

Return Line Filter

TF1



Features and Benefits

- Offered in pipe, SAE straight thread, flange and ISO 228 porting
- Various Dirt Alarm® options
- Available with No-Element indicator
- Available with NPTF inlet and outlet female test ports
- Available with magnet inserts
- Available with housing drain plug

30 gpm
120 L/min
300 psi
20 bar

Model No. of filter in photograph is TF11AZ105.

Flow Rating:	Up to 30 gpm (120 L/min) for 150 SUS (32 cSt) fluids
Max. Operating Pressure:	300 psi (20 bar)
Min. Yield Pressure:	1200 psi (80 bar), per NFPA T2.6.1
Rated Fatigue Pressure:	270 psi (19 bar), per NFPA T2.6.1-2005
Temp. Range:	-20°F to 225°F (-29°C to 107°C)
Bypass Setting:	Cracking: 30 psi (2 bar) Full Flow: 51 psi (4 bar)
Porting Head:	Cast Aluminum
Element Case:	Steel (TF1) or Stainless Steel (WTF1)
Weight of TF1-1A:	5.1 lbs. (2.3 kg)
Weight of TF1-2A:	6.3 lbs. (2.9 kg)
Element Change Clearance:	3.50" (90 mm)

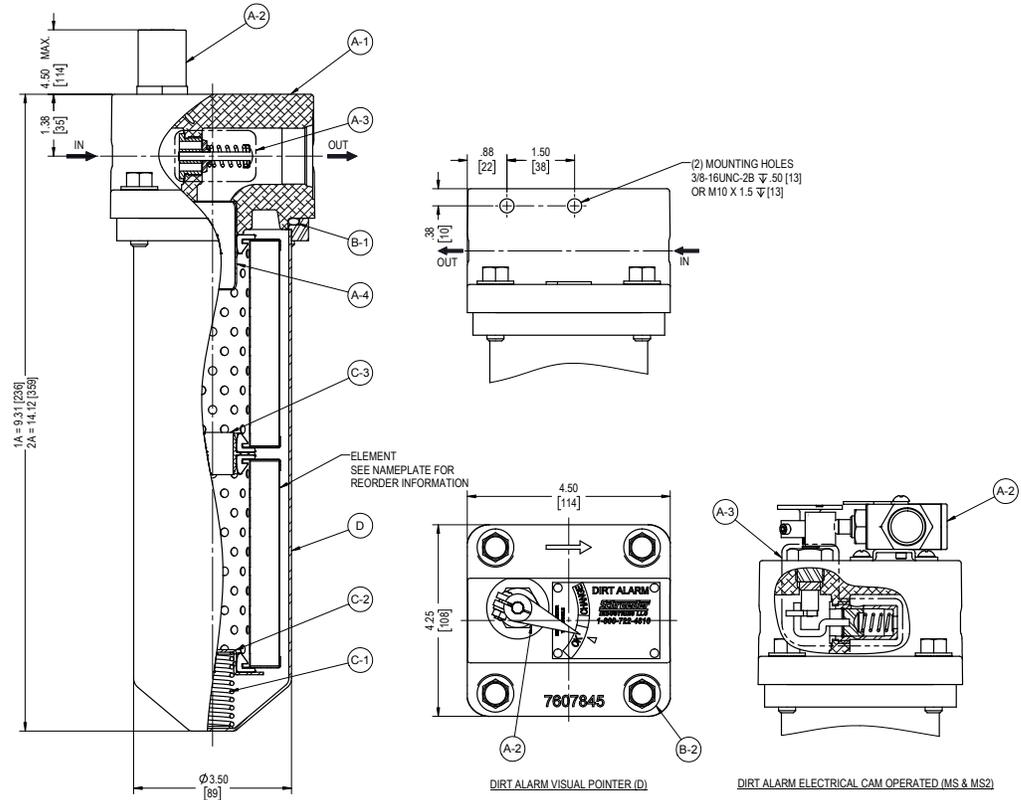
Filter Housing Specifications

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
Skydrol®	3, 5, 10 and 25 µ Z-Media® (synthetic) with H.5 seal designation (EPR seals and stainless steel wire mesh in element, and light oil coating on housing exterior)

Fluid Compatibility

Accessories For Tank-Mounted Filters

- IRF
- TF1
- KF3
- KL3
- LF1
- MLF1
- RLD
- GRTB
- MTA
- MTB
- ZT
- SPI
- KFT
- RT
- RTI
- LRT
- ART
- BRT
- TRT
- BFT
- QT
- KTK
- LTK
- MRT
- PAF1
- MAF1
- MF2



Metric dimensions in ().

