

Proportional pressure regulator VPPI

FESTO



Key features

Special characteristics

- Three predefined regulator presets, as well as the option of a custom preset
- Low-noise
- Flexible
- Highly dynamic up to 30 Hz
- The max. frequency of 30 Hz protects the system
- Available with Bluetooth interface
- Precise and stable: the powerful moving coil actuator also ensures that setpoint value changes are quick, easy and precise
- Lots of pressure ranges
- Pressure regulation range: -0.1 ... 1.2 MPa
- PWM operation: the VPPI detects PWM signals generated by any machine controller and adjusts them automatically

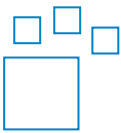
Function

The valve VPPI is a directly actuated proportional pressure regulator that uses two proportional 2/2-way valves as a basis.

The valve regulates a pneumatic pressure to an electronically defined value. This makes use of cascaded closed-loop control of pressure/motion and current.

Control is provided using an analogue current or voltage signal, or alternatively using a digital pattern (voltage version only) for adjustable setpoint values, or using a PWM signal (voltage version only).

Ordering data – Product options



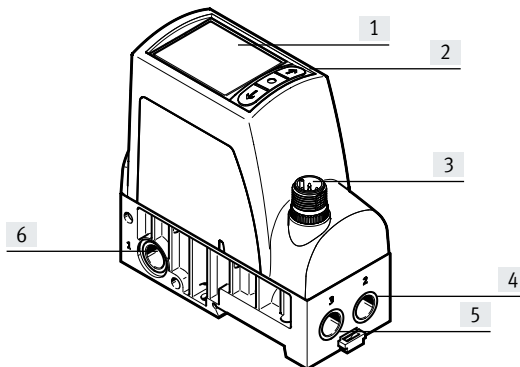
Configurable product
This product and all its product options can be ordered using the configurator.

The configurator can be found at
→ www.festo.com/catalogue/...
Enter the part number or the type.

Part no.	Type
8074287	VPPI

Key features

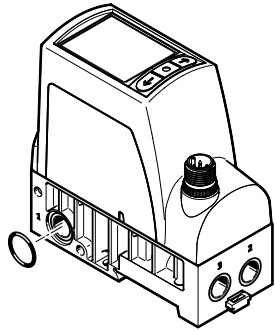
Configuration



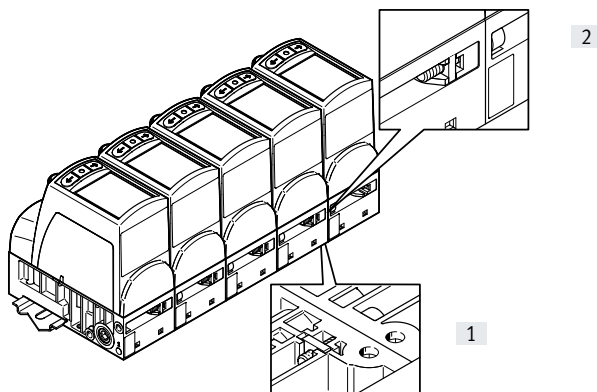
- [1] Display
- [2] Operating buttons display menu
- [3] Electrical connection, M12
- [4] Port 2, working air
- [5] Port 3, exhaust air
- [6] Port 1, compressed air

Mounting

Linking of valves



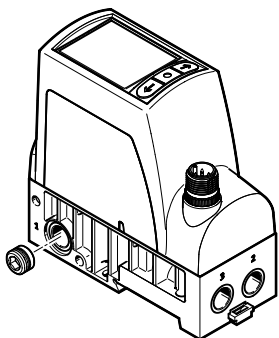
Up to five valves can be linked using connecting kit VAME-P18-K-P5. The connecting kit consists of two square nuts, two socket head screws and an O-ring.



- [1] The valves are connected on the underside using socket head screws and square nuts.
- [2] The valves are connected at the rear using socket head screws and square nuts.

Key features

Pressure zone separation

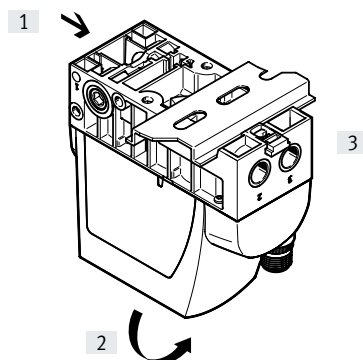


Linked valves can be divided into two pressure zones. To do this, duct 1 is closed on the corresponding side using a plug screw.

