

Proportional directional control valves VPWS

FESTO



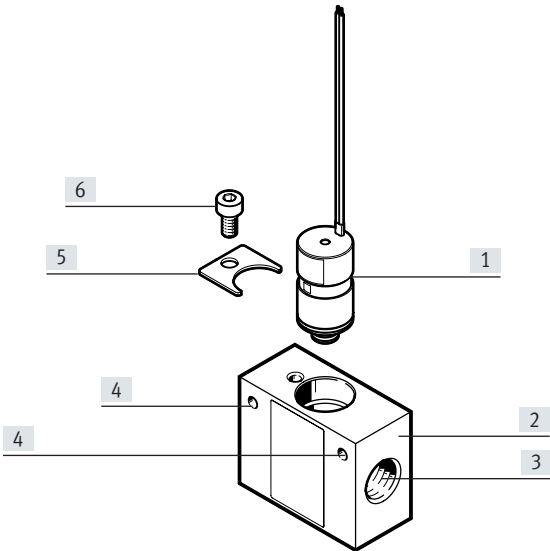
Key features

General

The solenoid valves VPWS are proportional directional control valves. This means that the flow rate of suitable media can be controlled proportionally. Approved operating media include air, oxygen and inert gases.


The solenoid valve VPWS should only be operated within the limits defined in the technical data. The specific on-site operating conditions are to be observed.

Overview of valve with manifold block



- [1] Solenoid valve VPWS
- [2] Manifold block
- [3] Pneumatic connection
- [4] Mounting hole for M3 screws
- [5] Mounting
- [6] Socket head screw M4

Fit the valve using a mounting component that engages in the shoulder of the housing. When using the mounting component from the accessories, an additional M4 screw is required for nominal width 1.0/ 1.5/ 2.2 and 6 (3 bar/7 bar); an M3 screw is required for nominal width 0.3.

 **Note**

The product has no redundancy and no error detection. Where required, steps must be taken to detect malfunctions in the customer product.

Type codes

001	Series	
VPWS	Proportional directional control valve	

002	Nominal width [mm]	
0.3	0.3	
1	1	
1.5	1.5	
2.2	2.2	
6	6	

003	Directional control valve type	
B	Sub-base valve	




004	Valve function	
6	2/2-way valve, normally closed	

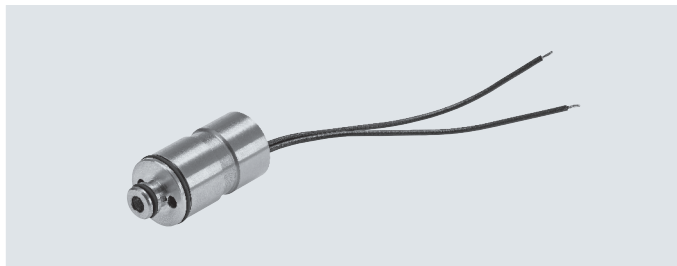
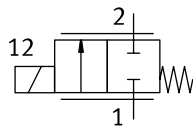
005	Pneumatic connection	
PC15	Cartridge 15 mm	
PC8	Cartridge 8 mm	

006	Pressure range [bar]	
3	0 ... 3	
7	0 ... 7	
8	0 ... 8	
10	0 ... 10	

007	Sealant	
V	FPM	

Datasheet

-  Flow rate
6.6 ... 220 l/min
-  Diameter of cartridge
5.8 ... 15 mm
-  Voltage
≤19 ... 19.9 V DC



General technical data

Nominal width DN		0.3 mm	1 mm	1.5 mm	2.2 mm	6 mm
Valve function		2/2-way proportional directional control valve, closed				
Reset method		Mechanical spring				
Design		Directly actuated poppet valve				
Sealing principle		Soft				
Actuation type		Electrical				
Type of control		Direct				
Flow direction		Not reversible				
Mounting position		Any				
Type of mounting		On sub-base				
		Plug-in				
		With accessories				
Pneumatic connection 1	[mm]	Cartridge 8	Cartridge 15			Cartridge 7.5
Pneumatic connection 2	[mm]	Cartridge 5.8	Cartridge 7.2			Cartridge 15
Flow rate q	VPWS-...	[l/min]	6.6 ... 8	68 ... 88	82 ... 98	46 ... 56
	VPWS-6-B-6-PC15-7-V	[l/min]	–			270 ... 350
Product weight	[g]	5	23			25
Protection rating to EN 60529		IP60				
Note on degree of protection		IP65 with suitable plug				
		In mounted state				
Vibration resistant		Transport application test with severity level 1 to FN 942017-4 and EN 60068-2-6				
Note on vibration resistance		Oscillation in the Z-direction can lead to flow fluctuations				
Shock resistance		Shock test SL1 in accordance with FN/EN				
Note on shock resistance		Shock in the Z-direction can lead to flow fluctuations				

