

## Filters MS-LF/LFM/LFX, MS series

**FESTO**



## Key features

### Service unit components of the MS series

#### Solutions for every application

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

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

#### Freely combinable functional modules

Pressure regulators, on/off and soft-start valves with safety function, filters, pressure and flow sensors, dryers, sensors and lubricators can be assembled into a suitable solution for every task. Thanks to the modular structure the components can be combined as required. The simple connection system saves time because there is no need to disassemble the

entire combination when replacing individual modules. Many of the components are also UL and ATEX certified.

#### 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 quickly and to transfer the order data without any hassle.

#### Engineering tools

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

→ [www.festo.com/engineering/service-unit](http://www.festo.com/engineering/service-unit)

#### Air quality

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

##### Selection criteria: Application

Filter combination is proposed based upon your selected application

- ☐ standard pneumatics operation of valves and cylinders, e.g. in automotive industry, secondary packaging
- ☐ mining and building industry applications without special air cleanliness requirements
- ☐ application of pressure operated tools and machines pneumatic hammer, air engine, positioning with proportional valve
- ☐ electronic, flatpanel and solar industry, textile and paper production application with residual oil content <0.5 mg/m<sup>3</sup>
- ☐ painting, powder coating, air bearing application with residual oil content <0.01 mg/m<sup>3</sup>
- ☐ food and beverage industry, optics application with residual oil content <0.003 mg/m<sup>3</sup> reduction of oil vapours and aromas

##### Selection criteria: ISO-class

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

| particle | water | oil |
|----------|-------|-----|
| 4        | *     |     |

ISO

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

##### Direct filter selection

Independent selection of filter combination

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



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

### Integrated sensors

Pressure and flow sensors



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

### Safety functions

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



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

### Saving energy

Service unit combinations MSE6



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

Intelligent mix of sizes



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

### Size differences

| Size                                               | MS2      | MS4              | MS6                    | MS9                            | MS12                   |
|----------------------------------------------------|----------|------------------|------------------------|--------------------------------|------------------------|
| Grid dimension [mm]                                | 25       | 40               | 62                     | 90                             | 124                    |
| Connection sizes                                   | M5, QS-6 | G1/8, G1/4, G3/8 | G1/4, G3/8, G1/2, G3/4 | G1/2, G3/4, G1, G1 1/4, G1 1/2 | G1, G1 1/4, G1 1/2, G2 |
| Standard nominal flow rate q <sub>N1</sub> [l/min] | 350      | 1800             | 6500                   | 20000                          | 22000                  |

1) Using pressure regulator MS-LR as an example

## Key features

**Note**

## Information

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

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

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

## Designing a service unit combination

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

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

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

## Product range for service unit components MS series

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

## Key features

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

## Key features

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

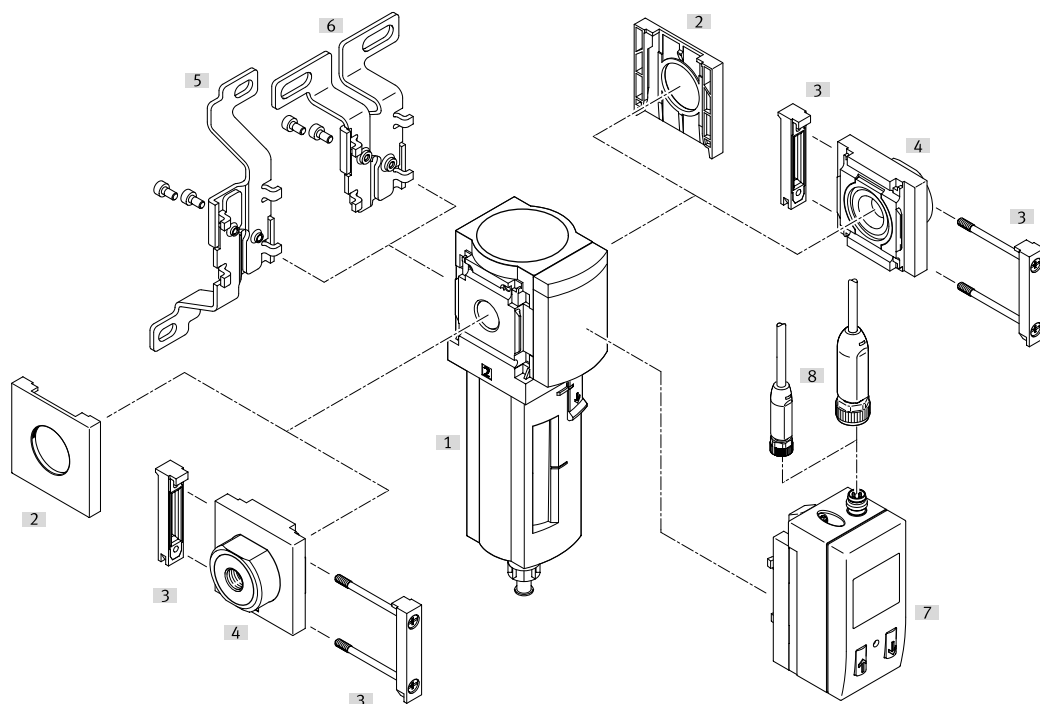
## Key features

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

## Key features

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

## Peripherals overview



 **Note**

Additional accessories:

- Module connector for combination with sizes MS4/MS6 or MS9 a  
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] | Filter<br>MS4/MS6-LF/LFM/LFX                        | ■                        | ■                     | ■                        | ■                     | 11                  |
| [2] | Cover cap<br>MS4/6-END                              | ■                        | —                     | ■                        | —                     | ms4-end,<br>ms6-end |
| [3] | Module connector<br>MS4/6-MV                        | —                        | ■                     | ■                        | ■                     | ms4-mv,<br>ms6-mv   |
| [4] | Connecting plate SET<br>MS4/6-AG...                 | —                        | ■                     | —                        | ■                     | ms4-ag,<br>ms6-ag   |
|     | Connecting plate SET<br>MS4/6-AQ...                 | —                        | ■                     | —                        | ■                     | ms4-aq,<br>ms6-aq   |
| [5] | Mounting bracket<br>MS4/6-WB                        | ■                        | ■                     | —                        | —                     | ms4-wb,<br>ms6-wb   |
| [6] | Mounting bracket<br>MS4-WBM                         | ■                        | ■                     | —                        | —                     | ms4-wbm             |
| [7] | Filter contamination indicator<br>DP, DN, DPI, DNI  | ■<br>for LFM             | ■<br>for LFM          | ■<br>for LFM             | ■<br>for LFM          | 31                  |
| [8] | Connecting cable<br>NEBA-M8...-LE3, NEBA-M12...-LE4 | ■<br>for LFM             | ■<br>for LFM          | ■<br>for LFM             | ■<br>for LFM          | neba                |
| —   | Mounting bracket<br>MS4/6-WP, WPB, WPE, WPM         | —                        | ■                     | ■                        | ■                     | ms4-wp,<br>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 | Filter design |  |
|-----|---------------|--|
| C   | 5 µm          |  |
| E   | 40 µm         |  |

| 006 | Bowl type                        |  |
|-----|----------------------------------|--|
| R   | Plastic tray with plastic basket |  |
| U   | Aluminium                        |  |

| 007 | Condensate drain                 |  |
|-----|----------------------------------|--|
| H   | Semi-automatic                   |  |
| M   | Manual                           |  |
| V   | Fully automatic, normally open   |  |
| VC  | Fully automatic, normally closed |  |

| 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        |  |
| AGF | Sub-base G1          |  |
| 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 | Filter design        |  |
| C   | 5 µm                 |  |
| E   | 40 µm                |  |

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

## Additional variants can be ordered using the modular system

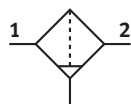
|                             |           |
|-----------------------------|-----------|
| Filter LF                   | → Page 22 |
| Fine and micro filters LFM  | → Page 34 |
| Activated carbon filter LFX | → Page 42 |

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

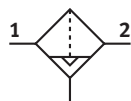
- Type of mounting
- EU certification
- UL certification
- Flow direction

## Datasheet

Function  
Condensate drain  
Manual, rotating



Semi- or fully automatic



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

-  [www.festo.com](http://www.festo.com)

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



- Good particle and condensate separation
- High flow rate with minimal pressure drop
- Available with manual, semi-automatic, fully automatic, or fully automatic, electrically actuated condensate drain
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22
- Choice of filter inserts 5 µm or 40 µm
- New filter cartridges → Page 93

| 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, G3/4 or G1         |
|                                 | 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<br>In-line installation                                                                                                      |                                      |
| Mounting position               |                        | Vertical ±5°                                                                                                                                  |                                      |
| Grade of filtration             | [µm]                   | 5<br>40                                                                                                                                       |                                      |
| Pore size                       | [µm]                   | < 5<br>< 40                                                                                                                                   |                                      |
| Air purity class at the output  |                        | Compressed air to ISO 8573-1:2010 [6:8:4] (grade of filtration 5 µm)<br>Compressed air to ISO 8573-1:2010 [7:8:4] (grade of filtration 40 µm) |                                      |
| Bowl guard                      |                        | Plastic bowl guard<br>Integrated as metal bowl                                                                                                |                                      |
| Condensate drain                |                        | Manual, rotating<br>Manual, non-detenting<br>Semi-automatic<br>Fully automatic<br>–<br>Fully automatic, electrically actuated                 |                                      |
| Degree of condensate separation | [%]                    | > 75                                                                                                                                          |                                      |
| Max. condensate volume          | [cm³]                  | 19 (with plastic bowl guard)<br>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] |       | MS4  |      |      | MS6  |      |      |
|--------------------------------------------------|-------|------|------|------|------|------|------|
| Size                                             |       | G1/8 | G1/4 | G3/8 | G1/4 | G3/8 | G1/2 |
| Pneumatic connection                             |       |      |      |      |      |      | G3/4 |
| Grade of filtration                              | 5 µm  | 1000 | 1300 | –    | 2000 | 3000 | 3200 |
|                                                  | 40 µm | 1100 | 1700 | 1700 | 2500 | 3800 | 4100 |

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

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

## Datasheet

| Operating and environmental conditions       |                                           |                                      |                                           |                                          |                                           |                                      |                                           |
|----------------------------------------------|-------------------------------------------|--------------------------------------|-------------------------------------------|------------------------------------------|-------------------------------------------|--------------------------------------|-------------------------------------------|
| Condensate drain                             | Manual, rotating                          |                                      | Semi-automatic                            |                                          | Fully automatic                           |                                      | Fully automatic, electrically actuated    |
|                                              | M                                         |                                      | H                                         |                                          | V                                         |                                      | E2, E3, E4                                |
| Size                                         | MS4                                       | MS6                                  | MS4                                       | MS6                                      | MS4                                       | MS6                                  | MS6                                       |
| Operating pressure [bar]                     | 0 ... 14<br>(0 ... 10) <sup>1)</sup>      | 0 ... 20<br>(0 ... 10) <sup>1)</sup> | 1.5 ... 12<br>(1.5 ... 10) <sup>1)</sup>  | 1.5 ... 12<br>(1.5 ... 10) <sup>1)</sup> | 2 ... 12<br>(2 ... 10) <sup>1)</sup>      | 2 ... 12<br>(2 ... 10) <sup>1)</sup> | 0.8 ... 16<br>(0.8 ... 10) <sup>1)</sup>  |
| Operating medium                             | Compressed air to ISO 8573-1:2010 [–:9:–] |                                      | Compressed air to ISO 8573-1:2010 [–:9:–] |                                          | Compressed air to ISO 8573-1:2010 [7:9:–] |                                      | Compressed air to ISO 8573-1:2010 [–:9:–] |
|                                              | Inert gases                               |                                      |                                           |                                          |                                           |                                      |                                           |
| Ambient temperature [°C]                     | –10 ... +60                               |                                      | –10 ... +60                               |                                          | –10 ... +60                               |                                      | +1 ... +60                                |
| Temperature of medium [°C]                   | –10 ... +60                               |                                      | –10 ... +60                               |                                          | –10 ... +60                               |                                      | +1 ... +60                                |
| Storage temperature [°C]                     | –10 ... +60                               |                                      | –10 ... +60                               |                                          | –10 ... +60                               |                                      | +1 ... +60                                |
| Corrosion resistance class CRC <sup>2)</sup> | 2                                         |                                      |                                           |                                          |                                           |                                      |                                           |
| Food-safe <sup>3)</sup>                      | See supplementary material information    |                                      |                                           |                                          |                                           |                                      | –                                         |
| UL certification <sup>3)</sup>               | c UL us - Recognized (OL)                 |                                      |                                           |                                          |                                           |                                      |                                           |

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

2) More information: [www.festo.com/x/topic/crc](http://www.festo.com/x/topic/crc)3) More information [www.festo.com/catalogue/ms-lf](http://www.festo.com/catalogue/ms-lf) → Support/Downloads.

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

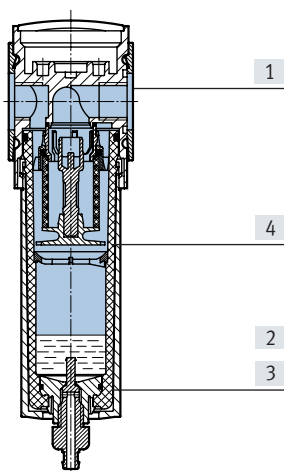
1) More information [www.festo.com/catalogue/ms-lf](http://www.festo.com/catalogue/ms-lf) → Support/Downloads

| Weight [g]                                                                                      |     |      |
|-------------------------------------------------------------------------------------------------|-----|------|
| Size                                                                                            | MS4 | MS6  |
| Filter with plastic bowl guard R                                                                | 189 | 600  |
| Filter with metal bowl U                                                                        | 349 | 820  |
| Filter with plastic bowl guard R and connecting plates                                          | 320 | 900  |
| Filter with metal bowl U and electrically actuated, fully automatic condensate drain E2, E3, E4 | –   | 1800 |

## Datasheet

## Materials

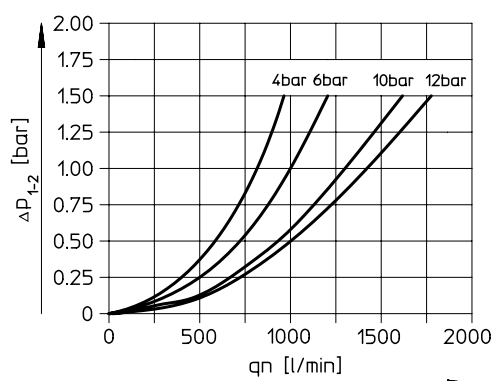
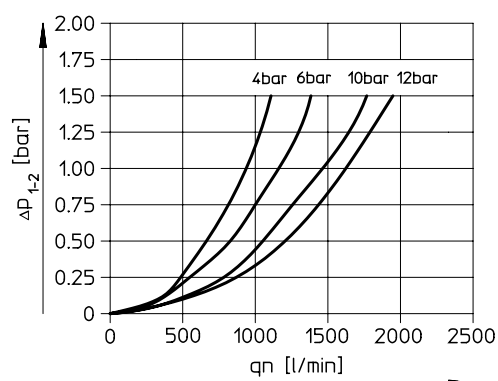
## Sectional view



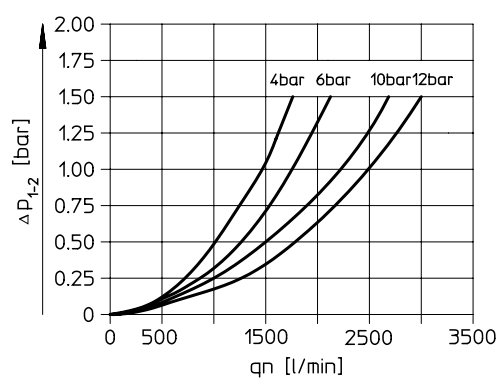
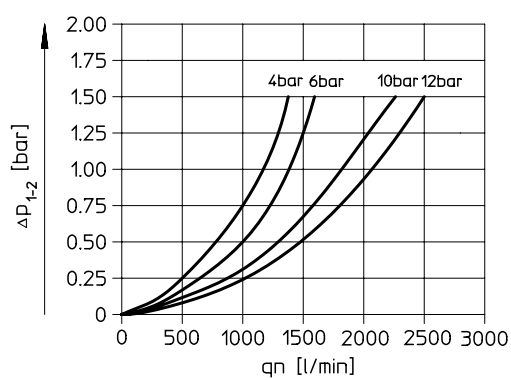
| Filter                 |                    |                                                |
|------------------------|--------------------|------------------------------------------------|
| [1]                    | Housing            | Die-cast aluminium                             |
| [2]    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

Standard flow rate  $q_n$  as a function of differential pressure  $\Delta p_{1-2}$ Grade of filtration 5  $\mu\text{m}$ 

MS4-LF-1/8

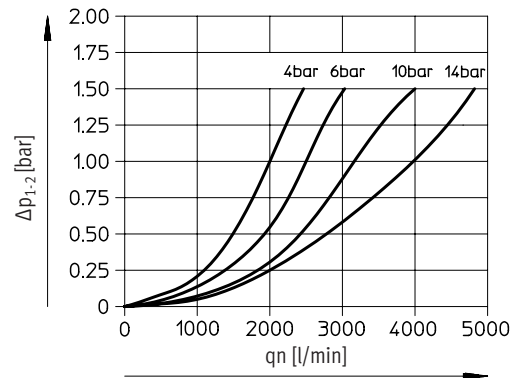
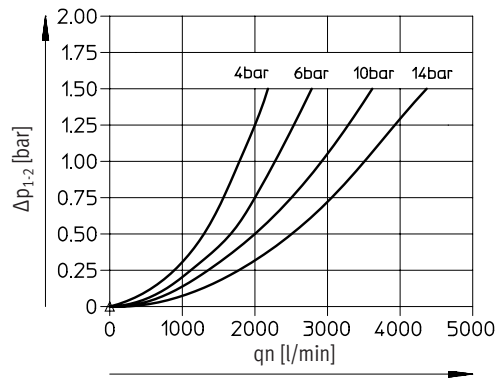
Grade of filtration 40  $\mu\text{m}$ 

MS4-LF-1/4

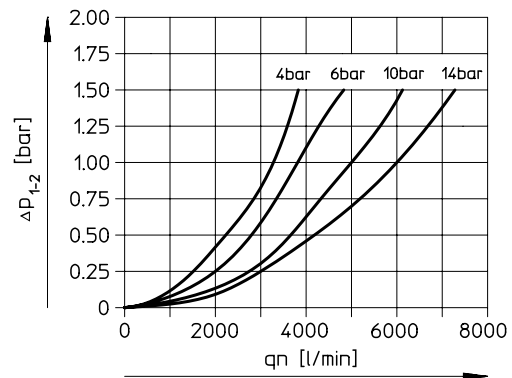
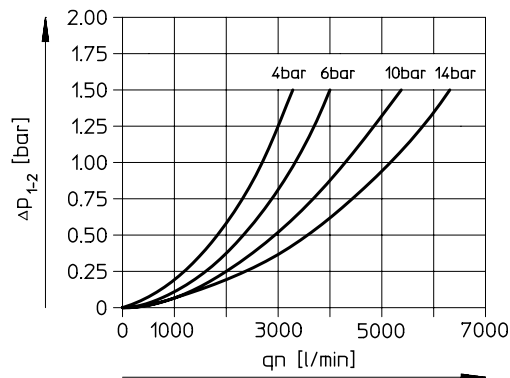


Datasheet

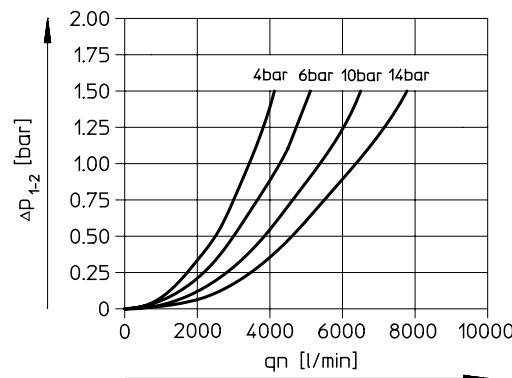
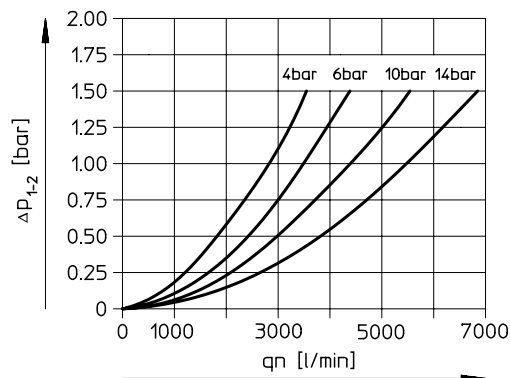
| Standard flow rate qn as a function of differential pressure Δp1-2 |                           |
|--------------------------------------------------------------------|---------------------------|
| Grade of filtration 5 μm                                           | Grade of filtration 40 μm |
| MS6-LF-1/4                                                         |                           |



|            |
|------------|
| MS6-LF-3/8 |
|------------|



|            |
|------------|
| MS6-LF-1/2 |
|------------|



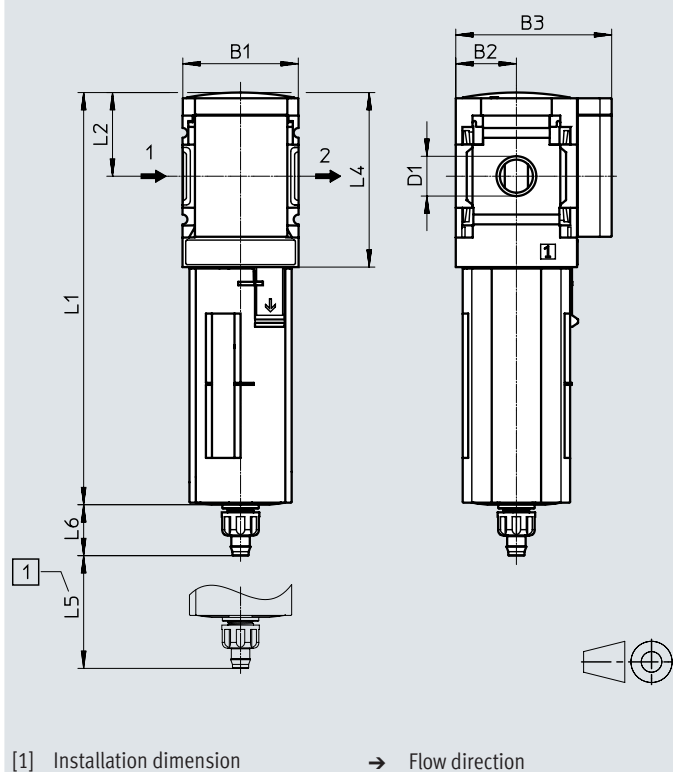
# Datasheet

## Dimensions – Basic version MS4-LF

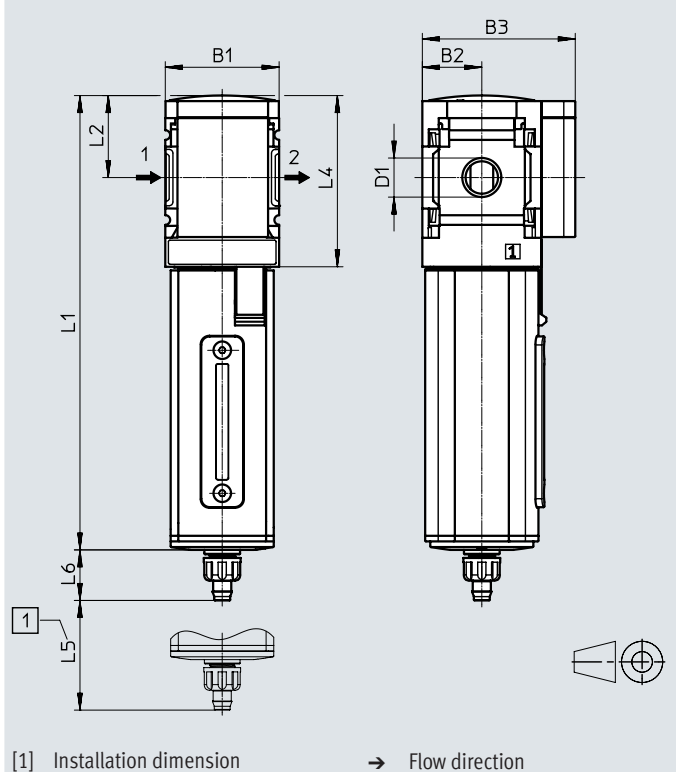
[Download CAD data → www.festo.com](http://www.festo.com)

Manual, rotary condensate drain

With plastic bowl guard R



With metal bowl U



| 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 | ≥ 60 | 17.7 |
| MS4-LF-1/4 |    |    |    | G1/4 |                    |            |    |      |      |      |

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

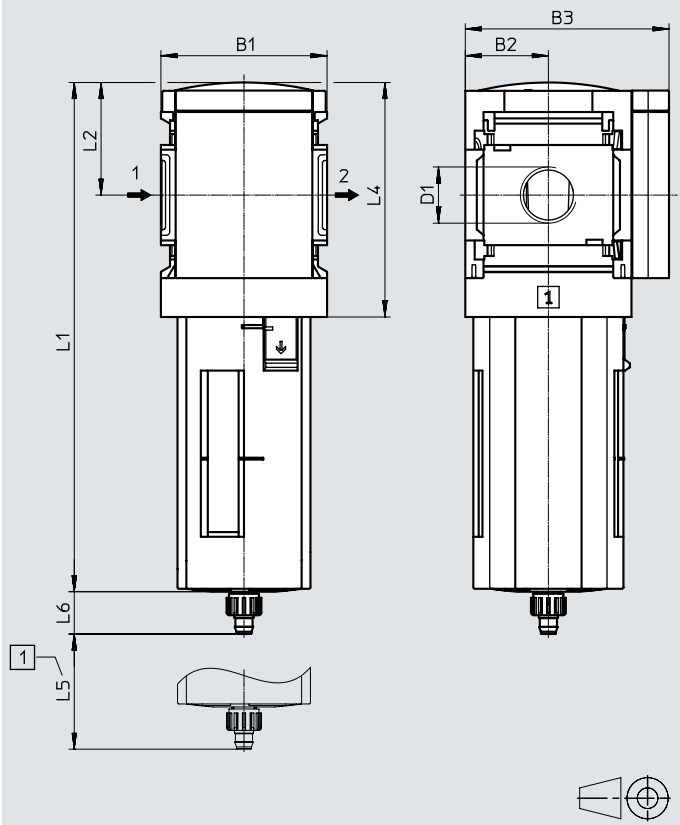
Datasheet

Dimensions – Basic version MS6-LF

Download CAD data → [www.festo.com](http://www.festo.com)

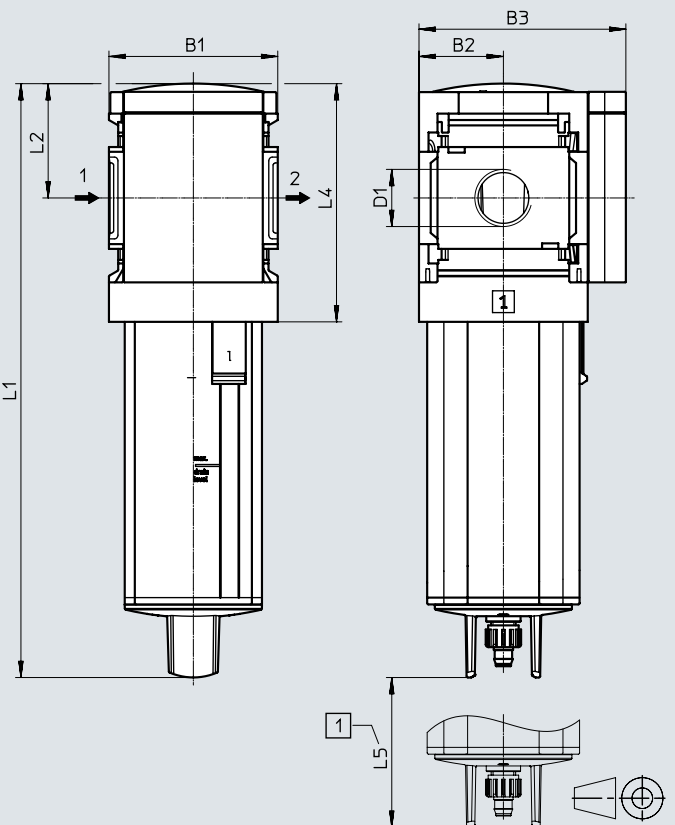
Manual, rotary condensate drain

With plastic bowl guard R



[1] Installation dimension → Flow direction

With metal bowl U



[1] Installation dimension → Flow direction

| Type       | B1 | B2 | B3 | D1   | L1                 |            | L2 | L4   | L5 | L6   |
|------------|----|----|----|------|--------------------|------------|----|------|----|------|
|            |    |    |    |      | Plastic bowl guard | Metal bowl |    |      |    |      |
| MS6-LF-1/4 | 62 | 31 | 76 | G1/4 | 190                | 218        | 42 | 87.5 | 80 | 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

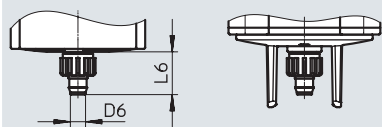
Download CAD data → [www.festo.com](http://www.festo.com)

[M] Manual, rotating

MS4-...-R/U-M

MS6-...-R-M

MS6-...-U-M



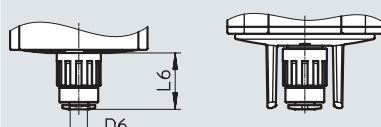
Barbed connector for plastic tubing PUN(-H)-8x1.25

[H] Semi-automatic

MS4-...-R/U-H

MS6-...-R-H

MS6-...-U-H



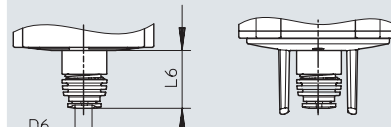
Push-in connector for plastic tubing PUN-6/PAN-6

[V] Fully automatic

MS4-...-R/U-V

MS6-...-R-V

MS6-...-U-V



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

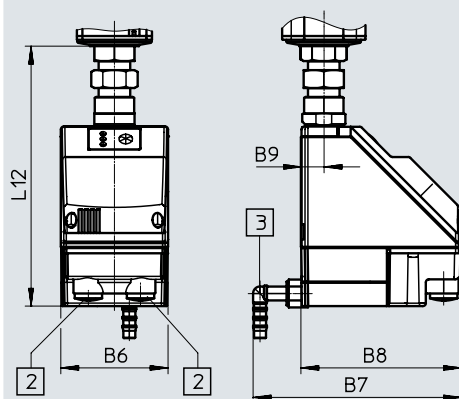
| Type                 | D6<br>Ø | L6   |
|----------------------|---------|------|
| Plastic bowl guard R |         |      |
| MS4-LF-...-M         | 5.6     | 17.7 |
| MS6-LF-...-M         |         | 15.8 |
| Metal bowl U         |         |      |
| MS4-LF-...-M         | 5.6     | 17.7 |
| MS6-LF-...-M         |         | —    |

| Type                        | D6<br>Ø | L6   |
|-----------------------------|---------|------|
| <b>Plastic bowl guard R</b> |         |      |
| MS4-LF-...-H                | 6.2     | 22.1 |
| MS6-LF-...-H                |         | 20.4 |
| <b>Metal bowl U</b>         |         |      |
| MS4-LF-...-H                | 6.2     | 22.1 |
| MS6-LF-...-H                |         | —    |

| Type                        | D6<br>Ø | L6   |
|-----------------------------|---------|------|
| <b>Plastic bowl guard R</b> |         |      |
| MS4-LF...-V                 | 6.2     | 20.4 |
| MS6-LF...-V                 |         | 18.5 |
| <b>Metal bowl U</b>         |         |      |
| MS4-LF...-V                 | 6.2     | 20.4 |
| MS6-LF...-V                 |         | —    |

