Proportional pressure regulators and valves VPPM, VPPE, MPPE, MPPES, MPYE and the new **VPPM-MPA**

For correct pressure and precise regulation

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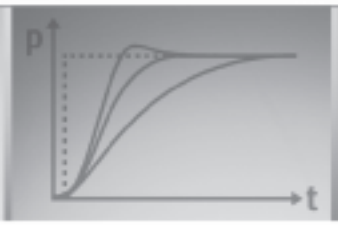
Precise, infinite regulation of pressure and flow

Info 241

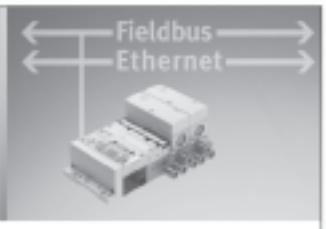
Reliable pressure and flow control

Applying pressure correctly – plus easy installation and precise regulation
Fast dynamic response, high repetition accuracy, short switching times, linear characteristics and stable regulation – these features can significantly improve product quality by precise adjustment and control of the process variables. These proportional pressure regulators provide infinite adjustment of pressure and thereby the force or flow, enabling the user to preset pressures, piston speeds and rotational speeds electrically.

Regulation at the press of a button



... sturdy – with 3 presets



... variable – via fieldbus

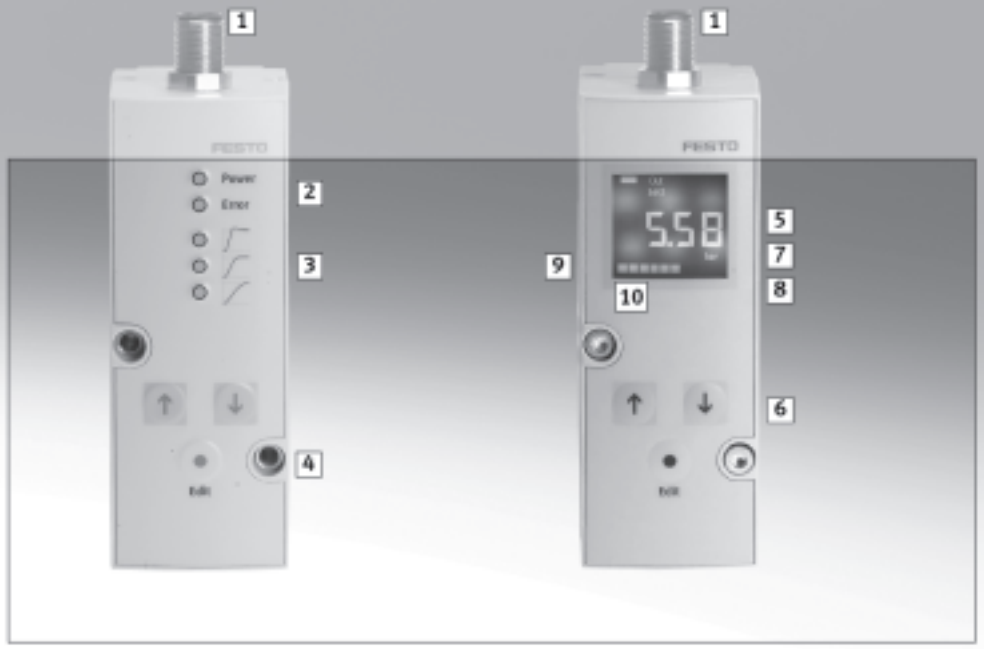
VPPM – the new dimension ...
... in proportional pressure regulators. The right parameters for each application – simply choose the correct regulator characteristic from 3 presets at the press of a button. Specialists are no longer required. Reliable regulation due to two-stage control circuit with multi-sensor control.

Pure individuality
Our modules for the VPPM are precisely adjusted to your requirements – for electronic, pneumatic and mechanical systems with maximum versatility.

Versatility
Inline or flanged version, current controlled, voltage controlled, connection to fieldbus/Ethernet via CPX terminal. From basic performance to high-tech product – something completely new.

Multi-sensor control
Integrated sensors for optimum regulation results and behaviour. Temperature-compensated, which means no pressure drifting during temperature changes.

Diagnostics
The VPPM reports the pressure reached as an electrical signal. It can also diagnose a specified value that cannot be reached. Almost all values can be remotely controlled and monitored via CPX.



LED or LCD versions of proportional pressure regulators

1 Connector plug M12, 8-pin
2 Status LEDs Power/Error
3 3 preset LEDs fast/universal/precise
4 3 pushbuttons for simple operation (choice of presets)
5 Display of current pressure
6 Presets can be selected via buttons or digital inputs
7 Adjustable pressure range
8 Different switch modes for switch output (diagnostics function)
9 Choice of units (bar, kPa or psi)
10 Bar display for identifying dynamic processes

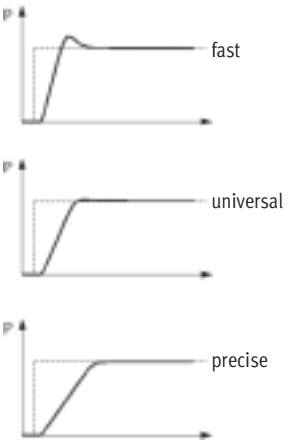
Main application

Can be put to universal use. Whether it is accuracy or speed that is required at the press of a button, or processes where force and pressure must be regulated precisely and flexibly, reliable regulation behaviour guarantees optimum results.

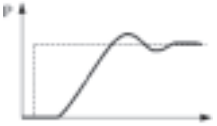
Advantages for commissioning and maintenance

- Festo plug & work®: no adjustment of the control circuit required
- No need to store special attachments
- Immediate commissioning
- Shorter retooling times
- Remote control regulation behaviour (presets – rapid, universal and precise)
- Can be adjusted to the application individually via presets
- Choice of several pressure ranges
- Process-optimised cylinder speed
- Flexible, adjustable flow rates
- Special adaptation possible

Only from Festo – reliable regulation with multi-sensor control

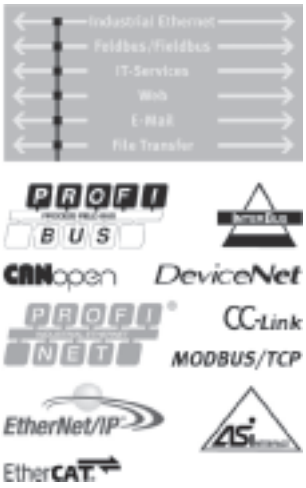


Without multi-sensor control generally causes overshooting.



VPPM-MPA on CPX/MPA – proportional technology in threefold linking

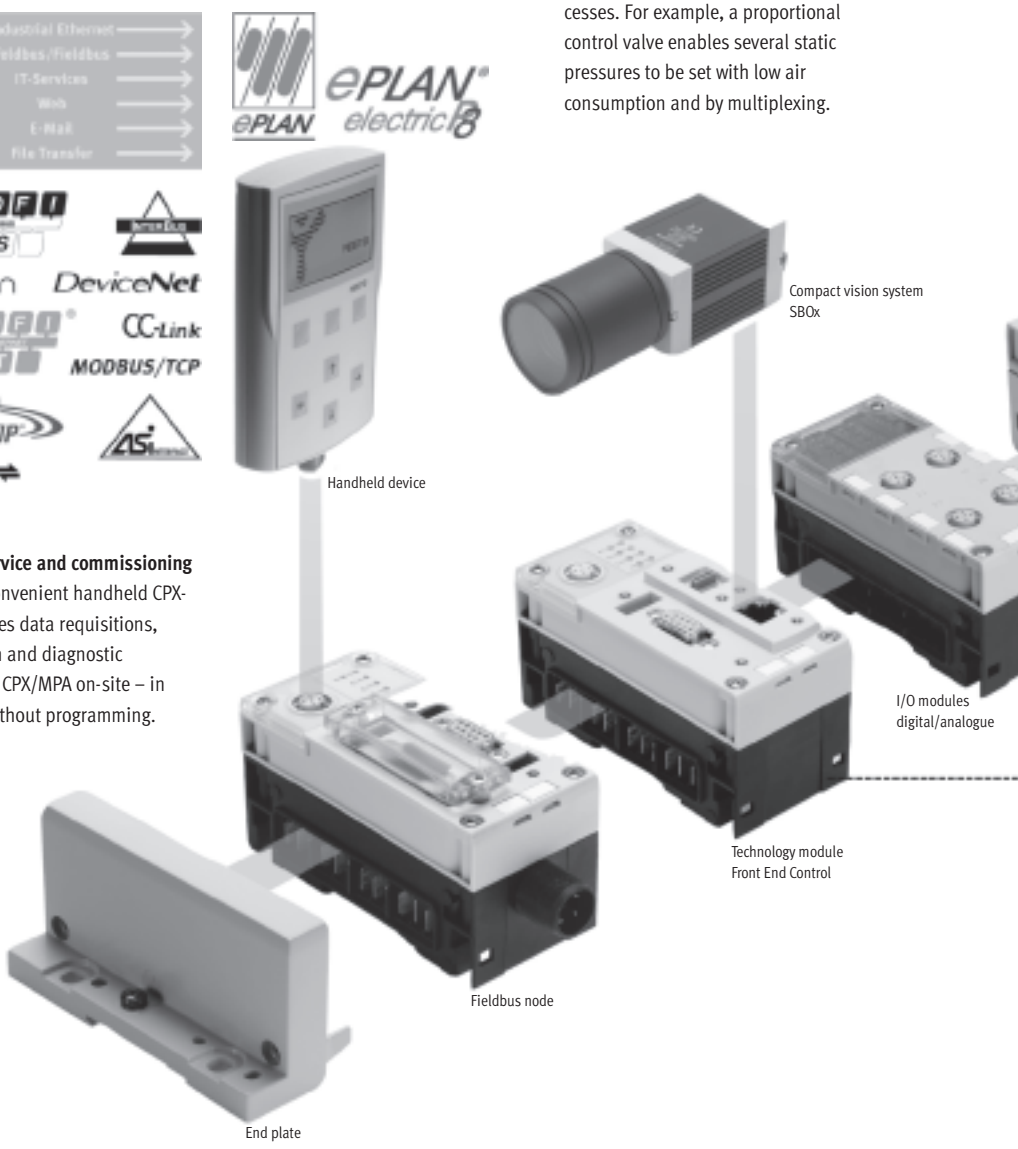
Versatile – integration into automation systems
The MPA valve terminal with fieldbus connection communicates in many different languages and is able to communicate with the fieldbus systems and automation systems of leading manufacturers.

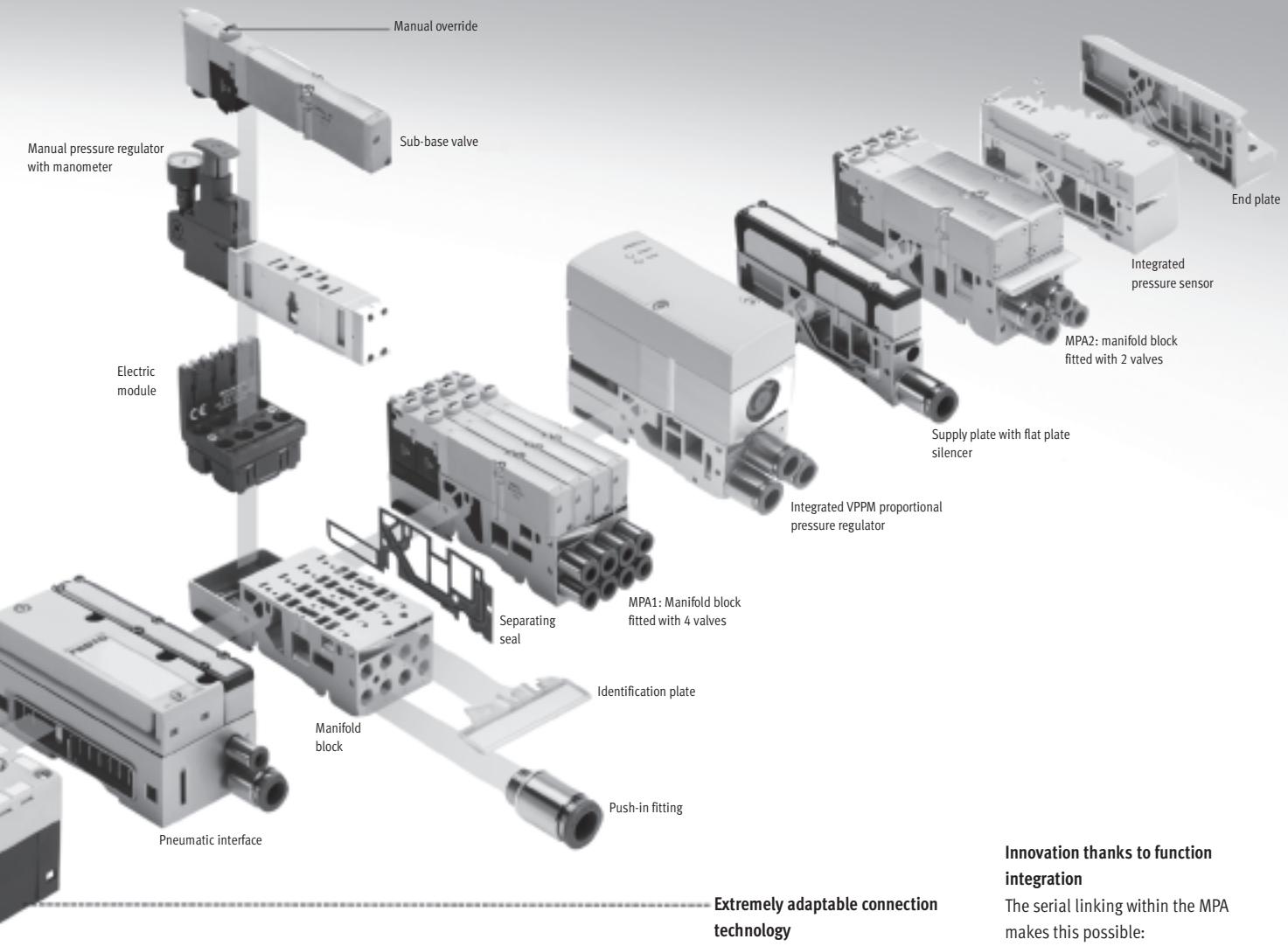


Simple – service and commissioning
The small, convenient handheld CPX-MMI facilitates data requisitions, configuration and diagnostic functions for CPX/MPA on-site – in plain text, without programming.

Faster configuration using CPX macro
Systematically more reliable and quicker planning and configuration with CPX modules – the CPX macro library for the electrical CAE software Eplan.

High flexibility due to individual pressure zones
New technologies and innovative products enable many possibilities. The pressure control valve integrated in a valve terminal offers remote controlled pressure zone regulation and therefore more flexibility in many processes. For example, a proportional control valve enables several static pressures to be set with low air consumption and by multiplexing.





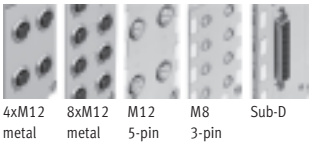
Better performance thanks to technology modules

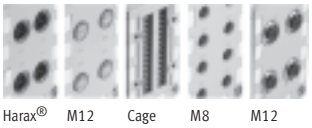
CPX-FEC provides a programmable valve terminal – remote controller on the fieldbus or Ethernet as a pre-processing unit for decentralised, autonomous subsystems. The CPX-CPI interface permits centralised and decentralised pneumatic/electrical systems side-by-side – leading to shorter cycle times and lower wiring costs.

Easy integration of the latest SBOx vision system in IP65 on CPX/MPA – simpler I/O operation, on CPI interface or via Ethernet.

For flexible and innovative quality assurance.

Extremely adaptable connection technology





Innovation thanks to function integration

The serial linking within the MPA makes this possible:

VPPM-MPA pressure control valve

- Pressure ranges 0.02 ... 2 bar/ 0.06 ... 6 bar/0.1 ... 10 bar
- flow up to 1400 l/min
- 3 presets can be accessed
- programmable switching points
- pressure range can be set
- temperature compensation
- highly accurate cascade regulation thanks to multi-sensor technology

New

Proportional pressure regulators VPPM

General information

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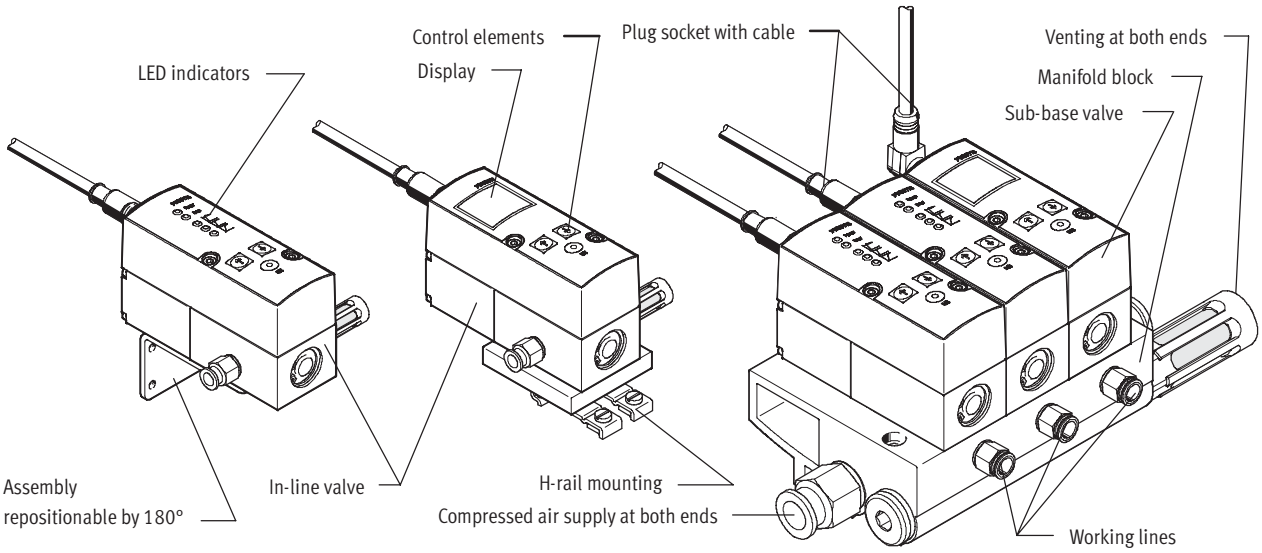
VPPM



Innovative

- Multi-sensor control (cascade control)
- Diagnostics
- Choice of regulation characteristics
- Temperature compensated
- High dynamic response
- High repetition accuracy
- Modular product system

Versatile

- Individual valves (in-line valve)
- Manifold valves (sub-base/flange valve)
- Various user interfaces
  - LED indicators
  - LCD display
  - Adjustment/selection buttons
- A choice of valves with different pressure ranges
- Pressure range can be modified on the valve
- Choice of different setpoint specifications
  - Current input
  - Voltage input

Reliable

- Integrated pressure sensor
  - with independent output
- Open circuit monitoring
- Pressure is maintained if the controller fails

Easy to mount

- Manifold block
- H-rail mounting
- Individually via mounting bracket
- QS fittings

