



**Series 1700 Electronic proportional regulators**

**General**

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**

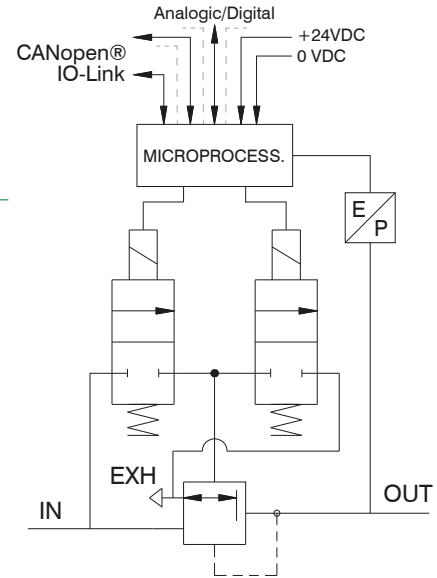
Typical applications will include the necessity to dynamically control the force of the actuator, be it thrust or torque.

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**

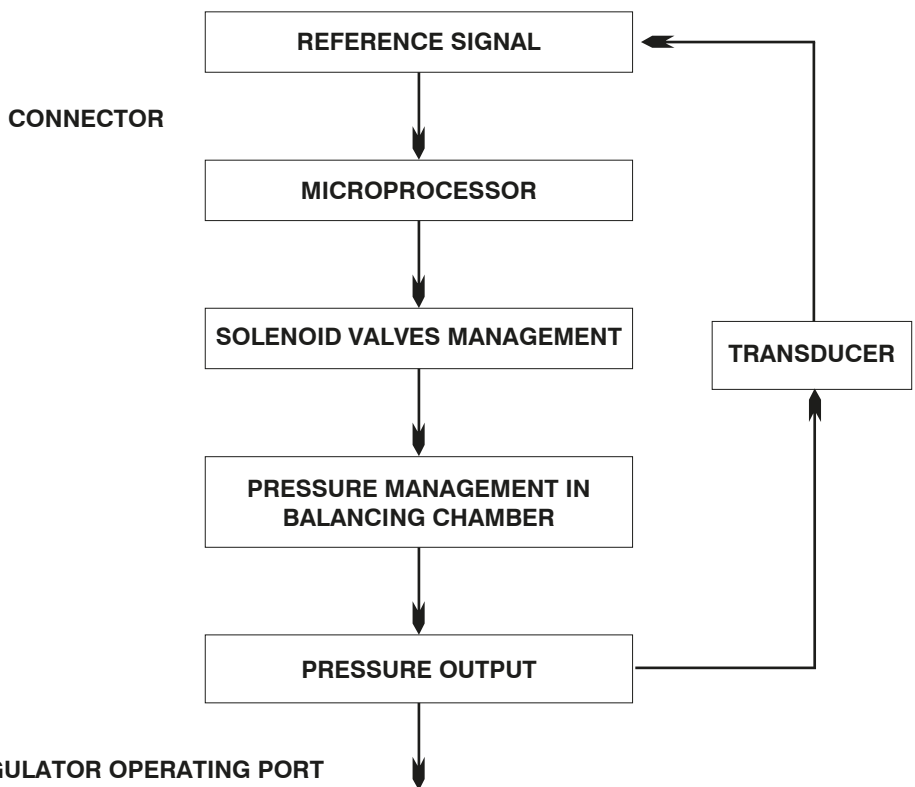
The supply and exhaust connections are on one side of the regulator and the working port is on the opposite side. The two remaining sides carry G 1/8" ports that are blanked off with removable plugs, these can be used to connect a pressure gauge or as an outlet port. If you order the version with the external feedback connection 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.



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## 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)	<b>Size 0</b>	<b>Size 1</b>	<b>Size 3</b>
	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	± 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

### Constructional

Body	Anodized aluminum		
Shutters	Brass with vulcanized NBR		
Diaphragm	Cloth-covered rubber		
Seals	NBR		
Cover for electrical part	Technopolymer		
Springs	AISI 302		
Weight	<b>Size 0</b>	<b>Size 1</b>	<b>Size 3</b>
	168 gr.	360 gr.	850 gr.

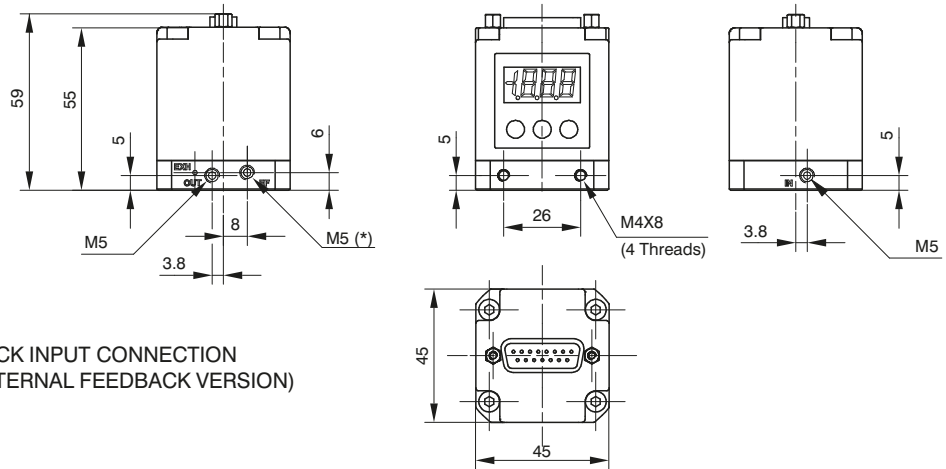
\* Selectable by keyboard or by RS-232

\*\* Valid only for devices with analog input



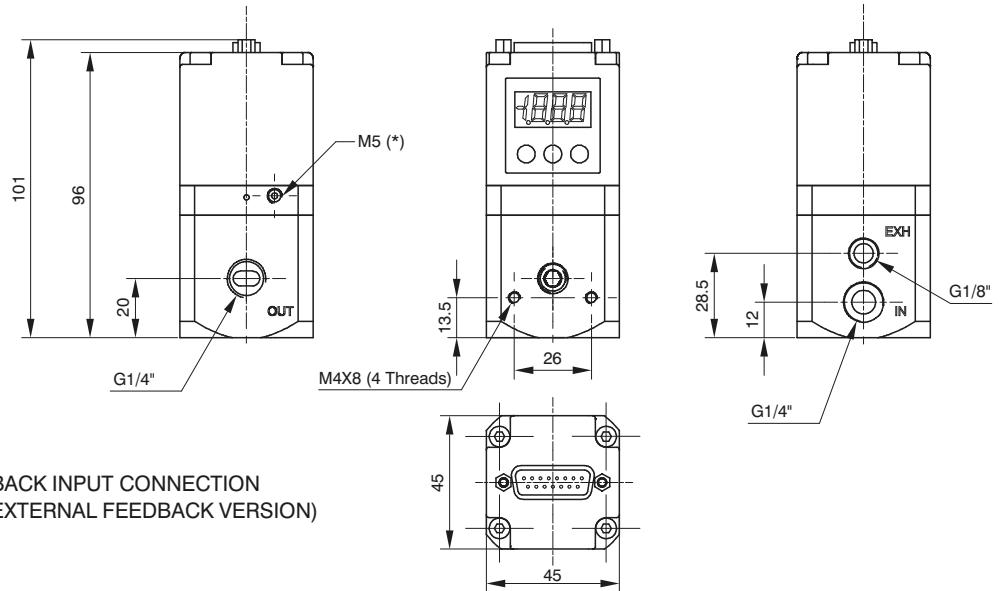
Overall dimensions ("521" standard version and CANopen version with SUB-D 15 poles)

