

Water separators MS-LWS, MS series

FESTO



MS series service unit components

Key features

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MS series service unit components		Freely combinable function modules	
Solutions for every application			
With its large product range, highly functional components and a wide choice of services, the MS series from Festo offers a complete concept for compressed air preparation. Suitable for simple standard applications as well as application-specific solutions to the highest quality standards.	Available as individual components, pre-assembled combinations ex-stock, application-specific combinations or complete turnkey solutions. The five sizes in the MS series achieve maximum flow rates with minimum space requirements.	Pressure regulators, on/off and soft-start valves with safety function, filter, pressure and flow sensors, dryers, sensors and lubricators. All these allow a suitable solution to be assembled for every task. Their modular structure means that the components	are freely combinable. A simple connection system saves time when replacing individual modules without dismantling the entire combination. What's more, many of the components are certified to UL and ATEX.

CAD models and configurator	Engineering tools
Convenient aids for planning and selecting application-specific individual devices and combinations. The product configurator lets you configure customised solutions quickly and transfer the order data with no hassle.	Selection tool for choosing the right service unit without oversizing, and with the right air quality class: → www.festo.com/engineering/wartungseinheit

Air quality

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

Selection criteria: Application

Filter combination is proposed based upon your selected application

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

Selection criteria: ISO-class

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

particle : water : oil

ISO

*1 Downstream from the compressor the water content is assumed to be ISO class 4, better classes can be achieved by applying an adsorption dryer PSD40 or a membrane dryer LDM1

Direct filter selection

Independent selection of filter combination

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

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

Integrated sensors	Safety functions	Energy savings	
Pressure and flow sensors	Soft-start/quick exhaust valves MS6-SV/MS9-SV	Service units MSE6	Intelligent mix of sizes



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



- 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
Port sizes	M5, QS-6	G1/8, G1/4, G3/8	G1/4, G3/8, G1/2, G3/4	G1/2, G3/4, G1, G1 1/4, G1 1/2	G1, G1 1/4, G1 1/2, G2
Standard nominal flow rate q _N ¹⁾ [l/min]	350	1800	6500	20000	22000

1) Using pressure regulator MS-LR as an example

MS series service unit components

Key features

Note

Information

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

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

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

Structure of a service unit

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

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

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

Total product range for MS series service unit components

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

MS series service unit components

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Total product range for MS series service unit components								
Type	Description	Size	Pneumatic connection					
			Push-in connector	Female thread			Connection plate with thread	
				M	G	NPT	G	NPT
Individual devices								
Filter regulators MS-LFR Technical data → Internet: ms-lfr								
	Filter and pressure regulator in a single device, grade of filtration 5 or 40 µm	2	QS-6	M5	–	–	–	–
		4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
Filters MS-LF Technical data → Internet: ms-lf								
	Grade of filtration 5 or 40 µm	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
Fine and micro filters MS-LFM Technical data → Internet: ms-lfm								
	Grade of filtration Q01 or 1 µm	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
Activated carbon filters MS-LFX Technical data → Internet: ms-lfx								
	For removing liquid and gaseous oil particles	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
Water separators MS-LWS Technical data → Internet: ms-lws								
	Remove condensed water from compressed air, maintenance-free	6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–

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Type	Description	Size	Pneumatic connection					
			Push-in connector	Female thread			Connection plate with thread	
				M	G	NPT	G	NPT
Individual devices								
Pressure regulators MS-LR Technical data ➔ Internet: ms-lr								
	For setting the required operating pressure, 4 pressure regulation ranges	2	QS-6	M5	–	–	–	–
		4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
Pressure regulators MS-LRB Technical data ➔ Internet: ms-lrb								
	For creating a regulator manifold with independent pressure regulation ranges. Pressure output is to the front or rear.	4	–	–	1/4	–	1/8, 1/4, 3/8	–
		6	–	–	1/2	–	1/4, 3/8, 1/2, 3/4	–
Precision pressure regulators MS-LRP Technical data ➔ Internet: ms-lrp								
	For precise setting of the required operating pressure, 4 pressure regulation ranges, pressure hysteresis 0.02 bar	6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
Precision pressure regulators MS-LRPB Technical data ➔ Internet: ms-lrpb								
	For configuring a regulator manifold with independent pressure regulation ranges. Pressure output is to the front or rear.	6	–	–	1/2	–	1/4, 3/8, 1/2, 3/4	–
Electrical pressure regulators MS-LRE Technical data ➔ Internet: ms-lre								
	Electrically adjustable pressure regulator, 4 pressure regulation ranges	6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
Lubricators MS-LOE Technical data ➔ Internet: ms-loe								
	Add a precisely adjustable amount of oil to the compressed air. The oil mist component is proportional to the compressed air flow rate.	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–

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

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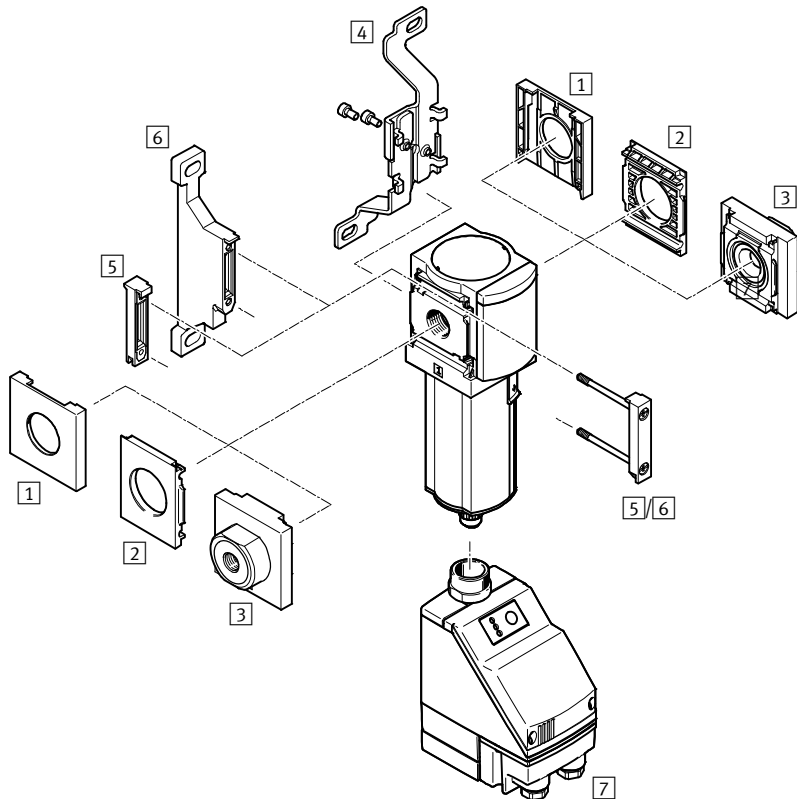
Total product range for MS series service unit components								
Type	Description	Size	Pneumatic connection					
			Push-in connector	Female thread			Connection plate with thread	
				M	G	NPT	G	NPT
Individual devices								
Membrane air dryers MS-LDM1 Technical data → Internet: ms-ldm								
	Wear-free membrane dryer with internal air consumption	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	1/8, 1/4, 3/8
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	1/4, 3/8, 1/2, 3/4
Branching modules MS-FRM Technical data → Internet: ms-frm								
	Compressed air distributor with 4 connections	4	–	–	1/8, 1/4	–	1/8, 1/4, 3/8	–
		6	–	–	1/4, 3/8, 1/2	–	1/4, 3/8, 1/2, 3/4	–
		9	–	–	3/4, 1	3/4, 1	1/2, 3/4, 1, 1 1/4, 1 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2
		12	–	–	–	–	1, 1 1/4, 1 1/2, 2	–
Distributor blocks MS-FRM-FRZ Technical data → Internet: ms-frm-frz								
	Compressed air distributor with 4 connections and half the grid dimension width	4	–	–	–	–	–	–
		6	–	–	–	–	–	–
Flow sensors SFAM Technical data → Internet: sfam								
	For absolute flow rate information and accumulated air consumption measurement	6	–	–	–	–	1/2	1/2
		9	–	–	–	–	1, 1 1/2	1, 1 1/2

