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Filter regulators MS-LFR, MS series

FESTO



★	Festo Core Range Solves the majority of your automation tasks	With the Festo Core Range, we have selected the most important products and functions from our broad product catalogue, and added the quickest delivery.
Worldwide:	Quickest delivery – wherever, whenever	The Core Range offers you the best value for your automation tasks.
Simply good:	Expected high Festo quality	
Fast:	Easy and fast to select	

Just look for the star!

Key features

MS series service unit components

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 minimum space requirements.

Freely combinable function modules

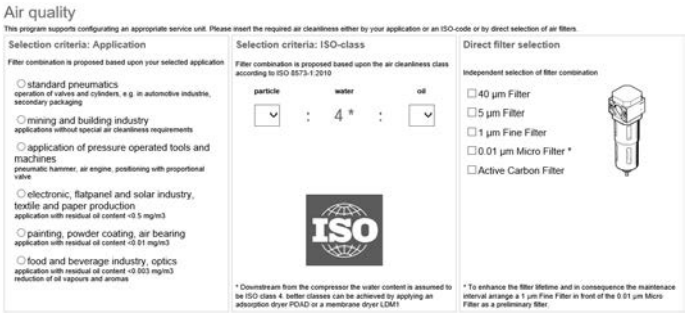
Pressure regulators, on/off and soft-start valves with safety function, filters, pressure and flow sensors, dryers, sensors and lubricators can be assembled into a suitable solution for every task. With the modular structure the components can be combined as required. The simple connection system saves time because replacing individual modules does not require disassembling the entire combination.
Many of the components are also UL and ATEX certified.

CAD models and configurator

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.

Engineering tools

Selection tool for choosing the right service unit combination without oversizing, and with the right air quality class:
➔ www.festo.com/engineering/service unit



Integrated sensors

Pressure and flow sensors



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

Safety functions

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



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

Energy savings

Service unit combinations MSE6



- Fully automatic monitoring and regulation of 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

Intelligent mix of sizes



- Optimum flow rate with size reduction of 18%
- Excellent energy efficiency
- Cost-optimised combinations – save up to 30%!

Size differences

Size		MS4	MS6	MS9	MS12
Grid dimension	[mm]	40	62	90	124
Connection sizes		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 qnN[1)]	[l/min]	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 technical data in the documentation for the corresponding service unit component.

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

Design of a service unit combination

The order of the individual service unit components within a 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 combination 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 completely assembled combination with UL or ATEX certification, if necessary.
When arranging a combination of individually configured and ordered service unit components, the points on the right must be complied with 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

Total product range for MS series service unit components

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								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 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
Service unit combinations MSE6								Datasheets → Internet: mse6
	Combinations with fieldbus connection for measuring pressure, flow rate and consumption	6	–	–	–	–	1/2	–

Key features

Total product range for MS series service unit components

Type	Description	Size	Pneumatic connection					
			Push-in connector	Female thread			Connecting plate with thread	
				M	G	NPT	G	NPT
Individual components								
Filter regulators MS-LFR								Datasheets → Internet: ms-lfr
	Filter and pressure regulator in a single device, 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	–
Filters MS-LF								Datasheets → Internet: ms-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: ms-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: ms-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: ms-lws
	Removes 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

Total product range for MS series service unit components

Type	Description	Size	Pneumatic connection					
			Push-in connector	Female thread			Connecting plate with thread	
				M	G	NPT	G	NPT
Individual components								
Pressure regulators MS-LR								Datasheets → Internet: ms-lr
	For setting the required operating pressure, 4 pressure regulation ranges	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-LRB								Datasheets → Internet: ms-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: ms-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: ms-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	–
Electrical pressure regulators MS-LRE								Datasheets → Internet: ms-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: ms-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

Total product range for MS series service unit components

Type	Description	Size	Pneumatic connection					
			Push-in connector	Female thread			Connecting plate with thread	
				M	G	NPT	G	NPT
Individual components								
On/off valves MS-EM								Datasheets → Internet: ms-em
	Manually actuated on/off valve for 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
		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: ms-ee
	Electrically actuated on/off valve for 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
		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	–
Soft-start valves MS-DL								Datasheets → Internet: ms-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: ms-de
	Electrically 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/quick exhaust valves MS-SV								Datasheets → Internet: ms-sv
	For building up pressure gradually and reducing pressure quickly and safely 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	–

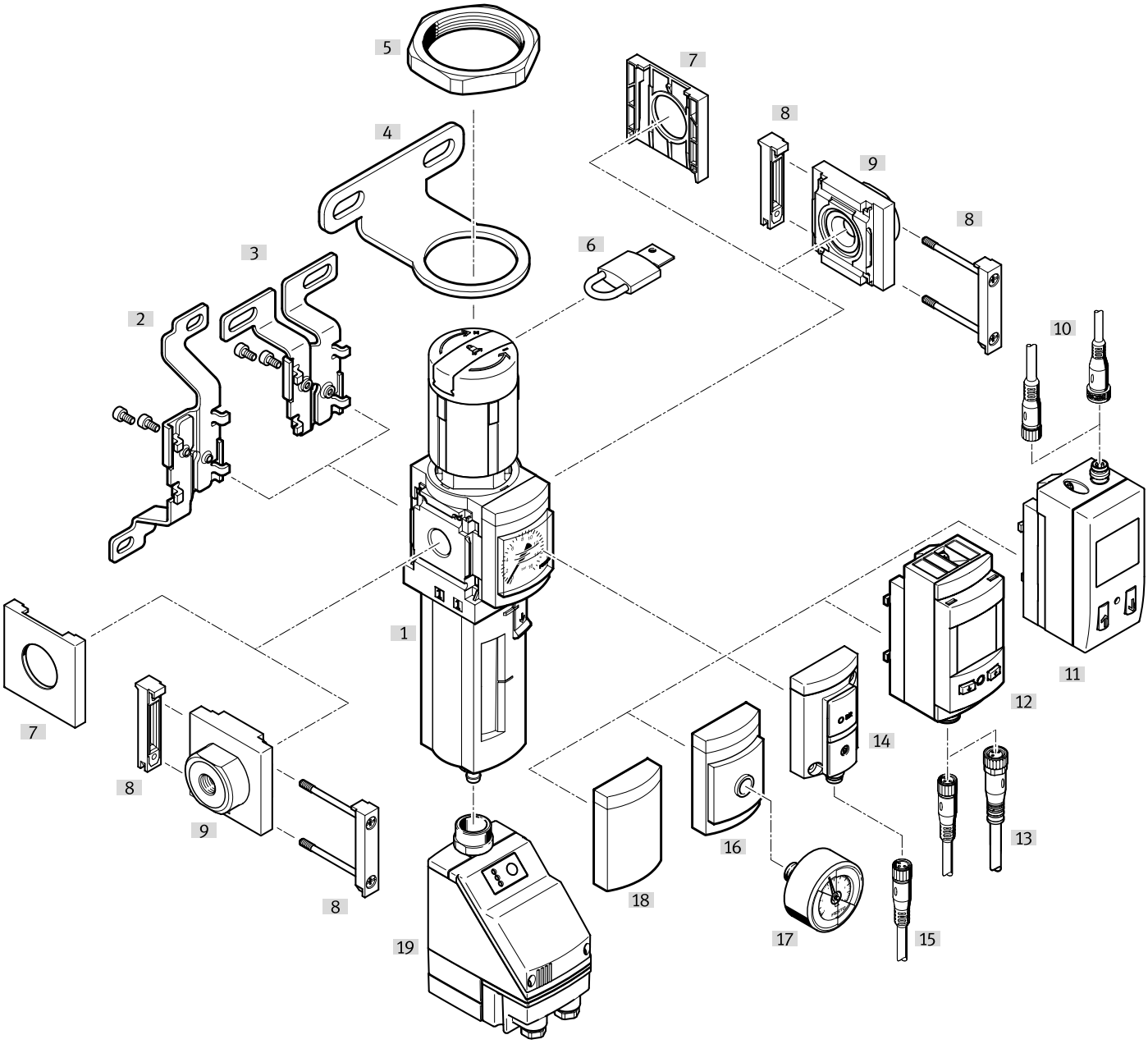
Key features

Total product range for MS series service unit components

Type	Description	Size	Pneumatic connection					
			Push-in connector	Female thread			Connecting plate with thread	
				M	G	NPT	G	NPT
Individual components								
Membrane air dryers MS-LDM1								Datasheets → Internet: ms-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: ms-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: ms-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

Filter regulator MS4/MS6-LFR



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		Individual device		Combination		→ Page/ Internet
		Without connecting plate	With connecting plate	Without connecting plate	With connecting plate	
[1]	Filter regulator MS4/MS6-LFR					10
[2]	Mounting bracket MS4/6-WB	■	■	–	–	ms4-wb, ms6-wb
[3]	Mounting bracket MS4-WBM	■	■	–	–	ms4-wbm
[4]	Mounting bracket MS4/6-WR	■	■	–	–	ms4-wr, ms6-wr
[5]	Hex nut MS4/6-WRS	■	■	■	■	ms4-wrs, ms6-wrs
[6]	Padlock LRVS-D	■	■	■	■	54
[7]	Cover cap MS4/6-END	■	–	■	–	ms4-end, ms6-end
[8]	Module connector MS4/6-MV	–	■	■	■	ms4-mv, ms6-mv
[9]	Connecting plate SET MS4/6-AG...	–	■	–	■	ms4-ag, ms6-ag
	Connecting plate SET MS4/6-AQ...	–	■	–	■	ms4-aq, ms6-aq
[10]	Connecting cable NEBU-M8...-LE3/NEBU-M12...-LE4	■	■	■	■	54
[11]	Pressure sensor with display AD1 ... AD4	■	■	■	■	28
[12]	Pressure sensor with LCD display AD11/AD12	■	■	■	■	28
[13]	Connecting cable NEBU-M8...-LE4/NEBU-M12...-LE4	■	■	■	■	54
[14]	Pressure sensor without display AD7 ... AD10	■	■	■	■	28
[15]	Connecting cable NEBU-M8...-LE3	■	■	■	■	54
[16]	Adapter for EN pressure gauge 1/8, 1/4 A8/A4	■	■	■	■	28
[17]	Pressure gauge MA	■	■	■	■	54
[18]	Cover plate VS	■	■	■	■	28
[19]	Electrically actuated condensate drain fully automatic E2, E3, E4	■	■	■	■	28
–	Mounting bracket MS4/6-WP/WPB/WPE/WPM	–	■	■	■	ms4-wp, ms6-wp

Type codes

001	Series	
MS	MS series	

002	Size	
4	Grid dimension 40 mm	

003	Function	
LFR	Filter regulator	

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 regulation range	
D5	0.3 ... 4 bar	
D6	0.3 ... 7 bar	
D7	0.5 ... 12 bar	

006	Filter version	
C	5 µm	
E	40 µm	

007	Bowl	
R	Plastic bowl with plastic bowl guard	
U	Metal bowl	

008	Condensate drain	
M	Manually	
H	Semi-automatic	
V	Automatic	

009	Pressure gauge alternatives	
	None	
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	
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	

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

011	Secondary exhausting	
	With secondary exhausting	
OS	Without secondary exhaust	

012	Rotary knob alternative	
	None	
LD	Long rotary knob	

013	Lockability	
	None	
AS	Can be locked using accessories	
E11	With integrated lock	

014	Type of mounting	
	Without mounting bracket	
WR	Mounting bracket with knurled nut on regulator knob	
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	

015	EU certification	
	None	
EX4	II 2GD	

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

017	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	
LFR	Filter regulator	

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 regulation range	
D5	0.3 ... 4 bar	
D6	0.3 ... 7 bar	
D7	0.5 ... 12 bar	
D8	0.5 ... 16 bar	

006	Filter version	
C	5 µm	
E	40 µm	

007	Bowl	
R	Plastic bowl with plastic bowl guard	
U	Metal bowl	

008	Condensate drain	
M	Manually	
H	Semi-automatic	
V	Automatic	
E2	External fully automatic condensate drain, electric, 110 V AC, terminals	
E3	External fully automatic condensate drain, electric, 230 V AC, terminals	
E4	External fully automatic condensate drain, electric, 24 V DC, terminals	

009	Pressure gauge alternatives	
	None	
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	
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	

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

011	Secondary exhausting	
	With secondary exhausting	
OS	Without secondary exhaust	

012	Rotary knob alternative	
	None	
LD	Long rotary knob	

013	Lockability	
	None	
AS	Can be locked using accessories	
E11	With integrated lock	

014	Type of mounting	
	Without mounting bracket	
WR	Mounting bracket with knurled nut on regulator knob	
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	

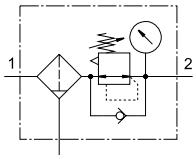
015	EU certification	
	None	
EX4	II 2GD	

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

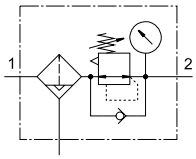
017	Flow direction	
	Flow direction from left to right	
Z	Flow direction from right to left	

Datasheet

Condensate drain, manual, with pressure gauge



Semi- or fully automatic condensate drain, with pressure gauge



In this device, the filter and pressure regulator are combined in one unit. The sintered filter with water separator removes contamination, pipe scale, rust and condensate from the compressed air.

Flow rate
850 ... 7200 l/min

Temperature range
–10 ... +60°C

Operating pressure
0.8 ... 20 bar

www.festo.com



- Good regulation characteristics with minimal hysteresis and input pressure compensation
- Good particle and condensate separation
- Available with or without secondary exhausting
- High flow rate
- Directly actuated diaphragm control valve
- Four pressure regulation ranges: 0.3 ... 4 bar, 0.3 ... 7 bar, 0.5 ... 12 bar and 0.5 ... 16 bar
- Actuator lock to protect set values from being adjusted
- Return flow option for exhausting from output 2 to output 1 already integrated
- Two pressure gauge connections for different installation options
- Optional pressure sensor
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22
- Choice of 5 µm or 40 µm filter inserts
- New filter cartridges ➔ 53

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		Filter regulator with/without pressure indication	
Regulator function		Output pressure constant, with return flow, with/without secondary exhausting	
Type of mounting		With accessories	
		In-line installation	
		Front panel mounting	
Mounting position		Vertical ±5°	
Grade of filtration	[µm]	5	
		40	
Air quality class at the output		Compressed air to ISO 85731:2010 [6:4:4] (grade of filtration 5 µm)	
		Compressed air to ISO 85731:2010 [7:4:4] (grade of filtration 40 µm)	
Bowl guard		Plastic bowl guard	
		Integrated as metal bowl	
Condensate drain		Manual	
		Semi-automatic	
		Fully automatic	
		–	Fully automatic, electrically actuated
Actuator lock		Rotary knob with latch, can be locked using accessories	
		Rotary knob with integrated lock	

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

Datasheet

General technical data				
Size			MS4	MS6
Pressure regulation range	[D5]	[bar]	0.3 ... 4	
	[D6]	[bar]	0.3 ... 7	
	[D7]	[bar]	0.5 ... 12 (0.5 ... 10 with pressure sensor AD... or with UL certification)	
	[D8]	[bar]	–	0.5 ... 16 (0.5 ... 10 with UL certification)
Max. pressure hysteresis		[bar]	0.25	
Pressure indicator			Via pressure sensor for displaying the output pressure on LCD display and electrical output	
			Via pressure sensor for displaying the output pressure by switching status indicator and electrical output	
			Via pressure gauge for displaying the output pressure	
			Via pressure gauge with red/green scale for displaying the output pressure	
			Prepared for G1/8	–
			Prepared for G1/4	
Max. condensate volume		[ml]	19 (with plastic bowl guard) 25 (with metal bowl)	38

Standard nominal flow rate qnN[1] [l/min]						
Size		MS4		MS6		
Pneumatic connection		G1/8	G1/4	G1/4	G3/8	G1/2
[D5] Pressure regulation range 0.3 ... 4 bar						
Grade of filtration	5 µm	900[2]	1800[2]	2000[2]	5500[2]	6900[2]
	40 µm	1100[2]	1900[2]	2200[2]	6000[2]	7200[2]
[D6] Pressure regulation range 0.3 ... 7 bar						
Grade of filtration	5 µm	900	1500	2700	5000	5600
	40 µm	1000	1700	2800	5700	6200
[D7] Pressure regulation range 0.5 ... 12 bar						
Grade of filtration	5 µm	850	1200	2200	3500	4000
	40 µm	900	1500	2500	4000	4500
[D8] Pressure regulation range 0.5 ... 16 bar						
Grade of filtration	5 µm	–	–	2000	3300	3800
	40 µm	–	–	2300	3500	4000

1) Measured at p1 = 10 bar and p2 = 6 bar, Δp = 1 bar

2) Measured at p1 = 10 bar and p2 = 3 bar, Δp = 1 bar

125 l/min must be available for the fully automatic condensate drain to close correctly.

