

Filters MS-LF/LFM/LFX, MS series

FESTO



Key features

Service unit components of the MS series		
Solutions for every application	Freely combinable functional modules	
With its large product range, highly effective components and a wide choice of functions, the Festo MS series offers a complete concept for compressed air preparation. It is suitable for simple standard applications as well as for application-specific solutions with very high quality requirements. Available as individual components, pre-assembled combinations ex-stock,	application-specific combinations or complete ready-to-install solutions. The five sizes in the MS series achieve maximum flow rates with low space requirements.	Pressure regulators, on/off and soft-start valves with safety function, filters, pressure and flow sensors, dryers, sensors and lubricators can be assembled into a suitable solution for every task. Thanks to the modular structure the components can be combined as required. The simple connection system saves time because there is no need to disassemble the entire combination when replacing individual modules. Many of the components are also UL and ATEX certified.

CAD models and configurator	Engineering tools
Convenient tools for planning and selecting application-specific individual components and combinations. The product configurator can be used to configure customised solutions quickly and to transfer the order data without any hassle.	Selection tool for choosing the right service unit combination without oversizing, and with the right air purity class: → www.festo.com/engineering/service-unit

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

Selection criteria: Application
Filter combination is proposed based upon your selected application

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

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

particle : 4 * : oil

ISO

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

Direct filter selection
Independent selection of filter combination

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

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

Integrated sensors	Safety functions	Saving energy	Intelligent mix of sizes
Pressure and flow sensors	Soft-start/quick exhaust valves MS6-SV/MS9-SV	Service unit combinations MSE6	



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



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



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



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

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

1) Using pressure regulator MS-LR as an example

Key features

Note

Information

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

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

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

Designing a service unit combination

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

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

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

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

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

Product range for service unit components MS series

Type	Description	Size	Pneumatic connection					
			Push-in connector	Female thread			Connecting plate with thread	
				M	G	NPT	G	NPT
Combinations								
Service unit combinations MSB-FRC Datasheets → Internet: msb								
	Combinations of filter regulator and lubricator	4	–	–	1/8, 1/4	–	–	–
		6	–	–	1/4, 3/8, 1/2	–	–	–
Service unit combinations MSB Datasheets → Internet: msb								
	Certain predefined combinations	4	–	–	1/4	–	–	–
		6	–	–	1/2	–	–	–
	Freely configurable combinations	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
Service unit combinations MSE6 Datasheets → Internet: mse6								
	Combinations with fieldbus connection for measuring pressure, flow rate and consumption	6	–	–	–	–	1/2	–

Key features

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

Key features

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

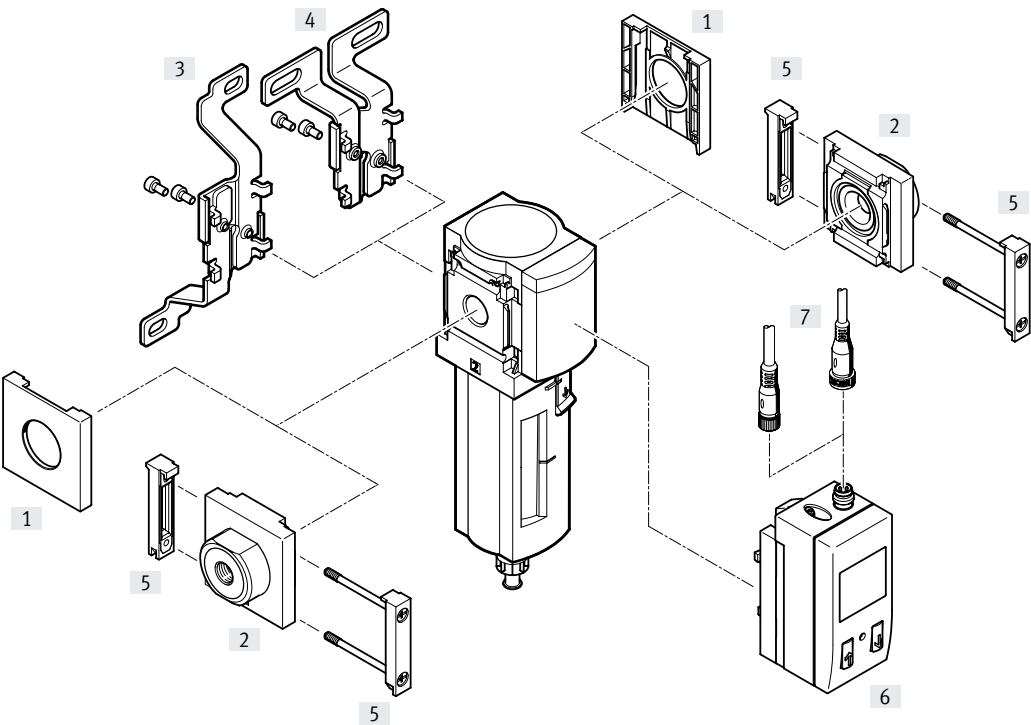
Key features

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

Key features

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

Peripherals overview



 **Note**

Additional accessories:

- Module connector for combination with sizes MS4/MS6 or MS9 → Internet: amv, rmv, armv
- Adapter 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 cap 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 contamination indicator DP, DN, DPI, DNI	■ for LFM	■ for LFM	■ for LFM	■ for LFM	29
[7]	Connecting cable NEBA-M8...-LE3, NEBA-M12...-LE4	■ for LFM	■ for LFM	■ for LFM	■ for LFM	neba
–	Mounting bracket MS4/6-WP, WPB, WPE, WPM	–	■	■	■	ms4-wp, ms6-wp

Type codes

001	Series	
MS	MS series	
002	Size	
4	Grid dimension 40 mm	
003	Function	
LF	Filter	
004	Pneumatic connection	
1/8	Female thread G1/8	
1/4	Female thread G1/4	
AGA	Sub-base G1/8	
AGB	Sub-base G1/4	
AGC	Sub-base G3/8	
AQK	Sub-base 1/8 NPT	
AQN	Sub-base 1/4 NPT	
AQP	Sub-base 3/8 NPT	
005	Grade of filtration	
C	5 µm	
E	40 µm	
006	Bowl type	
R	Plastic tray with plastic basket	
U	Aluminium	

007	Condensate drain	
M	Manually	
H	Semi-automatic	
V	Automatic	
008	Type of mounting	
	Without mounting bracket	
WP	Mounting bracket basic design	
WPM	Mounting bracket for hooking in service unit components	
WB	Mounting centrally at rear (wall mounting top and bottom), connecting plates not required	
WBM	Mounting centrally at rear (wall mounting top), connecting plates not required	
009	EU certification	
	None	
EX4	II 2GD	
010	UL certification	
	None	
UL1	cULus ordinary location for Canada and USA	
011	Flow direction	
	Flow direction from left to right	
Z	Flow direction from right to left	

Type codes

001	Series	
MS	MS series	
002	Size	
6	Grid dimension 62 mm	
003	Function	
LF	Filter	
004	Pneumatic connection	
1/4	Female thread G1/4	
3/8	Female thread G3/8	
1/2	Female thread G1/2	
AGB	Sub-base G1/4	
AGC	Sub-base G3/8	
AGD	Sub-base G1/2	
AGE	Sub-base G3/4	
AQN	Sub-base 1/4 NPT	
AQP	Sub-base 3/8 NPT	
AQR	Sub-base 1/2 NPT	
AQS	Sub-base 3/4 NPT	
005	Grade of filtration	
C	5 µm	
E	40 µm	

006	Bowl type	
R	Plastic tray with plastic basket	
U	Aluminium	
007	Condensate drain	
M	Manually	
H	Semi-automatic	
V	Automatic	
008	Type of mounting	
	Without mounting bracket	
WP	Mounting bracket basic design	
WPM	Mounting bracket for hooking in service unit components	
WB	Mounting centrally at rear (wall mounting top and bottom), connecting plates not required	
009	EU certification	
	None	
EX4	II 2GD	
010	UL certification	
	None	
UL1	cULus ordinary location for Canada and USA	
011	Flow direction	
	Flow direction from left to right	
Z	Flow direction from right to left	

Additional variants can be ordered using the modular system

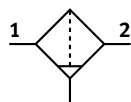
Filter LF	→ Page 20
Fine and micro filters LFM	→ Page 32
Activated carbon filter LFX	→ Page 38

- Pneumatic connection
- Condensate drain
- Application area (for LFM and LFX only)
- Filter contamination indicator (for LFM only)

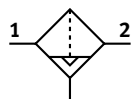
- Type of mounting
- EU certification
- UL certification
- Flow direction

Datasheet

Function
Condensate drain
Manual, rotating



Semi- or fully automatic



-  Flow rate
1000 ... 4100 l/min
-  Temperature range
-10 ... +60 °C
-  Operating pressure
0 ... 20 bar
-  www.festo.com

The sintered filter with centrifugal water separator removes contamination, rust and condensate from the compressed air. The filter cartridges can be replaced.



- 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 inserts 5 µm or 40 µm
- New filter cartridges → page 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...	1/8 NPT, 1/4 NPT or 3/8 NPT	1/4 NPT, 3/8 NPT, 1/2 NPT or 3/4 NPT
Design	Sintered filter with centrifugal separator	
Type of mounting	With accessories In-line installation	
Mounting position	Vertical ±5°	
Grade of filtration [µm]	5 40	
Pore size [µm]	< 5 < 40	
Air purity class at the output	Compressed air to ISO 8573-1:2010 [6:8:4] (grade of filtration 5 µm) Compressed air to ISO 8573-1:2010 [7:8:4] (grade of filtration 40 µm)	
Bowl guard	Plastic bowl guard Integrated as metal bowl	
Condensate drain	Manual, rotating Manual, non-detenting Semi-automatic Fully automatic – Fully automatic, electrically actuated	
Degree of condensate separation [%]	> 75	
Max. condensate volume [cm³]	19 (with plastic bowl guard) 25 (with metal bowl)	38

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

Standard nominal flow rate $q_{N^{1)}$ [l/min]					
Size	MS4			MS6	
Pneumatic connection	G1/8	G1/4		G1/4	G1/2
Grade of filtration 5 µm	1000	1300		2000	3200
40 µm	1100	1700		2500	4100

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

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

Datasheet

Operating and environmental conditions							
Condensate drain	Manual, rotating		Semi-automatic		Fully automatic		Fully automatic, electrically actuated
	M		H		V		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 to ISO 8573-1:2010 [–:9:–]		Compressed air to ISO 8573-1:2010 [–:9:–]		Compressed air to ISO 8573-1:2010 [7:9:–]		Compressed air to ISO 8573-1:2010 [–:9:–]
	Inert gases						
Ambient temperature [°C]	–10 ... +60		–10 ... +60		–10 ... +60		+1 ... +60
Temperature of medium [°C]	–10 ... +60		–10 ... +60		–10 ... +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⁾	c UL us - Recognized (OL)						

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

2) More information: www.festo.com/x/topic/crc3) More information: www.festo.com/catalogue/ms-lf → Support/Downloads.

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

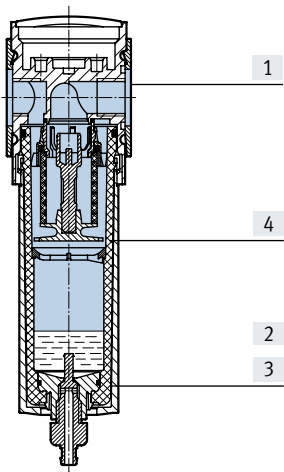
1) More information: www.festo.com/catalogue/ms-lf → Support/Downloads.

Weight [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 electrically actuated, fully automatic condensate drain E2, E3, E4	–	1800

Datasheet

Materials

Sectional view

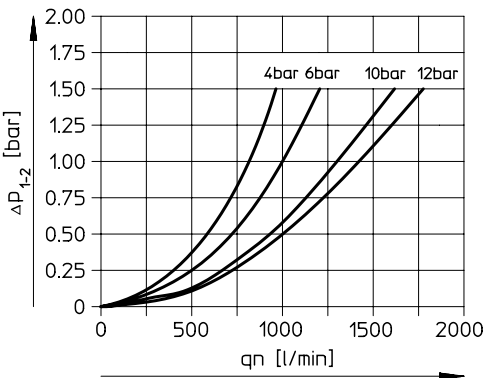


Filter		
[1]	Housing	Die-cast aluminium
[2]	Plastic bowl guard	PC
[3]	Metal bowl	Wrought aluminium alloy,
		Die-cast aluminium
	Inspection window	PA
[4]	Filter element	PE
–	Seals	NBR
Note on materials		RoHS-compliant
LABS (PWIS) conformity		VDMA24364-B1/B2-L

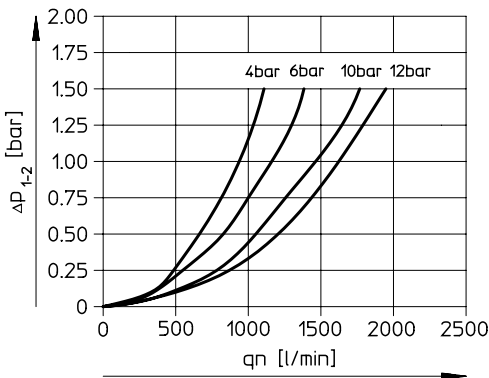
Standard flow rate q_n as a function of differential pressure Δp_{1-2}

Grade of filtration 5 μm

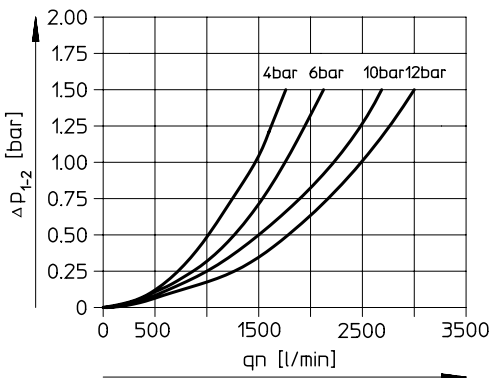
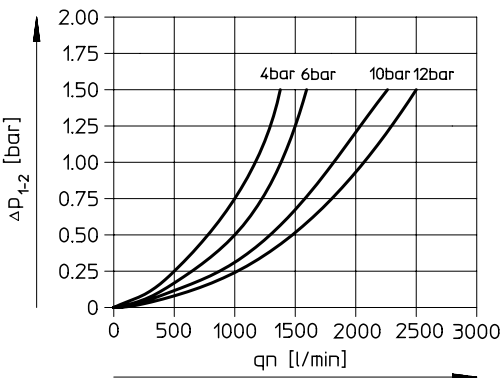
MS4-LF-1/8



Grade of filtration 40 μm

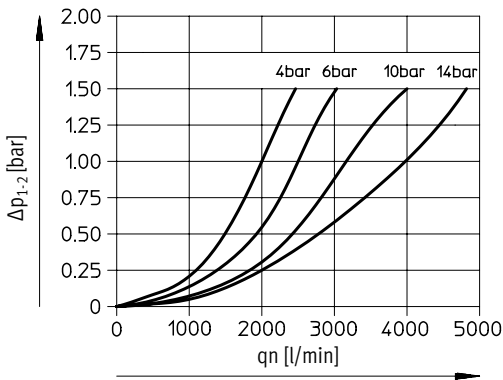
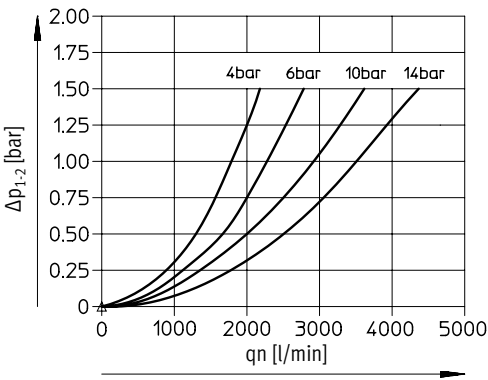


MS4-LF-1/4

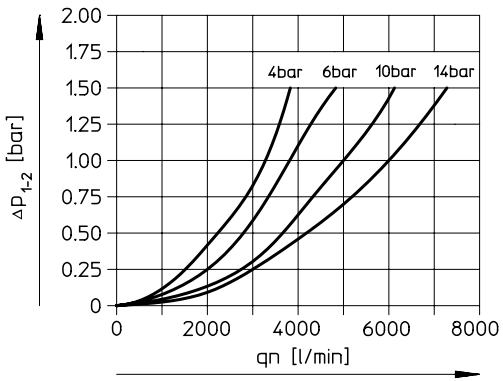
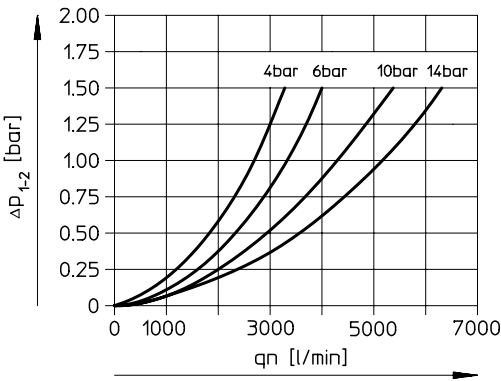


Datasheet

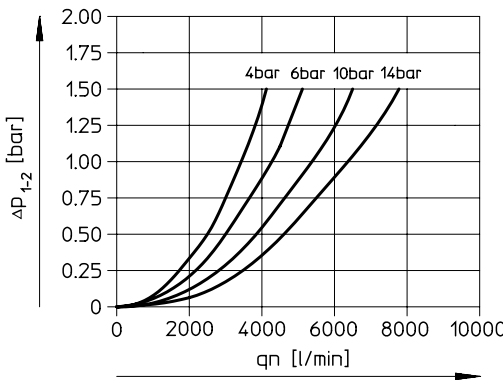
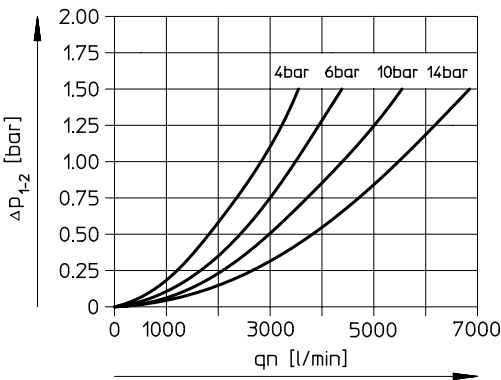
Standard flow rate qn as a function of differential pressure Δp1-2	
MS6-LF-1/4	Grade of filtration 40 μm



MS6-LF-3/8



MS6-LF-1/2



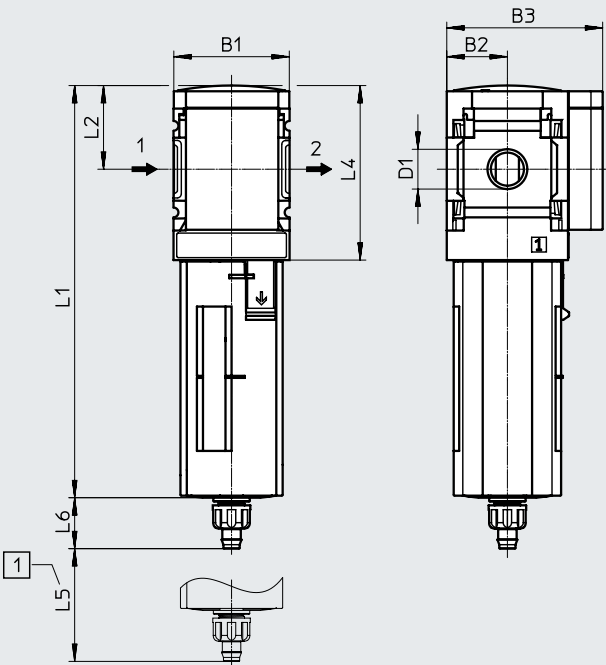
Datasheet

Dimensions – Basic version MS4-LF

Download CAD data → www.festo.com

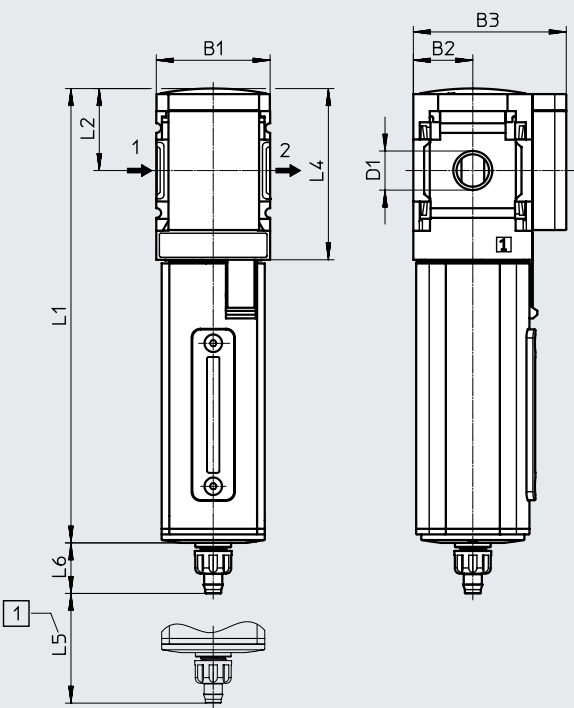
Manual, rotary condensate drain

With plastic bowl guard R



[1] Installation dimension → Flow direction

With metal bowl U



[1] Installation dimension → Flow direction

Type	B1	B2	B3	D1	L1		L2	L4	L5	L6
					Plastic bowl guard	Metal bowl				
MS4-LF-1/8	40	21	54	G1/8	142.8	159.4	29	60.5	75	17.7
MS4-LF-1/4				G1/4						

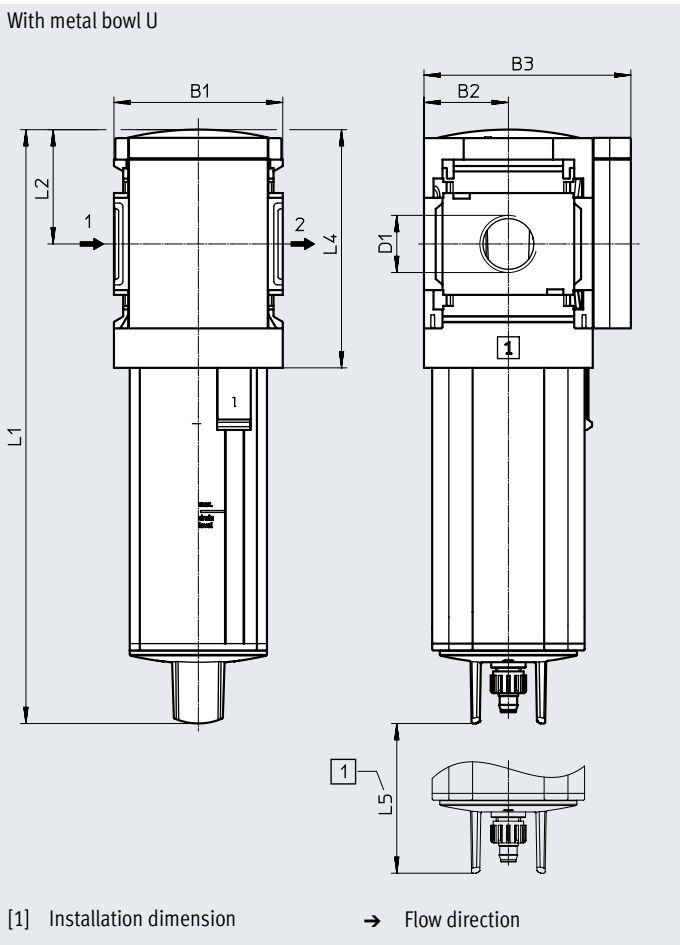
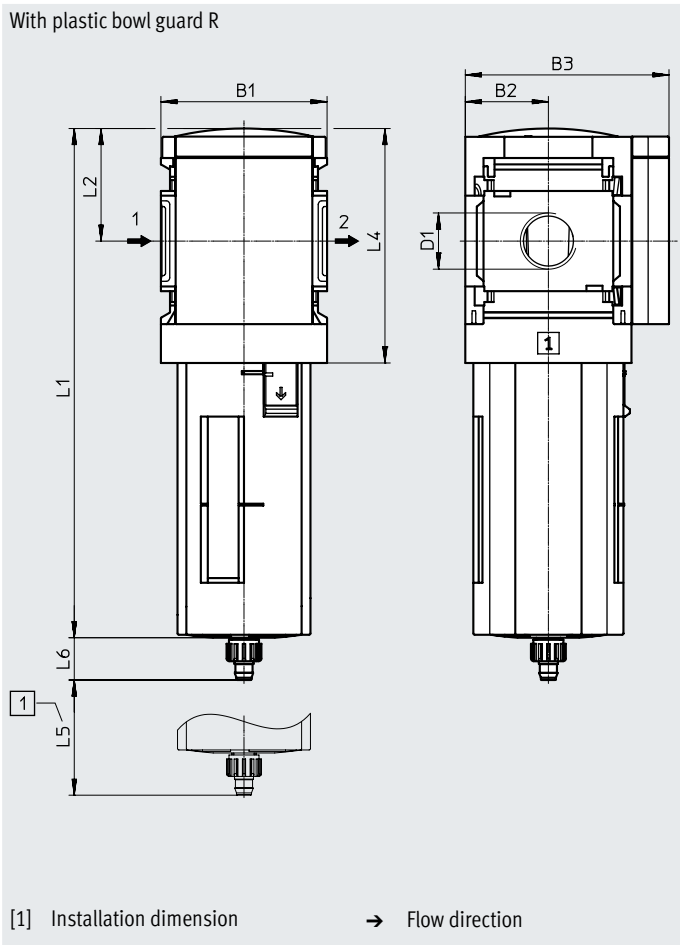
• Note: This product conforms to ISO 1179-1 and ISO 228-1.

