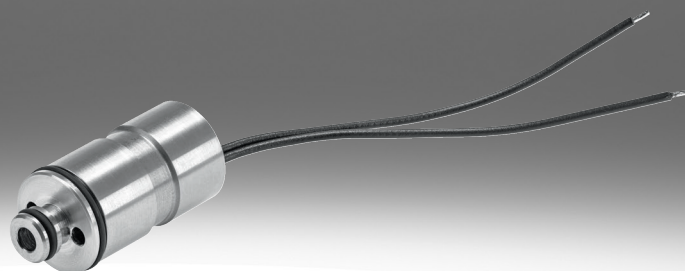


## Proportional directional control valve VPWS

**FESTO**



## Characteristics

### At a glance

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

The solenoid valves VPWS are proportional directional control valves. They can be used for the proportional control of the flow rate of suitable media. Permissible operating media are air, oxygen and inert gases.

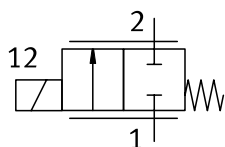
The solenoid valve VPWS should only be operated within the limits defined in the technical data. The specific on-site operating conditions must be taken into account. Installing the valve using a mounting that engages at the shoulder of the housing. If the mounting from the accessories is used, an M4 screw is also 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 error detection. If malfunctions need to be detected, this must be done by implementing the necessary measures in the customer's product.

The manifold block included in the accessories must also be cleaned to remove any contamination before using it with oxygen.

### Valve function

[C] Normally closed



### Diagrams

[Link !\[\]\(9c2e8d1b5bd77cb5c9f83b7a9cff79fd\_img.jpg\) vpws](#)


The diagrams shown in this document are also available online. These can be used 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 size                                       | 0.3 mm                                                                                     | 1 mm                                                                             | 1.5 mm          | 2.2 mm          | 6 mm              |
| Valve function                                     | 2/2 proportional directional control valve, closed                                         |                                                                                  |                 |                 |                   |
| Type of reset                                      | Mechanical spring                                                                          |                                                                                  |                 |                 |                   |
| Design                                             | Directly actuated poppet valve                                                             |                                                                                  |                 |                 |                   |
| Sealing principle                                  | Soft                                                                                       |                                                                                  |                 |                 |                   |
| Type of actuation                                  | Electrical                                                                                 |                                                                                  |                 |                 |                   |
| Type of piloting                                   | Direct                                                                                     |                                                                                  |                 |                 |                   |
| Flow direction                                     | Non-reversible                                                                             |                                                                                  |                 |                 |                   |
| Mounting position                                  | Any                                                                                        |                                                                                  |                 |                 |                   |
| Type of mounting                                   | On sub-base, Plug-in, With accessories                                                     |                                                                                  |                 |                 |                   |
| Pneumatic connection, port 1                       | Cartridge 8 mm                                                                             | Cartridge 15 mm                                                                  |                 |                 | Cartridge 7.5 mm  |
| Pneumatic connection, port 2                       | Cartridge 5.8 mm                                                                           | Cartridge 7.2 mm                                                                 |                 |                 | Cartridge 15 mm   |
| Standard flow rate (standard-<br>ised 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 to FN<br>942017-4 and EN 60068-2-<br>6 | Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6 |                 |                 |                   |
| Note on vibration resistance                       | Oscillation in the Z direction can lead to fluctuations in the flow rate                   |                                                                                  |                 |                 |                   |
| Shock resistance                                   | Shock test with severity level<br>1 to FN 942017-5 and EN<br>60068-2-27                    | Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27                |                 |                 |                   |
| Note on shock resistance                           | A shock in the Z-direction can lead to fluctuations in the flow rate                       |                                                                                  |                 |                 |                   |

| Operating and environmental conditions          |                                                                  |                              |               |               |                 |
|-------------------------------------------------|------------------------------------------------------------------|------------------------------|---------------|---------------|-----------------|
| Nominal size                                    | 0.3 mm                                                           | 1 mm                         | 1.5 mm        | 2.2 mm        | 6 mm            |
| Medium                                          | Inert gases<br>Air                                               | Inert gases<br>Air<br>Oxygen |               |               |                 |
| Note on the medium                              | Lubricated operation 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                                                       |                              |               |               |                 |
| Media temperature                               | 5 ... 50°C                                                       |                              |               |               |                 |
| Storage temperature                             | -40 ... 80°C                                                     |                              |               |               |                 |
| Corrosion resistance class<br>CRC <sup>1)</sup> | 1 - Low corrosion stress                                         |                              |               |               |                 |
| Biocompatibility according to<br>standard       | –                                                                | ISO 18562                    |               |               |                 |
| Oxygen suitability according to<br>standard     | –                                                                | ISO 15001                    |               |               |                 |
| Maximum impurity level for hy-<br>drocarbons    | –                                                                | 550                          |               |               |                 |

