

Filter regulators MS-LFR, MS series

FESTO



Festo core product range
Covers 80% of your automation tasks

Worldwide:
Superb:
Easy:

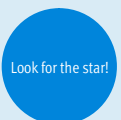
Always in stock
Festo quality at an attractive price
Reduces procurement and storing complexity



Generally ready for shipping ex works in 24 hours
Held in stock in 13 service centres worldwide
More than 2200 product



Generally ready for shipping ex works in 5 days
Assembled for you in 4 service centres worldwide
Up to 6 x 10¹² variants per product series



MS series service unit components

Key features



MS series service unit components

Solutions for every application

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

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

Freely combinable function modules

Pressure regulators, on/off and soft-start valves with safety function, filter, pressure and flow sensors, dryers, sensors and lubricators. All these allow a suitable solution to be assembled for every task. Their modular structure means that the components

are freely combinable. A simple connection system saves time when replacing individual modules without dismantling the entire combination. What's more, many of the components are certified to UL and ATEX.

CAD models and configurator

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

Engineering tools

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



Integrated sensors

Pressure and flow sensors



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

Safety functions

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



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

Energy savings

Service units MSE6



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

Intelligent mix of sizes



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

| Size differences | | | | | |
|--|----------|------------------|------------------------|--------------------------------|------------------------|
| Size | MS2 | MS4 | MS6 | MS9 | MS12 |
| Grid dimension [mm] | 25 | 40 | 62 | 90 | 124 |
| Port sizes | M5, QS-6 | 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 qnN ¹⁾ [l/min] | 350 | 1800 | 6500 | 20000 | 22000 |

1) Using pressure regulator MS-LR as an example

MS series service unit components

Key features

Note
Information

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

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

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





Structure of a service unit

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

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

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






Total product range for MS series service unit components

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

MS series service unit components

Key features









| Total product range for MS series service unit components | | | | | | | | |
|---|--|------|----------------------|---------------|---------------|--------|-----------------------------------|---------------------------|
| Type | Description | Size | Pneumatic connection | | | | | |
| | | | Push-in connector | Female thread | | | Connection plate with thread | |
| | | | | M | G | NPT | G | NPT |
| Individual devices | | | | | | | | |
| Filter regulators MS-LFR | | | | | | | Technical data → Internet: ms-lfr | |
|  | Filter and pressure regulator in a single device, grade of filtration 5 or 40 µm | 2 | QS-6 | M5 | – | – | – | – |
| | | 4 | – | – | 1/8, 1/4 | – | 1/8, 1/4, 3/8 | 1/8, 1/4, 3/8 |
| | | 6 | – | – | 1/4, 3/8, 1/2 | – | 1/4, 3/8, 1/2, 3/4 | 1/4, 3/8, 1/2, 3/4 |
| | | 9 | – | – | 3/4, 1 | 3/4, 1 | 1/2, 3/4, 1, 1 1/4, 1 1/2 | 1/2, 3/4, 1, 1 1/4, 1 1/2 |
| | | 12 | – | – | – | – | 1, 1 1/4, 1 1/2, 2 | – |
| Filters MS-LF | | | | | | | | |
| | | | | | | | Technical data → Internet: ms-lf | |
|  | Grade of filtration 5 or 40 µm | 4 | – | – | 1/8, 1/4 | – | 1/8, 1/4, 3/8 | 1/8, 1/4, 3/8 |
| | | 6 | – | – | 1/4, 3/8, 1/2 | – | 1/4, 3/8, 1/2, 3/4 | 1/4, 3/8, 1/2, 3/4 |
| | | 9 | – | – | 3/4, 1 | 3/4, 1 | 1/2, 3/4, 1, 1 1/4, 1 1/2 | 1/2, 3/4, 1, 1 1/4, 1 1/2 |
| | | 12 | – | – | – | – | 1, 1 1/4, 1 1/2, 2 | – |
| | | | | | | | | |
| Fine and micro filters MS-LFM | | | | | | | | |
| | | | | | | | Technical data → Internet: ms-lfm | |
|  | Grade of filtration 0.01 or 1 µm | 4 | – | – | 1/8, 1/4 | – | 1/8, 1/4, 3/8 | 1/8, 1/4, 3/8 |
| | | 6 | – | – | 1/4, 3/8, 1/2 | – | 1/4, 3/8, 1/2, 3/4 | 1/4, 3/8, 1/2, 3/4 |
| | | 9 | – | – | 3/4, 1 | 3/4, 1 | 1/2, 3/4, 1, 1 1/4, 1 1/2 | 1/2, 3/4, 1, 1 1/4, 1 1/2 |
| | | 12 | – | – | – | – | 1, 1 1/4, 1 1/2, 2 | – |
| | | | | | | | | |
| Activated carbon filters MS-LFX | | | | | | | | |
| | | | | | | | Technical data → Internet: ms-lfx | |
|  | For removing liquid and gaseous oil particles | 4 | – | – | 1/8, 1/4 | – | 1/8, 1/4, 3/8 | 1/8, 1/4, 3/8 |
| | | 6 | – | – | 1/4, 3/8, 1/2 | – | 1/4, 3/8, 1/2, 3/4 | 1/4, 3/8, 1/2, 3/4 |
| | | 9 | – | – | 3/4, 1 | 3/4, 1 | 1/2, 3/4, 1, 1 1/4, 1 1/2 | 1/2, 3/4, 1, 1 1/4, 1 1/2 |
| | | 12 | – | – | – | – | 1, 1 1/4, 1 1/2, 2 | – |
| | | | | | | | | |
| Water separators MS-LWS | | | | | | | | |
| | | | | | | | Technical data → Internet: ms-lws | |
|  | Remove condensed water from compressed air, maintenance-free | 6 | – | – | 1/4, 3/8, 1/2 | – | 1/4, 3/8, 1/2, 3/4 | 1/4, 3/8, 1/2, 3/4 |
| | | 9 | – | – | 3/4, 1 | 3/4, 1 | 1/2, 3/4, 1, 1 1/4, 1 1/2 | 1/2, 3/4, 1, 1 1/4, 1 1/2 |
| | | 12 | – | – | – | – | 1, 1 1/4, 1 1/2, 2 | – |
| | | | | | | | | |

MS series service unit components

Key features










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

MS series service unit components





Key features



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

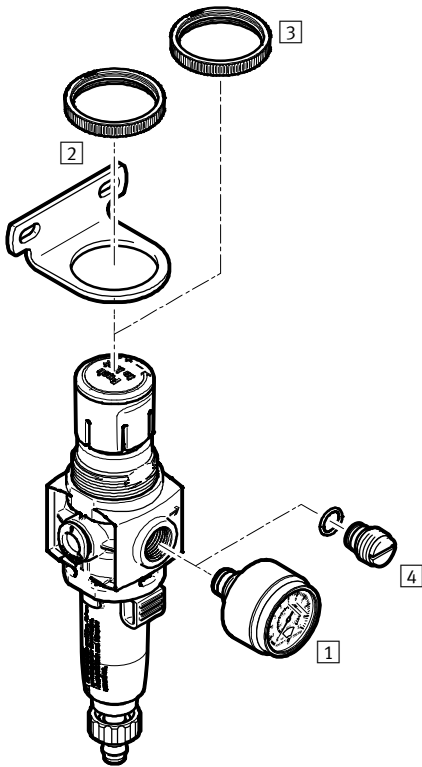
MS series service unit components

Key features

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

Filter regulators MS2-LFR, MS series

Peripherals overview



| Mounting components and accessories | | → Page/Internet |
|-------------------------------------|----------------------------|--|
| 1 | Pressure gauge PAGN | 57 |
| 2 | Mounting bracket MS2-WR | For wall mounting, knurled nut included in scope of delivery 58 |
| 3 | Nut MS2-WRS | For front panel mounting 58 |
| 4 | Plug screw MS2-G18S | 59 |
| - | Filter cartridge LFP | 59 |

Filter regulators MS2-LFR, MS series

Type codes

MS 2 - LFR - M5 - D6 - AR - BAR - C - M - B

Series

| | |
|----|-----------------------|
| MS | Standard service unit |
|----|-----------------------|

Size

| | |
|---|----------------------|
| 2 | Grid dimension 25 mm |
|---|----------------------|

Service function

| | |
|-----|------------------|
| LFR | Filter regulator |
|-----|------------------|

Pneumatic connection

| | |
|-----|--|
| M5 | Female thread M5 |
| QS6 | Push-in connector for tubing O.D. 6 mm |

Pressure regulation range

| | |
|----|---|
| D6 | Pressure regulation range 0.5 ... 7 bar |
|----|---|

Pressure gauge/adapter

| | |
|----|---|
| AR | Pressure gauge |
| A8 | Adapter for EN pressure gauge 1/8, without pressure gauge |

Pressure gauge scale

| | |
|-----|------------------------|
| | None |
| BAR | Display unit [bar/psi] |
| MPA | Display unit [MPa] |

Grade of filtration

| | |
|---|------|
| C | 5 µm |
|---|------|

Condensate drain

| | |
|---|---------------|
| M | Manual rotary |
|---|---------------|

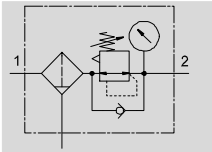
Version

| | |
|---|-------|
| B | Basic |
|---|-------|

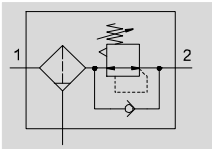
Filter regulators MS2-LFR, MS series




Technical data

With pressure gauge



Without pressure gauge



-  - Flow rate
140 ... 310 l/min
-  - Temperature range
-5 ... +50 °C
-  - Operating pressure
1 ... 10 bar



| General technical data | | |
|---------------------------------|---|--|
| | With pressure gauge | With adapter for EN pressure gauge 1/8, without pressure gauge |
| Pneumatic connection 1, 2 | M5 QS-6 | |
| Design | Filter regulator with pressure gauge | Filter regulator without pressure gauge |
| Regulating function | Output pressure constant, with return flow action, with secondary venting | |
| Type of mounting | With accessories In-line installation Front panel mounting | |
| Mounting position | Vertical ±5° | |
| Grade of filtration [µm] | 5 | |
| Air quality class at the outlet | Compressed air to ISO 8573-1:2010 [6:4:4] | |
| Condensate drain | Manual rotary | |
| Actuator lock | Rotary knob with detent | |
| Pressure regulation range [bar] | 0.5 ... 7 | |
| Max. pressure hysteresis [bar] | 0.25 | |
| Pressure indicator | With pressure gauge | G1/8 prepared |
| Max. condensate volume [ml] | 3 | |

| Characteristic flow rate values | | |
|--|-----|------|
| Pneumatic connection 1, 2 | M5 | QS-6 |
| Standard nominal flow rate [l/min] qn ¹⁾ | 140 | 310 |

1) Measured at p₁ = 10 bar and p₂ = 6 bar, Δp = 1 bar

Filter regulators MS2-LFR, MS series

Technical data

| Operating and environmental conditions | | |
|--|---|---------|
| Pneumatic connection 1, 2 | M5 | QS-6 |
| Operating pressure [bar] | 1 ... 10 | 1 ... 8 |
| Operating medium | Compressed air to ISO 8573-1:2010 [7:4:4] | |
| | Inert gases | |
| Ambient temperature [°C] | -5 ... +50 | |
| Temperature of medium [°C] | -5 ... +50 | |
| Storage temperature [°C] | -5 ... +50 | |
| Corrosion resistance class CRC ¹⁾ | 1 | |

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

Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

| Weights [g] | | |
|---------------------------|------|------|
| Pneumatic connection 1, 2 | M5 | QS-6 |
| With pressure gauge | 47.3 | 45 |
| Without pressure gauge | 42.3 | 40 |

| Materials | |
|-------------------|------------------------------|
| Housing | PA |
| Rotary knob | POM |
| Bowl | PC |
| Filter | PE |
| Separating disc | POM |
| Valve tappet | Wrought aluminium alloy, NBR |
| Diaphragm | NBR |
| Spring | High-alloy steel |
| Seals | NBR |
| Note on materials | RoHS-compliant |

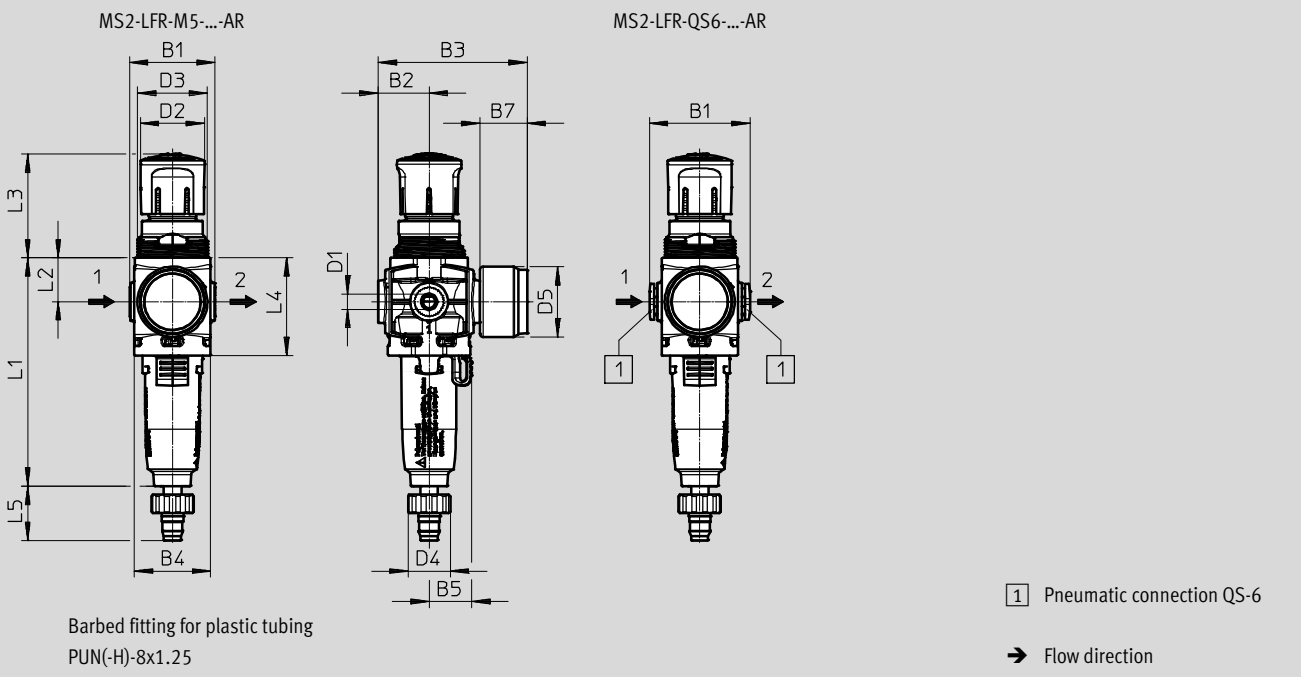
Filter regulators MS2-LFR, MS series

Technical data

Dimensions

Download CAD data → www.festo.com

With pressure gauge AR



| Type | B1 | B2 | B3 | B4 | B5 | B7 | D1 | D2 ∅ | D3 ∅ | D4 | D5 ∅ | L1 | L2 | L3 | L4 | L5 |
|--------------------|------|------|----|----|----|------|------|---------|---------|------|---------|------|------|------|----|------|
| MS2-LFR-M5-...-AR | 28 | 16.7 | 49 | 25 | 14 | 15.5 | M5 | 21 | M23x1 | 13.8 | 23 | 74.9 | 14.4 | 34.1 | 32 | 17.9 |
| MS2-LFR-QS6-...-AR | 33.1 | | | | | | QS-6 | | | | | | | | | |

Filter regulators MS2-LFR, MS series

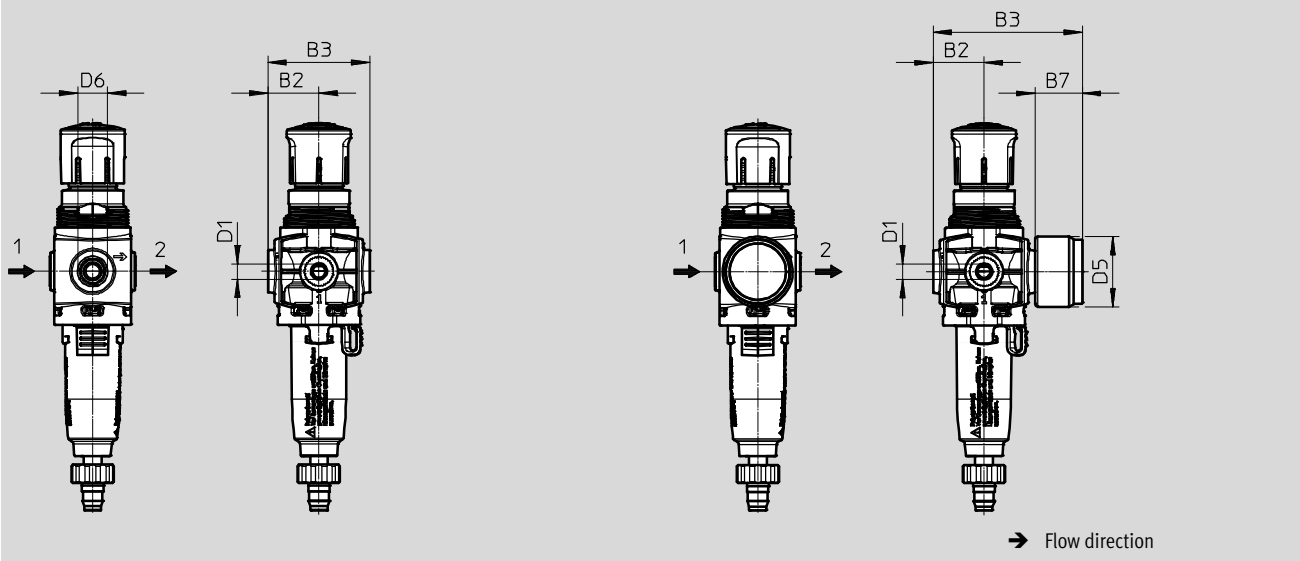
Technical data

Dimensions

Download CAD data → www.festo.com

With adapter A8 for EN pressure gauge 1/8, without pressure gauge

With pressure gauge AR



| Type | B2 | B3 | B7 | D1 | D5 Ø | D6 |
|--------------------|------|------|------|------|---------|------|
| MS2-LFR-M5-...-A8 | 16.7 | 33.4 | - | M5 | - | G1/8 |
| MS2-LFR-QS6-...-A8 | | | | QS-6 | | |
| MS2-LFR-M5-...-AR | 16.7 | 49 | 15.5 | M5 | 23 | - |
| MS2-LFR-QS6-...-AR | | | | QS-6 | | |

Ordering data

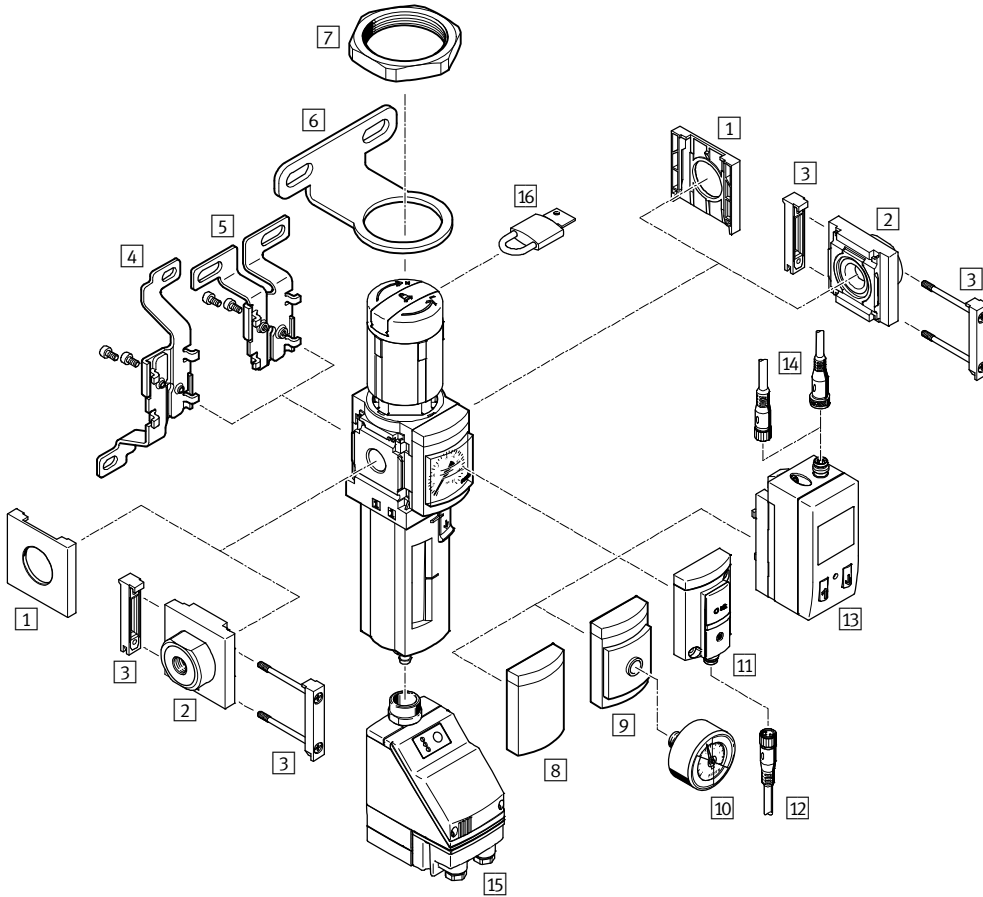
Pressure regulation range 0.5 ... 7 bar, rotary knob with detent

| Size | Pneumatic connection 1, 2 | Condensate drain | Part No. | Type |
|--|---------------------------|------------------|----------------|------------------------------------|
| Pressure gauge, display unit [bar/psi] | | | | |
| MS2 | M5 | Manual rotary | 8086641 | MS2-LFR-M5-D6-AR-BAR-C-M-B |
| | QS-6 | Manual rotary | 8086644 | MS2-LFR-QS6-D6-AR-BAR-C-M-B |
| Pressure gauge, display unit [MPa] | | | | |
| MS2 | M5 | Manual rotary | 8086642 | MS2-LFR-M5-D6-AR-MPA-C-M-B |
| | QS-6 | Manual rotary | 8086645 | MS2-LFR-QS6-D6-AR-MPA-C-M-B |
| Adapter for EN pressure gauge 1/8, without pressure gauge | | | | |
| MS2 | M5 | Manual rotary | 8086643 | MS2-LFR-M5-D6-A8-C-M-B |
| | QS-6 | Manual rotary | 8086646 | MS2-LFR-QS6-D6-A8-C-M-B |

