

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 NI/min respectively and supporting Analog/Digital, CANopen® or IO-Link communication interfaces.

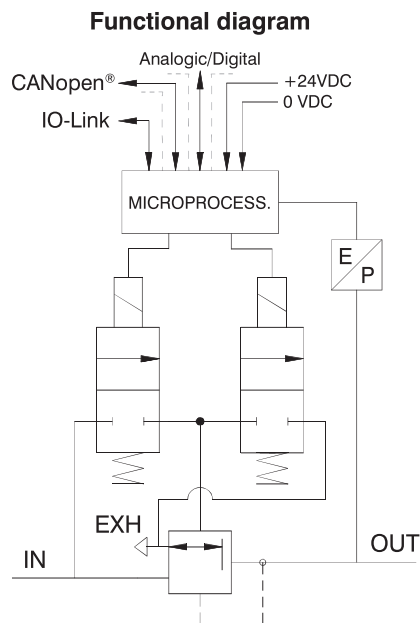
Application fields

Typical applications will include the necessity to dynamically control the force of the actuator, be it thrust or 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.

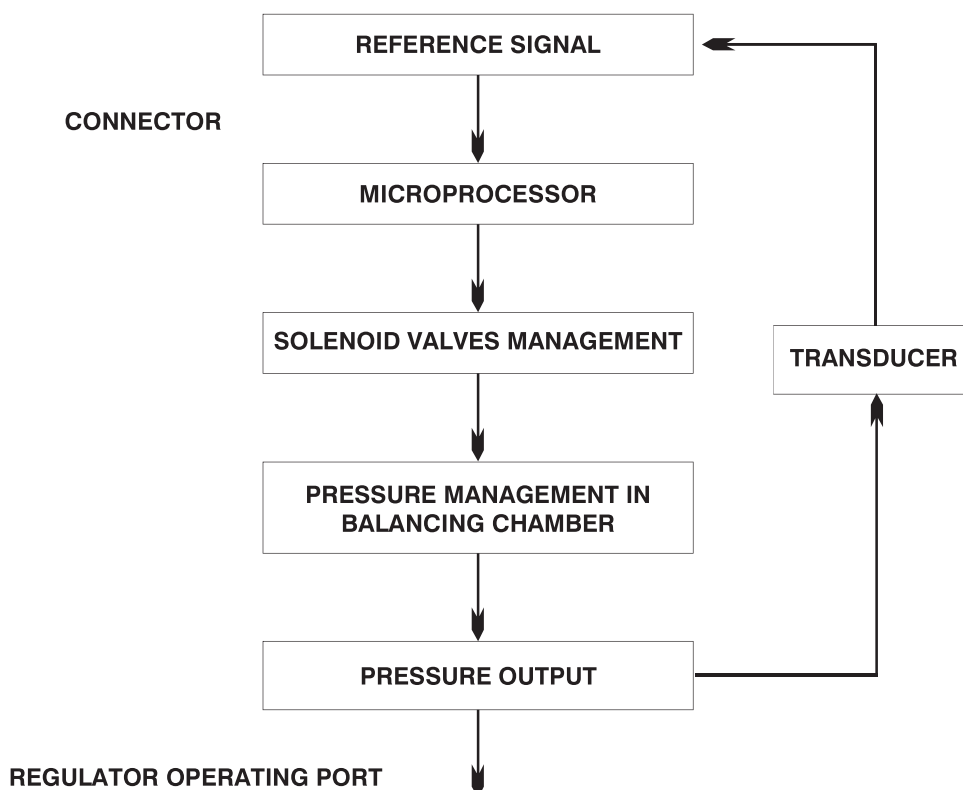
Product presentation

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 from 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.



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.





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 NI/min	1100 NI/min	4000 NI/min
Discharge flowrate (a 6 bar with 1 bar overpressure)	7 NI/min	1300 NI/min	4500 NI/min
Air consumption	< 1 NI/min	< 1 NI/min	< 1 NI/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
		*0 ... 5 V
		*1 ... 5 V
	Current	*4 ... 20 mA
		*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	\pm Insensitivity
Hysteresis	\pm Insensitivity
Repeatability	\pm 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

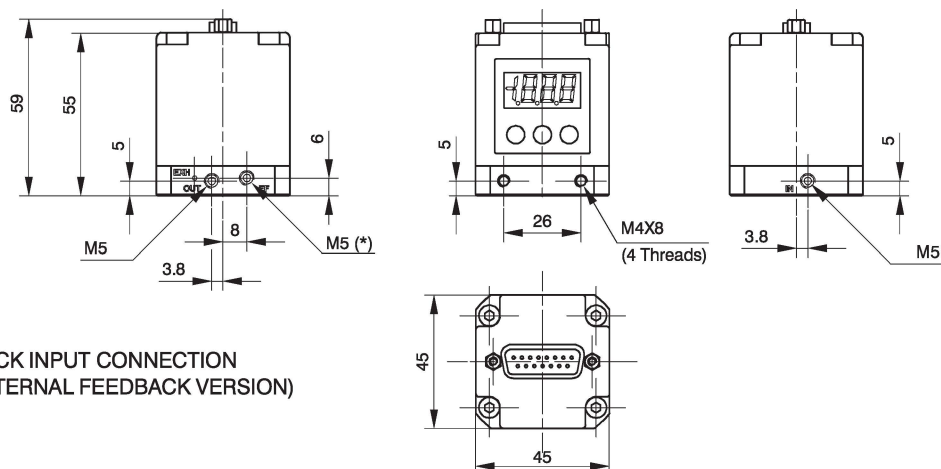
** Valid only for devices with analog input

2

AIR TREATMENT

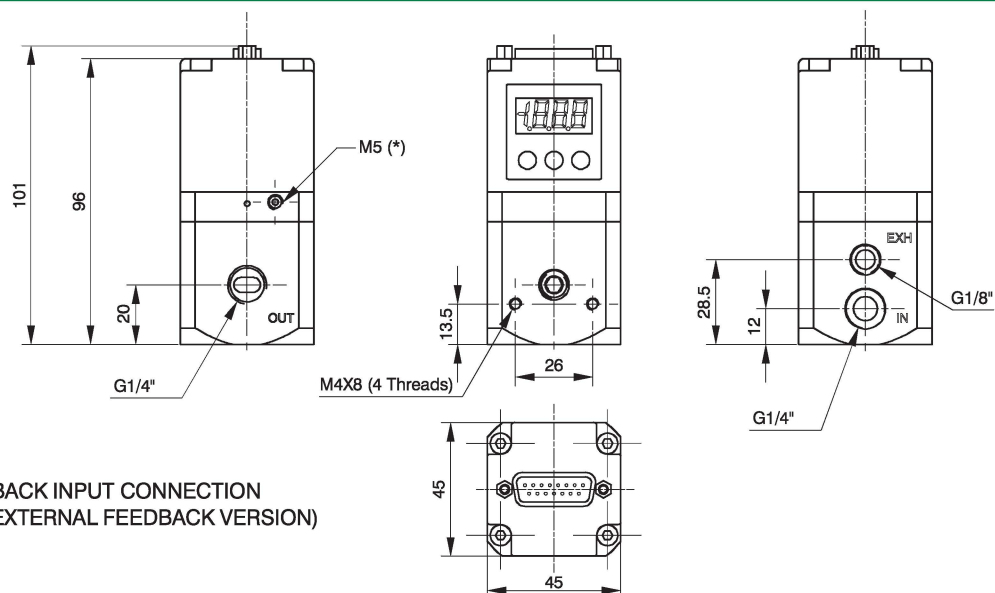
Overall dimensions ("521" standard version and CANopen® version with SUB-D 15 poles)

