

# Return Line Filter

# KF3



## Features and Benefits

- Meets HF4 automotive standard
- 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
- Takes the standard "K" element in K, KK or 27K lengths
- Allows consolidation of inventoried replacement elements by using K-size elements
- WKF3 model for water service available – refer to Section 7 of this catalog
- Also available with DirtCatcher® elements (KD & KKD)

**100 gpm**  
**380 L/min**  
**300 psi**  
**20 bar**

IRF  
 TF1  
**KF3**  
 KL3  
 LF1-2"  
 MLF1  
 RLD  
 GRTB  
 MTA  
 MTB  
 ZT

Model No. of filter in photograph is KF31K10S.



INDUSTRIAL



AUTOMOTIVE  
MANUFACTURING



STEEL  
MAKING



MOBILE  
VEHICLES

## Applications

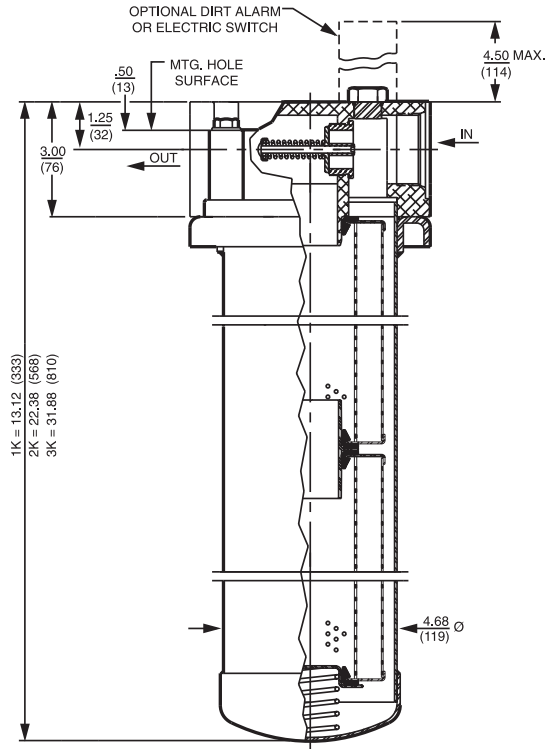
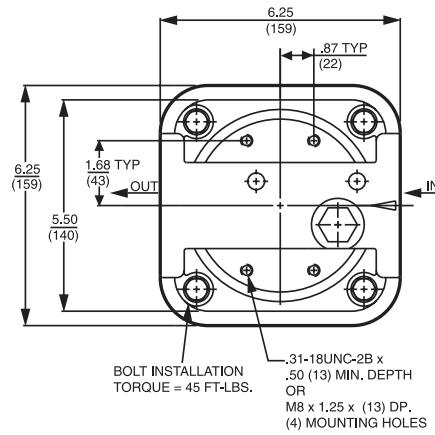
KFT  
 RT  
 RTI  
 LRT  
 ART  
 BFT  
 QT  
 KTK  
 LTK

|                           |   |
|---------------------------|---|
| Flow Rating:              | Up to 100 gpm (380 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:   | 290 psi (20 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)<br>Full Flow: 51 psi (4 bar) |
| Porting Head:             | Die Cast Aluminum                                     |
| Element Case:             | Steel   |
| Weight of KF3-1K:         | 10.5 lbs. (4.8 kg)                                    |
| Weight of KF3-2K:         | 14.2 lbs. (6.4 kg)                                    |
| Weight of KF3-3K:         | 18.5 lbs. (8.4 kg)                                    |
| Element Change Clearance: | 1.50" (40 mm) for all lengths                         |

## Filter Housing Specifications

Accessories for Tank-Mounted Filters

MRT  
 PAF1  
 MAF1  
 MF2



Metric dimensions in ( ).

