

General

Modern industrial applications require increasingly high performances from their pneumatic components. For example, the speed and thrust of a pneumatic cylinder, or the torque of a rotary actuator may need to be varied. These parameters often need to be modified dynamically while an operation is running.

Traditional solutions based upon pneumatic valves supplied with different pressures often take up excessive amounts of space. An alternative solution is a regulator that can vary pressure over time. This type of regulator is known as an electronically controlled proportional regulator.

Three sizes have been designed, with flow rates of 7, 1, 100 and 4,000 NI/min.

Application fields.

Typical applications will include the necessity to dynamically control the force of an 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.

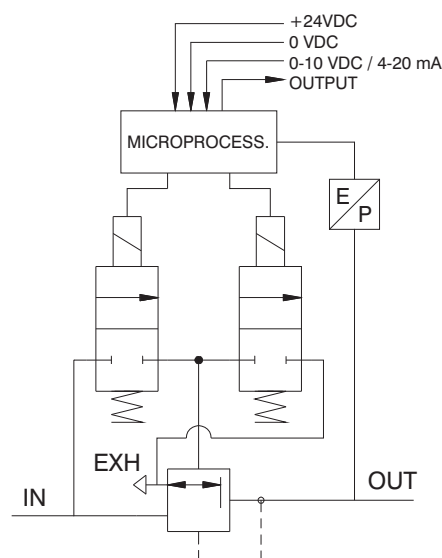
Product presentation

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 G1/8" 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.

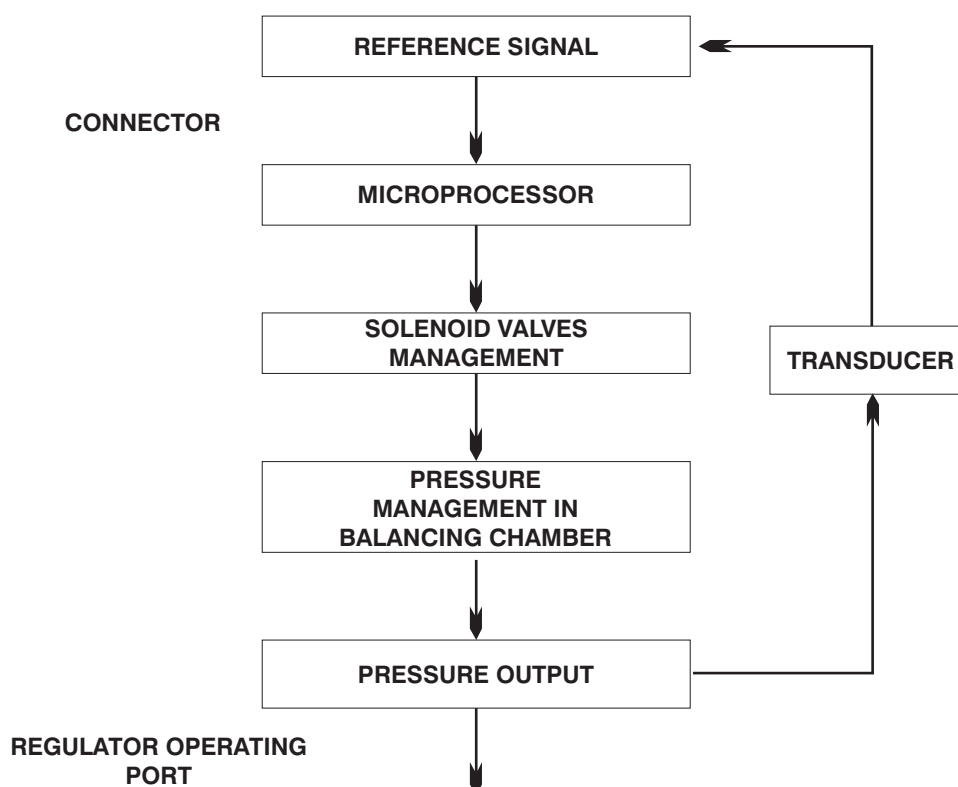
The new proportional regulator range has all the features that were only optional on the previous model. When placing your order it is only necessary to specify the type of control signal, Voltage (T) or current (C), and the pressure range required.

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 with the detected value and supplies the control solenoid valves accordingly.





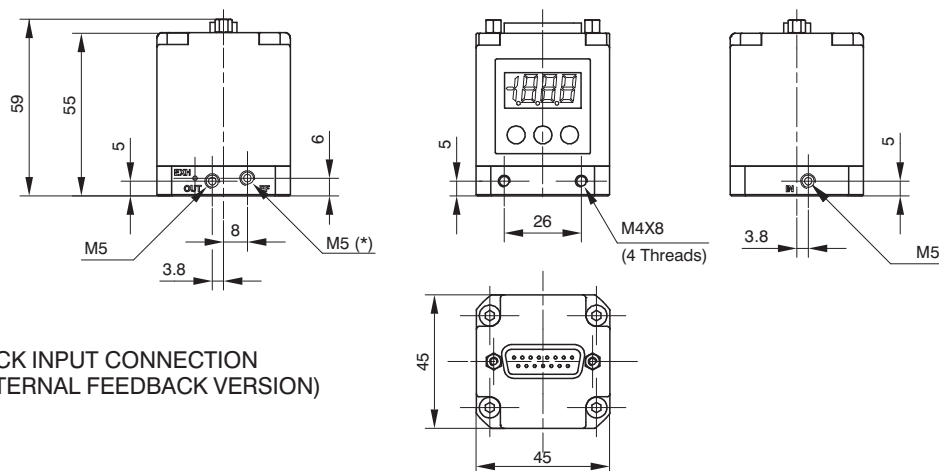
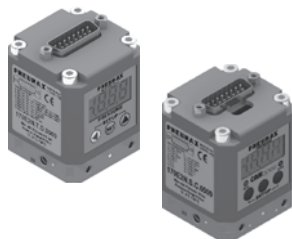
Features