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

## Datasheet

### Electrical data

| Nominal size                      | 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 R20               | 308 Ohm                                                                               | 60.5 Ohm     |        |        |              |
| Max. electrical power consumption | 1.5 W                                                                                 | 2.5 W        |        |        | 3 W          |
| Switching time on                 | –                                                                                     |              |        |        | 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 pulse-width modulation. |              |        |        |              |

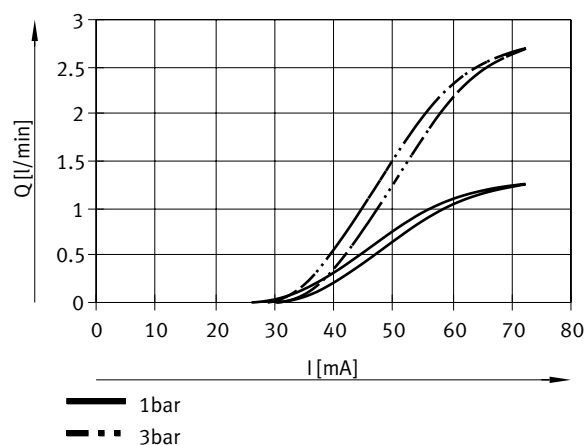
### Electrical connection

|                                                      |              |
|------------------------------------------------------|--------------|
| Electrical connection 1, connection type             | Cable        |
| Electrical connection 1, connector system            | Open end     |
| Electrical connection 1, number of connections/cores | 2            |
| Cable length                                         | 70 ... 80 mm |

### Materials

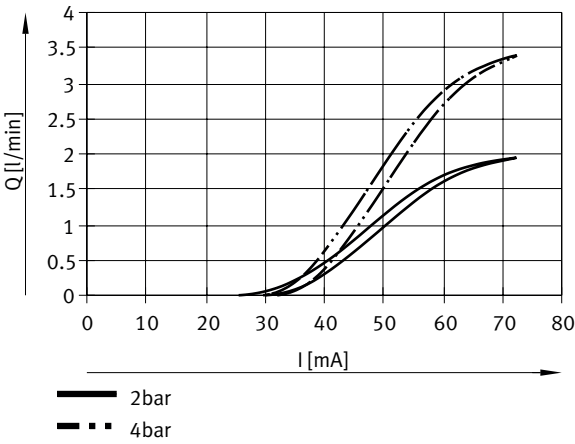
|                        |                    |
|------------------------|--------------------|
| Material housing       | High-alloy steel   |
| Material seals         | Fluoro rubber      |
| Note on materials      | RoHS compliant     |
| LABS (PWIS) conformity | VDMA24364 zone III |

### Characteristic flow rate curve, nominal width 0.3 mm, 1 bar and 3 bar

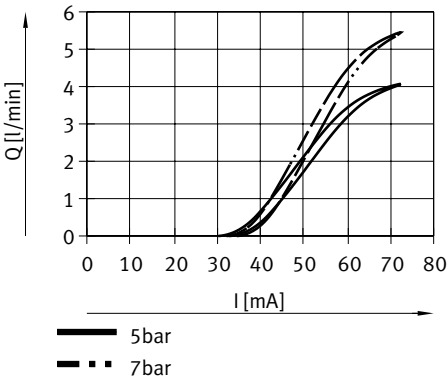


Datasheet

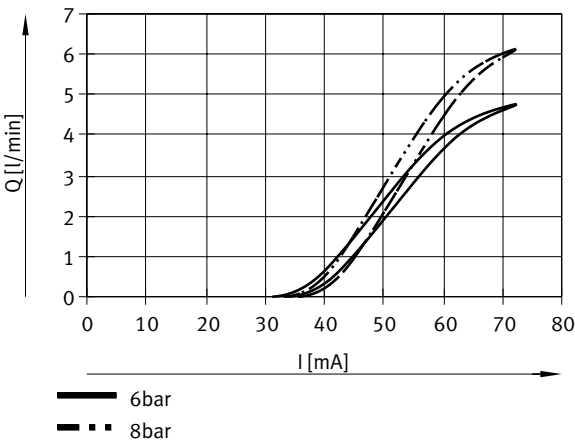
Characteristic flow rate curve, nominal width 0.3 mm, 2 bar and 4 bar



