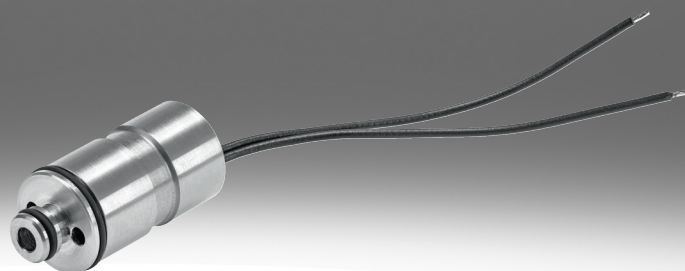


## Proportional directional control valve VPWS

**FESTO**



## Characteristics

### At a glance

[Link !\[\]\(99f58673407353e96a019fbca558fd72\_img.jpg\) vpws](#)

The VPWS solenoid valves are proportional directional control valves. The flow rate of suitable media can thus be controlled proportionally. Permissible operating media are air, oxygen and inert gases.

The VPWS solenoid valve may only be operated within the limits defined in the technical data. The specific operating conditions on site must be taken into account.

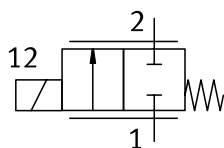
Assembly of the valve using a mounting that engages at the shoulder of the housing. If the mounting from the accessories is used, an additional M4 screw is required for nominal sizes 1.0/1.5/2.2 and 6 (3 bar/7 bar), and an M3 screw is required for nominal size 0.3.

Note: The product does not contain redundancy or fault detection. Malfunctions must be detected by measures in the customer's product, if required.

Before using with oxygen, the connection blocks found in the accessories must also be cleaned to remove any possible contamination.

### Valve function

[C] Normally closed



### Diagrams

[Link !\[\]\(e3275251d0893157c3584e20c81dc3ba\_img.jpg\) vpws](#)


The diagrams shown in this document are also available online. There, it is possible to display precise values.

## Type code

|      |                                        |  |
|------|----------------------------------------|--|
| 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

| General technical data                                       |                                                                                                |                                                                                      |                 |                 |                   |
|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------|-----------------|-------------------|
| Nominal width                                                | 0.3 mm                                                                                         | 1 mm                                                                                 | 1.5 mm          | 2.2 mm          | 6 mm              |
| Valve function                                               | 2/2 proportional directional control valve, closed                                             |                                                                                      |                 |                 |                   |
| Reset method                                                 | Mechanical spring                                                                              |                                                                                      |                 |                 |                   |
| Structural design                                            | Directly actuated poppet valve                                                                 |                                                                                      |                 |                 |                   |
| Sealing principle                                            | Soft                                                                                           |                                                                                      |                 |                 |                   |
| Actuation type                                               | Electrical                                                                                     |                                                                                      |                 |                 |                   |
| Type of control                                              | directly                                                                                       |                                                                                      |                 |                 |                   |
| Flow direction                                               | Non-reversible                                                                                 |                                                                                      |                 |                 |                   |
| Mounting position                                            | Any                                                                                            |                                                                                      |                 |                 |                   |
| Type of mounting                                             | On sub-base, Insertable, 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   |
| Standard flow rate (standard-<br>ized according to DIN 1343) | 6.6 ... 8 l/min                                                                                | 68 ... 88 l/min                                                                      | 82 ... 98 l/min | 46 ... 56 l/min | 200 ... 350 l/min |
| Product weight                                               | 5 g                                                                                            | 23 g                                                                                 |                 |                 | 25 g              |
| Degree of protection                                         | IP60                                                                                           |                                                                                      |                 |                 |                   |
| Note on degree of protection                                 | IP65 with suitable plug, In mounted state                                                      |                                                                                      |                 |                 |                   |
| Vibration resistance                                         | Transport application test<br>with severity level 1 as per<br>FN 942017-4 and EN 60068-<br>2-6 | Transport application test with severity level 2 as per FN 942017-4 and EN 60068-2-6 |                 |                 |                   |
| Note on vibration resistance                                 | Oscillation in the Z-direction can lead to flow fluctuation                                    |                                                                                      |                 |                 |                   |
| Shock resistance                                             | Shock test with severity level<br>1 as per FN 942017-5 and<br>EN 60068-2-27                    | Shock test with severity level 2 as per FN 942017-5 and EN 60068-2-27                |                 |                 |                   |
| Note on shock resistance                                     | A shock in the Z-direction can lead to flow fluctuation                                        |                                                                                      |                 |                 |                   |

