**: indicates the number of positions achieved by the valve and corresponds to the number of squares on the pneumatic simple.
**Function**: indicates the valve working diagram at rest condition and corresponds to the right square in the pneumatic scheme.

### Valves symbols

| Way | Pos. | Function | Symbol |
|---|---|---|---|
| 2 | 2 | Normally closed |  |
| 2 | 2 | Normally open |  |
| 3 | 2 | Normally closed |  |
| 3 | 2 | Normally open |  |
| 5 | 2 | Separated exhaust connections |  |
| 5 | 3 | Closed centres |  |
| 5 | 3 | Open centres |  |
| 5 | 3 | Pressured centres |  |

### Complementary valves

| | |
|---|---|
| Throttle valve |  |
| Bidirectional flow regulator |  |
| Unidirectional flow regulator |  |
| Quick exhaust valve |  |
| Shuttle valve |  |
| Silencer |  |
| Non-return valve without spring |  |
| Non-return valve with spring |  |
| Non-return valve controlled during closing |  |
| Non-return valve controlled during opening |  |

### Switching and Repositioning

| | |
|---|---|
| **Mechanical** | |
| Plunger |  |
| Sensitive plunger |  |
| Roller |  |
| Unidirectional roller |  |
| Sensitive roller |  |
| Pedal |  |
| Pedal - spring return |  |
| Push Button |  |
| Sensitive push button |  |
| Push button - two positions- |  |
| Lever |  |
| Lever - spring to center |  |
| Sensitive lever |  |
| Two position mechanical stop |  |
| Three position mechanical stop |  |
| Spring |  |
| **Pneumatics** | |
| Pneumatic |  |
| Pneumatic -return to center |  |
| Pneumatic - depressurised |  |
| Differential (pneumatic spring) |  |
| Differential external pilot |  |
| Sensitive differential |  |
| **Electrical** | |
| Solenoid |  |
| Bistable solenoid |  |
| Solenoid (internal pilot) |  |
| Solenoid (external pilot) |  |
| Solenoid - spring to center |  |

# Valves and solenoid valves (following)

## Piping and connections

| | |
|---|---|
| Pressure line | |
| Control line | |
| Exhaust line | |
| Flexible line | |
| Electric line | |
| Piping connections | |
| Piping intersection | |
| Main air connection | |

| | |
|---|---|
| One-way rotating intake | |
| Three-way rotating intake | |
| Closed air intake | |
| Air intake with connection | |
| Quick coupling connection without non-return valve | |
| Quick coupling connection with non-return valve | |
| Air exhaust unthreaded connection | |
| Air exhaust threaded connection | |

# Cylinders

## Single acting cylinders

| | |
|---|---|
| With external return | |
| With spring return | |
| With spring return | |

## Double acting cylinders

| | |
|---|---|
| Standard rod | |
| Double rod (through rod version) | |
| With non adjustable cushioning | |
| With adjustable cushioning | |
| With magnetic piston | |
| With magnetic piston with adjustable cushioning | |

## Tandem cylinders

| | |
|---|---|
| In tandem, common rod | |
| In tandem, independant rods | |
| In tandem, opposite rods | |
| Opposed, common rod | |

## Non rotating cylinders

| | |
|---|---|
| Standard rod / double acting | |
| Twin rod / double acting | |
| Twin rod / double acting through rod | |
| Twin through rod, double acting | |
| Guided compact cylinders | |

## Cylinders for piston rod lock

| | |
|---|---|
| With magnetic piston with adjustable cushioning | |
| With non magnetic piston with adjustable cushioning | |

## Rodless cylinders

| | |
|---|---|
| With magnetic piston With adjustable cushioning | |
| Cable cylinders with magnetic piston | |
| Cable cylinders with non magnetic piston | |

## Telescopic cylinders

| | |
|---|---|
| Single acting | |
| Double acting | |

## Various cylinders

| | |
|---|---|
| Rotating cylinders | |
| Rotating cylinder | |
| Bellows cylinder | |

## Pressure boosters

| | |
|---|---|
| Air-Air intensifier | |
| Air-oil intensifier | |
| Hydropneumatic accumulator | |




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# Air quality

Compressed air is a fundamental element for the operation of various modern industrial machines.
Different compressed air purity classes are required depending on its application and the industrial sector in which it is used.
Generally, it must be free of pollutants (dusts, water and oil) in order to maintain the characteristics of the final product and guarantee safety.
Standard ISO 8573-1:2010 specifies the permissible level of pollution for every cubic meter of compressed air.
The pollutants that have been analysed are grouped in three macro-families:

- Dusts / Solid particles

Each cubic meter of compressed air could contain a maximum quantity of particles in function of its dimension.

- Water

It could be present in liquid or gaseous state.

- Oil

Each cubic meter of compressed air can contain a maximum oil quantity in any of its form: liquid, aerosol, or vapour.

To uniquely determine the purity of compressed air, it is necessary to identify a numeric value for each of the three groups of pollutants illustrated above.
In general, industrial machines require compressed air with purity class of ISO 8573-1:2010 [1:4:1] of which:

- the first number (1) refers to solid particles with maximum concentration in proportion to their size but still less than 0.1 mg/m$^3$;
- the second number (4) refers to dried air with dewpoint temperature less than +3°C;
- The third number (1) refers to residual oil content less than 0.01 mg/m$^3$.

For a correct operation of our devices, we require compressed air with purity class of **ISO 8573-1:2010 [7:4:4]** unless otherwise indicated.
For example, our proportional regulators require compressed air with a purity class of ISO 8573-1:2010 [1:4:1].
According to standard ISO 8573-1:2010 pollutant levels could be summarized in the following table:

| Compressed air purity classes according to ISO 8573-1:2010 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Classe | Particles | | | | Humidity and Liquid Water | | Total Oil |
| | Maximum number of particles per cubic meter as a function of particle size d [b] | | | Mass concentration[b] $C_p$[mg/m$^3$] | Pressure dewpoint [°C] | Concentration of liquid water[b] $C_w$[g/m$^3$] | Concentration of total oil[b] (liquid, aereosol and vapour) [mg/m$^3$] |
| | 0,1 $\mu$m < $d$ ≤ 0,5 $\mu$m | 0,5 $\mu$m < $d$ ≤ 1,0 $\mu$m | 1,0 $\mu$m < $d$ ≤ 5,0 $\mu$m | | | | |
| 0 | As specified by the equipement user or supplier and more stringent than Class 1 | | | | | | |
| 1 | ≤ 20000 | ≤ 400 | ≤ 10 | - | ≤ -70 | - | ≤ 0,01 |
| 2 | ≤ 400000 | ≤ 6000 | ≤ 100 | - | ≤ -40 | - | ≤ 0,1 |
| 3 | - | ≤ 90000 | ≤ 1000 | - | ≤ -20 | - | ≤ 1 |
| 4 | - | - | ≤ 10000 | - | ≤ +3 | - | ≤ 5 |
| 5 | - | - | ≤ 100000 | - | ≤ +7 | - | - |
| 6 | - | | | 0 < $C_p$ ≤ 5 | ≤ +10 | - | - |
| 7 | - | | | 5 < $C_p$ ≤ 10 | - | $C_w$ ≤ 0,5 | - |
| 8 | - | | | - | - | 0,5 < $C_w$ ≤ 5 | - |
| 9 | - | | | - | - | 5 < $C_w$ ≤ 10 | - |
| X | - | | | $C_p$ > 10 | - | $C_w$ > 10 | >5 |

[b] At reference condition:
- Air temperature 20°C
- Absolute air pressure 100 kPa = [1 bar] (a)
- Relative water vapour pressure 0

# Dimensioning

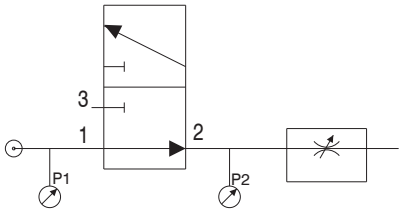
## Flow characteristics

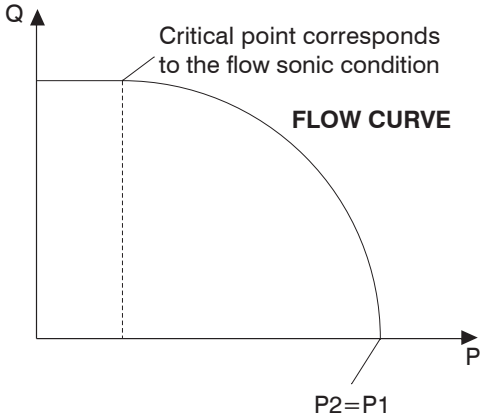
Each cylinder requires, in order to generate specific forces and operate at the needed speed, specific air flow through the control valve. It is therefore necessary to know and understand the laws that regulate the flow through a valve; and therefore the relation between pressure, pressure drop and flow rate. Only by doing so is it possible to determine whether a valve is capable of supplying the required flow rate to a cylinder at a given inlet pressure and with a reasonable pressure drop.
In order to carry out these analyses it is necessary to work with precise functional data; it is not sufficient to know the valve port size. This data is presented in different ways depending on the different applicable, standards and various experimental measurments methods.
The figures are mainly coefficients which must be used in specific equations, with which we can estimate the valve flow rate. In order to understand the meaning of these equations it is necessary to examine the flow inside a pneumatic valve. For example, let us consider the following conditions: a valve supplied with an absolute pressure P1 and with a flow regulator connected downstream.

Starting condition - flow regulator closed
- no flow rate (Q=0)
- Upstream and downstream pressure are identical (P2=P1)

Intermediate conditions - opening flow regulator
By progressively opening the flow regulator the pressure P2 will decrease and the flow rate increase up to a critical point at which the flow rate becomes constant even if the flow regulator is opened further..
This critical point corresponds to the sonic condition of the flow.

Final condition - flow regulator completely open
- maximum flow rate (constant from critical point)
- downstream pressure P2=0




On a varying P1 the curves maintain the same form and only shift into a higher or lower flow rate area depending on whether P1 has increased or decreased. The area of interest in pneumatic valve applications is the subsonic zone, just before the critical flow point is reached.
This zone is expressed in a number of different ways which average the effective flow pattern enabling simple description of the flow using experimental coefficients.

## Valve coefficients "C" and "B"

CETOP RP50P recommendation (derived from ISO 6358 standard) expresses flow rate in function of two experimental coefficients:
- conductance **C**
- critical pressure ratio **b**.

**Conductance C = Q*/$P_1$** is the ratio between maximum flow rate Q* and absolute inlet pressure $P_1$ under sonic flow condition at a temperature of 20°C.
**Critical ratio b = P*2/$P_1$** is the ratio between the output absolute pressure $P_2$ and the inlet absolute pressure $P_1$ at which the flow becomes sonic.
The expression that represents an elliptic approximation of the relationship between pressure and flow follows:

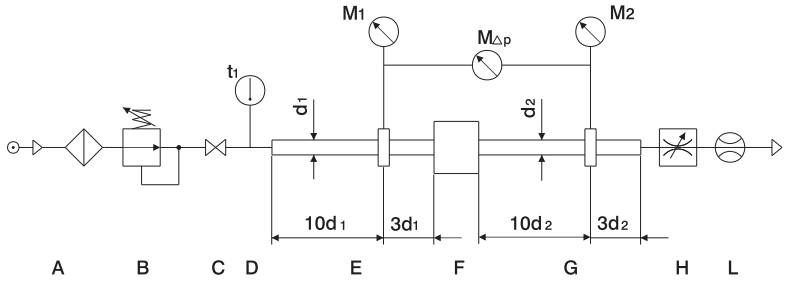
$$Q_N = C \bullet P_1 \bullet K_t \bullet \sqrt{1-\left(\frac{r-b}{1-b}\right)^2} \qquad [1]$$

where:

| | |
|---|---|
| $Q_N\ (dm^3/s)$ | is the flow rate in dm /s at normal condition : 1,013 bar and 20°C; |
| $C\ \left(\frac{dm^3}{s \bullet bar}\right)$ | is the valve conductance; |
| $P_1\ (bar)$ | is the inlet absolute pressure; |
| r | is the ratio between downstream and upstream pressure ($P_2/P_1$); |
| b | is the pressures critical ratio; |
| $kt = \sqrt{293/T_1}$ | is a corrective factor that consider the absolute inlet temperature $T_1$; |
| $T_1 = 273 + t_1\ (°K)$ | is the absolute temperature ($t_1$ is the temperature in °C). |


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The experimental determination of the valve coefficient C & b is carried out with compressed air following standardised procedures and according to the scheme below.




