

# Inline filter

**RE 51401/09.10**  
Replaces: 01.09

1/16

## Types 40 FLEN 0160 to 1000; 40 FLE 0045, 0055, 0120 to 0270

Nominal sizes **according to DIN 24550**: 0160 to 1000  
 Nominal sizes according to BRFs: 0045, 0055, 0120 to 270  
 Nominal pressure 40 bar  
 Connections up to SAE 4"  
 Operating temperature  $-10\text{ }^{\circ}\text{C}$  to  $+100\text{ }^{\circ}\text{C}$



## Table of contents

Contents	Page
Application, Features	1
Design, Filter element, Accessories, Characteristic curves	2
Quality and standardization	3
Ordering code	4
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 ... 11
Dimensions	12, 13
Spare parts	14, 15
Installation, commissioning and maintenance	16

## Application

- Filtration of pressure fluids and lubricants.
- Filtration of fluids and gases.
- Direct installation into pipe work.
- 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 optimised design due to 3D computer-supported design
- Low pressure drop
- Special highly efficient filter media

## Design

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Three part modular design comprising of lower filter part with inlet and outlet, mantel tube and removable threaded filter head.

Further design variants available on request.

## Filter element

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Pleated design with optimised pleat density and various filter media.

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

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

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

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### 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.

### Bypass valve

To protect the filter element during startup and over pressurisation due to clogging.

## Characteristic curves

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Our software "BRFilterSelect" makes it possible to optimise filter selection, see download area <http://www.eppensteiner.de>.

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

## Quality and standardization

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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 51401 are pressure holding equipment according to article 1, section 2.1.4 of the pressure equipment directive 97/23/EG (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.

## Ordering code

### Of the filter

		40	-	A	-	0	-	V2,2	-	S0		
<b>Pressure</b> 40 bar	= 40											<b>Complementary details</b> 0 = Without Z <sup>2)</sup> = Certificate
<b>Design</b> Inline filter with filter element according to DIN 24550	= FLEN											<b>Material</b> 0 = Standard D <sup>1)</sup> = Chemically nickelplated
Inline filter with filter element according to BRFS standard	= FLE											<b>Seal</b> M = NBR seal V = FKM seal
<b>Nom. size</b> FLEN...	= 0160 0250 0400 0630 1000											<b>Connection</b> S0 = Inlet/Outlet SAE flange
FLE...	= 0045 0055 0120 0200 0270											<b>Clogging indicator</b> V2,2 = Clogging indicator, optical specify hydraulic pressure 2.2 bar
<b>Filtration rating µm</b> <b>Nominal</b> Stainless steel wire mesh, cleanable: G10, G25	= G...											<b>Bypass valve</b> 0 = Without 7 = 3.5 bar
Paper, non-cleanable P10	= P...											
<b>Absolute (ISO 16889)</b> Micro glass, non-cleanable H3XL, H10XL, H20XL	= H...XL											
<b>Pressure differential</b> Max. admissible pressure differential of the filter element 30 bar	= A											
<b>Element model</b> Standard adhesive T = 100 °C	= 0...											
Standard material	= ...0											
Chemically nickel-plated	= ...D <sup>1)</sup>											
<b>Solenoid</b> Without	= 0											

**Ordering example:**

40 FLE 0270 H10XL-A00-07V2,2-S0M00

### Of the filter element

		1.	-	A	-	0	-			
<b>Filter element</b> Design	= 1.							<b>Seal</b> M = NBR seal V = FKM seal		
<b>Nom. size</b> FLEN...	= 0160 0250 0400 0630 1000							<b>Bypass valve</b> 0 = With filter element always 0		
FLE...	= 0045 0055 0120 0200 0270							<b>Element model</b> 0... = Standard adhesive T = 100 °C ...0 = Standard material ...D <sup>1)</sup> = Chemically nickel-plated		
<b>Filtration rating µm</b> <b>Nominal</b> Stainless steel wire mesh, cleanable: G10, G25	= G...									
Paper, non-cleanable: P10	= P...									
<b>Absolute (ISO 16889)</b> Micro glass, non-cleanable: H3XL, H10XL, H20XL	= H...XL									
<b>Pressure differential</b> Max. admissible pressure differential of the filter element 30 bar	= A									

**Ordering example:**

1. 0270 H10XL-A00-0-M

<sup>1)</sup> Only in connection with FKM seal.

<sup>2)</sup> Z = Manufacturer's inspection certificate M according to DIN 55350 T18

## Preferred types

### Inline filter with bypass, filtration rating 10 µm and nominal pressure 40 bar

Type	Flow [Li/min] → at $v = 30 \text{ mm}^2/\text{s}$ and $\Delta p = 0.8 \text{ bar}$	Material number
40 FLEN 0160 H10XL-A00-07V2,2-S0M00	317	R928000335
40 FLEN 0250 H10XL-A00-07V2,2-S0M00	416	R928000336
40 FLE 0045 H10XL-A00-07V2,2-S0M00	496	R928000340
40 FLE 0055 H10XL-A00-07V2,2-S0M00	537	R928000341
40 FLEN 0400 H10XL-A00-07V2,2-S0M00	885	R928000337
40 FLEN 0630 H10XL-A00-07V2,2-S0M00	1129	R928000338
40 FLE 0120 H10XL-A00-07V2,2-S0M00	1355	R928000342
40 FLEN 1000 H10XL-A00-07V2,2-S0M00	1610	R928000339
40 FLE 0200 H10XL-A00-07V2,2-S0M00	2180	R928000343
40 FLE 0270 H10XL-A00-07V2,2-S0M00	2360	R928000344

