

Mass flow controller VEMD

FESTO



Characteristics

At a glance

[Link !\[\]\(99f58673407353e96a019fbca558fd72_img.jpg\) vemd](#)

Operating mode:

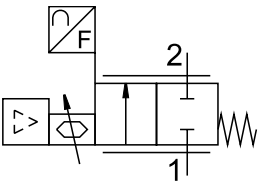
- The VEMD is a mass flow controller with integrated proportional valve. The flow rate is controlled using a closed loop control with integrated thermal sensor.
- The setpoint value for the flow rate can be specified using an analogue or digital interface, and the actual value is reported back in the same way.

Range of applications:

- The proportional flow control valve VEMD is intended to control a flow of air and inert gases proportionally to a specified setpoint value.
- The flow control valve is suitable for use in medical technology within the specified technical characteristics.
- Additional measures, for example with regard to hygiene and sterility, may be required for applications with special requirements.

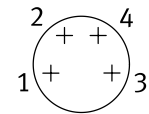
Valve function

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



Nominal width

[14] 1.4 mm



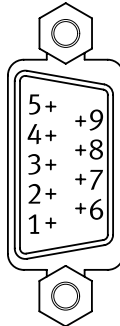
Pin assignment for VEMD-L-6-14-20-D21-M5-1-R1-V4:

- Pin 1: +24 V DC supply voltage
- Pin 2: + setpoint value 0.2 ... 10 V
- Pin 3:GND
- Pin 4: + actual value 0.2 ... 10 V

Pin assignment for VEMD-L-6-14-20-D21-M5-5-R1-V4:

- Pin 1: +12 V DC supply voltage
- Pin 2, 3 and 4 identical to the pin assignment of VEMD-L-6-14-20-D21-M5-1-R1-V4

[60] 6 mm



Pin 1:GND

- Pin 2: +24 V DC supply voltage
- Pin 3:RS232 RX external
- Pin 4:RS232 TX external
- Pin 5:RS485-P external
- Pin 6:Analogue input (IN)
- Pin 7:Analogue output (OUT)
- Pin 8:GND analogue
- Pin 9:RS485-N external

Characteristics

Display

The mass flow controller VEMD with a nominal diameter of 6 mm is available with or without a display.

[] None



[D] Display



Diagrams

Link [vemd](#)



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

Type code

| | | |
|------|--------------------------------|--|
| 001 | Series | |
| VEMD | Mass flow controller | |
| 002 | Variant | |
| | Plug and play | |
| 003 | Directional control valve type | |
| L | In-line valve | |
| 004 | Valve function | |
| 6 | 2/2-way valve, normally closed | |
| 005 | Nominal width | |
| 14 | 1.4 mm | |
| 60 | 6 mm | |
| 006 | Flow rate range | |
| 20 | 20 l/min | |
| 100 | 100 l/min | |
| 200 | 200 l/min | |
| 007 | Pressure range [bar] | |
| D9 | 0 ... 6 | |
| D21 | 0 ... 2.5 | |

| | | |
|-----|--------------------------------------|--|
| 008 | Pneumatic connection | |
| G14 | G1/4 | |
| M5 | M5 | |
| 009 | Nominal operating voltage | |
| 1 | 24 V DC | |
| 5 | 12 V DC | |
| 5Y | 12 V DC to 26 V DC | |
| 010 | Bus protocol/activation | |
| | None | |
| MP | Multiprotocol | |
| 011 | Electrical connection | |
| M1 | Multi-pin with SUB-D plug | |
| R1 | Individual connector M8, 4-pin | |
| 012 | Display | |
| | None | |
| D | Display | |
| 013 | Setpoint input for individual valves | |
| VA | 0 ... 10 V and 4 ... 20 mA | |
| V4 | 0.2 ... 10 V | |

Datasheet

General technical data, nominal width 1.4 mm



| | |
|---------------------------------------|---------------------------------------|
| Flow rate control range ¹⁾ | 0 ... 20 l/min |
| Valve function | 2-way proportional flow control valve |
| Dimensions (W x L x H) | 37 x 70 x 31 mm |
| Nominal size | 1.4 mm |
| Pneumatic connection, port 1 | Female thread M5 |
| Pneumatic connection, port 2 | Female thread M5 |
| Type of mounting | Direct mounting via thread |
| Mounting position | optional |
| Flow direction | Non-reversible |
| Product weight | 92 g |
| Size | – |

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

Electrical data, nominal width 1.4 mm

| | | |
|-----------------------------------|--|---------------|
| Flow rate control range | 0 ... 20 l/min | |
| Nominal operating voltage DC | 12 V | 24 V |
| Electrical connection | 4-pin M8x1 A-encoded to EN 61076-2-104 Plugs | |
| Operational voltage range DC | 11.1 ... 13.2 V | 22 ... 26.4 V |
| Signal range analogue input | 0.2 - 10 V | |
| Signal range analogue output | 0.2 - 10 V | |
| Setpoint value | 0.2 - 10 V | |
| Max. electrical power consumption | 1 W | |
| Max. current consumption | 65 mA | 40 mA |
| Duty cycle | 100% | |
| Reverse polarity protection | For operating voltage connections | |
| Degree of protection | IP40 | |
| Note on degree of protection | IP51 with horizontal installation | |

