

Filter regulator LFR, LFRS (NPT)

FESTO



Characteristics

At a glance

Space-saving design with filter and regulator in a single device.

- Two pressure gauge connections for variable installation
- Sizes Mini, Midi, Maxi

Pneumatic connection

Individual fittings can be connected via connecting plates with female threads.

Version

[D] D series, metal

Sturdy in full metal design for the specific requirements of the process automation industry

Pressure regulation range

Two pressure regulation ranges: 0.5...7 bar and 0.5...12 bar

Grade of filtration

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

Pressure gauge

The filter regulator can be ordered with or without a pressure gauge. The interface has a thread of 1/4 NPT or 1/8 NPT.

Function

Direct or pilot actuated pressure regulator with or without integrated return flow function.

The condensate is separated; then the compressed air is filtered. The output pressure is adjustable within the pressure range.

Condensate drain

The following functions can be selected:

- Manual
- Fully automatic, normally closed

Type code

001	Series	
LFR	Filter regulator	
002	Pneumatic connection, inch	
1/8	Female thread NPT 1/8	
1/4	Female thread NPT 1/4	
3/8	Female thread NPT 3/8	
3/4	Female thread NPT 3/4	
1/2	Female thread NPT 1/2	
1	Female thread NPT 1	
003	Version	
D	D series, metal	
004	Pressure regulation range	
	0.5 ... 12 bar (0.05 ... 1.2 MPa)	
7	0.5 ... 7 bar (0.05 ... 0.7 MPa)	

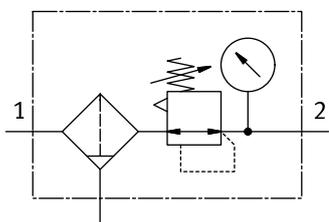
005	Grade of filtration	
	40 µm	
5M	5 µm	
006	Pressure gauge	
0	Without pressure gauge	
007	Size	
MINI	Grid dimension 40 mm (without connecting plates)	
MIDI	Grid dimension 55 mm (without connecting plates)	
MAXI	Grid dimension 66 mm (without connecting plates)	
008	Condensate drain	
	Manually rotating	
A	Fully automatic	
009	Thread type	
NPT	NPT thread	

Datasheet

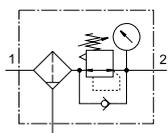
General technical data

Size	Maxi		Midi			Mini		
Pneumatic connection, port 1	3/4 NPT	1 NPT	3/8 NPT	1/2 NPT	3/4 NPT	1/8 NPT	1/4 NPT	3/8 NPT
Pneumatic connection, port 2	3/4 NPT	1 NPT	3/8 NPT	1/2 NPT	3/4 NPT	1/8 NPT	1/4 NPT	3/8 NPT
Standard nominal flow rate (standardised to DIN 1343)	7,600 ... 10,000 l/min	8,000 ... 11,000 l/min	2,400 ... 3,200 l/min	2,600 ... 3,900 l/min	2,600 ... 4,000 l/min	650 ... 900 l/min	1,200 ... 1,500 l/min	1,350 ... 1,700 l/min
Max. pressure hysteresis	0.4 bar		0.2 bar					
Condensate drain	Fully automatic Manually rotating		Fully automatic Manual, non-detenting					
Type of mounting	Either., In-line installation, Via mounting bracket, With accessories					Either., In-line installation, Via mounting bracket		
Mounting position	Vertical							
Grade of filtration	5 µm, 40 µm							
Max. condensate volume	80 cm ³		43 cm ³			22 cm ³		

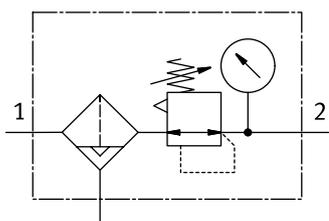
Function LFR/LFRS (manual condensate drain, with pressure gauge)



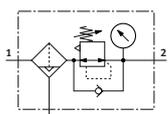
Function LFR/LFRS-...-DI-MAXI (manual condensate drain, with pressure gauge)



Function LFR/LFRS (semi- or fully automatic condensate drain, with pressure gauge)



Function LFR/LFRS-...-DI-MAXI (semi- or fully automatic condensate drain, with pressure gauge)