Water separators MS6-LWS, MS series

Peripherals overview

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Water separator MS6-LWS



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 MS6-END	■	–	■	–	ms6-end
2	Mounting plate MS6-AEND	■ ¹⁾	–	■ ¹⁾	–	ms6-aend
3	Connecting plate-SET MS6-AG...	–	■ ¹⁾	–	■ ¹⁾	ms6-ag
	Connecting plate-SET MS6-AQ...	–	■ ¹⁾	–	■ ¹⁾	ms6-aq
4	Mounting bracket MS6-WB	■	■	–	–	ms6-wb
5	Module connector MS6-MV	–	■	■	■	ms6-mv
6	Mounting bracket MS6-WP	■	■	■	■	ms6-wp
	Mounting bracket (not illustrated) MS6-WPB/WPE/WPM	■	■	■	■	ms6-wp
7	Fully automatic, electrically actuated condensate drain E2/E3/E4	■	■	■	■	15

1) Module connector MS6-MV [5] or mounting bracket MS6-WP/WPB/WPE/WPM [6] is required for mounting.

Water separators MS6-LWS, MS series

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Type codes

		MS	6	-	LWS	-	1/4	-	U	-	V
Series											
MS	Standard service unit										
Size											
6	Grid dimension 62 mm										
Service function											
LWS	Water separator										
Pneumatic connection											
1/4	Female thread G $\frac{1}{4}$										
3/8	Female thread G $\frac{3}{8}$										
1/2	Female thread G $\frac{1}{2}$										
Bowl guard											
U	Integrated as metal bowl										
Condensate drain											
V	Fully automatic										

Further variants can be ordered using the modular system → 15

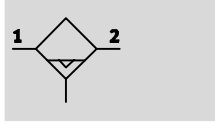
- Pneumatic connection
- Condensate drain
- Type of mounting
- EU certification
- UL certification
- Flow direction

Water separators MS6-LWS, MS series

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Technical data

Condensate drain,
fully automatic



-  - Flow rate
2,400 ... 3,800 l/min
-  - Temperature range
+1 ... +60 °C
-  - Operating pressure
0.8 ... 16 bar
-  - www.festo.com



The maintenance-free water separator removes condensate from the compressed air.

- Constantly high condensate separation (99%) up to the maximum flow rate
- Metal bowl
- Available with fully automatic or fully automatic, electrically actuated condensate drain
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22

General technical data		
Size	MS6	
Pneumatic connection 1, 2		
Female thread	G $\frac{1}{4}$, G $\frac{3}{8}$ or G $\frac{1}{2}$	
Connecting plate AG...	G $\frac{1}{4}$, G $\frac{3}{8}$, G $\frac{1}{2}$ or G $\frac{3}{4}$	
Connecting plate AQ...	NPT $\frac{1}{4}$, NPT $\frac{3}{8}$, NPT $\frac{1}{2}$ or NPT $\frac{3}{4}$	
Constructional design	Centrifugal separator	
Type of mounting	Via accessories	
	In-line installation	
Mounting position	Vertical $\pm 5^\circ$	
Air purity class at the output	Compressed air in accordance with ISO 8573-1:2010 [7:7:4] (with variant E2, E3 or E4: [-:7:4])	
Bowl guard	Integrated as metal bowl	
Condensate drain	Fully automatic	
	Fully automatic, electrically actuated	
Degree of condensate separation [%]	99	
Max. condensate volume [ml]	38	

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

Standard nominal flow rate $q_{nN}^{1)}$			
Size	MS6		
Pneumatic connection	G $\frac{1}{4}$ /NPT $\frac{1}{4}$	G $\frac{3}{8}$ /NPT $\frac{3}{8}$	G $\frac{1}{2}$ /NPT $\frac{1}{2}$
q_{nN} [l/min]	2,400	3,500	3,800

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

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Technical data

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Operating and environmental conditions		
Condensate drain	Fully automatic V	Fully automatic, electrical E2/E3/E4
Size	MS6	MS6
Operating pressure [bar]	2 ... 12 (2 ... 10) ¹⁾	0.8 ... 16 (0.8 ... 10) ¹⁾
Operating medium	Compressed air in accordance with ISO 8573-1:2010 [7:-:-]	Compressed air in accordance with ISO 8573-1:2010 [-:-:-]
	Inert gases	
Ambient temperature [°C]	+5 ... +60	+1 ... +60
Temperature of medium [°C]	+5 ... +60	+1 ... +60
Storage temperature [°C]	-10 ... +60	+1 ... +60
Corrosion resistance class CRC ²⁾	2	
Food-safe ³⁾	See supplementary material information	-
UL certification ³⁾	cULus recognized (OL)	

1) Value in brackets applies to MS6-LWS with UL certification.

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

Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

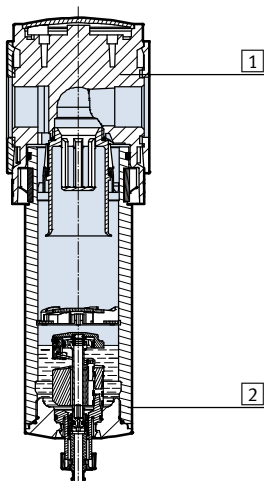
3) Additional information www.festo.com/sp → Certificates.

