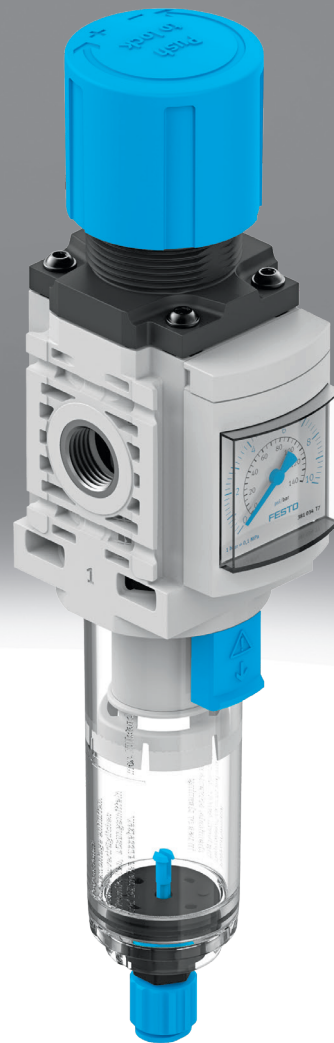


# Filter regulator MS-LFR-B

**FESTO**



## Characteristics

### At a glance

- Very compact and extremely lightweight series for use close to the process directly in the machine.
- Stable control response
- With secondary exhaust
- Integrated secondary exhaust and primary exhaust with return flow function
- The rotary knob locks into place to prevent unintentional rotation

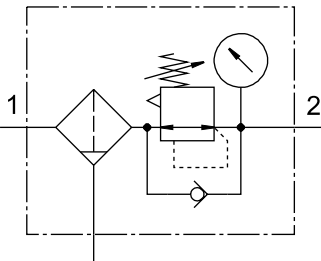
### Diagrams

Link [ms-lfr-b](#)



The diagrams shown in this document are also available online. These can be used to display precise values.

### Function



- For stepless, precise adjustment of the required operating pressure
- The pressure regulator keeps the working pressure largely constant, irrespective of compressed air fluctuations in the network and due to air consumption

### Pneumatic connection

Depending on the size, different connection types can be selected:  
Individual fittings that are fastened via a female thread

- Built-in connections into which the tubing can be directly inserted

### Pressure regulation range

The following ranges can be set:

- With MS2-...: 0.5 ... 7 bar
- With MS4-... and MS6-...: 0.3 ... 7 bar

### Grade of filtration

Grade of filtration of 5 µm or 40 µm can be selected.

### Condensate drain

The following functions can be selected:

- Manual
- Fully automatic, normally closed

### Pressure gauge alternatives

The pressure regulator can be ordered with or without a pressure gauge. The interface has a thread of G1/8.

### Alternative pressure gauge scale

The scaling of the built-in pressure gauge can be selected. The unit options available are [MPa], [bar] / [psi].

## Characteristics

### Special material properties

[F1A] Recommended for production plants for manufacturing lithium-ion batteries, F1A

Metals with more than 1% copper by mass are excluded from use. Exceptions are circuit boards, cables, electrical plug connectors and coils

### Version

[B] Second generation

Basic component with sturdy and lightweight polymer housing. Fully compatible with the MS series.

## Type code

<b>001</b>	<b>Series</b>	
<b>MS</b>	MS series	

<b>002</b>	<b>Size</b>	
<b>2</b>	Grid dimension 25 mm	
<b>4</b>	Grid dimension 40 mm	
<b>6</b>	Grid dimension 62 mm	

<b>003</b>	<b>Function</b>	
<b>LFR</b>	Filter regulator	

<b>004</b>	<b>Pneumatic connection</b>	
<b>M5</b>	Female thread M5	
<b>QS6</b>	Push-in connector 6 mm	
<b>1/4</b>	Female thread G1/4	
<b>1/2</b>	Female thread G1/2	

<b>005</b>	<b>Pressure regulation range</b>	
<b>D6</b>	0.3 ... 7 bar	

<b>006</b>	<b>Filter design</b>	
<b>C</b>	5 µm	
<b>E</b>	40 µm	

<b>007</b>	<b>Bowl type</b>	
<b>P</b>	Polymer	

<b>008</b>	<b>Condensate drain</b>	
<b>M</b>	Manually	
<b>VC</b>	Fully automatic, normally closed	

<b>009</b>	<b>Pressure gauge alternatives</b>	
<b>A8</b>	Adapter for EN pressure gauge 1/8, without pressure gauge	
<b>AG</b>	MS pressure gauge	
<b>AR</b>	With pressure gauge	

<b>010</b>	<b>Alternative pressure gauge scale</b>	
	MS pressure gauge	
<b>BAR</b>	bar	
<b>MPA</b>	MPa	

<b>011</b>	<b>Special material properties</b>	
	None	
<b>F1A</b>	Recommended for production plants for manufacturing lithium-ion batteries, F1A	

<b>012</b>	<b>Version</b>	
<b>B</b>	Second generation	

## Datasheet

General technical data						
Grade of filtration	5 µm			40 µm		
Size	2		4	6	4	6
Pneumatic connection, port 1	M5	QS-6	G1/4	G1/2	G1/4	G1/2
Pneumatic connection, port 2	M5	QS-6	G1/4	G1/2	G1/4	G1/2
Standard nominal flow rate (standardised to DIN 1343)	140 l/min	310 l/min	1,500 l/min	4,750 l/min	1,700 l/min	5,300 l/min
Pressure regulation range	0.05 ... 0.7 MPa		0.03 ... 0.7 MPa			
Pressure regulation range	0.5 ... 7 bar		0.3 ... 7 bar			
Pressure regulation range	7.25 ... 101.5 psi		4.35 ... 101.5 psi			
Max. pressure hysteresis	0.025 MPa		0.05 MPa	0.035 MPa	0.05 MPa	0.035 MPa
Max. pressure hysteresis	0.25 bar		0.5 bar	0.35 bar	0.5 bar	0.35 bar
Max. pressure hysteresis	3.625 psi		7.25 psi	5.075 psi	7.25 psi	5.075 psi
Design	Filter regulator with pressure gauge Filter regulator without pressure gauge		Filter regulator with pressure gauge Filter regulator without pressure gauge Directly actuated piston regulator			
Condensate drain	Manually rotating		Fully automatic, Manual, non-detenting, Manually rotating			
Degree of condensate separation	–		>75%			
Pore size	–		5 µm	40 µm		
Controller function	Output pressure constant, With secondary venting, With return flow function					
Type of mounting	Either., Front panel mounting, In-line installation, With accessories					
Mounting position	Vertical +/-5°					
Actuator lock	Rotary knob with detent					
Pressure gauge (ANALOG) or Pressure display (DIGITAL)	Prepared for G1/8, With pressure gauge					

Operating and environmental conditions						
Grade of filtration	5			40		
Size	2		4	6	4	6
Pneumatic connection, port 1	M5	QS-6	G1/4	G1/2	G1/4	G1/2
Condensate drain	Manually rotating		Fully automatic, Manual, non-detenting, Manually rotating			
Operating pressure	0.1 ... 1 MPa	0.1 ... 0.8 MPa		0.1 ... 1 MPa		
Operating pressure	1 ... 10 bar	1 ... 8 bar		1 ... 10 bar		
Operating pressure	14.5 ... 145 psi	14.5 ... 116 psi	14.5 ... 145 psi			
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4], Inert gases					
Ambient temperature	-5 ... 50°C					
Media temperature	-5 ... 50°C					
Storage temperature	-5 ... 50°C					
Corrosion resistance class CRC <sup>1)</sup>	1 - Low corrosion stress					

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

Materials						
Grade of filtration	5			40		
Size	2		4	6	4	6
Pneumatic connection, port 1	M5	QS-6	G1/4	G1/2	G1/4	G1/2
Material housing	PA-reinforced					
Material rotary knob	POM					
Material valve stem	Wrought aluminium alloy, NBR			POM		
Material membrane	NBR			–		
Material spring	High-alloy steel			High-alloy steel, Galvanised steel		
Material filter	PE					
Note on materials	RoHS-compliant					
LABS (PWIS) conformity	VDMA24364-B1/B2-L					
Air purity class at output	Compressed air to ISO 8573-1:2010 [6:4:4]				Compressed air to ISO 8573-1:2010 [7:4:4]	
Cleanroom class	Class 7 according to ISO 14644-1					

