

Filters MS-LF/LFM/LFX, MS series

FESTO



Key features

MS series service unit components

Solutions for every application

With its large product range, highly effective components and a wide choice of functions, the MS series from Festo offers a complete concept for compressed air preparation. It is suitable for simple standard applications as well as for application-specific solutions to the highest quality standards. Available as individual components, pre-assembled combinations ex-stock,

application-specific combinations or complete turnkey solutions. The five sizes in the MS series achieve maximum flow rates with low space requirements.

Freely combinable function modules

All the individual components, such as 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. The modular design means that the components can be combined as required. The simple connection system saves time when replacing

individual modules without needing to dismantle the entire combination. Many of the components are also UL and ATEX certified.

CAD models and configurator

Convenient tools for planning and selecting application-specific individual components and combinations. The product configurator can be used to configure customised solutions and transfer the order data quickly and easily.

Engineering tools

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



Integrated sensors

Pressure and flow sensors

Safety functions

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

Energy savings

Service unit combinations MSE6

Intelligent mix of sizes



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



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



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



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

Size differences

Size	MS2	MS4	MS6	MS9	MS12
Grid dimension [mm]	25	40	62	90	124
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 qn ¹⁾ [l/min]	350	1800	6500	20000	22000

1) Using pressure regulator MS-LR as an example

Key features

Note

Information

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

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

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





Design of a service unit combination

The order in which the individual service unit components are combined is relevant for safety and functionality. It is not possible to combine the service unit components in every 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 arranging individual service unit components. It ensures that it complies with the applicable rules. As a result, you get a fully assembled combination, including UL or ATEX certification if you need it. When arranging a combination of individually configured and ordered service unit components, the points on the right must be adhered to under all circumstances.

- Regulators MS-LFR/LR/LRP/LRE are only permissible in the flow direction with the same or decreasing pressure regulation range
- Filters MS-LFR/LF/LFM/LFX are only permissible in the flow direction with an increasing grade of filtration
- Lubricators MS-LOE are not permitted in the flow direction upstream from 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 MS series service unit components

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








Key features

Product range for MS series service unit components								
Type	Description	Size	Pneumatic connection					
			Push-in connector	Female thread			Connecting plate with thread	
			M	G	NPT	G	NPT	
Individual devices								
Filter regulators MS-LFR								Datasheets → Internet: ms-lfr
	Filter and pressure regulator in a single device, grade of filtration 5 or 40 µm	2	QS-6	M5	–	–	–	–
		4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
Filter MS-LF								Datasheets → Internet: ms-lf
	Grade of filtration 5 or 40 µm	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
Fine and micro filters MS-LFM								Datasheets → Internet: ms-lfm
	Grade of filtration 0.01 or 1 µm	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
Activated carbon filters MS-LFX								Datasheets → Internet: ms-lfx
	For removing liquid and gaseous oil particles	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
Water separators MS-LWS								Datasheets → Internet: ms-lws
	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 MS series service unit components								
Type	Description	Size	Pneumatic connection				Connecting plate with thread	
			Push-in connector	Female thread				
			M	G	NPT	G	NPT	
Individual devices								
Pressure regulators MS-LR								Datasheets → Internet: ms-lr
	For setting the required operating pressure, 4 pressure regulation ranges	2	QS-6	M5	–	–	–	–
		4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
Pressure regulators MS-LRB								Datasheets → Internet: ms-lrb
	For configuring a regulator manifold with independent pressure regulation ranges. Pressure output is to the front or rear.	4	–	–	1/4	–	1/8, 1/4, 3/8	–
		6	–	–	1/2	–	1/4, 3/8, 1/2, 3/4	–
Precision pressure regulators MS-LRP								Datasheets → Internet: ms-lrp
	For precise setting of the required operating pressure, 4 pressure regulation ranges, pressure hysteresis 0.02 bar	6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
Precision pressure regulators MS-LRPB								Datasheets → Internet: ms-lrpb
	For configuring a regulator manifold with independent pressure regulation ranges. Pressure output is to the front or rear.	6	–	–	1/2	–	1/4, 3/8, 1/2, 3/4	–
Electrical pressure regulators MS-LRE								Datasheets → Internet: ms-lre
	Electrically adjustable pressure regulator, 4 pressure regulation ranges	6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
Lubricators MS-LOE								Datasheets → Internet: ms-loe
	Add a precisely adjustable amount of oil to the compressed air. The amount of oil mist is proportional to the compressed air flow rate.	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–

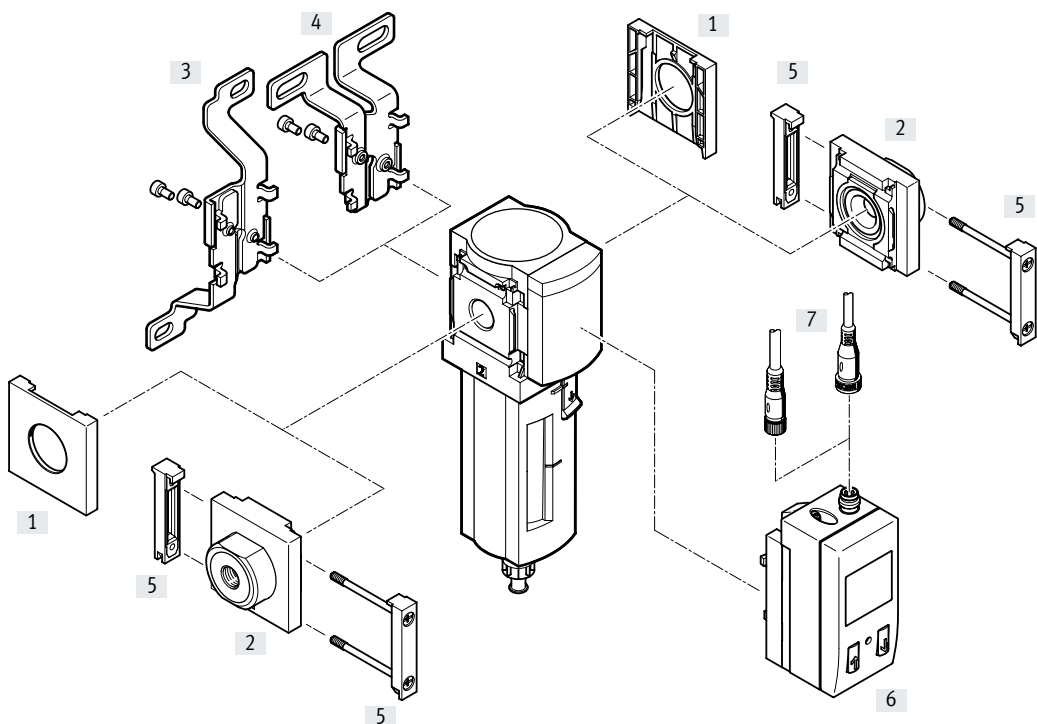
Key features

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

Key features

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

Peripherals overview



Note

Additional accessories:

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

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 NEBU-M8...-LE3, NEBU-M12...-LE4	■ for LFM	■ for LFM	■ for LFM	■ for LFM	nebu
-	Mounting bracket MS4/6-WP, WPB, WPE, WPM	-	■	■	■	ms4-wp, ms6-wp

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

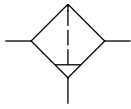
Further variants can be ordered using the modular system

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

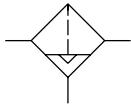
- Pneumatic connection
- Condensate drain
- Operating range (for LFM and LFX only)
- Filter contamination indicator (for LFM only)
- Type of mounting
- EU certification
- UL certification
- Flow direction

Datasheet

Function
Condensate drain
Manual



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 are replaceable.



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

General technical data		MS4	MS6
Size			
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	
Air quality 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 Semi-automatic Fully automatic - Fully automatic, electrically actuated	
Max. condensate volume	[cm ³]	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 $q_{nN}^{1)}$ [l/min]						
Size		MS4		MS6		
Pneumatic connection		G1/8	G1/4	G1/4	G3/8	G1/2
Grade of filtration	5 µm	1000	1300	2000	3000	3200
	40 µm	1100	1700	2500	3800	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		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:-] Inert gases		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:-]
Ambient temperature [°C]	-10 ... +60		+5 ... +60		+5 ... +60		+1 ... +60
Temperature of medium [°C]	-10 ... +60		+5 ... +60		+5 ... +60		+1 ... +60
Storage temperature [°C]	-10 ... +60		-10 ... +60		-10 ... +60		+1 ... +60
Corrosion resistance class CRC ²⁾	2						
Suitability for the food industry 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) Corrosion resistance class CRC 2 to Festo standard FN 940070

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

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

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

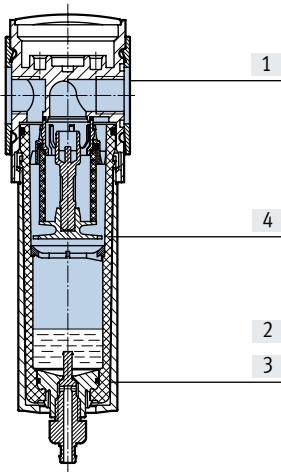
1) Additional information: www.festo.com/catalogue/ms → Support/Downloads

Weight [g]		
Size	MS4	MS6
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

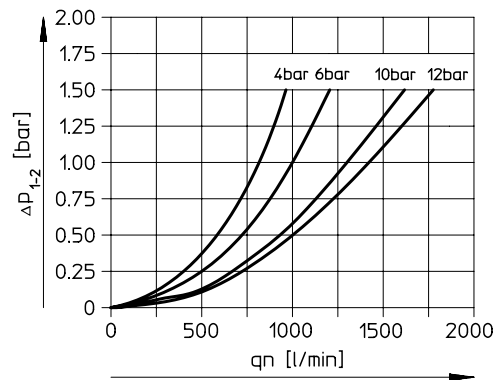


Filters		
[1]	Housing	Die-cast aluminium
[2]	Plastic bowl guard	PC
[3]	Metal bowl	Wrought aluminium alloy, Die-cast aluminium
	Inspection window	PA
[4]	Filter element	PE
-	Seals	NBR
Note on materials		RoHS-compliant Free of copper and PTFE

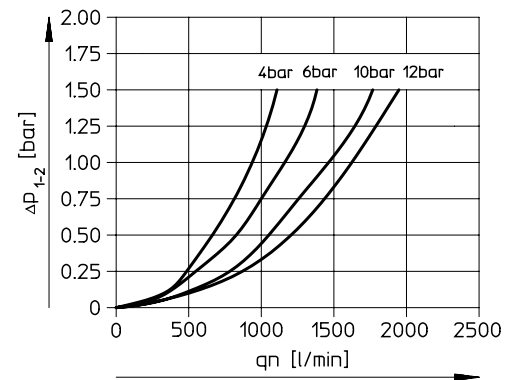
Standard flow rate q_n as a function of differential pressure Δp_{1-2}

Grade of filtration 5 μm

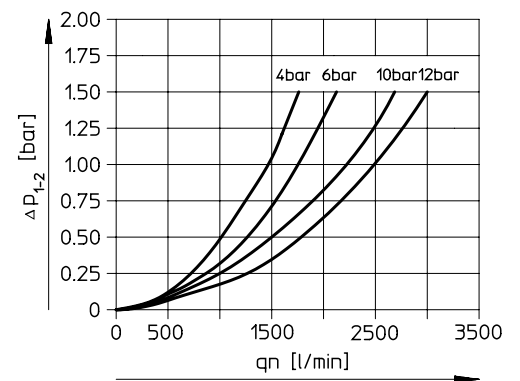
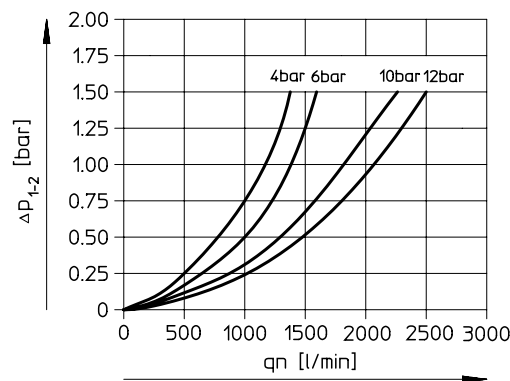
MS4-LF-1/8



Grade of filtration 40 μm



MS4-LF-1/4

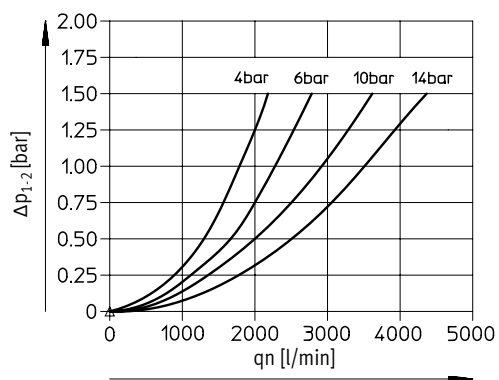


Datasheet

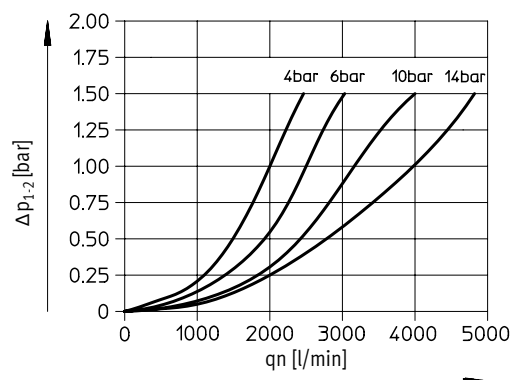
Standard flow rate q_n as a function of differential pressure Δp_{1-2}

Grade of filtration 5 μm

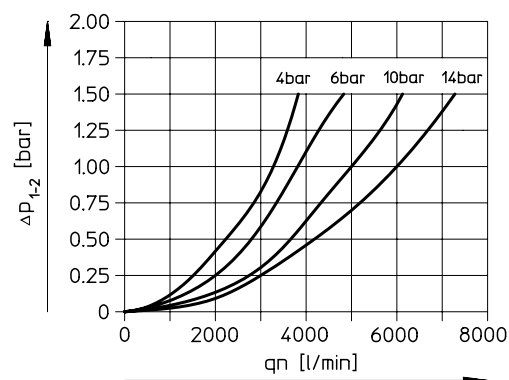
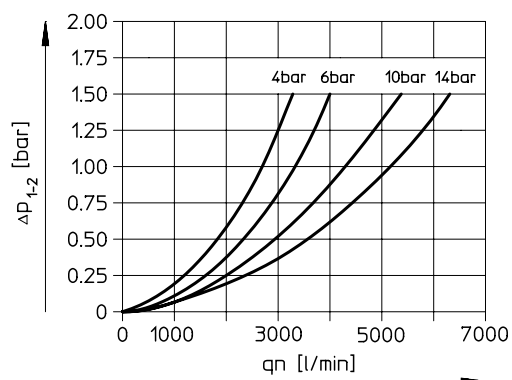
MS6-LF-1/4



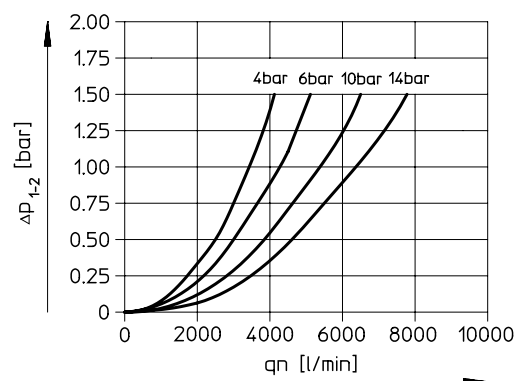
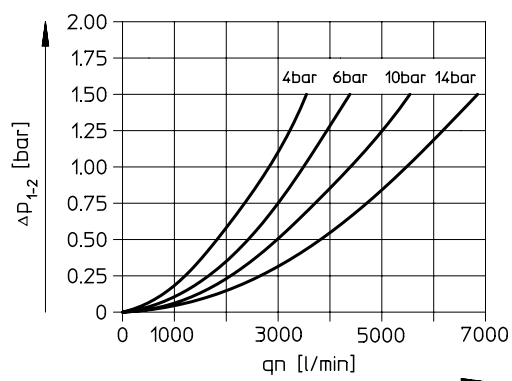
Grade of filtration 40 μm



MS6-LF-3/8



MS6-LF-1/2



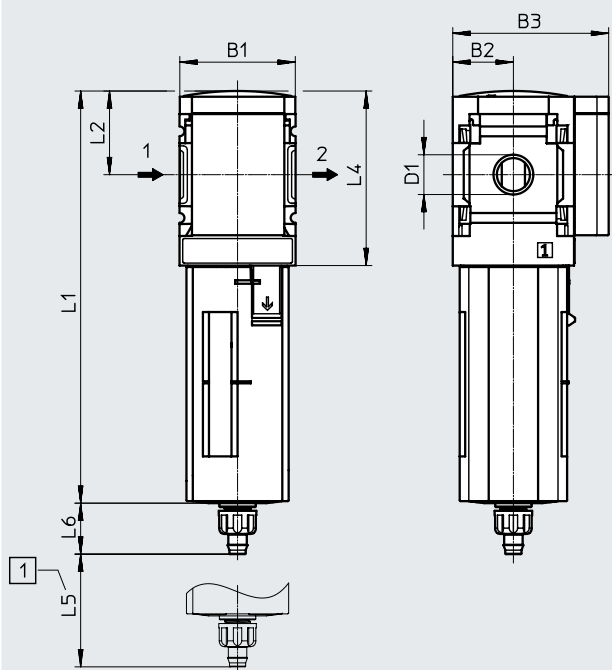
Datasheet

Dimensions – Basic version MS4-LF

Download CAD data → www.festo.com

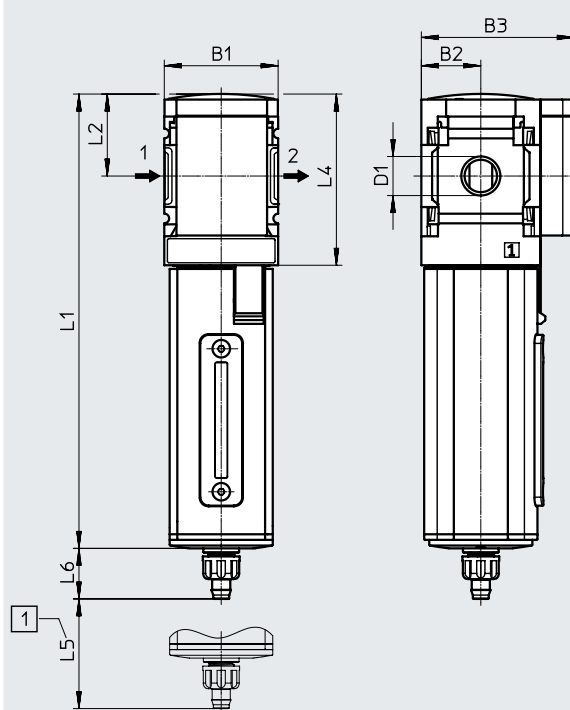
Condensate drain, manual

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.

