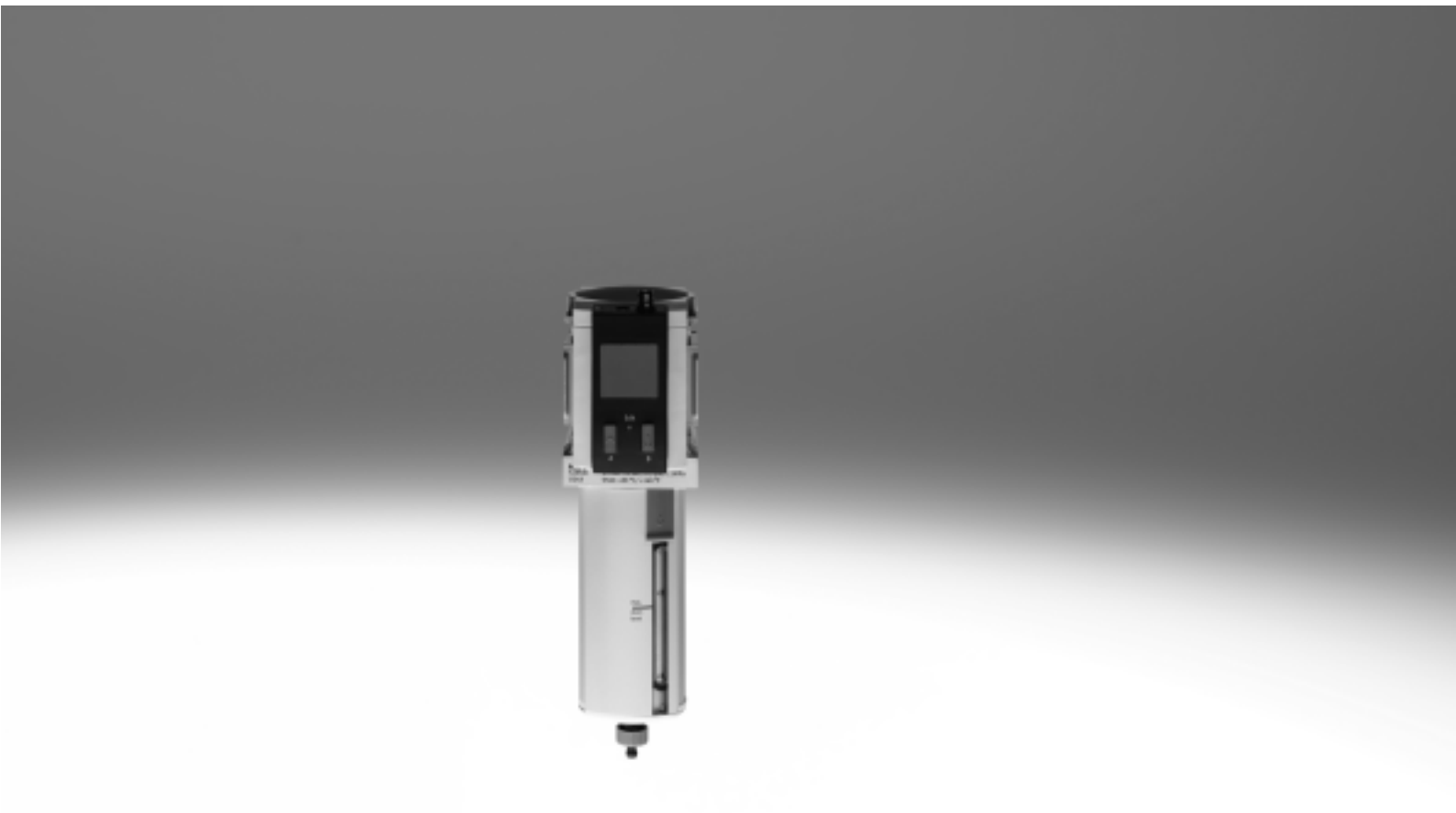
Filters MS-LF/LFM/LFX, MS series

FESTO



MS series service unit components

Key features

MS series service unit components

Solutions for every application

With its large product range, highly functional components and a wide choice of services, the MS series from Festo offers a complete concept for compressed air preparation. Suitable for simple standard applications as well as application-specific solutions to the highest quality standards.

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, filter, pressure and flow sensors, dryers, sensors and lubricators. All these allow a suitable solution to be assembled for every task. Their modular structure means that the components are freely combinable. A simple connection system saves time when replacing individual modules without dismantling the entire combination. What's more, many of the components are certified to UL and ATEX.

CAD models and configurator

Convenient aids for planning and selecting application-specific individual devices and combinations. The product configurator lets you configure customised solutions quickly and transfer the order data with no hassle.

Engineering tools

Selection tool for choosing the right service unit without oversizing, and with the right air quality class:

➔ **www.festo.com/engineering/wartungseinheit**

Integrated sensors

Pressure and flow sensors

- Maximum machine availability through controlled processes
- Reliable compressed air preparation and supply for systems
- Integrable 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 units 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 up to 18% smaller size
- Excellent energy efficiency
- Cost-optimised combinations – save up to 30%!

Size differences

Size		MS2	MS4	MS6	MS9	MS12
Grid dimension	[mm]	25	40	62	90	124
Port sizes		M5, QS-6	G⅛, G¼, G⅜	G¼, G⅜, G½, G¾	G½, G¾, G1, G1¼, G1½	G1, G1¼, G1½, G2
Standard nominal flow rate qnN[1)]	[l/min]	350	1800	6500	20000	22000

1) Using pressure regulator MS-LR as an example

MS series service unit components

Key features

Note

Information

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

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

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

Structure of a service unit

The order of the individual components within a service unit is relevant for safety and functionality. It is not possible to assemble the service unit components in any order in the flow direction. There are restrictions and rules.

The configurator for service unit MSB is a reliable and convenient way of arranging individual service unit components. This ensures that the applicable rules are complied with. As a result, you get a completely assembled combination with UL or ATEX certification if you need it. When arranging a combination of individually configured and ordered service unit components, the points on the right must be adhered to under all circumstances.

- Regulators MS-LFR/LR/LRP/LRE are only permissible in the flow direction with the same or decreasing pressure regulation range
- Filters MS-LFR/LF/LFM/LFX are only permissible in the flow direction with an increasing grade of filtration
- Lubricators MS-LOE are not permitted in the flow direction upstream of a filter MS-LFR/LFM/LF/LFX, water separator MS-LWS or membrane air dryer MS-LDM1
- A micro filter MS-LFM must be installed upstream of an activated carbon filter MS-LFX or membrane air dryer MS-LDM1 in the flow direction
- 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			Connection plate with thread	
				M	G	NPT	G	NPT
Combinations								
Service units MSB-FRC							Technical data ➔ Internet: msb	
	Combinations of filter regulator and lubricator	4	–	–	1/8, 1/4	–	–	–
		6	–	–	1/4, 3/8, 1/2	–	–	–
Service units MSB							Technical data ➔ Internet: msb	
	7 combinations, predefined	4	–	–	1/4	–	–	–
		6	–	–	1/2	–	–	–
	Combinations freely configurable	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 units MSE6							Technical data ➔ Internet: mse6	
	Combinations with fieldbus connection for measuring pressure, flow rate and consumption	6	–	–	–	–	1/2	–

MS series service unit components

Key features

Total product range for MS series service unit components								
Type	**Description**	**Size**	**Pneumatic connection**					
			Push-in connector	**Female thread**			**Connection plate with thread**	
				M	**G**	**NPT**	**G**	**NPT**
Individual devices								
Filter regulators MS-LFR							Technical data ➔ Internet: ms-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	–
Filters MS-LF							Technical data ➔ 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							Technical data ➔ 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							Technical data ➔ 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							Technical data ➔ Internet: ms-lws	
	Remove condensed water 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	–

MS series service unit components

Key features

FESTO

Total product range for MS series service unit components								
Type	**Description**	**Size**	**Pneumatic connection**					
			Push-in connector	**Female thread**			**Connection plate with thread**	
				M	**G**	**NPT**	**G**	**NPT**
Individual devices								
Pressure regulators MS-LR							Technical data ➔ Internet: ms-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-LRB							Technical data ➔ Internet: ms-lrb	
	For creating 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							Technical data ➔ 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							Technical data ➔ 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							Technical data ➔ 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							Technical data ➔ Internet: ms-loe	
	Add a precisely adjustable amount of oil to the compressed air. The oil mist component 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	–

MS series service unit components

Key features

Total product range for MS series service unit components								
Type	**Description**	**Size**	**Pneumatic connection**					
			Push-in connector	**Female thread**			**Connection plate with thread**	
				M	**G**	**NPT**	**G**	**NPT**
Individual devices								
On/off valves MS-EM							Technical data ➔ Internet: ms-em	
	Manually operated 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							Technical data ➔ Internet: ms-ee	
	Solenoid 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							Technical data ➔ Internet: ms-dl	
	Pneumatically actuated soft-start valve for slowly pressurising and exhausting pneumatic installations.	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
Soft-start valves MS-DE							Technical data ➔ Internet: ms-de	
	Solenoid actuated soft-start valve for slowly pressurising and exhausting pneumatic installations.	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
Soft-start/quick exhaust valves MS-SV							Technical data ➔ 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	–

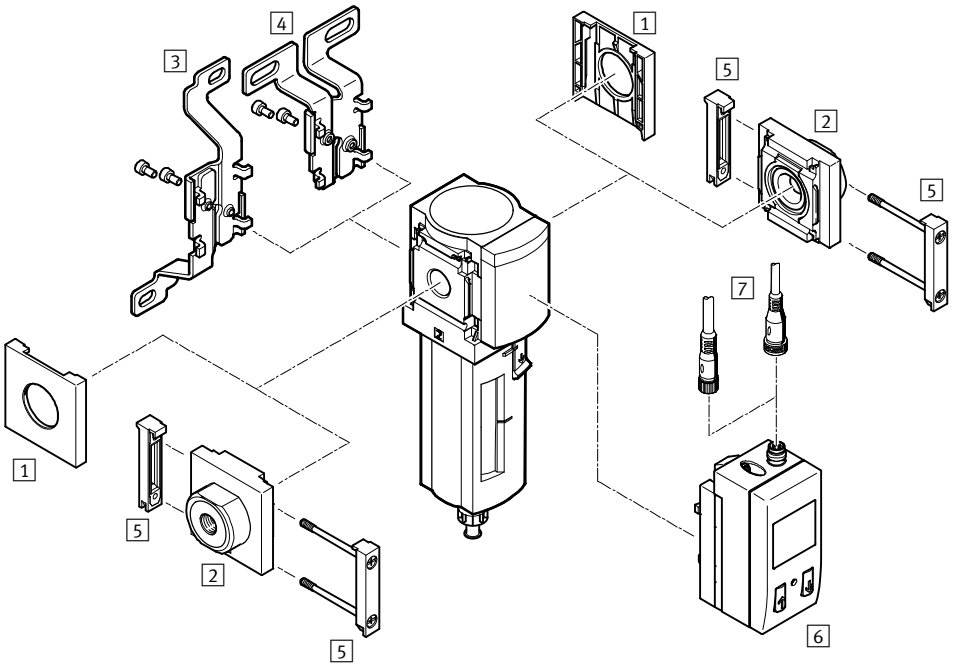
MS series service unit components

Key features

Total product range for MS series service unit components								
Type	**Description**	**Size**	**Pneumatic connection**					
			Push-in connector	**Female thread**			**Connection plate with thread**	
				M	**G**	**NPT**	**G**	**NPT**
Individual devices								
Membrane air dryers MS-LDM1							Technical data ➔ 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							Technical data ➔ Internet: ms-frm	
	Compressed air distributor 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							Technical data ➔ Internet: ms-frm-frz	
	Compressed air distributor with 4 connections and half the grid dimension width	4	–	–	–	–	–	–
		6	–	–	–	–	–	–
Flow sensors SFAM							Technical data ➔ Internet: sfam	
	For absolute flow rate information and accumulated air consumption measurement	6	–	–	–	–	1/2	1/2
		9	–	–	–	–	1, 1 1/2	1, 1 1/2

Filters MS4/MS6-LF/LFM/LFX, MS series

Peripherals overview



Note

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

Mounting attachments and accessories

		Individual device		Combination		➔ Page/Internet
		without connecting plate	with connecting plate	without connecting plate	with connecting plate	
1	Cover plate MS4/6-END	■	–	■	–	ms4-end, ms6-end
2	Connecting plate-SET MS4/6-AG...	–	■	–	■	ms4-ag, ms6-ag
	Connecting plate-SET MS4/6-AQ...	–	■	–	■	ms4-aq, ms6-aq
3	Mounting bracket MS4/6-WB	■	■	–	–	ms4-wb, ms6-wb
4	Mounting bracket MS4-WBM	■	■	–	–	ms4-wbm
5	Module connector MS4/6-MV	–	■	■	■	ms4-mv, ms6-mv
6	Filter pollution indicator DP/DN/DPI/DNI	■ for LFM	■ for LFM	■ for LFM	■ for LFM	32
7	Connecting cable NEBU-M8...-LE3/NEBU-M12...-LE4	■ for LFM	■ for LFM	■ for LFM	■ for LFM	nebu
–	Mounting bracket MS4/6-WP/WPB/WPE/WPM	–	■	■	■	ms4-wp, ms6-wp

Filters MS4/MS6-LF/LFM/LFX, MS series

Type codes

MS	6	–	LFM	–	¼	–	A	R	M	–		–	DA

Series	
MS	Standard service unit

Size	
4	Grid dimension 40 mm
6	Grid dimension 62 mm

Service function	
LF	Filter
LFM	Fine and micro filter
LFX	Activated carbon filter

Pneumatic connection	
MS4	
⅛	G⅛ thread
¼	G¼ thread
MS6	
¼	G¼ thread
⅜	G⅜ thread
½	G½ thread

Grade of filtration (for LF and LFM only)	
A	0.01 µm
B	1 µm
C	5 µm
E	40 µm

Bowl guard	
R	Plastic bowl guard
U	Integrated as metal bowl

Condensate drain (for LF and LFM only)	
M	Manual rotary
V	Fully automatic

Flow rate (for LFM and LFX only)	
	Standard
HF	High flow rate

Filter change sensor (for LFM only)	
	Without differential pressure indicator
DA	Differential pressure indicator

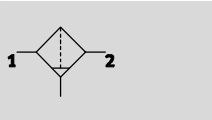
Further variants can be ordered using the modular system	
Filters LF	➔ 18
Fine and micro filters LFM	➔ 32
Activated carbon filters LFX	➔ 38

- Pneumatic connection
- Condensate drain
- Range of application (only for LFM and LFX)
- Filter pollution indicator (for LFM only)
- Type of mounting
- EU certification
- UL certification
- Flow direction

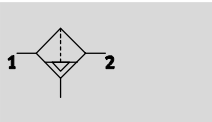
Filters MS4/MS6-LF, MS series

Technical data

Function
Condensate drain
manual rotary



semi or fully automatic



Flow rate
1,000 ... 4,100 l/min

Temperature range
–10 ... +60 °C

Operating pressure
0 ... 20 bar

www.festo.com

The sintered filter with centrifugal separation removes contamination, rust and condensate from the compressed air. The filter cartridges are replaceable.

- Good particle and condensate separation
- High flow rate with minimal pressure drop
- Available with manual, semi-automatic, fully automatic or fully automatic, electrically actuated condensate drain
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22
- Choice of filter cartridges: 5 µm or 40 µm
- New filter cartridges ➔ 89

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
	Connecting plate AQ...	NPT1/8, NPT1/4 or NPT3/8	NPT1/4, NPT3/8, NPT1/2 or NPT3/4
Design		Sintered filter with centrifugal separation	
Type of mounting		Via accessories	
		In-line installation	
Assembly position		Vertical ±5°	
Grade of filtration	[µm]	5	
		40	
Air purity class at the output		Compressed air in accordance with ISO 8573-1:2010 [6:8:4] (Grade of filtration 5 µm)	
		Compressed air in accordance with ISO 8573-1:2010 [7:8:4] (Grade of filtration 40 µm)	
Bowl guard		Plastic bowl guard	
		Integrated as metal bowl	
Condensate drain		Manual rotary	
		Semi-automatic	
		Fully automatic	
		–	Fully automatic, electrical
Max. condensate volume	[cm^3]	19 (with plastic bowl guard) 25 (with metal bowl)	38

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

Standard nominal flow rate qnN[1] [l/min]						
Size		MS4		MS6		
Pneumatic connection		G1/8	G1/4	G1/4	G3/8	G1/2
Grade of filtration	5 µm	1,000	1,300	2,000	3,000	3,200
	40 µm	1,100	1,700	2,500	3,800	4,100

1) Measured at p1 = 6 bar and Δp = 1 bar

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

Filters MS4/MS6-LF, MS series

Technical data

Operating and environmental conditions								
Condensate drain		Manual rotary M		Semi-automatic H		Fully automatic V		Fully automatic, electrical E2/E3/E4
Size		MS4	MS6	MS4	MS6	MS4	MS6	MS6
Operating pressure	[bar]	0 … 14 (0 … 10)[1]	0 … 20 (0 … 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 in accordance with ISO 8573-1:2010 [–:9:–]		Compressed air in accordance with ISO 8573-1:2010 [–:9:–]		Compressed air in accordance with ISO 8573-1:2010 [7:9:–]		Compressed air in accordance with ISO 8573-1:2010 [–:9:–]
		Inert gases						
Ambient temperature	[°C]	–10 … +60		+5 … +60		+5 … +60		+1 … +60
Temperature of medium	[°C]	–10 … +60		+5 … +60		+5 … +60		+1 … +60
Storage temperature	[°C]	–10 … +60		–10 … +60		–10 … +60		+1 … +60
Corrosion resistance class CRC[2]		2						
Food-safe[3]		See supplementary material information						–
UL certification[3]		cULus recognized (OL)						

1) Value in brackets applies to MS4/MS6-LF with UL certification.
2) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
3) Additional information www.festo.com/sp ➔ Certificates.

ATEX	
EU certification	EX4
ATEX category gas	II 2G
Ex-ignition protection type gas	Ex h IIC T6 Gb X
ATEX category dust	II 2D
EX-ignition protection type dust	Ex h IIIC T60°C Db X
ATEX 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.

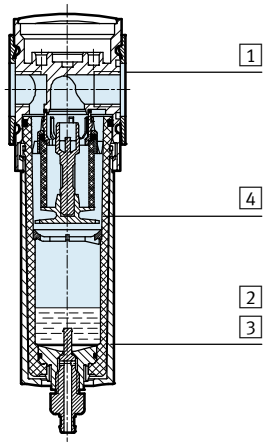
Weights [g]		
Size	MS4	MS6
Filter with plastic bowl guard R	189	600
Filter with metal bowl U	349	820
Filter with metal bowl U and fully automatic, electrically actuated condensate drain E2/E3/E4	–	1,800

Filters MS4/MS6-LF, MS series

Technical data

Materials

Sectional view

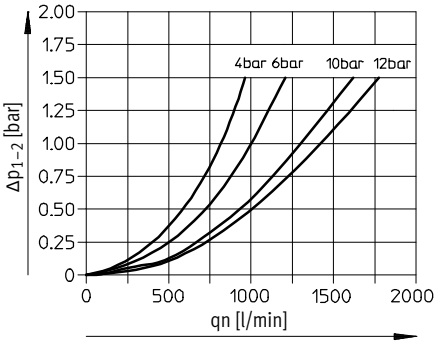


Filters		
1	Body	Die-cast aluminium
2	Plastic bowl guard	PC
3	Metal bowl	Wrought aluminium alloy, die-cast aluminium
	Viewing window	PA
4	Filter element	PE
–	Seals	NBR
Note on materials		RoHS-compliant
		Free of copper and PTFE

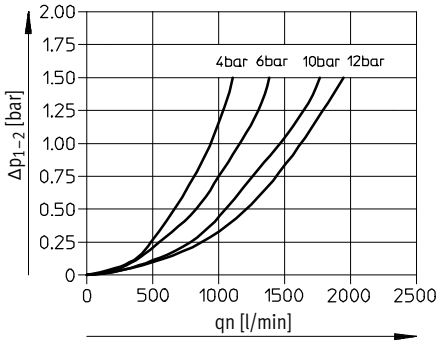
Standard flow rate qn as a function of the differential pressure Δp1-2

Grade of filtration 5 µm

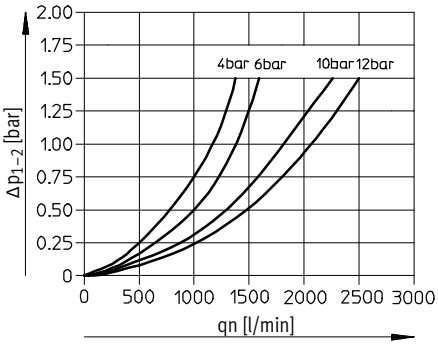
MS4-LF-⅛

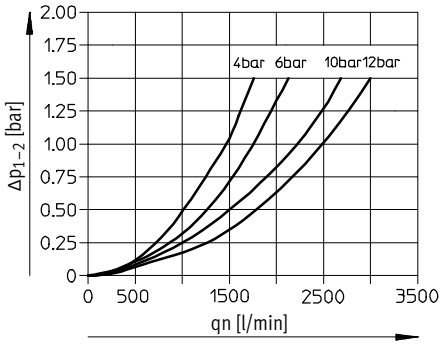


Grade of filtration 40 µm

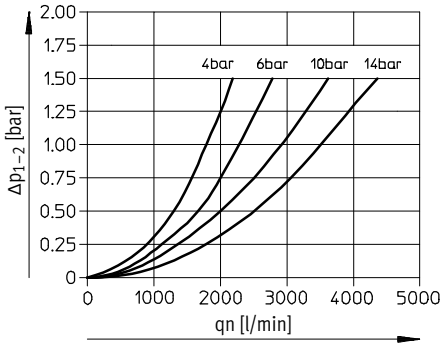
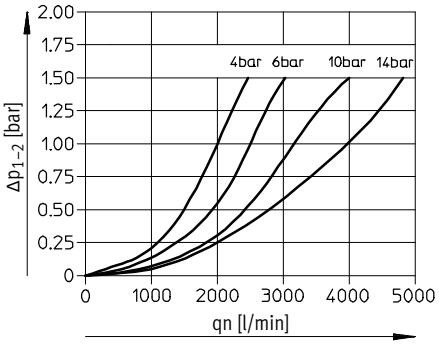
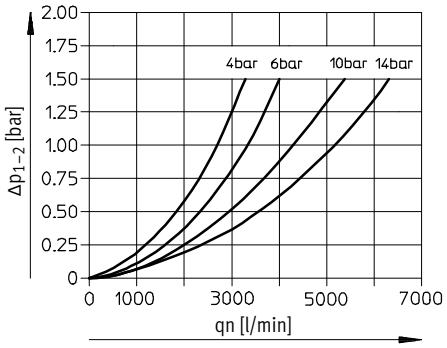
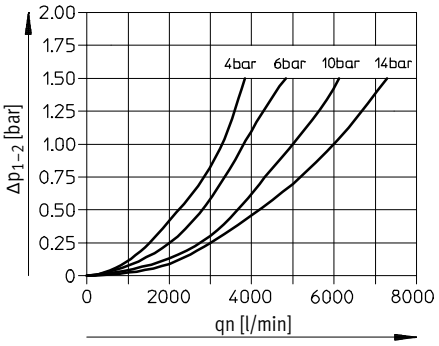
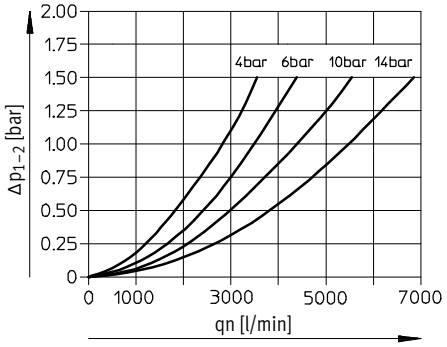
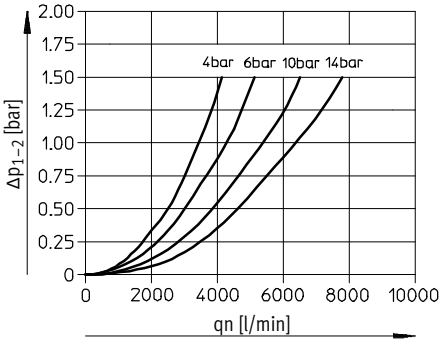


MS4-LF-¼





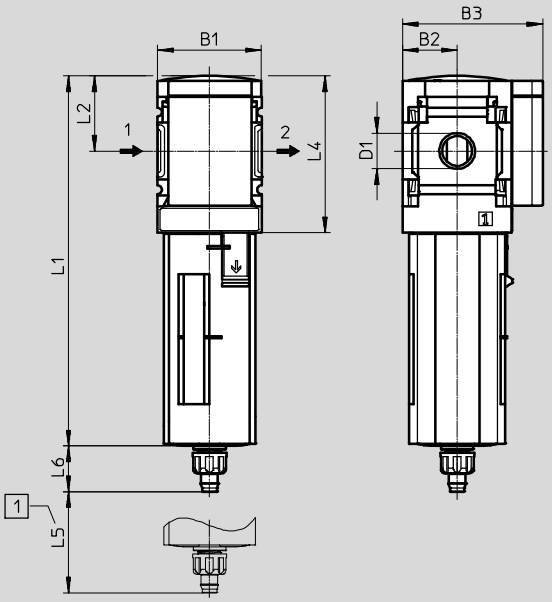
Standard flow rate qn as a function of the differential pressure Δp1-2

	Grade of filtration 5 µm	Grade of filtration 40 µm
MS6-LF-¼		
MS6-LF-⅜		
MS6-LF-½		

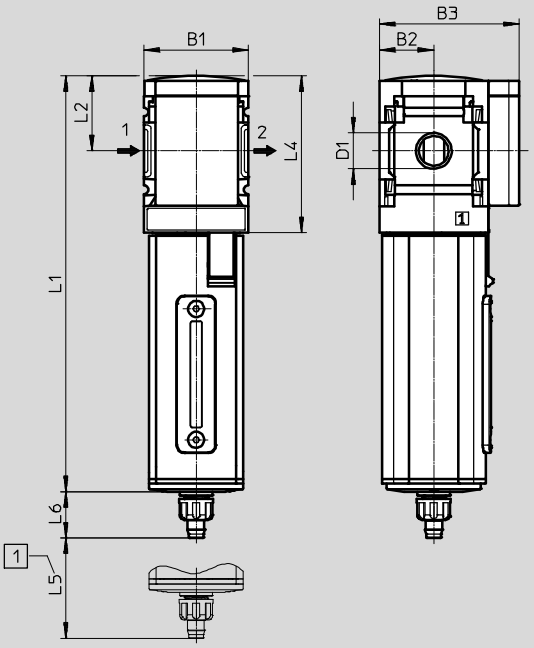
Dimensions – Basic version MS4-LF Download CAD data ➔ **www.festo.com**

