


# 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
- Also available with DirtCatcher® elements (KD & KKD)
- G** Available with quality-protected GeoSeal® Elements (GKF3)

 Part of the Schroeder Industries 2030 Initiative

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

IRF

TF1

**KF3**

KL3

LF1

MLF1

RLD

GRTB

MTA

MTB

ZT

KFT

RT

RTI

LRT

ART

BRT

TRT

BFT

QT

KTK

LTK

MRT

Model No. of filter in photograph is KF31K10SD5.

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) 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

Type Fluid	Appropriate Schroeder Media
Petroleum Based Fluids	All E media (cellulose), Z-Media® and ASP® media (synthetic)
High Water Content	All Z-Media® and ASP® Media (synthetic)
Invert Emulsions	10 and 25 µ Z-Media® (synthetic), 10 µ ASP® media (synthetic)
Water Glycols	3, 5, 10 and 25 µ Z-Media® (synthetic), 3, 5, and 10 µ ASP® 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 (EPR seals and stainless steel wire mesh in element, and light oil coating on housing exterior) and all ASP® media (synthetic)

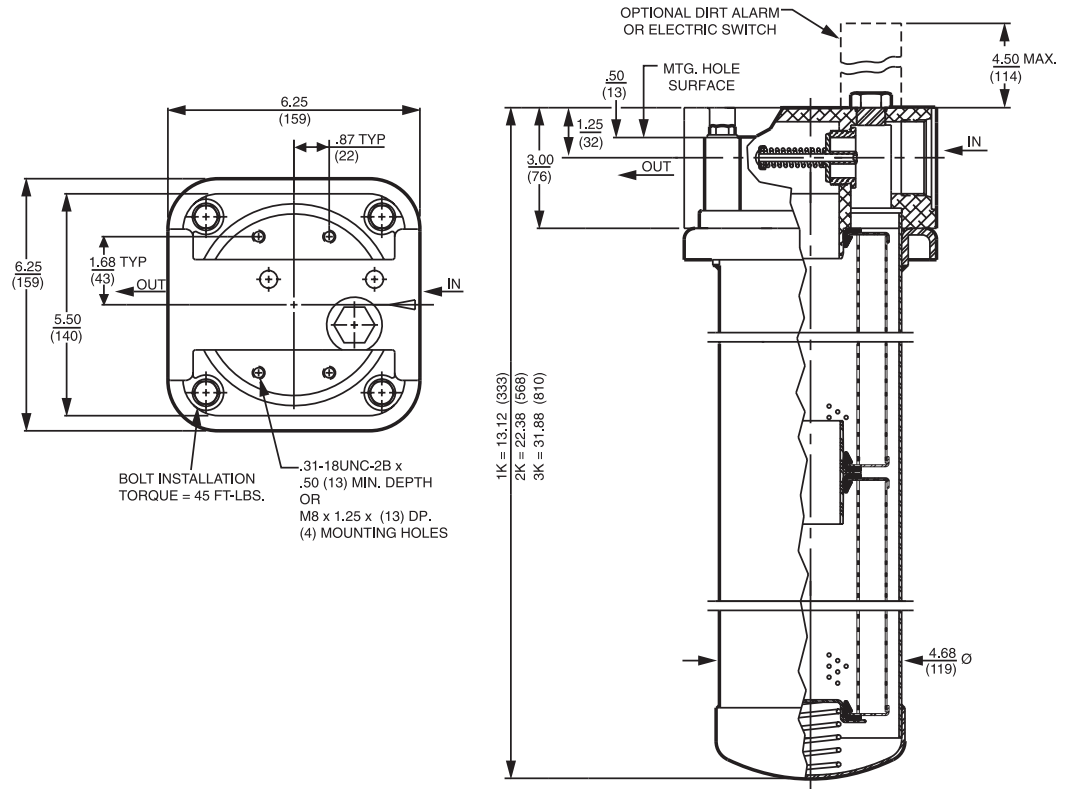
## Fluid Compatibility

### Accessories For Tank-Mounted Filters

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	
	$\beta_x \geq 75$	$\beta_x \geq 100$	$\beta_x \geq 200$	$\beta_x(c) \geq 200$	$\beta_x(c) \geq 1000$
KZ1/KKZ1/27KZ1	<1.0	<1.0	<1.0	<4.0	4.2
KZ3/KKZ3/27KZ3	<1.0	<1.0	<2.0	<4.0	4.8
KZ5/KKZ5/27KZ5	2.5	3.0	4.0	4.8	6.3
KZ10/KKZ10/27KZ10	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

