

**Proportional flow control valve VEMD**



# Proportional flow control valve VEMD

Key features

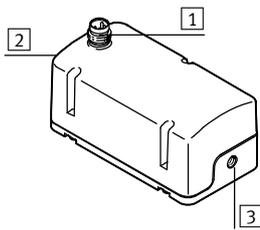
## Description

Thanks to the integrated low-noise piezo technology, minimal energy consumption and compact dimensions, the valve VEMD is perfectly suited to mobile applications.

### Advantages:

- Very low energy consumption
- High dynamic response
- No self-heating
- Absolutely silent
- Excellent price/performance ratio
- Sturdy and durable
- Linear control response
- Small installation space
- Minimal weight

## Mode of operation



- 1 Electrical connection
- 2 Port 1 (pressure supply port)
- 3 Port 2 (working port)

The VEMD is a mass flow controller with integrated piezo actuator. The flow rate is controlled via a closed-loop control circuit with integrated thermal sensor.

The setpoint value and the actual value of the flow rate can be specified and fed back using an analogue interface.

## Range of application

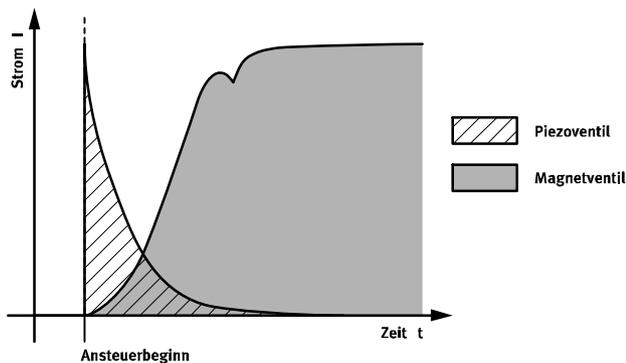
The proportional flow control valve VEMD is intended to be used for controlling the flow of air and inert gases in relation to a specified setpoint value.

The flow control valve is suitable for applications in medical technology within bounds of the specified key technical features.

Additional measures may be required for applications with special requirements,

such as for hygiene and sterility.

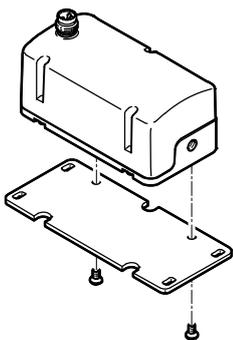
## Low energy consumption



Compared with solenoid valves, proportional valves with piezo technology require virtually no energy to maintain an active state thanks to their capacitive principle. The piezo valve operates like a capacitor: it needs current only at the start in order to charge the piezoceramics.

No further energy is needed to maintain its state. The valves therefore generate no heat. They consume up to 95% less energy than solenoid valves, which permanently require an electrical current.

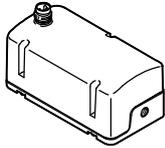
## Mounting



The valve VEMD is mounted on the wall mounting VAME-P14-W using two screws.

# Proportional flow control valve VEMD

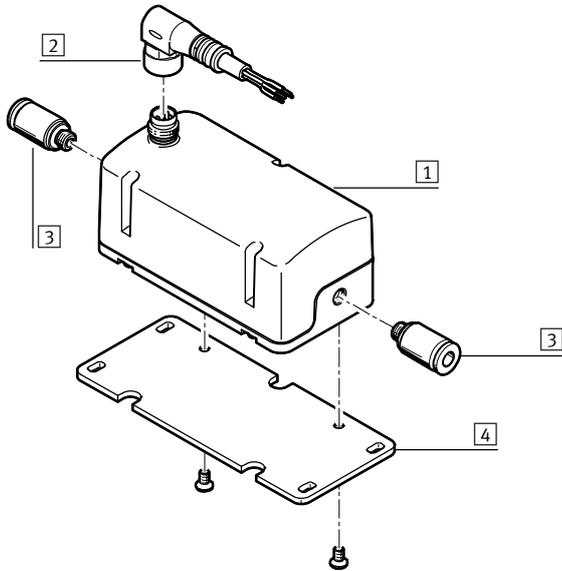
Product range overview

Function	Description		Nominal operating voltage [V DC]	Setpoint value [V]	Flow rate control range [l <sub>n</sub> /min]	Operating pressure [bar]
Proportional flow control valve		Mass flow controller, 2-way valve, normally closed	24	0.2 ... 10	0 ... 20	0 ... 2.5
			12			