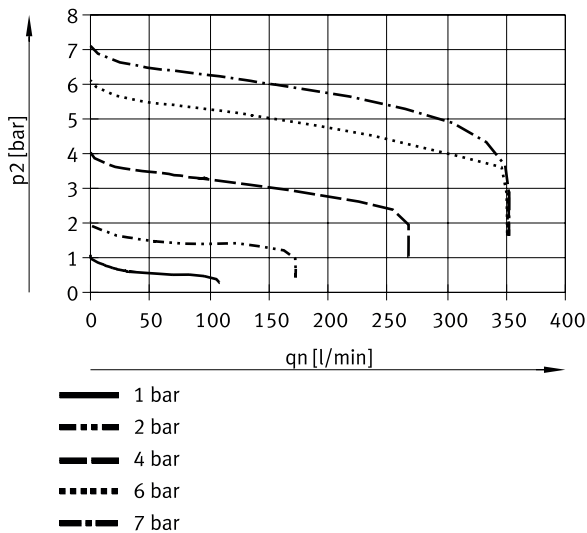
## Datasheet

### Additional material specifications – products for battery production

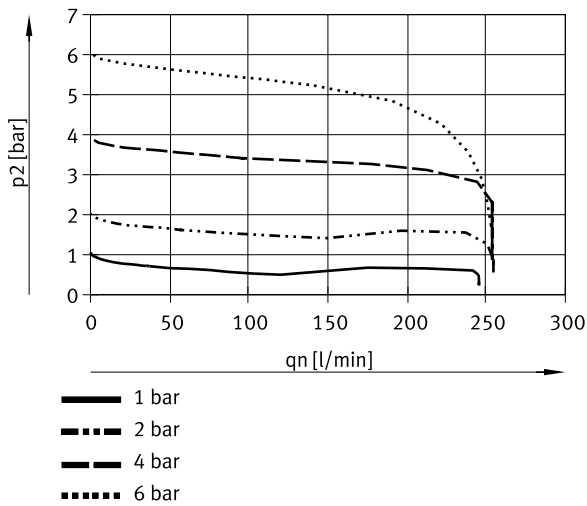
Suitability for the production of Li-ion batteries <sup>1)</sup>	Suitable for battery production according to the Festo internal definition of the degree of severity F1A with restrictions regarding the use of Cu/Zn/Ni
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<sup>1)</sup> only valid for MS...-F1A-B

### Standard flow rate $q_n$ as a function of output pressure $p_2$ ( $p_1 = 10 \text{ bar}$ ) – MS2-LFR-M5-...-B (grade of filtration: $5 \mu\text{m}$ )

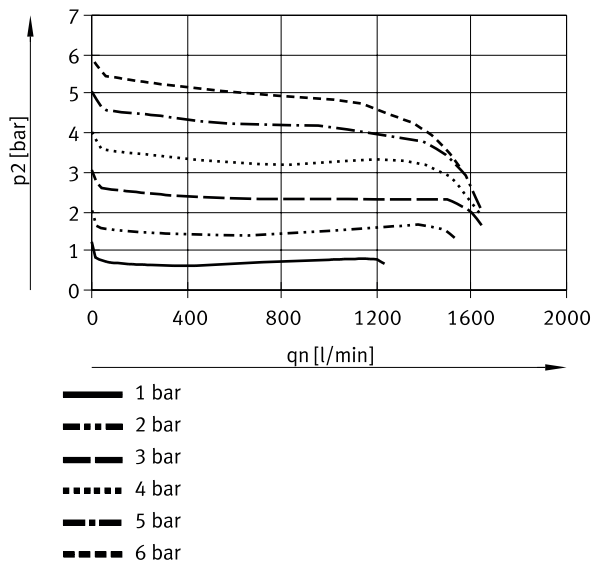


### Standard flow rate $q_n$ as a function of output pressure $p_2$ ( $p_1 = 7 \text{ bar}$ ) – MS2-LFR-QS6-...-B (grade of filtration: $5 \mu\text{m}$ )

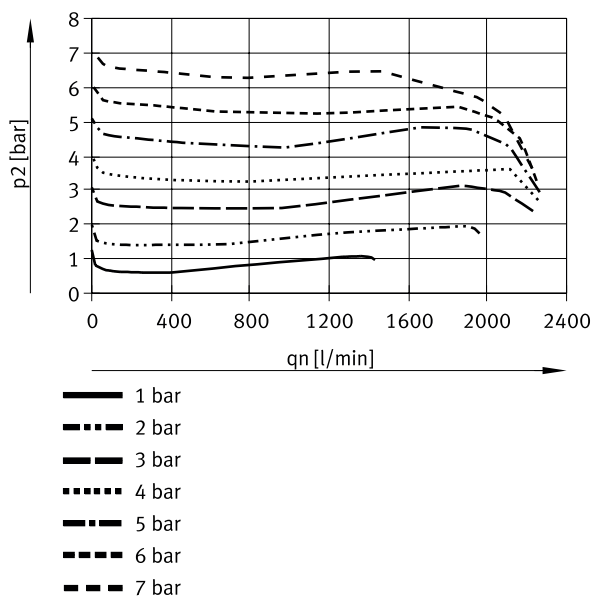


Datasheet

Standard flow rate  $q_n$  as a function of output pressure  $p_2$  ( $p_1 = 7 \text{ bar}$ ) – MS4-LFR...-C...-B (filter fineness:  $5 \mu\text{m}$ )

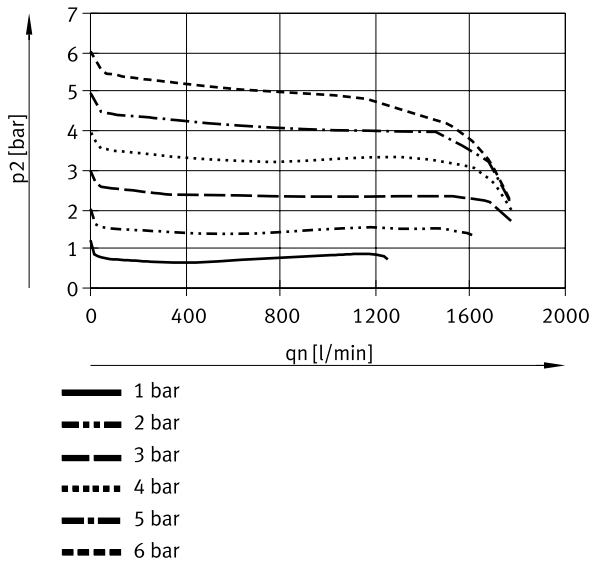


Standard flow rate  $q_n$  as a function of output pressure  $p_2$  ( $p_1 = 10 \text{ bar}$ ) – MS4-LFR...-C...-B (filter fineness:  $5 \mu\text{m}$ )

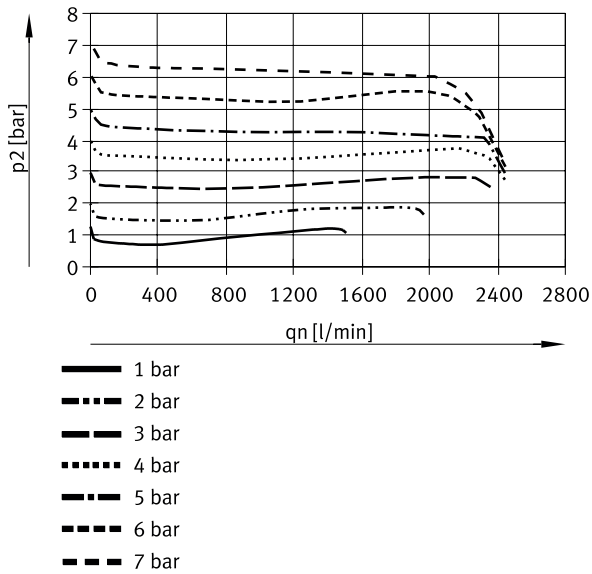


Datasheet

Standard flow rate  $q_n$  as a function of output pressure  $p_2$  ( $p_1 = 7 \text{ bar}$ ) – MS4-LFR...-E...-B (filter fineness:  $40 \mu\text{m}$ )



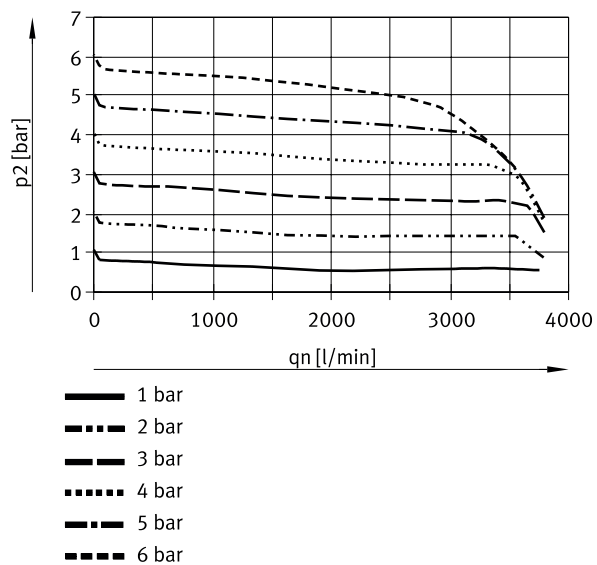
Standard flow rate  $q_n$  as a function of output pressure  $p_2$  ( $p_1 = 10 \text{ bar}$ ) – MS4-LFR...-E...-B (filter fineness:  $40 \mu\text{m}$ )



