

## Piezo valve VEMP

**FESTO**



## Characteristics

### At a glance

#### General information:

- The VEMP is a proportional 3/3-way valve in which a slotted piezo actuator (piezo actuator 1 and 2) is electrically controlled. The valve also has a connection for a pressure sensor.
- When combined with a pressure sensor and control electronics, the 3/3-way proportional valve can be used as a proportional-pressure regulator.
- Alternatively, the flow rate can also be controlled using a closed loop control by integrating a flow sensor in the output line (operation as 2/2-way valve).
- In normal position, the valve is closed. The working and pressure sensor ports are connected and always open, regardless of the switching status.
- The two piezo actuators can only be actuated separately; if they are activated simultaneously, safe and reliable operation cannot be ensured.

#### Innovative:

- Piezo technology
- Very low power consumption
- Extremely precise

#### Flexible:

- When combined with a pressure sensor and control electronics, it can be used as a proportional-pressure regulator
- When combined with a flow sensor and control electronics, it can be used as a proportional flow valve

#### Operationally safe:

- No self-heating
- Long service life

#### Easy to assemble:

- Can be mounted on a manifold rail
- Small installation space
- Lightweight

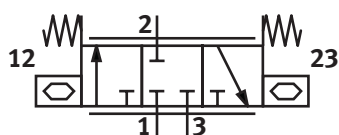
#### Low energy demand:

- Compared with solenoid valves, proportional valves with piezo technology require virtually no energy to maintain an active state thanks to their capacitive character. The piezo valve operates like a capacitor: it needs current only at the start in order to charge the piezo ceramics.
- No additional energy is needed to maintain this state and therefore the valves generate no heat. They consume up to 95% less energy than solenoid valves, which permanently require an electrical current.

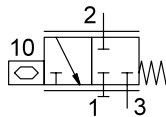
Note: For risk assessment when used in medical devices: The product does not contain redundancy or error detection. If malfunctions need to be detected, this must be done by implementing the necessary measures in the customer's product.

### Valve function

[3] 3/3-way valve, normally closed

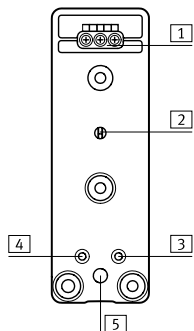


[6] 2/2-way valve, normally closed



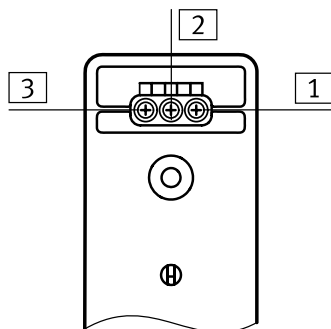
## Characteristics

### Pneumatic connection



- [1] Electrical connection
- [2] Connection for pressure sensor
- [3] Port 1 (pressure supply)
- [4] Port 3 (exhaust)
- [5] Port 2 (working port)

### Electrical connection



- Pin 1: GND
- Pin 2: Pressurisation
- Pin 3: Exhausting

### Diagrams

[Link](#)  [vemp](#)



The diagrams shown in this document are also available online. These can be used to display precise values.

## Type code

001	Series	
VEMP	Piezo valve	
002	Directional control valve type	
B	Sub-base valve	
003	Design principle	
S	Bending actuator	
004	Valve function	
3	3/3-way valve, normally closed	
005	Nominal width [mm]	
1.3	1.3	
1.6	1.6	

006	Pressure range [bar]	
D5	0 ... 0.5	
D7	0 ... 1	
D19	0 ... 1.7	
007	Pneumatic connection	
F	Flange/sub-base	
008	Nominal operating voltage	
22	250 V DC	
28	310 V DC	
009	Electrical connection	
T1	Pin	
010	Packaging quantity [pieces]	
	Standard	
P30	30	

