Proportional pressure regulator VPPI

Key features

Special characteristics

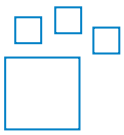
- Three predefined regulator presets, as well as the option of a custom preset
- Low-noise
- Flexible
- Highly dynamic up to 30 Hz
- The max. frequency of 30 Hz protects the system
- Available with Bluetooth interface
- Precise and stable: the powerful moving coil actuator also ensures that setpoint 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).

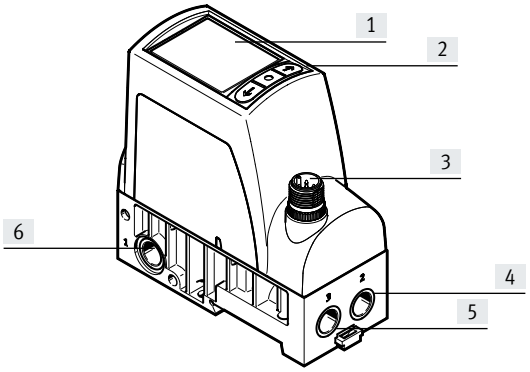
Ordering data – Product options



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. 8074287	Type VPPI

Key features

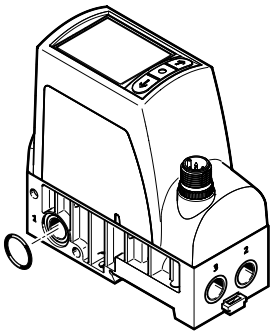
Configuration



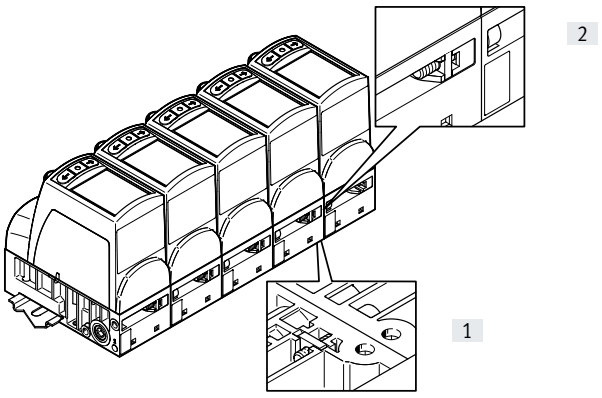
[1] Display
[2] Operating buttons display menu
[3] Electrical connection, M12
[4] Port 2, working air
[5] Port 3, exhaust air
[6] Port 1, compressed air

Mounting

Linking of valves



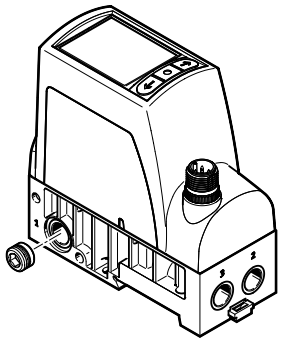
Up to five valves can be linked using connecting kit VAME-P18-K-P5. The connecting kit consists of two square nuts, two socket head screws and an O-ring.



[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

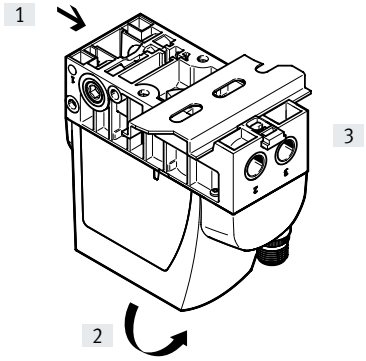
Pressure zone separation



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

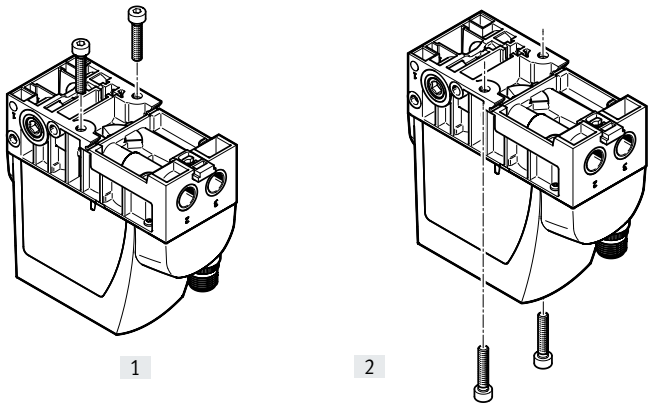
Via H-rail



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.

