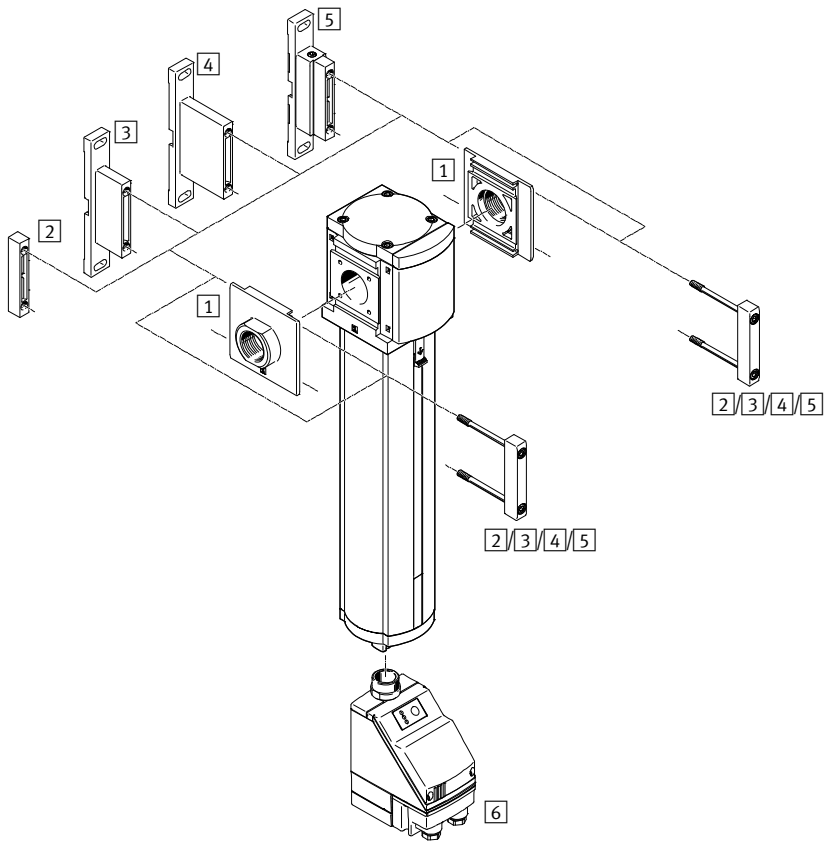



Filters MS-LFM/LFX, MS series, NPT



# Fine and micro filters MS9-LFM, MS series, NPT

Peripherals overview



-  - Note

Other accessories:

- Module connector for combination with size MS6, MS9 or MS12

➔ Internet: rmv, armv

| Mounting attachments and accessories |  |                                     |                                   |  |                     |
|--------------------------------------|--|-------------------------------------|-----------------------------------|--|---------------------|
|                                      | Individual device  | Combination                         |                                   |  | ➔ Page/<br>Internet |
|                                      |  | With female thread<br>3/4/1/N3/4/N1 | With connecting plate AG.../AQ... | Module without connect-<br>ing thread, without<br>connecting plate G |                     |
|                                      |  | Without EU<br>certification EX4     | With EU<br>certification EX4      |  |                     |
| [1]                                  | Connecting plate-SET<br>MS9-AG...                                    | -                                   | ■                                 | ■  | ms9-ag              |
|                                      | Connecting plate-SET<br>MS9-AQ...                                    | -                                   | ■                                 | -  | ms9-aq              |
| [2]                                  | Module connector<br>MS9-MV   | -                                   | -                                 | ■  | ms9-mv              |
| [3]                                  | Mounting bracket<br>MS9-WP   | ■                                   | ■                                 | ■  | ms9-wp              |
| [4]                                  | Mounting bracket<br>MS9-WPB  | ■                                   | ■                                 | ■  | ms9-wp              |
| [5]                                  | Mounting bracket<br>MS9-WPM  | ■                                   | ■                                 | -  | ms9-wp              |
| [6]                                  | Condensate drain, fully automatic, electrically<br>actuated E2/E3/E4 | ■                                   | ■                                 | ■  | 14                  |

# Fine and micro filters MS9-LFM, MS series, NPT

Type codes

MS 9 - LFM - N1 - A U M - HF - DA

**Series**

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

**Size**

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

**Service function**

|     |                       |
|-----|-----------------------|
| LFM | Fine and micro filter |
|-----|-----------------------|

**Pneumatic connection**

|                 |  |
|-----------------|--|
| N $\frac{3}{4}$ | Thread NPT $\frac{3}{4}$                                   |
| N1              | Thread NPT1  |
| G               | Module without connecting thread, without connecting plate |

**Grade of filtration**

|   |              |
|---|--------------|
| A | 0.01 $\mu$ m |
| B | 1 $\mu$ m    |

**Bowl guard**

|   |                          |
|---|--------------------------|
| U | integrated as metal bowl |
|---|--------------------------|

**Condensate drain**

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

**Flow rate**

|    |                |
|----|----------------|
|    | Standard       |
| HF | High flow rate |

**Filter contamination sensor**

|    |   |
|----|---|
|    | Without differential pressure indicator |
| DA | Differential pressure indicator         |

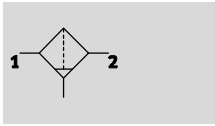
Further variants can be ordered using the modular system → 14




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

# Fine and micro filters MS9-LFM, MS series, NPT

Technical data

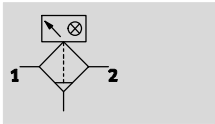
Condensate drain  
Manual rotary  
Without differential pressure indicator



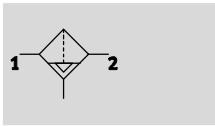
-  - Flow rate  
325 ... 10,000 l/min
-  - Temperature range  
-10 ... +60 °C
-  - Operating pressure  
0 ... 20 bar



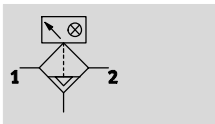
With differential pressure indicator



Condensate drain  
Semi or fully automatic  
Without differential pressure indicator



With differential pressure indicator



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

| General technical data                   |   |
|--|---|
| Size                                     | MS9   |
| Pneumatic connection 1, 2                |   |
| Female thread                            | G3/4, G1, NPT3/4 or NPT1  |
| Connecting plate AG...                   | G1/2, G3/4, G1, G1 1/4 or G1 1/2  |
| Connecting plate AQ...                   | NPT1/2, NPT3/4, NPT1, NPT1 1/4 or NPT1 1/2  |
| Module without connecting thread/plate G | -   |
| Constructional design                    | Fibre filter  |
| Type of mounting                         | Via accessories<br>In-line installation   |
| Installation position                    | Vertical ±5°  |
| Grade of filtration [µm]                 | 0.01 (micro filter MS9-LFM-A)<br>1 (fine filter MS9-LFM-B)  |
| Air purity class at the output           | Compressed air in accordance with ISO 8573-1:2010 [1:7:2] (micro filter MS9-LFM-A)<br>Compressed air in accordance with ISO 8573-1:2010 [5:7:3] (fine filter MS9-LFM-B) |
| Filter efficiency [%]                    | 99.9999 (Grade of filtration 0.01 µm, micro filter MS9-LFM-A)<br>99.99 (Grade of filtration 1 µm, fine filter MS9-LFM-B)  |
| Bowl guard                               | Integrated as metal bowl  |
| Condensate drain                         | Manual rotary<br>Semi-automatic<br>Fully automatic<br>Fully automatic, electrically actuated  |
| Differential pressure indicator          | Visual indicator  |
| Residual oil content [mg/m³]             | ≤0.01 (micro filter MS9-LFM-A)<br>≤0.5 (fine filter MS9-LFM-B)  |
| Max. condensate volume [cm³]             | 225   |