## Element Performance Information

| Element                                | Filtration Ratio Per ISO 4572/NFPA T3.10.8.8<br>Using automated particle counter (APC)<br>calibrated per ISO 4402 |                    |                    | Filtration Ratio wrt ISO 16889<br>Using APC calibrated per ISO 11171 |                        |
|--|---|--------------------|--------------------|--|------------------------|
|  | $\beta_x \geq 75$   | $\beta_x \geq 100$ | $\beta_x \geq 200$ | $\beta_x(c) \geq 200$  | $\beta_x(c) \geq 1000$ |
| K3/KK3/27K                             | 6.8   | 7.5                | 10.0               | N/A  | N/A                    |
| K10/KK10/27K10                         | 15.5  | 16.2               | 18.0               | N/A  | N/A                    |
| KZ1/KKZ1/27KZ1                         | <1.0  | <1.0               | <1.0               | <4.0   | 4.2                    |
| KZ3/KAS3/KKZ3/KKAS3/27KZ3/27KAS3       | <1.0  | <1.0               | <2.0               | <4.0   | 4.8                    |
| KZ5/KAS5/KKZ5/KKAS5/27KZ5/27KAS5       | 2.5   | 3.0                | 4.0                | 4.8  | 6.3                    |
| KZ10/KAS10/KKZ10/KKAS10/27KZ10/27KAS10 | 7.4   | 8.2                | 10.0               | 8.0  | 10.0                   |
| KZ25/KKZ25/27KZ25                      | 18.0  | 20.0               | 22.5               | 19.0   | 24.0                   |
| KZW1                                   | N/A   | N/A                | N/A                | <4.0   | <4.0                   |
| KZW3/KKZW3                             | N/A   | N/A                | N/A                | 4.0  | 4.8                    |
| KZW5/KKZW5                             | N/A   | N/A                | N/A                | 5.1  | 6.4                    |
| KZW10/KKZW10                           | N/A   | N/A                | N/A                | 6.9  | 8.6                    |
| KZW25/KKZW25                           | N/A   | N/A                | N/A                | 15.4   | 18.5                   |

## Dirt Holding Capacity

| Element    | DHC (g) | Element      | DHC (g) | Element        | DHC (g) | Element | DHC (g) | Element | DHC (g) | Element | DHC (g) |        |     |
|------------|---------|--------------|---------|----------------|---------|---------|---------|---------|---------|---------|---------|--------|-----|
| K3         | 54      | KK3          | 108     | 27K3           | 162     |         |         |         |         |         |         |        |     |
| K10        | 44      | KK10         | 88      | 27K10          | 132     |         |         |         |         |         |         |        |     |
| KZ1        | 112     | KKZ1         | 224     | 27KZ1          | 336     | KDZ1    | 89      | KKDZ1   | 188     | KZW1    | 61      |        |     |
| KZ3/KAS3   | 115     | KKZ3/KKAS3   | 230     | 27KZ3/27KAS3   | 345     | KDZ3    | 71      | KKDZ3   | 150     | KZW3    | 64      | KKZW3  | 128 |
| KZ5/KAS5   | 119     | KKZ5/KKAS5   | 238     | 27KZ5/27KAS5   | 357     | KDZ5    | 100     | KKDZ5   | 210     | KZW5    | 63      | KKZW5  | 126 |
| KZ10/KAS10 | 108     | KKZ10/KKAS10 | 216     | 27KZ10/27KAS10 | 324     | KDZ10   | 80      | KKDZ10  | 168     | KZW10   | 57      | KKZW10 | 114 |
| KZ25       | 93      | KKZ25        | 186     | 27KZ25         | 279     | KDZ25   | 81      | KKDZ25  | 171     | KZW25   | 79      | KKZW25 | 158 |

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

# Return Line Filter

# KF3

### Type Fluid Appropriate Schroeder Media

|                               |  |
|-------------------------------|--|
| <b>Petroleum Based Fluids</b> | All E media (cellulose), Z-Media® and ASP media (synthetic)  |
| <b>High Water Content</b>     | All Z-Media® and ASP Media (synthetic)   |
| <b>Invert Emulsions</b>       | 10 and 25 µ Z-Media® (synthetic), 10 µ ASP media (synthetic)   |
| <b>Water Glycols</b>          | 3, 5, 10 and 25 µ Z-Media® (synthetic), 3, 5, and 10 µ ASP Media (synthetic)   |
| <b>Phosphate Esters</b>       | 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)  |
| <b>Skydrol®</b>               | 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) |

### Fluid Compatibility

IRF  
TF1

**KF3**

KL3

LF1-2"

Skydrol® is a registered trademark of Solutia Inc.

