

Mass flow controller VEMD

FESTO



Characteristics

At a glance Link [vemd](#)

Mode of operation:

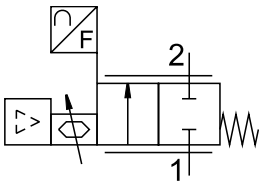
- The VEMD is a mass flow controller with integrated proportional valve. The flow rate is controlled via a closed loop control with integrated thermal sensor.
- The setpoint value for the flow rate can be specified via an analog or digital interface, and the actual value is also reported back in the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

Range of applications:

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

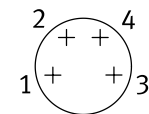
Valve function

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



Nominal width

[14] 1.4 mm



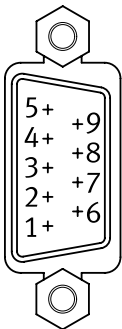
Pin assignment for VEMD-L-6-14-20-D21-M5-1-R1-V4:

- 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: 12... 24 V DC supply voltage

Pin 3: RS232 RX external

Pin 4: RS232 TX external

Pin 5: RS485-P external

Pin 6: Analog input (IN)

Pin 7: Analog output (OUT)

Pin 8: Analog (reference potential differential voltage input and voltage output)

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.

[]

Without



[D]

Display



Diagrams

Link [vemd](#)

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

Type code

001	Series	
VEMD	Mass flow controller	
002	Variant	
	Plug and Play	
003	Directional control valve type	
L	Inline 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	
10	10 l/min	
20	20 l/min	
50	50 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	
	Without	
MP	Multiprotocol	
011	Electrical connection	
M1	Multi-pin with Sub-D plug	
R1	Single plug M8, 4-pin	
012	Display	
	Without	
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 mm x 70 mm x 31 mm
Nominal width	1.4 mm
Pneumatic connection 1	Internal thread M5
Pneumatic connection 2	Internal thread M5
Type of mounting	Direct fastening via thread
Mounting position	Any
Flow direction	Non-reversible
Product weight	92 g
Size	10

¹⁾ The flow rate is calibrated at the factory to the standard physical conditions according to 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-coded as per EN 61076-2-104 Plug	
DC operating voltage range	11.1 ... 13.2 V	22 ... 26.4 V
Analog input signal range	0.2 - 10 V	
Analog output signal range	0.2 - 10 V	
Reference 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	Argon Compressed air to ISO 8573-1:2010 [5:4:1] Carbon dioxide Oxygen (oxygen applications according to IEC 60601-1 only on request) Nitrogen
Information on medium	Operation with oil lubrication not possible
Ambient conditions	Not suitable for use in environments enriched with oxygen according to IEC 60601-1
Special features	Oxygen-compatible as per 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 FS	2%
Temperature coefficient	0.1 %/K
Note on the flow rate control range	The specified flow control range only applies at room temperature. Above room temperature, a reduction of the max. adjustable flow rate may occur.
Ambient temperature	0 ... 50°C
Temperature of medium	5 ... 40°C
Storage temperature	-20 ... 70°C
Certification	RCM compliance mark
Conforms to standard	EN 61000-6-2 (EMC) EN 61000-6-3 (EMC)
CE marking (see declaration of conformity) ¹⁾	As per EU EMC directive As per EU RoHS directive
UKCA marking (see declaration of conformity) ²⁾	To UK instructions for EMC To UK RoHS instructions
KC characters	KC-EMV

1) For information about the area of use, see the declaration of conformity at: 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.

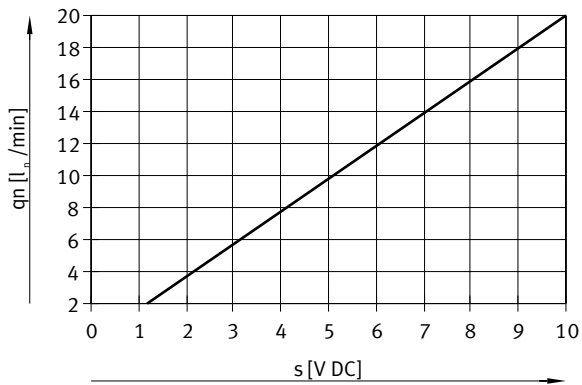
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Materials, nominal width 1.4 mm

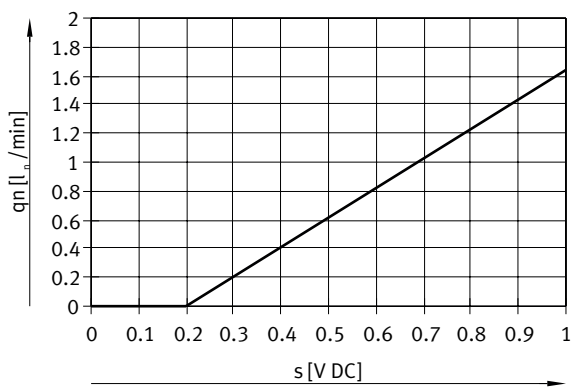
Flow rate control range	0 ... 20 l/min
Seals material	EPDM NBR
Cover material	PA-reinforced
Note on materials	RoHS compliant
LABS (PWIS) conformity	VDMA24364 Zone III