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

# Fine and micro filters MS9-LFM, MS series, NPT

Technical data

| Standard flow rate $q_n^{1)}$ [l/min]                     |          |                   |
|---|----------|-------------------|
| Version   | Standard | High flow rate HF |
| <b>Micro filter MS9-LFM-A</b>                             |          |                   |
| Max. standard flow rate for air purity class $q_{n \max}$ | 6,500    | 7,800             |
| Min. standard flow rate for air purity class $q_{n \min}$ | 325      | 390               |
| <b>Fine filter MS9-LFM-B</b>                              |          |                   |
| Max. standard flow rate for air purity class $q_{n \max}$ | 7,000    | 10,000            |
| Min. standard flow rate for air purity class $q_{n \min}$ | 350      | 500               |

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

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

| Operating and environmental conditions       |   |                     |                      |  |
|--|---|---------------------|----------------------|--|
| Condensate drain                             | Manual rotary<br>M  | Semi-automatic<br>H | Fully automatic<br>V | Fully automatic, electrically actuated<br>E2/E3/E4 |
| Operating pressure [bar]                     | 0 ... 20  | 1.5 ... 12          | 2 ... 12             | 0.8 ... 16   |
| Operating medium                             | Compressed air in accordance with ISO 8573-1:2010 [6:8:4] <sup>1)</sup> |                     |                      |  |
| Ambient temperature [°C]                     | -10 ... +60   | +5 ... +60          | +5 ... +60           | +1 ... +60   |
| Temperature of medium [°C]                   | -10 ... +60   | +5 ... +60          | +5 ... +60           | +1 ... +60   |
| Storage temperature [°C]                     | -10 ... +60   | +5 ... +60          | -10 ... +60          | +1 ... +60   |
| Corrosion resistance class CRC <sup>2)</sup> | 2   |                     |                      |  |
| UL Certification <sup>3)</sup>               | cULus recognized (OL)   |                     |                      |  |

1) It is recommended to prefilter the compressed air for the micro filter MS-LFM-A using a fine filter MS-LFM-B (grade of filtration 1  $\mu\text{m}$ ).

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

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

3) Additional information [www.festo.com/sp](http://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) <sup>1)</sup> | To EU Explosion Protection Directive (ATEX) |

1) Additional information [www.festo.com/sp](http://www.festo.com/sp) → Certificates.

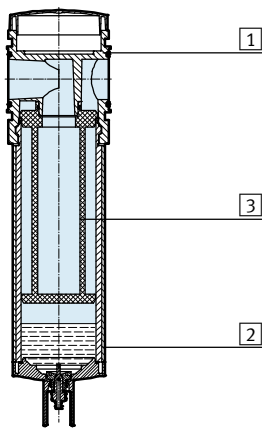
# Fine and micro filters MS9-LFM, MS series, NPT

Technical data

| Weights [g]   |          |                   |
|---|----------|-------------------|
| Version   | Standard | High flow rate HF |
| Fine and micro filter   | 2,000    | 2,500             |
| Fine and micro filter with condensate drain fully automatic, electrically actuated E2/E3/E4 | 2,900    | 2,900             |

## Materials

Sectional view



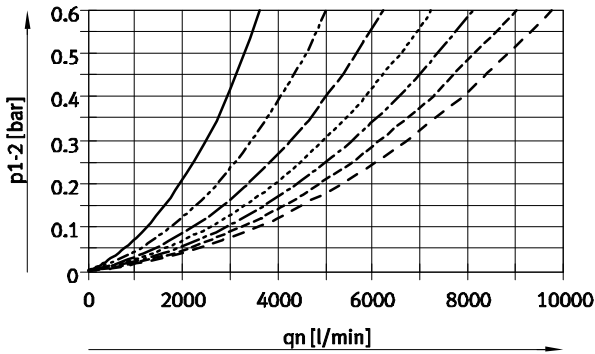
| Fine and micro filters |  |                         |
|------------------------|--|-------------------------|
| 1                      | Housing  | Die-cast aluminium      |
| 2                      | Bowl   | Wrought aluminium alloy |
|                        | Inspection window                  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

# Fine and micro filters MS9-LFM, MS series, NPT

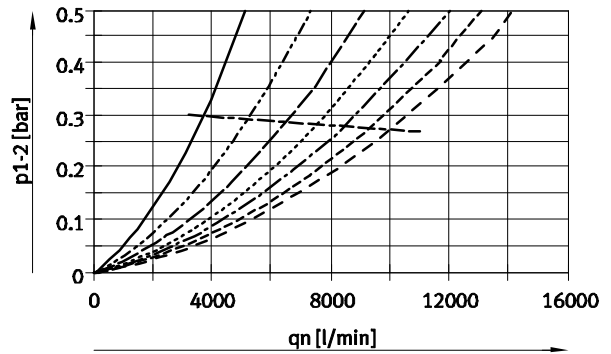
Technical data

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

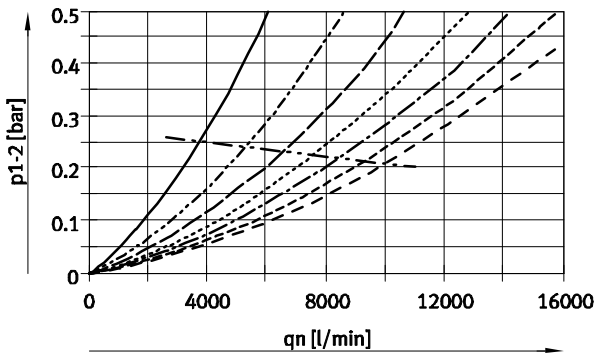
Grade of filtration 0.01  $\mu\text{m}$ , pneumatic connection G $\frac{1}{2}$ /NPT $\frac{1}{2}$



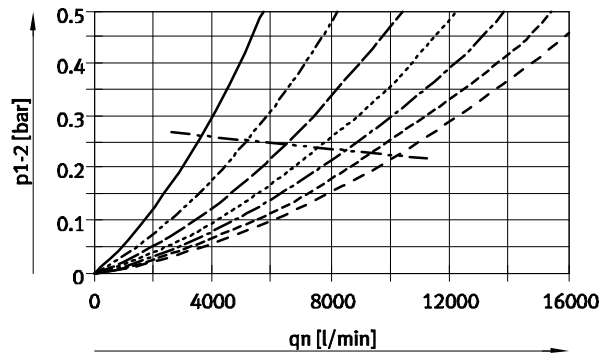
Grade of filtration 0.01  $\mu\text{m}$ , pneumatic connection G $\frac{3}{4}$ /NPT $\frac{3}{4}$



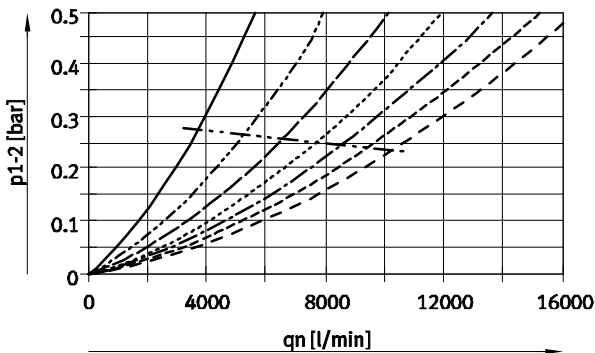
Grade of filtration 0.01  $\mu\text{m}$ , pneumatic connection G1/NPT1



Grade of filtration 0.01  $\mu\text{m}$ , pneumatic connection G1 $\frac{1}{4}$ /NPT1 $\frac{1}{4}$



Grade of filtration 0.01  $\mu\text{m}$ , pneumatic connection G1 $\frac{1}{2}$ /NPT1 $\frac{1}{2}$