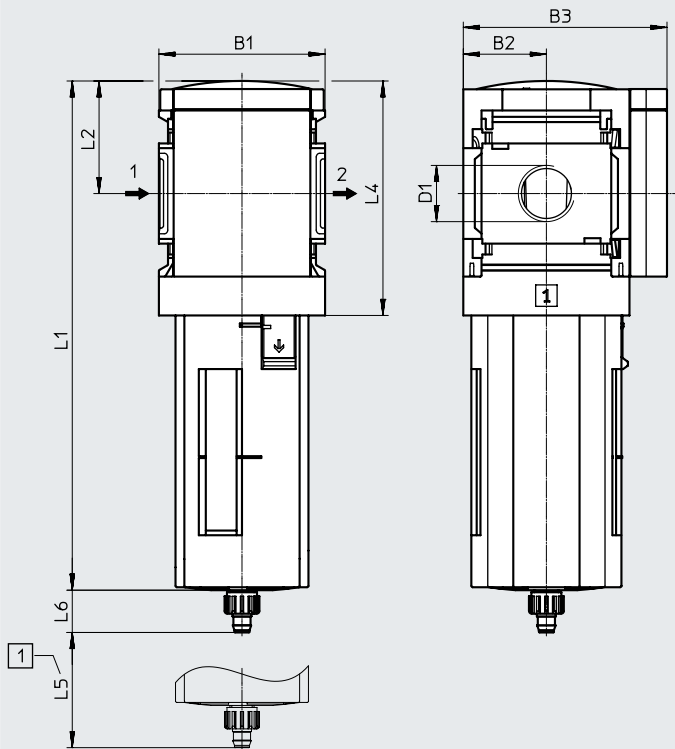
Datasheet

Dimensions – Basic version MS6-LF

Download CAD data → www.festo.com

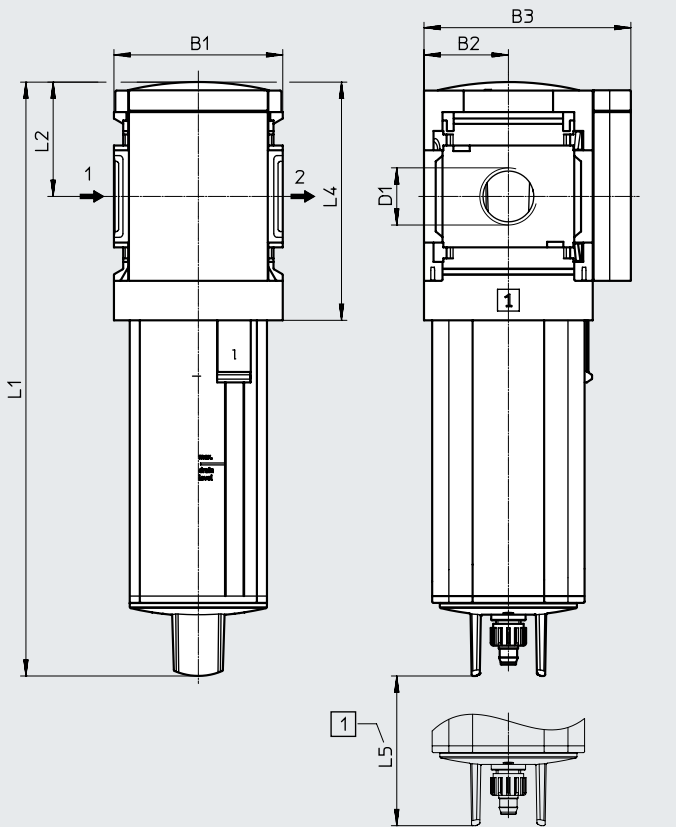
Condensate drain, manual

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-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

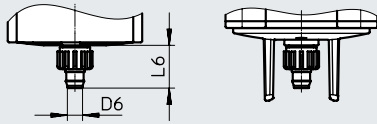
Download CAD data → www.festo.com

[M] Manual

MS4-...-R/U-M

MS6-...-R-M

MS6-...-U-M



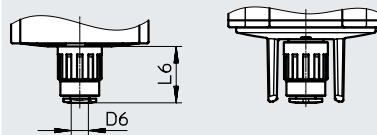
Barbed connector for plastic tubing PUN(-H)-8x1.25

[H] Semi-automatic

MS4-...-R/U-H

MS6-...-R-H

MS6-...-U-H



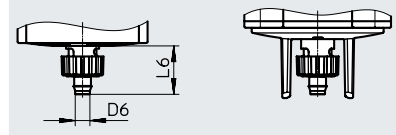
Push-in connector for plastic tubing PUN-6/PAN-6

[V] Fully automatic

MS4-...-R/U-V

MS6-...-R-V

MS6-...-U-V



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

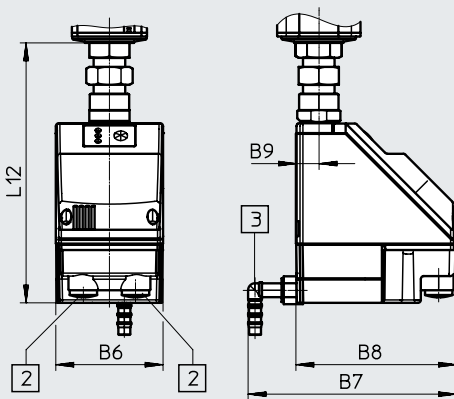
Type	D6 ∅	L6
Plastic bowl guard R		
MS4-LF-...-M	5.6	17.7
MS6-LF-...-M		15.8
Metal bowl U		
MS4-LF-...-M	5.6	17.7
MS6-LF-...-M		–

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

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

[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	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	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	G1/4	–	–	529400	MS4-LF-1/4-ERM-Z
MS6	Manual	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	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	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				Conditions	Code	Enter code
Grid dimension	[mm]	40	62			
Module no.		527695	527668			
Series		Standard			MS	MS
Size		4	6		...	
Function		Filters			-LF	-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 attaching 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

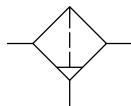
Datasheet

Function

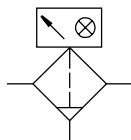
Condensate drain

Manual

Without differential pressure display



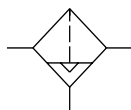
With differential pressure display or filter contamination indicator



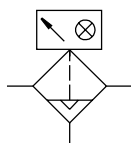
Condensate drain





Semi- or fully automatic

Without differential pressure display



With differential pressure display or filter contamination indicator



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



- High-efficiency filter for exceptionally clean compressed air
- Air quality to ISO 8573-1:2010
- Choice of manual, semi-automatic, fully automatic or fully automatic, electrically actuated condensate drain
- Available with differential pressure display for indicating filter contamination
- Available with electronic filter contamination indicator
- Available with filter cartridge for low flow rates, suitable for sealing air and purge air applications
- Optional EX4 version 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		MS4	MS6
Size			
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	[µm]	0.01 (micro filter MS-LFM-A) 1 (fine filter MS-LFM-B)	
Air quality class at the output		Compressed air to ISO 8573-1:2010 [1:7:2] (grade of filtration 0.01 µm, micro filter MS-LFM-A) Compressed air to ISO 8573-1:2010 [5:7:3] (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 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 replacement of 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		MS4	MS6
Size			
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

Standard flow rate $q_n^{1)}$ [l/min]				
Size	MS4	MS6		
Variant	Standard	Standard	High flow rate HF	Range of application HP, suitable for sealing air and purge air

Micro filter MS-LFM-A				
Max. standard flow rate for air purity class	360	900	2500	400
$q_{n \max}$				
Min. standard flow rate for air purity class	54	135	150	60
$q_{n \min}$				

Fine filter MS-LFM-B				
Max. standard flow rate for air purity class	360	950	3000	500
$q_{n \max}$				
Min. standard flow rate for air purity class	54	140	188	60
$q_{n \min}$				

 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		Semi-automatic		Fully automatic		Fully automatic, electrically actuated E2, E3, E4 MS6	
	M	MS6	H	MS6	V	MS6		
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 [6:8:4] ²⁾							
	Inert gases							
Ambient temperature	[°C]	-10 ... +60 (0 ... +50) ³⁾		+5 ... +60 (+5 ... +50) ³⁾		+5 ... +60 (+5 ... +50) ³⁾		+1 ... +60 (+1 ... +50) ³⁾
Temperature of medium	[°C]	-10 ... +60 (0 ... +50) ³⁾		+5 ... +60 (+5 ... +50) ³⁾		+5 ... +60 (+5 ... +50) ³⁾		+1 ... +60 (+1 ... +50) ³⁾
Storage temperature	[°C]	-10 ... +60 (0 ... +50) ³⁾		-10 ... +60 (0 ... +50) ³⁾		-10 ... +60 (0 ... +50) ³⁾		+1 ... +60 (+1 ... +50) ³⁾
Corrosion resistance class CRC ⁴⁾		2						
Suitability for the food industry 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) Corrosion resistance class CRC 2 to Festo standard FN 940070

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

 5) Additional information: www.festo.com/catalogue/ms → 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			

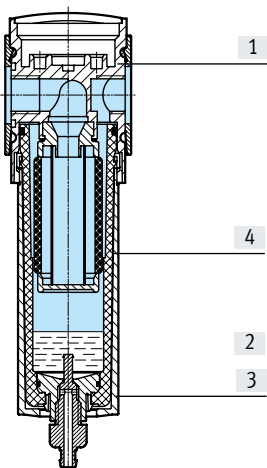
ATEX	
EU certification	EX4
ATEX category for gas	II 2G
Type of ignition protection for gas	Ex h IIC T6 Gb X
ATEX category for dust	II 2D
Type of ignition protection for dust	Ex h IIIC T60°C Db X
Explosion-proof ambient temperature	+5°C ≤ Ta ≤ +60°C
CE marking (see declaration of conformity) ¹⁾	To EU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

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

Weight [g]			
Size	MS4	MS6	
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 filters		
[1]	Housing	Die-cast aluminium
[2]	Plastic bowl guard	PC
[3]	Metal bowl	Wrought aluminium alloy, Die-cast aluminium
	Inspection window	PA
[4]	Filters	Borosilicate fibre
-	Seals	NBR
Note on materials		RoHS-compliant Free of copper and PTFE

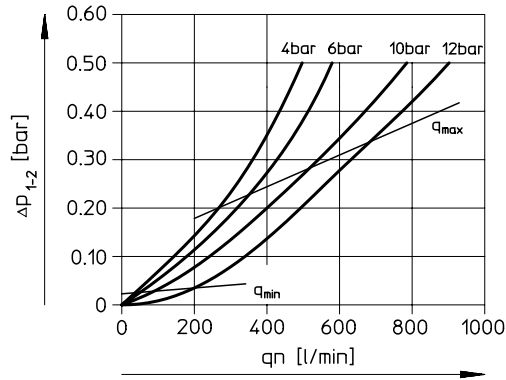
Filter contamination indicator	
Housing	PA, POM
Adapters	PA
Display	PC
Seals	NBR
Note on materials	Free of copper and PTFE

Datasheet

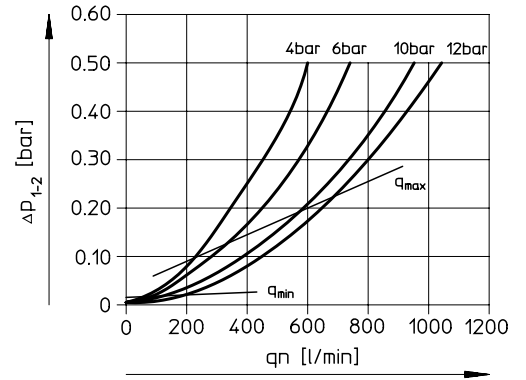
Standard flow rate q_n as a function of differential pressure Δp_{1-2}

Grade of filtration 0.01 μm

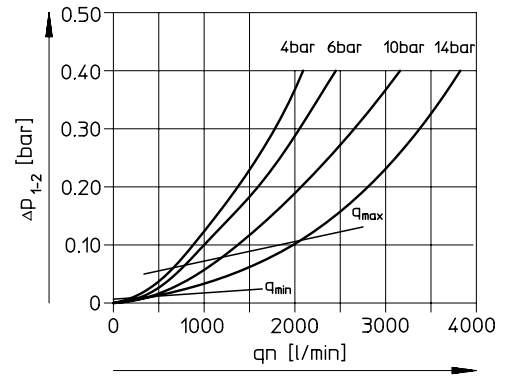
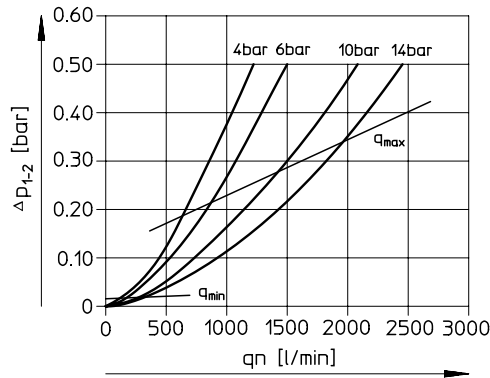
MS4-LFM-1/8 and MS4-LFM-1/4



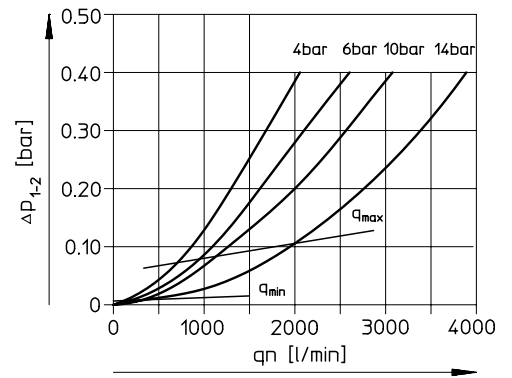
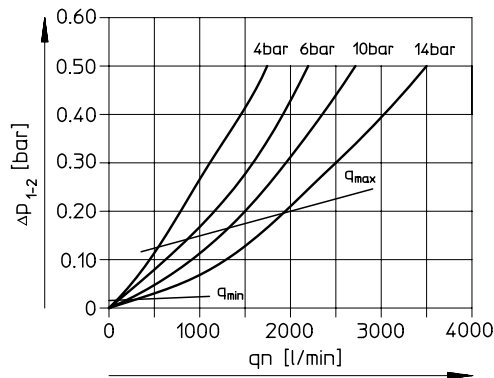
Grade of filtration 1 μm



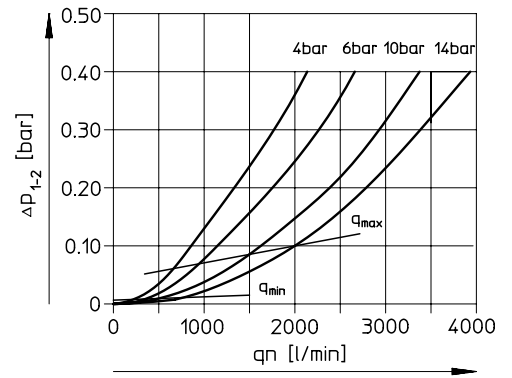
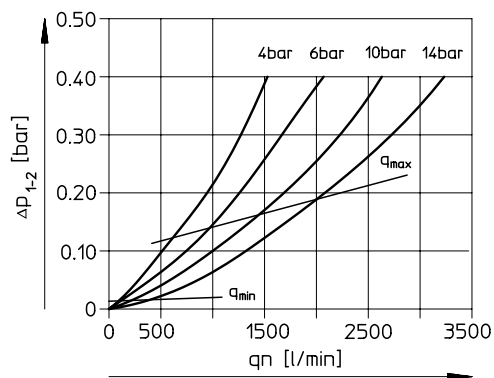
MS6-LFM-1/4



MS6-LFM-3/8



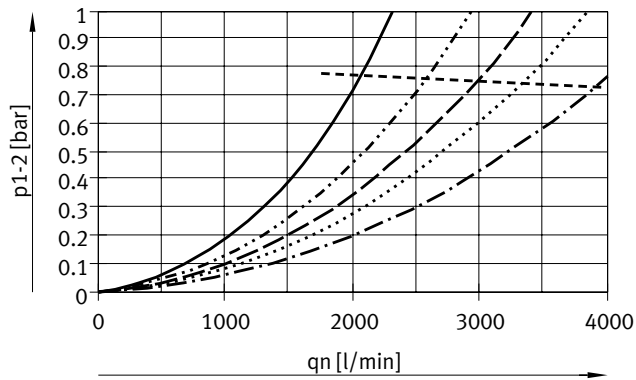
MS6-LFM-1/2



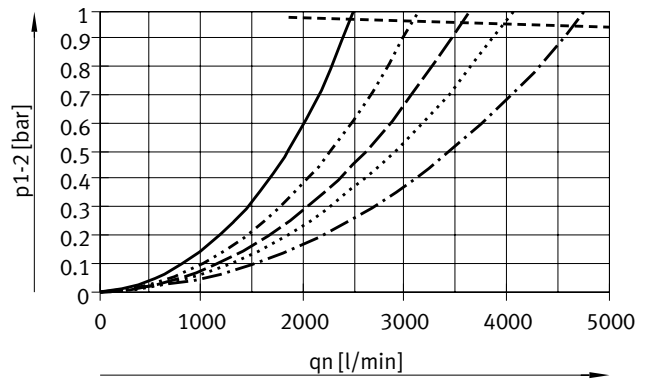
Datasheet

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

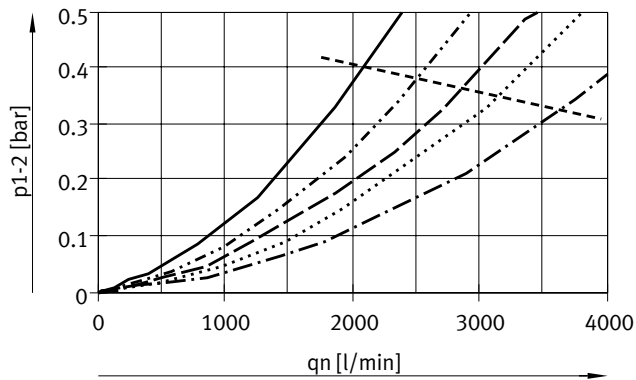
MS6-LFM-1/4-...-HF, grade of filtration 0.01 μm



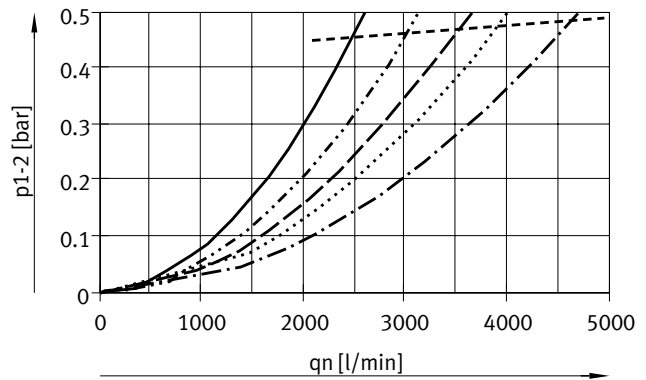
MS6-LFM-1/4-...-HF, grade of filtration 1 μm



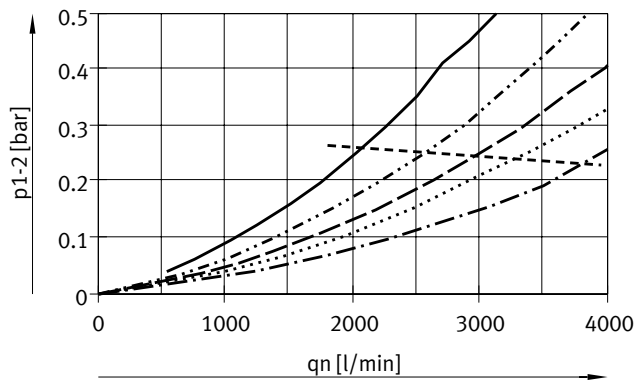
MS6-LFM-3/8-...-HF, grade of filtration 0.01 μm



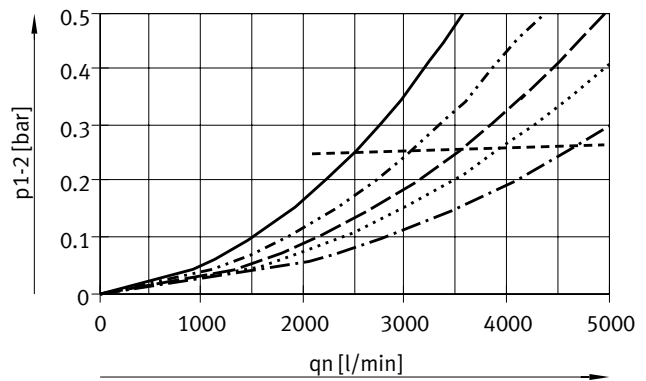
MS6-LFM-3/8-...-HF, grade of filtration 1 μm



