

EATON | **Vickers**

Low & High Pressure ProGuard Filters











VICKERS[®]

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Filter Guide

Low Pressure Filters, Up to 40 bar (600 PSI)

Model	Page	Model	Page
HV6R Series In Line	7	OFR 60/120 Series In Line	20
	Flows to: 1100 L/min (300 USgpm) Pressures to: 25 bar (350 PSI)		Flows to: 450 L/min (120 USgpm) Pressures to: 27,6 bar (400 PSI)
HV3R Series In Line	10	OFRS15 Series Spin-on	25
	Flows to: 280 L/min (75 USgpm) Pressures to: 50 bar (725 PSI)		Flows to: 60 L/min (15 USgpm) Pressures to: 7 bar (100 PSI)
HF4RT Series In Tank	13	OFRS25 Series Spin-on	29
	Flows to: 568L/min (150 USgpm) Pressures to: 7 bar (100 PSI)		Flows to: 95 L/min (25 USgpm) Pressures to: 7 bar (100 PSI)
OFR 15/30 Series In Line	16	OFRS60 Spin-on	33
	Flows to: 114 L/min (30 USgpm) Pressures to: 40 bar (600 PSI)		Flows to: 225 L/min (60 USgpm) Pressures to: 7 bar (100 PSI)

Filter Guide

Low Pressure Filters, Up to 40 bar (600 PSI)

Model	Page
HS22 Series Twin Spin-on	38



Flows to: 450 L/min (120 USgpm)
Pressures to: 14 bar (200 PSI)

OF3 Inlet Strainer	41
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Flows to: 379 L/min (100 USgpm)

10F/50F/100F Series Indicating Inlet Strainers	43
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Flows to: 700 L/min (185 USgpm)
Pressures to: 20,7 bar (300 PSI)

High Pressure Filters, Up to 420 bar (6000 PSI)

Model	Page
HF2P Series In Line and Subplate	49



Flows to: 90 L/min (24 USgpm)
Pressures to: 210 bar (3000 PSI)

HF3P Series In Line	52
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Flows to: 570 L/min (150 USgpm)
Pressures to: 420 bar (6000 PSI)

HF3PS Series Side Mount	55
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Flows to: 570 L/min (150 USgpm)
Pressures to: 310 bar (4500 PSI)

HF4P Series In Line and Subplate	58
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Flows to: 570 L/min (150 USgpm)
Pressures to: 345 bar (5000 PSI)

General Information

High Performance Control

Vickers high performance filters are designed for low and high pressure applications. With flows rated to 1100 L/min (300 gpm) and pressures rated to 420 bar (6000 PSI), Vickers provides a variety of options to implement Systemic Contamination ControlSM in hydraulic systems. To achieve Target Cleanliness Levels, filters are available in a wide range of:

- Port sizes
- Bypass valves
- ΔP indicators
- Media grades

Each grade of Vickers high efficiency filters is thoroughly multipass tested (ISO 4572, $\beta \geq 200$) and rated to achieve cleanliness levels in accordance with ISO 4406. For assistance in selecting a Target Cleanliness Level, consult American National Standard Institute ANSI (NFPA/JIC) T2.24.1-1991 or your local Eaton representative.

The Systemic Approach to Contamination Control

For a hydraulic or oil lubricated machine, the development of a Target Cleanliness Level and the plan to achieve it is as much a part of system design as the selection of the pump, valves, actuators or bearings. Proper selection and placement of contamination control devices in a system to attain the targeted cleanliness eliminates (the root cause) up to 80% of hydraulic system failures.

Additionally, the system cleanliness approach assures the user of the hydraulic system a cost effective approach to contamination control that allows the price of the filters and elements to be quickly recovered by the savings of improved performance, increased component life, increased oil life, increased uptime and fewer repairs. To stress the interacting relationship between component design, system design, filter performance and filter replacement, Eaton has named our approach to filters and filtration "The Systemic Approach to Contamination Control."

