Series WPR

2

AIR TREATMENT

- 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.
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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

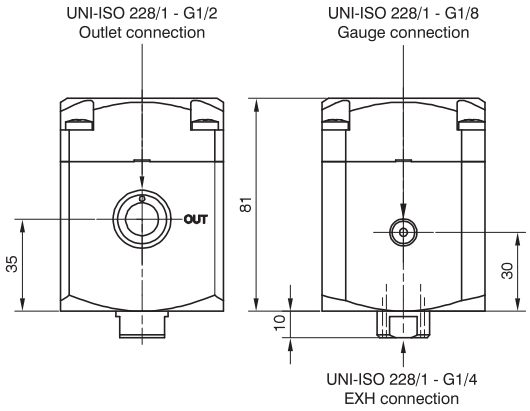
IN/OUT connections	G1/2"
EXH connections	G1/4"
Max. torque fitting tightening (Nm) IN/OUT/EXH connections	G1/2" Metallic: 30 G1/4" Metallic: 20
Fluid	20μm filtered and preferably non-lubricated air. For the proportional regulator pilot 5μm filtered non-lubricated and dehumidified air.
Pressure measurement	G1/8" pressure gauge socket
Assembly configuration	Stand alone
Assembly positions	Indifferent
Body and connections type	Aluminum body, integrated aluminum connections

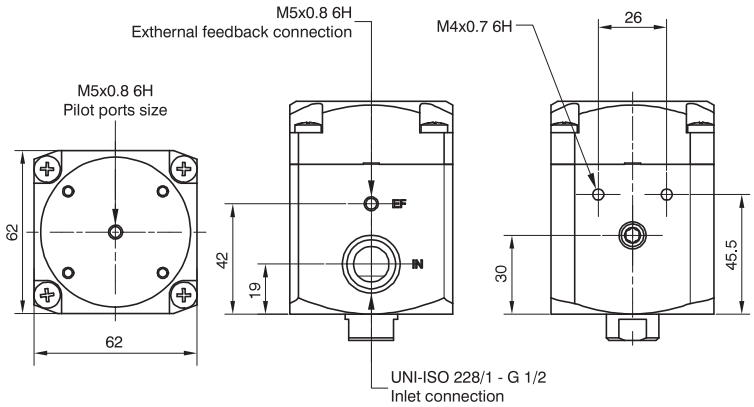
Operational characteristics

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

WPR pressure regulator

173P12R◉¹P

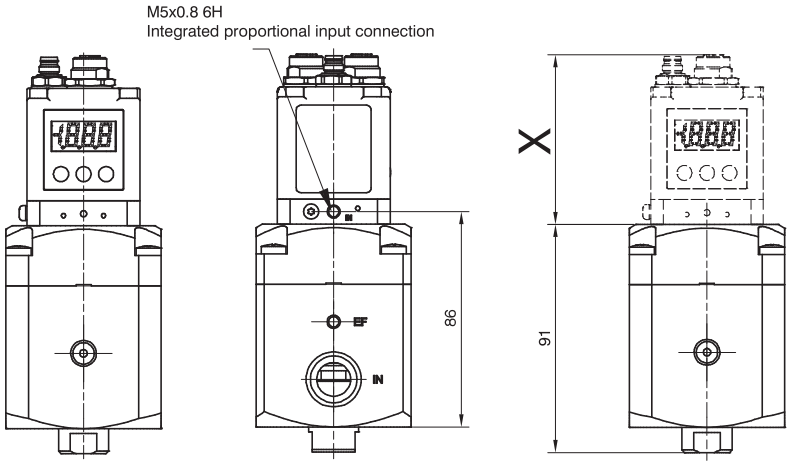




Coding: 173P12R◉¹Ⓟ◉²

◉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 *0 ... 20 mA
** Reference Signal - Voltage	*0 ... 10 V *0 ... 5 V *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

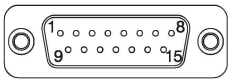
Installation and operation of the piloting proportional regulator

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.

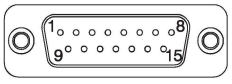
Proportional regulator, standard version with socket connector



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

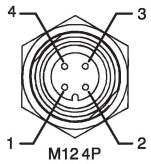
Proportional regulator, CANopen® version with socket connector



Connector 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

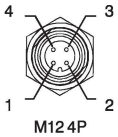
Proportional regulator, M12 BASIC and Standard version



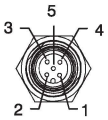
Connector PIN of the M12 BASIC version:
1 = POWER SUPPLY (+ 24 V DC)
2 = NC
3 = GND
4 = ANALOGUE INPUT

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

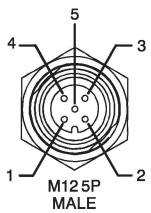


PIN	DESCRIPTION
1	+ 24 V DC (NODE AND INPUTS)
2	NC
3	GND
4	+ 24 V DC (OUTPUTS)



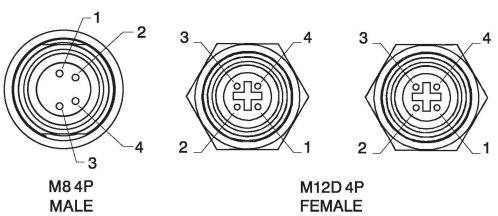
PIN	SIGNAL	DESCRIPTION
1	CAN_SHIELD	Optional Can Shield
2	CAN_V+	Optional Can external positive supply (Dedicated for supply of transceiver and Optocouplers, if galvanic isolation of the bus node applies)
3	CAN_GND	Ground / 0V / V-
4	CAN_H	CAN_H bus line (Dominant high)
5	CAN_L	CAN_L bus line (Dominant low)