Operating and environmental conditions

Nominal width DN		0.3 mm	1 mm	1.5 mm	2.2 mm	6 mm
Medium		Inert gases				
		Air				
		– Oxygen				
Note on the medium		Lubricated operation not possible				
Note on the medium, maximum particle size	[µm]	10				
Operating pressure	VPWS-...	[MPa]	0 ... 1	0 ... 1	0 ... 0.8	0 ... 0.3
		[bar]	0 ... 10	0 ... 10	0 ... 8	0 ... 3
	VPWS-6-B-6-PC15-7-V	[MPa]	–	–	–	0 ... 0.7
		[bar]	–	–	–	0 ... 7
Nominal operating pressure	VPWS-...	[MPa]	1	1	0 ... 0.8	0.3
		[bar]	10	10	8	3
		[psi]	145	145	116	43.5
	VPWS-6-B-6-PC15-7-V	[MPa]	–	–	–	0 ... 0.7
		[bar]	–	–	–	0 ... 7
		[psi]	–	–	–	101.5
Ambient temperature	[°C]	+5 ... +50				
Temperature of medium	[°C]	+5 ... +50				
Storage temperature	[°C]	–40 ... +80				
Corrosion resistance class CRC ¹⁾		1				
Biocompatibility according to standard		ISO 18562				
Oxygen suitability according to standard		ISO 15001				

1) More information www.festo.com/x/topic/crc

Datasheet

Electrical data				
Nominal width DN		0.3 mm	1 mm	1.5 mm 2.2 mm
Continuous operating voltage at 20 °C without inflow	[V DC]	≤ 28	≤ 16.5	
Continuous operating voltage at 50 °C without inflow	[V DC]	≤ 25	≤ 14.5	
Typical continuous operating voltage at 50 °C with inflow	[V DC]	≤ 32	≤ 19.0	
Continuous operating current at 20 °C without inflow	[mA]	≤ 58	≤ 180	
Continuous operating current at 50 °C without inflow	[mA]	≤ 52	≤ 160	
Typical continuous operating current at 50 °C with inflow	[mA]	≤ 70	≤ 200	
Max. switching frequency	[Hz]	25	18	
Hysteresis	[mA]	14	16	
Coil resistance	[Ω]	308	60.5	
Max. electrical power consumption	[W]	1.5	2.5	
Current regulating range	[mA]	0 ... 70	0 ... 200	
Duty cycle	[%]	100 (see operating instructions)		

Nominal width DN		6 mm	
Medium		Air	Oxygen
Continuous operating voltage at 20 °C without inflow	[V DC]	≤ 14.5	≤ 11.4
Continuous operating voltage at 50 °C without inflow	[V DC]	≤ 13.3	≤ 9.6
Typical continuous operating voltage at 50 °C with inflow (≥ 30 l/min)	[V DC]	≤ 19.9	
Continuous operating current at 20 °C without inflow	[mA]	≤ 180	≤ 150
Continuous operating current at 50 °C without inflow	[mA]	≤ 150	≤ 120
Typical continuous operating current at 50 °C with inflow	[mA]	≤ 225	
Switching time on	[ms]	10	
Hysteresis	[mA]	22.5	
Coil resistance	[Ω]	60.5	
Max. electrical power consumption	[W]	3	
Current regulating range	[mA]	0 ... 225	
Duty cycle	[%]	100 (see operating instructions)	

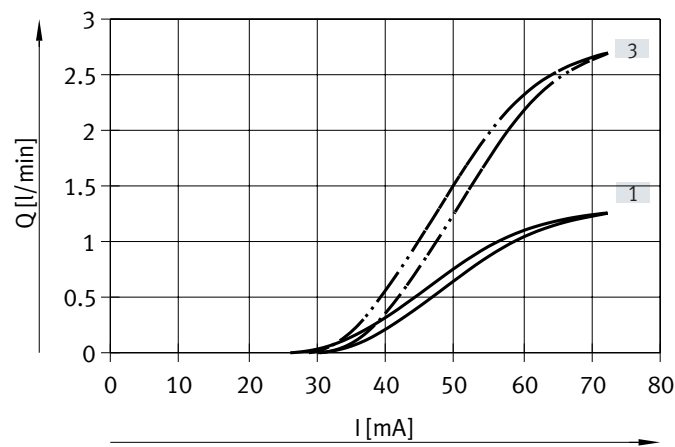
Electrical connection		
Electrical connection	Connection technology	Open end
	Number of pins/cores	2
	Connection type	Cable
Cable length	[mm]	70 ... 80

Materials	
Housing	High-alloy steel
Seals	FPM
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364 zone III

