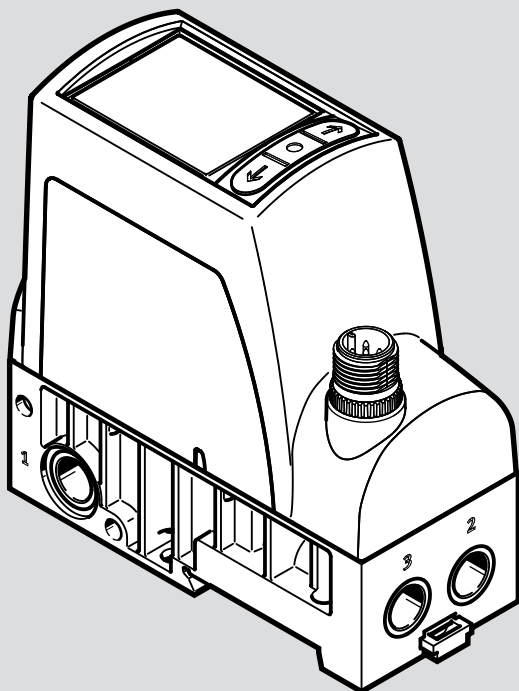


# VPPI-...-A4/-V1-S1D

Proportional-pressure regulator

# FESTO

Operating instruction



8195386

8195386  
2024-01b  
[8195388]

Translation of the original instructions

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# 1 About this document

## 1.1 Applicable documents

Document	Product	Content
Test report <sup>1)</sup>	Proportional-pressure regulator VPPI-...-T	Determined accuracies

1) Only if the test report was selected in the configurator when ordering the product. Available in the Support Portal by entering the product key.

Tab. 1: Applicable documents


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**i**

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

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## 1.2 Product labelling

Symbol	Meaning
	Warning! Damage to the product can result in mechanical, electrical or thermal hazards. Protect the product from mechanical impact.

Tab. 2: Warning symbol

# 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.
- The product may generate high frequency interference, which may require interference suppression measures in residential areas.
- If the 'Custom' parameter set is selected, pressure may briefly rise up to the supply pressures at the working port. This is independent of any set limit values 'Pressure min'/'Pressure max'.

## 2.2 Intended use


The proportional-pressure regulator controls the pressure proportionally to a specified setpoint value. The product is intended for use in industrial environments.

## 2.3 Training of qualified personnel

Work on the product may only be carried out by qualified personnel who can evaluate the work and detect dangers. The qualified personnel have skills and experience in dealing with electropneumatic (open-loop) control technology.

## 2.4 UL 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 approval information	
Product category code	QUYX7 (Canada) QUYX (USA)
File number	E322346
Considered standards	UL 61010 CSA C22.2 NO. 61010-1-12, 3rd Ed.
UL mark	

Tab. 3: UL approval information

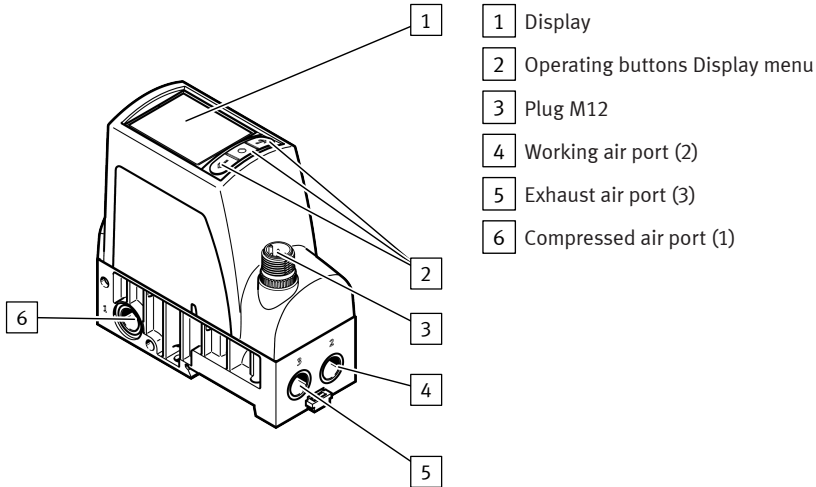
- Technical data for the product may have different values in other documents. The technical data in this document will always have priority for the UL-certified products.
- The unit must be powered by a power source that fulfils the requirements of an energy-limited circuit in accordance with IEC/EN/UL/CSA 61010-1 or a power source with limited power (LPS) in accordance with IEC/EN/UL/CSA 60950-1 or IEC/EN/UL/CSA 62368-1 or a Class 2 circuit in accordance with NEC or CEC.

## 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 Product design



- 1 Display
- 2 Operating buttons Display menu
- 3 Plug M12
- 4 Working air port (2)
- 5 Exhaust air port (3)
- 6 Compressed air port (1)

Fig. 1: Product design

### 4.2 Function

A built-in pressure sensor records the pressure at the working port and compares this value with the setpoint value. In the event of deviations between the setpoint value and actual value, the valve regulates until the outlet pressure has reached the setpoint value.

<b>VPPI -...- 3 -...</b> <b>Working pressure (2) blocked, normally closed</b>	<b>VPPI -...- 4 -...</b> <b>Working pressure (2) is exhausted to the pressure at the exhaust pressure (3), normally open</b>

Tab. 4: Pneumatic circuit symbol

## 5 Assembly

### 5.1 Preparation

- Make sure there is sufficient space for the connecting cable and tubing connections.
- Place the valve as close to the consumer as possible.
- Remove the plug screw and sealant from the duct (1).