Manual rotary condensate drain

With plastic bowl guard R



With metal bowl U



1 Installation dimensions ➔ Flow direction

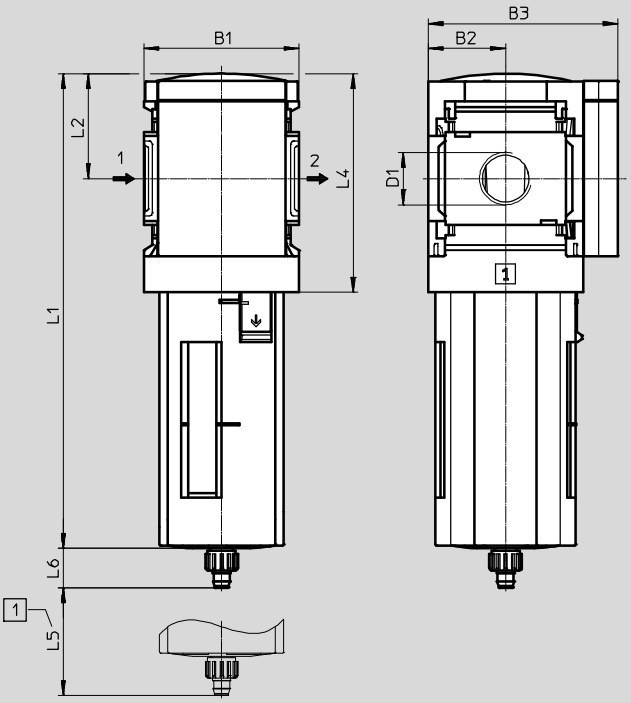
Type	B1	B2	B3	D1	L1		L2	L4	L5	L6
					Plastic bowl guard	Metal bowl				
MS4-LF-⅛	40	21	54	G⅛	142.8	159.4	29	60.5	75	17.7
MS4-LF-¼				G¼						

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

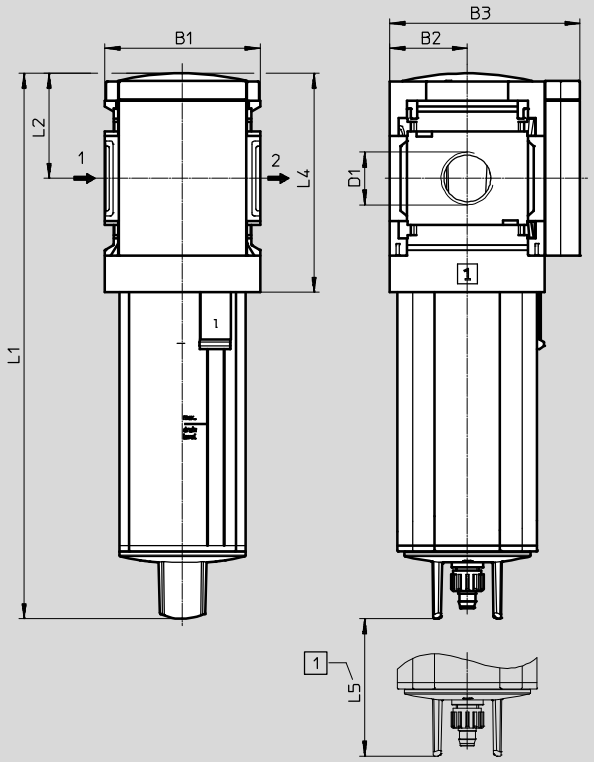
Dimensions – Basic version MS6-LF Download CAD data ➔ **www.festo.com**

Manual rotary condensate drain

With plastic bowl guard R



With metal bowl U



1 Installation dimensions ➔ Flow direction

Type	B1	B2	B3	D1	L1		L2	L4	L5	L6
					Plastic bowl guard	Metal bowl				
MS6-LF-¼	62	31	76	G¼	190	218	42	87.5	74	15.8
MS6-LF-⅜				G⅜						
MS6-LF-½				G½						

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

Filters MS4/MS6-LF, MS series

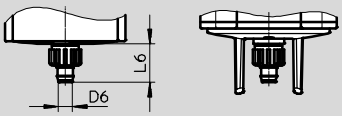
Technical data

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

Manual rotary M

MS4-...-R/U-M

MS6-...-R-M MS6-...-U-M



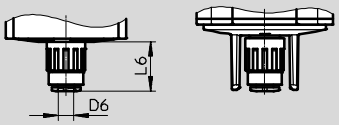
Barbed connector for plastic tubing PUN(-H)-8x1,25

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

Semi-automatic H

MS4-...-R/U-H

MS6-...-R-H MS6-...-U-H



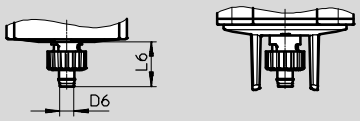
Push-in connector for plastic tubing PUN-6/PAN-6

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

Fully automatic V

MS4-...-R/U-V

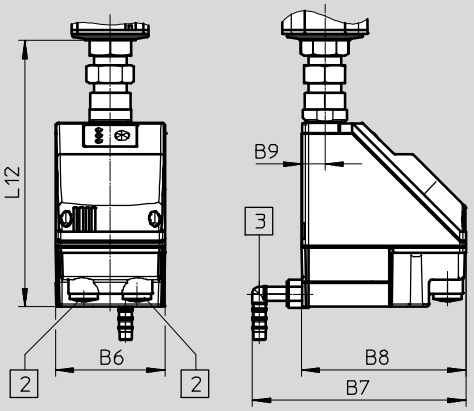
MS6-...-R-V MS6-...-U-V



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

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

Fully automatic, electrically actuated E2/E3/E4 Technical data ➔ Internet: pwea



Condensate drain PWEA:

2 Electrical connection: Screw terminal PG9

3 Connection 360° rotatable for plastic tubing PUN-H-12x2

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

Ordering data							
Plastic bowl guard							
Size	Condensate drain	Connection	Grade of filtration 5 µm			Grade of filtration 40 µm	
			Part No.	Type		Part No.	Type
Flow direction from left to right							
MS4	manual rotary	G1/8	**529403**	**MS4-LF-1/8-CRM**		**529407**	**MS4-LF-1/8-ERM**
		G1/4	**529395**	**MS4-LF-1/4-CRM**		**529399**	**MS4-LF-1/4-ERM**
	fully automatic	G1/8	**529405**	**MS4-LF-1/8-CRV**		–	–
		G1/4	**529397**	**MS4-LF-1/4-CRV**		**529401**	**MS4-LF-1/4-ERV**
MS6	manual rotary	G1/4	**529623**	**MS6-LF-1/4-CRM**		**529631**	**MS6-LF-1/4-ERM**
		G3/8	**529639**	**MS6-LF-3/8-CRM**		**529647**	**MS6-LF-3/8-ERM**
		G1/2	**529607**	**MS6-LF-1/2-CRM**		**529615**	**MS6-LF-1/2-ERM**
	fully automatic	G1/4	**529625**	**MS6-LF-1/4-CRV**		–	–
		G3/8	**529641**	**MS6-LF-3/8-CRV**		**529649**	**MS6-LF-3/8-ERV**
		G1/2	**529609**	**MS6-LF-1/2-CRV**		**529617**	**MS6-LF-1/2-ERV**
Flow direction from right to left							
MS4	manual rotary	G1/4	–	–		**529400**	**MS4-LF-1/4-ERM-Z**
MS6	manual rotary	G1/2	**529608**	**MS6-LF-1/2-CRM-Z**		**529616**	**MS6-LF-1/2-ERM-Z**
	fully automatic	G1/2	**529610**	**MS6-LF-1/2-CRV-Z**		**529618**	**MS6-LF-1/2-ERV-Z**

Ordering data							
Integrated as metal bowl							
Size	Condensate drain	Connection	Grade of filtration 5 µm			Grade of filtration 40 µm	
			Part No.	Type		Part No.	Type
Flow direction from left to right							
MS4	manual rotary	G1/4	**535654**	**MS4-LF-1/4-CUM**		**535660**	**MS4-LF-1/4-EUM**
	fully automatic	G1/4	–	–		**535658**	**MS4-LF-1/4-EUV**
MS6	manual rotary	G1/2	**529611**	**MS6-LF-1/2-CUM**		**529619**	**MS6-LF-1/2-EUM**
	fully automatic	G1/2	**529613**	**MS6-LF-1/2-CUV**		**529621**	**MS6-LF-1/2-EUV**
Flow direction from right to left							
MS6	fully automatic	G1/2	**529614**	**MS6-LF-1/2-CUV-Z**		–	–

Filters MS4/MS6-LF, MS series

Ordering data – Modular products

FESTO

Ordering table

	Grid dimension [mm]	40	62	Condi-tions	Code		Enter code
M	Module No.	**527695**	**527668**				
	Series	Standard			**MS**		MS
	Size	4	6		**...**		
	Function	Filters			**-LF**		-LF
	Pneumatic connection	Female thread G⅛	–	1	**-⅛**		
		Female thread G¼	Female thread G¼	1	**-¼**		
		–	Female thread G⅜	1	**-⅜**		
		–	Female thread G½	1	**-½**		
		Connecting plate G⅛	–		**-AGA**		
		Connecting plate G¼	Connecting plate G¼		**-AGB**		
		Connecting plate G⅜	Connecting plate G⅜		**-AGC**		
		–	Connecting plate G½		**-AGD**		
		–	Connecting plate G¾		**-AGE**		
		Connecting plate NPT⅛	–	1	**-AQK**		
		Connecting plate NPT¼	Connecting plate NPT¼	1	**-AQN**		
		Connecting plate NPT⅜	Connecting plate NPT⅜	1	**-AQP**		
		–	Connecting plate NPT½	1	**-AQR**		
		–	Connecting plate NPT¾	1	**-AQS**		
	Grade of filtration	40 µm			**-E**		
		5 µm			**-C**		
	Bowl	Plastic bowl with plastic bowl guard			**-R**		
↓		Metal bowl			**-U**		

1 **⅛, ¼, ⅜, ½, AQK, AQN, AQP, AQR, AQS, E2, E3, E4, WPM**
Not with EU certification EX4

M Mandatory data
O Options

Transfer order code

	MS		–	**LF**	–		–		–	

Ordering table

	Grid dimension [mm]	40	62	Condi-tions	Code		Enter code
↓ M	Condensate drain	Manual			**-M**		
		Semi-automatic (P1 max. 12 bar)			**-H**		
		Fully automatic (P1 max. 12 bar)			**-V**		
		–	External fully automatic condensate drain, electrical, 115 V AC, terminals	1 2	**-E2**		
		–	External fully automatic condensate drain, electrical, 230 V AC, terminals	1 2	**-E3**		
		–	External fully automatic condensate drain, electrical, 24 V DC, terminals	1 2	**-E4**		
O	Type of mounting	Mounting bracket standard design		3	**-WP**		
		Mounting bracket for attaching the service units		1 3	**-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	II 2GD to EU Explosion Protection Directive (ATEX)			**-EX4**		
	UL certification	cULus, ordinary location for Canada and USA			**-UL1**		
	Flow direction	Flow direction from right to left			**-Z**		

2 **E2, E3, E4** Only with metal bowl U.

3 **WP, WPM** Only with connecting plate AGA, AGB, AGC, AGD, AGE, AQK, AQN, AQP, AQR or AQS.

M Mandatory data
O Options

Transfer order code

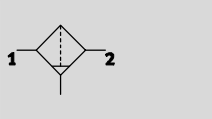
– [ ] – [ ] – [ ] – [ ] – [ ]

Fine and micro filters MS4/MS6-LFM, MS series

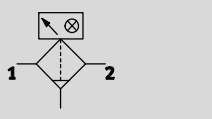
Technical data

FESTO

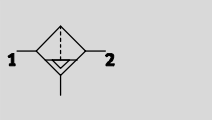
Function
Condensate drain
manual rotary
without differential pressure indicator



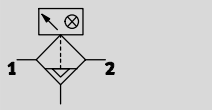
with differential pressure indicator or filter pollution indicator



Condensate drain
semi or fully automatic
without differential pressure indicator



with differential pressure indicator or filter pollution indicator



Flow rate
54 … 3,000 l/min

Temperature range
–10 … +60 °C

Operating pressure
0 … 20 bar

www.festo.com

- High-performance filter for exceptionally clean compressed air
- Air quality to ISO 8573-1:2010
- Available with manual, semi-automatic, fully automatic or fully automatic, electrically actuated condensate drain
- Available with differential pressure indicator for display of filter pollution
- Available with electronic filter pollution indicator
- Optionally with filter cartridge for low flow rates, suitable for sealing air and cleaning air
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22
- Choice of filter cartridges: 0.01 µm or 1 µm
- New filter cartridges ➔ 89

General technical data			
Size		MS4	MS6
Pneumatic connection 1, 2			
	Female thread	G⅛ or G¼	G¼, G⅜ or G½
	Connecting plate AG...	G⅛, G¼ or G⅜	G¼, G⅜, G½ or G¾
	Connecting plate AQ...	NPT⅛, NPT¼ or NPT⅜	NPT¼, NPT⅜, NPT½ or NPT¾
Constructional design		Fibre filter	
Type of mounting		Via accessories	
		In-line installation	
Mounting position		Vertical ±5°	
Grade of filtration	[µm]	0.01 (micro filter MS-LFM-A)	
		1 (fine filter MS-LFM-B)	
Air purity class at the output		Compressed air in accordance with ISO 8573-1:2010 [1:7:2] (Grade of filtration 0.01µm, micro filter MS-LFM-A)	
		Compressed air in accordance with ISO 8573-1:2010 [5:7:3] (Grade of filtration 1µm, fine filter MS-LFM-B)	
Filter efficiency	[%]	99.9999 (Grade of filtration 0.01µm, micro filter MS-LFM-A)	
		99.99 (Grade of filtration 1µm, fine filter MS-LFM-B)	
Bowl guard		Plastic bowl guard	
		Integrated as metal bowl	
Condensate drain		Manual rotary	
		Semi-automatic	
		Fully automatic	
		–	Fully automatic, electrically actuated
Differential pressure indication[1)]		Visual display	
		With filter pollution indicator based on differential pressure	

1) Recommended max. differential pressure for changing the filter cartridge is $\Delta p_{1\text{-}2}$ = 0.35 bar; for the micro filter MS6-LFM-A with range of application HP $\Delta p_{1\text{-}2}$ = 0.5 bar

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

Fine and micro filters MS4/MS6-LFM, MS series

Technical data

General technical data			
Size		MS4	MS6
Residual oil content	[mg/m³]	≤0.01 (micro filter MS-LFM-A) ≤0.5 (fine filter MS-LFM-B)	
Max. condensate volume	[cm³]	19 (with plastic bowl guard) 25 (with metal shell)	38

Standard flow rate q_n[1] [l/min]				
Size	MS4	MS6		
Variant	Standard	Standard	High flow rate HF	Range of application HP, suitable for sealing air and cleaning air
Micro filter MS-LFM-A				
Max. standard flow rate for air purity class $q_{n\ max}$	360	900	2,500	400
Min. standard flow rate for air purity class $q_{n\ min}$	54	135	150	60
Fine filter MS-LFM-B				
Max. standard flow rate for air purity class $q_{n\ max}$	360	950	3,000	500
Min. standard flow rate for air purity class $q_{n\ min}$	54	140	188	60

1) Measured at p1 = 6 bar.
125 l/min must be available for the fully automatic condensate drain to close correctly.

Operating and environmental conditions							
Condensate drain		Manual rotary M		Semi-automatic H		Fully automatic V		Fully automatic, electrical E2/E3/E4
Size		MS4	MS6	MS4	MS6	MS4	MS6	MS6
Operating pressure	[bar]	0 … 14 (0 … 10)[1]	0 … 20 (0 … 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 in accordance with ISO 8573-1:2010 [6:8:4][2]						
		Inert gases						
Ambient temperature	[°C]	–10 … +60 (0 … +50)[3]		+5 … +60 (+5 … +50)[3]		+5 … +60 (+5 … +50)[3]		+1 … +60 (+1 … +50)[3]
Temperature of medium	[°C]	–10 … +60 (0 … +50)[3]		+5 … +60 (+5 … +50)[3]		+5 … +60 (+5 … +50)[3]		+1 … +60 (+1 … +50)[3]
Storage temperature	[°C]	–10 … +60 (0 … +50)[3]		–10 … +60 (0 … +50)[3]		–10 … +60 (0 … +50)[3]		+1 … +60 (+1 … +50)[3]
Corrosion resistance class CRC[4]		2						
Food-safe[5]		See supplementary material information						–
UL certification[5]		cULus recognized (OL)						

1) Value in brackets applies to MS4/MS6-LFM with UL certification or with filter pollution indicator DP/DN/DPI/DPN.
2) It is recommended to prefilter the compressed air for the micro filter MS-LFM-A using a fine filter MS-LFM-B (grade of filtration 1 µm).
3) Value in brackets applies to MS4/MS6-LFM with filter pollution indicator DP/DN/DPI/DPN.
4) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
5) Additional information www.festo.com/sp ➔ Certificates.

Technical data – Filter pollution indicator					
Filter pollution indicator		DP	DN	DPI	DNI
Pressure measuring range	[bar]	0 … +1			
Measured variable		Differential pressure; percentage value for filter pollution			
Switch output		PNP	NPN	PNP	NPN
Analogue output	[mA]	–		4 … 20	
Operating voltage range	[V DC]	15 … 30			
Max. output current	[mA]	150			
Protection class		IP65			
CE mark (see declaration of conformity)		In accordance with EU EMC directive			
		In accordance with EU Low Voltage Directive			

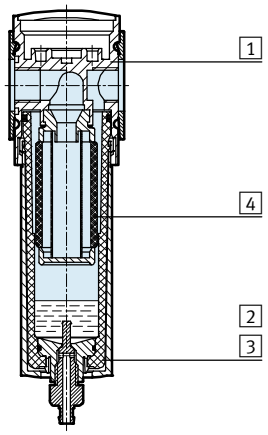
ATEX	
EU certification	EX4
ATEX category gas	II 2G
Ex-ignition protection type gas	Ex h IIC T6 Gb X
ATEX category dust	II 2D
EX-ignition protection type dust	Ex h IIIC T60°C Db X
ATEX ambient temperature	+5 °C ≤ Ta ≤ +60 °C
CE mark (see declaration of conformity)[1)]	To EU Explosion Protection Directive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

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

Weight [g]			
Size	MS4	MS6	
Variant	Standard	Standard/Range of application HP	High flow rate HF
Fine and micro filter with plastic bowl guard R	190	600	1,280
Fine and micro filter with metal bowl U	350	820	1,500
Fine and micro filter with metal bowl guard U and fully automatic, electrically actuated condensate drain E2/E3/E4	–	1,800	2,180
Filter pollution indicator	80	100	100

Materials

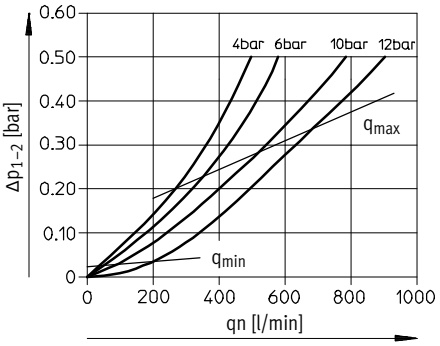
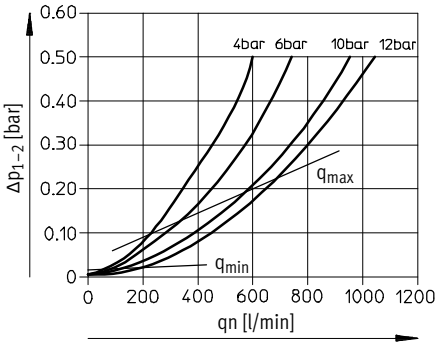
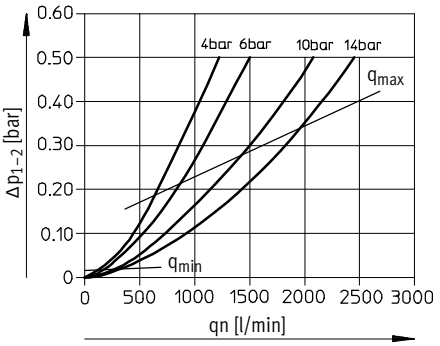
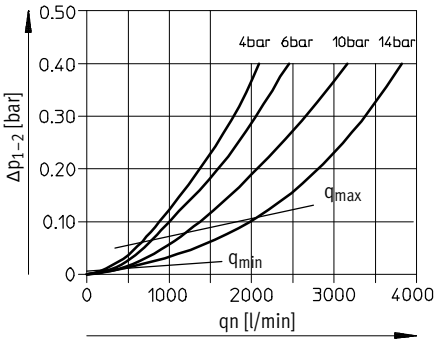
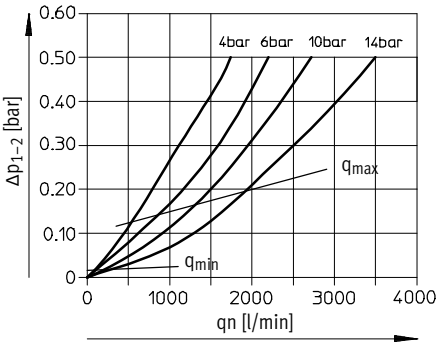
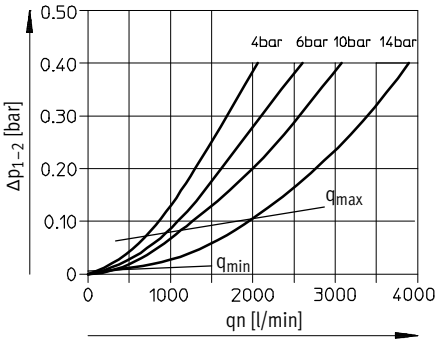
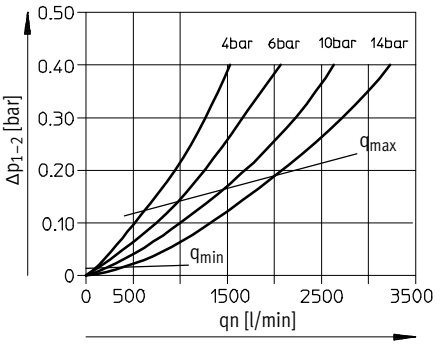
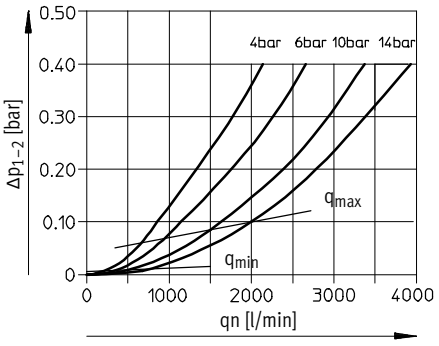
Sectional view



Fine and micro filters		
1	Housing	Die-cast aluminium
2	Plastic bowl guard	PC
3	Metal bowl	Wrought aluminium alloy, die-cast aluminium
	Viewing window	PA
4	Filter	Borosilicate fibre
–	Seals	NBR
Note on materials		RoHS-compliant
		Free of copper and PTFE

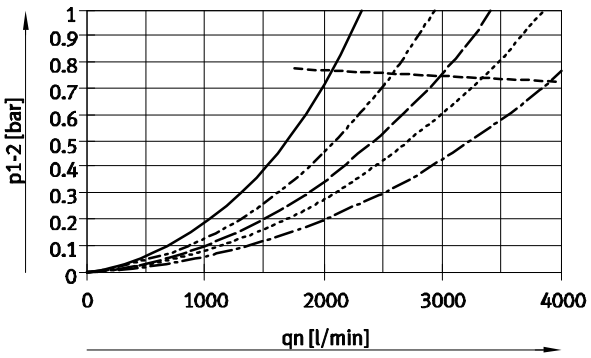
Filter pollution indicator	
Housing	PA POM
Adapter	PA
Display	PC
Seals	NBR
Note on materials	Free of copper and PTFE

Standard flow rate qn as a function of the differential pressure Δp1-2

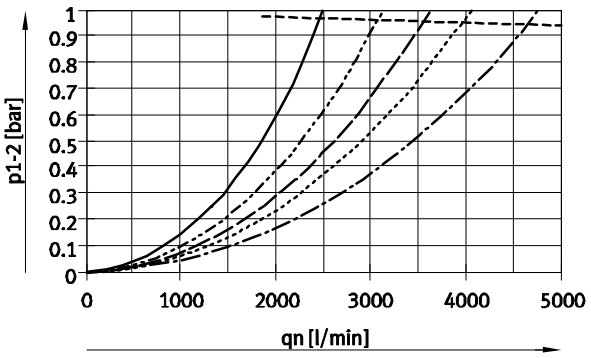
	Grade of filtration 0.01 µm	Grade of filtration 1 µm
MS4-LFM-⅛ and MS4-LFM-¼		
MS6-LFM-¼		
MS6-LFM-⅜		
MS6-LFM-½		

Standard flow rate qn as a function of the differential pressure p1-2

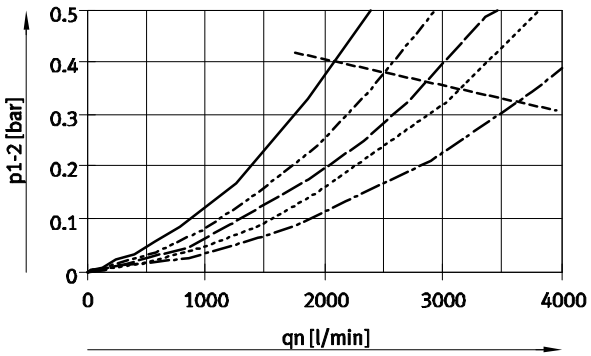
MS6-LFM-¼-...-HF, Grade of filtration 0.01 µm



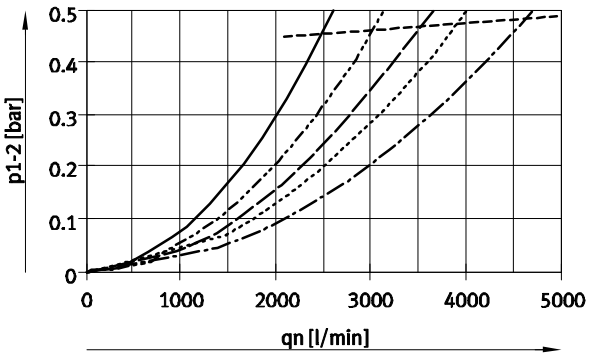
MS6-LFM-¼-...-HF, Grade of filtration 1 µm



