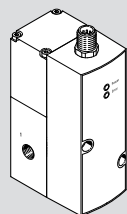


# VPPX

## Proportional-pressure regulator



# FESTO

Festo SE & Co. KG  
Rüter Straße 82  
73734 Esslingen  
Deutschland  
+49 711 347-0

www.festo.com



8134351

### Operating instructions

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[8134353]

Translation of the original instructions

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## 1 Applicable Documents

All available documents for the product → [www.festo.com/sp](http://www.festo.com/sp).

## 2 Safety

### 2.1 Safety instructions

- Only use the product in its original condition without unauthorised modifications.
- Only use the product if it is in perfect technical condition.
- Take into account the ambient conditions at the location of use.
- Before working on the product, switch off the power supply and secure it against being switched on again.
- Store the product in a cool, dry environment protected from UV and corrosion. Keep storage times short.

### 2.2 Intended use

The proportional-pressure regulator is intended to regulate a pressure or an external value proportional to a specified setpoint value. The product is intended for use in industrial environments.

### 2.3 Approvals

In combination with the UL inspection mark on the product, the information in this section must also be observed in order to comply with the certification conditions of Underwriters Laboratories Inc. (UL) for USA and Canada.

#### UL certification information

Product category code	QUYX, QUYX7
File number	E322346
Considered standards	UL 610101, CAN/CSAC22.2 No. 610101
UL mark	

Tab. 1

- The unit shall be supplied by a power source which fulfils the requirements on a limited-energy circuit in accordance to IEC/EN/UL/CSA 61010-1 or on a Limited Power Source (LPS) in accordance to IEC/EN/UL/CSA 60950-1 or IEC/EN/UL/CSA 62368-1 or a Class 2 circuit in accordance to NEC or CEC.

#### Electrical data and ambient conditions

Supply voltage	24 V DC
Max. power VPPX-6, VPPX-8	7 W
Max. power VPPX-12	12 W
Rated pressure	up to 1.1 MPa
Max. installation height	2000 m

Tab. 2

## 3 Additional information

- Contact the regional Festo contact if you have technical problems → [www.festo.com](http://www.festo.com).
- Accessories and spare parts → [www.festo.com/catalogue](http://www.festo.com/catalogue).

## 4 Product overview

### 4.1 Function

The proportional-pressure regulator is intended to regulate a pressure or an external value proportional to a specified setpoint value.

If the proportional-pressure regulator is operated in the 'internal' mode, the integrated pressure sensor records the pressure at the working port and compares this setpoint/actual deviation with the setpoint value. If there is a deviation from the setpoint/actual value, the valve readjusts until the setpoint value is reached at the output.

In the 'external' mode the additional external sensor records the value and feeds it back directly to the proportional-pressure regulator. This value is compared to the setpoint value. If there is a deviation between the setpoint value and actual value, the valve regulates the output pressure until the value of the external sensor reaches the setpoint value.

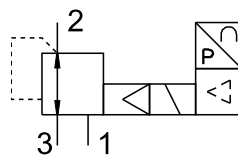


Fig. 1: Pneumatic circuit symbol

## 4.2 Structure

### 4.2.1 Product design

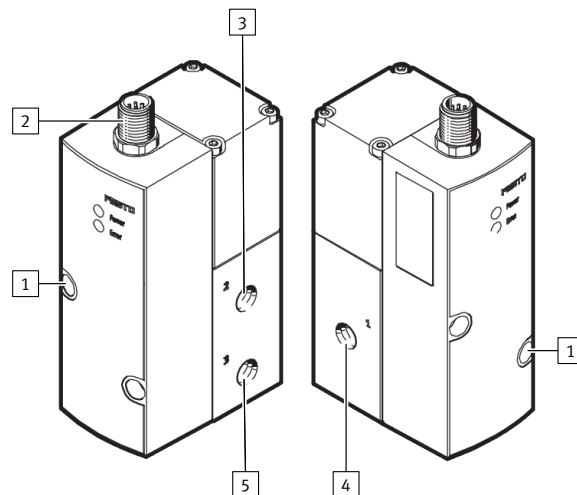


Fig. 2: Connections and mounting holes (in-line valve)

- |                               |                           |
|-------------------------------|---------------------------|
| 1 Through-holes for fastening | 4 Compressed air port (1) |
| 2 Electrical connecting plug  | 5 Exhaust air port (3)    |
| 3 Working air port (2)        |                           |

