Section 6:

SUCTION FILTERS

v.040224

Section 6 Suction Filters Selection Guide

		Pressure psi (bar)	Flow gpm (L/min)	Element Length/Size	Page
Suction Filters	**Tank-Mounted Suction Filter**				
	ST	NA	20 (75)	K, KT	341
	Top-Ported Suction Filter				
	SKF3	300 (20)	25 (95)	KT	345
	In-Line Magnetic Suction Separators				
	TF-SKB	NA	12.5 (47)	SKB	349
	KF3-SKB QUALITY PROTECTION	NA	35 (130)	SKB	350
	Tank-Mounted Magnetic Suction Separator				
	BFT-SKB	NA	75 (285)	SKB	351

Tank-Mounted Suction Filter ST

Model No. of filter in photograph is ST1K10SY.

Features and Benefits

- Tank-mounted suction filter for hydrostatic suction service
- Optional check valve prevents reservoir siphoning
- Easy Element changeout
- Inlet filter protects pump, reduces start-up failures

20 gpm 75 L/min

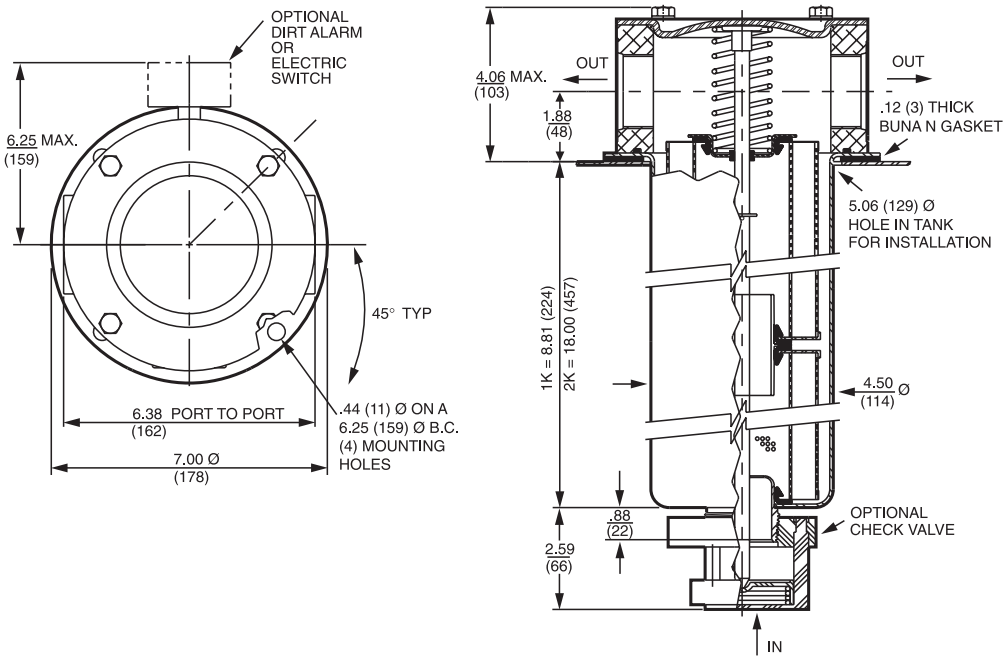
Filter Housing Specifications

Flow Rating:	Up to 20 gpm (75 L/min) for 150 SUS (32 cSt) fluids
Max. Operating Pressure:	Suction Filter
Min. Yield Pressure:	Not Applicable
Rated Fatigue Pressure:	Not Applicable
Temp. Range:	-20°F to 225°F (-29°C to 107°C)
Bypass Setting:	Non-bypassing
Porting Head:	Die Cast Aluminum
Cap:	Steel
Element Case:	Steel
Weight of ST-1K:	11.1 lbs. (5.0 kg)
Weight of ST-2K:	14.7 lbs. (6.7 kg)
Element Change Clearance:	7.25" (185 mm) for 1K; 17.50" (445 mm) for KK

Fluid Compatibility

Type Fluid	Appropriate Schroeder Media
Petroleum Based Fluids	All E media (cellulose) and Z-Media® (synthetic)
High Water Content	10 µ Z-Media® (synthetic)
Invert Emulsions	10 µ Z-Media® (synthetic)
Water Glycols	10 µ Z-Media® (synthetic)
Phosphate Esters	10 µ Z-Media® (synthetic) with H (EPR) seal designation and 10 µ E media (cellulose) with H (EPR) seal designation
Skydrol®	10 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)

Tank-Mounted Suction Filter



Metric dimensions in ( ).