Datasheet

Operating and environmental conditions							
Condensate drain	Manual		Semi-automatic		Fully automatic		Fully automatic, electrically actuated
Size	MS4	MS6	MS4	MS6	MS4	MS6	MS6
Operating pressure [bar]	0.8 ... 14 (0.8 ... 10)[1]	0.8 ... 20 (0.8 ... 10)[1]	1.5 ... 12 (1.5 ... 10)[1]	1.5 ... 12 (1.5 ... 10)[1]	2 ... 12 (2 ... 10)[1]	2 ... 12 (2 ... 10)[1]	0.8 ... 16 (0.8 ... 10)[1]
Operating medium	Compressed air to ISO 8573-1:2010 [–:4:–]		Compressed air to ISO 8573-1:2010 [–:4:–]		Compressed air to ISO 8573-1:2010 [7:4:–]		Compressed air to ISO 8573-1:2010 [–:4:–]
	Inert gases						
Ambient temperature [°C]	–10 ... +60 (0 ... +50)[2]		+5 ... +60 (+5 ... +50)[2]		+5 ... +60 (+5 ... +50)[2]		+1 ... +60 (+1 ... +50)[2]
Temperature of medium [°C]	–10 ... +60 (0 ... +50)[2]		+5 ... +60 (+5 ... +50)[2]		+5 ... +60 (+5 ... +50)[2]		+1 ... +60 (+1 ... +50)[2]
Storage temperature [°C]	–10 ... +60		–10 ... +60		–10 ... +60		+1 ... +60
Corrosion resistance class CRC[3]	2						
Suitability for use in the food industry[4]	See supplementary material information						–
UL certification[4]	c UL us - Recognized (OL)						

1) Value in brackets applies to MS4/MS6-LFR with UL certification.
2) Value in brackets applies to MS4/MS6-LFR with pressure sensor
3) 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 which are in direct contact with a normal industrial environment.
4) Additional information: www.festo.com/sp ➔ Certificates.

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	+5°C ≤ Ta ≤ +60°C
CE mark (see declaration of conformity)[1]	To EU Explosion Protection Directive (ATEX)

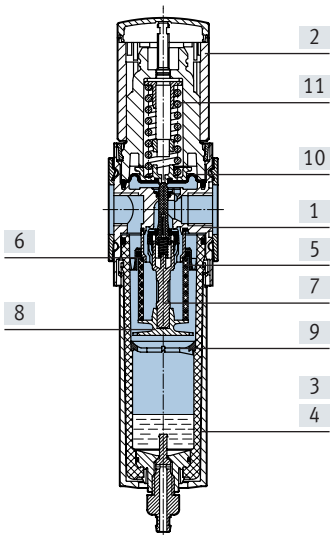
1) Additional information: www.festo.com/sp ➔ Certificates.

Weights [g]				
Size	MS4		MS6	
Rotary knob	Without integrated lock	With integrated lock	Without integrated lock	With integrated lock
Filter regulator with plastic bowl guard	275	400	875	1145
Filter regulator with metal bowl	475	600	1087	1627
Filter regulator with metal bowl and electrically actuated condensate drain, fully automatic	–	–	1800	2070

Datasheet

Materials

Sectional view

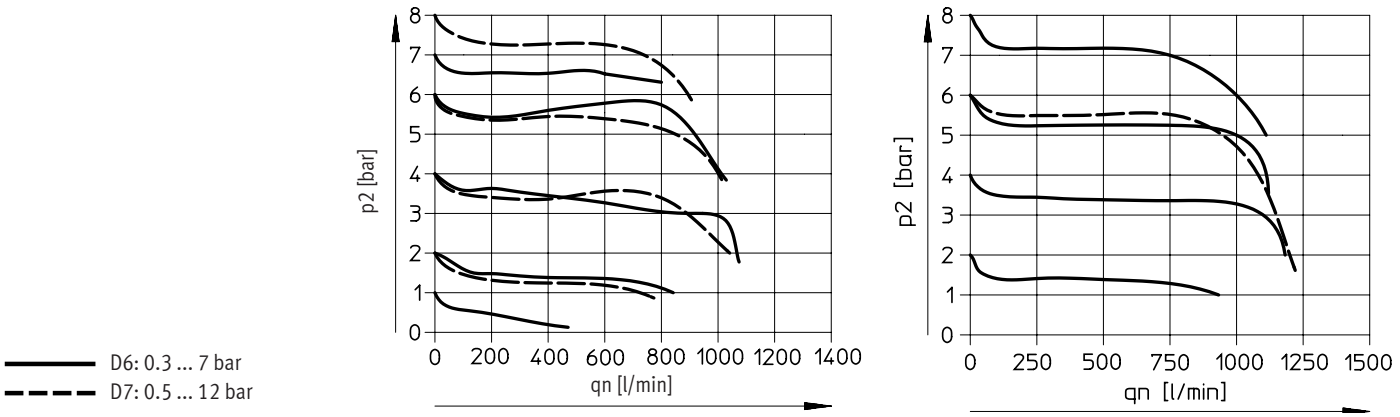


Filter regulator		
[1]	Housing	Die-cast aluminium
[2]	Rotary knob	PA, POM
	Rotary knob with integrated lock	Aluminium
[3]	Plastic bowl guard	PC
[4]	Metal bowl	Wrought aluminium alloy, die-cast aluminium
	Inspection window	PA
[5]	Filter element	PE
[6]	Spin disc	POM
[7]	Filter support	POM
[8]	Separating disc	POM
[9]	Stabilising disc	POM
[10]	Diaphragm	NBR
[11]	Spring	Steel
–	Seals	NBR
Note on materials		RoHS-compliant
		Free of copper and PTFE only with cover plate

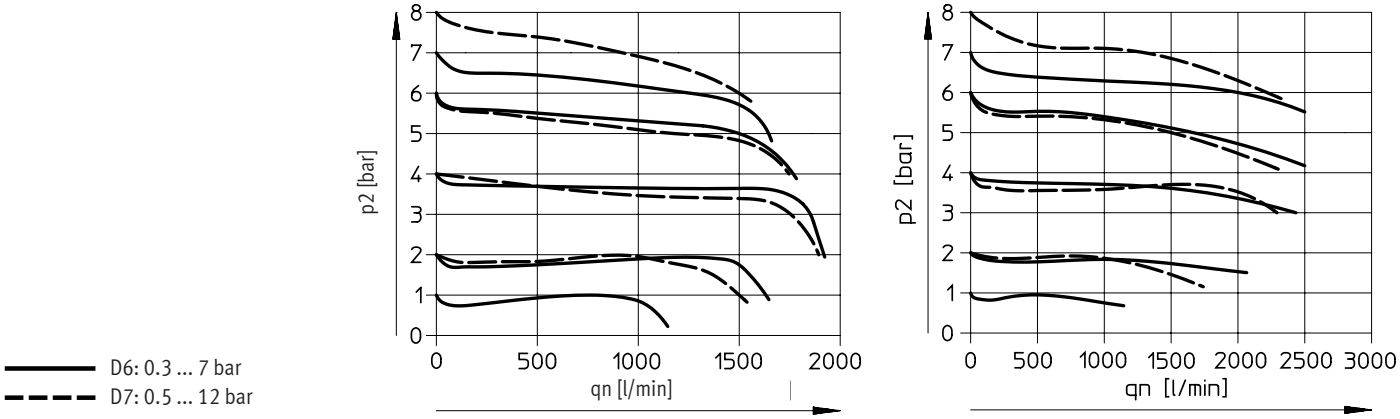
Standard flow rate qn as a function of output pressure p2 (p1 = 10 bar)

Grade of filtration 5 µm | Grade of filtration 40 µm

MS4-LFR-1/8



MS4-LFR-1/4

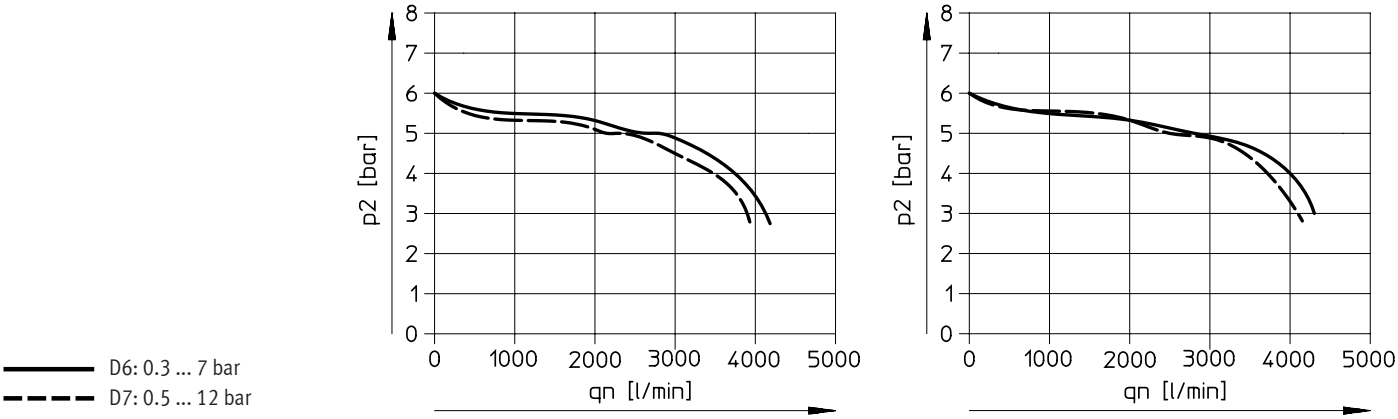


Datasheet

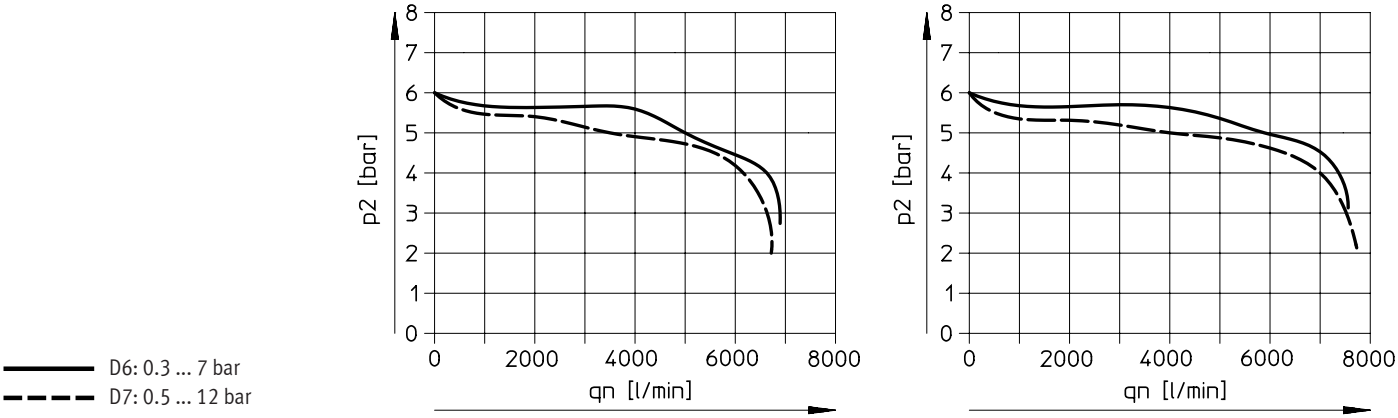
Standard flow rate qn as a function of output pressure p2 (p1 = 10 bar)

	Grade of filtration 5 µm	Grade of filtration 40 µm

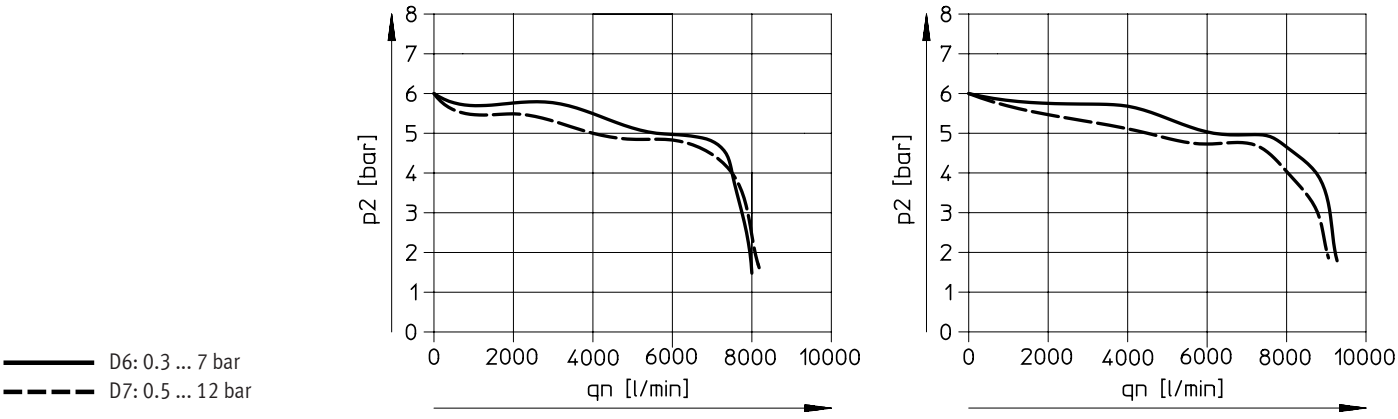
MS6-LFR-1/4



MS6-LFR-3/8



MS6-LFR-1/2

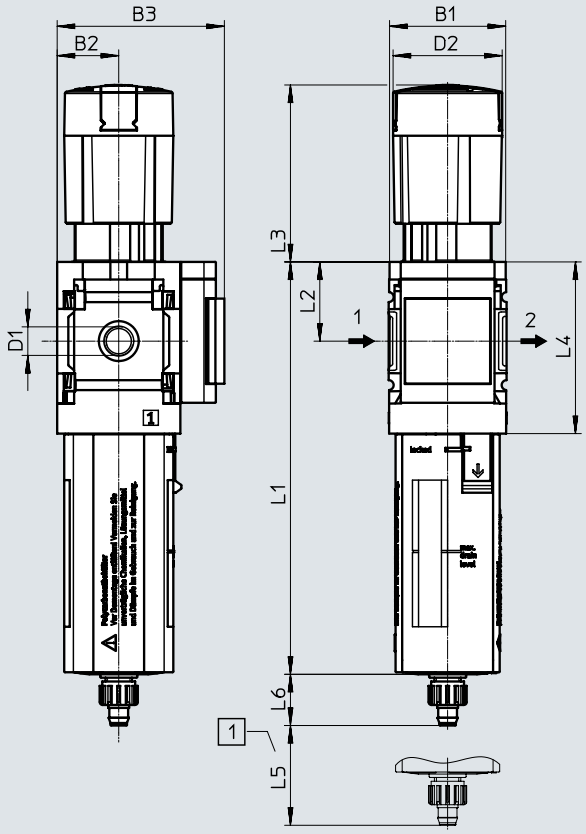


Datasheet

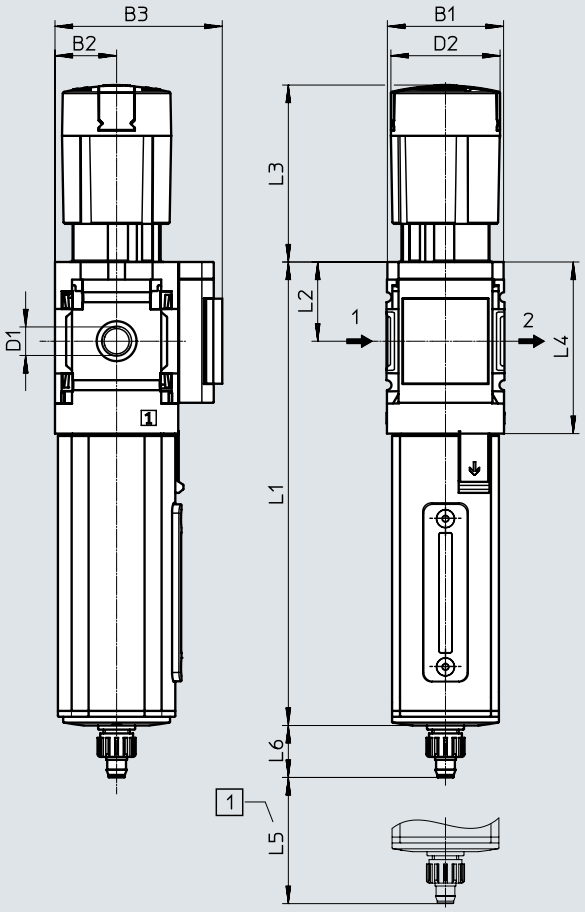
Dimensions – Basic version MS4-LFR Download CAD data ➔ www.festo.com

[ ] Integrated MS pressure gauge with standard scale
[M] Condensate drain, manual
[AS] Rotary knob with latch, can be locked using accessories

