The 10 FREN filter has been phased out.

When all inventory has been depleted, this filter will be obsolete.

Tank mounted return line filter

RE 51425/12.10 1/14
Replaces: 07.09

Type 10 FREN 0160; 0250; 0400; 0630; 1000

rueklauffilter_d

Size according to DIN 24550: 0160 to 1000
Nominal pressure 10 bar *[145 psi]*

Table of contents

Features

The tank mounted return line filters are designed for installation on fluid tanks. They serve the separation of solid materials from the whole fluid flowing back to the tanks.

They distinguish themselves by the following:

- Special highly efficient filter media
- Adsorption of very fine particles across a broad pressure differential range
- High dirt holding capacity thanks to large specific filter area
- Good chemical resistance of the filter elements
- High collapse resistance of the filter elements (e.g. in case of cold start)
- Filter ratings: 3…100 µm
- By default equipped with mechanical optical clogging indicator with memory function

Information on available spare parts:
www.boschrexroth.com/spc

Ordering code

of the filter

10	FREN		– A00 – 07	–		00

Nominal pressure
10 bar **= 10**

Series
Tank mounted return line filter
Filter element according to
DIN 24550 **FREN**

Size
0160 **= 0160**
0250 **= 0250**
0400 **= 0400**
0630 **= 0630**
1000 **= 1000**

Filtration rating in µm nominal
Stainless steel wire mesh, cleanable
G10, G25, G40, G100 **= G…**
Further models (filter media,
connections “A”) on request

Absolute (ISO 16889)
Micro glass, not cleanable
H3XL, H6XL, H10XL, H20XL **= H…XL**

Pressure differential
max admissible pressure differential of the filter element
30 bar (with bypass valve - valve 2.5 bar) **= A00**

Complementary details
00 = without

Seal
M = NBR seal
V = FKM seal

Connection
00 = Standard
U6 = SAE 24 (with size 0160; size 0250)

Maintenance indicator
V2.2 = Maintenance indicator, specify mech./ optical switching pressure 2.2 bar
MR = Pressure gauge display 0-10 bar

Bypass valve
07 = Bypass 3.5 bar

Order example:
10 FREN 0160 H10XL-A00-07V2,2-00M00

Further models, e.g. filter media, connections, are available at request.

of the filter element

1.		– A00 – 0 –

Filter element
Design **= 1.**

Size
0160 **= 0160**
0250 **= 0250**
0400 **= 0400**
0630 **= 0630**
1000 **= 1000**

Filtration rating in µm nominal
Stainless steel wire mesh, cleanable:
G10; G25; G40; G100 **= G…**

Absolute (ISO 16889)
Micro glass, not cleanable:
H3XL, H6XL, H10XL H20XL **= H…XL**

Seal
M = NBR seal
V = FKM seal

Bypass valve
0 = at filter element always 0

Pressure differential
max. admissible pressure differential
of the filter element
A00 = 30 bar

Order example:
1. 0160 H10XL-A00-0-M

Standard types

Tank mounted return line filter, filtration rating 20 µm

Type	Flow in l/min *[gpm]* with ν = 33 mm²/s *[155 SUS]* and Δp = 0.5 bar *[7.25 psi]*	Material no.
10 FREN 0160 H20XL-A00-07V2,2-00M00	230 *[61]*	**R928019537** *[R928022768]*
10 FREN 0250-H20XL-A00-07V2,2-00M00	315 *[83]*	**R928022752** *[R928022769]*
10 FREN 0400-H20XL-A00-07V2,2-00M00	425 *[112]*	**R928019842**
10 FREN 0630-H20XL-A00-07V2,2-00M00	640 *[169]*	**R928019539**
10 FREN 1000-H20XL-A00-07V2,2-00M00	850 *[224]*	**R928022753**

Tank mounted return line filter, filtration rating 10 µm

Type	Flow in l/min *[gpm]* with ν = 33 mm²/s *[155 SUS]* and Δp = 0.5 bar *[7.25 psi]*	Material no.
10 FREN 0160-H10XL-A00-07V2,2-00M00	160 *[42]*	**R928019464** *[R928022766]*
10 FREN 0250-H10XL-A00-07V2,2-00M00	250 *[66]*	**R928019351** *[R928022767]*
10 FREN 0400-H10XL-A00-07V2,2-00M00	325 *[86]*	**R928019463**
10 FREN 0630-H10XL-A00-07V2,2-00M00	470 *[145]*	**R928019478**
10 FREN 1000-H10XL-A00-07V2,2-00M00	685 *[181]*	**R928019465**

