Proportional directional control valves VPWS

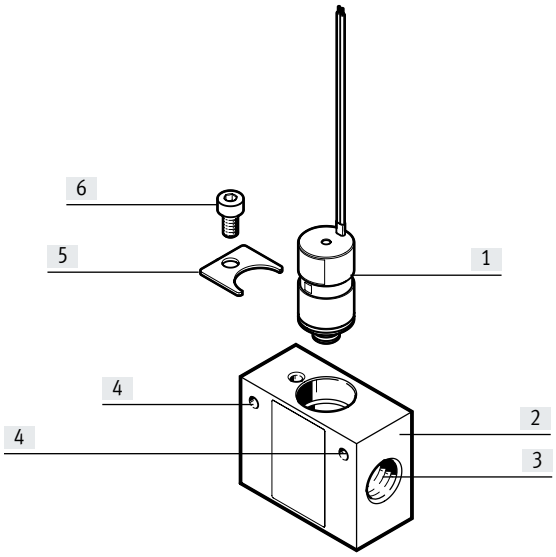
Key features

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

Note

The product has no redundancy and no error detection. When malfunctions need to be detected, this must be done by implementing the necessary measures 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	

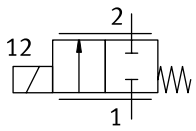
005	Pneumatic connection	
PC15	Cartridge 15 mm	
PC8	Cartridge 8 mm	

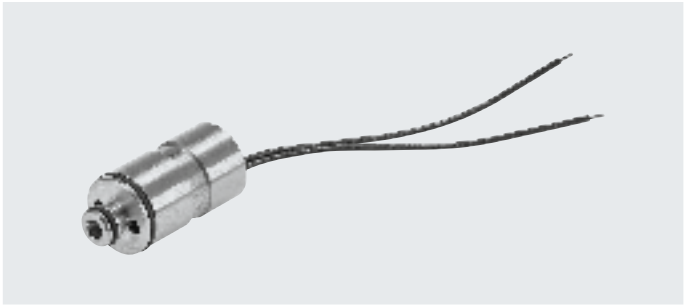
006	Pressure range [bar]	
3	0 ... 3	
7	0 ... 7	
8	0 ... 8	
10	0 ... 10	

007	Sealant	
V	FPM	

Technical data

- Flow rate
  46 ... 220 l/min
- Diameter of cartridge
  7.5 ... 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				
Direction of flow			Not reversible				
Mounting position			Any				
Type of mounting			On sub-base				
			Plug-in				
			With accessories				
Pneumatic connection 1			Cartridge 8 mm	Cartridge 15 mm			Cartridge 7.5 mm
Pneumatic connection 2			Cartridge 5.8 mm	Cartridge 7.2 mm			Cartridge 15 mm
Flow rate q	VPWS-...	[l/min]	6.6 ... 8	68 ... 88	82 ... 98	46 ... 56	200 ... 220
	VPWS-6-B-6-PC15-7-V	[l/min]	–				270 ... 350
Product weight		[g]	5	23			25
Degree of protection to EN 60529			IP60				
Note on degree of protection			IP65 with suitable plug				
			In assembled state				

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	0.2
		[bar]	10	10	8	3	2
		[psi]	145	145	116	43.5	29
	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				

1) More information: www.festo.com/x/topic/kbk

Technical data

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]	–	≤ 16.5		
Continuous operating voltage at 50°C without inflow	[V DC]	–	≤ 14.5		
Typical continuous operating voltage at 50 °C with inflow	[V DC]	–	≤ 19.0		
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 ED	[%]	100 (see assembly instructions)			

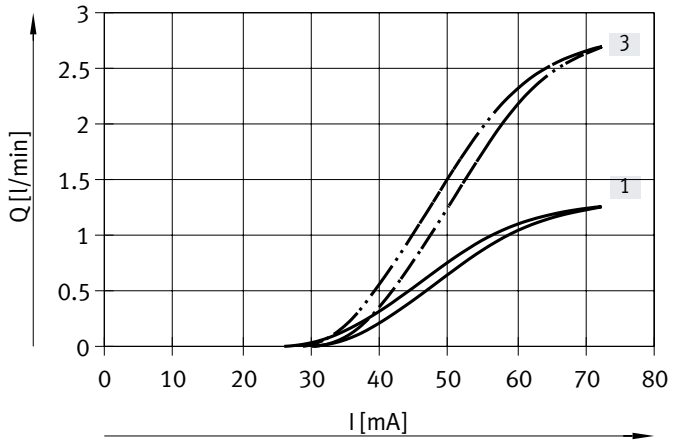
Nominal width DN		6 mm	
		Air	Oxygen
Continuous operating voltage at 20°C without inflow	[V DC]	≤ 14.5	≤ 11.4
Continuous operating voltage at 50°C without inflow	[V DC]	≤ 13.3	≤ 9.6
Typical continuous operating voltage at 50°C with inflow (≥ 30 l/min)	[V DC]	≤ 19.9	
Switching time on	[ms]	10	
Hysteresis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

