

High Pressure Filter

Manifold mounting
Type : 250/450-FE/FEN

Technical Data

Design	: Simplex Manifold mounting
Max. Pressure (PS)	: 250 bar [3625 psi] 450 bar [6525 psi].
Test Pressure (PT)	: 1.43 x PS (as per CE/PED) 1.3 x PS (as per ASME)
Temperature range	: -20°C to +100°C (Standard) -4°F to +212°F (Standard)
Connection	: Upto DN50
Element design	: FE Series - EPE standard FEN Series - As per DIN-24550
Material of Construction	
Head	: GGG50.
Bowl	: Carbon Steel.
Seals	: Nitrile / Viton / EPDM.
Paint	: Bowl Externally painted in RAL-5010. Others on request.

Flow Capacity	
0005 / 0040	50 lpm [13 gpm]
0008 / 0063	80 lpm [20 gpm]
0013 / 0100	130 lpm [35 gpm]
0015	150 lpm [40 gpm]
0018	180 lpm [45 gpm]
0020 / 0160	200 lpm [50 gpm]
0030 / 0250	300 lpm [65 gpm]
0045 / 0400	450 lpm [100 gpm]
0095 / 0630	950 lpm [250 gpm]
0145 / 1000	1450 lpm [380 gpm]

Description

The 250/450-FE/FEN series Filters are used for direct manifold mounting avoiding piping and provide wear protection of downstream components & systems. The filter inlet & outlet are on the same plane and located one above the other with inlet on the top. The flow path arrows (inlet and outlet) are marked on filter head.

The Filter head is provided with an element locating spigot. The Filter bowl is mounted below the filter head and is unscrewed for maintenance.

Accessories

Maintenance indicator - for monitoring the filter element contamination status. Available in various designs including

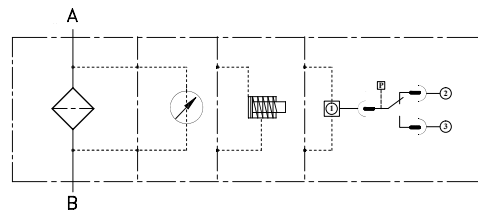
- Optical (pop-up version) with Electrical option.
- Optical (dual dial version) with Electrical option.
- Optical-Electrical with 2 switching points.

Magnet - to protect the filter from ferrous contamination.

Drain valve - for draining the filter during servicing.



Hydraulic Symbol



Filter Element

The Filter Element is of star-pleated design with optimised pleat density for providing prolonged life.

The filter element is of Out-to-In design and the contaminant is retained outside the filter element and collected in the filter bowl.

The elements are available in various media options and selected based on the required oil cleanliness, initial pressure drop and dirt holding capabilities.

Media options for the filter element include
 SS Wire Mesh - Cleanable, Nominal filtration.
 Paper - Non-cleanable, Nominal filtration.
 Non-woven - Non-cleanable, Nominal filtration.
 Inorganic glass fibre - Non-cleanable, Absolute filtration acc. to ISO-16889.
 Aquasorb - Water absorbing media, Non-cleanable.

For special applications / fluids the filter elements are supplied with SS hardware (end caps & inner tube) and / or different adhesives.

Technical specifications subject to change.

Ordering Code - Filter

1 2 3 4 5 6ab 7 8 9ab 10 11 12 13
450 - **FE** - **0013** - **H10XP** - **A** - **0 P** - **0** - **0** - **A5.0** - **DN14** - **P** - **0** - **0** /