Filter regulators MS4/MS6-LFR, MS series

Peripherals overview

Filter regulator MS4/MS6-LFR



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

Filter regulators MS4/MS6-LFR, MS series

Peripherals overview

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| Mounting attachments and accessories | | | | | | |
|--------------------------------------|---|--------------------------|-----------------------|--------------------------|-----------------------|---------------------|
| | | Individual device | | Combination | | → Page/ Internet |
| | | Without connecting plate | With connecting plate | Without connecting plate | With connecting plate | |
| 1 | Cover cap MS4/6-END | ■ | - | ■ | - | ms4-end, ms6-end |
| 2 | Connecting plate-SET MS4/6-AG... | - | ■ | - | ■ | ms4-ag, ms6-ag |
| | Connecting plate-SET MS4/6-AQ... | - | ■ | - | ■ | ms4-aq, ms6-aq |
| 3 | Module connector MS4/6-MV | - | ■ | ■ | ■ | ms4-mv, ms6-mv |
| 4 | Mounting bracket MS4/6-WB | ■ | ■ | - | - | ms4-wb, ms6-wb |
| 5 | Mounting bracket MS4-WBM | ■ | ■ | - | - | ms4-wbm |
| 6 | Mounting bracket MS4/6-WR | ■ | ■ | - | - | ms4-wr, ms6-wr |
| 7 | Hex nut MS4/6-WRS | ■ | ■ | ■ | ■ | ms4-wrs, ms6-wrs |
| 8 | Cover plate VS | ■ | ■ | ■ | ■ | 32 |
| 9 | Adapter plate for EN pressure gauge 1/8/1/4 A8/A4 | ■ | ■ | ■ | ■ | 32 |
| 10 | Pressure gauge MA | ■ | ■ | ■ | ■ | 61 |
| 11 | Pressure sensor without display AD7 ... AD10 | ■ | ■ | ■ | ■ | 32 |
| 12 | Connecting cable NEBU-M8...-LE3 | ■ | ■ | ■ | ■ | 61 |
| 13 | Pressure sensor with display AD1 ... AD4 | ■ | ■ | ■ | ■ | 32 |
| 14 | Connecting cable NEBU-M8...-LE3/NEBU-M12...-LE4 | ■ | ■ | ■ | ■ | 61 |
| 15 | Fully automatic condensate drain, electrically actuated E2/E3/E4 | ■ | ■ | ■ | ■ | 32 |
| 16 | Padlock LRVS-D | ■ | ■ | ■ | ■ | 61 |
| - | Mounting bracket MS4/6-WP/WPB/WPE/WPM | - | ■ | ■ | ■ | ms4-wp, ms6-wp |

Filter regulators MS4/MS6-LFR, MS series

Type codes

MS 6 - LFR - 1/2 - D7 - E R M - AS -

Series

| | |
|----|-----------------------|
| MS | Standard service unit |
|----|-----------------------|

Size

| | |
|---|----------------------|
| 4 | Grid dimension 40 mm |
| 6 | Grid dimension 62 mm |

Service function

| | |
|-----|------------------|
| LFR | Filter regulator |
|-----|------------------|

Pneumatic connection

| | |
|-----|--------------------|
| MS4 | |
| 1/8 | Female thread G1/8 |
| 1/4 | Female thread G1/4 |
| MS6 | |
| 1/4 | Female thread G1/4 |
| 3/8 | Female thread G3/8 |
| 1/2 | Female thread G1/2 |

Pressure regulation range

| | |
|----|--|
| D6 | Pressure regulation range 0.3 ... 7 bar |
| D7 | Pressure regulation range 0.5 ... 12 bar |

Grade of filtration

| | |
|---|-------|
| C | 5 µm |
| E | 40 µm |

Bowl guard

| | |
|---|--------------------------|
| R | Plastic bowl guard |
| U | Integrated as metal bowl |

Condensate drain

| | |
|---|-----------------|
| M | Manual rotary |
| V | Fully automatic |

Security

| | |
|----|---|
| AS | Rotary knob with detent, lockable via accessories |
|----|---|

Flow direction

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

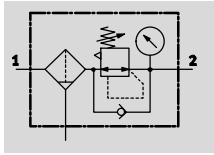
Additional variants can be ordered using the modular system → 32

- Pneumatic connection
- Pressure regulation range
- Condensate drain
- Pressure gauge alternatives
- Alternative pressure gauge scale
- Secondary venting
- Rotary knob
- Security
- Type of mounting
- EU certification
- UL certification

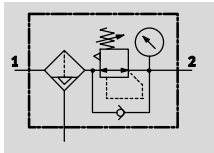
Filter regulators MS4/MS6-LFR, MS series

Technical data

Manual rotary condensate drain, with pressure gauge



Semi or fully automatic condensate drain, with pressure gauge



With this device, the filter and pressure regulator are combined into a single unit. The sintered filter with water separator removes contamination, pipe sinter, rust and condensate from the compressed air.

- - Flow rate
850 ... 7,200 l/min
- - Temperature range
-10 ... +60 °C
- - Operating pressure
0.8 ... 20 bar
- - www.festo.com



- Good regulation characteristics with low hysteresis and primary pressure compensation
- Good particle and condensate separation
- Available with or without secondary venting
- High flow rate
- Directly-actuated diaphragm regulator
- Four pressure regulation ranges: 0.3 ... 4 bar, 0.3 ... 7 bar, 0.5 ... 12 bar and 0.5 ... 16 bar
- Regulator lock for protecting the values against adjustment
- Two pressure gauge connections for different fitting options
- Return flow option for exhausting from output 2 to output 1 already integrated
- Optional pressure sensor
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22
- Choice of filter cartridges: 5 µm or 40 µm
- New filter cartridges → 60

| General technical data | | |
|--------------------------------|---|--|
| Size | MS4 | MS6 |
| Pneumatic connection 1, 2 | Female thread | G1/8 or G1/4 |
| | Connecting plate AG... | G1/8, G1/4 or G3/8 |
| | Connecting plate AQ... | NPT1/8, NPT1/4 or NPT3/8 |
| Constructional design | Filter regulator with/without pressure display | |
| Regulating function | Output pressure constant, with return flow action, with/without secondary venting | |
| Type of mounting | Via accessories | |
| | In-line installation | |
| | Front panel mounting | |
| Mounting position | Vertical ±5° | |
| Grade of filtration [µm] | 5 | |
| | 40 | |
| Air purity class at the output | Compressed air in accordance with ISO 8573-1:2010 [6:4:4] (Grade of filtration 5 µm) | |
| | Compressed air in accordance with ISO 8573-1:2010 [7:4:4] (Grade of filtration 40 µm) | |
| Bowl guard | Plastic bowl guard | |
| | Integrated as metal bowl | |
| Condensate drain | Manual rotary | |
| | Semi-automatic | |
| | Fully automatic | |
| | - | Fully automatic, electrically actuated |
| Regulator lock | Rotary knob with detent, lockable via accessories | |
| | Rotary knob with integrated lock | |

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

Filter regulators MS4/MS6-LFR, MS series

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Technical data

| General technical data | | |
|--|---|---|
| Size | MS4 | MS6 |
| Pressure regulation range | D5 [bar] | 0.3 ... 4 |
| | D6 [bar] | 0.3 ... 7 |
| | D7 [bar] | 0.5 ... 12 (0.5 ... 10 with pressure sensor variant AD... or with UL certification) |
| | D8 [bar] | – |
| Max. hysteresis | [bar] | 0.25 |
| Pressure display | Via pressure sensor for displaying output pressure via LCD display and electrical output | |
| | Via pressure sensor for displaying output pressure via operational status indicator and electrical output | |
| | Via pressure gauge for displaying output pressure | |
| | Via pressure gauge with red/green scale for displaying output pressure | |
| | G ¹ / ₈ prepared | – |
| G ¹ / ₄ prepared | | |
| Max. condensate volume | [cm ³] | 19 (with plastic bowl guard) 25 (with metal bowl) |
| | | 38 |

| Standard nominal flow rate q _{nN} ¹⁾ [l/min] | | | | | | |
|--|-------------------------------|-------------------------------|---------------------|-------------------------------|-------------------------------|-------------------------------|
| Size | MS4 | | | MS6 | | |
| Pneumatic connection | G ¹ / ₈ | G ¹ / ₄ | | G ¹ / ₄ | G ³ / ₈ | G ¹ / ₂ |
| D5 – Pressure regulation range 0.3 ... 4 bar | | | | | | |
| Grade of filtration | 5 µm | 900 ²⁾ | 1,800 ²⁾ | 2,000 ²⁾ | 5,500 ²⁾ | 6,900 ²⁾ |
| | 40 µm | 1,100 ²⁾ | 1,900 ²⁾ | 2,200 ²⁾ | 6,000 ²⁾ | 7,200 ²⁾ |
| D6 – Pressure regulation range 0.3 ... 7 bar | | | | | | |
| Grade of filtration | 5 µm | 900 | 1,500 | 2,700 | 5,000 | 5,600 |
| | 40 µm | 1,000 | 1,700 | 2,800 | 5,700 | 6,200 |
| D7 – Pressure regulation range 0.5 ... 12 bar | | | | | | |
| Grade of filtration | 5 µm | 850 | 1,200 | 2,200 | 3,500 | 4,000 |
| | 40 µm | 900 | 1,500 | 2,500 | 4,000 | 4,500 |
| D8 – Pressure regulation range 0.5 ... 16 bar | | | | | | |
| Grade of filtration | 5 µm | – | – | 2,000 | 3,300 | 3,800 |
| | 40 µm | – | – | 2,300 | 3,500 | 4,000 |

1) Measured at p₁ = 10 bar and p₂ = 6 bar, Δp = 1 bar

2) Measured at p₁ = 10 bar and p₂ = 3 bar, Δp = 1 bar

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

Filter regulators MS4/MS6-LFR, MS series

Technical data

| Operating and environmental conditions | | | | | | | |
|--|--|--|--|--|--|--------------------------------------|--|
| Condensate drain | Manual rotary M | | Semi-automatic H | | Fully automatic V | | Fully automatic, electrical E2/E3/E4 |
| Size | MS4 | MS6 | MS4 | MS6 | MS4 | MS6 | MS6 |
| Operating pressure [bar] | 0.8 ... 14 (0.8 ... 10) ¹⁾ | 0.8 ... 20 (0.8 ... 10) ¹⁾ | 1.5 ... 12 (1.5 ... 10) ¹⁾ | 1.5 ... 12 (1.5 ... 10) ¹⁾ | 2 ... 12 (2 ... 10) ¹⁾ | 2 ... 12 (2 ... 10) ¹⁾ | 0.8 ... 16 (0.8 ... 10) ¹⁾ |
| Operating medium | Compressed air in accordance with ISO 8573-1:2010 [-:4:-] | | Compressed air in accordance with ISO 8573-1:2010 [-:4:-] | | Compressed air in accordance with ISO 8573-1:2010 [7:4:-] | | Compressed air in accordance with ISO 8573-1:2010 [-:4:-] |
| | Inert gases | | | | | | |
| Ambient temperature [°C] | -10 ... +60 (0 ... +50) ²⁾ | | +5 ... +60 (+5 ... +50) ²⁾ | | +5 ... +60 (+5 ... +50) ²⁾ | | +1 ... +60 (+1 ... +50) ²⁾ |
| Temperature of medium [°C] | -10 ... +60 (0 ... +50) ²⁾ | | +5 ... +60 (+5 ... +50) ²⁾ | | +5 ... +60 (+5 ... +50) ²⁾ | | +1 ... +60 (+1 ... +50) ²⁾ |
| Storage temperature [°C] | -10 ... +60 | | -10 ... +60 | | -10 ... +60 | | +1 ... +60 |
| Corrosion resistance class CRC ³⁾ | 2 | | | | | | |
| Food-safe ⁴⁾ | See supplementary material information | | | | | | - |
| UL certification ⁴⁾ | cULus recognized (OL) | | | | | | |

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

2) Value in brackets applies to MS4/MS6-LFR with pressure sensor AD...

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

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

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

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

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

| Weight [g] | | | | |
|---|-----------------------------|--------------------------|-----------------------------|--------------------------|
| Size | MS4 | | MS6 | |
| | Without integrated lock E11 | With integrated lock E11 | Without integrated lock E11 | With integrated lock E11 |
| Filter regulator with plastic bowl guard R | 275 | 400 | 875 | 1,145 |
| Filter regulator with metal bowl U | 475 | 600 | 1,087 | 1,627 |
| Filter regulator with metal bowl U and fully automatic condensate drain, electrically actuated E2/E3/E4 | - | - | 1,800 | 2,070 |

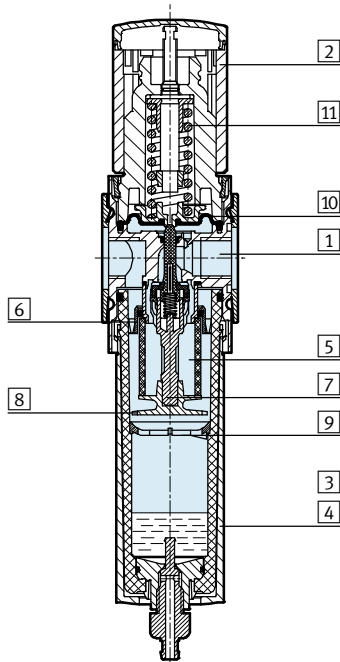
Filter regulators MS4/MS6-LFR, MS series

Technical data



Materials

Sectional view



| Filter regulator | | |
|-------------------|--------------------------------------|--|
| 1 | Housing | Die-cast aluminium |
| 2 | Rotary knob | PA/POM |
| | Rotary knob with integrated lock E11 | Aluminium |
| 3 | Plastic bowl guard | PC |
| 4 | Metal bowl | Wrought aluminium alloy, die-cast aluminium |
| | Inspection window | PA |
| 5 | Filter element | PE |
| 6 | Spin disc | POM |
| 7 | Filter holder | POM |
| 8 | Separating plate | POM |
| 9 | Stabilising disc | POM |
| 10 | Diaphragm | NBR |
| 11 | Spring | Steel |
| - | Seals | NBR |
| Note on materials | | RoHS-compliant |
| | | Free of copper and PTFE only with cover plate VS |

Standard flow rate q_n as a function of output pressure p_2

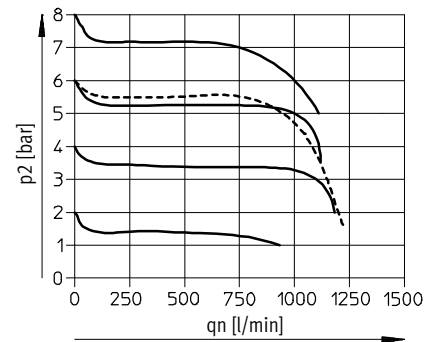
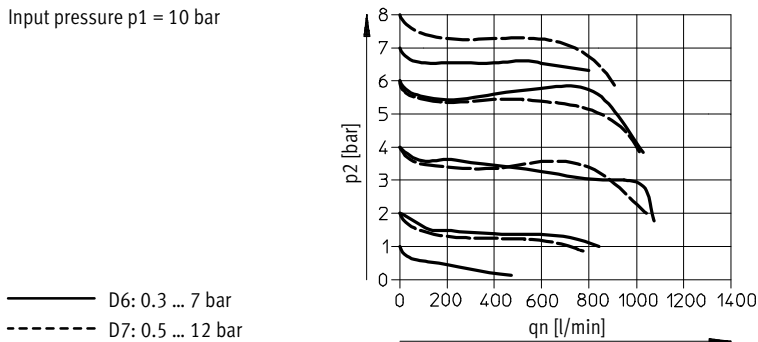
Pressure regulation range D6 or D7

Grade of filtration 5 μm

Grade of filtration 40 μm

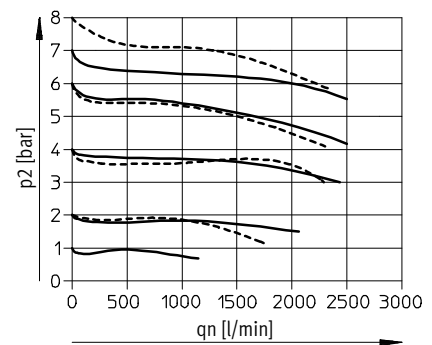
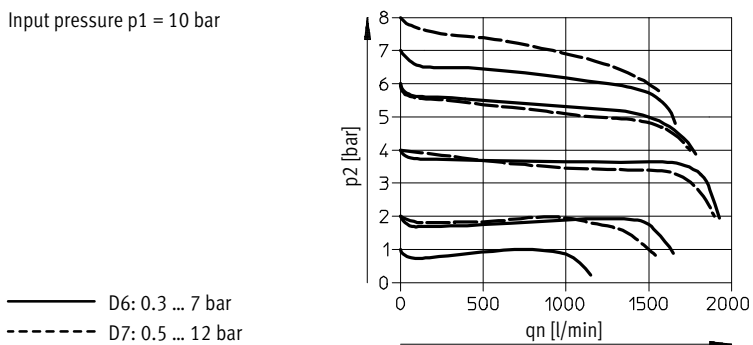
MS4-LFR-1/8

Input pressure $p_1 = 10$ bar



MS4-LFR-1/4

Input pressure $p_1 = 10$ bar



Filter regulators MS4/MS6-LFR, MS series

Technical data

Standard flow rate q_n as a function of output pressure p_2

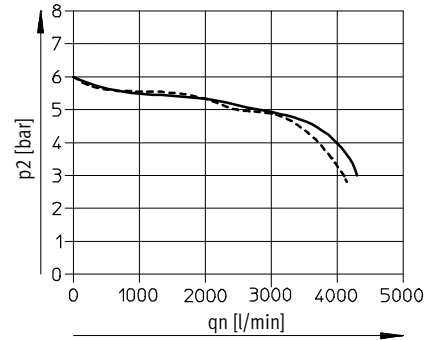
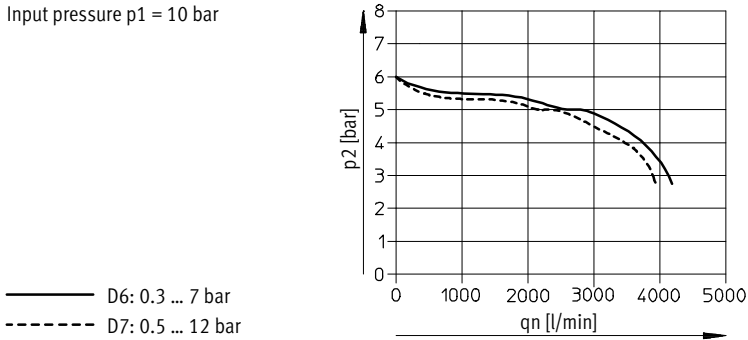
Pressure regulation range D6 or D7

Grade of filtration 5 μm

Grade of filtration 40 μm

MS6-LFR- $\frac{1}{4}$

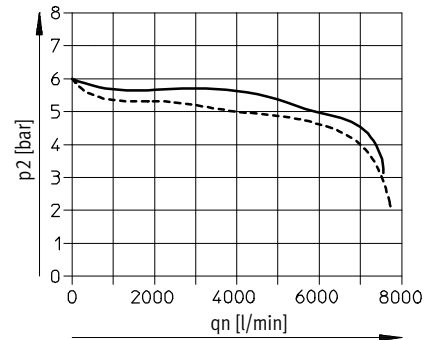
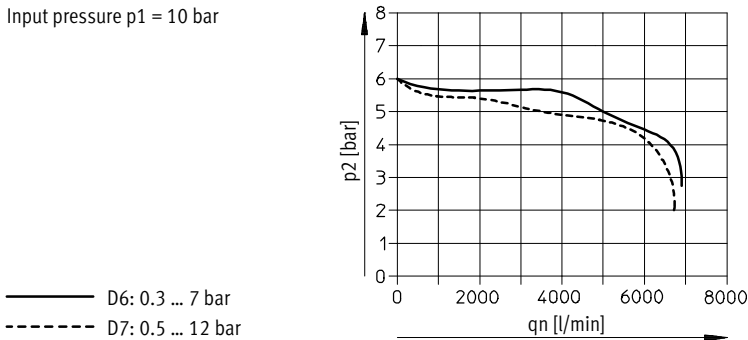
Input pressure $p_1 = 10$ bar



— D6: 0.3 ... 7 bar
- - - D7: 0.5 ... 12 bar

MS6-LFR- $\frac{3}{8}$

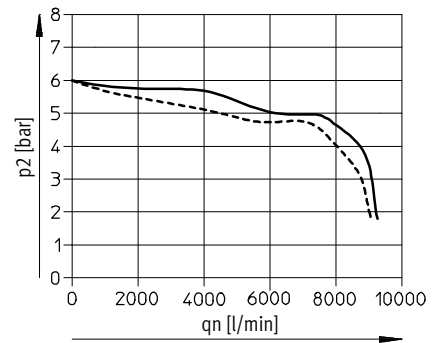
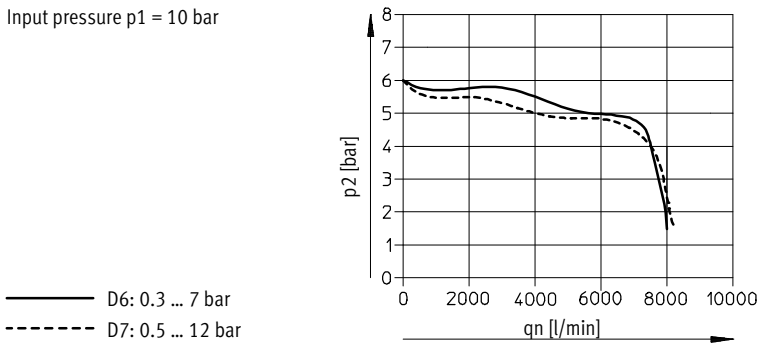
Input pressure $p_1 = 10$ bar