Datasheet

Operating and environmental conditions, nominal width 1.4 mm

| | |
|--|---|
| Flow rate control range | 0 ... 20 l/min |
| Operating pressure | 0 ... 0.25 MPa |
| Operating pressure | 0 ... 2.5 bar |
| Overload pressure | 0.6 MPa |
| Overload pressure | 6 bar |
| Burst pressure | 1 MPa |
| Burst pressure | 10 bar |
| Medium | Compressed air to ISO 8573-1:2010 [5:4:1] Inert gases Oxygen (oxygen applications to IEC 60601-1 only on request) Nitrogen |
| Note on the medium | Lubricated operation not possible |
| Environmental conditions | Not suitable for use in an environment enriched with oxygen 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 in ± %FS | 1 %FS |
| Hysteresis in ± %FS | 2.5 %FS |
| Linearity error in ± %FS | 2% |
| Temperature coefficient | 0.1 %/K |
| Ambient temperature | 0 ... 50°C |
| Media temperature | 5 ... 40°C |
| Storage temperature | -20 ... 70°C |
| Approval | RCM trademark |
| Conforms to standard | EN 61000-6-2 (EMC) EN 61000-6-3 (EMC) |
| CE mark (see declaration of conformity) ¹⁾ | To EU EMC Directive In accordance with EU RoHS Directive |
| UKCA marking (see declaration of conformity) ²⁾ | To UK instructions for EMC To UK RoHS instructions |
| KC mark | KC-EMV |

1) For information about the area of use, see the declaration of conformity at: [www.festo.com/catalogue/... d Support/Downloads](http://www.festo.com/catalogue/...d Support/Downloads).

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

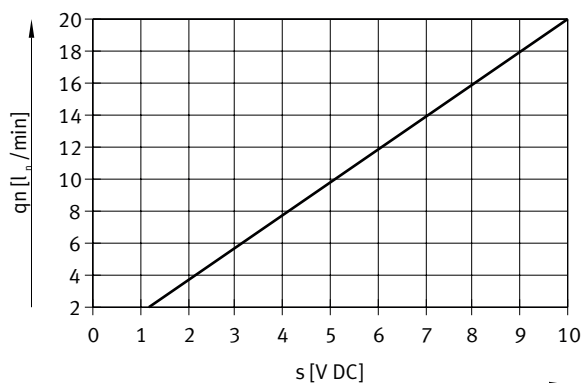
2) For information about the area of use, see the declaration of conformity at: [www.festo.com/catalogue/... d Support/Downloads](http://www.festo.com/catalogue/...d Support/Downloads).

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Materials, nominal width 1.4 mm

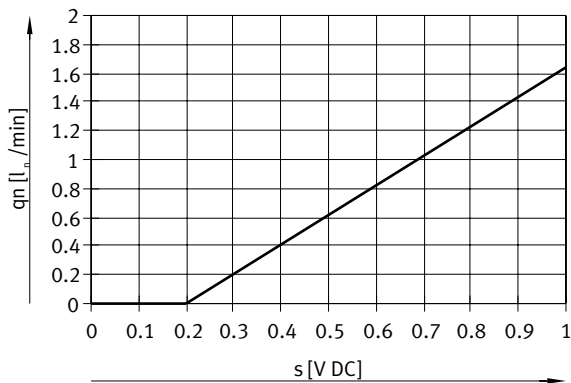
| | |
|-------------------------|--------------------|
| Flow rate control range | 0 ... 20 l/min |
| Material seals | EPDM NBR |
| Material cover | PA-reinforced |
| Note on materials | RoHS-compliant |
| LABS (PWIS) conformity | VDMA24364 zone III |

Flow rate q_n as a function of setpoint value s , total value range, nominal width 1.4 mm

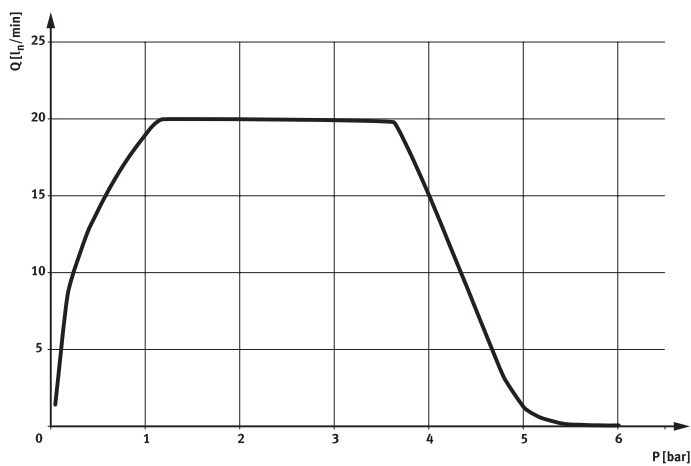


Datasheet

Flow rate q_n as a function of setpoint value s , detail range, nominal width 1.4 mm



Maximum flow rate above operating pressure, at room temperature, nominal width 1.4 mm



General technical data, nominal width 6 mm



| | | |
|---------------------------------------|---|-----------------|
| Flow rate control range ¹⁾ | 4 ... 200 l/min | 2 ... 100 l/min |
| Valve function | 2-way proportional flow control valve | |
| Dimensions (W x L x H) | 116 mm x 38 mm x 124 mm | |
| Nominal size | 6 mm | |
| Pneumatic connection, port 1 | Female thread G1/4 | |
| Pneumatic connection, port 2 | Female thread G1/4 | |
| Type of mounting | Direct mounting via through-hole Mounting plate, attached with screws On H-rail via accessories Screw-clamped Via through-hole for M4 screw | |
| Mounting position | optional | |
| Flow direction | Non-reversible | |
| Product weight | 630 g | |
| Size | 100 | |