### Inline filter with bypass, filtration rating 3 µm and nominal pressure 40 bar

Type	Flow [Li/min] → at $v = 30 \text{ mm}^2/\text{s}$ and $\Delta p = 0.8 \text{ bar}$	Material number
40 FLEN 0160 H3XL-A00-07V2,2-S0M00	135	R928000325
40 FLEN 0250 H3XL-A00-07V2,2-S0M00	210	R928000326
40 FLE 0045 H3XL-A00-07V2,2-S0M00	310	R928000330
40 FLE 0055 H3XL-A00-07V2,2-S0M00	385	R928000331
40 FLEN 0400 H3XL-A00-07V2,2-S0M00	390	R928000327
40 FLEN 0630 H3XL-A00-07V2,2-S0M00	610	R928000328
40 FLEN 1000 H3XL-A00-07V2,2-S0M00	715	R928000329
40 FLE 0120 H3XL-A00-07V2,2-S0M00	960	R928000332
40 FLE 0200 H3XL-A00-07V2,2-S0M00	1260	R928000333
40 FLE 0270 H3XL-A00-07V2,2-S0M00	1520	R928000334

## Ordering details: Electronic switching element for clogging indicator

ABZ	F	V	-1X/	-DIN
Rexroth power unit accessories	Filter	Clogging indicator	Electronic switching element with 1 switching point (changeover) round plug-in connection M12x1 <b>= E1SP-M12X1</b>	Electronic switching element with 2 switching points (normally open/normally closed), 75%, 100%, round plug-in connection M12x1, 3 LED <b>= E2SP-M12X1</b>
			Electronic switching element with 2 switching points (normally open/normally closed), 75%, 100%, signal suppression up to 30 °C round plug-in connection M12x1, 3 LED <b>= E2SPSU-M12X1</b>	

**-DIN =** Identification for DIN and SAE models

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

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  $p_{nom.} = 40 \text{ bar}$  [580 psi] with bypass valve, nominal size 270, with filter element  $10 \mu\text{m}$  and electronic switching element M12x1 with 1 switching point for pressure fluid mineral oil HLP according to DIN 51524.

**Filter:** 40 FLE 0270 H10XL-A00-07V2,2-S0M00

**Material number:** R928000344

**Clogging indicator:** ABZ FV-E1SP-M12X1-1X/-DIN

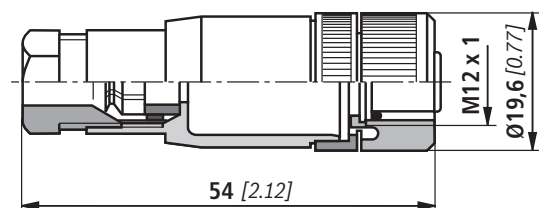
**Material number:** R901025339

## 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



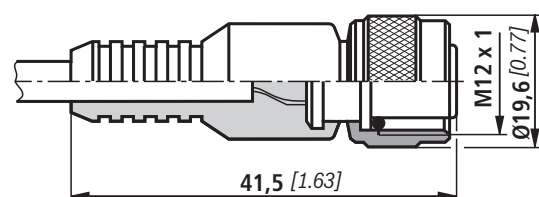
Plug-in connector for K24-3m 4-pin, M12 x 1 with moulded in PVC cable, 3 m long.

**Line cross-section:** 4 x 0.34 mm<sup>2</sup>

**Core marking:**

1	Brown
2	White
3	Blue
4	Black

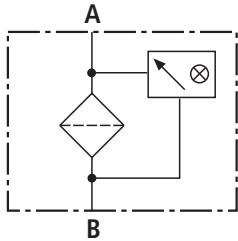
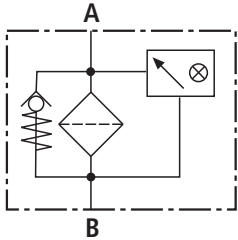
Material no. R900064381



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

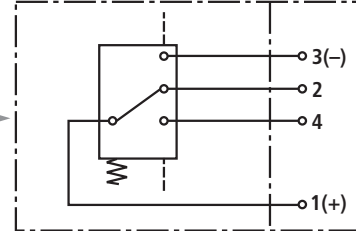
# Symbols

**Pressure filter**



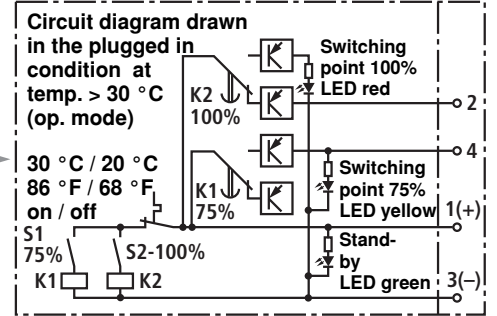
**Electronic switching element  
for clogging indicator**