Tank mounted return line filter, filtration rating 3 µm

Type	Flow in l/min *[gpm]* with ν = 33 mm²/s *[155 SUS]* and Δp = 0.5 bar *[7.25 psi]*	Material no.
10 FREN 0160-H3XL-A00-07V2,2-00M00	94 *[24.5]*	**R928022754** *[R928022770]*
10 FREN 0250-H3XL-A00-07V2,2-00M00	150 *[40]*	**R928022755** *[R928022771]*
10 FREN 0400-H3XL-A00-07V2,2-00M00	210 *[56.5]*	**R928022756**
10 FREN 0630-H3XL-A00-07V2,2-00M00	335 *[89]*	**R928022758**
10 FREN 1000-H3XL-A00-07V2,2-00M00	440 *[116]*	**R928022759**

Ordering code, standard types: Electronic switching element for maintenance indicator

ABZ | F | V – | – 1X / – DIN

Rexroth power unit accessories

Filter

Maintenance indicator

Electronic switching element with
1 switching point (changeover)
round plug-in connection M12x1 **= 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**

1X = **Component series**
Component series 10 to 19
(10 to 19; identical
installation and connection dimensions)

–DIN = Mark for
DIN and SAE model

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

Order example:

Tank return line filter with mechanical optical maintenance indicator for $p_{Nominal}$ = 10 bar *[145 psi]* with bypass valve, size 0160, with filter element 10 µm and electronic switching element M12x1 with 1 switching point for hydraulic fluid mineral oil HLP according to DIN 51524.

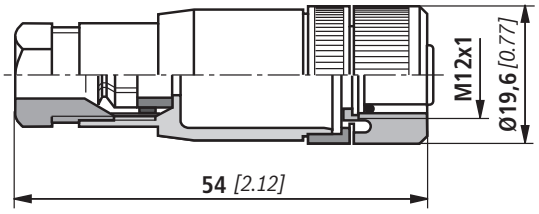
Filter: **10 FREN 0160 H20XL-A00-07V2,2-00M00** **Material number: R928019537**
Maintenance indicator: **ABZFV-E1SP-M12X1-1X/-DIN** **Material number: R901025339**

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

For electronic switching element with round plug-in connection M12x1

Mating connector suitable for K24 4-pin, M12x1 with screw connection, cable gland Pg9.

Material no. R900031155



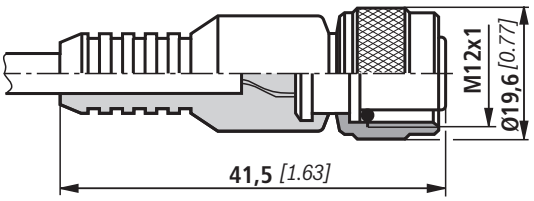
Mating connector suitable for K24-3m 4-pin, M12x1 with potted-in PVC cable, 3 m long.

Line cross-section: 4 x 0.34 mm²

Core marking:

1 Brown
2 White
3 Blue
4 Black

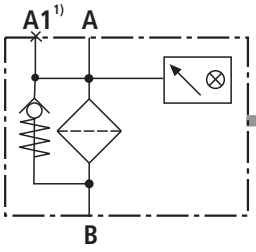
Material no. R900064381



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

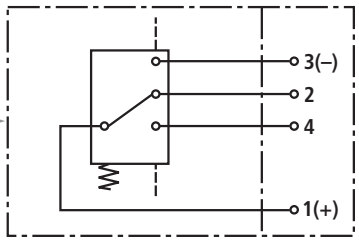
Symbols

Return line filter with bypass and mechanical indicator



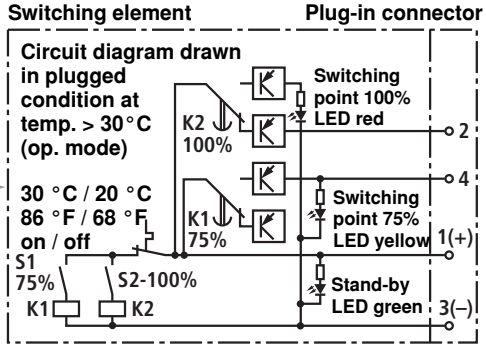
Electronic switching element for maintenance indicator

