

Inline filter

RE 51402/09.10
Replaces: 02.09

1/14

Types 100 FLEN 0160 to 0630; 100 FLE 0045, 0055, 0120

Nominal sizes **according to DIN 24550**: 0160 to 0630
 Nominal sizes according to BRFS: 0045, 0055, 0120
 Nominal pressure 100 bar
 Connections up to SAE 3"
 Operating temperature $-10\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$



H7590

Table of contents

Contents	Page
Application, Features	1
Design, Filter element, Accessories, Characteristic curves, Quality and standardization	2
Ordering code	3
Preferred types	4
Ordering details:	
Electronic switching element for clogging indicator	5
Plug-in connectors according to IEC 60947-5-2	5
Symbols	6
Technical data	7
Characteristic curves	8...10
Unit dimensions	11
Spare parts list	12, 13
Installation, commissioning and maintenance	14

Application

- Filtration of pressure fluids and lubricants.
- Filtration of fluids and gases.
- Direct installation into pipelines.
- Direct wear protection of downstream components and systems.
- Offline filtration at high filter service lives.

Features:

- Filters for inline installation
- Particularly suited for off-line filtration
- Extremely large filter area
- Flow-optimized design due to 3D computer-supported design
- Low pressure drop
- Special highly efficient filter media

Design

Two-part design of filter housing with inlet and outlet as well as flange-mounted filter cover.

Further design variants available on request.

Filter element

Pleated design with optimized pleat density and various filter media.

For further detailed information please refer to our brochure "Filter elements".

The filter element is the most important component of the "FILTER" system in view of prolonged life and the wear protection of the systems.

The most important criteria for selection are the required degree of cleanliness of the operating medium, the initial pressure differential and the contamination retention capacity.

Accessories

Clogging indicator

Basically, the filter is equipped with mechanical optical clogging indicator. The electronic clogging indicator is connected via the electronic switching element with 1 or 2 switching points, which has to be ordered separately. The electronic switching element is attached to the mechanical optical clogging indicator and held by means of a locking ring.

Characteristic curves

An optimum filter selection is made possible by our "BRFilterSelect" software, see download area <http://www.eppensteiner.de>.

Additional characteristic curves for the filters in this catalogue can be found in the BRFS filter calculation program.

Quality and standardization

The development, manufacture and assembly of BRFS industrial filters and BRFS filter elements is carried out within the framework of a certified quality management system in accordance with ISO 9001:2000.

The pressure filters for hydraulic applications according to 51402 are pressure holding equipment according to article 1, section 2.1.4 of the pressure equipment directive 97/23/EC (DGRL). However, on the basis of the exception in article 1, section 3.6 of the DGRL, hydraulic filters are exempt from the DGRL if they are not classified higher than category I (guideline 1/19). They do not receive a CE mark.

Preferred types

Inline filter with bypass, filtration rating 10 µm and nominal pressure 100 bar

Type	Flow in L/min at $v = 30 \text{ mm}^2/\text{s}$ and $\Delta p = 0.8 \text{ bar}$	Material number
100 FLEN 0160 H10XL-A00-09V5,0-S0M00	317	R928000536
100 FLEN 0250 H10XL-A00-09V5,0-S0M00	416	R928000537
100 FLE 0045 H10XL-A00-09V5,0-S0M00	496	R928000540
100 FLE 0055 H10XL-A00-09V5,0-S0M00	537	R928000541
100 FLEN 0400 H10XL-A00-09V5,0-S0M00	885	R928000538
100 FLEN 0630 H10XL-A00-09V5,0-S0M00	1129	R928000539
100 FLE 0120 H10XL-A00-09V5,0-S0M00	1355	R928000542

Inline filter with bypass, filtration rating 3 µm and nominal pressure 100 bar

Type	Flow in L/min at $v = 30 \text{ mm}^2/\text{s}$ and $\Delta p = 0.8 \text{ bar}$	Material number
100 FLEN 0160 H3XL-A00-09V5,0-S0M00	135	R928000529
100 FLEN 0250 H3XL-A00-09V5,0-S0M00	210	R928000530
100 FLE 0045 H3XL-A00-09V5,0-S0M00	310	R928000533
100 FLE 0055 H3XL-A00-09V5,0-S0M00	385	R928000534
100 FLEN 0400 H3XL-A00-09V5,0-S0M00	390	R928000531
100 FLEN 0630 H3XL-A00-09V5,0-S0M00	610	R928000532
100 FLE 0120 H3XL-A00-09V5,0-S0M00	960	R928000535

Inline filter without bypass, filtration rating 10 µm and nominal pressure 100 bar