Element Performance Information & Dirt Holding Capacity

	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	
Element	$ß_x \geq 75$	$ß_x \geq 100$	$ß_x \geq 200$	$ß_{x(c)} \geq 200$	$ß_{x(c)} \geq 1000$
KTZ10	7.4	8.0	10.0	8.0	10.0

Element	DHC (gm)
KTZ10	56

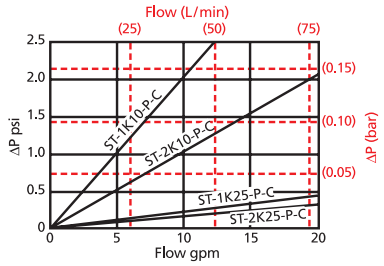
Element Collapse Rating: 150 psid (10 bar)

Flow Direction: Inside Out

Element Nominal Dimensions: 3.9" (99 mm) O.D. x 9.0" (230 mm) long

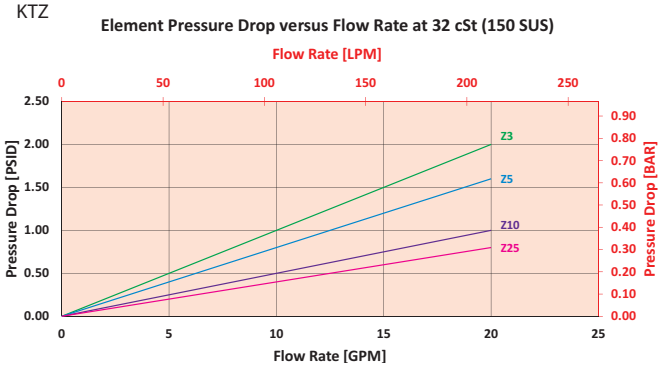
$\Delta P_{housing}$

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

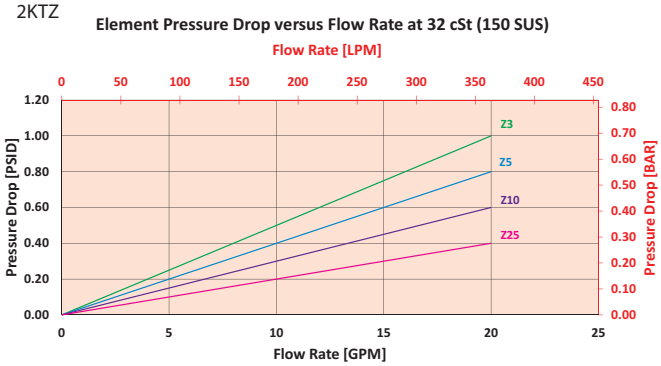


$\Delta P_{element}$

KTZ



2KTZ



$$\Delta P_{filter} = \Delta P_{housing} + (\Delta P_{element} * V_f)$$

Exercise:

Determine ΔP_{filter} at 15 gpm (57 L/min) for ST1KTZ10PY using 160 SUS (34 cSt) fluid.

Use the element pressure curve to determine $\Delta P_{housing}$ at 15 gpm. In this case, $\Delta P_{housing}$ is 1.5 psi (.10 bar) according to the graph for the ST element.

Use the element pressure curve to determine $\Delta P_{element}$ at 15 gpm. In this case, $\Delta P_{element}$ is .75 psi (.05 bar) according to the graph for the KZT10 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 $\Delta P_{housing}$ with the true element pressure differential, ($\Delta P_{element} * V_f$). The $\Delta P_{element}$ from the graph has to be multiplied by the viscosity factor to get the true pressure differential across the element.