Proportional pressure regulators VPPM

General information

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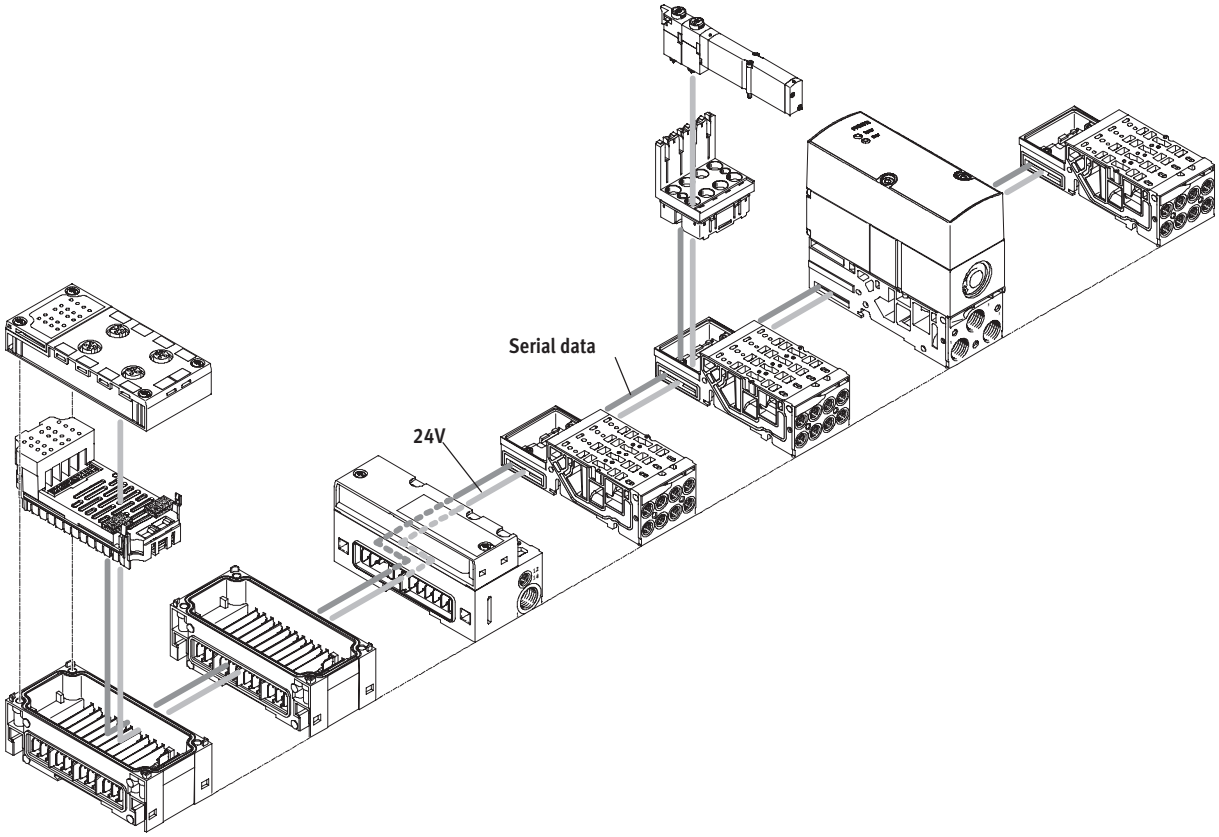
VPPM on the valve terminal MPA



Innovative

- Multi-sensor control
- Diagnostics via bus
- Choice of regulation characteristics
- High dynamic response
- 2 accuracy levels
- Pressure zone regulation
- Multiplexing

Versatile

- For all common protocols
- As an individual pressure regulator
- As a pressure zone regulator
- Choice of 3 valves with different pressure ranges
- 3 pressure ranges (presets) can be set via the bus
- Internal or external compressed air supply possible

Reliable

- Long service life
- LED display for the operating status
- Pressure is maintained if the supply voltage fails
- Fast troubleshooting thanks to LEDs on the valves and diagnostics via fieldbus
- Ease of servicing through replaceable valves

Easy to mount

- Simple replacement of the valves
- Tested units
- Easy extension of the valve terminal

Proportional pressure regulators VPPM

General information

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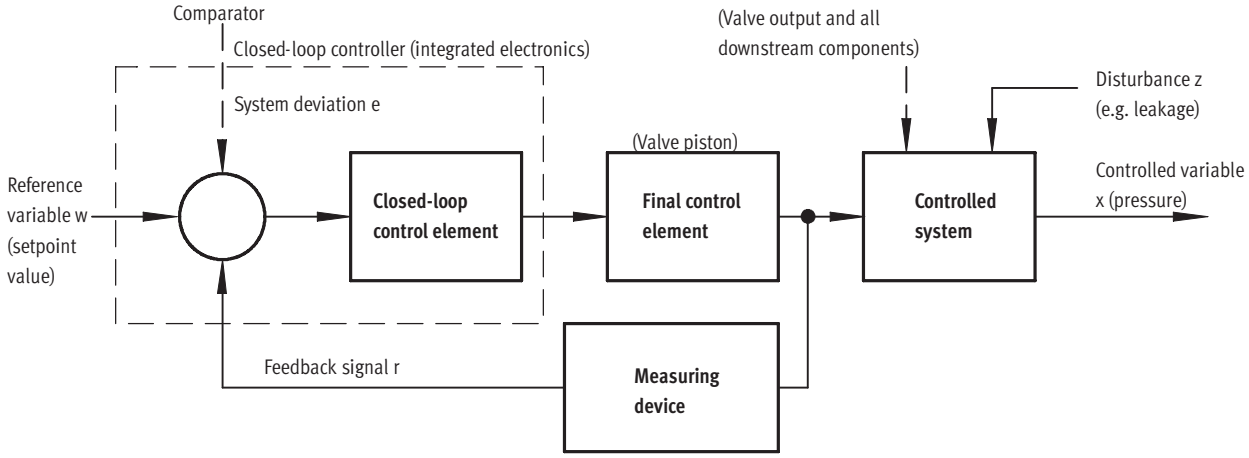
Layout of a control circuit



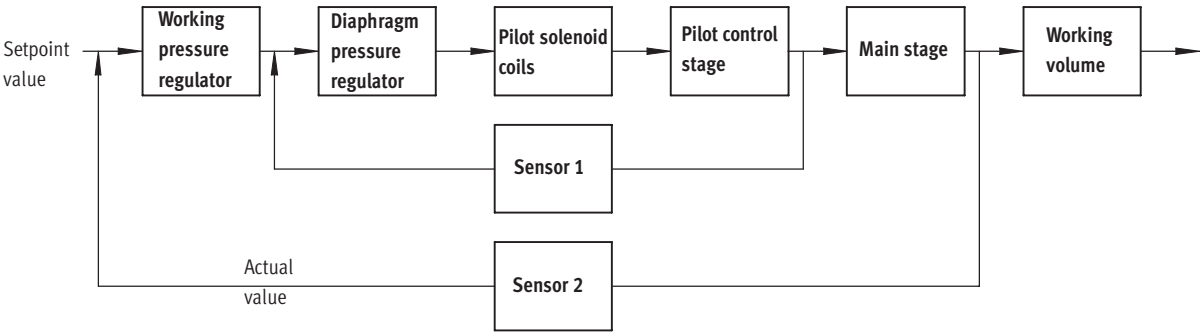
Layout

The figure shows a closed-loop control circuit. The reference variable w (setpoint value, e.g. 5 volts or 8 mA) initially acts on a comparator. The measuring device sends the controlled variable x value (actual value, e.g. 3 bar) to the comparator as a feedback signal r. The closed-loop control element detects the system deviation e and actuates the final control element. The output of the final control element acts on the controlled system. The closed-loop control element thus attempts to compensate for the difference between the reference variable w and the controlled variable x by using the final control element.

Method of operation

This process runs continuously so changes in the reference variable are always detected. However, a system deviation will also appear if the reference variable is constant but the controlled variable changes. This happens when the flow through the valve changes in response to a switching action, a cylinder movement or a change in load. The disturbance variable z will also cause a system deviation. An example of this is when the pressure drops in the air supply. The disturbance variable z acts on the controlled variable x unintentionally. In all cases, the regulator attempts to readjust the controlled variable x to the reference variable w.

Multi-sensor control (cascade control) of the VPPM



Cascade control

Unlike conventional direct-acting regulators, with multi-sensor control several control circuits are nested inside each other. The overall controlled system is divided into smaller sub-controlled circuits that are easier to control for the specific task.

Control precision

Multi-sensor control significantly improves control precision and dynamic response in comparison with single-acting regulators.

Proportional pressure regulators VPPM

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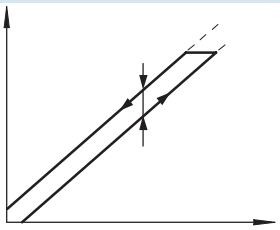
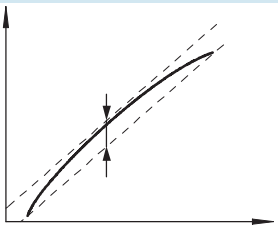
Terms related to the proportional pressure regulator

Hysteresis



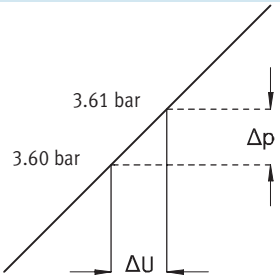
There is always a linear relationship within a certain tolerance between the setpoint value entered and the pressure output. Nevertheless it makes a difference whether the setpoint value is entered as rising or falling. The difference between the maximum deviations is referred to as hysteresis.

Linearity error



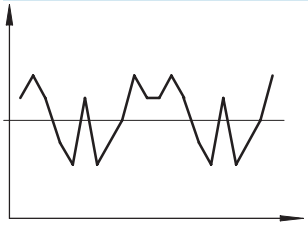
A perfectly linear progression of the control characteristic of the output pressure is theoretical. The maximum percentage deviation from this theoretical control characteristic is referred to as the linearity error. The percentage value refers to the maximum output pressure (full scale).

Response sensitivity



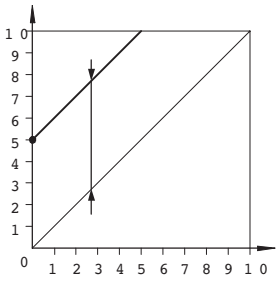
The response sensitivity of the device determines how sensitively one can change, i.e. adjust, a pressure.
The smallest setpoint value difference that results in a change in the output pressure is referred to as the response sensitivity. In this case, 0.01 bar.

Repetition accuracy (reproducibility)



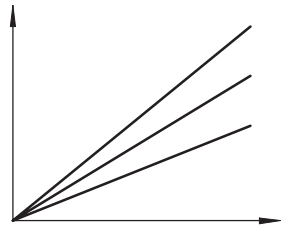
The repetition accuracy is the margin within which the fluid output variables are scattered when the same electrical input signal coming from the same direction is repeatedly adjusted. The repetition accuracy is expressed as a percentage of the maximum fluid output signal.

Zero offset



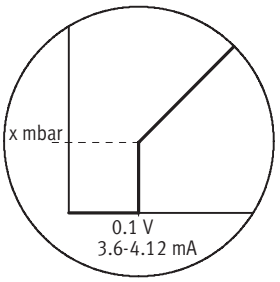
If, for example, a VPPM cannot be vented for safety reasons, the minimum pressure can be increased from the zero point. The smallest setpoint value is then assigned an output pressure of 5 bar, for example, and the largest setpoint value an output pressure of 10 bar. Zero suppression is automatically switched off if zero offsetting is used.

Pressure range adaptation



In the delivery condition, 100% setpoint value equals 100% fluid output signal. Pressure range adaptation or adjustment enables the fluid output variable to be matched to the setpoint value.

Zero point suppression

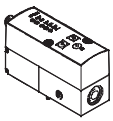
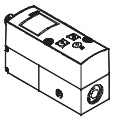
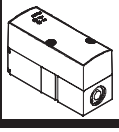


In practice there exists the possibility of residual voltage or residual current at the setpoint input of the VPPM via the setpoint generator.
Zero point suppression is used so that the valve is reliably vented at a setpoint value of zero.

New

Proportional pressure regulators VPPM

Product range overview

Function	Version	Construc-tional design	Pneumatic connection 1, 2, 3	Nominal diameter pressurise/ exhaust [mm]	Pressure regulation range [bar]	Setpoint value input			➔ Page/ Internet
						Voltage type 0 ... 10 V	Current type 4 ... 20 mA	Digital –	
Pressure regulators	**With LED**								
		Pilot actuated diaphragm valve	G⅛	6/4.5	0.02 ... 2 0.06 ... 6 0.1 ... 10	■	■	–	15
			Sub-base	6/4.5	0.02 ... 2 0.06 ... 6 0.1 ... 10	■	■	–	
	With LCD								
		Pilot actuated diaphragm valve	G⅛	6/4.5	0.02 ... 2 0.06 ... 6 0.1 ... 10	■	■	–	15
			Sub-base	6/4.5	0.02 ... 2 0.06 ... 6 0.1 ... 10	■	■	–	
	With LED for valve terminal MPA								
		Pilot actuated diaphragm valve	Manifold block MPA	6/4.5	0.02 ... 2 0.06 ... 6 0.1 ... 10	–	–	■	15

Proportional pressure regulators VPPM

Peripherals overview

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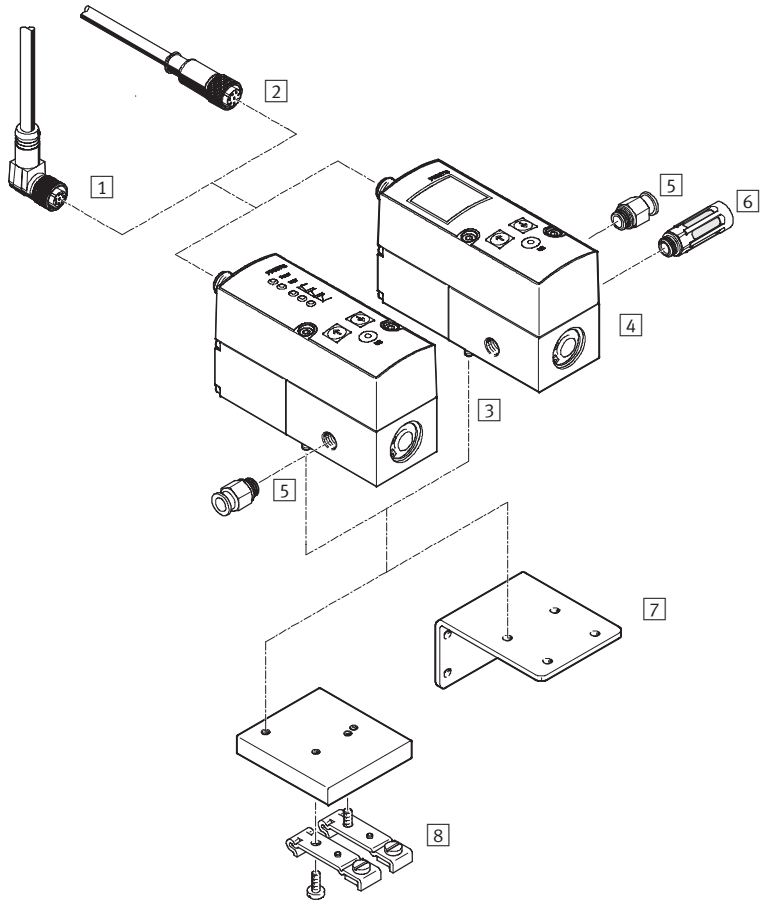
Individual valve



Accessories

		Brief description	➔ Page/Internet
1	Plug socket with cable, angled NEBU-M12W8-...	–	27
2	Plug socket with cable, straight SIM-M12-8GD-...	–	27
3	Proportional pressure regulator VPPM	Operator unit with LED	15
4	Proportional pressure regulator VPPM	Operator unit with LCD	15
5	Push-in fitting QS	For connecting compressed air tubing with standard outside diameter	qs
6	Silencer	For fitting on exhaust ports	u
7	Mounting bracket VAME-P1-A	For attaching the valve	24
8	H-rail mounting VAME-P1-T	For mounting on a H-rail	25

Proportional pressure regulators VPPM

Peripherals overview

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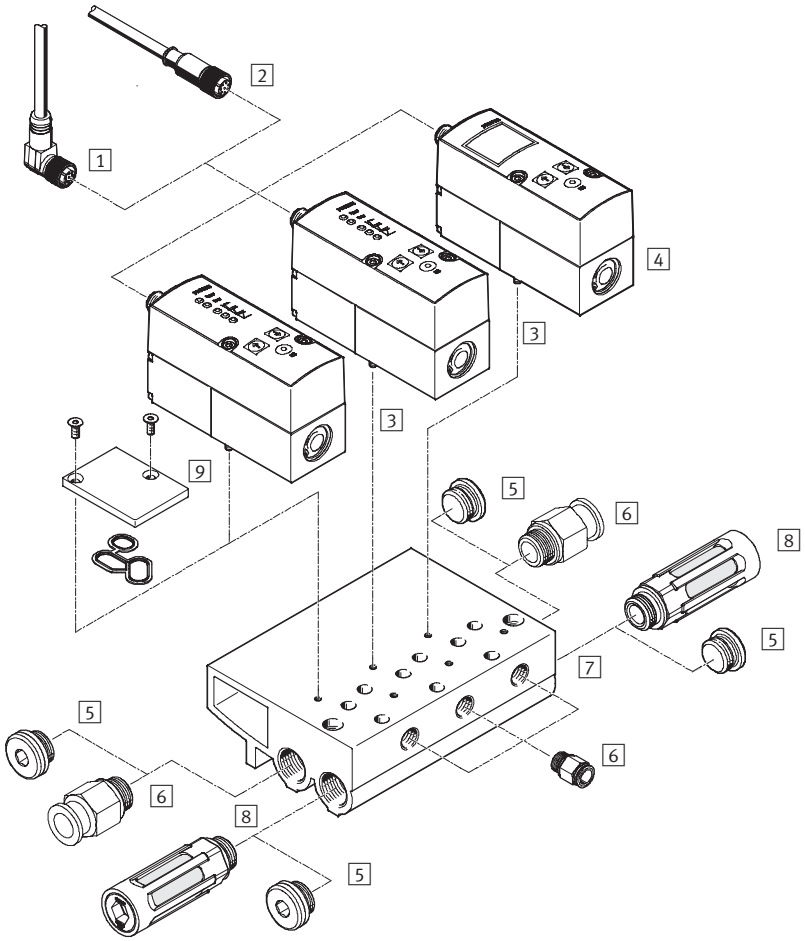
Valve manifold