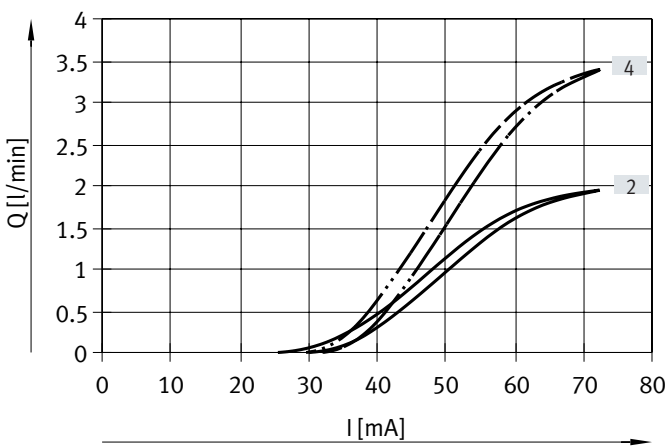
Datasheet

Flow rate/current characteristic curves

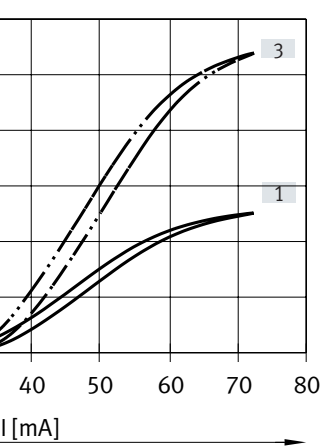
Nominal width 0.3 mm



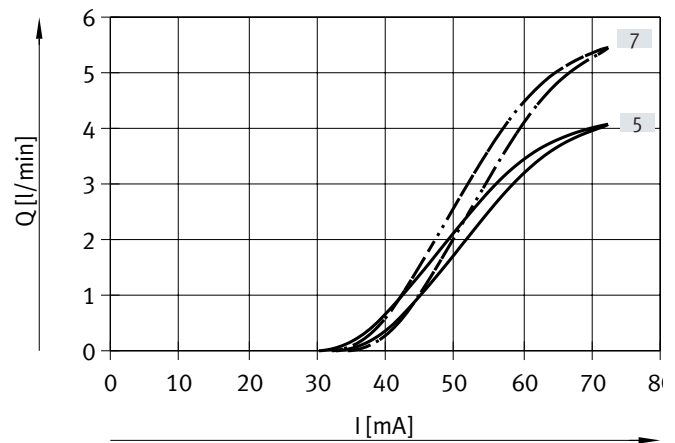
[1] Characteristic curve for 1 bar



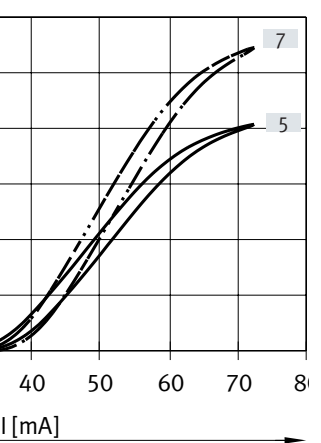
[2] Characteristic curve for 2 bar



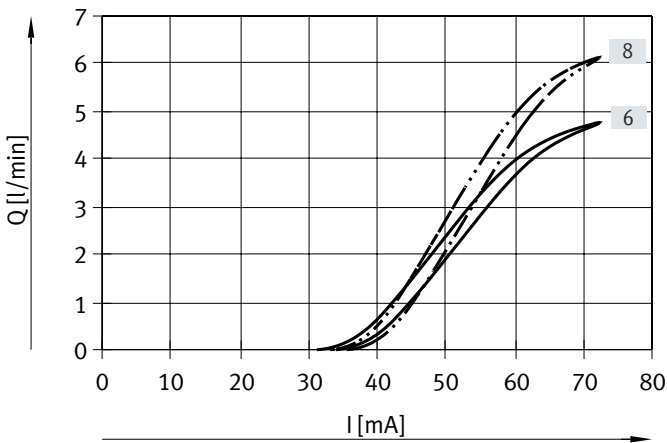
[3] Characteristic curve for 3 bar



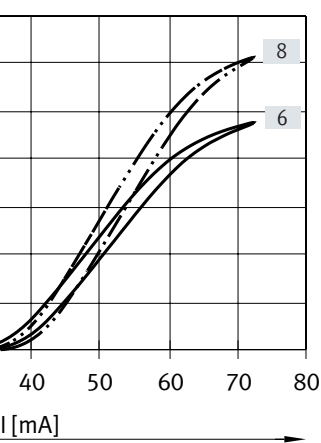
[5] Characteristic curve for 5 bar



[7] Characteristic curve for 7 bar



[6] Characteristic curve for 6 bar

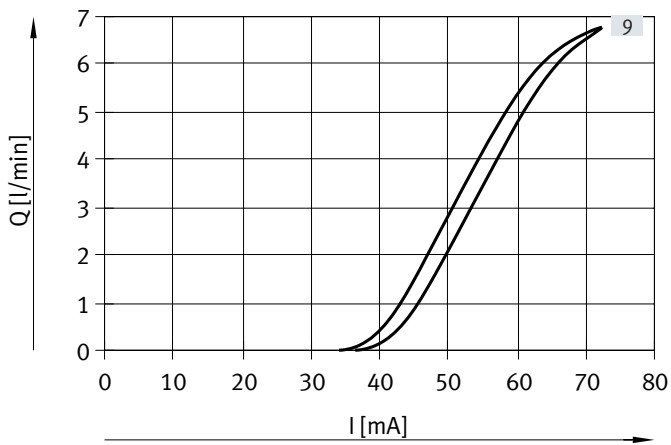


[8] Characteristic curve for 8 bar

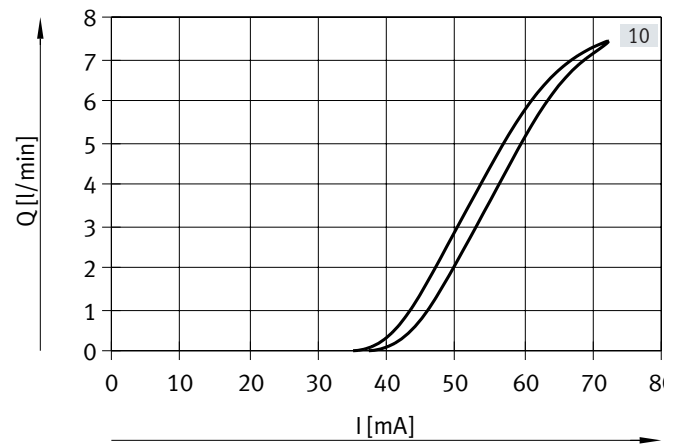
Datasheet

Flow rate/current characteristic curves

Nominal width 0.3 mm



[9] Characteristic curve for 9 bar



[10] Characteristic curve for 10 bar

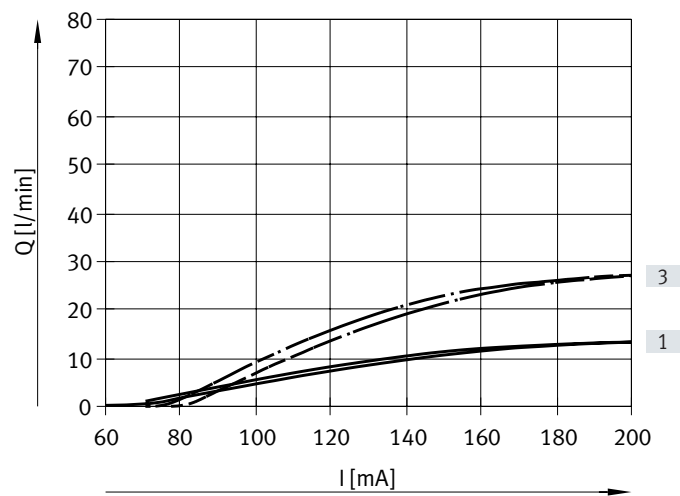
**Note**

Resonance may occur during operation at a low frequency and this may affect the flow rate. Operation at very low flow rates may generate noise. No resonance occurs during operation at a frequency of 0.3 Hz or higher.

