

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

FESTO



Festo Core Range
Solves the majority of your automation tasks

Worldwide:
Simply good:
Fast:

Quickest delivery – wherever, whenever
Expected high Festo quality
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 replacing individ-

ual modules does not require disassembling the entire combination. 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 components 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 service unit without oversizing, and with the right air purity class:

→ www.festo.com/engineering/service-unit

Air quality

This 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

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



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

* 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

Energy savings

Service unit combinations MSE6

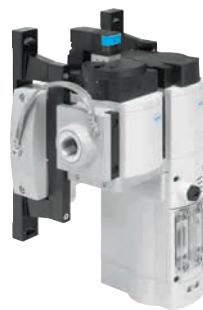
Intelligent mix of sizes



- 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





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 it 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/LRE 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
Combinations								
Service unit combinations MSB-FRC								Datasheets → Internet: msb
	Combinations of filter regulator and lubricator	4	–	–	1/8, 1/4	–	–	–
		6	–	–	1/4, 3/8, 1/2	–	–	–
Service unit combinations MSB								
Service unit combinations MSB								Datasheets → Internet: msb
	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
Service unit combinations MSE6								
Service unit combinations MSE6								Datasheets → Internet: mse6
	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
Individual devices								
Filter regulators MS-LFR Datasheets → Internet: ms2-lfr; ms4-lfr; ms6-lfr; ms9-lfr; ms12-lfr								
	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	–
Filter regulators MS-LFR-B Datasheets → Internet: ms4-lfr-b; ms6-lfr-b								
	Filter and pressure regulator in a single device in polymer housing, grade of filtration 5 or 40 µm	4	–	–	1/4	–	–	–
		6	–	–	1/2	–	–	–
Filters MS-LF Datasheets → Internet: ms4-lf; ms6-lf; ms9-lf; ms12-lf								
	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	–
Fine and micro filters MS-LFM Datasheets → Internet: ms4-lfm; ms6-lfm; ms9-lfm; ms12-lfm								
	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	–
Activated carbon filters MS-LFX Datasheets → Internet: ms4-lfx; ms6-lfx; ms9-lfx; ms12-lfx								
	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	–
Water separators MS-LWS Datasheets → Internet: ms6-lws; ms9-lws; ms12-lws								
	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
Individual devices								
Pressure regulators MS-LR Datasheets → Internet: ms2-lr; ms4-lr; ms6-lr; ms9-lr; ms12-lr								
	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	–
Pressure regulators MS-LR-B Datasheets → Internet: ms4-lr-b; ms6-lr-b								
	For setting the required operating pressure, in polymer housing	4	–	–	1/4	–	–	–
		6	–	–	1/2	–	–	–
Pressure regulators MS-LRB Datasheets → Internet: ms4-lrb; ms6-lrb								
	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	–
Precision pressure regulators MS-LRP Datasheets → Internet: ms6-lrp								
	For precise setting of 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
Precision pressure regulators MS-LRPB Datasheets → Internet: ms6-lrpb								
	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	–
Electric pressure regulators MS-LRE Datasheets → Internet: ms6-lre								
	Electrically adjustable pressure regulator, 4 pressure regulation ranges	6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
Lubricators MS-LOE Datasheets → Internet: ms4-loe; ms6-loe; ms9-loe; ms12-loe								
	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	–

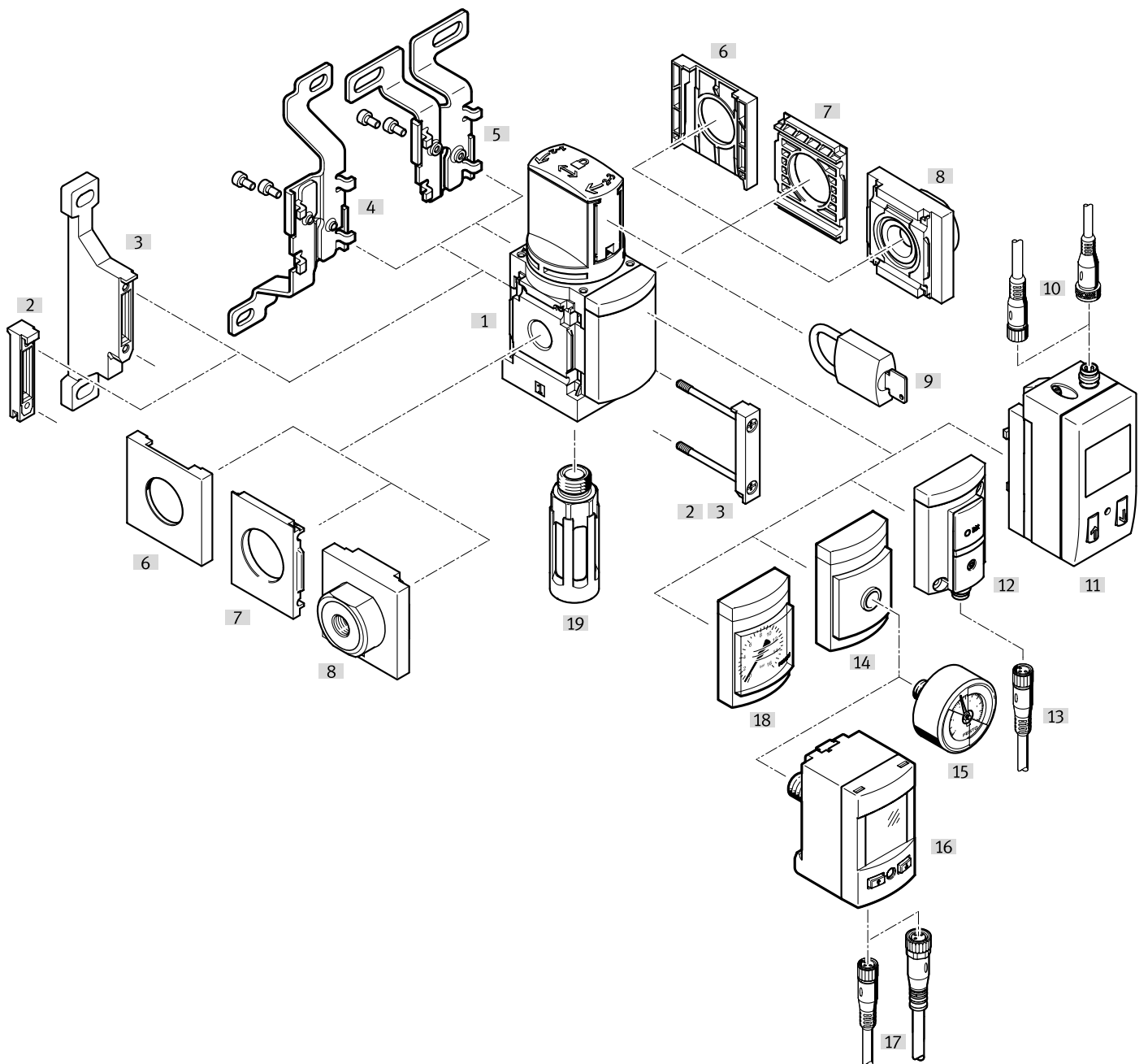
Key features

Product range for service unit components of the MS series								
Type	Description	Size	Pneumatic connection					
			Push-in connector	Female thread			Connecting plate with thread	
				M	G	NPT	G	NPT
Individual devices								
On/off valves MS-EM 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	–
On/off valves MS-EE 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	–
On/off valves MS-EE-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	–	–	–
Soft-start valves MS-DL Datasheets → Internet: ms4-dl; ms6-dl; ms12-dl								
	Pneumatically actuated soft-start valve for slow pressurisation and exhaust of pneumatic installations.	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	–
Soft-start valves MS-DE Datasheets → Internet: ms4-de; ms6-de; ms12-de								
	Electrically actuated soft-start valve for slowly pressurising and exhausting pneumatic installations.	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	–
On/off valves MS-EDE-B Datasheets → Internet: ms4-edeb; ms6-edeb								
	Electrically actuated soft-start valve in polymer housing for slowly pressurising and exhausting pneumatic installations.	4	–	–	1/4	–	–	–
		6	–	–	1/2	–	–	–
Soft-start/quick exhaust valves MS-SV 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
Individual devices								
Membrane air dryers MS-LDM1 Datasheets → Internet: ms4-ldm; ms6-ldm								
	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
Branching modules MS-FRM Datasheets → Internet: ms4-frm; ms6-frm; ms9-frm; ms12-frm								
	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	–
Distributor blocks MS-FRM-FRZ Datasheets → Internet: ms4-frm-frz; ms6-frm-frz								
	Compressed air distributors with 4 connections and half the grid width	4	–	–	–	–	–	–
		6	–	–	–	–	–	–
Flow sensors SFAM Datasheets → Internet: sfam								
	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
Can be ordered via the modular product system			
[3]	Mounting bracket	[WP]	18
	Mounting bracket (not shown)	[WPM]	
[4]	Mounting bracket	[WB]	
[5]	Mounting bracket	[WBM]	
[8]	Connecting plate SET ¹⁾	[AG...]	
	Connecting plate SET ¹⁾	[AQ...]	
[11]	Pressure sensor SDE1 with LCD display	[AD1], [AD2], [AD3], [AD4]	
[12]	Pressure sensor SDE5 with status indicator	[AD7], [AD8], [AD9], [AD10]	
[14]	Adapter for EN pressure gauge 1/8, 1/4	[A8], [A4]	
[18]	MS pressure gauge	[AG], [RG]	
[19]	Silencer	[S]	
Can be ordered as accessories			
[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 ²⁾	MS4/6-AEND	ms4-aend, ms6-aend
[8]	Connecting plate SET ²⁾	MS4/6-AG...	ms4-ag, ms6-ag
[9]	Padlock	LRVS-D	103
[10]	Connecting cable	NEBU-M8...-LE3, NEBU-M12...-LE4	103
[13]	Connecting cable	NEBU-M8...-LE3	103
[15]	Pressure gauge	MA	103
[16]	Pressure sensor	SPAU...-T	102
[17]	Connecting cable	NEBU-M8...-LE4, NEBU-M12...-LE4	103
[19]	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

001	Series	
MS	MS series	
002	Size	
4	Grid dimension 40 mm	
003	Function	
EM1	On/off valve, manual	
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	
AQK	Sub-base 1/8 NPT	
AQN	Sub-base 1/4 NPT	
AQP	Sub-base 3/8 NPT	
005	Silencer	
	None	
S	Silencer	
006	Pressure gauge alternatives	
	None	
AG	MS pressure gauge	
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	
AD1	Pressure sensor with LCD display, M8 plug, PNP, 3-pin	
AD2	Pressure sensor with LCD display, M8 plug, NPN, 3-pin	
AD3	Pressure sensor with LCD display, M12 plug, PNP, 4-pin, analogue output 4 ... 20 mA	
AD4	Pressure sensor with LCD display, M12 plug, NPN, 4-pin, analogue output 4 ... 20 mA	
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	
MPA	MPa	
008	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	
009	EU certification	
	None	
EX4	II 2GD	
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	

Type codes – MS6-EM1

001	Series
MS6	MS-series, size 6
002	Size
6	Grid dimension 62 mm
003	Function
EM1	On/off valve, manual
004	Pneumatic connection
1/4	Female thread G1/4
3/8	Female thread G3/8
1/2	Female thread G1/2
AGB	Sub-base G1/4
AGC	Sub-base G3/8
AGD	Sub-base G1/2
AGE	Sub-base G3/4
AQN	Sub-base 1/4 NPT
AQP	Sub-base 3/8 NPT
AQR	Sub-base 1/2 NPT
AQS	Sub-base 3/4 NPT
005	Silencer
	None
S	Silencer

006	Pressure gauge alternatives
	None
AG	MS pressure gauge
A4	Adapter for EN pressure gauge 1/4, without pressure gauge
RG	Integrated pressure gauge, red/green scale
AD1	Pressure sensor with LCD display, M8 plug, PNP, 3-pin
AD2	Pressure sensor with LCD display, M8 plug, NPN, 3-pin
AD3	Pressure sensor with LCD display, M12 plug, PNP, 4-pin, analogue output 4 ... 20 mA
AD4	Pressure sensor with LCD display, M12 plug, NPN, 4-pin, analogue output 4 ... 20 mA
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
MPA	MPa

008	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

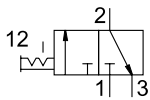
009	EU certification
	None
EX4	II 2GD

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

Function



- - Flow rate 1200 ... 8700 l/min
- - Temperature range
-10 ... +60°C
- - Operating pressure
0 ... 18 bar
- - 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 ¹⁾	
Display pressure	Via pressure sensor for indicating the output pressure and electrical output via LCD display Via pressure sensor for indicating the output pressure and electrical output via status indicator 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 air function	Cannot be throttled	
Switching position indication	Knob actuator direction = flow direction	
Type of control	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
Standard nominal flow rate q_N¹⁾ [l/min]					
In main flow direction 1 → 2	1200	2200	3000	5500	8700
In relief direction 2 → 3	1900	1700	6800	6600	6200
C value [l/s*min]					
In main flow direction 1 → 2	4.6	9.0	10.7	21.2	30.8
b value					
In main flow direction 1 → 2	0.51	0.39	0.56	0.49	0.57

1) Measured at p₁ = 6 bar and p₂ = 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 [bar]	0 ... 14 (0 ... 10) ¹⁾	0 ... 10	0 ... 18 (0 ... 10) ¹⁾	0 ... 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 ²⁾	2			
Food-safe ³⁾	See supplementary material information			
UL certification ³⁾	c UL us - Recognized (OL)			

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

2) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements that are in direct contact with a normal industrial environment.

3) Additional information: www.festo.com/catalogue/ms → Support/Downloads.

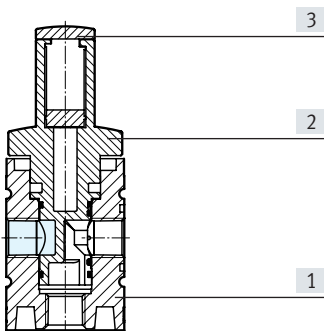
ATEX	
EU certification	[EX4]
ATEX category for gas	II 2G
Type of ignition protection for gas	Ex h IIC T6 Gb X
ATEX category for dust	II 2D
Type of ignition protection for dust	Ex h IIIC T60°C Db X
Explosion-proof ambient temperature	-10°C ≤ Ta ≤ +60°C
CE marking (see declaration of conformity) ¹⁾	To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

1) Additional information: www.festo.com/catalogue/ms → 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]	Spool	Reinforced PA
-	Seals	NBR, TPE-U(PU)
Note on materials		RoHS-compliant
		Free of copper and PTFE (not with MS pressure gauge with standard scale or pressure sensor)

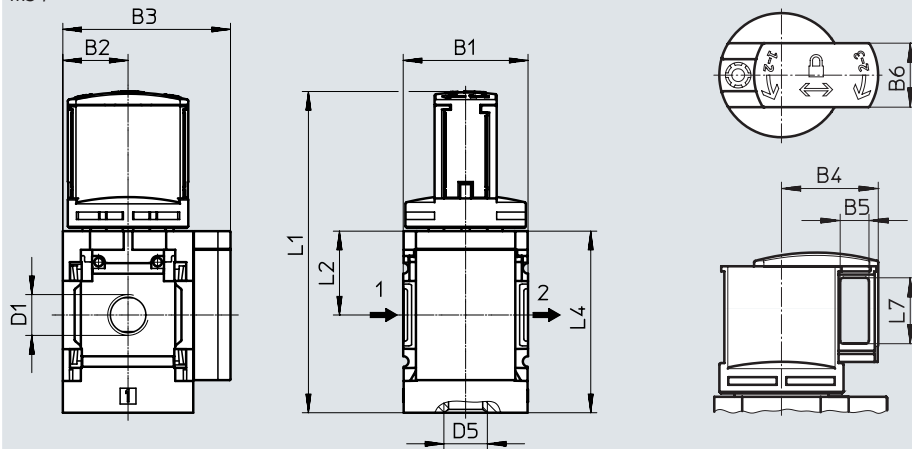
Datasheet

Dimensions – Basic version

Download CAD data → www.festo.com

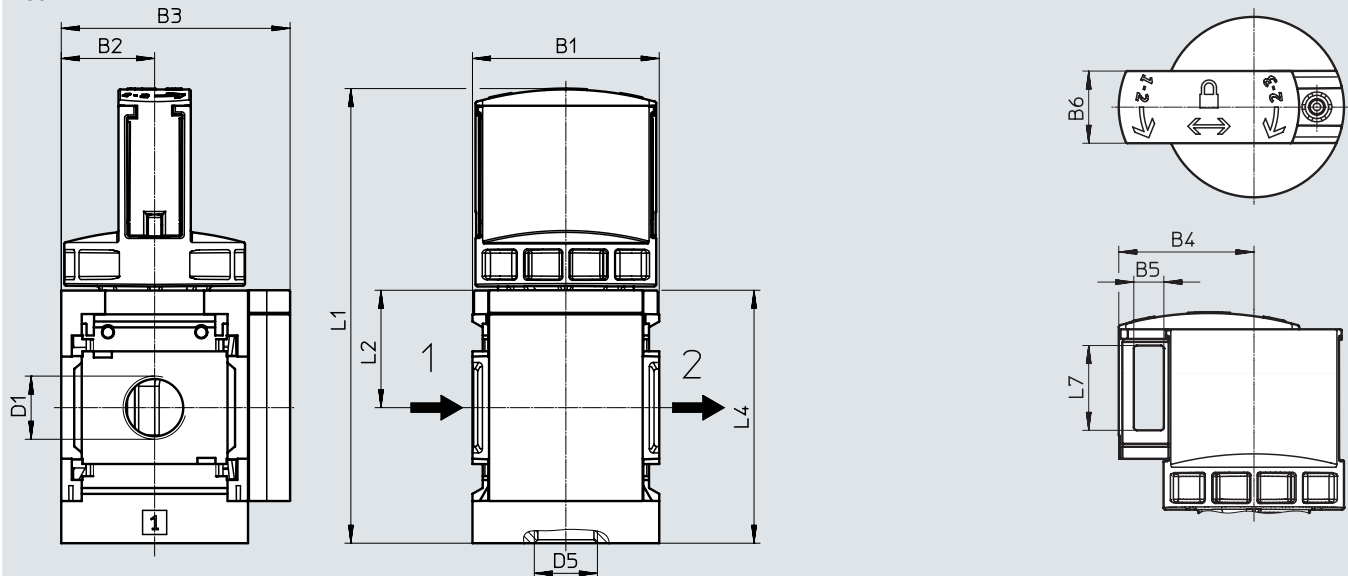
With female thread, with cover plate

MS4



→ Flow direction

MS6



→ Flow direction

Type	B1	B2	B3	B4	B5	B6	D1	D5	L1	L2	L4	L7
MS4-...												
MS4-EM1-1/8	40	21	54	30	9	20	G1/8	G1/4	104	27	59	21
MS4-EM1-1/4							G1/4					
MS6-...												
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.