1	Max. working pressure	250 bar [3625 psi] 450 bar [6525 psi]	= 250 = 450
2	Filter type	Manifold mounting - EPE Standard Element Manifold mount - Element acc. to DIN 24550	= FE = FEN
3	Nominal Size	Filter type FE Filter type FEN	= 0003 (* 2.0004 element) 0005 0008 0013 0015 0018 0020 0030 0045 0095 0145 = 0040 0063 0100 0160 0250 0400 0630 1000
4	Filtering Media & Filtration Grade	<u>Nominal Filtration Grade</u> SS Wire Mesh Cleanable with additional epoxy layer upstream for 10/25/40µm	= G10 G25 G40 G60 G80 G100 Others on request
		Paper Non-cleanable with epoxy mesh	= P5 P10 P25
		Non-Woven Non-cleanable with epoxy mesh	= VS10 VS25 VS40 VS60
		<u>Absolute Filtration Grade (ISO16889)</u> Glass Fibre Non-cleanable with epoxy mesh	= H1XL H3XL H6XL H10XL H16XL H20XL
		Long Life Glass Fibre Non-cleanable with plastic mesh & outer sleeve	= H3XP H5XP H10XP H15XP H20XP
		Long Life Glass Fibre Non-cleanable with epoxy mesh	= H3XE H5XE H10XE H15XE H20XE
		Glass Fibre - Electrically Conductive Non-cleanable with epoxy mesh	= H3XC H5XC H10XC H15XC H20XC
		Glass Fibre - Water Absorbing Non-cleanable with epoxy mesh	= AS1 AS3 AS6 AS10 AS20
SS Fibre Cleanable with SS mesh	= M5 M10 M15		
5	Differential Pressure of Element	<u>Maximum allowed differential pressure</u> 30 bar [435 psid] 60 bar [870 psid] 160 bar [2321 psid] 330 bar [4785 psid]	= A (standard) = D = C = B
6a	Element Adhesive	Standard Adhesive T=100°C [212°F] Epoxy Adhesive (for fuels) High Temp. Adhesive T=160°C [320°F]	= 0 (standard) = 1 = E
6b	Element Hardware (End Caps + Inner Tube)	Carbon Steel + Carbon Steel Polyamide + Carbon Steel Stainless Steel + Stainless Steel Nickel Coated CS + Nickel Coated CS Carbon Steel + Stainless Steel	= C (standard) = P (standard) = X = D = M
7	Magnet	Without With ring magnet ^(a)	= 0 (standard) = X

* Before ordering, check for availability.

^(a) Magnets kept loose under the elements.

Ordering Code - Filter

1 2 3 4 5 6ab 7 8 9ab 10 11 12 13
450 - FE - 0013 - H10XP - A - 0 P - 0 - 0 - A5.0 - DN14 - P - 0 - 0 /

8	Bypass Valve	Without With Bypass valve (on request)	= 0 (standard) = *
9a	Maintenance Indicator - type	Without Optical (Pop-up) Optical(Pop-up) + Electrical with DIN Plug Optical(Pop-up) + Electrical with Lamp Optical + Electrical with 2 Switching points - set to operate at 75% and 100% Optical (Dual dial) Optical(dial) + Electrical with DIN Plug Optical(dial) + Electrical with Lamp Special	= 0 (standard) = A.. = B.. = D.. = T.. = AD.. = BD.. = DD.. = SP
9b	Maintenance Indicator - cracking pressure	Without 0.8 bar [11.6 psid] 1.5 bar [21.7 psid] 2.5 bar [36.2 psid] 4.2 bar [60.9 psid] 5.0 bar [72.5 psid] 6.0 bar [87.0 psid] 7.0 bar [101.5 psid] Other pressure (in bar)	= - (standard) = ..0.8 = ..1.5 = ..2.5 = ..4.2 = ..5.0 (standard) = ..6.0 = ..7.0 = as applicable
10	Inlet / Outlet - connections (Refer C1 on pg.5)	DN14 - Ø14 DN18 - Ø18 DN32 - Ø32 DN50 - Ø50	= DN14 = DN18 = DN32 = DN50
11	Seal Material	Nitrile Viton EPDM Neoprene	= P (standard) = V = E = N
12	Housing Material	Standard - as per catalogue Special	= 0 (standard) = SP
13	Other Options (multiple options possible)	Without With 1/4" drain port - duly plugged With 1/4" CS drain valve in bowl With 1/4" SS drain valve in bowl	= 0 (standard) = 4 = DV = DVX

