

## Fine filter MS9N-LFM-B

**FESTO**



## Characteristics

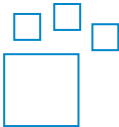
### At a glance

High-efficiency filter for exceptionally clean compressed air.

- With NPT connection thread
- Removal of oil aerosols from compressed air
- Air quality according to ISO 8573-1:2010
- Available with differential pressure gauge to indicate contamination
- Available with electronic filter clogging indicator

### Ordering data - modular system

Link [ms9-lfm-b](#)



Configurable product

This product and all its product options can be ordered online via the configurator.

### Size

Width dimension: 90 mm

Standard nominal flow rate:

- 350 ... 10000 l/min

### Pneumatic connection

The installation of connection plates makes it easier to replace the module if necessary (e.g., when using piping).

### Bowl type

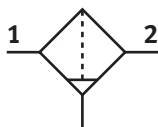
Shell protection by means of integrated metal shell.

### Condensate drains

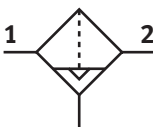
The following functions can be selected:

- Manual
- Semi-automatic
- Fully automatic
- Fully automatic, normally closed

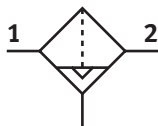
[M] Manual



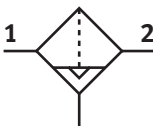
[H] Semi-automatic



[V] Automatic



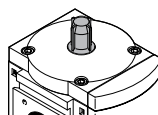
[VC] Fully automatic, normally closed



### Filter change sensing

Optionally available with differential pressure display for filter contamination.

[DA] Differential pressure display, visual



## Characteristics

### Type of mounting

#### [WP] Mounting bracket standard design



- Mounting attachment and connector for air preparation unit combination or for individual device with port plates
- In conjunction with connection plate MS9-AQ... for wall mounting of a single appliance

#### [WPB] Mounting bracket for large wall gap



- For connecting the modules for wall mounting
- In conjunction with connection plate MS9-AQ... for wall mounting of a single appliance
- Same wall distance for mixing combination with series MS12 when using the mounting bracket MS12-WP

#### [WPM] Mounting bracket for hooking in air preparation units



- Mounting attachment and connector for air preparation unit combination
- Mount and dismount the service unit combination quickly
- Spacer for maintaining the mounting gap
- Same wall distance for mixing combination with series MS6 when using mounting bracket MS6-WPB

### EX certification EU

Optional device variant EX4 for use in potentially explosive areas of zones 1, 2, 21 and 22

### UL certification

Optional device variant UL1, which meets the safety requirements for the Canadian and US markets.

### Flow direction

Available with opposite flow direction.

## Type code

|      |                                                    |  |
|------|----------------------------------------------------|--|
| 001  | Series                                             |  |
| MS   | MS series                                          |  |
| 002  | Size                                               |  |
| 9    | Width dimension 90 mm                              |  |
| 003  | Function                                           |  |
| LFM  | Fine and micro filters                             |  |
| 004  | Pneumatic connection                               |  |
| 3/4  | Internal thread G3/4                               |  |
| 1    | Internal thread G1                                 |  |
| AGD  | Sub-base G1/2                                      |  |
| AGE  | Sub-base G3/4                                      |  |
| AGF  | Sub-base G1                                        |  |
| AGG  | Sub-base G1 1/4                                    |  |
| AGH  | Sub-base G1 1/2                                    |  |
| AQR  | Sub-base 1/2 NPT                                   |  |
| AQS  | Sub-base 3/4 NPT                                   |  |
| AQT  | Sub-base 1 NPT                                     |  |
| AQU  | Sub-base 1 1/4 NPT                                 |  |
| AQV  | Sub-base 1 1/2 NPT                                 |  |
| G    | Module without connecting thread, without sub-base |  |
| N3/4 | Internal thread 3/4 NPT                            |  |
| N1   | Internal thread 1 NPT                              |  |
| 005  | Filter design                                      |  |
| A    | 0.01 µm                                            |  |
| B    | 1 µm                                               |  |
| 006  | Bowl type                                          |  |
| U    | Aluminum                                           |  |

|     |                                                                                    |  |
|-----|------------------------------------------------------------------------------------|--|
| 007 | Condensate drain                                                                   |  |
| E2  | External fully automatic condensate drain, electric, 110 VAC, connection terminals |  |
| E3  | External fully automatic condensate drain, electric, 230 VAC, connection terminals |  |
| E4  | External fully automatic condensate drain, electric, 24 V DC, connection terminals |  |
| H   | Semi-automatic                                                                     |  |
| M   | Manual                                                                             |  |
| V   | Fully automatic, normally open                                                     |  |
| VC  | Fully automatic, normally closed                                                   |  |
| 008 | Flow rate                                                                          |  |
|     | Standard                                                                           |  |
| HF  | High flow rate                                                                     |  |
| 009 | Filter change sensing                                                              |  |
|     | Without                                                                            |  |
| DA  | Differential pressure display, visual                                              |  |
| DN  | Filter contamination indicator, M8 plug, NPN, 3-pin                                |  |
| DNI | Filter contamination indicator, M12 plug, NPN, 4-pin, analog output 4...20 mA      |  |
| DP  | Filter contamination indicator, M8 plug, PNP, 3-pin                                |  |
| DPI | Filter contamination indicator, M12 plug, PNP, 4-pin, analog output 4...20 mA      |  |
| 010 | Type of mounting                                                                   |  |
|     | Without mounting bracket                                                           |  |
| WP  | Mounting bracket standard design                                                   |  |
| WPB | Mounting bracket for large wall gap                                                |  |
| WPM | Mounting bracket for hooking in air preparation units                              |  |
| 011 | EX certification EU                                                                |  |
|     | None                                                                               |  |
| EX4 | II 2GD                                                                             |  |
| 012 | UL certification                                                                   |  |
|     | None                                                                               |  |
| UL1 | cULus ordinary location for Canada and USA                                         |  |
| 013 | Flow direction                                                                     |  |
|     | Flow direction from left to right                                                  |  |
| Z   | Flow direction from right to left                                                  |  |

