

Filter regulators MS-LFR, MS series

FESTO



Key features

Service unit components of the MS series

Solutions for every application

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

Available as individual components, pre-assembled combinations ex-stock, application-specific combinations or complete ready-to-install solutions. The five sizes of the MS series achieve maximum flow rates with minimum space requirements.

CAD models and configurator

Convenient tools for planning and selecting application-specific individual devices and combinations. The product configurator can be used to configure customised solutions quickly and to 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 purity class:

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

Freely combinable functional 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. Thanks to the modular structure the components can be combined as required. The simple connection system saves time because there is no need to disassemble the entire combination when replacing individual modules.

Many of the components are also UL and ATEX certified.

Air quality

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

Selection criteria: Application

Filter combination is proposed based upon your selected application

- ☐ standard pneumatics operation of valves and cylinders, e.g. in automotive industry, secondary packaging
- ☐ mining and building industry applications without special air cleanliness requirements
- ☐ application of pressure operated tools and machines pneumatic hammer, air engine, positioning with proportional valve
- ☐ electronic, flatpanel and solar industry, textile and paper production application with residual oil content <0.5 mg/m³
- ☐ painting, powder coating, air bearing application with residual oil content <0.01 mg/m³
- ☐ food and beverage industry, optics application with residual oil content <0.003 mg/m³ reduction of oil vapours and aromas

Selection criteria: ISO-class

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

particle : 4 * : oil

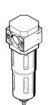


* Downstream from the compressor the water content is assumed to be ISO class 4, better classes can be achieved by applying an adsorption dryer PDAD or a membrane dryer LDM1

Direct filter selection

Independent selection of filter combination

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



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

Integrated sensors

Pressure and flow sensors

Safety functions

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

Saving energy

Service unit combinations MSE6

Intelligent mix of sizes



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



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



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



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

Size differences

Size		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 q _N 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 components of the MS series service units.

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

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

Designing a service unit combination

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

The configurator for the service unit combination MSB is a reliable and convenient way of combining the individual service unit components and ensures compliance with the applicable rules. As a result, you get a fully assembled combination with UL or ATEX certification, if necessary. When combining a unit from individually configured and ordered service unit components, the points on the right must be adhered to under all circumstances.

- Regulators MS-LFR/LR/LRP are only permissible in the flow direction with the same or decreasing pressure regulation range
- Filters MS-LFR/LF/LFM/LFX are only permissible in the flow direction with an increasing grade of filtration
- Lubricators MS-LOE are not permitted in the flow direction upstream of a filter MS-LFR/LFM/LF/LFX, water separator MS-LWS or membrane air dryer MS-LDM1
- A micro filter MS-LFM must be installed in the flow direction upstream of an activated carbon filter MS-LFX or membrane air dryer MS-LDM1
- A flow sensor SFAM cannot be installed directly downstream of a regulator MS-LFR/LR; a branching module MS-FRM must be positioned between them
- A soft-start/quick exhaust valve MS-SV must be the last service unit component in the flow direction

Product range for service unit components MS series

Type	Description	Size	Pneumatic connection					
			Push-in connector	Female thread			Connecting plate with thread	
				M	G	NPT	G	NPT
Combinations								
Service unit combinations MSB-FRC								Datasheets → Internet: msb
	Combinations of filter regulator and lubricator	4	–	–	1/8, 1/4	–	–	–
		6	–	–	1/4, 3/8, 1/2	–	–	–
Service unit combinations MSB								
								Datasheets → Internet: msb
	Certain predefined combinations	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

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

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

Key features

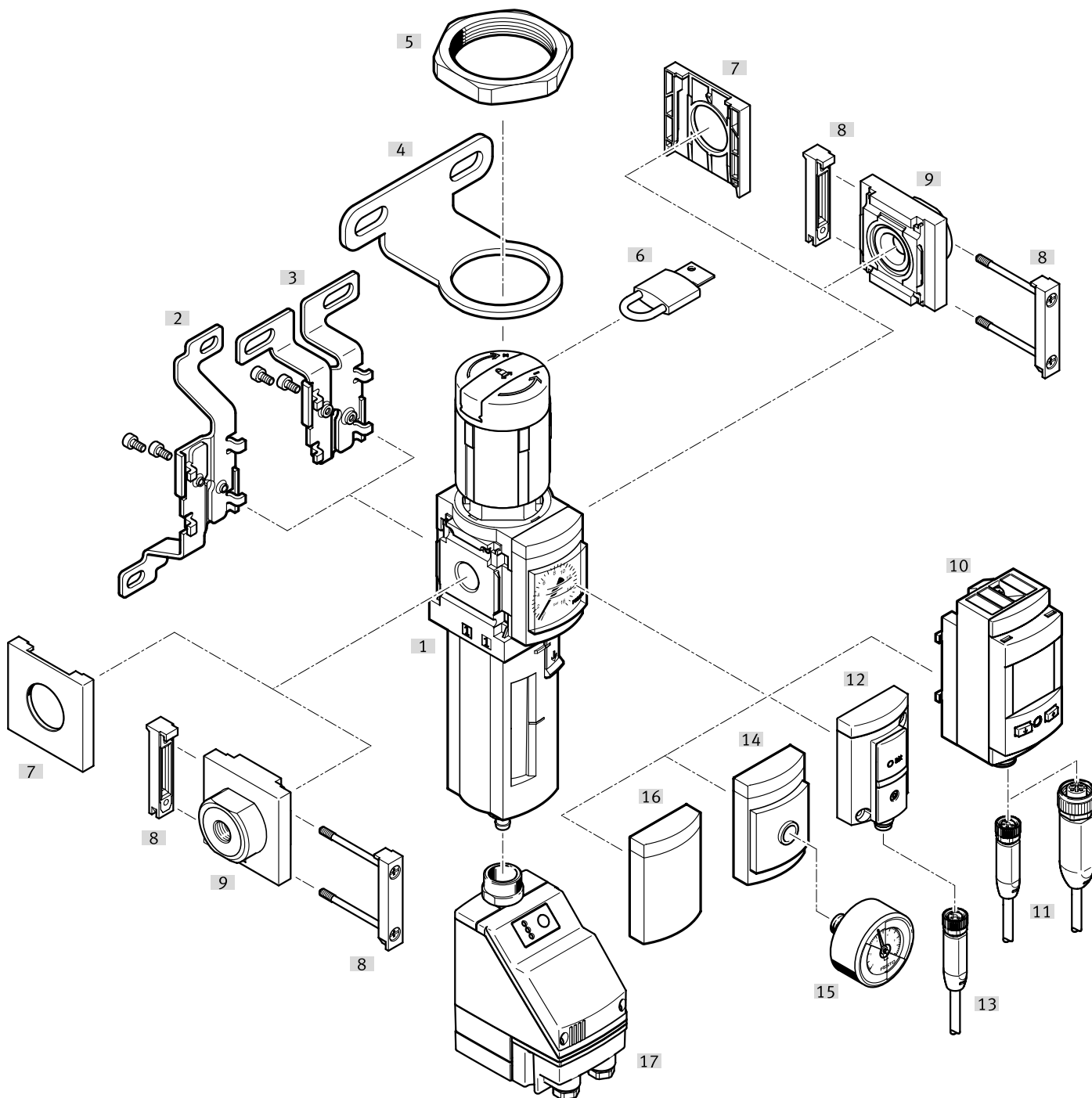
Product range for service unit components MS series								
Type	Description	Size	Pneumatic connection					
			Push-in connector	Female thread			Connecting plate with thread	
				M	G	NPT	G	NPT
Individual devices								
On/off valves MS-EM			Datasheets → Internet: ms4-em; ms6-em; ms9-em; ms12-em					
	Manually actuated on/off valve for pressurising and exhausting pneumatic systems.	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
On/off valves MS-EE								
	Electrically actuated on/off valve for pressurising and exhausting pneumatic systems.	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
On/off valves MS-EE-B								
	Electrically actuated on/off valve in polymer housing for pressurising and exhausting pneumatic systems.	4	–	–	1/4	–	–	–
		6	–	–	1/2	–	–	–
Soft-start valves MS-DL								
	Pneumatically actuated soft-start valve for slowly pressurising pneumatic systems.	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
Soft-start valves MS-DE								
	Electrically actuated soft-start valve for slowly pressurising pneumatic systems.	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
On/off valves MS-EDE-B								
	Electrically actuated soft-start valve in polymer housing for slowly pressurising and exhausting pneumatic systems.	4	–	–	1/4	–	–	–
		6	–	–	1/2	–	–	–
Soft-start/quick exhaust valves 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

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

Peripherals overview

Filter regulator MS4/MS6-LFR



Note

Additional accessories:

- Module connectors for combination with size MS4/MS6 or size MS9
→ Internet: amv, rmv, armv
- Adapters 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]	Pressure sensor with LCD display AD11/AD12	■	■	■	■	28
[11]	Connecting cable NEBA-M8...-LE4/NEBA-M12...-LE4	■	■	■	■	54
[12]	Pressure sensor without display AD7 ... AD10	■	■	■	■	28
[13]	Connecting cable NEBA-M8...-LE3	■	■	■	■	54
[14]	Adapter for EN pressure gauge 1/8, 1/4 A8/A4	■	■	■	■	28
[15]	Pressure gauge MA	■	■	■	■	54
[16]	Cover plate VS	■	■	■	■	28
[17]	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 1/8 NPT
AQN	Sub-base 1/4 NPT
AQP	Sub-base 3/8 NPT

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

006	Filter design
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
A4	Adapter for EN pressure gauge 1/4, without pressure gauge
A8	Adapter for EN pressure gauge 1/8, without pressure gauge
AD7	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/O
AD8	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/C
AD9	Pressure sensor with switching display, M8 plug, window comparator, PNP, N/O
AD10	Pressure sensor with operational status indicator, M8 plug, window comparator, PNP, N/C
AD11	Pressure sensor with LCD display, M12 plug, 4-pin, IO-Link®, PNP, NPN, 0...10 V, 1...5 V, 4...20 mA
AD12	Pressure sensor with LCD display, M8 plug, 4-pin, IO-Link®, PNP, NPN, 0...10 V, 1...5 V, 4...20 mA
RG	Integrated pressure gauge, red/green scale
VS	Cover plate

010	Secondary exhausting
	With secondary exhausting
OS	Without secondary exhaust

011	Rotary knob alternative
	None
LD	Long rotary knob

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

013	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

014	EU certification
	None
EX4	II 2GD

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

016	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 1/4 NPT	
AQP	Sub-base 3/8 NPT	
AQR	Sub-base 1/2 NPT	
AQS	Sub-base 3/4 NPT	
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 design	
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	
A4	Adapter for EN pressure gauge 1/4, without pressure gauge	
A8	Adapter for EN pressure gauge 1/8, without pressure gauge	
AD7	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/O	
AD8	Pressure sensor with switching display, M8 plug, threshold value comparator, PNP, N/C	
AD9	Pressure sensor with switching display, M8 plug, window comparator, PNP, N/O	
AD10	Pressure sensor with operational status indicator, M8 plug, window comparator, PNP, N/C	
AD11	Pressure sensor with LCD display, M12 plug, 4-pin, IO-Link®, PNP, NPN, 0...10 V, 1...5 V, 4...20 mA	
AD12	Pressure sensor with LCD display, M8 plug, 4-pin, IO-Link®, PNP, NPN, 0...10 V, 1...5 V, 4...20 mA	
RG	Integrated pressure gauge, red/green scale	
VS	Cover plate	

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	

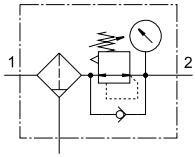
015	EU certification	
	None	
EX4	II 2GD	

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

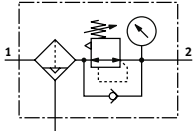
017	Flow direction	
	Flow direction from left to right	
Z	Flow direction from right to left	

Datasheet

Condensate drain, manual, rotating,
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 com-
pressed 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 primary 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 the 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
	[AQ...]	1/8 NPT, 1/4 NPT or 3/8 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	
Pore size [µm]	< 5	
	< 40	
Air purity class at the output	Compressed air in accordance with ISO 8573-1:2010 [6:4:4] (grade of filtration 5 µm)	
	Compressed air in accordance with ISO 8573-1:2010 [7:4:4] (grade of filtration 40 µm)	
Bowl guard	Plastic bowl guard	
	Integrated as metal bowl	
Condensate drain	Manual, rotating	
	Manual, non-detenting	
	Semi-automatic	
	Fully automatic	
	-	Fully automatic, electrically actuated
Degree of condensate separation [%]	> 75	
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 indication			With pressure sensor for indicating the output pressure via LCD display and electrical output	
			With pressure sensor for indicating the output pressure via the switching status indicator and electrical output	
			Via pressure gauge for displaying the output pressure	
			With pressure gauge with red/green scale for indicating the output pressure	
			Prepared for G1/8	
			Prepared for G1/4	
Max. condensate volume	[ml]	19 (with plastic bowl guard)		38
		25 (with metal bowl)		

Standard nominal flow rate $q_{N^{1)}$ [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 $p_1 = 10$ bar and $p_2 = 6$ bar, $\Delta p = 1$ bar2) Measured at $p_1 = 10$ bar and $p_2 = 3$ bar, $\Delta p = 1$ bar

- ‡ - A flow of 125 l/min is required to ensure trouble-free closing of the fully automatic condensate drain.