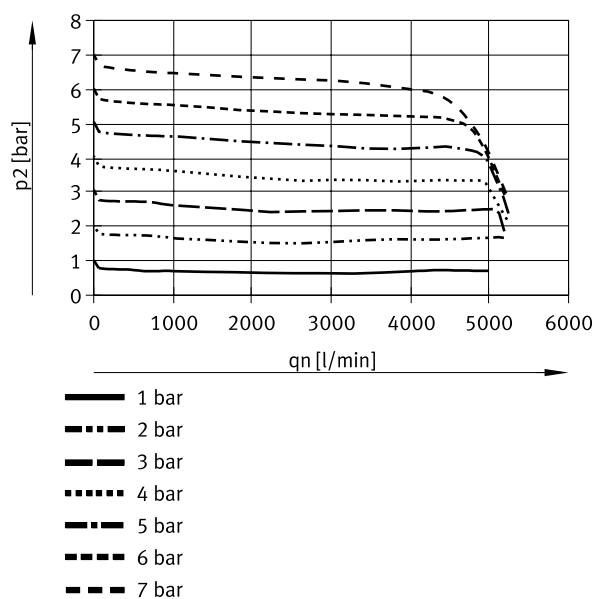


## Datasheet

Standard flow rate  $q_n$  as a function of output pressure  $p_2$  ( $p_1 = 7 \text{ bar}$ ) – MS6-LFR...-C...-B (filter fineness:  $5 \mu\text{m}$ )

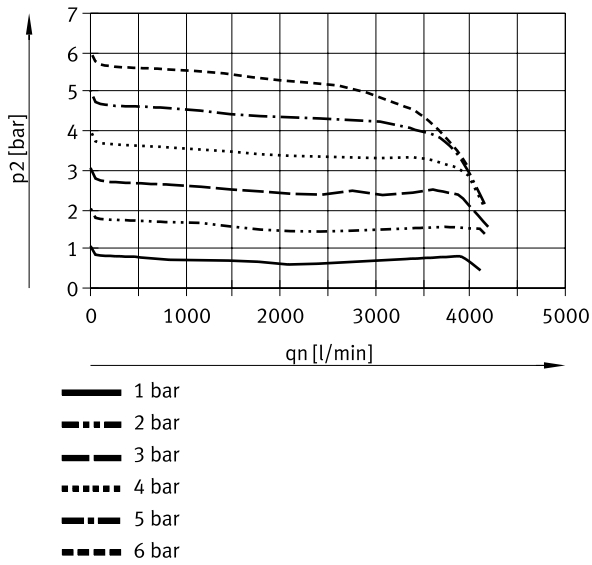


Standard flow rate  $q_n$  as a function of output pressure  $p_2$  ( $p_1 = 10 \text{ bar}$ ) – MS6-LFR...-C...-B (filter fineness:  $5 \mu\text{m}$ )

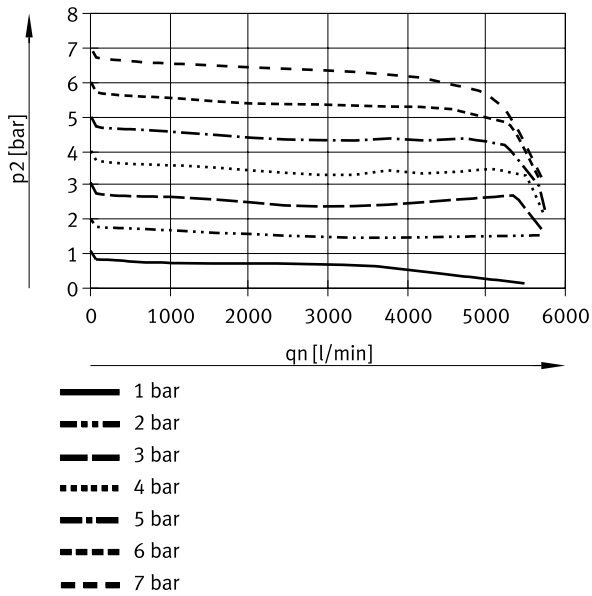


Datasheet

Standard flow rate  $q_n$  as a function of output pressure  $p_2$  ( $p_1 = 7 \text{ bar}$ ) – MS6-LFR-...-E-...-B (filter fineness:  $40 \mu\text{m}$ )



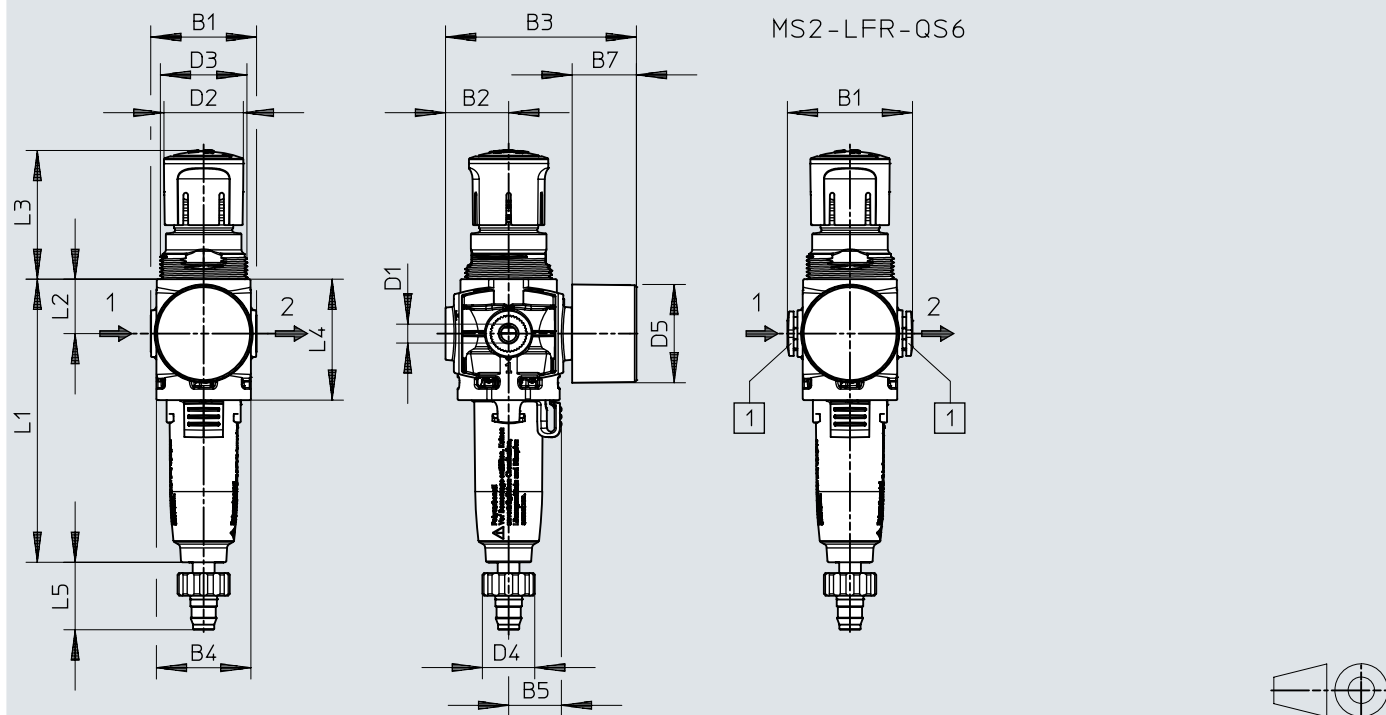
Standard flow rate  $q_n$  as a function of output pressure  $p_2$  ( $p_1 = 10 \text{ bar}$ ) – MS6-LFR-...-E-...-B (filter fineness:  $40 \mu\text{m}$ )