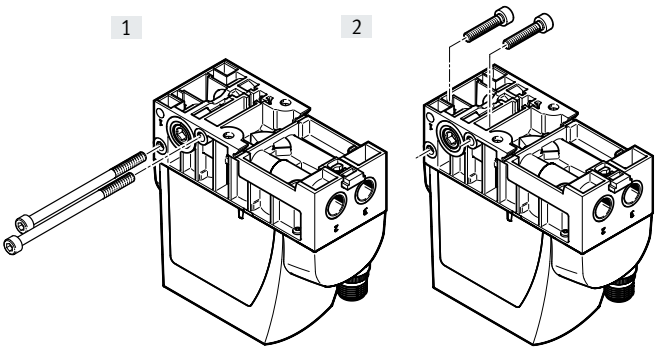
Underneath the valve



Individual mounting underneath:
[1] Mounting using screws M4 and square nuts
[2] Mounting using screws M4

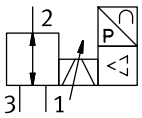
Linked valves are mounted on the valve underside in the same way. Only the two outermost screws are used for mounting.

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	
						Voltage type	Current type
				[MPa]	[bar]	0 ... 10 V	4 ... 20 mA
Proportional pressure regulator	**Poppet valve with spring return**						
		**VPPI-5L-3**	• 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	

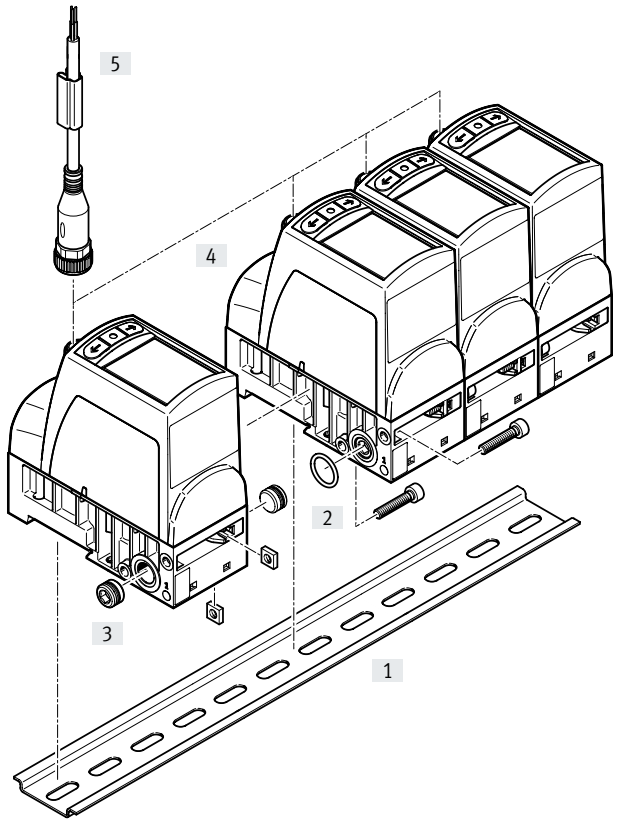
008	Setpoint input for individual valves	
A4	4 ... 20 mA	
V1	0 ... 10 V	

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

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 qnN 1-2		[l/min]	–	150	375	900	1400	1630
Standard nominal flow rate qnN 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
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		RCM
KC marking		KC EMC
CE marking (see declaration of conformity)		To EU EMC Directive[1)]
		To EU RoHS Directive[1)]
UKCA marking (see declaration of conformity)		To UK EMC regulations[1)]
		To UK RoHS regulations[1)]
Food-safe		See further information on materials[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.

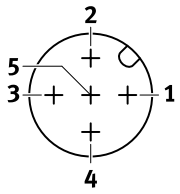
2) Further information www.festo.com/catalogue/... ➔ Support/Downloads.