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

Datasheets → Internet: pwea



Condensate drain PWEA:

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



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

## Datasheet

| Ordering data                     |                  |                                   |                          |                  |   |                           |                  |        |                  |
|-----------------------------------|------------------|-----------------------------------|--------------------------|------------------|---|---------------------------|------------------|--------|------------------|
| Plastic guard                     |                  |                                   |                          |                  |   |                           |                  |        |                  |
| Size                              | Condensate drain | Connection                        | Grade of filtration 5 µm |                  |   | Grade of filtration 40 µm |                  |        |                  |
|                                   |                  |                                   | Part no.                 | Type             |   | Part no.                  | Type             |        |                  |
| Flow direction from left to right |                  |                                   |                          |                  |   |                           |                  |        |                  |
| MS4                               | Manual, rotating | G1/8                              | 529403                   | MS4-LF-1/8-CRM   |   | 529407                    | MS4-LF-1/8-ERM   |        |                  |
|                                   |                  | G1/4                              | 529395                   | MS4-LF-1/4-CRM   |   | 529399                    | MS4-LF-1/4-ERM   |        |                  |
|                                   |                  | G3/8                              | –                        | –                |   | 8232834                   | MS4-LF-AGC-E-R-M |        |                  |
|                                   | Fully automatic  | G1/8                              | 529405                   | MS4-LF-1/8-CRV   |   | –                         | –                |        |                  |
|                                   |                  | G1/4                              | 529397                   | MS4-LF-1/4-CRV   |   | 529401                    | MS4-LF-1/4-ERV   |        |                  |
| MS6                               | Manual, rotating | G1/4                              | 529623                   | MS6-LF-1/4-CRM   |   | 529631                    | MS6-LF-1/4-ERM   |        |                  |
|                                   |                  | G3/8                              | 529639                   | MS6-LF-3/8-CRM   |   | 529647                    | MS6-LF-3/8-ERM   |        |                  |
|                                   |                  | G1/2                              | 529607                   | MS6-LF-1/2-CRM   |   | 529615                    | MS6-LF-1/2-ERM   |        |                  |
|                                   |                  | G3/4                              | –                        | –                |   | 8232877                   | MS6-LF-AGE-E-R-M |        |                  |
|                                   |                  | G1                                | 8232879                  | MS6-LF-AGF-C-R-M |   | 8232880                   | MS6-LF-AGF-E-R-M |        |                  |
|                                   | 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   |        |                  |
|                                   |                  | G3/4                              | –                        | –                |   | 8232878                   | MS6-LF-AGE-E-R-V |        |                  |
|                                   |                  | G1                                | –                        | –                |   | 8232881                   | MS6-LF-AGF-E-R-V |        |                  |
|                                   |                  | Flow direction from right to left |                          |                  |   |                           |                  |        |                  |
|                                   |                  | MS4                               | Manual, rotating         | G1/4             | – | –                         |                  | 529400 | MS4-LF-1/4-ERM-Z |
| MS6                               | Manual, rotating | G1/2                              | 529608                   | MS6-LF-1/2-CRM-Z |   | 529616                    | MS6-LF-1/2-ERM-Z |        |                  |
|                                   | Fully automatic  | G1/2                              | 529610                   | MS6-LF-1/2-CRV-Z |   | 529618                    | MS6-LF-1/2-ERV-Z |        |                  |

| Ordering data                     |                  |            |                          |                  |  |                           |                |
|-----------------------------------|------------------|------------|--------------------------|------------------|--|---------------------------|----------------|
| Plastic guard                     |                  |            |                          |                  |  |                           |                |
| Size                              | Condensate drain | Connection | Grade of filtration 5 µm |                  |  | Grade of filtration 40 µm |                |
|                                   |                  |            | Part no.                 | Type             |  | Part no.                  | Type           |
| Flow direction from left to right |                  |            |                          |                  |  |                           |                |
| MS4                               | Manual, rotating | G1/4       | 535654                   | MS4-LF-1/4-CUM   |  | 535660                    | MS4-LF-1/4-EUM |
|                                   | Fully automatic  | G1/4       | –                        | –                |  | 535658                    | MS4-LF-1/4-EUV |
| MS6                               | Manual, rotating | G1/2       | 529611                   | MS6-LF-1/2-CUM   |  | 529619                    | MS6-LF-1/2-EUM |
|                                   | Fully automatic  | G1/2       | 529613                   | MS6-LF-1/2-CUV   |  | 529621                    | MS6-LF-1/2-EUV |
| Flow direction from right to left |                  |            |                          |                  |  |                           |                |
| MS6                               | Fully automatic  | G1/2       | 529614                   | MS6-LF-1/2-CUV-Z |  | –                         | –              |

## Ordering data – Modular product system

| Ordering table       |                                                                                                       |                                                                                     |         |            |      |
|----------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------|------------|------|
| Grid dimension       | [mm]                                                                                                  | 40                                                                                  | 62      | Conditions | Code |
| Module no.           |                                                                                                       | 527695                                                                              | 527668  |            |      |
| Series               | Standard                                                                                              |                                                                                     |         |            | MS   |
| Size                 | 4                                                                                                     | 6                                                                                   |         |            | ...  |
| Function             | Filter                                                                                                |                                                                                     |         |            | -LF  |
| Pneumatic connection | Female thread G1/8                                                                                    | –                                                                                   | [1]     | -1/8       |      |
|                      | Female thread G1/4                                                                                    | Female thread G1/4                                                                  | [1]     | -1/4       |      |
|                      | –                                                                                                     | Female thread G3/8                                                                  | [1]     | -3/8       |      |
|                      | –                                                                                                     | Female thread G1/2                                                                  | [1]     | -1/2       |      |
|                      | Connecting plate G1/8                                                                                 | –                                                                                   |         | -AGA       |      |
|                      | Connecting plate G1/4                                                                                 | Connecting plate G1/4                                                               |         | -AGB       |      |
|                      | Connecting plate G3/8                                                                                 | Connecting plate G3/8                                                               |         | -AGC       |      |
|                      | –                                                                                                     | Connecting plate G1/2                                                               |         | -AGD       |      |
|                      | –                                                                                                     | Connecting plate G3/4                                                               |         | -AGE       |      |
|                      | –                                                                                                     | Connecting plate G1                                                                 |         | -AGF       |      |
|                      | Connecting plate 1/8 NPT                                                                              | –                                                                                   | [1]     | -AQK       |      |
|                      | Connecting plate 1/4 NPT                                                                              | Connecting plate 1/4 NPT                                                            | [1]     | -AQN       |      |
|                      | Connecting plate 3/8 NPT                                                                              | Connecting plate 3/8 NPT                                                            | [1]     | -AQP       |      |
|                      | –                                                                                                     | Connecting plate 1/2 NPT                                                            | [1]     | -AQR       |      |
|                      | –                                                                                                     | Connecting plate 3/4 NPT                                                            | [1]     | -AQS       |      |
| 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) open without pressure                                                |                                                                                     |         | -V         |      |
|                      | Fully automatic (P1 max. 12 bar) closed without pressure                                              |                                                                                     |         | -VC        |      |
|                      | –                                                                                                     | External fully automatic condensate drain, electric, 115 V AC, connection terminals | [1] [2] | -E2        |      |
|                      | –                                                                                                     | External fully automatic condensate drain, electric, 230 V AC, connection terminals | [1] [2] | -E3        |      |
|                      | –                                                                                                     | External fully automatic condensate drain, electric, 24 V DC, connection terminals  | [1] [2] | -E4        |      |
| Type of mounting     | Mounting bracket standard design                                                                      |                                                                                     | [3]     | -WP        |      |
|                      | Mounting bracket for hooking in service unit components                                               |                                                                                     | [1] [3] | -WPM       |      |
|                      | Mounting bracket centrally at the rear (wall mounting top and bottom), connecting plates not required |                                                                                     |         | -WB        |      |
|                      | Mounting bracket centrally at the rear (wall mounting top), connecting plates not required            | –                                                                                   |         | -WBM       |      |
| EU certification     | II 2GD to EU Explosion Protection Directive (ATEX)                                                    |                                                                                     |         | -EX4       |      |
| UL certification     | cULus, ordinary location for Canada and USA                                                           |                                                                                     |         | -UL1       |      |
| Flow direction       | Flow direction from right to left                                                                     |                                                                                     |         | -Z         |      |

[1] 1/8, 1/4, 3/8, 1/2, AQK, AQN, AQP, AQR, AQS, E2, E3, E4, WPM

Not with EU EX4 certification

[2] E2, E3, E4 Only with metal bowl U

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

## Type codes

|     |           |  |
|-----|-----------|--|
| 001 | Series    |  |
| MS  | MS series |  |

|     |                      |  |
|-----|----------------------|--|
| 002 | Size                 |  |
| 4   | Grid dimension 40 mm |  |

|     |                        |  |
|-----|------------------------|--|
| 003 | Function               |  |
| LFM | Fine and micro filters |  |

|     |                      |  |
|-----|----------------------|--|
| 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 | Filter design |  |
| A   | 0.01 µm       |  |
| B   | 1 µm          |  |

|     |                                  |  |
|-----|----------------------------------|--|
| 006 | Bowl type                        |  |
| R   | Plastic tray with plastic basket |  |
| U   | Aluminium                        |  |

|     |                                  |  |
|-----|----------------------------------|--|
| 007 | Condensate drain                 |  |
| H   | Semi-automatic                   |  |
| M   | Manual                           |  |
| V   | Fully automatic, normally open   |  |
| VC  | Fully automatic, normally closed |  |

|     |                                                                                 |  |
|-----|---------------------------------------------------------------------------------|--|
| 008 | 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 |  |

|     |                                                                                           |  |
|-----|-------------------------------------------------------------------------------------------|--|
| 009 | 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            |  |

|     |                  |  |
|-----|------------------|--|
| 010 | EU certification |  |
|     | None             |  |
| EX4 | II 2GD           |  |

|     |                                            |  |
|-----|--------------------------------------------|--|
| 011 | UL certification                           |  |
|     | None                                       |  |
| UL1 | cULus ordinary location for Canada and USA |  |

|     |                                   |  |
|-----|-----------------------------------|--|
| 012 | Flow direction                    |  |
|     | Flow direction from left to right |  |
| Z   | Flow direction from right to left |  |

## Type codes

|            |                                                                                     |  |
|------------|-------------------------------------------------------------------------------------|--|
| <b>001</b> | <b>Series</b>                                                                       |  |
| <b>MS</b>  | MS series                                                                           |  |
| <b>002</b> | <b>Size</b>                                                                         |  |
| <b>6</b>   | Grid dimension 62 mm                                                                |  |
| <b>003</b> | <b>Function</b>                                                                     |  |
| <b>LFM</b> | Fine and micro filters                                                              |  |
| <b>004</b> | <b>Pneumatic connection</b>                                                         |  |
| <b>1/4</b> | Female thread G1/4                                                                  |  |
| <b>3/8</b> | Female thread G3/8                                                                  |  |
| <b>1/2</b> | Female thread G1/2                                                                  |  |
| <b>AGB</b> | Sub-base G1/4                                                                       |  |
| <b>AGC</b> | Sub-base G3/8                                                                       |  |
| <b>AGD</b> | Sub-base G1/2                                                                       |  |
| <b>AGE</b> | Sub-base G3/4                                                                       |  |
| <b>AGF</b> | Sub-base G1                                                                         |  |
| <b>AQN</b> | Sub-base 1/4 NPT                                                                    |  |
| <b>AQP</b> | Sub-base 3/8 NPT                                                                    |  |
| <b>AQR</b> | Sub-base 1/2 NPT                                                                    |  |
| <b>AQS</b> | Sub-base 3/4 NPT                                                                    |  |
| <b>005</b> | <b>Filter design</b>                                                                |  |
| <b>A</b>   | 0.01 µm                                                                             |  |
| <b>B</b>   | 1 µm                                                                                |  |
| <b>006</b> | <b>Bowl type</b>                                                                    |  |
| <b>R</b>   | Plastic tray with plastic basket                                                    |  |
| <b>U</b>   | Aluminium                                                                           |  |
| <b>007</b> | <b>Condensate drain</b>                                                             |  |
| <b>E2</b>  | External fully automatic condensate drain, electric, 110 V AC, connection terminals |  |
| <b>E3</b>  | External fully automatic condensate drain, electric, 230 V AC, connection terminals |  |
| <b>E4</b>  | External fully automatic condensate drain, electric, 24 V DC, connection terminals  |  |
| <b>H</b>   | Semi-automatic                                                                      |  |
| <b>M</b>   | Manual                                                                              |  |
| <b>V</b>   | Fully automatic, normally open                                                      |  |
| <b>VC</b>  | Fully automatic, normally closed                                                    |  |

|            |                                                                                           |  |
|------------|-------------------------------------------------------------------------------------------|--|
| <b>008</b> | <b>Flow rate</b>                                                                          |  |
|            | Standard                                                                                  |  |
| <b>HF</b>  | High flow rate                                                                            |  |
| <b>009</b> | <b>Range of applications</b>                                                              |  |
|            | None                                                                                      |  |
| <b>HP</b>  | Suitable for sealing air and purge air                                                    |  |
| <b>010</b> | <b>Filter change sensing</b>                                                              |  |
|            | None                                                                                      |  |
| <b>DA</b>  | Differential pressure display, visual                                                     |  |
| <b>DN</b>  | Filter contamination indicator, M8 plug, NPN, 3-pin                                       |  |
| <b>DNI</b> | Filter contamination indicator, M12 plug, NPN, 4-pin, analogue output 4...20 mA           |  |
| <b>DP</b>  | Filter contamination indicator, M8 plug, PNP, 3-pin                                       |  |
| <b>DPI</b> | Filter contamination indicator, M12 plug, PNP, 4-pin, analogue output 4...20 mA           |  |
| <b>011</b> | <b>Type of mounting</b>                                                                   |  |
|            | Without mounting bracket                                                                  |  |
| <b>WP</b>  | Mounting bracket basic design                                                             |  |
| <b>WPM</b> | Mounting bracket for hooking in service unit components                                   |  |
| <b>WB</b>  | Mounting centrally at rear (wall mounting top and bottom), connecting plates not required |  |
| <b>012</b> | <b>EU certification</b>                                                                   |  |
|            | None                                                                                      |  |
| <b>EX4</b> | II 2GD                                                                                    |  |
| <b>013</b> | <b>UL certification</b>                                                                   |  |
|            | None                                                                                      |  |
| <b>UL1</b> | cULus ordinary location for Canada and USA                                                |  |
| <b>014</b> | <b>Flow direction</b>                                                                     |  |
|            | Flow direction from left to right                                                         |  |
| <b>Z</b>   | Flow direction from right to left                                                         |  |

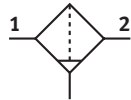
## Datasheet

### Function

Condensate drain

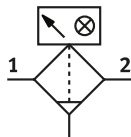
Manual, rotating

Without differential pressure display



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

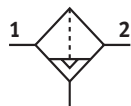
With differential pressure display or  
filter contamination indicator



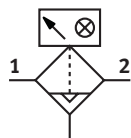
Condensate drain

Semi- or fully automatic

Without differential pressure display



With differential pressure display or  
filter contamination indicator



- [www.festo.com](http://www.festo.com)



- High-efficiency filter for exceptionally clean compressed air
- Air quality to ISO 8573-1:2010
- Available with manual, semi-automatic, fully automatic, or fully automatic, electrically actuated condensate drain
- Available with differential pressure indicator for indicating filter contamination
- Available with electronic filter pollution indicator
- Available with filter cartridge for low flow rates, suitable for sealing air and purge air applications
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22
- Choice of filter inserts 0.01 µm or 1 µm
- New filter cartridges → Page 93

| 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, G3/4 or G1           |
|                                             | 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<br>In-line installation                                                                                                                                                     |                                        |
| Mounting position                           |                        | Vertical ±5°                                                                                                                                                                                 |                                        |
| Grade of filtration                         | [µm]                   | 0.01 (micro filter MS-LFM-A)<br>1 (fine filter MS-LFM-B)                                                                                                                                     |                                        |
| Air purity class at the output              |                        | Compressed air to ISO 8573-1:2010 [3:4:2] (grade of filtration 0.01 µm, micro filter MS-LFM-A)<br>Compressed air to ISO 8573-1:2010 [5:4:3] (grade of filtration 1 µm, fine filter MS-LFM-B) |                                        |
| Bowl guard                                  |                        | Plastic bowl guard<br>Integrated as metal bowl                                                                                                                                               |                                        |
| Condensate drain                            |                        | Manual, rotating<br>Manual, non-detenting<br>Semi-automatic<br>Fully automatic<br>—                                                                                                          |                                        |
|                                             |                        |                                                                                                                                                                                              | Fully automatic, electrically actuated |
| Differential pressure display <sup>1)</sup> |                        | Visual indicator<br>With filter contamination indicator based on differential pressure                                                                                                       |                                        |

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

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

## Datasheet

| General technical data                          |                      |                                                              |  |     |
|-------------------------------------------------|----------------------|--------------------------------------------------------------|--|-----|
| Size                                            |                      | MS4                                                          |  | MS6 |
| Residual oil content                            | [mg/m <sup>3</sup> ] | ≤0.01 (micro filter MS-LFM-A)<br>≤0.5 (fine filter MS-LFM-A) |  |     |
| Max. condensate volume                          | [ml]                 | 19 (with plastic bowl guard)<br>25 (with metal bowl)         |  | 38  |
| Filter efficiency, fine particles <sup>1)</sup> | [%]                  | 99.995 (micro filter MS-LFM-A)<br>99 (fine filter MS-LFM-B)  |  |     |
| Filter efficiency, oil aerosol <sup>1)</sup>    | [%]                  | 99 (micro filter MS-LFM-A)<br>90 (fine filter MS-LFM-B)      |  |     |
| MPPS                                            | [µm]                 | 0.05 (micro filter MS-LFM-A)                                 |  |     |
| Filter efficiency MPPS                          | [%]                  | 99.95 (micro filter MS-LFM-A)                                |  |     |

1) It is recommended to pre-filter the compressed air for the MS-LFM-A ultrafine filter with an MS-LFM-B fine filter (filter fineness 1 µm).  
This results in a total separation efficiency of 99.99995% for fine particles and 99.9% for oil aerosol.

| Standard flow rate qn1 [l/min]               |  |          |          |                                                             |
|----------------------------------------------|--|----------|----------|-------------------------------------------------------------|
| Size                                         |  | MS4      |          | MS6                                                         |
| Variants                                     |  | Standard | Standard | High flow rate HF                                           |
|                                              |  |          |          | Application area HP, suitable for sealing air and purge air |
| Micro filter MS-LFM-A                        |  |          |          |                                                             |
| Max. standard flow rate for air purity class |  | 360      | 900      | 2500                                                        |
| q <sub>n max</sub>                           |  |          |          | 400                                                         |
| Min. standard flow rate for air purity class |  | 54       | 135      | 150                                                         |
| qn min                                       |  |          |          | 60                                                          |
| Fine filter MS-LFM-B                         |  |          |          |                                                             |
| Max. standard flow rate for air purity class |  | 360      | 950      | 3000                                                        |
| q <sub>n max</sub>                           |  |          |          | 500                                                         |
| Min. standard flow rate for air purity class |  | 54       | 140      | 188                                                         |
| qn min                                       |  |          |          | 60                                                          |

1) Measured at p1 = 6 bar.

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

| Operating and environmental conditions       |       |                                             |                                      |                                          |                                          |                                        |                                      |                                          |
|----------------------------------------------|-------|---------------------------------------------|--------------------------------------|------------------------------------------|------------------------------------------|----------------------------------------|--------------------------------------|------------------------------------------|
| Condensate drain                             |       | Manual, rotating                            |                                      | Semi-automatic                           |                                          | Fully automatic                        |                                      | Fully automatic, electrically actuated   |
|                                              |       | M                                           |                                      | H                                        |                                          | V                                      |                                      | E2, E3, E4                               |
| Size                                         |       | MS4                                         | MS6                                  | MS4                                      | MS6                                      | MS4                                    | MS6                                  | MS6                                      |
| Operating pressure                           | [bar] | 0 ... 14<br>(0 ... 10) <sup>1)</sup>        | 0 ... 20<br>(0 ... 10) <sup>1)</sup> | 1.5 ... 12<br>(1.5 ... 10) <sup>1)</sup> | 1.5 ... 12<br>(1.5 ... 10) <sup>1)</sup> | 2 ... 12<br>(2 ... 10) <sup>1)</sup>   | 2 ... 12<br>(2 ... 10) <sup>1)</sup> | 0.8 ... 16<br>(0.8 ... 10) <sup>1)</sup> |
| Operating medium                             |       | Compressed air to ISO 8573-1:2010 [6:4:4]2) |                                      |                                          |                                          |                                        |                                      |                                          |
|                                              |       | Inert gases                                 |                                      |                                          |                                          |                                        |                                      |                                          |
| Ambient temperature                          | [°C]  | -10 ... +60 (0 ... +50) <sup>3)</sup>       |                                      | -10 ... +60 (+5 ... +50) <sup>3)</sup>   |                                          | -10 ... +60 (+5 ... +50) <sup>3)</sup> |                                      | +1 ... +60 (+1 ... +50) <sup>3)</sup>    |
| Temperature of medium                        | [°C]  | -10 ... +60 (0 ... +50) <sup>3)</sup>       |                                      | -10 ... +60 (+5 ... +50) <sup>3)</sup>   |                                          | -10 ... +60 (+5 ... +50) <sup>3)</sup> |                                      | +1 ... +60 (+1 ... +50) <sup>3)</sup>    |
| Storage temperature                          | [°C]  | -10 ... +60 (0 ... +50) <sup>3)</sup>       |                                      | -10 ... +60 (0 ... +50) <sup>3)</sup>    |                                          | -10 ... +60 (0 ... +50) <sup>3)</sup>  |                                      | +1 ... +60 (+1 ... +50) <sup>3)</sup>    |
| Corrosion resistance class CRC <sup>4)</sup> |       | 2                                           |                                      |                                          |                                          |                                        |                                      |                                          |
| Food-safe <sup>5)</sup>                      |       | See supplementary material information      |                                      |                                          |                                          |                                        |                                      |                                          |
| UL certification <sup>5)</sup>               |       | 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 pre-filter the compressed air for the MS-LFM-A ultrafine filter with an MS-LFM-B fine filter (filter fineness 1 µm).  
This results in a total separation efficiency of 99.99995% for fine particles and 99.9% for oil aerosol.

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

4) More information: [www.festo.com/x/topic/crc](http://www.festo.com/x/topic/crc)

5) More information [www.festo.com/catalogue/ms-lfm](http://www.festo.com/catalogue/ms-lfm) → Support/Downloads..

## Datasheet

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

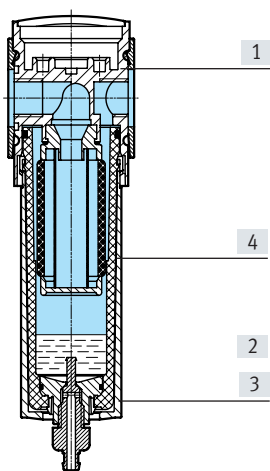
| ATEX                                                       |                                             |
|------------------------------------------------------------|---------------------------------------------|
| EU certification                                           | EX4                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

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

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

## Materials

## Sectional view



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

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

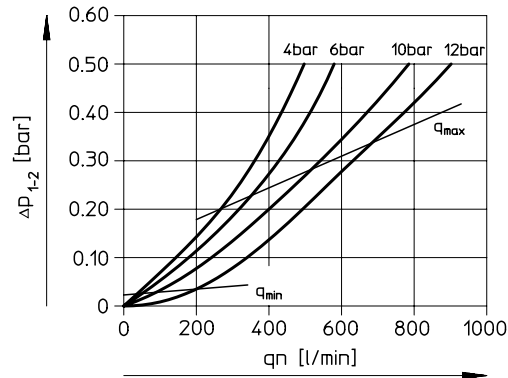


# Datasheet

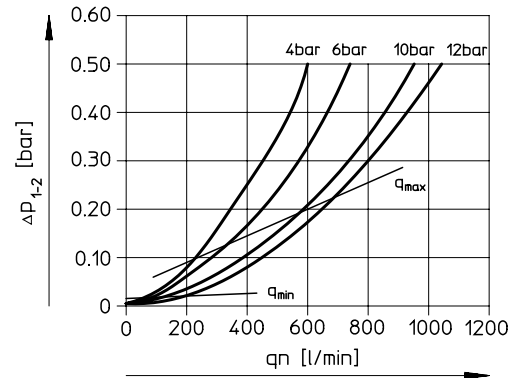
## Standard flow rate $q_n$ as a function of differential pressure $\Delta p_{1-2}$

Grade of filtration 0.01  $\mu\text{m}$

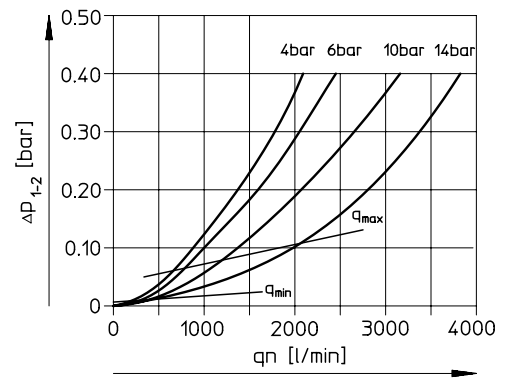
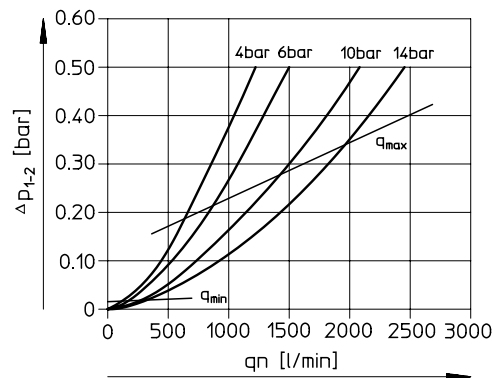
MS4-LFM-1/8 and MS4-LFM-1/4



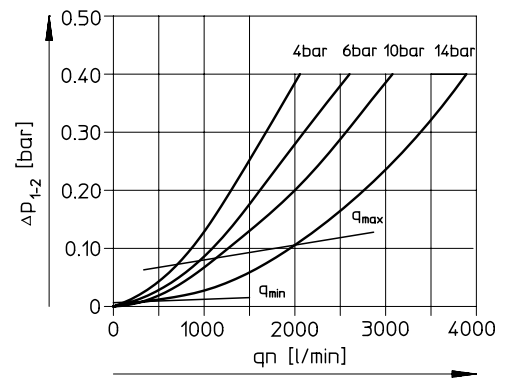
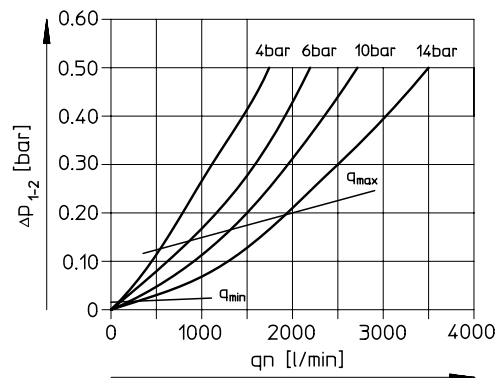
Grade of filtration 1  $\mu\text{m}$



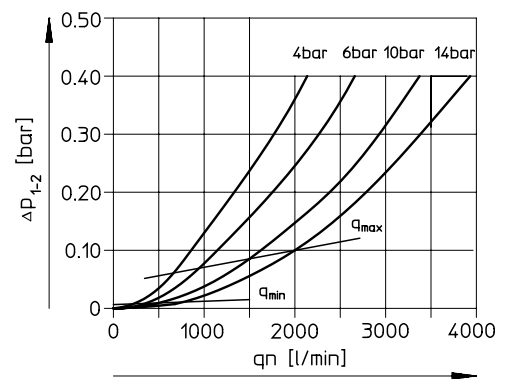
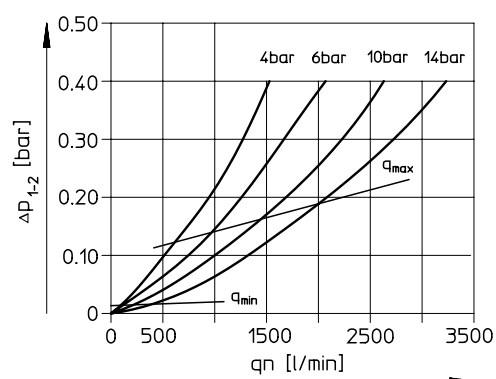
MS6-LFM-1/4



MS6-LFM-3/8



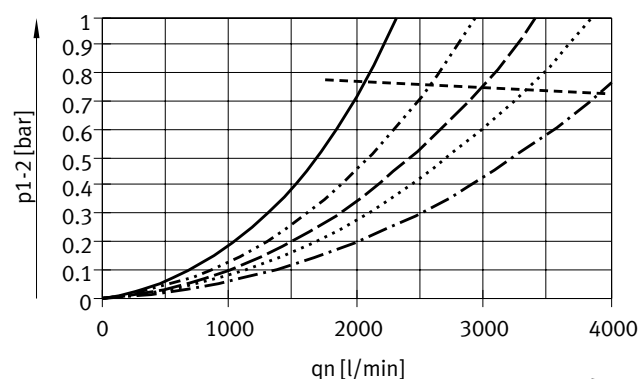
MS6-LFM-1/2



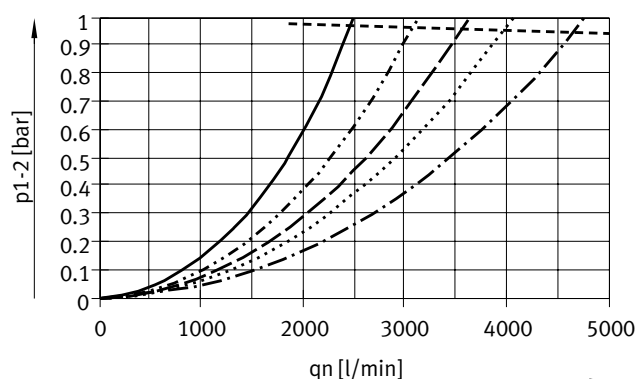
## Datasheet

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

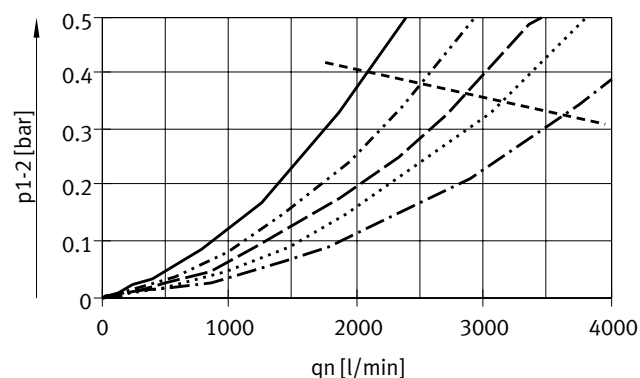
MS6-LFM-1/4-...-HF, grade of filtration 0.01  $\mu\text{m}$