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

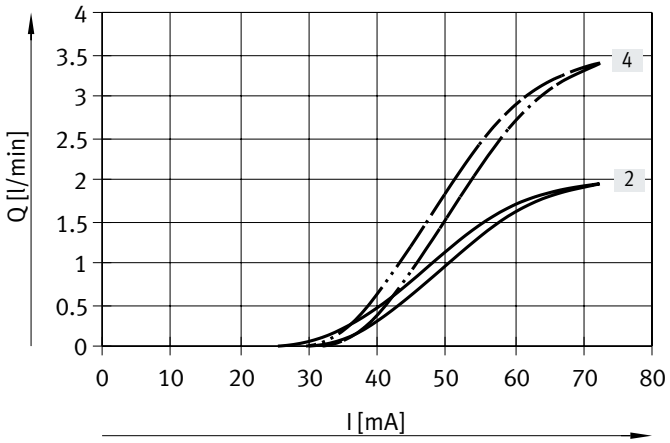
Materials	
Housing	High-alloy steel
Seals	FPM
Note on materials	RoHS-compliant
PWIS conformity	VDMA24364 zone III

Technical data

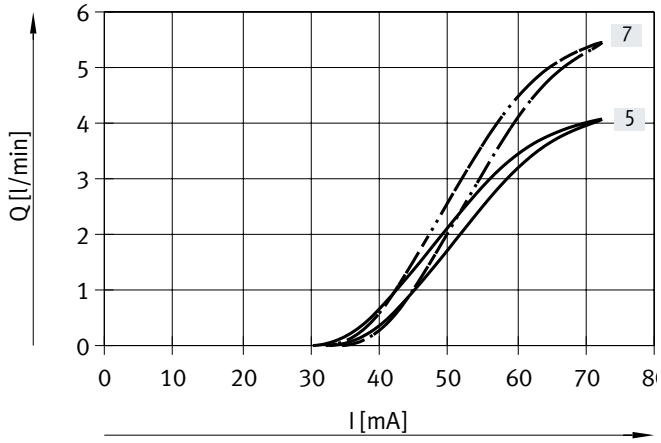
Flow rate/current characteristic curves
Nominal width 0.3 mm



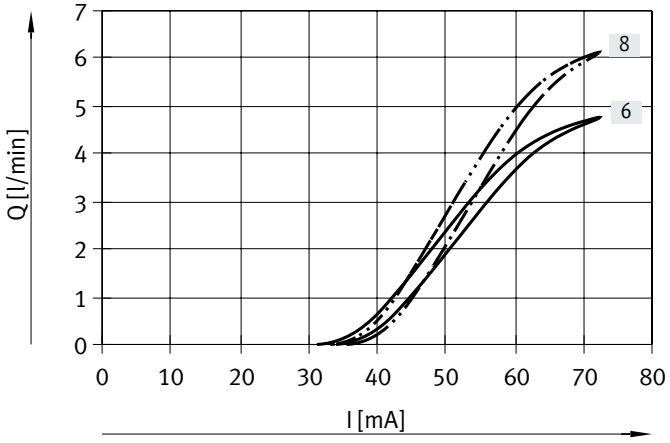
[1] Characteristic curve for 1 bar
[3] Characteristic curve for 3 bar