### Element Selection Based on Flow Rate

MLF1  
RLD  
GRTB  
MTA  
MTB  
ZT

KFT

RT

RTI

LRT

ART

BFT

QT

KTK

LTK

MRT

Accessories for Tank-Mounted Filters

PAF1

MAF1

MF2

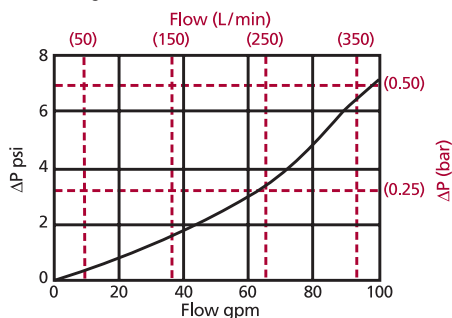
| Pressure            | Element  |          | Element selections are predicated on the use of 150 SUS (32 cSt) petroleum based fluid and a 30 psi (2.1 bar) bypass valve. |     |                   |     |     |
|---------------------|----------|----------|---|-----|-------------------|-----|-----|
|                     | Series   | Part No. | 1K3   |     | 2K3 <sup>†</sup>  |     |     |
| To 300 psi (20 bar) | E Media  | K3       | 1K3   |     | 2K3 <sup>†</sup>  |     |     |
|                     |          | K10      | 1K10  |     | 2K10 <sup>†</sup> |     |     |
|                     |          | K25      | 1K25  |     | 2K25 <sup>†</sup> |     |     |
|                     | Z-Media® | KZ1      | 1KZ1  |     | 2KZ1 <sup>†</sup> |     |     |
|                     |          | KZ3      | 1KZ3  |     | 2KZ3 <sup>†</sup> |     |     |
|                     |          | KZ5      | 1KZ5  |     | 2KZ5 <sup>†</sup> |     |     |
|                     |          | KZ10     | 1KZ10   |     |                   |     |     |
|                     |          | 1KZ25    |   |     |                   |     |     |
| Flow                | gpm      | 0        | 20  | 40  | 60                | 80  | 100 |
|                     | (L/min)  | 0        | 50  | 150 | 250               | 380 |     |

†Double and triple stacking of K-size elements can be replaced by single KK & 27K elements, respectively. 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.

### ΔP<sub>housing</sub>

KF3 ΔP<sub>housing</sub> 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.

$$\Delta P_{\text{filter}} = \Delta P_{\text{housing}} + \Delta P_{\text{element}}$$

### Exercise:

Determine ΔP at 60 gpm (225 L/min) for KF32KZ5SD5 using 200 SUS (44 cSt) fluid.

### Solution:

$$\begin{aligned} \Delta P_{\text{housing}} &= 3.5 \text{ psi } [.24 \text{ bar}] \\ \Delta P_{\text{element}} &= 60 \times .04 \times (200 \div 150) = 3.2 \text{ psi} \\ &\text{or} \\ &= [225 \times (.04 \div 54.9) \times (44 \div 32) = .23 \text{ bar}] \\ \Delta P_{\text{total}} &= 3.5 + 3.2 = 6.7 \text{ psi} \\ &\text{or} \\ &= [.24 + .23 = .47 \text{ bar}] \end{aligned}$$

### ΔP<sub>element</sub>

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

El. ΔP factors @ 150 SUS (32 cSt):

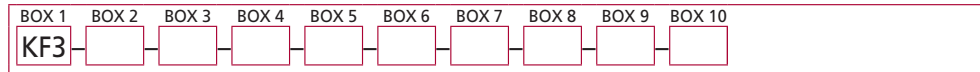
|                   | 1K  | 2K  | 3K  | 1K           | 2K      |
|-------------------|-----|-----|-----|--------------|---------|
| <b>K3</b>         | .25 | .12 | .08 |              |         |
| <b>K10</b>        | .09 | .05 | .03 |              |         |
| <b>K25</b>        | .02 | .01 | .01 |              |         |
| <b>KZ1</b>        | .20 | .10 | .05 | <b>KDZ1</b>  | .24 .12 |
| <b>KZ3/KAS3</b>   | .10 | .05 | .03 | <b>KDZ3</b>  | .12 .06 |
| <b>KZ5/KAS5</b>   | .08 | .04 | .02 | <b>KDZ5</b>  | .10 .05 |
| <b>KZ10/KAS10</b> | .05 | .03 | .02 | <b>KDZ10</b> | .06 .03 |
| <b>KZ25</b>       | .04 | .02 | .01 | <b>KDZ25</b> | .04 .02 |
|                   | 1K  | 2K  |     |              |         |
| <b>KZW1</b>       | .43 |     |     |              |         |
| <b>KZW3</b>       | .32 | .16 |     |              |         |
| <b>KZW5</b>       | .28 | .14 |     |              |         |
| <b>KZW10</b>      | .23 | .12 |     |              |         |
| <b>KZW25</b>      | .14 | .07 |     |              |         |

If working in units of bars & L/min, divide above factor by 54.9.

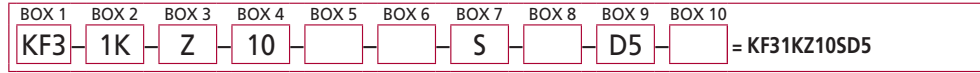
Viscosity factor: Divide viscosity by 150 SUS (32 cSt).