Plug screws for duct 1 can be ordered as accessories (VAME-P18-BP-G18-P5). In the case of pressure zone separation, the compressed air must be supplied from both sides.

Mounting

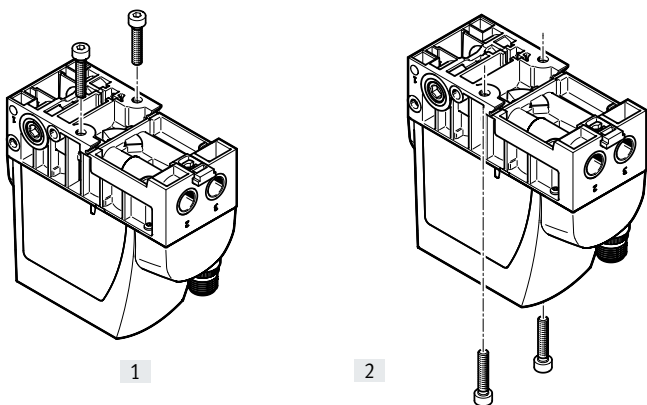
Via H-rail



The valve VPPI is hung onto the H-rail [1]. It is then swivelled onto the H-rail [2] and secured in place using the clamping piece [3].

Linked valves are mounted on the H-rail in the same way. The clamping pieces of the outer valves can be used to secure them in place.

Underneath the valve

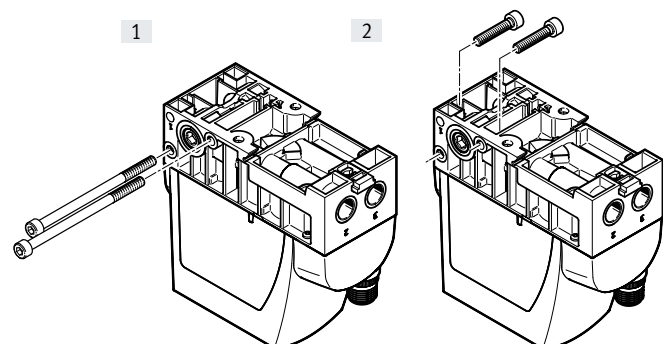


Individual mounting underneath:

- [1] Mounting using screws M4 and square nuts
- [2] Mounting using screws M4

Linked valves are mounted on the valve underside in the same way. Only the two outermost screws are used for mounting.

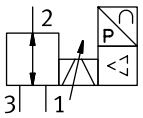
On the side



Individual mounting on the side:

- [1] Using through screws
- [2] Using internal screws

Product range overview

Function	Circuit symbol	Type	Valve function	Pressure regulation range		Setpoint value input	
				[MPa]	[bar]	Voltage type	Current type
						0 ... 10 V	4 ... 20 mA
Proportional pressure regulator		VPPI-5L-3	<ul style="list-style-type: none"> • 3-way proportional pressure regulator • Normally closed 	-0.1 ... 0	-1 ... 0	■	■
				-0.1 ... 0.1	-1 ... 1	■	■
				0 ... 0.2	0 ... 2	■	■
				0 ... 0.6	0 ... 6	■	■
				0 ... 1	0 ... 10	■	■
				0 ... 1.2	0 ... 12	■	■