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)
- p1: 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)
- p1: 8 bar
- p 1: 10 bar (q_{min} : 194 l/min)
- p 1: 14 bar (q_{min} : 230 l/min)
- q_{max}

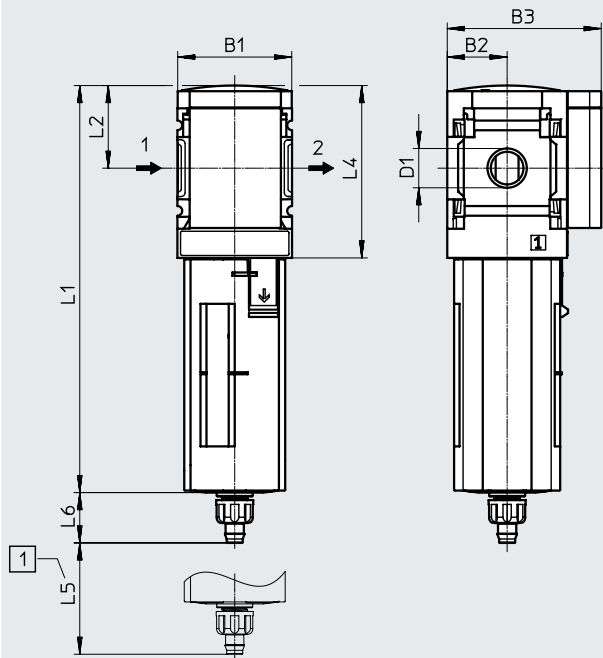
Datasheet

Dimensions – Basic version MS4-LFM

Download CAD data → www.festo.com

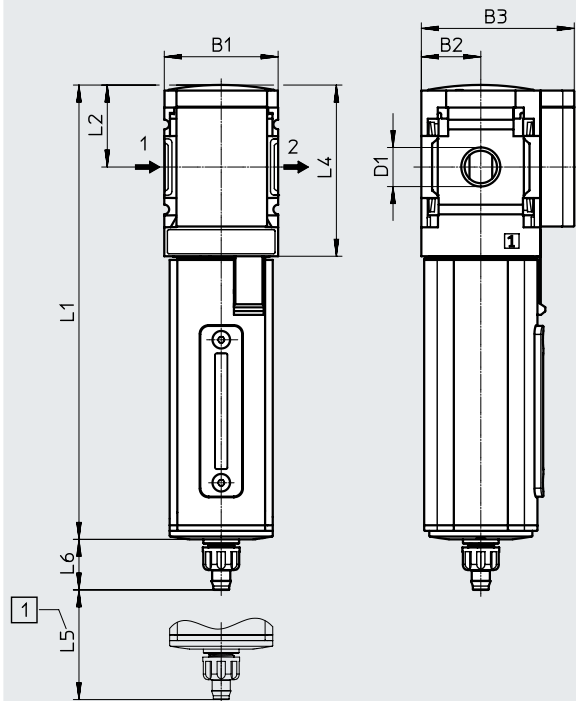
Condensate drain, manual

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.

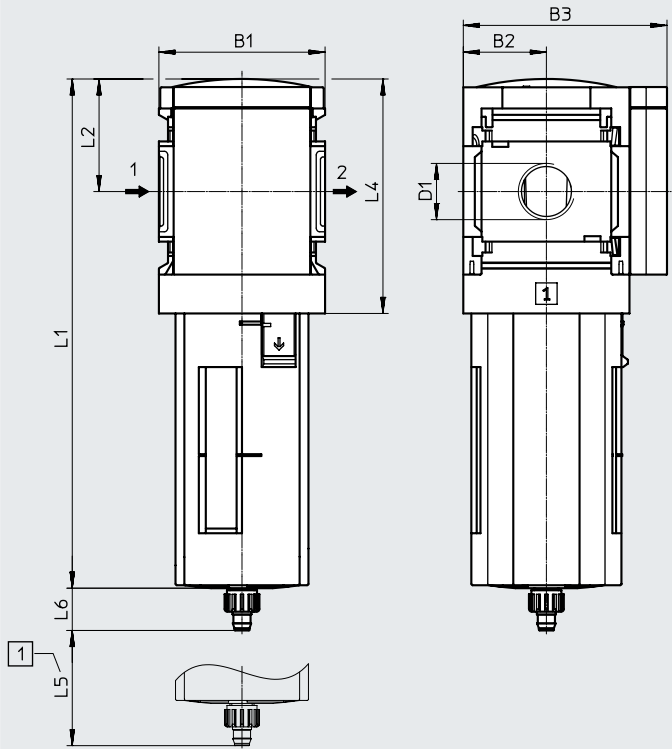
Datasheet

Dimensions – Basic version MS6-LFM

Download CAD data → www.festo.com

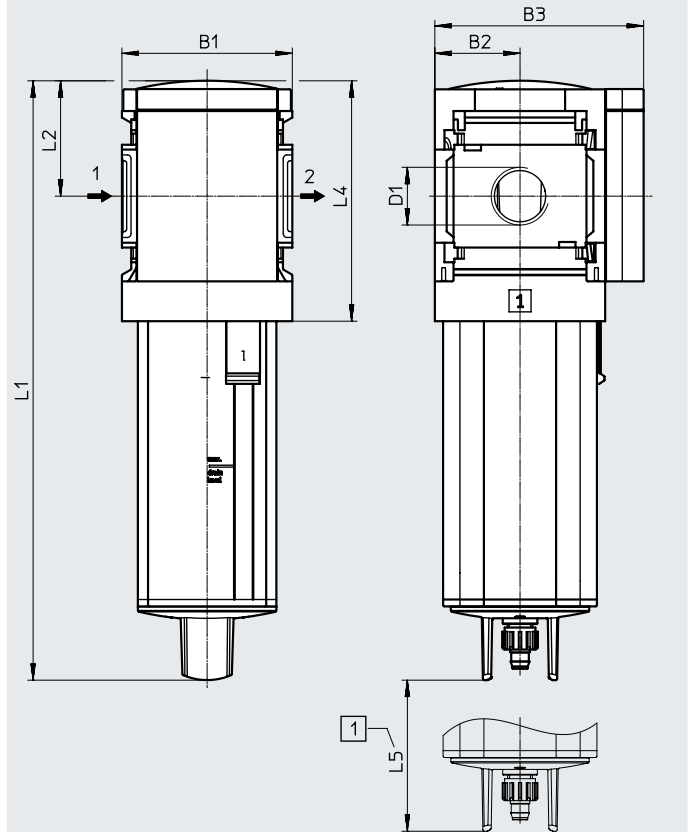
Condensate drain, manual

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.

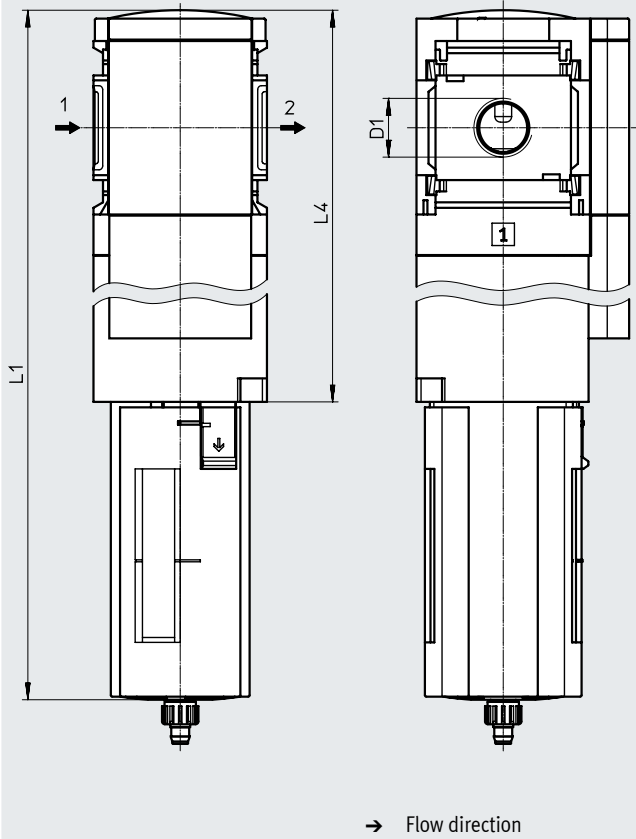
Datasheet

Dimensions – High flow rate HF

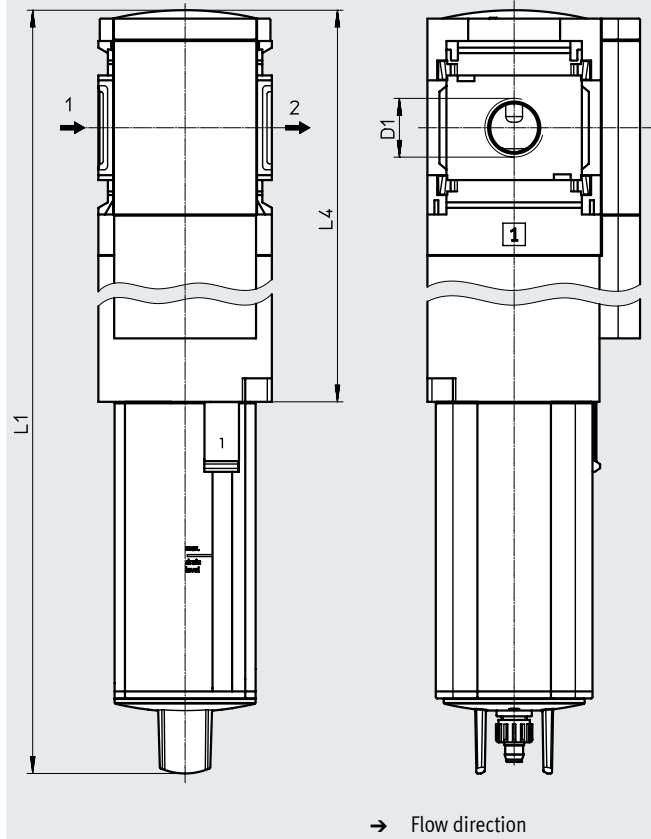
Download CAD data → www.festo.com

Condensate drain, manual

With plastic bowl guard R



With metal bowl U



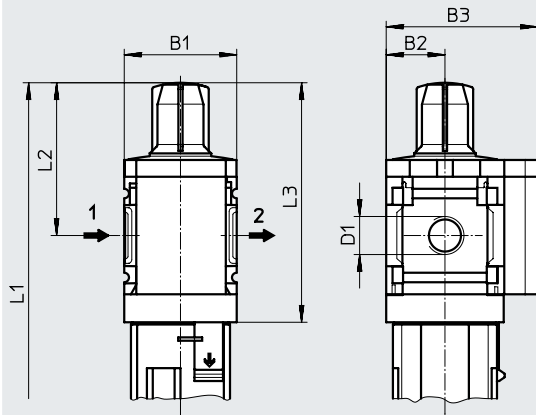
Type	D1	L1		L4
		Plastic bowl guard	Metal bowl	
MS6-LFM-1/4-...-HF	G1/4	313	340	207
MS6-LFM-3/8-...-HF	G3/8			
MS6-LFM-1/2-...-HF	G1/2			

† - 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

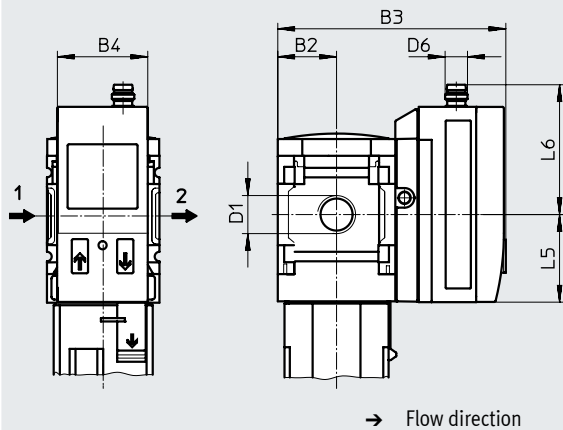
Type	B1	B2	B3	D1	L1		L2	L3
					Plastic bowl guard	Metal bowl		
MS4-LFM-1/8-...-DA	40	21	54	G1/8	168.4	186.8	55.8	87.3
MS4-LFM-1/4-...-DA				G1/4				
MS6-LFM-1/4-...-DA	62	31	76	G1/4	229	257	78	124
MS6-LFM-3/8-...-DA				G3/8				
MS6-LFM-1/2-...-DA				G1/2				
MS6-LFM-1/4-...-HF-DA	62	31	76	G1/4	349	376	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 DPI:
Filter contamination indicator with 4-pin M12x1 plug, 1 switching output PNP and 4 ... 20 mA analogue

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

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	31	103	32.3	G1/4	M12x1	35.1	55.8
MS6-LFM-3/8-...-DPI/DNI				G3/8			
MS6-LFM-1/2-...-DPI/DNI				G1/2			

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

Datasheet

Dimensions – Condensate drain

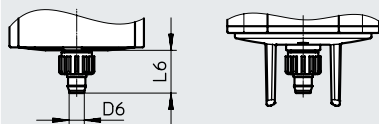
Download CAD data → www.festo.com

[M] Manual

MS4-...-R/U-M

MS6-...-R-M

MS6-...-U-M



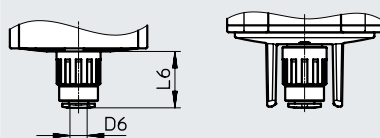
Barbed connector for plastic tubing PUN(-H)-8x1.25

[H] Semi-automatic

MS4-...-R/U-H

MS6-...-R-H

MS6-...-U-H



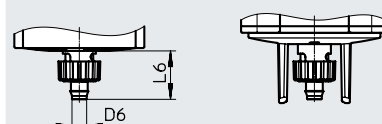
Push-in connector for plastic tubing PUN-6/PAN-6

[V] Fully automatic

MS4-...-U-V

MS6-...-R-V

MS6-...-U-V



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

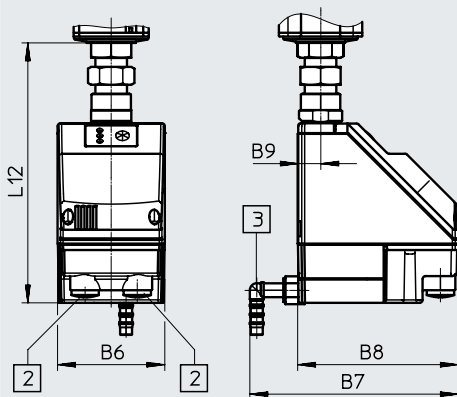
Type	D6 ø	L6
Plastic bowl guard R		
MS4-LFM-...-M	5.6	17.7
MS6-LFM-...-M		15.8
Metal bowl U		
MS4-LFM-...-M	5.6	17.7
MS6-LFM-...-M		–

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	5.6	18.5
Metal bowl U		
MS4-LFM-...-V	5.6	20.4
MS6-LFM-...-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 bowl, without differential pressure display						
Size	Condensate drain	Connection	Micro filters		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	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	G1/4	529663	MS6-LFM-1/4-ARM	529667	MS6-LFM-1/4-BRM
		G3/8	529671	MS6-LFM-3/8-ARM	529675	MS6-LFM-3/8-BRM
		G1/2	529655	MS6-LFM-1/2-ARM	529659	MS6-LFM-1/2-BRM
	Fully automatic	G1/4	530510	MS6-LFM-1/4-ARV	530514	MS6-LFM-1/4-BRV
		G3/8	530518	MS6-LFM-3/8-ARV	–	–
		G1/2	530502	MS6-LFM-1/2-ARV	530506	MS6-LFM-1/2-BRV
Flow direction from right to left						
MS4	Manual	G1/4	529460	MS4-LFM-1/4-ARM-Z	–	–
MS6	Fully automatic	G1/2	–	–	530508	MS6-LFM-1/2-BRV-Z
Ordering data						
Plastic bowl, with differential pressure display						
Size	Condensate drain	Connection	Micro filters		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	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	G1/4	536869	MS6-LFM-1/4-ARM-DA	536833	MS6-LFM-1/4-BRM-DA
		G3/8	536870	MS6-LFM-3/8-ARM-DA	–	–
		G1/2	536871	MS6-LFM-1/2-ARM-DA	536835	MS6-LFM-1/2-BRM-DA
	Fully automatic	G1/2	536877	MS6-LFM-1/2-ARV-DA	536841	MS6-LFM-1/2-BRV-DA
Ordering data						
Integrated as metal bowl, without differential pressure display						
Size	Condensate drain	Connection	Micro filters		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
Ordering data						
Integrated as metal bowl, with differential pressure display						
Size	Condensate drain	Connection	Micro filters		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
Flow direction from right to left						
MS6	Fully automatic	G1/4	537216	MS6-LFM-1/4-AUV-DA-Z	–	–

Ordering data – Modular product system

Ordering table						
Grid dimension	[mm]	40	62	Conditions	Code	Enter code
Module no.		527697	527670			
Series		Standard			MS	MS
Size		4	6		...	
Function		Fine and micro filters			-LFM	-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		40	62	Conditions	Code	Enter code
Grid dimension	[mm]					
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	
Range of application	–	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 attaching 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

Not with HF flow rate or filter change sensing DA

[5] DP, DN, DPI, DNI

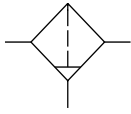
Measuring range max. 10 bar





[6] WP, WPM

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

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 EX4 version 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 filters	
Type of mounting	With accessories In-line installation	
Mounting position	Vertical ±5°	
Air quality 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/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]

Size	MS4	MS6		
Variant	Standard	Standard	High flow rate HF	Range of application 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 $p_1 = 6$ bar.