Solution:

$\Delta P_{housing}$ = 1.5 psi [.75 bar] | $\Delta P_{element}$ = .75 psi [.05 bar]

V_f = 160 SUS (34 cSt) / 150 SUS (32 cSt) = 1.07

ΔP_{filter} = 1.5 psi + (.75 psi * 1.07) = 2.3 psi

OR

ΔP_{filter} = .10 bar + (0.05 bar * 1.07) = 0.15 bar

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

Ele.	ΔP	Ele.	ΔP	Ele.	ΔP
K3	0.25	KZW25	0.14	2KZW10	0.12
K10	0.09	2K3	0.12	2KZW25	0.07
K25	0.02	2K10	0.05	3K3	0.08
KAS3	0.10	2K25	0.01	3K10	0.03
KAS5	0.08	2KAS3	0.05	3K25	0.01
KAS10	0.05	2KAS5	0.04	3KAS3	0.03
KZX10	0.22	2KAS10	0.03	3KAS5	0.02
KZW1	0.43	2KZX10	0.11	3KAS10	0.02
KZW3	0.32	2KZW1	-	3KZX10	0.07
KZW5	0.28	2KZW3	0.16		
KZW10	0.23	2KZW5	0.14		

ST Tank-Mounted Suction Filter

Filter Model Number Selection

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

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8
ST							

Example: NOTE: Only box 8 may contain more than one option

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	
ST	1	K25		P		Y		= ST1K25PY

BOX 1 – Filter Series

ST

BOX 2 – Number of Elements

1
2

BOX 3 – Element Part Number

K10 = K size 10 µ E media (cellulose)
K25 = K size 25 µ E media (cellulose)
KTZ3 = K size 3 µ Excellement® Z-Media® (synthetic) inside-out flow
KTZ5 = K size 5 µ Excellement® Z-Media® (synthetic) inside-out flow
KTZ10 = K size 10 µ Excellement® Z-Media® (synthetic) inside-out flow
KTZ25 = K size 25 µ Excellement® Z-Media® (synthetic) inside-out flow

BOX 4 – Seal Material

Omit = Buna N
H = EPR
W = Buna N
H.5 = Skydrol® compatibility

BOX 5 – Outlet Port

P = 1½" NPTF
PP = Dual 1½" NPTF
S = SAE 24
SS = Dual SAE 24
B = ISO 228 G-1½"
BB = ISO 228 G-1½"

BOX 6 – Optional Check Valve

Omit = None
C = Check Valve

BOX 7 – Dirt Alarm® Options

	Omit	= None
Visual	Y	= Vacuum gauge
	YR	= Vacuum gauge mounted on opposite side of standard location
Electrical	VS	= Electrical Vacuum Switch
	VSR	= Electrical Vacuum Switch mounted on opposite side of standard location
	VSR1	= Heavy-Duty Vacuum Switch

BOX 8 – Additional Options

Omit = None
G2293 = Cork Gasket
G547 = Two ⅛" gauge ports

NOTES:

Box 3. Replacement element part numbers are identical to contents of Boxes 3 and 4.

Box 4. For options H and W, 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. Skydrol® is a registered trademark of Solutia Inc.

Box 6. See also "Accessories for Tank-Mounted Filters," page 299.

Top-Ported Suction Filter SKF3

Features and Benefits

- Top-ported suction filter for hydrostatic suction service
- Easy element changeout
- Inlet filter protects pump, reduces start-up failures
- 2.5 psi suction bypass available

25 gpm
95 L/min
300 psi
20 bar

Model No. of filter in photograph is SKF31KTZ25S2.5Y

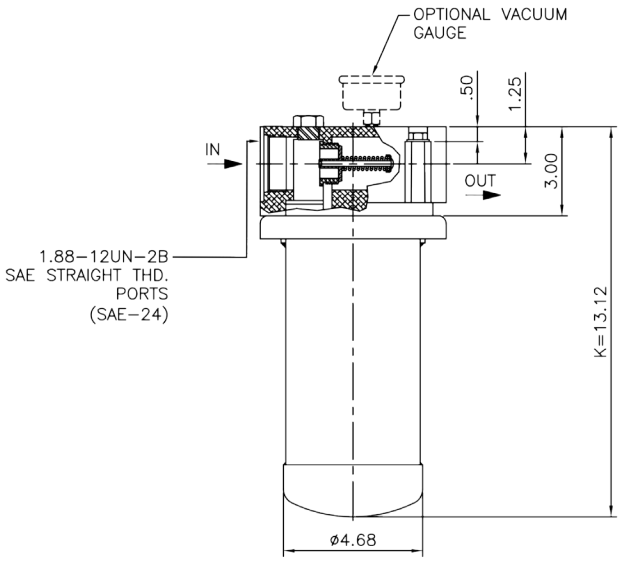
Filter Housing Specifications

Flow Rating:	Up to 25 gpm (95 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: 2.5 psi (0.2 bar) Full Flow: Contact Factory
Porting Base:	Die Cast Aluminum
Element Case:	Steel
Weight of SKF3:	10.5 lbs. (4.8 kg)
Element Change Clearance:	1.50" (40 mm) for all lengths