Type codes

001	Series	
VPPI	Proportional-pressure regulator	

002	Nominal width [mm]	
5	5	

003	Directional control valve type	
L	In-line valve	

004	Valve function	
4	3/3-way valve, normally open	
3	3/3-way valve, normally closed	

005	Pneumatic connection	
G18	G1/8	

006	Lower pressure value of control range	
1V	-1 bar	
0L	0 bar	
...L	... bar	

007	Upper pressure value of control range	
0H	0 bar	
1H	1 bar	
2H	2 bar	
6H	6 bar	
10H	10 bar	
12H	12 bar	
...H	... bar	

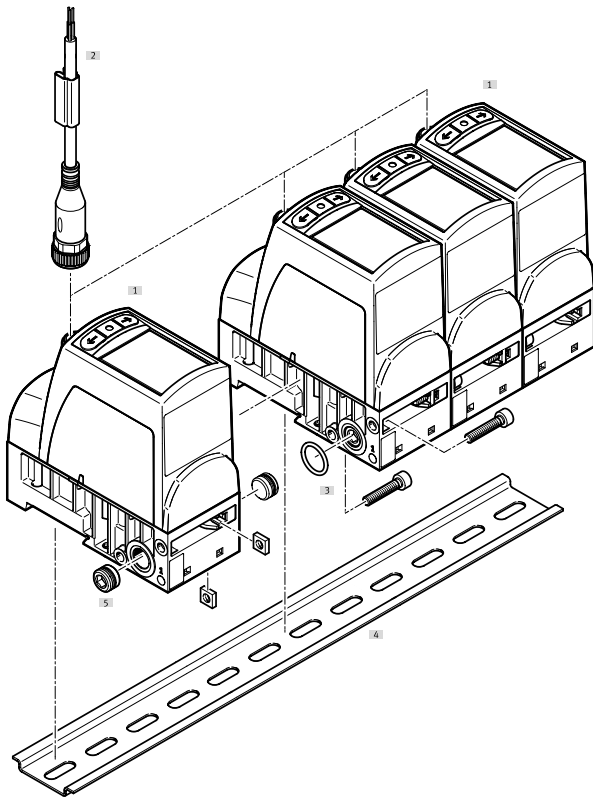
008	Setpoint input for individual valves	
A4	4 ... 20 mA	
V1	0 ... 10 V	

009	Overall accuracy	
S1	1 %	

010	Operator unit/interface	
	None	
D	Display	
BT	Bluetooth	

011	Certificate	
	None	
T	Test report	

Peripherals overview





Accessories


	Type/order code	Description	→ Page/Internet
[1]	VPPI	Proportional pressure regulator	16
[2]	NEBU-M12W5	Connecting cable	16
[3]	VAME-P18-K-P5	Connecting kit, enables several proportional pressure regulators to be linked using a common compressed air supply	16
[4]	NRH-35-2000	DIN mounting rail, for a maximum of five proportional pressure regulators	17
[5]	B	Blanking plug	17

Proportional pressure regulator VPPI

Datasheet

 - Flow rate
150 ... 1630 l/min

 - Voltage
21.6 ... 27.6 V DC

 - Pressure regulation range
-0.1 ... 0 MPa
-0.1 ... 0.1 MPa
0 ... 0.2 MPa
0 ... 0.6 MPa
0 ... 1 MPa
0 ... 1.2 MPa



General technical data		-1 bar	±1 bar	2 bar	6 bar	10 bar	12 bar
Valve function		3-way proportional pressure regulator					
Design		Poppet valve with spring return					
Reset method		Mechanical spring					
Dimensions W x L x H		42.2 mm x 95.3 mm x 94.3 mm					
Display type		LED					
	With display (-...D-...)	TFT colour					
Safety instructions		Safety position VPPI, normally closed					
Display size	With display (-...D-...)	1.77"					
Display resolution		128x160 pixels					
Nominal size pressurisation/exhaust	[mm]	5					
Pneumatic connection 1		G1/8					
Pneumatic connection 2		G1/8					
Pneumatic connection 3		G1/8					
Standard nominal flow rate q _N 1-2	[l/min]	-	150	375	900	1400	1630
Standard nominal flow rate q _N 2-3	[l/min]	20	20	210	480	750	850
Sealing principle		Soft					
Flow direction		Not reversible					
Actuation type		Electrical					
Type of control		Direct					
Type of mounting		Via through-hole for M4 screw, via H-rail					
Mounting position		Any					
Degree of protection		IP65					
Corrosion resistance class ¹⁾		2					
Product weight	[g]	365					
	With display (-...D-...)	[g]	370				
Max. tightening torque of fitting	[Nm]	8.5					
Application note		The product is suitable for industrial purposes only. In residential areas, measures for radio interference suppression may have to be taken.					

