Top-Ported Pressure Filter **PF40**

Model No. of filter in photograph is PF409HZ10S.

Features and Benefits

- Top-ported pressure filter
- All steel housing offers unparalleled fatigue rating
- Available with non-bypass option with high collapse element
- Two bowl lengths provide optimal sizing for the application
- Offered in conventional sub-plate, SAE straight thread, and ISO 228 porting

50 gpm
190 L/min
4000 psi
275 bar

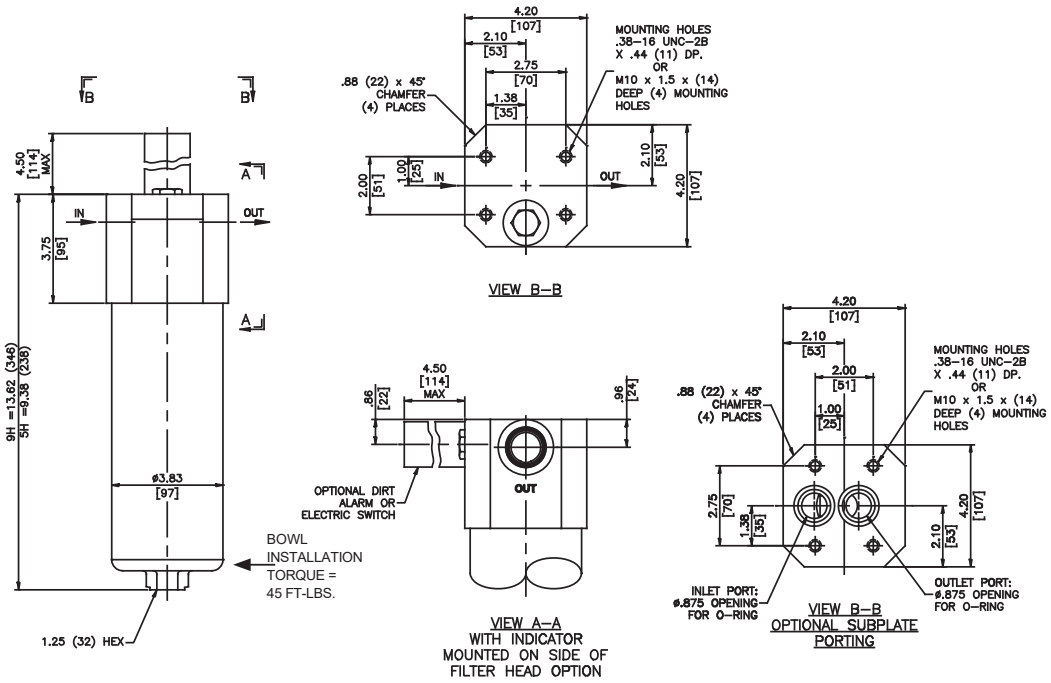
Filter Housing Specifications

Flow Rating:	Up to 50 gpm (190 L/min) for 150 SUS (32 cSt) fluids
Max. Operating Pressure:	4000 psi (275 bar)
Min. Yield Pressure:	12,000 psi (828 bar), per NFPA T2.6.1
Rated Fatigue Pressure:	2500 psi (173 bar), per NFPA T2.6.1-R1-2005
Temp. Range:	-20°F to 225°F (-29°C to 107°C)
Bypass Setting:	Cracking: 40 psi (2.8 bar) Full Flow: 75 psi (5.2 bar)
Porting Head: Element Case:	Steel Steel
Weight of PF40-5H: Weight of PF40-9H:	21.8 lbs. (9.9 kg) 25.5 lbs. (11.6 kg)
Element Change Clearance:	3.25" (83 mm)

Fluid Compatibility

Type Fluid	Appropriate Schroeder Media
Petroleum Based Fluids	All E Media (cellulose) and Z-Media® (synthetic)
High Water Content	All Z-Media® (synthetic)
Invert Emulsions	10 and 25 µ Z-Media® (synthetic)
Water Glycols	3, 5, 10 and 25 µ Z-Media® (synthetic)
Phosphate Esters	All Z-Media® (synthetic) with H (EPR) seal designation

PF40 Top-Ported Pressure Filter



Metric dimensions in ( ).
Dimensions shown are inches (millimeters) for general information and overall envelope size only.
For complete dimensions please contact Schroeder Industries to request a certified print.