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

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

Weight [g]	
Size	MS6
Water separator	820
Water separator with fully automatic, electrically actuated condensate drain E2/E3/E4	1,800

Materials	
Sectional view	



Water separator		
1	Housing	Die-cast aluminium
2	Bowl	Wrought aluminium alloy
	Inspection window	PA
-	Seals	NBR
Note on materials		RoHS-compliant
		Free of copper and PTFE

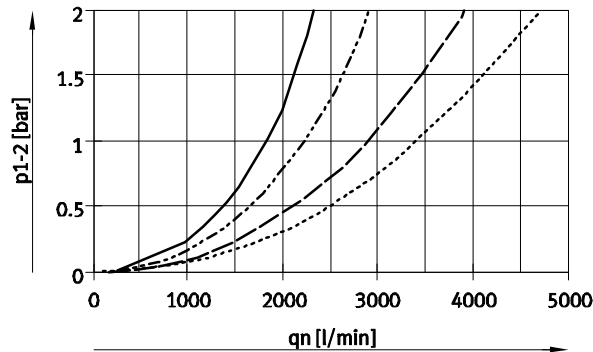
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Technical data

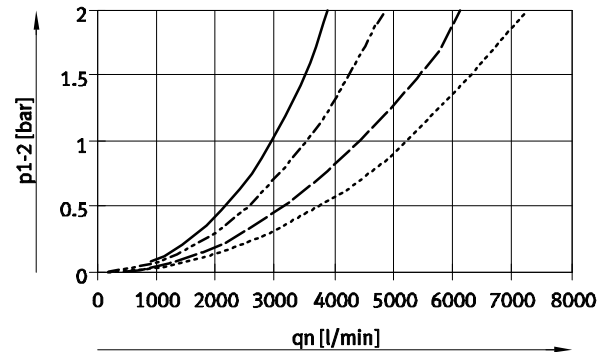
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Standard flow rate q_n as a function of differential pressure p_{1-2}

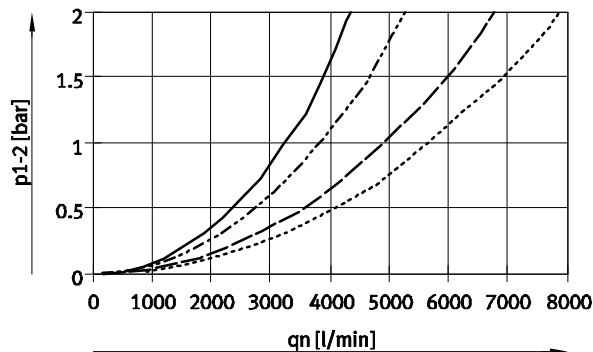
Pneumatic connection $G\frac{1}{4}/NPT\frac{1}{4}$



Pneumatic connection $G\frac{3}{8}/NPT\frac{3}{8}$



Pneumatic connection $G\frac{1}{2}/NPT\frac{1}{2}$



- 4 bar
- - - 6 bar
- · - · 10 bar
- · · · 14 bar

Water separators MS6-LWS, MS series

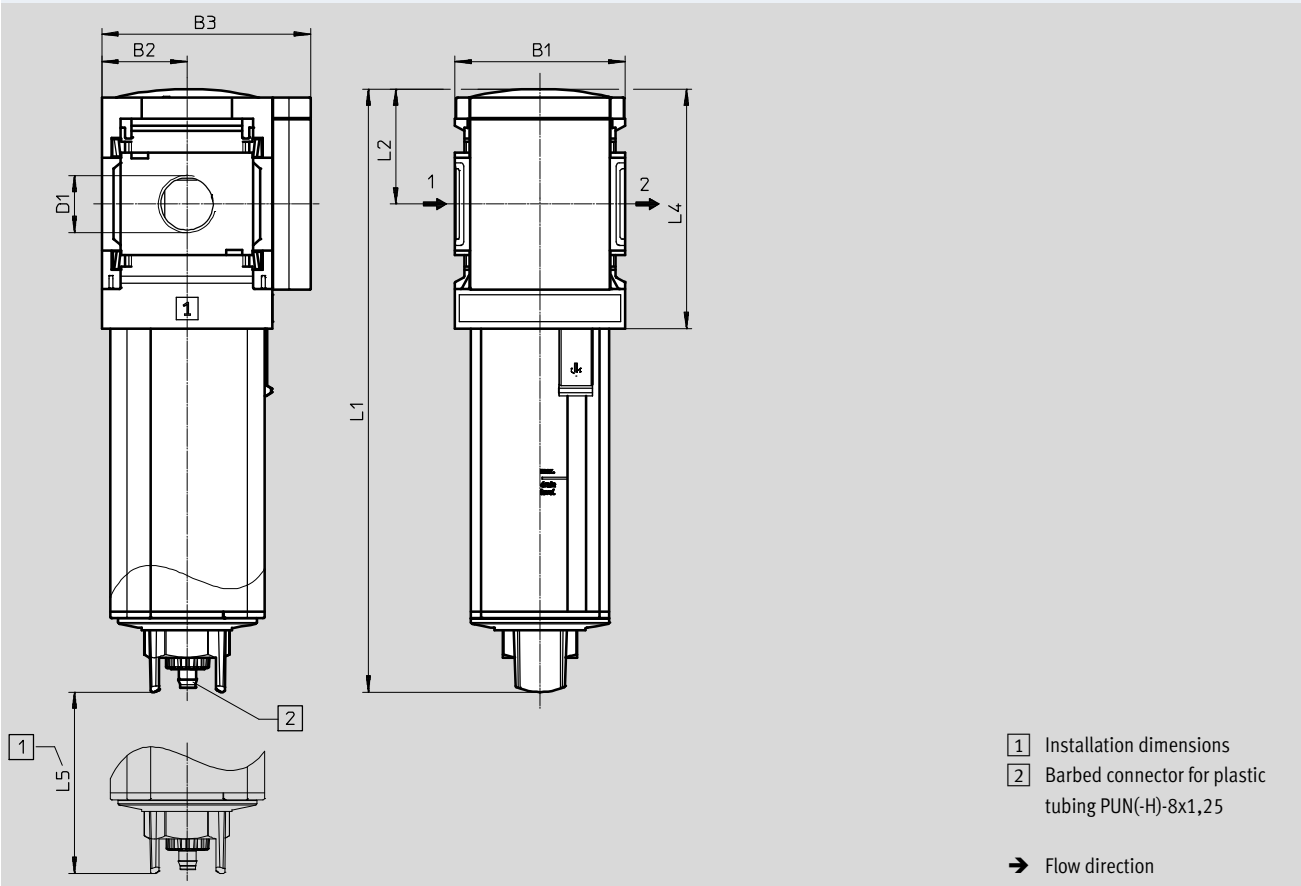
Technical data

FESTO

Dimensions – Basic version

Download CAD data → www.festo.com

Fully automatic condensate drain V



Type	B1	B2	B3	D1	L1	L2	L4	L5
MS6-LWS-1/4-...-V	62	31	76	G $\frac{1}{4}$	220	42	88	64
MS6-LWS-3/8-...-V				G $\frac{3}{8}$				
MS6-LWS-1/2-...-V				G $\frac{1}{2}$				