Size 0



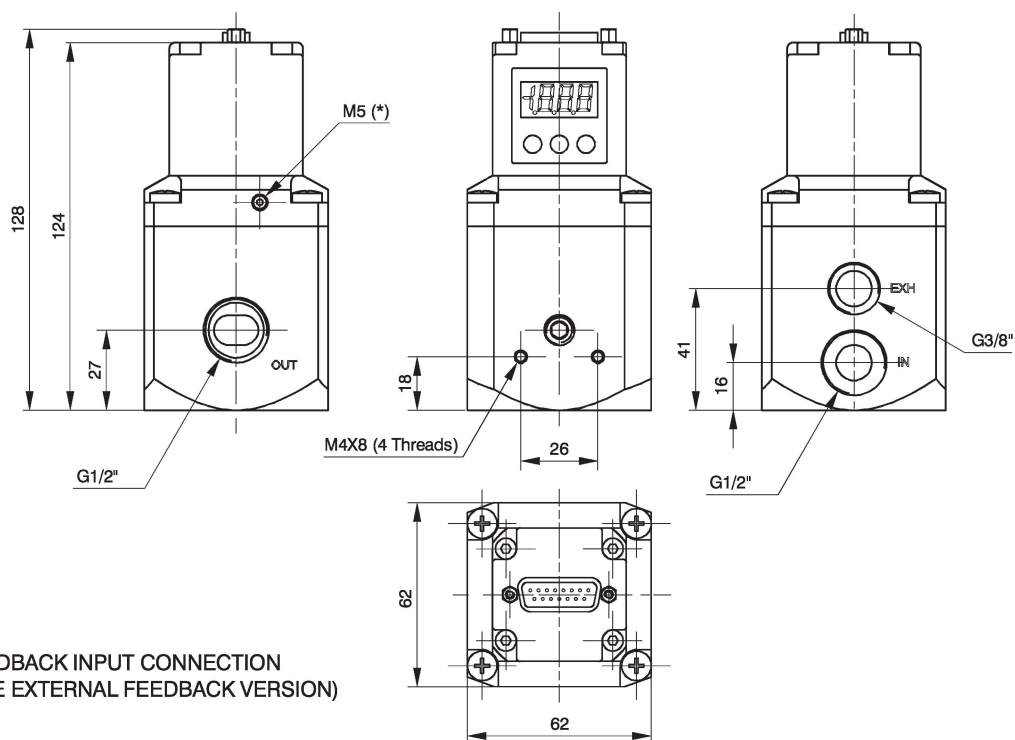
* = EXTERNAL FEEDBACK INPUT CONNECTION
(AVAILABLE ONLY ON THE EXTERNAL FEEDBACK VERSION)

Size 1



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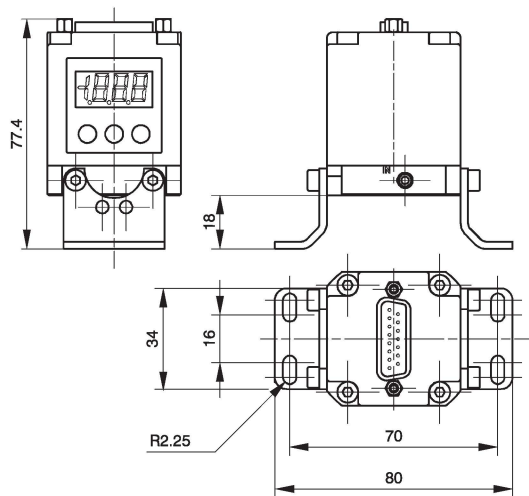
Size 3



* = EXTERNAL FEEDBACK INPUT CONNECTION
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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:



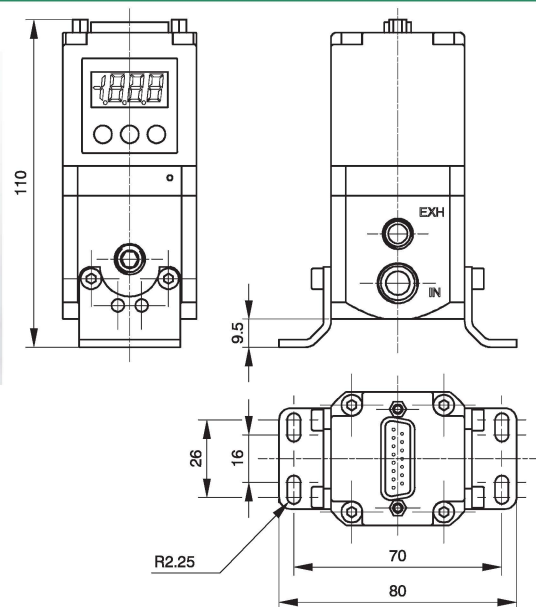
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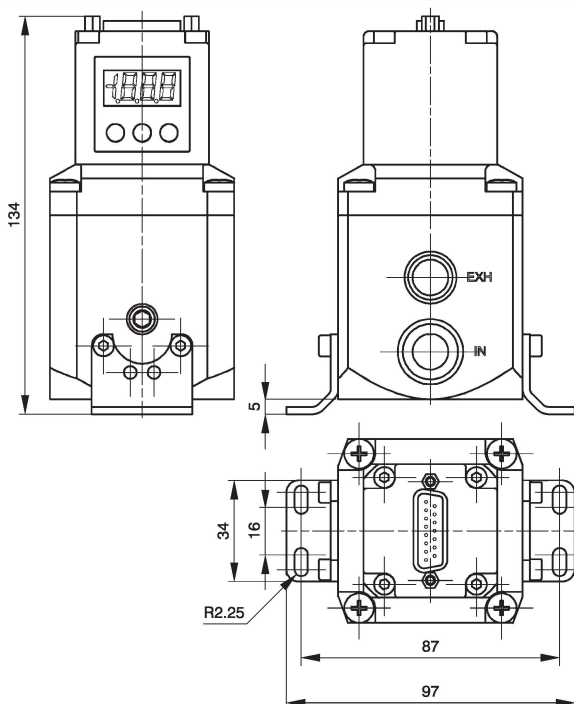
2