# Datasheet

| General technical data            |                                                            |       |
|-----------------------------------|------------------------------------------------------------|-------|
| Pneumatic connection 1            | 3/4 NPT                                                    | 1 NPT |
| Pneumatic connection 2            | 3/4 NPT                                                    | 1 NPT |
| Size                              | 9                                                          |       |
| Structural design                 | Fiber filter                                               |       |
| Grade of filtration               | 1 µm                                                       |       |
| Type of mounting                  | Alternatively:<br>In-line installation<br>With accessories |       |
| Mounting position                 | Vertical ±5°                                               |       |
| Air quality class at the output   | Compressed air according to ISO 8573-1:2010 [5:4:3]        |       |
| Filter efficiency                 | 99.99%                                                     |       |
| Condensate drain                  | Fully automatic, Manual, non-detenting, Manual, rotating   |       |
| Max. condensate volume            | 225 ml                                                     |       |
| Filter efficiency, fine particles | 99%                                                        |       |
| Filter efficiency, oil aerosol    | 90%                                                        |       |

| Standard nominal flow rate q <sub>N</sub>     |              |                     |
|-----------------------------------------------|--------------|---------------------|
| Flow rate                                     | Standard [L] | High flow rate [HF] |
| Min. standard flow rate for air quality class | 350 l/min    | 500 l/min           |
| Max. standard flow rate for air quality class | 7,000 l/min  | 10,000 l/min        |

| Operating and ambient conditions               |                                               |                  |
|------------------------------------------------|-----------------------------------------------|------------------|
| Condensate drain                               | Fully automatic, Manual, non-detenting        | Manual, rotating |
| Operating pressure                             | 0.2 ... 1.2 MPa                               | 0 ... 2 MPa      |
| Operating pressure                             | 2 ... 12 bar                                  | 0 ... 20 bar     |
| Operating pressure                             | 29 ... 174 psi                                | 0 ... 290 psi    |
| Operating medium                               | Compressed air as per ISO 8573-1:2010 [6:4:4] |                  |
| Ambient temperature                            | -10 ... 60°C                                  |                  |
| Temperature of medium                          | -10 ... 60°C                                  |                  |
| Storage temperature                            | -10 ... 60°C                                  |                  |
| Corrosion resistance class (CRC) <sup>1)</sup> | 2 - Moderate corrosion stress                 |                  |

1) Further information, visit [www.festo.com/x/topic/kbk](http://www.festo.com/x/topic/kbk)

| ATEX                                                       |                                                 |
|------------------------------------------------------------|-------------------------------------------------|
| ATEX category gas                                          | II 2G                                           |
| Type of ignition protection for gas                        | Ex h IIC T6 Gb X                                |
| ATEX category for dust                                     | II 2D                                           |
| Type of (ignition) protection for dust                     | Ex h IIIC T60°C Db X                            |
| Explosive ambient temperature                              | +5°C ≤ Ta ≤ +60°C                               |
| CE marking (see declaration of conformity) <sup>1)</sup>   | as per EU explosion protection directive (ATEX) |
| UKCA marking (see declaration of conformity) <sup>2)</sup> | acc. to UK EX instructions                      |

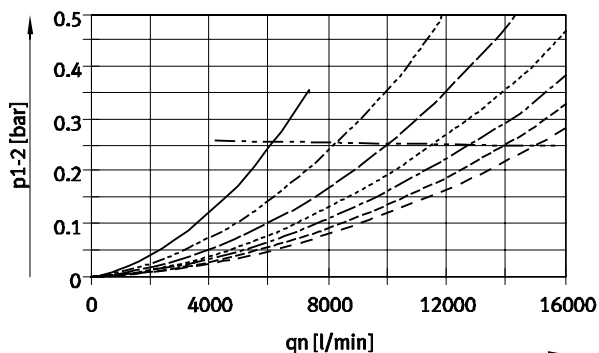
1) Further information [www.festo.com/catalogue/ms-lfm](http://www.festo.com/catalogue/ms-lfm) → Support/Downloads.

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

| Materials                      |                          |
|--------------------------------|--------------------------|
| Housing material               | Die-cast aluminum        |
| Material of bowl               | Wrought aluminum alloy   |
| Inspection window material     | PA                       |
| Compressed air filter material | Borosilicate glass fiber |
| Seals material                 | NBR                      |
| LABS (PWIS) conformity         | VDMA24364-B1/B2-L        |

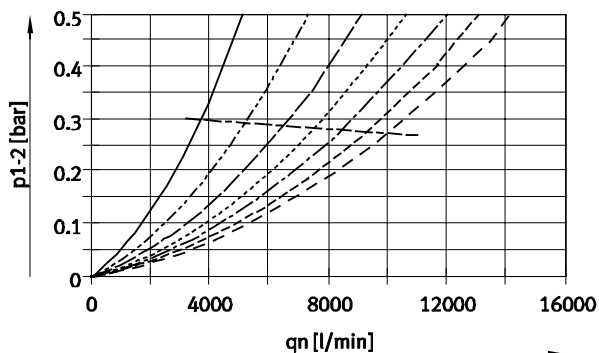
# Datasheet

## Standard flow rate $q_n$ as a function of differential pressure $\Delta p_{1-2}$ – (pneumatic connection G1/2 NPT)



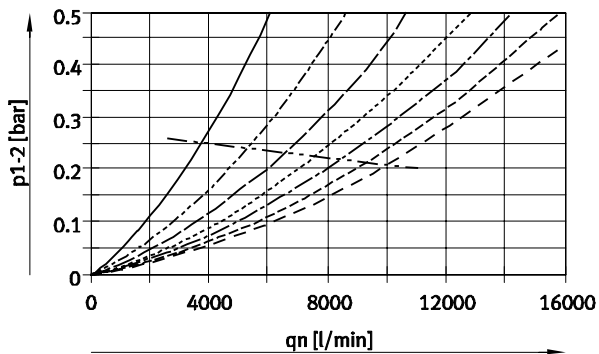
- 2 bar
- - - 4 bar
- 6 bar ( $q_{n \text{ min}}$ : 500 l/min)
- - - 8 bar
- 10 bar
- - - 12 bar
- - - 14 bar
- - -  $q_{n \text{ max}}$