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

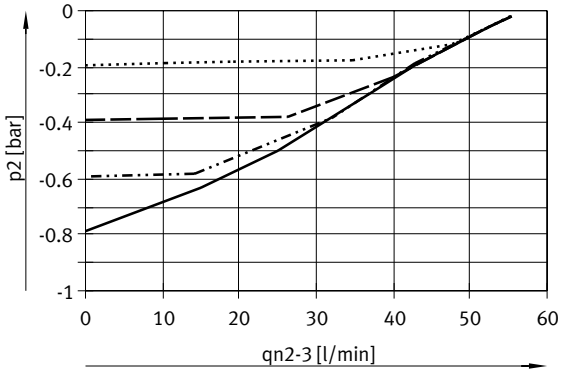


Pin	Allocation	
	Analogue	Alternative (digital input)
1	+ 24 V DC	+ 24 V DC
2	Setpoint value (-)	DI1
3	GND	GND
4	Setpoint value (+)/PWM	DI0
5	Actual value output • Related to pin 2 "Setpoint value (-)" for type VPPI- ... -V1- • Related to pin 3 "GND" for VPPI- ... -A4-...	DI2

Datasheet

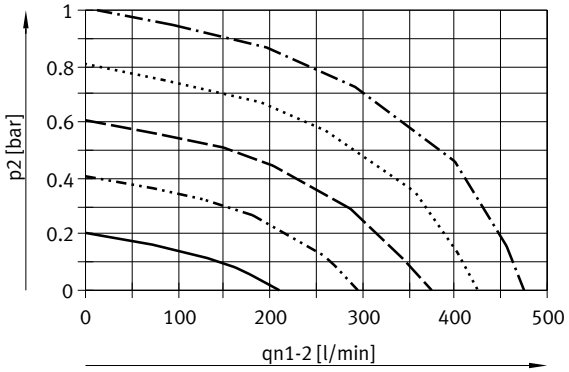
Flow rate qn for valves with pressure regulation range –1 ... 0 bar and for valves with pressure regulation range –1 ... +1 bar