## 5.2 Assembling

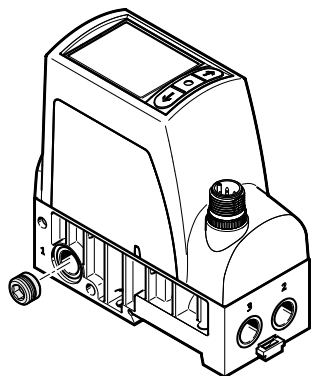
### 5.2.1 Creating pressure zones



For separating pressure zones, connect the compressed air supply to both ends of the valve manifold.

For pressure zone separation, the plug screw can be left in duct (1) of the valve. Plug screws for duct (1) can also be ordered as accessories (VAME-P18-BP-G18-P5) → [www.festo.com/catalogue](http://www.festo.com/catalogue).

- Screw the plug screw into the duct (1) of the selected valve. Screw in the plug screw until it is flush with the surrounding surface.

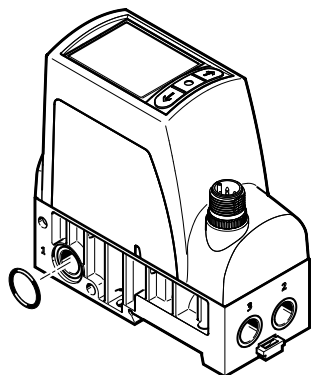


### 5.2.2 Linkage of valves

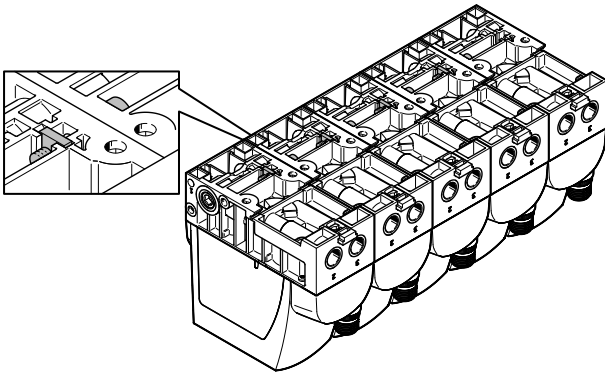
Up to 5 valves can be linked. The connecting kit VAME-P18-K-P5 is required for linking → [www.festo.com/catalogue](http://www.festo.com/catalogue).

The connecting kit consists of 2 square nuts, 2 socket head screws and an O-ring.

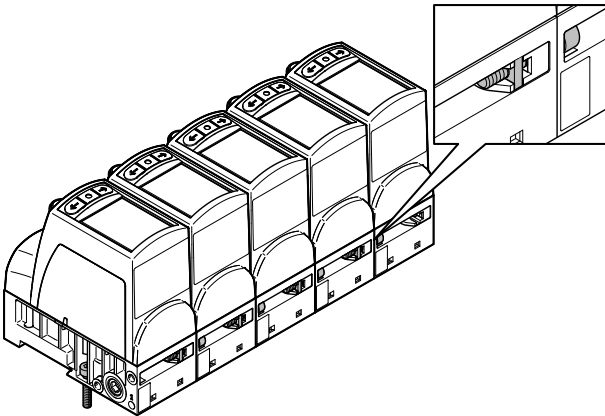
1. Remove the plug screw and sealing material from the duct (1).
2. Insert the O-ring into the duct (1) between 2 valves.



3. Connect the valves on the underside using socket head screws and square nuts. Tightening torque:  $1.2 \pm 0.2$  Nm



4. Connect valves at the rear using socket head screws and square nuts. Tightening torque:  $1.2 \pm 0.2$  Nm



## 5.3 Mounting

### 5.3.1 Mounting via bottom of valve

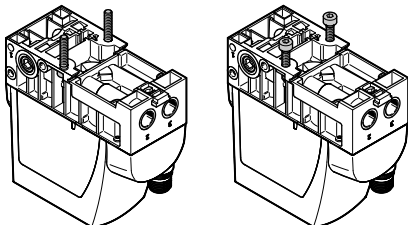


Fig. 2: Mounting via bottom of valve with M4 screws/M4 screws and square nuts



### 5.3.2 Mounting via valve side surface

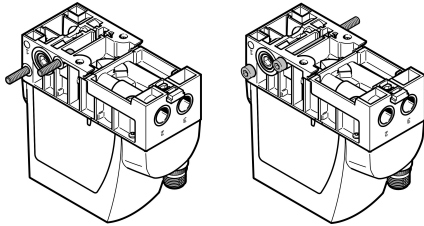


Fig. 3: Mounting via side with internal M4 screws/M4 through screws

### 5.3.3 Mounting on H-rail

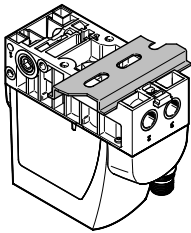


Fig. 4: Individual valve

## 5.4 Fitting

# 6 Installation

## 6.1 Installation, pneumatic

### Valves for standard operation

1. Attach the tubing to the ports:
  - Compressed air (1)
  - Working air (2)
2. Fit a silencer at the exhaust pressure (3) or install ducted exhaust air.