Characteristic flow rate curve, nominal width 0.3 mm, 5 bar and 7 bar

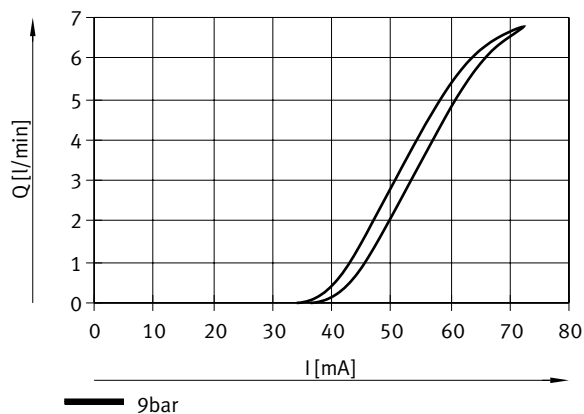


Characteristic flow rate curve, nominal width 0.3 mm, 6 bar and 8 bar

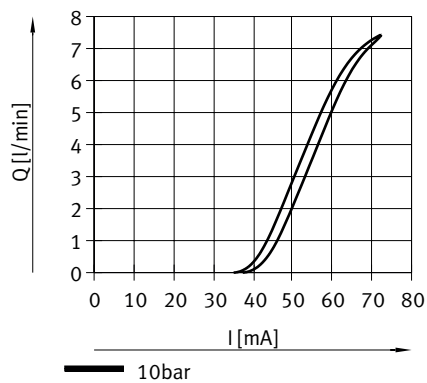


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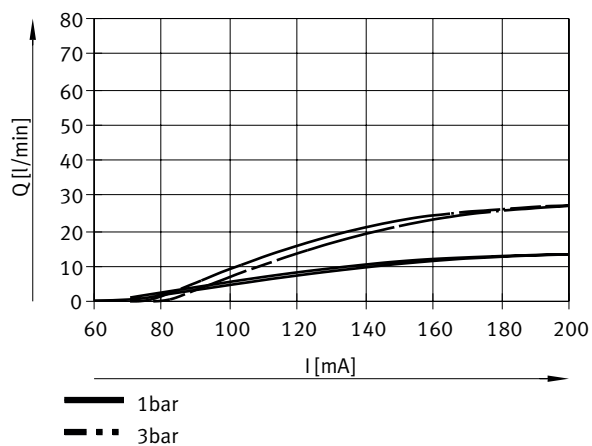
Characteristic flow rate curve, nominal width 0.3 mm, 9 bar



Characteristic flow rate curve, nominal width 0.3 mm, 10 bar

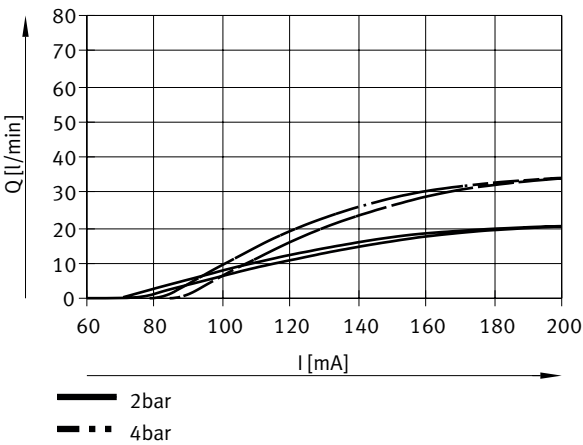


Characteristic flow rate curve, nominal width 1 mm, 1 bar and 3 bar

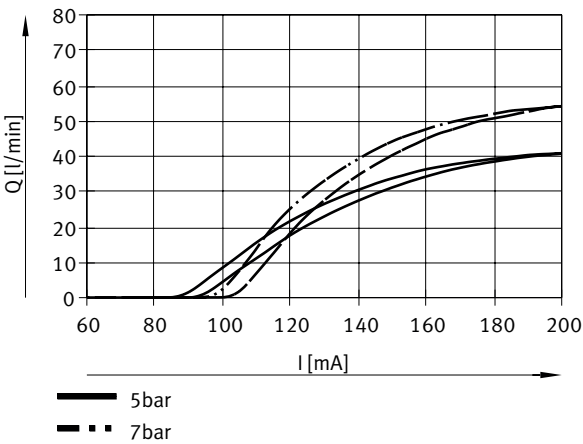


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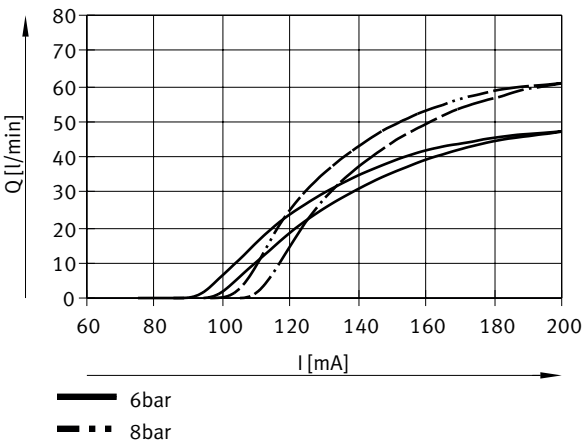
Characteristic flow rate curve, nominal width 1 mm, 2 bar and 4 bar



