

GRESEN®

Hydraulic And Lube Filter Series

Catalog 2300-GR1/US



Parker Filtration

Global Filtration Technology

The Parker Hannifin Filtration Group assures:

- Consistent quality
- Technical innovation
- Premier customer service

Parker's technical resources provide the right filtration technologies that conform to your requirements. That's why thousands of manufacturers and equipment users around the world rely on Parker Filtration products and people.

Worldwide Sales and Service

Parker operates sales and service centers in major industrial areas worldwide. Call 1-800-C-PARKER for more information and for a synopsis of our Filtration Technology Textbook.

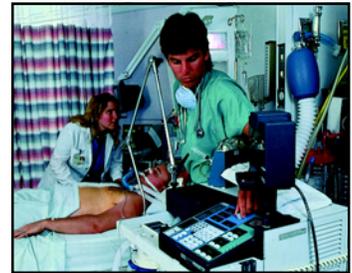
Hydraulic, Lubrication & Coolant Filtration

High-performance filtration systems for production machinery in industrial, mobile and military/marine.



Compressed Air & Gas Filtration

Complete line of compressed air/gas filtration products; coalescing, particulate and adsorption filters in many applications in many industries.



Process & Chemical Fluid Filtration

Liquid filtration systems for beverage, chemical and food processing; cosmetic, paint, water treatment; photo-processing; and micro-chip fabrication.



Fuel Conditioning & Filtration

Parker air, fuel and oil filtration systems provide quality protection for engines operating in any environment, anywhere in the world.



Legal Notifications



WARNING

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The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Offer of Sale

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Parker/Gresen General Introduction

When Parker Hannifin acquired Gresen, it was an opportunity for product extension and cross selling. Gresen was a manufacturer of a wide range of hydraulic pumps, motors, cylinders, control valves, filter and electronic controls for on and off highway vehicles.

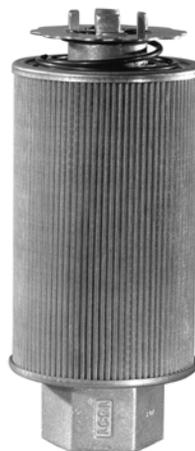
Gresen is a strategic complement to Parker's existing hydraulics business, adding a variety of mobile products which will offer customers the convenience and value of total system capabilities for their motion and control applications, all from one source.

FST2 Series

Hydraulic and Lube Filters

Sump Type Filter Assembly

- Easy installation and tools free serviceability.
- Five elements including washable wire mesh.
- Two built-in by-pass valves available.
- NPT and SAE ports available for plumbing versatility.



Specifications:

Nominal Flow Rating:
50 GPM (189 litres/min)

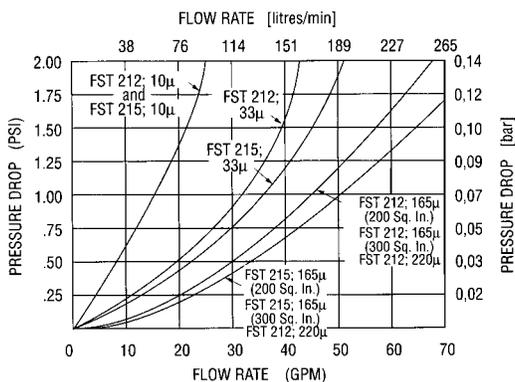
Operating Temperature:
-65°F (-54°C) to 250°F (121°C)

Materials:
Center Post: Cast Aluminum
Seals: Buna-N

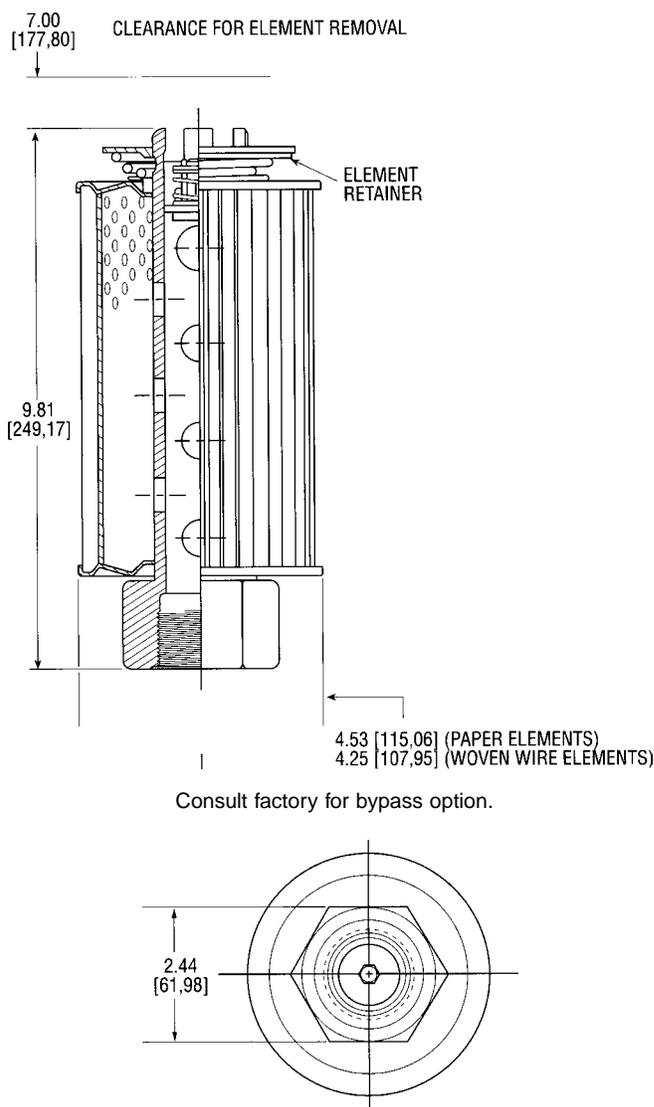
Fluid Compatibility:
All petroleum base fluids

Approximate Shipping Weight:
3 lbs (1.4 kg)

Pressure Curves

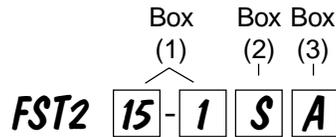


Dimensions=Inches [millimeters]



FST2 How to Specify

Example:



Box 1: Port Type	
Symbol	Description
12-1	NPT 1¼"
15-1	NPT 1½"
12-2	SAE #20

Box 2: Filter Elements	
Symbol	Description
E	10 micron cellulose
L	33 micron cellulose
S	165 micron/ 100 wire mesh (200 sq. ft.)
T	165 micron/ 100 wire mesh (300 sq. ft.)
U	220 micron/ 60 wire mesh

Box 3: By-Pass Springs	
Symbol	Description
A	3 PSI (0.2 Bar)
N	No By-Pass

Replacement Elements

Code	Description	Service Kit Numbers
		Elements
E	10 micron cellulose	K-23026
L	33 micron cellulose	K-23027
S	165 micron/100 wire mesh (200 sq. ft.)	K-25001
T	165 micron/100 wire mesh (300 sq. ft.)	K-25002
U	220 micron/60 wire mesh	K-23011

New Style By-Pass Service Kits

Individual Bypass Service kits	Code	Description
927719	N	No By-Pass
930506	A	3 PSI (0.2 bar) By-Pass Kit
N/A	B	N/A

FST3 Series

Hydraulic and Lube Filters

Tank Mounted Suction Screens

- Cast iron bushings for long lasting durability.
- Thru-wall design for easy installation and serviceability.
- Twelve washable stainless steel wire mesh elements.
- Optional built-in by-pass for pump protection.
- NPT ports from ½" to 3" for plumbing versatility.



Specifications:

Nominal Flow Rating:
Up to 100 GPM

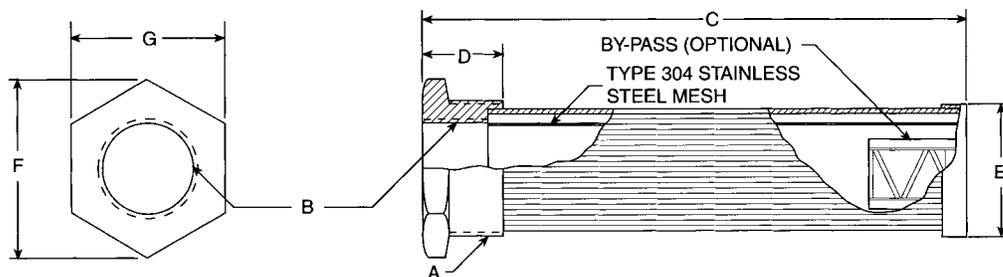
Operating Temperature:
-65°F (-54°C) to 250°F (121°C)

Materials:

Bushings: Cast Iron
Screen: 140μ Stainless Steel Wire Mesh

Fluid Compatibility:

All petroleum base fluids



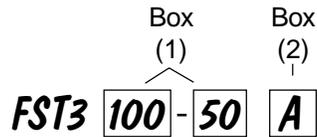
Dimensions

Model Code	Flow Rating		NPT Bushing		Length	Dimensions		Diameter		Dimensions	Dimensions
	gpm	lpm	inches	inches	inches (mm)	inches	(mm)	inches	(mm)	inches (mm)	inches (mm)
			A	B	C	D		E		F	G
FST 100-50	5	18.93	1	½	5.34 (135.64)	1.10 (27.94)		1.03 (26.16)		1.65 (41.91)	1.45 (36.83)
FST 100-50 A	5	18.93	1	½	5.34 (135.64)	1.10 (27.94)		1.03 (26.16)		1.65 (41.91)	1.45 (36.83)
FST 125-75	10	37.85	1¼	¾	8.17 (207.52)	1.20 (30.48)		1.36 (34.54)		2.05 (52.07)	1.81 (45.97)
FST 125-75 A	10	37.85	1¼	¾	8.17 (207.52)	1.20 (30.48)		1.36 (34.54)		2.05 (52.07)	1.81 (45.97)
FST 150-100	15	56.78	1½	1	8.20 (208.28)	1.30 (33.02)		1.62 (41.15)		2.50 (63.50)	2.20 (55.88)
FST 150-100 A	15	56.78	1½	1	8.20 (208.28)	1.30 (33.02)		1.62 (41.15)		2.50 (63.50)	2.20 (55.88)
FST 200-125	25	94.63	2	1¼	9.04 (229.62)	1.30 (33.02)		2.00 (50.80)		2.94 (74.68)	2.57 (65.28)
FST 200-125 A	25	94.63	2	1¼	9.04 (229.62)	1.30 (33.02)		2.00 (50.80)		2.94 (74.68)	2.57 (65.28)
FST 300-200	50	189.25	3	2	9.70 (246.38)	1.70 (43.18)		3.00 (76.20)		3.76 (95.50)	3.25 (82.55)
FST 300-200 A	50	189.25	3	2	9.70 (246.38)	1.70 (43.18)		3.00 (76.20)		3.76 (95.50)	3.25 (82.55)
FST 400-300	100	378.50	4	3	11.30 (287.02)	1.80 (45.72)		4.00 (101.60)		5.34 (135.64)	4.67 (118.62)
FST 400-300 A	100	378.50	4	3	11.30 (287.02)	1.80 (45.72)		4.00 (101.60)		5.34 (135.64)	4.67 (118.62)

NOTE: Models with an "A" suffix, contain an integral 3 PSI (0.2 bar) By-Pass.