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



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

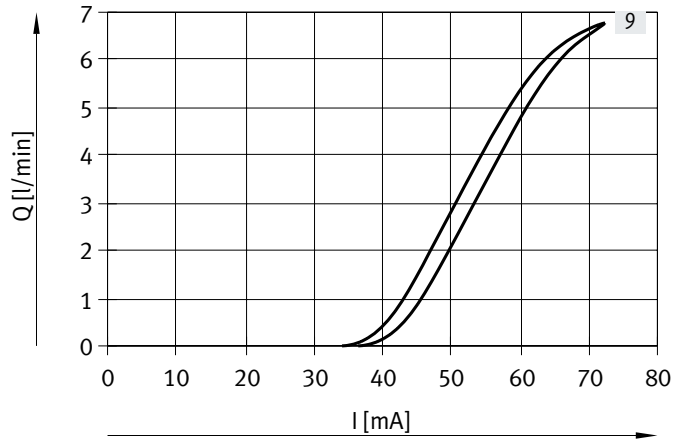


[6] Characteristic curve for 6 bar
[8] Characteristic curve for 8 bar

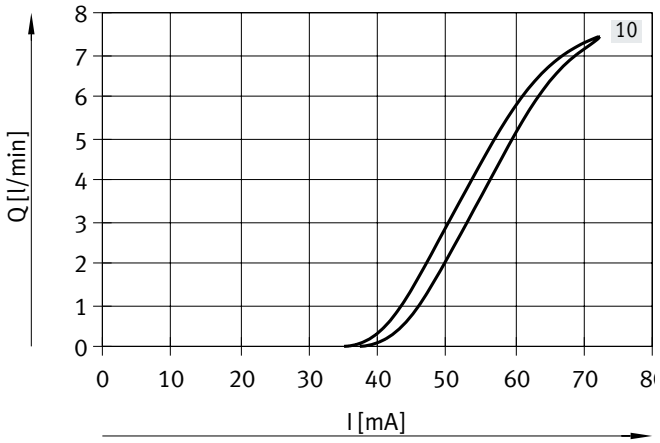
Technical data

Flow rate/current characteristic curves

Nominal width 0.3 mm



[9] Characteristic curve for 9 bar



[10] Characteristic curve for 10 bar

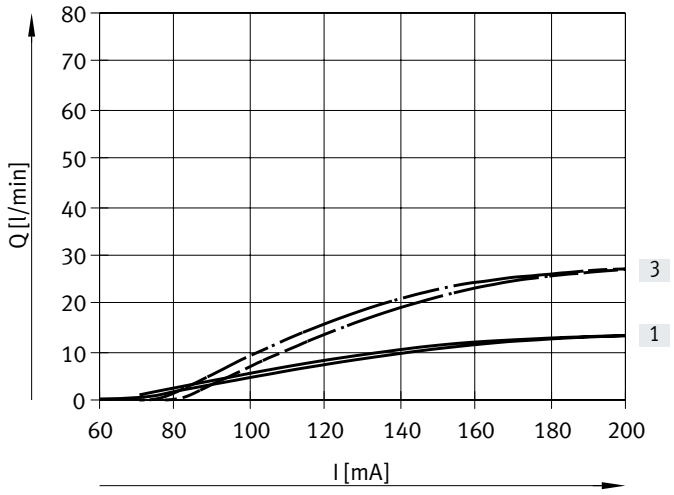
Note

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.