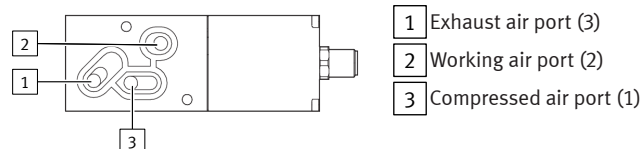


Fig. 3: Pneumatic ports (sub base valve)

### 4.2.2 Display components

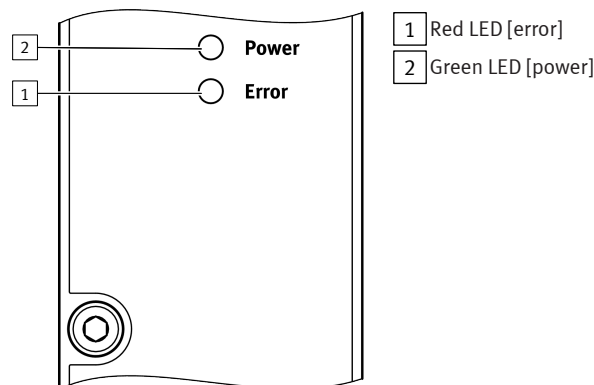


Fig. 4: Display components

## 5 Transport

Store and transport the product in its original packaging. Observe the weight, the dimensions and the ambient conditions.

## 6 Assembly

### 6.1 Mounting clearances

During assembly make sure that there is sufficient space for the cable connection and the tubing connections. Place the device as close to the consumer as possible. This leads to better control accuracy and shorter response times.

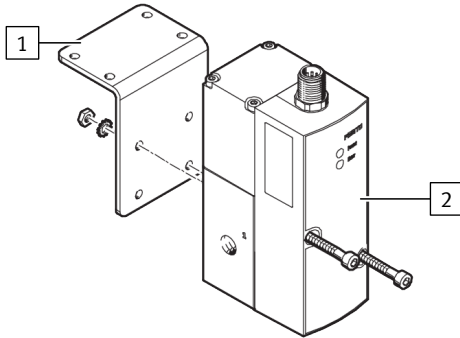
### 6.2 Wall mounting (in-line valve)

#### VPPX-6L-... und VPPX-8L-...

- Fasten the VPPX-... [2] with 2 M4 screws. If necessary, use the bracket VAME-P1-A [1].
  - Tightening torque: 1.5 Nm



When mounting the VPPX-... with the aid of the bracket the VPPX-... must only be statically loaded.



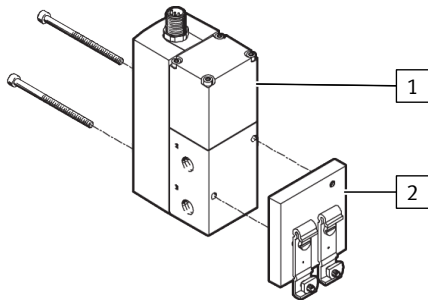
#### VPPX-12L-...

- Fasten the VPPX-... with 2 M5 screws.
  - Tightening torque: 2.0 Nm

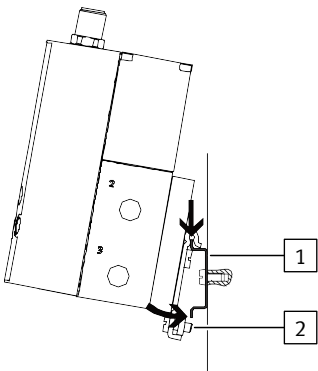
### 6.3 H.rail mounting (in-line valve)

#### VPPX-6L-... und VPPX-8L-...

- Attach the H-rail adapter VAME-P1-T [2] to the VPPX-... with 2 screws [1].
  - Screws: M4 x 65 for VPPX-6L-..., M4 x 77 for VPPX-8L-...
  - Tightening torque: 1.5 Nm



- Attach the VPPX-... to the H-rail.