## Dimensions

Dimensions – MS2-LFR-...-B with pressure gauge

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



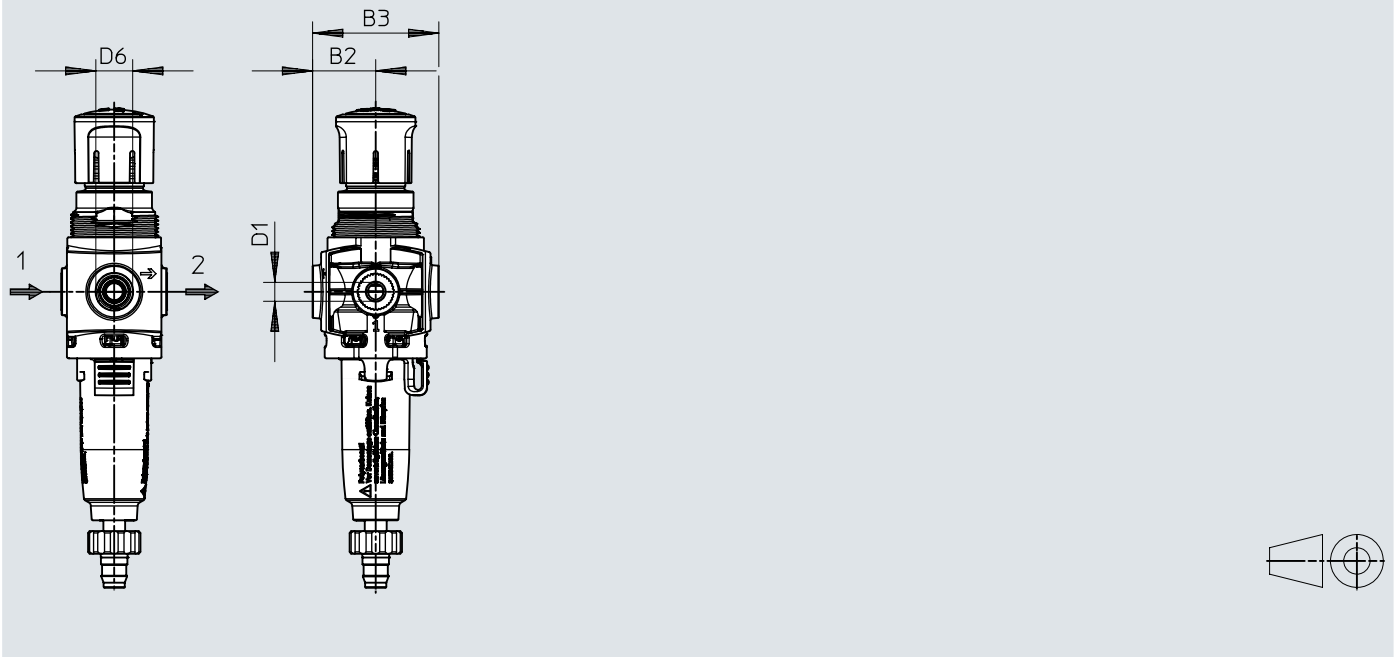
[1] Pneumatic connection QS-6

	B1	B2	B3	B4	B5	B7	D1	D2 ∅	D3 ∅	D4	D5 ∅	L1	L2	L3	L4	L5
MS2-LFR-M5-...-AR	28	16,7	51	25	14	17	M5	21	M23x1	13,8	26	74,9	14,4	34,1	32	17,9
MS2-LFR-QS6-...-AR	33,1						QS-6									

## Dimensions

Dimensions – MS2-LFR-...-B adaptor for EN pressure gauge 1/8, without pressure gauge