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

Datasheet

| Electrical data, nominal width 6 mm | | |
|-------------------------------------|---|-----------------|
| Flow rate control range | 4 ... 200 l/min | 2 ... 100 l/min |
| Nominal operating voltage DC | 24 V | |
| Operational voltage range DC | 12 ... 24 V | |
| Signal range analogue input | 0 - 5 V 0 - 10 V 0 - 20 mA | |
| Signal range analogue output | 0 - 10 V 1 - 5 V 4 - 20 mA | |
| Setpoint value | 4 - 20 mA 0 - 10 V 1 - 5 V Modbus® | |
| Max. electrical power consumption | 8.5 W | |
| Duty cycle | 100% | |
| Reverse polarity protection | For operating voltage connections | |
| Degree of protection | IP40 | |

| Operating and environmental conditions, nominal width 6 mm | | |
|--|--|-----------------|
| Flow rate control range | 4 ... 200 l/min | 2 ... 100 l/min |
| Nominal operating pressure | 0.3 MPa | |
| Nominal operating pressure | 3 bar | |
| Nominal operating pressure | 43.5 psi | |
| Operating pressure | 0.1 ... 0.6 MPa | |
| Operating pressure | 1 ... 6 bar | |
| Overload pressure | 0.8 MPa | |
| Overload pressure | 8 bar | |
| Burst pressure | 1.8 MPa | |
| Burst pressure | 18 bar | |
| Medium | Argon Compressed air as per ISO 8573-1:2010 [5:3:1] Carbon dioxide Oxygen Nitrogen | |
| Note on the medium | Lubricated operation not possible | |
| Environmental conditions | Not suitable for use in an environment enriched with oxygen to IEC 60601-1 Cleanest possible ambient air Dry | |
| Special characteristics | - | |
| Repetition accuracy of flow rate | ± (0.25% o.m.v. + 0.25% FS) | |
| Repetition accuracy in ± %FS | - | |
| Ambient temperature | 5 ... 40°C | |
| Media temperature | 5 ... 40°C | |
| Storage temperature | -20 ... 70°C | |
| Approval | C-Tick RCM trademark c UL us listed (OL) | |
| Conforms to standard | IEC 61010-1 | |
| CE mark (see declaration of conformity) ¹⁾ | To EU EMC Directive In accordance with EU RoHS Directive | |
| UKCA marking (see declaration of conformity) ²⁾ | To UK instructions for EMC To UK RoHS instructions | |
| KC mark | KC-EMV | |

1) For information about the area of use, see the declaration of conformity at: [www.festo.com/catalogue/... d Support/Downloads](http://www.festo.com/catalogue/...d/Support/Downloads).

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

2) For information about the area of use, see the declaration of conformity at: [www.festo.com/catalogue/... d Support/Downloads](http://www.festo.com/catalogue/...d/Support/Downloads).

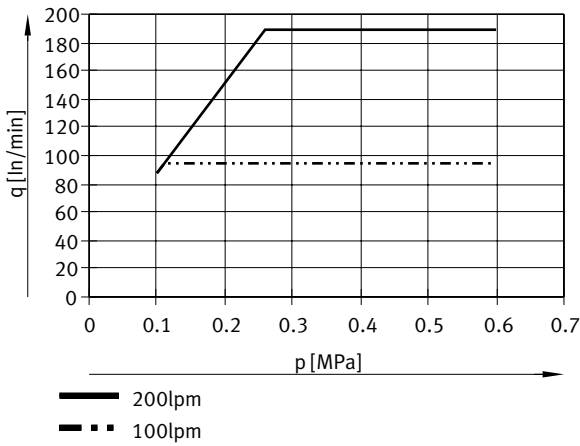
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Datasheet

Materials, nominal width 6 mm

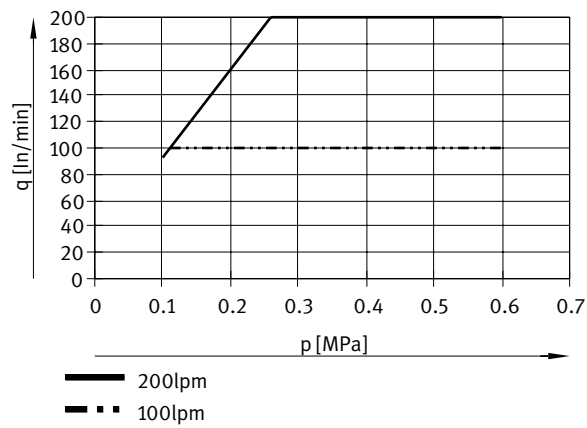
| | | |
|-------------------------|--------------------|-----------------|
| Flow rate control range | 4 ... 200 l/min | 2 ... 100 l/min |
| Material seals | EPDM FPM | |
| Note on materials | RoHS-compliant | |
| LABS (PWIS) conformity | VDMA24364 zone III | |

Maximum flow rate in relation to input pressure, at room temperature, nominal width 6 mm, air



Maximum flow rate in relation to input pressure, at room temperature, nominal width 6 mm, N2

