

## On-off/soft-start valves MS-EM/EE/DL/DE, MS series

**FESTO**



Festo Core Range  
Solves the majority of your automation tasks

Worldwide: Quickest delivery – wherever, whenever  
Simply good: Expected high Festo quality  
Fast: Easy and fast to select

With the Festo Core Range, we have selected the most important products and functions from our broad product catalogue, and added the quickest delivery.

The Core Range offers you the best value for your automation tasks.

Just look  
for the  
star!

## Key features

### Service unit components of the MS series

Solutions for every application

With its large product range, highly effective components and a wide choice of functions, the MS series from Festo offers a complete concept for compressed air preparation. It is suitable for simple standard applications as well as application-specific solutions with very high quality requirements. Available as individual components, pre-assembled combinations ex-stock,

application-specific combinations or complete turnkey solutions. The five sizes in the MS series achieve maximum flow rates with low space requirements.

Freely combinable function modules

Pressure regulators, on/off and soft-start valves with safety function, filters, pressure and flow sensors, dryers, sensors and lubricators can be assembled into a suitable solution for every task. With the modular structure the components can be combined as required. The simple connection system saves time because the entire combination doesn't need to be disassembled

when replacing individual modules.

Many of the components are also UL and ATEX certified.

CAD models and configurator

Engineering tools

Convenient tools for planning and selecting application-specific individual devices and combinations. The product configurator lets you configure customised solutions quickly and transfer the order data without any hassle.

Selection tool for choosing the right combination of service unit components without oversizing, and with the right air purity class:

→ [www.festo.com/engineering/service-unit](http://www.festo.com/engineering/service-unit)

#### Air quality

The program supports configuring an appropriate service unit. Please insert the required air cleanliness either by your application or an ISO code or by direct selection of air filters.

**Selection criteria: Application**

Filter combination is proposed based upon your selected application

- standard pneumatics operation of valves and cylinders, e.g. in automotive industry, secondary packaging
- mining and building industry applications without special air cleanliness requirements
- application of pressure operated tools and machines pneumatic hammer, air engine, positioning with proportional valve
- electronic, flatpanel and solar industry, textile and paper production application with residual oil content <math>< 0.5 \text{ mg/m}^3</math>
- painting, powder coating, air bearing application with residual oil content <math>< 0.01 \text{ mg/m}^3</math>
- food and beverage industry, optics application with residual oil content <math>< 0.003 \text{ mg/m}^3</math> reduction of oil vapours and aromas

**Selection criteria: ISO-class**

Filter combination is proposed based upon the air cleanliness class according to ISO 8573-1:2010

particle : 4 \* : oil


**ISO**

\* Downstream from the compressor the water content is assumed to be ISO class 4. Better classes can be achieved by applying an adsorption dryer PDND or a membrane dryer LDM1

**Direct filter selection**

Independent selection of filter combination

- 40 µm Filter
- 5 µm Filter
- 1 µm Fine Filter
- 0.01 µm Micro Filter \*
- Active Carbon Filter



\* To enhance the filter lifetime and in consequence the maintenance interval arrange a 1 µm Fine Filter in front of the 0.01 µm Micro Filter as a preliminary filter.

### Integrated sensors

Pressure and flow sensors

### Safety functions

Soft-start/quick exhaust valves  
MS6-SV/MS9-SV

### Saving energy

Service unit combinations MSE6

Intelligent mix of sizes



- Maximum machine availability thanks to controlled processes
- Reliable compressed air preparation and supply for systems
- Integrated or stand-alone
- Easy to connect with M8/M12 plug



- Fast and reliable exhausting of systems up to Performance Level e, certified to EN ISO 13849-1
- Integrated soft-start function



- Fully automatic monitoring and regulation of the compressed air supply
- Automatic shut-off of the compressed air in stand-by mode
- Detection and notification of leakages
- Condition monitoring of relevant process data



- Optimum flow rate with a size that is up to 18% smaller
- Excellent energy efficiency
- Cost-optimised combinations – save up to 30%!

### Size differences

Size	MS2	MS4	MS6	MS9	MS12
Grid dimension [mm]	25	40	62	90	124
Connection sizes	M5, QS-6	G1/8, G1/4, G3/8	G1/4, G3/8, G1/2, G3/4	G1/2, G3/4, G1, G1 1/4, G1 1/2	G1, G1 1/4, G1 1/2, G2
Standard nominal flow rate $q_{nN}^{1)}$ [l/min]	350	1800	6500	20000	22000

1) Using pressure regulator MS-LR as an example

## Key features

### Note

#### Information

The next few pages provide a brief overview of the product range for the MS series service unit components.

You can find detailed information and all the technical data in the documentation for the relevant service unit component.

Accessories such as connecting plates or mounting brackets can be ordered either via the configurator or separately.

#### Design of a service unit combination





The sequence of the individual components within a service unit combination is relevant for safety and functionality. The service unit components cannot be combined in any order in the flow direction. There are restrictions and rules.

The configurator for the service unit MSB is a reliable and convenient way of arranging individual service unit components and ensures compliance with the applicable rules. As a result, you get a fully assembled unit, including UL or ATEX certification, if necessary.







When combining a unit from individually configured and ordered service unit components, the points on the right must be adhered to under all circumstances.

- Regulators MS-LFR/LR/LRP are only permissible in the flow direction with the same or decreasing pressure regulation range
- Filters MS-LFR/LF/LFM/LFX are only permissible in the flow direction with an increasing grade of filtration
- Lubricators MS-LOE are not permitted in the flow direction upstream of a filter MS-LFR/LFM/LF/LFX, water separator MS-LWS or membrane air dryer MS-LDM1


- A micro filter MS-LFM must be installed in the flow direction upstream of an activated carbon filter MS-LFX or membrane air dryer MS-LDM1
- A flow sensor SFAM cannot be installed directly downstream of a regulator MS-LFR/LR; a branching module MS-FRM must be positioned between them
- A soft-start/quick exhaust valve MS-SV must be the last service unit component in the flow direction

Product range for service unit components of the MS series								
Type	Description	Size	Pneumatic connection					
			Push-in connector	Female thread			Connecting plate with thread	
				M	G	NPT	G	NPT
<b>Combinations</b>								
<b>Service unit combinations MSB-FRC</b> <span style="float: right;">Datasheets → Internet: msb</span>								
	Combinations of filter regulator and lubricator	4	–	–	1/8, 1/4	–	–	–
		6	–	–	1/4, 3/8, 1/2	–	–	–
<b>Service unit combinations MSB</b> <span style="float: right;">Datasheets → Internet: msb</span>								
	7 combinations, predefined	4	–	–	1/4	–	–	–
		6	–	–	1/2	–	–	–
	Freely configurable combinations	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1 1/4, 1 1/2	1/2, 3/4, 1 1/4, 1 1/2
<b>Service unit combinations MSE6</b> <span style="float: right;">Datasheets → Internet: mse6</span>								
	Combinations with fieldbus connection for measuring pressure, flow rate and consumption	6	–	–	–	–	1/2	–










## Key features

Product range for service unit components of the MS series								
Type	Description	Size	Pneumatic connection					
			Push-in connector	Female thread			Connecting plate with thread	
				M	G	NPT	G	NPT
<b>Individual devices</b>								
<b>Filter regulators MS-LFR</b> <span style="float: right;">Datasheets → Internet: ms2-lfr; ms4-lfr; ms6-lfr; ms9-lfr; ms12-lfr</span>								
	Filter and pressure regulator in a single device, grade of filtration 5 or 40 µm	2	QS-6	M5	–	–	–	–
		4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
<b>Filter regulators MS-LFR-B</b> <span style="float: right;">Datasheets → Internet: ms4-lfr-b; ms6-lfr-b</span>								
	Filter and pressure regulator in a single device in polymer housing, grade of filtration 5 or 40 µm	4	–	–	1/4	–	–	–
		6	–	–	1/2	–	–	–
<b>Filters MS-LF</b> <span style="float: right;">Datasheets → Internet: ms4-lf; ms6-lf; ms9-lf; ms12-lf</span>								
	Grade of filtration 5 or 40 µm	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
<b>Fine and micro filters MS-LFM</b> <span style="float: right;">Datasheets → Internet: ms4-lfm; ms6-lfm; ms9-lfm; ms12-lfm</span>								
	Grade of filtration 0.01 or 1 µm	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
<b>Activated carbon filters MS-LFX</b> <span style="float: right;">Datasheets → Internet: ms4-lfx; ms6-lfx; ms9-lfx; ms12-lfx</span>								
	For removing liquid and gaseous oil particles	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
<b>Water separators MS-LWS</b> <span style="float: right;">Datasheets → Internet: ms6-lws; ms9-lws; ms12-lws</span>								
	Remove condensate from compressed air, maintenance-free	6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–





## Key features

Product range for service unit components of the MS series								
Type	Description	Size	Pneumatic connection					
			Push-in connector	Female thread			Connecting plate with thread	
				M	G	NPT	G	NPT
<b>Individual devices</b>								
<b>Pressure regulators MS-LR</b> <span style="float: right;">Datasheets → Internet: ms2-lr; ms4-lr; ms6-lr; ms9-lr; ms12-lr</span>								
	For setting the required operating pressure, 4 pressure regulation ranges	2	QS-6	M5	–	–	–	–
		4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
<b>Pressure regulators MS-LR-B</b> <span style="float: right;">Datasheets → Internet: ms4-lr-b; ms6-lr-b</span>								
	For setting the required operating pressure, in polymer housing	4	–	–	1/4	–	–	–
		6	–	–	1/2	–	–	–
<b>Pressure regulators MS-LRB</b> <span style="float: right;">Datasheets → Internet: ms4-lrb; ms6-lrb</span>								
	For configuring a regulator manifold with independent pressure regulation ranges. Pressure output is to the front or rear.	4	–	–	1/4	–	1/8, 1/4, 3/8	–
		6	–	–	1/2	–	1/4, 3/8, 1/2, 3/4	–
<b>Precision pressure regulators MS-LRP</b> <span style="float: right;">Datasheets → Internet: ms6-lrp</span>								
	For precisely setting the required operating pressure, 4 pressure regulation ranges, pressure hysteresis 0.02 bar	6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
<b>Precision pressure regulators MS-LRPB</b> <span style="float: right;">Datasheets → Internet: ms6-lrpb</span>								
	For configuring a regulator manifold with independent pressure regulation ranges. Pressure output is to the front or rear.	6	–	–	1/2	–	1/4, 3/8, 1/2, 3/4	–
<b>Lubricators MS-LOE</b> <span style="float: right;">Datasheets → Internet: ms4-loe; ms6-loe; ms9-loe; ms12-loe</span>								
	Add a precisely adjustable amount of oil to the compressed air. The amount of oil mist is proportional to the compressed air flow rate.	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–

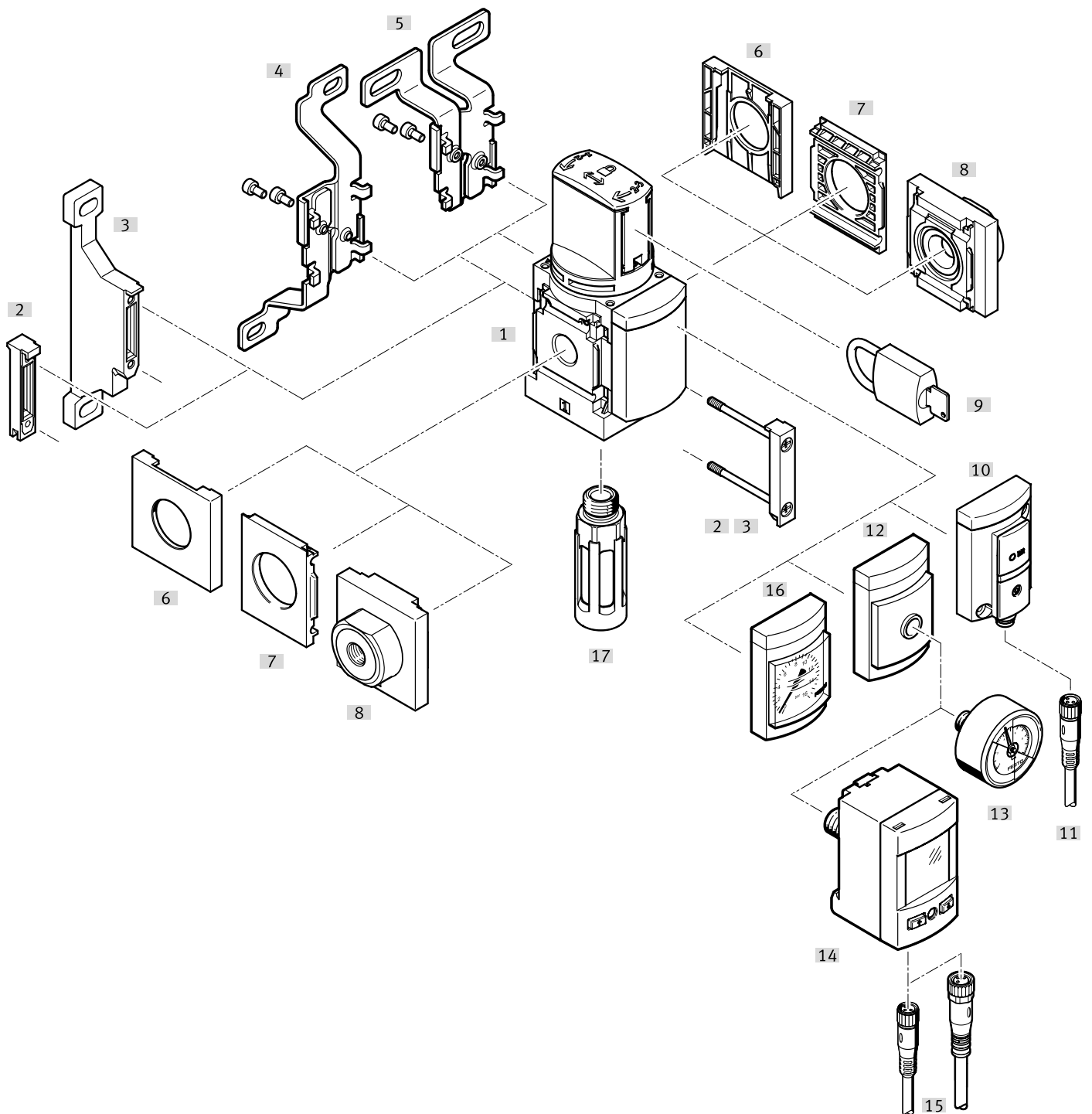
## Key features

Product range for service unit components of the MS series								
Type	Description	Size	Pneumatic connection			Connecting plate with thread		
			Push-in connector	Female thread				NPT
			M	G	NPT	G	NPT	
<b>Individual devices</b>								
<b>On/off valves MS-EM</b>						Datasheets → Internet: ms4-em; ms6-em; ms9-em; ms12-em		
	Manually actuated on/off valve for pressurising and exhausting pneumatic systems.	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
<b>On/off valves MS-EE</b>								
<b>On/off valves MS-EE</b>						Datasheets → Internet: ms4-ee; ms6-ee; ms9-ee; ms12-ee		
	Electrically actuated on/off valve for pressurising and exhausting pneumatic systems.	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
<b>On/off valves MS-EE-B</b>								
<b>On/off valves MS-EE-B</b>						Datasheets → Internet: ms4-ee-b; ms6-ee-b		
	Electrically actuated on/off valve in polymer housing for pressurising and exhausting pneumatic systems.	4	–	–	1/4	–	–	–
		6	–	–	1/2	–	–	–
<b>Soft-start valves MS-DL</b>								
<b>Soft-start valves MS-DL</b>						Datasheets → Internet: ms4-dl; ms6-dl; ms12-dl		
	Pneumatically actuated soft-start valve for slowly pressurising and exhausting pneumatic systems.	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
<b>Soft-start valves MS-DE</b>								
<b>Soft-start valves MS-DE</b>						Datasheets → Internet: ms4-de; ms6-de; ms12-de		
	Electrically actuated soft-start valve for slowly pressurising and exhausting pneumatic systems.	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
<b>On/off valves MS-EDE-B</b>								
<b>On/off valves MS-EDE-B</b>						Datasheets → Internet: ms4-ed-e-b; ms6-ed-e-b		
	Electrically actuated soft-start valve in polymer housing for slowly pressurising and exhausting pneumatic systems.	4	–	–	1/4	–	–	–
		6	–	–	1/2	–	–	–
<b>Soft-start/quick exhaust valves MS-SV</b>								
<b>Soft-start/quick exhaust valves MS-SV</b>						Datasheets → Internet: ms6-sv; ms9-sv		
	For gradually increasing pressurisation and quick, safe pressure reduction in pneumatic piping systems. Up to category 1, PL c.	6	–	–	1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
	Up to category 3, PL d. Up to category 4, PL e in the case of optional extension.	6	–	–	1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
	Up to category 4, PL e.	6	–	–	1/2	–	1/4, 3/8, 1/2, 3/4	–

## Key features

Product range for service unit components of the MS series								
Type	Description	Size	Pneumatic connection					
			Push-in connector	Female thread			Connecting plate with thread	
				M	G	NPT	G	NPT
<b>Individual devices</b>								
<b>Membrane air dryers MS-LDM1</b> <span style="float: right;">Datasheets → Internet: ms4-ldm; ms6-ldm</span>								
	Wear-free membrane dryer with internal air consumption	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
<b>Branching modules MS-FRM</b> <span style="float: right;">Datasheets → Internet: ms4-frm; ms6-frm; ms9-frm; ms12-frm</span>								
	Compressed air distributors with 4 connections	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	–
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	–
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
<b>Distributor blocks MS-FRM-FRZ</b> <span style="float: right;">Datasheets → Internet: ms4-frm-frz; ms6-frm-frz</span>								
	Compressed air distributors with 4 connections and half the grid width	4	–	–	–	–	–	–
		6	–	–	–	–	–	–
<b>Flow sensors SFAM</b> <span style="float: right;">Datasheets → Internet: sfam</span>								
	For absolute flow rate information and cumulative air consumption measurement	6	–	–	–	–	1/2	1/2
		9	–	–	–	–	1, 1 1/2	1, 1 1/2

Peripherals overview



**Note**

Additional accessories:

- Module connector for combination with size MS4/MS6 or size MS9  
→ Internet: amv, rmv, armv
- Adapter for mounting on profiles  
→ Internet: ipm-80, ipm-40-80, ipm-80-80



## Peripherals overview

Mounting attachments and accessories		Order code	→ Page/Internet
[1]	On/off valve	MS4/6-EM1	12
<b>Can be ordered via the modular product system</b>			
[3]	Mounting bracket	[WP]	18
	Mounting bracket (not shown)	[WPM]	
[4]	Mounting bracket	[WB]	
[5]	Mounting bracket	[WBM]	
[8]	Connecting plate SET <sup>1)</sup>	[AG...]	
	Connecting plate SET <sup>1)</sup>	[AQ...]	
[10]	Pressure sensor SDE5 with status indicator	[AD7], [AD8], [AD9], [AD10]	
[12]	Adapter for EN pressure gauge 1/8, 1/4	[A8], [A4]	
[16]	MS pressure gauge	[AG], [RG]	
[17]	Silencer	[S]	
<b>Can be ordered as accessories</b>			
[2]	Module connector	MS4/6-MV	ms4-mv, ms6-mv
[3]	Mounting bracket	MS4/6-WP	ms4-wp, ms6-wp
	Mounting bracket (not shown)	MS4/6-WPB/WPE/WPM	ms4-wp, ms6-wp
[4]	Mounting bracket	MS4/6-WB	ms4-wb, ms6-wb
[5]	Mounting bracket	MS4-WBM	ms4-wbm
[6]	Cover cap	MS4/6-END	ms4-end, ms6-end
[7]	Mounting plate <sup>2)</sup>	MS4/6-AEND	ms4-aend, ms6-aend
[8]	Connecting plate SET <sup>2)</sup>	MS4/6-AG...	ms4-ag, ms6-ag
[9]	Padlock	LRVS-D	103
[11]	Connecting cable	NEBA-M8...-LE3	103
[13]	Pressure gauge	MA	103
[14]	Pressure sensor	SPAU-...-T	102
[15]	Connecting cable	NEBA-M8...-LE4, NEBA-M12...-LE4	103
[17]	Silencer	U	103

1) Module connector [2] is included in the scope of delivery.

2) Module connector MS4/6-MV [2] or mounting bracket MS4/6-WP, WPB, WPE, WPM [3] is required for mounting.

## Type codes – MS4-EM1

<b>001</b>	<b>Series</b>	
<b>MS</b>	MS series	
<b>002</b>	<b>Size</b>	
<b>4</b>	Grid dimension 40 mm	
<b>003</b>	<b>Function</b>	
<b>EM1</b>	On/off valve, manual	
<b>004</b>	<b>Pneumatic connection</b>	
<b>1/8</b>	Female thread G1/8	
<b>1/4</b>	Female thread G1/4	
<b>AGA</b>	Sub-base G1/8	
<b>AGB</b>	Sub-base G1/4	
<b>AGC</b>	Sub-base G3/8	
<b>AQK</b>	Sub-base 1/8 NPT	
<b>AQN</b>	Sub-base 1/4 NPT	
<b>AQP</b>	Sub-base 3/8 NPT	
<b>005</b>	<b>Silencer</b>	
	None	
<b>S</b>	Silencer	
<b>006</b>	<b>Pressure gauge alternatives</b>	
	None	
<b>A4</b>	Adapter for EN pressure gauge 1/4, without pressure gauge	
<b>A8</b>	Adapter for EN pressure gauge 1/8, without pressure gauge	
<b>AD7</b>	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/O	
<b>AD8</b>	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/C	
<b>AD9</b>	Pressure sensor with switching display, M8 plug, window comparator, PNP, N/O	
<b>AD10</b>	Pressure sensor with operational status indicator, M8 plug, window comparator, PNP, N/C	
<b>AG</b>	MS pressure gauge	
<b>RG</b>	Integrated pressure gauge, red/green scale	

<b>007</b>	<b>Alternative pressure gauge scale</b>	
	MS pressure gauge	
<b>PSI</b>	psi	
<b>MPA</b>	MPa	
<b>008</b>	<b>Type of mounting</b>	
	Without mounting bracket	
<b>WP</b>	Mounting bracket basic design	
<b>WPM</b>	Mounting bracket for hooking in service unit components	
<b>WB</b>	Mounting centrally at rear (wall mounting top and bottom), connecting plates not required	
<b>WBM</b>	Mounting centrally at rear (wall mounting top), connecting plates not required	
<b>009</b>	<b>EU certification</b>	
	None	
<b>EX4</b>	II 2GD	
<b>010</b>	<b>UL certification</b>	
	None	
<b>UL1</b>	cULus ordinary location for Canada and USA	
<b>011</b>	<b>Flow direction</b>	
	Flow direction from left to right	
<b>Z</b>	Flow direction from right to left	
<b>012</b>	<b>Special material properties</b>	
	None	
<b>F1A</b>	Recommended for production facilities for the manufacture of lithium-ion batteries	

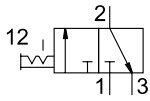
## Type codes – MS6-EM1

001	Series
<b>MS6</b>	MS-series, size 6
002	Size
<b>6</b>	Grid dimension 62 mm
003	Function
<b>EM1</b>	On/off valve, manual
004	Pneumatic connection
<b>1/4</b>	Female thread G1/4
<b>3/8</b>	Female thread G3/8
<b>1/2</b>	Female thread G1/2
<b>AGB</b>	Sub-base G1/4
<b>AGC</b>	Sub-base G3/8
<b>AGD</b>	Sub-base G1/2
<b>AGE</b>	Sub-base G3/4
<b>AQN</b>	Sub-base 1/4 NPT
<b>AQP</b>	Sub-base 3/8 NPT
<b>AQR</b>	Sub-base 1/2 NPT
<b>AQS</b>	Sub-base 3/4 NPT
005	Silencer
	None
<b>S</b>	Silencer
006	Pressure gauge alternatives
	None
<b>A4</b>	Adapter for EN pressure gauge 1/4, without pressure gauge
<b>AD7</b>	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/O
<b>AD8</b>	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/C
<b>AD9</b>	Pressure sensor with switching display, M8 plug, window comparator, PNP, N/O
<b>AD10</b>	Pressure sensor with operational status indicator, M8 plug, window comparator, PNP, N/C
<b>AG</b>	MS pressure gauge
<b>RG</b>	Integrated pressure gauge, red/green scale

007	Alternative pressure gauge scale
	MS pressure gauge
<b>PSI</b>	psi
<b>MPA</b>	MPa
008	Type of mounting
	Without mounting bracket
<b>WP</b>	Mounting bracket basic design
<b>WPM</b>	Mounting bracket for hooking in service unit components
<b>WB</b>	Mounting centrally at rear (wall mounting top and bottom), connecting plates not required
009	EU certification
	None
<b>EX4</b>	II 2GD
010	UL certification
	None
<b>UL1</b>	cULus ordinary location for Canada and USA
011	Flow direction
	Flow direction from left to right
<b>Z</b>	Flow direction from right to left
012	Special material properties
	None
<b>F1A</b>	Recommended for production facilities for the manufacture of lithium-ion batteries

## Datasheet

### Function



- Flow rate  
1200 ... 8700 l/min
- Temperature range  
-10 ... +60 °C
- Operating pressure  
0 ... 18 bar
- [www.festo.com](http://www.festo.com)



- Manually actuated on/off valve for pressurising and exhausting pneumatic systems
- The valve is switched by turning the rotary knob
- A silencer can be connected to port 3 or the exhaust air can be ducted here
- When the valve is closed, the rotary knob can be secured with a padlock
- Optional pressure gauge
- Optional pressure sensor
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22

### General technical data

Size	MS4	MS6
Pneumatic connection 1, 2		
Female thread	G1/8 or G1/4	G1/4, G3/8 or G1/2
Connecting plate [AG...]	G1/8, G1/4 or G3/8	G1/4, G3/8, G1/2 or G3/4
[AQ...]	1/8 NPT, 1/4 NPT or 3/8 NPT	1/4 NPT, 3/8 NPT, 1/2 NPT or 3/4 NPT
Pneumatic connection 3	G1/4	G1/2
Design	Rotary switching valve	
Type of mounting	With accessories In-line installation	
Mounting position	Any <sup>1)</sup>	
Pressure indication	Via pressure sensor for indicating the output pressure and electrical output via LCD display Via pressure sensor for indicating the status of the output pressure and the electrical output Via pressure gauge for displaying the output pressure Via pressure gauge with red/green scale for indicating the output pressure Prepared for G1/8 Prepared for G1/4	
Valve function	3/2-way valve, bistable	
Exhaust function	Cannot be throttled	
Switching position indication	Knob actuator direction = flow direction	
Type of actuation	Direct	
Flow direction	Not reversible	

1) The on/off valve must be mounted vertically when combined with a pressure sensor as condensate must not collect in the pressure sensor.

† Note: This product conforms to ISO 1179-1 and ISO 228-1.

### Characteristic flow rate values

Size	MS4		MS6		
Pneumatic connection 1, 2	G1/8	G1/4	G1/4	G3/8	G1/2
<b>Standard nominal flow rate q<sub>N</sub><sup>1)</sup> [l/min]</b>					
In main flow direction 1 → 2	1200	2200	3000	5500	8700
In relief direction 2 → 3	1900	1700	6800	6600	6200
<b>C value [l/s*min]</b>					
In main flow direction 1 → 2	4.6	9.0	10.7	21.2	30.8
<b>b value</b>					
In main flow direction 1 → 2	0.51	0.39	0.56	0.49	0.57

1) Measured at p<sub>1</sub> = 6 bar and p<sub>2</sub> = 5 bar, Δp = 1 bar.

## Datasheet

Operating and environmental conditions				
Size	MS4		MS6	
On/off valve	Without pressure sensor	With pressure sensor	Without pressure sensor	With pressure sensor
Operating pressure	[MPa]	0 ... 1.4 (0 ... 1) <sup>1)</sup>	0 ... 1	–
	[bar]	0 ... 14 (0 ... 10) <sup>1)</sup>	0 ... 10	0 ... 18 (0 ... 10) <sup>1)</sup>
	[psi]	0 ... 203 (0 ... 145) <sup>1)</sup>	0 ... 145	–
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4] Inert gases			
Note on the operating/pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)			
Ambient temperature	[°C]	–10 ... +60	0 ... +50	–10 ... +60
Temperature of medium	[°C]	–10 ... +60	0 ... +50	–10 ... +60
Corrosion resistance class CRC <sup>2)</sup>	2 - Moderate corrosion stress			
Food-safe <sup>3)</sup>	See supplementary material information			
UL certification <sup>3)</sup>	c UL us - Recognized (OL)			

1) Value in brackets applies to MS4/MS6-EM1 with UL certification.

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

3) More information: [www.festo.com/catalogue/ms-em1](http://www.festo.com/catalogue/ms-em1) → Support/Downloads.

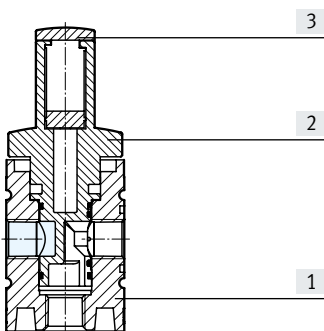
ATEX	
EU certification	EX4
ATEX category for gas	II 2G
Type of (ignition) protection for gas	Ex h IIC T6 Gb X
ATEX category for dust	II 2D
Type of (ignition) protection for dust	Ex h IIIC T60°C Db X
Explosion ambient temperature	–10°C ≤ Ta ≤ +60 °C
Explosion protection certification outside the EU	EPL Db (GB) EPL Gb (GB)
CE marking (see declaration of conformity) <sup>1)</sup>	To EU Explosion Protection Directive (ATEX)
UKCA marking (see declaration of conformity) <sup>1)</sup>	To UK EX instructions

1) More information: [www.festo.com/catalogue/ms-em1](http://www.festo.com/catalogue/ms-em1) → Support/Downloads.

Weight [g]		
Size	MS4	MS6
On/off valve	190	580
On/off valve with silencer	210	655

## Materials

### Sectional view



On/off valve	
[1] Housing	Die-cast aluminium
[2] Rotary piston	Reinforced PA
[3] Slide	Reinforced PA
– Seals	NBR, TPE-U(PU)
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L
Suitable for the production of Li-ion batteries <sup>1)</sup>	Metals with more than 1% copper, zinc or nickel by mass are excluded from use. Exceptions are nickel in steel, chemically nickel-plated surfaces, circuit boards, cables, electrical plug connectors and coils

1) Applies for F1A products



### Note

Foreign particles can adhere to the product or form during installation.

Depending on the application, it may be necessary to purge the product with clean compressed air, to clean it after installation and to operate it with ducted exhaust air.

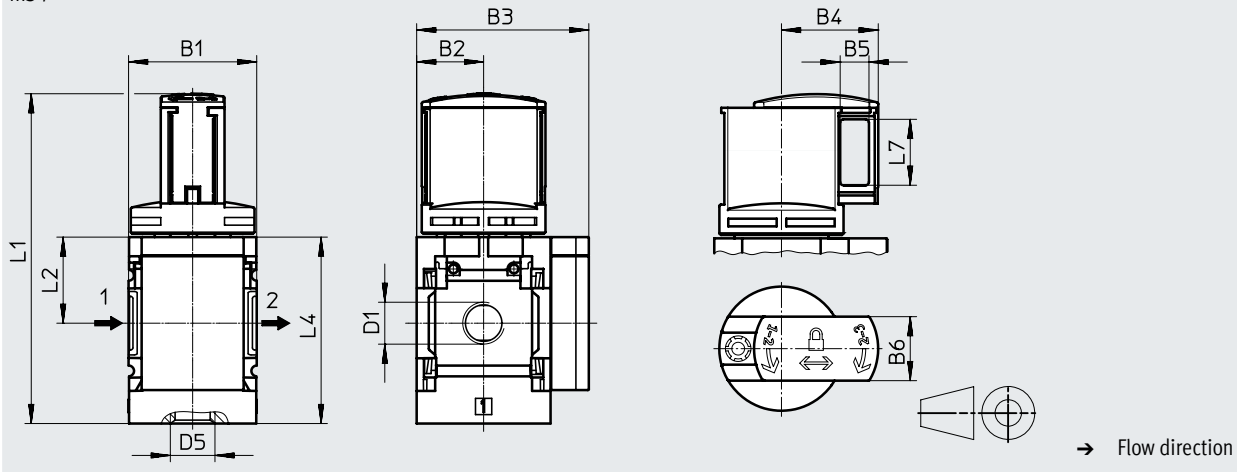
# Datasheet

## Dimensions – Basic version

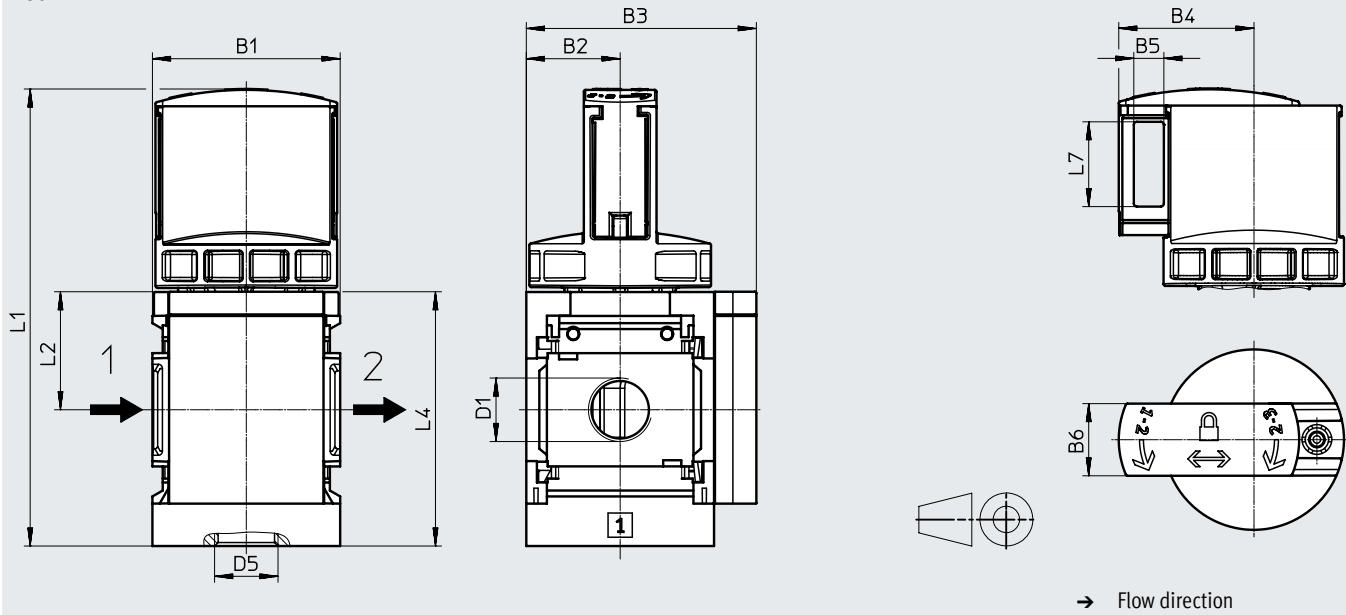
Download CAD data → [www.festo.com](http://www.festo.com)

With female thread, with cover plate

MS4



MS6



Type	B1	B2	B3	B4	B5	B6	D1	D5	L1	L2	L4	L7
<b>MS4-...</b>												
MS4-EM1-1/8	40	21	54	30	9	20	G1/8	G1/4	104	27	59	21
MS4-EM1-1/4							G1/4					
<b>MS6-...</b>												
MS6-EM1-1/4	62	31	76	45	10	24	G1/4	G1/2	150.7	39	84.5	28.2
MS6-EM1-3/8							G3/8					
MS6-EM1-1/2							G1/2					

† Note: This product conforms to ISO 1179-1 and ISO 228-1.