Characteristic flow rate curve, nominal width 1 mm, 5 bar and 7 bar

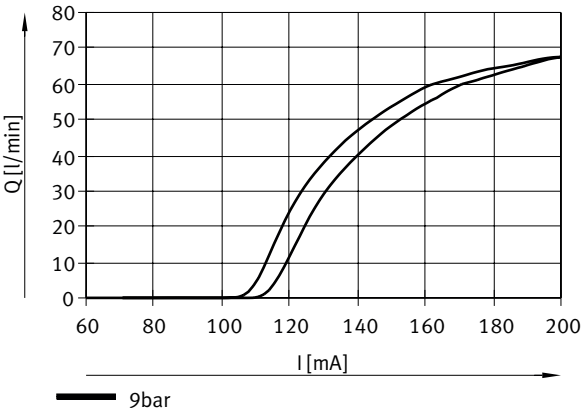


Characteristic flow rate curve, nominal width 1 mm, 6 bar and 8 bar

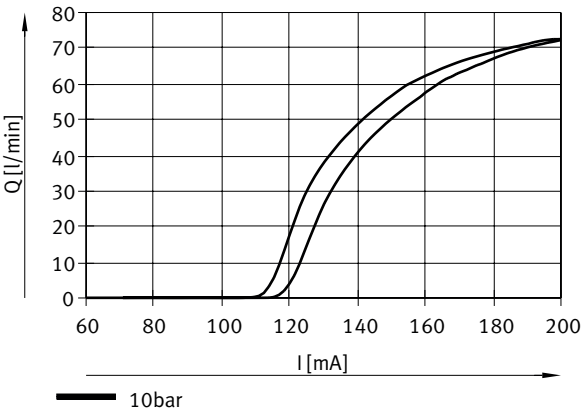


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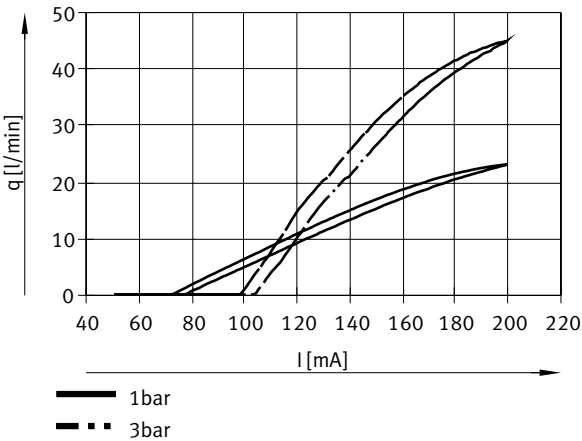
Characteristic flow rate curve, nominal width 1 mm, 9 bar