1) Further information www.festo.com/x/topic/kbk

Datasheet

Electrical data			
Operating voltage range		[V DC]	21.6 ... 27.6
Nominal operating voltage		[V DC]	24
Nominal current		[A]	0.15
Max. current consumption		[mA]	525
Max. electrical power consumption		[W]	14.5
Reverse polarity protection			For all electrical connections
Short circuit current rating			For all electrical connections
Max. cable length		[m]	30
Electrical connection 1			
Function			Actual value output
			Setpoint input
			Power supply
Connection type			Plug
Connection technology			M12x1, A-coded to EN 61076-2-101
Number of pins/wires			5
Tightening torque		[Nm]	1.5
Setpoint input			
Setpoint value input	Voltage type (-V1-...)	[V]	0 ... 10/PMW signal/ digital ¹⁾
	Current type (-A4-...)	[mA]	4 ... 20
Input resistance	Voltage type (-V1-...)	[kOhm]	100
	Current type (-A4-...)	[kOhm]	0.3
Actual value output			
Switching output ¹⁾			Push-pull
Max. output current (switching output) ¹⁾		[mA]	25
Analogue output signal range	Voltage type (-V1-...)	[V]	0 ... 10
	Current type (-A4-...)	[mA]	4 ... 20
Max. load resistance of current output	Current type (-A4-...)	[ohm]	500
Min. load resistance of voltage output	Voltage type (-V1-...)	[ohm]	2000
Accuracy of analogue output in FS		[%]	1

1) Only in combination with display variant VPPI-...V...-...D-...

Datasheet

Operating and environmental conditions		
Medium		Compressed air to ISO 8573-1:2010 [7:4:4] Inert gases
Note on the medium		Lubricated operation not possible
Temperature of medium	[°C]	0 ... 50
Ambient temperature	[°C]	0 ... 50
Storage temperature	[°C]	- 20 ... 70
Climatic category		3K3 to EN 60721
Relative humidity		0 ... 85 % Non-condensing
Nominal operating altitude	[m above sea level]	< 3000
Sound power level LwA	[dB(A)]	62.5
Sound power level at a distance of 1 m	[dB(A)]	51.9
Linearity full scale	[%]	0.9
Hysteresis full scale	[%]	0.4
Reproducibility full scale	[%]	0.4
Overall accuracy full scale	[%]	1.1
Temperature coefficient K	[%]	0.02
Total leakage	[l/h]	5
Certification	All, except VPPI-...-...BT-...	RCM
		c UL us - Listed (OL)
	Only VPPI-...-...BT-...	FCC
		MIC c UL us - Listed (OL)
Certificate-issuing authority		UL E322346
Pollution degree		2
Cleanroom class		ISO class 4
KC marking	All, except VPPI-...-...BT-...	KC EMC
CE marking (see declaration of conformity)	VPPI-...	To EU EMC Directive ¹⁾
		To EU RoHS Directive ¹⁾
	Only VPPI-...-...BT-...	To EU Radio Equipment Directive (RED) ¹⁾
UKCA marking (see declaration of conformity)	VPPI-...	To UK EMC regulations ¹⁾
		To UK RoHS regulations ¹⁾
Food-safe		See supplementary material information ²⁾
Vibration resistant		Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6
		Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27

1) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... → Support/Downloads.

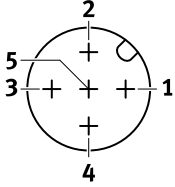
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

2) More information: www.festo.com/catalogue/... → Support/Downloads.

Datasheet

Operating and environmental conditions		-1 bar	±1 bar	2 bar	6 bar	10 bar	12 bar
Operating pressure	[bar]	0 ... 2	1 ... 2	2 ... 4	6 ... 8	10 ... 12	12 ... 13
Pressure regulation range	[MPa]	-0.1 ... 0	-0.1 ... 0.1	0 ... 0.2	0 ... 0.6	0 ... 1	0 ... 1.2
	[bar]	-1 ... 0	-1 ... 1	0 ... 2	0 ... 6	0 ... 10	0 ... 12
Input pressure 1	[MPa]	0 ... 0.6	0 ... 0.6	0 ... 0.6	0 ... 1.3	0 ... 1.3	0 ... 1.3
	[bar]	0 ... 6	0 ... 6	0 ... 6	0 ... 13	0 ... 13	0 ... 13
Input pressure 3	[MPa]	-0.1	-0.1	-	-	-	-
	[bar]	-1	-1	-	-	-	-
Burst pressure	[bar]	40	40	40	40	40	40

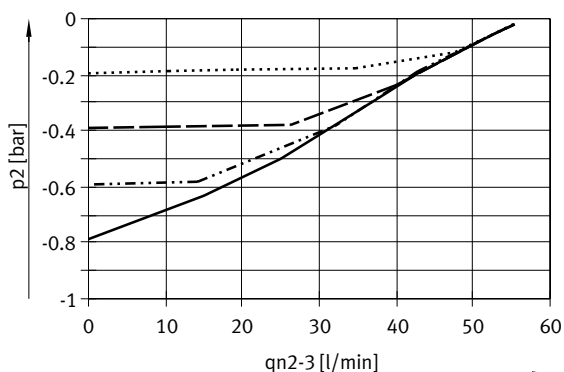
Information on materials	
Note on materials	RoHS-compliant
Housing material	Reinforced PA
Sealing material	HNBR
	PTFE