Technical data

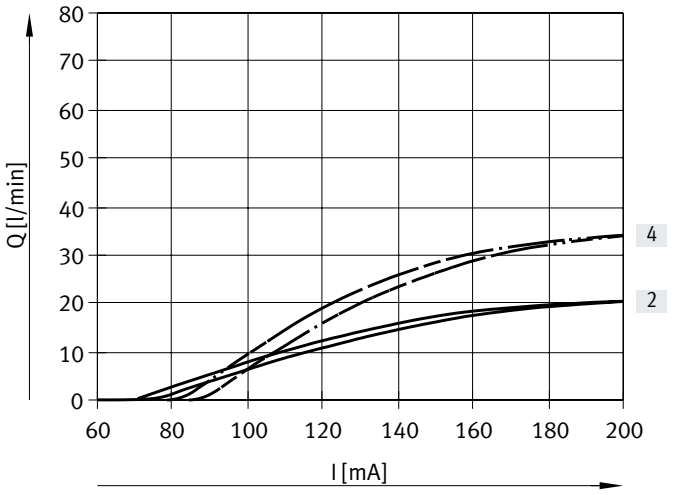
Flow rate/current characteristic curves

Nominal width 1 mm



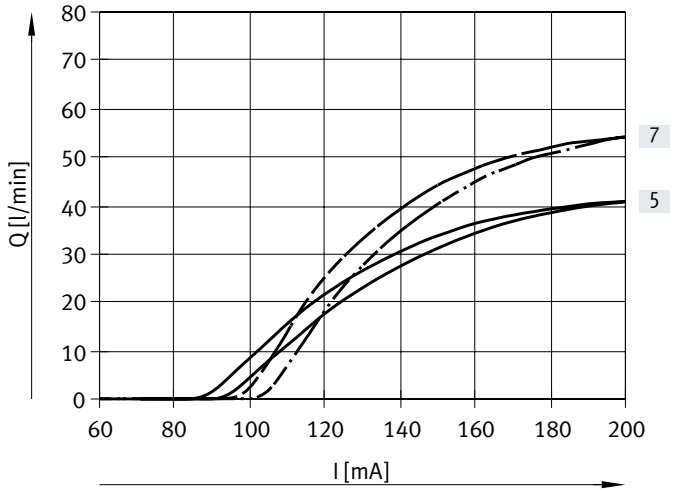
[1] Characteristic curve for 1 bar

[3] Characteristic curve for 3 bar



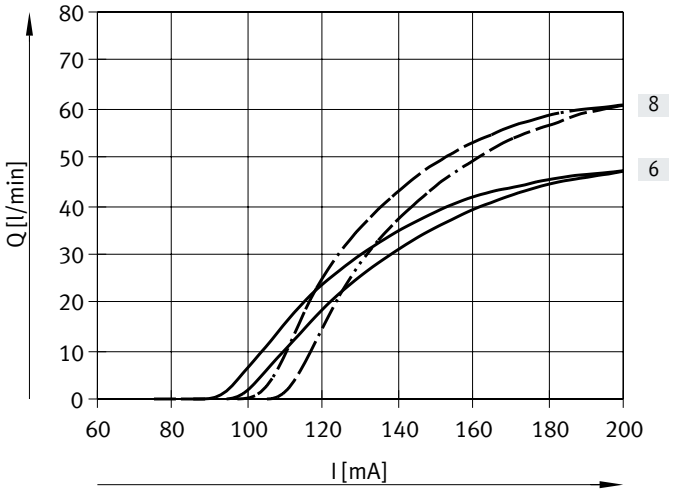
[2] Characteristic curve for 2 bar

[4] Characteristic curve for 4 bar



[5] Characteristic curve for 5 bar

[7] Characteristic curve for 7 bar



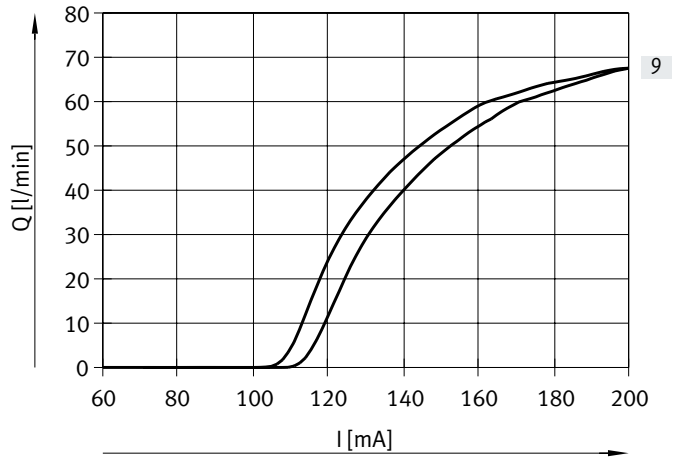
[6] Characteristic curve for 6 bar

[8] Characteristic curve for 8 bar

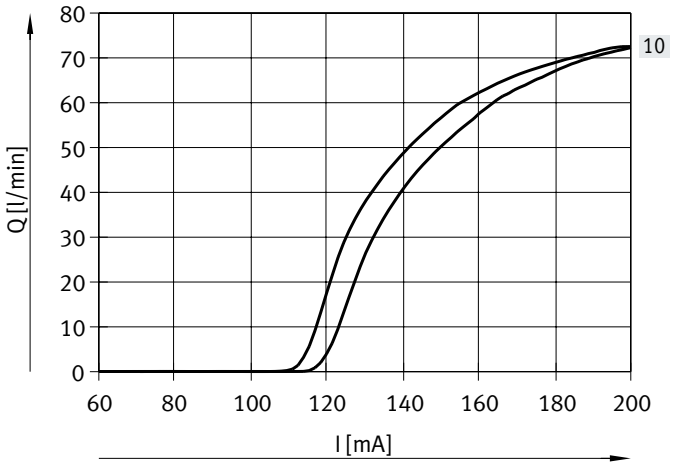
Technical data

Flow rate/current characteristic curves

Nominal width 1 mm