Fluid Compatibility

Type Fluid	Appropriate Schroeder Media
Petroleum Based Fluids	All E-Media (cellulose), Z-Media®
High Water Content	All Z-Media®
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
Skydrol®	3, 5, 10 and 25 µ Z-Media® (synthetic) with H.5 seal designation

SKF3 Top-Ported Suction Filter



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	
	$\beta_x \geq 75$	$\beta_x \geq 100$	$\beta_x \geq 200$	$\beta_x(c) \geq 200$	$\beta_x(c) \geq 1000$
KTZ1/GKTZ1	<1.0	<1.0	<1.0	<4.0	4.2
KTZ3/GKTZ3	<1.0	<1.0	<2.0	<4.0	4.8
KTZ5/GKTZ5	2.5	3.0	4.0	4.8	6.3
KTZ10/GKTZ10	7.4	8.2	10.0	8.0	10.0
KTZ25/GKTZ25	18.0	20.0	22.5	19.0	24.0

Dirt Holding Capacity

Element	DHC (gm)
KTZ1/GKTZ1	112
KTZ3/GKTZ3	115
KTZ5/GKTZ5	119
KTZ10/GKTZ10	108
KTZ25/GKTZ25	93

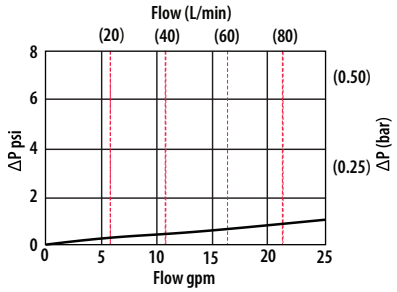
Element Collapse Rating: 150 psid (10 bar) for standard elements

Flow Direction: Inside Out

Element Nominal Dimensions: K: 3.9" (99 mm) O.D. x 9.0" (230 mm) long

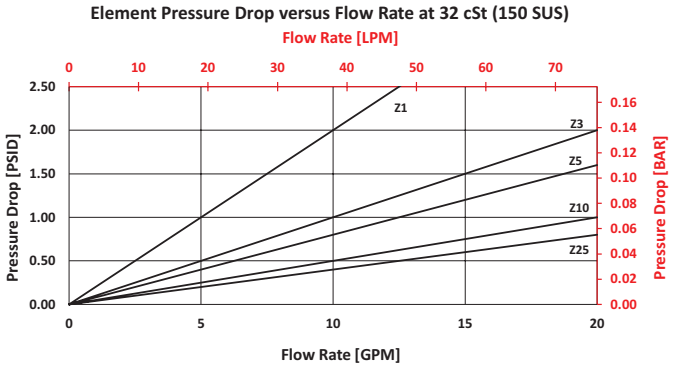
$\Delta P_{housing}$

SKF3 $\Delta P_{housing}$ for fluids with sp gr (specific gravity) = 0.86:



$\Delta P_{element}$

KTZ1



Curves Also Available Upon Request

$$\Delta P_{filter} = \Delta P_{housing} + (\Delta P_{element} * V_f)$$

Exercise:

Determine ΔP_{filter} at 20 gpm (76 L/min) for SKF31KTZ25S2.5Y using 200 SUS (44 cSt) fluid.

Use the housing pressure curve to determine ΔPhousing at 20 gpm. In this case, ΔPhousing is 0.7 psi (.05 bar) on the graph for the SKF3 housing.

Use the element pressure curve to determine ΔPelement at 20 gpm. In this case, ΔPelement is 0.8 psi (.06 bar) according to the graph for the 1KTZ25 element.

Because the viscosity in this sample is 200 SUS (44 cSt), we determine the Viscosity Factor (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, ΔPfilter , is calculated by adding ΔPhousing with the true element pressure differential, (ΔPelement*Vf). The ΔPelement from the graph has to be multiplied by the viscosity factor to get the true pressure differential across the element.