Pin allocation, electrical connection			
	Pin	Allocation	
		Analogue	Alternative / digital input (switchable with display variant)
	1	+ 24 V DC	+ 24 V DC
	2	Setpoint value (-)	DI1
	3	GND	GND
	4	Setpoint value (+)/PWM	DI0
	5	Actual value output <ul style="list-style-type: none"> • Related to pin 2 "Setpoint value (-)" for type VPPI- ... -V1- • Related to pin 3 "GND" for VPPI- ... -A4-... 	DI2

Datasheet

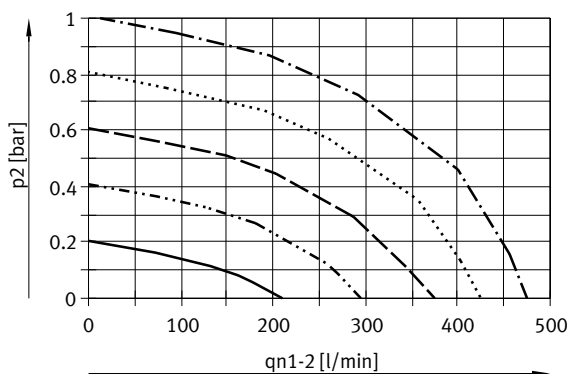
Flow rate q_n for valves with pressure regulation range $-1 \dots 0$ bar and for valves with pressure regulation range $-1 \dots +1$ bar

Flow rate $2 > 3$; as a function of output pressure p_2

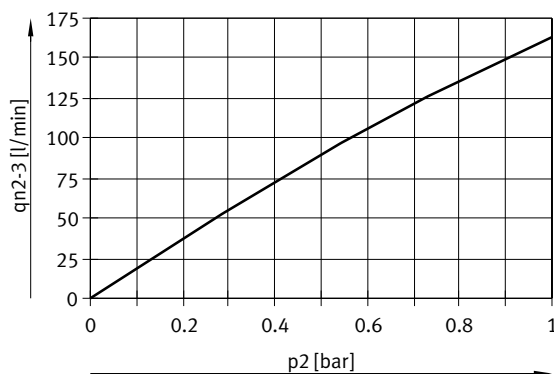


Flow rate q_n for valves with pressure regulation range $-1 \dots +1$ bar

Flow rate $1 > 2$; as a function of output pressure p_2

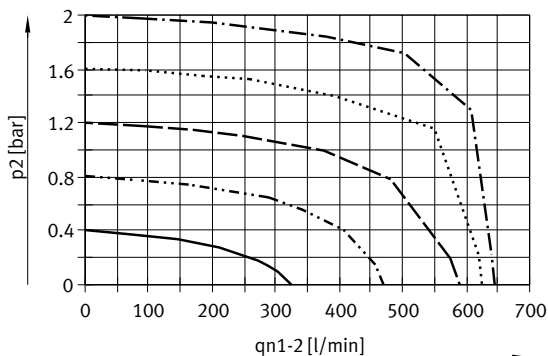


Flow rate $2 > 3$; as a function of output pressure p_2

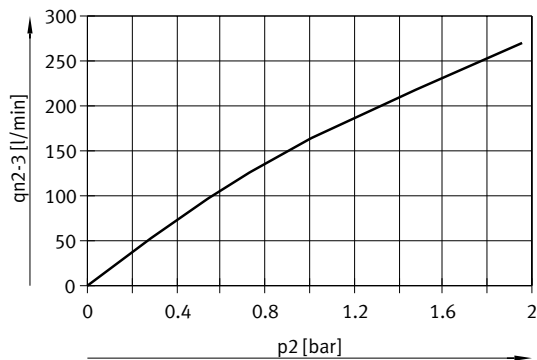


Flow rate q_n for valves with pressure regulation range $0 \dots 2$ bar

Flow rate $1 > 2$; as a function of output pressure p_2



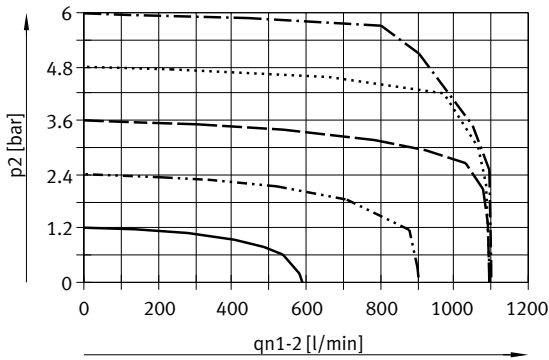
Flow rate $2 > 3$; as a function of output pressure p_2