Datasheet

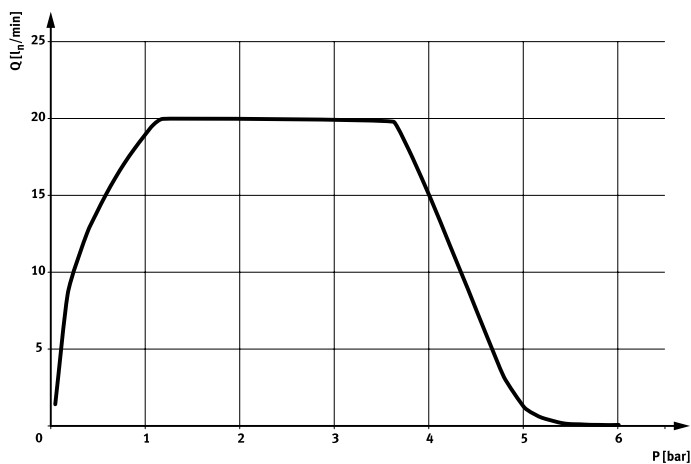
Flow rate q_n as a function of setpoint value s , total value range, nominal width 1.4 mm



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



Datasheet

General technical data, nominal width 6 mm



Flow rate control range ¹⁾	2 ... 200 l/min	0.1 ... 10 l/min	1 ... 100 l/min	0.5 ... 50 l/min
Valve function	2-way proportional flow control valve, Closed			
Dimensions W x L x H	116 mm x 38 mm x 124 mm			
Nominal width	6 mm	1 mm	6 mm	
Pneumatic connection 1	Internal thread G1/4			
Pneumatic connection 2	Internal thread G1/4			
Type of mounting	Direct mounting via through-hole Mounting plate, screwed on On H-rail with accessories Screwed on With through-hole for M4 screw			
Mounting position	Any			
Actuation type	Electrical			
Flow direction	Non-reversible			
Product weight	630 g			
Size	100			

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

Datasheet

Electrical data, nominal width 6 mm				
Flow rate control range	2 ... 200 l/min	0.1 ... 10 l/min	1 ... 100 l/min	0.5 ... 50 l/min
Display type	LED Color TFT			
Nominal operating voltage DC	24 V			
DC operating voltage range	12 ... 24 V			
Analog input signal range	0 - 10 V 4 - 20 mA 1 - 5 V			
Analog output signal range	0 - 10 V 1 - 5 V 4 - 20 mA			
Reference 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			
Diagnostic function	Indication via LED			
Electrical connection 1, function	Communication			
Electrical connection 1, connection type	Socket			
Electrical connection 1, connection technology	RJ45			
Electrical connection 1, number of pins/wires	8			
Electrical connection 2, function	Analog input, Communication, Power supply			
Electrical connection 2, connection type	Plug			
Electrical connection 2, connection technology	Sub-D			
Electrical connection 2, number of pins/wires	9			

Datasheet

Operating and environmental conditions, nominal width 6 mm

Flow rate control range	2 ... 200 l/min		0.1 ... 10 l/min		1 ... 100 l/min		0.5 ... 50 l/min	
Display type ¹⁾	LED	LED, Color TFT	LED	LED, Color TFT	LED	LED, Color TFT	LED	LED, Color TFT
Normal nominal flow rate (normalized to DIN 1343)	200 l/min		10 l/min		100 l/min		50 l/min	
Operating medium	Argon Compressed air to ISO 8573-1:2010 [6:4:1] Carbon dioxide Oxygen Nitrogen							
Information on operating and pilot media	Operation with oil lubrication not possible, Maximum particle size 10 µm			Operation with oil lubrication not possible, Maximum particle size 5 µm	Operation with oil lubrication not possible, Maximum particle size 10 µm			
Nominal operating pressure	0.3 MPa							
Nominal operating pressure	43.5 psi							
Nominal operating pressure	3 bar							
Operating pressure	0.1 ... 0.6 MPa							
Operating pressure	1 ... 6 bar							
Information on operating pressure	For inlet pressures above 4 bar and low flow rates: Avoid components in the pneumatic laminar flow inlet that reflect pressure waves. The reflection of pressure waves can lead to vibrations in the system and to accuracy deviations in the product.							
Overload pressure	0.8 MPa							
Overload pressure	8 bar							
Burst pressure	1.8 MPa							
Burst pressure	18 bar							
Maximum permissible leakage	0.6 l/h							
Ambient conditions	Not suitable for use in environments enriched with oxygen according to IEC 60601-1 Cleanest possible ambient air Dry							
Accuracy of flow rate	± (1.3% read + 0.7% FS)							
Repetition accuracy of flow rate value	± (0.1% read + 0.1%FS)							
Oxygen suitability according to standard	ASTM G 63 ASTM G 93 ASTM G 94 CGA G 4.1 EIGA IGC 33/06/E ISO 15001							
Nominal altitude of use above sea level	<= 2000 m ASL (> 79.5 kPa)							
Max. installation height	2,000 m							
Pressure dew point	-20°C							
Ambient temperature	5 ... 40°C							
Temperature of medium	5 ... 40°C							
Storage temperature	-20 ... 70°C							
Relative air humidity	0 - 90%, Non-condensating							
Certification	C-Tick RCM compliance mark c UL us - Listed (OL)							
Conforms to standard	IEC 61010-1 ISO 15001							
Certificate issuing authority	UL E322346							
CE marking (see declaration of conformity) ²⁾	As per EU EMC directive As per EU RoHS directive							
UKCA marking (see declaration of conformity) ³⁾	To UK instructions for EMC To UK RoHS instructions							

1) LED = Version without a display, LED and TFT Color = Version with a display

2) For information about the area of use, see the declaration of conformity at: www.festo.com/catalogue/... -> Support/Downloads.