Type	Flow in L/min at $v = 30 \text{ mm}^2/\text{s}$ and $\Delta p = 0.8 \text{ bar}$	Material number
100 FLEN 0160 H10XL-C00-00V5,0-S0M00	317	R928000578
100 FLEN 0250 H10XL-C00-00V5,0-S0M00	416	R928000579
100 FLE 0045 H10XL-C00-00V5,0-S0M00	496	R928000582
100 FLE 0055 H10XL-C00-00V5,0-S0M00	537	R928000583
100 FLEN 0400 H10XL-C00-00V5,0-S0M00	885	R928000580
100 FLEN 0630 H10XL-C00-00V5,0-S0M00	1129	R928000581
100 FLE 0120 H10XL-C00-00V5,0-S0M00	1355	R928000584

Inline filter without bypass, filtration rating 3 µm and nominal pressure 100 bar

Type	Flow in L/min at $v = 30 \text{ mm}^2/\text{s}$ and $\Delta p = 0.8 \text{ bar}$	Material number
100 FLEN 0160 H3XL-C00-00V5,0-S0M00	135	R928000571
100 FLEN 0250 H3XL-C00-00V5,0-S0M00	210	R928000572
100 FLE 0045 H3XL-C00-00V5,0-S0M00	310	R928000575
100 FLE 0055 H3XL-C00-00V5,0-S0M00	385	R928000576
100 FLEN 0400 H3XL-C00-00V5,0-S0M00	390	R928000573
100 FLEN 0630 H3XL-C00-00V5,0-S0M00	610	R928000574
100 FLE 0120 H3XL-C00-00V5,0-S0M00	960	R928000577

Ordering details: Electronic switching element for clogging indicator

	ABZ	F	V	-1X/	-DIN	
Rexroth power unit accessories						-DIN = Identification for DIN and SAE models
Filter						
Clogging indicator						Unit series
Electronic switching element with 1 switching point (changeover) Round plug-in connection M12x1						Unit series 10 to 19 (10 to 19; unchanged installation and connection dimensions)
						1X =
Electronic switching element with 2 switching points (normally open/normally closed), 75%, 100%, round plug-in connection M12x1, 3 LED						= E1SP-M12X1
Electronic switching element with 2 switching points (normally open/normally closed), 75%, 100%, round plug-in connection M12x1, 3 LED						= E2SP-M12X1
Electronic switching element with 2 switching points (normally open/normally closed), 75%, 100%, signal suppression until 30 °C Round plug-in connection M12x1, 3 LED						= E2SPSU-M12X1

Electronic switching element	Material no.
ABZ FV-E1SP-M12X1-1X/-DIN	R901025339
ABZ FV-E2SP-M12X1-1X/-DIN	R901025340
ABZ FV-E2SPSU-M12X1-1X/-DIN	R901025341

Ordering example: Pressure filter with mechanical optical clogging indicator for $p_{nom.} = 100 \text{ bar}$ [1450 psi] with bypass valve, nominal size 0045, with filter element 10 μm and electronic switching element M12x1 with 1 switching point for pressure fluid mineral oil HLP according to DIN 51524.

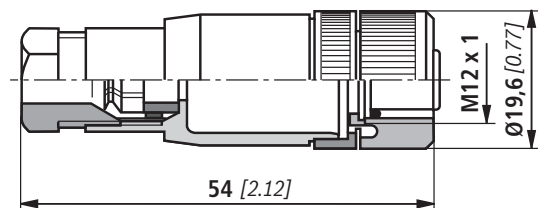
Filter: 100 FLE 0045 H10XL-A00-09V5,0-S0M00 **Material number: R928000540**
Clogging indicator: ABZ FV-E1SP-M12X1-1X/-DIN **Material number: R901025339**

Plug-in connectors according to IEC 60947-5-2 (dimensions in mm [inch])

For electronic switching element with round plug-in connection M12 x 1

Plug-in connector for K24 4-pin, M12 x 1 with screwed connection, cable fitting Pg9.

Material no. R900031155

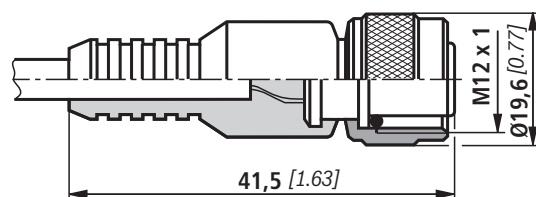


Plug-in connector for K24-3m 4-pin, M12 x 1 with molded in PVC cable, 3 m long.