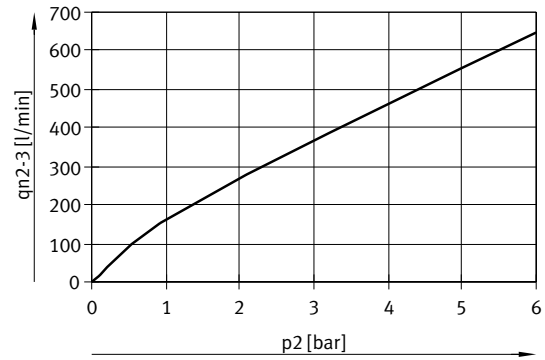
Datasheet

Flow rate q_n for valves with pressure regulation range 0 ... 6 bar

Flow rate 1 > 2; as a function of output pressure p_2

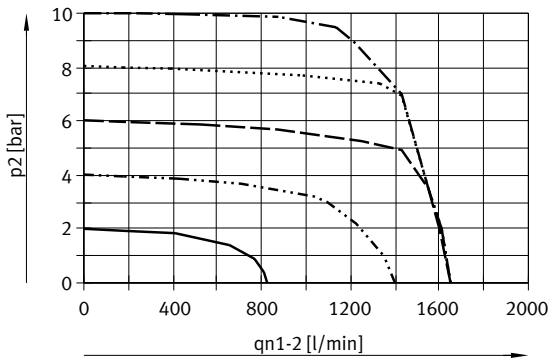


Flow rate 2 > 3; as a function of output pressure p_2

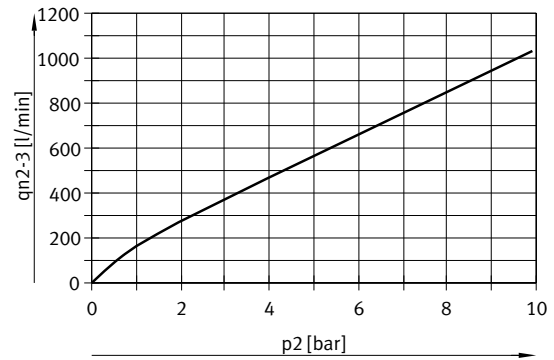


Flow rate q_n for valves with pressure regulation range 0 ... 10 bar

Flow rate 1 > 2; as a function of output pressure p_2

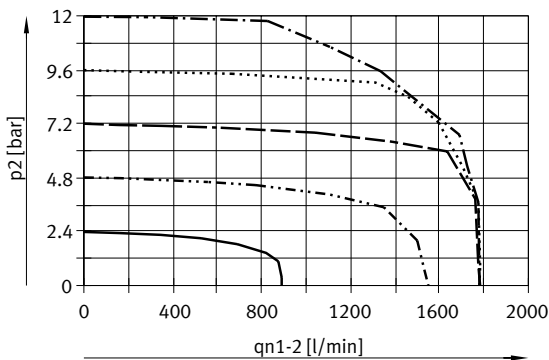


Flow rate 2 > 3; as a function of output pressure p_2

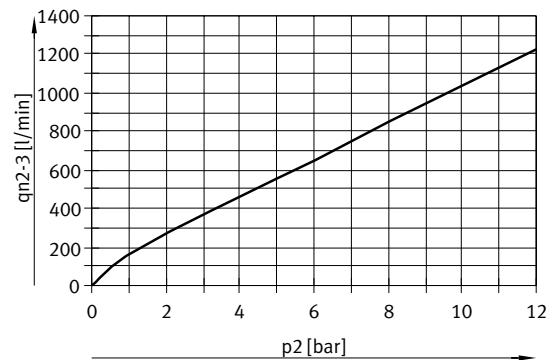


Flow rate q_n for valves with pressure regulation range 0 ... 12 bar

Flow rate 1 > 2; as a function of output pressure p_2



Flow rate 2 > 3; as a function of output pressure p_2

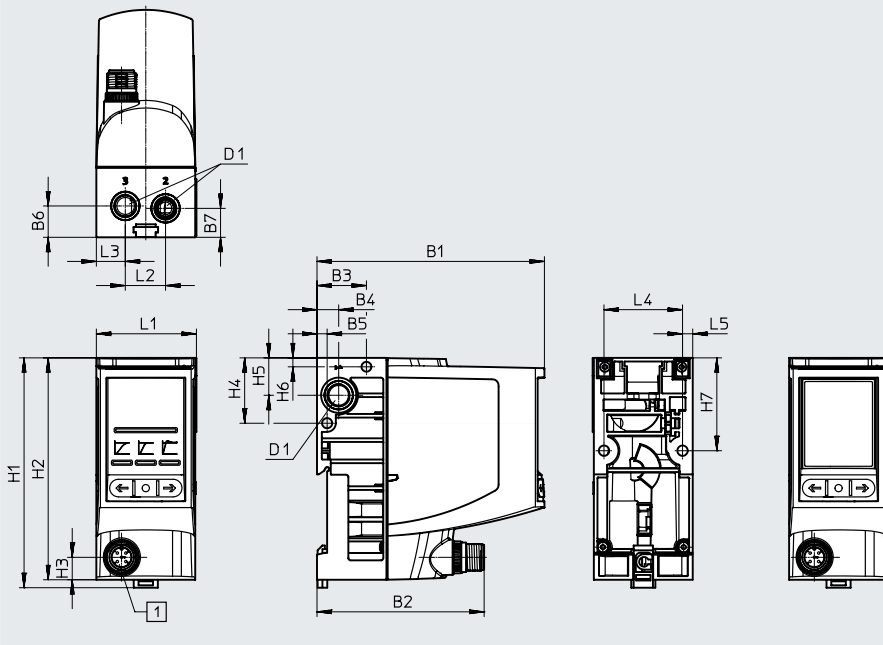


Datasheet

Dimensions

Download CAD data → www.festo.com

[1] M12x1, A-coded to EN 61076-2-101



Type	B1	B2	B3	B4	B5	B6	B7	D1	H1	H2	H3	H4	H5	H6	H7
VPPI	94.3	69.3	20.5	9	4.2	13	12	G1/8	95.3	92	9.3	27.1	15.5	3.7	38.5

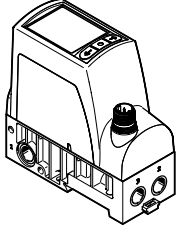