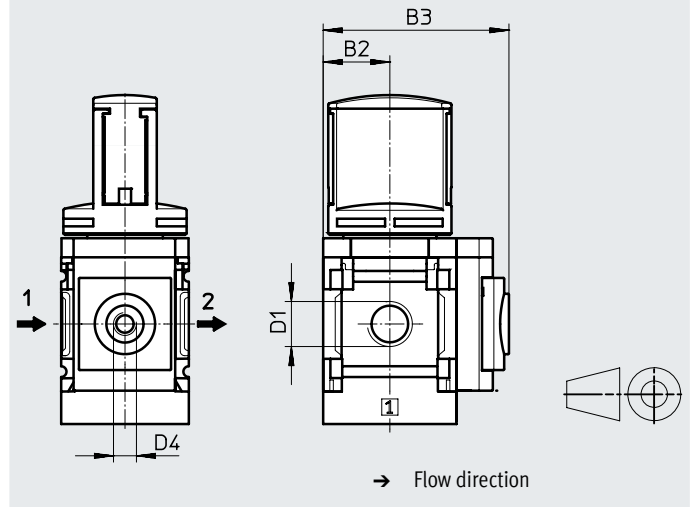
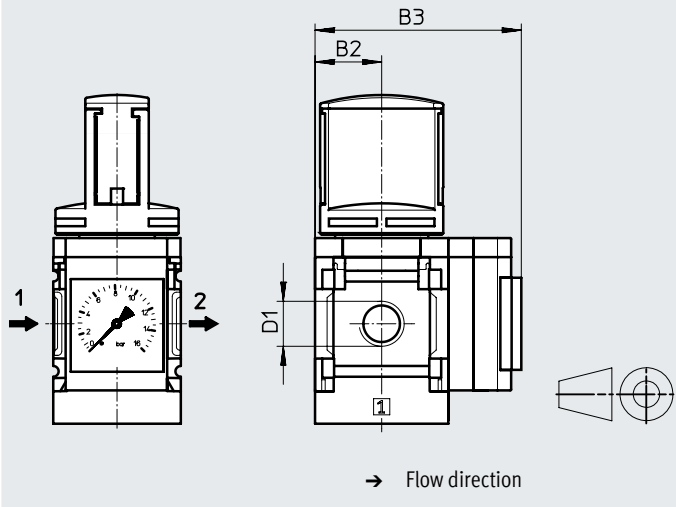
Datasheet

Dimensions – Pressure gauges/pressure gauge alternatives

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

- [AG] Integrated MS pressure gauge with standard scale
- [RG] Integrated MS pressure gauge with red/green scale

- [A8] Adapter for EN pressure gauge 1/8, without pressure gauge
- [A4] Adapter for EN pressure gauge 1/4, without pressure gauge



Type	B2	B3	D1	D4
<b>MS4-...</b>				
MS4-EM1-1/8-...-AG	21	57	G1/8	-
MS4-EM1-1/4-...-AG			G1/4	
MS4-EM1-1/8-...-RG	21	58.5	G1/8	-
MS4-EM1-1/4-...-RG			G1/4	
MS4-EM1-1/8-...-A8	21	58.5	G1/8	G1/8
MS4-EM1-1/4-...-A8			G1/4	
MS4-EM1-1/8-...-A4	21	58.5	G1/8	G1/4
MS4-EM1-1/4-...-A4			G1/4	
<b>MS6-...</b>				
MS6-EM1-1/4-...-AG	31	77	G1/4	-
MS6-EM1-3/8-...-AG			G3/8	
MS6-EM1-1/2-...-AG			G1/2	
MS6-EM1-1/4-...-RG	31	78.5	G1/4	-
MS6-EM1-3/8-...-RG			G3/8	
MS6-EM1-1/2-...-RG			G1/2	
MS6-EM1-1/4-...-A4	31	78.5	G1/4	G1/4
MS6-EM1-3/8-...-A4			G3/8	
MS6-EM1-1/2-...-A4			G1/2	

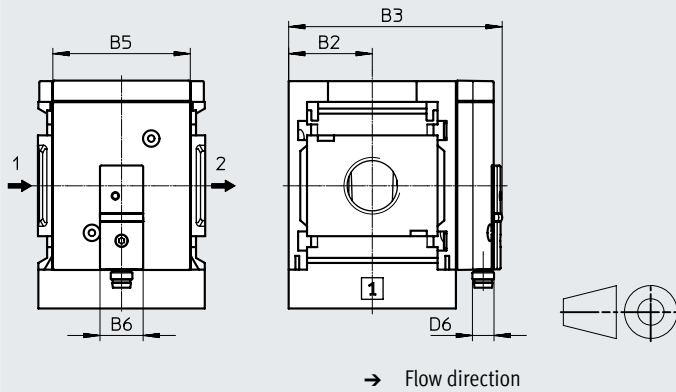
Datasheet

**Dimensions – Pressure sensor**

[AD7], [AD8], [AD9], [AD10] Pressure sensor with status indicator

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

Datasheets → Internet: sde5



[AD7]:  
SDE5-D10-O-...-P-M8 with 1x 3-pin M8 plug, threshold value comparator, 1 switching output PNP, N/O contact

[AD8]:  
SDE5-D10-C-...-P-M8 with 1x 3-pin M8 plug, threshold value comparator, 1 switching output PNP, N/C contact

[AD9]:  
SDE5-D10-O3-...-P-M8 with 1x 3-pin M8 plug, window comparator, 1 switching output PNP, N/O contact

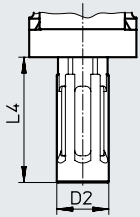
[AD10]:  
SDE5-D10-C3-...-P-M8 with 1x 3-pin M8 plug, window comparator, 1 switching output PNP, N/C contact

Type	B2	B3	B5	B6	D6	L5	L6
<b>MS4-...</b>							
MS4-...-AD7, AD8, AD9, AD10	21	59.1	~32	16	M8x1	-	-
<b>MS6-...</b>							
MS6-...-AD7, AD8, AD9, AD10	31	79.1	~51	16	M8x1	-	-



## Datasheet

## Dimensions – Silencer

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

Type	D2	L4
MS4-EM1-...-S	20	49
MS6-EM1-...-S	28	109

## ★ Core Range

Ordering data				
Size	Connection	Flow direction	Part no.	Type
MS4	G1/4	From left to right	★ 541258	MS4-EM1-1/4
MS6	G1/2	From left to right	★ 541267	MS6-EM1-1/2
With silencer				
MS4	G1/4	From left to right	★ 541259	MS4-EM1-1/4-S
MS6	G1/2	From left to right	★ 541268	MS6-EM1-1/2-S

Ordering data				
Size	Connection	Flow direction	Part no.	Type
MS4	G1/8	From left to right	541262	MS4-EM1-1/8
	G1/4	From right to left	541261	MS4-EM1-1/4-Z
		From left to right	8183561	MS4-EM1-1/4-F1A <sup>1)</sup>
MS6	G1/4	From left to right	541271	MS6-EM1-1/4
	G3/8	From left to right	541275	MS6-EM1-3/8
	G1/2	From right to left	541270	MS6-EM1-1/2-Z
		From left to right	8183562	MS6-EM1-1/2-F1A <sup>1)</sup>
With silencer				
MS4	G1/8	From left to right	541263	MS4-EM1-1/8-S
	G1/4	From right to left	541260	MS4-EM1-1/4-S-Z
MS6	G1/4	From left to right	541272	MS6-EM1-1/4-S
	G3/8	From left to right	541276	MS6-EM1-3/8-S
	G1/2	From right to left	541269	MS6-EM1-1/2-S-Z

1) Recommended for production plants for manufacturing lithium-ion batteries

Ordering data – Modular product system

Ordering table							
Grid dimension	[mm]	40	62	Conditions	Code	Enter code	
Module no.	<b>541266</b>		<b>541279</b>				
Series	Standard				<b>MS</b>	MS	
Size	4	6				...	
Function	On/off valve, manual				<b>-EM1</b>	-EM1	
Pneumatic connection	Female thread G1/8	-		[1]	<b>-1/8</b>		
	Female thread G1/4	Female thread G1/4		[1]	<b>-1/4</b>		
	-	Female thread G3/8		[1]	<b>-3/8</b>		
	-	Female thread G1/2		[1]	<b>-1/2</b>		
	Connecting plate G1/8	-			<b>-AGA</b>		
	Connecting plate G1/4	Connecting plate G1/4			<b>-AGB</b>		
	Connecting plate G3/8	Connecting plate G3/8			<b>-AGC</b>		
	-	Connecting plate G1/2			<b>-AGD</b>		
	-	Connecting plate G3/4			<b>-AGE</b>		
	Connecting plate 1/8 NPT	-		[1]	<b>-AQK</b>		
	Connecting plate 1/4 NPT	Connecting plate 1/4 NPT		[1]	<b>-AQN</b>		
	Connecting plate 3/8 NPT	Connecting plate 3/8 NPT		[1]	<b>-AQP</b>		
	-	Connecting plate 1/2 NPT		[1]	<b>-AQR</b>		
	-	Connecting plate 3/4 NPT		[1]	<b>-AQS</b>		
Rotary knob colour	Standard (black/blue)						
	Red				<b>-R</b>		
Silencer	None						
	Silencer				<b>-S</b>		
Pressure gauge/pressure gauge alternatives	None						
	MS pressure gauge, bar				<b>-AG</b>		
	Adapter for EN pressure gauge 1/8, without pressure gauge	-			<b>-A8</b>		
	Adapter for EN pressure gauge 1/4, without pressure gauge				<b>-A4</b>		
	Integrated pressure gauge, red/green scale				<b>-RG</b>		
	Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/O contact				[1] [2]	<b>-AD7</b>	
	Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/C contact				[1] [2]	<b>-AD8</b>	
	Pressure sensor with status indicator, plug M8, window comparator, PNP, N/O contact				[1] [2]	<b>-AD9</b>	
Pressure sensor with status indicator, plug M8, window comparator, PNP, N/C contact				[1] [2]	<b>-AD10</b>		
Alternative pressure gauge scale	None						
	psi				[3]	<b>-PSI</b>	
	MPa				[4]	<b>-MPA</b>	

[1] 1/8; 1/4; 3/8; 1/2, AQK, AQN, AQP, AQR, AQS, AD7 ... AD10, WPM

[2] AD7 ... AD10 Measuring range max. 10 bar.

[3] PSI Only in combination with pressure gauge AG.

[4] MPA Only in combination with pressure gauge AG or RG.

## Ordering data – Modular product system

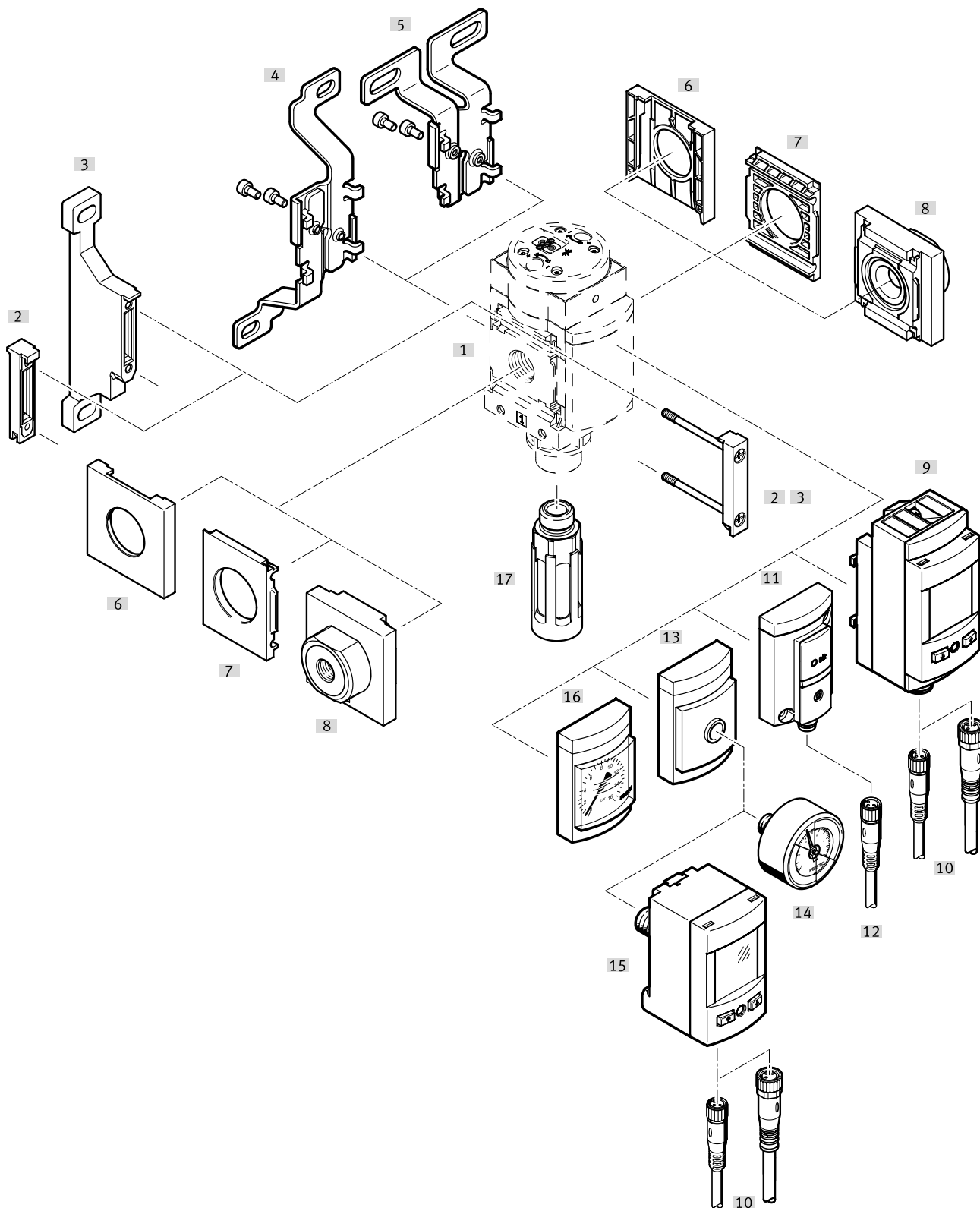
Ordering table		Grid dimension	[mm]	40	62	Conditions	Code	Enter code
Type of mounting	Without mounting bracket							
	Mounting bracket standard design					[5]	<b>-WP</b>	
	Mounting bracket for hooking in service unit components					[1] [5]	<b>-WPM</b>	
	Mounting bracket centrally at rear (wall mounting top and bottom), connecting plates not required						<b>-WB</b>	
	Mounting bracket centrally at rear (wall mounting top), connecting plates not required				-		<b>-WBM</b>	
EU certification	None							
	II 2GD to EU Explosion Protection Directive (ATEX)						<b>-EX4</b>	
UL certification	None							
	cULus, ordinary location for Canada and USA						<b>-UL1</b>	
Flow direction	Flow direction from left to right							
	Flow direction from right to left						<b>-Z</b>	

[1] 1/8; 1/4; 3/8; Not with EU EX4 certification.

1/2, AQK, AQN,  
AQR, AQR, AQS,  
AD7 ... AD10,  
WPM

[5] WP, WPM Only with connecting plate AGA, AGB, AGC, AGD, AGE, AQK, AQN, AQR, AQR or AQS.

Peripherals overview



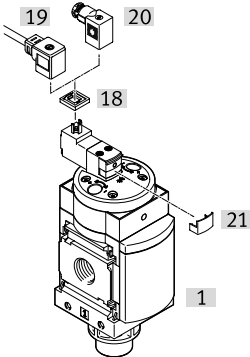
**Note**

Additional accessories:

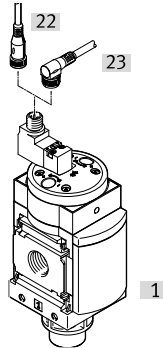
- Module connector for combination with size MS4/MS6 or size MS9  
→ Internet: amv, rmv, armv
- Adapter for mounting on profiles  
→ Internet: ipm-80, ipm-40-80, ipm-80-80

## Peripherals overview

Supply voltage  
[V24], [V24P], [10V24], [10V24C],  
[V110], [V230]



Supply voltage  
[10V24D], [10V24F], [10V24P]



Mounting attachments and accessories		Order code	→ Page/Internet
[1]	On/off valve	MS4/6-EE	24
<b>Can be ordered via the modular product system</b>			
[3]	Mounting bracket	[WP]	32
	Mounting bracket (not shown)	[WPM]	
[4]	Mounting bracket	[WB]	
[5]	Mounting bracket	[WBM]	
[8]	Connecting plate SET <sup>1)</sup>	[AG...]	
	Connecting plate SET <sup>1)</sup>	[AQ...]	
[9]	Pressure sensor SPAU with LCD display	[AD11], [AD12]	
[11]	Pressure sensor SDE5 with status indicator	[AD7], [AD8], [AD9], [AD10]	
[13]	Adapter for EN pressure gauge 1/8, 1/4	[A8], [A4]	
[16]	MS pressure gauge	[AG], [RG]	
[17]	Silencer	[S]	
<b>Can be ordered as accessories</b>			
[2]	Module connector	MS4/6-MV	ms4-mv, ms6-mv
[3]	Mounting bracket	MS4/6-WP	ms4-wp, ms6-wp
	Mounting bracket (not shown)	MS4/6-WPB/WPE/WPM	ms4-wp, ms6-wp
[4]	Mounting bracket	MS4/6-WB	ms4-wb, ms6-wb
[5]	Mounting bracket	MS4-WBM	ms4-wbm
[6]	Cover cap	MS4/6-END	ms4-end, ms6-end
[7]	Mounting plate <sup>2)</sup>	MS4/6-AEND	ms4-aend, ms6-aend
[8]	Connecting plate SET <sup>2)</sup>	MS4/6-AG...	ms4-ag, ms6-ag
[10]	Connecting cable	NEBA-M8...-LE4, NEBA-M12...-LE4	103
[12]	Connecting cable	NEBA-M8...-LE3	103
[14]	Pressure gauge	MA	103
[15]	Pressure sensor	SPAU...-T	102
[17]	Silencer	U	103
[18]	Illuminating seal	MEB-LD	102
[19]	Plug socket with cable	KMEB	102
[20]	Plug socket <sup>3)</sup>	MSSD-EB	102
[21]	Locking clip	CPV18-HV	102
[22]	Connecting cable	NEBA-M12G5	103
[23]	Connecting cable	NEBA-M12W5	103

1) Module connector [2] is included in the scope of delivery.

2) Module connector MS4/6-MV [2] or mounting bracket MS4/6-WP, WPB, WPE, WPM [3] is required for mounting.

3) For on/off valve MS...V24P and MS...V24...-EX2, the plug socket is included in the scope of delivery.

## Type codes

<b>001</b>	<b>Series</b>
<b>MS</b>	MS series

<b>002</b>	<b>Size</b>
<b>4</b>	Grid dimension 40 mm

<b>003</b>	<b>Function</b>
<b>EE</b>	On/off valve, electric

<b>004</b>	<b>Pneumatic connection</b>
<b>1/8</b>	Female thread G1/8
<b>1/4</b>	Female thread G1/4
<b>AGA</b>	Sub-base G1/8
<b>AGB</b>	Sub-base G1/4
<b>AGC</b>	Sub-base G3/8
<b>AQK</b>	Sub-base 1/8 NPT
<b>AQN</b>	Sub-base 1/4 NPT
<b>AQP</b>	Sub-base 3/8 NPT

<b>005</b>	<b>Supply voltage</b>
<b>V230</b>	230 V AC (connection pattern to EN 175301)
<b>10V24</b>	24 V DC, 10 bar, connection pattern to EN 175301
<b>V110</b>	110 V AC (connection pattern to EN 175301)
<b>10V24C</b>	24 V DC, 10 bar (connection pattern to EN 175301) without manual override
<b>10V24D</b>	24V DC, 10 bar, M12 (connection pattern according to IEC 61076-2-101) without manual override
<b>10V24F</b>	24 V DC, 10 bar, M12 (connection pattern to IEC 61076-2-101). Non-detenting manual override on the pilot actuator
<b>10V24P</b>	24 V DC, 10 bar, M12 (connection pattern to IEC 61076-2-101)
<b>V24</b>	24 V DC (connection pattern to EN 175301)
<b>V24P</b>	24 V DC plug, M12 socket adapter (connection pattern to IEC 61076-2-101)

<b>006</b>	<b>Silencer</b>
	None
<b>S</b>	Silencer

<b>007</b>	<b>Pressure gauge alternatives</b>
	None
<b>A4</b>	Adapter for EN pressure gauge 1/4, without pressure gauge
<b>A8</b>	Adapter for EN pressure gauge 1/8, without pressure gauge
<b>AD7</b>	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/O
<b>AD8</b>	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/C
<b>AD9</b>	Pressure sensor with switching display, M8 plug, window comparator, PNP, N/O
<b>AD10</b>	Pressure sensor with operational status indicator, M8 plug, window comparator, PNP, N/C
<b>AD11</b>	Pressure sensor with LCD display, M12 plug, 4-pin, IO-Link®, PNP, NPN, 0...10 V, 1...5 V, 4...20 mA
<b>AD12</b>	Pressure sensor with LCD display, M8 plug, 4-pin, IO-Link®, PNP, NPN, 0...10 V, 1...5 V, 4...20 mA
<b>AG</b>	MS pressure gauge
<b>RG</b>	Integrated pressure gauge, red/green scale

<b>008</b>	<b>Alternative pressure gauge scale</b>
	MS pressure gauge
<b>PSI</b>	psi
<b>MPA</b>	MPa

<b>009</b>	<b>Type of mounting</b>
	Without mounting bracket
<b>WP</b>	Mounting bracket basic design
<b>WPM</b>	Mounting bracket for hooking in service unit components
<b>WB</b>	Mounting centrally at rear (wall mounting top and bottom), connecting plates not required
<b>WBM</b>	Mounting centrally at rear (wall mounting top), connecting plates not required

<b>010</b>	<b>EU certification</b>
	None
<b>EX2</b>	II 3GD

<b>011</b>	<b>UL certification</b>
	None
<b>UL1</b>	cULus ordinary location for Canada and USA

<b>012</b>	<b>Flow direction</b>
	Flow direction from left to right
<b>Z</b>	Flow direction from right to left

## Type codes

001 Series	
<b>MS</b>	MS series
002 Size	
<b>6</b>	Grid dimension 62 mm
003 Function	
<b>EE</b>	On/off valve, electric
004 Pneumatic connection	
<b>1/4</b>	Female thread G1/4
<b>3/8</b>	Female thread G3/8
<b>1/2</b>	Female thread G1/2
<b>AGB</b>	Sub-base G1/4
<b>AGC</b>	Sub-base G3/8
<b>AGD</b>	Sub-base G1/2
<b>AGE</b>	Sub-base G3/4
<b>AQN</b>	Sub-base 1/4 NPT
<b>AQP</b>	Sub-base 3/8 NPT
<b>AQR</b>	Sub-base 1/2 NPT
<b>AQS</b>	Sub-base 3/4 NPT
005 Supply voltage	
<b>V230</b>	230 V AC (connection pattern to EN 175301)
<b>10V24</b>	24 V DC, 10 bar, connection pattern to EN 175301
<b>V110</b>	110 V AC (connection pattern to EN 175301)
<b>10V24C</b>	24 V DC, 10 bar (connection pattern to EN 175301) without manual override
<b>10V24D</b>	24 V DC, 10 bar, M12 (connection pattern according to IEC 61076-2-101) without manual override
<b>10V24F</b>	24 V DC, 10 bar, M12 (connection pattern to IEC 61076-2-101). Non-detenting manual override on the pilot actuator
<b>10V24P</b>	24 V DC, 10 bar, M12 (connection pattern to IEC 61076-2-101)
<b>V24</b>	24 V DC (connection pattern to EN 175301)
<b>V24P</b>	24 V DC plug, M12 socket adapter (connection pattern to IEC 61076-2-101)
006 Silencer	
	None
<b>S</b>	Silencer

007 Pressure gauge alternatives	
	None
<b>A4</b>	Adapter for EN pressure gauge 1/4, without pressure gauge
<b>A8</b>	Adapter for EN pressure gauge 1/8, without pressure gauge
<b>AD7</b>	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/O
<b>AD8</b>	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/C
<b>AD9</b>	Pressure sensor with switching display, M8 plug, window comparator, PNP, N/O
<b>AD10</b>	Pressure sensor with operational status indicator, M8 plug, window comparator, PNP, N/C
<b>AD11</b>	Pressure sensor with LCD display, M12 plug, 4-pin, IO-Link®, PNP, NPN, 0...10 V, 1...5 V, 4...20 mA
<b>AD12</b>	Pressure sensor with LCD display, M8 plug, 4-pin, IO-Link®, PNP, NPN, 0...10 V, 1...5 V, 4...20 mA
<b>AG</b>	MS pressure gauge
<b>RG</b>	Integrated pressure gauge, red/green scale

008 Alternative pressure gauge scale	
	MS pressure gauge
<b>PSI</b>	psi
<b>MPA</b>	MPa

009 Type of mounting	
	Without mounting bracket
<b>WP</b>	Mounting bracket basic design
<b>WPM</b>	Mounting bracket for hooking in service unit components
<b>WB</b>	Mounting centrally at rear (wall mounting top and bottom), connecting plates not required

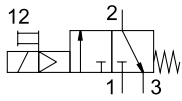
010 EU certification	
	None
<b>EX2</b>	II 3GD

011 UL certification	
	None
<b>UL1</b>	cULus ordinary location for Canada and USA

012 Flow direction	
	Flow direction from left to right
<b>Z</b>	Flow direction from right to left

## Datasheet

### Function



- Flow rate  
1000 ... 7000 l/min
- Temperature range  
-10 ... +60 °C
- Operating pressure  
4 ... 18 bar
- [www.festo.com](http://www.festo.com)



- Electrically actuated on/off valve for pressurising and exhausting pneumatic systems
- With solenoid coil, without plug socket
- Choice of three voltage ranges
- Ducted exhaust is possible via a threaded connection with silencer
- Manual override: non-detenting and detenting (variant 10V24/10V24F non-detenting only)
- Solenoid actuator can be repositioned by 180°
- Optional pressure sensor
- Optional device variant EX2 for use in potentially explosive areas in zones 2 and 22

### General technical data

Size	MS4	MS6
Pneumatic connection 1, 2		
Female thread	G1/8 or G1/4	G1/4, G3/8 or G1/2
Connecting plate [AG...]	G1/8, G1/4 or G3/8	G1/4, G3/8, G1/2 or G3/4
[AQ...]	1/8 NPT, 1/4 NPT or 3/8 NPT	1/4 NPT, 3/8 NPT, 1/2 NPT or 3/4 NPT
Pneumatic connection 3	G1/4	G1/2
Design	Piston spool valve	
Lap	Overlap	
Type of mounting	With accessories In-line installation	
Mounting position	Any <sup>1)</sup>	
Pressure indication	Via pressure sensor for indicating the output pressure and electrical output via LCD display Via pressure sensor for indicating the status of the output pressure and the electrical output Via pressure gauge for displaying the output pressure Via pressure gauge with red/green scale for indicating the output pressure Prepared for G1/8 Prepared for G1/4	
Valve function	3/2-way valve, closed, single solenoid	
Exhaust function	Cannot be throttled	
Manual override	Electrical	
With supply voltage [10V24], [10V24F]	Non-detenting	
[V24], [V24P], [10V24P], [V110], [V230]	Non-detenting/detenting	
[10V24C], [10V24D]	None	
Actuation type		
Reset method	Mechanical spring	
Switching position indication	With accessories	
Type of actuation	Piloted	
Pilot air supply	Internal	
Flow direction	Not reversible	

1) The on/off valve must be mounted vertically when combined with a pressure sensor as condensate must not collect in the pressure sensor.

† Note: This product conforms to ISO 1179-1 and ISO 228-1.



## Datasheet

Electrical data		
Characteristic coil data		
With supply voltage	[V24], [V24P]	24 V DC: 1.5 W; permissible voltage fluctuations -25%/+10%
	[10V24...]	24 V DC: 1.8 W; permissible voltage fluctuations -15%/+10%
	[V110]	110 V AC: 50/60 Hz; pick-up power 3.0 VA; holding power 2.4 VA; permissible voltage fluctuations ±10%
	[V230]	230 V AC: 50/60 Hz; pick-up power 3.0 VA; holding power 2.4 VA; permissible voltage fluctuations -14%/+10%
Electrical connection		
With supply voltage	[V24], [10V24], [10V24C], [V110], [V230]	Plug, square design to EN 175301-803, type C
	[V24P], [10V24D], [10V24F], [10V24P]	M12x1 to ISO 20401 in line with IEC 61076-2-101
Degree of protection for solenoid coil		IP65
Duty cycle [%]		100

Characteristic flow rate values					
Size	MS4			MS6	
Pneumatic connection 1, 2	G1/8	G1/4	G1/4	G3/8	G1/2
Standard nominal flow rate $q_{nN^{1)}$ [l/min]					
In main flow direction 1 → 2	1000	2000	2600	5500	7000
In relief direction 2 → 3	1600	1600	7000	6200	5500
C value [l/s*min]					
In main flow direction 1 → 2	4.5	9.5	11.0	22.0	29.0
b value					
In main flow direction 1 → 2	0.5	0.44	0.5	0.5	0.4

1) Measured at  $p_1 = 6$  bar and  $p_2 = 5$  bar,  $\Delta p = 1$  bar.

Operating and environmental conditions							
Size	MS4			MS6			
On/off valve	Without pressure sensor			With pressure sensor	Without pressure sensor		With pressure sensor
Supply voltage	[V110], [V230], [V24P], [V24]	[V24]	[V24P], [10V24...]		[V110], [V230], [V24P], [V24]	[V24], [V24P], [10V24...]	
Operating pressure [bar]	4 ... 14	4 ... 10		4 ... 18	4 ... 10		
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4] Inert gases						
Note on the operating/pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)						
Ambient temperature [°C]	-10 ... +60	-10 ... +50	0 ... +50	-10 ... +60	-10 ... +50	0 ... +50	
Temperature of medium [°C]	-10 ... +60	-10 ... +50	0 ... +50	-10 ... +60	-10 ... +50	0 ... +50	
Corrosion resistance class CRC <sup>1)</sup>	2 - Moderate corrosion stress						
Food-safe <sup>2)</sup>	See supplementary material information (except for solenoid valve)						
UL certification <sup>2)</sup>	-			c UL us - Recognized (OL)	-		c UL us - Recognized (OL)
CE marking (see declaration of conformity) <sup>2)</sup>	To EU EMC Directive To EU Low Voltage Directive To EU RoHS Directive						
UKCA marking (see declaration of conformity) <sup>2)</sup>	To UK instructions for EMC To UK RoHS instructions To UK regulations for electrical equipment						
KC marking	-			KC EMC	-		KC EMC

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

2) More information: [www.festo.com/catalogue/ms-ee](http://www.festo.com/catalogue/ms-ee) → Support/Downloads.

## Datasheet

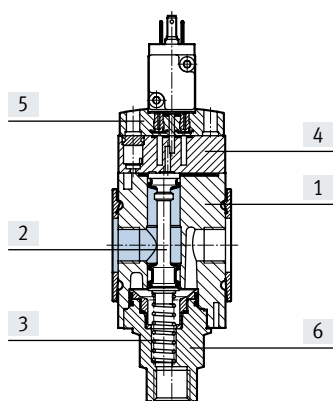
ATEX	
EU certification	[EX2]
ATEX category for gas	II 3G
Type of (ignition) protection for gas	Ex nA IIC T4 X Gc
ATEX category for dust	II 3D
Type of (ignition) protection for dust	Ex tc IIIC T105°C IP65 Dc X
Explosion ambient temperature	-10°C ≤ Ta ≤ +60 °C
CE marking (see declaration of conformity) <sup>1)</sup>	To EU Explosion Protection Directive (ATEX)
UKCA marking (see declaration of conformity) <sup>1)</sup>	To UK EX instructions
Explosion protection certification outside the EU	EPL Dc (GB)
	EPL Gc (GB)

1) More information: [www.festo.com/catalogue/ms-ee](http://www.festo.com/catalogue/ms-ee) → Support/Downloads.

Weight [g]		
Size	MS4	MS6
On/off valve	273	740
On/off valve with silencer	289	816

### Materials

Sectional view

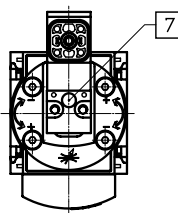
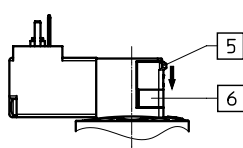
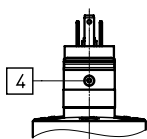


On/off valve		
[1]	Housing	Die-cast aluminium
[2]	Piston	NBR/aluminium
[3]	Springs	High-alloy stainless steel
[4]	End cover	PA
[5]	Plate	PA
[6]	Socket end connection	PA
-	Seals	NBR
Note on materials		RoHS-compliant
LABS (PWIS) conformity		VDMA24364-B1/B2-L

### Manual override

[V24], [V24P], [V110], [V230] Supply voltage

[10V24], [10V24F], [10V24P] Supply voltage



[4] Manual override: non-detenting (as supplied)

[5] Spool

[6] Cover

-  - **Note**

For detenting manual override, remove the grey cover [6] and push the spool [5] downwards.

[7] Detenting and non-detenting manual override.

[10V24] and [10V24F] non-detenting only.

# Datasheet

## Dimensions – Basic version

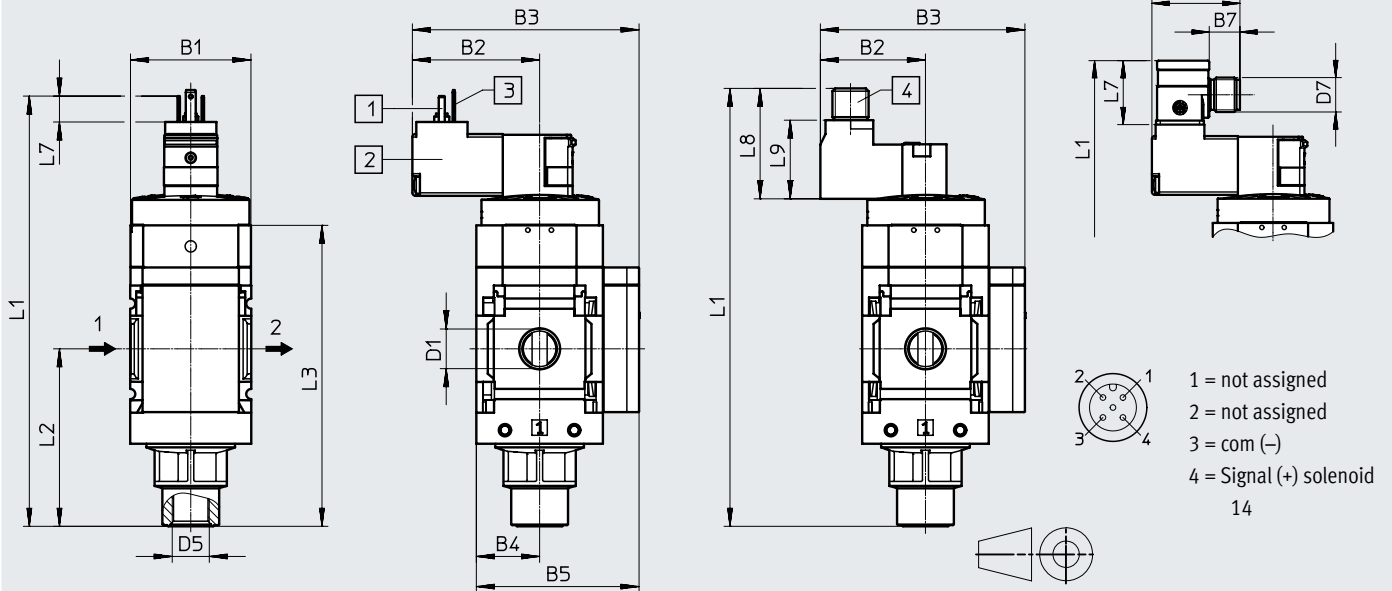
Download CAD data → [www.festo.com](http://www.festo.com)

With female thread, with cover plate

[V24], [10V24], [10V24C], [V110], [V230]  
Supply voltage

[10V24D], [10V24F], [10V24P]  
Supply voltage

[V24P]  
Supply voltage



[1] Plug connection to EN 175301-803

[2] Solenoid actuator can be repositioned by 180°, i.e. solenoid points to the front  
[3] PIN for solenoid actuators 110 V and 230 V only

[4] Electrical connection M12x1 to ISO 20401 conforming to IEC 61076-2-101, 4-pin version for connecting cable NEBA-M12

→ Flow direction

Type	B1	B2		B3		B4	B5	B6	B7	D1	D5	D7
		[V24] [V24P] [V110] [V230]	[10V24] [10V24C] [10V24D] [10V24F] [10V24P]	[V24] [V24P] [V110] [V230]	[10V24] [10V24C] [10V24D] [10V24F] [10V24P]							

MS4-...												
MS4-EE-1/8	40	42	35	75	68	21	54	31	11	G1/8	G1/4	M12x1
MS4-EE-1/4										G1/4		
MS6-...												
MS6-EE-1/4	62	52	45	97	90	31	76	31	11	G1/4	G1/2	M12x1
MS6-EE-3/8										G3/8		
MS6-EE-1/2										G1/2		

Type	L1					L2	L3	L7		L8	L9	
	[V24] [V110] [V230]	[V24P]	[V24-EX2]	[10V24] [10V24C]	[10V24D] [10V24F] [10V24P]			[V24P]	[V24-EX2]			
MS4-...												
MS4-EE-1/8	142.8	156 <sup>1)</sup>	160 <sup>1)</sup>	140	145	59	100	8.6	22 <sup>1)</sup>	26 <sup>1)</sup>	37	26
MS4-EE-1/4												
MS6-...												
MS6-EE-1/4	186	199 <sup>1)</sup>	203 <sup>1)</sup>	183	188	84	143	8.6	22 <sup>1)</sup>	26 <sup>1)</sup>	37	27.5
MS6-EE-3/8												
MS6-EE-1/2												

1) Measured with plug socket MSSD-EB (included in the scope of delivery).