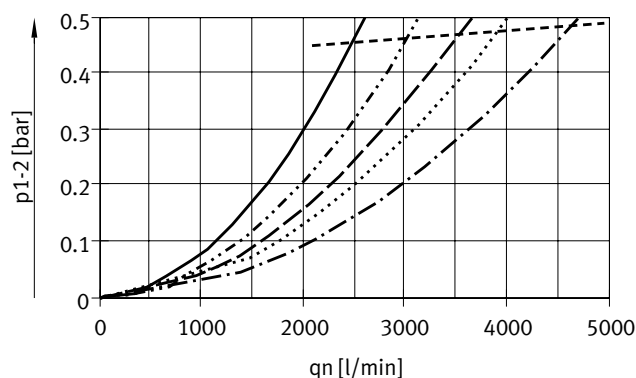
MS6-LFM-1/4-...-HF, grade of filtration 1  $\mu\text{m}$



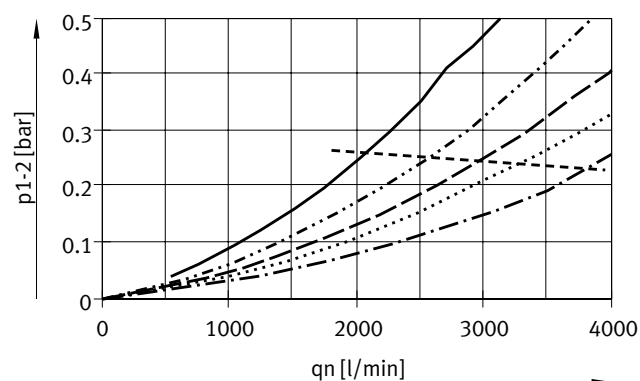
MS6-LFM-3/8-...-HF, grade of filtration 0.01  $\mu\text{m}$



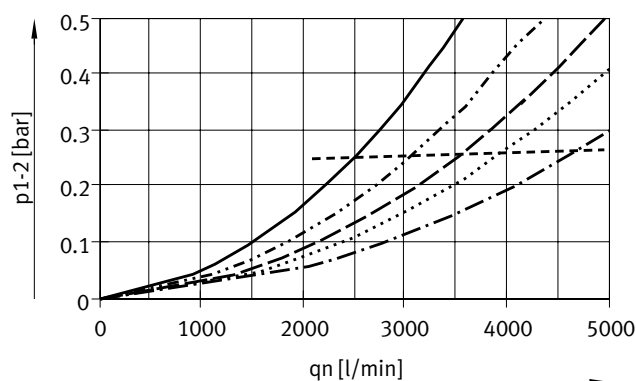
MS6-LFM-3/8-...-HF, grade of filtration 1  $\mu\text{m}$



MS6-LFM-1/2-...-HF, grade of filtration 0.01  $\mu\text{m}$



MS6-LFM-1/2-...-HF, grade of filtration 1  $\mu\text{m}$



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

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

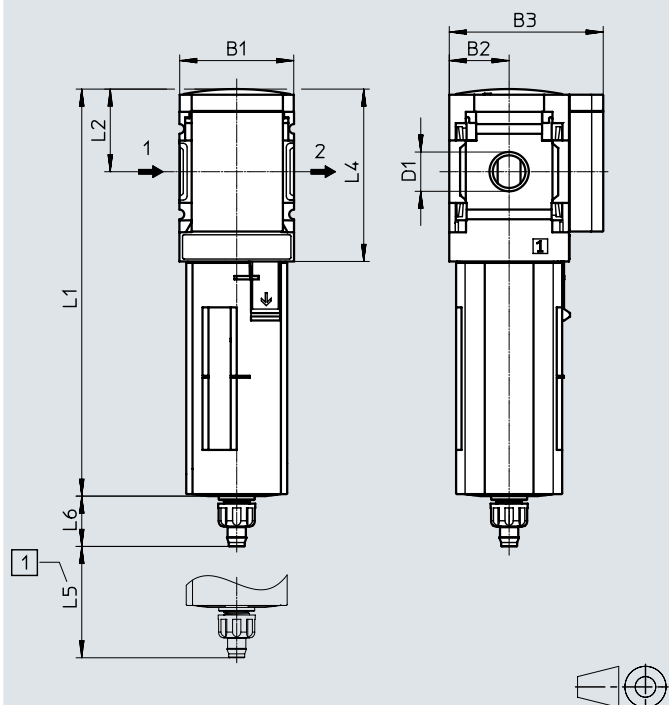
# Datasheet

## Dimensions – Basic version MS4-LFM

[Download CAD data → www.festo.com](http://www.festo.com)

Manual, rotary condensate drain

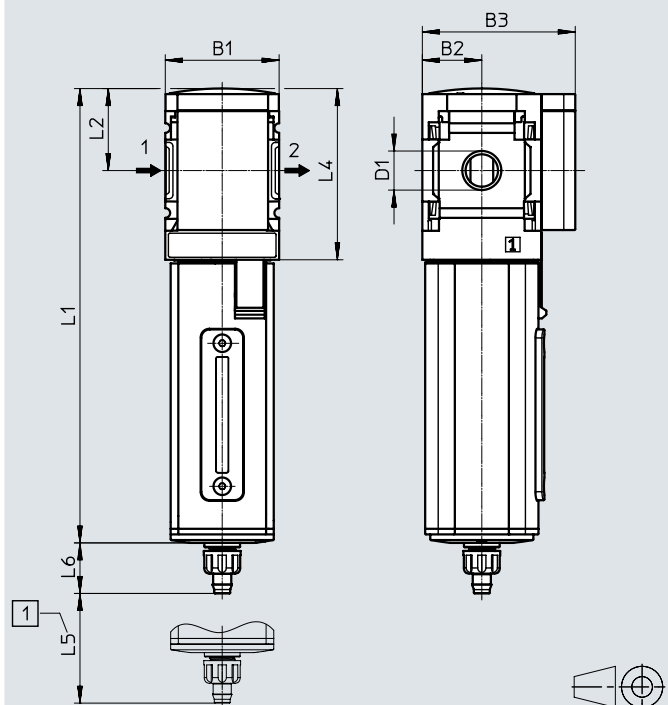
With plastic bowl guard R



[1] Installation dimension

→ Flow direction

With metal bowl U



[1] Installation dimension

→ Flow direction

| Type        | B1 | B2 | B3 | D1   | L1                 |            | L2 | L4   | L5   | L6   |
|-------------|----|----|----|------|--------------------|------------|----|------|------|------|
|             |    |    |    |      | Plastic bowl guard | Metal bowl |    |      |      |      |
| MS4-LFM-1/8 | 40 | 21 | 54 | G1/8 | 141.6              | 160        | 29 | 60.5 | ≥ 60 | 17.7 |
| MS4-LFM-1/4 |    |    |    | G1/4 |                    |            |    |      |      |      |

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

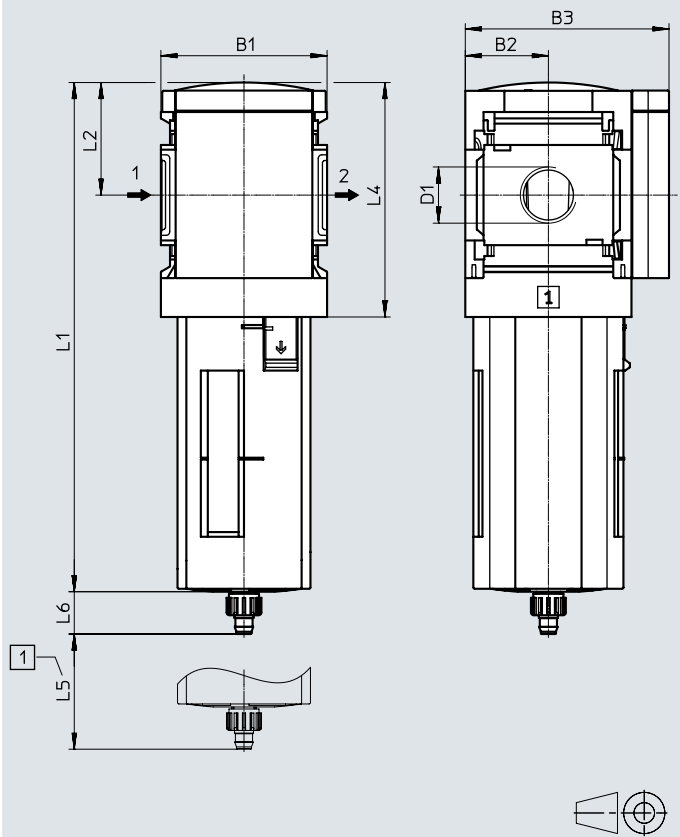
Datasheet

Dimensions – Basic version MS6-LFM

Download CAD data → [www.festo.com](http://www.festo.com)

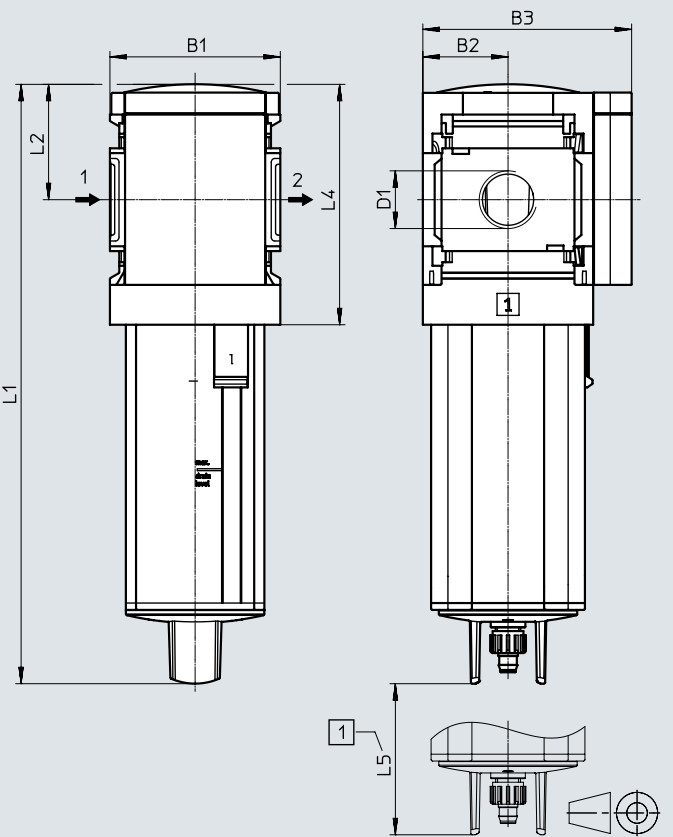
Manual, rotary condensate drain

With plastic bowl guard R



[1] Installation dimension → Flow direction

With metal bowl U



[1] Installation dimension → Flow direction

| Type        | B1 | B2 | B3 | D1   | L1                 |            | L2 | L4 | L5   | L6   |
|-------------|----|----|----|------|--------------------|------------|----|----|------|------|
|             |    |    |    |      | Plastic bowl guard | Metal bowl |    |    |      |      |
| MS6-LFM-1/4 | 62 | 31 | 76 | G1/4 | 193                | 221        | 42 | 88 | ≥ 80 | 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.

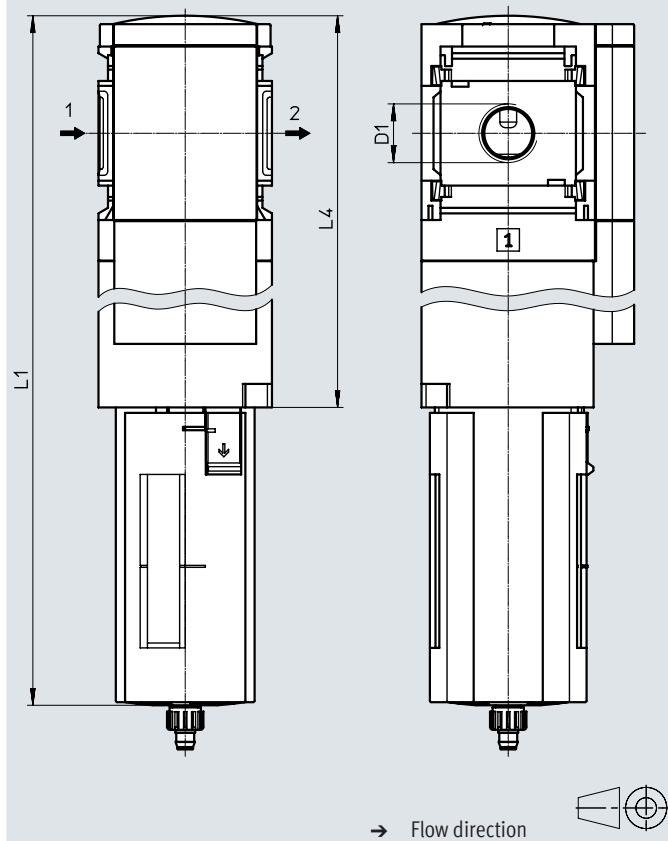
# Datasheet

## Dimensions – High flow rate HF

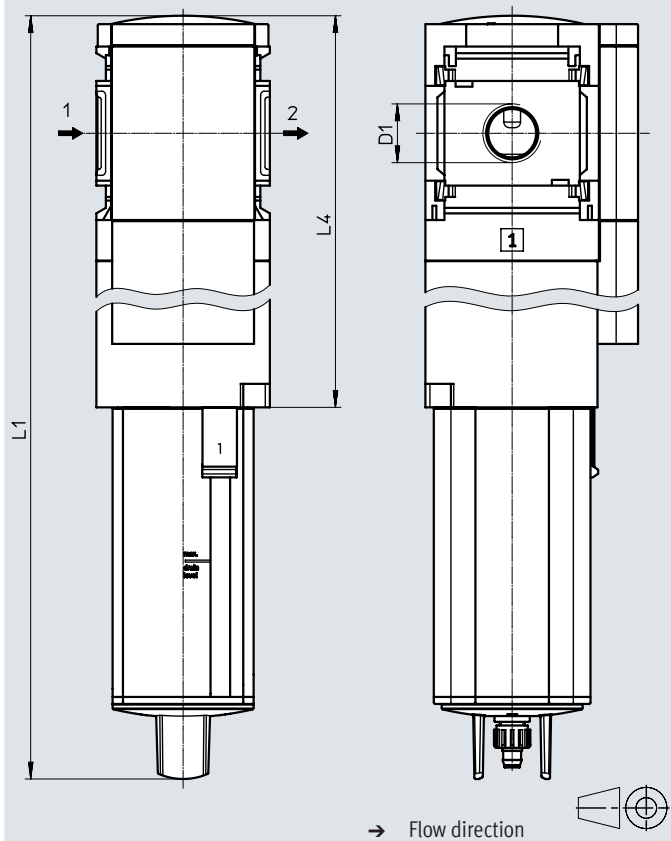
[Download CAD data → www.festo.com](http://www.festo.com)

Manual, rotary condensate drain

With plastic bowl guard R



With metal bowl U

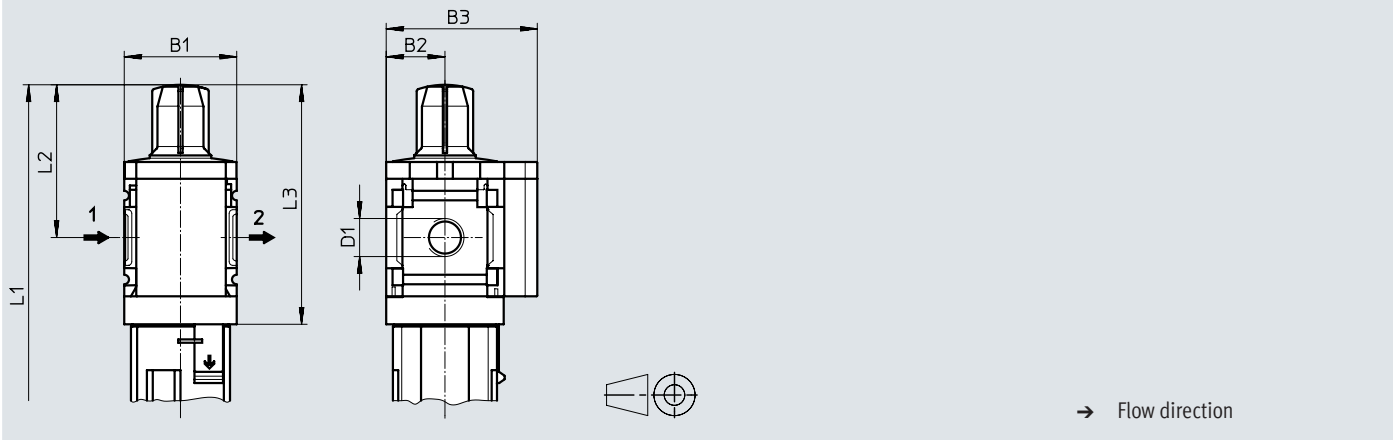


| Type               | D1   | L1                 |            | L4  |
|--------------------|------|--------------------|------------|-----|
|                    |      | Plastic bowl guard | Metal bowl |     |
| MS6-LFM-1/4-...-HF | G1/4 | 313                | 340        | 207 |
| MS6-LFM-3/8-...-HF | 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](http://www.festo.com)

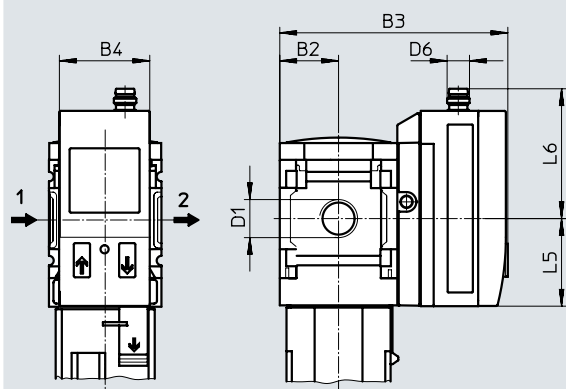


| Type                  | B1 | B2 | B3 | D1   | L1                 |            | L2   | L3   |
|-----------------------|----|----|----|------|--------------------|------------|------|------|
|                       |    |    |    |      | Plastic bowl guard | Metal bowl |      |      |
| MS4-LFM-1/8-...-DA    | 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](http://www.festo.com)

→ Flow direction

## Variant DP:

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

## Variant DN:

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

## Variant DPI:

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

## Variant DNI:

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

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

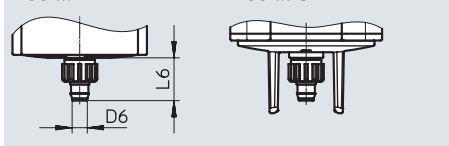
Datasheet

Dimensions – Condensate drain

[M] Manual, rotating

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

MS6-...-U-M



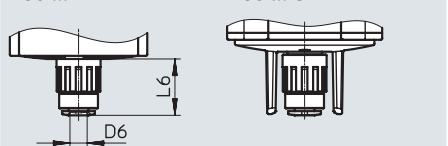
Barbed connector for plastic tubing PUN(-H)-8x1.25

| Type                 | D6<br>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        |         | –    |

[H] Semi-automatic

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

MS6-...-U-H



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

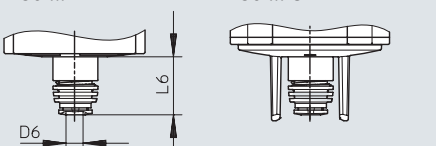
| Type                 | D6<br>ø | L6   |
|----------------------|---------|------|
| Plastic bowl guard R |         |      |
| MS4-LFM-...-H        | 6.2     | 22.1 |
| MS6-LFM-...-H        |         | 20.4 |
| Metal bowl U         |         |      |
| MS4-LFM-...-H        | 6.2     | 22.1 |
| MS6-LFM-...-H        |         | –    |

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[V] Fully automatic

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

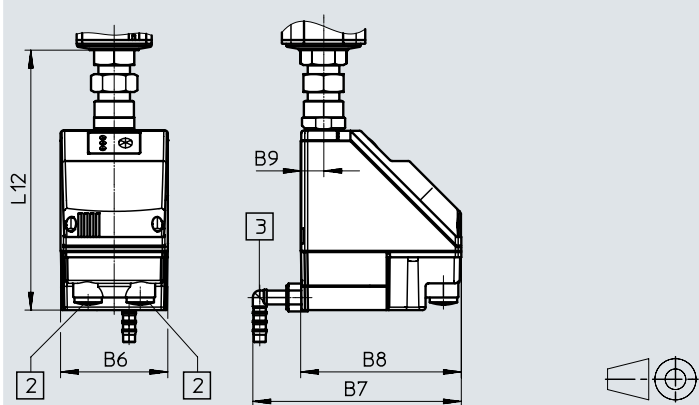
MS6-...-U-V



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

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

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



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

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



## Datasheet

## Ordering data

Plastic guard, without differential pressure display

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

## Flow direction from left to right

|     |                  |      |        |                 |        |                 |
|-----|------------------|------|--------|-----------------|--------|-----------------|
| MS4 | Manual, rotating | G1/8 | 529463 | MS4-LFM-1/8-ARM | 529465 | MS4-LFM-1/8-BRM |
|     |                  | G1/4 | 529459 | MS4-LFM-1/4-ARM | 529461 | MS4-LFM-1/4-BRM |
| MS6 | Manual, rotating | G1/4 | 529663 | MS6-LFM-1/4-ARM | 529667 | MS6-LFM-1/4-BRM |
|     |                  | G3/8 | 529671 | MS6-LFM-3/8-ARM | 529675 | MS6-LFM-3/8-BRM |
|     |                  | G1/2 | 529655 | MS6-LFM-1/2-ARM | 529659 | MS6-LFM-1/2-BRM |
|     |                  | G1/4 | 530510 | MS6-LFM-1/4-ARV | 530514 | MS6-LFM-1/4-BRV |
|     | Fully automatic  | G3/8 | 530518 | MS6-LFM-3/8-ARV | –      | –               |
|     |                  | G1/2 | 530502 | MS6-LFM-1/2-ARV | 530506 | MS6-LFM-1/2-BRV |

## Flow direction from right to left

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

## Ordering data

Plastic guard, with differential pressure display

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

## Flow direction from left to right

|     |                  |      |        |                    |        |                    |
|-----|------------------|------|--------|--------------------|--------|--------------------|
| MS4 | Manual, rotating | G1/8 | 536821 | MS4-LFM-1/8-ARM-DA | –      | –                  |
|     |                  | G1/4 | 536822 | MS4-LFM-1/4-ARM-DA | 536818 | MS4-LFM-1/4-BRM-DA |
| MS6 | Manual, rotating | G1/4 | 536869 | MS6-LFM-1/4-ARM-DA | 536833 | MS6-LFM-1/4-BRM-DA |
|     |                  | G3/8 | 536870 | MS6-LFM-3/8-ARM-DA | –      | –                  |
|     |                  | G1/2 | 536871 | MS6-LFM-1/2-ARM-DA | 536835 | MS6-LFM-1/2-BRM-DA |
|     | Fully automatic  | G1/2 | 536877 | MS6-LFM-1/2-ARV-DA | 536841 | MS6-LFM-1/2-BRV-DA |

## Ordering data

Integrated as metal bowl, without differential pressure display

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

## Flow direction from left to right

|     |                 |      |        |                 |        |                 |
|-----|-----------------|------|--------|-----------------|--------|-----------------|
| MS4 | Fully automatic | G1/4 | 535768 | MS4-LFM-1/4-AUV | 535766 | MS4-LFM-1/4-BUV |
| MS6 | Fully automatic | G1/4 | 529665 | MS6-LFM-1/4-AUV | –      | –               |
|     |                 | G3/8 | 529673 | MS6-LFM-3/8-AUV | –      | –               |
|     |                 | G1/2 | 529657 | MS6-LFM-1/2-AUV | 529661 | MS6-LFM-1/2-BUV |

## Flow direction from right to left

|     |                 |      |        |                   |        |                   |
|-----|-----------------|------|--------|-------------------|--------|-------------------|
| MS6 | Fully automatic | G1/2 | 529658 | MS6-LFM-1/2-AUV-Z | 529662 | MS6-LFM-1/2-BUV-Z |
|-----|-----------------|------|--------|-------------------|--------|-------------------|

## Ordering data

Integrated as metal bowl, with differential pressure display

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

## Flow direction from left to right

|     |                 |      |        |                    |        |                    |
|-----|-----------------|------|--------|--------------------|--------|--------------------|
| MS4 | Fully automatic | G1/4 | 537214 | MS4-LFM-1/4-AUV-DA | –      | –                  |
| MS6 | Fully automatic | G1/2 | 536883 | MS6-LFM-1/2-AUV-DA | 536847 | MS6-LFM-1/2-BUV-DA |

## Flow direction from left to right, high flow rate

|     |                 |      |        |                       |        |                       |
|-----|-----------------|------|--------|-----------------------|--------|-----------------------|
| MS6 | Fully automatic | G1/2 | 552926 | MS6-LFM-1/2-AUV-HF-DA | 552925 | MS6-LFM-1/2-BUV-HF-DA |
|-----|-----------------|------|--------|-----------------------|--------|-----------------------|

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

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

## Ordering data – Modular product system

| Ordering table        |                                                                                                       |                                                                                     |    |            |      |
|-----------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----|------------|------|
| Grid dimension        | [mm]                                                                                                  | 40                                                                                  | 62 | Conditions | Code |
| Condensate drain      | Manual                                                                                                |                                                                                     |    |            | -M   |
|                       | Semi-automatic (P1 max. 12 bar)                                                                       |                                                                                     |    |            | -H   |
|                       | Fully automatic (P1 max. 12 bar) open without pressure                                                |                                                                                     |    | [2]        | -V   |
|                       | Fully automatic (P1 max. 12 bar) closed without pressure                                              |                                                                                     |    | [2]        | -VC  |
|                       | –                                                                                                     | 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 applications | –                                                                                                     | Suitable for sealing air and purge air                                              |    | [4]        | -HP  |
| Filter change sensing | Differential pressure display, visual                                                                 |                                                                                     |    |            | -DA  |
|                       | Filter contamination indicator, M8 plug, PNP, 3-pin                                                   |                                                                                     |    | [1] [5]    | -DP  |
|                       | Filter contamination indicator, M8 plug, NPN, 3-pin                                                   |                                                                                     |    | [1] [5]    | -DN  |
|                       | Filter contamination indicator, M12 plug, PNP, 4-pin, analogue output 4 ... 20 mA                     |                                                                                     |    | [1] [5]    | -DPI |
|                       | Filter contamination indicator, M12 plug, NPN, 4-pin, analogue output 4 ... 20 mA                     |                                                                                     |    | [1] [5]    | -DNI |
| Type of mounting      | Mounting bracket standard design                                                                      |                                                                                     |    | [6]        | -WP  |
|                       | Mounting bracket for hooking in service unit components                                               |                                                                                     |    | [1] [6]    | -WPM |
|                       | Mounting bracket centrally at the rear (wall mounting top and bottom), connecting plates not required |                                                                                     |    |            | -WB  |
|                       | Mounting bracket centrally at the rear (wall mounting top), connecting plates not required            | –                                                                                   |    |            | -WBM |
| EU certification      | II 2GD to EU Explosion Protection Directive (ATEX)                                                    |                                                                                     |    |            | -EX4 |
| UL certification      | cULus, ordinary location for Canada and USA                                                           |                                                                                     |    |            | -UL1 |
| Flow direction        | Flow direction from right to left                                                                     |                                                                                     |    |            | -Z   |

[1] 1/8, 1/4, 3/8, 1/2, AQK, AQN, AQP, AQR, AQS, E2, E3, E4, DP, DN, DPI, DNI, WPM

Not with EU EX4 certification

[2] V, VC

Size 4: only with metal bowl U

[3] E2, E3, E4

Only with metal bowl U

[4] HP

Not with flow rate HF or filter 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

## Type codes

|            |                                  |  |
|------------|----------------------------------|--|
| <b>001</b> | <b>Series</b>                    |  |
| <b>MS</b>  | MS series                        |  |
| <b>002</b> | <b>Size</b>                      |  |
| <b>4</b>   | Grid dimension 40 mm             |  |
| <b>003</b> | <b>Function</b>                  |  |
| <b>LFX</b> | Activated carbon filter          |  |
| <b>004</b> | <b>Pneumatic connection</b>      |  |
| <b>1/8</b> | Female thread G1/8               |  |
| <b>1/4</b> | Female thread G1/4               |  |
| <b>AGA</b> | Sub-base G1/8                    |  |
| <b>AGB</b> | Sub-base G1/4                    |  |
| <b>AGC</b> | Sub-base G3/8                    |  |
| <b>AQK</b> | Sub-base NPT1/8                  |  |
| <b>AQN</b> | Sub-base NPT1/4                  |  |
| <b>AQP</b> | Sub-base NPT3/8                  |  |
| <b>005</b> | <b>Bowl type</b>                 |  |
| <b>R</b>   | Plastic tray with plastic basket |  |
| <b>U</b>   | Aluminium                        |  |

|            |                                                                                           |  |
|------------|-------------------------------------------------------------------------------------------|--|
| <b>006</b> | <b>Type of mounting</b>                                                                   |  |
|            | Without mounting bracket                                                                  |  |
| <b>WP</b>  | Mounting bracket basic design                                                             |  |
| <b>WPM</b> | Mounting bracket for hooking in service unit components                                   |  |
| <b>WB</b>  | Mounting centrally at rear (wall mounting top and bottom), connecting plates not required |  |
| <b>WBM</b> | Mounting centrally at rear (wall mounting top), connecting plates not required            |  |
| <b>007</b> | <b>EU certification</b>                                                                   |  |
|            | None                                                                                      |  |
| <b>EX4</b> | II 2GD                                                                                    |  |
| <b>008</b> | <b>UL certification</b>                                                                   |  |
|            | None                                                                                      |  |
| <b>UL1</b> | cULus ordinary location for Canada and USA                                                |  |
| <b>009</b> | <b>Flow direction</b>                                                                     |  |
|            | Flow direction from left to right                                                         |  |
| <b>Z</b>   | Flow direction from right to left                                                         |  |

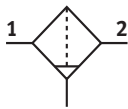
## Type codes

|            |                                  |  |
|------------|----------------------------------|--|
| <b>001</b> | <b>Series</b>                    |  |
| <b>MS</b>  | MS series                        |  |
| <b>002</b> | <b>Size</b>                      |  |
| <b>6</b>   | Grid dimension 62 mm             |  |
| <b>003</b> | <b>Function</b>                  |  |
| <b>LFX</b> | Activated carbon filter          |  |
| <b>004</b> | <b>Pneumatic connection</b>      |  |
| <b>1/4</b> | Female thread G1/4               |  |
| <b>3/8</b> | Female thread G3/8               |  |
| <b>1/2</b> | Female thread G1/2               |  |
| <b>AGB</b> | Sub-base G1/4                    |  |
| <b>AGC</b> | Sub-base G3/8                    |  |
| <b>AGD</b> | Sub-base G1/2                    |  |
| <b>AGE</b> | Sub-base G3/4                    |  |
| <b>AGF</b> | Sub-base G1                      |  |
| <b>AQN</b> | Sub-base 1/4 NPT                 |  |
| <b>AQP</b> | Sub-base 3/8 NPT                 |  |
| <b>AQR</b> | Sub-base 1/2 NPT                 |  |
| <b>AQS</b> | Sub-base 3/4 NPT                 |  |
| <b>005</b> | <b>Bowl type</b>                 |  |
| <b>R</b>   | Plastic tray with plastic basket |  |
| <b>U</b>   | Aluminium                        |  |

|            |                                                                                           |  |
|------------|-------------------------------------------------------------------------------------------|--|
| <b>006</b> | <b>Flow rate</b>                                                                          |  |
|            | Standard                                                                                  |  |
| <b>HF</b>  | High flow rate                                                                            |  |
| <b>007</b> | <b>Range of applications</b>                                                              |  |
|            | None                                                                                      |  |
| <b>HP</b>  | Suitable for sealing air and purge air                                                    |  |
| <b>008</b> | <b>Type of mounting</b>                                                                   |  |
|            | Without mounting bracket                                                                  |  |
| <b>WB</b>  | Mounting centrally at rear (wall mounting top and bottom), connecting plates not required |  |
| <b>WP</b>  | Mounting bracket basic design                                                             |  |
| <b>WPM</b> | Mounting bracket for hooking in service unit components                                   |  |
| <b>009</b> | <b>EX certification EU</b>                                                                |  |
|            | None                                                                                      |  |
| <b>EX4</b> | II 2GD                                                                                    |  |
| <b>010</b> | <b>UL certification</b>                                                                   |  |
|            | None                                                                                      |  |
| <b>UL1</b> | cULus ordinary location for Canada and USA                                                |  |
| <b>011</b> | <b>Flow direction</b>                                                                     |  |
|            | Flow direction from left to right                                                         |  |
| <b>Z</b>   | Flow direction from right to left                                                         |  |

Datasheet

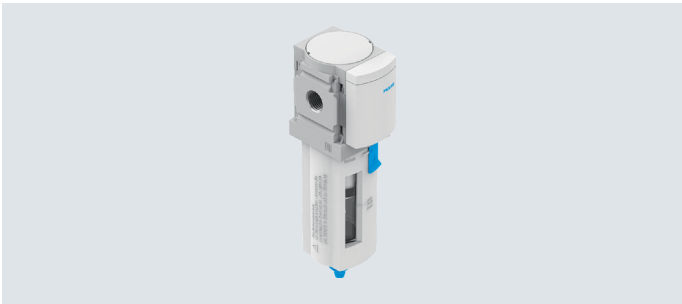
Function



-  - Flow rate  
max. 2500 l/min
-  - Temperature range  
-10 ... +60 °C
-  - Operating pressure  
0 ... 20 bar
-  - [www.festo.com](http://www.festo.com)

-  - **Note**  
Prefiltration with micro filter MS-LFM-A (grade of filtration 0.01 µm) is recommended.