— D6: 0.3 ... 7 bar
- - - D7: 0.5 ... 12 bar

MS6-LFR- $\frac{1}{2}$

Input pressure $p_1 = 10$ bar



— D6: 0.3 ... 7 bar
- - - D7: 0.5 ... 12 bar

Filter regulators MS4/MS6-LFR, MS series

Technical data



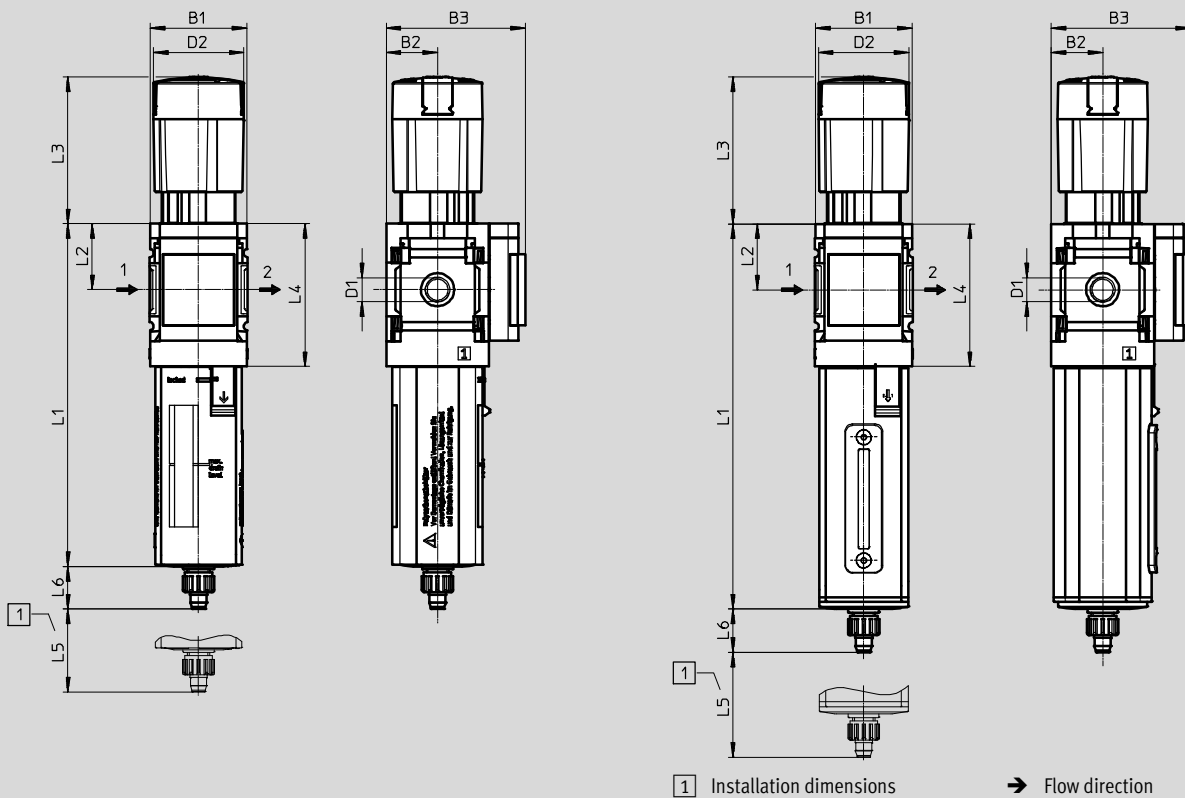
Dimensions – Basic version MS4-LFR

Download CAD data → www.festo.com

Integrated MS pressure gauge with standard scale, manual rotary condensate drain, rotary knob with detent, lockable via accessories

With plastic bowl guard R

With metal bowl U



| Type | B1 | B2 | B3 | D1 | D2 | L1 | | L2 | L3 | L4 | L5 | L6 |
|-------------|----|----|----|------|------|--------------------|------------|----|------|------|----|------|
| | | | | | | Plastic bowl guard | Metal bowl | | | | | |
| MS4-LFR-1/8 | 40 | 21 | 57 | G1/8 | 37.2 | 140.6 | 158 | 27 | 60.2 | 58.5 | 25 | 17.7 |
| MS4-LFR-1/4 | | | | G1/4 | | | | | | | | |

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

Filter regulators MS4/MS6-LFR, MS series

Technical data



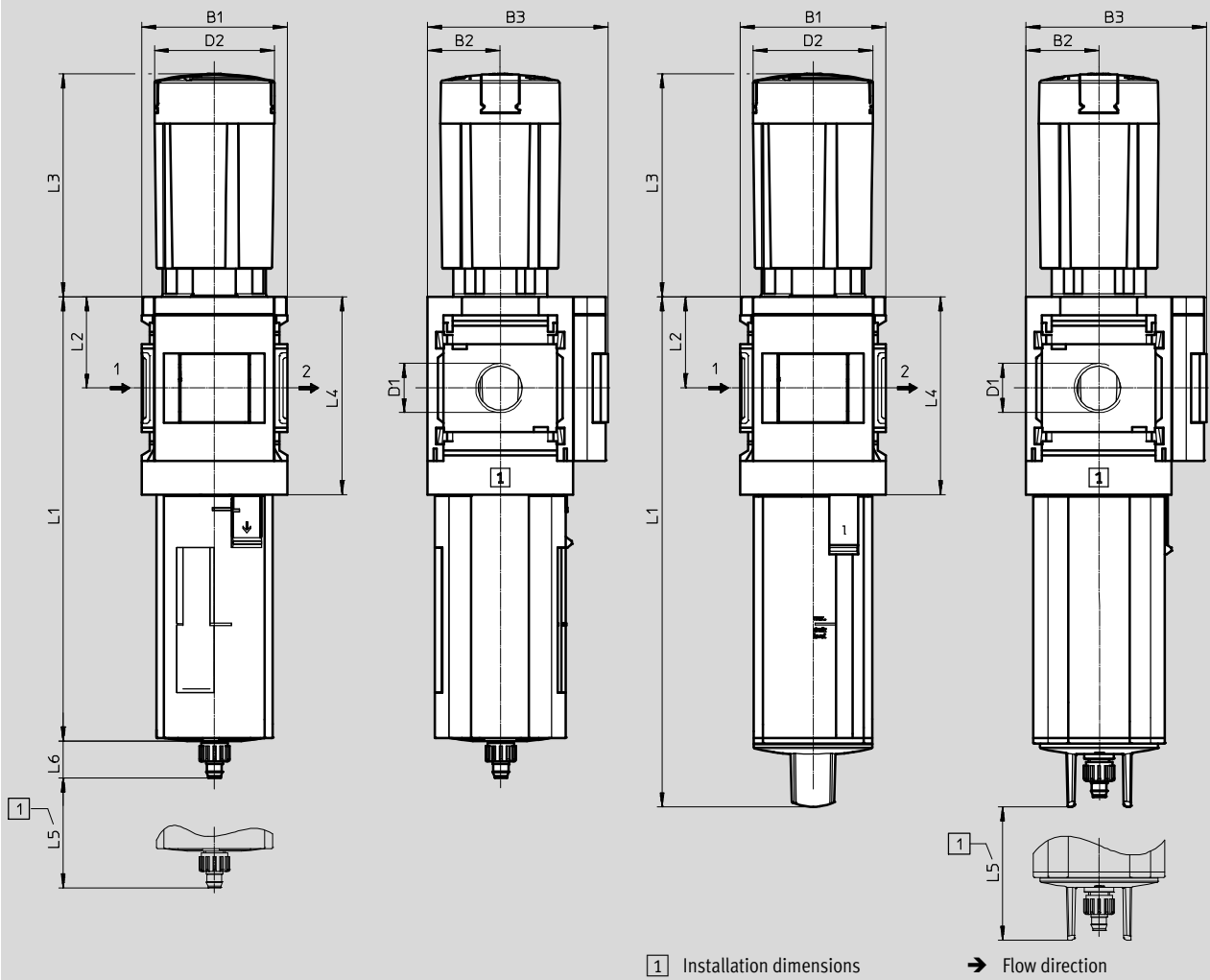
Dimensions – Basic version MS6-LFR

Download CAD data → www.festo.com

Integrated MS pressure gauge with standard scale, manual rotary condensate drain, rotary knob with detent, lockable via accessories

With plastic bowl guard R

With metal bowl U



| Type | B1 | B2 | B3 | D1 | D2 | L1 | | L2 | L3 | L4 | L5 | L6 |
|-------------|----|----|----|------|------|--------------------|------------|----|------|----|----|------|
| | | | | | | Plastic bowl guard | Metal bowl | | | | | |
| MS6-LFR-1/4 | 62 | 31 | 77 | G1/4 | 51.2 | 190 | 218 | 39 | 95.1 | 85 | 68 | 15.8 |
| MS6-LFR-3/8 | | | | G3/8 | | | | | | | | |
| MS6-LFR-1/2 | | | | G1/2 | | | | | | | | |

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

Filter regulators MS4/MS6-LFR, MS series

Technical data

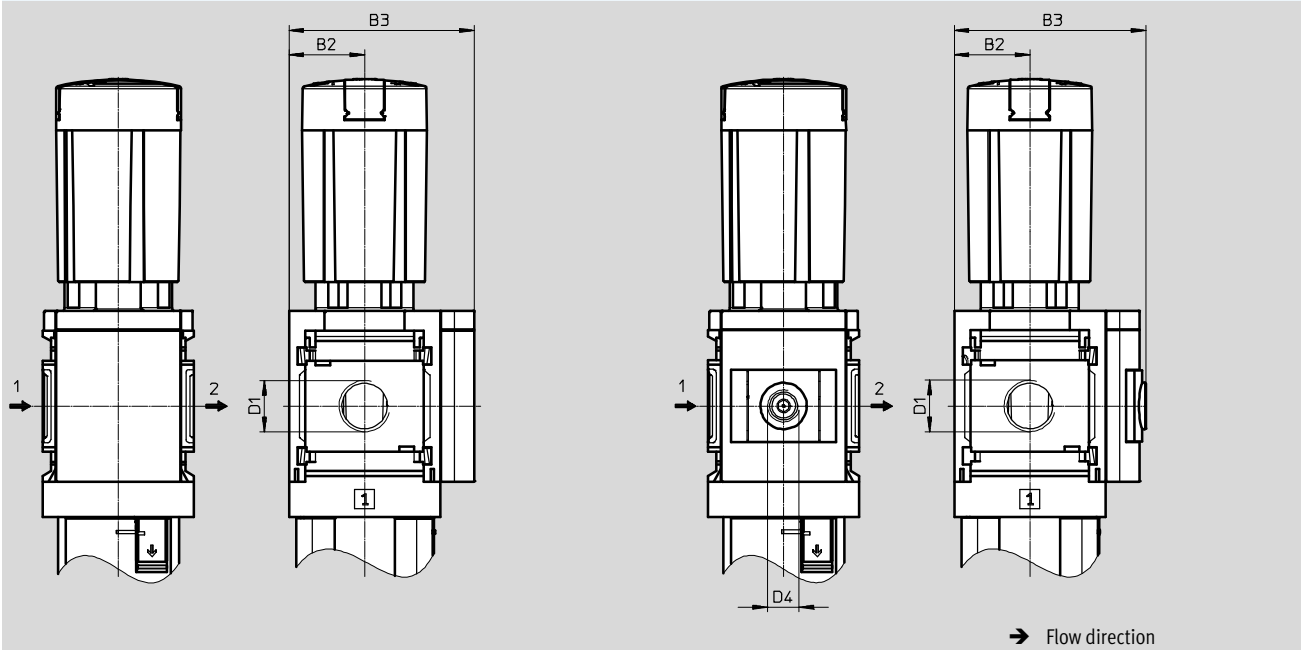
FESTO

Dimensions – Pressure gauge alternatives

Download CAD data → www.festo.com

Cover plate VS

Adapter plate A8/A4 for EN pressure gauge 1/8/1/4, without pressure gauge



| Type | B2 | B3 | D1 | D4 |
|--------------------|----|------|------|------|
| MS4-LFR-1/8-...-VS | 21 | 54 | G1/8 | - |
| MS4-LFR-1/4-...-VS | | | G1/4 | |
| MS4-LFR-1/8-...-A8 | 21 | 58.5 | G1/8 | G1/8 |
| MS4-LFR-1/4-...-A8 | | | G1/4 | |
| MS4-LFR-1/8-...-A4 | 21 | 58.5 | G1/8 | G1/4 |
| MS4-LFR-1/4-...-A4 | | | G1/4 | |
| MS6-LFR-1/4-...-VS | 31 | 76 | G1/4 | - |
| MS6-LFR-3/8-...-VS | | | G3/8 | |
| MS6-LFR-1/2-...-VS | | | G1/2 | |
| MS6-LFR-1/4-...-A4 | 31 | 78.5 | G1/4 | G1/4 |
| MS6-LFR-3/8-...-A4 | | | G3/8 | |
| MS6-LFR-1/2-...-A4 | | | G1/2 | |

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

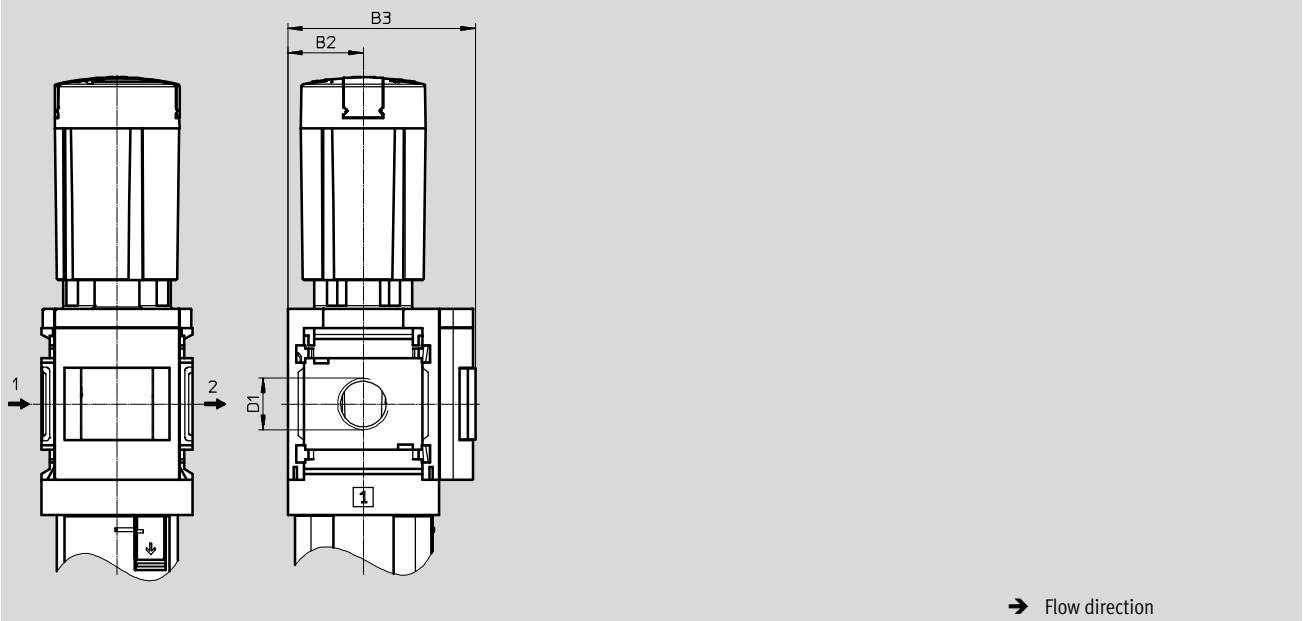
Filter regulators MS4/MS6-LFR, MS series

Technical data

Dimensions – Pressure gauge alternatives

Download CAD data → www.festo.com

Integrated MS pressure gauge with red/green scale RG



| Type | B2 | B3 | D1 |
|--------------------|----|------|------|
| MS4-LFR-1/8-...-RG | 21 | 58.5 | G1/8 |
| MS4-LFR-1/4-...-RG | | | G1/4 |
| MS6-LFR-1/4-...-RG | 31 | 78.5 | G1/4 |
| MS6-LFR-3/8-...-RG | | | G3/8 |
| MS6-LFR-1/2-...-RG | | | G1/2 |

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

Filter regulators MS4/MS6-LFR, MS series

Technical data

Dimensions – Pressure gauge alternatives Download CAD data → www.festo.com
 Pressure sensor with LCD display AD1 ... AD4 Technical data → Internet: sde1

Variant AD1:
SDE1-D10-G2-MS-L-P1-M8 with 3-pin plug M8x1, 1 switching output PNP

Variant AD2:
SDE1-D10-G2-MS-L-N1-M8 with 3-pin plug M8x1, 1 switching output NPN

Variant AD3:
SDE1-D10-G2-MS-L-PI-M12 with 4-pin plug M12x1, 1 switching output PNP and 4 ... 20 mA analogue

Variant AD4:
SDE1-D10-G2-MS-L-NI-M12 with 4-pin plug M12x1, 1 switching output NPN and 4 ... 20 mA analogue

→ Flow direction

| Type | B2 | B3 | D1 | D6 | L5 | L6 |
|-------------------------|----|------|------|-------|------|------|
| MS4-LFR-1/8-...-AD1/AD2 | 21 | 82.6 | G1/8 | M8x1 | 35.1 | 46.7 |
| MS4-LFR-1/4-...-AD1/AD2 | | | G1/4 | | | |
| MS4-LFR-1/8-...-AD3/AD4 | 21 | 82.6 | G1/8 | M12x1 | 35.1 | 55.8 |
| MS4-LFR-1/4-...-AD3/AD4 | | | G1/4 | | | |
| MS6-LFR-1/4-...-AD1/AD2 | 31 | 103 | G1/4 | M8x1 | 35.1 | 46.7 |
| MS6-LFR-3/8-...-AD1/AD2 | | | G3/8 | | | |
| MS6-LFR-1/2-...-AD1/AD2 | | | G1/2 | | | |
| MS6-LFR-1/4-...-AD3/AD4 | 31 | 103 | G1/4 | M12x1 | 35.1 | 55.8 |
| MS6-LFR-3/8-...-AD3/AD4 | | | G3/8 | | | |
| MS6-LFR-1/2-...-AD3/AD4 | | | G1/2 | | | |

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

Filter regulators MS4/MS6-LFR, MS series

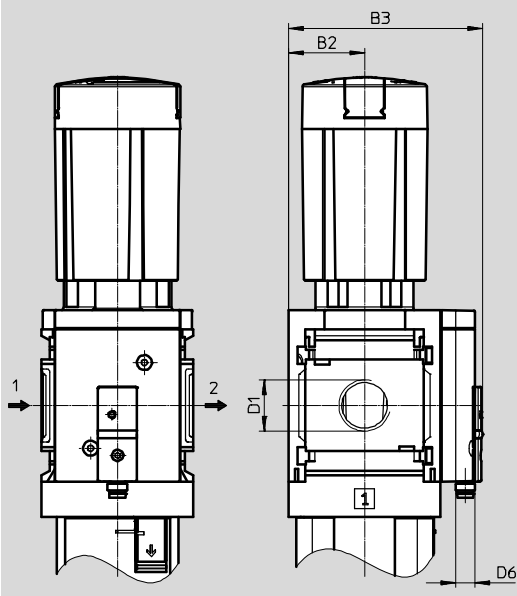
Technical data

Dimensions – Pressure gauge alternatives

Download CAD data → www.festo.com

Pressure sensor without LCD display (operational status indicator only) AD7 ... AD10

Technical data → Internet: sde5



Variant AD7:
SDE5-D10-O-...-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/O contact

Variant AD9:
SDE5-D10-O3-...-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/O contact

Variant AD8:
SDE5-D10-C-...-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/C contact

Variant AD10:
SDE5-D10-C3-...-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/C contact

→ Flow direction

| Type | B2 | B3 | D1 | D6 |
|----------------------------------|----|------|------|------|
| MS4-LFR-1/8-...-AD7/AD8/AD9/AD10 | 21 | 59.1 | G1/8 | M8x1 |
| MS4-LFR-1/4-...-AD7/AD8/AD9/AD10 | | | G1/4 | |
| MS6-LFR-1/4-...-AD7/AD8/AD9/AD10 | 31 | 79 | G1/4 | M8x1 |
| MS6-LFR-3/8-...-AD7/AD8/AD9/AD10 | | | G3/8 | |
| MS6-LFR-1/2-...-AD7/AD8/AD9/AD10 | | | G1/2 | |

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

Filter regulators MS4/MS6-LFR, MS series

Technical data



Dimensions – Rotary knob

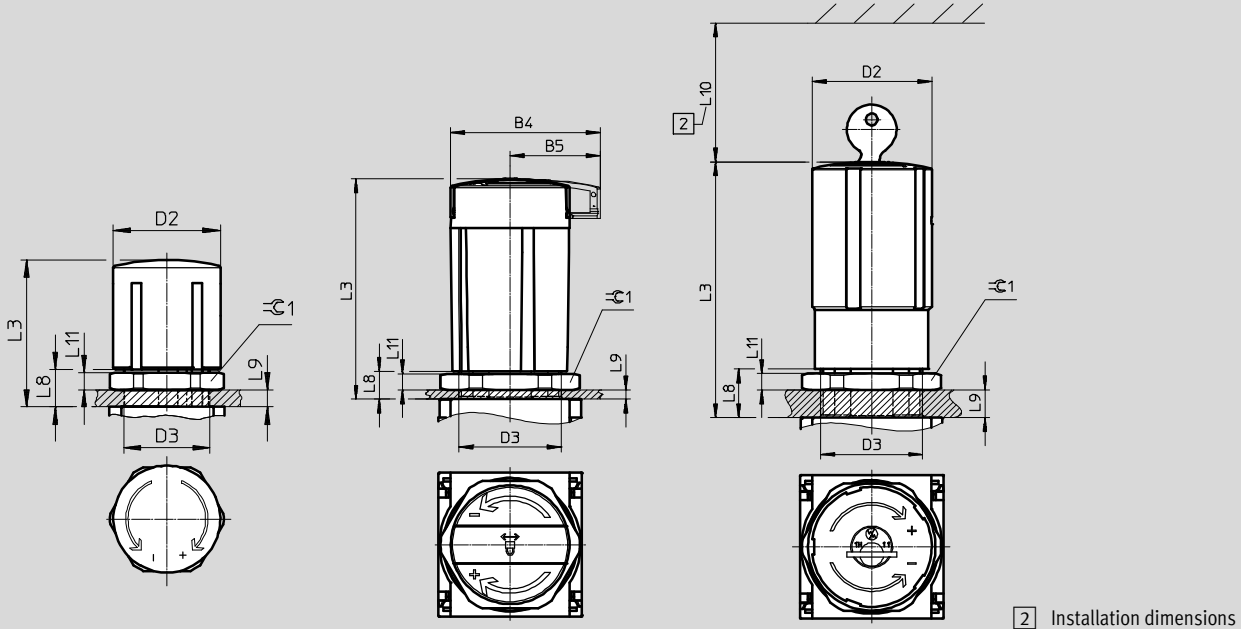
Download CAD data → www.festo.com

For installation into control panel or attaching with hex nut MS4/6-WRS (not included in the scope of delivery)