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

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

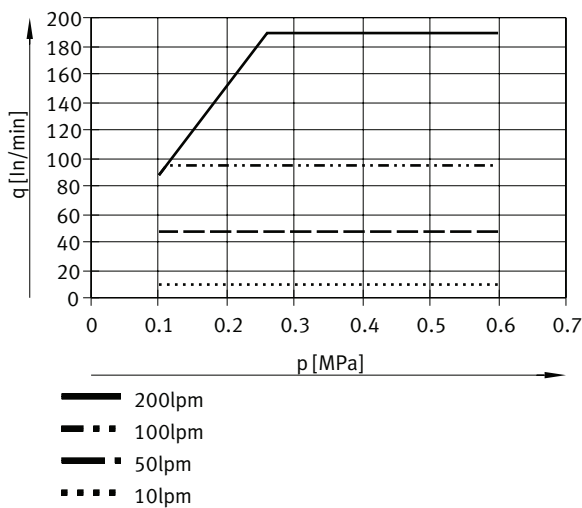
Datasheet

Materials, nominal width 6 mm

Flow rate control range	2 ... 200 l/min		0.1 ... 10 l/min		1 ... 100 l/min		0.5 ... 50 l/min	
Display type ¹⁾	LED	LED, Color TFT	LED	LED, Color TFT	LED	LED, Color TFT	LED	LED, Color TFT
Housing material	Anodized aluminum PA-reinforced PC	Anodized aluminum PA-reinforced PC POM	Anodized aluminum PA-reinforced PC	Anodized aluminum PA-reinforced PC POM	Anodized aluminum PA-reinforced PC	Anodized aluminum PA-reinforced PC POM	Anodized aluminum PA-reinforced PC	Anodized aluminum PA-reinforced PC POM
Seals material	EPDM FPM							
Materials in contact with the media	Wrought aluminum alloy, anodized EPDM Epoxy FPM PA-reinforced PFPE grease with inorganic thickeners Silicon Silicon nitride high-alloy stainless steel							
Note on materials	RoHS compliant							
LABS (PWIS) conformity	VDMA24364 Zone III							

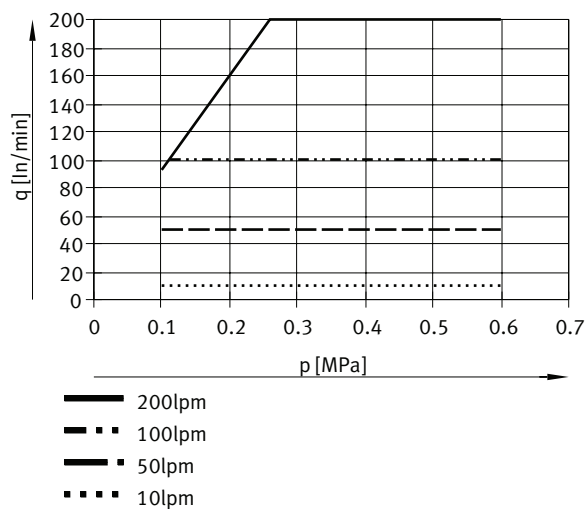
1) LED = Version without a display, LED and TFT Color = Version with a display

Maximum flow rate above input pressure, at room temperature, nominal width 6 mm, air



Datasheet

Maximum flow rate above input pressure, at room temperature, nominal width 6 mm, N2



Materials, nominal width 6 mm

Maximum flow rates for the various gases:

VEMD-...-10:

- N2: 10 ln/min
- Q 12.50 g/min
- Air: 9.7 ln/min
- AR: 7.0 ln/min
- CO2: 6.4 ln/min
- O2: 8.8 ln/min

VEMD-...-50:

- N2: 50 ln/min
- Q 62.49 g/min
- Air: 48.4 ln/min
- AR: 35.1 ln/min
- CO2: 31.8 ln/min
- O2: 43.8 ln/min

VEMD-...-100:

- N2: 100 ln/min
- Q 124.98 g/min
- Air: 96.7 ln/min
- AR: 70.1 ln/min
- CO2: 63.7 ln/min
- O2: 87.5 ln/min