- Removes liquid and gaseous oil particles from compressed air using activated carbon
- Eliminates odours and vapours
- Available with filter cartridge for low flow rates, suitable for sealing air and purge air applications
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22
- New filter cartridges → Page 93



| 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, G3/4 or G1         |
| Connecting plate AQ...           | 1/8 NPT, 1/4 NPT or 3/8 NPT               | 1/4 NPT, 3/8 NPT, 1/2 NPT or 3/4 NPT |
| Design                           | Activated carbon filter                   |                                      |
| Type of mounting                 | With accessories                          |                                      |
|                                  | In-line installation                      |                                      |
| Mounting position                | Vertical ±5°                              |                                      |
| Air purity class at the output1) | Compressed air to ISO 8573-1:2010 [3:4:1] |                                      |
| Bowl guard                       | Plastic bowl guard                        |                                      |
|                                  | Integrated as metal bowl                  |                                      |
| Residual oil content [mg/m³]     | ≤0.003                                    |                                      |

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

| Standard flow rate qn1) [l/min]                     |          |          |                   |                                                             |
|-----------------------------------------------------|----------|----------|-------------------|-------------------------------------------------------------|
| Size                                                | MS4      | MS6      |                   |                                                             |
| Variants                                            | Standard | Standard | High flow rate HF | Application area HP, suitable for sealing air and purge air |
| Max. standard flow rate for air purity class qn max | 360      | 900      | 2500              | 900                                                         |

1) Measured at p1 = 6 bar.

## Datasheet

| Operating and environmental conditions       |       |                                           |                                   |
|----------------------------------------------|-------|-------------------------------------------|-----------------------------------|
| Size                                         |       | MS4                                       | MS6                               |
| Operating pressure                           | [bar] | 0 ... 14 (0 ... 10) <sup>1)</sup>         | 0 ... 20 (0 ... 10) <sup>1)</sup> |
| Operating medium                             |       | Compressed air to ISO 8573-1:2010 [3:4:2] |                                   |
| Ambient temperature                          | [°C]  | -10 ... +60                               |                                   |
| Temperature of medium                        | [°C]  | +5 ... +30                                |                                   |
| Storage temperature                          | [°C]  | -10 ... +60                               |                                   |
| Corrosion resistance class CRC <sup>2)</sup> |       | 2                                         |                                   |
| Food-safe <sup>3)</sup>                      |       | See supplementary material information    |                                   |
| UL certification <sup>3)</sup>               |       | c UL us - Recognized (OL)                 |                                   |

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

2) More information: [www.festo.com/x/topic/crc](http://www.festo.com/x/topic/crc)3) More information: [www.festo.com/catalogue/ms-lfx d Support/Downloads](http://www.festo.com/catalogue/ms-lfx d Support/Downloads).

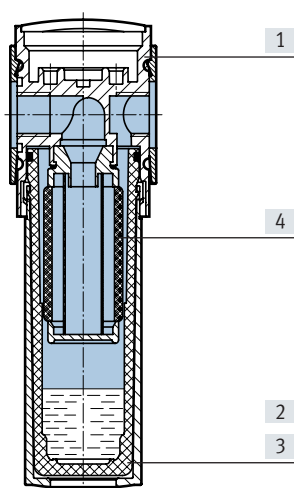
| ATEX                                                       |                                             |
|------------------------------------------------------------|---------------------------------------------|
| EU certification                                           | EX4                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

1) More information: [www.festo.com/catalogue/ms-lfx d Support/Downloads](http://www.festo.com/catalogue/ms-lfx d Support/Downloads).

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

## Materials

## Sectional view

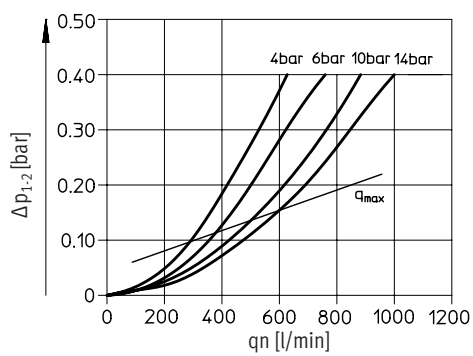


| Activated carbon filter |                    |                                                |
|-------------------------|--------------------|------------------------------------------------|
| [1]                     | Housing            | Die-cast aluminium                             |
| [2] 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

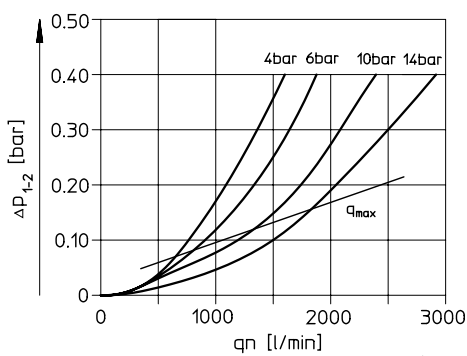
## Datasheet

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

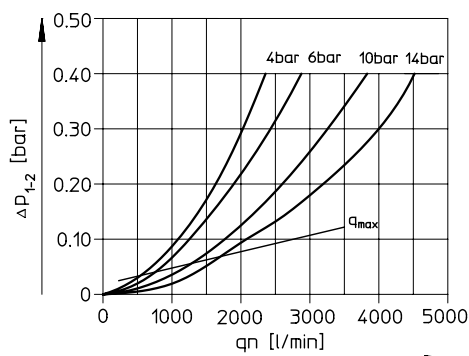
MS4-LFX-1/8 and MS4-LFX-1/4



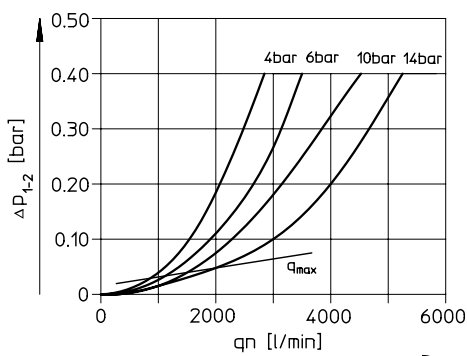
MS6-LFX-1/4



MS6-LFX-3/8

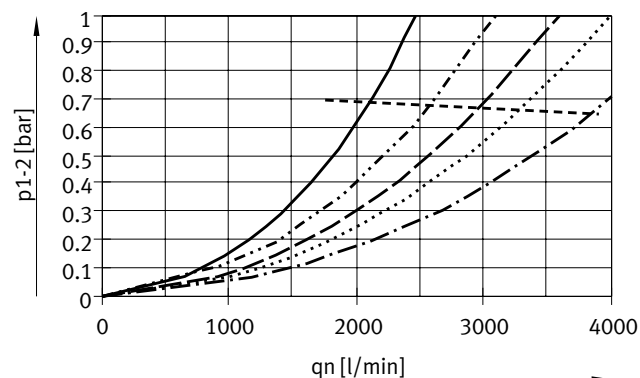


MS6-LFX-1/2

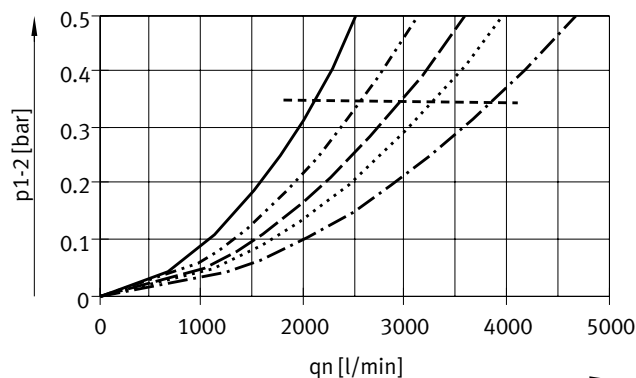


### Standard flow rate $q_n$ as a function of differential pressure $p_{1-2}$

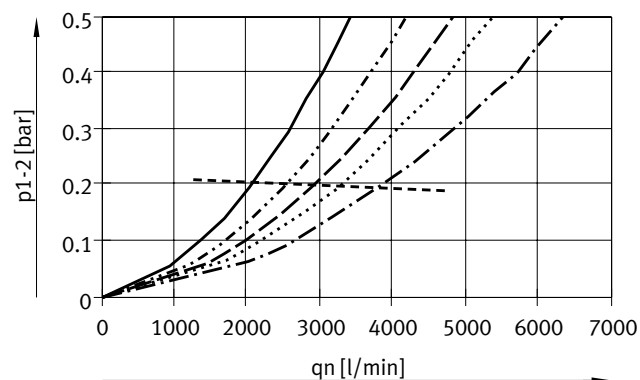
MS6-LFX-1/4-...-HF



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
- - -  $q_{max}$

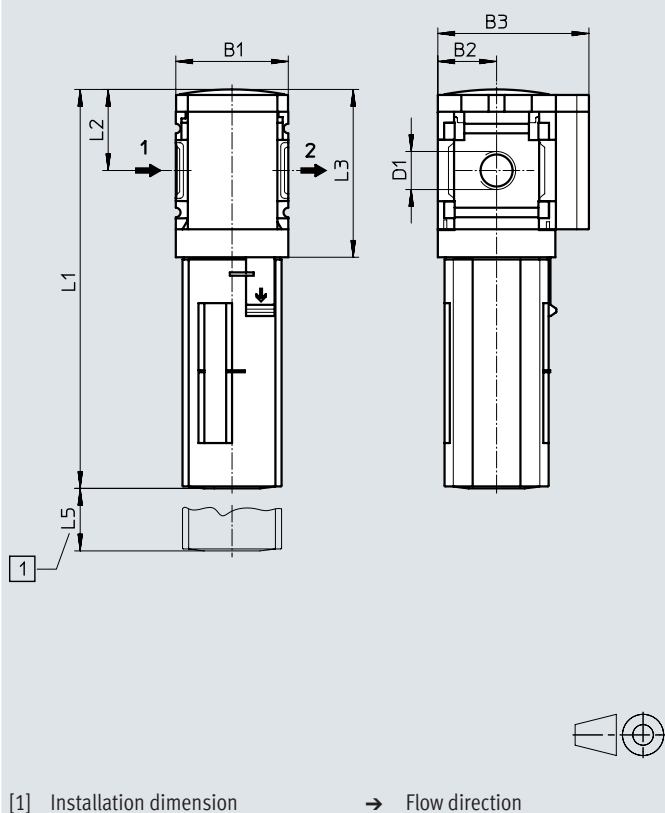


## Datasheet

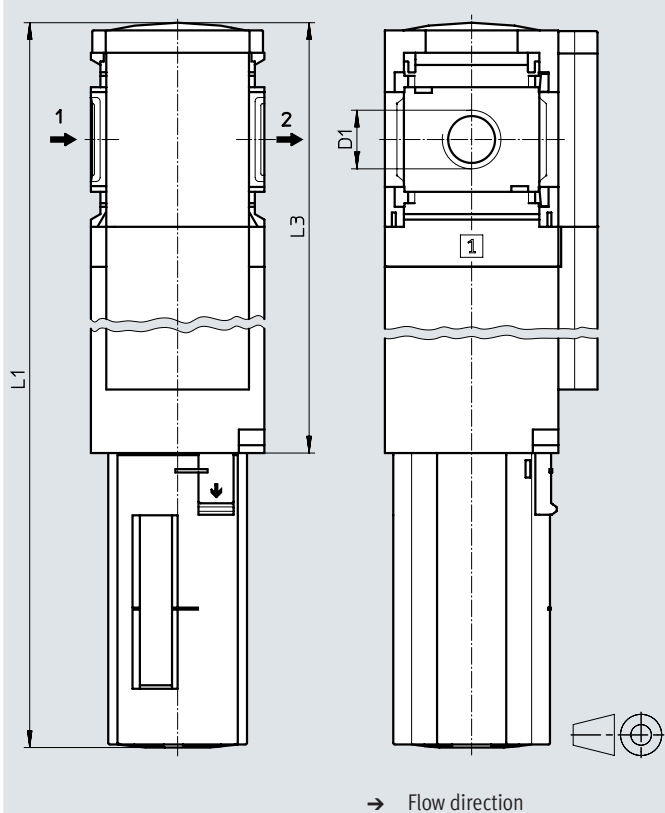
## Dimensions – Basic version

Download CAD data → [www.festo.com](http://www.festo.com)

Standard/range of application HP



High flow rate HF



| Type               | B1 | B2 | B3 | D1   | L1         |       | L2 | L3  | L5    |
|--------------------|----|----|----|------|------------|-------|----|-----|-------|
|                    |    |    |    |      | Bowl guard |       |    |     |       |
|                    |    |    |    |      | Polymer    | Metal |    |     |       |
| MS4-LFX-1/8        | 40 | 21 | 54 | G1/8 | 142.8      | 160.4 | 29 | 60  | ≥ 80  |
| 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 filter                |                          |            | -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 G1      |            | -AGF |            |
|                       | Connecting plate 1/8 NPT                                                                              | –                                      |                          | [1]        | -AQK |            |
|                       | Connecting plate 1/4 NPT                                                                              |                                        | Connecting plate 1/4 NPT | [1]        | -AQN |            |
|                       | Connecting plate 3/8 NPT                                                                              |                                        | Connecting plate 3/8 NPT | [1]        | -AQP |            |
|                       | –                                                                                                     |                                        | Connecting plate 1/2 NPT | [1]        | -AQR |            |
|                       | –                                                                                                     |                                        | Connecting plate 3/4 NPT | [1]        | -AQS |            |
| Bowl                  | Plastic bowl with plastic bowl guard                                                                  |                                        |                          |            | -R   |            |
|                       | Metal bowl                                                                                            |                                        |                          |            | -U   |            |
| Flow rate             | –                                                                                                     | High flow rate                         |                          |            | -HF  |            |
| Range of applications | –                                                                                                     | Suitable for sealing air and purge air |                          | [2]        | -HP  |            |
| Type of mounting      | Mounting bracket standard design                                                                      |                                        |                          | [3]        | -WP  |            |
|                       | Mounting bracket for hooking in service unit components                                               |                                        |                          | [1] [3]    | -WPM |            |
|                       | Mounting bracket centrally at the rear (wall mounting top and bottom), connecting plates not required |                                        |                          |            | -WB  |            |
|                       | Mounting bracket centrally at the rear (wall mounting top), connecting plates not required            | –                                      |                          |            | -WBM |            |
| EU certification      | II 2GD to EU Explosion Protection Directive (ATEX)                                                    |                                        |                          |            | -EX4 |            |
| UL certification      | cULus, ordinary location for Canada and USA                                                           |                                        |                          |            | -UL1 |            |
| Flow direction        | Flow direction from right to left                                                                     |                                        |                          |            | -Z   |            |

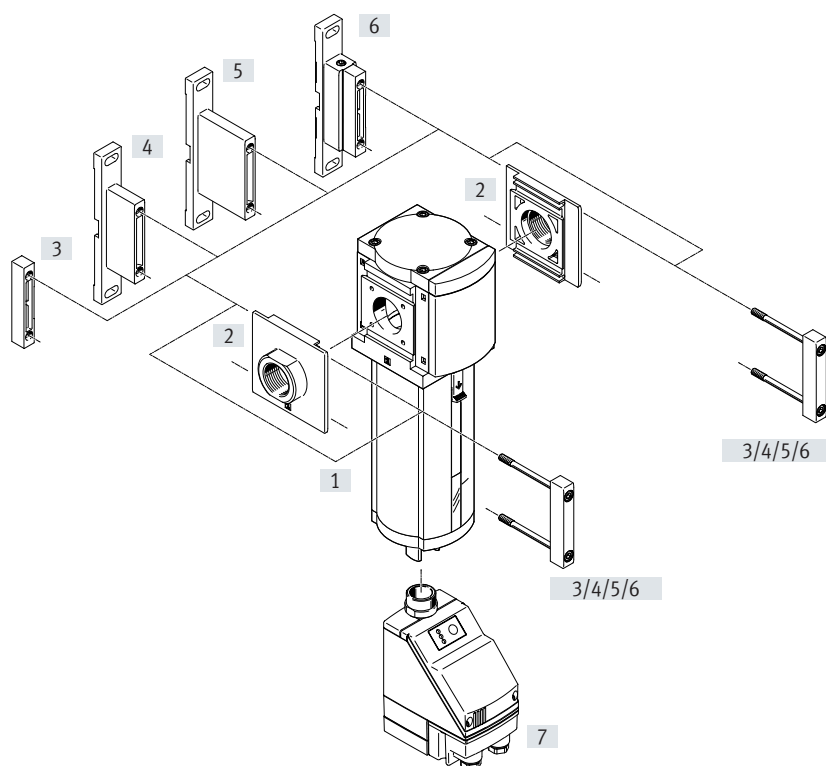
[1] 1/8, 1/4, 3/8, 1/2, AQK, AQN, AQP, AQR, AQS, WPM

Not with EU EX4 certification

[2] HP Not with flow rate HF

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

## Peripherals overview



-  - **Note**

Additional accessories:

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

## Mounting attachments and accessories

|     |                                                                       | Individual device                      |                                                                      |                              | Combination                                                        | → Page/Internet |
|-----|-----------------------------------------------------------------------|----------------------------------------|----------------------------------------------------------------------|------------------------------|--------------------------------------------------------------------|-----------------|
|     |                                                                       | With female thread<br>3/4, 1, N3/4, N1 | With connecting plate AG.../AQ...<br>Without EU EX4<br>certification | With EU EX4<br>certification | Module without connecting<br>thread, without connecting<br>plate G |                 |
| [1] | Filter<br>MS9-LF                                                      | ■                                      | ■                                                                    | ■                            | ■                                                                  | 45              |
| [2] | Connecting plate SET<br>MS9-AG...                                     | –                                      | ■                                                                    | ■                            | ■                                                                  | ms9-ag          |
|     | Connecting plate SET<br>MS9-AQ...                                     | –                                      | ■                                                                    | –                            | ■                                                                  | ms9-aq          |
| [3] | Module connector<br>MS9-MV                                            | –                                      | –                                                                    | –                            | ■                                                                  | ms9-mv          |
| [4] | Mounting bracket<br>MS9-WP                                            | ■                                      | ■                                                                    | ■                            | ■                                                                  | ms9-wp          |
| [5] | Mounting bracket<br>MS9-WPB                                           | ■                                      | ■                                                                    | ■                            | ■                                                                  | ms9-wp          |
| [6] | Mounting bracket<br>MS9-WPM                                           | ■                                      | ■                                                                    | –                            | ■                                                                  | ms9-wp          |
| [7] | Fully automatic condensate drain, electrically actuated<br>E2, E3, E4 | ■                                      | ■                                                                    | –                            | ■                                                                  | 49              |

## 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  | 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  | Filter design                                      |  |
| C    | 5 µm                                               |  |
| E    | 40 µm                                              |  |

|     |                                                                                     |  |
|-----|-------------------------------------------------------------------------------------|--|
| 006 | Bowl type                                                                           |  |
| U   | Aluminium                                                                           |  |
| 007 | Condensate drain                                                                    |  |
| E2  | External fully automatic condensate drain, electric, 110 V AC, connection terminals |  |
| E3  | External fully automatic condensate drain, electric, 230 V AC, connection terminals |  |
| E4  | External fully automatic condensate drain, electric, 24 V DC, connection terminals  |  |
| H   | Semi-automatic                                                                      |  |
| M   | Manual                                                                              |  |
| V   | Fully automatic, normally open                                                      |  |
| VC  | Fully automatic, normally closed                                                    |  |
| 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 50

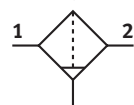
- Pneumatic connection
- Condensate drain
- Type of mounting
- EU certification
- UL certification
- Flow direction

## Datasheet

### Function

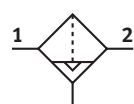
Condensate drain

Manual, rotating



Condensate drain

Semi- or fully automatic



-  Flow rate  
6000 ... 16000 l/min
-  Temperature range  
-10 ... +60 °C
-  Operating pressure  
0 ... 20 bar
-  [www.festo.com](http://www.festo.com)



- Good particle and condensate separation
- High flow rate with minimal pressure drop
- Available with manual, semi-automatic, fully automatic, or fully automatic, electrically actuated condensate drain
- Choice of filter inserts 5 µm or 40 µm
- New filter cartridges → Page 94
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22

| General technical data                              |                                                                                                                                               |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Size                                                | MS9                                                                                                                                           |
| Pneumatic connection 1, 2                           |                                                                                                                                               |
| Female thread                                       | G3/4, G1, 3/4 NPT or 1 NPT                                                                                                                    |
| Connecting plate AG...                              | G1/2, G3/4, G1, G1 1/4 or G1 1/2                                                                                                              |
| Connecting plate AQ...                              | 1/2 NPT, 3/4 NPT, 1 NPT, 1 1/4 NPT or 1 1/2 NPT                                                                                               |
| Module without connecting thread/connecting plate G | —                                                                                                                                             |
| Design                                              | Sintered filter with centrifugal separator                                                                                                    |
| Type of mounting                                    | With accessories<br>In-line installation                                                                                                      |
| Mounting position                                   | Vertical ±5°                                                                                                                                  |
| Grade of filtration [µm]                            | 5<br>40                                                                                                                                       |
| Air purity class at the output                      | Compressed air to ISO 8573-1:2010 [6:8:4] (grade of filtration 5 µm)<br>Compressed air to ISO 8573-1:2010 [7:8:4] (grade of filtration 40 µm) |
| Bowl guard                                          | Integrated as metal bowl                                                                                                                      |
| Condensate drain                                    | Manual, rotating<br>Semi-automatic<br>Fully automatic<br>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 <sub>N1</sub> [l/min] |       |               |               |                                                    |
|----------------------------------------------------|-------|---------------|---------------|----------------------------------------------------|
| Pneumatic connection                               |       | G1/2, 1/2 NPT | G3/4, 3/4 NPT | G1, G1 1/4, G1 1/2/<br>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<sub>1</sub> = 6 bar and Δp = 1 bar

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

## Datasheet

| Operating and environmental conditions       |       | Manual, rotating                          | 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:–] |
|                                              |       | Inert gases                               |                                           |                                           |                                           |
| Ambient temperature                          | [°C]  | –10 ... +60                               | –10 ... +60                               | –10 ... +60                               | +1 ... +60                                |
| Temperature of medium                        | [°C]  | –10 ... +60                               | –10 ... +60                               | –10 ... +60                               | +1 ... +60                                |
| Storage temperature                          | [°C]  | –10 ... +60                               | –10 ... +60                               | –10 ... +60                               | +1 ... +60                                |
| Corrosion resistance class CRC <sup>1)</sup> |       | 2                                         |                                           |                                           |                                           |
| UL certification <sup>2)</sup>               |       | c UL us - Recognized (OL)                 |                                           |                                           |                                           |

1) More information: [www.festo.com/x/topic/crc](http://www.festo.com/x/topic/crc)2) More information [www.festo.com/catalogue/ms9-lf](http://www.festo.com/catalogue/ms9-lf) → Support/Downloads..