| Operating and environmental conditions         |                                                                            |                            |               |               |                 |
|------------------------------------------------|----------------------------------------------------------------------------|----------------------------|---------------|---------------|-----------------|
| Nominal width                                  | 0.3 mm                                                                     | 1 mm                       | 1.5 mm        | 2.2 mm        | 6 mm            |
| Medium                                         | Inert gas<br>Air                                                           | Inert gas<br>Air<br>Oxygen |               |               |                 |
| Information on medium                          | Operation with oil lubrication not possible<br>Maximum particle size 10 µm |                            |               |               |                 |
| Operating pressure                             | 0 ... 1 MPa                                                                |                            | 0 ... 0.8 MPa | 0 ... 0.3 MPa | 0 ... 0.7 MPa   |
| Operating pressure                             | 0 ... 10 bar                                                               |                            | 0 ... 8 bar   | 0 ... 3 bar   | 0 ... 7 bar     |
| Nominal operating pressure                     | 1 MPa                                                                      |                            | 0.8 MPa       | 0.3 MPa       | 0.2 ... 0.7 MPa |
| Nominal operating pressure                     | 10 bar                                                                     |                            | 8 bar         | 3 bar         | 2 ... 7 bar     |
| Ambient temperature                            | 5 ... 50°C                                                                 |                            |               |               |                 |
| Temperature of medium                          | 5 ... 50°C                                                                 |                            |               |               |                 |
| Storage temperature                            | -40 ... 80°C                                                               |                            |               |               |                 |
| Corrosion resistance class (CRC) <sup>1)</sup> | 1 - Low corrosion stress                                                   |                            |               |               |                 |
| Biocompatibility according to standard         | –                                                                          | ISO 18562                  |               |               |                 |
| Oxygen suitability according to standard       | –                                                                          | ISO 15001                  |               |               |                 |
| Impurity level, hydrocarbons maximum           | –                                                                          | 550                        |               |               |                 |

1) Further information, visit [www.festo.com/x/topic/kbk](http://www.festo.com/x/topic/kbk)

## Datasheet

### Electrical data

| Nominal width                     | 0.3 mm                                                             | 1 mm         | 1.5 mm | 2.2 mm | 6 mm         |
|-----------------------------------|--------------------------------------------------------------------|--------------|--------|--------|--------------|
| Max. switching frequency          | 25 Hz                                                              | 18 Hz        |        |        | –            |
| Hysteresis                        | 14 mA                                                              | 16 mA        |        |        | 22.5 mA      |
| Coil resistance                   | 308 Ohm                                                            | 60.5 Ohm     |        |        |              |
| Max. electrical power consumption | 1.5 W                                                              | 2.5 W        |        |        | 3 W          |
| On switching time                 | –                                                                  |              |        |        | 10 ms        |
| Current regulating range          | 0 ... 70 mA                                                        | 0 ... 200 mA |        |        | 0 ... 225 mA |
| Duty cycle                        | 100% (see operating instructions)                                  |              |        |        |              |
| Voltage PWM control               | 32 V                                                               | 24 V         |        |        |              |
| Frequency PWM control             | 5 kHz                                                              | 3 kHz        |        |        |              |
| Note on PWM control               | The permissible current range must not be exceeded when using PWM. |              |        |        |              |

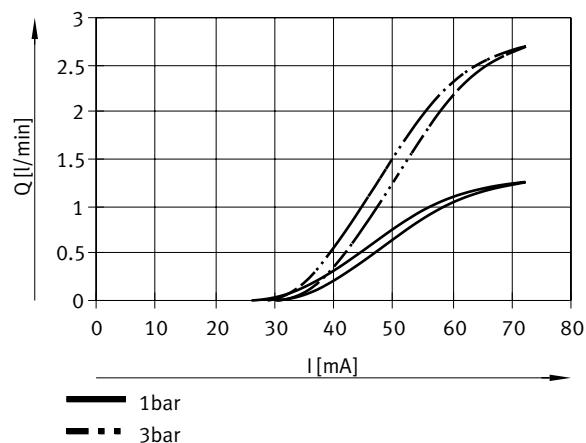
### Electrical connection

|                                                |              |
|------------------------------------------------|--------------|
| Electrical connection 1, connection type       | Cable        |
| Electrical connection 1, connection technology | Open end     |
| Electrical connection 1, number of pins/wires  | 2            |
| Cable length                                   | 70 ... 80 mm |

### Materials

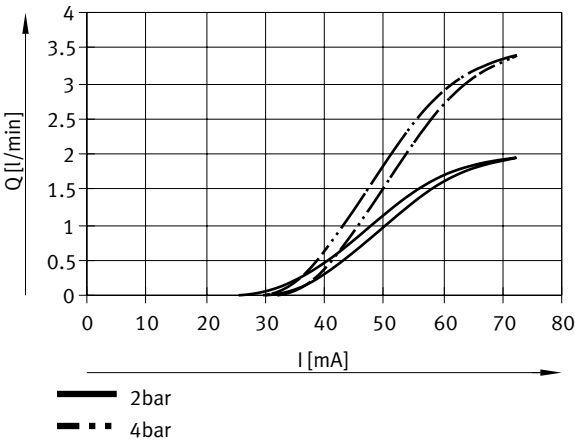
|                        |                    |
|------------------------|--------------------|
| Housing material       | High-alloy steel   |
| Seals material         | FPM                |
| Note on materials      | RoHS compliant     |
| LABS (PWIS) conformity | VDMA24364 Zone III |