Element Performance Information & Dirt Holding Capacity

Element	Filtration Ratio Per ISO 4572/NFPA T3.10.8.8 Using automated particle counter (APC) calibrated per ISO 4402			Filtration Ratio per ISO 16889 Using APC calibrated per ISO 11171	
	$\beta_x \geq 75$	$\beta_x \geq 100$	$\beta_x \geq 200$	$\beta_{x(c)} \geq 200$	$\beta_{x(c)} \geq 1000$
5HZ1/9HZ1	<1.0	<1.0	<1.0	<4.0	4.2
5HZ3/9HZ3	<1.0	<1.0	<2.0	<1.0	4.8
5HZ5/9HZ5	2.5	3.0	4.0	4.8	6.3
5HZ10/9HZ10	7.4	8.2	10.0	8.0	10.0
5HZ25/9HZ25	18.0	20.0	22.5	19.0	24.0
5HZX1/9HZX1	<1.0	<1.0	<1.0	<4.0	4.2
5HZX3/9HZX3	<1.0	<1.0	<2.0	<1.0	4.8
5HZX5/9HZX5	2.5	3.0	4.0	4.8	6.3
5HZX10/9HZX10	7.4	8.2	10.0	8.0	10.0
5HZX25/9HZX25	18.0	20.0	22.5	19.0	24.0

Element	DHC (gm)	Element	DHC (gm)	Element	DHC (gm)	Element	DHC (gm)
5HZ1	26	9HZ1	51	5HZX1	14	9HZX1	29
5HZ3	28	9HZ3	42	5HZX3	14	9HZX3	29
5HZ5	39	9HZ5	59	5HZX5	15	9HZX5	31
5HZ10	31	9HZ10	47	5HZX10	15	9HZX10	31
5HZ25	32	9HZ25	48	5HZX25	16	9HZX25	33

Element Collapse Rating: 150 psid (10 bar) for standard elements
3000 psid (210 bar) for high collapse elements

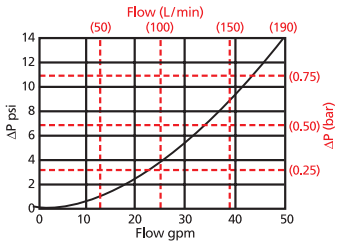
Flow Direction: Outside In

Element Nominal Dimensions: 5H: 2.5" (100 mm) O.D. x 5.36" (136 mm) long
9H: 2.5" (100 mm) O.D. x 9.63" (244 mm) long

Pressure Drop Information
Based on Flow Rate and Viscosity

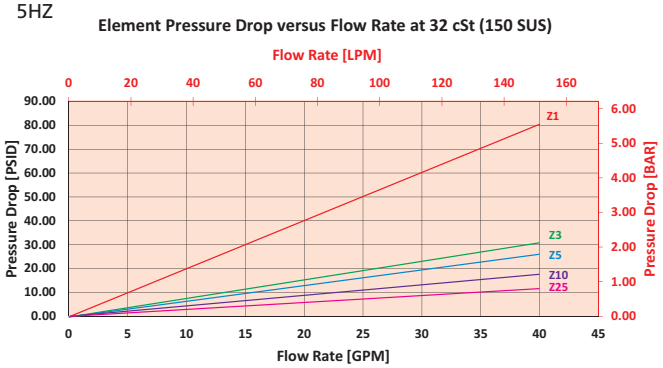
$\Delta P_{housing}$

PF40 $\Delta P_{housing}$ for fluids with sp gr (specific gravity) = 0.86:

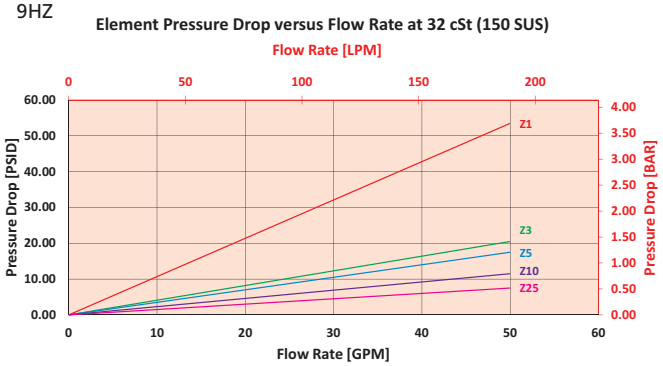


$\Delta P_{element}$

5HZ



9HZ



$$\Delta P_{filter} = \Delta P_{housing} + (\Delta P_{element} * \nu_f)$$

Exercise:

Determine ΔP_{filter} at 20 gpm (75.7 L/min) for PF405HZ3SD5S using 160 SUS (34 cSt) fluid.

Use the housing pressure curve to determine $\Delta P_{housing}$ at 20 gpm. In this case, $\Delta P_{housing}$ is 2.5 psi (.17 bar) on the graph for the PF40 housing.

Use the element pressure curve to determine $\Delta P_{element}$ at 20 gpm. In this case, $\Delta P_{element}$ is 15 psi (1 bar) according to the graph for the 5HZ3 element.

Because the viscosity in this sample is 160 SUS (34 cSt), we determine the **Viscosity Factor (ν_f)** by dividing the **Operating Fluid Viscosity** with the **Standard Viscosity** of 150 SUS (32 cSt). To best determine your Operating Fluid Viscosity, please reference the chart in Appendix D.

Finally, the overall filter pressure differential, ΔP_{filter} , is calculated by adding $\Delta P_{housing}$ with the true element pressure differential, ($\Delta P_{element} * \nu_f$). The $\Delta P_{element}$ from the graph has to be multiplied by the viscosity factor to get the true pressure differential across the element.