Line cross-section: 4 x 0.34 mm²

Core marking:
 1 Brown
 2 White
 3 Blue
 4 Black

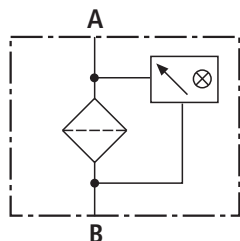
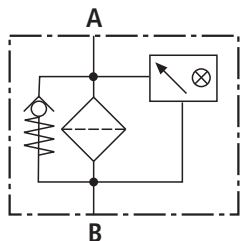
Material no. R900064381



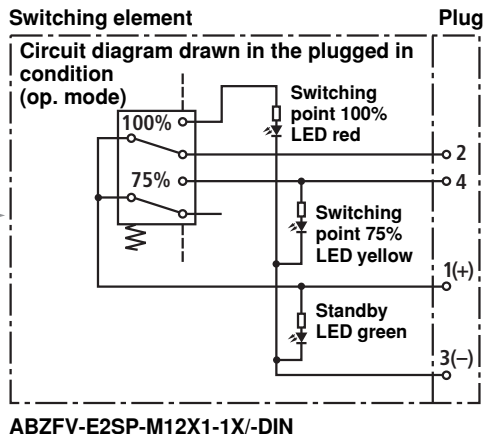
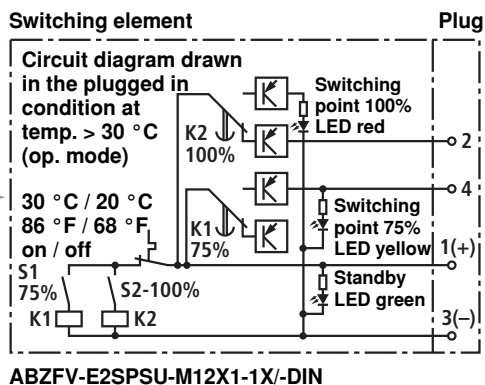
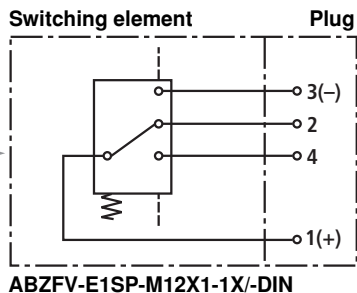
For additional round plug-in connections, see data sheet 08006.

Symbols

Pressure filter



**Electronic switching element
for clogging indicator**



Technical data (For applications outside these parameters, please consult us!)**Electronic** (electric switching element)

Electrical connection		Round plug-in connection M12 x 1, 4-pin
Contact load, direct voltage	A	Max. 1
Voltage range	E1SP-M12x1 V DC/AC	Max. 150
	E2SP V DC	10 to 30
Max. switching capacity with ohmic loads		20 VA; 20 W; (70 VA)
Switching type	E1SP-M12x1	Changeover
	E2SP-M12x1	Normally open at 75% of the response pressure, Normally closed at 100% of the response pressure
	E2SPSU-M12x1	Normally open at 75% of the response pressure, Normally closed at 100% of the response pressure Signal switching through at 30 °C [86 °F], Return switching at 20 °C [68 °F]
Display via LEDs in the electronic switching element E2SP...		Stand-by (LED green); 75% switching point (LED yellow) 100% switching point (LED red)
Type of protection according to EN 60529		IP 65
For direct voltage above 24 V a spark suppression is to be provided to protect the switching contacts.		
Weight	Electronic switching element: – with round plug-in connection M12 x 1	kg [lbs] 0.1 [0.22]