Size 0



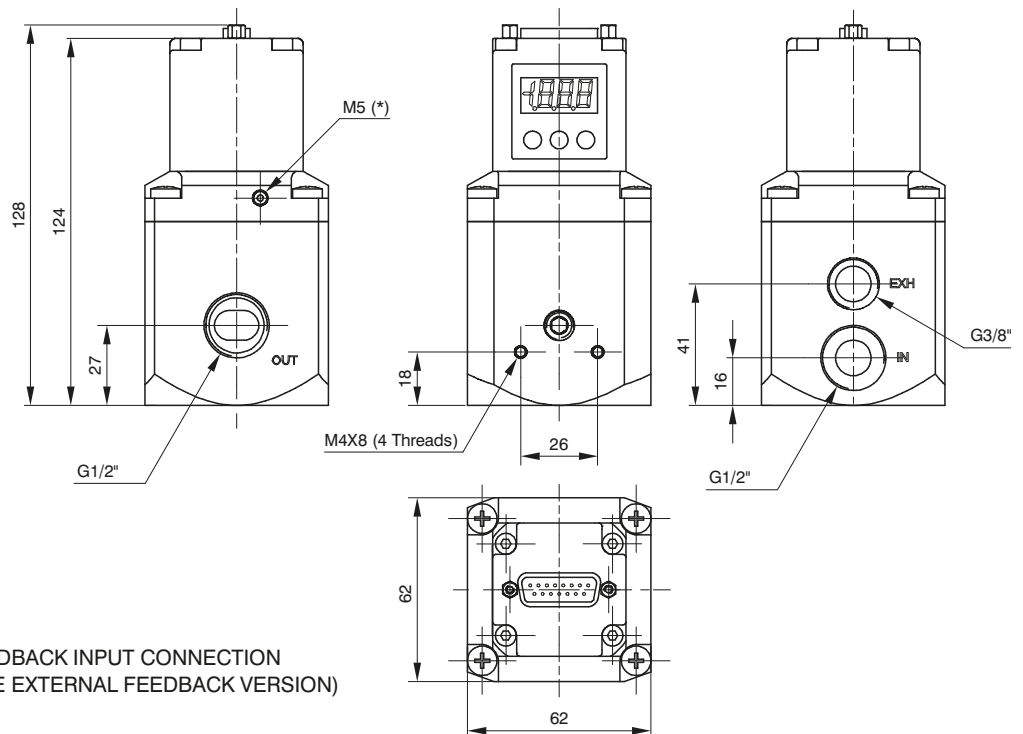
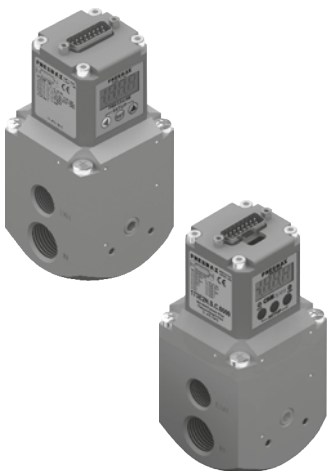
\* = EXTERNAL FEEDBACK INPUT CONNECTION  
(AVAILABLE ONLY ON THE EXTERNAL FEEDBACK VERSION)

Size 1



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

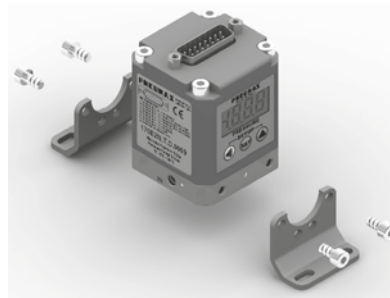
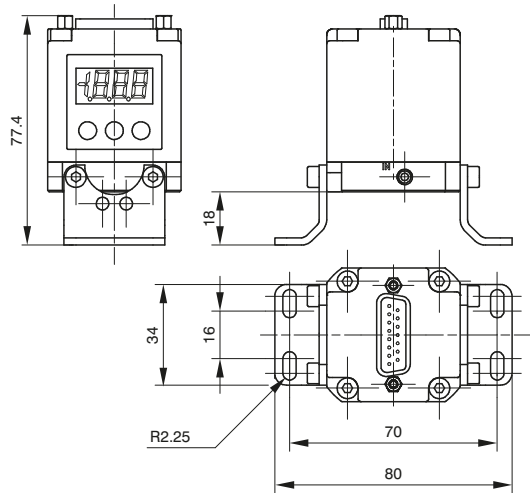
Size 3



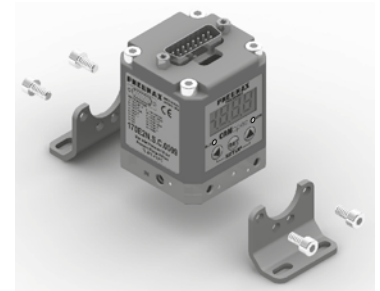
\* = EXTERNAL FEEDBACK INPUT CONNECTION  
(AVAILABLE ONLY ON THE EXTERNAL FEEDBACK VERSION)