Datasheet

Dimensions – Basic version MS6-LF

Manual, rotary condensate drain

Download CAD data → www.festo.com



Type	B1	B2	B3	D1	L1		L2	L4	L5	L6
					Plastic bowl guard	Metal bowl				
MS6-LF-1/4	62	31	76	G1/4	190	218	42	87.5	74	15.8
MS6-LF-3/8				G3/8						
MS6-LF-1/2				G1/2						

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

Datasheet

Dimensions – Condensate drain

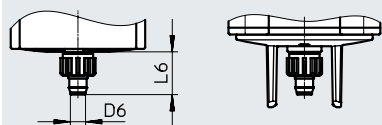
Download CAD data → www.festo.com

[M] Manual rotary

MS4-...-R/U-M

MS6-...-R-M

MS6-...-U-M



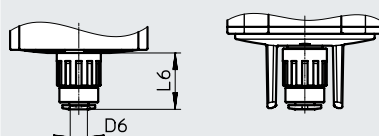
Barbed connector for plastic tubing
PUN(-H)-8x1.25

[H] Semi-automatic

MS4-...-R/U-H

MS6-...-R-H

MS6-...-U-H



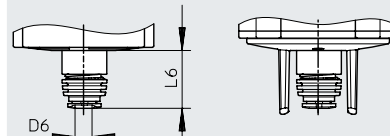
Push-in connector for plastic tubing
PUN-6/PAN-6

[V] Fully automatic

MS4-...-R/U-V

MS6-...-R-V

MS6-...-U-V



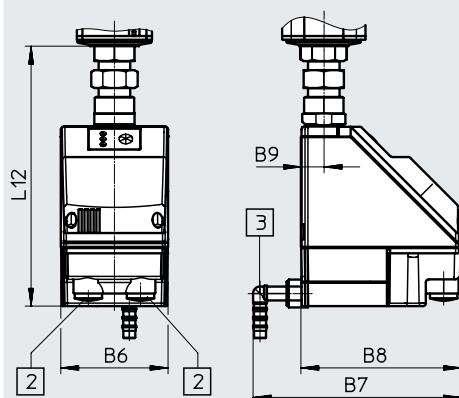
Push-in connector for plastic tubing
PUN-6/PAN-6

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

Type	D6 Ø	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		—

Type	D6 Ø	L6
Plastic bowl guard R		
MS4-LF...-V	6.2	20.4
MS6-LF...-V		18.5
Metal bowl U		
MS4-LF...-V	6.2	20.4
MS6-LF...-V		—

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

Datasheets → Internet: pwea

Condensate drain PWEA:

[2] Electrical connection:

screw terminal PG9

[3] Connection can be rotated 360°

for plastic tubing PUN-H-12x2

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

Datasheet

Ordering data							
Plastic 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, rotating	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, rotating	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, rotating	G1/4	–	–		529400	MS4-LF-1/4-ERM-Z
MS6	Manual, rotating	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, rotating	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, rotating	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		–	–

Ordering data – Modular product system

Ordering table					
Grid dimension	[mm]	40	62	Conditions	Code
Module no.		527695	527668		
Series	Standard				MS
Size	4	6			...
Function	Filter				-LF
Pneumatic connection	Female thread G1/8	–	[1]	-1/8	
	Female thread G1/4	Female thread G1/4	[1]	-1/4	
	–	Female thread G3/8	[1]	-3/8	
	–	Female thread G1/2	[1]	-1/2	
	Connecting plate G1/8	–		-AGA	
	Connecting plate G1/4	Connecting plate G1/4		-AGB	
	Connecting plate G3/8	Connecting plate G3/8		-AGC	
	–	Connecting plate G1/2		-AGD	
	–	Connecting plate G3/4		-AGE	
	Connecting plate 1/8 NPT	–	[1]	-AQK	
	Connecting plate 1/4 NPT	Connecting plate 1/4 NPT	[1]	-AQN	
	Connecting plate 3/8 NPT	Connecting plate 3/8 NPT	[1]	-AQP	
	–	Connecting plate 1/2 NPT	[1]	-AQR	
	–	Connecting plate 3/4 NPT	[1]	-AQS	
Grade of filtration	40 µm			-E	
	5 µm			-C	
Bowl	Plastic bowl with plastic bowl guard			-R	
	Metal bowl			-U	
Condensate drain	Manual			-M	
	Semi-automatic (P1 max. 12 bar)			-H	
	Fully automatic (P1 max. 12 bar)			-V	
	–	External fully automatic condensate drain, electric, 115 V AC, connection terminals	[1] [2]	-E2	
	–	External fully automatic condensate drain, electric, 230 V AC, connection terminals	[1] [2]	-E3	
	–	External fully automatic condensate drain, electric, 24 V DC, connection terminals	[1] [2]	-E4	
Type of mounting	Mounting bracket standard design		[3]	-WP	
	Mounting bracket for hooking in service unit components		[1] [3]	-WPM	
	Mounting bracket centrally at the rear (wall mounting top and bottom), connecting plates not required			-WB	
	Mounting bracket centrally at the rear (wall mounting top), connecting plates not required	–		-WBM	
EU certification	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] 1/8, 1/4, 3/8, 1/2, AQK, AQN, AQP, AQR, AQS, E2, E3, E4, WPM

Not with EU EX4 certification

[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

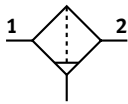
Datasheet

Function

Condensate drain

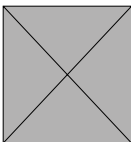
Manual, rotating

Without differential pressure display



-  Flow rate
54 ... 3000 l/min
-  Temperature range
-10 ... +60 °C
-  Operating pressure
0 ... 20 bar

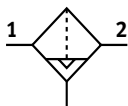
With differential pressure display or filter contamination indicator



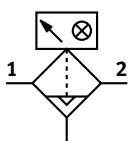
Condensate drain

Semi- or fully automatic

Without differential pressure display



With differential pressure display or filter contamination indicator



-  www.festo.com



- High-efficiency 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 indicating filter contamination
- Available with electronic filter pollution indicator
- Available with filter cartridge for low flow rates, suitable for sealing air and purge air applications
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22
- Choice of filter inserts 0.01 µm or 1 µm
- New filter cartridges → page 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...	1/8 NPT, 1/4 NPT or 3/8 NPT	1/4 NPT, 3/8 NPT, 1/2 NPT or 3/4 NPT
Design	Fibre filter	
Type of mounting	With accessories	
	In-line installation	
Mounting position	Vertical ±5°	
Grade of filtration	0.01 (micro filter MS-LFM-A)	
	1 (fine filter MS-LFM-B)	
Air purity class at the output	Compressed air to ISO 8573-1:2010 [3:4:2] (grade of filtration 0.01 µm, micro filter MS-LFM-A)	
	Compressed air to ISO 8573-1:2010 [5:4:3] (grade of filtration 1 µm, fine filter MS-LFM-B)	
Filter efficiency	99.9999 (grade of filtration 0.01 µm, micro filter MS-LFM-A)	
	99.99 (grade of filtration 1 µm, fine filter MS-LFM-B)	
Bowl guard	Plastic bowl guard	
	Integrated as metal bowl	
Condensate drain	Manual, rotating	
	Manual, non-detenting	
	Semi-automatic	
	Fully automatic	
	-	Fully automatic, electrically actuated
Differential pressure display ¹⁾	Visual indicator	
	With filter contamination indicator based on differential pressure	

1) Recommended max. differential pressure for replacing filter cartridge is $\Delta p_{1,2} = 0.35$ bar, with micro filter MS6-LFM-A with operating range HP $\Delta p_{1,2} = 0.5$ bar.

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

Datasheet

General technical data				
Size		MS4		MS6
Residual oil content	[mg/m ³]	≤0.01 (micro filter MS-LFM-A) ≤0.5 (fine filter MS-LFM-B)		
Max. condensate volume	[ml]	19 (with plastic bowl guard) 25 (with metal bowl)		38
Filter efficiency, fine particles	[%]	99.995 (micro filter MS-LFM-A) 99 (fine filter MS-LFM-B)		
Filter efficiency, oil aerosol	[%]	99 (micro filter MS-LFM-A) 90 (fine filter MS-LFM-B)		
MPPS	[µm]	0.05 (micro filter MS-LFM-A)		
Filter efficiency MPPS	[%]	99.95 (micro filter MS-LFM-A)		

Standard flow rate $q_n^{1)}$ [l/min]				
Size		MS4		MS6
Variant		Standard	Standard	High flow rate HF
				Application area HP, suitable for sealing air and purge air
Micro filter MS-LFM-A				
Max. standard flow rate for air purity class		360	900	2500
$q_{n \max}$				400
Min. standard flow rate for air purity class		54	135	150
$q_{n \min}$				60
Fine filter MS-LFM-B				
Max. standard flow rate for air purity class		360	950	3000
$q_{n \max}$				500
Min. standard flow rate for air purity class		54	140	188
$q_{n \min}$				60

1) Measured at $p_1 = 6$ bar.

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

Operating and environmental conditions							
Condensate drain	Manual, rotating		Semi-automatic		Fully automatic		Fully automatic, electrically actuated
	M		H		V		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 to ISO 8573-1:2010 [6:4:4] ²⁾						
	Inert gases						
Ambient temperature [°C]	-10 ... +60 (0 ... +50) ³⁾		-10 ... +60 (+5 ... +50) ³⁾		-10 ... +60 (+5 ... +50) ³⁾		+1 ... +60 (+1 ... +50) ³⁾
Temperature of medium [°C]	-10 ... +60 (0 ... +50) ³⁾		-10 ... +60 (+5 ... +50) ³⁾		-10 ... +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⁾	c UL us - Recognized (OL)						

1) Value in brackets applies to MS4/MS6-LFM with UL certification or with filter contamination indicator DP/DN/DPI/DNI.

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 contamination indicator DP/DN/DPI/DNI.

4) More information: www.festo.com/x/topic/crc5) More information: www.festo.com/catalogue/ms-lfm → Support/Downloads.

Datasheet

Technical data – Filter pollution indicator				
Filter contamination indicator	DP	DN	DPI	DNI
Pressure measuring range [bar]	0 ... +1			
Measured variable	Differential pressure; percentage value for filter contamination			
Switching output	PNP	NPN	PNP	NPN
Analogue output [mA]	–		4 ... 20	
Operating voltage range [V DC]	15 ... 30			
Max. output current [mA]	150			
Degree of protection	IP65			
CE marking (see declaration of conformity)	To EU EMC Directive			
	To EU Low Voltage Directive			

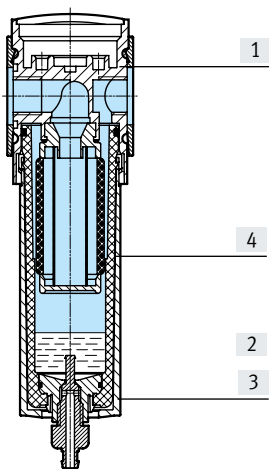
ATEX	
EU certification	EX4
ATEX category for gas	II 2G
Type of ignition protection for gas	Ex h IIC T6 Gb X
ATEX category for dust	II 2D
Type of ignition protection for dust	Ex h IIIC T60°C Db X
Explosion-proof ambient temperature	–10 °C ≤ Ta ≤ +60 °C
Explosion protection certification outside the EU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

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

Weight [g]			
Size	MS4	MS6	
Variant	Standard	Standard/range of application HP	High flow rate HF
Fine and micro filters with plastic bowl guard R	190	600	1280
Fine and micro filters with metal bowl U	350	820	1500
Fine and micro filters with metal bowl U and electrically actuated, fully automatic condensate drain E2, E3, E4	–	1800	2180
Filter contamination indicator	80	100	100

Materials

Sectional view



Fine and micro filter		
[1]	Housing	Die-cast aluminium
[2]	Plastic bowl guard	PC
[3]	Metal bowl	Wrought aluminium alloy, Die-cast aluminium
	Inspection window	PA
[4]	Filter	Borosilicate fibre
–	Seals	NBR
Note on materials		RoHS-compliant
LABS (PWIS) conformity		VDMA24364-B1/B2-L

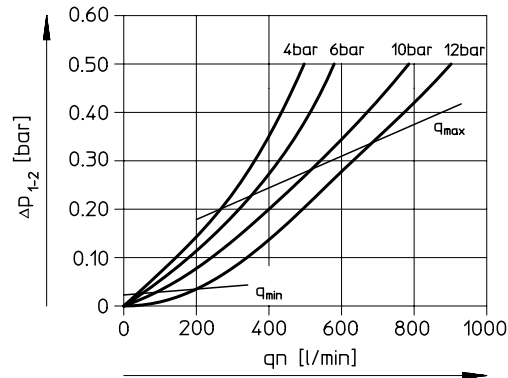
Filter contamination indicator	
Housing	PA, POM
Adapter	PA
Display	PC
Seals	NBR
LABS (PWIS) conformity	VDMA24364-B1/B2-L

Datasheet

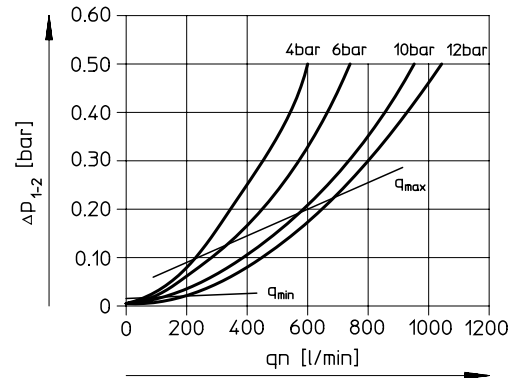
Standard flow rate q_n as a function of differential pressure Δp_{1-2}

Grade of filtration 0.01 μm

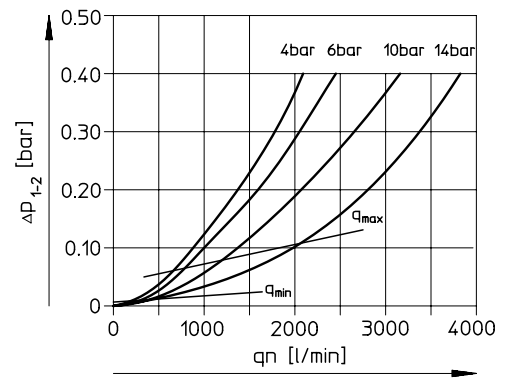
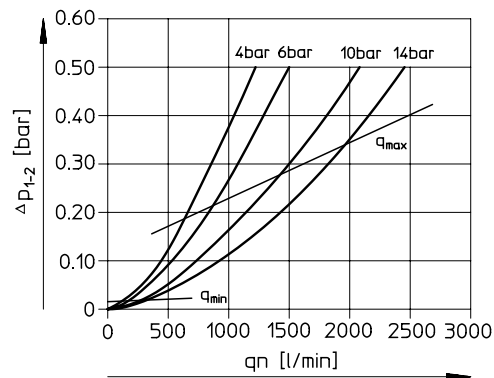
MS4-LFM-1/8 and MS4-LFM-1/4



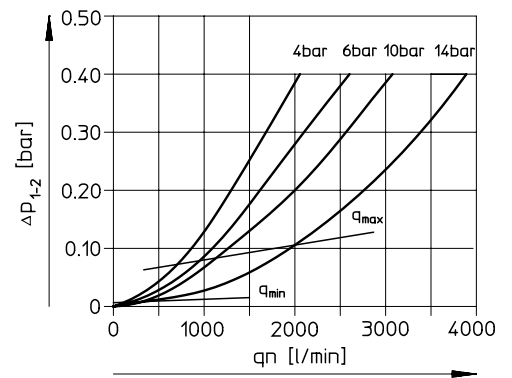
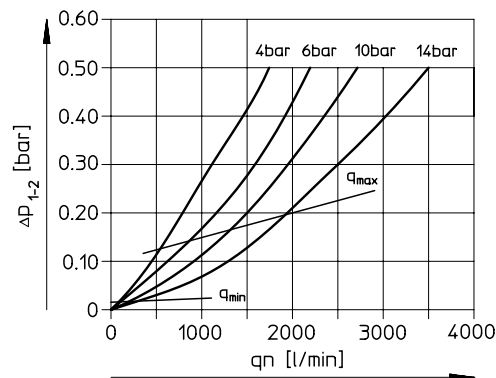
Grade of filtration 1 μm



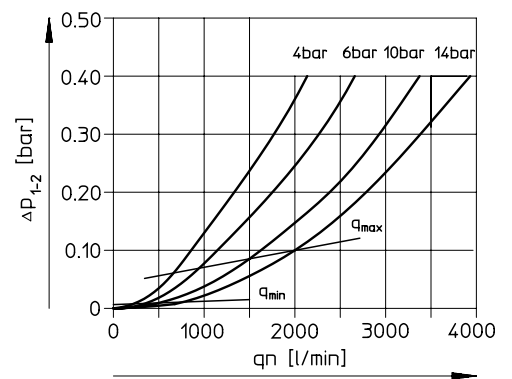
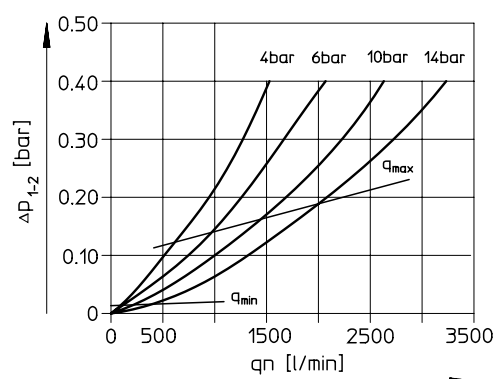
MS6-LFM-1/4



MS6-LFM-3/8



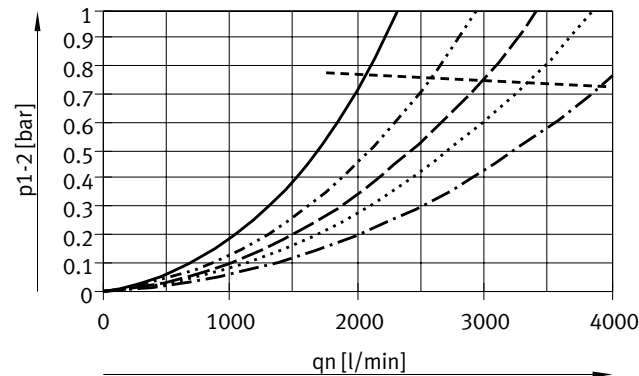
MS6-LFM-1/2



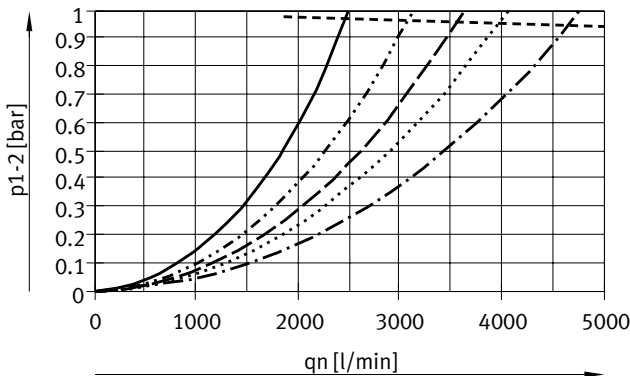
Datasheet

Standard flow rate q_n as a function of differential pressure p_{1-2}

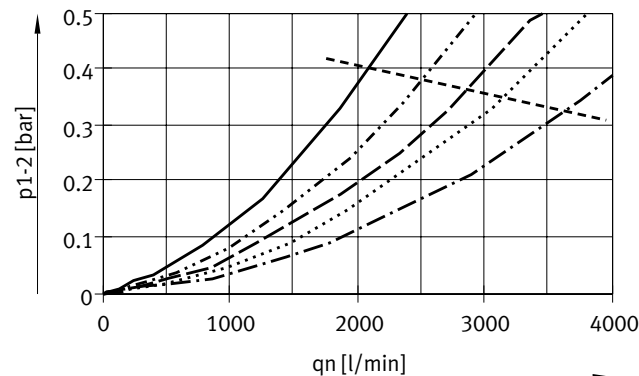
MS6-LFM-1/4-...-HF, grade of filtration 0.01 μm



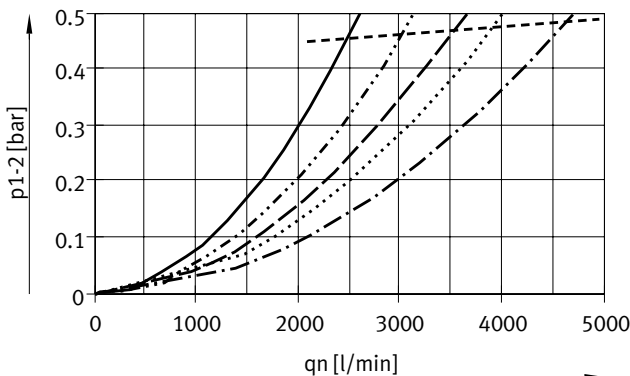
MS6-LFM-1/4-...-HF, grade of filtration 1 μm



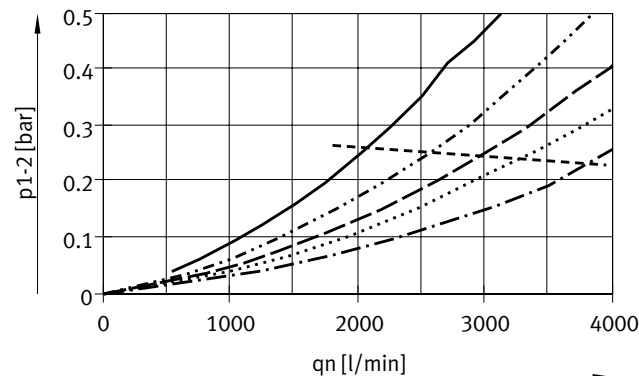
MS6-LFM-3/8-...-HF, grade of filtration 0.01 μm



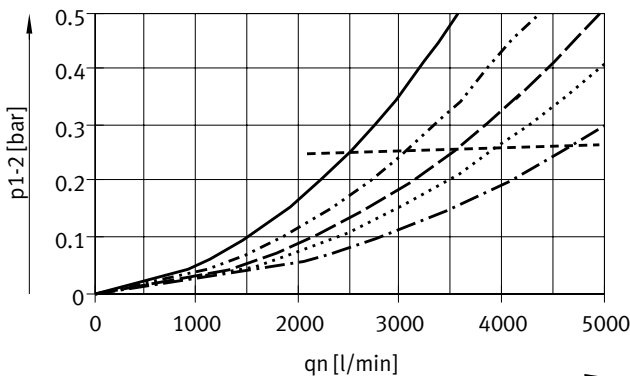
MS6-LFM-3/8-...-HF, grade of filtration 1 μm



MS6-LFM-1/2-...-HF, grade of filtration 0.01 μm



MS6-LFM-1/2-...-HF, grade of filtration 1 μm



— p_1 : 4 bar ($q_{\min}$: 103 l/min)
- · - · - p_1 : 6 bar ($q_{\min}$: 125 l/min)
- - - p_1 : 8 bar
· · · · · p_1 : 10 bar ($q_{\min}$: 162 l/min)
- · - · - p_1 : 14 bar ($q_{\min}$: 192 l/min)
- - - $q_{\max}$

— p_1 : 4 bar ($q_{\min}$: 124 l/min)
- · - · - p_1 : 6 bar ($q_{\min}$: 150 l/min)
- - - p_1 : 8 bar
· · · · · p_1 : 10 bar ($q_{\min}$: 194 l/min)
- · - · - p_1 : 14 bar ($q_{\min}$: 230 l/min)
- - - $q_{\max}$