## Datasheet

General technical data				
Nominal size	1.3 mm		1.6 mm	
Valve function	2/2-way, closed, monostable, 3/3-way, closed, monostable	3/3-way, closed, monostable		
Standard nominal flow rate (standardised to DIN 1343)	28 l/min	19 l/min	18 l/min	27 l/min
Standard nominal flow rate 2-3	29 l/min	20 l/min	19 l/min	28 l/min
Operating pressure	0 ... 1.7 bar	0 ... 1.1 bar	0 ... 0.7 bar	0 ... 1.1 bar
Nominal operating pressure	1.7 bar	1 bar	0.5 bar	1 bar
Dimensions (W x L x H)	17.2 x 52.1 x 7.2 mm			
Grid dimension	17.2 mm			
Pneumatic connection, port 1	Flange			
Pneumatic connection, port 2	Flange			
Pneumatic connection, port 3	Flange			
Type of actuation	Electric			
Type of mounting	On manifold rail On sub-base			
Mounting position	optional			
Flow direction	Non-reversible			
Product weight	8 g			
Special characteristics	Oxygen-compatible to DIN EN 1797			

Electrical data	
Nominal operating voltage DC	250 ... 310 V
Operational voltage range DC	0 ... 310 V
Max. electrical power consumption	1 mW
Max. current consumption <sup>1)</sup>	5 mA
Max. switching frequency	5 Hz
Note on degree of protection	Depending on connection block

1) If the charging current of 5 mA is exceeded, there is the risk of an ignition hazard for the piezo actuators both in an oxygen-enriched environment and in air.

Operating and environmental conditions		
Nominal size	1.3 mm	1.6 mm
Valve function	2/2-way, closed, monostable, 3/3-way, closed, monostable	3/3-way, closed, monostable
Operating medium	Compressed air as per ISO 8573-1:2010 [5:3:1]	
Note on operating and pilot medium	Lubricated operation not possible	
Oxygen suitability according to standard	ASTM G 63 ASTM G 93 ISO 15001	
Biocompatibility according to standard	ISO 18562	
Ambient temperature	0 ... 50°C	-20 ... 70°C
Media temperature	0 ... 50°C	-20 ... 60°C
Corrosion resistance class CRC <sup>1)</sup>	2 - Moderate corrosion stress	

1) More information [www.festo.com/x/topic/crc](http://www.festo.com/x/topic/crc)

Safety characteristics	
CE mark (see declaration of conformity) <sup>1)</sup>	To EU Low Voltage Directive
Shock resistance	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27
Vibration resistance	Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6

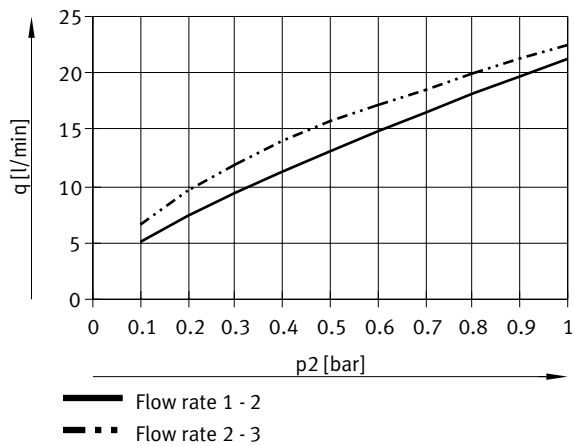
1) More information [www.festo.com/catalogue/...](http://www.festo.com/catalogue/...) -> Support/Downloads.

## Datasheet

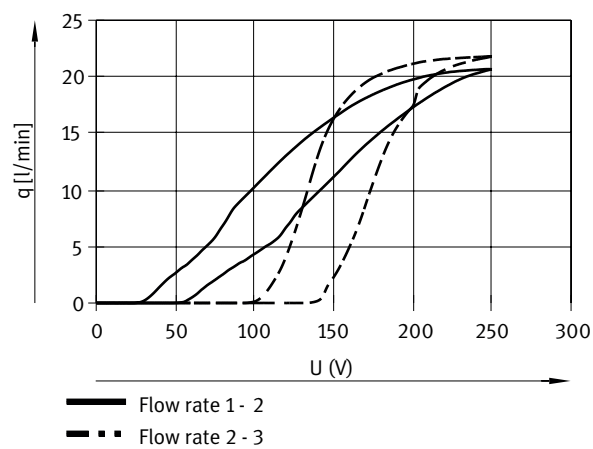
### Materials

Material seals	EPDM
Material housing	PA-reinforced
Material cover	PA-reinforced
Note on materials	RoHS-compliant