* Before ordering, check for availability

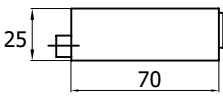
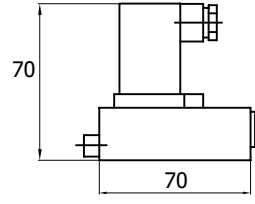
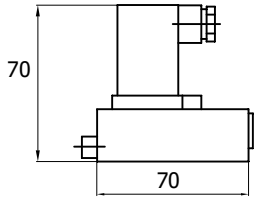
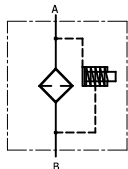
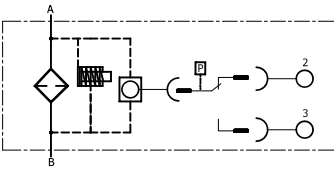
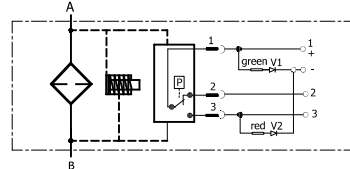
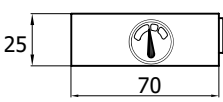
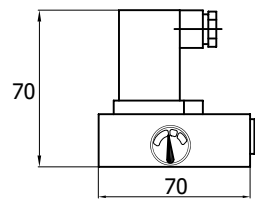
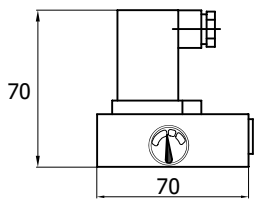
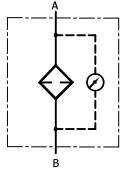
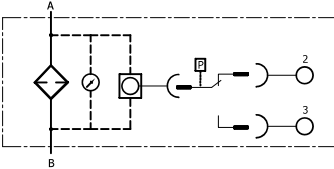
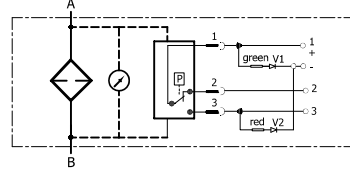
Ordering Code - Filter Element

2. **0013 - H10XP - A - 0 P - 0 - P**
 3 4 5 6ab 11

Ordering Code - Seal Kit

D - 450 - FE - 0013 - A - DN14 - P - 0
 1 2 3 9a 10 11

Maintenance Indicators

		
A = Optical (Pop-up)	B = Optical (Pop-up) + Electrical	D = Optical (Pop-up) + Electrical with 2 LEDs
Ordering Code F-xx-A0-00-00-P	Ordering Code F-xx-GW-02-00-P	Ordering Code F-xx-GW-26-00-P
		
		
AD = Optical (Dual Dial)	BD = Optical (Dual Dial) + Electrical	DD = Optical (Dual Dial) + Electrical with 2 LEDs
Ordering Code FD-xx-A0-00-00-P	Ordering Code FD-xx-GW-02-00-P	Ordering Code FD-xx-GW-26-00-P
		

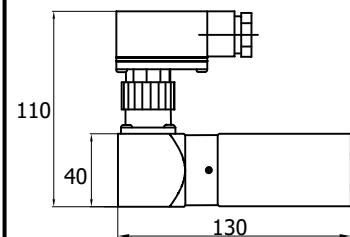
Maintenance Indicator functioning

These indicators work on the differential pressure and operate when a preset pressure differential is reached between the inlet & outlet ports. In the pop-up version a red indicator pin pops out in the housing chamber thereby indicating the state whereas in the dual dial version two dial gauges - with green, yellow & red bands - placed on opposite side indicate the condition. If available, the electronic switching element is also triggered.

In the 2-switching points version (type T) the green LED glows in operating condition, yellow LED glows when 75% of the preset pressure differential is reached and red LED at 100%.

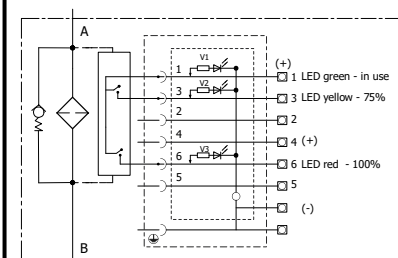
Tightening Torque Values :Nm [ft/lbs] ±10%

Type	Inlet/Outlet Port Size	Bowl to head Torque	Mounting Hole Size	Mounting Bolt
250/450 FE 0003-0013	Ø14	40 [29]	Ø14	M12
250/450 FE 0015-0018	Ø18	50 [37]	Ø18	M16
250/450 FE 0020-0045	Ø32	60 [44]	Ø23	M20
450 FE 0095-0145	Ø50	60 [44]	Ø27	M24
250/250 FEN 0040-0100	Ø14	40 [29]	Ø14	M12
250/450 FEN 0160-0400	Ø32	60 [44]	Ø23	M20
450 FEN 0630-1000	Ø50	60 [44]	Ø27	M24