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

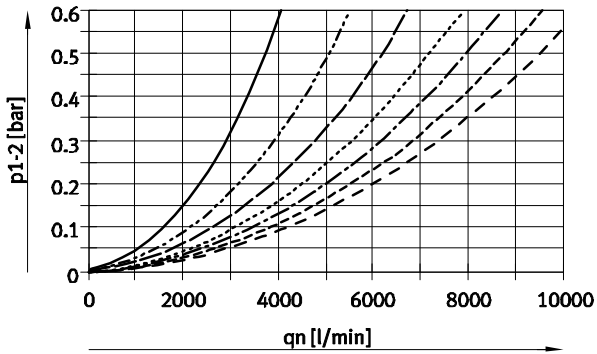
# Fine and micro filters MS9-LFM, MS series, NPT

Technical data

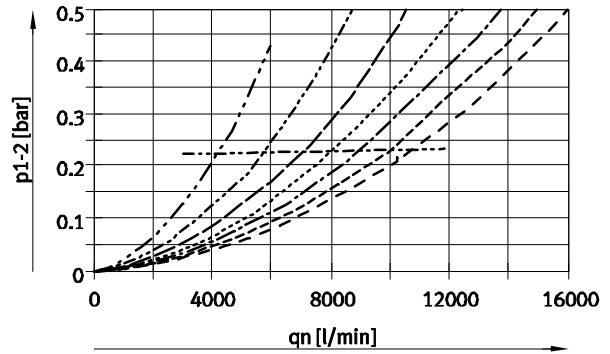


## Standard flow rate $q_n$ as a function of the differential pressure $p_{1-2}$

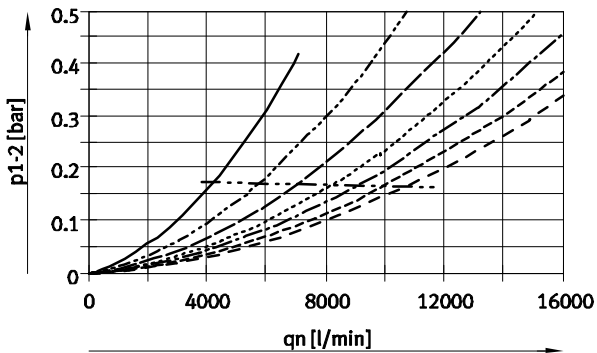
Grade of filtration 1  $\mu\text{m}$ , pneumatic connection G $1/2$ /NPT $1/2$



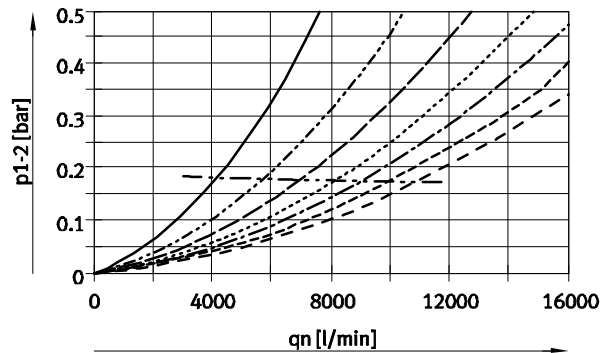
Grade of filtration 1  $\mu\text{m}$ , pneumatic connection G $3/4$ /NPT $3/4$



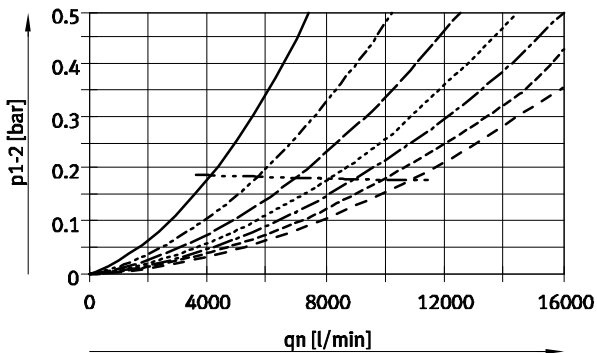
Grade of filtration 1  $\mu\text{m}$ , pneumatic connection G1/NPT1



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



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



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



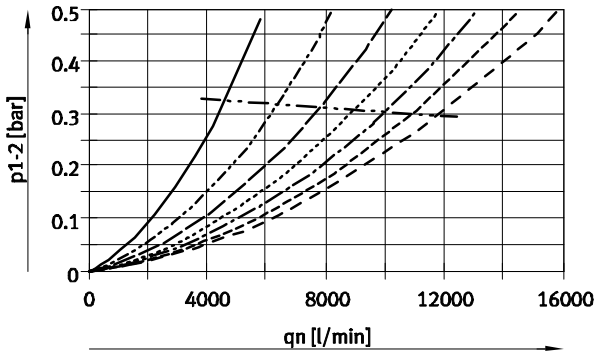
# Fine and micro filters MS9-LFM, MS series, NPT

Technical data

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

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

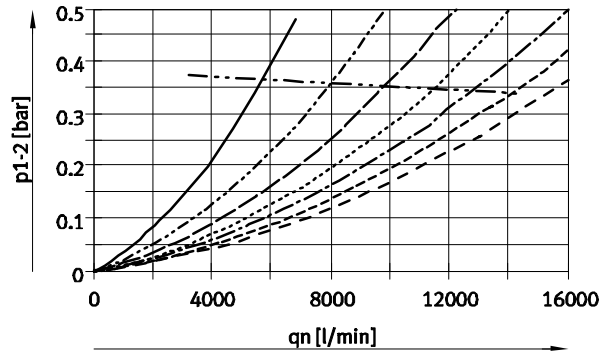
High flow rate HF



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

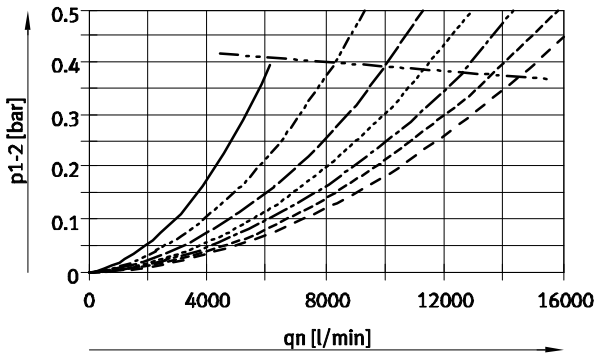
Grade of filtration 0.01  $\mu\text{m}$ , pneumatic connection G1/NPT1

High flow rate HF



Grade of filtration 1  $\mu\text{m}$ , pneumatic connection G $\frac{3}{4}$ /NPT $\frac{3}{4}$