Datasheet

Operating and environmental conditions							
Condensate drain	Manual, rotating		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⁾		-10 ... +60 (+5 ... +50) ²⁾		-10 ... +60 (+5 ... +50) ²⁾		+1 ... +60 (+1 ... +50) ²⁾
Temperature of medium [°C]	-10 ... +60 (0 ... +50) ²⁾		-10 ... +60 (+5 ... +50) ²⁾		-10 ... +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						
Food safe 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) More information: www.festo.com/x/topic/crc4) More information: www.festo.com/catalogue/ms-lfr → Support/Downloads.

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

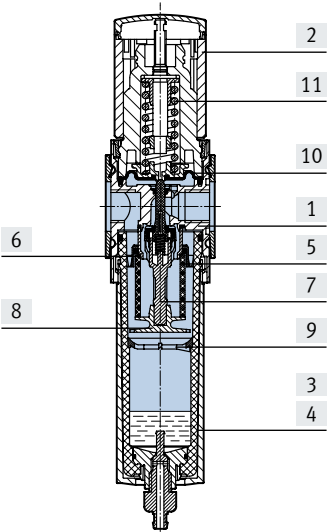
1) More information: www.festo.com/catalogue/ms-lfr → Support/Downloads.

Weight [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



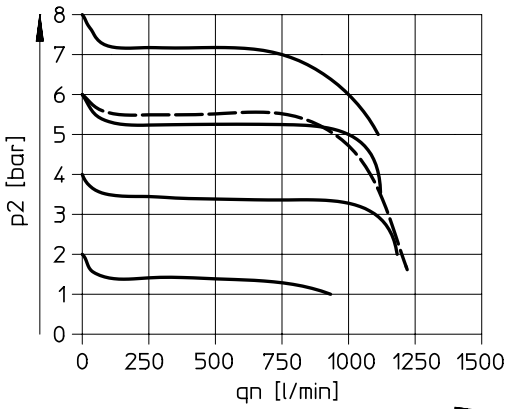
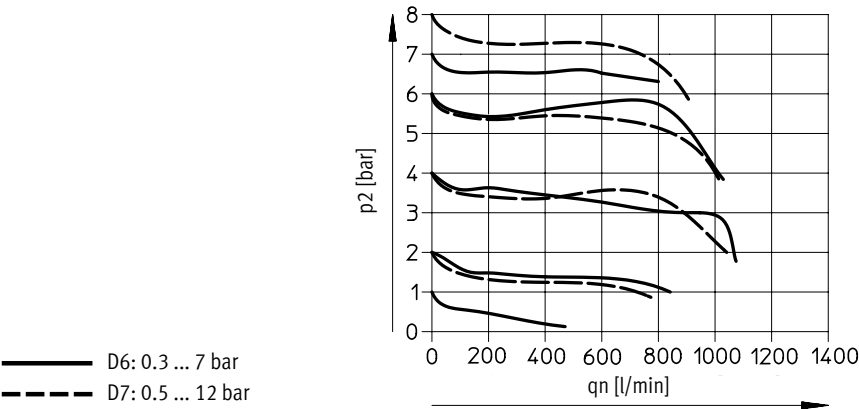
Filter regulator		
[1]	Housing	Die-cast aluminium
[2]	Rotary knob	PA, POM
	Rotary knob with integrated lock	Aluminium
[3]	Plastic bowl guard	PC
[4]	Metal bowl	Wrought aluminium alloy, die-cast aluminium
	Inspection window	PA
[5]	Filter element	PE
[6]	Spin disc	POM
[7]	Filter support	POM
[8]	Separating disc	POM
[9]	Stabilising disc	POM
[10]	Diaphragm	NBR
[11]	Spring	Steel
–	Seals	NBR
Note on materials		RoHS-compliant
LABS (PWIS) conformity		VDMA24364-B1/B2-L

Standard flow rate q_n as a function of output pressure p_2 ($p_1 = 10 \text{ bar}$)

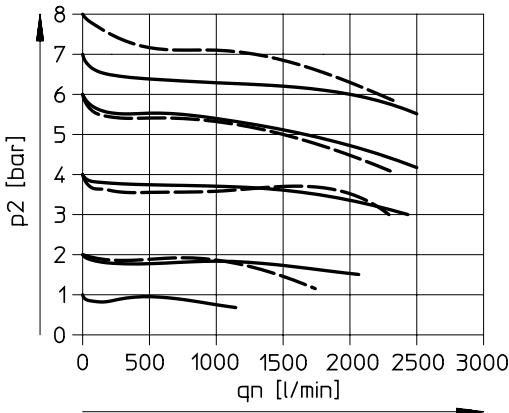
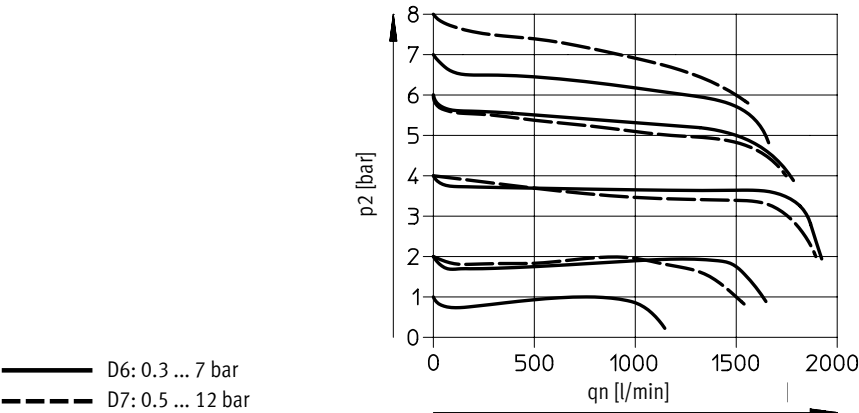
Grade of filtration $5 \mu\text{m}$

Grade of filtration $40 \mu\text{m}$

MS4-LFR-1/8



MS4-LFR-1/4

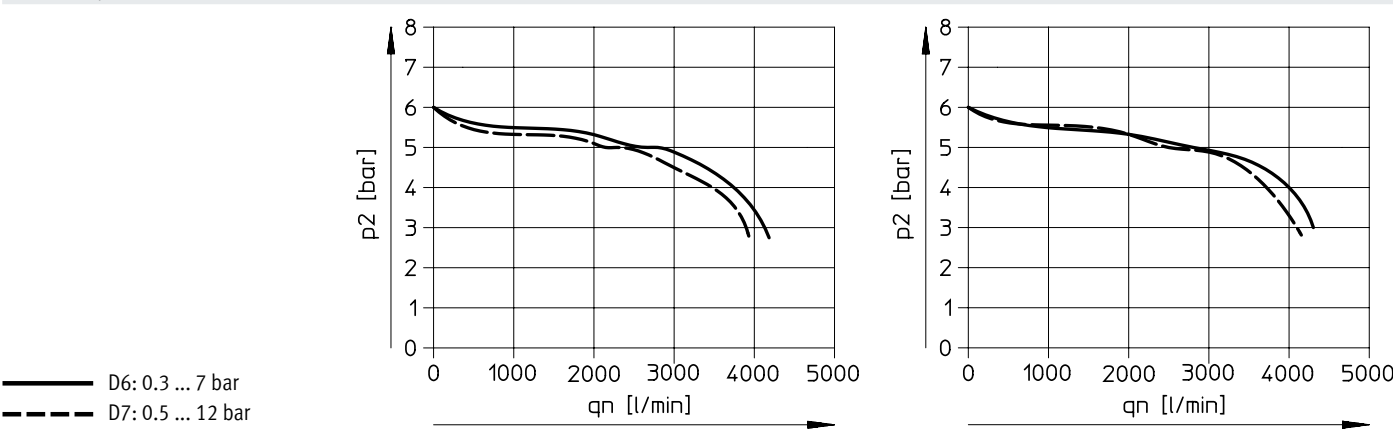


Datasheet

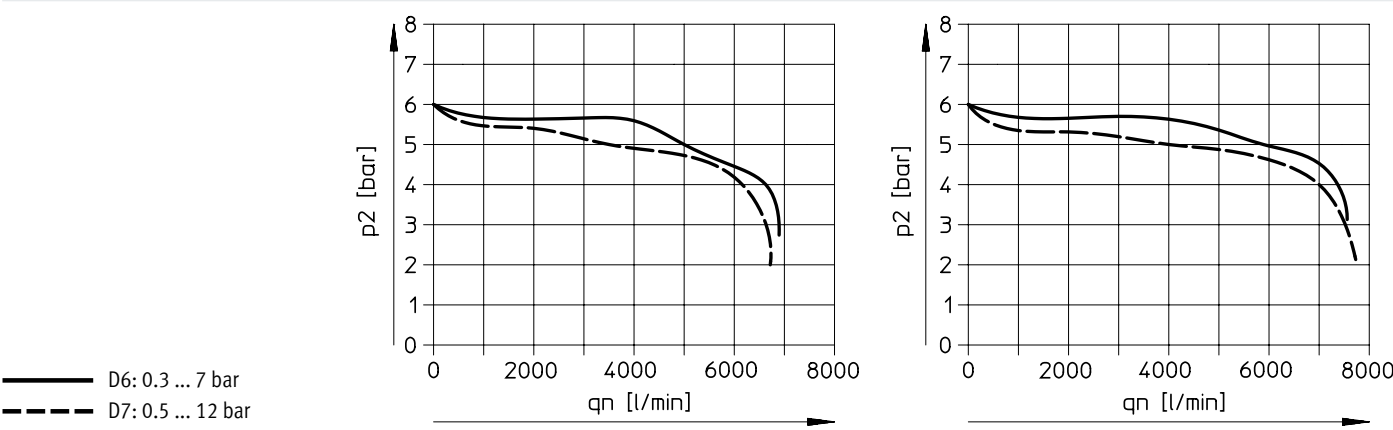
Standard flow rate q_n as a function of output pressure p_2 ($p_1 = 10 \text{ bar}$)