# Proportional flow control valve VEMD

Peripherals overview

## VEMD on mounting plate



		→ Page/Internet
1	Proportional flow control valve VEMD	- 10
2	Connecting cable NEBU	- 10
3	Push-in fitting QSM/NPQM	For connecting tubing with standard outside diameters 10
4	Mounting plate VAME-P14	For mounting the valve 10

# Proportional flow control valve VEMD

Type codes

VEMD - L - 6 - 14 - 20 - D21 - M5 - - R1 - V1

**Type**

VEMD	Proportional flow control valve
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**Type of directional control valve**

L	In-line valve
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**Valve function**

6	2/2-way valve, normally closed
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**Nominal width**

14	1.4 mm
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**Flow rate range**

20	20 l <sub>n</sub> /min
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**Pressure range**

D21	0 ... 2.5 bar
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**Pneumatic connection**

M5	M5
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**Nominal operating voltage**

1	24 V DC
5	12 V DC

**Electrical connection**

R1	Single plug M8, 4-pin
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**Setpoint value input**

V4	0.2 ... 10 V
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# Proportional flow control valve VEMD

Technical data

-  Flow rate control range  
0 ... 20 l<sub>n</sub>/min
  
-  Voltage  
12, 24 V DC
  
-  Operating pressure  
0 ... 2.5 bar



General technical data		
Valve function		2-way proportional flow control valve
Flow rate control range <sup>1)</sup>	[ l <sub>n</sub> /min ]	0 ... 20
Dimensions W x L x H	[ mm ]	37x70x31
Nominal width	[ mm ]	1.4
Pneumatic port 1, 2		Female thread M5
Type of mounting		Direct mounting via thread
Mounting position		Any
Flow direction		Non-reversible
Product weight	[ g ]	92

1) The flow is calibrated at the factory to the physical standard conditions in accordance with DIN 1343 (1013 mbar, 0°C)

Electrical data		
	VEMD-L-6-14-20-D21-M5-1-R1-V4	VEMD-L-6-14-20-D21-M5-5-R1-V4
Electrical connection	Plug M8x1, 4-pin, to EN 60947-5-2	
Nominal operating voltage	[ V DC ] 24	12
Operating voltage range	[ V DC ] 22 ... 26.4	11.1 ... 13.2
Analogue input signal range	[ V ] 0.2 ... 10	
Analogue output signal range	[ V ] 0.2 ... 10	
Setpoint value	[ V ] 0.2 ... 10	
Max. electrical power consumption	[ W ] 1	
Max. current consumption	[ mA ] 40	65
Duty cycle	[ % ] 100	
Reverse polarity protection	For operating voltage connections	
Degree of protection	IP40, in any mounting position	
	IP51, in horizontal mounting position	

# Proportional flow control valve VEMD

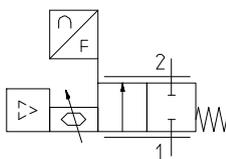
Technical data

Operating and environmental conditions		
Operating pressure	[bar]	0 ... 2.5
Overload pressure	[bar]	6
Burst pressure	[bar]	10
Medium		<ul style="list-style-type: none"> <li>• Oxygen (oxygen applications according to IEC 60601-1 only on request)</li> <li>• Compressed air to ISO 8573-1:2010 [6:4:4]</li> <li>• Inert gases</li> <li>• Nitrogen</li> </ul>
Note on the medium		Lubricated operation not possible
Ambient conditions		Not suitable for use in an oxygen-enriched environment according to IEC 60601-1
Special characteristics		Oxygen-compatible to DIN EN 1797
Accuracy of flow rate	[%]	± (4% o.m.v. + 1.25% FS)
Repetition accuracy FS	[%]	1
Hysteresis FS	[%]	2.5
Linearity error FS	[%]	2
Temperature coefficient K	[%]	0.1
Ambient temperature	[°C]	0 ... 50
Temperature of medium	[°C]	5 ... 40
Storage temperature	[°C]	- 20 ... 70
Certification		RCM compliance mark
CE marking (see declaration of conformity)		To EU EMC Directive <sup>2)</sup>