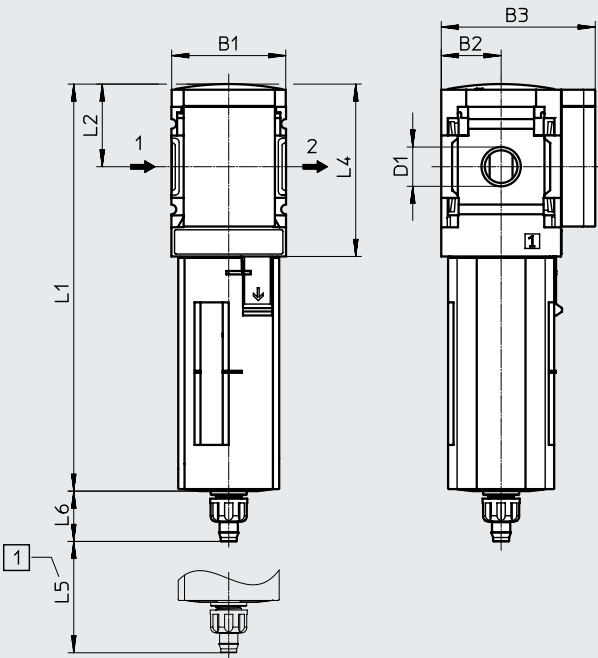
Datasheet

Dimensions – Basic version MS4-LFM

Download CAD data → www.festo.com

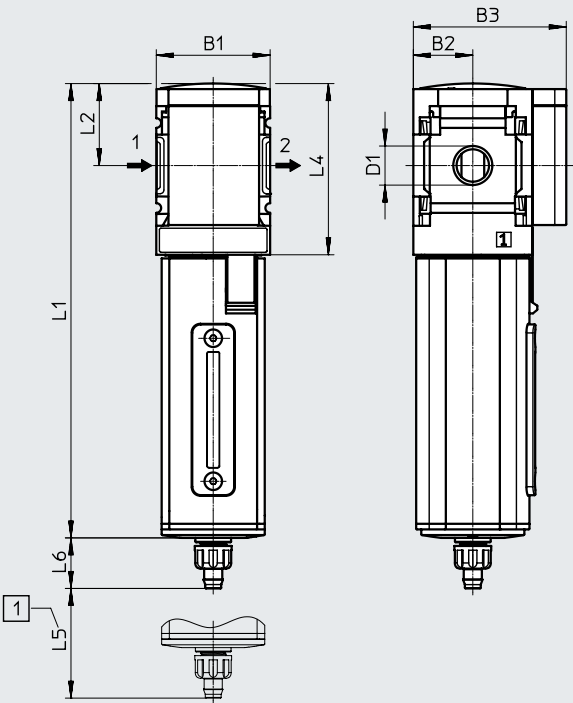
Manual, rotary condensate drain

With plastic bowl guard R



[1] Installation dimension → Flow direction

With metal bowl U



[1] Installation dimension → Flow direction

Type	B1	B2	B3	D1	L1		L2	L4	L5	L6
					Plastic bowl guard	Metal bowl				
MS4-LFM-1/8	40	21	54	G1/8	141.6	160	29	60.5	25	17.7
MS4-LFM-1/4				G1/4						

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

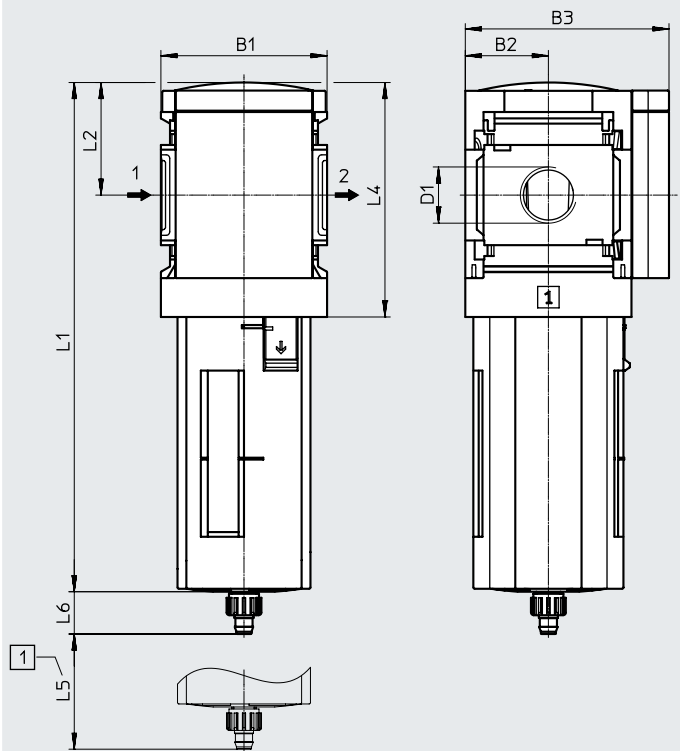
Datasheet

Dimensions – Basic version MS6-LFM

Download CAD data → www.festo.com

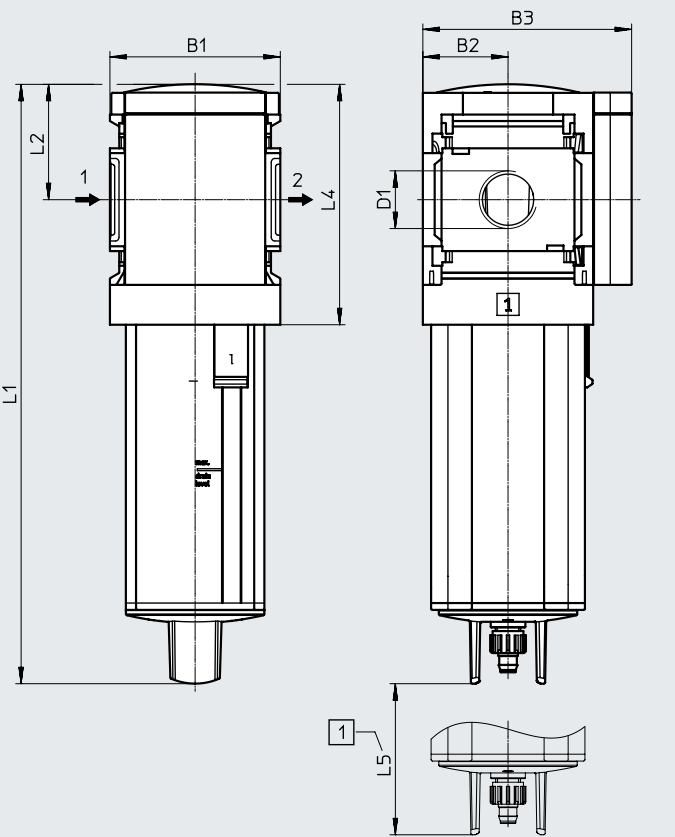
Manual, rotary condensate drain

With plastic bowl guard R



[1] Installation dimension → Flow direction

With metal bowl U



[1] Installation dimension → Flow direction

Type	B1	B2	B3	D1	L1		L2	L4	L5	L6
					Plastic bowl guard	Metal bowl				
MS6-LFM-1/4	62	31	76	G1/4	193	221	42	88	75	15.8
MS6-LFM-3/8				G3/8						
MS6-LFM-1/2				G1/2						

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

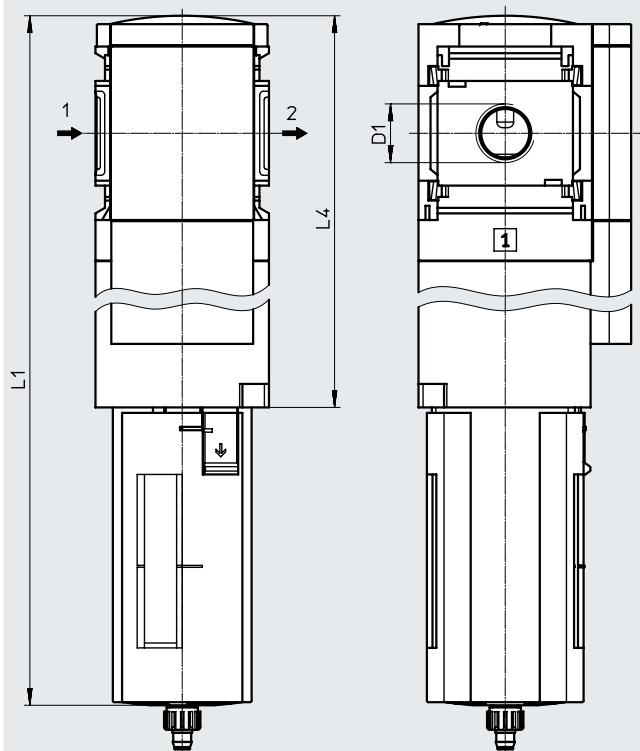
Datasheet

Dimensions – High flow rate HF

Download CAD data → www.festo.com

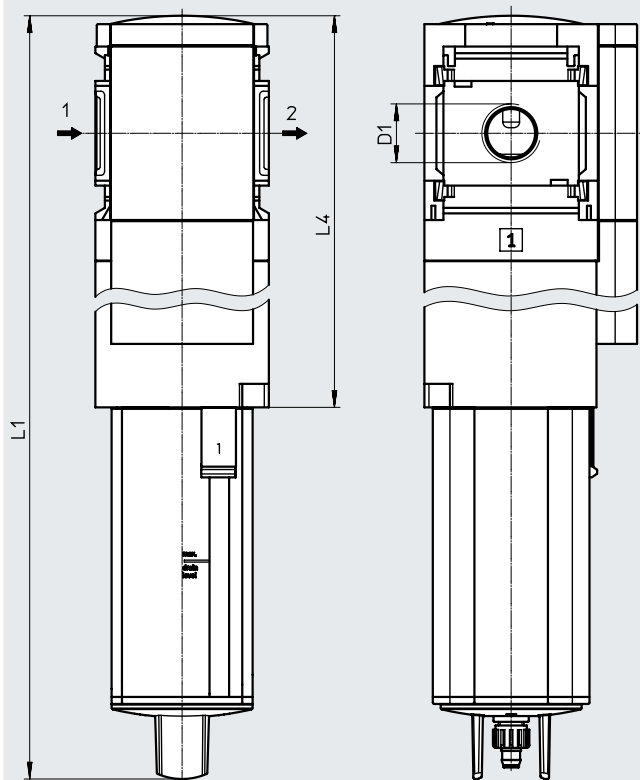
Manual, rotary condensate drain

With plastic bowl guard R



→ Flow direction

With metal bowl U



→ Flow direction

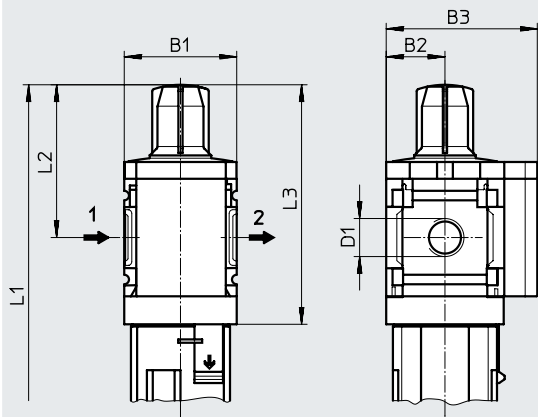
Type	D1	L1		L4
		Plastic bowl guard	Metal bowl	
MS6-LFM-1/4-...-HF	G1/4	313	340	207
MS6-LFM-3/8-...-HF	G3/8			
MS6-LFM-1/2-...-HF	G1/2			

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

Datasheet

Dimensions – Differential pressure display DA

Download CAD data → www.festo.com



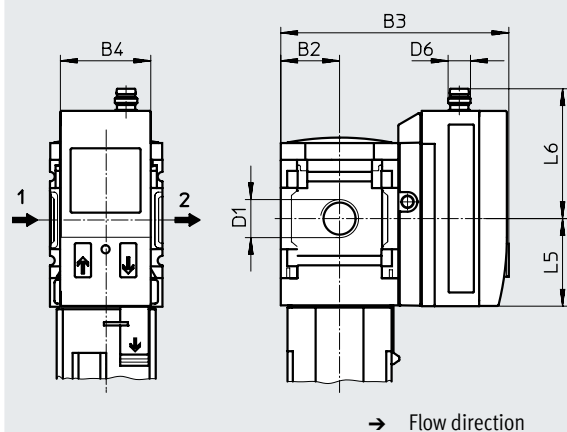
→ Flow direction

Type	B1	B2	B3	D1	L1		L2	L3
					Plastic bowl guard	Metal bowl		
MS4-LFM-1/8-...-DA	40	21	54	G1/8	168.4	186.8	55.8	87.3
MS4-LFM-1/4-...-DA				G1/4				
MS6-LFM-1/4-...-DA	62	31	76	G1/4	229	257	78	124
MS6-LFM-3/8-...-DA				G3/8				
MS6-LFM-1/2-...-DA				G1/2				
MS6-LFM-1/4-...-HF-DA	62	31	76	G1/4	349	376	78	124
MS6-LFM-3/8-...-HF-DA				G3/8				
MS6-LFM-1/2-...-HF-DA				G1/2				

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

Datasheet

Dimensions – Filter contamination indicator DP, DN, DPI, DNI

Download CAD data → www.festo.com

Variant DP:
Filter contamination indicator with
3-pin M8x1 plug, 1 switching output
PNP

Variant DN:
Filter contamination indicator with
3-pin M8x1 plug, 1 switching output
NPN

Variant DPI:
Filter contamination indicator with
4-pin M12x1 plug,
1 switching output PNP and
4 ... 20 mA analogue

Variant DNI:
Filter contamination indicator with
4-pin M12x1 plug,
1 switching output NPN and
4 ... 20 mA analogue

Type	B2	B3	B4	D1	D6	L5	L6
MS4-LFM-1/8-...-DP/DN	21	82.6	32.3	G1/8	M8x1	35.1	46.7
MS4-LFM-1/4-...-DP/DN				G1/4			
MS4-LFM-1/8-...-DPI/DNI	21	82.6	32.3	G1/8	M12x1	35.1	55.8
MS4-LFM-1/4-...-DPI/DNI				G1/4			
MS6-LFM-1/4-...-DP/DN	31	103	32.3	G1/4	M8x1	35.1	46.7
MS6-LFM-3/8-...-DP/DN				G3/8			
MS6-LFM-1/2-...-DP/DN				G1/2			
MS6-LFM-1/4-...-DPI/DNI				G1/4			
MS6-LFM-3/8-...-DPI/DNI	31	103	32.3	G3/8	M12x1	35.1	55.8
MS6-LFM-1/2-...-DPI/DNI				G1/2			

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

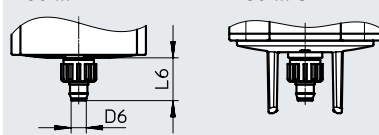
Datasheet

Dimensions – Condensate drain

[M] Manual rotary

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

MS6-...-U-M

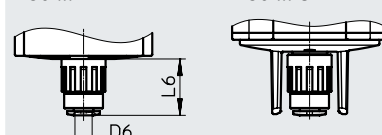


Barbed connector for plastic tubing
PUN(-H)-8x1.25

[H] Semi-automatic

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

MS6-...-U-H

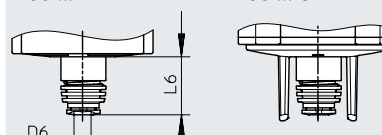


Push-in connector for plastic tubing
PUN-6/PAN-6

[V] Fully automatic

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

MS6-...-U-V



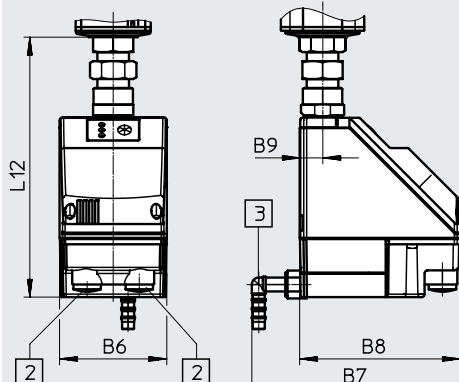
Push-in connector for plastic tubing
PUN-6/PAN-6

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

Type	D6 ø	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		–

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

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



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

Datasheets → Internet: pwea

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

Datasheet

Ordering data

Plastic guard, without differential pressure display

Size	Condensate drain	Connection	Micro filter		Fine filters	
			Grade of filtration 0.01 µm		Grade of filtration 1 µm	
			Part no.	Type	Part no.	Type

Flow direction from left to right

MS4	Manual, rotating	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, rotating	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
		G1/4	530510	MS6-LFM-1/4-ARV	530514	MS6-LFM-1/4-BRV
	Fully automatic	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, rotating	G1/4	529460	MS4-LFM-1/4-ARM-Z	–	–
MS6	Fully automatic	G1/2	–	–	530508	MS6-LFM-1/2-BRV-Z

Ordering data

Plastic guard, with differential pressure display

Size	Condensate drain	Connection	Micro filter		Fine filters	
			Grade of filtration 0.01 µm		Grade of filtration 1 µm	
			Part no.	Type	Part no.	Type

Flow direction from left to right

MS4	Manual, rotating	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, rotating	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
		G1/2	536877	MS6-LFM-1/2-ARV-DA	536841	MS6-LFM-1/2-BRV-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 display

Size	Condensate drain	Connection	Micro filter		Fine filters	
			Grade of filtration 0.01 µm		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
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Ordering data

Integrated as metal bowl, with differential pressure display

Size	Condensate drain	Connection	Micro filter		Fine filters	
			Grade of filtration 0.01 µm		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
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Flow direction from right to left

MS6	Fully automatic	G1/4	537216	MS6-LFM-1/4-AUV-DA-Z	–	–
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Ordering data – Modular product system

Ordering table					
Grid dimension	[mm]	40	62	Conditions	Code
Module no.		527697	527670		
Series		Standard			MS
Size		4	6		...
Function		Fine and micro filter			-LFM
Pneumatic connection	Female thread G1/8	–	[1]	-1/8	
	Female thread G1/4	Female thread G1/4	[1]	-1/4	
	–	Female thread G3/8	[1]	-3/8	
	–	Female thread G1/2	[1]	-1/2	
	Connecting plate G1/8	–		-AGA	
	Connecting plate G1/4	Connecting plate G1/4		-AGB	
	Connecting plate G3/8	Connecting plate G3/8		-AGC	
	–	Connecting plate G1/2		-AGD	
	–	Connecting plate G3/4		-AGE	
	Connecting plate 1/8 NPT	–	[1]	-AQK	
	Connecting plate 1/4 NPT	Connecting plate 1/4 NPT	[1]	-AQN	
	Connecting plate 3/8 NPT	Connecting plate 3/8 NPT	[1]	-AQP	
	–	Connecting plate 1/2 NPT	[1]	-AQR	
	–	Connecting plate 3/4 NPT	[1]	-AQS	
Grade of filtration	1 µm			-B	
	0.01 µm			-A	
Bowl	Plastic bowl with plastic bowl guard			-R	
	Metal bowl			-U	

[1] 1/8, 1/4, 3/8, 1/2, AQK, AQN, AQP, AQR, AQS, E2, E3, E4, DP, DN, DPI, DNI, WPM
Not with EU EX4 certification

Ordering data – Modular product system

Ordering table						
Grid dimension	[mm]	40	62	Conditions	Code	Enter code
Condensate drain	Manual				-M	
	Semi-automatic (P1 max. 12 bar)				-H	
	Fully automatic (P1 max. 12 bar)			[2]	-V	
	–	External fully automatic condensate drain, electric, 115 V AC, connection terminals	[1] [3]	-E2		
	–	External fully automatic condensate drain, electric, 230 V AC, connection terminals	[1] [3]	-E3		
	–	External fully automatic condensate drain, electric, 24 V DC, connection terminals	[1] [3]	-E4		
Flow rate	–	High flow rate			-HF	
Application area	–	Suitable for sealing air and purge air		[4]	-HP	
Filter change sensing	Differential pressure display, 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, NPN, 4-pin, analogue output 4 ... 20 mA			[1] [5]	-DNI	
Type of mounting	Mounting bracket standard design			[6]	-WP	
	Mounting bracket for hooking in service unit components			[1] [6]	-WPM	
	Mounting bracket centrally at the rear (wall mounting top and bottom), connecting plates not required				-WB	
	Mounting bracket centrally at the rear (wall mounting top), connecting plates not required	–			-WBM	
EU certification	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} 1/8, 1/4, 3/8, 1/2, AQK, AQN, AQP, AQR, AQS, E2, E3, E4, DP, DN, DPI, DNI, WPM

Not with EU EX4 certification

{2} V Size 4: only with metal bowl U

{3} E2, E3, E4 Only with metal bowl U

{4} HP

{5} DP, DN, DPI, DNI

{6} WP, WPM

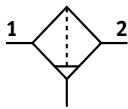
Not with flow rate HF or filter change sensing DA

Measuring range max. 10 bar

Only with connecting plate AGA, AGB, AGC, AGD, AGE, AQK, AQN, AQP, AQR or AQS

Datasheet

Function



- - Flow rate
max. 2500 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) is recommended.

- Removes liquid and gaseous oil particles from compressed air using activated carbon
- Eliminates odours and vapours
- Available with filter cartridge for low flow rates, suitable for sealing air and purge air applications
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22
- New filter cartridges → page 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...	1/8 NPT, 1/4 NPT or 3/8 NPT	1/4 NPT, 3/8 NPT, 1/2 NPT or 3/4 NPT
Design	Activated carbon filter	
Type of mounting	With accessories	
	In-line installation	
Mounting position	Vertical ±5°	
Air purity class at the output ¹⁾	Compressed air to ISO 8573-1:2010 [1:4:1]	
Bowl guard	Plastic bowl guard	
	Integrated as metal bowl	
Residual oil content [mg/m³]	≤0.003	

1) It is recommended to replace the filter cartridge with a new cartridge after 1000 operating hours (applicable for ambient temperature of 21 °C). The service life of the filter cartridges is reduced at higher temperatures.
- - Note: This product conforms to ISO 1179-1 and ISO 228-1.

Standard flow rate q _n ¹⁾ [l/min]				
Size	MS4	MS6		
Variant	Standard	Standard	High flow rate HF	Application area HP, suitable for sealing air and purge air
Max. standard flow rate for air purity class q _{n max}	360	900	2500	900

1) Measured at p1 = 6 bar.

Datasheet

Operating and environmental conditions		
Size	MS4	MS6
Operating pressure [bar]	0 ... 14 (0 ... 10) ¹⁾	0 ... 20 (0 ... 10) ¹⁾
Operating medium	Compressed air to 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⁾	c UL us - Recognized (OL)	

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

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

3) More information: www.festo.com/catalogue/ms-lfx → Support/Downloads.

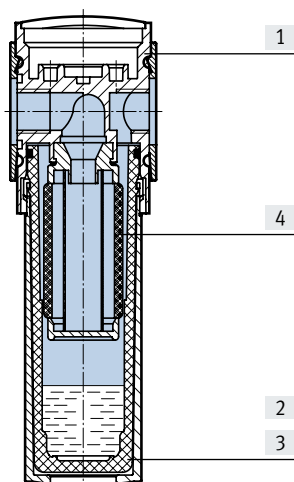
ATEX	
EU certification	EX4
ATEX category for gas	II 2G
Type of ignition protection for gas	Ex h IIC T6 Gb X
ATEX category for dust	II 2D
Type of ignition protection for dust	Ex h IIIC T60°C Db X
Explosion-proof ambient temperature	-10 °C ≤ Ta ≤ +60 °C
Explosion protection certification outside the EU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

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

Weight [g]			
Size	MS4	MS6	
Variant	Standard	Standard/range of application HP	High flow rate HF
Activated carbon filter, plastic bowl with plastic bowl guard R	190	600	1280
Activated carbon filter with metal bowl guard U	350	820	1500

Materials

Sectional view

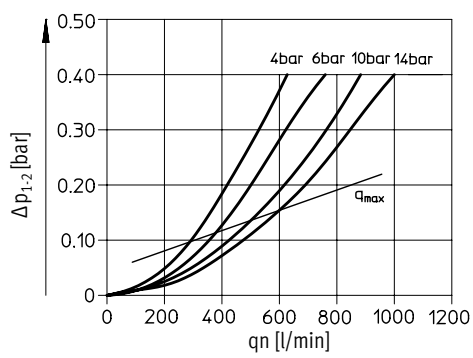


Activated carbon filter		
[1]	Housing	Die-cast aluminium
[2]	Plastic bowl guard	PC
[3]	Metal bowl	Wrought aluminium alloy, Die-cast aluminium
	Inspection window	PA
[4]	Filter	Activated carbon
–	Seals	NBR
Note on materials		RoHS-compliant
LABS (PWIS) conformity		VDMA24364-B1/B2-L