Proportional regulator, IO-Link version



Connector PIN:
1 = L+
2 = + 24 V DC (P24)
3 = L-
4 = C/Q
5 = GND (N24)

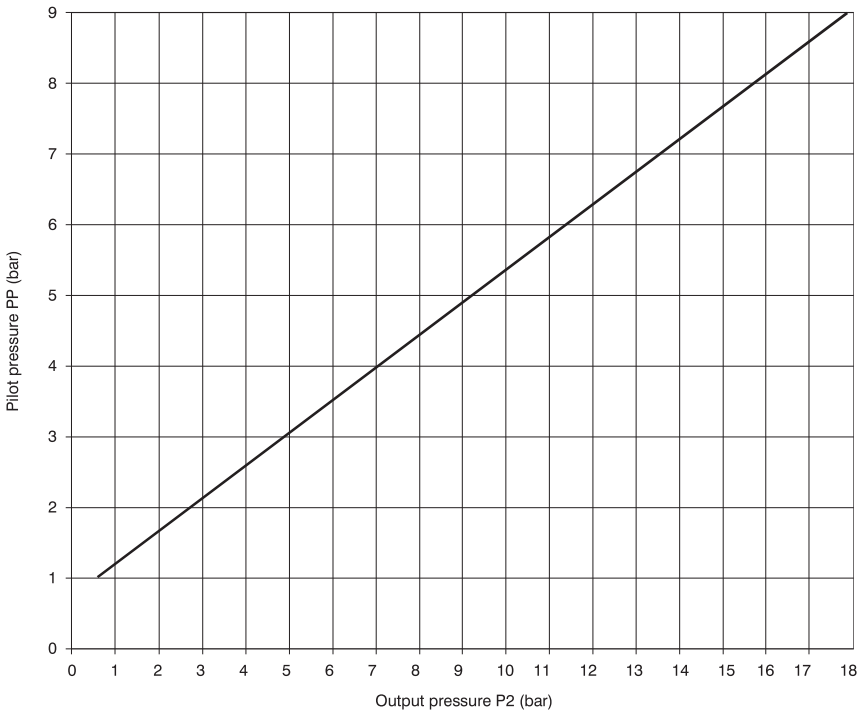
Proportional regulator, EtherCAT® version, PROFINET IO RT and EtherNet/IP



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)

Piloting curves



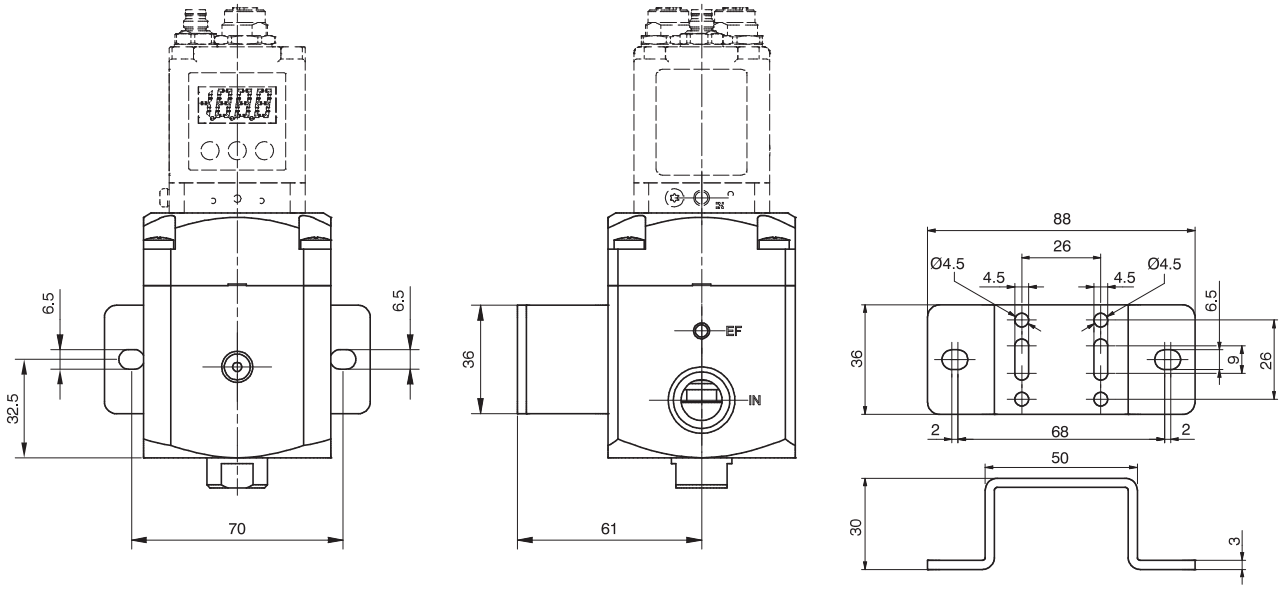
Inlet pressure P1=20bar																	
Piloting pressure	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9
Output pressure	0.6	1.7	2.7	3.7	4.9	5.9	7	8.2	9.7	10.5	11.6	12.7	13.7	14.8	15.8	16.9	18
P1/P2	0.62	1.14	1.36	1.5	1.64	1.69	1.75	1.82	1.94	1.91	1.93	1.95	1.96	1.97	1.98	1.99	2

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

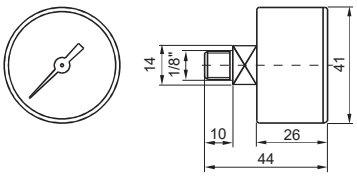
Fixing bracket

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