[R] With plastic bowl guard



[U] With metal bowl



[1] Installation dimension ➔ Flow direction

Type	B1	B2	B3	D1	D2	L1		L2	L3	L4	L5	L6
						Plastic bowl guard	Metal bowl					
MS4-LFR-1/8	40	21	57	G1/8	37.2	140.6	158	27	60.2	58.5	≥25	17.7
MS4-LFR-1/4				G1/4								

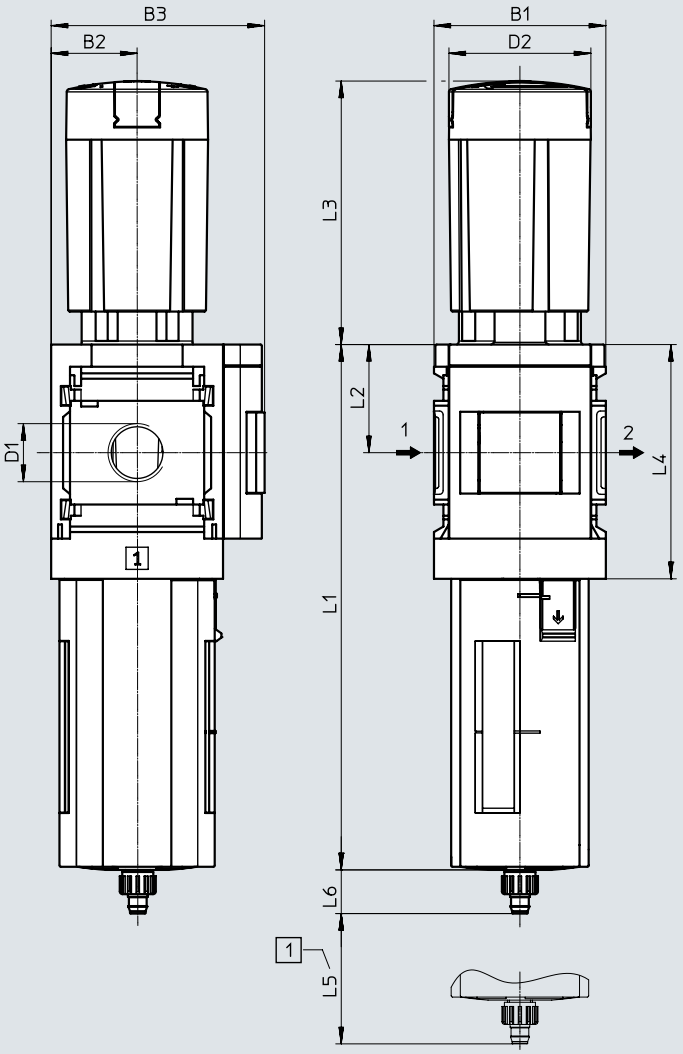
Note: this product conforms to ISO 1179-1 and ISO 228-1.

Datasheet

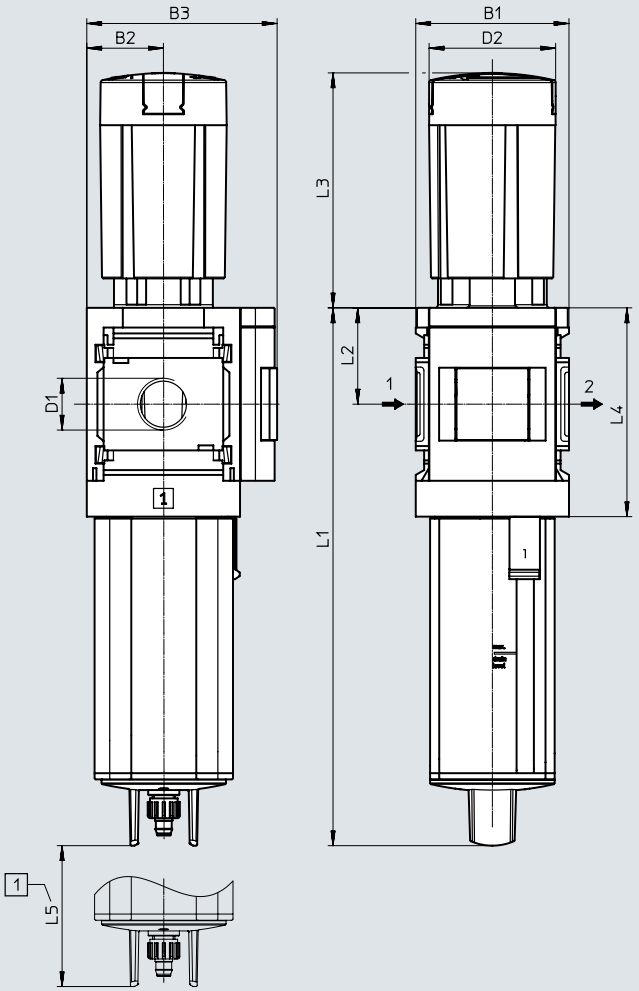
Dimensions – Basic version MS6-LFR Download CAD data ➔ www.festo.com

[ ] Integrated MS pressure gauge with standard scale
[M] Condensate drain, manual
[AS] Rotary knob with latch, can be locked using accessories

[R] With plastic bowl guard



[U] With metal bowl



[1] Installation dimension ➔ Flow direction

Type	B1	B2	B3	D1	D2	L1		L2	L3	L4	L5	L6
						Plastic bowl guard	Metal bowl					
MS6-LFR-1/4	62	31	77	G1/4	51.2	190	218	39	95.1	85	68	15.8
MS6-LFR-3/8				G3/8								
MS6-LFR-1/2				G1/2								

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

Datasheet

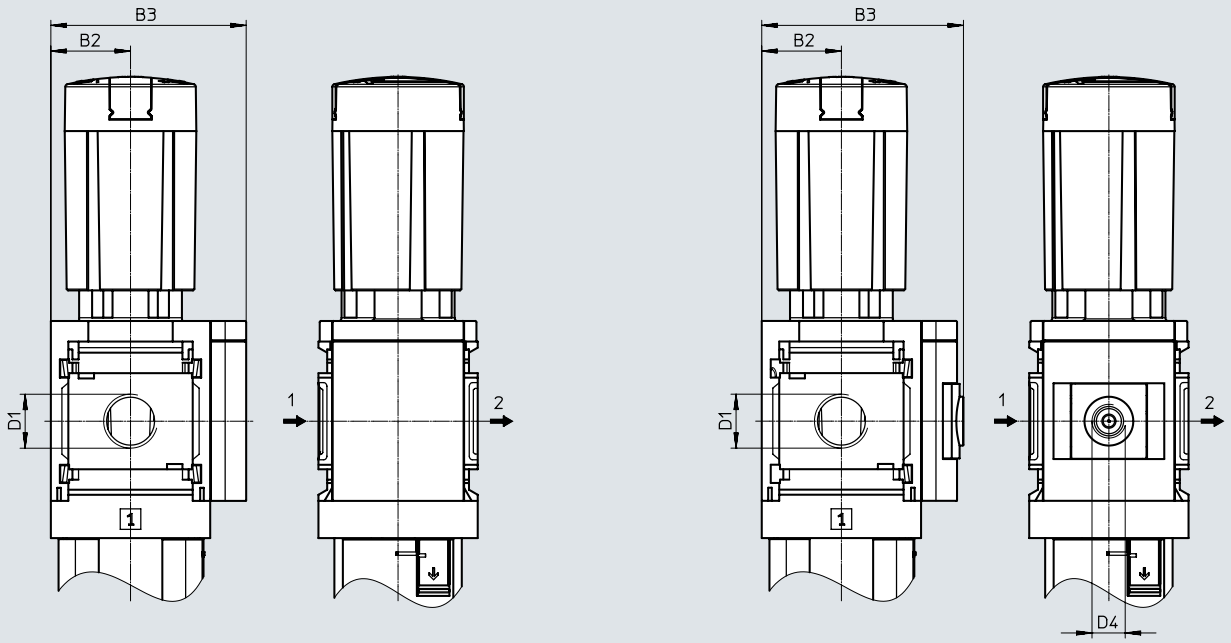
Dimensions – Pressure gauge alternatives

Download CAD data ➔ www.festo.com

[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



➔ Flow direction

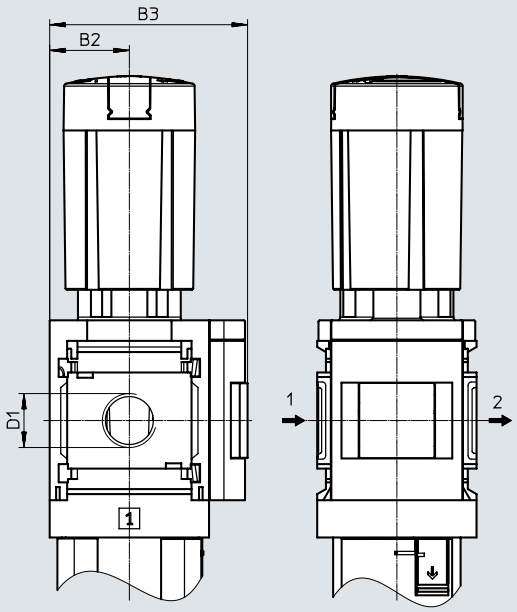
Type	B2	B3	D1	D4
MS4-LFR-1/8-...-VS	21	54	G1/8	–
MS4-LFR-1/4-...-VS			G1/4	
MS4-LFR-1/8-...-A8	21	58.5	G1/8	G1/8
MS4-LFR-1/4-...-A8			G1/4	
MS4-LFR-1/8-...-A4	21	58.5	G1/8	G1/4
MS4-LFR-1/4-...-A4			G1/4	
MS6-LFR-1/4-...-VS	31	76	G1/4	–
MS6-LFR-3/8-...-VS			G3/8	
MS6-LFR-1/2-...-VS			G1/2	
MS6-LFR-1/4-...-A4	31	78.5	G1/4	G1/4
MS6-LFR-3/8-...-A4			G3/8	
MS6-LFR-1/2-...-A4			G1/2	

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

Datasheet

Dimensions – Pressure gauge alternatives Download CAD data ➔ www.festo.com

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



➔ Flow direction

Type	B2	B3	D1
MS4-LFR-1/8-...-RG	21	58.5	G1/8
MS4-LFR-1/4-...-RG			G1/4
MS6-LFR-1/4-...-RG	31	78.5	G1/4
MS6-LFR-3/8-...-RG			G3/8
MS6-LFR-1/2-...-RG			G1/2

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

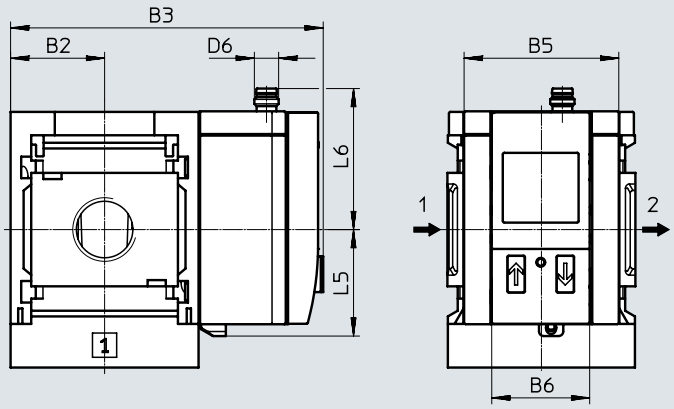
Datasheet

Dimensions – Pressure gauge alternatives

Download CAD data ➔ www.festo.com

[AD1 ... AD4] Pressure sensor with LCD display

Datasheets ➔ Internet: sde1



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

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

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

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

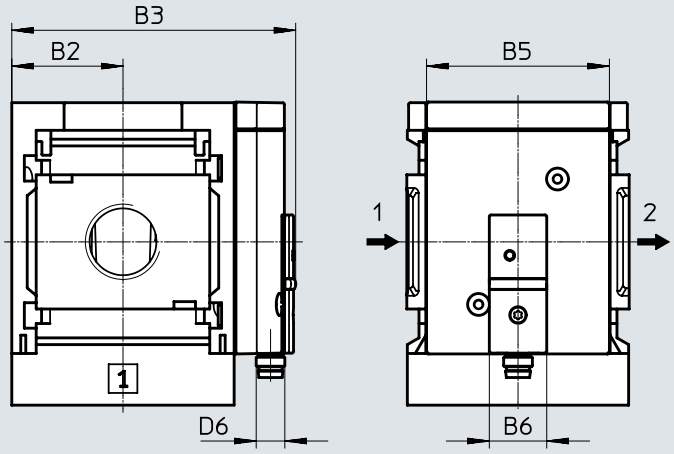
➔ Flow direction

Type	B2	B3	B5	B6	D6	L5	L6
MS4-LFR-...-AD1/AD2	21	82.6	32	32.3	M8x1	35.1	46.7
MS4-LFR-...-AD3/AD4	21	82.6	32	32.3	M12x1	35.1	55.8
MS6-LFR-...-AD1/AD2	31	103	51	32.3	M8x1	35.1	46.7
MS6-LFR-...-AD3/AD4	31	103	51	32.3	M12x1	35.1	55.8

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

[AD7 ... AD10] Pressure sensor without LCD display (switching status indicator only)

Datasheets ➔ Internet: sde5



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

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

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

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

➔ Flow direction

Type	B2	B3	B5	B6	D6
MS4-LFR-...-AD7/AD8/AD9/AD10	21	59.1	32	16	M8x1
MS6-LFR-...-AD7/AD8/AD9/AD10	31	79.1	51	16	M8x1

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

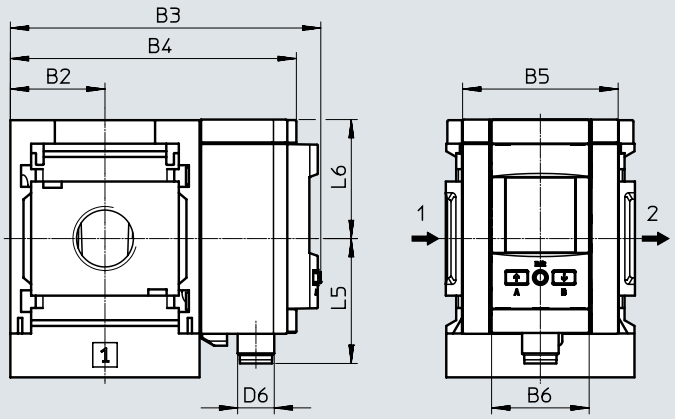
Datasheet

Dimensions – Pressure gauge alternatives

Download CAD data ➔ www.festo.com

[AD11/AD12] Pressure sensor with LCD display

Datasheets ➔ Internet: spau



Variant AD11:
SPAU-P10R-MS-L-PNLK-M12 with M12 plug, 4-pin, IO-Link, PNP, NPN, 0 ... 10 V, 1 ... 5 V, 4 ... 20 mA

Variant AD12:
SPAU-P10R-MS-L-PNLK-M8 with M8 plug, 4-pin, IO-Link, PNP, NPN, 0 ... 10 V, 1 ... 5 V, 4 ... 20 mA

➔ Flow direction

Type	B2	B3	B4	B5	B6	D6	L5	L6
MS4-LFR-...-AD11	21	81.2	73.3	32	32	M12x1	41.2	39
MS4-LFR-...-AD12	21	81.2	73.3	32	32	M8x1	37.9	39
MS6-LFR-...-AD11	31	101.8	93.7	51	32	M12x1	41.2	39
MS6-LFR-...-AD12	31	101.8	93.7	51	32	M8x1	37.9	39

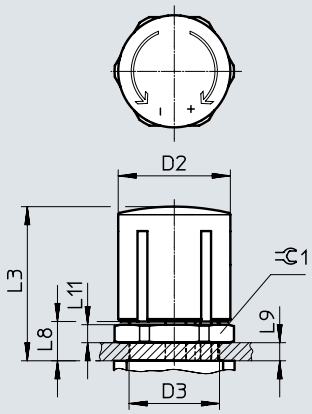
Note: this product conforms to ISO 1179-1 and ISO 228-1.