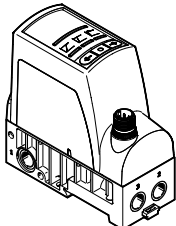
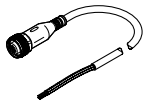
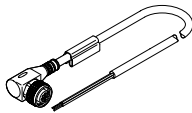

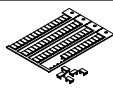

Type	L1	L2	L3	L4	L5
VPPI	41.2	16.7	12	32.6	4.2

Ordering data – Modular product system



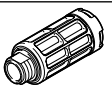
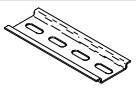
Ordering table		Conditions	Code	Enter code
Module no.	8074287			
Design	Proportional pressure regulator		VPPI	VPPI
Nominal size	5 mm		-5	-5
Valve type	In-line valve		L	L
Valve function	3/3-way valve, normally open		-4	
	3/3-way valve, normally closed		-3	
Pneumatic connection	G1/8		-G18	-G18
Lower pressure value of control range	... bar	[1]	-...L	
	0 bar	[1]	-0L	
	-1 bar	[2]	-1V	
Upper pressure value of control range	...H	[1]	...H	
	0 bar	[1]	0H	
	1 bar	[1]	1H	
	2 bar	[1]	2H	
	6 bar	[1]	6H	
	10 bar	[1]	10H	
Setpoint value input for individual valves	4 ... 20 mA		-A4	
	0 ... 10 V		-V1	
Overall accuracy	1%		-S1	-S1
Operator unit/interface	Display		D	
	Bluetooth		BT	
	None			
Certificates	With digital test report		-T	
	None			