FST3 How to Specify

Example:



Box 1: Element Connection Thread Sizes	
Symbol	Description
100-50	1" NPT Male Tank and ½" NPT Female Element
125-75	1¼" NPT Male Tank and ¾" NPT Female Element
150-100	1½" NPT Male Tank and 1" NPT Female Element
200-125	2" NPT Male Tank and ¾" NPT Female Element
300-200	3" NPT Male Tank and 2" NPT Female Element
400-300	4" NPT Male Tank and 3" NPT Female Element

Box 2: By-Pass Springs	
Symbol	Description
A	3 PSI (0.2 Bar)
N	No Bypass

FBR2 Series

Hydraulic and Lube Filters

Pressurized Reservoir Filter Breather

- One pressurized spring to reduce chance of pump cavitation.
- Low profile, inexpensive spin-on elements in 4" and 6" versions.
- Filters incoming air, allowing clean atmospheric pressure into reservoir.



Specifications:

Air Permeability:

4" Element = 52CFM (409.1 cu.cms/min)
6" Element = 60CFM (472.0 cu.cms/min)

Operating Pressure (Max.):

100 PSI (6.9 bar)

Degree of Filtration:

10 μ Micron Nominal

Operating Temperature:

-65°F (-54°C) to 250°F (121°C)

Materials:

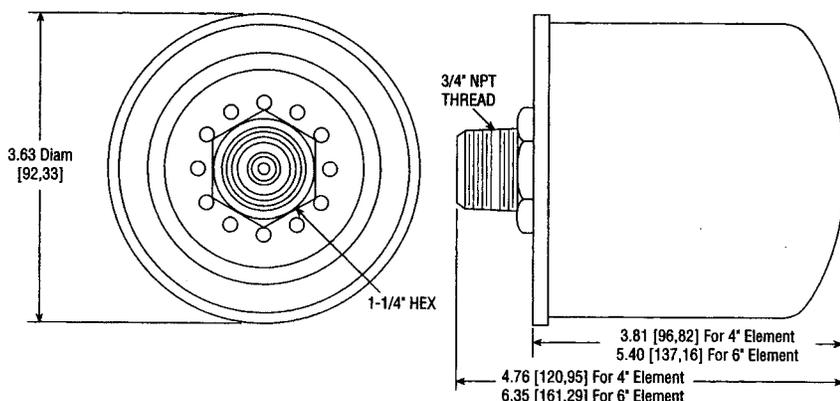
Element: Steel Can, Cellulose Media
Seals: Buna-N
Air Valve: Steel

Approximate Shipping Weight:

2.5 lbs (1.1 kg)



Dimensions=inches [millimeters]



FBR2 How to Specify

Example:

Box Box
(1) (2)
|
|

FBR2 04 - A

Box 1: Filter Element with Threaded Adapter	
Symbol	Description
04	4" Element 10 Micron 52 CFM (409.1 ccm)
06	6" Element 10 Micron 60 CFM (472.0 ccm)

Box 2: Air Bypass Valve	
Symbol	Description
A	Adapter With 5 PSI Bypass
N	Adapter With No Bypass

Individual Element Service Kit: (04) Filter Breathers

Part Number	Description
K-45000	(04) Replacement Element Only

Individual Element Service Kit: (06) Filter Breathers

Part Number	Description
K-22001	(06) Replacement Element Only

Replacement Bypass Valve

Part Number	Description
355264	Adapter Only
936173	Adapter With 5 PSI Bypass

NOTE: Recommended canister change out is after 500 hours of operation. More frequent replacement may be required when operated in heavily contaminated areas such as grinding operations, primary metal mills, and on mobile equipment. Under such conditions, increase replacement frequency to every 250 hours.

FSP1 Series

Hydraulic and Lube Filters

Low Pressure Spin-On Type

Specifications:

Pressure Ratings:

Maximum Allowable Operating Pressure (MAOP): 150 psi (10.3 bar)

Design Safety Factor: 2.5:1

Operating Temperatures:

-40°F to 225°F (-40°C to 107°C)

Element Collapse Rating:

100 psid minimum

Element Condition Indicators:

Gauge: Color coded 15/25 psi

Pressure Switch:

Normally open
20 +/- 2 psi
5 Amps @ 24 VDC

Vacuum Switch:

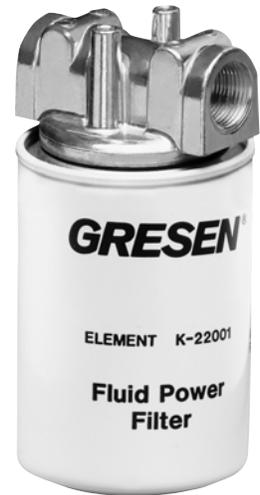
Normally open
5" +/- 1" Hg
1.0 Amp @ 120 VAC

Filter Material:

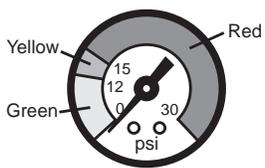
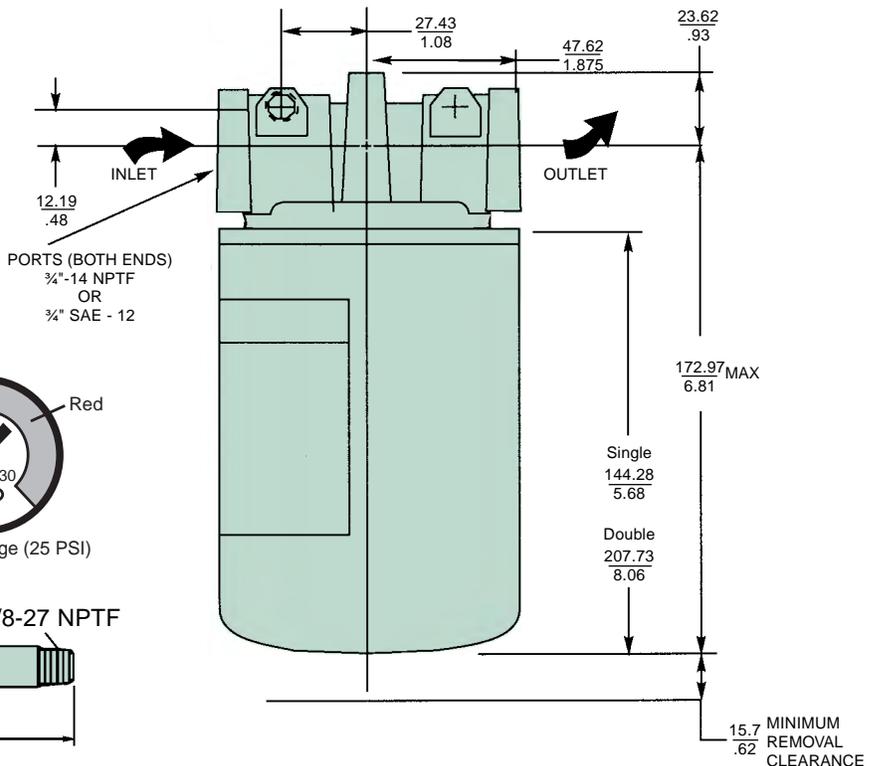
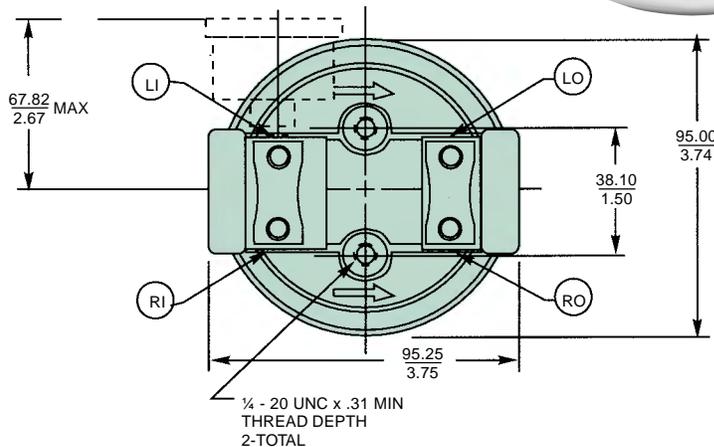
Head: Aluminum
Canister: Low Carbon Steel

Shipping Weights (approximate):

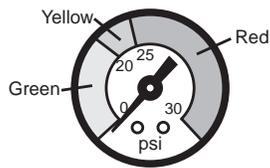
1.6 lbs.



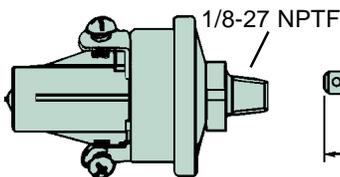
Linear Measure: millimeter
inch



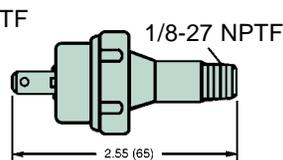
Indicator Gauge (15 PSI)



Indicator Gauge (25 PSI)



VACUUM SWITCH



PRESSURE SWITCH

FSP1 How to Specify

Example:

Box (1) Box (2) Box (3) Box (4) Box (5)
 ↓ ↓ ↓ ↓ ↓
FSP107 - 2 - E - D - 3 - H

Symbol	Description
FSP107	Spin-on (¾" Nom.)

BOX 1 : Port Size	
Symbol	Description
1	¾" NPT
2	SAE 12

BOX 2: Element Media	
Symbol	Description
E	10C-1, 10 micron cellulose/poly, single length
F	10C-2, 10 micron cellulose/poly, double length
G	10B-1, 10 micron glass, single length
J	25C-1, 25 micron cellulose, single length

BOX 3: Bypass Setting	
Symbol	Description
N	None
A	3 psi
D	15 psi
F	25 psi

BOX 4: Indicator	
Symbol	Description
N	None
1	Pressure Gauge
2	Vacuum Gauge
3	Tri-color, 15 psi
4	Tri-color, 25 psi
6	Vacuum Switch, 2 psi
7	Pressure Switch
Note: Indicator will be packaged separately.	

BOX 5: Gauge Port Location	
Symbol	Description
H	Inlet and Outlet, Both Sides All ports drilled and tapped

Fluid Condition Indicators

Part Number	Description
K-F-PSI	0-200 PSI Pressure gauge
934239	Vacuum gauge
926359	15 PSI Pressure switch
926923	25 PSI Pressure switch
934238	15 PSI Tri-color gauge
934237	25 PSI Tri-color gauge
926949	Vacuum switch

Replacement Bypass Valves

Part Number	Description
929057	3 PSI
929059	15 PSI
928979	25 PSI

Replacement Spin-on Cans

Part Number	Description
K-22001	10 micron cellulose, single length
K-22017	10 micron cellulose/poly, double length
K-22016	10 micron glass/synthetic, single length
K-22002	33 micron cellulose, single length

NOTE: For replacement head, consult factory.