Grade of filtration $5 \mu\text{m}$ Grade of filtration $40 \mu\text{m}$

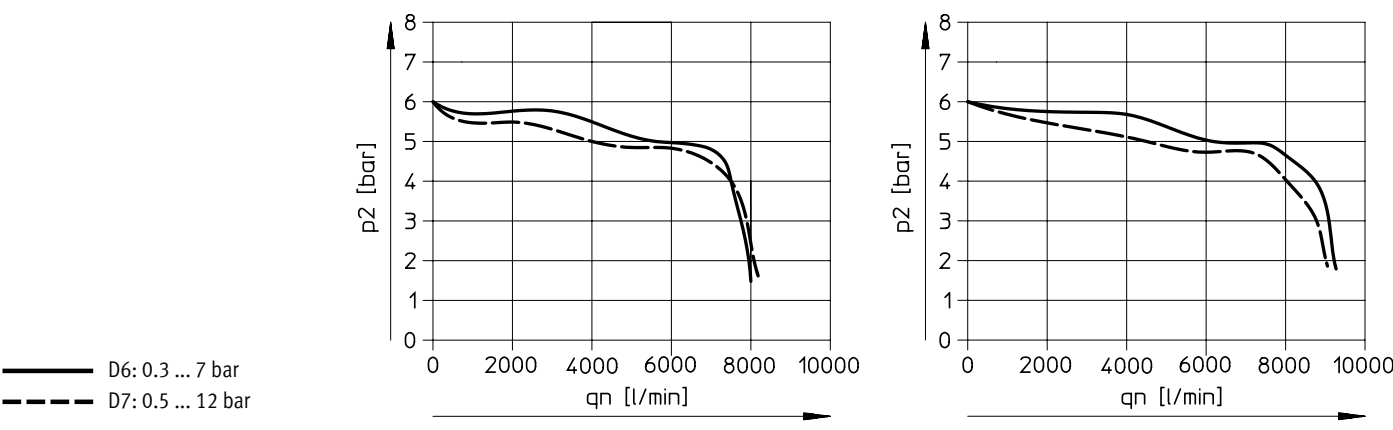
MS6-LFR-1/4



MS6-LFR-3/8



MS6-LFR-1/2



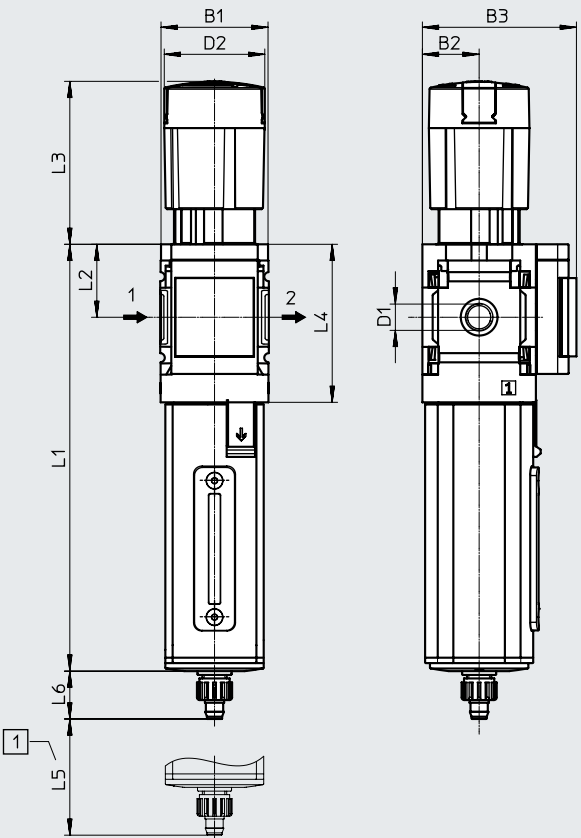
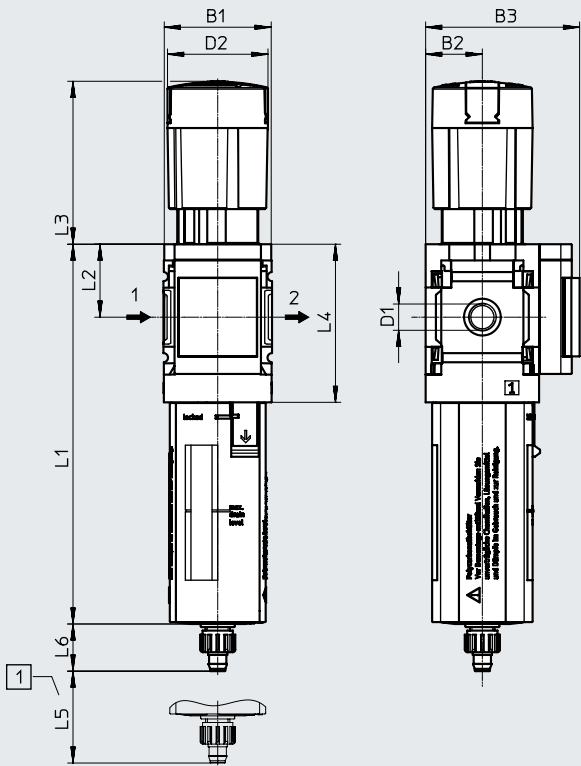
Datasheet

Dimensions – Basic version MS4-LFR

Download CAD data → www.festo.com

- [] Integrated MS pressure gauge with standard scale
- [M] Condensate drain, manual, rotating
- [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.

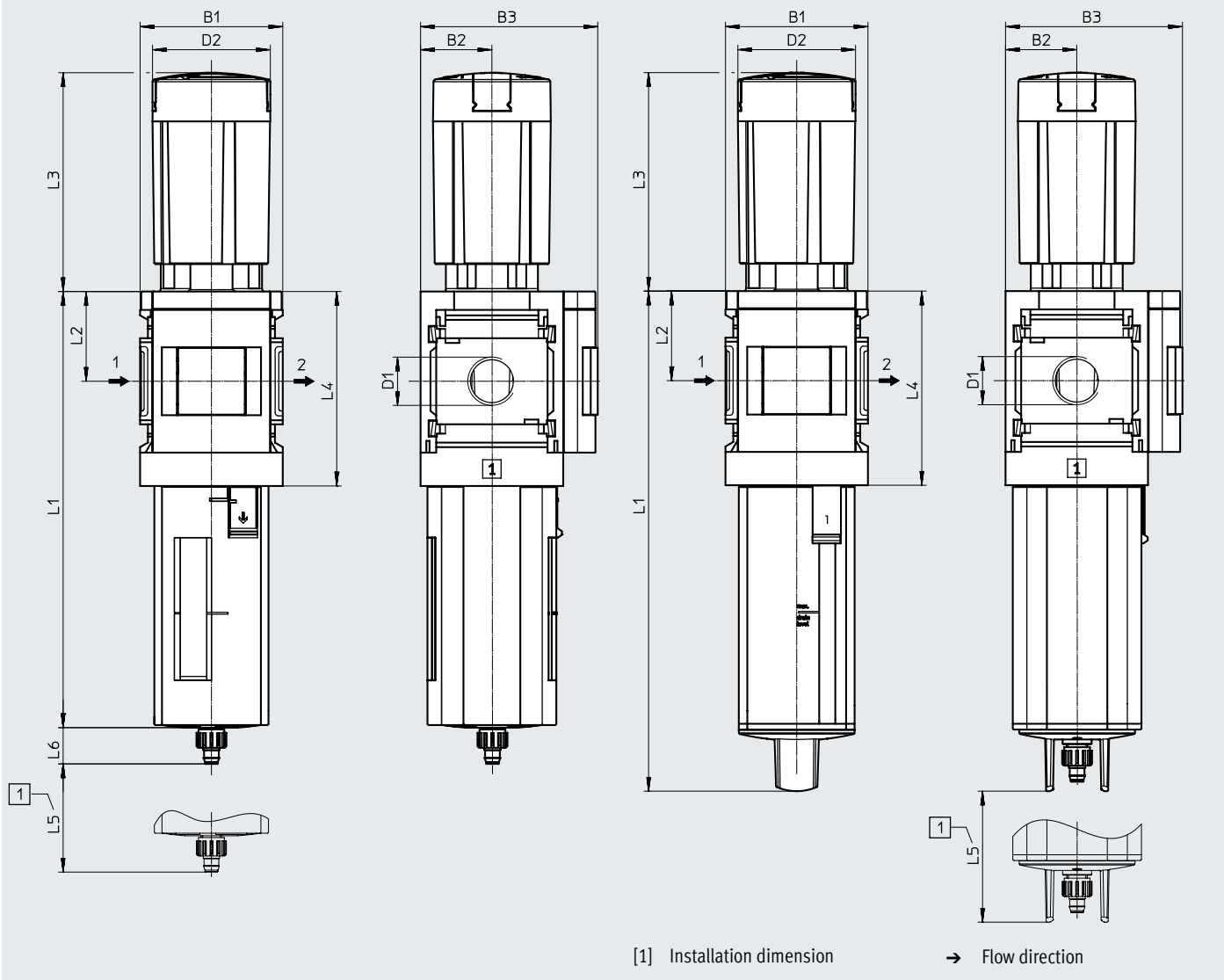
Datasheet

Dimensions – Basic version MS6-LFR

Download CAD data → www.festo.com

- [] Integrated MS pressure gauge with standard scale
- [M] Condensate drain, manual, rotating
- [AS] Rotary knob with latch, can be locked using accessories
- [R] With plastic bowl guard

[U] With metal bowl



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

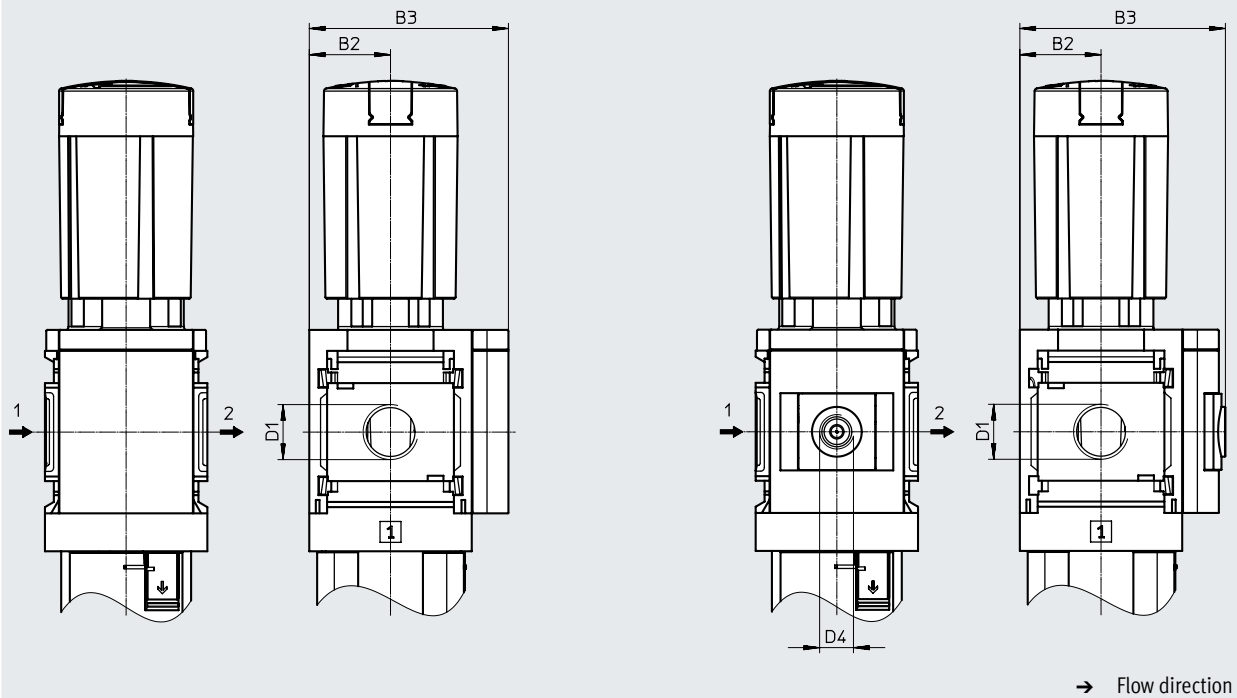
Dimensions – Pressure gauge alternatives