Datasheet

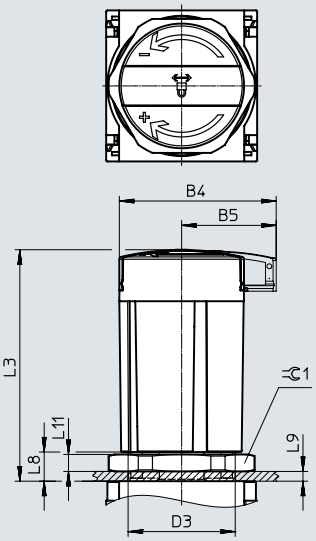
Dimensions – Rotary knob Download CAD data ➔ www.festo.com

For installation into control panel or mounting with hex nut MS4/6-WRS (not included in the scope of delivery)

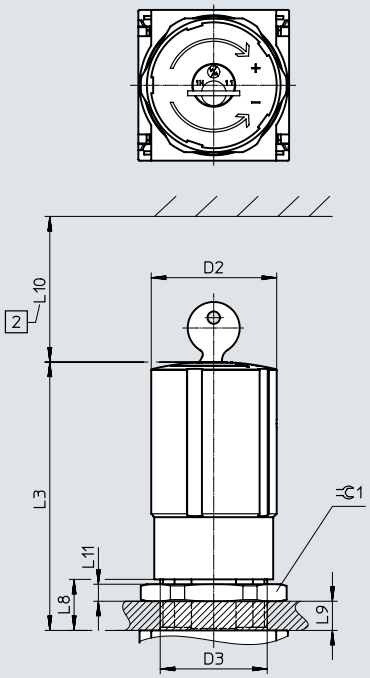
[ ] Rotary knob with latch



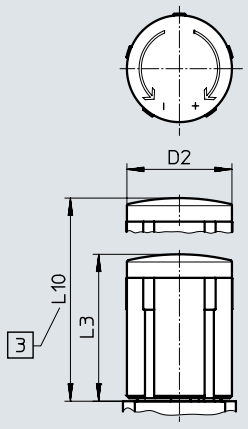
[AS] Rotary knob with latch, can be locked using accessories



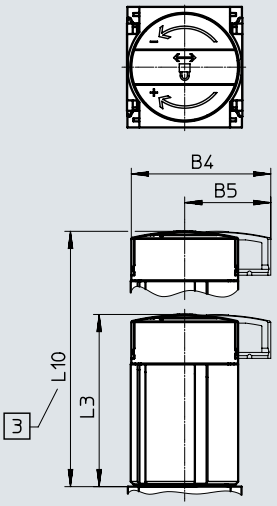
[E11] Rotary knob with integrated lock



[LD] Rotary knob, long, with latch



[LD-AS] Rotary knob, long, with latch, can be locked using accessories



[2] Installation dimension
[3] For pressure adjustment: fully pull out telescopic rotary knob

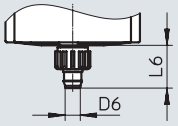
Type	B4	B5	D2	D3	L3	L8	L9	L10	L11	⊂1
MS4-LFR-...	–	–	37.2	M30x1.5	51.1	13	5	–	6	36
MS4-LFR-...-AS	48.6	30			60.2	13	5			
MS4-LFR-...-E11	–	–			76	14	6	60		
MS4-LFR-...-LD	–	–		–	51.1	–	–	76.8	–	–
MS4-LFR-...-LD-AS	48.6	30			60			85.7		
MS6-LFR-...	–	–	51.2	M44x1	86	21	14	–	7	55
MS6-LFR-...-AS	64.4	38.8			95.1	12	5			
MS6-LFR-...-E11	–	–			110	21	14	60		
MS6-LFR-...-LD	–	–		–	86	–	–	139	–	–
MS6-LFR-...-LD-AS	64.4	38.8			95.5			148.5		

Datasheet

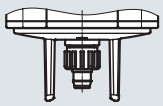
Dimensions – Condensate drain Download CAD data ➔ www.festo.com

[M] Manual

MS4-...-R/U-M
MS6-...-R-M



MS6-...-U-M

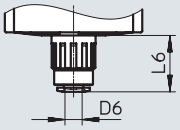


Barbed connector for plastic tubing PUN(-H)-8x1.25

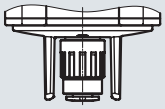
Type	D6 ø	L6
Plastic bowl guard R		
MS4-LFR-...-M	5.6	17.7
MS6-LFR-...-M		15.8
Metal bowl U		
MS4-LFR-...-M	5.6	17.7
MS6-LFR-...-M		–

[H] Semi-automatic

MS4-...-R/U-H
MS6-...-R-H



MS6-...-U-H

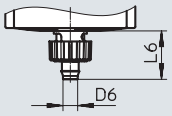


Push-in connector for plastic tubing PUN-6/PAN-6

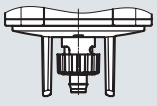
Type	D6 ø	L6
Plastic bowl guard R		
MS4-LFR-...-H	6.2	22.1
MS6-LFR-...-H		20.4
Metal bowl U		
MS4-LFR-...-H	6.2	22.1
MS6-LFR-...-H		–

[V] Fully automatic

MS4-...-R/U-V
MS6-...-R-V



MS6-...-U-V

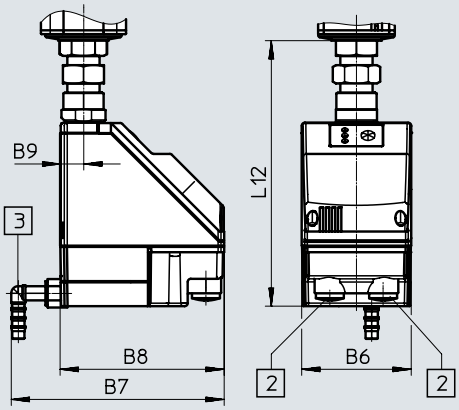


Barbed connector for plastic tubing PUN(-H)-8x1.25

Type	D6 ø	L6
Plastic bowl guard R		
MS4-LFR-...-V	5.6	20.4
MS6-LFR-...-V		18.5
Metal bowl U		
MS4-LFR-...-V	5.6	20.4
MS6-LFR-...-V		–

[E2]/[E3]/[E4] Fully automatic, electrically actuated

Datasheets ➔ Internet: pwea



Condensate drain PWEA:
[2] Electrical connection: screw terminal PG9
[3] Connection can be rotated 360° for plastic tubing PUN-H-12x2

Type	B6	B7	B8	B9	L12
MS6-LFR-...-E2/E3/E4	72	140	108	15	174.5

Datasheet

★ Core Range

Ordering data

Pressure regulation range 0.3 ... 7 bar, plastic bowl guard, integrated MS pressure gauge with standard scale, display unit [bar], rotary knob with latch, can be locked using accessories

Size	Connection	Condensate drain	Grade of filtration 5 µm		Grade of filtration 40 µm	
			Part no.	Type	Part no.	Type
Flow direction from left to right						
MS4	G1/4	Manual	★ **529144**	**MS4-LFR-1/4-D6-CRM-AS**	★ **529148**	**MS4-LFR-1/4-D6-ERM-AS**
		Fully automatic	★ **529146**	**MS4-LFR-1/4-D6-CRV-AS**	★ **529150**	**MS4-LFR-1/4-D6-ERV-AS**
MS6	G1/2	Manual	★ **529176**	**MS6-LFR-1/2-D6-CRM-AS**	★ **529180**	**MS6-LFR-1/2-D6-ERM-AS**
		Fully automatic	★ **529178**	**MS6-LFR-1/2-D6-CRV-AS**	★ **529182**	**MS6-LFR-1/2-D6-ERV-AS**

Ordering data

Pressure regulation range 0.5 ... 12 bar, plastic bowl guard, integrated MS pressure gauge with standard scale, display unit [bar], rotary knob with latch, can be locked using accessories

Size	Connection	Condensate drain	Grade of filtration 5 µm		Grade of filtration 40 µm	
			Part no.	Type	Part no.	Type
Flow direction from left to right						
MS4	G1/4	Manual	★ **529152**	**MS4-LFR-1/4-D7-CRM-AS**	★ **529156**	**MS4-LFR-1/4-D7-ERM-AS**
		Fully automatic	★ **529154**	**MS4-LFR-1/4-D7-CRV-AS**	★ **529158**	**MS4-LFR-1/4-D7-ERV-AS**
MS6	G1/2	Manual	★ **529184**	**MS6-LFR-1/2-D7-CRM-AS**	★ **529188**	**MS6-LFR-1/2-D7-ERM-AS**
		Fully automatic	★ **529186**	**MS6-LFR-1/2-D7-CRV-AS**	★ **529190**	**MS6-LFR-1/2-D7-ERV-AS**

Ordering data

Pressure regulation range 0.5 ... 12 bar, integrated as metal bowl, integrated MS pressure gauge with standard scale, display unit [bar], rotary knob with latch, can be locked using accessories

Size	Connection	Condensate drain	Grade of filtration 5 µm		Grade of filtration 40 µm	
			Part no.	Type	Part no.	Type
Flow direction from left to right						
MS4	G1/4	Manual	–	–	★ **535724**	**MS4-LFR-1/4-D7-EUM-AS**
		Fully automatic	★ **535720**	**MS4-LFR-1/4-D7-CUV-AS**	★ **535722**	**MS4-LFR-1/4-D7-EUV-AS**
MS6	G1/2	Manual	★ **530338**	**MS6-LFR-1/2-D7-CUM-AS**	★ **529192**	**MS6-LFR-1/2-D7-EUM-AS**
		Fully automatic	★ **530340**	**MS6-LFR-1/2-D7-CUV-AS**	★ **529194**	**MS6-LFR-1/2-D7-EUV-AS**

Datasheet

Ordering data

Pressure regulation range 0.3 ... 7 bar, plastic bowl guard, integrated MS pressure gauge with standard scale, display unit [bar], rotary knob with latch, can be locked using accessories

Size	Connection	Condensate drain	Grade of filtration 5 µm			Grade of filtration 40 µm	
			Part no.	Type		Part no.	Type
Flow direction from left to right							
MS4	G1/8	Manual	**529160**	**MS4-LFR-1/8-D6-CRM-AS**		**529164**	**MS4-LFR-1/8-D6-ERM-AS**
		Fully automatic	**529162**	**MS4-LFR-1/8-D6-CRV-AS**		**529166**	**MS4-LFR-1/8-D6-ERV-AS**
MS6	G1/4	Manual	**529196**	**MS6-LFR-1/4-D6-CRM-AS**		**529200**	**MS6-LFR-1/4-D6-ERM-AS**
		Fully automatic	**–**	**–**		**529202**	**MS6-LFR-1/4-D6-ERV-AS**
	G3/8	Manual	**529216**	**MS6-LFR-3/8-D6-CRM-AS**		**529220**	**MS6-LFR-3/8-D6-ERM-AS**
		Fully automatic	**529218**	**MS6-LFR-3/8-D6-CRV-AS**		**529222**	**MS6-LFR-3/8-D6-ERV-AS**
Flow direction from right to left							
MS4	G1/4	Manual	**529145**	**MS4-LFR-1/4-D6-CRM-AS-Z**		**529149**	**MS4-LFR-1/4-D6-ERM-AS-Z**
		Fully automatic	**–**	**–**		**529151**	**MS4-LFR-1/4-D6-ERV-AS-Z**
MS6	G3/8	Fully automatic	**529219**	**MS6-LFR-3/8-D6-CRV-AS-Z**		**–**	**–**
	G1/2	Manual	**529177**	**MS6-LFR-1/2-D6-CRM-AS-Z**		**529181**	**MS6-LFR-1/2-D6-ERM-AS-Z**
		Fully automatic	**–**	**–**		**529183**	**MS6-LFR-1/2-D6-ERV-AS-Z**

Datasheet

Ordering data

Pressure regulation range 0.5 ... 12 bar, plastic bowl guard, integrated MS pressure gauge with standard scale, display unit [bar], rotary knob with latch, can be locked using accessories

Size	Connection	Condensate drain	Grade of filtration 5 µm		Grade of filtration 40 µm	
			Part no.	Type	Part no.	Type
Flow direction from left to right						
MS4	G1/8	Manual	**529168**	**MS4-LFR-1/8-D7-CRM-AS**	**529172**	**MS4-LFR-1/8-D7-ERM-AS**
		Fully automatic	**529170**	**MS4-LFR-1/8-D7-CRV-AS**	**529174**	**MS4-LFR-1/8-D7-ERV-AS**
MS6	G1/4	Manual	**529204**	**MS6-LFR-1/4-D7-CRM-AS**	**529208**	**MS6-LFR-1/4-D7-ERM-AS**
		Fully automatic	**529206**	**MS6-LFR-1/4-D7-CRV-AS**	**529210**	**MS6-LFR-1/4-D7-ERV-AS**
	G3/8	Manual	**529224**	**MS6-LFR-3/8-D7-CRM-AS**	**529228**	**MS6-LFR-3/8-D7-ERM-AS**
		Fully automatic	**529226**	**MS6-LFR-3/8-D7-CRV-AS**	**529230**	**MS6-LFR-3/8-D7-ERV-AS**
Flow direction from right to left						
MS4	G1/4	Manual	**529153**	**MS4-LFR-1/4-D7-CRM-AS-Z**	**529157**	**MS4-LFR-1/4-D7-ERM-AS-Z**
		Fully automatic	**529155**	**MS4-LFR-1/4-D7-CRV-AS-Z**	**529159**	**MS4-LFR-1/4-D7-ERV-AS-Z**
MS6	G1/4	Manual	**529205**	**MS6-LFR-1/4-D7-CRM-AS-Z**	**–**	**–**
	G1/2	Manual	**529185**	**MS6-LFR-1/2-D7-CRM-AS-Z**	**529189**	**MS6-LFR-1/2-D7-ERM-AS-Z**
		Fully automatic	**529187**	**MS6-LFR-1/2-D7-CRV-AS-Z**	**529191**	**MS6-LFR-1/2-D7-ERV-AS-Z**

Ordering data

Pressure regulation range 0.5 ... 12 bar, integrated as metal bowl, integrated MS pressure gauge with standard scale, display unit [bar], rotary knob with latch, can be locked using accessories

Size	Connection	Condensate drain	Grade of filtration 5 µm		Grade of filtration 40 µm	
			Part no.	Type	Part no.	Type
Flow direction from left to right						
MS6	G3/8	Manual	**–**	**–**	**529232**	**MS6-LFR-3/8-D7-EUM-AS**
		Fully automatic	**530348**	**MS6-LFR-3/8-D7-CUV-AS**	**529234**	**MS6-LFR-3/8-D7-EUV-AS**

Ordering data – Modular product system

Ordering table

Grid dimension [mm]		40	62	Conditions	Code	Enter code
Module no.		**526489**	**526490**			
Series		Standard			**MS**	MS
Size		4	6		**...**	
Function		Filter regulator			**-LFR**	-LFR
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 regulation range		0.3 ... 4 bar			**-D5**	
		0.3 ... 7 bar			**-D6**	
		0.5 ... 12 bar			**-D7**	
		–	0.5 ... 16 bar	[1]	**-D8**	
Grade of filtration		40 µm			**-E**	
		5 µm			**-C**	
Bowl		Plastic bowl with plastic bowl guard			**-R**	
		Metal bowl			**-U**	
Condensate drain		manual			**-M**	
		semi-automatic (P1 max. 12 bar)		[2]	**-H**	
		Fully automatic (P1 max. 12 bar)		[2]	**-V**	
	External, fully automatic, electric	–	115 V AC, connection terminals	[1] [3]	**-E2**	
		–	230 V AC, connection terminals	[1] [3]	**-E3**	
		–	24 V DC, terminals	[1] [3]	**-E4**	

[1] 1/8, 1/4, 3/8, 1/2, AQK, AQN, AQP, AQR, AQS, D8, E2, E3, E4, AD1 ... AD4, AD7 ... AD10, AD11/AD2, E11, WPM — Not with EU EX4 certification.

[2] H, V — Not with pressure regulation range D8.

[3] E2, E3, E4 — Only with metal bowl U.