### CETOP test circuit

A Compressed air generator.
B Pressure regulator to set upstream pressure P1.
C Shut off valve.
D Temperature sensor to check upstream temperature t 1, positioned in a low velocity area.
E Pipe where the upstream pressure is measured.
F Test valve.
G Pipe where the downstream pressure is measured.
H Flow regulator to adjust the downstream pressure P2.
L Flow meter.
M1,M2 Pressure measuring equipment for upstream and downstream.
MΔP Pressure drop measuring equipment assuming P1-P2< 1 bar.

Pipes E & G, used to measure the valve upstream and downstream pressure, must be sized according to the standard's specifications and change in size depending on the valve port sizes; the position of the connection at which the measurements are taken depends on the pipe's inner diameter.
Conductance C is determined with the following equation, measuring the critical flow rate Q* through the valve, where upstream pressure P1 is constant and greater than 3 bar.

$$C = \frac{Q^*}{P_1 \bullet K_t} \qquad [2]$$

Pressure critical ration **b** can be calculated using the following equation:

$$b = 1 - \frac{\Delta P}{P_1 \left[1 - \sqrt{1 - \left(\frac{Q'}{Q^*}\right)^2}\right]} \qquad [3]$$

Considering a given constant pressure $P_1$ it is necessary to proceed measuring the flow rate Q' corresponding to a pressure drop $\Delta P = P_1 - P_2 = 1$ bar.
Equation 3 is used to calculate the critical ratio as it is difficult to experimentally identify the exact pressure P*2 at which the flow becomes sonic.
The values of both the conductance C and the critical ratio b are experimentally calculated and are the average of the results obtained.
Equation [1] is used to calculate the flow in subsonic conditions $P_2 > b \cdot P_1$ when values C ; b and the valve working conditions ($P_1$, $P_2$, $T_1$) are known.
Under sonic conditions , $P_2 \leq b \cdot P_1$ the equation can be simplified and the maximum flow rate can be calculated as follows:

$$\mathbf{Q^* = C \cdot P_1 \cdot k_t} \qquad [4]$$

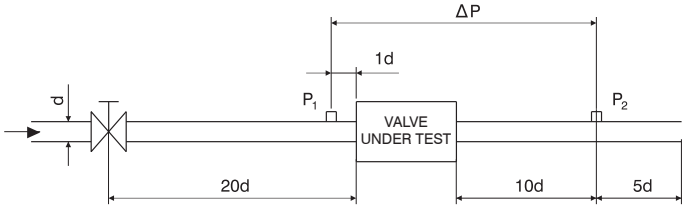
### Hydraulic coefficient Kv

The hydraulic coefficient allows, using the equation. The calculation of the flow rate of a fluid through a valve.

$$Q = Kv \sqrt{\frac{\Delta p}{\varrho}} \quad (l/min) \qquad [5]$$

where:
Q is the fluid flow rate in l/min
Δp is the pressure drop inside the valve calculated in bar (P1 - P1)
$\varrho$ is the fluid density calculated in Kg/dm³
Kv is the hydraulic coefficient calculated in $\frac{l}{min}\left(\frac{kg}{dm^3 \bullet bar}\right)^{1/2}$

Using these measurement units the flow rate coefficient Kv represents the flow rate (in liters) of water across the valve with a pressure drop of 1 bar.
The measurement are carried out using the standardised circuit below on which the connection ports are positioned according to the pipe inner bore size (norm VDE/VDI 2173).



## Hydraulic circuit

In some cases flow rate is measured in m³/h which correspond a Kv measured

To obtain Kv expressed in $\frac{l}{min}\left(\frac{kg}{dm^3 \cdot bar}\right)^{1/2}$ it is sufficient to multiply the Kv value expressed in $\frac{m^3}{h}\left(\frac{kg}{dm^3 \cdot bar}\right)^{1/2}$ By the coefficient 16,66.

The coefficient kv is perfectly suitable to express the flow rate of fluids but only gives approximate values in case of compressed air. Experiences gained in hydraulic environments can be inferred in the pneumatic field, bearing in mind the difference in density, and assuming that the air flow will generate the same pressure drops and flow reductions as water It is therefore possible to calculate reliable values for compressed air using flow coefficients Kv obtained from experiments with water.

To define the flow rate Qn through a valve at a given constant absolute inlet pressure $P_1$, regardless of fluctuations of the downstream absolute pressure $P_2$, refer to the equation below:

$$Q_N = 28,6 \cdot K_v \sqrt{P_2 \cdot \Delta P} \cdot \sqrt{\frac{T_n}{T_1}} \qquad [6]$$

where:

Qn is the flow rate in volume l/min;

$K_v$ is the hydraulic coefficient $\frac{l}{min}\left(\frac{kg}{dm^3 \cdot bar}\right)^{1/2}$

$T_n$ is the absolute reference temperature;
$T_1$ is the inlet absolute temperature in °K;
$P_2$ is the downstream absolute pressure in bar;
$\Delta P$ is the pressure drop $P_1$ - $P_2$ in bar.

Equation [6] is real up to $\Delta P = \frac{P_1}{2}$ therefore $P_2 = \frac{P_1}{2}$

For lower $P_2$ values the flow rate is considered to be constant, corresponding to the sonic flow rate Q*n given by the following equation:

$$Q^*_N = 14,3 \cdot K_v \cdot P_1 \sqrt{\frac{T_n}{T_1}} \qquad [7]$$

## The nominal flow rate $Q_{Nn}$

The nominal flow rate is the flow volume (at normal conditions) that passes through a valve with an upstream pressure $P_1$=6bar (7 bar absolute pressure) and a pressure drop of 1 bar, corresponding to a downstream relative pressure $P_2$ of 5bar (6 bar absolute pressure).
Normally the nominal flow rate is expressed in l/min and can be easily deduced from an experimental flow curve drawn for a upstream pressure of 6 bar (relative). Nominal flow rate can be useful for a preliminary assesment of the performances of different valves but in reality can be used only if the working conditions are the same as those mentioned before. In order to be able to compare valve charactersistics which are expressed in different coefficients it is possible to use conversion equations.
Given the C and b coefficient, it is possible to determine the nominal flow rate using the following equation:

$$Q_{Nn} = 420 \cdot C \cdot \sqrt{1-\left(\frac{0,857 - b}{1 - b}\right)^2} \qquad [8]$$

where: $Q_{Nn}$ = is in l/min and C in $\frac{dm^3}{s \cdot bar}$

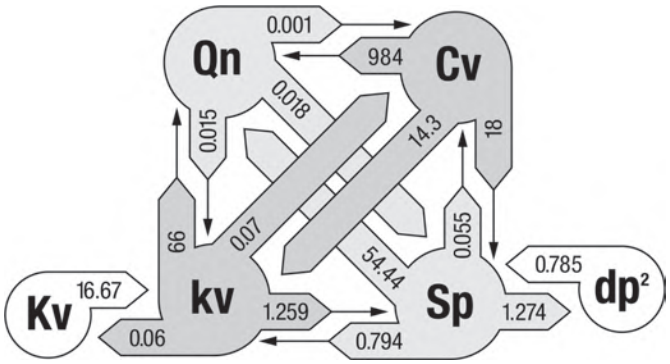
The correlation between the hydraulic coefficient $K_v$ and the corresponding nominal flow rate is as follows:

where:

$Q_{Nn} = 66\,K_v$

$Q_{Nn}$ is in l/min and $K_v$ in $\frac{l}{min}\left(\frac{kg}{dm^3 \cdot bar}\right)^{1/2}$

## Conversion table



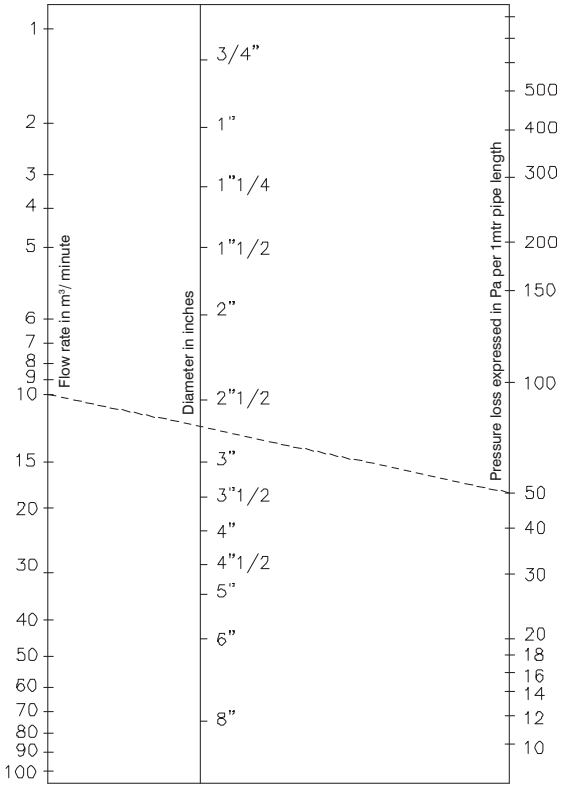

| | | |
|---|---|---|
| **Qn** | Nominal flow rate | Nl/min |
| **kv** | Hydraulic coefficient | l/min |
| **Kv** | | m³ /hours |
| **Cv** | | USA gallons/min |
| **Sp** | Nominal inner section area | mm² |
| **dp²** | Nominal diameter* | mm² |

*to calculate the diameter dp (mm²) square root of dp²


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## Pipes flow resistence

The C factor (l/sec) indicates the pipe flow capacity and is the ratio between the maximum flow rate and absolute pressure (ISO 6358). The flow capacity progressively decreases with increasing pipe length, due to the air friction on the pipe inner surface increasing the pressure drop. Therefore the longer the pipe the smaller the flow rate. The chart below shows the flow rate characteristics of different pipe sizes (i/d and o/d) in function of the length.