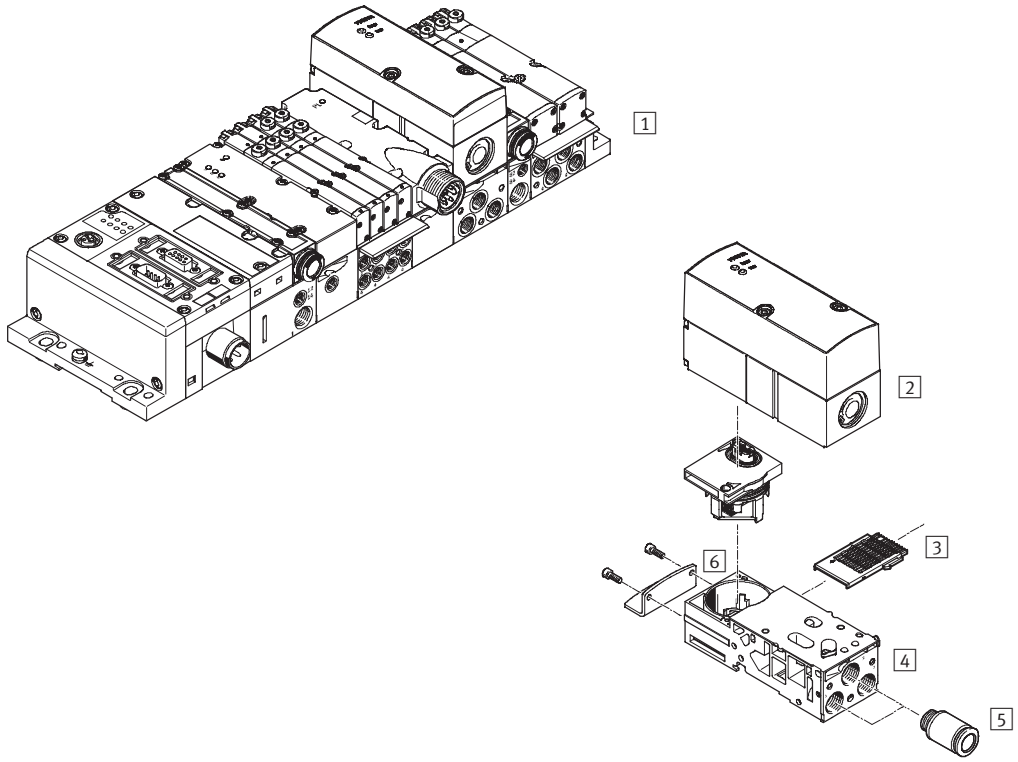


Accessories		
	Brief description	**→ Page/Internet**
1 Plug socket with cable, angled NEBU-M12W8-...	–	27
2 Plug socket with cable, straight SIM-M12-8GD-...	–	27
3 Proportional pressure regulator VPPM	Operator unit with LED	15
4 Proportional pressure regulator VPPM	Operator unit with LCD	15
5 Blanking plug B	–	b
6 Push-in fitting QS	For connecting compressed air tubing with standard outside diameter	qs
7 Manifold block VABM	–	22
8 Silencer	For fitting on exhaust ports	u
9 Blanking plate VABB-P1	For vacant position; seal and countersunk screws included in the scope of delivery	23

Proportional pressure regulators VPPM

System overview

VPPM for valve terminal MPA



Accessories

		Brief description	➔ Page/Internet
1	Valve terminal MPA	With fieldbus connection and VPPM	mpa
2	Proportional pressure regulator VPPM	For valve terminal MPA	mpa
3	Electrical manifold module VMPA1-FB-EV-AB	For sub-base of the proportional pressure regulator	mpa
4	Sub-base VMPA-FB-AP-P1	Without electrical manifold module and electrical module	mpa
5	Push-in fitting QS	–	qs
6	Attachment VMPA-BG	–	mpa

Proportional pressure regulators VPPM

Type codes

VPPM	–	6	L		–	L	–	1	–	G18	–	0L	6H	–	V1	N	–	S1	–	

Type	
VPPM	Modular proportional pressure regulator

Nominal diameter	
6	6 mm

Design	
L	In-line valve
F	Flanged valve

Mounting method	
	Freely mountable

Dynamic response class	
L	Low

Valve function	
1	3/2-way valve, normally closed

Pneumatic connection	
G18	Thread G1⁄8
F	Flange/sub-base

Lower pressure value of regulation range	
0L	0 bar

Upper pressure value of regulation range	
2H	2 bar
6H	6 bar
10H	10 bar

Setpoint specification for individual valve	
V1	0 ... 10 V
A4	4 ... 20 mA

Switching output	
N	Negative switching
P	Positive switching

Accuracy	
	2% (standard)
S1	1%

Operator unit	
	LED (standard)
C1	With LCD, pressure unit variable

Proportional pressure regulators VPPM

Technical data

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Flow rate
380 ... 1,400 l/min

Voltage
21.6 ... 26.4 V DC

Pressure regulation range
0.02 ... 10 bar

Variants
- Setpoint input as analogue voltage signal 0 ... 10 V
- Setpoint input as analogue current signal 4 ... 20 mA
- LED version
- With LCD display
- NPN or PNP switching output
- Integration in valve terminal via fieldbus

General technical data

			G1⁄8	Sub-base	Valve terminal MPA
Constructional design			Pilot actuated diaphragm regulator		
Sealing principle			Soft		
Actuation type			Electric		
Type of control			Pilot actuated via 2/2-way valves		
Type of mounting			Via through-hole, via accessories		
Mounting position			Any		
Nominal diameter	Pressurisation	[mm]	6		
	Exhaust	[mm]	4.5		
Standard nominal flow rate		[l/min]	→ Graphs		
Product weight		[g]	400		

Electrical data

			G1⁄8	Sub-base	Valve terminal MPA
Electrical connection			Plug, round design, 8-pin, M12		Terminal linking
Operating voltage range		[V DC]	24 ± 10% = 21.6 ... 26.4		
Residual ripple			10%		
Max. electrical power consumption		[W]	7		
Signal setpoint input	Voltage	[V DC]	0 ... 10		Digitally via fieldbus
	Current	[mA]	4 ... 20		
Protection against short circuit			For all electrical connections		
Protection against polarity reversal			For all electrical connections		
Protection class			IP65		
CE mark			EU conformity in accordance with the directive 89/336/EEC (EMC)		

Note

If the power supply cable is interrupted, output pressure is maintained unregulated.

Proportional pressure regulators VPPM

Technical data

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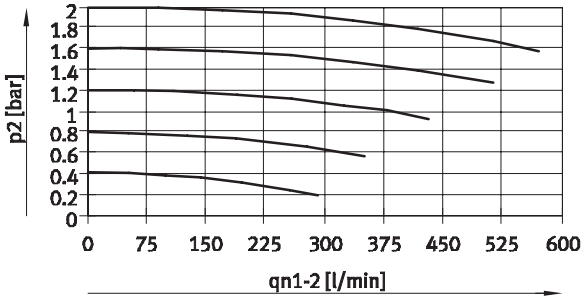
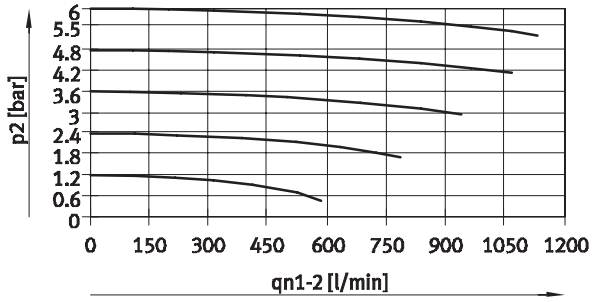
Flow rate qn from 1 → as a function of output pressure p2

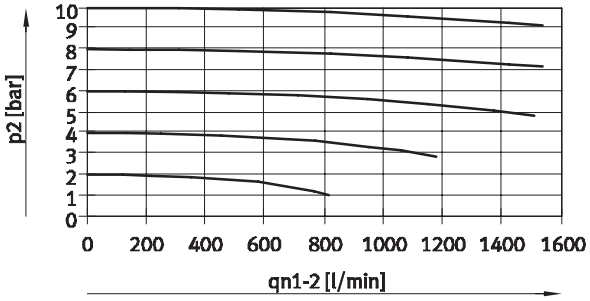
VPPM-6L-...-0L2H-... (2 bar)



VPPM-6L-...-0L6H-... (6 bar)

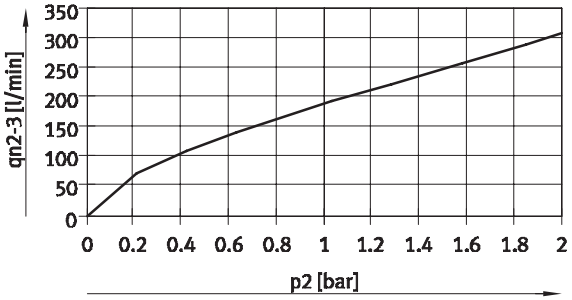


VPPM-6L-...-0L10H-... (10 bar)

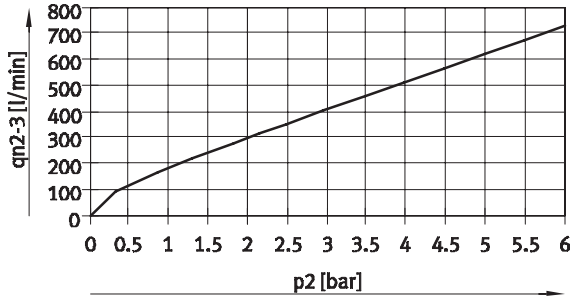


Flow rate qn from 2 → 3 as a function of output pressure p2

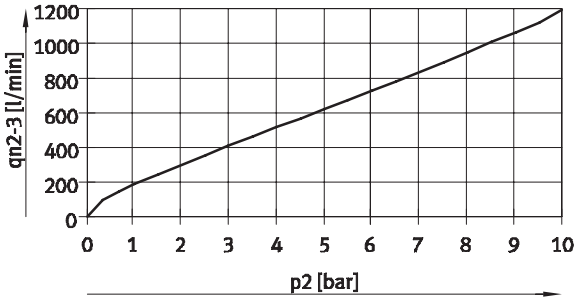
VPPM-6L-...-0L2H-... (2 bar)



VPPM-6L-...-0L6H-... (6 bar)



VPPM-6L-...-0L10H-... (10 bar)



Proportional pressure regulators VPPM

Technical data

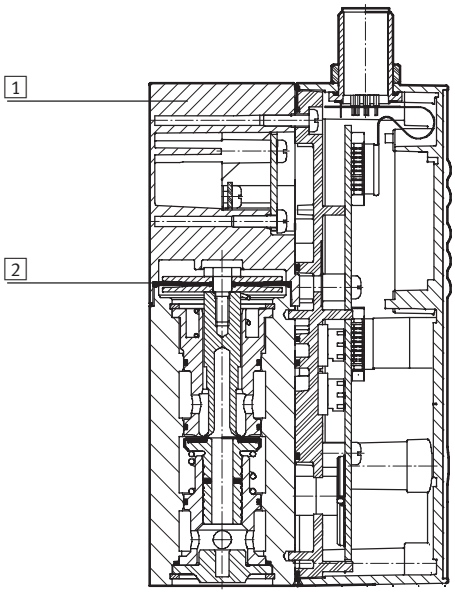
Operating and environmental conditions				
Pressure regulation range	[bar]	0.02 ... 2	0.06 ... 6	0.1 ... 10
Operating medium		Compressed air, filtered, unlubricated, grade of filtration 40 µm Neutral gases		
Supply pressure 1	[bar]	0 ... 4 2)	0 ... 8 2)	0 ... 11 2)
Max. hysteresis	[mbar]	10	30	50
FS (full scale) linearity error	[%]	± 0.5		
FS (full scale) repetition accuracy	[%]	0.5		
Temperature coefficient	[%/°C]	0.04/1		
Ambient temperature	[°C]	0 ... 60		
Temperature of medium	[°C]	10 ... 50		
Corrosion resistance	[CRC]	2 1)		

1) Corrosion resistance class 2 as per Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

2) Supply pressure 1 should always be 1 bar greater than the maximum regulated output pressure.

Materials

Sectional view



1	Housing	Wrought aluminium alloy
2	Diaphragm	Nitrile rubber

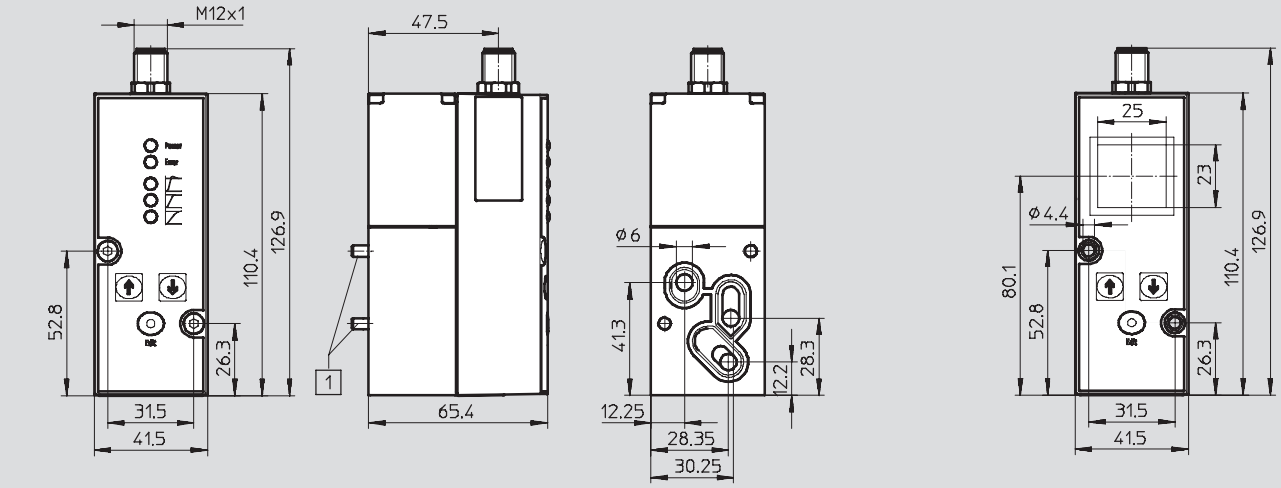
Proportional pressure regulators VPPM

Technical data

FESTO

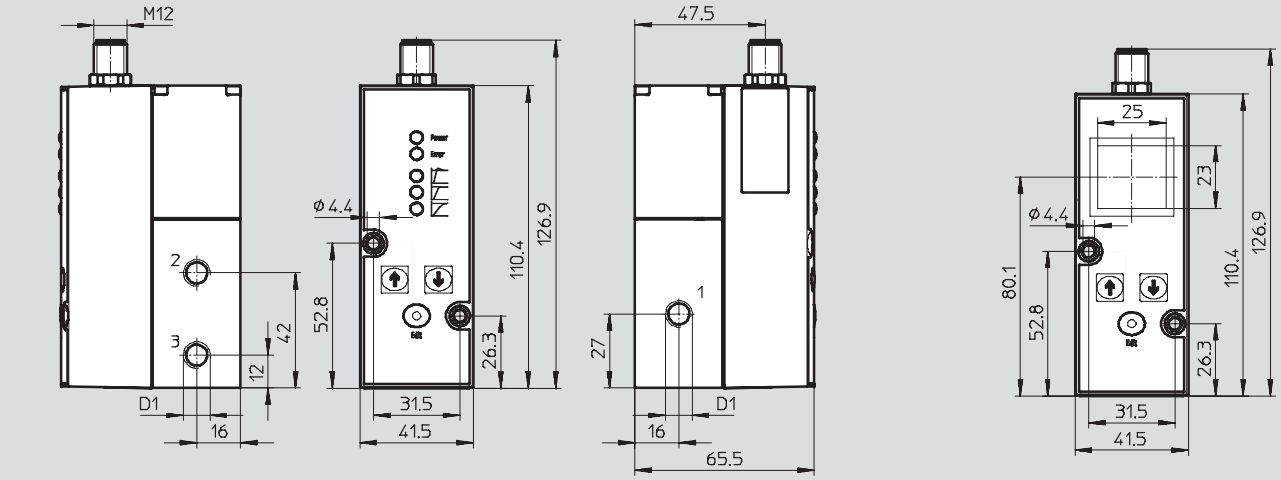
Dimensions Download CAD data ➔ **www.festo.com**

VPPM-6F With LCD



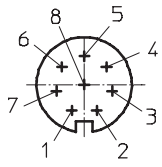
1 Socket head screw M5x65

VPPM-6L With LCD



D1 = G1/8

M12 – Pin allocation



1	Digital input D1
2	DC +24 V supply voltage
3	Analogue input W–
4	Analogue input W+
5	Digital input D2
6	Analogue output X
7	DC 0 V or GND
8	Digital output D3

Proportional pressure regulators VPPM

Technical data

FESTO

Ordering data					
Pneumatic connection	Pressure regulation range [bar]	Voltage type 0 ... 10 V Part No.	Type	Current type 4 ... 20 mA Part No.	Type
Overall accuracy 2%					
G1/8	0.02 ... 2	542 233	VPPM-6L-L-1-G18-0L2H-V1N	542 236	VPPM-6L-L-1-G18-0L2H-A4N
	0.06 ... 6	542 234	VPPM-6L-L-1-G18-0L6H-V1N	542 237	VPPM-6L-L-1-G18-0L6H-A4N
		554 043	VPPM-6L-L-1-G18-0L6H-V1P	554 045	VPPM-6L-L-1-G18-0L6H-A4P
		558 337	VPPM-6L-L-1-G18-0L6H-V1P-C1	558 338	VPPM-6L-L-1-G18-0L6H-A4P-C1
	0.1 ... 10	542 235	VPPM-6L-L-1-G18-0L10H-V1N	542 238	VPPM-6L-L-1-G18-0L10H-A4N
		554 044	VPPM-6L-L-1-G18-0L10H-V1P	554 046	VPPM-6L-L-1-G18-0L10H-A4P
Sub-base	0.02 ... 2	542 245	VPPM-6F-L-1-F-0L2H-V1N	542 248	VPPM-6F-L-1-F-0L2H-A4N
	0.06 ... 6	542 246	VPPM-6F-L-1-F-0L6H-V1N	542 249	VPPM-6F-L-1-F-0L6H-A4N
		558 339	VPPM-6F-L-1-F-0L6H-V1P-C1	558 340	VPPM-6F-L-1-F-0L6H-A4P-C1
		558 347	VPPM-6F-L-1-F-0L6H-V1N-C1		
	0.1 ... 10	542 247	VPPM-6F-L-1-F-0L10H-V1N	542 250	VPPM-6F-L-1-F-0L10H-A4N
Overall accuracy 1%					
G1/8	0.02 ... 2	542 227	VPPM-6L-L-1-G18-0L2H-V1N-S1	542 230	VPPM-6L-L-1-G18-0L2H-A4N-S1
	0.06 ... 6	542 228	VPPM-6L-L-1-G18-0L6H-V1N-S1	542 231	VPPM-6L-L-1-G18-0L6H-A4N-S1
		554 039	VPPM-6L-L-1-G18-0L6H-V1P-S1	554 041	VPPM-6L-L-1-G18-0L6H-A4P-S1
	0.1 ... 10	542 229	VPPM-6L-L-1-G18-0L10H-V1N-S1	542 232	VPPM-6L-L-1-G18-0L10H-A4N-S1
		554 040	VPPM-6L-L-1-G18-0L10H-V1P-S1	554 042	VPPM-6L-L-1-G18-0L10H-A4P-S1
		558 335	VPPM-6L-L-1-G18-0L10H-V1P-S1-C1	558 336	VPPM-6L-L-1-G18-0L10H-A4P-S1-C1
Sub-base	0.02 ... 2	542 239	VPPM-6F-L-1-F-0L2H-V1N-S1	542 242	VPPM-6F-L-1-F-0L2H-A4N-S1
	0.06 ... 6	542 240	VPPM-6F-L-1-F-0L6H-V1N-S1	542 243	VPPM-6F-L-1-F-0L6H-A4N-S1
	0.1 ... 10	542 241	VPPM-6F-L-1-F-0L10H-V1N-S1	542 244	VPPM-6F-L-1-F-0L10H-A4N-S1

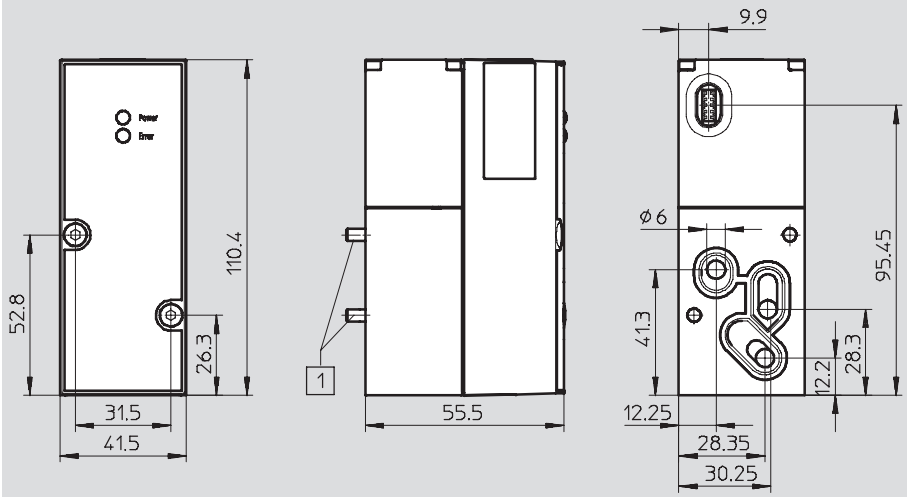
Note

Further variants can be ordered using the modular system.
➔ 20

VPPM for MPA fieldbus variant including accessories must be ordered together with the valve terminal.
➔ internet: mpa