Datasheet

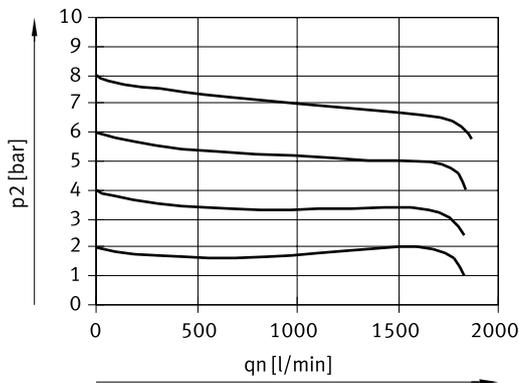
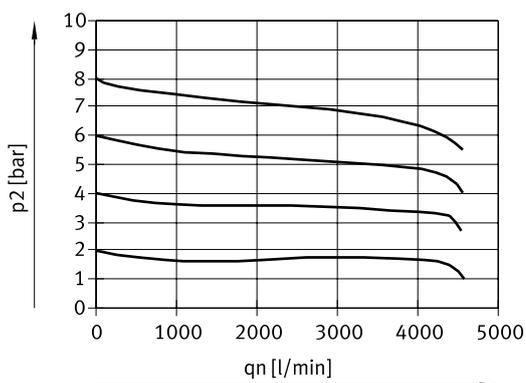
Operating and environmental conditions

Grade of filtration	5			40		
Condensate drain	Fully automatic	Manual, non-detenting	Manually rotating	Fully automatic	Manual, non-detenting	Manually rotating
Air purity class at output	Compressed air to ISO 8573-1:2010 [6:8:4], Inert gases			Compressed air to ISO 8573-1:2010 [7:8:4], Inert gases		
Operating pressure	0.2 ... 1.2 MPa	0.1 ... 1.6 MPa		0.2 ... 1.2 MPa	0.1 ... 1.6 MPa	
Operating pressure	2 ... 12 bar	1 ... 16 bar		2 ... 12 bar	1 ... 16 bar	
Operating pressure	29 ... 174 psi	14.5 ... 232 psi		29 ... 174 psi	14.5 ... 232 psi	
Operating medium	Compressed air to ISO 8573-1:2010 [7:9:-] Inert gases	Compressed air to ISO 8573-1:2010 [-:9:-] Inert gases		Compressed air to ISO 8573-1:2010 [7:9:-] Inert gases	Compressed air to ISO 8573-1:2010 [-:9:-] Inert gases	
Note on operating and pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)					
Ambient temperature	5 ... 60°C, 41 ... 140°F	-10 ... 60°C	-10 ... 60°C, 14 ... 140°F	5 ... 60°C, 41 ... 140°F	-10 ... 60°C	-10 ... 60°C, 14 ... 140°F
Media temperature	5 ... 60°C, 41 ... 140°F	-10 ... 60°C	-10 ... 60°C, 14 ... 140°F	5 ... 60°C, 41 ... 140°F	-10 ... 60°C	-10 ... 60°C, 14 ... 140°F
Storage temperature	-14 ... 140°C, 14 ... 140°F	-10 ... 60°C	-14 ... 140°C, 14 ... 140°F	-10 ... 60°C, 14 ... 140°F	-10 ... 60°C	-10 ... 60°C, 14 ... 140°F
Corrosion resistance class CRC ¹⁾	2 - Moderate corrosion stress					

1) More information www.festo.com/x/topic/crc

Materials

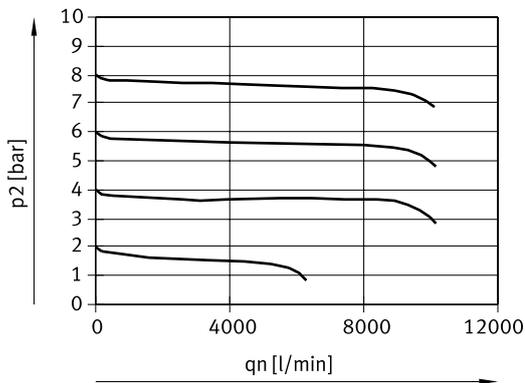
Material housing	Die-cast zinc
Material bowl	PC
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L

Standard flow rate q_n as a function of output pressure p_2 (LFR/LFRS-1/4-D-MINI)Standard flow rate q_n as a function of output pressure p_2 (LFR/LFRS-1/2-D-MIDI)

Datasheet

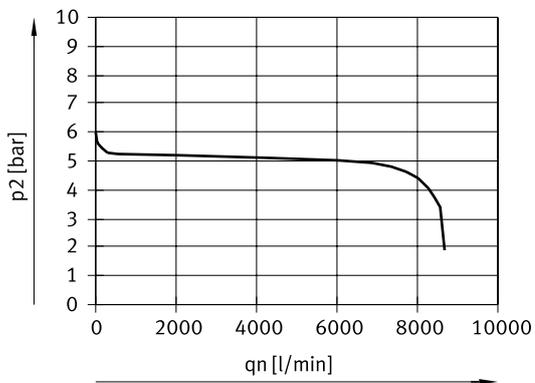
Standard flow rate q_n as a function of output pressure p_2 (LFR/LFRS-1-D-MAXI)