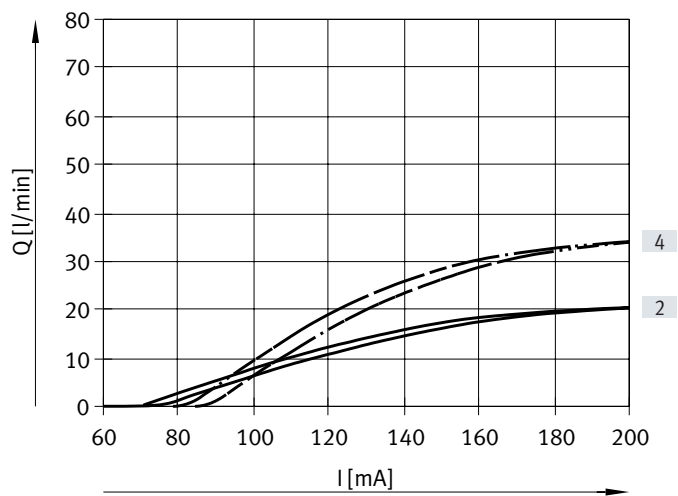
Datasheet

Flow rate/current characteristic curves

Nominal width 1 mm



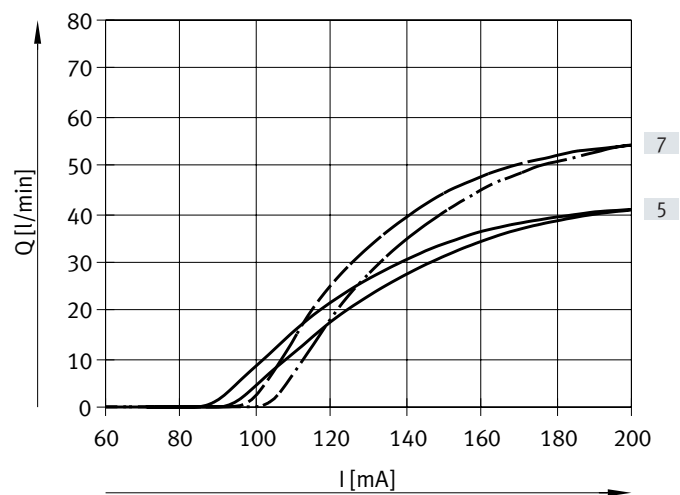
[1] Characteristic curve for 1 bar



[2] Characteristic curve for 2 bar

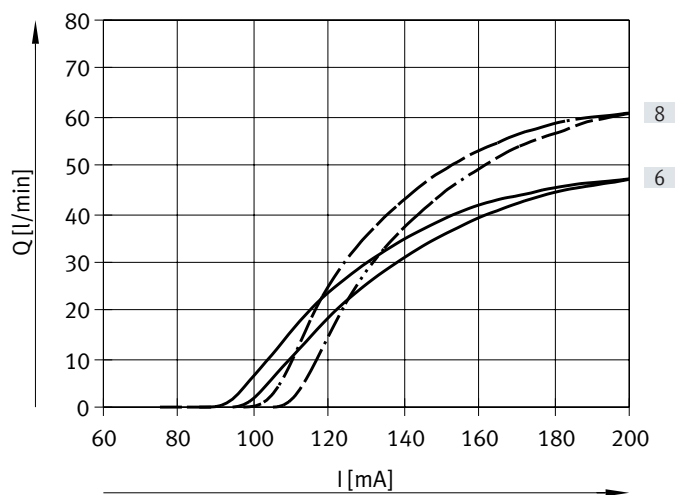
[3] Characteristic curve for 3 bar

[4] Characteristic curve for 4 bar



[5] Characteristic curve for 5 bar

[7] Characteristic curve for 7 bar



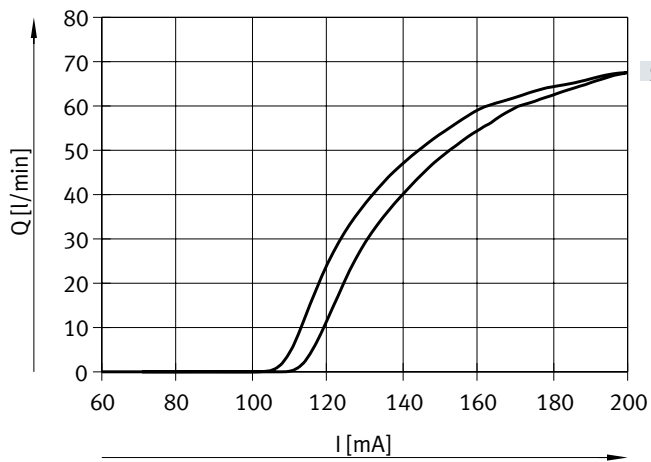
[6] Characteristic curve for 6 bar

[8] Characteristic curve for 8 bar

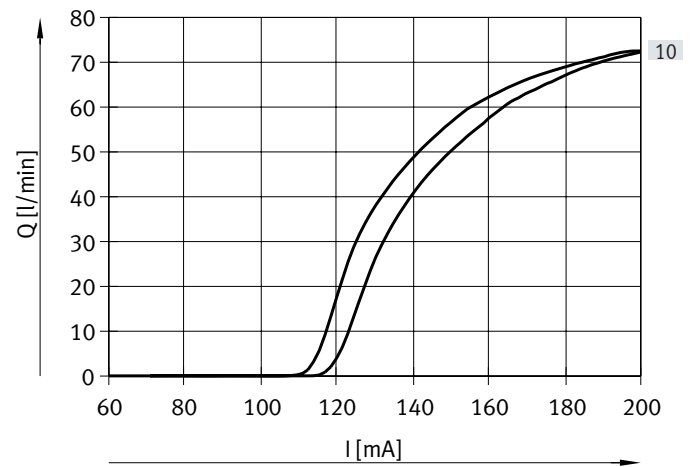
Datasheet

Flow rate/current characteristic curves

Nominal width 1 mm



[9] Characteristic curve for 9 bar



[10] Characteristic curve for 10 bar



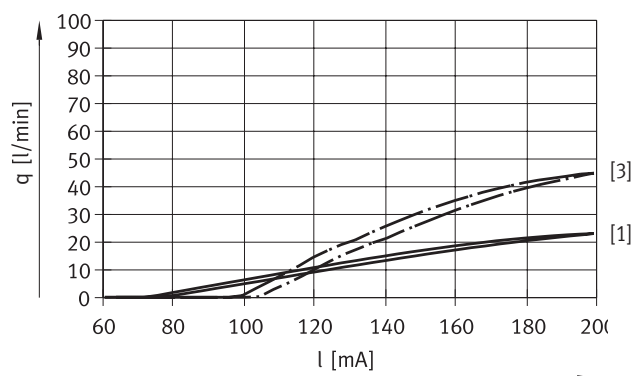
Note

Resonance may occur during operation at a low frequency and this may affect the flow rate. Operation at very low flow rates may generate noise. No resonance occurs during operation at a frequency of 0.3 Hz or higher.