AIR TREATMENT

Size 1

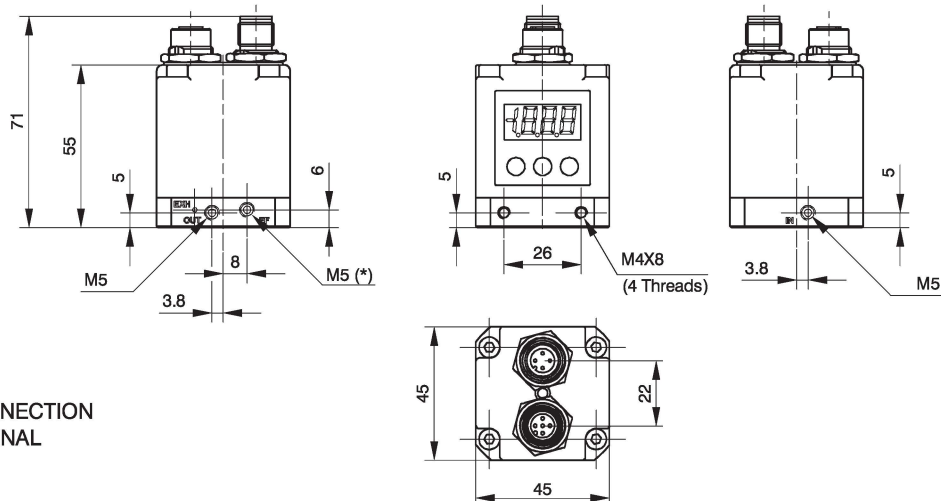


Size 3



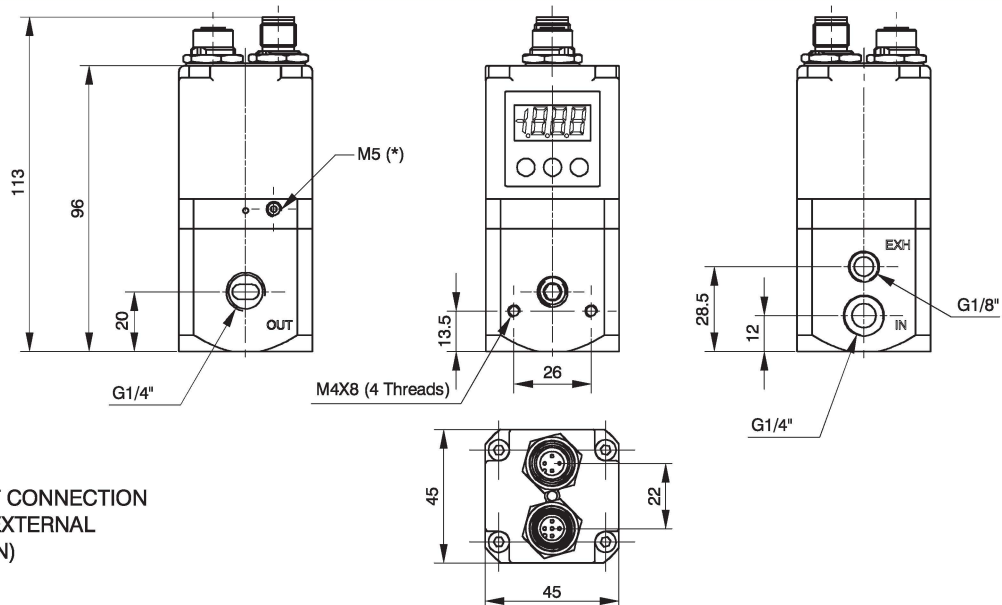
Overall dimensions ("521 M12 version" - CANopen® version)

Size 0



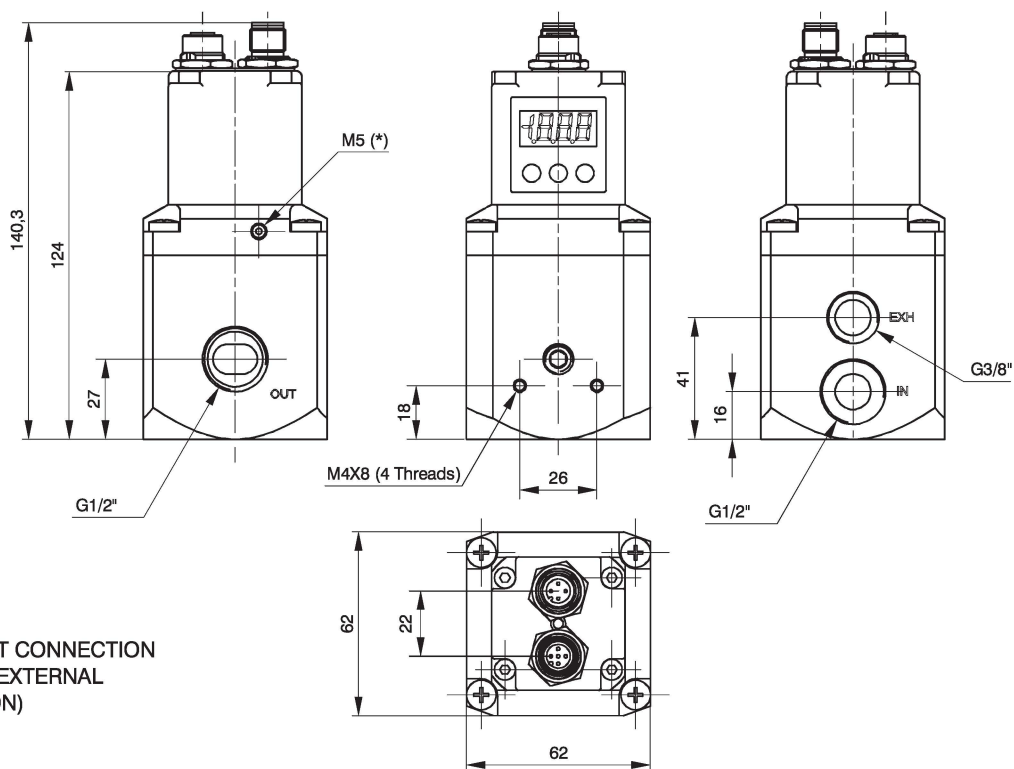
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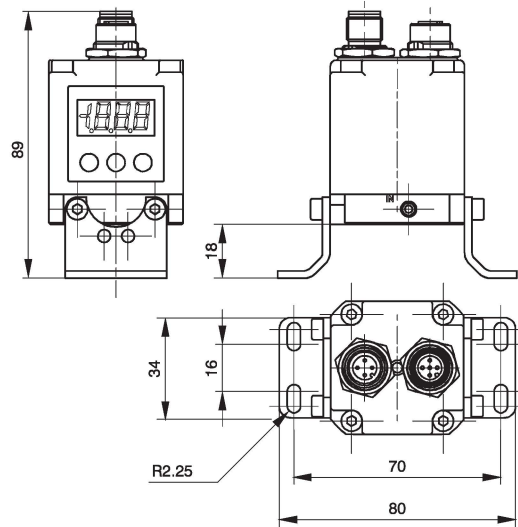
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Mounting options ("521 M12 version" - CANopen® version)