Input pressure $p_1 = 10$ bar

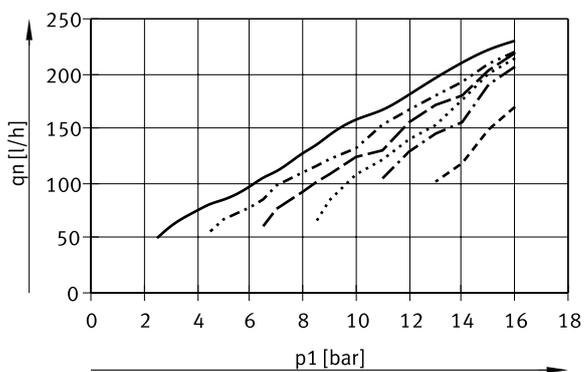


Standard flow rate q_n as a function of output pressure p_2 (LFR/LFRS-1-D-DI-MAXI)

Input pressure $p_1 = 10$ bar



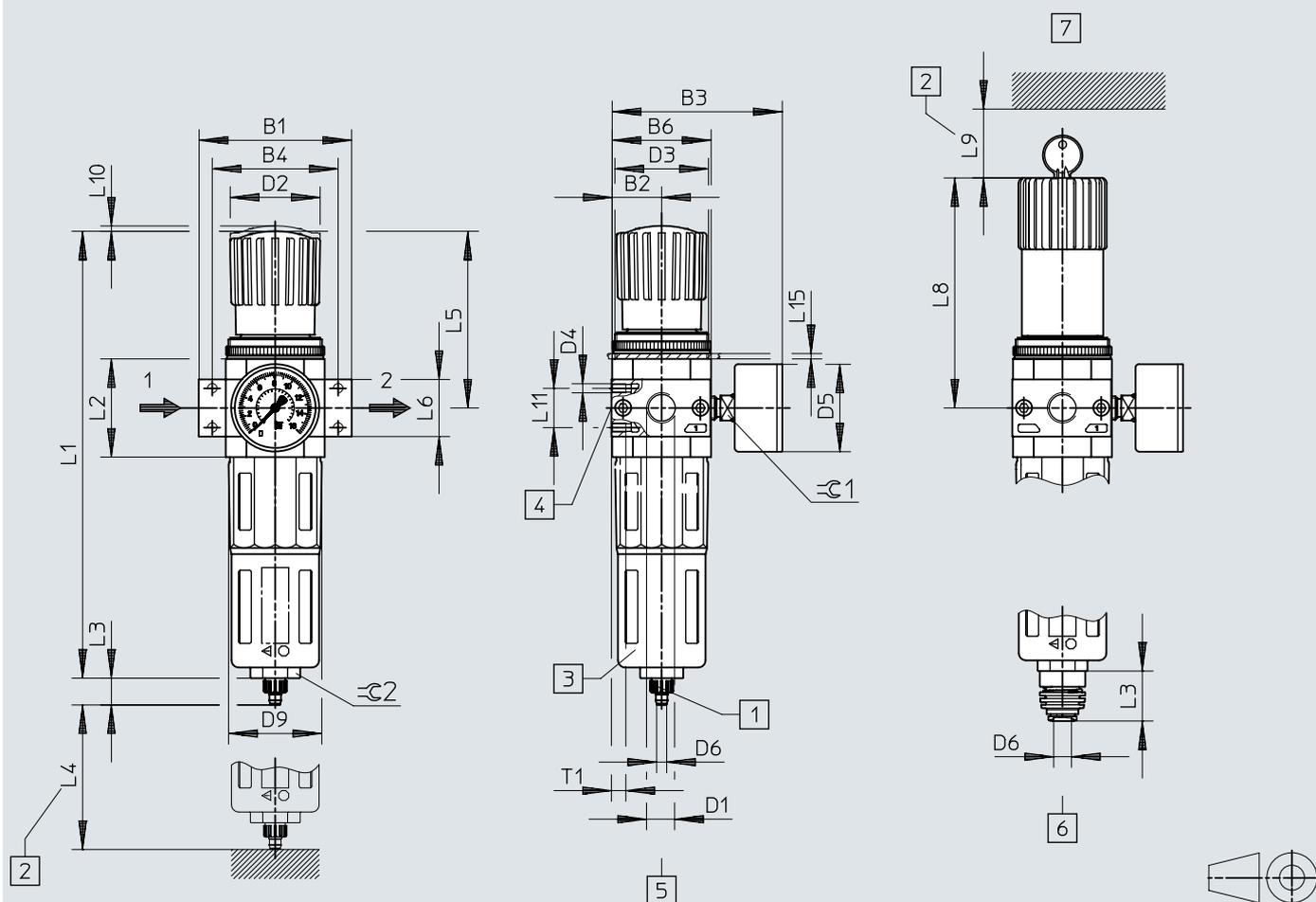
Internal air consumption q_n as a function of input pressure p_1 (LFR/LFRS-...-MAXI)