Rotary knob with detent

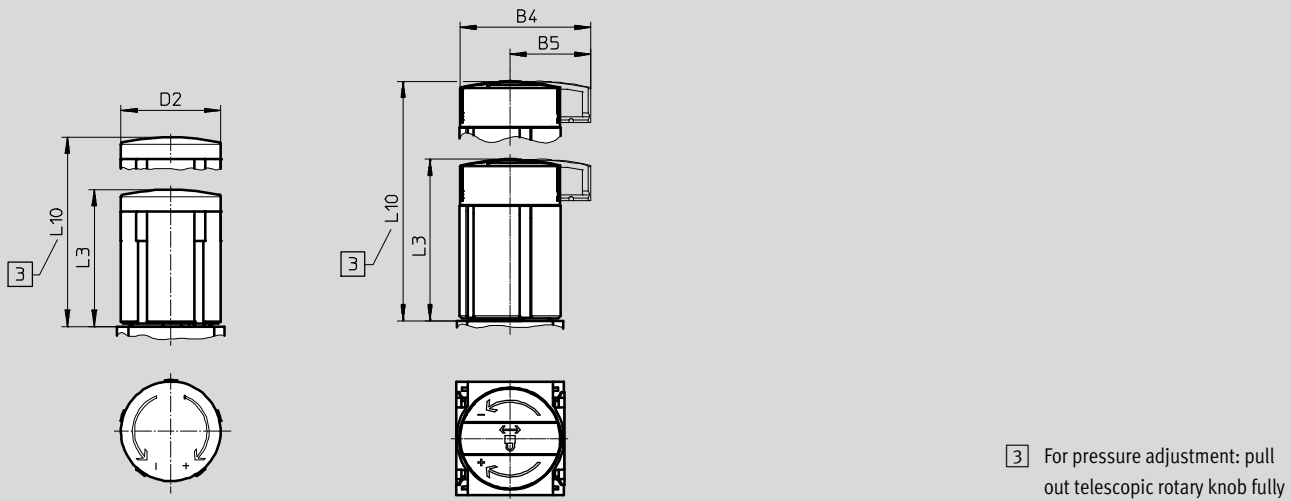
Rotary knob with detent, lockable via accessories AS

Rotary knob with integrated lock E11



Long rotary knob with detent LD

Long rotary knob with detent, lockable via accessories LD-AS

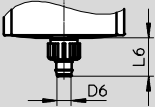
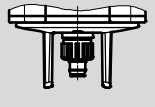
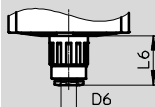
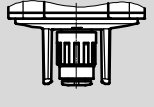
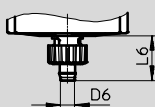
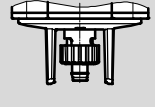


| Type | B4 | B5 | D2 | D3 | L3 | L8 | L9 | L10 | L11 | ⌀1 |
|-------------------|------|------|------|---------|------|------|------|------|-------|----|
| MS4-LFR-... | - | - | 37.2 | M30x1.5 | 51.1 | 13 | 5 | - | 6 | 36 |
| MS4-LFR-...-AS | 48.6 | 30 | | | 60.2 | 13 | 5 | | | |
| MS4-LFR-...-E11 | - | - | | | 76 | 14 | 6 | 60 | | |
| MS4-LFR-...-LD | - | - | | - | - | - | 76.8 | - | - | |
| MS4-LFR-...-LD-AS | 48.6 | 30 | - | - | 60 | - | - | 85.7 | - | - |
| MS6-LFR-... | - | - | 51.2 | M44x1 | 86 | 21 | 14 | - | 7 | 55 |
| MS6-LFR-...-AS | 64.4 | 38.8 | | | 95.1 | 12 | 5 | | | |
| MS6-LFR-...-E11 | - | - | | | 110 | 21 | 14 | 60 | | |
| MS6-LFR-...-LD | - | - | | - | - | - | 139 | - | - | |
| MS6-LFR-...-LD-AS | 64.4 | 38.8 | | - | - | 95.5 | - | - | 148.5 | - |

Filter regulators MS4/MS6-LFR, MS series

Technical data

Download CAD data → www.festo.com

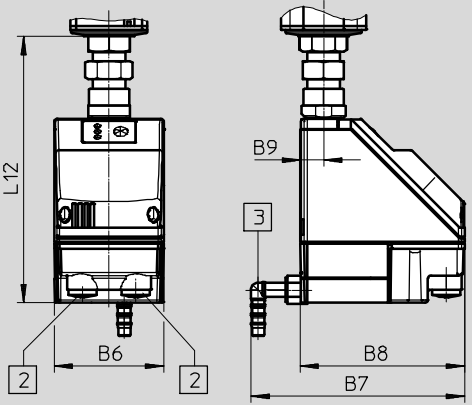
| Manual rotary M | | Semi-automatic H | | Fully automatic V | |
|---|---|---|---|---|---|
| MS4-...-R/U-M | MS6-...-U-M | MS4-...-R/U-H | MS6-...-U-H | MS4-...-R/U-V | MS6-...-U-V |
| MS6-...-R-M | | MS6-...-R-H | | MS6-...-R-V | |
|  |  |  |  |  |  |
| Barbed connector for plastic tubing PUN(H)-8x1,25 | | Push-in connector for plastic tubing PUN-6/PAN-6 | | Barbed connector for plastic tubing PUN(H)-8x1,25 | |

| Type | D6 Ø | L6 |
|----------------------|---------|------|
| Plastic bowl guard R | | |
| MS4-LFR-...-M | 5.6 | 17.7 |
| MS6-LFR-...-M | | 15.8 |
| Metal bowl U | | |
| MS4-LFR-...-M | 5.6 | 17.7 |
| MS6-LFR-...-M | | - |

| Type | D6 Ø | L6 |
|----------------------|---------|------|
| Plastic bowl guard R | | |
| MS4-LFR-...-H | 6.2 | 22.1 |
| MS6-LFR-...-H | | 20.4 |
| Metal bowl U | | |
| MS4-LFR-...-H | 6.2 | 22.1 |
| MS6-LFR-...-H | | - |

| Type | D6 Ø | L6 |
|----------------------|---------|------|
| Plastic bowl guard R | | |
| MS4-LFR-...-V | 5.6 | 20.4 |
| MS6-LFR-...-V | | 18.5 |
| Metal bowl U | | |
| MS4-LFR-...-V | 5.6 | 20.4 |
| MS6-LFR-...-V | | - |

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



Condensate drain PWEA:

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

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

Filter regulators MS4/MS6-LFR, MS series

Technical data

★ Core product range

| Ordering data | | | | | | |
|--|-----------------|------------------|--------------------------|-----------------------------------|---------------------------|-----------------------------------|
| Pressure regulation range 0.3 ... 7 bar, plastic bowl guard, integrated MS pressure gauge with standard scale, display unit [bar], rotary knob with detent, lockable via accessories | | | | | | |
| Size | Connection | Condensate drain | Grade of filtration 5 µm | | Grade of filtration 40 µm | |
| | | | Part No. | Type | Part No. | Type |
| Flow direction from left to right | | | | | | |
| MS4 | G $\frac{1}{4}$ | Manual rotary | ★ 529144 | MS4-LFR- $\frac{1}{4}$ -D6-CRM-AS | ★ 529148 | MS4-LFR- $\frac{1}{4}$ -D6-ERM-AS |
| | | Fully automatic | ★ 529146 | MS4-LFR- $\frac{1}{4}$ -D6-CRV-AS | ★ 529150 | MS4-LFR- $\frac{1}{4}$ -D6-ERV-AS |
| MS6 | G $\frac{1}{2}$ | Manual rotary | ★ 529176 | MS6-LFR- $\frac{1}{2}$ -D6-CRM-AS | ★ 529180 | MS6-LFR- $\frac{1}{2}$ -D6-ERM-AS |
| | | Fully automatic | ★ 529178 | MS6-LFR- $\frac{1}{2}$ -D6-CRV-AS | ★ 529182 | MS6-LFR- $\frac{1}{2}$ -D6-ERV-AS |

| Ordering data | | | | | | |
|---|-----------------|------------------|--------------------------|-----------------------------------|---------------------------|-----------------------------------|
| Pressure regulation range 0.5 ... 12 bar, plastic bowl guard, integrated MS pressure gauge with standard scale, display unit [bar], rotary knob with detent, lockable via accessories | | | | | | |
| Size | Connection | Condensate drain | Grade of filtration 5 µm | | Grade of filtration 40 µm | |
| | | | Part No. | Type | Part No. | Type |
| Flow direction from left to right | | | | | | |
| MS4 | G $\frac{1}{4}$ | Manual rotary | ★ 529152 | MS4-LFR- $\frac{1}{4}$ -D7-CRM-AS | ★ 529156 | MS4-LFR- $\frac{1}{4}$ -D7-ERM-AS |
| | | Fully automatic | ★ 529154 | MS4-LFR- $\frac{1}{4}$ -D7-CRV-AS | ★ 529158 | MS4-LFR- $\frac{1}{4}$ -D7-ERV-AS |
| MS6 | G $\frac{1}{2}$ | Manual rotary | ★ 529184 | MS6-LFR- $\frac{1}{2}$ -D7-CRM-AS | ★ 529188 | MS6-LFR- $\frac{1}{2}$ -D7-ERM-AS |
| | | Fully automatic | ★ 529186 | MS6-LFR- $\frac{1}{2}$ -D7-CRV-AS | ★ 529190 | MS6-LFR- $\frac{1}{2}$ -D7-ERV-AS |

| Ordering data | | | | | | |
|---|-----------------|------------------|--------------------------|-----------------------------------|---------------------------|-----------------------------------|
| Pressure regulation range 0.5 ... 12 bar, integrated as metal bowl, integrated MS pressure gauge with standard scale, display unit [bar], rotary knob with detent, lockable via accessories | | | | | | |
| Size | Connection | Condensate drain | Grade of filtration 5 µm | | Grade of filtration 40 µm | |
| | | | Part No. | Type | Part No. | Type |
| Flow direction from left to right | | | | | | |
| MS4 | G $\frac{1}{4}$ | Manual rotary | - | - | ★ 535724 | MS4-LFR- $\frac{1}{4}$ -D7-EUM-AS |
| | | Fully automatic | ★ 535720 | MS4-LFR- $\frac{1}{4}$ -D7-CUV-AS | ★ 535722 | MS4-LFR- $\frac{1}{4}$ -D7-EUV-AS |
| MS6 | G $\frac{1}{2}$ | Manual rotary | ★ 530338 | MS6-LFR- $\frac{1}{2}$ -D7-CUM-AS | ★ 529192 | MS6-LFR- $\frac{1}{2}$ -D7-EUM-AS |
| | | Fully automatic | ★ 530340 | MS6-LFR- $\frac{1}{2}$ -D7-CUV-AS | ★ 529194 | MS6-LFR- $\frac{1}{2}$ -D7-EUV-AS |

Festo core product range

- ★ Generally ready for shipping ex works in 24 hours
- ☆ Generally ready for shipping ex works in 5 days

Filter regulators MS4/MS6-LFR, MS series

Technical data

| Ordering data | | | | | | |
|--|-------------------------------|-------------------------------|--------------------------|---|---|---|
| Pressure regulation range 0.3 ... 7 bar, plastic bowl guard, integrated MS pressure gauge with standard scale, display unit [bar], rotary knob with detent, lockable via accessories | | | | | | |
| Size | Connection | Condensate drain | Grade of filtration 5 µm | | Grade of filtration 40 µm | |
| | | | Part No. | Type | Part No. | Type |
| Flow direction from left to right | | | | | | |
| MS4 | G ¹ / ₈ | Manual rotary | 529160 | MS4-LFR- ¹ / ₈ -D6-CRM-AS | 529164 | MS4-LFR- ¹ / ₈ -D6-ERM-AS |
| | | Fully automatic | 529162 | MS4-LFR- ¹ / ₈ -D6-CRV-AS | | 529166 |
| MS6 | G ¹ / ₄ | Manual rotary | 529196 | MS6-LFR- ¹ / ₄ -D6-CRM-AS | 529200 | MS6-LFR- ¹ / ₄ -D6-ERM-AS |
| | | Fully automatic | – | – | | 529202 |
| | G ³ / ₈ | Manual rotary | 529216 | MS6-LFR- ³ / ₈ -D6-CRM-AS | 529220 | MS6-LFR- ³ / ₈ -D6-ERM-AS |
| | | Fully automatic | 529218 | MS6-LFR- ³ / ₈ -D6-CRV-AS | | 529222 |
| Flow direction from right to left | | | | | | |
| MS4 | G ¹ / ₄ | Manual rotary | 529145 | MS4-LFR- ¹ / ₄ -D6-CRM-AS-Z | 529149 | MS4-LFR- ¹ / ₄ -D6-ERM-AS-Z |
| | | Fully automatic | – | – | | 529151 |
| MS6 | G ³ / ₈ | Fully automatic | 529219 | MS6-LFR- ³ / ₈ -D6-CRV-AS-Z | – | – |
| | | G ¹ / ₂ | Manual rotary | 529177 | MS6-LFR- ¹ / ₂ -D6-CRM-AS-Z | 529181 |
| | Fully automatic | | – | – | 529183 | |

| Ordering data | | | | | | |
|---|-------------------------------|-------------------------------|--------------------------|---|---|---|
| Pressure regulation range 0.5 ... 12 bar, plastic bowl guard, integrated MS pressure gauge with standard scale, display unit [bar], rotary knob with detent, lockable via accessories | | | | | | |
| Size | Connection | Condensate drain | Grade of filtration 5 µm | | Grade of filtration 40 µm | |
| | | | Part No. | Type | Part No. | Type |
| Flow direction from left to right | | | | | | |
| MS4 | G ¹ / ₈ | Manual rotary | 529168 | MS4-LFR- ¹ / ₈ -D7-CRM-AS | 529172 | MS4-LFR- ¹ / ₈ -D7-ERM-AS |
| | | Fully automatic | 529170 | MS4-LFR- ¹ / ₈ -D7-CRV-AS | | 529174 |
| MS6 | G ¹ / ₄ | Manual rotary | 529204 | MS6-LFR- ¹ / ₄ -D7-CRM-AS | 529208 | MS6-LFR- ¹ / ₄ -D7-ERM-AS |
| | | Fully automatic | 529206 | MS6-LFR- ¹ / ₄ -D7-CRV-AS | | 529210 |
| | G ³ / ₈ | Manual rotary | 529224 | MS6-LFR- ³ / ₈ -D7-CRM-AS | 529228 | MS6-LFR- ³ / ₈ -D7-ERM-AS |
| | | Fully automatic | 529226 | MS6-LFR- ³ / ₈ -D7-CRV-AS | | 529230 |
| Flow direction from right to left | | | | | | |
| MS4 | G ¹ / ₄ | Manual rotary | 529153 | MS4-LFR- ¹ / ₄ -D7-CRM-AS-Z | 529157 | MS4-LFR- ¹ / ₄ -D7-ERM-AS-Z |
| | | Fully automatic | 529155 | MS4-LFR- ¹ / ₄ -D7-CRV-AS-Z | | 529159 |
| MS6 | G ¹ / ₄ | Manual rotary | 529205 | MS6-LFR- ¹ / ₄ -D7-CRM-AS-Z | – | – |
| | | G ¹ / ₂ | Manual rotary | 529185 | MS6-LFR- ¹ / ₂ -D7-CRM-AS-Z | 529189 |
| | Fully automatic | | 529187 | MS6-LFR- ¹ / ₂ -D7-CRV-AS-Z | 529191 | |

| Ordering data | | | | | | |
|---|-------------------------------|------------------|--------------------------|---|---------------------------|---|
| Pressure regulation range 0.5 ... 12 bar, integrated as metal bowl, integrated MS pressure gauge with standard scale, display unit [bar], rotary knob with detent, lockable via accessories | | | | | | |
| Size | Connection | Condensate drain | Grade of filtration 5 µm | | Grade of filtration 40 µm | |
| | | | Part No. | Type | Part No. | Type |
| Flow direction from left to right | | | | | | |
| MS6 | G ³ / ₈ | Manual rotary | – | – | 529232 | MS6-LFR- ³ / ₈ -D7-EUM-AS |
| | | Fully automatic | 530348 | MS6-LFR- ³ / ₈ -D7-CUV-AS | | 529234 |

Filter regulators MS4/MS6-LFR, MS series

Ordering data – Modular products

| Ordering table | | | | | | | |
|----------------|---------------------------|---------------------------------------|------------------------------------|---------------------|-------------------|---------------|--|
| Grid dimension | [mm] | 40 | 62 | Condi- tions | Code | Enter code | |
| M | Module No. | 526489 | 526490 | | | | |
| | Series | Standard | | | MS | MS | |
| | Size | 4 | 6 | | ... | | |
| | Function | Filter regulator | | | -LFR | -LFR | |
| | Pneumatic connection | Female thread G $\frac{1}{8}$ | – | 1 | - $\frac{1}{8}$ | | |
| | | Female thread G $\frac{1}{4}$ | Female thread G $\frac{1}{4}$ | 1 | ★- $\frac{1}{4}$ | | |
| | | – | Female thread G $\frac{3}{8}$ | 1 | - $\frac{3}{8}$ | | |
| | | – | Female thread G $\frac{1}{2}$ | 1 | ★- $\frac{1}{2}$ | | |
| | | Connecting plate G $\frac{1}{8}$ | – | | -AGA | | |
| | | Connecting plate G $\frac{1}{4}$ | Connecting plate G $\frac{1}{4}$ | | ★-AGB | | |
| | | Connecting plate G $\frac{3}{8}$ | Connecting plate G $\frac{3}{8}$ | | -AGC | | |
| | | – | Connecting plate G $\frac{1}{2}$ | | ★-AGD | | |
| | | – | Connecting plate G $\frac{3}{4}$ | | -AGE | | |
| | | Connecting plate NPT $\frac{1}{8}$ | – | 1 | -AQK | | |
| | | Connecting plate NPT $\frac{1}{4}$ | Connecting plate NPT $\frac{1}{4}$ | 1 | -AQN | | |
| | | Connecting plate NPT $\frac{3}{8}$ | Connecting plate NPT $\frac{3}{8}$ | 1 | -AQP | | |
| | | – | Connecting plate NPT $\frac{1}{2}$ | 1 | -AQR | | |
| | | – | Connecting plate NPT $\frac{3}{4}$ | 1 | -AQS | | |
| | Pressure regulation range | 0.3 ... 4 bar | | | ★-D5 | | |
| | | 0.3 ... 7 bar | | | ★-D6 | | |
| | | 0.5 ... 12 bar | | | ★-D7 | | |
| | | – | 0.5 ... 16 bar | 1 | -D8 | | |
| | Grade of filtration | 40 μ m | | | ★-E | | |
| | | 5 μ m | | | ★-C | | |
| | Bowl | Plastic bowl with plastic bowl guard | | | ★-R | | |
| | | Metal bowl | | | -U | | |
| | Condensate drain | Manual | | | ★-M | | |
| | | Semi-automatic (P1 max. 12 bar) | | 2 | -H | | |
| | | Fully automatic (P1 max. 12 bar) | | 2 | ★-V | | |
| | | External, fully automatic, electrical | – | 115 V AC, terminals | 1 3 | -E2 | |
| | | | – | 230 V AC, terminals | 1 3 | -E3 | |
| | – | | 24 V DC, terminals | 1 3 | -E4 | | |

1 $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, AQK, AQN, AQP, AQR, AQS, D8, E2, E3, E4, AD1 ... AD4, AD7 ... AD10, **3** E2, E3, E4 Only with metal bowl U

E11, WPM

Not with EU certification EX4

2 H, V Not with pressure regulation range D8

M Mandatory data

O Options

Transfer order code

MS - **LFR** - - - - -

Festo core product range

★ Generally ready for shipping ex works in 24 hours

☆ Generally ready for shipping ex works in 5 days

Filter regulators MS4/MS6-LFR, MS series

Ordering data – Modular products

| Ordering table | | | | | | | |
|-------------------|---|--|--|-----------------|-------|---------------|--|
| Grid dimension | [mm] | 40 | 62 | Condi- tions | Code | Enter code | |
| O | Pressure gauge alternatives | Cover plate | | | ★ -VS | | |
| | | Adapter plate for EN pressure gauge 1/8, without pressure gauge | - | | -A8 | | |
| | | Adapter plate for EN pressure gauge 1/4, without pressure gauge | | | -A4 | | |
| | | Integrated pressure gauge, red-green scale | | 4 | -RG | | |
| | | Pressure sensor with LCD display, plug M8, 1 switching output PNP, 3-pin | | 1 | 5 | -AD1 | |
| | | Pressure sensor with LCD display, plug M8, 1 switching output NPN, 3-pin | | 1 | 5 | -AD2 | |
| | | Pressure sensor with LCD display, plug M12, 1 switching output PNP, 4-pin, analogue output 4 ... 20 mA | | 1 | 5 | -AD3 | |
| | | Pressure sensor with LCD display, plug M12, 1 switching output NPN, 4-pin, analogue output 4 ... 20 mA | | 1 | 5 | -AD4 | |
| | | Pressure sensor with operational status indicator, plug M8, threshold value comparator, PNP, N/O contact | | 1 | 5 | -AD7 | |
| | | Pressure sensor with operational status indicator, plug M8, threshold value comparator, PNP, N/C contact | | 1 | 5 | -AD8 | |
| | | Pressure sensor with operational status indicator, plug M8, window comparator, PNP, N/O contact | | 1 | 5 | -AD9 | |
| | | Pressure sensor with operational status indicator, plug M8, window comparator, PNP, N/C contact | | 1 | 5 | -AD10 | |
| | | Alternative pressure gauge scale | psi | | 6 | -PSI | |
| | | | MPa | | 6 | -MPA | |
| Secondary venting | Without secondary venting | | | -OS | | | |
| Rotary knob | Long rotary knob | | 7 | -LD | | | |
| M | Security | Without | | | | | |
| | | Lockable via accessories | | | ★ -AS | | |
| | | With integrated lock | | 1 | -E11 | | |
| O | Type of mounting | Mounting bracket with knurled nut for regulator head | | 8 | ★ -WR | | |
| | | Mounting bracket standard design | | 9 | -WP | | |
| | | Mounting bracket for attaching the service units | | 1 | 9 | -WPM | |
| | | Mounting bracket centrally at rear (wall mounting top and bottom), connecting plates not required | | | | ★ -WB | |
| | | Mounting bracket centrally at rear (wall mounting top), connecting plates not required | - | | | -WBM | |
| | | EU certification | II 2GD to EU Explosion Protection Directive (ATEX) | | | -EX4 | |
| UL certification | cULus, ordinary location for Canada and USA | | | -UL1 | | | |
| Flow direction | Flow direction from right to left | | | -Z | | | |