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



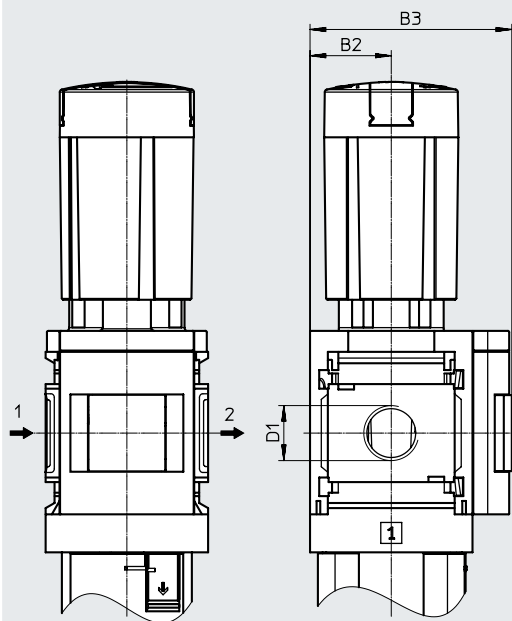
Type	B2	B3	D1	D4
MS4-LFR-1/8-...-VS	21	54	G1/8	–
MS4-LFR-1/4-...-VS			G1/4	
MS4-LFR-1/8-...-A8	21	58.5	G1/8	G1/8
MS4-LFR-1/4-...-A8			G1/4	
MS4-LFR-1/8-...-A4	21	58.5	G1/8	G1/4
MS4-LFR-1/4-...-A4			G1/4	
MS6-LFR-1/4-...-VS	31	76	G1/4	–
MS6-LFR-3/8-...-VS			G3/8	
MS6-LFR-1/2-...-VS			G1/2	
MS6-LFR-1/4-...-A4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

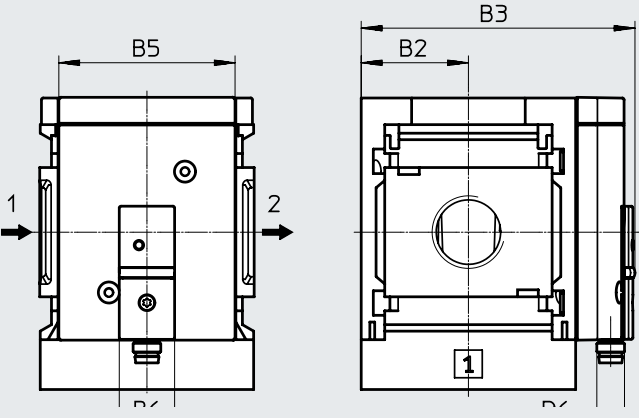
⚡ Note: This product conforms to ISO 1179-1 and ISO 228-1.

Datasheet

Dimensions – Pressure gauge alternatives

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

Download CAD data → www.festo.com
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 1x 3-pin
M8 plug, threshold value compara-
tor, 1 switching output PNP, N/C con-
tact

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

Variant AD10:
SDE5-D10-C3-...-P-M8 with 1x 3-pin
M8 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.

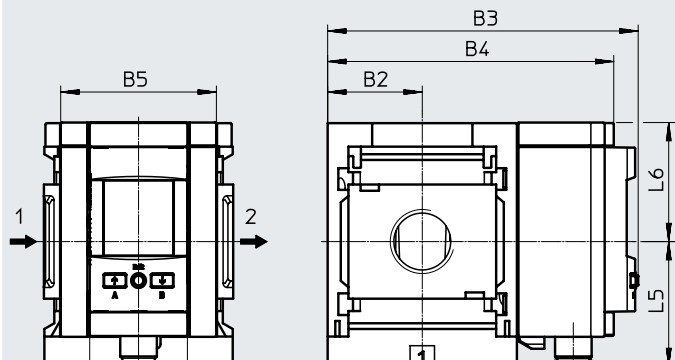
Datasheet

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
plug M12, 4-pin, IO-Link®, PNP,
NPN, 0 ... 10 V, 1 ... 5 V, 4 ... 20 mA

Variant AD12:
SPAU-P10R-MS-L-PNLK-M8 with plug
M8, 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

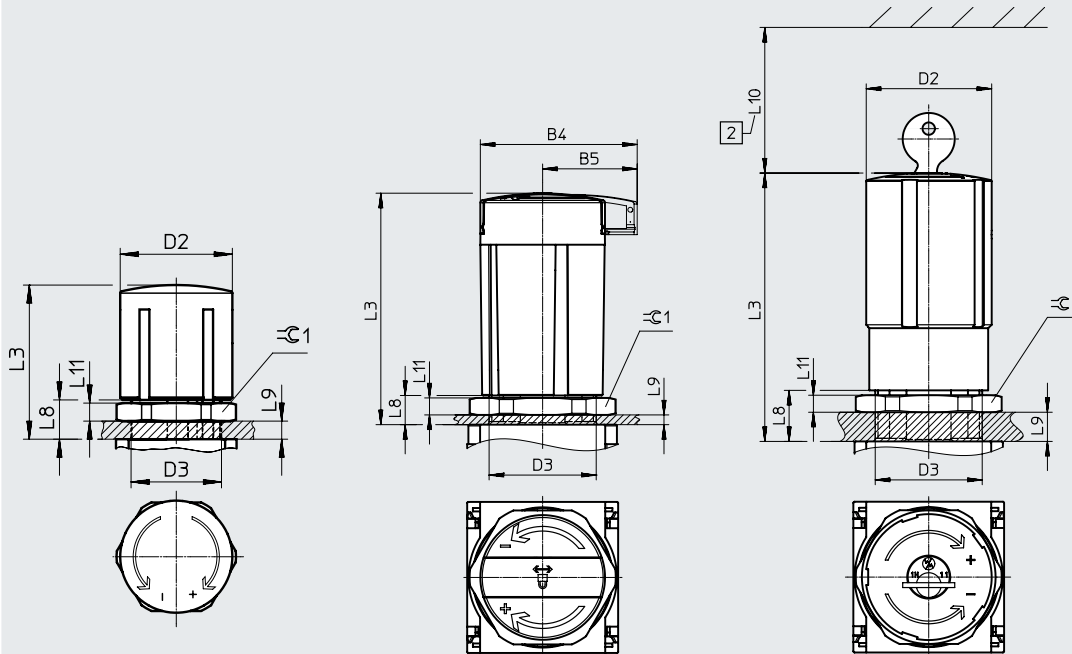
Download CAD data → www.festo.com

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

[] Rotary knob with latch

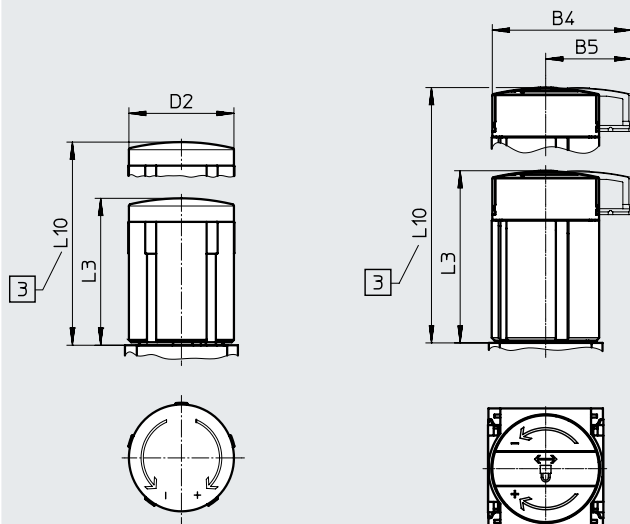
[AS] Rotary knob with latch, can be locked using accessories

[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

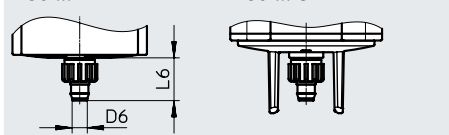
Type	B4	B5	D2	D3	L3	L8	L9	L10	L11	⌀ 1
MS4-LFR-...	–	–	37.2	M30x1.5	51.1	13	5	–	6	36
MS4-LFR-...-AS	48.6	30			60.2	13	5			
MS4-LFR-...-E11	–	–			76	14	6			
MS4-LFR-...-LD	–	–		–	51.1	–	–	76.8	–	–
MS4-LFR-...-LD-AS	48.6	30			60			85.7		
MS6-LFR-...	–	–	51.2	M44x1	86	21	14	–	7	55
MS6-LFR-...-AS	64.4	38.8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

[M] Manual, rotating

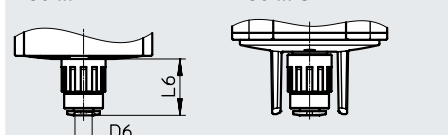
MS4-...-R/U-M
MS6-...-R-M MS6-...-U-M



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

[H] Semi-automatic

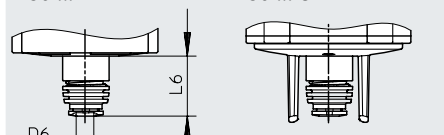
MS4-...-R/U-H
MS6-...-R-H MS6-...-U-H



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

[V] Fully automatic

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



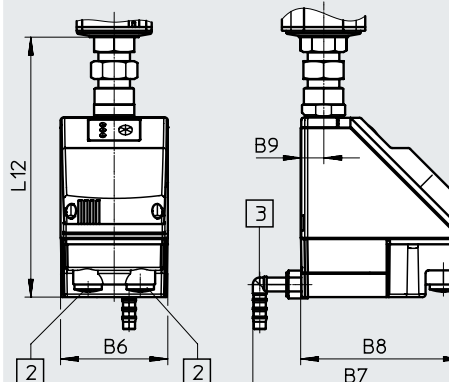
Push-in connector for plastic tubing PUN-6/PAN-6

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		–

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		–

Type	D6 ø	L6
Plastic bowl guard R		
MS4-LFR-...-V	6.2	20.4
MS6-LFR-...-V		18.5
Metal bowl U		
MS4-LFR-...-V	6.2	20.4
MS6-LFR-...-V		–

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



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

Download CAD data → www.festo.com

Datasheets → Internet: pwea

Datasheet

★ Core Range

Ordering data

Pressure regulation range 0.3 ... 4 bar, plastic bowl guard, integrated MS pressure gauge with standard scale, display unit [bar], rotary knob with latch, with integrated lock

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, rotating	–	–	8190246	MS6-LFR-3/8-D5-ERM-E11
-----	------	------------------	---	---	---------	------------------------

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, lockable with accessories or integrated lock

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, rotating	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	G3/8	Manual, rotating	–	–	8190247	MS6-LFR-3/8-D6-E-R-M-E11
			529176	MS6-LFR-1/2-D6-CRM-AS	529180	MS6-LFR-1/2-D6-ERM-AS
			–	–	589898	MS6-LFR-1/2-D6-E-R-M-RG-AS
			–	–	529182	MS6-LFR-1/2-D6-ERV-AS
	G1/2	Fully automatic	529178	MS6-LFR-1/2-D6-CRV-AS	610054	MS6-LFR-1/2-D6-E-R-V-AS-UL1
			579069	MS6-LFR-1/2-D6-C-R-V-A4-AS	8190245	MS6-LFR-1/2-D6-E-R-V-RG-AS
			609971	MS6-LFR-1/2-D6-C-R-V-RG-AS	595910	MS6-LFR-1/2-D6-E-R-V-RG-AS-UL1
			594970	MS6-LFR-1/2-D6-C-R-V-RG-AS-Z		

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, lockable with accessories or integrated lock

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, rotating	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	G3/8	Manual, rotating	–	–	611737	MS6-LFR-3/8-D7-E-R-M-E11
			529184	MS6-LFR-1/2-D7-CRM-AS	529188	MS6-LFR-1/2-D7-ERM-AS
			–	–	588774	MS6-LFR-1/2-D7-E-R-M
			–	–	563024	MS6-LFR-1/2-D7-E-R-M-A4-AS
			–	–	588899	MS6-LFR-1/2-D7-E-R-M-RG
			–	–	579051	MS6-LFR-1/2-D7-E-R-M-RG-AS
	G1/2	Fully automatic	529186	MS6-LFR-1/2-D7-CRV-AS	529190	MS6-LFR-1/2-D7-ERV-AS
			609974	MS6-LFR-1/2-D7-C-R-V-A4-AS	–	–
			578836	MS6-LFR-1/2-D7-C-R-V-RG-AS	–	–
			583193	MS6-LFR-1/2-D7-C-R-V-RG-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, rotating	–	–	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, rotating	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, rotating	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, rotating	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, rotating	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, rotating	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, rotating	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, rotating	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, rotating	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, rotating	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, rotating	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, rotating	529205	MS6-LFR-1/4-D7-CRM-AS-Z		–	–	
	G1/2	Manual, rotating	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, rotating	–	–		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
Module no.		526489	526490		
Series	Standard				MS
Size	4	6			...
Function	Filter regulator				-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 G1			-AGF
	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, connection terminals	[1] [3]		-E4

[1] 1/8, 1/4, 3/8, 1/2, AQK, AQN, AQP, AQR, AQS, D8, E2, E3, E4, AD7 ... AD10, AD11/AD2, E11, WPM

Not with EU EX4 certification.