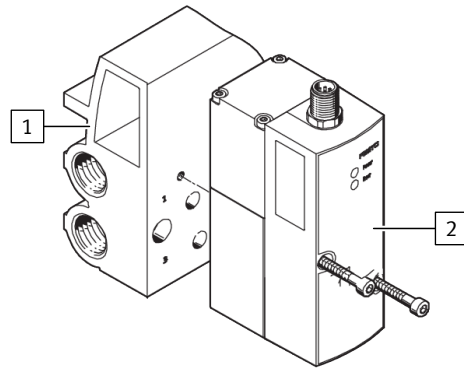


- Fasten the VPPX-... with the retaining screw [2] of the H-rail adapter.
  - Tightening torque: 1.5 Nm

### 6.4 Manifold block assembly (sub base valve)

#### VPPX-6F-... und VPPX-8F-...

- Fasten the VPPX-... [2] to the manifold block [1] with 2 screws.
  - Screws: M4 x 65 for -6F-..., M4 x 77 for VPPX-8F-...
  - Tightening torque: 1.5 Nm



## 7 Installation

### 7.1 Pneumatic installation (in-line valve)

- Connect the compressed air port (1) and the working air port (2) with tubing → Fig. 2.
- Fit a silencer at the exhaust air port (3) or install an exhaust air duct → Fig. 2.

### Operating medium

#### NOTICE

Too much residual oil content in the compressed air will reduce the service life of the valve.

- When using bio-oils (oils that are based on synthetic ester or native ester, e.g. rapeseed oil methyl ester), the maximum residual oil content of 0.1 mg/m<sup>3</sup> must not be exceeded (ISO 8573-1:2010 [-:-:2]).

### 7.2 Electrical installation

#### WARNING

#### Risk of injury due to electric shock.

- For the electrical power supply, use only PELV circuits in accordance with IEC 60204-1/EN 60204-1 (Protective Extra-Low Voltage, PELV).
- Observe the general requirements of IEC 60204-1/EN 60204-1 for PELV circuits.
- Only use voltage sources that ensure a reliable electric separation from the mains network in accordance with IEC 60204-1/EN 60204-1.

#### NOTICE

#### Malfunction due to impaired immunity to interference

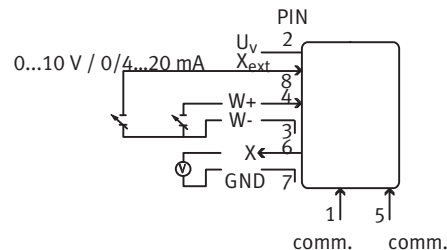
Long signal lines reduce the immunity to interference.

- Use the shortest possible signal lines.

#### NOTICE

- The connector must not be twisted out of the intended position.
- The tightening torque of the M12 plug socket with cable must not exceed 0.5 Nm.

- Lay the electrical connection cable without crushing, kinking or stretching it.
- If a shielded electrical connection cable is used, earth the shield at the end of the cable remote from the valve.
- Wire the VPPX-... in accordance with the plug pattern.



The pins on the electrical connection are assigned as follows:

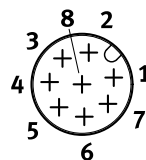


Fig. 5: Pin allocation

PIN	Wire colour <sup>1)</sup>	Port identifications
1	white (WH)	Digital communication (do not connect)
2	brown (BN)	+24 V DC supply voltage

PIN	Wire colour <sup>1)</sup>	Port identifications
3	green (GN)	Analogue input W- (- setpoint value)
4	yellow (YE)	Analogue input W+ (+ setpoint value)
5	grey (GY)	Digital communication (do not connect)
6	pink (PK)	Analogue output X (actual value)
7	blue (BU)	DC 0 V or GND
8	red (RD)	Analogue input X <sub>ext</sub> (external actual value)

1) With usage of the plug socket with cable as specified in accessories.

Tab. 3: Pin allocation

## 8 Commissioning

### i

- Keep high-frequency radiation away from the VPPX-... to avoid increased tolerances of the outlet pressure.
- The VPPX-... interprets setpoint signals that are less than 1% Full Scale (FS) as 0 V or 4 mA. In this case the working pressure is set to ambient pressure.
- At typical input values below 3.6 mA, the valve detects a cable break and the last pressure set remains unregulated. Leakage results in a change of pressure over the long term.
- At the factory setting the VPPX-... operates like a standard pressure regulator with the controller setting Preset 2. The external actual value input is inactive.

- Connect the VPPX-... with a setpoint value signal. The VPPX-... has a differential input. Apply the setpoint signal 0 ... 10 V or 4 ... 20 mA to contacts 3 and 4. Apply the lower potential to contact 3 and the higher potential to contact 4.

### i

Contact 3 (- setpoint value) can be connected to contact 7 (GND).