### Valves VPPI-...-1V...H-... for vacuum operation or combined vacuum and standard operation

1. Attach the tubing to the ports:
  - Vacuum (3)
  - Working air (2)
2. Connect a compressed air supply to port (1) or mount a silencer to protect the valve from coarse dirt particles.

## 6.2 Electrical installation

### **⚠ WARNING**

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

- For the electric power supply, use SELV or PELV circuits that guarantee a reliable electric disconnection from the mains network.
- Observe IEC 60204-1/EN 60204-1.

1. If a screened cable is used: earth the screen at the cable end away from the valve.
2. Do not crush, kink or stretch electrical connecting cables during installation.
3. Tighten the electrical connecting cable on the M12 plug. Tightening torque: maximum 0.3 Nm

Connection	Pin	Assignment		Wire colour <sup>1)</sup> (NEBU-M12...)
		Analogue	Digital input (VPPI-...-V only)	
	1	+ 24 V DC	+ 24 V DC	BN
	2	Setpoint value (-)	DI1	WH
	3	GND	GND	BU
	4	Setpoint value (+)/PWM	DI0	BK
	5	Actual value output – based on pin 2 "setpoint value (-)" for type VPPI-...-V... – based on pin 3 "GND" for VPPI-...-A...	DI2	GY

1) Colour code in accordance with IEC 60757:1983-01

Tab. 5: Pin allocation for M12 plug, 5-pin

## 7 Commissioning

#### Requirements:

- The valve is mounted.
  - The pneumatic and electrical installation is complete and tested.
1. Check operating conditions and critical limits → 11 Technical data.
  2. Switch on the power supply.
  3. Switch on the compressed air supply.
  4. Parameterise valve.

## 8 Parameterisation

The valve can be parameterised in the display menu using the 3 operating buttons.

## 8.1 Function of the Operating Buttons

The basic functions of the operating buttons are:

### Press Middle Button:

- Navigate one menu level deeper.
- Accept edited value.

### Hold Middle Button for 3 s (or No Button Press for More than 60 s):

- From any menu level back to the start screen (if a value is currently being edited, it is not accepted).

### Press Left / Right Button:

- Navigate within a menu level.

### Navigate to the Menu Item 'Exit' with the Left or Right Pushbutton and Confirm with the Middle Pushbutton:

- Navigate one menu level higher.

## 8.2 Menu Levels

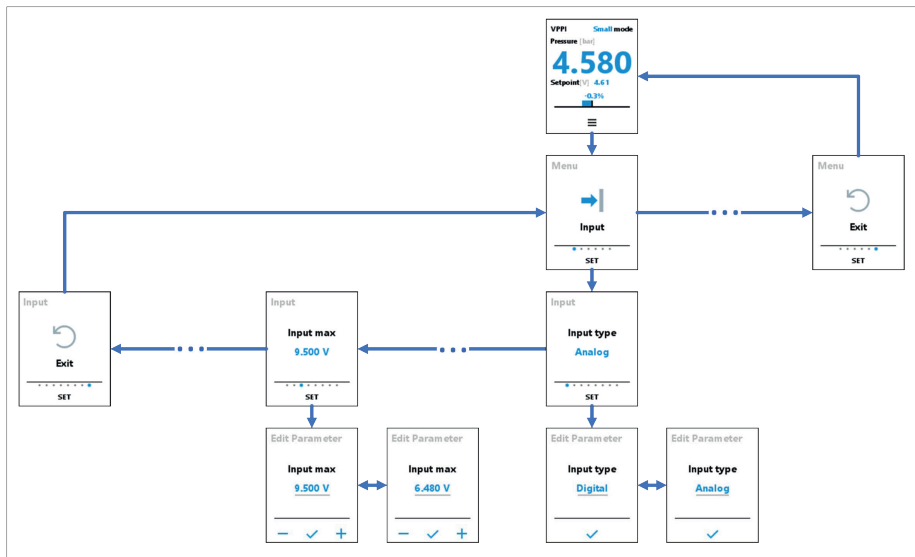


Fig. 5: Menu levels (excerpt)

### 8.3 Contents of the menu

#### Menu level 1 'Input'

Menu option	Content	Description
'Input type'	'Analog'/'Digital'	<p>Appears only for voltage variants. 'Input type' = 'Analog' is for current variants.</p> <ul style="list-style-type: none"> <li>- 'Analog': an analogue voltage/current value via setpoint value (+) and setpoint value (-) determines the setpoint pressure.</li> <li>- 'Digital': one of 8 setpoint values is specified via three digital 24 V inputs. The three inputs are interpreted as a binary number with 3 bits.</li> </ul> <p>The allocation is as follows:</p> <ul style="list-style-type: none"> <li>- Setpoint value (+): DI0 or least significant bit</li> <li>- Setpoint value (-): DI1</li> <li>- Actual value output: DI2 or most significant bit</li> </ul> <p>The value 000 means 0 bar and cannot be edited; the remaining 7 values can be set in 'Input values'. There is no actual value output in this mode.</p>
'Input unit'	[V/mA]/[bar/kPa/psi]/%	<p>Appears only if 'Input type' = 'Analog'.</p> <p>Determines the unit in which the setpoint value is displayed on the main screen.</p>
'Input max'	e.g. 5 V	<p>Appears only if 'Input type' = 'Analog'.</p> <p>upper limit of the analogue setpoint value range</p>
'Input min'	e.g. 0 V	<p>Appears only if 'Input type' = 'Analog'.</p> <p>lower limit of the analogue setpoint value range</p>
'Ramp-up-time'	'Off'/X ms X= 75/125/250/500/ 750/1000/1500/ 2000	<p>Setpoint jumps upwards are filtered with a low-pass filter. The set value is the time constant (tau) in milliseconds.</p>
'Ramp-down-time'	'Off'/X ms X= 75/125/250/500/ 750/1000/1500/ 2000	<p>Setpoint jumps downwards are filtered with a low-pass filter. The set value is the time constant (tau) in milliseconds.</p> <p>Exception: with variants VPPI-...-...L...H-... exhausting to 0 bar is always run as quickly as possible. If deceleration is desired, the pressure must first be exhausted to a pressure of <math>\geq 1\%</math> FS.</p>