Dimensions Download CAD data ➔ **www.festo.com**

VPPM for valve terminal MPA



1 Socket head screw M4x55

Proportional pressure regulators VPPM

Ordering data – Modular products

FESTO

M **Mandatory data** →

Module No.	Design		Nominal diameter	Valve type		Dynamic response		Valve mode		Type of connection
543 432	VPPM	–	6	L F	–	L	–	1	–	G18 F
Order example										
543 432	**VPPM**	–	**6**	**F**	–	**L**	–	**1**	–	**F**

Ordering table

Size		6	Condi-tions	Code		Enter code
M	Module No.	**543 432**				
	Design	Modular pressure regulator		**VPPM**		VPPM
	Nominal diameter	6		**-6**		-6
	Valve type	In-line	1	**L**		
		Flanged valve	2	**F**		
	Dynamic response	Low dynamic response (pilot-actuated, soft-sealing)		**-L**		-L
	Valve mode	3/2-way valve, normally closed		**-1**		-1
	Type of connection	G1⁄8 thread		**-G18**		
↓		Flange/sub-base		**-F**		

1 **L** Only with connection type G18 (G1⁄8 thread)

2 **F** Only with connection type F (flange/sub-base)

Transfer order code

543 432	**VPPM**	–	**6**		–	**L**	–	**1**	–	

Proportional pressure regulators VPPM

FESTO

Ordering data – Modular products

➔ M Mandatory data						O Options	
	Pressure regulation range	Alternative lower pressure regulation range	Alternative upper pressure regulation range		Setpoint specification	Switching output	Overall accuracy	Operator unit
	0L2H 0L6H 0L10H	0.1 ... 10L	0.1 ... 10H		V1 A4	P N	S1	C1
–		**6.5L**	**7.1H**	–	**A4**	**P**	**S1**	**C1**

Ordering table

Size		6	Conditions	Code		Enter code
➔ M	Pressure regulation range	0 ... 2 bar		**-0L2H**		
		0 ... 6 bar		**-0L6H**		
		0 ... 10 bar		**-0L10H**		
	Alternative lower pressure regulation range	0.1 ... 10 bar	3	**-...L**		
	Alternative upper pressure regulation range	0.1 ... 10 bar	4	**...H**		
	Setpoint specification	Voltage (standard 0 ... 10 V)		**-V1**		
		Current (standard 4 ... 20 mA)		**-A4**		
	Switching output	Positive switching		**P**		
		Negative switching		**N**		
O	Overall accuracy	1%		**-S1**		
	Operator unit	With LCD, pressure unit variable		**C1**		

3 **...L** Not with pressure regulation range (0L2H, 0L6H, 0L10H).
Must always be less than alternative upper pressure regulation range H

4 **...H** Not with pressure regulation range (0L2H, 0L6H, 0L10H).
Must always be greater than alternative lower pressure regulation range L

Transfer order code

–				–			–	

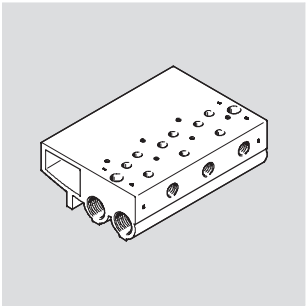
Proportional pressure regulators VPPM

Accessories

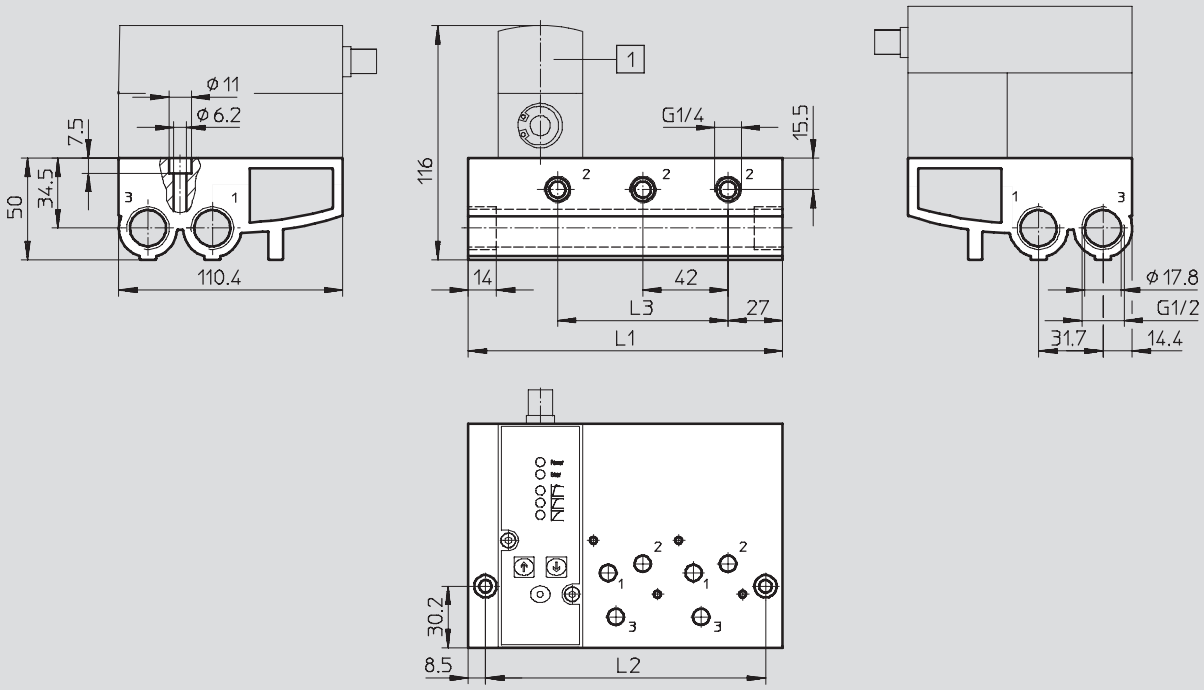
FESTO

Sub-base VABM-P1

Material:
Wrought aluminium alloy



Dimensions Download CAD data ➔ **www.festo.com**



1 Proportional pressure regulator VPPM

Dimensions and ordering data

Valve positions	L1	L2	L3	Weight [g]	CRC[1]	Part No.	Type
2	113	96	42	900	2	**542 252**	**VABM-P1-SF-G18-2-P3**
3	155	138	84	1,230	2	**542 253**	**VABM-P1-SF-G18-3-P3**
4	197	180	126	1,565	2	**542 254**	**VABM-P1-SF-G18-4-P3**

1) Corrosion resistance class 2 as per Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

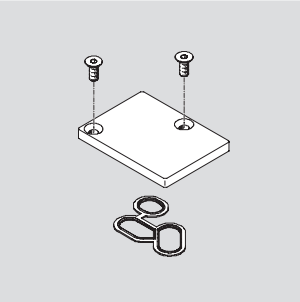
Proportional pressure regulators VPPM

Accessories

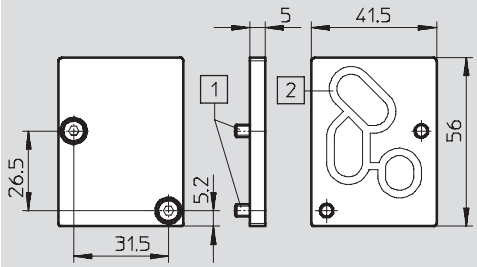
FESTO

Blanking plate VABB-P1

Material:
Wrought aluminium alloy, NBR, steel



Dimensions Download CAD data ➔ **www.festo.com**



1 Countersunk screw M4x10

2 Seal VMPA- ...

Ordering data

Weight [g]	CRC	Part No.	Type
35	1 [1)]	**558 350**	**VABB-P1**

1) Corrosion resistance class 1 as per Festo standard 940 070
Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.

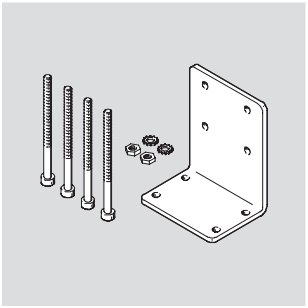
Proportional pressure regulators VPPM

Accessories

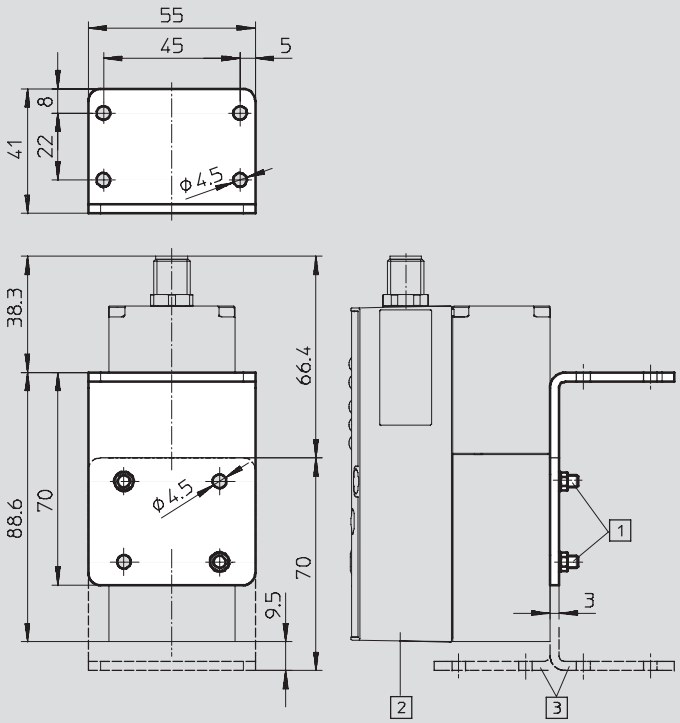
FESTO

Mounting bracket VAME-P1-A

Material:
Wrought aluminium alloy, steel



Dimensions Download CAD data ➔ **www.festo.com**



1 Socket head screw M4

2 Proportional pressure regulator VPPM

3 Mounting bracket can be reversed if required

Ordering data

Weight [g]	CRC	Part No.	Type
71	1 [1)]	**542 251**	**VAME-P1-A**

1) Corrosion resistance class 1 as per Festo standard 940 070
Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.

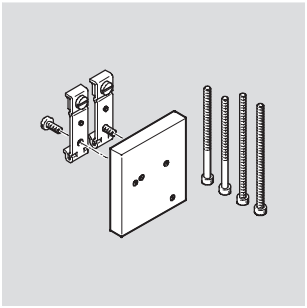
Proportional pressure regulators VPPM

Accessories

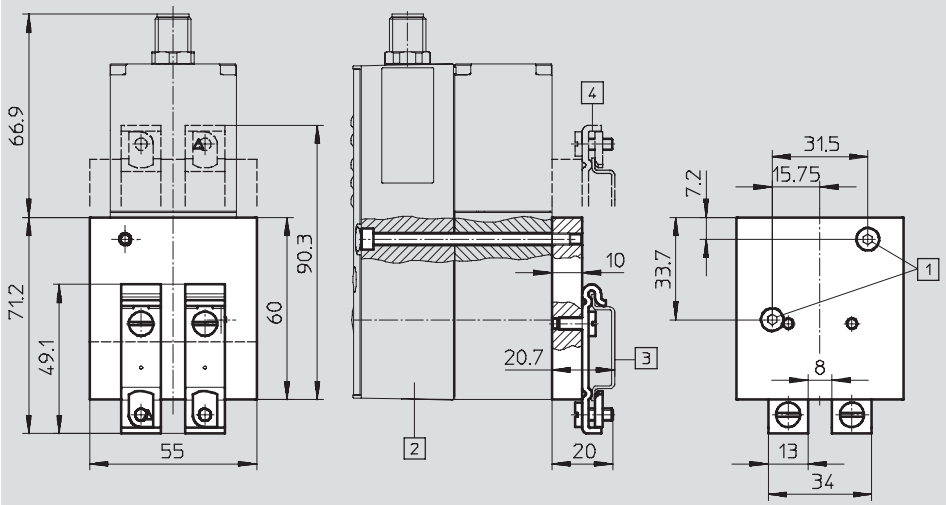
FESTO

H-rail mounting VAME-P1-T

Material:
Wrought aluminium alloy, steel



Dimensions Download CAD data ➔ **www.festo.com**



1 Socket head screw M4

2 Proportional pressure regulator VPPM

3 H-rail NRH

4 H-rail mounting can be rotated by 180º if required

Ordering data			
Weight [g]	CRC	Part No.	Type
150	1 [1)]	**542 255**	**VAME-P1-T**

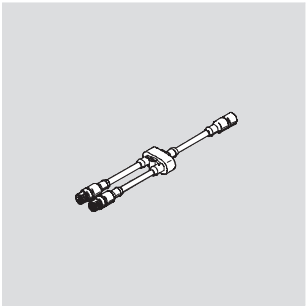
1) Corrosion resistance class 1 as per Festo standard 940 070
Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.

Proportional pressure regulators VPPM

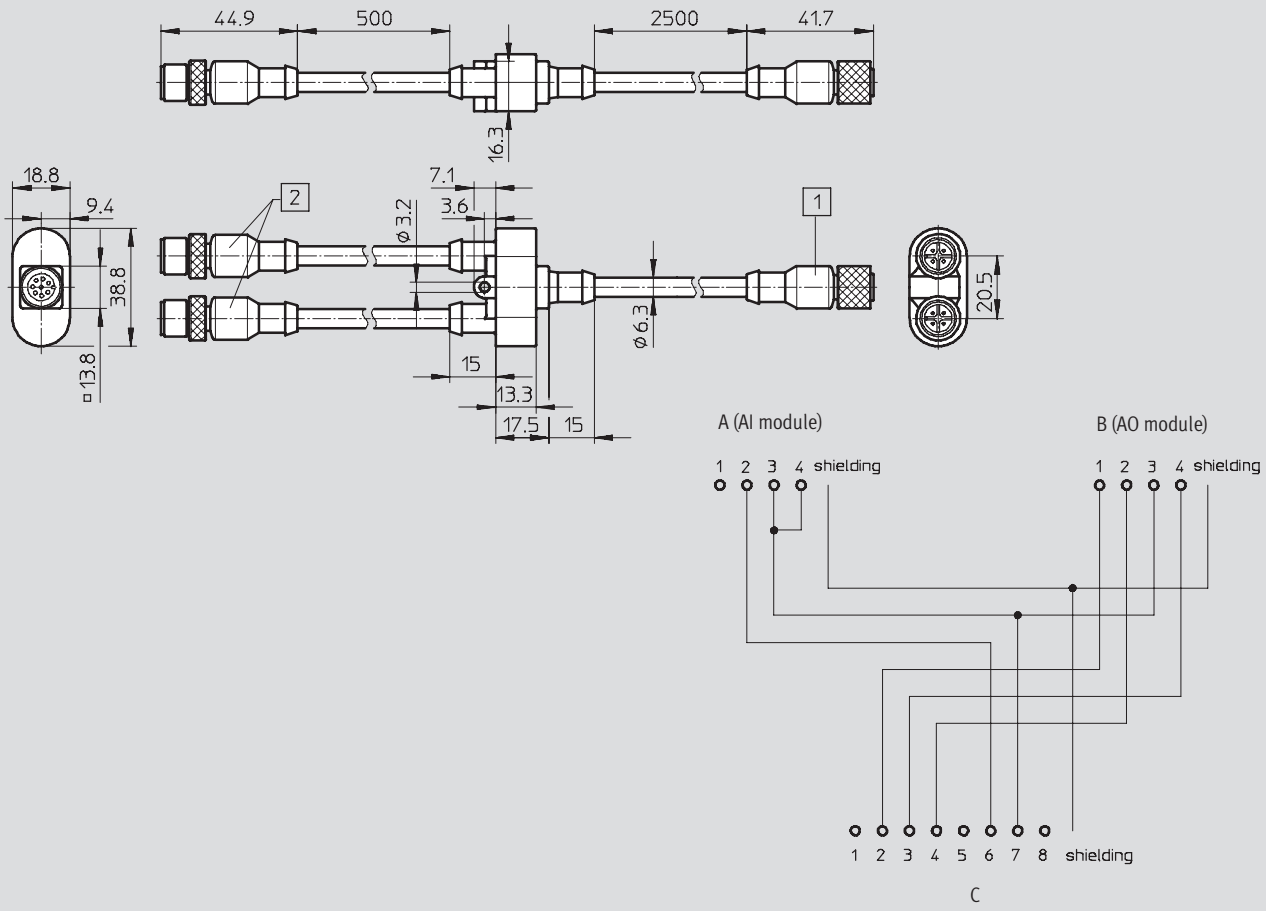
Accessories

Plug socket with cable
NEBV-M12G8-KD-3-M12G4

For connecting the VPPM with the analogue input and output modules of the controller CPX.



Dimensions and pin allocation Download CAD data ➔ **www.festo.com**



1 Straight socket, 8-pin, to VPPM

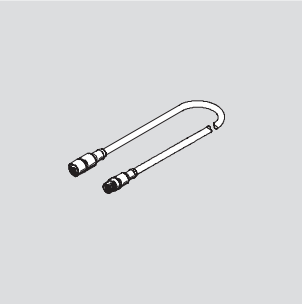
2 Straight plug, 4-pin, to CPX modules

Proportional pressure regulators VPPM

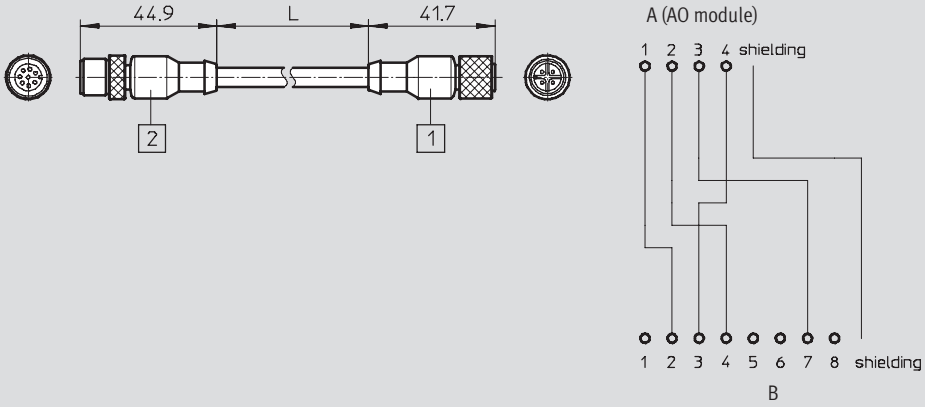
Accessories

Plug socket with cable
NEBV-M12G8-K-2-M12G4
NEBV-M12G8-K-5-M12G4

For connecting the VPPM with the analogue output modules of the controller CPX.