Element	DHC (g)	Element	DHC (g)	Element	DHC (g)	Element	DHC (g)	Element	DHC (g)	Element	DHC (g)
KZ1	112	KKZ1	224	27KZ1	336	KDZ1	89	KKDZ1	188	KZW1	61
KZ3	115	KKZ3	230	27KZ3	345	KDZ3	71	KKDZ3	150	KZW3	64
KZ5	119	KKZ5	238	27KZ5	357	KDZ5	100	KKDZ5	210	KZW5	63
KZ10	108	KKZ10	216	27KZ10	324	KDZ10	80	KKDZ10	168	KZW10	57
KZ25	93	KKZ25	186	27KZ25	279	KDZ25	81	KKDZ25	171	KZW25	79
										KKZW3	128
										KKZW5	126
										KKZW10	114
										KKZW25	158

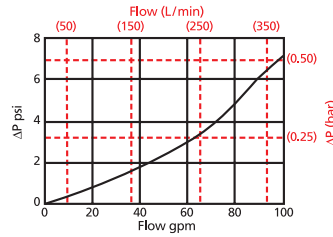
Element Collapse Rating: 150 psid (10 bar) for standard elements

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

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

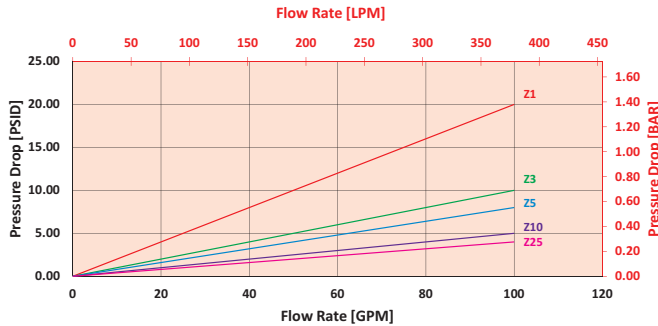
KF3  $\Delta P_{\text{housing}}$  for fluids with sp gr (specific gravity) = 0.86:



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

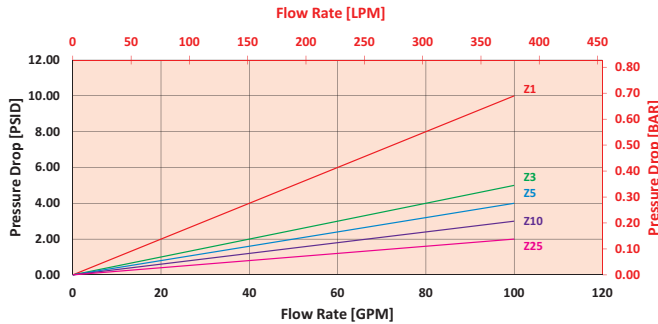
KZ

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



2KZ/KKZ

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



$$\Delta P_{\text{filter}} = \Delta P_{\text{housing}} + (\Delta P_{\text{element}} * \mathbf{V}_f)$$

**Exercise:**

Determine  $\Delta P_{\text{filter}}$  at 70 gpm (265.3 L/min) for KF31KZ10SD5 using 160 SUS (34 cSt) fluid.

Use the housing pressure curve to determine  $\Delta P_{\text{housing}}$  at 70 gpm. In this case,  $\Delta P_{\text{housing}}$  is 4 psi (.27 bar) on the graph for the KF3 housing.

Use the element pressure curve to determine  $\Delta P_{\text{element}}$  at 70 gpm. In this case,  $\Delta P_{\text{element}}$  is 3 psi (.21 bar) according to the graph for the KZ10 element.

Because the viscosity in this sample is 160 SUS (34 cSt), we determine the **Viscosity Factor ( $\mathbf{V}_f$ )** 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,  $(\Delta P_{\text{element}} * \mathbf{V}_f)$ . 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:**

$\Delta P_{\text{housing}} = 4 \text{ psi } [.227 \text{ bar}] \mid \Delta P_{\text{element}} = 3 \text{ psi } [.21 \text{ bar}]$

$\mathbf{V}_f = 160 \text{ SUS (34 cSt) } / 150 \text{ SUS (32 cSt)} = 1.1$

$\Delta P_{\text{filter}} = 4 \text{ psi } + (3 \text{ psi } * 1.1) = 7.7 \text{ psi}$

**OR**

$\Delta P_{\text{filter}} = .27 \text{ bar } + (.21 \text{ bar } * 1.1) = .50 \text{ bar}$

**Pressure Drop Information Based on Flow Rate and Viscosity**

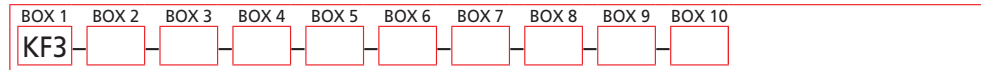
Note:  
If your element is not graphed, use the following equation:  
 $\Delta P_{\text{element}} = \text{Flow Rate} \times \Delta P_f$  Plug this variable into the overall pressure drop equation.