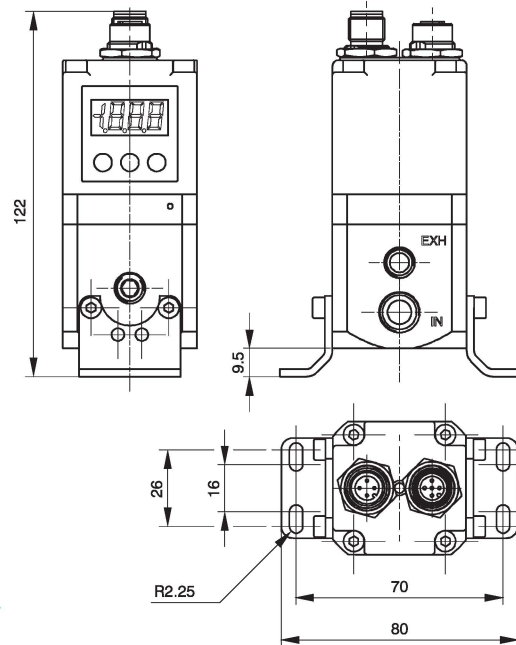
In addition to mounting directly using the M4 tapping on the body, the 170M5 bracket may also be used, as shown below:



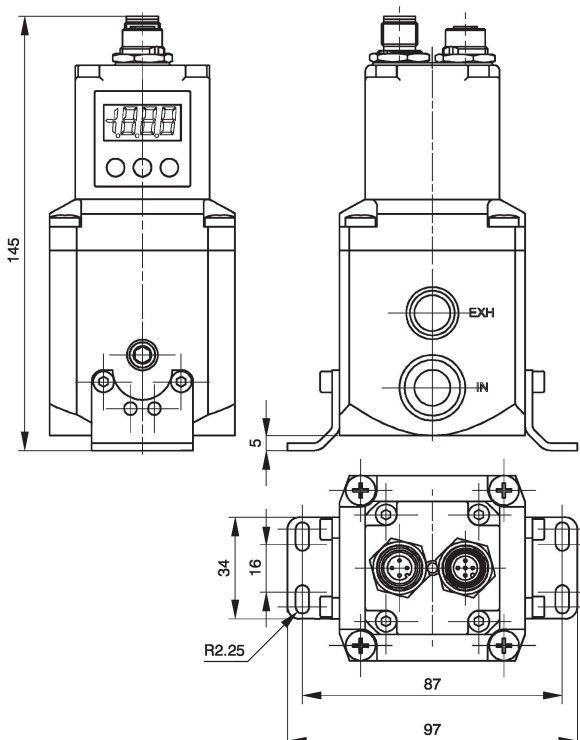
Size 0



Size 1

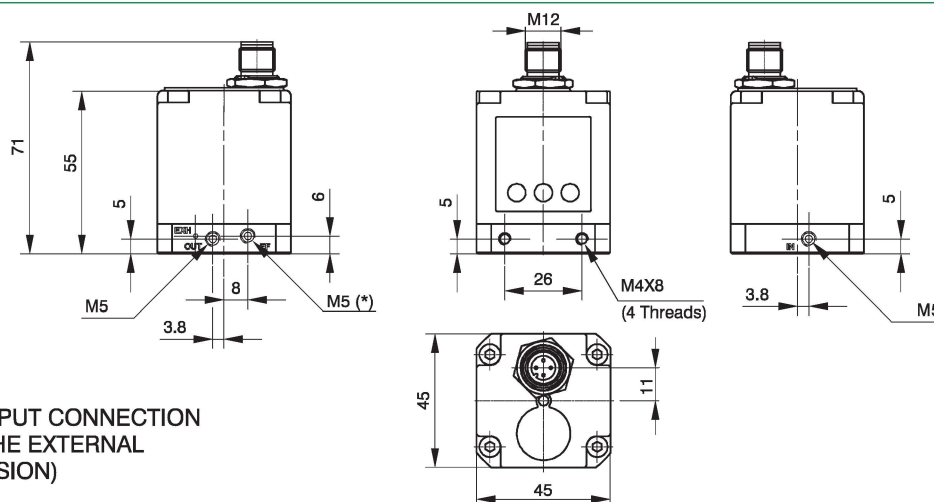


Size 3



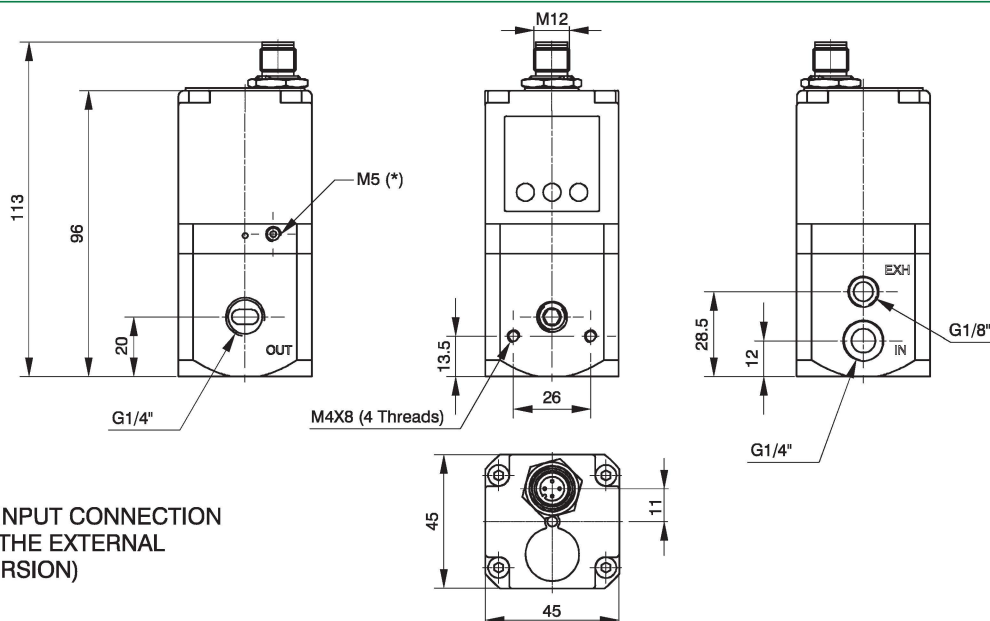
Overall dimensions ("521 M12 BASIC version")