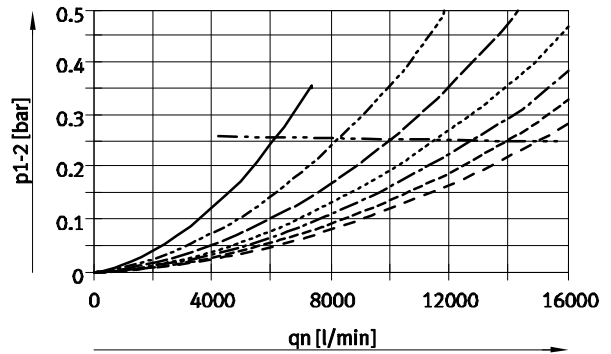
High flow rate HF



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

Grade of filtration 1  $\mu\text{m}$ , pneumatic connection G1/NPT1

High flow rate HF



# Fine and micro filters MS9-LFM, MS series, NPT

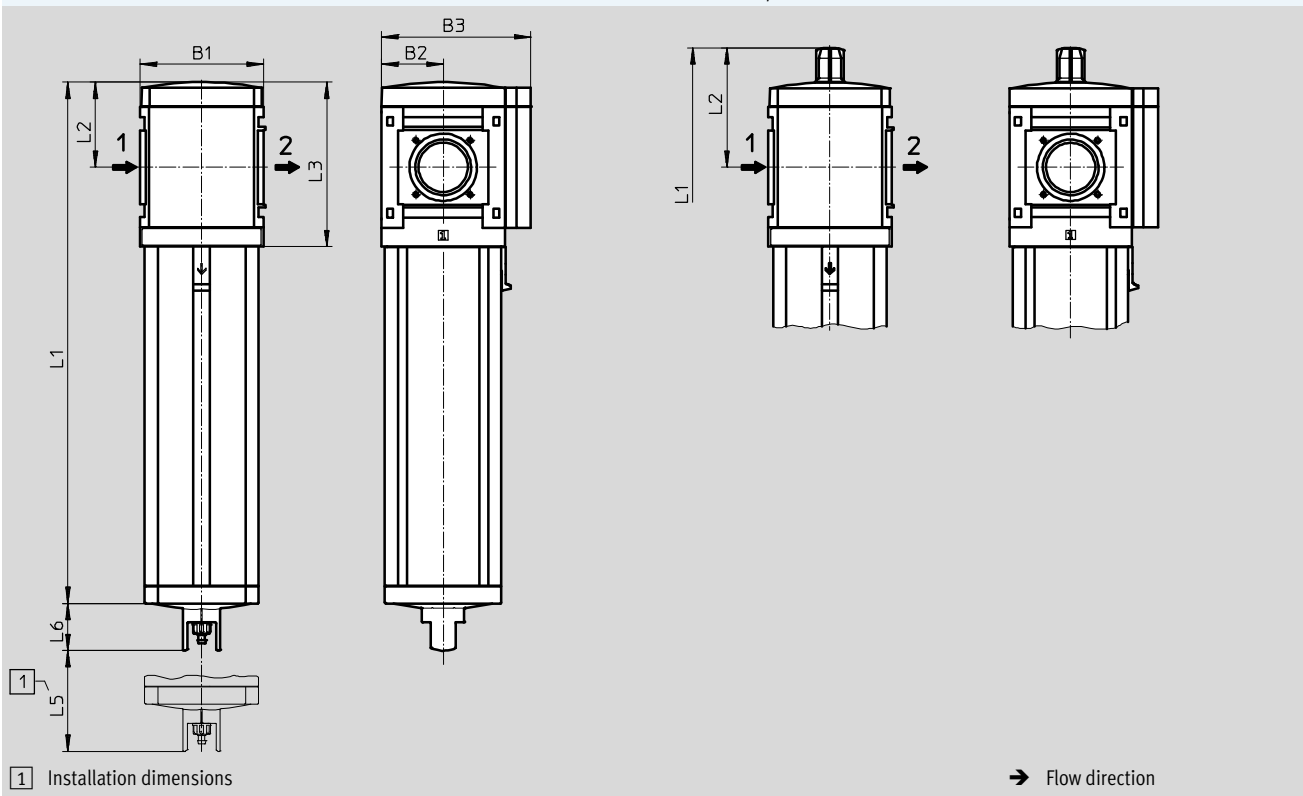
Technical data

## Dimensions – Basic version

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

Module without connecting thread, without connecting plate G

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



| Type             | B1 | B2 | B3  | L1       |                   | L2 | L3  | L5 | L6   |
|------------------|----|----|-----|----------|-------------------|----|-----|----|------|
|                  |    |    |     | Standard | High flow rate HF |    |     |    |      |
| MS9-LFM-G        | 90 | 45 | 109 | 380.5    | 480.5             | 62 | 120 | 50 | 34.5 |
| MS9-LFM-G-...-DA |    |    |     | 405.5    | 505.5             |    |     |    |      |

# Fine and micro filters MS9-LFM, MS series, NPT

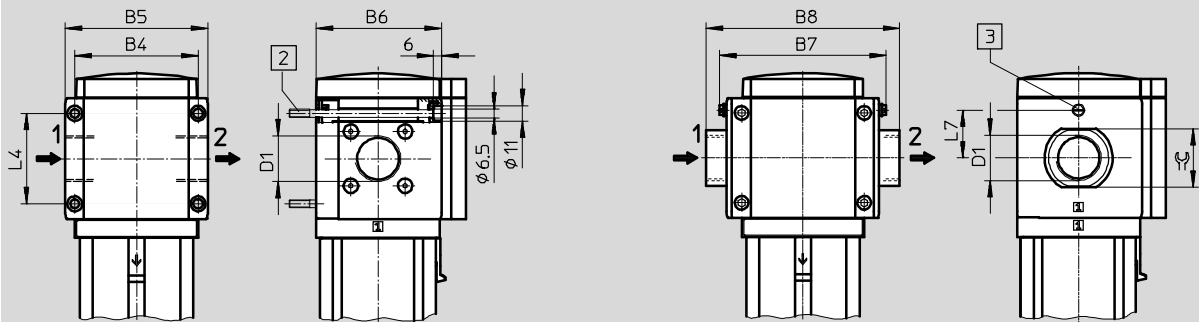
Technical data

## Dimensions – Connecting thread/connecting plate

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

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

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



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

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

→ Flow direction

| Type         | B4          | B5  | B6   | B7  |     | B8  | D1              | L4 | L7 |     | =C              |      |
|--------------|-------------|-----|------|-----|-----|-----|-----------------|----|----|-----|-----------------|------|
|              |             |     |      |     | EX4 |     |                 |    |    | EX4 |                 |      |
| MS9-LFM-3/4  | 90          | 104 | 91.5 | -   | -   | -   | G3/4            | 66 | -  | -   | -               |      |
| MS9-LFM-1    |             |     |      |     |     |     | G1              |    |    |     |                 |      |
| MS9-LFM-AGD  | -           | -   | -    | 112 | 122 | 132 | G1/2            | -  | 35 | -   | 30              |      |
| MS9-LFM-AGE  |             |     |      |     |     |     | G3/4            |    |    |     | 36              |      |
| MS9-LFM-AGF  |             |     |      |     |     |     | G1              |    |    |     | 41              |      |
| MS9-LFM-AGG  |             |     |      |     |     |     | G1 1/4          |    |    |     | 50              |      |
| MS9-LFM-AGH  |             |     |      |     |     |     | G1 1/2          |    |    |     | 55              |      |
| MS9-LFM-N3/4 |             |     |      |     |     |     | 90              |    |    |     | 104             | 91.5 |
| MS9-LFM-N1   | NPT1-11 1/2 |     |      |     |     |     |                 |    |    |     |                 |      |
| MS9-LFM-AQR  | -           | -   | -    | 112 | 122 | 132 | NPT1/2-14       | -  | 35 | -   | 30              |      |
| MS9-LFM-AQS  |             |     |      |     |     |     | NPT3/4-14       |    |    |     | 36              |      |
| MS9-LFM-AQT  |             |     |      |     |     |     | NPT1-11 1/2     |    |    |     | 41              |      |
| MS9-LFM-AQU  |             |     |      |     |     |     | NPT1 1/4-11 1/2 |    |    |     | 50              |      |
| MS9-LFM-AQV  |             |     |      |     |     |     | 162             |    |    |     | NPT1 1/2-11 1/2 | 55   |
|              |             |     |      |     |     |     |                 |    |    |     |                 |      |

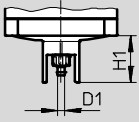
-||- Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Fine and micro filters MS9-LFM, MS series, NPT

Technical data

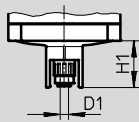
**Dimensions – Condensate drain** Download CAD data → [www.festo.com](http://www.festo.com)