Switching element **Plug-in connector**



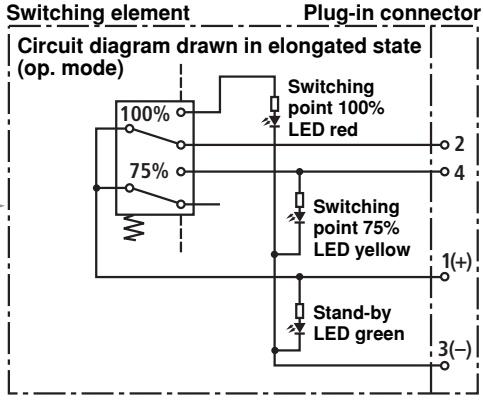
ABZFV-E1SP-M12X1-1X/-DIN

Switching element **Plug-in connector**



ABZFV-E2SPSU-M12X1-1X/-DIN

Switching element **Plug-in connector**



ABZFV-E2SP-M12X1-1X/-DIN

1) **A1 = Filling port (only size 160...1000)**

Function, section

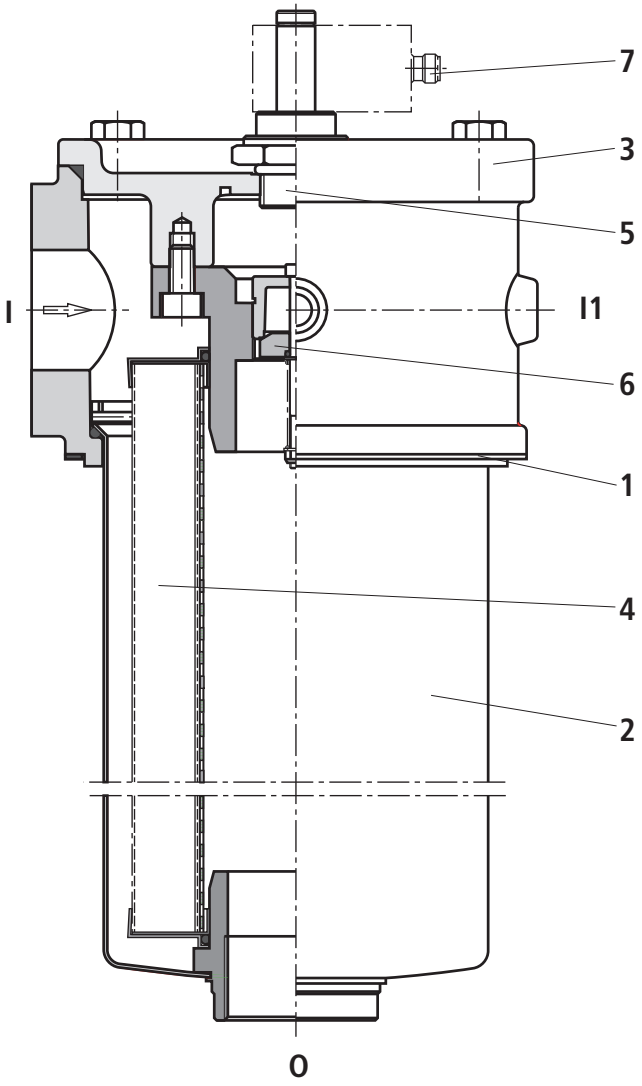
The tank mounted return line filters are designed for direct attachment to the fluid tank.

They basically consist of filter head (1), filter bowl (2), cover (3), filter element (4) as well as mechanical optical maintenance indicator (5). Bypass valves (6) are integrated in the filter covers.

Via port I, the hydraulic fluid reaches the filter element (4) where it is cleaned according to the filtration rating. The dirt particles filtered out settle in the filter element (4). Via port O, the filtered hydraulic fluid enters the tank.

The basic version of the return line filters contains a mechanical optical maintenance indicator (5). The electronic switching element for the maintenance indicator (7) must be specified separately in the order.

The additional port I1 of the tank mounted return line filters is suitable for filling the fluid tank or for the subsequent connection of additional return lines.



Technical data (For applications outside these parameters, please consult us!)

general

Installation position			Vertical				
Ambient temperature range		°C *[°F]*	–30 to +70 *[–22 to +158]*				
Size		Size	0160	0250	0400	0630	1000
Weight		kg *[lbs]*	4.5 *[9.9]*	6.5 *[14.3]*	5.6 *[12.3]*	7.9 *[17.4]*	15 *[33.1]*
Material	Filter cover		Aluminum				
	Filter head		Aluminum				
	Filter bowl		Aluminum				Steel
	Optical maintenance indicator		Aluminum				
	Electronic switching element		Plastic PA 6				

hydraulic

Maximum operating pressure	bar *[psi]*	10 *[145]*
Cracking pressure of the bypass valve	bar *[psi]*	3.5 ± 0.35 *[50.7 ± 5]*
Response pressure of the maintenance indicator	bar *[psi]*	2.2 ± 0.25 *[31.9 ± 3.6]*
Hydraulic fluid temperature range	°C *[°F]*	–10 to 100 *[14 to 212]*

electrical (electronic switching element)

Electrical connection			Round plug-in connection M12x1, 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 power with resistive load			20 VA; 20 W; (70 VA)
Switching type	E1SP-M12x1		Changeover
	E2SP-M12x1		Normally open contact at 75% of the response pressure, Normally closed contact at 100% of the response pressure
	E2SPSU-M12x1		Normally open contact at 75% of the response pressure, Normally closed contact at 100% of the response pressure Signal interconnection 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)
Protection class according to EN 60529			IP 65
For direct voltage above 24 V, spark extinguishing is to be provided for protecting the switching contacts.			
Weight	Electronic switching element – with round plug-in connection M12x1	kg *[lbs]*	0.1 *[0.22]*

Technical data (For applications outside these parameters, please consult us!)