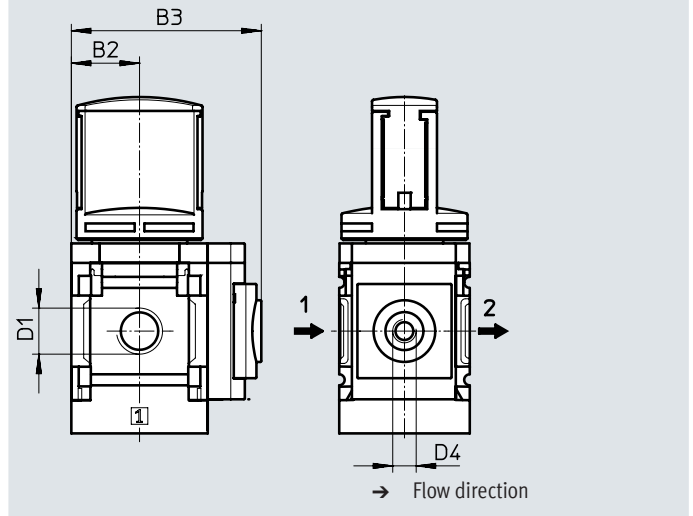
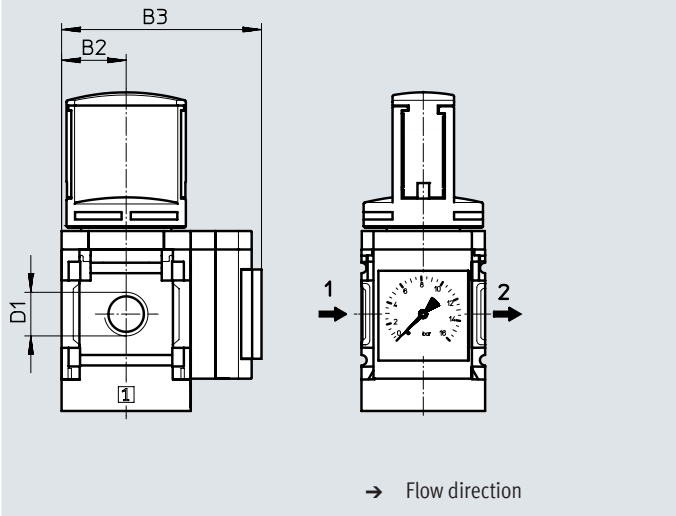
Datasheet

Dimensions – Pressure gauge/pressure gauge alternatives

Download CAD data → 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
MS4-...				
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	
MS6-...				
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	

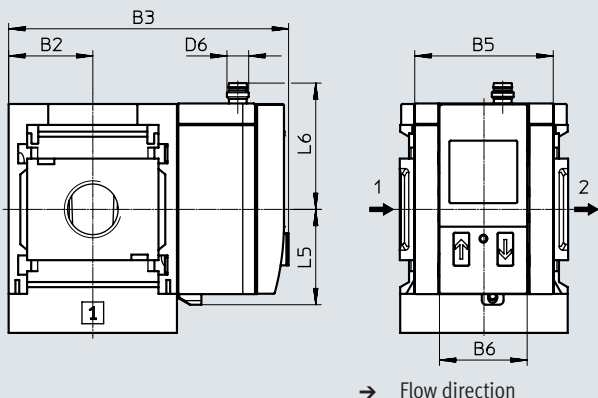
Datasheet

Dimensions – Pressure sensor

Download CAD data → www.festo.com

[AD1], [AD2], [AD3], [AD4] Pressure sensor with LCD display

Datasheets → Internet: sde1



[AD1]:
SDE1-D10-G2-MS...-L-P1-M8 with 3-pin plug M8x1, 1 switching output PNP

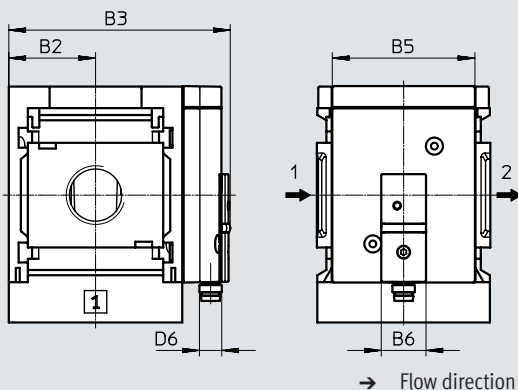
[AD3]:
SDE1-D10-G2-MS...-L-PI-M12 with 4-pin plug M12x1, 1 switching output PNP and 4 ... 20 mA analogue

[AD2]:
SDE1-D10-G2-MS...-L-N1-M8 with 3-pin plug M8x1, 1 switching output NPN

[AD4]:
SDE1-D10-G2-MS...-L-NI-M12 with 4-pin plug M12x1, 1 switching output NPN and 4 ... 20 mA analogue

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

Datasheets → Internet: sde5



[AD7]:
SDE5-D10-O-...-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/O contact

[AD9]:
SDE5-D10-O3-...-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/O contact

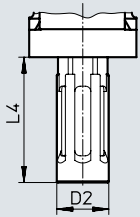
[AD8]:
SDE5-D10-C-...-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/C contact

[AD10]:
SDE5-D10-C3-...-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/C contact

Type	B2	B3	B5	B6	D6	L5	L6
MS4-...							
MS4-...AD1, AD2	21	82.6	32	32.3	M8x1	35.1	46.7
MS4-...AD3, AD4					M12x1		55.8
MS4-...AD7, AD8, AD9, AD10	21	59.1	~32	16	M8x1	-	-
MS6-...							
MS6-...AD1, AD2	31	103	51	32.3	M8x1	35.1	46.7
MS6-...AD3, AD4					M12x1		55.8
MS6-...AD7, AD8, AD9, AD10	31	79.1	~51	16	M8x1	-	-

Datasheet

Dimensions – Silencer

Download CAD data → 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
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
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

Ordering data – Modular product system

Ordering table		Grid dimension	[mm]	40	62	Conditions	Code	Enter code
Module no.	541266	541279						
Series	Standard						MS	MS
Size	4	6					...	
Function	On/off valve, manual						-EM1	-EM1
Pneumatic connection	Female thread G1/8	–			[1]		-1/8	
	Female thread G1/4	Female thread G1/4			[1]		-1/4	
	–	Female thread G3/8			[1]		-3/8	
	–	Female thread G1/2			[1]		-1/2	
	Connecting plate G1/8	–					-AGA	
	Connecting plate G1/4	Connecting plate G1/4					-AGB	
	Connecting plate G3/8	Connecting plate G3/8					-AGC	
	–	Connecting plate G1/2					-AGD	
	–	Connecting plate G3/4					-AGE	
	Connecting plate 1/8 NPT	–			[1]		-AQK	
	Connecting plate 1/4 NPT	Connecting plate 1/4 NPT			[1]		-AQN	
	Connecting plate 3/8 NPT	Connecting plate 3/8 NPT			[1]		-AQP	
	–	Connecting plate 1/2 NPT			[1]		-AQR	
–	Connecting plate 3/4 NPT			[1]		-AQS		
Rotary knob colour	Standard (black/blue)							
	Red						-R	
Silencer	None							
	Silencer						-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 LCD display, M8 plug, 1 switching output PNP, 3-pin				[1] [2]		-AD1	
	Pressure sensor with LCD display, M8 plug, 1 switching output NPN, 3-pin				[1] [2]		-AD2	
	Pressure sensor with LCD display, plug M12, 1 switching output PNP, 4-pin, analogue output 4 ... 20 mA				[1] [2]		-AD3	
	Pressure sensor with LCD display, plug M12, 1 switching output NPN, 4-pin, analogue output 4 ... 20 mA				[1] [2]		-AD4	
	Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/O contact				[1] [2]		-AD7	
Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/C contact				[1] [2]		-AD8		
Pressure sensor with status indicator, plug M8, window comparator, PNP, N/O contact				[1] [2]		-AD9		
Pressure sensor with status indicator, plug M8, window comparator, PNP, N/C contact				[1] [2]		-AD10		
Alternative pressure gauge scale	None							
	psi				[3]		-PSI	
	MPa				[4]		-MPA	

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

1/2, AQK, AQN, AQP, AQR, AQS, AD1 ... AD4, AD7 ... AD10, WPM

[2] AD1 ... AD4, 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

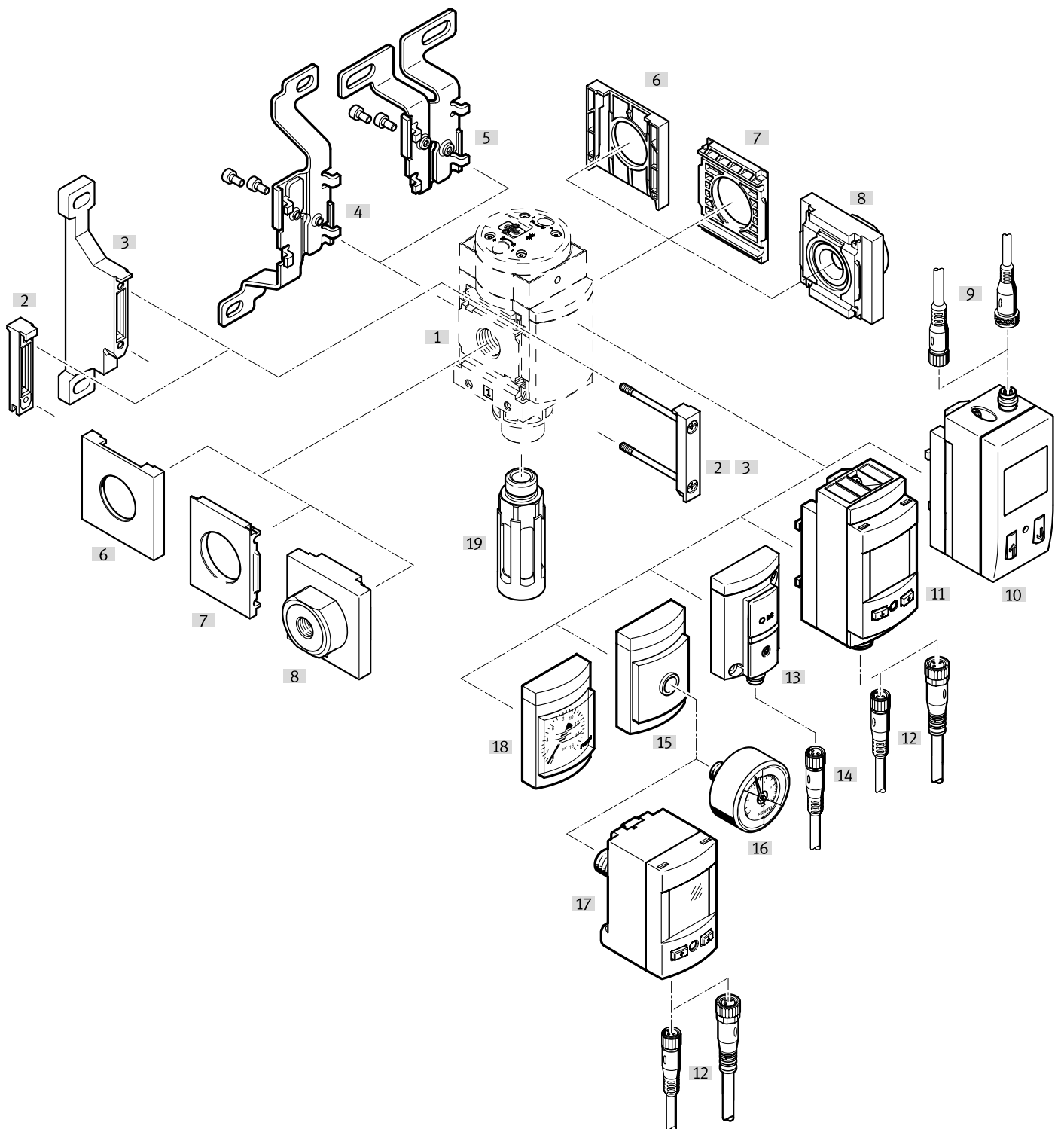
Ordering table		Grid dimension	[mm]	40	62	Conditions	Code	Enter code
Type of mounting	Without mounting bracket							
	Mounting bracket standard design					[5]	-WP	
	Mounting bracket for attaching service unit components					[1] [5]	-WPM	
	Mounting bracket centrally at rear (wall mounting top and bottom), 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,
AQR, AQR, AQS,
AD1 ... AD4,
AD7 ... AD10,
WPM

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

Peripherals overview



Note

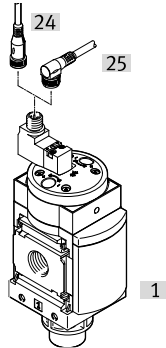
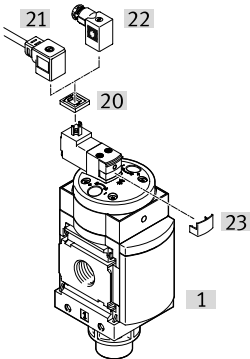
Additional accessories:

- 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
Can be ordered via the modular product system			
[3]	Mounting bracket	[WP]	32
	Mounting bracket (not shown)	[WPM]	
[4]	Mounting bracket	[WB]	
[5]	Mounting bracket	[WBM]	
[8]	Connecting plate SET ¹⁾	[AG...]	
	Connecting plate SET ¹⁾	[AQ...]	
[10]	Pressure sensor SDE1 with LCD display	[AD1], [AD2], [AD3], [AD4]	
[11]	Pressure sensor SPAU with LCD display	[AD11], [AD12]	
[13]	Pressure sensor SDE5 with status indicator	[AD7], [AD8], [AD9], [AD10]	
[15]	Adapter for EN pressure gauge 1/8, 1/4	[A8], [A4]	
[18]	MS pressure gauge	[AG], [RG]	
[19]	Silencer	[S]	
Can be ordered as accessories			
[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 ²⁾	MS4/6-AEND	ms4-aend, ms6-aend
[8]	Connecting plate SET ²⁾	MS4/6-AG...	ms4-ag, ms6-ag
[9]	Connecting cable	NEBU-M8...-LE3, NEBU-M12...-LE4	103
[12]	Connecting cable	NEBU-M8...-LE4, NEBU-M12...-LE4	103
[14]	Connecting cable	NEBU-M8...-LE3	103
[16]	Pressure gauge	MA	103
[17]	Pressure sensor	SPAU...-T	102
[19]	Silencer	U	103
[20]	Illuminating seal	MEB-LD	102
[21]	Plug socket with cable	KMEB	102
[22]	Plug socket ³⁾	MSSD-EB	102
[23]	Locking clip	CPV18-HV	102
[24]	Connecting cable	NEBU-M12G5	103
[25]	Connecting cable	NEBU-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

001	Series
MS	MS series

002	Size
4	Grid dimension 40 mm

003	Function
EE	On/off valve, electric

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
AQK	Sub-base 1/8 NPT
AQN	Sub-base 1/4 NPT
AQP	Sub-base 3/8 NPT

005	Supply voltage
V230	230 V AC (connection pattern to EN 175301)
10V24	24 V DC, 10 bar, connection pattern to EN 175301
V110	110 V AC (connection pattern to EN 175301)
10V24C	24 V DC, 10 bar (connection pattern to EN 175301) without manual override
10V24D	24 V DC, 10 bar, M12 (connection pattern to EN 60947-5-2) without manual override
10V24F	24 V DC, 10 bar, M12 (connection pattern to EN 60947-5-2). Manual override on the pilot actuator non-detenting, internally detenting
10V24P	24 V DC, 10 bar, M12 plug socket adapter (connection pattern to EN 60947-5-2)
V24	24 V DC (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
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
AD1	Pressure sensor with LCD display, M8 plug, PNP, 3-pin
AD2	Pressure sensor with LCD display, M8 plug, NPN, 3-pin
AD3	Pressure sensor with LCD display, M12 plug, PNP, 4-pin, analogue output 4 ... 20 mA
AD4	Pressure sensor with LCD display, M12 plug, NPN, 4-pin, analogue output 4 ... 20 mA
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

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

009	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

010	EU certification
	None
EX2	II 3GD

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

012	Flow direction
	Flow direction from left to right
Z	Flow direction from right to left

013	Version
B	Basic

Type codes

001 Series	
MS6	MS-series, size 6
002 Size	
6	Grid dimension 62 mm
003 Function	
EE	On/off valve, electric
004 Pneumatic connection	
1/4	Female thread G1/4
3/8	Female thread G3/8
1/2	Female thread G1/2
AGB	Sub-base G1/4
AGC	Sub-base G3/8
AGD	Sub-base G1/2
AGE	Sub-base G3/4
AQN	Sub-base 1/4 NPT
AQP	Sub-base 3/8 NPT
AQR	Sub-base 1/2 NPT
AQS	Sub-base 3/4 NPT
005 Supply voltage	
V230	230 V AC (connection pattern to EN 175301)
10V24	24 V DC, 10 bar, connection pattern to EN 175301
V110	110 V AC (connection pattern to EN 175301)
10V24C	24 V DC, 10 bar (connection pattern to EN 175301) without manual override
10V24D	24 V DC, 10 bar, M12 (connection pattern to EN 60947-5-2) without manual override
10V24F	24 V DC, 10 bar, M12 (connection pattern to EN 60947-5-2). Manual override on the pilot actuator non-detenting, internally detenting
10V24P	24 V DC, 10 bar, M12 plug socket adapter (connection pattern to EN 60947-5-2)
V24	24 V DC (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
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
AD1	Pressure sensor with LCD display, M8 plug, PNP, 3-pin
AD2	Pressure sensor with LCD display, M8 plug, NPN, 3-pin
AD3	Pressure sensor with LCD display, M12 plug, PNP, 4-pin, analogue output 4 ... 20 mA
AD4	Pressure sensor with LCD display, M12 plug, NPN, 4-pin, analogue output 4 ... 20 mA
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

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

009 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

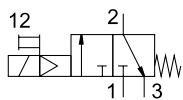
010 EU certification	
	None
EX2	II 3GD





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

012 Flow direction	
	Flow direction from left to right
Z	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



- Electrically actuated on/off valve for pressurising and exhausting pneumatic systems
- With solenoid coil, without plug socket
- Choice of three voltage ranges
- Ducted exhaust 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	
Type of mounting	With accessories In-line installation	
Mounting position	Any ¹⁾	
Display pressure	Via pressure sensor for indicating the output pressure and electrical output via LCD display Via pressure sensor for indicating the output pressure and electrical output via status indicator 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 air function	Cannot be throttled	
Manual override		
With supply voltage [10V24], [10V24F]	Non-detenting	
[V24], [V24P], [10V24P], [V110], [V230]	Non-detenting/detenting	
[10V24C], [10V24D]	None	
Reset method	Mechanical spring	
Switching position indication	With accessories	
Type of control	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 EN 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 $q_{N^{1}}$ [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	[V24], [V24P], [V110], [V230]	[10V24...]		[V24], [V24P], [V110], [V230]	[10V24...]	
Operating pressure [bar]	4 ... 14 (4 ... 10) ¹⁾	4 ... 10	4 ... 10	4 ... 18 (4 ... 10) ¹⁾	4 ... 10	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 ²⁾	2					
Food-safe ³⁾	See supplementary material information (except for solenoid valve)					
UL certification ³⁾	c UL us - Recognized (OL)					
CE marking (see declaration of conformity) ³⁾	To EU EMC Directive To EU Low Voltage Directive					
KC marking	–	–	KC EMC	–	–	KC EMC

1) Value in brackets applies to MS4/MS6-EE with UL certification or with silencer in combination with EU certification.

2) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements that are in direct contact with a normal industrial environment.

3) Additional information: www.festo.com/catalogue/ms → Support/Downloads.

Datasheet

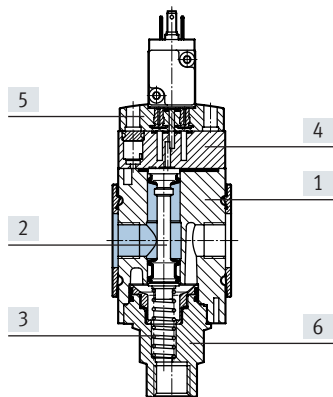
ATEX	
EU certification	[EX2]
ATEX category for gas	II 3G
Type of (ignition) protection for gas	Ex nA IIC T4 X Gc
ATEX category for dust	II 3D
Type of (ignition) protection for dust	Ex tc IIIC T105°C X Dc IP65
Explosion-proof ambient temperature	-10°C ≤ Ta ≤ +60°C
CE marking (see declaration of conformity) ¹⁾	To EU Explosion Protection Directive (ATEX)
	To EU EMC Directive
	To EU Low Voltage Directive

1) Additional information: www.festo.com/catalogue/ms → Support/Downloads.

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

Materials

Sectional view

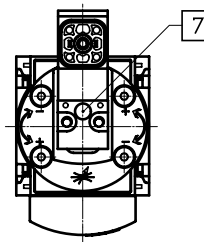
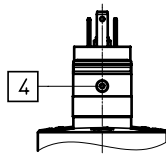
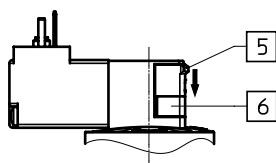


On/off valve		
[1]	Housing	Die-cast aluminium
[2]	Piston	NBR/aluminium
[3]	Springs	High-alloy stainless steel
[4]	End cover	PA
[5]	Plate	PA
[6]	Socket end connection	PA
-	Seals	NBR
Note on materials		RoHS-compliant
		Free of copper and PTFE (not with supply voltage [24P], [10V24...], MS pressure gauge with standard scale or pressure sensor)

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] Manual override: non-detenting and detenting.

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

Datasheet

Dimensions – Basic version

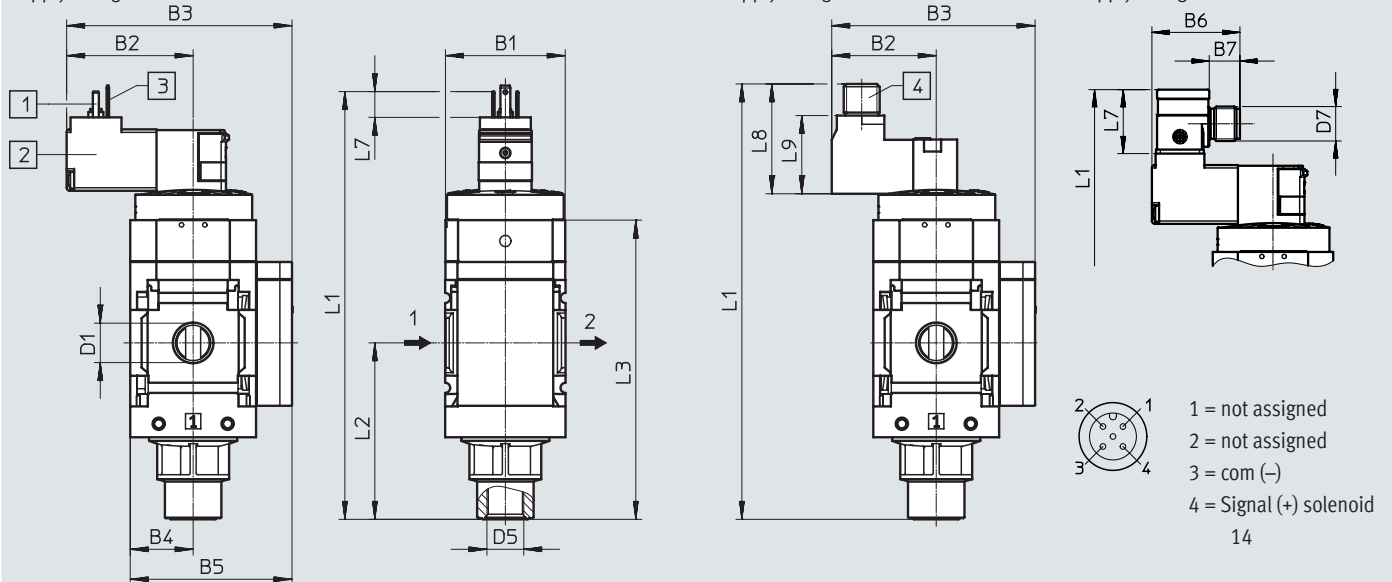
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With female thread, with cover plate

[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 EN 61076-2-101, 4-pin version for connecting cable NEBU-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 ¹⁾	160 ¹⁾	140	145	59	100	8.6	22 ¹⁾	26 ¹⁾	37	26
MS4-EE-1/4												
MS6-...												
MS6-EE-1/4	186	199 ¹⁾	203 ¹⁾	183	188	84	143	8.6	22 ¹⁾	26 ¹⁾	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.