Menu option	Content	Description
'Force input'	e.g. 50%	With this, a setpoint value between 0 ... 100 % of the parameterised pressure range can be specified directly via the menu. During this specification, the setpoint input is ignored.
'Exit'	–	–

Tab. 6: "Input"

**Menu level 1'Input values'**

The 'Input values' menu option only appears if 'Input type' = 'Digital' has been selected.

Menu option	Content	Description
'Value 001'	e.g. 6 bar	Setpoint value, if value of the digital inputs = 001
'Value 010'	e.g. 6 bar	Setpoint value, if value of the digital inputs = 010
'Value 011'	e.g. 6 bar	Setpoint value, if value of the digital inputs = 011
'Value 100'	e.g. 6 bar	Setpoint value, if value of the digital inputs = 100
'Value 101'	e.g. 6 bar	Setpoint value, if value of the digital inputs = 101
'Value 110'	e.g. 6 bar	Setpoint value, if value of the digital inputs = 110
'Value 111'	e.g. 6 bar	Setpoint value, if value of the digital inputs = 111
'Exit'	–	–

Tab. 7: "Input values"



One of 8 setpoint values is specified via three digital 24 V inputs. The three inputs are interpreted as a binary number with 3 bits.

The allocation is as follows:

- Setpoint value (+): DI0 or least significant bit
- Setpoint value (-): DI1
- Actual value output: DI2 or most significant bit

The value 000 means 0 bar, the remaining 7 values can be set in 'Input values'.

### Menu level 1'Output'

**i**  
 The 'Output' menu option only appears if 'Input type' = 'Analog' has been selected.

Menu option	Content	Description
'Output type'	'Analog'/'Digital'	Appears only for voltage variants. 'Output type' = 'Analog' is for current variants. <ul style="list-style-type: none"> <li>- 'Analog': the current actual pressure is output as an analogue voltage/current value via the actual value output.</li> <li>- 'Digital': a digital 24 V signal is output via the actual value output, which switches as soon as the actual value is within the parameterised limits.</li> </ul>
'Output max'	e.g. 5 V	Appears only if 'Output type' = 'Analog'. Upper limit of the electrical actual value output in analogue mode
'Output min'	e.g. 0 V	Appears only if 'Output type' = 'Analog'. Lower limit of the electrical actual value output in analogue mode
'Digital out'	'High OK'/'Low OK'	Appears only if 'Input type' = 'Digital'. Switchover of the meaning of high or low signal at the digital output: <ul style="list-style-type: none"> <li>- 'High OK': High is output if the actual value lies within the parameterised limits.</li> <li>- 'Low OK': Low is output if the actual value lies within the parameterised limits.</li> </ul>
'Hysteresis +/-'	e.g. 0.200 bar	Appears only if 'Input type' = 'Digital'. Setting of the limits for the digital output. The set value corresponds to the maximum deviation from the setpoint value, which is evaluated as OK for the digital output.
'Output delay'	e.g. 100 ms	Appears only if 'Input type' = 'Digital'. Delayed output of edge changes at the actual value output in order to filter short status changes (e.g. with setpoint value jumps). Shorter pulses than defined in 'Output delay' are not output.
'Exit'	-	-

Tab. 8: "Output"

**Menu level 1'Pressure'**

<b>Menu option</b>	<b>Content</b>	<b>Description</b>
'Pressure unit'	bar/kPa/psi	Pressure unit in which all pressures are displayed.
'Pressure max'	e.g. 5 bar	Appears only if 'Input type' = 'Analog'. Upper limit of the pressure regulation range
'Pressure min'	e.g. 1 bar	Appears only if 'Input type' = 'Analog'. Lower limit of the pressure regulation range
'Exit'	–	–

Tab. 9: "Pressure"

**Menu level 1'Parameters'**

<b>Menu option</b>	<b>Content</b>	<b>Description</b>
'Parameter set'	Setting of the control response	
	'Small'	– 'Small': default set for all applications. Optimised for closed volumes of 100 ml to approx. 750 ml. For larger volumes, 'Small' results in a softer control response than 'Large'. For applications with flow rate 'Small' is only suitable to a limited extent (< 100 l/min)
	'Large'	– 'Large': optimised for closed volumes ( $\geq$ 750 ml on 1 m tubing, $\varnothing$ 8 mm). Faster regulation of pressure jumps.
	'Flow'	– 'Flow': designed for flow rate applications. Softer control response due to greater hysteresis. Can also be used for closed volumes.
	'Custom'	– 'Custom': individual adaptation to higher volumes or applications with longer/thinner tubing or constrictions within the application.
'Reference run'	'Start'	Appears only if 'Parameter set' = 'Custom' → Running homing.
'Tune pres incr'	e.g. 5200	'Tuning pressure increase' appears only if 'Parameter set' = 'Custom'. Setting of the tuning parameter for pressure jumps upwards.