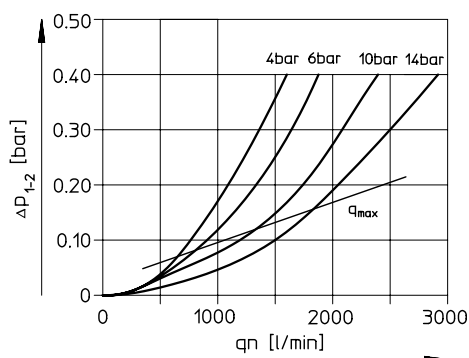
Datasheet

Standard flow rate q_n as a function of differential pressure Δp_{1-2}

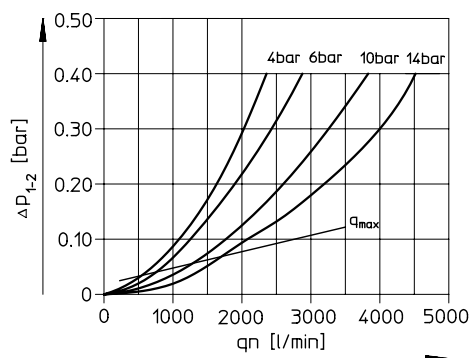
MS4-LFX-1/8 and MS4-LFX-1/4



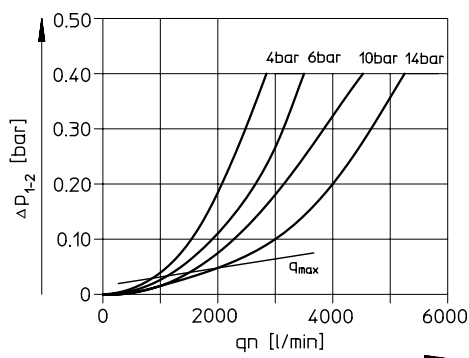
MS6-LFX-1/4



MS6-LFX-3/8

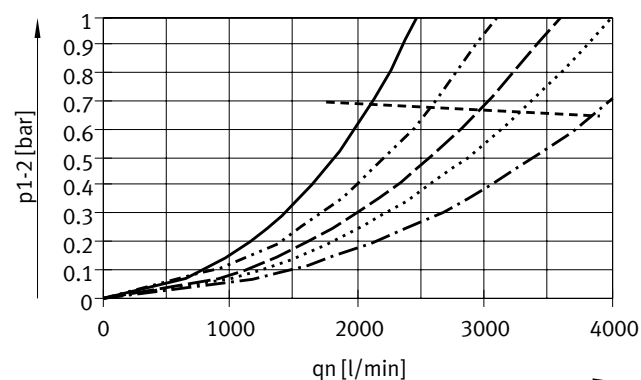


MS6-LFX-1/2

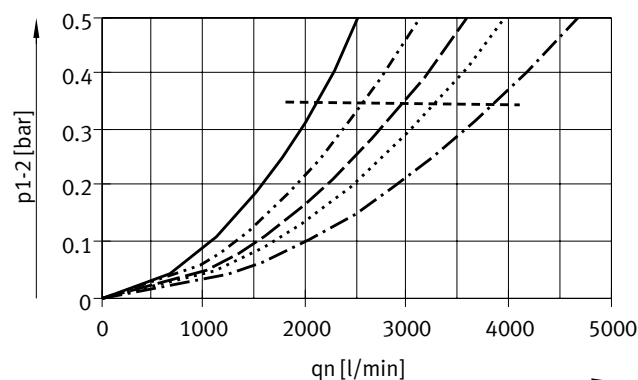


Standard flow rate q_n as a function of differential pressure p_{1-2}

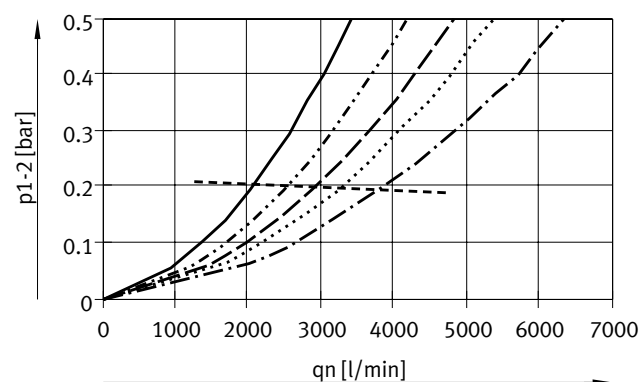
MS6-LFX-1/4-...-HF



MS6-LFX-3/8-...-HF



MS6-LFX-1/2-...-HF



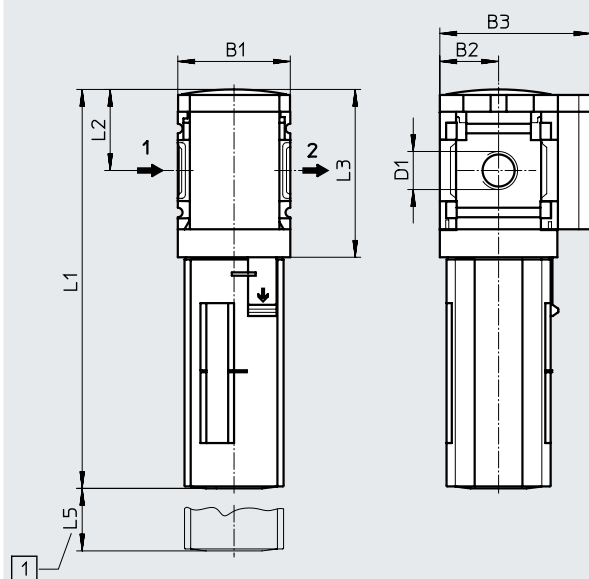
- p 1: 4 bar
- p 1: 6 bar
- p 1: 8 bar
- p 1: 10 bar
- · - · p 1: 14 bar
- qmax

Datasheet

Dimensions – Basic version

Download CAD data → www.festo.com

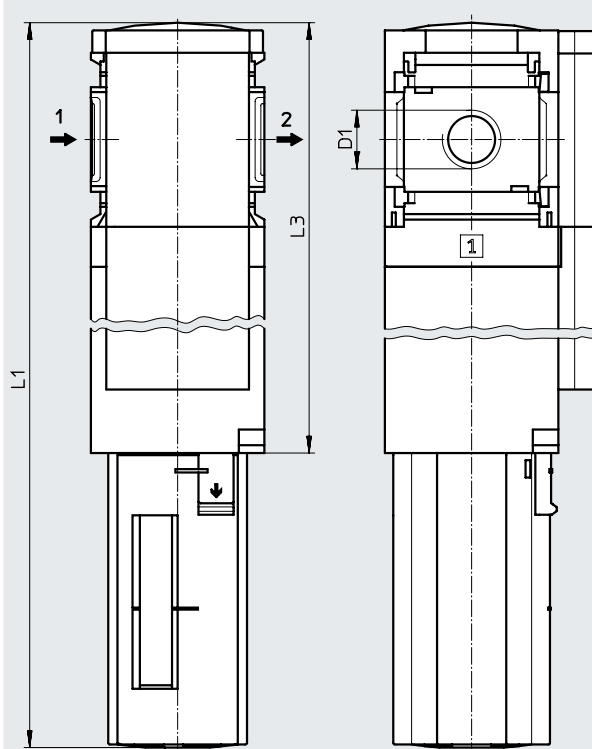
Standard/range of application HP



[1] Installation dimension

→ Flow direction

High flow rate HF



→ Flow direction

Type	B1	B2	B3	D1	L1		L2	L3	L5
					Bowl guard				
					Plastic	Metal			
MS4-LFX-1/8	40	21	54	G1/8	142.8	160.4	29	60	73
MS4-LFX-1/4				G1/4					
MS6-LFX-1/4	62	31	76	G1/4	192	198	42	88	100
MS6-LFX-3/8				G3/8					
MS6-LFX-1/2				G1/2					
MS6-LFX-1/4-...-HF	62	31	76	G1/4	312	318	42	207	100
MS6-LFX-3/8-...-HF				G3/8					
MS6-LFX-1/2-...-HF				G1/2					

Note: This product conforms to ISO 1179-1 and 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	G1/8	–	–	536709	MS4-LFX-1/8-U
	G1/4	529467	MS4-LFX-1/4-R	535782	MS4-LFX-1/4-U
MS6	G1/4	529683	MS6-LFX-1/4-R	529685	MS6-LFX-1/4-U
	G3/8	529687	MS6-LFX-3/8-R	–	–
	G1/2	529679	MS6-LFX-1/2-R	529681	MS6-LFX-1/2-U
Flow direction from left to right, high flow rate					
MS6	G1/2	–	–	552927	MS6-LFX-1/2-U-HF
Flow direction from right to left					
MS4	G1/4	529468	MS4-LFX-1/4-R-Z	–	–
MS6	G1/2	529680	MS6-LFX-1/2-R-Z	–	–

Ordering data – Modular product system

Ordering table					
Grid dimension	[mm]	40	62	Conditions	Code
Module no.		527699	527672		
Series		Standard			MS
Size		4	6		...
Function		Activated carbon filter			-LFX
Pneumatic connection		Female thread G1/8	–	[1]	-1/8
		Female thread G1/4	Female thread G1/4	[1]	-1/4
		–	Female thread G3/8	[1]	-3/8
		–	Female thread G1/2	[1]	-1/2
		Connecting plate G1/8	–		-AGA
		Connecting plate G1/4	Connecting plate G1/4		-AGB
		Connecting plate G3/8	Connecting plate G3/8		-AGC
		–	Connecting plate G1/2		-AGD
		–	Connecting plate G3/4		-AGE
		Connecting plate 1/8 NPT	–	[1]	-AQK
		Connecting plate 1/4 NPT	Connecting plate 1/4 NPT	[1]	-AQN
		Connecting plate 3/8 NPT	Connecting plate 3/8 NPT	[1]	-AQP
		–	Connecting plate 1/2 NPT	[1]	-AQR
		–	Connecting plate 3/4 NPT	[1]	-AQS
Bowl		Plastic bowl with plastic bowl guard			-R
		Metal bowl			-U
Flow rate		–	High flow rate		-HF
Application area		–	Suitable for sealing air and purge air	[2]	-HP
Type of mounting		Mounting bracket standard design		[3]	-WP
		Mounting bracket for hooking in service unit components		[1] [3]	-WPM
		Mounting bracket centrally at the rear (wall mounting top and bottom), connecting plates not required			-WB
		Mounting bracket centrally at the rear (wall mounting top), connecting plates not required	–		-WBM
EU certification		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

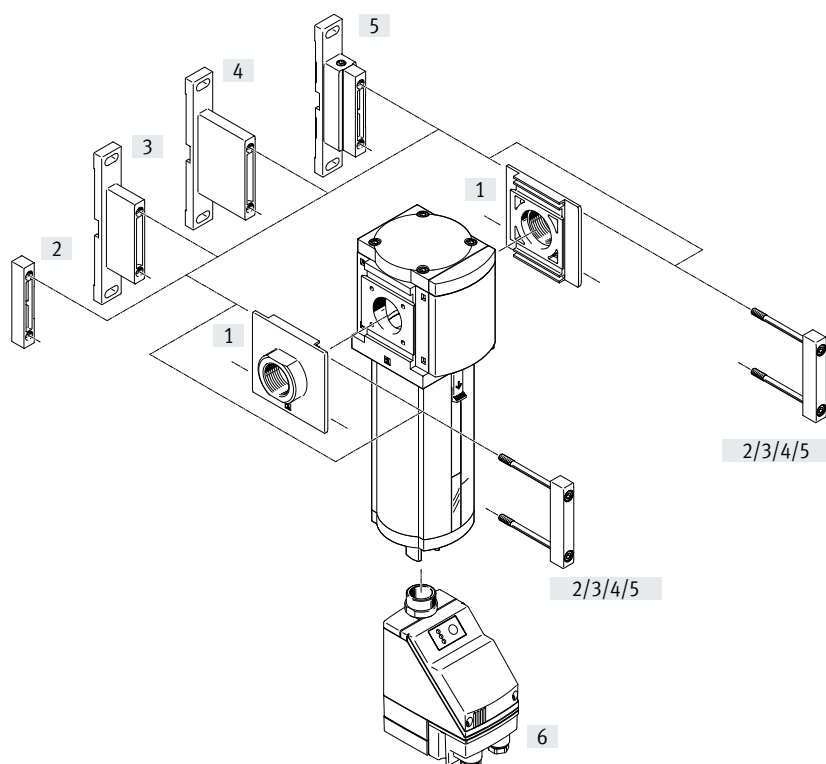
[1] 1/8, 1/4, 3/8, 1/2, AQK, AQN, AQP, AQR, AQS, WPM

Not with EU EX4 certification

[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

Peripherals overview



-  - **Note**

Additional accessories:

- Module connector for combination with sizes MS6/MS9 or MS12

→ Internet: rmv, armv

Mounting attachments and accessories

		Individual device			Combination	→ Page/Internet
		With female thread 3/4, 1, N3/4, N1	With connecting plate AG.../AQ... Without EU EX4 cer- tification	With EU EX4 certification	Module without connecting thread, without connecting plate G	
[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]	Fully automatic condensate drain, electrically actuated E2, E3, E4	■	■	—	■	45

Type codes

001	Series	
MS	MS series	
002	Size	
9	Grid dimension 90 mm	
003	Function	
LF	Filter	
004	Pneumatic connection	
3/4	Female thread G3/4	
1	Female thread G1	
AGD	Sub-base G1/2	
AGE	Sub-base G3/4	
AGF	Sub-base G1	
AGG	Sub-base G1 1/4	
AGH	Sub-base G1 1/2	
N3/4	Female thread N3/4	
N1	Female thread N1	
AQR	Sub-base 1/2 NPT	
AQS	Sub-base 3/4 NPT	
AQT	Sub-base 1 NPT	
AQU	Sub-base 1 1/4 NPT	
AQV	Sub-base 1 1/2 NPT	
G	Module without connecting thread, without sub-base	
005	Grade of filtration	
C	5 µm	
E	40 µm	

006	Bowl type	
U	Aluminium	
007	Condensate drain	
M	Manually	
H	Semi-automatic	
V	Automatic	
E2	External fully automatic condensate drain, electric, 110 V AC, terminals	
E3	External fully automatic condensate drain, electric, 230 V AC, terminals	
E4	External fully automatic condensate drain, electric, 24 V DC, terminals	
008	Type of mounting	
	Without mounting bracket	
WP	Mounting bracket basic design	
WPB	Mounting bracket for large wall gap	
WPM	Mounting bracket for hooking in service unit components	
009	UL certification	
	None	
UL1	cULus ordinary location for Canada and USA	
010	Flow direction	
	Flow direction from left to right	
Z	Flow direction from right to left	

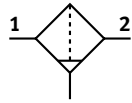
Additional variants can be ordered using the modular product system → page 46

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

Datasheet

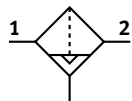
Function

Condensate drain
Manual, rotating



Condensate drain

Semi- or fully automatic



-  Flow rate
6000 ... 16000 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 inserts 5 µm or 40 µm
- New filter cartridges → page 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	G3/4, G1, 3/4 NPT or 1 NPT
Connecting plate AG...	G1/2, G3/4, G1, G1 1/4 or G1 1/2
Connecting plate AQ...	1/2 NPT, 3/4 NPT, 1 NPT, 1 1/4 NPT or 1 1/2 NPT
Module without connecting thread/connecting plate G	–
Design	Sintered filter with centrifugal separator
Type of mounting	With accessories In-line installation
Mounting position	Vertical ±5°
Grade of filtration [µm]	5 40
Air purity class at the output	Compressed air to ISO 8573-1:2010 [6:8:4] (grade of filtration 5 µm) Compressed air to ISO 8573-1:2010 [7:8:4] (grade of filtration 40 µm)
Bowl guard	Integrated as metal bowl
Condensate drain	Manual, rotating Semi-automatic Fully automatic Fully automatic, electrically actuated
Max. condensate volume [ml]	220

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

Standard nominal flow rate $q_{nN}^{1)}$ [l/min]				
Pneumatic connection		G1/2, 1/2 NPT	G3/4, 3/4 NPT	G1, G1 1/4, G1 1/2/ 1 NPT, 1 1/4 NPT, 1 1/2 NPT
Grade of filtration	5 µm	6000	8500	9500
	40 µm	8000	12500	16000

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

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

Datasheet

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

1) More information: www.festo.com/x/topic/crc2) More information: www.festo.com/catalogue/ms9-lf → Support/Downloads.

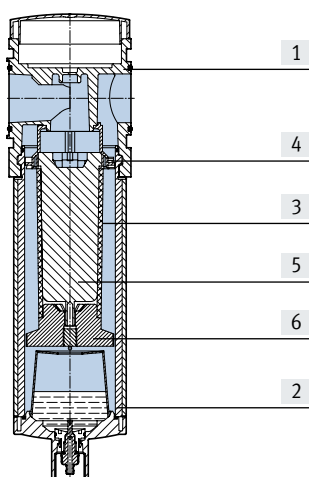
ATEX	
EU certification	EX4
ATEX category for gas	II 2G
Type of ignition protection for gas	Ex h IIC T6 Gb X
ATEX category for dust	II 2D
Type of ignition protection for dust	Ex h IIIC T60°C Db X
Explosion-proof ambient temperature	–10 °C ≤ Ta ≤ +60 °C
Explosion protection certification outside the EU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

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

Weight [g]	
Filter	2000
Filter with electrically actuated, fully automatic condensate drain E2, E3, E4	2400

Materials

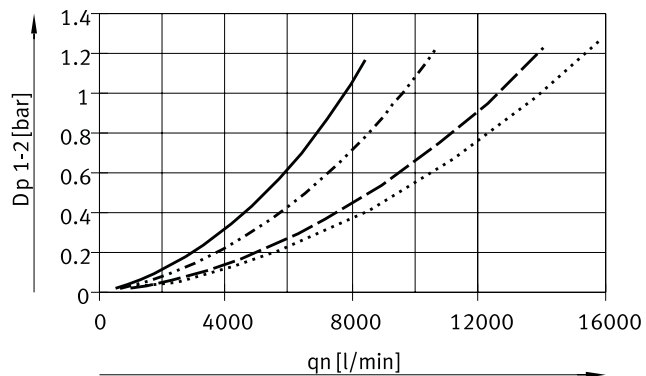
Sectional view



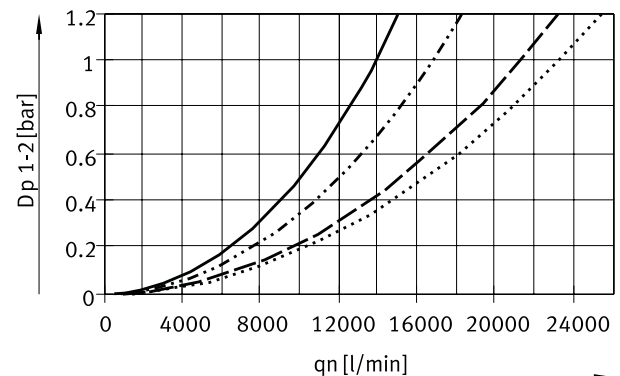
Filter		
[1]	Housing	Die-cast aluminium
[2]	Bowl	Wrought aluminium alloy
	Inspection window	PA
[3]	Filter	PE
[4]	Spin disc	POM
[5]	Filter support	POM
[6]	Separating disc	POM
–	Covering	Reinforced PA
–	Connecting plate, module connector, mounting bracket	Die-cast aluminium
–	Seals	NBR
Note on materials		RoHS-compliant
LABS (PWIS) conformity		VDMA24364-B1/B2-L

Datasheet

 Standard flow rate q_n as a function of differential pressure Δp_{1-2}

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


— 4 bar - - - 10 bar
 - · - · - 6 bar · · · · · 12 bar

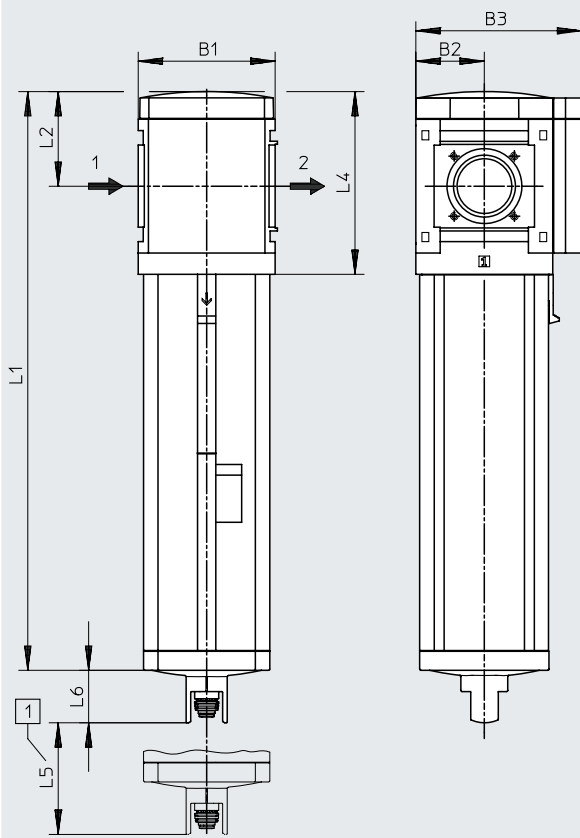
 Grade of filtration 40 μm , pneumatic connection G1, 1 NPT


— 4 bar - - - 10 bar
 - · - · - 6 bar · · · · · 12 bar

Dimensions – Basic version

 Download CAD data → www.festo.com

Module without connecting thread, without connecting plate G



[1] Installation dimension

→ Flow direction

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

Datasheet

Dimensions – Connecting thread/connecting plate

With female thread 3/4, 1, N3/4, N1

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

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

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

→ Flow direction

Download CAD data → www.festo.com

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

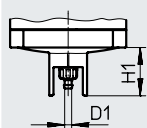
• Note: This product conforms to ISO 1179-1 and ISO 228-1.

Datasheet

Dimensions – Condensate drain

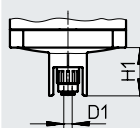
Download CAD data → www.festo.com

[M] Manual rotary



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

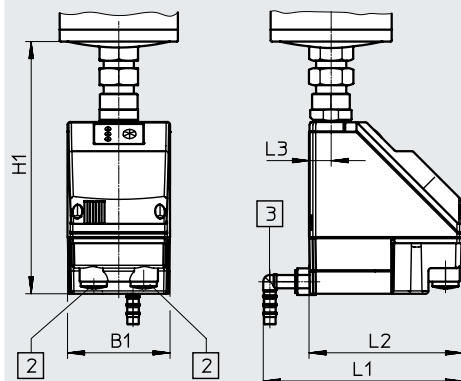
[H] Semi-automatic/[V] Fully automatic



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

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

Datasheets → Internet: [pwea](http://pwea.com)



Condensate drain PWEA:

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

Type	B1	D1	H1	L1	L2	L3
MS9-LF-...-M	–	5.6	34.5	–	–	–
MS9-LF-...-H/V	–	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, rotating	–	564108	MS9-LF-G-CUM	564106	MS9-LF-G-EUM
	Fully automatic	–	564109	MS9-LF-G-CUV	564107	MS9-LF-G-EUV

Ordering data – Modular product system

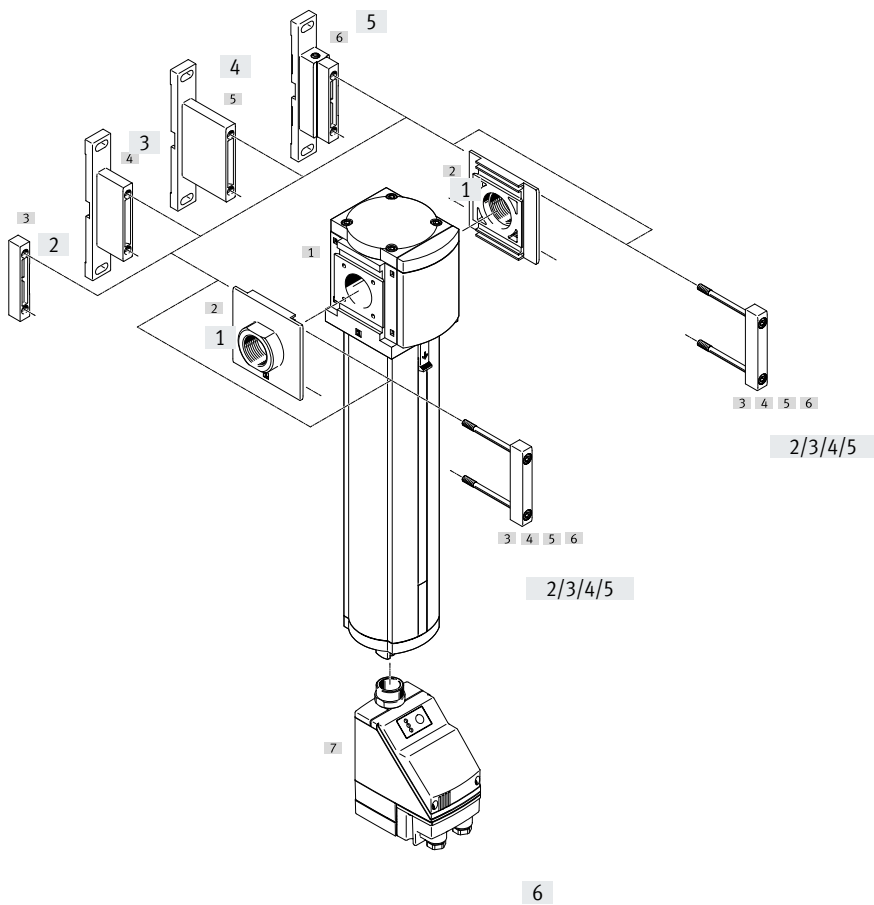
Ordering table				
Grid dimension	[mm]	90	Conditions	Code
Module no.	562532			
Series	Standard			MS
Size	9			9
Function	Filter			-LF
Pneumatic connection	Female thread G3/4	[1]		-3/4
	Female thread G1	[1]		-1
	Connecting plate G1/2			-AGD
	Connecting plate G3/4			-AGE
	Connecting plate G1			-AGF
	Connecting plate G1 1/4			-AGG
	Connecting plate G1 1/2			-AGH
	Female thread 3/4 NPT	[1]		-N3/4
	Female thread 1 NPT	[1]		-N1
	Connecting plate 1/2 NPT	[1]		-AQR
	Connecting plate 3/4 NPT	[1]		-AQS
	Connecting plate 1 NPT	[1]		-AQT
	Connecting plate 1 1/4 NPT	[1]		-AQU
	Connecting plate 1 1/2 NPT	[1]		-AQV
	Module without connecting thread, without connecting plate	[1]		-G
Grade of filtration	40 µm			-E
	5 µm			-C
Bowl	Metal bowl			-U
Condensate drain	Manual			-M
	Semi-automatic (P1 max. 12 bar)			-H
	Fully automatic (P1 max. 12 bar)			-V
External, fully auto- matic, electric	115 V AC, connection terminals (P1 max. 16 bar)	[1]		-E2
	230 V AC, connection terminals (P1 max. 16 bar)	[1]		-E3
	24 V DC, connection terminals (P1 max. 16 bar)	[1]		-E4
Type of mounting	Mounting bracket standard design	[2]		-WP
	Mounting bracket for hooking in service unit components	[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] 3/4, 1, N3/4, N1, AQR, AQS, AQT, AQU, AQV, G, E2, E3, E4, WPM

Not with EU EX4 certification

[2] WP, WPM, WPB Not with pneumatic connection G

Peripherals overview



-  - **Note**

Additional accessories:

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

Mounting attachments and accessories

		Individual device		Combination	→ Page/Internet
		With female thread 3/4, 1, N3/4, N1	With connecting plate AG.../AQ... Without EU EX4 cer- tification	With EU EX4 certification	
[1]	Connecting plate SET MS9-AG...	–	■	■	ms9-ag
	Connecting plate SET MS9-AQ...	–	■	–	ms9-aq
[2]	Module connector MS9-MV	–	–	–	ms9-mv
[3]	Mounting bracket MS9-WP	■	■	■	ms9-wp
[4]	Mounting bracket MS9-WPB	■	■	■	ms9-wp
[5]	Mounting bracket MS9-WPM	■	■	–	ms9-wp
[6]	Fully automatic condensate drain, electrically actuated E2, E3, E4	■	■	–	57

Type codes

001	Series	
MS	MS series	

002	Size	
9	Grid dimension 90 mm	

003	Function	
LFM	Fine and micro filters	

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

005	Grade of filtration	
A	0.01 µm	
B	1 µm	

006	Bowl type	
U	Aluminium	

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

008	Flow rate	
	Standard	
HF	High flow rate	

009	Filter change sensing	
	None	
DA	Differential pressure display, visual	
DN	Filter contamination indicator, M8 plug, NPN, 3-pin	
DNI	Filter contamination indicator, M12 plug, NPN, 4-pin, analogue output 4...20 mA	
DP	Filter contamination indicator, M8 plug, PNP, 3-pin	
DPI	Filter contamination indicator, M12 plug, PNP, 4-pin, analogue output 4...20 mA	

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

011	EU certification	
	None	
EX4	II 2GD	

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

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

Additional variants can be ordered using the modular product system → page 59

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

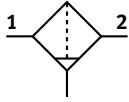
Datasheet

Function

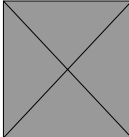
Condensate drain

Manual, rotating

Without differential pressure display



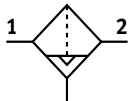
With differential pressure display



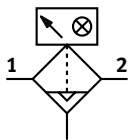
Condensate drain

Semi- or fully automatic

Without differential pressure display



With differential pressure display



-  - Flow rate
325 ... 10000 l/min
-  - Temperature range
-10 ... +60 °C
-  - Operating pressure
0 ... 20 bar



- High-efficiency 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 indicating filter contamination
- Choice of filter inserts 0.01 µm or 1 µm
- New filter cartridges → page 90
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22

General technical data		MS9
Size		MS9
Pneumatic connection 1, 2		
	Female thread	G3/4, G1, 3/4 NPT or 1 NPT
	Connecting plate AG...	G1/2, G3/4, G1, G1 1/4 or G1 1/2
	Connecting plate AQ...	1/2 NPT, 3/4 NPT, 1 NPT, 1 1/4 NPT or 1 1/2 NPT
	Module without connecting thread/connecting plate G	–
Design		Fibre filter
Type of mounting		With accessories In-line installation
Mounting 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 to ISO 8573-1:2010 [3:4:2] (micro filter MS9-LFM-A) Compressed air to ISO 8573-1:2010 [5:4:3] (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, rotating Manual, non-detenting Semi-automatic Fully automatic Fully automatic, electrically actuated
Differential pressure display		Visual indicator

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

Datasheet

General technical data		
Variant	Standard	High flow rate HF
Residual oil content [mg/m ³]	≤0.01 (micro filter MS9-LFM-A) ≤0.5 (fine filter MS9-LFM-B)	
Max. condensate volume [ml]	225	
Filter efficiency, fine particles [%]	99.995 (micro filter MS9-LFM-A) 99 (fine filter MS9-LFM-B)	
Filter efficiency, oil aerosol [%]	99 (micro filter MS9-LFM-A) 90 (fine filter MS9-LFM-B)	
MPPS [μm]	0.08 (micro filter MS-LFM-A)	0.1 (micro filter MS-LFM-A)
Filter efficiency MPPS [%]	99.981 (micro filter MS-LFM-A)	99.968 (micro filter MS-LFM-A)

Standard flow rate $q_n^{1)}$ [l/min]		
Variant	Standard	High flow rate HF
Micro filter MS9-LFM-A		
Max. standard flow rate for air purity class $q_{n \max}$	6500	7800
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 $q_{n \max}$	7000	10000
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, rotating	Semi-automatic	Fully automatic	Fully automatic, electrically actuated
	M	H	V	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 [6:4:4] ¹⁾			
Ambient temperature [°C]	-10 ... +60	+5 ... +60	+5 ... +60 (-10 ... +60) ²⁾	+1 ... +60
Temperature of medium [°C]	-10 ... +60	+5 ... +60	+5 ... +60 (-10 ... +60) ²⁾	+1 ... +60
Storage temperature [°C]	-10 ... +60	+5 ... +60	-10 ... +60	+1 ... +60
Corrosion resistance class CRC ³⁾	2 - Moderate corrosion stress			
UL certification ⁴⁾	c UL us - 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) For fine filter with grade of filtration 1 μm.

3) More information: www.festo.com/x/topic/crc4) More information: www.festo.com/catalogue/ms9-lfm → Support/Downloads.

ATEX	
EU certification	EX4
ATEX category for gas	II 2G
Type of ignition protection for gas	Ex h IIC T6 Gb X
ATEX category for dust	II 2D
Type of ignition protection for dust	Ex h IIIC T60°C Db X
Explosion-proof ambient temperature	+5°C ≤ Ta ≤ +60 °C
Explosion protection certification outside the EU	EPL Db (GB) EPL Gb (GB)
CE marking (see declaration of conformity) ¹⁾	To EU Explosion Protection Directive (ATEX)
UKCA marking (see declaration of conformity) ¹⁾	To UK explosion regulations

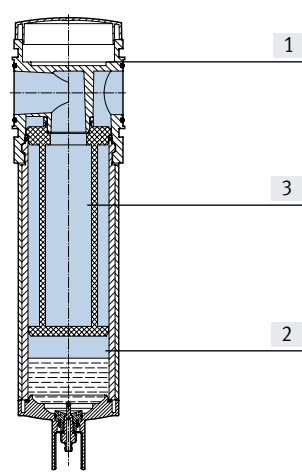
1) More information: www.festo.com/catalogue/ms9-lfm → Support/Downloads.

Datasheet

Weight [g]		
Variant	Standard	High flow rate HF
Fine and micro filter	2000	2500
Fine and micro filters with electrically actuated, fully automatic condensate drain E2, E3, E4	2900	2900

Materials

Sectional view

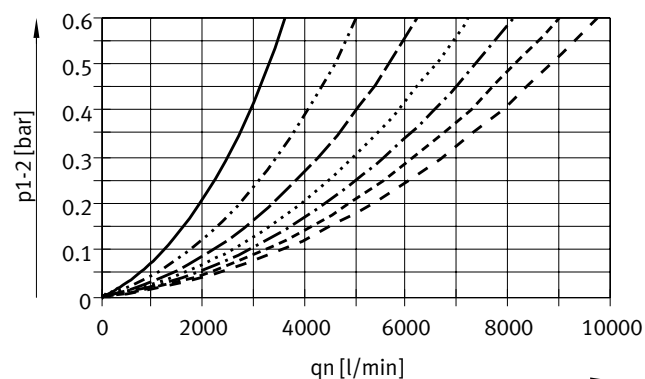


Fine and micro filter		
[1]	Housing	Die-cast aluminium
[2]	Bowl	Wrought aluminium alloy
	Inspection window	PA
[3]	Filter	Borosilicate fibre
-	Covering	Reinforced PA
-	Connecting plate, module connector, mounting bracket	Die-cast aluminium
-	Seals	NBR
LABS (PWIS) conformity		VDMA24364-B1/B2-L

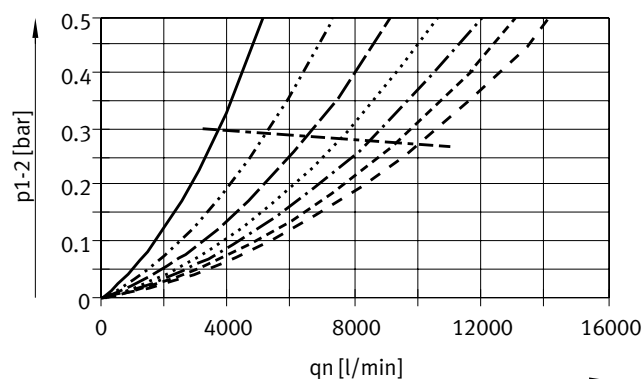
Datasheet

Standard flow rate q_n as a function of differential pressure p_{1-2}

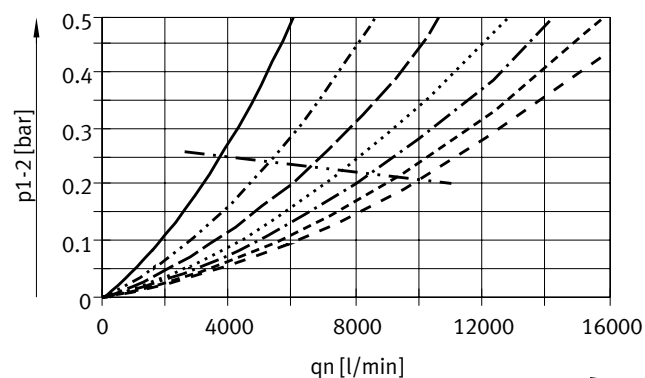
Grade of filtration 0.01 μm , pneumatic connection G1/2, 1/2 NPT



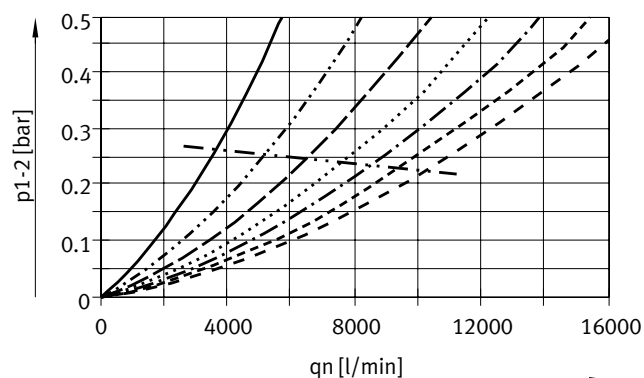
Grade of filtration 0.01 μm , pneumatic connection G3/4, 3/4 NPT



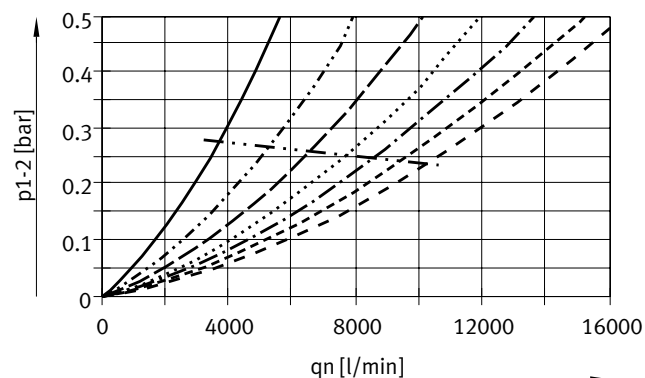
Grade of filtration 0.01 μm , pneumatic connection G1, 1 NPT



Grade of filtration 0.01 μm , pneumatic connection G1 1/4, 1 1/4 NPT

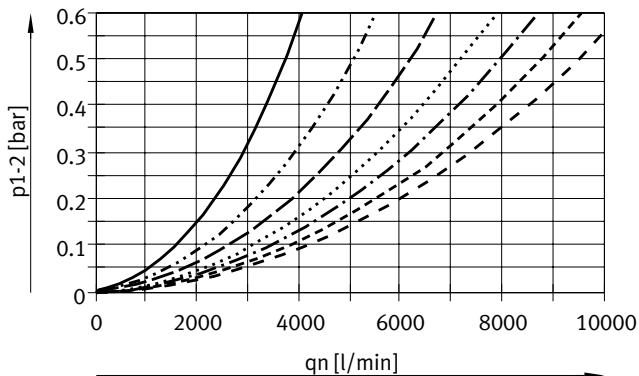
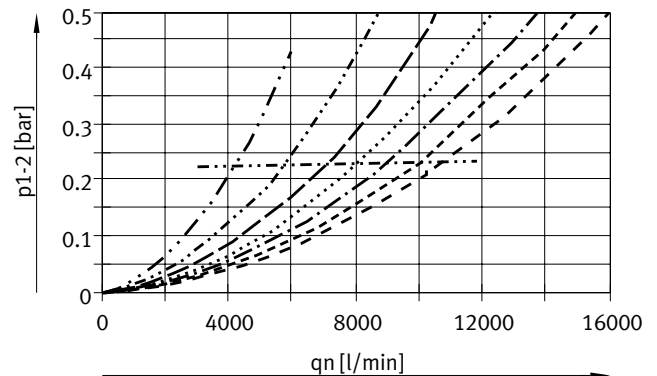
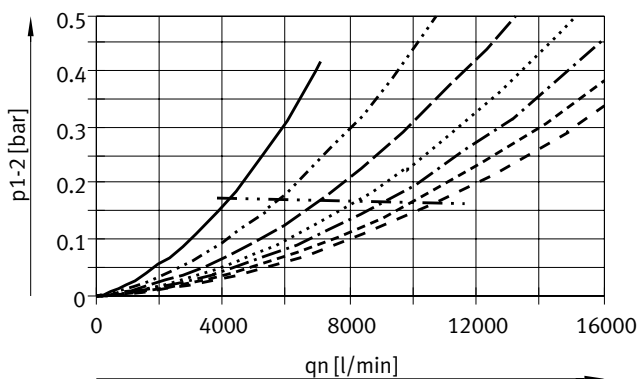
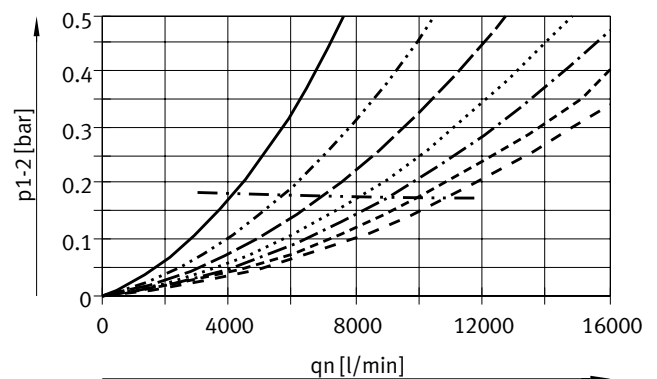
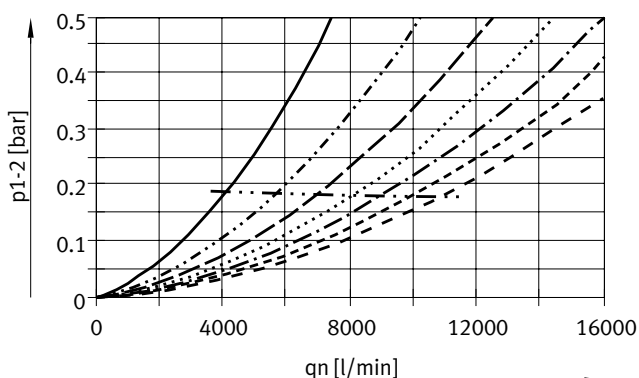


Grade of filtration 0.01 μm , pneumatic connection G1 1/2, 1 1/2 NPT



- 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 are above the measured q_n values)

Datasheet

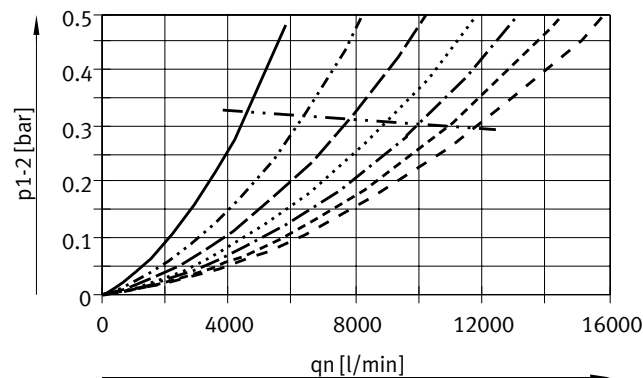
Standard flow rate q_n as a function of differential pressure p_{1-2} Grade of filtration 1 μm , pneumatic connection G1/2, 1/2 NPTGrade of filtration 1 μm , pneumatic connection G3/4, 3/4 NPTGrade of filtration 1 μm , pneumatic connection G1, 1 NPTGrade of filtration 1 μm , pneumatic connection G1 1/4, 1 1/4 NPTGrade of filtration 1 μm , pneumatic connection G1 1/2, 1 1/2 NPT

- 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 are above the measured q_n values)

Datasheet

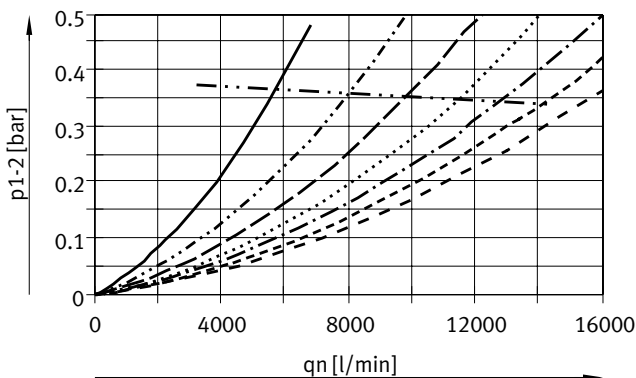
Standard flow rate q_n as a function of differential pressure p_{1-2}

Grade of filtration 0.01 μm , pneumatic connection G3/4, 3/4 NPT
High flow rate HF



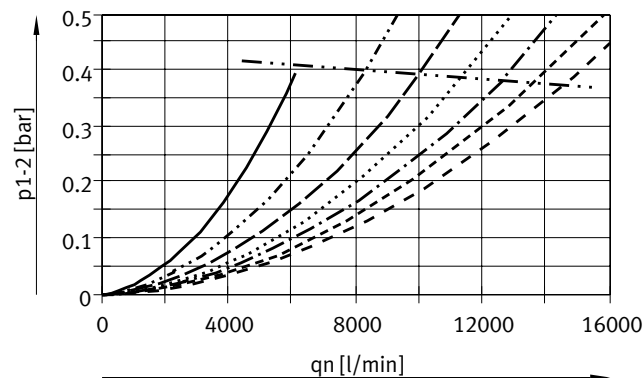
- 2 bar
- 4 bar
- 6 bar ($q_{n \text{ min}}$: 390 l/min)
- 8 bar
- 10 bar
- 12 bar
- 14 bar
- $q_{n \text{ max}}$

Grade of filtration 0.01 μm , pneumatic connection G1, 1 NPT
High flow rate HF



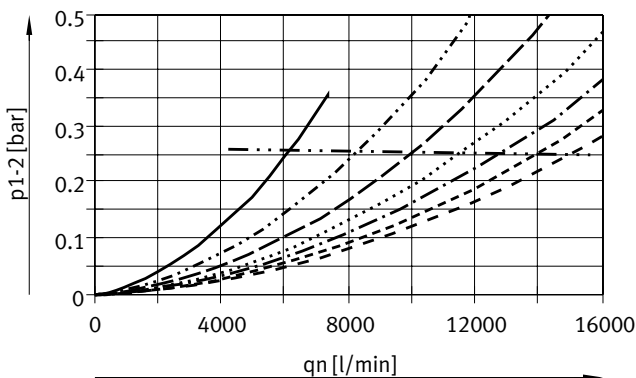
- 2 bar
- 4 bar
- 6 bar ($q_{n \text{ min}}$: 390 l/min)
- 8 bar
- 10 bar
- 12 bar
- 14 bar
- $q_{n \text{ max}}$

Grade of filtration 1 μm , pneumatic connection G3/4, 3/4 NPT
High flow rate HF



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

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

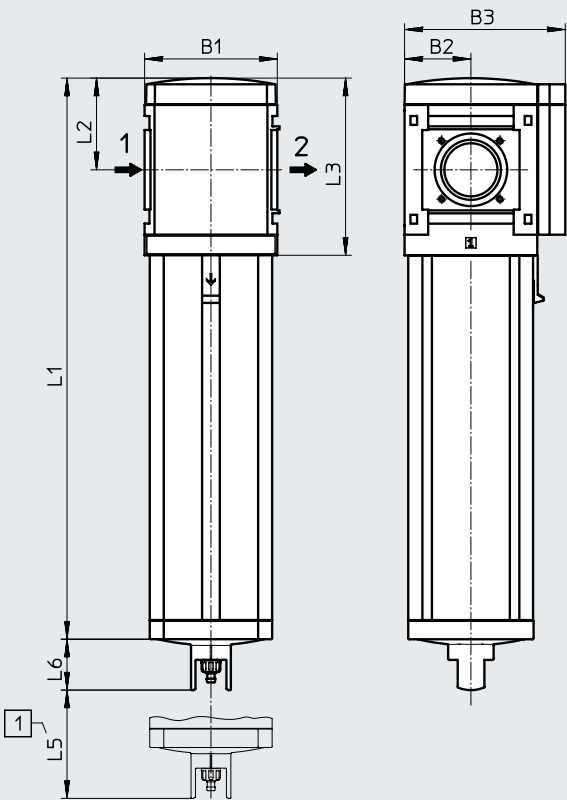


- 2 bar
- 4 bar
- 6 bar ($q_{n \text{ min}}$: 500 l/min)
- 8 bar
- 10 bar
- 12 bar
- 14 bar
- $q_{n \text{ max}}$

Datasheet

Dimensions – Basic version

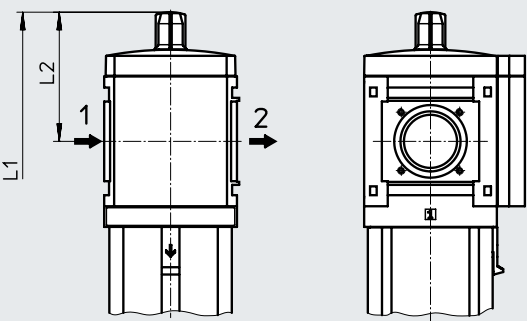
Module without connecting thread, without connecting plate G



[1] Installation dimension → Flow direction

Download CAD data → www.festo.com

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



→ 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			

Datasheet

Dimensions – Connecting thread/connecting plate

With female thread 3/4, 1, N3/4, N1

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

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

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

Download CAD data → www.festo.com

→ Flow direction

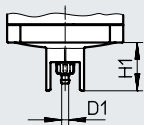
Type	B4	B5	B6	B7		B8	D1	L4	L7	≅
					EX4				EX4	
MS9-LFM-3/4	90	104	91.5	–	–	–	G3/4	66	–	–
MS9-LFM-1							G1			
MS9-LFM-AGD	–	–	–	112	122	132	G1/2	–	35	30
MS9-LFM-AGE						132	G3/4			36
MS9-LFM-AGF						142	G1			41
MS9-LFM-AGG						162	G1 1/4			50
MS9-LFM-AGH						176	G1 1/2			55
MS9-LFM-N3/4	90	104	91.5	–	–	–	3/4 NPT	66	–	–
MS9-LFM-N1							1 NPT			
MS9-LFM-AQR	–	–	–	112	122	132	1/2 NPT	–	35	30
MS9-LFM-AQS						132	3/4 NPT			36
MS9-LFM-AQT						142	1 NPT			41
MS9-LFM-AQU						162	1 1/4 NPT			50
MS9-LFM-AQV						176	1 1/2 NPT			55

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

Datasheet

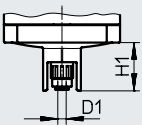
Dimensions – Condensate drain

[M] Manual rotary



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

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

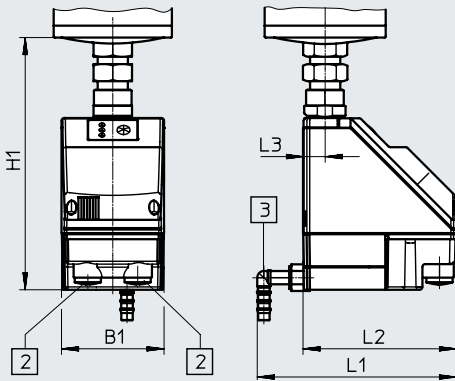


Push-in connector for plastic tubing
PUN-6/PAN-6

Download CAD data → www.festo.com

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

Datasheets → Internet: pwea



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

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

Datasheet

Ordering data							
Without differential pressure display							
Size	Condensate drain	Connection	Micro filter		Fine filters		
			Grade of filtration 0.01 µm		Grade of filtration 1 µm		
			Part no.	Type	Part no.	Type	
Standard							
MS9	Manual, rotating	G3/4	553070	MS9-LFM-3/4-AUM		553074	MS9-LFM-3/4-BUM
		G1	553000	MS9-LFM-1-AUM		553004	MS9-LFM-1-BUM
		–	564047	MS9-LFM-G-AUM		564039	MS9-LFM-G-BUM
	Fully automatic	G3/4	553072	MS9-LFM-3/4-AUV		553076	MS9-LFM-3/4-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, rotating	G3/4	552964	MS9-LFM-3/4-AUM-HF		552968	MS9-LFM-3/4-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	G3/4	552966	MS9-LFM-3/4-AUV-HF		552970	MS9-LFM-3/4-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 display							
Size	Condensate drain	Connection	Micro filter		Fine filters		
			Grade of filtration 0.01 µm		Grade of filtration 1 µm		
			Part no.	Type	Part no.	Type	
Standard							
MS9	Manual, rotating	G3/4	553078	MS9-LFM-3/4-AUM-DA		553082	MS9-LFM-3/4-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	G3/4	553080	MS9-LFM-3/4-AUV-DA		553084	MS9-LFM-3/4-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, rotating	G3/4	552972	MS9-LFM-3/4-AUM-HF-DA		552976	MS9-LFM-3/4-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	G3/4	552974	MS9-LFM-3/4-AUV-HF-DA		552978	MS9-LFM-3/4-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