Characteristic curves

Specific weight: $< 0.9 \text{ kg/dm}^3$

Δp Q characteristic curves for complete filters

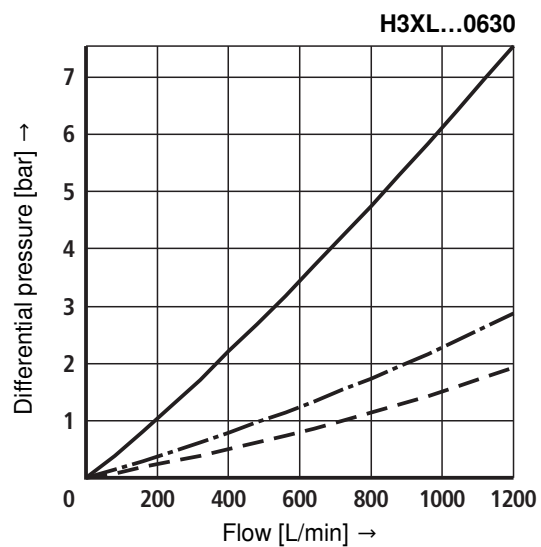
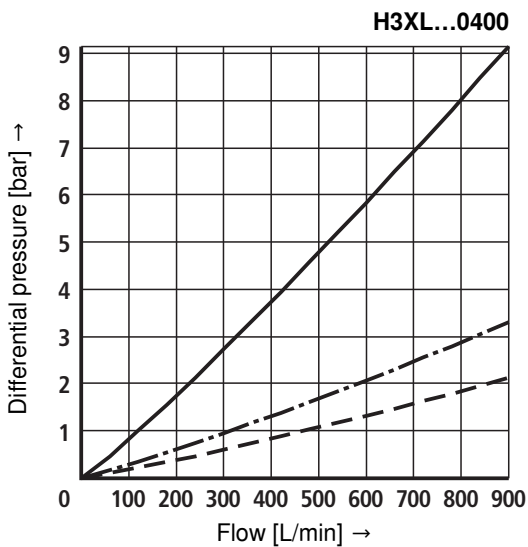
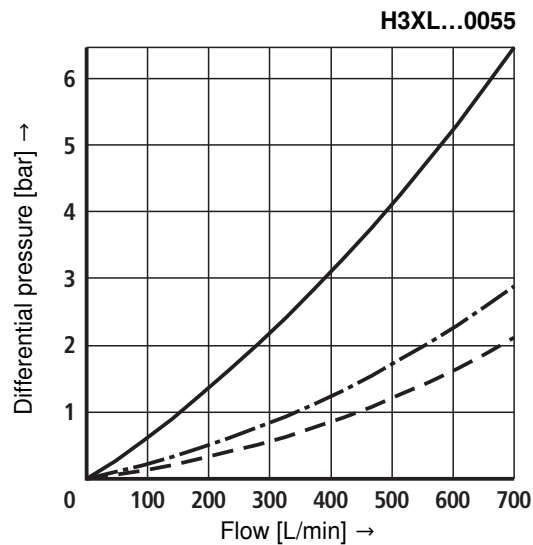
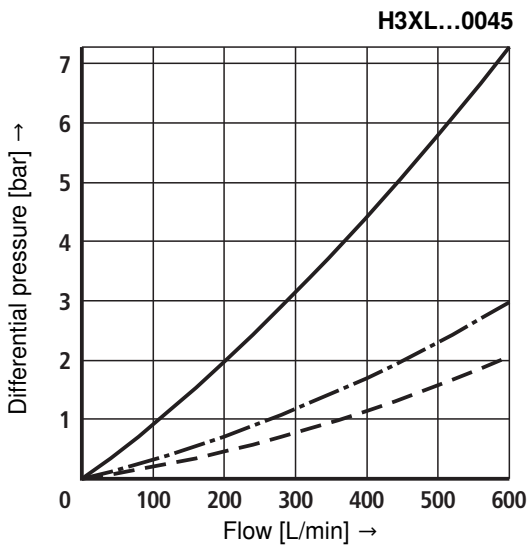
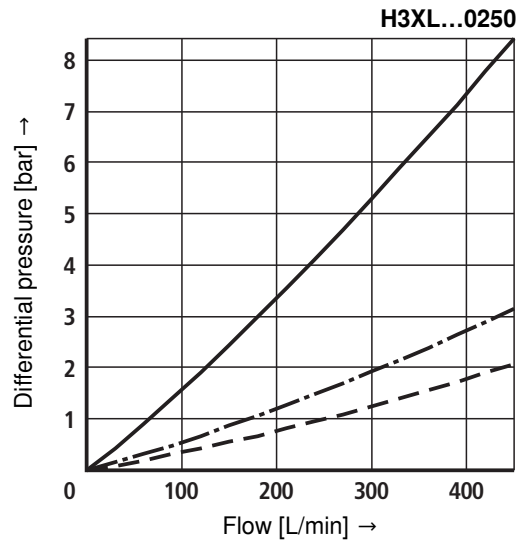
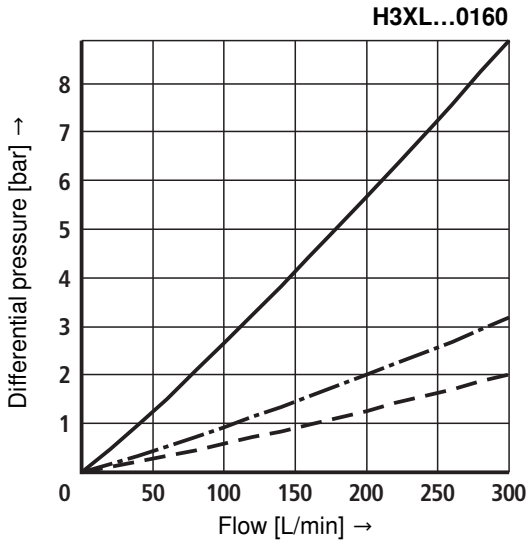
Recommended initial Δp for design = 0.8 bar

H3XL...

An optimum filter selection is made possible by our computer program "BRFilterSelect".