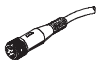
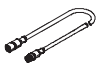
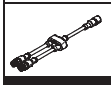


Dimensions and pin allocation Download CAD data ➔ **www.festo.com**



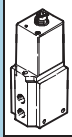
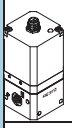
Type	2	1	L1
NEBV-M12G8-K-2-M12G4	Straight socket, M12, 8-pin to VPPM	Straight plug, M12, 4-pin to CPX module	2 m
NEBV-M12G8-K-5-M12G4			5 m

Ordering data

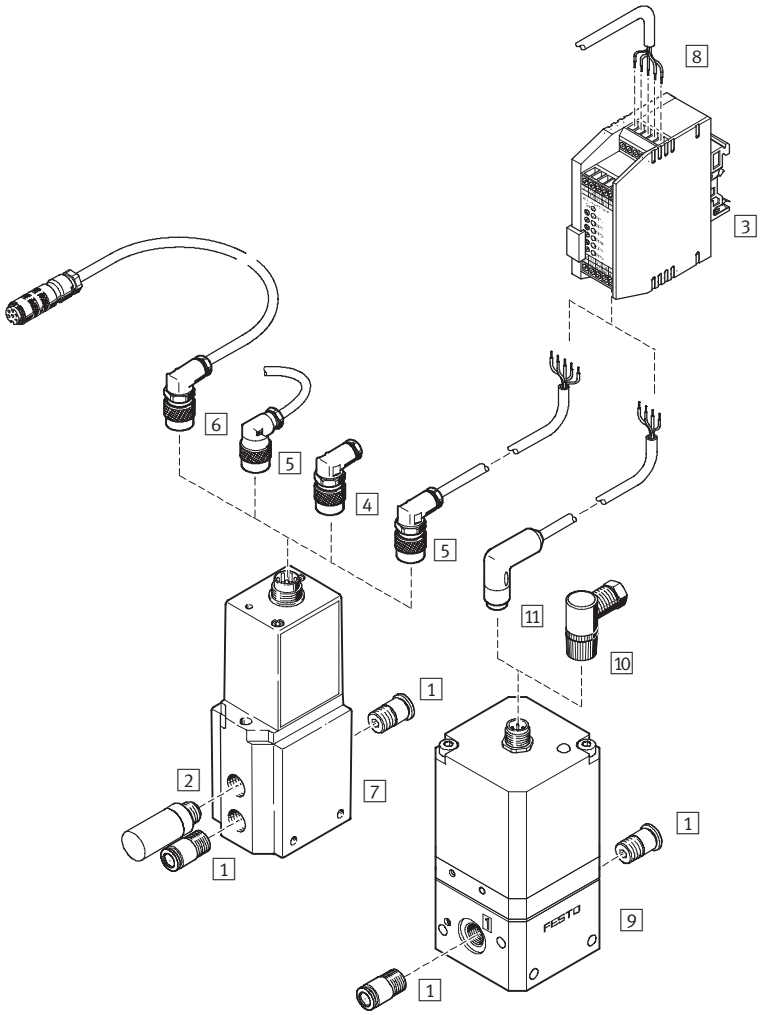
	Description	Cable length [m]	Part No.	Type
Plug socket with cable			Technical data ➔ Internet: plug socket with cable	
	Straight socket, 8-pin, M12	2	**525 616**	**SIM-M12-8GD-2-PU**
		5	**525 618**	**SIM-M12-8GD-5-PU**
	Angled socket, 8-pin, M12	2	**542 256**	**NEBU-M12W8-2-N-LE8**
		5	**542 257**	**NEBU-M12W8-5-N-LE8**
	One straight socket, 8-pin, and one straight plug, 4-pin	2	**553 575**	**NEBV-M12G8-K-2-M12G4**
		5	**553 576**	**NEBV-M12G8-K-5-M12G4**
	One straight socket, 8-pin, and two straight plugs, 4-pin	–	**547 888**	**NEBV-M12G8-KD-3-M12G4**

Proportional pressure regulators MPPE/VPPE/MPPES

Product range overview

Function	Version	Type	Constructional design	Pneumatic connection 1	Nominal size pressurising/ exhaust [mm]	Pressure regulation range[1] [bar]	Setpoint value input Voltage type 0 ... 10 V	Setpoint value input Current type 4 ... 20 mA	→ Page/Internet
Pressure regulators	with pilot control via 2/2-way valves (switching valves)								
		MPPE	Pilot-actuated poppet valve	G⅛	5/5	0 ... 1 0 ... 2.5 0 ... 6 0 ... 10	■	■	34
				G¼	7/7		■	■	
				G½	11/12		■	■	
		VPPE	Pilot-actuated poppet valve	G⅛	5/2.5	0.15 ... 6	■	–	30
	with proportional solenoid								
		MPPES	Directly-actuated valve	G⅛	3/2	0 ... 2 0 ... 6 0 ... 10	■	■	40
			Pilot-actuated valve	G¼	7/7		■	■	
				G½	11/12		■	■	

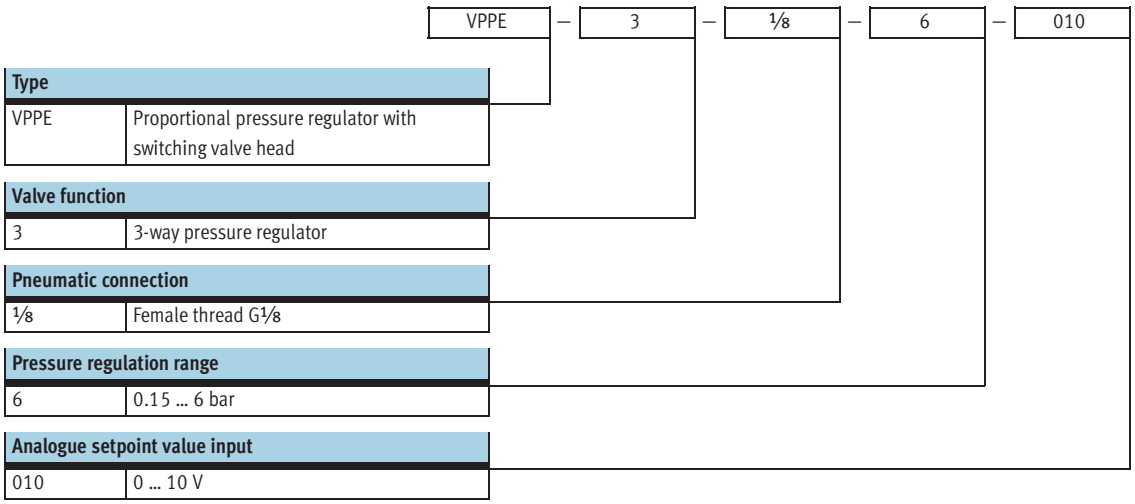
1) Pressure regulation range also by customer request



Accessories			
		Brief description	**➔ Page/Internet**
1	Push-in fitting QS	For connecting compressed air tubing with standard O.D.	quick star
2	Silencer	For fitting in exhaust ports	u
3	Setpoint value module MPZ	For generating 6+1 analogue voltage signals	54
4	Angled plug socket MPPE-3-B	–	46
5	Plug socket with cable KMPE-B	–	46
6	Connecting cable KVIA-MPPE	–	46
7	Proportional pressure regulator MPPE	–	35
8	Digital input/output	For controlling the setpoint module	–
9	Proportional pressure regulator VPPE	–	31
10	Plug socket, angled SIE-WD-TR	–	sie-wd
–	Plug socket, straight SIE-GD	–	sie-gd
11	Plug socket with cable, angled SIM-M12-4WD-5PU	–	46
–	Plug socket with cable, straight SIM-M12-4GD-5PU	–	46

Proportional pressure regulators VPPE

Type codes



Proportional pressure regulators VPPE

Technical data

FESTO

Flow rate
600 l/min

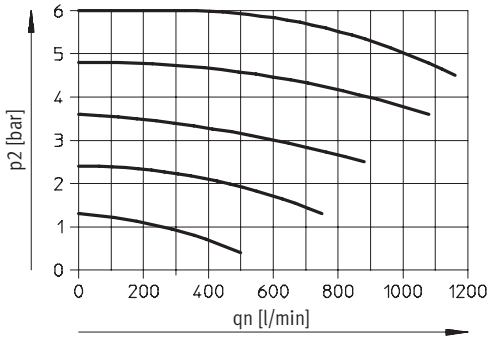
Voltage
21.6 ... 26.4 V DC

Pressure regulation range
0.15 ... 6 bar

Variants
- Setpoint value input as analogue voltage signal 0 ... 10 V

General technical data			
Pneumatic connection 1 and 2			G1⁄8
Constructional design			Pilot-actuated piston regulator
Sealing principle			Soft
Actuation mode			Electrical
Pilot control mode			Pilot actuated via 2/2-way valves
Type of mounting			Via through-holes
Assembly position			Any
Nominal size	Ventilation	[mm]	5
	Exhaust	[mm]	2.5
Standard nominal flow rate		[l/min]	➔ Graphs
Product weight		[g]	420

Flow rate qn as a function of the output pressure p2



Electrical data		
Electrical connection		Plug, round design, 4-pin, M12x1
Operating voltage range	[V DC]	21.6 ... 26.4
Residual ripple		10 %
Max. electrical power consumption	[W]	2.5
Signal setpoint value input	[V DC]	0 ... 10
Protection against short circuit		For all electrical connections
Protection against polarity reversal		For all electrical connections
Protection class		IP65
CE symbol		EU conformity in accordance with the directive 89/336/EEC (EMC)

Proportional pressure regulators VPPE

Technical data

Operating and environmental conditions		
Operating medium		Filtered compressed air, grade of filtration 40µm Neutral gases
Input pressure 1	[bar]	7 ... 8
Pressure regulation range	[bar]	0.15 ... 6
Max. hysteresis	[bar]	0.15
Ambient temperature	[°C]	10 ... 50
Temperature of medium	[°C]	10 ... 50
Corrosion resistance class CRC[1)]		2

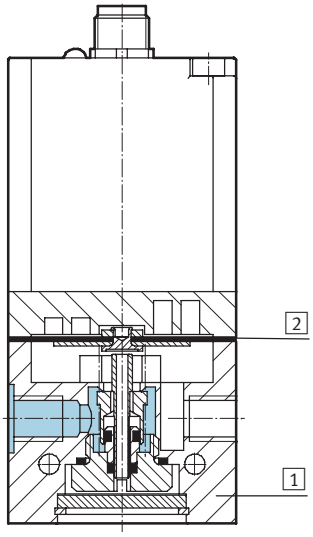
1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

- - Safety advice

If the power supply cable is interrupted, output pressure is maintained unregulated.

Materials

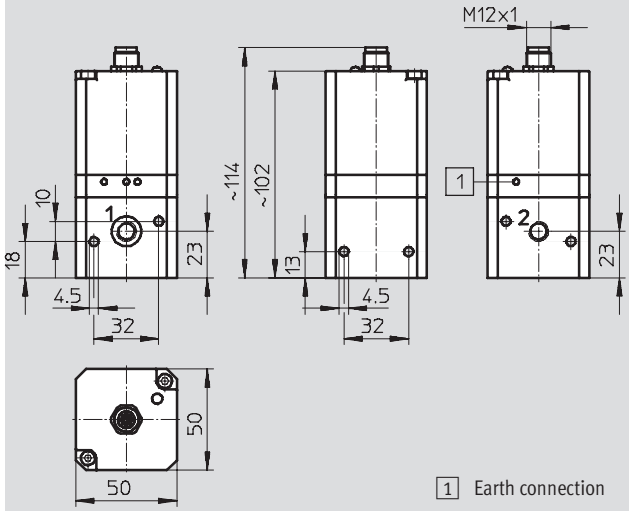
Sectional view



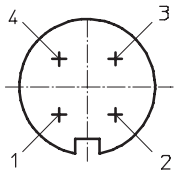
1	Housing	Wrought aluminium alloy
2	Diaphragm	Nitrile rubber

Dimensions

Download CAD data ➔ **www.festo.com**



M12x1 – Terminal allocation



1	Power supply 21.6 ... 26.4 V DC
2	Nominal value (–)
3	GND (–)
4	Nominal value (+) 0 ... 10 V DC

Ordering data

Pneumatic connection	Pressure regulation range [bar]	Part No.	Type
G1/8	0 ... 6	**539 639**	**VPPE-3-1/8-6-010**

Proportional pressure regulators MPPE

Type codes

Basic version

MPPE	–	3	–	⅛	–	1	–	010	–	B

Type	
MPPE	Proportional pressure regulator with switching valve

Valve function	
3	3-way pressure regulator

Pneumatic connection	
⅛	G⅛
¼	G¼
½	G½

Pressure regulation range	
1	0 ... 1 bar
2.5	0 ... 2.5 bar
6	0 ... 6 bar
10	0 ... 10 bar

Setpoint value input	
010	Analogue voltage signal
420	Analogue current signal

Generation	
B	B series

Special pressure regulation range by customer request

MPPE	–	3	–	⅛	–	1	–	6	–	010	–	B

Type	
MPPE	Proportional pressure regulator with switching valve

Valve function	
3	3-way pressure regulator

Pneumatic connection	
⅛	G⅛
¼	G¼
½	G½

Required pressure at 0 V or 4 mA [bar]

Required pressure at 10 V or 20 mA [bar]

Setpoint value input	
010	Analogue voltage signal
420	Analogue current signal

Generation	
B	B series

Proportional pressure regulators MPPE

Technical data

FESTO

Flow rate
350 ... 5,500 l/min

Voltage
18 ... 30 V DC

Pressure regulation ranges
0 ... 1 bar
0 ... 2.5 bar
0 ... 6 bar
0 ... 10 bar

Variants
- Setpoint value input as analogue voltage signal 0 ... 10 V
- Setpoint value input as analogue current signal 4 ... 20 mA

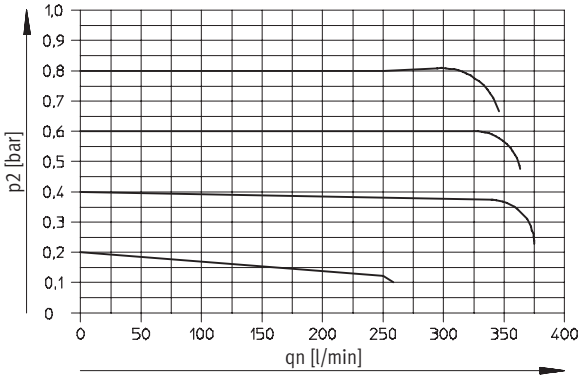
MPPE-3-...-B

General technical data					
Pneumatic connection			G1/8	G1/4	G1/2
Constructional design			Pilot actuated piston regulator		
Sealing principle			Soft		
Actuation type			Electrical		
Type of pilot control			Pilot actuated using 2/2-way valves		
Type of mounting			Via through-holes		
Mounting position			Any		
Nominal size	Ventilation	[mm]	5	7	11
	Exhaust	[mm]	5	7	12
Standard nominal flow rate		[l/min]	➔ Diagrams		
Product weight		[g]	710	920	2,400

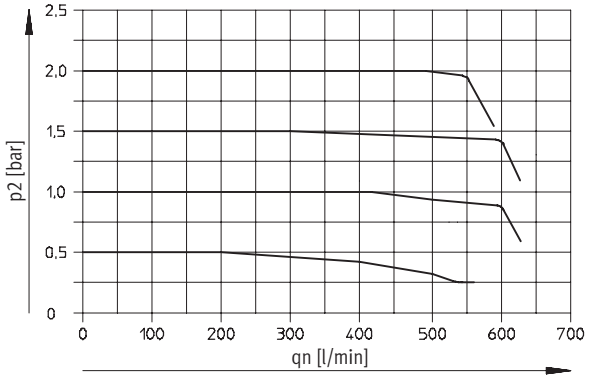
Flow rate qn as a function of the output pressure p2

Pneumatic connection G1/8

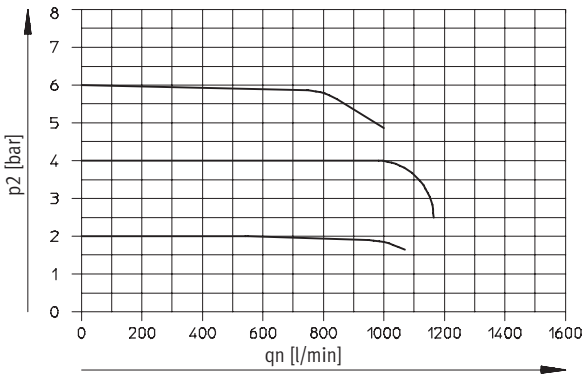
Pressure regulation range 0 ... 1 bar



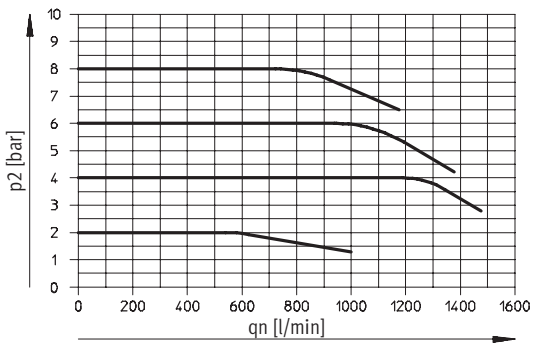
Pressure regulation range 0 ... 2.5 bar



Pressure regulation range 0 ... 6 bar



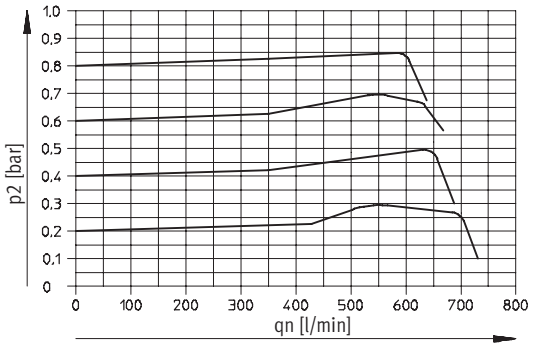
Pressure regulation range 0 ... 10 bar



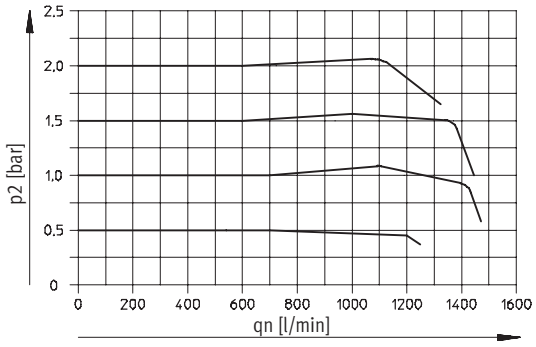
Flow rate qn as a function of the output pressure p2