FSP2 Series

Hydraulic and Lube Filters

Low Pressure Spin-On Type

Specifications:

Pressure Ratings:

Maximum Allowable Operating Pressure (MAOP): 150 psi (10.3 bar)

Design Safety Factor: 2.5:1

Operating Temperatures:

-40°F to 225°F (-40°C to 107°C)

Element Collapse Rating:

100 psid minimum

Element Condition Indicators:

Gauge: Color coded 15/25 psi

Pressure Switch:

Normally open
20 +/- 2 psi
5 Amps @ 24 VDC

Vacuum Switch:

Normally open
5" +/- 1" Hg
1.0 Amp @ 120 VAC

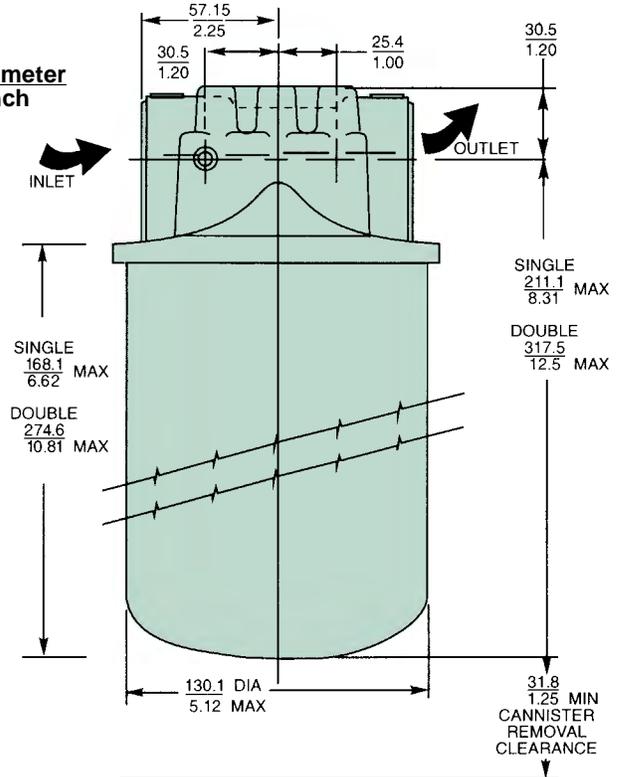
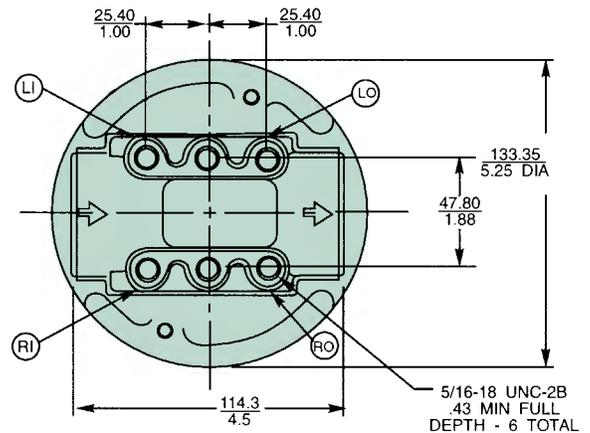
Filter Material:

Head: Aluminum
Canister: Low Carbon Steel

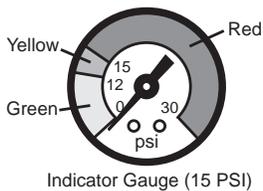
Shipping Weights (approximate):

Single length: 3.7 lbs.
Double length: 5.3 lbs.

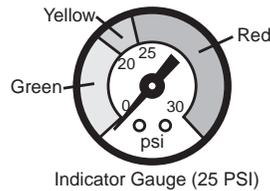
Linear Measure: millimeter
inch



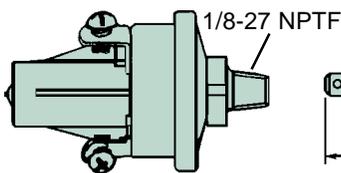
Ports: (both ends)
1/4"-11 1/2" NPTF
or
1/4" SAE-20



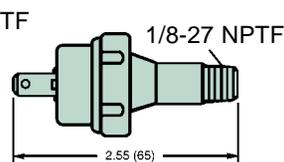
Indicator Gauge (15 PSI)



Indicator Gauge (25 PSI)



VACUUM SWITCH



PRESSURE SWITCH

FSP2 How to Specify

Example:

Box (1) Box (2) Box (3) Box (4) Box (5)
 ↓ ↓ ↓ ↓ ↓
FSP212 - 1 - F - F - 4 - H

Symbol	Description
FSP212	Spin-on (1¼" Nom.)

BOX 1: Port Size	
Symbol	Description
1	1¼" NPT
2	SAE 20

BOX 2: Element Media	
Symbol	Description
A	03B-1, 3 micron glass combo, single length
B	03B-2, 3 micron glass/synth., double length
E	10C-1, 10 micron cellulose/poly, single length
F	10C-2, 10 micron cellulose/poly, double length
J	25C-1, 25 micron cellulose, single length
K	10B-1, 10 micron glass, single length
L	10B-2, 10 micron glass, double length

BOX 3: Bypass Setting	
Symbol	Description
N	None
A	3 psi
D	15 psi
F	25 psi

BOX 4: Indicator	
Symbol	Description
N	None
1	Pressure Gauge
2	Vacuum Gauge
3	Tri-color, 15 psi
4	Tri-color, 25 psi
6	Vacuum Switch, 2 psi
7	Pressure Switch

Fluid Condition Indicators

Part Number	Description
K-F-PSI	0-200 PSI Pressure gauge
934239	Vacuum gauge
926359	15 PSI Pressure switch
926923	25 PSI Pressure switch
934238	15 PSI Tri-color gauge
934237	25 PSI Tri-color gauge
926949	Vacuum switch

BOX 5: Gauge Port Location	
Symbol	Description
H	Inlet and Outlet, Both Sides

Replacement Bypass Valves

Part Number	Description
K-23046	No Bypass
930506	3 PSI
930509	15 PSI
930507	25 PSI

Replacement Spin-on Cans

Part Number	Description
K-23020	3 micron glass combo, single length
K-23062	3 micron glass/synth., double length
K-23018	10 micron cellulose/poly, single length
K-23063	10 micron cellulose/poly, double length
K-23019	25 micron cellulose, single length
K-23064	10 micron glass, single length
K-23065	10 micron glass, double length

NOTE: For replacement head, consult factory.

FSP4 Series

Hydraulic and Lube Filters

Low Pressure Spin-On Type

- Heavy duty cast aluminum head for economical long lasting durability.
- NPT, SAE, BSP and SAE 4-bolt flange ports available for plumbing versatility.
- Easy to install and service spin-on elements.
- Standard (6") and long (10") elements for greater contamination capacities.
- Three field installable, built in by-pass options.



Specifications:

Nominal Flow Rating:
90 GPM (340 litres/min)

Operating Pressure (Max.):
200PSI (14 bar)

Operating Temperature:
-65°F (-54°C) to 250°F (121°C)

Materials:

Head: Cast Aluminum
Seals: Buna-N

Fluid Compatability:
All petroleum base fluids

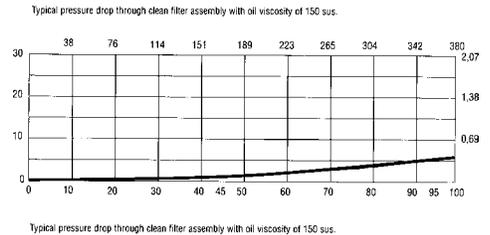
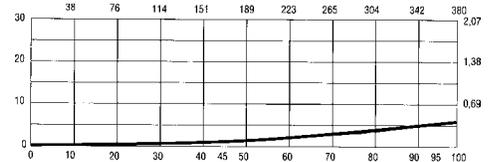
Approximate Shipping Weight:
19 lbs. (8.6 kg)

Element Condition Indicators:
Gauge: Color coded 15/25 psi

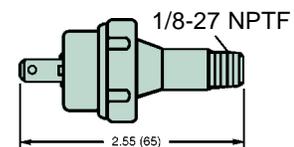
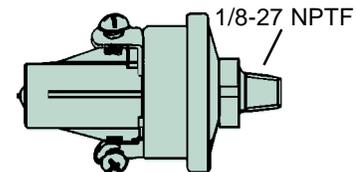
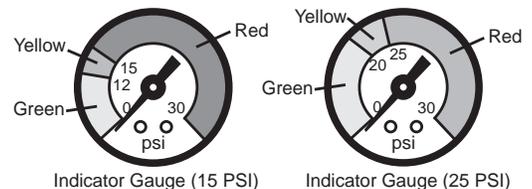
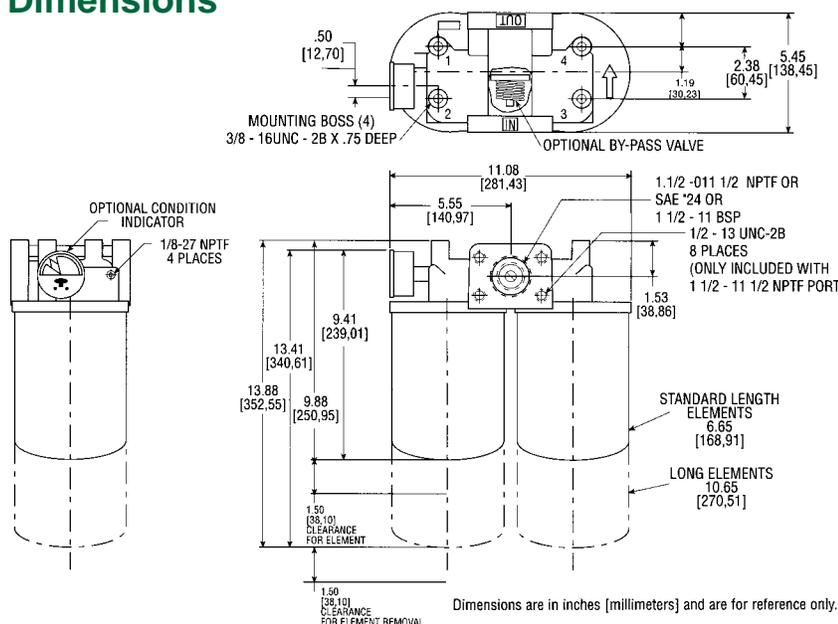
Pressure Switch:
Normally open
20 +/- 2 psi
5 Amps @ 24 VDC

Vacuum Switch:
Normally open
5" +/- 1" Hg
1.0 Amp @ 120 VAC

Pressure Curves



Dimensions



FSP4 How to Specify

Example:

Box Box Box Box Box
(1) (2) (3) (4) (5)
↓ ↓ ↓ ↓ ↓

FSP415 - 2 A D 3 H

Box 1: Inlet & Outlet Port Size Symbol	Description
2	SAE #24
3	BSPP 1½"
5	1¼" NPT and 1½" SAE Flange

Box 2: Elements Symbol	Description
A	3 micron glass combo, single length
B	3 micron glass/syn., double length
E	10 micron cellulose/ poly, single length
F	10 micron cell/poly, double length
J	25 micron cellulose, single length
K	10 micron glass, single length
L	10 micron glass, double length

Box 3: By-Pass Springs and Service Kits		
Symbol	Description	Service Kit
N	None	K-23046
A	3 PSI (0.2 Bar)	930506
D	15 PSI (1.0 Bar)	930509
F	25 PSI (1.7 Bar)	930507

BOX 4 : Indicator	
Symbol	Description
N	None
1	Pressure Gauge
2	Vacuum Gauge
3	Tri-color, 15 psi
4	Tri-color, 25 psi
6	Vacuum Switch, 2 psi
7	Pressure Switch

Box 5: Port Location	
Symbol	Description
H	Inlet and Outlet, Both Sides

Note: Indicator ports are
1/8" - 27 NPT

Replacement Spin-on Cans

Part Number	Description
K-23020	3 micron glass combo, single length
K-23062	3 micron glass/syn., double length
K-23018	10 micron cellulose/ poly, single length
K-23063	10 micron cell/poly, double length
K-23019	25 micron cellulose, single length
K-23064	10 micron glass, single length
K-23065	10 micron glass, double length