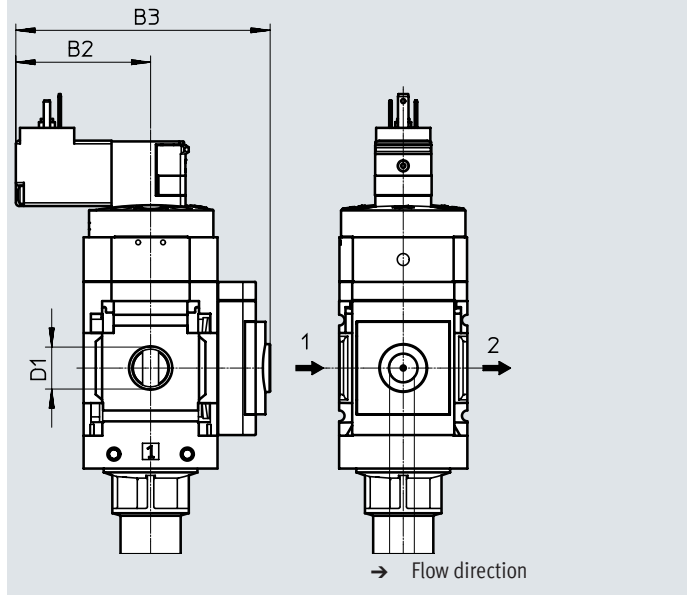
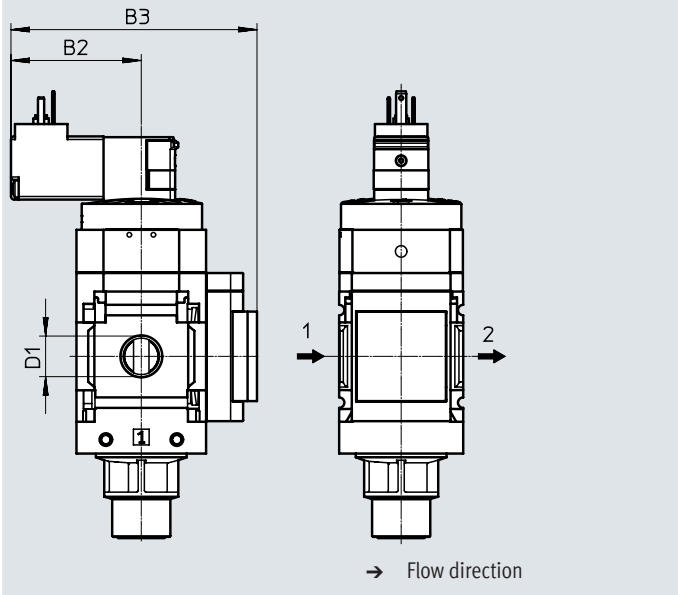
Datasheet

Dimensions – Pressure gauge/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]		
MS4-...						
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	
MS6-...						
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	

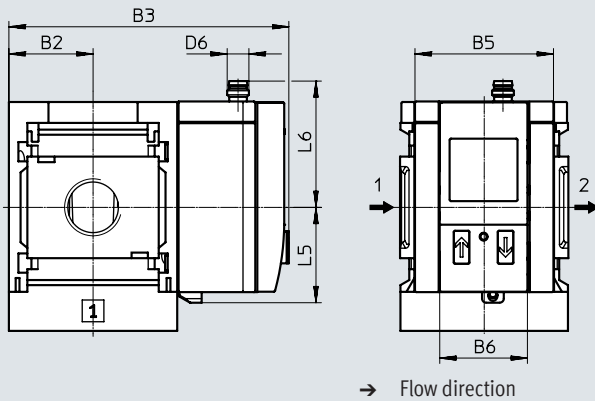
Datasheet

Dimensions – Pressure sensor

Download CAD data → www.festo.com

[AD1], [AD2], [AD3], [AD4] Pressure sensor with LCD display

Datasheets → Internet: sde1



[AD1]:
SDE1-D10-G2-MS...-L-P1-M8 with 3-pin plug M8x1, 1 switching output PNP

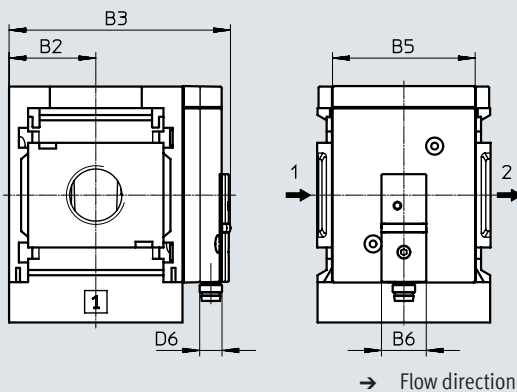
[AD3]:
SDE1-D10-G2-MS...-L-PI-M12 with 4-pin plug M12x1, 1 switching output PNP and 4 ... 20 mA analogue

[AD2]:
SDE1-D10-G2-MS...-L-N1-M8 with 3-pin plug M8x1, 1 switching output NPN

[AD4]:
SDE1-D10-G2-MS...-L-NI-M12 with 4-pin plug M12x1, 1 switching output NPN and 4 ... 20 mA analogue

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

Datasheets → Internet: sde5



[AD7]:
SDE5-D10-O-...-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/O contact

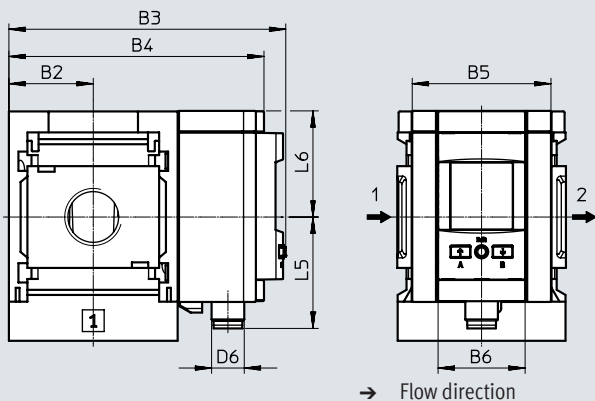
[AD9]:
SDE5-D10-O3-...-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/O contact

[AD8]:
SDE5-D10-C-...-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/C contact

[AD10]:
SDE5-D10-C3-...-P-M8 with 3-pin plug M8x1, 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 4-pin plug M12x1 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 4-pin plug M8x1 A-coded, switching output 2x PNP or 2x NPN switchable and 0 ... 10 V, 1 ... 5 V, 4 ... 20 mA analogue

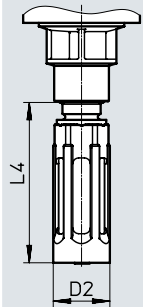
Type	B2	B3	B4	B5	B6	D6	L5	L6
MS4-...								
MS4-...-AD1, AD2	21	82.6	-	32	32.3	M8x1	35.1	46.7
MS4-...-AD3, AD4						M12x1		55.8
MS4-...-AD7, AD8, AD9, AD10	21	59.1	-	~32	16	M8x1	-	-
MS4-...-AD11	21	81.2	73.3	32	32	M12x1	41.2	39
MS4-...-AD12						M8x1		
MS6-...								
MS6-...-AD1, AD2	31	103	-	51	32.3	M8x1	35.1	46.7
MS6-...-AD3, AD4						M12x1		55.8
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		

Datasheet

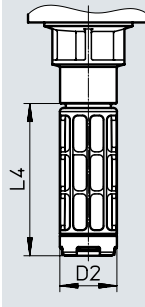
Dimensions – Silencer

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[S] Silencer



[S] Silencer
[EX2] EU certification



Type	D2	L4
MS4-...		
MS4-EE-...S	20	55
MS4-EE-...S-...EX2	19	50.7
MS6-...		
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.		527709	527682			
Series		Standard			MS	MS
Size		4	6		...	
Function		On/off valve, electric			-EE	-EE
Pneumatic connection	Female thread G1/8	-		[1]	-1/8	
	Female thread G1/4	Female thread G1/4		[1]	-1/4	
	-	Female thread G3/8		[1]	-3/8	
	-	Female thread G1/2		[1]	-1/2	
	Connecting plate G1/8	-			-AGA	
	Connecting plate G1/4	Connecting plate G1/4			-AGB	
	Connecting plate G3/8	Connecting plate G3/8			-AGC	
	-	Connecting plate G1/2			-AGD	
	-	Connecting plate G3/4			-AGE	
	Connecting plate 1/8 NPT	-		[1]	-AQK	
	Connecting plate 1/4 NPT	Connecting plate 1/4 NPT		[1]	-AQN	
	Connecting plate 3/8 NPT	Connecting plate 3/8 NPT		[1]	-AQP	
	-	Connecting plate 1/2 NPT		[1]	-AQR	
	-	Connecting plate 3/4 NPT		[1]	-AQS	
Supply voltage	24 V DC (plug pattern to EN 175301)	4 ... 14 bar 4 ... 18 bar			-V24	
	24 V DC, M12x1 to ISO 20401 in line with EN 61076-2-101	4 ... 14 bar 4 ... 18 bar		[1]	-V24P	
	24 V DC (plug pattern to EN 175301), 4 ... 10 bar, manual override non-detenting			[1] [2]	-10V24	
	24 V DC (plug pattern to EN 175301), 4 ... 10 bar, no manual override			[1] [2]	-10V24C	
	24 V DC, M12x1 to ISO 20401 in line with EN 61076-2-101, 4 ... 10 bar, no manual override			[1] [2]	-10V24D	
	24 V DC, M12x1 to ISO 20401 in line with EN 61076-2-101, 4 ... 10 bar, manual override non-detenting			[1] [2]	-10V24F	
	24 V DC, M12x1 to ISO 20401 in line with EN 61076-2-101, 4 ... 10 bar, manual override non-detenting/detenting			[1] [2]	-10V24P	
	110 V AC (plug pattern to EN 175301)	4 ... 14 bar 4 ... 18 bar		[1]	-V110	
	230 V AC (plug pattern to EN 175301)	4 ... 14 bar 4 ... 18 bar		[1]	-V230	

[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,
AD1 ... AD4,
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 LCD display, M8 plug, 1 switching output PNP, 3-pin					[1] [4]	-AD1	
	Pressure sensor with LCD display, M8 plug, 1 switching output NPN, 3-pin					[1] [4]	-AD2	
	Pressure sensor with LCD display, plug M12, 1 switching output PNP, 4-pin, analogue output 4 ... 20 mA					[1] [4]	-AD3	
	Pressure sensor with LCD display, plug M12, 1 switching output NPN, 4-pin, analogue output 4 ... 20 mA					[1] [4]	-AD4	
	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 attaching 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,
AD1 ... AD4,
AD7 ... AD12,
WPM

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

[4] AD1 ... AD4, Measuring range max. 10 bar.

AD7 ... AD12

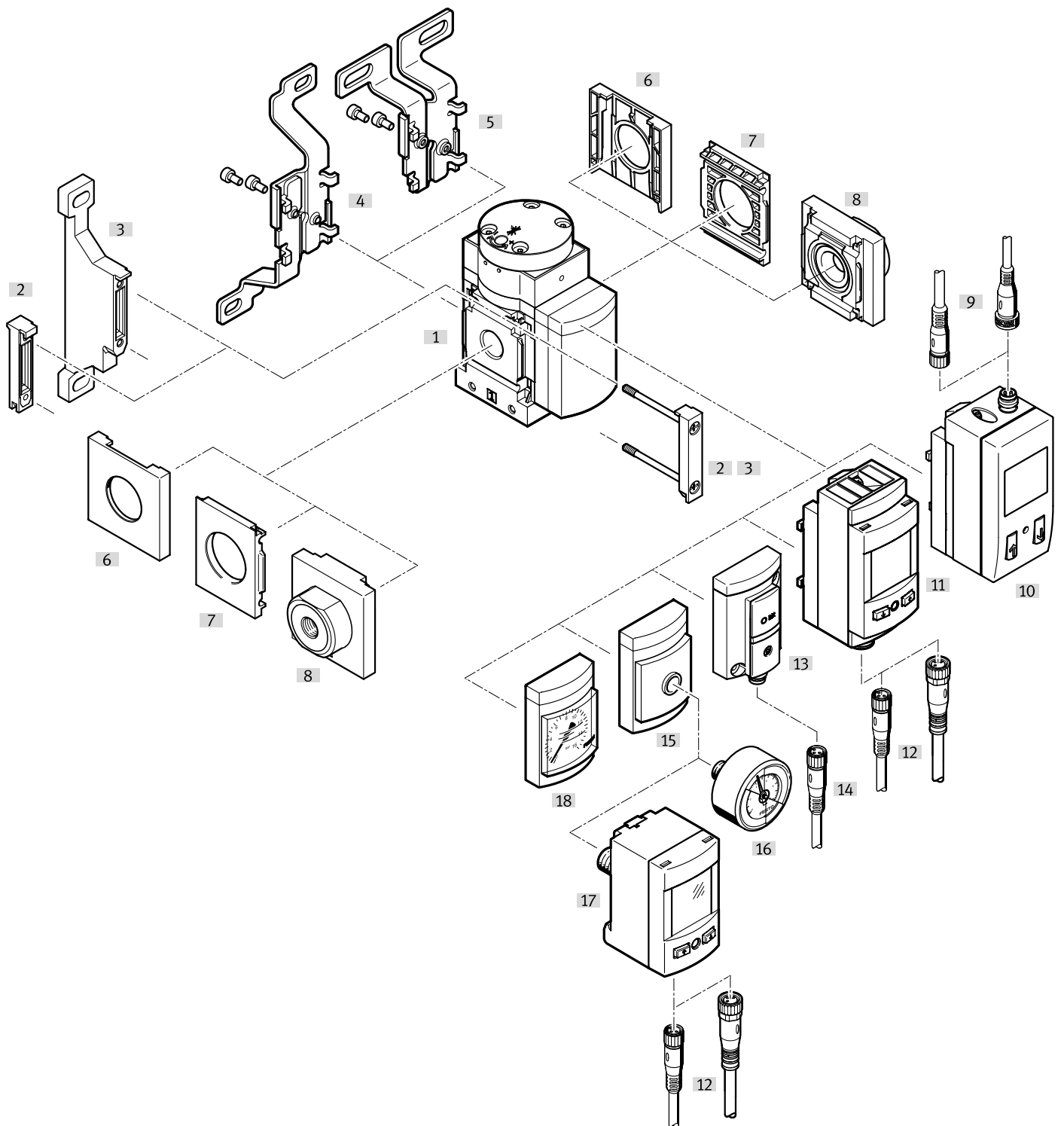
[5] PSI Only in combination with pressure gauge AG.

[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
Can be ordered via the modular product system			
[3]	Mounting bracket	[WP]	44
	Mounting bracket (not shown)	[WPM]	
[4]	Mounting bracket	[WB]	
[5]	Mounting bracket	[WBM]	
[8]	Connecting plate SET ¹⁾	[AG...]	
	Connecting plate SET ¹⁾	[AQ...]	
[10]	Pressure sensor SDE1 with LCD display	[AD1], [AD2], [AD3], [AD4]	
[11]	Pressure sensor SPAU with LCD display	[AD11], [AD12]	
[13]	Pressure sensor SDE5 with status indicator	[AD7], [AD8], [AD9], [AD10]	
[15]	Adapter for EN pressure gauge 1/8, 1/4	[A8], [A4]	
[18]	MS pressure gauge	[AG], [RG]	
Can be ordered as accessories			
[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 ²⁾	MS4/6-AEND	ms4-aend, ms6-aend
[8]	Connecting plate SET ²⁾	MS4/6-AG...	ms4-ag, ms6-ag
[9]	Connecting cable	NEBU-M8...-LE3, NEBU-M12...-LE4	103
[12]	Connecting cable	NEBU-M8...-LE4, NEBU-M12...-LE4	103
[14]	Connecting cable	NEBU-M8...-LE3	103
[16]	Pressure gauge	MA	103
[17]	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	
AQK	Sub-base NPT1/8	
AQN	Sub-base NPT1/4	
AQP	Sub-base NPT3/8	

005	Pressure gauge alternatives	
	None	
AG	MS 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	
A4	Adapter for EN pressure gauge 1/4, without pressure gauge	
RG	Integrated pressure gauge, red/green scale	
AD1	Pressure sensor with LCD display, M8 plug, PNP, 3-pin	
AD2	Pressure sensor with LCD display, M8 plug, NPN, 3-pin	
AD3	Pressure sensor with LCD display, M12 plug, PNP, 4-pin, analogue output 4 ... 20 mA	
AD4	Pressure sensor with LCD display, M12 plug, NPN, 4-pin, analogue output 4 ... 20 mA	
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	

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	
MS	MS series	
002	Size	
6	Grid dimension 62 mm	
003	Function	
DL	Soft-start valve, pneumatic	
004	Pneumatic connection	
1/4	Female thread G1/4	
3/8	Female thread G3/8	
1/2	Female thread G1/2	
AGB	Sub-base G1/4	
AGC	Sub-base G3/8	
AGD	Sub-base G1/2	
AGE	Sub-base G3/4	
AQN	Sub-base NPT1/4	
AQP	Sub-base NPT3/8	
AQR	Sub-base NPT1/2	
AQS	Sub-base NPT3/4	
005	Pressure gauge alternatives	
	None	
AG	MS pressure gauge	
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	
AD1	Pressure sensor with LCD display, M8 plug, PNP, 3-pin	
AD2	Pressure sensor with LCD display, M8 plug, NPN, 3-pin	
AD3	Pressure sensor with LCD display, M12 plug, PNP, 4-pin, analogue output 4 ... 20 mA	
AD4	Pressure sensor with LCD display, M12 plug, NPN, 4-pin, analogue output 4 ... 20 mA	
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	

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	

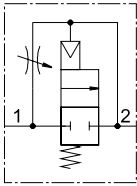
008	EU certification	
	None	
EX2	II 3GD to EU Explosion Protection Directive (ATEX)	
EX4	II 2GD	




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	

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 outlet 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

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 ¹⁾	
Display pressure	Via pressure sensor for indicating the output pressure and electrical output via LCD display Via pressure sensor for indicating the output pressure and electrical output via status indicator 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 air function	Can be throttled	
Reset method	Mechanical spring	
Type of control	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) ¹⁾	4 ... 10	4 ... 18 (4 ... 10) ¹⁾	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 ²⁾	2			
Food-safe ³⁾	See supplementary material information			
UL certification ³⁾	c UL us - Recognized (OL)			

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

2) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements that are in direct contact with a normal industrial environment.

3) Additional information: www.festo.com/catalogue/ms → 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-proof ambient temperature	-10°C ≤ Ta ≤ +60°C
CE marking (see declaration of conformity) ¹⁾	To EU Explosion Protection Directive (ATEX)

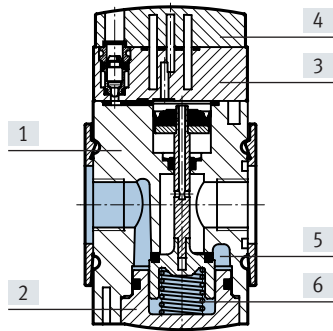
1) Additional information: www.festo.com/catalogue/ms → Support/Downloads.

Datasheet

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

Materials

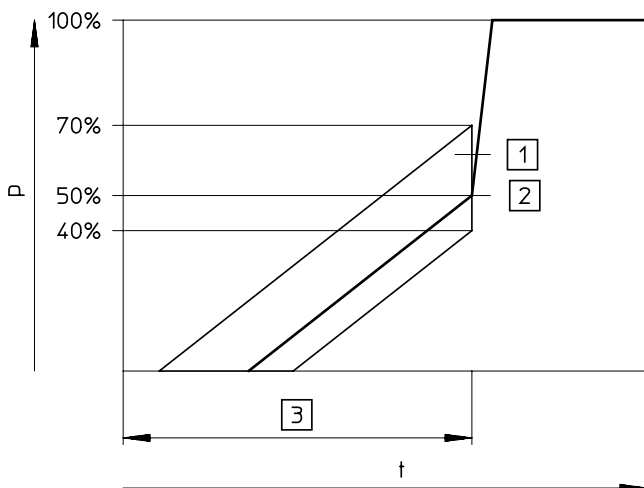
Sectional view



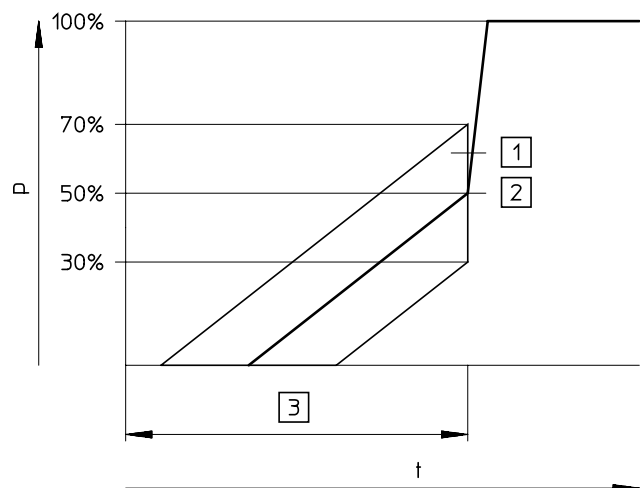
Soft-start valve		
[1]	Housing	Die-cast aluminium
[2]	Bottom	PET
[3]	End cover	PA
[4]	Plate	PA
[5]	Seat	Aluminium
[6]	Springs	Spring steel
-	Seals	NBR
Note on materials		RoHS-compliant
		Free of copper and PTFE (not with MS pressure gauge with standard scale or pressure sensor)

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

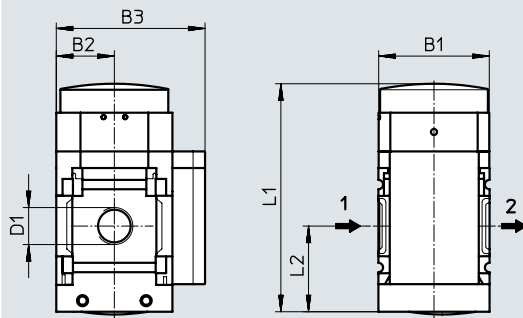
The +20%/–20% switching point tolerance refers to the operating pressure p1. Example: A switching point from 1.2 bar to 2.8 bar is permissible at an operating pressure of 4 bar.