Characteristic flow rate curve, nominal width 1 mm, 10 bar

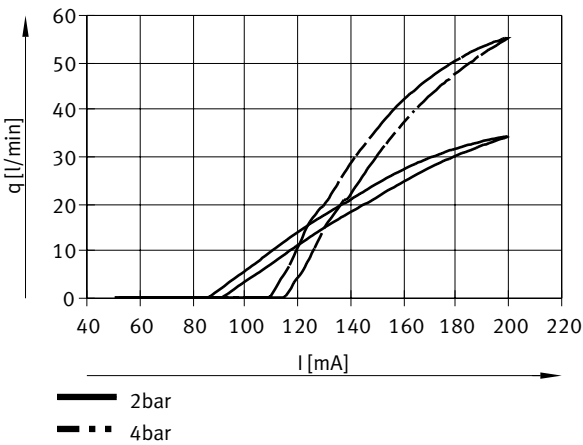


Characteristic flow rate curve, nominal width 1.5 mm, 1 bar and 3 bar

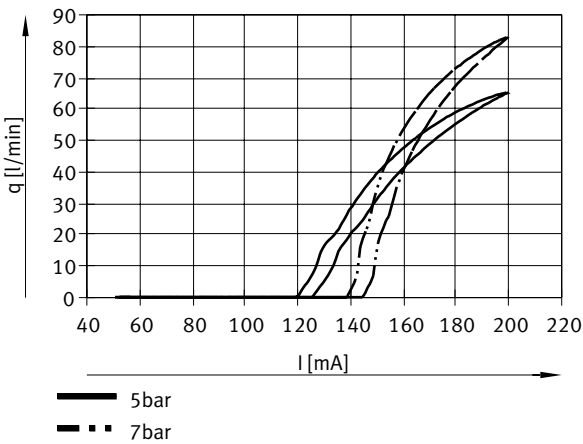


Datasheet

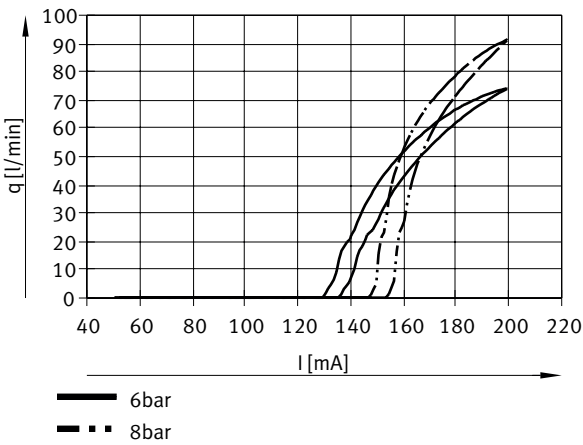
Characteristic flow rate curve, nominal width 1.5 mm, 2 bar and 4 bar



Characteristic flow rate curve, nominal width 1.5 mm, 5 bar and 7 bar

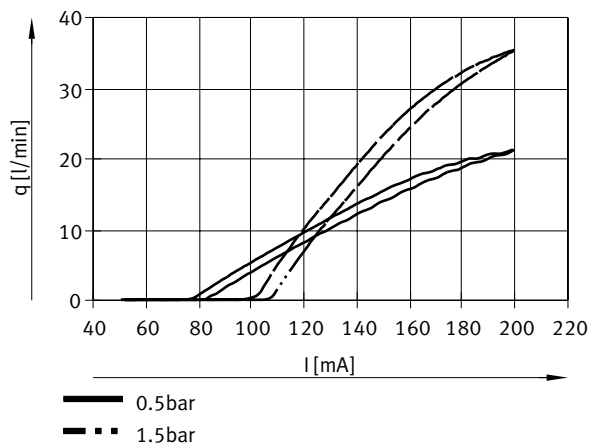


Characteristic flow rate curve, nominal width 1.5 mm, 6 bar and 8 bar

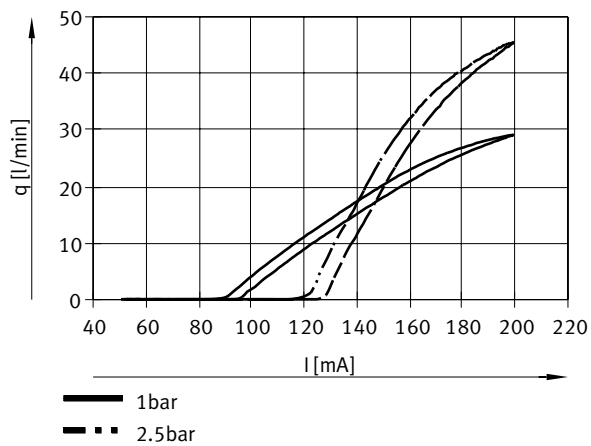


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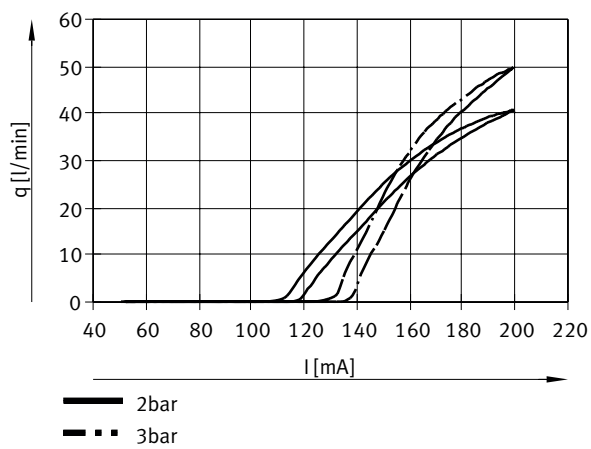
Characteristic flow rate curve, nominal width 2.2 mm, 0.5 bar and 1.5 bar