[2] H, V

Not with pressure regulation range D8.

[3] E2, E3, E4

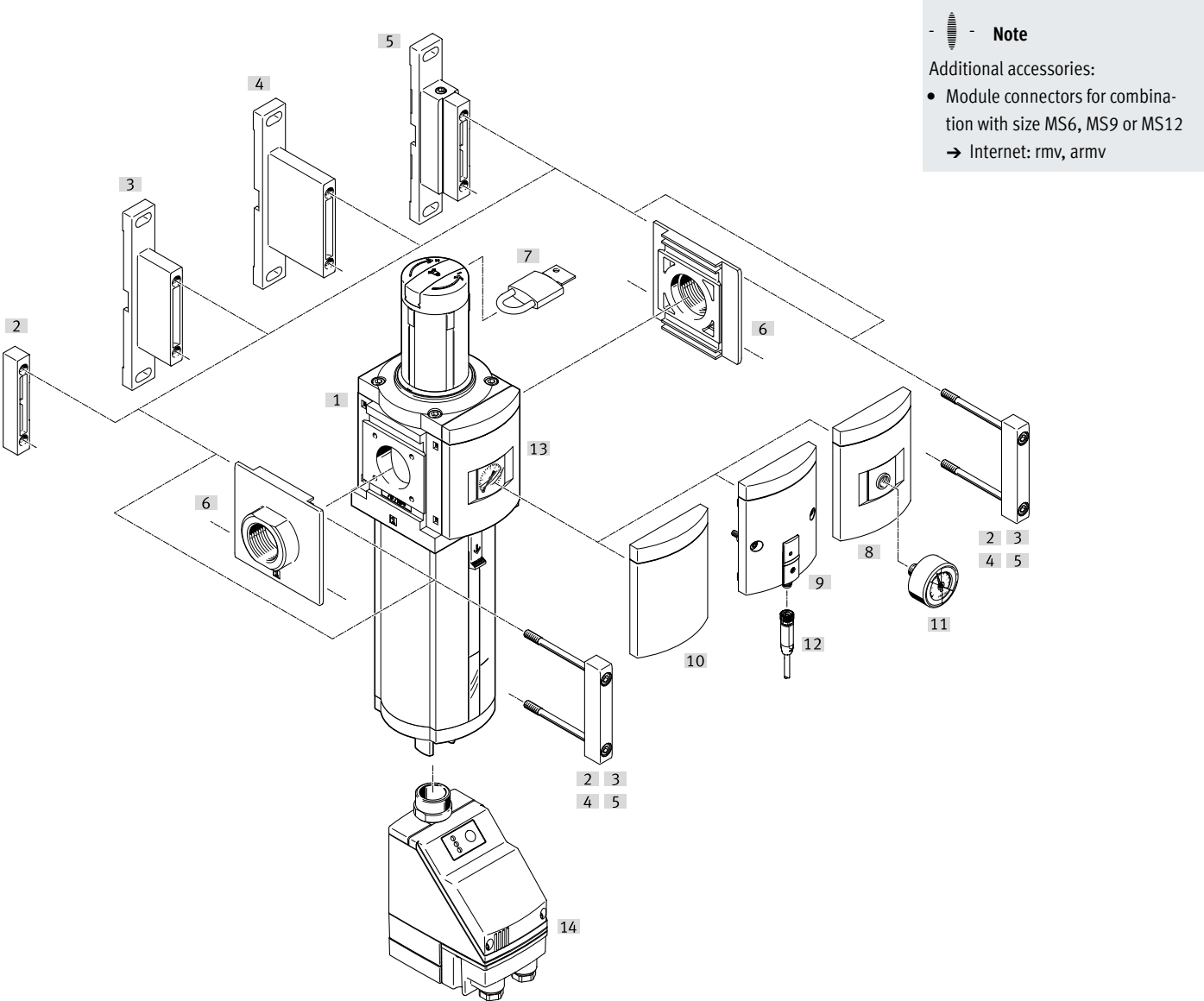
Only with metal bowl U.

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 switching status indicator, plug M8, threshold value comparator, PNP, N/O contact			[1] [5]	-AD7	
	Pressure sensor with switching status indicator, plug M8, 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	None					
	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 hooking in service unit components			[1] [9]	-WPM	
	Mounting bracket centrally at the rear (wall mounting top and bottom), connecting plates not required				-WB	
	Mounting bracket centrally at the 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] AD7 ... AD10, Measuring range max. 10 bar.
 AD11/AD12 Not with pressure regulation range D8.
 [6] PSI, MPA Not with pressure gauge alternatives VS, A8, A4, 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



Mounting attachments and accessories		Individual device			Combination Module without connecting thread, without connecting plate	→ Page/ Internet
		With female thread	With connecting plate Without EU certification	With EU certification		
[1]	Filter regulators MS9-LFR	■	■	■	■	32
[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]	Connecting plate SET MS9-AG...	—	■	■	■	ms9-ag
	Connecting plate SET MS9-AQ...	—	■	—	■	ms9-aq
[7]	Padlock LRVS-D	■	■	■	■	54
[8]	Adapter for EN pressure gauge 1/4 A4	■	■	■	■	42
[9]	Pressure sensor without display AD7 ... AD10	■	■	—	■	42
[10]	Cover plate VS	■	■	■	■	42
[11]	Pressure gauge MA	■	■	■	■	54
[12]	Connecting cable NEBA-M8...-LE3	■	■	—	■	54
[13]	MS pressure gauge AG	■	■	■	■	42
[14]	Electrically actuated condensate drain fully automatic E2, E3, E4	■	■	—	■	42

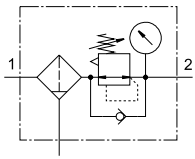
Type codes

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 G1 1/4	
AGH	Sub-base G1 1/2	
N1	1 NPT	
AQR	Sub-base NPT1/2	
AQS	Sub-base NPT3/4	
AQT	Sub-base NPT1	
AQU	Sub-base NPT1 1/4	
AQV	Sub-base NPT1 1/2	
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	

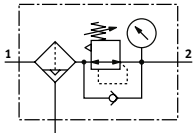
009	Regulator type	
	Pilot actuated	
DI	Directly actuated	
010	Pressure gauge alternatives	
	None	
AG	MS pressure gauge	
VS	Cover plate	
A8	Adapter for EN pressure gauge 1/8, without pressure gauge	
A4	Adapter for EN pressure gauge 1/4, without pressure gauge	
RG	Integrated pressure gauge, red/green 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, rotating,
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
- - www.festo.com



- Good regulation characteristics with minimal hysteresis and primary 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 the 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
Pore size	[µm]		5
			40
Air purity class at the output			Compressed air in accordance with ISO 8573-1:2010 [6:4:4] (grade of filtration 5 µm)
			Compressed air in accordance with ISO 8573-1:2010 [7:4:4] (grade of filtration 40 µm)
Bowl guard			Integrated as metal bowl
Condensate drain			Manual, rotating
			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 indication		With pressure sensor for indicating the output pressure via the switching status indicator and electrical output
		Via pressure gauge for displaying the output pressure
		With pressure gauge with red/green scale for indicating the output pressure
		Prepared for G1/4
Max. condensate volume	[ml]	220

Standard nominal flow rate $q_{N^{1)2)}$ [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

⚡ A flow of 125 l/min is required to ensure trouble-free closing of the fully automatic condensate drain.

Operating and environmental conditions				
Condensate drain	Manual, rotating	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	–10 ... +60	–10 ... +60	+1 ... +60
Ambient temperature with pressure sensor [°C]	0 ... +50	+5 ... +50	+5 ... +50	+1 ... +50
Temperature of medium [°C]	–10 ... +60	–10 ... +60	–10 ... +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) More information: www.festo.com/x/topic/crc2) More information: www.festo.com/catalogue/ms9-lfr → Support/Downloads.

Datasheet

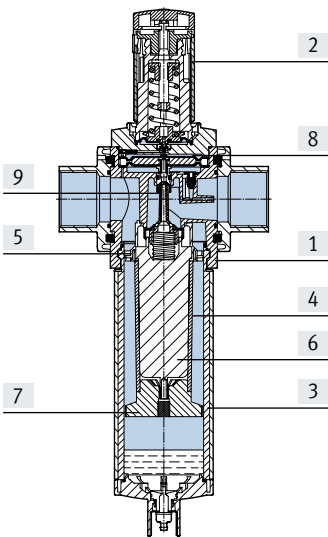
ATEX	
EU certification	[EX4]
ATEX category for gas	II 2G
Type of ignition protection for gas	Ex h IIC T6 Gb X
ATEX category for dust	II 2D
Type of ignition protection for dust	Ex h IIIC T60°C Db X
Explosion-proof ambient temperature	-10°C ≤ Ta ≤ +60°C
Explosion protection certification outside the EU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

1) More information: www.festo.com/catalogue/ms9-lfr → Support/Downloads.