### Flow rate characteristics, nominal size 1.5 mm, 1 bar and 3 bar

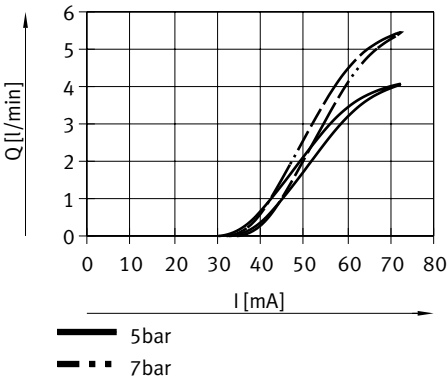


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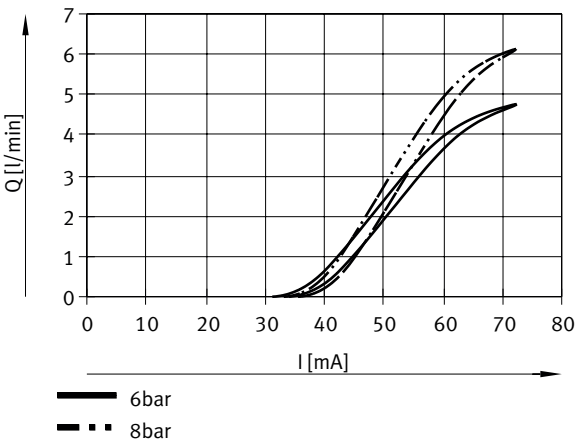
Flow rate characteristics, nominal size 1.5 mm, 2 bar and 4 bar



Flow rate characteristics, nominal size 1.5 mm, 5 bar and 7 bar

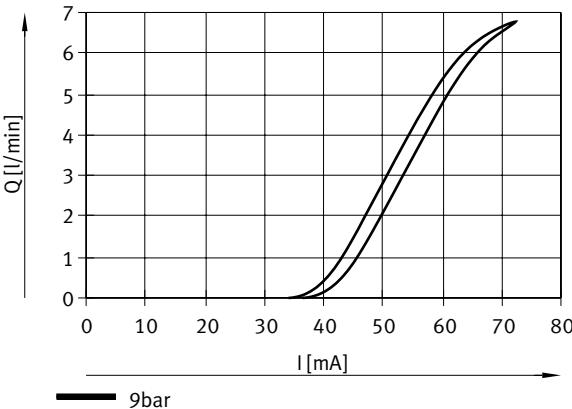


Flow rate characteristics, nominal size 1.5 mm, 6 bar and 8 bar

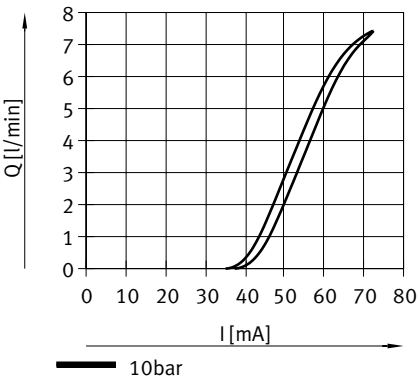


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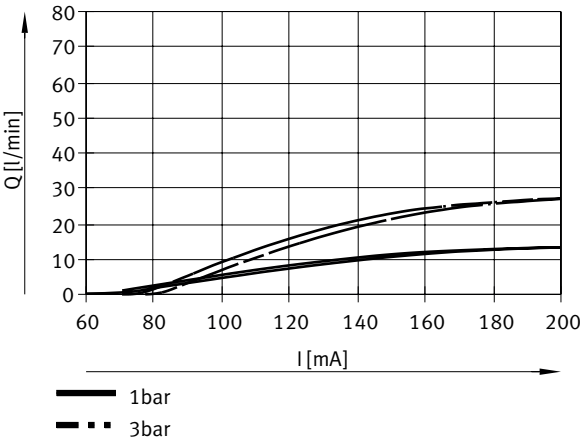
Flow rate characteristics, nominal size 1.5 mm, 1 bar and 3 bar



Flow rate characteristics, nominal size 1.5 mm, 2 bar and 4 bar

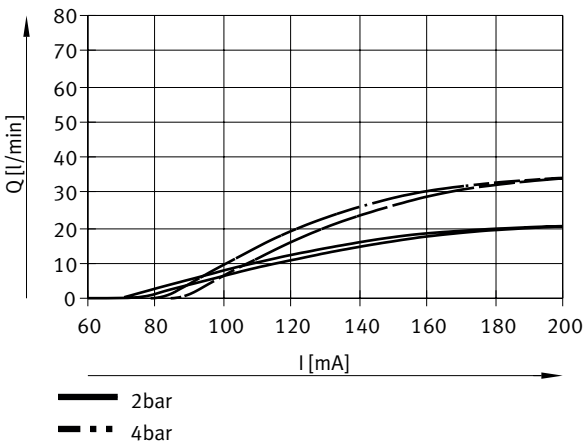


Flow/current characteristic curves, nominal diameter 1 mm, 1 bar and 3 bar

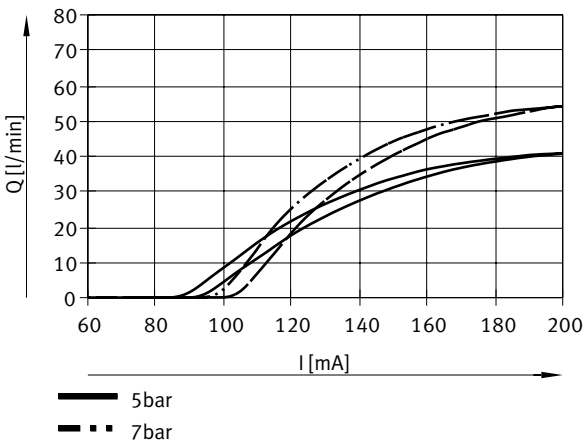


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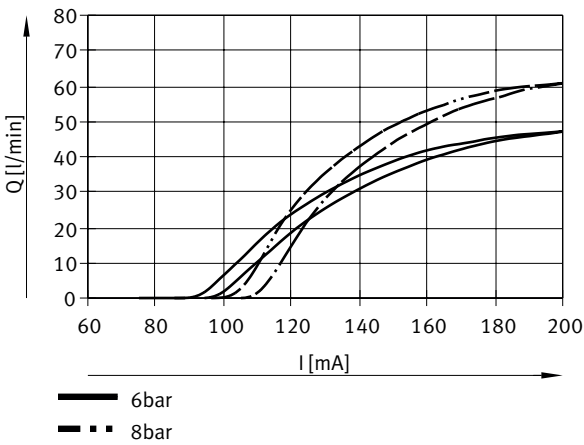
Flow/current characteristic curves, nominal diameter 1 mm, 2 bar and 4 bar