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

Water separators MS6-LWS, MS series

Technical data

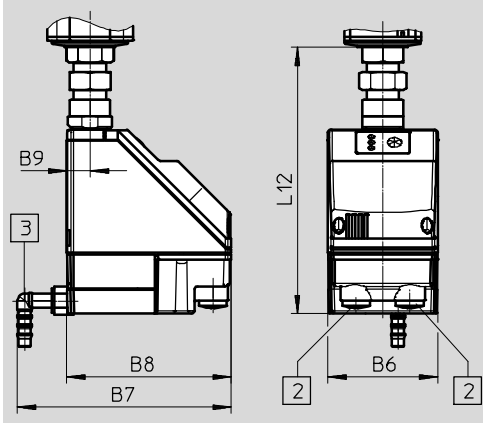
FESTO

Dimensions – Condensate drain

Fully automatic, electrically actuated E2/E3/E4

Download CAD data → www.festo.com

Technical data → Internet: pwea



Condensate drain PWEA:

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

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

Ordering data

Size	Condensate drain	Connection	Part No.	Type
Integrated as metal bowl				
MS6	Fully automatic	G1/4	564868	MS6-LWS-1/4-U-V
		G3/8	564869	MS6-LWS-3/8-U-V
		G1/2	564870	MS6-LWS-1/2-U-V

Water separators MS6-LWS, MS series

Ordering data – Modular products

FESTO

Ordering table					
Grid dimension	[mm]	62	Condi- tions	Code	Enter code
[M] Module No.	564858				
Series	Standard			MS	MS
Size	6			6	6
Function	Water separator			-LWS	-LWS
Pneumatic connection	Female thread G $\frac{1}{4}$		1	-1/4	
	Female thread G $\frac{3}{8}$		1	-3/8	
	Female thread G $\frac{1}{2}$		1	-1/2	
	Connecting plate G $\frac{1}{4}$			-AGB	
	Connecting plate G $\frac{3}{8}$			-AGC	
	Connecting plate G $\frac{1}{2}$			-AGD	
	Connecting plate G $\frac{3}{4}$			-AGE	
	Connecting plate NPT $\frac{1}{4}$		1	-AQN	
	Connecting plate NPT $\frac{3}{8}$		1	-AQP	
	Connecting plate NPT $\frac{1}{2}$		1	-AQR	
	Connecting plate NPT $\frac{3}{4}$		1	-AQS	
Bowl guard	Metal bowl			-U	-U
Condensate drain	Fully automatic (P1 max. 12 bar)			-V	
	External, fully automatic, electric	115 V AC, terminals (P1 max. 16 bar)	1	-E2	
		230 V AC, terminals (P1 max. 16 bar)	1	-E3	
		24 V DC, terminals (P1 max. 16 bar)	1	-E4	
[O] Type of mounting	Mounting bracket standard design		2	-WP	
	Mounting bracket for attaching the service units		1 2	-WPM	
	Mounting bracket centrally at rear (wall mounting top and bottom), connecting plates not required			-WB	
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 1/4, 3/8, 1/2, AQN, AQP, AQR, AQS, E2, E3, E4, WPM

Not with EU certification EX4

2 WP, WPM Only with connecting plate AGB, AGC, AGD, AGE, AQN, AQP, AQR or AQS.

[M] Mandatory data

[O] Options

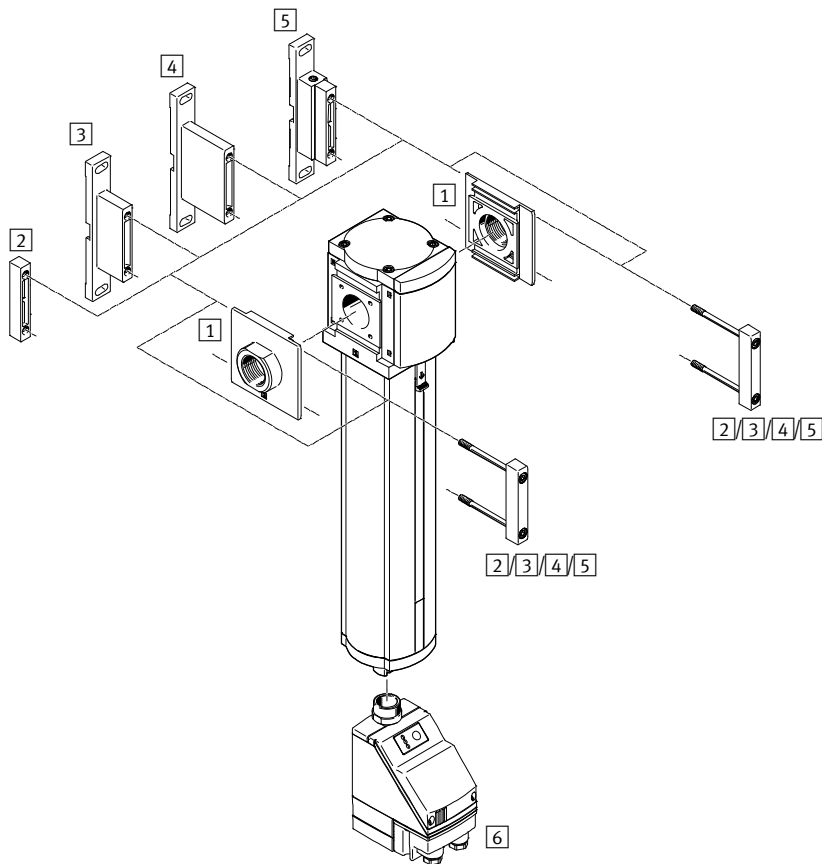
Transfer order code

564858 MS 6 - LWS - U - - - - -

Water separators MS9-LWS, MS series

Peripherals overview

FESTO



Note

Additional accessories:

– Module connector for combinations with size MS6, MS9 or MS12

→ Internet: rmv, armv

Mounting attachments and accessories					
	Individual device	Combination			→ Page/ Internet
		With female thread	With connecting plate AG.../AQ... Without EU certification EX4	With EU certification EX4	
[1] Connecting plate-SET MS9-AG...	–	■	■	■	ms9-ag
Connecting plate-SET MS9-AQ...	–	■	–	■	ms9-aq
[2] Module connector MS9-MV	–	–	–	■	ms9-mv
[3] Mounting bracket MS9-WP	■	■	■	■	ms9-wp
[4] Mounting bracket MS9-WPB	■	■	■	■	ms9-wp
[5] Mounting bracket MS9-WPM	■	■	–	■	ms9-wp
[6] Condensate drain, fully automatic, electrically actuated E2/E3/E4	■	■	–	■	23