Solution:

$\Delta P_{housing}$ = 0.7 psi [.21 bar] | $\Delta P_{element}$ = 0.8 psi [.415 bar]

V_f = 200 SUS (42.4 cSt) / 150 SUS (32 cSt) = 1.333

ΔP_{filter} = 0.7 psi + (0.8 psi * 1.333) = 1.8 psi

OR

ΔP_{filter} = .05 bar + (.06 bar * 1.333) = .13 bar

SKF3 Top-Ported Suction Filter

Filter Model Number Selection

How to Build a Valid Model Number for a Schroeder SKF3:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8
SKF3							

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	
SKF3	1K	Z	25		S	2.5	Y	=SKF31KTZ25S2.5Y

BOX 1

Filter Series
SKF3
GSKF3 (GeoSeal®)

BOX 2

Number & Size of Elements
1KT
GeoSeal®
1KTG

BOX 3

Media Type
Omit = E media (cellulose)
Z = Excellement® Z-Media® (synthetic)
M = M Media (reusable metal)

BOX 4

Micron Rating	
1 = 1µ	(Z-Media)
3 = 3µ	(E, Z-Media)
5 = 5µ	(Z-Media)
10 = 10µ	(E, Z and M-Media)
25 = 25µ	(E, Z and M-Media)
60 = 60µ	(M-Media)
150 = 150µ	(M-Media)

BOX 5

Seal Material
Omit = Buna N
H = EPR
V = Viton®
H.5 = Skydrol® Compatibility
W = Buna N with anodized parts

BOX 6

Magnetic Core
Omit = No Magnetic Core
M = Magnetic Core

BOX 7

Porting	
P =	1 1/2" NPTF
S =	SAE 24
F =	1½" SAE-4-bolt flange Code 61
B =	ISO 228 G-1½"

BOX 8

Bypass	
Omit =	No Bypass
2.5 =	2.5 psi Suction Bypass

BOX 9

Dirt Alarm® Options		
	Omit =	None
Visual	Y =	Vacuum guage
Electrical	VS =	Electrical Vacuum Switch
	VS1 =	Heavy-Duty Vacuum Switch

NOTES:

Box 2. Replacement element part numbers are a combination of Boxes 2, 3, and 4. Example: KTZ25

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.

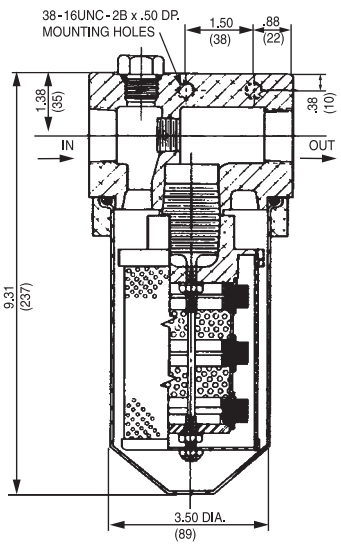
Box 7. For option F, bolt thread depth .63" (16 mm). B porting option supplied with metric mounting holes.

Features and Benefits

- Protects components downstream by capturing potentially harmful ferrous particles

Specifications

Flow Rating:	12.5 gpm (47 L/min)
Element Replacement Part Number:	SKB-1
Element Change Clearance:	2.5" (65 mm)
Weight of TF-SKB:	5.8 lbs (2.6 kg)



Metric dimensions in ( ).

How to Build a Valid Model Number for a Schroeder TF-SKB:

BOX 1	BOX 2	BOX 3	BOX 4
TF-SKB –	–	–	

Example: NOTE: One option per box

BOX 1	BOX 2	BOX 3	BOX 4	
TF-SKB –	–	P –	Y	= TF-SKBPY

BOX 1 – Filter Series

TF-SKB

BOX 2 – Seal Material

Omit = Buna N

BOX 3 – Porting

P = 1" NPTF

BOX 4 – Dirt Alarm® Options

	Omit =	None
Visual	Y =	Vacuum gauge
Electrical	VS =	Electrical Vacuum Switch
	VS1 =	Heavy-Duty Vacuum Switch

Filter Model Number Selection

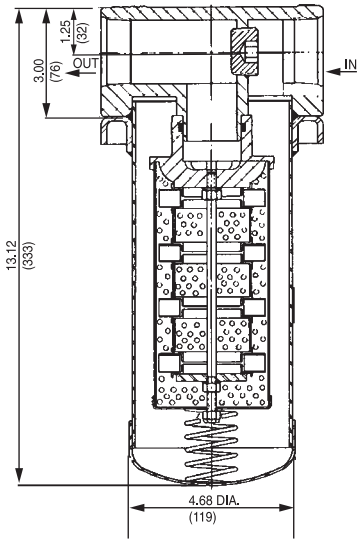
NOTE:

Box 1. Element replacement part number: SKB-1.

