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

Model No. of filter in photograph is TF11AZ10SD5.

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
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)

Fluid Compatibility

<table>
<thead>
<tr>
<th>Type Fluid</th>
<th>Appropriate Schroeder Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum Based Fluids</td>
<td>All E media (cellulose) and Z-Media® (synthetic)</td>
</tr>
<tr>
<td>High Water Content</td>
<td>All Z-Media® (synthetic)</td>
</tr>
<tr>
<td>Invert Emulsions</td>
<td>10 and 25 µ Z-Media® (synthetic)</td>
</tr>
<tr>
<td>Water Glycols</td>
<td>3, 5, 10 and 25 µ Z-Media® (synthetic)</td>
</tr>
<tr>
<td>Phosphate Esters</td>
<td>All Z-Media® (synthetic) with H (EPR) seal designation</td>
</tr>
<tr>
<td>Skydrol®</td>
<td>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)</td>
</tr>
</tbody>
</table>

Accessories For Tank-Mounted Filters
- PAF1
- MAF1
- MF2
Metric dimensions in ( ).

<table>
<thead>
<tr>
<th>Element</th>
<th>Filtration Ratio Per ISO 4572/NFPA T3.10.8.8</th>
<th>Filtration Ratio per ISO 16889</th>
</tr>
</thead>
<tbody>
<tr>
<td>AZ1</td>
<td>$\beta_a \geq 75$</td>
<td>$\beta_a \geq 100$</td>
</tr>
<tr>
<td>AZ3</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>AZ5</td>
<td>2.5</td>
<td>3.0</td>
</tr>
<tr>
<td>AZ10</td>
<td>7.4</td>
<td>8.2</td>
</tr>
<tr>
<td>AZ25</td>
<td>18.0</td>
<td>20.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Element</th>
<th>DHC (gm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A3</td>
<td>16</td>
</tr>
<tr>
<td>A10</td>
<td>13</td>
</tr>
<tr>
<td>AZ1</td>
<td>25</td>
</tr>
<tr>
<td>AZ3</td>
<td>26</td>
</tr>
<tr>
<td>AZ5</td>
<td>30</td>
</tr>
<tr>
<td>AZ10</td>
<td>28</td>
</tr>
<tr>
<td>AZ25</td>
<td>28</td>
</tr>
</tbody>
</table>

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
\[ \Delta P_{\text{filter}} = \Delta P_{\text{housing}} + (\Delta P_{\text{element}} \times V_f) \]

**Exercise:**
Determine \( \Delta P_{\text{filter}} \) 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, \( \Delta P_{\text{filter}} \), is calculated by adding \( \Delta P_{\text{housing}} \) with the true element pressure differential, \( \Delta P_{\text{element}} \times V_f \). 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:**
\[ \Delta P_{\text{housing}} = 3 \text{ psi} [.21 \text{ bar}] \]
\[ \Delta P_{\text{element}} = 7.5 \text{ psi} [.52 \text{ bar}] \]
\[ V_f = 175 \text{ SUS (37.2 cSt)} / 150 \text{ SUS (32 cSt)} = 1.2 \]
\[ \Delta P_{\text{filter}} = 3 \text{ psi} + (7.5 \text{ psi} \times 1.2) = 12 \text{ psi} \]
\[ \text{OR} \]
\[ \Delta P_{\text{filter}} = .21 \text{ bar} + (.52 \text{ bar} \times 1.2) = .83 \text{ bar} \]
## Return Line Filter

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

<table>
<thead>
<tr>
<th>BOX 1</th>
<th>BOX 2</th>
<th>BOX 3</th>
<th>BOX 4</th>
<th>BOX 5</th>
<th>BOX 6</th>
<th>BOX 7</th>
<th>BOX 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>TF1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>TF1</th>
<th>1</th>
<th>A3</th>
<th></th>
<th>P</th>
<th>D5</th>
<th></th>
<th></th>
</tr>
</thead>
</table>

= TF11A3PD5

### BOX 1 - Filter Series
- **TF1**

### BOX 2 - Number of Elements
- 1
- 2

### BOX 3 - Element Part Number
- 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)

### BOX 4 - Seal Material
- Omit = Buna N
- H = EPR
- V = Viton®
- H.5 = Skydrol® compatibility

### BOX 5 - Magnet Option
- Omit = None
- M = Magnet inserts

### BOX 6 - Porting Options
- P = 1" NPTF
- S = SAE-16
- B = ISO 228 G-1"
- 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

### BOX 7 - Dirt Alarm® Options
- Omit = None
- Visual: D = Pointer
- Visual pop-up: D5 = Visual pop-up
- Visual with Thermal Lockout: D8 = Visual w/ thermal lockout

### BOX 8 - Omit = None
- L = Two ¼" NPTF inlet and outlet female test ports
- G440 = ½" drain on bottom of housing

### NOTES:
- 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.