† Note: This product conforms to ISO 1179-1 and ISO 228-1.

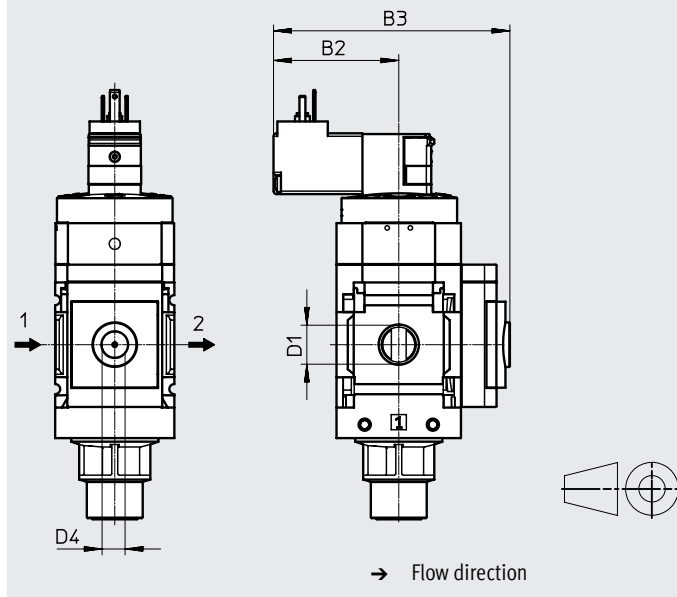
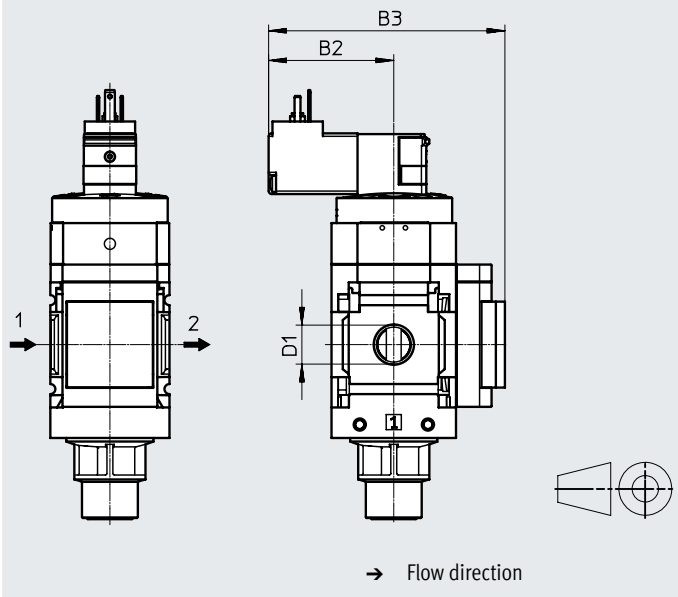
Datasheet

Dimensions – Pressure gauges/pressure gauge alternatives

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- [AG] Integrated MS pressure gauge with standard scale
- [RG] Integrated MS pressure gauge with red/green scale

- [A8] Adapter for EN pressure gauge 1/8, without pressure gauge
- [A4] Adapter for EN pressure gauge 1/4, without pressure gauge



Type	B2		B3		D1	D4
	[V24] [V24P] [V110] [V230]	[10V24] [10V24C] [10V24D] [10V24F] [10V24P]	[V24] [V24P] [V110] [V230]	[10V24] [10V24C] [10V24D] [10V24F] [10V24P]		
<b>MS4-...</b>						
MS4-EE-1/8-...-AG	42	35	86	79	G1/8	-
MS4-EE-1/4-...-AG					G1/4	
MS4-EE-1/8-...-RG	42	35	87.5	80.5	G1/8	-
MS4-EE-1/4-...-RG					G1/4	
MS4-EE-1/8-...-A8	42	35	79.5	72.5	G1/8	G1/8
MS4-EE-1/4-...-A8					G1/4	
MS4-EE-1/8-...-A4	42	35	79.5	72.5	G1/8	G1/4
MS4-EE-1/4-...-A4					G1/4	
<b>MS6-...</b>						
MS6-EE-1/4-...-AG	52	45	98	91	G1/4	-
MS6-EE-3/8-...-AG					G3/8	
MS6-EE-1/2-...-AG					G1/2	
MS6-EE-1/4-...-RG	52	45	99.5	92.5	G1/4	-
MS6-EE-3/8-...-RG					G3/8	
MS6-EE-1/2-...-RG					G1/2	
MS6-EE-1/4-...-A8	52	45	99.5	92.5	G1/4	G1/8
MS6-EE-3/8-...-A8					G3/8	
MS6-EE-1/2-...-A8					G1/2	
MS6-EE-1/4-...-A4	52	45	99.5	92.5	G1/4	G1/4
MS6-EE-3/8-...-A4					G3/8	
MS6-EE-1/2-...-A4					G1/2	

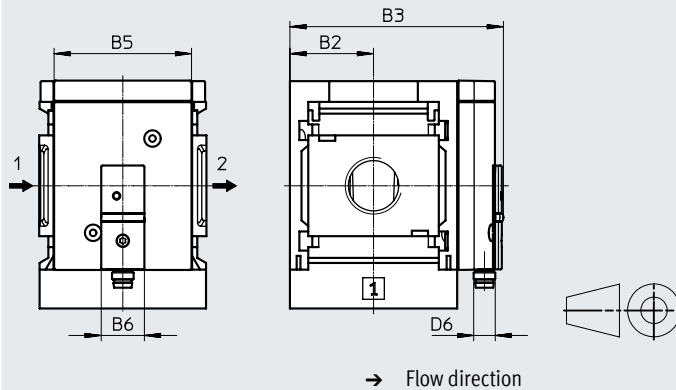
Datasheet

**Dimensions – Pressure sensor**

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

[AD7], [AD8], [AD9], [AD10] Pressure sensor with status indicator

Datasheets → Internet: sde5



[AD7]:  
SDE5-D10-O-...-P-M8 with 1x 3-pin M8 plug, threshold value comparator, 1 switching output PNP, N/O contact

[AD9]:  
SDE5-D10-O3-...-P-M8 with 1x 3-pin M8 plug, window comparator, 1 switching output PNP, N/O contact

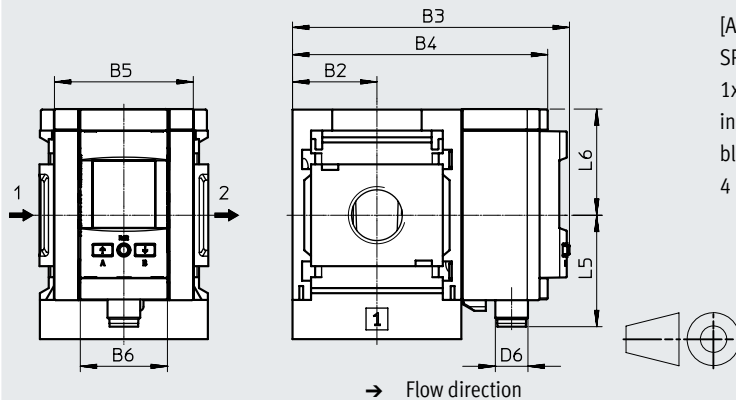
[AD8]:  
SDE5-D10-C-...-P-M8 with 1x 3-pin M8 plug, threshold value comparator, 1 switching output PNP, N/C contact

[AD10]:  
SDE5-D10-C3-...-P-M8 with 1x 3-pin M8 plug, window comparator, 1 switching output PNP, N/C contact

→ Flow direction

[AD11], [AD12] Pressure sensor with LCD display

Datasheets → Internet: spau



[AD11]:  
SPAU-P10R-MS...-L-PNLK-M12D with 1x 4-pin M12 plug, A-coded, switching output 2x PNP or 2x NPN switchable and 0 ... 10 V, 1 ... 5 V, 4 ... 20 mA analogue

[AD12]:  
SPAU-P10R-MS...-L-PNLK-M8D with 1x 4-pin M8 plug, A-coded, switching output 2x PNP or 2x NPN switchable and 0 ... 10 V, 1 ... 5 V, 4 ... 20 mA analogue

→ Flow direction

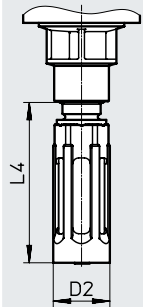
Type	B2	B3	B4	B5	B6	D6	L5	L6
<b>MS4-...</b>								
MS4-...AD7, AD8, AD9, AD10	21	59.1	-	~32	16	M8x1	-	-
MS4-...AD11	21	81.2	73.3	32	32	M12x1	41.2	39
MS4-...AD12						M8x1	37.9	
<b>MS6-...</b>								
MS6-...AD7, AD8, AD9, AD10	31	79.1	-	~51	16	M8x1	-	-
MS6-...AD11	31	101.8	93.7	51	32	M12x1	41.2	39
MS6-...AD12						M8x1	37.9	

## Datasheet

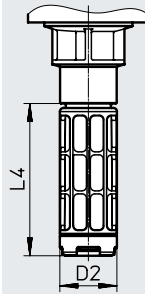
### Dimensions – Silencer

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

[S] Silencer



[S] Silencer  
[EX2] EU certification



Type	D2	L4
<b>MS4-...</b>		
MS4-EE-...S	20	55
MS4-EE-...S-...EX2	19	50.7
<b>MS6-...</b>		
MS6-EE-...S	28	108
MS6-EE-...S-...EX2	43	80

## Datasheet

## ★ Core Range

Ordering data					
Size	Connection	Supply voltage	Flow direction	Part no.	Type
MS4	G1/4	24 V DC	From left to right	★ 542578	MS4-EE-1/4-10V24
MS6	G1/2	24 V DC	From left to right	★ 542582	MS6-EE-1/2-10V24
With silencer					
MS4	G1/4	24 V DC	From left to right	★ 542598	MS4-EE-1/4-10V24-S
MS6	G1/2	24 V DC	From left to right	★ 542602	MS6-EE-1/2-10V24-S

Ordering data					
Size	Connection	Supply voltage	Flow direction	Part no.	Type
MS4	G1/8	24 V DC	From left to right	542580	MS4-EE-1/8-10V24
	G1/4	24 V DC	From right to left	542579	MS4-EE-1/4-10V24-Z
		110 V AC	From left to right	529535	MS4-EE-1/4-V110
		230 V AC	From left to right	529537	MS4-EE-1/4-V230
MS6	G1/4	24 V DC	From left to right	542584	MS6-EE-1/4-10V24
	G3/8	24 V DC	From left to right	542586	MS6-EE-3/8-10V24
	G1/2	24 V DC	From right to left	542583	MS6-EE-1/2-10V24-Z
		110 V AC	From left to right	529823	MS6-EE-1/2-V110
		230 V AC	From left to right	529825	MS6-EE-1/2-V230
	With silencer				
MS4	G1/8	24 V DC	From left to right	542600	MS4-EE-1/8-10V24-S
	G1/4	24 V DC	From right to left	542599	MS4-EE-1/4-10V24-S-Z
		110 V AC	From left to right	538719	MS4-EE-1/4-V110-S
MS6	G1/4	24 V DC	From left to right	542604	MS6-EE-1/4-10V24-S
	G3/8	24 V DC	From left to right	542606	MS6-EE-3/8-10V24-S
	G1/2	24 V DC	From right to left	542603	MS6-EE-1/2-10V24-S-Z
		110 V AC	From left to right	538731	MS6-EE-1/2-V110-S

Ordering data – Modular product system

Ordering table						
Grid dimension	[mm]	40	62	Conditions	Code	Enter code
Module no.		<b>527709</b>	<b>527682</b>			
Series		Standard			<b>MS</b>	MS
Size		4	6		...	
Function		On/off valve, electric			<b>-EE</b>	-EE
Pneumatic connection	Female thread G1/8	-		[1]	<b>-1/8</b>	
	Female thread G1/4	Female thread G1/4		[1]	<b>-1/4</b>	
	-	Female thread G3/8		[1]	<b>-3/8</b>	
	-	Female thread G1/2		[1]	<b>-1/2</b>	
	Connecting plate G1/8	-			<b>-AGA</b>	
	Connecting plate G1/4	Connecting plate G1/4			<b>-AGB</b>	
	Connecting plate G3/8	Connecting plate G3/8			<b>-AGC</b>	
	-	Connecting plate G1/2			<b>-AGD</b>	
	-	Connecting plate G3/4			<b>-AGE</b>	
	Connecting plate 1/8 NPT	-		[1]	<b>-AQK</b>	
	Connecting plate 1/4 NPT	Connecting plate 1/4 NPT		[1]	<b>-AQN</b>	
	Connecting plate 3/8 NPT	Connecting plate 3/8 NPT		[1]	<b>-AQP</b>	
	-	Connecting plate 1/2 NPT		[1]	<b>-AQR</b>	
	-	Connecting plate 3/4 NPT		[1]	<b>-AQS</b>	
Supply voltage	24 V DC (plug pattern to EN 175301)	4 ... 14 bar   4 ... 18 bar			<b>-V24</b>	
	24 V DC, M12x1 to ISO 20401 in line with IEC 61076-2-101	4 ... 14 bar   4 ... 18 bar		[1]	<b>-V24P</b>	
	24 V DC (plug pattern to EN 175301), 4 ... 10 bar, manual override non-detenting			[1] [2]	<b>-10V24</b>	
	24 V DC (plug pattern to EN 175301), 4 ... 10 bar, no manual override			[1] [2]	<b>-10V24C</b>	
	24 V DC, M12x1 to ISO 20401 in line with IEC 61076-2-101, 4 ... 10 bar, no manual override			[1] [2]	<b>-10V24D</b>	
	24 V DC, M12x1 to ISO 20401 in line with IEC 61076-2-101, 4 ... 10 bar, manual override non-detenting			[1] [2]	<b>-10V24F</b>	
	24 V DC, M12x1 to ISO 20401 in line with IEC 61076-2-101, 4 ... 10 bar, manual override non-detenting/detenting			[1] [2]	<b>-10V24P</b>	
	110 V AC (plug pattern to EN 175301)	4 ... 14 bar   4 ... 18 bar		[1]	<b>-V110</b>	
	230 V AC (plug pattern to EN 175301)	4 ... 14 bar   4 ... 18 bar		[1]	<b>-V230</b>	

[1] 1/8; 1/4; 3/8; Not with EU EX2 certification.  
 1/2, AQK, AQN,  
 AQP, AQR, AQS,  
 V24P, 10V24,  
 10V24C, 10V24D,  
 10V24F, 10V24P,  
 V110, V230,  
 AD7 ... AD12,  
 WPM

[2] 10V24, 10V24C, Max. operating pressure: 10 bar.  
 10V24D, 10V24F,  
 10V24P



## Ordering data – Modular product system

Ordering table		Grid dimension	[mm]	40	62	Conditions	Code	Enter code
Silencer	None							
	Silencer					[3]	-S	
Pressure gauge/pressure gauge alternatives	None							
	MS pressure gauge, bar						-AG	
	Adapter for EN pressure gauge 1/8, without pressure gauge						-A8	
	Adapter for EN pressure gauge 1/4, without pressure gauge						-A4	
	Integrated pressure gauge, red/green scale						-RG	
	Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/O contact					[1] [4]	-AD7	
	Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/C contact					[1] [4]	-AD8	
	Pressure sensor with status indicator, plug M8, window comparator, PNP, N/O contact					[1] [4]	-AD9	
	Pressure sensor with status indicator, plug M8, window comparator, PNP, N/C contact					[1] [4]	-AD10	
	Pressure sensor with LCD display, plug M12, 4-pin, IO-Link®, PNP, NPN, 0... 10 V, 1 ... 5 V, 4 ... 20 mA					[1] [4]	-AD11	
	Pressure sensor with LCD display, plug M8, 4-pin, IO-Link®, PNP, NPN, 0... 10 V, 1 ... 5 V, 4 ... 20 mA					[1] [4]	-AD12	
Alternative pressure gauge scale	None							
	psi					[5]	-PSI	
	MPa					[6]	-MPA	
Type of mounting	Without mounting bracket							
	Mounting bracket standard design					[7]	-WP	
	Mounting bracket for hooking in service unit components					[1] [7]	-WPM	
	Mounting bracket centrally at rear (wall mounting top and bottom), connecting plates not required						-WB	
	Mounting bracket centrally at rear (wall mounting top), connecting plates not required						-WBM	
EU certification	None							
	II 3GD to EU Explosion Protection Directive (ATEX)						-EX2	
UL certification	None							
	cULus, ordinary location for Canada and USA					[8]	-UL1	
Flow direction	Flow direction from left to right							
	Flow direction from right to left						-Z	

[1] 1/8; 1/4; 3/8; Not with EU EX2 certification.

1/2, AQK, AQN,  
AQP, AQR, AQS,  
V24P, 10V24,  
10V24C, 10V24D,  
10V24F, 10V24P,  
V110, V230,  
AD7 ... AD12,  
WPM

[3] S Max. operating pressure 10 bar in combination with EU EX2 certification.

[4] AD7 ... AD12 Measuring range max. 10 bar.

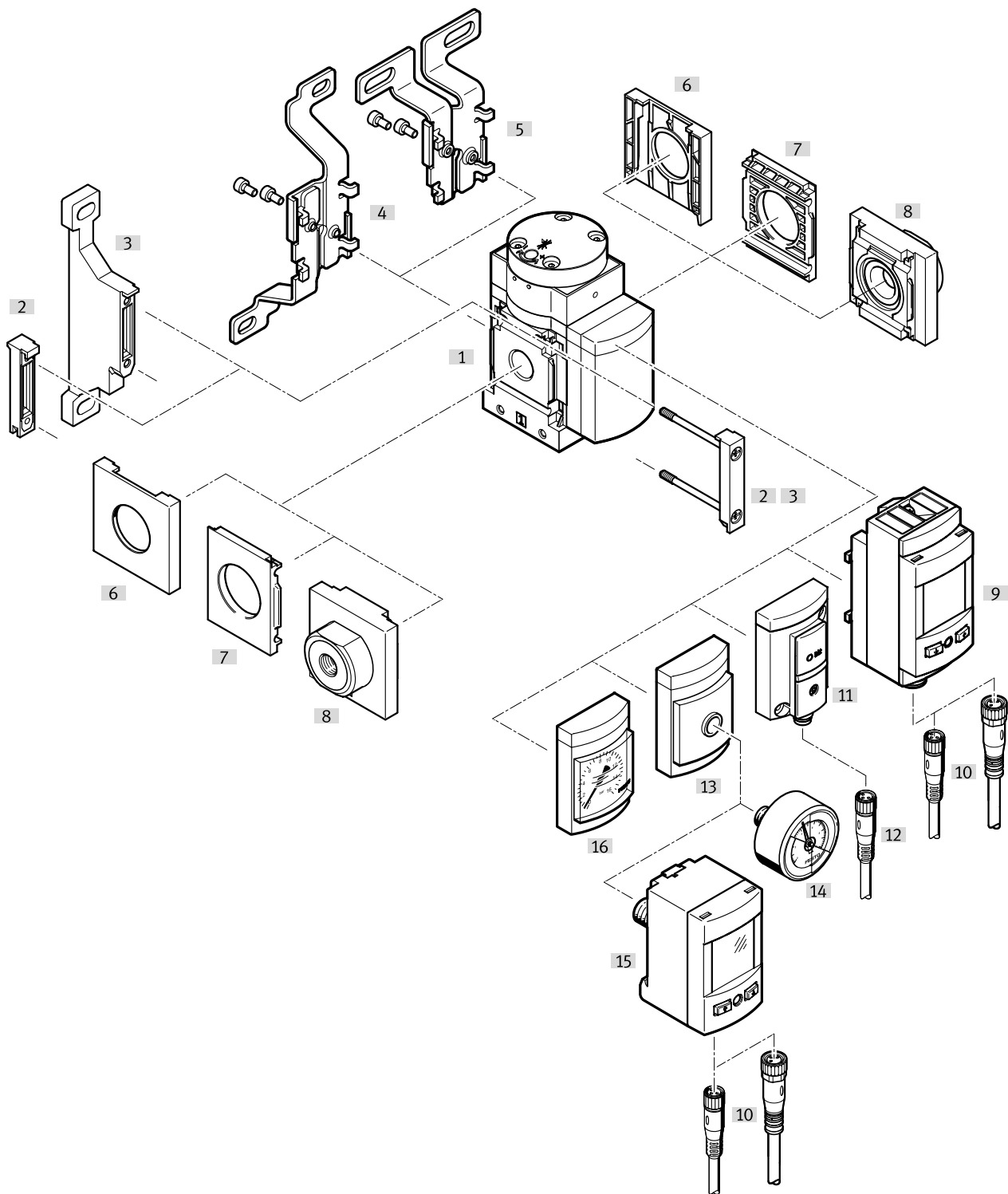
[5] PSI Only in combination with pressure gauge AG.

[6] MPA Only in combination with pressure gauge AG or RG.

[7] WP, WPM Only with connecting plate AGA, AGB, AGC, AGD, AGE, AQK, AQN, AQP, AQR or AQS.

[8] UL1 Not with supply voltage V110, V230.

Peripherals overview



**Note**

Additional accessories:

- Module connector for combination with size MS4/MS6 or size MS9  
→ Internet: amv, rmv, armv
- Adapter for mounting on profiles  
→ Internet: ipm-80, ipm-40-80, ipm-80-80

## Peripherals overview

Mounting attachments and accessories		Order code	→ Page/Internet
[1]	Soft-start valve	MS4/6-DL	38
<b>Can be ordered via the modular product system</b>			
[3]	Mounting bracket	[WP]	44
	Mounting bracket (not shown)	[WPM]	
[4]	Mounting bracket	[WB]	
[5]	Mounting bracket	[WBM]	
[8]	Connecting plate SET <sup>1)</sup>	[AG...]	
	Connecting plate SET <sup>1)</sup>	[AQ...]	
[9]	Pressure sensor SPAU with LCD display	[AD11], [AD12]	
[11]	Pressure sensor SDE5 with status indicator	[AD7], [AD8], [AD9], [AD10]	
[13]	Adapter for EN pressure gauge 1/8, 1/4	[A8], [A4]	
[16]	MS pressure gauge	[AG], [RG]	
<b>Can be ordered as accessories</b>			
[2]	Module connector	MS4/6-MV	ms4-mv, ms6-mv
[3]	Mounting bracket	MS4/6-WP	ms4-wp, ms6-wp
	Mounting bracket (not shown)	MS4/6-WPB/WPE/WPM	ms4-wp, ms6-wp
[4]	Mounting bracket	MS4/6-WB	ms4-wb, ms6-wb
[5]	Mounting bracket	MS4-WBM	ms4-wbm
[6]	Cover cap	MS4/6-END	ms4-end, ms6-end
[7]	Mounting plate <sup>2)</sup>	MS4/6-AEND	ms4-aend, ms6-aend
[8]	Connecting plate SET <sup>2)</sup>	MS4/6-AG...	ms4-ag, ms6-ag
[10]	Connecting cable	NEBA-M8...-LE4, NEBA-M12...-LE4	103
[12]	Connecting cable	NEBA-M8...-LE3	103
[14]	Pressure gauge	MA	103
[15]	Pressure sensor	SPAU-...-T	102

1) Module connector [2] is included in the scope of delivery.

2) Module connector MS4/6-MV [2] or mounting bracket MS4/6-WP, WPB, WPE, WPM [3] is required for mounting.

## Type codes

001	Series
MS	MS series
002	Size
4	Grid dimension 40 mm
003	Function
DL	Soft-start valve, pneumatic
004	Pneumatic connection
1/8	Female thread G1/8
1/4	Female thread G1/4
AGA	Sub-base G1/8
AGB	Sub-base G1/4
AGC	Sub-base G3/8
005	Pressure gauge alternatives
	None
A4	Adapter for EN pressure gauge 1/4, without pressure gauge
A8	Adapter for EN pressure gauge 1/8, without pressure gauge
A8M	Adapter for EN pressure gauge 1/8, with precision pressure gauge
AD7	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/O
AD8	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/C
AD9	Pressure sensor with switching display, M8 plug, window comparator, PNP, N/O
AD10	Pressure sensor with operational status indicator, M8 plug, window comparator, PNP, N/C
AD11	Pressure sensor with LCD display, M12 plug, 4-pin, IO-Link®, PNP, NPN, 0...10 V, 1...5 V, 4...20 mA
AD12	Pressure sensor with LCD display, M8 plug, 4-pin, IO-Link®, PNP, NPN, 0...10 V, 1...5 V, 4...20 mA
AG	MS pressure gauge
RG	Integrated pressure gauge, red/green scale

006	Alternative pressure gauge scale
	MS pressure gauge
PSI	psi
MPA	MPa
007	Type of mounting
	Without mounting bracket
WP	Mounting bracket basic design
WPM	Mounting bracket for hooking in service unit components
WB	Mounting centrally at rear (wall mounting top and bottom), connecting plates not required
WBM	Mounting centrally at rear (wall mounting top), connecting plates not required
008	EU certification
	None
EX2	II 3GD to EU Explosion Protection Directive (ATEX)
EX4	II 2GD
009	UL certification
	None
UL1	cULus ordinary location for Canada and USA
010	Flow direction
	Flow direction from left to right
Z	Flow direction from right to left

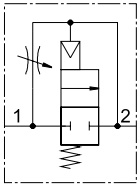
## Type codes




001 Series	
<b>MS</b>	MS series
002 Size	
<b>6</b>	Grid dimension 62 mm
003 Function	
<b>DL</b>	Soft-start valve, pneumatic
004 Pneumatic connection	
<b>1/4</b>	Female thread G1/4
<b>3/8</b>	Female thread G3/8
<b>1/2</b>	Female thread G1/2
<b>AGB</b>	Sub-base G1/4
<b>AGC</b>	Sub-base G3/8
<b>AGD</b>	Sub-base G1/2
<b>AGE</b>	Sub-base G3/4
005 Pressure gauge alternatives	
	None
<b>A4</b>	Adapter for EN pressure gauge 1/4, without pressure gauge
<b>A8</b>	Adapter for EN pressure gauge 1/8, without pressure gauge
<b>AD7</b>	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/O
<b>AD8</b>	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/C
<b>AD9</b>	Pressure sensor with switching display, M8 plug, window comparator, PNP, N/O
<b>AD10</b>	Pressure sensor with operational status indicator, M8 plug, window comparator, PNP, N/C
<b>AD11</b>	Pressure sensor with LCD display, M12 plug, 4-pin, IO-Link®, PNP, NPN, 0...10 V, 1...5 V, 4...20 mA
<b>AD12</b>	Pressure sensor with LCD display, M8 plug, 4-pin, IO-Link®, PNP, NPN, 0...10 V, 1...5 V, 4...20 mA
<b>AG</b>	MS pressure gauge
<b>RG</b>	Integrated pressure gauge, red/green scale

006 Alternative pressure gauge scale	
	MS pressure gauge
<b>PSI</b>	psi
<b>MPA</b>	MPa
007 Type of mounting	
	Without mounting bracket
<b>WP</b>	Mounting bracket basic design
<b>WPM</b>	Mounting bracket for hooking in service unit components
<b>WB</b>	Mounting centrally at rear (wall mounting top and bottom), connecting plates not required
008 EU certification	
	None
<b>EX2</b>	II 3GD to EU Explosion Protection Directive (ATEX)
<b>EX4</b>	II 2GD
009 UL certification	
	None
<b>UL1</b>	cULus ordinary location for Canada and USA
010 Flow direction	
	Flow direction from left to right
<b>Z</b>	Flow direction from right to left

## Datasheet

### Function



-  - Flow rate  
1000 ... 6450 l/min
-  - Temperature range  
-10 ... +60 °C
-  - Operating pressure  
4 ... 18 bar



The duration of the pressure build-up is set using the restrictor attached to the valve cap.

The output pressure p2 rises slowly in accordance with the restrictor setting.

The main seat opens when the switch-through pressure is reached.

- Pneumatically actuated soft-start valve for slowly pressurising and exhausting pneumatic systems (for use with on/off valves EM1 and EE)
- The drives move slowly and reliably into the initial position
- Sudden and erratic movements are avoided
- Main seat opening at approx. 50% of operating pressure
- Adjustable switching time delay
- Optional pressure sensor
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22

General technical data		MS4	MS6
Size			
Pneumatic connection 1, 2			
Female thread		G1/8 or G1/4	G1/4, G3/8 or G1/2
Connecting plate	[AG...]	G1/8, G1/4 or G3/8	G1/4, G3/8, G1/2 or G3/4
	[AQ...]	1/8 NPT, 1/4 NPT or 3/8 NPT	1/4 NPT, 3/8 NPT, 1/2 NPT or 3/4 NPT
Design		Piston seat	
Type of mounting		With accessories In-line installation	
Mounting position		Any <sup>1)</sup>	
Pressure indication		Via pressure sensor for indicating the output pressure and electrical output via LCD display Via pressure sensor for indicating the status of the output pressure and the electrical output Via pressure gauge for displaying the output pressure Via pressure gauge with red/green scale for indicating the output pressure Prepared for G1/8 Prepared for G1/4	
Valve function		2/2-way valve	
Exhaust function		Can be throttled	
Reset method		Mechanical spring	
Type of actuation		Direct	
Pilot air supply		External	
Flow direction		Not reversible	

1) The soft-start valve must be mounted vertically when combined with a pressure sensor as condensate must not collect in the pressure sensor.

† Note: This product conforms to ISO 1179-1 and ISO 228-1.

## Datasheet

Characteristic flow rate values					
Size	MS4			MS6	
Pneumatic connection 1, 2	G1/8	G1/4	G1/4	G3/8	G1/2
Standard nominal flow rate $q_{nN}^{1)}$ [l/min]					
In main flow direction 1 → 2	1000	2000	2800	5050	6450
In relief direction 2 → 1	1000	2000	2800	5050	6400
C value [l/s*min]					
In main flow direction 1 → 2	4.6	9.6	11.22	21.05	28.97
b value					
In main flow direction 1 → 2	0.5	0.45	0.54	0.48	0.39

1) Measured at  $p_1 = 6$  bar and  $p_2 = 5$  bar,  $\Delta p = 1$  bar.

Operating and environmental conditions				
Size	MS4		MS6	
Soft-start valve	Without pressure sensor	With pressure sensor	Without pressure sensor	With pressure sensor
Operating pressure [bar]	4 ... 14 (4 ... 10) <sup>1)</sup>	4 ... 10	4 ... 18 (4 ... 10) <sup>1)</sup>	4 ... 10
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4] Inert gases			
Note on the operating/pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)			
Ambient temperature [°C]	-10 ... +60	0 ... +50	-10 ... +60	0 ... +50
Temperature of medium [°C]	-10 ... +60	0 ... +50	-10 ... +60	0 ... +50
Corrosion resistance class CRC <sup>2)</sup>	2 - Moderate corrosion stress			
Food-safe <sup>3)</sup>	See supplementary material information			
UL certification <sup>3)</sup>	c UL us - Recognized (OL)			

1) Value in brackets applies to MS4/MS6-DL with UL certification.

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

3) More information: [www.festo.com/catalogue/ms-dl](http://www.festo.com/catalogue/ms-dl) → Support/Downloads.

ATEX	
EU certification	EX4
ATEX category for gas	II 2G
Type of (ignition) protection for gas	Ex h IIC T6 Gb X
ATEX category for dust	II 2D
Type of (ignition) protection for dust	Ex h IIIC T60°C Db X
Explosion ambient temperature	$-10^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$
Explosion protection certification outside the EU	EPL Db (GB) EPL Gb (GB)
CE marking (see declaration of conformity) <sup>1)</sup>	To EU Explosion Protection Directive (ATEX)
UKCA marking (see declaration of conformity) <sup>1)</sup>	To UK EX instructions

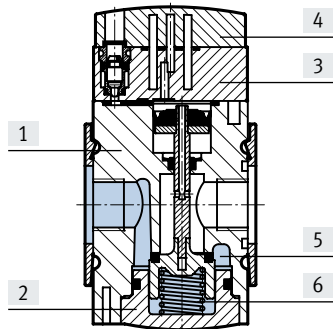
1) More information: [www.festo.com/catalogue/ms-dl](http://www.festo.com/catalogue/ms-dl) → Support/Downloads.

## Datasheet

Weight [g]		
Size	MS4	MS6
Soft-start valve	213	650

### Materials

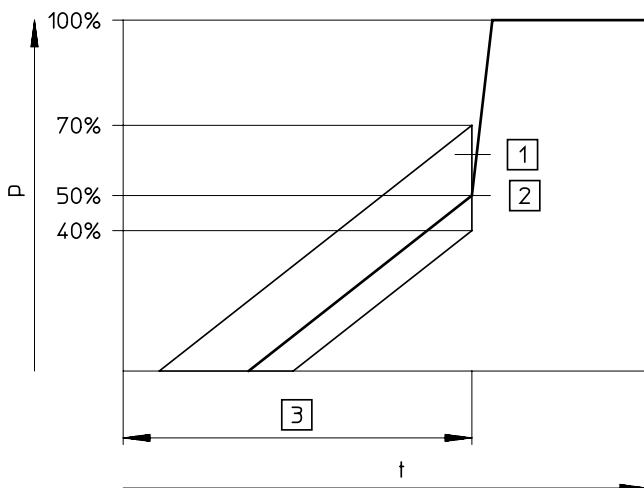
Sectional view



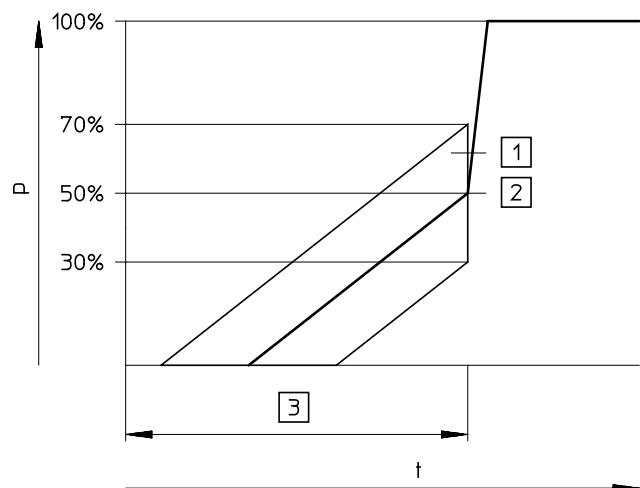
Soft-start valve		
[1]	Housing	Die-cast aluminium
[2]	Floor	PET
[3]	End cover	PA
[4]	Plate	PA
[5]	Seat	Aluminium
[6]	Springs	Spring steel
-	Seals	NBR
Note on materials		RoHS-compliant
LABS (PWIS) conformity		VDMA24364-B1/B2-L

### Switching point – Pressure p as a function of time t

MS4



MS6



- [1] Tolerance range
- [2] Switching point
- [3] Filling time is adjustable via a restrictor

#### - - Note

The +20%/–10% switching point tolerance refers to the operating pressure p1. Example: A switching point from 1.6 bar to 2.8 bar is permissible at an operating pressure of 4 bar.