Weight [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

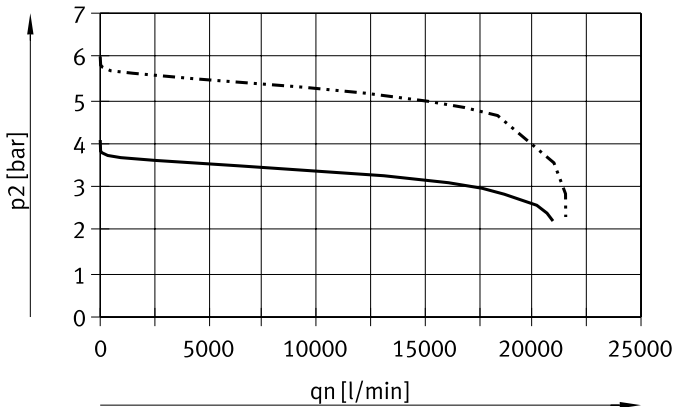


Filter regulator		
[1]	Housing	Die-cast aluminium
[2]	Rotary knob	PA
	Rotary knob with integrated lock	Aluminium
[3]	Bowl	Wrought aluminium alloy
	Inspection window	PA
[4]	Filter element	PE
[5]	Spin disc	POM
[6]	Filter support	POM
[7]	Separating disc	POM
[8]	Diaphragm	NBR
[9]	Valve tappet	Wrought aluminium alloy, NBR, POM
–	Covering	Reinforced PA
–	Connecting plate, module connector, mounting bracket	Die-cast aluminium
–	Seals	NBR
Note on materials		RoHS-compliant
LABS (PWIS) conformity		VDMA24364-B1/B2-L

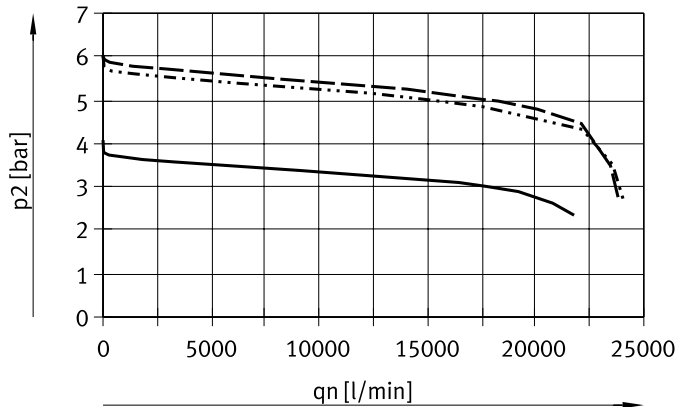
Datasheet

Standard flow rate q_n as a function of output pressure p_2 ($p_1 = 10$ bar)

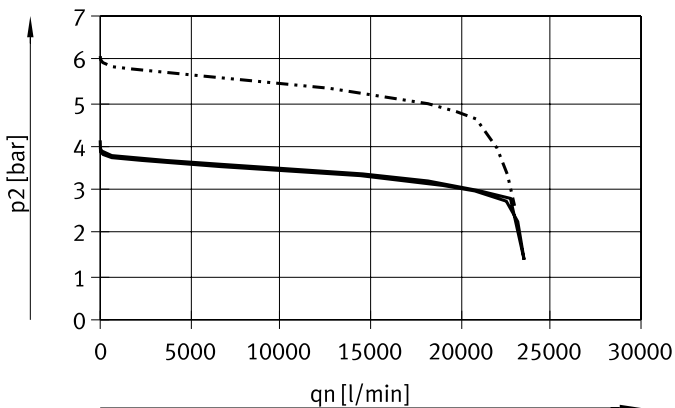
Piloted filter-diaphragm regulator

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

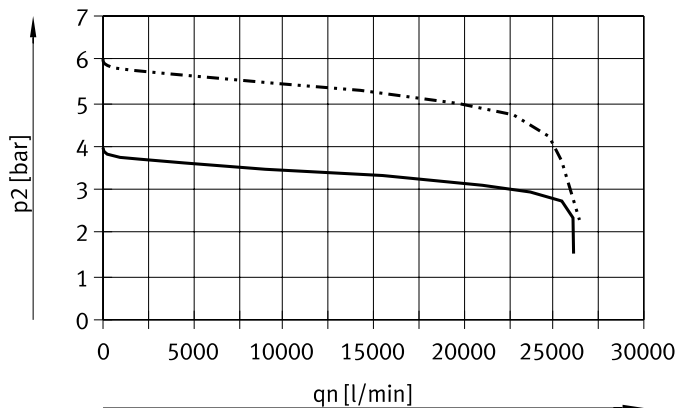
— MS9-LFR-...-D5
 MS9-LFR-...-D6/D7/D8

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

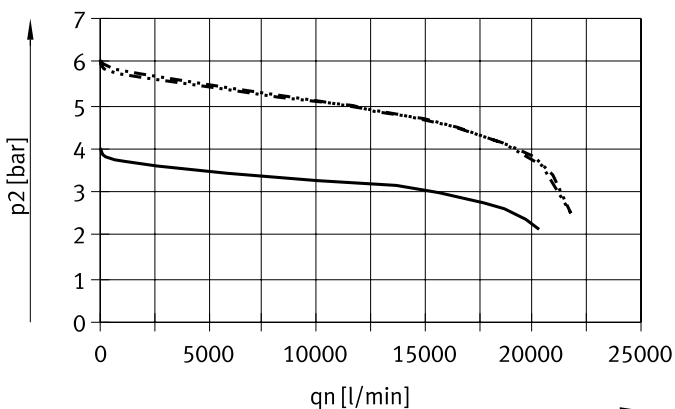
— MS9-LFR-...-D5
 MS9-LFR-...-D6/D8
 --- MS9-LFR-...-D7

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

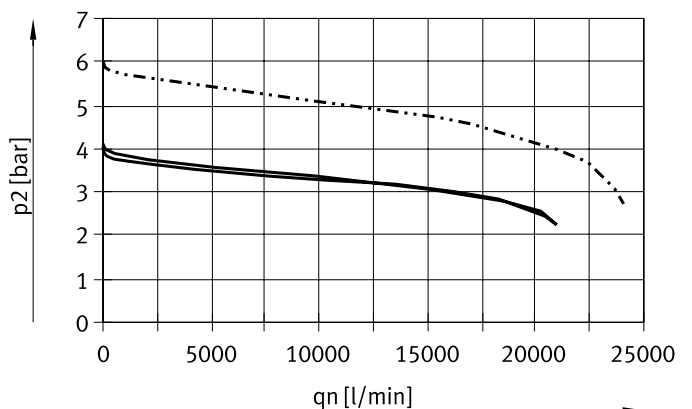
— MS9-LFR-...-D5
 MS9-LFR-...-D6/D7/D8

Grade of filtration 40 μm , pneumatic connection G1 or 1 NPT**Standard flow rate q_n as a function of output pressure p_2 at operating pressure $p_1 = 10$ 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

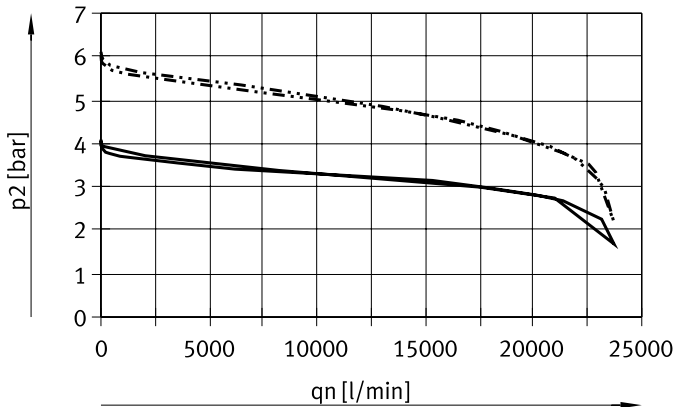
Grade of filtration 40 μm , pneumatic connection G3/4 or 3/4 NPT

Datasheet

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

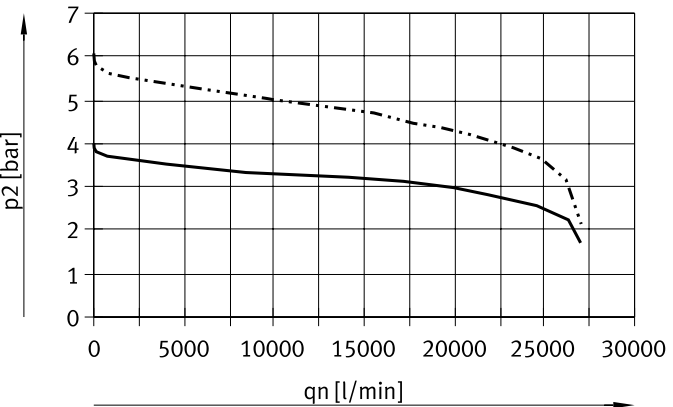
Directly actuated filter-diaphragm regulator

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



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

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



Dimensions – Basic version

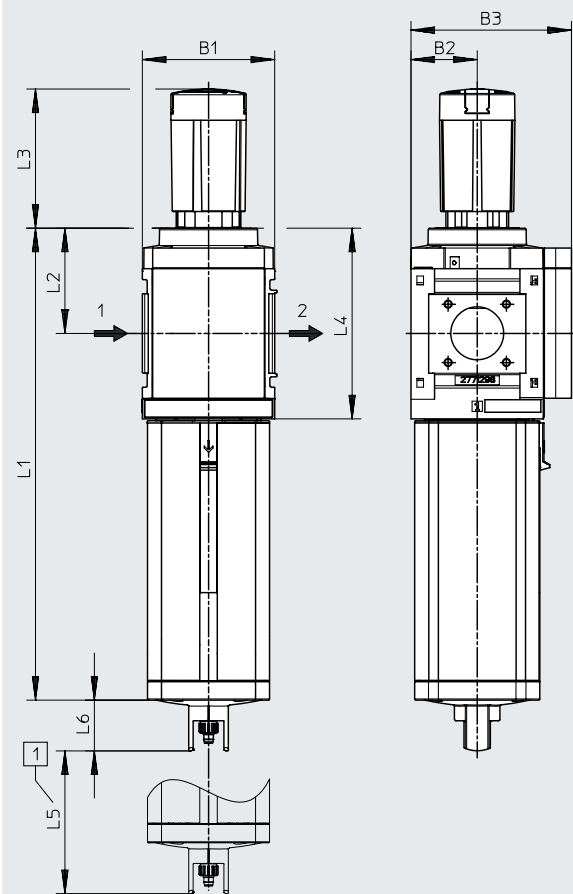
Download CAD data → www.festo.com

[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

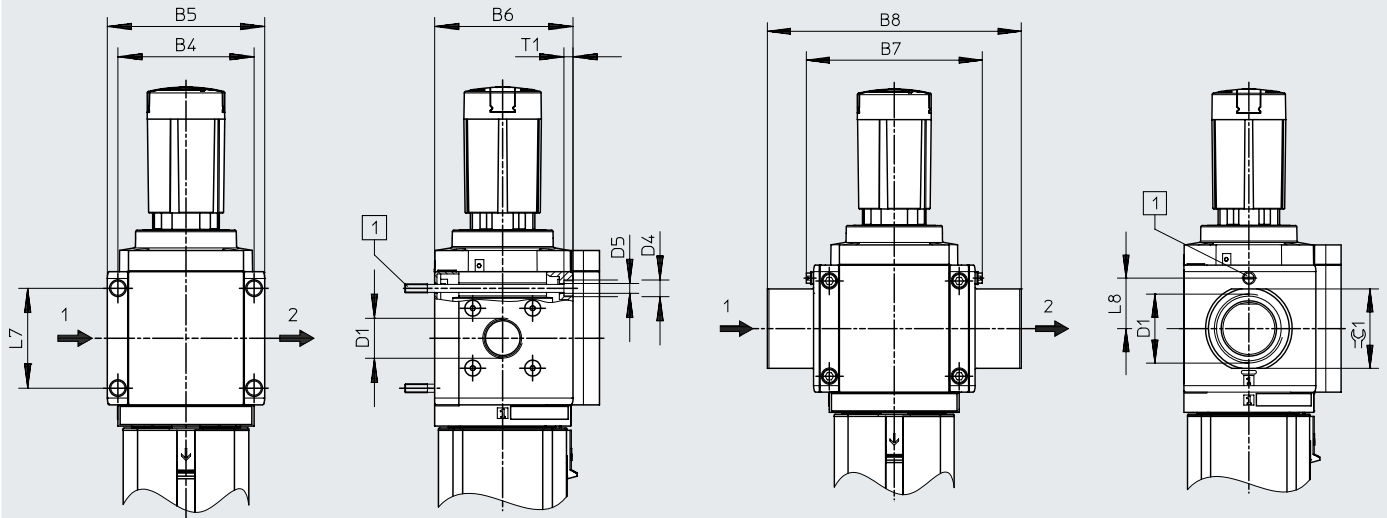
Datasheet

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 included 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.