Flow/current characteristic curves, nominal diameter 1 mm, 5 bar and 7 bar

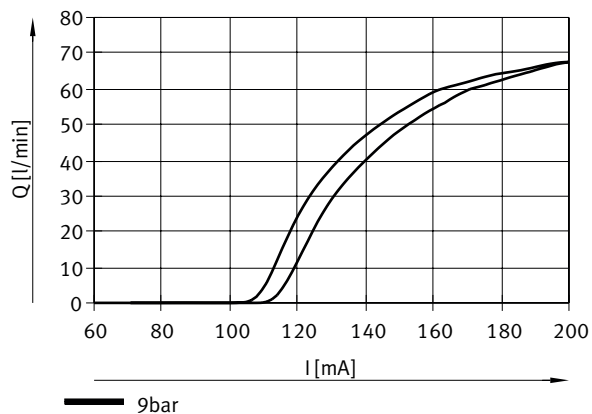


Flow rate characteristics, nominal width 1.6 mm, 8 bar and 3 bar

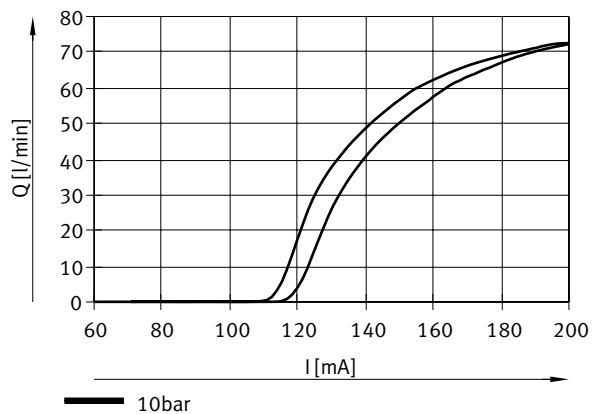


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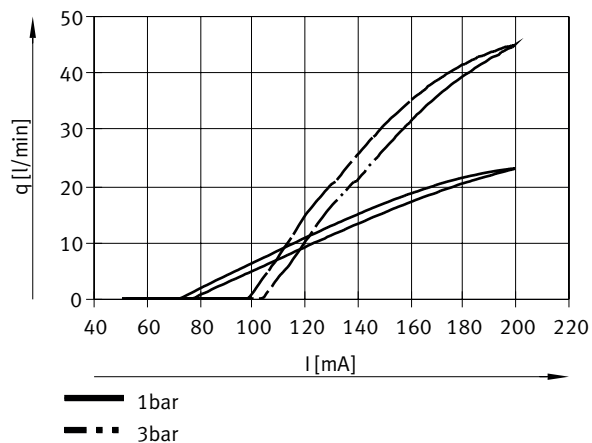
Flow/current characteristic curves, nominal diameter 1 mm, 9 bar