Pneumatic connection G¼

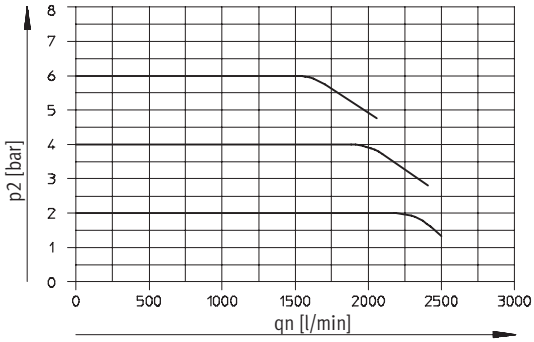
Pressure regulation range 0 ... 1 bar



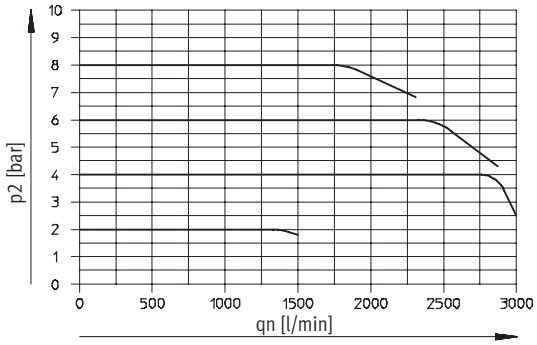
Pressure regulation range 0 ... 2.5 bar



Pressure regulation range 0 ... 6 bar

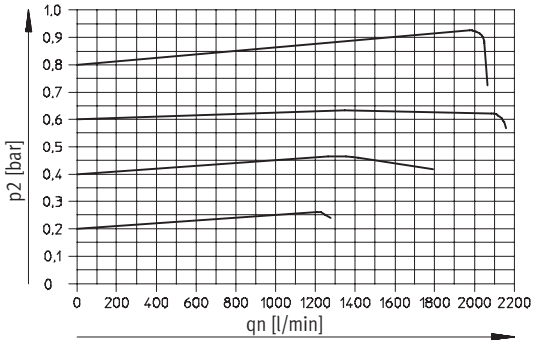


Pressure regulation range 0 ... 10 bar

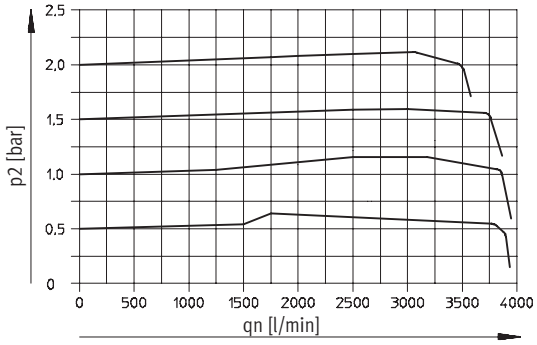


Pneumatic connection G½

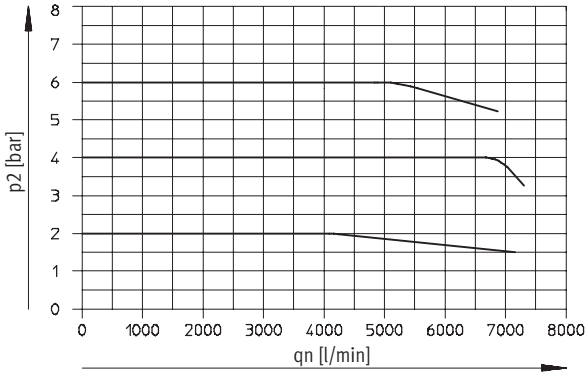
Pressure regulation range 0 ... 1 bar



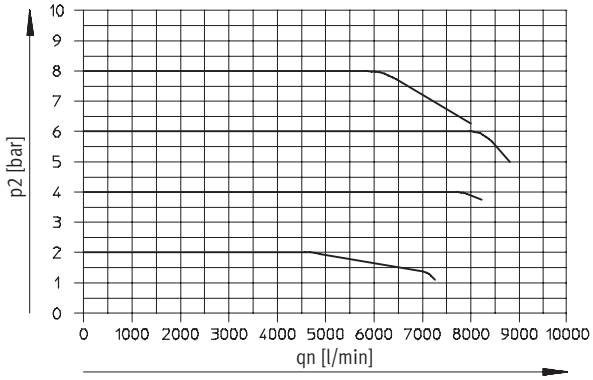
Pressure regulation range 0 ... 2.5 bar



Pressure regulation range 0 ... 6 bar



Pressure regulation range 0 ... 10 bar



Operating and environmental conditions					
Pressure regulation range	[bar]	0 ... 1	0 ... 2.5	0 ... 6	0 ... 10
Operating medium		Filtered compressed air, lubricated or unlubricated Neutral gases			
Input pressure 1	[bar]	1.5 ... 2	3.5 ... 4.5	7 ... 8	11 ... 12
Max. hysteresis	[mbar]	30	40	40	50
Ambient temperature	[°C]	0 ... 50			
Temperature of medium	[°C]	0 ... 60			
Corrosion resistance class CRC[1)]		2	2	2	2

1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents.

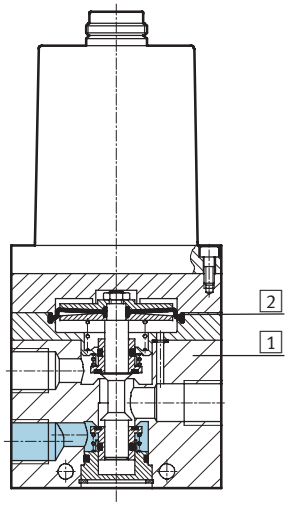
Response times/step responses to output 2 at $p1_{max}$ [s]									
Pressure regulation range [bar]		0 ... 1		0 ... 2.5		0 ... 6		0 ... 10	
Volume to output 2		On[1)]	Off[2)]	On[1)]	Off[2)]	On[1)]	Off[2)]	On[1)]	Off[2)]
0 l	G⅛	0.095	0.165	0.100	0.180	0.100	0.190	0.125	0.220
	G¼	0.140	0.225	0.150	0.260	0.150	0.260	0.160	0.280
	G½	0.170	0.500	0.170	0.500	0.170	0.510	0.140	0.535
0.7 l	G⅛	0.140	0.250	0.180	0.310	0.220	0.340	0.250	0.380
	G¼	0.150	0.280	0.170	0.320	0.180	0.360	0.200	0.390
	G½	0.120	0.510	0.130	0.520	0.160	0.560	0.180	0.600
2 l	G⅛	0.340	0.730	0.380	0.990	0.430	1.250	0.600	1.160
	G¼	0.360	0.620	0.400	0.700	0.540	0.930	0.540	1.050
	G½	0.330	0.600	0.410	0.720	0.570	1.000	0.540	1.000

1) On = 0 ... 90% $p_{2max.}$
2) Off = 100 ... 10% $p_{2max.}$

Electrical data						
Pressure regulation range			[bar]	0 ... 1	0 ... 2.5	0 ... 6	0 ... 10
Electrical connection				Plug, round design to DIN 45 326, M16 x 0.75, 8-pin			
Operating voltage range		U_B	[V DC]	18 ... 30			
Residual ripple				10%			
Power consumption		$P_{max.}$	[W]	3.6 (at 30 V DC and 100% duty cycle)			
Signal setpoint value input	Voltage	U_w	[V DC]	0 ... 10			
	Current	I_w	[mA]	4 ... 20			
Signal actual value output	Voltage	U_x	[V DC]	0 ... 10			
	Current	I_x	[mA]	4 ... 20			
Signal actual value input external	Voltage	$U_{x,ext.}$	[V DC]	0 ... 10			
	Current	$I_{x,ext.}$	[mA]	4 ... 20			
Protection class to DIN 60 529				IP65 (with connection socket)			
Safety note				If the power supply cable is interrupted, output pressure is maintained unregulated			
Protection against polarity reversal	Setpoint value input Voltage signal 0 ... 10 V			For all electrical connections			
	Setpoint value input Current signal 4 ... 20 mA			For operating voltage			
Protection against short circuit				No			

Materials

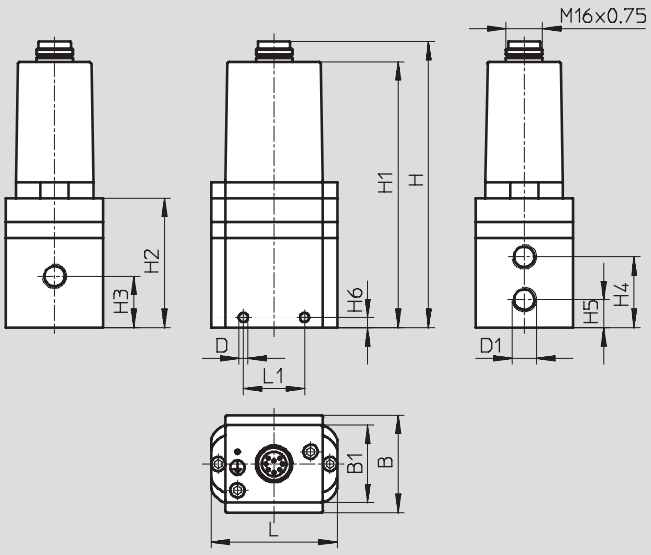
Sectional view



1	Housing	Wrought aluminium alloy
2	Diaphragm	Nitrile rubber

Dimensions

Download CAD data ➔ **www.festo.com**



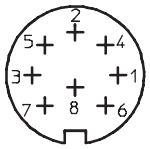
Pneumatic connection D1	B	B1	D ∅	H	H1	H2	H3	H4	H5	H6	L	L1
G1/8	38	–	4.5	129.1	119.1	60.2	18.8	26.8	9.3	4	62	34
G1/4	48	38	4.5	140.7	130.7	63.6	25.3	34.8	13.8	5	62	30
G1/2	76	38	7	194.6	184.6	117.5	53	74	32	18	86	50

Proportional pressure regulators MPPE

Technical data

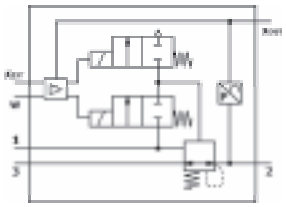
FESTO

Terminal allocation



1	WH	$X_{ext,in}$ (external actual value input)
2	BN	GND
3	GN	GND
4	YE	W_{in} (setpoint value input)
5	GY	10 V_{out} (external potentiometer supply)
6	PK	X_{out} (actual value output)
7	RD	24 V DC (supply voltage)
8	BU	GND

Switching function



Ordering data

Pneumatic connection	Pressure regulation range [bar]	Voltage type 0 ... 10 V Part No.	Type	Current type 4 ... 20 mA Part No.	Type
Basic version					
G1/8	0 ... 1	**161 160**	**MPPE-3-1/8-1-010-B**	**161 163**	**MPPE-3-1/8-1-420-B**
	0 ... 2.5	**164 315**	**MPPE-3-1/8-2,5-010-B**	**164 316**	**MPPE-3-1/8-2,5-420-B**
	0 ... 6	**161 161**	**MPPE-3-1/8-6-010-B**	**161 164**	**MPPE-3-1/8-6-420-B**
	0 ... 10	**161 162**	**MPPE-3-1/8-10-010-B**	**161 165**	**MPPE-3-1/8-10-420-B**
G1/4	0 ... 1	**161 166**	**MPPE-3-1/4-1-010-B**	**161 169**	**MPPE-3-1/4-1-420-B**
	0 ... 2.5	**164 317**	**MPPE-3-1/4-2,5-010-B**	**164 318**	**MPPE-3-1/4-2,5-420-B**
	0 ... 6	**161 167**	**MPPE-3-1/4-6-010-B**	**161 170**	**MPPE-3-1/4-6-420-B**
	0 ... 10	**161 168**	**MPPE-3-1/4-10-010-B**	**161 171**	**MPPE-3-1/4-10-420-B**
G1/2	0 ... 1	**161 172**	**MPPE-3-1/2-1-010-B**	**161 175**	**MPPE-3-1/2-1-420-B**
	0 ... 2.5	**164 319**	**MPPE-3-1/2-2,5-010-B**	**164 320**	**MPPE-3-1/2-2,5-420-B**
	0 ... 6	**161 173**	**MPPE-3-1/2-6-010-B**	**161 176**	**MPPE-3-1/2-6-420-B**
	0 ... 10	**161 174**	**MPPE-3-1/2-10-010-B**	**161 177**	**MPPE-3-1/2-10-420-B**
Special adaptation type[1]					
G1/8	0 ... 10	**164 330**	**MPPE-3-1/8-...-...-010-B**[1]	**164 330**	**MPPE-3-1/8-...-...-420-B**[1]
G1/4	0 ... 10	**164 331**	**MPPE-3-1/4-...-...-010-B**[1]	**164 331**	**MPPE-3-1/4-...-...-420-B**[1]
G1/2	0 ... 10	**164 332**	**MPPE-3-1/2-...-...-010-B**[1]	**164 332**	**MPPE-3-1/2-...-...-420-B**[1]

1) The special adaptation type allows a lower pressure to be assigned to the setpoint value 0 V or 4 mA and an upper pressure to be assigned to the setpoint value 10 V or 20 mA. Upper and lower pressure by customer request.

Proportional pressure regulators MPPES

Type codes

Basic version

MPPES	–	3	–	⅛	–	1	–	010

Type	
MPPES	Proportional pressure regulator with proportional solenoid

Valve function	
3	3-way pressure regulator

Pneumatic connection	
⅛	G⅛
¼	G¼
½	G½

Pressure regulation range	
2	0 ... 2 bar
6	0 ... 6 bar
10	0 ... 10 bar

Setpoint value input	
010	Analogue voltage signal
420	Analogue current signal

Special pressure regulation range by customer request

MPPES	–	3	–	⅛	–	1	–	6	–	010

Type	
MPPES	Proportional pressure regulator with proportional solenoid

Valve function	
3	3-way pressure regulator

Pneumatic connection	
⅛	G⅛
¼	G¼
½	G½

Required pressure at 0 V or 4 mA [bar]

Required pressure at 10 V or 20 mA [bar]

Setpoint value input	
010	Analogue voltage signal
420	Analogue current signal

Proportional pressure regulators MPPES

Technical data

FESTO

Flow rate
230 … 5,500 l/min

Voltage
18 … 30 V DC

Pressure regulation ranges
0 … 2 bar
0 … 6 bar
0 … 10 bar

Variants
- Setpoint value input as analogue voltage signal 0 … 10 V
- Setpoint value input as analogue current signal 4 … 20 mA

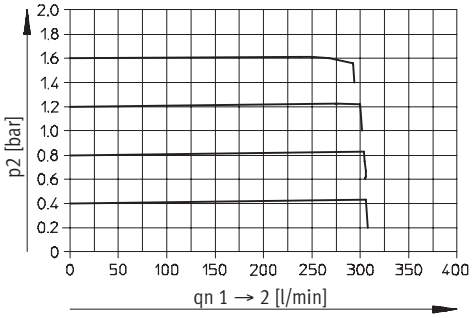
MPPES-3-⅛-… MPPES-3-¼-… MPPES-3-½-…

General technical data					
Pneumatic connection			G⅛	G¼	G½
Constructional design			Directly actuated piston regulator	Pilot actuated piston regulator	
Sealing principle			Soft		
Actuation type			Electrical		
Type of pilot control			Direct	Pilot actuated	
Type of mounting			Via through-holes		
Mounting position			Any		
Nominal size	Ventilation	[mm]	3	7	11
	Exhaust	[mm]	2	7	12
Standard nominal flow rate		[l/min]	➔ Diagrams		
Product weight		[g]	915	1 310	2 670

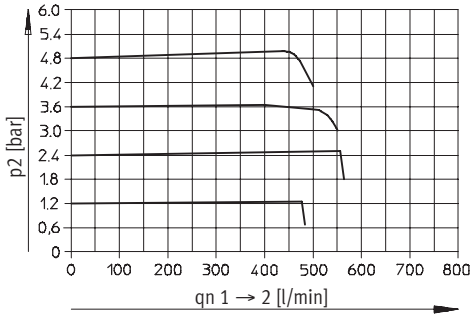
Flow rate qn as a function of the output pressure p2

Pneumatic connection G⅛

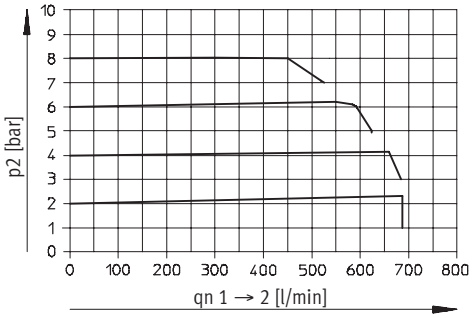
Pressure regulation range 0 … 2 bar



Pressure regulation range 0 … 6 bar



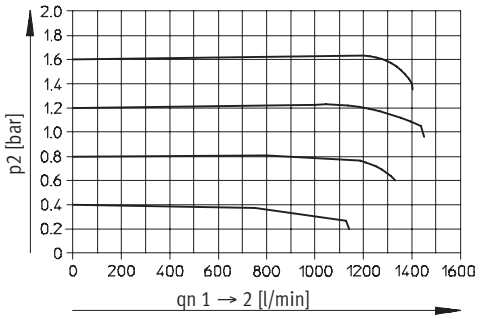
Pressure regulation range 0 … 10 bar



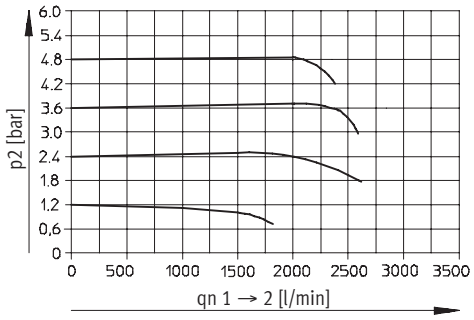
Flow rate qn as a function of the output pressure p2

Pneumatic connection G¼

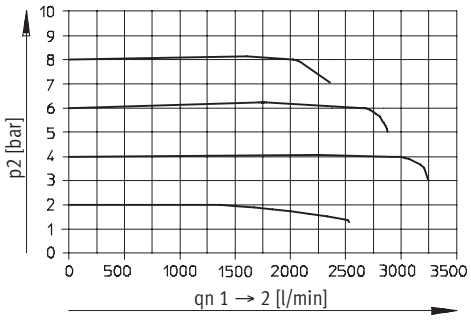
Pressure regulation range 0 ... 2 bar



Pressure regulation range 0 ... 6 bar

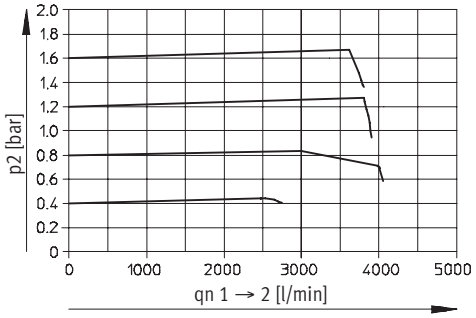


Pressure regulation range 0 ... 10 bar

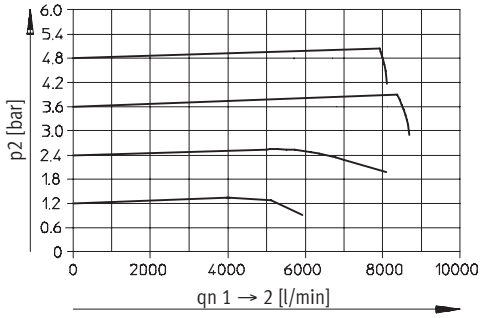


Pneumatic connection G½

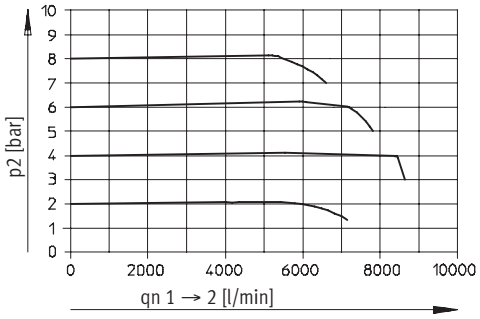
Pressure regulation range 0 ... 2 bar



Pressure regulation range 0 ... 6 bar



Pressure regulation range 0 ... 10 bar



Proportional pressure regulators MPPES

Technical data

Operating and environmental conditions				
Pressure regulation range	[bar]	0 ... 2	0 ... 6	0 ... 10
Operating medium		Filtered compressed air, lubricated or unlubricated Neutral gases		
Input pressure 1	[bar]	3 ... 4	7 ... 8	11 ... 12
Max. hysteresis	[mbar]	10	50	50
Ambient temperature	[°C]	0 ... 50		
Temperature of medium	[°C]	0 ... 60		
Corrosion resistance class CRC[1)]		2	2	2

1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents.