**Mounting options ("521" standard version and CANopen version with SUB-D 15 poles)**

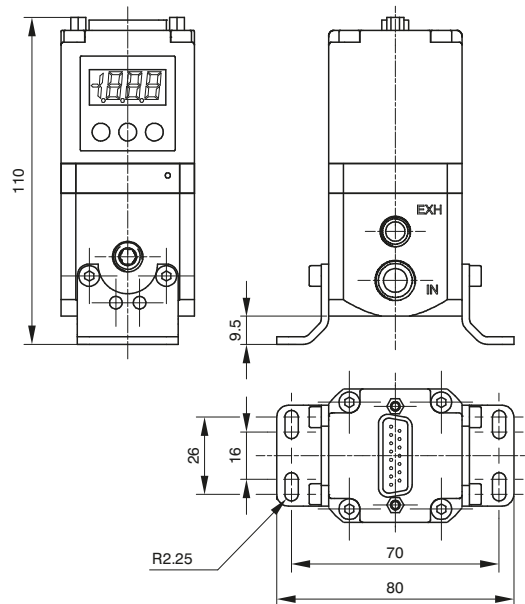
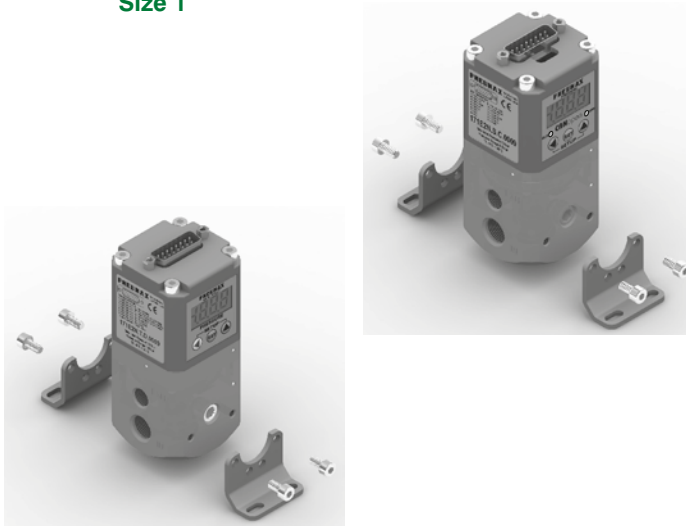
In addition to mounting directly using the M4 tapping on the body, the 170M5 bracket may also be used, as shown below:



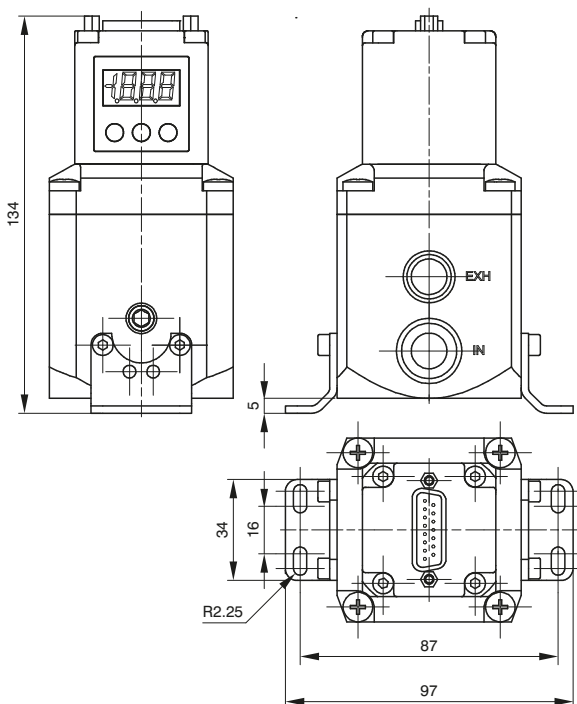
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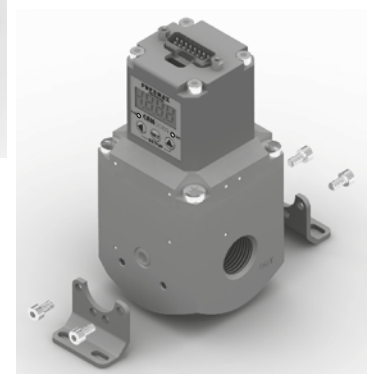
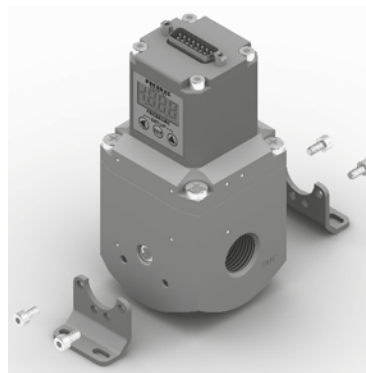
Size 1



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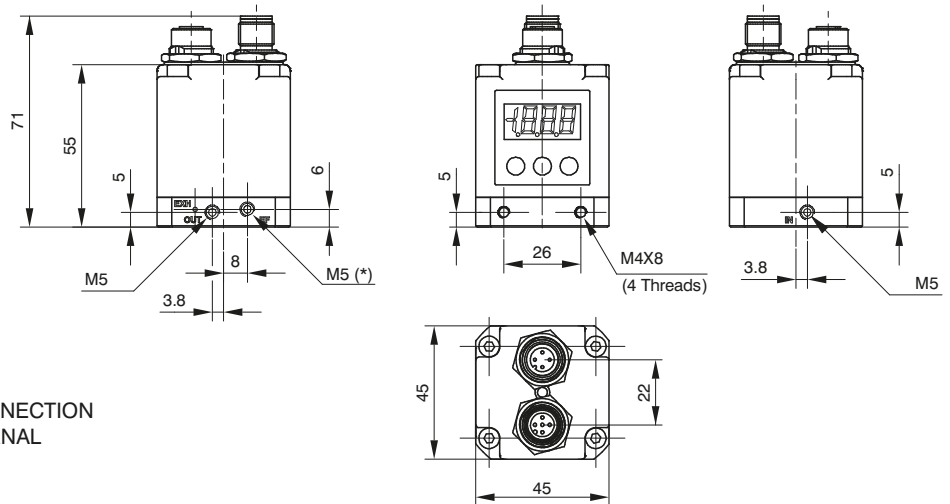
Size 3





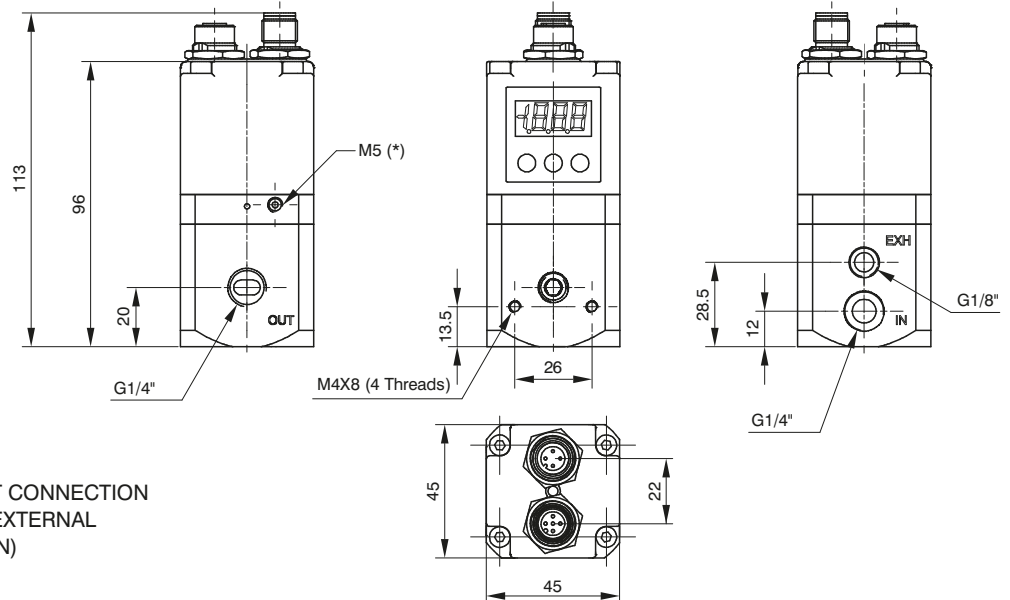
Overall dimensions ("521 M12 version" - CANopen version)