## Standard flow rate $q_n$ as a function of differential pressure $\Delta p_{1-2}$ – (pneumatic connection G3/4 NPT)

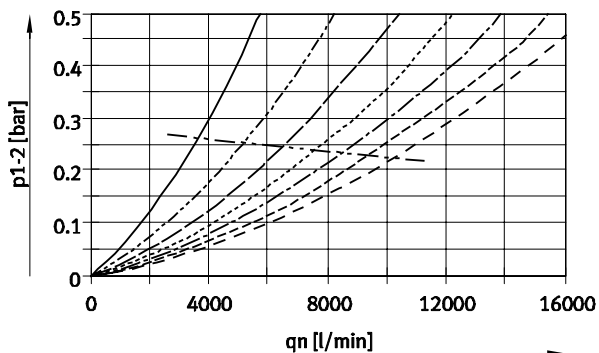


- 2 bar
  - - - 4 bar ( $q_{n \text{ min}}$ : 268 l/min)
  - 6 bar ( $q_{n \text{ min}}$ : 325 l/min)
  - - - 8 bar
  - 10 bar ( $q_{n \text{ min}}$ : 420 l/min)
  - - - 12 bar
  - - - 14 bar ( $q_{n \text{ min}}$ : 498 l/min)
  - - -  $q_{n \text{ max}}$
- (with MS9-LFM-AGD/AQR:  $q_{n \text{ max}}$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

## Datasheet

Standard flow rate  $q_n$  as a function of differential pressure  $\Delta p_{1-2}$  – (pneumatic connection G1 NPT)

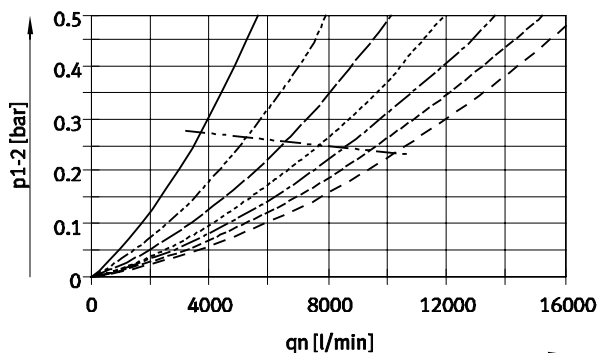
- 2 bar
- - - 4 bar ( $q_{n \min}$ : 268 l/min)
- · - 6 bar ( $q_{n \min}$ : 325 l/min)
- - - 8 bar
- · - 10 bar ( $q_{n \min}$ : 420 l/min)
- - - 12 bar
- - - 14 bar ( $q_{n \min}$ : 498 l/min)
- - -  $q_{n \max}$   
(with MS9-LFM-AGD/AQR:  $q_{n \max}$ -values  
lie above the measured  $q_n$ -values)

Standard flow rate  $q_n$  as a function of differential pressure  $\Delta p_{1-2}$  – (pneumatic connection 1 1/4 NPT)

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

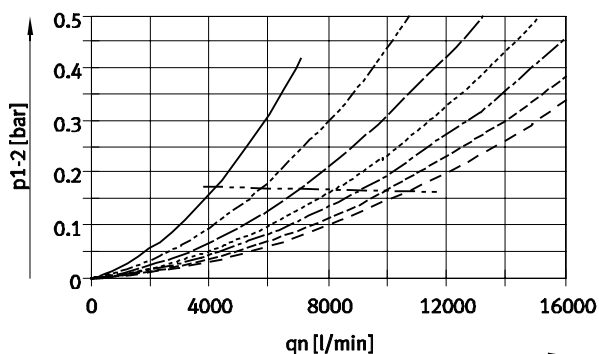
# Datasheet

## Standard flow rate $q_n$ as a function of differential pressure $\Delta p_{1-2}$ – (pneumatic connection 1 1/2 NPT)



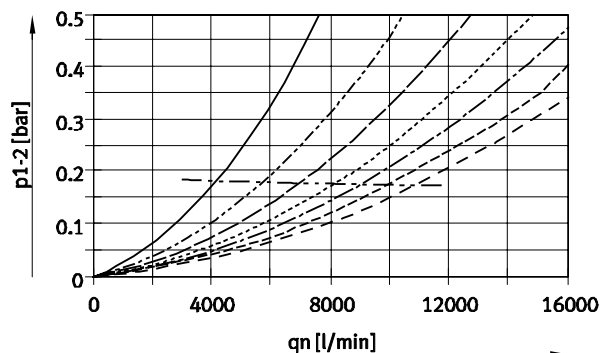
- 2 bar
- - - 4 bar ( $q_{n \text{ min}}$ : 268 l/min)
- · - · 6 bar ( $q_{n \text{ min}}$ : 325 l/min)
- - - - 8 bar
- · - · - 10 bar ( $q_{n \text{ min}}$ : 420 l/min)
- - - - - 12 bar
- · - · - - 14 bar ( $q_{n \text{ min}}$ : 498 l/min)
- - - - -  $q_{n \text{ max}}$   
(with MS9-LFM-AGD/AQR:  $q_{n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

## Standard flow rate $q_n$ as a function of differential pressure $\Delta p_{1-2}$ (pneumatic connection 3/4 NPT – high flow rate HF)



- 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)