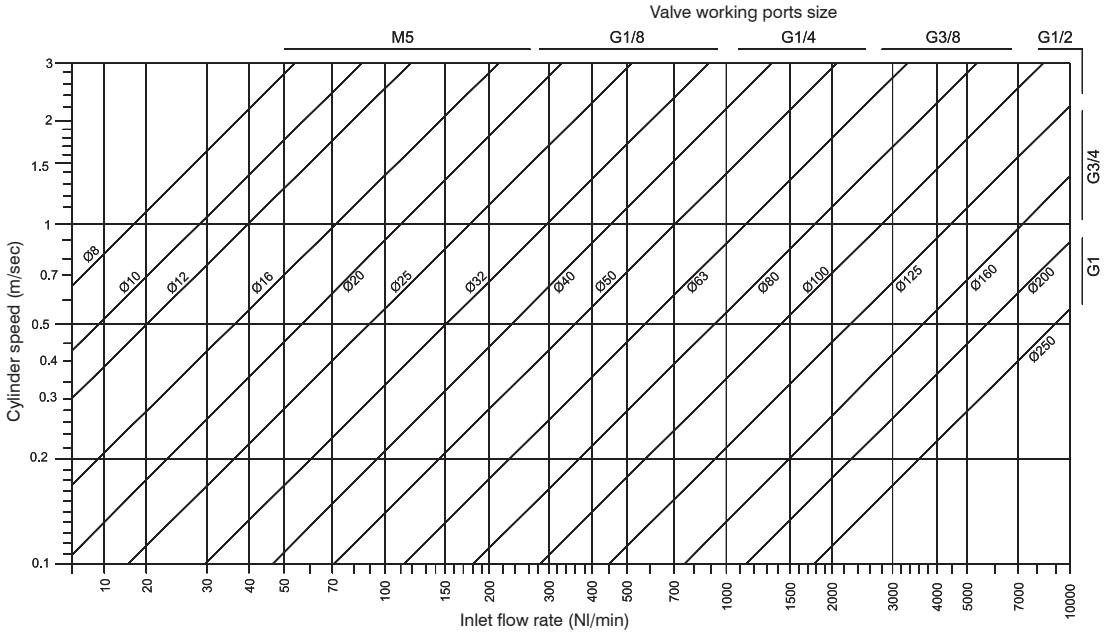



## Valve sizing

The choice of the correct size valve is essential in order to ensure that the cylinder to be controlled will perform as expected. It is therefore necessary to know the cycle time to be achieved and to calculate the coefficient T which will be used as multiplier for the air consumption value previously calculated. The result of this equation, expressed in Nl/min and multiplied by a safety factor of 1.2, corresponds to the minimum flow rate needed (at standard conditions 6 bar supply and 5 bar on the consumption connection) to operate the cylinder at the required rate.

$$T = \frac{60\ Qn}{\text{cycle time}} = T \times \text{Consumption}$$

It is also imortant to ensure that the pipes used to connect the valve to the air supply and to the cylinder do not affect the flow rate in any way. The pipe inner bore must therefore be at least 1.5 times the diameter of the valve nominal orifice size. The choice of the fittings is also very important, the inner bore must be equal or greater than the pipe I/D. The diagram below shows the flow rate required to operate different size cylinders atvarying speeds and also the valve connection sizes.



## Cylinder air consumption

The air consumption corresponds to the volume of air that the cylinder uses in a complete cycle ( stroke out and back in ) at a specific pressure.

**Consumption = Pa x C x (A+b)**

**Pa**= Absolute pressure (bar)
**C**= Cylinder stroke (dm)
**A**= see tab. 1 ($dm^2$)
**b**= see tab. 2 ($dm^2$)

Air consumption is measured in Normal-liters (Nl) which correspond to the volume that a specific quantity (mass) of gas would fill at atmospheric pressure.

Calculation example:
ISO 15552 cylinder - 1319 series:
Supply pressure 6 bar (Pa=7 bar)
Stroke 50mm (C=0,5 dm)
Ø63 (A=0,31157 $dm^2$)
Rod Ø=20 mm (b=0,28017 $dm^2$)

**Consumption** = 7 (bar) x 0,5 (dm) x (0,31157+0,28017) = **2,072 Nl**
(In order to calculate the air consumption for a specific number of cycles it is sufficient to multiply the above value for the number of cycles)

| Piston surface area | |
|---|---|
| **Ø cylinder** | **A** |
| Ø8 | 0,00502 $dm^2$ |
| Ø10 | 0,00785 $dm^2$ |
| Ø12 | 0,01130 $dm^2$ |
| Ø16 | 0,02010 $dm^2$ |
| Ø20 | 0,03140 $dm^2$ |
| Ø25 | 0,04906 $dm^2$ |
| Ø32 | 0,08038 $dm^2$ |
| Ø40 | 0,12560 $dm^2$ |
| Ø50 | 0,19625 $dm^2$ |
| Ø63 | 0,31157 $dm^2$ |
| Ø80 | 0,50240 $dm^2$ |
| Ø100 | 0,78500 $dm^2$ |
| Ø125 | 1,22656 $dm^2$ |
| Ø160 | 2,00960 $dm^2$ |
| Ø200 | 3,14000 $dm^2$ |

tab.1

| Surface difference cylinder piston / rod Ø | |
|---|---|
| **Ø cylinder - Ø rod** | **b** |
| Ø8 - Ø4 | 0,00377 $dm^2$ |
| Ø10 - Ø4 | 0,00659 $dm^2$ |
| Ø12 - Ø6 | 0,00848 $dm^2$ |
| Ø16 - Ø6 | 0,01727 $dm^2$ |
| Ø20 - Ø8 | 0,02638 $dm^2$ |
| Ø25 - Ø10 | 0,04121 $dm^2$ |
| Ø32 - Ø12 | 0,06908 $dm^2$ |
| Ø40 - Ø14 | 0,11021 $dm^2$ |
| Ø40 - Ø16 | 0,10550 $dm^2$ |
| Ø40 - Ø18 | 0,10017 $dm^2$ |
| Ø50 - Ø14 | 0,18086 $dm^2$ |
| Ø50 - Ø18 | 0,17082 $dm^2$ |
| Ø50 - Ø20 | 0,16485 $dm^2$ |
| Ø63 - Ø20 | 0,28017 $dm^2$ |
| Ø63 - Ø22 | 0,27357 $dm^2$ |
| Ø80 - Ø22 | 0,46441 $dm^2$ |
| Ø80 - Ø25 | 0,45334 $dm^2$ |
| Ø100 - Ø25 | 0,73594 $dm^2$ |
| Ø100 - Ø30 | 0,71435 $dm^2$ |
| Ø125 - Ø30 | 1,15591 $dm^2$ |
| Ø125 - Ø32 | 1,14618 $dm^2$ |
| Ø160 - Ø40 | 1,88400 $dm^2$ |
| Ø200 - Ø40 | 3,01440 $dm^2$ |

tab.2

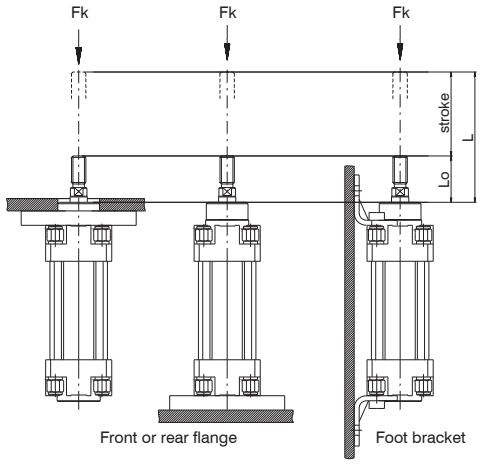



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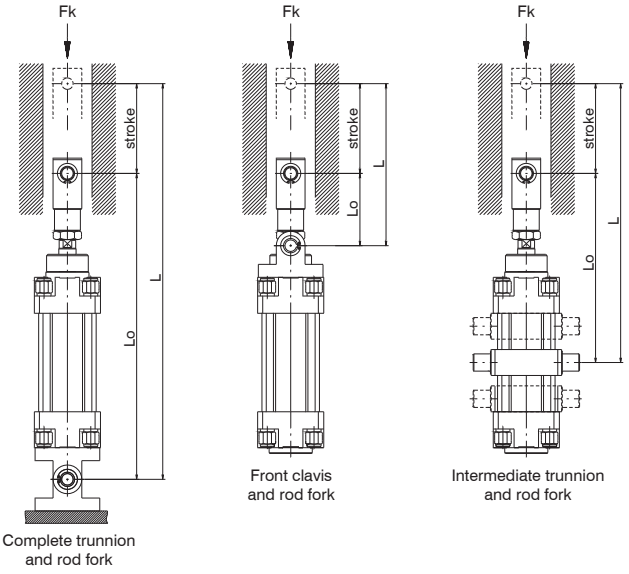
## Allowed axial load (combined bending and compressing load)

This is the maximum load that can be applied axially on the rod tip. Above this value the rod might bend under compression. This value depends on a number of factors such as load size, rod diameter, the distance at which the load is applied (bending and compressing length L) and the conditions under which the load is applied (cylinder mountings). Among the possible conditions, the following three are the most common.

**CASE 1**
Fixed cylinder and free load




**CASE 2**
Cylinder fixed with pin and loosen load




The maximum axial load can be calculated in two ways:
In an empirical way (see equations) or by checking the following diagram which shows the worst possible conditions (case 1 & 2) For all other possible mountings alternatives the axial load will surely be higher.

$$Fk = \frac{p^3 \times E \times d^4}{64 \times L^2 \times C} \quad (N)$$

$$d = \sqrt[4]{\frac{Fk \times 64 \times L^2 \times C}{p^3 \times E}} \quad (cm)$$

$$L = \sqrt{\frac{p^3 \times E \times d^4}{Fk \times 64 \times C}} \quad (cm)$$

**E** = rod material coefficient of elasticity (N/cm²) (steel=2,1x10⁷ N/cm²)
**d** = rod diameter (cm)
**L** = bending and compression distance (cm)
**C** = safety factor (from 2,5 to 5)

*Example:* **Axial load verification**

Cylinder ø80 mm
Rod diameter ø20 mm
Stroke 600 mm
Mounting CASE 2 intermediate trunnion: L0=290 mm
Load 2000 N
L (distance)= 29+60=89 cm
**Fk**= ($\pi^3$ x 2,1 x $10^7$ x $2^4$) : (64 x $89^2$ x 5) = 4104 N
(Above the 2000 N applied)

The same result can be obtained using the below diagram : following the bending and compression distance line relative to 900 mm up to the intersection with the 20 mm Ø line we obtain 4000 N.

*Example:* **Rod diameter sizing**

Considering the same conditions as in the above case we need to determinate the rod diameter suitable to withstand a 4000N load

$$d = \sqrt[3]{(4000 \times 64 \times 89^2 \times 5) / (p^3 \times 2{,}1 \times 10^7)} = 2 \text{ cm}$$

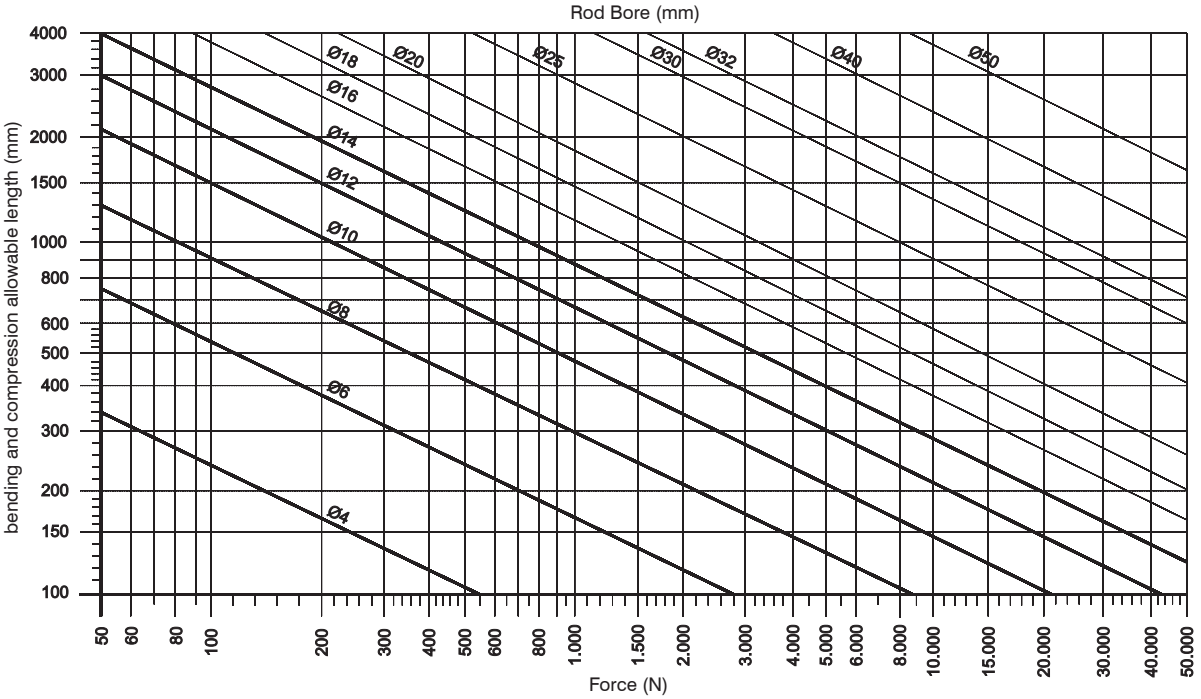
The diameter to choose is the next one up : Ø25 mm

Also this second example can be resolved using the below diagram: following the bending and compression distance line relative to 900mm up to the intersection with the 4000 N maximum load we obtain Ø20 mm.