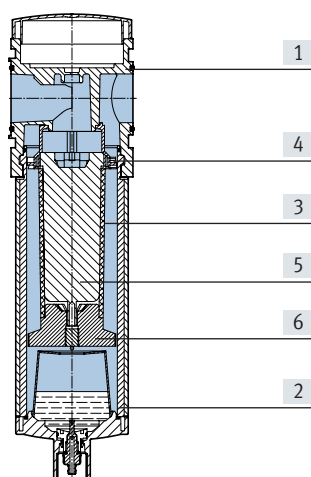
| ATEX                                                       |                                             |
|------------------------------------------------------------|---------------------------------------------|
| EU certification                                           | EX4                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

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

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

## Materials

## Sectional view

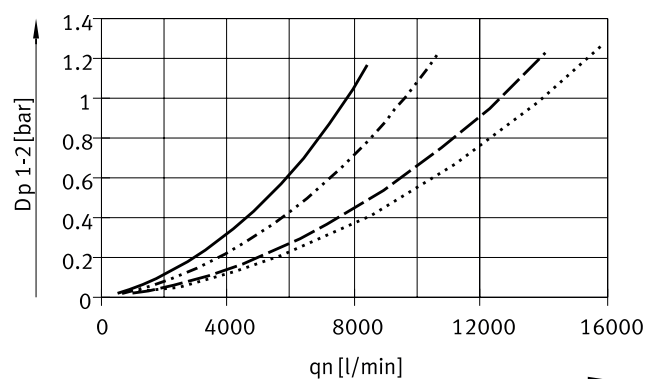


| Filter                 |                                                      |                         |
|------------------------|------------------------------------------------------|-------------------------|
| [1]                    | Housing                                              | Die-cast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

# Datasheet

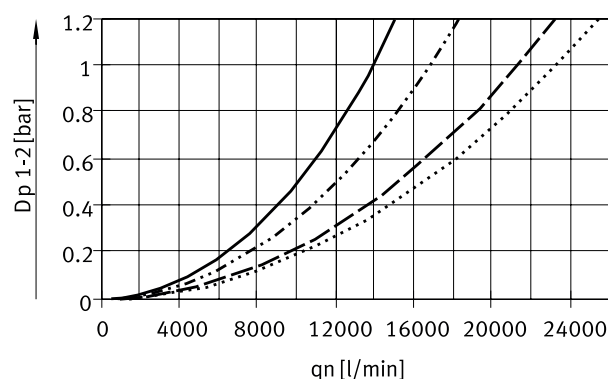
## Standard flow rate $q_n$ as a function of differential pressure $\Delta p_{1-2}$

Grade of filtration 5  $\mu\text{m}$ , pneumatic connection G1, 1 NPT



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

Grade of filtration 40  $\mu\text{m}$ , pneumatic connection G1, 1 NPT

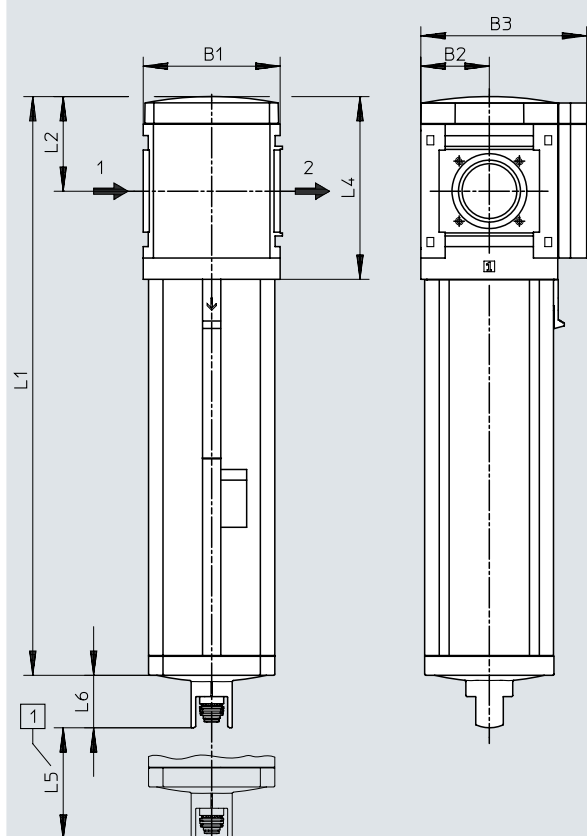


— 4 bar  
- - - 10 bar  
- · - · - 6 bar  
····· 12 bar

## Dimensions – Basic version

Download CAD data → [www.festo.com](http://www.festo.com)

Module without connecting thread, without connecting plate G



[1] Installation dimension

→ Flow direction

| Type     | B1 | B2 | B3  | L1    | L2 | L4  | L5    | L6   |
|----------|----|----|-----|-------|----|-----|-------|------|
| MS9-LF-G | 90 | 45 | 109 | 310.5 | 62 | 120 | ≥ 160 | 34.5 |

Datasheet

**Dimensions – Connecting thread/connecting plate**

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

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

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

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

→ Flow direction

Download CAD data → [www.festo.com](http://www.festo.com)

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

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

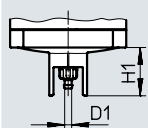


## Datasheet

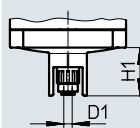
## Dimensions – Condensate drain

Download CAD data → [www.festo.com](http://www.festo.com)

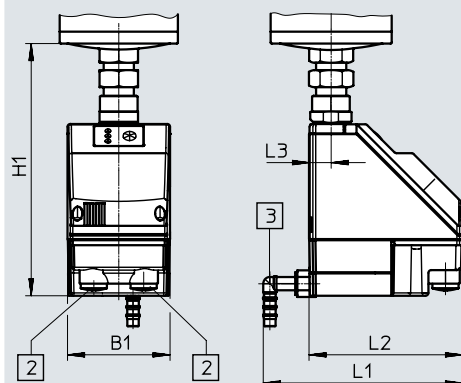
[M] Manual, rotating

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

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

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

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

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

Condensate drain PWEA:

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

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

## Ordering data

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

## Ordering data – Modular product system

| Ordering table                      |                                                            | Conditions | Code  | Enter code |
|-------------------------------------|------------------------------------------------------------|------------|-------|------------|
| Grid dimension                      | [mm] 90                                                    |            |       |            |
| Module no.                          | 562532                                                     |            |       |            |
| Series                              | Standard                                                   |            | MS    | MS         |
| Size                                | 9                                                          |            | 9     | 9          |
| Function                            | Filter                                                     |            | -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) open without pressure     |            | -V    |            |
|                                     | Fully automatic (P1 max. 12 bar) closed without pressure   |            | -VC   |            |
| 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 hooking in service unit components    | [1] [2]    | -WPM  |            |
|                                     | Mounting bracket for large wall gap                        | [2]        | -WPB  |            |
| EU certification                    | II 2GD to EU Explosion Protection Directive (ATEX)         |            | -EX4  |            |
| UL certification                    | cULus, ordinary location for Canada and USA                |            | -UL1  |            |
| Flow direction                      | Flow direction from right to left                          |            | -Z    |            |

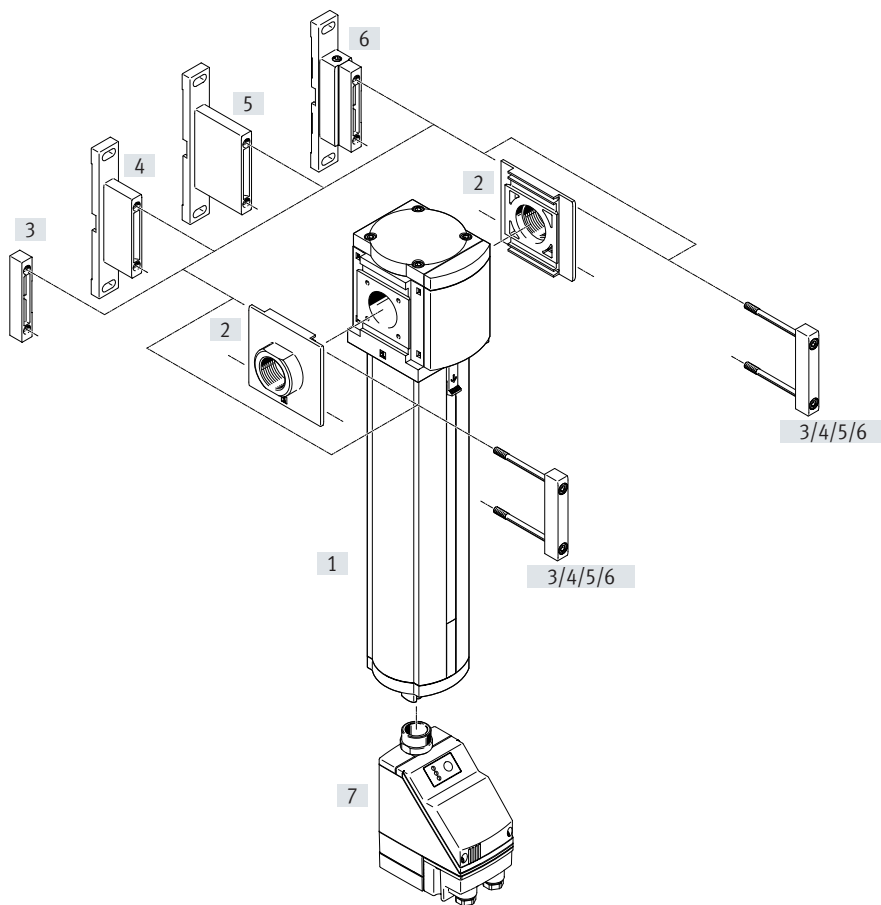
[1] 3/4, 1, N3/4, N1, AQR, AQS, AQT, AQU, AQV, G, E2, E3, E4, WPM

Not with EU EX4 certification

[2] WP, WPM, WPB

Not with pneumatic connection G

## Peripherals overview



- - **Note**

Additional accessories:

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

## Mounting attachments and accessories

|                                                                        | Individual device | Combination                         |                                                              | → Page/Internet |
|------------------------------------------------------------------------|-------------------|-------------------------------------|--------------------------------------------------------------|-----------------|
|                                                                        |                   | With female thread 3/4, 1, N3/4, N1 | Module without connecting thread, without connecting plate G |                 |
| [1] Fine and micro filter MS9-LFM                                      | ■                 | ■                                   | ■                                                            | 53              |
| [2] Connecting plate SET MS9-AG...                                     | –                 | ■                                   | ■                                                            | ms9-ag          |
| Connecting plate SET MS9-AQ...                                         | –                 | ■                                   | –                                                            | ms9-aq          |
| [3] Module connector MS9-MV                                            | –                 | –                                   | –                                                            | ms9-mv          |
| [4] Mounting bracket MS9-WP                                            | ■                 | ■                                   | ■                                                            | ms9-wp          |
| [5] Mounting bracket MS9-WPB                                           | ■                 | ■                                   | ■                                                            | ms9-wp          |
| [6] Mounting bracket MS9-WPM                                           | ■                 | ■                                   | –                                                            | ms9-wp          |
| [7] Fully automatic condensate drain, electrically actuated E2, E3, E4 | ■                 | ■                                   | –                                                            | 61              |

## 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  | 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  | Filter design                                      |  |
| A    | 0.01 µm                                            |  |
| B    | 1 µm                                               |  |
| 006  | Bowl type                                          |  |
| U    | Aluminium                                          |  |

|     |                                                                                     |  |
|-----|-------------------------------------------------------------------------------------|--|
| 007 | Condensate drain                                                                    |  |
| E2  | External fully automatic condensate drain, electric, 110 V AC, connection terminals |  |
| E3  | External fully automatic condensate drain, electric, 230 V AC, connection terminals |  |
| E4  | External fully automatic condensate drain, electric, 24 V DC, connection terminals  |  |
| H   | Semi-automatic                                                                      |  |
| M   | Manual                                                                              |  |
| V   | Fully automatic, normally open                                                      |  |
| VC  | Fully automatic, normally closed                                                    |  |
| 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 63

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

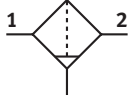
## Datasheet

### Function

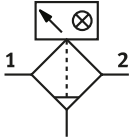
Condensate drain

Manual, rotating

Without differential pressure display



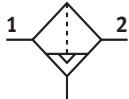
With differential pressure display



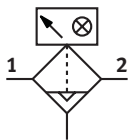
Condensate drain

Semi- or fully automatic

Without differential pressure display



With differential pressure display



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



- High-efficiency filter for exceptionally clean compressed air
- Air quality to ISO 8573-1:2010
- Available with manual, semi-automatic, fully automatic, or fully automatic, electrically actuated condensate drain
- Available with differential pressure indicator for indicating filter contamination
- Choice of filter inserts 0.01 µm or 1 µm
- New filter cartridges → Page 94
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22

| General technical data                              |                                                                                                                                         |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Size                                                | MS9                                                                                                                                     |
| Pneumatic connection 1, 2                           |                                                                                                                                         |
| Female thread                                       | G3/4, G1, 3/4 NPT or 1 NPT                                                                                                              |
| Connecting plate AG...                              | G1/2, G3/4, G1, G1 1/4 or G1 1/2                                                                                                        |
| Connecting plate AQ...                              | 1/2 NPT, 3/4 NPT, 1 NPT, 1 1/4 NPT or 1 1/2 NPT                                                                                         |
| Module without connecting thread/connecting plate G | –                                                                                                                                       |
| Design                                              | Fibre filter                                                                                                                            |
| Type of mounting                                    | With accessories<br>In-line installation                                                                                                |
| Mounting position                                   | Vertical ±5°                                                                                                                            |
| Grade of filtration [µm]                            | 0.01 (micro filter MS9-LFM-A)<br>1 (fine filter MS9-LFM-B)                                                                              |
| Air purity class at the output                      | Compressed air to ISO 8573-1:2010 [3:4:2] (micro filter MS9-LFM-A)<br>Compressed air to ISO 8573-1:2010 [5:4:3] (fine filter MS9-LFM-B) |
| Bowl guard                                          | Integrated as metal bowl                                                                                                                |
| Condensate drain                                    | Manual, rotating<br>Manual, non-detenting<br>Semi-automatic<br>Fully automatic<br>Fully automatic, electrically actuated                |
| Differential pressure display                       | Visual indicator                                                                                                                        |

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

## Datasheet

| General technical data                    |                                                                |                                |
|-------------------------------------------|----------------------------------------------------------------|--------------------------------|
| Variants                                  | Standard                                                       | High flow rate HF              |
| Residual oil content [mg/m <sup>3</sup> ] | 50.01 (micro filter MS9-LFM-A)<br>50.5 (fine filter MS9-LFM-B) |                                |
| Max. condensate volume [ml]               | 225                                                            |                                |
| Filter efficiency, fine particles [%]     | 99.995 (micro filter MS9-LFM-A)<br>99 (fine filter MS9-LFM-B)  |                                |
| Filter efficiency, oil aerosol [%]        | 99 (micro filter MS9-LFM-A)<br>90 (fine filter MS9-LFM-B)      |                                |
| MPPS [µm]                                 | 0.08 (micro filter MS-LFM-A)                                   | 0.1 (micro filter MS-LFM-A)    |
| Filter efficiency MPPS [%]                | 99.981 (micro filter MS-LFM-A)                                 | 99.968 (micro filter MS-LFM-A) |

| Standard flow rate qn1 [l/min]                                  |          |                   |
|-----------------------------------------------------------------|----------|-------------------|
| Variants                                                        | Standard | High flow rate HF |
| <b>Micro filter MS9-LFM-A</b>                                   |          |                   |
| Max. standard flow rate for air purity class q <sub>n max</sub> | 6500     | 7800              |
| Min. standard flow rate for air purity class q <sub>n min</sub> | 325      | 390               |
| <b>Fine filter MS9-LFM-B</b>                                    |          |                   |
| Max. standard flow rate for air purity class q <sub>n max</sub> | 7000     | 10000             |
| Min. standard flow rate for air purity class q <sub>n min</sub> | 350      | 500               |

1) Measured at p<sub>1</sub> = 6 bar

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

| Operating and environmental conditions       |                                                             |                |                                        |                                        |
|----------------------------------------------|-------------------------------------------------------------|----------------|----------------------------------------|----------------------------------------|
| Condensate drain                             | Manual, rotating                                            | Semi-automatic | Fully automatic                        | Fully automatic, electrically actuated |
|                                              | M                                                           | H              | V                                      | E2, E3, E4                             |
| Operating pressure [bar]                     | 0 ... 20                                                    | 1.5 ... 12     | 2 ... 12                               | 0.8 ... 16                             |
| Operating medium                             | Compressed air in accordance with ISO 8573-1:2010 [6:4:4]1) |                |                                        |                                        |
| Ambient temperature [°C]                     | -10 ... +60                                                 | +5 ... +60     | +5 ... +60 (-10 ... +60) <sup>2)</sup> | +1 ... +60                             |
| Temperature of medium [°C]                   | -10 ... +60                                                 | +5 ... +60     | +5 ... +60 (-10 ... +60) <sup>2)</sup> | +1 ... +60                             |
| Storage temperature [°C]                     | -10 ... +60                                                 | +5 ... +60     | -10 ... +60                            | +1 ... +60                             |
| Corrosion resistance class CRC <sup>3)</sup> | 2 - Moderate corrosion stress                               |                |                                        |                                        |
| UL certification <sup>4)</sup>               | c UL us - Recognized (OL)                                   |                |                                        |                                        |

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

2) For fine filter with grade of filtration 1 µm.

3) More information: [www.festo.com/x/topic/crc](http://www.festo.com/x/topic/crc)4) More information [www.festo.com/catalogue/ms9-lfm](http://www.festo.com/catalogue/ms9-lfm) → Support/Downloads.

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

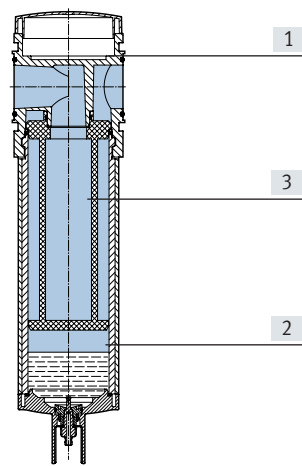
1) More information [www.festo.com/catalogue/ms9-lfm](http://www.festo.com/catalogue/ms9-lfm) → Support/Downloads.

Datasheet

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

Materials

Sectional view

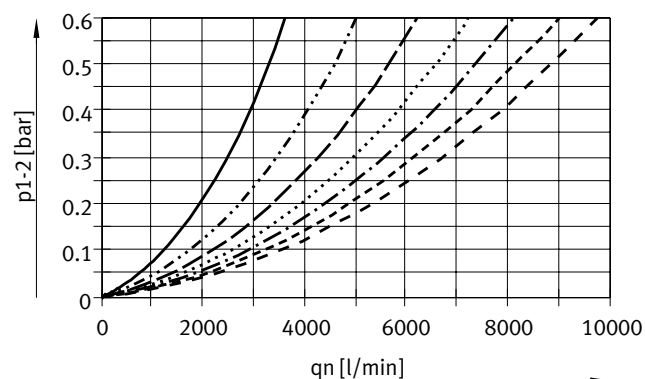


| Fine and micro filter  |                                                      |                         |
|------------------------|------------------------------------------------------|-------------------------|
| [1]                    | Housing                                              | Die-cast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

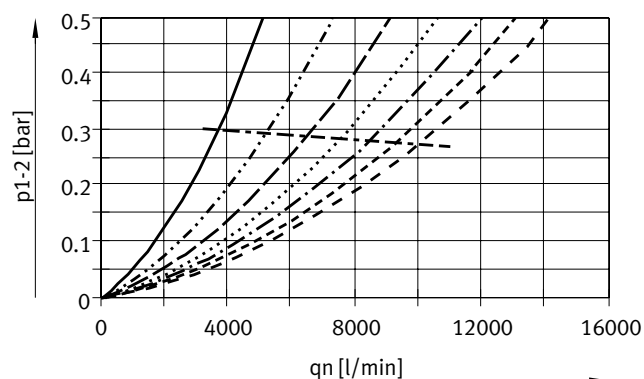
# Datasheet

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

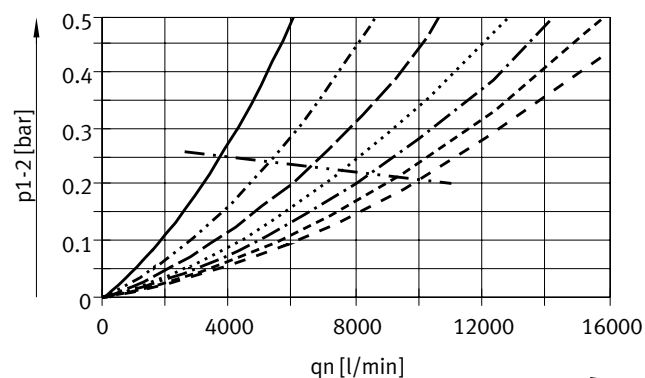
Grade of filtration 0.01  $\mu\text{m}$ , pneumatic connection G1/2, 1/2 NPT



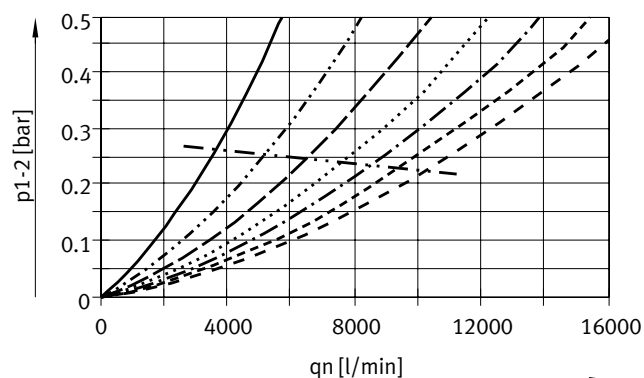
Grade of filtration 0.01  $\mu\text{m}$ , pneumatic connection G3/4, 3/4 NPT



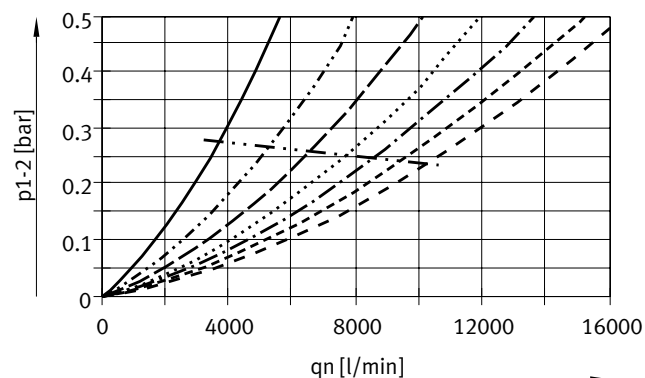
Grade of filtration 0.01  $\mu\text{m}$ , pneumatic connection G1, 1 NPT



Grade of filtration 0.01  $\mu\text{m}$ , pneumatic connection G1 1/4, 1 1/4 NPT



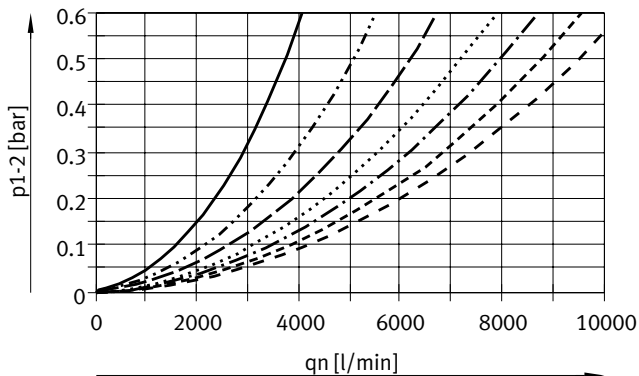
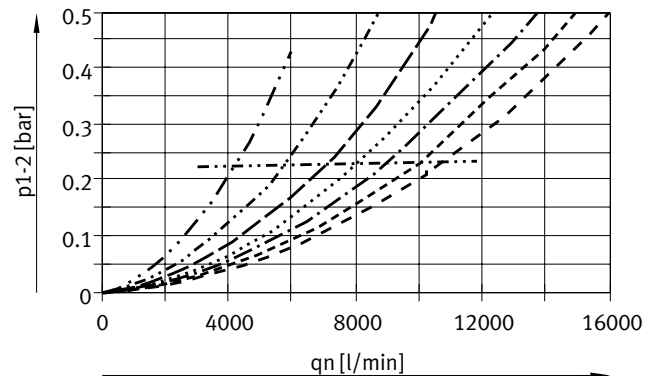
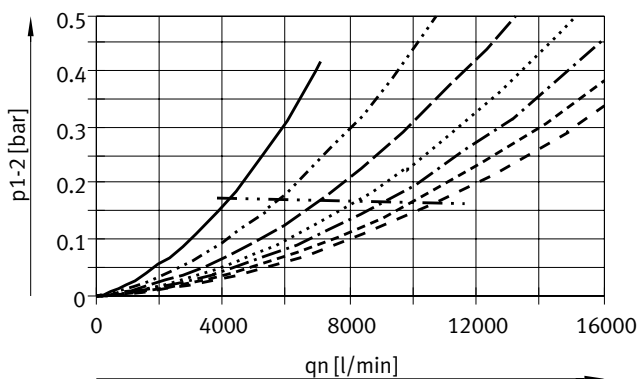
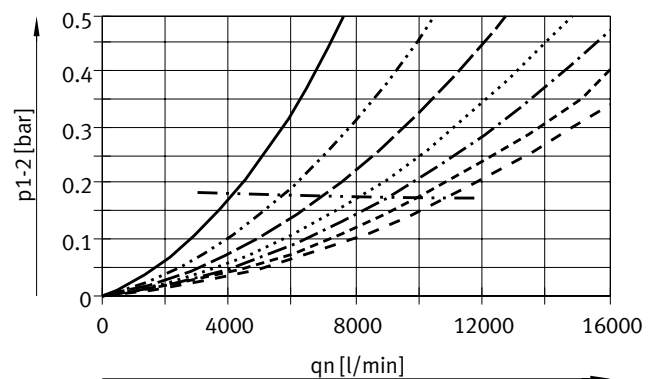
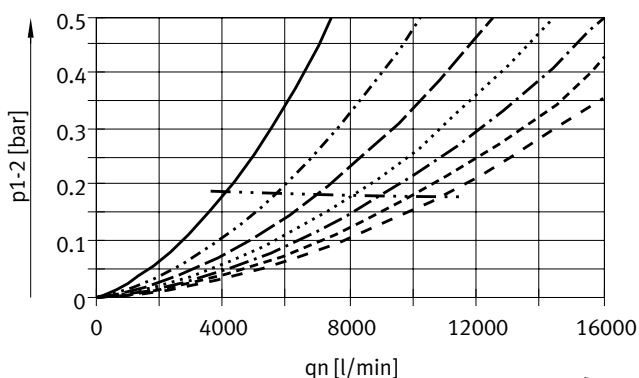
Grade of filtration 0.01  $\mu\text{m}$ , pneumatic connection G1 1/2, 1 1/2 NPT



- 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

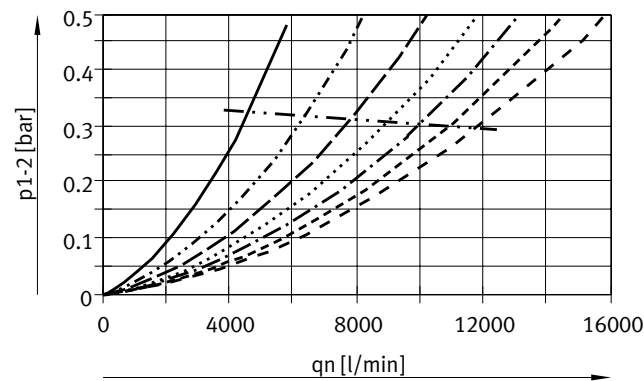
Standard flow rate  $q_n$  as a function of differential pressure  $p_{1-2}$ Grade of filtration 1  $\mu\text{m}$ , pneumatic connection G1/2, 1/2 NPTGrade of filtration 1  $\mu\text{m}$ , pneumatic connection G3/4, 3/4 NPTGrade of filtration 1  $\mu\text{m}$ , pneumatic connection G1, 1 NPTGrade of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

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

Datasheet

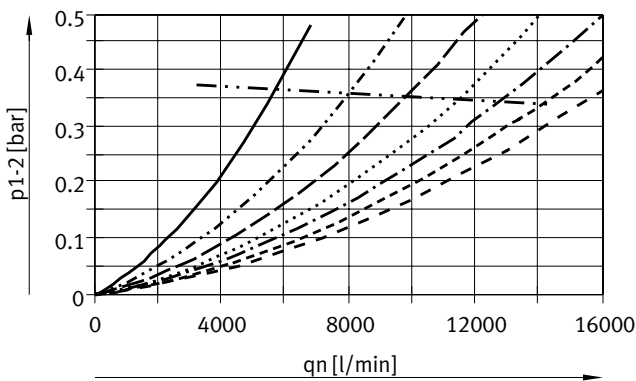
Standard flow rate  $q_n$  as a function of differential pressure  $p_{1-2}$

Grade of filtration 0.01  $\mu\text{m}$ , pneumatic connection G3/4, 3/4 NPT  
High flow rate HF



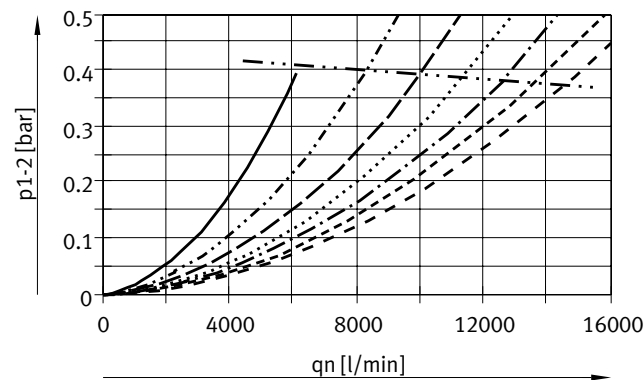
- 2 bar
- 4 bar
- 6 bar ( $q_{n \min}$ : 390 l/min)
- 8 bar
- 10 bar
- 12 bar
- 14 bar
- $q_{n \max}$

Grade of filtration 0.01  $\mu\text{m}$ , pneumatic connection G1, 1 NPT  
High flow rate HF



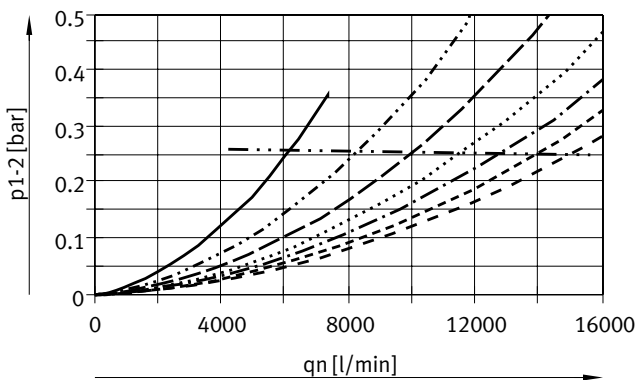
- 2 bar
- 4 bar
- 6 bar ( $q_{n \min}$ : 390 l/min)
- 8 bar
- 10 bar
- 12 bar
- 14 bar
- $q_{n \max}$

Grade of filtration 1  $\mu\text{m}$ , pneumatic connection G3/4, 3/4 NPT  
High flow rate HF



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

Grade of filtration 1  $\mu\text{m}$ , pneumatic connection G1, 1 NPT  
High flow rate HF

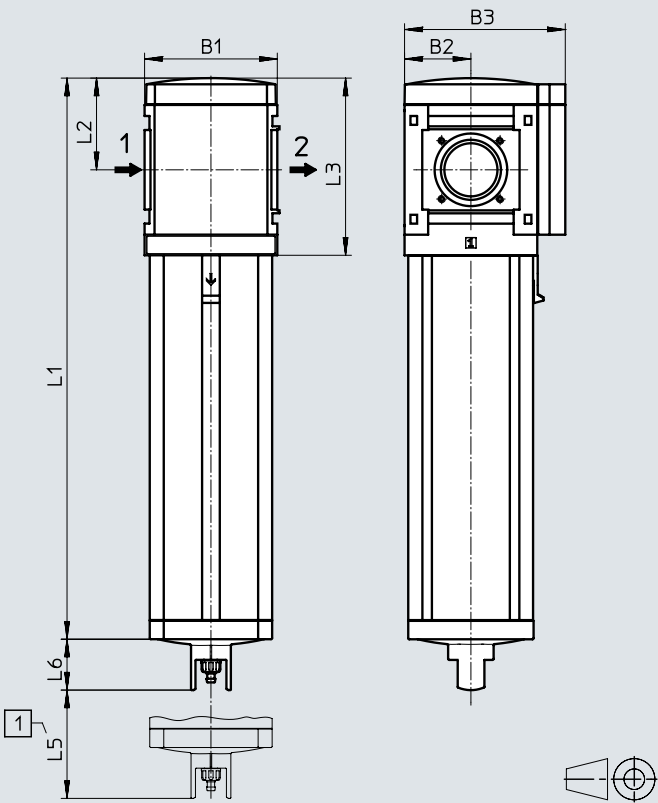


- 2 bar
- 4 bar
- 6 bar ( $q_{n \min}$ : 500 l/min)
- 8 bar
- 10 bar
- 12 bar
- 14 bar
- $q_{n \max}$

Datasheet

Dimensions – Basic version

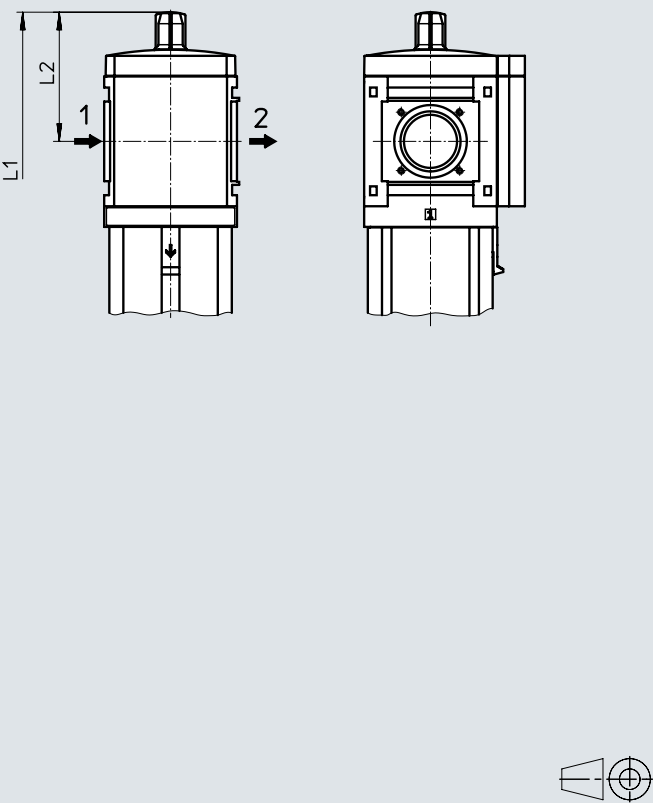
Module without connecting thread, without connecting plate G



[1] Installation dimension → Flow direction

Download CAD data → [www.festo.com](http://www.festo.com)

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



→ Flow direction

| Type              | B1 | B2 | B3  | L1       |                   | L2 | L3  | L5    | L6   |
|-------------------|----|----|-----|----------|-------------------|----|-----|-------|------|
|                   |    |    |     | Standard | High flow rate HF |    |     |       |      |
| MS9-LFM-G         | 90 | 45 | 109 | 380.5    | 480.5             | 62 | 120 | ≥ 220 | 34.5 |
| MS9-LFM-G-....-DA |    |    |     | 405.5    | 505.5             | 88 |     |       |      |

Datasheet

**Dimensions – Connecting thread/connecting plate**

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

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

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

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

→ Flow direction

Download CAD data → [www.festo.com](http://www.festo.com)

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

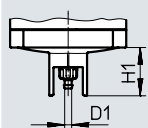
⚠ Note: This product conforms to ISO 1179-1 and ISO 228-1.