Fluid Condition Indicators

Part Number	Description
K-F-PSI	0-200 PSI Pressure gauge
934239	Vacuum gauge
926359	15 PSI Pressure switch
926923	25 PSI Pressure switch
934238	15 PSI Tri-color gauge
934237	25 PSI Tri-color gauge
926949	Vacuum switch

FLR2 Series

Hydraulic and Lube Filters

Low Pressure Cartridge Type

- Heavy duty cast aluminum head for economical long lasting durability.
- NPT, SAE, BSPP and flange available for plumbing versatility.
- Seven element choices for application variations.
- Three field installable, built in by-pass options.
- Five filter condition indicators to aid in circuit troubleshooting and system preventive maintenance plan



Specifications:

Nominal Flow Rating:
50 GPM (189 litres/min)

Operating Pressure (Max.):
200PSI (14 bar)

Operating Temperature:
-65°F (-54°C) to
250°F (121°C)

Materials:
Head: Cast Aluminum
Bowl: Zinc Plated Steel
Seals: Buna-N

Fluid Compatibility:
All petroleum base fluids

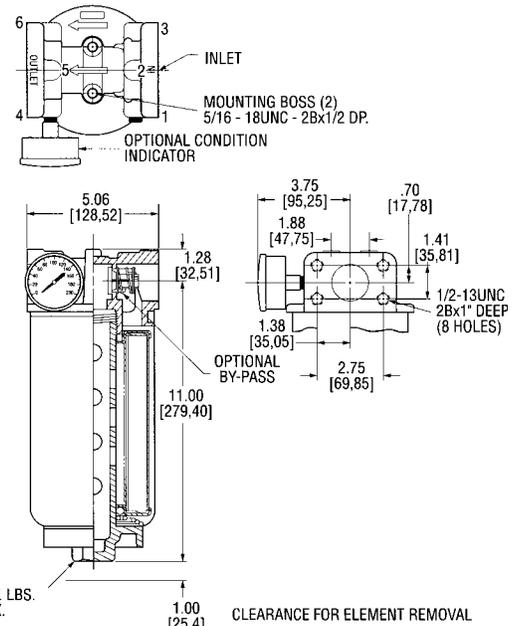
Approximate Shipping Weight:
9 lbs. (4.1 kg)

Element Condition Indicators:
Gauge: Color coded 15/25 psi

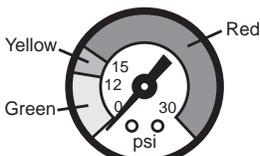
Pressure Switch:
Normally open
20 +/- 2 psi
5 Amps @ 24 VDC

Vacuum Switch:
Normally open
5" +/- 1" Hg
1.0 Amp @ 120 VAC

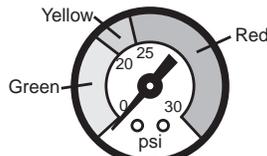
Dimensions



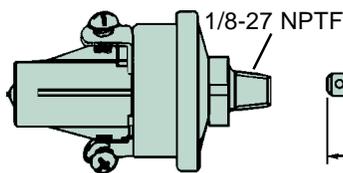
Dimensions are in inches [millimeters] and are for reference only.



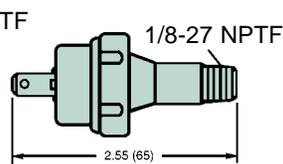
Indicator Gauge (15 PSI)



Indicator Gauge (25 PSI)

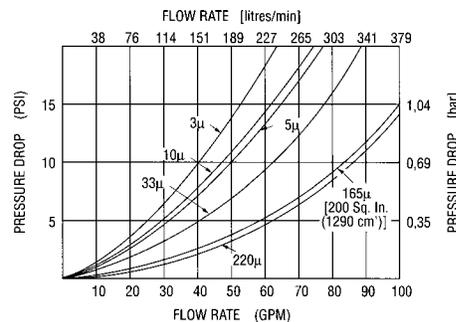


VACUUM SWITCH



PRESSURE SWITCH

Pressure Curves



Typical pressure drop through clean filter assembly with oil viscosity of 150 sus.

FLR2 How to Specify

Example:

Box Box Box Box Box
(1) (2) (3) (4) (5)
↓ ↓ ↓ ↓ ↓

FLR215 - 1 A D 3 H

Box 1: Inlet & Outlet Port Size Symbol	Description
1	NPT 1½"
2	SAE 20
3	BSPP 1½"
9	1¼" NPT and 1½" SAE Flange

Box 2: Elements Symbol	Description
A	3 micron glass combination
W	5 micron glass
E	10 micron cellulose
L	33 micron cellulose
S	165 micron/ 100 wire mesh (200 sq. in.)
T	165 micron/ 100 wire mesh (300 sq. in.)
U	220 micron/ 60 wire mesh

Box 3: By-Pass Springs and Service Kits Symbol	Description	Service Kit
N	None	K-23046
A	3 PSI (0.2 Bar)	930506
D	15 PSI (1.0 Bar)	930509
F	25 PSI (1.7 Bar)	93507

BOX 4 : Indicator Symbol	Description
N	None
1	Pressure Gauge
2	Vacuum Gauge
3	Tri-color, 15 psi
4	Tri-color, 25 psi
6	Vacuum Switch, 2 psi
7	Pressure Switch

Box 5: Port Location Symbol	Description
H	Inlet and Outlet, Both Sides

These ports are 1/8" - 27 NPTF
(4) ea 1/8" pipe plugs included
with every assembly

Element Service Kits

Part Number	Description
K-23045	3 micron glass combination
K-23049	5 micron glass
K-23015	10 micron cellulose
K-23014	33 micron cellulose
K-23001	165 micron/100 wire mesh (200 sq. in.)
K-23003	165 micron/100 wire mesh (300 sq. in.)
K-23002	220 micron/60 wire mesh

Fluid Condition Indicators

Part Number	Description
K-F-PSI	0-200 PSI Pressure gauge
934239	Vacuum gauge
926359	15 PSI Pressure switch
926923	25 PSI Pressure switch
934238	15 PSI Tri-color gauge
934237	25 PSI Tri-color gauge
926949	Vacuum switch

RF4 Series

Hydraulic and Lube Filters

RF4 Return Line Filter

150 psi Application

Full Flow Bypass

Mandatory to prevent excessive back pressure into system, which could cause improper adjustments to actuator circuits to meet cycle times.

Gauge Port Available

For visual or electrical indication.

Gauge or Electrical Indicator

With 15 PSI and 25 PSI calibration.

Element

2, 3, 5, 10, and 20 micron and water removal elements with $\beta \geq 200$ with dual stage filtering media for up to 40% increased dirt holding capacity.

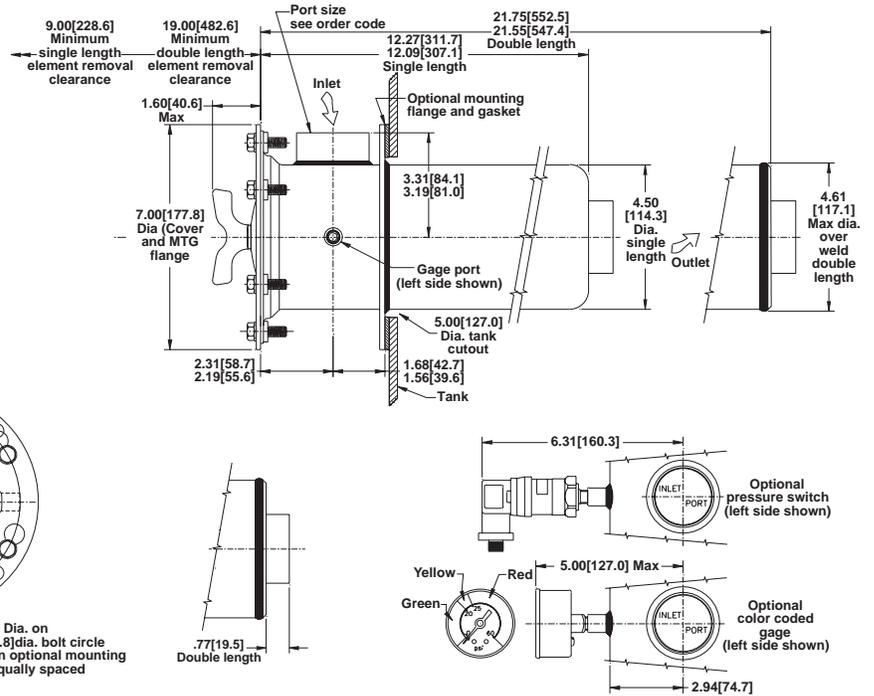
Mounting Provisions

Mounting flange (optional).
Simple in-tank installation.

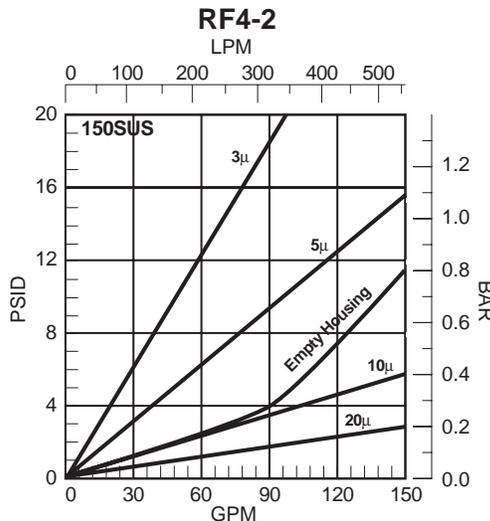
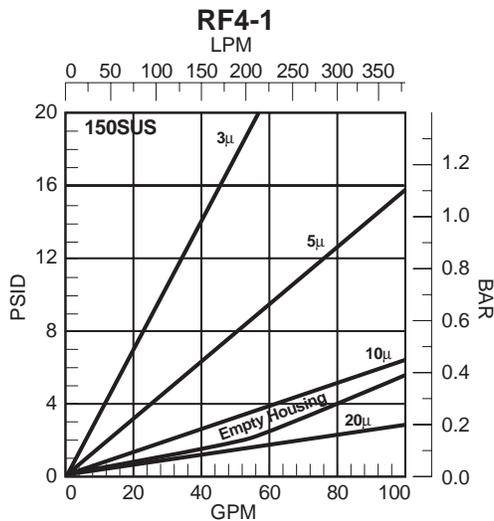
Single or Double Length



RF4-1



Flow Rate Curves



RF4 How to Specify

Example:

Box (1)	Box (2)	Box (3)	Box (4)	Box (5)	Box (6)	Box (7)	Box (8)	Box (9)
	RF4	1	10Q	GL	25	P999	1	Design number assigned by Parker

BOX 1: Seals	
Symbol	Description
None	Buna N (nitrile)
F3	Fluorocarbon

BOX 2: Housing	
Symbol	Description
RF4	Return filter

BOX 3: Housing Length	
Symbol	Description
1	Single length
2	Double length
1F	Single length with mounting flange
2F	Double length with mounting flange

BOX 4: Filter Media	
Symbol	Description
20C	20 micron cellulose
10C	10 micron cellulose
03C	3 micron cellulose
WR	Water removal
20Q	Microglass III
10Q	Microglass III
05Q	Microglass III
02Q	Microglass III

BOX 5: Indicator	
Symbol	Description
N	No indicator, no pressure port
GL	Gauge, left side
PL	No indicator, plugged pressure port (left side)
SL	Pressure switch, left side

Note: Left side is on the viewer's left when looking into inlet with bowl down.