#### - - Note

The +20%/–20% switching point tolerance refers to the operating pressure p1. Example: A switching point from 1.2 bar to 2.8 bar is permissible at an operating pressure of 4 bar.

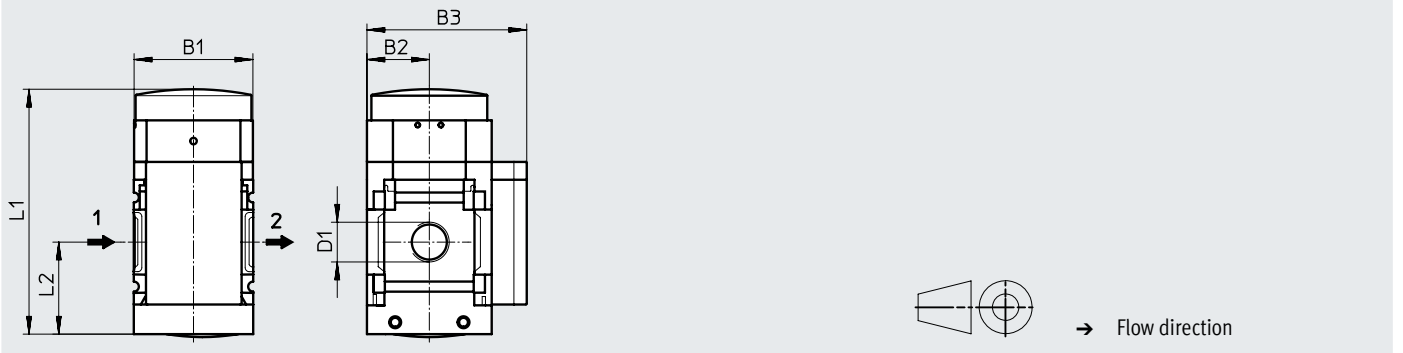


Datasheet

Dimensions – Basic version

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

With female thread, with cover plate



Type	B1	B2	B3	D1	L1	L2
<b>MS4-...</b>						
MS4-DL-1/8	40	21	54	G1/8	83.2	31.5
MS4-DL-1/4				G1/4		
<b>MS6-...</b>						
MS6-DL-1/4	62	31	76	G1/4	108	46
MS6-DL-3/8				G3/8		
MS6-DL-1/2				G1/2		

† Note: This product conforms to ISO 1179-1 and ISO 228-1.

Dimensions – Pressure gauges/pressure gauge alternatives

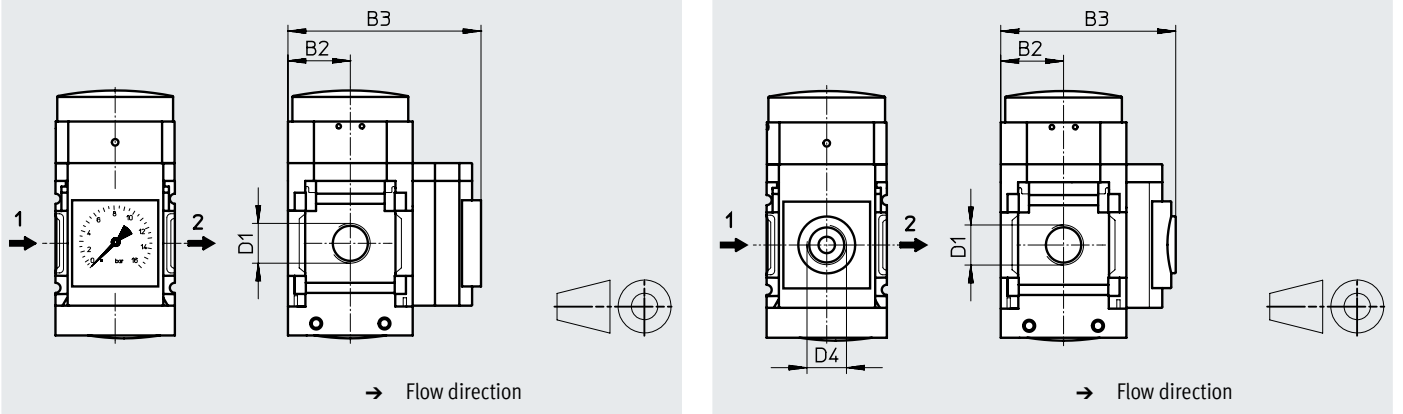
Download CAD data → [www.festo.com](http://www.festo.com)

[AG] Integrated MS pressure gauge with standard scale

[RG] Integrated MS pressure gauge with red/green scale

[A8] Adapter for EN pressure gauge 1/8, without pressure gauge

[A4] Adapter for EN pressure gauge 1/4, without pressure gauge



Type	B2	B3	D4
<b>MS4-...</b>			
MS4-...-AG	21	57	-
MS4-...-RG	21	58.5	-
MS4-...-A8	21	58.5	G1/8
MS4-...-A4	21	58.5	G1/4
<b>MS6-...</b>			
MS6-...-AG	31	77	-
MS6-...-RG	31	78.5	-
MS6-...-A8	31	78.5	G1/8
MS6-...-A4	31	78.5	G1/4

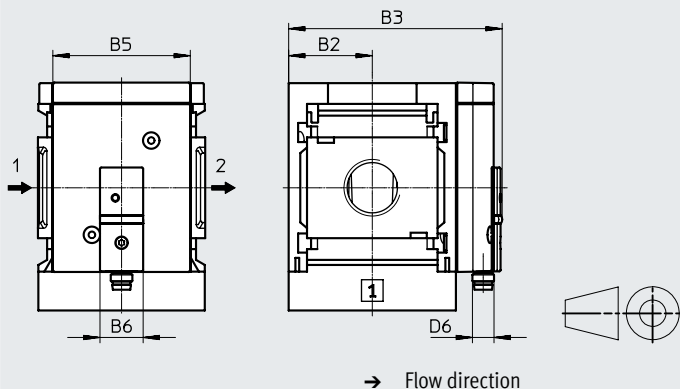
Datasheet

**Dimensions – Pressure sensor**

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

[AD7], [AD8], [AD9], [AD10] Pressure sensor with status indicator

Datasheets → Internet: sde5



[AD7]:  
SDE5-D10-O-...-P-M8 with 1x 3-pin M8 plug, threshold value comparator, 1 switching output PNP, N/O contact

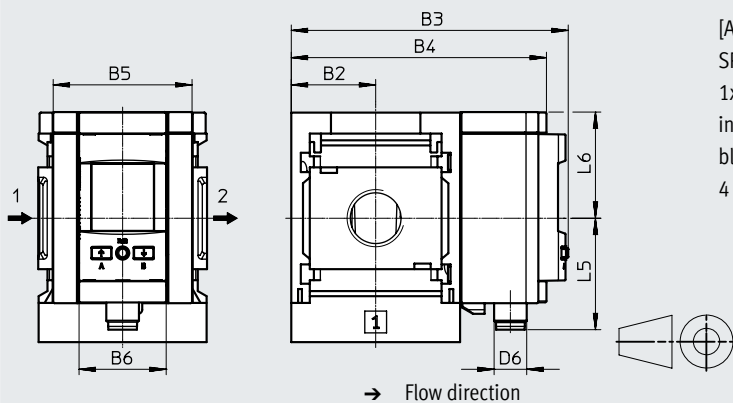
[AD9]:  
SDE5-D10-O3-...-P-M8 with 1x 3-pin M8 plug, window comparator, 1 switching output PNP, N/O contact

[AD8]:  
SDE5-D10-C-...-P-M8 with 1x 3-pin M8 plug, threshold value comparator, 1 switching output PNP, N/C contact

[AD10]:  
SDE5-D10-C3-...-P-M8 with 1x 3-pin M8 plug, window comparator, 1 switching output PNP, N/C contact

[AD11], [AD12] Pressure sensor with LCD display

Datasheets → Internet: spau



[AD11]:  
SPAU-P10R-MS...-L-PNLK-M12D with 1x 4-pin M12 plug, A-coded, switching output 2x PNP or 2x NPN switchable and 0 ... 10 V, 1 ... 5 V, 4 ... 20 mA analogue

[AD12]:  
SPAU-P10R-MS...-L-PNLK-M8D with 1x 4-pin M8 plug, A-coded, switching output 2x PNP or 2x NPN switchable and 0 ... 10 V, 1 ... 5 V, 4 ... 20 mA analogue

Type	B2	B3	B4	B5	B6	D6	L5	L6
<b>MS4-...</b>								
MS4-...AD7, AD8, AD9, AD10	21	59.1	-	~32	16	M8x1	-	-
MS4-...AD11	21	81.2	73.3	32	32	M12x1	41.2	39
MS4-...AD12						M8x1	37.9	
<b>MS6-...</b>								
MS6-...AD7, AD8, AD9, AD10	31	79.1	-	~51	16	M8x1	-	-
MS6-...AD11	31	101.8	93.7	51	32	M12x1	41.2	39
MS6-...AD12						M8x1	37.9	

## Datasheet

## ★ Core Range

Ordering data				
Size	Connection	Flow direction	Part no.	Type
MS4	G1/4	From left to right	★ 529531	MS4-DL-1/4
MS6	G1/2	From left to right	★ 529817	MS6-DL-1/2

Ordering data				
Size	Connection	Flow direction	Part no.	Type
MS4	G1/8	From left to right	529533	MS4-DL-1/8
	G1/4	From right to left	529532	MS4-DL-1/4-Z
MS6	G1/4	From left to right	529819	MS6-DL-1/4
	G3/8	From left to right	529821	MS6-DL-3/8
	G1/2	From right to left	529818	MS6-DL-1/2-Z

## Ordering data – Modular product system

Ordering table						
Grid dimension	[mm]	40	62	Conditions	Code	Enter code
Module no.		<b>527711</b>	<b>527684</b>			
Series		Standard			<b>MS</b>	MS
Size		4	6		...	
Function		Soft-start valve, pneumatic			<b>-DL</b>	-DL
Pneumatic connection	Female thread G1/8	–		[1]	<b>-1/8</b>	
	Female thread G1/4	Female thread G1/4		[1]	<b>-1/4</b>	
	–	Female thread G3/8		[1]	<b>-3/8</b>	
	–	Female thread G1/2		[1]	<b>-1/2</b>	
	Connecting plate G1/8	–			<b>-AGA</b>	
	Connecting plate G1/4	Connecting plate G1/4			<b>-AGB</b>	
	Connecting plate G3/8	Connecting plate G3/8			<b>-AGC</b>	
	–	Connecting plate G1/2			<b>-AGD</b>	
	–	Connecting plate G3/4			<b>-AGE</b>	
	Connecting plate 1/8 NPT	–		[1]	<b>-AQK</b>	
	Connecting plate 1/4 NPT	Connecting plate 1/4 NPT		[1]	<b>-AQN</b>	
	Connecting plate 3/8 NPT	Connecting plate 3/8 NPT		[1]	<b>-AQP</b>	
	–	Connecting plate 1/2 NPT		[1]	<b>-AQR</b>	
	–	Connecting plate 3/4 NPT		[1]	<b>-AQS</b>	
Pressure gauge/pressure gauge alternatives	None					
	MS pressure gauge, bar				<b>-AG</b>	
	Adapter for EN pressure gauge 1/8, without pressure gauge				<b>-A8</b>	
	Adapter for EN pressure gauge 1/4, without pressure gauge				<b>-A4</b>	
	Integrated pressure gauge, red/green scale				<b>-RG</b>	
	Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/O contact			[1] [2]	<b>-AD7</b>	
	Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/C contact			[1] [2]	<b>-AD8</b>	
	Pressure sensor with status indicator, plug M8, window comparator, PNP, N/O contact			[1] [2]	<b>-AD9</b>	
	Pressure sensor with status indicator, plug M8, window comparator, PNP, N/C contact			[1] [2]	<b>-AD10</b>	
	Pressure sensor with LCD display, plug M12, 4-pin, IO-Link®, PNP, NPN, 0... 10 V, 1 ... 5 V, 4 ... 20 mA			[1] [2]	<b>-AD11</b>	
	Pressure sensor with LCD display, plug M8, 4-pin, IO-Link®, PNP, NPN, 0... 10 V, 1 ... 5 V, 4 ... 20 mA			[1] [2]	<b>-AD12</b>	
Alternative pressure gauge scale	None					
	psi			[3]	<b>-PSI</b>	
	MPa			[4]	<b>-MPA</b>	

[1] 1/8; 1/4; 3/8; Not with EU EX4 certification.  
1/2, AQK, AQN,  
AQP, AQR, AQS,  
AD7 ... AD12,  
WPM

[2] AD7 ... AD12 Measuring range max. 10 bar.

[3] PSI Only in combination with pressure gauge AG.

[4] MPA Only in combination with pressure gauge AG or RG.

## Ordering data – Modular product system

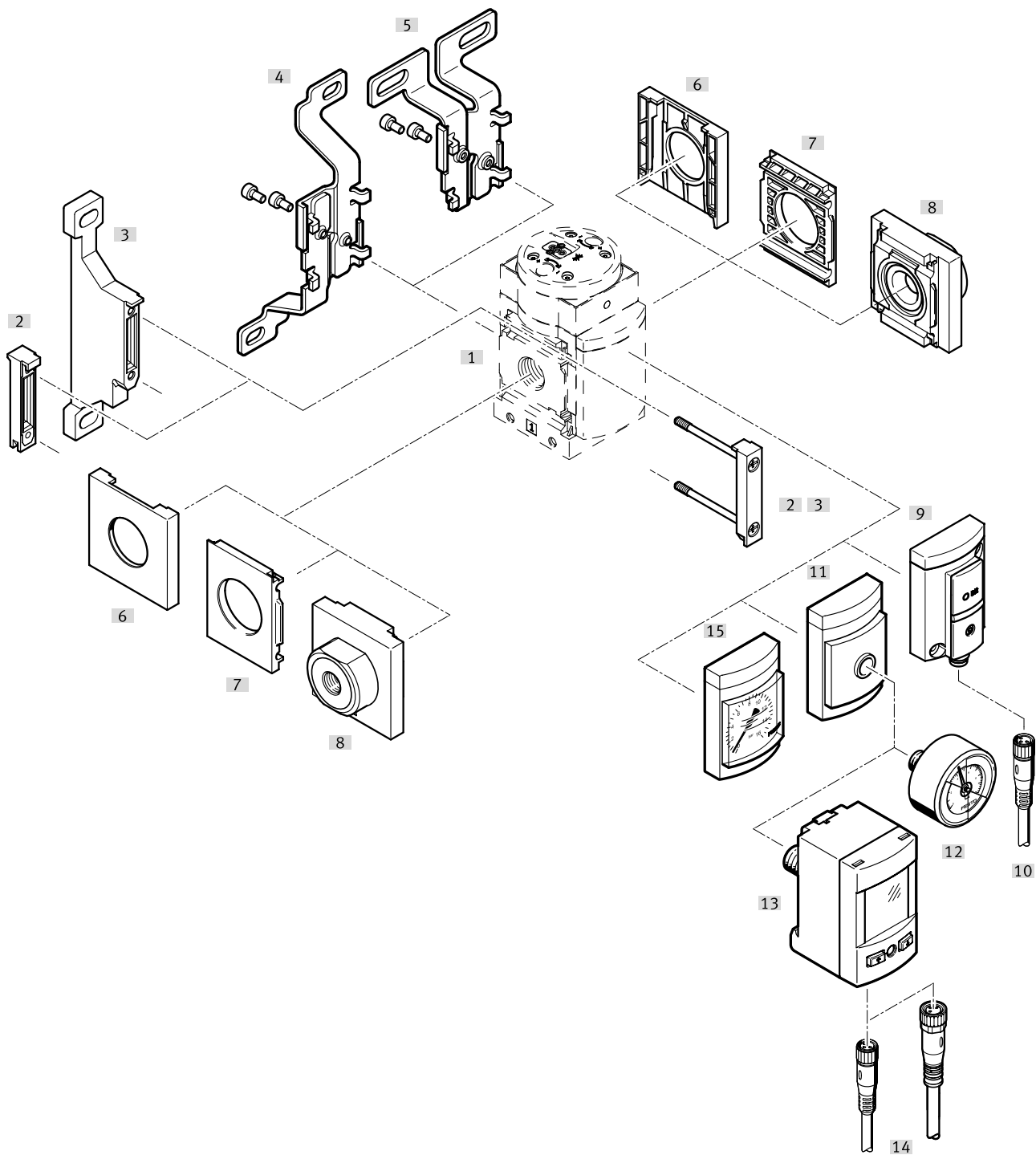
Ordering table		Grid dimension		Conditions	Code	Enter code
	[mm]	40	62			
Type of mounting	Without mounting bracket					
	Mounting bracket standard design			[5]	-WP	
	Mounting bracket for hooking in service unit components			[1] [5]	-WPM	
	Mounting bracket centrally at rear (wall mounting top and bottom), connecting plates not required				-WB	
	Mounting bracket centrally at rear (wall mounting top), connecting plates not required	-			-WBM	
EU certification	None					
	II 2GD to EU Explosion Protection Directive (ATEX)				-EX4	
UL certification	None					
	cULus, ordinary location for Canada and USA				-UL1	
Flow direction	Flow direction from left to right					
	Flow direction from right to left				-Z	

[1] 1/8; 1/4; 3/8; Not with EU EX4 certification.

1/2, AQK, AQN,  
AQP, AQR, AQS,  
AD7 ... AD12,  
WPM

[5] WP, WPM Only with connecting plate AGA, AGB, AGC, AGD, AGE, AQK, AQN, AQP, AQR or AQS.

Peripherals overview



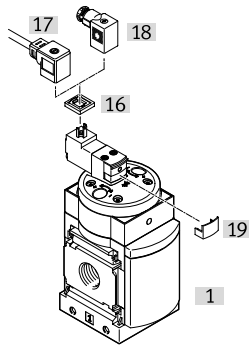
**Note**

Additional accessories:

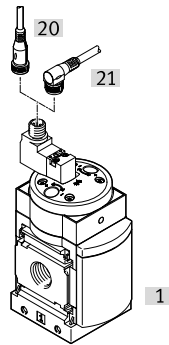
- Module connector for combination with size MS4/MS6 or size MS9  
→ Internet: amv, rmv, armv
- Adapter for mounting on profiles  
→ Internet: ipm-80, ipm-40-80, ipm-80-80

## Peripherals overview

Supply voltage  
[V24], [10V24], [V110], [V230]



Supply voltage  
[10V24P]



Mounting attachments and accessories		Order code	→ Page/Internet
[1]	Soft-start valve	MS4/6-DE	50
<b>Can be ordered via the modular product system</b>			
[3]	Mounting bracket	[WP]	56
	Mounting bracket (not shown)	[WPM]	
[4]	Mounting bracket	[WB]	
[5]	Mounting bracket	[WBM]	
[8]	Connecting plate SET <sup>1)</sup>	[AG...]	
	Connecting plate SET <sup>1)</sup>	[AQ...]	
[9]	Pressure sensor SDE5 with status indicator	[AD7], [AD8], [AD9], [AD10]	
[11]	Adapter for EN pressure gauge 1/8, 1/4	[A8], [A4]	
[15]	MS pressure gauge	[AG], [RG]	
<b>Can be ordered as accessories</b>			
[2]	Module connector	MS4/6-MV	ms4-mv, ms6-mv
[3]	Mounting bracket	MS4/6-WP	ms4-wp, ms6-wp
	Mounting bracket (not shown)	MS4/6-WPB/WPE/WPM	ms4-wp, ms6-wp
[4]	Mounting bracket	MS4/6-WB	ms4-wb, ms6-wb
[5]	Mounting bracket	MS4-WBM	ms4-wbm
[6]	Cover cap	MS4/6-END	ms4-end, ms6-end
[7]	Mounting plate <sup>2)</sup>	MS4/6-AEND	ms4-aend, ms6-aend
[8]	Connecting plate SET <sup>2)</sup>	MS4/6-AG...	ms4-ag, ms6-ag
[13]	Pressure sensor	SPAU-...T	102
[12]	Pressure gauge	MA	103
[10]	Connecting cable	NEBA-M8...-LE3	103
[14]	Connecting cable	NEBA-M8...-LE4, NEBA-M12...-LE4	103
[16]	Illuminating seal	MEB-LD	102
[17]	Plug socket with cable	KMEB	102
[18]	Plug socket <sup>3)</sup>	MSSD-EB	102
[19]	Locking clip	CPV18-HV	102
[20]	Connecting cable	NEBA-M12G5	103
[21]	Connecting cable	NEBA-M12W5	103

1) Module connector [2] is included in the scope of delivery.

2) Module connector MS4/6-MV [2] or mounting bracket MS4/6-WP, WPB, WPE, WPM [3] is required for mounting.

3) For soft-start valve MS...V24...EX2, the plug socket is included in the scope of delivery.

## Type codes

<b>001</b>	<b>Series</b>	
<b>MS4</b>	MS series, size 4	
<b>002</b>	<b>Size</b>	
<b>4</b>	Grid dimension 40 mm	
<b>003</b>	<b>Function</b>	
<b>DE</b>	Soft-start valve, electric	
<b>004</b>	<b>Pneumatic connection</b>	
<b>1/8</b>	Female thread G1/8	
<b>1/4</b>	Female thread G1/4	
<b>AGA</b>	Sub-base G1/8	
<b>AGB</b>	Sub-base G1/4	
<b>AGC</b>	Sub-base G3/8	
<b>005</b>	<b>Supply voltage</b>	
<b>10V24</b>	24 V DC, 10 bar, connection pattern to EN 175301	
<b>10V24P</b>	24 V DC, 10 bar, M12 plug socket adapter (connection pattern to EN 60947-5-2)	
<b>V110</b>	110 V AC (connection pattern to EN 175301)	
<b>V230</b>	230 V AC (connection pattern to EN 175301)	
<b>V24</b>	24 V DC (connection pattern to EN 175301)	
<b>006</b>	<b>Pressure gauge alternatives</b>	
	None	
<b>A4</b>	Adapter for EN pressure gauge 1/4, without pressure gauge	
<b>A8</b>	Adapter for EN pressure gauge 1/8, without pressure gauge	
<b>AD7</b>	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/O	
<b>AD8</b>	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/C	
<b>AD9</b>	Pressure sensor with switching display, M8 plug, window comparator, PNP, N/O	
<b>AD10</b>	Pressure sensor with operational status indicator, M8 plug, window comparator, PNP, N/C	
<b>AG</b>	MS pressure gauge	
<b>RG</b>	Integrated pressure gauge, red/green scale	

<b>007</b>	<b>Alternative pressure gauge scale</b>	
	MS pressure gauge	
<b>PSI</b>	psi	
<b>MPA</b>	MPa	
<b>008</b>	<b>Type of mounting</b>	
	Without mounting bracket	
<b>WP</b>	Mounting bracket basic design	
<b>WPM</b>	Mounting bracket for hooking in service unit components	
<b>WB</b>	Mounting centrally at rear (wall mounting top and bottom), connecting plates not required	
<b>WBM</b>	Mounting centrally at rear (wall mounting top), connecting plates not required	
<b>009</b>	<b>EU certification</b>	
	None	
<b>EX2</b>	II 3GD to EU Explosion Protection Directive (ATEX)	
<b>010</b>	<b>UL certification</b>	
	None	
<b>UL1</b>	cULus ordinary location for Canada and USA	
<b>011</b>	<b>Flow direction</b>	
	Flow direction from left to right	
<b>Z</b>	Flow direction from right to left	



## Type codes

<b>001</b>	Series
<b>MS</b>	MS series

<b>002</b>	Size
<b>6</b>	Grid dimension 62 mm

<b>003</b>	Function
<b>DE</b>	Soft-start valve, electric

<b>004</b>	Pneumatic connection
<b>1/4</b>	Female thread G1/4
<b>3/8</b>	Female thread G3/8
<b>1/2</b>	Female thread G1/2
<b>AGB</b>	Sub-base G1/4
<b>AGC</b>	Sub-base G3/8
<b>AGD</b>	Sub-base G1/2
<b>AGE</b>	Sub-base G3/4

<b>005</b>	Supply voltage
<b>10V24</b>	24 V DC, 10 bar, connection pattern to EN 175301
<b>10V24P</b>	24 V DC, 10 bar, M12 plug socket adapter (connection pattern to EN 60947-5-2)
<b>V110</b>	110 V AC (connection pattern to EN 175301)
<b>V230</b>	230 V AC (connection pattern to EN 175301)
<b>V24</b>	24 V DC (connection pattern to EN 175301)

<b>006</b>	Pressure gauge alternatives
	None
<b>A4</b>	Adapter for EN pressure gauge 1/4, without pressure gauge
<b>AD7</b>	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/O
<b>AD8</b>	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/C
<b>AD9</b>	Pressure sensor with switching display, M8 plug, window comparator, PNP, N/O
<b>AD10</b>	Pressure sensor with operational status indicator, M8 plug, window comparator, PNP, N/C
<b>AG</b>	MS pressure gauge
<b>RG</b>	Integrated pressure gauge, red/green scale

<b>007</b>	Alternative pressure gauge scale
	MS pressure gauge
<b>PSI</b>	psi
<b>MPA</b>	MPa

<b>008</b>	Type of mounting
	Without mounting bracket
<b>WP</b>	Mounting bracket basic design
<b>WPM</b>	Mounting bracket for hooking in service unit components
<b>WB</b>	Mounting centrally at rear (wall mounting top and bottom), connecting plates not required

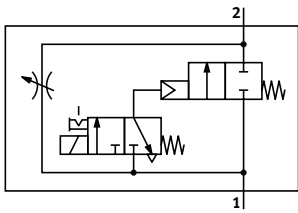
<b>009</b>	EU certification
	None
<b>EX2</b>	II 3GD to EU Explosion Protection Directive (ATEX)





<b>010</b>	UL certification
	None
<b>UL1</b>	cULus ordinary location for Canada and USA

<b>011</b>	Flow direction
	Flow direction from left to right
<b>Z</b>	Flow direction from right to left

## Datasheet

### Function



-  Flow rate  
1000 ... 6450 l/min
-  Temperature range  
-10 ... +60 °C
-  Operating pressure  
4 ... 18 bar
-  [www.festo.com](http://www.festo.com)



The duration of the pressure build-up is set using the restrictor attached to the valve cap. The output pressure p2 rises slowly in accordance with the restrictor setting. While the solenoid valve is not actuated, only the flow rate of the flow control valve is available. The main seat is only opened when the solenoid valve is energised.

When the solenoid valve is switched off, the main seat is closed and only the flow rate of the flow control valve is available. When exhausting a system, the solenoid valve should remain switched on; this increases the volume flow from 2 to 1 and shortens the exhaust time. For this, a quick exhaust valve must be connected upstream.

- Electrically actuated soft-start valve for slowly pressurising and exhausting pneumatic installations
- The drives move slowly and reliably into the initial position
- Sudden and erratic movements are avoided
- With solenoid coil, without plug socket
- Choice of three voltage ranges
- The switching pressure can be precisely controlled with a solenoid valve
- Adjustable switching time delay
- Manual override: non-detenting and detenting (variant 10V24 non-detenting only)
- Solenoid actuator can be repositioned by 180°
- Optional pressure sensor
- Optional device variant EX2 for use in potentially explosive areas in zones 2 and 22

### General technical data

Size	MS4	MS6
Pneumatic connection 1, 2		
Female thread	G1/8 or G1/4	G1/4, G3/8 or G1/2
Connecting plate [AG...]	G1/8, G1/4 or G3/8	G1/4, G3/8, G1/2 or G3/4
[AQ...]	1/8 NPT, 1/4 NPT or 3/8 NPT	1/4 NPT, 3/8 NPT, 1/2 NPT or 3/4 NPT
Design	Piston seat	
Type of mounting	With accessories In-line installation	
Mounting position	Any <sup>1)</sup>	
Pressure indication	Via pressure sensor for indicating the output pressure and electrical output via LCD display Via pressure sensor for indicating the status of the output pressure and the electrical output Via pressure gauge for displaying the output pressure Via pressure gauge with red/green scale for indicating the output pressure	
	Prepared for G1/8	-
	Prepared for G1/4	
Valve function	2/2-way valve	
Manual override		
With supply voltage [10V24]	Non-detenting	
[V24], [10V24P], [V110], [V230]	Non-detenting/detenting	
Type of mounting	Electrical	
Reset method	Mechanical spring	
Signal status display	With accessories	
Switching status indication	With accessories	
Type of actuation	Piloted	
Pilot air supply	Internal	
Flow direction	Not reversible	

<sup>1)</sup> The soft-start valve must be mounted vertically when combined with a pressure sensor as condensate must not collect in the pressure sensor.

† Note: This product conforms to ISO 1179-1 and ISO 228-1.

## Datasheet

Electrical data		
Characteristic coil data		
With supply voltage	[V24]	24 V DC: 1.5 W; permissible voltage fluctuations -25%/+10%
	[10V24], [10V24P]	24 V DC: 1.8 W; permissible voltage fluctuations -15%/+10%
	[V110]	110 V AC: 50/60 Hz; pick-up power 3.0 VA; holding power 2.4 VA; permissible voltage fluctuations ±10%
	[V230]	230 V AC: 50/60 Hz; pick-up power 3.0 VA; holding power 2.4 VA; permissible voltage fluctuations -14%/+10%
Electrical connection		
With supply voltage	[V24], [10V24], [V110], [V230]	Plug, square design to EN 175301-803, type C
	[10V24P]	M12x1 to IEC 61076-2-101 M12x1 to ISO 20401 in line with IEC 61076-2-101
Degree of protection for solenoid coil		IP65
Duty cycle [%]		100

Characteristic flow rate values					
Size	MS4			MS6	
Pneumatic connection 1, 2	G1/8	G1/4	G1/4	G3/8	G1/2
Standard nominal flow rate $q_{nN}^{1)}$ [l/min]					
In main flow direction 1 → 2	1000	2000	2700	5050	6450
In relief direction 2 → 1 <sup>2)</sup>	1000	2000	2600	5050	6400
C value [l/s*min]					
In main flow direction 1 → 2	4.6	9.6	11.22	21.05	28.97
b value					
In main flow direction 1 → 2	0.5	0.45	0.54	0.48	0.39

- 1) Measured at  $p_1 = 6$  bar and  $p_2 = 5$  bar,  $\Delta p = 1$  bar.  
2) With energised solenoid valve.

Operating and environmental conditions							
Size	MS4			MS6			
Soft-start valve	Without pressure sensor			With pressure sensor	Without pressure sensor		With pressure sensor
Supply voltage	[V110], [V230], [V24]	[V24]	[10V24...]		[V110], [V230], [V24]	[10V24...]	
Operating pressure [bar]	4 ... 14	4 ... 10		4 ... 18	4 ... 10		
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4] Inert gases						
Note on the operating/pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)						
Ambient temperature [°C]	-10 ... +60	-10 ... +50	0 ... +50	-10 ... +60	-10 ... +50	0 ... +50	
Temperature of medium [°C]	-10 ... +60	-10 ... +50	0 ... +50	-10 ... +60	-10 ... +50	0 ... +50	
Corrosion resistance class CRC <sup>1)</sup>	2 - Moderate corrosion stress						
Food-safe <sup>2)</sup>	See supplementary material information (except for solenoid valve)						
UL certification <sup>2)</sup>	-			c UL us - Recognized (OL)	-		c UL us - Recognized (OL)
CE marking (see declaration of conformity) <sup>2)</sup>	To EU EMC Directive To EU Low Voltage Directive To EU RoHS Directive						
UKCA marking (see declaration of conformity) <sup>2)</sup>	To UK instructions for EMC To UK RoHS instructions To UK regulations for electrical equipment						
KC marking	-			KC EMC	-		KC EMC

- 1) More information [www.festo.com/x/topic/crc](http://www.festo.com/x/topic/crc)  
2) More information: [www.festo.com/catalogue/ms-de](http://www.festo.com/catalogue/ms-de) → Support/Downloads.

## Datasheet

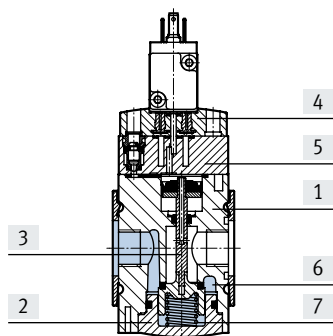
ATEX	
EU certification	[EX2]
ATEX category for gas	II 3G
Type of (ignition) protection for gas	Ex nA IIC T4 X Gc
ATEX category for dust	II 3D
Type of (ignition) protection for dust	Ex tc IIIC T105°C IP65 Dc X
Explosion ambient temperature	-10°C ≤ Ta ≤ +60 °C
CE marking (see declaration of conformity) <sup>1)</sup>	To EU Explosion Protection Directive (ATEX)
UKCA marking (see declaration of conformity) <sup>1)</sup>	To UK EX instructions
Explosion protection certification outside the EU	EPL Dc (GB)
	EPL Gc (GB)

1) More information: [www.festo.com/catalogue/ms-de](http://www.festo.com/catalogue/ms-de) → Support/Downloads.

Weight [g]		
Size	MS4	MS6
Soft-start valve	263	680

### Materials

Sectional view

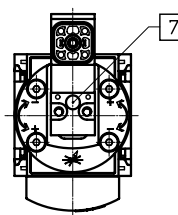
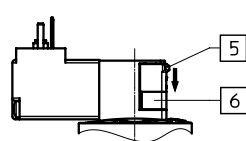
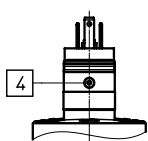


Soft-start valve		
[1]	Housing	Die-cast aluminium
[2]	Floor	PET
[3]	Valve tappet	Aluminium
[4]	End cover	PA
[5]	Plate	PA
[6]	Seat	Aluminium
[7]	Springs	Spring steel
-	Seals	NBR
Note on materials		RoHS-compliant
LABS (PWIS) conformity		VDMA24364-B1/B2-L

### Manual override

[V24], [V110], [V230] Supply voltage

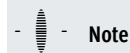
[10V24], [10V24P] Supply voltage



[4] Manual override: non-detenting (as supplied)

[5] Spool

[6] Cover



#### Note

For detenting manual override, remove the grey cover [6] and push the spool [5] downwards.

[7] Manual override: non-detenting and detenting ([10V24] non-detenting only)

Datasheet

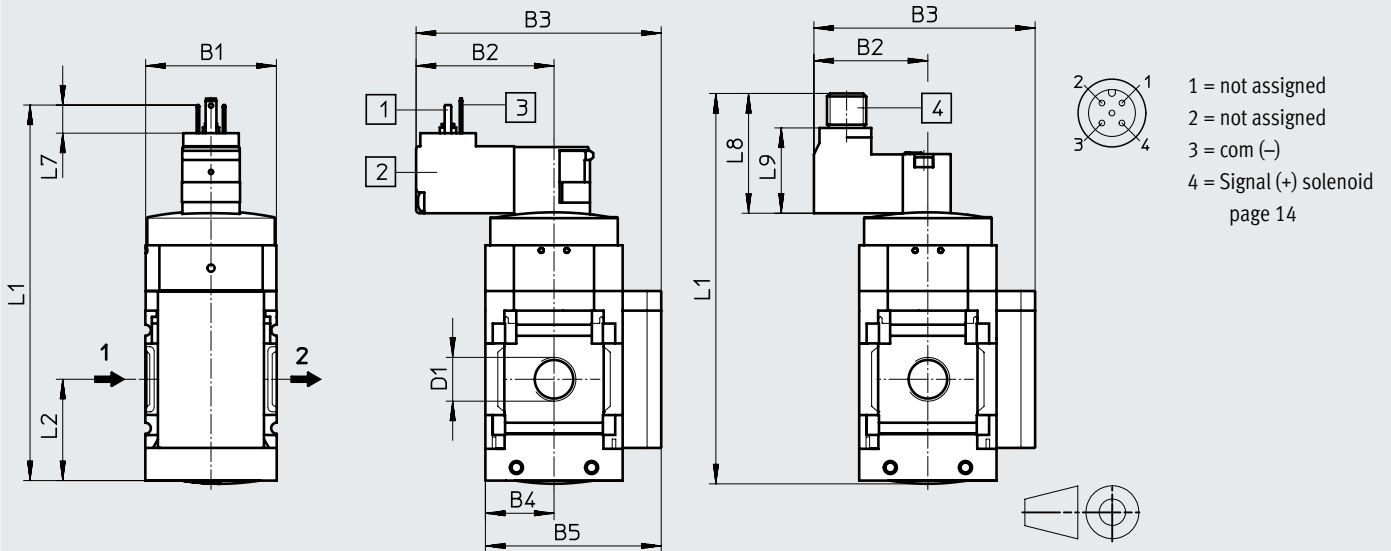
Dimensions – Basic version

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

With female thread, with cover plate

[V24], [10V24], [V110], [V230] Supply voltage

[10V24P] Supply voltage



[1] Plug connection to EN 175301-803

[2] Solenoid actuator can be repositioned by 180°, i.e. solenoid points to the front  
 [3] PIN for solenoid actuators 110 V and 230 V only

[4] Electrical connection M12x1 to ISO 20401 conforming to IEC 61076-2-101, 4-pin version for connecting cable NEBA-M12

→ Flow direction

Type	B1	B2		B3		B4	B5	D1
		[V24] [V110] [V230]	[10V24] [10V24P]	[V24] [V110] [V230]	[10V24] [10V24P]			
<b>MS4-...</b>								
MS4-DE-1/8	40	42.2	34.9	75.2	67.9	21	54	G1/8
MS4-DE-1/4								G1/4
<b>MS6-...</b>								
MS6-DE-1/4	62	52	44	97	89	31	76	G1/4
MS6-DE-3/8								G3/8
MS6-DE-1/2								G1/2

Type	L1			L2	L7	L8	L9
	[V24] [V110] [V230]	[10V24]	[10V24P]				
<b>MS4-...</b>							
MS4-DE-1/8	115.4	112.9	117.8	31.5	8.6	36.7	26.1
MS4-DE-1/4							
<b>MS6-...</b>							
MS6-DE-1/4	149	147	152	46	8.6	37	26
MS6-DE-3/8							
MS6-DE-1/2							

† Note: This product conforms to ISO 1179-1 and ISO 228-1.