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

Dimensions

Dimensions – Filter regulators LFR/LFRS, Mini/Midi/Maxi

Download CAD data www.festo.com

- [1] Barbed connector for plastic tubing PUN(-H)-8x1.25
- [2] Installation dimension
- [3] Metal bowl guard
- [4] Second pressure gauge connection
- [5] Manual condensate drain
- [6] Fully automatic condensate drain for plastic tubing PUN-6/PAN-6
- [7] Lockable

Dimensions

	B1	B2	B3	B4	B6	D1	D2 ∅	D3	D4	D5 ∅	D6 ∅	D9 ∅		
LFR/LFRS-1/8-D-MINI (A)	64	20	76	~52	40	G1/8	31	M36x1.5	M4	39	5,6	38		
LFR/LFRS-1/4-D-MINI (A)						G1/4								
LFR/LFRS-3/8-D-MINI (A)						G3/8								
LFR/LFRS-1/4-D-MIDI (A)	~85	27,5	~94,5	~70	55	G1/4	50	M52x1.5	M5	39	5,6	52		
LFR/LFRS-3/8-D-MIDI (A)						G3/8								
LFR/LFRS-1/2-D-MIDI (A)						G1/2								
LFR/LFRS-3/4-D-MIDI (A)						G3/4								
LFR/LFRS-1/2-D-MAXI (A)	96	33	106	80	66	G1/2	31	M36x1.5	M5	39	5,6	65		
LFR/LFRS-1/2-D-DI-MAXI (A)			105			49	M52x1.5							
LFR/LFRS-3/4-D-MAXI (A)			106			31	M36x1.5							
LFR/LFRS-3/4-D-DI-MAXI (A)			105			49	M52x1.5							
LFR/LFRS-1-D-MAXI (A)			116			106	91	G1					31	M36x1.5
LFR/LFRS-1-D-DI-MAXI (A)						105							49	M52x1.5

	L1	L2	L3	L4 min.	L5	L6	L8	L9	L10	L11 ±0,2	L15 max.	T1 min.	≈∅ 1	≈∅ 2	
LFR/LFRS-1/8-D-MINI (A)	192,9	40	15 (19) ¹⁾	60	~69	20	98	60	3	11	3	7	14	22	
LFR/LFRS-1/4-D-MINI (A)															
LFR/LFRS-3/8-D-MINI (A)															
LFR/LFRS-1/4-D-MIDI (A)	250	55 ±0,1	15 (19) ¹⁾	80	99	32 ±0,3	130	60	3	22	5	8	14	24	
LFR/LFRS-3/8-D-MIDI (A)															
LFR/LFRS-1/2-D-MIDI (A)															
LFR/LFRS-3/4-D-MIDI (A)															
LFR/LFRS-1/2-D-MAXI (A)	252	66	15 (19) ¹⁾	90	82	32	111	60	3	22	4	8	14	24	
LFR/LFRS-1/2-D-DI-MAXI (A)					~105	32	135		4						
LFR/LFRS-3/4-D-MAXI (A)					82	32	111		3						
LFR/LFRS-3/4-D-DI-MAXI (A)					~105	36	135		4						
LFR/LFRS-1-D-MAXI (A)					252	82	40		111						3
LFR/LFRS-1-D-DI-MAXI (A)					275	~105	41		135						4