Datasheet

Dimensions – Basic version

Download CAD data → www.festo.com

With female thread, with cover plate



→ Flow direction

Type	B1	B2	B3	D1	L1	L2
MS4-...						
MS4-DL-1/8	40	21	54	G1/8	83.2	31.5
MS4-DL-1/4				G1/4		
MS6-...						
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 gauge/pressure gauge alternatives

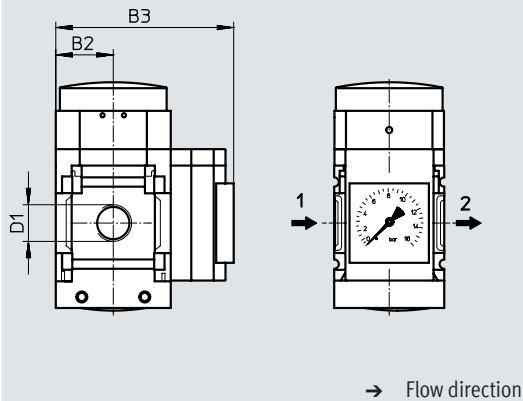
Download CAD data → www.festo.com

[AG] Integrated MS pressure gauge with standard scale

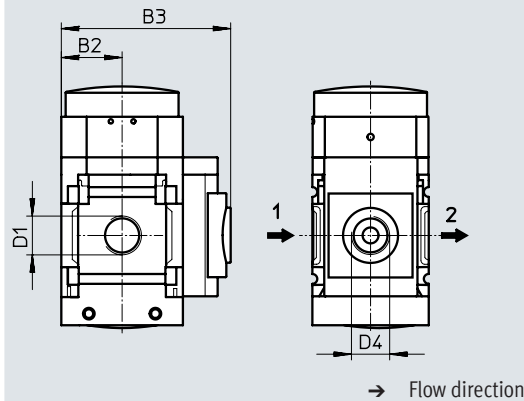
[RG] Integrated MS pressure gauge with red/green scale

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

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



→ Flow direction



→ Flow direction

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

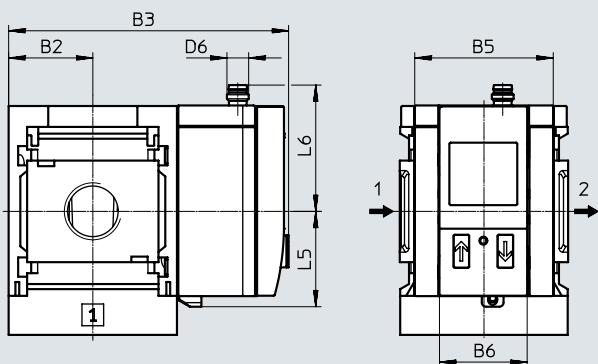
Datasheet

Dimensions – Pressure sensor

Download CAD data → www.festo.com

[AD1], [AD2], [AD3], [AD4] Pressure sensor with LCD display

Datasheets → Internet: sde1



→ Flow direction

[AD1]:
SDE1-D10-G2-MS...-L-P1-M8 with 3-pin plug M8x1, 1 switching output PNP

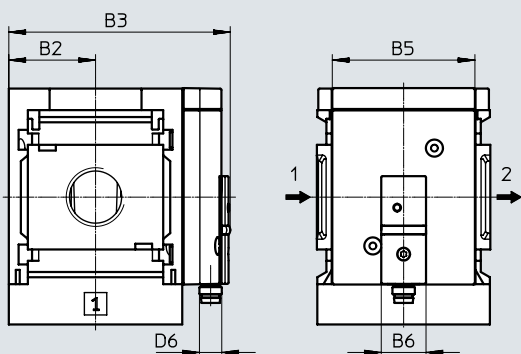
[AD3]:
SDE1-D10-G2-MS...-L-PI-M12 with 4-pin plug M12x1, 1 switching output PNP and 4 ... 20 mA analogue

[AD2]:
SDE1-D10-G2-MS...-L-N1-M8 with 3-pin plug M8x1, 1 switching output NPN

[AD4]:
SDE1-D10-G2-MS...-L-NI-M12 with 4-pin plug M12x1, 1 switching output NPN and 4 ... 20 mA analogue

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

Datasheets → Internet: sde5



→ Flow direction

[AD7]:
SDE5-D10-O-...-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/O contact

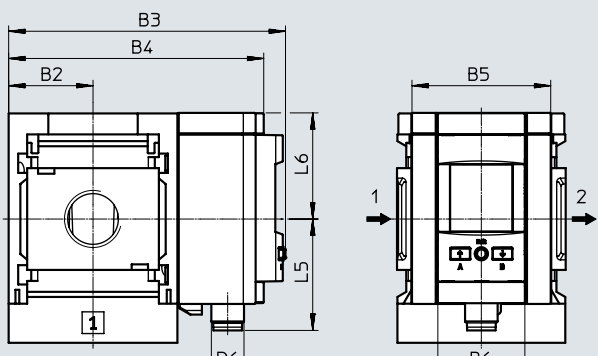
[AD9]:
SDE5-D10-O3-...-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/O contact

[AD8]:
SDE5-D10-C-...-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/C contact

[AD10]:
SDE5-D10-C3-...-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/C contact

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

Datasheets → Internet: spau



→ Flow direction

[AD11]:
SPAU-P10R-MS...-L-PNLK-M12D with 4-pin plug M12x1 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 4-pin plug M8x1 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
MS4-...								
MS4-...AD1/AD2	21	82.6	-	32	32.3	M8x1	35.1	46.7
MS4-...AD3/AD4						M12x1		55.8
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		
MS6-...								
MS6-...AD1/AD2	31	103	-	51	32.3	M8x1	35.1	46.7
MS6-...AD3/AD4						M12x1		55.8
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		

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.		527711			527684			
Series		Standard					MS	MS
Size		4		6			...	
Function		Soft-start valve, pneumatic					-DL	-DL
Pneumatic connection	Female thread G1/8	–				[1]	-1/8	
	Female thread G1/4	Female thread G1/4				[1]	-1/4	
	–	Female thread G3/8				[1]	-3/8	
	–	Female thread G1/2				[1]	-1/2	
	Connecting plate G1/8	–					-AGA	
	Connecting plate G1/4	Connecting plate G1/4					-AGB	
	Connecting plate G3/8	Connecting plate G3/8					-AGC	
	–	Connecting plate G1/2					-AGD	
	–	Connecting plate G3/4					-AGE	
	Connecting plate 1/8 NPT	–				[1]	-AQK	
	Connecting plate 1/4 NPT	Connecting plate 1/4 NPT				[1]	-AQN	
	Connecting plate 3/8 NPT	Connecting plate 3/8 NPT				[1]	-AQP	
	–	Connecting plate 1/2 NPT				[1]	-AQR	
	–	Connecting plate 3/4 NPT				[1]	-AQS	
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 LCD display, M8 plug, 1 switching output PNP, 3-pin					[1] [2]	-AD1	
	Pressure sensor with LCD display, M8 plug, 1 switching output NPN, 3-pin					[1] [2]	-AD2	
	Pressure sensor with LCD display, plug M12, 1 switching output PNP, 4-pin, analogue output 4 ... 20 mA					[1] [2]	-AD3	
	Pressure sensor with LCD display, plug M12, 1 switching output NPN, 4-pin, analogue output 4 ... 20 mA					[1] [2]	-AD4	
	Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/O contact					[1] [2]	-AD7	
	Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/C contact					[1] [2]	-AD8	
	Pressure sensor with status indicator, plug M8, window comparator, PNP, N/O contact					[1] [2]	-AD9	
	Pressure sensor with status indicator, plug M8, window comparator, PNP, N/C contact					[1] [2]	-AD10	
	Pressure sensor with LCD display, plug M12, 4-pin, IO-Link, PNP, NPN, 0... 10 V, 1 ... 5 V, 4 ... 20 mA					[1] [2]	-AD11	
Pressure sensor with LCD display, plug M8, 4-pin, IO-Link, PNP, NPN, 0... 10 V, 1 ... 5 V, 4 ... 20 mA					[1] [2]	-AD12		
Alternative pressure gauge scale	None							
	psi					[3]	-PSI	
	MPa					[4]	-MPA	

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

1/2, AQK, AQN,
AQP, AQR, AQS,
AD1 ... AD4,
AD7 ... AD12,
WPM

[2] AD1 ... AD4, Measuring range max. 10 bar.
AD7 ... AD12

[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

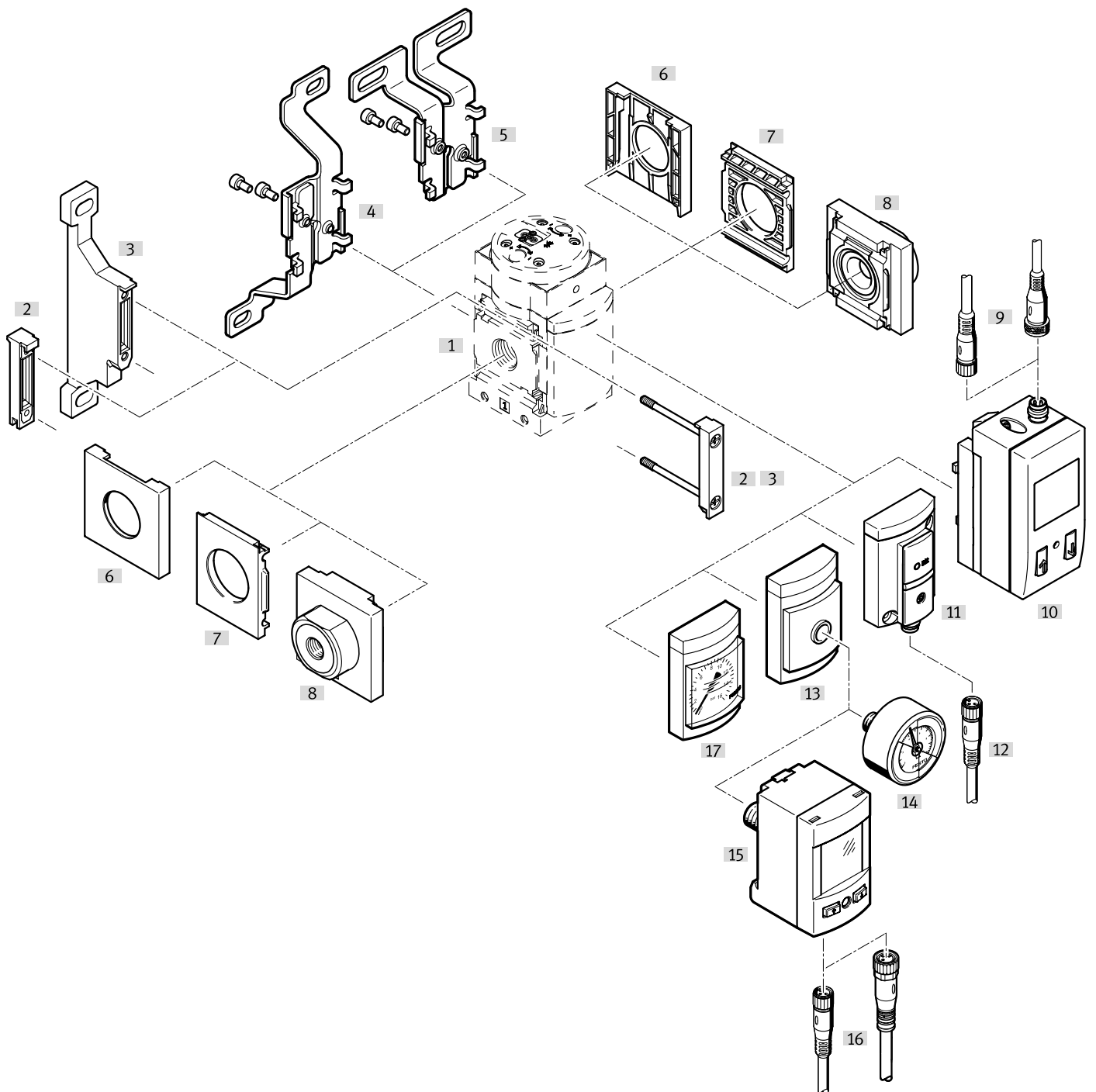
Ordering table		Grid dimension	[mm]	40	62	Conditions	Code	Enter code
Type of mounting	Without mounting bracket							
	Mounting bracket standard design					[5]	-WP	
	Mounting bracket for attaching service unit components					[1] [5]	-WPM	
	Mounting bracket centrally at rear (wall mounting top and bottom), 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,
AQR, AQR, AQS,
AD1 ... AD4,
AD7 ... AD12,
WPM

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

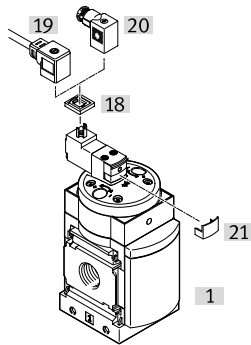
Peripherals overview



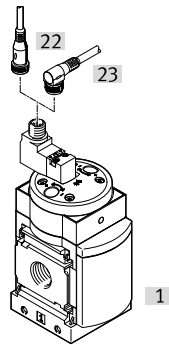
Note
 Additional accessories:
 • Module connector for combination with size MS4/MS6 or size MS9
 → Internet: amv, rmv, armv
 • Adapter for mounting on profiles
 → Internet: ipm-80, ipm-40-80, ipm-80-80

Peripherals overview

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



Supply voltage
[10V24P]



Mounting attachments and accessories		Order code	→ Page/Internet
[1]	Soft-start valve	MS4/6-DE	50
Can be ordered via the modular product system			
[3]	Mounting bracket	[WP]	56
	Mounting bracket (not shown)	[WPM]	
[4]	Mounting bracket	[WB]	
[5]	Mounting bracket	[WBM]	
[8]	Connecting plate SET ¹⁾	[AG...]	
	Connecting plate SET ¹⁾	[AQ...]	
[10]	Pressure sensor SDE1 with LCD display	[AD1], [AD2], [AD3], [AD4]	
[11]	Pressure sensor SDE5 with status indicator	[AD7], [AD8], [AD9], [AD10]	
[13]	Adapter for EN pressure gauge 1/8, 1/4	[A8], [A4]	
[17]	MS pressure gauge	[AG], [RG]	
Can be ordered as accessories			
[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 ²⁾	MS4/6-AEND	ms4-aend, ms6-aend
[8]	Connecting plate SET ²⁾	MS4/6-AG...	ms4-ag, ms6-ag
[15]	Pressure sensor	SPAU-...T	102
[14]	Pressure gauge	MA	103
[12]	Connecting cable	NEBU-M8...-LE3	103
[16]	Connecting cable	NEBU-M8...-LE4, NEBU-M12...-LE4	103
[9]	Connecting cable	NEBU-M8...-LE3, NEBU-M12...-LE4	103
[18]	Illuminating seal	MEB-LD	102
[19]	Plug socket with cable	KMEB	102
[20]	Plug socket ³⁾	MSSD-EB	102
[21]	Locking clip	CPV18-HV	102
[22]	Connecting cable	NEBU-M12G5	103
[23]	Connecting cable	NEBU-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

001	Series	
MS	MS series	
002	Size	
4	Grid dimension 40 mm	
003	Function	
DE	Soft-start valve, electric	
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	Supply voltage	
10V24	24 V DC, 10 bar, connection pattern to EN 175301	
10V24P	24 V DC, 10 bar, M12 plug socket adapter (connection pattern to EN 60947-5-2)	
V110	110 V AC (connection pattern to EN 175301)	
V230	230 V AC (connection pattern to EN 175301)	
V24	24 V DC (connection pattern to EN 175301)	
006	Pressure gauge alternatives	
	None	
AG	MS pressure gauge	
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	
AD1	Pressure sensor with LCD display, M8 plug, PNP, 3-pin	
AD2	Pressure sensor with LCD display, M8 plug, NPN, 3-pin	
AD3	Pressure sensor with LCD display, M12 plug, PNP, 4-pin, analogue output 4 ... 20 mA	
AD4	Pressure sensor with LCD display, M12 plug, NPN, 4-pin, analogue output 4 ... 20 mA	
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	
MPA	MPa	
008	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	
009	EU certification	
	None	
EX2	II 3GD to EU Explosion Protection Directive (ATEX)	
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	

Type codes

001	Series	
MS	MS series	
002	Size	
6	Grid dimension 62 mm	
003	Function	
DE	Soft-start valve, electric	
004	Pneumatic connection	
1/4	Female thread G1/4	
3/8	Female thread G3/8	
1/2	Female thread G1/2	
AGB	Sub-base G1/4	
AGC	Sub-base G3/8	
AGD	Sub-base G1/2	
AGE	Sub-base G3/4	
005	Supply voltage	
10V24	24 V DC, 10 bar, connection pattern to EN 175301	
10V24P	24 V DC, 10 bar, M12 plug socket adapter (connection pattern to EN 60947-5-2)	
V110	110 V AC (connection pattern to EN 175301)	
V230	230 V AC (connection pattern to EN 175301)	
V24	24 V DC (connection pattern to EN 175301)	

006	Pressure gauge alternatives	
	None	
AG	MS pressure gauge	
A4	Adapter for EN pressure gauge 1/4, without pressure gauge	
RG	Integrated pressure gauge, red/green scale	
AD1	Pressure sensor with LCD display, M8 plug, PNP, 3-pin	
AD2	Pressure sensor with LCD display, M8 plug, NPN, 3-pin	
AD3	Pressure sensor with LCD display, M12 plug, PNP, 4-pin, analogue output 4 ... 20 mA	
AD4	Pressure sensor with LCD display, M12 plug, NPN, 4-pin, analogue output 4 ... 20 mA	
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	
MPA	MPa	

008	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	

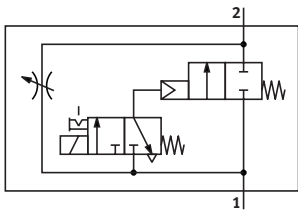
009	EU certification	
	None	
EX2	II 3GD to EU Explosion Protection Directive (ATEX)	





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

Function



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



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

The outlet 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 exhausting time.

- 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 ¹⁾	
Display pressure	Via pressure sensor for indicating the output pressure and electrical output via LCD display Via pressure sensor for indicating the output pressure and electrical output via status indicator 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	
Reset method	Mechanical spring	
Signal status indication	With accessories	
Type of control	Piloted	
Pilot air supply	Internal	
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

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 EN 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 ²⁾	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	[V24], [V110], [V230]	[10V24], [10V24P]		[V24], [V110], [V230]	[10V24], [10V24P]	
Operating pressure [bar]	4 ... 14 (4 ... 10) ¹⁾	4 ... 10	4 ... 10	4 ... 18 (4 ... 10) ¹⁾	4 ... 10	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 ²⁾	2					
Food-safe ³⁾	See supplementary material information (except for solenoid valve)					
UL certification ³⁾	c UL us - Recognized (OL)					
CE marking (see declaration of conformity) ³⁾	To EU EMC Directive					
	To EU Low Voltage Directive					
KC marking	-	-	KC EMC	-	-	KC EMC

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

2) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements that are in direct contact with a normal industrial environment.

3) Additional information: www.festo.com/catalogue/ms → Support/Downloads.

Datasheet

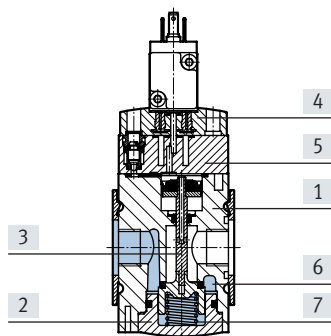
ATEX	
EU certification	[EX2]
ATEX category for gas	II 3G
Type of (ignition) protection for gas	Ex nA IIC T4 X Gc
ATEX category for dust	II 3D
Type of (ignition) protection for dust	Ex tc IIIC T105°C X Dc IP65
Explosion-proof ambient temperature	-10°C ≤ Ta ≤ +60°C
CE marking (see declaration of conformity) ¹⁾	To EU Explosion Protection Directive (ATEX)
	To EU EMC Directive
	To EU Low Voltage Directive

1) Additional information: www.festo.com/catalogue/ms → Support/Downloads.

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

Materials

Sectional view

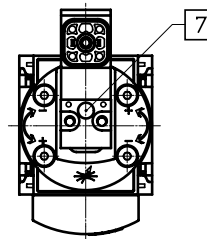
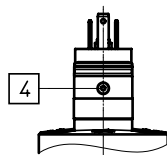
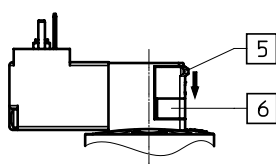


Soft-start valve		
[1]	Housing	Die-cast aluminium
[2]	Bottom	PET
[3]	Valve tappet	Aluminium
[4]	End cover	PA
[5]	Plate	PA
[6]	Seat	Aluminium
[7]	Springs	Spring steel
-	Seals	NBR
Note on materials		RoHS-compliant
		Free of copper and PTFE (not with supply voltage [10V24], [10V24P], MS pressure gauge with standard scale or pressure sensor)

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

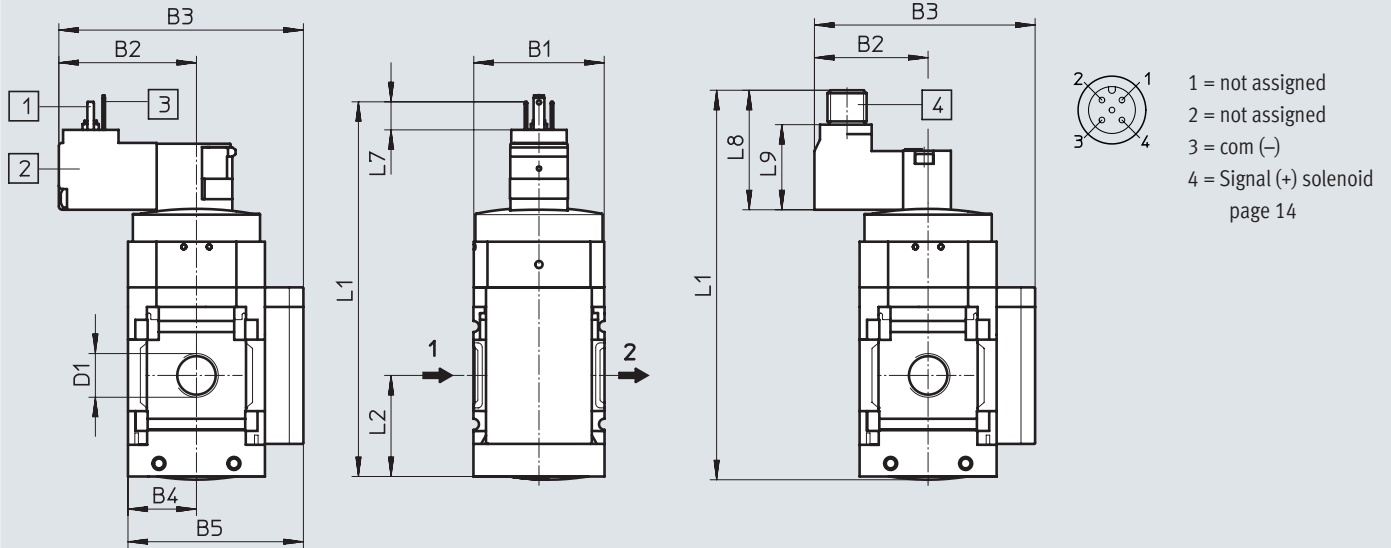
Dimensions – Basic version

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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 EN 61076-2-101, 4-pin version for connecting cable NEBU-M12
- Flow direction

Type	B1	B2		B3		B4	B5	D1
		[V24] [V110] [V230]	[10V24] [10V24P]	[V24] [V110] [V230]	[10V24] [10V24P]			
MS4-...								
MS4-DE-1/8	40	42.2	34.9	75.2	67.9	21	54	G1/8
MS4-DE-1/4								G1/4
MS6-...								
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]				
MS4-...							
MS4-DE-1/8	115.4	112.9	117.8	31.5	8.6	36.7	26.1
MS4-DE-1/4							
MS6-...							
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.