Flow/current characteristic curves, nominal diameter 1 mm, 10 bar

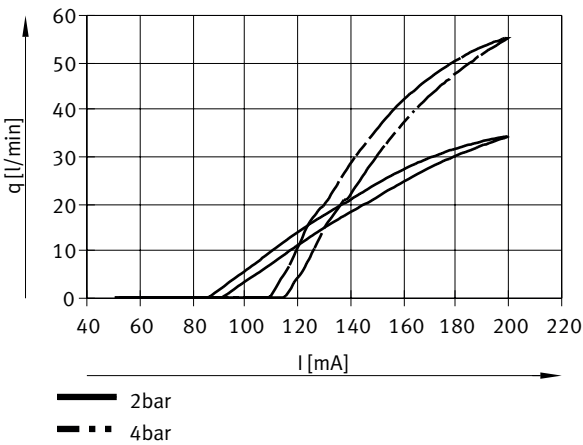


Flow rate characteristics, nominal size 1.5 mm, 1 bar and 3 bar

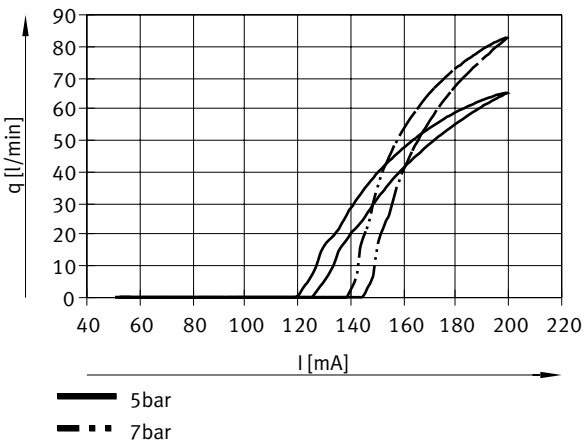


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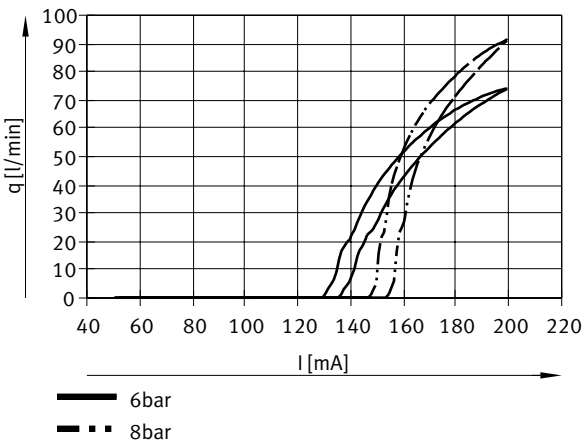
Flow rate characteristics, nominal size 1.5 mm, 2 bar and 4 bar



Flow rate characteristics, nominal size 1.5 mm, 5 bar and 7 bar

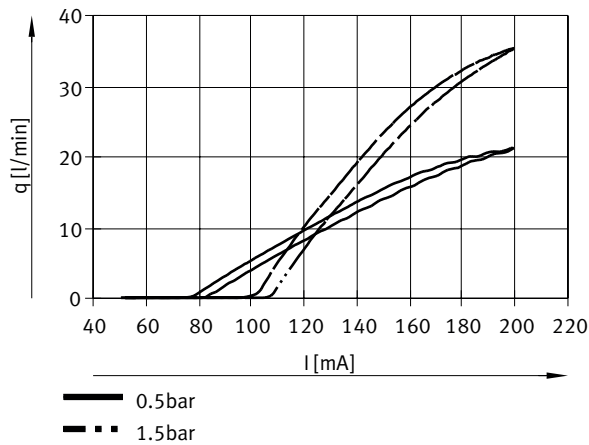


Flow rate characteristics, nominal size 1.5 mm, 6 bar and 8 bar

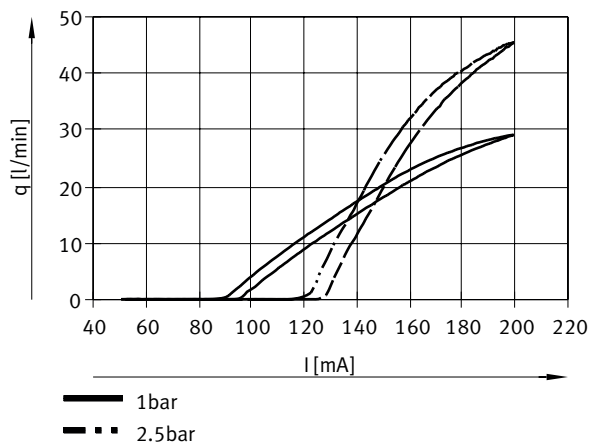


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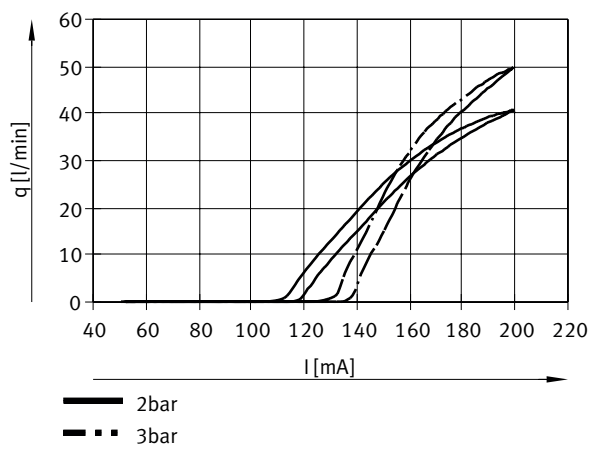
Flow rate characteristics, nominal size 2.2 mm, 0.5 bar and 1.5 bar