- 1) The upper control range pressure value must always be greater than the lower control range pressure value
 With an upper control range pressure value of less than 10 bar and greater than 6 bar, the difference with respect to the lower control range pressure value must be at least 1 bar
 With an upper control range pressure value of less than 6 bar and greater than 2 bar, the difference with respect to the lower control range pressure value must be at least 0.6 bar
 With an upper control range pressure value of less than 2 bar, the difference with respect to the lower control range pressure value must be at least 0.5 bar
- 2) 1V Only with upper control range pressure value of 0H and 1H (0 bar and 1 bar)

Accessories

Ordering data		Pressure regulation range [MPa] [bar]	Description	Part no.	Type		
Proportional pressure regulator							
With display							
	0 ... 0.6	0 ... 6	Normally open	Voltage type 0 ... 10 V	8104666	VPPI-5L-4-G18-0L6H-V1-S1D	
	0 ... 1	0 ... 10		Voltage type 0 ... 10 V	8104671	VPPI-5L-4-G18-0L10H-V1-S1D	
	-0.1 ... 0.1	-1 ... 1	Normally closed	Voltage type 0 ... 10 V	8104673	VPPI-5L-3-G18-1V1H-V1-S1D	
	0 ... 0.6	0 ... 6		Voltage type 0 ... 10 V	8104665	VPPI-5L-3-G18-0L6H-V1-S1D	
	0 ... 0.6	0 ... 6		Current type 4 ... 20 mA	8104667	VPPI-5L-3-G18-0L6H-A4-S1D	
	0 ... 1	0 ... 10		Voltage type 0 ... 10 V	8104669	VPPI-5L-3-G18-0L10H-V1-S1D	
	0 ... 1	0 ... 10		Current type 4 ... 20 mA	8104670	VPPI-5L-3-G18-0L10H-A4-S1D	
	0 ... 1.2	0 ... 12		Voltage type 0 ... 10 V	8104672	VPPI-5L-3-G18-0L12H-V1-S1D	
	Without display						
	0 ... 0.6	0 ... 6	Normally closed	Voltage type 0 ... 10 V	-	8104664	VPPI-5L-3-G18-0L6H-V1-S1
	0 ... 1	0 ... 10				8104668	VPPI-5L-3-G18-0L10H-V1-S1
	0 ... 0.2	0 ... 2	With Bluetooth interface	Voltage type 0 ... 10 V	-	8153295	VPPI-5L-3-G18-0L2H-V1-S1BT
	0 ... 0.6	0 ... 6				8153296	VPPI-5L-3-G18-0L6H-V1-S1BT
	0 ... 1	0 ... 10				8153297	VPPI-5L-3-G18-0L10H-V1-S1BT
	-0.1 ... 0	-1 ... 0				8153298	VPPI-5L-3-G18-1V0H-V1-S1BT
	Ordering data						
Ordering data		Description	Part no.	Type			
Connecting cable Datasheets → Internet: nebu							
	Straight socket, M12x1, A-coded	2.5 m	541330	NEBU-M12G5-K-2.5-LE5			
		5 m	541331	NEBU-M12G5-K-5-LE5			
	Angled socket, M12x1, A-coded	2.5 m	567843	NEBU-M12W5-K-2.5-LE5			
		5 m	567844	NEBU-M12W5-K-5-LE5			
Inscription label holder Datasheets → Internet: vmpal							
	10 pieces	561115	VMPAL-ST-AP-20				
Inscription label Datasheets → Internet: vmpal							
	64 inscription labels	18576	IBS-6X10				
Connecting kit Datasheets → Internet: nebu							
	Connecting kit, for linking several proportional pressure regulators using a common compressed air supply	8108270	VAME-P18-K-P5				

Accessories

Ordering data		Description	Part no.	Type	PU ¹⁾
Blanking plug Datasheets → Internet: b					
	For G1/8 thread		3568	B-1/8-10	10
			534213	B-1/8-100	100
Plug screw Datasheets → Internet: vame					
	For duct 1 of the valve for pressure zone separation		8108292	VAME-P18-BP-G18-P5	5
			8108271	VAME-P18-BP-G18-P10	10
Silencer Datasheets → Internet: uc					
	For reducing noise at exhaust ports	For G1/8 thread	2307	U-1/8	1
			534222	U-1/8-50	50
			161419	UC-1/8	1
			534219	UC-1/8-50	50
DIN mounting rail Datasheets → Internet: nrh					
	H-rail to EN 60715	2 m	35430	NRH-35-2000	1

1) Packaging unit.