Datasheet

Operating and environmental conditions		MS4	MS6
Size			
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	
Suitability for the food industry ³⁾		See supplementary material information	
UL certification ³⁾		c UL us - Recognized (OL)	

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

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

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

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

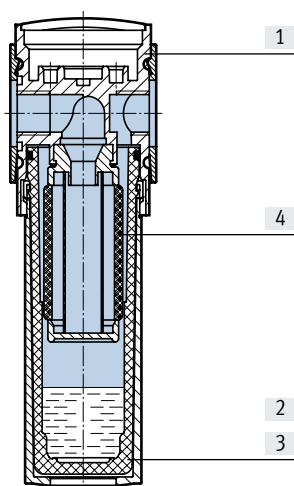
ATEX		EX4
EU certification		
ATEX category for gas		II 2G
Type of ignition protection for gas		Ex h IIC T6 Gb X
ATEX category for dust		II 2D
Type of ignition protection for dust		Ex h IIIC T60°C Db X
Explosion-proof ambient temperature		-10°C ≤ Ta ≤ +60°C
CE marking (see declaration of conformity) ¹⁾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

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

Weight [g]			
Size	MS4	MS6	
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

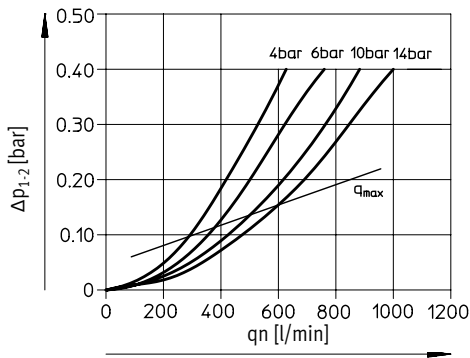


Activated carbon filters		
[1]	Housing	Die-cast aluminium
[2]	Plastic bowl guard	PC
[3]	Metal bowl	Wrought aluminium alloy, Die-cast aluminium
	Inspection window	PA
[4]	Filters	Activated carbon
-	Seals	NBR
	Note on materials	RoHS-compliant Free of copper and PTFE

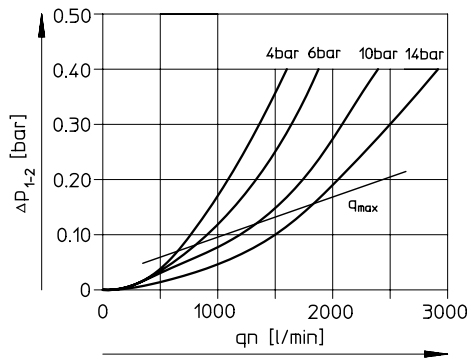
Datasheet

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

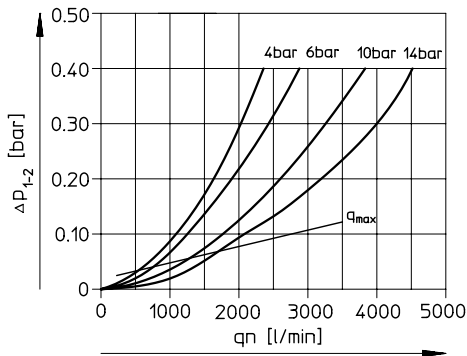
MS4-LFX-1/8 and MS4-LFX-1/4



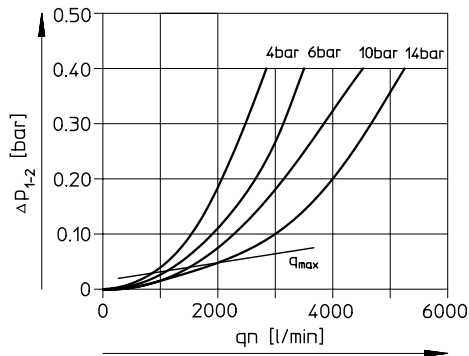
MS6-LFX-1/4



MS6-LFX-3/8

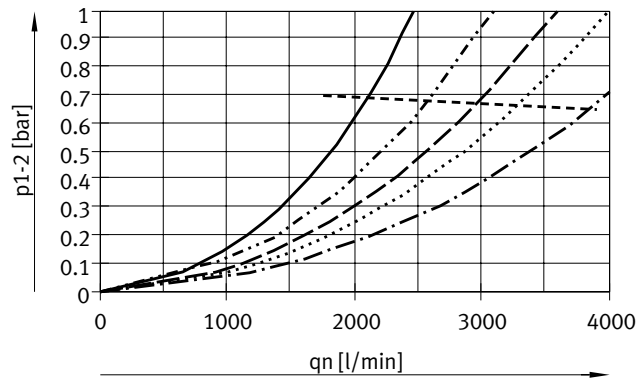


MS6-LFX-1/2

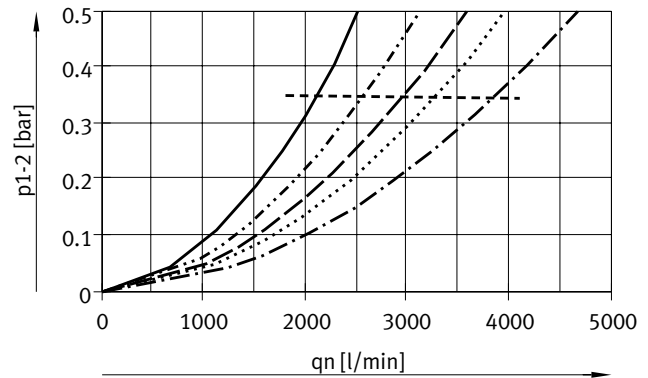


Standard flow rate q_n as a function of differential pressure p_{1-2}

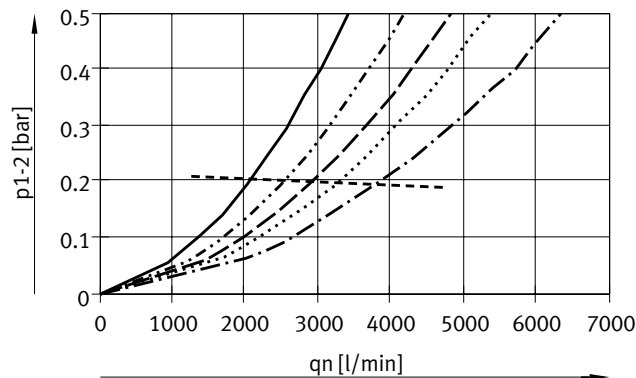
MS6-LFX-1/4-...-HF



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



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



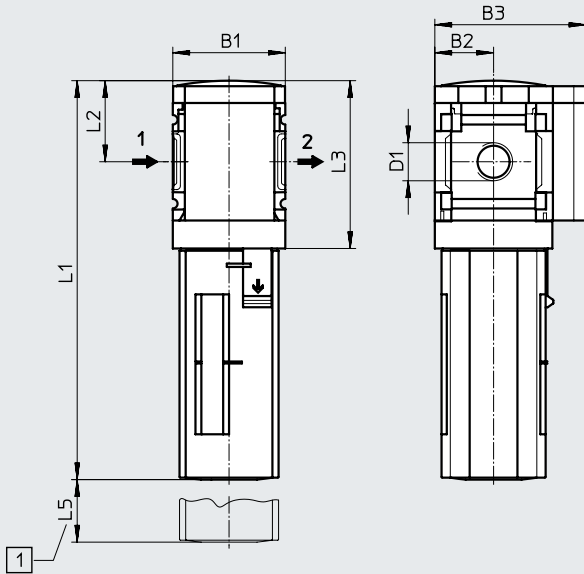
- p 1: 4 bar
- ⋯ p 1: 6 bar
- - - p 1: 8 bar
- ⋯⋯ p 1: 10 bar
- · - · p 1: 14 bar
- ⋯⋯ q_{max}

Datasheet

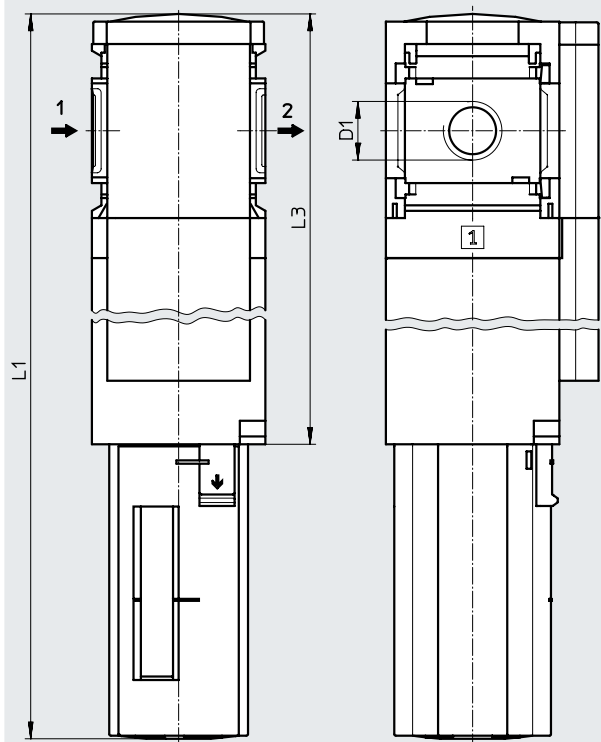
Dimensions – Basic version

Standard/range of application HP

Download CAD data → www.festo.com



High flow rate HF



[1] Installation dimension

→ Flow direction

→ Flow direction

Type	B1	B2	B3	D1	L1		L2	L3	L5
					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

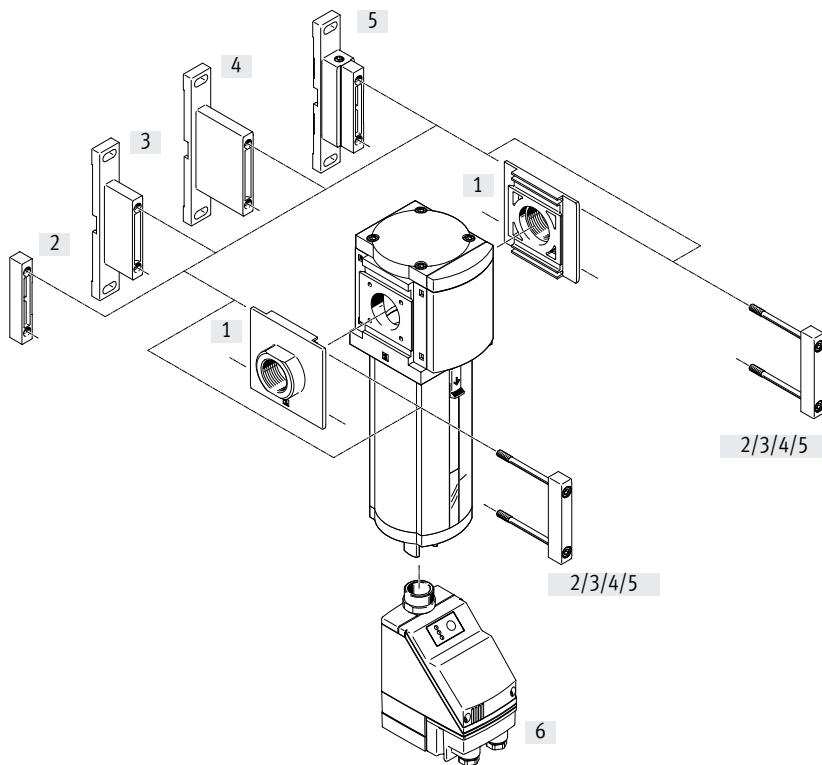
Ordering table		Grid dimension	[mm]	40	62	Conditions	Code	Enter code
Module no.	527699	527672						
Series	Standard						MS	MS
Size	4	6					...	
Function	Activated carbon filters						-LFX	-LFX
Pneumatic connection	Female thread G1/8	–			[1]		-1/8	
	Female thread G1/4	Female thread G1/4			[1]		-1/4	
	–	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	
Range of application	–	Suitable for sealing air and purge air			[2]		-HP	
Type of mounting	Mounting bracket, standard design				[3]		-WP	
	Mounting bracket for attaching 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 Module without connecting thread, without connecting plate G	→ Page/Internet
		With female thread 3/4, 1, N3/4, N1	With connecting plate AG.../AQ... Without 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]	Condensate drain, fully automatic, 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

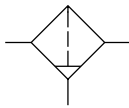
010	Flow direction
	Flow direction from left to right
Z	Flow direction from right to left

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

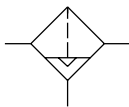
- Pneumatic connection
- Condensate drain
- Type of mounting
- EU certification
- UL certification
- Flow direction





Datasheet

Function
Condensate drain
Manual



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
- Choice of manual, semi-automatic, fully automatic or fully automatic, electrically actuated condensate drain
- Choice of 5 µm or 40 µm filter inserts
- New filter cartridges → Page 90
- Optional EX4 version 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		Sintered filter with centrifugal separator
Type of mounting		With accessories In-line installation
Mounting position		Vertical ±5°
Grade of filtration [µm]		5 40
Air quality class at the output		Compressed air to ISO 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 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]		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		Manual	Semi-automatic	Fully automatic	Fully automatic, electrically actuated
Condensate drain		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:–]
Ambient temperature		–10 ... +60	+5 ... +60	+5 ... +60	+1 ... +60
Temperature of medium		–10 ... +60	+5 ... +60	+5 ... +60	+1 ... +60
Storage temperature		–10 ... +60	+5 ... +60	+5 ... +60	+1 ... +60
Corrosion resistance class CRC ¹⁾		2			
UL certification ²⁾		c UL us - Recognized (OL)			

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

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

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

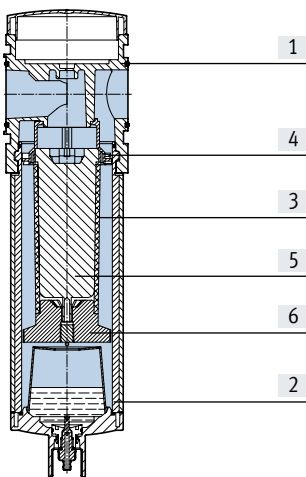
ATEX	
EU certification	EX4
ATEX category for gas	II 2G
Type of ignition protection for gas	Ex h IIC T6 Gb X
ATEX category for dust	II 2D
Type of ignition protection for dust	Ex h IIIC T60°C Db X
Explosion-proof ambient temperature	+5°C ≤ Ta ≤ +60°C
CE marking (see declaration of conformity) ¹⁾	To EU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

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

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

Materials

Sectional view

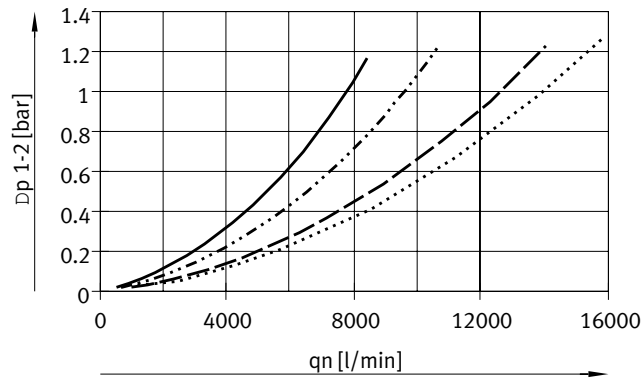


Filters		
[1]	Housing	Die-cast aluminium
[2]	Bowl	Wrought aluminium alloy
	Inspection window	PA
[3]	Filters	PE
[4]	Spin disc	POM
[5]	Filter support	POM
[6]	Separating disc	POM
–	Cover	PA-reinforced
–	Connecting plate, module connector, mounting bracket	Die-cast aluminium
–	Seals	NBR
Note on materials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

Datasheet

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

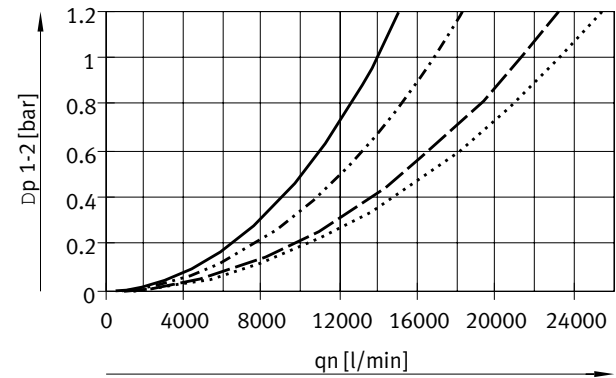
Grade of filtration 5 μm , pneumatic connection G1, 1 NPT



— 4 bar
 6 bar

--- 10 bar
 12 bar

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



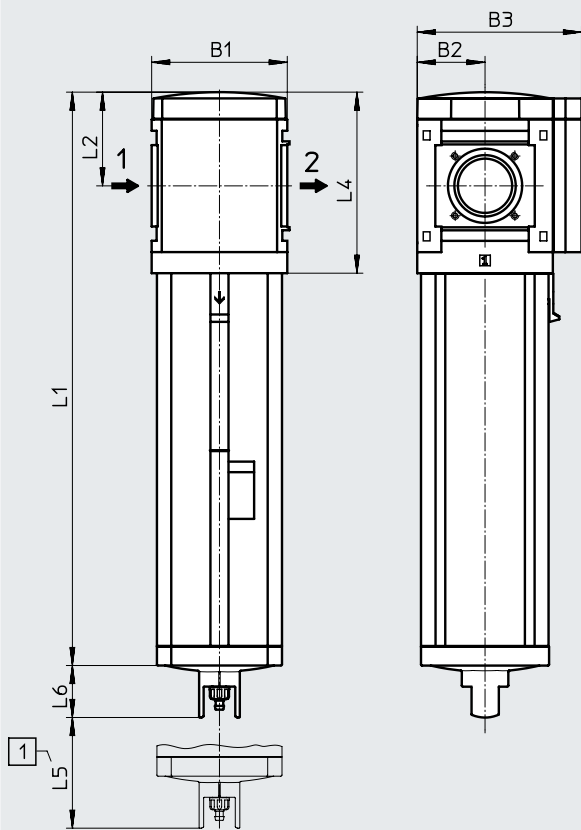
— 4 bar
 6 bar

--- 10 bar
 12 bar

Dimensions – Basic version

Module without connecting thread, without connecting plate G

Download CAD data → www.festo.com



[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

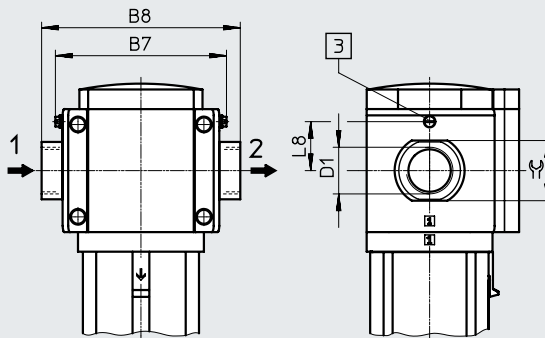
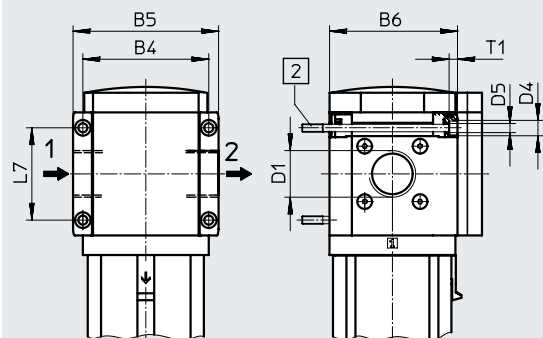
Datasheet

Dimensions – Connecting thread/connecting plate

Download CAD data → www.festo.com

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

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



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

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

→ Flow direction

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

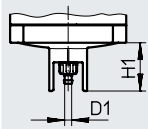
Note: This product conforms to ISO 1179-1 and ISO 228-1.