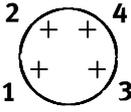
- 2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: [www.festo.com/sp](http://www.festo.com/sp) → Certificates.  
 If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Materials	
Seals	EPDM, NBR
Housing	PA-reinforced
Note on materials	RoHS-compliant
	Contains paint-wetting impairment substances

## Circuit symbol



2-way valve, normally closed

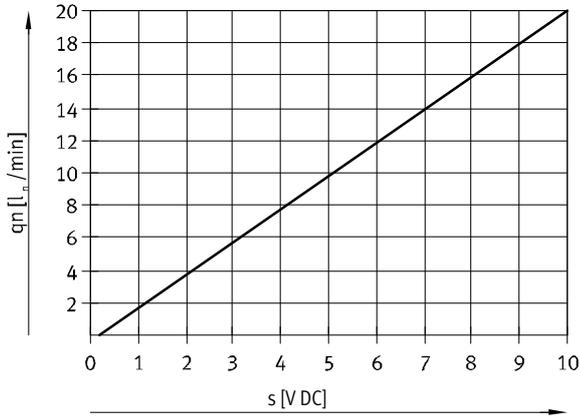
Pin allocation			
	Pin	Function	
		VEMD-L-6-14-20-D21-M5-1-R1-V4	VEMD-L-6-14-20-D21-M5-5-R1-V4
	1	+24 V DC supply voltage	+12 V DC supply voltage
	2	+ Setpoint value 0.2 ... 10 V	
	3	GND	
	4	+ Actual value 0.2 ... 10 V	

# Proportional flow control valve VEMD

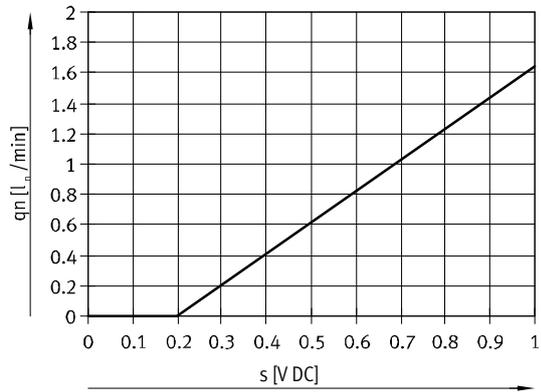
Technical data

## Flow $q_n$ as a function of setpoint value $s$

Complete range of values



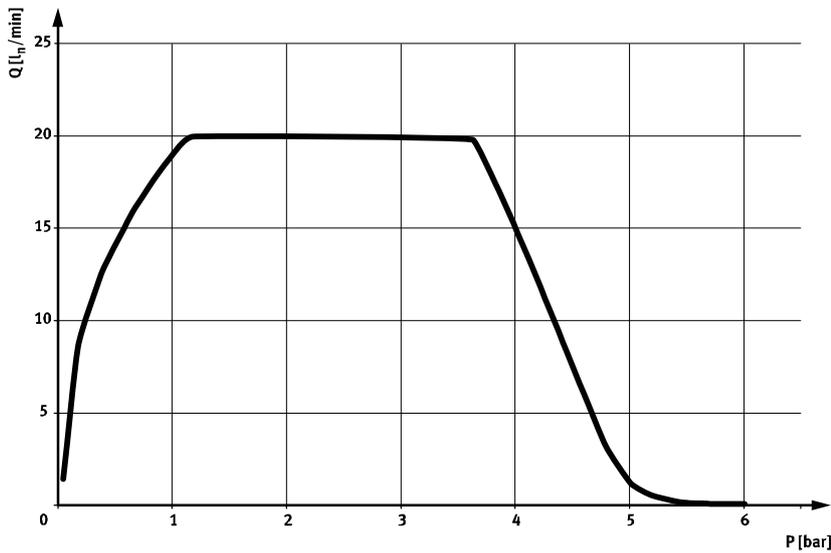
Detail area



Formula for calculating the setpoint value  $s$  as a function of the required nominal flow rate