### VEMP-BS-3-13-D7-F-22T1, 1.3 mm nominal width, flow rate above operating pressure at 250 V

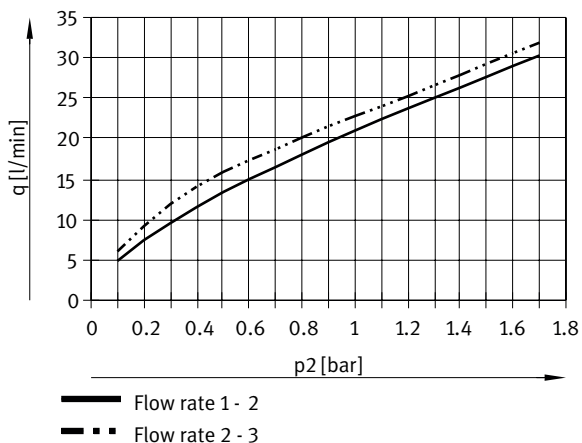


### VEMP-BS-3-13-D7-F-22T1, 1.3 mm nominal width, flow rate above voltage at room temperature, operating pressure 1 bar

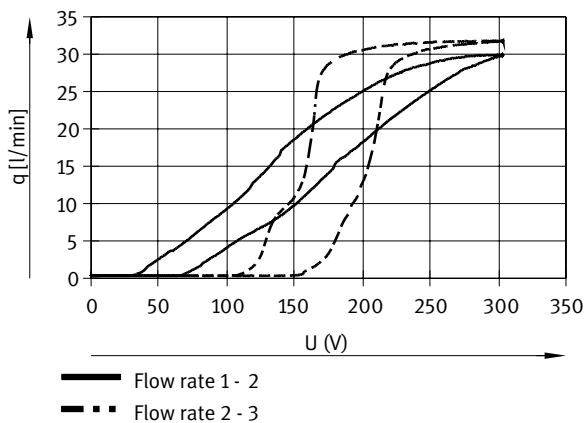


## Datasheet

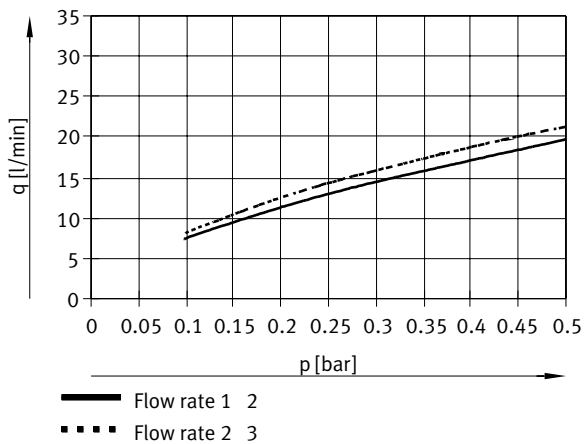
## VEMP-BS-3-13-D19-F-28T1, 1.3 mm nominal width, flow rate above operating pressure at 310 V



## VEMP-BS-3-13-D19-F-28T1, 1.3 mm nominal width, flow rate above voltage at room temperature, operating pressure 1.7 bar