Size 0



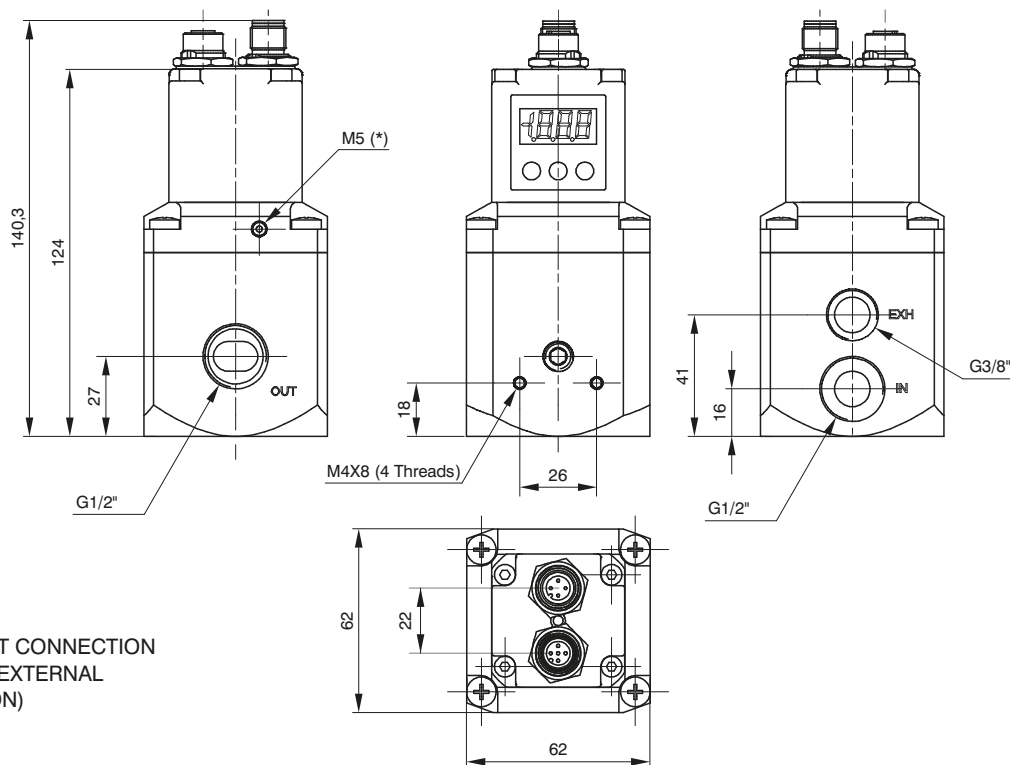
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Size 1



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FEEDBACK VERSION)

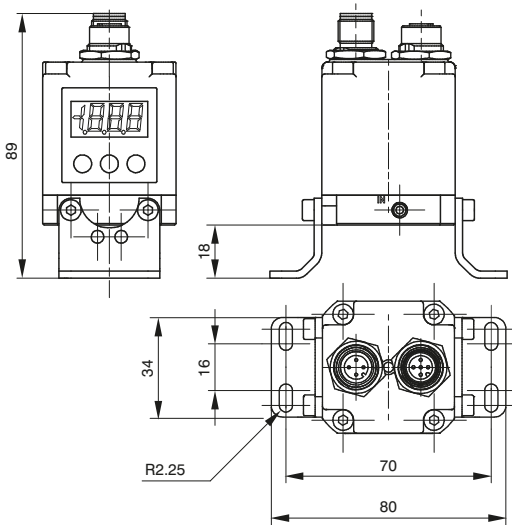
Size 3



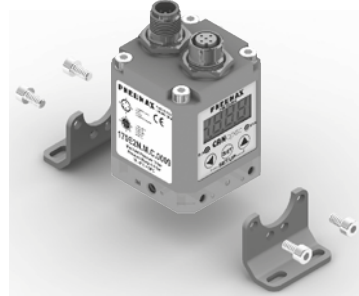
\* = EXTERNAL FEEDBACK INPUT CONNECTION  
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**Mounting options ("521 M12 version" - CANopen version)**

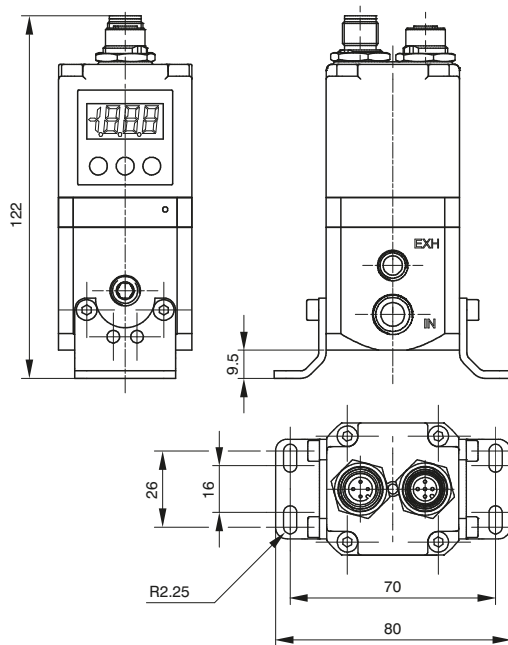
In addition to mounting directly using the M4 tapping on the body, the 170M5 bracket may also be used, as shown below:



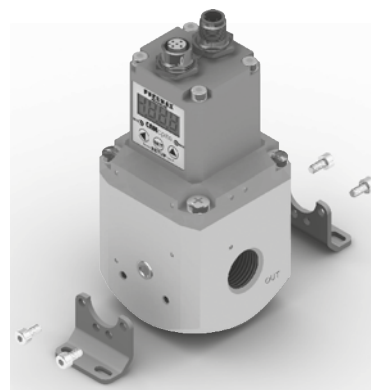
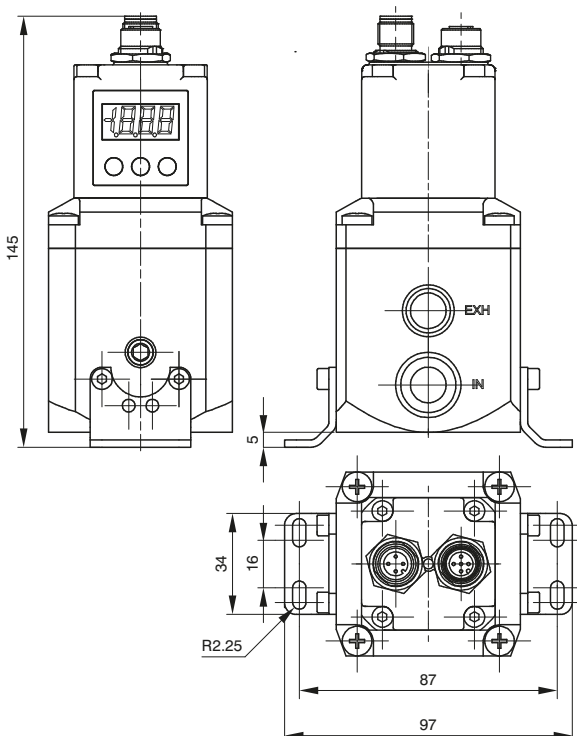
Size 0