Datasheet

Dimensions – Condensate drain

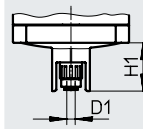
Download CAD data → www.festo.com

[M] Manually rotating/[V] full automatic



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

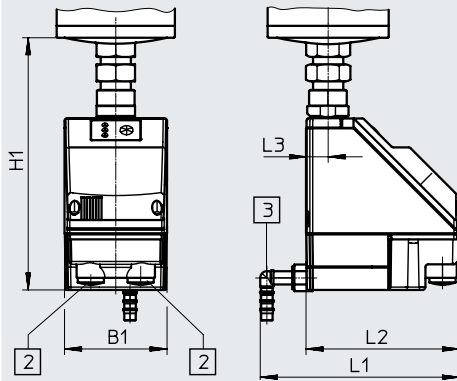
[H] Semi-automatic



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

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

Datasheets → Internet: [pwea](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/V	-	5.6	34.5	-	-	-
MS9-LF...-H	-	6.2	-	-	-	-
MS9-LF...-E2, E3, E4	72	-	178	140	108	15

Ordering data

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

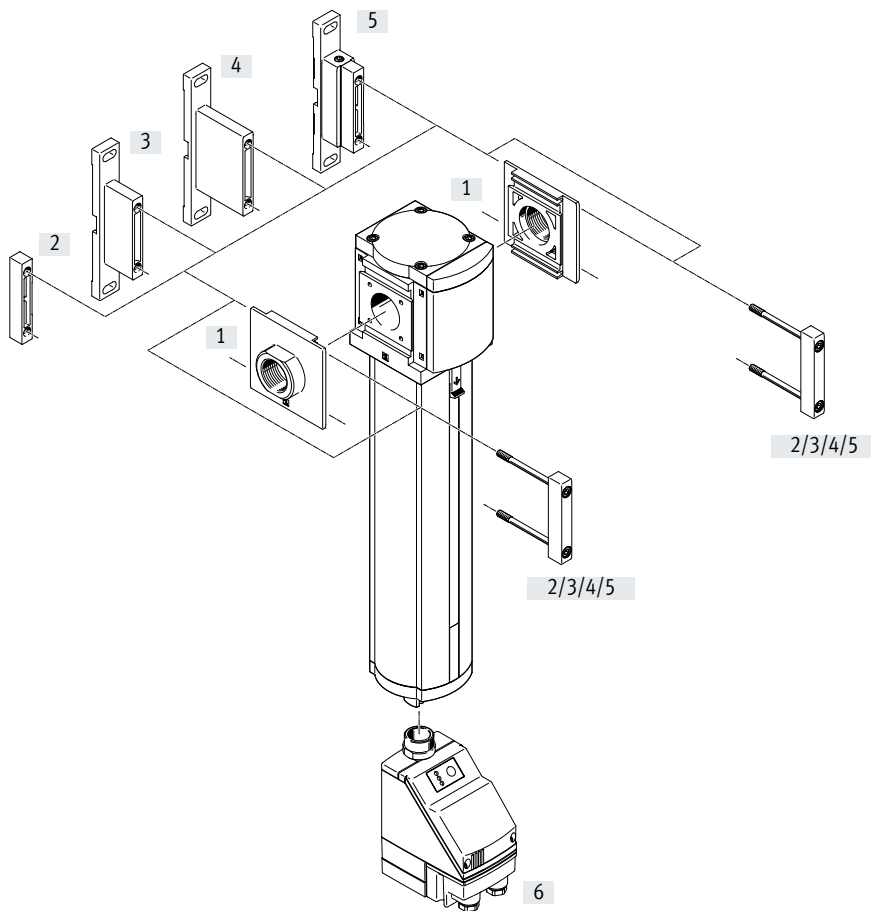
Ordering data – Modular product system

Ordering table		Grid dimension	[mm]	90	Conditions	Code	Enter code
Module no.		562532					
Series		Standard				MS	MS
Size		9				9	9
Function		Filters				-LF	-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	-U
Condensate drain	Manual					-M	
	Semi-automatic (P1 max. 12 bar)					-H	
	Fully automatic (P1 max. 12 bar)					-V	
External, fully automatic, electric	115 V AC, connection terminals (P1 max. 16 bar)			[1]		-E2	
	230 V AC, connection terminals (P1 max. 16 bar)			[1]		-E3	
	24 V DC, connection terminals (P1 max. 16 bar)			[1]		-E4	
Type of mounting	Mounting bracket, standard design			[2]		-WP	
	Mounting bracket for attaching 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 Module without connecting thread, without connecting plate G	→ Page/Internet
		With female thread 3/4, 1, N3/4, N1	With connecting plate AG.../AQ... Without 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]	Condensate drain, fully automatic, 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

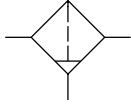
Datasheet

Function

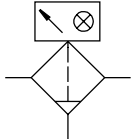
Condensate drain

Manual

Without differential pressure display



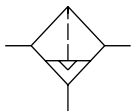
With differential pressure display



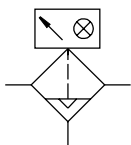
Condensate drain




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
- Choice of manual, semi-automatic, fully automatic or fully automatic, electrically actuated condensate drain
- Available with differential pressure display for indicating filter contamination
- Choice of filter inserts 0.01 µm or 1 µm
- New filter cartridges → Page 90
- Optional EX4 version 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 quality class at the output		Compressed air to ISO 8573-1:2010 [1:7:2] (micro filter MS9-LFM-A) Compressed air to ISO 8573-1:2010 [5:7:3] (fine filter MS9-LFM-B)
Filter efficiency	[%]	99.9999 (grade of filtration 0.01 µm, micro filter MS9-LFM-A) 99.99 (grade of filtration 1 µm, fine filter MS9-LFM-B)
Bowl guard		Integrated as metal bowl
Condensate drain		Manual Semi-automatic Fully automatic Fully automatic, electrically actuated
Differential pressure display		Visual indicator
Residual oil content	[mg/m³]	≤0.01 (micro filter MS9-LFM-A) ≤0.5 (fine filter MS9-LFM-B)
Max. condensate volume	[cm³]	225

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

Datasheet

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 $p_1 = 6$ bar

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

Operating and environmental conditions				
Condensate drain	Manual	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 to ISO 8573-1:2010 [6:8:4] ¹⁾			
Ambient temperature [°C]	-10 ... +60	+5 ... +60	+5 ... +60	+1 ... +60
Temperature of medium [°C]	-10 ... +60	+5 ... +60	+5 ... +60	+1 ... +60
Storage temperature [°C]	-10 ... +60	+5 ... +60	-10 ... +60	+1 ... +60
Corrosion resistance class CRC ²⁾	2			
UL certification ³⁾	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 μ m).

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

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

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

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

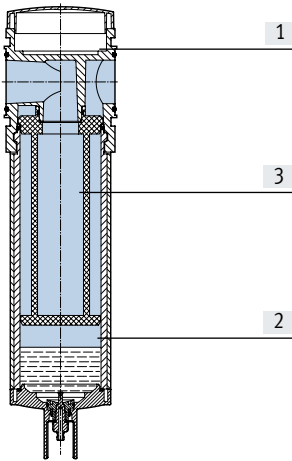
1) Additional information: www.festo.com/catalogue/ms → Support/Downloads.

Datasheet

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

Materials

Sectional view



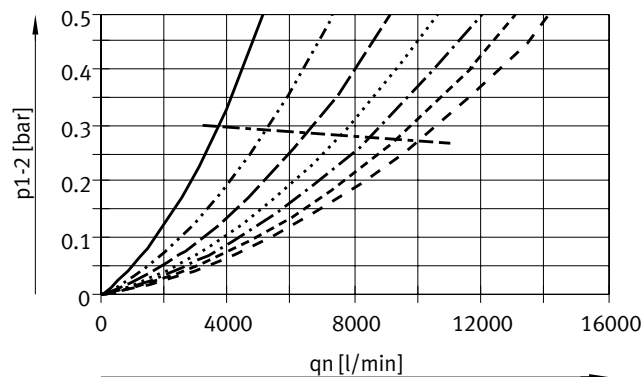
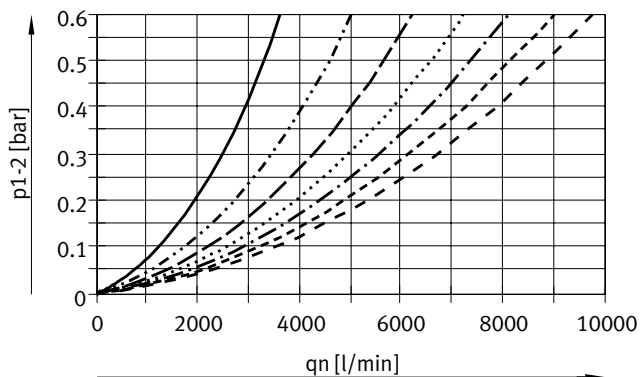
Fine and micro filters		
[1]	Housing	Die-cast aluminium
[2]	Bowl	Wrought aluminium alloy
	Inspection window	PA
[3]	Filters	Borosilicate fibre
-	Cover	PA-reinforced
-	Connecting plate, module connector, mounting bracket	Die-cast aluminium
-	Seals	NBR
	Note on materials	Free of copper and PTFE

Datasheet

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

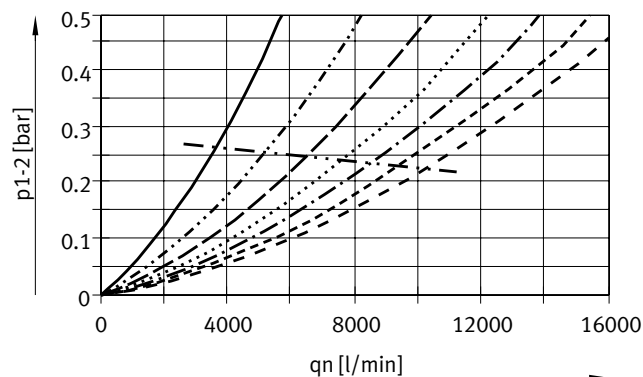
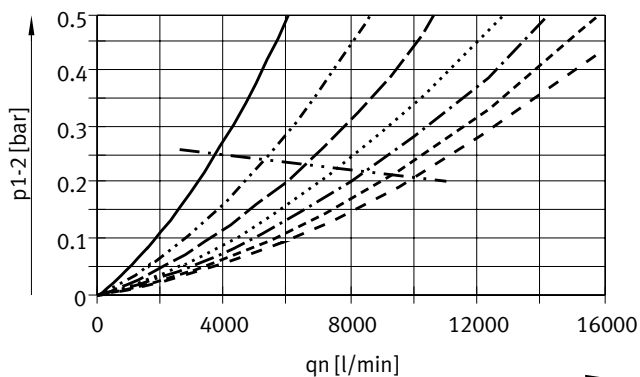
Grade of filtration 0.01 μm , pneumatic connection G1/2, 1/2 NPT

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

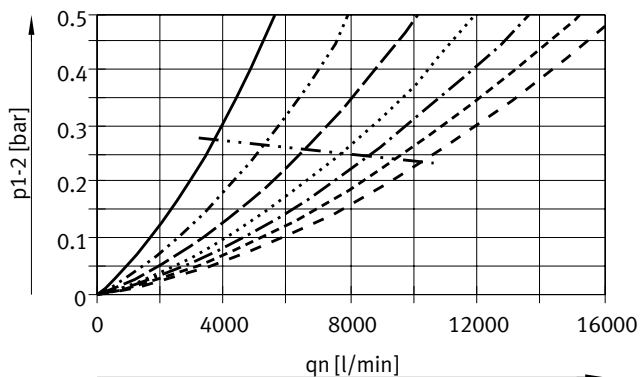


Grade of filtration 0.01 μm , pneumatic connection G1, 1 NPT

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

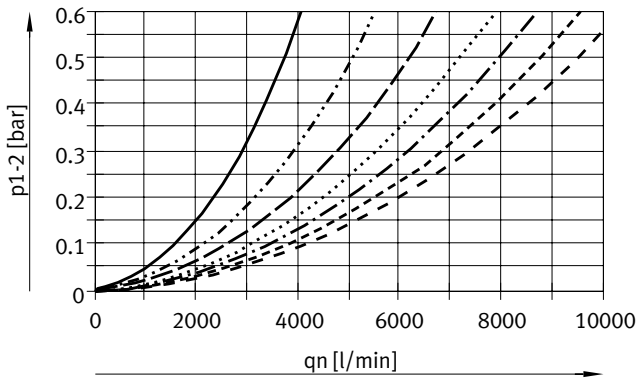


- 2 bar
- · - · - 4 bar ($q_{n \text{ min}}$: 268 l/min)
- - - 6 bar ($q_{n \text{ min}}$: 325 l/min)
- · · · · 8 bar
- · - · - 10 bar ($q_{n \text{ min}}$: 420 l/min)
- - - 12 bar
- - - 14 bar ($q_{n \text{ min}}$: 498 l/min)
- · - · - $q_{n \text{ max}}$
(with MS9-LFM-AGD/AQR: $q_{n \text{ max}}$ values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

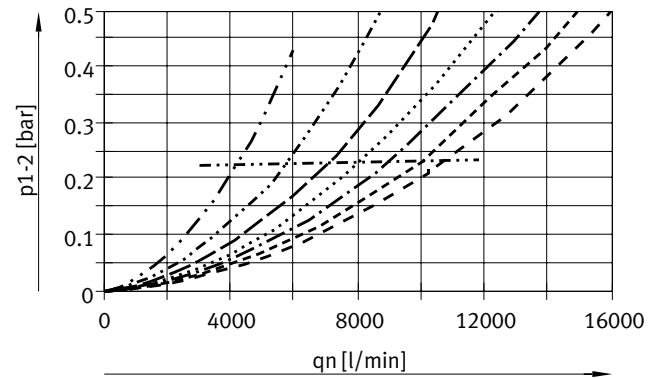
Datasheet

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

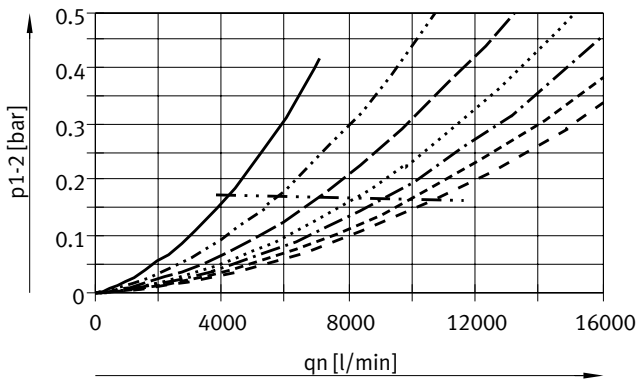
Grade of filtration 1 μm , pneumatic connection G1/2, 1/2 NPT



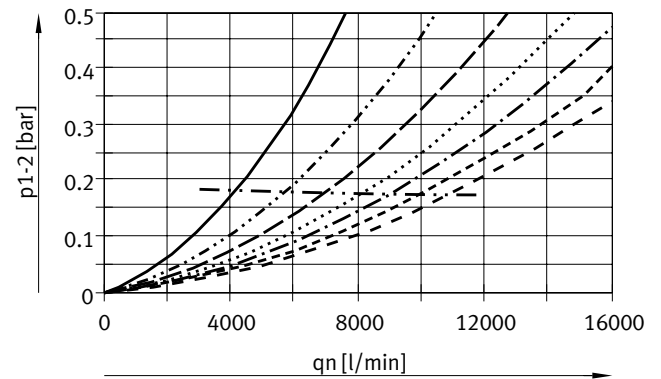
Grade of filtration 1 μm , pneumatic connection G3/4, 3/4 NPT



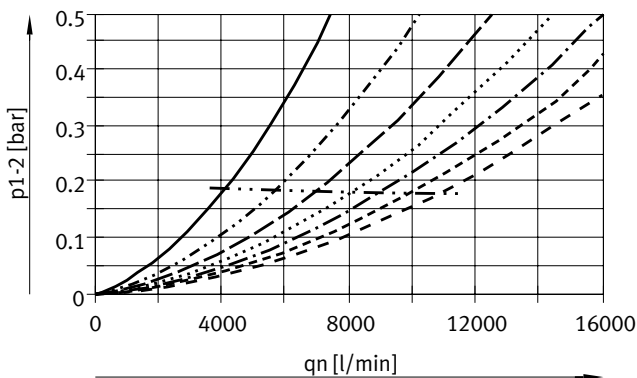
Grade of filtration 1 μm , pneumatic connection G1, 1 NPT



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



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

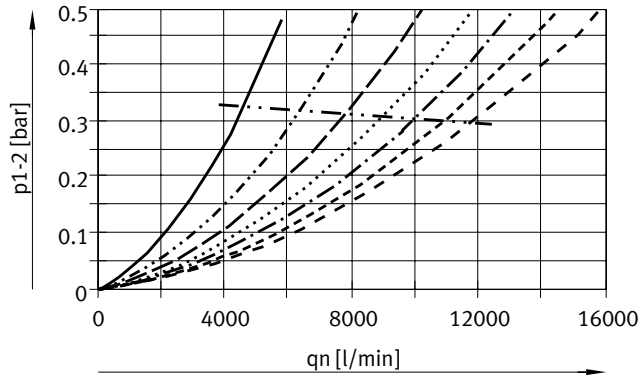


- 2 bar
- 4 bar ($q_{n \text{ min}}$: 289 l/min)
- 6 bar ($q_{n \text{ min}}$: 350 l/min)
- 8 bar
- · - · 10 bar ($q_{n \text{ min}}$: 450 l/min)
- 12 bar
- - - - 14 bar ($q_{n \text{ min}}$: 540 l/min)
- · - · - · $q_{n \text{ max}}$
(with MS9-LFM-AGD/AQR: $q_{n \text{ max}}$ values are above the measured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

Datasheet

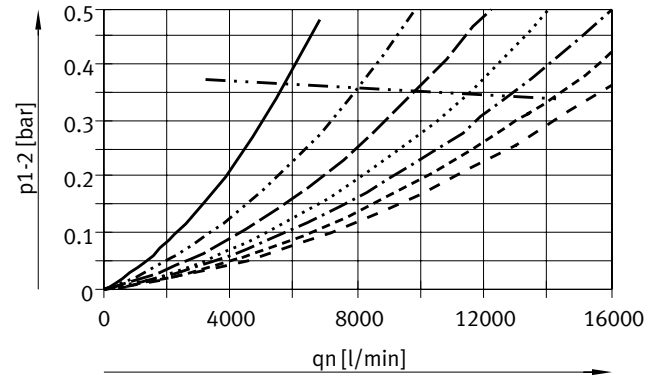
Standard flow rate q_n as a function of differential pressure p_{1-2}

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



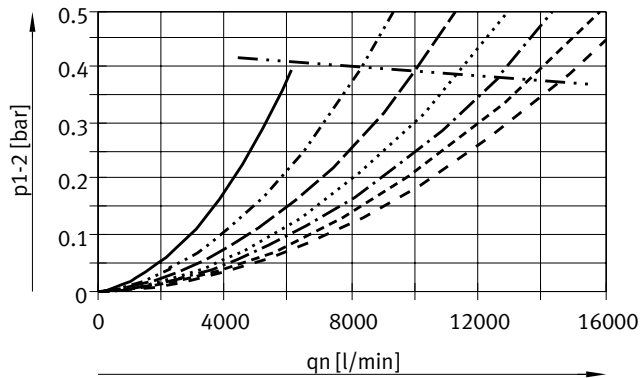
- 2 bar
- 4 bar
- - - 6 bar ($q_{n \text{ min}}$: 390 l/min)
- 8 bar
- · - · 10 bar
- - - 12 bar
- - - 14 bar
- · - · $q_{n \text{ max}}$

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



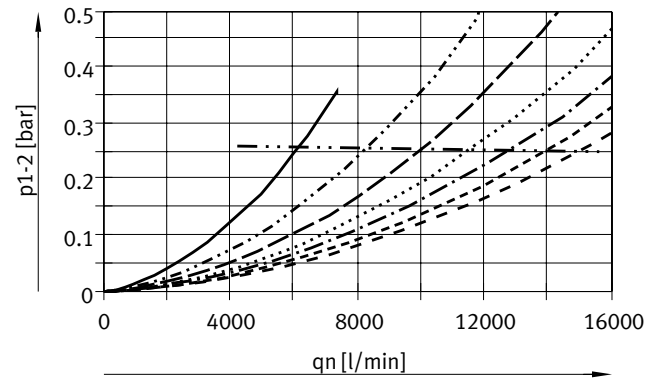
- 2 bar
- 4 bar
- - - 6 bar ($q_{n \text{ min}}$: 390 l/min)
- 8 bar
- · - · 10 bar
- - - 12 bar
- - - 14 bar
- · - · $q_{n \text{ max}}$

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
- · - · $q_{n \text{ max}}$