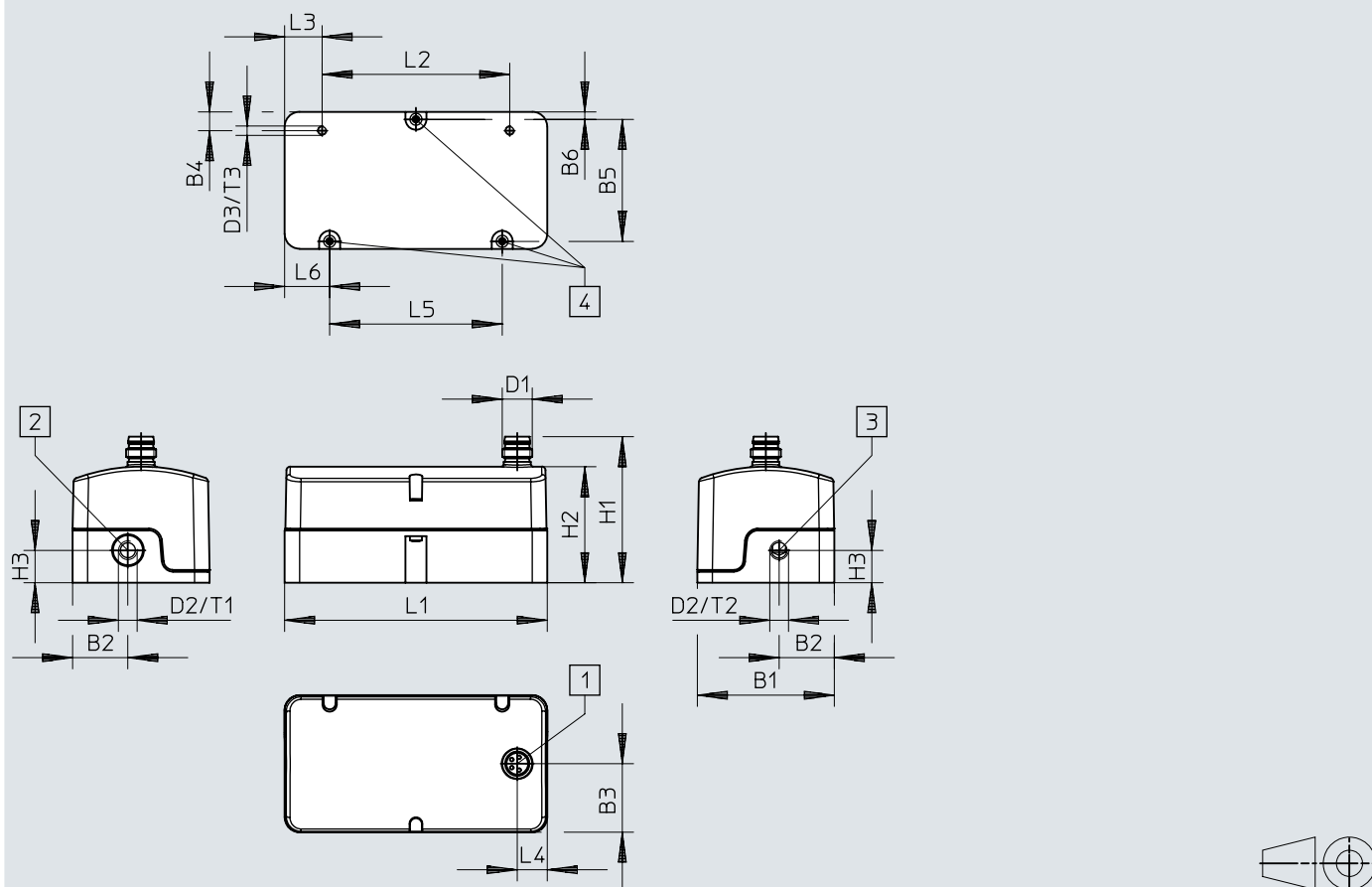
VEMD-...-200:

- N2: 200 ln/min
- Q 249.97 g/min
- Air: 193.4 ln/min
- AR: 140.25 ln/min
- CO2: 127.3 ln/min
- O2: 175.1 ln/min

Dimensions

Dimensions – Mass flow controller VEMD, nominal width 1.4mm

Download CAD data www.festo.com



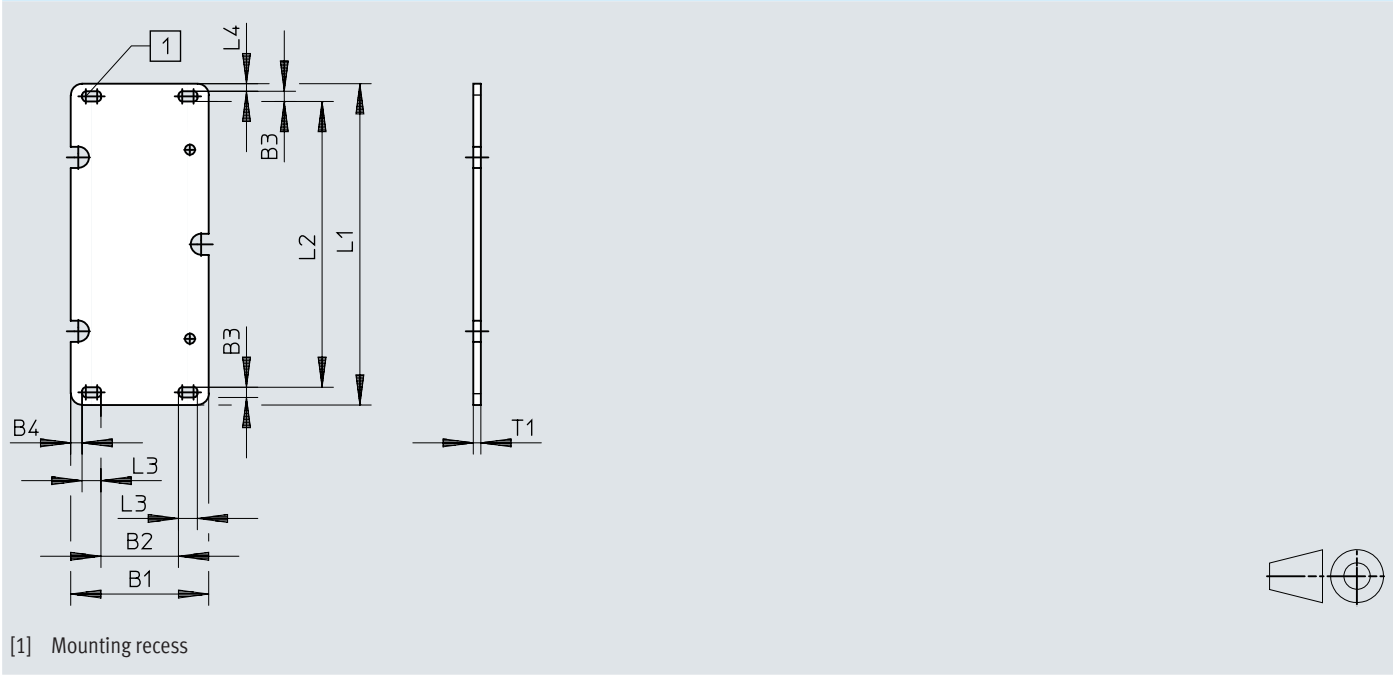
- [1] Connecting plug, 4-pin
- [2] Pressure supply port 1
- [3] Working port 2
- [4] Mounting points through-holes $\varnothing$ 2.2 mm