Datasheet

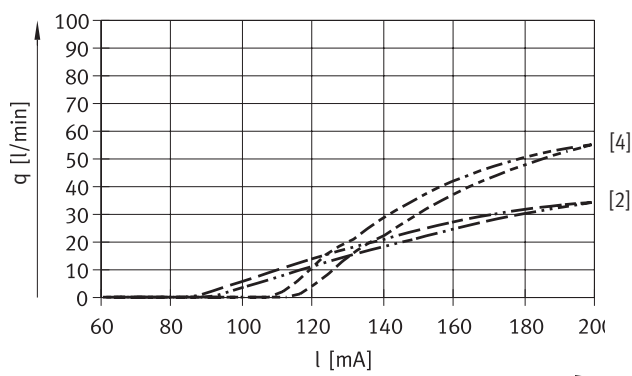
Flow rate/current characteristic curves

Nominal width 1.5 mm



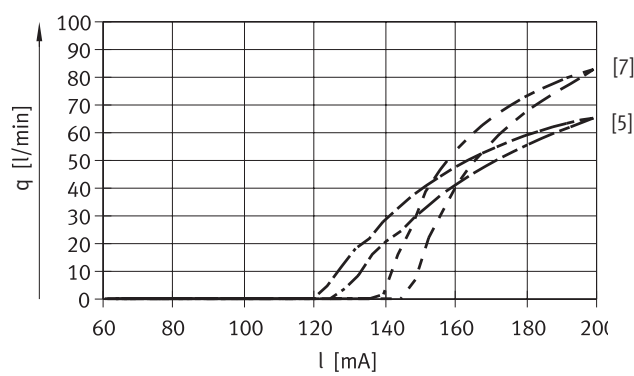
[1] Characteristic curve for 1 bar

[3] Characteristic curve for 3 bar



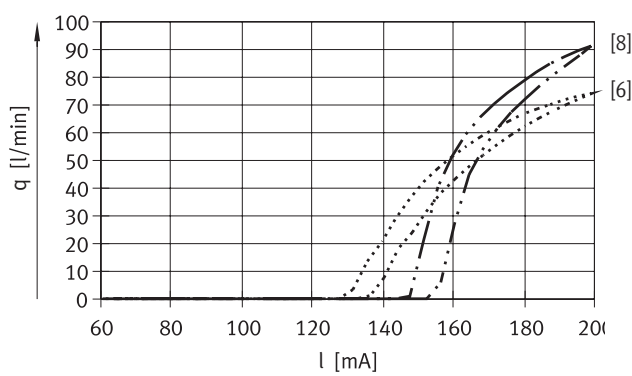
[2] Characteristic curve for 2 bar

[4] Characteristic curve for 4 bar



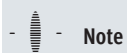
[5] Characteristic curve for 5 bar

[7] Characteristic curve for 7 bar



[6] Characteristic curve for 6 bar

[8] Characteristic curve for 8 bar



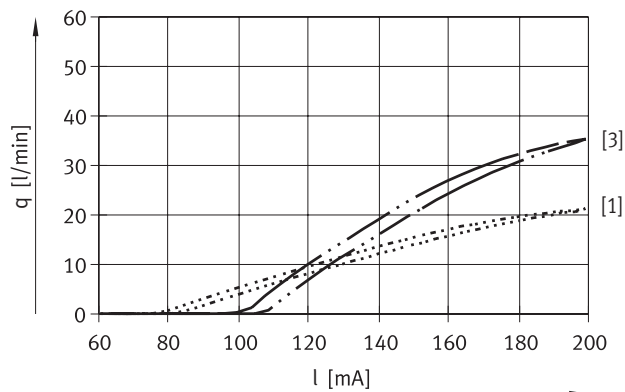
Note

Resonance may occur during operation at a low frequency and this may affect the flow rate. Operation at very low flow rates may generate noise. No resonance occurs during operation at a frequency of 0.3 Hz or higher.