Manual rotary M/fully automatic V



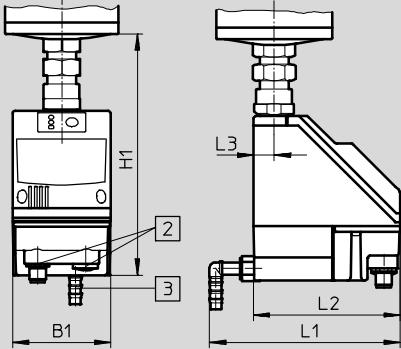
Barbed connector for plastic tubing PUN(-H)-8x1,25

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-LFM-...-M/V      | -  | 5.6 | 34.5 | -   | -   | -  |
| MS9-LFM-...-H        |    | 6.2 |      |     |     |    |
| MS9-LFM-...-E2/E3/E4 | 72 | -   | 178  | 140 | 108 | 15 |

# Fine and micro filters MS9-LFM, MS series, NPT

Technical data

| Ordering data                           |                  |                   |                             |                                 |                          |                                 |
|---|------------------|-------------------|-----------------------------|---------------------------------|--------------------------|---------------------------------|
| Without differential pressure indicator |                  |                   |                             |                                 |                          |                                 |
| Size                                    | Condensate drain | Connection        | Micro filter                |                                 | Fine filter              |                                 |
|   |                  |                   | Grade of filtration 0.01 µm |                                 | Grade of filtration 1 µm |                                 |
|   |                  |                   | Part No.                    | Type                            | Part No.                 | Type                            |
| Standard                                |                  |                   |                             |                                 |                          |                                 |
| MS9                                     | Manual rotary    | NPT $\frac{3}{4}$ | 553086                      | MS9-LFM-N $\frac{3}{4}$ -AUM    | 553090                   | MS9-LFM-N $\frac{3}{4}$ -BUM    |
|   |                  | NPT1              | 553016                      | MS9-LFM-N1-AUM                  | 553020                   | MS9-LFM-N1-BUM                  |
|   |                  | -                 | 564047                      | MS9-LFM-G-AUM                   | 564039                   | MS9-LFM-G-BUM                   |
|   | Fully automatic  | NPT $\frac{3}{4}$ | 553088                      | MS9-LFM-N $\frac{3}{4}$ -AUV    | 553092                   | MS9-LFM-N $\frac{3}{4}$ -BUV    |
|   |                  | NPT1              | 553018                      | MS9-LFM-N1-AUV                  | 553022                   | MS9-LFM-N1-BUV                  |
|   |                  | -                 | 564049                      | MS9-LFM-G-AUV                   | 564041                   | MS9-LFM-G-BUV                   |
| High flow rate                          |                  |                   |                             |                                 |                          |                                 |
| MS9                                     | Manual rotary    | NPT $\frac{3}{4}$ | 552980                      | MS9-LFM-N $\frac{3}{4}$ -AUM-HF | 552984                   | MS9-LFM-N $\frac{3}{4}$ -BUM-HF |
|   |                  | NPT1              | 553054                      | MS9-LFM-N1-AUM-HF               | 553058                   | MS9-LFM-N1-BUM-HF               |
|   |                  | -                 | 564051                      | MS9-LFM-G-AUM-HF                | 564043                   | MS9-LFM-G-BUM-HF                |
|   | Fully automatic  | NPT $\frac{3}{4}$ | 552982                      | MS9-LFM-N $\frac{3}{4}$ -AUV-HF | 552986                   | MS9-LFM-N $\frac{3}{4}$ -BUV-HF |
|   |                  | NPT1              | 553056                      | MS9-LFM-N1-AUV-HF               | 553060                   | MS9-LFM-N1-BUV-HF               |
|   |                  | -                 | 564053                      | MS9-LFM-G-AUV-HF                | 564045                   | MS9-LFM-G-BUV-HF                |

| Ordering data                        |                  |                   |                             |                                    |                          |                                    |
|--------------------------------------|------------------|-------------------|-----------------------------|------------------------------------|--------------------------|------------------------------------|
| With differential pressure indicator |                  |                   |                             |                                    |                          |                                    |
| Size                                 | Condensate drain | Connection        | Micro filter                |                                    | Fine filter              |                                    |
|                                      |                  |                   | Grade of filtration 0.01 µm |                                    | Grade of filtration 1 µm |                                    |
|                                      |                  |                   | Part No.                    | Type                               | Part No.                 | Type                               |
| Standard                             |                  |                   |                             |                                    |                          |                                    |
| MS9                                  | Manual rotary    | NPT $\frac{3}{4}$ | 553094                      | MS9-LFM-N $\frac{3}{4}$ -AUM-DA    | 553098                   | MS9-LFM-N $\frac{3}{4}$ -BUM-DA    |
|                                      |                  | NPT1              | 553024                      | MS9-LFM-N1-AUM-DA                  | 553028                   | MS9-LFM-N1-BUM-DA                  |
|                                      |                  | -                 | 564048                      | MS9-LFM-G-AUM-DA                   | 564040                   | MS9-LFM-G-BUM-DA                   |
|                                      | Fully automatic  | NPT $\frac{3}{4}$ | 553096                      | MS9-LFM-N $\frac{3}{4}$ -AUV-DA    | 553100                   | MS9-LFM-N $\frac{3}{4}$ -BUV-DA    |
|                                      |                  | NPT1              | 553026                      | MS9-LFM-N1-AUV-DA                  | 553030                   | MS9-LFM-N1-BUV-DA                  |
|                                      |                  | -                 | 564050                      | MS9-LFM-G-AUV-DA                   | 564042                   | MS9-LFM-G-BUV-DA                   |
| High flow rate                       |                  |                   |                             |                                    |                          |                                    |
| MS9                                  | Manual rotary    | NPT $\frac{3}{4}$ | 552988                      | MS9-LFM-N $\frac{3}{4}$ -AUM-HF-DA | 552992                   | MS9-LFM-N $\frac{3}{4}$ -BUM-HF-DA |
|                                      |                  | NPT1              | 553062                      | MS9-LFM-N1-AUM-HF-DA               | 553066                   | MS9-LFM-N1-BUM-HF-DA               |
|                                      |                  | -                 | 564052                      | MS9-LFM-G-AUM-HF-DA                | 564044                   | MS9-LFM-G-BUM-HF-DA                |
|                                      | Fully automatic  | NPT $\frac{3}{4}$ | 552990                      | MS9-LFM-N $\frac{3}{4}$ -AUV-HF-DA | 552994                   | MS9-LFM-N $\frac{3}{4}$ -BUV-HF-DA |
|                                      |                  | NPT1              | 553064                      | MS9-LFM-N1-AUV-HF-DA               | 553068                   | MS9-LFM-N1-BUV-HF-DA               |
|                                      |                  | -                 | 564054                      | MS9-LFM-G-AUV-HF-DA                | 564046                   | MS9-LFM-G-BUV-HF-DA                |