Filter element

Glass fiber paper H..XL		Single-use element on the basis of inorganic fiber				
		Filtration ratio according to ISO 16889 to Δp = 5 bar *[72.5 psi]*			Achievable oil cleanliness according to ISO 4406 (SAE-AS 4059)	
Particle separation	H20XL	$\beta_{20(c)} \geq 200$			19/16/12 – 22/17/14	
	H10XL	$\beta_{10(c)} \geq 200$			17/14/10 – 21/16/13	
	H6XL	$\beta_{6(c)} \geq 200$			15/12/10 – 19/14/11	
	H3XL	$\beta_{5(c)} \geq 200$			13/10/8 – 17/13/10	
Admissible differential pressure	bar *[psi]*	30 *[435]*				
Size	Size	0160	0250	0400	630	1000
Weight	kg *[lbs]*	0.8 *[1.8]*	1.1 *[2.4]*	2.1 *[4.6]*	2.9 *[6.4]*	3.7 *[8.2]*

Seal material for hydraulic fluids

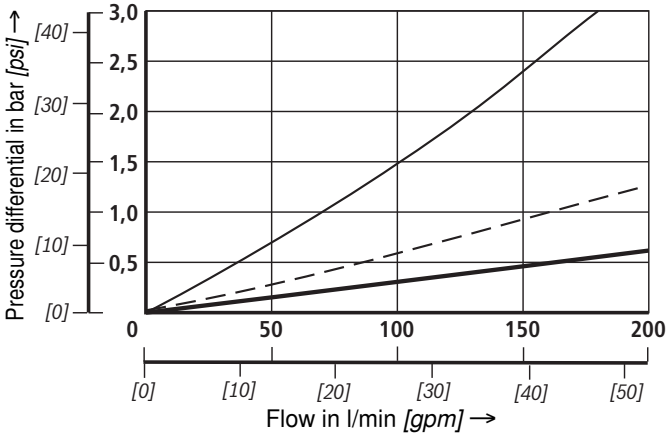
Mineral oils			Ordering code
Mineral oil	HLP	according to DIN 51524	M

Flame-resistant hydraulic fluids			Ordering code
Emulsions	HFA-E	according to DIN 24320	M
Synthetic water solutions	HFA-S	according to DIN 24320	M
Water solutions	HFC	according to VDMA 24317	M
Phosphoric acid esters	HFD-R	according to VDMA 24317	V
Organic esters	HFD-U	according to VDMA 24317	V

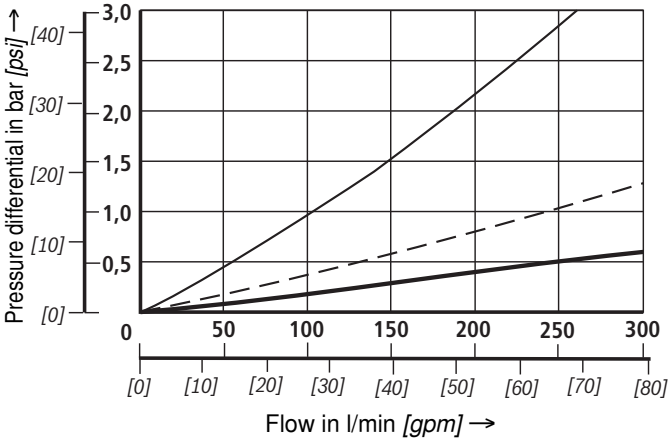
Hydraulic fluids that are fast biodegradable			Ordering code
Triglycerides (rape seed oil)	HETG	according to VDMA 24568	M
Synthetic esters	HEES	according to VDMA 24568	V
Polyglycols	HEPG	according to VDMA 24568	V

Characteristic curves H10XL

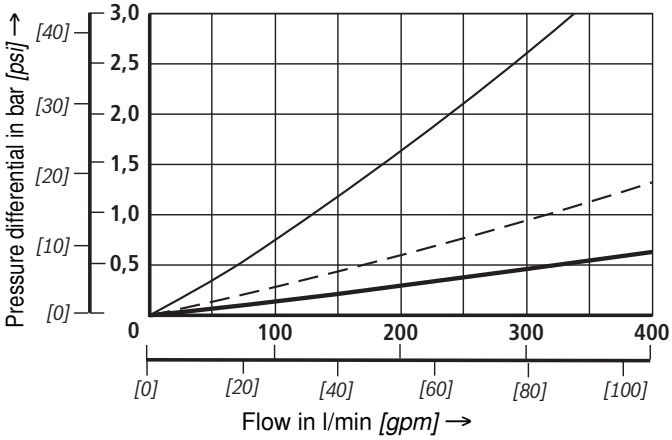
10 FREN 0160 H10XL...