T = Optical/Electrical with 3 LEDs & 2 Switching points

Ordering Code
R-xx-GW-09-Z0-P



xx - preset differential pressure (bar)

Dimensions

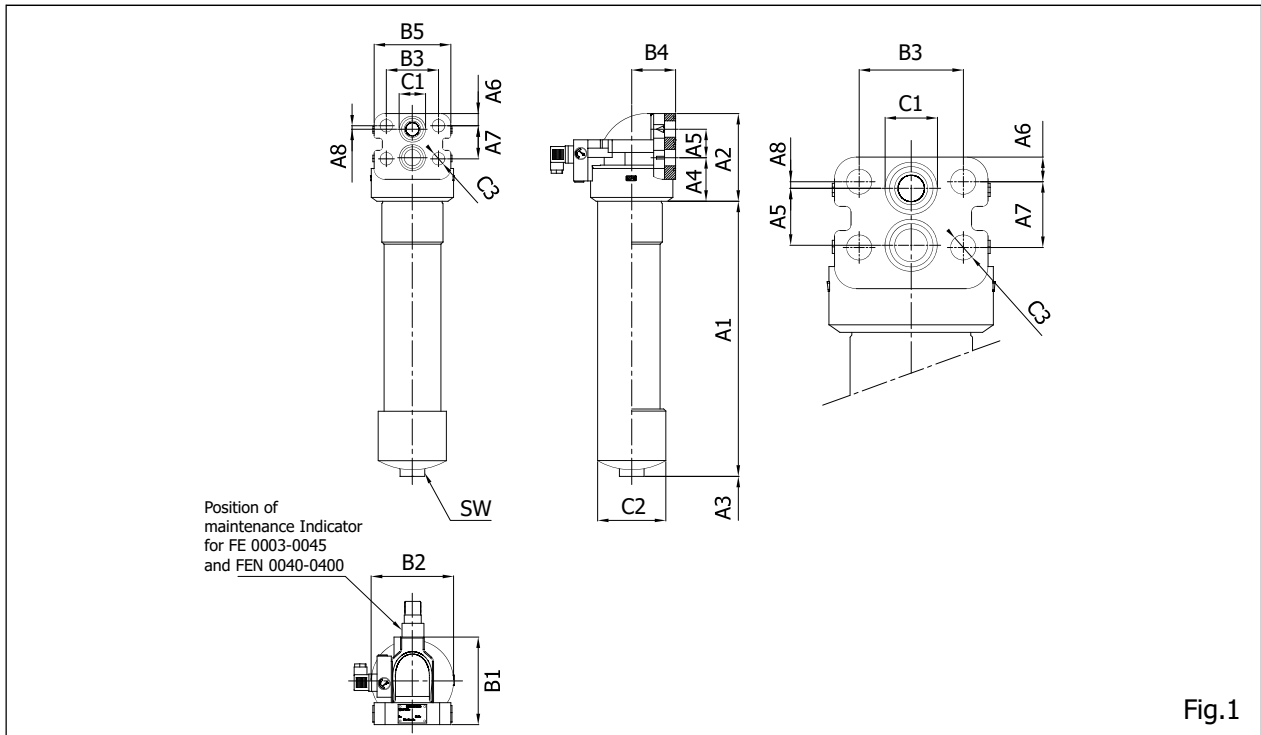


Fig.1

Type	Capacity ltr [gal]	Weight kg [lbs] ¹⁾	A1	A2	A3 ²⁾	A4	A5	A6	A7	A8
250/450 FE 0003	0.2 [0.05]	4.60 [10.14]	99 [3.90]	112 [4.41]	100 [3.94]	56 [2.20]	28 [1.10]	12 [0.47]	45 [1.77]	16 [0.63]
250/450 FE 0005	0.2 [0.05]	4.60 [10.14]	99 [3.90]		110 [4.33]					
250/450 FEN 0040	0.3 [0.08]	5.90 [13.00]	162 [6.38]							
250/450 FE 0008	0.5 [0.13]	6.10 [13.45]	252 [9.92]							
250/450 FEN 0063	0.9 [0.24]	11.00 [24.25]	186 [7.32]							
250/450 FE 0013	1.1 [0.29]	12.70 [28.00]	235 [9.25]	150 [5.91]	130 [5.12]	80 [3.15]	35 [1.38]	19 [0.75]	55 [2.16]	16 [0.63]
250/450 FEN 0100	1.3 [0.34]	16.80 [37.04]	171 [6.73]	160 [6.30]	150 [5.91]	79.5 [3.13]	52 [2.05]	22.5 [0.89]	60 [2.36]	6 [0.24]
250/450 FE 0015	1.9 [0.50]	19.20 [42.33]	259 [10.20]							
250/450 FE 0018	3.0 [0.79]	24.10 [53.13]	413 [16.26]							
250/450 FE 0020	4.5 [1.19]	47.5 [104.70]	415 [16.34]							
250/450 FEN 0160	6.2 [1.64]	67.5 [148.80]	636 [25.04]							
250/450 FE 0030	4.5 [1.19]	47.5 [104.70]	415 [16.34]	225 [8.86]	117 [4.61]	67 [2.64]	25 [0.98]	86 [3.38]	16 [0.63]	
250/450 FEN 0250	6.2 [1.64]	67.5 [148.80]	636 [25.04]							