Water separators MS9-LWS, MS series

FESTO

Type codes

		MS	9	-	LWS	-	G	-	U	-	V
Series											
MS	Standard service unit										
Size											
9	Grid dimension 90 mm										
Service function											
LWS	Water separator										
Pneumatic connection											
G	Module without connecting thread, without connecting plate										
Bowl guard											
U	Integrated as metal bowl										
Condensate drain											
V	Fully automatic										

Additional variants can be ordered using the modular product system → 23

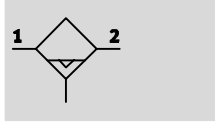
- Pneumatic connection
- Condensate drain
- Type of mounting
- EU certification
- UL certification
- Flow direction

Water separators MS9-LWS, MS series

FESTO

Technical data

Condensate drain,
fully automatic



-  - Flow rate
12,000 ... 15,000 l/min
-  - Temperature range
+1 ... +60 °C
-  - Operating pressure
0.8 ... 16 bar



The water separator removes
condensate from the compressed air.

- Constantly high condensate separation (99%) up to the maximum flow rate
- Metal bowl
- Available with fully automatic or fully automatic, electrically actuated condensate drain
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22

General technical data	
Size	MS9
Pneumatic connection 1, 2	
Female thread	G3/4, G1, NPT3/4 or NPT1
Connecting plate AG...	G1/2, G3/4, G1, G1 1/4 or G1 1/2
Connecting plate AQ...	NPT1/2, NPT3/4, NPT1, NPT1 1/4 or NPT1 1/2
Module without connecting thread/plate G	–
Design	Centrifugal separator
Type of mounting	Via accessories In-line installation
Mounting position	Vertical ±5°
Air purity class at the output	Compressed air in accordance with ISO 8573-1:2010 [–:7:4]
Bowl guard	Integrated as metal bowl
Condensate drain	Fully automatic Fully automatic, electrically actuated
Degree of condensate separation [%]	99
Max. condensate volume [ml]	220

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

Standard nominal flow rate qnN ¹⁾ [l/min]			
Pneumatic connection	G3/4/NPT3/4	G1/NPT1	Module without connecting thread, without connecting plate G
qnN [l/min]	12,000 ±15%	15,000 ±15%	15,000 ±15%

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

Water separators MS9-LWS, MS series

Technical data

FESTO

Operating and environmental conditions		
Condensate drain	Fully automatic V	Fully automatic, electrically actuated E2/E3/E4
Operating pressure [bar]	2 ... 12	0.8 ... 16
Operating medium	Compressed air in accordance with ISO 8573-1:2010 [–:–:–]	
Ambient temperature [°C]	+5 ... +60	+1 ... +60
Temperature of medium [°C]	+5 ... +60	+1 ... +60
Storage temperature [°C]	+5 ... +60	+1 ... +60
Corrosion resistance class CRC ¹⁾	2	
UL certification ²⁾	cULus recognized (OL)	

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

Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

2) Additional information www.festo.com/sp → Certificates.

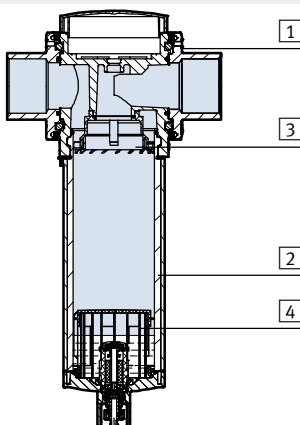
ATEX	
EU certification	EX4
ATEX category gas	II 2G
Ex-ignition protection type gas	Ex h IIC T6 Gb X
ATEX category dust	II 2D
EX-ignition protection type dust	Ex h IIIC T60°C Db X
ATEX ambient temperature	+5 °C ≤ Ta ≤ +60 °C
CE mark (see declaration of conformity) ¹⁾	To EU Explosion Protection Directive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

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

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

Materials

Sectional view



Water separator		
1	Housing	Die-cast aluminium
2	Bowl	Wrought aluminium alloy
	Inspection window	PA
3	Spin disc	POM
4	Isolating disc	POM
–	Cover	PA reinforced
–	Connecting plate, module connector, mounting bracket	Die-cast aluminium
–	Seals	NBR
Note on materials		RoHS-compliant

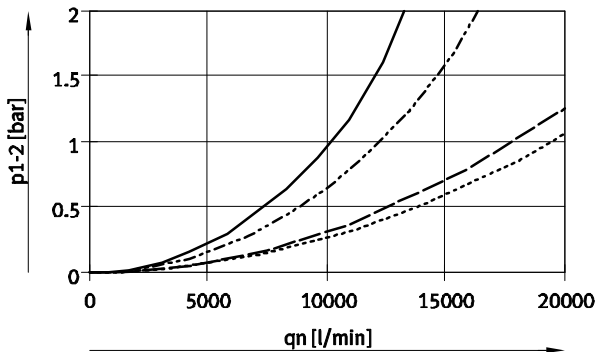
Water separators MS9-LWS, MS series

Technical data

FESTO

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

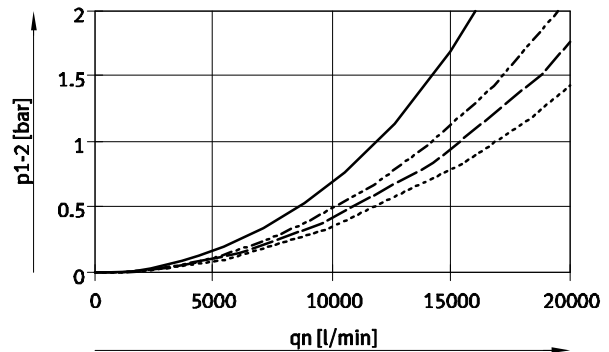
Pneumatic connection G $\frac{3}{4}$ /NPT $\frac{3}{4}$