Oil viscosity:

- 120 mm²/s
- · - 46 mm²/s
- - - 30 mm²/s



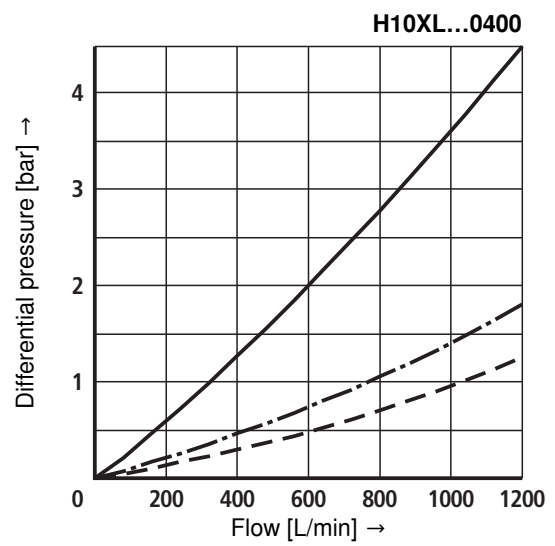
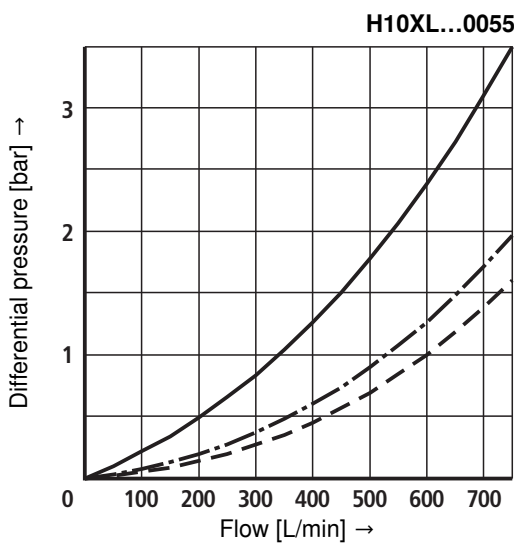
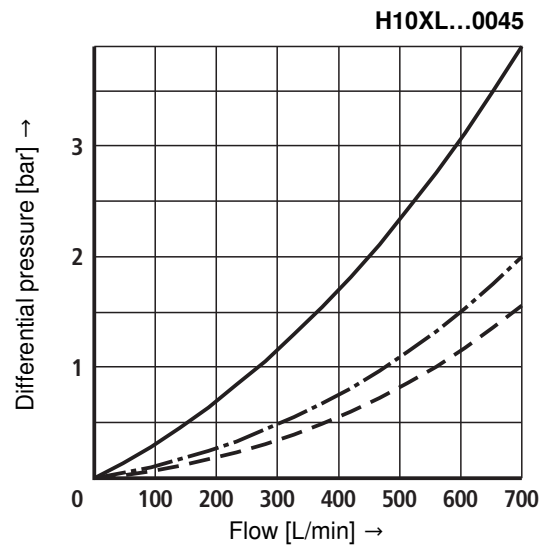
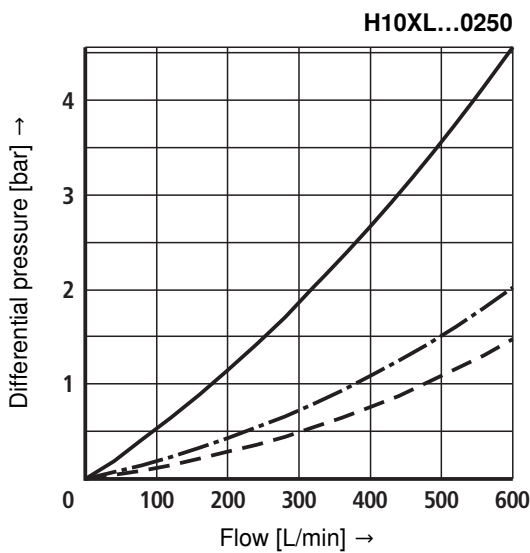
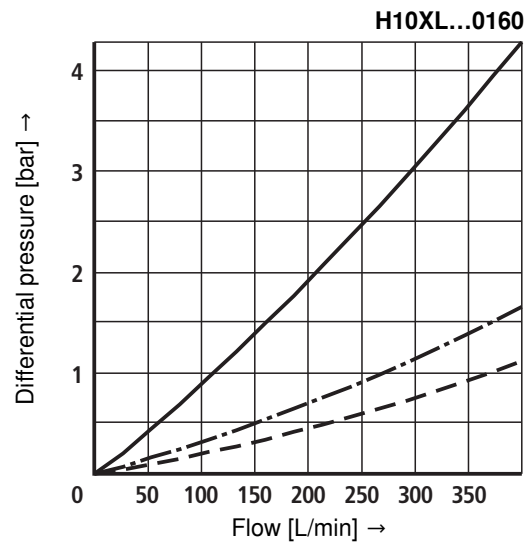
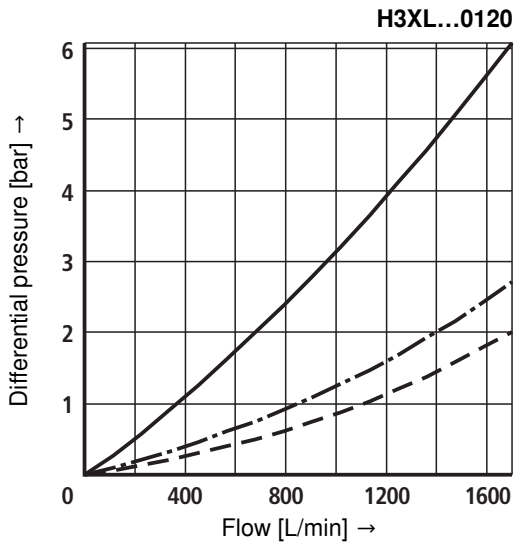
Characteristic curves