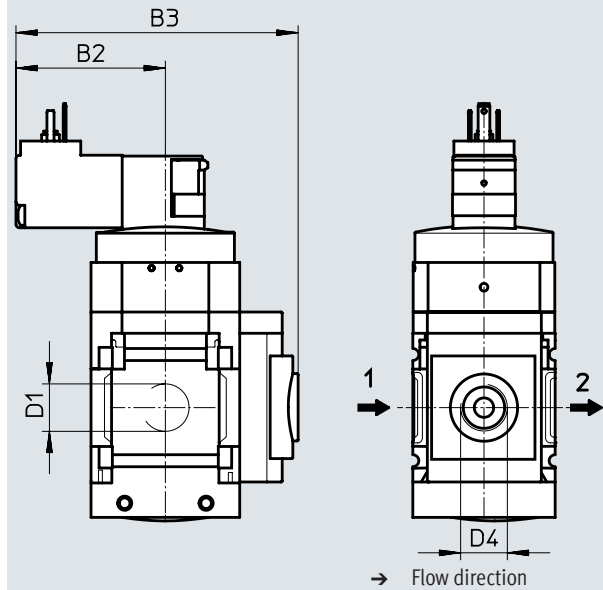
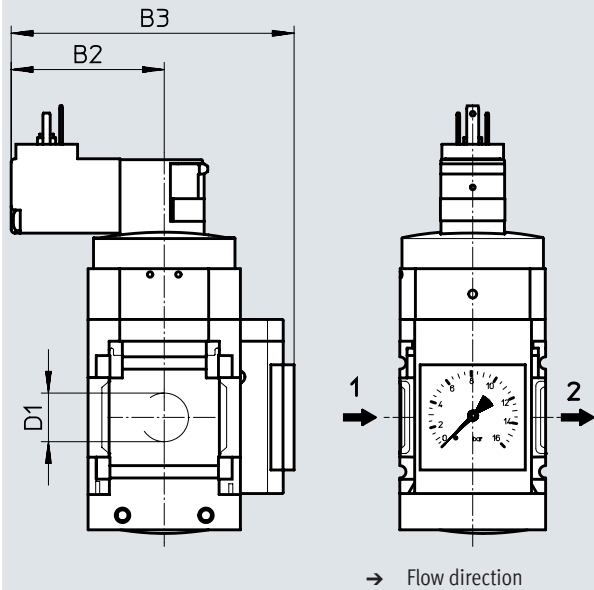
Datasheet

Dimensions – Pressure gauge/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] [V110] [V230]	[10V24] [10V24P]	[V24] [V110] [V230]	[10V24] [10V24P]		
MS4-...						
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	
MS6-...						
MS6-DE-1/4-...-AG	52	44	98	90	G1/4	-
MS6-DE-3/8-...-AG					G3/8	
MS6-DE-1/2-...-AG					G1/2	
MS6-DE-1/4-...-RG	52	44	99.5	91.5	G1/4	-
MS6-DE-3/8-...-RG					G3/8	
MS6-DE-1/2-...-RG					G1/2	
MS6-DE-1/4-...-A4	52	44	99.5	91.5	G1/4	G1/4
MS6-DE-3/8-...-A4					G3/8	
MS6-DE-1/2-...-A4					G1/2	

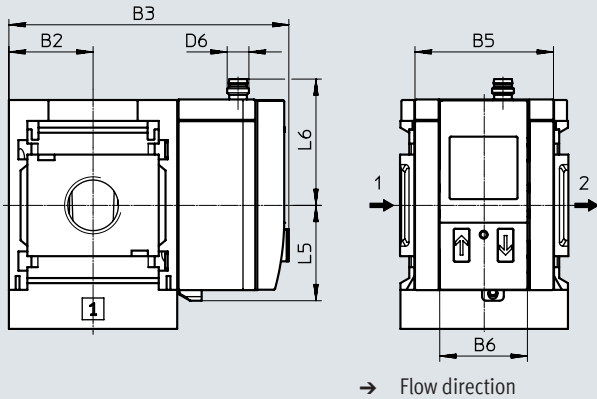
Datasheet

Dimensions – Pressure sensor

Download CAD data → www.festo.com

[AD1], [AD2], [AD3], [AD4] Pressure sensor with LCD display

Datasheets → Internet: sde1



[AD1]:
SDE1-D10-G2-MS...-L-P1-M8 with 3-pin plug M8x1, 1 switching output PNP

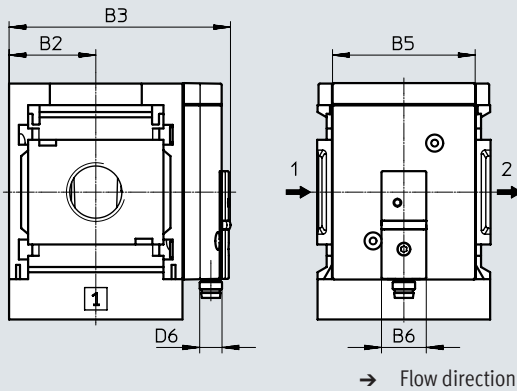
[AD3]:
SDE1-D10-G2-MS...-L-PI-M12 with 4-pin plug M12x1, 1 switching output PNP and 4 ... 20 mA analogue

[AD2]:
SDE1-D10-G2-MS...-L-N1-M8 with 3-pin plug M8x1, 1 switching output NPN

[AD4]:
SDE1-D10-G2-MS...-L-NI-M12 with 4-pin plug M12x1, 1 switching output NPN and 4 ... 20 mA analogue

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

Datasheets → Internet: sde5



[AD7]:
SDE5-D10-O-...-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/O contact

[AD9]:
SDE5-D10-O3-...-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/O contact

[AD8]:
SDE5-D10-C-...-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/C contact

[AD10]:
SDE5-D10-C3-...-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/C contact

Type	B2	B3	B4	B5	B6	D6	L5	L6
MS4-...								
MS4-...-AD1, AD2	21	82.6	-	32	32.3	M8x1	35.1	46.7
MS4-...-AD3, AD4						M12x1		55.8
MS4-...-AD7, AD8, AD9, AD10	21	59.1	-	~32	16	M8x1	-	-
MS6-...								
MS6-...-AD1, AD2	31	103	-	51	32.3	M8x1	35.1	46.7
MS6-...-AD3, AD4						M12x1		55.8
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
	G3/8	24 V DC	From left to right	542566	MS6-DE-3/8-10V24
		24 V DC	From left to right	542562	MS6-DE-1/2-10V24
	G1/2	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.		527713	527686			
Series		Standard			MS	MS
Size		4	6		...	
Function		Soft-start valve, electric			-DE	-DE
Pneumatic connection	Female thread G1/8	-		[1]	-1/8	
	Female thread G1/4	Female thread G1/4		[1]	-1/4	
	-	Female thread G3/8		[1]	-3/8	
	-	Female thread G1/2		[1]	-1/2	
	Connecting plate G1/8	-			-AGA	
	Connecting plate G1/4	Connecting plate G1/4			-AGB	
	Connecting plate G3/8	Connecting plate G3/8			-AGC	
	-	Connecting plate G1/2			-AGD	
	-	Connecting plate G3/4			-AGE	
	Connecting plate 1/8 NPT	-		[1]	-AQK	
	Connecting plate 1/4 NPT	Connecting plate 1/4 NPT		[1]	-AQN	
	Connecting plate 3/8 NPT	Connecting plate 3/8 NPT		[1]	-AQP	
	-	Connecting plate 1/2 NPT		[1]	-AQR	
	-	Connecting plate 3/4 NPT		[1]	-AQS	
Supply voltage	24 V DC (plug pattern to EN 175301)	4 ... 14 bar			-V24	
		4 ... 18 bar				
	24 V DC (plug pattern to EN 175301)	4 ... 10 bar		[1] [2]	-10V24	
		4 ... 18 bar				
	24 V DC, M12 to IEC 61076-2-101	4 ... 10 bar		[1] [2]	-10V24P	
		4 ... 18 bar				
110 V AC (plug pattern to EN 175301)	4 ... 14 bar		[1]	-V110		
	4 ... 18 bar					
230 V AC (plug pattern to EN 175301)	4 ... 14 bar		[1]	-V230		
	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,
 AD1 ... AD4,
 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						-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 LCD display, M8 plug, 1 switching output PNP, 3-pin					[1] [3]	-AD1	
	Pressure sensor with LCD display, M8 plug, 1 switching output NPN, 3-pin					[1] [3]	-AD2	
	Pressure sensor with LCD display, plug M12, 1 switching output PNP, 4-pin, analogue output 4 ... 20 mA					[1] [3]	-AD3	
	Pressure sensor with LCD display, plug M12, 1 switching output NPN, 4-pin, analogue output 4 ... 20 mA					[1] [3]	-AD4	
	Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/O contact					[1] [3]	-AD7	
	Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/C contact					[1] [3]	-AD8	
	Pressure sensor with status indicator, plug M8, window comparator, PNP, N/O contact					[1] [3]	-AD9	
	Pressure sensor with status indicator, plug M8, window comparator, PNP, N/C contact					[1] [3]	-AD10	
Alternative pressure gauge scale	None							
	psi					[4]	-PSI	
	MPa					[5]	-MPA	
Type of mounting	Without mounting bracket							
	Mounting bracket standard design					[6]	-WP	
	Mounting bracket for attaching service unit components					[1] [6]	-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					[7]	-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,
10V24, 10V24P,
V110, V230,
AD1 ... AD4,
AD7 ... AD10,
WPM

[3] AD1 ... AD4, Measuring range max. 10 bar.
AD7 ... AD10

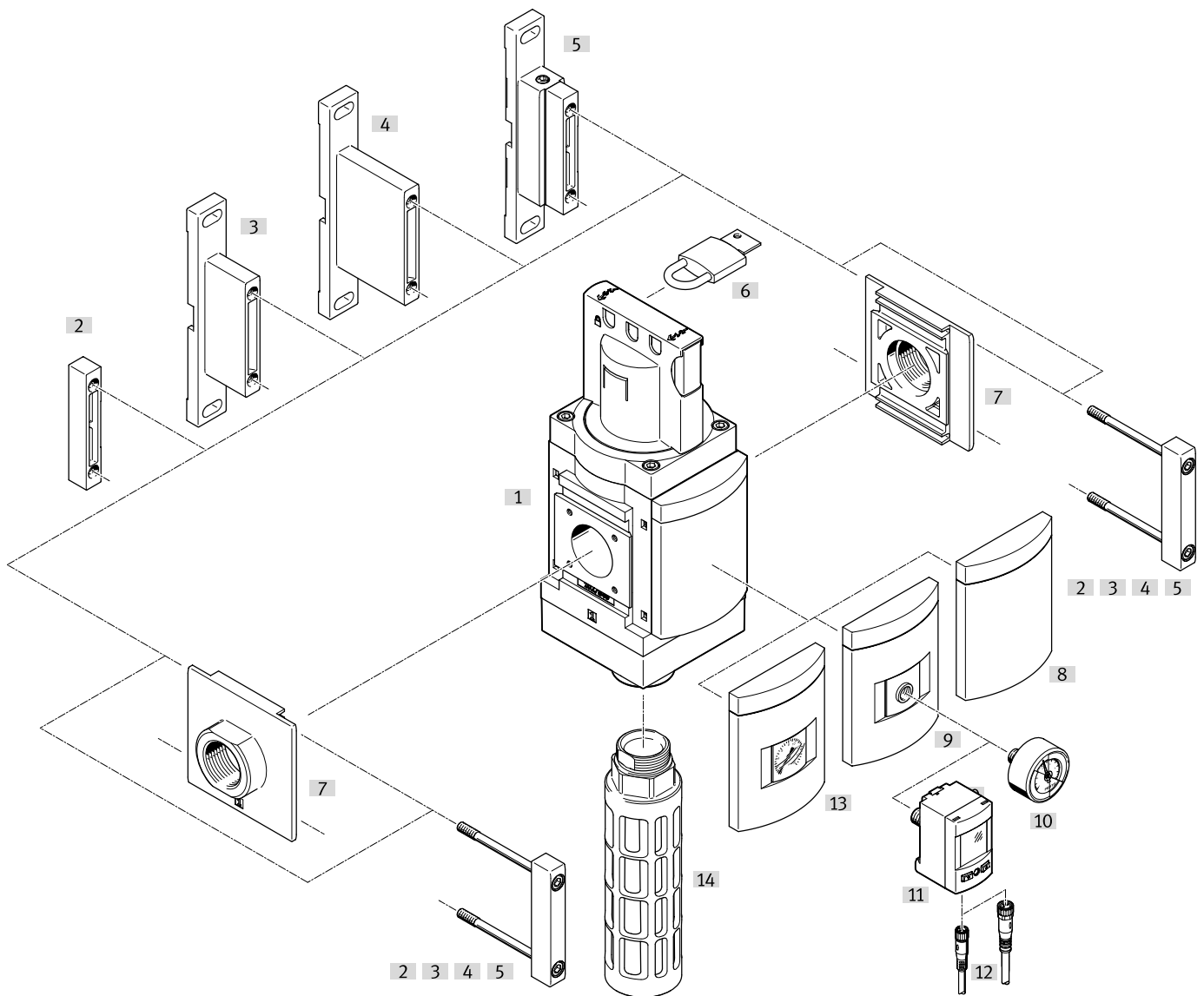
[4] PSI Only in combination with pressure gauge AG.

[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
Can be ordered via the modular product system			
[3]	Mounting bracket ²⁾	[WP]	66
[4]	Mounting bracket ²⁾	[WPB]	
[5]	Mounting bracket	[WPM]	
[7]	Connecting plate SET ¹⁾	[AG...]	
	Connecting plate SET ¹⁾	[AQ...]	
[8]	Cover plate	[VS]	
[9]	Adapter for EN pressure gauge 1/4	[A4]	
[13]	MS pressure gauge	[AG], [RG]	
[14]	Silencer	[S]	
Can be ordered as accessories			
[2]	Module connector	MS9-MV	ms9-mv
[3]	Mounting bracket ²⁾	MS9-WP	ms9-wp
[4]	Mounting bracket ²⁾	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	NEBU-M8...-LE4, NEBU-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 reverse side 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

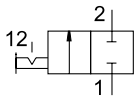
009	Type of mounting
	Without mounting bracket
WP	Mounting bracket basic design
WPB	Mounting bracket for large wall gap
WPM	Mounting bracket for hooking in service unit components

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

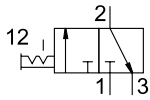
011	Flow direction
	Flow direction from left to right
Z	Flow direction from right to left

Datasheet

2/2-way valve, bistable



3/12-way valve, bistable



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



- Manually actuated on/off valve for pressurising and exhausting pneumatic systems
- Ducted exhaust possible via a threaded connection with silencer
- The switching position is immediately recognisable
- Actuator secured 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
Type of mounting		With accessories In-line installation
Mounting position		Any ¹⁾
Actuator lock		Rotary knob with latch
Display pressure		Via pressure sensor for indicating the output pressure and electrical output via status indicator 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 air function		Cannot be throttled
Reset method		Force-pilot operated
Type of control		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]
Standard nominal flow rate qn¹⁾ [l/min]								
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
C value [l/s*min]								
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 value								
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 p₁ = 6 bar and p₂ = 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 ¹⁾	2	
Noise level [dB (A)]	93 ²⁾ with silencer	
UL certification ³⁾	c UL us - Recognized (OL)	

1) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements that are in direct contact with a normal industrial environment.

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

3) Additional information: www.festo.com/catalogue/ms → 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-proof ambient temperature	–10°C ≤ Ta ≤ +60°C
CE marking (see declaration of conformity) ¹⁾	To EU Explosion Protection Directive (ATEX)

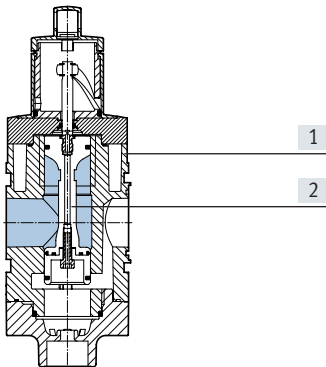
1) Additional information: www.festo.com/catalogue/ms → Support/Downloads.

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

Dimensions – Basic version

Download CAD data → www.festo.com

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

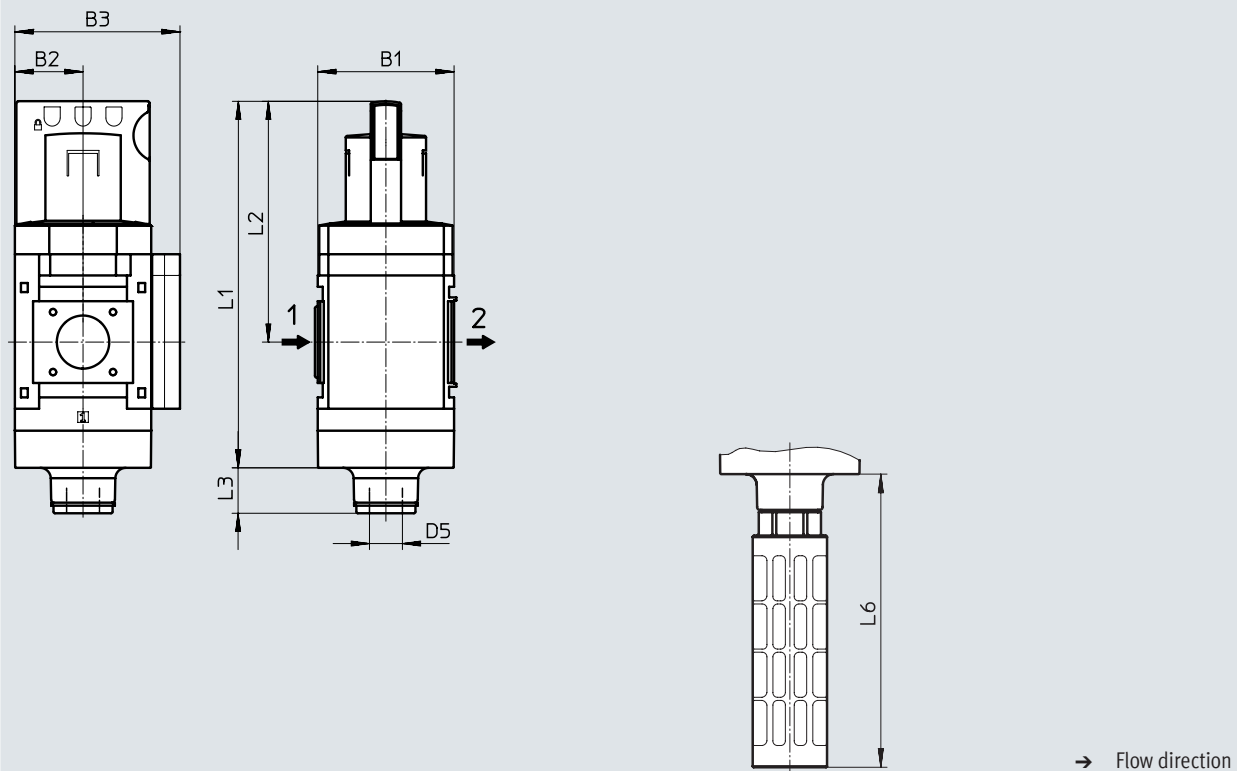
[S] Silencer

[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	-	-

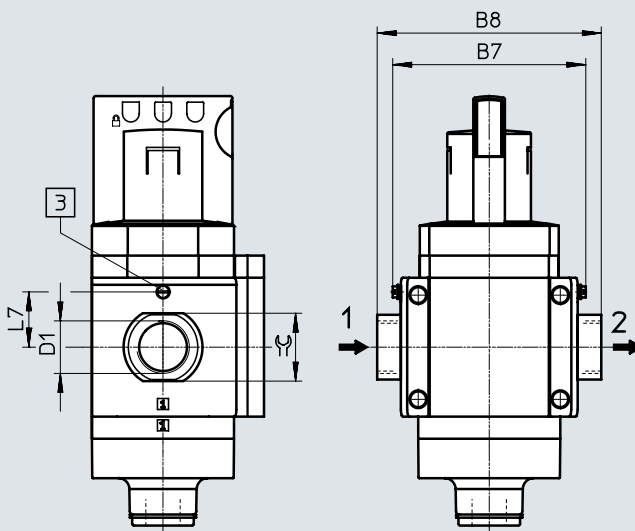
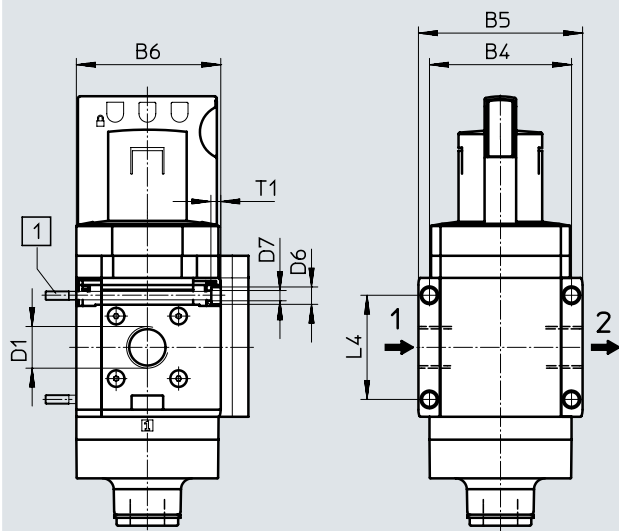
Datasheet

