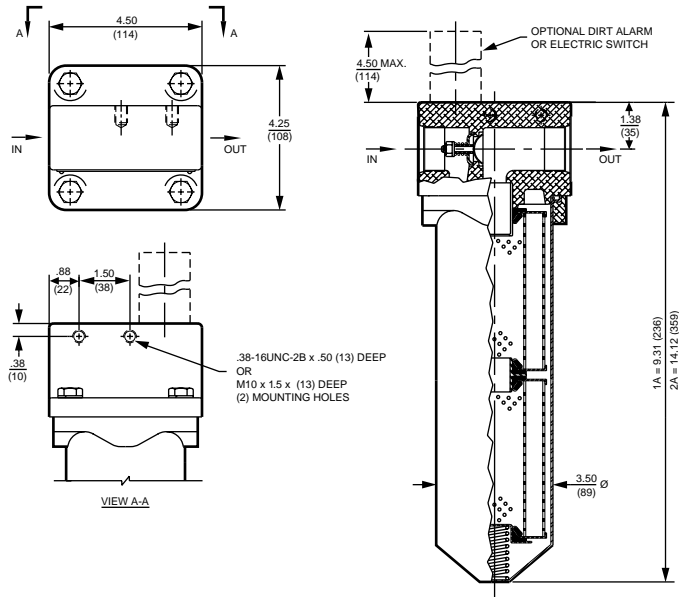


# TF1 Return Line Filter

**30 gpm**  
**120 L/min**  
**300 psi**  
**20 bar**



Metric dimensions in ( ).  
Model No. of filter in photograph is TF11AZ10SD5.

## Filter Housing Specifications

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)
Rated Fatigue Pressure:	270 psi (19 bar), per NFPA T2.6.1-1974
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)

## Element Performance Information

Element	Absolute Rating Per ISO 4572/NFPA T3.10.8.8 Using automated particle counter (APC) calibrated per ISO 4402			Abs. Rating wrt ISO 16889 Using APC calibrated per ISO 11171		Dirt Holding Capacity gm
	$\beta_x \geq 75$	$\beta_x \geq 100$	$\beta_x \geq 200$	$\beta_{x(c)} \geq 200$	$\beta_{x(c)} \geq 1000$	
A3	6.8	7.5	10.0	N/A	N/A	16
A10	15.5	16.2	18.0	N/A	N/A	13
AZ1	<1.0	<1.0	<1.0	<4.0	4.2	25
AZ3	<1.0	<1.0	<2.0	4.7	5.8	26
AZ5	2.5	3.0	4.0	6.5	7.5	22
AZ10	7.4	8.2	10.0	10.0	12.7	28
AZ25	18.0	20.0	22.5	19.0	24.0	28

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

## Fluid Compatibility

Type Fluid	Appropriate Schroeder Media
Petroleum Based Fluids	All Paper (E) and Synthetic (Z) media
High Water Content	Z1, Z3, Z5, Z10, Z25
Invert Emulsions	Z10, Z25
Water Glycols	Z3, Z5, Z10, Z25
Phosphate Esters	All Z media with EPR Seals
Skydrol	Z3H.5, Z5H.5, Z10H.5 and Z25H.5

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.

# Return Line Filter TF1

- Pipe, SAE straight, flange, and BSPP porting available.

## Features

ST  
SKB Housings

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.	1A3		2A3	
To 300 psi (20 bar)	E Media	A3	1A3		2A3	
		A10	1A10		2A10	
		A25	1A25			
	Z Media	AZ1	1AZ1		2AZ1	
		AZ3	1AZ3		2AZ3	
		AZ5	AZ5			
		AZ10	AZ10			
	AZ25	AZ25				
Flow	gpm	0	10	20	30	
	(L/min)	0	25	50	75	100

## Element Selection Based on Flow Rate

MTA  
MTB  
GT  
ZT  
KT  
RT  
RTI

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

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

**Exercise:**  
Determine  $\Delta P$  at 20 gpm (75 L/min) for TF12AZ3PD using 200 SUS (44 cSt) fluid.

### Solution:

$$\Delta P_{\text{housing}} = 4.5 \text{ psi } [.30 \text{ bar}]$$

$$\Delta P_{\text{element}} = 20 \times .25 \times (200 \div 150) = 6.7 \text{ psi}$$

or

$$= [75 \times (.25 \div 54.9) \times (44 \div 32) = .47 \text{ bar}]$$

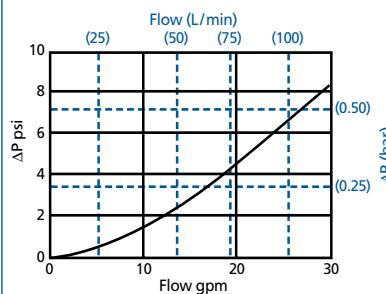
$$\Delta P_{\text{total}} = 4.5 + 6.7 = 11.2 \text{ psi}$$

or

$$= [.30 + .47 = .77 \text{ bar}]$$

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

TF1  $\Delta P_{\text{housing}}$  for fluids with sp gr = 0.86:



sp gr = specific gravity

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

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

El.  $\Delta P$  factors @ 150 SUS (32 cSt):

	1A	2A
A3	.53	.27
A10	.36	.18
A25	.05	.03
AZ1	.70	.35
AZ3	.50	.25
AZ5	.32	.16
AZ10	.25	.13
AZ25	.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).

## Pressure Drop Information

Based on Flow Rate and Viscosity

KFT  
LRT  
BFT  
QT  
Accessories for Tank-Mounted Filters

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

Filter Series	No. of Elements	Element Part No.	Seal Material	Porting	Dirt Alarm® (See Appendix A for complete list of options)
TF1	1	A3** A10** A25**	(Omit) = Buna N	P = 1" NPTF  S = 1 5/16" -12 SAE Straight (SAE-16)	D = Pointer D5 = Cartridge MS = Cam Operated Electric Switch MS2 = Cam Operated Electric Switch
	2	AZ1 AZ3 AZ5 AZ10 AZ25	H = EPR***  V = Viton***	F = 1" SAE J518 4-Bolt Flange Code 61*  B = ISO 228 G-1 (1-11 BSPP) (B porting supplied with metric mounting holes)	Electric Cartridge: MS5AC/DC/LC Family (See Appendix A)  MS15DC = DC Switch (SPST)
		AM10 AM60			

\*Not available with Dirt Alarm.  
\*\*Only available with Buna N seals.

\*\*\*Aluminum parts are anodized.

## Filter Model Number Selection

MAF1  
MF2  
TF1  
KF3  
LF1—2"

L = Two 1/4" NPTF inlet & outlet female test ports  
N = No-Element indicator

G440 = 1/2" drain on bottom of housing  
M = Magnet Inserts

See Appendix B for additional information on these options and instructions on how to order.

## Other Available Options

MLF1  
SRLT  
RLT  
KF8  
K9  
QF15  
QLF15  
QFD5