Menu option	Content	Description
'Tune pres decr'	e.g. 5600	'Tuning pressure decrease' appears only if 'Parameter set' = 'Custom'. Setting of the tuning parameter for pressure jumps downwards.
'Exit'	–	–

Tab. 10: "Parameters"

### 'Custom' parameter set

If the 'Custom' parameter set is selected, brief pressure rises up to the input pressure are possible at the working port. This is independent of any set limit values ('Pressure min'/'Pressure max'). The complete input pressure or the vacuum present at the exhaust port can be present at the working port during the regulation process and during homing.

If the application and the tuning parameters do not match, an uncontrolled response is possible (continuous oscillation, continuous maximum or minimum pressure at the working port). If the application is changed, the tuning parameters must be adjusted.

The 'Custom' parameter set permits individual adjustment/optimisation of the control response for an application. This adjustment enables greater pressure dynamics in the face of a constriction compared to a standard controller. This considerably reduces settling times for pressure jumps. The two required model parameters ('Tuning increase'/'Tuning decrease') can be determined automatically via homing. The determined model parameters can also be adjusted manually at the port at any time. Free input of the two model parameters without homing is also possible.

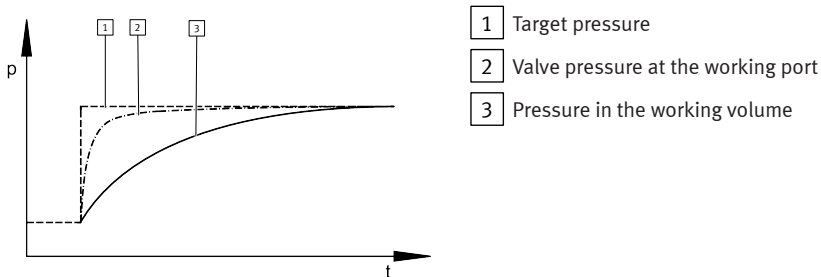


Fig. 6: Pressure jump in standard controller (basic representation)



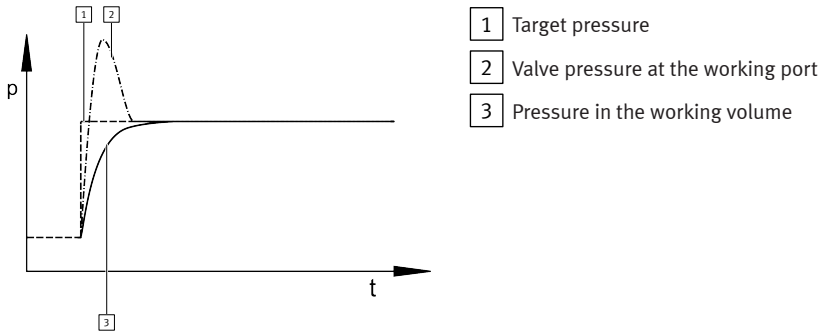


Fig. 7: Pressure jump preset "Custom" (basic representation)

### Running homing

1. Connect application (connected volumes, tubing, air consumption and supply pressure must correspond to the working conditions).
2. Activate 'Custom' parameter set.
3. Select 'Reference run' menu option.
  - ↪ A warning appears.
4. Confirm warning with the middle button.
5. Use the arrow keys to change from the 'Cancel' menu option to the 'Start' menu option and confirm with the middle pushbutton.
  - ↪ Homing is started.
6. Wait until 'Successful' or 'Failed' is displayed.
  - Homing typically takes 30 ... 40 s.
  - ↪ The 'Successful' result indicates that homing has automatically determined tuning parameters. The 'Failed' result indicates that homing has failed.

### Possible causes of a failed homing ('Failed'):

- Lack of supply pressure (working pressure does not reach 'Pressure max'.)
- application too fast (no bottleneck)
- extremely slow application (very large volume, very long tubing)

In these cases, the 'Custom' parameter set can be used by manually entering the 'Tune pres incr'/'Tune pres decr' parameters.

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### i

Manual adjustment/free input of the tuning parameters:

The physical meaning of 'Tune pres incr'/'Tune pres decr' corresponds to that of a master value for the pressurisation or exhaust process. If the tuning parameter is increased, the control response is softened. If the tuning parameter is reduced, the control response becomes more aggressive.