Pneumatic	Fluid		Air filtered at 5 micron and dehumidified			
	Minimum inlet pressure		Desired outlet pressure + 1 bar			
	Maximum inlet pressure		10 bar			
	Outlet pressure		Ordering code	0009	0005	0001
			Pressure value	0 - 9 bar	0 - 5 bar	0 - 1 bar
	Nominal flowrate from 1 to 2 (6 bar Δp 1 bar)		Size 0	Size 1		Size 3
			7 NI /min	1.100 NI /min		4.000 NI/min
	Discharge flowrate (at 6 bar with 1 bar overpressure)		7 NI /min	1.300 NI /min		4.500 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% (stabilised with ripple <1%)			
	Standby current consumption		55 mA			
	Current consumption with solenoid valves on		145 mA			
	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			
	Voltage analog output		*0 - 10 V *0 - 5 V			
	Current analog output		*4 - 20 mA *0 - 20 mA			
	Digital inputs		24VDC ± 10%			
	Digital outputs		24 VDC PNP (max current 50 mA)			
	Connector		D-sub 15 poles			
Functional	Linearity		< ± 0,3 % F.S.			
	Hysteresis		<0,3 % F.S.			
	Repeatability		< ± 0,3 % F.S.			
	Sensitivity		< ± 0,3 % F.S.			
	Assembly position		Indifferent			
	Protection grade		IP65 (with casing fitted)			
	Ambient temperature		-5° - 50°C / 23° - 122°F			
Constructional	Body		Anodised aluminium			
	Shutters		Brass with vulcanised NBR			
	Diaphragm		Cloth-covered rubber			
	Seals		NBR			
	Cover for electrical part		Technopolymer			
	Springs		AISI 302			
	Weight	Size 0	Size 1		Size 3	
168 gr.		360 gr.		850 gr.		

* Selectable by keyboard or by RS-232

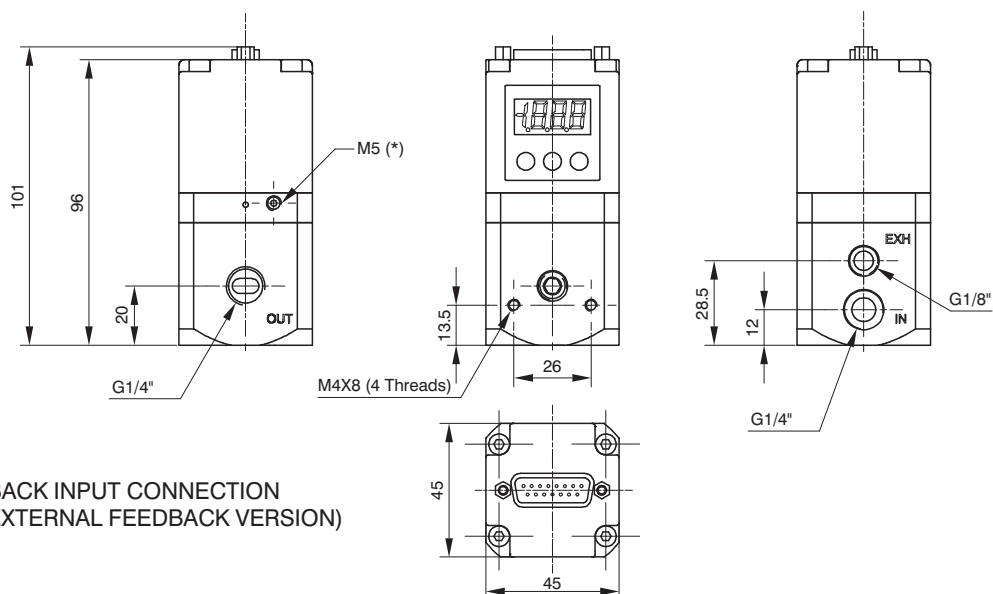
Overall dimensions (Standard version and CANopen version with SUB-D 15 poles)

SIZE 0



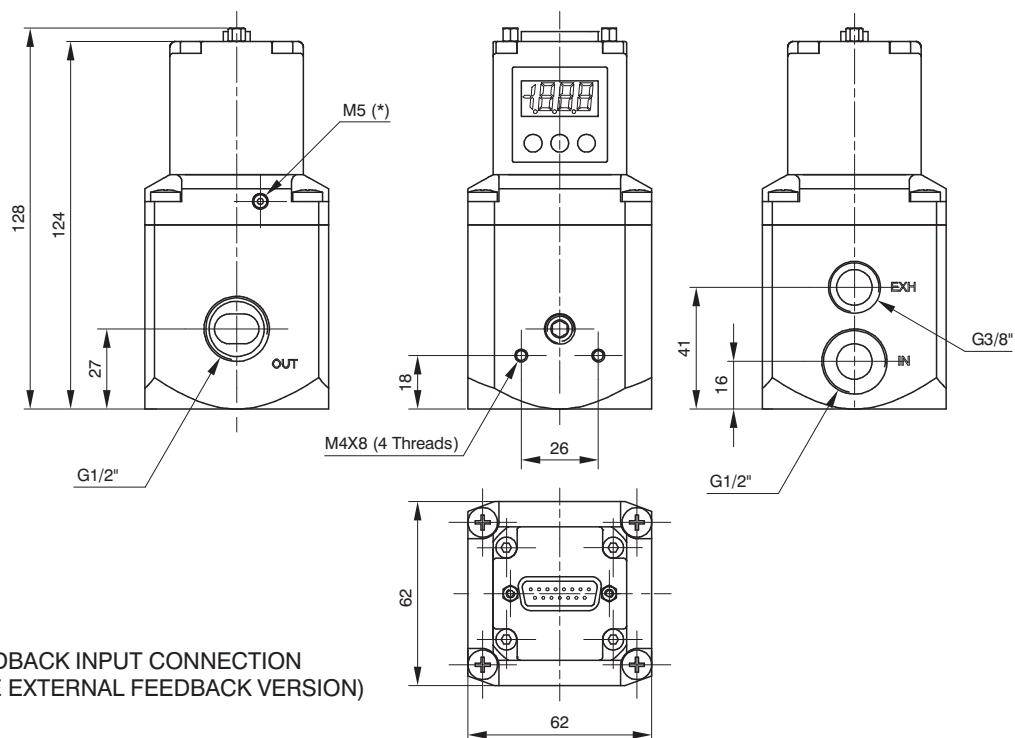
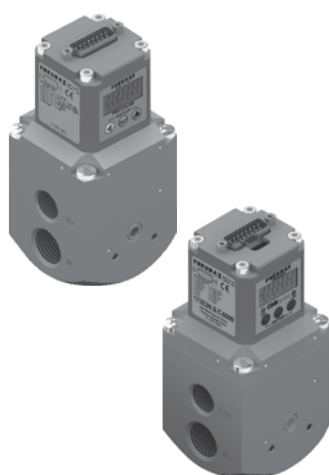
* = EXTERNAL FEEDBACK INPUT CONNECTION
(AVAILABLE ONLY ON THE EXTERNAL FEEDBACK VERSION)