Ordering data – Modular product system

Ordering table				
Grid dimension	[mm]	90	Conditions	Code
Module no.	552940			
Series	Standard service unit			MS
Size	9			9
Function	Fine and micro filter			-LFM
Pneumatic connection	Female thread G3/4	[1]	-3/4	
	Female thread G1	[1]	-1	
	Connecting plate G1/2		-AGD	
	Connecting plate G3/4		-AGE	
	Connecting plate G1		-AGF	
	Connecting plate G1 1/4		-AGG	
	Connecting plate G1 1/2		-AGH	
	Female thread 3/4 NPT	[1]	-N3/4	
	Female thread 1 NPT	[1]	-N1	
	Connecting plate 1/2 NPT	[1]	-AQR	
	Connecting plate 3/4 NPT	[1]	-AQS	
	Connecting plate 1 NPT	[1]	-AQT	
	Connecting plate 1 1/4 NPT	[1]	-AQU	
	Connecting plate 1 1/2 NPT	[1]	-AQV	
	Module without connecting thread, without connecting plate	[1]	-G	
Grade of filtration	1 µm		-B	
	0.01 µm		-A	
Bowl	Metal bowl			-U
Condensate drain	Manual			-M
	Semi-automatic (P1 max. 12 bar)			-H
	Fully automatic (P1 max. 12 bar)			-V
External, fully auto- matic, electric	115 V AC, connection terminals (P1 max. 16 bar)	[1]	-E2	
	230 V AC, connection terminals (P1 max. 16 bar)	[1]	-E3	
	24 V DC, connection terminals (P1 max. 16 bar)	[1]	-E4	
Flow rate	High flow rate			-HF
Filter change sensing	Differential pressure display, visual			-DA
Type of mounting	Mounting bracket standard design		[2]	-WP
	Mounting bracket for hooking in service unit components		[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

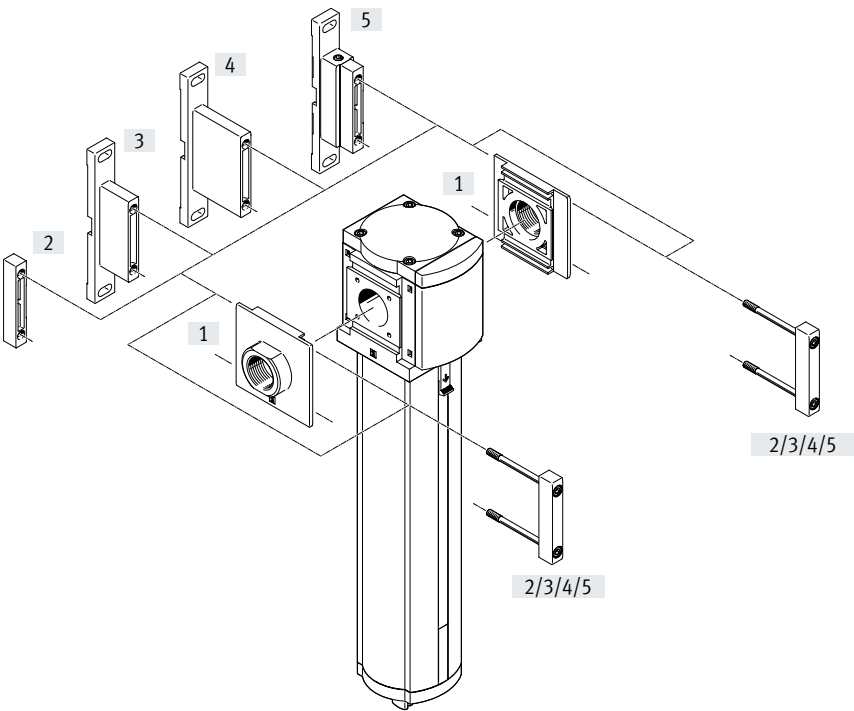
[1] 3/4, 1, N3/4, N1, AQR, AQS, AQT, AQU, AQV, G, E2, E3, E4, WPM

Not with EU EX4 certification

[2] WP, WPM, WPB

Not with pneumatic connection G

Peripherals overview



Mounting attachments and accessories		Individual device			Combination	→ Page/Internet
		With female thread 3/4, 1, N3/4, N1	With connecting plate AG.../AQ...		Module without connecting thread, without connecting plate G	
			Without EU EX4 cer- tification	With EU EX4 certifi- cation		
[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

Type codes

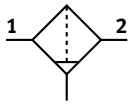
001	Series	
MS	MS series	
002	Size	
9	Grid dimension 90 mm	
003	Function	
LFX	Activated carbon filter	
004	Pneumatic connection	
3/4	Female thread G3/4	
1	Female thread G1	
AGD	Sub-base G1/2	
AGE	Sub-base G3/4	
AGF	Sub-base G1	
AGG	Connecting plate G1 1/4	
AGH	Connecting plate G1 1/2	
N3/4	Female thread 3/4 NPT	
N1	Female thread 1 NPT	
AQR	Sub-base 1/2 NPT	
AQS	Sub-base 3/4 NPT	
AQT	Sub-base 1 NPT	
AQU	Sub-base 1 1/4 NPT	
AQV	Sub-base 1 1/2 NPT	
G	Module without connecting thread, without sub-base	
005	Bowl type	
U	Aluminium	
006	Type of mounting	
	Without mounting bracket	
WP	Mounting bracket basic design	
WPB	Mounting bracket for large wall gap	
WPM	Mounting bracket for hooking in service unit components	
007	UL certification	
	None	
UL1	cULus ordinary location for Canada and USA	
008	Flow direction	
	Flow direction from left to right	
Z	Flow direction from right to left	

Additional variants can be ordered using the modular product system → page 66

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

Datasheet

Function



-  - Flow rate
max. 6500 l/min
-  - Temperature range
-10 ... +60 °C
-  - Operating pressure
0 ... 20 bar



- Removes 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) is recommended
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22
- New filter cartridges → page 90

General technical data

Size	MS9
Pneumatic connection 1, 2	
Female thread	G3/4, G1, 3/4 NPT or 1 NPT
Connecting plate AG...	G1/2, G3/4, G1, G1 1/4 or G1 1/2
Connecting plate AQ...	1/2 NPT, 3/4 NPT, 1 NPT, 1 1/4 NPT or 1 1/2 NPT
Module without connecting thread/connecting plate G	–
Design	Activated carbon filter
Type of mounting	With accessories In-line installation
Mounting position	Vertical ±5°
Air purity class at the output ¹⁾	Compressed air to ISO 8573-1:2010 [1:4:1]
Bowl guard	Integrated as metal bowl
Residual oil content [mg/m ³]	≤0.003

1) It is recommended to replace the filter cartridge with a new cartridge after 1000 operating hours (applicable for ambient temperature of 21 °C). The service life of the filter cartridges is reduced at higher temperatures.

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

Standard flow rate $q_n^{1)}$ [l/min]

Max. standard flow rate for air purity class $q_{n \max}$	6500
---	------

1) Measured at $p_1 = 6 \text{ bar}$

Operating and environmental conditions

Operating pressure [bar]	0 ... 20
Operating medium	Compressed air to 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⁾	c UL us - Recognized (OL)

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

2) More information: www.festo.com/catalogue/ms9-lfx → Support/Downloads.

Datasheet

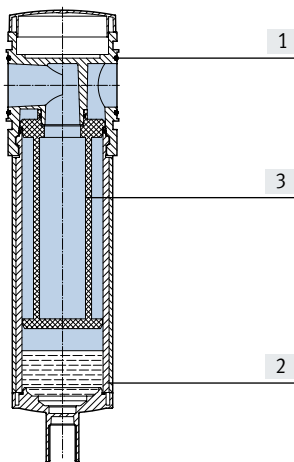
ATEX	
EU certification	EX4
ATEX category for gas	II 2G
Type of ignition protection for gas	Ex h IIC T6 Gb X
ATEX category for dust	II 2D
Type of ignition protection for dust	Ex h IIIC T60°C Db X
Explosion-proof ambient temperature	$-10\text{ °C} \leq T_a \leq +60\text{ °C}$
Explosion protection certification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

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

Weight [g]	
Activated carbon filter	2000

Materials

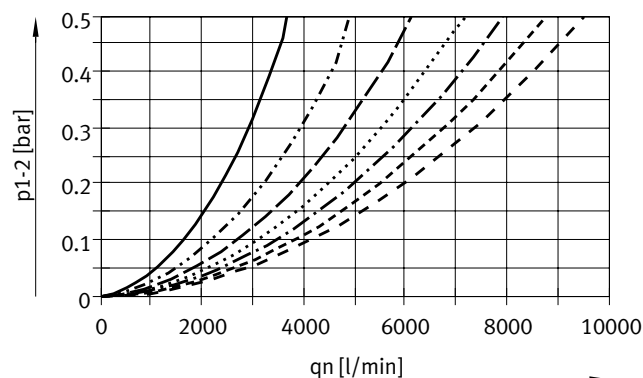
Sectional view



Activated carbon filter		
[1]	Housing	Die-cast aluminium
[2]	Bowl	Wrought aluminium alloy
	Inspection window	PA
[3]	Filter	Activated carbon
–	Covering	Reinforced PA
–	Connecting plate, module connector, mounting bracket	Die-cast aluminium
–	Seals	NBR
	LABS (PWIS) conformity	VDMA24364-B1/B2-L

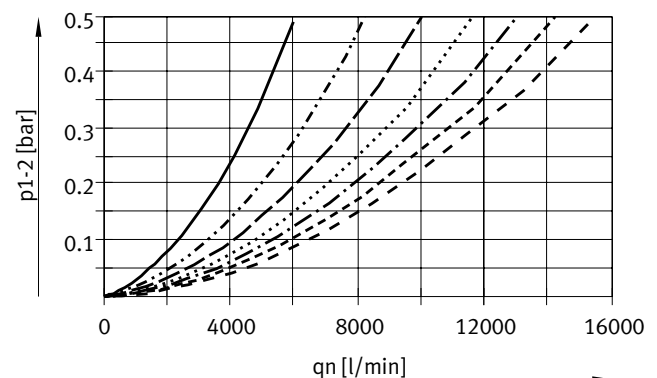
Standard flow rate q_n as a function of differential pressure p_{1-2}

Pneumatic connection G1/2, 1/2 NPT



— 2 bar
 4 bar
 - - - 6 bar
 8 bar
 - . - . - 10 bar
 - - - - - 12 bar
 - - - - - 14 bar

Pneumatic connection G3/4, 3/4 NPT

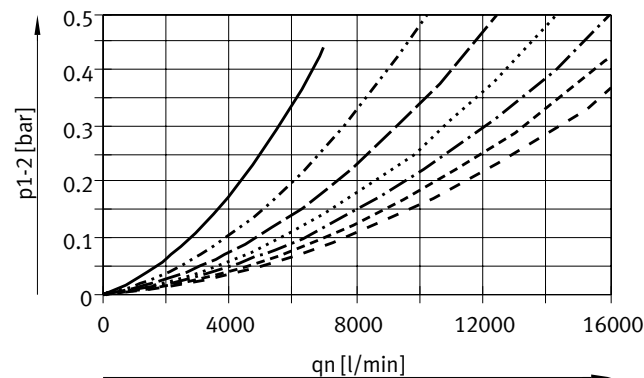


— 2 bar
 4 bar
 - - - 6 bar
 8 bar
 - . - . - 10 bar
 - - - - - 12 bar
 - - - - - 14 bar

Datasheet

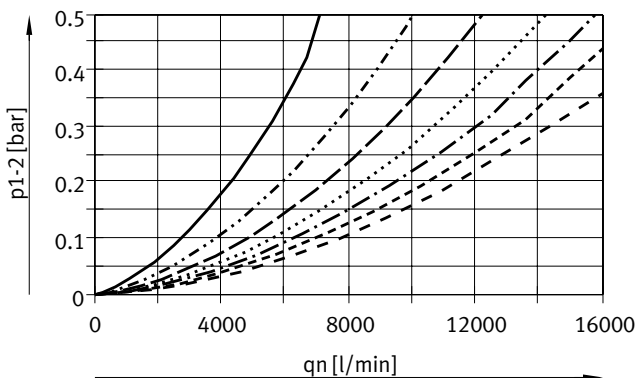
Standard flow rate qn as a function of differential pressure p1-2

Pneumatic connection G1, 1 NPT



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

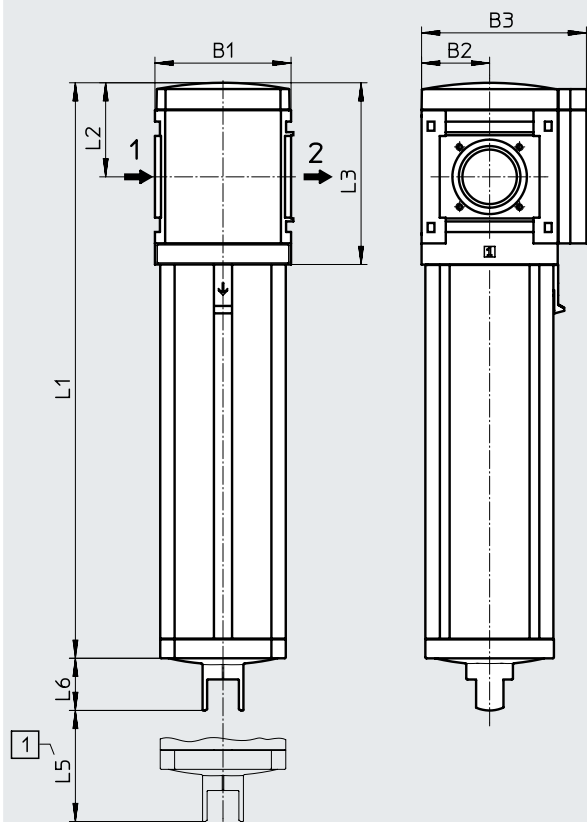
Pneumatic connection G1 1/2, 1 1/2 NPT



Dimensions – Basic version

Download CAD data → www.festo.com

Module without connecting thread, without connecting plate G



[1] Installation dimension

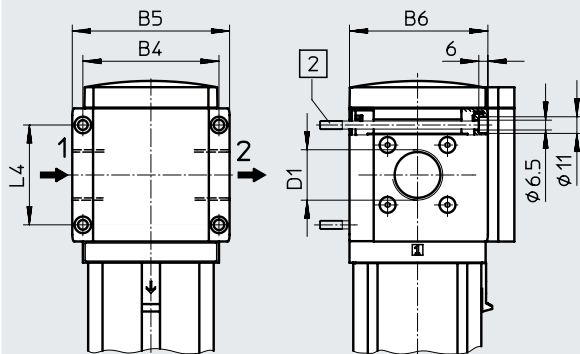
→ Flow direction

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

Datasheet

Dimensions – Connecting thread/connecting plate

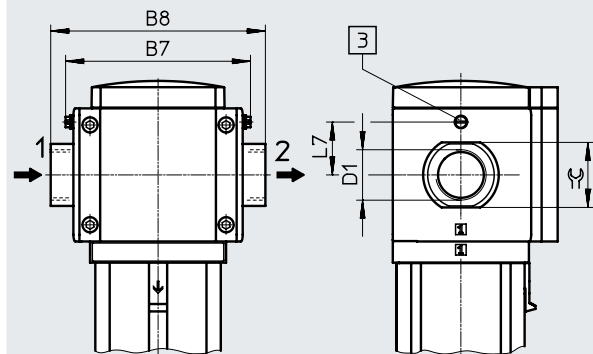
With female thread 3/4, 1, N3/4, N1



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

Download CAD data → www.festo.com

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



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

Type	B4	B5	B6	B7		B8	D1	L4	L7	≅
					EX4				EX4	
MS9-LFX-3/4	90	104	91.5	–	–	–	G3/4	66	–	–
MS9-LFX-1							G1			
MS9-LFX-AGD	–	–	–	112	122	132	G1/2	–	35	30
MS9-LFX-AGE						132	G3/4			36
MS9-LFX-AGF						142	G1			41
MS9-LFX-AGG						162	G1 1/4			50
MS9-LFX-AGH						176	G1 1/2			55
MS9-LFX-N3/4						90	104			91.5
MS9-LFX-N1	1 NPT									
MS9-LFX-AQR	–	–	–	112	122	132	1/2 NPT	–	35	30
MS9-LFX-AQS						132	3/4 NPT			36
MS9-LFX-AQT						142	1 NPT			41
MS9-LFX-AQU						162	1 1/4 NPT			50
MS9-LFX-AQV						176	1 1/2 NPT			55

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

Ordering data

Size	Connection	Part no.	Type
MS9	G3/4	552996	MS9-LFX-3/4-U
	G1	553032	MS9-LFX-1-U
	–	564038	MS9-LFX-G-U

Ordering data – Modular product system

Ordering table		Conditions	Code	Enter code
Grid dimension	[mm] 90			
Module no.	552942			
Series	Standard service unit		MS	MS
Size	9		9	9
Function	Activated carbon filter		-LFX	-LFX
Pneumatic connection	Female thread G3/4	[1]	-3/4	
	Female thread G1	[1]	-1	
	Connecting plate G1/2		-AGD	
	Connecting plate G3/4		-AGE	
	Connecting plate G1		-AGF	
	Connecting plate G1 1/4		-AGG	
	Connecting plate G1 1/2		-AGH	
	Female thread 3/4 NPT	[1]	-N3/4	
	Female thread 1 NPT	[1]	-N1	
	Connecting plate 1/2 NPT	[1]	-AQR	
	Connecting plate 3/4 NPT	[1]	-AQS	
	Connecting plate 1 NPT	[1]	-AQT	
	Connecting plate 1 1/4 NPT	[1]	-AQU	
	Connecting plate 1 1/2 NPT	[1]	-AQV	
	Module without connecting thread, without connecting plate	[1]	-G	
Bowl	Metal bowl		-U	-U
Type of mounting	Mounting bracket standard design	[2]	-WP	
	Mounting bracket for hooking in service unit components	[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	

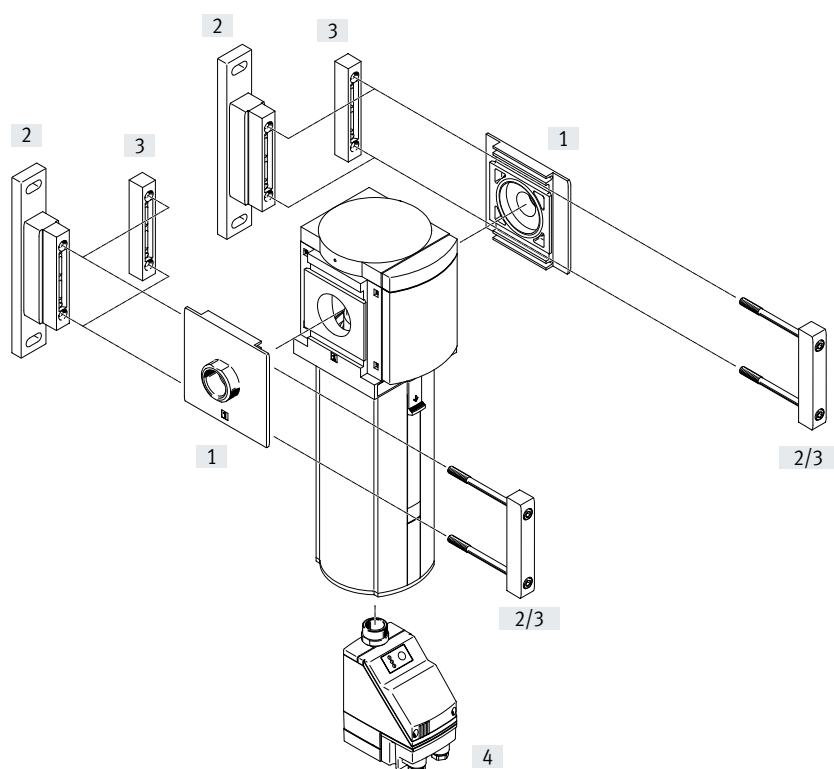
[1] 3/4, 1, N3/4, N1, AQR, AQS, AQT, AQU, AQV, G, WPM

Not with EU EX4 certification

[2] WP, WPM, WPB

Not with pneumatic connection G

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]	Fully automatic condensate drain, electrically actuated E2, E3, E4	72

Type codes

001	Series	
MS	MS series	

002	Size	
12	Grid dimension 124 mm	

003	Function	
LF	Filter	

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

005	Grade of filtration	
C	5 µm	
E	40 µm	

006	Bowl type	
U	Aluminium	

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

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

009	Flow direction	
	Flow direction from left to right	
Z	Flow direction from right to left	

Additional variants can be ordered using the modular product system → page 73

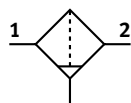
- Pneumatic connection
- Condensate drain
- Type of mounting
- Flow direction

Datasheet

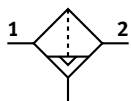
Function

Condensate drain

Manual, rotating



Fully automatic



-  Flow rate
11500 ... 16000 l/min
-  Temperature range
10 ... +60 °C
-  Operating pressure
0.8 ... 20 bar



The sintered filter with centrifugal water separator removes contamination, rust and condensate from the compressed air. The filter cartridges can be replaced.