4 **RG** Alternative pressure gauge scale PSI serves only as an auxiliary scale

5 **AD1 ... AD4, AD7 ... AD10**
Measuring range max. 10 bar
Not with pressure regulation range D8

6 **PSI, MPA** Not with pressure gauge alternatives VS, A8, A4, AD1 ... AD4, AD7 ... AD10

7 **LD** Not with security E11

8 **WR** Not with long rotary knob LD

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

M Mandatory data

O Options

Transfer order code

- [] - [] - [] - [] - [] - [] - [] - [] - [] - []

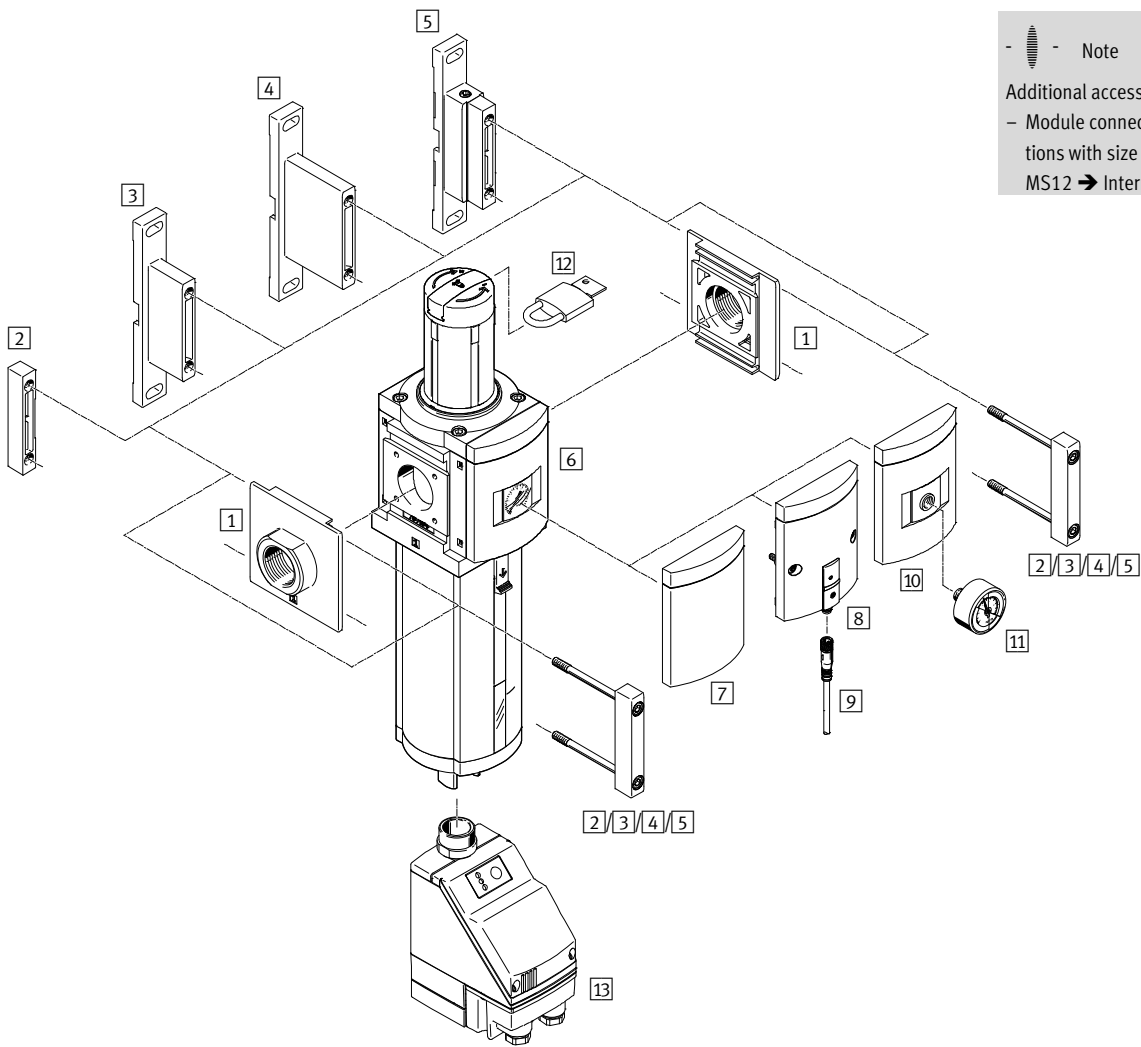
Festo core product range


★ Generally ready for shipping ex works in 24 hours

☆ Generally ready for shipping ex works in 5 days

Filter regulators MS9-LFR, MS series

Peripherals overview



-  - Note
 Additional accessories:
 - Module connector for combinations with size MS6, MS9 or MS12 → Internet: rmv, armv

Filter regulators MS9-LFR, MS series

Peripherals overview

FESTO

| Mounting attachments and accessories | | | | | |
|--------------------------------------|--|-------------------------------------|--|--|---------------------|
| | | Individual unit | | Combination Module without connect- ing thread, without connecting plate G/NG | → Page/ Internet |
| | | With female thread 3/4/1/N3/4/N1 | With connecting plate AG.../AQ... Without EU certification EX4 | | |
| 1 | Connecting plate-SET MS9-AG... | - | ■ | ■ | ms9-ag |
| | Connecting plate-SET MS9-AQ... | - | ■ | - | ms9-aq |
| 2 | Module connector MS9-MV | - | - | - | ms9-mv |
| 3 | Mounting bracket MS9-WP | ■ | ■ | ■ | ms9-wp |
| 4 | Mounting bracket MS9-WPB | ■ | ■ | ■ | ms9-wp |
| 5 | Mounting bracket MS9-WPM | ■ | ■ | - | ms9-wp |
| 6 | MS pressure gauge AG | ■ | ■ | ■ | 46 |
| 7 | Cover plate VS | ■ | ■ | ■ | 46 |
| 8 | Pressure sensor without display AD7 ... AD10 | ■ | ■ | - | 46 |
| 9 | Connecting cable NEBU-M8...-LE3 | ■ | ■ | - | 61 |
| 10 | Adapter plate for EN pressure gauge 1/4 A4 | ■ | ■ | ■ | 46 |
| 11 | Pressure gauge MA | ■ | ■ | ■ | 61 |
| 12 | Padlock LRVS-D | ■ | ■ | ■ | 61 |
| 13 | Condensate drain, fully automatic, electrically actuated E2/E3/E4 | ■ | ■ | - | 46 |

Filter regulators MS9-LFR, MS series

Type codes

FESTO

MS 9 - LFR - G - D6 - E U M - DI - AG - BAR - AS

Series

| | |
|----|-----------------------|
| MS | Standard service unit |
|----|-----------------------|

Size

| | |
|---|----------------------|
| 9 | Grid dimension 90 mm |
|---|----------------------|

Service function

| | |
|-----|------------------|
| LFR | Filter regulator |
|-----|------------------|

Pneumatic connection

| | |
|----|---|
| G | Module without connecting thread, without connecting plate |
| NG | Module without connecting thread, without connecting plate (inch) |

Pressure regulation range/operation mode

| | |
|----|-----------------------------------|
| D6 | 0.5 ... 7 bar, manually operated |
| D7 | 0.5 ... 12 bar, manually operated |

Grade of filtration

| | |
|---|-------|
| C | 5 µm |
| E | 40 µm |

Bowl guard

| | |
|---|--------------------------|
| U | Integrated as metal bowl |
|---|--------------------------|

Condensate drain

| | |
|---|-----------------|
| M | Manual rotary |
| V | Fully automatic |

Regulator type

| | |
|----|-------------------|
| | Piloted |
| DI | Directly actuated |

Pressure gauge

| | |
|----|-------------------|
| AG | MS pressure gauge |
|----|-------------------|

Pressure gauge scale

| | |
|-----|-----|
| BAR | bar |
| PSI | psi |

Security

| | |
|----|--|
| AS | Rotary knob with detent, can be locked using accessories |
|----|--|

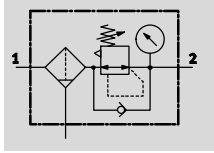
Additional variants can be ordered using the modular system → 46

- Pneumatic connection
- Pressure regulation range
- Condensate drain
- Pressure gauge alternatives
- Alternative pressure gauge scale
- Secondary venting
- Security lock
- Type of mounting
- EU certification
- UL certification
- Flow direction

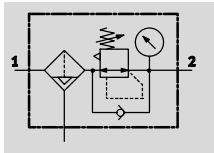
Filter regulators MS9-LFR, MS series

Technical data

Manual rotary condensate drain, with pressure gauge



Semi or fully automatic condensate drain, with pressure gauge



With this component, the filter and pressure regulator are combined into a single unit. The sintered filter with water separator removes contamination, pipe sinter, rust and condensate from the compressed air.

- - Flow rate
10,000 ... 23,000 l/min
- - Temperature range
-10 ... +60 °C
- - Supply pressure
1 ... 20 bar
- - www.festo.com



- Good regulation characteristics with low hysteresis and primary pressure compensation
- Good particle and condensate separation
- Piloted or directly actuated filter-diaphragm regulator
- High flow rates
- Available with or without secondary venting
- Four pressure regulation ranges: 0.5 ... 4 bar, 0.5 ... 7 bar, 0.5 ... 12 bar and 0.5 ... 16 bar
- Pressure gauge connection for different fitting options
- Available with manual, semi-automatic, fully automatic or fully automatic, electrically actuated condensate drain
- Actuator lock to protect set values against adjustment
- Optional pressure sensor
- Choice of filter cartridges: 5 µm or 40 µm
- New filter cartridges → 60
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22

| General technical data | | |
|--|---|---|
| Pneumatic connection 1, 2 | | |
| | Female thread | G3/4, G1, NPT3/4 or NPT1 |
| | Connecting plate AG... | G1/2, G3/4, G1, G1 1/4 or G1 1/2 |
| | Connecting plate AQ... | NPT1/2, NPT3/4, NPT1, NPT1 1/4 or NPT1 1/2 |
| | Module without connecting thread/plate G/NG | - |
| Design | | |
| | Piloted | Output pressure constant, with return flow action, with primary pressure compensation, with secondary venting |
| | Directly actuated | Output pressure constant, with return flow action, with/without secondary venting |
| Type of mounting | | |
| | | Via accessories |
| | | In-line installation |
| Mounting position | | |
| | | Vertical ±5° |
| Grade of filtration [µm] | | |
| | | 5 (air purity class at the output: compressed air in accordance with ISO 8573-1:2010 [6:4:4]) |
| | | 40 (air purity class at the output: compressed air in accordance with ISO 8573-1:2010 [7:4:4]) |
| Bowl guard | | |
| | | Integrated as metal bowl |
| Condensate drain | | |
| | | Manual rotary |
| | | Semi-automatic |
| | | Fully automatic |
| | | Fully automatic, electrically actuated |
| Security | | |
| | | Rotary knob with detent, lockable via accessories |
| | | Rotary knob with integrated lock |
| Pressure regulation range/operation mode | | |
| | D5 [bar] | 0.5 ... 4, manually operated |
| | D6 [bar] | 0.5 ... 7, manually operated |
| | D7 [bar] | 0.5 ... 12, manually operated (0.5 ... 10 with pressure sensor variant AD...) |
| | D8 [bar] | 0.5 ... 16, manually operated (0.5 ... 10 with pressure sensor variant AD...) |

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

Filter regulators MS9-LFR, MS series

FESTO

Technical data

| General technical data | |
|--------------------------------|---|
| Max. pressure hysteresis [bar] | 0.4 |
| Pressure display | Via pressure sensor for displaying output pressure via operational status indicator and electrical output |
| | Via pressure gauge for displaying output pressure |
| | Via pressure gauge with red/green scale for displaying output pressure |
| | G $\frac{1}{4}$ prepared |
| Max. condensate volume [ml] | 220 |

| Standard nominal flow rate $q_{nN}^{1)2)}$ [l/min] | | | | | |
|--|------------------------------------|----------------------|------------------------------------|---|----------------------|
| Design | Piloted filter-diaphragm regulator | | | Directly actuated filter-diaphragm regulator DI | |
| Pneumatic connection | G $\frac{3}{4}$ /NPT $\frac{3}{4}$ | G1/NPT1 | G $\frac{3}{4}$ /NPT $\frac{3}{4}$ | G1/NPT1 | |
| D5 – Pressure regulation range 0.5 ... 4 bar | | | | | |
| Grade of filtration | 5 μ m | 17,000 ³⁾ | 20,000 ³⁾ | 16,000 ³⁾ | 18,000 ³⁾ |
| | 40 μ m | 18,000 ³⁾ | 23,000 ³⁾ | 16,000 ³⁾ | 20,000 ³⁾ |
| D6 – Pressure regulation range 0.5 ... 7 bar | | | | | |
| Grade of filtration | 5 μ m | 15,000 | 18,000 | 12,000 | 10,000 |
| | 40 μ m | 16,000 | 20,000 | 12,000 | 10,000 |
| D7 – Pressure regulation range 0.5 ... 12 bar | | | | | |
| Grade of filtration | 5 μ m | 15,000 | 18,000 | – | – |
| | 40 μ m | 16,000 | 20,000 | – | – |
| D8 – Pressure regulation range 0.5 ... 16 bar | | | | | |
| Grade of filtration | 5 μ m | 15,000 | 18,000 | – | – |
| | 40 μ m | 16,000 | 20,000 | – | – |

1) All values $\pm 15\%$

2) Measured at $p_1 = 10$ bar and $p_2 = 6$ bar, $\Delta p = 1$ bar

3) Measured at $p_1 = 10$ bar and $p_2 = 4$ bar, $\Delta p = 1$ bar

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

| Operating and environmental conditions | | | | |
|--|--|--|--|--|
| Condensate drain | Manual rotary | Semi-automatic | Fully automatic | Fully automatic, electrically actuated |
| | M | H | V | E2/E3/E4 |
| Operating pressure [bar] | 1 ... 20 | 1.5 ... 12 | 2 ... 12 | 1 ... 16 |
| Operating medium | Compressed air in accordance with ISO 8573-1:2010 [-:4:-] | Compressed air in accordance with ISO 8573-1:2010 [-:4:-] | Compressed air in accordance with ISO 8573-1:2010 [7:4:-] | Compressed air in accordance with ISO 8573-1:2010 [-:4:-] |
| | Inert gases | | | |
| Ambient temperature [°C] | -10 ... +60 | +5 ... +60 | +5 ... +60 | +1 ... +60 |
| Ambient temperature with pressure sensor AD [°C] | 0 ... +50 | +5 ... +50 | +5 ... +50 | +1 ... +50 |
| Temperature of medium [°C] | -10 ... +60 | +5 ... +60 | +5 ... +60 | +1 ... +60 |
| Temperature of medium with pressure sensor AD [°C] | 0 ... +50 | +5 ... +50 | +5 ... +50 | +1 ... +50 |
| Storage temperature [°C] | -10 ... +60 | +5 ... +60 | +5 ... +60 | +1 ... +60 |
| Corrosion resistance class CRC ¹⁾ | 2 | | | |
| UL certification ²⁾ | cULus recognized (OL) | | | |

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

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

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

Filter regulators MS9-LFR, MS series

Technical data

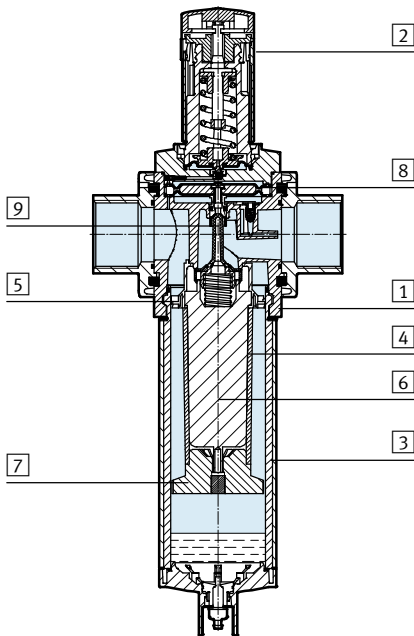
| ATEX | |
|---|---|
| EU certification | EX4 |
| ATEX category gas | II 2G |
| Ex-ignition protection type gas | Ex h IIC T6 Gb X |
| ATEX category dust | II 2D |
| EX-ignition protection type dust | Ex h IIIC T60°C Db X |
| ATEX ambient temperature | +5 °C ≤ Ta ≤ +60 °C |
| CE mark (see declaration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

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

| Weight [g] | | |
|---|-----------------------------|--------------------------|
| Rotary knob | Without integrated lock E11 | With integrated lock E11 |
| Filter regulator with metal bowl U | 2,400 | 2,700 |
| Filter regulator with metal bowl U and fully automatic condensate drain, electrically actuated E2/E3/E4 | 2,800 | 3,100 |

Materials

Sectional view



| Filter regulator | |
|-------------------------------------|--|
| 1 | Housing Die-cast aluminium |
| 2 | Rotary knob PA |
| | Rotary knob with integrated lock E11 Aluminium |
| 3 | Bowl Wrought aluminium alloy |
| | Inspection window PA |
| 4 | Filter element PE |
| 5 | Spin disc POM |
| 6 | Filter holder POM |
| 7 | Separating plate POM |
| 8 | Diaphragm NBR |
| 9 | Valve stem Wrought aluminium alloy, NBR, POM |
| - | Cover PA reinforced |
| - | Connecting plate, module connector, mounting bracket Die-cast aluminium |
| - | Seals NBR |
| Note on materials RoHS-compliant | |

Filter regulators MS9-LFR, MS series

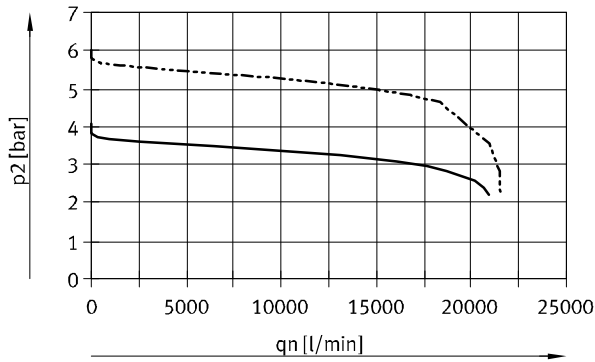
Technical data



Standard flow rate q_n as a function of output pressure p_2 at operating pressure $p_1 = 10$ bar

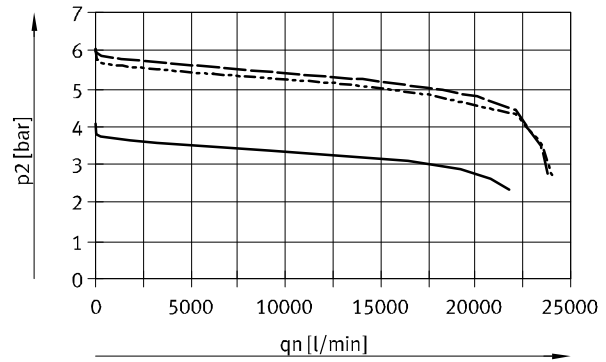
Piloted filter-diaphragm regulator

Grade of filtration 5 μm , pneumatic connection $G\frac{3}{4}/NPT\frac{3}{4}$



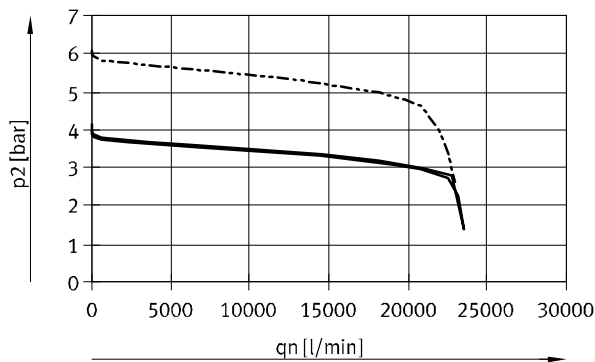
— MS9-LFR...-D5
 - - - MS9-LFR...-D6/D7/D8

Grade of filtration 40 μm , pneumatic connection $G\frac{3}{4}/NPT\frac{3}{4}$



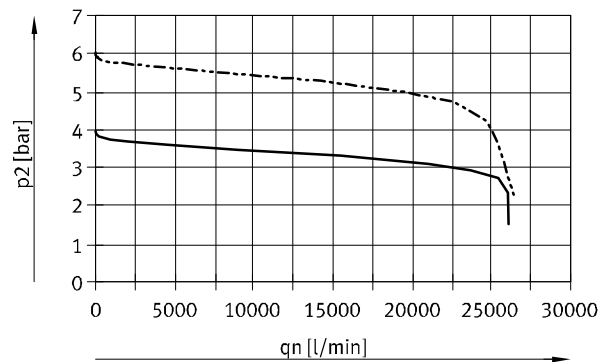
— MS9-LFR...-D5
 - - - MS9-LFR...-D6/D8
 - · - MS9-LFR...-D7

Grade of filtration 5 μm , pneumatic connection $G1/NPT1$



— MS9-LFR...-D5
 - - - MS9-LFR...-D6/D7/D8

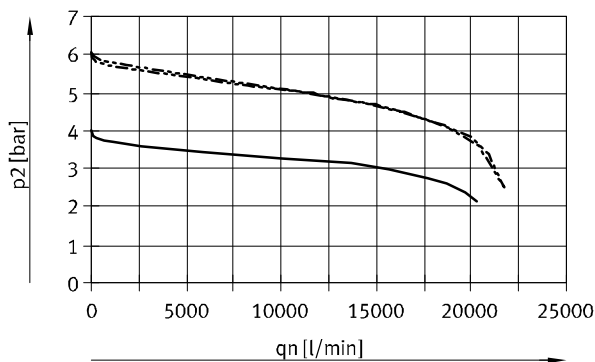
Grade of filtration 40 μm , pneumatic connection $G1/NPT1$