Characteristic flow rate curve, nominal width 2.2 mm, 1 bar and 2.5 bar

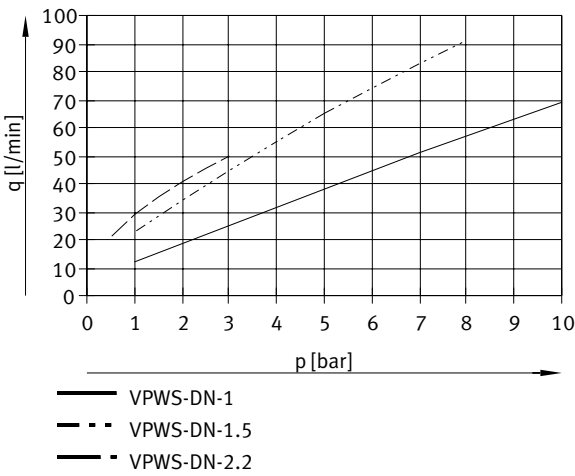


Characteristic flow rate curve, nominal width 2.2 mm, 2 bar and 3 bar

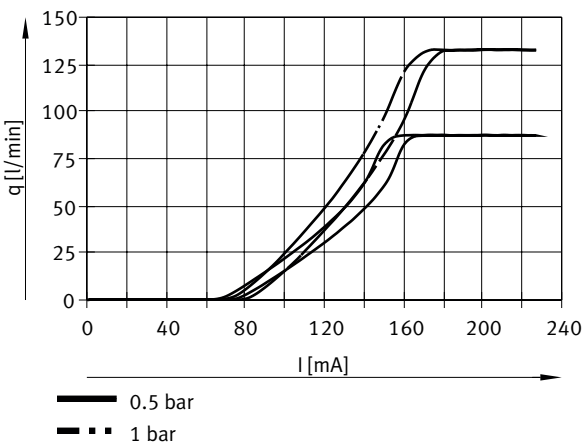


Datasheet

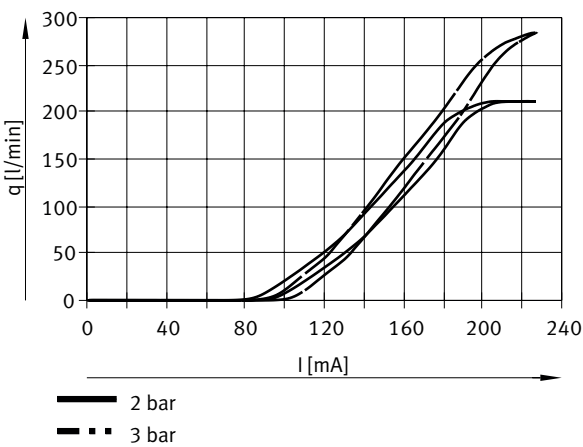
Characteristic flow-pressure curve at 200 mA



Characteristic flow rate curve, nominal width 6 mm, VPWS-6-B-6-PC15-3-V, 0.5 bar and 1 bar

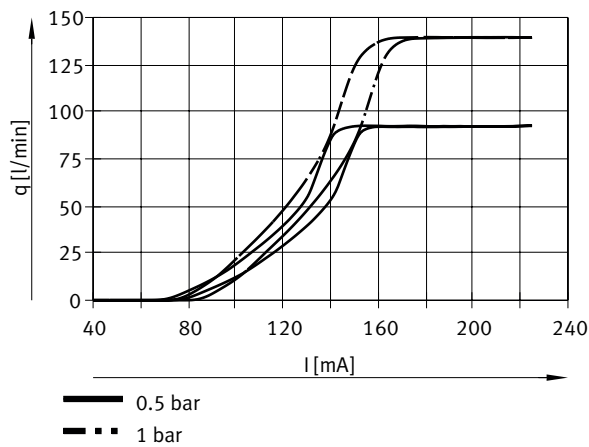


Characteristic flow rate curve, nominal width 6 mm, VPWS-6-B-6-PC15-3-V, 2 bar and 3 bar

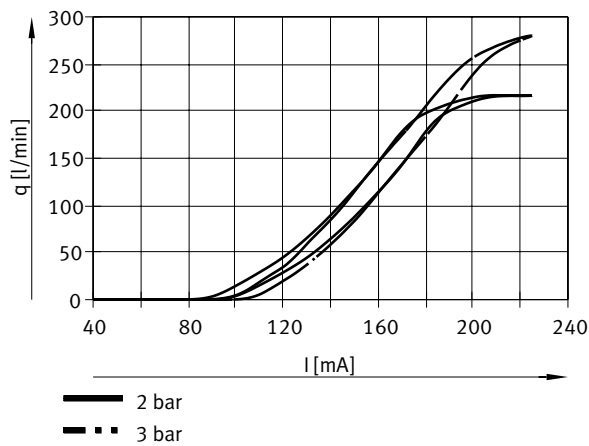


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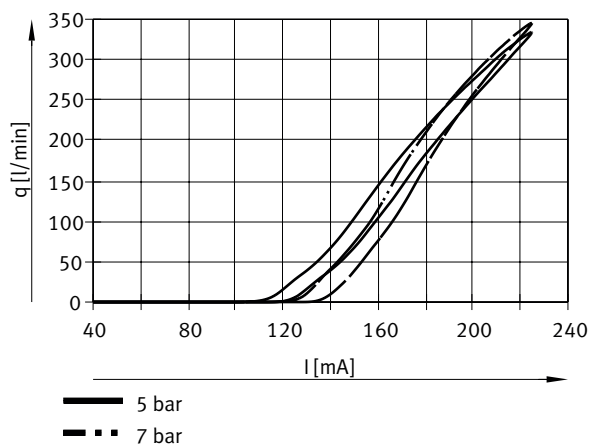
Characteristic flow rate curve, nominal width 6 mm, VPWS-6-B-6-PC15-7-V, 0.5 bar and 1 bar