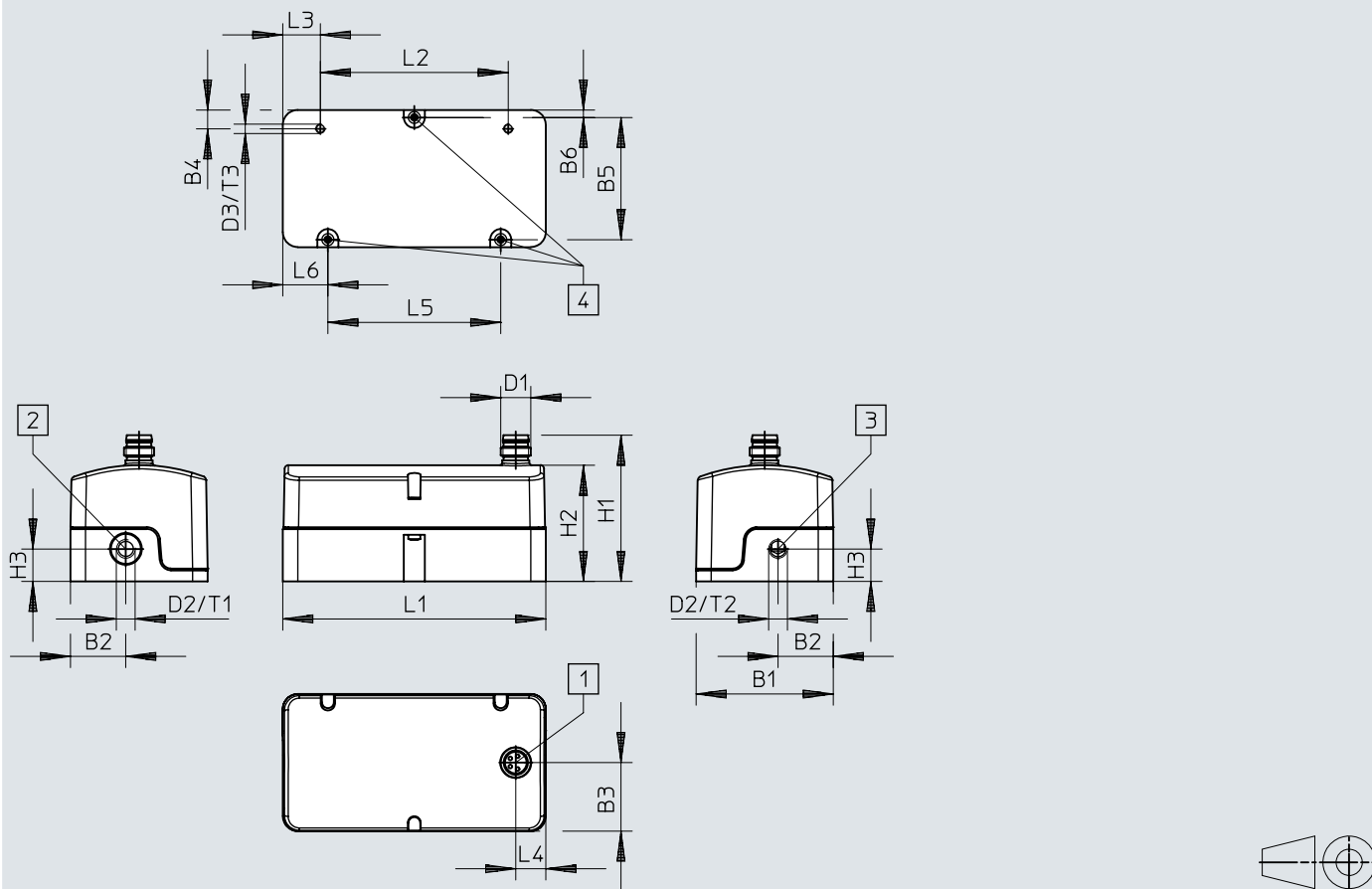
VEMD (p/q N2)



Dimensions

Dimensions – Proportional flow control valve VEMD, nominal width 1.4 mm

Download CAD data www.festo.com



- [1] Connecting plug, 4-pin
- [2] Pressure supply port 1
- [3] Working port 2
- [4] Mounting points through-holes \varnothing 2.2 mm

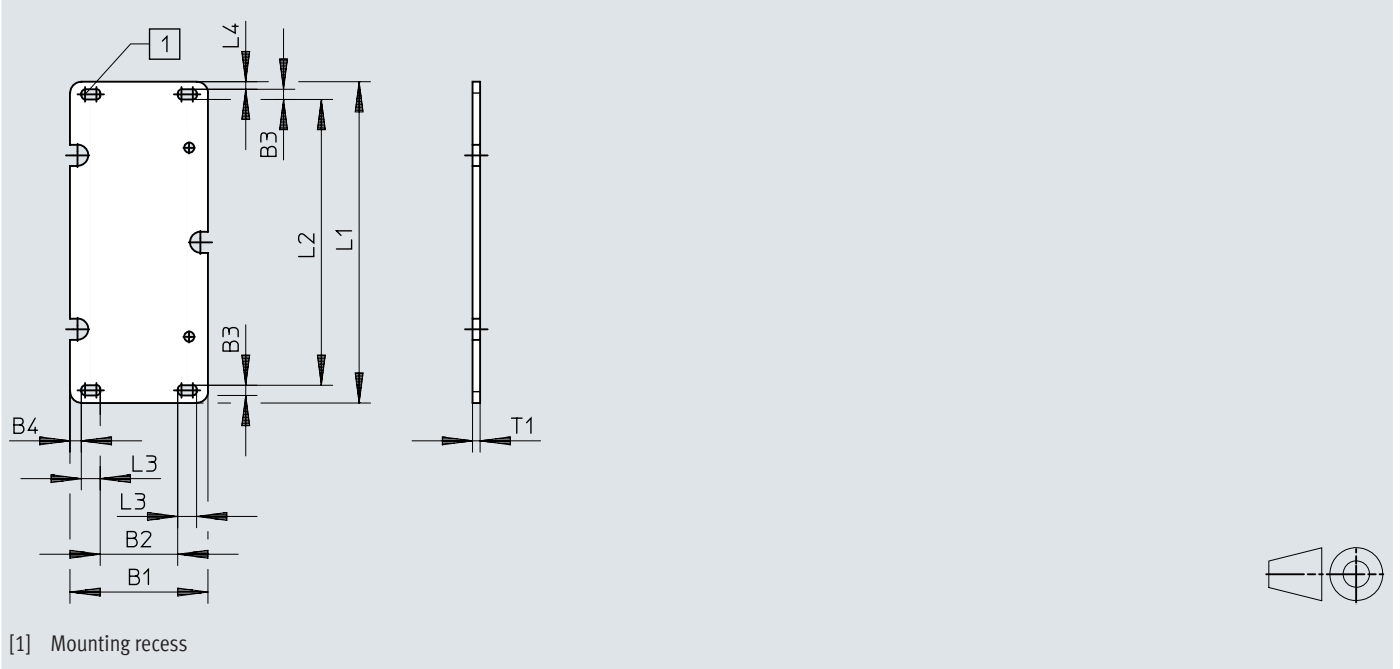
| | B1 | B2 | B3 | B4 | B5 | B6 | D1 | D2 | D3 |
|------|------|------|------|----|------|----|------|----|------|
| VEMD | 36,5 | 14,7 | 18,3 | 5 | 32,5 | 2 | M8x1 | M5 | M2,5 |