	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 Download CAD data www.festo.com

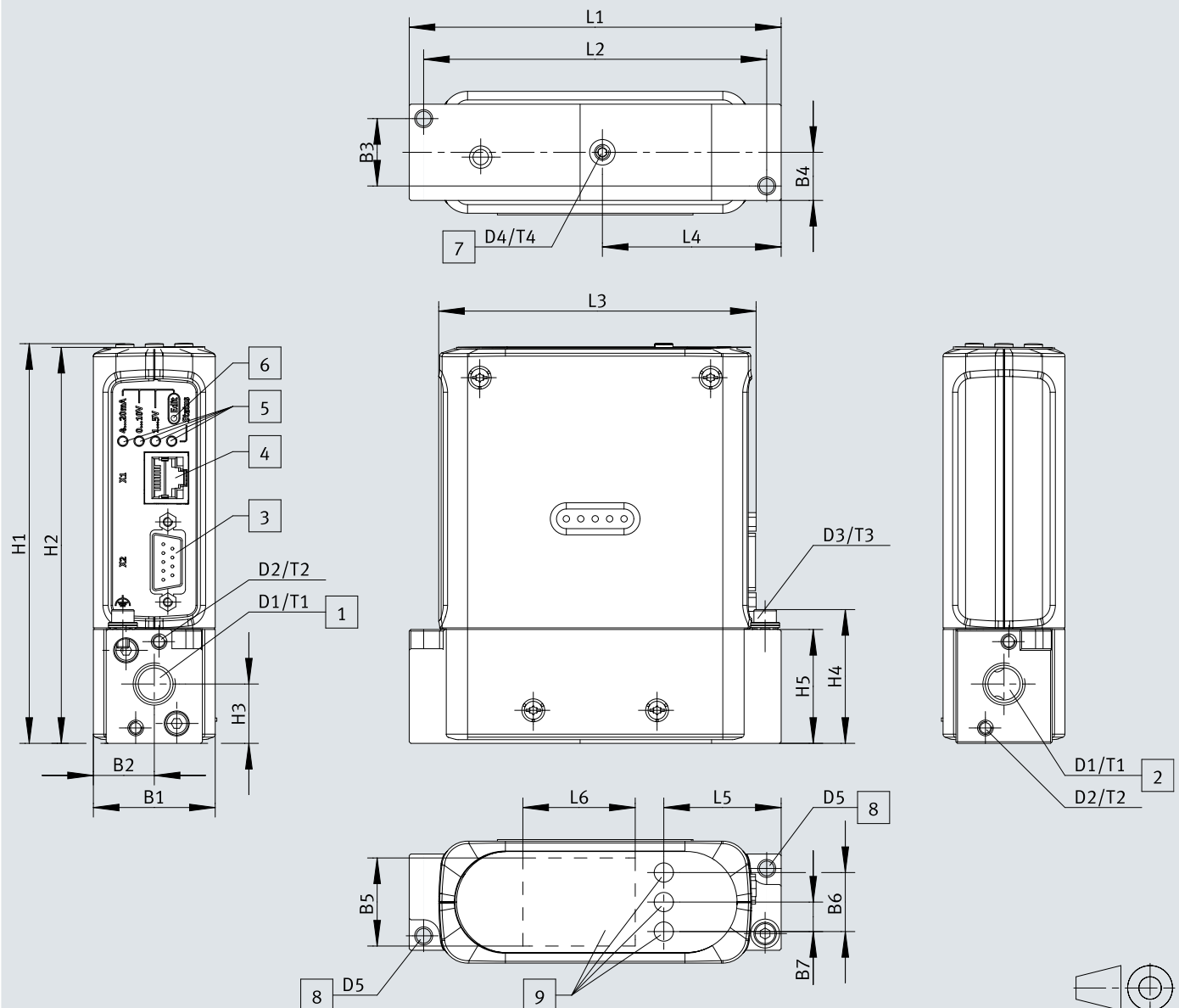


	B1	B2	B3	B4	L1	L2	L3	L4	T1
VAME-P14-W	36,5	20,5	2,7	3	85	75,6	5	2	2

Dimensions

Dimensions – Mass flow controller VEMD, nominal width 6 mm

Download CAD data www.festo.com



- [1] Exhaust air/pneumatic output
- [2] Working air/pneumatic input
- [3] Sub-D connection
- [4] RJ45 connection (Ethernet)
- [5] LED indicator
- [6] Analog input setting button
- [7] H-rail connection
- [8] Connection for wall mounting
- [9] Display with operating buttons (not included in the version without a display)

Dimensions

	B1	B2	B3	B4	B5	B6	B7	D1 Ø	D2 Ø	D3 Ø	D4 Ø	D5 Ø	H1	H2
VEMD-L-6-60-10-D9-G14-5YMPM1-VA	38	19	21	15	-	-	-	G1/4	M4	M4	M4	4,6	124,6	123,5
VEMD-L-6-60-50-D9-G14-5YMPM1-VA														
VEMD-L-6-60-100-D9-G14-5YMPM1-VA														
VEMD-L-6-60-200-D9-G14-5YMPM1-VA														
VEMD-L-6-60-10-D9-G14-5YMPM1D-VA					27,5	18,4	9,2							