With the third equation or using the diagram it is possible to calculate the bending and compression distance.



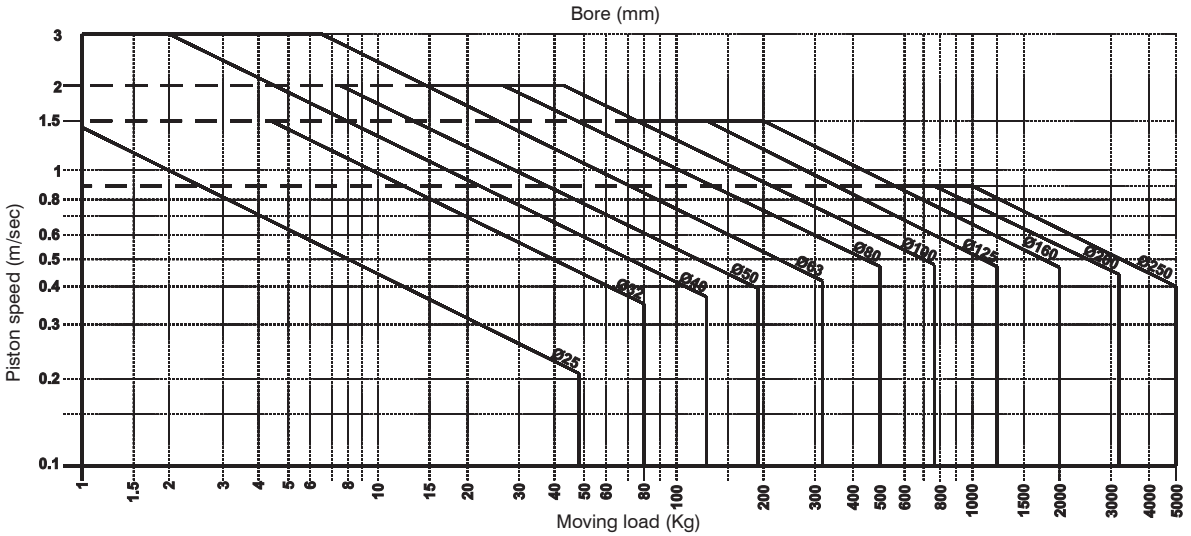
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## End of stroke cushioning capability

The function of the end of stroke cushioning is to reduce the kinetic energy generated by movement of the load and to prevent high speed impact between the piston and end caps that could compromise the unit functionality. The use of non-cushioned cylinders is not recomended on high speed applications unless external means of deceleration (such as dampers) are used.

The maximum load that can be cushioned depends on the speed of the unit and the cylinder cushioning capacity. The chartbelow shows the values relative to the ISO 15552 series cylinders considering the out stroke movement and a supply pressure of 6 bar. The acceptable values for any diameter are those found below each size line.




## Cylinder sizing

In order to properly size a cylinder it is necessary to consider the following parameters:

**Force generated:** calculated in function of the piston area and of the pressure that acts upon it.

**F= area x pressure** (daN) = ($cm^2$) x (bar)

The value is theoretical and needs to be reduced by approximately 10-15% in order to compensate for the effects of friction. We must also consider that the force generated during the return stroke (traction) is lower, as the area on which the pressure acts is reduced by the presence of the rod.

**Weight of the load:** the force generated by the cylinder must be sufficient to move the load in the desired direction within the specified time (cycle time). The load ratio (RdC) must not exceed 70%.

$$\frac{\text{Needed force (load weight)}}{\text{Available force (generated)}} \times 100 = \text{RdC}$$


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice.

## Load position

**Vertical lift** (pull upwards): the real force generated by the cylinder must be sufficient to counterbalance the load and to accelerate it.

Example:
Weight to be lifted 120Kg
Working pressure 6 bar
Load ratio 70%
Using the load ratio equation it is possible to calculate the force needed to lift the load:

$$\text{Available force} = \frac{\text{Load}}{\text{Rdc}} \times 100$$ the result is 171,4 daN

A 63 bore cylinder which generates a theoretical force of 187 daN is suitable for the application.
A similar load ratio allows, using unidirectional flow regulators, good speed control.

When the speed is below 20 mm/sec. It is difficult to properly control the movement.
The load ratio must be reduced to 50% on slow speed applications. In these conditions, or where constant movement is required, the use of a hydraulic speed control unit is recommended. On applications were the load is moving downwards, thereby increasing the force generated by the actuator, it is usually necessary to use flow regulators.

**Horizontal or inclined movement:** If the load is supported and the working position is horizontal, it is necessary to multiply the needed force by the coefficient of friction.

The coefficient of friction m varies according to the material.
For example considering m= 0.4
Weight to be moved 120 Kg
Pressure 6 bar
Load ratio 70%
Solving the load ratio equation it is possible to calculate the available force:

$$\text{Available force} = \frac{\text{Load}}{\text{Rdc}} \times 100 \times m$$ which, in the above conditions is 68,57 daN

A Ø40 bore cylinder that generates a theoretical force of 75.4 daN is suitable for the application.
In cases of inclined application the required force increases according to the angle.
Also in these conditions it is necessary to multiply the needed force by a coefficient of friction.

| Theoretical force -Push- (N) - rod moving out | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bore (mm) | Push area ($mm^2$) | Feeding pressure (bar) | | | | | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Ø6 | 28 | 2,5 | 5,5 | 8 | 11 | 13,5 | 16,5 | 19 | 22 | 24,5 | 27,5 |
| Ø8 | 50 | 4,5 | 9,5 | 14,5 | 19,5 | 24,5 | 29,5 | 34 | 39 | 44 | 49 |
| Ø10 | 79 | 7,5 | 15 | 23 | 30,5 | 38 | 46 | 53,5 | 61,5 | 69 | 76,5 |
| Ø12 | 113 | 11 | 22 | 33 | 44 | 55 | 66 | 77 | 88 | 99 | 110 |
| Ø16 | 201 | 19 | 39 | 59 | 78 | 98 | 118 | 137 | 157 | 177 | 197 |
| Ø20 | 314 | 30 | 61 | 92 | 123 | 153 | 184 | 215 | 246 | 277 | 307 |
| Ø25 | 491 | 48 | 96 | 144 | 192 | 240 | 288 | 336 | 384 | 433 | 481 |
| Ø32 | 804 | 78 | 157 | 236 | 315 | 394 | 472 | 551 | 630 | 709 | 788 |
| Ø40 | 1.256 | 123 | 246 | 369 | 492 | 615 | 739 | 862 | 985 | 1.108 | 1.231 |
| Ø50 | 1.963 | 192 | 384 | 577 | 769 | 962 | 1.154 | 1.347 | 1.539 | 1.732 | 1.924 |
| Ø63 | 3.116 | 305 | 611 | 916 | 1.222 | 1.527 | 1.833 | 2.138 | 2.444 | 2.749 | 3.055 |
| Ø80 | 5.024 | 492 | 985 | 1.478 | 1.970 | 2.463 | 2.956 | 3.448 | 3.941 | 4.434 | 4.926 |
| Ø100 | 7.850 | 769 | 1.539 | 2.309 | 3.079 | 3.849 | 4.618 | 5.388 | 6.158 | 6.928 | 7.698 |
| Ø125 | 12.266 | 1.202 | 2.405 | 3.608 | 4.811 | 6.014 | 7.217 | 8.419 | 9.622 | 10.825 | 12.028 |
| Ø160 | 20.096 | 1.970 | 3.941 | 5.912 | 7.882 | 9.853 | 11.824 | 13.795 | 15.765 | 17.736 | 19.707 |
| Ø200 | 31.400 | 3.079 | 6.158 | 9.237 | 12.317 | 15.396 | 18.475 | 21.555 | 24.634 | 27.713 | 30.792 |
| Ø250 | 49.063 | 4.811 | 9.622 | 14.434 | 19.245 | 24.056 | 28.868 | 33.679 | 38.491 | 43.302 | 48.113 |

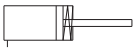
| Surface difference - Cylinder piston / rod Ø | |
|---|---|
| Ø cylinder - Ø rod | b |
| Ø8 - Ø4 | 0,377 $cm^2$ |
| Ø10 - Ø4 | 0,659 $cm^2$ |
| Ø12 - Ø6 | 0,848 $cm^2$ |
| Ø16 - Ø6 | 1,727 $cm^2$ |
| Ø20 - Ø8 | 2,638 $cm^2$ |
| Ø25 - Ø10 | 4,121 $cm^2$ |
| Ø32 - Ø12 | 6,908 $cm^2$ |
| Ø40 - Ø14 | 11,021 $cm^2$ |
| Ø40 - Ø16 | 10,550 $cm^2$ |
| Ø40 - Ø18 | 10,017 $cm^2$ |
| Ø50 - Ø14 | 18,086 $cm^2$ |
| Ø50 - Ø18 | 17,082 $cm^2$ |
| Ø50 - Ø20 | 16,485 $cm^2$ |
| Ø63 - Ø20 | 28,017 $cm^2$ |
| Ø63 - Ø22 | 27,357 $cm^2$ |
| Ø80 - Ø22 | 46,441 $cm^2$ |
| Ø80 - Ø25 | 45,334 $cm^2$ |
| Ø100 - Ø25 | 73,594 $cm^2$ |
| Ø100 - Ø30 | 71,435 $cm^2$ |
| Ø125 - Ø30 | 115,591 $cm^2$ |
| Ø125 - Ø32 | 114,618 $cm^2$ |
| Ø160 - Ø40 | 188,400 $cm^2$ |
| Ø200 - Ø40 | 301,440 $cm^2$ |

tab.2

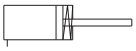


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice.