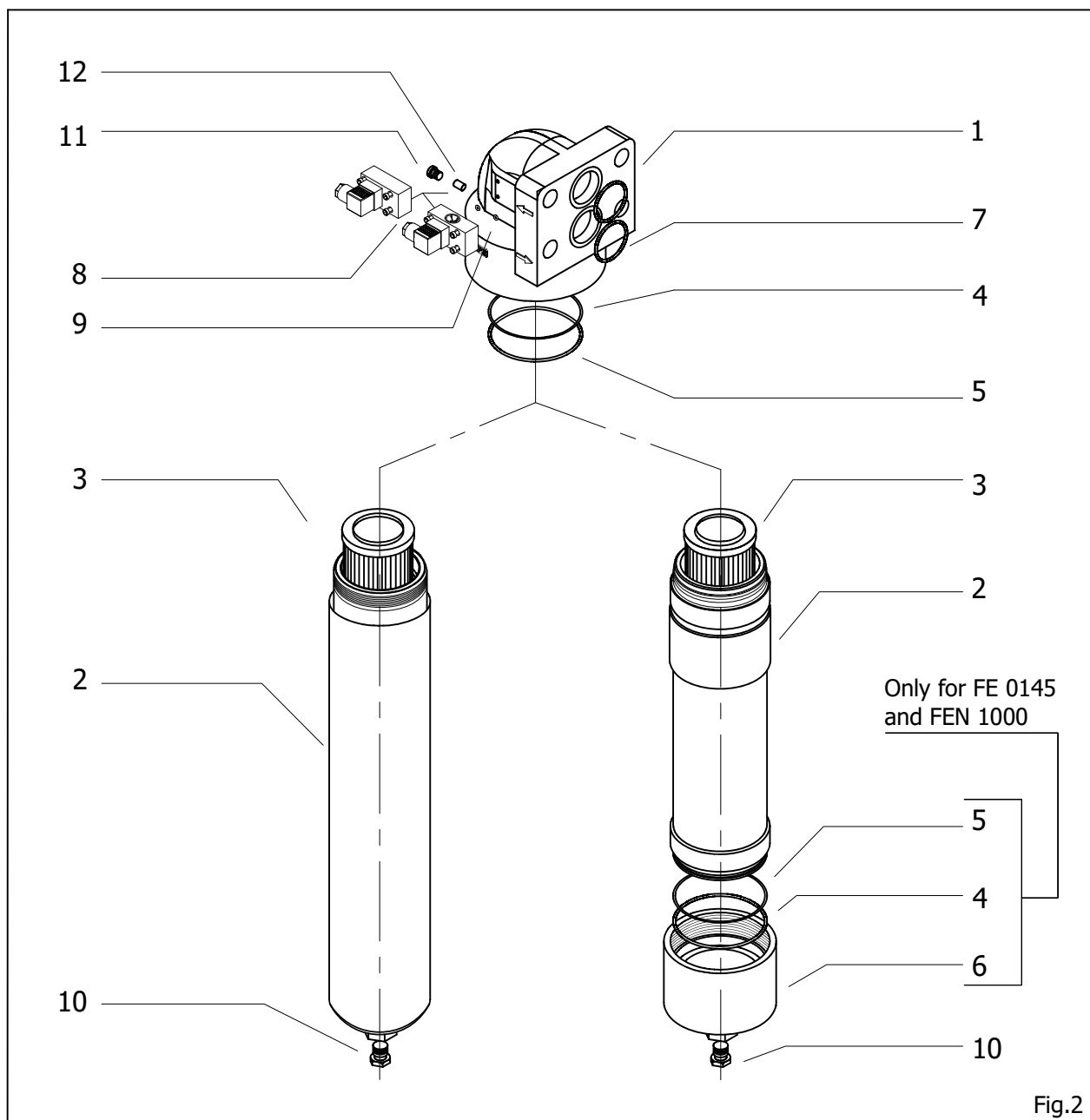
Type	Port	B1	B2	B3	B4	B5	C1	C2	C3	SW
250/450 FE 0003	DN14	95 [3.74]	88 [3.46]	57 [2.24]	48 [1.89]	80 [3.15]	Ø14 [Ø0.55]	Ø67 [Ø2.64]	Ø14 [Ø0.55]	24 [0.95]
250/450 FE 0005										
250/450 FEN 0040										
250/450 FE 0008										
250/450 FEN 0063										
250/450 FE 0013	DN18	130 [5.12]	125 [4.92]	72 [2.83]	65 [2.56]	110 [4.33]	Ø18 [Ø0.71]	Ø92 [Ø3.62]	Ø18 [Ø0.71]	32 [1.26]
250/450 FEN 0100										
250/450 FE 0015	DN32	160 [6.30]	150 [5.91]	95 [3.74]	80 [3.15]	140 [5.51]	Ø32 [Ø1.26]	Ø114 [Ø4.49]	Ø23 [Ø0.91]	32 [1.26]
250/450 FE 0018										
250/450 FE 0020										
250/450 FEN 0250										
250/450 FEN 0250										
250/450 FE 0045	DN50	199 [7.83]	195 [7.68]	140 [5.51]	99 [3.90]	191 [7.52]	Ø50 [Ø1.97]	Ø140 [Ø5.51]	Ø27 [Ø1.06]	41 [1.61]
450 FE 0095								Ø160 [Ø6.30]		
450 FEN 0630										
450 FE 0145										
450 FEN 1000										