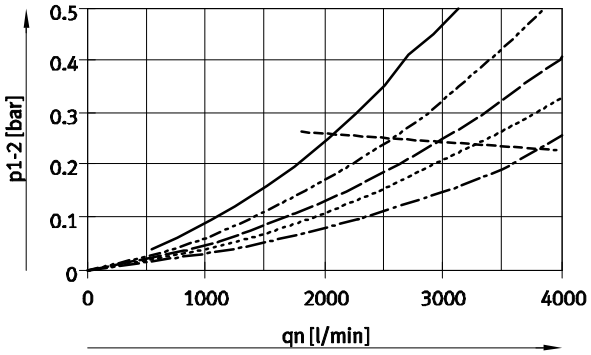
MS6-LFM-⅜-...-HF, Grade of filtration 0.01 µm



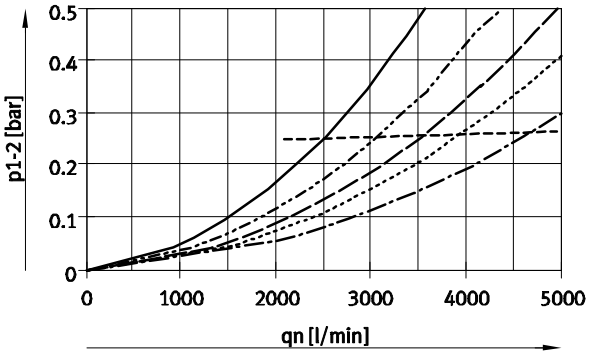
MS6-LFM-⅜-...-HF, Grade of filtration 1 µm



MS6-LFM-½-...-HF, Grade of filtration 0.01 µm



MS6-LFM-½-...-HF, Grade of filtration 1 µm



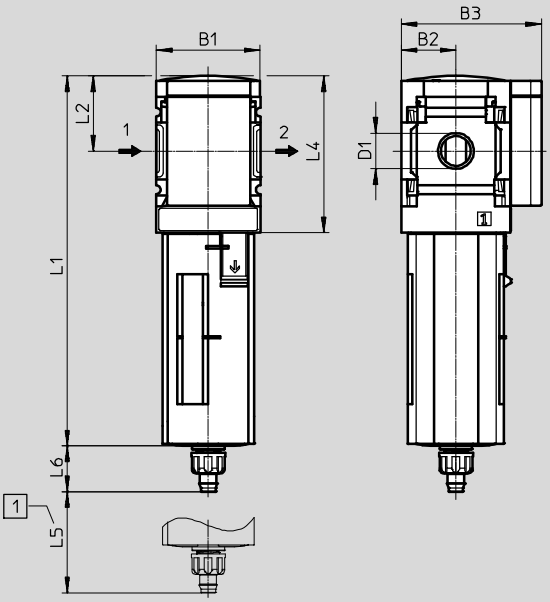
- p1: 4 bar (q_{min}: 103 l/min)
- p1: 6 bar (q_{min}: 125 l/min)
- p1: 8 bar
- p1: 10 bar (q_{min}: 162 l/min)
- p1: 14 bar (q_{min}: 192 l/min)
- q_{max}

- p1: 4 bar (q_{min}: 124 l/min)
- p1: 6 bar (q_{min}: 150 l/min)
- p1: 8 bar
- p1: 10 bar (q_{min}: 194 l/min)
- p1: 14 bar (q_{min}: 230 l/min)
- q_{max}

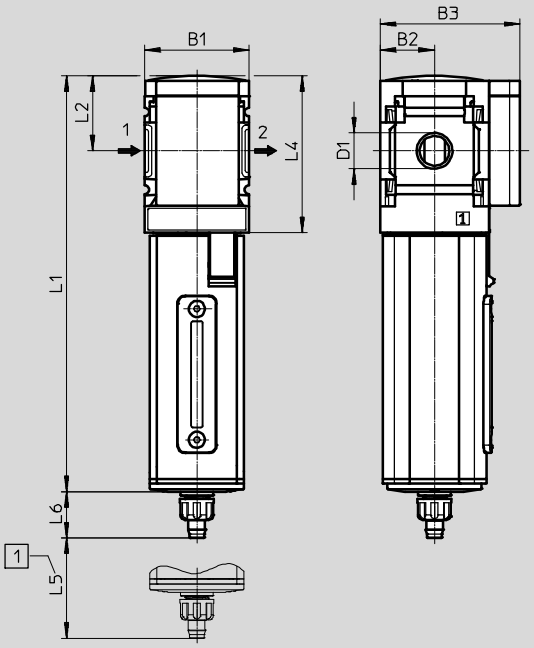
Dimensions – Basic version MS4-LFM Download CAD data ➔ **www.festo.com**

Manual rotary condensate drain

With plastic bowl guard R



With metal bowl U



1 Installation dimensions ➔ Flow direction

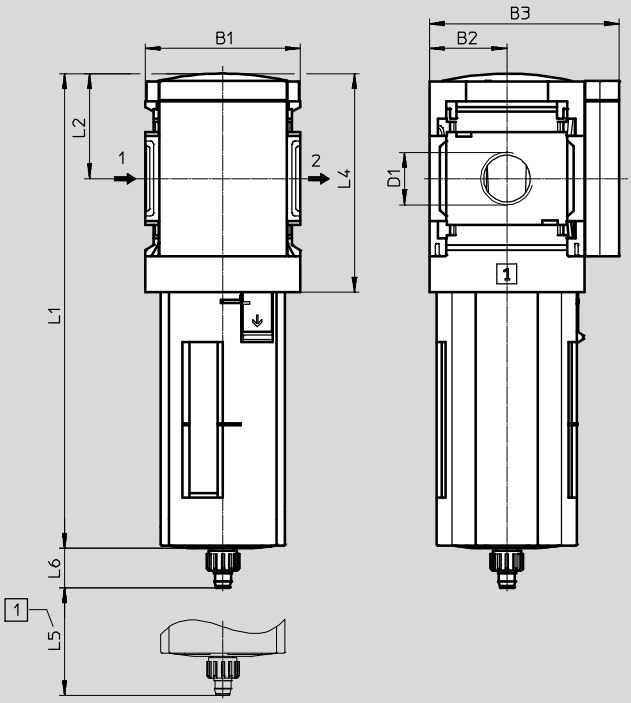
Type	B1	B2	B3	D1	L1		L2	L4	L5	L6
					Plastic bowl guard	Metal bowl				
MS4-LFM-⅛	40	21	54	G⅛	141.6	160	29	60.5	25	17.7
MS4-LFM-¼				G¼						

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

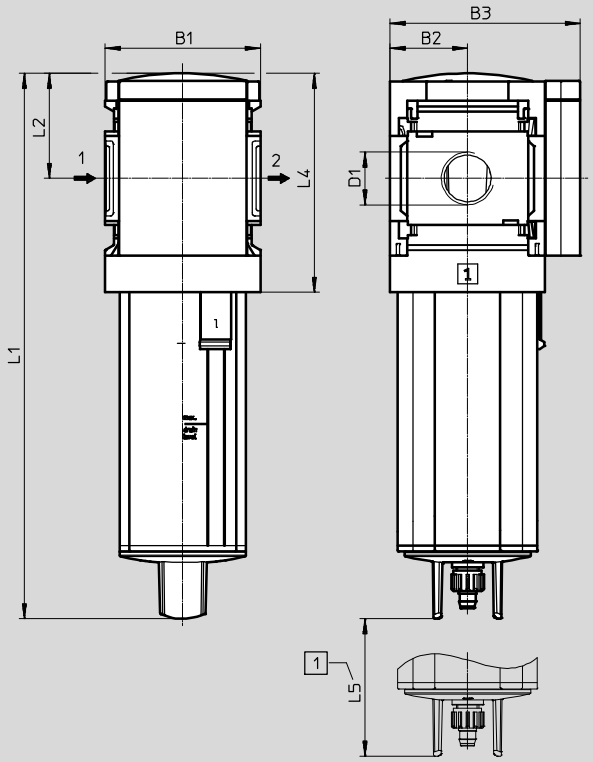
Dimensions – Basic version MS6-LFM Download CAD data ➔ **www.festo.com**

Manual rotary condensate drain

With plastic bowl guard R



With metal bowl U



1 Installation dimensions

➔ Flow direction

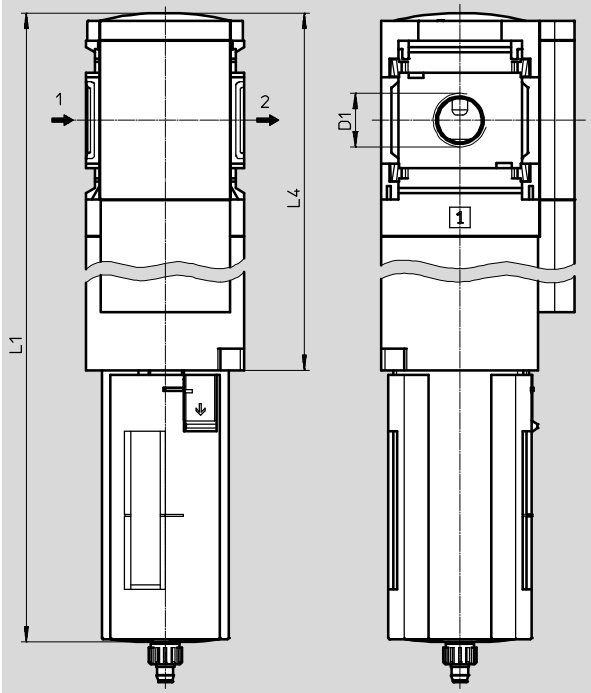
Type	B1	B2	B3	D1	L1		L2	L4	L5	L6
					Plastic bowl guard	Metal bowl				
MS6-LFM-¼	62	31	76	G¼	193	221	42	88	75	15.8
MS6-LFM-⅜				G⅜						
MS6-LFM-½				G½						

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

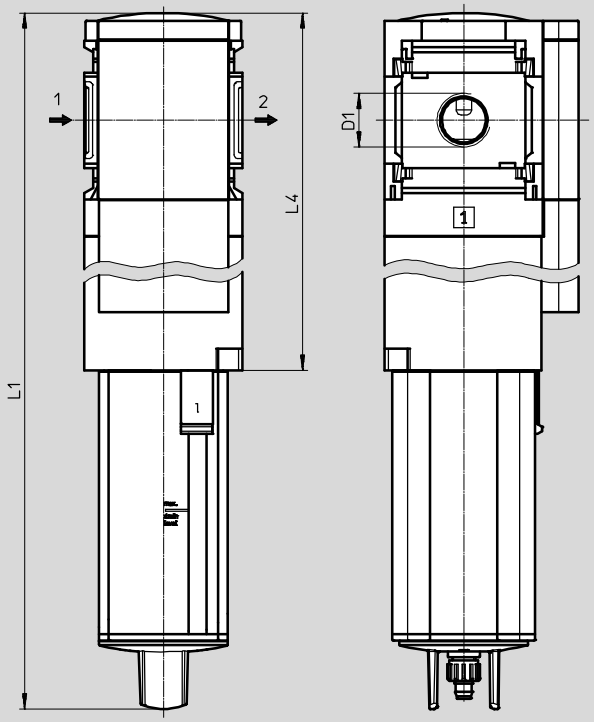
Dimensions – High flow rate HF Download CAD data ➔ **www.festo.com**

Manual rotary condensate drain

With plastic bowl guard R



With metal bowl U

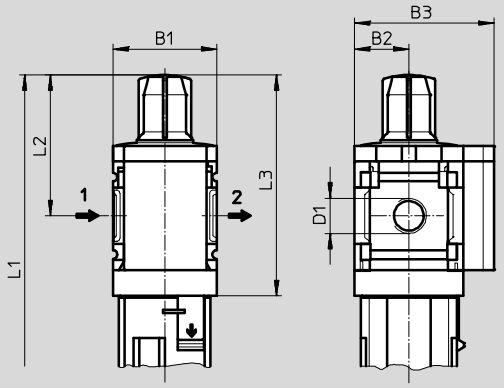


➔ Flow direction

Type	D1	L1		L4
		Plastic bowl guard	Metal bowl	
MS6-LFM-¼-...-HF	G¼	313	340	207
MS6-LFM-⅜-...-HF	G⅜			
MS6-LFM-½-...-HF	G½			

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

Dimensions – Differential pressure indicator DA Download CAD data ➔ **www.festo.com**

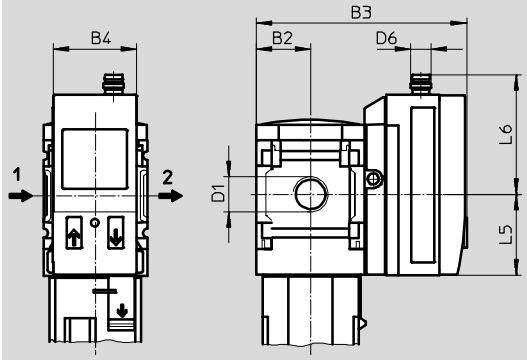


➔ Flow direction

Type	B1	B2	B3	D1	L1		L2	L3
					Plastic bowl guard	Metal bowl		
MS4-LFM-⅛-...-DA	40	21	54	G⅛	168.4	186.8	55.8	87.3
MS4-LFM-¼-...-DA				G¼				
MS6-LFM-¼-...-DA	62	31	76	G¼	229	257	78	124
MS6-LFM-⅜-...-DA				G⅜				
MS6-LFM-½-...-DA				G½				
MS6-LFM-¼-...-HF-DA	62	31	76	G¼	349	376	78	124
MS6-LFM-⅜-...-HF-DA				G⅜				
MS6-LFM-½-...-HF-DA				G½				

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

Dimensions – Filter pollution indicator DP/DN/DPI/DNI Download CAD data ➔ **www.festo.com**



➔ Flow direction

Variant DP:
Filter pollution indicator with 3-pin M8x1 plug, 1 switch output PNP

Variant DN:
Filter pollution indicator with 3-pin M8x1 plug, 1 switch output NPN

Variant DPI:
Filter pollution indicator with 4-pin M12x1 plug, 1 switch output PNP and 4 … 20 mA analogue

Variant DNI:
Filter pollution indicator with 4-pin M12x1 plug, 1 switch output NPN and 4 … 20 mA analogue

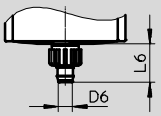
Type	B2	B3	B4	D1	D6	L5	L6
MS4-LFM-⅛-…-DP/DN	21	82.6	32.3	G⅛	M8x1	35.1	46.7
MS4-LFM-¼-…-DP/DN				G¼			
MS4-LFM-⅛-…-DPI/DNI	21	82.6	32.3	G⅛	M12x1	35.1	55.8
MS4-LFM-¼-…-DPI/DNI				G¼			
MS6-LFM-¼-…-DP/DN	31	103	32.3	G¼	M8x1	35.1	46.7
MS6-LFM-⅜-…-DP/DN				G⅜			
MS6-LFM-½-…-DP/DN				G½			
MS6-LFM-¼-…-DPI/DNI	31	103	32.3	G¼	M12x1	35.1	55.8
MS6-LFM-⅜-…-DPI/DNI				G⅜			
MS6-LFM-½-…-DPI/DNI				G½			

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

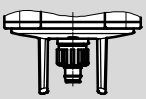
Dimensions – Condensate drain Download CAD data ➔ **www.festo.com**

Manual rotary M

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



MS6-...-U-M

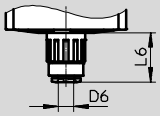


Barbed connector for plastic tubing PUN(-H)-8x1,25

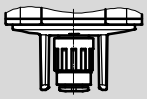
Type	D6 ∅	L6
Plastic bowl guard R		
MS4-LFM-...-M	5.6	17.7
MS6-LFM-...-M		15.8
Metal bowl U		
MS4-LFM-...-M	5.6	17.7
MS6-LFM-...-M		–

Semi-automatic H

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



MS6-...-U-H

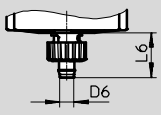


Push-in connector for plastic tubing PUN-6/PAN-6

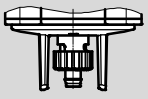
Type	D6 ∅	L6
Plastic bowl guard R		
MS4-LFM-...-H	6.2	22.1
MS6-LFM-...-H		20.4
Metal bowl U		
MS4-LFM-...-H	6.2	22.1
MS6-LFM-...-H		–

Fully automatic V

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



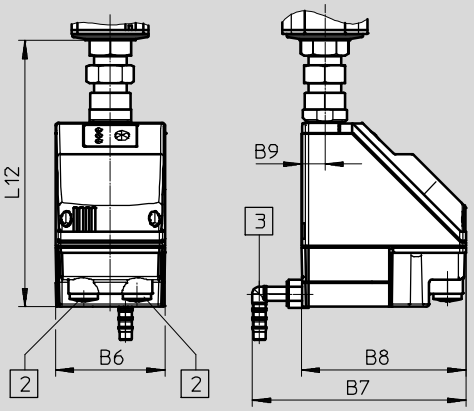
MS6-...-U-V



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

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

Fully automatic, electrically actuated E2/E3/E4 Technical data ➔ Internet: pwea



Condensate drain PWEA:
- 2 Electrical connection: Screw terminal PG9
- 3 Connection 360° rotatable for plastic tubing PUN-H-12x2

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

Ordering data

Plastic bowl guard, without differential pressure indicator

Size	Condensate drain	Connection	Micro filter, grade of filtration 0.01 µm		Fine filter, grade of filtration 1 µm	
			Part No.	Type	Part No.	Type
Flow direction from left to right						
MS4	Manual rotary	G1/8	**529463**	**MS4-LFM-1/8-ARM**	**529465**	**MS4-LFM-1/8-BRM**
		G1/4	**529459**	**MS4-LFM-1/4-ARM**	**529461**	**MS4-LFM-1/4-BRM**
MS6	Manual rotary	G1/4	**529663**	**MS6-LFM-1/4-ARM**	**529667**	**MS6-LFM-1/4-BRM**
		G3/8	**529671**	**MS6-LFM-3/8-ARM**	**529675**	**MS6-LFM-3/8-BRM**
		G1/2	**529655**	**MS6-LFM-1/2-ARM**	**529659**	**MS6-LFM-1/2-BRM**
	Fully automatic	G1/4	**530510**	**MS6-LFM-1/4-ARV**	**530514**	**MS6-LFM-1/4-BRV**
		G3/8	**530518**	**MS6-LFM-3/8-ARV**	–	–
		G1/2	**530502**	**MS6-LFM-1/2-ARV**	**530506**	**MS6-LFM-1/2-BRV**
Flow direction from right to left						
MS4	Manual rotary	G1/4	**529460**	**MS4-LFM-1/4-ARM-Z**	–	–
MS6	Fully automatic	G1/2	–	–	**530508**	**MS6-LFM-1/2-BRV-Z**

Ordering data

Plastic bowl guard, with differential pressure indicator

Size	Condensate drain	Connection	Micro filter, grade of filtration 0.01 µm		Fine filter, grade of filtration 1 µm	
			Part No.	Type	Part No.	Type
Flow direction from left to right						
MS4	Manual rotary	G1/8	**536821**	**MS4-LFM-1/8-ARM-DA**	–	–
		G1/4	**536822**	**MS4-LFM-1/4-ARM-DA**	**536818**	**MS4-LFM-1/4-BRM-DA**
MS6	Manual rotary	G1/4	**536869**	**MS6-LFM-1/4-ARM-DA**	**536833**	**MS6-LFM-1/4-BRM-DA**
		G3/8	**536870**	**MS6-LFM-3/8-ARM-DA**	–	–
		G1/2	**536871**	**MS6-LFM-1/2-ARM-DA**	**536835**	**MS6-LFM-1/2-BRM-DA**
	Fully automatic	G1/2	**536877**	**MS6-LFM-1/2-ARV-DA**	**536841**	**MS6-LFM-1/2-BRV-DA**

Ordering data

Integrated as metal bowl, without differential pressure indicator

Size	Condensate drain	Connection	Micro filter, grade of filtration 0.01 µm		Fine filter, grade of filtration 1 µm	
			Part No.	Type	Part No.	Type
Flow direction from left to right						
MS4	Fully automatic	G1/4	**535768**	**MS4-LFM-1/4-AUV**	**535766**	**MS4-LFM-1/4-BUV**
MS6	Fully automatic	G1/4	**529665**	**MS6-LFM-1/4-AUV**	–	–
		G3/8	**529673**	**MS6-LFM-3/8-AUV**	–	–
		G1/2	**529657**	**MS6-LFM-1/2-AUV**	**529661**	**MS6-LFM-1/2-BUV**
Flow direction from right to left						
MS6	Fully automatic	G1/2	**529658**	**MS6-LFM-1/2-AUV-Z**	**529662**	**MS6-LFM-1/2-BUV-Z**

Ordering data

Integrated as metal bowl, with differential pressure indicator

Size	Condensate drain	Connection	Micro filter, grade of filtration 0.01 µm		Fine filter, grade of filtration 1 µm	
			Part No.	Type	Part No.	Type
Flow direction from left to right						
MS4	Fully automatic	G1/4	**537214**	**MS4-LFM-1/4-AUV-DA**	–	–
MS6	Fully automatic	G1/2	**536883**	**MS6-LFM-1/2-AUV-DA**	**536847**	**MS6-LFM-1/2-BUV-DA**
Flow direction from left to right, high flow rate						
MS6	Fully automatic	G1/2	**552926**	**MS6-LFM-1/2-AUV-HF-DA**	**552925**	**MS6-LFM-1/2-BUV-HF-DA**
Flow direction from right to left						
MS4	Fully automatic	G1/4	**537216**	**MS4-LFM-1/4-AUV-DA-Z**	–	–

Fine and micro filters MS4/MS6-LFM, MS series

Ordering data – Modular products

Ordering table

	Grid dimension [mm]	40	62	Condi-tions	Code		Enter code
M	Module No.	**527697**	**527670**				
	Series	Standard			**MS**		MS
	Size	4	6		**...**		
	Function	Fine and micro filter			**-LFM**		-LFM
	Pneumatic connection	Female thread G⅛	–	1	**-⅛**		
		Female thread G¼	Female thread G¼	1	**-¼**		
		–	Female thread G⅜	1	**-⅜**		
		–	Female thread G½	1	**-½**		
		Connecting plate G⅛	–		**-AGA**		
		Connecting plate G¼	Connecting plate G¼		**-AGB**		
		Connecting plate G⅜	Connecting plate G⅜		**-AGC**		
		–	Connecting plate G½		**-AGD**		
		–	Connecting plate G¾		**-AGE**		
		Connecting plate NPT⅛	–	1	**-AQK**		
		Connecting plate NPT¼	Connecting plate NPT¼	1	**-AQN**		
		Connecting plate NPT⅜	Connecting plate NPT⅜	1	**-AQP**		
		–	Connecting plate NPT½	1	**-AQR**		
		–	Connecting plate NPT¾	1	**-AQS**		
	Grade of filtration	1 µm			**-B**		
		0.01 µm			**-A**		
	Bowl	Plastic bowl with plastic bowl guard			**-R**		
↓		Metal bowl			**-U**		

1 **⅛, ¼, ⅜, ½, AQK, AQN, AQP, AQR, AQS, E2, E3, E4, DP, DN, DPI, DNI, WPM**
Not with EU certification EX4

M Mandatory data
O Options

Transfer order code

	MS		–	**LFM**	–		–		–	

Ordering table

	Grid dimension [mm]	40	62	Condi-tions	Code		Enter code
↓ M	Condensate drain	Manual			-M		
		Semi-automatic (P1 max. 12 bar)			-H		
		Fully automatic (P1 max. 12 bar)		2	-V		
		–	External fully automatic condensate drain, electrical, 115 V AC, terminals	1 3	-E2		
		–	External fully automatic condensate drain, electrical, 230 V AC, terminals	1 3	-E3		
		–	External fully automatic condensate drain, electrical, 24 V DC, terminals	1 3	-E4		
O	Flow rate	–	High flow rate		-HF		
	Range of application	–	Suitable for sealing air and cleaning air	4	-HP		
	Filter contamination sensing	Differential pressure indicator, visual			-DA		
		Filter contamination indicator, M8 plug, PNP, 3-pin		1 5	-DP		
		Filter contamination indicator, M8 plug, NPN, 3-pin		1 5	-DN		
		Filter contamination indicator, M12 plug, PNP, 4-pin, analogue output 4 … 20 mA		1 5	-DPI		
		Filter contamination indicator, M12 plug, PNP, 4-pin, analogue output 4 … 20 mA		1 5	-DNI		
	Type of mounting	Mounting bracket standard design		6	-WP		
		Mounting bracket for attaching the service units		1 6	-WPM		
		Mounting bracket centrally at rear (wall mounting top and bottom), connecting plates not required			-WB		
		Mounting bracket centrally at rear (wall mounting top), connecting plates not required	–		-WBM		
	EU certification	II 2GD to EU Explosion Protection Directive (ATEX)			-EX4		
	UL certification	cULus, ordinary location for Canada and USA			-UL1		
	Flow direction	Flow direction from right to left			-Z		

2 **V** Size 4: only with metal bowl U

3 **E2, E3, E4** Only with metal bowl U

4 **HP** Not with flow rate HF or filter contamination sensing DA

5 **DP, DN, DPI, DNI** Measuring range max. 10 bar

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

M Mandatory data

O Options

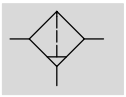
Transfer order code

– [ ] – [ ] – [ ] – [ ] – [ ] – [ ] – [ ] – [ ]

Active carbon filters MS4/MS6-LFX, MS series

Technical data

Function



- Flow rate
  max. 2,500 l/min
- Temperature range
  –10 … +60 °C
- Operating pressure
  0 … 20 bar
- www.festo.com

Note

Prefiltration with micro filter MS-LFM-A, grade of filtration 0.01 µm, recommended.

- Removal of liquid and gaseous oil particles from compressed air using active carbon
- Eliminates odours and vapours
- Optionally with filter cartridge for low flow rates, suitable for sealing air and cleaning air
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22
- New filter cartridges ➔ 89

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
	Connecting plate AQ...	NPT1/8, NPT1/4 or NPT3/8	NPT1/4, NPT3/8, NPT1/2 or NPT3/4
Design		Active carbon filter	
Type of mounting		Via accessories	
		In-line installation	
Assembly position		Vertical ±5°	
Air purity class at the output[1]		Compressed air in accordance with ISO 8573-1:2010 [1:4:1]	
Bowl guard		Plastic bowl guard	
		Integrated as metal bowl	
Residual oil content	[mg/m³]	≤0.003	

1) We recommend that the filter cartridge be replaced by a new one after 1,000 operating hours. (Applies to an ambient temperature of 21 °C. At higher temperatures the service life of the filter cartridge will be reduced.)

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

Standard flow rate q_n[1] [l/min]				
Size	MS4	MS6		
Variant	Standard	Standard	High flow rate HF	Range of application HP, suitable for sealing air and cleaning air
Max. standard flow rate for air purity class $q_{n\,max}$	360	900	2,500	900

1) Measured at p1 = 6 bar.