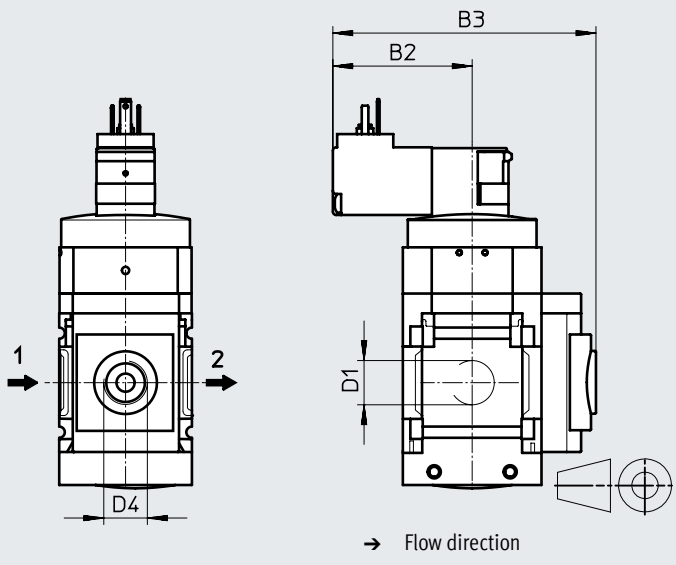
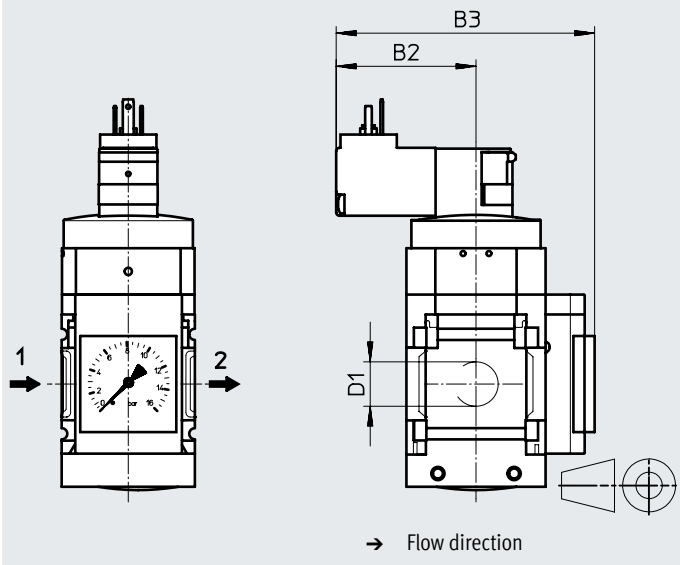
Datasheet

Dimensions – Pressure gauges/pressure gauge alternatives

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

- [AG] Integrated MS pressure gauge with standard scale
- [RG] Integrated MS pressure gauge with red/green scale

- [A8] Adapter for EN pressure gauge 1/8, without pressure gauge
- [A4] Adapter for EN pressure gauge 1/4, without pressure gauge



Type	B2		B3		D1	D4
	[V24] [V110] [V230]	[10V24] [10V24P]	[V24] [V110] [V230]	[10V24] [10V24P]		
<b>MS4-...</b>						
MS4-DE-1/8-...-AG	42.2	34.9	78.2	70.9	G1/8	-
MS4-DE-1/4-...-AG					G1/4	
MS4-DE-1/8-...-RG	42.2	34.9	79.7	72.4	G1/8	-
MS4-DE-1/4-...-RG					G1/4	
MS4-DE-1/8-...-A8	42.2	34.9	79.7	72.4	G1/8	G1/8
MS4-DE-1/4-...-A8					G1/4	
MS4-DE-1/8-...-A4	42.2	34.9	79.7	72.4	G1/8	G1/4
MS4-DE-1/4-...-A4					G1/4	
<b>MS6-...</b>						
MS6-DE-1/4-...-AG	52	44	98	90	G1/4	-
MS6-DE-3/8-...-AG					G3/8	
MS6-DE-1/2-...-AG	52	44	99.5	91.5	G1/2	-
MS6-DE-1/4-...-RG					G1/4	
MS6-DE-3/8-...-RG					G3/8	
MS6-DE-1/2-...-RG	52	44	99.5	91.5	G1/2	G1/4
MS6-DE-1/4-...-A4					G1/4	
MS6-DE-3/8-...-A4					G3/8	
MS6-DE-1/2-...-A4					G1/2	

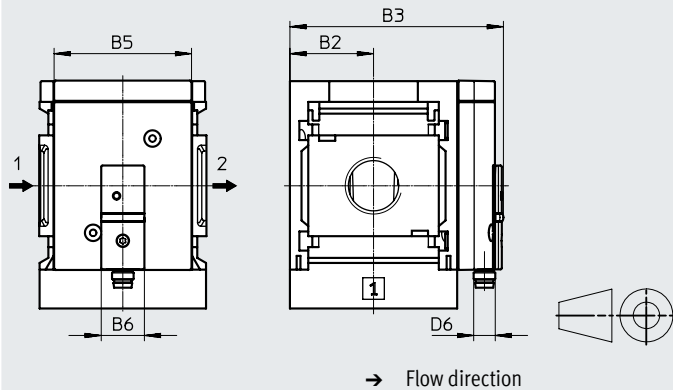
Datasheet

**Dimensions – Pressure sensor**

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

[AD7], [AD8], [AD9], [AD10] Pressure sensor with status indicator

Datasheets → Internet: sde5



[AD7]:  
SDE5-D10-O-...-P-M8 with 1x 3-pin M8 plug, threshold value comparator, 1 switching output PNP, N/O contact

[AD9]:  
SDE5-D10-O3-...-P-M8 with 1x 3-pin M8 plug, window comparator, 1 switching output PNP, N/O contact

[AD8]:  
SDE5-D10-C-...-P-M8 with 1x 3-pin M8 plug, threshold value comparator, 1 switching output PNP, N/C contact

[AD10]:  
SDE5-D10-C3-...-P-M8 with 1x 3-pin M8 plug, window comparator, 1 switching output PNP, N/C contact

Type	B2	B3	B4	B5	B6	D6	L5	L6
<b>MS4-...</b>								
MS4-...-AD7, AD8, AD9, AD10	21	59.1	-	~32	16	M8x1	-	-
<b>MS6-...</b>								
MS6-...-AD7, AD8, AD9, AD10	31	79.1	-	~51	16	M8x1	-	-

**Ordering data**

Size	Connection	Supply voltage	Flow direction	Part no.	Type
MS4	G1/4	24 V DC	From left to right	542558	MS4-DE-1/4-10V24
		110 V AC	From left to right	529519	MS4-DE-1/4-V110
		230 V AC	From left to right	529521	MS4-DE-1/4-V230
MS6	G1/4	24 V DC	From left to right	542564	MS6-DE-1/4-10V24
		24 V DC	From left to right	542566	MS6-DE-3/8-10V24
	G1/2	24 V DC	From left to right	542562	MS6-DE-1/2-10V24
		110 V AC	From left to right	529799	MS6-DE-1/2-V110
		230 V AC	From left to right	529801	MS6-DE-1/2-V230

## Ordering data – Modular product system

Ordering table						
Grid dimension	[mm]	40	62	Conditions	Code	Enter code
Module no.		<b>527713</b>	<b>527686</b>			
Series		Standard			<b>MS</b>	MS
Size		4	6		...	
Function		Soft-start valve, electric			<b>-DE</b>	-DE
Pneumatic connection	Female thread G1/8	–		[1]	<b>-1/8</b>	
	Female thread G1/4	Female thread G1/4		[1]	<b>-1/4</b>	
	–	Female thread G3/8		[1]	<b>-3/8</b>	
	–	Female thread G1/2		[1]	<b>-1/2</b>	
	Connecting plate G1/8	–			<b>-AGA</b>	
	Connecting plate G1/4	Connecting plate G1/4			<b>-AGB</b>	
	Connecting plate G3/8	Connecting plate G3/8			<b>-AGC</b>	
	–	Connecting plate G1/2			<b>-AGD</b>	
	–	Connecting plate G3/4			<b>-AGE</b>	
	Connecting plate 1/8 NPT	–		[1]	<b>-AQK</b>	
	Connecting plate 1/4 NPT	Connecting plate 1/4 NPT		[1]	<b>-AQN</b>	
	Connecting plate 3/8 NPT	Connecting plate 3/8 NPT		[1]	<b>-AQP</b>	
	–	Connecting plate 1/2 NPT		[1]	<b>-AQR</b>	
	–	Connecting plate 3/4 NPT		[1]	<b>-AQS</b>	
Supply voltage	24 V DC (plug pattern to EN 175301)	4 ... 14 bar			<b>-V24</b>	
		4 ... 18 bar				
	24 V DC (plug pattern to EN 175301)	4 ... 10 bar		[1] [2]	<b>-10V24</b>	
		4 ... 18 bar				
	24 V DC, M12 to IEC 61076-2-101	4 ... 10 bar		[1] [2]	<b>-10V24P</b>	
		4 ... 18 bar				
	110 V AC (plug pattern to EN 175301)	4 ... 14 bar		[1]	<b>-V110</b>	
		4 ... 18 bar				
230 V AC (plug pattern to EN 175301)	4 ... 14 bar		[1]	<b>-V230</b>		
	4 ... 18 bar					

[1] 1/8; 1/4; 3/8; Not with EU EX2 certification.  
 1/2, AQK, AQN,  
 AQP, AQR, AQS,  
 10V24, 10V24P,  
 V110, V230,  
 AD7 ... AD10,  
 WPM

[2] 10V24, 10V24P Max. operating pressure: 10 bar.



## Ordering data – Modular product system

Ordering table		Grid dimension	[mm]	40	62	Conditions	Code	Enter code
Pressure gauge/pressure gauge alternatives	None							
	MS pressure gauge, bar						<b>-AG</b>	
	Adapter for EN pressure gauge 1/8, without pressure gauge						<b>-A8</b>	
	Adapter for EN pressure gauge 1/4, without pressure gauge						<b>-A4</b>	
	Integrated pressure gauge, red/green scale						<b>-RG</b>	
	Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/O contact					[1] [3]	<b>-AD7</b>	
	Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/C contact					[1] [3]	<b>-AD8</b>	
	Pressure sensor with status indicator, plug M8, window comparator, PNP, N/O contact					[1] [3]	<b>-AD9</b>	
	Pressure sensor with status indicator, plug M8, window comparator, PNP, N/C contact					[1] [3]	<b>-AD10</b>	
Alternative pressure gauge scale	None							
	psi					[4]	<b>-PSI</b>	
	MPa					[5]	<b>-MPA</b>	
Type of mounting	Without mounting bracket							
	Mounting bracket standard design					[6]	<b>-WP</b>	
	Mounting bracket for hooking in service unit components					[1] [6]	<b>-WPM</b>	
	Mounting bracket centrally at rear (wall mounting top and bottom), connecting plates not required						<b>-WB</b>	
	Mounting bracket centrally at rear (wall mounting top), connecting plates not required						<b>-WBM</b>	
EU certification	None							
	II 3GD to EU Explosion Protection Directive (ATEX)						<b>-EX2</b>	
UL certification	None							
	cULus, ordinary location for Canada and USA					[7]	<b>-UL1</b>	
Flow direction	Flow direction from left to right							
	Flow direction from right to left						<b>-Z</b>	

[1] 1/8; 1/4; 3/8; 1/2, AQK, AQN, AQP, AQR, AQS, 10V24, 10V24P, V110, V230, AD7 ... AD10, WPM

[3] AD7 ... AD10 Measuring range max. 10 bar.

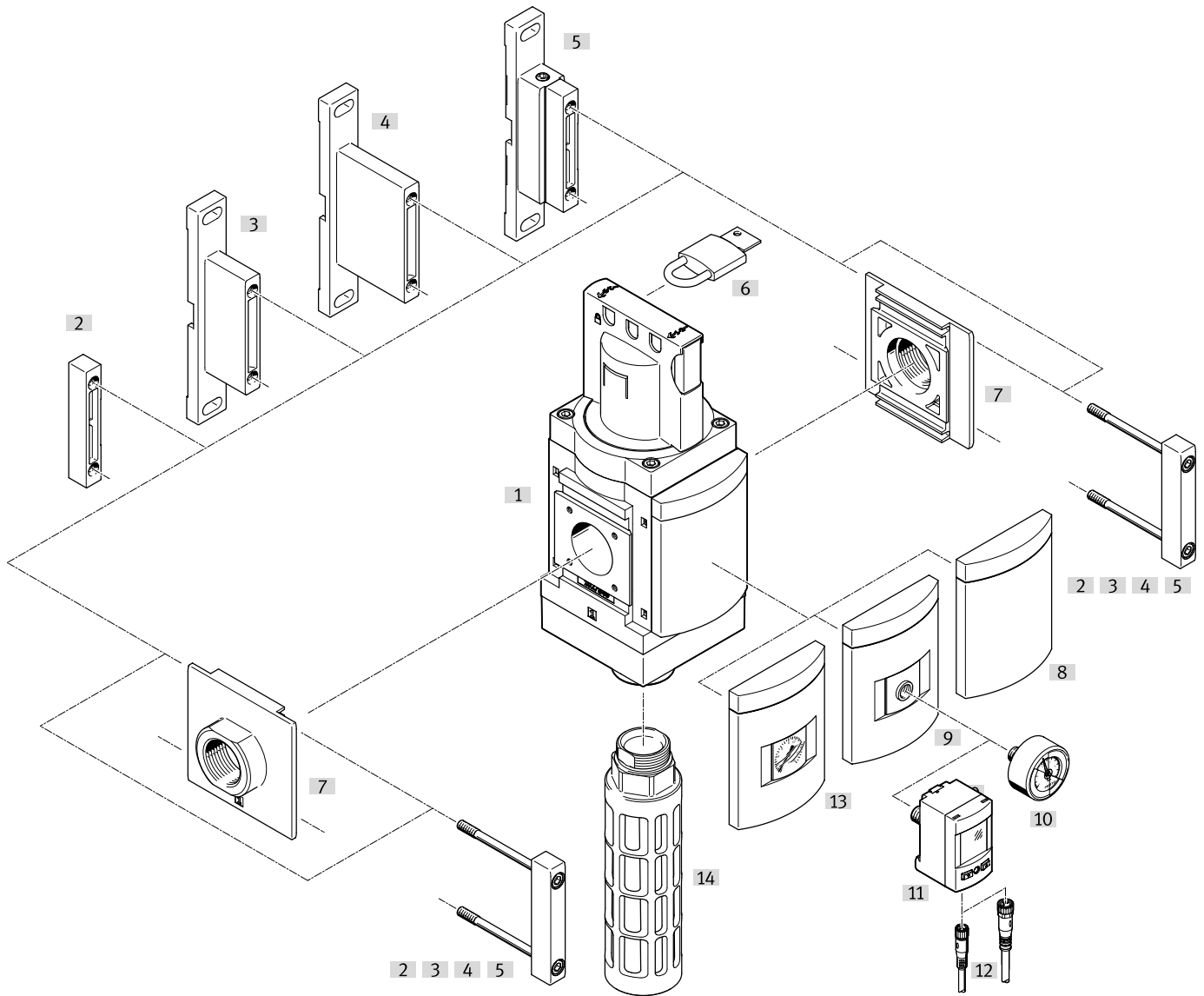
[4] PSI Only in combination with pressure gauge AG.

[5] MPA Only in combination with pressure gauge AG or RG.

[6] WP, WPM Only with connecting plate AGA, AGB, AGC, AGD, AGE, AQK, AQN, AQP, AQR or AQS.

[7] UL1 Not with supply voltage V110, V230.

Peripherals overview



**Note**  
 Additional accessories:  
 • Module connector for combination with size MS6, MS9 or MS12  
 → Internet: rmv, armv

## Peripherals overview

Mounting attachments and accessories		Order code	→ Page/Internet
[1]	On/off valve	MS9-EM	61
<b>Can be ordered via the modular product system</b>			
[3]	Mounting bracket <sup>2)</sup>	[WP]	66
[4]	Mounting bracket <sup>2)</sup>	[WPB]	
[5]	Mounting bracket	[WPM]	
[7]	Connecting plate SET <sup>1)</sup>	[AG...]	
	Connecting plate SET <sup>1)</sup>	[AQ...]	
[8]	Cover plate	[VS]	
[9]	Adapter for EN pressure gauge 1/4	[A4]	
[13]	MS pressure gauge	[AG], [RG]	
[14]	Silencer	[S]	
<b>Can be ordered as accessories</b>			
[2]	Module connector	MS9-MV	ms9-mv
[3]	Mounting bracket <sup>2)</sup>	MS9-WP	ms9-wp
[4]	Mounting bracket <sup>2)</sup>	MS9-WPB	ms9-wp
[5]	Mounting bracket	MS9-WPM	ms9-wp
[6]	Padlock	LRVS-D	103
[7]	Connecting plate SET	MS9-AG...	ms9-ag
	Connecting plate SET	MS9-AQ..	ms9-aq
[10]	Pressure gauge	MA	103
[11]	Pressure sensor	SPAU-...-T-R14M	102
[12]	Connecting cable	NEBA-M8...-LE4, NEBA-M12...-LE4	103
[14]	Silencer	U	103

1) Module connector [2] is included in the scope of delivery.

2) The screws for the wall bracket on the rear are partially covered by the housing of this service unit component. Depending on the configuration of the service unit combination, the screws will no longer be accessible. The mounting bracket MS9-WPM is therefore recommended for wall mounting. It can be used to attach a fully assembled combination to the pre-mounted wall bracket.

## Type codes

001 Series	
MS	MS series
002 Size	
9	Grid dimension 90 mm
003 Function	
EM	On/off valve, manual
004 Pneumatic connection	
3/4	Female thread G3/4
1	Female thread G1
AGD	Sub-base G1/2
AGE	Sub-base G3/4
AGF	Sub-base G1
AGG	Connecting plate G1 1/4
AGH	Connecting plate G1 1/2
N3/4	Female thread 3/4 NPT
N1	Female thread 1 NPT
AQR	Sub-base 1/2 NPT
AQS	Sub-base 3/4 NPT
AQT	Sub-base 1 NPT
AQU	Sub-base 1 1/4 NPT
AQV	Sub-base 1 1/2 NPT
G	Module without connecting thread, without sub-base
NG	Module without connecting thread, without sub-base (inch)
005 Silencer	
	None
S	Silencer

006 Pressure gauge alternatives	
	None
AG	MS pressure gauge
VS	Cover plate
A8	Adapter for EN pressure gauge 1/8, without pressure gauge
A4	Adapter for EN pressure gauge 1/4, without pressure gauge
RG	Integrated pressure gauge, red/green scale
AD7	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/O
AD8	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/C
AD9	Pressure sensor with switching display, M8 plug, window comparator, PNP, N/O
AD10	Pressure sensor with operational status indicator, M8 plug, window comparator, PNP, N/C

007 Alternative pressure gauge scale	
	MS pressure gauge
PSI	psi
BAR	bar
MPA	MPa

008 Valve function	
	Standard
2	2/2-way valve

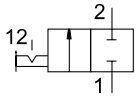
009 Type of mounting	
	Without mounting bracket
WP	Mounting bracket basic design
WPB	Mounting bracket for large wall gap
WPM	Mounting bracket for hooking in service unit components

010 UL certification	
	None
UL1	cULus ordinary location for Canada and USA

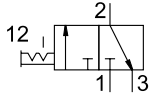
011 Flow direction	
	Flow direction from left to right
Z	Flow direction from right to left

## Datasheet

2/2-way valve, bistable



3/2-way valve, bistable



- Flow rate  
8000 ... 18000 l/min
- Temperature range  
-10 ... +60 °C
- Operating pressure  
0 ... 20 bar
- [www.festo.com](http://www.festo.com)



- Manually actuated on/off valve for pressurising and exhausting pneumatic systems
- Ducted exhaust is possible via a threaded connection with silencer
- The switching position is immediately recognisable
- Actuation is prevented by locking the rotary knob
- Commercially available padlock can be used for security
- Optional pressure gauge
- Optional pressure sensor
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22

### General technical data

Pneumatic connection 1, 2		
Female thread		G3/4, G1, 3/4 NPT or 1 NPT
Connecting plate	[AG...]	G1/2, G3/4, G1, G1 1/4 or G1 1/2
	[AQ...]	1/2 NPT, 3/4 NPT, 1 NPT, 1 1/4 NPT or 1 1/2 NPT
Module without connecting thread/connecting plate	[G], [NG]	–
Pneumatic connection 3		
Pneumatic connection 1, 2	[3/4], [1], [AG...], [G]	G1
	[N3/4], [N1], [AQ...], [NG]	G1 with silencer [S]
		1 NPT without silencer [S]
Design		Piston spool valve
Lap		Overlap
Type of mounting		With accessories
		In-line installation
Mounting position		Any <sup>1)</sup>
Actuator lock		Rotary knob with latch
Pressure indication		Via pressure sensor for indicating the status of the output pressure and the electrical output
		Via pressure gauge for displaying the output pressure
		Via pressure gauge with red/green scale for indicating the output pressure
		Prepared for G1/4
Valve function		2/2-way valve, bistable
		3/2-way valve, bistable
Exhaust function		Cannot be throttled
Reset method		Force-pilot actuated
Type of actuation		Direct
Sealing principle		Soft

1) The on/off valve must be mounted vertically when combined with a pressure sensor as condensate must not collect in the pressure sensor.

† Note: This product conforms to ISO 1179-1 and ISO 228-1.

## Datasheet

Characteristic flow rate values								
Pneumatic connection 1, 2	Female thread		Connecting plate					None
	[3/4], [N3/4]	[1], [N1]	[AGD], [AQR]	[AGE], [AQS]	[AGF], [AQT]	[AGG], [AQU]	[AGH], [AQV]	[G], [NG]
<b>Standard nominal flow rate qn<sup>1)</sup> [l/min]</b>								
In main flow direction 1 → 2	14500	18000	8000	14000	18000	18000	18000	18000
In relief direction 2 → 3	14900	14100	16500	14400	13800	13200	13200	14100
<b>C value [l/s*min]</b>								
In main flow direction 1 → 2	59.59	76.90	32.75	57.50	75.65	75.51	75.17	–
In relief direction 2 → 3	55.11	53.54	56.22	54.07	52.73	51.06	51.36	–
<b>b value</b>								
In main flow direction 1 → 2	0.41	0.37	0.45	0.39	0.38	0.39	0.38	–
In relief direction 2 → 3	0.50	0.48	0.60	0.49	0.47	0.45	0.44	–

1) Measured at p<sub>1</sub> = 6 bar and p<sub>2</sub> = 5 bar, Δp = 1 bar.

Operating and environmental conditions		
	Without pressure sensor	Pressure sensor
Operating pressure [bar]	0 ... 20	0 ... 10
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4]	
Note on the operating/pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)	
Ambient temperature [°C]	–10 ... +60	0 ... +50
Temperature of medium [°C]	–10 ... +60	0 ... +50
Corrosion resistance class CRC <sup>1)</sup>	2 - Moderate corrosion stress	
Noise level [dB (A)]	93 <sup>2)</sup> with silencer	
UL certification <sup>3)</sup>	c UL us - Recognized (OL)	

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

2) Exhaust at 10 bar at a distance of 1 m.

3) More information: [www.festo.com/catalogue/ms9-em](http://www.festo.com/catalogue/ms9-em) → Support/Downloads.

ATEX	
EU certification	[EX4]
ATEX category for gas	II 2G
Type of (ignition) protection for gas	Ex h IIC T6 Gb X
ATEX category for dust	II 2D
Type of (ignition) protection for dust	Ex h IIIC T60°C Db X
Explosion ambient temperature	–10°C ≤ Ta ≤ +60 °C
CE marking (see declaration of conformity) <sup>1)</sup>	To EU Explosion Protection Directive (ATEX)

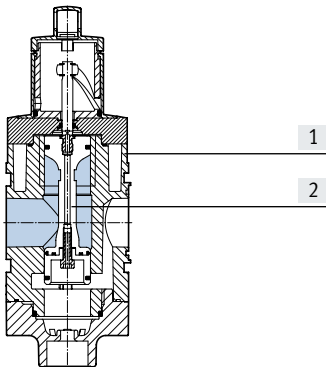
1) More information: [www.festo.com/catalogue/ms9-em](http://www.festo.com/catalogue/ms9-em) → Support/Downloads.

Weight [g]	
On/off valve	2200
On/off valve with silencer	2400

## Datasheet

### Materials

Sectional view



On/off valve		
[1]	Housing	Die-cast aluminium
[2]	Piston spool	POM
-	Seals	NBR
Note on materials		RoHS-compliant
LABS (PWIS) conformity		VDMA24364-B1/B2-L

### Dimensions – Basic version

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

[G], [NG] Module without connecting thread, without connecting plate

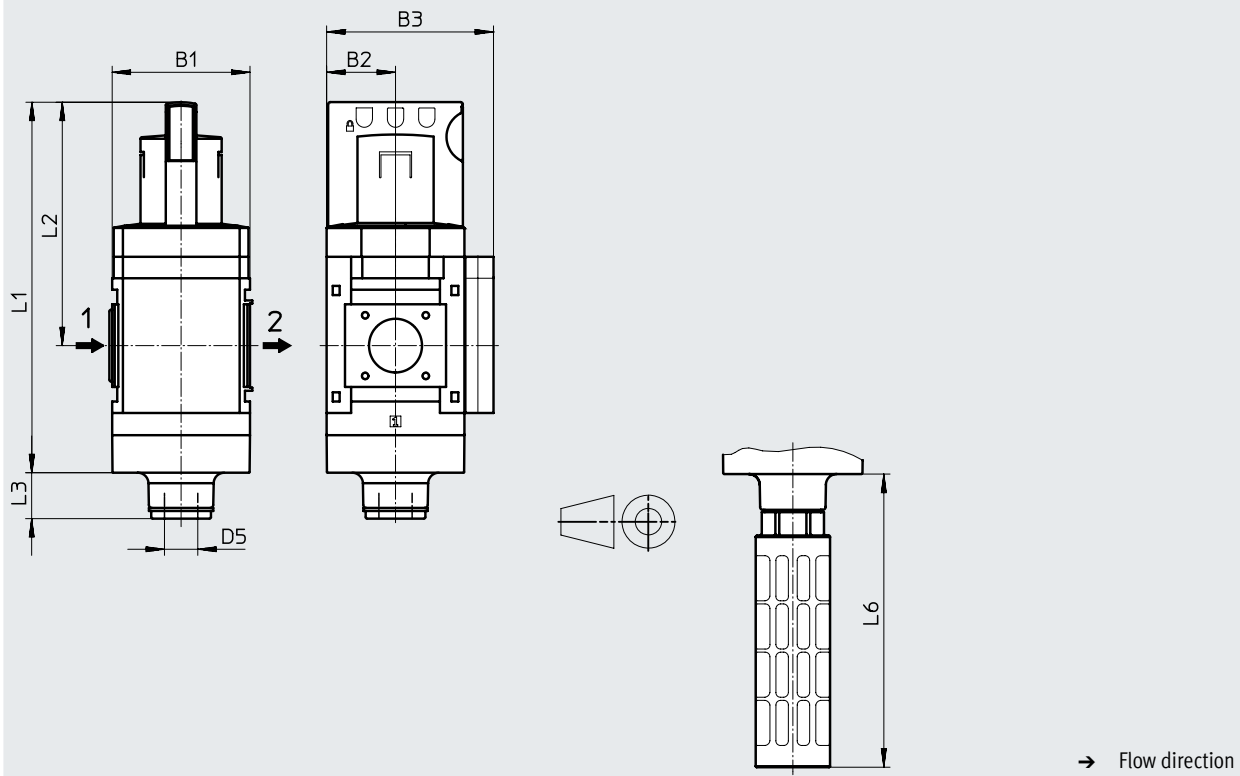
[S] Silencer

[VS] Cover plate

[EX4] EU certification

□ 3/2-way valve

[2] 2/2-way valve



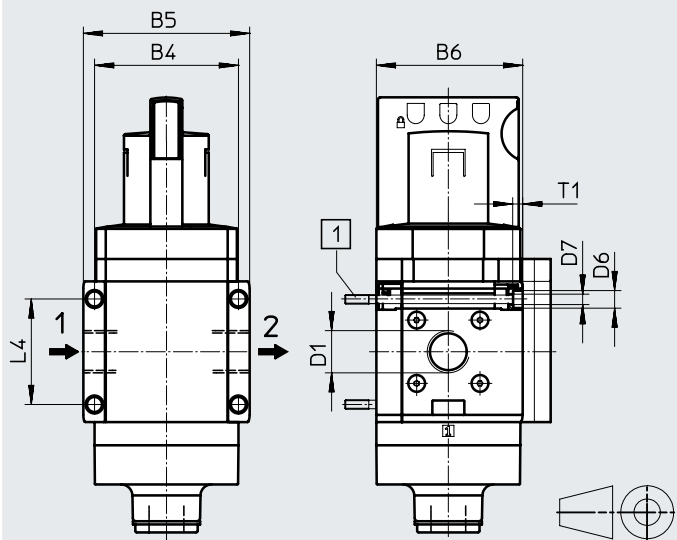
Type	B1	B2	B3	D5	L1	L2	L3	L6	
								[S]	[S]+[EX4]
MS9-EM-G, NG-VS	90	45	109	G1	242	159	23	189	138
MS9-EM-G, NG-VS-2							30	-	-

Datasheet

Dimensions – Female thread/connecting plate

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

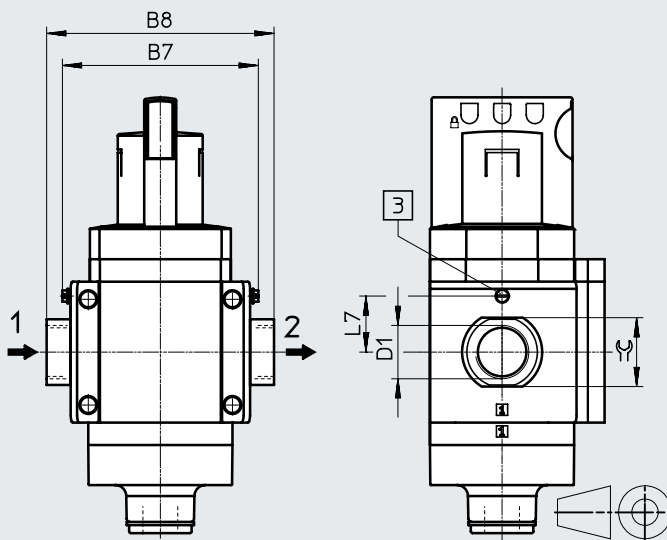
[3/4], [1], [N3/4], [N1] Female thread



[1] Retaining screw M6xmin. 90 to DIN 912 (not in the scope of delivery) for wall mounting without mounting bracket

→ Flow direction

[AG...], [AQ...] Connecting plate



[3] Earthing screw M4x8 (only with MS9-...-EX4)

→ Flow direction

Type	B4	B5	B6	B7		B8	D1	D6	D7	L4	L7	T1	≅
					[EX4]						[EX4]		
MS9-EM-3/4	90	104	91.5	-	-	-	G3/4	11	6.5	66	-	6	-
MS9-EM-1							G1						
MS9-EM-AGD	-	-	-	112	122	-	132	-	-	-	35	-	30
MS9-EM-AGE							132						36
MS9-EM-AGF							142						41
MS9-EM-AGG							162						50
MS9-EM-AGH							176						55
MS9-EM-N3/4	90	104	91.5	-	-	-	3/4 NPT	11	6.5	66	-	6	-
MS9-EM-N1							1 NPT						
MS9-EM-AQR	-	-	-	112	-	-	132	-	-	-	-	-	30
MS9-EM-AQS							132						36
MS9-EM-AQT							142						41
MS9-EM-AQU							162						50
MS9-EM-AQV							176						55

† Note: This product conforms to ISO 1179-1 and ISO 228-1.