Response times/step responses to output 2 at $p1_{max}$ [s]							
Pressure regulation range [bar]		0 ... 2		0 ... 6		0 ... 10	
Volume to output 2		On[1)]	Off[2)]	On[1)]	Off[2)]	On[1)]	Off[2)]
0 l	G⅛	0.220	0.410	0.210	0.280	0.200	0.290
	G¼	0.200	0.890	0.200	0.640	0.200	0.360
	G½	0.220	1.000	0.230	0.660	0.230	0.450
2 l	G⅛	0.660	2.530	1.200	5.760	1.370	6.300
	G¼	0.200	1.000	0.450	0.760	0.460	0.900
	G½	0.320	1.000	0.340	0.570	0.350	0.630
10 l	G⅛	2.700	2.800	5.150	24.000	5.800	27.000
	G¼	0.900	2.700	1.500	3.000	1.900	3.400
	G½	0.800	1.400	1.100	1.500	1.300	1.800

1) On = 0 ... 90% $p_{2max.}$
2) Off = 100 ... 10% $p_{2max.}$

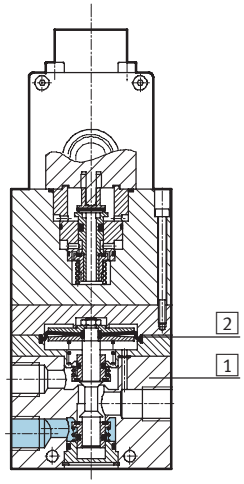
Electrical data						
Pressure regulation range			[bar]	0 ... 2	0 ... 6	0 ... 10
Electrical connection				Plug, round design to DIN 45 326, M16 x 0.75, 8-pin		
Operating voltage range		U_B	[V DC]	18 ... 30		
Residual ripple				10%		
Power consumption		$P_{max.}$	[W]	20 (at 30 V DC)		
Signal setpoint value input	Voltage	U_w	[V DC]	0 ... 10		
	Current	I_w	[mA]	4 ... 20		
Signal actual value input	Voltage	U_x	[V DC]	0 ... 10		
	Current	I_x	[mA]	4 ... 20		
Signal actual value input external	Voltage	$U_{x,ext.}$	[V DC]	0 ... 10		
	Current	$I_{x,ext.}$	[mA]	4 ... 20		
Protection class to DIN 60 529				IP65 (with connection socket)		
Safety note				If the power supply cable is interrupted, output pressure is maintained unregulated.		
Protection against polarity reversal	Setpoint value input Voltage signal 0 ... 10 V			For all electrical connections		
	Setpoint value input Current signal 4 ... 20 mA			For operating voltage		
Protection against short circuit				No		

Proportional pressure regulators MPPES

Technical data

Materials

Sectional view



1	Housing	Wrought aluminium alloy
2	Diaphragm	Nitrile rubber

Note

If the power supply cable is interrupted, output pressure is maintained unregulated.

Dimensions

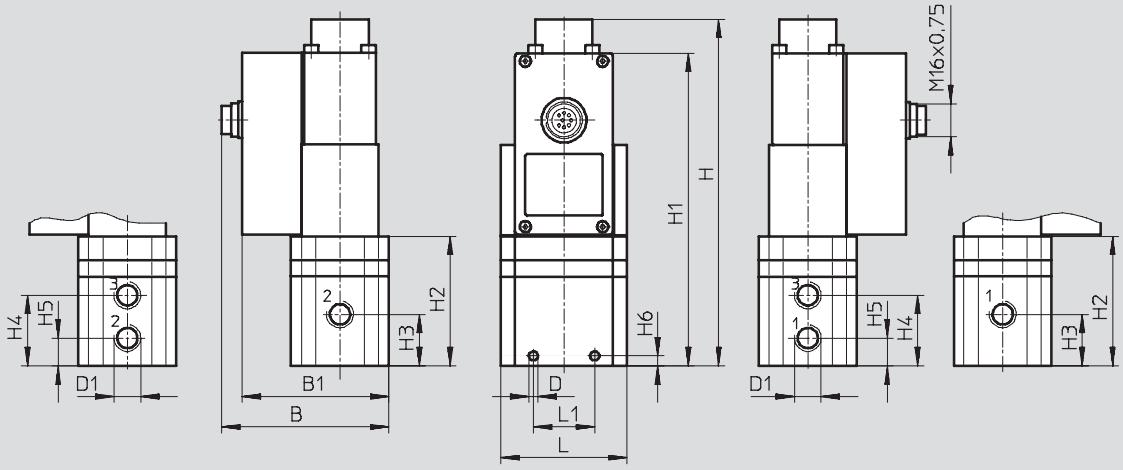
Download CAD data ➔ **www.festo.com**

MPPES-3-⅛-...

MPPES-3-¼-...
MPPES-3-½-...

MPPES-3-¼-...
MPPES-3-½-...

MPPES-3-⅛-...



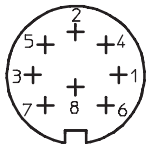
Pneumatic connection D1	B	B1	D ∅	H	H1	H2	H3	H4	H5	H6	L	L1
G⅛	77.1	67.1	4.4	116.5	100	55	34	45	23	4	62	34
G¼	82.1	72.1	4.5	170.2	153.7	63.7	25.3	34.8	13.8	5	62	30
G½	96.1	86.1	7	227.1	210.6	120.6	53	74	32	18	86	50

Proportional pressure regulators MPPES

Technical data

Connections

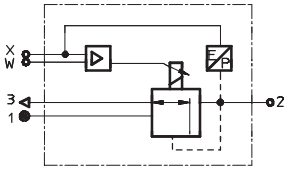
Terminal allocation



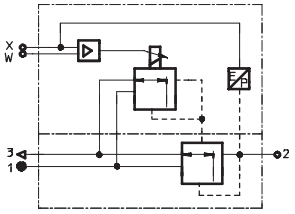
1	WH	n. c.
2	BN	GND
3	GN	GND
4	YE	W_{in} (setpoint value input)
5	GY	n. c.
6	PK	X_{out} (actual value output)
7	RD	24 V DC (supply voltage)
8	BU	GND

Switching function

MPPES-3-⅛-...



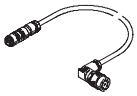
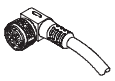
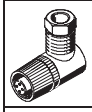
MPPES-3-¼-.../MPPES-3-½-...



Ordering data

Pneumatic connection	Pressure regulation range [bar]	Voltage type 0 ... 10 V Part No.	Type	Current type 4 ... 20 mA Part No.	Type
Basic version					
G⅛	0 ... 2	**187 350**	**MPPES-3-⅛-2-010**	**187 351**	**MPPES-3-⅛-2-420**
	0 ... 6	**187 352**	**MPPES-3-⅛-6-010**	**187 353**	**MPPES-3-⅛-6-420**
	0 ... 10	**187 348**	**MPPES-3-⅛-10-010**	**187 349**	**MPPES-3-⅛-10-420**
G¼	0 ... 2	**187 335**	**MPPES-3-¼-2-010**	**187 336**	**MPPES-3-¼-2-420**
	0 ... 6	**187 337**	**MPPES-3-¼-6-010**	**187 338**	**MPPES-3-¼-6-420**
	0 ... 10	**187 333**	**MPPES-3-¼-10-010**	**187 334**	**MPPES-3-¼-10-420**
G½	0 ... 2	**187 328**	**MPPES-3-½-2-010**	**187 329**	**MPPES-3-½-2-420**
	0 ... 6	**187 330**	**MPPES-3-½-6-010**	**187 331**	**MPPES-3-½-6-420**
	0 ... 10	**187 326**	**MPPES-3-½-10-010**	**187 327**	**MPPES-3-½-10-420**
Special adaptation type[1]					
G⅛	0 ... 10	**187 347**	**MPPES-3-⅛-PU-PO-010**	**187 762**	**MPPES-3-⅛-PU-PO-420**
G¼	0 ... 10	**187 339**	**MPPES-3-¼-PU-PO-010**	**187 744**	**MPPES-3-¼-PU-PO-420**
G½	0 ... 10	**187 332**	**MPPES-3-½-PU-PO-010**	**187 735**	**MPPES-3-½-PU-PO-420**

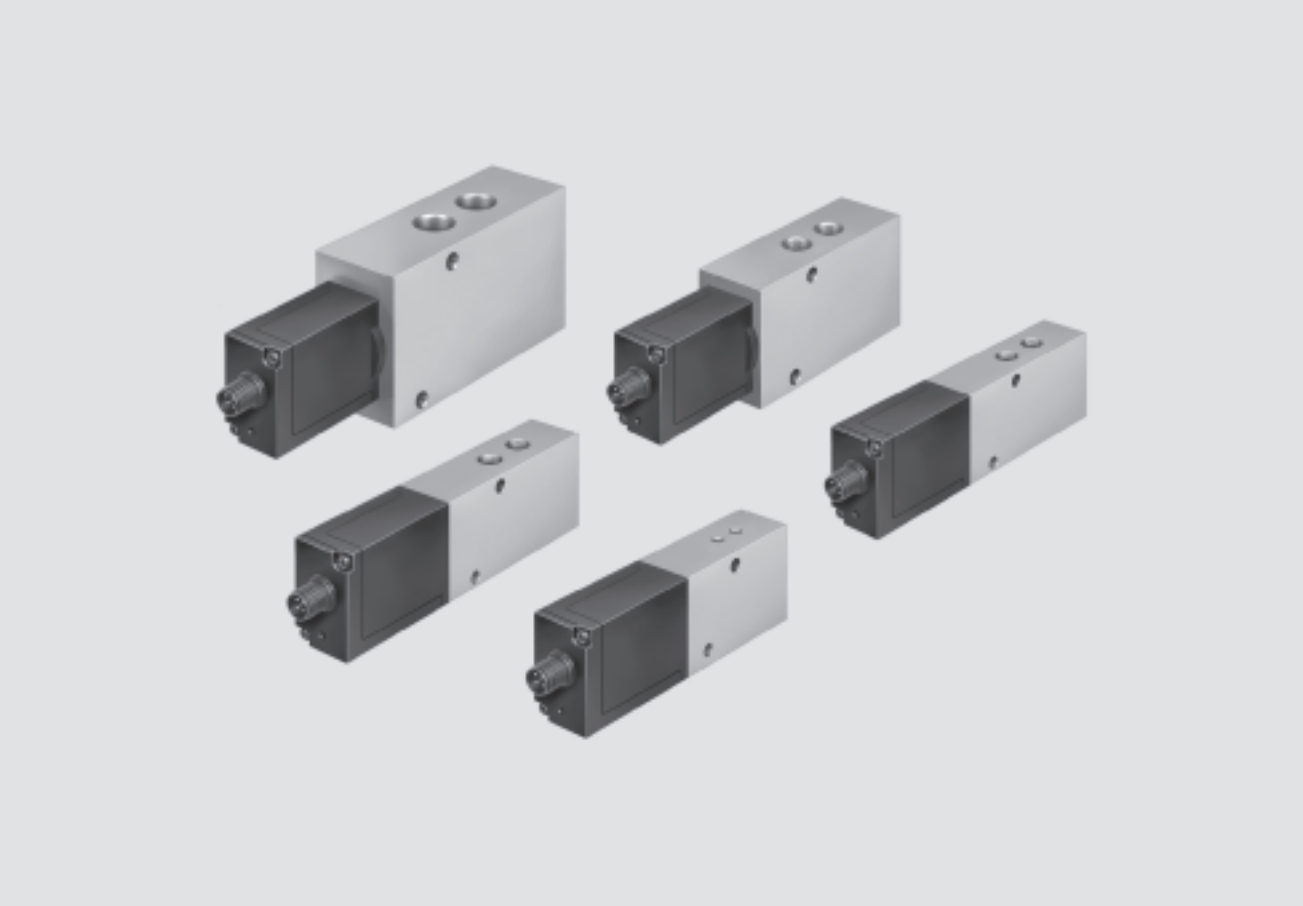
1) The special adaptation type allows a lower pressure PU to be assigned to the setpoint value 0 V or 4 mA and an upper pressure PO to be assigned to the setpoint value 10 V or 20 mA. PU and PO by customer request.

Ordering data				
	Description	Cable length [m]	Part No.	Type
Connecting cable				Technical data ➔ Internet: kvia
	Connecting cable to the analogue module of valve terminal type 03/04	5	**163 882**	**KVIA-MPPE-5**
		10	**163 883**	**KVIA-MPPE-10**
Plug socket with cable				Technical data ➔ Internet: sim-m12
	Straight, 4-pin, M12x1	5	**164 259**	**SIM-M12-4GD-5-PU**
Plug socket with cable				Technical data ➔ Internet: sim-m12
	Angled, 4-pin, M12x1	5	**164 258**	**SIM-M12-4WD-5-PU**
Plug socket with cable				Technical data ➔ Internet: kmppe
	Angled, 8-pin, M16x0.75	2.5	**161 879**	**KMPPE-B-2,5**
		5	**161 878**	**KMPPE-B-5**
Sensor socket				Technical data ➔ Internet: sie-gd
	Straight, 4-pin, M12x1	–	**18 494**	**SIE-GD**
Sensor socket				Technical data ➔ Internet: sie-wd
	Angled, 4-pin, M12x1	–	**12 956**	**SIE-WD-TR**
Angled plug socket				Technical data ➔ Internet: mppe
	Angled, 8-pin, M16x0.75	–	**161 839**	**MPPE-3-B**
Push-in fitting				Technical data ➔ Internet: quick star
	For connecting compressed air tubing with standard external diameters			
Silencer				Technical data ➔ Internet: u
	For fitting in exhaust ports			
Reducing nipple				
	–			

1) Max. 10 m

Proportional directional control valves MPYE

Key features



General information

- The directly actuated proportional directional control valve has a position-controlled spool. This transforms an analogue input signal into a corresponding opening cross-section at the valve outputs.
- In combination with an external position controller and displacement encoder, a precise pneumatic positioning system can be created.
- Flow control function for varying cylinder speed
- 5/3-way function for varying the direction of movement

Wide choice of variants

- Setpoint value input
  - Analogue voltage signal
  - Analogue current signal
- Flow rates from 100 ... 2 000 l/min

Proportional directional control valves MPYE

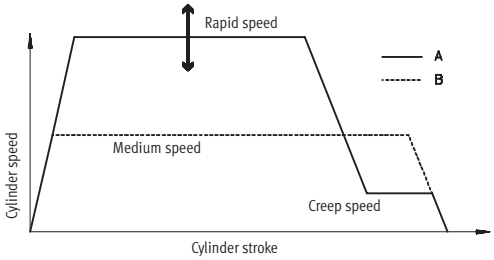
Key features and type codes

Short machine cycle times – fast switching of programmed flow rates

- Reduce machine cycle times by optimising cylinder speeds
  - Assembly technology
  - Handling technology
  - Furniture industry

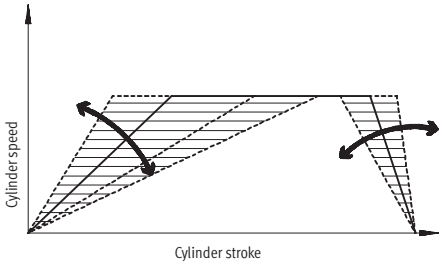
A: Proportional valves allow different speed levels and speed ramps to be set.

B: Speed regulation with directional control valves is more difficult and is performed by means of exhaust air flow control.



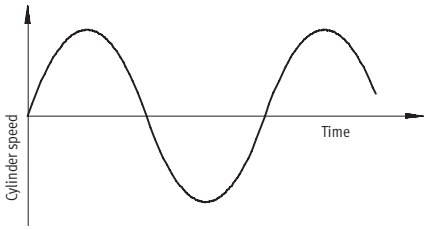
Flexible cylinder speeds – Achieving variable flow rates

- Flexibly adapting cylinder speeds to the process. Traversing individual acceleration ramps (gentle approach with delicate goods)
  - Automobile suppliers
  - Production technology
  - Conveyor technology
  - Test engineering



Proportional directional control valve as final control element – Dynamic and fast changing of flow rates

- Fatigue tests
- Pneumatic positioning with SPC200
- SoftStop with end-position controller SPC11



Type codes

MPYE	–	5	–	⅛ LF	–	010	–	B

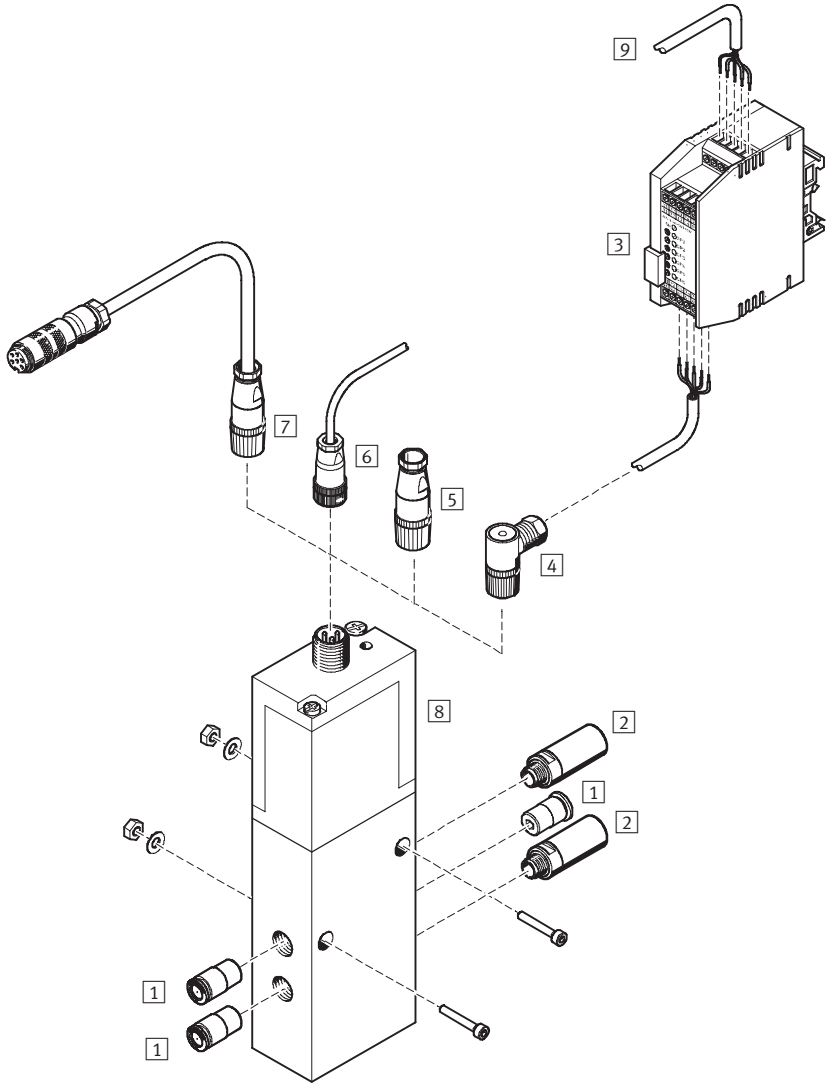
Type	
MPYE	Proportional directional control valve

Valve function	
5	5/3-way valve

Pneumatic connection	
M5	M5
⅛ LF	G⅛ Low Flow
⅛ HF	G⅛ High Flow
¼	G¼
⅜	G⅜

Setpoint value input	
010	Analogue voltage signal
420	Analogue current signal

Generation	
B	B series



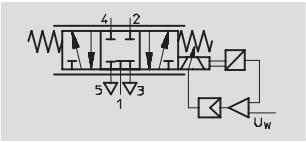
Accessories		
	Brief description	**➔ Page/Internet**
1 Push-in fitting QS	For connecting compressed air tubing with standard external diameters	quick star
2 Silencer	For fitting in exhaust ports	u
3 Setpoint module MPZ	For generating 6+1 analogue voltage signals	mpz
4 Sensor socket SIE-WD-TR	Angled, 4-pin, M12x1	53
5 Sensor socket SIE-GD	Straight, 4-pin, M12x1	53
6 Connecting cable KMPYE	–	53
7 Connecting cable KVIA-MPYE	Connecting cable to the analogue module of valve terminal type 03	53
8 Proportional directional control valve MPYE	–	50
9 Digital input/output	For controlling the setpoint module	–