Active carbon filters MS4/MS6-LFX, MS series

Technical data

Operating and environmental conditions			
Size		MS4	MS6
Operating pressure	[bar]	0 … 14 (0 … 10)[1]	0 … 20 (0 … 10)[1]
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [1:4:2]	
		Inert gases	
Ambient temperature	[°C]	–10 … +60	
Temperature of medium	[°C]	+5 … +30	
Storage temperature	[°C]	–10 … +60	
Corrosion resistance class CRC[2]		2	
Food-safe[3]		See supplementary material information	
UL certification[3]		cULus recognized (OL)	

1) Value in brackets applies to MS4/MS6-LFX with UL certification.
2) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
3) Additional information www.festo.com/sp ➔ Certificates.

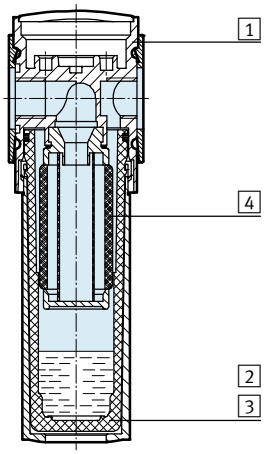
ATEX	
EU certification	EX4
ATEX category gas	II 2G
Ex-ignition protection type gas	Ex h IIC T6 Gb X
ATEX category dust	II 2D
EX-ignition protection type dust	Ex h IIIC T60°C Db X
ATEX ambient temperature	–10 °C ≤ Ta ≤ +60 °C
CE mark (see declaration of conformity)[1]	To EU Explosion Protection Directive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

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

Weights [g]			
Size	MS4	MS6	
Variant	Standard	Standard/Range of application HP	High flow rate HF
Active carbon filter with plastic bowl guard R	190	600	1,280
Active carbon filter with metal bowl U	350	820	1,500

Materials

Sectional view



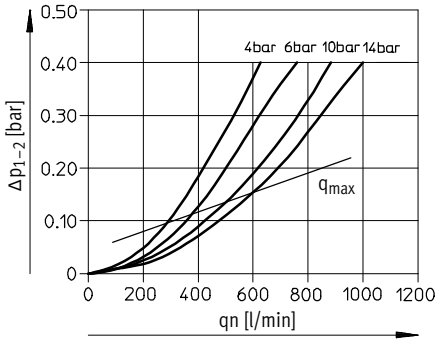
Active carbon filter		
1	Body	Die-cast aluminium
2	Plastic bowl guard	PC
3	Metal bowl	Wrought aluminium alloy, die-cast aluminium
	Viewing window	PA
4	Filters	Active carbon
–	Seals	NBR
Note on materials		RoHS-compliant
		Free of copper and PTFE

Active carbon filters MS4/MS6-LFX, MS series

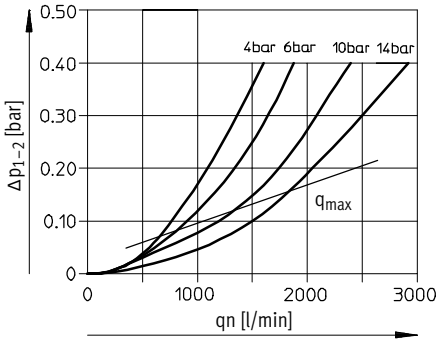
Technical data

Standard flow rate qn as a function of the differential pressure Δp1-2

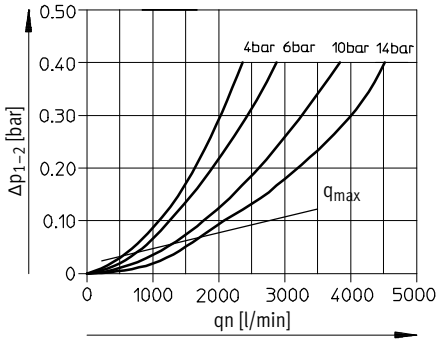
MS4-LFX-⅛ and MS4-LFX-¼



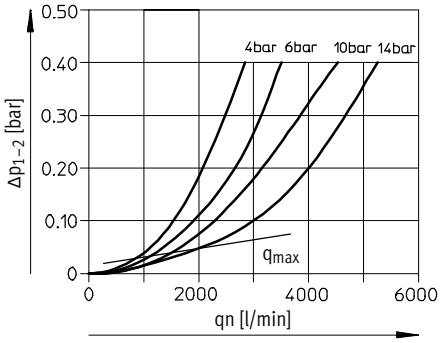
MS6-LFX-¼



MS6-LFX-⅜

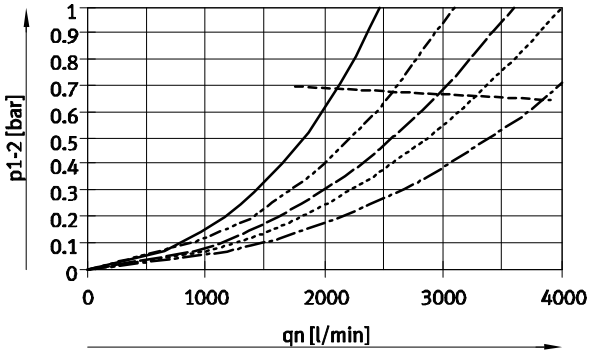


MS6-LFX-½

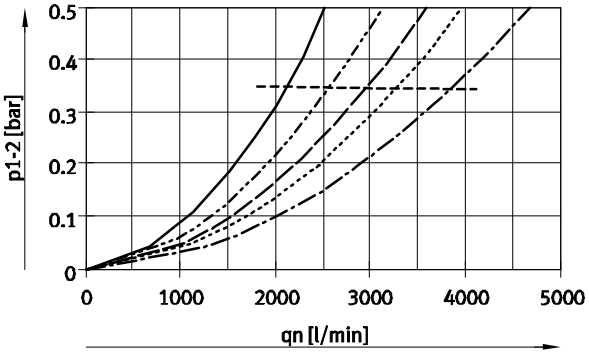


Standard flow rate qn as a function of the differential pressure p1-2

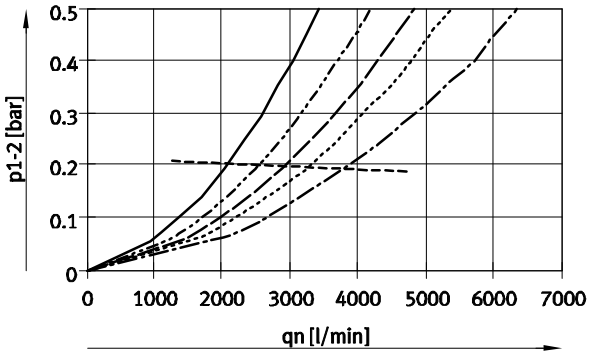
MS6-LFX-¼-...-HF

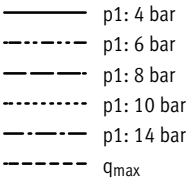


MS6-LFX-⅜-...-HF



MS6-LFX-½-...-HF



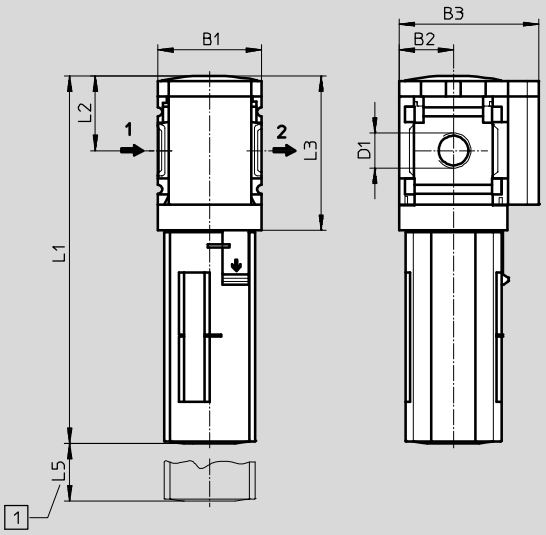


Active carbon filters MS4/MS6-LFX, MS series

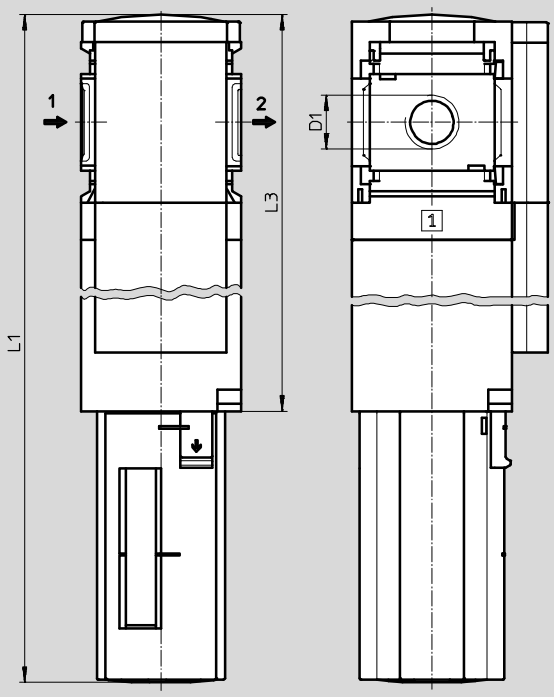
Technical data

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

Standard/Range of application HP



High flow rate HF



1 Installation dimensions

➔ Flow direction

Type	B1	B2	B3	D1	L1 Bowl guard		L2	L3	L5
					Plastic	Metal			
MS4-LFX-⅛	40	21	54	G⅛	142.8	160.4	29	60	73
MS4-LFX-¼				G¼					
MS6-LFX-¼	62	31	76	G¼	192	198	42	88	100
MS6-LFX-⅜				G⅜					
MS6-LFX-½				G½					
MS6-LFX-¼-...-HF	62	31	76	G¼	312	318	42	207	100
MS6-LFX-⅜-...-HF				G⅜					
MS6-LFX-½-...-HF				G½					

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

Ordering data

Size	Connection	Plastic bowl guard		Integrated as metal bowl	
		Part No.	Type	Part No.	Type
Flow direction from left to right					
MS4	G⅛	–	–	**536709**	**MS4-LFX-⅛-U**
	G¼	**529467**	**MS4-LFX-¼-R**	**535782**	**MS4-LFX-¼-U**
MS6	G¼	**529683**	**MS6-LFX-¼-R**	**529685**	**MS6-LFX-¼-U**
	G⅜	**529687**	**MS6-LFX-⅜-R**	–	–
	G½	**529679**	**MS6-LFX-½-R**	**529681**	**MS6-LFX-½-U**
Flow direction from left to right, high flow rate					
MS6	G½	–	–	**552927**	**MS6-LFX-½-U-HF**
Flow direction from right to left					
MS4	G¼	**529468**	**MS4-LFX-¼-R-Z**	–	–
MS6	G½	**529680**	**MS6-LFX-½-R-Z**	–	–

Activated carbon filters MS4/MS6-LFX, MS series

Ordering data – Modular products

Ordering table

	Grid dimension [mm]	40	62	Condi-tions	Code	Enter code
M	Module No.	**527699**	**527672**			
	Series	Standard			**MS**	MS
	Size	4	6		**...**	
	Function	Activated carbon filter			**-LFX**	-LFX
	Pneumatic connection	Female thread G⅛	–	1	**-⅛**	
		Female thread G¼	Female thread G¼	1	**-¼**	
		–	Female thread G⅜	1	**-⅜**	
		–	Female thread G½	1	**-½**	
		Connecting plate G⅛	–		**-AGA**	
		Connecting plate G¼	Connecting plate G¼		**-AGB**	
		Connecting plate G⅜	Connecting plate G⅜		**-AGC**	
		–	Connecting plate G½		**-AGD**	
		–	Connecting plate G¾		**-AGE**	
		Connecting plate NPT⅛	–	1	**-AQK**	
		Connecting plate NPT¼	Connecting plate NPT¼	1	**-AQN**	
		Connecting plate NPT⅜	Connecting plate NPT⅜	1	**-AQP**	
		–	Connecting plate NPT½	1	**-AQR**	
		–	Connecting plate NPT¾	1	**-AQS**	
	Bowl	Plastic bowl with plastic bowl guard			**-R**	
		Metal bowl			**-U**	
O	Flow rate	–	High flow rate		**-HF**	
	Range of application	–	Suitable for sealing air and cleaning air	2	**-HP**	
	Type of mounting	Mounting bracket standard design		3	**-WP**	
		Mounting bracket for attaching the service units		1 3	**-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	II 2GD to EU Explosion Protection Directive (ATEX)			**-EX4**	
	UL certification	cULus, ordinary location for Canada and USA			**-UL1**	
	Flow direction	Flow direction from right to left			**-Z**	

1 **⅛, ¼, ⅜, ½, AQK, AQN, AQP, AQR, AQS, WPM**
Not with EU certification EX4

2 **HP** Not with flow rate HF

3 **WP, WPM** Only with connecting plate AGA, AGB, AGC, AGD, AGE, AQK, AQN, AQP, AQR or AQS.

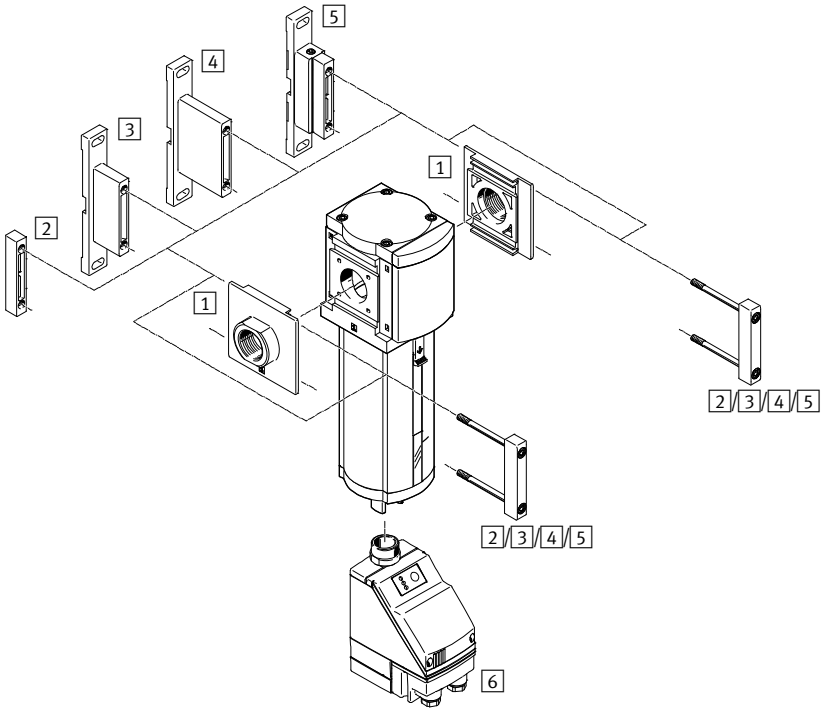
M Mandatory data
O Options

Transfer order code

	MS		–	**LFX**	–		–		–		–		–		–		–		–	

Filters MS9-LF, MS series

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 ¾/1/N¾/N1	With connecting plate AG.../AQ...		Module without connecting thread, without connecting plate G	
			Without EU certification EX4	With EU certification EX4		
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	Condensate drain, fully automatic, electrically actuated E2/E3/E4	■	■	–	■	46

Filters MS9-LF, MS series

Type codes

MS	9	–	LF	–	G	–	E	U	M

Series	
MS	Standard service unit

Size	
9	Grid dimension 90 mm

Service function	
LF	Filter

Connection size	
G	Module without connecting thread, without connecting plate

Grade of filtration	
C	5 µm
E	40 µm

Bowl guard	
U	Integrated as metal bowl

Condensate drain	
M	Manual rotary
V	Fully automatic

Additional variants can be ordered using the modular system ➔ 46

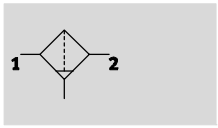
- Pneumatic connection
- Condensate drain
- Type of mounting
- EU certification
- UL certification
- Flow direction

Filters MS9-LF, MS series

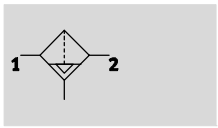
Technical data

FESTO

Condensate drain,
manual rotary



Condensate drain,
semi or fully automatic



Flow rate
6,000 ... 16,000 l/min

Temperature range
–10 ... +60 °C

Operating pressure
0 ... 20 bar

www.festo.com

- Good particle and condensate separation
- High flow rate with minimal pressure drop
- Available with manual, semi-automatic, fully automatic or fully automatic, electrically actuated condensate drain
- Choice of filter cartridges: 5 µm or 40 µm
- New filter cartridges ➔ 90
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22

General technical data		
Size		MS9
Pneumatic connection 1, 2		
	Female thread	G¾, G1, NPT¾ or NPT1
	Connecting plate AG...	G½, G¾, G1, G1¼ or G1½
	Connecting plate AQ...	NPT½, NPT¾, NPT1, NPT1¼ or NPT1½
	Module without connecting thread/plate G	–
Design		Sintered filter with centrifugal separator
Type of mounting		Via accessories
		In-line installation
Mounting position		Vertical ±5°
Grade of filtration	[µm]	5
		40
Air purity class at the output		Compressed air in accordance with ISO 8573-1:2010 [6:8:4] (grade of filtration 5 µm)
		Compressed air in accordance with ISO 8573-1:2010 [7:8:4] (grade of filtration 40 µm)
Bowl guard		Integrated as metal bowl
Condensate drain		Manual rotary
		Semi-automatic
		Fully automatic
		Fully automatic, electrically actuated
Max. condensate volume	[ml]	220

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

Standard nominal flow rate qnN[1] [l/min]				
Pneumatic connection		G½/NPT½	G¾/NPT¾	G1/G1¼/G1½/ NPT1/NPT1¼/NPT1½
Grade of filtration	5 µm	6,000	8,500	9,500
	40 µm	8,000	12,500	16,000

1) Measured at p1 = 6 bar and Δp = 1 bar

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

Filters MS9-LF, MS series

Technical data

Operating and environmental conditions					
Condensate drain		Manual rotary M	Semi-automatic H	Fully automatic V	Fully automatic, electrically actuated E2/E3/E4
Operating pressure	[bar]	0 … 20	1.5 … 12	2 … 12	1 … 16
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [–:9:–]	Compressed air in accordance with ISO 8573-1:2010 [–:9:–]	Compressed air in accordance with ISO 8573-1:2010 [7:9:–]	Compressed air in accordance with ISO 8573-1:2010 [–:9:–]
		Inert gases			
Ambient temperature	[°C]	–10 … +60	+5 … +60	+5 … +60	+1 … +60
Temperature of medium	[°C]	–10 … +60	+5 … +60	+5 … +60	+1 … +60
Storage temperature	[°C]	–10 … +60	+5 … +60	+5 … +60	+1 … +60
Corrosion resistance class CRC[1]		2			
UL certification[2]		cULus recognized (OL)			

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
2) Additional information www.festo.com/sp ➔ Certificates.

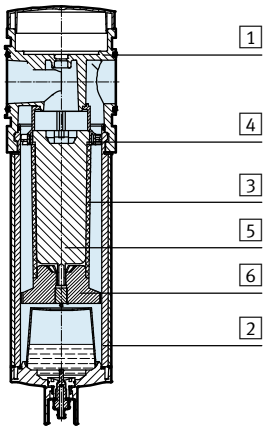
ATEX	
EU certification	EX4
ATEX category gas	II 2G
Ex-ignition protection type gas	Ex h IIC T6 Gb X
ATEX category dust	II 2D
EX-ignition protection type dust	Ex h IIIC T60°C Db X
ATEX ambient temperature	+5 °C ≤ Ta ≤ +60 °C
CE mark (see declaration of conformity)[1]	To EU Explosion Protection Directive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

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

Weight [g]	
Filter	2,000
Filter with condensate drain, fully automatic, electrically actuated E2/E3/E4	2,400

Materials

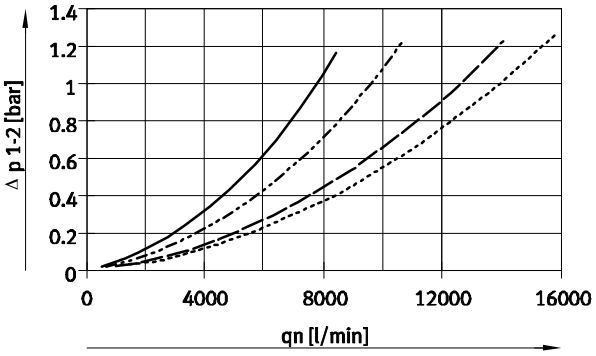
Sectional view



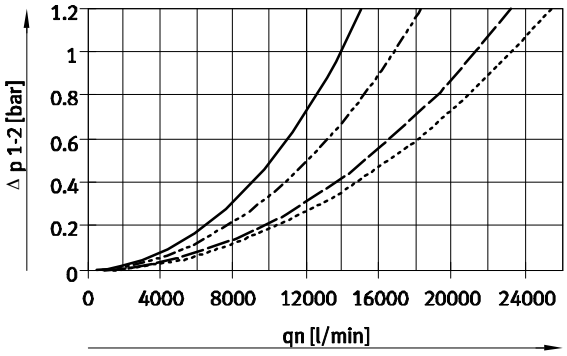
Filter		
1	Housing	Die-cast aluminium
2	Bowl	Wrought aluminium alloy
	Inspection window	PA
3	Filter	PE
4	Spin disc	POM
5	Filter holder	POM
6	Separating plate	POM
–	Cover	PA reinforced
–	Connecting plate, module connector, mounting bracket	Die-cast aluminium
–	Seals	NBR
Note on materials		RoHS-compliant

Standard flow rate qn as a function of differential pressure Δp1-2

Grade of filtration 5 µm, pneumatic connection G1/NPT1



Grade of filtration 40 µm, pneumatic connection G1/NPT1

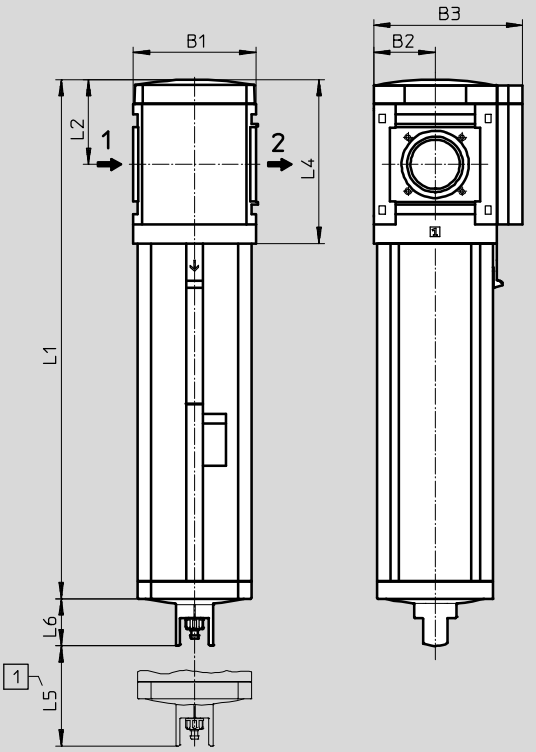


4 bar
6 bar
10 bar
12 bar

Dimensions – Basic version

Download CAD data ➔ **www.festo.com**

Module without connecting thread, without connecting plate G



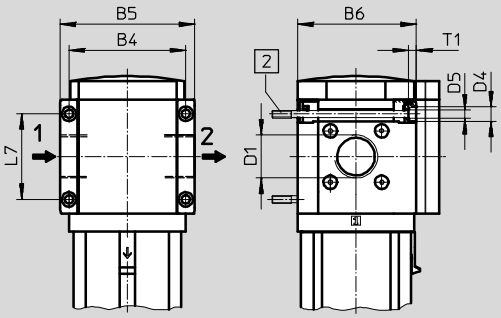
1 Installation dimensions

➔ Flow direction

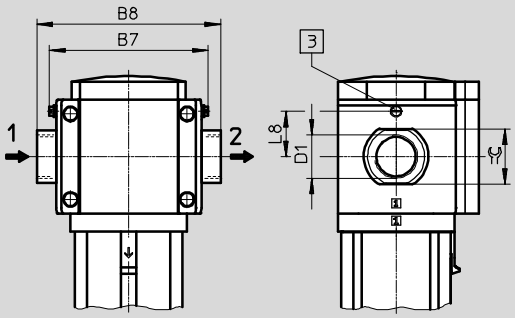
Type	B1	B2	B3	L1	L2	L4	L5	L6
MS9-LF-G	90	45	109	310.5	62	120	150	34.5

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

With female thread ¾/1/N¾/N1



With connecting plate AG.../AQ...