- Power the VPPX-... with direct current.
  - Supply voltage UV = 24 V DC ±10%

## 9 Maintenance

### 9.1 Disassembly

#### NOTICE

- When switching off the VPPX-..., first make sure that the setpoint value is set to 0, then that the supply pressure and finally the supply voltage are switched off.

- Switch off the following energy sources:
  - Operating voltage
  - Compressed air
- Disconnect the connections from the device.
- Remove the device from the mounting surface or H-rail.

### 9.2 Cleaning

- Switch off the following energy sources to clean the outside:
  - Operating voltage
  - Compressed air

## 10 Malfunctions

Cause	Status of the LED displays	
	Green LED [power]	Red LED [error]
- Undervoltage or overvoltage of the setpoint value	on	on
- Hardware error - Overvoltage (> 30 V) - Internal temperature too high	on	flashes
- Undervoltage (< 18 V)	off	off

Tab. 4: Status of the LED displays

Malfunction	Possible cause	Remedy
Device does not respond	No supply voltage, LED [power] off.	Check the connection of the supply voltage 24 V DC.
	No data communication.	- Check control unit. - Check connection.
Flow rate too low	Restriction of the flow cross section by connection technology.	Use alternative connections.
Pressure rise too slow	Large cylinder volume and long tube length.	Select a different parameter set or switch to an external sensor with Festo Configuration Tool (FCT).
Pressure constant despite modified setpoint specification	Break in the electrical connecting cable.	Replace electrical connecting cable.
	Supply pressure P1 too low.	Increase supply pressure.

Tab. 5: Fault clearance

## 11 Technical data

### General technical data

Design	Proportional-pressure regulator	
Mounting position	As desired, preferably horizontal (display elements facing upwards)	
Materials		
Housing	Wrought aluminium alloy	
Cover	PAXMD6 GF50/gr-P PA6-GB20,GF10/gr-P	
Seals	Nitrile rubber	
Lubrication	silicone-free	
Weight		
VPPX-6...	[g]	400
VPPX-8...	[g]	560
VPPX-12...	[g]	2050

Tab. 6: General technical data

### Operating and environmental conditions

Medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4] inert gases	
Information on operating medium	Lubricated operation not possible	
Degree of protection	IP 65 when mounted, with tightened mounting screws, in combination with plug socket according to accessories.	
Ambient temperature	[°C]	0 ... 60
Temperature of medium	[°C]	10 ... 50
Storage temperature	[°C]	-10 ... +70
Vibration and shock		
Vibration	Tested in accordance with DIN/IEC 68/EN 60068 Part 2-6; wall mounting: 0.35 mm path at 10 ... 60 Hz, 5 g acceleration at 60 ... 150 Hz <sup>1)</sup>	
Shock	Tested in accordance with DIN/IEC 68/EN 60068 Part 2-27; wall mounting: ±30 g at 11 ms duration; 5 shocks per direction <sup>1)</sup>	

1) Information does not apply when mounting the VPPM-.../VPPX-... on bracket VAME-P1-A/-T.

Tab. 7: Operating and environmental conditions

### Characteristic electrical values

Electrical connection	Pin contact M12x1, 8-pin	
Permissible operating voltage	[V DC]	21.6 ... 26.4 Permissible residual ripple max. 10%
Power rating of digital switching output D3 (PIN 8 in el. connection)	[mA]	max. 60
Max. permissible supply line length and signal line length	[m]	30
Max. electrical power consumption		
VPPX-6... and VPPX-8...	[W]	7
VPPX-12L-...	[W]	12
Voltage type		
Setpoint variable	[V DC]	0 ... 10
Input resistance (setpoint value)	[kΩ]	10
Output actual value load	[kΩ]	min. 2
Current type		
Setpoint variable	[mA]	4 ... 20
Input resistance (setpoint value)	[Ω]	250
Output actual value load	[Ω]	max. 500

Tab. 8: Characteristic electrical values

### Control characteristics<sup>1)</sup>

Linearity	1% Full Scale (FS)/2% Full Scale (FS)
Hysteresis	0.5% Full Scale (FS)
Reproducibility	0.5% Full Scale (FS)
Total accuracy	1.25% (S1)/2.25 (2%)
Temperature coefficient	0.04/K

1) Maximum deviation, characteristic values determined at room temperature in accordance with ISO 10094. Linearity refers to the ideal characteristic curve.

Tab. 9: Control characteristics