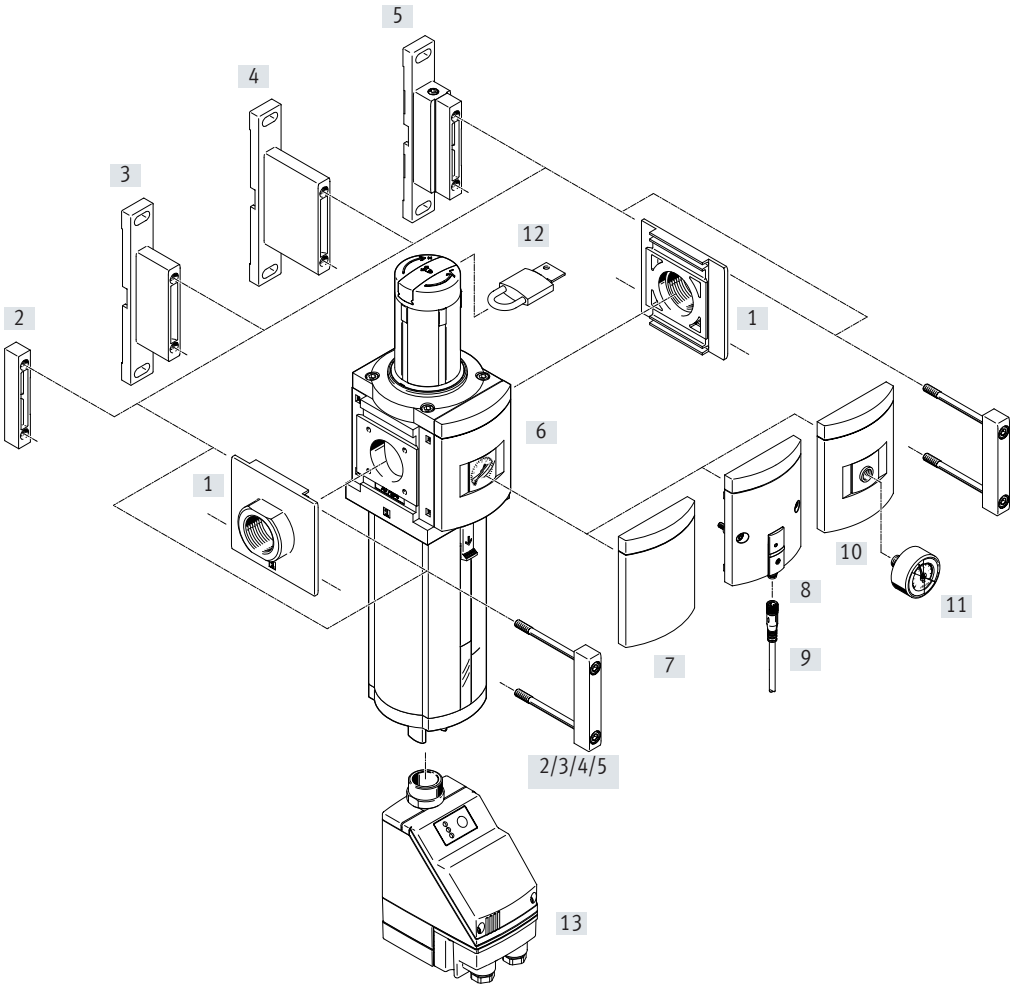
Ordering data – Modular product system

Ordering table

Grid dimension [mm]	40	62	Conditions	Code	Enter code
Pressure gauge alternatives	MS pressure gauge				
	Cover plate			**-VS**	
	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		[4]	**-RG**	
	Pressure sensor with LCD display, M8 plug, 1 switching output PNP, 3-pin		[1] [5]	**-AD1**	
	Pressure sensor with LCD display, M8 plug, 1 switching output NPN, 3-pin		[1] [5]	**-AD2**	
	Pressure sensor with LCD display, M12 plug, 1 switching output PNP, 4-pin, analogue output 4 ... 20 mA		[1] [5]	**-AD3**	
	Pressure sensor with LCD display, M12 plug, 1 switching output NPN, 4-pin, analogue output 4 ... 20 mA		[1] [5]	**-AD4**	
	Pressure sensor with switching status indicator, M8 plug, threshold value comparator, PNP, N/O contact		[1] [5]	**-AD7**	
	Pressure sensor with switching status indicator, M8 plug, threshold value comparator, PNP, N/C contact		[1] [5]	**-AD8**	
	Pressure sensor with switching status indicator, M8 plug, window comparator, PNP, N/O contact		[1] [5]	**-AD9**	
	Pressure sensor with switching status indicator, M8 plug, window comparator, PNP, N/C contact		[1] [5]	**-AD10**	
	Pressure sensor with LCD display, M12 plug, 4-pin, IO-Link, PNP, NPN, 0 ... 10 V, 1 ... 5 V, 4 ... 20 mA		[1] [5]	**-AD11**	
	Pressure sensor with LCD display, M8 plug, 4-pin, IO-Link, PNP, NPN, 0 ... 10 V, 1 ... 5 V, 4 ... 20 mA		[1] [5]	**-AD12**	
Alternative pressure gauge scale	MS pressure gauge, bar				
	psi		[6]	**-PSI**	
	MPa		[6]	**-MPA**	
Secondary exhausting	With secondary exhausting				
	Without secondary exhausting			**-OS**	
Rotary knob	Standard				
	Long rotary knob		[7]	**-LD**	
Locking option	Without				
	Lockable using accessories			**-AS**	
	With integrated lock		[1]	**-E11**	
Type of mounting	Without mounting bracket				
	Mounting bracket with knurled nut for regulator head		[8]	**-WR**	
	Mounting bracket standard design		[9]	**-WP**	
	Mounting bracket for attaching service unit components		[1] [9]	**-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**	

[4] RG — Alternative pressure gauge scale PSI to be used as auxiliary scale only.
[5] AD1 ... AD4, AD7 ... AD10, AD11/AD12 — Measuring range max. 10 bar. Not with pressure regulation range D8.
[6] PSI, MPA — Not with pressure gauge alternatives VS, A8, A4, AD1 ... AD4, AD7 ... AD10.
[7] LD — Not with locking option E11.
[8] WR — Not with long rotary knob LD.
[9] WP, WPM — Only with connecting plate AGA, AGB, AGC, AGD, AGE, AQK, AQN, AQP, AQR or AQS.

Peripherals overview



Note

Additional accessories:

- Module connector for combination with size MS6, MS9 or MS12
  → Internet: rmv, armv

Mounting attachments and accessories

		Individual device			Combination	→ Page/ Internet
		With female thread	With connecting plate		Module without connecting thread, without connecting plate	
			Without EU certification	With EU certification		
[1]	Connecting plate SET MS9-AG...	–	■	■	■	ms9-ag
	Connecting plate SET MS9-AQ...	–	■	–	■	ms9-aq
[2]	Module connector MS9-MV	–	–	–	■	ms9-mv
[3]	Mounting bracket MS9-WP	■	■	■	■	ms9-wp
[4]	Mounting bracket MS9-WPB	■	■	■	■	ms9-wp
[5]	Mounting bracket MS9-WPM	■	■	–	■	ms9-wp
[6]	MS pressure gauge AG	■	■	■	■	42
[7]	Cover plate VS	■	■	■	■	42
[8]	Pressure sensor without display AD7 ... AD10	■	■	–	■	42
[9]	Connecting cable NEBU-M8...-LE3	■	■	–	■	54
[10]	Adapter for EN pressure gauge 1/4 A4	■	■	■	■	42
[11]	Pressure gauge MA	■	■	■	■	54
[12]	Padlock LRVS-D	■	■	■	■	54
[13]	Electrically actuated condensate drain fully automatic E2, E3, E4	■	■	–	■	42

Type codes

001	Series	
MS	MS series	

002	Size	
9	Grid dimension 90 mm	

003	Function	
LFR	Filter regulator	

004	Pneumatic connection	
3/4	Female thread G3/4	
G1	G1	
AGD	Sub-base G1/2	
AGE	Sub-base G3/4	
AGF	Sub-base G1	
AGG	Sub-base G11/4	
AGH	Sub-base G11/2	
N1	1 NPT	
AQR	Sub-base NPT1/2	
AQS	Sub-base NPT3/4	
AQT	Sub-base NPT1	
AQU	Sub-base NPT11/4	
AQV	Sub-base NPT11/2	
G	Module without connecting thread, without sub-base	
NG	Module without connecting thread, without sub-base (inch)	
3/4”	Female thread NPT 3/4	

005	Pressure regulation range	
D5	0.3 ... 4 bar	
D6	0.3 ... 7 bar	
D7	0.5 ... 12 bar	
D8	0.5 ... 16 bar	

006	Grade of filtration	
C	5 µm	
E	40 µm	

007	Bowl	
U	Metal bowl	

008	Condensate drain	
M	Manually	
H	Semi-automatic	
V	Automatic	
E2	External fully automatic condensate drain, electric, 110 V AC, terminals	
E3	External fully automatic condensate drain, electric, 230 V AC, terminals	
E4	External fully automatic condensate drain, electric, 24 V DC, terminals	

009	Regulator type	
	Pilot actuated	
DI	Directly actuated	

010	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	

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

012	Secondary exhausting	
	With secondary exhausting	
OS	Without secondary exhaust	

013	Lockability	
	None	
AS	Can be locked using accessories	
E11	With integrated lock	

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

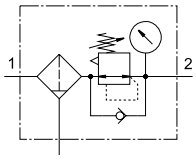
015	EU certification	
	None	
EX4	II 2GD	

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

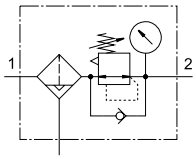
017	Flow direction	
	Flow direction from left to right	
Z	Flow direction from right to left	

Datasheet

Condensate drain, manual, with pressure gauge



Semi- or fully automatic condensate drain, with pressure gauge



In this device, the filter and pressure regulator are combined in one unit. The sintered filter with water separator removes contamination, pipe scale, rust and condensate from the compressed air.

Flow rate
10000 ... 23000 l/min

Temperature range
–10 ... +60°C

Operating pressure
1 ... 20 bar

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- Good regulation characteristics with minimal hysteresis and input pressure compensation
- Good particle and condensate separation
- Piloted or directly actuated filter-diaphragm regulator
- High flow rate
- Available with or without secondary exhausting
- Four pressure regulation ranges: 0.5 ... 4 bar, 0.5 ... 7 bar, 0.5 ... 12 bar and 0.5 ... 16 bar
- Pressure gauge connection for different mounting options
- Available with manual, semi-automatic, fully automatic or fully automatic, electrically actuated condensate drain
- Actuator lock to protect set values from being adjusted
- Optional pressure sensor
- Choice of 5 µm or 40 µm filter inserts
- New filter cartridges → 53
- 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]	–
Design			Piloted filter-diaphragm regulator
			Directly actuated filter-diaphragm regulator
Regulator function	piloted		Output pressure constant, with return flow, with input pressure compensation, with secondary exhausting
	directly actuated		Output pressure constant, with return flow, with/without secondary exhausting
Type of mounting			With accessories
			In-line installation
Mounting position			Vertical ±5°
Grade of filtration		[µm]	5
			40
Air quality class at the output			Compressed air to ISO 85731:2010 [6:4:4] (grade of filtration 5 µm)
			Compressed air to ISO 85731:2010 [7:4:4] (grade of filtration 40 µm)
Bowl guard			Integrated as metal bowl
Condensate drain			Manual
			Semi-automatic
			Fully automatic
			Fully automatic, electrically actuated
Actuator lock			Rotary knob with latch, can be locked using accessories
			Rotary knob with integrated lock
Pressure regulation range/ actuation		[D5] [bar]	0.5 ... 4, manually actuated
		[D6] [bar]	0.5 ... 7, manually actuated
		[D7] [bar]	0.5 ... 12, manually actuated (0.5 ... 10 with pressure sensor variant)
		[D8] [bar]	0.5 ... 16, manually actuated (0.5 ... 10 with pressure sensor variant)

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

Datasheet

General technical data		
Max. pressure hysteresis	[bar]	0.4
Pressure indicator		Via pressure sensor for displaying the output pressure by switching status indicator and electrical output
		Via pressure gauge for displaying the output pressure
		Via pressure gauge with red/green scale for displaying the output pressure
		Prepared for G1/4
Max. condensate volume	[ml]	220

Standard nominal flow rate qnN[1)2)] [l/min]					
Design		Piloted filter-diaphragm regulator		Directly actuated filter-diaphragm regulator	
Pneumatic connection		G3/4, 3/4 NPT	G1, 1 NPT	G3/4, 3/4 NPT	G1, 1 NPT
[D5] Pressure regulation range 0.5 ... 4 bar					
Grade of filtration	5 µm	17000[3)]	20000[3)]	16000[3)]	18000[3)]
	40 µm	18000[3)]	23000[3)]	16000[3)]	20000[3)]
[D6] Pressure regulation range 0.5 ... 7 bar					
Grade of filtration	5 µm	15000	18000	12000	10000
	40 µm	16000	20000	12000	10000
[D7] Pressure regulation range 0.5 ... 12 bar					
Grade of filtration	5 µm	15000	18000	–	–
	40 µm	16000	20000	–	–
[D8] Pressure regulation range 0.5 ... 16 bar					
Grade of filtration	5 µm	15000	18000	–	–
	40 µm	16000	20000	–	–

1) All values ±15%
2) Measured at p1 = 10 bar and p2 = 6 bar, Δp = 1 bar
3) Measured at p1 = 10 bar and p2 = 4 bar, Δp = 1 bar

125 l/min must be available for the fully automatic condensate drain to close correctly.

Operating and environmental conditions					
Condensate drain		Manual	Semi-automatic	Fully automatic	Fully automatic, electrically actuated
Operating pressure	[bar]	1 ... 20	1.5 ... 12	2 ... 12	1 ... 16
Operating medium		Compressed air to ISO 8573-1:2010 [–:4:–]	Compressed air to ISO 8573-1:2010 [–:4:–]	Compressed air to ISO 8573-1:2010 [7:4:–]	Compressed air to ISO 8573-1:2010 [–:4:–]
		Inert gases			
Ambient temperature	[°C]	–10 ... +60	+5 ... +60	+5 ... +60	+1 ... +60
Ambient temperature with pressure sensor	[°C]	0 ... +50	+5 ... +50	+5 ... +50	+1 ... +50
Temperature of medium	[°C]	–10 ... +60	+5 ... +60	+5 ... +60	+1 ... +60
Temperature of medium with pressure sensor	[°C]	0 ... +50	+5 ... +50	+5 ... +50	+1 ... +50
Storage temperature	[°C]	–10 ... +60	+5 ... +60	+5 ... +60	+1 ... +60
Corrosion resistance class CRC[1)]		2			
UL certification[2)]		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 which are in direct contact with a normal industrial environment.
2) Additional information: www.festo.com/sp → Certificates.

Datasheet

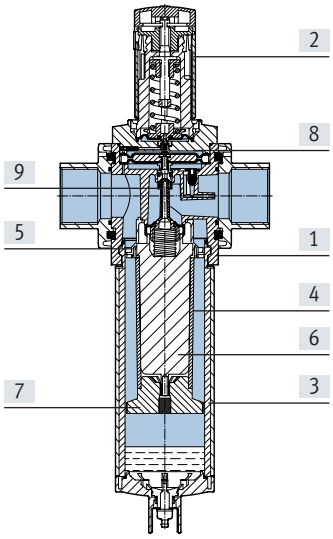
ATEX	
EU certification	[EX4]
ATEX category for gas	II 2G
Type of (ignition) protection for gas	Ex h IIC T6 Gb X
ATEX category for dust	II 2D
Type of (ignition) protection for dust	Ex h IIIC T60°C Db X
Explosion-proof ambient temperature	+5°C ≤ Ta ≤ +60°C
CE mark (see declaration of conformity)[1)]	To EU Explosion Protection Directive (ATEX)

1) Additional information: www.festo.com/sp → Certificates.

Weights [g]		
Rotary knob	Without integrated lock	With integrated lock
Filter regulator with metal bowl	2400	2700
Filter regulator with metal bowl and electrically actuated condensate drain, fully automatic	2800	3100

Materials

Sectional view



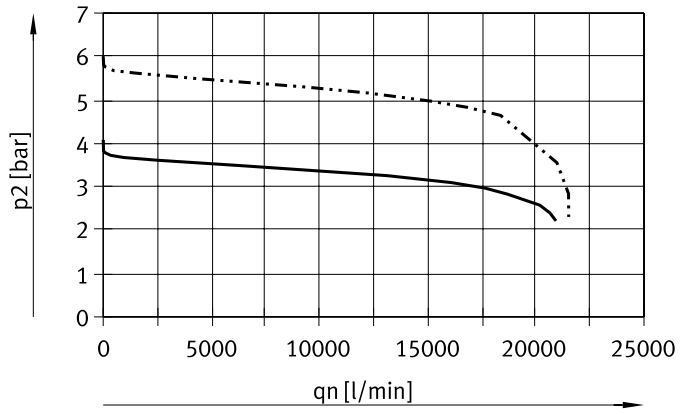
Filter regulator		
[1]	Housing	Die-cast aluminium
[2]	Rotary knob	PA
	Rotary knob with integrated lock	Aluminium
[3]	Bowl	Wrought aluminium alloy
	Inspection window	PA
[4]	Filter element	PE
[5]	Spin disc	POM
[6]	Filter support	POM
[7]	Separating disc	POM
[8]	Diaphragm	NBR
[9]	Valve tappet	Wrought aluminium alloy, NBR, POM
–	Cover	PA-reinforced
–	Connecting plate, module connector, mounting bracket	Die-cast aluminium
–	Seals	NBR
Note on materials		RoHS-compliant

Datasheet

Standard flow rate qn as a function of output pressure p2 (p1 = 10 bar)