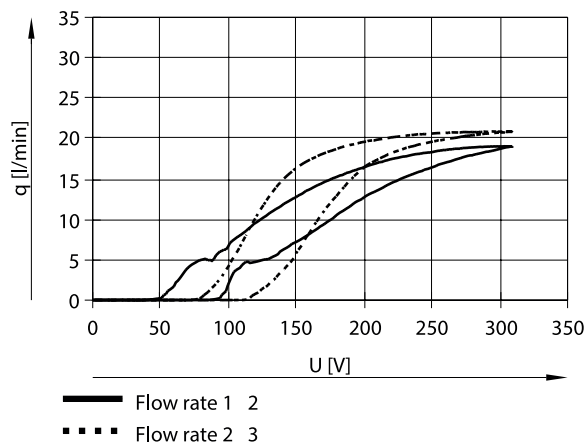


## VEMP-BS-3-16-D5-F-28T1, 1.6 mm nominal width, flow rate above operating pressure at 310 V

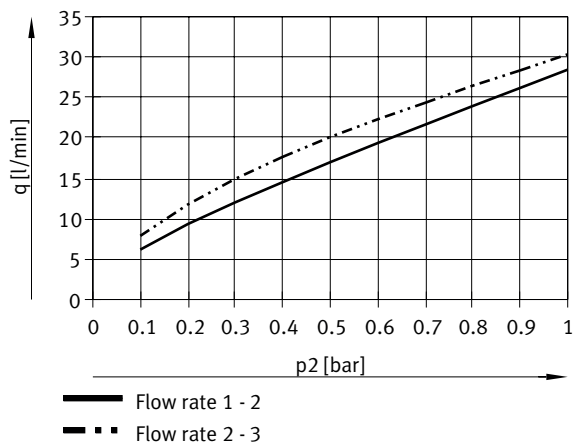


## Datasheet

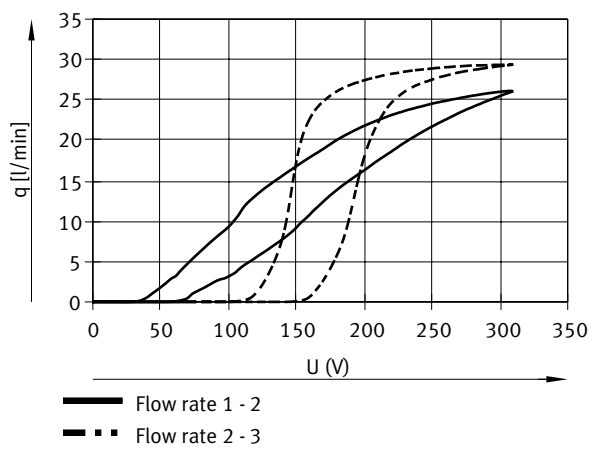
VEMP-BS-3-16-D5-F-28T1, 1.6 mm nominal width, flow rate above voltage at room temperature, operating pressure 0.5 bar



VEMP-BS-3-16-D7-F-28T1, 1.6 mm nominal width, flow rate above operating pressure at 310 V



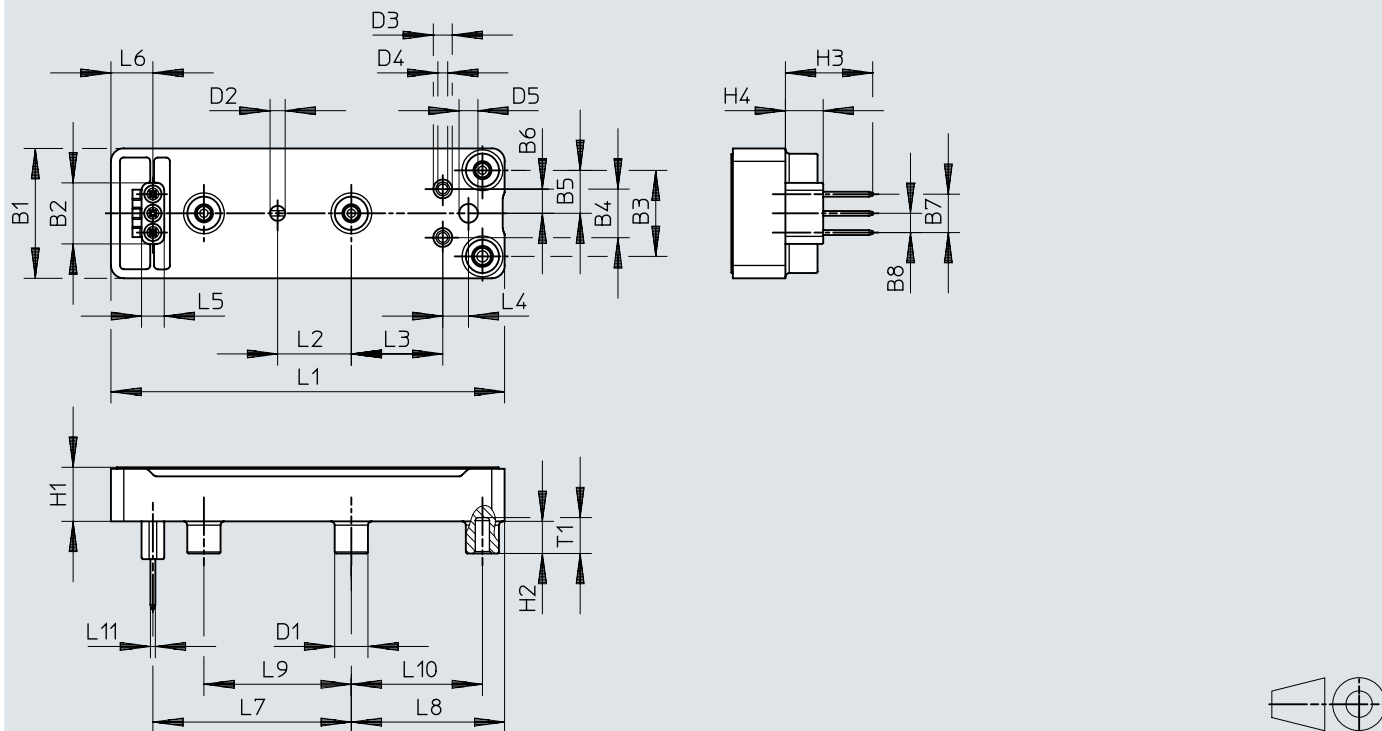
VEMP-BS-3-16-D7-F-28T1, 1.6 mm nominal width, flow rate above voltage at room temperature, operating pressure 1 bar