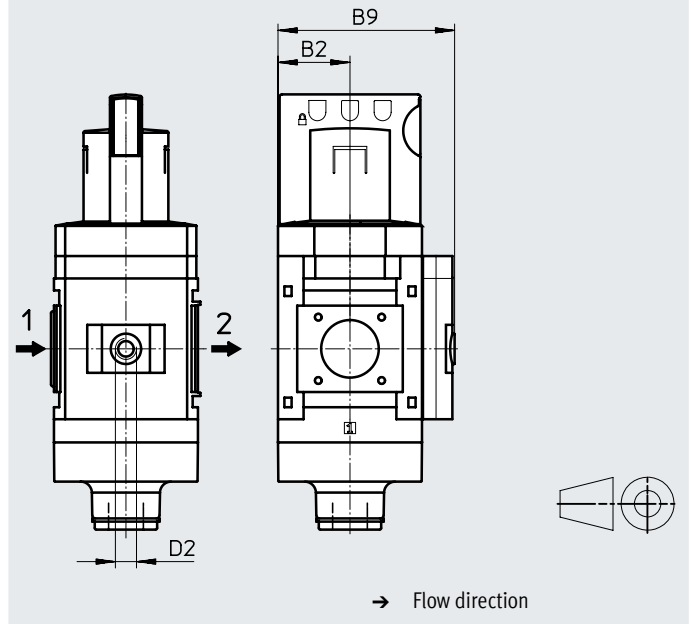
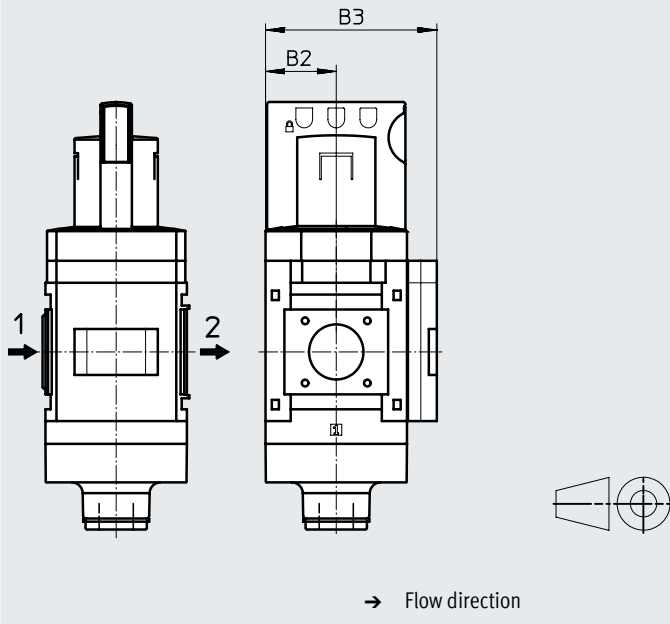
Datasheet

Dimensions – Pressure gauges/adapters

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

- [AG] Integrated MS pressure gauge with standard scale
- [RG] Integrated MS pressure gauge with red/green scale

- [A4] Adapter for EN pressure gauge 1/4, without pressure gauge



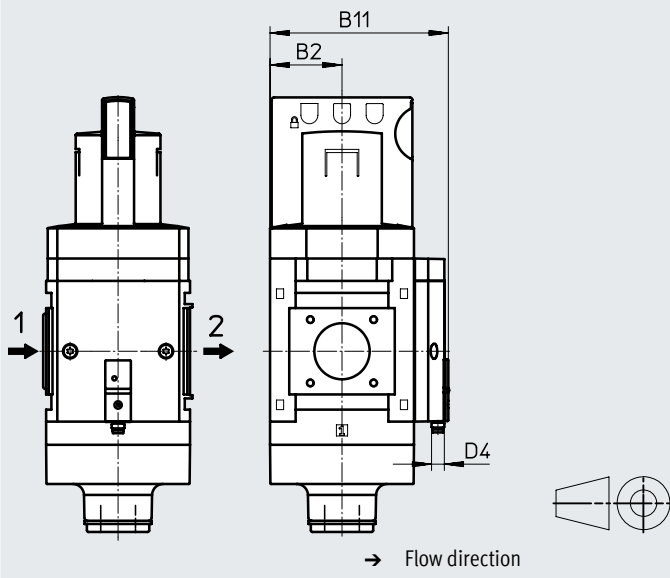
Type	B2	B3	B9	D2
MS9-EM-...-AG, RG	45	109	–	–
MS9-EM-...-A4	–	–	110	G1/4

Dimensions – Pressure sensor

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

- [AD7], [AD8], [AD9], [AD10] Pressure sensor with status indicator

Datasheets → Internet: sde5



- [AD7]: SDE5-D10-O-...-P-M8 with 1x 3-pin M8 plug, threshold value comparator, 1 switching output PNP, N/O contact

- [AD9]: SDE5-D10-O3-...-P-M8 with 1x 3-pin M8 plug, window comparator, 1 switching output PNP, N/O contact

- [AD8]: SDE5-D10-C-...-P-M8 with 1x 3-pin M8 plug, threshold value comparator, 1 switching output PNP, N/C contact

- [AD10]: SDE5-D10-C3-...-P-M8 with 1x 3-pin M8 plug, window comparator, 1 switching output PNP, N/C contact

Type	B2	B11	D4
MS9-EM-...-AD7, AD8, AD9, AD10	45	112	M8

Ordering data

3/2-way valve, silencer, cover plate

Size	Connection 1, 2	Connection 3	Flow direction	Part no.	Type
MS9	Without connecting thread	G thread	From left to right	562952	MS9-EM-G-S-VS
		G thread	From left to right	562954	MS9-EM-NG-S-VS

## Ordering data – Modular product system

Ordering table		Grid dimension	[mm]	90	Conditions	Code	Enter code
Module no.	<b>562178</b>						
Series	Standard					<b>MS</b>	MS
Size	9					<b>9</b>	9
Function	On/off valve, manual					<b>-EM</b>	-EM
Pneumatic connection	Female thread G3/4	[1]				<b>-3/4</b>	
	Female thread G1	[1]				<b>-1</b>	
	Connecting plate G1/2					<b>-AGD</b>	
	Connecting plate G3/4					<b>-AGE</b>	
	Connecting plate G1					<b>-AGF</b>	
	Connecting plate G1 1/4					<b>-AGG</b>	
	Connecting plate G1 1/2					<b>-AGH</b>	
	Female thread 3/4 NPT	[1]				<b>-N3/4</b>	
	Female thread 1 NPT	[1]				<b>-N1</b>	
	Connecting plate 1/2 NPT	[1]				<b>-AQR</b>	
	Connecting plate 3/4 NPT	[1]				<b>-AQS</b>	
	Connecting plate 1 NPT	[1]				<b>-AQT</b>	
	Connecting plate 1 1/4 NPT	[1]				<b>-AQU</b>	
	Connecting plate 1 1/2 NPT	[1]				<b>-AQV</b>	
	Module without connecting thread, without connecting plate	[1]				<b>-G</b>	
Module without connecting thread, without connecting plate (connection 3 in NPT)	[1]				<b>-NG</b>		
Rotary knob colour	Standard (black/blue)						
	Red					<b>-R</b>	
Silencer	None						
	Silencer					<b>-S</b>	
Pressure gauge/adapter	MS pressure gauge, bar					<b>-AG</b>	
	Cover plate					<b>-VS</b>	
	Adapter for EN pressure gauge 1/4, without pressure gauge					<b>-A4</b>	
	Integrated pressure gauge, red/green scale	[2]				<b>-RG</b>	
	Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/O contact	[1] [3]				<b>-AD7</b>	
	Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/C contact	[1] [3]				<b>-AD8</b>	
	Pressure sensor with status indicator, plug M8, window comparator, PNP, N/O contact	[1] [3]				<b>-AD9</b>	
Pressure sensor with status indicator, plug M8, window comparator, PNP, N/C contact	[1] [3]				<b>-AD10</b>		
Alternative pressure gauge scale	None	[4]					
	psi	[5]				<b>-PSI</b>	
	MPa	[5]				<b>-MPA</b>	
	bar	[5]				<b>-BAR</b>	
Valve function	Standard (3/2-way valve)						
	2/2-way valve	[6]				<b>-2</b>	
Type of mounting	Without mounting bracket						
	Mounting bracket standard design	[7]				<b>-WP</b>	
	Mounting bracket for hooking in service unit components	[1] [7]				<b>-WPM</b>	
	Mounting bracket for large wall gap	[7]				<b>-WPB</b>	
EU certification	None						
	II 2GD to EU Explosion Protection Directive (ATEX)					<b>-EX4</b>	
UL certification	None						
	cULus, ordinary location for Canada and USA					<b>-UL1</b>	
Flow direction	Flow direction from left to right						
	Flow direction from right to left					<b>-Z</b>	

[1] 3/4; 1, N3/4, N1, Not with EU EX4 certification.

AQR, AQS, AQT,  
AQU, AQV, G, NG,  
AD7 ... AD10,  
WPM

[2] RG Not with alternative pressure gauge scale PSI, PSI scale is only used as an auxiliary scale.

[3] AD7 ... AD10 Measuring range max. 10 bar.

[4] – Not with pressure gauge AG, RG.

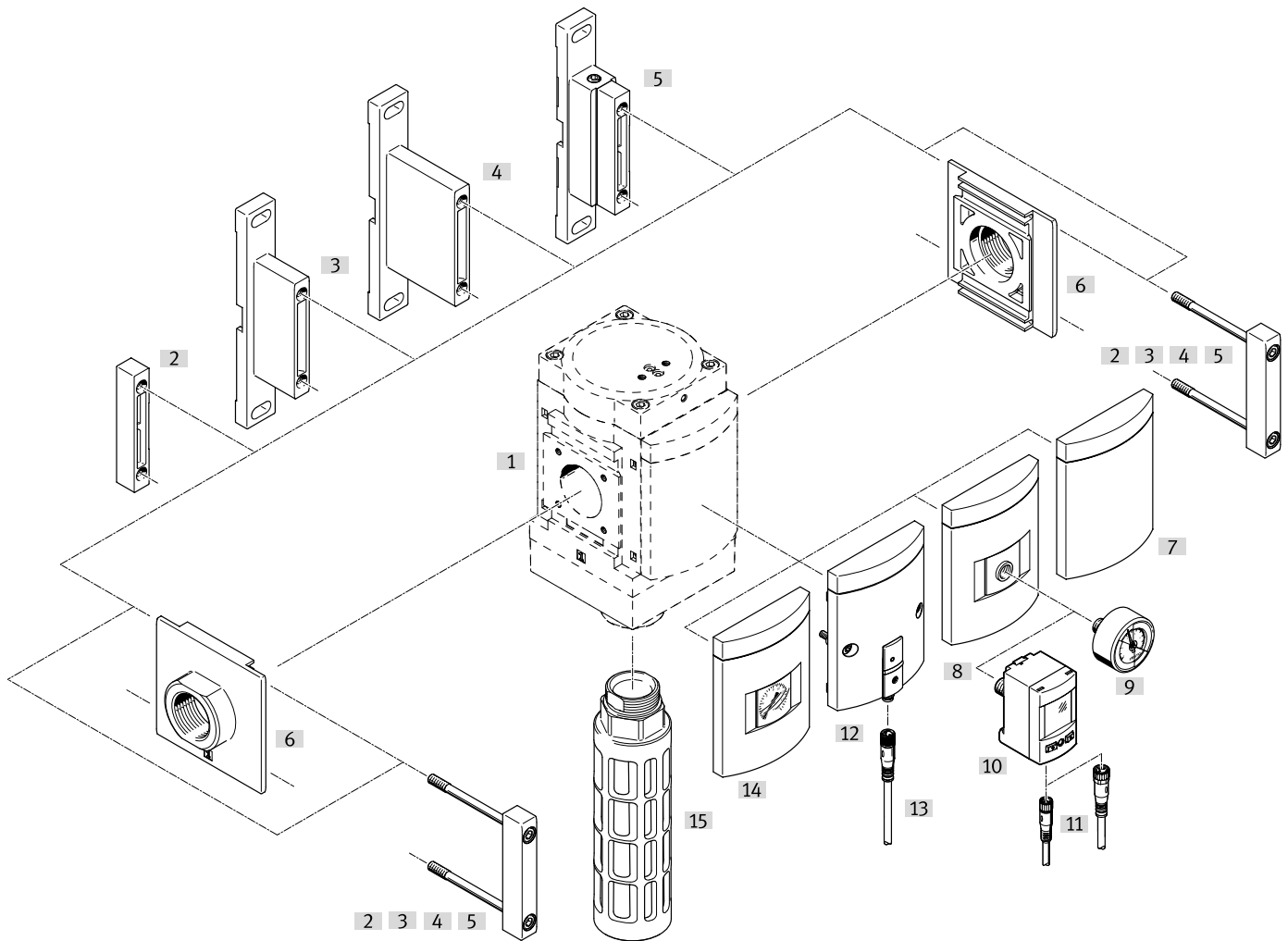
[5] PSI, MPA, BAR Not with adapter VS, A4, AD7, AD8, AD9, AD10.


[6] 2 Not with silencer S.

[7] WP, WPM, WPB Not with pneumatic connection G, NG.



Peripherals overview

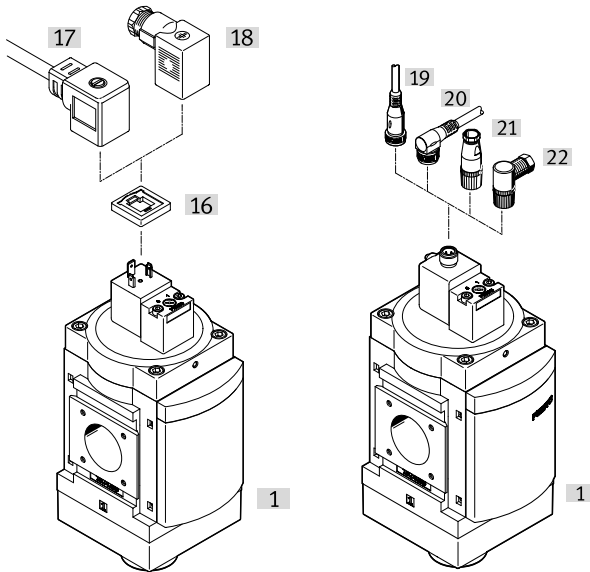


 **Note**  
 Additional accessories:  
 • Module connector for combination with size MS6, MS9 or MS12  
 → Internet: rmv, armv

## Peripherals overview

Supply voltage  
V24, V110, V230

Supply voltage  
V24P



## Mounting attachments and accessories

	Order code	→ Page/Internet
[1] On/off valve	MS9-EE	71
<b>Can be ordered via the modular product system</b>		
[3] Mounting bracket <sup>2)</sup>	[WP]	76
[4] Mounting bracket <sup>2)</sup>	[WPB]	
[5] Mounting bracket	[WPM]	
[6] Connecting plate SET <sup>1)</sup>	[AG...]	
Connecting plate SET <sup>1)</sup>	[AQ...]	
[8] Adapter for EN pressure gauge 1/4	[A4]	
[7] Cover plate	[VS]	
[12] Pressure sensor SDE5 with status indicator	[AD7]	
[14] MS pressure gauge	[AG], [RG]	
[15] Silencer	[S]	
<b>Can be ordered as accessories</b>		
[2] Module connector	MS9-MV	ms9-mv
[3] Mounting bracket <sup>2)</sup>	MS9-WP	ms9-wp
[4] Mounting bracket <sup>2)</sup>	MS9-WPB	ms9-wp
[5] Mounting bracket	MS9-WPM	ms9-wp
[6] Connecting plate SET	MS9-AG...	ms9-ag
Connecting plate SET	MS9-AQ...	ms9-aq
[9] Pressure gauge	MA	103
[10] Pressure sensor	SPAU-...-T-R14M	102
[11] Connecting cable	NEBA-M8...-LE4, NEBA-M12...-LE4	103
[13] Connecting cable	NEBA-M8...-LE3	103
[15] Silencer	U	103
[16] Illuminating seal	MC-LD	102
[17] Connecting cable	KMC	102
[18] Plug socket	MSSD-C	102
[19] Connecting cable	NEBA-M12G5	103
[20] Connecting cable	NEBA-M12W5	103
[21] Sensor socket	NECB-M12G4-C2	103
[22] Angled plug socket	NECB-M12W4-C2	103

1) Module connector [2] is included in the scope of delivery.

2) The screws for the wall bracket on the rear are partially covered by the housing of this service unit component. Depending on the configuration of the service unit combination, the screws will no longer be accessible. The mounting bracket MS9-WPM is therefore recommended for wall mounting. It can be used to attach a fully assembled combination to the pre-mounted wall bracket.

## Type codes

001	Series
MS	MS series

002	Size
9	Grid dimension 90 mm

003	Function
EE	On/off valve, electric

004	Pneumatic connection
3/4	Female thread G3/4
1	Female thread G1
AGD	Sub-base G1/2
AGE	Sub-base G3/4
AGF	Sub-base G1
AGG	Connecting plate G1 1/4
AGH	Connecting plate G1 1/2
N3/4	Female thread 3/4 NPT
N1	Female thread 1 NPT
AQR	Sub-base 1/2 NPT
AQS	Sub-base 3/4 NPT
AQT	Sub-base 1 NPT
AQU	Sub-base 1 1/4 NPT
AQV	Sub-base 1 1/2 NPT
G	Module without connecting thread, without sub-base
NG	Module without connecting thread, without sub-base (inch)

005	Supply voltage
V110	110 V AC (connection pattern to EN 175301)
V24	24 V DC (connection pattern to EN 175301)
V230	230 V AC (connection pattern to EN 175301)
V24P	24 V DC plug (connection pattern M12 to DESINA)

006	Silencer
	None
S	Silencer

007	Pressure gauge alternatives
	None
AG	MS pressure gauge
VS	Cover plate
A8	Adapter for EN pressure gauge 1/8, without pressure gauge
A4	Adapter for EN pressure gauge 1/4, without pressure gauge
RG	Integrated pressure gauge, red/green scale
AD7	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/O

008	Alternative pressure gauge scale
	MS pressure gauge
PSI	psi
BAR	bar
MPA	MPa

009	Valve function
	Standard
2	2/2-way valve

010	Type of mounting
	Without mounting bracket
WP	Mounting bracket basic design
WPB	Mounting bracket for large wall gap
WPM	Mounting bracket for hooking in service unit components

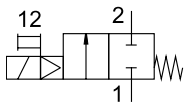
011	EU certification
	None
EX2	II 3GD

012	UL certification
	None
UL1	cULus ordinary location for Canada and USA

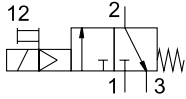
013	Flow direction
	Flow direction from left to right
Z	Flow direction from right to left


## Datasheet


2/2-way valve, closed, single solenoid




3/2-way valve, closed, single solenoid



•  Flow rate  
8000 ... 18000 l/min

•  Temperature range  
-10 ... +60 °C

•  Operating pressure  
3.5 ... 16 bar

•  [www.festo.com](http://www.festo.com)



- Electrically actuated on/off valve for pressurising and exhausting pneumatic systems
- Ducted exhaust is possible via a threaded connection with silencer
- With solenoid coil, without plug socket
- Choice of three voltage ranges
- Detenting and non-detenting manual override
- Optional pressure gauge
- Optional device variant EX2 for use in potentially explosive areas in zones 2 and 22 (plug socket MSSD-C-24V-EX included in scope of delivery)

### General technical data

Pneumatic connection 1, 2		
Female thread		G3/4, G1, 3/4 NPT or 1 NPT
Connecting plate	[AG...]	G1/2, G3/4, G1, G1 1/4 or G1 1/2
	[AQ...]	1/2 NPT, 3/4 NPT, 1 NPT, 1 1/4 NPT or 1 1/2 NPT
Module without connecting thread/connecting plate	[G, NG]	–
Pneumatic connection 3		
Pneumatic connection 1, 2	[3/4], [1]/[AG...], [G]	G1
	[N3/4], [N1], [AQ...], [NG]	G1 with silencer [S]
	[N3/4], [N1], [AQ...]	1 NPT without silencer [S]
Design		Piston spool valve
Lap		Overlap
Type of mounting		With accessories In-line installation
Mounting position		Any
Pressure indication		Via pressure sensor for indicating the status of the output pressure and the electrical output Via pressure gauge for displaying the output pressure Via pressure gauge with red/green scale for indicating the output pressure Prepared for G1/4
Valve function		2/2-way valve, closed, single solenoid 3/2-way valve, closed, single solenoid
Exhaust function		Cannot be throttled
Manual override		Non-detenting/detenting
Reset method		Mechanical spring
Type of actuation		Piloted
Pilot air supply		Internal
Sealing principle		Soft

† Note: This product conforms to ISO 1179-1 and ISO 228-1.

## Datasheet

Electrical data		
Characteristic coil data		
With supply voltage	[V24], [V24P]	24 V DC: 4.5 W, permissible voltage fluctuations $\pm 10\%$
	[V110]	110 V AC: 50 Hz, pick-up power 11.5 W, holding power 8.9 W, permissible voltage fluctuations $\pm 10\%$
		110 V AC: 60 Hz, pick-up power 9.5 W, holding power 6.2 W, permissible voltage fluctuations $\pm 10\%$
	[V230]	230 V AC: 50 Hz, pick-up power 11.5 W, holding power 9.1 W, permissible voltage fluctuations $\pm 10\%$
		230 V AC: 60 Hz, pick-up power 9.5 W, holding power 6.4 W, permissible voltage fluctuations $\pm 10\%$
Electrical connection		
With supply voltage	[V24], [V110], [V230]	Plug, square design to EN 175301-803, type A
	[V24P]	M12 plug, 4-pin to DESINA
Degree of protection for solenoid coil		IP65
Duty cycle [%]		100

Characteristic flow rate values								
Pneumatic connection	Female thread		Connecting plate					None
	G3/4/3/4 NPT	G1/1 NPT	AGD/AQR	AGE/AQS	AGF/AQT	AGG/AQU	AGH/AQV	G, NG
<b>Standard nominal flow rate <math>q_{nN^{1)}</math> [l/min]</b>								
In main flow direction 1 $\rightarrow$ 2	14500	18000	8000	14000	18000	18000	18000	18000
In relief direction 2 $\rightarrow$ 3	14900	14100	16500	14400	13800	13200	13200	14100
<b>C value [l/s*min]</b>								
In main flow direction 1 $\rightarrow$ 2	59.59	76.90	32.75	57.50	75.65	75.51	75.17	–
In relief direction 2 $\rightarrow$ 3	55.11	53.54	56.22	54.07	52.73	51.06	51.36	–
<b>b value</b>								
In main flow direction 1 $\rightarrow$ 2	0.41	0.37	0.45	0.39	0.38	0.39	0.38	–
In relief direction 2 $\rightarrow$ 3	0.50	0.48	0.60	0.49	0.47	0.45	0.44	–

1) Measured at  $p_1 = 6$  bar and  $p_2 = 5$  bar,  $\Delta p = 1$  bar.

Operating and environmental conditions	
Operating pressure [bar]	3.5 ... 16
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4]
Note on the operating/pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)
Ambient temperature [°C]	-10 ... +60
Temperature of medium [°C]	-10 ... +60
Corrosion resistance class CRC <sup>1)</sup>	2 - Moderate corrosion stress
Noise level [dB (A)]	93 <sup>2)</sup> with silencer
UL certification <sup>3)</sup>	c UL us - Recognized (OL)
CE marking (see declaration of conformity) <sup>3)</sup>	To EU Low Voltage Directive
UKCA marking (see declaration of conformity) <sup>3)</sup>	To UK regulations for electrical equipment

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

2) Exhaust at 10 bar at a distance of 1 m.

3) More information: [www.festo.com/catalogue/ms9-ee](http://www.festo.com/catalogue/ms9-ee)  $\rightarrow$  Support/Downloads.

ATEX	
EU certification	EX2
ATEX category for gas	II 3G
Type of (ignition) protection for gas	Ex nA IIC T5 X Gc
ATEX category for dust	II 3D
Type of (ignition) protection for dust	Ex tc IIIC T85°C X Dc IP65
Explosion ambient temperature	$-10^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$
Explosion protection certification outside the EU	EPL Db (GB) EPL Gb (GB)
CE marking (see declaration of conformity) <sup>1)</sup>	To EU Explosion Protection Directive (ATEX)
UKCA marking (see declaration of conformity) <sup>1)</sup>	To UK regulations for explosions

1) More information: [www.festo.com/catalogue/ms9-ee](http://www.festo.com/catalogue/ms9-ee)  $\rightarrow$  Support/Downloads.

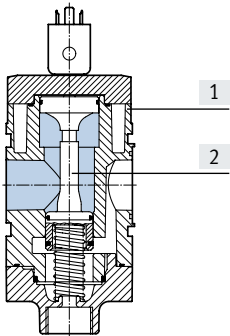


# Datasheet

Weight [g]	
On/off valve	2100
On/off valve with silencer S	2300

## Materials

Sectional view



On/off valve		
[1]	Housing	Die-cast aluminium
[2]	Piston spool	POM
-	Seals	NBR
Note on materials		RoHS-compliant
LABS (PWIS) conformity		VDMA24364-B1/B2-L

## Dimensions – Basic version

[G], [NG] Module without connecting thread, without connecting plate

[S] Silencer

[VS] Cover plate

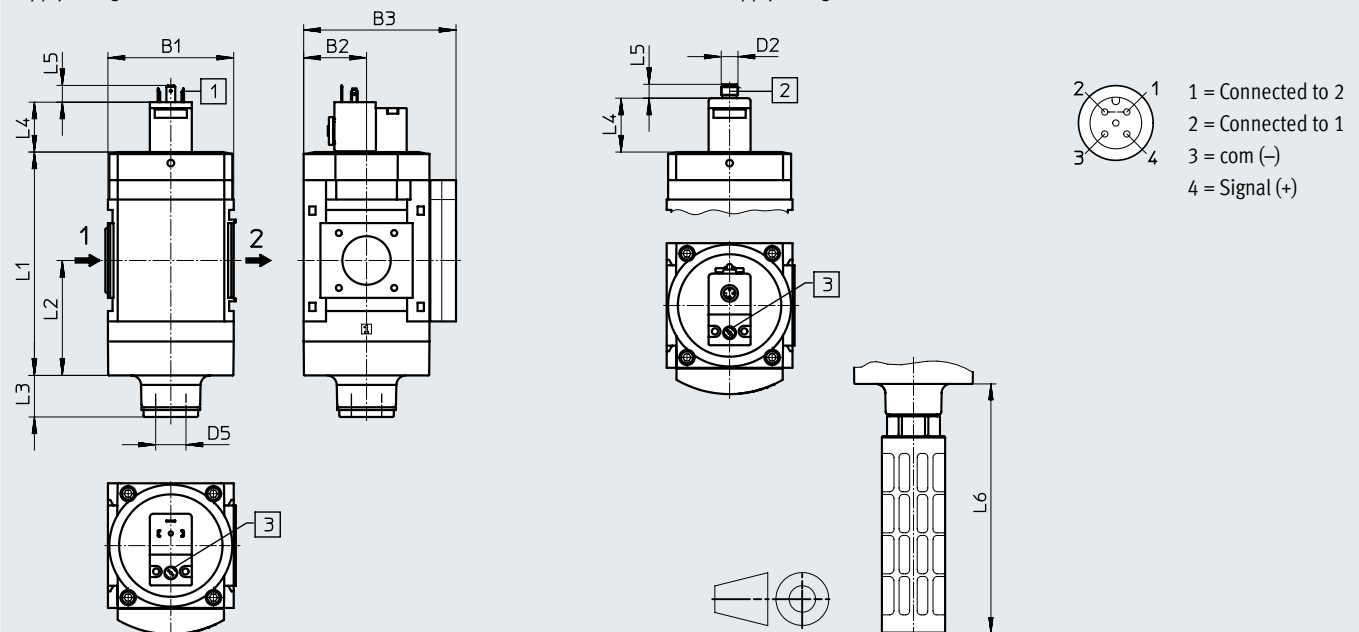
[V24], [V110], [V230]

Supply voltage

[V24P]

Supply voltage

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



[1] Plug connection to EN 175301-803

[2] Plug connection M12, 4-pin to DESINA for connecting cable NEBA-M12

[3] Manual override

→ Flow direction

Type	B1	B2	B3	D2	D5	L1	L2	L3		L4	L5	L6
								2/2-way valve	3/2-way valve			
MS9-EE-G, NG-V24, V110, V230	90	45	109	-	G1	161	83	30	23	36	12	189
MS9-EE-G, NG-V24P				M12x1						39	10	

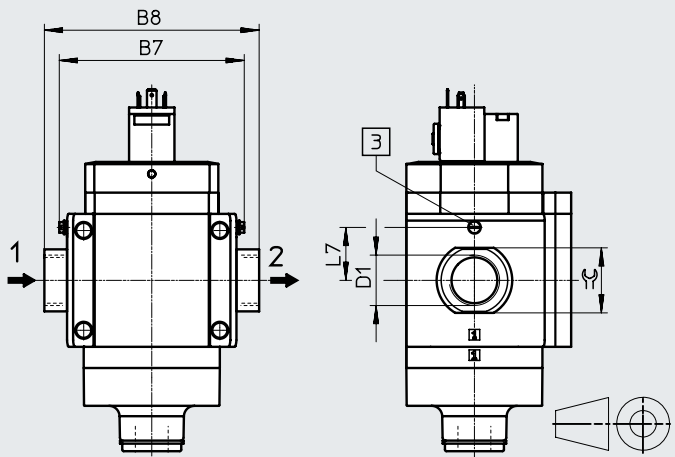
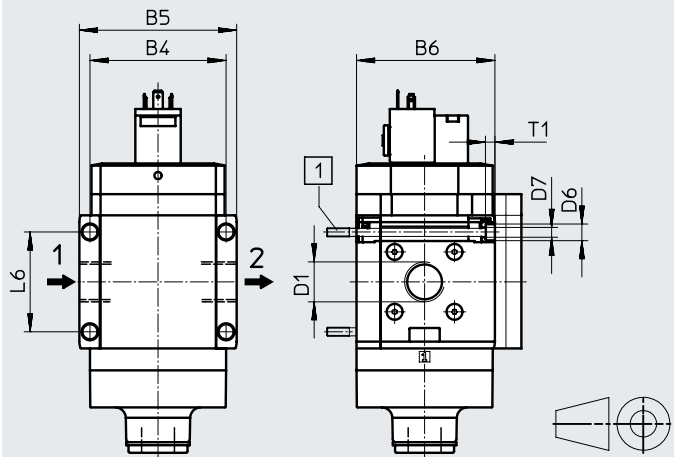
Datasheet

Dimensions – Female thread/connecting plate

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

[3/4], [1], [N3/4], [N1] Female thread

[AG...], [AQ...] Connecting plate



[1] Retaining screw M6xmin. 90 to DIN 912 (not in the scope of delivery) for wall mounting without mounting bracket → Flow direction

[3] Earthing screw M4x8 (only with MS9-...-EX2) → Flow direction

Type	B4	B5	B6	B7		B8	D1	D6	D7	L6	L7		T1	☉
					EX2							EX2		
MS9-EE-3/4	90	104	91.5	-	-	-	G3/4	11	6.5	66	-	6	-	
MS9-EE-1							G1							
MS9-EE-AGD	-	-	-	112	122	132	G1/2	-	-	-	35	-	30	
MS9-EE-AGE							G3/4						36	
MS9-EE-AGF							G1						41	
MS9-EE-AGG							G1 1/4						50	
MS9-EE-AGH							G1 1/2						55	
MS9-EE-N3/4							90						104	91.5
MS9-EE-N1	1 NPT													
MS9-EE-AQR	-	-	-	112	-	132	1/2 NPT	-	-	-	-	-	30	
MS9-EE-AQS						132	3/4 NPT						36	
MS9-EE-AQT						142	1 NPT						41	
MS9-EE-AQU						162	1 1/4 NPT						50	
MS9-EE-AQV						176	1 1/2 NPT						55	

† Note: This product conforms to ISO 1179-1 and ISO 228-1.

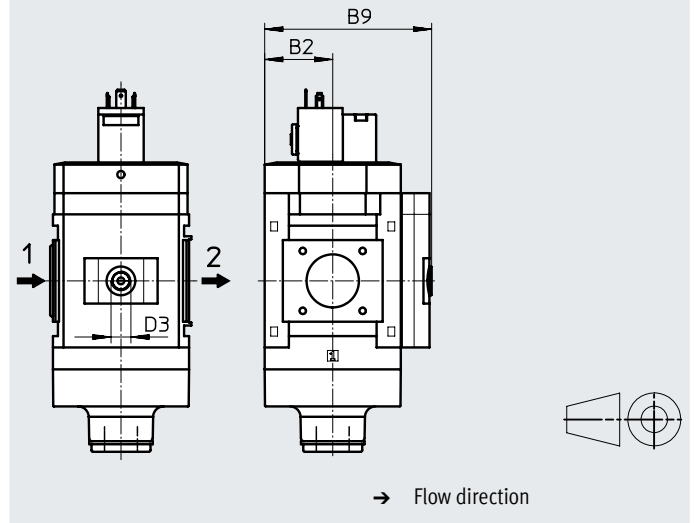
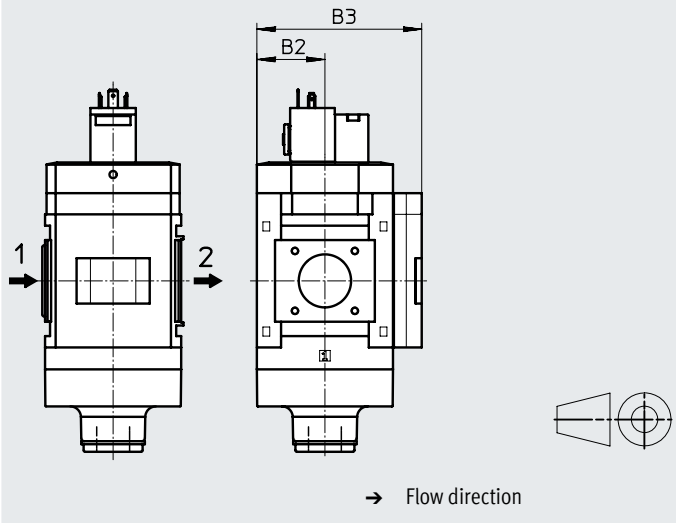
Datasheet

Dimensions – Pressure gauges/pressure gauge alternatives

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

- [AG] Integrated MS pressure gauge with standard scale
- [RG] Integrated MS pressure gauge with red/green scale

- [A4] Adapter for EN pressure gauge 1/4, without pressure gauge



Type	B2	B3	B9	D3
MS9-EE-...-AG, RG	45	109	-	-
MS9-EE-...-A4		-	110	G1/4

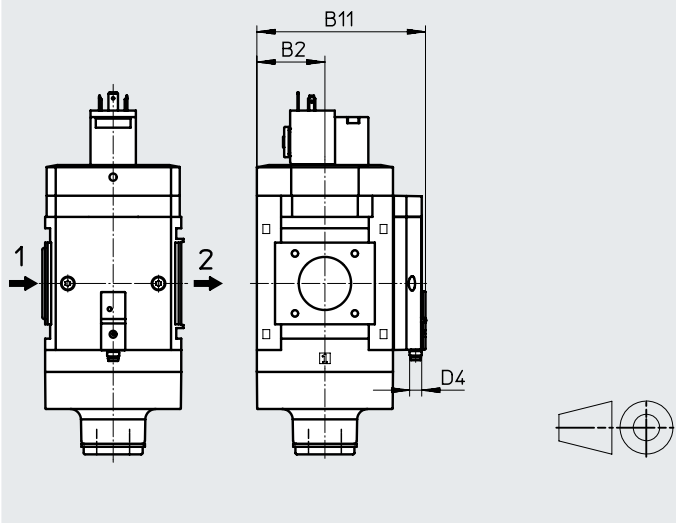
Note: This product conforms to ISO 1179-1 and ISO 228-1.

Dimensions – Pressure gauges/pressure gauge alternatives

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

- [AD7] Pressure sensor with status indicator

- [AD7]:  
SDE5-D10-O-...-P-M8 with 1x 3-pin  
M8 plug, threshold value compar-  
ator, 1 switching output PNP, N/O con-  
tact



Type	B2	B11	D4
MS9-EE-...-AD7	45	112	M8x1

Ordering data

3/2-way valve, with silencer, supply voltage 24 V DC

Size	Part no.	Type
<b>Cover plate</b>		
MS9	562940	MS9-EE-G-V24-S-VS
<b>Pneumatic connection 3 in NPT, cover plate</b>		
MS9	562946	MS9-EE-NG-V24-S-VS

## Ordering data – Modular product system

Ordering table		Grid dimension	[mm]	90	Conditions	Code	Enter code
Module no.	<b>562177</b>						
Series	Standard					<b>MS</b>	MS
Size	9					<b>9</b>	9
Function	On/off valve, electric					<b>-EE</b>	-EE
Pneumatic connection	Female thread G3/4			[1]		<b>-3/4</b>	
	Female thread G1			[1]		<b>-1</b>	
	Connecting plate G1/2					<b>-AGD</b>	
	Connecting plate G3/4					<b>-AGE</b>	
	Connecting plate G1					<b>-AGF</b>	
	Connecting plate G1 1/4					<b>-AGG</b>	
	Connecting plate G1 1/2					<b>-AGH</b>	
	Female thread 3/4 NPT			[1]		<b>-N3/4</b>	
	Female thread 1 NPT			[1]		<b>-N1</b>	
	Connecting plate 1/2 NPT			[1]		<b>-AQR</b>	
	Connecting plate 3/4 NPT			[1]		<b>-AQS</b>	
	Connecting plate 1 NPT			[1]		<b>-AQT</b>	
	Connecting plate 1 1/4 NPT			[1]		<b>-AQU</b>	
	Connecting plate 1 1/2 NPT			[1]		<b>-AQV</b>	
	Module without connecting thread, without connecting plate			[1]		<b>-G</b>	
Module without connecting thread, without connecting plate (connection 3 in NPT)			[1]		<b>-NG</b>		
Supply voltage	24 V DC (plug pattern to EN 175301), 16 bar					<b>-V24</b>	
	24 V DC plug (plug pattern M12 to DESINA), 16 bar			[1]		<b>-V24P</b>	
	110 V AC (plug pattern to EN 175301), 16 bar			[1]		<b>-V110</b>	
	230 V AC (plug pattern to EN 175301), 16 bar			[1]		<b>-V230</b>	

[1] 3/4; 1, N3/4, N1, Not with EU EX2 certification.  
 AQR, AQS, AQT,  
 AQU, AQV, G, NG,  
 V24P, V110,  
 V230,  
 AD7,  
 WPM

## Ordering data – Modular product system

Ordering table					
Grid dimension	[mm]	90	Conditions	Code	Enter code
Silencer		Silencer		<b>-S</b>	
Pressure gauge/pressure gauge alternatives		MS pressure gauge, bar		<b>-AG</b>	
		Cover plate		<b>-VS</b>	
		Adapter for EN pressure gauge 1/4, without pressure gauge		<b>-A4</b>	
		Integrated pressure gauge, red/green scale	[2]	<b>-RG</b>	
		Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/O contact	[1] [3]	<b>-AD7</b>	
Alternative pressure gauge scale		psi	[4]	<b>-PSI</b>	
		MPa	[4]	<b>-MPA</b>	
		bar	[4]	<b>-BAR</b>	
Valve function		Standard (3/2-way valve)		<b>-</b>	
		2/2-way valve	[5]	<b>-2</b>	
Type of mounting		Mounting bracket standard design	[6]	<b>-WP</b>	
		Mounting bracket for hooking in service unit components	[1] [6]	<b>-WPM</b>	
		Mounting bracket for large wall gap	[6]	<b>-WPB</b>	
EU certification		II 3GD to EU Explosion Protection Directive (ATEX)		<b>-EX2</b>	
UL certification		cULus, ordinary location for Canada and USA	[7]	<b>-UL1</b>	
Flow direction		Flow direction from right to left		<b>-Z</b>	

[1] 3/4; 1, N3/4, N1, Not with EU EX2 certification.