Dimensions – Female thread/connecting plate

Download CAD data → www.festo.com

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

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



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

→ Flow direction

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

→ Flow direction

Type	B4	B5	B6	B7		B8	D1	D6	D7	L4	L7	T1	=G
					[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	G1/2	-	-	-	35	-	30
MS9-EM-AGE						132	G3/4						36
MS9-EM-AGF						142	G1						41
MS9-EM-AGG						162	G1 1/4						50
MS9-EM-AGH						176	G1 1/2						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	1/2 NPT	-	-	-	-	-	30
MS9-EM-AQS						132	3/4 NPT						36
MS9-EM-AQT						142	1 NPT						41
MS9-EM-AQU						162	1 1/4 NPT						50
MS9-EM-AQV						176	1 1/2 NPT						55

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

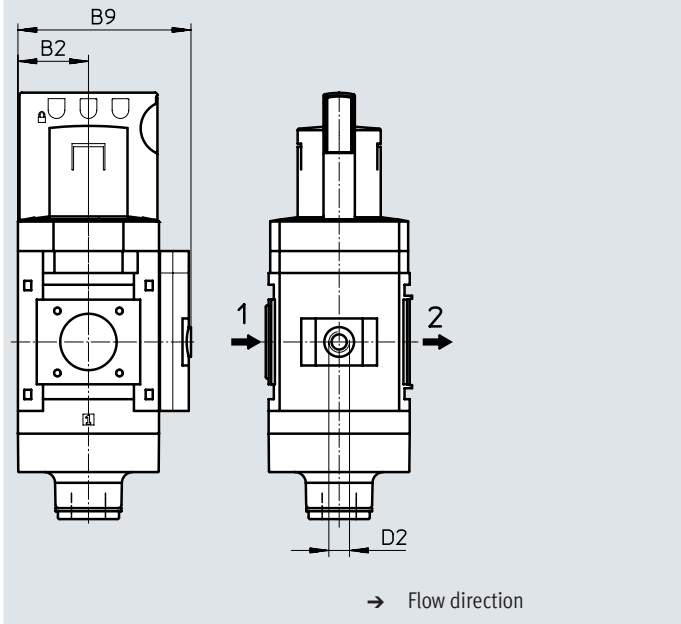
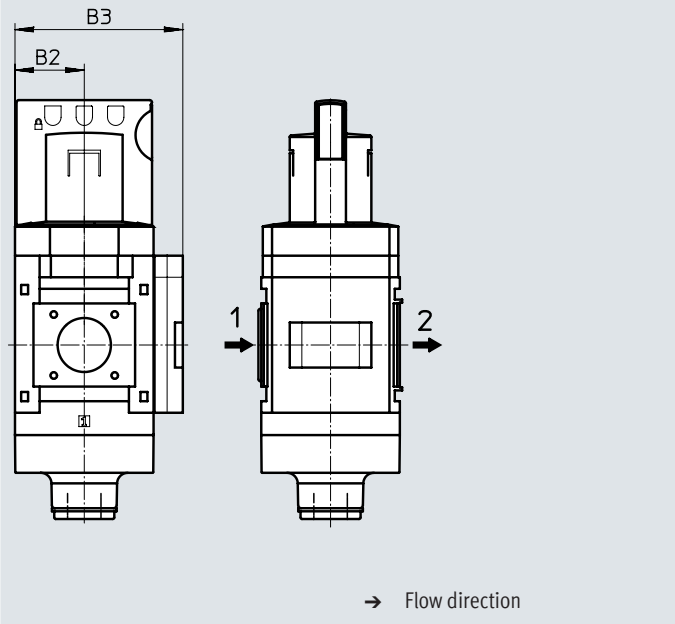
Datasheet

Dimensions – Pressure gauges/adapters

Download CAD data → 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



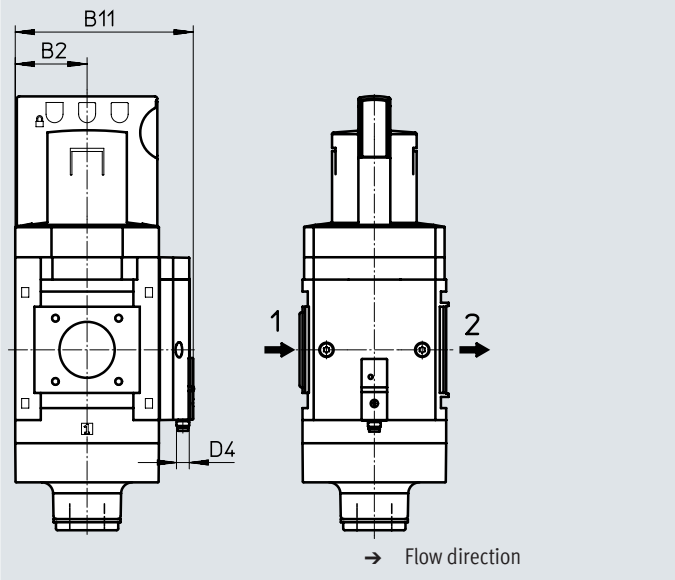
Type	B2	B3	B9	D2
MS9-EM-...-AG, RG	45	109	–	–
MS9-EM-...-A4	–	–	110	G1/4

Dimensions – Pressure sensor

Download CAD data → www.festo.com

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

Datasheets → Internet: sde5



[AD7]:
 SDE5-D10-O-...-P-M8 with 3-pin plug
 M8x1, threshold value comparator,
 1 switching output PNP, N/O contact

[AD9]:
 SDE5-D10-O3-...-P-M8 with 3-pin
 plug M8x1, window comparator,
 1 switching output PNP, N/O contact

[AD8]:
 SDE5-D10-C-...-P-M8 with 3-pin plug
 M8x1, threshold value comparator,
 1 switching output PNP, N/C contact

[AD10]:
 SDE5-D10-C3-...-P-M8 with 3-pin
 plug M8x1, 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.	562178						
Series	Standard					MS	MS
Size	9					9	9
Function	On/off valve, manual					-EM	-EM
Pneumatic connection	Female thread G3/4	[1]				-3/4	
	Female thread G1	[1]				-1	
	Connecting plate G1/2					-AGD	
	Connecting plate G3/4					-AGE	
	Connecting plate G1					-AGF	
	Connecting plate G1 1/4					-AGG	
	Connecting plate G1 1/2					-AGH	
	Female thread 3/4 NPT	[1]				-N3/4	
	Female thread 1 NPT	[1]				-N1	
	Connecting plate 1/2 NPT	[1]				-AQR	
	Connecting plate 3/4 NPT	[1]				-AQS	
	Connecting plate 1 NPT	[1]				-AQT	
	Connecting plate 1 1/4 NPT	[1]				-AQU	
	Connecting plate 1 1/2 NPT	[1]				-AQV	
	Module without connecting thread, without connecting plate	[1]				-G	
Module without connecting thread, without connecting plate (connection 3 in NPT)	[1]				-NG		
Rotary knob colour	Standard (black/blue)						
	Red					-R	
Silencer	None						
	Silencer					-S	
Pressure gauge/adapter	MS pressure gauge, bar					-AG	
	Cover plate					-VS	
	Adapter for EN pressure gauge 1/4, without pressure gauge					-A4	
	Integrated pressure gauge, red/green scale	[2]				-RG	
	Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/O contact	[1] [3]				-AD7	
	Pressure sensor with status indicator, plug M8, threshold value comparator, PNP, N/C contact	[1] [3]				-AD8	
	Pressure sensor with status indicator, plug M8, window comparator, PNP, N/O contact	[1] [3]				-AD9	
Pressure sensor with status indicator, plug M8, window comparator, PNP, N/C contact	[1] [3]				-AD10		
Alternative pressure gauge scale	None	[4]					
	psi	[5]				-PSI	
	MPa	[5]				-MPA	
	bar	[5]				-BAR	
Valve function	Standard (3/2-way valve)						
	2/2-way valve	[6]				-2	
Type of mounting	Without mounting bracket						
	Mounting bracket standard design	[7]				-WP	
	Mounting bracket for attaching service unit components	[1] [7]				-WPM	
	Mounting bracket for large wall gap	[7]				-WPB	
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] 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 serves only as an auxiliary scale.

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

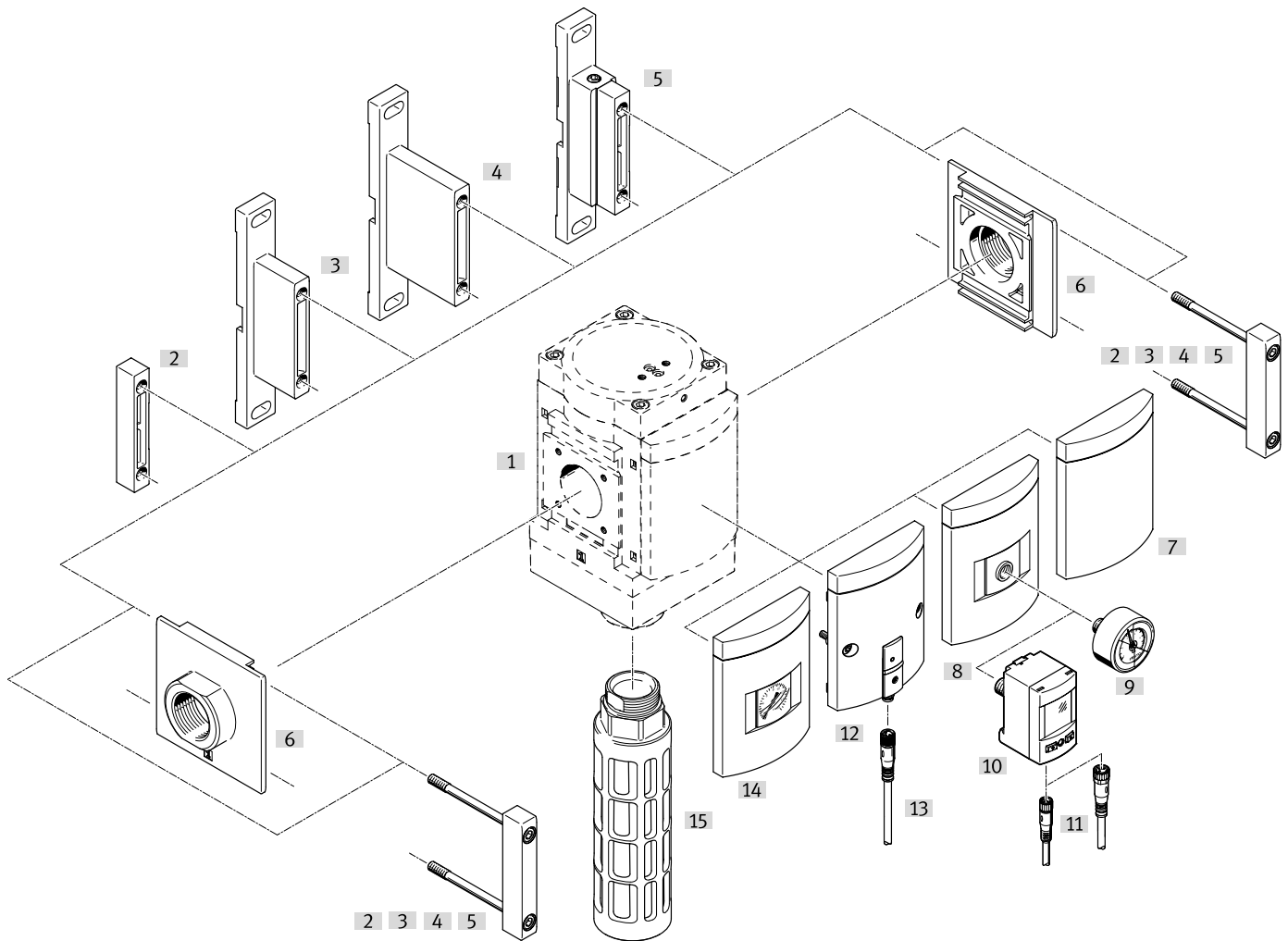
[4] – Not with pressure gauge AG, RG.


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

[6] 2 Not with silencer S.

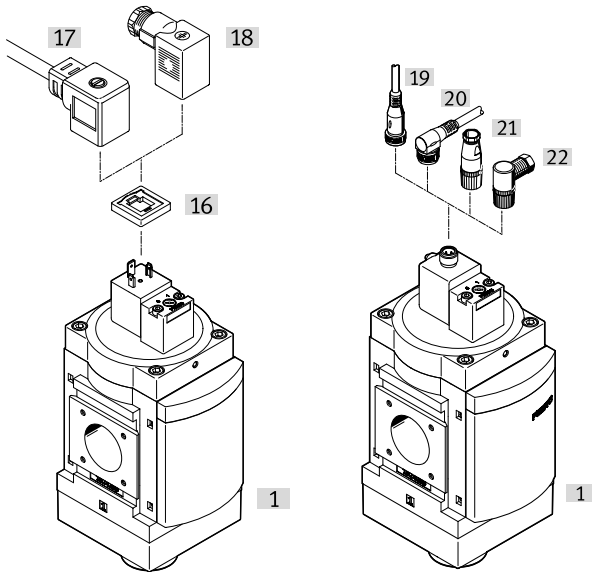
[7] WP, WPM, WPB Not with pneumatic connection G, NG.

Peripherals overview



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

Peripherals overview

Supply voltage
V24, V110, V230Supply voltage
V24P

Mounting attachments and accessories

	Order code	→ Page/Internet
[1] On/off valve	MS9-EE	71
Can be ordered via the modular product system		
[3] Mounting bracket ²⁾	[WP]	76
[4] Mounting bracket ²⁾	[WPB]	
[5] Mounting bracket	[WPM]	
[6] Connecting plate SET ¹⁾	[AG...]	
Connecting plate SET ¹⁾	[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]	
Can be ordered as accessories		
[2] Module connector	MS9-MV	ms9-mv
[3] Mounting bracket ²⁾	MS9-WP	ms9-wp
[4] Mounting bracket ²⁾	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	NEBU-M8...-LE4, NEBU-M12...-LE4	103
[13] Connecting cable	NEBU-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	NEBU-M12G5	103
[20] Connecting cable	NEBU-M12W5	103
[21] Sensor socket	SIE-GD	103
[22] Angled plug socket	SIE-WD	103

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

2) The screws for the wall bracket on the reverse side 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

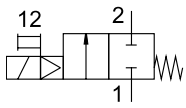
011	EU certification
	None
EX2	II 3GD

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

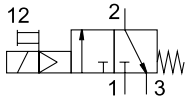
013	Flow direction
	Flow direction from left to right
Z	Flow direction from right to left


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



- Electrically actuated on/off valve for pressurising and exhausting pneumatic systems
- Ducted exhaust 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
Type of mounting		With accessories In-line installation
Mounting position		Any
Display pressure		Via pressure sensor for indicating the output pressure and electrical output via status indicator 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 air function		Cannot be throttled
Manual override		Non-detenting/detenting
Reset method		Mechanical spring
Type of control		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]	Plug M12, 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

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

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

C value [l/s*min]

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 value

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 ¹⁾	2
Noise level [dB (A)]	93 ²⁾ with silencer
UL certification ³⁾	c UL us - Recognized (OL)

1) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements that are in direct contact with a normal industrial environment.

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

3) Additional information: www.festo.com/catalogue/ms \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-proof ambient temperature	$-10^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$
CE marking (see declaration of conformity) ¹⁾	To EU Explosion Protection Directive (ATEX)

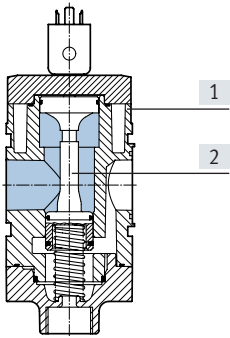
1) Additional information: www.festo.com/catalogue/ms \rightarrow Support/Downloads.

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

Dimensions – Basic version

Download CAD data → www.festo.com

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

[S] Silencer

[VS] 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 NEBU-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	

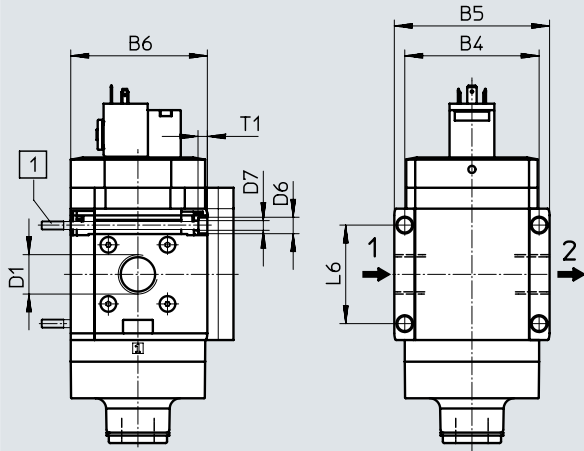
Datasheet

Dimensions – Female thread/connecting plate

Download CAD data → www.festo.com

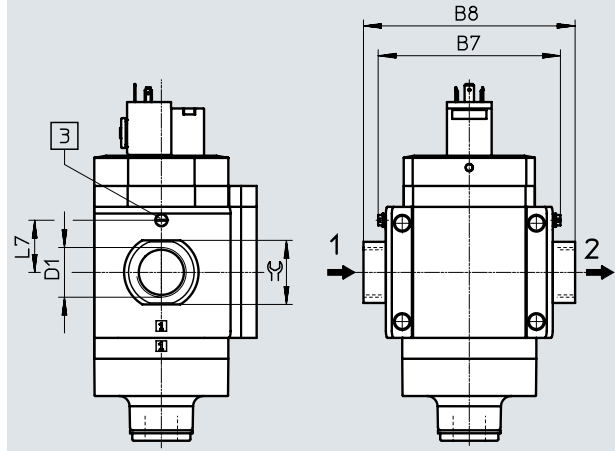
[3/4], [1], [N3/4], [N1] Female thread

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



[1] Retaining screw M6xmin. 90 to DIN 912 (not included 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	=C
					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						132	G3/4						36	
MS9-EE-AGF						142	G1						41	
MS9-EE-AGG						162	G1 1/4						50	
MS9-EE-AGH						176	G1 1/2						55	
MS9-EE-N3/4	90	104	91.5	-	-	-	3/4 NPT	11	6.5	66	-	6	-	-
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	

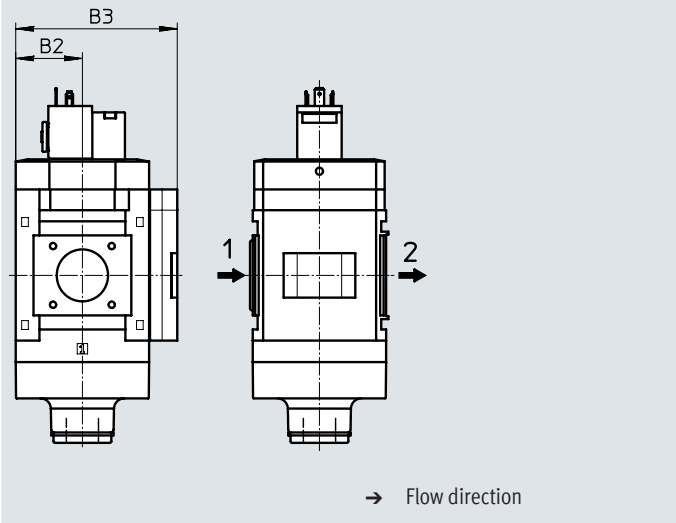
Note: This product conforms to ISO 1179-1 and ISO 228-1.

Datasheet

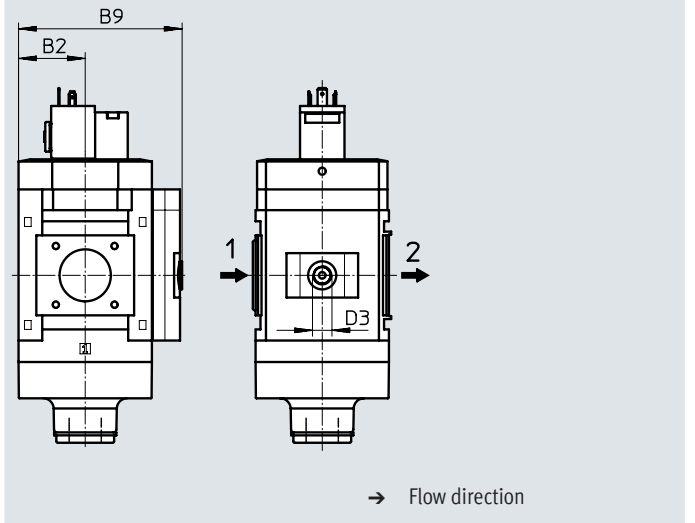
Dimensions – Pressure gauge/pressure gauge alternatives

Download CAD data → 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



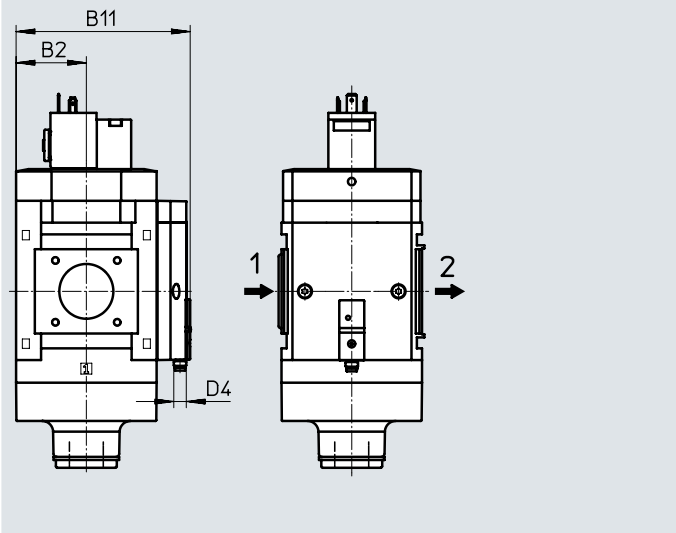
Type	B2	B3	B9	D3
MS9-EE-...-AG, RG	45	109	-	-
MS9-EE-...-A4		-	110	G1/4

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

Dimensions – Pressure gauge/pressure gauge alternatives

Download CAD data → www.festo.com

- [AD7] Pressure sensor with status indicator



- [AD7]:
SDE5-D10-O-...-P-M8 with 3-pin plug
M8x1, threshold value comparator,
1 switching output PNP, N/O contact

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
------	----------	------

Cover plate

MS9	562940	MS9-EE-G-V24-S-VS
-----	--------	-------------------

Pneumatic connection 3 in NPT, cover plate

MS9	562946	MS9-EE-NG-V24-S-VS
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Ordering data – Modular product system

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

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

[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 serves only as an auxiliary scale.