VEMD-L-6-60-50-D9-G14-5YMPM1D-VA														
VEMD-L-6-60-100-D9-G14-5YMPM1D-VA														
VEMD-L-6-60-200-D9-G14-5YMPM1D-VA														

	H3	H4	H5	L1	L2	L3	L4	L5	L6	T1	T2	T3	T4
VEMD-L-6-60-10-D9-G14-5YMPM1-VA	18,5	42	35,5	116	107	100	55,8			13	8	8	10
VEMD-L-6-60-50-D9-G14-5YMPM1-VA													
VEMD-L-6-60-100-D9-G14-5YMPM1-VA								-	-				
VEMD-L-6-60-200-D9-G14-5YMPM1-VA													
VEMD-L-6-60-10-D9-G14-5YMPM1D-VA													
VEMD-L-6-60-50-D9-G14-5YMPM1D-VA								36,5	35				
VEMD-L-6-60-100-D9-G14-5YMPM1D-VA													
VEMD-L-6-60-200-D9-G14-5YMPM1D-VA													

Ordering data

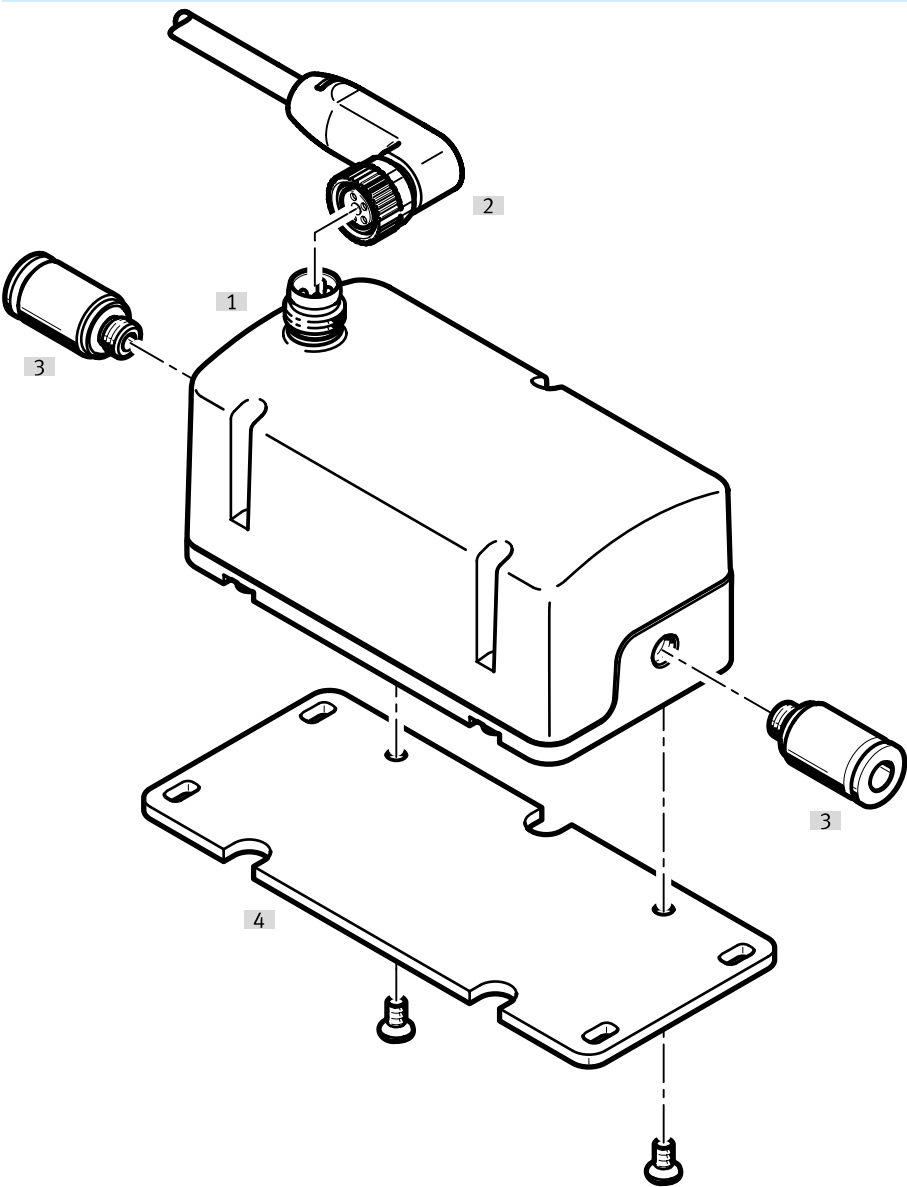
Mass flow controller VEMD, nominal diameter 1.4 mm, without display						
	Operating pressure	Operating pressure	Nominal operating voltage DC	Flow rate control range	Part no.	Type
	0 ... 0.25 MPa	0 ... 2.5 bar	12 V	0 ... 20 l/min	8086473	VEMD-L-6-14-20-D21-M5-5-R1-V4
			24 V		8086472	VEMD-L-6-14-20-D21-M5-1-R1-V4