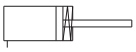
## Single acting cylinder spring initial and final load characteristics

| Microbore cylinders ISO 6431 - 1260 series | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Front spring | Rear spring | Bore | | | | | |
| | | | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 |
| Initial load (N) external spring |  |  | 9,9 | 10,8 | 10,8 | 7,9 | 19,7 | 39,3 | 39,3 |
| Final load (N) compressed load |  |  | 26,5 | 22,6 | 22,6 | 49,1 | 53,0 | 106,0 | 106,0 |

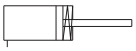
(stroke 0-40 mm)

| Microbore cylinders ISO 6431 - 1280 series "MIR" | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Front spring | Rear spring | Bore | | | | | |
| | | | Ø8 | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
| Initial load (N) external spring |  |  | 2,2 | 2,2 | 4,0 | 7,5 | 11,0 | 16,5 | 23,0 |
| Final load (N) compressed load |  |  | 4,2 | 4,2 | 8,7 | 21,0 | 22,0 | 30,7 | 30,7 |

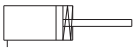
(stroke 0-50 mm)

| Cylinders ISO 15552 - 1319-20-21 series | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Front spring | Rear spring | Bore | | | | | |
| | | | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
| Initial load (N) external spring |  |  | 17,2 | 24,6 | 51,0 | 51,0 | 98,1 | 98,1 |
| Final load (N) compressed load |  |  | 41,7 | 83,4 | 114,8 | 114,8 | 194,2 | 194,2 |

(stroke 0-50 mm)

| Short stroke compact cylinders | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Front spring | Rear spring | Bore | | | | | | |
| | | | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
| Initial load (N) external spring |  |  | 7,9 | 9,9 | 34,4 | 34,4 | 50,1 | 54,0 | 117,7 | 108,9 |
| Final load (N) compressed load |  |  | 27,5 | 26,5 | 59,9 | 63,8 | 79,5 | 85,4 | 157,0 | 134,4 |

(stroke 0-10 mm)

| "Europe" Compact cylinders | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Front spring | Rear spring | Bore | | | | | | | | |
| | | | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 |
| Initial load (N) external spring |  |  | 3,9 | 4,4 | 4,9 | 9,8 | 12,3 | 16,7 | 27,5 | 37,3 | 59,4 | 101,3 |
| Final load (N) compressed load |  |  | 9,3 | 17,7 | 18,1 | 25,5 | 34,3 | 44,1 | 51,0 | 63,8 | 99,4 | 141,9 |

(Ø12 stroke 0-10 mm - Ø16¸100 stroke 0-25 mm)

| Cylinder nuts recommended tightening torque | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Bore size | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 | Ø125 | Ø160 | Ø200 |
| Torque (Nm) | 8 | 8 | 16 | 16 | 22 | 22 | 30 | 85 | 85 |


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# Measure and conversion units

### International system of units - table

| Size | Name | Symbol |
|---|---|---|
| Lenght | Meter | m |
| Area | square meter | $m^2$ |
| Volume | cubic meter | $m^3$ |
| Force | Newton | N |
| Mass | kilogram | Kg |
| Pressure | Pascal | Pa ($N/m^2$) |
| Work and Energy | Joulle | J (Nm) |
| Power | Watt | W (J/s) |
| Time | Second | s |
| Speed | meter / second | m/s |
| Acceleration | meter / $second^2$ | $m/s^2$ |
| Flow rate | meter / $second^3$ | $m^3/s$ |
| Temperature | Kelvin | °K |
| Frequency | Hertz | Hz (1/s) |
| Electric current | Ampere | A |
| Voltage | Volt | V (W/A) |
| Electrical resistance | Ohm | Ω (V/A) |
| Electric power | Volt Ampere | VA (VA) |

### Measure and conversion units

| Lenght | Centimetre (cm) | Meter (m) | Inch (In) | Foot (ft) | Yard (yd) |
|---|---|---|---|---|---|
| 1 Meter (m) | 100 | 1 | 39,37 | 3,281 | 1,094 |
| 1 Inch (In) | 2,54 | $2,54x10^{-2}$ | 1 | $8,33x10^{-2}$ | 0,028 |
| 1 Foot (ft) | 30,48 | 0,3048 | 12 | 1 | 0,333 |
| 1 Yard (yd) | 91,44 | 0,9144 | 36 | 3 | 1 |

| Area | Square centimetre ($cm^2$) | Square meter ($m^2$) | Square inch (sq in) | Square foot (sq ft) | Square yard (sq yd) |
|---|---|---|---|---|---|
| 1 Square centimetre ($cm^2$) | 1 | $1x10^{-4}$ | 0,155 | $1,08x10^{-3}$ | $1,2x10^{-4}$ |
| 1 Square meter ($m^2$) | $1x10^{4}$ | 1 | 1.550 | 10,764 | 1,2 |
| 1 Square inch (sq in) | 6,452 | $6,45x10^{-4}$ | 1 | $6,95x10^{-3}$ | $7,72x10^{-4}$ |
| 1 Square foot (sq ft) | 929 | $9,29x10^{-2}$ | 144 | 1 | 0,111 |
| 1 Square yard (sq yd) | 8.361 | 0,8361 | 1.296 | 9 | 1 |

| Volume | Litre ($l=dm^3$) | Cubic metre ($m^3$) | Cubic inch (cu in) | Cubic foot (cu ft) | Gallon (gal-USA) | Gallon (gal-GB) |
|---|---|---|---|---|---|---|
| 1 Litre (l) = $1dm^3$ | 1 | $1x10^{-3}$ | 61,02 | $3,53x10^{-2}$ | 0,2642 | 0,22 |
| 1 Cubic meter ($m^3$) | 1.000 | 1 | $6,102x10^{4}$ | 35,31 | 264,2 | 220 |
| 1 Cubic inch (cu in) | $1,64x10^{-2}$ | $1,64x10^{-5}$ | 1 | $5,8x10^{-4}$ | $4,33x10^{-3}$ | $3,6x10^{-3}$ |
| 1 Cubic foot (cu ft) | 28,317 | $2,83x10^{-2}$ | 1.728 | 1 | 7,48 | 6,23 |
| 1 Gallon (gal -USA) | 3,785 | $3,79x10^{-3}$ | 231 | 0,1337 | 1 | 0,8327 |
| 1 Gallon (gal -GB) | 4,546 | $4,55x10^{-3}$ | 277,4 | 0,1605 | 1,2 | 1 |



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| Mass (Weight) | Kilogram (Kg) | Pound (lb) | Hundred-weight USA | Hundred-weight GB |
|---|---|---|---|---|
| 1 Kilogram (Kg) | 1 | 2,205 | $1{,}102 \times 10^{-3}$ | $9{,}842 \times 10^{-4}$ |
| 1 Pound (lb) | 0,4536 | 1 | $5 \times 10^{-4}$ | $4{,}464 \times 10^{-4}$ |
| 1 Hundred-weight USA | 907,2 | 2.000 | 1 | 0,8929 |
| 1 Hundred-weight GB | 1.016 | 2.240 | 1,12 | 1 |

| Force | Newton (N) | Kilopound (kgp) | Poundal (pdl) |
|---|---|---|---|
| 1 Newton (N) | 1 | 0,102 | 7,23 |
| 1 Kilopound (kgp) | 9,807 | 1 | 70,93 |
| 1 Poundal (pdl) | 0,1383 | 0,0141 | 1 |

| Pressure | Pascal (Pa) | Bar (bar) | Poundal/ pollice$^2$ (psi) | Technical atmosphere (at=kg/cm$^2$) | Atmosphere (atm) | Column of Mercury (mmHg = Torr) | Column of water (m$H_2O$) |
|---|---|---|---|---|---|---|---|
| 1 Pascal (Pa) | 1 | $1 \times 10^{-5}$ | $1{,}45 \times 10^{-4}$ | $1{,}02 \times 10^{-5}$ | $9{,}87 \times 10^{-6}$ | $7{,}5 \times 10^{-3}$ | $1{,}02 \times 10^{-4}$ |
| 1 Bar (bar) | $1 \times 10^{5}$ | 1 | 14,50 | 1,02 | 0,9869 | 750 | 10,2 |
| 1 Poundal/pollice$^2$ (psi) | 6.895 | 0,069 | 1 | $7{,}03 \times 10^{-2}$ | 0,06805 | 51,72 | 0,703 |
| 1 Technical atmosphere (at=kg/cm$^2$) | $9{,}807 \times 10^{4}$ | 0,9807 | 14,22 | 1 | 0,9678 | 735,6 | 10 |
| 1 Atmosphere (atm) | $1{,}013 \times 10^{5}$ | 1,013 | 14,70 | 1,033 | 1 | 760 | 10,33 |
| 1 millimetre of mercury (mmHg = Torr) | 133,32 | $1{,}34 \times 10^{-3}$ | $1{,}934 \times 10^{-2}$ | $1{,}36 \times 10^{-3}$ | $1{,}316 \times 10^{-3}$ | 1 | $1{,}36 \times 10^{-2}$ |
| 1 Metre of water (m$H_2O$) | 9.810 | $9{,}81 \times 10^{-2}$ | 1,423 | 0,1 | $9{,}682 \times 10^{-2}$ | 73,6 | 1 |

| Work and Energy | Kilocalorie (kcal) | Kilogrammetre (kgm) | Kilowatt (kWh) | Horse power/hr (Hph) non Metric | Joule (J) |
|---|---|---|---|---|---|
| 1 Kilocalorie (kcal) | 1 | 427 | $1{,}163 \times 10^{-3}$ | $1{,}561 \times 10^{-3}$ | 4.190 |
| 1 Kilogrammeter (kgm) | $2{,}34 \times 10^{-3}$ | 1 | $2{,}724 \times 10^{-6}$ | $3{,}653 \times 10^{-6}$ | 9,806 |
| 1 Kilowatt-hour (kWh) | 860 | 367.122 | 1 | 1,341 | $3{,}6 \times 10^{5}$ |
| 1 Horsepower/hour-non metric (hph) | 641 | 273.761 | 0,7457 | 1 | $2{,}685 \times 10^{6}$ |
| 1 Joule (J) | $2{,}39 \times 10^{-4}$ | 0,102 | $2{,}78 \times 10^{-7}$ | $3{,}725 \times 10^{-7}$ | 1 |

| Temperature | Kelvin (K) | Celsius (°C) | Fahrenheit (°F) |
|---|---|---|---|
| Kelvin (K) | / | K-273 = °C | (K-273)x1,8 = °F |
| Celsius (°C) | °C+273 = K | / | (°Cx1,8)+32 = °F |
| Fahrenheit (°F) | 273+[(°F-32):1,8] = K | (°F-32):1,8 = °C | / |