Specific weight: $< 0.9 \text{ kg/dm}^3$
 Δp Q characteristic curves for complete filters
 Recommended initial Δp for design = 0.8 bar

H3XL... and H10XL...

An optimum filter selection is made possible by our computer program "BRFilterSelect".

Oil viscosity:
 ——— 120 mm²/s
 - - - 46 mm²/s
 - - - 30 mm²/s



Characteristic curves

H10XL...

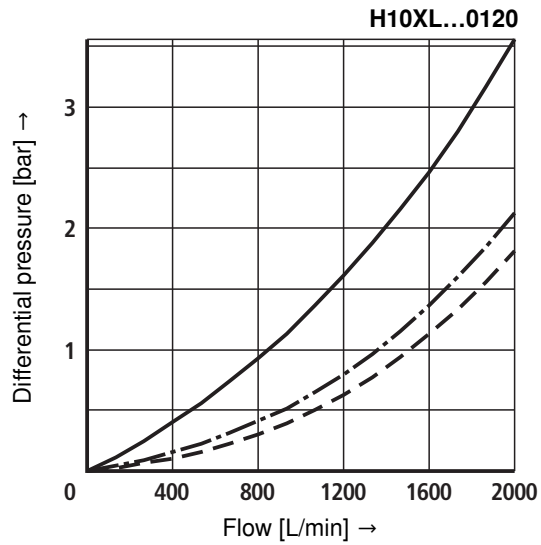
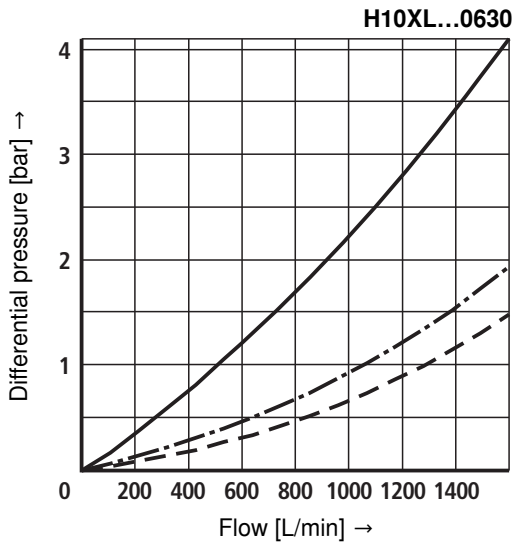
Specific weight: $< 0.9 \text{ kg/dm}^3$