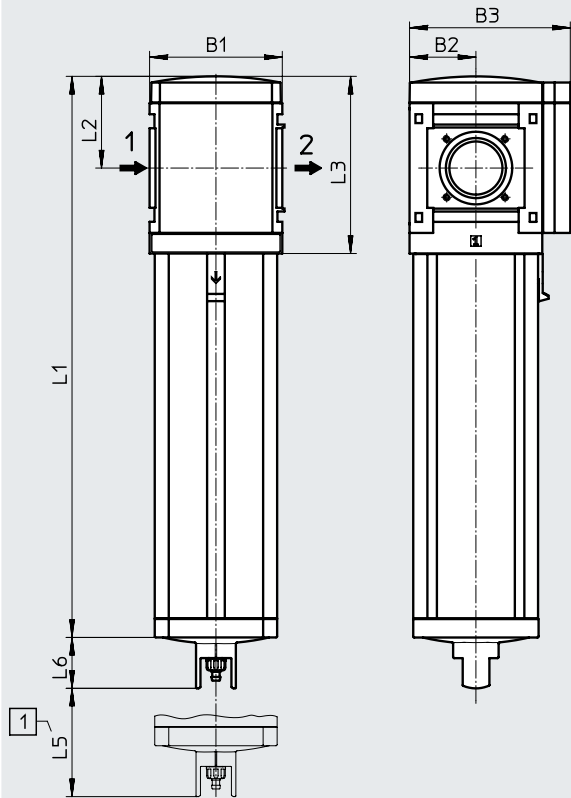
Datasheet

Dimensions – Basic version

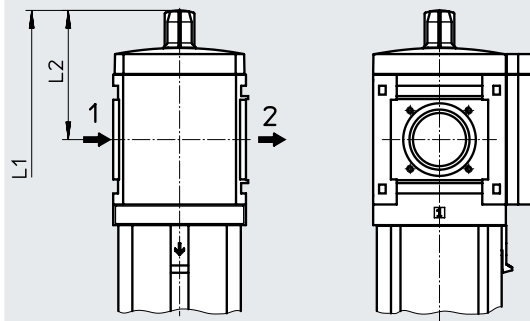
Download CAD data → www.festo.com

Module without connecting thread, without connecting plate G

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



[1] Installation dimension → Flow direction



→ 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				

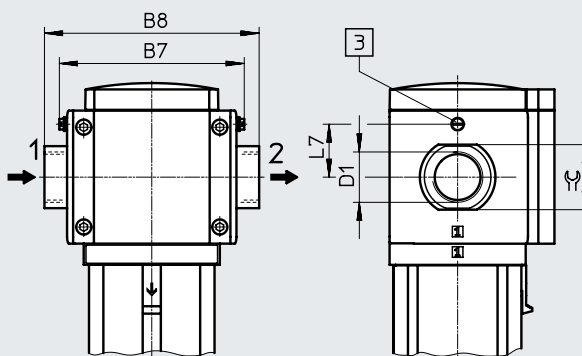
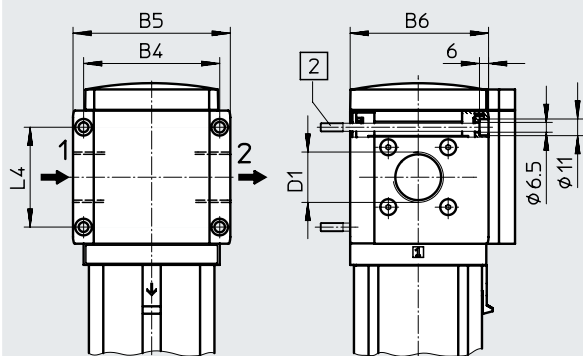
Datasheet

Dimensions – Connecting thread/connecting plate

Download CAD data → www.festo.com

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

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



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

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

→ Flow direction

Type	B4	B5	B6	B7		B8	D1	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							G3/4					36		
MS9-LFM-AGF							G1						41	
MS9-LFM-AGG							G1 1/4							50
MS9-LFM-AGH							G1 1/2							
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							3/4 NPT					36		
MS9-LFM-AQT							1 NPT						41	
MS9-LFM-AQU							1 1/4 NPT							50
MS9-LFM-AQV							1 1/2 NPT							

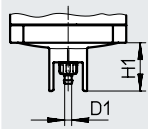
† Note: This product conforms to ISO 1179-1 and ISO 228-1.

Datasheet

Dimensions – Condensate drain

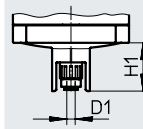
Download CAD data → www.festo.com

[M] Manually rotating/[V] full automatic



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

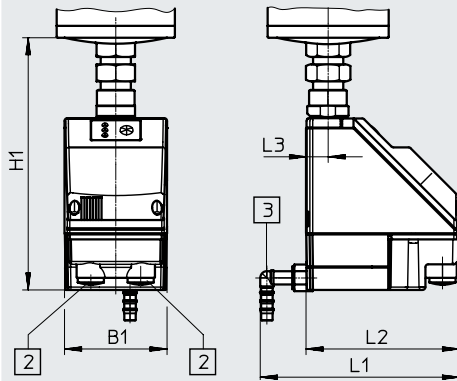
[H] Semi-automatic



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

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

Datasheets → Internet: [pwea](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-LFM-...-M/V	-	5.6	34.5	-	-	-
MS9-LFM-...-H	-	6.2	-	-	-	-
MS9-LFM-...-E2, E3, E4	72	-	178	140	108	15

Datasheet

Ordering data						
Without differential pressure display						
Size	Condensate drain	Connection	Micro filters		Fine filters	
			Grade of filtration 0.01 µm		Grade of filtration 1 µm	
			Part no.	Type	Part no.	Type
Standard						
MS9	Manual	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	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 filters		Fine filters	
			Grade of filtration 0.01 µm		Grade of filtration 1 µm	
			Part no.	Type	Part no.	Type
Standard						
MS9	Manual	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	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

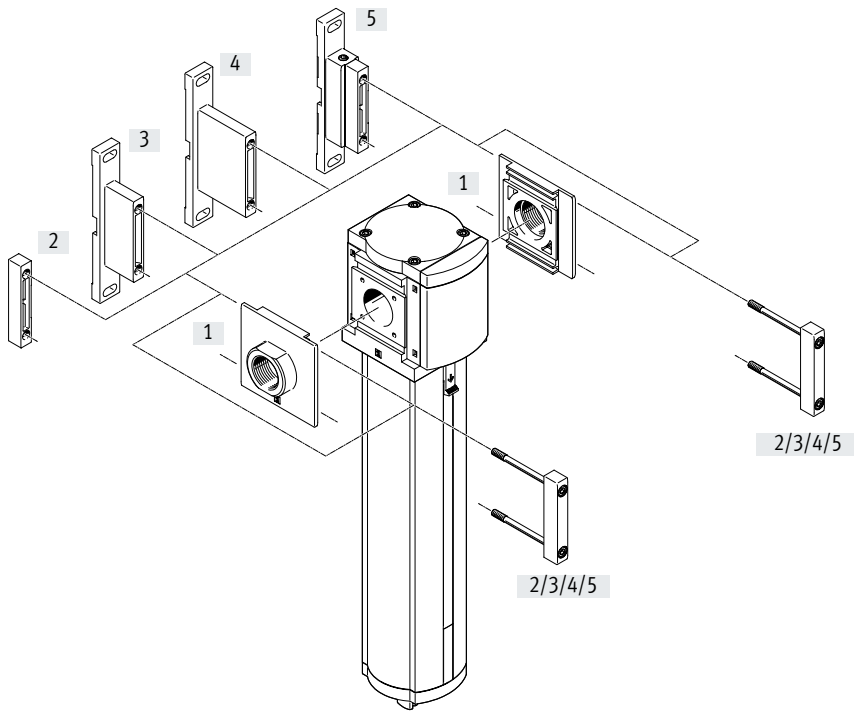
Ordering data – Modular product system

Ordering table		Grid dimension [mm]	90	Conditions	Code	Enter code
Module no.			552940			
Series			Standard service unit		MS	MS
Size			9		9	9
Function			Fine and micro filters		-LFM	-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	-U
Condensate drain	Manual				-M	
	Semi-automatic (P1 max. 12 bar)				-H	
	Fully automatic (P1 max. 12 bar)				-V	
External, fully automatic, electric	115 V AC, connection terminals (P1 max. 16 bar)			[1]	-E2	
	230 V AC, connection terminals (P1 max. 16 bar)			[1]	-E3	
	24 V DC, connection terminals (P1 max. 16 bar)			[1]	-E4	
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 attaching 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 Module without connecting thread, without connecting plate G	→ Page/Internet
		With female thread 3/4, 1, N3/4, N1	With connecting plate AG.../AQ... Without 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

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

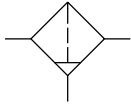
005	Bowl type
U	Aluminium
006	Type of mounting
	Without mounting bracket
WP	Mounting bracket basic design
WPB	Mounting bracket for large wall gap
WPM	Mounting bracket for hooking in service unit components
007	UL certification
	None
UL1	cULus ordinary location for Canada and USA
008	Flow direction
	Flow 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
- New filter cartridges → Page 90
- Optional EX4 version 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	Activated carbon filters
Type of mounting	With accessories In-line installation
Mounting position	Vertical ±5°
Air quality 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 $p_1 = 6$ 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⁾	cUL us - Recognized (OL)

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
 Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.
 2) Additional information: www.festo.com/catalogue/ms → Support/Downloads.

Datasheet

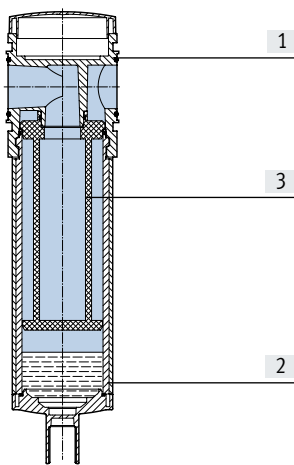
ATEX	
EU certification	EX4
ATEX category for gas	II 2G
Type of ignition protection for gas	Ex h IIC T6 Gb X
ATEX category for dust	II 2D
Type of ignition protection for dust	Ex h IIIC T60°C Db X
Explosion-proof ambient temperature	-10°C ≤ Ta ≤ +60°C
CE marking (see declaration of conformity) ¹⁾	To EU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

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

Weight [g]	
Activated carbon filters	2000

Materials

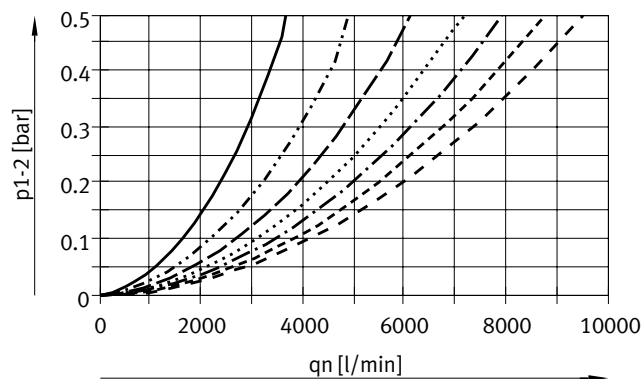
Sectional view



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

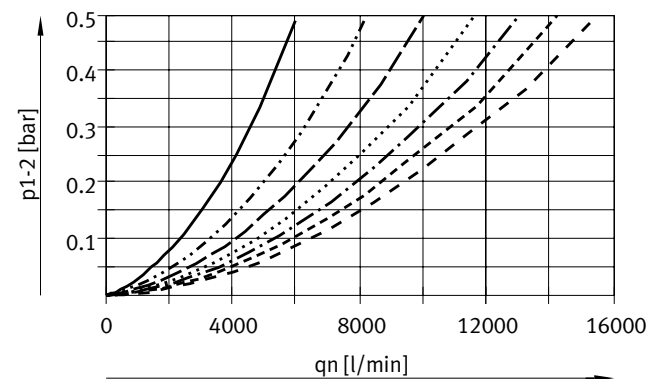
Standard flow rate q_n as a function of differential pressure p_{1-2}

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

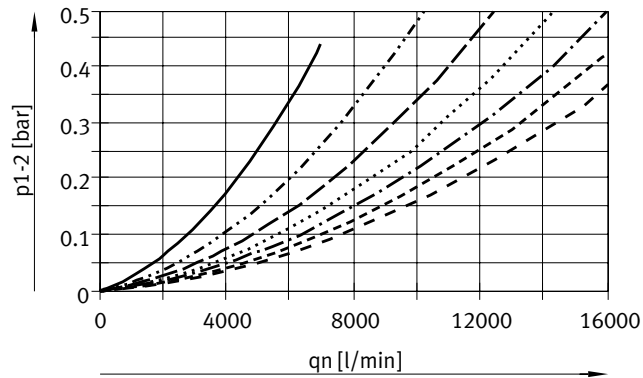


——— 2 bar
 - - - - - 4 bar
 - - - - - 6 bar
 ······· 8 bar
 - · - · - 10 bar
 - - - - - 12 bar
 - - - - - 14 bar

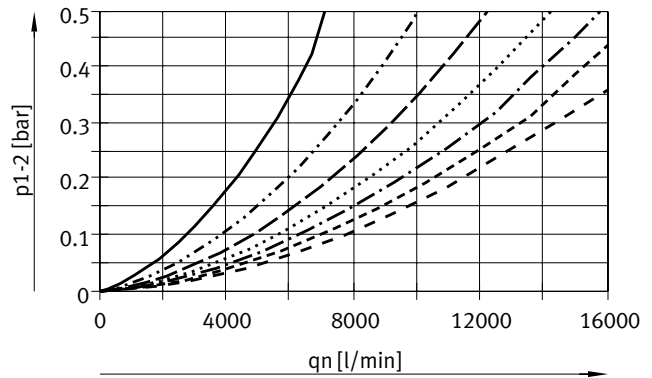
Datasheet

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

Pneumatic connection G1, 1 NPT



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

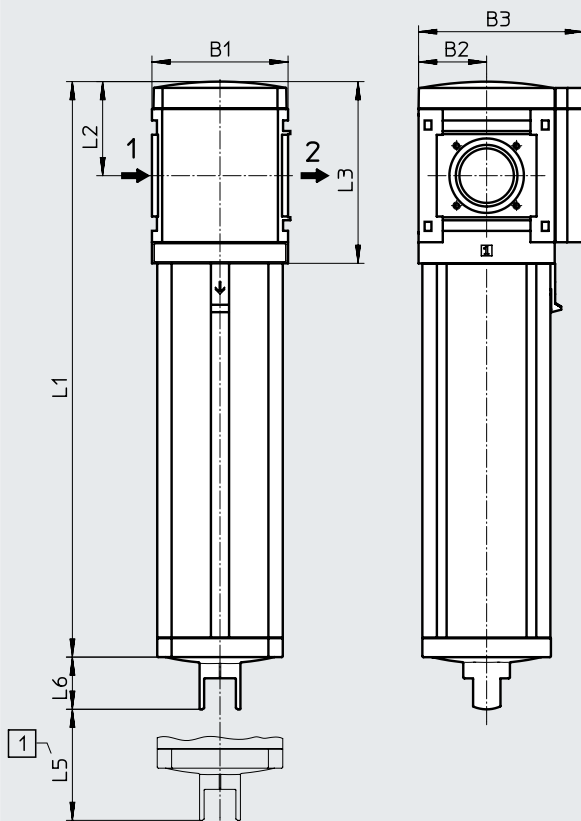


- 2 bar
- 4 bar
- - - 6 bar
- · - · 8 bar
- · - · - · 10 bar
- - - - - 12 bar
- · - · - · - · 14 bar

Dimensions – Basic version

Download CAD data → www.festo.com

Module without connecting thread, without connecting plate G



[1] Installation dimension

→ Flow direction

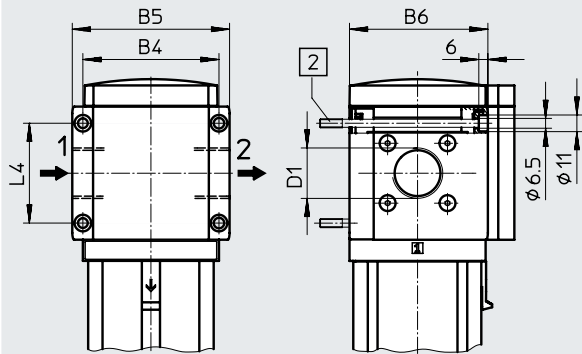
Type	B1	B2	B3	L1	L2	L3	L5	L6
MS9-LFX-G	90	45	109	380.5	62	120	50	34.5

Datasheet

Dimensions – Connecting thread/connecting plate

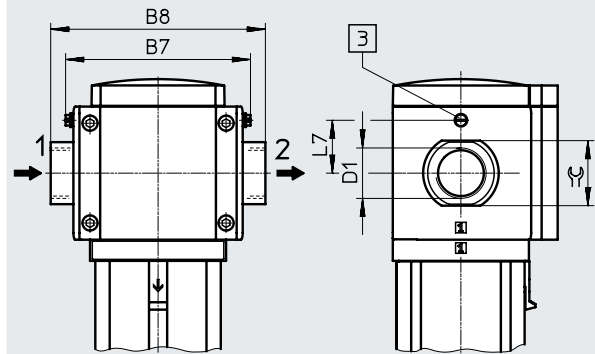
Download CAD data → www.festo.com

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

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	-	-	-	3/4 NPT	66	-	-	
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

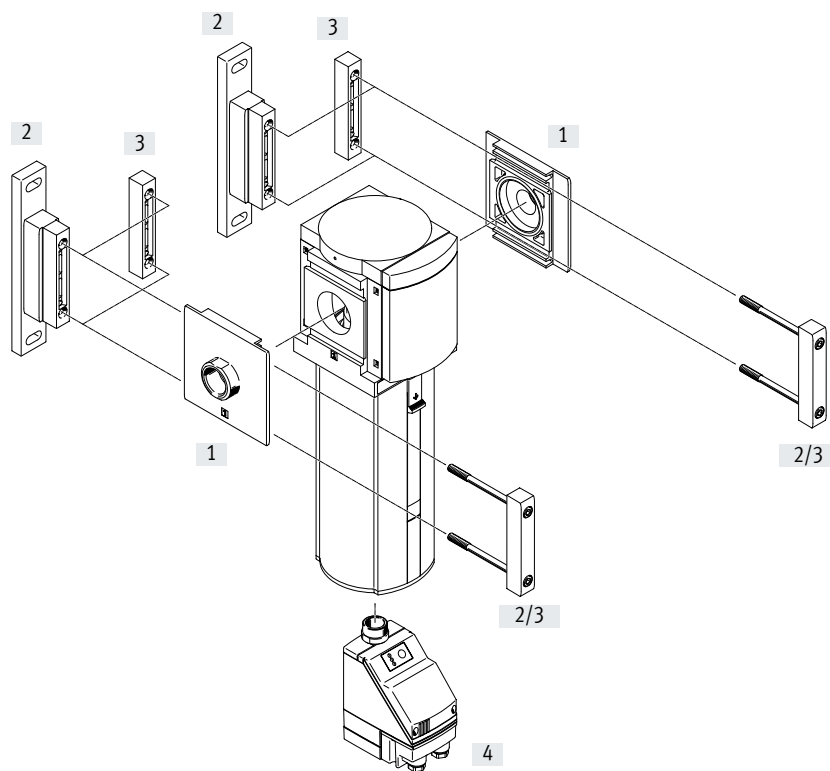
Ordering data – Modular product system


Ordering table		Grid dimension	[mm]	90	Conditions	Code	Enter code
Module no.		552942					
Series		Standard service unit				MS	MS
Size		9				9	9
Function		Activated carbon filters				-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 attaching 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]	Condensate drain, fully automatic, 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

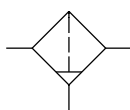
009	Flow direction
	Flow direction from left to right
Z	Flow direction from right to left

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

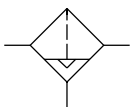
- Pneumatic connection
- Condensate drain
- Type of mounting
- Flow direction




Datasheet

Function
Condensate drain
Manual



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 are replaceable.