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

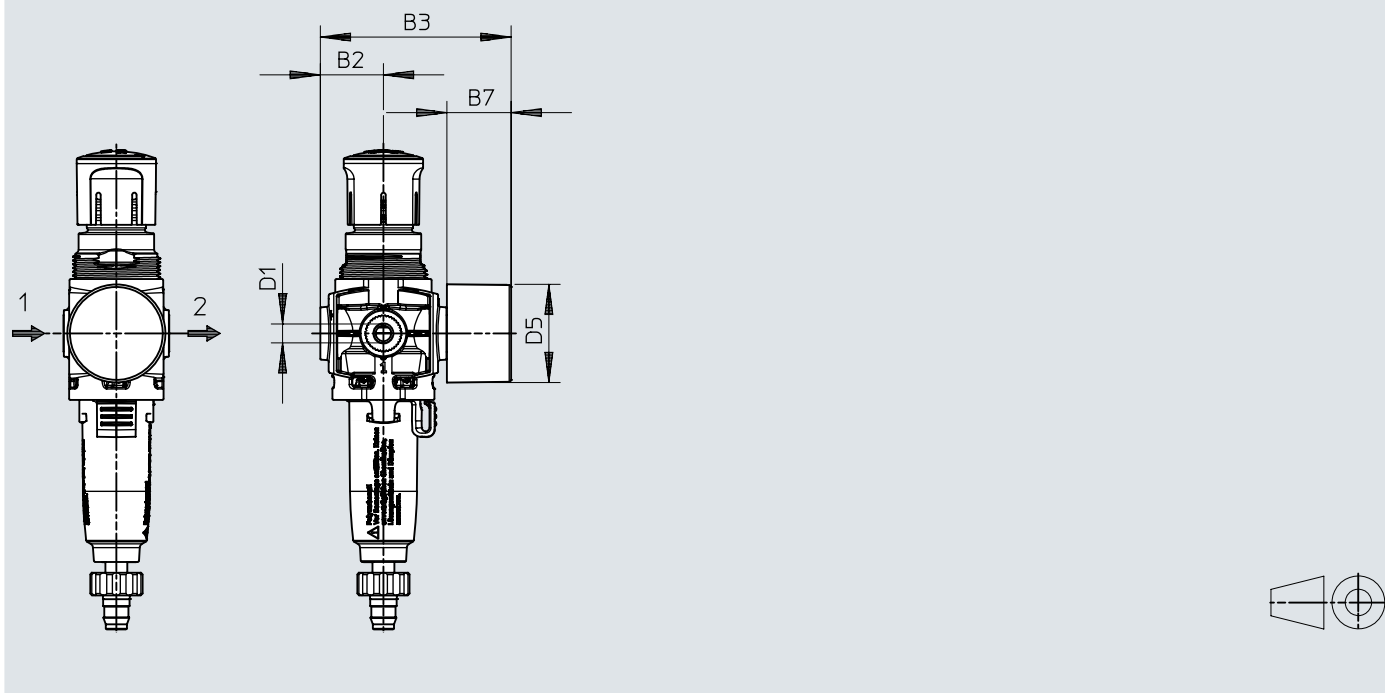


	B2	B3	D1	D6
MS2-LFR-M5-...-A8	16,7	33,4	M5	G1/8
MS2-LFR-QS6-...-A8			QS-6	

## Dimensions

Dimensions – MS2-LFR-...-B pressure gauge

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

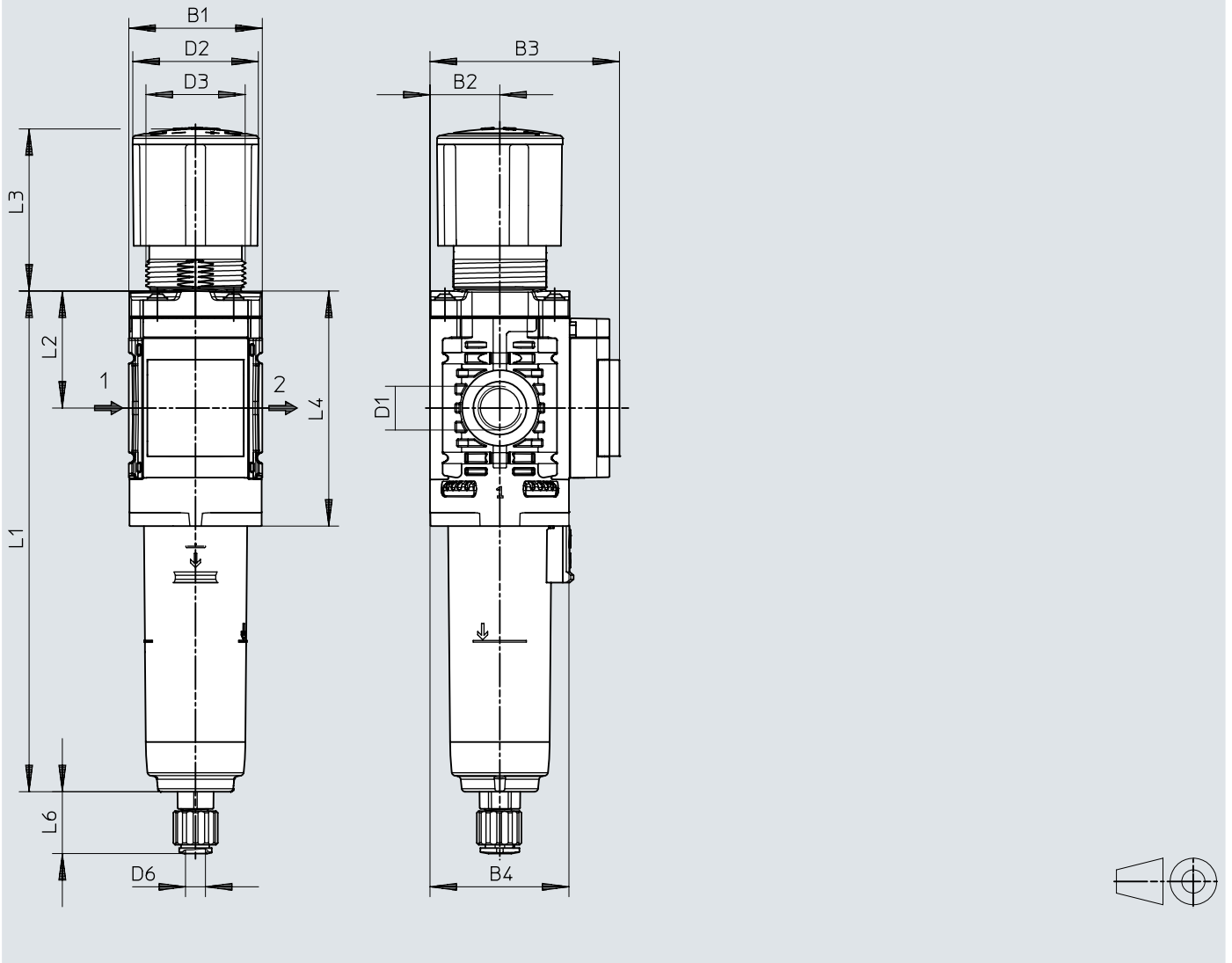


	B2	B3	B7	D1	D5 ø
MS2-LFR-M5-...-AR	16,7	51	17	M5	26
MS2-LFR-QS6-...-AR				QS-6	

## Dimensions

Dimensions – MS4-LFR...-B with pressure gauge

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

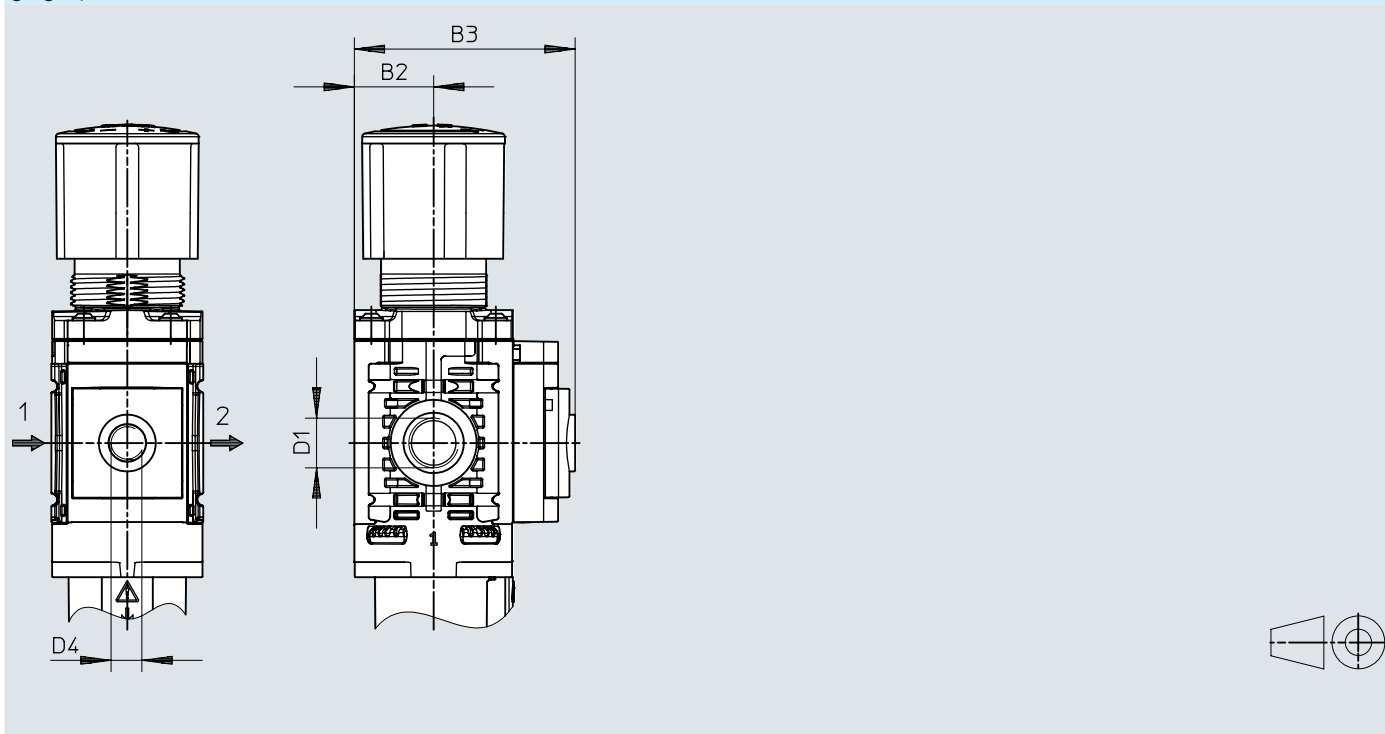


	B1	B2	B3	B4	D1	D2 ∅	D3	D6	L1	L2	L3	L4	L6
MS4-LFR-1/4-...-AG	40,2	21	57	41,8	G1/4	37,8	M30x1,5	QS6	150,6	34,9	49,4	70,7	18,6

## Dimensions

Dimensions – MS4-LFR-...-B without pressure gauge, adapter for EN pressure gauge 1/8