Size 0



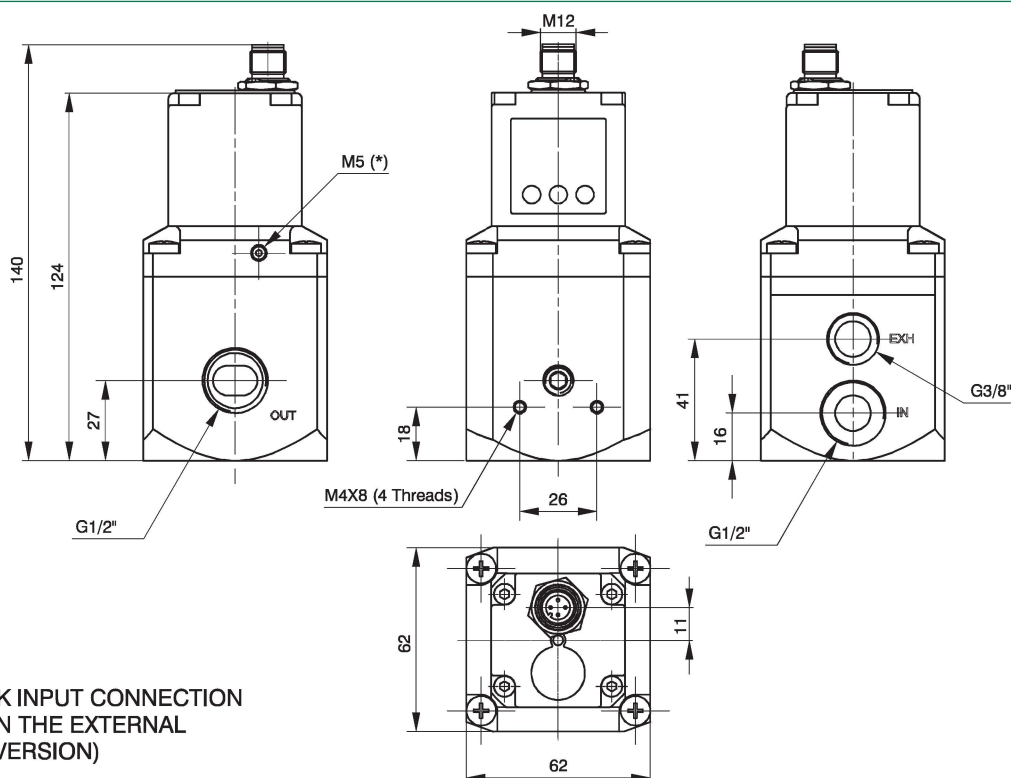
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Size 1



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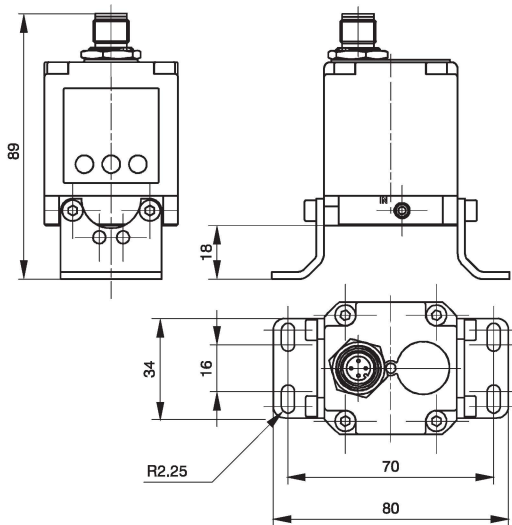
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* = EXTERNAL FEEDBACK INPUT CONNECTION
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FEEDBACK VERSION)

Mounting options ("521 M12 BASIC version")

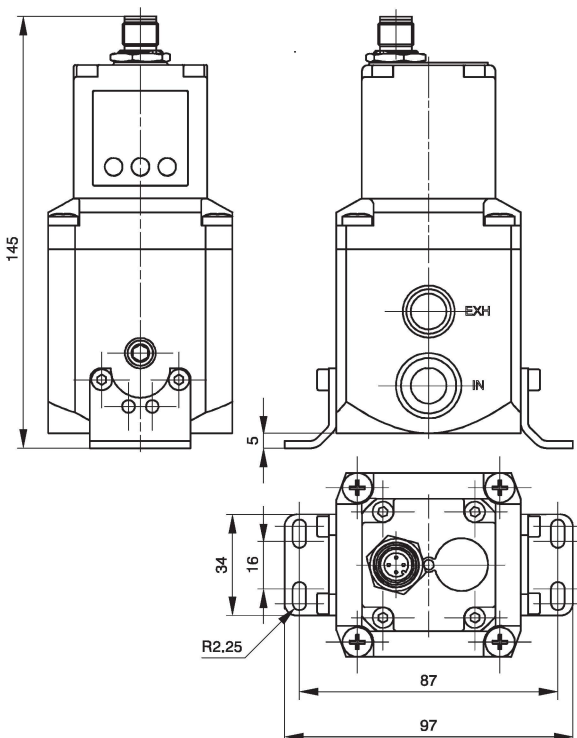
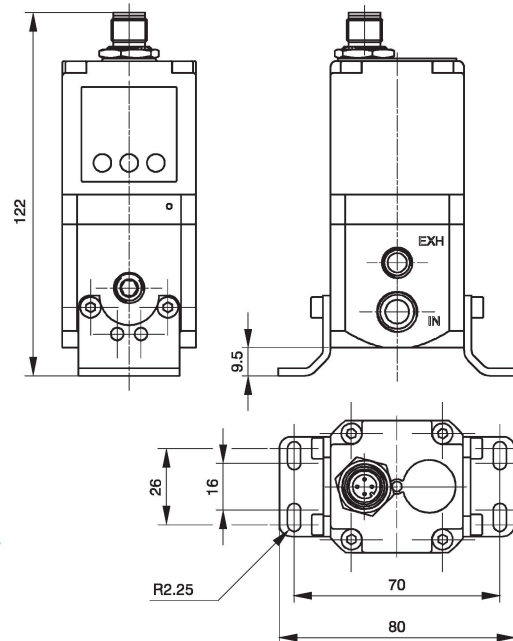
In addition to mounting directly using the M4 tappings on the body, the 170M5 bracket may also be used, as shown below:



Size 0



Size 1

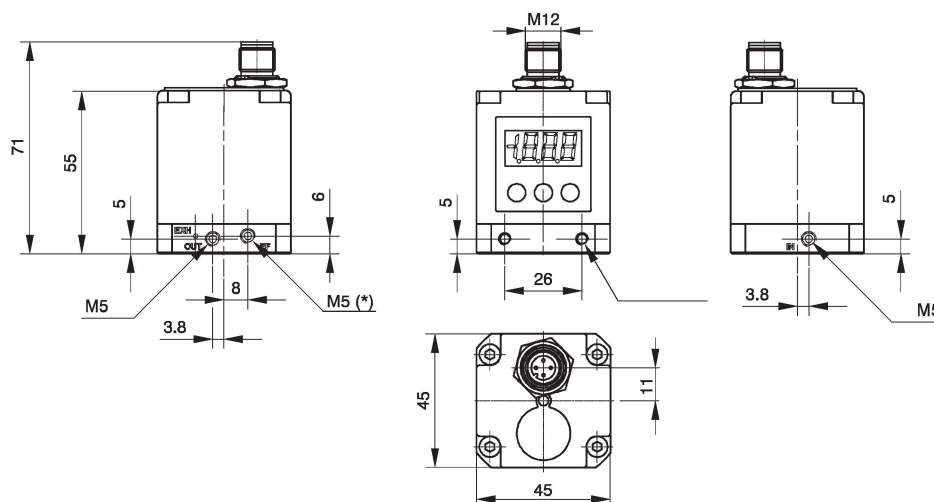


Size 3

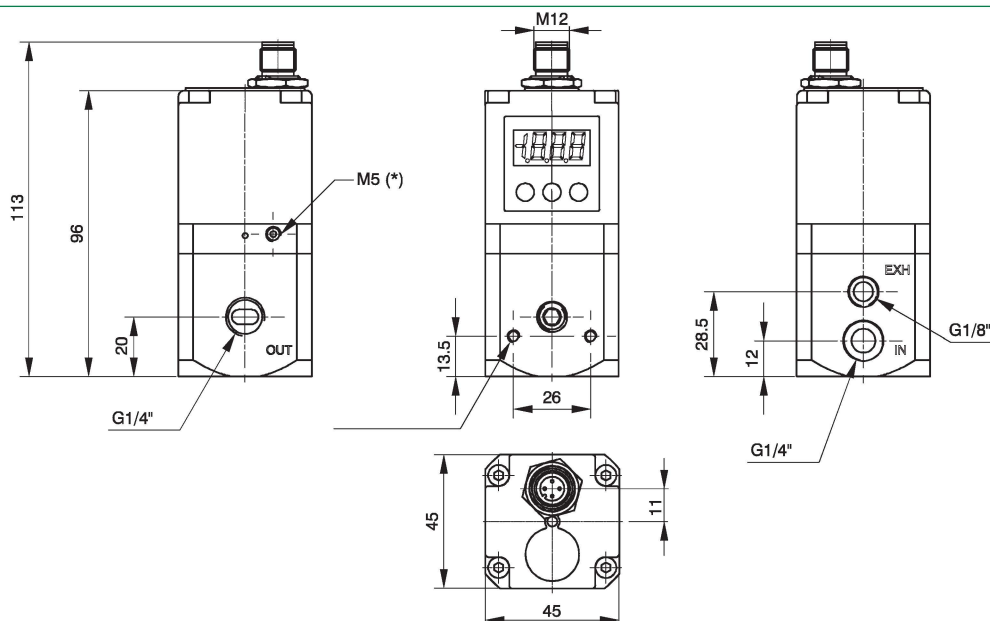


Overall dimensions ("521 M12 version" - Standard version)

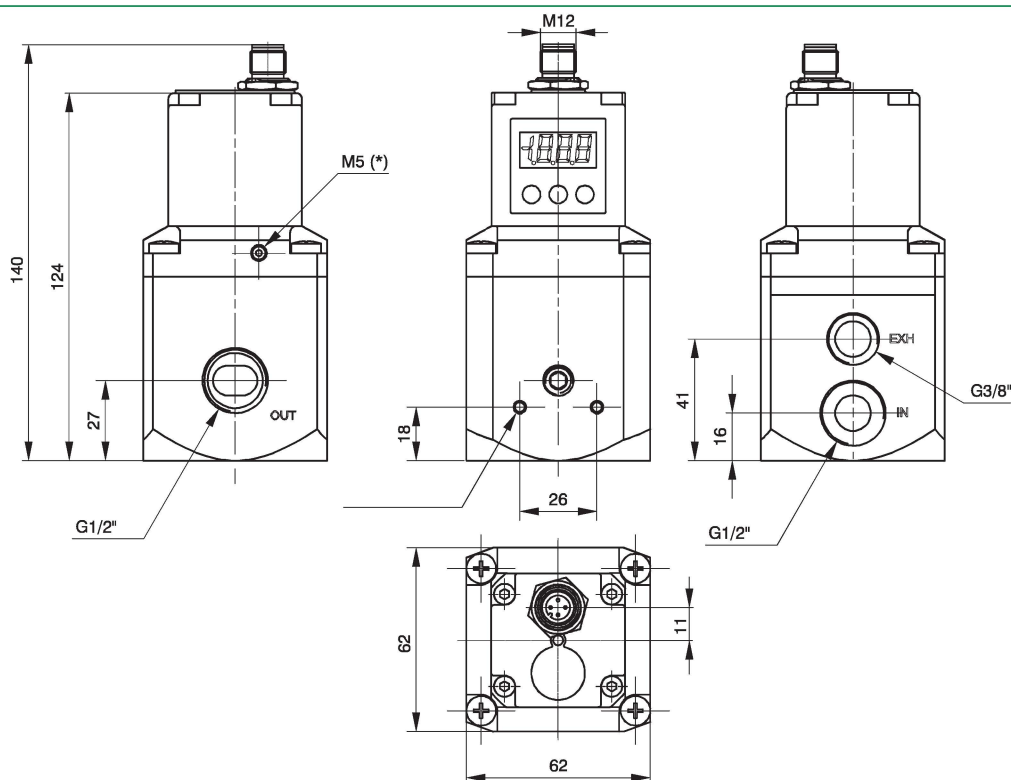
Size 0



Size 1

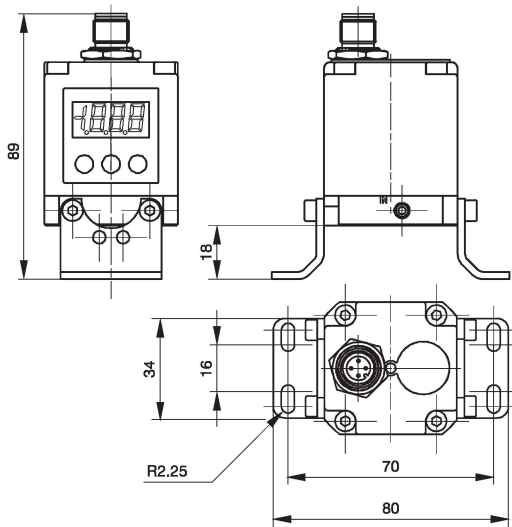


Size 3



Mounting options ("521 M12 version" - Standard version)