Flow rate characteristics, nominal size 2.2 mm, 1 bar and 2.5 bar

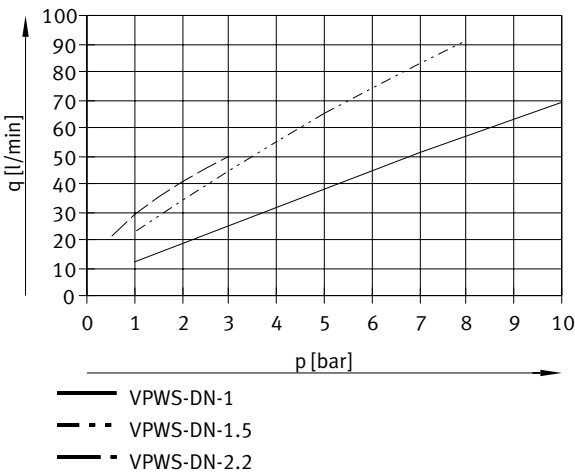


Flow rate characteristics, nominal size 2.2 mm, 2 bar and 3 bar

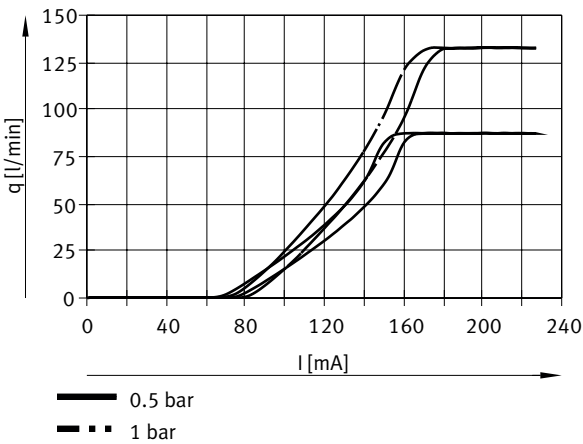


Datasheet

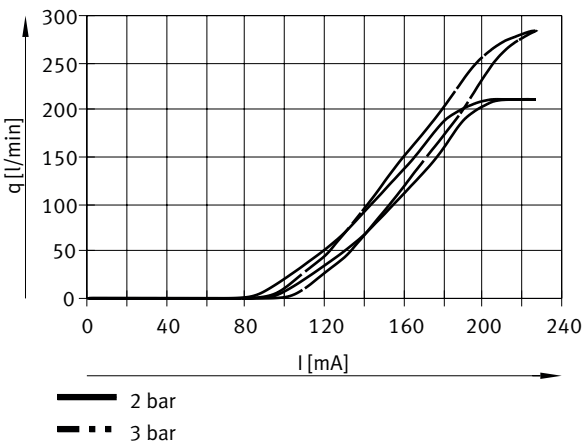
Flow-rate pressure characteristic at 200 mA



Flow rate characteristics, nominal size 6 mm, VPWS-6-B-6-PC15-3-V, 0.5 bar and 1 bar

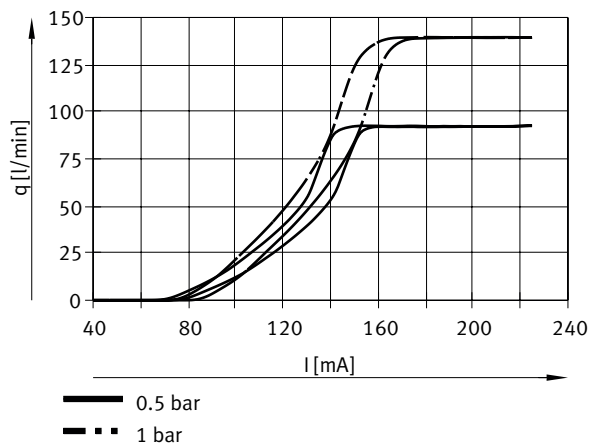


Flow rate characteristics, nominal size 6 mm, VPWS-6-B-6-PC15-3-V, 2 bar and 3 bar

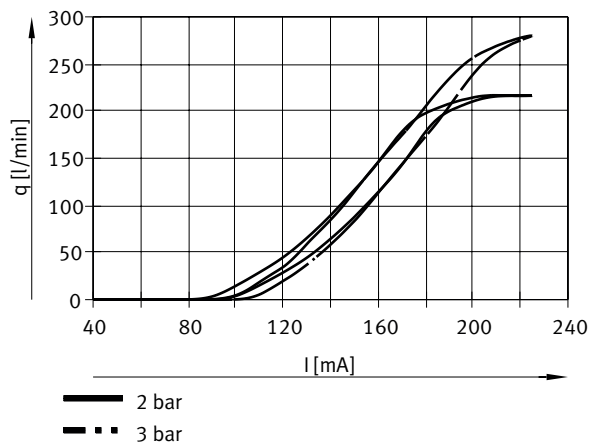


## Datasheet

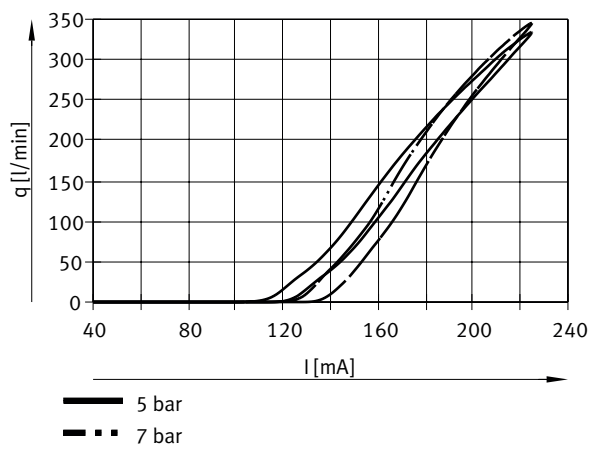
Flow rate characteristics, nominal size 6 mm, VPWS-6-B-6-PC15-7-V, 0.5 bar and 1 bar



Flow rate characteristics, nominal size 6 mm, VPWS-6-B-6-PC15-7-V, 2 bar and 3 bar

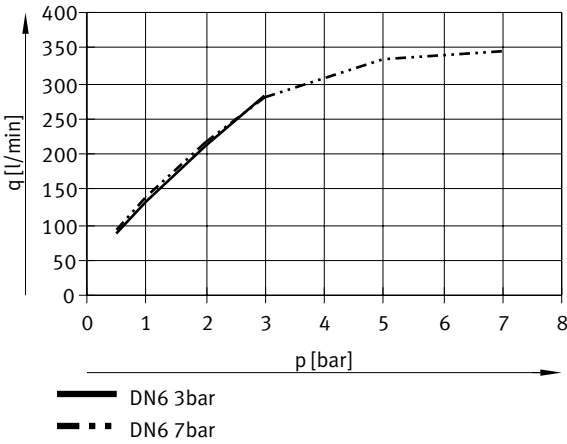


Flow rate characteristics, nominal size 6 mm, VPWS-6-B-6-PC15-7-V, 5 bar and 7 bar