$$s = \frac{9.8 \times (q_n + 4/9.8)}{20}$$

## Maximum flow rate plotted against operating pressure, at room temperature

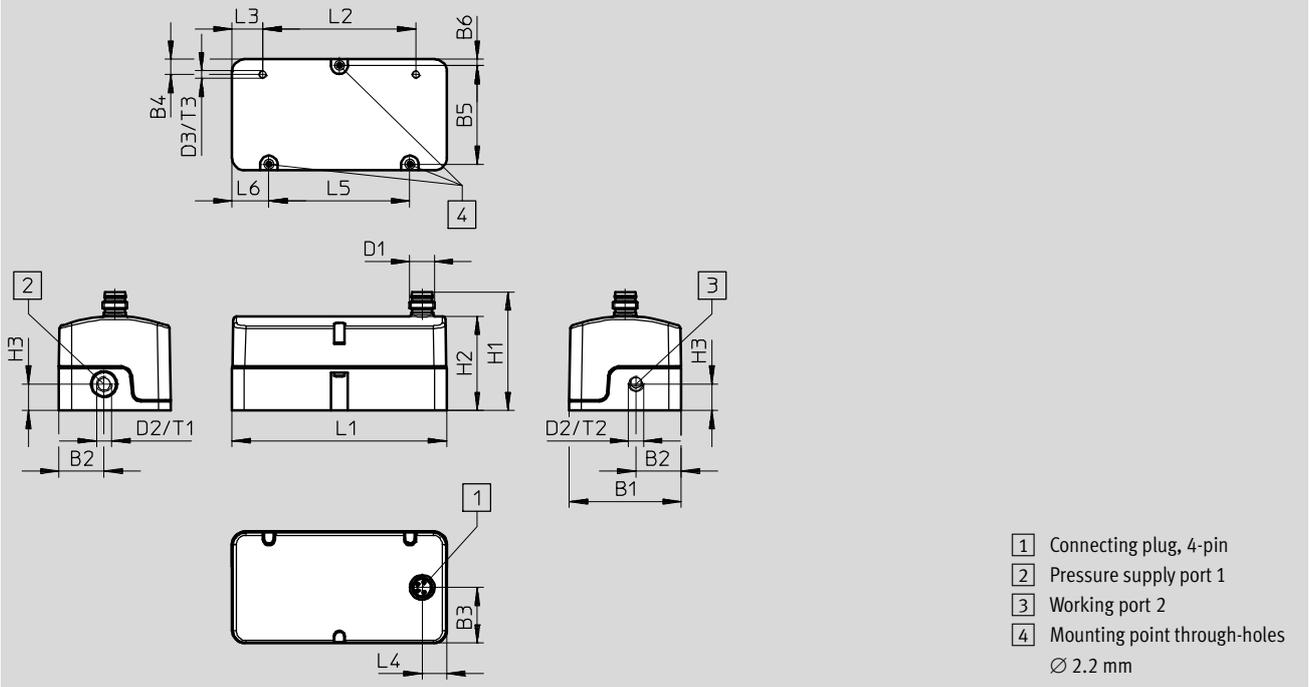


# Proportional flow control valve VEMD

Technical data

## Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)