| | 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

Dimensions – Wall mounting VAME-P14-W

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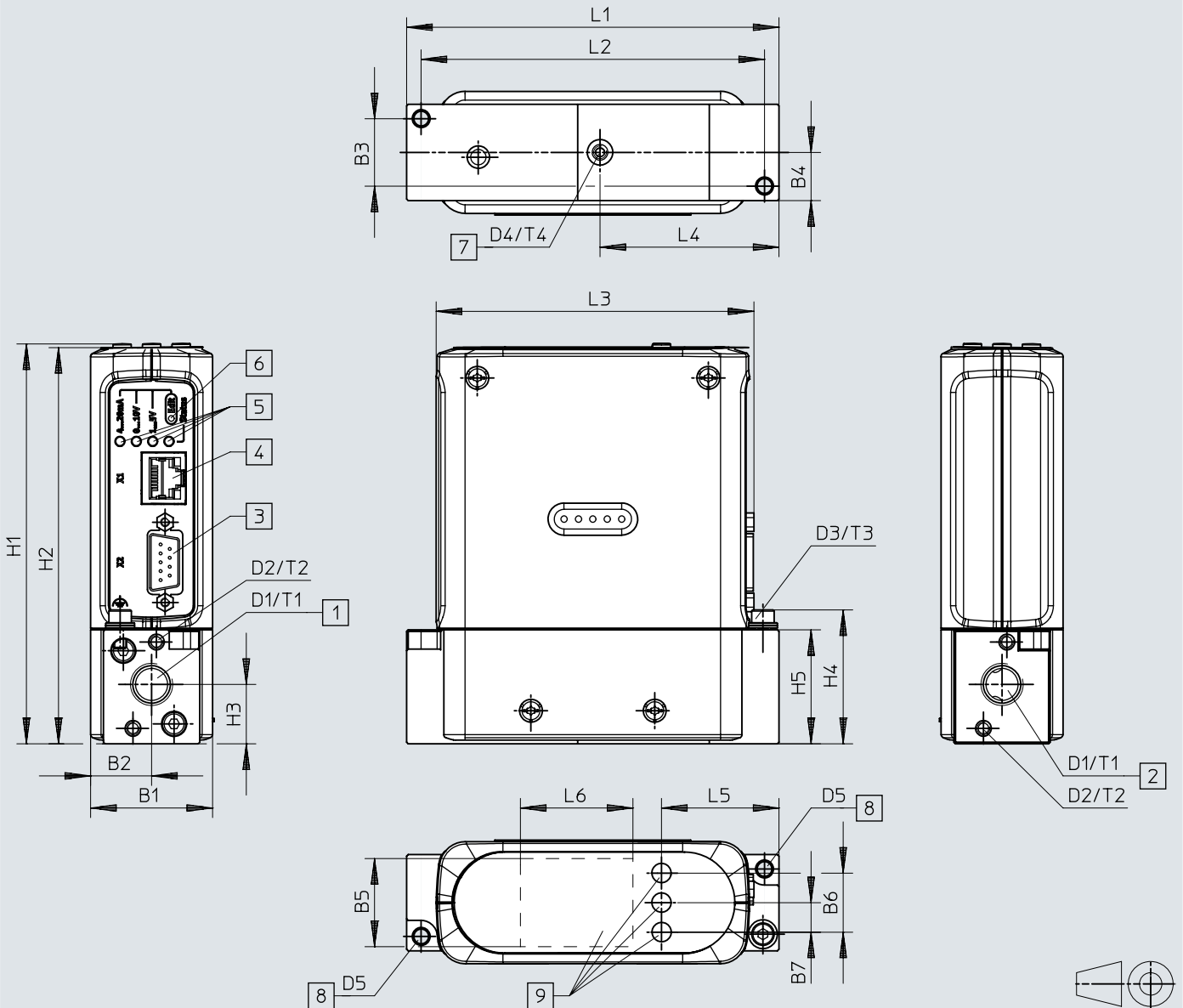


| | B1 | B2 | B3 | B4 | L1 | L2 | L3 | L4 | T1 |
|------------|------|------|-----|----|----|------|----|----|----|
| VAME-P14-W | 36,5 | 20,5 | 2,7 | 3 | 85 | 75,6 | 5 | 2 | 2 |

Dimensions

Dimensions – Proportional flow control valve VEMD, nominal width 6 mm

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- [1] Exhaust air/pneumatic output
- [2] Working air/pneumatic input
- [3] Sub-D connection
- [4] RJ45 connection (Ethernet)
- [5] LED indicator
- [6] "End user to edit" button
- [7] H-rail connection
- [8] Connection for wall mounting
- [9] Display with operating buttons (not applicable for part nos. 8163824 and 8184633)