[9] Characteristic curve for 9 bar



[10] Characteristic curve for 10 bar

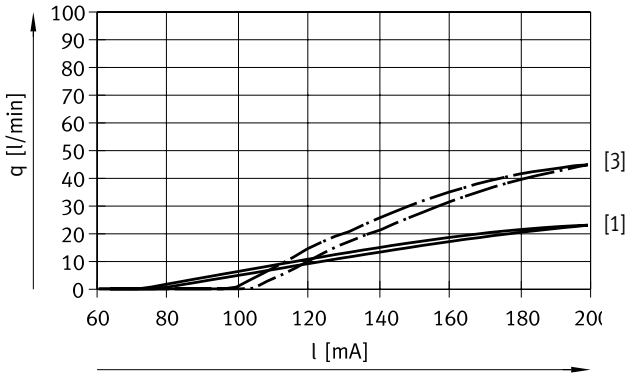
Note

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.

Technical data

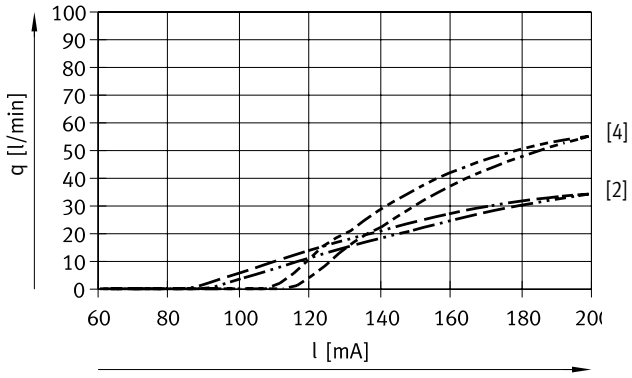
Flow rate/current characteristic curves

Nominal width 1.5 mm



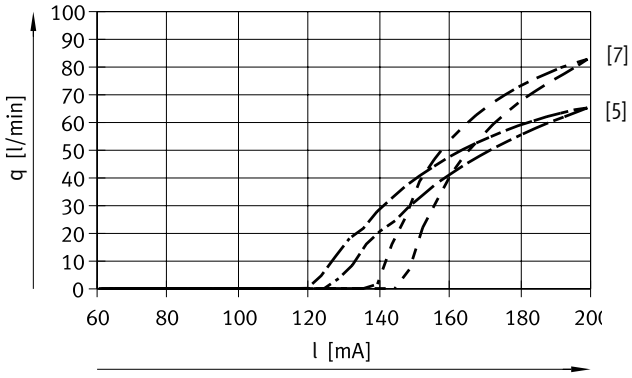
[1] Characteristic curve for 1 bar

[3] Characteristic curve for 3 bar



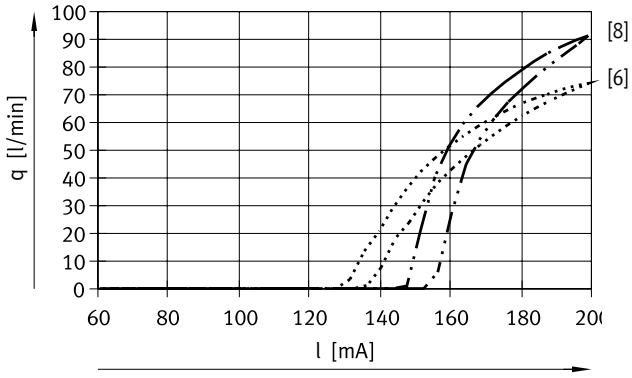
[2] Characteristic curve for 2 bar

[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

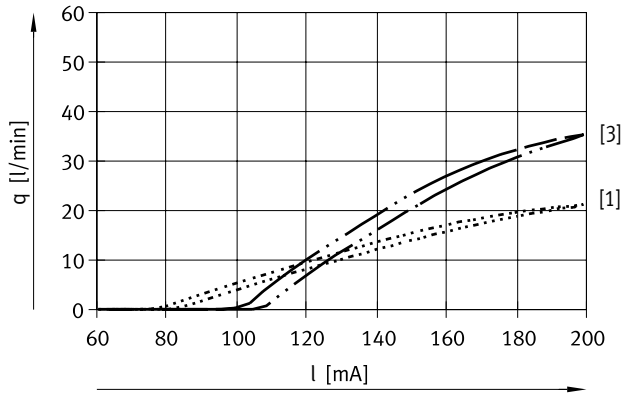
Note

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.