**Switching element Plug**



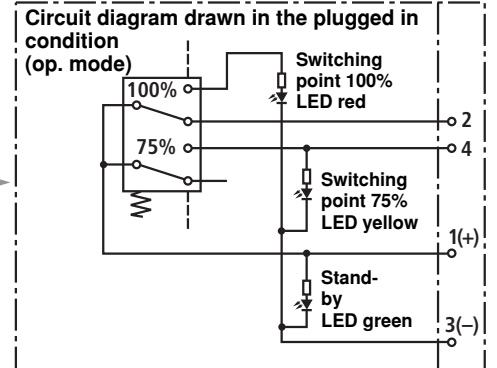
**ABZFV-E1SP-M12X1-1X/-DIN**

**Switching element Plug**



**ABZFV-E2SPSU-M12X1-1X/-DIN**

**Switching element Plug**



**ABZFV-E2SP-M12X1-1X/-DIN**

**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

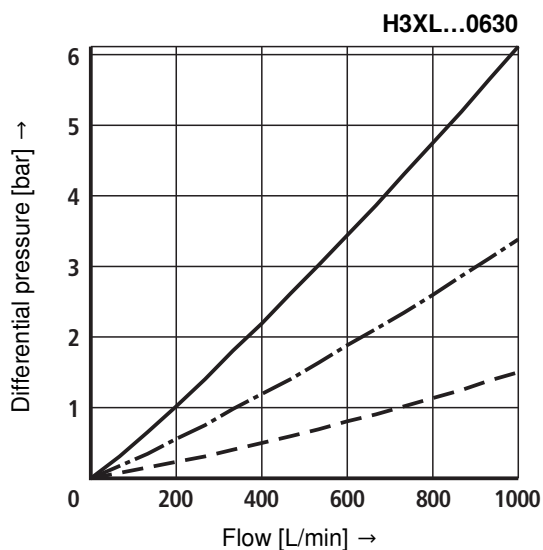
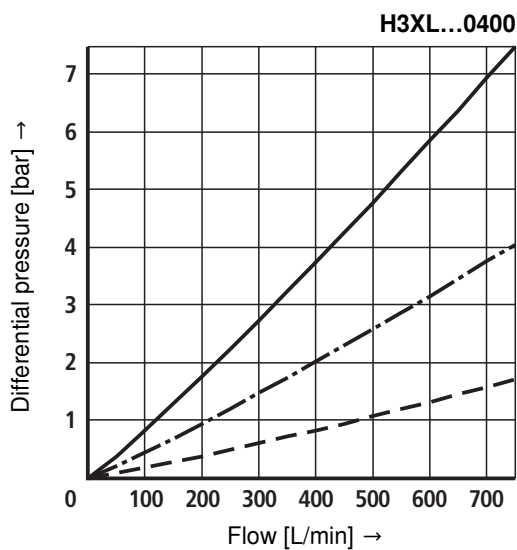
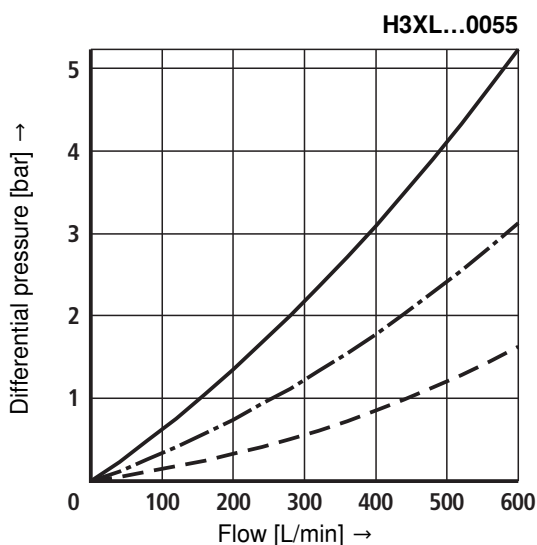
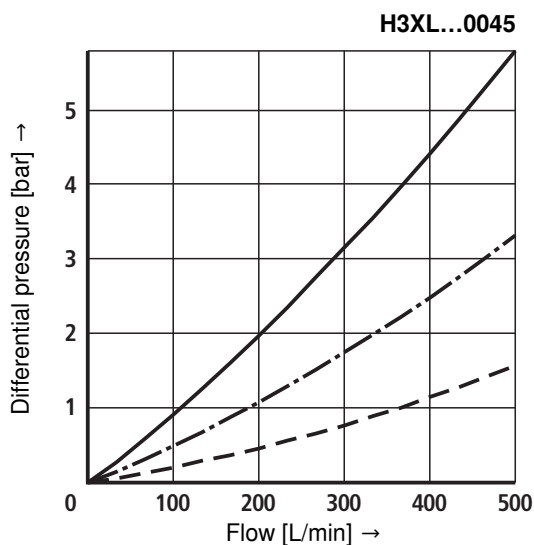
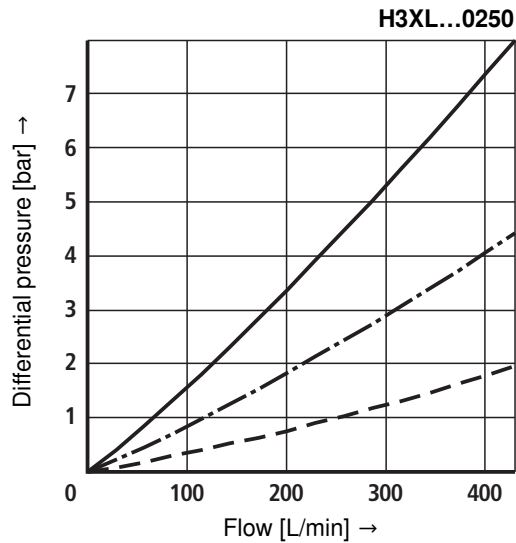
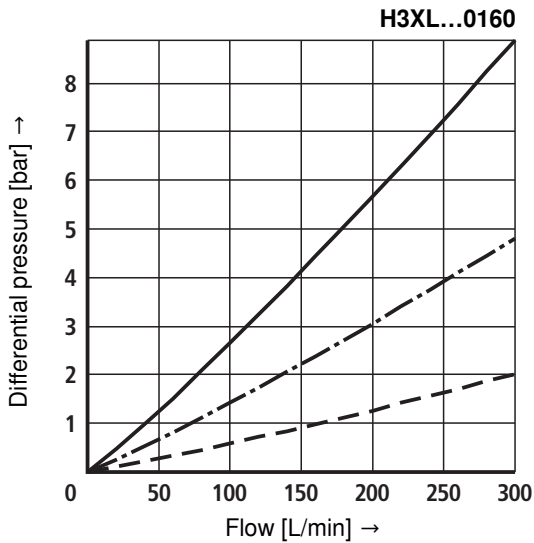
## H3XL...