Datasheet

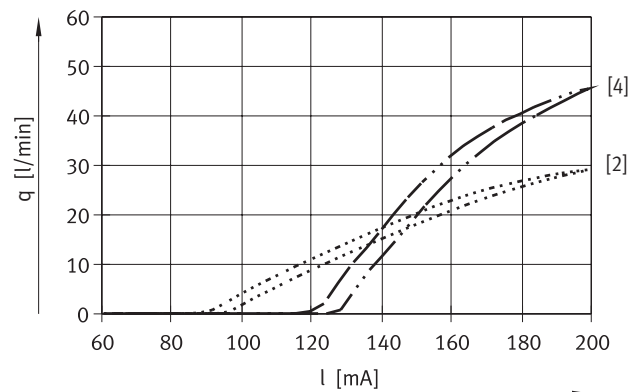
Flow rate/current characteristic curves

Nominal width 2.2 mm



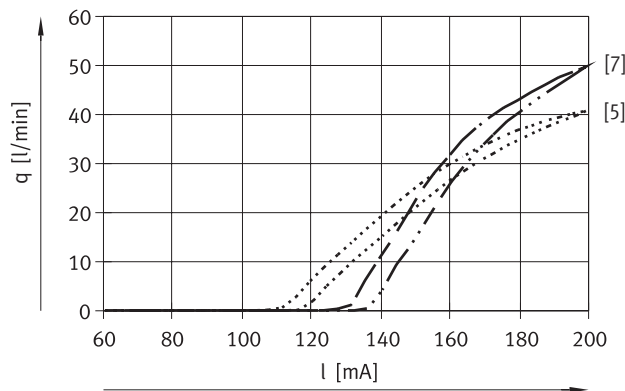
[1] Characteristic curve for 0.5 bar

[3] Characteristic curve for 1.5 bar



[2] Characteristic curve for 1.0 bar

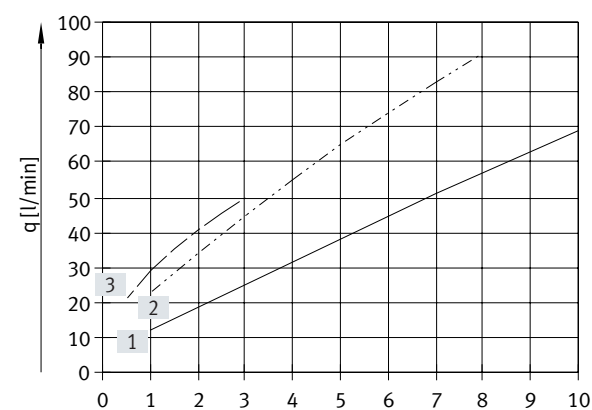
[4] Characteristic curve for 2.5 bar



[5] Characteristic curve for 2.0 bar

[7] Characteristic curve for 3.0 bar

Flow rate/pressure characteristic curve at 200 mA

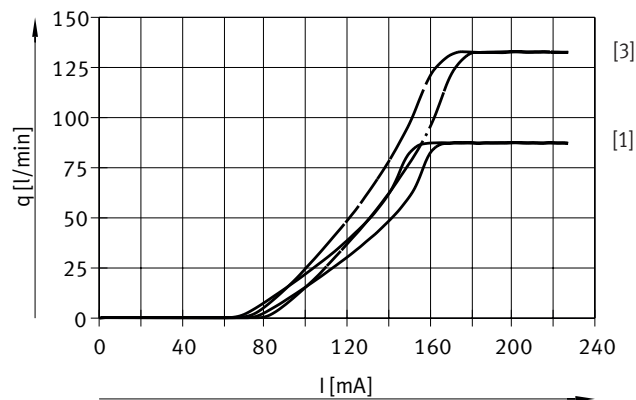


- [1] VPWS-DN 1
- [2] VPWS-DN 1.5
- [3] VPWS-DN 2.2

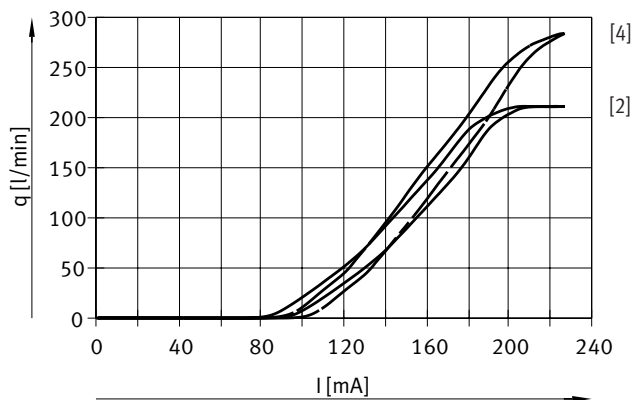
Datasheet

Flow rate/current characteristic curves

Nominal width 6 mm, VPWS-6-B-6-PC15-3-V

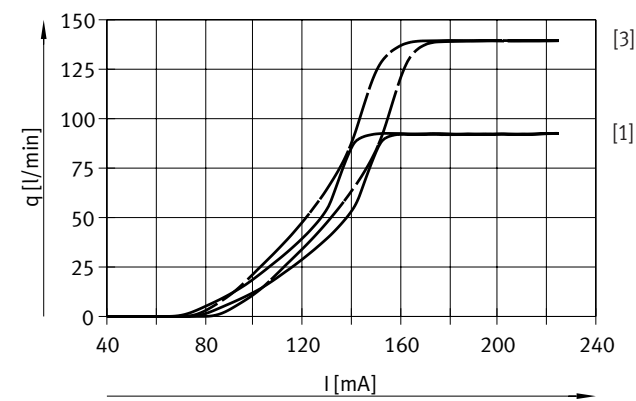


[1] Characteristic curve for 0.5 bar [3] Characteristic curve for 1 bar