Mass flow controller VEMD, nominal diameter 6 mm, with display						
	Operating pressure	Operating pressure	DC operating voltage range	Flow rate control range	Part no.	Type
	0.1 ... 0.6 MPa	1 ... 6 bar	12 ... 24 V	0.1 ... 10 l/min	8163826	VEMD-L-6-10-10-D9-G14-5YMPM1D-VA
				0.5 ... 50 l/min	8163828	VEMD-L-6-60-50-D9-G14-5YMPM1D-VA
				1 ... 100 l/min	8163829	VEMD-L-6-60-100-D9-G14-5YMPM1D-VA
				2 ... 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	DC operating voltage range	Flow rate control range	Part no.	Type
	0.1 ... 0.6 MPa	1 ... 6 bar	12 ... 24 V	0.1 ... 10 l/min	8163821	VEMD-L-6-10-10-D9-G14-5YMPM1-VA
				0.5 ... 50 l/min	8163823	VEMD-L-6-60-50-D9-G14-5YMPM1-VA
				1 ... 100 l/min	8163824	VEMD-L-6-60-100-D9-G14-5YMPM1-VA
				2 ... 200 l/min	8163825	VEMD-L-6-60-200-D9-G14-5YMPM1-VA

Peripherals overview

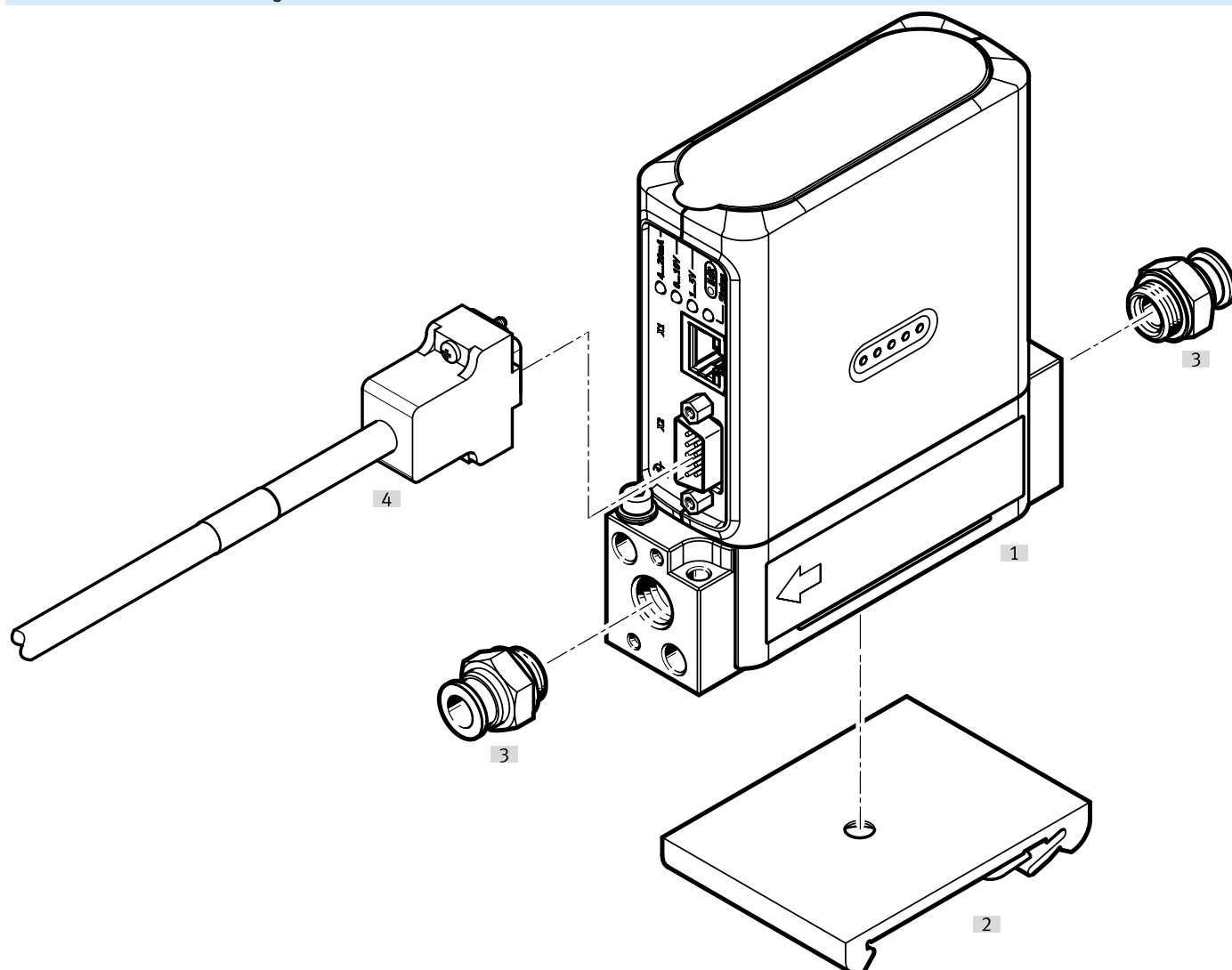
VEMD-L-6-14-... on mounting plate



Accessories		→ Page/Internet
Type/order code	Description	
[1] Mass flow controller VEMD	–	vemd
[2] Connecting cable NEBA	–	20
[3] Push-in fitting QSM/NPQM	for connecting tubing with standard O.D.	20
[4] Mounting plate VAME-P14	for mounting the valve	20

Peripherals overview

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



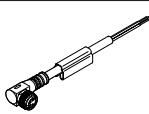
Accessories		→ Page/Internet
Type/order code	Description	
[1] Mass flow controller VEMD	-	vemd
[2] H-rail mounting CAFM	for mounting the valve	21
[3] Push-in fitting QS	for connecting tubing with standard O.D.	21
[4] Connecting cable KMP6	-	21

Accessories

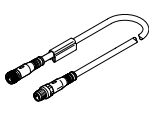
Connecting cable, straight socket, open end, for nominal width 1.4 mm

	Electrical connection 1, connection type	Electrical connection 1, connection technology	Electrical connection 1, number of pins/wires	Cable length	Part no.	Type
	Socket	M8x1 A-coded as per 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

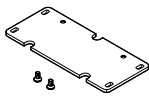
Connecting cable, angled socket, open end, for nominal width 1.4 mm

	Electrical connection 1, connection type	Electrical connection 1, connection technology	Electrical connection 1, number of pins/wires	Cable length	Part no.	Type
	Socket	M8x1 A-coded as per 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, connection type	Electrical connection 1, connection technology	Electrical connection 1, number of pins/wires	Cable length	Part no.	Type