SIZE 1



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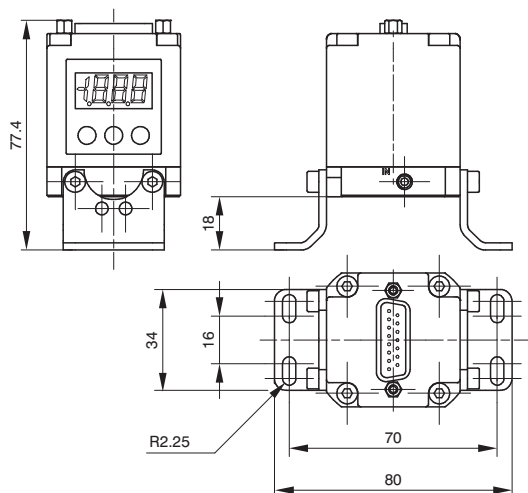
SIZE 3



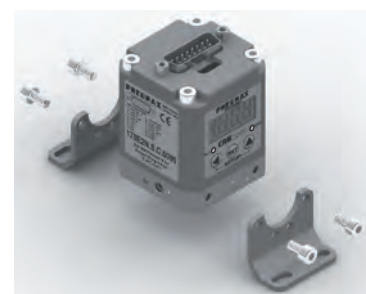
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Mounting options (Standard version and CANopen version with SUB-D 15 poles)

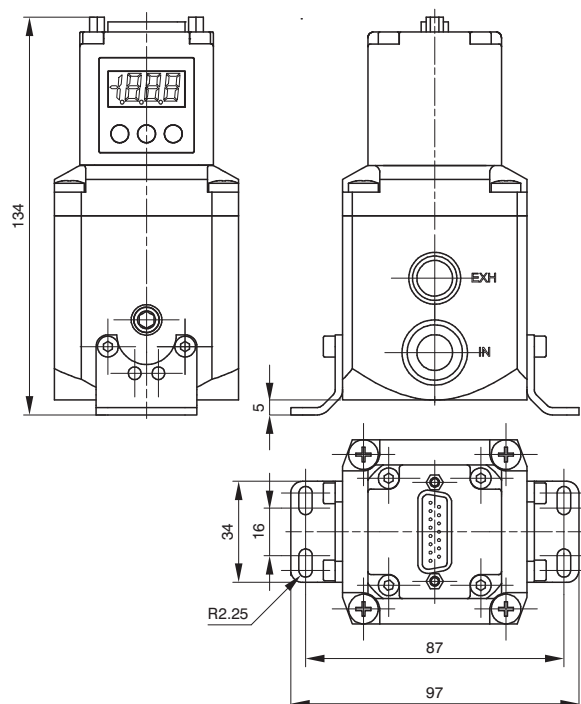
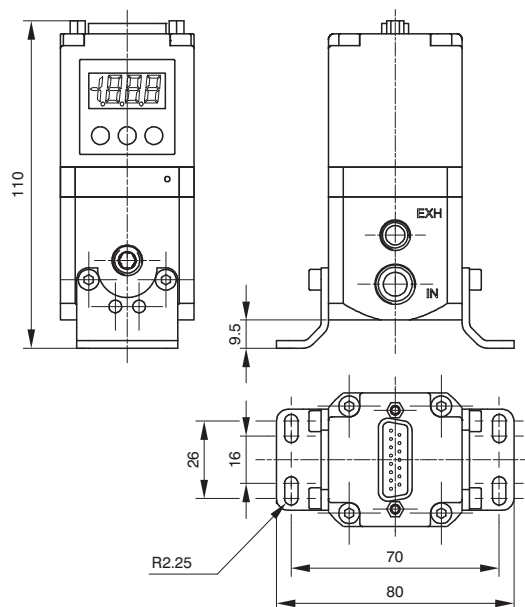
In addition to mounting directly using the M4 tapping on the body, the 170M5 bracket may also be used, as shown below:



SIZE 0



SIZE 1

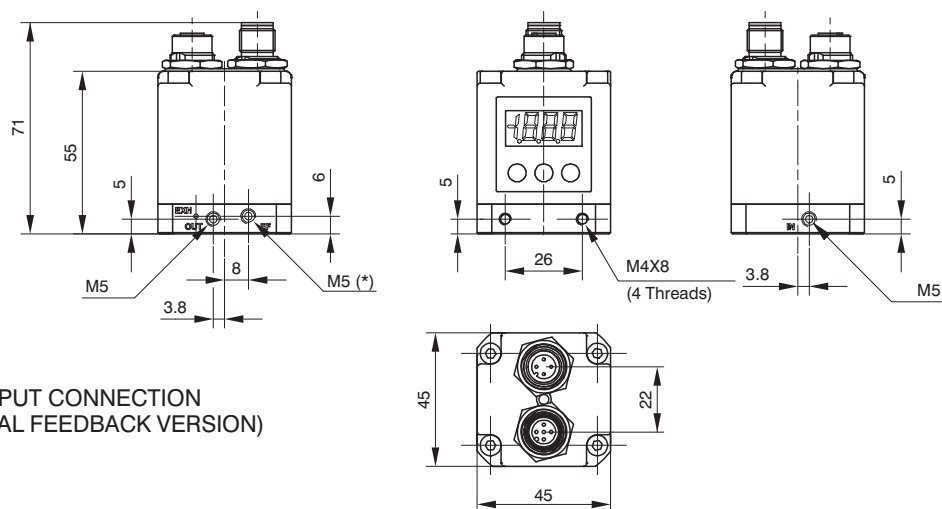


SIZE 3



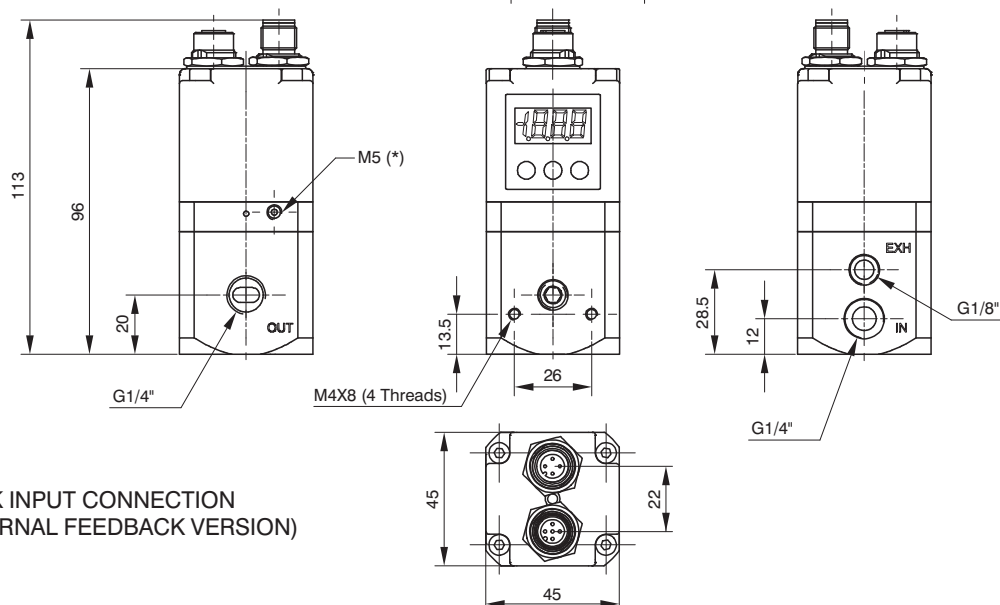
Overall dimensions (CANopen version with M12 connector)

SIZE 0



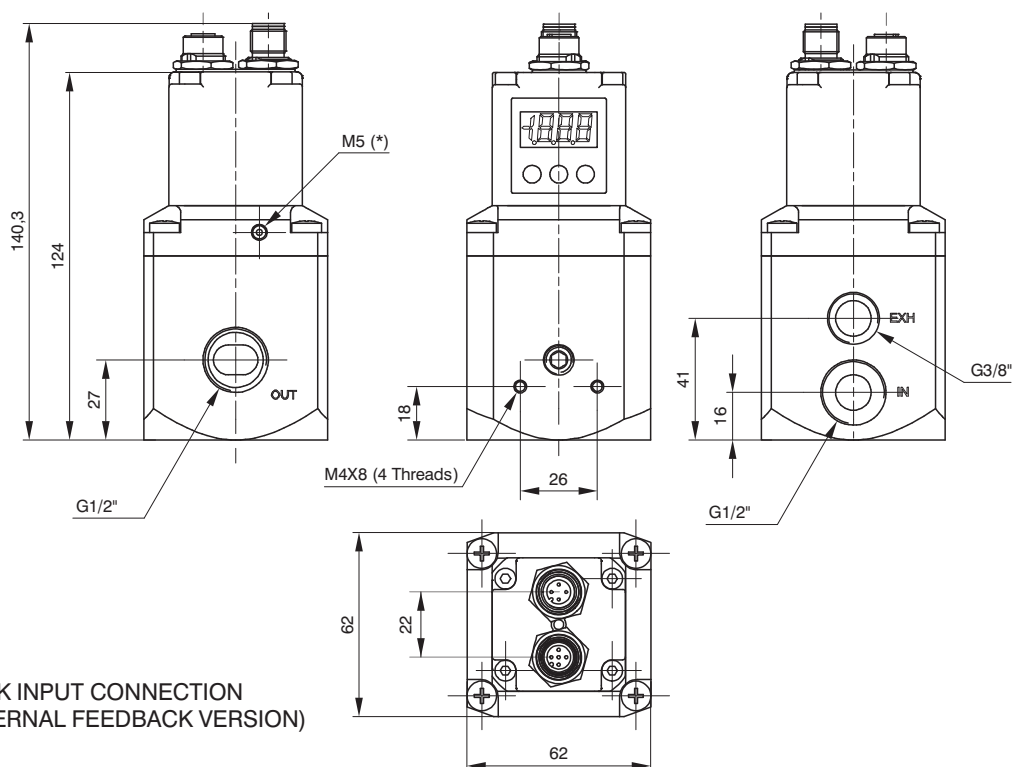
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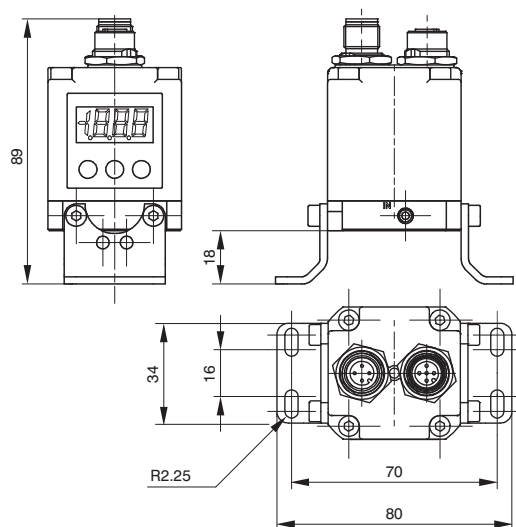
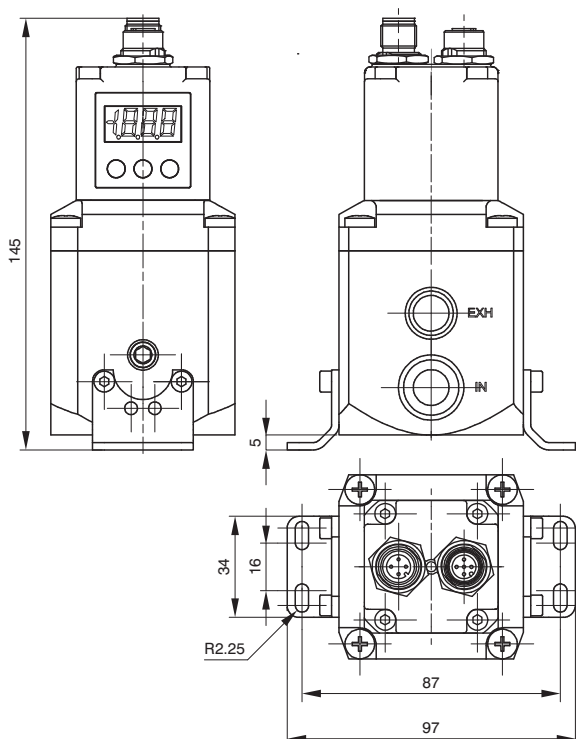
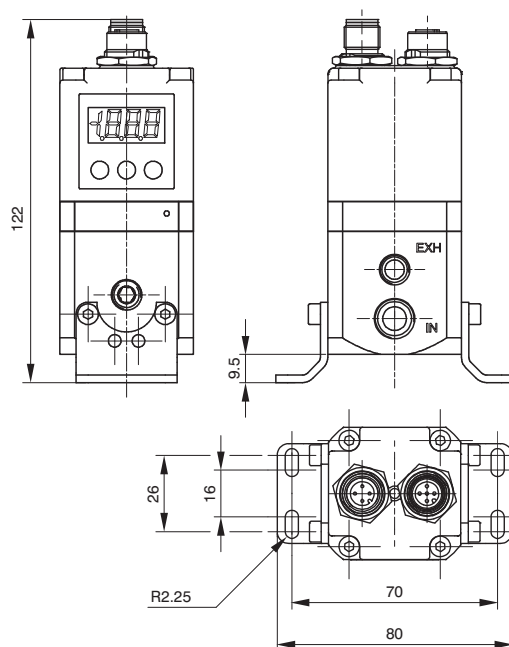
SIZE 3