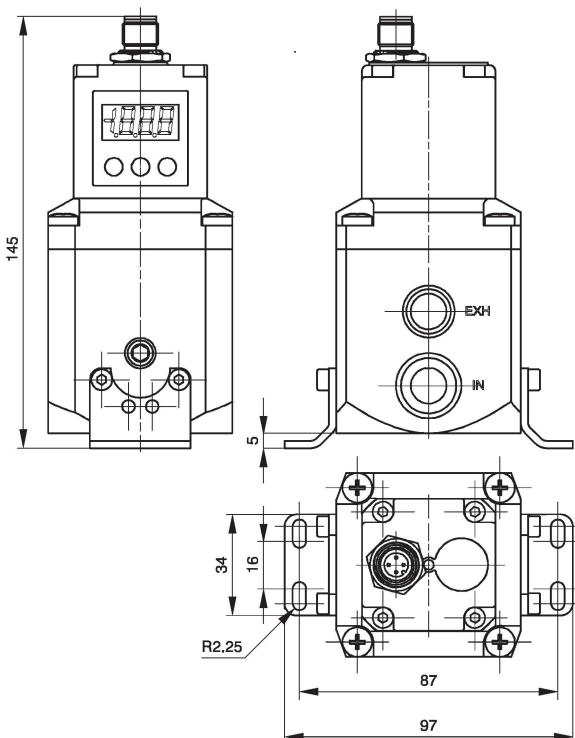
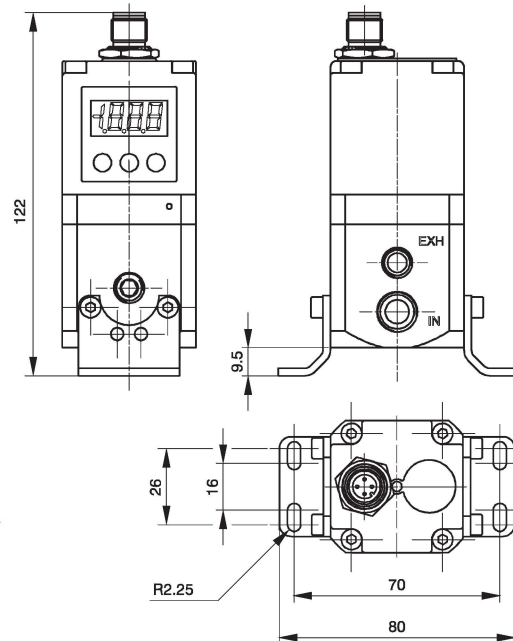
In addition to mounting directly using the M4 tappings on the body, the 170M5 bracket may also be used, as shown below:



Size 0



Size 1

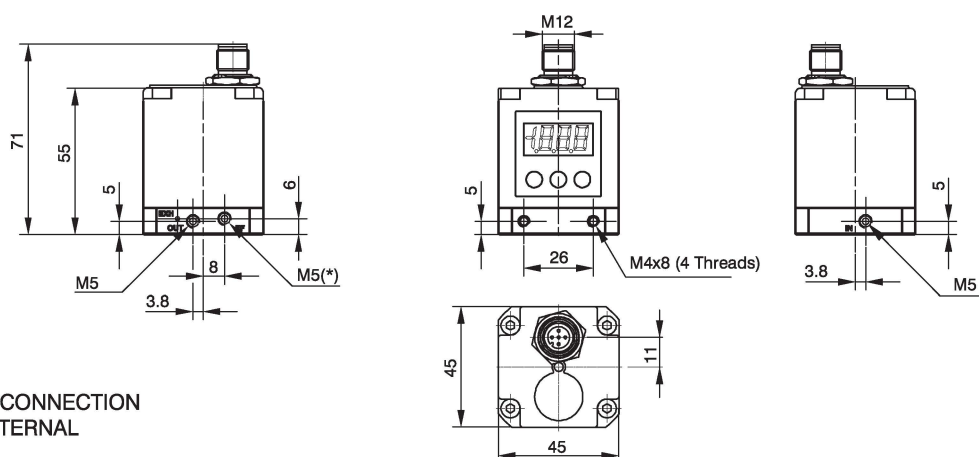


Size 3



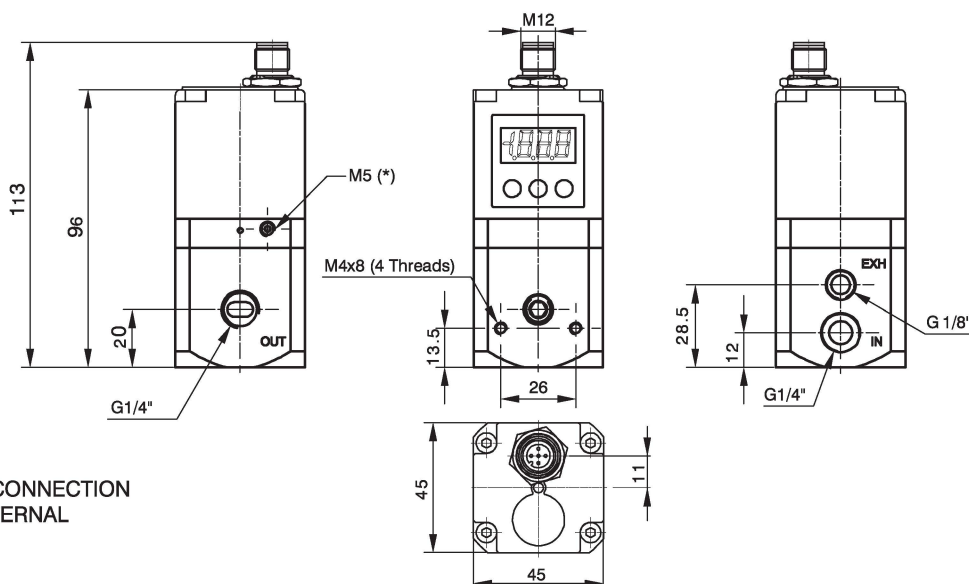
Overall dimensions ("521 IO-Link version")