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

$\Delta p$ -Q characteristic curves for complete filters recommended initial  $\Delta p$  for design = 0.8 bar

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

Oil viscosity:  
 — 120 mm<sup>2</sup>/s  
 - · - 46 mm<sup>2</sup>/s  
 - - - 30 mm<sup>2</sup>/s





### Characteristic curves

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

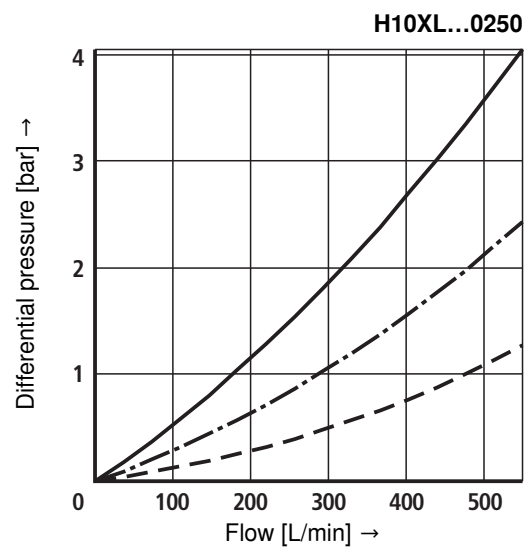
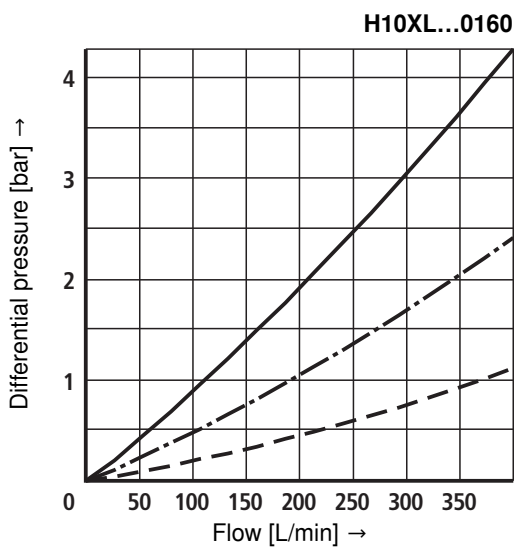
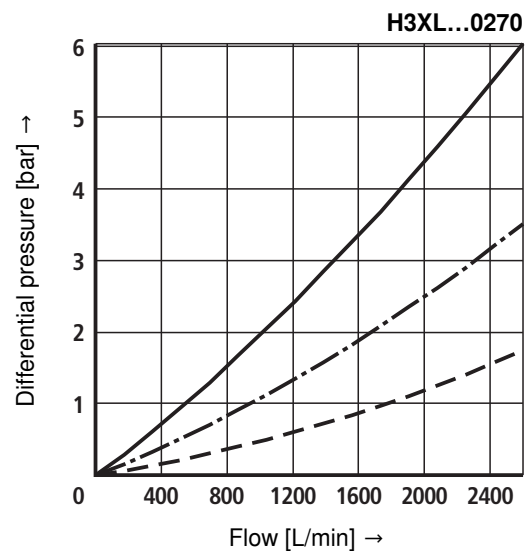
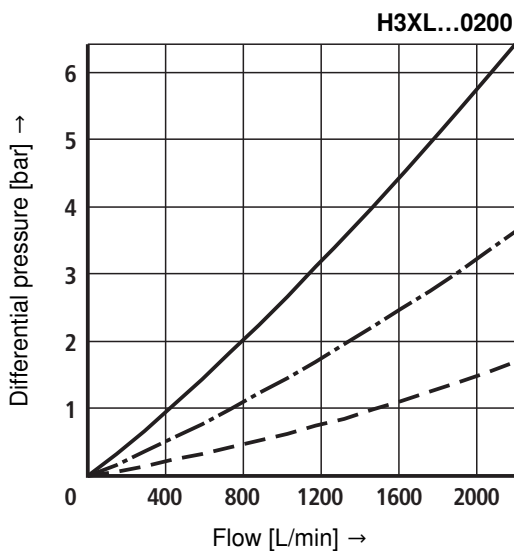
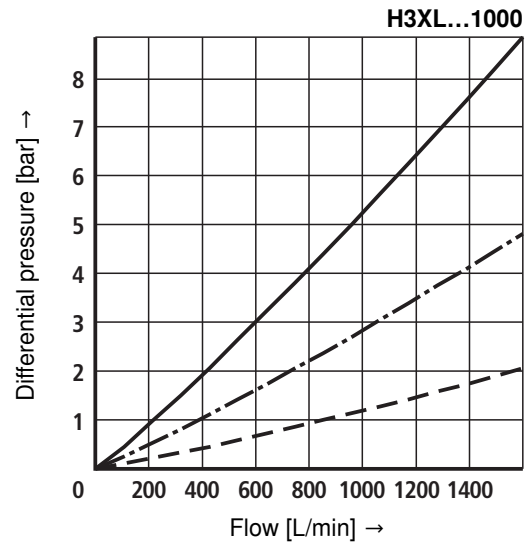
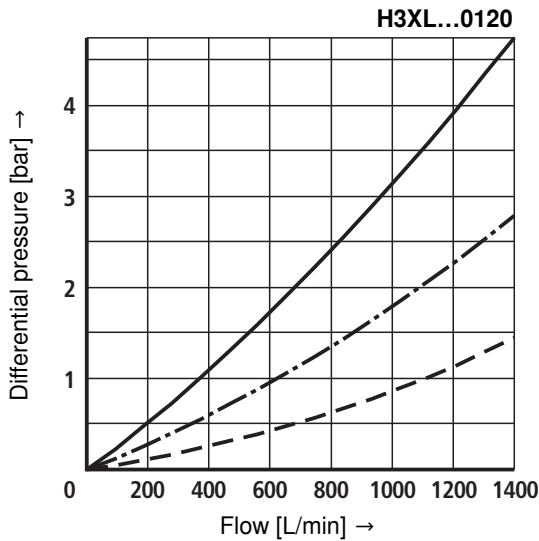
$\Delta p$ -Q characteristic curves for complete filters recommended initial  $\Delta p$  for design = 0.8 bar