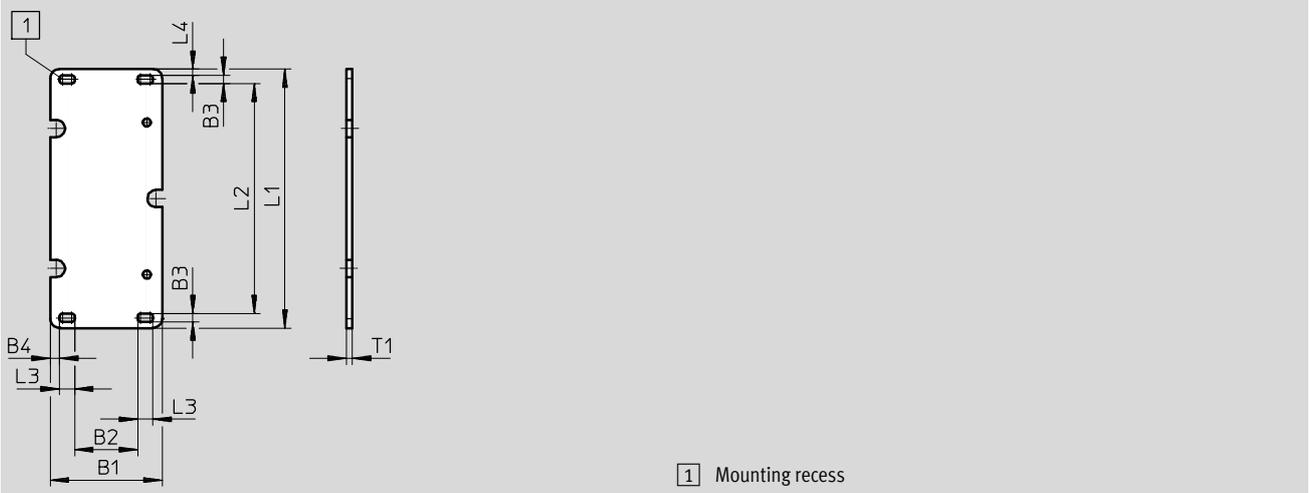
Type	B1	B2	B3	B4	B5	B6	D1	D2	D3
VEMD	36.5	14.7	18.3	5	32.5	2	M8x1	M5	M2.5

Type	H1	H2	H3	L1	L2	L3	L4	L5	L6	T1	T2	T3
VEMD	38.9	30.9	8.6	70	50	10	8	46	12	8	5	5

## Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

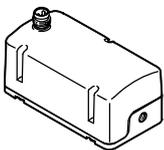
Wall mounting



Type	B1	B2	B3	B4	L1	L2	L3	L4	T1
VAME-P14-W	36.5	20.5	2.7	3	85	75.6	5	2	2

# Proportional flow control valve VEMD

Accessories

Ordering data					
	Description	Operating pressure [bar]	Nominal operating voltage [V DC]	Part no.	Type
Proportional flow control valve					
	Mass flow controller, 2-way valve, normally closed	0 ... 2.5	24	<b>8086472</b>	<b>VEMD-L-6-14-20-D21-M5-1-R1-V4</b>
			12	<b>8086473</b>	<b>VEMD-L-6-14-20-D21-M5-5-R1-V4</b>

Ordering data					
	Description			Part no.	Type
Connecting cable <span style="float: right;">Technical data → Internet: nebu</span>					
	Straight socket, M8x1, 4-pin Open end, 4-wire		2.5 m	<b>541342</b>	<b>NEBU-M8G4-K-2.5-LE4</b>
			5 m	<b>541343</b>	<b>NEBU-M8G4-K-5-LE4</b>
	Angled socket, M8x1, 4-pin Open end, 4-wire		2.5 m	<b>541344</b>	<b>NEBU-M8W4-K-2.5-LE4</b>
	Straight socket, M8x1, 4-pin Straight plug, M8x1, 4-pin		2.5 m	<b>554035</b>	<b>NEBU-M8G4-K-2.5-M8G4</b>
			5 m	<b>541345</b>	<b>NEBU-M8W4-K-5-LE4</b>
Wall mounting					
	For valve assembly			<b>5225721</b>	<b>VAME-P14-W</b>
Push-in fitting, male thread M5					
	With internal hex	Metal version	For tubing O.D. 4 mm	<b>558657</b>	<b>NPQM-DK-M5-Q4-P10</b>
			For tubing O.D. 6 mm	<b>558658</b>	<b>NPQM-DK-M5-Q6-P10</b>
		Polymer version	For tubing O.D. 3 mm	<b>153313</b>	<b>QSM-M5-3-I</b>
			For tubing O.D. 4 mm	<b>153315</b>	<b>QSM-M5-4-I</b>
	With external hex	Metal version	For tubing O.D. 3 mm	<b>153302</b>	<b>QSM-M5-3</b>
			For tubing O.D. 4 mm	<b>153304</b>	<b>QSM-M5-4</b>
			For tubing O.D. 6 mm	<b>153306</b>	<b>QSM-M5-6</b>