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

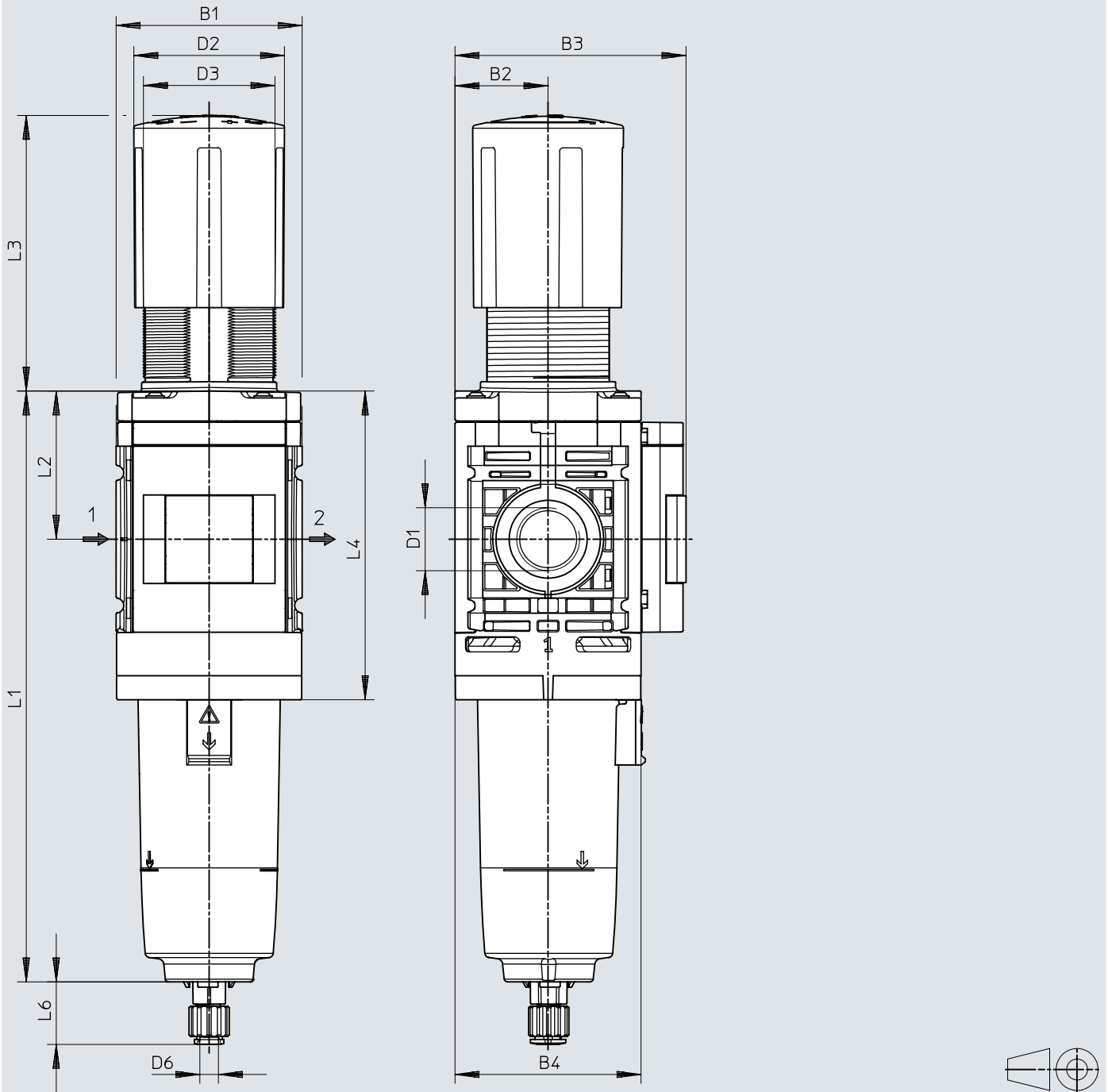


	B2	B3	D1	D4
MS4-LFR-1/4-...-A8	21	59,6	G1/4	G1/8

## Dimensions

Dimensions – MS6-LFR...-B with pressure gauge

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



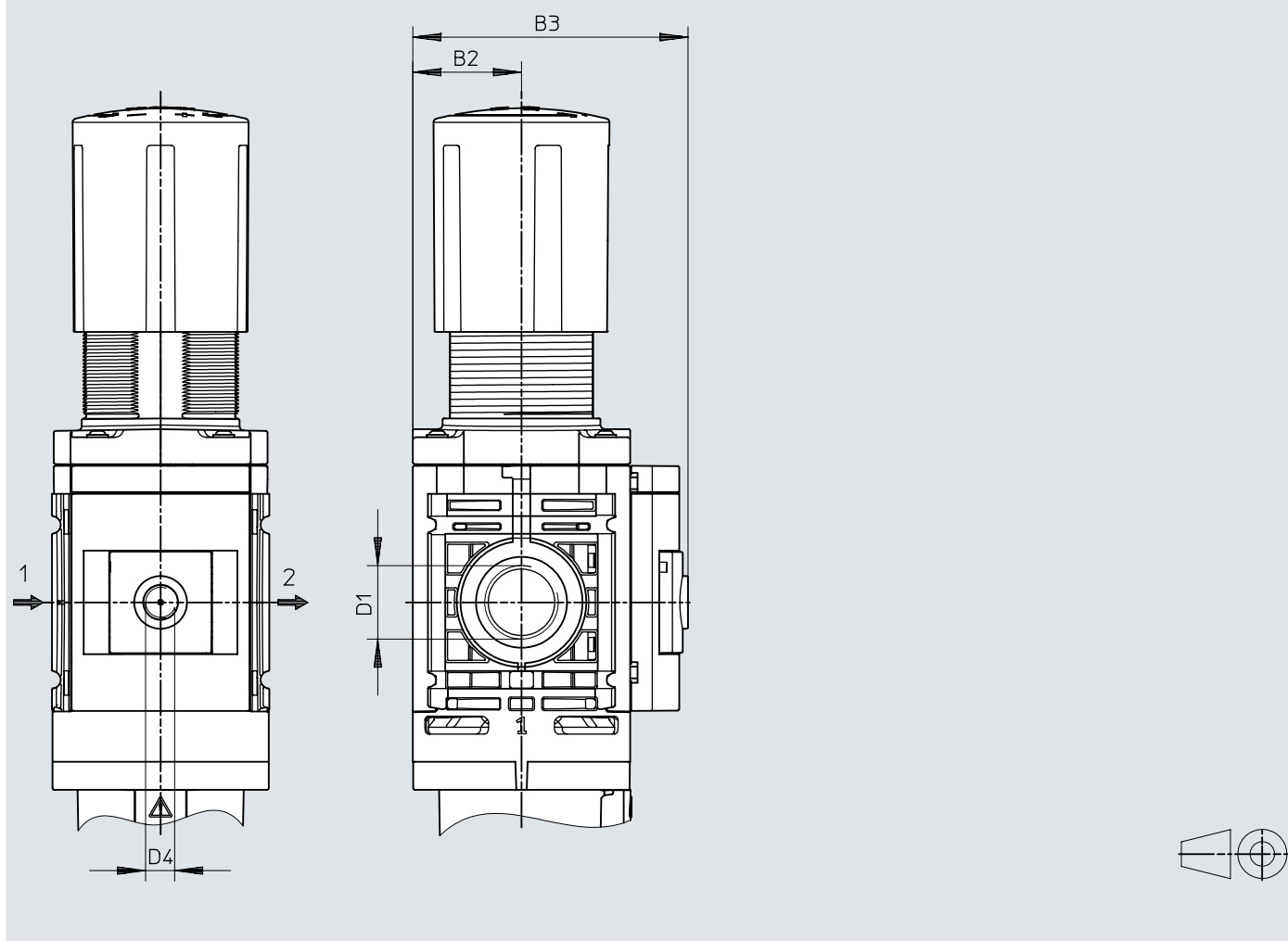
	B1	B2	B3	B4	D1	D2 ø	D3 ø	D6	L1	L2	L3	L4	L6
MS6-LFR-1/2-...-AG-...-M	62	31	77	62	G1/2	50,2	43,9	QS6	197	49,4	91,8	102,9	20,9
MS6-LFR-1/2-...-AG-...-VC													22,3



## Dimensions

Dimensions – MS6-LFR-...-B without pressure gauge, adapter for EN pressure gauge 1/8

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

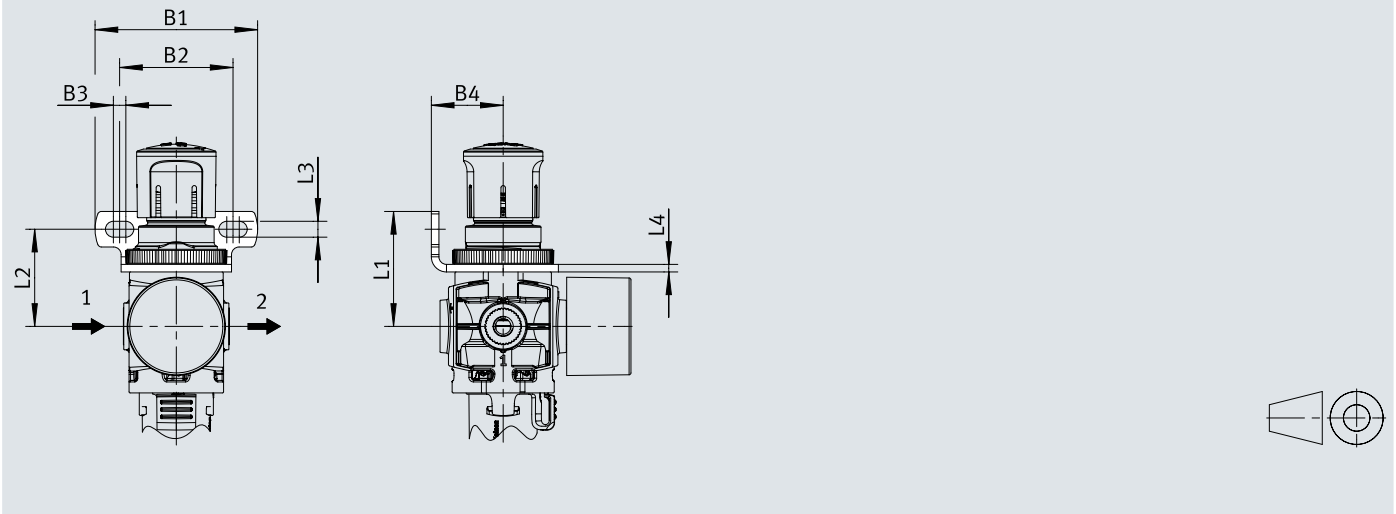


	B2	B3	D1	D4
MS6-LFR-1/2-...-A8	31	78,5	G1/2	G1/8

## Dimensions

### Dimensions – Mounting bracket MS...-WR-B

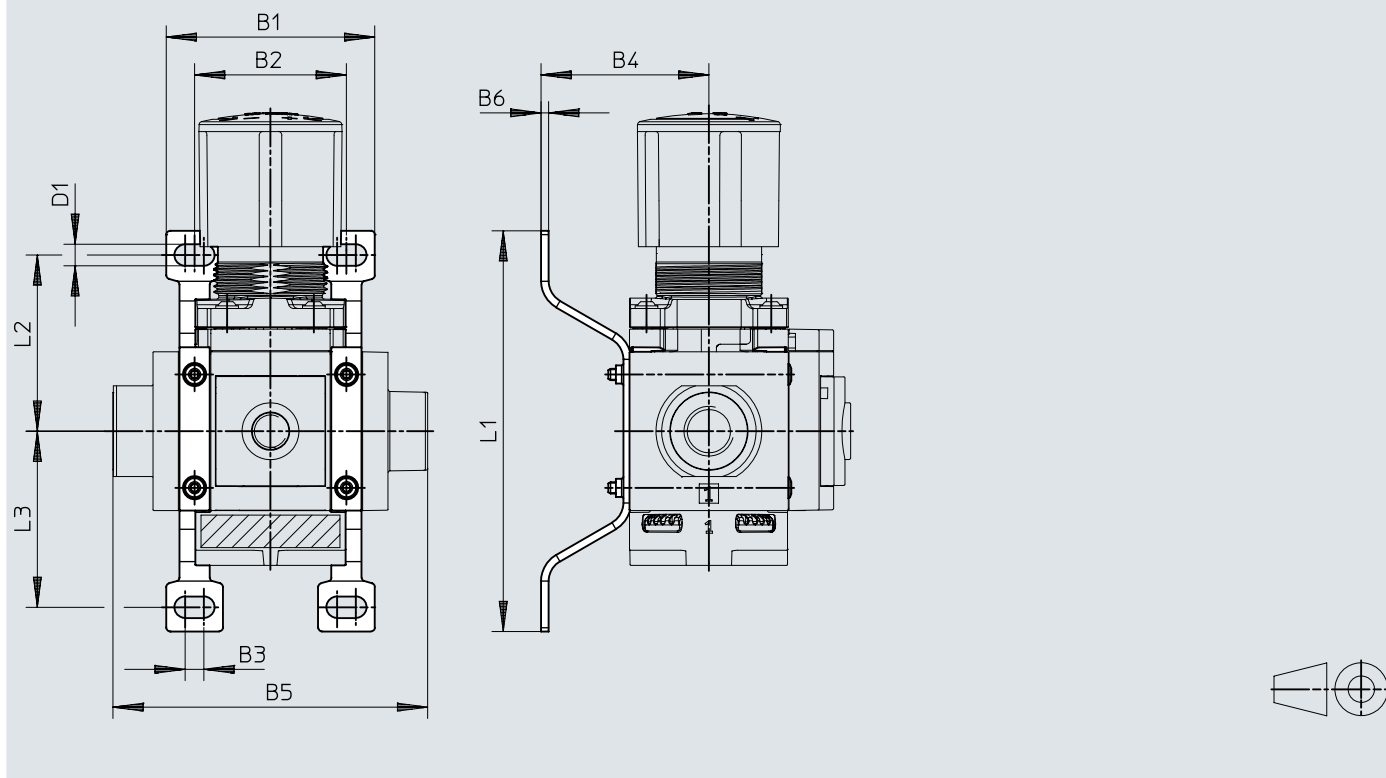
Download CAD data [www.festo.com](http://www.festo.com)