KF3-SKB In-Line Magnetic Suction Separators

Features and Benefits

- Protects components downstream by capturing potentially harmful ferrous particles



Specifications

Flow Rating:	35 gpm (130 L/min)
Element Replacement Part Number:	A-LF-1789
Element Change Clearance:	1.5" (40 mm)
Weight of KF3-SKB:	11.5 lbs (5.2 kg)

Metric dimensions in ( ).

Filter Model Number Selection

How to Build a Valid Model Number for a Schroeder KF3-SKB:

BOX 1	BOX 2	BOX 3	BOX 4
KF3-SKB –	–	–	

Example: NOTE: One option per box

BOX 1	BOX 2	BOX 3	BOX 4	
KF3-SKB –	–	P –	Y	= KF3-SKBPY

BOX 1 – Filter Series

KF3-SKB

BOX 2 – Seal Material

Omit =	Buna N

BOX 3 – Porting

P =	1½" NPTF

BOX 4 – Dirt Alarm® Options

	Omit =	None
Visual	Y =	Vacuum gauge
Electrical	VS =	Electrical Vacuum Switch
	VS1 =	Heavy-Duty Vacuum Switch

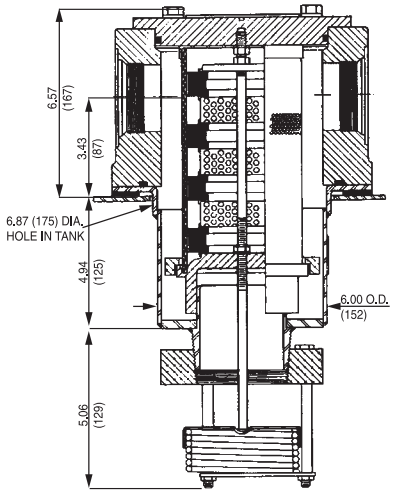
NOTE:

Box 1. Element replacement part number: A-LF-1789.

Tank-Mounted Magnetic Suction Seperators BFT-SKB

Features and Benefits

- Protects components downstream by capturing potentially harmful ferrous particles



Metric dimensions in ( ).

Specifications

Flow Rating:	75 gpm (285 L/min)
Element Replacement Part Number:	with check valve: A-SKB-3-76 without check valve: SKB-3
Element Change Clearance:	13.5" (345 mm)
Weight of BFT-SKB:	32.0 lbs (14.5 kg)

Filter Model Number Selection

How to Build a Valid Model Number for a Schroeder BFT-SKB::

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5
BFT-SKB –		–	–	

Example: NOTE: One option per box

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	
BFT-SKB –		– P –		– Y	= BFT-SKBPY

BOX 1

Filter Series
BFT-SKB

BOX 2

Seal Material
Omit = Buna N

BOX 3

Porting
P = 2½" NPTF
PP = Dual 2½" NPTF
F = 2½" SAE 4-bolt flange Code 61
FF = Dual 2½" SAE 4-bolt flange Code 61

Box 4

Other Options
Omit = None
C = Check Valve

BOX 5

Dirt Alarm® Options		
	Omit =	None
Visual	Y =	Vacuum gauge
	YR =	Vacuum gauge mounted on opposite side of standard location
Electrical	VS =	Electrical Vacuum Switch
	VSR =	Electrical Vacuum Switch on opposite side of standard location
	VS1 =	Heavy-Duty Vacuum Switch

NOTE:

Box 1. See specifications on previous page for element replacement part numbers.

Magnet Inserts for Filters

Magnet Inserts for Filters

K9, 2K9/3K9, MKF50, MKC50, KF5, IRF, KL3, KF30, KF50, KC50, KC65 and TF50 are available with magnet inserts to trap ferrous material that passes through the filter element.

These inserts are removed with the element each time service is performed and cleaned before being reinserted with new elements.

Replacements are available by ordering parts:

	Single Element	Double Element	Triple Element
K9, 2K9/3K9, MKF50, MKC50, KF5, IRF, KL3, KF30, KF50, KC50, KC65, KF3, LF1, MLF1	A-LF-1592	A-LF-1593	A-LF-1594
TF50	A-TF-301-1	A-TF-302-1