Δp Q characteristic curves for complete filters

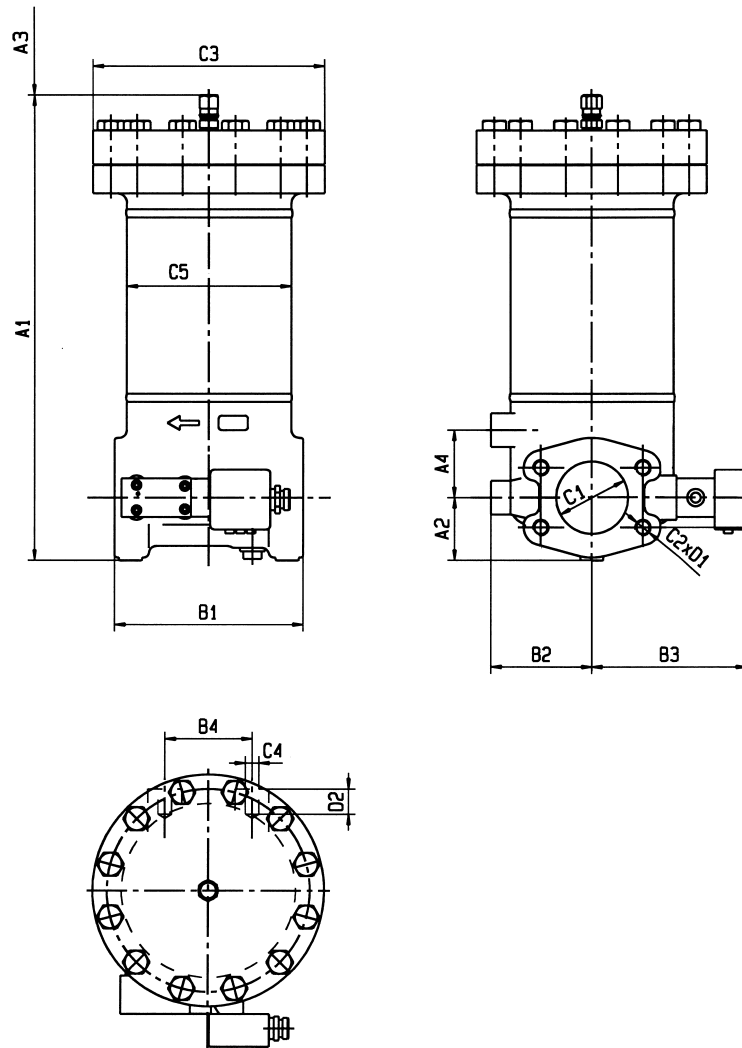
Recommended initial Δp for design = 0.8 bar

An optimum filter selection is made possible by our computer program "BRFilterSelect".

Oil viscosity:
 ——— 120 mm²/s
 - · - · 46 mm²/s
 - - - 30 mm²/s



Unit dimensions (dimensions in mm)



Filter housing for filter elements in accordance with DIN 24550

Type 100 FLEN...	Volume in l	Weight in kg ¹⁾	A1	A2	A3 ²⁾	A4	B1	B2	B3	B4	C1	C2	C3	C4	C5	D1	D2
0160	2.1	22.4	351	50	160	60	160	95	144	70	SAE 2" 3000 psi DN50	M12	Ø 200	M16	Ø 140	21	22
0250	3.2	28.0	441		250												
0400	5.1	34.0	482	65	250	70	195	105	158	90	SAE 3" 3000 psi DN80	M16	Ø 240	M16	Ø 170	22	20
0630	7.8	38.3	632		400												

Filter housing for filter elements according to BRFS standard

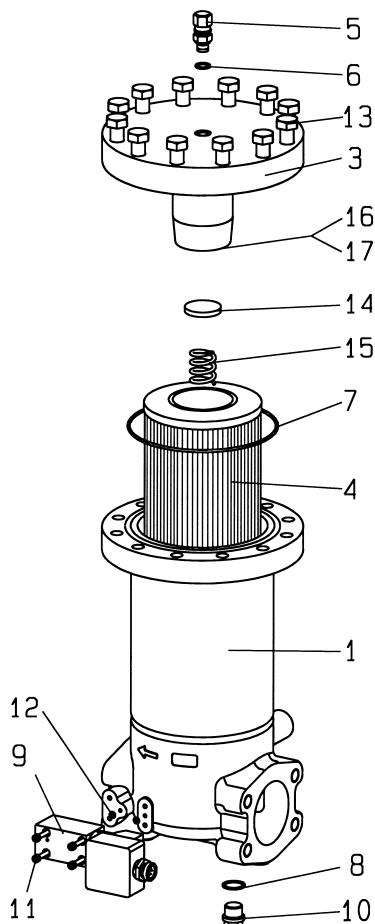
Type 100 FLE...	Volume in l	Weight in kg ¹⁾	A1	A2	A3 ²⁾	A4	B1	B2	B3	B4	C1	C2	C3	C4	C5	D1	D2
0045	5.1	29.0	591	50	400	60	160	95	144	70	SAE 2" 3000 psi DN50	M12	Ø 200	M16	Ø 140	21	22
0055	7.1	33	759		568												
0120	14.3	49.2	989	65	750	70	195	105	158	90	SAE 3" 3000 psi DN80	M16	Ø 240	M16	Ø 170	22	20

¹⁾ Weight including standard filter element and clogging indicator.

²⁾ Withdrawal dimension for filter element replacement.