Standard flow rate q_n as a function of output pressure p_2 at operating pressure $p_1 = 10$ bar

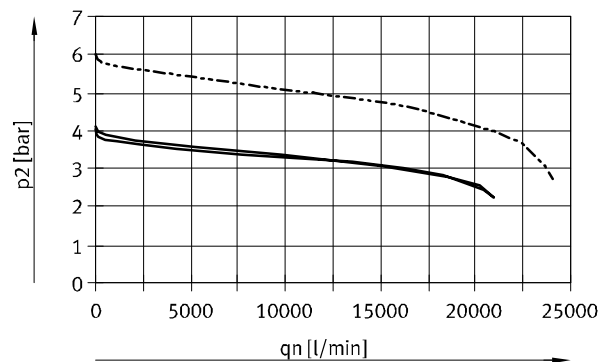
Directly actuated filter-diaphragm regulator DI

Grade of filtration 5 μm , pneumatic connection $G\frac{3}{4}/NPT\frac{3}{4}$



— MS9-LFR...-D5
 - - - MS9-LFR...-D6

Grade of filtration 40 μm , pneumatic connection $G\frac{3}{4}/NPT\frac{3}{4}$



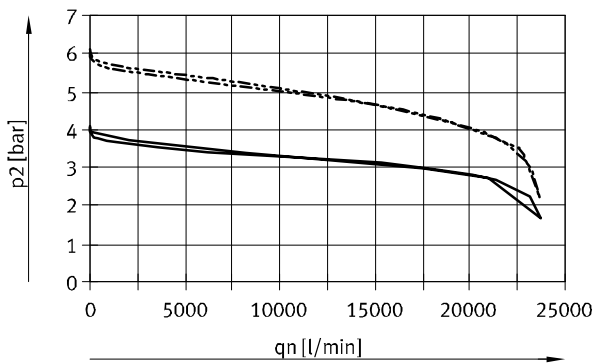
Filter regulators MS9-LFR, MS series

Technical data

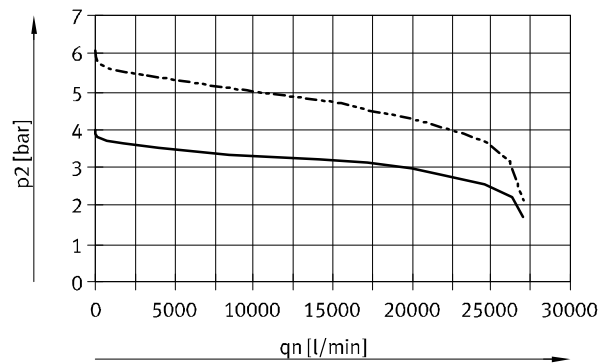
Standard flow rate q_n as a function of output pressure p_2 at operating pressure $p_1 = 10$ bar

Directly actuated filter-diaphragm regulator DI

Grade of filtration 5 μm , pneumatic connection G1/NPT1



Grade of filtration 40 μm , pneumatic connection G1/NPT1

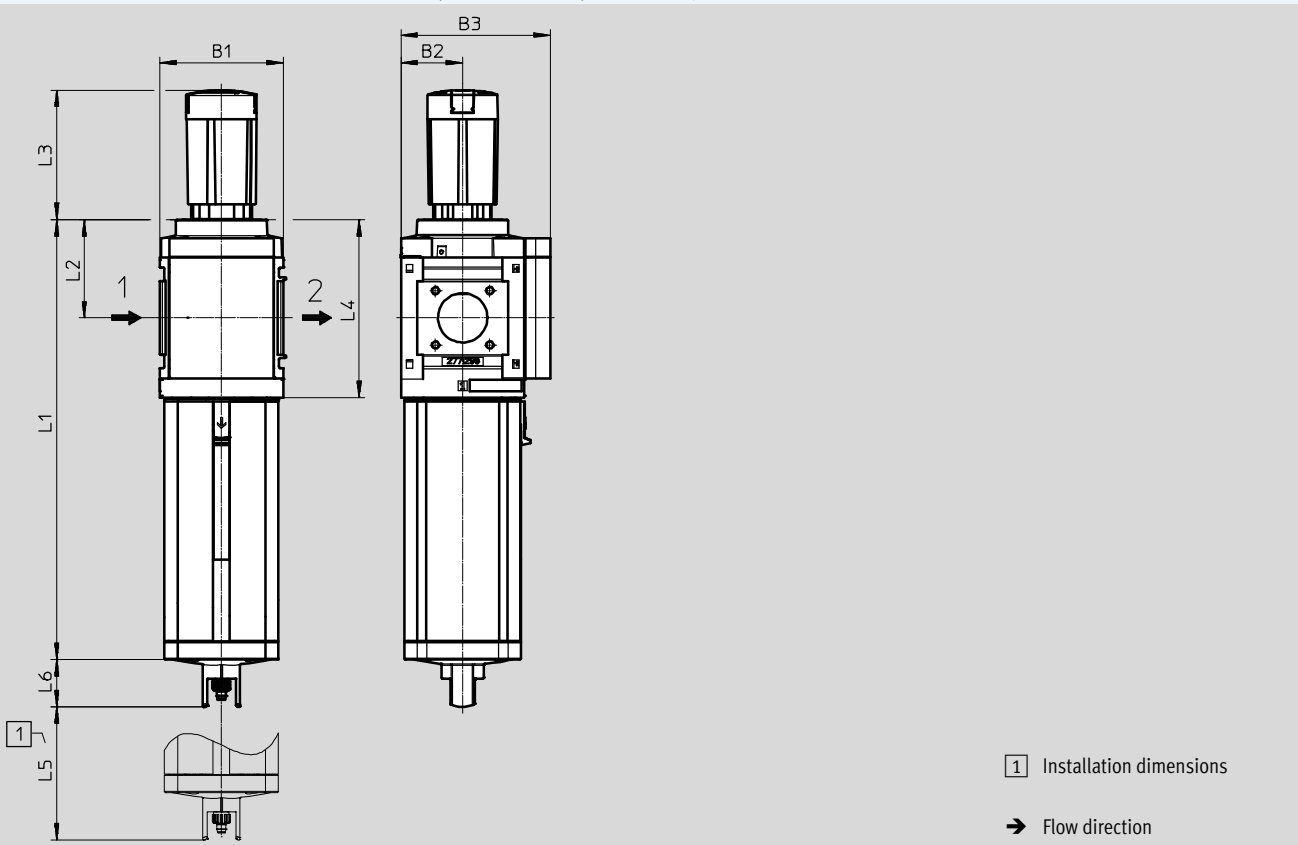


— MS9-LFR-...-D5
 - - - MS9-LFR-...-D6

Dimensions – Basic version

Download CAD data → www.festo.com

Module without connecting thread, without connecting plate G/NG, cover plate VS, rotary knob with detent, lockable via accessories



| Type | B1 | B2 | B3 | L1 | L2 | L3 | L4 | L5 | L6 |
|--------------|----|----|-----|-------|------|------|-----|-----|------|
| MS9-LFR-G/NG | 90 | 45 | 109 | 320.5 | 71.5 | 94.5 | 127 | 150 | 34.5 |

Filter regulators MS9-LFR, MS series

Technical data

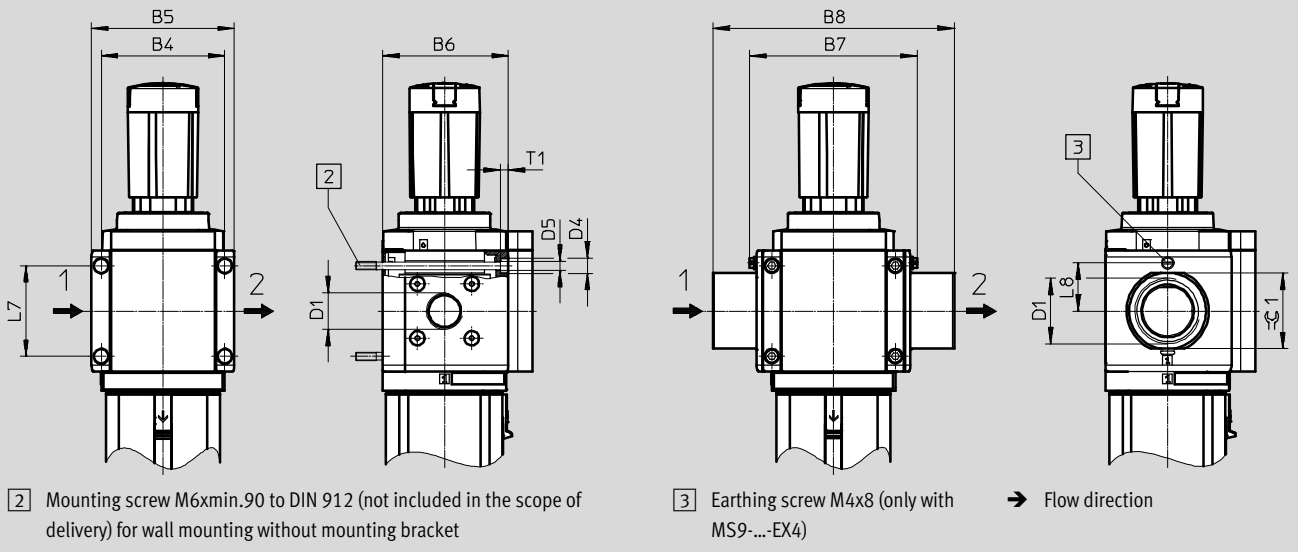
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Dimensions – Connecting thread/connecting plate

Download CAD data → www.festo.com

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

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



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

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

Filter regulators MS9-LFR, MS series

Technical data

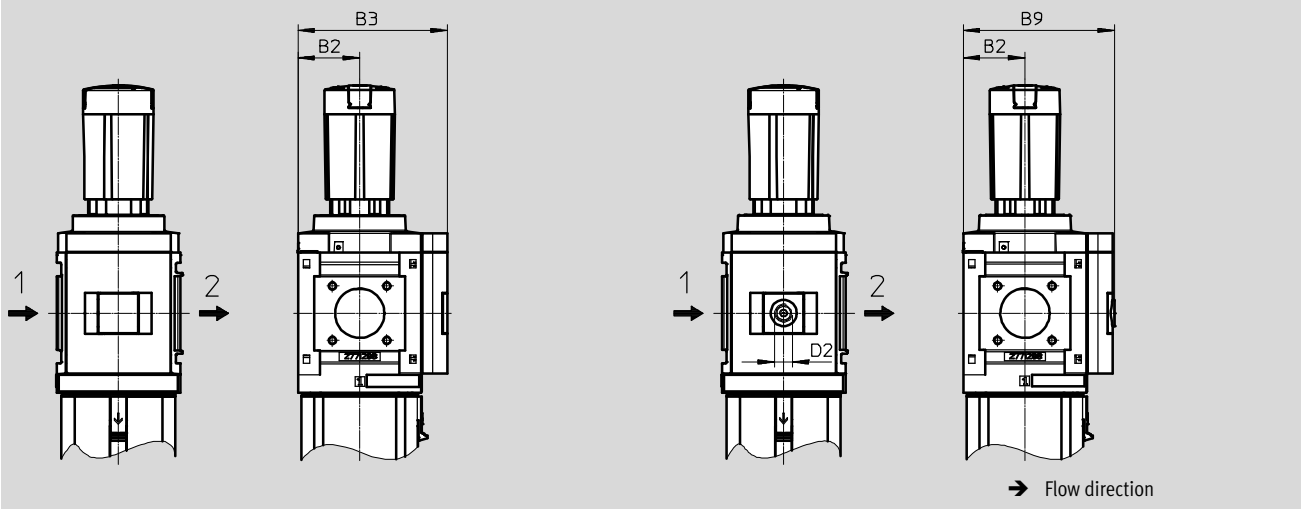
FESTO

Dimensions – Pressure gauge alternatives

Download CAD data → www.festo.com

Integrated MS pressure gauge with standard scale AG or red/green scale RG

Adapter plate A4 for EN pressure gauge 1/4, without pressure gauge



| Type | B2 | B3 | B9 | D2 |
|-------------------|----|-----|-----|------|
| MS9-LFR-...-AG/RG | 45 | 109 | - | - |
| MS9-LFR-...-A4 | | - | 110 | G1/4 |

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

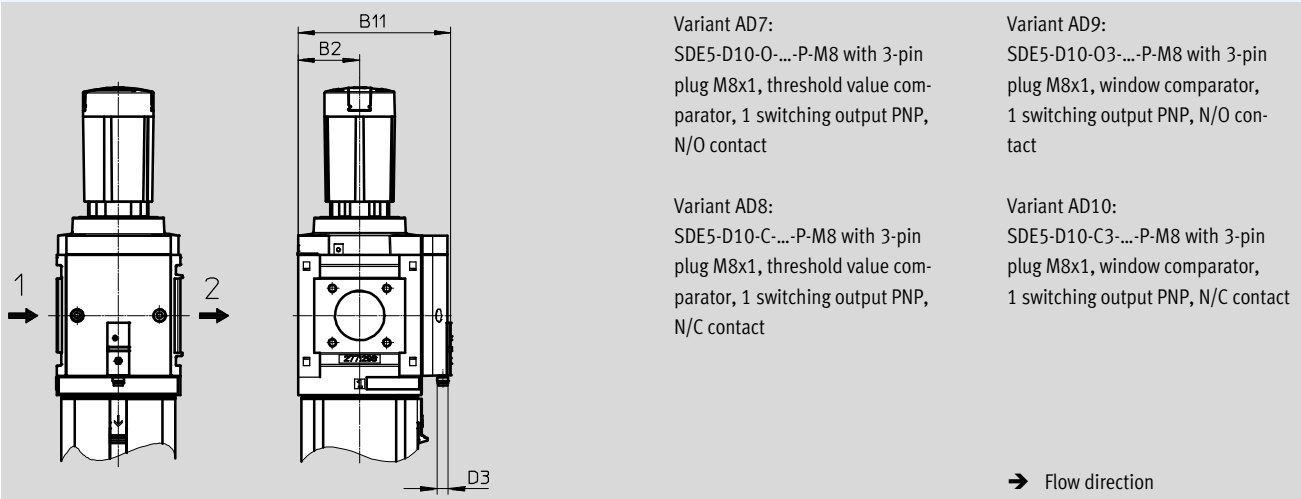
Dimensions – Pressure gauge alternatives

Download CAD data → www.festo.com

Pressure sensor without LCD display (operational status indicator only)

Technical data → Internet: sde5

AD7 ... AD10



Variant AD7:
SDE5-D10-0-...-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/O contact

Variant AD9:
SDE5-D10-03-...-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/O contact

Variant AD8:
SDE5-D10-C-...-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/C contact

Variant AD10:
SDE5-D10-C3-...-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/C contact

| Type | B2 | B11 | D3 |
|------------------------------|----|-----|------|
| MS9-LFR-...-AD7/AD8/AD9/AD10 | 45 | 112 | M8x1 |

Filter regulators MS9-LFR, MS series

Technical data

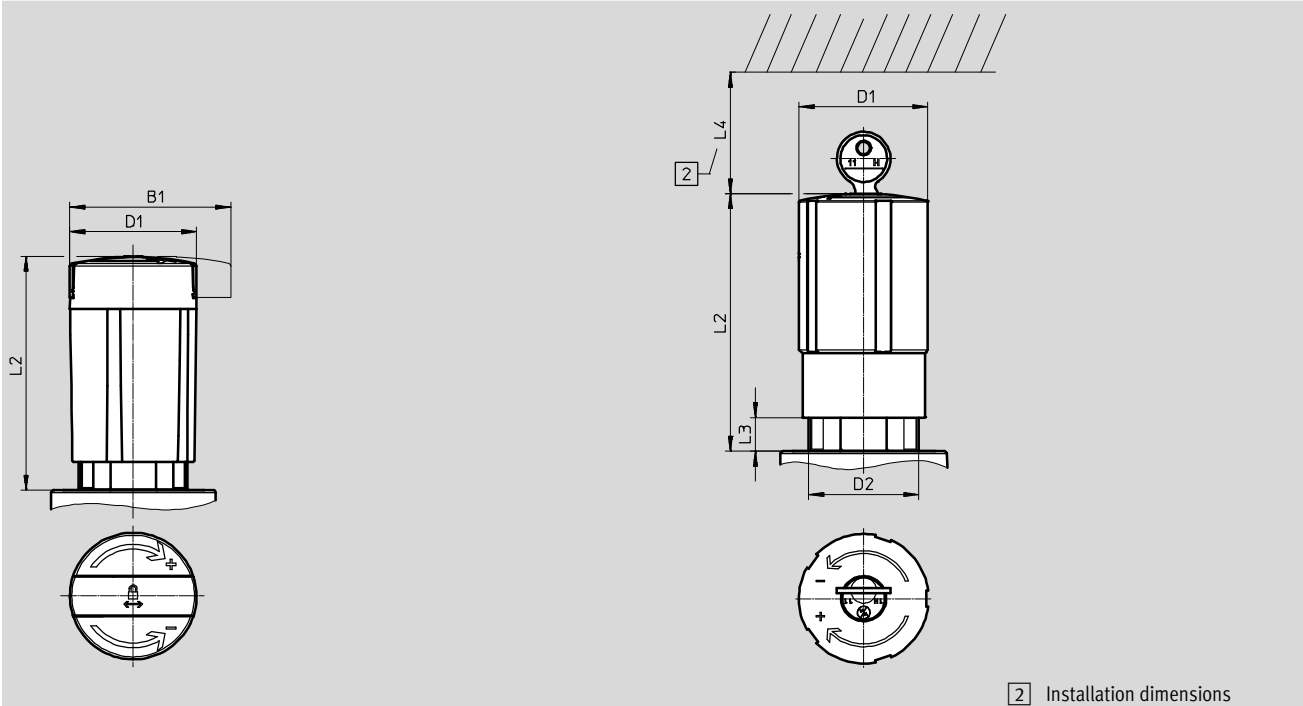
FESTO

Dimensions – Rotary knob

Download CAD data → www.festo.com

Rotary knob with detent, lockable via accessories AS

Rotary knob with integrated lock E11



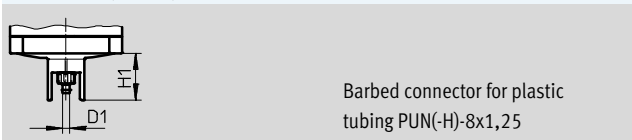
2 Installation dimensions

| Type | B1 | D1 | D2 | L2 | L3 | L4 |
|-----------------|------|------|-------|-------|------|----|
| MS9-LFR-...-AS | 64.4 | 51.2 | M44x1 | 94.5 | - | - |
| MS9-LFR-...-E11 | - | | | 103.5 | 13.5 | 60 |

Dimensions – Condensate drain

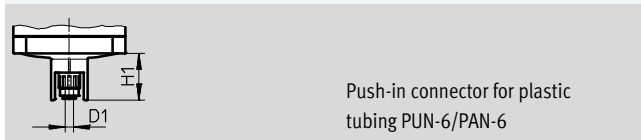
Download CAD data → www.festo.com

Manual rotary M/fully automatic V



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

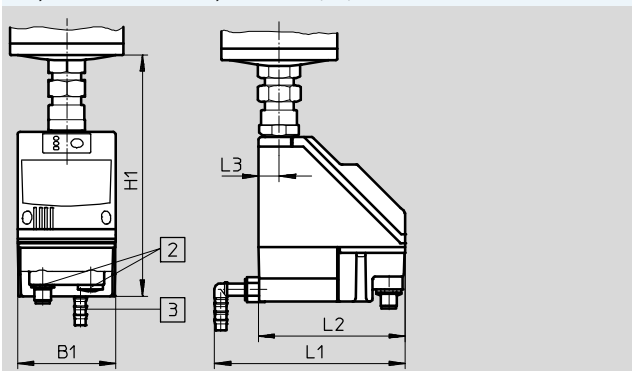
Semi-automatic H



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

Fully automatic, electrically actuated E2/E3/E4

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



Condensate drain PWEA:

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

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

Filter regulators MS9-LFR, MS series

Technical data

| Ordering data | | | | | |
|---|------------------|--------------------------|--------------------------------|---------------------------|--------------------------------|
| Size | Condensate drain | Grade of filtration 5 µm | | Grade of filtration 40 µm | |
| | | Part No. | Type | Part No. | Type |
| Pressure regulation range 0.5 ... 7 bar, piloted filter-diaphragm regulator, integrated MS pressure gauge with standard scale AG, display unit [bar], rotary knob with detent, lockable via accessories | | | | | |
| MS9 | Manual rotary | 564114 | MS9-LFR-G-D6-CUM-AG-BAR-AS | 564110 | MS9-LFR-G-D6-EUM-AG-BAR-AS |
| | Fully automatic | 564115 | MS9-LFR-G-D6-CUV-AG-BAR-AS | 564111 | MS9-LFR-G-D6-EUV-AG-BAR-AS |
| Pressure regulation range 0.5 ... 7 bar, directly actuated filter-diaphragm regulator, integrated MS pressure gauge with standard scale AG, display unit [bar], rotary knob with detent, lockable via accessories | | | | | |
| MS9 | Manual rotary | 564116 | MS9-LFR-G-D6-CUM-DI-AG-BAR-AS | 564112 | MS9-LFR-G-D6-EUM-DI-AG-BAR-AS |
| | Fully automatic | 564117 | MS9-LFR-G-D6-CUV-DI-AG-BAR-AS | 564113 | MS9-LFR-G-D6-EUV-DI-AG-BAR-AS |
| Pressure regulation range 0.5 ... 7 bar, directly actuated filter-diaphragm regulator, integrated MS pressure gauge with standard scale AG, display unit [psi], rotary knob with detent, lockable via accessories | | | | | |
| MS9 | Manual rotary | 564128 | MS9-LFR-NG-D6-CUM-DI-AG-PSI-AS | 564124 | MS9-LFR-NG-D6-EUM-DI-AG-PSI-AS |
| | Fully automatic | 564129 | MS9-LFR-NG-D6-CUV-DI-AG-PSI-AS | 564125 | MS9-LFR-NG-D6-EUV-DI-AG-PSI-AS |
| Pressure regulation range 0.5 ... 12 bar, piloted filter-diaphragm regulator, integrated MS pressure gauge with standard scale AG, display unit [bar], rotary knob with detent, lockable via accessories | | | | | |
| MS9 | Manual rotary | 564120 | MS9-LFR-G-D7-CUM-AG-BAR-AS | 564118 | MS9-LFR-G-D7-EUM-AG-BAR-AS |
| | Fully automatic | 564121 | MS9-LFR-G-D7-CUV-AG-BAR-AS | 564119 | MS9-LFR-G-D7-EUV-AG-BAR-AS |