## Datasheet

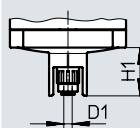
## Dimensions – Condensate drain

Download CAD data → [www.festo.com](http://www.festo.com)

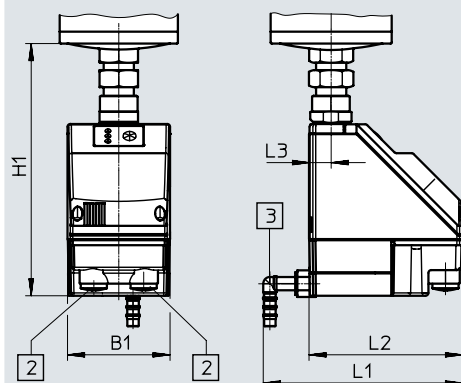
[M] Manual, rotating

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

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

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

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

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

Condensate drain PWEA:

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

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

## Datasheet

## Ordering data

Without differential pressure display

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

## Standard

|     |                  |      |        |                 |        |                 |
|-----|------------------|------|--------|-----------------|--------|-----------------|
| MS9 | Manual, rotating | G3/4 | 553070 | MS9-LFM-3/4-AUM | 553074 | MS9-LFM-3/4-BUM |
|     |                  | G1   | 553000 | MS9-LFM-1-AUM   | 553004 | MS9-LFM-1-BUM   |
|     |                  | –    | 564047 | MS9-LFM-G-AUM   | 564039 | MS9-LFM-G-BUM   |
|     | Fully automatic  | G3/4 | 553072 | MS9-LFM-3/4-AUV | 553076 | MS9-LFM-3/4-BUV |
|     |                  | G1   | 553002 | MS9-LFM-1-AUV   | 553006 | MS9-LFM-1-BUV   |
|     |                  | –    | 564049 | MS9-LFM-G-AUV   | 564041 | MS9-LFM-G-BUV   |

## High flow rate

|     |                  |      |        |                    |        |                    |
|-----|------------------|------|--------|--------------------|--------|--------------------|
| MS9 | Manual, rotating | G3/4 | 552964 | MS9-LFM-3/4-AUM-HF | 552968 | MS9-LFM-3/4-BUM-HF |
|     |                  | G1   | 553038 | MS9-LFM-1-AUM-HF   | 553042 | MS9-LFM-1-BUM-HF   |
|     |                  | –    | 564051 | MS9-LFM-G-AUM-HF   | 564043 | MS9-LFM-G-BUM-HF   |
|     | Fully automatic  | G3/4 | 552966 | MS9-LFM-3/4-AUV-HF | 552970 | MS9-LFM-3/4-BUV-HF |
|     |                  | G1   | 553040 | MS9-LFM-1-AUV-HF   | 553044 | MS9-LFM-1-BUV-HF   |
|     |                  | –    | 564053 | MS9-LFM-G-AUV-HF   | 564045 | MS9-LFM-G-BUV-HF   |

## Ordering data

With differential pressure display

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

## Standard

|     |                  |      |        |                    |        |                    |
|-----|------------------|------|--------|--------------------|--------|--------------------|
| MS9 | Manual, rotating | G3/4 | 553078 | MS9-LFM-3/4-AUM-DA | 553082 | MS9-LFM-3/4-BUM-DA |
|     |                  | G1   | 553008 | MS9-LFM-1-AUM-DA   | 553012 | MS9-LFM-1-BUM-DA   |
|     |                  | –    | 564048 | MS9-LFM-G-AUM-DA   | 564040 | MS9-LFM-G-BUM-DA   |
|     | Fully automatic  | G3/4 | 553080 | MS9-LFM-3/4-AUV-DA | 553084 | MS9-LFM-3/4-BUV-DA |
|     |                  | G1   | 553010 | MS9-LFM-1-AUV-DA   | 553014 | MS9-LFM-1-BUV-DA   |
|     |                  | –    | 564050 | MS9-LFM-G-AUV-DA   | 564042 | MS9-LFM-G-BUV-DA   |

## High flow rate

|     |                  |      |        |                       |        |                       |
|-----|------------------|------|--------|-----------------------|--------|-----------------------|
| MS9 | Manual, rotating | G3/4 | 552972 | MS9-LFM-3/4-AUM-HF-DA | 552976 | MS9-LFM-3/4-BUM-HF-DA |
|     |                  | G1   | 553046 | MS9-LFM-1-AUM-HF-DA   | 553050 | MS9-LFM-1-BUM-HF-DA   |
|     |                  | –    | 564052 | MS9-LFM-G-AUM-HF-DA   | 564044 | MS9-LFM-G-BUM-HF-DA   |
|     | Fully automatic  | G3/4 | 552974 | MS9-LFM-3/4-AUV-HF-DA | 552978 | MS9-LFM-3/4-BUV-HF-DA |
|     |                  | G1   | 553048 | MS9-LFM-1-AUV-HF-DA   | 553052 | MS9-LFM-1-BUV-HF-DA   |
|     |                  | –    | 564054 | MS9-LFM-G-AUV-HF-DA   | 564046 | MS9-LFM-G-BUV-HF-DA   |

## Ordering data – Modular product system

| Ordering table                      |  | Grid dimension | [mm] | 90                                                         | Conditions | Code         | Enter code |
|-------------------------------------|--|----------------|------|------------------------------------------------------------|------------|--------------|------------|
| Module no.                          |  |                |      | <b>552940</b>                                              |            |              |            |
| Series                              |  |                |      | Standard service unit                                      |            | <b>MS</b>    | MS         |
| Size                                |  |                |      | 9                                                          |            | <b>9</b>     | 9          |
| Function                            |  |                |      | Fine and micro filter                                      |            | <b>-LFM</b>  | -LFM       |
| Pneumatic connection                |  |                |      | Female thread G3/4                                         | [1]        | <b>-3/4</b>  |            |
|                                     |  |                |      | Female thread G1                                           | [1]        | <b>-1</b>    |            |
|                                     |  |                |      | Connecting plate G1/2                                      |            | <b>-AGD</b>  |            |
|                                     |  |                |      | Connecting plate G3/4                                      |            | <b>-AGE</b>  |            |
|                                     |  |                |      | Connecting plate G1                                        |            | <b>-AGF</b>  |            |
|                                     |  |                |      | Connecting plate G1 1/4                                    |            | <b>-AGG</b>  |            |
|                                     |  |                |      | Connecting plate G1 1/2                                    |            | <b>-AGH</b>  |            |
|                                     |  |                |      | Female thread 3/4 NPT                                      | [1]        | <b>-N3/4</b> |            |
|                                     |  |                |      | Female thread 1 NPT                                        | [1]        | <b>-N1</b>   |            |
|                                     |  |                |      | Connecting plate 1/2 NPT                                   | [1]        | <b>-AQR</b>  |            |
|                                     |  |                |      | Connecting plate 3/4 NPT                                   | [1]        | <b>-AQS</b>  |            |
|                                     |  |                |      | Connecting plate 1 NPT                                     | [1]        | <b>-AQT</b>  |            |
|                                     |  |                |      | Connecting plate 1 1/4 NPT                                 | [1]        | <b>-AQU</b>  |            |
|                                     |  |                |      | Connecting plate 1 1/2 NPT                                 | [1]        | <b>-AQV</b>  |            |
|                                     |  |                |      | Module without connecting thread, without connecting plate | [1]        | <b>-G</b>    |            |
| Grade of filtration                 |  |                |      | 1 µm                                                       |            | <b>-B</b>    |            |
|                                     |  |                |      | 0.01 µm                                                    |            | <b>-A</b>    |            |
| Bowl                                |  |                |      | Metal bowl                                                 |            | <b>-U</b>    | -U         |
| Condensate drain                    |  |                |      | Manual                                                     |            | <b>-M</b>    |            |
|                                     |  |                |      | Semi-automatic (P1 max. 12 bar)                            |            | <b>-H</b>    |            |
|                                     |  |                |      | Fully automatic (P1 max. 12 bar) open without pressure     |            | <b>-V</b>    |            |
|                                     |  |                |      | Fully automatic (P1 max. 12 bar) closed without pressure   |            | <b>-VC</b>   |            |
| External, fully automatic, electric |  |                |      | 115 V AC, connection terminals (P1 max. 16 bar)            | [1]        | <b>-E2</b>   |            |
|                                     |  |                |      | 230 V AC, connection terminals (P1 max. 16 bar)            | [1]        | <b>-E3</b>   |            |
|                                     |  |                |      | 24 V DC, connection terminals (P1 max. 16 bar)             | [1]        | <b>-E4</b>   |            |
| Flow rate                           |  |                |      | High flow rate                                             |            | <b>-HF</b>   |            |
| Filter change sensing               |  |                |      | Differential pressure display, visual                      |            | <b>-DA</b>   |            |
| Type of mounting                    |  |                |      | Mounting bracket standard design                           | [2]        | <b>-WP</b>   |            |
|                                     |  |                |      | Mounting bracket for hooking in service unit components    | [1] [2]    | <b>-WPM</b>  |            |
|                                     |  |                |      | Mounting bracket for large wall gap                        | [2]        | <b>-WPB</b>  |            |
| EU certification                    |  |                |      | II 2GD to EU Explosion Protection Directive (ATEX)         |            | <b>-EX4</b>  |            |
| UL certification                    |  |                |      | cULus, ordinary location for Canada and USA                |            | <b>-UL1</b>  |            |
| Flow direction                      |  |                |      | Flow direction from right to left                          |            | <b>-Z</b>    |            |

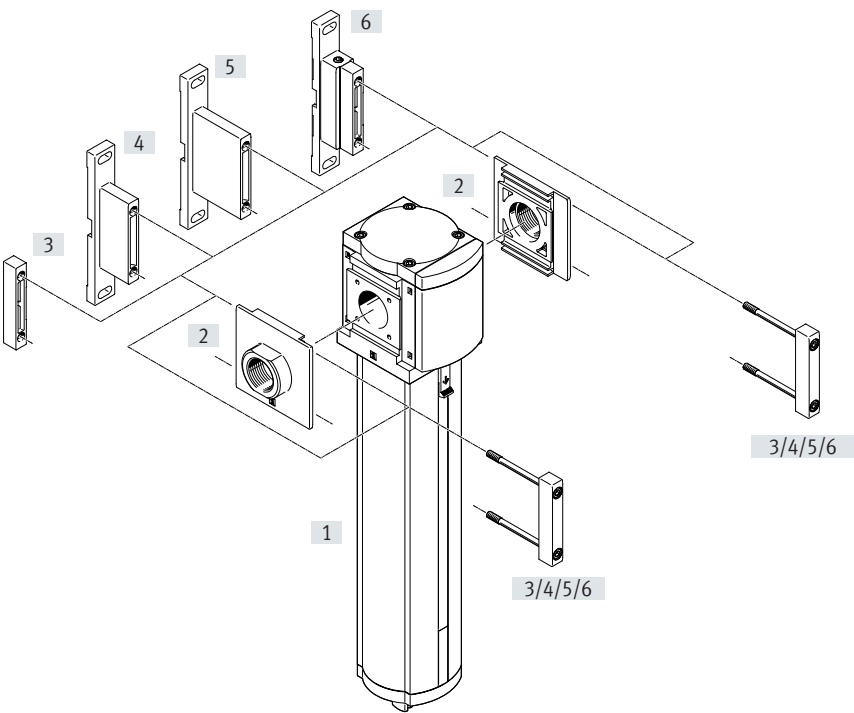
[1] 3/4, 1, N3/4, N1, AQR, AQS, AQT, AQU, AQV, G, E2, E3, E4, WPM

Not with EU EX4 certification

[2] WP, WPM, WPB

Not with pneumatic connection G

Peripherals overview



 **Note**

Additional accessories:

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

| Mounting attachments and accessories |                                    | Individual device                      |                                   |                              | Combination                                                        | → Page/Internet |
|--------------------------------------|------------------------------------|----------------------------------------|-----------------------------------|------------------------------|--------------------------------------------------------------------|-----------------|
|                                      |                                    | With female thread<br>3/4, 1, N3/4, N1 | With connecting plate AG.../AQ... |                              | Module without connecting<br>thread, without connecting<br>plate G |                 |
|                                      |                                    |                                        | Without EU EX4<br>certification   | With EU EX4<br>certification |                                                                    |                 |
| [1]                                  | Activated carbon filter<br>MS9-LFX | ■                                      | ■                                 | ■                            | ■                                                                  | 66              |
| [2]                                  | Connecting plate SET<br>MS9-AG...  | –                                      | ■                                 | ■                            | ■                                                                  | ms9-ag          |
|                                      | Connecting plate SET<br>MS9-AQ...  | –                                      | ■                                 | –                            | ■                                                                  | ms9-aq          |
| [3]                                  | Module connector<br>MS9-MV         | –                                      | –                                 | –                            | ■                                                                  | ms9-mv          |
| [4]                                  | Mounting bracket<br>MS9-WP         | ■                                      | ■                                 | ■                            | ■                                                                  | ms9-wp          |
| [5]                                  | Mounting bracket<br>MS9-WPB        | ■                                      | ■                                 | ■                            | ■                                                                  | ms9-wp          |
| [6]                                  | Mounting bracket<br>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 |  |

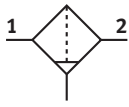
| 005 | Bowl type                                               |  |
|-----|---------------------------------------------------------|--|
| U   | Aluminium                                               |  |
| 006 | Type of mounting                                        |  |
|     | Without mounting 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 70

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

## Datasheet

## Function



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



- Removes liquid and gaseous oil particles from compressed air using activated carbon
- Eliminates odours and vapours
- Prefiltration with micro filter MS9-LFM-A (grade of filtration 0.01 µm) is recommended
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22
- New filter cartridges → Page 94

## General technical data

|                                                     |                                                 |
|-----------------------------------------------------|-------------------------------------------------|
| Size                                                | MS9                                             |
| Pneumatic connection 1, 2                           |                                                 |
| Female thread                                       | G3/4, G1, 3/4 NPT or 1 NPT                      |
| Connecting plate AG...                              | G1/2, G3/4, G1, G1 1/4 or G1 1/2                |
| Connecting plate AQ...                              | 1/2 NPT, 3/4 NPT, 1 NPT, 1 1/4 NPT or 1 1/2 NPT |
| Module without connecting thread/connecting plate G | –                                               |
| Design                                              | Activated carbon filter                         |
| Type of mounting                                    | With accessories<br>In-line installation        |
| Mounting position                                   | Vertical ±5°                                    |
| Air purity class at the output1)                    | Compressed air to ISO 8573-1:2010 [3:4:1]       |
| Bowl guard                                          | Integrated as metal bowl                        |
| Residual oil content [mg/m³]                        | ≤0.003                                          |

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

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

## Standard flow rate qn1) [l/min]

|                                                                    |      |
|--------------------------------------------------------------------|------|
| Max. standard flow rate for air purity class<br>q <sub>N max</sub> | 6500 |
|--------------------------------------------------------------------|------|

1) Measured at p<sub>1</sub> = 6 bar

## Operating and environmental conditions

|                                              |                                           |
|----------------------------------------------|-------------------------------------------|
| Operating pressure [bar]                     | 0 ... 20                                  |
| Operating medium                             | Compressed air to ISO 8573-1:2010 [3:4:2] |
| Ambient temperature [°C]                     | -10 ... +60                               |
| Temperature of medium [°C]                   | +5 ... +30                                |
| Storage temperature [°C]                     | -10 ... +60                               |
| Corrosion resistance class CRC <sup>1)</sup> | 2                                         |
| UL certification <sup>2)</sup>               | c UL us - Recognized (OL)                 |

1) More information: [www.festo.com/x/topic/crc](http://www.festo.com/x/topic/crc)

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

## Datasheet

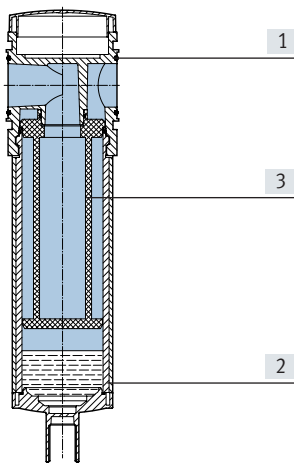
|                                                            |                                             |
|------------------------------------------------------------|---------------------------------------------|
| <b>ATEX</b>                                                |                    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

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

|                         |      |
|-------------------------|------|
| <b>Weight [g]</b>       |      |
| Activated carbon filter | 2000 |

### Materials

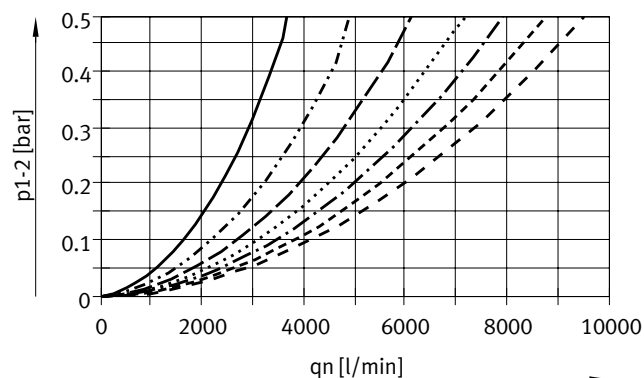
#### Sectional view



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

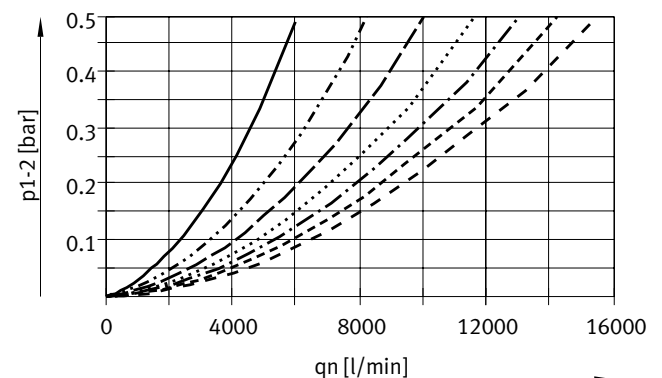
### Standard flow rate $q_n$ as a function of differential pressure $p_{1-2}$

Pneumatic connection G1/2, 1/2 NPT



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

Pneumatic connection G3/4, 3/4 NPT

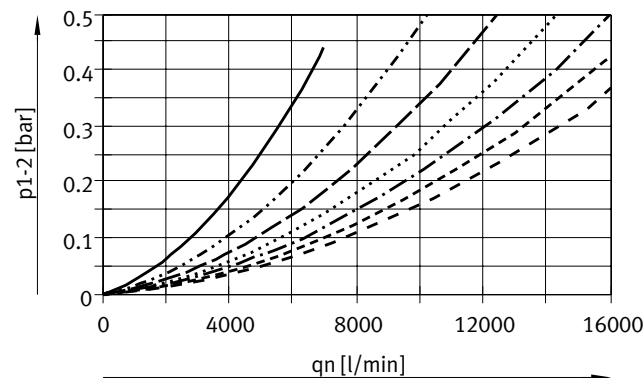


— 2 bar  
 - · - · - 4 bar  
 - - - - 6 bar  
 · · · · · 8 bar  
 - · - · - 10 bar  
 - - - - 12 bar  
 - - - - 14 bar

Datasheet

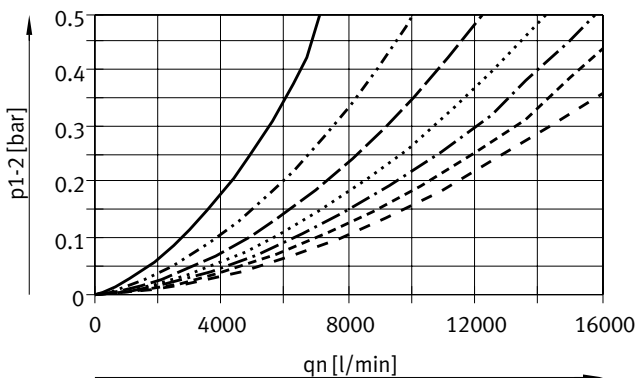
Standard flow rate  $q_n$  as a function of differential pressure  $p_{1-2}$

Pneumatic connection G1, 1 NPT



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

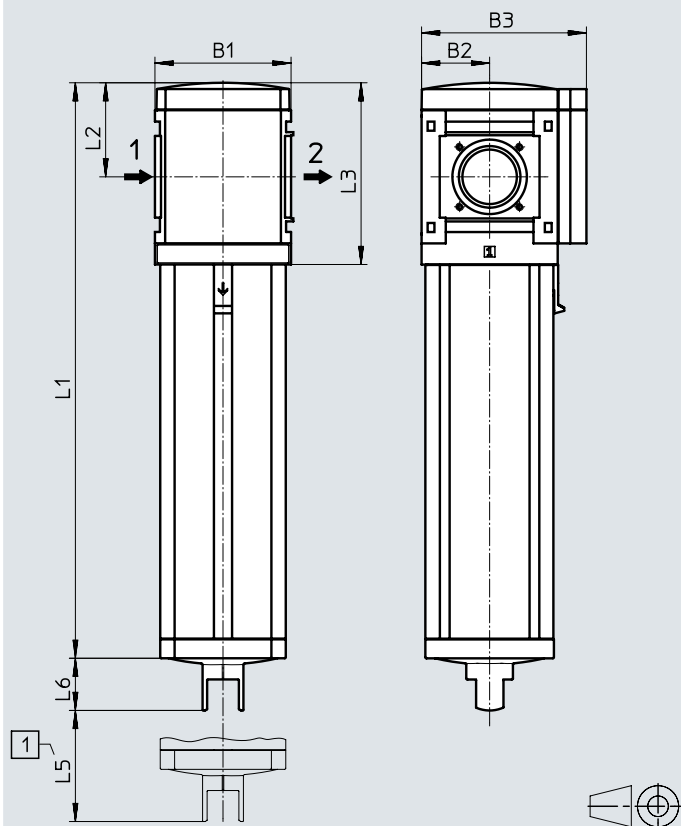
Pneumatic connection G1 1/2, 1 1/2 NPT



Dimensions – Basic version

Download CAD data → [www.festo.com](http://www.festo.com)

Module without connecting thread, without connecting plate G



[1] Installation dimension

→ Flow direction

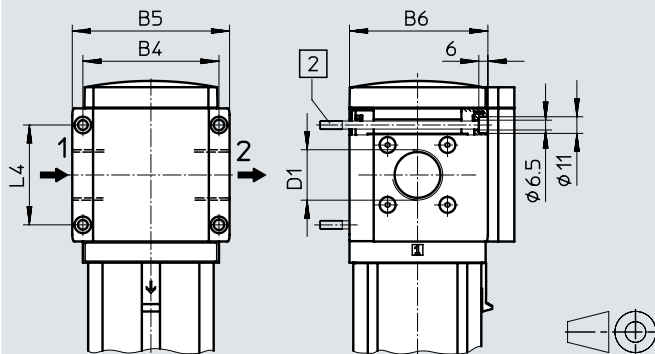
| Type      | B1 | B2 | B3  | L1    | L2 | L3  | L5    | L6   |
|-----------|----|----|-----|-------|----|-----|-------|------|
| MS9-LFX-G | 90 | 45 | 109 | 380.5 | 62 | 120 | ≥ 220 | 34.5 |

## Datasheet

## Dimensions – Connecting thread/connecting plate

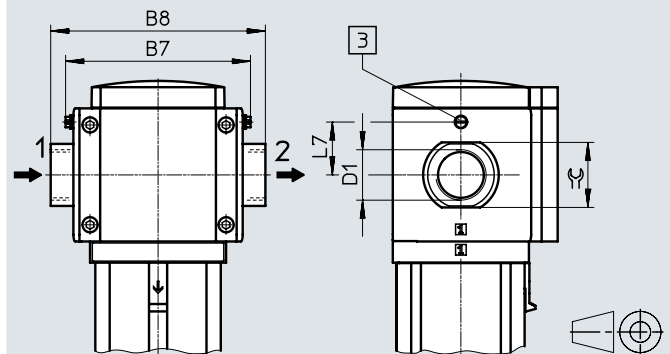
Download CAD data → [www.festo.com](http://www.festo.com)

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 |
| 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       |
| Module no.           | 552942                                                     |         |            | Enter code |
| Series               | Standard service unit                                      |         | MS         | MS         |
| Size                 | 9                                                          |         | 9          | 9          |
| Function             | Activated carbon filter                                    |         | -LFX       | -LFX       |
| Pneumatic connection | Female thread G3/4                                         | [1]     | -3/4       |            |
|                      | Female thread G1                                           | [1]     | -1         |            |
|                      | Connecting plate G1/2                                      |         | -AGD       |            |
|                      | Connecting plate G3/4                                      |         | -AGE       |            |
|                      | Connecting plate G1                                        |         | -AGF       |            |
|                      | Connecting plate G1 1/4                                    |         | -AGG       |            |
|                      | Connecting plate G1 1/2                                    |         | -AGH       |            |
|                      | Female thread 3/4 NPT                                      | [1]     | -N3/4      |            |
|                      | Female thread 1 NPT                                        | [1]     | -N1        |            |
|                      | Connecting plate 1/2 NPT                                   | [1]     | -AQR       |            |
|                      | Connecting plate 3/4 NPT                                   | [1]     | -AQS       |            |
|                      | Connecting plate 1 NPT                                     | [1]     | -AQT       |            |
|                      | Connecting plate 1 1/4 NPT                                 | [1]     | -AQU       |            |
|                      | Connecting plate 1 1/2 NPT                                 | [1]     | -AQV       |            |
|                      | Module without connecting thread, without connecting plate | [1]     | -G         |            |
| Bowl                 | Metal bowl                                                 |         | -U         | -U         |
| Type of mounting     | Mounting bracket standard design                           | [2]     | -WP        |            |
|                      | Mounting bracket for hooking in service unit components    | [1] [2] | -WPM       |            |
|                      | Mounting bracket for large wall gap                        | [2]     | -WPB       |            |
| EU certification     | II 2GD to EU Explosion Protection Directive (ATEX)         |         | -EX4       |            |
| UL certification     | cULus, ordinary location for Canada and USA                |         | -UL1       |            |
| Flow direction       | Flow direction from right to left                          |         | -Z         |            |

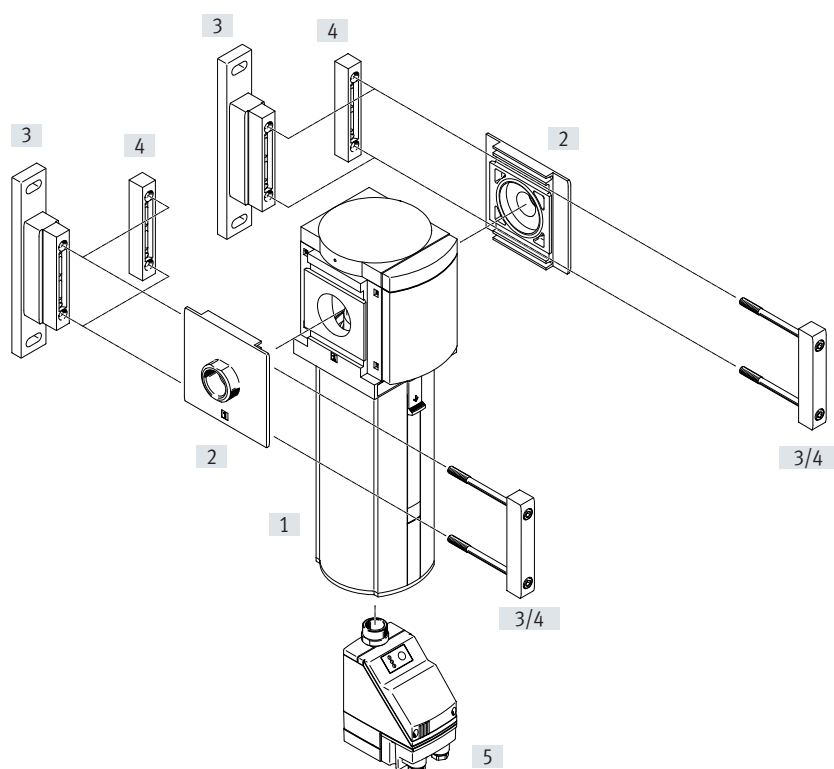
[1] 3/4, 1, N3/4, N1, AQR, AQS, AQT, AQU, AQV, G, WPM

Not with EU EX4 certification

[2] WP, WPM, WPB

Not with pneumatic connection G

## Peripherals overview



-  - **Note**

Additional accessories:

- Module connector for combination with size MS9 a Internet: armv

### Mounting attachments and accessories

|     |                                                                       | → Page/Internet |
|-----|-----------------------------------------------------------------------|-----------------|
| [1] | Filter<br>MS12-LF                                                     | 73              |
| [2] | Connecting plate SET<br>MS12-AG...                                    | ms12-ag         |
| [3] | Mounting bracket<br>MS12-WP                                           | ms12-wp         |
| [4] | Module connector<br>MS12-MV                                           | ms12-mv         |
| [5] | Fully automatic condensate drain, electrically actuated<br>E2, E3, E4 | 76              |

## 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 | Connecting plate G1 1/4                            |  |
| AGH | Connecting plate G1 1/2                            |  |
| AGI | Sub-base G2                                        |  |
| G   | Module without connecting thread, without sub-base |  |

|     |               |  |
|-----|---------------|--|
| 005 | Filter design |  |
| C   | 5 µm          |  |
| E   | 40 µm         |  |

|     |           |  |
|-----|-----------|--|
| 006 | Bowl type |  |
| U   | Aluminium |  |

|     |                                                                                     |  |
|-----|-------------------------------------------------------------------------------------|--|
| 007 | Condensate drain                                                                    |  |
| E2  | External fully automatic condensate drain, electric, 110 V AC, connection terminals |  |
| E3  | External fully automatic condensate drain, electric, 230 V AC, connection terminals |  |
| E4  | External fully automatic condensate drain, electric, 24 V DC, connection terminals  |  |
| M   | Manual                                                                              |  |
| V   | Fully automatic, normally open                                                      |  |
| VC  | Fully automatic, normally closed                                                    |  |

|     |                               |  |
|-----|-------------------------------|--|
| 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 77

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

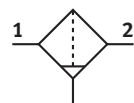


## Datasheet

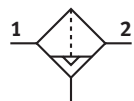
### Function

Condensate drain

Manual, rotating



Fully automatic



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



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

- Good particle and condensate separation
- High flow rate with minimal pressure drop
- Available with manual, fully automatic or fully automatic, electrically actuated condensate drain
- Choice of filter inserts 5 µm or 40 µm
- New filter cartridges → Page 95