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## ISO metric thread UNI 4535-64

| Coarse ISO metric thread | | | |
|---|---|---|---|
| Thread | Pitch (mm) | Ø Drilling (mm) | Ø Drill (mm) |
| M 1,6 | 0,35 | 1,321 | 1,20 |
| M 1,8 | 0,35 | 1,521 | 1,45 |
| M 2 | 0,40 | 1,679 | 1,60 |
| M 2,2 | 0,45 | 1,838 | 1,75 |
| M 2,5 | 0,45 | 2,138 | 2,05 |
| M 3 | 0,50 | 2,599 | 2,5 |
| M 3,5 | 0,60 | 3,010 | 2,9 |
| M 4 | 0,70 | 3,422 | 3,3 |
| M 4,5 | 0,75 | 3,878 | 3,7 |
| M 5 | 0,80 | 4,334 | 4,2 |
| M 6 | 1 | 5,153 | 5 |
| M 7 | 1 | 6,153 | 6 |
| M 8 | 1,25 | 6,912 | 6,8 |
| M 9 | 1,25 | 7,912 | 7,8 |
| M 10 | 1,5 | 8,676 | 8,5 |
| M 11 | 1,5 | 9,676 | 9,5 |
| M 12 | 1,75 | 10,441 | 10,2 |
| M 14 | 2 | 12,210 | 12 |
| M 16 | 2 | 14,210 | 14 |
| M 18 | 2,5 | 15,744 | 15,5 |
| M 20 | 2,5 | 17,744 | 17,5 |
| M 22 | 2,5 | 19,744 | 19,5 |
| M 24 | 3 | 21,252 | 21 |
| M 27 | 3 | 24,252 | 24 |
| M 30 | 3,5 | 26,771 | 26,5 |
| M 33 | 3,5 | 29,771 | 29,5 |
| M 36 | 4 | 32,270 | 32 |
| M 39 | 4 | 35,270 | 35 |
| M 42 | 4,5 | 37,799 | 37,5 |
| M 45 | 4,5 | 40,799 | 40,5 |
| M 48 | 5 | 43,297 | 43 |
| M 52 | 5 | 47,297 | 47 |
| M 56 | 5,5 | 50,796 | 50,5 |
| M 60 | 5,5 | 54,796 | 54,5 |
| M 64 | 6 | 58,305 | 58 |
| M 68 | 6 | 62,305 | 62 |

| Fine ISO metric thread | | | |
|---|---|---|---|
| Thread | Pitch (mm) | Ø Drilling (mm) | Ø Drill (mm) |
| M 3 | 0,35 | 2,721 | 2,65 |
| M 4 | 0,50 | 3,599 | 3,5 |
| M 5 | 0,50 | 4,599 | 4,5 |
| M 6 | 0,75 | 5,378 | 5,2 |
| M 7 | 0,75 | 6,378 | 6,2 |
| M 8 | 0,75 | 7,378 | 7,2 |
| M 8 | 1 | 7,153 | 7 |
| M 9 | 1 | 8,153 | 8 |
| M 10 | 0,75 | 9,378 | 9,2 |
| M 10 | 1 | 9,153 | 9 |
| M 10 | 1,25 | 8,912 | 8,8 |
| M 11 | 1 | 10,153 | 10 |
| M 12 | 1 | 11,153 | 11 |
| M 12 | 1,25 | 10,912 | 10,8 |
| M 12 | 1,5 | 10,676 | 10,5 |
| M 14 | 1 | 13,153 | 13 |
| M 14 | 1,25 | 12,912 | 12,8 |
| M 14 | 1,5 | 12,676 | 12,5 |
| M 15 | 1 | 14,153 | 14 |
| M 15 | 1,5 | 13,676 | 13,5 |
| M 16 | 1 | 15,153 | 15 |
| M 16 | 1,5 | 14,676 | 14,5 |
| M 18 | 1 | 17,153 | 17 |
| M 18 | 1,5 | 16,676 | 16,5 |
| M 18 | 2 | 16,210 | 16 |
| M 20 | 1 | 19,153 | 19 |
| M 20 | 1,5 | 18,676 | 18,5 |
| M 20 | 2 | 18,210 | 18 |
| M 22 | 1 | 21,153 | 21 |
| M 22 | 1,5 | 20,676 | 20,5 |
| M 21 | 2 | 20,210 | 20 |
| M 24 | 1 | 23,153 | 23 |
| M 24 | 1,5 | 22,676 | 22,5 |
| M 24 | 2 | 22,210 | 22 |
| M 24 | 1 | 24,153 | 24 |
| M 25 | 1,5 | 23,676 | 23,5 |
| M 26 | 1,5 | 24,676 | 24,5 |
| M 27 | 1,5 | 25,676 | 25,5 |
| M 27 | 2 | 25,210 | 25 |
| M 28 | 1,5 | 26,676 | 26,5 |
| M 30 | 1,5 | 28,676 | 28,5 |
| M 30 | 2 | 28,210 | 28 |
| M 32 | 1,5 | 30,676 | 30,5 |
| M 33 | 2 | 31,210 | 31 |
| M 35 | 1,5 | 33,676 | 33,5 |
| M 36 | 1,5 | 34,676 | 34,5 |
| M 36 | 2 | 34,210 | 34 |
| M 36 | 3 | 33,252 | 33 |
| M 38 | 1,5 | 36,676 | 36,5 |
| M 39 | 3 | 36,252 | 36 |
| M 40 | 1,5 | 38,676 | 38,5 |
| M 42 | 1,5 | 40,676 | 40,5 |
| M 45 | 1,5 | 43,676 | 43,5 |
| M 50 | 1,5 | 48,676 | 48,5 |

## GAS thread

| «G» UNI 338-66 | | | |
|---|---|---|---|
| Thread | Ø External (mm) | Ø Drilling (mm) | Ø Drill point (mm) |
| G 1/8” - 28 | 9,73 | 8,68 | 8,70 |
| G 1/4” - 19 | 13,16 | 11,62 | 11,75 |
| G 3/8” - 19 | 16,66 | 15,12 | 15,25 |
| G 1/2” - 14 | 20,95 | 18,86 | 19,00 |
| G 5/8” - 14 | 22,91 | 20,82 | 21,00 |
| G 3/4” - 14 | 26,44 | 24,35 | 24,50 |
| G 7/8” - 14 | 30,20 | 28,11 | 28,25 |
| G 1” - 11 | 33,25 | 30,59 | 30,50 |
| G 1 1/8” - 11 | 37,90 | 35,24 | 35,50 |
| G 1 1/4” - 11 | 41,91 | 39,25 | 39,50 |
| G 1 3/8” - 11 | 44,32 | 41,66 | 41,50 |
| G 1 1/2” - 11 | 47,80 | 45,14 | 45,00 |
| G 1 5/8” - 11 | 51,32 | 48,67 | 48,50 |
| G 1 3/4” - 11 | 53,75 | 51,08 | 51,00 |
| G 2” - 11 | 59,61 | 56,95 | 57,00 |
| G 2 1/4” - 11 | 65,71 | 63,05 | 63,00 |
| G 2 1/2” - 11 | 75,18 | 72,52 | 72,50 |
| G 2 3/4” - 11 | 81,53 | 78,87 | 79,00 |
| G 3” - 11 | 87,88 | 85,22 | 85,50 |
| G 3 1/4” - 11 | 93,98 | 91,32 | 91,50 |
| G 3 1/2” - 11 | 100,33 | 97,67 | 97,50 |
| G 3 3/4” - 11 | 106,68 | 104,02 | 104,00 |
| G 4” - 11 | 113,03 | 110,37 | 110,50 |

| «Gc» UNI 339-66 | | | |
|---|---|---|---|
| Thread | Ø External (mm) | Ø Drilling (mm) | Ø Drill point (mm) |
| Gc 1/8” - 28 | 8,5 | 4,9 | 3,1 |
| Gc 1/4” - 19 | 11,5 | 7,3 | 4,7 |
| Gc 3/8” - 19 | 15,0 | 7,7 | 5,1 |
| Gc 1/2” - 14 | 18,5 | 10,0 | 6,4 |
| Gc 3/4” - 14 | 23,5 | 11,3 | 7,7 |
| Gc 1” - 11 | 30,0 | 12,7 | 8,1 |
| Gc 1 1/4” - 11 | 38,0 | 15,0 | 10,4 |
| Gc 1 3/8” - 11 | 41,0 | 15,0 | 10,4 |
| Gc 1 1/2” - 11 | 44,5 | 15,0 | 10,4 |
| Gc 2” - 11 | 56,0 | 18,2 | 13,6 |
| Gc 2 1/2” - 11 | 72,0 | 21,0 | 14,0 |
| Gc 3” - 11 | 85,0 | 24,1 | 17,1 |
| | | **max** | **min** |




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# Alphanumeric index

## Air distribution


| Coding | Series | Family | Page |
|---|---|---|---|
| 1001... | 1000 | ISO 5599-1 valves & solenoid valves | 265-269 |
| 1001.52... | 1000 | ISO 5599-1 valves & solenoid valves | 265 |
| 1001.53... | 1000 | ISO 5599-1 valves & solenoid valves | 265 |
| 1002... | 1000 | ISO 5599-1 valves & solenoid valves | 267-269 |
| 1002.52... | 1000 | ISO 5599-1 valves & solenoid valves | 267 |
| 1002.53... | 1000 | ISO 5599-1 valves & solenoid valves | 267 |
| 1011.52... | 1000 | ISO 5599-1 valves & solenoid valves | 270-271 |
| 1011.53... | 1000 | ISO 5599-1 valves & solenoid valves | 270-271 |
| 1012.52... | 1000 | ISO 5599-1 valves & solenoid valves | 272-273 |
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Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

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| 5312A.F04.00 | 2300 ENOVA | Solenoid valves manifold | 523 |
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| 5312A.F04.00 | PX | Solenoid valves manifold | 354 |
| 5312A.F05.00 | 2300 ENOVA | Solenoid valves manifold | 523 |
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| 17202B… | 1700 | Air service units | 101-105 |
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| 17410.M2 | 1700 | Air service units | 128-129 |
| 17430.A | 1700 | Air service units | 122-123 |
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| N171CB…D | Airplus | Air service units | 40-43 |
| N171CDA… | Airplus | Air service units | 10-13 |
| N171CE… | Airplus | Air service units | 22-27 |
| N171CF… | Airplus | Air service units | 6-9 |
| N171CL… | Airplus | Air service units | 48-51 |
| N171CM…A | Airplus | Air service units | 40-43 |
| N171CM…B | Airplus | Air service units | 40-43 |
| N171CM…C | Airplus | Air service units | 40-43 |
| N171CM…D | Airplus | Air service units | 40-43 |
| N171CP… | Airplus | Air service units | 61-63 |
| N171CP…A | Airplus | Air service units | 40-43 |
| N171CP…B | Airplus | Air service units | 40-43 |
| N171CP…C | Airplus | Air service units | 40-43 |
| N171CP…D | Airplus | Air service units | 40-43 |
| N171CPA | Airplus | Air service units | 57-58 |
| N171CPP… | Airplus | Air service units | 59-60 |
| N171CR… | Airplus | Air service units | 30-33 |
| N171CV… | Airplus | Air service units | 52-54 |
| N171X | Airplus | Air service units | 77 |
| N171Y | Airplus | Air service units | 77 |
| N171YP | Airplus | Air service units | 46 |
| N172AAP… | Airplus | Air service units | 55-56 |
| N172ADA… | Airplus | Air service units | 10-13 |
| N172AE… | Airplus | Air service units | 22-27 |
| N172AF… | Airplus | Air service units | 6-9 |
| N172AL… | Airplus | Air service units | 48-51 |
| N172AP… | Airplus | Air service units | 61-63 |
| N172APA | Airplus | Air service units | 57-58 |
| N172APP… | Airplus | Air service units | 59-60 |
| N172AR… | Airplus | Air service units | 30-33 |
| N172AV… | Airplus | Air service units | 52-54 |
| N172BAP… | Airplus | Air service units | 55-56 |
| N172BDA… | Airplus | Air service units | 10-13 |
| N172BE… | Airplus | Air service units | 22-27 |
| N172BF… | Airplus | Air service units | 6-9 |
| N172BL… | Airplus | Air service units | 48-51 |
| N172BP… | Airplus | Air service units | 61-63 |
| N172BPA | Airplus | Air service units | 57-58 |
| N172BPP… | Airplus | Air service units | 59-60 |
| N172BR… | Airplus | Air service units | 30-33 |
| N172BV… | Airplus | Air service units | 52-54 |