Characteristic flow rate curve, nominal width 6 mm, VPWS-6-B-6-PC15-7-V, 2 bar and 3 bar

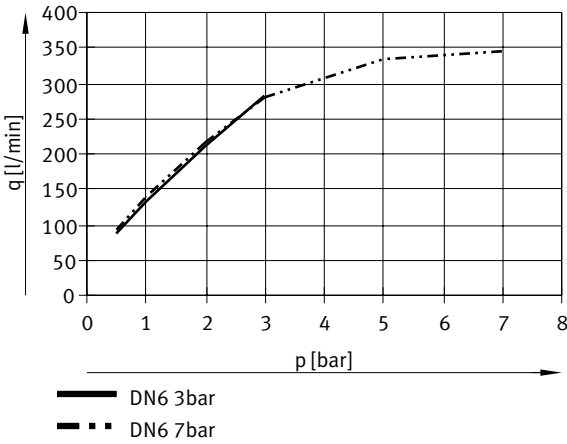


Characteristic flow rate curve, nominal width 6 mm, VPWS-6-B-6-PC15-7-V, 5 bar and 7 bar



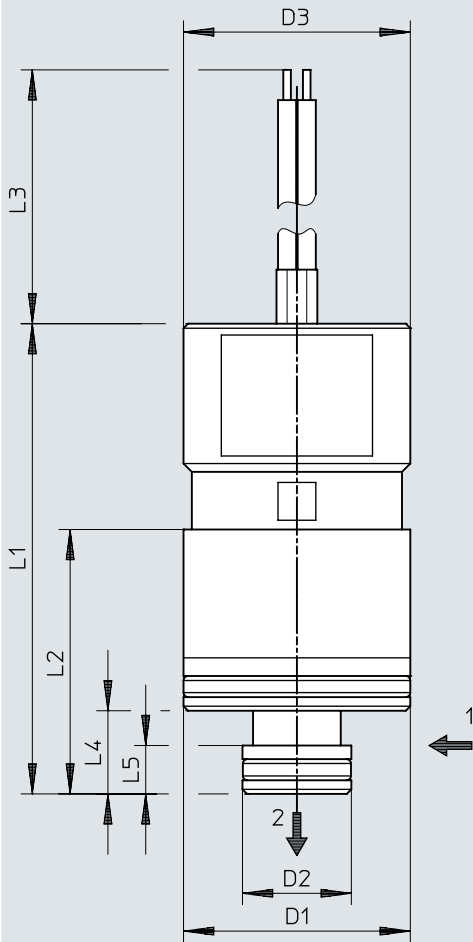
Datasheet

Characteristic flow-pressure curve at 225 mA



## Dimensions

## Dimensions – Proportional directional control valve VPWS

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

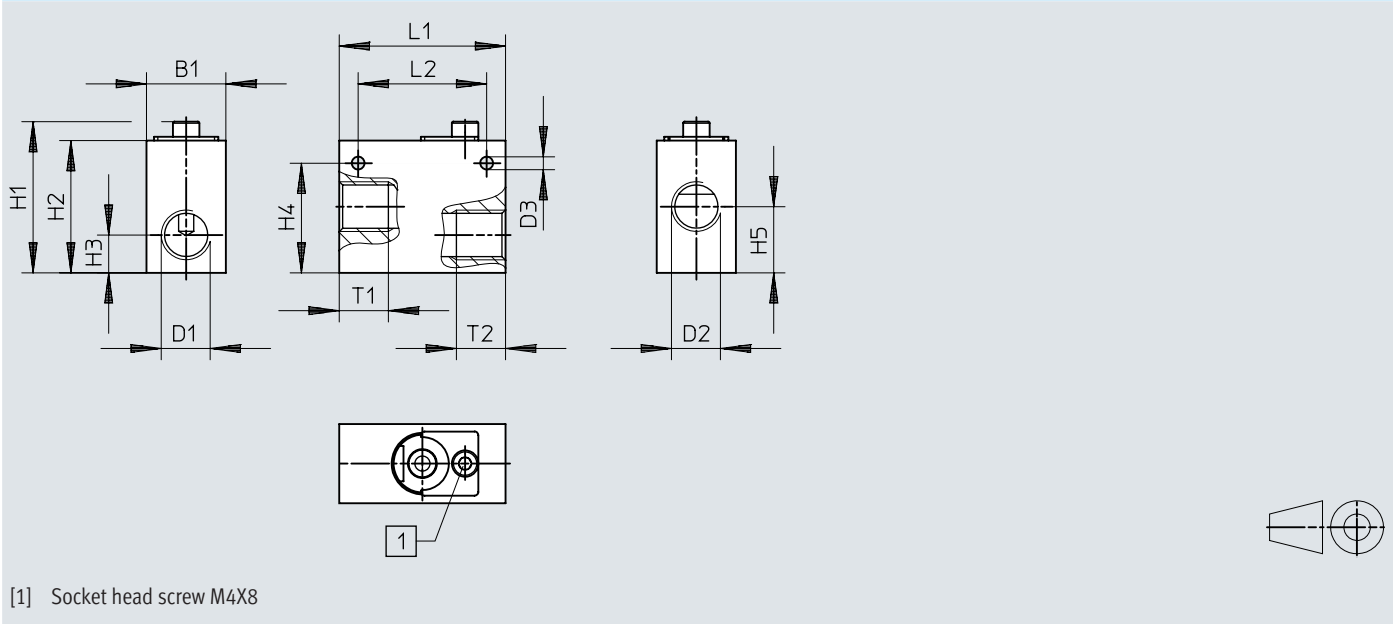
[1] Pneumatic connection 1 (for VPWS-6 as connection 2)