[3] AD7 Measuring range max. 10 bar.

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

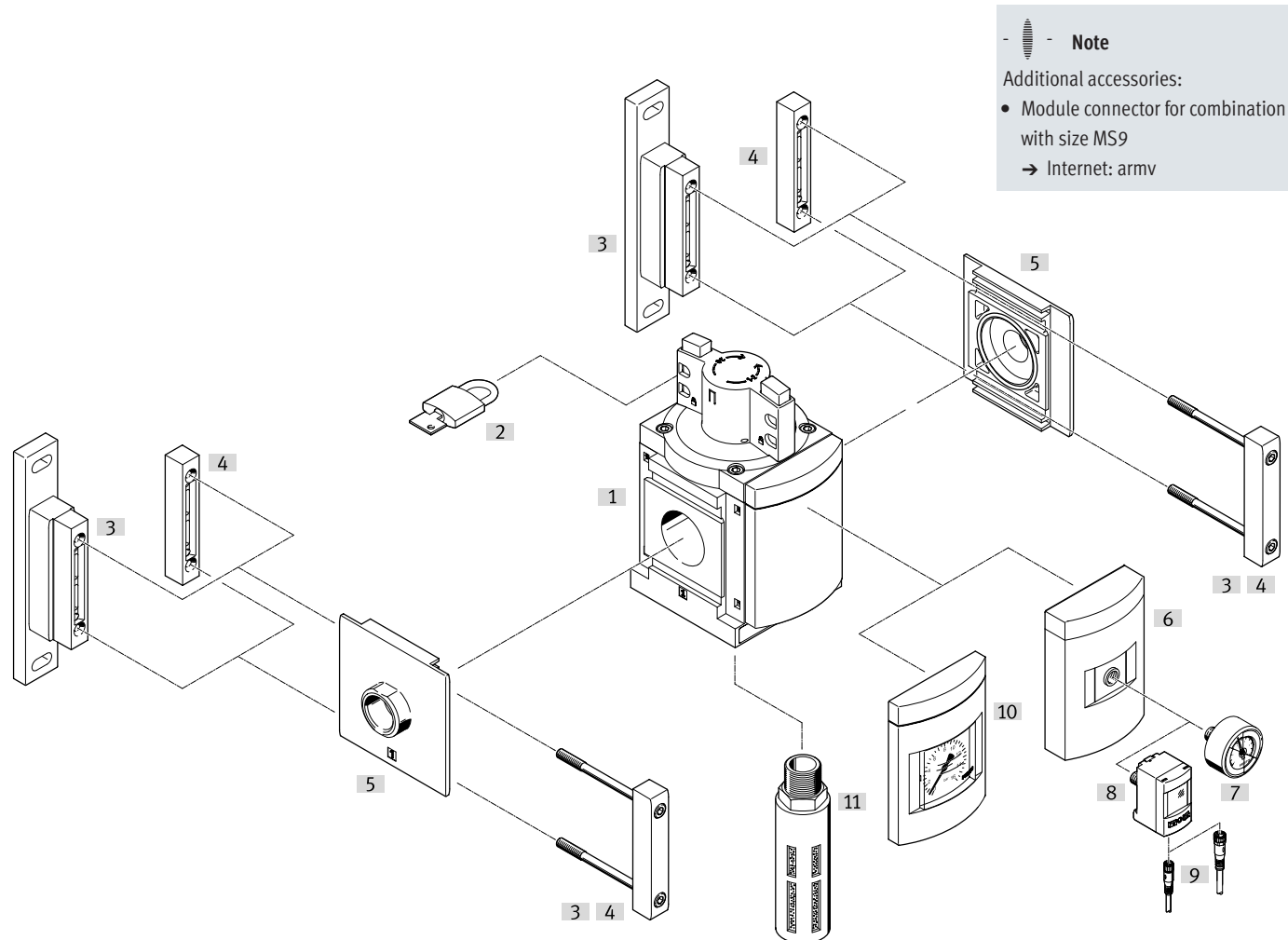
[5] 2 Not with silencer S.

[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



Mounting attachments and accessories

	Order code	→ Page/Internet
[1] On/off valve	MS12-EM	80
Can be ordered via the modular product system		
[3] Mounting bracket	[WP]	83
[5] Connecting plate SET ¹⁾	[AG...]	
[6] Adapter for EN pressure gauge 1/4	[A4]	
[10] MS pressure gauge	[AG]	
[11] Silencer	[S]	
Can be ordered as accessories		
[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	NEBU-M8...-LE4, NEBU-M12...-LE4	103
[11] Silencer	U	103

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

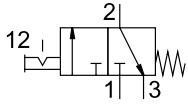
Type codes





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

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



- Manually actuated on/off valve for pressurising and exhausting pneumatic systems
- Ducted exhaust possible via a threaded connection with silencer
- The switching position is immediately recognisable
- Actuator secured 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
Type of mounting	With accessories In-line installation
Mounting position	Any
Valve function	3/2-way valve, bistable
Exhaust air function	Cannot be throttled
Switching position indication	Knob actuator direction = flow direction
Type of control	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 ¹⁾	2

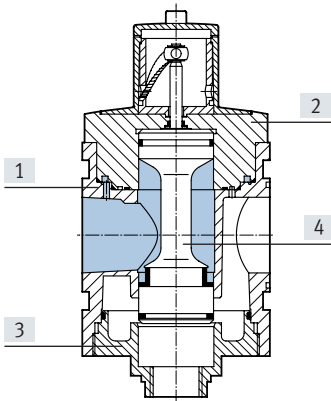
1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements that are in direct contact with a normal industrial environment.

Datasheet

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

Materials

Sectional view

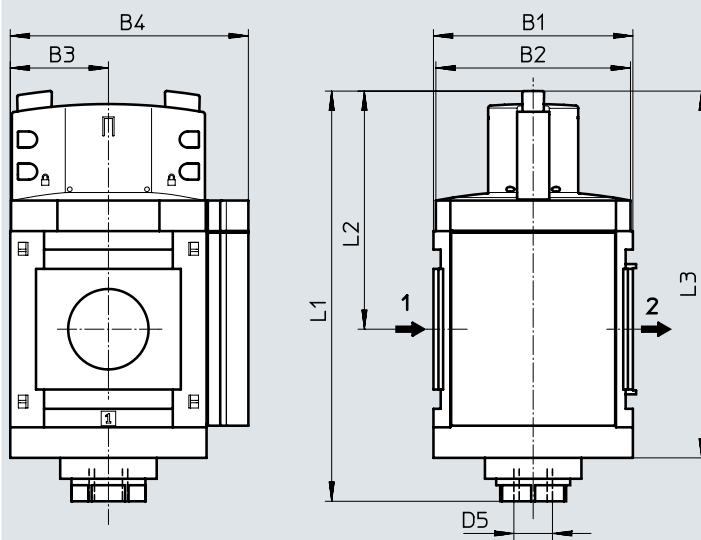


On/off valve		
[1]	Housing	Die-cast aluminium
[2]	Top cover	Aluminium
[3]	Bottom cover	Aluminium
[4]	Valve tappet	Stainless steel, POM, NBR
-	Springs	Steel
-	Covers/cover plates	PA
-	Seals	NBR
-	Connecting plate, module connector, mounting bracket	Die-cast aluminium
Note on materials		Free of copper and PTFE (not with variant AG)

Dimensions – Basic version

Download CAD data → www.festo.com

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



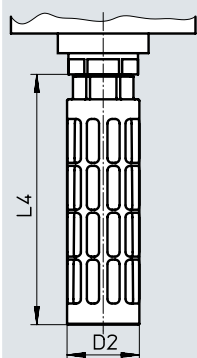
→ Flow direction

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



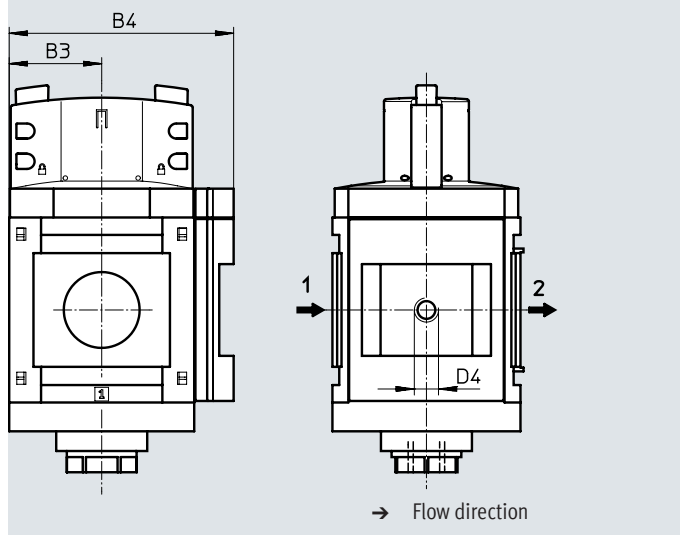
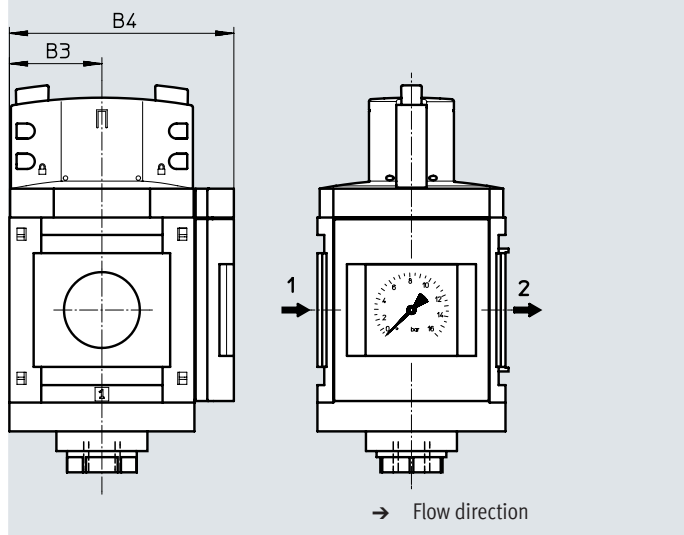
Type	D2 ∅	L4
MS12-EM-...S	47.8	165.5

Dimensions – Pressure gauge/pressure gauge alternatives

Download CAD data → 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

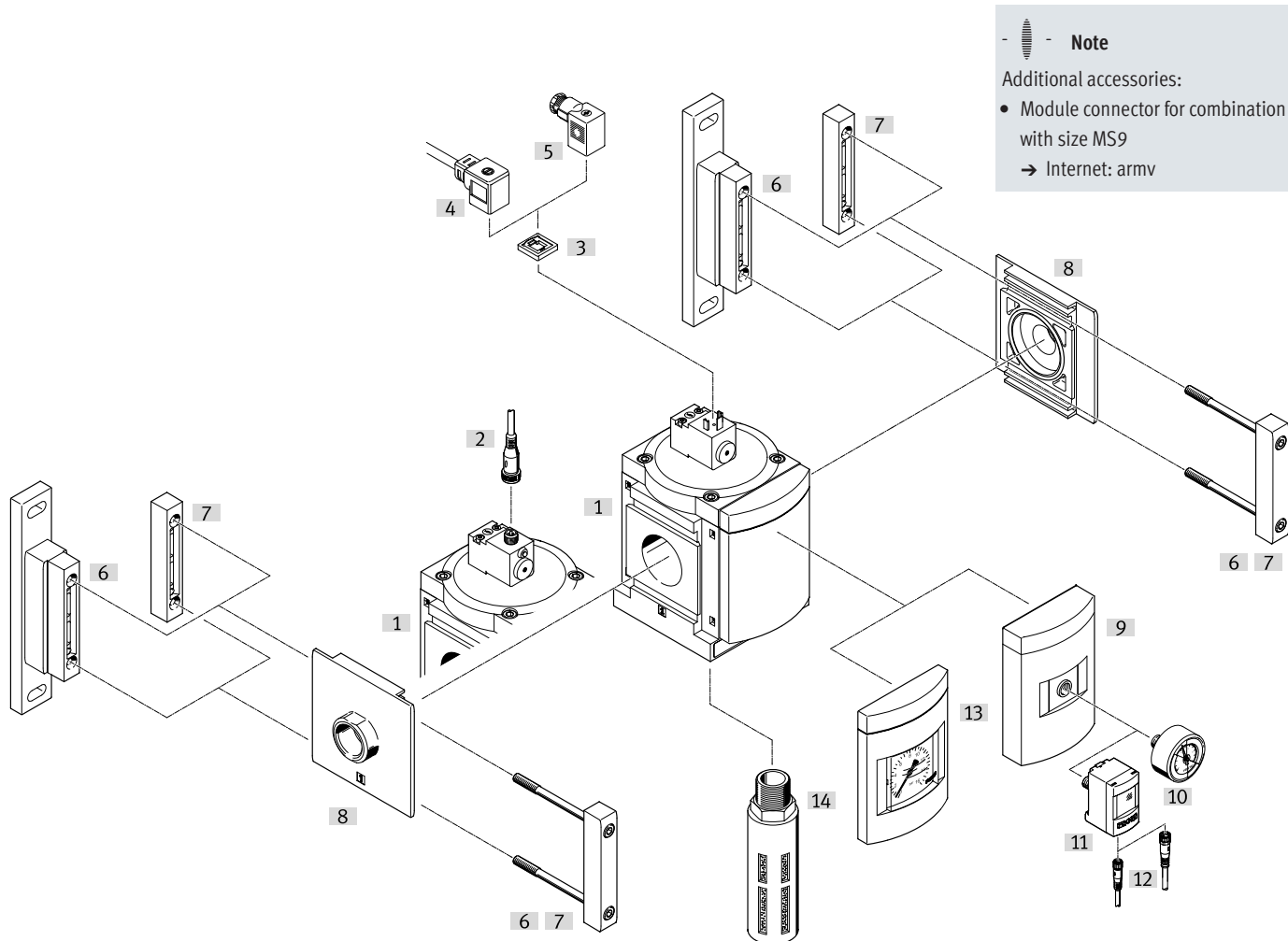
Ordering data – Modular product system

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

- [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
Can be ordered via the modular product system		
[6] Mounting bracket	[WP]	89
[8] Connecting plate SET ¹⁾	[AG...]	
[9] Adapter for EN pressure gauge 1/4	[A4]	
[13] MS pressure gauge	[AG]	
[14] Silencer	[S]	
Can be ordered as accessories		
[2] Connecting cable	NEBU-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	NEBU-M8...-LE4, NEBU-M12...-LE4	103
[14] Silencer	U	103

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

Type codes

001	Series
MS	MS series

002	Size
12	Grid dimension 124 mm

003	Function
EE	On/off valve, electric

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

005	Supply voltage
V110	110 V AC (connection pattern to EN 175301)
V230	230 V AC (connection pattern to EN 175301)
V24	24 V DC (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
A4	Adapter for EN pressure gauge 1/4, without pressure gauge

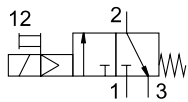
008	Alternative pressure gauge scale
	MS pressure gauge
PSI	psi
MPA	MPa





009	Type of mounting
	Without mounting bracket
WP	Mounting bracket basic design

010	Flow direction
	Flow direction from left to right
Z	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



- Electrically actuated on/off valve for pressurising and exhausting pneumatic systems
- With solenoid coil, without plug socket
- Choice of three voltage ranges
- Ducted exhaust 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
Type of mounting	With accessories In-line installation
Mounting position	Any
Valve function	3/2-way valve, single solenoid, closed
Exhaust air function	Cannot be throttled
Reset method	Mechanical spring
Switching position indication	With accessories LED (with variant V24P)
Type of control	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]	Plug M12, 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 ¹⁾	2

1) Corrosion resistance class CRC 2 to Festo standard FN 940070

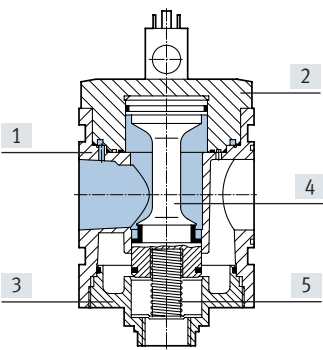
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements that are in direct contact with a normal industrial environment.

Weight [g]

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

Materials

Sectional view



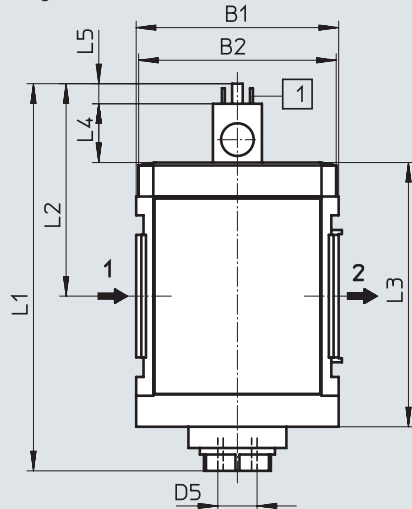
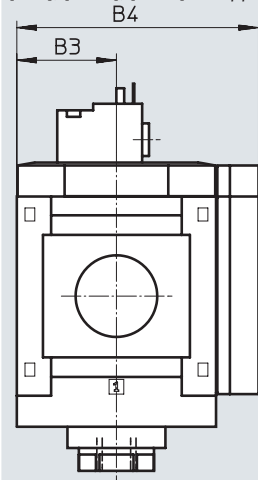
On/off valve		
[1]	Housing	Die-cast aluminium
[2]	Top cover	Aluminium
[3]	Bottom cover	Aluminium
[4]	Valve tappet	Stainless steel, POM, NBR
[5]	Springs	Steel
-	Covers/cover plates	PA
-	Seals	NBR
-	Connecting plate, module connector, mounting bracket	Die-cast aluminium
Note on materials		Free of copper and PTFE (not with variant AG)

Dimensions – Basic version

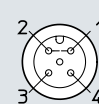
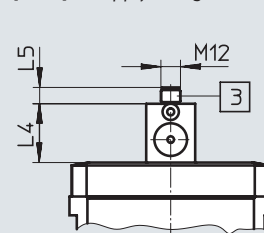
Download CAD data → www.festo.com

[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 NEBU-M12

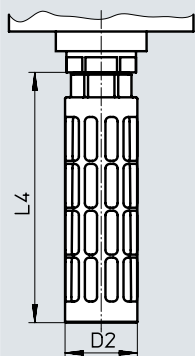
→ Flow direction

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



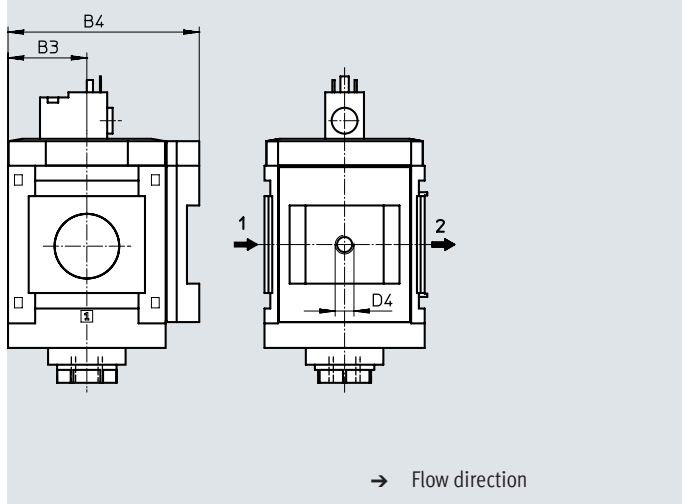
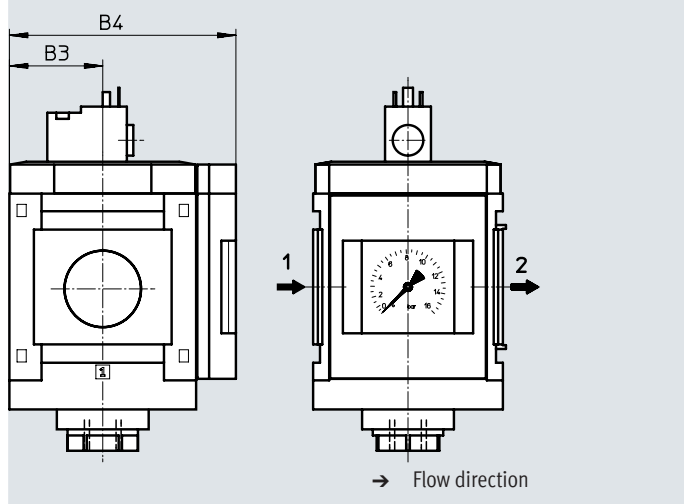
Type	D2 ∅	L4
MS12-EE...S	47.8	165.5