	B1 ±0,2	B2	B3	B4	L1	L2	L3 ±0,1	L4
MS2-WR-B	43	30	3,3	19	30,4	25,7	4,2	2
MS4-WR-B	68	38	14	40	52	44	7	2,5
MS6-WR-B	70	38,2	14,2	40	67	57	7,1	3

## Dimensions

## Dimensions – Wall mounting kit MS...-WPE-B

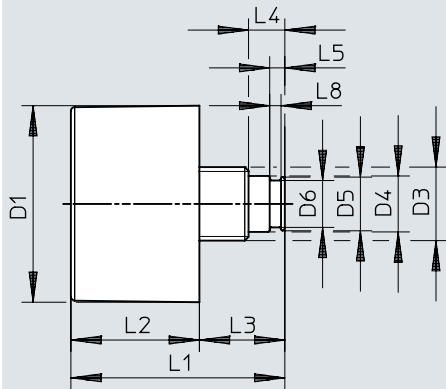
Download CAD data [www.festo.com](http://www.festo.com)

	B1	B2	B3	B4	B5	B6	D1 ø	L1	L2	L3
MS4-WPE-B	55,2	40,2	5	44,4	83,3	2	5,7	106	46,6	46,6
MS6-WPE-B	79	62	4,3	53,9	114,9	2	6,5	158	71	71

## Dimensions

### Dimensions – Pressure gauge PAGN

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



	D1 ∅	D3	D4 ∅ ±0,05	D5 ∅	D6 ∅ ±0,05	L1	L2	L3	L4	L5	L8 ±0,05
PAGN-26-10-G18S	26	G1/8	7.4	7.1	6.2	28.3	17	11.3	4.8	2	1.5
PAGN-26-1M-G18S											

## Ordering data

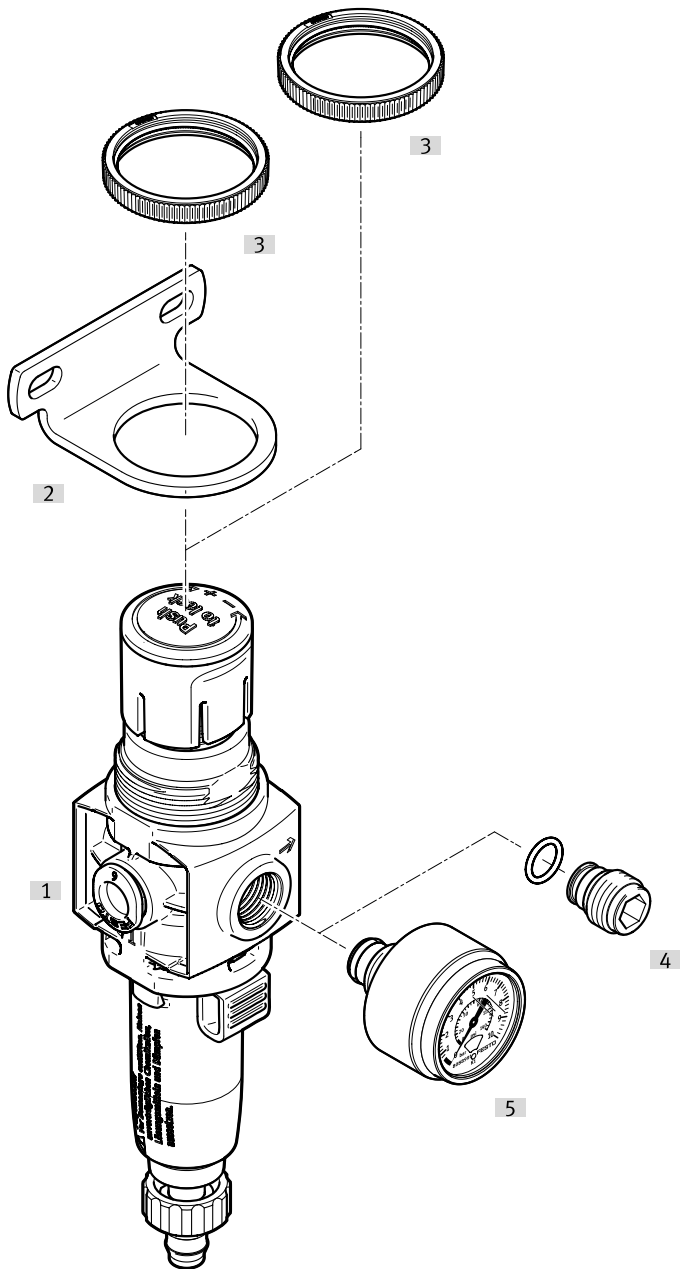
Ordering data – condensate drain, manual							
Size	Pneumatic connection, port 1	Grade of filtration	Pressure gauge (ANALOG) or Pressure display (DIGITAL)	Displayable units	Product weight	Part no.	Type
2	M5	5 µm	Prepared for G1/8		39 g	8086643	MS2-LFR-M5-D6-C-P-M-A8-B
			With pressure gauge	MPa	46.8 g	8086642	MS2-LFR-M5-D6-C-P-M-AR-MPA-B
				bar, psi		8086641	MS2-LFR-M5-D6-C-P-M-AR-BAR-B
	QS-6	5 µm	Prepared for G1/8		35.7 g	8086646	MS2-LFR-QS6-D6-C-P-M-A8-B
			With pressure gauge	MPa	43.5 g	8086645	MS2-LFR-QS6-D6-C-P-M-AR-MPA-B
				bar, psi		8086644	MS2-LFR-QS6-D6-C-P-M-AR-BAR-B
4	G1/4	5 µm	Prepared for G1/8		204 g	8098260	MS4-LFR-1/4-D6-C-P-M-A8-B
			With pressure gauge	MPa	207 g	8098265	MS4-LFR-1/4-D6-C-P-M-AG-MPA-B
				bar, psi		8098257	MS4-LFR-1/4-D6-C-P-M-AG-BAR-B
		40 µm	Prepared for G1/8		204 g	8098255	MS4-LFR-1/4-D6-E-P-M-A8-B
			With pressure gauge	MPa	207 g	8098254	MS4-LFR-1/4-D6-E-P-M-AG-MPA-B
				bar, psi		8098258	MS4-LFR-1/4-D6-E-P-M-AG-BAR-B
	G1/2	5 µm	Prepared for G1/8		578 g	8098301	MS6-LFR-1/2-D6-C-P-M-A8-B
			With pressure gauge	MPa	581 g	8098310	MS6-LFR-1/2-D6-C-P-M-AG-MPA-B
				bar, psi		8098300	MS6-LFR-1/2-D6-C-P-M-AG-BAR-B
		40 µm	Prepared for G1/8		578 g	8098311	MS6-LFR-1/2-D6-E-P-M-A8-B
			With pressure gauge	MPa	581 g	8098307	MS6-LFR-1/2-D6-E-P-M-AG-MPA-B
				bar, psi		8098304	MS6-LFR-1/2-D6-E-P-M-AG-BAR-B

Ordering data – Manual condensate drain (products for battery production)							
Size	Pneumatic connection, port 1	Grade of filtration	Pressure gauge (ANALOG) or Pressure display (DIGITAL)	Displayable units	Product weight	Part no.	Type
4	G1/4	5 µm	Prepared for G1/8		204 g	8175803	MS4-LFR-1/4-D6-C-P-M-A8-F1A-B
			With pressure gauge	MPa	207 g	8175801	MS4-LFR-1/4-D6-C-P-M-AG-MPA-F1A-B
				bar, psi		8175802	MS4-LFR-1/4-D6-C-P-M-AG-BAR-F1A-B
		40 µm	Prepared for G1/8		204 g	8175800	MS4-LFR-1/4-D6-E-P-M-A8-F1A-B
			With pressure gauge	MPa	207 g	8175798	MS4-LFR-1/4-D6-E-P-M-AG-MPA-F1A-B
				bar, psi		8175799	MS4-LFR-1/4-D6-E-P-M-AG-BAR-F1A-B
6	G1/2	5 µm	Prepared for G1/8		578 g	8175824	MS6-LFR-1/2-D6-C-P-M-A8-F1A-B
			With pressure gauge	MPa	581 g	8175822	MS6-LFR-1/2-D6-C-P-M-AG-MPA-F1A-B
				bar, psi		8175823	MS6-LFR-1/2-D6-C-P-M-AG-BAR-F1A-B
		40 µm	Prepared for G1/8		578 g	8175821	MS6-LFR-1/2-D6-E-P-M-A8-F1A-B
			With pressure gauge	MPa	581 g	8175819	MS6-LFR-1/2-D6-E-P-M-AG-MPA-F1A-B
				bar, psi		8175820	MS6-LFR-1/2-D6-E-P-M-AG-BAR-F1A-B