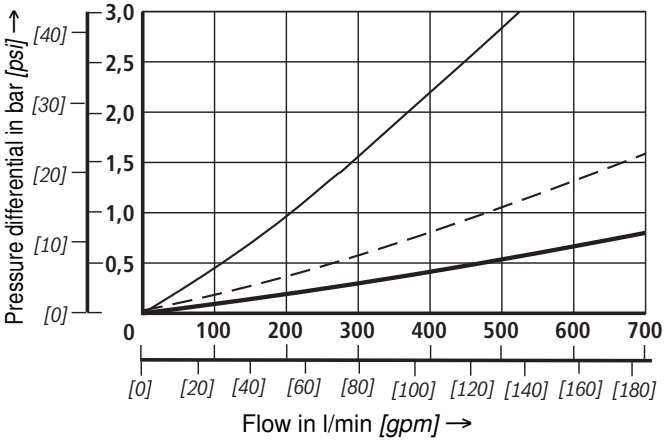
10 FREN 0250 H10XL...



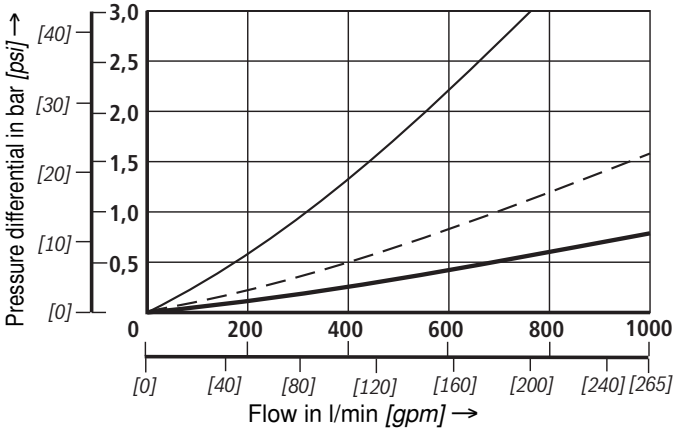
10 FREN 0400 H10XL...

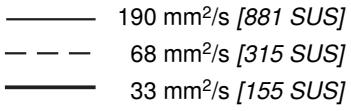


10 FREN 0630 H10XL...



10 FREN 1000 H10XL...

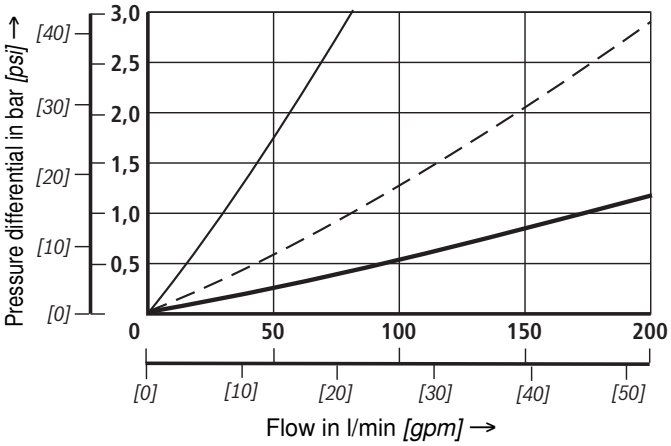




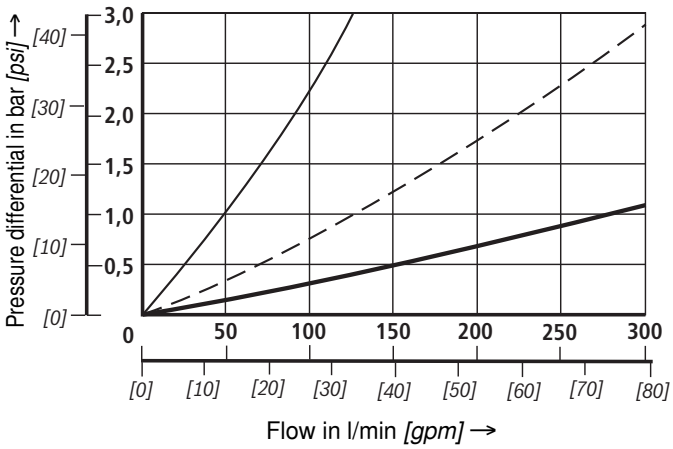
An optimal filter design and the design with other filter media and filtration ratings are enabled by our computer program "BR Filter Select".