### H3XL... und H10XL...

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

Oil viscosity:

- 120 mm<sup>2</sup>/s
- · - 46 mm<sup>2</sup>/s
- - - 30 mm<sup>2</sup>/s



### Characteristic curves

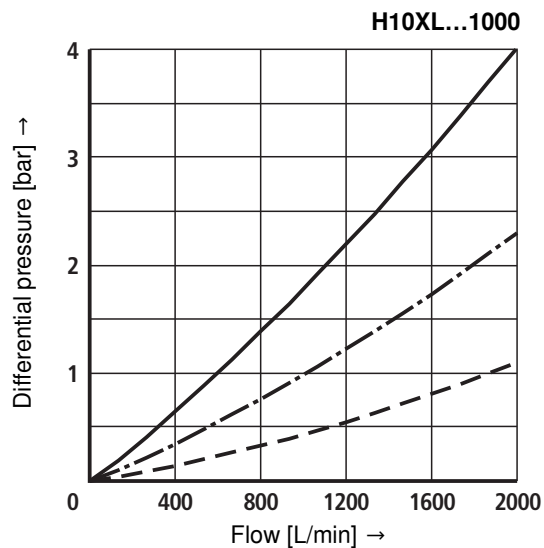
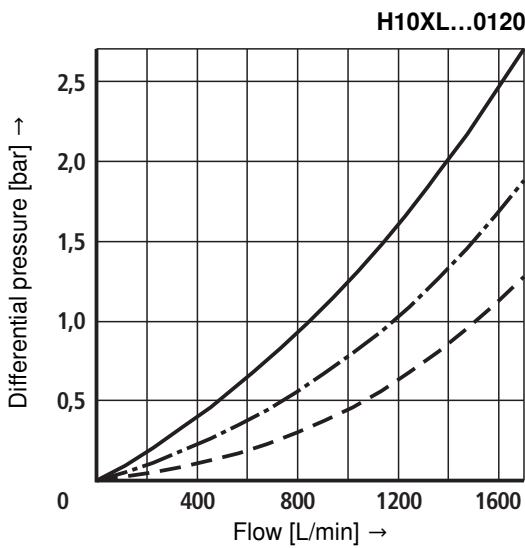
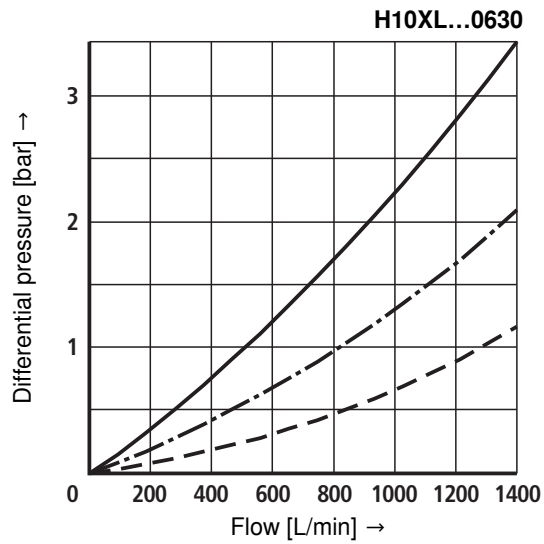
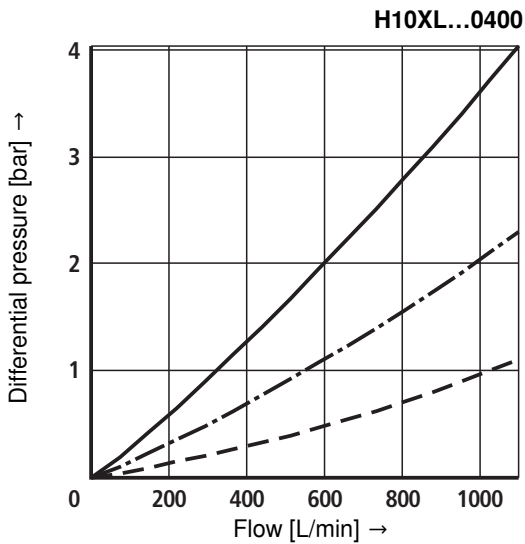
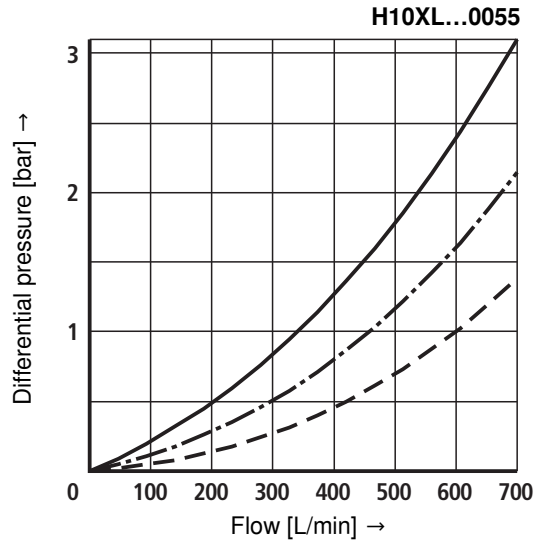
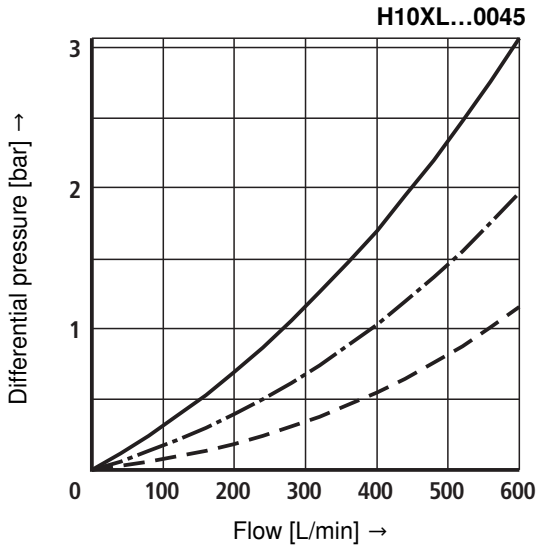
### H10XL...