Technical data

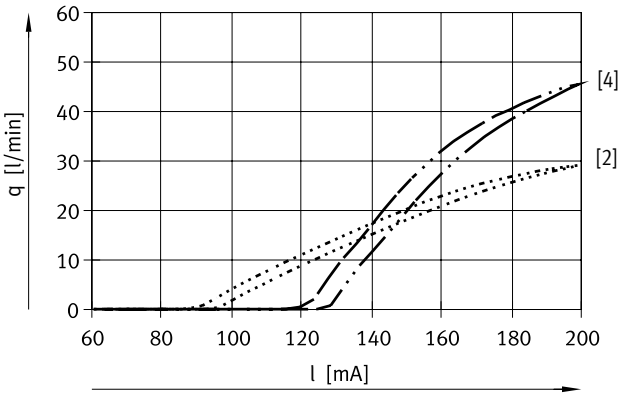
Flow rate/current characteristic curves

Nominal width 2.2 mm



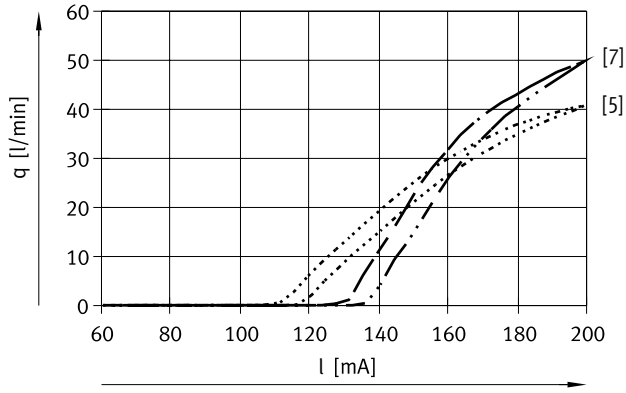
[1] Characteristic curve for 0.5 bar

[3] Characteristic curve for 1.5 bar



[2] Characteristic curve for 1.0 bar

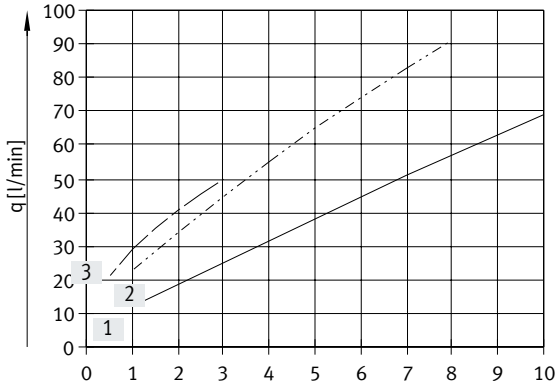
[4] Characteristic curve for 2.5 bar



[5] Characteristic curve for 2.0 bar

[7] Characteristic curve for 3.0 bar

Flow rate/pressure characteristic curve at 200 mA

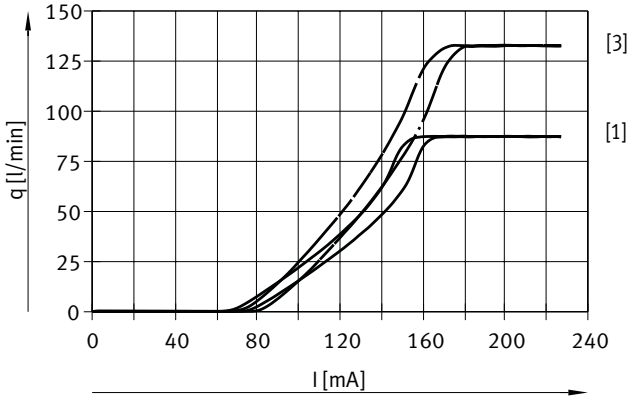


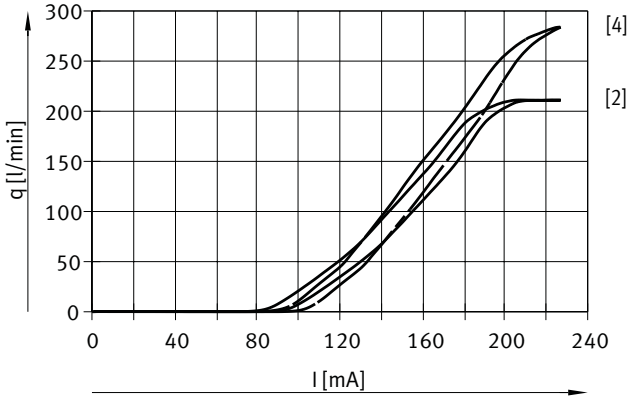
[1] VPWS-DN 1
[2] VPWS-DN 1.5