Dimensions


| | B1 | B2 | B3 | B4 | B5 | B6 | B7 | D1 ∅ | D2 ∅ | D3 ∅ | D4 ∅ | D5 ∅ | H1 | H2 |
|-----------------------------------|------|----|------|-----|------|------|------|---------|---------|---------|---------|---------|-------|-------|
| VEMD-L-6-60-100-D9-G14-5YMPM1-VA | 38 | 19 | 21 | 15 | - | - | - | G1/4 | M4 | M4 | M4 | 4,6 | 124,6 | 123,5 |
| VEMD-L-6-60-200-D9-G14-5YMPM1-VA | | | | | | | | | | | | | | |
| VEMD-L-6-60-100-D9-G14-5YMPM1D-VA | | | | | | | | | | | | | | |
| VEMD-L-6-60-200-D9-G14-5YMPM1D-VA | | | | | 27,5 | 18,4 | 9,2 | | | | | | | |
| | H3 | H4 | H5 | L1 | L2 | L3 | L4 | L5 | L6 | T1 | T2 | T3 | T4 | |
| VEMD-L-6-60-100-D9-G14-5YMPM1-VA | 18,5 | 42 | 35,5 | 116 | 107 | 100 | 55,8 | - | - | 13 | 8 | 8 | 10 | |
| VEMD-L-6-60-200-D9-G14-5YMPM1-VA | | | | | | | | | | | | | | |
| VEMD-L-6-60-100-D9-G14-5YMPM1D-VA | | | | | | | | | | | | | | |
| VEMD-L-6-60-200-D9-G14-5YMPM1D-VA | | | | | | | | 36,6 | 35 | | | | | |

Ordering data


Proportional flow control valve VEMD, nominal width 1.4 mm, without display

| | Operating pressure | Operating pressure | Nominal operating voltage DC | Flow rate control range | Part no. | Type |
|--|--------------------|--------------------|------------------------------|-------------------------|-----------|-------------------------------|
|  | 0 ... 0.25 MPa | 0 ... 2.5 bar | 12 V | 0 ... 20 l/min | ★ 8086473 | VEMD-L-6-14-20-D21-M5-5-R1-V4 |
| | | | 24 V | | ★ 8086472 | VEMD-L-6-14-20-D21-M5-1-R1-V4 |

Mass flow controller VEMD, nominal diameter 6 mm, with display

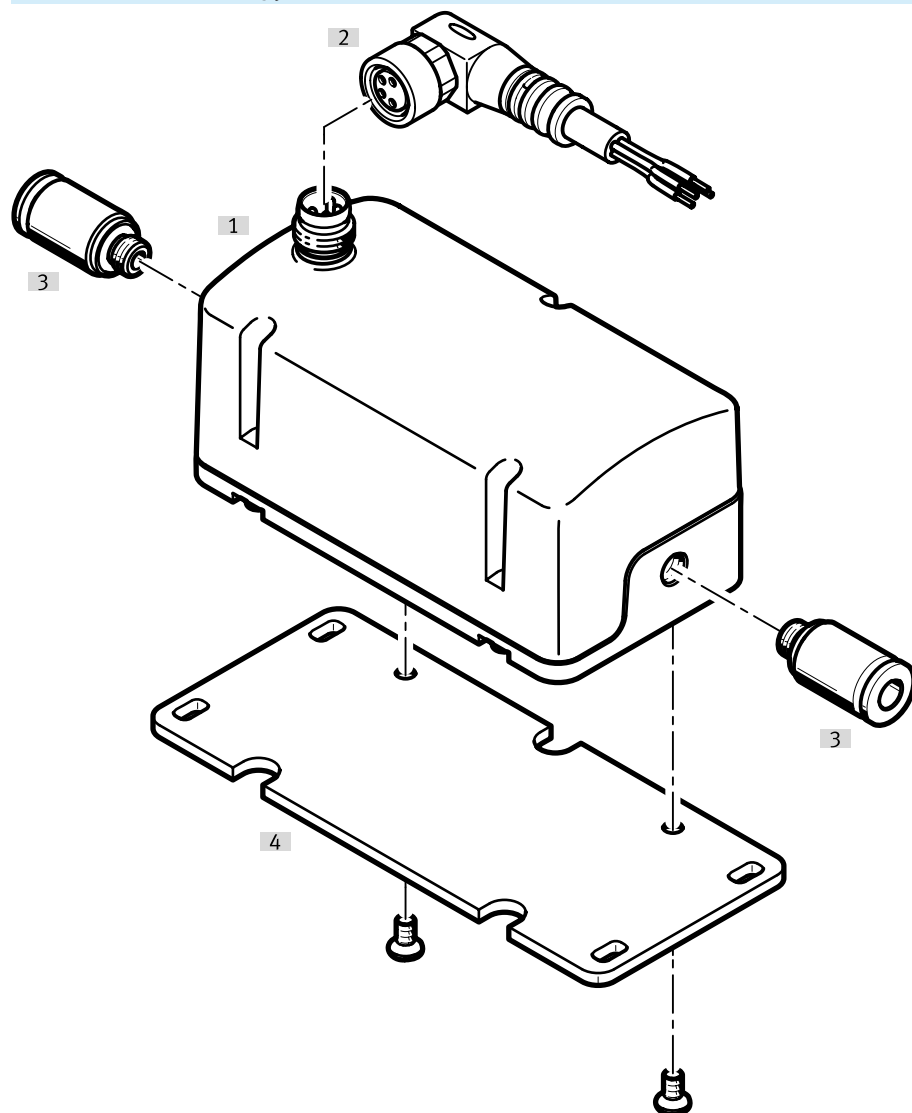
| | Operating pressure | Operating pressure | Operational voltage range DC | Flow rate control range | Part no. | Type |
|--|--------------------|--------------------|------------------------------|-------------------------|-----------|-----------------------------------|
|  | 0.1 ... 0.6 MPa | 1 ... 6 bar | 12 ... 24 V | 2 ... 100 l/min | 8163829 | VEMD-L-6-60-100-D9-G14-5YMPM1D-VA |
| | | | | 4 ... 200 l/min | ★ 8163830 | VEMD-L-6-60-200-D9-G14-5YMPM1D-VA |