## Dimensions

## Dimensions – Piezo valves VEMP

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

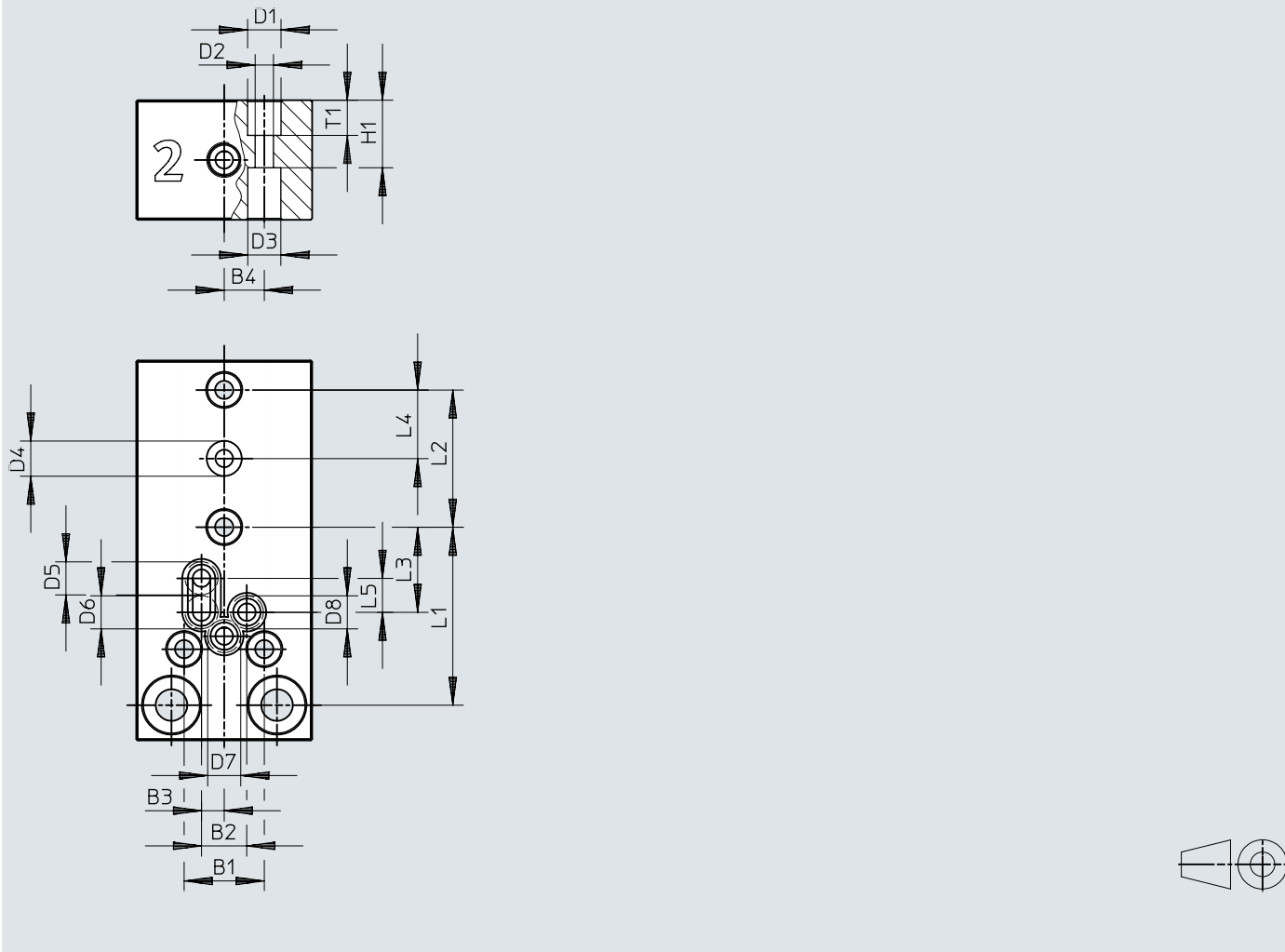
	B1	B2	B3	B4	B5	B6	B7	B8	D1 ∅	D2 ∅	D3 ∅	D4 ∅	D5 ∅	H1
VEMP	17,2	8,1	11,4	6,4	5,7	3,2	5,1	2,5	4,4	2	2,5	1,3/1,6	2,5	7,2