### 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 | Internal                                                              |
| Design                                    |                                                     | Sintered filter with centrifugal separator                            |
| Type of mounting                          |                                                     | With accessories                                                      |
|                                           |                                                     | In-line installation                                                  |
| Mounting position                         |                                                     | Vertical ±5°                                                          |
| Grade of filtration [µm]                  |                                                     | 5                                                                     |
|                                           |                                                     | 40                                                                    |
| Pore size [µm]                            |                                                     | < 5                                                                   |
|                                           |                                                     | < 40                                                                  |
| Air purity class at the output            |                                                     | Compressed air to ISO 8573-1:2010 [6:8:4] (grade of filtration 5 µm)  |
|                                           |                                                     | Compressed air to ISO 8573-1:2010 [7:8:4] (grade of filtration 40 µm) |
| Bowl guard                                |                                                     | Integrated as metal bowl                                              |
| Condensate drain                          |                                                     | Manual, rotating                                                      |
|                                           |                                                     | Fully automatic                                                       |
|                                           |                                                     | Fully automatic, electrically actuated                                |
| Degree of condensate separation [%]       |                                                     | > 75                                                                  |
| Max. condensate volume [cm <sup>3</sup> ] |                                                     | 400                                                                   |

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

### Standard nominal flow rate q<sub>N1</sub> [l/min]

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

1) Dependent on the connecting plate selected; must be ordered separately as an accessory → Internet: ms12-ag  
Measured at p<sub>1</sub> = 6 bar and Δp = 0.5 bar

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

Datasheet

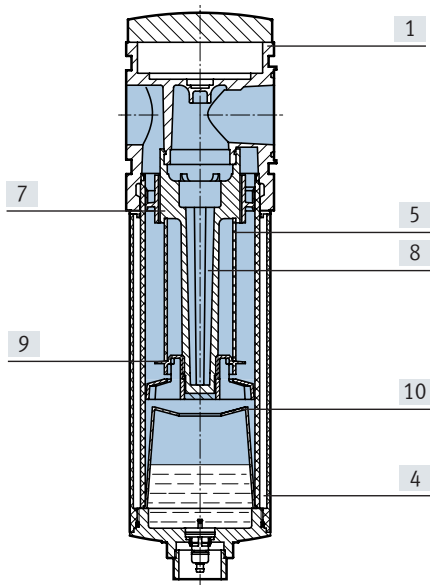
| Operating and environmental conditions |                   |                                              |                                                               |                                                      |
|----------------------------------------|-------------------|----------------------------------------------|--------------------------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

1) More information: [www.festo.com/x/topic/crc](http://www.festo.com/x/topic/crc)

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

Materials

Sectional view

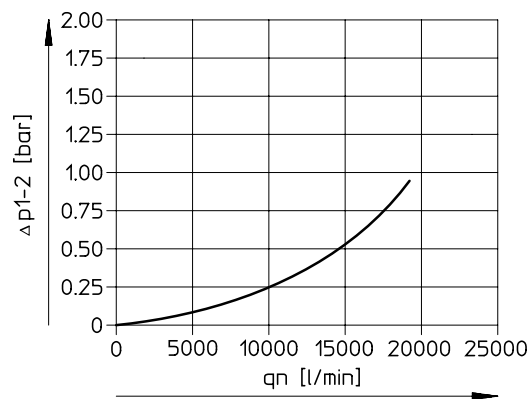
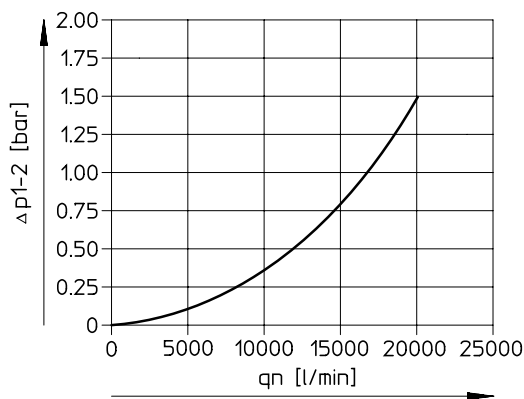


| Filter                 |                  |                         |
|------------------------|------------------|-------------------------|
| [1]                    | Housing          | Die-cast aluminium      |
| [4]                    | Metal bowl       | Wrought aluminium alloy |
| [5]       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

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

|                                     |                                                           |                                                           |
|-------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|
| Grade of filtration 5 $\mu\text{m}$ | With connecting plate MS12-AGF<br>Pneumatic connection G1 | With connecting plate MS12-AGI<br>Pneumatic connection G2 |
|-------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|

$p_1 = 6 \text{ bar}$



## Datasheet

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

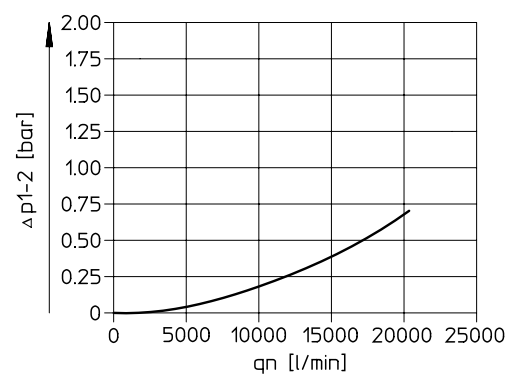
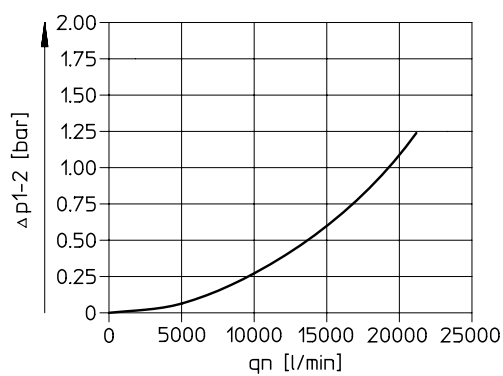
Grade of filtration 40  $\mu\text{m}$ 

With connecting plate MS12-AGF

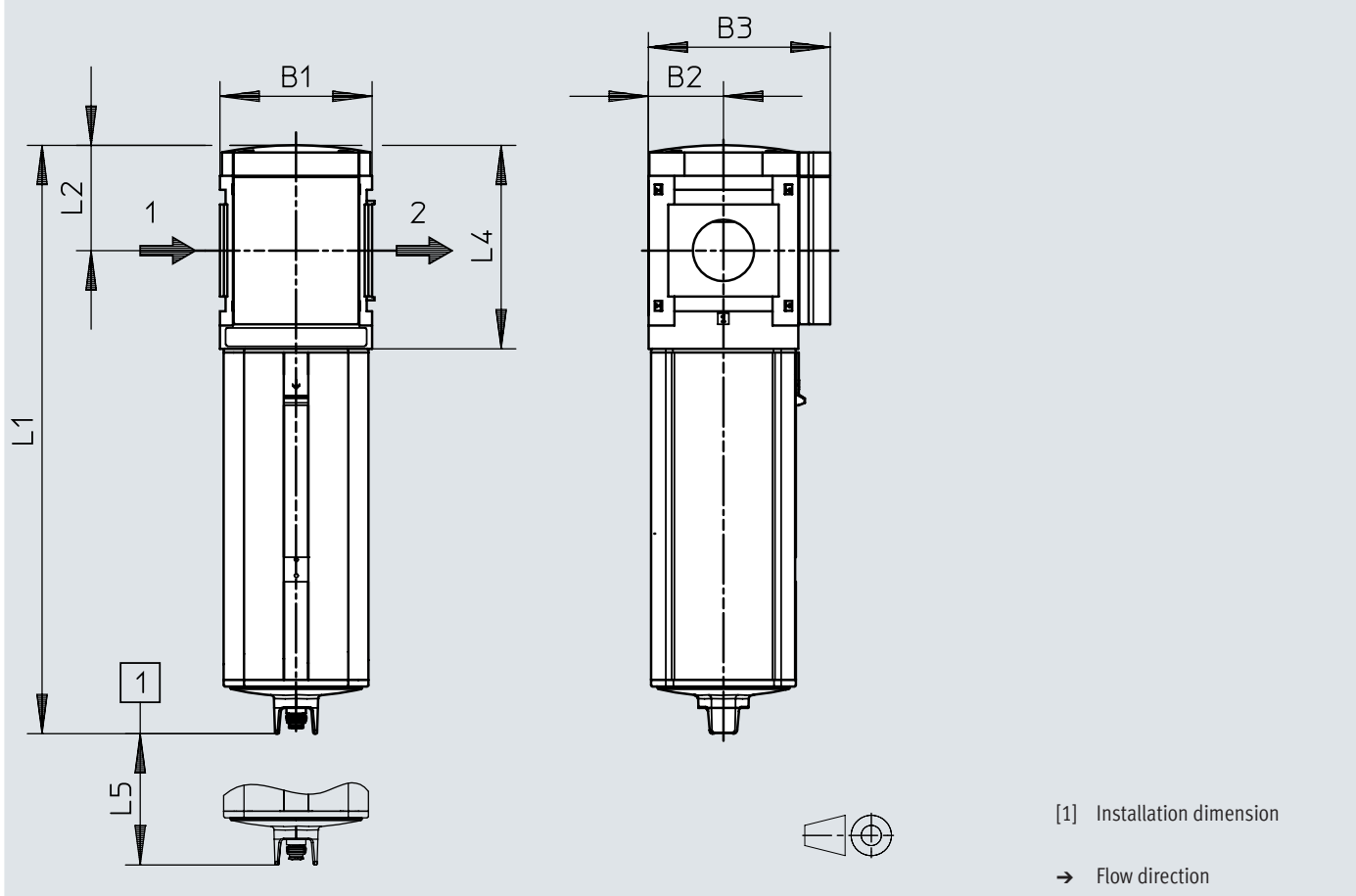
Pneumatic connection G1

With connecting plate MS12-AGI

Pneumatic connection G2

 $p_1 = 6 \text{ bar}$ 

### Dimensions – Basic version

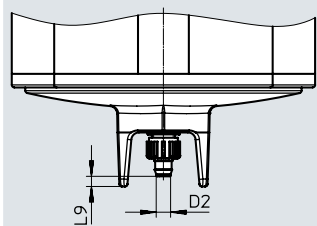
Download CAD data → [www.festo.com](http://www.festo.com)

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

Datasheet

**Dimensions – Condensate drain**

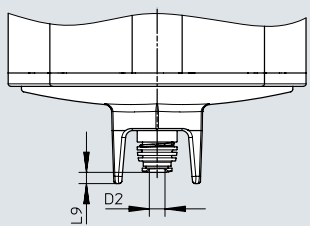
[M] Manual, rotating



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

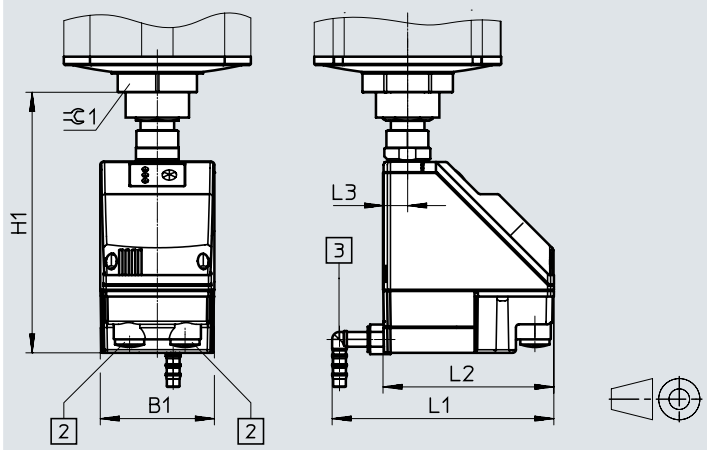
Download CAD data → [www.festo.com](http://www.festo.com)

[V] Fully automatic



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

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



Condensate drain PWEA:

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

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

| Type                   | B1 | D2<br>ø | H1  | L1  | L2  | L3 | L9  | ≅ 1 |
|------------------------|----|---------|-----|-----|-----|----|-----|-----|
| MS12-LF-...-M          | –  | 5.6     | –   | –   | –   | –  | 4   | –   |
| MS12-LF-...-V          | –  | 6.2     | –   | –   | –   | –  | 4.5 | –   |
| MS12-LF-...-E2, E3, E4 | 72 | –       | 164 | 140 | 108 | 15 | –   | 50  |

| Ordering data |                  |                         |                          |               |                           |               |
|---------------|------------------|-------------------------|--------------------------|---------------|---------------------------|---------------|
| Metal bowl    |                  |                         |                          |               |                           |               |
| Size          | Condensate drain | Connection              | Grade of filtration 5 µm |               | Grade of filtration 40 µm |               |
|               |                  |                         | Part no.                 | Type          | Part no.                  | Type          |
| MS12          | Fully automatic  | G1 ... G2 <sup>1)</sup> | 537152                   | MS12-LF-G-CUV | 537151                    | MS12-LF-G-EUV |

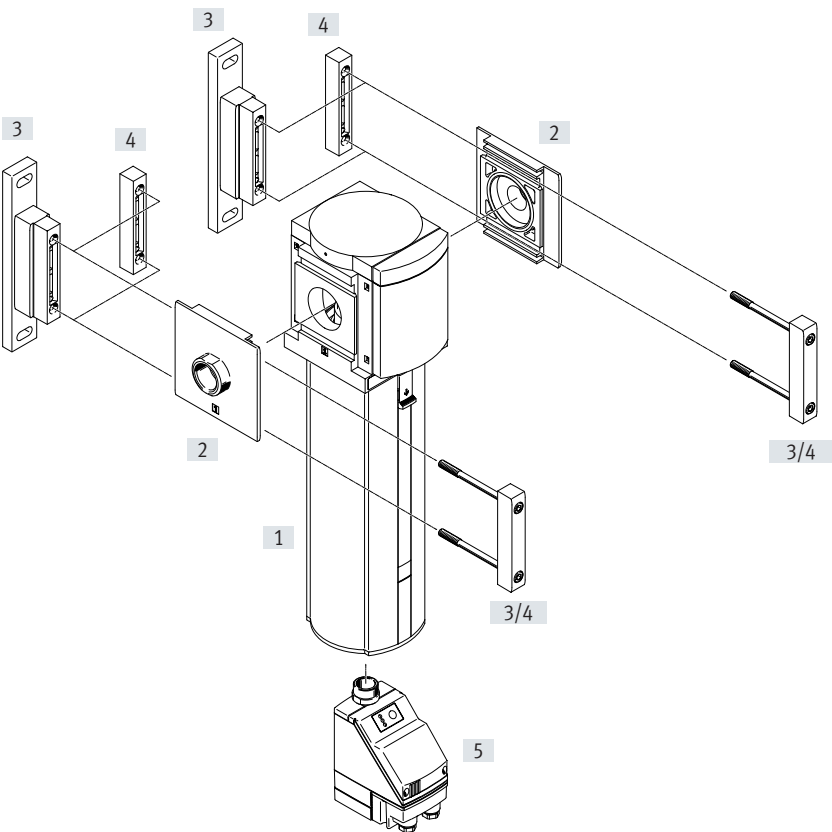
1) Connecting plate must be ordered separately as an accessory a Internet: [ms12-ag](http://ms12-ag.com)  
- † - Note: This product conforms to ISO 1179-1 and ISO 228-1.

## Ordering data – Modular product system

| Ordering table                      |                                                            | Conditions | Code | Enter code |
|-------------------------------------|------------------------------------------------------------|------------|------|------------|
| Grid dimension                      | 124                                                        |            |      |            |
|                                     | [mm]                                                       |            |      |            |
| Module no.                          | 535023                                                     |            |      |            |
| Series                              | Standard                                                   |            | MS   | MS         |
| Size                                | 12                                                         |            | 12   | 12         |
| Function                            | Filter                                                     |            | -LF  | -LF        |
| Pneumatic connection                | Connecting plate G1                                        |            | -AGF |            |
|                                     | Connecting plate G1 1/4                                    |            | -AGG |            |
|                                     | Connecting plate G1 1/2                                    |            | -AGH |            |
|                                     | Connecting plate G2                                        |            | -AGI |            |
|                                     | Module without connecting thread, without connecting plate |            | -G   |            |
| Grade of filtration                 | 40 µm                                                      |            | -E   |            |
|                                     | 5 µm                                                       |            | -C   |            |
| Bowl                                | Metal bowl                                                 |            | -U   | -U         |
| Condensate drain                    | Manual                                                     |            | -M   |            |
|                                     | Fully automatic (P1 max. 12 bar) open without pressure     |            | -V   |            |
|                                     | Fully automatic (P1 max. 12 bar) closed without pressure   |            | -VC  |            |
| 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]                                  | Fine and micro filter<br>MS12-LFM                                     | 80              |
| [2]                                  | Connecting plate SET<br>MS12-AG...                                    | ms12-ag         |
| [3]                                  | Mounting bracket<br>MS12-WP                                           | ms12-wp         |
| [4]                                  | Module connector<br>MS12-MV                                           | ms12-mv         |
| [5]                                  | Fully automatic condensate drain, electrically actuated<br>E2, E3, E4 | 85              |

## 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 | Connecting plate G1 1/4                            |  |
| AGH | Connecting plate G1 1/2                            |  |
| AGI | Sub-base G2                                        |  |
| G   | Module without connecting thread, without sub-base |  |
| 005 | Filter design                                      |  |
| A   | 0.01 µm                                            |  |
| B   | 1 µm                                               |  |
| 006 | Bowl type                                          |  |
| U   | Aluminium                                          |  |

|     |                                                                                     |  |
|-----|-------------------------------------------------------------------------------------|--|
| 007 | Condensate drain                                                                    |  |
| E2  | External fully automatic condensate drain, electric, 110 V AC, connection terminals |  |
| E3  | External fully automatic condensate drain, electric, 230 V AC, connection terminals |  |
| E4  | External fully automatic condensate drain, electric, 24 V DC, connection terminals  |  |
| M   | Manual                                                                              |  |
| V   | Fully automatic, normally open                                                      |  |
| VC  | Fully automatic, normally closed                                                    |  |
| 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 86

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

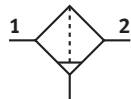
# Datasheet

## Function

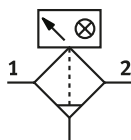
Condensate drain

Manual, rotating

Without differential pressure display



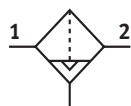
With differential pressure display



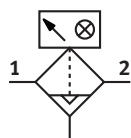
Condensate drain

Semi- or fully automatic

Without differential pressure display



With differential pressure display



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



- High-efficiency filter for exceptionally clean compressed air
- Air quality to ISO 8573-1:2010
- Available with manual, fully automatic or fully automatic, electrically actuated condensate drain
- Available with optical differential pressure indicator for filter contamination
- Choice of filter inserts 0.01 µm or 1 µm
- New filter cartridges → Page 95

| 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<br>In-line installation                                                                                                                                                         |
| Mounting position                                   |         | Vertical ±5°                                                                                                                                                                                     |
| Grade of filtration                                 | [µm]    | 0.01 (micro filter MS12-LFM-A)<br>1 (fine filter MS12-LFM-B)                                                                                                                                     |
| Air purity class at the output                      |         | Compressed air to ISO 8573-1:2010 [1:7:2] (grade of filtration 0.01 µm, micro filter MS12-LFM-A)<br>Compressed air to ISO 8573-1:2010 [5:7:3] (grade of filtration 1 µm, fine filter MS12-LFM-B) |
| Bowl guard                                          |         | Integrated as metal bowl                                                                                                                                                                         |
| Condensate drain                                    |         | Manual, rotating<br>Fully automatic<br>Fully automatic, electrically actuated                                                                                                                    |
| Max. condensate volume                              | [ml]    | 400                                                                                                                                                                                              |
| Residual oil content                                | [mg/m³] | 0.01 (micro filter MS12-LFM-A)<br>0.5 (fine filter MS12-LFM-B)                                                                                                                                   |
| Filter efficiency, fine particles                   | [%]     | 99.995 (micro filter MS12-LFM-A)<br>99 (fine filter MS12-LFM-B)                                                                                                                                  |
| Filter efficiency, oil aerosol                      | [%]     | 99 (micro filter MS12-LFM-A)<br>90 (fine filter MS12-LFM-B)                                                                                                                                      |
| MPPS                                                | [µm]    | 0.08 (micro filter MS12-LFM-A)                                                                                                                                                                   |
| Filter efficiency MPPS                              | [%]     | 99.968 (micro filter MS12-LFM-A)                                                                                                                                                                 |
| Vibration resistant                                 |         | Transport application test with severity level 1 to FN 942017-4 and EN 60068-2-6 (fine filter MS12-LFM-B)                                                                                        |
| Shock resistance                                    |         | Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27 (fine filter MS12-LFM-B)                                                                                                       |

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



## Datasheet

| Standard flow rate $q_n$ [l/min]                             |       |       |        |        |
|--------------------------------------------------------------|-------|-------|--------|--------|
| Operating pressure                                           | 4 bar | 6 bar | 10 bar | 14 bar |
| <b>Micro filter MS12-LFM-A</b>                               |       |       |        |        |
| Max. standard flow rate for air purity class<br>$q_{n \max}$ | 16670 | 23300 | 36670  | 50000  |
| Min. standard flow rate for air purity class<br>$q_{n \min}$ | 500   | 700   | 1100   | 1500   |
| <b>Fine filter MS12-LFM-B</b>                                |       |       |        |        |
| Max. standard flow rate for air purity class<br>$q_{n \max}$ | 16670 | 23300 | 36670  | 50000  |
| Min. standard flow rate for air purity class<br>$q_{n \min}$ | 625   | 950   | 1390   | 1675   |

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

| Operating and environmental conditions       |                                                             |                                                              |                                                      |
|----------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------|
| Condensate drain                             | Manual, rotating<br>M                                       | Fully automatic<br>V                                         | Fully automatic, electrically actuated<br>E2, E3, E4 |
| Operating pressure [bar]                     | 0.8 ... 20                                                  | 2 ... 12                                                     | 0.8 ... 16                                           |
| Operating medium                             | Compressed air in accordance with ISO 8573-1:2010 [6:8:4]1) |                                                              |                                                      |
|                                              | Inert gases                                                 |                                                              |                                                      |
| Note on the operating/pilot medium           | –                                                           | Ester oil < 0.1mg/m³,<br>according to ISO 8573-1:2010 [:::2] | –                                                    |
| Ambient temperature [°C]                     | –10 ... +60                                                 | +5 ... +60                                                   | +1 ... +60                                           |
| Temperature of medium [°C]                   | –10 ... +60                                                 | +5 ... +60                                                   | +1 ... +60                                           |
| Storage temperature [°C]                     | –10 ... +60                                                 | –10 ... +60                                                  | +1 ... +60                                           |
| Corrosion resistance class CRC <sup>2)</sup> | 2 - Moderate corrosion stress                               |                                                              |                                                      |

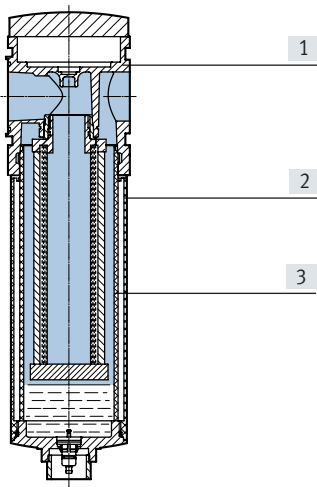
1) It is recommended to prefilter the compressed air for the micro filter MS-LFM-A using a fine filter MS-LFM-B (grade of filtration 1 µm).

2) More information: [www.festo.com/x/topic/crc](http://www.festo.com/x/topic/crc)

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

## Materials

### Sectional view



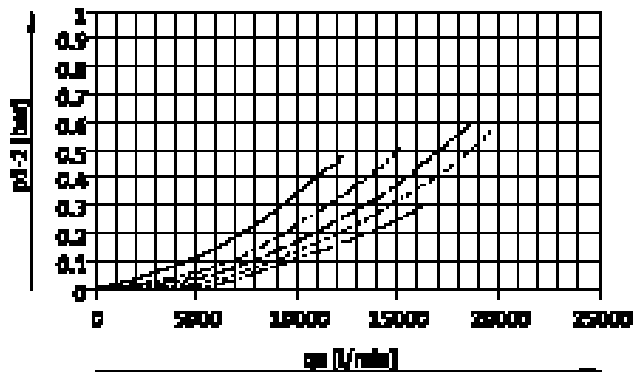
| Fine and micro filter  |                   |                         |
|------------------------|-------------------|-------------------------|
| [1]                    | Housing           | Die-cast aluminium      |
| [2]                    | Metal bowl        | Wrought aluminium alloy |
|       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

Datasheet

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

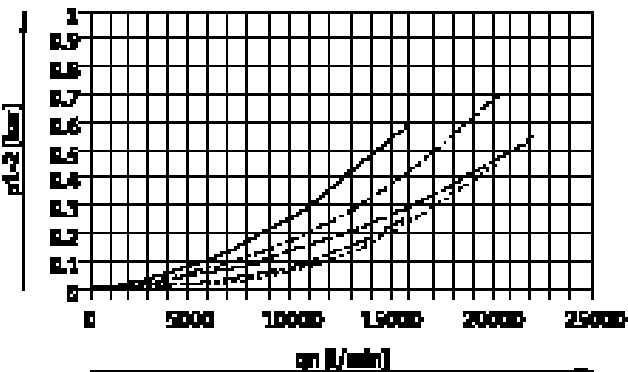
Grade of filtration 0.01  $\mu\text{m}$

With connecting plate MS12-AGF, pneumatic connection G1



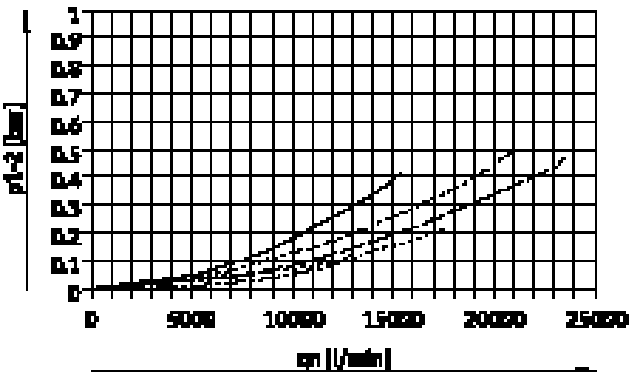
Grade of filtration 0.01  $\mu\text{m}$

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



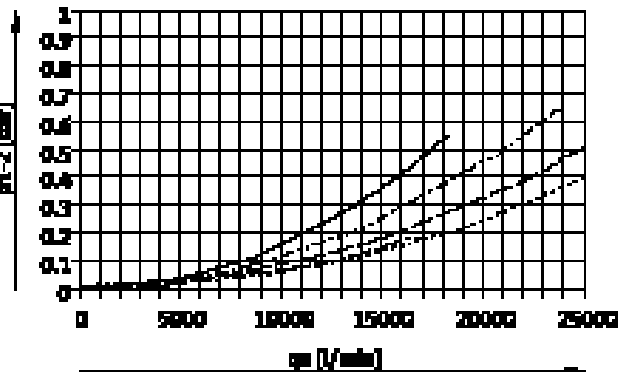
Grade of filtration 0.01  $\mu\text{m}$

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



Grade of filtration 0.01  $\mu\text{m}$

With connecting plate MS12-AGI, pneumatic connection G2

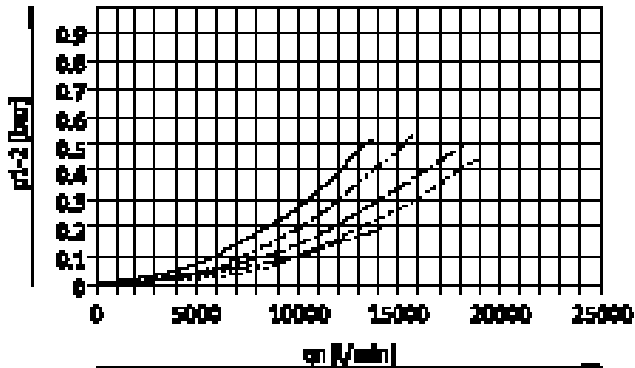


- $p_1$ : 4 bar
- - -  $p_1$ : 6 bar
- - -  $p_1$ : 8 bar
- .....  $p_1$ : 10 bar
- . - .  $p_1$ : 12 bar

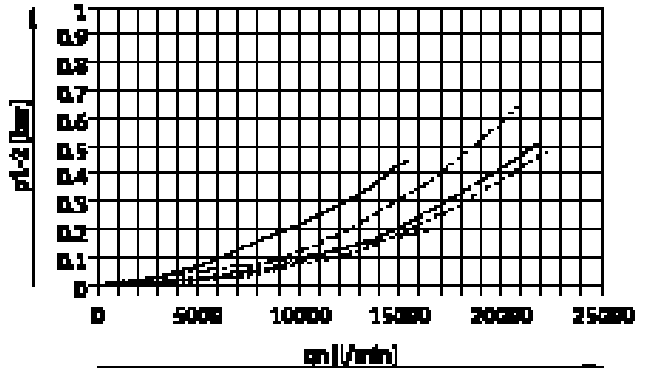
## Datasheet

Standard flow rate  $q_n$  as a function of differential pressure  $p_1 - p_2$ Grade of filtration  $1\ \mu\text{m}$ 

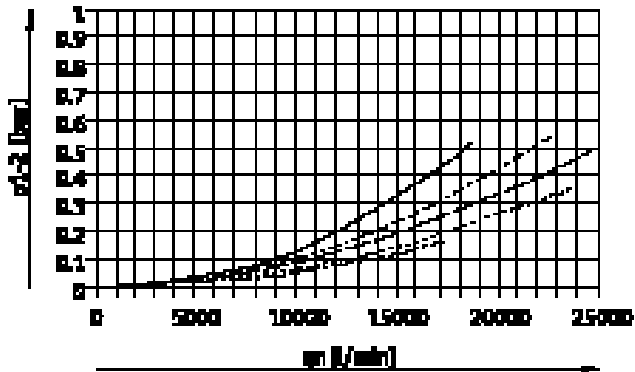
With connecting plate MS12-AGF, pneumatic connection G1

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

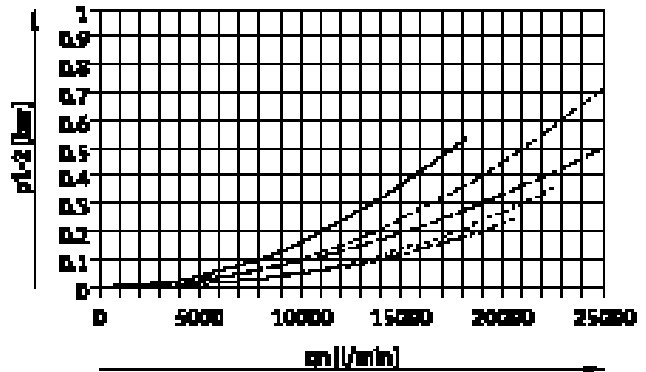
With connecting plate MS12-AGG, pneumatic connection G1 1/4