Size 0



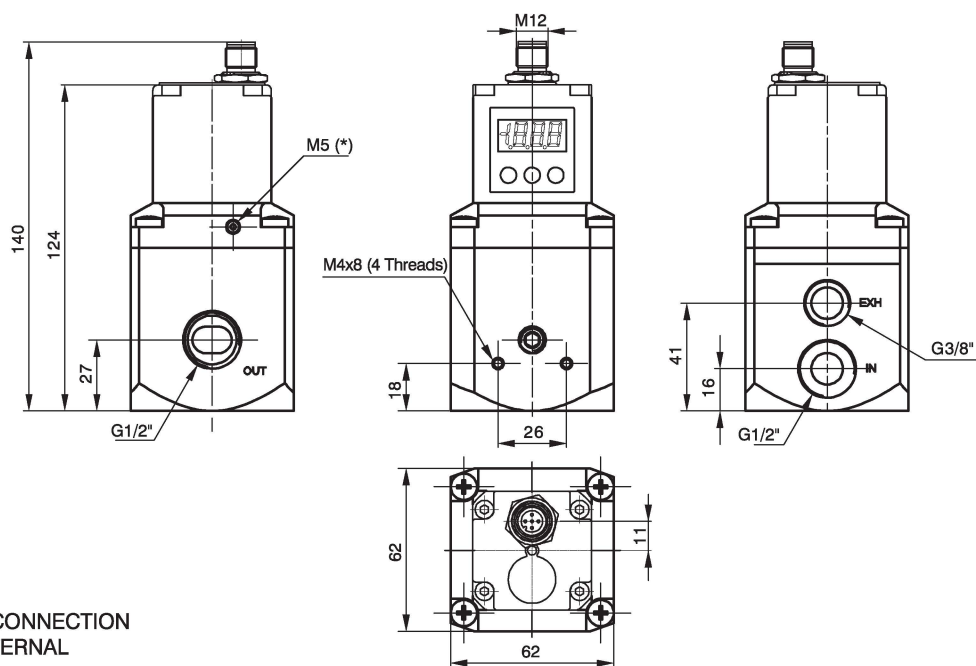
* = EXTERNAL FEEDBACK INPUT CONNECTION
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Size 1



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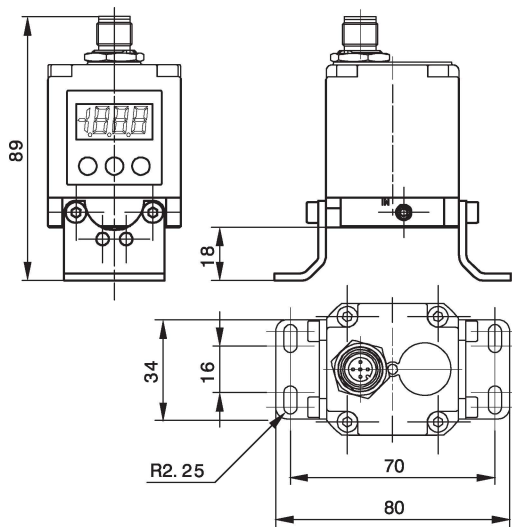
Size 3



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FEEDBACK VERSION)

Mounting options ("521 IO-Link version")

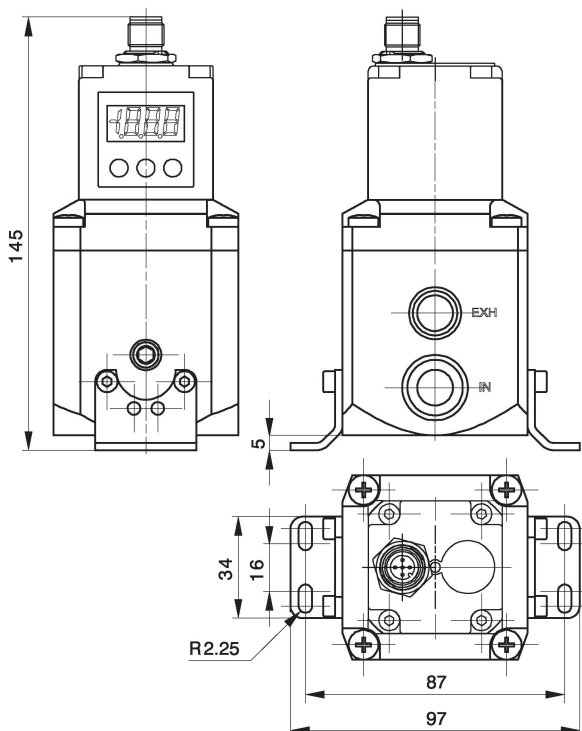
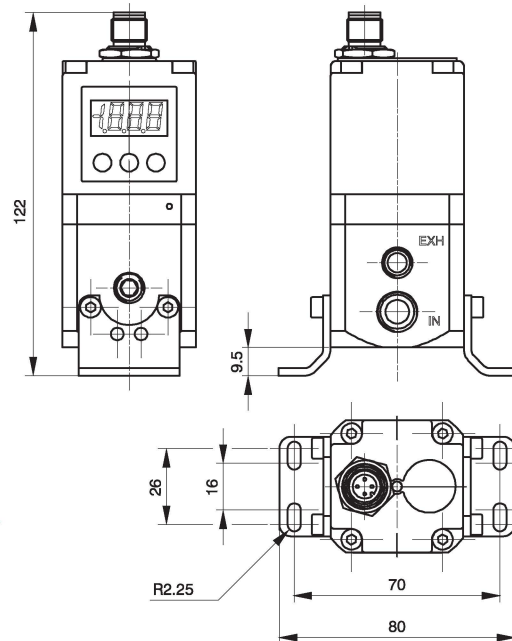
In addition to mounting directly using the M4 tappings on the body, the 170M5 bracket may also be used, as shown below.



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.

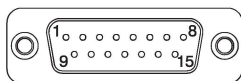
A version of the device is available that exhausts the downstream circuit when the power supply is removed. (Option "A" at the end of the ordering code).

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

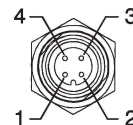


CONNECTOR PINOUT:

- 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

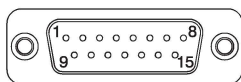
CONNECTOR PINOUT:

- 1 = POWER SUPPLY (24 VDC)
- 2 = ANALOG OUTPUT (depending on the model)
- 3 = GND
- 4 = ANALOG INPUT

"521" CANopen® version with D-SUB connector



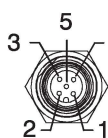
TOP VIEW OF THE REGULATOR CONNECTOR



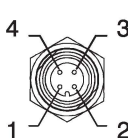
CONNECTOR PINOUT:

- 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

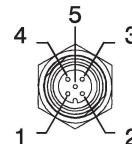


M12 5P
FEMALE



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)

ORDERING CODES

"521" standard version with SUB-D 15 poles



17 E2N. . D .

VARIANT

- = Standard Version
(no additional 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 .

VARIANT

- = Standard Version
(no additional 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 additional 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

VARIANT

- = Standard Version
(no additional 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)
- T** = Voltage signal (0-10 V)

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

ORDERING CODES

"521 M12 version" - Standard version



17 E2N.

- SIZE**
- 0 = Size 0
 - 1 = Size 1
 - 3 = Size 3

PRESSURE RANGE

- 0001 = Range 0 - 1 bar
- 0005 = Range 0 - 5 bar
- 0009 = Range 0 - 9 bar

OUTPUT

- F = Voltage analogue output
- G = Current analogue output
- H = Digital output

MANAGEMENT

- C = Current signal (4-20 mA)
- T = Voltage signal (0-10 V)

VARIANT

- = Standard Version
(no additional 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

VARIANT:

- Standard version
- E = External pressure feedback
- A = Exhaust downstream circuit
without power supply
- AE = A Variant + E Variant

PRESSURE RANGE:

- 0009 = Range 0 - 9 bar

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