Filter regulators MS9-LFR, MS series

Ordering data – Modular products

| Ordering table | | Grid dimension [mm] | 90 | Condi-tions | Code | Enter code | |
|----------------|-------------------------------------|---|--------------------------------------|-------------|-----------------------------------|------------|--|
| M | Module No. | 562531 | | | | | |
| | Series | Standard | | | MS | MS | |
| | Size | 9 | | | 9 | 9 | |
| | Function | Filter regulator | | | -LFR | -LFR | |
| | Pneumatic connection | Female thread G $\frac{3}{4}$ | | 1 | -$\frac{3}{4}$ | | |
| | | Female thread G1 | | 1 | -1 | | |
| | | Connecting plate G $\frac{1}{2}$ | | | -AGD | | |
| | | Connecting plate G $\frac{3}{4}$ | | | -AGE | | |
| | | Connecting plate G1 | | | -AGF | | |
| | | Connecting plate G1 $\frac{1}{4}$ | | | -AGG | | |
| | | Connecting plate G1 $\frac{1}{2}$ | | | -AGH | | |
| | | Female thread NPT $\frac{3}{4}$ | | 1 | -N$\frac{3}{4}$ | | |
| | | Female thread NPT1 | | 1 | -N1 | | |
| | | Connecting plate NPT $\frac{1}{2}$ | | 1 | -AQR | | |
| | | Connecting plate NPT $\frac{3}{4}$ | | 1 | -AQS | | |
| | | Connecting plate NPT1 | | 1 | -AQT | | |
| | | Connecting plate NPT1 $\frac{1}{4}$ | | 1 | -AQU | | |
| | | Connecting plate NPT1 $\frac{1}{2}$ | | 1 | -AQV | | |
| | | Module without connecting thread, without connecting plate | | 1 | -G | | |
| | | Module without connecting thread, without connecting plate (inch) | | 1 | -NG | | |
| | | Pressure regulation range/ operation mode | 0.5 ... 4 bar, manually operated | | | -D5 | |
| | 0.5 ... 7 bar, manually operated | | | | -D6 | | |
| | 0.5 ... 12 bar, manually operated | | | | -D7 | | |
| | 0.5 ... 16 bar, manually operated | | | 1 | -D8 | | |
| | Grade of filtration | 40 μ m | | | -E | | |
| | | 5 μ m | | | -C | | |
| | Bowl | Metal bowl | | | -U | -U | |
| | Condensate drain | Manual | | | -M | | |
| | | Semi-automatic (P1 max. 12 bar) | | | -H | | |
| | | Fully automatic (P1 max. 12 bar) | | | -V | | |
| | | External, fully automatic, electric | 115 V AC, terminals (P1 max. 16 bar) | | 1 | -E2 | |
| | | | 230 V AC, terminals (P1 max. 16 bar) | | 1 | -E3 | |
| | 24 V DC, terminals (P1 max. 16 bar) | | 1 | -E4 | | | |

1 $\frac{3}{4}$, 1, N $\frac{3}{4}$, N1, AQR, AQS, AQT, AQU, AQV, G, NG, D8, E2, E3, E4, AD7, AD8, AD9, AD10, E11, WPM
Not with EU certification EX4

- M** Mandatory data
- O** Options

Transfer order code

562531 MS 9 - LFR - [] - [] - [] - U - []

Filter regulators MS9-LFR, MS series

Ordering data – Modular products

| Ordering table | | | | | |
|--------------------------|--|--|---|-------|---------------|
| Grid dimension | [mm] | 90 | Condi- tions | Code | Enter code |
| <input type="checkbox"/> | Regulator type | Directly actuated | <input type="checkbox"/> 2 | -DI | |
| <input type="checkbox"/> | Pressure gauge/pressure gauge alternatives | MS pressure gauge | | -AG | |
| | | Cover plate | | -VS | |
| | | Adapter plate for EN pressure gauge 1/4, without pressure gauge | | -A4 | |
| | | Integrated pressure gauge, red/green scale | <input type="checkbox"/> 3 | -RG | |
| | | Pressure sensor with operational status indicator, plug M8, threshold value comparator, PNP, N/O contact | <input type="checkbox"/> 1 <input type="checkbox"/> 4 | -AD7 | |
| | | Pressure sensor with operational status indicator, plug M8, threshold value comparator, PNP, N/C contact | <input type="checkbox"/> 1 <input type="checkbox"/> 4 | -AD8 | |
| | | Pressure sensor with operational status indicator, plug M8, window comparator, PNP, N/O contact | <input type="checkbox"/> 1 <input type="checkbox"/> 4 | -AD9 | |
| | | Pressure sensor with operational status indicator, plug M8, window comparator, PNP, N/C contact | <input type="checkbox"/> 1 <input type="checkbox"/> 4 | -AD10 | |
| <input type="checkbox"/> | Alternative pressure gauge scale | psi | <input type="checkbox"/> 5 | -PSI | |
| | | MPa | <input type="checkbox"/> 5 | -MPA | |
| | | bar | <input type="checkbox"/> 5 | -BAR | |
| | Secondary venting | Without secondary venting | <input type="checkbox"/> 6 | -OS | |
| <input type="checkbox"/> | Security | Lockable via accessories | | -AS | |
| | | With integrated lock | <input type="checkbox"/> 1 | -E11 | |
| <input type="checkbox"/> | Type of mounting | Mounting bracket standard design | <input type="checkbox"/> 7 | -WP | |
| | | Mounting bracket for attaching the service units | <input type="checkbox"/> 1 <input type="checkbox"/> 7 | -WPM | |
| | | Mounting bracket for large wall gap | <input type="checkbox"/> 7 | -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, NG, D8, E2, E3, E4, AD7, AD8, AD9, AD10, 6 OS Only with regulator type DI
- E11, WPM** 7 WP, WPM, WPB Not with pneumatic connection G/NG
- Not with EU certification EX4
- 2 DI Not with pressure regulation range D7, D8
- 3 RG Not with alternative pressure gauge scale PSI
- PSI scale serves only as an auxiliary scale
- 4 AD7 ... AD10 Measuring range max. 10 bar
- 5 PSI, MPA, BAR Not with pressure gauge alternatives VS, A4, AD7, AD8, AD9, AD10

- Mandatory data
- Options

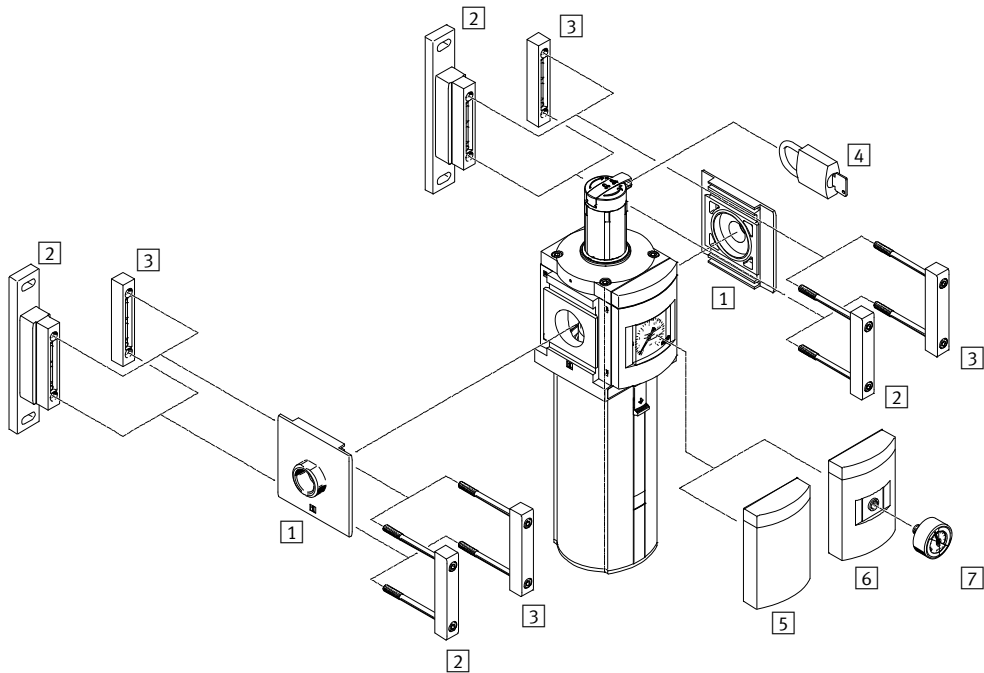
Transfer order code


- - - - - - - - - -

Filter regulators MS12-LFR, MS series

Peripherals overview

Filter regulators MS12-LFR



-  - Note
 Additional accessories:
 - Module connector for combination with size MS9 → Internet: armv

Mounting attachments and accessories

| | | → Page/Internet |
|---|---|-----------------|
| 1 | Connecting plate-SET MS12-AG... | ms12-ag |
| 2 | Mounting bracket MS12-WP | ms12-wp |
| 3 | Module connector MS12-MV | ms12-mv |
| 4 | Padlock LRVS-D | 61 |
| 5 | Cover plate VS | 56 |
| 6 | Adapter for EN pressure gauge 1/4 A4 | 56 |
| 7 | Pressure gauge MA | 61 |

Filter regulators MS12-LFR, MS series

Type codes

MS 12 - LFR - G - D7 - C U V - LD - AS

| Series | |
|---------------------------|---|
| MS | Standard service unit |
| Size | |
| 12 | Grid dimension 124 mm |
| Service function | |
| LFR | Filter regulator |
| Pneumatic connection | |
| G | Module without connecting thread, without connecting plate Connecting plates → Accessories |
| Pressure regulation range | |
| D7 | Pressure regulation range 0.5 ... 12 bar |
| Grade of filtration | |
| C | 5 µm |
| E | 40 µm |
| Bowl guard | |
| U | Integrated as metal bowl |
| Condensate drain | |
| V | Fully automatic |
| Rotary knob | |
| LD | Long rotary knob |
| Security | |
| AS | Rotary knob with detent, lockable via accessories |

Further variants can be ordered using the modular system → 56

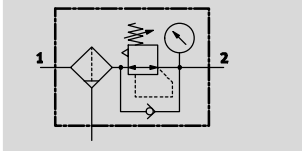
- Pneumatic connection
- Pressure regulation range
- Condensate drain
- Pressure gauge alternatives
- Alternative pressure gauge scale
- Security
- Type of mounting
- Flow direction

Filter regulators MS12-LFR, MS series

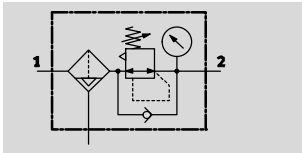
Technical data





FESTO

Function
Condensate drain
manual rotary
with pressure gauge



Condensate drain
fully automatic
with pressure gauge




-  - Flow rate
11,000 ... 17,000 l/min
-  - Temperature range
-10 ... +60 °C
-  - Operating pressure
0.8 ... 20 bar
-  - www.festo.com



With this device, the filter and pressure regulator are combined into a single unit. The sintered filter with water separator removes contamination, pipe sinter, rust and condensate from the compressed air.

- Good control characteristics with low hysteresis and primary pressure compensation
- Good particle and condensate separation
- High flow rates
- Pilot actuated diaphragm regulator without intrinsic air consumption
- Three pressure regulation ranges: 0.3 ... 7 bar, 0.5 ... 12 bar and 0.5 ... 16 bar
- Pressure gauge connection for different fitting options
- Available with manual, fully automatic or fully automatic, electrically actuated condensate drain
- Regulator lock for protecting the values against adjustment
- Choice of filter cartridges: 5 µm or 40 µm
- New filter cartridges → 60

| General technical data | | |
|---|--|--------------------|
| Pneumatic connection 1, 2 | | |
| Connecting plate AG... | | G1, G1¼, G1½ or G2 |
| Module without connecting thread/plate G | | – |
| Design | | |
| Filter regulator with/without pressure gauge | | |
| Sintered filter with centrifugal separation | | |
| Pilot actuated diaphragm regulator | | |
| Regulating function | | |
| Output pressure constant, with primary pressure compensation, with secondary venting | | |
| Type of mounting | | |
| Via accessories | | |
| In-line installation | | |
| Assembly position | | |
| Vertical ±5° | | |
| Grade of filtration [µm] | | 5 |
| | | 40 |
| Air purity class at the output | | |
| Compressed air in accordance with ISO 8573-1:2010 [6:4:4] (Grade of filtration 5 µm) | | |
| Compressed air in accordance with ISO 8573-1:2010 [7:4:4] (Grade of filtration 40 µm) | | |
| Bowl guard | | |
| Integrated as metal bowl | | |
| Condensate drain | | |
| Manual rotary | | |
| Fully automatic | | |
| Fully automatic, electrical actuated | | |
| Regulator lock | | |
| Rotary knob with detent, lockable via accessories | | |
| Rotary knob with integrated lock | | |
| Pressure regulation range | | |
| D6 [bar] | | 0.3 ... 7 |
| D7 [bar] | | 0.5 ... 12 |
| D8 [bar] | | 0.5 ... 16 |
| Max. hysteresis [bar] | | 0.4 |
| Pressure indicator | | |
| With pressure gauge | | |
| Max. condensate volume [cm³] | | 400 |

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

Filter regulators MS12-LFR, MS series

Technical data

| Standard nominal flow rate $q_{nN}^{1)}$ [l/min] | | | | | |
|--|-------|--------|--------|--------|--------|
| Pneumatic connection | G1 | G1¼ | G1½ | G2 | |
| Grade of filtration | 5 µm | 11,000 | 11,500 | 12,000 | 14,000 |
| | 40 µm | 12,000 | 12,500 | 13,000 | 17,000 |

- 1) Dependent on connecting plate selected, must be ordered separately as an accessory → Internet: ms12-ag
 measured at $p_1 = 10$ bar and $p_2 = 6$ bar, $\Delta p = 0.5$ bar
 - 125 l/min must be available for the fully automatic condensate drain to close correctly.

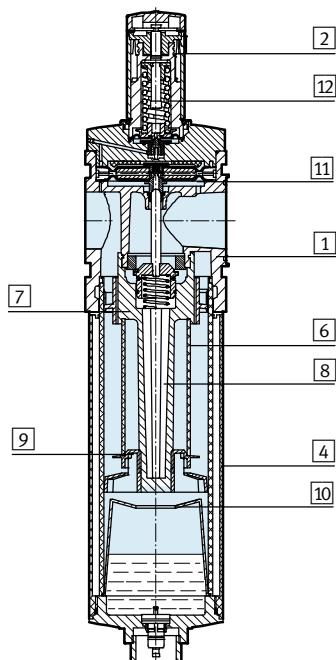
| Operating and environmental conditions | | | |
|--|--|--|--|
| Condensate drain | Manual rotary M | Fully automatic V | Fully automatic, electrically actuated E2/E3/E4 |
| Operating pressure [bar] | 0.8 ... 20 | 2 ... 12 | 0.8 ... 16 |
| Operating medium | Compressed air in accordance with ISO 8573-1:2010 [-:4:-] | Compressed air in accordance with ISO 8573-1:2010 [7:4:-] | Compressed air in accordance with ISO 8573-1:2010 [-:4:-] |
| | Inert gases | | |
| Ambient temperature [°C] | -10 ... +60 | +5 ... +60 | +1 ... +60 |
| Temperature of medium [°C] | -10 ... +60 | +5 ... +60 | +1 ... +60 |
| Storage temperature [°C] | -10 ... +60 | -10 ... +60 | +1 ... +60 |
| Corrosion resistance class CRC ¹⁾ | 2 | | |

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

| Weights [g] | | |
|---|-----------------------------|--------------------------|
| Rotary knob | Without integrated lock E11 | With integrated lock E11 |
| Filter regulator with metal bowl U | 7,000 | 7,300 |
| Filter regulator with metal bowl U and fully automatic, electrically actuated condensate drain E2/E3/E4 | 7,700 | 8,000 |

Materials

Sectional view



| Filter regulator | |
|------------------|---|
| 1 | Body Die-cast aluminium |
| 2 | Rotary knob PA |
| | Rotary knob with integrated lock E11 Aluminium |
| 4 | Metal bowl Wrought aluminium alloy |
| 6 | Filter element Sintered bronze |
| 7 | Spin disc POM |
| 8 | Filter holder POM |
| 9 | Separating plate POM |
| 10 | Stabilising disc POM |
| 11 | Diaphragm NBR |
| 12 | Spring Steel |
| - | Seals NBR |

Filter regulators MS12-LFR, MS series

Technical data



Standard flow rate q_n as a function of output pressure p_2

Grade of filtration 40 μm

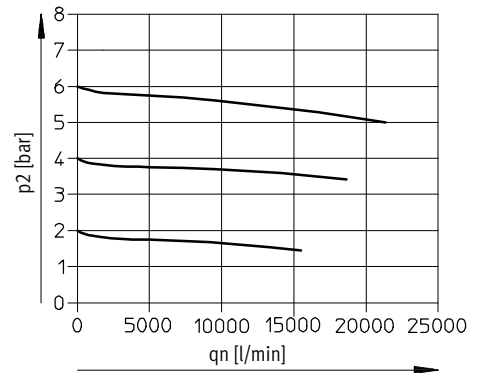
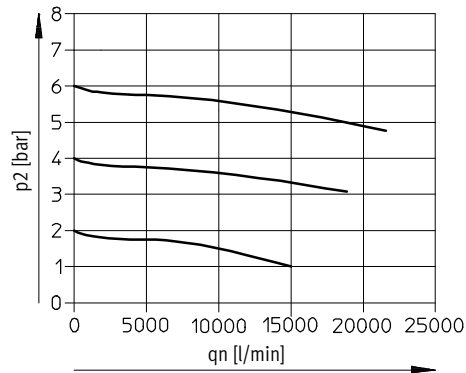
With connecting plate MS12-AGF

Pneumatic connection G1

With connecting plate MS12-AGG

Pneumatic connection G1¼

Input pressure $p_1 = 10$ bar



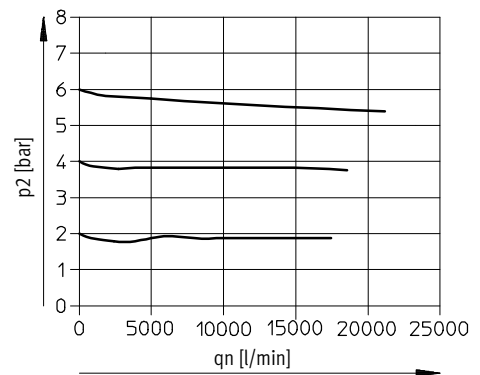
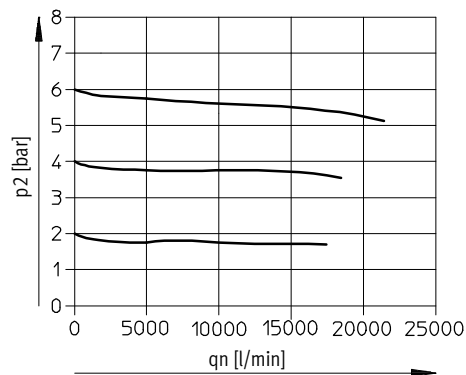
With connecting plate MS12-AGH

Pneumatic connection G1½

With connecting plate MS12-AGI

Pneumatic connection G2

Input pressure $p_1 = 10$ bar



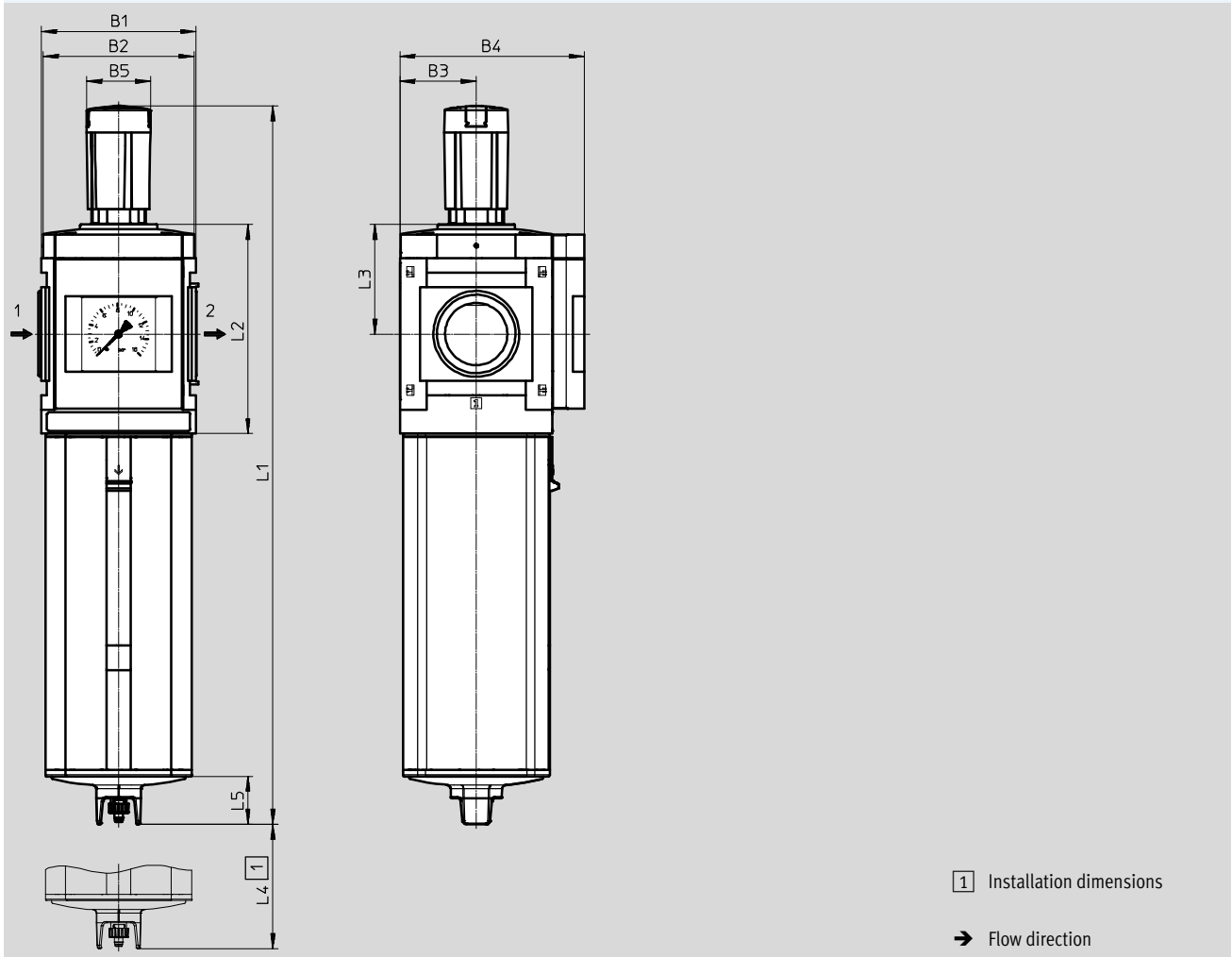
Filter regulators MS12-LFR, MS series

Technical data

Dimensions – Basic version

Download CAD data → www.festo.com

Module without connecting thread, without connecting plate, integrated MS pressure gauge with standard scale, long rotary knob with detent, lockable via accessories



| Type | B1 | B2 | B3 | B4 | B5 | L1 | L2 | L3 | L4 | L5 |
|------------|-----|-----|----|-----|-----------|-----|-----|----|-----|----|
| MS12-LFR-G | 124 | 122 | 61 | 148 | 51.2 ∅ | 577 | 168 | 88 | 250 | 39 |