Dimensions – Pressure gauge/pressure gauge alternatives

Download CAD data → 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

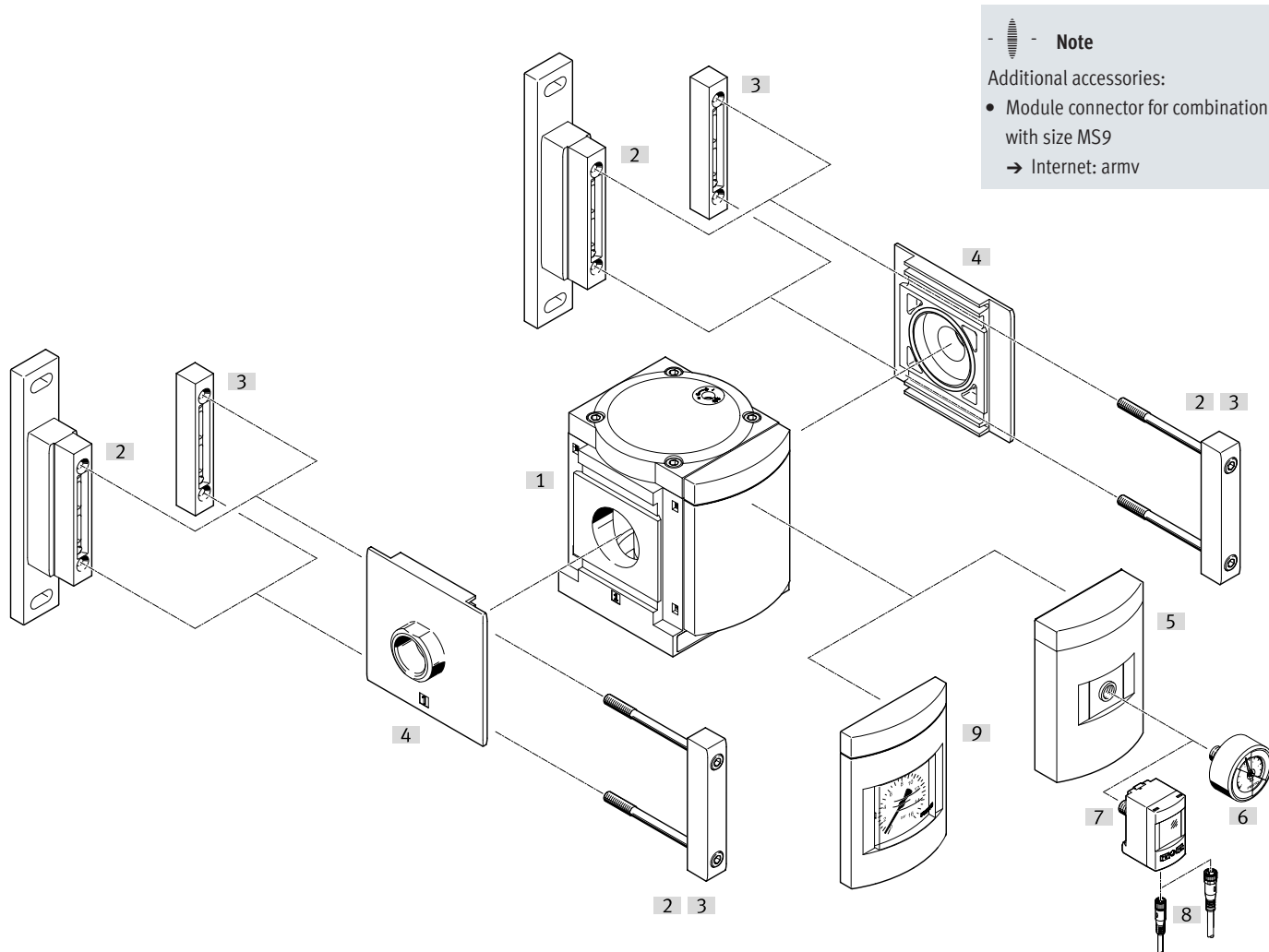
Ordering data – Modular product system

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

- [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



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-DL	92
Can be ordered via the modular product system		
[2] Mounting bracket	[WP]	95
[4] Connecting plate SET ¹⁾	[AG...]	
[5] Adapter for EN pressure gauge 1/4	[A4]	
[9] MS pressure gauge	[AG]	
Can be ordered as accessories		
[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	NEBU-M8...-LE4, NEBU-M12...-LE4	103

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

Type codes

001	Series	
MS	MS series	

002	Size	
12	Grid dimension 124 mm	

003	Function	
DL	Soft-start valve, pneumatic	

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

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

006	Alternative pressure gauge scale	
	MS pressure gauge	
PSI	psi	
MPA	MPa	

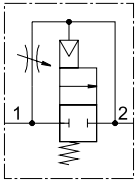
007	Type of mounting	
	Without mounting bracket	
WP	Mounting bracket basic design	





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

009	Flow direction	
	Flow direction from left to right	
Z	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



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

The outlet 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 air function	Can be throttled
Reset method	Mechanical spring
Type of control	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 ¹⁾	2

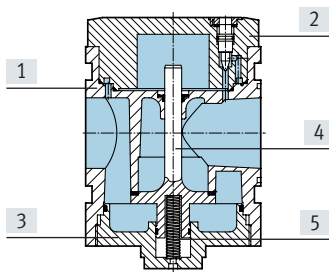
1) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements that are in direct contact with a normal industrial environment.

Weight [g]	
Soft-start valve	3600

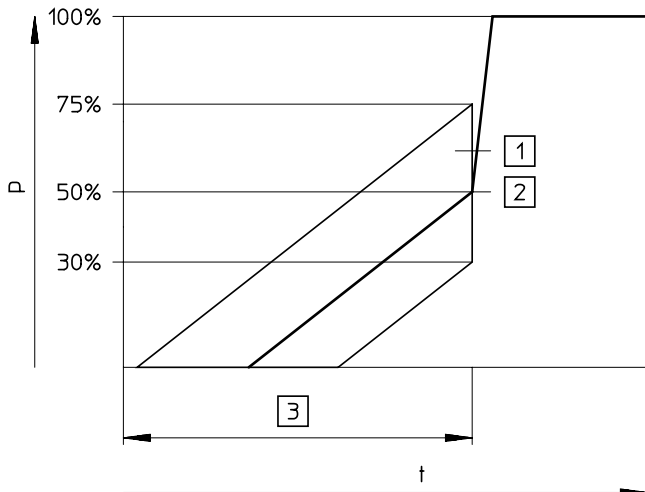
Materials

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
Note on materials		Free of copper and PTFE (not with variant AG)

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

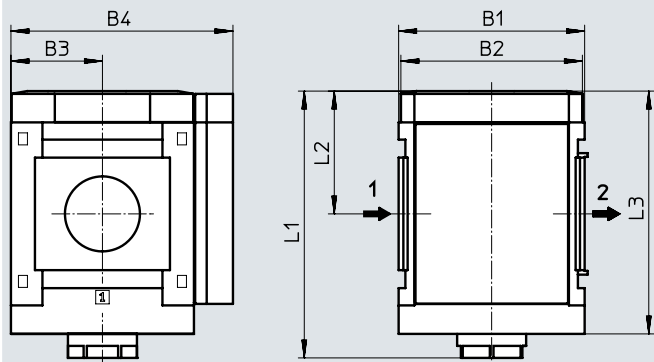
The +25%/-20% switching point tolerance refers to the operating pressure p_1 .
Example: A switching point from 1.2 bar to 3.0 bar is permissible at an operating pressure of 4 bar.

Datasheet

Dimensions – Basic version

Download CAD data → www.festo.com

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



→ Flow direction

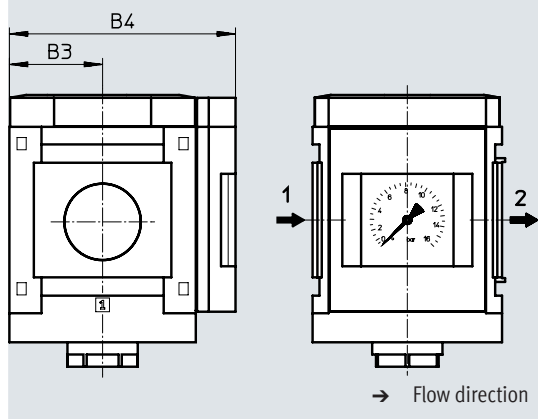
Type	B1	B2	B3	B4	L1	L2	L3
MS12-DL-G	124	122	61	148	178	82	162

Dimensions – Pressure gauge/pressure gauge alternatives

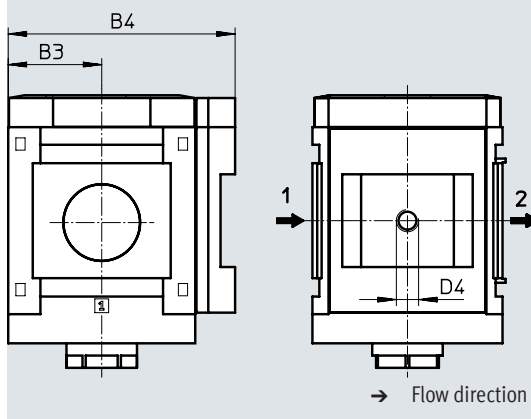
Download CAD data → www.festo.com

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

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



→ Flow direction



→ Flow direction

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

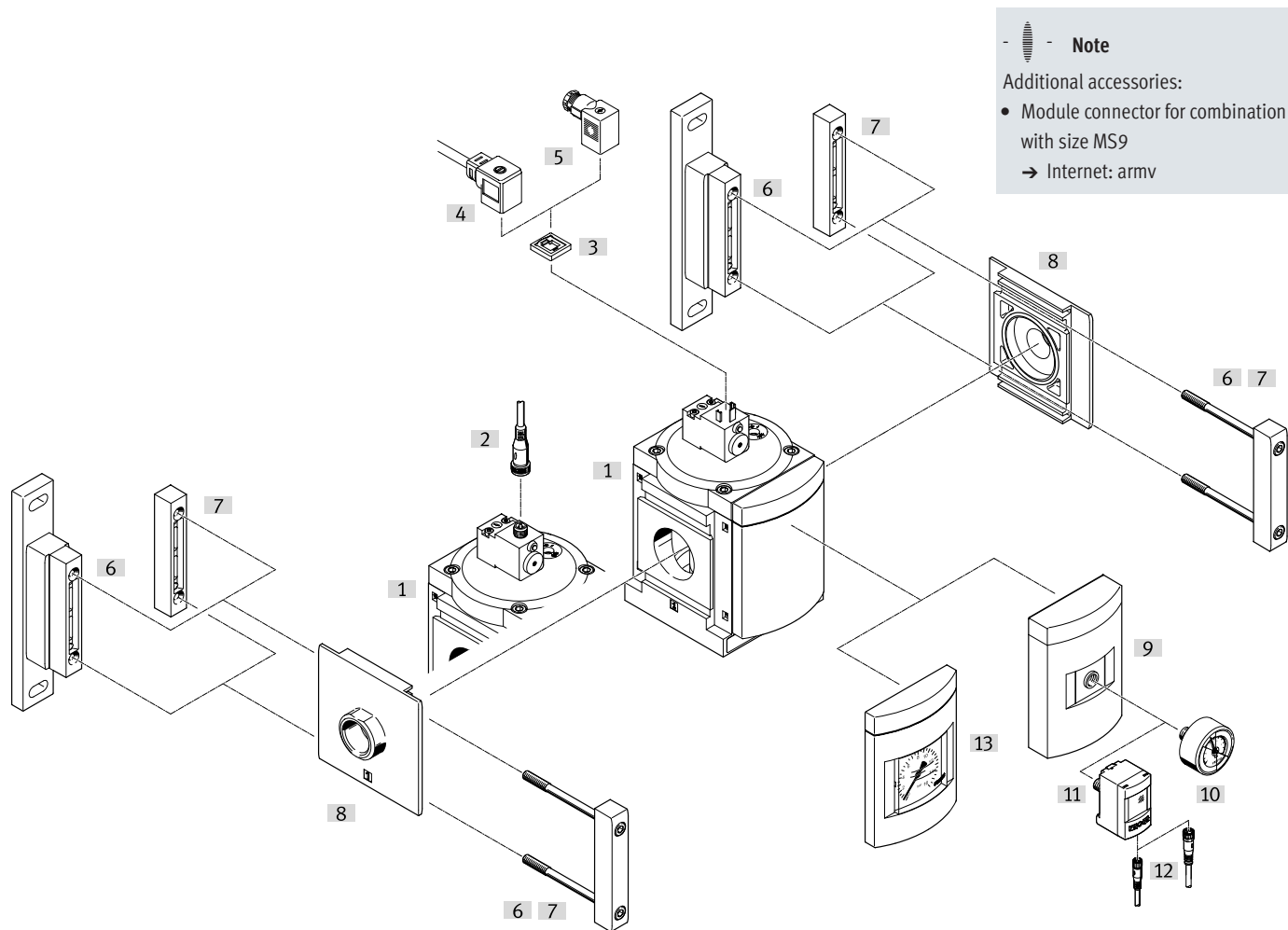
Ordering data – Modular product system

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

- [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



Mounting attachments and accessories

	Order code	→ Page/Internet
[1] Soft-start valve	MS12-DE	98
Can be ordered via the modular product system		
[6] Mounting bracket	[WP]	101
[8] Connecting plate SET ¹⁾	[AG...]	
[9] Adapter for EN pressure gauge 1/4	[A4]	
[13] MS pressure gauge	[AG]	
Can be ordered as accessories		
[2] Connecting cable	NEBU-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	NEBU-M8...-LE4, NEBU-M12...-LE4	103

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

Type codes

001	Series
MS	MS series

002	Size
12	Grid dimension 124 mm

003	Function
DE	Soft-start valve, electric

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

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

006	Pressure gauge alternatives
	None
AG	MS pressure gauge
A4	Adapter for EN pressure gauge 1/4, without pressure gauge

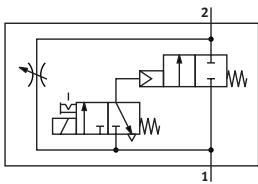
007	Alternative pressure gauge scale
	MS pressure gauge
PSI	psi
MPA	MPa

008	Type of mounting
	Without mounting bracket
WP	Mounting bracket basic design

009	Flow direction
	Flow direction from left to right
Z	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



The duration of the pressure build-up is set using the restrictor attached to the valve cap. The outlet 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 exhausting 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 air function	Can be throttled
Reset method	Mechanical spring
Signal status indication	With accessories LED (with variant V24P)
Type of control	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]	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
Electrical connection		
With supply voltage	[V24], [V110], [V230]	Plug, square design to EN 175301-803, type A
	[V24P]	Plug M12, 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 ²⁾	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
Corrosion resistance class CRC ¹⁾	2

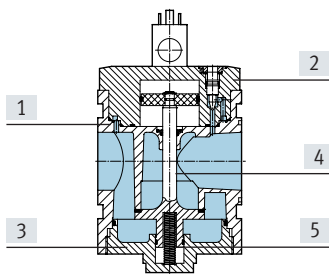
1) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements that are in direct contact with a normal industrial environment.

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
Note on materials		Free of copper and PTFE (not with variant AG)

Datasheet

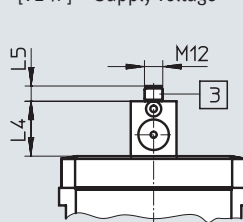
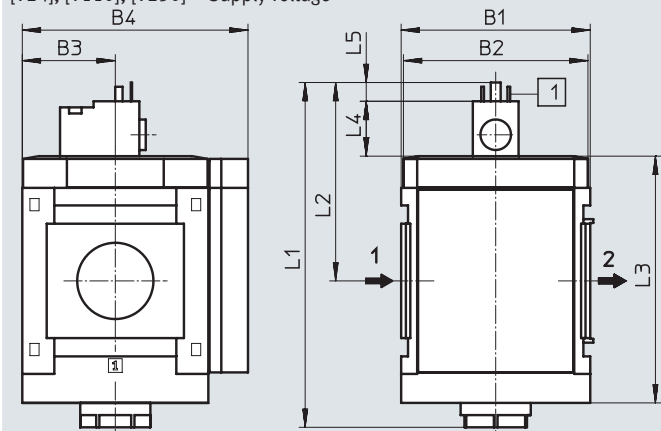
Dimensions – Basic version

Download CAD data → 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 NEBU-M12

→ Flow direction

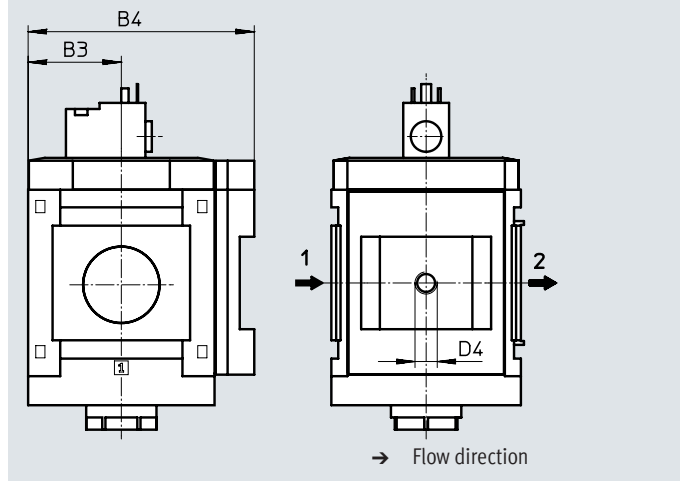
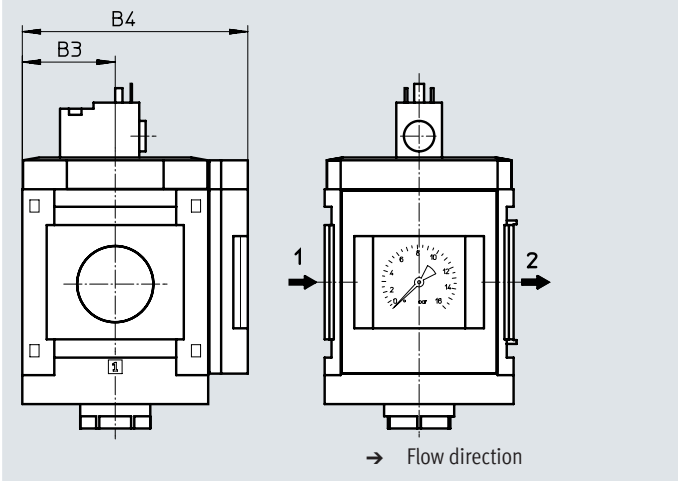
Type	B1	B2	B3	B4	L1	L2	L3	L4	L5
MS12-DE-G-V24, V110, V230	124	122	61	148	226	130	162	35.7	12.3
MS12-DE-G-V24P								36	10

Dimensions – Pressure gauge/pressure gauge alternatives

Download CAD data → 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

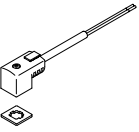
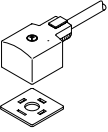
Ordering data – Modular product system


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


- [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	
			3-pin	LED	5	547271	KMEB-3-24-5	
				LED	2.5	★ 151688	KMEB-1-24-2.5-LED	
				LED	5	151689	KMEB-1-24-5-LED	
		230 V AC	3-pin	–	2.5	10	193457	KMEB-1-24-10-LED
						5	151690	KMEB-1-230AC-2.5
					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	
					2.5	30932	KMC-1-230AC-2.5	
		230 V AC	3-pin	–	5	30934	KMC-1-230AC-5	


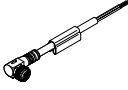
Ordering data – Illuminating seal MEB-LD/MC-LD					Datasheets → Internet: meb, mc
	Description	Operating voltage range	Part no.	Type	
	For plug socket with cable KMEB and plug socket MSSD-EB	12 ... 24 V DC	151717	MEB-LD-12-24DC	
		230 V DC/AC ±10%	151718	MEB-LD-230AC	
	For connecting cable KMC and plug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

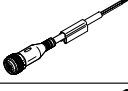
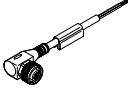
Ordering data – Locking clip CPV18-HV				Datasheets → Internet: cpv18-hv
	Description		Part no.	Type
	For MS4/6-EE/DE...V24	Cover for the manual override, the clip prevents actuation	530056	CPV18-HV
				PU ¹⁾

[1] Packaging unit

Ordering data – Pressure sensor							Datasheets → Internet: spau
	Pneumatic connection	Display type	Switching output	Electrical connection	Part no.	Type	
For direct mounting on adapter with connecting thread 1/8 or 1/4, pressure measuring range 0 ... 10 bar, relative pressure measurement							
	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	

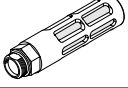
Accessories


Ordering data – Connecting cable NEBU-M8					Datasheets → Internet: nebu	
	Electrical connection	Number of wires	Cable length [m]	Part no.	Type	
	M8x1, straight socket	3	2.5	★ 541333	NEBU-M8G3-K-2.5-LE3	
			5	★ 541334	NEBU-M8G3-K-5-LE3	
	M8x1, angled socket	3	2.5	★ 541338	NEBU-M8W3-K-2.5-LE3	
			5	★ 541341	NEBU-M8W3-K-5-LE3	

Ordering data – Connecting cable NEBU-M12					Datasheets → Internet: nebu	
	Electrical connection	Number of wires	Cable length [m]	Part no.	Type	
	M12x1, straight socket	4	2.5	★ 550326	NEBU-M12G5-K-2.5-LE4	
			5	★ 541328	NEBU-M12G5-K-5-LE4	
	M12x1, angled socket	4	2.5	550325	NEBU-M12W5-K-2.5-LE4	
			5	541329	NEBU-M12W5-K-5-LE4	

Ordering data – Sensor socket SIE-GD				Datasheets → Internet: sie-gd	
	Electrical connection			Part no.	Type
	M12x1, 4-pin			18494	SIE-GD

Ordering data – Angled plug socket SIE-WD				Datasheets → Internet: sie-wd	
	Electrical connection			Part no.	Type
	M12x1, 4-pin			12956	SIE-WD-TR

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		Part no.	Type	
			[bar]	[psi]			
	Pressure gauge MA, EN 837-1					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	
	Pressure gauge MA, EN 837-1, with red/green range					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

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