Solution:

$\Delta P_{housing}$ = 2.5 psi [.17 bar] | $\Delta P_{element}$ = 15 psi [1 bar]

ν_f = 160 SUS (34 cSt) / 150 SUS (32 cSt) = 1.1

ΔP_{filter} = 2.5 psi + (15 psi * 1.1) = 19 psi

OR

ΔP_{filter} = .17 bar + (1 bar * 1.1) = 1.3 bar

Note:
If your element is not graphed, use the following equation:
$\Delta P_{element}$ = Flow Rate x ΔP_f. Plug this variable into the overall pressure drop equation.

Ele.	ΔP
5HZX3	1.17
5HZX10	0.50
5HZX25	0.27
9HZX3	0.62
9HZX10	0.26
9HZX25	0.14

PF40 Top-Ported Pressure Filter

Filter Model Number Selection

How to Build a Valid Model Number for a Schroeder PF40:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	BOX 9	BOX 10	
PF40										
PF40	5	HZ3		S			D5	S		= PF405HZ3SD5S

BOX 1 — Filter Series

- PF40
- PFN40 (Non-bypassing: requires ZX high collapse elements)

BOX 2 — Element Length (in)

- 5
- 9

BOX 3 — Element Part Number

- HZ1 = H size 1 µ Excellement® Z-Media® (synthetic)
- HZ3 = H size 3 µ Excellement® Z-Media® (synthetic)
- HZ5 = H size 5 µ Excellement® Z-Media® (synthetic)
- HZ10 = H size 10 µ Excellement® Z-Media® (synthetic)
- HZ25 = H size 25 µ Excellement® Z-Media® (synthetic)
- HZX3 = H size 3 µ Excellement® Z-Media® (high collapse center tube)
- HZX10 = H size 10 µ Excellement® Z-Media® (high collapse center tube)
- HZX25 = H size 25 µ Excellement® Z-Media® (high collapse center tube)

BOX 4 — Seal Material

- Omit = Buna N
- H = EPR
- V = Viton®
- H.5 = Skydrol® compatibility

BOX 5 — Porting

- S = SAE-16
- B = ISO 228 G-1"

BOX 6 — Bypass

- Omit = 40 PSI bypass
- X = Blocked Bypass
- 50 = 50 PSI bypass

(Omit box 6 if PFN40 is used)

BOX 7 — Test Points

- Omit = None
- L = Two ¼" NPTF inlet & outlet female test ports
- U = Schroeder Check 7/16"-20 UNF test point installation in head (upstream)

BOX 8 — Dirt Alarm® Options

	Omit = None
Visual	D5 = Visual pop-up
Visual with Thermal Lockout	D8 = Visual w/ thermal lockout
Electrical	MS5 = Electrical w/ 12 in. 18 gauge 4-conductor cable MS5LC = Low current MS5 MS10 = Electrical w/ DIN connector (male end only) MS10LC = Low current MS10 MS11 = Electrical w/ 12 ft. 4-conductor wire MS12 = Electrical w/ 5 pin Brad Harrison connector (male end only) MS12LC = Low current MS12 MS16 = Electrical w/ weather-packed sealed connector MS16LC = Low current MS16 MS17LC = Electrical w/ 4 pin Brad Harrison male connector
Electrical with Thermal Lockout	MS5T = MS5 (see above) w/ thermal lockout MS5LCT = Low current MS5T MS10T = MS10 (see above) w/ thermal lockout MS10LCT = Low current MS10T MS12T = MS12 (see above) w/ thermal lockout MS12LCT = Low current MS12T MS16T = MS16 (see above) w/ thermal lockout MS16LCT = Low current MS16T MS17LCT = Low current MS17T
Electrical Visual	MS13DC = Supplied w/ threaded connector & light MS14DC = Supplied w/ 5 pin Brad Harrison connector & light (male end)
Electrical Visual with Thermal Lockout	MS13DCT = MS13 (see above), direct current, w/ thermal lockout MS13DCLCT = Low current MS13DCT MS14DCT = MS14 (see above), direct current, w/ thermal lockout MS14DCLCT = Low current MS14DCT

BOX 9 — Dirt Alarm® Location

- Omit = Top mounted
- S = Side mounted

BOX 10 — Bowl Drain Options

- Omit = None
- DR = Drain 7/16"-20

NOTES:

Box 2. Replacement element part numbers are a combination of Boxes 2, 3 and 4. Example: 5HZ10V

Box 4. For options H, V, and H.5, all aluminum parts are anodized. H.5 seal designation includes the following: EPR seals, stainless steel wire mesh on elements, and light oil coating on housing exterior. Viton® is a registered trademark of DuPont Dow Elastomers. Skydrol® is a registered trademark of Solutia Inc.

Box 5. B porting option supplied with metric mounting holes.

Box 6. When X is paired with a standard filter series, a standard bushing and spring plate will be used.

Box 8. Standard indicator setting for non-bypassing model is 50 psi unless otherwise noted.