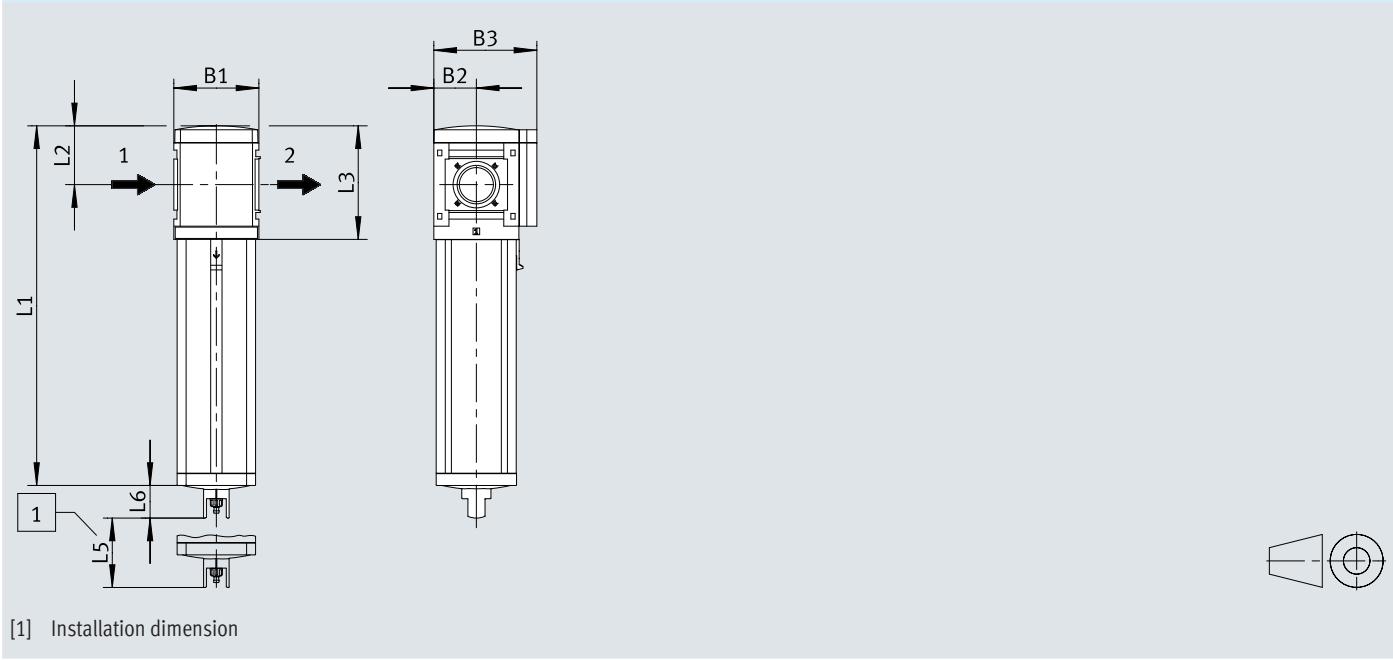
## Datasheet

Standard flow rate  $q_n$  as a function of differential pressure  $\Delta p_{1-2}$  (pneumatic connection 1 NPT – high flow rate HF)

- 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)

Dimensions

Dimensions – Module without connecting thread, without connecting plate G Download CAD data [www.festo.com](http://www.festo.com)



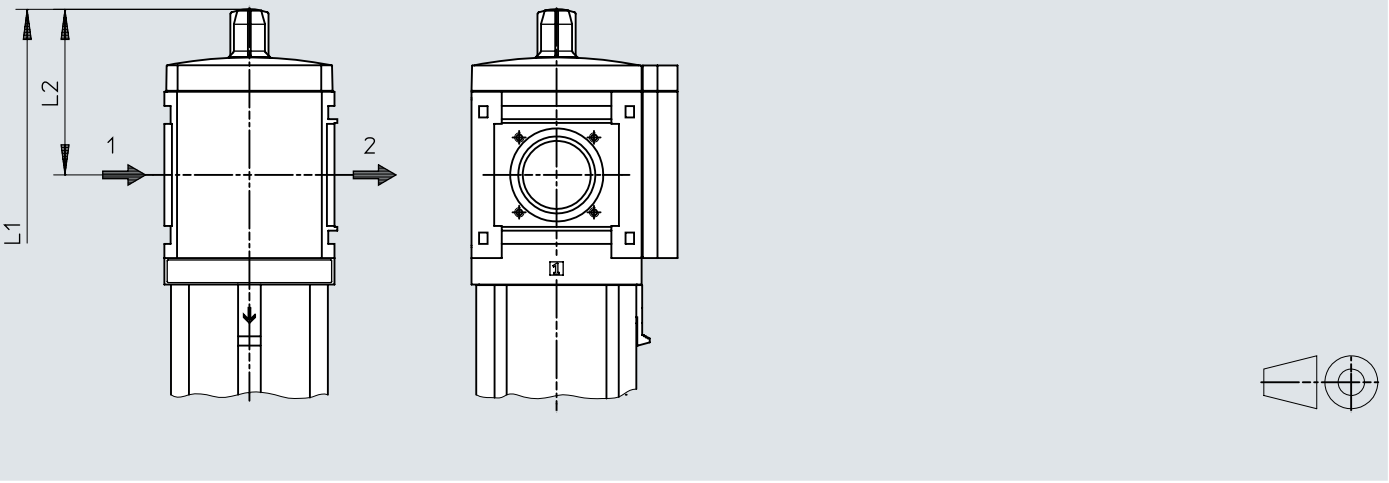
|           | B1 | B2 | B3  | L1    |       | L2 | L3  | L5 | L6   |
|-----------|----|----|-----|-------|-------|----|-----|----|------|
|           |    |    |     | 1)    | 2)    |    |     |    |      |
| MS9-LFM-G | 90 | 45 | 109 | 380,5 | 480,5 | 62 | 120 | 50 | 34,5 |