Ordering data

Pressure regulation range 0.5 ... 12 bar, rotary knob with latch, connecting plates with threaded connection, with pressure gauge, outer scale in bar, inner scale in psi									
Size	Condensate drain	Pneumatic connection, port 1	Grade of filtration	Standard nominal flow rate (standardised to DIN 1343)	Product weight	Part no.	Type		
Maxi	Fully automatic		5 µm	1,178.4 cfm	1,359.382 oz	546469	LFR-D-5M-MAXI-A		
			40 µm	1,524.07 cfm	1,289.925 oz	546438	LFR-D-MAXI-A		
		3/4 NPT	5 µm	7,600 l/min	1,370 g	173809	LFR-3/4-D-5M-MAXI-A-NPT		
			40 µm	9,700 l/min		173805	LFR-3/4-D-MAXI-A-NPT		
		1 NPT	5 µm	8,000 l/min	1,470 g	173817	LFR-1-D-5M-MAXI-A-NPT		
			40 µm	10,000 l/min		173813	LFR-1-D-MAXI-A-NPT		
		Manually rotating		5 µm	1,178.4 cfm	1,359.382 oz	546468	LFR-D-5M-MAXI	
				40 µm	1,524.07 cfm	1,289.925 oz	546437	LFR-D-MAXI	
	3/4 NPT		5 µm	7,600 l/min	1,370 g	173808	LFR-3/4-D-5M-MAXI-NPT		
			40 µm	9,700 l/min		173804	LFR-3/4-D-MAXI-NPT		
	1 NPT		5 µm	8,000 l/min	1,470 g	173816	LFR-1-D-5M-MAXI-NPT		
			40 µm	10,000 l/min		173812	LFR-1-D-MAXI-NPT		
	Midi		Fully automatic		5 µm	377.09 cfm	893.025 oz	546462	LFR-D-5M-MIDI-A
					40 µm	487.07 cfm	912.87 oz	546426	LFR-D-MIDI-A
		3/8 NPT		5 µm	2,400 l/min	900 g	173785	LFR-3/8-D-5M-MIDI-A-NPT	
				40 µm	3,100 l/min	920 g	173781	LFR-3/8-D-MIDI-A-NPT	
1/2 NPT		5 µm		2,600 l/min	900 g	173793	LFR-1/2-D-5M-MIDI-A-NPT		
		40 µm		3,400 l/min	920 g	173789	LFR-1/2-D-MIDI-A-NPT		
3/4 NPT		5 µm		2,600 l/min	900 g	173801	LFR-3/4-D-5M-MIDI-A-NPT		
		40 µm		3,400 l/min	920 g	173797	LFR-3/4-D-MIDI-A-NPT		
Manual, non-de-tenting		3/8 NPT		5 µm	2,400 l/min	900 g	173784	LFR-3/8-D-5M-MIDI-NPT	
				40 µm	3,100 l/min	920 g	173780	LFR-3/8-D-MIDI-NPT	
		1/2 NPT		5 µm	2,600 l/min	900 g	173792	LFR-1/2-D-5M-MIDI-NPT	
				40 µm	3,400 l/min	920 g	173788	LFR-1/2-D-MIDI-NPT	
		3/4 NPT	5 µm	2,600 l/min	900 g	173800	LFR-3/4-D-5M-MIDI-NPT		
			40 µm	3,400 l/min	920 g	173796	LFR-3/4-D-MIDI-NPT		
Manually rotating			5 µm	377.09 cfm	893.025 oz	546461	LFR-D-5M-MIDI		
			40 µm	487.07 cfm	912.87 oz	546425	LFR-D-MIDI		
Mini		Fully automatic		5 µm	102.13 cfm	456.435 oz	546455	LFR-D-5M-MINI-A	
				40 µm	117.84 cfm	406.822 oz	546433	LFR-D-MINI-A	
			1/8 NPT		750 l/min	460 g	173757	LFR-1/8-D-MINI-A-NPT	
				5 µm	1,200 l/min		173769	LFR-1/4-D-5M-MINI-A-NPT	
	1/4 NPT		40 µm	1,400 l/min		173765	LFR-1/4-D-MINI-A-NPT		
			5 µm	1,350 l/min		173777	LFR-3/8-D-5M-MINI-A-NPT		
	3/8 NPT		40 µm	1,600 l/min		173773	LFR-3/8-D-MINI-A-NPT		
			5 µm	650 l/min		173760	LFR-1/8-D-5M-MINI-NPT		
	1/8 NPT		40 µm	750 l/min		173756	LFR-1/8-D-MINI-NPT		
			5 µm	1,200 l/min		173768	LFR-1/4-D-5M-MINI-NPT		
	1/4 NPT		40 µm	1,400 l/min		173764	LFR-1/4-D-MINI-NPT		
			5 µm	1,350 l/min		173776	LFR-3/8-D-5M-MINI-NPT		
	3/8 NPT	40 µm	1,600 l/min		173772	LFR-3/8-D-MINI-NPT			
		5 µm	102.13 cfm	456.435 oz	546454	LFR-D-5M-MINI			
	Manually rotating		40 µm	117.84 cfm	406.822 oz	546432	LFR-D-MINI		

Pressure regulation range 0.5 ... 12 bar, rotary knob with latch, connecting plates with threaded connection, without pressure gauge							
Size	Condensate drain	Pneumatic connection, port 1	Grade of filtration	Standard nominal flow rate (standardised to DIN 1343)	Product weight	Part no.	Type
Maxi	Fully automatic	1 NPT	40 µm	10,000 l/min	1,400 g	173815	LFR-1-D-O-MAXI-A-NPT
	Manually rotating	3/4 NPT		9,700 l/min	1,300 g	173806	LFR-3/4-D-O-MAXI-NPT
Midi	Fully automatic	3/8 NPT		3,100 l/min	830 g	173783	LFR-3/8-D-O-MIDI-A-NPT
		1/2 NPT		3,400 l/min		173791	LFR-1/2-D-O-MIDI-A-NPT
		3/8 NPT		3,100 l/min		173782	LFR-3/8-D-O-MIDI-NPT
	Manual, non-de-tenting	1/2 NPT		3,400 l/min		173790	LFR-1/2-D-O-MIDI-NPT
		3/4 NPT				173798	LFR-3/4-D-O-MIDI-NPT
		1/8 NPT		750 l/min	410 g	173759	LFR-1/8-D-O-MINI-A-NPT
Mini	Fully automatic	1/4 NPT		1,400 l/min		173767	LFR-1/4-D-O-MINI-A-NPT