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**Menu level 1'Display'**

<b>Menu option</b>	<b>Content</b>	<b>Description</b>
'Pin code'	0000 ... 9999	Protect device against accidental parameter changes. Pin 0000 switches off pin sensing.
'Sleep timeout'	'Off'/X s, X min X= 5/10/20/40 s 1/3/5 min	Deactivation/activation of sleep mode. If there is no key input in the set time, the valve switches from the main screen to sleep mode, whereby reduced information is displayed on a darkened screen. This setting has no influence on the pressure regulation function.
'Rotate'	'Off'/90°/180°/-90°	Rotates the entire display on the screen for operation when the installation is rotated.
'Graph'	'Accuracy Graph'/'Full-scale Graph'	Displays a deviation graph or a full-scale graph on the main screen.
'Main value'	'Pressure'/'Setpoint'	Highlights either the actual value or the setpoint value on the main screen.
'Exit'	–	–

Tab. 11: "Display"

## 9 Malfunctions

### 9.1 Diagnostics

<b>Error text in the display</b>	<b>Fault description</b>	<b>Remedy</b>
'Overheat'	Working temperature is too high. Valve is in temperature shut-off.	Switch off the valve, let it cool down and restart. Reduce ambient temperature or temperature of medium.
'Cable break'	Cable break setpoint input	Check connection to setpoint generator. Replace electrical connecting cable.
'Oscillation'	Continuous vibration detected.	Select another parameter set for application.
'No air supply'	No input pressure p1. Setpoint value not reached.	Increase input pressure p1. Maintain permissible maximum operating pressure → 11 Technical data.
'DC-supply low'	Supply voltage is too low.	Increase supply voltage.

Error text in the display	Fault description	Remedy
'DC-supply high'	Supply voltage is too high.	Reduce supply voltage.
'Heat protection'	Temperature critical, power reduction active.	Reduce ambient temperature or temperature of medium. Ensure sufficient compressed air supply.
'High deviation'	Setpoint value not reached. Input pressure p1 is too low. Air consumption at the working port is too high.	Increase input pressure p1. Maintain permissible maximum operating pressure → 11 Technical data.
'Setpoint high'	Analogue setpoint value is too high.	Correct setpoint value.

Tab. 12: Error text in the display

## 9.2 Fault clearance

Fault description	Cause	Remedy
Valve does not respond.	Operating voltage not applied.	Check the operating voltage connection.
	No setpoint voltage.	Check the controller and connection.
	Working temperature is too high. Valve is in temperature shut-off.	Switch off the valve, let it cool down and restart. Reduce ambient temperature and / or temperature of medium.
Valve normally open: The working pressure at (2) falls to the level at (3) (ambient pressure or vacuum).	Cable break setpoint input	Check connection to setpoint generator. Replace electrical connecting cable.
Valve normally closed: The working pressure at (2) deviates upwards or downwards from the setpoint value (working pressure is neither pressurised nor exhausted).	Cable break setpoint input	Check connection to setpoint generator. Replace electrical connecting cable.
Setpoint value not reached.	Input pressure at (1) is too low.	Increase input pressure at (1). Maintain permissible maximum operating pressure → 11 Technical data.

Tab. 13: Fault clearance

## 10 Disassembly

1. Specify setpoint value 0 bar (0 MPa).
2. Switch off compressed air supply.
3. Switch off operating voltage.
4. Remove electrical connecting cables.
5. Remove compressed air lines.
6. Dismantle the product.

## 11 Technical data

### 11.1 Technical data, general

<b>VPPI-...-A4/V1-S1</b>	
Certificates, declaration of conformity	→ <a href="http://www.festo.com/sp">www.festo.com/sp</a>
Valve function	3-way proportional-pressure regulator
Mounting position	Any
Product weight [g]	370
Ambient temperature [°C]	0 ... + 50
Storage temperature [°C]	-20 ... +70
Temperature of medium [°C]	0 ... + 50
Degree of protection	IP65 Not applicable to UL
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4]
	Inert gases
Information on the operating medium	Lubricated operation not possible
Climate class in accordance with EN 60721	3k3
Nominal operating altitude	< 3000 m above MSL
<b>Materials</b>	
Seals	HNBR
Housing	PA-reinforced

Tab. 14: Technical data, general

<b>Vibration resistance/shock resistance (in accordance with IEC 60068)</b>	
Vibration resistance in accordance with IEC 60068-2-6	Single valve mounted with screws: SL2
	Single valve mounted on H-rail: SG1
	Linkage of a maximum of 3 valves: SG2
	Linkage of a maximum of 5 valves: SG1
Shock resistance in accordance with IEC 60068-2-27	Single valve mounted with screws: SL2
	Single valve on H-rail: SL1
	Linkage of a maximum of 3 valves with side screw mounting: SG2
	Linkage of a maximum of 5 valves with side screw mounting: SG1

Tab. 15: Operating conditions and ambient conditions

<b>Type of severity level (SL)</b>					
<b>Vibration load</b>					
Frequency range [Hz]		Acceleration [ $m/s^2$ ]		Deflection [mm]	
SL1	SL2	SL1	SG2	SL1	SL2
2 ... 8	2 ... 8	–	–	$\pm 3.5$	$\pm 3.5$
8 ... 27	8 ... 27	10	10	–	–
27 ... 58	27 ... 60	–	–	$\pm 0.15$	$\pm 0.35$
58 ... 160	60 ... 160	20	50	–	–
160 ... 200	160 ... 200	10	10	–	–
<b>Shock load</b>					
Acceleration [ $m/s^2$ ]		Duration [ms]		Shocks per direction	
SL1	SL2	SL1	SL2	SL1	SL2
$\pm 150$	$\pm 300$	11	11	5	5
<b>Continuous shock load</b>					
Acceleration [ $m/s^2$ ]		Duration [ms]		Shocks per direction	
$\pm 150$		6		1000	

Tab. 16: Type of severity level (SL)

### Cable break detection

Values for 'Input min' > 500 mV or > 2 mA activate the internal sensors for cable break detection. The sensor detects a cable break at voltages of < 500 mV or at currents of < 2 mA.