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	
	$\beta_x \geq 75$	$\beta_x \geq 100$	$\beta_x \geq 200$	$\beta_x(c) \geq 200$	$\beta_x(c) \geq 1000$
AZ1	<1.0	<1.0	<1.0	<4.0	4.2
AZ3	<1.0	<1.0	<2.0	<4.0	4.8
AZ5	2.5	3.0	4.0	4.8	6.3
AZ10	7.4	8.2	10.0	8.0	10.0
AZ25	18.0	20.0	22.5	19.0	24.0

Element	DHC (gm)
A3	16
A10	13
AZ1	25
AZ3	26
AZ5	30
AZ10	28
AZ25	28

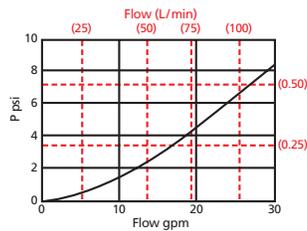
Element Collapse Rating: 150 psid (10 bar)

Flow Direction: Outside In

Element Nominal Dimensions: 3.0" (75 mm) O.D. x 4.5" (115 mm) long

$\Delta P_{\text{housing}}$

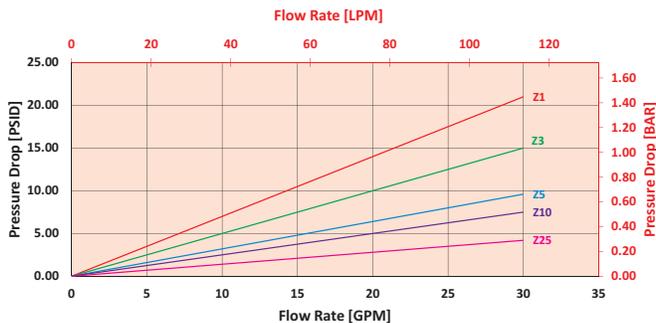
TF1 $\Delta P_{\text{housing}}$ for fluids with sp gr (specific gravity) = 0.86:



$\Delta P_{\text{element}}$

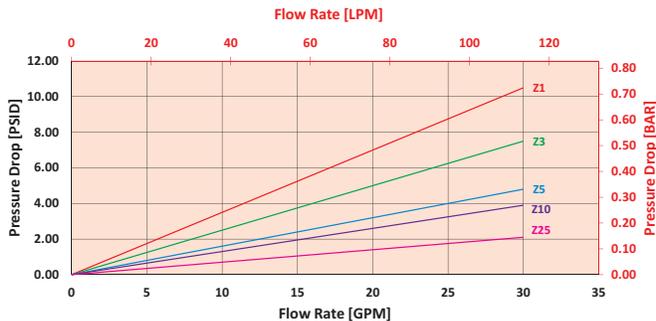
AZ

Element Pressure Drop versus Flow Rate at 32 cSt (150 SUS)



2AZ

Element Pressure Drop versus Flow Rate at 32 cSt (150 SUS)



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

Exercise:

Determine ΔP_{filter} at 15 gpm (57 L/min) for TF11AZ3PD5 using 175 SUS (37.2 cSt) fluid.

Use the housing pressure curve to determine $\Delta P_{\text{housing}}$ at 15 gpm. In this case, $\Delta P_{\text{housing}}$ is 3 psi (.21 bar) on the graph for the TF1 housing.

Use the element pressure curve to determine $\Delta P_{\text{element}}$ at 15 gpm. In this case, $\Delta P_{\text{element}}$ is 7.5 psi (.52 bar) according to the graph for the AZ3 element.

