

Top-Ported Return Line Filter

MLF1



Features and wBenefits

- 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
- Available with quality-protected GeoSeal® Elements (GMLF1)

200 gpm
760 L/min
300 psi
20 bar

IRF

TF1

KF3

KL3

LF1

MLF1

RLD

GRTB

MTA

MTB

ZT

KFT

RT

RTI

LRT

ART

BFT

QT

KTK

LTK

MRT

Model No. of filter in photograph is MLF14K10PD.

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)

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® (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 (EPR seals and stainless steel wire mesh in element, and light oil coating on housing exterior) and all ASP® media (synthetic).

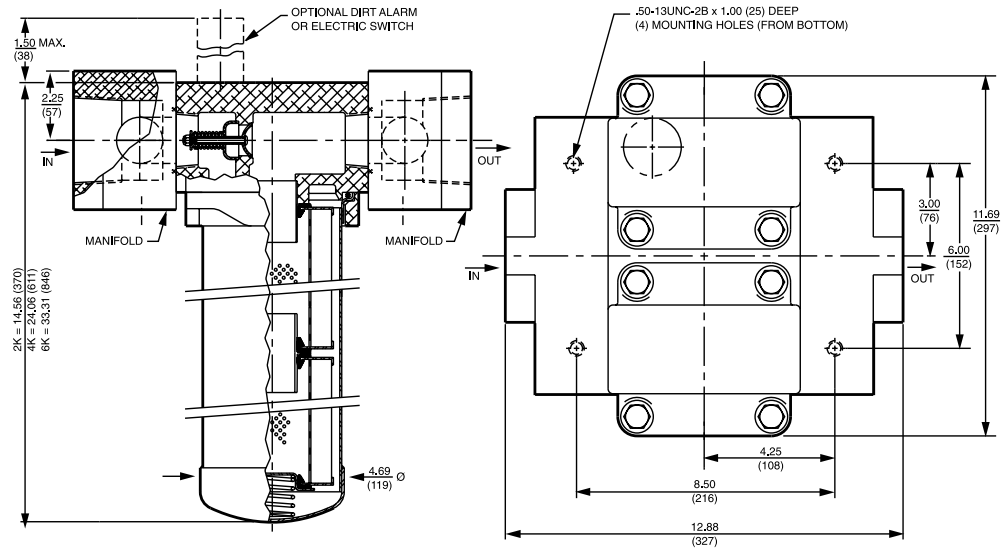
Fluid Compatibility

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	<1.0	<1.0	<1.0	<4.0	4.2
KZ3	<1.0	<1.0	<2.0	<4.0	4.8
KZ5	2.5	3.0	4.0	4.8	6.3
KZ10	7.4	8.2	10.0	8.0	10.0
KZ25	18.0	20.0	22.5	19.0	24.0
KZW3	N/A	N/A	N/A	<4.0	4.8
KZW5	N/A	N/A	N/A	5.1	6.4
KZW10	N/A	N/A	N/A	6.9	8.6
KZW25	N/A	N/A	N/A	15.4	18.5

Element	DHC (gm)	Element	DHC (gm)	Element	DHC (gm)	Element	DHC (gm)
2KZ1	224	4KZ1	448	6KZ1	672		
2KZ3	230	4KZ3	460	6KZ3	690	KZW3	64
2KZ5	238	4KZ5	476	6KZ5	714	KZW5	63
2KZ10	216	4KZ10	432	6KZ10	648	KZW10	67
2KZ25	186	4KZ25	372	6KZ25	558	KZW25	79

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

Flow Direction: Outside In

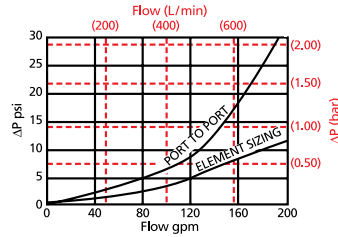
Element Nominal Dimensions: K: 3.9" (99 mm) O.D. x 9.0" (230 mm) long
 KK: 3.9" (99 mm) O.D. x 18.0" (460 mm) long
 27K: 3.9" (99 mm) O.D. x 27.0" (690 mm) long

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MLF1

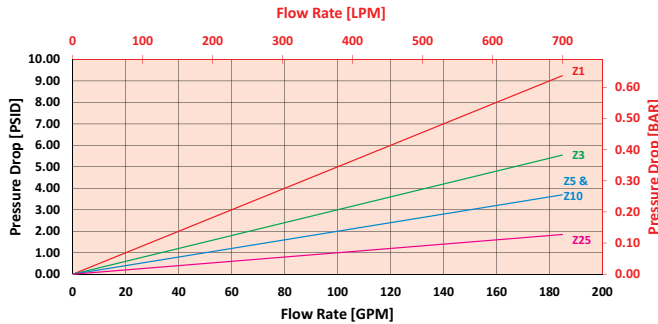
$\Delta P_{\text{housing}}$

MLF1 $\Delta P_{\text{housing}}$ for fluids with sp gr (specific gravity) = 0.86:

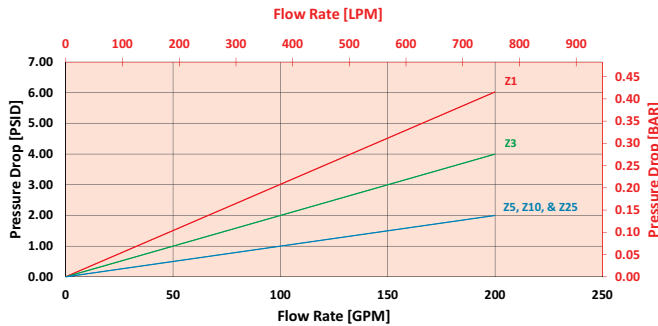


$\Delta P_{\text{element}}$

4KZ/2KKZ Element Pressure Drop versus Flow Rate at 32 cSt (150 SUS)



6KZ/2-27KZ 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 150 gpm (568.5 L/min) for MLF14K10PD using 160 SUS (34 cSt) fluid.

Use the housing pressure curve to determine $\Delta P_{\text{housing}}$ at 150 gpm. In this case, $\Delta P_{\text{housing}}$ is 15 psi (1 bar) on the graph for the MLF1 housing.

Use the element pressure curve to determine $\Delta P_{\text{element}}$ at 150 gpm. In this case, $\Delta P_{\text{element}}$ is 3 psi (.21 bar) according to the graph for the KKZ10 element.

Because the viscosity in this sample is 160 SUS (34 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:

$$\Delta P_{\text{housing}} = 15 \text{ psi [1 bar]} \quad | \quad \Delta P_{\text{element}} = 3 \text{ psi [.21 bar]}$$

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

$$\Delta P_{\text{filter}} = 15 \text{ psi} + (3 \text{ psi} * 1.1) = 18.3 \text{ psi}$$

OR

$$\Delta P_{\text{filter}} = 1 \text{ bar} + (.21 \text{ bar} * 1.1) = 1.2 \text{ bar}$$

Pressure Drop Information
Based on
Flow Rate
and Viscosity

Note:

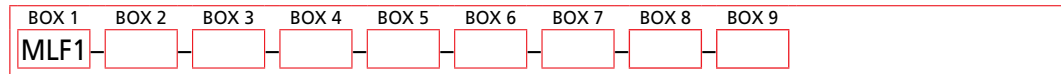
If your element is not graphed, use the following equation:

$\Delta P_{\text{element}} = \text{Flow Rate} \times \Delta P_f$ Plug this variable into the overall pressure drop equation.

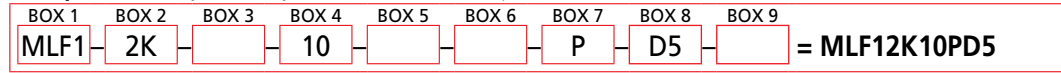
Ele.	ΔP	Ele.	ΔP	Ele.	ΔP
2KZ1	0.10	2K3	0.12	4K3/ KK3	0.06
2KZ3	0.05	2K10	0.05	4K10/ KK10	0.02
2KZ5	0.04	2K25	0.01	4K25/ KK25	0.01
2KZ10	0.03	2KAS3	0.05	4KAS3/ KKAS3	0.03
2KZ25	0.02	2KAS5	0.04	4KAS5/ KKAS5	0.02
KZW3	0.32	2KAS10	0.03	4KAS10/ KKAS10	0.02
KZW5	0.28	2KZW3/ KKZW3	0.16	6KAS3/ 27KAS3	0.02
KZW10	0.23	2KZW5/ KKZW5	0.14	6KAS5/ 27KAS5	0.01
KZW25	0.14			6KAS10/ 27KAS10	0.01

Filter Model Number Selection

How to Build a Valid Model Number for a Schroeder MLF1:



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



BOX 1	BOX 2	BOX 3	BOX 4
Filter Series	Number & Size of Elements	Media Type	Micron Rating
MLF1 GMLF1 (GeoSeal®)	2K, KK, 27K 4K 6K	Omit = E media (cellulose) Z = Excellement® Z-Media® (synthetic) AS = Anti-Static Pleat Media (synthetic) ZW = Aqua-Excellement™ ZW media DZ = DirtCatcher® with Excellement® Z-Media® W = W media (water removal) M = M media (reusable metal mesh)	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 5	BOX 6	BOX 7
Seal Material	Magnet Option	Porting
Omit = Buna N H = EPR V = Viton® H.5 = Skydrol® Compatibility	Omit = None M = Magnet inserts	P = 2½" NPTF F = 2½" SAE 4-bolt flange Code 61

BOX 8	BOX 9
Dirt Alarm® Options	Additional Options
Omit = None	Omit = None
Visual D = Pointer D5 = Visual pop-up	L = Two ¼" NPTF inlet and outlet female test ports G426 = ¾" drain on bottom of housing G440 = ½" drain on bottom of housing
Visual with Thermal Lockout D8 = Visual w/ thermal lockout	
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	
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 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.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.