Mass flow controller VEMD, nominal diameter 6 mm, without display

| | Operating pressure | Operating pressure | Operational voltage range DC | Flow rate control range | Part no. | Type |
|--|--------------------|--------------------|------------------------------|-------------------------|-----------|----------------------------------|
|  | 0.1 ... 0.6 MPa | 1 ... 6 bar | 12 ... 24 V | 2 ... 100 l/min | 8163824 | VEMD-L-6-60-100-D9-G14-5YMPM1-VA |
| | | | | 4 ... 200 l/min | ★ 8163825 | VEMD-L-6-60-200-D9-G14-5YMPM1-VA |

Peripherals

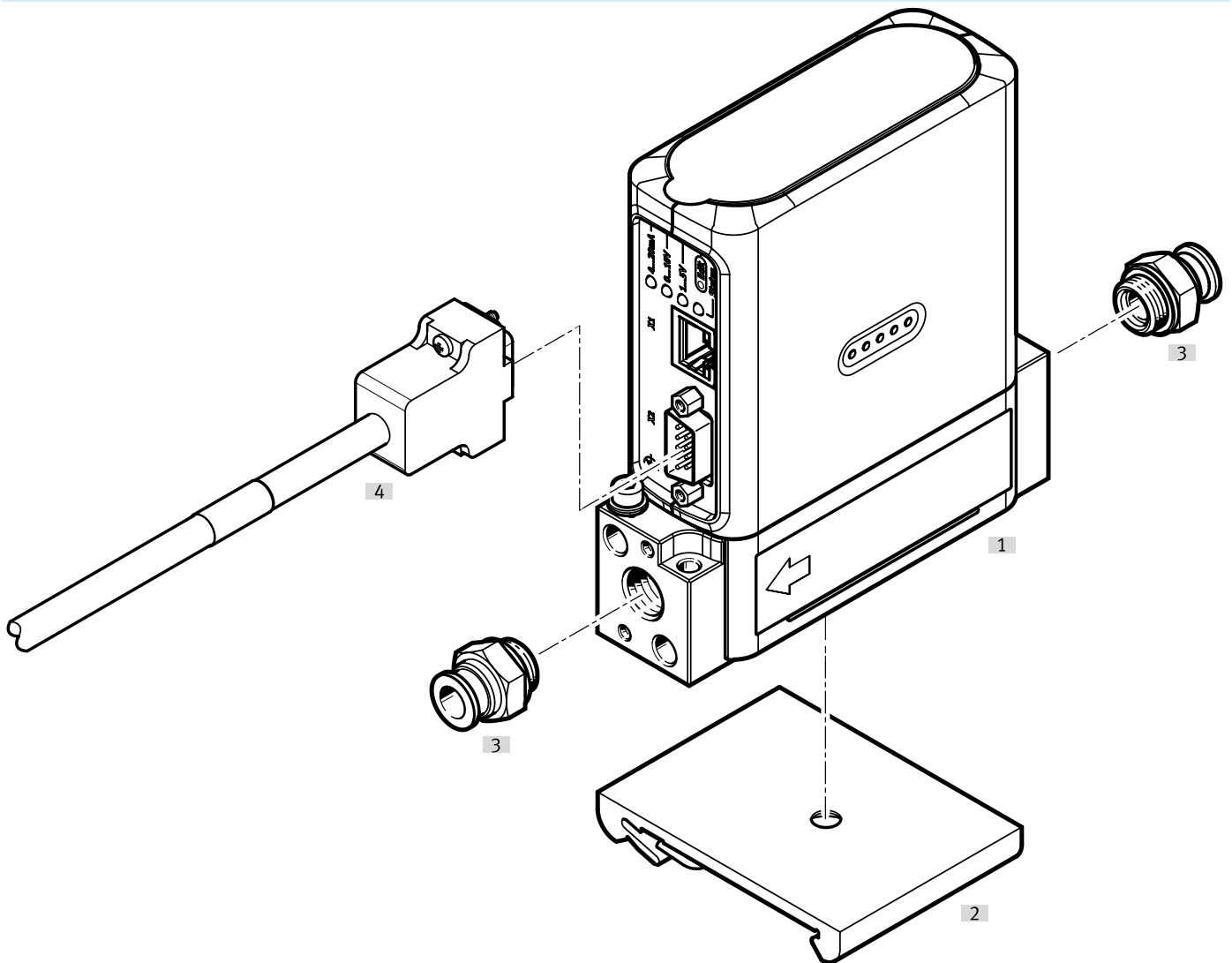
VEMD-L-6-14-... on mounting plate



| Accessories | | | → Link |
|--|--|--|----------------------|
| Type/order code | Description | | |
| [1] Proportional flow control valve VEMD | - | | vemd |
| [2] Connecting cable NEBA | - | | 17 |
| [3] Push-in fitting QSM/NPQM | For connecting tubing with standard O.D. | | 17 |
| [4] Mounting plate VAME-P14 | For mounting the valve | | 17 |

Peripherals

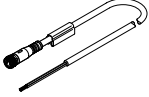
VEMD-L-6-60-... on H-rail mounting



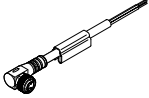
| Accessories | | → Link |
|-------------------------------|--|----------------------|
| Type/order code | Description | |
| [1] Mass flow controller VEMD | – | vemd |
| [2] H-rail mounting CAFM | For mounting the valve | 18 |
| [3] Push-in fitting QS | For connecting tubing with standard O.D. | 18 |
| [4] Connecting cable KMP6 | – | 18 |