Flow rate 2 > 3; as a function of output pressure p2

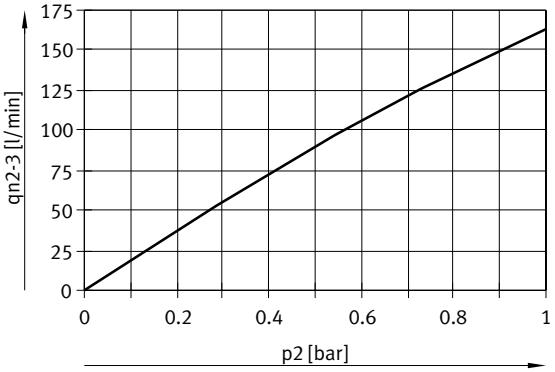


Flow rate qn for valves with pressure regulation range –1 ... +1 bar

Flow rate 1 > 2; as a function of output pressure p2

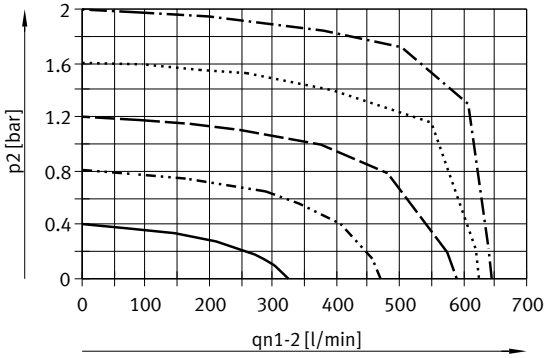


Flow rate 2 > 3; as a function of output pressure p2

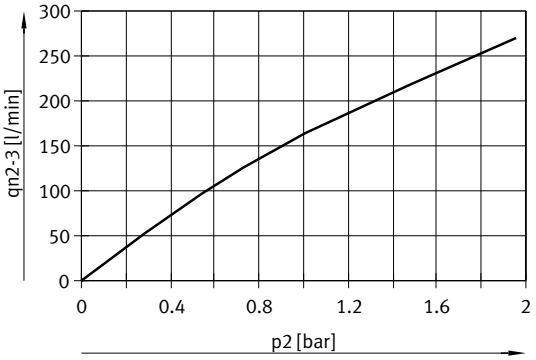


Flow rate qn for valves with pressure regulation range 0 ... 2 bar

Flow rate 1 > 2; as a function of output pressure p2



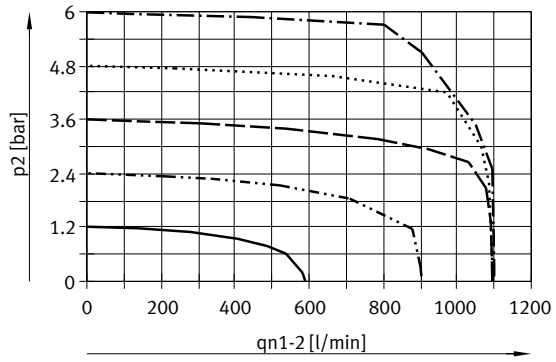
Flow rate 2 > 3; as a function of output pressure p2