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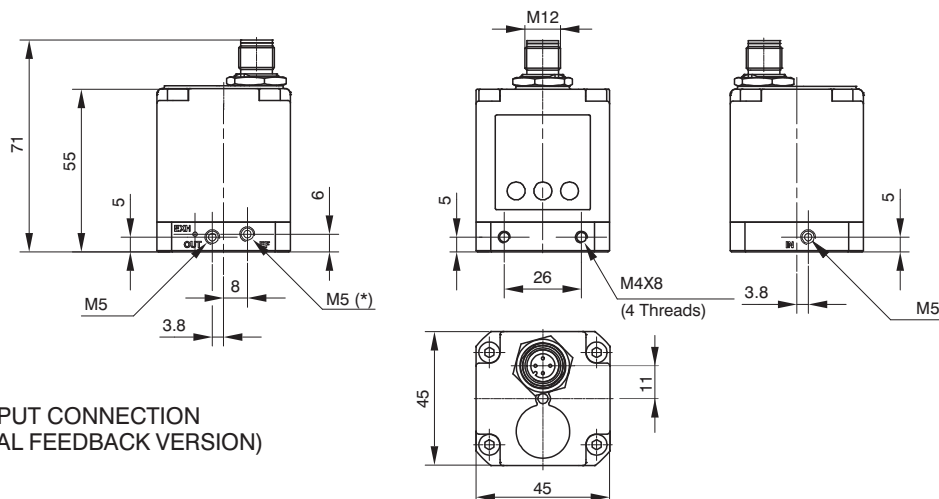
Mounting options (CANopen version with M12 connector)

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**

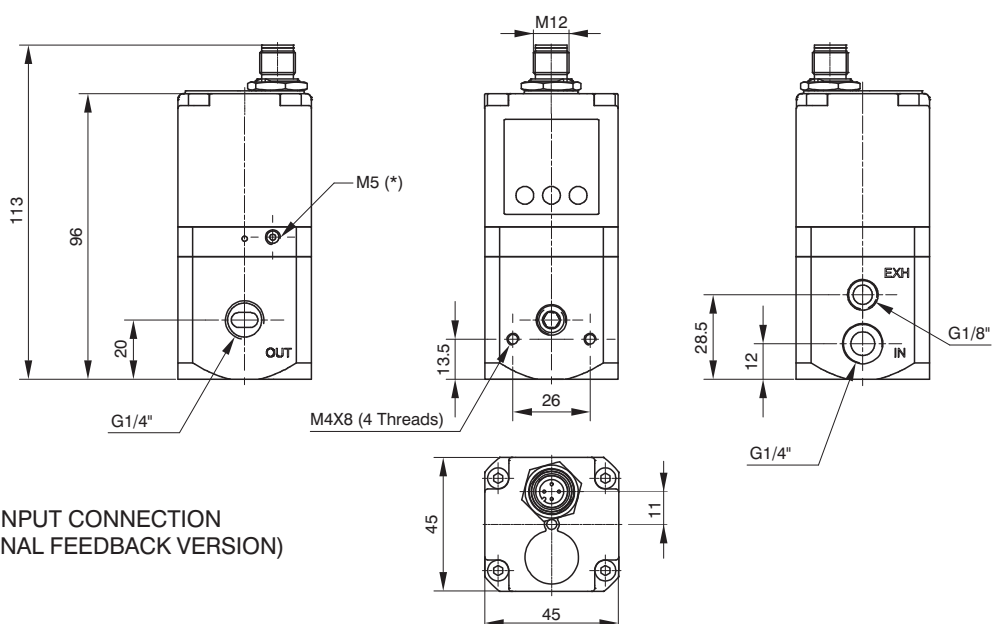
Overall dimensions (ECONOMIC version)

SIZE 0



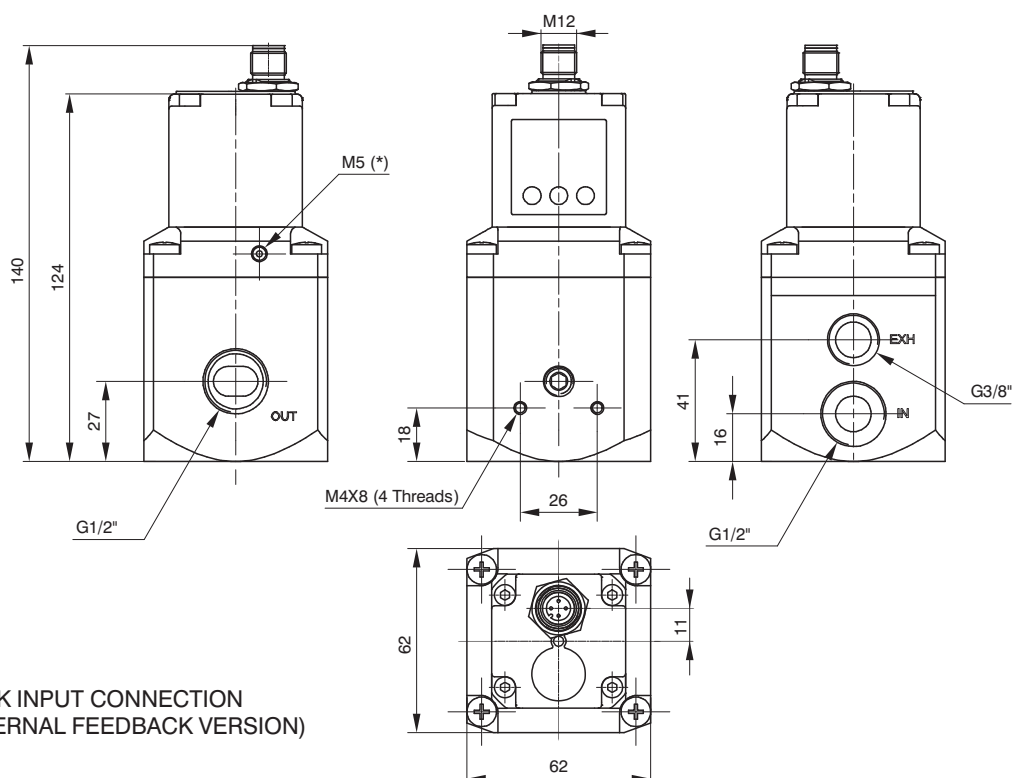
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(AVAILABLE ONLY ON THE EXTERNAL FEEDBACK VERSION)