AQR, AQS, AQT,  
 AQU, AQV, G, NG,  
 V24P, V110,  
 V230,  
 AD7,  
 WPM

[2] RG Not with alternative pressure gauge scale PSI, PSI scale is only used as an auxiliary scale.

[3] AD7 Measuring range max. 10 bar.

[4] PSI, MPA, BAR Not with adapter VS, A4, AD7.

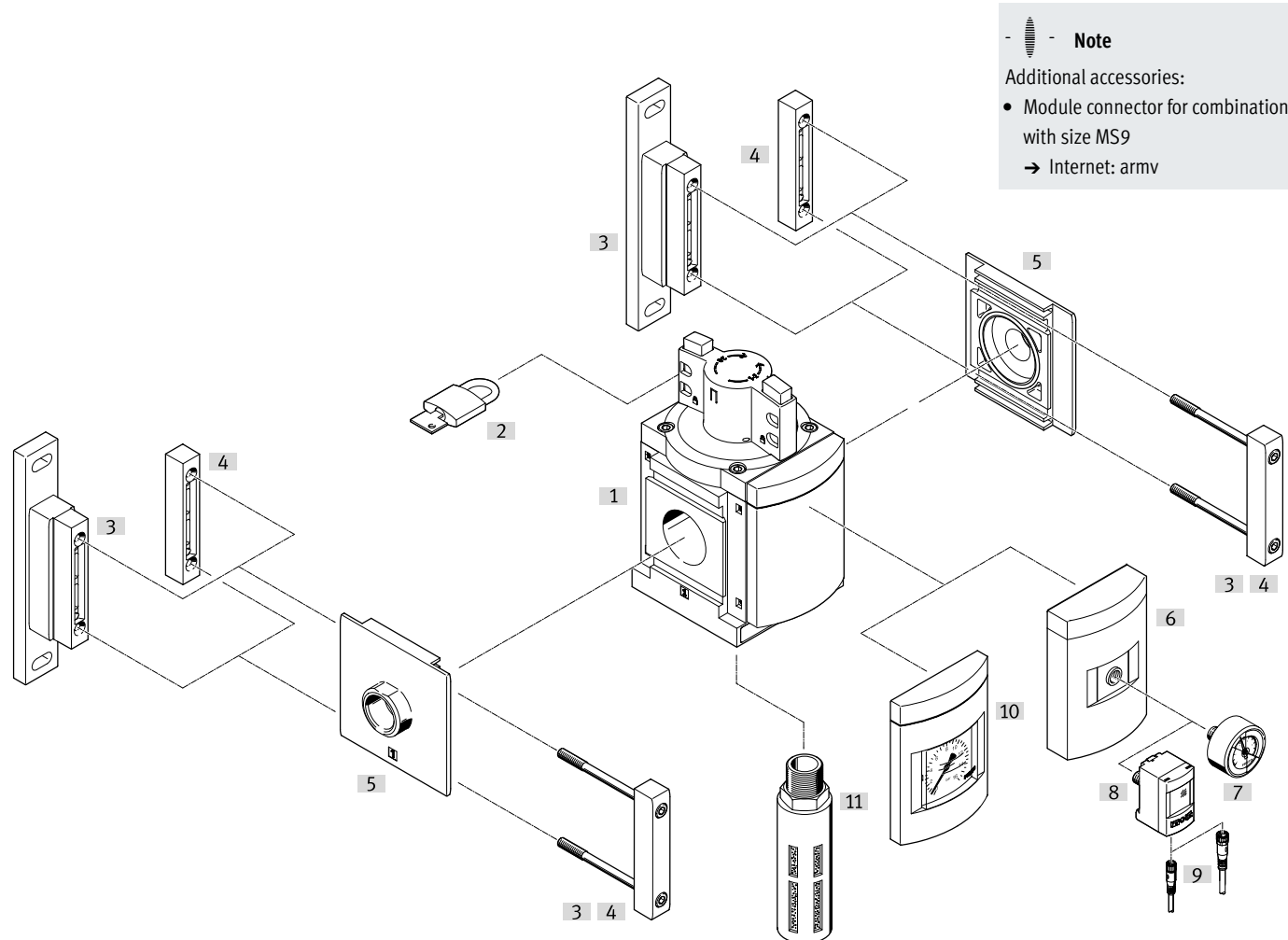
[5] 2 Not with silencer S.

[6] WP, WPM, WPB Not with pneumatic connection G, NG.

[7] UL1 Not with supply voltage V110, V230.

## Peripherals overview

### On/off valve MS12-EM



**Note**  
 Additional accessories:  
 • Module connector for combination with size MS9  
 → Internet: armv

Mounting attachments and accessories		Order code	→ Page/Internet
[1]	On/off valve	MS12-EM	80
<b>Can be ordered via the modular product system</b>			
[3]	Mounting bracket	[WP]	83
[5]	Connecting plate SET <sup>1)</sup>	[AG...]	
[6]	Adapter for EN pressure gauge 1/4	[A4]	
[10]	MS pressure gauge	[AG]	
[11]	Silencer	[S]	
<b>Can be ordered as accessories</b>			
[2]	Padlock	LRVS-D	103
[3]	Mounting bracket	MS12-WP	ms12-wp
[4]	Module connector	MS12-MV	ms12-mv
[5]	Connecting plate SET	MS12-AG...	ms12-ag
[7]	Pressure gauge	MA	103
[8]	Pressure sensor	SPAU-...-T-R14M	102
[9]	Connecting cable	NEBA-M8...-LE4, NEBA-M12...-LE4	103
[11]	Silencer	U	103

1) Module connector [4] is included in the scope of delivery.

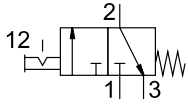
## Type codes





001	Series
<b>MS</b>	MS series
002	Size
<b>12</b>	Grid dimension 124 mm
003	Function
<b>EM</b>	On/off valve, manual
004	Pneumatic connection
<b>AGF</b>	Sub-base G1
<b>AGG</b>	Connecting plate G1 1/4
<b>AGH</b>	Connecting plate G1 1/2
<b>AGI</b>	Sub-base G2
<b>G</b>	Module without connecting thread, without sub-base
005	Silencer
	None
<b>S</b>	Silencer

006	Pressure gauge alternatives
	None
<b>AG</b>	MS pressure gauge
<b>A4</b>	Adapter for EN pressure gauge 1/4, without pressure gauge
007	Alternative pressure gauge scale
	MS pressure gauge
<b>PSI</b>	psi
<b>MPA</b>	MPa
008	Type of mounting
	Without mounting bracket
<b>WP</b>	Mounting bracket basic design
009	Flow direction
	Flow direction from left to right
<b>Z</b>	Flow direction from right to left

## Datasheet

### Function:



-  - Flow rate  
25000 ... 32000 l/min
-  - Temperature range  
-10 ... +60 °C
-  - Operating pressure  
0 ... 20 bar
-  - [www.festo.com](http://www.festo.com)



- Manually actuated on/off valve for pressurising and exhausting pneumatic systems
- Ducted exhaust is possible via a threaded connection with silencer
- The switching position is immediately recognisable
- Actuation is prevented by locking the rotary knob
- Commercially available padlock can be used for security

### General technical data

Pneumatic connection 1, 2	
Connecting plate [AG...]	G1, G1 1/4, G1 1/2 or G2
Module without connecting thread/connecting plate [G]	-
Pneumatic connection 3	G1
Design	Piston spool valve
Lap	Overlap
Type of mounting	With accessories In-line installation
Mounting position	Any
Valve function	3/2-way valve, bistable
Exhaust function	Cannot be throttled
Switching position indication	Knob actuator direction = flow direction
Type of actuation	Direct
Flow direction	Not reversible

† Note: This product conforms to ISO 1179-1 and ISO 228-1.

### Standard nominal flow rate $q_{nN}^{1)}$ [l/min]

In main flow direction 1 → 2	25000 ... 32000
In relief direction 2 → 3	13000

1) Measured at  $p_1 = 6$  bar and  $\Delta p = 1$  bar.

### Operating and environmental conditions

Operating pressure [bar]	0 ... 20
Operating medium	Compressed air to ISO 8573-1:2010 [---:-]
Ambient temperature [°C]	-10 ... +60
Temperature of medium [°C]	-10 ... +60
Corrosion resistance class CRC <sup>1)</sup>	2 - Moderate corrosion stress

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

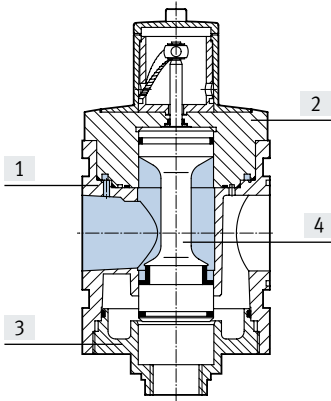


## Datasheet

Weight [g]	
On/off valve	3900
On/off valve with silencer S	4000

### Materials

Sectional view

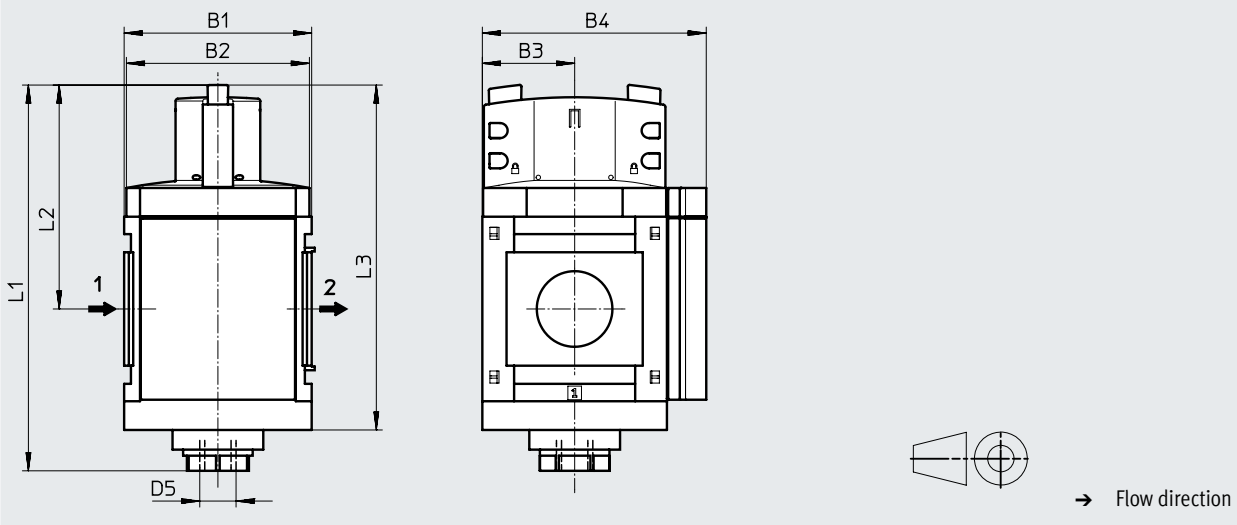


On/off valve		
[1]	Housing	Die-cast aluminium
[2]	Top cover	Aluminium
[3]	Bottom cover	Aluminium
[4]	Valve tappet	Stainless steel, POM, NBR
-	Springs	Steel
-	Covers/cover plates	PA
-	Seals	NBR
-	Connecting plate, module connector, mounting bracket	Die-cast aluminium
LABS (PWIS) conformity		VDMA24364-B1/B2-L

### Dimensions – Basic version

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

Module without connecting thread, without connecting plate G, with cover plate

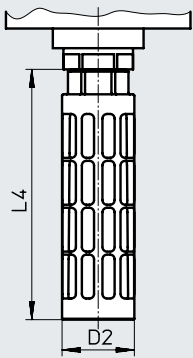


Type	B1	B2	B3	B4	L1	L2	L3	D5
MS12-EM-G	124	122	61	148	255	148	228	G1

Datasheet

Dimensions – Silencer

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



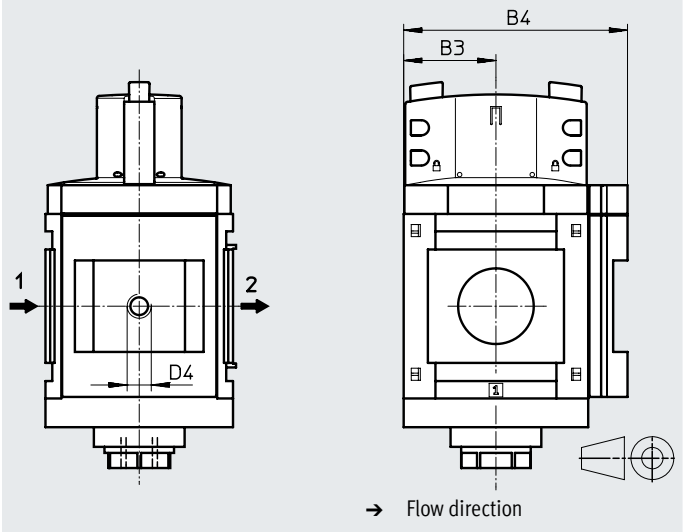
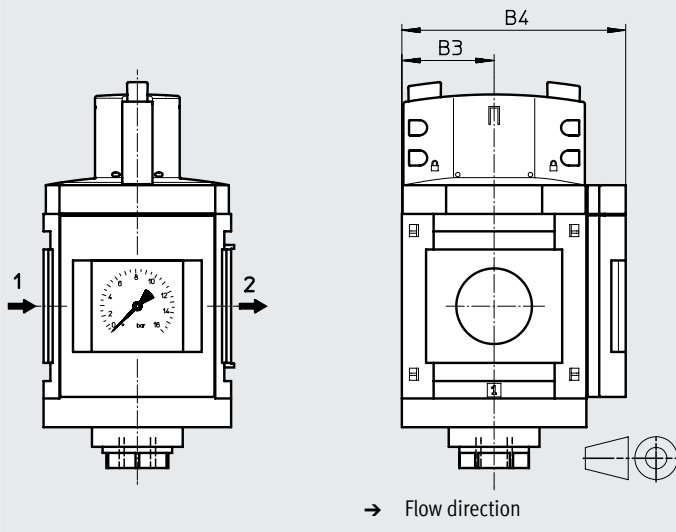
Type	D2 ∅	L4
MS12-EM...S	47.8	165.5

Dimensions – Pressure gauges/pressure gauge alternatives

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

[AG] Integrated MS pressure gauge with standard scale, display unit [bar]

[A4] Adapter for EN pressure gauge 1/4, without pressure gauge



Type	B3	B4	D4
MS12-EM...-AG	61	148	–
MS12-EM...-A4	61	148	G1/4

† Note: This product conforms to ISO 1179-1 and ISO 228-1.

Ordering data

Size	Part no.	Type
MS12	541495	MS12-EM-G

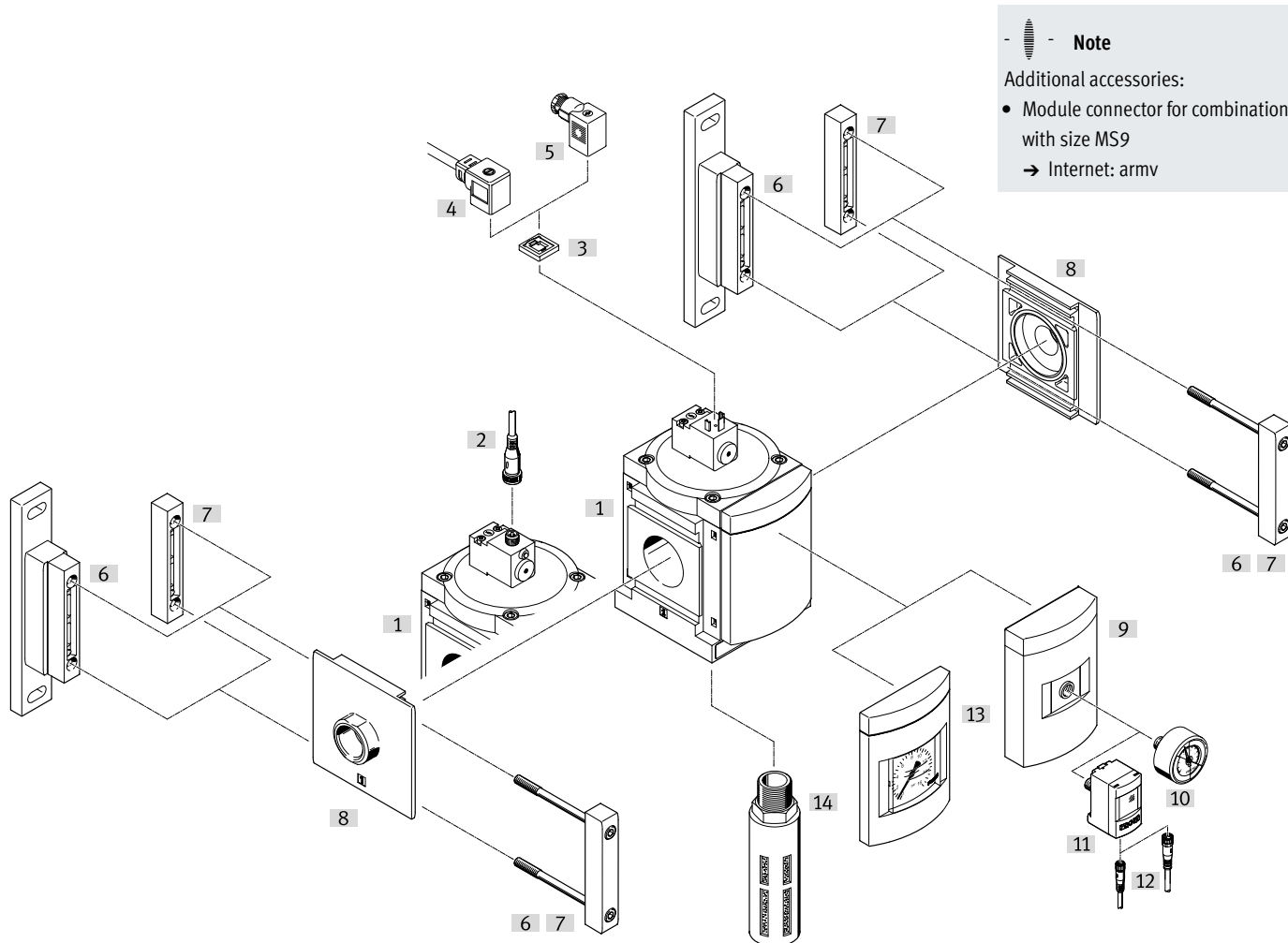
## Ordering data – Modular product system

Ordering table		Grid dimension [mm]	124	Conditions	Code	Enter code
Module no.		<b>535031</b>				
Series		Standard			<b>MS</b>	MS
Size		12			<b>12</b>	12
Function		On/off valve, manual			<b>-EM</b>	-EM
Pneumatic connection		Connecting plate G1			<b>-AGF</b>	
		Connecting plate G1 1/4			<b>-AGG</b>	
		Connecting plate G1 1/2			<b>-AGH</b>	
		Connecting plate G2			<b>-AGI</b>	
		Module without connecting thread, without connecting plate			<b>-G</b>	
Silencer		Silencer			<b>-S</b>	
Pressure gauge/pressure gauge alternatives		MS pressure gauge, bar			<b>-AG</b>	
		Adapter for EN pressure gauge 1/4, without pressure gauge			<b>-A4</b>	
Alternative pressure gauge scale		psi	[1]		<b>-PSI</b>	
		MPa	[1]		<b>-MPA</b>	
Type of mounting		Mounting bracket standard design	[2]		<b>-WP</b>	
Flow direction		Flow direction from right to left			<b>-Z</b>	

- [1] PSI, MPA      Only with pressure gauge AG  
 [2] WP            Only with connecting plate AGF, AGG, AGH or AGI.

## Peripherals overview

### On/off valve MS12-EE



**Note**  
 Additional accessories:  
 • Module connector for combination with size MS9  
 → Internet: armv

#### Mounting attachments and accessories

	Order code	→ Page/Internet
[1] On/off valve	MS12-EE	86
<b>Can be ordered via the modular product system</b>		
[6] Mounting bracket	[WP]	89
[8] Connecting plate SET <sup>1)</sup>	[AG...]	
[9] Adapter for EN pressure gauge 1/4	[A4]	
[13] MS pressure gauge	[AG]	
[14] Silencer	[S]	
<b>Can be ordered as accessories</b>		
[2] Connecting cable	NEBA-M12...-LE4	103
[3] Illuminating seal	MC-LD	102
[4] Connecting cable	KMC	102
[5] Plug socket	MSSD-C	102
[6] Mounting bracket	MS12-WP	ms12-wp
[7] Module connector	MS12-MV	ms12-mv
[8] Connecting plate SET	MS12-AG...	ms12-ag
[10] Pressure gauge	MA	103
[11] Pressure sensor	SPAU...-T-R14M	102
[12] Connecting cable	NEBA-M8...-LE4, NEBA-M12...-LE4	103
[14] Silencer	U	103

1) Module connector [7] is included in the scope of delivery.

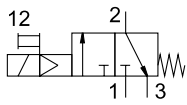
## Type codes





001		Series
<b>MS</b>		MS series
002		Size
<b>12</b>		Grid dimension 124 mm
003		Function
<b>EE</b>		On/off valve, electric
004		Pneumatic connection
<b>AGF</b>		Sub-base G1
<b>AGG</b>		Connecting plate G1 1/4
<b>AGH</b>		Connecting plate G1 1/2
<b>AGI</b>		Sub-base G2
<b>G</b>		Module without connecting thread, without sub-base
005		Supply voltage
<b>V110</b>		110 V AC (connection pattern to EN 175301)
<b>V230</b>		230 V AC (connection pattern to EN 175301)
<b>V24</b>		24 V DC (connection pattern to EN 175301)
<b>V24P</b>		24 V DC plug (connection pattern M12 to DESINA)

006		Silencer
		None
<b>S</b>		Silencer
007		Pressure gauge alternatives
		None
<b>AG</b>		MS pressure gauge
<b>A4</b>		Adapter for EN pressure gauge 1/4, without pressure gauge
008		Alternative pressure gauge scale
		MS pressure gauge
<b>PSI</b>		psi
<b>MPA</b>		MPa
009		Type of mounting
		Without mounting bracket
<b>WP</b>		Mounting bracket basic design
010		Flow direction
		Flow direction from left to right
<b>Z</b>		Flow direction from right to left

## Datasheet

Function:



-  Flow rate  
25000 ... 32000 l/min
-  Temperature range  
-10 ... +50 °C
-  Operating pressure  
3 ... 16 bar
-  [www.festo.com](http://www.festo.com)



- Electrically actuated on/off valve for pressurising and exhausting pneumatic systems
- With solenoid coil, without plug socket
- Choice of three voltage ranges
- Ducted exhaust is possible via a threaded connection with silencer
- Detenting and non-detenting manual override

### General technical data

Pneumatic connection 1, 2		
Connecting plate	[AG...]	G1, G1 1/4, G1 1/2 or G2
Module without connecting thread/connecting plate	[G]	–
Pneumatic connection 3		G1
Design		Piston spool valve
Lap		Overlap
Type of mounting		With accessories In-line installation
Mounting position		Any
Valve function		3/2-way valve, single solenoid, closed
Exhaust function		Cannot be throttled
Reset method		Mechanical spring
Switching position indication		With accessories LED (with variant V24P)
Type of actuation		Piloted
Pilot air supply		Internal
Flow direction		Not reversible

† Note: This product conforms to ISO 1179-1 and ISO 228-1.

### Electrical data

Characteristic coil data		
With supply voltage	[V24], [V24P]	24 V DC: 4.5 W, permissible voltage fluctuations ±10%
	[V110]	110 V AC: 50 Hz, pick-up power 11.5 W, holding power 8.9 W, permissible voltage fluctuations ±10%
		110 V AC: 60 Hz, pick-up power 9.5 W, holding power 6.2 W, permissible voltage fluctuations ±10%
	[V230]	230 V AC: 50 Hz, pick-up power 11.5 W, holding power 9.1 W, permissible voltage fluctuations ±10%
		230 V AC: 60 Hz, pick-up power 9.5 W, holding power 6.4 W, permissible voltage fluctuations ±10%
Electrical connection		
With supply voltage	[V24], [V110], [V230]	Plug, square design to EN 175301-803, type A
	[V24P]	M12 plug, 4-pin to DESINA
Degree of protection for solenoid coil		IP65
Duty cycle [%]		100

### Standard nominal flow rate $q_{nN}^{1)}$ [l/min]

In main flow direction 1 → 2	25000 ... 32000
In relief direction 2 → 3	8900

1) Measured at  $p_1 = 6$  bar and  $\Delta p = 1$  bar.

# Datasheet

## Operating and environmental conditions

Operating pressure [bar]	3 ... 16
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4] Inert gases
Note on the operating/pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)
Ambient temperature [°C]	-10 ... +50
Temperature of medium [°C]	-10 ... +50
Corrosion resistance class CRC <sup>1)</sup>	2 - Moderate corrosion stress

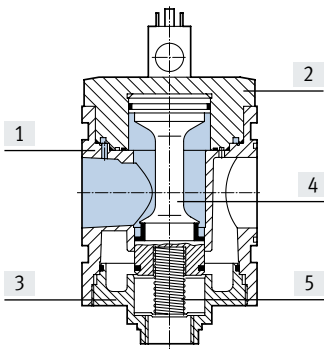
1) More information [www.festo.com/x/topic/crc](http://www.festo.com/x/topic/crc)

## Weight [g]

On/off valve	3800
On/off valve with silencer S	3900

## Materials

Sectional view



On/off valve		
[1]	Housing	Die-cast aluminium
[2]	Top cover	Aluminium
[3]	Bottom cover	Aluminium
[4]	Valve tappet	Stainless steel, POM, NBR
[5]	Springs	Steel
-	Covers/cover plates	PA
-	Seals	NBR
-	Connecting plate, module connector, mounting bracket	Die-cast aluminium
LABS (PWIS) conformity		VDMA24364-B1/B2-L

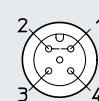
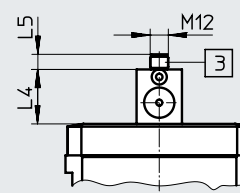
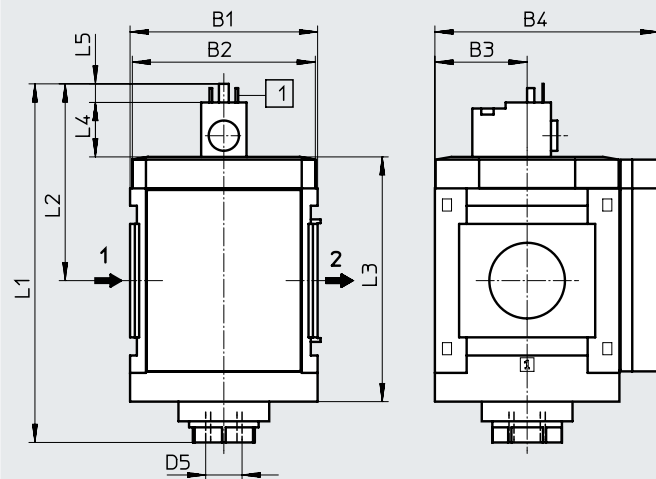
## Dimensions – Basic version

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

[G] Module without connecting thread, without connecting plate, with cover plate

[V24], [V110], [V230] Supply voltage

[V24P] Supply voltage



- 1 = Connected to 2
- 2 = Connected to 1
- 3 = com (-)
- 4 = Signal (+)

[1] Plug connection to EN 175301-803

[2] Plug connection M12, 4-pin to DESINA for connecting cable NEBA-M12

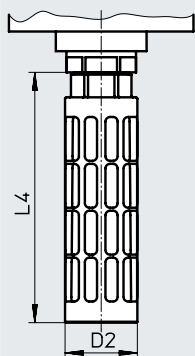
→ Flow direction

Type	B1	B2	B3	B4	L1	L2	L3	L4	L5	D5
MS12-EE-G-V24, V110, V230	124	122	61	148	237	130	162	35.7	12.3	G1
MS12-EE-G-V24P								36	10	

Datasheet

Dimensions – Silencer

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



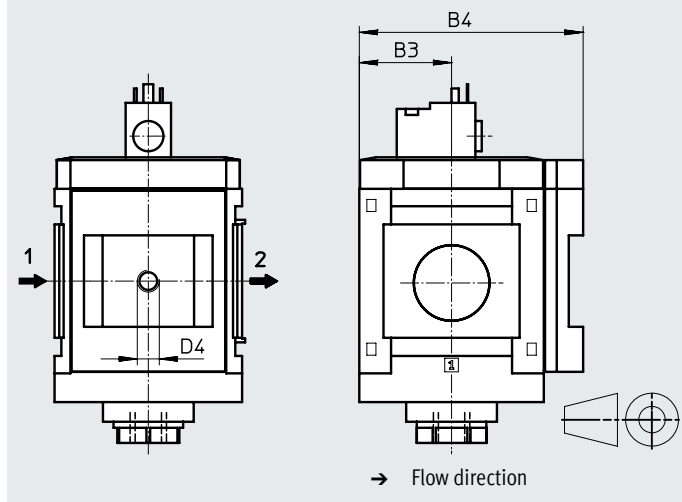
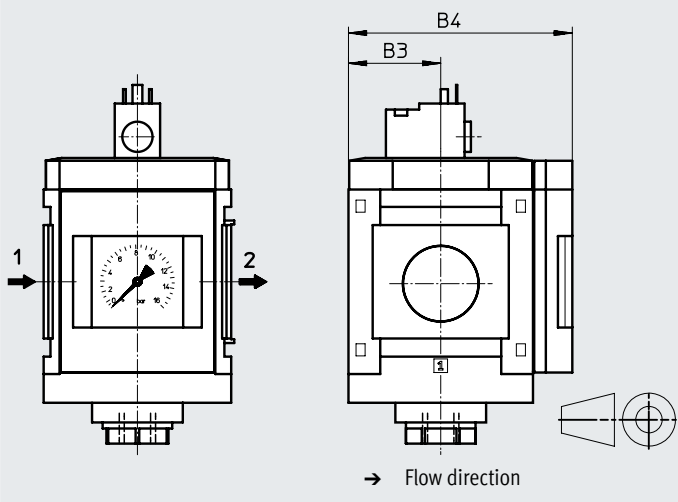
Type	D2 ∅	L4
MS12-EE...S	47.8	165.5

Dimensions – Pressure gauges/pressure gauge alternatives

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

[AG] Integrated MS pressure gauge with standard scale, display unit [bar]

[A4] Adapter for EN pressure gauge 1/4, without pressure gauge



Type	B3	B4	D4
MS12-EE...AG	61	148	-
MS12-EE...A4	61	148	G1/4

Note: This product conforms to ISO 1179-1 and ISO 228-1.

Ordering data

Size	Supply voltage 24 V DC	
	Part no.	Type
MS12	541496	MS12-EE-G-V24



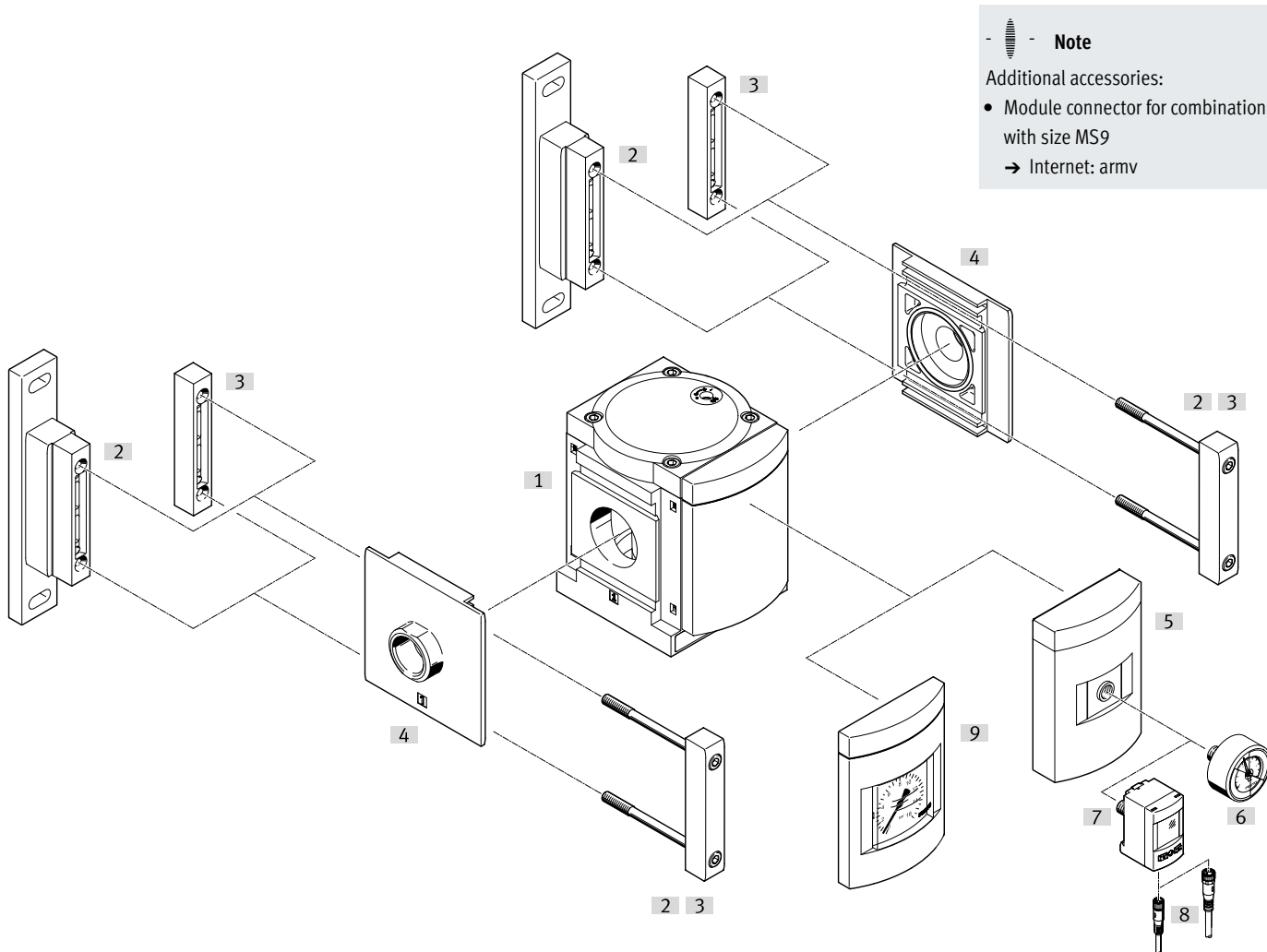
## Ordering data – Modular product system

Ordering table					
Grid dimension	[mm]	124	Conditions	Code	Enter code
Module no.		<b>535032</b>			
Series		Standard		<b>MS</b>	MS
Size		12		<b>12</b>	12
Function		On/off valve, electric		<b>-EE</b>	-EE
Pneumatic connection		Connecting plate G1		<b>-AGF</b>	
		Connecting plate G1 1/4		<b>-AGG</b>	
		Connecting plate G1 1/2		<b>-AGH</b>	
		Connecting plate G2		<b>-AGI</b>	
		Module without connecting thread, without connecting plate		<b>-G</b>	
Supply voltage		24 V DC (plug pattern to EN 175301), 16 bar		<b>-V24</b>	
		24 V DC plug (plug pattern M12 to DESINA), 16 bar		<b>-V24P</b>	
		110 V AC (plug pattern to EN 175301), 16 bar		<b>-V110</b>	
		230 V AC (plug pattern to EN 175301), 16 bar		<b>-V230</b>	
Silencer		Silencer		<b>-S</b>	
Pressure gauge/pressure gauge alternatives		MS pressure gauge, bar		<b>-AG</b>	
		Adapter for EN pressure gauge 1/4, without pressure gauge		<b>-A4</b>	
Alternative pressure gauge scale		psi	[1]	<b>-PSI</b>	
		MPa	[1]	<b>-MPA</b>	
Type of mounting		Mounting bracket standard design	[2]	<b>-WP</b>	
Flow direction		Flow direction from right to left		<b>-Z</b>	

- [1] PSI, MPA      Only with pressure gauge AG  
 [2] WP            Only with connecting plate AGF, AGG, AGH or AGI.