	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	T1
VEMP	4,3	11,6	5	52,1	9,8	12,1	3,4	3	5,6	26,3	20,3	19,5	17,4	0,6	4,8

## Dimensions


Dimensions – Example of manifold rail, seal

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



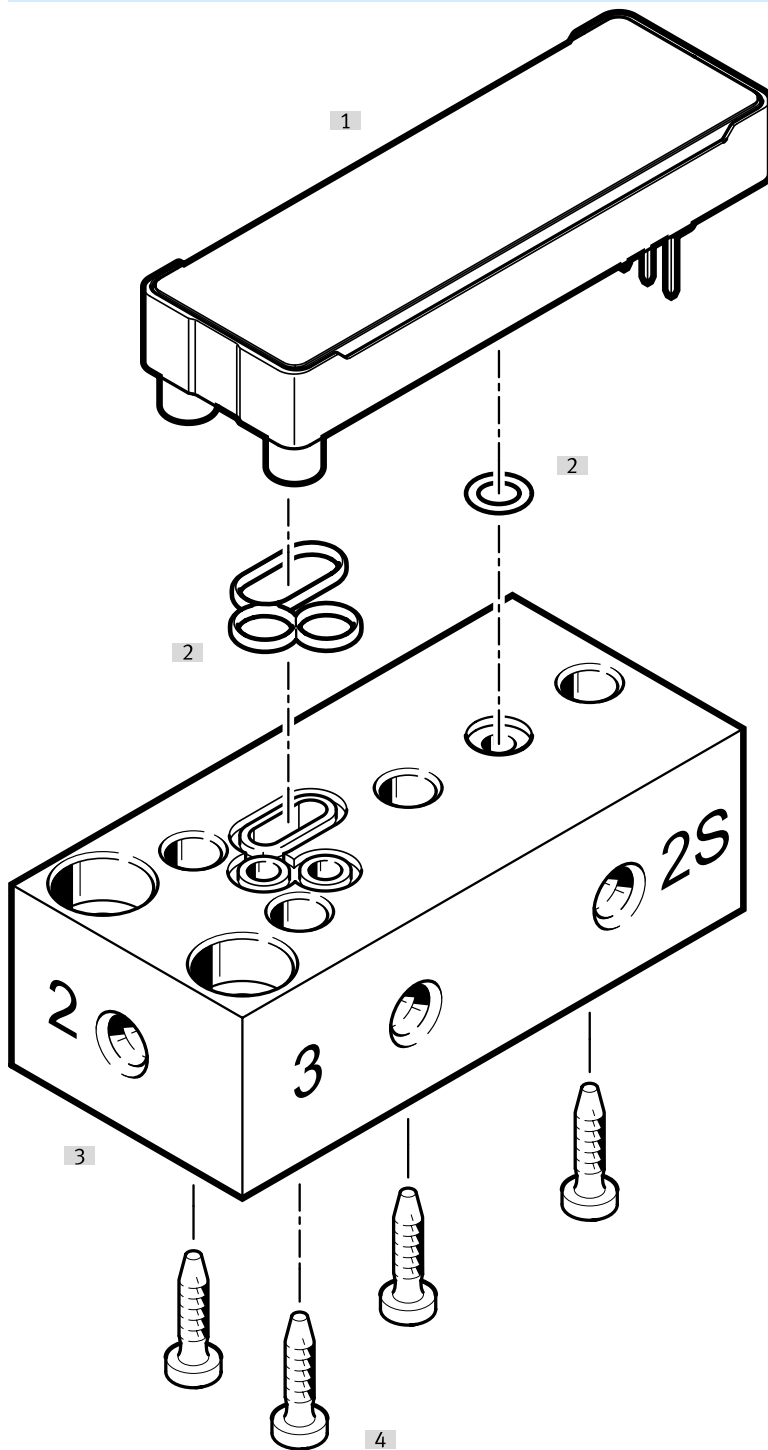
	B1	B2	B3	B4	D1 ∅	D2 ∅	D3 ∅	D4 ∅	D5 ∅	
VEMP	11,4	6,4	3,2	5,7	4,8	2,6	4,7	5	4,7	
	D6 ∅	D7 ∅	D8 ∅	H1	L1	L2	L3	L4	L5	T1
VEMP	4,7	4,7	4,7	9,6	25,3	19,5	12,1	9,8	4,8	5