Ele.	$\Delta P$	Ele.	$\Delta P$	Ele.	$\Delta P$
K3	0.25	2K3/ KK3	0.12	3KZ1/ 27KZ1	0.05
K10	0.09	2K10/ KK10	0.05	3KZ3/ 27KZ3	0.03
K25	0.02	2K25/ KK25	0.01	3KZ5/ 27KZ5	0.02
KAS3	0.10	2KAS3/ KKAS3	0.05	3KZ10/ 27KZ10	0.02
KAS5	0.08	2KAS5/ KKAS5	0.04	3KZ25/ 27KZ25	0.01
KAS10	0.05	2KAS10/ KKAS10	0.03	K3K	0.08
KDZ1	0.24	2KDZ1	0.12	3K10	0.03
KDZ3	0.12	2KDZ3	0.06	3K25	0.01
KDZ5	0.10	2KDZ5	0.05	3KAS3/ 27KAS3	0.03
KDZ10	0.06	2KDZ10	0.03	3KAS5/ 27KAS5	0.02
KDZ25	0.04	2KDZ25	0.02	3KAS10/ 27KAS10	0.02
KZW1	0.43	2KZW1	-		
KZW3	0.32	2KZW3/ KKZW3	0.16		
KZW5	0.28	2KZW5/ KKZW5	0.14		
KZW10	0.23	2KZW10/ KKZW10	0.12		
KZW25	0.14	2KZW25/ KKZW25	0.07		

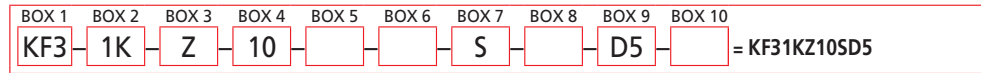
## Filter Model Number Selection

Highlighted product eligible for **QuickDelivery**

### 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	1K, KK,27K	Omit = E media (cellulose)	1 = 1 μ (Z, ZW and DZ media)
GKF3 (GeoSeal®)	2K	AS = Anti-Static Pleat Media	3 = 3 μ (E, AS, Z, ZW and DZ media)
WKF3 (Water)	3K	Z = Excellement® Z-Media® (synthetic)	5 = 5 μ (AS, Z, ZW and DZ media)
	<b>GeoSeal®</b>	ZW = Aqua-Excellement® ZW media	10 = 10 μ (E, AS, Z, ZW, M and DZ media)
	1KG, KKG, 27KG	W = Water Removal media	25 = 25 μ (E, Z, ZW, M and DZ media)
	2KG	M = M Media (reusable metal)	60 = 60 μ (M media)
	3KG	DZ = DirtCatcher® Excellement® Z-Media®	
		<b>Water System Element Options</b>	
		KM10 = K size 25 μ M media (reusable metal)	
		KM25 = K size 10 μ M media (reusable metal)	
		KM60 = K size 60 μ M media (reusable metal)	
		KM150 = K size 150 μ M media (reusable metal)	
		KM260 = K size 260 μ M media (reusable metal)	
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	Omit = None	P = 1½" NPTF	Omit = 30 psi cracking
H = EPR	M = Magnet	S = SAE-24	50 = 50 psi cracking (req. for HF4)
V = Viton®		F = 1½" SAE-4-bolt flange Code 61	
H.5 = Skydrol® Compatibility		B = ISO 228 G-1½"	
W = Buna N			
BOX 9	BOX 10		
<b>Dirt Alarm® Options</b>	<b>Additional Options</b>		
Omit = None	Omit = None		
Visual	D = Pointer	L = Two ¼" NPTF inlet and outlet test ports	
	D5 = Visual pop-up	N = No-Element indicator	
Visual with Thermal Lockout	D8 = Visual w/ thermal lockout	G426 = ¾" drain on bottom of housing	
Electrical	MS5 = Electrical w/ 12 in. 18 gauge 4-conductor cable	G440 = ½" drain on bottom of housing	
	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		
Electrical with Thermal Lockout	MS17LC = Electrical w/ 4 pin Brad Harrison male connector		
	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 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 Dirt Alarm