Datasheet

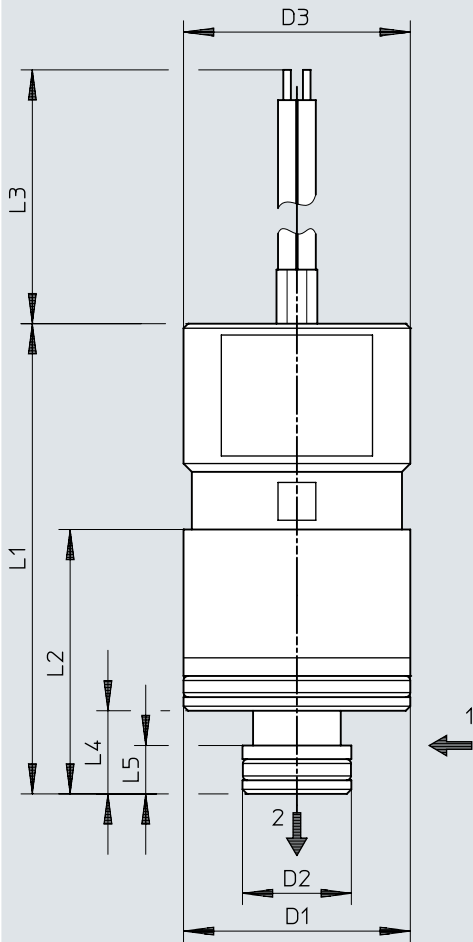
Flow-rate pressure characteristic at 225 mA



## Dimensions

Dimensions – VPWS proportional directional control valve

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



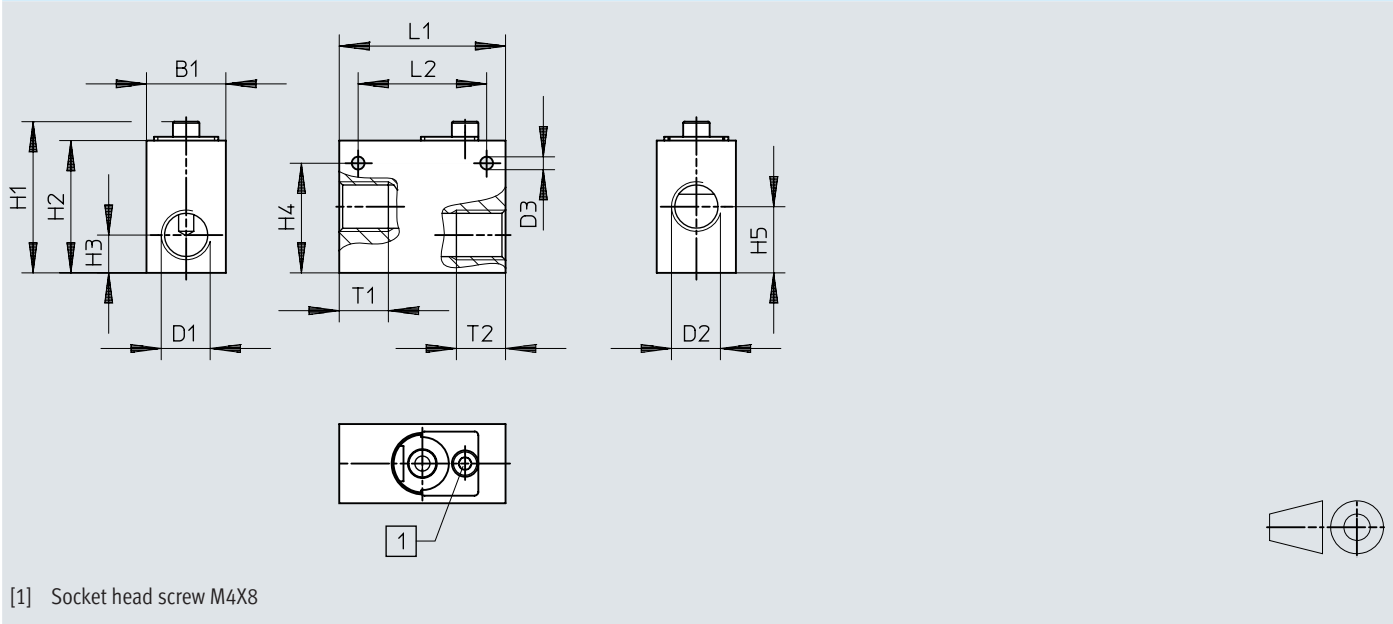
[1] Pneumatic connection 1 (for VPWS-6 as connection 2)

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

|                       | D1<br>Ø | D2<br>Ø | D3<br>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