Characteristic curves H3XL

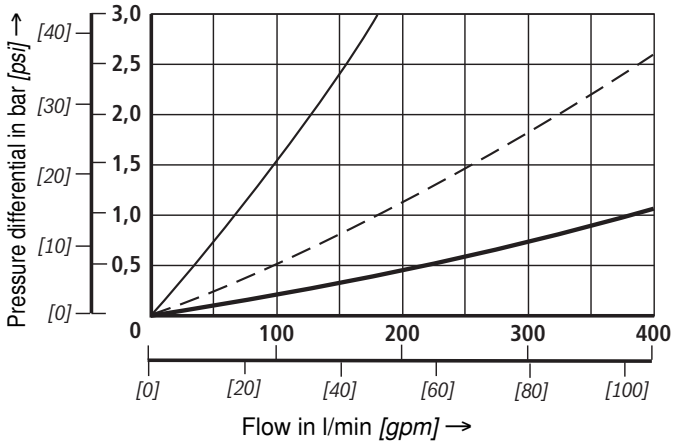
10 FREN 0160 H3XL...



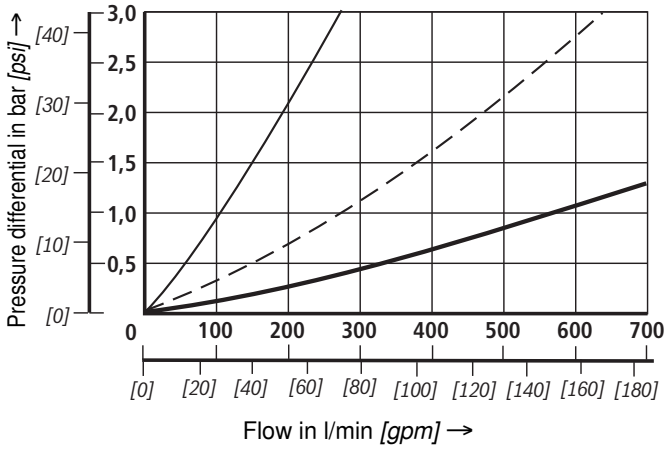
10 FREN 0250 H3XL...



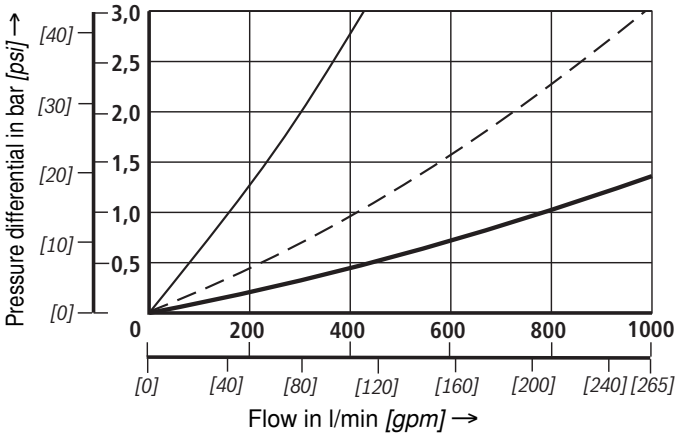
10 FREN 0400 H3XL...



10 FREN 0630 H3XL...



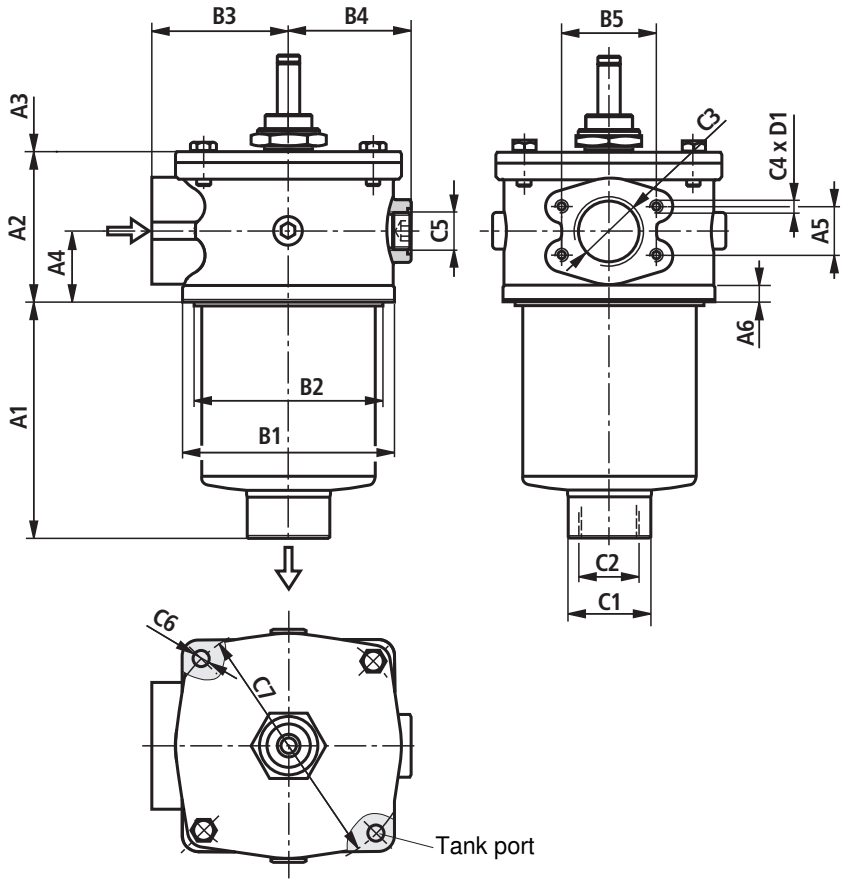
10 FREN 1000 H3XL...