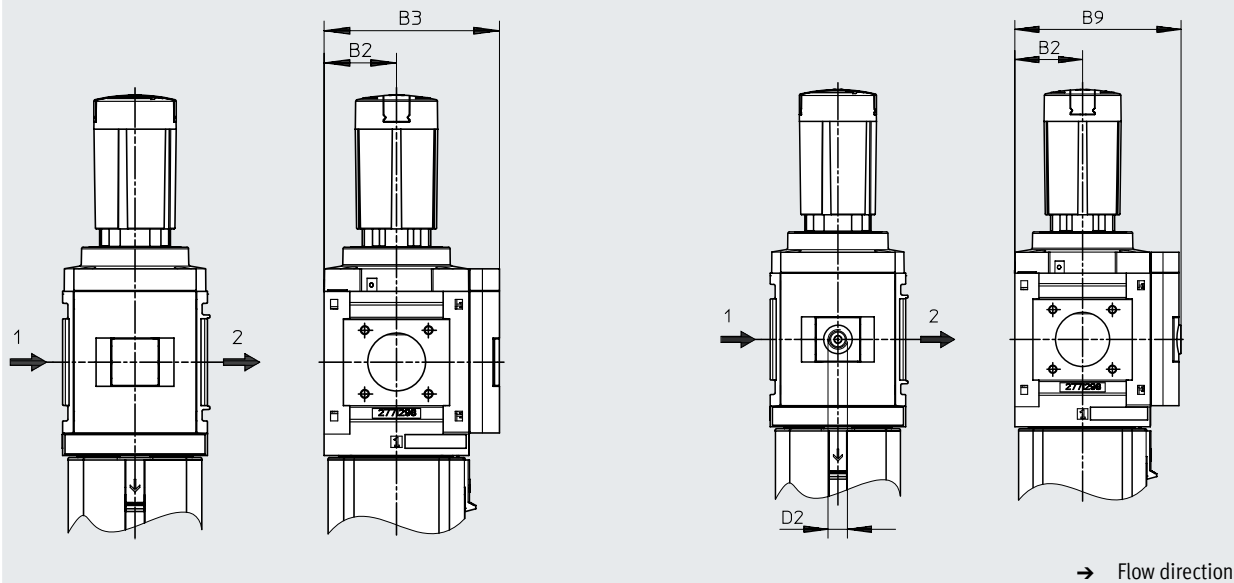
Datasheet

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



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

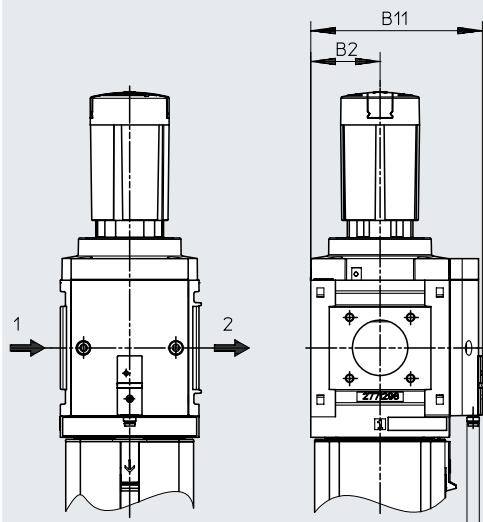
† Note: This product conforms to ISO 1179-1 and ISO 228-1.

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 1x 3-pin
M8 plug, threshold value compara-
tor, 1 switching output PNP, N/C con-
tact
- Variant AD9:
SDE5-D10-O3-...-P-M8 with 1x 3-pin
M8 plug, window comparator,
1 switching output PNP, N/O contact
- Variant AD10:
SDE5-D10-C3-...-P-M8 with 1x 3-pin
M8 plug, window comparator,
1 switching output PNP, N/C contact

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

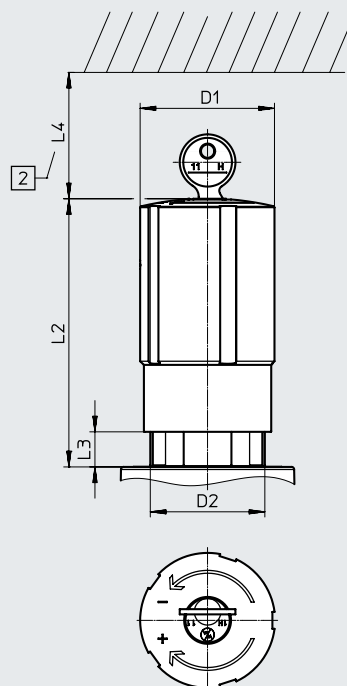
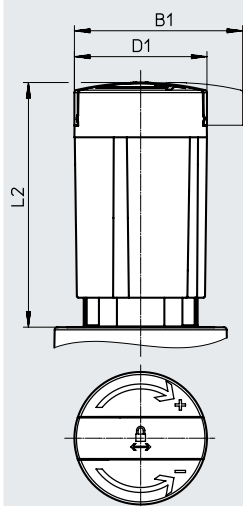
Datasheet

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



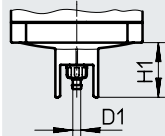
[2] Installation dimension

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

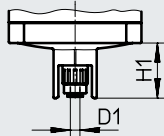
[M] Manual, rotating



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

Download CAD data → www.festo.com

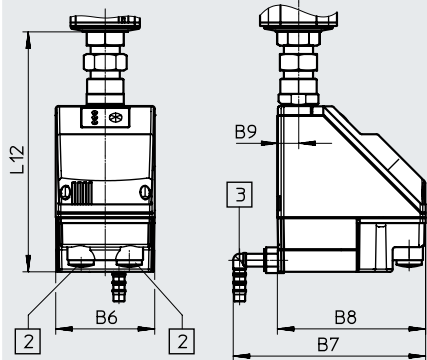
[H]/[V] Semi-automatic/fully automatic



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	–	–	–	–	5.6	34.5	–
MS9-LFR-...-H/V					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, rotating	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, rotating	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, rotating	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, rotating	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
Module no.	562531			
Series	Standard			MS
Size	9			9
Function	Filter regulator			-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
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, Not with EU EX4 certification.
 AQR, AQS, AQT,
 AQU, AQV, G, NG,
 D8, E2, E3, E4,
 AD7, AD8, AD9,
 AD10, E11, WPM

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, plug M8, threshold value comparator, PNP, N/O contact			[1] [4]		-AD7	
	Pressure sensor with switching status indicator, plug M8, 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 hooking in service unit components			[1] [7]		-WPM	
	Mounting bracket for large wall gap			[7]		-WPB	
EU certification	None						
	II 2GD to EU Explosion Protection Directive (ATEX)					-EX4	
UL certification	None						
	cULus, ordinary location for Canada and USA					-UL1	
Flow direction	Flow direction from left to right						
	Flow direction from right to left					-Z	

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

AQR, AQS, AQT,
 AQU, AQV, G, NG,
 D8, E2, E3, E4,
 AD7, AD8, AD9,
 AD10, E11, WPM

[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.

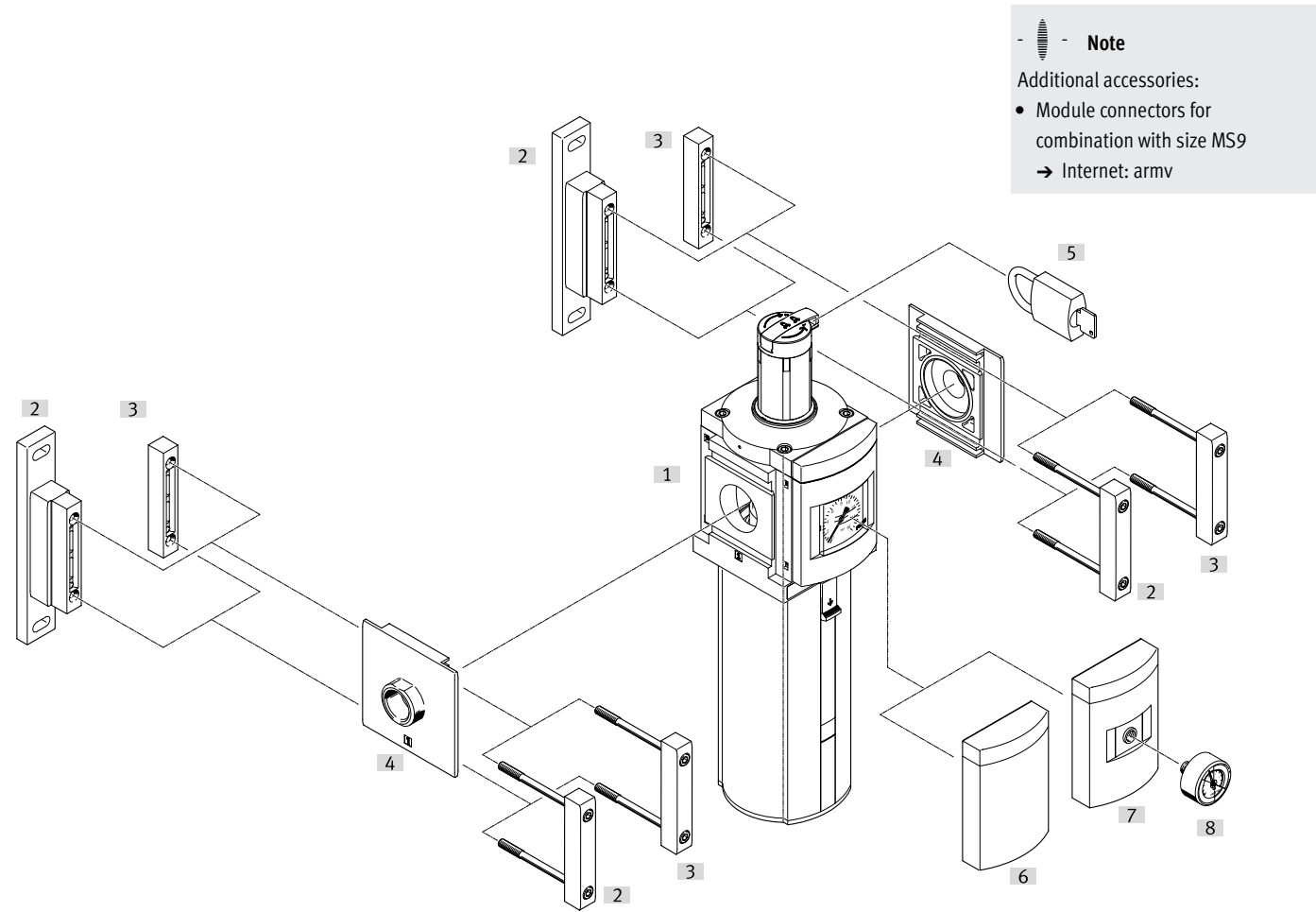
[5] PSI, MPA, BAR Not with pressure gauge alternatives VS, A4, AD7, AD8, AD9, AD10.

[6] OS Only with regulator type DI.

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

Peripherals overview

Filter regulator MS12-LFR



Mounting attachments and accessories		→ Page/Internet
[1]	Filter regulators MS12-LFR	46
[2]	Mounting bracket MS12-WP	ms12-wp
[3]	Module connector MS12-MV	ms12-mv
[4]	Connecting plate SET MS12-AG...	ms12-ag
[5]	Padlock LRVS-D	54
[6]	Cover plate VS	52
[7]	Adapter for EN pressure gauge 1/4 A4	52
[8]	Pressure gauge MA	54

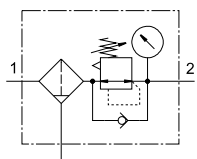
Type codes

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	

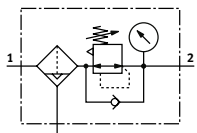
008	Condensate drain	
M	Manually	
V	Automatic	
E2	External fully automatic condensate drain, electric, 110 V AC, terminals	
E3	External fully automatic condensate drain, electric, 230 V AC, terminals	
E4	External fully automatic condensate drain, electric, 24 V DC, terminals	
009	Pressure gauge alternatives	
	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, rotating, 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 primary 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 the 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			Constant output pressure with primary pressure compensation and secondary exhausting
Type of mounting			With accessories
			In-line installation
Mounting position			Vertical ±5°
Grade of filtration	[µm]		5
			40
Pore size	[µm]		5
			40
Air purity class at the output			Compressed air in accordance with ISO 8573-1:2010 [6:4:4] (grade of filtration 5 µm)
			Compressed air in accordance with ISO 8573-1:2010 [7:4:4] (grade of filtration 40 µm)
Bowl guard			Integrated as metal bowl
Condensate drain			Manual, rotating
			Fully automatic
			Fully automatic, electrically actuated
Degree of condensate separation	[%]		> 75
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 indication			With pressure gauge
Max. condensate volume		[ml]	400

Datasheet

Standard nominal flow rate $q_{N^{(1)}}$ [l/min]					
Pneumatic connection		G1	G1 1/4	G1 1/2	G2
Grade of filtration	5 μ m	11000	11500	12000	14000
	40 μ m	12000	12500	13000	17000

1) Depending on the connecting plate selected, must be ordered separately as an accessory → Internet: ms12-ag

Measured at $p_1 = 10$ bar and $p_2 = 6$ bar, $\Delta p = 0.5$ bar

• A flow of 125 l/min is required to ensure trouble-free closing of the fully automatic condensate drain.