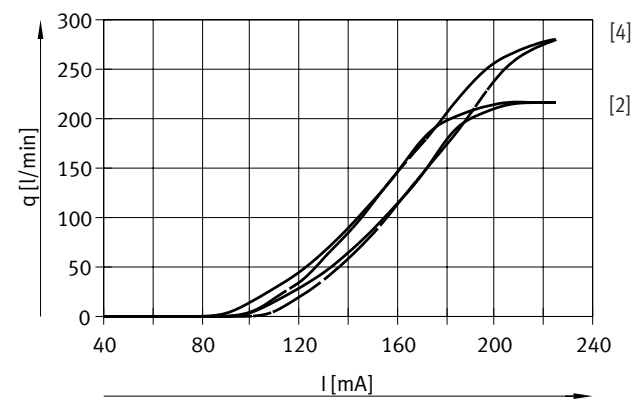


[2] Characteristic curve for 2 bar [4] Characteristic curve for 3 bar

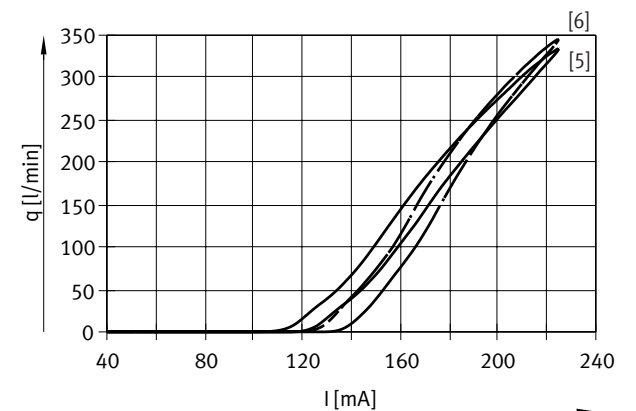
Nominal width 6 mm, VPWS-6-B-6-PC15-7-V



[1] Characteristic curve for 0.5 bar [3] Characteristic curve for 1 bar



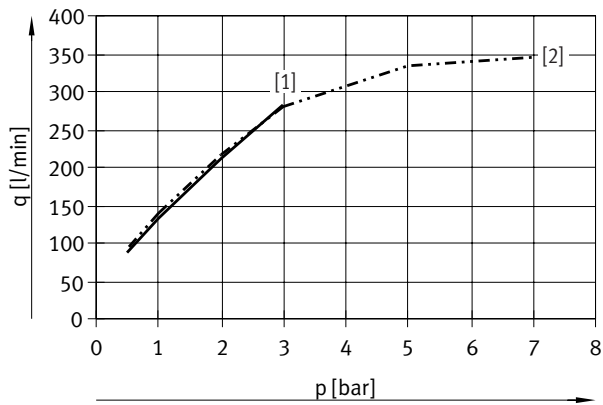
[2] Characteristic curve for 2 bar [4] Characteristic curve for 3 bar



[5] Characteristic curve for 5 bar [6] Characteristic curve for 7 bar

Datasheet

Characteristic flow rate-pressure curve at 225 mA



[1] VPWS-DN 6

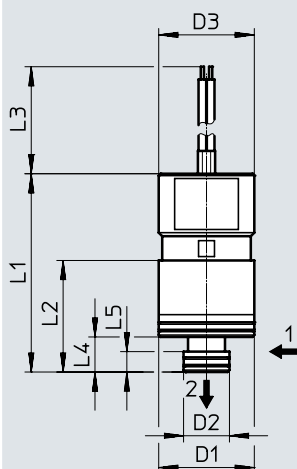
[2] VPWS-DN 6, 7 bar

Datasheet

Dimensions

Download CAD data → www.festo.com

Proportional directional control valve



[1] Pneumatic connection 1
(for VPWS-6 as connection 2)