BOX 6: Bypass Setting	
Symbol	Description
15	15 psid
25	25 psid

BOX 7: PORTS	
Symbol	Description
Inlet (Side)	
E9	1½" NPT
P9	SAE-24
Outlet (Bottom)	
99	No fitting
E9	1½" NPT
F8	Check valve

Note: Two symbols required. The first symbol describes inlet port.

BOX 8: Modifications	
Symbol	Description
1	None
11	No bypass

BOX 9: Design Number
Applied to the filter by Parker Hydraulic Filter Division. Use the full model code, including the design number when ordering replacement parts.

REPLACEMENT ELEMENTS

Element Code	ELEMENT: SINGLE (RF4-1)	ELEMENT: DOUBLE (RF4-2)
	Fluorocarbon P/N	Fluorocarbon P/N
03C	925772	925791
10C	925520	925792
20C	925773	925793
WR	930156	928557
20Q	931018Q	931020Q
10Q	932670Q	932679Q
05Q	932669Q	932678Q
02Q	932668Q	932677Q

PARTS LIST

Description	Part Number	Quantity	Description	Part Number	Quantity
Bowl assembly	Consult Factory	1	Elements	See Table	1
Cover assembly			Check valve	925119	1 (optional)
15 psid bypass	932908	1	Pressure gauge		
25 psid bypass	932909	1	15 psi	934238	1 (optional)
Cover o-ring			25 psi	934237	1 (optional)
Buna	N72247	1	Pressure Switch		
Fluorocarbon	V72247	1	15 psi	926359	1 (optional)
Hex head cap screws	926633	6	25 psi	926923	1 (optional)
Gasket (mounting flange)	928852	1			

FLR4 Series

Hydraulic and Lube Filters

Low Pressure Dual Element Cartridge Type

- Heavy duty cast aluminum head and zinc plated steel housing for economical long lasting durability.
- Dual element design for maximum contamination capacity.
- NPT, SAE, BSPP and flange available for plumbing versatility.
- Seven element choices for application variations.
- Four field installable, built in by-pass options for over pressure protection.
- Five filter condition indicators to aid in circuit troubleshooting and system preventive maintenance plans.



Specifications:

Nominal Flow Rating:
90 GPM (340 litres/min)

Operating Pressure (Max.):
200PSI (14 bar)

Operating Temperature:
-65°F (-54°C) to 250°F (121°C)

Element Condition Indicators:
Gauge: Color coded 15/25 psi

Pressure Switch:
Normally open
20 +/- 2 psi
5 Amps @ 24 VDC

Vacuum Switch:
Normally open
5" +/- 1" Hg
1.0 Amp @ 120 VAC

Materials:

Head: Cast Aluminum
Bowl: Zinc Plated Steel
Seals: Buna-N

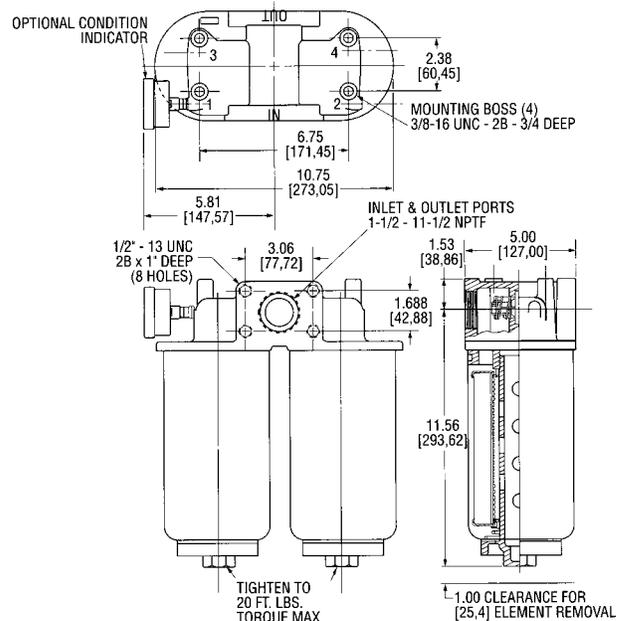
Fluid Compatability:

All petroleum base fluids

Approximate Shipping Weight:

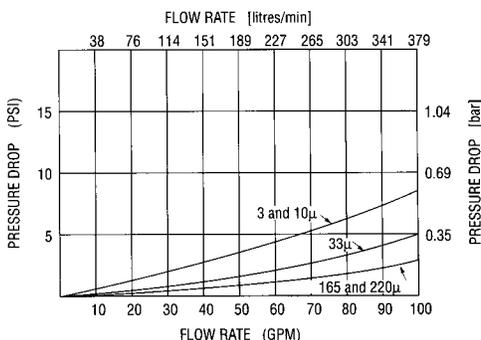
19 lbs. (8.6 kg)

Dimensions

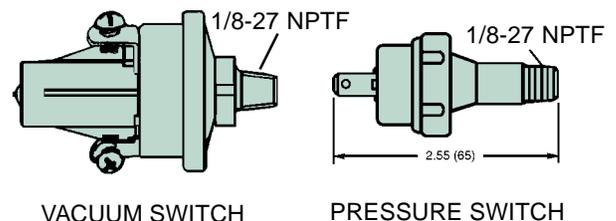
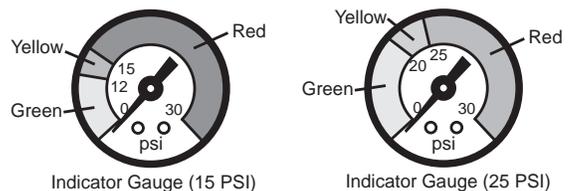


Dimensions are in inches [millimeters] and are for reference only.

Pressure Curves



Typical pressure drop through clean filter assembly with oil viscosity of 150 sus.



FLR4 How to Specify

Example:

Box Box Box Box Box
(1) (2) (3) (4) (5)

FLR415 - 5 A D 1 H

Box 1: Port Type	
Symbol	Description
2	SAE 24
3	BSPP 1½"
5	1¼" NPT and 1½" SAE SAE Flange

Box 2: Elements	
Symbol	Description
A	3 micron glass combination
W	5 micron glass
E	10 micron cellulose
L	33 micron cellulose
S	165 micron/ 100 wire mesh (200 sq. in.)
T	165 micron/ 100 wire mesh (300 sq. in.)
U	220 micron/ 60 wire mesh

Box 3: By-Pass Springs and Service Kits		
Symbol	Description	Service Kit
N	None	K-23046
A	3 PSI (0.2 Bar)	930506
D	15 PSI (1.0 Bar)	930509
F	25 PSI (1.7 Bar)	930507

Box 4: Filter Condition Indicators	
Symbol	Description
N	None
1	Pressure Gauge
2	Vacuum Gauge
3	Tri-color, 15 psi
4	Tri-color, 25 psi
6	Vacuum Switch, 2 psi
7	Pressure Switch

Box 5: Indicator Location	
H	Inlet and Outlet, Both Sides
<p>These ports are 1/8" - 27 NPTF (4) ea 1/8" pipe plugs included with every assembly</p>	

Element Service Kit Numbers

Part Number	Description
K-23045	3 micron glass combination
K-23049	5 micron glass
K-23015	10 micron cellulose
K-23014	33 micron cellulose
K-23001	165 micron/100 wire mesh (200 sq. in.)
K-23003	165 micron/100 wire mesh (300 sq. in.)
K-23002	220 micron/60 wire mesh

Fluid Condition Indicators

Part Number	Description
K-F-PSI	0-200 PSI Pressure gauge
934239	Vacuum gauge
926359	15 PSI Pressure switch
926923	25 PSI Pressure switch
934238	15 PSI Tri-color gauge
934237	25 PSI Tri-color gauge
926949	Vacuum switch

Reservoir Accessories

Hydraulic and Lube Filters

Non-Metallic Filler Breathers Single-Hole and Six-Hole Styles

Specifications:

Materials:

Body: Non-corrodible glass filled nylon.

Valve: Nylon/Nitrile.

Dipstick: ABS, acetal Hi/Lo indicators.

Filtration Element: Expanded polyurethane foam, 10 micron.

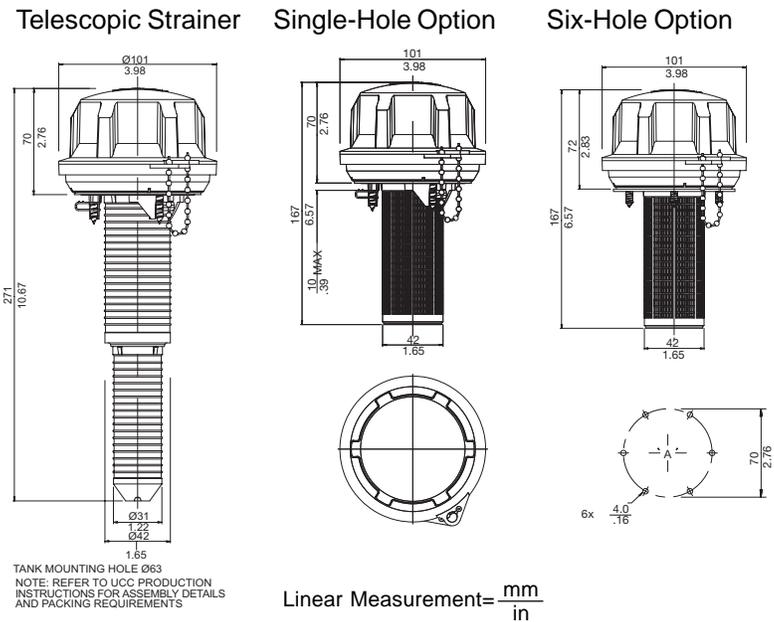
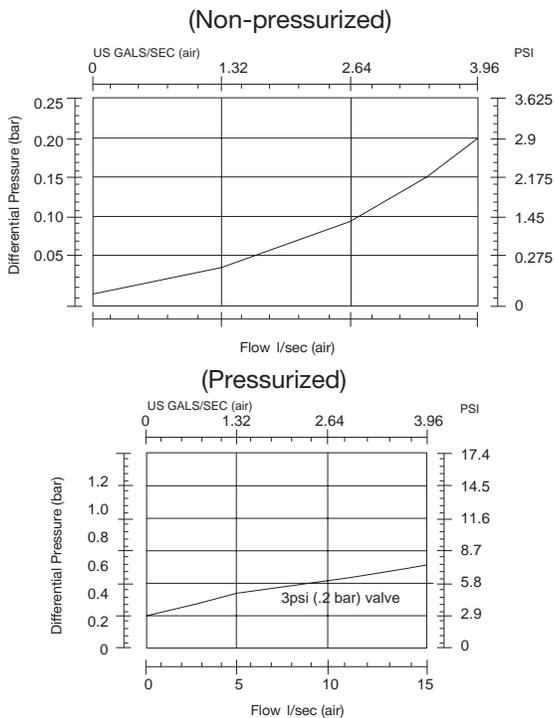
Operating Temperatures: -22°F (-30°C) to 195°F (90°C).

Seals: Nitrile (single-hole), cork gasket (six-hole).

Pressurization Options: 3 psi (0.2 bar).

Dipstick: (optional) 7.9 in. (200 mm) or 15.8 in. (400 mm) lengths with adjustable Hi/Lo indicators.

Anti-Splash Design!