[3] VPWS-DN 2.2

Technical data

Flow rate/current characteristic curves

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

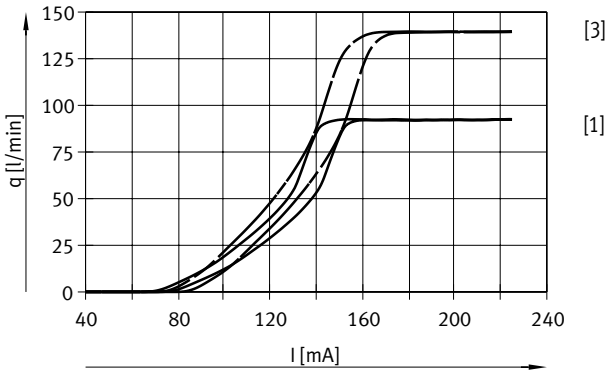


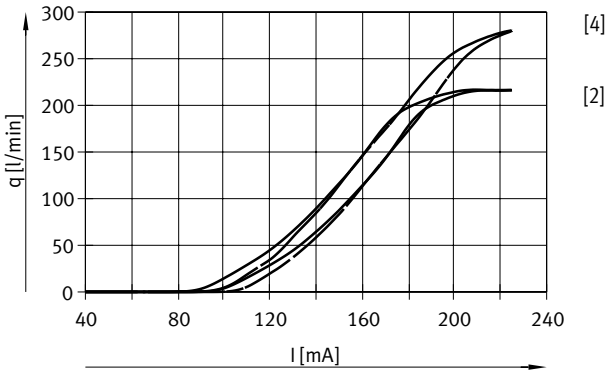


[1] Characteristic curve for 0.5 bar [3] Characteristic curve for 1 bar

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

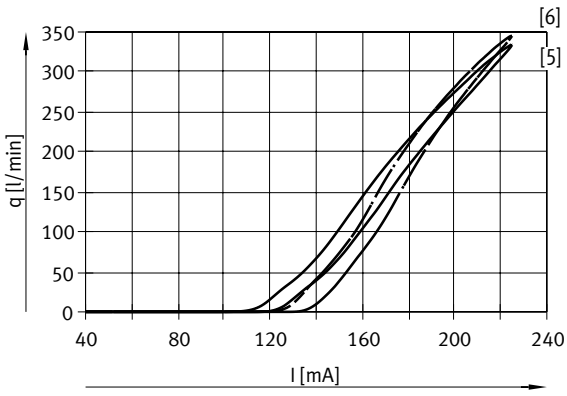
Nominal width 6 mm. VPWS-6-B-6-PC15-7-V





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

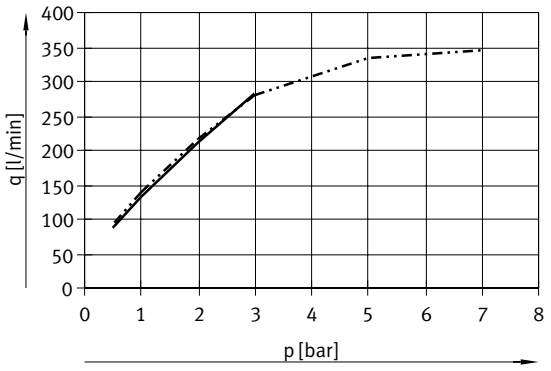
[2] Characteristic curve for 2 bar [4] Characteristic curve for 3 bar