[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

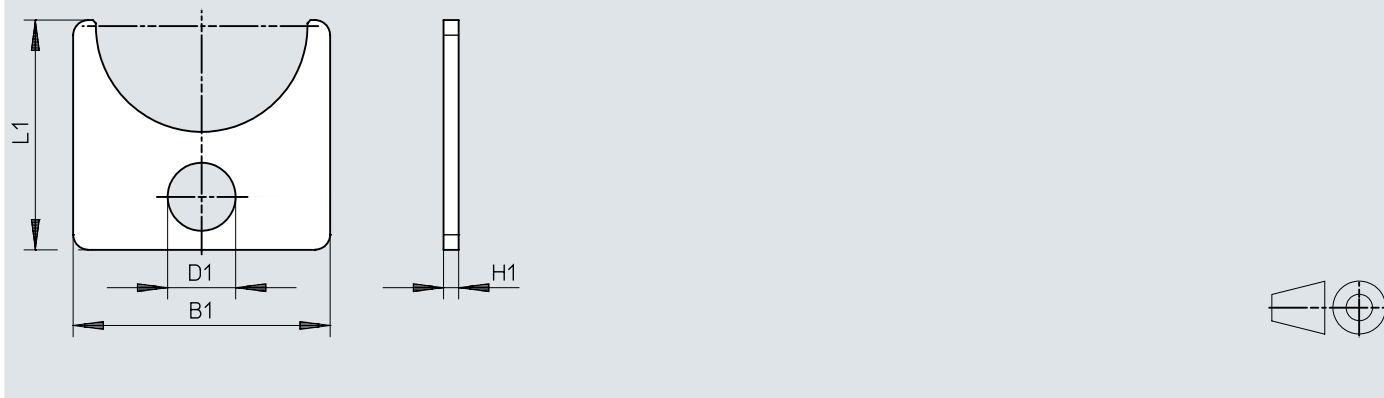
Dimensions – Manifold block VABS Download CAD data [www.festo.com](http://www.festo.com)



|                 | 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

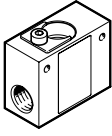
[Download CAD data](#) [www.festo.com](http://www.festo.com)


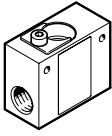
|                    | B1 | D1  | H1  | L1   |
|--------------------|----|-----|-----|------|
| VAME-P4-PC8-P-P10  | 9  | 3,4 | 0,5 | 11,5 |
| VAME-P4-PC15-P-P10 | 17 | 4,5 | 1   | 15,2 |

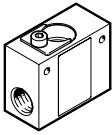
## Ordering data

| Proportional directional control valve VPWS                                      |              |                                               |                            |                    |          |                       |
|----------------------------------------------------------------------------------|--------------|-----------------------------------------------|----------------------------|--------------------|----------|-----------------------|
|                                                                                  | Nominal size | Standard flow rate (standardised 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, port 1 | Pneumatic connection, port 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, port 1 | Pneumatic connection, port 2 | Part no. | Type            |
|                          | G1/4                         | G1/4                         | 8087327  | VABS-P4-10S-G14 |

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

| Mounting, suitable for 2/2-way proportional directional control valve VPWS on manifold block VABS |              |          |                    |
|---------------------------------------------------------------------------------------------------|--------------|----------|--------------------|
|                                                                                                   | Size of pack | Part no. | Type               |
|                | 10           | 8187513  | VAME-P4-PC8-P-P10  |
|                                                                                                   |              | 8087347  | VAME-P4-PC15-P-P10 |