Non-pressurized

Single-Hole	Six-Hole	Micron Rating	Description	Screws*
FB1.A1A1A2P	FB1.D1A1A2P	10	Filler breather without strainer	(6)-M10x.5
FB1.A1A1B2P	FB1.D1A1B2P	10	Filler breather with 3.7" (95 mm) strainer	(6)-M10x.5
FB1.A1A1C2P	FB1.D1A1C2P	10	Filler breather with telescopic strainer	(6)-M10x.5

Pressurized

Single-Hole	Six-Hole	Micron Rating	Description	Screws*
Not Available	FB1.D1B1A2P	10	3 psi (.2 bar) without strainer	(6)-M10x.5
Not Available	FB1.D1B1B2P	10	3 psi (.2 bar) with 3.7" (95 mm) strainer	(6)-M10x.5
Not Available	FB1.D1B1C2P	10	3 psi (.2 bar) with telescopic strainer	(6)-M10x.5

Dipsticks

Part Number	Description
DIP.FB2	Pack of (10) x 7.9"
DIP.FB4	Pack of (10) x 15.8"

*Mounting screws for six-hole only

Non-Metallic Breathers

Threaded Type

Specifications:

Materials:

Body: Nylon 66.

Valve: Nylon/Nitrile.

Dipstick: ABS, acetal Hi/Lo indicators.

Filtration Element: Expanded polyurethane foam, 10 micron.

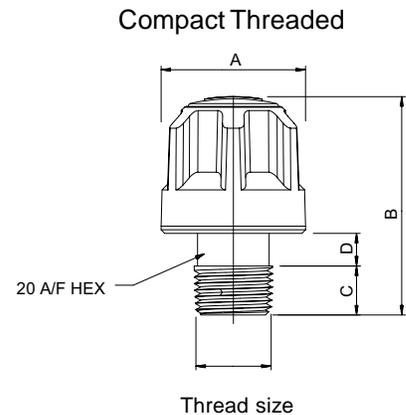
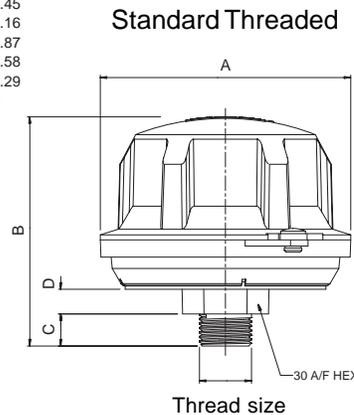
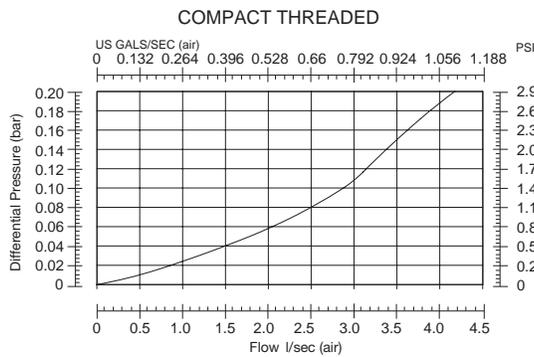
Operating Temperatures: -22°F (-30°C) to 195°F (90°C).

Seals: Nitrile.

Pressurization Options: 3 psi (0.2 bar).

Dipstick: (optional) 7.9 in. (200 mm) or 15.8 in. (400mm) lengths with adjustable Hi/Lo indicators.

Anti-Splash Design!



Compact Threaded

Part Number	Micron Rating	Thread	Pressure	"A"	"B"	"C"	"D"
SB1.A1A2P*	10	1/4"NPT	non-pressurized	1.6" (40 mm)	2.2" (57 mm)	.55" (14 mm)	.24" (6 mm)
SB1.B1A2P*	10	3/8" NPT	non-pressurized	1.6" (40 mm)	2.3" (57 mm)	.49" (12.5 mm)	.35" (9 mm)
SB1.C1A2P*	10	1/2" NPT	non-pressurized	1.6" (40 mm)	2.4" (60 mm)	.53" (13.5 mm)	.35" (9 mm)
SB1.D1A2P*	10	3/4" NPT	non-pressurized	1.6" (40 mm)	2.4" (60 mm)	.55" (14 mm)	.35" (9 mm)

*Pack of (10) pieces.

Standard Threaded

Part Number	Micron Rating	Thread	Pressure	"A"	"B"	"C"	"D"
FB1.C1A3A2P	10	1/2"NPT	non-pressurized	4.0" (101 mm)	3.7" (93 mm)	.51" (13 mm)	.39" (10 mm)
FB1.C1B3A2P	10	1/2" NPT	3 psi (.2 bar)	4.0" (101 mm)	3.7" (93 mm)	.51" (13 mm)	.39" (10 mm)
FB1.B1A3A2P	10	3/4" NPT	non-pressurized	4.0" (101 mm)	3.8" (95 mm)	.63" (16 mm)	.39" (10 mm)
FB1.B1B3A2P	10	3/4" NPT	3 psi (.2 bar)	4.0" (101 mm)	3.8" (95 mm)	.63" (16 mm)	.39" (10 mm)

Dipsticks

Part Number	Description
DIP.FB2	Pack of (10) x 7.9"
DIP.FB4	Pack of (10) x 15.8"

Reservoir Accessories

Hydraulic and Lube Filters

Metal Filler Breathers

Flange Type

Specifications:

Materials:

Cap & Plate: Nickel chrome plated steel.

Valve: Nylon/Nitrile.

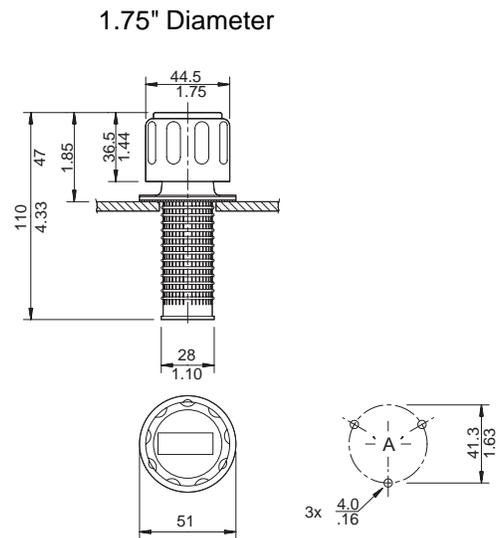
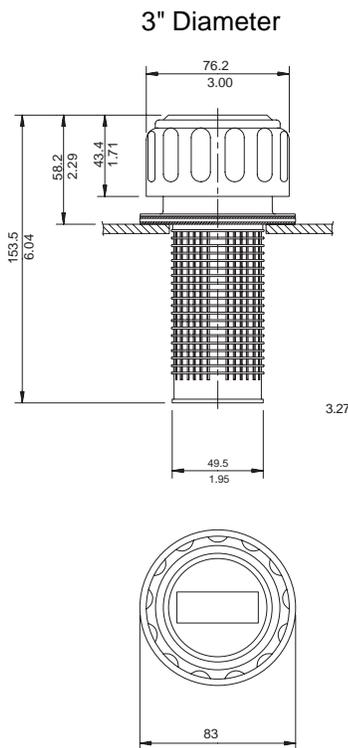
Gasket: Cork.

Filtration Element: Expanded polyurethane foam, 10 micron.

Operating Temperatures: -22°F (-30°C) to 195°F (90°C).

Seals: Nitrile.

Pressurization Options: none, 5 psi (0.35 bar).



Linear Measurement = $\frac{\text{mm}}{\text{in}}$

Flange Type, Non-pressurized

Part No.	Part No. (Cap Assy.)	Micron Rating	Air Flow	Description	Screws
AB.1163.10	CP1.D1A1A1P	10	2 gallon/sec. (7.5 l/sec.)	3" (76 mm) diameter	(6)-M10x.5
MB1.D1A1B2P	Not Available	10	2 gallon/sec. (7.5 l/sec.)	3" (76 mm) diameter, with locking lug	(6)-M10x.5
MB1.A1A1B1P	CP1.A2A1A1P	10	1.3 gallon/sec. (5 l/sec.)	1.75" (44.5 mm) diameter	(6)-M10x.5

Flange Type, Pressurized

Part No.	Part No. (Cap Assy.)	Micron Rating	Air Flow	Description	Screws
MB1.D1C1B1P	CP1.D1C1A1P	10	2 gallon/sec. (7.5 l/sec.)	5 psi (.35 bar), 3" (76 mm) diameter	(6)-M10x.5

Metal Breathers

Threaded Type

Specifications:

Materials:

Cap & Plate: Nickel chrome plated steel.
Valve: Nylon/Nitrile.

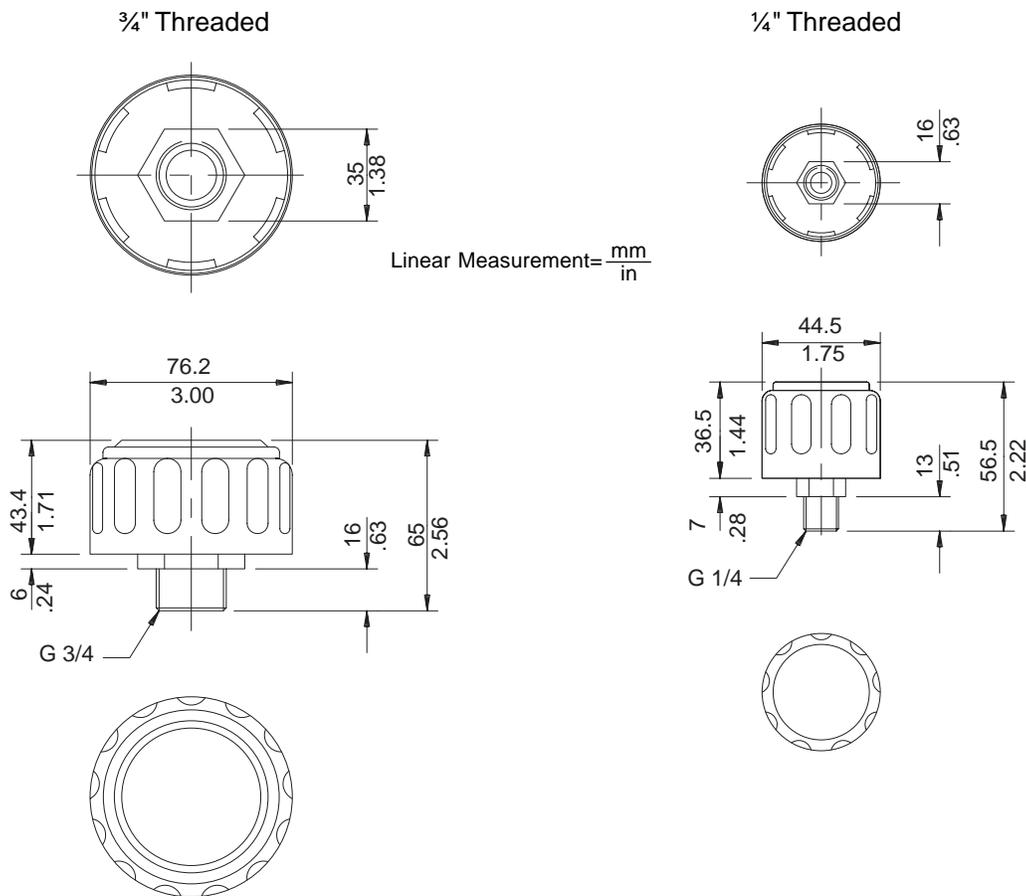
Gasket: Cork.

Filtration Element: Expanded polyurethane foam, 10 micron.

Operating Temperatures: -22°F (-30°C) to 195°F (90°C).

Seals: Nitrile.