## Ordering data

Sub-base valve VEMP							
	Valve function	Nominal size	Operating pressure	Standard nominal flow rate (standardised to DIN 1343)	Standard nominal flow rate 2-3	Part no.	Type
	2/2-way, closed, monostable, 3/3-way, closed, monostable	1.3 mm	0 ... 1.7 bar	28 l/min	29 l/min	8065734	VEMP-BS-3-13-D19-F-28T1
						8065735	VEMP-BS-3-13-D19-F-28T1-P30
	3/3-way, closed, monostable	1.3 mm	0 ... 1.1 bar	19 l/min	20 l/min	8064292	VEMP-BS-3-13-D7-F-22T1
						8064293	VEMP-BS-3-13-D7-F-22T1-P30
	3/3-way, closed, monostable	1.6 mm	0 ... 0.7 bar	18 l/min	19 l/min	8065738	VEMP-BS-3-16-D5-F-28T1
						8065739	VEMP-BS-3-16-D5-F-28T1-P30
			0 ... 1.1 bar	27 l/min	28 l/min	8064295	VEMP-BS-3-16-D7-F-28T1-P30
						8064294	VEMP-BS-3-16-D7-F-28T1

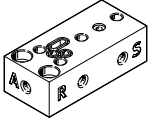
## Peripherals

Example: VEMP with sub-base




Accessories			→ Link
Type/order code	Description		
[1] VEMP piezo valve	-		<a href="#">vemp</a>
[2] Assortment of seals	-		13
[3] Connecting plate	-		13
[4] Screw set	-		13


## Accessories

Connecting plate					
	Construction width	Material sub-base	Product weight	Part no.	Type
	25 mm	Anodised wrought aluminium alloy	55 g	<b>8068637</b>	<b>VABS-P12-S-M5-P3</b>

Assortment of seals			
	Material seals	Part no.	Type
	NBR	<b>8065525</b>	<b>VABD-P12-S-P30</b>

Screw set				
	Material screws	Size of pack	Part no.	Type
	Tempered steel	120	<b>8065526</b>	<b>VAME-P12-MK</b>