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

$\Delta p$ -Q characteristic curves for complete filters recommended initial  $\Delta p$  for design = 0.8 bar

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

Oil viscosity:  
 — 120 mm<sup>2</sup>/s  
 - · - 46 mm<sup>2</sup>/s  
 - - - 30 mm<sup>2</sup>/s



### Characteristic curves

### H10XL...

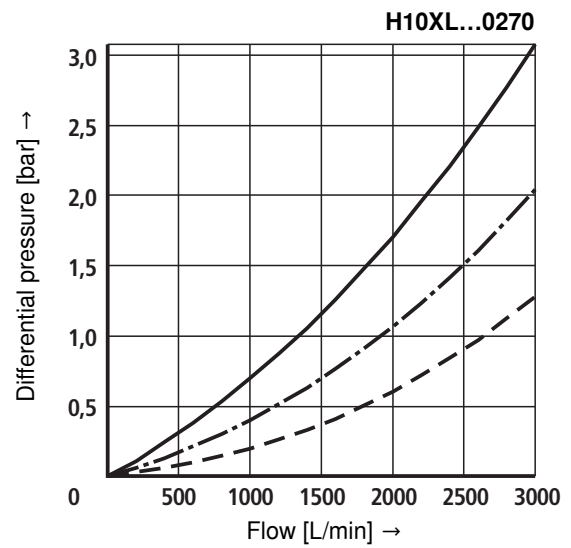
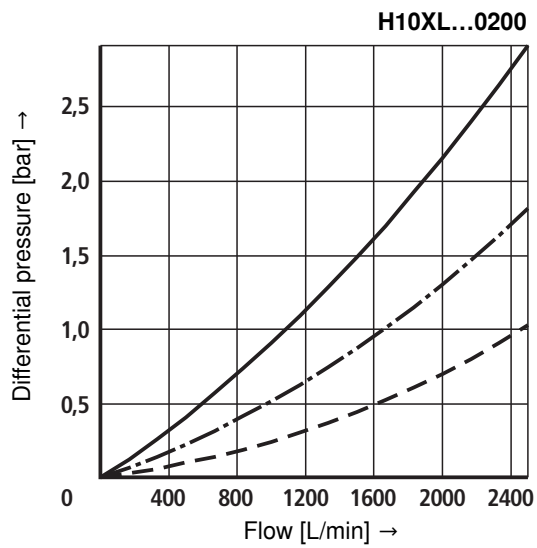
Specific weight: <math>< 0.9 \text{ kg/dm}^3</math>