## Peripherals overview

### Soft-start valve MS12-DL



#### Mounting attachments and accessories

	Order code	→ Page/Internet
[1] Soft-start valve	MS12-DL	92
<b>Can be ordered via the modular product system</b>		
[2] Mounting bracket	[WP]	95
[4] Connecting plate SET <sup>1)</sup>	[AG...]	
[5] Adapter for EN pressure gauge 1/4	[A4]	
[9] MS pressure gauge	[AG]	
<b>Can be ordered as accessories</b>		
[2] Mounting bracket	MS12-WP	ms12-wp
[3] Module connector	MS12-MV	ms12-mv
[4] Connecting plate SET	MS12-AG...	ms12-ag
[6] Pressure gauge	MA	103
[7] Pressure sensor	SPAU...-T-R14M	102
[8] Connecting cable	NEBA-M8...-LE4, NEBA-M12...-LE4	103

1) Module connector [3] is included in the scope of delivery.

## Type codes

<b>001</b>	<b>Series</b>	
<b>MS</b>	MS series	

<b>002</b>	<b>Size</b>	
<b>12</b>	Grid dimension 124 mm	

<b>003</b>	<b>Function</b>	
<b>DL</b>	Soft-start valve, pneumatic	

<b>004</b>	<b>Pneumatic connection</b>	
<b>AGF</b>	Sub-base G1	
<b>AGG</b>	Connecting plate G1 1/4	
<b>AGH</b>	Connecting plate G1 1/2	
<b>AGI</b>	Sub-base G2	
<b>G</b>	Module without connecting thread, without sub-base	

<b>005</b>	<b>Pressure gauge alternatives</b>	
	None	
<b>AG</b>	MS pressure gauge	
<b>A4</b>	Adapter for EN pressure gauge 1/4, without pressure gauge	

<b>006</b>	<b>Alternative pressure gauge scale</b>	
	MS pressure gauge	
<b>PSI</b>	psi	
<b>MPA</b>	MPa	

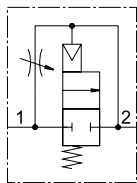
<b>007</b>	<b>Type of mounting</b>	
	Without mounting bracket	
<b>WP</b>	Mounting bracket basic design	





<b>008</b>	<b>UL certification</b>	
	None	
<b>UL1</b>	cULus ordinary location for Canada and USA	

<b>009</b>	<b>Flow direction</b>	
	Flow direction from left to right	
<b>Z</b>	Flow direction from right to left	

## Datasheet

Function:



-  Flow rate  
25000 ... 42000 l/min
-  Temperature range  
-10 ... +60 °C
-  Operating pressure  
2 ... 20 bar
-  [www.festo.com](http://www.festo.com)



The duration of the pressure build-up is set using the restrictor attached to the valve cap.

The output pressure  $p_2$  rises slowly in accordance with the restrictor setting. The main seat opens when the switch-through pressure is reached.

- Pneumatically actuated soft-start valve for slowly pressurising and exhausting pneumatic systems (for use with on/off valves EM and EE)
- The drives move slowly and reliably into the initial position
- Sudden and erratic movements are avoided
- Main seat opening at approx. 50% of operating pressure
- Adjustable switching time delay

### General technical data

Pneumatic connection 1, 2	
Connecting plate [AG...]	G1, G1 1/4, G1 1/2 or G2
Module without connecting thread/connecting plate [G]	–
Design	Piston seat
Type of mounting	With accessories In-line installation
Mounting position	Any
Valve function	2/2-way valve
Exhaust function	Can be throttled
Reset method	Mechanical spring
Type of actuation	Direct
Pilot air supply	Internal
Flow direction	Not reversible

† Note: This product conforms to ISO 1179-1 and ISO 228-1.

### Standard nominal flow rate $q_{nN}^{1)}$ [l/min]

In main flow direction 1 → 2	25000 ... 42000
In relief direction 2 → 1	25000 ... 42000

1) Measured at  $p_1 = 6$  bar and  $p_2 = 5$  bar,  $\Delta p = 1$  bar.

## Datasheet

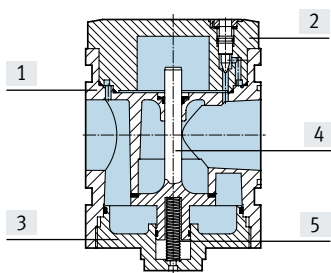
Operating and environmental conditions		
Operating pressure	[bar]	2 ... 20
Operating medium		Compressed air to ISO 8573-1:2010 [7:-:-]
Ambient temperature	[°C]	-10 ... +60
Temperature of medium	[°C]	-10 ... +60
Corrosion resistance class	CRC <sup>1)</sup>	2

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

Weight [g]	
Soft-start valve	3600

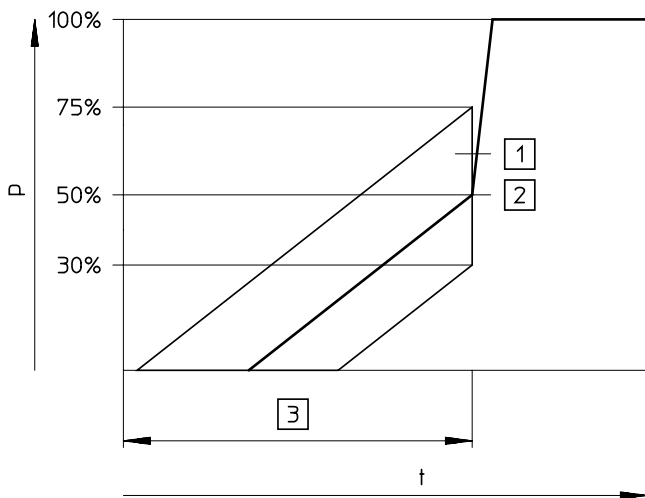
### Materials

Sectional view



Soft-start valve		
[1]	Housing	Die-cast aluminium
[2]	Top cover	Aluminium
[3]	Bottom cover	Aluminium
[4]	Valve tappet	Aluminium, NBR
[5]	Springs	Steel
-	Covers/cover plates	PA
-	Seals	NBR
-	Connecting plate, module connector, mounting bracket	Die-cast aluminium
LABS (PWIS) conformity		VDMA24364-B1/B2-L

### Switching point – Pressure p as a function of time t



- [1] Tolerance range
- [2] Switching point
- [3] Filling time is adjustable via a restrictor

#### Note

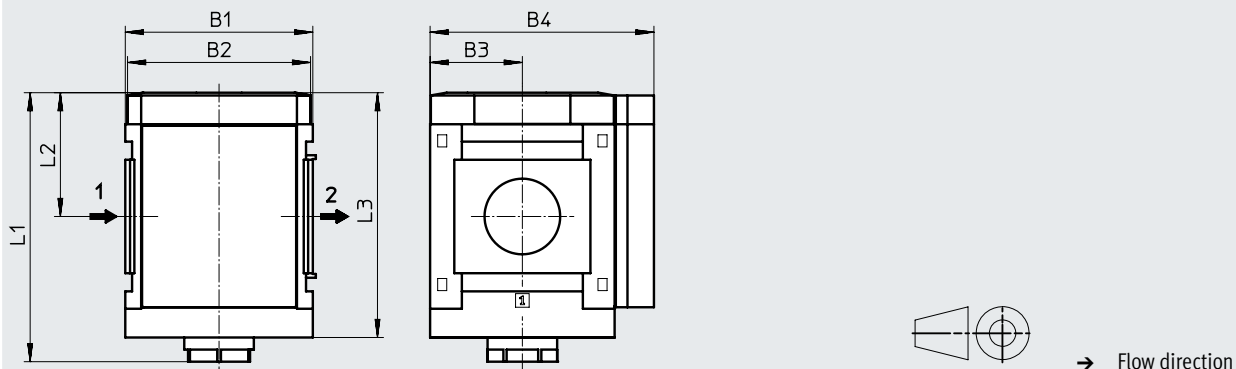
The  $\pm 25\%$  switching point tolerance refers to the operating pressure  $p_1$ .  
 Example: A switching point from 1.2 bar to 3.0 bar is permissible at an operating pressure of 4 bar.

Datasheet

**Dimensions – Basic version**

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

[G] Module without connecting thread, without connecting plate, with cover plate



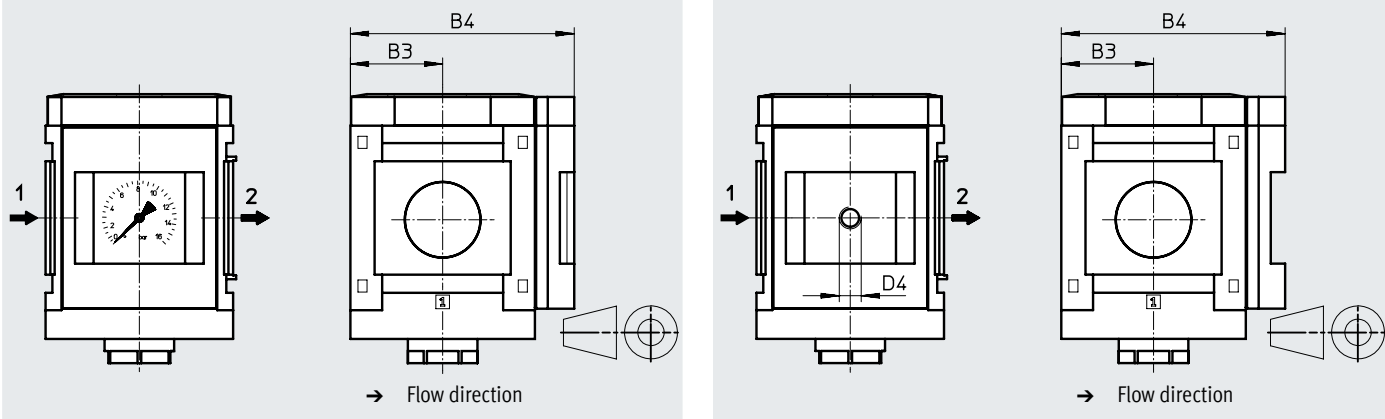
Type	B1	B2	B3	B4	L1	L2	L3
MS12-DL-G	124	122	61	148	178	82	162

**Dimensions – Pressure gauges/pressure gauge alternatives**

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

[AG] Integrated MS pressure gauge with standard scale, display unit [bar]

[A4] Adapter for EN pressure gauge 1/4, without pressure gauge



Type	B3	B4	D4
MS12-DL-...-AG	61	148	-
MS12-DL-...-A4	61	148	G1/4

† Note: This product conforms to ISO 1179-1 and ISO 228-1.

**Ordering data**

Size	Part no.	Type
MS12	541497	MS12-DL-G

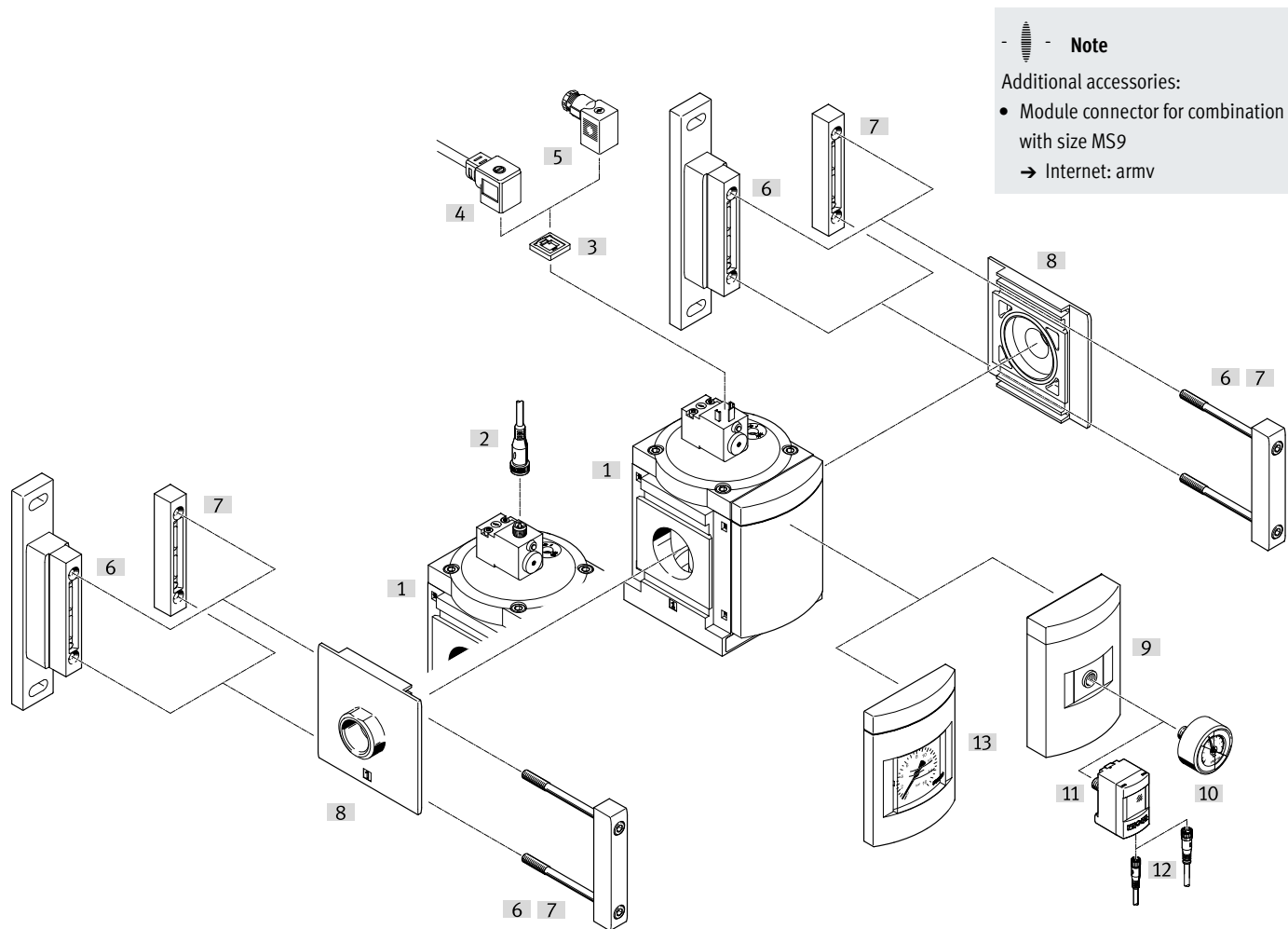
## Ordering data – Modular product system

Ordering table					
Grid dimension	[mm]	124	Conditions	Code	Enter code
Module no.		<b>535033</b>			
Series		Standard		<b>MS</b>	MS
Size		12		<b>12</b>	12
Function		Soft-start valve, pneumatic		<b>-DL</b>	-DL
Pneumatic connection		Connecting plate G1		<b>-AGF</b>	
		Connecting plate G1 1/4		<b>-AGG</b>	
		Connecting plate G1 1/2		<b>-AGH</b>	
		Connecting plate G2		<b>-AGI</b>	
		Module without connecting thread, without connecting plate		<b>-G</b>	
Pressure gauge/pressure gauge alternatives		MS pressure gauge, bar		<b>-AG</b>	
		Adapter for EN pressure gauge 1/4, without pressure gauge		<b>-A4</b>	
Alternative pressure gauge scale		psi	[1]	<b>-PSI</b>	
		MPa	[1]	<b>-MPA</b>	
Type of mounting		Mounting bracket standard design	[2]	<b>-WP</b>	
Flow direction		Flow direction from right to left		<b>-Z</b>	

- [1] PSI, MPA      Only with pressure gauge AG  
 [2] WP            Only with connecting plate AGF, AGG, AGH or AGI.

## Peripherals overview

### Soft-start valve MS12-DE



**Note**  
 Additional accessories:  
 • Module connector for combination with size MS9  
 → Internet: armv

#### Mounting attachments and accessories

	Order code	→ Page/Internet
[1] Soft-start valve	MS12-DE	98
<b>Can be ordered via the modular product system</b>		
[6] Mounting bracket	[WP]	101
[8] Connecting plate SET <sup>1)</sup>	[AG...]	
[9] Adapter for EN pressure gauge 1/4	[A4]	
[13] MS pressure gauge	[AG]	
<b>Can be ordered as accessories</b>		
[2] Connecting cable	NEBA-M12...-LE4	103
[3] Illuminating seal	MC-LD	102
[4] Connecting cable	KMC	102
[5] Plug socket	MSSD-C	102
[6] Mounting bracket	MS12-WP	ms12-wp
[7] Module connector	MS12-MV	ms12-mv
[8] Connecting plate SET	MS12-AG...	ms12-ag
[10] Pressure gauge	MA	103
[11] Pressure sensor	SPAU...-T-R14M	102
[12] Connecting cable	NEBA-M8...-LE4, NEBA-M12...-LE4	103

1) Module connector [7] is included in the scope of delivery.



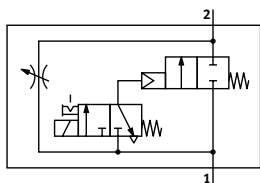
## Type codes

001		Series
<b>MS</b>		MS series
002		Size
<b>12</b>		Grid dimension 124 mm
003		Function
<b>DE</b>		Soft-start valve, electric
004		Pneumatic connection
<b>AGF</b>		Sub-base G1
<b>AGG</b>		Connecting plate G1 1/4
<b>AGH</b>		Connecting plate G1 1/2
<b>AGI</b>		Sub-base G2
<b>G</b>		Module without connecting thread, without sub-base
005		Supply voltage
<b>V110</b>		110 V AC (connection pattern to EN 175301)
<b>V230</b>		230 V AC (connection pattern to EN 175301)
<b>V24</b>		24 V DC (connection pattern to EN 175301)
<b>V24P</b>		24 V DC plug (connection pattern M12 to DESINA)

006		Pressure gauge alternatives
		None
<b>AG</b>		MS pressure gauge
<b>A4</b>		Adapter for EN pressure gauge 1/4, without pressure gauge
007		Alternative pressure gauge scale
		MS pressure gauge
<b>PSI</b>		psi
<b>MPA</b>		MPa
008		Type of mounting
		Without mounting bracket
<b>WP</b>		Mounting bracket basic design
009		Flow direction
		Flow direction from left to right
<b>Z</b>		Flow direction from right to left

## Datasheet

Function:



- Flow rate  
25000 ... 42000 l/min
- Temperature range  
-10 ... +50 °C
- Operating pressure  
3 ... 16 bar
- [www.festo.com](http://www.festo.com)



The duration of the pressure build-up is set using the restrictor attached to the valve cap. The output pressure p2 rises slowly in accordance with the restrictor setting. While the solenoid valve is not actuated, only the flow rate of the flow control valve is available. The main seat is only opened when the solenoid valve is energised.

When the solenoid valve is switched off, the main seat is closed and only the flow rate of the flow control valve is available. When exhausting a system, the solenoid valve should remain switched on; this increases the volume flow from 2 to 1 and shortens the exhaust time.

- Electrically actuated soft-start valve for slowly pressurising and exhausting pneumatic systems
- The drives move slowly and reliably into the initial position
- Sudden and erratic movements are avoided
- With solenoid coil, without plug socket
- The switching pressure can be precisely controlled with a solenoid valve
- Adjustable switching time delay
- Choice of three voltage ranges
- Detenting and non-detenting manual override

### General technical data

Pneumatic connection 1, 2	
Connecting plate [AG...]	G1, G1 1/4, G1 1/2 or G2
Module without connecting thread/connecting plate [G]	-
Pneumatic connection 3	G1
Design	Piston seat
Type of mounting	With accessories In-line installation
Mounting position	Any
Valve function	2/2-way valve
Exhaust function	Can be throttled
Reset method	Mechanical spring
Signal status display	With accessories LED (with variant V24P)
Type of actuation	Piloted
Pilot air supply	Internal
Flow direction	Not reversible

† Note: This product conforms to ISO 1179-1 and ISO 228-1.

### Electrical data

<b>Characteristic coil data</b>		
With supply voltage	[V24]	24 V DC: 8.4 W
		42 V AC: 50 Hz, pick-up power 14 VA, holding power 10 VA
		42 V AC: 60 Hz, pick-up power 12 VA, holding power 7 VA
	[V24P]	24 V DC
	[V110]	110 V AC
	[V230]	230 V AC
<b>Electrical connection</b>		
With supply voltage	[V24], [V110], [V230]	Plug, square design to EN 175301-803, type A
	[V24P]	M12 plug, 4-pin to DESINA
Degree of protection for solenoid coil		IP65
Duty cycle [%]		100

## Datasheet

Standard nominal flow rate $q_{nN}^{1)}$ [l/min]	
In main flow direction 1 → 2	25000 ... 42000
In relief direction 2 → 1 <sup>2)</sup>	25000 ... 42000

1) Measured at  $p_1 = 6$  bar and  $p_2 = 5$  bar,  $\Delta p = 1$  bar.

2) With energised solenoid valve.

Operating and environmental conditions	
Operating pressure [bar]	3 ... 16
Operating medium	Compressed air to ISO 8573-1:2010 [–:–:–]
Ambient temperature [°C]	–10 ... +50
Temperature of medium [°C]	–10 ... +50
CE marking (see declaration of conformity) <sup>1)</sup>	To EU Low Voltage Directive
UKCA marking (see declaration of conformity) <sup>1)</sup>	To UK regulations for electrical equipment
Corrosion resistance class CRC <sup>2)</sup>	2 - Moderate corrosion stress

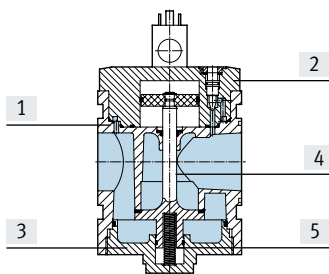
1) More information: [www.festo.com/catalogue/ms12-de](http://www.festo.com/catalogue/ms12-de) → Support/Downloads.

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

Weight [g]	
Soft-start valve	3800

### Materials

Sectional view



Soft-start valve		
[1]	Housing	Die-cast aluminium
[2]	Top cover	Aluminium
[3]	Bottom cover	Aluminium
[4]	Valve tappet	Aluminium, NBR
[5]	Springs	Steel
–	Covers/cover plates	PA
–	Seals	NBR
–	Connecting plate, module connector, mounting bracket	Die-cast aluminium
LABS (PWIS) conformity		VDMA24364-B1/B2-L

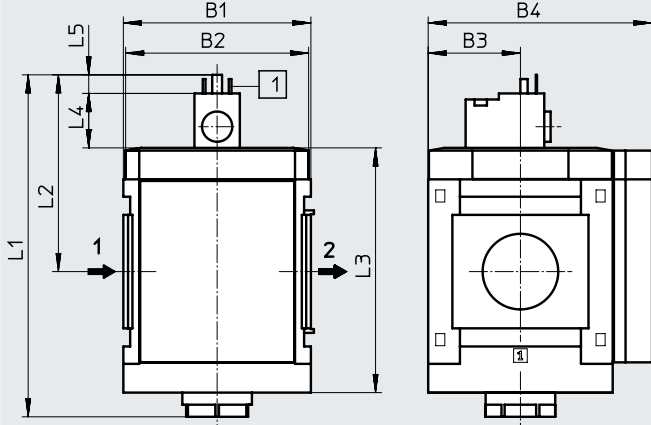
Datasheet

Dimensions – Basic version

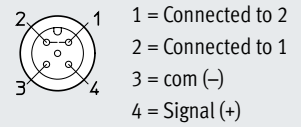
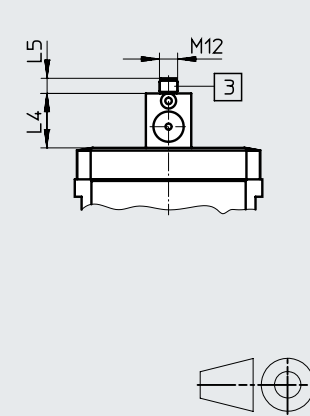
Download CAD data → [www.festo.com](http://www.festo.com)

[G] Module without connecting thread, without connecting plate, with cover plate

[V24], [V110], [V230] Supply voltage



[V24P] Supply voltage



[1] Plug connection to EN 175301-803

[2] Plug connection M12, 4-pin to DESINA for connecting cable NEBA-M12

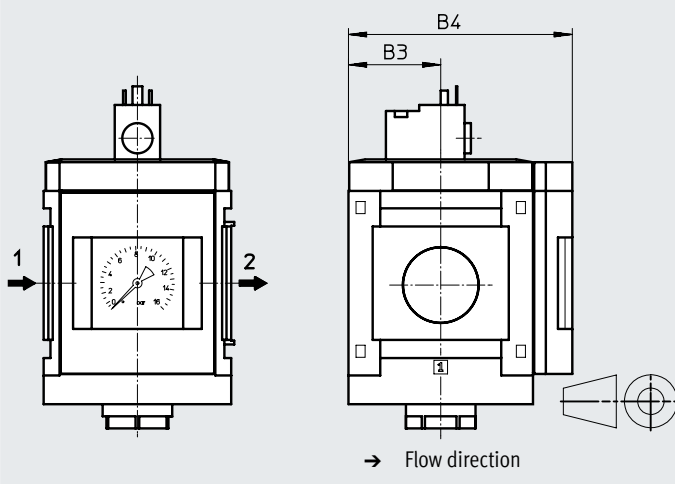
→ Flow direction

Type	B1	B2	B3	B4	L1	L2	L3	L4	L5
MS12-DE-G-V24, V110, V230	124	122	61	148	226	130	162	35.7	12.3
MS12-DE-G-V24P								36	10

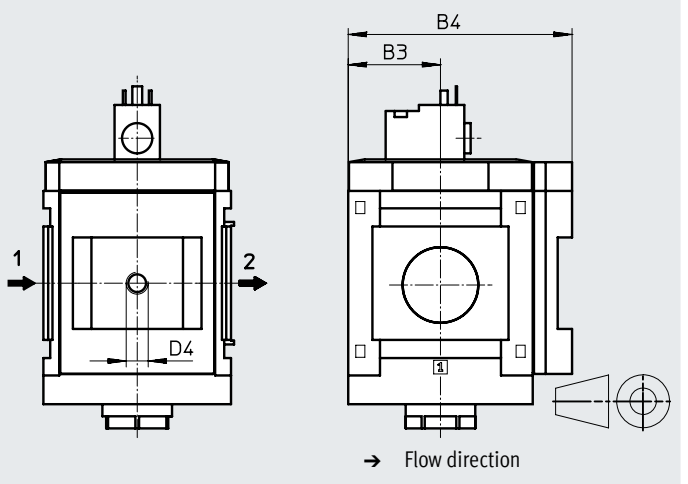
Dimensions – Pressure gauges/pressure gauge alternatives

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

[AG] Integrated MS pressure gauge with standard scale, display unit [bar]



[A4] Adapter for EN pressure gauge 1/4, without pressure gauge



Type	B3	B4	D4
MS12-DE-...-AG	61	148	-
MS12-DE-...-A4	61	148	G1/4

† Note: This product conforms to ISO 1179-1 and ISO 228-1.

Ordering data


Size	Supply voltage 24 V DC	
	Part no.	Type
MS12	541498	MS12-DE-G-V24

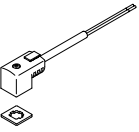
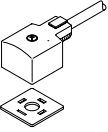
## Ordering data – Modular product system


Ordering table					
Grid dimension	[mm]	124	Conditions	Code	Enter code
Module no.		<b>535034</b>			
Series		Standard		<b>MS</b>	MS
Size		12		<b>12</b>	12
Function		Soft-start valve, electric		<b>-DE</b>	-DE
Pneumatic connection		Connecting plate G1		<b>-AGF</b>	
		Connecting plate G1 1/4		<b>-AGG</b>	
		Connecting plate G1 1/2		<b>-AGH</b>	
		Connecting plate G2		<b>-AGI</b>	
		Module without connecting thread, without connecting plate		<b>-G</b>	
Supply voltage		24 V DC (plug pattern to EN 175301), 16 bar		<b>-V24</b>	
		24 V DC plug (plug pattern M12 to DESINA), 16 bar		<b>-V24P</b>	
		110 V AC (plug pattern to EN 175301), 16 bar		<b>-V110</b>	
		230 V AC (plug pattern to EN 175301), 16 bar		<b>-V230</b>	
Pressure gauge/pressure gauge alternatives		MS pressure gauge, bar		<b>-AG</b>	
		Adapter for EN pressure gauge 1/4, without pressure gauge		<b>-A4</b>	
Alternative pressure gauge scale		psi	[1]	<b>-PSI</b>	
		MPa	[1]	<b>-MPA</b>	
Type of mounting		Mounting bracket standard design	[2]	<b>-WP</b>	
Flow direction		Flow direction from right to left		<b>-Z</b>	


- [1] PSI, MPA      Only with pressure gauge AG  
 [2] WP            Only with connecting plate AGF, AGG, AGH or AGI.

## Accessories


Ordering data – Plug socket MSSD						Datasheets → Internet: mssd
	Description		Electrical connection	Cable connection	Part no.	Type
	For MS4/6-EE/DE	–	3-pin	Screw terminal	★ 151687	MSSD-EB
			4-pin	Insulation displacement connector	192745	MSSD-EB-S-M14
	For use in explosion protection areas	–	3-pin	Screw terminal	570367	MSSD-EB-M12-24VDC-SD-EX
			4-pin	Insulation displacement connector	192748	MSSD-C-S-M16
For MS9-EE, For MS12-EE/DE	–	3-pin	Screw terminal	34583	MSSD-C	
		4-pin	Insulation displacement connector	192748	MSSD-C-S-M16	

Ordering data – Plug socket with cable KMEB/Connecting cable KMC								Datasheets → Internet: kmeb, kmc
	Description	Operating voltage	Electrical connection	Switching status indication	Cable length [m]	Part no.	Type	
	For MS4/6-EE/DE	24 V DC	2-pin	LED	2.5	547268	KMEB-3-24-2.5-LED	
				–	5	547269	KMEB-3-24-5-LED	
			–	2.5	547270	KMEB-3-24-2.5		
				5	547271	KMEB-3-24-5		
		3-pin	LED	2.5	★ 151688	KMEB-1-24-2.5-LED		
				5	151689	KMEB-1-24-5-LED		
			–	10	193457	KMEB-1-24-10-LED		
				230 V AC	3-pin	–	2.5	151690
5	151691	KMEB-1-230AC-5						
	For MS9-EE, For MS12-EE/DE	24 V DC	3-pin	LED	2.5	30931	KMC-1-24DC-2.5-LED	
					5	30933	KMC-1-24DC-5-LED	
					10	193459	KMC-1-24-10-LED	
		230 V AC	3-pin	–	2.5	30932	KMC-1-230AC-2.5	
					5	30934	KMC-1-230AC-5	

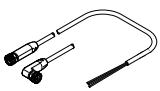
Ordering data – Illuminating seal MEB-LD/MC-LD					Datasheets → Internet: meb, mc
	Description	Operating voltage range	Part no.	Type	
	For plug socket with cable KMEB and plug socket MSSD-EB	12 ... 24 V DC	151717	MEB-LD-12-24DC	
		230 V DC/AC ±10%	151718	MEB-LD-230AC	
	For connecting cable KMC and plug socket MSSD-C	12 ... 24 V DC	19145	MC-LD-12-24DC	
		230 V DC/AC ±10%	19146	MC-LD-230AC	

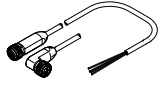
Ordering data – Locking clip CPV18-HV				Datasheets → Internet: cpv18-hv
	Description		Part no.	Type
	For MS4/6-EE/DE...V24	Cover for the manual override, the clip prevents actuation	530056	CPV18-HV
				PU <sup>1)</sup> 10


[1] Packaging unit


Ordering data –							Datasheets → Internet: spau
	Pneumatic connection	Display type	Switching output	Electrical connection	Part no.	Type	
<b>For direct mounting on the adapter with connecting thread 1/8 or 1/4, pressure measuring range 0 ... 10 bar, relative pressure measurement</b>							
	Male thread R1/8	Illuminated LCD	2x PNP or 2x NPN switchable	M8x1, 4-pin	8001203	SPAU-P10R-T-R18M-L-PNLK-PNVBA-M8D	
	Male thread R1/4			M12x1, 4-pin	8001206	SPAU-P10R-T-R18M-L-PNLK-PNVBA-M12D	
				M8x1, 4-pin	8001209	SPAU-P10R-T-R14M-L-PNLK-PNVBA-M8D	
				M12x1, 4-pin	8001208	SPAU-P10R-T-R14M-L-PNLK-PNVBA-M12D	

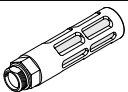
## Accessories


Ordering data – Connecting cable NEBA-M8					Datasheets → Internet: neba	
	Electrical connection	Number of cores	Cable length [m]	Part no.	Type	
	M8x1, straight socket	3	2,5	★ 8078223	NEBA-M8G3-U-2.5-N-LE3	
			5	★ 8078224	NEBA-M8G3-U-5-N-LE3	
	M8x1, angled socket	3	2,5	★ 8078230	NEBA-M8W3-U-2.5-N-LE3	
			5	★ 8078231	NEBA-M8W3-U-5-N-LE3	

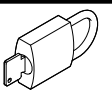
Ordering data – Connecting cable NEBA-M12					Datasheets → Internet: neba	
	Electrical connection	Number of cores	Cable length [m]	Part no.	Type	
	M12x1, straight socket	4	2,5	★ 8078239	NEBA-M12G5-U-2.5-N-LE4	
			5	★ 8078240	NEBA-M12G5-U-5-N-LE4	
	M12x1, angled socket	4	2,5	8078248	NEBA-M12W5-U-2.5-N-LE4	
			5	8078249	NEBA-M12W5-U-5-N-LE4	

Ordering data – Sensor socket NECB				Datasheets → Internet: necb	
	Electrical connection			Part no.	Type
	M12x1, A-coded to IEC 61076-2-101			8162290	NECB-M12G4-C2

Ordering data – Angled plug socket NECB				Datasheets → Internet: necb	
	Electrical connection			Part no.	Type
	M12x1, A-coded to IEC 61076-2-101			8162292	NECB-M12W4-C2

Ordering data – Silencer U					Datasheets → Internet: u	
	Description	Pneumatic connection		Part no.	Type	
	For MS4-EM1/EE	G1/4		6842	U-1/4-B	
	For MS6-EM1/EE	G1/2		6844	U-1/2-B	
	For MS9/12-EM/EE	G1		151990	U-1-B	

Ordering data – Pressure gauge MA						Datasheets → Internet: ma	
	Nominal size	Pneumatic connection	Display range [bar]	[psi]	Part no.	Type	
	<b>Pressure gauge MA, EN 837-1</b>					Datasheets → Internet: ma	
	40	R1/4	0 ... 16	0 ... 232	187080	MA-40-16-R1/4-EN	
		G1/4	0 ... 16	0 ... 232	183901	MA-40-16-G1/4-EN	
	<b>Pressure gauge MA, EN 837-1, with red/green range</b>					Datasheets → Internet: ma	
	40	R1/8	0 ... 16	–	525726	MA-40-16-R1/8-E-RG	
50	R1/4	0 ... 16	–	525729	MA-50-16-R1/4-E-RG		

Ordering data – Padlock LRVS-D			
	Weight [g]	Part no.	Type
	120	193786	LRVS-D