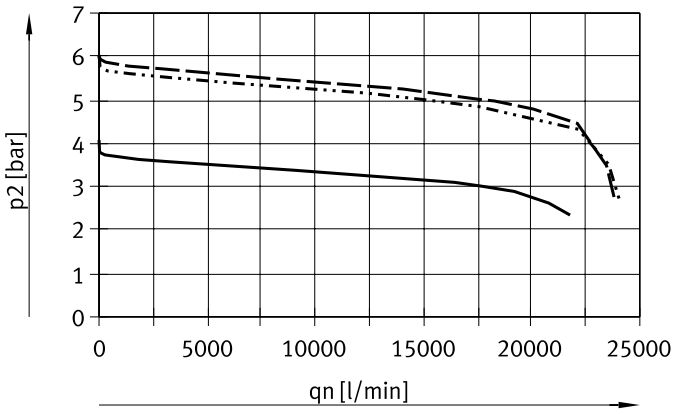
Piloted filter-diaphragm regulator

Grade of filtration 5 µm, pneumatic connection G3/4 or 3/4 NPT



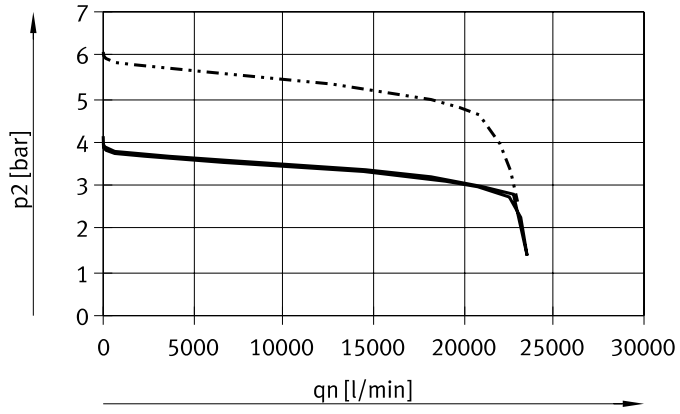
MS9-LFR-...-D5
MS9-LFR-...-D6/D7/D8

Grade of filtration 40 µm, pneumatic connection G3/4 or 3/4 NPT



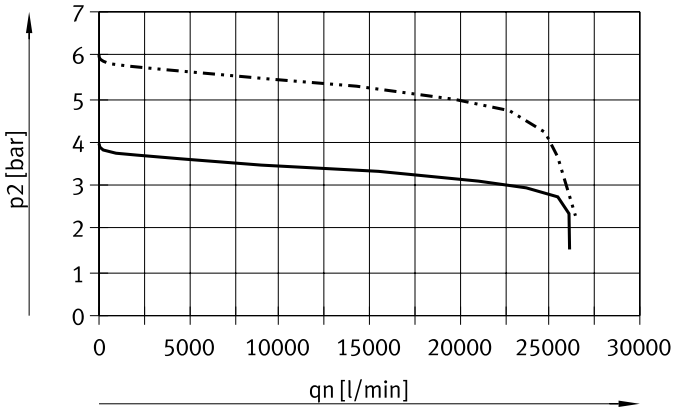
MS9-LFR-...-D5
MS9-LFR-...-D6/D8
MS9-LFR-...-D7

Grade of filtration 5 µm, pneumatic connection G1 or 1 NPT



MS9-LFR-...-D5
MS9-LFR-...-D6/D7/D8

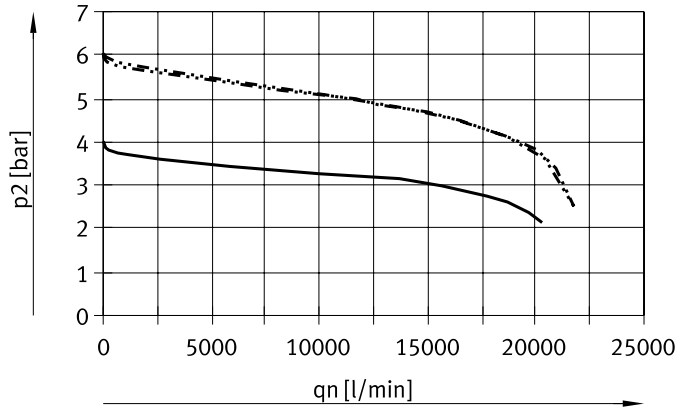
Grade of filtration 40 µm, pneumatic connection G1 or 1 NPT



Standard flow rate qn as a function of output pressure p2 at operating pressure p1 = 10 bar

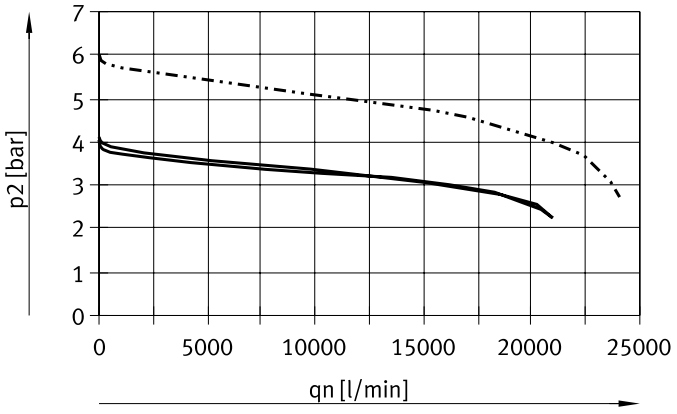
Directly actuated filter-diaphragm regulator

Grade of filtration 5 µm, pneumatic connection G3/4 or 3/4 NPT



MS9-LFR-...-D5
MS9-LFR-...-D6

Grade of filtration 40 µm, pneumatic connection G3/4 or 3/4 NPT

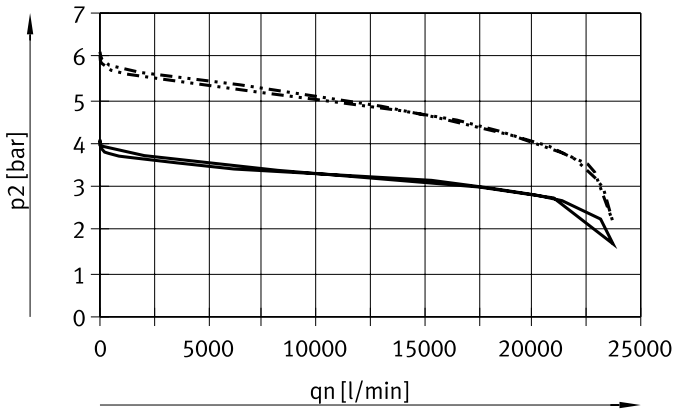


Datasheet

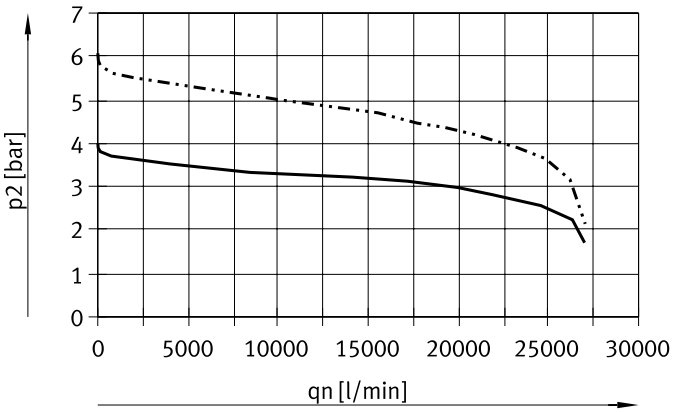
Standard flow rate qn as a function of output pressure p2 (p1 = 10 bar)

Directly actuated filter-diaphragm regulator

Grade of filtration 5 µm, pneumatic connection G1 or 1 NPT



Grade of filtration 40 µm, pneumatic connection G1 or 1 NPT



MS9-LFR-...-D5

MS9-LFR-...-D6

Dimensions – Basic version

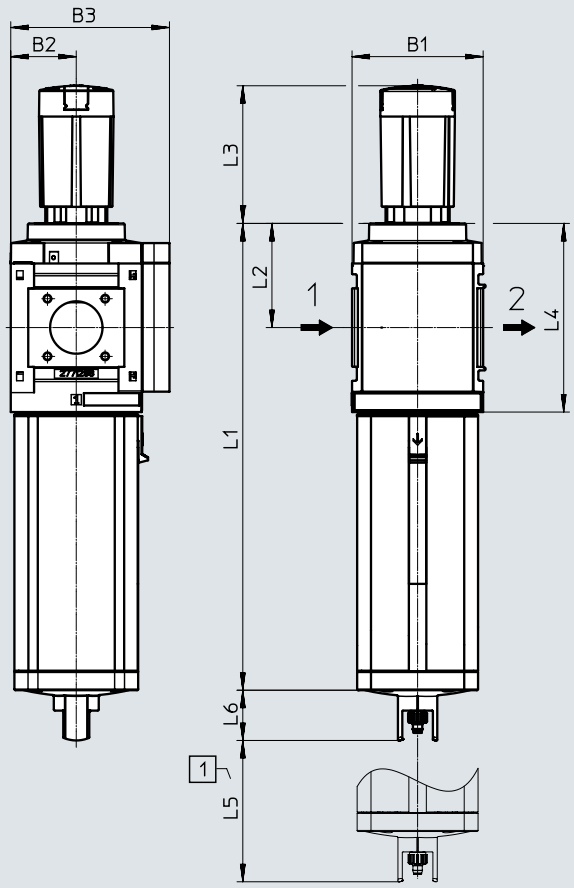
Download CAD data ➔ www.festo.com

[G]/[NG] Module without connecting thread, without connecting plate (inch)

[M]/[V] Rotary condensate drain, manual/fully automatic

[VS] Cover plate

[AS] Rotary knob with latch, can be locked using accessories



[1] Installation dimension

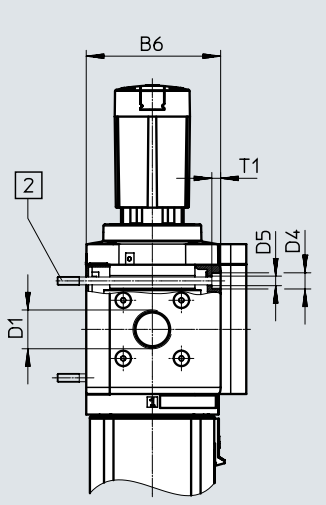
➔ Flow direction

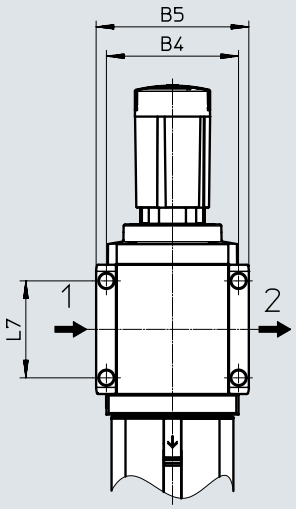
Type	B1	B2	B3	L1	L2	L3	L4	L5	L6
MS9-LFR-G/NG	90	45	109	320.5	71.5	94.5	127	150	34.5

Datasheet

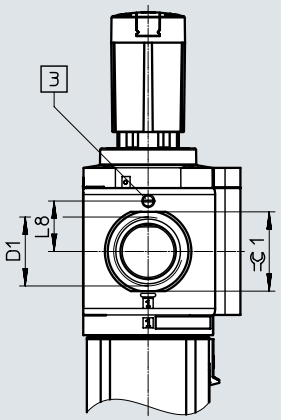
Dimensions – Connecting thread/connecting plate Download CAD data ➔ www.festo.com

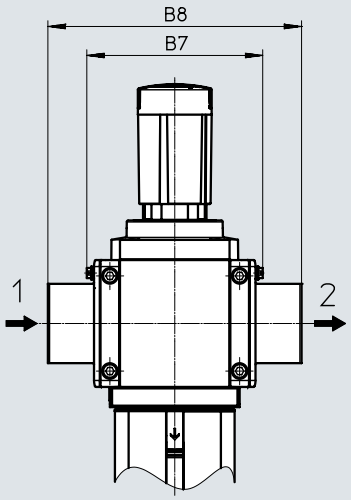
[3/4]/[1]/[N3/4]/[N1] Female thread





[AG...]/[AQ...] Connecting plate





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

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

➔ Flow direction

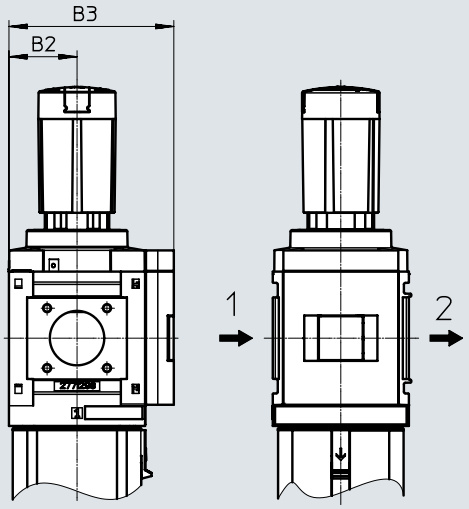
Type	B4	B5	B6	B7		B8	D1	D4	D5	L7	L8	T1	⊊
					[EX4]						[EX4]		
MS9-LFR-3/4	90	104	91.5	–	–	–	G3/4	11	6.5	66	–	6	–
MS9-LFR-1							G1						
MS9-LFR-AGD	–	–	–	112	122	132	G1/2	–	–	–	35	–	30
MS9-LFR-AGE						132	G3/4						36
MS9-LFR-AGF						142	G1						41
MS9-LFR-AGG						162	G1 1/4						50
MS9-LFR-AGH						176	G1 1/2						55
MS9-LFR-N3/4	90	104	91.5	–	–	–	3/4 NPT	11	6.5	66	–	6	–
MS9-LFR-N1							1 NPT						
MS9-LFR-AQR	–	–	–	112	–	132	1/2 NPT	–	–	–	–	–	30
MS9-LFR-AQS						132	3/4 NPT						36
MS9-LFR-AQT						142	1 NPT						41
MS9-LFR-AQU						162	1 1/4 NPT						50
MS9-LFR-AQV						176	1 1/2 NPT						55

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

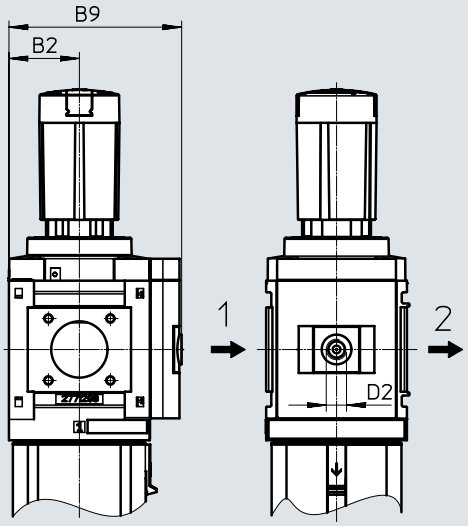
Datasheet

Dimensions – 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



➔ Flow direction

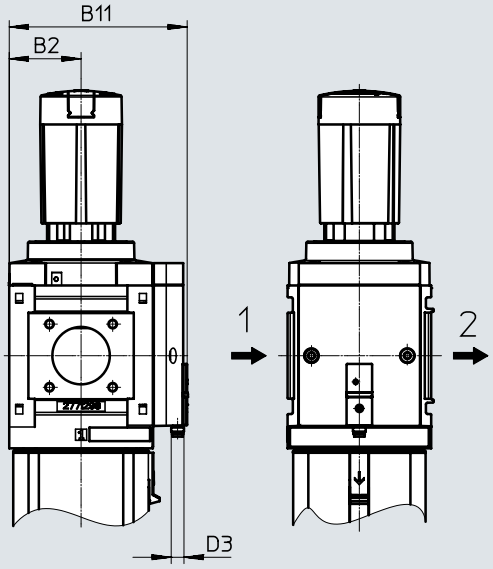
Type	B2	B3	B9	D2
MS9-LFR-...-AG/RG	45	109	–	–
MS9-LFR-...-A4		–	110	G1/4

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

Dimensions – Pressure gauge alternatives Download CAD data ➔ www.festo.com

Datasheets ➔ Internet: sde5

[AD7 ... AD10] Pressure sensor without LCD display (switching status indicator only)



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

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

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

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

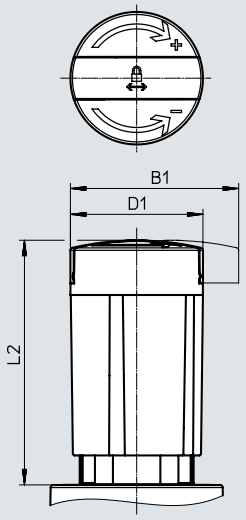
➔ Flow direction

Type	B2	B11	D3
MS9-LFR-...-AD7/AD8/AD9/AD10	45	112	M8x1

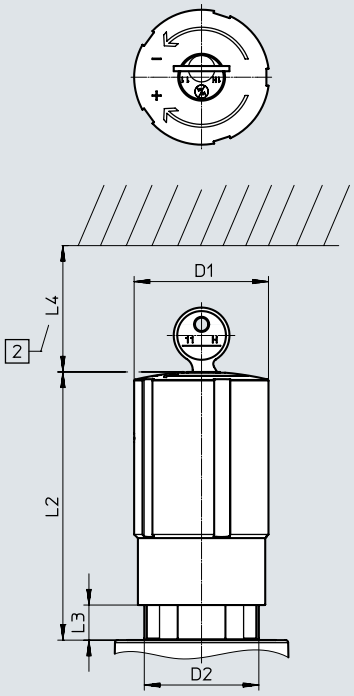
Datasheet

Dimensions – Rotary knob Download CAD data ➔ www.festo.com

[AS] Rotary knob with latch, can be locked using accessories



[E11] Rotary knob with integrated lock



[2] Installation dimension

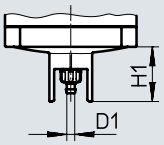
Type	B1	D1	D2	L2	L3	L4
MS9-LFR-...-AS	64.4	51.2	M44x1	94.5	–	–
MS9-LFR-...-E11	–			103.5	13.5	60