— 4 bar
- - - 6 bar

- · - 10 bar
· · · 12 bar

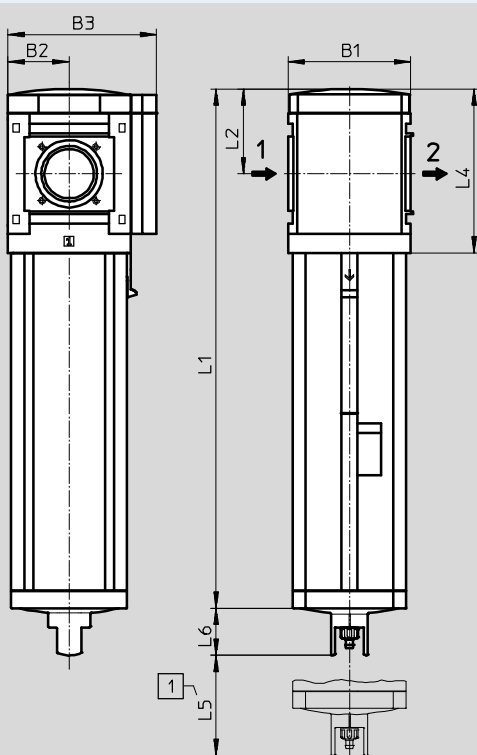
Pneumatic connection G1/NPT1



Dimensions – Basic version

Download CAD data → www.festo.com

Module without connecting thread, without connecting plate G, fully automatic condensate drain V



1 Installation dimensions

→ Flow direction

Type	B1	B2	B3	L1	L2	L4	L5	L6
MS9-LWS-G	90	45	109	310.5	62	120	50	34.5

Water separators MS9-LWS, MS series

Technical data

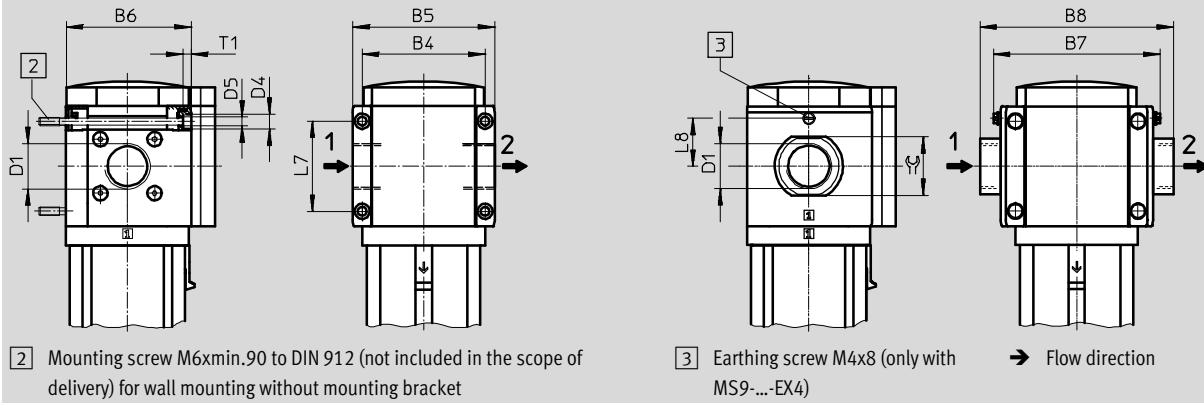
FESTO

Dimensions – Connecting thread/connecting plate

Download CAD data → www.festo.com

With female thread

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



Type	B4	B5	B6	B7		B8	D1	D4	D5	L7	L8		T1	≙
					EX4							EX4		
MS9-LWS-3/4	90	104	91.5	-	-	-	G3/4	11	6.5	66	-	-	6	-
MS9-LWS-1							G1							
MS9-LWS-AGD	-	-	-	112	122	132	G1/2	-	-	-	35	-	-	30
MS9-LWS-AGE						132	G3/4							36
MS9-LWS-AGF						142	G1							41
MS9-LWS-AGG						162	G1 1/4							50
MS9-LWS-AGH						176	G1 1/2							55
MS9-LWS-N3/4	90	104	91.5	-	-	-	NPT3/4-14	11	6.5	66	-	-	6	-
MS9-LWS-N1							NPT1-11 1/2							
MS9-LWS-AQR	-	-	-	112	122	132	NPT1/2-14	-	-	-	35	-	-	30
MS9-LWS-AQS						132	NPT3/4-14							36
MS9-LWS-AQT						142	NPT1-11 1/2							41
MS9-LWS-AQU						162	NPT1 1/4-11 1/2							50
MS9-LWS-AQV						176	NPT1 1/2-11 1/2							55

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

Water separators MS9-LWS, MS series

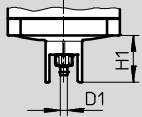
FESTO

Technical data

Dimensions – Condensate drain

Download CAD data → www.festo.com

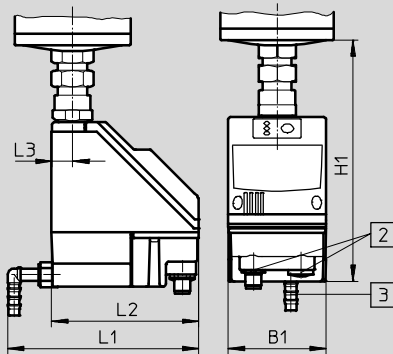
Fully automatic V



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

Fully automatic, electrically actuated E2/E3/E4

Technical data → Internet: [pwea](http://pwea.festo.com)



Condensate drain PWEA:

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

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

Ordering data

Size	Condensate drain	Connection	Part No.	Type
MS9	Fully automatic	–	571468	MS9-LWS-G-U-V

Water separators MS9-LWS, MS series

Ordering data – Modular products

FESTO

Ordering table					
Grid dimension	[mm]	90	Condi- tions	Code	Enter code
M Module No.	567857				
Series	Standard			MS	MS
Size	9			9	9
Function	Water separator			-LWS	-LWS
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 NPT3/4	1		-N3/4	
	Female thread NPT1	1		-N1	
	Connecting plate NPT1/2	1		-AQR	
	Connecting plate NPT3/4	1		-AQS	
	Connecting plate NPT1	1		-AQT	
	Connecting plate NPT1 1/4	1		-AQU	
	Connecting plate NPT1 1/2	1		-AQV	
	Module without connecting thread, without connecting plate	1		-G	
Bowl	Metal bowl			-U	-U
Condensate drain	Fully automatic (P1 max. 12 bar)			-V	
	External, fully automatic, electric	115 V AC, terminals (P1 max. 16 bar)	1	-E2	
		230 V AC, terminals (P1 max. 16 bar)	1	-E3	
		24 V DC, terminals (P1 max. 16 bar)	1	-E4	
O Type of mounting	Mounting bracket standard design	2		-WP	
	Mounting bracket for attaching the service units	1 2		-WPM	
	Mounting bracket for large wall gap	2		-WPB	
EU certification	II 2GD to EU Explosion Protection Directive (ATEX)			-EX4	
UL certification	cULus, ordinary location for Canada and USA			-UL1	
Flow direction	Flow direction from right to left			-Z	