Spare parts list

100 FLEN 0160 - 0630
100 FLE 0045 - 0120



Part	Piece	Description	Material	Size					
				FLEN	FLE	0160	0250	0045	0055
1	1	Filter housing	Various	Please indicate ordering information "Filter"					
3	1	Filter cover	Various	Please indicate ordering information "Filter"					
4	1	Filter element	Various	Please indicate ordering information "Filter Element"					
5	1	Bleed screw	5.8	Part No. 4158					
6	1	Seal ring	Soft steel	Please indicate ordering information "Filter"					
7	1	Seal ring	NBR / FKM	Please indicate ordering information "Filter"					
8	1	Seal ring	Soft steel	Please indicate ordering information "Filter"					
9	1	Maintenance indicator	Various	See ordering information "Clogging indicator"					
10	1	Plug	Steel	Part No. 789					
11	4	Hexagon socket head cap screw	8.8	Part No. 633					
12	2	Seal ring	NBR / FKM	Please indicate ordering information "Filter"					
13	8	Hexagonal head screw	8.8	Part No. 602			-		
	12			-			Part No. 603		
14	1	Valve calotte	Various	Please indicate ordering information "Filter"					
15	1	Valve spring	1.0600						
16	1	Valve disk	Steel						
17	1	Locking ring	Spring steel						

All part no.s BRFS-specific.

Spare parts (insert for DIN and SAE filters)

Mechanical optical Clogging indicator

Rexroth power unit accessories

Filter

Clogging indicator

Mechanical optical clogging indicator for high-pressure filters
Switching point 5 bar [72 psi] = HV5

ABZ	F	V	HV5	1X	/	DIN
-----	---	---	-----	----	---	-----

DIN = Identification for DIN and SAE model

M = Sealing material
V = See table below

1X = Unit series
(10 to 19; unchanged
installation and connection dimensions)

Mechanical optical clogging indicator	Material no.
ABZFV-HV5-1X/M-DIN	R901025313

The ordering details for filter elements and sealing kits can be found on page 3.

Sealing kits must be ordered by stating the complete part key.

Sealing material and surface coating for pressure fluids

			Order detail	
Mineral oils			Sealing material	Element model
Mineral oil	HLP	according to DIN 51524	M	...0
Fire-resistant hydraulic fluids				
Emulsions	HFA-E	according to DIN 24320	M	...0
Synthetic water solutions	HFA-S	according to DIN 24320	M	...D
Water solutions	HFC	according to VDMA 24317	M	...D
Phosphate esters	HFD-R	according to VDMA 24317	V	...D
Organic esters	HFD-U	according to VDMA 24317	V	...D
Hydraulic fluids that are fast biodegradable				
Triglycerides (rape seed oil)	HETG	according to VDMA 24568	M	...D
Synthetic esters	HEES	according to VDMA 24568	V	...D
Polyglycoles	HEPG	according to VDMA 24568	V	...D

Installation, commissioning and maintenance

Installation

Verify operating pressure with name plate information.

Screw the filter housing Pos. 1 to the fastening device, considering the flow direction (direction arrows) and the withdrawal height of the filter element Pos. 4.

Remove the plugs from the filter inlet and outlets. Fit the filter into the pipe work, ensuring that it is fitted free of tension.

Warning!

Assemble and disassemble the filter only when system is depressurized!

Vessel is under pressure!

When disassembling the filter, please note that the filter inlet and the filter outlet need to be emptied separately!

Remove the filter bowl only if it is not pressurized!

Do not replace the clogging indicator while the filter is under pressure!

Functional and safety warranty only applicable when using genuine Rexroth spare parts!

Service filter only by trained personnel!

Commissioning

Switch on system pump.

Bleed filter by opening the plug / bleed valve position 5, close when operating fluid vents.

Maintenance

If at operating temperature, the red indicator pin shows out of the clogging indicator Pos. 9 and/or if the switching process in the electric display is triggered, the filter element is clogged and needs to be replaced or cleaned.

Filter element replacement

Switch of the system pump.

Open bleed screw (position 5) and relieve pressure.

Open plug Pos. 10 and drain the contaminated oil from the filter housing.

Unscrew the filter head / filter cover Pos. 3 and remove the filter element from the centering spigot in the lower filter part by turnign it lightly and remove it from the filter housing.

Again close plug Pos. 10.

Replace filter elements H...-XL and P..., clean the filter element with material G The efficiency of the cleaning process depends on the type of contamination and the value of the pressure differential before the filter element was exchanged.

If the pressure differential after replacing the filter element is more than 50% of the value before replacing the filter element then the G.... element also needs to be replaced.

Install the cleaned or new filter element into the filter housing and with light turning movements push it on to the centering spigot. Beforehand, apply some oil to the seal ring in the filter element. During installation take care to ensure that the filter element is not damaged due to contact on the top edge of the mantel tube.

Check the seal ring Pos. 7 in the mantel tube for damage or wear and replace if necessary.

Re-mount the filter cover with hexagonal head screws. (100 FLE...).

Carry out commissioning as described above.

Technical modifications reserved!

Notes

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Notes

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