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

Technical data

Flow rate/pressure characteristic curve at 225 mA

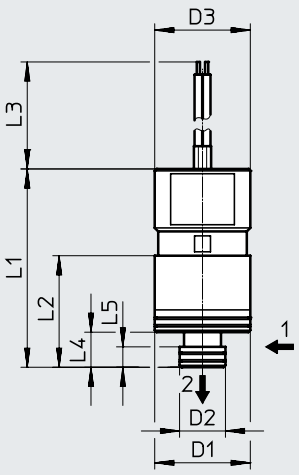


VPWS-DN 6
VPWS-DN 6. 7 bar

Technical data

Dimensions Download CAD data ➔ www.festo.com

Proportional directional control valve



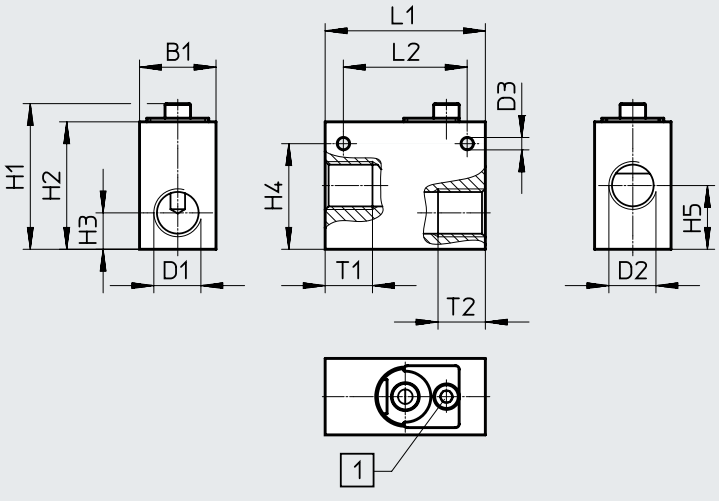
[1] Pneumatic connection 1 (with VPWS-6 as connection 2)

[2] Pneumatic connection 2 (with 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



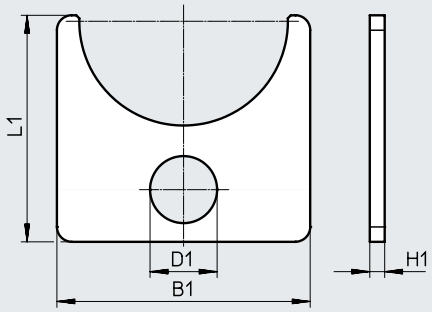
[1] Socket head screw M4X8

Type	B1	D1	D2	D3 ø	H1	H2	H3	H4	H5	L1	L2	T1	T2
VABS-P4-8S-G18	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

Technical data

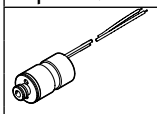
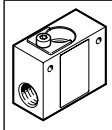
Dimensions Download CAD data ➔ www.festo.com

Mounting



Type	B1	D1	H1	L1
VAME-P4-PC8-P-P10	9	3.6	0.5	10.9
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					
	Suitable for proportional directional control valves with nominal width 0.3 mm Set for 2/2-way proportional directional control valve VPWS. comprising: • Manifold block VABS-P4-8S-G18 • 1 mounting component from the set VAME-P4-PC15-P-P10 • Socket head screw M4x8		**8186785**	**VABS-P4-8S-G18**	1
	Suitable for proportional directional control valves with nominal width 1.5 and 2.2 mm Set for 2/2-way proportional directional control valve VPWS. comprising: • Manifold block VABS-P4-10S-G14 • 1 mounting component from the set VAME-P4-PC15-P-P10 • Socket head screw M4x8		**8087327**	**VABS-P4-10S-G14**	1
	Suitable for proportional directional control valve with nominal width 6 mm Set for 2/2-way proportional directional control valve VPWS. comprising: • Manifold block VABS-P4-20S-G38 • 1 mounting component from the set VAME-P4-PC15-P-P10 • Socket head screw M4x8		**8087328**	**VABS-P4-20S-G38**	1
Mounting					
	For 2/2-way proportional directional control valve VPWS in manifold block VABS (set comprises 10 mountings for 10 proportional directional control valves VPWS)		**8187513**	**VAME-P4-PC8-P-P10**	10
			8087347	**VAME-P4-PC15-P-P10**	1

1) Packaging unit.