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

Not with EU certification EX4

2 WP, WPM, WPB

Not with pneumatic connection G

M Mandatory data

O Options

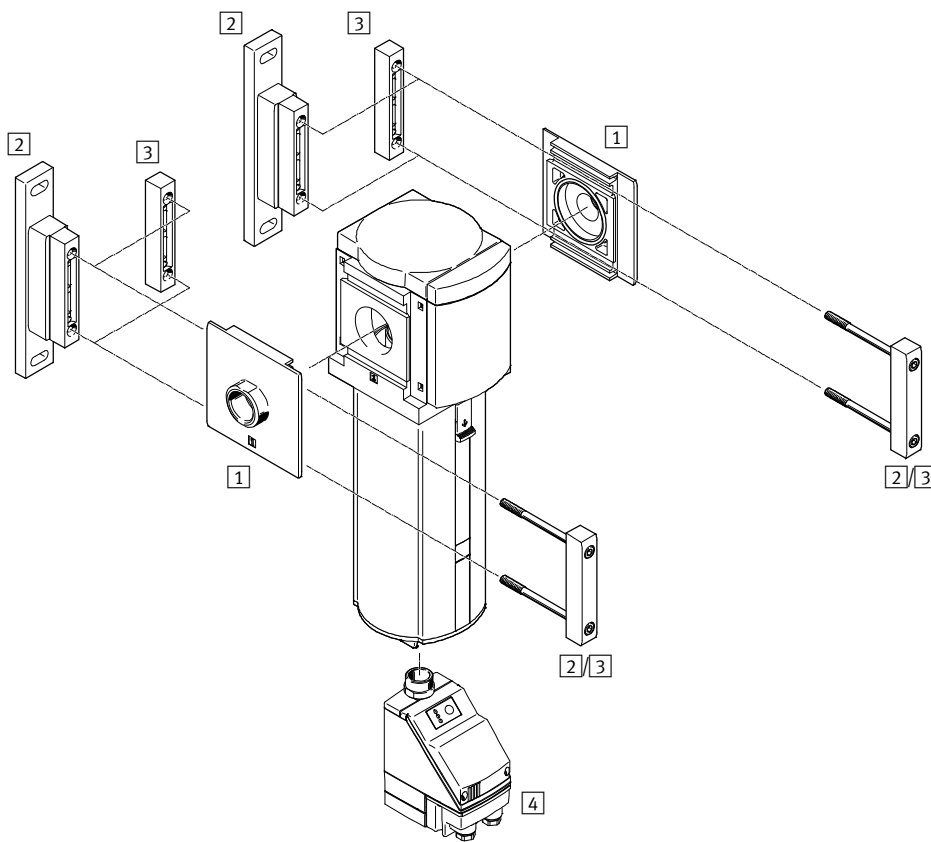
Transfer order code

567857 MS 9 - LWS - U - - - - -

Water separators MS12-LWS, MS series

Peripherals overview

FESTO



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
	Connecting plate-SET MS12-AQ...	ms12-aq
2	Mounting bracket MS12-WP	ms12-wp
3	Module connector MS12-MV	ms12-mv
4	Fully automatic, electrically actuated condensate drain E2/E3/E4	30

Water separators MS12-LWS, MS series

FESTO

Type codes

		MS	12	-	LWS	-	G	-	U	-	V
Series											
MS	Standard service unit										
Size											
12	Grid dimension 124 mm										
Service function											
LWS	Water separator										
Pneumatic connection											
G	Module without connecting thread, without connecting plate										
Bowl guard											
U	Integrated as metal bowl										
Condensate drain											
V	Fully automatic										

Additional variants can be ordered using the modular product system → 30

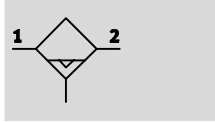
- Pneumatic connection
- Condensate drain
- Type of mounting
- Flow direction

Water separators MS12-LWS, MS series

FESTO

Technical data

Condensate drain,
fully automatic



-  - Flow rate
25,000 l/min
-  - Temperature range
+1 ... +60 °C
-  - Operating pressure
0.8 ... 16 bar



The water separator removes
condensate from the compressed air.

- Constantly high condensate separation (99%) up to the maximum flow rate
- Metal bowl
- Available with fully automatic or fully automatic, electrically actuated condensate drain

General technical data		
Pneumatic connection 1, 2		
Connecting plate AG...		G1, G1¼, G1½ or G2
Connecting plate AQ...		NPT1, NPT1¼, NPT1½ or NPT2
Module without connecting thread/plate G		–
Design		Centrifugal separator
Type of mounting		Via accessories
		In-line installation
Mounting position		Vertical ±5°
Air purity class at the output		Compressed air to ISO 8573-1:2010 [–:7:4]
Bowl guard		Integrated as metal bowl
Condensate drain		Fully automatic
		Fully automatic, electrically actuated
Degree of condensate separation	[%]	99
Max. condensate volume	[ml]	400

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

Flow rates		
Standard nominal flow rate	[l/min]	25,000 ±15%
q _{nN} ¹⁾		
Max. standard flow rate	[l/min]	40,000 ±15%
q _{n max.}		

1) Measured at p₁ = 6 bar and Δp = 0.5 bar

Water separators MS12-LWS, MS series

Technical data

FESTO

Operating and environmental conditions		
Condensate drain	Fully automatic V	Fully automatic, electrically actuated E2/E3/E4
Operating pressure [bar]	2 ... 12	0.8 ... 16
Operating medium	Compressed air to ISO 8573-1:2010 [–:–:–]	
Ambient temperature [°C]	+5 ... +60	+1 ... +60
Temperature of medium [°C]	+5 ... +60	+1 ... +60
Storage temperature [°C]	+5 ... +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 may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Weight [g]	
Water separator	6,300
Water separator with fully automatic, electrically actuated condensate drain E2/E3/E4	7,000
Accessories	
Connecting plate AG...	1,300
Mounting bracket WP	700

Materials

A detailed cross-sectional diagram of a water separator assembly. The diagram shows the internal components and their assembly. Four numbered callouts are present: 1 points to the top housing, 2 points to the large central bowl, 3 points to the separating plate, and 4 points to the bottom assembly including the spin disc and connecting plate. The diagram uses hatching to indicate different materials and cross-sections.