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

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

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

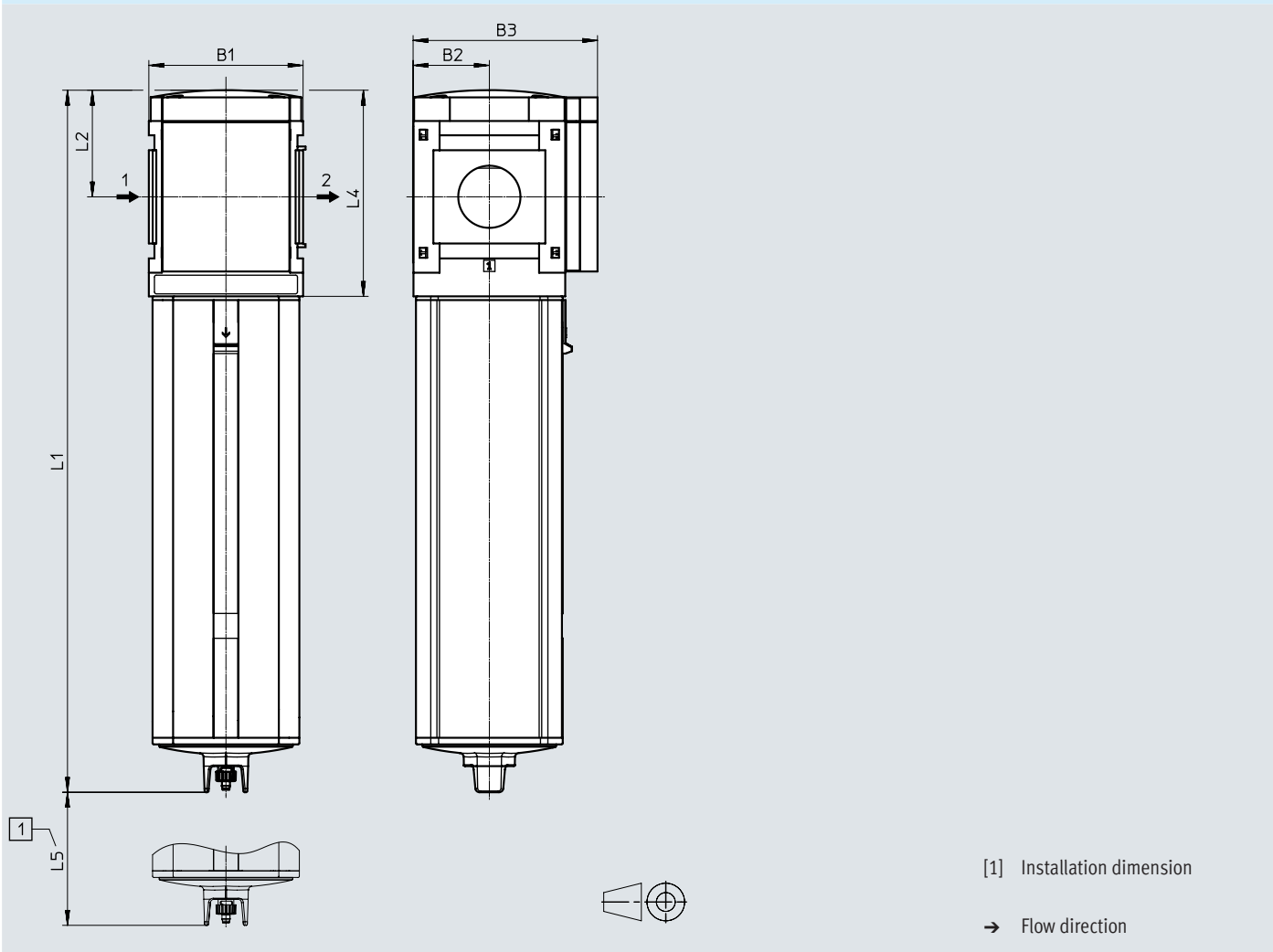
With connecting plate MS12-AGI, pneumatic connection G2



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

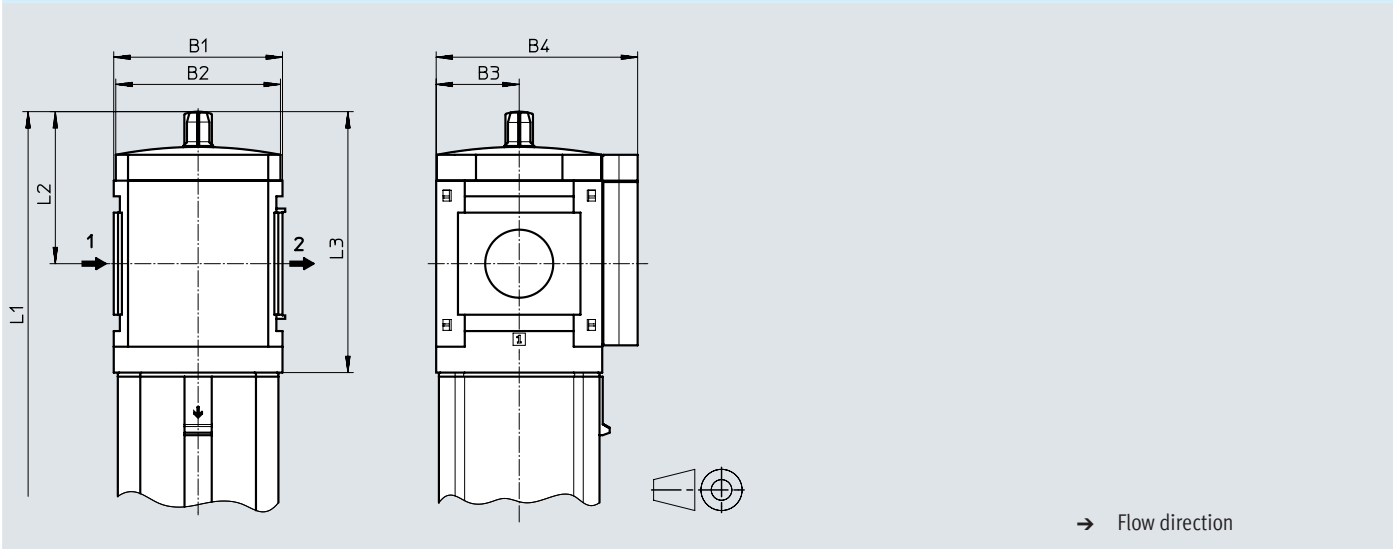
Datasheet

Dimensions – Basic version Download CAD data → [www.festo.com](http://www.festo.com)



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

Dimensions – Differential pressure display Download CAD data → [www.festo.com](http://www.festo.com)

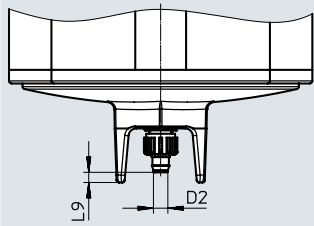


| Type            | B1  | B2  | B3 | B4  | L1  | L2  | L3  |
|-----------------|-----|-----|----|-----|-----|-----|-----|
| MS12-LFM-...-DA | 124 | 122 | 61 | 148 | 590 | 112 | 192 |

# Datasheet

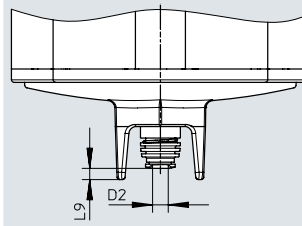
## Dimensions – Condensate drain

[M] Manual, rotating



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

[V] Fully automatic

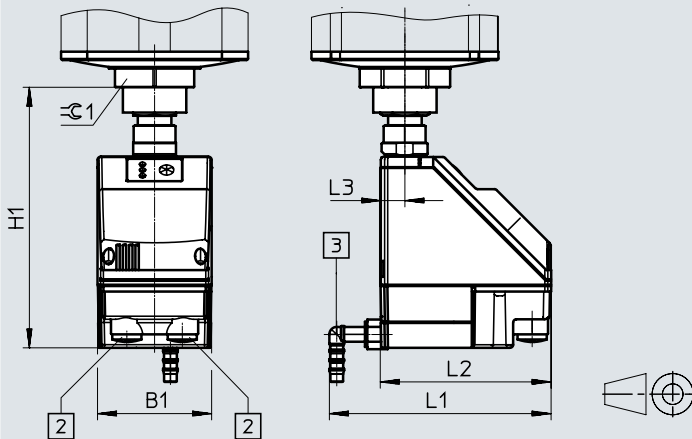


Download CAD data → [www.festo.com](http://www.festo.com)

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

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

Datasheets → Internet: pwea



Condensate drain PWEA:

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

| Type                    | B1 | D2<br>Ø | H1  | L1  | L2  | L3 | L9  | $\varnothing 1$ |
|-------------------------|----|---------|-----|-----|-----|----|-----|-----------------|
| MS12-LFM-...-M          | –  | 5.6     | –   | –   | –   | –  | 4   | –               |
| MS12-LFM-...-V          | –  | 6.2     | –   | –   | –   | –  | 4.5 | –               |
| MS12-LFM-...-E2, E3, E4 | 72 | –       | 164 | 140 | 108 | 15 | –   | 50              |

## Ordering data

Metal bowl

| Size | Condensate drain | Connection              | Micro filter<br>Grade of filtration 0.01 µm |                | Fine filters<br>Grade of filtration 1 µm |                |
|------|------------------|-------------------------|---------------------------------------------|----------------|------------------------------------------|----------------|
|      |                  |                         | Part no.                                    | Type           | Part no.                                 | Type           |
| MS12 | Fully automatic  | G1 ... G2 <sup>1)</sup> | 537154                                      | MS12-LFM-G-AUV | 537153                                   | MS12-LFM-G-BUV |

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

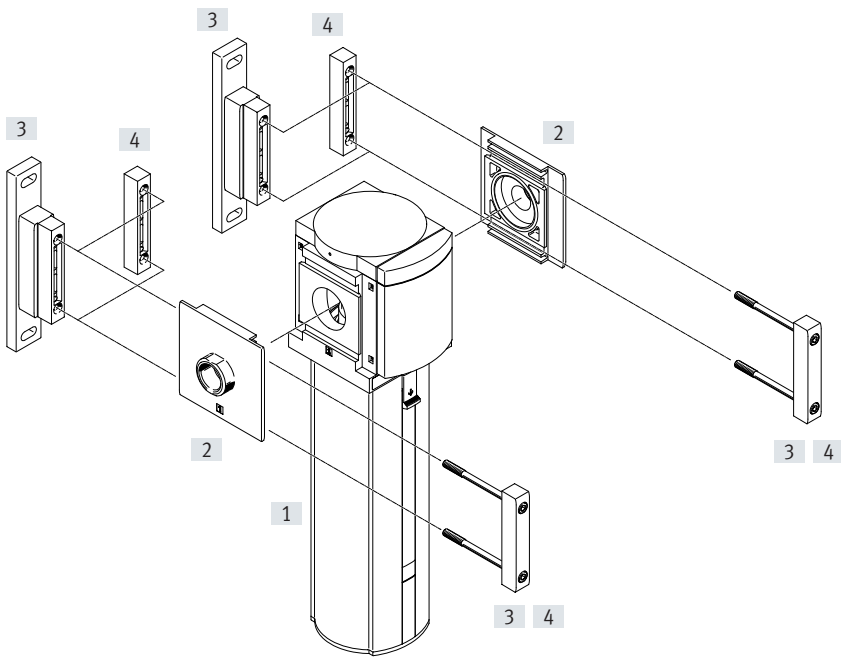
† Note: This product conforms to ISO 1179-1 and ISO 228-1.

## Ordering data – Modular product system

| Ordering table                      |                                                            | Conditions | Code | Enter code |
|-------------------------------------|------------------------------------------------------------|------------|------|------------|
| Grid dimension                      | 124                                                        |            |      |            |
|                                     | [mm]                                                       |            |      |            |
| Module no.                          | 535042                                                     |            |      |            |
| Series                              | Standard                                                   |            | MS   | MS         |
| Size                                | 12                                                         |            | 12   | 12         |
| Function                            | Fine and micro filter                                      |            | -LFM | -LFM       |
| Pneumatic connection                | Connecting plate G1                                        |            | -AGF |            |
|                                     | Connecting plate G1 1/4                                    |            | -AGG |            |
|                                     | Connecting plate G1 1/2                                    |            | -AGH |            |
|                                     | Connecting plate G2                                        |            | -AGI |            |
|                                     | Module without connecting thread, without connecting plate |            | -G   |            |
| Grade of filtration                 | 1 µm                                                       |            | -B   |            |
|                                     | 0.01 µm                                                    |            | -A   |            |
| Bowl                                | Metal bowl                                                 |            | -U   | -U         |
| Condensate drain                    | Manual                                                     |            | -M   |            |
|                                     | Fully automatic (P1 max. 12 bar) open without pressure     |            | -V   |            |
|                                     | Fully automatic (P1 max. 12 bar) closed without pressure   |            | -VC  |            |
| External, fully automatic, electric | 115 V AC, connection terminals (P1 max. 16 bar)            |            | -E2  |            |
|                                     | 230 V AC, connection terminals (P1 max. 16 bar)            |            | -E3  |            |
|                                     | 24 V DC, connection terminals (P1 max. 16 bar)             |            | -E4  |            |
| Filter change sensing               | Differential pressure display, visual                      |            | -DA  |            |
| Type of mounting                    | Mounting bracket standard design                           | [1]        | -WP  |            |
| Flow direction                      | Flow direction from right to left                          |            | -Z   |            |

[1] WP Only with connecting plate AGF, AGG, AGH or AGI

Peripherals overview



 **Note**

Additional accessories:

- Module connector for combination with size MS9 → internet: armv

| Mounting attachments and accessories |                                     |  | → Page/Internet |
|--------------------------------------|-------------------------------------|--|-----------------|
| [1]                                  | Activated carbon filter<br>MS12-LFX |  | 89              |
| [2]                                  | Connecting plate SET<br>MS12-AG...  |  | ms12-ag         |
| [3]                                  | Mounting bracket<br>MS12-WP         |  | ms12-wp         |
| [4]                                  | Module connector<br>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 |  |

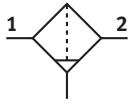
Additional variants can be ordered using the modular product system → Page 92

- 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 95

## General technical data

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

<sup>1)</sup> 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  |

Standard nominal flow rate  $q_n$  [l/min]

|                                                       |      |      |      |      |
|-------------------------------------------------------|------|------|------|------|
| Connecting plate                                      | AGF  | AGG  | AGH  | AGI  |
| Standard nominal flow rate (standardised to DIN 1343) | 4800 | 5000 | 5500 | 6000 |

## Operating and environmental conditions

|                                              |                                           |
|----------------------------------------------|-------------------------------------------|
| Operating pressure [bar]                     | 0 ... 20                                  |
| Operating medium                             | Compressed air to ISO 8573-1:2010 [3:4:2] |
|                                              | Inert gases                               |
| Ambient temperature [°C]                     | -10 ... +60                               |
| Temperature of medium [°C]                   | +5 ... +30                                |
| Storage temperature [°C]                     | -10 ... +60                               |
| Corrosion resistance class CRC <sup>1)</sup> | 2                                         |

<sup>1)</sup> More information: [www.festo.com/x/topic/crc](http://www.festo.com/x/topic/crc)

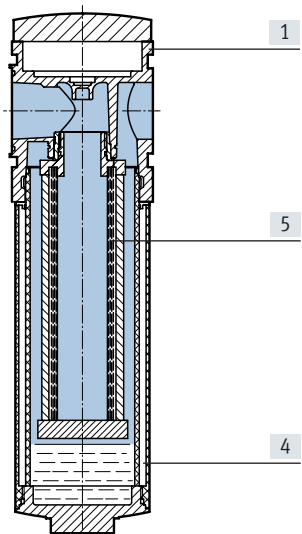
## Weight [g]

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

Datasheet

Materials

Sectional view

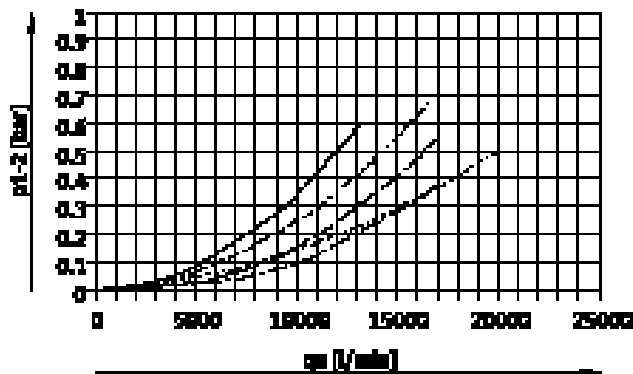


| Activated carbon filter |                                |                         |
|-------------------------|--------------------------------|-------------------------|
| [1]                     | Housing                        | Die-cast aluminium      |
| [4]                     | Metal bowl                     | Wrought aluminium alloy |
|                         | Inspection window              | PC                      |
| [5]                     | Filter                         | Activated carbon        |
| -                       | Seals                          | NBR                     |
| -                       | Connecting plate <sup>1)</sup> | Wrought aluminium alloy |
| -                       | Mounting bracket 1)            | Wrought aluminium alloy |
| -                       | Module connector 1)            | Wrought aluminium alloy |
| Note on materials       |                                | RoHs-compliant          |
| LABS (PWIS) conformity  |                                | VDMA24364-B1/B2-L       |

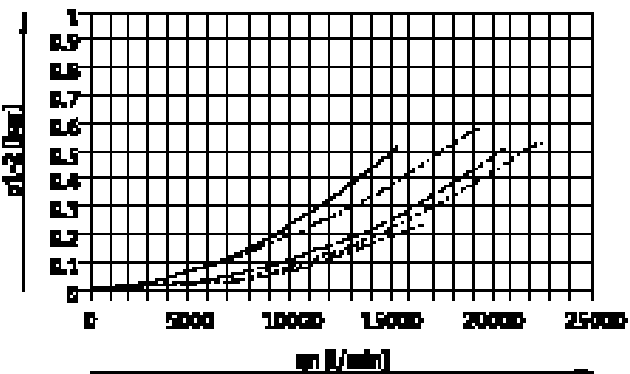
1) Modular product system

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

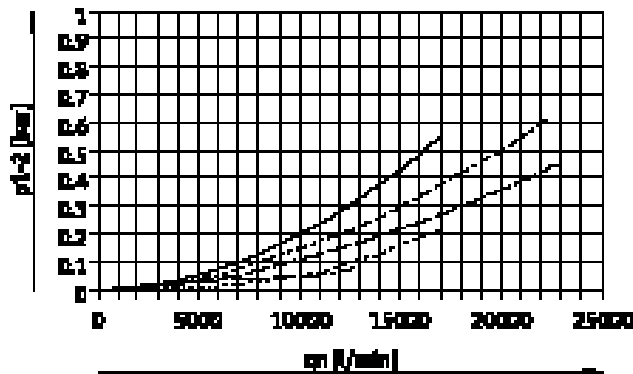
With connecting plate MS12-AGF, pneumatic connection G1



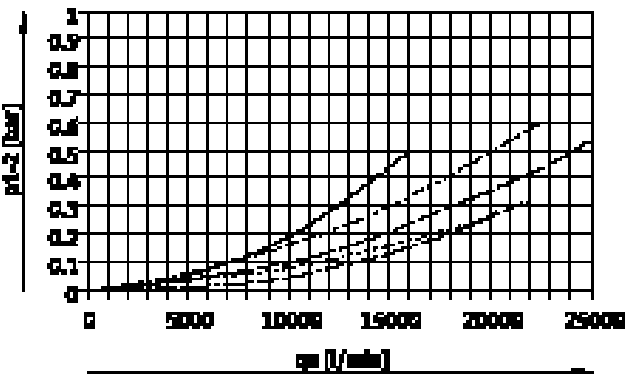
With connecting plate MS12-AGG, pneumatic connection G1 1/4



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



With connecting plate MS12-AGI, pneumatic connection G2

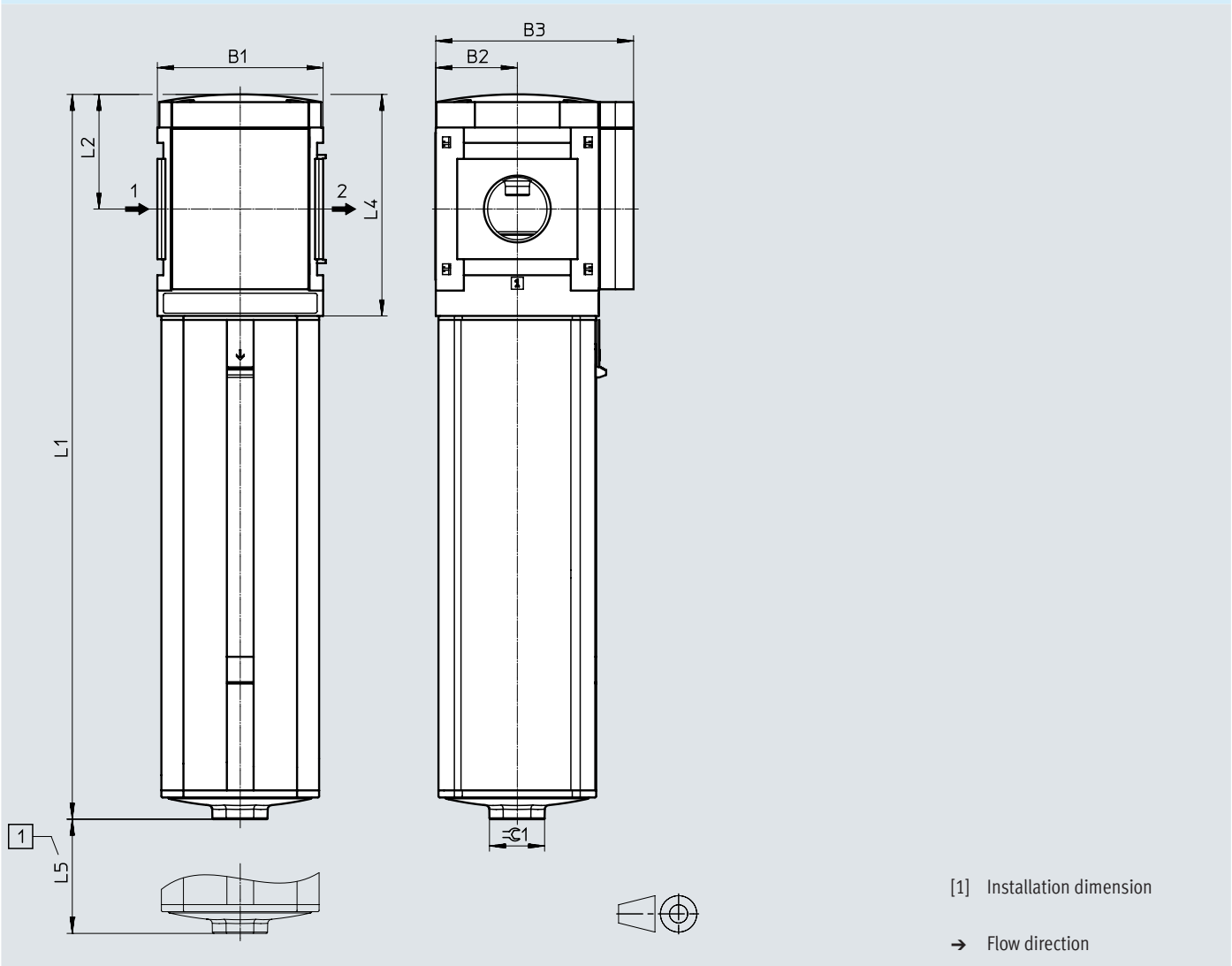


- p1: 4 bar
- - - - - p1: 6 bar
- - - - - p1: 8 bar
- ..... p1: 10 bar
- . - . - p1: 12 bar

Datasheet

Dimensions – Basic version

Download CAD data → [www.festo.com](http://www.festo.com)



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

Ordering data

| Metal bowl |                         |          |              |
|------------|-------------------------|----------|--------------|
| Size       | Connection              | Part no. | Type         |
| MS12       | G1 ... G2 <sup>1)</sup> | 537155   | MS12-LFX-G-U |

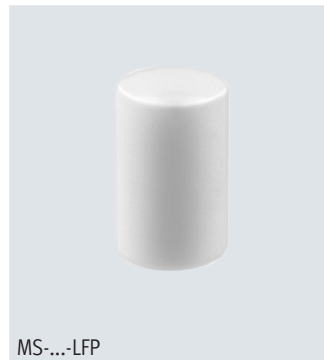
1) Connecting plate must be ordered separately as an accessory a Internet: ms12-ag  
· ‡ · Note: This product conforms to ISO 1179-1 and ISO 228-1.

## Ordering data – Modular product system

| Ordering table       |                                                            |     |             |      |
|----------------------|------------------------------------------------------------|-----|-------------|------|
| Grid dimension       | [mm]                                                       | 124 | Conditions  | Code |
| Module no.           | <b>535043</b>                                              |     |             |      |
| Series               | Standard                                                   |     | <b>MS</b>   | MS   |
| Size                 | 12                                                         |     | <b>12</b>   | 12   |
| Function             | Activated carbon filter                                    |     | <b>-LFX</b> | -LFX |
| Pneumatic connection | Connecting plate G1                                        |     | <b>-AGF</b> |      |
|                      | Connecting plate G1 1/4                                    |     | <b>-AGG</b> |      |
|                      | Connecting plate G1 1/2                                    |     | <b>-AGH</b> |      |
|                      | Connecting plate G2                                        |     | <b>-AGI</b> |      |
|                      | Module without connecting thread, without connecting plate |     | <b>-G</b>   |      |
| Bowl                 | Metal bowl                                                 |     | <b>-U</b>   | -U   |
| Type of mounting     | Mounting bracket standard design                           | [1] | <b>-WP</b>  |      |
| Flow direction       | Flow direction from right to left                          |     | <b>-Z</b>   |      |

[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<br>[μm] | Information on materials<br>- Filter | CRC <sup>1)</sup> | Part no. | Type                           |
| MS4                                                         | Micro filter cartridge            | 0.01                        | –                                    | –                 | 162674   | MS4/D-MINI-LFM-A <sup>2)</sup> |
|                                                             | Fine filter cartridge             | 1                           | –                                    | –                 | 162677   | MS4/D-MINI-LFM-B <sup>2)</sup> |
|                                                             | Filter cartridge (colour: blue)   | 5                           | PE                                   | 2                 | 534501   | MS4-LFP-C                      |
|                                                             | Filter cartridge (colour: white)  | 40                          | PE                                   | 2                 | 534502   | MS4-LFP-E                      |
|                                                             | Activated carbon filter cartridge | –                           | Activated carbon                     | –                 | 532912   | MS4/D-MINI-LFX                 |
| MS6                                                         | Micro filter cartridge            | 0.01                        | –                                    | –                 | 532909   | MS6-LFM-A                      |
|                                                             | Fine filter cartridge             | 1                           | –                                    | –                 | 532910   | MS6-LFM-B                      |
|                                                             | Filter cartridge (colour: blue)   | 5                           | PE                                   | 2                 | 534499   | MS6-LFP-C                      |
|                                                             | Filter cartridge (colour: white)  | 40                          | PE                                   | 2                 | 534500   | MS6-LFP-E                      |
|                                                             | Activated carbon filter cartridge | –                           | Activated carbon                     | –                 | 532911   | MS6-LFX                        |
| MS4-...-B                                                   | Filter cartridge (colour: blue)   | 5                           | PE                                   | 2                 | 8129064  | MS4-LFP1-C                     |
|                                                             | Filter cartridge (colour: white)  | 40                          | PE                                   | 2                 | 8129062  | MS4-LFP1-E                     |
| MS6-...-B                                                   | Filter cartridge (colour: blue)   | 5                           | PE                                   | 2                 | 8129063  | MS6-LFP1-C                     |
|                                                             | Filter cartridge (colour: white)  | 40                          | PE                                   | 2                 | 8129061  | MS6-LFP1-E                     |
| High flow rate HF                                           |                                   |                             |                                      |                   |          |                                |
| MS6                                                         | Micro filter cartridge            | 0.01                        | Borosilicate fibre                   | 2                 | 552093   | MS6-LFM-A-HF                   |
|                                                             | Fine filter cartridge             | 1                           | Borosilicate fibre                   | 2                 | 552092   | MS6-LFM-B-HF                   |
|                                                             | Activated carbon filter cartridge | –                           | Activated carbon                     | 2                 | 552094   | MS6-LFX-HF <sup>2)</sup>       |
| Application area HP, suitable for sealing air and purge air |                                   |                             |                                      |                   |          |                                |
| MS6                                                         | Micro filter cartridge            | 0.01                        | Borosilicate fibre                   | 2                 | 547922   | MS6-LFM-AI <sup>2)</sup>       |
|                                                             | Fine filter cartridge             | 1                           | Borosilicate fibre                   | 2                 | 547923   | MS6-LFM-BI <sup>2)</sup>       |
|                                                             | Activated carbon filter cartridge | –                           | Activated carbon                     | 2                 | 547925   | MS6-LFX-AKI <sup>2)</sup>      |

1) More information [www.festo.com/x/topic/crc](http://www.festo.com/x/topic/crc)

2) RoHS-compliant

Accessories

Filter cartridges,  
MS9 series



MS-9-LFM



MS-9-LFX

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

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

## Accessories

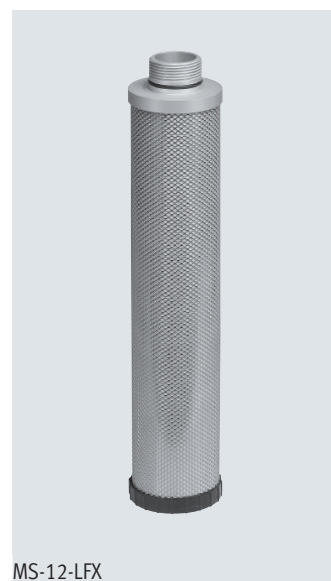
### Filter cartridges, MS12 series



MS-12-LFM-B



MS-12-LFM-A



MS-12-LFX

| Ordering data |                                      |                             |                                      |                   |               |          |                          |
|---------------|--------------------------------------|-----------------------------|--------------------------------------|-------------------|---------------|----------|--------------------------|
| Size          | Filter cartridge                     | Grade of filtration<br>[µm] | Information on materials<br>- filter | CRC <sup>1)</sup> | Weight<br>[g] | Part no. | Type                     |
| MS12          | Micro filter cartridge               | 0.01                        | Borosilicate fibre                   | 2                 | 425           | 537146   | MS12-LFM-A <sup>2)</sup> |
|               | Fine filter cartridge                | 1                           | Borosilicate fibre                   | 2                 | 395           | 537145   | MS12-LFM-B <sup>2)</sup> |
|               | 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<br>cartridge | -                           | Activated carbon                     | 2                 | 445           | 537147   | MS12-LFX <sup>2)</sup>   |

1) More information [www.festo.com/x/topic/crc](http://www.festo.com/x/topic/crc)

2) RoHS-compliant