Because the viscosity in this sample is 175 SUS (37.2 cSt), we determine the **Viscosity Factor (V_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 $\Delta P_{\text{housing}}$ with the true element pressure differential, $(\Delta P_{\text{element}} * V_f)$. The $\Delta P_{\text{element}}$ from the graph has to be multiplied by the viscosity factor to get the true pressure differential across the element.

Solution:

$$\Delta P_{\text{housing}} = 3 \text{ psi } [.21 \text{ bar}] \quad | \quad \Delta P_{\text{element}} = 7.5 \text{ psi } [.52 \text{ bar}]$$

$$V_f = 175 \text{ SUS } (37.2 \text{ cSt}) / 150 \text{ SUS } (32 \text{ cSt}) = 1.2$$

$$\Delta P_{\text{filter}} = 3 \text{ psi } + (7.5 \text{ psi } * 1.2) = 12 \text{ psi}$$

OR

$$\Delta P_{\text{filter}} = .21 \text{ bar } + (.52 \text{ bar } * 1.2) = .83 \text{ bar}$$

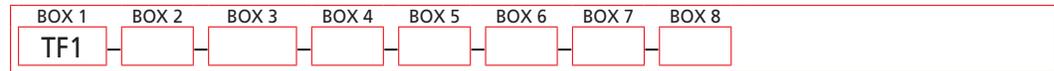
Pressure Drop Information Based on Flow Rate and Viscosity

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

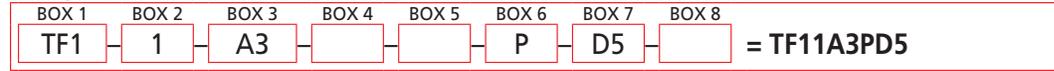
Ele.	ΔP	Ele.	ΔP
A3	0.53	AA3	0.27
A10	0.36	AA10	0.18
A25	0.05	AA25	0.03

Filter Model Number Selection

How to Build a Valid Model Number for a Schroeder TF1:



Example: NOTE: Only box 8 may contain more than one option



BOX 1	BOX 2	BOX 3	BOX 4	BOX 5
Filter Series	Number of Elements	Element Part Number	Seal Material	Magnet Option
TF1	1 2	A3 = 3 μ E media (cellulose) A10 = 10 μ E media (cellulose) A25 = 25 μ E media (cellulose) AZ1 = 1 μ Excellement® Z-Media® (synthetic) AZ3 = 3 μ Excellement® Z-Media® (synthetic) AZ5 = 5 μ Excellement® Z-Media® (synthetic) AZ10 = 10 μ Excellement® Z-Media® (synthetic) AZ25 = 25 μ Excellement® Z-Media® (synthetic) AM10 = 10 μ M media (reusable metal) AM25 = 25 μ M media (reusable metal) AM60 = 60 μ M media (reusable metal) AM150 = 150 μ M media (reusable metal)	Omit = Buna N H = EPR V = Viton® H.5 = Skydrol® compatibility	Omit = None M = Magnet inserts
WTF1				

BOX 6	BOX 7	BOX 8
Porting Options	Dirt Alarm® Options	
P = 1" NPTF S = SAE-16 B = ISO 228 G-1"	Omit = None	Omit = None
10 = 10 psi bypass setting 15 = 15 psi bypass setting 20 = 20 psi bypass setting 25 = 25 psi bypass setting 30 = 30 psi bypass setting 40 = 40 psi bypass setting 60 = 60 psi bypass setting 75 = 75 psi bypass setting	Visual D = Pointer D5 = Visual pop-up	L = Two ¼" NPTF inlet and outlet female test ports
	Visual with Thermal Lockout D8 = Visual w/ thermal lockout	N = No-Element indicator
	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	G440 = ½" drain on bottom of housing
	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 MS = Cam operated switch w/ ½" conduit female connection MS13 = Supplied w/ threaded connector & light MS14 = 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	

NOTES:

Box 1. WTF1 includes a Anodized Head and a Stainless Steel Bowl.

Box 3. Replacement element part numbers are identical to contents of Boxes 3 and 4. E media elements are only available with Buna N seals.

Box 4. For option V, 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 6. B porting option supplied with metric mounting holes.