# Fine and micro filters MS9-LFM, MS series, NPT

Ordering data – Modular products

| Ordering table |  | Grid dimension [mm]  | 90  | Condi-<br>tions   | Code                              | Enter<br>code |  |
|----------------|--|--|---|-------------------|-----------------------------------|---------------|--|
| <b>M</b>       | Module No.                               | <b>552940</b>  |   |                   |                                   |               |  |
|                | Series                                   | Standard service unit                                      |   |                   | <b>MS</b>                         | MS            |  |
|                | Size                                     | 9  |   |                   | <b>9</b>                          | 9             |  |
|                | Function                                 | Fine and micro filter                                      |   |                   | <b>-LFM</b>                       | -LFM          |  |
|                | Pneumatic connection                     | Female thread G $\frac{3}{4}$                              |   | <b>1</b>          | <b>-<math>\frac{3}{4}</math></b>  |               |  |
|                |  | Female thread G1   |   | <b>1</b>          | <b>-1</b>                         |               |  |
|                |  | Connecting plate G $\frac{1}{2}$                           |   |                   | <b>-AGD</b>                       |               |  |
|                |  | Connecting plate G $\frac{3}{4}$                           |   |                   | <b>-AGE</b>                       |               |  |
|                |  | Connecting plate G1  |   |                   | <b>-AGF</b>                       |               |  |
|                |  | Connecting plate G1 $\frac{1}{4}$                          |   |                   | <b>-AGG</b>                       |               |  |
|                |  | Connecting plate G1 $\frac{1}{2}$                          |   |                   | <b>-AGH</b>                       |               |  |
|                |  | Female thread NPT $\frac{3}{4}$                            |   | <b>1</b>          | <b>-N<math>\frac{3}{4}</math></b> |               |  |
|                |  | Female thread NPT1   |   | <b>1</b>          | <b>-N1</b>                        |               |  |
|                |  | Connecting plate NPT $\frac{1}{2}$                         |   | <b>1</b>          | <b>-AQR</b>                       |               |  |
|                |  | Connecting plate NPT $\frac{3}{4}$                         |   | <b>1</b>          | <b>-AQS</b>                       |               |  |
|                |  | Connecting plate NPT1                                      |   | <b>1</b>          | <b>-AQT</b>                       |               |  |
|                |  | Connecting plate NPT1 $\frac{1}{4}$                        |   | <b>1</b>          | <b>-AQU</b>                       |               |  |
|                |  | Connecting plate NPT1 $\frac{1}{2}$                        |   | <b>1</b>          | <b>-AQV</b>                       |               |  |
|                |  | Module without connecting thread, without connecting plate |   | <b>1</b>          | <b>-G</b>                         |               |  |
|                |  | Grade of filtration  | 1 $\mu$ m                                 |                   |                                   | <b>-B</b>     |  |
|                | 0.01 $\mu$ m                             |  |   |                   | <b>-A</b>                         |               |  |
|                | Bowl                                     | Metal bowl   |   |                   | <b>-U</b>                         | -U            |  |
|                | Condensate drain                         | Manual   |   |                   | <b>-M</b>                         |               |  |
|                |  | Semi-automatic (P1 max. 12 bar)                            |   |                   | <b>-H</b>                         |               |  |
|                |  | Fully automatic (P1 max. 12 bar)                           |   |                   | <b>-V</b>                         |               |  |
|                |  | External, fully automatic, electric                        | 115 V AC, terminal strip (P1 max. 16 bar) |                   | <b>1</b>                          | <b>-E2</b>    |  |
|                |  |  | 230 V AC, terminal strip (P1 max. 16 bar) |                   | <b>1</b>                          | <b>-E3</b>    |  |
|                | 24 V DC, terminal strip (P1 max. 16 bar) |  | <b>1</b>                                  | <b>-E4</b>        |                                   |               |  |
| <b>O</b>       | Flow rate                                | High flow rate   |   |                   | <b>-HF</b>                        |               |  |
|                | Filter contamination sensor              | Differential pressure indicator, visual                    |   |                   | <b>-DA</b>                        |               |  |
|                | Type of mounting                         | Mounting bracket standard design                           |   | <b>2</b>          | <b>-WP</b>                        |               |  |
|                |  | Mounting bracket for attaching the service units           |   | <b>1</b> <b>2</b> | <b>-WPM</b>                       |               |  |
|                |  | Wall mounting bracket for large wall gap                   |   | <b>2</b>          | <b>-WPB</b>                       |               |  |
|                | EU certification                         | II 2GD to EU Explosion Protection Directive (ATEX)         |   |                   | <b>-EX4</b>                       |               |  |
|                | UL certification                         | cULus, ordinary location for Canada and USA                |   |                   | <b>-UL1</b>                       |               |  |
|                | Flow direction                           | Flow direction from right to left                          |   |                   | <b>-Z</b>                         |               |  |

**1**  $\frac{3}{4}$ , 1, N $\frac{3}{4}$ , N1, AQR, AQS, AQT, AQU, AQV, G, E2, E3, E4, WPM

Not with EU certification EX4

**2** WP, WPM, WPB Not with pneumatic connection G

**M** Mandatory data

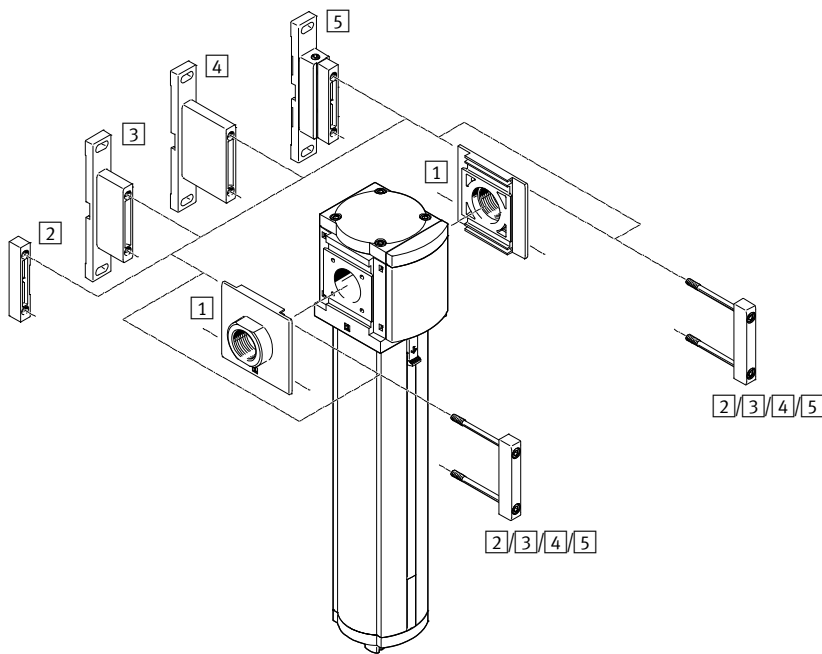
**O** Options


Transfer order code

552940 MS 9 - LFM - - - U - - - - -

# Activated carbon filters MS9-LFX, MS series, NPT

Peripherals overview



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

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

# Activated carbon filters MS9-LFX, MS series, NPT

Type codes

|                             |  |    |   |   |     |   |                 |   |   |
|-----------------------------|--|----|---|---|-----|---|-----------------|---|---|
|                             |  | MS | 9 | - | LFX | - | N $\frac{3}{4}$ | - | U |
| <b>Series</b>               |  |    |   |   |     |   |                 |   |   |
| MS                          | Standard service unit                                      |    |   |   |     |   |                 |   |   |
| <b>Size</b>                 |  |    |   |   |     |   |                 |   |   |
| 9                           | Grid dimension 90 mm                                       |    |   |   |     |   |                 |   |   |
| <b>Service function</b>     |  |    |   |   |     |   |                 |   |   |
| LFX                         | Activated carbon filter                                    |    |   |   |     |   |                 |   |   |
| <b>Pneumatic connection</b> |  |    |   |   |     |   |                 |   |   |
| N $\frac{3}{4}$             | Thread NPT $\frac{3}{4}$                                   |    |   |   |     |   |                 |   |   |
| N1                          | Thread NPT1  |    |   |   |     |   |                 |   |   |
| G                           | Module without connecting thread, without connecting plate |    |   |   |     |   |                 |   |   |
| <b>Bowl guard</b>           |  |    |   |   |     |   |                 |   |   |
| U                           | Integrated as metal bowl                                   |    |   |   |     |   |                 |   |   |

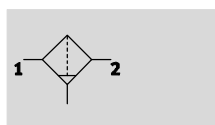
Further variants can be ordered using the modular system → 21

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



# Activated carbon filters MS9-LFX, MS series, NPT

Technical data



- - Flow rate  
max. 6,500 l/min
- - Temperature range  
-10 ... +60 °C
- - Operating pressure  
0 ... 20 bar