Ordering data

Pressure regulation range 0.5 ... 12 bar, rotary knob with latch, connecting plates with threaded connection, without pressure gauge							
Size	Condensate drain	Pneumatic connection, port 1	Grade of filtration	Standard nominal flow rate (standardised to DIN 1343)	Product weight	Part no.	Type
Mini	Manual, non-de-tenting	1/4 NPT	40 µm	1,400 l/min	410 g	173766	LFR-1/4-D-O-MINI-NPT
		3/8 NPT		1,600 l/min		173774	LFR-3/8-D-O-MINI-NPT

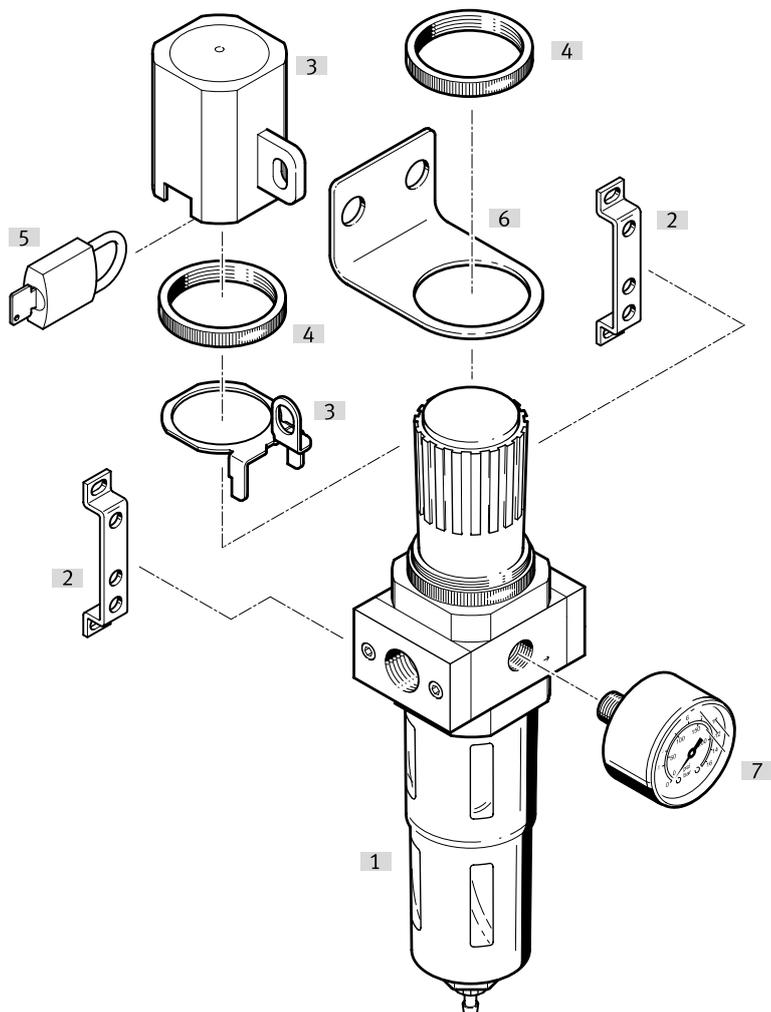
Pressure regulation range 0.5 ... 7 bar, rotary knob with latch, connecting plates with threaded connection, with pressure gauge, outer scale in bar, inner scale in psi							
Size	Condensate drain	Pneumatic connection, port 1	Grade of filtration	Standard nominal flow rate (standardised to DIN 1343)	Product weight	Part no.	Type
Maxi	Fully automatic	3/4 NPT	40 µm	10,000 l/min	1,370 g	173811	LFR-3/4-D-7-MAXI-A-NPT
		1 NPT		11,000 l/min	1,470 g	173819	LFR-1-D-7-MAXI-A-NPT
	Manually rotating			1,492.64 cfm	1,458.608 oz	546470	LFR-D-7-MAXI
		3/4 NPT		10,000 l/min	1,370 g	173810	LFR-3/4-D-7-MAXI-NPT
		1 NPT		11,000 l/min	1,470 g	173818	LFR-1-D-7-MAXI-NPT
	Midi	Fully automatic			329.95 cfm	893.025 oz	546464
3/8 NPT			3,200 l/min	900 g	173787	LFR-3/8-D-7-MIDI-A-NPT	
1/2 NPT			3,900 l/min		173795	LFR-1/2-D-7-MIDI-A-NPT	
3/4 NPT		4,000 l/min	173803		LFR-3/4-D-7-MIDI-A-NPT		
Manual, non-de-tenting		3/8 NPT	3,200 l/min	173786	LFR-3/8-D-7-MIDI-NPT		
		1/2 NPT	3,900 l/min	173794	LFR-1/2-D-7-MIDI-NPT		
		3/4 NPT	4,000 l/min	173802	LFR-3/4-D-7-MIDI-NPT		
Manually rotating			329.95 cfm	893.025 oz	546463	LFR-D-7-MIDI	
Mini		Fully automatic		141.41 cfm	456.435 oz	546457	LFR-D-7-MINI-A
			1/8 NPT	900 l/min	460 g	173763	LFR-1/8-D-7-MINI-A-NPT
			1/4 NPT	1,500 l/min		173771	LFR-1/4-D-7-MINI-A-NPT
		3/8 NPT	1,700 l/min	173779		LFR-3/8-D-7-MINI-A-NPT	
	Manual, non-de-tenting	1/8 NPT	900 l/min	173762	LFR-1/8-D-7-MINI-NPT		
		1/4 NPT	1,500 l/min	173770	LFR-1/4-D-7-MINI-NPT		
		3/8 NPT	1,700 l/min	173778	LFR-3/8-D-7-MINI-NPT		
	Manually rotating		141.41 cfm	456.435 oz	546456	LFR-D-7-MINI	