¹⁾ = Weight including standard filter element and maintenance indicator

²⁾ = Servicing height for filter element replacement

Dimensions in mm [inch]

Spare parts list



Spare Parts List

		Size FE Size FEN		0003	0005 0040	0008 0063	0013 0100	0015	0018	0020 0160	0030 0250	0045 0400	0095 0630	0145 1000
Item #	Qty.	Description	Material											
1	1	Filter Head	GGG50						-					
2	1	Filter Bowl	Carbon steel						-					
3	1	Filter Element	Various	As per "Ordering Code - Filter Element"										
4	1(2)	Housing O-Ring	Buna N/Viton	Sold as kit - "Ordering Code - Filter Seal Kit"										
5	1(2)	Support Ring	Teflon	Sold as kit - "Ordering Code - Filter Seal Kit"										
6	1	Bottom Bowl	Carbon Steel						n/a					-
7	2	Head O-Rings	Buna N/Viton	Sold as kit - "Ordering Code - Filter Seal Kit"										
8	1	Indicator	Carbon Steel	As per Section "Maintenance Indicator"										
9	2	Indicator O-Rings	Buna N/Viton	Sold as kit - "Ordering Code - Filter Seal Kit"										
10	1	Drain plug	Steel	Part No.DBP01										
11	1	Plug	Steel						n/a					-
12	1	Set Screw	5.8						n/a					-

Installation

Before installation, conduct a visual check to ensure that the filter has not suffered any damage during shipping / handling. Verify that the requested type matches with what stamped on the nameplate.

Verify operating pressure with name plate information.

During assembly of the filter the flow direction (direction arrows on the filter head) and the required service height (A3 in fig.1) of the filter element are to be taken into consideration.

Mount the filter assembly using the mounting holes on the filter head (C3) considering the flow direction. Failure to observe flow direction during assembly with cause damage to the filter element and components downstream.

Tighten the mounting bolts adequately.

We recommend using a suitable safety relief valve in the system to ensure the user and equipment are protected against possible damage caused by pressure surges.

Provide for the required servicing clearance below the filter for cleaning / replacing the filter element.

These filters must preferably be installed in vertical position with the filter bowl at the bottom to ensure proper venting and draining.