Size 1

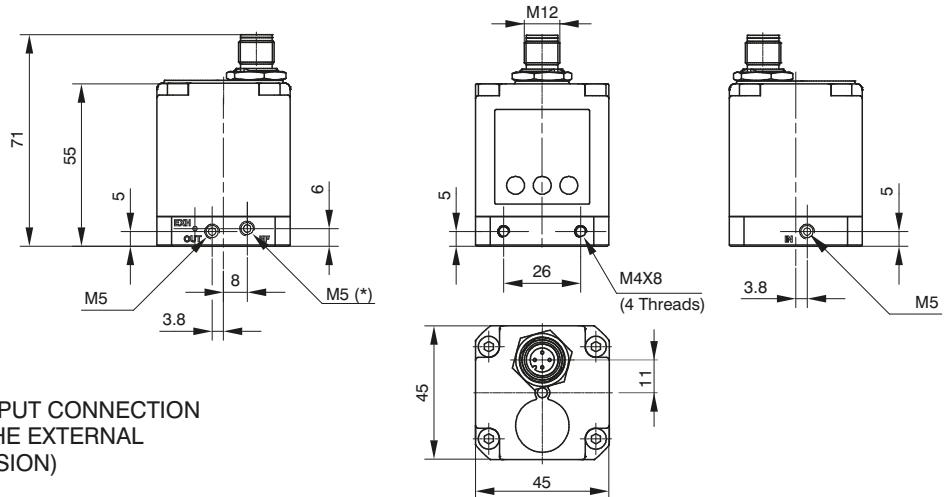


Size 3



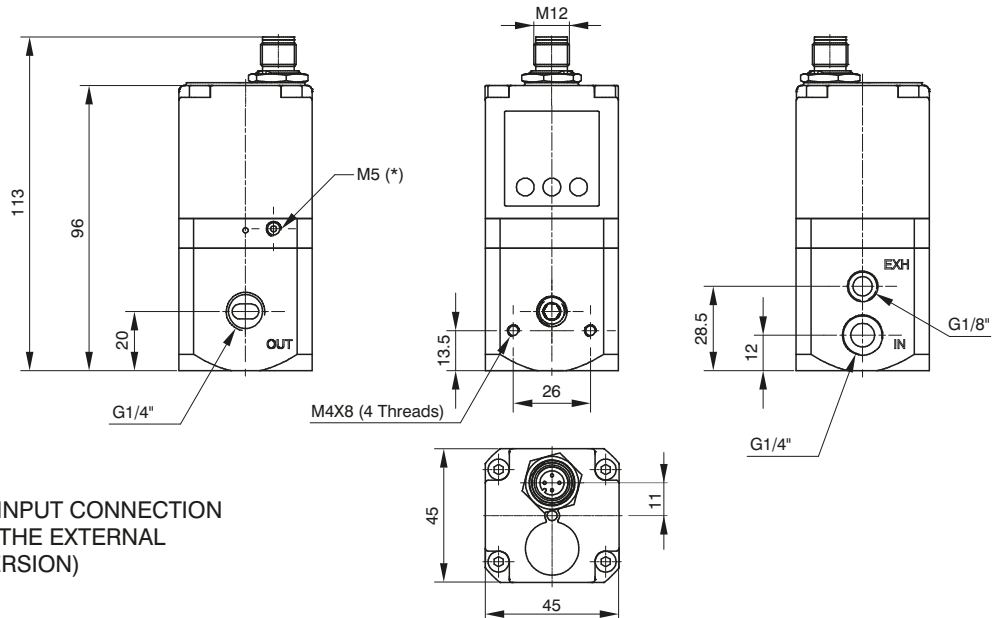
Overall dimensions ("521 M12 BASIC version")

Size 0



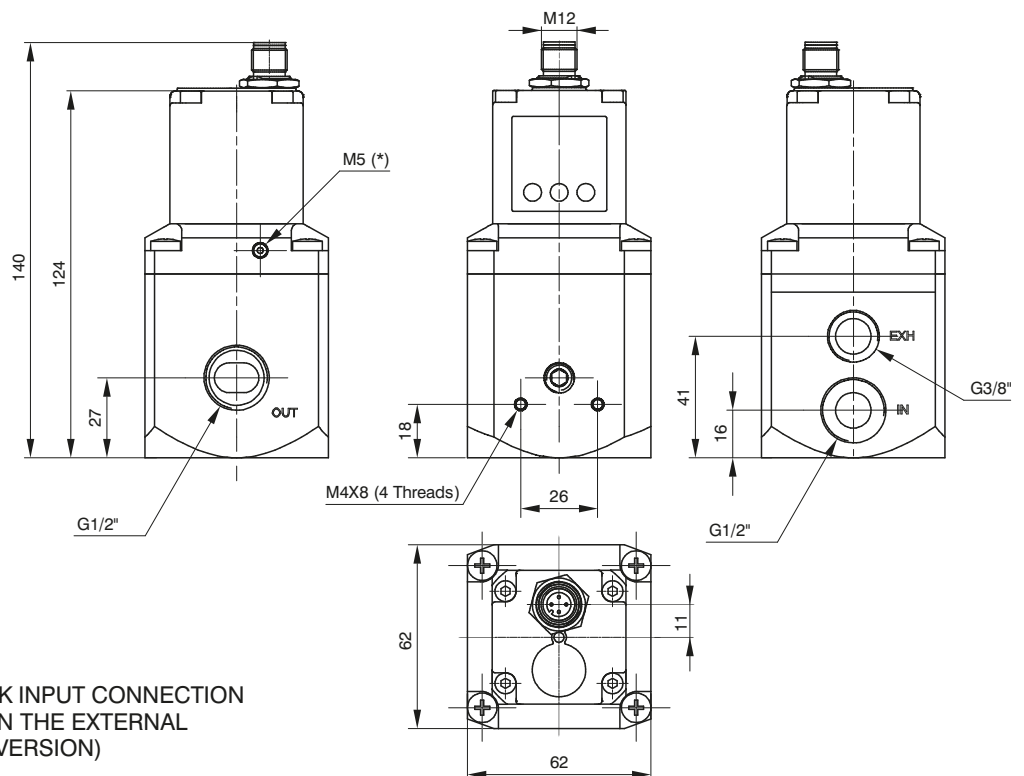
\* = EXTERNAL FEEDBACK INPUT CONNECTION  
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Size 1