Datasheet

Dimensions – Condensate drain

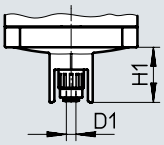
Download CAD data ➔ www.festo.com

[M]/[V] Manual/fully automatic



Barbed connector for plastic tubing
PUN(-H)-8x1.25

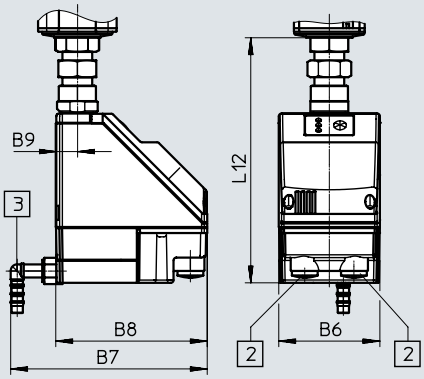
[H] Semi-automatic



Push-in connector for plastic tubing
PUN-6/PAN-6

[E2]/[E3]/[E4] Fully automatic, electrically actuated

Datasheets ➔ Internet: pwea



Condensate drain PWEA:

[2] Electrical connection: screw terminal PG9

[3] Connection can be rotated 360° for plastic tubing PUN-H-12x2

Type	B6	B7	B8	B9	D1	H1	L12
MS9-LFR-...-M/V	–				5.6	34.5	–
MS9-LFR-...-H					6.2		
MS9-LFR-...-E2/E3/E4	72	140	108	15	–		178

Datasheet

Ordering data

Size	Condensate drain	Grade of filtration 5 µm		Grade of filtration 40 µm	
		Part no.	Type	Part no.	Type
Pressure regulation range 0.5 ... 7 bar, piloted filter diaphragm regulator, integrated MS pressure gauge with standard scale, display unit [bar], rotary knob with latch, can be locked using accessories					
MS9	Manual	**564114**	**MS9-LFR-G-D6-CUM-AG-BAR-AS**	**564110**	**MS9-LFR-G-D6-EUM-AG-BAR-AS**
	Fully automatic	**564115**	**MS9-LFR-G-D6-CUV-AG-BAR-AS**	**564111**	**MS9-LFR-G-D6-EUV-AG-BAR-AS**
Pressure regulation range 0.5 ... 7 bar, directly actuated filter diaphragm regulator, integrated MS pressure gauge with standard scale, display unit [bar], rotary knob with latch, can be locked using accessories					
MS9	Manual	**564116**	**MS9-LFR-G-D6-CUM-DI-AG-BAR-AS**	**564112**	**MS9-LFR-G-D6-EUM-DI-AG-BAR-AS**
	Fully automatic	**564117**	**MS9-LFR-G-D6-CUV-DI-AG-BAR-AS**	**564113**	**MS9-LFR-G-D6-EUV-DI-AG-BAR-AS**
Pressure regulation range 0.5 ... 7 bar, directly actuated filter diaphragm regulator, integrated MS pressure gauge with standard scale, display unit [psi], rotary knob with latch, can be locked using accessories					
MS9	Manual	**564128**	**MS9-LFR-NG-D6-CUM-DI-AG-PSI-AS**	**564124**	**MS9-LFR-NG-D6-EUM-DI-AG-PSI-AS**
	Fully automatic	**564129**	**MS9-LFR-NG-D6-CUV-DI-AG-PSI-AS**	**564125**	**MS9-LFR-NG-D6-EUV-DI-AG-PSI-AS**
Pressure regulation range 0.5 ... 12 bar, piloted filter diaphragm regulator, integrated MS pressure gauge with standard scale, display unit [bar], rotary knob with latch, can be locked using accessories					
MS9	Manual	**564120**	**MS9-LFR-G-D7-CUM-AG-BAR-AS**	**564118**	**MS9-LFR-G-D7-EUM-AG-BAR-AS**
	Fully automatic	**564121**	**MS9-LFR-G-D7-CUV-AG-BAR-AS**	**564119**	**MS9-LFR-G-D7-EUV-AG-BAR-AS**

Ordering data – Modular product system

Ordering table

Grid dimension [mm]		90	Conditions	Code		Enter code
Module no.		**562531**				
Series		Standard		**MS**		MS
Size		9		**9**		9
Function		Filter regulator		**-LFR**		-LFR
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 (inch)	[1]	**-NG**		
Pressure regulation range/actuation		0.5 ... 4 bar, manually actuated		**-D5**		
		0.5 ... 7 bar, manually actuated		**-D6**		
		0.5 ... 12 bar, manually actuated		**-D7**		
		0.5 ... 16 bar, manually actuated	[1]	**-D8**		
Grade of filtration		40 µm		**-E**		
		5 µm		**-C**		
Bowl		Metal bowl		**-U**		-U
Condensate drain		Manual		**-M**		
		Semi-automatic (P1 max. 12 bar)		**-H**		
		Fully automatic (P1 max. 12 bar)		**-V**		
	External, fully automatic, electric	115 V AC, connection terminals (P1 max. 16 bar)	[1]	**-E2**		
		230 V AC, connection terminals (P1 max. 16 bar)	[1]	**-E3**		
		24 V DC, connection terminals (P1 max. 16 bar)	[1]	**-E4**		

[1] 3/4, 1, N3/4, N1, AQR, AQS, AQT, AQU, AQV, G, NG, D8, E2, E3, E4, AD7, AD8, AD9, AD10, E11, WPM Not with EU EX4 certification.

Ordering data – Modular product system

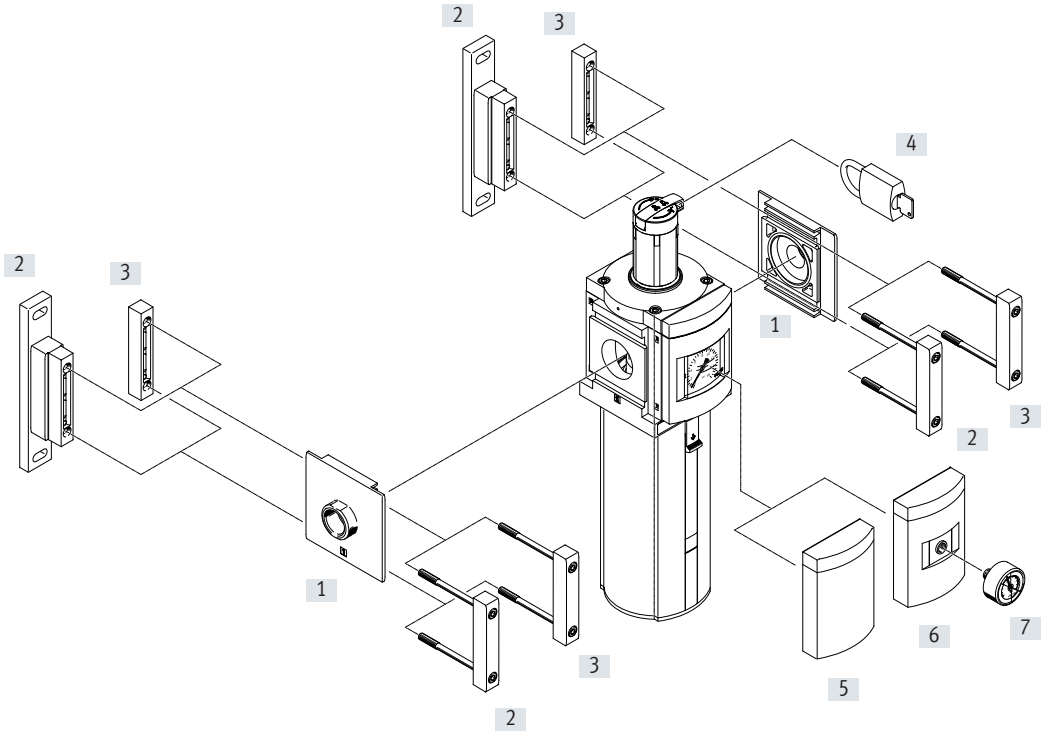
Ordering table

Grid dimension [mm]	90	Conditions	Code	Enter code
Regulator type	Piloted			
	Directly actuated	[2]	**-DI**	
Pressure gauge/pressure gauge alternatives	MS pressure gauge		**-AG**	
	Cover plate		**-VS**	
	Adapter for EN pressure gauge 1/4, without pressure gauge		**-A4**	
	Integrated pressure gauge, red/green scale	[3]	**-RG**	
	Pressure sensor with switching status indicator, M8 plug, threshold value comparator, PNP, N/O contact	[1] [4]	**-AD7**	
	Pressure sensor with switching status indicator, M8 plug, threshold value comparator, PNP, N/C contact	[1] [4]	**-AD8**	
	Pressure sensor with switching status indicator, M8 plug, window comparator, PNP, N/O contact	[1] [4]	**-AD9**	
	Pressure sensor with switching status indicator, M8 plug, window comparator, PNP, N/C contact	[1] [4]	**-AD10**	
Alternative pressure gauge scale	psi	[5]	**-PSI**	
	MPa	[5]	**-MPA**	
	Bar	[5]	**-BAR**	
Secondary exhausting	With secondary exhausting			
	Without secondary exhausting	[6]	**-OS**	
Locking option	Lockable using accessories		**-AS**	
	With integrated lock	[1]	**-E11**	
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, AQR, AQS, AQT, AQU, AQV, G, NG, D8, E2, E3, E4, AD7, AD8, AD9, AD10, E11, WPM — Not with EU EX4 certification.
[2] DI — Not with pressure regulation range D7, D8.
[3] RG — Not with alternative pressure gauge scale PSI. PSI scale serves only as an auxiliary scale.
[4] AD7 ... AD10 — Measuring range max. 10 bar.
[5] PSI, MPA, BAR — Not with pressure gauge alternatives VS, A4, AD7, AD8, AD9, AD10.
[6] OS — Only with regulator type DI.
[7] WP, WPM, WPB — Not with pneumatic connection G, NG.

Peripherals overview

Filter regulator MS12-LFR



Note

Additional accessories:

- Module connector for combination with size MS9 → Internet: armv

Mounting attachments and accessories

		→ Page/Internet
[1]	Connecting plate SET MS12-AG...	ms12-ag
[2]	Mounting bracket MS12-WP	ms12-wp
[3]	Module connector MS12-MV	ms12-mv
[4]	Padlock LRVS-D	54
[5]	Cover plate VS	52
[6]	Adapter for EN pressure gauge 1/4 A4	52
[7]	Pressure gauge MA	54

Type codes

001	Series	
MS	MS series	

002	Size	
12	Grid dimension 124 mm	

003	Function	
LFR	Filter regulator	

004	Pneumatic connection	
AGF	Sub-base G1	
AGG	Sub-base G11/4	
AGH	Sub-base G11/2	
AGI	Sub-base G2	
G	Module without connecting thread, without sub-base	

005	Pressure regulation range	
D6	0.3 ... 7 bar	
D7	0.5 ... 12 bar	
D8	0.5 ... 16 bar	

006	Filter version	
C	5 µm	
E	40 µm	

007	Bowl	
U	Metal bowl	

008	Condensate drain	
M	Manually	
V	Automatic	
E2	External fully automatic condensate drain, electric, 110 V AC, terminals	
E3	External fully automatic condensate drain, electric, 230 V AC, terminals	
E4	External fully automatic condensate drain, electric, 24 V DC, terminals	

009	Pressure gauge alternatives	
	None	
VS	Cover plate	
A4	Adapter for EN pressure gauge 1/4, without pressure gauge	

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

011	Rotary knob	
LD	Long rotary knob	

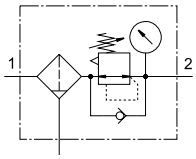
012	Lockability	
	None	
AS	Can be locked using accessories	
E11	With integrated lock	

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

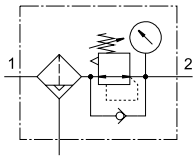
014	Flow direction	
	Flow direction from left to right	
Z	Flow direction from right to left	

Datasheet

Condensate drain, manual, with pressure gauge



Condensate drain fully automatic, with pressure gauge



Flow rate
11000 ... 17000 l/min

Temperature range
–10 ... +60°C

Operating pressure
0.8 ... 20 bar

www.festo.com



In this device, the filter and pressure regulator are combined in one unit. The sintered filter with water separator removes contamination, pipe scale, rust and condensate from the compressed air.

- Good regulation characteristics with minimal hysteresis and input pressure compensation
- Good particle and condensate separation
- High flow rate
- Pilot actuated diaphragm regulator without internal air consumption
- Three pressure regulation ranges: 0.3 ... 7 bar, 0.5 ... 12 bar and 0.5 ... 16 bar
- Pressure gauge connection for different mounting options
- Available with manual, fully automatic or fully automatic, electrically actuated condensate drain
- Actuator lock to protect set values from being adjusted
- Choice of 5 µm or 40 µm filter inserts
- New filter cartridges ➔ 53

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			Filter regulator with/without pressure gauge
			Sintered filter with centrifugal separator
			piloted diaphragm regulator
Regulator function			Output pressure constant, with input pressure compensation, with secondary exhausting
Type of mounting			With accessories
			In-line installation
Mounting position			Vertical ±5°
Grade of filtration		[µm]	5
			40
Air quality class at the output			Compressed air to ISO 85731:2010 [6:4:4] (grade of filtration 5 µm)
			Compressed air to ISO 85731:2010 [7:4:4] (grade of filtration 40 µm)
Bowl guard			Integrated as metal bowl
Condensate drain			Manual
			Fully automatic
			Fully automatic, electrically actuated
Actuator lock			Rotary knob with latch, can be locked using accessories
			Rotary knob with integrated lock
Pressure regulation range	[D6]	[bar]	0.3 ... 7
	[D7]	[bar]	0.5 ... 12
	[D8]	[bar]	0.5 ... 16
Max. pressure hysteresis		[bar]	0.4
Pressure indicator			With pressure gauge
Max. condensate volume		[cm^3]	400

Datasheet

Standard nominal flow rate qnN[1] [l/min]					
Pneumatic connection		G1	G1 1/4	G1 1/2	G2
Grade of filtration	5 µm	11000	11500	12000	14000
	40 µm	12000	12500	13000	17000

1) Dependent on the selected sub-base; must be ordered separately as an accessory → Internet: ms12-ag
Measured at p1 = 10 bar and p2 = 6 bar, Δp = 0.5 bar

125 l/min must be available for the fully automatic condensate drain to close correctly.

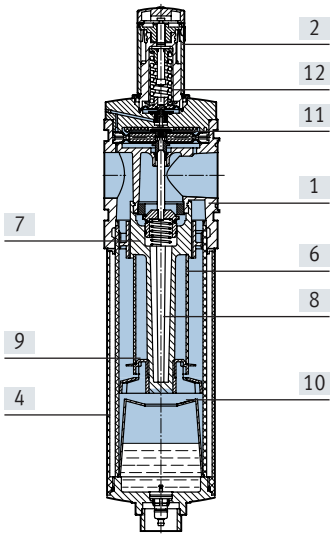
Operating and environmental conditions				
Condensate drain		Manual	Fully automatic	Fully automatic, electrically actuated
Operating pressure	[bar]	0.8 ... 20	2 ... 12	0.8 ... 16
Operating medium		Compressed air to ISO 8573-1:2010 [–:4:–]	Compressed air to ISO 8573-1:2010 [7:4:–]	Compressed air to ISO 8573-1:2010 [–:4:–]
		Inert gases		
Ambient temperature	[°C]	–10 ... +60	+5 ... +60	+1 ... +60
Temperature of medium	[°C]	–10 ... +60	+5 ... +60	+1 ... +60
Storage temperature	[°C]	–10 ... +60	–10 ... +60	+1 ... +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 which are in direct contact with a normal industrial environment.