Ordering data – Condensate drain, fully automatic, manual, non-detenting							
Size	Pneumatic connection, port 1	Grade of filtration	Pressure gauge (ANALOG) or Pressure display (DIGITAL)	Displayable units	Product weight	Part no.	Type
4	G1/4	5 µm	Prepared for G1/8		213 g	8098263	MS4-LFR-1/4-D6-C-P-VC-A8-B
			With pressure gauge	MPa	216 g	8098266	MS4-LFR-1/4-D6-C-P-VC-AG-MPA-B
				bar, psi		8098259	MS4-LFR-1/4-D6-C-P-VC-AG-BAR-B
		40 µm	Prepared for G1/8		213 g	8098262	MS4-LFR-1/4-D6-E-P-VC-A8-B
			With pressure gauge	MPa	216 g	8098256	MS4-LFR-1/4-D6-E-P-VC-AG-MPA-B
				bar, psi		8098264	MS4-LFR-1/4-D6-E-P-VC-AG-BAR-B
6	G1/2	5 µm	Prepared for G1/8		585 g	8098303	MS6-LFR-1/2-D6-C-P-VC-A8-B
			With pressure gauge	MPa	589 g	8098302	MS6-LFR-1/2-D6-C-P-VC-AG-MPA-B
				bar, psi		8098309	MS6-LFR-1/2-D6-C-P-VC-AG-BAR-B
		40 µm	Prepared for G1/8		585 g	8098306	MS6-LFR-1/2-D6-E-P-VC-A8-B
			With pressure gauge	MPa	589 g	8098305	MS6-LFR-1/2-D6-E-P-VC-AG-MPA-B
				bar, psi		8098312	MS6-LFR-1/2-D6-E-P-VC-AG-BAR-B

## Peripherals

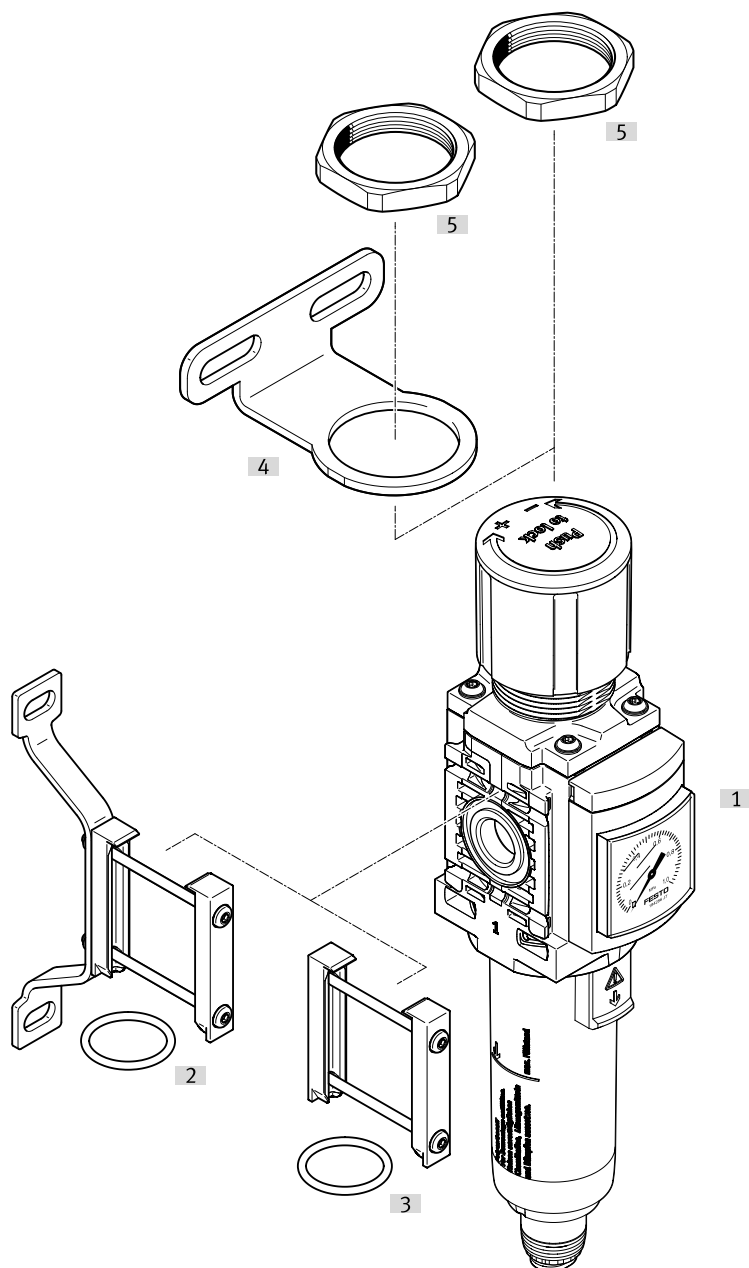
### Peripherals overview size 2



Accessories		→ Link
Type/order code	Description	
[1] Filter regulator MS-2-LFR-...B		<a href="#">ms-lfr-b</a>
[2] Mounting bracket MS2-WR-B	For wall mounting, knurled nut included in the scope of delivery	<a href="#">24</a>
[3] Nut MS2-WRS	For front panel mounting	<a href="#">25</a>
[4] Plug screw MS2-G18S		<a href="#">25</a>
[5] Pressure gauge PAGN		<a href="#">24</a>

## Peripherals


### Peripherals overview sizes 4 and 6




Accessories		→ Link
Type/order code	Description	
[1] Filter regulator MS4/6-LFR-...-B		<a href="#">ms-lfr-b</a>
[2] Wall mounting kit MS...-WPE-B	For connecting the modules for wall mounting	<a href="#">24</a>
[3] Module connector MS...-MV1	For connecting the modules	<a href="#">24</a>
[4] Mounting bracket MS...-WR-B	For wall mounting, knurled nut included in the scope of delivery	<a href="#">24</a>
[5] Nut MS...-WRS	For front panel mounting	<a href="#">25</a>


## Accessories


Pressure gauge PAGN						
	Nominal size of pressure gauge	Indicating range	Indicating range	Product weight	Part no.	Type
	26		0 ... 10 bar	8 g	8088985	PAGN-26-10-G18S
		0 ... 1 MPa			8088986	PAGN-26-1M-G18S

Mounting bracket MS...-WR-B						
	Size	Suitability for the production of Li-ion batteries <sup>1)</sup>	Product weight	Part no.	Type	
			13.8 g	8087978	MS2-WR-B	
		F1a	14.6 g	8167322	MS2-WR-F1A-B	
	4		49 g	8149680	MS4-WR-B	
		F1a		8176693	MS4-WR-F1A-B	
	6		90 g	8149681	MS6-WR-B	
		F1a		8176696	MS6-WR-F1A-B	

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


Wall mounting kit MS...-WPE-B					
	Size	Product weight	Part no.	Type	
	4	30 g	8118600	MS4-WPE-B	
	6	58 g	8118599	MS6-WPE-B	

Filter cartridge MS...-LFP...					
	Size	Grade of filtration	Part no.	Type	
	4	5 µm	8129064	MS4-LFP1-C	
		40 µm	8129062	MS4-LFP1-E	
	6	5 µm	8129063	MS6-LFP1-C	
		40 µm	8129061	MS6-LFP1-E	
	Micro	5 µm	526818	MS2/LFP-D-MICRO-5M	


Module connector MS...-MV1					
	Size	Suitability for the production of Li-ion batteries <sup>1)</sup>	Product weight	Part no.	Type
	4		13 g	8119201	MS4-MV1




## Accessories

Module connector MS...-MV1					
	Size	Suitability for the production of Li-ion batteries <sup>1)</sup>	Product weight	Part no.	Type
	4	F1a	36 g	<b>8176695</b>	<b>MS4-MV1-F1A</b>
	6		33 g	<b>8119204</b>	<b>MS6-MV1</b>
		F1a	54 g	<b>8176697</b>	<b>MS6-MV1-F1A</b>

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

Nut MS...-WRS					
	Size		Product weight	Part no.	Type
			0.7 g	<b>8098037</b>	<b>MS2-WRS</b>
	4		6.9 g	<b>532187</b>	<b>MS4-WRS</b>
	6		20.9 g	<b>532188</b>	<b>MS6-WRS</b>

Plug screw					
	Short type code		Product weight	Part no.	Type
	MS2-G18S		4.6 g	<b>8095766</b>	<b>MS2-G18S</b>