Proceed to the assembly ensuring the filter is not subjected to any abnormal forces and also fastened to avoid the transmission of vibrations. Tighten the inlet and outlet connections to the specified torques.

Make sure the optical part of the indicator is visible and the electricals connected appropriately.

If the maintenance indicator is ignored the element can collapse thereby bypassing the filter element and contaminated fluid will pass to the clean side of the filter outlet thereby compromising the filtration effectiveness and risking the downstream components.

Connecting electrical indicator

Connect indicator using the three wired cable.

Verify electrical ratings on the indicator (6) name plate.

Connection settings:

- | | |
|------------|----------------------------------|
| 1. Closer | 1 (black) + 3 (blue) |
| 2. Opener | 1 (black) + 2 (brown) |
| 3. Changer | 1 (black) + 2 (brown) + 3 (blue) |

Special Instructions

It is strictly forbidden to:

- weld or solder or carry out any mechanical operations on the filter.
- engrave or permanently stamp the surfaces of the filter and / or carry out other operations that could affect or change the mechanical properties of the filter.
- use the filter as a structural element: it should not be subjected to stresses or loads.
- change the data of the nameplate and / or filter without the permission of the manufacturer.
- use a different fluid than those designed for.

Starting Operation

Switch on the service pump.

Ensure the filter is completely filled with the working fluid and air in the housing vented.

Maintenance

The filter element is clogged and must be changed or cleaned when at operating temperature the red pointer on the pop-up indicator (8) is hard against the plastic cap / the pointer on the dual dial indicator (8) is at the end of the red marking and / or the switching process on the electrical indicator is triggered.

Filter element service

Switch off pump. Drain the filter housing through the drain plug (10) / drain valve. Unscrew filter bowl (2) and remove filter element (3), turning slightly off from its locator in the filter head (1). Check filter bowl inside and clean if necessary.

Filter element of type H...XL, H...XP, H...XE, H...XC, AS..., P... and VS ... is to be replaced.

Filter elements with G... & M... media are cleanable. The effectiveness of cleaning depends on the type of dirt and the level of the differential pressure at the time of changing the filter element. If the differential pressure after the filter element's cleaning process exceeds more than 50% of the pre-service value the G... & M... filter element also needs to be replaced.

Remove the safety packing from the new filter element before installing in the filter.

Replace filter element by slightly turning it back on its locator. Check Housing O-Ring (4) and Support Ring (5) on filter bowl (2), replace in case of damage or wear. Screw filter bowl and tighten to the specified torque (page 4) at hexagon bolt using a suitable tool.

Operate filter as described above.

Pressure Directives

Pressure Line Filters for hydraulic application are pressure holding equipment according to Article 2 Section 5 of the Pressure Equipment Directive 2014/68/EU. However, on the basis of the exception in Article 1, Section 2(f) of the PED the pressure line filters are exempt from the PED if they are not classified higher than category I (Guideline A-19) & do not receive any CE mark.

Disposal / Environmental Protection

Careless disposal of the filter, filter element and the residual fluid contained therein can cause environmental pollution.

Dispose the filter / filter element in accordance with provisions applicable in the country of use.

Fluid residues are to be disposed according to the respective safety data sheets valid for the specific hydraulic fluids.

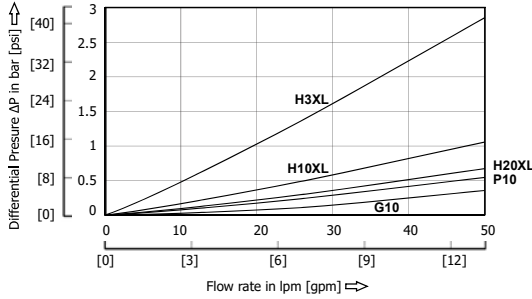
Performance Curves (Flow rate Vs Pressure Drop) - for complete filters

Oil Viscosity : 30 mm²/s [142 SUS]

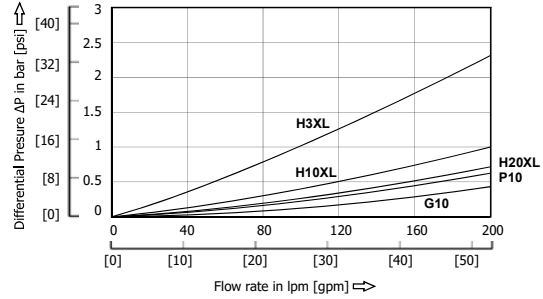
Specific gravity < 0.9 kg/dm³

Recommended initial Pressure Drop (ΔP) for assembly = 1.5 bar [21.7 psid]