Weights [g]		
Rotary knob	Without integrated lock	With integrated lock
Filter regulator with metal bowl	7000	7300
Filter regulator with metal bowl and electrically actuated condensate drain, fully automatic	7700	8000

Materials

Sectional view



Filter regulator		
[1]	Housing	Die-cast aluminium
[2]	Rotary knob	PA
	Rotary knob with integrated lock	Aluminium
[4]	Metal bowl	Wrought aluminium alloy
[6]	Filter element	Sintered bronze
[7]	Spin disc	POM
[8]	Filter support	POM
[9]	Separating disc	POM
[10]	Stabilising disc	POM
[11]	Diaphragm	NBR
[12]	Spring	Steel
–	Seals	NBR

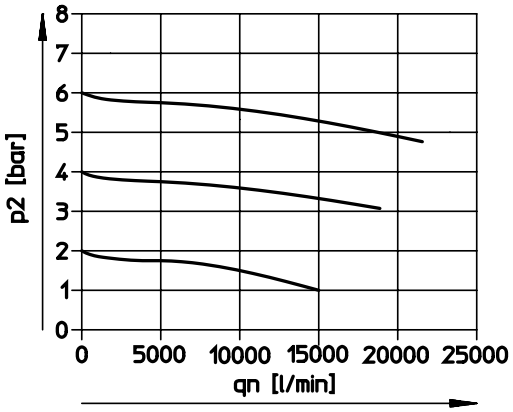
Datasheet

Standard flow rate qn as a function of output pressure p2 (p1 = 10 bar)

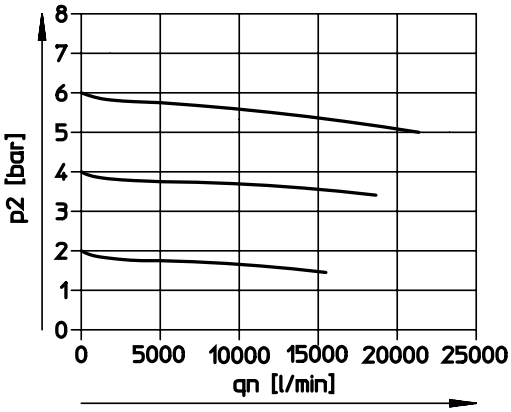
Grade of filtration 40 µm

Input pressure p1 = 10 bar

Pneumatic connection G1 with connecting plate MS12-AGF

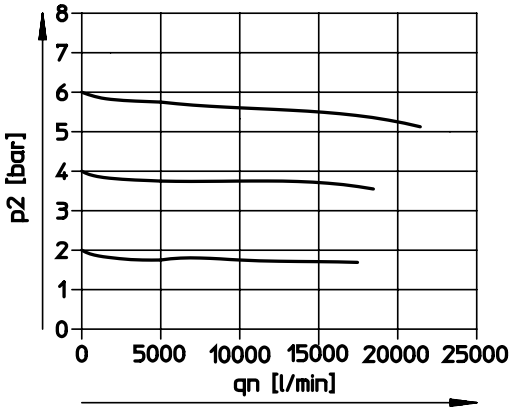


Pneumatic connection G1 1/4 with connecting plate MS12-AGG

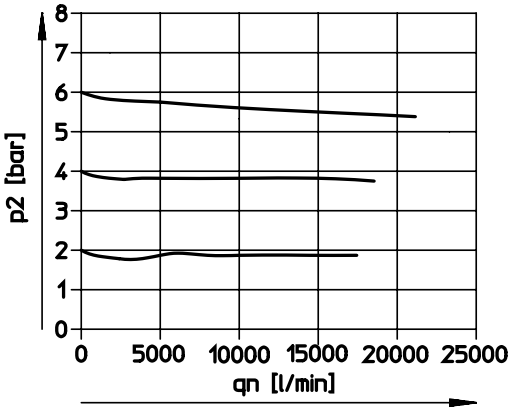


Input pressure p1 = 10 bar

Pneumatic connection G1 1/2 with connecting plate MS12-AGH



Pneumatic connection G2 with connecting plate MS12-AGI



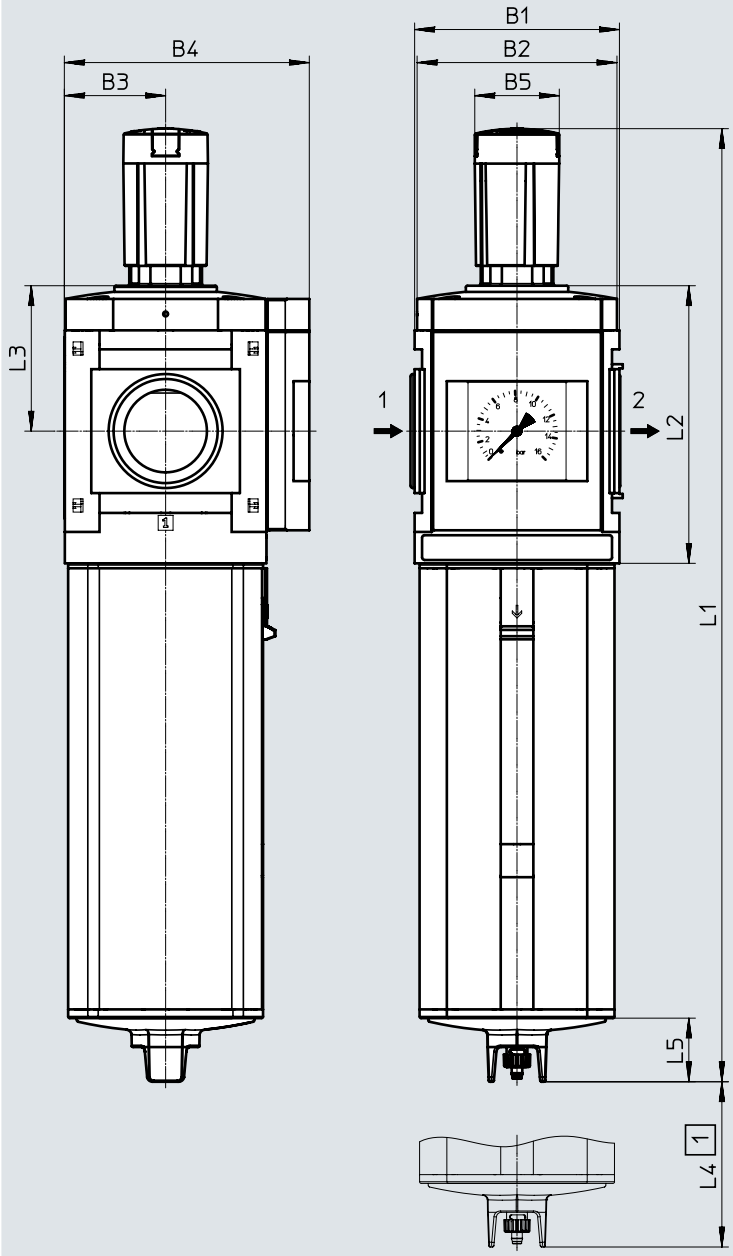
Datasheet

Dimensions – Basic version Download CAD data ➔ www.festo.com

[G] Module without connecting thread, without connecting plate

[ ] Integrated MS pressure gauge with standard scale

[AS] Rotary knob, long, with latch, can be locked using accessories



[1] Installation dimension

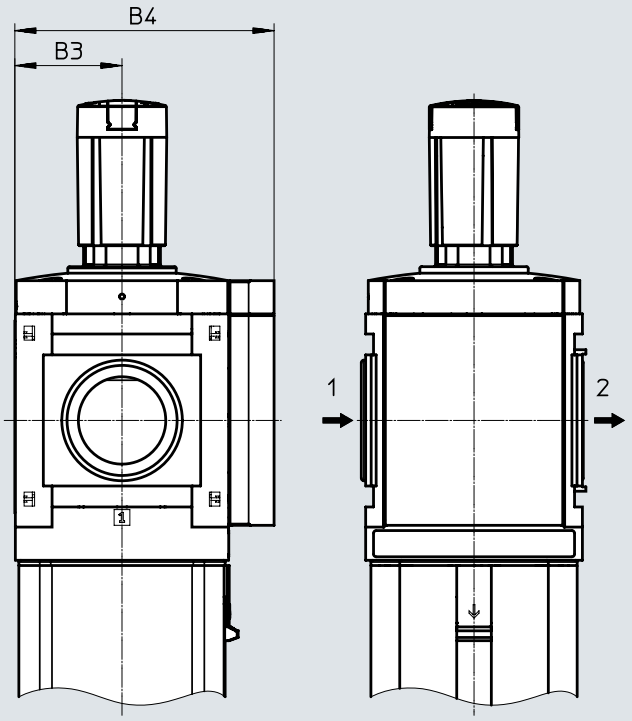
➔ Flow direction

Type	B1	B2	B3	B4	B5 ø	L1	L2	L3	L4	L5
MS12-LFR-G	124	122	61	148	51.2	577	168	88	250	39

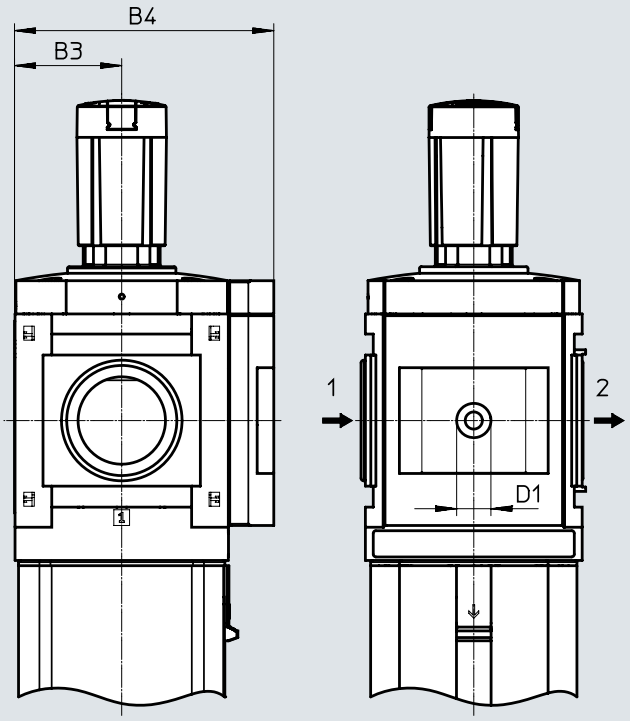
Datasheet

Dimensions – Pressure gauge alternatives Download CAD data ➔ www.festo.com

[VS] Cover plate



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



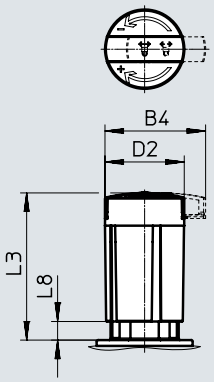
➔ Flow direction

Type	B3	B4	D1
MS12-LFR-...-VS	61	148	–
MS12-LFR-...-A4	61	148	G1/4

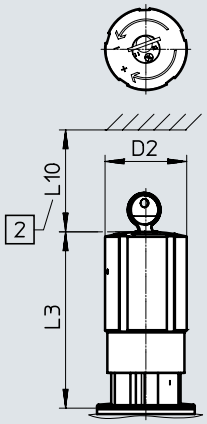
Note: this product conforms to ISO 1179-1 and ISO 228-1.

Dimensions – Rotary knob Download CAD data ➔ www.festo.com

[LD-AS] Rotary knob, long, with latch, can be locked using accessories



[E11] Rotary knob with integrated lock



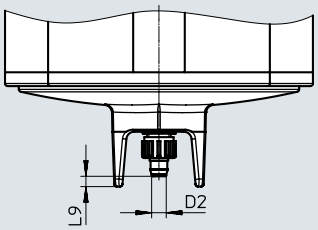
[2] Installation dimension

Type	B4	D2 ø	L3	L8	L10
MS12-LFR-...-LD-AS	64.4	51.2	95	12	–
MS12-LFR-...-E11	–	51.8	112	–	60

Datasheet

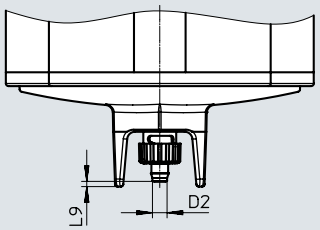
Dimensions – Condensate drain Download CAD data ➔ www.festo.com

[M] Manual



Barbed connector for plastic tubing PUN(-H)-8x1.25

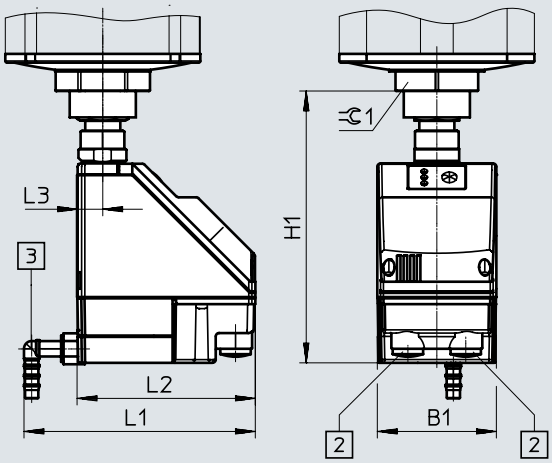
[V] Fully automatic



Barbed connector for plastic tubing PUN(-H)-8x1.25

[E2]/[E3]/[E4] Fully automatic, electrically actuated

Datasheets ➔ Internet: pwea



Condensate drain PWEA:
- [2] Electrical connection: screw terminal PG9
- [3] Connection can be rotated 360° for plastic tubing PUN-H-12x2

Type	B1	D2 ⌀	H1	L1	L2	L3	L9	⊂1
MS12-LFR-...-M	–	5.6	–	–	–	–	4	–
MS12-LFR-...-V	–	5.6	–	–	–	–	2	–
MS12-LFR-...-E2/E3/E4	72	–	164	140	108	15	–	50

Ordering data

Size	Condensate drain	Grade of filtration 5 µm			Grade of filtration 40 µm	
		Part no.	Type		Part no.	Type
Pressure regulation range 0.5 ... 12 bar, metal bowl, integrated MS pressure gauge with standard scale, display unit [bar], rotary knob, long, with latch, can be locked using accessories						
MS12	Fully automatic	**537150**	**MS12-LFR-G-D7-CUV-LD-AS**		**537149**	**MS12-LFR-G-D7-EUV-LD-AS**

Ordering data – Modular product system

Ordering table

Grid dimension [mm]	124	Conditions	Code	Enter code
Module no.	**535022**			
Series	Standard		**MS**	MS
Size	12		**12**	12
Function	Filter regulator		**-LFR**	-LFR
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 regulation range	0.3 ... 7 bar		**-D6**	
	0.5 ... 12 bar		**-D7**	
	0.5 ... 16 bar		**-D8**	
Grade of filtration	40 µm		**-E**	
	5 µm		**-C**	
Bowl	Metal bowl		**-U**	-U
Condensate drain	Manual		**-M**	
	Fully automatic (P1 max. 12 bar)	[1]	**-V**	
	External fully automatic condensate drain, electric, 115 V AC, connection terminals		**-E2**	
	External fully automatic condensate drain, electric, 230 V AC, connection terminals		**-E3**	
	External fully automatic condensate drain, electric, 24 V DC, connection terminals		**-E4**	
Pressure gauge alternatives	MS pressure gauge			
	Cover plate		**-VS**	
	Adapter for EN pressure gauge 1/4, without pressure gauge		**-A4**	
Alternative pressure gauge scale	MS pressure gauge, bar			
	psi	[2]	**-PSI**	
	MPa	[2]	**-MPA**	
Rotary knob	Without			
	Long rotary knob	[3]	**-LD**	
Locking option	Lockable using accessories	[4]	**-AS**	
	With integrated lock		**-E11**	
Type of mounting	Without mounting bracket			
	Mounting bracket standard design	[5]	**-WP**	
Flow direction	Flow direction from left to right			
	Flow direction from right to left		**-Z**	

[1] V Not with pressure regulation range D8.
[2] PSI, MPA Not with pressure gauge alternatives VS, A4.
[3] LD Not with locking option E11.
[4] AS Only with rotary knob LD.
[5] WP Only with connecting plate AGF, AGG, AGH or AGI.

Accessories

Filter cartridge MS-LFP



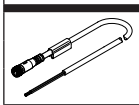
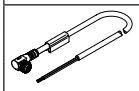
Ordering data

Size	Grade of filtration [µm]	Part no.	Type
MS4	5 (colour: blue)	**534501**	**MS4-LFP-C**
	40 (colour: white)	**534502**	**MS4-LFP-E**
MS6	5 (colour: blue)	**534499**	**MS6-LFP-C**
	40 (colour: white)	**534500**	**MS6-LFP-E**
MS9	5	**570309**	**MS9-LFP-C**
	40	**570310**	**MS9-LFP-E**
MS12	5	**537143**	**MS12-LFP-C**
	40	**537144**	**MS12-LFP-E**

Accessories

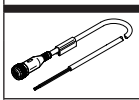
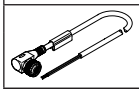
Ordering data – Connecting cable NEBU-M8

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
		4	2.5	541342	NEBU-M8G4-K-2.5-LE4
	M8x1, angled plug socket	3	2.5	★ 541338	NEBU-M8W3-K-2.5-LE3
			5	★ 541341	NEBU-M8W3-K-5-LE3
		4	2.5	541344	NEBU-M8W4-K-2.5-LE4

Ordering data – Connecting cable NEBU-M12

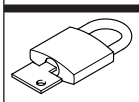
Datasheets → Internet: nebu

	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 plug socket	4	2.5	550325	NEBU-M12W5-K-2.5-LE4
			5	541329	NEBU-M12W5-K-5-LE4

Ordering data – Pressure gauge MA

	Nominal size	Pneumatic connection	Display range [bar]	[psi]	Part no.	Type
	**Pressure gauge MA, DIN 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, DIN 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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