\* = EXTERNAL FEEDBACK INPUT CONNECTION  
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FEEDBACK VERSION)

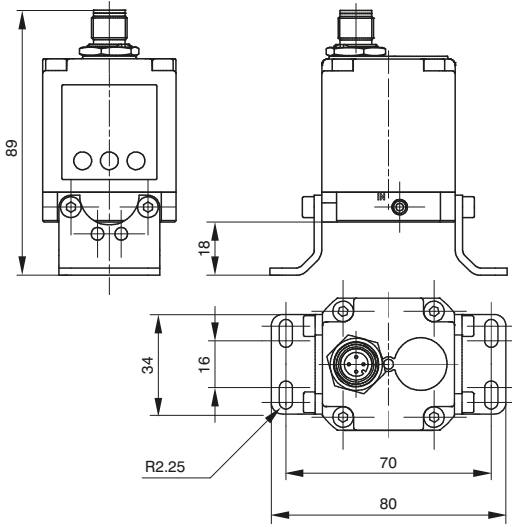
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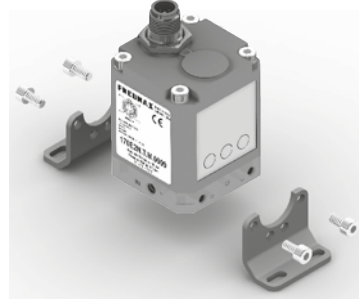
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**Mounting options ("521 M12 BASIC version")**

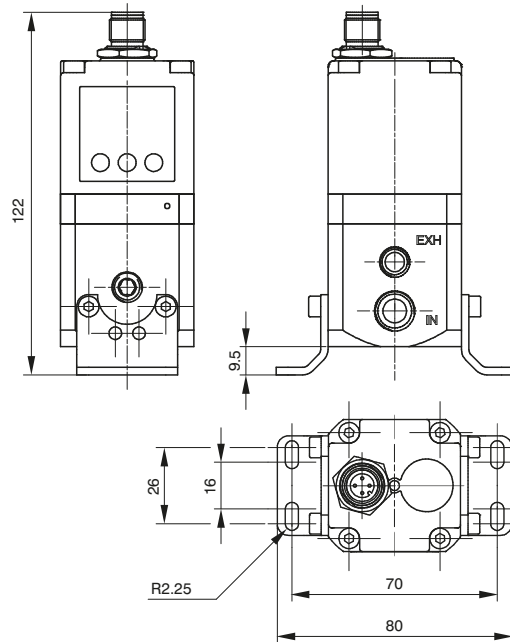
In addition to mounting directly using the M4 tapping on the body, the 170M5 bracket may also be used, as shown below:



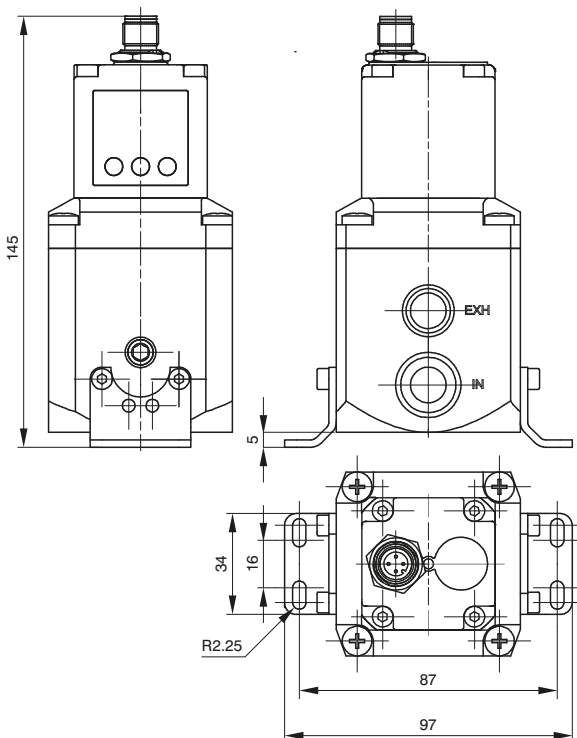
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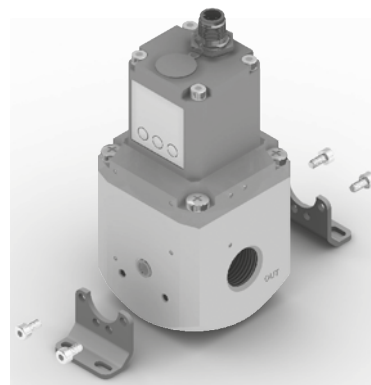
Size 1



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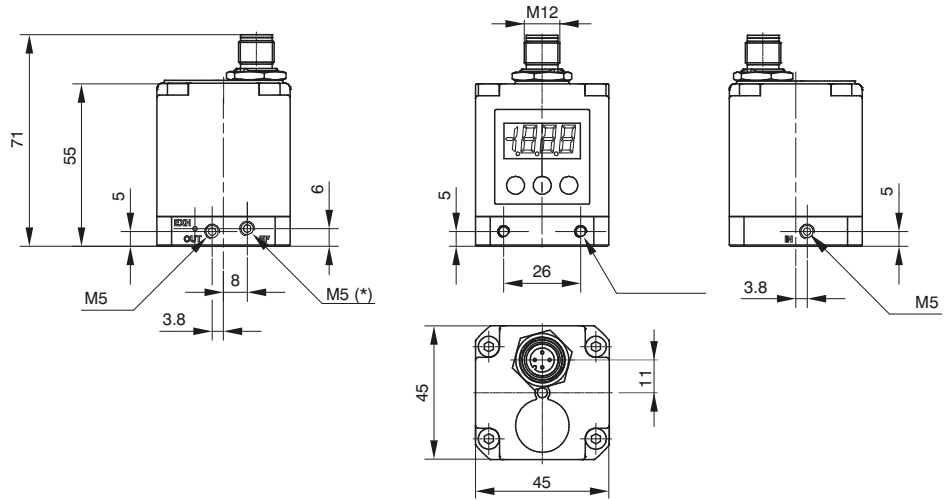
Size 3