- 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 5 µm or 40 µm filter inserts
- 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		Sintered filter with centrifugal separator
Type of mounting		With accessories In-line installation
Mounting position		Vertical ±5°
Grade of filtration [µm]		5 40
Air quality class at the output		Compressed air to ISO 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 Fully automatic Fully automatic, electrically actuated
Max. condensate volume [cm³]		400

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

Standard nominal flow rate qnN¹⁾ [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 p1 = 6 bar and Δp = 0,5 bar

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

Datasheet

Operating and environmental conditions		Manual M	Fully automatic V	Fully automatic, electrically actuated E2, E3, E4
Condensate drain				
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		
Ambient temperature	[°C]	-10 ... +60	+5 ... +60	+1 ... +60
Temperature of medium	[°C]	-10 ... +60	+5 ... +60	+1 ... +60
Storage temperature	[°C]	-10 ... +60	-10 ... +60	+1 ... +60
Corrosion resistance class	CRC ¹⁾	2		

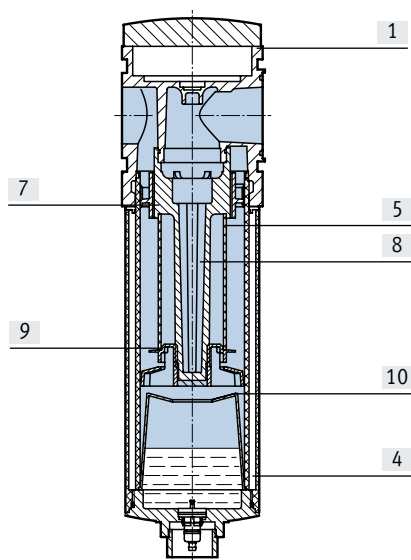
1) Corrosion resistance class CRC 2 to Festo standard FN 940070

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

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



Filters		
[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

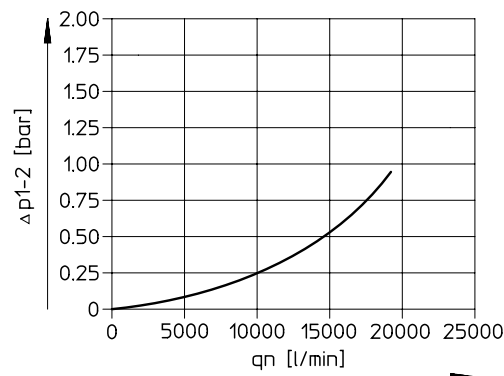
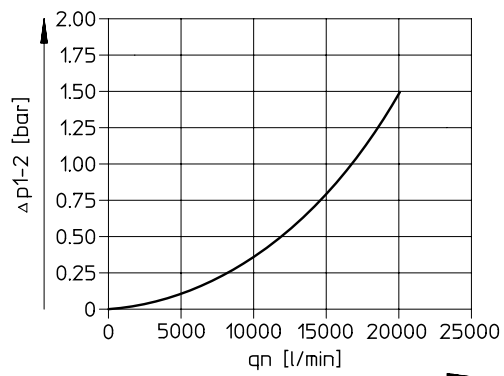
Standard flow rate q_n as a function of differential pressure Δp_{1-2}

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

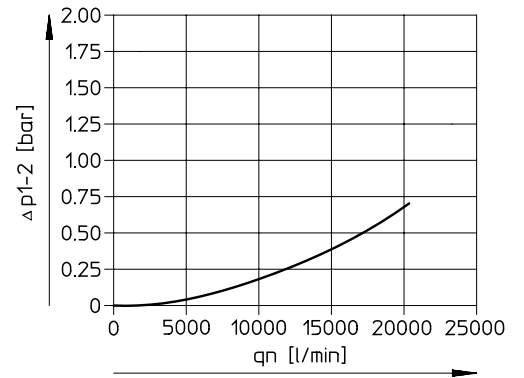
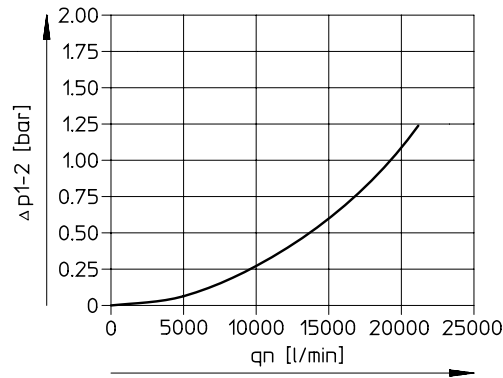
Standard flow rate q_n as a function of differential pressure Δp_{1-2}

Grade of filtration 40 μm

With connecting plate MS12-AGF
Pneumatic connection G1

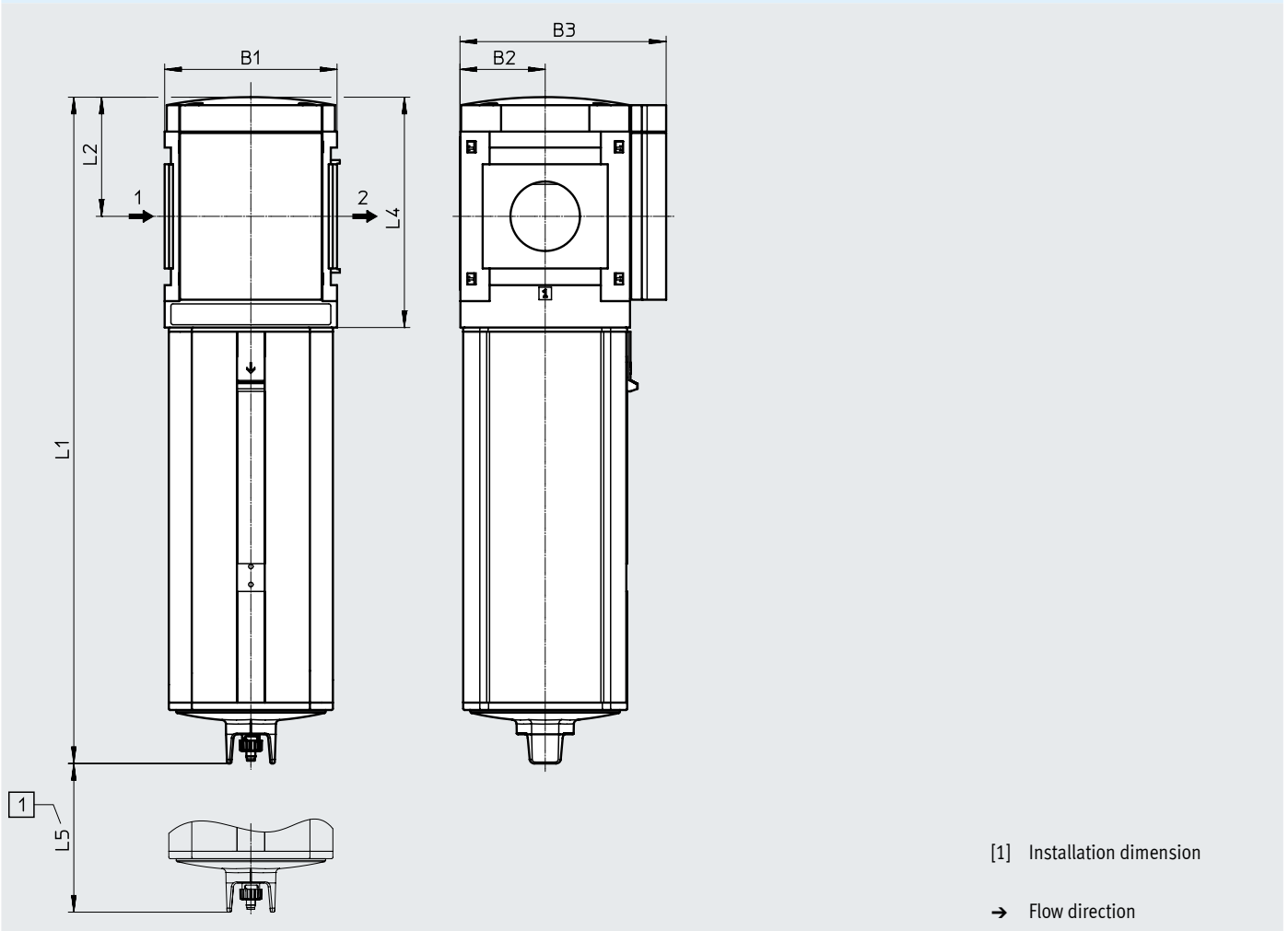
With connecting plate MS12-AGI
Pneumatic connection G2

$p_1 = 6 \text{ bar}$



Dimensions – Basic version

Download CAD data → www.festo.com



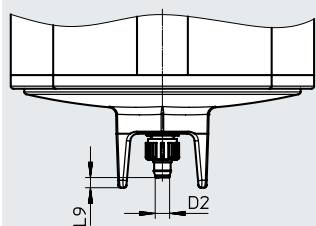
Type	B1	B2	B3	L1	L2	L4	L5
MS12-LF	124	61	148	480	86	166	250

Datasheet

Dimensions – Condensate drain

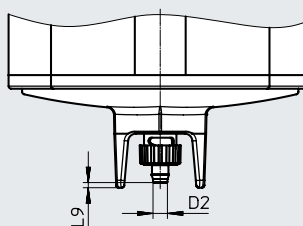
Download CAD data → www.festo.com

[M] Manual



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

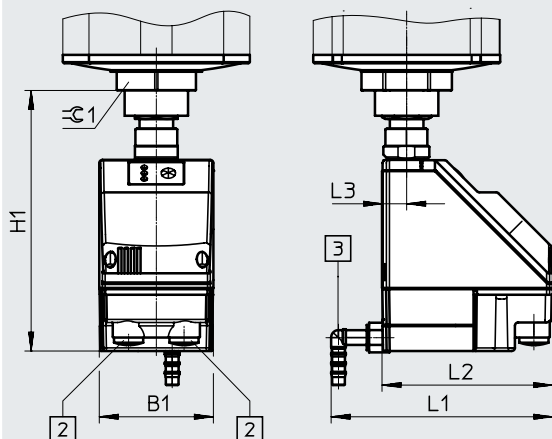
[V] Fully automatic



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

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

Datasheets → Internet: [pwea](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	D2 ∅	H1	L1	L2	L3	L9	∅ 1
MS12-LF-...-M	-	5.6	-	-	-	-	4	-
MS12-LF-...-V	-	5.6	-	-	-	-	2	-
MS12-LF-...-E2, E3, E4	72	-	164	140	108	15	-	50

Ordering data

Metal bowl

Size	Condensate drain	Connection	Grade of filtration 5 µm		Grade of filtration 40 µm	
			Part no.	Type	Part no.	Type
MS12	Fully automatic	G1 ... G2 ¹⁾	537152	MS12-LF-G-CUV	537151	MS12-LF-G-EUV

1) Connecting plate must be ordered separately as an accessory → Internet: [ms12-ag](http://ms12-ag.com)

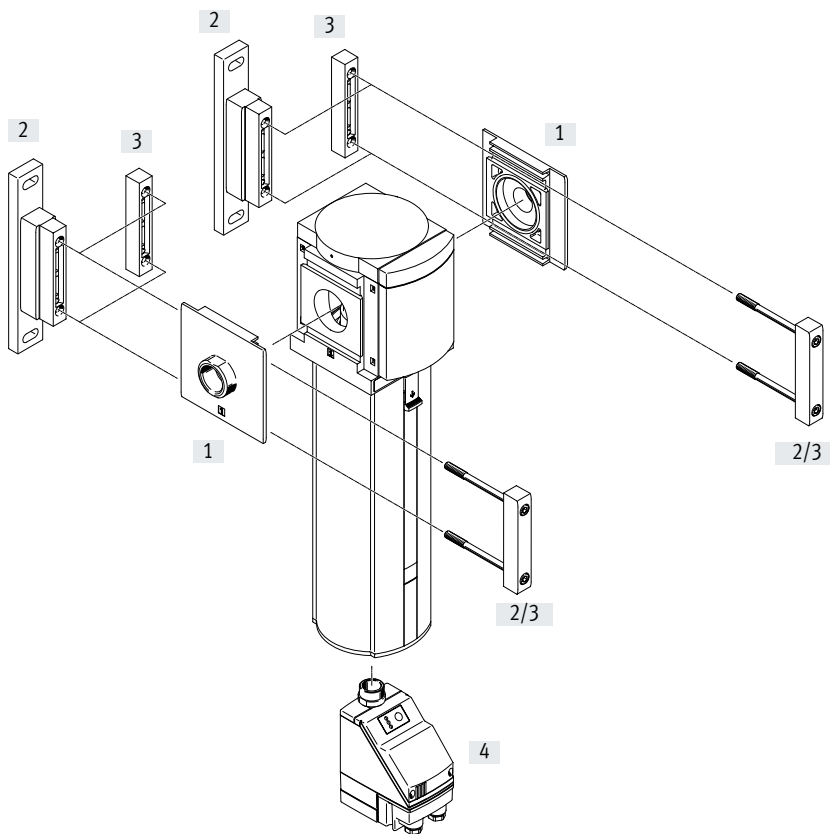
• Note: This product conforms to ISO 1179-1 and ISO 228-1.

Ordering data – Modular product system

Ordering table		Conditions	Code	Enter code
Grid dimension [mm]	124			
Module no.	535023			
Series	Standard		MS	MS
Size	12		12	12
Function	Filters		-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]	Condensate drain, fully automatic, 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

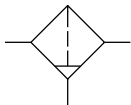
Datasheet

Function

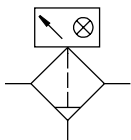
Condensate drain

Manual

Without differential pressure display



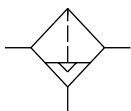
With differential pressure display



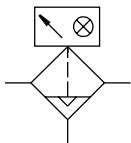
Condensate drain




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 display 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 quality 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 Fully automatic Fully automatic, electrically actuated
Max. condensate volume [cm ³]	400

† 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 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 [6:8:4] ¹⁾			
	Inert gases			
Ambient temperature [°C]	-10 ... +60	+5 ... +60	+1 ... +60	
Temperature of medium [°C]	-10 ... +60	+5 ... +60	+1 ... +60	
Storage temperature [°C]	-10 ... +60	-10 ... +60	+1 ... +60	
Corrosion resistance class CRC ²⁾	2			

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

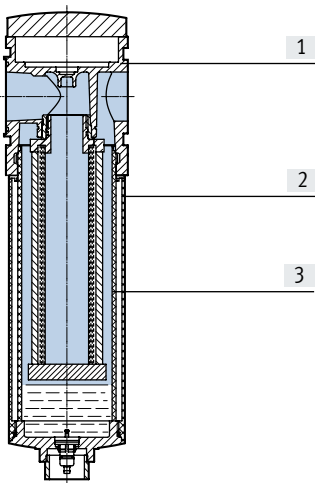
2) Corrosion resistance class CRC 2 to Festo standard FN 940070

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

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



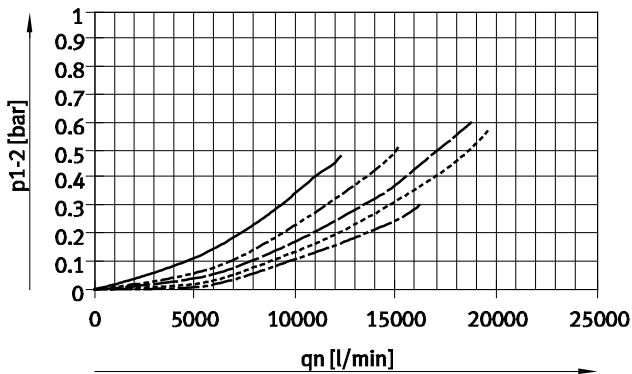
Fine and micro filters		
[1]	Housing	Die-cast aluminium
[2]	Metal bowl	Wrought aluminium alloy
	Inspection window	PC
[3]	Filter element	Borosilicate fibre
-	Seals	NBR
Note on materials		RoHS-compliant
		Free of copper and PTFE

Datasheet

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

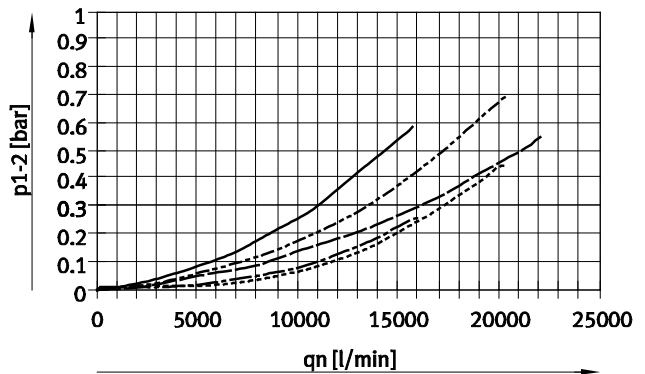
Grade of filtration 0.01 μm

With connecting plate MS12-AGF, pneumatic connection G1



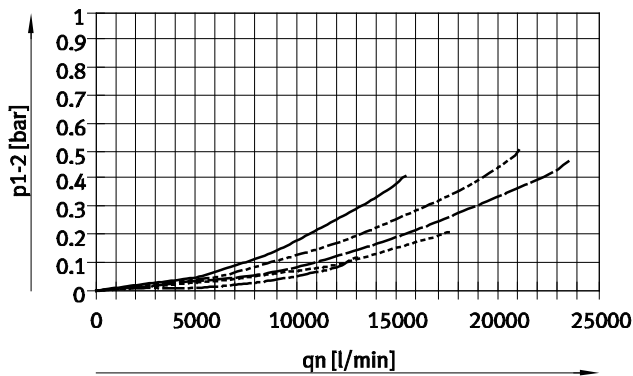
Grade of filtration 0.01 μm

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



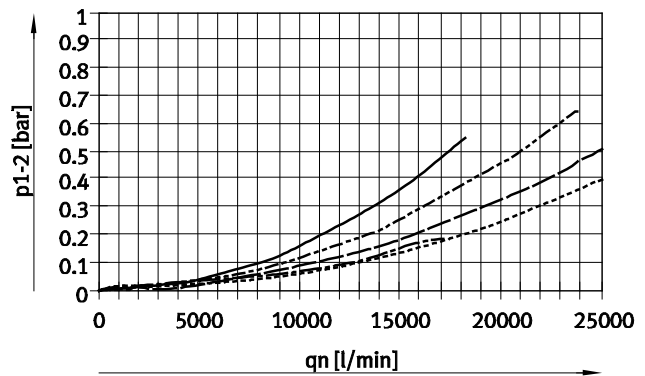
Grade of filtration 0.01 μm

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



Grade of filtration 0.01 μm

With connecting plate MS12-AGI, pneumatic connection G2



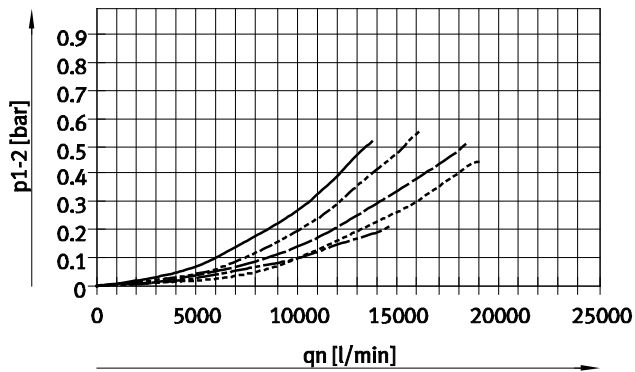
- p1: 4 bar
- · - · - · p1: 6 bar
- - - - - p1: 8 bar
- · · · · p1: 10 bar
- · - · - · p1: 12 bar