Accessories

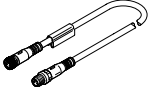
Connecting cable, straight socket, open end, for nominal width 1.4 mm

| | Electrical connection 1, function | Electrical connection 1, connection type | Electrical connection 1, cable outlet | Electrical connection 1, connector system | Electrical connection 1, number of connections/cores | Cable length | Part no. | Type |
|---|-----------------------------------|--|---------------------------------------|---|--|--------------|-----------|-----------------------|
|  | Field device side | Socket | Straight | M8x1, A-coded, to EN 61076-2-104 | 4 | 2.5 m | ★ 8078227 | NEBA-M8G4-U-2.5-N-LE4 |
| | | | | | | 5 m | ★ 8078228 | NEBA-M8G4-U-5-N-LE4 |

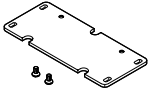
Connecting cable, angled socket, open end, for nominal width 1.4 mm

| | Electrical connection 1, function | Electrical connection 1, connection type | Electrical connection 1, cable outlet | Electrical connection 1, connector system | Electrical connection 1, number of connections/cores | Cable length | Part no. | Type |
|---|-----------------------------------|--|---------------------------------------|---|--|--------------|-----------|-----------------------|
|  | Field device side | Socket | Angled | M8x1, A-coded, to EN 61076-2-104 | 4 | 2.5 m | ★ 8078233 | NEBA-M8W4-U-2.5-N-LE4 |


Connecting cable, straight socket, straight plug, for nominal width 1.4 mm

| | Electrical connection 1, function | Electrical connection 1, connection type | Electrical connection 1, cable outlet | Electrical connection 1, connector system | Electrical connection 1, number of connections/cores | Cable length | Part no. | Type |
|---|-----------------------------------|--|---------------------------------------|---|--|--------------|-----------|------------------------|
|  | Field device side | Socket | Straight Angled | M8x1, A-coded, to EN 61076-2-104 | 4 | 2.5 m | 8078295 | NEBA-M8G4-U-2.5-N-M8G4 |
| | | | | | | 5 m | ★ 8078234 | NEBA-M8W4-U-5-N-LE4 |


Wall mounting, for valve mounting, for nominal width 1.4 mm

| | Mounting position | Part no. | Type |
|---|-------------------|----------|------------|
|  | optional | 5225721 | VAME-P14-W |


Push-in fitting, with hex socket, metal version, for nominal width 1.4 mm


| | Pneumatic connection, port 1 | Pneumatic connection, port 2 | Part no. | Type |
|---|------------------------------|-------------------------------------|----------|-------------------|
|  | Male thread M5 | For tubing outside diameter of 4 mm | 558657 | NPQM-DK-M5-Q4-P10 |
| | | For tubing outside diameter of 6 mm | 558658 | NPQM-DK-M5-Q6-P10 |


Push-in fitting, with hex socket, polymer version, for nominal width 1.4 mm

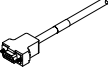
| | Pneumatic connection, port 1 | Pneumatic connection, port 2 | Part no. | Type |
|---|------------------------------|-------------------------------------|----------|------------|
|  | Male thread M5 | For tubing outer diameter of 3 mm | 153313 | QSM-M5-3-I |
| | | For tubing outside diameter of 4 mm | ★ 153315 | QSM-M5-4-I |
| | | For tubing outside diameter of 6 mm | ★ 153317 | QSM-M5-6-I |

Accessories

| Push-in fitting, with external hex, metal version, for nominal width 1.4 mm | | | | | |
|--|------------------------------|-------------------------------------|----------|----------|--|
| | Pneumatic connection, port 1 | Pneumatic connection, port 2 | Part no. | Type | |
|  | Male thread M5 | For tubing outer diameter of 3 mm | 153302 | QSM-M5-3 | |
| | | For tubing outside diameter of 4 mm | ★ 153304 | QSM-M5-4 | |
| | | For tubing outside diameter of 6 mm | ★ 153306 | QSM-M5-6 | |

| Push-in fitting, with external hex, for nominal width 6 mm | | | | | |
|--|------------------------------|-------------------------------------|--------------|----------|--------------|
| | Pneumatic connection, port 1 | Pneumatic connection, port 2 | Size of pack | Part no. | Type |
|  | Male thread G1/4 | For tubing outside diameter of 8 mm | 10 | ★ 186099 | QS-G1/4-8 |
| | | | 50 | ★ 132040 | QS-G1/4-8-50 |

| Push-in fitting, with external hex, for nominal width 6 mm | | | | | |
|--|------------------------------|--------------------------------------|--------------|----------|-------------------|
| | Pneumatic connection, port 1 | Pneumatic connection, port 2 | Size of pack | Part no. | Type |
|  | Male thread G1/4 | For tubing outside diameter of 6 mm | 10 | 8203297 | NPQO-D-G14-Q6-P10 |
| | | For tubing outside diameter of 8 mm | | 8203298 | NPQO-D-G14-Q8-P10 |
| | | For tubing outside diameter of 10 mm | 5 | 8203299 | NPQO-D-G14-Q10-P5 |

| Connecting cable, for nominal width 6 mm | | | | | | | | |
|--|-----------------------------------|--|---------------------------------------|---|--|--------------|----------|----------------|
| | Electrical connection 1, function | Electrical connection 1, connection type | Electrical connection 1, cable outlet | Electrical connection 1, connector system | Electrical connection 1, number of connections/cores | Cable length | Part no. | Type |
|  | Field device side | Socket | Straight | Sub-D | 9 | 2.5 m | 531184 | KMP6-09P-8-2,5 |
| | | | | | | 5 m | 531185 | KMP6-09P-8-5 |
| | | | | | | 10 m | 531186 | KMP6-09P-8-10 |

| H-rail mounting, for nominal width 6 mm | | | |
|--|----------------|----------|-----------|
| | Product weight | Part no. | Type |
|  | 22 g | 570043 | CAFM-F1-H |