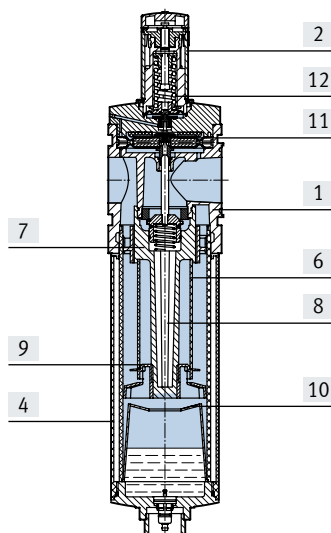
Operating and environmental conditions			
Condensate drain	Manual, rotating	Fully automatic	Fully automatic, electrically actuated
Operating pressure [bar]	0.8 ... 20	2 ... 12	0.8 ... 16
Operating medium	Compressed air to ISO 8573-1:2010 [–:4:–]	Compressed air to ISO 8573-1 [2010:7:4:–]	Compressed air to ISO 8573-1:2010 [–:4:–]
	Inert gases		
Note on the operating/pilot medium	–	Ester oil < 0.1mg/m ³ , according to ISO 8573-1:2010 [–:2]	–
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 - Moderate corrosion stress		

1) More information: www.festo.com/x/topic/crc

Weight [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
LABS (PWIS) conformity		VDMA24364-B1/B2-L

Datasheet

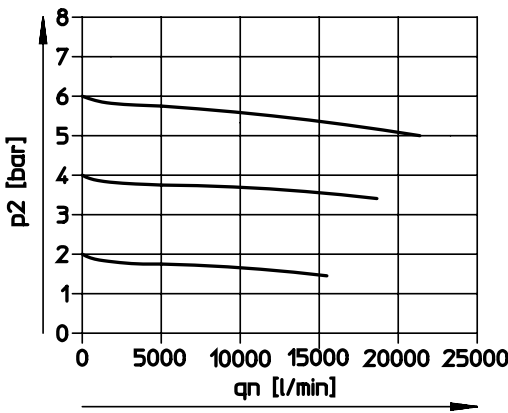
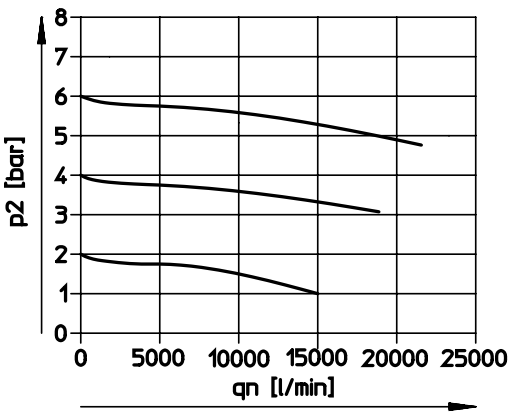
Standard flow rate q_n as a function of output pressure p_2 ($p_1 = 10$ bar)

Grade of filtration 40 μm

Pneumatic connection G1 with connecting plate MS12-AGF

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

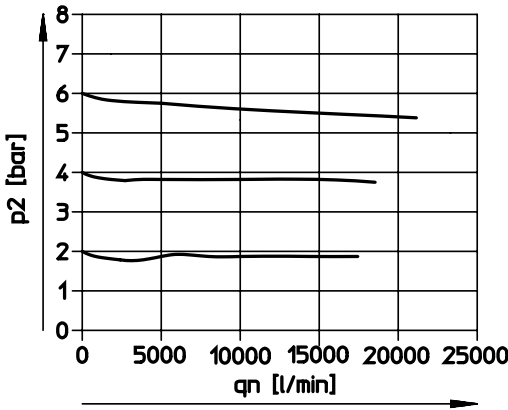
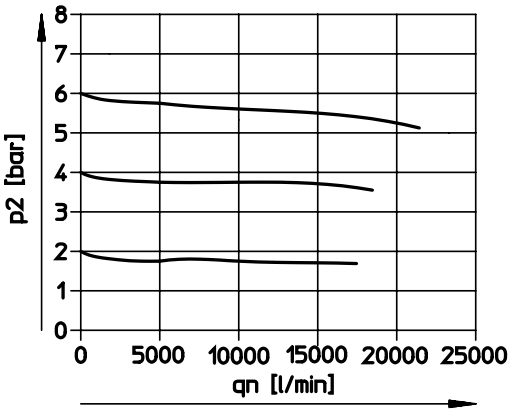
Input pressure $p_1 = 10$ bar



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

Pneumatic connection G2 with connecting plate MS12-AGI

Input pressure $p_1 = 10$ bar



Datasheet

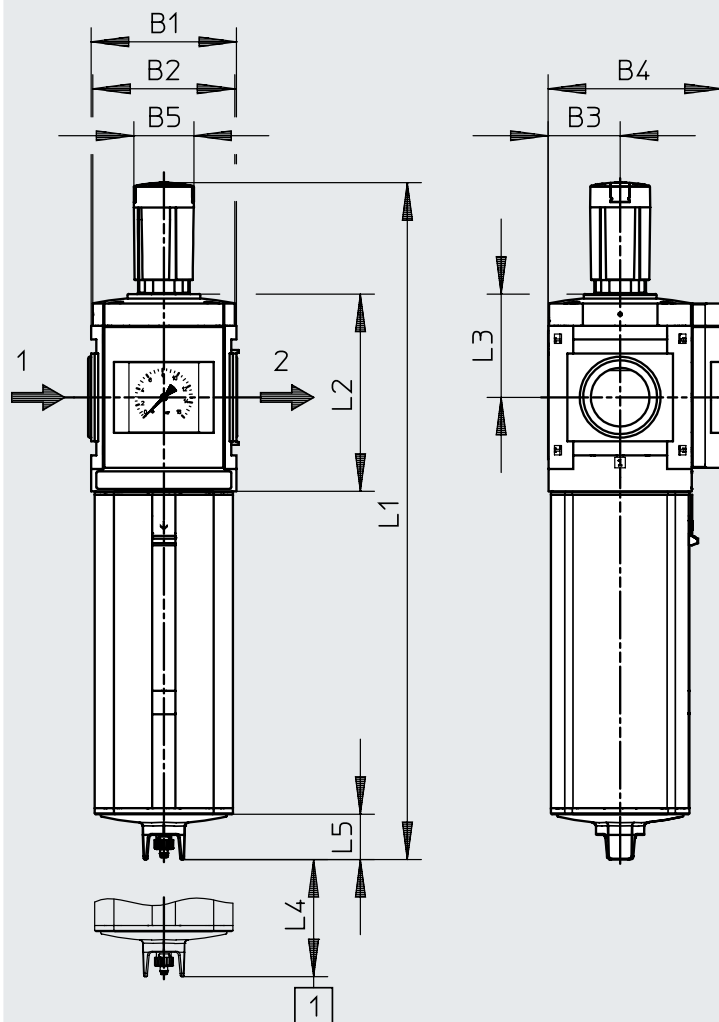
Dimensions – Basic version

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

[VS] Cover plate

Download CAD data → www.festo.com

[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

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

Download CAD data → www.festo.com

[E11] Rotary knob with integrated lock

[2] Installation dimension

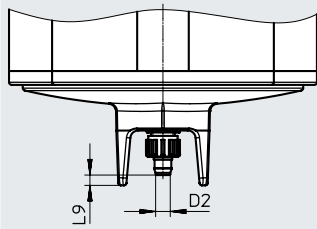
Type	B4	D2 Ø	L3	L8	L10
MS12-LFR-...-LD-AS	64.4	51.2	95	12	–
MS12-LFR-...-E11	–	51.8	112	–	60

Datasheet

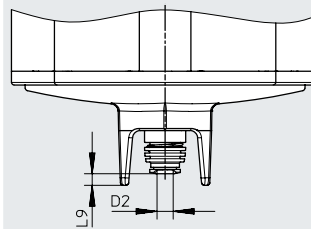
Dimensions – Condensate drain

Download CAD data → www.festo.com

[M] Manual, rotating

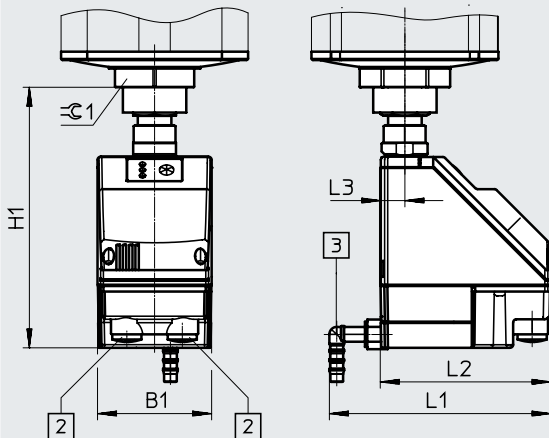
Barbed connector for plastic tubing
PUN(-H)-8x1.25

[V] Fully 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	B1	D2 Ø	H1	L1	L2	L3	L4	≈C 1
MS12-LFR...-M	–	5.6	–	–	–	–	4	–
MS12-LFR...-V	–	6.2	–	–	–	–	4.5	–
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		Conditions	Code	Enter code
Grid dimension	[mm] 124			
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	None			
	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.

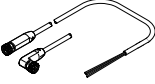
Accessories

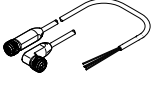
Filter cartridge MS-LFP



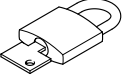
Ordering data			
Size	Grade of filtration [μm]	Part no.	Type
MS4	5 (colour: blue)	534501	MS4-LFP-C
	40 (colour: white)	534502	MS4-LFP-E
MS6	5 (colour: blue)	534499	MS6-LFP-C
	40 (colour: white)	534500	MS6-LFP-E
MS9	5	570309	MS9-LFP-C
	40	570310	MS9-LFP-E
MS12	5	537143	MS12-LFP-C
	40	537144	MS12-LFP-E

Accessories

Ordering data – Connecting cable NEBA-M8					Datasheets → Internet: neba
	Electrical connection	Number of cores	Cable length [m]	Part no.	Type
	M8x1, straight socket	3	2.5	8078223	NEBA-M8G3-U-2.5-N-LE3
			5	8078224	NEBA-M8G3-U-5-N-LE3
	M8x1, angled socket	3	2.5	8078227	NEBA-M8G4-U-2.5-N-LE4
			5	8078230	NEBA-M8W3-U-2.5-N-LE3
		4	2.5	8078231	NEBA-M8W3-U-5-N-LE3
			2.5	8078233	NEBA-M8W4-U-2.5-N-LE4

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

Ordering data – 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 LRV5-D			
	Weight [g]	Part no.	Type
	120	193786	LRV5-D