Datasheet

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

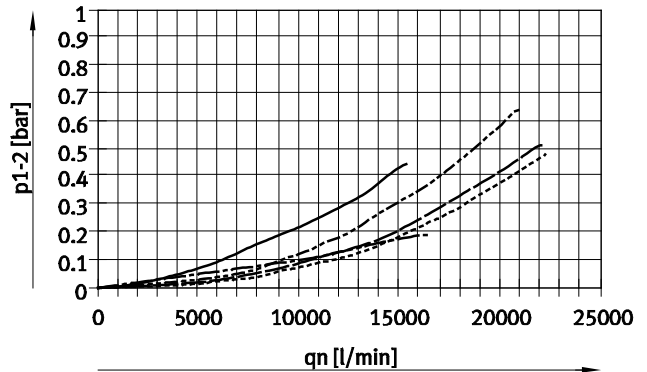
Grade of filtration $1 \mu\text{m}$

With connecting plate MS12-AGF, pneumatic connection G1



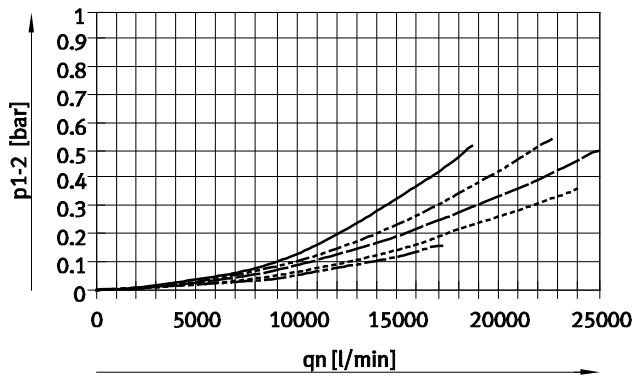
Grade of filtration $1 \mu\text{m}$

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



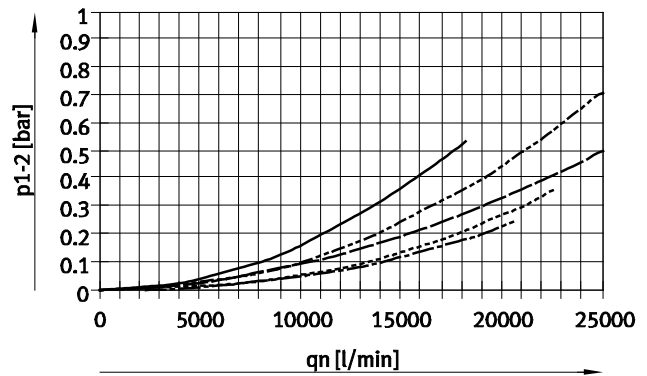
Grade of filtration $1 \mu\text{m}$

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

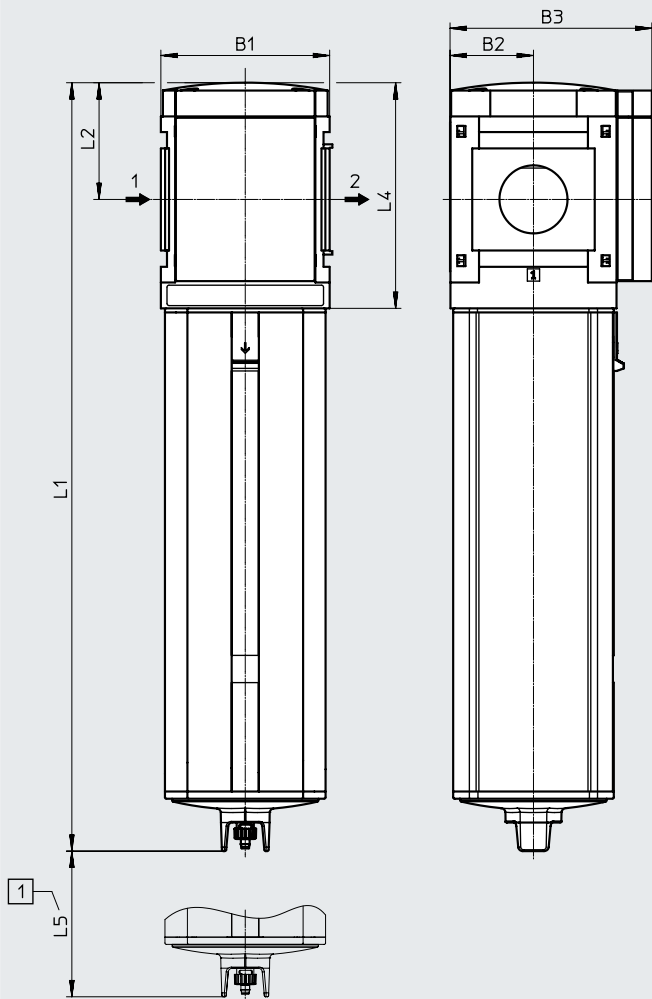


- p_1 : 4 bar
- · - · - p_1 : 6 bar
- - - p_1 : 8 bar
- · · · · p_1 : 10 bar
- · - · - p_1 : 12 bar

Datasheet

Dimensions – Basic version

Download CAD data → www.festo.com



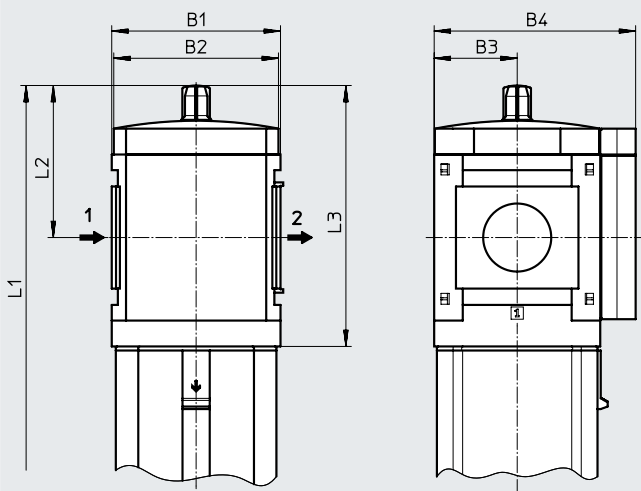
[1] Installation dimension

→ Flow direction

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



→ Flow direction

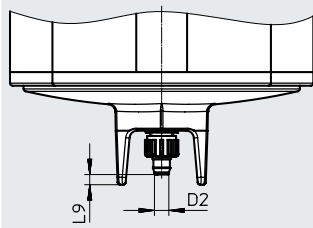
Type	B1	B2	B3	B4	L1	L2	L3
MS12-LFM-...-DA	124	122	61	148	590	112	192

Datasheet

Dimensions – Condensate drain

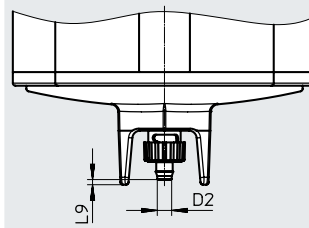
Download CAD data → www.festo.com

[M] Manual



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

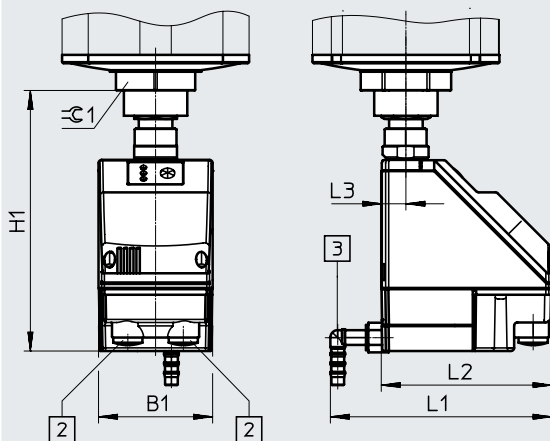
[V] Fully automatic



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

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

Datasheets → Internet: [pwea](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	D2 ∅	H1	L1	L2	L3	L9	≙ 1
MS12-LFM-...-M	-	5.6	-	-	-	-	4	-
MS12-LFM-...-V	-	5.6	-	-	-	-	2	-
MS12-LFM-...-E2, E3, E4	72	-	164	140	108	15	-	50

Ordering data

Metal bowl							
Size	Condensate drain	Connection	Micro filters 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](http://ms12-ag.com).

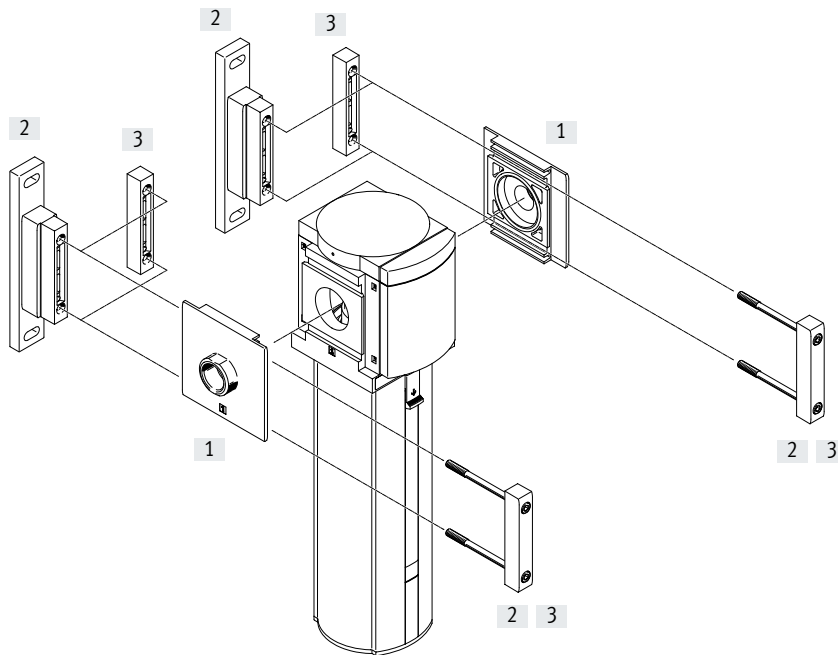
† Note: This product conforms to ISO 1179-1 and ISO 228-1.

Ordering data – Modular product system

Ordering table		Conditions	Code	Enter code
Grid dimension [mm]	124			
Module no.	535042			
Series	Standard		MS	MS
Size	12		12	12
Function	Fine and micro filters		-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

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	

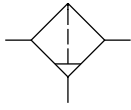
005	Bowl type	
U	Aluminium	
006	Type of mounting	
	Without mounting bracket	
WP	Mounting bracket basic design	
007	Flow direction	
	Flow direction from left to right	
Z	Flow direction from right to left	

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 filters
Type of mounting	With accessories In-line installation
Mounting position	Vertical ±5°
Air quality 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 $q_{n \max}$	5065	7090	11150	15190

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) Corrosion resistance class CRC 2 to Festo standard FN 940070

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

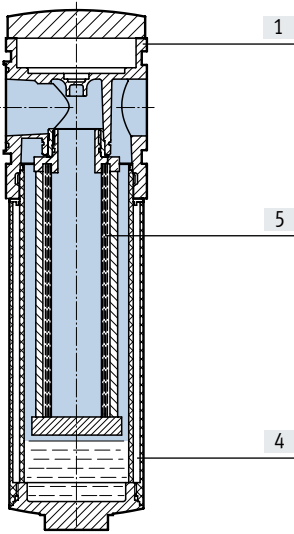
Weight [g]

Activated carbon filter with metal bowl guard U	7000
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Datasheet

Materials

Sectional view

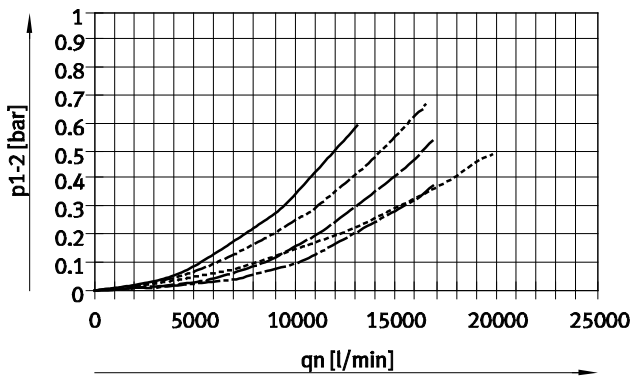


Activated carbon filters

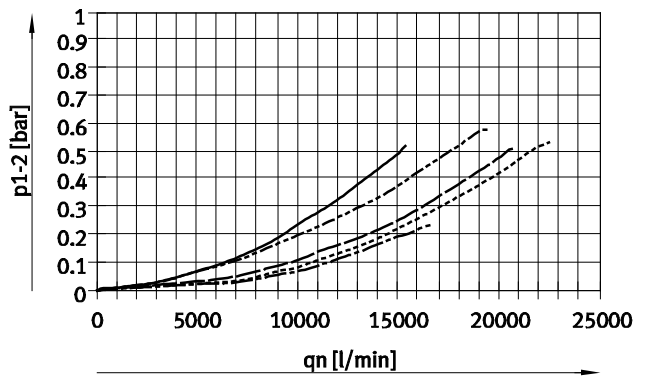
[1]	Housing	Die-cast aluminium
[4]	Metal bowl	Wrought aluminium alloy
	Inspection window	PC
[5]	Filters	Activated carbon
-	Seals	NBR
Note on materials		RoHS-compliant
		Free of copper and PTFE

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

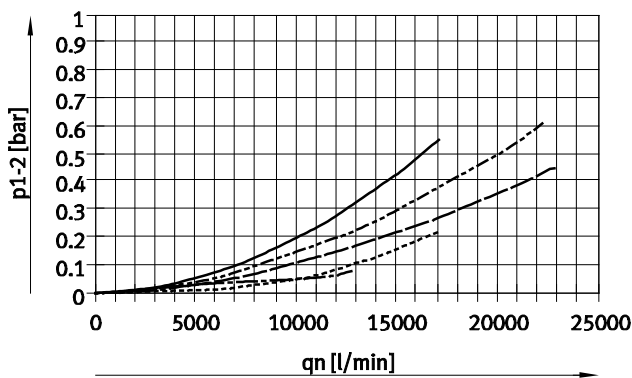
With connecting plate MS12-AGF, pneumatic connection G1



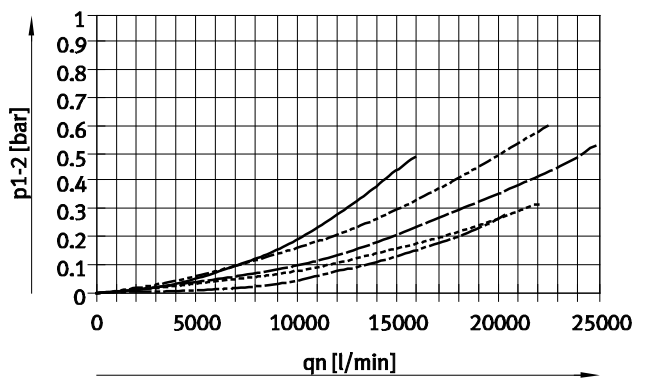
With connecting plate MS12-AGG, pneumatic connection G1 1/4



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



With connecting plate MS12-AGI, pneumatic connection G2

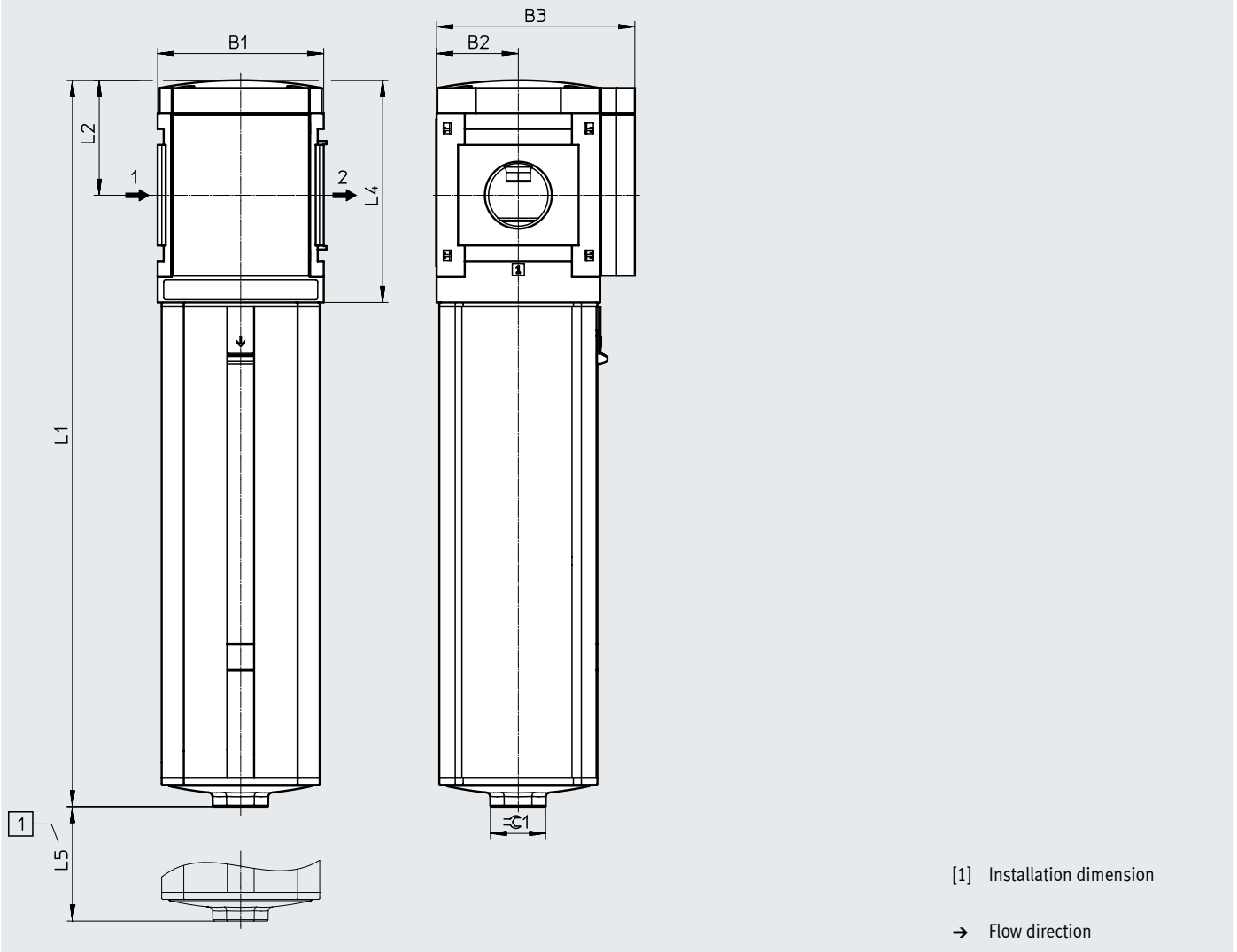


- p1: 4 bar
- - - - - p1: 6 bar
- - - - - p1: 8 bar
- p1: 10 bar
- · - · - p1: 12 bar

Datasheet

Dimensions – Basic version

Download CAD data → www.festo.com



Type	B1	B2	B3	L1	L2	L4	L5	$\varnothing 1$
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		Conditions	Code	Enter code
Grid dimension	[mm] 124			
Module no.	535043			
Series	Standard		MS	MS
Size	12		12	12
Function	Activated carbon filters		-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

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⁾³⁾
	Fine-filter cartridge	1	–	–	162677	MS4/D-MINI-LFM-B ²⁾³⁾
	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 ²⁾
	Fine-filter cartridge	1	Borosilicate fibre	2	552092	MS6-LFM-B-HF ²⁾
	Activated carbon filter cartridge	–	Activated carbon	2	552094	MS6-LFX-HF ²⁾
HP applications, suitable for sealing air and purge air						
MS6	Micro-filter cartridge	0.01	Borosilicate fibre	2	547922	MS6-LFM-AI ²⁾³⁾
	Fine-filter cartridge	1	Borosilicate fibre	2	547923	MS6-LFM-BI ²⁾³⁾
	Activated carbon filter cartridge	–	Activated carbon	2	547925	MS6-LFX-AKI ²⁾³⁾

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

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

2) Free of copper and PTFE

3) 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-A²⁾
	Fine-filter cartridge	1	Borosilicate fibre	2	553037	MS9-LFM-B²⁾
	Filter cartridge	5	PE	2	570309	MS9-LFP-C³⁾
	Filter cartridge	40	PE	2	570310	MS9-LFP-E³⁾
	Activated carbon filter cartridge	–	Activated carbon	2	552946	MS9-LFX²⁾
High flow rate HF						
MS9	Micro-filter cartridge	0.01	Borosilicate fibre	2	552944	MS9-LFM-A-HF²⁾
	Fine-filter cartridge	1	Borosilicate fibre	2	552945	MS9-LFM-B-HF²⁾

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

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

2) Free of copper and PTFE

3) RoHS-compliant

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⁾³⁾
	Fine-filter cartridge	1	Borosilicate fibre	2	395	537145	MS12-LFM-B ²⁾³⁾
	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⁾³⁾

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

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

2) Free of copper and PTFE

3) RoHS-compliant