| Coding | Series | Family | Page |
|---|---|---|---|
| N172CAP… | Airplus | Air service units | 55-56 |
| N172CDA… | Airplus | Air service units | 10-13 |
| N172CE… | Airplus | Air service units | 22-27 |
| N172CF… | Airplus | Air service units | 6-9 |
| N172CL… | Airplus | Air service units | 48-51 |
| N172CP… | Airplus | Air service units | 61-63 |
| N172CPA | Airplus | Air service units | 57-58 |
| N172CPP… | Airplus | Air service units | 59-60 |
| N172CR… | Airplus | Air service units | 30-33 |
| N172CV… | Airplus | Air service units | 52-54 |
| N172X | Airplus | Air service units | 77 |
| N172Y | Airplus | Air service units | 77 |
| N173AAP… | Airplus | Air service units | 55-56 |
| N173ADA… | Airplus | Air service units | 10-13 |
| N173ADBV… | Airplus | Air service units | 14-17 |
| N173ADD… | Airplus | Air service units | 18-21 |
| N173AE… | Airplus | Air service units | 22-27 |
| N173AF… | Airplus | Air service units | 6-9 |
| N173AL… | Airplus | Air service units | 48-51 |
| N173AP… | Airplus | Air service units | 61-63 |
| N173APA | Airplus | Air service units | 57-58 |
| N173APP… | Airplus | Air service units | 59-60 |
| N173AR… | Airplus | Air service units | 30-33 |
| N173AV… | Airplus | Air service units | 52-54 |
| N173BAP… | Airplus | Air service units | 55-56 |
| N173BDA… | Airplus | Air service units | 10-13 |
| N173BDBV… | Airplus | Air service units | 14-17 |
| N173BDCV… | Airplus | Air service units | 14-17 |
| N173BDD… | Airplus | Air service units | 18-21 |
| N173BE… | Airplus | Air service units | 22-27 |
| N173BF… | Airplus | Air service units | 6-9 |
| N173BL… | Airplus | Air service units | 48-51 |
| N173BP… | Airplus | Air service units | 61-63 |
| N173BPA | Airplus | Air service units | 57-58 |
| N173BPP… | Airplus | Air service units | 59-60 |
| N173BR… | Airplus | Air service units | 30-33 |
| N173BV… | Airplus | Air service units | 52-54 |
| N173BV2S… | Airplus | Air service units | 65-71 |
| N173BVS… | Airplus | Air service units | 65-71 |
| N173CAP… | Airplus | Air service units | 55-56 |
| N173CDA… | Airplus | Air service units | 10-13 |
| N173CDBV… | Airplus | Air service units | 14-17 |
| N173CDD… | Airplus | Air service units | 18-21 |
| N173CE… | Airplus | Air service units | 22-27 |
| N173CF… | Airplus | Air service units | 6-9 |
| N173CL… | Airplus | Air service units | 48-51 |
| N173CP… | Airplus | Air service units | 61-63 |
| N173CPA | Airplus | Air service units | 57-58 |
| N173CPP… | Airplus | Air service units | 59-60 |
| N173CR… | Airplus | Air service units | 30-33 |
| N173CV… | Airplus | Air service units | 52-54 |
| N173X | Airplus | Air service units | 77 |
| N173Y | Airplus | Air service units | 77 |
| N174BAP… | Airplus | Air service units | 55-56 |
| N174BDA… | Airplus | Air service units | 10-13 |
| N174BDAV… | Airplus | Air service units | 14-17 |
| N174BDD… | Airplus | Air service units | 18-21 |
| N174BE… | Airplus | Air service units | 22-27 |
| N174BF… | Airplus | Air service units | 6-9 |
| N174BL… | Airplus | Air service units | 48-51 |
| N174BP… | Airplus | Air service units | 61-63 |
| N174BPA | Airplus | Air service units | 57-58 |
| N174BPP… | Airplus | Air service units | 59-60 |
| N174BR… | Airplus | Air service units | 30-33 |
| N174BV… | Airplus | Air service units | 52-54 |
| N174CE… | Airplus | Air service units | 22-27 |
| N174CF… | Airplus | Air service units | 6-9 |
| N174CR… | Airplus | Air service units | 30-33 |
| N174X | Airplus | Air service units | 77 |
| N174Y | Airplus | Air service units | 77 |
| P171AAP… | Airplus | Air service units | 55-56 |
| P171ADA… | Airplus | Air service units | 10-13 |

| Coding | Series | Family | Page |
|---|---|---|---|
| P171AE… | Airplus | Air service units | 22-27 |
| P171AF… | Airplus | Air service units | 6-9 |
| P171AL… | Airplus | Air service units | 48-51 |
| P171AP… | Airplus | Air service units | 61-63 |
| P171APA | Airplus | Air service units | 57-58 |
| P171APP… | Airplus | Air service units | 59-60 |
| P171AR… | Airplus | Air service units | 30-33 |
| P171AV… | Airplus | Air service units | 52-54 |
| P171BAP… | Airplus | Air service units | 55-56 |
| P171BDA… | Airplus | Air service units | 10-13 |
| P171BE… | Airplus | Air service units | 22-27 |
| P171BF… | Airplus | Air service units | 6-9 |
| P171BL… | Airplus | Air service units | 48-51 |
| P171BP… | Airplus | Air service units | 61-63 |
| P171BPA | Airplus | Air service units | 57-58 |
| P171BPP… | Airplus | Air service units | 59-60 |
| P171BR… | Airplus | Air service units | 30-33 |
| P171BV… | Airplus | Air service units | 52-54 |
| P171CAP… | Airplus | Air service units | 55-56 |
| P171CDA… | Airplus | Air service units | 10-13 |
| P171CE… | Airplus | Air service units | 22-27 |
| P171CF… | Airplus | Air service units | 6-9 |
| P171CL… | Airplus | Air service units | 48-51 |
| P171CP… | Airplus | Air service units | 61-63 |
| P171CPA | Airplus | Air service units | 57-58 |
| P171CPP… | Airplus | Air service units | 59-60 |
| P171CR… | Airplus | Air service units | 30-33 |
| P171CV… | Airplus | Air service units | 52-54 |
| P172AAP… | Airplus | Air service units | 55-56 |
| P172ADA… | Airplus | Air service units | 10-13 |
| P172AE… | Airplus | Air service units | 22-27 |
| P172AF… | Airplus | Air service units | 6-9 |
| P172AL… | Airplus | Air service units | 48-51 |
| P172AP… | Airplus | Air service units | 61-63 |
| P172APA | Airplus | Air service units | 57-58 |
| P172APP… | Airplus | Air service units | 59-60 |
| P172AR… | Airplus | Air service units | 30-33 |
| P172AV… | Airplus | Air service units | 52-54 |
| P172BAP… | Airplus | Air service units | 55-56 |
| P172BDA… | Airplus | Air service units | 10-13 |
| P172BE… | Airplus | Air service units | 22-27 |
| P172BF… | Airplus | Air service units | 6-9 |
| P172BL… | Airplus | Air service units | 48-51 |
| P172BP… | Airplus | Air service units | 61-63 |
| P172BPA | Airplus | Air service units | 57-58 |
| P172BPP… | Airplus | Air service units | 59-60 |
| P172BR… | Airplus | Air service units | 30-33 |
| P172BV… | Airplus | Air service units | 52-54 |
| P172CAP… | Airplus | Air service units | 55-56 |
| P172CDA… | Airplus | Air service units | 10-13 |
| P172CE… | Airplus | Air service units | 22-27 |
| P172CF… | Airplus | Air service units | 6-9 |
| P172CL… | Airplus | Air service units | 48-51 |
| P172CP… | Airplus | Air service units | 61-63 |
| P172CPA | Airplus | Air service units | 57-58 |
| P172CPP… | Airplus | Air service units | 59-60 |
| P172CR… | Airplus | Air service units | 30-33 |
| P172CV… | Airplus | Air service units | 52-54 |
| P173AAP… | Airplus | Air service units | 55-56 |
| P173ADA… | Airplus | Air service units | 10-13 |
| P173ADBV… | Airplus | Air service units | 14-17 |
| P173ADD… | Airplus | Air service units | 18-21 |
| P173AE… | Airplus | Air service units | 22-27 |
| P173AF… | Airplus | Air service units | 6-9 |
| P173AL… | Airplus | Air service units | 48-51 |
| P173AP… | Airplus | Air service units | 61-63 |
| P173APA | Airplus | Air service units | 57-58 |
| P173APP… | Airplus | Air service units | 59-60 |
| P173AR… | Airplus | Air service units | 30-33 |
| P173AV… | Airplus | Air service units | 52-54 |
| P173BAP… | Airplus | Air service units | 55-56 |
| P173BDA… | Airplus | Air service units | 10-13 |


Overall dimensions and technical information are provided solely for informative purposes and may be modified without notice