	Socket	M8x1 A-coded as per 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
	Any	5225721	VAME-P14-W

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

	Pneumatic connection 1	Pneumatic connection 2	Part no.	Type
	External thread M5	for pneumatic tubing outside diameter 4 mm	558657	NPQM-DK-M5-Q4-P10
		for pneumatic tubing outside diameter 6 mm	558658	NPQM-DK-M5-Q6-P10

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

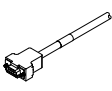
	Pneumatic connection 1	Pneumatic connection 2	Part no.	Type
	External thread M5	for pneumatic tubing outside diameter 3 mm	153313	QSM-M5-3-I
		for pneumatic tubing outside diameter 4 mm	153315	QSM-M5-4-I
		for pneumatic tubing outside diameter 6 mm	153317	QSM-M5-6-I

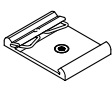
Accessories

Push-in fitting, with external hex, metal version, for nominal width 1.4 mm					
	Pneumatic connection 1	Pneumatic connection 2	Part no.	Type	
	External thread M5	for pneumatic tubing outside diameter 3 mm	153302	QSM-M5-3	
		for pneumatic tubing outside diameter 4 mm	153304	QSM-M5-4	
		for pneumatic tubing outside diameter 6 mm	153306	QSM-M5-6	

Push-in fitting, with external hex, for nominal width 6 mm					
	Pneumatic connection 1	Pneumatic connection 2	Pack size	Part no.	Type
	External thread G1/4	for pneumatic tubing outside diameter 6 mm	10	186097	QS-G1/4-6
			100	132039	QS-G1/4-6-100
		for pneumatic tubing outside diameter 8 mm	10	186099	QS-G1/4-8
			50	132040	QS-G1/4-8-50
		for pneumatic tubing outside diameter 10 mm	10	186101	QS-G1/4-10
			50	132041	QS-G1/4-10-50

Push-in fitting, with external hex, for nominal width 6 mm					
	Pneumatic connection 1	Pneumatic connection 2	Pack size	Part no.	Type
	External thread G1/4	for pneumatic tubing outside diameter 6 mm	10	8203297	NPQO-D-G14-Q6-P10
		for pneumatic tubing outside diameter 8 mm		8203298	NPQO-D-G14-Q8-P10
		for pneumatic tubing outside diameter 10 mm	5	8203299	NPQO-D-G14-Q10-P5

Connecting cable, for nominal width 6 mm						
	Electrical connection 1, connection type	Electrical connection 1, connection technology	Electrical connection 1, number of pins/wires	Cable length	Part no.	Type
	Socket	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