## Filter Model Number Selection

### How to Build a Valid Model Number for a Schroeder KF3:



**Example:** NOTE: Only box 10 may contain more than one option



| BOX 1   | BOX 2                                | BOX 3   | BOX 4  |
|---|--------------------------------------|---|--|
| <b>Filter Series</b>  | <b>Number &amp; Size of Elements</b> | <b>Media Type</b>   | <b>Micron Rating</b>   |
| KF3<br>(See Section 7 for Water Service version)  | 1K, KK, 27K<br>2K<br>3K              | Omit = E media (cellulose)<br>ASP = Anti-Stat Pleat media<br>Z = Excellement® Z-Media® (synthetic)<br>ZW = Aqua-Excellement® ZW media<br>W = Water Removal media<br>M = M Media (reusable metal)<br>DZ = DirtCatcher® Excellement® Z-Media® | 1 = 1 μ (Z, ZW and DZ media)<br>3 = 3 μ (E, AS, Z, ZW and DZ media)<br>5 = 5 μ (AS, Z, ZW and DZ media)<br>10 = 10 μ (E, AS, Z, ZW, M and DZ media)<br>25 = 25 μ (E, Z, ZW, M and DZ media)<br>60 = 60 μ (M media) |
| BOX 5   | BOX 6                                | BOX 7   | BOX 8  |
| <b>Seal Material</b>  | <b>Magnet Option</b>                 | <b>Porting</b>  | <b>Bypass Setting</b>  |
| Omit = Buna N<br>H = EPR<br>V = Viton®<br>H.5 = Skydrol® Compatibility<br>W = Buna N  | Omit = None<br>M = Magnet            | P = 1½" NPTF<br>S = SAE-24<br>F = 1½" SAE4-bolt flange Code 61<br>B24 = ISO 228 G-1½"   | Omit = 30 psi cracking<br>50 = 50 psi cracking (req. for HF4)  |
| BOX 9   |                                      |   | BOX 10   |
| <b>Dirt Alarm® Options</b>  |                                      |   | <b>Additional Options</b>  |
| Omit = None   |                                      |   | Omit = None  |
| Visual<br>D = Pointer<br>D5 = Visual pop-up   |                                      |   | L = Two ¼" NPTF inlet and outlet test ports<br>N = No-Element indicator  |
| Visual with Thermal Lockout<br>D8 = Visual w/ thermal lockout   |                                      |   | G426 = ¾" drain on bottom of housing<br>G440 = ½" drain on bottom of housing   |
| Electrical<br>MS5 = Electrical w/ 12 in. 18 gauge 4-conductor cable<br>MS5LC = Low current MS5<br>MS10 = Electrical w/ DIN connector (male end only)<br>MS10LC = Low current MS10<br>MS11 = Electrical w/ 12 ft. 4-conductor wire<br>MS12 = Electrical w/ 5 pin Brad Harrison connector (male end only)<br>MS12LC = Low current MS12<br>MS16 = Electrical w/ weather-packed sealed connector<br>MS16LC = Low current MS16                       |                                      |   |  |
| Electrical with Thermal Lockout<br>MS17LC = Electrical w/ 4 pin Brad Harrison male connector<br>MS5T = MS5 (see above) w/ thermal lockout<br>MS5LCT = Low current MS5T<br>MS10T = MS10 (see above) w/ thermal lockout<br>MS10LCT = Low current MS10T<br>MS12T = MS12 (see above) w/ thermal lockout<br>MS12LCT = Low current MS12T<br>MS16T = MS16 (see above) w/ thermal lockout<br>MS16LCT = Low current MS16T<br>MS17LCT = Low current MS17T |                                      |   |  |
| Electrical Visual<br>MS = Cam operated switch w/ ½" conduit female connection<br>MS13 = Supplied w/ threaded connector & light<br>MS14 = Supplied w/ 5 pin Brad Harrison connector & light (male end)   |                                      |   |  |
| Electrical Visual with Thermal Lockout<br>MS13DCT = MS13 (see above), direct current, w/ thermal lockout<br>MS13DCLCT = Low current MS13DCT<br>MS14DCT = MS14 (see above), direct current, w/ thermal lockout<br>MS14DCLCT = Low current MS14DCT  |                                      |   |  |

#### NOTES:

- Box 2. Double and triple stacking of K-size elements can be replaced by single KK and 27K elements, respectively. Number of elements must equal 1 when using KK or 27K elements. ZW media not available in 27K.
- Box 3. Replacement element part numbers are identical to contents of Boxes 2, 3, 4, and 5.
- Box 5. For options H, W, 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 7. For option F, bolt thread depth .63" (16 mm). B porting option supplied with metric mounting holes.
- Box 10. Option L not available with MS & MS2 dirt alarm options.