| Coding | Series | Family | Page |
|---|---|---|---|
| P173BDBV… | Airplus | Air service units | 14-17 |
| P173BDCV… | Airplus | Air service units | 14-17 |
| P173BDD… | Airplus | Air service units | 18-21 |
| P173BE… | Airplus | Air service units | 22-27 |
| P173BF… | Airplus | Air service units | 6-9 |
| P173BL… | Airplus | Air service units | 48-51 |
| P173BP… | Airplus | Air service units | 61-63 |
| P173BPA | Airplus | Air service units | 57-58 |
| P173BPP… | Airplus | Air service units | 59-60 |
| P173BR… | Airplus | Air service units | 30-33 |
| P173BV… | Airplus | Air service units | 52-54 |
| P173CAP… | Airplus | Air service units | 55-56 |
| P173CDA… | Airplus | Air service units | 10-13 |
| P173CDBV… | Airplus | Air service units | 14-17 |
| P173CDD… | Airplus | Air service units | 18-21 |
| P173CE… | Airplus | Air service units | 22-27 |
| P173CF… | Airplus | Air service units | 6-9 |
| P173CL… | Airplus | Air service units | 48-51 |
| P173CP… | Airplus | Air service units | 61-63 |
| P173CPA | Airplus | Air service units | 57-58 |
| P173CPP… | Airplus | Air service units | 59-60 |
| P173CR… | Airplus | Air service units | 30-33 |
| P173CV… | Airplus | Air service units | 52-54 |
| P174BAP… | Airplus | Air service units | 55-56 |
| P174BDA… | Airplus | Air service units | 10-13 |
| P174BDAV… | Airplus | Air service units | 14-17 |
| P174BDD… | Airplus | Air service units | 18-21 |
| P174BE… | Airplus | Air service units | 22-27 |
| P174BF… | Airplus | Air service units | 6-9 |
| P174BL… | Airplus | Air service units | 48-51 |
| P174BP… | Airplus | Air service units | 61-63 |
| P174BPA | Airplus | Air service units | 57-58 |
| P174BPP… | Airplus | Air service units | 59-60 |
| P174BR… | Airplus | Air service units | 30-33 |
| P174BR…P | Airplus | Air service units | 35-38 |
| P174BV… | Airplus | Air service units | 52-54 |
| P174CDA… | Airplus | Air service units | 10-13 |
| P174CE… | Airplus | Air service units | 22-27 |
| P174CF… | Airplus | Air service units | 6-9 |
| P174CR… | Airplus | Air service units | 30-33 |
| P174CR…P | Airplus | Air service units | 35-38 |
| RB173BR2C | 1700 | Air service units | 153-155 |
| RP171AB… | Airplus | Air service units | 78-80 |
| RP171ABM… | Airplus | Air service units | 81-83 |
| RP171BB… | Airplus | Air service units | 78-80 |
| RP171BBM… | Airplus | Air service units | 81-83 |
| SF172AE… | 1700 Steel line | Air service units | 169-173 |
| SF172AF… | 1700 Steel line | Air service units | 161-164 |
| SF172AR… | 1700 Steel line | Air service units | 165-168 |
| SF172BE… | 1700 Steel line | Air service units | 169-173 |
| SF172BF… | 1700 Steel line | Air service units | 161-164 |
| SF172BR… | 1700 Steel line | Air service units | 165-168 |
| SF172CE… | 1700 Steel line | Air service units | 169-173 |
| SF172CF… | 1700 Steel line | Air service units | 161-164 |
| SF172CR… | 1700 Steel line | Air service units | 165-168 |
| SF173AE… | 1700 Steel line | Air service units | 169-173 |
| SF173AF… | 1700 Steel line | Air service units | 161-164 |
| SF173AR… | 1700 Steel line | Air service units | 165-168 |
| SF173BE… | 1700 Steel line | Air service units | 169-173 |
| SF173BF… | 1700 Steel line | Air service units | 161-164 |
| SF173BR… | 1700 Steel line | Air service units | 165-168 |
| SF173DE… | 1700 Steel line | Air service units | 169-173 |
| SF173DF… | 1700 Steel line | Air service units | 161-164 |
| SF173DR… | 1700 Steel line | Air service units | 165-168 |
| SF174AE… | 1700 Steel line | Air service units | 169-173 |
| SF174AF… | 1700 Steel line | Air service units | 161-164 |
| SF174AR… | 1700 Steel line | Air service units | 165-168 |
| SF174BE… | 1700 Steel line | Air service units | 169-173 |
| SF174BF… | 1700 Steel line | Air service units | 161-164 |
| SF174BR… | 1700 Steel line | Air service units | 165-168 |
| SF174DE… | 1700 Steel line | Air service units | 169-173 |
| SF174DF… | 1700 Steel line | Air service units | 161-164 |
| SF174DR… | 1700 Steel line | Air service units | 165-168 |
| SM172AE… | 1700 Steel line | Air service units | 169-173 |
| SM172BE… | 1700 Steel line | Air service units | 169-173 |
| SM172CE… | 1700 Steel line | Air service units | 169-173 |
| SM173AE… | 1700 Steel line | Air service units | 169-173 |
| SM173BE… | 1700 Steel line | Air service units | 169-173 |
| SM173DE… | 1700 Steel line | Air service units | 169-173 |
| SM174AE… | 1700 Steel line | Air service units | 169-173 |
| SM174BE… | 1700 Steel line | Air service units | 169-173 |
| SM174DE… | 1700 Steel line | Air service units | 169-173 |
| SS17...50 | 1700 Steel line | Air service units | 174 |
| SS17070AA | 1700 Steel line | Air service units | 174 |
| SS17070AB | 1700 Steel line | Air service units | 174 |
| SS17255 | 1700 Steel line | Air service units | 175 |
| SS172AE… | 1700 Steel line | Air service units | 169-173 |
| SS172AF… | 1700 Steel line | Air service units | 161-164 |
| SS172AR… | 1700 Steel line | Air service units | 165-168 |
| SS172BE… | 1700 Steel line | Air service units | 169-173 |
| SS172BF… | 1700 Steel line | Air service units | 161-164 |
| SS172BR… | 1700 Steel line | Air service units | 165-168 |
| SS172CE… | 1700 Steel line | Air service units | 169-173 |
| SS172CF… | 1700 Steel line | Air service units | 161-164 |
| SS172CR… | 1700 Steel line | Air service units | 165-168 |
| SS173AE… | 1700 Steel line | Air service units | 169-173 |
| SS173AF… | 1700 Steel line | Air service units | 161-164 |
| SS173AR… | 1700 Steel line | Air service units | 165-168 |
| SS173BE… | 1700 Steel line | Air service units | 169-173 |
| SS173BF… | 1700 Steel line | Air service units | 161-164 |
| SS173BR… | 1700 Steel line | Air service units | 165-168 |
| SS173DE… | 1700 Steel line | Air service units | 169-173 |
| SS173DF… | 1700 Steel line | Air service units | 161-164 |
| SS173DR… | 1700 Steel line | Air service units | 165-168 |
| SS17455 | 1700 Steel line | Air service units | 175 |
| SS174AE… | 1700 Steel line | Air service units | 169-173 |
| SS174AF… | 1700 Steel line | Air service units | 161-164 |
| SS174AR… | 1700 Steel line | Air service units | 165-168 |
| SS174BE… | 1700 Steel line | Air service units | 169-173 |
| SS174BF… | 1700 Steel line | Air service units | 161-164 |
| SS174BR… | 1700 Steel line | Air service units | 165-168 |
| SS174DE… | 1700 Steel line | Air service units | 169-173 |
| SS174DF… | 1700 Steel line | Air service units | 161-164 |
| SS174DR… | 1700 Steel line | Air service units | 165-168 |
| T17150 | Airplus | Air service units | 29;34 |
| T17150 | Airplus | Air service units | 29;34 |
| T171AAP… | Airplus | Air service units | 55-56 |
| T171AB…A | Airplus | Air service units | 40-43 |
| T171AB…B | Airplus | Air service units | 40-43 |
| T171AB…C | Airplus | Air service units | 40-43 |
| T171AB…D | Airplus | Air service units | 40-43 |
| T171ADA… | Airplus | Air service units | 10-13 |
| T171AE… | Airplus | Air service units | 22-27 |
| T171AF… | Airplus | Air service units | 6-9 |
| T171AL… | Airplus | Air service units | 48-51 |
| T171AM…A | Airplus | Air service units | 40-43 |
| T171AM…B | Airplus | Air service units | 40-43 |
| T171AM…C | Airplus | Air service units | 40-43 |
| T171AM…D | Airplus | Air service units | 40-43 |
| T171AP… | Airplus | Air service units | 61-63 |
| T171AP…A | Airplus | Air service units | 40-43 |
| T171AP…B | Airplus | Air service units | 40-43 |
| T171AP…C | Airplus | Air service units | 40-43 |
| T171AP…D | Airplus | Air service units | 40-43 |
| T171APA | Airplus | Air service units | 57-58 |
| T171APP… | Airplus | Air service units | 59-60 |
| T171AR… | Airplus | Air service units | 30-33 |
| T171AV… | Airplus | Air service units | 52-54 |
| T171BAP… | Airplus | Air service units | 55-56 |
| T171BB…A | Airplus | Air service units | 40-43 |
| T171BB…B | Airplus | Air service units | 40-43 |
| T171BB…C | Airplus | Air service units | 40-43 |
| T171BB…D | Airplus | Air service units | 40-43 |
| T171BDA… | Airplus | Air service units | 10-13 |

| Coding | Series | Family | Page |
|---|---|---|---|
| T171BE… | Airplus | Air service units | 22-27 |
| T171BF… | Airplus | Air service units | 6-9 |
| T171BL… | Airplus | Air service units | 48-51 |
| T171BM…A | Airplus | Air service units | 40-43 |
| T171BM…B | Airplus | Air service units | 40-43 |
| T171BM…C | Airplus | Air service units | 40-43 |
| T171BM…D | Airplus | Air service units | 40-43 |
| T171BP… | Airplus | Air service units | 61-63 |
| T171BP…A | Airplus | Air service units | 40-43 |
| T171BP…B | Airplus | Air service units | 40-43 |
| T171BP…C | Airplus | Air service units | 40-43 |
| T171BP…D | Airplus | Air service units | 40-43 |
| T171BPA | Airplus | Air service units | 57-58 |
| T171BPP… | Airplus | Air service units | 59-60 |
| T171BR… | Airplus | Air service units | 30-33 |
| T171BV… | Airplus | Air service units | 52-54 |
| T171CAP… | Airplus | Air service units | 55-56 |
| T171CB…A | Airplus | Air service units | 40-43 |
| T171CB…B | Airplus | Air service units | 40-43 |
| T171CB…C | Airplus | Air service units | 40-43 |
| T171CB…D | Airplus | Air service units | 40-43 |
| T171CDA… | Airplus | Air service units | 10-13 |
| T171CE… | Airplus | Air service units | 22-27 |
| T171CF… | Airplus | Air service units | 6-9 |
| T171CL… | Airplus | Air service units | 48-51 |
| T171CM…A | Airplus | Air service units | 40-43 |
| T171CM…B | Airplus | Air service units | 40-43 |
| T171CM…C | Airplus | Air service units | 40-43 |
| T171CM…D | Airplus | Air service units | 40-43 |
| T171CP… | Airplus | Air service units | 61-63 |
| T171CP…A | Airplus | Air service units | 40-43 |
| T171CP…B | Airplus | Air service units | 40-43 |
| T171CP…C | Airplus | Air service units | 40-43 |
| T171CP…D | Airplus | Air service units | 40-43 |
| T171CPA | Airplus | Air service units | 57-58 |
| T171CPP… | Airplus | Air service units | 59-60 |
| T171CR… | Airplus | Air service units | 30-33 |
| T171CV… | Airplus | Air service units | 52-54 |
| T171X | Airplus | Air service units | 46;77 |
| T171Y | Airplus | Air service units | 46;77 |
| T17250 | Airplus | Air service units | 29;34 |
| T17250 | 1700 | Air service units | 156 |
| T172AAP… | Airplus | Air service units | 55-56 |
| T172ADA… | Airplus | Air service units | 10-13 |
| T172AE… | Airplus | Air service units | 22-27 |
| T172AF… | Airplus | Air service units | 6-9 |
| T172AL… | Airplus | Air service units | 48-51 |
| T172AP… | Airplus | Air service units | 61-63 |
| T172APA | Airplus | Air service units | 57-58 |
| T172APP… | Airplus | Air service units | 59-60 |
| T172AR… | Airplus | Air service units | 30-33 |
| T172AV… | Airplus | Air service units | 52-54 |
| T172BAP… | Airplus | Air service units | 55-56 |
| T172BDA… | Airplus | Air service units | 10-13 |
| T172BE… | Airplus | Air service units | 22-27 |
| T172BF… | Airplus | Air service units | 6-9 |
| T172BL… | Airplus | Air service units | 48-51 |
| T172BP… | Airplus | Air service units | 61-63 |
| T172BPA | Airplus | Air service units | 57-58 |
| T172BPP… | Airplus | Air service units | 59-60 |
| T172BR… | Airplus | Air service units | 30-33 |
| T172BV… | Airplus | Air service units | 52-54 |
| T172CAP… | Airplus | Air service units | 55-56 |
| T172CDA… | Airplus | Air service units | 10-13 |
| T172CE… | Airplus | Air service units | 22-27 |
| T172CF… | Airplus | Air service units | 6-9 |
| T172CL… | Airplus | Air service units | 48-51 |
| T172CP… | Airplus | Air service units | 61-63 |
| T172CPA | Airplus | Air service units | 57-58 |
| T172CPP… | Airplus | Air service units | 59-60 |
| T172CR… | Airplus | Air service units | 30-33 |
| T172CV… | Airplus | Air service units | 52-54 |
| T172X | Airplus | Air service units | 77 |
| T172Y | Airplus | Air service units | 77 |
| T173AAP… | Airplus | Air service units | 55-56 |
| T173ADA… | Airplus | Air service units | 10-13 |
| T173ADBV… | Airplus | Air service units | 14-17 |
| T173ADD… | Airplus | Air service units | 18-21 |
| T173AE… | Airplus | Air service units | 22-27 |
| T173AF… | Airplus | Air service units | 6-9 |
| T173AL… | Airplus | Air service units | 48-51 |
| T173AP… | Airplus | Air service units | 61-63 |
| T173APA | Airplus | Air service units | 57-58 |
| T173APP… | Airplus | Air service units | 59-60 |
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