2 Mounting 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)

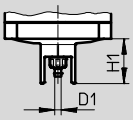
➔ Flow direction

Type	B4	B5	B6	B7		B8	D1	D4	D5	L7	L8	T1	⫷
					EX4						EX4		
MS9-LF-¾	90	104	91.5	–	–	–	G¾	11	6.5	66	–	6	–
MS9-LF-1							G1						
MS9-LF-AGD	–	–	–	112	122	132	G½	–	–	–	35	–	30
MS9-LF-AGE						132	G¾						36
MS9-LF-AGF						142	G1						41
MS9-LF-AGG						162	G1¼						50
MS9-LF-AGH						176	G1½						55
MS9-LF-N¾	90	104	91.5	–	–	–	NPT¾-14	11	6.5	66	–	6	–
MS9-LF-N1							NPT1-11½						
MS9-LF-AQR	–	–	–	112	122	132	NPT½-14	–	–	–	35	–	30
MS9-LF-AQS						132	NPT¾-14						36
MS9-LF-AQT						142	NPT1-11½						41
MS9-LF-AQU						162	NPT1¼-11½						50
MS9-LF-AQV						176	NPT1½-11½						55

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

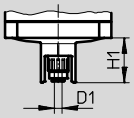
Dimensions – Condensate drain Download CAD data ➔ **www.festo.com**

Manual rotary M/fully automatic V



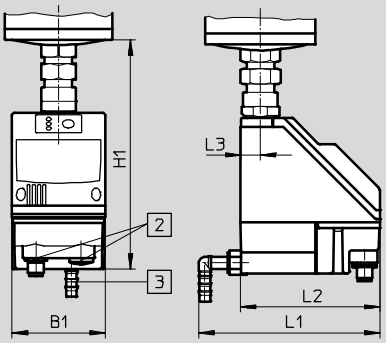
Barbed connector for plastic tubing PUN(-H)-8x1,25

Semi-automatic H



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

Fully automatic, electrically actuated E2/E3/E4 Technical data ➔ Internet: pwea



Condensate drain PWEA:
- 2 Electrical connection: Screw terminal PG9
- 3 Connection 360° rotatable for plastic tubing PUN-H-12x2

Type	B1	D1	H1	L1	L2	L3
MS9-LF-...-M/V	–	5.6	34.5	–	–	–
MS9-LF-...-H		6.2				
MS9-LF-...-E2/E3/E4	72	–	178	140	108	15

Ordering data

Size	Condensate drain	Connection	Grade of filtration 5 µm		Grade of filtration 40 µm	
			Part No.	Type	Part No.	Type
MS9	Manual rotary	–	**564108**	**MS9-LF-G-CUM**	**564106**	**MS9-LF-G-EUM**
	Fully automatic	–	**564109**	**MS9-LF-G-CUV**	**564107**	**MS9-LF-G-EUV**

Ordering table

			Grid dimension [mm] 90	Conditions	Code		Enter code
M	Module No.		**562532**				
	Series		Standard		**MS**		MS
	Size		9		**9**		9
	Function		Filter		**-LF**		-LF
	Pneumatic connection		Female thread G¾	1	**-¾**		
			Female thread G1	1	**-1**		
			Connecting plate G½		**-AGD**		
			Connecting plate G¾		**-AGE**		
			Connecting plate G1		**-AGF**		
			Connecting plate G1¼		**-AGG**		
			Connecting plate G1½		**-AGH**		
			Female thread NPT¾	1	**-N¾**		
			Female thread NPT1	1	**-N1**		
			Connecting plate NPT½	1	**-AQR**		
			Connecting plate NPT¾	1	**-AQS**		
			Connecting plate NPT1	1	**-AQT**		
			Connecting plate NPT1¼	1	**-AQU**		
			Connecting plate NPT1½	1	**-AQV**		
			Module without connecting thread, without connecting plate	1	**-G**		
	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, terminals (P1 max. 16 bar)	1	**-E2**		
			230 V AC, terminals (P1 max. 16 bar)	1	**-E3**		
			24 V DC, terminals (P1 max. 16 bar)	1	**-E4**		
O	Type of mounting		Mounting bracket standard design	2	**-WP**		
			Mounting bracket for attaching the service units	1 2	**-WPM**		
			Mounting bracket for large wall gap	2	**-WPB**		
	EU certification		II 2GD to EU Explosion Protection Directive (ATEX)		**-EX4**		
	UL certification		cULus, ordinary location for Canada and USA		**-UL1**		
	Flow direction		Flow direction from right to left		**-Z**		

1 **¾, 1, N¾, N1, AQR, AQS, AQT, AQU, AQV, G, E2, E3, E4, WPM** Not with EU certification EX4

2 **WP, WPM, WPB** Not with pneumatic connection G

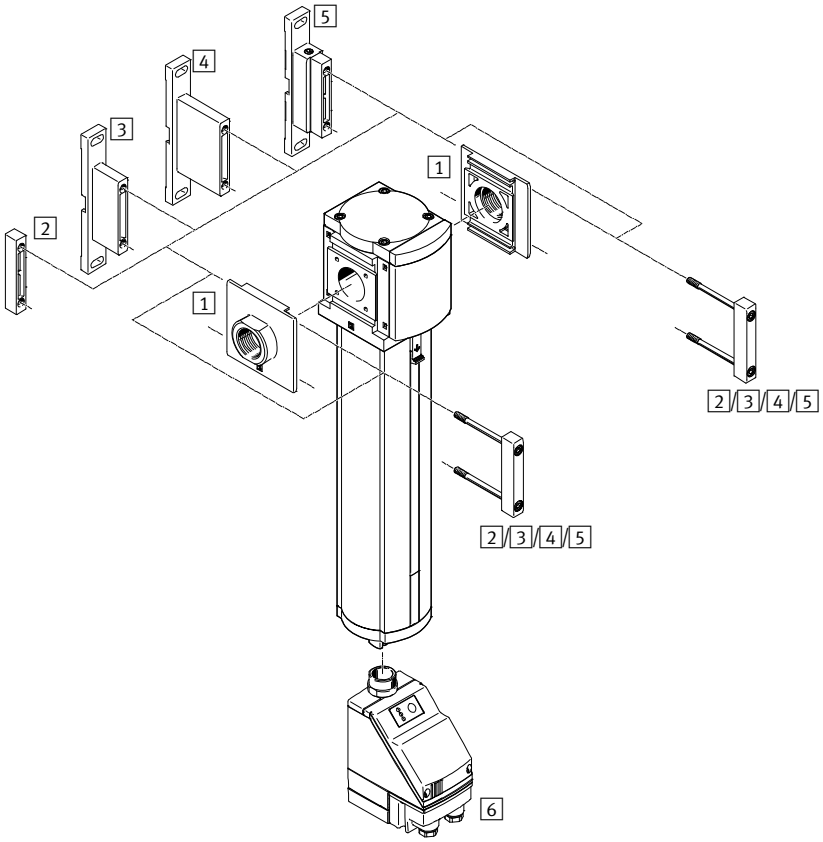
M Mandatory data
O Options

Transfer order code

562532	MS	9	–	LF	–		–		–	U	–		–		–		–		–	

Fine and micro filters MS9-LFM, MS series

Peripherals overview



- Note

Other 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 ¾/1/N¾/N1	With connecting plate AG.../AQ...		Module without connecting thread, without connecting plate G	
			Without EU certification EX4	With EU certification EX4		
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	Condensate drain, fully automatic, electrically actuated E2/E3/E4	■	■	–	■	59

Fine and micro filters MS9-LFM, MS series

Type codes

MS	9	–	LFM	–	1	–	A	U	M	–	HF	–	DA

Series	
MS	Standard service unit

Size	
9	Grid dimension 90 mm

Service function	
LFM	Fine and micro filter

Pneumatic connection	
¾	Thread G¾
1	Thread G1
G	Module without connecting thread, without connecting plate

Grade of filtration	
A	0.01 µm
B	1 µm

Bowl guard	
U	Integrated as metal bowl

Condensate drain	
M	Manual rotary
V	Fully automatic

Flow rate	
	Standard
HF	High flow rate

Filter contamination sensor	
	Without differential pressure indicator
DA	Differential pressure indicator

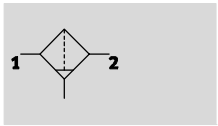
Further variants can be ordered using the modular system ➔ 59

- Pneumatic connection
- Condensate drain
- Type of mounting
- EU certification
- UL certification
- Flow direction

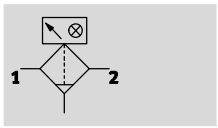
Fine and micro filters MS9-LFM, MS series

Technical data

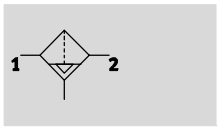
Condensate drain
Manual rotary
Without differential pressure indicator



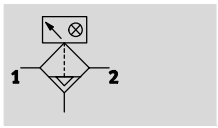
With differential pressure indicator



Condensate drain
Semi or fully automatic
Without differential pressure indicator



With differential pressure indicator



Flow rate
325 … 10,000 l/min

Temperature range
–10 … +60 °C

Operating pressure
0 … 20 bar

- High-performance filter for exceptionally clean compressed air
- Air quality to ISO 8573-1:2010
- Available with manual, semi-automatic, fully automatic or fully automatic, electrically actuated condensate drain
- Available with differential pressure indicator for indication of contamination
- Choice of filter cartridges: 0.01 µm or 1 µm
- New filter cartridges ➔ 90
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22

General technical data		
Size		MS9
Pneumatic connection 1, 2		
	Female thread	G¾, G1, NPT¾ or NPT1
	Connecting plate AG…	G½, G¾, G1, G1¼ or G1½
	Connecting plate AQ…	NPT½, NPT¾, NPT1, NPT1¼ or NPT1½
	Module without connecting thread/plate G	–
Constructional design		Fibre filter
Type of mounting		Via accessories
		In-line installation
Installation position		Vertical ±5°
Grade of filtration	[µm]	0.01 (micro filter MS9-LFM-A)
		1 (fine filter MS9-LFM-B)
Air purity class at the output		Compressed air in accordance with ISO 8573-1:2010 [1:7:2] (micro filter MS9-LFM-A)
		Compressed air in accordance with ISO 8573-1:2010 [5:7:3] (fine filter MS9-LFM-B)
Filter efficiency	[%]	99.9999 (Grade of filtration 0.01 µm, micro filter MS9-LFM-A)
		99.99 (Grade of filtration 1 µm, fine filter MS9-LFM-B)
Bowl guard		Integrated as metal bowl
Condensate drain		Manual rotary
		Semi-automatic
		Fully automatic
		Fully automatic, electrically actuated
Differential pressure indicator		Visual indicator
Residual oil content	[mg/m³]	≤0.01 (micro filter MS9-LFM-A) ≤0.5 (fine filter MS9-LFM-B)
Max. condensate volume	[cm³]	225

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

Fine and micro filters MS9-LFM, MS series

Technical data

Standard flow rate q_n[1] [l/min]		
Version	Standard	High flow rate HF
Micro filter MS9-LFM-A		
Max. standard flow rate for air purity class $q_{n\ max}$	6,500	7,800
Min. standard flow rate for air purity class $q_{n\ min}$	325	390
Fine filter MS9-LFM-B		
Max. standard flow rate for air purity class $q_{n\ max}$	7,000	10,000
Min. standard flow rate for air purity class $q_{n\ min}$	350	500

1) Measured at p1 = 6 bar

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

Operating and environmental conditions					
Condensate drain		Manual rotary M	Semi-automatic H	Fully automatic V	Fully automatic, electrically actuated E2/E3/E4
Operating pressure	[bar]	0 … 20	1.5 … 12	2 … 12	0.8 … 16
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [6:8:4][1]			
Ambient temperature	[°C]	–10 … +60	+5 … +60	+5 … +60	+1 … +60
Temperature of medium	[°C]	–10 … +60	+5 … +60	+5 … +60	+1 … +60
Storage temperature	[°C]	–10 … +60	+5 … +60	–10 … +60	+1 … +60
Corrosion resistance class CRC[2]		2			
UL certification[3]		cULus recognized (OL)			

1) It is recommended to prefilter the compressed air for the micro filter MS-LFM-A using a fine filter MS-LFM-B (grade of filtration 1 µm).
2) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
3) Additional information www.festo.com/sp ➔ Certificates.

ATEX	
EU certification	EX4
ATEX category gas	II 2G
Ex-ignition protection type gas	Ex h IIC T6 Gb X
ATEX category dust	II 2D
EX-ignition protection type dust	Ex h IIIC T60°C Db X
ATEX 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.

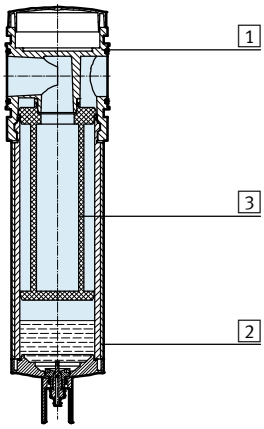
Fine and micro filters MS9-LFM, MS series

Technical data

Weights [g]		
Version	Standard	High flow rate HF
Fine and micro filter	2,000	2,500
Fine and micro filter with condensate drain fully automatic, electrically actuated E2/E3/E4	2,900	2,900

Materials

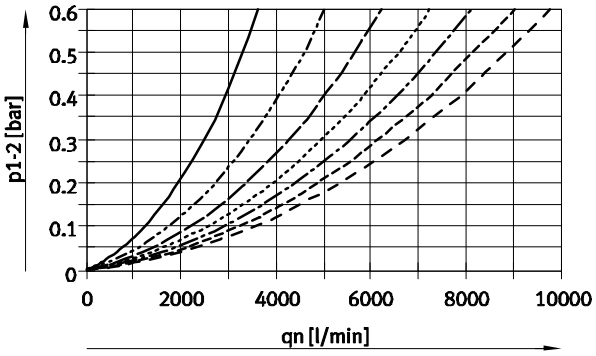
Sectional view



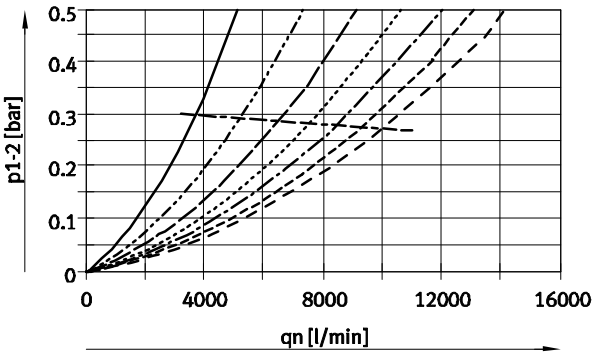
Fine and micro filters		
1	Housing	Die-cast aluminium
2	Bowl	Wrought aluminium alloy
	Inspection window	PA
3	Filter	Borosilicate fibre
–	Cover	PA reinforced
–	Connecting plate, module connector, mounting bracket	Die-cast aluminium
–	Seals	NBR
Note on materials		Free of copper and PTFE

Standard flow rate qn as a function of the differential pressure p1-2

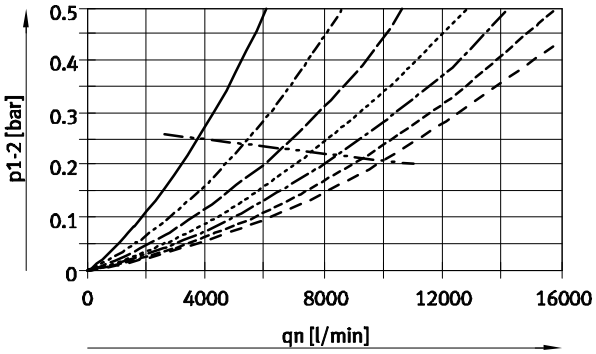
Grade of filtration 0.01 µm, pneumatic connection G½/NPT½



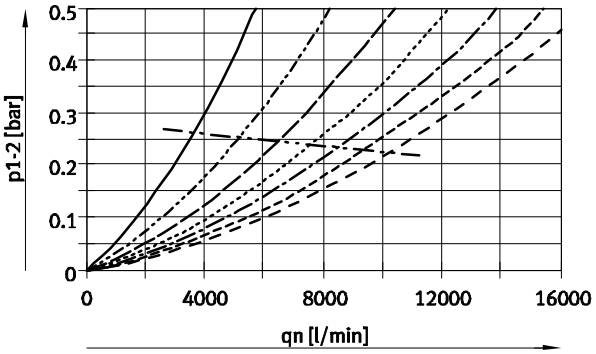
Grade of filtration 0.01 µm, pneumatic connection G¾/NPT¾



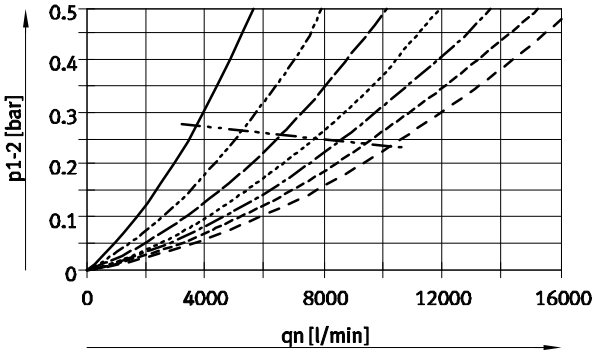
Grade of filtration 0.01 µm, pneumatic connection G1/NPT1



Grade of filtration 0.01 µm, pneumatic connection G1¼/NPT1¼



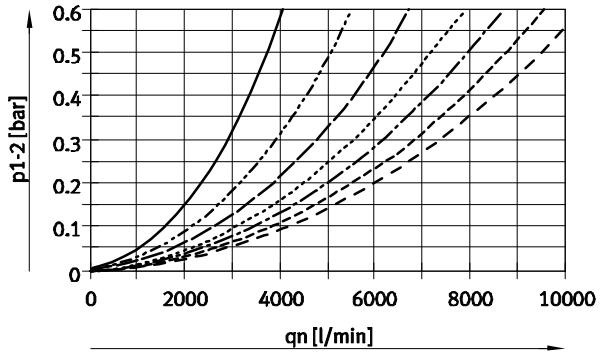
Grade of filtration 0.01 µm, pneumatic connection G1½/NPT1½



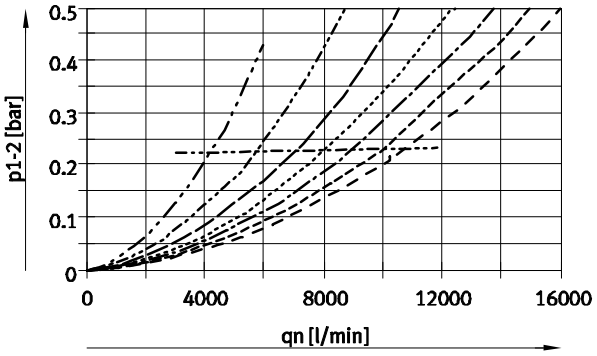
- 2 bar
- 4 bar ($q_{n\,min}$: 268 l/min)
- 6 bar ($q_{n\,min}$: 325 l/min)
- 8 bar
- 10 bar ($q_{n\,min}$: 420 l/min)
- 12 bar
- 14 bar ($q_{n\,min}$: 498 l/min)
- $q_{n\,max}$
  (with MS9-LFM-AGD/AQR: $q_{n\,max}$-values lie above the measured q_n-values)

Standard flow rate qn as a function of the differential pressure p1-2

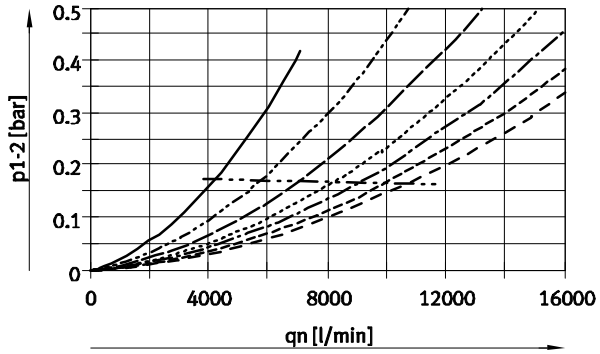
Grade of filtration 1 µm, pneumatic connection G½/NPT½



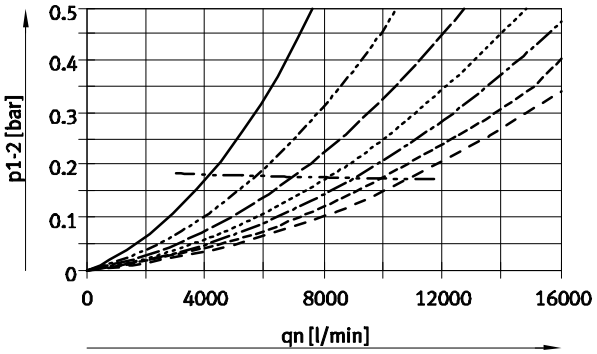
Grade of filtration 1 µm, pneumatic connection G¾/NPT¾



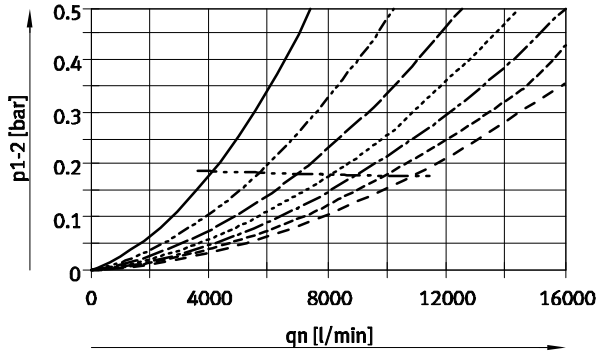
Grade of filtration 1 µm, pneumatic connection G1/NPT1



Grade of filtration 1 µm, pneumatic connection G1¼/NPT1¼



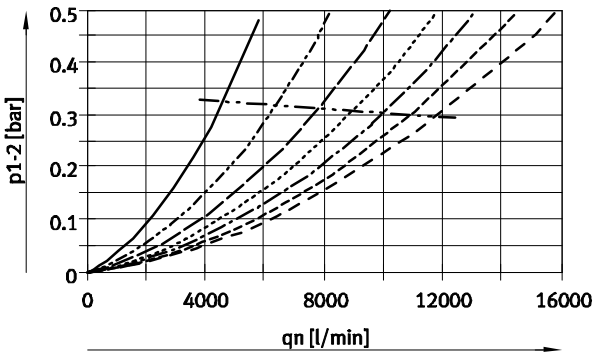
Grade of filtration 1 µm, pneumatic connection G1½/NPT1½



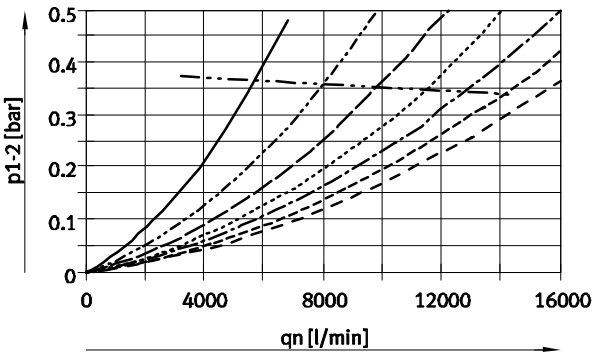
——— 2 bar
–·–·– 4 bar ($q_{n\,min}$: 289 l/min)
— — — 6 bar ($q_{n\,min}$: 350 l/min)
·····8 bar
—·—·— 10 bar ($q_{n\,min}$: 450 l/min)
– – – 12 bar
– – – – 14 bar ($q_{n\,min}$: 540 l/min)
– — ·— $q_{n\,max}$
(with MS9-LFM-AGD/AQR: $q_{n\,max}$-values lie above the measured q_n-values)

Standard flow rate qn as a function of the differential pressure p1-2

Grade of filtration 0.01 µm, pneumatic connection G¾/NPT¾
High flow rate HF

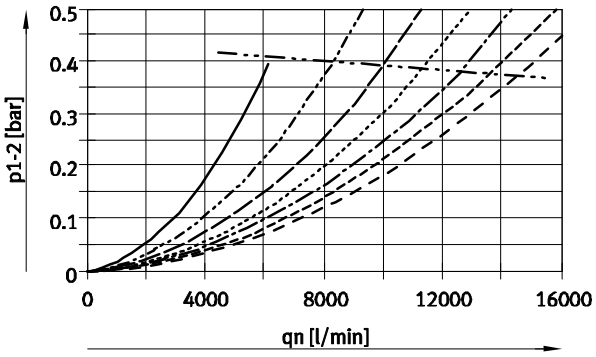


Grade of filtration 0.01 µm, pneumatic connection G1/NPT1
High flow rate HF

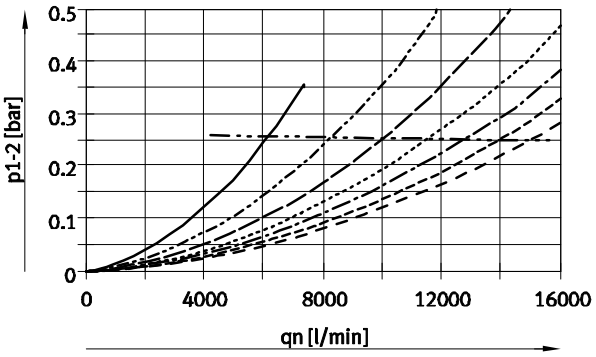


- 2 bar
- 4 bar
- 6 bar ($q_{n\ min}$: 390 l/min)
- 8 bar
- 10 bar
- 12 bar
- 14 bar
- $q_{n\ max}$

Grade of filtration 1 µm, pneumatic connection G¾/NPT¾
High flow rate HF



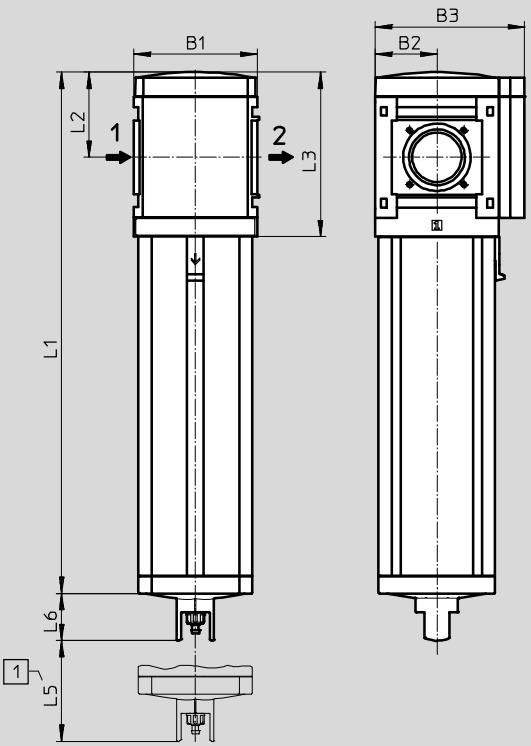
Grade of filtration 1 µm, pneumatic connection G1/NPT1
High flow rate HF



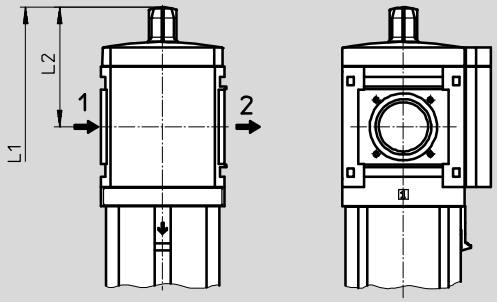
- 2 bar
- 4 bar
- 6 bar ($q_{n\ min}$: 500 l/min)
- 8 bar
- 10 bar
- 12 bar
- 14 bar
- $q_{n\ max}$

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

Module without connecting thread, without connecting plate G



Module without connecting thread, without connecting plate G, with differential pressure indicator DA



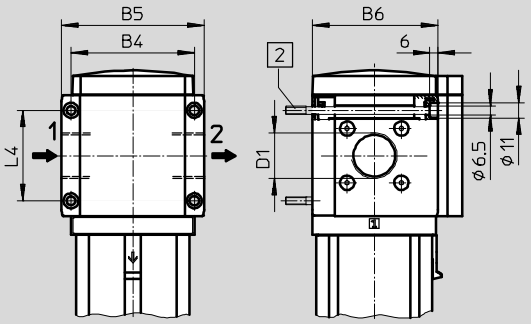
1 Installation dimensions

➔ Flow direction

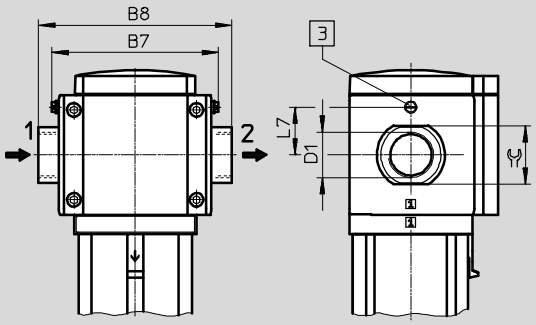
Type	B1	B2	B3	L1		L2	L3	L5	L6
				Standard	High flow rate HF				
MS9-LFM-G	90	45	109	380.5	480.5	62	120	50	34.5
MS9-LFM-G-...-DA				405.5	505.5	88			

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

With female thread ¾/1/N¾/N1



With connecting plate AG.../AQ...