- 1) Standard
- 2) High flow rate HF

Dimensions

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

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



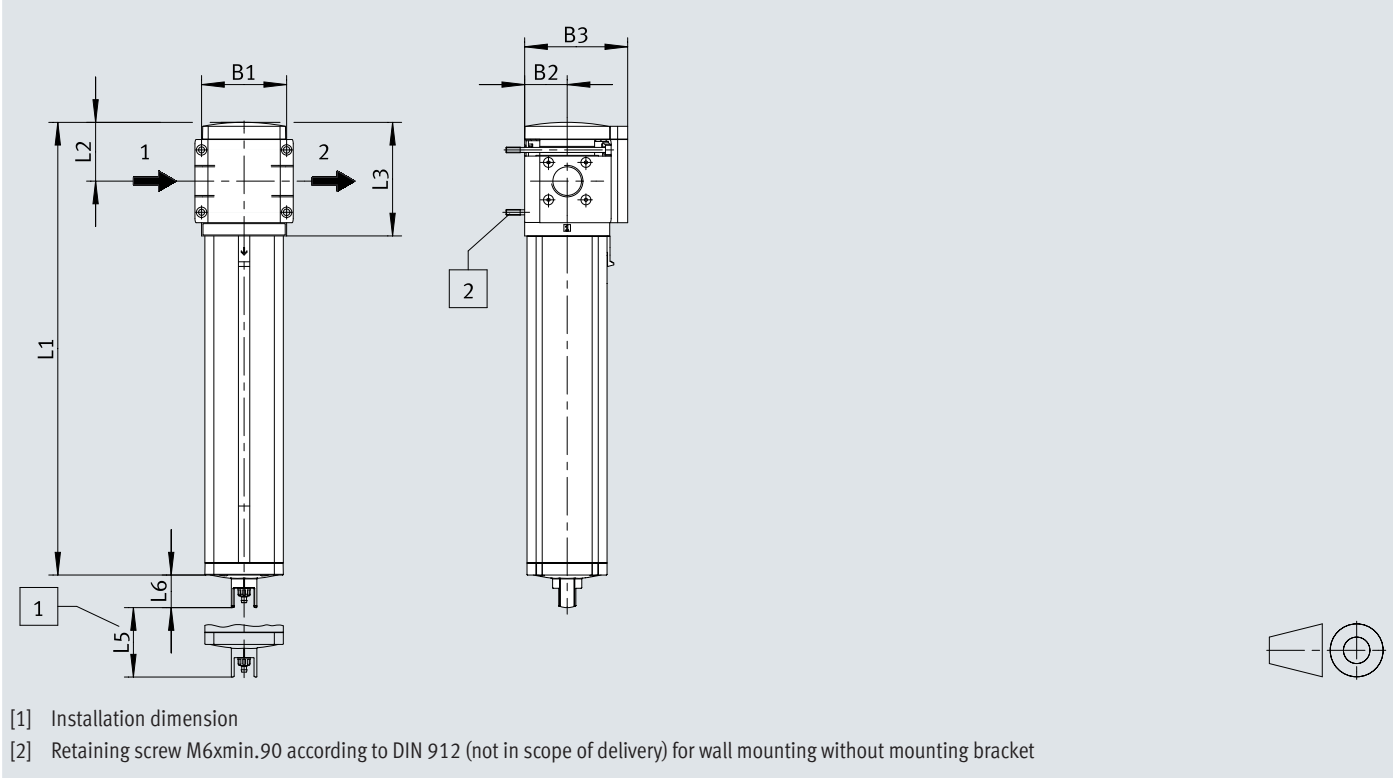
|                  | B1 | B2 | B3  | 1)    | L1    | 2) | L2 | L3  | L5 | L6   |
|------------------|----|----|-----|-------|-------|----|----|-----|----|------|
| MS9-LFM-G-...-DA | 90 | 45 | 109 | 405,5 | 505,5 |    | 88 | 120 | 50 | 34,5 |

- 1) Standard
- 2) High flow rate HF

Dimensions

Dimensions – Connecting thread/connecting plate with internal thread 3/4, 1, N3/4, N1

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

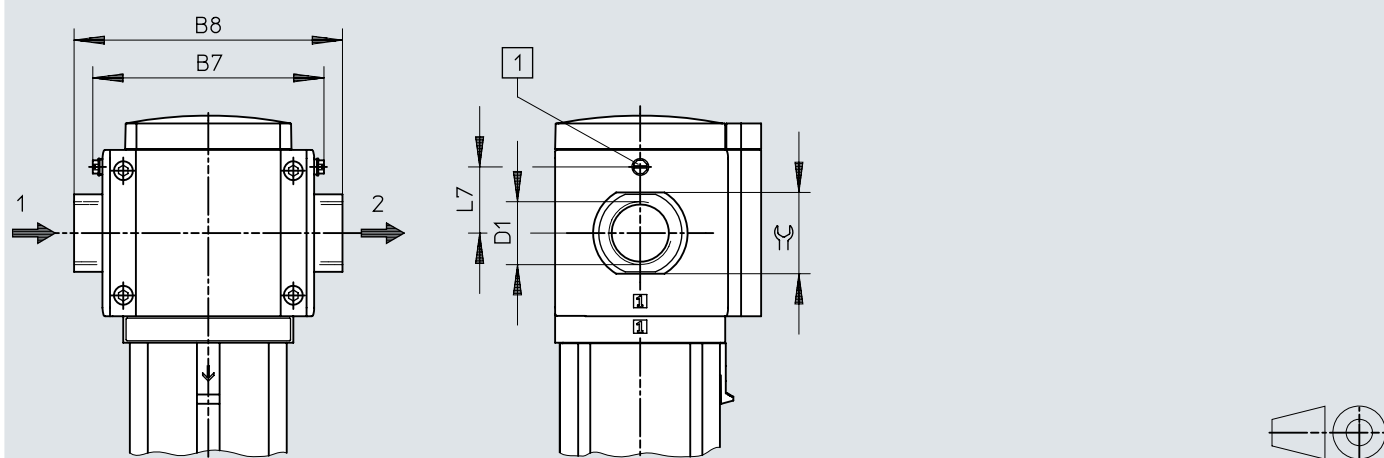


|              | B4 | B5  | B6   | D1      | L4 |
|--------------|----|-----|------|---------|----|
| MS9-LFM-3/4  | 90 | 104 | 91,5 | G3/4    | 66 |
| MS9-LFM-1    |    |     |      | G1      |    |
| MS9-LFM-N3/4 | 90 | 104 | 91,5 | 3/4 NPT | 66 |
| MS9-LFM-N1   |    |     |      | 1 NPT   |    |

## Dimensions

Dimensions – Connecting thread/connecting plate with connecting plate  
AG.../AQ...