190 mm²/s *[881 SUS]*
68 mm²/s *[315 SUS]*
33 mm²/s *[155 SUS]*

An optimal filter design and the design with other filter media and filtration ratings are enabled by our computer program "BR Filter Select".

Unit dimensions size 0160-1000 (dimensions in mm)



Filter housing for filter elements in accordance with DIN 24550

10 FREN Size	Volume in l	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5
0160	3.3	173	110	210	50	–	12	Ø155	Ø138	100	89.5	–
0250	4.3	263		300								
0400	6.6	235	130	250	60	42.9	14	Ø192	Ø176	100	108.5	77.8
0630	9.5	385		400								
1000	15	381	175	400	80	61.9		Ø220	Ø203	135	125	106.4

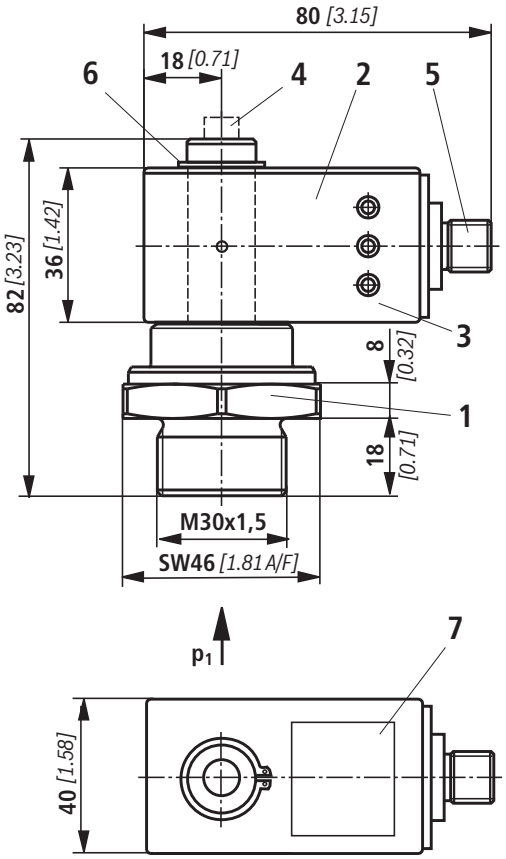
10 FREN Size	C1	C2	C3	C4	C5	C6	C7
0160	Ø60	G1/2	G11/4 *[SAE 24]*	–	G3/4	Ø11.5	Ø185
0250			G11/2 *[SAE 24]*				
0400	Ø70.8	G2	SAE 2“ 3000psi	M12	G1/4		Ø220
0630			SAE 2 ½“ 3000psi				
1000	Ø114.3	G3	SAE 3“ 3000psi	M16	G1		Ø250

[1] Weight including standard filter element and maintenance indicator

[2] Servicing height for filter element replacement

Maintenance indicator (dimensions in mm *[inch]*)

Electronic switching element M12x1



1 Mechanical optical maintenance indicator;
max. tightening torque MA max. = 50 Nm *[36.88lb-ft]*

2 Switching element with locking ring for electrical clogging indicator (can be rotated by 360°); plug-in connection M12x1 or according to DIN EN 175201-804

3 Housing with three LEDs: 24V =

Green: Stand-by

Yellow: Switching point 75%

Red: Switching point 100%

4 Optical indicator bistable

5 Round connector M12x1, 4-pin

6 Locking ring, DIN 471-16x1

7 Nameplate

Note:

Presentation contains mechanical optical maintenance indicator (1) and electronic switching element (2).
Round connector M12x1 (item 6)
For connection e.g. to ABZFV-E1SP-M12x1 (see page 3).
Switching elements with increased switching power at request.