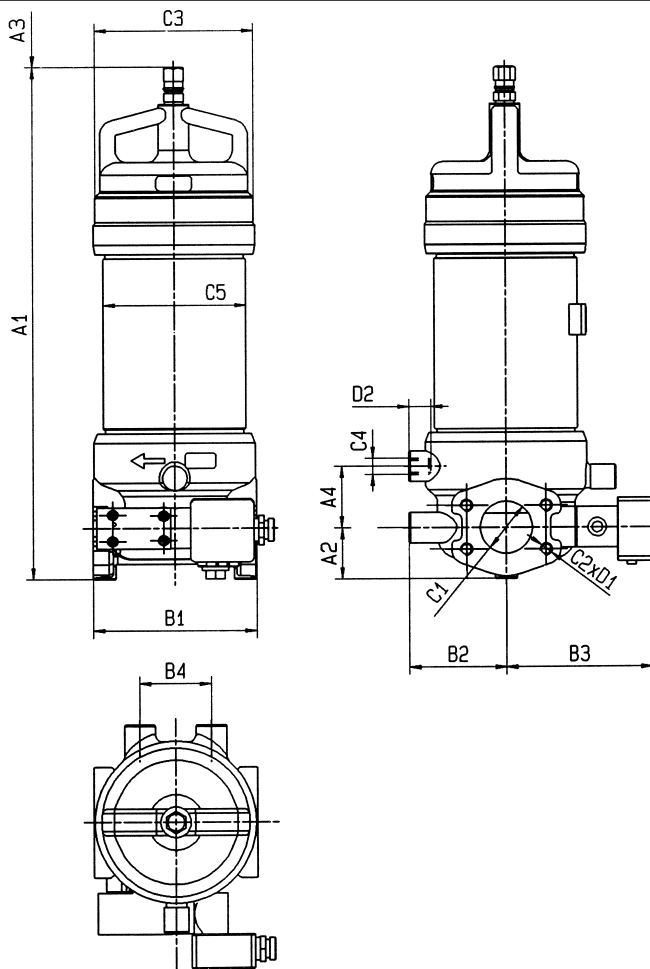
$\Delta p$ -Q characteristic curves for complete filters recommended  
initial  $\Delta p$  for design = 0.8 bar

A proper filter design is enabled by our computer program  
"BRFilterSelect".

Oil viscosity:

- 120  $\text{mm}^2/\text{s}$
- · - 46  $\text{mm}^2/\text{s}$
- - - 30  $\text{mm}^2/\text{s}$



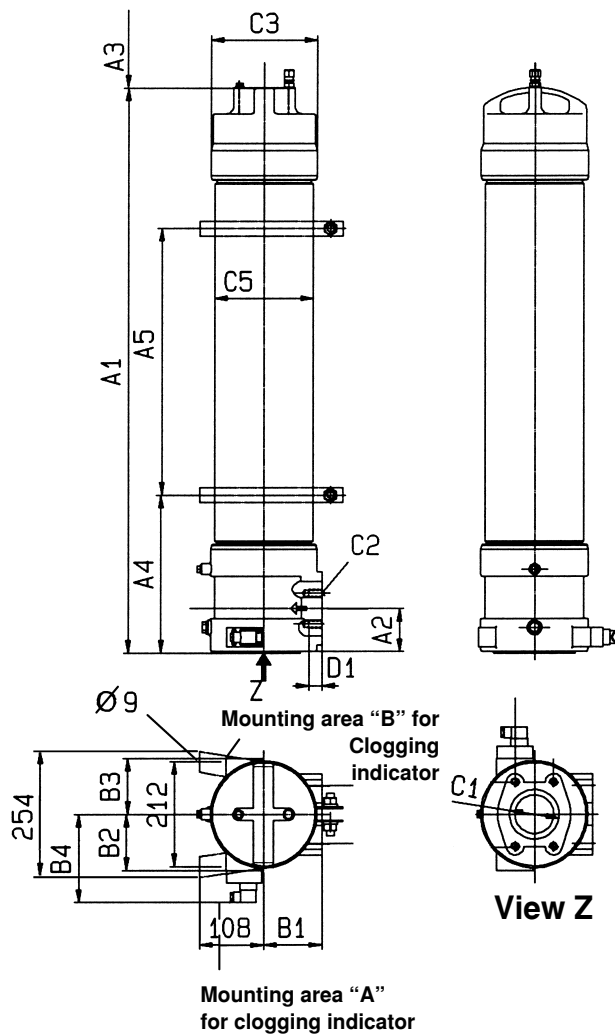
**Dimensions:** 40 FLEN 0160 - 0630, 40 FLE 0045, 0055, 0120 (dimensions in mm)**Filter housing for filter elements in accordance with DIN 24550**

Type 40 FLEN...	Volume in L	Weight in kg <sup>1)</sup>	A1	A2	A3 <sup>2)</sup>	A4	B1	B2	B3	B4	C1	C2	C3	C4	C5	D1	D2
<b>0160</b>	1.4	12.0	411	49.5	160	60	160	95	143	70	SAE 2" 3000 psi DN50	M12	Ø 158	M16	Ø 140	21	22
<b>0250</b>	2.7	13.2	501		250												
<b>0400</b>	4.0	19.5	543	61.5	70	195	105	155	90	SAE 3" 3000 psi DN80	M16	Ø 188	M16	Ø 170	21	20	
<b>0630</b>	7.1	21.9	693														400

**Filter housing for filter elements according to BRFS standard**

Type 40 FLE...	Volume in L	Weight in kg <sup>1)</sup>	A1	A2	A3 <sup>2)</sup>	A4	B1	B2	B3	B4	C1	C2	C3	C4	C5	D1	D2
<b>0045</b>	4.8	19.0	663	49.5	400	60	160	95	143	70	SAE 2" 3000 psi DN50	M12	Ø 158	M16	Ø 140	21	22
<b>0055</b>	6.8	23.0	831		568												
<b>0120</b>	14	27.4	1050	61.5	750	70	195	105	155	90	SAE 3" 3000 psi DN80	M16	Ø 188	M16	Ø 170	21	20

<sup>1)</sup> Weight including standard filter element and clogging indicator.<sup>2)</sup> Withdrawal dimension for filter element replacement.