SIZE 1



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

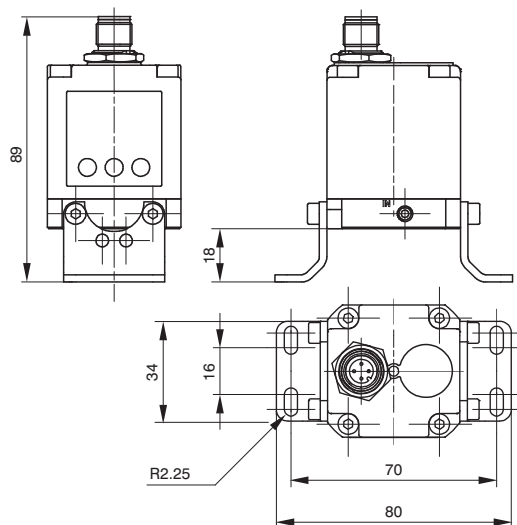
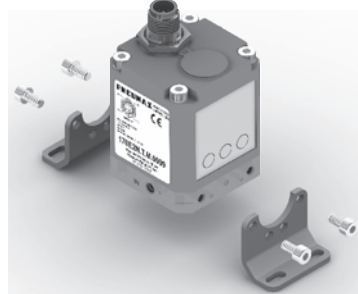
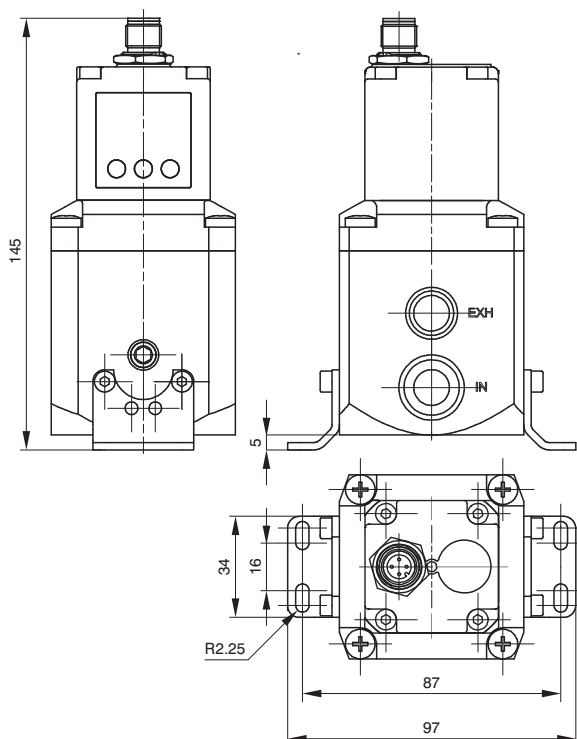
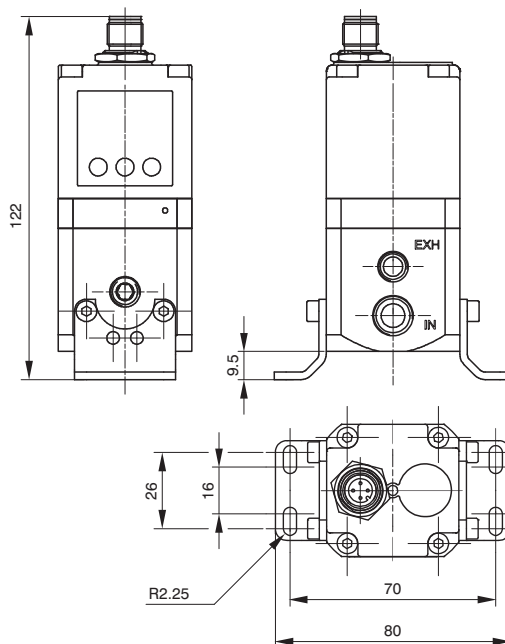
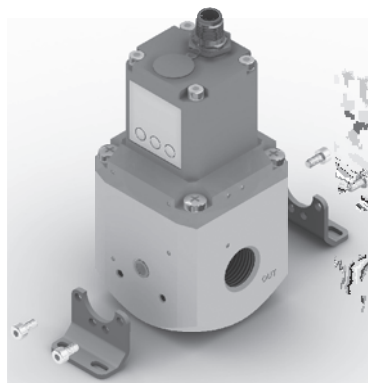
SIZE 3



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

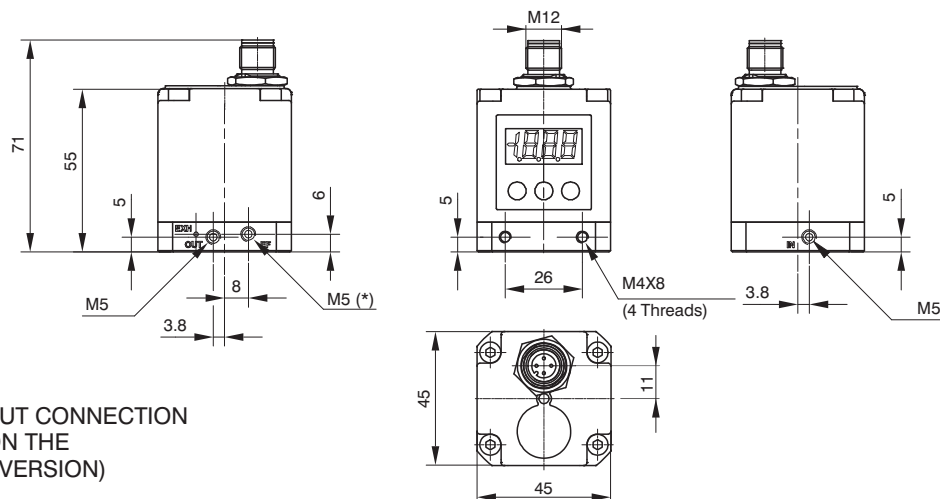
Mounting options (ECONOMIC version)