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

| General technical data                       |   |
|--|---|
| Size   | MS9   |
| Pneumatic connection 1, 2                    |   |
| Female thread                                | G3/4, G1, NPT3/4 or NPT1                                  |
| Connecting plate AG...                       | G1/2, G3/4, G1, G1 1/4 or G1 1/2                          |
| Connecting plate AQ...                       | NPT1/2, NPT3/4, NPT1, NPT1 1/4 or NPT1 1/2                |
| Module without connecting thread/plate G     | -   |
| Constructional design                        | Activated carbon filter                                   |
| Type of mounting                             | Via accessories<br>In-line installation                   |
| Installation position                        | Vertical ±5°  |
| Air purity class at the output <sup>1)</sup> | Compressed air in accordance with ISO 8573-1:2010 [1:4:2] |
| Bowl guard                                   | Integrated as metal bowl                                  |
| Residual oil content [mg/m <sup>3</sup> ]    | ≤0.003  |

1) It is recommended to replace filter cartridges after 1,000 operating hours (applies to an ambient temperature of 21 °C). The service life of a filter cartridge is reduced at higher temperatures.  
 - - Note: This product conforms to ISO 1179-1 and to ISO 228-1

| Standard flow rate $q_n^{1)}$ [l/min]                     |       |
|---|-------|
| Max. standard flow rate for air purity class $q_{n \max}$ | 6,500 |

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

| Operating and environmental conditions       |   |
|--|---|
| Operating pressure [bar]                     | 0 ... 20  |
| Operating medium                             | Compressed air in accordance with ISO 8573-1:2010 [1:4:2] |
| Ambient temperature [°C]                     | -10 ... +60   |
| Temperature of medium [°C]                   | +5 ... +30  |
| Storage temperature [°C]                     | -10 ... +60   |
| Corrosion resistance class CRC <sup>1)</sup> | 2   |
| UL Certification <sup>2)</sup>               | 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](http://www.festo.com/sp) → Certificates.

# Activated carbon filters MS9-LFX, MS series, NPT

Technical data

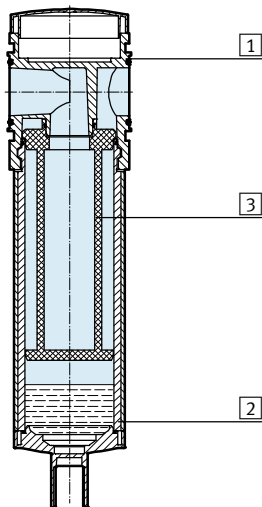
| ATEX  |   |
|---|---|
| EU certification                                      | EX4   |
| ATEX category gas                                     | II 2G                                       |
| Ex-ignition protection type gas                       | Ex h IIC T6 Gb X                            |
| ATEX category dust                                    | II 2D                                       |
| EX-ignition protection type dust                      | Ex h IIIC T60°C Db X                        |
| ATEX ambient temperature                              | -10 °C ≤ Ta ≤ +60 °C                        |
| CE mark (see declaration of conformity) <sup>1)</sup> | To EU Explosion Protection Directive (ATEX) |

1) Additional information [www.festo.com/sp](http://www.festo.com/sp) → Certificates.

| Weights [g]             |       |
|-------------------------|-------|
| Activated carbon filter | 2,000 |

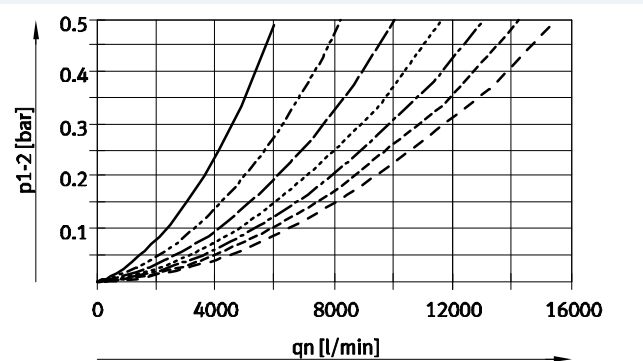
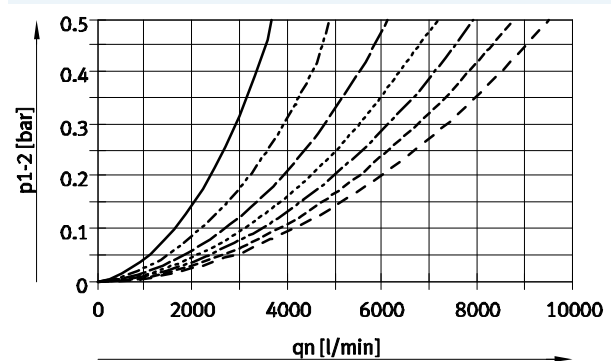
## Materials

Sectional view



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

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



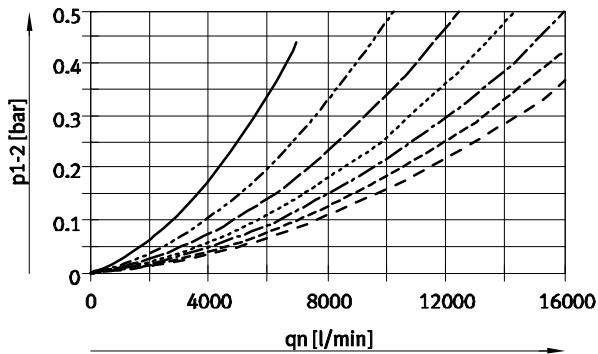
- 2 bar
- - - 4 bar
- · - 6 bar
- · · 8 bar
- - - - 10 bar
- · - · 12 bar
- · - · · 14 bar

# Activated carbon filters MS9-LFX, MS series, NPT

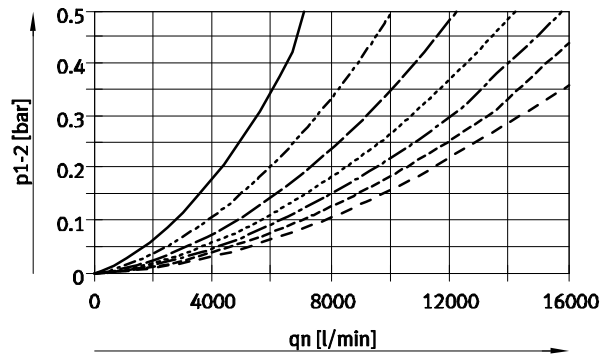
Technical data

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

Pneumatic connection G1/NPT1



Pneumatic connection G1½/NPT1½

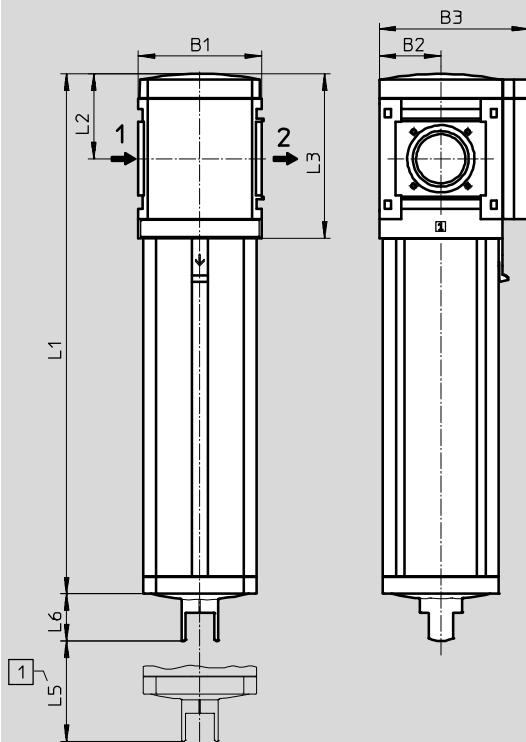


- 2 bar
- - - 4 bar
- · - 6 bar
- · · 8 bar
- - - - 10 bar
- · - · 12 bar
- · - · · 14 bar

## Dimensions – Basic version

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

Module without connecting thread, without connecting plate G



1 Installation dimensions

→ Flow direction

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

# Activated carbon filters MS9-LFX, MS series, NPT

Technical data

**Dimensions – Connecting thread/connecting plate** Download CAD data → [www.festo.com](http://www.festo.com)

With female thread 3/4"/1/N3/4/N1 With connecting plate AG.../AQ...