**Dimensions:** 40 FLEN 1000, 40 FLE 0200 - 0270 (dimensions in mm)**Filter housing for filter elements in accordance with DIN 24550**

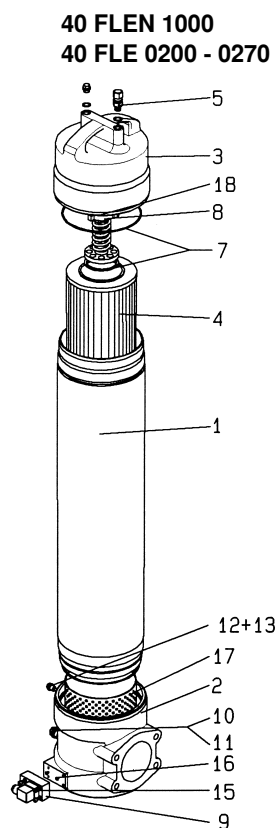
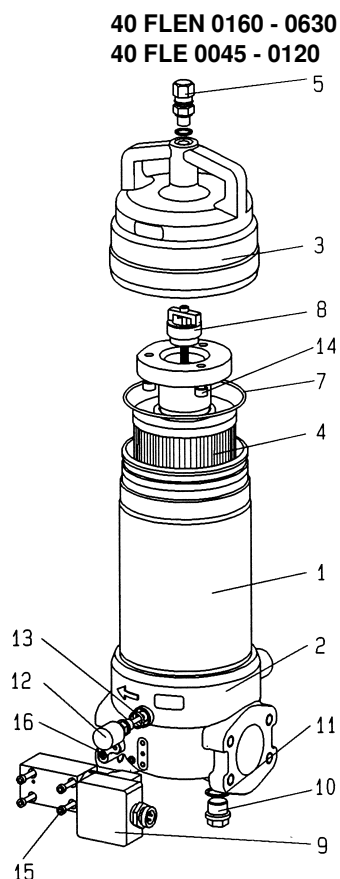
Type 40 FLEN...	Volume in L	Weight in kg <sup>1)</sup>	A1	A2	A3 <sup>2)</sup>	A4	A5	B1	B2	B3	B4	C1	C2	C3	C5	D1
1000	12	50	553	90		260	65	118	113	113	183	SAE 4" 3000 psi DN100	M16	Ø 216	Ø 200	26

**Filter housing for filter elements according to BRFS standard**

Type 40 FLE...	Volume in L	Weight in kg <sup>1)</sup>	A1	A2	A3 <sup>2)</sup>	A4	A5	B1	B2	B3	B4	C1	C2	C3	C5	D1
0200	22	60	911	90	758	320	310	118	113	113	183	SAE 4" 3000 psi DN100	M16	Ø 188	Ø 200	26
0270	28	70	1145		992		540									

<sup>1)</sup> Weight including standard filter element and clogging indicator.<sup>2)</sup> Withdrawal dimension for filter element replacement.

## Spare parts list



Part	Piece	Description	Material	Size											
				FLEN		FLE		0160	0250			0400	0630		1000
							0045	0055				0120		0200	0270
1	1	Filter housing	Various	Please indicate ordering information "Filter"											
2	1	Lower filter part	Various	Please indicate ordering information "Filter"											
3	1	Filter head	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											
7	3	Seal ring	NBR / FKM	Please indicate ordering information "Filter"											
8	1	Bypass valve	Various	Part No. 5360										Please indicate ordering information "Filter"	
9	1	Clogged indicator	Various	See ordering information "Clogging indicator"											
10	1	Blanking plug	Steel	Part No. 789											
11	1	Seal ring	Soft steel	Please indicate ordering information "Filter"											
12	1	Locking screw	Various	Part No. 4844											
13	1	Seal ring	Soft steel	Please indicate ordering information "Filter"											
14	3	Socket head cap screw	8.8	Part No. 637				Part No. 652				-			
15	4	Socket head cap screw	8.8	Part No. 633											
16	2	Seal ring	NBR / FKM	Please indicate ordering information "Filter"											
17	1	Protective basket	Steel	-										Part No. 4736	
18	1	Blanking plug	Steel	-										Part No. 795	

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 low-pressure filters  
switching point 2.2 bar [32 psi]

= NV2

ABZ | F | V - NV2 - 1X / - DIN

DIN = Identification for DIN and SAE models

M =

V =

### Sealing material

See table below

See table below

### Unit series

Unit series 10 to 19

(10 to 19; unchanged

installation and connection dimensions)

1X =

Mechanical optical Clogging indicator	Material no.
ABZ FV-NV2-1X/M-DIN	R901025312

The ordering details for filter elements 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

			Ordering detail	
Mineral oils			Sealing material	Element model and material
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 (position 1) to the fastening device considering the flow direction (direction arrows) and withdrawal height of the filter element (position 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 depressurised!

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 pressurised!

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 the red indicator pin shows out of the logging indicator and/ or if the switching process in the electric display is triggered, the filter element is clogged and needs to be replaced or cleaned respectively.

### Filter element replacement

Switch of the operating pump.

Open bleed screw (position 5) and relieve pressure.

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

Unscrew upper filter part / filter cover (position 3) and pull filter element from the spigot by rotating it slightly, and remove the same from the filter housing.

Again close plug Pos. 10.

Replace filter elements H...-XL, 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 filter element seal ring. 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. Install filter head by rotating it clock-wise by hand up to the last thread and rotate back 1/4 rotation. Don't use any tools.

Carry out commissioning as described above.

Technical modifications reserved!