<b>Cable break detection</b>		
Valve variant	Default value 'Input min', adjustable	Cable break detection
VPPI-...-A4-...	< 2 mA	Cable break detection inactive.
	≥ 2 mA	Cable break detection active. At analogue input values below 2 mA the 'Cable break' error is displayed and the valve moves to the normal position.
VPPI-...-V1-...	< 500 mV	Cable break detection inactive.
	≥ 500 mV	Cable break detection active. At analogue input values below 500 mV the 'Cable break' error is displayed and the valve moves to the normal position.

Tab. 17: Cable break detection

<b>Zero point suppression</b>		
Valve variant	'Pressure min' menu setting	Response with < 0.7% Full scale setpoint value
VPPI-...-...L...H-...	0 MPa	Exhaust to 0 bar and keep the exhaust open.
	> 0 MPa	Active control on 'Pressure min'.
VPPI-...-1V1H-...	-0.1 MPa	Valve moves to normal position.
	> -0.1 MPA	Active control on 'Pressure min'.
VPPI-...-1VOH-...	-	Active control on 'Pressure max'.

Tab. 18: Zero point suppression

Setpoint values < 0.7% Full scale above the minimum input value ('Input min') are interpreted as the lowest input value in order to suppress noise at the input signal → Fig. 8. Depending on the valve variant and the minimum input pressure, there may be a special response in this area → Tab. 18 Zero point suppression.

Technical data

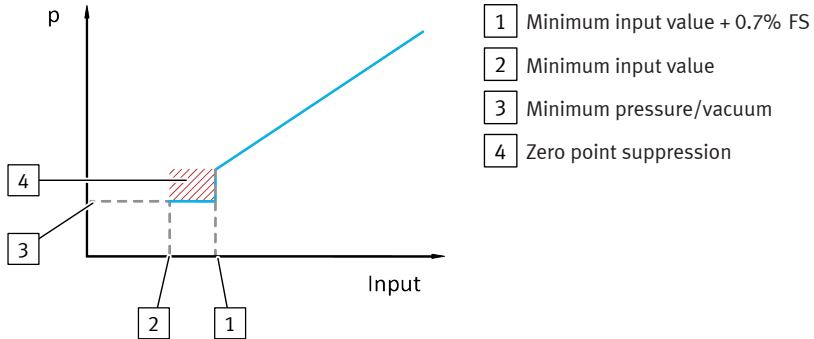


Fig. 8: Zero point suppression

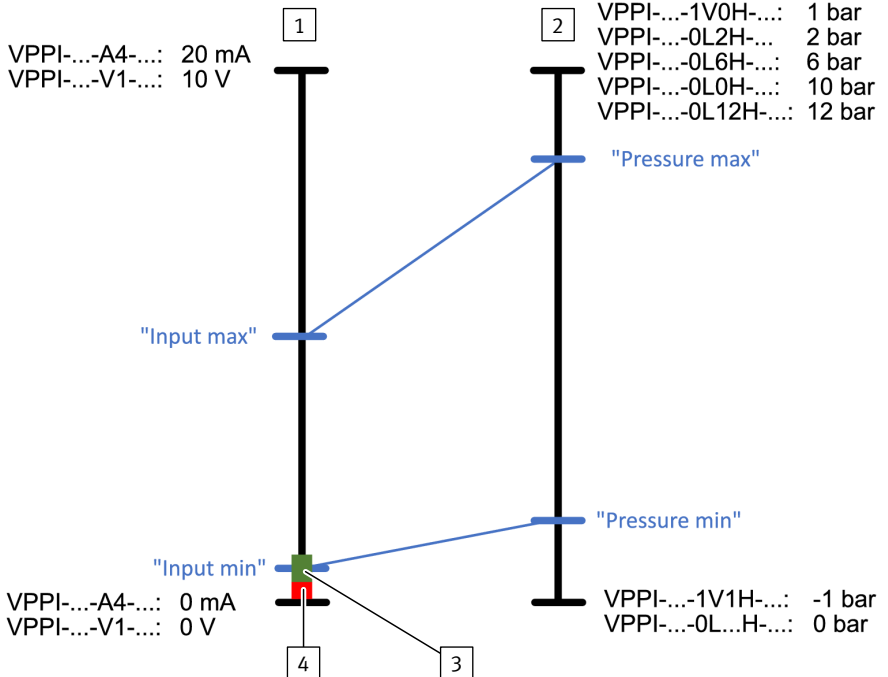


Fig. 9: Valve variants for excess pressure and vacuum/excess pressure

- 1 Analogue setpoint value
- 2 Target pressure
- 3 Zero shutdown
- 4 Cable break