Pressure regulation range 0.5 ... 12 bar, directly actuated diaphragm regulator with integrated reverse flow function, rotary knob with latch, connecting plates with threaded connection, with pressure gauge, outer scale in bar, inner scale in psi							
Size	Condensate drain	Grade of filtration	Standard nominal flow rate (standardised to DIN 1343)	Product weight	Part no.	Type	
Maxi	Fully automatic	40 µm	707.04 cfm	1,587.6 oz	546515	LFR-D-DI-MAXI-A	
	Manually rotating				546512	LFR-D-DI-MAXI	

Pressure regulation range 0.5 ... 7 bar, directly actuated diaphragm regulator with integrated reverse flow function, rotary knob with latch, connecting plates with threaded connection, with pressure gauge, outer scale in bar, inner scale in psi							
Size	Condensate drain	Grade of filtration	Standard nominal flow rate (standardised to DIN 1343)	Product weight	Part no.	Type	
Maxi	Fully automatic	40 µm	1,194.12 cfm	1,587.6 oz	546518	LFR-D-7-DI-MAXI-A	
	Manually rotating				546514	LFR-D-7-DI-MAXI	

Peripherals

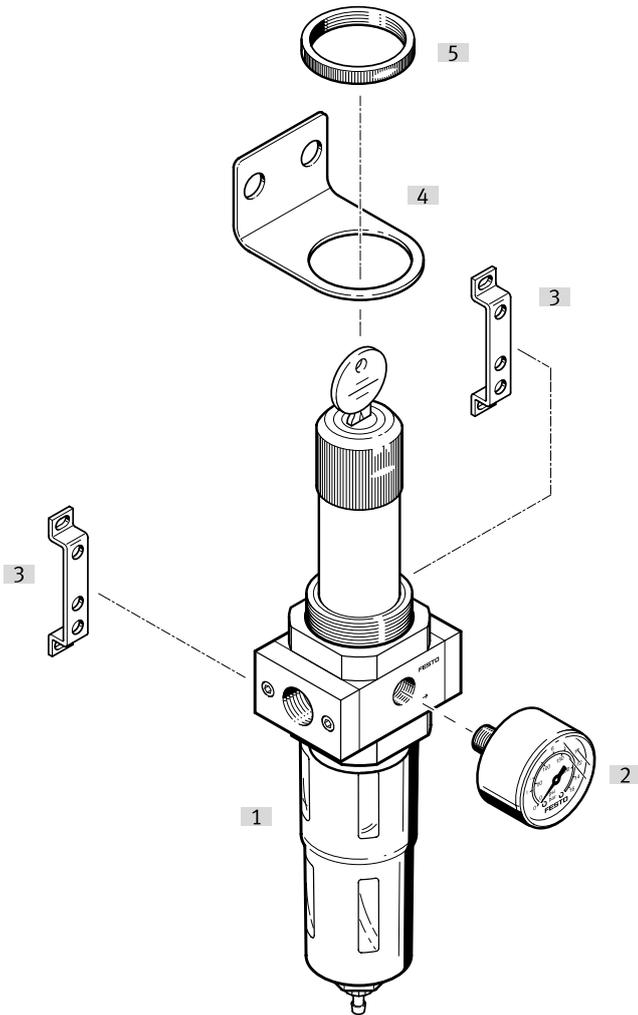
Filter regulator LFR



Accessories		→ Link
Type/order code	Description	
[1] Filter regulator LFR		lfr-d
[2] Mounting bracket HFOE		13
[3] Regulator lock LRVS		14
[4] Knurled nut HMR	Included in the scope of delivery	lfr-d
[5] Padlock LRVS-D		14
[6] Mounting bracket HR-D		13
[7] Pressure gauge MA		13

Peripherals

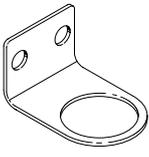
Filter regulator LFRS (lockable)



Accessories		→ Link
Type/order code	Description	
[1] Filter regulator LFRS		lfrs-d
[2] Pressure gauge MA		13
[3] Mounting bracket HFOE		13
[4] Mounting bracket HR-D		13
[5] Knurled nut HMR	Included in the scope of delivery	lfrs-d

Accessories

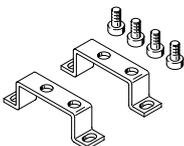
Mounting bracket HR-D-R3

	Material bracket	Corrosion resistance class CRC ¹⁾	Product weight	Part no.	Type
	Steel	3 - high corrosion stress	73 g	4650310	HR-D-R3

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

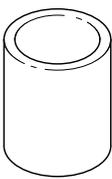
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional surface requirements that are in direct contact with a normal industrial environment.