2 Mounting screw M6xmin.90 to DIN 912 (not included in scope of delivery) for wall mounting without mounting bracket

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

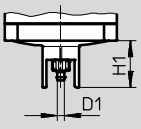
➔ Flow direction

Type	B4	B5	B6	B7		B8	D1	L4	L7	⌀
					EX4				EX4	
MS9-LFM-¾	90	104	91.5	–	–	–	G¾	66	–	–
MS9-LFM-1							G1			
MS9-LFM-AGD	–	–	–	112	122	132	G½	–	35	30
MS9-LFM-AGE						132	G¾			36
MS9-LFM-AGF						142	G1			41
MS9-LFM-AGG						162	G1¼			50
MS9-LFM-AGH						176	G1½			55
MS9-LFM-N¾	90	104	91.5	–	–	–	NPT¾-14	66	–	–
MS9-LFM-N1							NPT1-11½			
MS9-LFM-AQR	–	–	–	112	122	132	NPT½-14	–	35	30
MS9-LFM-AQS						132	NPT¾-14			36
MS9-LFM-AQT						142	NPT1-11½			41
MS9-LFM-AQU						162	NPT1¼-11½			50
MS9-LFM-AQV						176	NPT1½-11½			55

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

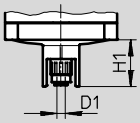
Dimensions – Condensate drain Download CAD data ➔ **www.festo.com**

Manual rotary M/fully automatic V



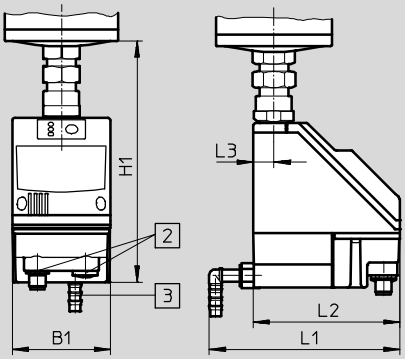
Barbed connector for plastic tubing PUN(-H)-8x1,25

Semi-automatic H



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

Fully automatic, electrically actuated E2/E3/E4 Technical data ➔ Internet: pwea



Condensate drain PWEA:
- 2 Electrical connection: Screw terminal PG9
- 3 Connection 360° rotatable for plastic tubing PUN-H-12x2

Type	B1	D1	H1	L1	L2	L3
MS9-LFM-...-M/V	–	5.6	34.5	–	–	–
MS9-LFM-...-H		6.2				
MS9-LFM-...-E2/E3/E4	72	–	178	140	108	15

Fine and micro filters MS9-LFM, MS series

Technical data

Ordering data								
Without differential pressure indicator								
Size	Condensate drain	Connection	Micro filter Grade of filtration 0.01 µm			Fine filter Grade of filtration 1 µm		
			Part No.	Type		Part No.	Type	
Standard								
MS9	Manual rotary	G¾	**553070**	**MS9-LFM-¾-AUM**		**553074**	**MS9-LFM-¾-BUM**	
		G1	**553000**	**MS9-LFM-1-AUM**		**553004**	**MS9-LFM-1-BUM**	
		–	**564047**	**MS9-LFM-G-AUM**		**564039**	**MS9-LFM-G-BUM**	
	Fully automatic	G¾	**553072**	**MS9-LFM-¾-AUV**		**553076**	**MS9-LFM-¾-BUV**	
		G1	**553002**	**MS9-LFM-1-AUV**		**553006**	**MS9-LFM-1-BUV**	
		–	**564049**	**MS9-LFM-G-AUV**		**564041**	**MS9-LFM-G-BUV**	
High flow rate								
MS9	Manual rotary	G¾	**552964**	**MS9-LFM-¾-AUM-HF**		**552968**	**MS9-LFM-¾-BUM-HF**	
		G1	**553038**	**MS9-LFM-1-AUM-HF**		**553042**	**MS9-LFM-1-BUM-HF**	
		–	**564051**	**MS9-LFM-G-AUM-HF**		**564043**	**MS9-LFM-G-BUM-HF**	
	Fully automatic	G¾	**552966**	**MS9-LFM-¾-AUV-HF**		**552970**	**MS9-LFM-¾-BUV-HF**	
		G1	**553040**	**MS9-LFM-1-AUV-HF**		**553044**	**MS9-LFM-1-BUV-HF**	
		–	**564053**	**MS9-LFM-G-AUV-HF**		**564045**	**MS9-LFM-G-BUV-HF**	

Ordering data								
With differential pressure indicator								
Size	Condensate drain	Connection	Micro filter Grade of filtration 0.01 µm			Fine filter Grade of filtration 1 µm		
			Part No.	Type		Part No.	Type	
Standard								
MS9	Manual rotary	G¾	**553078**	**MS9-LFM-¾-AUM-DA**		**553082**	**MS9-LFM-¾-BUM-DA**	
		G1	**553008**	**MS9-LFM-1-AUM-DA**		**553012**	**MS9-LFM-1-BUM-DA**	
		–	**564048**	**MS9-LFM-G-AUM-DA**		**564040**	**MS9-LFM-G-BUM-DA**	
	Fully automatic	G¾	**553080**	**MS9-LFM-¾-AUV-DA**		**553084**	**MS9-LFM-¾-BUV-DA**	
		G1	**553010**	**MS9-LFM-1-AUV-DA**		**553014**	**MS9-LFM-1-BUV-DA**	
		–	**564050**	**MS9-LFM-G-AUV-DA**		**564042**	**MS9-LFM-G-BUV-DA**	
High flow rate								
MS9	Manual rotary	G¾	**552972**	**MS9-LFM-¾-AUM-HF-DA**		**552976**	**MS9-LFM-¾-BUM-HF-DA**	
		G1	**553046**	**MS9-LFM-1-AUM-HF-DA**		**553050**	**MS9-LFM-1-BUM-HF-DA**	
		–	**564052**	**MS9-LFM-G-AUM-HF-DA**		**564044**	**MS9-LFM-G-BUM-HF-DA**	
	Fully automatic	G¾	**552974**	**MS9-LFM-¾-AUV-HF-DA**		**552978**	**MS9-LFM-¾-BUV-HF-DA**	
		G1	**553048**	**MS9-LFM-1-AUV-HF-DA**		**553052**	**MS9-LFM-1-BUV-HF-DA**	
		–	**564054**	**MS9-LFM-G-AUV-HF-DA**		**564046**	**MS9-LFM-G-BUV-HF-DA**	

Fine and micro filters MS9-LFM, MS series

Ordering data – Modular products

Ordering table

	Grid dimension [mm]	90	Conditions	Code	Enter code
M	Module No.	**552940**			
	Series	Standard service unit		**MS**	MS
	Size	9		**9**	9
	Function	Fine and micro filter		**-LFM**	-LFM
	Pneumatic connection	Female thread G¾	1	**-¾**	
		Female thread G1	1	**-1**	
		Connecting plate G½		**-AGD**	
		Connecting plate G¾		**-AGE**	
		Connecting plate G1		**-AGF**	
		Connecting plate G1¼		**-AGG**	
		Connecting plate G1½		**-AGH**	
		Female thread NPT¾	1	**-N¾**	
		Female thread NPT1	1	**-N1**	
		Connecting plate NPT½	1	**-AQR**	
		Connecting plate NPT¾	1	**-AQS**	
		Connecting plate NPT1	1	**-AQT**	
		Connecting plate NPT1¼	1	**-AQU**	
		Connecting plate NPT1½	1	**-AQV**	
		Module without connecting thread, without connecting plate	1	**-G**	
	Grade of filtration	1 µm		**-B**	
		0.01 µm		**-A**	
	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, terminal strip (P1 max. 16 bar)	1	**-E2**	
		230 V AC, terminal strip (P1 max. 16 bar)	1	**-E3**	
		24 V DC, terminal strip (P1 max. 16 bar)	1	**-E4**	
O	Flow rate	High flow rate		**-HF**	
	Filter contamination sensor	Differential pressure indicator, visual		**-DA**	
	Type of mounting	Mounting bracket standard design	2	**-WP**	
		Mounting bracket for attaching the service units	1 2	**-WPM**	
		Wall mounting bracket for large wall gap	2	**-WPB**	
	EU certification	II 2GD to EU Explosion Protection Directive (ATEX)		**-EX4**	
	UL certification	cULus, ordinary location for Canada and USA		**-UL1**	
	Flow direction	Flow direction from right to left		**-Z**	

1 **¾, 1, N¾, N1, AQR, AQS, AQT, AQU, AQV, G, E2, E3, E4, WPM**
Not with EU certification EX4

2 **WP, WPM, WPB** Not with pneumatic connection G

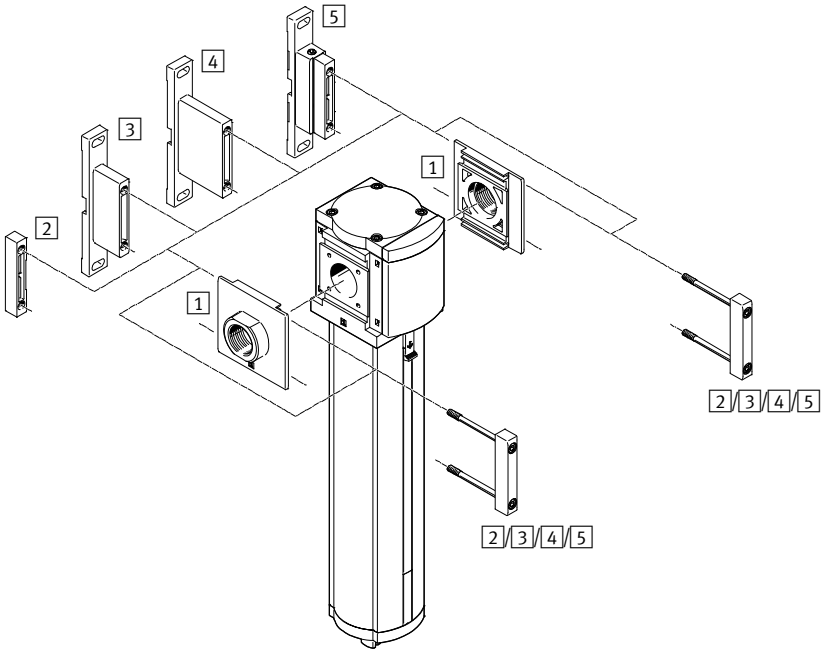
M Mandatory data
O Options

Transfer order code

552940	MS	9	–	LFM	–		–		–	U	–		–		–		–		–		–		–	

Activated carbon filters MS9-LFX, MS series

Peripherals overview



- Note

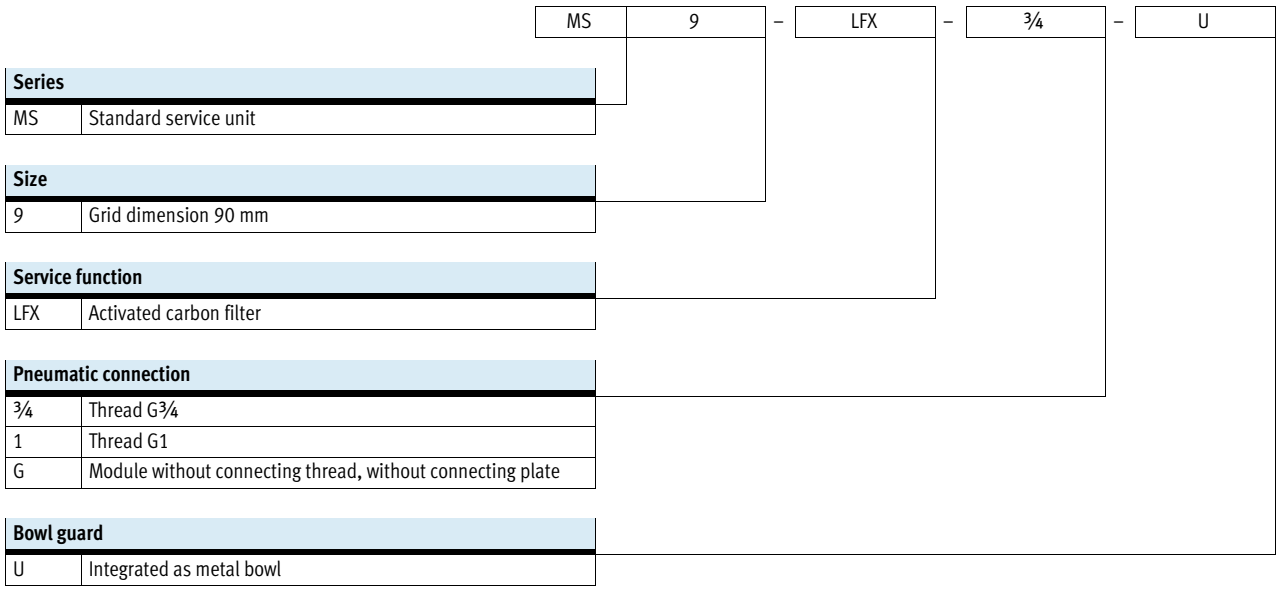
Other accessories:
– Module connector for combination with size MS6, MS9 or MS12
➔ Internet: rmv, armv

Mounting attachments and accessories

		Individual device			Combination	➔ Page/ Internet
		With female thread ¾/1/N¾/N1	With connecting plate AG.../AQ...		Module without connecting thread, without connecting plate G	
			Without EU certification EX4	With EU certification EX4		
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

Activated carbon filters MS9-LFX, MS series

Type codes



Series	
MS	Standard service unit

Size	
9	Grid dimension 90 mm

Service function	
LFX	Activated carbon filter

Pneumatic connection	
¾	Thread G¾
1	Thread G1
G	Module without connecting thread, without connecting plate

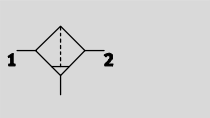
Bowl guard	
U	Integrated as metal bowl

Further variants can be ordered using the modular system ➔ 66

- Pneumatic connection
- Type of mounting
- EU certification
- UL certification
- Flow direction

Activated carbon filters MS9-LFX, MS series

Technical data



Flow rate
max. 6,500 l/min

Temperature range
–10 … +60 °C

Operating pressure
0 … 20 bar

- Removal of liquid and gaseous oil particles from compressed air using activated carbon
- Eliminates odours and vapours
- Prefiltration with micro filter MS9-LFM-A, grade of filtration 0.01 µm, recommended
- New filter cartridges ➔ 90
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22

General technical data		
Size		MS9
Pneumatic connection 1, 2		
	Female thread	G¾, G1, NPT¾ or NPT1
	Connecting plate AG...	G½, G¾, G1, G1¼ or G1½
	Connecting plate AQ...	NPT½, NPT¾, NPT1, NPT1¼ or NPT1½
	Module without connecting thread/plate G	–
Constructional design		Activated carbon filter
Type of mounting		Via accessories
		In-line installation
Installation position		Vertical ±5°
Air purity class at the output[1]		Compressed air in accordance with ISO 8573-1:2010 [1:4:1]
Bowl guard		Integrated as metal bowl
Residual oil content	[mg/m³]	≤0.003

1) It is recommended to replace filter cartridges after 1,000 operating hours (applies to an ambient temperature of 21 °C). The service life of a filter cartridge is reduced at higher temperatures.
Note: This product conforms to ISO 1179-1 and to ISO 228-1

Standard flow rate q_n[1] [l/min]	
Max. standard flow rate for air purity class $q_{n\ max}$	6,500

1) Measured at p1 = 6 bar

Operating and environmental conditions		
Operating pressure	[bar]	0 … 20
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [1:4:2]
Ambient temperature	[°C]	–10 … +60
Temperature of medium	[°C]	+5 … +30
Storage temperature	[°C]	–10 … +60
Corrosion resistance class CRC[1]		2
UL certification[2]		cULus recognized (OL)

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
2) Additional information www.festo.com/sp ➔ Certificates.

Activated carbon filters MS9-LFX, MS series

Technical data

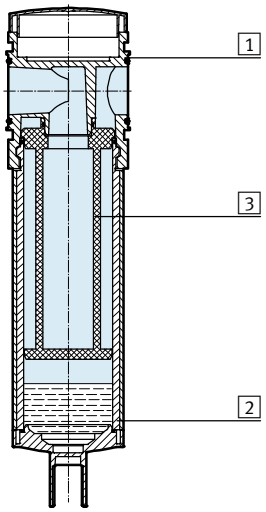
ATEX	
EU certification	EX4
ATEX category gas	II 2G
Ex-ignition protection type gas	Ex h IIC T6 Gb X
ATEX category dust	II 2D
EX-ignition protection type dust	Ex h IIIC T60°C Db X
ATEX ambient temperature	−10 °C ≤ Ta ≤ +60 °C
CE mark (see declaration of conformity)[1)]	To EU Explosion Protection Directive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

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

Weights [g]	
Activated carbon filter	2,000

Materials

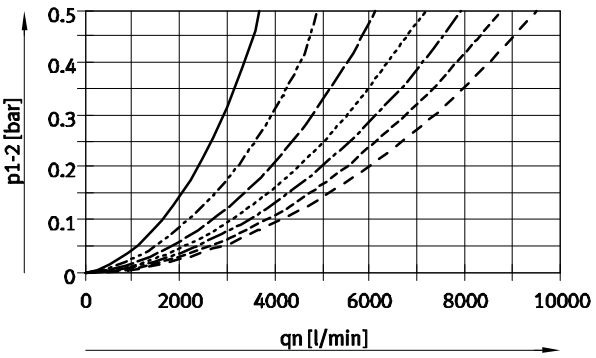
Sectional view



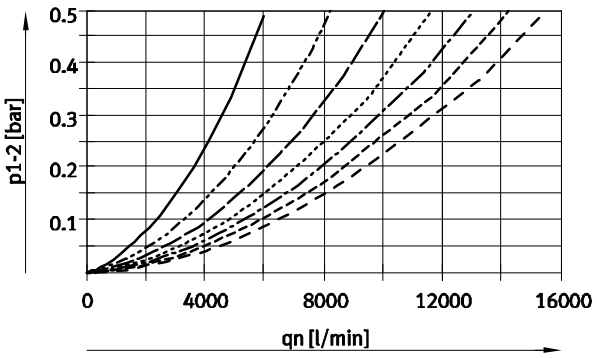
Activated carbon filter		
1	Housing	Die-cast aluminium
2	Bowl	Wrought aluminium alloy
	Inspection window	PA
3	Filter	Activated carbon
–	Cover	PA reinforced
–	Connecting plate, module connector, mounting bracket	Die-cast aluminium
–	Seals	NBR
Note on materials		Free of copper and PTFE

Standard flow rate qn as a function of the differential pressure p1-2

Pneumatic connection G½/NPT½



Pneumatic connection G¾/NPT¾



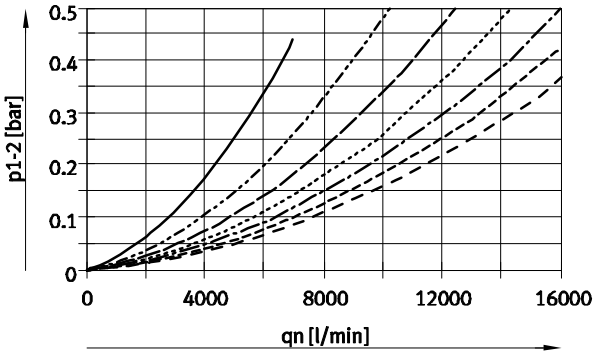
2 bar
4 bar
6 bar
8 bar
10 bar
12 bar
14 bar

Activated carbon filters MS9-LFX, MS series

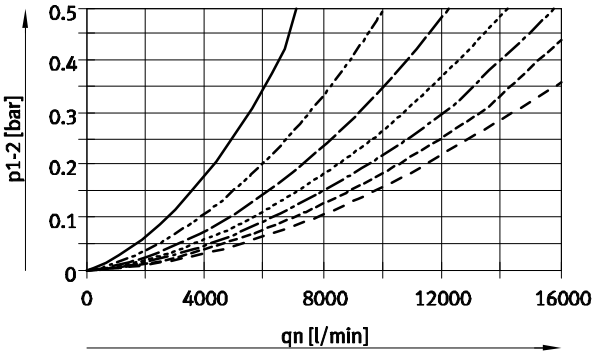
Technical data

Standard flow rate qn as a function of the differential pressure p1-2

Pneumatic connection G1/NPT1



Pneumatic connection G1½/NPT1½

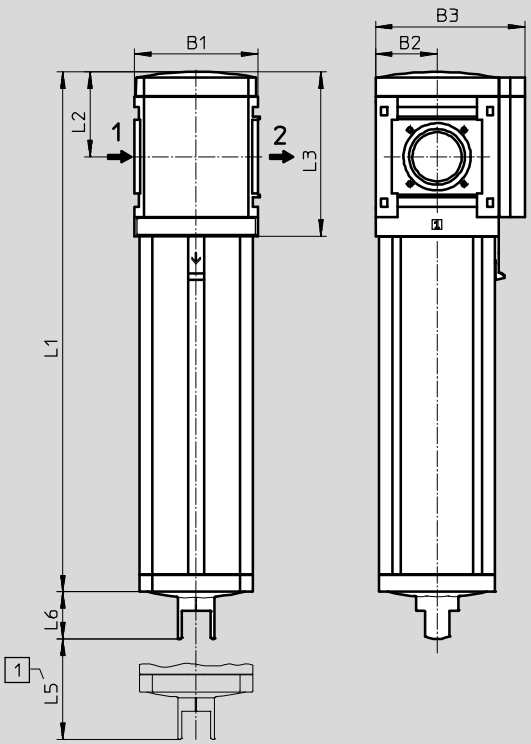


2 bar
4 bar
6 bar
8 bar
10 bar
12 bar
14 bar

Dimensions – Basic version

Download CAD data ➔ **www.festo.com**

Module without connecting thread, without connecting plate G



1 Installation dimensions

➔ Flow direction

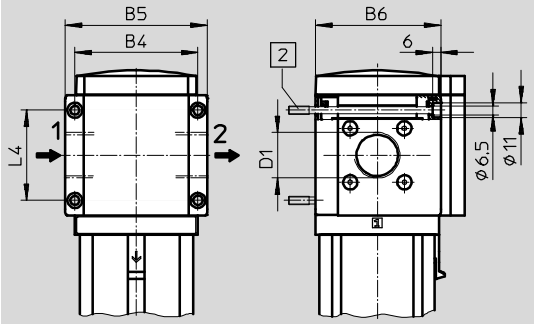
Type	B1	B2	B3	L1	L2	L3	L5	L6
MS9-LFX-G	90	45	109	380.5	62	120	50	34.5

Activated carbon filters MS9-LFX, MS series

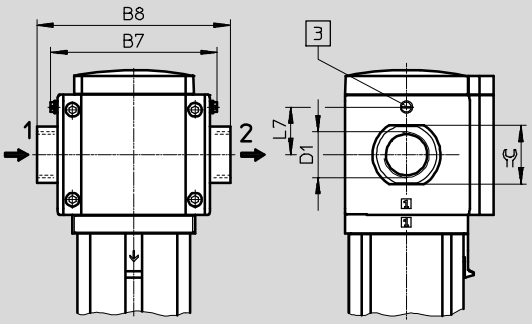
Technical data

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

With female thread ¾/1/N¾/N1



With connecting plate AG.../AQ...



2 Mounting screw M6xmin.90 to DIN 912 (not included in 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	L4	L7	⌀
					EX4				EX4	
MS9-LFX-¾	90	104	91.5	–	–	–	G¾	66	–	–
MS9-LFX-1							G1			
MS9-LFX-AGD	–	–	–	112	122	132	G½	–	35	30
MS9-LFX-AGE						132	G¾			36
MS9-LFX-AGF						142	G1			41
MS9-LFX-AGG						162	G1¼			50
MS9-LFX-AGH						176	G1½			55
MS9-LFX-N¾	90	104	91.5	–	–	–	NPT¾-14	66	–	–
MS9-LFX-N1							NPT1-11½			
MS9-LFX-AQR	–	–	–	112	122	132	NPT½-14	–	35	30
MS9-LFX-AQS						132	NPT¾-14			36
MS9-LFX-AQT						142	NPT1-11½			41
MS9-LFX-AQU						162	NPT1¼-11½			50
MS9-LFX-AQV						176	NPT1½-11½			55

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

Ordering data

Size	Connection	Part No.	Type
MS9	G¾	**552996**	**MS9-LFX-¾-U**
	G1	**553032**	**MS9-LFX-1-U**
	–	**564038**	**MS9-LFX-G-U**

Activated carbon filters MS9-LFX, MS series

Ordering data – Modular products

Ordering table

	Grid dimension [mm]	90	Condi-tions	Code		Enter code
M	Module No.	**552942**				
	Series	Standard service unit		**MS**		MS
	Size	9		**9**		9
	Function	Activated carbon filter		**-LFX**		-LFX
	Pneumatic connection	Female thread G¾	1	**-¾**		
		Female thread G1	1	**-1**		
		Connecting plate G½		**-AGD**		
		Connecting plate G¾		**-AGE**		
		Connecting plate G1		**-AGF**		
		Connecting plate G1¼		**-AGG**		
		Connecting plate G1½		**-AGH**		
		Female thread NPT¾	1	**-N¾**		
		Female thread NPT1	1	**-N1**		
		Connecting plate NPT½	1	**-AQR**		
		Connecting plate NPT¾	1	**-AQS**		
		Connecting plate NPT1	1	**-AQT**		
		Connecting plate NPT1¼	1	**-AQU**		
		Connecting plate NPT1½	1	**-AQV**		
		Module without connecting thread, without connecting plate	1	**-G**		
	Bowl	Metal bowl		**-U**		-U
O	Type of mounting	Mounting bracket standard design	2	**-WP**		
		Mounting bracket for attaching the service units	1 2	**-WPM**		
		Wall mounting bracket for large wall gap	2	**-WPB**		
	EU certification	II 2GD to EU Explosion Protection Directive (ATEX)		**-EX4**		
	UL certification	cULus, ordinary location for Canada and USA		**-UL1**		
	Flow direction	Flow direction from right to left		**-Z**		

1 **¾, 1, N¾, N1, AQR, AQS, AQT, AQU, AQV, G, WPM** Not with EU certification EX4

2 **WP, WPM, WPB** Not with pneumatic connection G

M Mandatory data

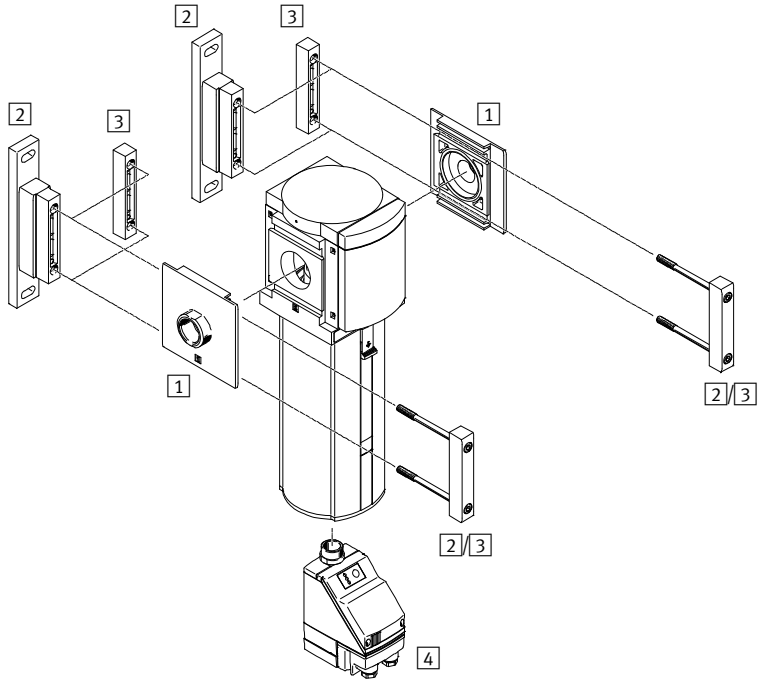
O Options

Transfer order code

552942	**MS**	**9**	–	**LFX**	–		–	**U**	–		–		–		–		–	

Filters MS12-LF, MS series

Peripherals overview



- Note

Additional accessories:

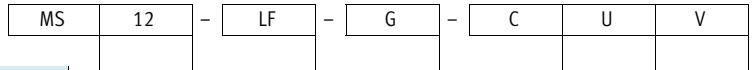
– Module connector for combination with size MS9 ➔ Internet: armv

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	Condensate drain, fully automatic, electrically actuated E2/E3/E4	73

Filters MS12-LF, MS series

Type codes



Series	
MS	Standard service unit

Size	
12	Grid dimension 124 mm

Service function	
LF	Filter

Connection size	
G	Module without connecting thread, without connecting plate Connecting plates ➔ Accessories

Grade of filtration	
C	5 µm
E	40 µm

Bowl guard	
U	Integrated as metal bowl

Condensate drain	
V	Fully automatic

Further variants can be ordered using the modular system ➔ 73

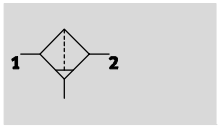
- Pneumatic connection
- Condensate drain
- Type of mounting
- Flow direction

Filters MS12-LF, MS series

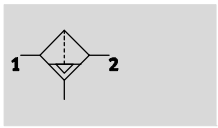
Technical data

FESTO

Function
Condensate drain
manual rotary



fully automatic



Flow rate
11,500 ... 16,000 l/min

Temperature range
–10 ... +60 °C

Operating pressure
0.8 ... 20 bar

The sintered filter with centrifugal separation removes contamination, rust and condensate from the compressed air. The filter cartridges are replaceable.