2 Mounting screw M6xmin.90 to DIN 912 (not included in scope of delivery) for wall mounting without mounting bracket
 
3 Earthing screw M4x8 (only with MS9-...-EX4)
 
→ Flow direction

| Type         | B4          | B5  | B6   | B7  |     | B8  | D1              | L4 | L7  | ≅    |
|--------------|-------------|-----|------|-----|-----|-----|-----------------|----|-----|------|
|              |             |     |      |     | EX4 |     |                 |    | EX4 |      |
| MS9-LFX-3/4  | 90          | 104 | 91.5 | -   | -   | -   | G3/4            | 66 | -   | -    |
| MS9-LFX-1    |             |     |      |     |     |     | G1              |    |     |      |
| MS9-LFX-AGD  | -           | -   | -    | 112 | 122 | 132 | G1/2            | -  | 35  | 30   |
| MS9-LFX-AGE  |             |     |      |     |     | 132 | G3/4            |    |     | 36   |
| MS9-LFX-AGF  |             |     |      |     |     | 142 | G1              |    |     | 41   |
| MS9-LFX-AGG  |             |     |      |     |     | 162 | G1 1/4          |    |     | 50   |
| MS9-LFX-AGH  |             |     |      |     |     | 176 | G1 1/2          |    |     | 55   |
| MS9-LFX-N3/4 |             |     |      |     |     | 90  | 104             |    |     | 91.5 |
| MS9-LFX-N1   | NPT1-11 1/2 |     |      |     |     |     |                 |    |     |      |
| MS9-LFX-AQR  | -           | -   | -    | 112 | 122 | 132 | NPT1/2-14       | -  | 35  | 30   |
| MS9-LFX-AQS  |             |     |      |     |     | 132 | NPT3/4-14       |    |     | 36   |
| MS9-LFX-AQT  |             |     |      |     |     | 142 | NPT1-11 1/2     |    |     | 41   |
| MS9-LFX-AQU  |             |     |      |     |     | 162 | NPT1 1/4-11 1/2 |    |     | 50   |
| MS9-LFX-AQV  |             |     |      |     |     | 176 | NPT1 1/2-11 1/2 |    |     | 55   |

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

| Ordering data |            |          |                |
|---------------|------------|----------|----------------|
| Size          | Connection | Part No. | Type           |
| MS9           | NPT3/4     | 552998   | MS9-LFX-N3/4-U |
|               | NPT1       | 553034   | MS9-LFX-N1-U   |
|               | -          | 564038   | MS9-LFX-G-U    |

# Activated carbon filters MS9-LFX, MS series, NPT

Ordering data – Modular products

| Ordering table |                      |  |                   |                                   |               |
|----------------|----------------------|--|-------------------|-----------------------------------|---------------|
| Grid dimension | [mm]                 | 90   | Condi-<br>tions   | Code                              | Enter<br>code |
| <b>M</b>       | Module No.           | 552942   |                   |                                   |               |
|                | Series               | Standard service unit                                      |                   | <b>MS</b>                         | MS            |
|                | Size                 | 9  |                   | <b>9</b>                          | 9             |
|                | Function             | Activated carbon filter                                    |                   | <b>-LFX</b>                       | -LFX          |
|                | Pneumatic connection | Female thread G $\frac{3}{4}$                              | <b>1</b>          | <b>-<math>\frac{3}{4}</math></b>  |               |
|                |                      | Female thread G1   | <b>1</b>          | <b>-1</b>                         |               |
|                |                      | Connecting plate G $\frac{1}{2}$                           |                   | <b>-AGD</b>                       |               |
|                |                      | Connecting plate G $\frac{3}{4}$                           |                   | <b>-AGE</b>                       |               |
|                |                      | Connecting plate G1  |                   | <b>-AGF</b>                       |               |
|                |                      | Connecting plate G1 $\frac{1}{4}$                          |                   | <b>-AGG</b>                       |               |
|                |                      | Connecting plate G1 $\frac{1}{2}$                          |                   | <b>-AGH</b>                       |               |
|                |                      | Female thread NPT $\frac{3}{4}$                            | <b>1</b>          | <b>-N<math>\frac{3}{4}</math></b> |               |
|                |                      | Female thread NPT1   | <b>1</b>          | <b>-N1</b>                        |               |
|                |                      | Connecting plate NPT $\frac{1}{2}$                         | <b>1</b>          | <b>-AQR</b>                       |               |
|                |                      | Connecting plate NPT $\frac{3}{4}$                         | <b>1</b>          | <b>-AQS</b>                       |               |
|                |                      | Connecting plate NPT1                                      | <b>1</b>          | <b>-AQT</b>                       |               |
|                |                      | Connecting plate NPT1 $\frac{1}{4}$                        | <b>1</b>          | <b>-AQU</b>                       |               |
|                |                      | Connecting plate NPT1 $\frac{1}{2}$                        | <b>1</b>          | <b>-AQV</b>                       |               |
|                |                      | Module without connecting thread, without connecting plate | <b>1</b>          | <b>-G</b>                         |               |
|                |                      | Bowl   | Metal bowl        |                                   | <b>-U</b>     |
| <b>O</b>       | Type of mounting     | Mounting bracket standard design                           | <b>2</b>          | <b>-WP</b>                        |               |
|                |                      | Mounting bracket for attaching the service units           | <b>1</b> <b>2</b> | <b>-WPM</b>                       |               |
|                |                      | Wall mounting bracket for large wall gap                   | <b>2</b>          | <b>-WPB</b>                       |               |
|                | EU certification     | II 2GD to EU Explosion Protection Directive (ATEX)         |                   | <b>-EX4</b>                       |               |
|                | UL certification     | cULus, ordinary location for Canada and USA                |                   | <b>-UL1</b>                       |               |
|                | Flow direction       | Flow direction from right to left                          |                   | <b>-Z</b>                         |               |

**1**  $\frac{3}{4}$ , 1, N $\frac{3}{4}$ , N1, AQR, AQS, AQT, AQU, AQV, G, WPM

Not with EU certification EX4

**2** **WP, WPM, WPB** Not with pneumatic connection G

**M** Mandatory data

**O** Options

Transfer order code

552942 MS 9 - LFX - [ ] - U [ ] - [ ] - [ ] - [ ]

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

Accessories

**FESTO**

Filter cartridges, MS9 series



| Ordering data     |                                   |                             |          |              |
|-------------------|-----------------------------------|-----------------------------|----------|--------------|
| Size              | Filter cartridge                  | Grade of filtration<br>[µm] | Part No. | Type         |
| MS9               | Micro-filter cartridge            | 0.01                        | 553036   | MS9-LFM-A    |
|                   | Fine-filter cartridge             | 1                           | 553037   | MS9-LFM-B    |
|                   | Activated carbon filter cartridge | -                           | 552946   | MS9-LFX      |
| High flow rate HF |                                   |                             |          |              |
| MS9               | Micro-filter cartridge            | 0.01                        | 552944   | MS9-LFM-A-HF |
|                   | Fine-filter cartridge             | 1                           | 552945   | MS9-LFM-B-HF |