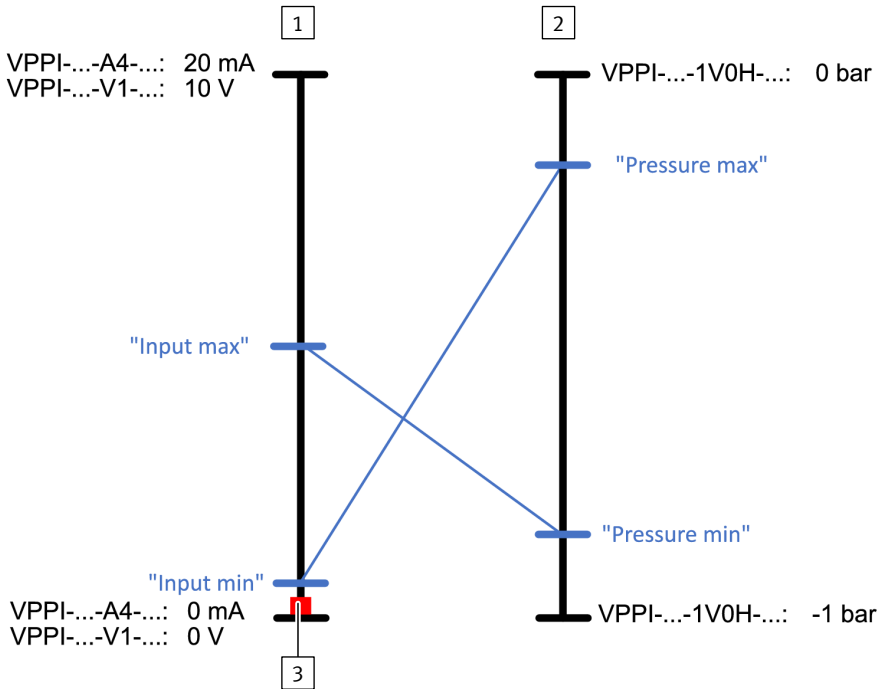


Fig. 10: Valve variants for vacuum

- 1 Analogue setpoint value
- 2 Target pressure
- 3 Cable break

Closed-loop systems characteristics <sup>1)</sup>	
Linearity	0.9% FS (full scale)
Hysteresis	0.4% FS
Reproducibility	0.4% FS
Total accuracy	1.1% FS
Temperature coefficient	0.02/K

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

Tab. 19: Closed-loop systems characteristics



## 11.2 Technical data, pneumatic

VPPI-...-	1V0H <sup>1)</sup>	1V1H	0L2H	0L6H	0L10H	0L12H
Input pressure at (1) <sup>2)</sup> [MPa] [bar]	0 ... 0.6 0 ... 6	0 ... 0.6 0 ... 6	0 ... 0.6 0 ... 6	0 ... 1.3 0 ... 13	0 ... 1.3 0 ... 13	0 ... 1.3 0 ... 13
Operating pressure at (1) <sup>3)</sup> [MPa] [bar]	0 ... 0.2 0 ... 2	0.1 ... 0.2 1 ... 2	0.2 ... 0.4 2 ... 4	0.6 ... 0.8 6 ... 8	1.0 ... 1.2 10 ... 12	1.2 ... 1.3 12 ... 13
Input pressure at (3) [MPa] Vacuum [bar]	-0.1 ... 0 -1 ... 0	-0.1 ... 0 -1 ... 0	-	-	-	-
Operating pressure at (3) [MPa] [bar]	-0.1 ... 0 -1 ... 0	-0.1 ... 0 -1 ... 0	-	-	-	-
Pressure regulation range <sup>4)</sup> on (2) [MPa] [bar]	-0.1 ... 0 -1 ... 0	-0.1 ... +0.1 -1 ... +1	0 ... 0.2 0 ... 2	0 ... 0.6 0 ... 6	0 ... 1.0 0 ... 10	0 ... 1.2 0 ... 12

1) For variants VPPI-...-1V0H... 0% corresponds to setpoint value 0 bar and 100% to setpoint value -1 bar.

2) The valve can be operated at an input pressure within the specified range. It must be noted here that the specified control quality is only fulfilled with a permanent supply within the operating pressure range and that the control pressure can reach the maximum available input pressure.

3) The specified control quality is only achieved if there is a permanent operating pressure supply at the valve within the specified range.

4) Active regulation is only from a setpoint value of 1% FS, below which the valve is at zero point suppression.

Tab. 20: Technical data, pneumatic

## 11.3 Technical data, electrical

VPPI-...-S1	-A4	-V1
Nominal operating voltage [V DC]	24	
Operating voltage range [V DC]	21.6 ... 27.6	
Nominal current [mA]	150	
Max. current consumption [mA]	≤ 525	
Max. permissible signal line length [m]	30	
Setpoint input		
Setpoint value input	[V DC]	0 ... 10
	[mA]	4 ... 20
Input voltage PWM/digital inputs [V DC]	-	24 Type 1 in accordance with DIN EN 61131
PWM frequency [Hz]	-	200 ... 800
PWM duty cycle [%]	-	20 ... 100

## Technical data

VPPI-...-S1		-A4	-V1
Input resistance	[kΩ]	–	100
	[kΩ]	0.3	–
Actual value output			
Max. output current	[mA]	25	
Analogue output	[V DC]	–	0 ... 10
	[mA]	4 ... 20	–

Tab. 21: Technical data, electrical

### 11.4 Technical data for UL certification

VPPI	
Installation site	For indoor use only. Suitable for use in moist environments.
Pollution degree	2
Relative humidity	[%] 0 ... 85
Maximum fluid temperature/ambient	[°C] 0 ... +50
	[°F] 32 ... +122
Operating voltage range	[V DC] 21.6 ... 27.6
Max. current consumption	[mA] 525
Max. installation height	[m] 3000
Overvoltage category	II
Protection class	III SELV/PELV

Tab. 22: Technical data UL



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