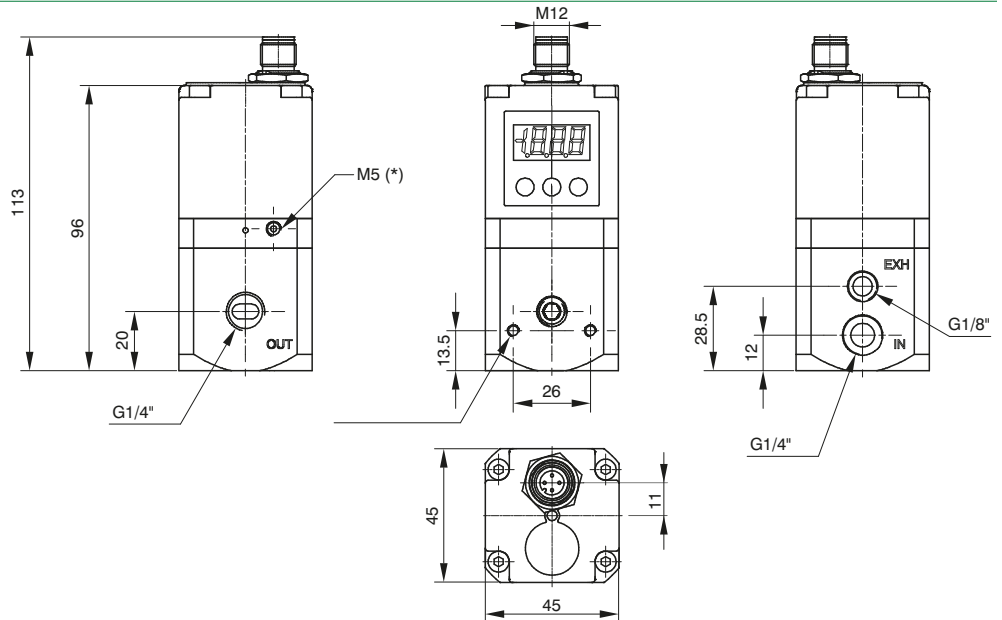


Overall dimensions ("521 M12 version" - Standard version)