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

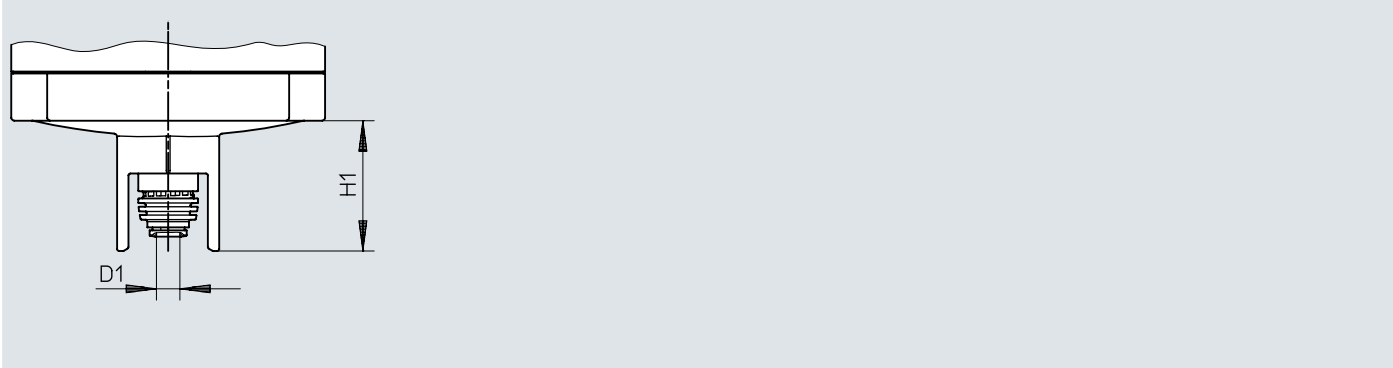


[1] Grounding screw M4x8 (only for MS9-...-EX4)

|             | B7  |     | B8  | D1        | L7  | ≅  |
|-------------|-----|-----|-----|-----------|-----|----|
|             |     | EX4 |     |           | EX4 |    |
| MS9-LFM-AGD | 112 | 122 | 132 | G1/2      | 35  | 30 |
| MS9-LFM-AGE |     |     | 132 | G3/4      |     | 36 |
| MS9-LFM-AGF |     |     | 142 | G1        |     | 41 |
| MS9-LFM-AGG |     |     | 162 | G1 1/4    |     | 50 |
| MS9-LFM-AGH |     |     | 176 | G1 1/2    |     | 55 |
| MS9-LFM-AQR | 112 | 122 | 132 | 1/2 NPT   | 35  | 30 |
| MS9-LFM-AQS |     |     | 132 | 3/4 NPT   |     | 36 |
| MS9-LFM-AQT |     |     | 142 | 1 NPT     |     | 41 |
| MS9-LFM-AQU |     |     | 162 | 1 1/4 NPT |     | 50 |
| MS9-LFM-AQV |     |     | 176 | 1 1/2 NPT |     | 55 |

Dimensions

Dimensions – Condensate drain, manual rotary, fully automatic [Download CAD data](#) [www.festo.com](http://www.festo.com)