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**

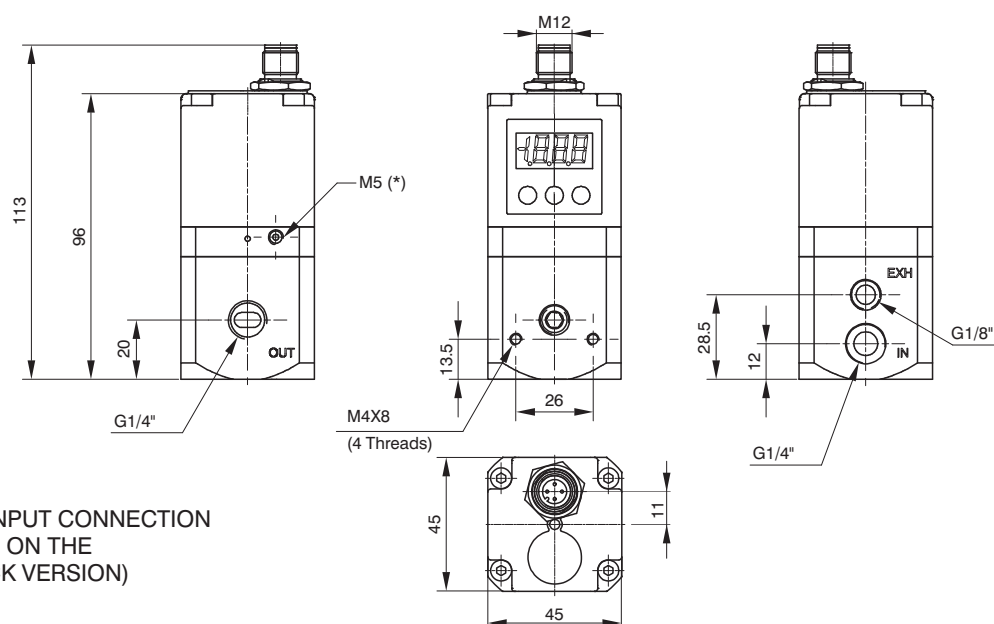
Overall dimensions (M12 Standard version)

SIZE 0



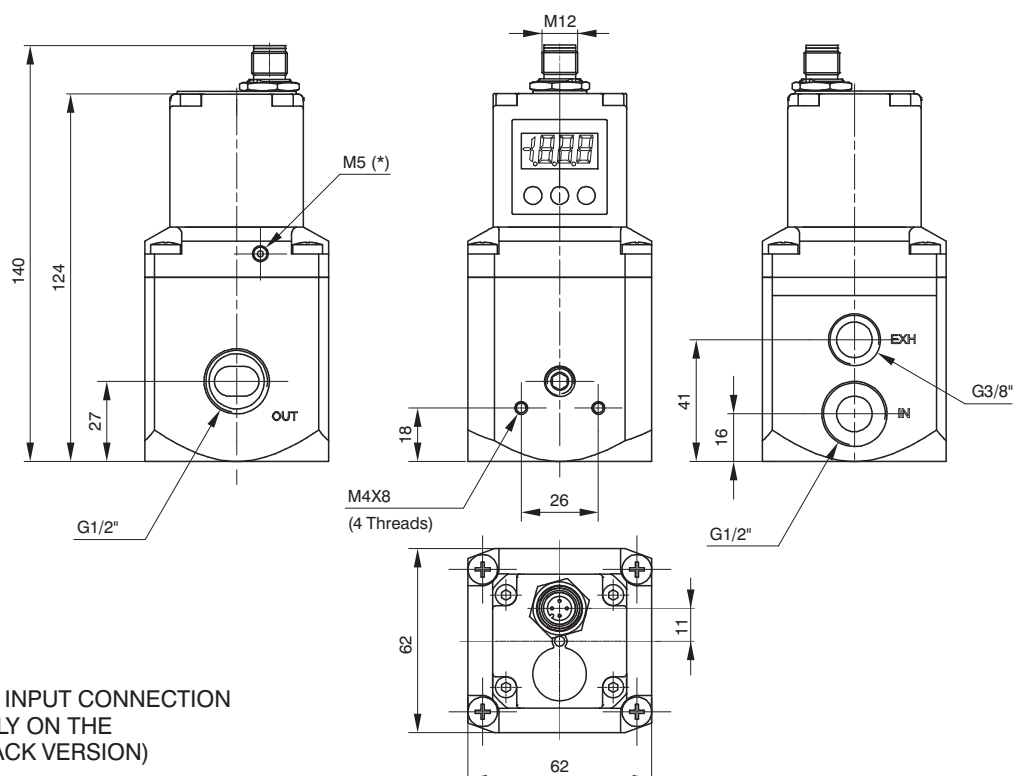
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SIZE 1