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

General technical data

Pneumatic connection 1, 2		
Connecting plate AG... Module without connecting thread/connecting plate G		G1, G1 1/4, G1 1/2 or G2
		Internal
Design		Sintered filter with centrifugal separator
Type of mounting		With accessories
		In-line installation
Mounting position		Vertical ±5°
Grade of filtration	[µm]	5
		40
Pore size	[µm]	< 5
		< 40
Air purity class at the output		Compressed air to ISO 8573-1:2010 [6:8:4] (grade of filtration 5 µm)
		Compressed air to ISO 8573-1:2010 [7:8:4] (grade of filtration 40 µm)
Bowl guard		Integrated as metal bowl
Condensate drain		Manual, rotating
		Fully automatic
		Fully automatic, electrically actuated
Degree of condensate separation	[%]	> 75
Max. condensate volume	[cm³]	400

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

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

Pneumatic connection		G1	G1 1/4	G1 1/2	G2
Grade of filtration	5 µm	11500	12500	13500	14000
	40 µm	12500	13000	14000	16000

1) Dependent on the connecting plate selected; must be ordered separately as an accessory → Internet: ms12-ag
Measured at $p_1 = 6$ bar and $\Delta p = 0.5$ bar

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

Datasheet

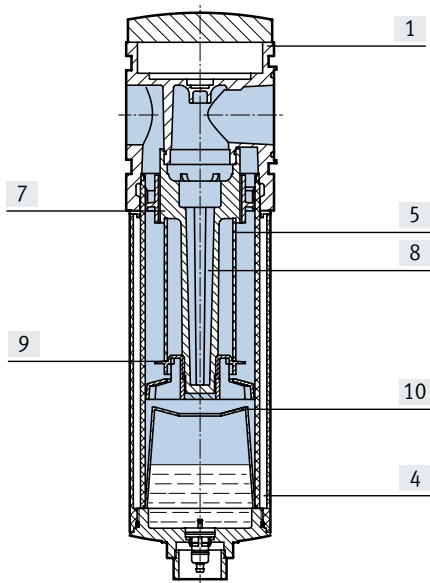
Operating and environmental conditions				
Condensate drain		Manual, rotating M	Fully automatic V	Fully automatic, electrically actuated E2, E3, E4
Operating pressure	[bar]	0.8 ... 20	2 ... 12	0.8 ... 16
Operating medium		Compressed air to ISO 8573-1:2010 [–:9:–]	Compressed air to ISO 8573-1:2010 [7:9:–]	Compressed air to ISO 8573-1:2010 [–:9:–]
		Inert gases		
Note on the operating/pilot medium		–	Ester oil < 0.1mg/m³, according to ISO 8573-1:2010 [–::2]	–
Ambient temperature	[°C]	–10 ... +60	+5 ... +60	+1 ... +60
Temperature of medium	[°C]	–10 ... +60	+5 ... +60	+1 ... +60
Storage temperature	[°C]	–10 ... +60	–10 ... +60	+1 ... +60
Corrosion resistance class	CRC ¹⁾	2		

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

Weight [g]	
Filter with metal bowl U	6500
Filter with metal bowl U and electrically actuated, fully automatic condensate drain E2, E3, E4	7200

Materials

Sectional view

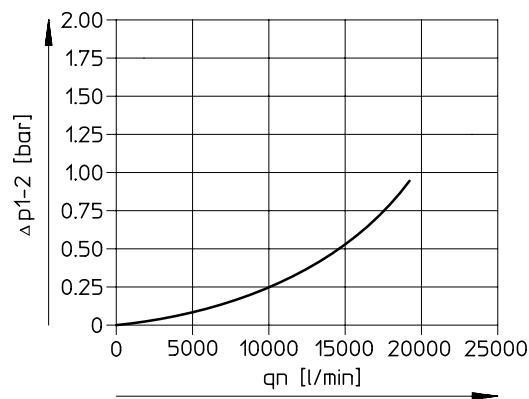
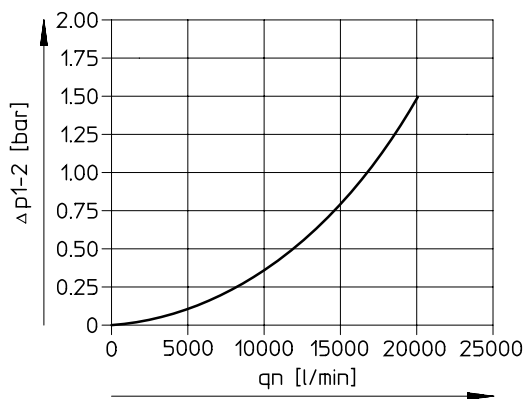


Filter		
[1]	Housing	Die-cast aluminium
[4]	Metal bowl	Wrought aluminium alloy
[5]	Filter element	Sintered bronze
[7]	Spin disc	POM
[8]	Filter support	POM
[9]	Separating disc	POM
[10]	Stabilising disc	POM
–	Seals	NBR
LABS (PWIS) conformity		VDMA24364-B1/B2-L

Standard flow rate q_n as a function of differential pressure Δp_{1-2}

Grade of filtration 5 μm	With connecting plate MS12-AGF Pneumatic connection G1	With connecting plate MS12-AGI Pneumatic connection G2
-------------------------------------	---	---

$p_1 = 6 \text{ bar}$



Datasheet

Standard flow rate q_n as a function of differential pressure Δp_{1-2}

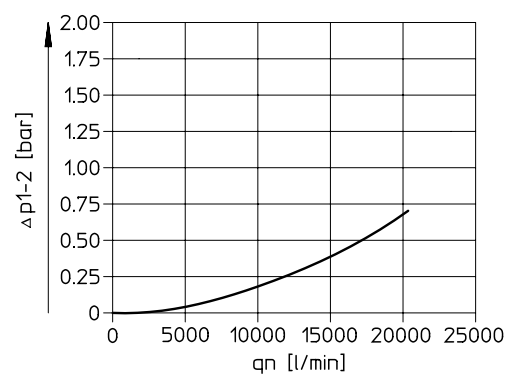
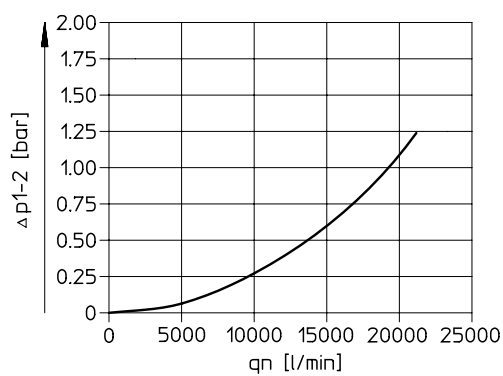
Grade of filtration 40 μm

With connecting plate MS12-AGF

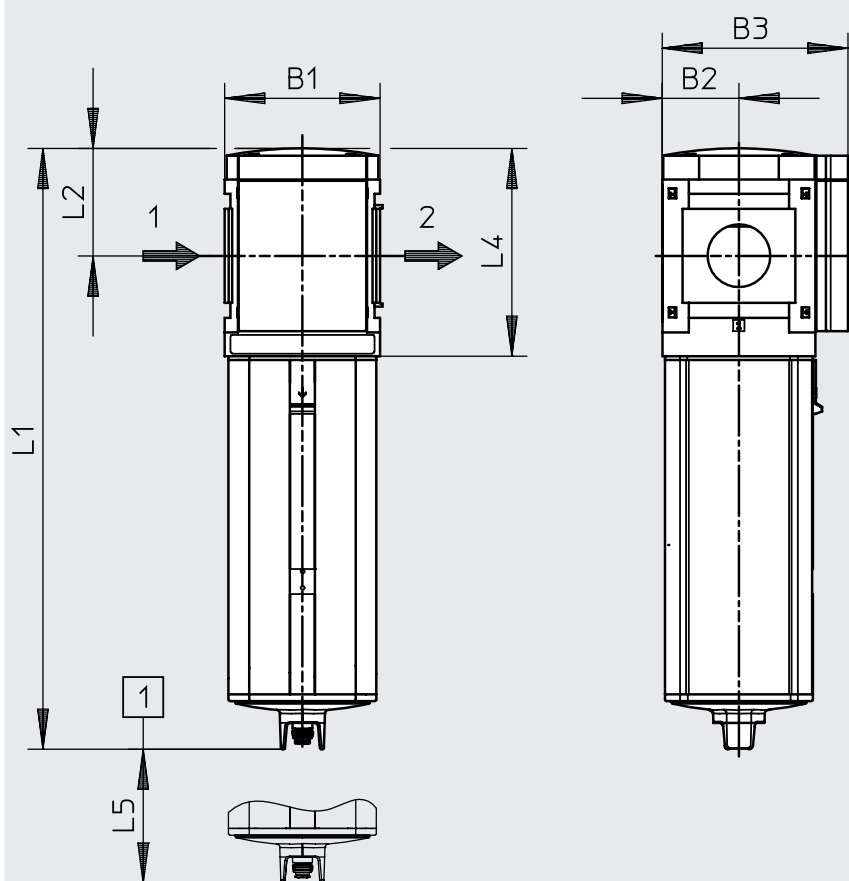
Pneumatic connection G1

With connecting plate MS12-AGI

Pneumatic connection G2

 $p_1 = 6 \text{ bar}$ 

Dimensions – Basic version

Download CAD data → www.festo.com

[1] Installation dimension

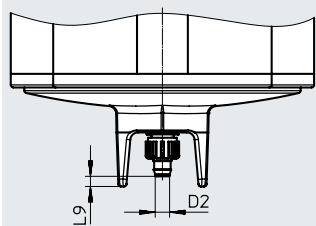
→ Flow direction

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

Datasheet

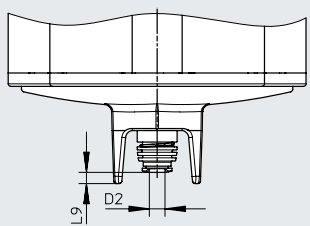
Dimensions – Condensate drain

[M] Manual rotary



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

[V] Fully automatic

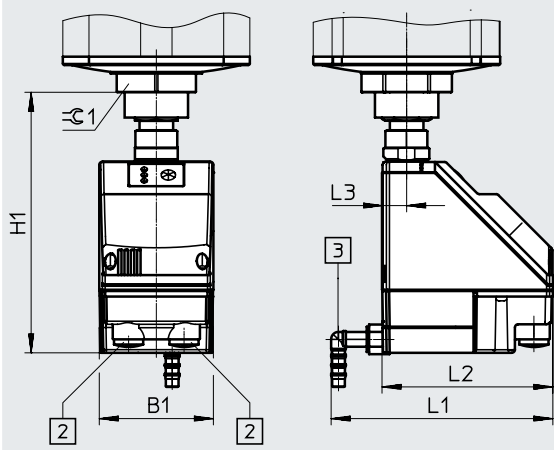


Push-in connector for plastic tubing
PUN-6/PAN-6

Download CAD data → www.festo.com

Datasheets → Internet: pwea

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



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

Datasheets → Internet: pwea

Type	B1	D2 ø	H1	L1	L2	L3	L9	≅ 1
MS12-LF-...-M	–	5.6	–	–	–	–	4	–
MS12-LF-...-V	–	6.2	–	–	–	–	4.5	–
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	

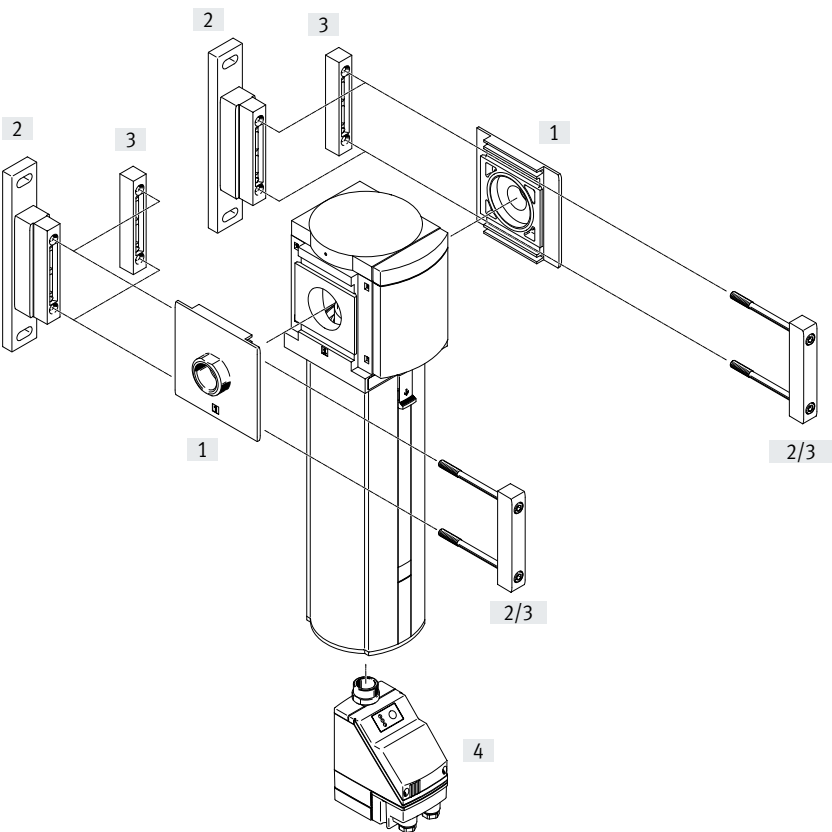
1) Connecting plate must be ordered separately as an accessory → Internet: ms12-ag
- † - Note: This product conforms to ISO 1179-1 and ISO 228-1.

Ordering data – Modular product system

Ordering table				
Grid dimension	124	Conditions	Code	Enter code
	[mm]			
Module no.	535023			
Series	Standard		MS	MS
Size	12		12	12
Function	Filter		-LF	-LF
Pneumatic connection	Connecting plate G1		-AGF	
	Connecting plate G1 1/4		-AGG	
	Connecting plate G1 1/2		-AGH	
	Connecting plate G2		-AGI	
	Module without connecting thread, without connecting plate		-G	
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, connection terminals (P1 max. 16 bar)		-E2	
	230 V AC, connection terminals (P1 max. 16 bar)		-E3	
	24 V DC, connection terminals (P1 max. 16 bar)		-E4	
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

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]	Fully automatic condensate drain, electrically actuated E2, E3, E4	81

Type codes

001	Series	
MS	MS series	
002	Size	
12	Grid dimension 124 mm	
003	Function	
LFM	Fine and micro filters	
004	Pneumatic connection	
AGF	Sub-base G1	
AGG	Sub-base G1 1/4	
AGH	Sub-base G1 1/2	
AGI	Sub-base G2	
G	Module without connecting thread, without sub-base	
005	Grade of filtration	
A	0.01 µm	
B	1 µm	
006	Bowl type	
U	Aluminium	

007	Condensate drain	
M	Manually	
V	Automatic	
E2	External fully automatic condensate drain, electric, 110 V AC, terminals	
E3	External fully automatic condensate drain, electric, 230 V AC, terminals	
E4	External fully automatic condensate drain, electric, 24 V DC, terminals	
008	Filter change sensing	
	None	
DA	Differential pressure display, visual	
009	Type of mounting	
	Without mounting bracket	
WP	Mounting bracket basic design	
010	Flow direction	
	Flow direction from left to right	
Z	Flow direction from right to left	

Additional variants can be ordered using the modular product system → page 82

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

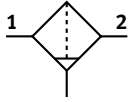
Datasheet

Function

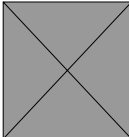
Condensate drain

Manual, rotating

Without differential pressure display



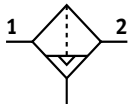
With differential pressure display



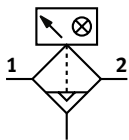
Condensate drain

Semi- or fully automatic

Without differential pressure display



With differential pressure display



-  - Flow rate
500 ... 50000 l/min
-  - Temperature range
-10 ... +60 °C
-  - Operating pressure
0.8 ... 20 bar



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

General technical data

Pneumatic connection 1, 2		
Connecting plate AG...		G1, G1 1/4, G1 1/2 or G2
Module without connecting thread/connecting plate G		–
Design		Fibre filter
Type of mounting		With accessories In-line installation
Mounting 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 to ISO 8573-1:2010 [1:7:2] (grade of filtration 0.01 µm, micro filter MS12-LFM-A) Compressed air to ISO 8573-1:2010 [5:7:3] (grade of filtration 1 µm, fine filter MS12-LFM-B)
Filter efficiency	[%]	99.9999 (grade of filtration 0.01 µm, micro filter MS12-LFM-A) 99.99 (grade of filtration 1 µm, fine filter MS12-LFM-B)
Bowl guard		Integrated as metal bowl
Condensate drain		Manual, rotating Fully automatic Fully automatic, electrically actuated
Max. condensate volume	[ml]	400
Residual oil content	[mg/m³]	0.01 (micro filter MS12-LFM-A) 0.5 (fine filter MS12-LFM-B)
Filter efficiency, fine particles	[%]	99.995 (micro filter MS12-LFM-A) 99 (fine filter MS12-LFM-B)
Filter efficiency, oil aerosol	[%]	99 (micro filter MS12-LFM-A) 90 (fine filter MS12-LFM-B)
MPPS	[µm]	0.08 (micro filter MS12-LFM-A)
Filter efficiency MPPS	[%]	99.968 (micro filter MS12-LFM-A)
Vibration resistant		Transport application test with severity level 1 to FN 942017-4 and EN 60068-2-6 (fine filter MS12-LFM-B)
Shock resistance		Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27 (fine filter MS12-LFM-B)

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

Datasheet

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 $q_{n \max}$	16670	23300	36670	50000
Min. standard flow rate for air purity class $q_{n \min}$	500	700	1100	1500
Fine filter MS12-LFM-B				
Max. standard flow rate for air purity class $q_{n \max}$	16670	23300	36670	50000
Min. standard flow rate for air purity class $q_{n \min}$	625	950	1390	1675

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

Operating and environmental conditions			
Condensate drain	Manual, rotating M	Fully automatic V	Fully automatic, electrically 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		
Note on the operating/pilot medium	–	Ester oil < 0.1mg/m³, according to ISO 8573-1:2010 [:::2]	–
Ambient temperature [°C]	–10 ... +60	+5 ... +60	+1 ... +60
Temperature of medium [°C]	–10 ... +60	+5 ... +60	+1 ... +60
Storage temperature [°C]	–10 ... +60	–10 ... +60	+1 ... +60
Corrosion resistance class CRC ²⁾	2 - Moderate corrosion stress		

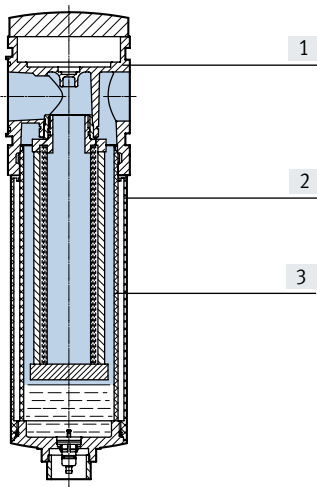
1) It is recommended to prefilter the compressed air for the micro filter MS-LFM-A using a fine filter MS-LFM-B (grade of filtration 1 µm).

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

Weight [g]	
Fine and micro filters with metal bowl U	7000
Fine and micro filters with metal bowl U and electrically actuated, fully automatic condensate drain E2, E3, E4	7700

Materials

Sectional view



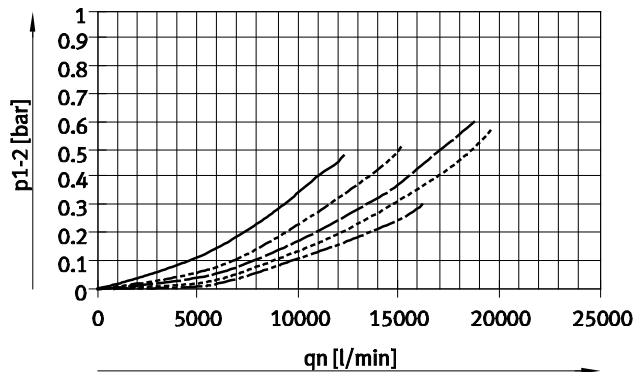
Fine and micro filter		
[1]	Housing	Die-cast aluminium
[2]	Metal bowl	Wrought aluminium alloy
	Inspection window	PC
[3]	Filter element	Borosilicate fibre
–	Seals	NBR
Note on materials		RoHS-compliant
LABS (PWIS) conformity		VDMA24364-B1/B2-L

Datasheet

Standard flow rate q_n as a function of differential pressure p_{1-2}

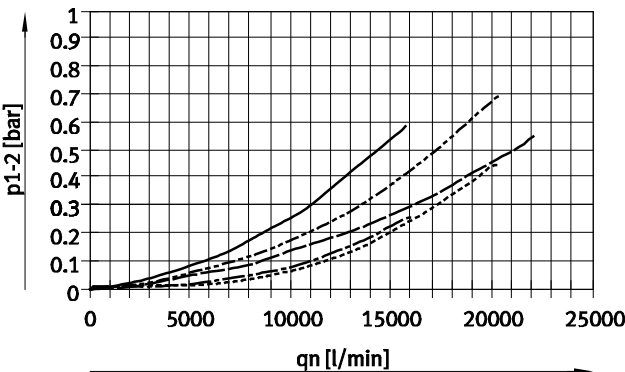
Grade of filtration 0.01 μm

With connecting plate MS12-AGF, pneumatic connection G1



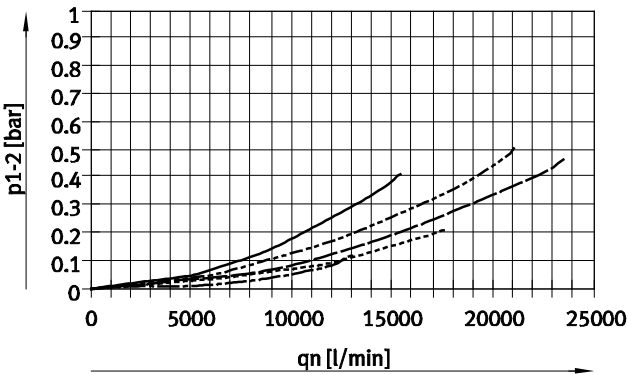
Grade of filtration 0.01 μm

With connecting plate MS12-AGG, pneumatic connection G1 1/4



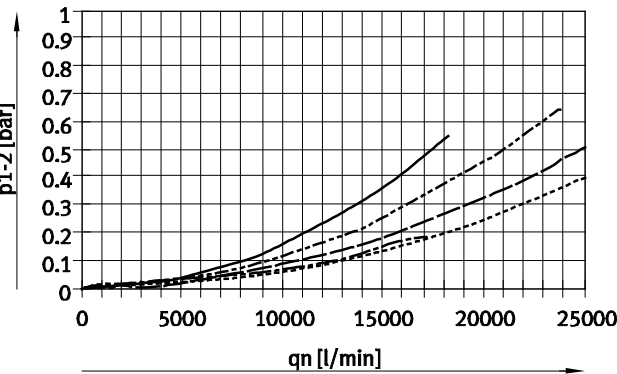
Grade of filtration 0.01 μm

With connecting plate MS12-AGH, pneumatic connection G1 1/2



Grade of filtration 0.01 μm

With connecting plate MS12-AGI, pneumatic connection G2



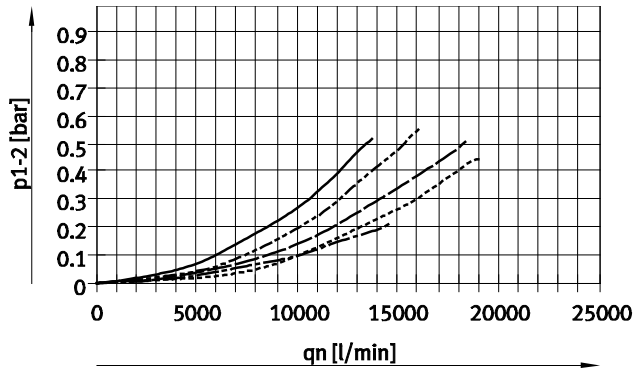
- p_1 : 4 bar
- · - · - p_1 : 6 bar
- - - p_1 : 8 bar
- · · · · p_1 : 10 bar
- · - · - p_1 : 12 bar

Datasheet

Standard flow rate q_n as a function of differential pressure $p_1 - p_2$

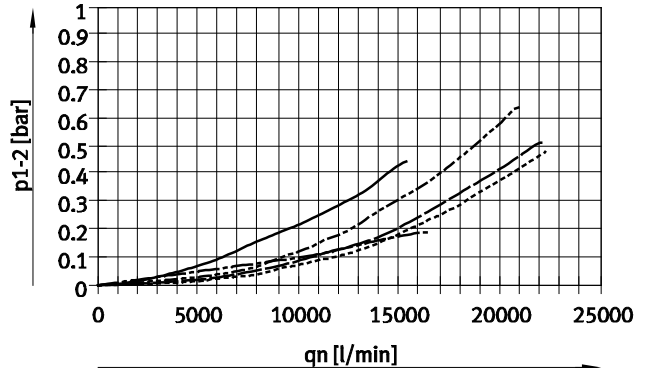
Grade of filtration $1\ \mu\text{m}$

With connecting plate MS12-AGF, pneumatic connection G1



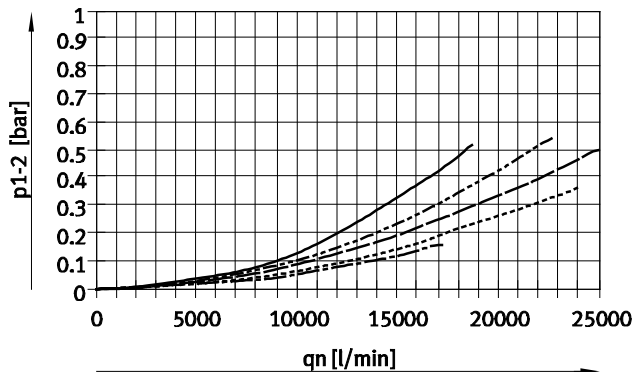
Grade of filtration $1\ \mu\text{m}$

With connecting plate MS12-AGG, pneumatic connection G1 1/4



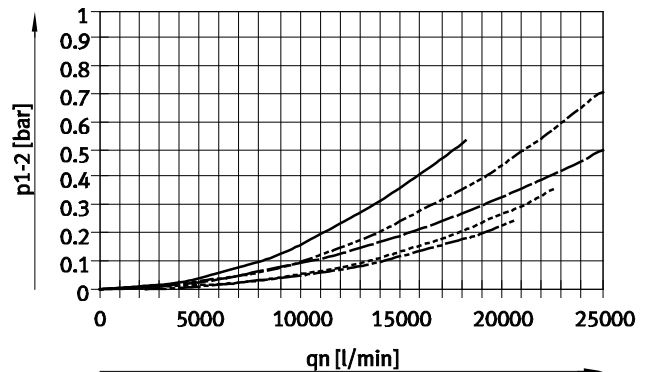
Grade of filtration $1\ \mu\text{m}$

With connecting plate MS12-AGH, pneumatic connection G1 1/2



Grade of filtration $1\ \mu\text{m}$

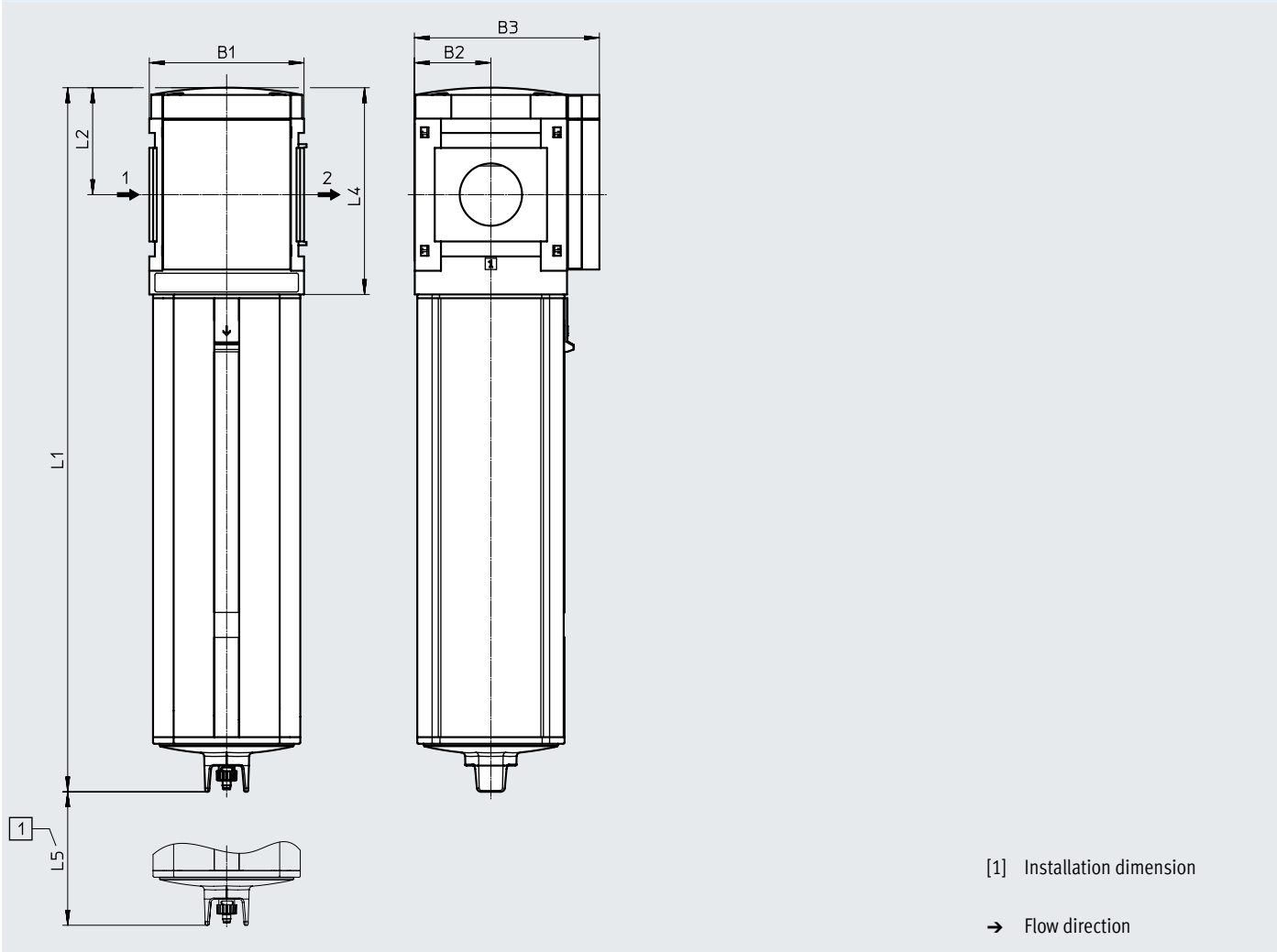
With connecting plate MS12-AGI, pneumatic connection G2