Pressurization Options: none, 5 psi (0.35 bar).



Threaded, Non-pressurized

Part Number	Micron Rating	Air Flow	Thread	Description
MB1.B1A3A1P	10	1.3 gallon/sec. (5 l/sec.)	3/4" NPT	3" (76 mm) diameter
MB1.C1A3A1P	10	.7 gallon/sec. (2.5 l/sec.)	1/4" NPT	1.75" (44.5 mm) diameter

Threaded, Pressurized

Part Number	Micron Rating	Air Flow	Thread	Description
MB1.B1C3A1P	10	2 gallon/sec. (7.5 l/sec.)	3/4" NPT	5psi (.35 bar) with 3" (76 mm) diameter

Reservoir Accessories

Hydraulic and Lube Filters

Breathers

Desiccant Type

Specifications:

Materials:

Casing: Clarified copolymer polypropylene.

Cap: Copolymer polypropylene.

Stand pipe: PVC.

Filtration Element: Polyester, silica gel, activated carbon.

Operating Temperatures: -20°F (-29°C) to 250°F (121°C).

Seals: None.

Maximum Allowable

Operating Pressure (MAOP): 5 psi (.34 bar).

Particle Removal Efficiency:

98.7% (beta 75) @ 3 micron

99.5% (beta 200) @ 4 micron

99.9% (beta 1000) @ 5.3 micron

Weight:

934330 1.25 lbs. (.57 kg) each.

934331 1.75 lbs. (.79 kg) each.

934332 2.25 lbs. (1.02 kg) each.



Features

Foam Pads

Isolates the removal materials from contact with heavy reservoir mist and securely holds materials in place.

Filter Pads

Specially designed filter pads remove solid particulate on upstream side and then regenerate by releasing those particles when air flow reverses direction. Lower pad removes airborne contamination and second pad protects against any migration of desiccant and activated carbon.

Air Intakes

A total of eight air intakes may be exposed to allow air to freely flow in and out of the TriCeptor.

Silica Gel Desiccant

Has the highest removal capability by volume of any adsorption method. Indicates condition by changing color.

Activated Carbon

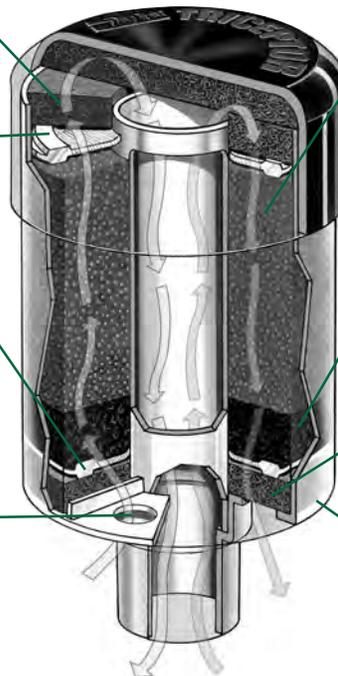
Removes oil vapors and associated odors. The mixture percentage is designed to provide a life consistent with the silica gel.

Foam pad

Insures filter pad is properly positioned and protects it from external damage.

Molded Housing

Durable shock absorbing casing provides reliable service and simple press in mounting.

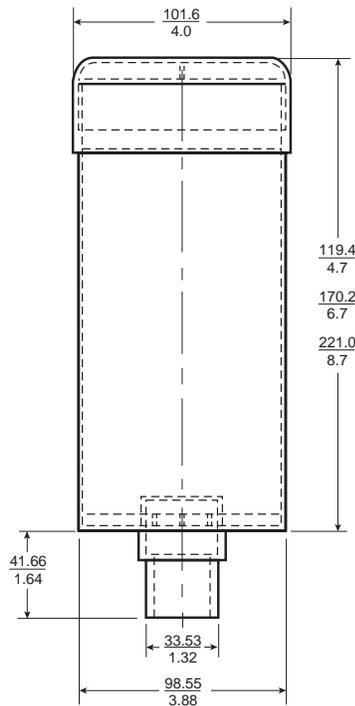


Installation

TriCeptor breathers are designed for simple installation on most equipment, regardless of mounting connection. Since TriCeptor breathers are disposable, the simple press fit design allows for quick and easy maintenance. Several mounting adapters (shown below) are available to provide the desired mounting. The installation/ replacement process consists of four easy steps:

1. Remove from protective plastic wrap.
2. Remove 1" blue cap from standpipe.
3. Remove foil label to expose the necessary amount of air intake holes.
4. Press TriCeptor into mounting adapter.

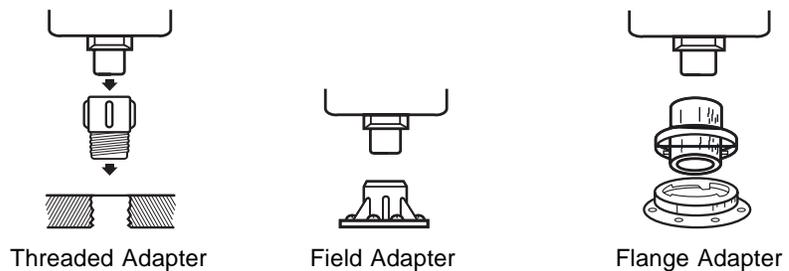
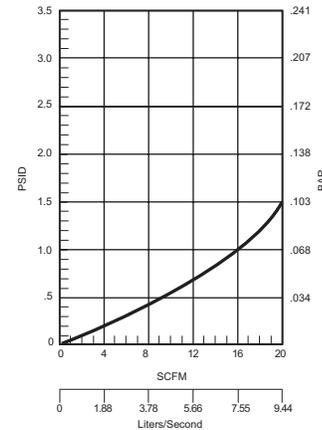
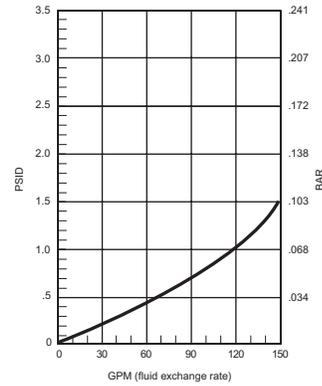
Servicing the TriCeptor breather is also very easy. When the silica gel changes color from blue to a pink, the breather is no longer active and needs to be replaced. Simply remove the unit and discard properly.



Linear Measurement = $\frac{\text{mm}}{\text{in}}$

Air Flow Performance

The curves below show the air flow performance of the three TriCeptor breathers. To insure the longest life possible, the initial clean pressure drop should not exceed 1.5 psid (.103 bar).



Model	Part Number	Quantity
5" Breather	934330	6 pcs.
7" Breather	934331	6 pcs.
9" Breather	934332	6 pcs.
Threaded Adapter	934365	1 pc.
Field Adapter	934366	1 pc.
Flange Adapter	934367	1 pc.

Reservoir Accessories

Hydraulic and Lube Filters

Breathers

Spin-on Type

Specifications:

Materials: Low carbon steel.

Filtration Element: Cellulose.

Operating Temperatures:

-40°F (-40°C) to 225°F (107°C).

Seals: Nitrile.

Weight: 12AT - 1.2 lbs(.54 kg) each.
50AT - 2.3 lbs. (1.0 kg) each.

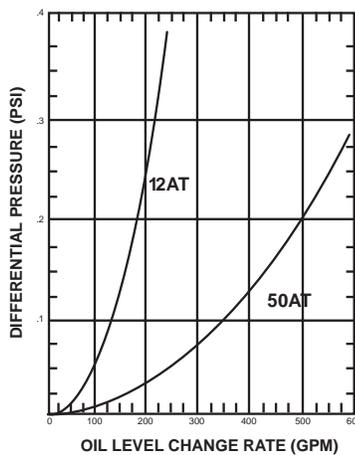
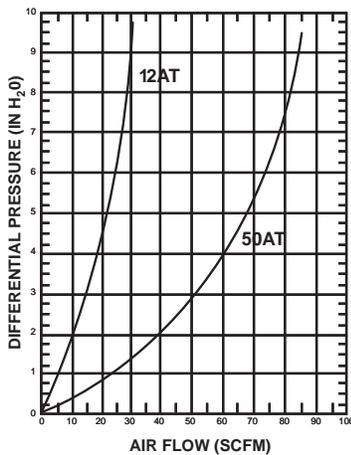
Sizing

Select the proper size canister for the maximum rate of reservoir draw down or air exchange rate. As a rule of thumb, clean pressure drop should be limited to 0.18 psid (5" H₂O).

Recommended canister change out is after 500 hours of operation. More frequent replacement may be required when operated in heavily contaminated areas such as grinding operations, primary metal mills, and on mobile equipment. Under such conditions, increase replacement frequency to every 250 hours.

Graphs are for 03C canisters only. Total pressure drop across canister, adaptor, and pipe may be found by adding pressure drops below:

- + 1.5% for each inch of 12AT adaptor or 3/4" pipe used.
- + 3.0% for each 3/4" elbow used.
- + 1.0% for each inch of 50AT adaptor or 1-1/4" pipe used.
- + 2.0% for each 1-1/4" elbow used.

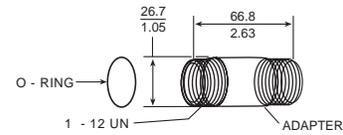
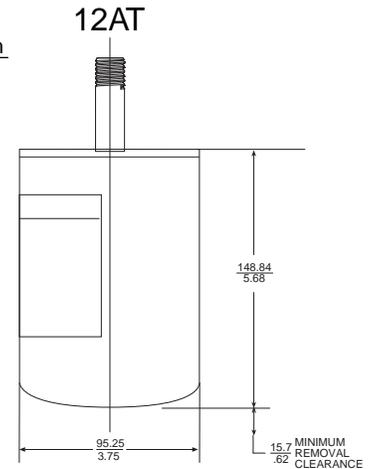


Element	Air Rating*	Diameter	Adaptor Kit
926543	1 micron	3.75"	926876
921999	2 micron	3.75"	926876
925023	5 micron	3.75"	926876
926541	1 micron	5.1"	926875
926169	2 micron	5.1"	926875
926170	5 micron	5.1"	926875

*99% removal efficiency for particles larger than stated size in air.

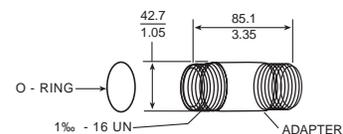
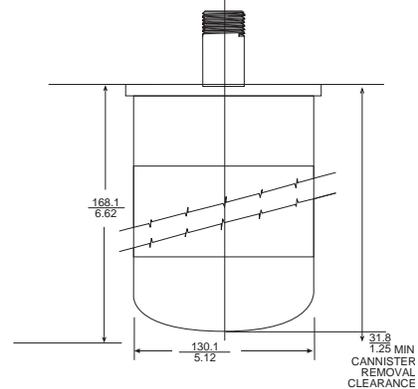


Linear Measurement = $\frac{\text{mm}}{\text{in}}$



P/N 926876

50AT



P/N 926875

Diffusers

Specifications:

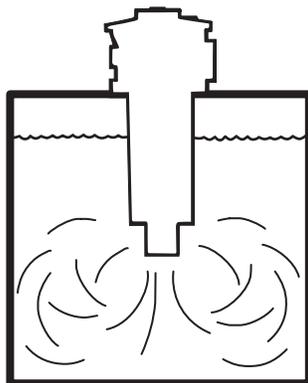
Operating Temperatures: 195°F (90°C) maximum.

Materials: Body & end cap: Zintec.
Head: glass-filled nylon.

