Top-Ported Return Line Filter

Features and Benefits
- Equipped with inlet and outlet manifolds
- Meets HF4 automotive standard
- Offered in pipe and flange porting
- Available in 2, 4 or 6 element configurations
- Various Dirt Alarm® options
- Available with NPTF inlet and outlet female test ports
- Available with housing drain plugs

Model No. of filter in photograph is MLF14K10PD.

Applications
- Industrial
- Automotive Manufacturing
- Machine Tool
- Steel Making
- Mobile Vehicles
- Railroad

Flow Rating: Up to 200 gpm (760 L/min) for 150 SUS (32 cSt) fluids
Max. Operating Pressure: 300 psi (20 bar)
Min. Yield Pressure: 1000 psi (70 bar), per NFPA T2.6.1
Rated Fatigue Pressure: 250 psi (17 bar), per NFPA T2.6.1-2005
Temp. Range: -20°F to 225°F (-29°C to 107°C)
Bypass Setting: Cracking: 25 psi (2 bar)
              Full Flow: 60 psi (4 bar)
Porting Head: Anodized Cast Aluminum
Element Case: Steel
Weight of MLF1-2K: 44.0 lbs. (20.0 kg)
Weight of MLF1-4K: 50.0 lbs. (23.0 kg)
Weight of MLF1-6K: 58.0 lbs. (26.0 kg)
Element Change Clearance: 2.0" (55 mm)
## Top-Ported Return Line Filter

**MLF1**

**Element**

### Performance Information

<table>
<thead>
<tr>
<th>Element</th>
<th>Filtration Ratio Per ISO 4572/NFPA T3.10.8.8</th>
<th>Filtration Ratio wrt ISO 16889</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Using automated particle counter (APC) calibrated per ISO 4402</td>
<td>Using APC calibrated per ISO 11171</td>
</tr>
<tr>
<td></td>
<td>( \beta_x \geq 75 )</td>
<td>( \beta_x \geq 100 )</td>
</tr>
<tr>
<td>K3</td>
<td>6.8</td>
<td>7.5</td>
</tr>
<tr>
<td>K10</td>
<td>15.5</td>
<td>16.2</td>
</tr>
<tr>
<td>KZ1</td>
<td>&lt;1.0</td>
<td>&lt;1.0</td>
</tr>
<tr>
<td>KZ3/KAS3</td>
<td>&lt;1.0</td>
<td>&lt;1.0</td>
</tr>
<tr>
<td>KZ5/KAS5</td>
<td>2.5</td>
<td>3.0</td>
</tr>
<tr>
<td>KZ10/KAS10</td>
<td>7.4</td>
<td>8.2</td>
</tr>
<tr>
<td>KZ25</td>
<td>18.0</td>
<td>20.0</td>
</tr>
<tr>
<td>KZW3</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>KZW5</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>KZW10</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>KZW25</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### Dirt Holding Capacity

<table>
<thead>
<tr>
<th>Element</th>
<th>DHC (gm)</th>
<th>Element</th>
<th>DHC (gm)</th>
<th>Element</th>
<th>DHC (gm)</th>
<th>Element</th>
<th>DHC (gm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2K3</td>
<td>108</td>
<td>4K3</td>
<td>216</td>
<td>6K3</td>
<td>324</td>
<td>KZW3</td>
<td>64</td>
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<tr>
<td>2K10</td>
<td>88</td>
<td>4K10</td>
<td>176</td>
<td>6K10</td>
<td>264</td>
<td>KZW5</td>
<td>63</td>
</tr>
<tr>
<td>2KZ1</td>
<td>224</td>
<td>4KZ1</td>
<td>448</td>
<td>6KZ1</td>
<td>672</td>
<td>KZW10</td>
<td>67</td>
</tr>
<tr>
<td>2KZ3/KAS3</td>
<td>230</td>
<td>4KZ3/4KAS3</td>
<td>460</td>
<td>6KZ3/6KAS3</td>
<td>690</td>
<td>KZW25</td>
<td>79</td>
</tr>
<tr>
<td>2KZ5/KAS5</td>
<td>238</td>
<td>4KZ5/4KAS5</td>
<td>476</td>
<td>6KZ5/6KAS5</td>
<td>714</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2KZ10/KAS10</td>
<td>216</td>
<td>4KZ10/4KAS10</td>
<td>432</td>
<td>6KZ10/6KAS10</td>
<td>648</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2KZ25</td>
<td>186</td>
<td>4KZ25</td>
<td>372</td>
<td>6KZ25</td>
<td>558</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Element Collapse Rating:** 150 psid (10 bar) for standard elements

**Flow Direction:** Outside In

**Element Nominal Dimensions:**

- K: 3.9" (99 mm) O.D. x 9.0" (230 mm) long
- KK: 3.9" (99 mm) O.D. x 18.0" (460 mm) long
- 27K: 3.9" (99 mm) O.D. x 27.0" (690 mm) long
Type Fluid  | Appropriate Schroeder Media
--- | ---
Petroleum Based Fluids | All E media (cellulose), Z-Media® and ASP 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 and 3 and 10 µ E media (cellulose) with H (EPR) seal designation and all ASP media (synthetic)
Skydrol® | 3, 5, 10 and 25 µ Z-Media® (synthetic) with H.5 seal designation and W media (water removal) with H.5 seal designation (EPR seals and stainless steel wire mesh in element, and light oil coating on housing exterior) and all ASP media (synthetic).

Shown above are the elements most commonly used in this housing.