- Good particle and condensate separation
- High flow rate with minimal pressure drop
- Available with manual, fully automatic or fully automatic, electrically actuated condensate drain
- Choice of filter cartridges: 5 µm or 40 µm
- New filter cartridges ➔ 91

General technical data		
Pneumatic connection 1, 2		
	Connecting plate AG...	G1, G1¼, G1½ or G2
	Module without connecting thread/plate G	–
Design		Sintered filter with centrifugal separation
Type of mounting		Via accessories
		In-line installation
Assembly position		Vertical ±5°
Grade of filtration	[µm]	5
		40
Air purity class at the output		Compressed air in accordance with ISO 8573-1:2010 [6:8:4] (Grade of filtration 5 µm)
		Compressed air in accordance with ISO 8573-1:2010 [7:8:4] (Grade of filtration 40 µm)
Bowl guard		Integrated as metal bowl
Condensate drain		Manual rotary
		Fully automatic
		Fully automatic, electrical actuated
Max. condensate volume	[cm^3]	400

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

Standard nominal flow rate qnN[1] [l/min]					
Pneumatic connection		G1	G1¼	G1½	G2
Grade of filtration	5 µm	11,500	12,500	13,500	14,000
	40 µm	12,500	13,000	14,000	16,000

1) Dependent on connecting plate selected, must be ordered separately as an accessory ➔ Internet: ms12-ag
Measured at p1 = 6 bar and Δp = 0.5 bar

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

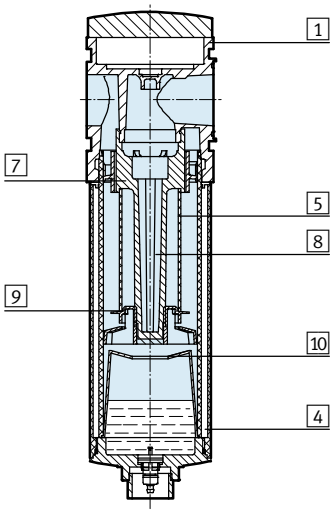
Operating and environmental conditions				
Condensate drain		Manual rotary M	Fully automatic V	Fully automatic, electrical actuated E2/E3/E4
Operating pressure	[bar]	0.8 ... 20	2 ... 12	0.8 ... 16
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [–:9:–]	Compressed air in accordance with ISO 8573-1:2010 [7:9:–]	Compressed air in accordance with ISO 8573-1:2010 [–:9:–]
		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	CRC[1)]	2		

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Weights [g]	
Filter with metal bowl U	6,500
Filter with metal bowl U and fully automatic, electrically actuated condensate drain E2/E3/E4	7,200

Materials

Sectional view



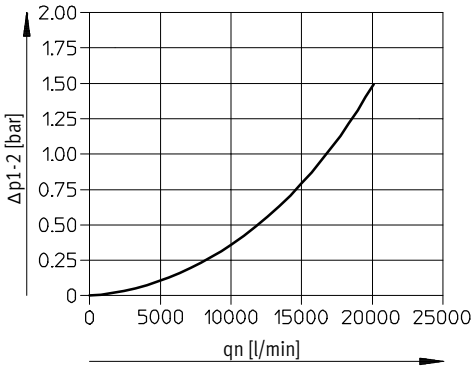
Filter		
1	Body	Die-cast aluminium
4	Metal bowl	Wrought aluminium alloy
5	Filter element	Sintered bronze
7	Spin disc	POM
8	Filter holder	POM
9	Separating plate	POM
10	Stabilising disc	POM
–	Seals	NBR

Standard flow rate qn as a function of the differential pressure Δp1-2

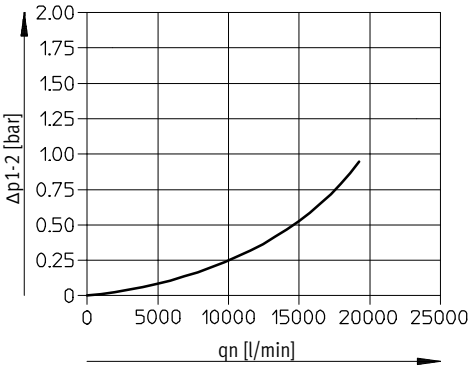
Grade of filtration 5 µm

p1 = 6 bar

With connecting plate MS12-AGF
Pneumatic connection G1



With connecting plate MS12-AGI
Pneumatic connection G2

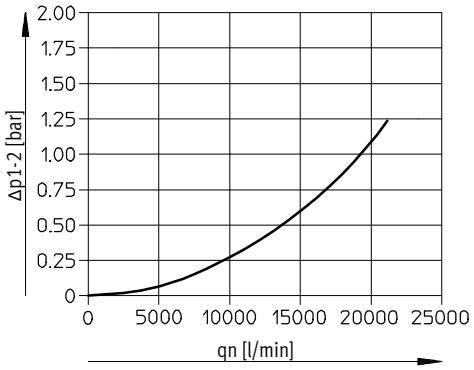


Standard flow rate qn as a function of the differential pressure Δp1-2

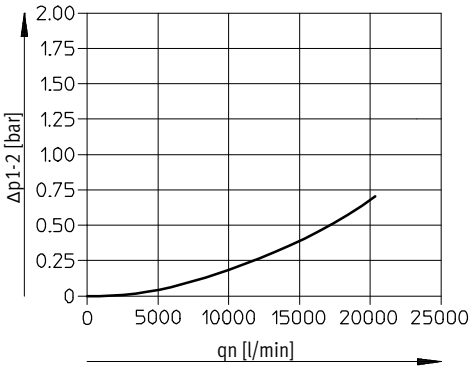
Grade of filtration 40 µm

p1 = 6 bar

With connecting plate MS12-AGF
Pneumatic connection G1

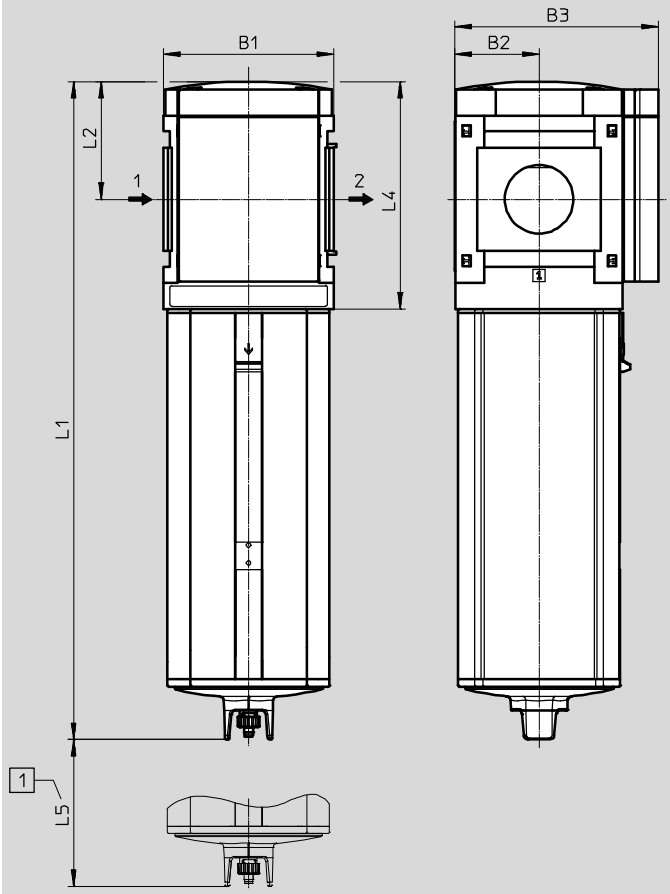


With connecting plate MS12-AGI
Pneumatic connection G2



Dimensions – Basic version

Download CAD data ➔ **www.festo.com**



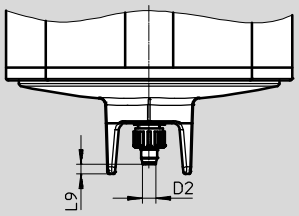
[1] Installation dimensions

➔ Flow direction

Type	B1	B2	B3	L1	L2	L4	L5
MS12-LF	124	61	148	480	86	166	250

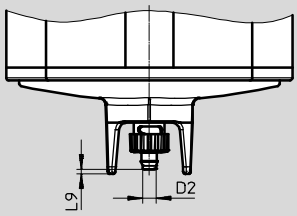
Dimensions – Condensate drain Download CAD data ➔ **www.festo.com**

Manual rotary M



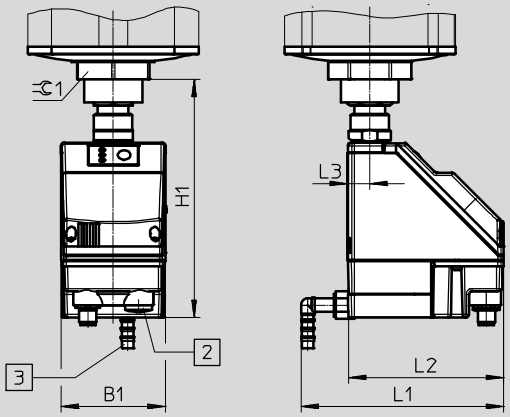
Barbed connector for plastic tubing PUN(-H)-8x1,25

Fully automatic V



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

Fully automatic, electrically actuated E2/E3/E4 Technical data ➔ Internet: pwea



Condensate drain PWEA:
- 2 Electrical connection: Screw terminal PG9
- 3 Connection 360° rotatable for plastic tubing PUN-H-12x2

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

Ordering data

Metal bowl

Size	Condensate drain	Connection	Grade of filtration 5 µm		Grade of filtration 40 µm	
			Part No.	Type	Part No.	Type
MS12	fully automatic	G1 ... G2[1)]	**537152**	**MS12-LF-G-CUV**	**537151**	**MS12-LF-G-EUV**

1) Connecting plate must be ordered separately as an accessory ➔ Internet: ms12-ag

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

Filters MS12-LF, MS series

Ordering data – Modular products

FESTO

Ordering table

	Grid dimension [mm]	124	Conditions	Code		Enter code
M	Module No.	**535023**				
	Series	Standard		**MS**		MS
	Size	12		**12**		12
	Function	Filter		**-LF**		-LF
	Pneumatic connection	Connecting plate G1		**-AGF**		
		Connecting plate G1¼		**-AGG**		
		Connecting plate G1½		**-AGH**		
		Connecting plate G2		**-AGI**		
		Module without connecting thread, without connecting plate		**-G**		
	Grade of filtration	40 µm		**-E**		
		5 µm		**-C**		
	Bowl	Metal bowl		**-U**		-U
	Condensate drain	Manual		**-M**		
		Fully automatic (P1 max. 12 bar)		**-V**		
	External, fully automatic, electric	115 V AC, terminals (P1 max. 16 bar)		**-E2**		
		230 V AC, terminals (P1 max. 16 bar)		**-E3**		
		24 V DC, terminals (P1 max. 16 bar)		**-E4**		
O	Type of mounting	Mounting bracket standard design	1	**-WP**		
	Flow direction	Flow direction from right to left		**-Z**		

1 **WP** Only with connecting plate AGF, AGG, AGH or AGI.

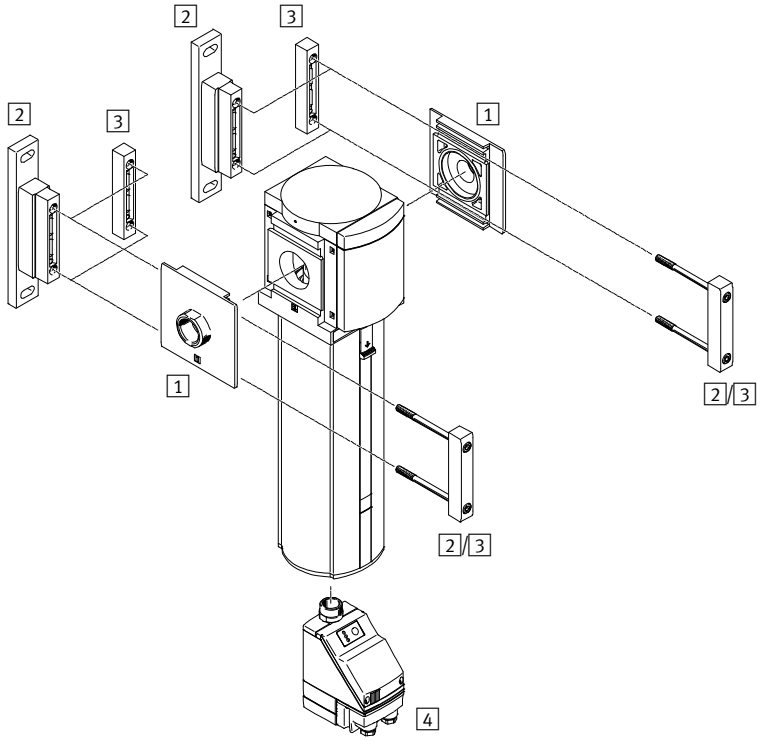
M Mandatory data
O Options

Transfer order code

535023	MS	12	–	LF	–		–		–	U	–		–		–	

Fine and micro filters MS12-LFM, MS series

Peripherals overview



Note

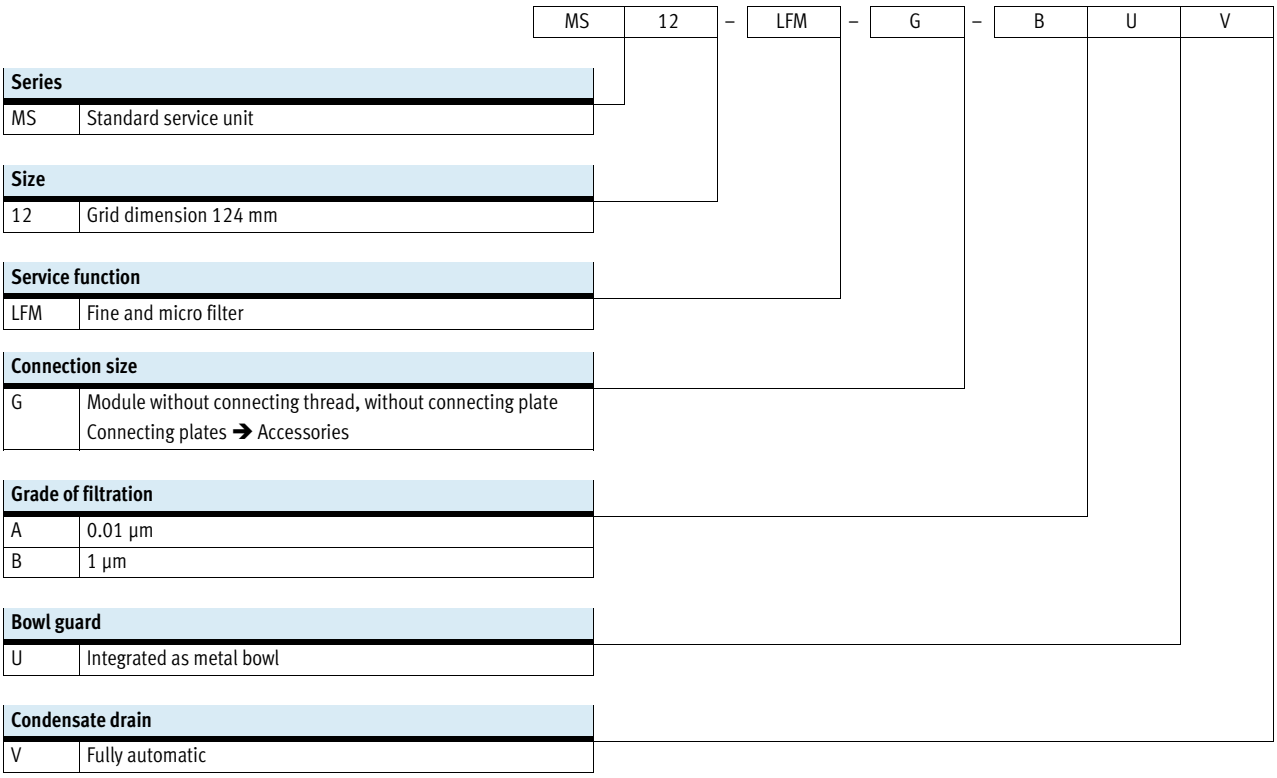
Additional accessories:

– 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	Condensate drain, fully automatic, electrically actuated E2/E3/E4	82

Fine and micro filters MS12-LFM, MS series

Type codes



Series	
MS	Standard service unit

Size	
12	Grid dimension 124 mm

Service function	
LFM	Fine and micro filter

Connection size	
G	Module without connecting thread, without connecting plate Connecting plates ➔ Accessories

Grade of filtration	
A	0.01 µm
B	1 µm

Bowl guard	
U	Integrated as metal bowl

Condensate drain	
V	Fully automatic

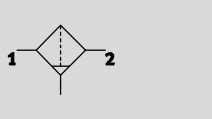
Further variants can be ordered using the modular system ➔ 82

- Pneumatic connection
- Condensate drain
- Filter change sensor
- Type of mounting
- Flow direction

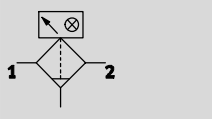
Fine and micro filters MS12-LFM, MS series

Technical data

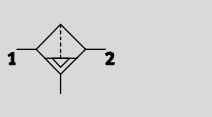
Function
Condensate drain
manual rotary
without differential pressure indicator



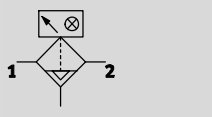
with differential pressure indicator



Condensate drain
fully automatic
without differential pressure indicator



with differential pressure indicator



Flow rate
500 ... 50,000 l/min

Temperature range
–10 ... +60 °C

Operating pressure
0.8 ... 20 bar

- High-performance filter for exceptionally clean compressed air
- Air quality to ISO 8573-1:2010
- Available with manual, fully automatic or fully automatic, electrically actuated condensate drain
- Available with differential pressure indicator for optical indication of filter contamination
- Choice of filter cartridges: 0.01 µm or 1 µm
- New filter cartridges ➔ 91

General technical data		
Pneumatic connection 1, 2		
	Connecting plate AG...	G1, G1¼, G1½ or G2
	Module without connecting thread/plate G	–
Design		Fibre filter
Type of mounting		Via accessories
		In-line installation
Assembly position		Vertical ±5°
Grade of filtration [µm]		0.01 (micro filter MS12-LFM-A)
		1 (fine filter MS12-LFM-B)
Air purity class at the output		Compressed air in accordance with ISO 8573-1:2010 [1:7:2] (Grade of filtration 0.01µm, micro filter MS12-LFM-A)
		Compressed air in accordance with ISO 8573-1:2010 [5:7:3] (Grade of filtration 1µm, fine filter MS12-LFM-B)
Filter efficiency [%]		99.9999 (Grade of filtration 0.01µm, micro filter MS12-LFM-A)
		99.99 (Grade of filtration 1µm, fine filter MS12-LFM-B)
Bowl guard		Integrated as metal bowl
Condensate drain		Manual rotary
		Fully automatic
		Fully automatic, electrical actuated
Max. condensate volume [cm^3]		400

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

Fine and micro filters MS12-LFM, MS series

Technical data

Standard flow rate q_n [l/min]				
Operating pressure	4 bar	6 bar	10 bar	14 bar
Micro filter MS12-LFM-A				
Max. standard flow rate for air purity class $q_{n\ max}$	16,670	23,300	36,670	50,000
Min. standard flow rate for air purity class $q_{n\ min}$	500	700	1,100	1,500
Fine filter MS12-LFM-B				
Max. standard flow rate for air purity class $q_{n\ max}$	16,670	23,300	36,670	50,000
Min. standard flow rate for air purity class $q_{n\ min}$	625	950	1,390	1,675

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

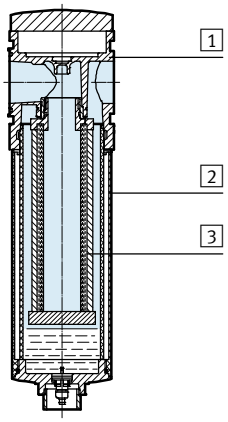
Operating and environmental conditions				
Condensate drain		Manual rotary M	Fully automatic V	Fully automatic, electrical actuated E2/E3/E4
Operating pressure	[bar]	0.8 ... 20	2 ... 12	0.8 ... 16
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [6:8:4][1]		
		Inert gases		
Ambient 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	CRC[2]	2		

1) It is recommended to prefilter the compressed air for the micro filter MS-LFM-A using a fine filter MS-LFM-B (grade of filtration 1 µm).
2) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Weights [g]	
Fine and micro filter with metal bowl U	7,000
Fine and micro filter with metal bowl U and fully automatic, electrically actuated condensate drain E2/E3/E4	7,700

Materials

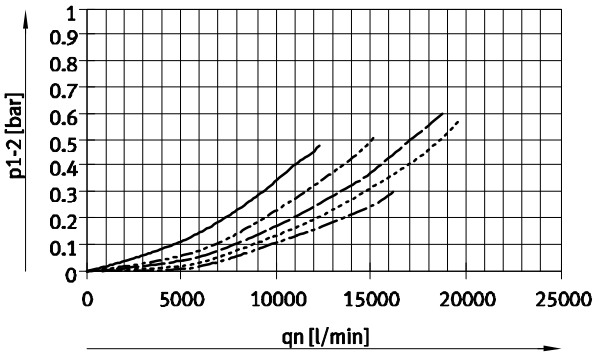
Sectional view



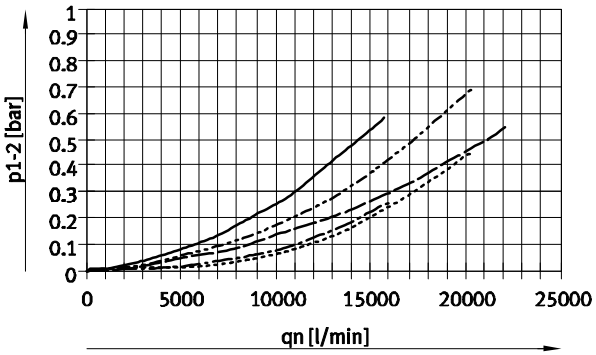
Fine and micro filter		
1	Body	Die-cast aluminium
2	Metal bowl	Wrought aluminium alloy
	Viewing window	PC
3	Filter element	Borosilicate mesh
–	Seals	NBR
Note on materials		RoHS-compliant
		Free of copper and PTFE

Standard flow rate qn as a function of the differential pressure p1-2

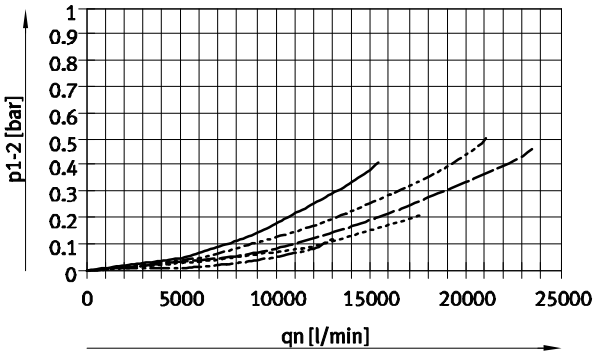
Grade of filtration 0.01 µm
With connecting plate MS12-AGF, Pneumatic connection G1



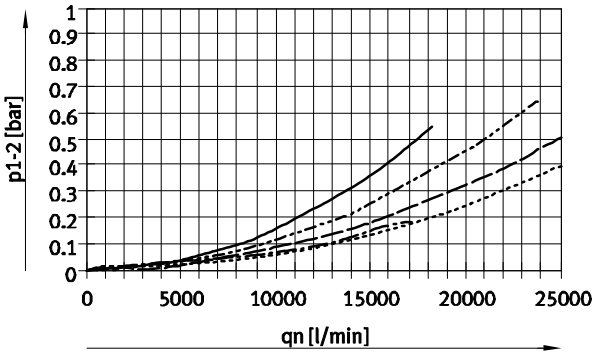
Grade of filtration 0.01 µm
With connecting plate MS12-AGG, Pneumatic connection G1¼



Grade of filtration 0.01 µm
With connecting plate MS12-AGH, Pneumatic connection G1½