Water separator		
1	Housing	Die-cast aluminium
2	Bowl	Wrought aluminium alloy
	Inspection window	PA
3	Spin disc	POM
4	Separating plate	POM
–	Cover	PA reinforced
–	Connecting plate, module connector, mounting bracket	Die-cast aluminium
–	Seals	Nitrile rubber
Note on materials		RoHS-compliant

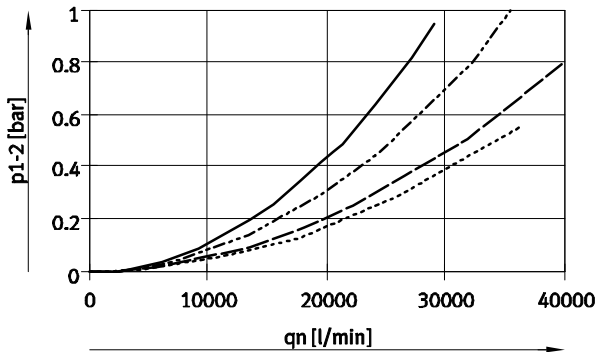
Water separators MS12-LWS, MS series

Technical data

FESTO

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

Pneumatic connection G1½/G2/NPT1½/NPT2

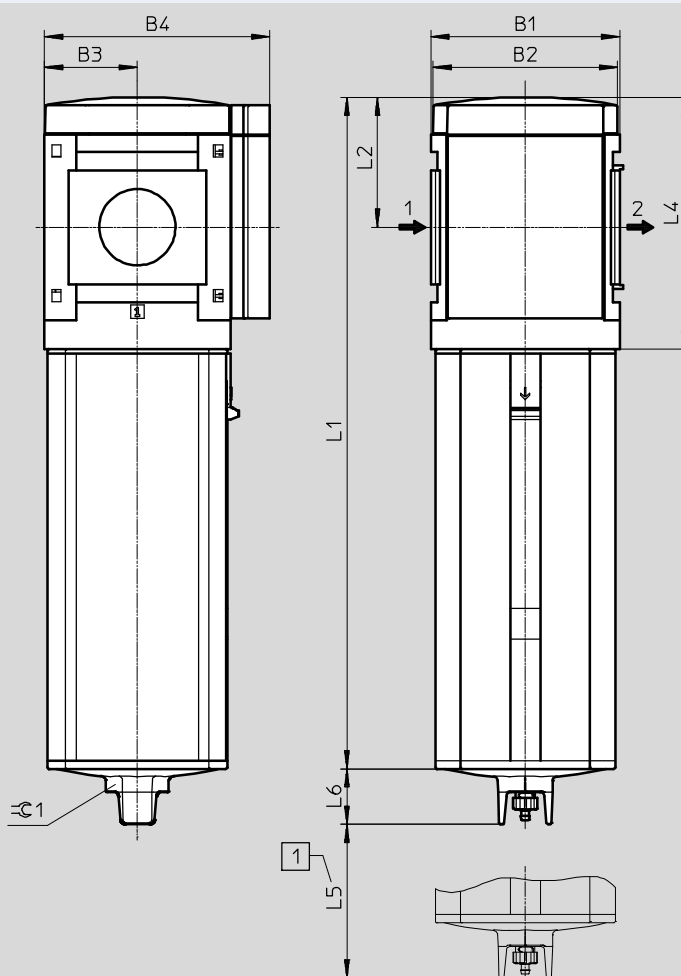


— 4 bar
- - - 6 bar
- · - 10 bar
· · · 12 bar

Dimensions – Basic version

Download CAD data → www.festo.com

Module without connecting thread, without connecting plate G, fully automatic condensate drain V



Note
Dimensions with
- connecting plate → ms12-ag
- mounting bracket → ms12-wp

1 Installation dimensions
→ Flow direction

Type	B1	B2	B3	B4	L1	L2	L4	L5	L6	∅ 1
MS12-LWS-G	124	122	61	148	441	85	165	60	36	36

Water separators MS12-LWS, MS series

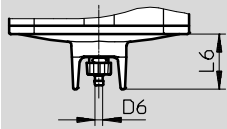
FESTO

Technical data

Dimensions – Condensate drain

Download CAD data → www.festo.com

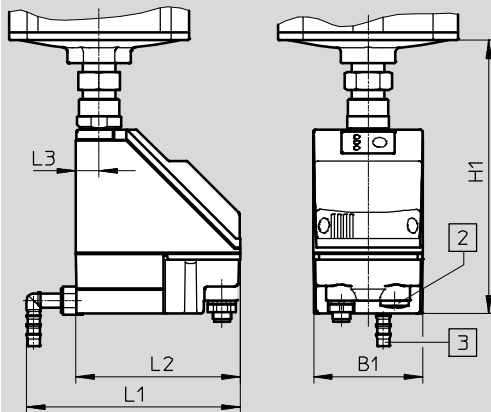
Fully automatic V



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

Fully automatic, electrically actuated E2/E3/E4

Technical data → Internet: pwea



Condensate drain PWEA:

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

Type	B1	D6	H1	L1	L2	L3	L6
MS12-LWS-...-V	–	5.6	–	–	–	–	36
MS12-LWS-...-E2/E3/E4	72	–	179	140	108	15	–

Ordering data

Size	Condensate drain	Connection	Part No.	Type
MS12	Fully automatic	–	8005550	MS12-LWS-G-U-V

Water separators MS12-LWS, MS series

FESTO

Ordering data – Modular products

Ordering table								
Grid dimension		[mm]	124	Condi- tions	Code	Enter code		
M	Module No.		569827					
	Series		Standard			MS		MS
	Size		12			12		12
	Function		Water separator			-LWS		-LWS
	Pneumatic connection		Connecting plate G1			-AGF		
			Connecting plate G1¼			-AGG		
			Connecting plate G1½			-AGH		
			Connecting plate G2			-AGI		
			Connecting plate NPT1			-AQT		
			Connecting plate NPT1¼			-AQU		
			Connecting plate NPT1½			-AQV		
			Connecting plate NPT2			-AQW		
			Module without connecting thread, without connecting plate		1	-G		
	Bowl		Metal bowl			-U		-U
	Condensate drain		Fully automatic (P1 max. 12 bar)			-V		
	External, fully automatic, electric		115 V AC, terminals (P1 max. 16 bar)			-E2		
			230 V AC, terminals (P1 max. 16 bar)			-E3		
24 V DC, terminals (P1 max. 16 bar)				-E4				
O	Type of mounting		Mounting bracket standard design		2	-WP		
	Flow direction		Flow direction from right to left			-Z		

- 1 G** Not with mounting type WP.
2 WP Only with connecting plate AGF, AGG, AGH, AGI, AQT, AQU, AQV or AQW.

- M** Mandatory data
O Options

Transfer order code

569827 MS 12 - LWS - - U - - -

Festo - Your Partner in Automation



1 Festo Inc.
5300 Explorer Drive
Mississauga, ON L4W 5G4
Canada

Festo Customer Interaction Center

Tel: 1 877 463 3786
Fax: 1 877 393 3786
Email: customer.service.ca@festo.com



2 Festo Pneumatic
Av. Ceylán 3,
Col. Tequesquináhuac
54020 Tlalneapantla,
Estado de México

Multinational Contact Center

01 800 337 8669
ventas.mexico@festo.com



3 Festo Corporation
1377 Motor Parkway
Suite 310
Islandia, NY 11749

Festo Customer Interaction Center

1 800 993 3786
1 800 963 3786
customer.service.us@festo.com



4 Regional Service Center
7777 Columbia Road
Mason, OH 45040

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