**Note:** Contact factory regarding use of E media in High Water Content, Invert Emulsion and Water Glycol Applications. For more information, refer to Fluid Compatibility: Fire Resistant Fluids, pages 19 and 20.

**Pressure Drop Information**

**Flow Rate and Viscoity**

\[ \Delta P_{\text{element}} = \text{flow} \times \text{element } \Delta P \text{ factor} \times \text{viscosity factor} \]

**Element Selection Based on Flow Rate**

<table>
<thead>
<tr>
<th>E Media</th>
<th>K3</th>
<th>K10</th>
<th>K25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part No.</td>
<td>4K3</td>
<td>4K10</td>
<td>4K25</td>
</tr>
<tr>
<td>Z-Media®</td>
<td>KZ1</td>
<td>KZ3</td>
<td>KZ5</td>
</tr>
<tr>
<td>Part No.</td>
<td>4KZ1</td>
<td>4KZ3</td>
<td>4KZ5</td>
</tr>
<tr>
<td></td>
<td>KZ10</td>
<td>KZ25</td>
<td></td>
</tr>
<tr>
<td>Part No.</td>
<td>2KZ10</td>
<td>2KZ25</td>
<td></td>
</tr>
</tbody>
</table>

**MLF1**

<table>
<thead>
<tr>
<th>Pressure (psi)</th>
<th>E Media</th>
<th>K3</th>
<th>K10</th>
<th>K25</th>
</tr>
</thead>
<tbody>
<tr>
<td>To 300 psi (20 bar)</td>
<td>Part No.</td>
<td>4K3</td>
<td>4K10</td>
<td>4K25</td>
</tr>
<tr>
<td></td>
<td>Z-Media®</td>
<td>KZ1</td>
<td>KZ3</td>
<td>KZ5</td>
</tr>
<tr>
<td></td>
<td>Part No.</td>
<td>4KZ1</td>
<td>4KZ3</td>
<td>4KZ5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>KZ10</td>
<td>KZ25</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Part No.</td>
<td>2KZ10</td>
<td>2KZ25</td>
</tr>
</tbody>
</table>

**Pressure Drop Information**

**Flow Rate and Viscoity**

\[ \Delta P_{\text{housing}} = \Delta P_{\text{housing}} \text{ for fluids with sp gr } = 0.86: \]

**Sp gr = specific gravity**

Sizing of elements should be based on element flow information provided in the Element Selection chart above.

\[ \Delta P_{\text{filter}} = \Delta P_{\text{housing}} + \Delta P_{\text{element}} \]

The \( \Delta P \) housing curve labeled “Element Sizing” is the pressure drop between the inlet and outlet areas of the filter's bypass valve and should be used for filter sizing. The “Port to Port” \( \Delta P \) takes into consideration the inlet and outlet manifolds. This pressure drop can be significantly higher due to these additional flow constrictions. Although this \( \Delta P \) does not affect the performance of the filter, it should be considered for overall system design.

**Fluid Compatibility**

- IRF
- TF1
- KF3
- KL3
- LF1–2”

Skydrol® is a registered trademark of Solutia Inc.
### How to Build a Valid Model Number for a Schroeder MLF1:

<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>
<th>BOX 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLF1</td>
<td>2K</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>P</td>
<td>D5</td>
<td>–</td>
</tr>
</tbody>
</table>

Example: NOTE: Only box 9 may contain more than one option

MLF1 – 2K – 10 – 10 – P – D5 = MLF12K10PD5

### Filter Model Number Selection

#### BOX 1
- **Filter Series**: MLF1
- **Number and Size of Elements**
  - 2K, KK, 27K
  - 4K
  - 6K

#### BOX 2
- **Media Type**
  - Omit = E media (cellulose)
  - Z = ExcCellent® Z-Media® (synthetic)
  - AS = Anti-Stat Pleat media (synthetic)
  - ZW = Aqua-ExcCellent™ ZW media
  - DZ = Dirtcatcher® with ExcCellent® Z-Media®
  - W = W media (water removal)
  - M = M media (reusable metal mesh)

#### BOX 3
- **Micron Rating**
  - 1 = 1 µ Z, ZW, and DZ media
  - 3 = 3 µ AS, E, Z, ZW, and DZ media
  - 5 = 5 µ AS, Z, ZW, DZ media
  - 10 = 10 µ AS, E, M, Z, ZW, and DZ media
  - 25 = 25 µ E, M, Z, ZW, and DZ media
  - 60 = 60 µ M media
  - 150 = 150 µ M media

#### BOX 4
- **Seal Material**
  - Omit = Buna N
  - H = EPR
  - V = Viton®
  - H.S = Skydrol® Compatibility

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

#### BOX 6
- **Porting**
  - P = 2½” NPTF
  - F = 2½” SAE 4-bolt flange Code 61

#### BOX 8
- **Dirt Alarm® Options**
  - Omit = None
    - D = Pointer
    - D5 = Visual pop-up
  - Visual with Thermal Lockout
    - D8 = Visual w/ thermal lockout

#### BOX 9
- **Additional Options**
  - Omit = None
    - L = Two ¾” NPTF inlet and outlet female test ports
    - G426 = ¾” drain on bottom of housing
    - G440 = ½” drain on bottom of housing

### NOTES:

- **Box 2**: Double and triple stacking of K-size elements can be replaced by KK and 27K elements, respectively. Number of elements must equal 2 when using KK or 27K elements.

- **Box 3**: Replacement element part numbers are identical to contents of Boxes 2, 3, 4, and 5. K25 is not available with EPR seals.

- **Box 5**: For options H, V, and H.S, all aluminum parts are anodized. H.S 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.