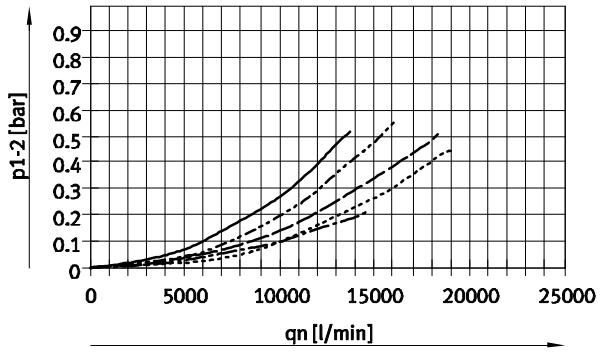
Grade of filtration 0.01 µm
With connecting plate MS12-AGI, Pneumatic connection G2



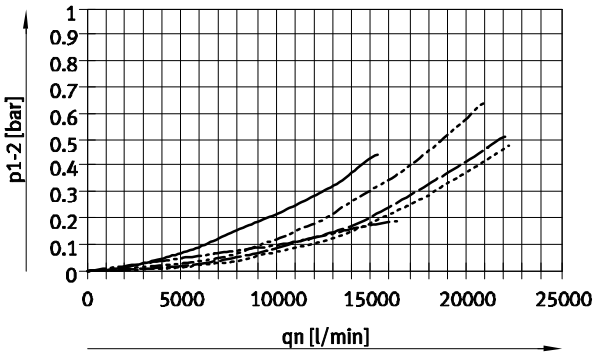
p1: 4 bar
p1: 6 bar
p1: 8 bar
p1: 10 bar
p1: 12 bar

Standard flow rate qn as a function of the differential pressure p1-2

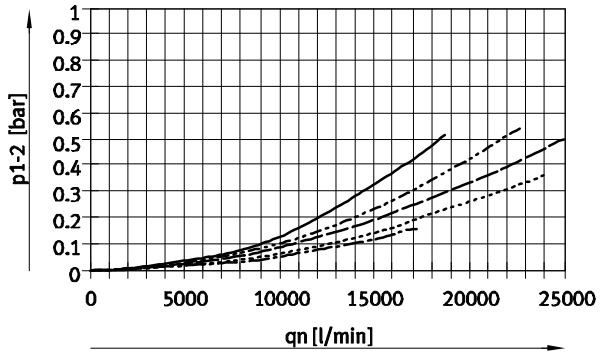
Grade of filtration 1 µm
With connecting plate MS12-AGF, Pneumatic connection G1



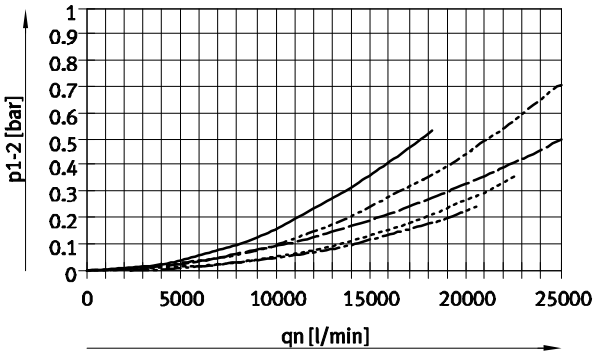
Grade of filtration 1 µm
With connecting plate MS12-AGG, Pneumatic connection G1¼



Grade of filtration 1 µm
With connecting plate MS12-AGH, Pneumatic connection G1½

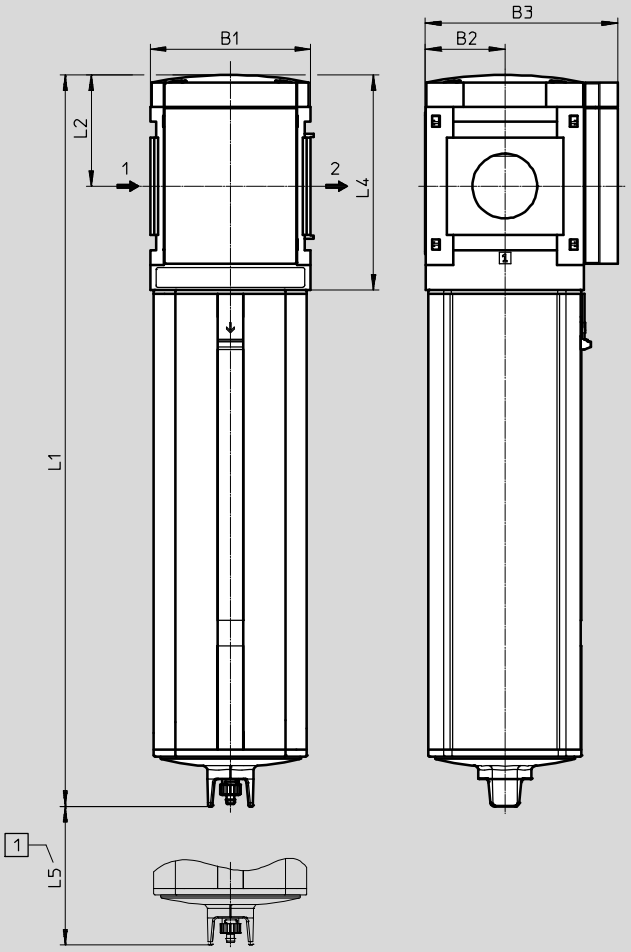


Grade of filtration 1 µm
With connecting plate MS12-AGI, Pneumatic connection G2



p1: 4 bar
p1: 6 bar
p1: 8 bar
p1: 10 bar
p1: 12 bar

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

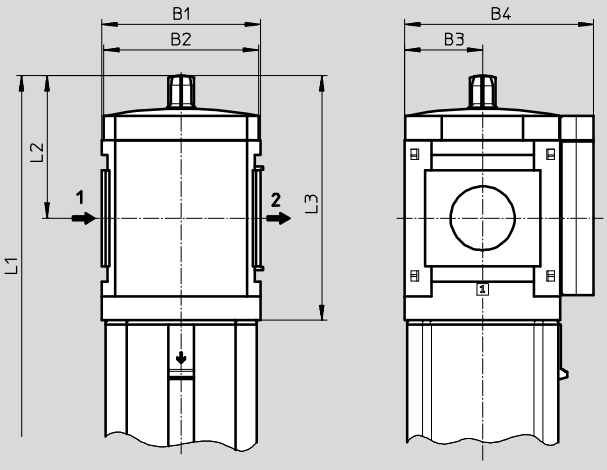


1 Installation dimensions

➔ Flow direction

Type	B1	B2	B3	L1	L2	L4	L5
MS12-LFM	124	61	148	565	86	166	350

Dimensions – Differential pressure indicator Download CAD data ➔ **www.festo.com**

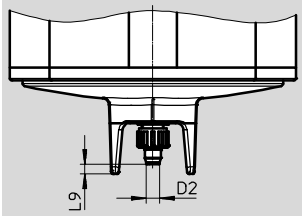


➔ Flow direction

Type	B1	B2	B3	B4	L1	L2	L3
MS12-LFM-...-DA	124	122	61	148	590	112	192

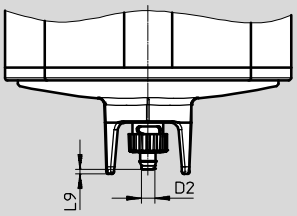
Dimensions – Condensate drain Download CAD data ➔ **www.festo.com**

Manual rotary M



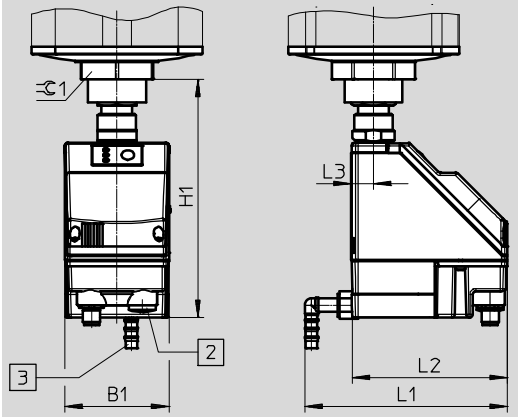
Barbed connector for plastic tubing PUN(-H)-8x1,25

Fully automatic V



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

Fully automatic, electrically actuated E2/E3/E4 Technical data ➔ Internet: pwea



Condensate drain PWEA:
- 2 Electrical connection: Screw terminal PG9
- 3 Connection 360° rotatable for plastic tubing PUN-H-12x2

Type	B1	D2 ∅	H1	L1	L2	L3	L9	SW1
MS12-LFM-...-M	–	5.6	–	–	–	–	4	–
MS12-LFM-...-V	–	5.6	–	–	–	–	2	–
MS12-LFM-...-E2/E3/E4	72	–	164	140	108	15	–	50

Ordering data

Metal bowl

Size	Condensate drain	Connection	Micro filter Grade of filtration 0.01 µm		Fine filter Grade of filtration 1 µm	
			Part No.	Type	Part No.	Type
MS12	fully automatic	G1 ... G2[1)]	**537154**	**MS12-LFM-G-AUV**	**537153**	**MS12-LFM-G-BUV**

1) Connecting plate must be ordered separately as an accessory ➔ Internet: ms12-ag

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

Fine and micro filters MS12-LFM, MS series

Ordering data – Modular products

Ordering table

	Grid dimension [mm]	124	Condi-tions	Code		Enter code
M	Module No.	**535042**				
	Series	Standard		**MS**		MS
	Size	12		**12**		12
	Function	Fine and micro filter		**-LFM**		-LFM
	Pneumatic connection	Connecting plate G1		**-AGF**		
		Connecting plate G1¼		**-AGG**		
		Connecting plate G1½		**-AGH**		
		Connecting plate G2		**-AGI**		
		Module without connecting thread, without connecting plate		**-G**		
	Grade of filtration	1 µm		**-B**		
		0.01 µm		**-A**		
	Bowl	Metal bowl		**-U**		-U
	Condensate drain	Manual		**-M**		
		Fully automatic (P1 max. 12 bar)		**-V**		
	External, fully automatic, electric	115 V AC, terminals (P1 max. 16 bar)		**-E2**		
		230 V AC, terminals (P1 max. 16 bar)		**-E3**		
		24 V DC, terminals (P1 max. 16 bar)		**-E4**		
O	Filter change sensor	Differential pressure indicator, optical		**-DA**		
	Type of mounting	Mounting bracket standard design	1	**-WP**		
	Flow direction	Flow direction from right to left		**-Z**		

1 **WP** Only with connecting plate AGF, AGG, AGH or AGI.

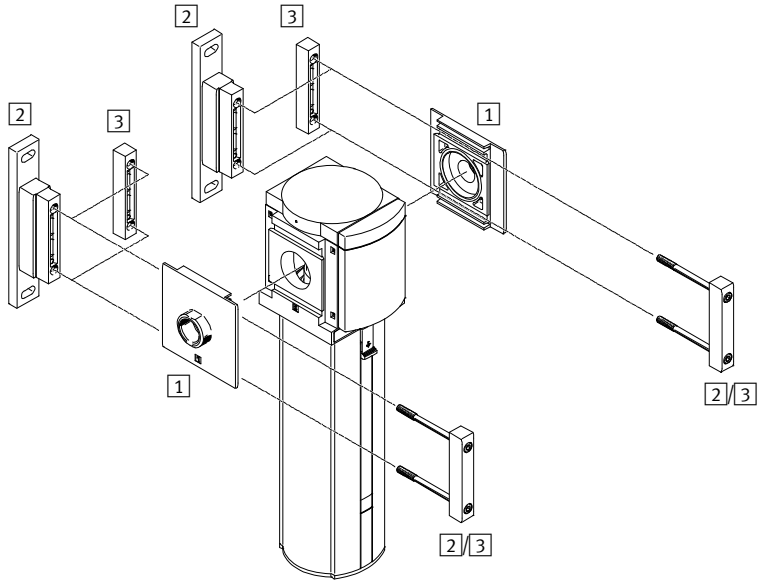
M Mandatory data
O Options

Transfer order code

535042	**MS**	**12**	–	**LFM**	–		–		–	**U**	–		–		–		–		–	

Active carbon filters MS12-LFX, MS series

Peripherals overview



- Note

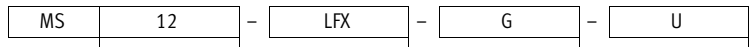
Additional accessories:

– 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

Active carbon filters MS12-LFX, MS series

Type codes



Series	
MS	Standard service unit

Size	
12	Grid dimension 124 mm

Service function	
LFX	Active carbon filter

Connection size	
G	Module without connecting thread, without connecting plate Connecting plates ➔ Accessories

Bowl guard	
U	Integrated as metal bowl

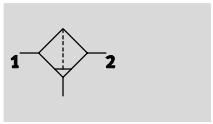
Further variants can be ordered using the modular system ➔ 88

- Pneumatic connection
- Type of mounting
- Flow direction

Active carbon filters MS12-LFX, MS series

Technical data

Function



Flow rate
5,065 ... 15,190 l/min

Temperature range
–10 ... +60 °C

Operating pressure
0 ... 20 bar

- Removal of liquid and gaseous oil particles from compressed air using active carbon
- Eliminates odours and vapours
- Prefiltration with micro filter MS12-LFM-A, grade of filtration 0.01 µm, recommended
- New filter cartridges ➔ 91

General technical data		
Pneumatic connection 1, 2		
	Connecting plate AG...	G1, G1¼, G1½ or G2
	Module without connecting thread/plate G	–
Design		Active carbon filter
Type of mounting		Via accessories
		In-line installation
Assembly position		Vertical ±5°
Air purity class at the output[1]		Compressed air in accordance with ISO 8573-1:2010 [1:4:1]
Bowl guard		Integrated as metal bowl
Residual oil content	[mg/m³]	≤ 0.003

1) We recommend that the filter cartridge be replaced by a new one after 1,000 operating hours. (Applies to an ambient temperature of 21 °C. At higher temperatures the service life of the filter cartridge will be reduced.)

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

Standard flow rate q_n [l/min]				
Operating pressure	4 bar	6 bar	10 bar	14 bar
Max. standard flow rate for air purity class $q_{n\,max}$	5,065	7,090	11,150	15,190

Operating and environmental conditions		
Operating pressure	[bar]	0 ... 20
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [1:4:2]
		Inert gases
Ambient temperature	[°C]	–10 ... +60
Temperature of medium	[°C]	+5 ... +30
Storage temperature	[°C]	–10 ... +60
Corrosion resistance	CRC[1]	2

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Weights [g]	
Active carbon filter with metal bowl U	7,000

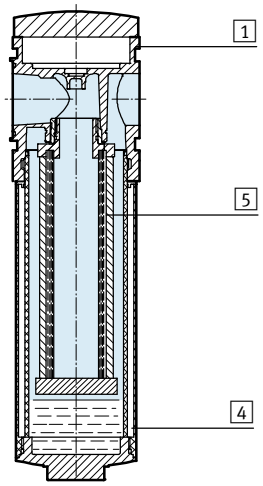
Active carbon filters MS12-LFX, MS series

Technical data

FESTO

Materials

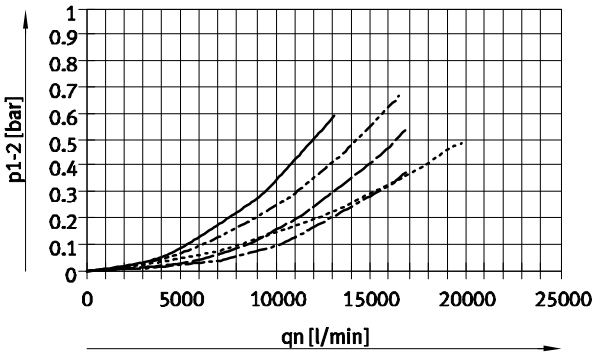
Sectional view



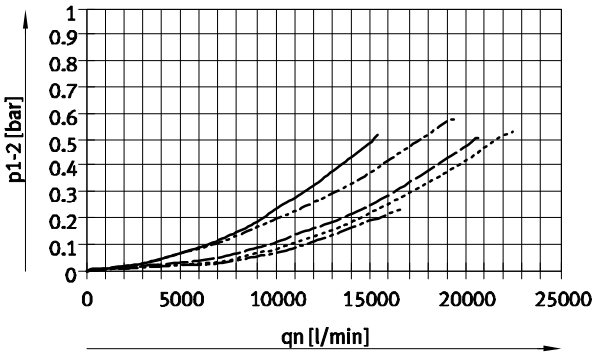
Active carbon filter		
1	Body	Die-cast aluminium
4	Metal bowl	Wrought aluminium alloy
	Viewing window	PC
5	Filter	Active carbon
–	Seals	NBR
Note on materials		RoHS-compliant
		Free of copper and PTFE

Standard flow rate qn as a function of the differential pressure p1-2

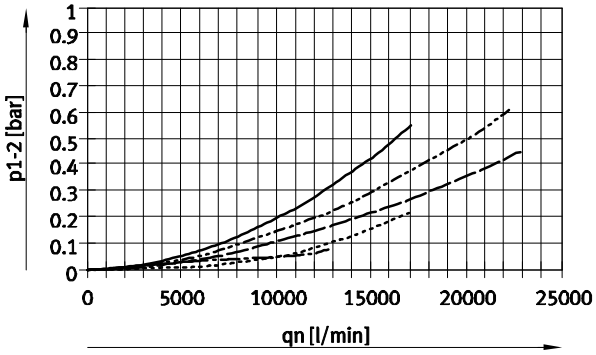
With connecting plate MS12-AGF, Pneumatic connection G1



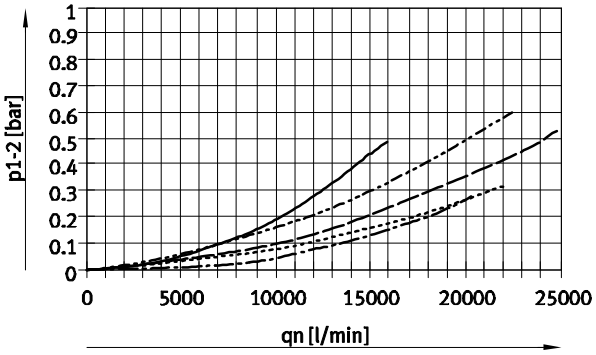
With connecting plate MS12-AGG, Pneumatic connection G1¼



With connecting plate MS12-AGH, Pneumatic connection G1½

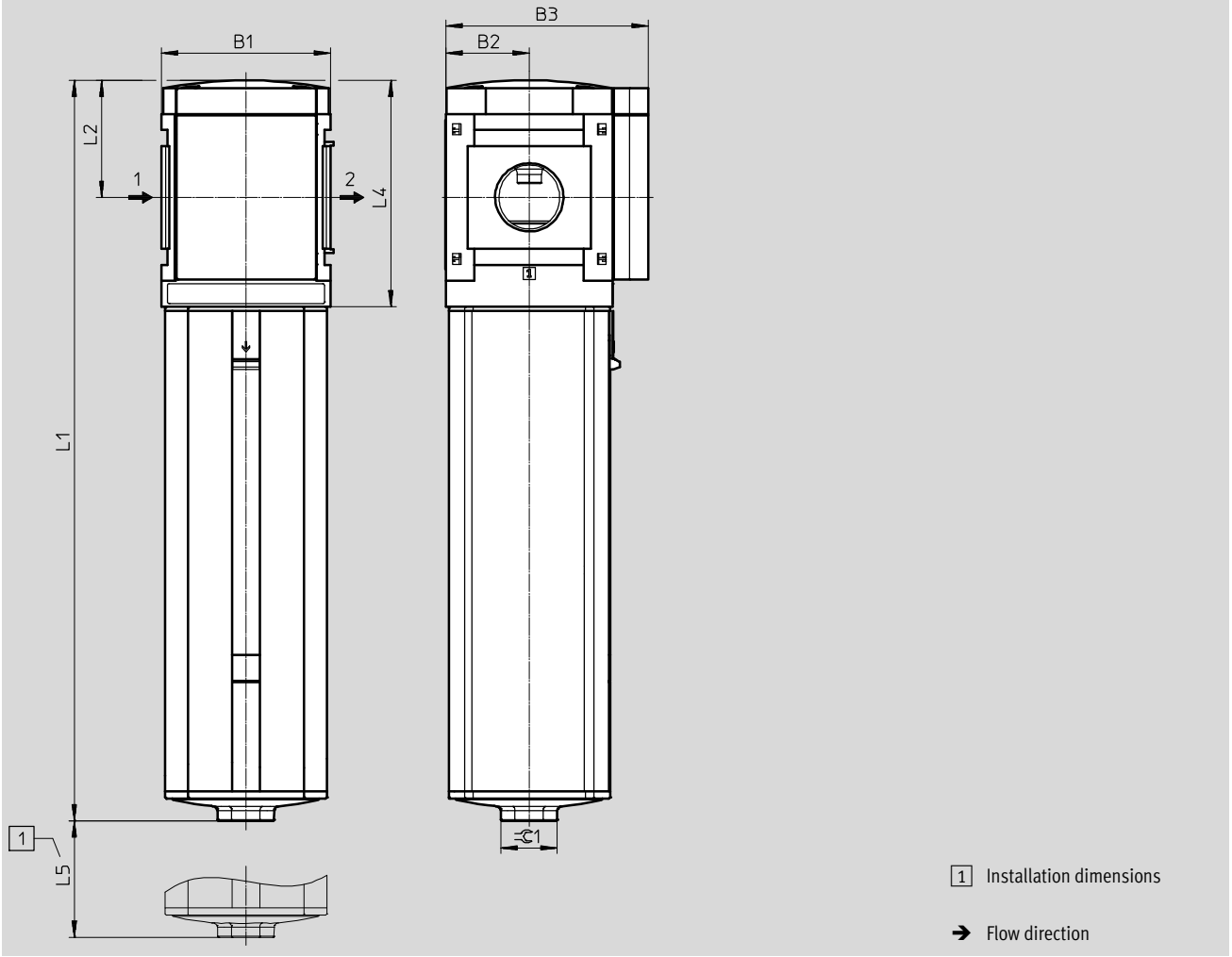


With connecting plate MS12-AGI, Pneumatic connection G2



p1: 4 bar
p1: 6 bar
p1: 8 bar
p1: 10 bar
p1: 12 bar

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



Type	B1	B2	B3	L1	L2	L4	L5	⌀1
MS12-LFX	124	61	148	542	86	166	350	36

Ordering data			
Metal bowl			
Size	Connection	Part No.	Type
MS12	G1 … G2[1)]	**537155**	**MS12-LFX-G-U**

1) Connecting plate must be ordered separately as an accessory ➔ Internet: ms12-ag

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

Active carbon filters MS12-LFX, MS series

Ordering data – Modular products

Ordering table

	Grid dimension [mm]	124	Condi-tions	Code		Enter code
M	Module No.	**535043**				
	Series	Standard		**MS**		MS
	Size	12		**12**		12
	Function	Active carbon filter		**-LFX**		-LFX
	Pneumatic connection	Connecting plate G1		**-AGF**		
		Connecting plate G1¼		**-AGG**		
		Connecting plate G1½		**-AGH**		
		Connecting plate G2		**-AGI**		
		Module without connecting thread, without connecting plate		**-G**		
	Bowl	Metal bowl		**-U**		-U
O	Type of mounting	Mounting bracket standard design	1	**-WP**		
	Flow direction	Flow direction from right to left		**-Z**		

1 **WP** Only with connecting plate AGF, AGG, AGH or AGI.

M Mandatory data
O Options

Transfer order code

535043	MS	12	–	LFX	–		–	U	–		–	

Filters MS-LF/LFM/LFX, MS series

Accessories

Filter cartridges, MS4/MS6 series


MS...-LFM


MS...-LFP


MS...-LFX

Ordering data				
Size	Filter cartridge	Grade of filtration [µm]	Part No.	Type
MS4	Micro-filter cartridge	0.01	**162674**	**MS4/D-MINI-LFM-A**
	Fine-filter cartridge	1	**162677**	**MS4/D-MINI-LFM-B**
	Filter cartridge (colour: blue)	5	**534501**	**MS4-LFP-C**
	Filter cartridge (colour: white)	40	**534502**	**MS4-LFP-E**
	Activated carbon filter cartridge	–	**532912**	**MS4/D-MINI-LFX**
MS6	Micro-filter cartridge	0.01	**532909**	**MS6-LFM-A**
	Fine-filter cartridge	1	**532910**	**MS6-LFM-B**
	Filter cartridge (colour: blue)	5	**534499**	**MS6-LFP-C**
	Filter cartridge (colour: white)	40	**534500**	**MS6-LFP-E**
	Activated carbon filter cartridge	–	**532911**	**MS6-LFX**
High flow rate HF				
MS6	Micro-filter cartridge	0.01	**552093**	**MS6-LFM-A-HF**
	Fine-filter cartridge	1	**552092**	**MS6-LFM-B-HF**
	Activated carbon filter cartridge	–	**552094**	**MS6-LFX-HF**
Range of application HP, suitable for sealing air and cleaning air				
MS6	Micro-filter cartridge	0,01	**547922**	**MS6-LFM-AI**
	Fine-filter cartridge	1	**547923**	**MS6-LFM-BI**
	Activated carbon filter cartridge	–	**547925**	**MS6-LFX-AKI**

Filter cartridges, MS9 series


MS9-LFM

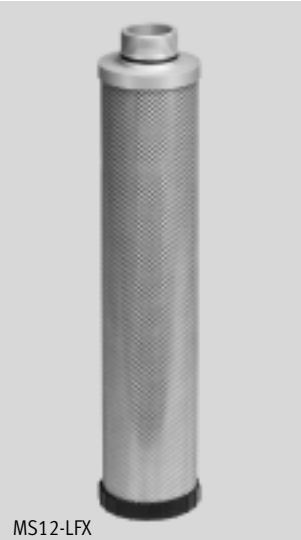

MS9-LFX

Ordering data				
Size	Filter cartridge	Grade of filtration [µm]	Part No.	Type
MS9	Micro-filter cartridge	0.01	**553036**	**MS9-LFM-A**
	Fine-filter cartridge	1	**553037**	**MS9-LFM-B**
	Filter cartridge	5	**570309**	**MS9-LFP-C**
	Filter cartridge	40	**570310**	**MS9-LFP-E**
	Activated carbon filter cartridge	–	**552946**	**MS9-LFX**
High flow rate HF				
MS9	Micro-filter cartridge	0.01	**552944**	**MS9-LFM-A-HF**
	Fine-filter cartridge	1	**552945**	**MS9-LFM-B-HF**

Filter cartridges, MS12 series


MS12-LFM-B


MS12-LFM-A


MS12-LFX

Ordering data

Size	Filter cartridge	Grade of filtration [µm]	Part No.	Type
MS12	Micro-filter cartridge	0.01	**537146**	**MS12-LFM-A**
	Fine-filter cartridge	1	**537145**	**MS12-LFM-B**
	Filter cartridge	5	**537143**	**MS12-LFP-C**
	Filter cartridge	40	**537144**	**MS12-LFP-E**
	Activated carbon filter cartridge	–	**537147**	**MS12-LFX**