Mounting bracket HFOE-D-MIDI/MAXI

	Short type code	Corrosion resistance class CRC ¹⁾	Part no.	Type
	HFOE	2 - Moderate corrosion stress	159593	HFOE-D-MIDI/MAXI

1) More information: www.festo.com/x/topic/crc

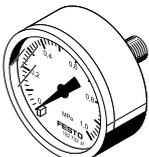
Filter cartridges, D series, metal

	Size	Grade of filtration ¹⁾	Part no.	Type
	Maxi	5 µm	159641	LFP-D-MAXI-5M
		40 µm	363664	LFP-D-MAXI-40M
	Midi	5 µm	159594	LFP-D-MIDI-5M
		40 µm	363667	LFP-D-MIDI-40M
	Mini	5 µm	159640	LFP-D-MINI-5M
		40 µm	363665	LFP-D-MINI-40M

1) Grade of filtration 5 µm: colour blue

Grade of filtration 40 µm: colour white

Pressure gauge MA

	Pneumatic connection	Indicating range	Conforms to standard	Product weight	Part no.	Type
	G1/8	0 ... 10 bar	EN 837-1	60 g	359874	MA-40-10-1/8
		0 ... 16 bar			345395	MA-40-16-1/8
	G1/4	0 ... 10 bar		70 g	183900	MA-40-10-G1/4-EN
		0 ... 16 bar			359873	MA-50-10-1/4
	R1/8	0 ... 10 bar		60 g	356759	MA-50-16-1/4
		0 ... 10 bar			162835	MA-40-10-1/8-EN

Flanged pressure gauge FMA

	Pneumatic connection	Indicating range	Conforms to standard	Product weight	Part no.	Type
	G1/4	0 ... 10 bar	EN 837-1	80 g	159596	FMA-40-10-1/4-EN

Accessories

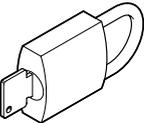
Flanged pressure gauge FMA

	Pneumatic connection	Indicating range	Conforms to standard	Product weight	Part no.	Type
	G1/4	0 ... 10 bar	EN 837-1	100 g	159599	FMA-50-10-1/4-EN
		0 ... 16 bar		80 g	159597	FMA-40-16-1/4-EN
				100 g	159600	FMA-50-16-1/4-EN

Regulator lock LRVS

	Size	LABS (PWIS) conformity	Product weight	Part no.	Type
	Grid dimension 40 mm (without sub-bases)	VDMA24364-B1/B2-L	40 g	193781	LRVS-D-MINI
	Grid dimension 55 mm (without sub-bases)		60 g	193782	LRVS-D-MIDI
	Grid dimension 66 mm (without sub-bases)		36 g	193784	LRVS-D-DI-MAXI
			56 g	193783	LRVS-D-MAXI

Padlock LRVS-D

	Corrosion resistance class CRC ¹⁾	LABS (PWIS) conformity	Product weight	Part no.	Type
	2 - Moderate corrosion stress	VDMA24364-B1/B2-L	120 g	193786	LRVS-D

1) More information: www.festo.com/x/topic/crc