- p_1 : 4 bar
- · - · - p_1 : 6 bar
- - - p_1 : 8 bar
- · · · · p_1 : 10 bar
- · - · - p_1 : 12 bar

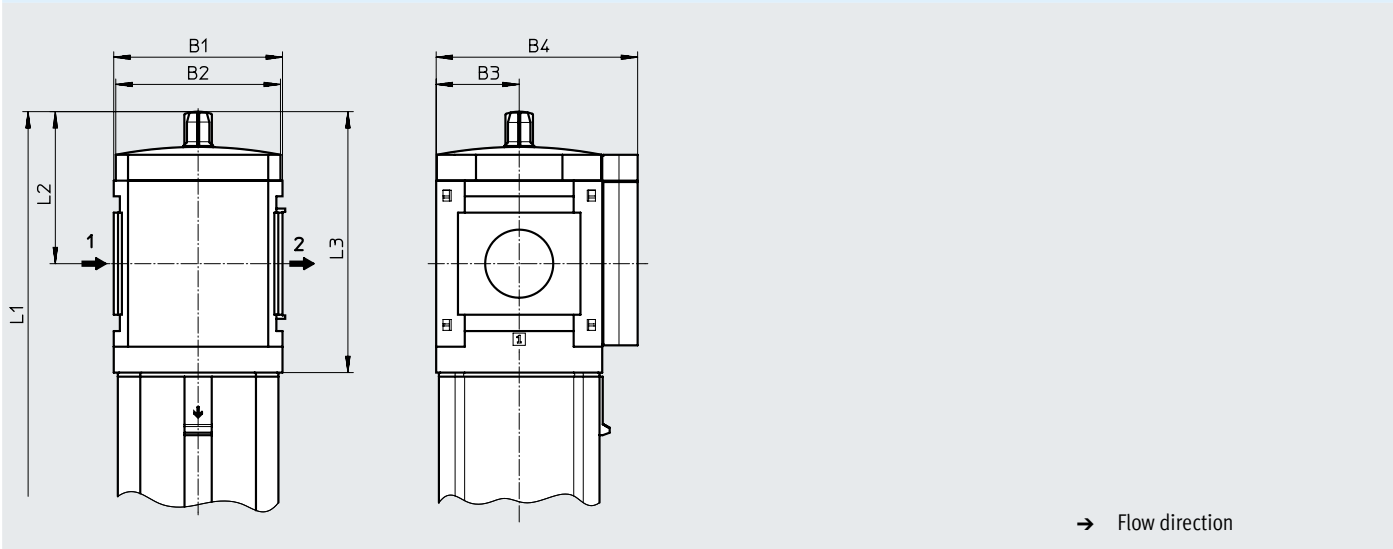
Datasheet

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



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

Dimensions – Differential pressure display Download CAD data → www.festo.com

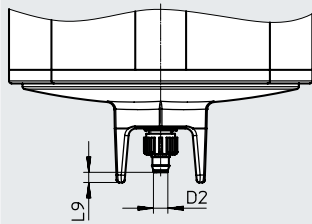


Type	B1	B2	B3	B4	L1	L2	L3
MS12-LFM-...-DA	124	122	61	148	590	112	192

Datasheet

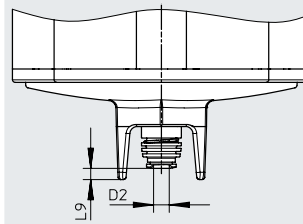
Dimensions – Condensate drain

[M] Manual rotary



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

[V] Fully automatic

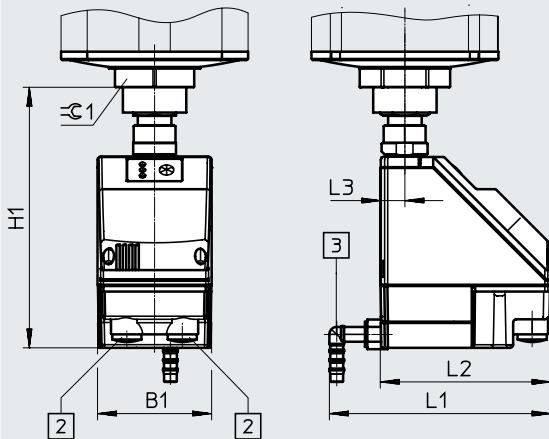


Push-in connector for plastic tubing
PUN-6/PAN-6

Download CAD data → www.festo.com

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

Datasheets → Internet: pwea



Condensate drain PWEA:

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

Type	B1	D2 Ø	H1	L1	L2	L3	L9	≅ 1
MS12-LFM-...-M	–	5.6	–	–	–	–	4	–
MS12-LFM-...-V	–	6.2	–	–	–	–	4.5	–
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 filters 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.

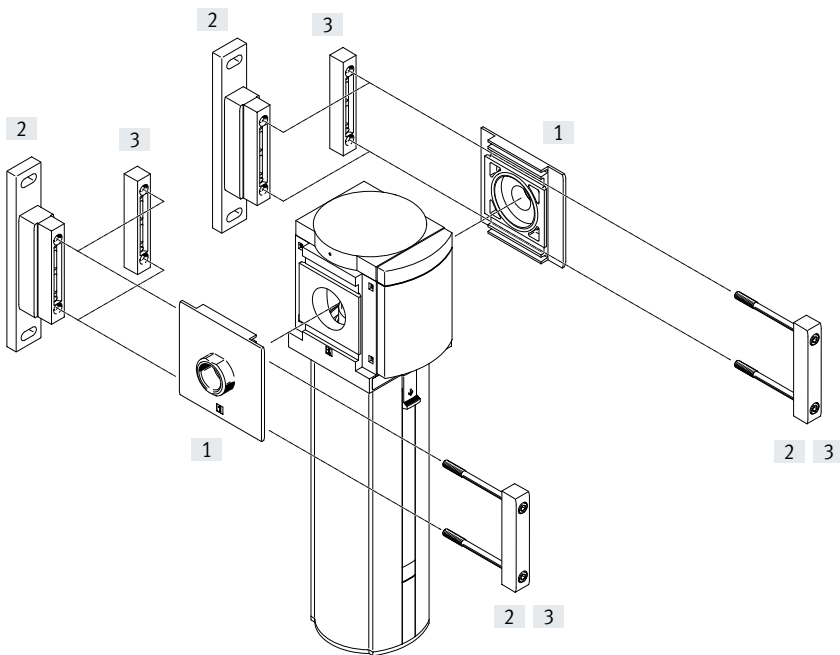
† Note: This product conforms to ISO 1179-1 and ISO 228-1.

Ordering data – Modular product system

Ordering table		Conditions	Code	Enter code
Grid dimension	124			
	[mm]			
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 G1 1/4		-AGG	
	Connecting plate G1 1/2		-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, connection terminals (P1 max. 16 bar)		-E2	
	230 V AC, connection terminals (P1 max. 16 bar)		-E3	
	24 V DC, connection terminals (P1 max. 16 bar)		-E4	
Filter change sensing	Differential pressure display, visual		-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

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

Type codes

001	Series	
MS	MS series	
002	Size	
12	Grid dimension 124 mm	
003	Function	
LFX	Activated carbon filter	
004	Pneumatic connection	
AGF	Sub-base G1	
AGG	Sub-base G1 1/4	
AGH	Sub-base G1 1/2	
AGI	Sub-base G2	
G	Module without connecting thread, without sub-base	

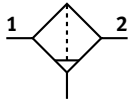
005	Bowl type	
U	Aluminium	
006	Type of mounting	
	Without mounting bracket	
WP	Mounting bracket basic design	
007	Flow direction	
	Flow direction from left to right	
Z	Flow direction from right to left	

Additional variants can be ordered using the modular product system → page 88

- Pneumatic connection
- Type of mounting
- Flow direction

Datasheet

Function



-  - Flow rate
5065 ... 15190 l/min
-  - Temperature range
-10 ... +60 °C
-  - Operating pressure
0 ... 20 bar



- Removes liquid and gaseous oil particles from compressed air using activated carbon
- Eliminates odours and vapours
- Prefiltration with micro filter MS12-LFM-A (grade of filtration 0.01 µm) is recommended
- New filter cartridges → page 91

General technical data

Pneumatic connection 1, 2	
Connecting plate AG...	G1, G1 1/4, G1 1/2 or G2
Module without connecting thread/connecting plate G	–
Design	Activated carbon filter
Type of mounting	With accessories
	In-line installation
Mounting position	Vertical ±5°
Air purity class at the output ¹⁾	Compressed air to ISO 8573-1:2010 [1:4:1]
Bowl guard	Integrated as metal bowl
Residual oil content [mg/m ³]	≤ 0.003

1) It is recommended to replace the filter cartridge with a new cartridge after 1000 operating hours (applicable for ambient temperature of 21 °C). The service life of the filter cartridges is reduced at higher temperatures.

† Note: This product conforms to ISO 1179-1 and 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	5065	7090	11150	15190
$q_{n \max}$				

Operating and environmental conditions

Operating pressure [bar]	0 ... 20
Operating medium	Compressed air to 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 ¹⁾	2

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

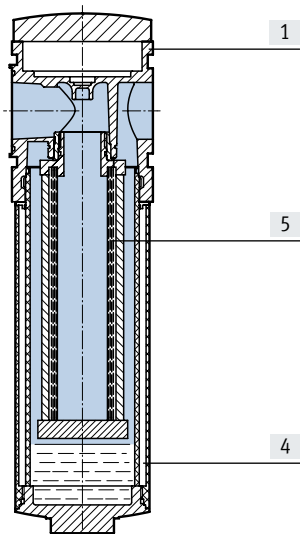
Weight [g]

Activated carbon filter with metal bowl guard U	7000
---	------

Datasheet

Materials

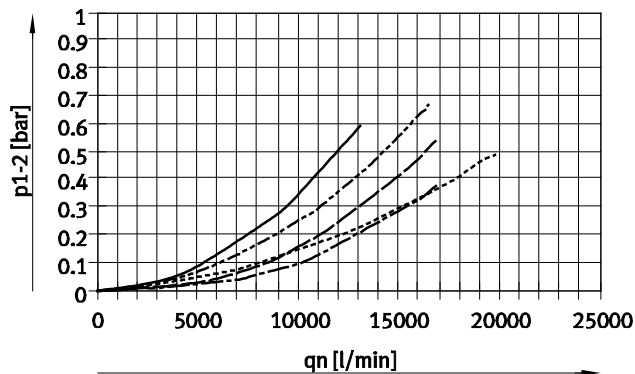
Sectional view



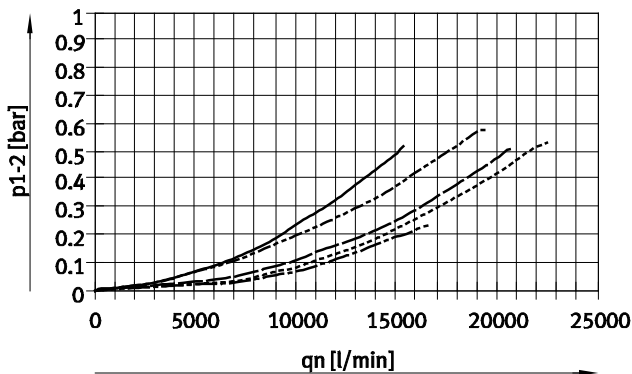
Activated carbon filter		
[1]	Housing	Die-cast aluminium
[4]	Metal bowl	Wrought aluminium alloy
	Inspection window	PC
[5]	Filter	Activated carbon
-	Seals	NBR
Note on materials		RoHS-compliant
LABS (PWIS) conformity		VDMA24364-B1/B2-L

Standard flow rate q_n as a function of differential pressure Δp_{1-2}

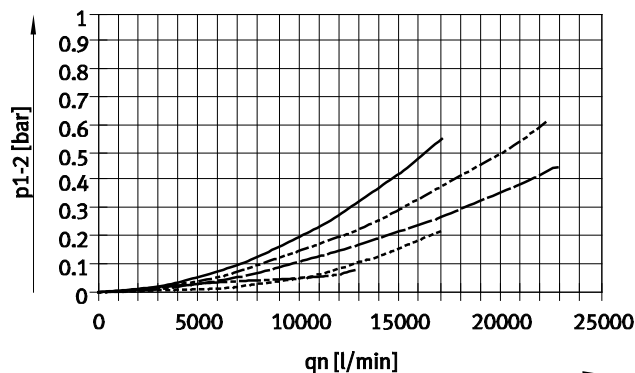
With connecting plate MS12-AGF, pneumatic connection G1



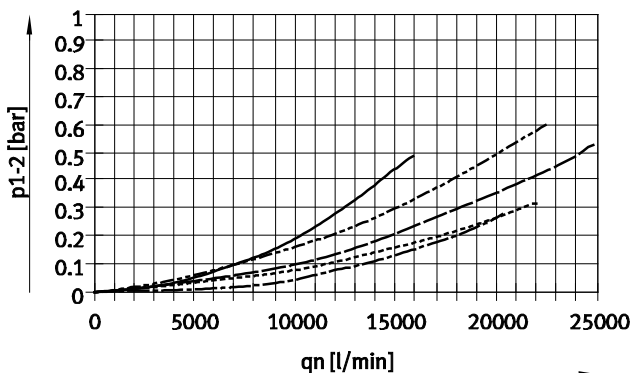
With connecting plate MS12-AGG, pneumatic connection G1 1/4



With connecting plate MS12-AGH, pneumatic connection G1 1/2



With connecting plate MS12-AGI, pneumatic connection G2

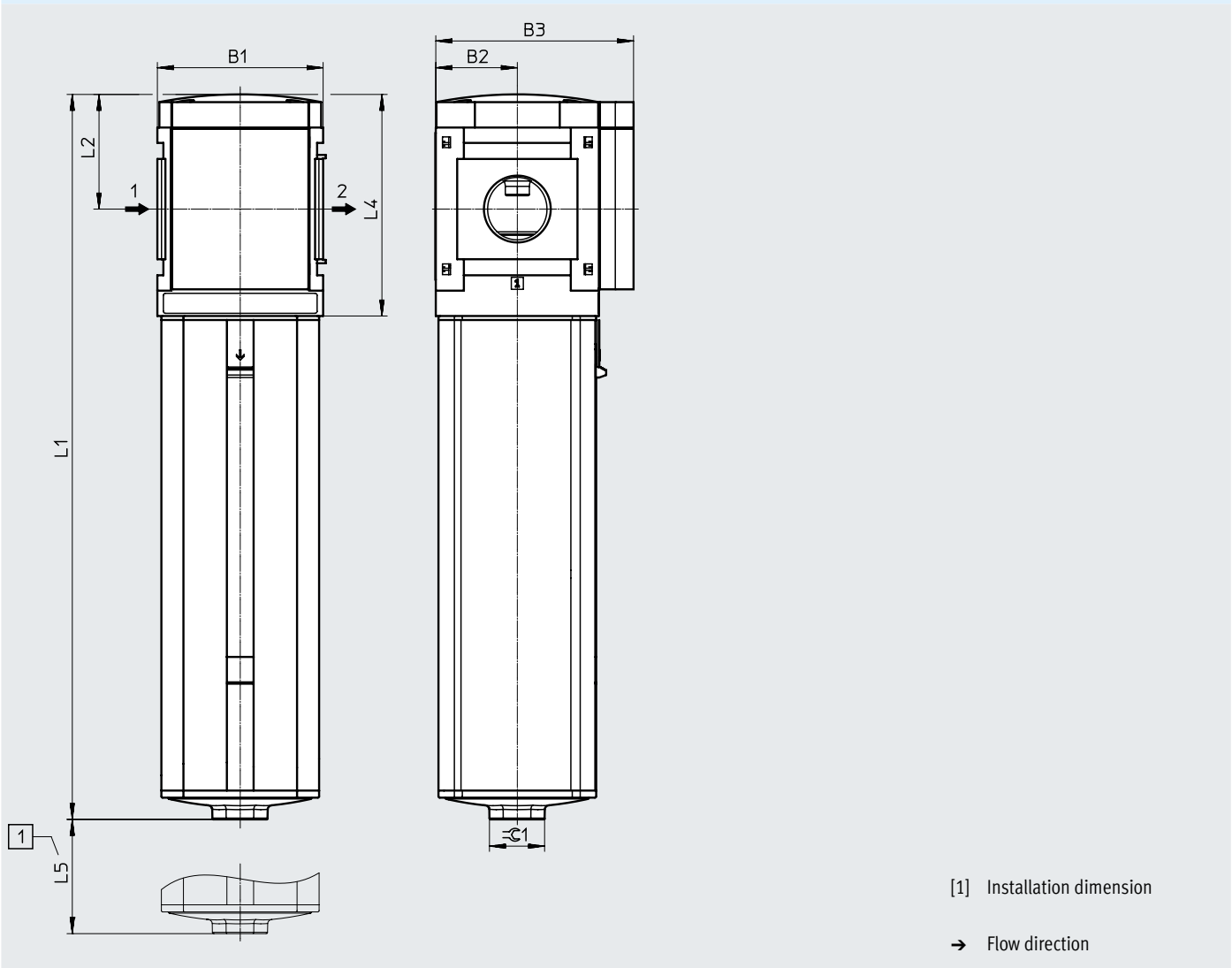


- p_1 : 4 bar
- - - p_1 : 6 bar
- - - p_1 : 8 bar
- p_1 : 10 bar
- . - . p_1 : 12 bar

Datasheet

Dimensions – Basic version

Download CAD data → www.festo.com



Type	B1	B2	B3	L1	L2	L4	L5	≈G 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 ISO 228-1.

Ordering data – Modular product system

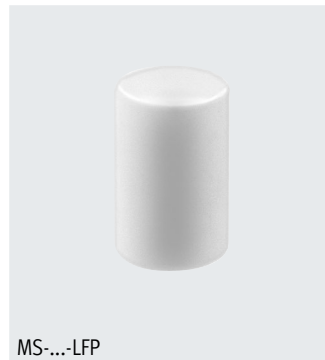
Ordering table				
Grid dimension	[mm]	124	Conditions	Code
Module no.	535043			
Series	Standard		MS	MS
Size	12		12	12
Function	Activated carbon filter		-LFX	-LFX
Pneumatic connection	Connecting plate G1		-AGF	
	Connecting plate G1 1/4		-AGG	
	Connecting plate G1 1/2		-AGH	
	Connecting plate G2		-AGI	
	Module without connecting thread, without connecting plate		-G	
Bowl	Metal bowl		-U	-U
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

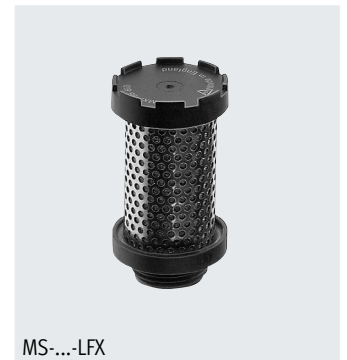
Accessories

Filter cartridges,
MS4/MS6 series

MS-...-LFM



MS-...-LFP



MS-...-LFX

Ordering data						
Size	Filter cartridge	Grade of filtration [μm]	Information on materials - Filter	CRC ¹⁾	Part no.	Type
MS4	Micro filter cartridge	0.01	–	–	162674	MS4/D-MINI-LFM-A ²⁾
	Fine filter cartridge	1	–	–	162677	MS4/D-MINI-LFM-B ²⁾
	Filter cartridge (colour: blue)	5	PE	2	534501	MS4-LFP-C
	Filter cartridge (colour: white)	40	PE	2	534502	MS4-LFP-E
	Activated carbon filter cartridge	–	Activated carbon	–	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	PE	2	534499	MS6-LFP-C
	Filter cartridge (colour: white)	40	PE	2	534500	MS6-LFP-E
	Activated carbon filter cartridge	–	Activated carbon	–	532911	MS6-LFX
MS4-...-B	Filter cartridge (colour: blue)	5	PE	2	8129064	MS4-LFP1-C
	Filter cartridge (colour: white)	40	PE	2	8129062	MS4-LFP1-E
MS6-...-B	Filter cartridge (colour: blue)	5	PE	2	8129063	MS6-LFP1-C
	Filter cartridge (colour: white)	40	PE	2	8129061	MS6-LFP1-E
High flow rate HF						
MS6	Micro filter cartridge	0.01	Borosilicate fibre	2	552093	MS6-LFM-A-HF
	Fine filter cartridge	1	Borosilicate fibre	2	552092	MS6-LFM-B-HF
	Activated carbon filter cartridge	–	Activated carbon	2	552094	MS6-LFX-HF ²⁾
Application area HP, suitable for sealing air and purge air						
MS6	Micro filter cartridge	0.01	Borosilicate fibre	2	547922	MS6-LFM-AI ²⁾
	Fine filter cartridge	1	Borosilicate fibre	2	547923	MS6-LFM-BI ²⁾
	Activated carbon filter cartridge	–	Activated carbon	2	547925	MS6-LFX-AKI ²⁾

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

2) RoHS-compliant

Accessories

Filter cartridges,
MS9 series



MS-9-LFM



MS-9-LFX

Ordering data						
Size	Filter cartridge	Grade of filtration [µm]	Information on materials - filter	CRC ¹⁾	Part no.	Type
MS9	Micro filter cartridge	0.01	Borosilicate fibre	2	553036	MS9-LFM-A
	Fine filter cartridge	1	Borosilicate fibre	2	553037	MS9-LFM-B
	Filter cartridge	5	PE	2	570309	MS9-LFP-C ²⁾
	Filter cartridge	40	PE	2	570310	MS9-LFP-E ²⁾
	Activated carbon filter cartridge	–	Activated carbon	2	552946	MS9-LFX
High flow rate HF						
MS9	Micro filter cartridge	0.01	Borosilicate fibre	2	552944	MS9-LFM-A-HF ³⁾
	Fine filter cartridge	1	Borosilicate fibre	2	552945	MS9-LFM-B-HF ³⁾

1) More information: www.festo.com/x/topic/crc
2) RoHS-compliant
3) LABS (PWIS) conformity: VDMA24364-B1/B2-L

Accessories

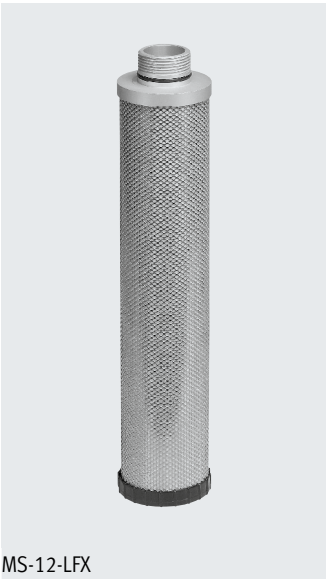
Filter cartridges, MS12 series



MS-12-LFM-B



MS-12-LFM-A



MS-12-LFX

Ordering data							
Size	Filter cartridge	Grade of filtration [µm]	Information on materials - filter	CRC ¹⁾	Weight [g]	Part no.	Type
MS12	Micro filter cartridge	0.01	Borosilicate fibre	2	425	537146	MS12-LFM-A ²⁾
	Fine filter cartridge	1	Borosilicate fibre	2	395	537145	MS12-LFM-B ²⁾
	Filter cartridge	5	Sintered bronze	2	295	537143	MS12-LFP-C
	Filter cartridge	40	Sintered bronze	2	295	537144	MS12-LFP-E
	Activated carbon filter cartridge	-	Activated carbon	2	445	537147	MS12-LFX ²⁾

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

2) RoHS-compliant