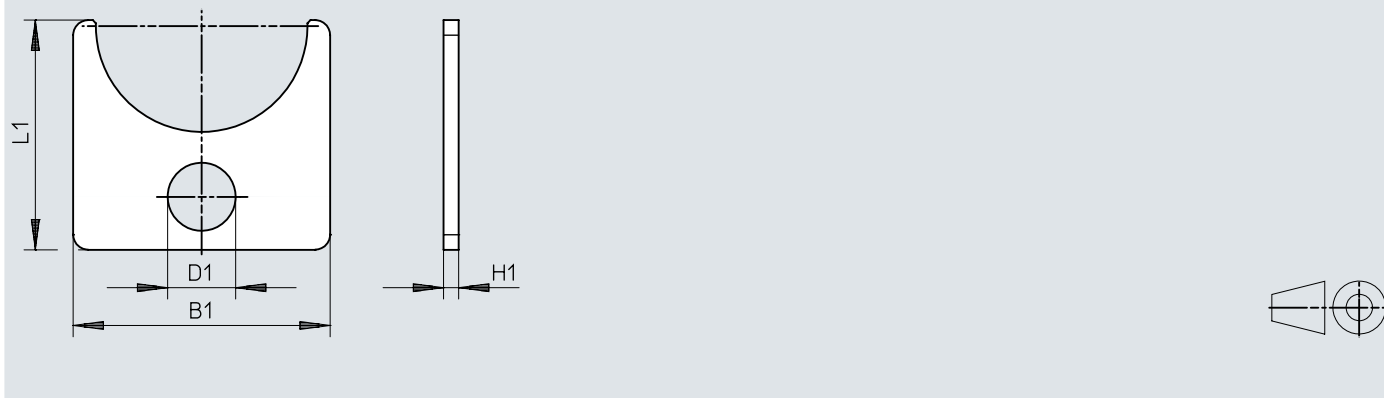
Dimensions – Manifold block VABS Download CAD data [www.festo.com](http://www.festo.com)



|                 | B1 | D1   | D2   | D3<br>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 |

## Dimensions

### Dimensions – Mounting VAME

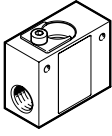
[Download CAD data](#) [www.festo.com](http://www.festo.com)


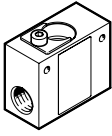
|                    | B1 | D1  | H1  | L1   |
|--------------------|----|-----|-----|------|
| VAME-P4-PC8-P-P10  | 9  | 3,4 | 0,5 | 11,5 |
| VAME-P4-PC15-P-P10 | 17 | 4,5 | 1   | 15,2 |

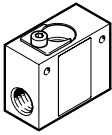
## Ordering data

| Proportional directional control valve VPWS                                      |               |                                                         |                            |                    |          |                       |
|----------------------------------------------------------------------------------|---------------|---------------------------------------------------------|----------------------------|--------------------|----------|-----------------------|
|                                                                                  | Nominal width | Standard flow rate (standardized according to DIN 1343) | Nominal operating pressure | Operating pressure | Part no. | Type                  |
|  | 0.3 mm        | 6.6 ... 8 l/min                                         | 1 MPa                      | 0 ... 1 MPa        | 8186784  | VPWS-0.3-B-6-PC8-10-V |
|                                                                                  | 1 mm          | 68 ... 88 l/min                                         |                            |                    | 8186783  | VPWS-1-B-6-PC15-10-V  |
|                                                                                  | 1.5 mm        | 82 ... 98 l/min                                         | 0.8 MPa                    | 0 ... 0.8 MPa      | 8074075  | VPWS-1.5-B-6-PC15-8-V |
|                                                                                  | 2.2 mm        | 46 ... 56 l/min                                         | 0.3 MPa                    | 0 ... 0.3 MPa      | 8074074  | VPWS-2.2-B-6-PC15-3-V |
|                                                                                  | 6 mm          | 200 ... 230 l/min                                       | 0.2 MPa                    |                    | 8074537  | VPWS-6-B-6-PC15-3-V   |
|                                                                                  |               | 270 ... 350 l/min                                       | 0.7 MPa                    | 0 ... 0.7 MPa      | 8074538  | VPWS-6-B-6-PC15-7-V   |

## Accessories

| Manifold block, suitable for proportional directional control valves with nominal width 0.3 mm |                        |                        |          |               |
|------------------------------------------------------------------------------------------------|------------------------|------------------------|----------|---------------|
|                                                                                                | Pneumatic connection 1 | Pneumatic connection 2 | Part no. | Type          |
|               | M5                     | M5                     | 8186785  | VABS-P4-8S-M5 |

| Manifold block, suitable for proportional directional control valves with nominal width 1, 1.5 and 2.2 mm |                        |                        |          |                 |
|-----------------------------------------------------------------------------------------------------------|------------------------|------------------------|----------|-----------------|
|                                                                                                           | Pneumatic connection 1 | Pneumatic connection 2 | Part no. | Type            |
|                          | G1/4                   | G1/4                   | 8087327  | VABS-P4-10S-G14 |

| Manifold block, suitable for proportional directional control valves with nominal size 6 mm |                        |                        |          |                 |
|---------------------------------------------------------------------------------------------|------------------------|------------------------|----------|-----------------|
|                                                                                             | Pneumatic connection 1 | Pneumatic connection 2 | Part no. | Type            |
|           | G3/8                   | G3/8                   | 8087328  | VABS-P4-20S-G38 |

| Mounting, suitable for 2/2 proportional directional control valve VPWS in connection block VABS |           |          |                    |
|-------------------------------------------------------------------------------------------------|-----------|----------|--------------------|
|                                                                                                 | Pack size | Part no. | Type               |
|              | 10        | 8187513  | VAME-P4-PC8-P-P10  |
|                                                                                                 |           | 8087347  | VAME-P4-PC15-P-P10 |