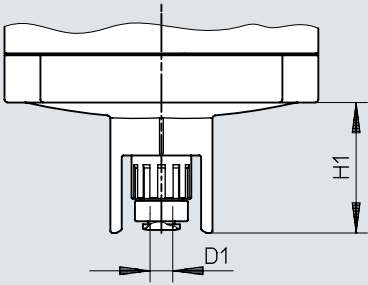


|                | D1  | H1   |
|----------------|-----|------|
| MS9-LF-...-M/V | 5,6 | 34,5 |

Dimensions

Dimensions – Condensate drain, semiautomatic

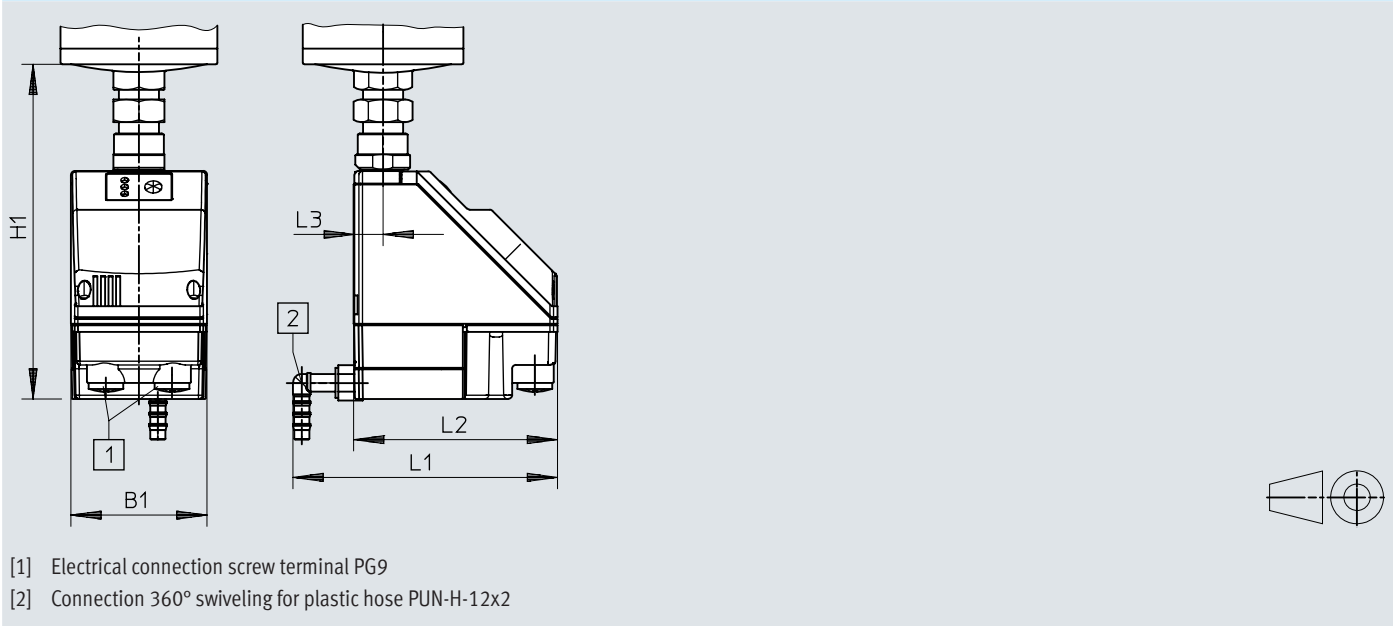
Download CAD data [www.festo.com](http://www.festo.com)



|              | D1  | H1   |
|--------------|-----|------|
| MS9-LF-...-H | 6,2 | 34,5 |

Dimensions

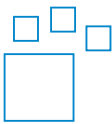
Dimensions – Condensate drain fully automatic, electrically controlled Download CAD data [www.festo.com](http://www.festo.com)



|                       | B1 | H1  | L1  | L2  | L3 |
|-----------------------|----|-----|-----|-----|----|
| MS9-LF-...-E2, E3, E4 | 72 | 178 | 140 | 108 | 15 |