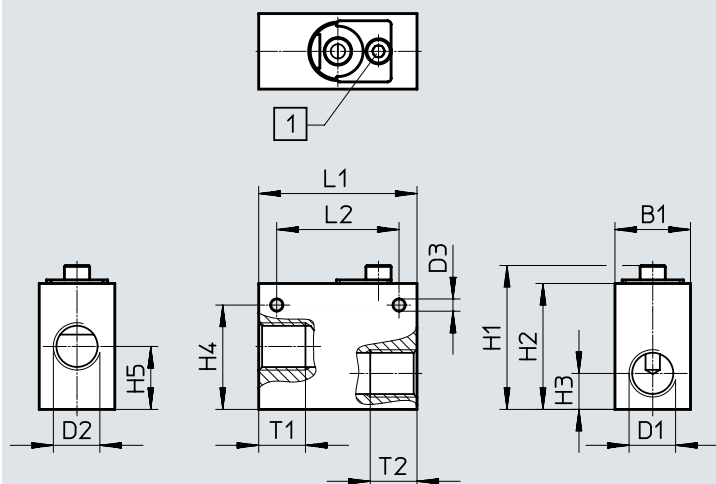
[2] Pneumatic connection 2
(for VPWS-6 as connection 1)

Type	D1 ø	D2 ø	D3 ø	L1	L2	L3	L4	L5
VPWS-0.3-B-6-PC8-10-V	8	5.8	8	24.3	11.5	70 ... 80	4.5	2.6
VPWS-1-B-6-PC15-10-V	15	7.2	15	31	17.5	70 ... 80	5.5	3.2
VPWS-1.5-B-6-PC15-8-V	15	7.2	15	31	17.5	70 ... 80	5.5	3.2
VPWS-2.2-B-6-PC15-3-V	15	7.2	15	31	17.5	70 ... 80	5.5	3.2
VPWS-6-B-6-PC15-3-V	15	7.5	15	36.4	22.9	70 ... 80	7.23	2.9
VPWS-6-B-6-PC15-7-V	15	7.5	15	36.4	22.9	70 ... 80	7.23	2.9

Dimensions

Download CAD data → www.festo.com

Manifold block



[1] Socket head screw M4x8 (M3x5 for VABS-P4-8S-M5)

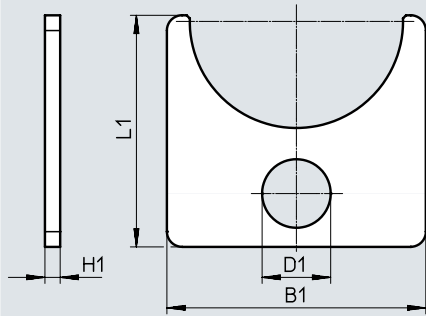
Type	B1	D1	D2	D3 ø	H1	H2	H3	H4	H5	L1	L2	T1	T2
VABS-P4-8S-M5	12	M5	M5	3.5	22.4	19	4.6	–	9.9	–	–	5	5
VABS-P4-10S-G14	21	G1/4	G1/4	3.4	40	35	10	29	17.5	44	34	13	13
VABS-P4-20S-G38	25	G3/8	G3/8	3.4	47	42	11.5	36	19	44	34	13	13

Datasheet

Dimensions


Download CAD data → www.festo.com

Mounting

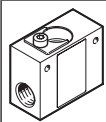


Type	B1	D1	H1	L1
VAME-P4-PC8-P-P10	9	3.4	0.5	11.5
VAME-P4-PC15-P-P10	17	4.5	1	15.2

Ordering data

			Part no.	Type	PU ¹⁾
Proportional directional control valve					
	2/2-way proportional directional control valve, closed	Nominal width 0.3 mm	8186784	VPWS-0.3-B-6-PC8-10-V	1
		Nominal width 1 mm	8186783	VPWS-1-B-6-PC15-10-V	1
		Nominal width 1.5 mm	8074075	VPWS-1.5-B-6-PC15-8-V	1
		Nominal width 2.2 mm	8074074	VPWS-2.2-B-6-PC15-3-V	1
		Nominal width 6 mm	8074537	VPWS-6-B-6-PC15-3-V	1
		Nominal width 6 mm	8074538	VPWS-6-B-6-PC15-7-V	1

Manifold block



<p>Suitable for proportional directional control valves with nominal width 0.3 mm</p> <p>Set for 2/2-way proportional directional control valve VPWS, comprising:</p> <ul style="list-style-type: none"> Manifold block VABS-P4-8S-M5 1 mounting component from the set VAME-P4-PC8-P-P10 Socket head screw M3x5 	8186785	VABS-P4-8S-M5	1
	8087327	VABS-P4-10S-G14	1
	8087328	VABS-P4-20S-G38	1

Mounting



For 2/2-way proportional directional control valve VPWS on manifold block VABS (set comprises 10 mounting components for 10 proportional directional control valves VPWS)	8187513	VAME-P4-PC8-P-P10	10
	8087347	VAME-P4-PC15-P-P10	10

1) Packaging unit.