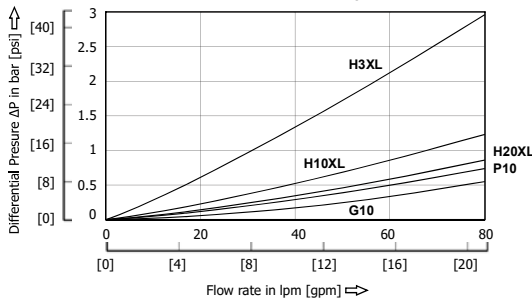
... FE-0005 / FEN-0040 - DN14



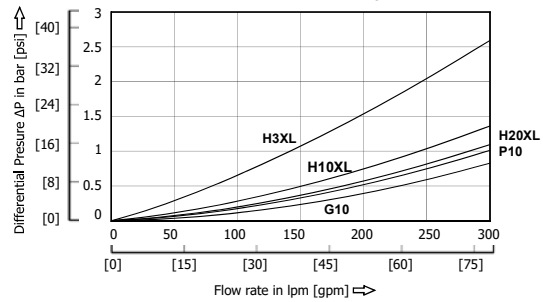
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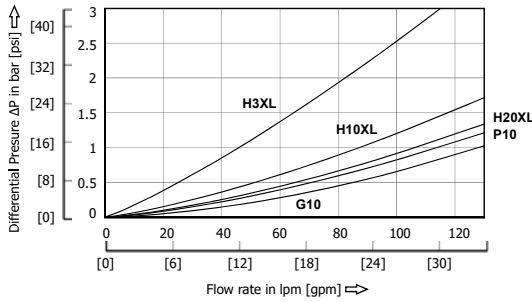
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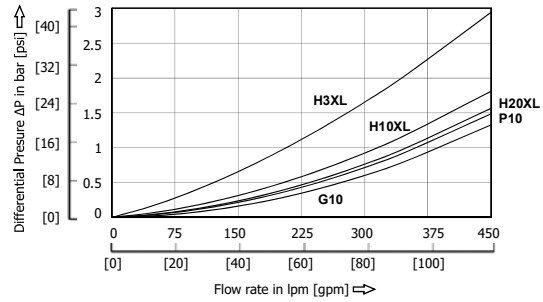
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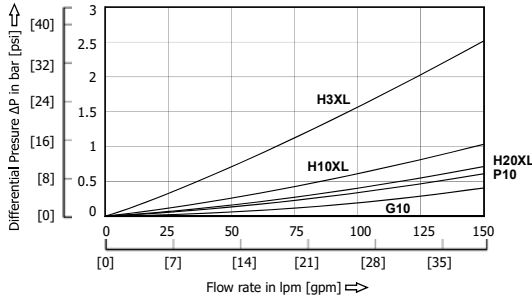
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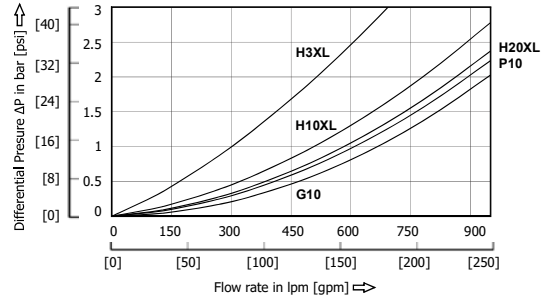
... FE-0045 / FEN-0400 - DN32



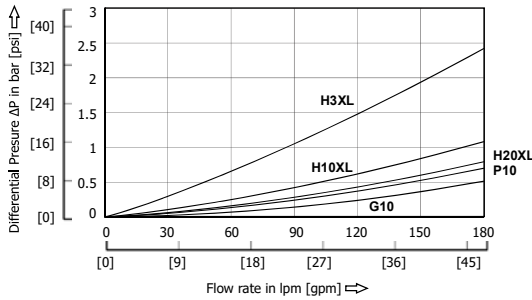
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... FE-0095 / FEN-0630 - DN50



... FE-0018 - DN18



... FE-0145 / FEN-1000 - DN50