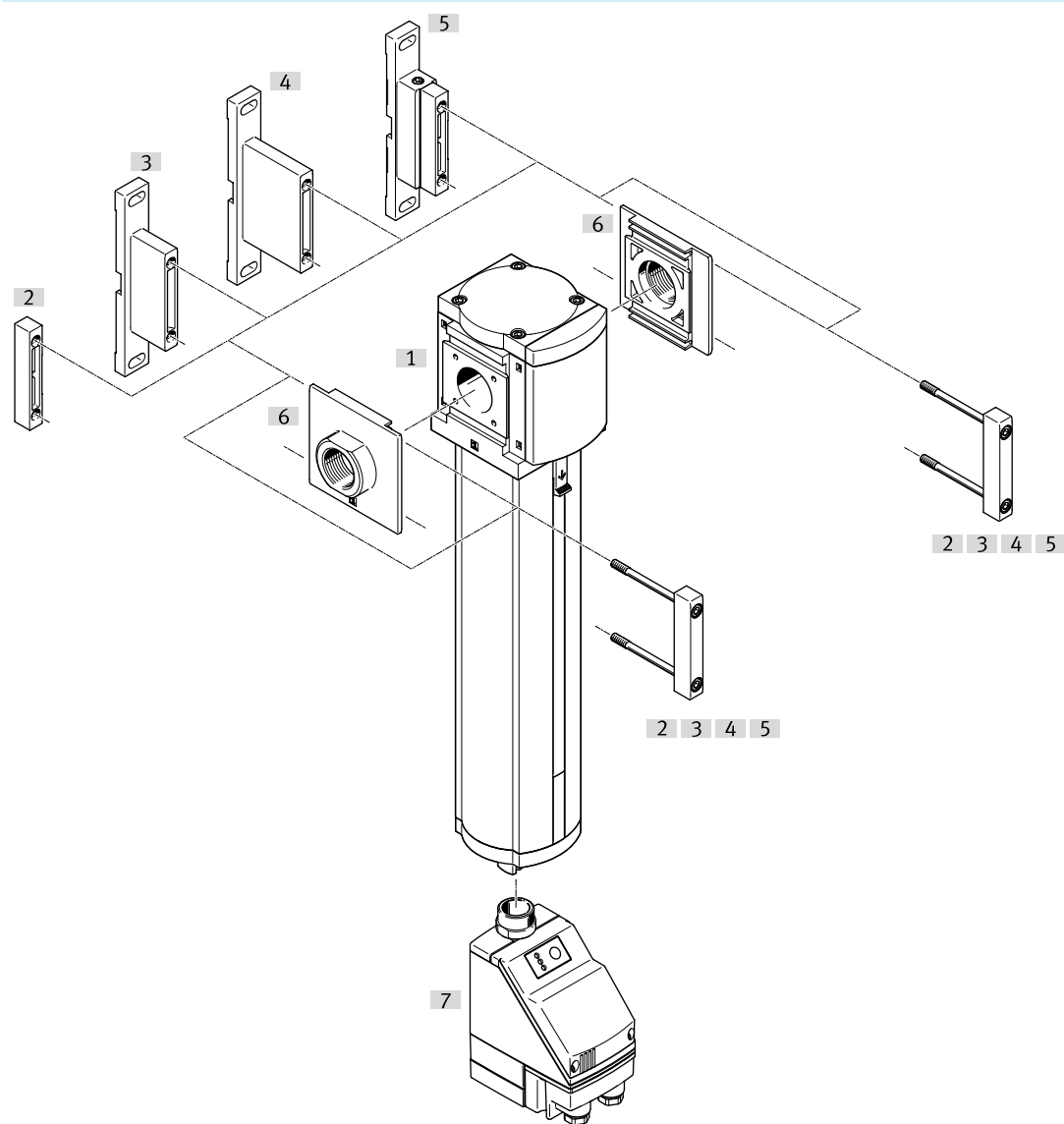
## Ordering data

| Ordering data                                                                     |                        |                     |                                         |                |          |                     |                   |
|-----------------------------------------------------------------------------------|------------------------|---------------------|-----------------------------------------|----------------|----------|---------------------|-------------------|
|                                                                                   | Pneumatic connection 1 | Grade of filtration | Condensate drain                        | Product weight | Part no. | Type                |                   |
|  | 3/4 NPT                | 1 µm                | Fully automatic, Manual, non-de-tenting | 2,000 g        | 553100   | MS9-LFM-N3/4-BUV-DA |                   |
|                                                                                   |                        |                     | Manual, rotating                        |                | 553090   | MS9-LFM-N3/4-BUM    |                   |
|                                                                                   |                        |                     |                                         |                | 553098   | MS9-LFM-N3/4-BUM-DA |                   |
|                                                                                   | 1 NPT                  |                     | Manual, rotating                        | 2,500 g        | 552984   | MS9-LFM-N3/4-BUM-HF |                   |
|                                                                                   |                        |                     |                                         | 2,000 g        | 553022   | MS9-LFM-N1-BUV      |                   |
|                                                                                   |                        |                     | Manual, rotating                        |                |          | 553028              | MS9-LFM-N1-BUM-DA |
|                                                                                   |                        |                     |                                         | 2,500 g        | 553058   | MS9-LFM-N1-BUM-HF   |                   |

| Ordering data– Modular product system                                             |           |          |         |
|-----------------------------------------------------------------------------------|-----------|----------|---------|
|                                                                                   | Type code | Part no. | Type    |
|  | MS9-LFM   | 552940   | MS9-LFM |

Peripherals overview

Peripherals overview



| Accessories                                                              |                                                                            | → Page/Internet         |
|--------------------------------------------------------------------------|----------------------------------------------------------------------------|-------------------------|
| Type/order code                                                          | Description                                                                |                         |
| [1] Fine filter M9N-LFM-B                                                |                                                                            | <a href="#">ms9-lfr</a> |
| [2] Sub-base-SET MS9-AQ...                                               | for device combinations                                                    | 19                      |
| [3] Module connector MS9-MV                                              | for appliance combinations and individual appliances with connection plate | 19                      |
| [4] Mounting bracket MS9-WP                                              | for single device                                                          | 19                      |
| [5] Mounting bracket MS9-WPB                                             | for single device                                                          | 20                      |
| [6] Mounting bracket MS9-WPM                                             | for single device                                                          | 20                      |
| [7] Condensate drain fully automatic, electrically controlled E2, E3, E4 |                                                                            | <a href="#">pwea</a>    |
| [8] Fine filter cartridge MS9-LFM-B                                      | Not shown                                                                  | <a href="#">ms9-lfm</a> |

## Accessories

| Fine filter cartridges MS9-LFM-B                                                  |                     |                                |                        |          |              |
|-----------------------------------------------------------------------------------|---------------------|--------------------------------|------------------------|----------|--------------|
|                                                                                   | Grade of filtration | Compressed air filter material | LABS (PWIS) conformity | Part no. | Type         |
|  | 1 µm                | Borosilicate glass fiber       | VDMA24364-B1/B2-L      | 552945   | MS9-LFM-B-HF |
|                                                                                   |                     |                                |                        | 553037   | MS9-LFM-B    |

| Sub-base-SET MS9-AG...                                                            |                        |                      |                        |                |          |         |
|-----------------------------------------------------------------------------------|------------------------|----------------------|------------------------|----------------|----------|---------|
|                                                                                   | Pneumatic connection 1 | Material of sub-base | LABS (PWIS) conformity | Product weight | Part no. | Type    |
|  | 1/2 NPT                | Die-cast aluminum    | VDMA24364-B1/B2-L      | 300 g          | 552959   | MS9-AQR |
|                                                                                   | 3/4 NPT                |                      |                        |                | 552960   | MS9-AQS |
|                                                                                   | 1 NPT                  |                      |                        |                | 552961   | MS9-AQT |
|                                                                                   | 1 1/4 NPT              |                      |                        | 400 g          | 552962   | MS9-AQU |
|                                                                                   | 1 1/2 NPT              |                      |                        |                | 552963   | MS9-AQV |
|                                                                                   |                        |                      |                        |                |          |         |

| Module connector MS9-MV                                                             |                           |                        |                |          |        |
|-------------------------------------------------------------------------------------|---------------------------|------------------------|----------------|----------|--------|
|                                                                                     | Module connector material | LABS (PWIS) conformity | Product weight | Part no. | Type   |
|  | Die-cast aluminum         | VDMA24364-B1/B2-L      | 110 g          | 552950   | MS9-MV |

| Mounting bracket MS9-WP                                                             |                   |                        |                |          |        |
|-------------------------------------------------------------------------------------|-------------------|------------------------|----------------|----------|--------|
|                                                                                     | Bracket material  | LABS (PWIS) conformity | Product weight | Part no. | Type   |
|  | Die-cast aluminum | VDMA24364-B1/B2-L      | 180 g          | 552947   | MS9-WP |

Accessories

| Mounting bracket MS9-WPB                                                         |                   |                        |                |          |         |
|----------------------------------------------------------------------------------|-------------------|------------------------|----------------|----------|---------|
|                                                                                  | Bracket material  | LABS (PWIS) conformity | Product weight | Part no. | Type    |
|  | Die-cast aluminum | VDMA24364-B1/B2-L      | 210 g          | 552949   | MS9-WPB |

| Mounting bracket MS9-WP                                                          |                   |                        |                |          |         |
|----------------------------------------------------------------------------------|-------------------|------------------------|----------------|----------|---------|
|                                                                                  | Bracket material  | LABS (PWIS) conformity | Product weight | Part no. | Type    |
|  | Die-cast aluminum | VDMA24364-B1/B2-L      | 220 g          | 552948   | MS9-WPM |