* = EXTERNAL FEEDBACK INPUT CONNECTION
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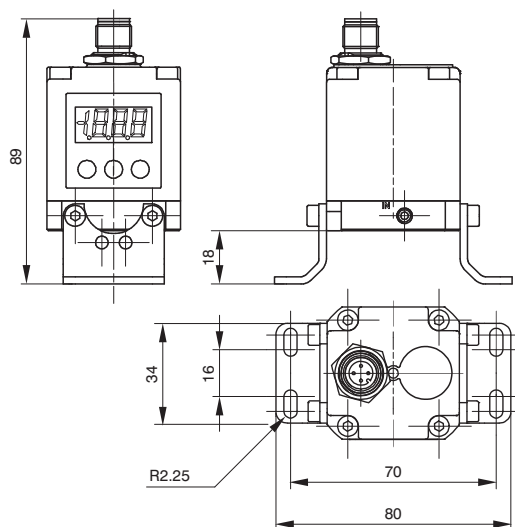
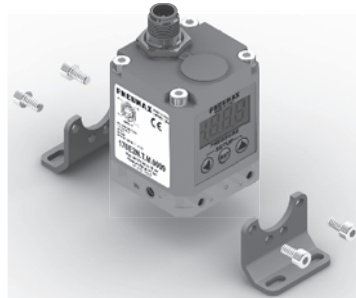
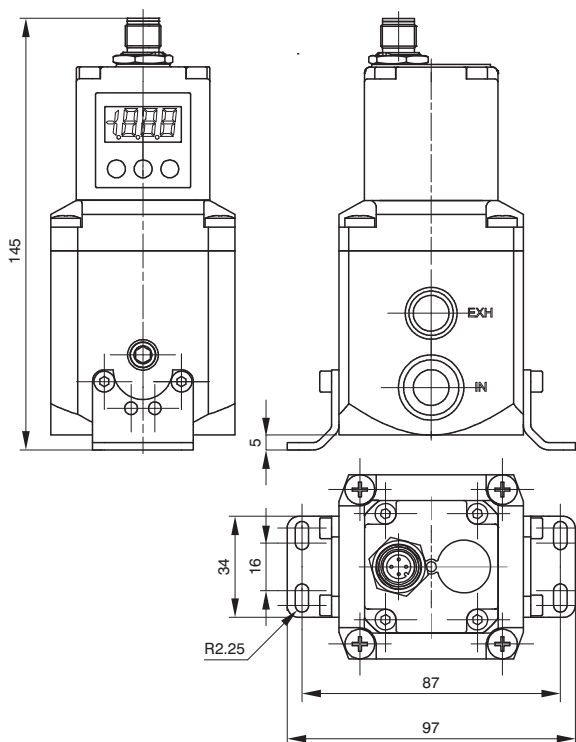
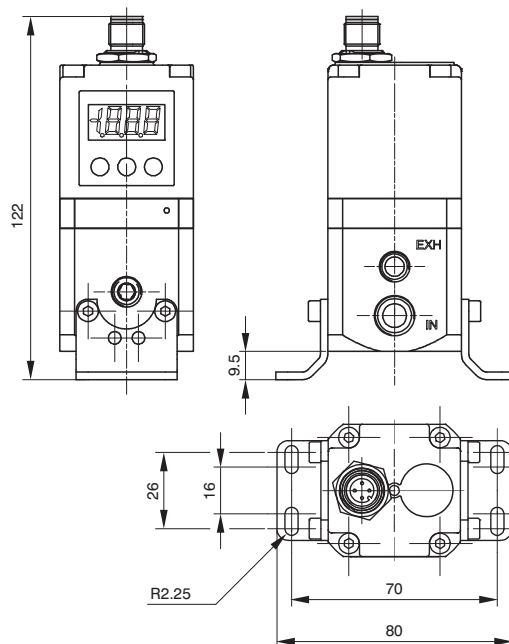
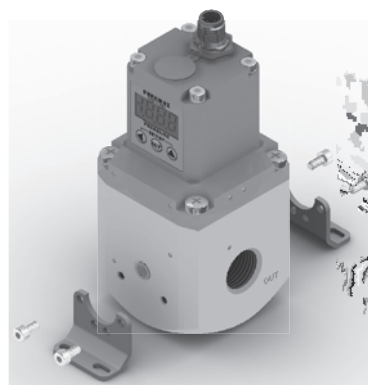
SIZE 3



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

Mounting options (M12 Standard 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**

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).

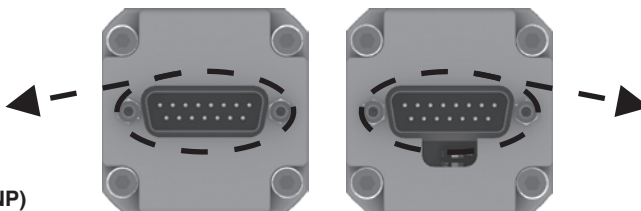
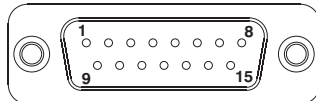
If the compressed-air supply is suspended and the electric power supply is maintained a whirring will be heard that is due to the solenoid valves; an operating parameter can be activated (P18) that triggers the regulator protection whenever the requested pressure is not reached within 4 seconds of the 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.

TOP VIEW OF THE REGULATOR CONNECTOR

Standard version

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 = 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



CANopen version with SUB-D 15 poles

CONNECTOR PIN :

- 1 = CAN_SHLD
- 2 = CAN_V+
- 3 = CAN_GND
- 4 = CAN_H
- 5 = CAN_L
- 6 = NC
- 7 = NC
- 8 = NC
- 9 = SUPPLY (24 VDC)
- 10 = CAN_SHLD
- 11 = CAN_V+
- 12 = CAN_GND
- 13 = CAN_H
- 14 = CAN_L
- 15 = GND

ECONOMIC version

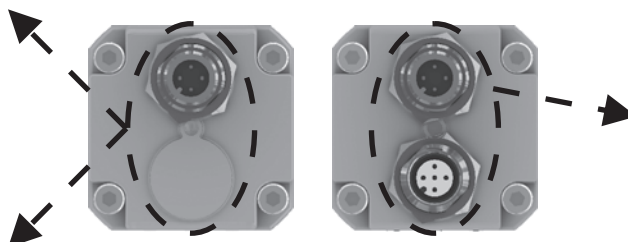
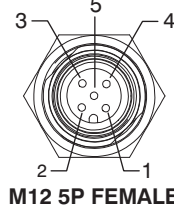
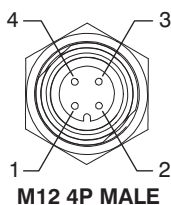
CONNECTOR PIN:

- 1 = SUPPLY (24 VDC)
- 2 = NC
- 3 = GND
- 4 = ANALOG INPUT

M12 Standard version

CONNECTOR PIN:

- 1 = SUPPLY (24 VDC)
- 2 = OUTPUT (according to the model)
- 3 = GND
- 4 = ANALOG INPUT



CANopen version with M12 connector

MALE CONNECTOR PIN :

- 1 = +24 VDC
- 2 = NC
- 3 = GND
- 4 = NC

FEMALE CONNECTOR PIN :

- 1 = CAN_SHLD
- 2 = CAN_V+
- 3 = CAN_GND
- 4 = CAN_H
- 5 = CAN_L

ORDERING CODES
Standard version



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

ORDERING CODES
Version with CANopen protocol




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

- SIZE :
- 0 = Size 0
 - 1 = Size 1
 - 3 = Size 3

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

* Whitout cable

Fixing bracket
170M5


ORDERING CODES

Version with CANopen protocol M12 connector



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

Accessories

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

ECONOMIC 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.

Accessories

Model with M12 connector

POWER SUPPLY connector

Female straight connector M12A 4P

5312A.F04.00



Fixing bracket

170M5



ORDERING CODES
M12 Standard version



17 E2N.

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)

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

Note:
This model doesn't include display and 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.

Accessories

Model with M12 connector
POWER SUPPLY connector
Female straight connector M12A 4P
5312A.F04.00


Fixing bracket
170M5