Proportional directional control valves MPYE

Technical data

FESTO

Function



Voltage
17 ... 30 V DC

Flow rate
100 ... 2 000 l/min

Pressure
0 ... 10 bar

Variants

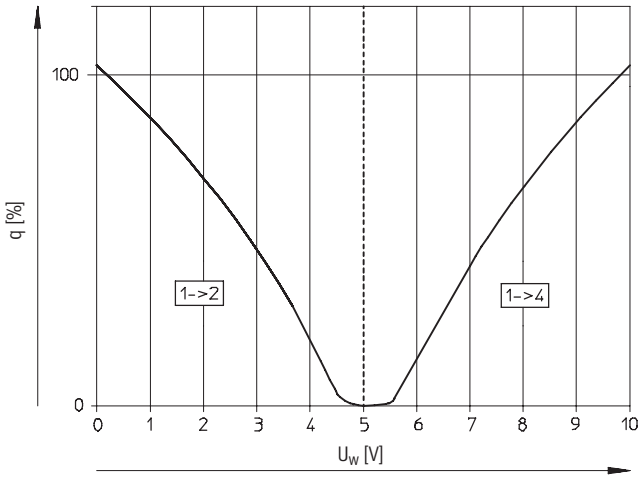
- Setpoint value input as analogue voltage signal 0 ... 10 V
- Setpoint value input as analogue current signal 4 ... 20 mA

General technical data						
Pneumatic connection		M5	G1/8		G1/4	G3/8
			Low flow	High flow		
Valve function		5/3-way, normally closed				
Constructional design		Piston spool, directly actuated, controlled piston spool position				
Sealing principle		Hard				
Actuation type		Electrical				
Type of reset		Mechanical spring				
Type of pilot control		Direct				
Direction of flow		Non-reversible				
Type of mounting		Via through-holes				
Mounting position[1)]		Any				
Operating medium		Compressed air, filtered (to 5 µm), unlubricated				
Nominal size	[mm]	2	4	6	8	10
Standard nominal flow rate	[l/min]	100	350	700	1 400	2 000
Product weight	[g]	290	330	330	530	740

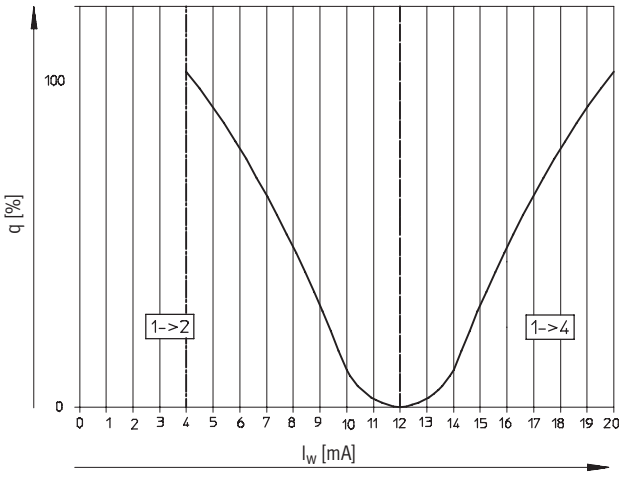
1) If the proportional directional control valve is in motion during operation, it must be mounted at right angles to the direction of movement.

Flow rate q at 6 ⇢ 5 bar as a function of the setpoint voltage U

Voltage type MPYE-5-...-010-B



Current type MPYE-5-...-420-B



Proportional directional control valves MPYE

Technical data

Electrical data							
Pneumatic connection			M5	G⅛ Low flow	G⅛ High flow	G¼	G⅜
Power supply		[V DC]	17 ... 30				
Max. current consumption	in mid-position	[mA]	100				
	at full stroke	[mA]	1 100				
Setpoint value	Voltage type	[V DC]	0 ... 10				
	Current type	[mA]	4 ... 20				
Max. hysteresis[1)]		[%]	0.4				
Valve mid-position	Voltage type	[V DC]	5 (±0.1)				
	Current type	[mA]	12 (±0.16)				
Duty cycle[2)]		[%]	100				
Critical frequency[3)]		[Hz]	125	100	100	90	65
Safety setting			Active mid-position in the event of setpoint value cable break				
Protection against polarity reversal	Voltage type		For all electrical connections				
	Current type		For setpoint value				
Protection class			IP65				
Electrical connection			4-pin plug socket, round design, M12x1				

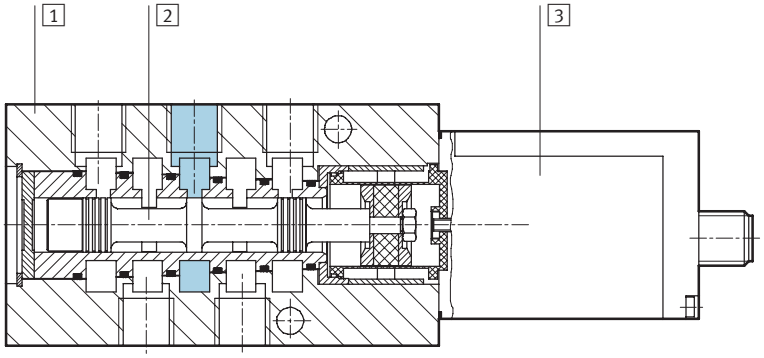
1) Referred to the maximum stroke of the piston spool.
2) The proportional direction control valve automatically switches off if it overheats (goes to mid-position) and switches back on once it cools down.
3) Corresponds to the 3dB frequency at the maximum movement stroke of the piston spool.

Operating and environmental conditions		
Operating pressure	[bar]	0 ... 10
Ambient temperature	[°C]	0 ... 50
Vibration resistance[1)]		To DIN/IEC 68 Parts 2 -6, severity level 2
Continuous shock resistance[1)]		To DIN/IEC 68 Parts 2 -27, severity level 2
CE symbol		To 89/336/EEC (EMC regulation)
Temperature of medium	[°C]	5 ... 40, condensation not permitted

1) If the proportional directional control valve is in motion during operation, it must be mounted at right angles to the direction of movement.

Materials

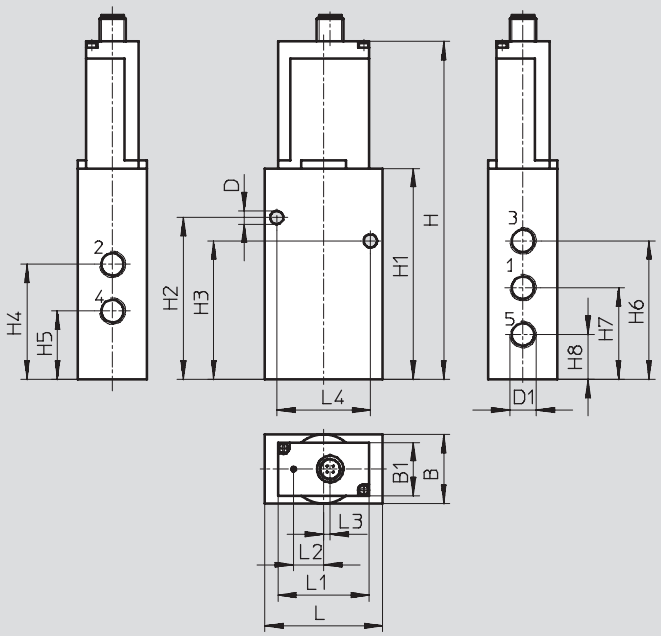
Sectional view



1	Housing	Anodised aluminium
2	Valve spool	Tempered aluminium
3	Housing for electronics	Galvanised acrylic butadiene styrene
–	Seals	Nitrile rubber

Dimensions

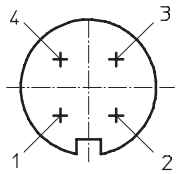
Download CAD data ➔ **www.festo.com**



Pneumatic connection D1	B	B1	D ∅	H	H1	H2	H3	H4
M5	26	–	5.5	129.9	69	56.1	38.1	32.1
G1⁄8	26	–	5.5	149.3	88.4	71.3	55.1	45.8
G1⁄4	35	26	6.5	164.6	103.7	79.6	68.1	56.6
G3⁄8	40	26	6.5	176.6	115.7	98.4	79.4	65.4

Pneumatic connection D1	H5	H6	H7	H8	L	L1	L2	L3	L4
M5	20.1	38.1	26.1	14.1	45	–	14.8	3.2	32
G1⁄8	26.8	55.3	36.3	17.3	45	–	14.8	3.2	35
G1⁄4	33.6	68.1	45.1	22.1	58	45	14.8	3.2	46
G3⁄8	37.4	82.4	51.4	20.4	67	45	14.8	3.2	54

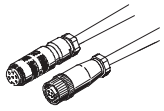
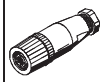
Terminal allocation



1 24 V DC, supply voltage
2 GND
3 Uw/I_W, setpoint input
4 GND

Ordering data

Pneumatic connection	Voltage type 0 ... 10 mV		Current type 4 ... 20 mA	
	Part No.	Type	Part No.	Type
M5	**154 200**	**MPYE-5-M5-010-B**	**162 959**	**MPYE-5-M5-420-B**
G1⁄8	**151 692**	**MPYE-5-1⁄8LF-010-B**	**161 978**	**MPYE-5-1⁄8LF-420-B**
	151 693	**MPYE-5-1⁄8HF-010-B**	**161 979**	**MPYE-5-1⁄8HF-420-B**
G1⁄4	**151 694**	**MPYE-5-1⁄4-010-B**	**161 980**	**MPYE-5-1⁄4-420-B**
G3⁄8	**151 695**	**MPYE-5-3⁄8-010-B**	**161 981**	**MPYE-5-3⁄8-420-B**

Ordering data				
	Description	Cable length [m]	Part No.	Type
Connecting cable				Technical data ➔ Internet: kmpye, kvia
	Screened	5	**151 909**	**KMPYE-5**
		X length[1]	**151 910**	**KMPYE-...**
	Connecting cable to the analogue module of valve terminal type 03	5	**161 984**	**KVIA-MPYE-5**
		10	**161 985**	**KVIA-MPYE-10**
	Connecting cable to the axis interface of the axis controller SPC200	0.3	**170 239**	**KMPYE-AIF-1-GS-GD-0,3**
		2	**170 238**	**KMPYE-AIF-1-GS-GD-2**
Sensor socket				Technical data ➔ Internet: sie-gd
	Straight, 4-pin, M12x1	–	**18 494**	**SIE-GD**
Sensor socket				Technical data ➔ Internet: sie-wd
	Angled, 4-pin, M12x1	–	**12 956**	**SIE-WD-TR**
Push-in fitting				Technical data ➔ Internet: quick star
	For connecting compressed air tubing with standard external diameters			
Silencer				Technical data ➔ Internet: u
	For fitting in exhaust ports			
Reducing nipple				
	–			

1) Max. 10 m

Proportional pressure regulators MPPE/VPPE/MPPES

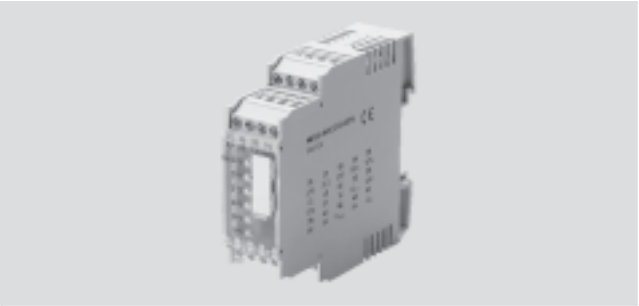
Accessories

Setpoint module MPZ

- ⎓ - Voltage
  20 ... 30 V DC

Function

- Generation of 6+1 analogue set-point values for the proportional pressure regulators MPPE, MPPES and MPYE
- Digital controller
- Output voltage adjustable via spindle potentiometer



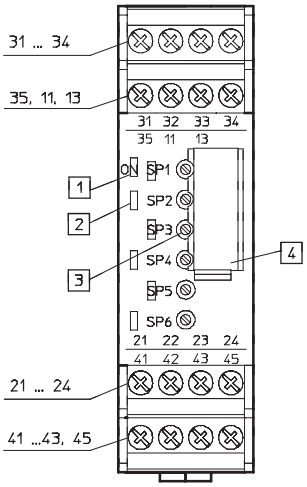
General technical data			
Mode of operation			Digital-analogue circuit with analogue output
Electrical connection			Screw terminal
Connection cross section		[mm²]	2.5
Operating voltage range		[V DC]	20 ... 30
Adjustable output voltage		[V DC]	0 ... 10
Max. output current		[mA]	27
Power consumption at 24 V DC		[W]	1.5
Supply setpoint value adjustment	Voltage	[V]	10 ... 10.6
	Current	[mA]	6 ... 6.36
External setpoint input	Voltage	[V DC]	0 ... 10
	Potentiometer	[kΩ]	2.5 ... 10
Setpoint controller	Input resistance	[kΩ]	3
Residual ripple		[%]	Max. 10
Display	Ready		Green LED
	Setpoint active		Yellow LED
Type of mounting			On H-rail
Assembly position			Any
Product weight		[g]	80

Operating and environmental conditions		
Ambient temperature	[°C]	0 ... 60
Protection class		IP20
CE symbol (declaration of conformity)		In accordance with EU EMC directive
Corrosion resistance class CRC[1)]		2

1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents

Connections and control elements

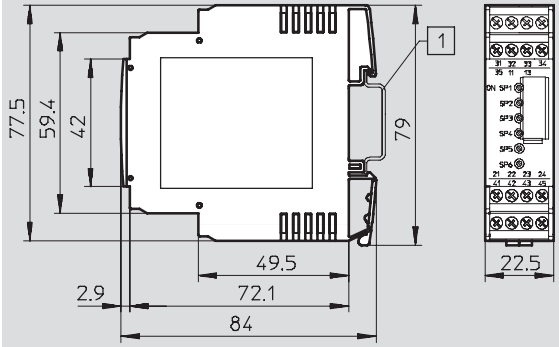
Connections			Priority
31	Activate setpoint 1	SP1	1 (highest)
32	Activate setpoint 2	SP2	2
33	Activate setpoint 3	SP3	3
34	Activate setpoint 4	SP4	4
35	Activate setpoint 5	SP5	5
11	Activate setpoint 6	SP6	6
13	Control line	0 V	–
21	Control line	0 V	–
22	External setpoint input	$U_{w, in}$ = 0 ... 10 V DC	7 (lowest)
23	Control line	10 V DC	–
24	Screening	PE	–
41	Control line	0 V DC	–
42	Setpoint output	$U_{w, out}$	–
43	Power supply	–	–
45	Power supply	+	–



1 Operational status display, green LED
2 Setpoint display active (SP1 ... SP6), yellow LED
3 Setpoint potentiometer SP1 ... SP6
4 Inscription label

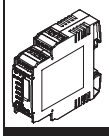
Dimensions

Download CAD data ➔ **www.festo.com**



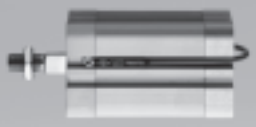
1 H-rail to DIN EN 60715

Ordering data

	Description	Part No.	Type
	Setpoint module for generating 6 + 1 analogue voltage signals	**546 224**	**MPZ-1-24DC-SGH-6-SW**

Products and services – everything from a single source

Products incorporating new ideas are created when enthusiasm for technology and efficiency come together. Tailor-made service goes without saying when the customer is the focus of attention.



Pneumatic and electrical drives

- Pneumatic cylinders
- Semi-rotary drives
- Handling modules
- Servopneumatic positioning systems
- Electromechanical drives
- Positioning controllers and controllers

Valves and valve terminals

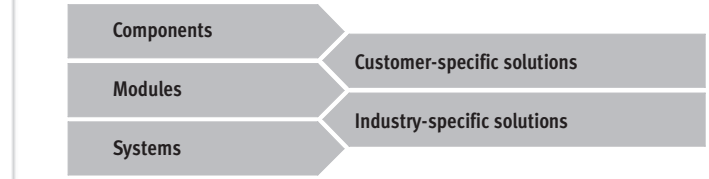
- Standard valves
- Universal and application-optimised valves
- Manually and mechanically actuated valves
- Shut-off, pressure control and flow control valves
- Proportional valves
- Safety valves

Fieldbus systems/ electrical peripherals

- Fieldbus Direct
- Installation system CP/CPI
- Modular electrical terminal CPX

Compressed air preparation

- Service unit combinations
- Filter regulators
- Filters
- Pressure regulators
- Lubricators
- On-off and soft-start valves
- Dryers
- Pressure amplifiers
- Accessories for compressed air preparation



Services from Festo to increase your productivity – across the entire value creation sequence

Engineering – for greater speed in the development process

- CAD models
- 14 engineering tools
- Digital catalogue
- FluidDRAW®
- More than 1,000 technical consultants and project engineers worldwide
- Technical hotlines

Supply chain – for greater speed in the procurement process

- E-commerce and online shop
- Online order tracking
- Euro special manufacturing service
- Logistics optimisation

Gripping and vacuum technology

- Vacuum generators
- Vacuum grippers
- Vacuum security valves
- Vacuum accessories
- Standard grippers
- Micro grippers
- Precision grippers
- Heavy-duty grippers

Sensors and monitoring units

- Proximity sensors
- Pressure and flow sensors
- Display and operating units
- Inductive and optical proximity sensors
- Displacement encoders for positioning cylinders
- Optical orientation detection and quality inspection

Controllers/bus systems

- Pneumatic and electropneumatic controllers
- Programmable logic controllers
- Fieldbus systems and accessories
- Timers/counters
- Software for visualisation and data acquisition
- Display and operating units

Accessories

- Pipes
- Tubing
- Pipe connectors and fittings
- Electrical connection technology
- Silencers
- Reservoirs
- Air guns

All in all, 100% product and service quality

A customer-oriented range with unlimited flexibility:
Components combine to produce ready-to-install modules and systems. Included in this are special designs – since at Festo, most industry-specific products and customer-specific solutions are based on the 23,000 plus catalogue products. Combined with the services for the entire value creation sequence, the end result is unbeatable economy.

Assembly – for greater speed in the assembly/commissioning process

- Prepack
- Preassembly
- Turnkey pneumatics
- Handling solutions

Operation – for greater speed in the operational process

- Spare parts service
- Energy saving service
- Compressed air consumption analysis
- Compressed air quality analysis
- Customer service

What must be observed when using Festo components?

Specified limit values for technical data and any specific instructions must be adhered to by the user in order to ensure recommended operating conditions.
When pneumatic components are used, the user shall ensure that they are operated using correctly prepared compressed air without aggressive media.
When Festo components are used in safety-oriented applications, the user shall ensure that all applicable national and local safety laws and regulations, for example the machine directive, together with the relevant references to standards are observed.
Unauthorised conversions or modifications to products and systems from Festo involve a safety risk and are thus not permissible.
Festo does not accept any liability for resulting damages.
You should contact Festo's advisors if one of the following apply to your application:

- The ambient conditions and conditions of use or the operating medium differ from the specified technical data.
- The product is to perform a safety function.
- A risk or safety analysis is required.
- You are unsure about the product's suitability for use in the planned application.
- You are unsure about the product's suitability for use in safety-oriented applications.