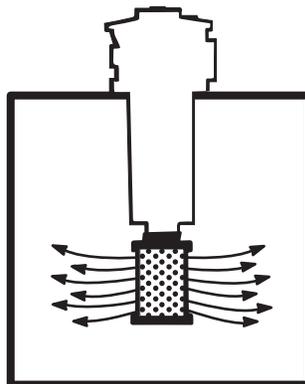
Weight: See chart below.

Benefits:

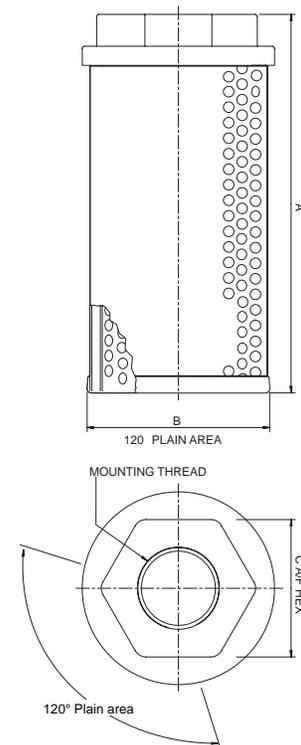
Installing a diffuser in a hydraulic reservoir is a simple change that can make a dramatic difference in system efficiency. With special concentric tubes designed with discharge holes 180° opposed, fluid aeration, foaming and reservoir noise are reduced. Pump life is also extended by reducing cavitation to the pump inlet. The effects of fitting a system with a diffuser are shown below.



Flow without diffuser



Flow with diffuser fitted



Part Number	Thread (NPT)	Nominal Flow GPM (LPM)	Length "A" Inch (mm)	Diameter "B" Inch (mm)	HEX "C" Inch (mm)	Weight Lbs. (kg)
DF1.A2BP	3/4"	13 (50)	4.7 (120)	2.4 (62)	1.81 (46)	.60 (0.27)
DF1.B4BP	1"	30 (114)	5.0 (127)	3.4 (86)	2.17 (55)	.93 (0.42)
DF1.B6BP	1 1/2"	60 (227)	7.0 (178)	3.4 (86)	2.56 (65)	1.23 (0.56)
DF1.B9BP	2"	120 (454)	9.5 (242)	3.4 (86)	2.95 (75)	1.52 (0.69)

Reservoir Accessories

Hydraulic and Lube Filters

Fluid Level/Temperature Gauges

Specifications:

Materials:

Lens: Transparent polyamide.

Lens base: Nylon 66.

Shroud: High impact polystyrene (no aluminum content).

Seals: Nitrile.

Maximum Operating Pressure: 14.7 psi (1 bar).

Operating Temperatures: -22°F (-30°C) to 195°F (90°C).

Thermometer Range: 90°F to 210°F (30°C to 90°C).

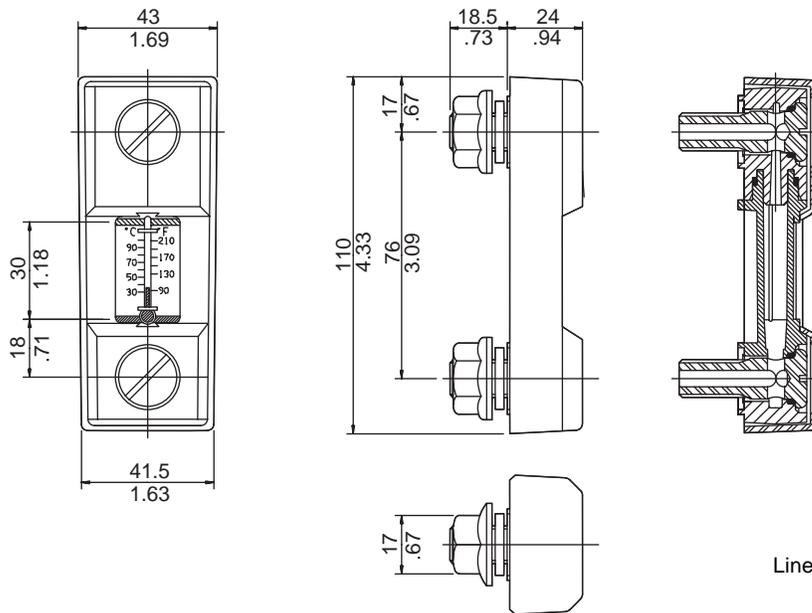
Indicator: Blue alcohol.

Fluid Compatibility: Mineral and petroleum based fluids.

Mounting: Front or rear fixing, two holes (M10).



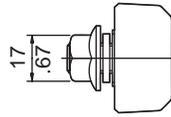
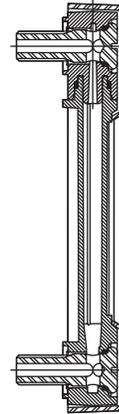
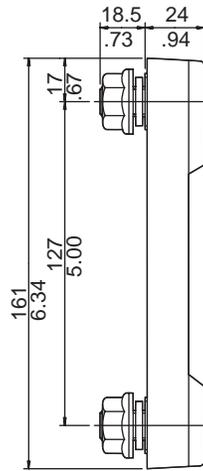
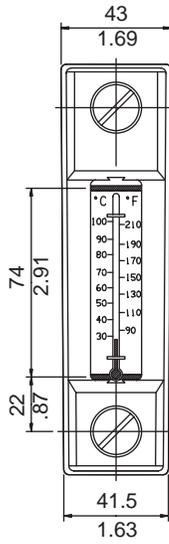
Length 3



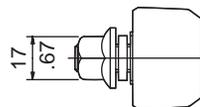
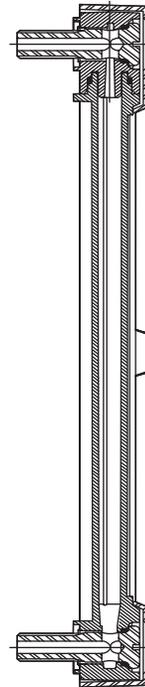
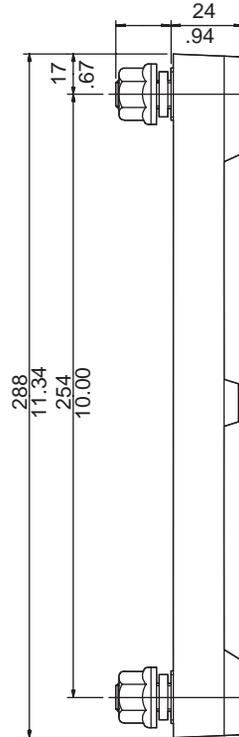
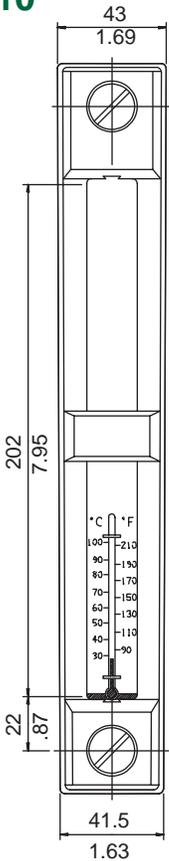
Linear Measurement = $\frac{\text{mm}}{\text{in}}$

Part Number	Thread	Length	Description
LG1.A2A2P	M10	3	Fluid level and temperature
LG1.B2A2P	M10	5	Fluid level and temperature
LG1.C2A2P	M10	10	Fluid level and temperature

Length 5



Length 10



Linear Measurement = $\frac{\text{mm}}{\text{in}}$

Reservoir Accessories

Suction Strainers

Specifications:

Materials:

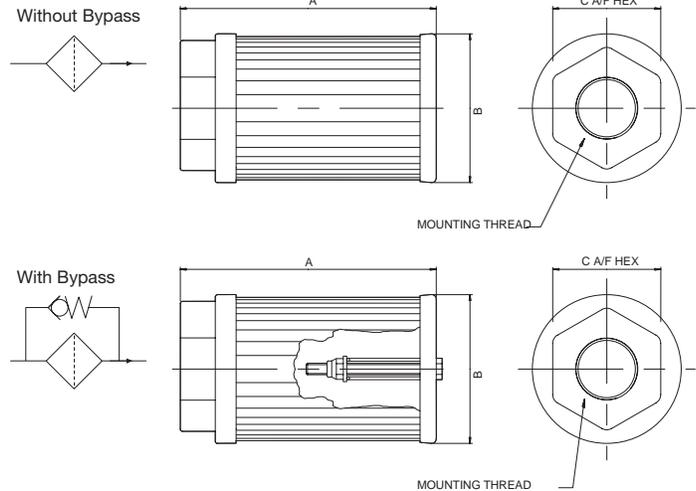
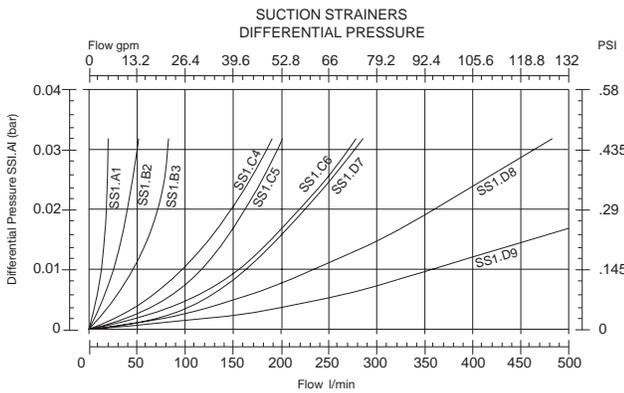
Media: Stainless steel.
 Tube and endcap: Zintec.
 Head: glass filled nylon.

Filtration Element: 125 micron stainless steel mesh.

Operating Temperatures: 195°F (90°C) maximum.

Bypass: None, 3 psi (0.2 bar).

Weight: See chart below.



Part Number With Bypass	Part Number Without Bypass	Port (NPT)	Nominal Flow GPM (LPM)	Length "A" Inch (mm)	Diameter "B" Inch (mm)	Hex "C" Inch (mm)	Weight Lbs. (kg)
SS1.A1B1BP	SS1.A1B1AP	1/2"	4 (15)	4.15 (105.5)	1.81 (46)	1.42 (36)	.18 (.08)
SS1.B2B1BP	SS1.B2B1AP	3/4"	7 (25)	4.31 (109.5)	2.52 (64)	1.81 (46)	.33 (.15)
SS1.B3B1BP	SS1.B3B1AP	1"	13 (50)	5.50 (139.5)	2.52 (64)	2.17 (55)	.37 (.17)
SS1.C4B1BP	SS1.C4B1AP	1 1/2"	25 (95)	5.51 (140)	3.39 (86)	2.56 (65)	.62 (.28)
SS1.C5B1BP	SS1.C5B1AP	1 1/2"	34 (130)	7.87 (200)	3.39 (86)	2.56 (65)	.73 (.33)
SS1.C6B1BP	SS1.C6B1AP	2"	48 (180)	10.24 (260)	3.39 (86)	2.95 (75)	.88 (.40)
SS1.D7B1BP	SS1.D7B1AP	2"	59 (225)	5.91 (150)	5.91 (150)	2.76 (70)	1.41 (.64)
SS1.D8B1BP	SS1.D8B1AP	2 1/2"	92 (350)	8.35 (212)	5.91 (150)	3.54 (90)	1.59 (.72)
SS1.D9B1BP	SS1.D9B1AP	3"	132 (500)	10.71 (272)	5.91 (150)	3.94 (100)	2.03 (.92)

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Parker Hannifin Corporation

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