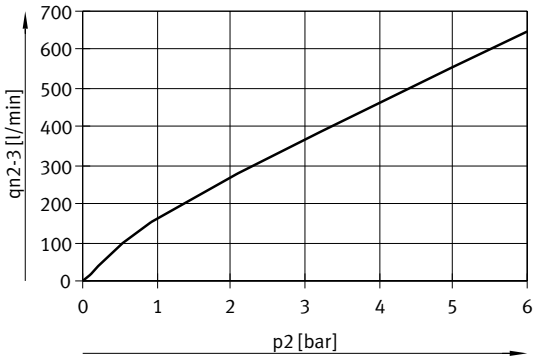
Datasheet

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

Flow rate 1 > 2; as a function of output pressure p2

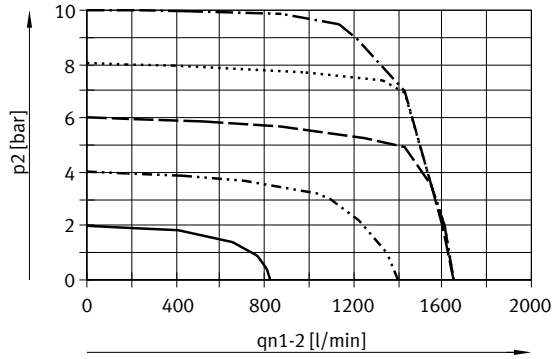


Flow rate 2 > 3; as a function of output pressure p2

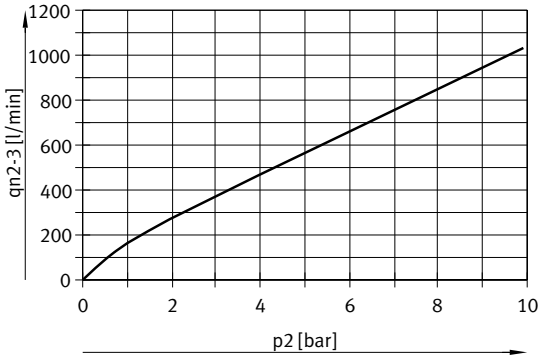


Flow rate qn for valves with pressure regulation range 0 ... 10 bar

Flow rate 1 > 2; as a function of output pressure p2

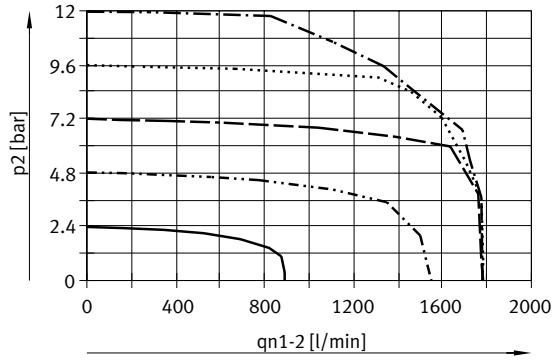


Flow rate 2 > 3; as a function of output pressure p2

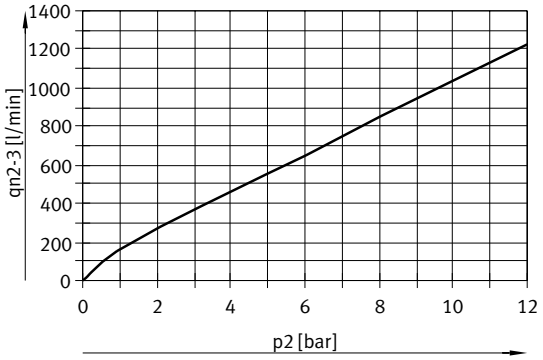


Flow rate qn for valves with pressure regulation range 0 ... 12 bar

Flow rate 1 > 2; as a function of output pressure p2



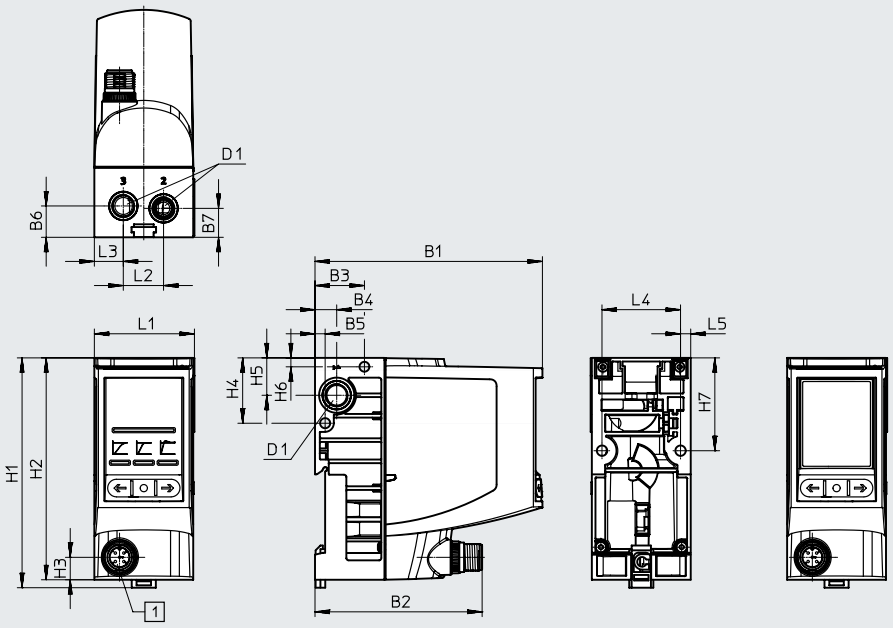
Flow rate 2 > 3; as a function of output pressure p2



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

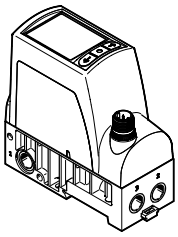
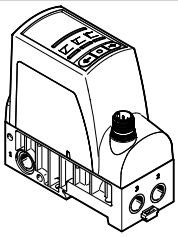
		Conditions	Code		Enter code
Module no.	**8074287**				
Design	Proportional pressure regulator		**VPPI**		VPPI
Nominal size	5 mm		**-5**		-5
Valve type	In-line valve		**L**		L
Valve function	3/3-way valve, normally open		**-4**		
	3/3-way valve, normally closed		**-3**		
Pneumatic connection	G1/8		**-G18**		-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**		
	12 bar	[1]	**12H**		
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

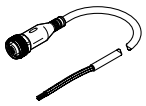
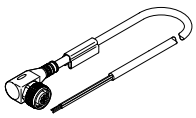
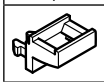
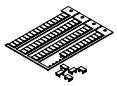
2) 1V Only with upper control range pressure value of 0H and 1H (0 bar and 1 bar)

Accessories

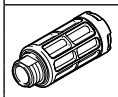
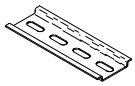
Ordering data

	Pressure regulation range [MPa]	[bar]	Description		Part no.	Type
Proportional pressure regulator						
With display						
	0 ... 0.6	0 ... 6	Normally closed	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		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	**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

	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.