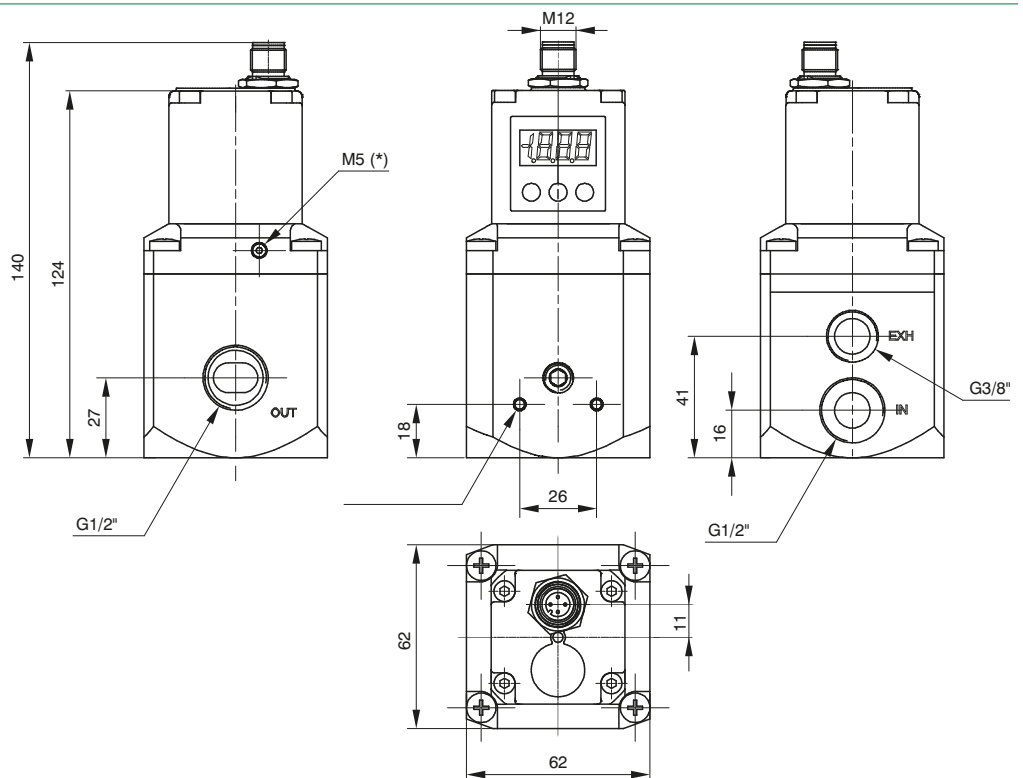
Size 0



Size 1

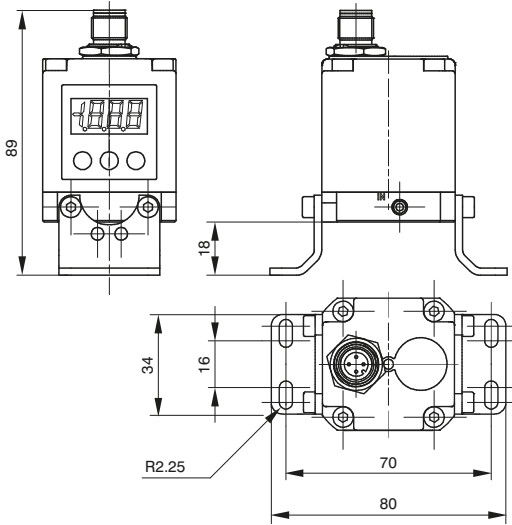


Size 3

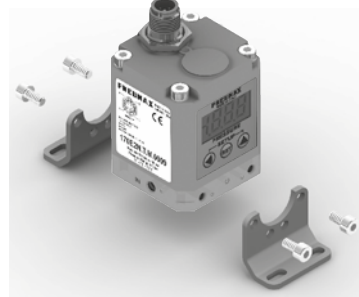


**Mounting options ("521 M12 version" - Standard version)**

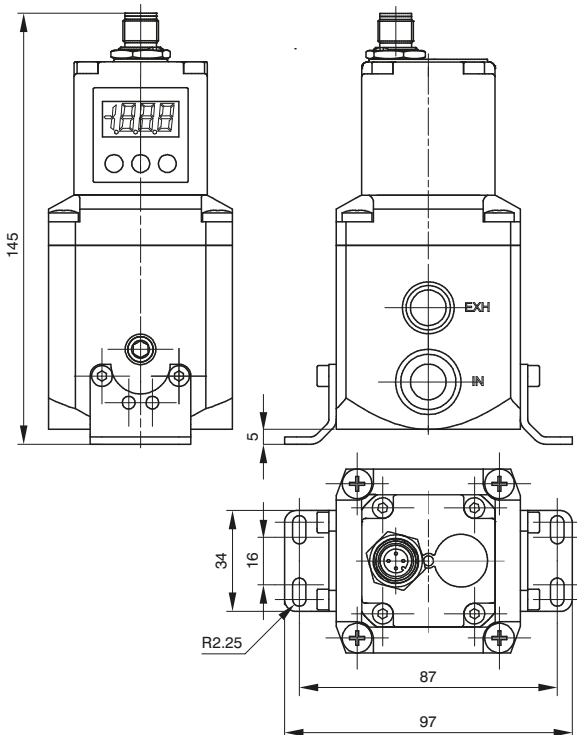
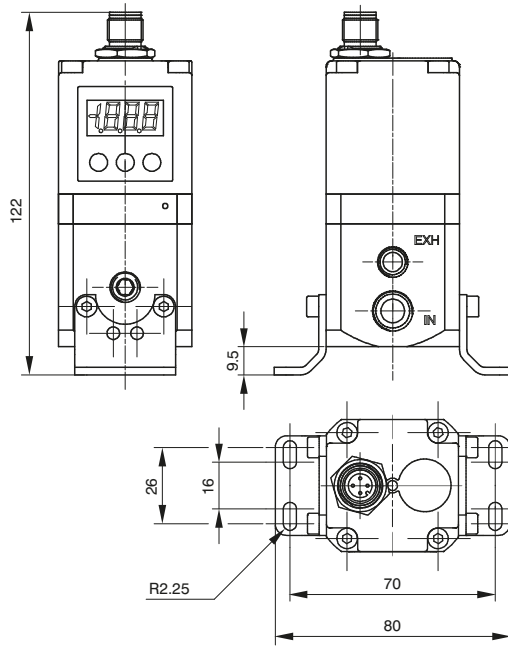
In addition to mounting directly using the M4 tappings on the body, the 170M5 bracket may also be used, as shown below:



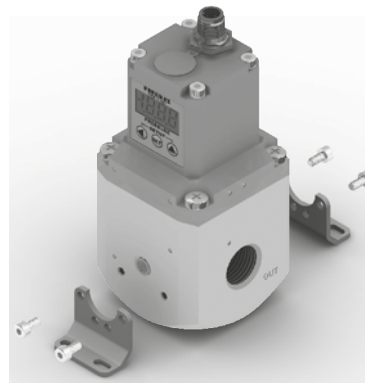
Size 0



Size 1

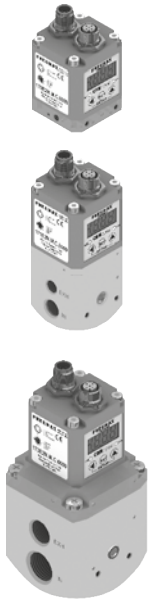


Size 3



**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

**Accessoris**

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

Model with M12 connector
<b>NETWORK connector</b>
Male straight connector M12A 5P
<b>5312A.M05.00</b>

<b>Fixing bracket</b>
<b>170M5</b>

**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.

**Accessories**

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

<b>Fixing bracket</b>
<b>170M5</b>



**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 additional letter required)
- E = External pressure feedback
- A = Exhaust downstream pressure when power supply is removed
- AE = A Variant + E Variant

**Accessories**

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


Fixing bracket
<b>170M5</b>


**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 pressure without power supply
  - AE = A Variant + E Variant
- PRESSURE RANGE:**
- 0009 = Range 0 - 9 bar

**Accessories**

Model with M12 connector
<b>POWER SUPPLY connector</b>
Female straight connector M12A 5P
<b>5312A.F05.00</b>


Fixing bracket
<b>170M5</b>




**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**

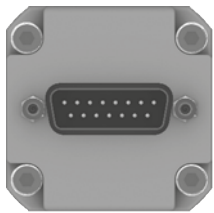
**NOTES ON OPERATION**



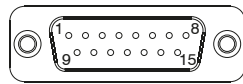
If the electric supply is interrupted, the outlet pressure is maintained at the set value. However, maintaining the exact value cannot be ensured as it is impossible to operate the solenoid valves.  
 In order to discharge the circuit downstream, zero the reference, make sure that the display shows a 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.

AIR SERVICE UNITS

**"521" Standard version with D-SUB connector**



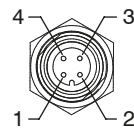
TOP VIEW OF THE REGULATOR CONNECTOR



- 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

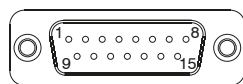
- M12 BASIC version**  
**CONNECTOR PINOUT:**  
 1 = POWER SUPPLY (24 VDC)  
 2 = NC  
 3 = GND  
 4 = ANALOG INPUT

- M12 Standard version**  
**CONNECTOR PINOUT:**  
 1 = POWER SUPPLY (24 VDC)  
 2 = ANALOG OUTPUT (depending on the model)  
 3 = GND  
 4 = ANALOG INPUT

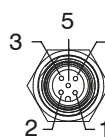
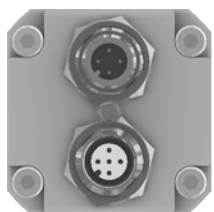
**"521" CANopen® version with D-SUB connector**



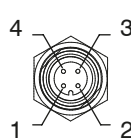
TOP VIEW OF THE REGULATOR CONNECTOR



**"521" CANopen® version with M12 connector**



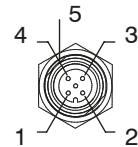
M12 5P FEMALE



M12 4P MALE

- 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" 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

**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

**SIZE :**  
**0** = Size 0  
**1** = Size 1  
**3** = Size 3

**Accessories**

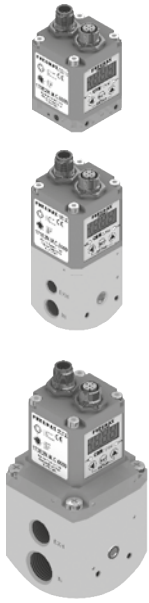
Model with SUB-D 15 poles connector	
	<b>5300.F15.00.00</b> : Straight connector + Casing IP65
	<b>5300.F15.00.03</b> : Straight connector + Cable 3 meters
	<b>5300.F15.00.05</b> : Straight connector + Cable 5 meters
	<b>5300.F15.90.00</b> : 90° connector + Casing IP65
	<b>5300.F15.90.03</b> : 90° connector + Cable 3 meters
	<b>5300.F15.90.05</b> : 90° connector + Cable 5 meters

\* Whitout cable

Fixing bracket
<b>170M5</b>

**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

**Accessoris**

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


Model with M12 connector
<b>NETWORK connector</b>
Male straight connector M12A 5P
<b>5312A.M05.00</b>


<b>Fixing bracket</b>
<b>170M5</b>


**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.

**Accessories**

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


<b>Fixing bracket</b>
<b>170M5</b>




**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 additional letter required)
- E = External pressure feedback
- A = Exhaust downstream pressure when power supply is removed
- AE = A Variant + E Variant

**Accessories**

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


Fixing bracket
<b>170M5</b>


**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 pressure without power supply
  - AE = A Variant + E Variant
- PRESSURE RANGE:**
- 0009 = Range 0 - 9 bar

**Accessories**

Model with M12 connector
<b>POWER SUPPLY connector</b>
Female straight connector M12A 5P
<b>5312A.F05.00</b>


Fixing bracket
<b>170M5</b>