Spare parts list

Mechanical optical maintenance indicator

ABZ F V – RV2 – 1X / – DIN

Rexroth Anlagenbau-Zubehör (accessories)

Filter

Maintenance indicator

Mechanical optical maintenance indicator for return line filters switching point 2.2 bar *[31.9 psi]* **= RV2**

DIN = Mark for DIN and SAE model

Seal material

M = See table on page 7

V = See table on page 7

Component series

1X = Component series 10 to 19 (10 to 19; identical installation and connection dimensions)

Mechanical optical maintenance indicator	Material no.
ABZFV-RV2-1X/M-DIN	**R901025310**

Seal kit

D 10FREN –

Seal kit

Series 10 FREN

Size

Size 0160-0250 **0160-0250**

Size 0400-0630 **0400-0630**

Size 1000 **1000**

Seal material

M = NBR seal

V = FKM seal

Seal kit	Material no.
D10FREN0160-0250-M	**R928022774**
D10FREN0400-0630-M	**R928022775**
D10FREN1000-M	**R928022776**

Installation, operating and maintenance instructions

Installation of the filter

When installing the filter make sure that:

a) The required servicing height for removing the filter element item 4 and the filter bowl item 2 is available,

b) The installation opening for assembling the filter in the tank cover is not too large so that unobjectionable sealing is guaranteed,

c) The filter is assembled on the tank cover without tension stress.

The filter is designed with a two-part housing. It is to be installed into the tank with the filter bowl downward. It is recommended to lead drain pipes as of a length of 500 mm in a bracket in order to avoid oscillations caused by the fluid flow in the tank. It is to be ensured that in case of maintenance works, the filter bowl and the drain pipe are pulled out of the filter head together.

Connection of the electrical maintenance indicator

The filter is generally equipped with mechanical optical maintenance indicator. The electrical maintenance indicator is connected via the electrical switching element with 1 or 2 switching points, which is attached to the mechanical optical maintenance indicator and held by means of the locking ring.

When must the filter element be exchanged or cleaned respectively?

Upon start-up in cold condition, the red pushbutton of the optical maintenance indicator may jump out and an electrical signal of the electrical indicator is output. Only push the red pushbutton in again after the operating temperature has been reached. If it jumps out again immediately or if the electrical signal has not gone out at operating temperature, the filter element must be exchanged or cleaned respectively after the end of the shift.

Element exchange

- Switch off the system, the filter must be discharged on the pressure side.
- Remove the screws at the filter cover and pull the latter upwards.
- Remove the filter element item 4 from the lower spigot in the filter bowl by turning it slightly.
- Check the O rings at the filter cover and at the filter bowl for damage. If necessary, they are to be renewed.
- Replace filter elements H...XL, clean the filter element with material G ….
- The efficiency of the cleaning process depends on the characteristics of contamination and the amount of the pressure differential before the filter element exchange. If the differential pressure after the filter element exchange exceeds 50 % of the value before the filter element exchange, the G… element also needs to be replaced.
- Check whether the type designation or material number on the replacement element corresponds to the type designation/material number on the nameplate of the filter.
- Install replaced or cleaned filter element on the spigot again by slightly turning it.
- Re-assemble the filter in reverse order as described above.

Classification according to pressure equipment directive 97/23/EC

The tank mounted return line filters according to 51425 are pressure holding equipment according to article 1, section 2.1.4 of the Pressure Equipment Directive 97/23/EC (PED). As the maximum operating pressure does not exceed 10 bar, they are - according to annex II diagram 4 of the PED - produced according to article 3, paragraph 3 “good engineering practice” and not provided with a CE mark.

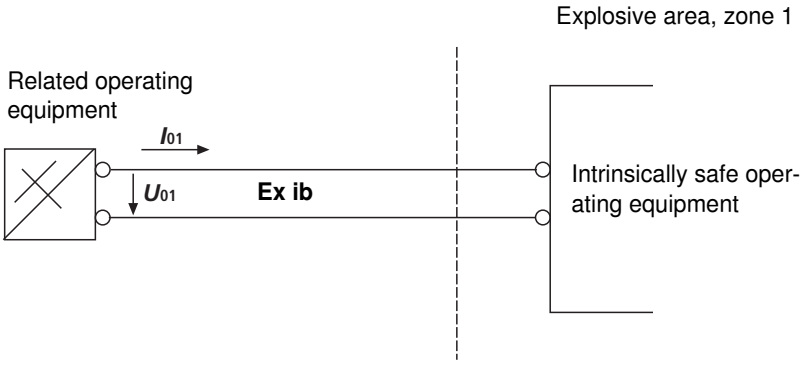
Use in explosive areas according to directive 94/9/EC (ATEX)

The tank mounted return line filters according to 51425 are no equipment or components in the sense of directive 94/9/EC and are not provided with a CE mark.

When using the tank mounted return line filters Size 0160 to 1000 according to 51425 in explosive areas, potential equalization has to be ensured.

According to DIN EN 50020, the electrical maintenance indicators are simple, electrical operating equipment not having own voltage sources. This simple, electrical operating equipment may - according to DIN EN 60079-14 - in intrinsically safe electrical circuits (EEx ib] be used in systems for device group II, category 2G (zone 1) and category 3G (zone 2) without marking and certification. The operating equipment is assigned to explosion group II B and temperature class T5.

Possible circuit according to DIN EN 60079-14



With electrical maintenance indicators with two switching points, switching units with two intrinsically safe input circles must be used.

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