Filter regulators MS12-LFR, MS series

Technical data

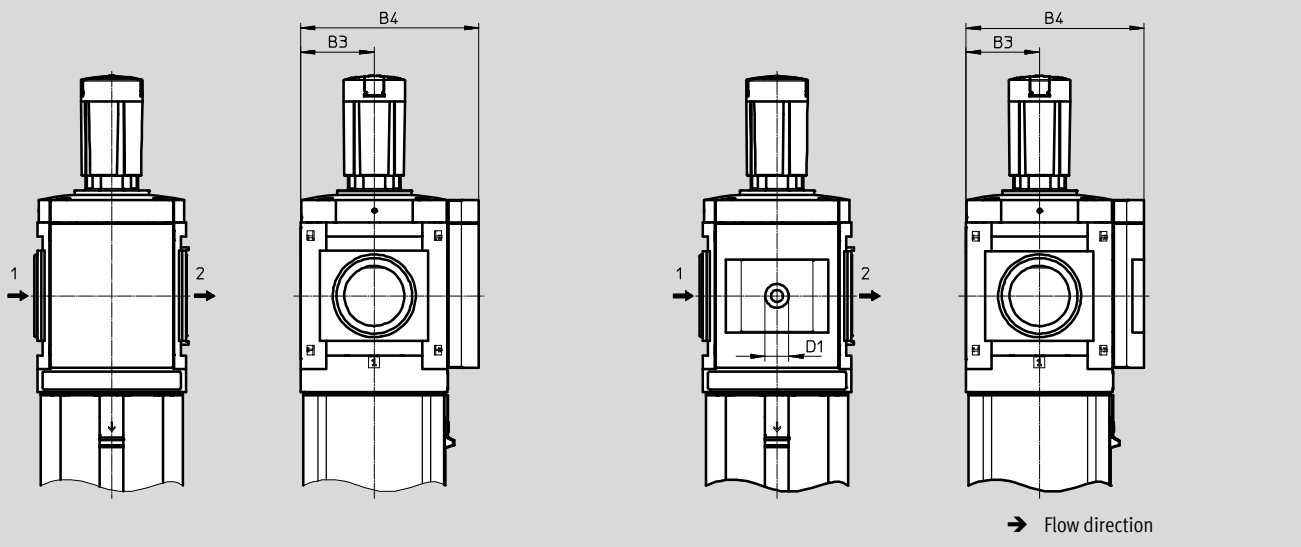
FESTO

Dimensions – Pressure gauge alternatives

Download CAD data → www.festo.com

Cover plate VS

Adapter A4 for EN pressure gauge 1/4, without pressure gauge



| Type | B3 | B4 | D4 |
|-----------------|----|-----|------|
| MS12-LFR-...-VS | 61 | 148 | – |
| MS12-LFR-...-A4 | 61 | 148 | G1/4 |

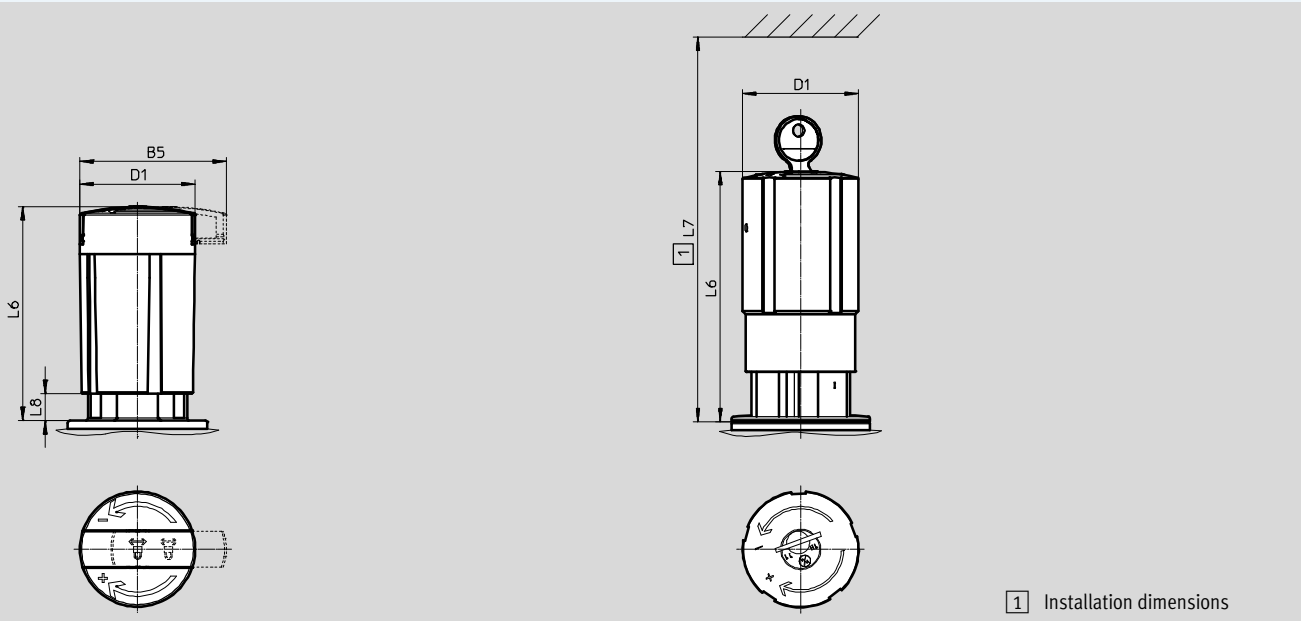
– Note: This product conforms to ISO 1179-1 and to ISO 228-1

Dimensions – Rotary knob

Download CAD data → www.festo.com

Long rotary knob with detent, lockable via accessories LD-AS

Rotary knob with integrated lock E11



| Type | B5 | D1 | L6 | L7 | L8 |
|--------------------|------|------|-----|-----|----|
| MS12-LFR-...-LD-AS | 64.4 | 51.2 | 96 | – | 12 |
| MS12-LFR-...-E11 | – | 51.8 | 112 | 172 | – |

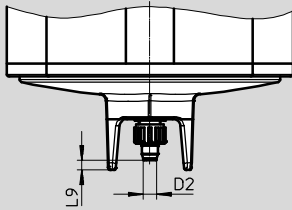
Filter regulators MS12-LFR, MS series

Technical data

Dimensions – Condensate drain

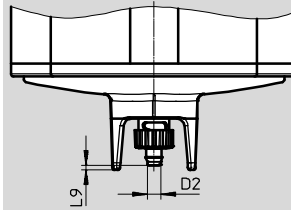
Download CAD data → www.festo.com

Manual rotary M



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

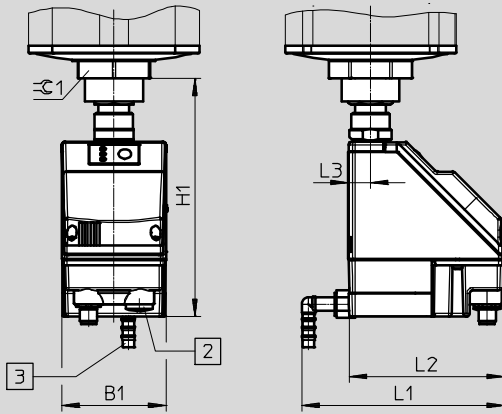
Fully automatic V



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

Fully automatic, electrically actuated E2/E3/E4

Technical data → Internet: pwea



Condensate drain PWEA:

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

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

Ordering data

| Size | Condensate drain | Grade of filtration 5 µm | | Grade of filtration 40 µm | |
|---|------------------|--------------------------|-------------------------|---------------------------|-------------------------|
| | | Part No. | Type | Part No. | Type |
| Pressure regulation range 0.5 ... 1.2 bar, metal bowl, integrated MS pressure gauge with standard scale, display unit [bar], long rotary knob with detent, lockable via accessories | | | | | |
| MS12 | Fully automatic | 537150 | MS12-LFR-G-D7-CUV-LD-AS | 537149 | MS12-LFR-G-D7-EUV-LD-AS |

Filter regulators MS12-LFR, MS series

Ordering data – Modular products

| Ordering table | | Grid dimension | [mm] | 224 | Condi- tions | Code | Enter code |
|----------------|----------------------------------|---|------|-----|-----------------|-------------|---------------|
| M | Module No. | 535022 | | | | | |
| | Series | Standard | | | | MS | MS |
| | Size | 12 | | | | 12 | 12 |
| | Function | Filter regulator | | | | -LFR | -LFR |
| | Pneumatic connection | Connecting plate G1 | | | | -AGF | |
| | | Connecting plate G1¼ | | | | -AGG | |
| | | Connecting plate G1½ | | | | -AGH | |
| | | Connecting plate G2 | | | | -AGI | |
| | | Module without connecting thread, without connecting plate | | | | -G | |
| | Pressure regulation range | 0.3 ... 7 bar | | | | -D6 | |
| | | 0.5 ... 12 bar | | | | -D7 | |
| | | 0.5 ... 16 bar | | | | -D8 | |
| | Grade of filtration | 40 µm | | | | -E | |
| | | 5 µm | | | | -C | |
| | Bowl | Metal bowl | | | | -U | -U |
| | Condensate drain | Manual | | | | -M | |
| | | Fully automatic (P1 max. 12 bar) | | | 1 | -V | |
| | | External fully automatic condensate drain, electrical, 115 V AC, terminal strip | | | | -E2 | |
| | | External fully automatic condensate drain, electrical, 230 V AC, terminal strip | | | | -E3 | |
| | | External fully automatic condensate drain, electrical, 24 V DC, terminal strip | | | | -E4 | |
| O | Pressure gauge alternatives | Cover plate | | | | -VS | |
| | | Adapter plate for EN pressure gauge ¼, without pressure gauge | | | | -A4 | |
| | Alternative pressure gauge scale | psi | | | 2 | -PSI | |
| | | MPa | | | 2 | -MPA | |
| | Rotary knob | Long rotary knob | | | 3 | -LD | |
| M | Security | Lockable via accessories | | | 4 | -AS | |
| | | With integrated lock | | | | -E11 | |
| O | Type of mounting | Mounting bracket standard design | | | 5 | -WP | |
| | Flow direction | Flow direction from right to left | | | | -Z | |

- 1 V** Not with pressure regulation range D8
- 2 PSI, MPA** Not with pressure gauge alternatives VS, A4
- 3 LD** Not with security E11
- 4 AS** Only with rotary knob LD
- 5 WP** Only with connecting plate AGF, AGG, AGH or AGI

- M** Mandatory data
- O** Options

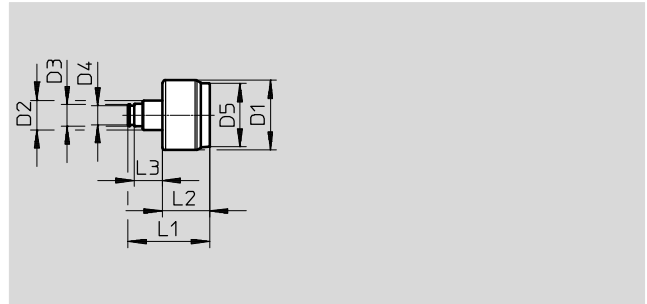
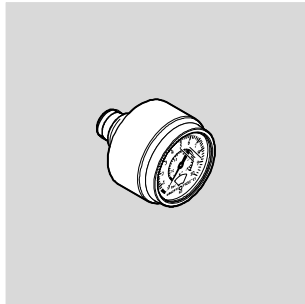
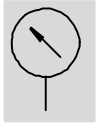
Transfer order code

535022 MS 12 - LFR - - - - U - - - - -

Filter regulators MS2-LFR, MS series

Accessories

Pressure gauge PAGN



| Dimensions | | | | | | | |
|------------|------|-----|-------|------|------|------|-----|
| D1 | D2 | D3 | D4 | D5 | L1 | L2 | L3 |
| ∅ | | ∅ | ∅ | ∅ | | | |
| | | | ±0.05 | | | | |
| 23 | G1/8 | 7.1 | 6.2 | 20.8 | 26.8 | 15.5 | 9.3 |

| General technical data | |
|------------------------------------|-------------------------------|
| Nominal size | 23 |
| Pneumatic connection | G1/8 with sealing ring |
| Operating medium | Inert gases Neutral fluids |
| Note on operating/ pilot medium | No oxygen No acetylene |
| Design | Bourdon tube pressure gauge |
| Type of mounting | In-line installation |
| Connection position | Centred, rear side |
| Ambient temperature [°C] | -5 ... +50 |
| Temperature of medium [°C] | -5 ... +50 ¹⁾ |
| Storage temperature [°C] | -5 ... +50 |
| Measurement accuracy class | 4 |
| Continuous load factor | 0.75 |
| Intermittent load factor | 0.6 |
| Degree of protection | IP44 |
| Weight [g] | 6 |

1) If the temperature of the medium used is below 0°C, ensure the operating medium is dry.

| Materials | |
|--------------------------------------|-----------------------|
| Housing | ABS (colour: black) |
| Inspection window | PMMA |
| Screwed trunnion | ABS reinforced |
| Materials in contact with the medium | ABS reinforced, brass |
| Note on materials | RoHS-compliant |

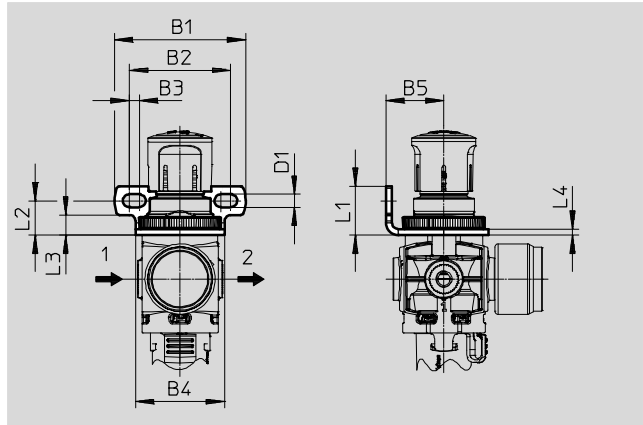
| Ordering data | | | | | | |
|---------------|------------------------|--------------------|---------------|---------------|----------|-----------------|
| Nominal size | Pneumatic connection | Operating pressure | Display range | | Part No. | Type |
| | | | Outer scale | Inner scale | | |
| 23 | G1/8 with sealing ring | 0 ... 10 bar | 0 ... 10 bar | 0 ... 145 psi | 8088991 | PAGN-23-10-G18S |
| | | 0 ... 1 MPa | 0 ... 1 MPa | - | | |

Filter regulators MS2-LFR, MS series

Accessories

Mounting bracket MS2-WR

- For wall mounting
- For filter regulator, pressure regulator
- Knurled nut included in scope of delivery



| Dimensions | | | | | | | | | |
|------------|------|-----|-------|----|------|----|------|-----|----|
| B1 | B2 | B3 | B4 | B5 | D1 | L1 | L2 | L3 | L4 |
| ±0.2 | | | ±0.15 | | ±0.1 | | ±0.5 | | |
| 4.3 | 33.3 | 3.3 | 29.2 | 19 | 4.2 | 16 | 11.3 | 6.6 | 2 |

| Materials | |
|--------------------|----------------|
| Mounting bracket | Steel |
| Note on materials: | RoHS-compliant |

| Ordering data | | | | |
|---------------|-------------------|------------|----------------|---------------|
| Size | CRC ¹⁾ | Weight [g] | Part No. | Type |
| MS2 | 1 | 13.8 | 8087978 | MS2-WR |

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
 Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Nut MS2-WRS

- For front panel mounting



| Materials | |
|--------------------|----------------|
| Note on materials: | RoHS-compliant |

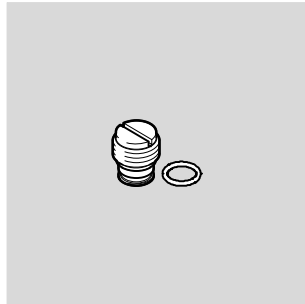
| Ordering data | | | | |
|---------------|-------------------|------------|----------------|----------------|
| Size | CRC ¹⁾ | Weight [g] | Part No. | Type |
| MS2 | 1 | 0.7 | 8098037 | MS2-WRS |

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
 Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Filter regulators MS2-LFR, MS series

Accessories

Plug screw MS2-G18S

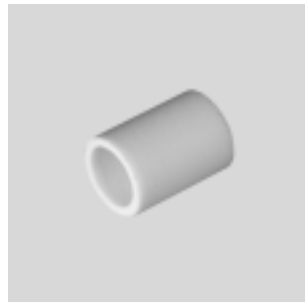


| Materials | |
|--------------------|----------------|
| Note on materials: | RoHS-compliant |

| Ordering data | | | | |
|---------------|-------------------|------------|----------------|-----------------|
| Size | CRC ¹⁾ | Weight [g] | Part No. | Type |
| MS2 | 1 | 4.6 | 8095766 | MS2-G18S |

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
 Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Filter cartridge LFP



| Ordering data | | | |
|---------------|--------------------------|---------------|-----------------------|
| Size | Grade of filtration [µm] | Part No. | Type |
| MS2 | 5 | 526818 | LFP-D-MICRO-5M |

Filter regulators MS-LFR, MS series

Accessories

FESTO

Filter cartridge MS-LFP

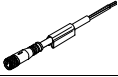





| Ordering data | | | |
|---------------|-----------------------------|----------|------------|
| Size | Grade of filtration [µm] | Part No. | Type |
| MS4 | 5 (colour: blue) | 534501 | MS4-LFP-C |
| | 40 (colour: white) | 534502 | MS4-LFP-E |
| MS6 | 5 (colour: blue) | 534499 | MS6-LFP-C |
| | 40 (colour: white) | 534500 | MS6-LFP-E |
| MS9 | 5 | 570309 | MS9-LFP-C |
| | 40 | 570310 | MS9-LFP-E |
| MS12 | 5 | 537143 | MS12-LFP-C |
| | 40 | 537144 | MS12-LFP-E |


Filter regulators MS-LFR, MS series


Accessories

FESTO

| Ordering data – Connecting cable NEBU-M8 | | | | Technical data → Internet: nebu | |
|---|-----------------------|-----------------|------------------|---------------------------------|---------------------|
| | Electrical connection | Number of wires | Cable length [m] | Part No. | Type |
|  | M8x1, straight socket | 3 | 2.5 | ★ 541333 | NEBU-M8G3-K-2.5-LE3 |
| | | | 5 | ★ 541334 | NEBU-M8G3-K-5-LE3 |
|  | M8x1, angled socket | 3 | 2.5 | ★ 541338 | NEBU-M8W3-K-2.5-LE3 |
| | | | 5 | ★ 541341 | NEBU-M8W3-K-5-LE3 |

| Ordering data – Connecting cable NEBU-M12 | | | | Technical data → Internet: nebu | |
|---|------------------------|-----------------|------------------|---------------------------------|----------------------|
| | Electrical connection | Number of wires | Cable length [m] | Part No. | Type |
|  | M12x1, straight socket | 4 | 2.5 | ★ 550326 | NEBU-M12G5-K-2.5-LE4 |
| | | | 5 | ★ 541328 | NEBU-M12G5-K-5-LE4 |
|  | M12x1, angled socket | 4 | 2.5 | 550325 | NEBU-M12W5-K-2.5-LE4 |
| | | | 5 | 541329 | NEBU-M12W5-K-5-LE4 |

| Ordering data – Pressure gauge MA | | | | | Technical data → Internet: ma | |
|---|---|----------------------|------------------|-----------|--------------------------------|------------------------------|
| | Nominal size | Pneumatic connection | Indicating range | | Part No. | Type |
| | | | [bar] | [psi] | | |
|  | Pressure gauge MA, DIN EN 837-1 | | | | Technical data → Internet: ma | |
| | 40 | R $\frac{1}{4}$ | 0 ... 16 | 0 ... 232 | 187080 | MA-40-16-R $\frac{1}{4}$ -EN |
| | | G $\frac{1}{4}$ | 0 ... 16 | 0 ... 232 | 183901 | MA-40-16-G $\frac{1}{4}$ -EN |
| | Pressure gauge MA, DIN EN 837-1, with red-green range | | | | Technical data → Internet: ma | |
| 40 | R $\frac{1}{8}$ | 0 ... 16 | – | 525726 | MA-40-16-R $\frac{1}{8}$ -E-RG | |
| 50 | R $\frac{1}{4}$ | 0 ... 16 | – | 525729 | MA-50-16-R $\frac{1}{4}$ -E-RG | |

| Ordering data – Padlock LRVS-D | | | Technical data → Internet: ma | |
|---|------------|--|-------------------------------|--------|
| | Weight [g] | | Part No. | Type |
|  | 120 | | 193786 | LRVS-D |

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