This approach has three steps:

- **Set a target cleanliness level.**
Using the Vickers Target Cleanliness Worksheet (#578), it is easy to determine the target ISO Cleanliness Level. This target is based on the application's components and system dynamics.
- **Select filters and filter elements to achieve the target.**
The Systemic Approach to Contamination Control (#561) offers options to consider when selecting our high efficiency filters, such as the options available for location and sizing of filters in the system to achieve a specified target cleanliness level.
- **Monitor the system to ensure the target is maintained.**

The Vickers Fluid Analysis Laboratory and the Target-Pro Portable Particle Counter report the fluid cleanliness in the three digit ISO Code

Cleanliness level format, corresponding to the 2, 5 and 15 micron particle counts. From this information, it is possible to determine whether the system has the clean fluid it needs for long, dependable operation.

Supporting Literature

- Vickers Reservoir Vent Filters #5027/EN/0196/P
- Vickers CleanCart Portable Filtering Transfer Cart #601
- Vickers Fluid Analysis Service #588
- Vickers Guide to Alternative Fluids #579
- Vickers Recommended Sampling Chart #603
- Vickers Return in Investment: ProActive Maintenance #707
- The Systemic Approach to Contamination Control #561
- Vickers Target Cleanliness Worksheet #578
- Vickers Target-Pro Particle Counter #709
- Vickers Water Contamination Solutions #5026/EN/0196/A
- ANSI Systems Standards for Stationary Industrial Machinery #675

System Cleanliness Ratings

Code	Typical ISO 4406 cleanliness level achieved*	Number of times pump flow passes through filter	Typical filter placements
03	14/12/10	2.0	Full flow pressure and return line
	15/13/11	1.5	Full flow pressure or return and recirculation loop
	16/14/12	1.0	Full flow pressure or return line
	17/15/13	.5	Recirculation loop sized to 10% of system vol/min
05	16/14/12	2.0	Full flow pressure and return line
	17/15/13	1.5	Full flow pressure or return and recirculation loop
	18/16/14	1.0	Full flow pressure or return line
	19/17/15	.5	Recirculation loop sized to 10% of system vol/min
10	18/16/14	2.0	Full flow pressure and return line
	19/17/14	1.5	Full flow pressure or return and recirculation loop
	20/18/15	1.0	Full flow pressure or return line
	21/19/16	.5	Recirculation loop sized to 10% of system vol/min

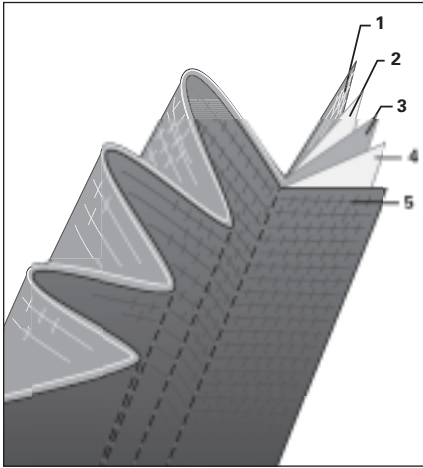
* For assistance in determining the Target Cleanliness Level and selecting the proper filter element consult your local Eaton representative.

Media/Seal Kit General Information

Element: Five Layer Media

Vickers Pak Construction

All Vickers filter elements are constructed with five layers, making them durable and highly efficient.



1. High strength support
2. Non woven synthetic diffuser layer
3. Vickers glass micro fiber media with special resin binder
4. Non woven synthetic diffuser (drainage) layer
5. High strength support

H-Pak Construction

For systems where a bypass valve is undesirable, such as servo systems, the H-Pak media provides high collapse rated housing pressures. H-Pak media construction utilizes 304 stainless steel inner and outer mesh support along with heavier core tubes and media support to protect the system.

C-Pak Construction

C-Pak media uses five layer construction. C-Pak incorporates epoxy coated carbon steel as the two outer face layers to retain the inner media pak layers.

R-Pak Construction

The R-Pak spin-on filter elements are designed for low clean pressure drop and high efficiency. R-Pak incorporates a five layer media construction with outer layers of epoxy coated carbon steel wire to retain the inner media pak layers.

L-Pak Construction

The L-Pak is specially designed for lubrication applications. Using the same five layer construction as the C-Pak, the L-Pak also has a deep pleat construction to maximize element life in steady flow, low pulsation systems.

Seal Kits

Note

Seal kits include all soft goods to fully service a unit.

Series	Seal Type	Seal Kit Part #
HV6R	Buna-N	3039688
	Viton-A*	3039689
HV3R	Buna-N	3039690
	Viton-A	3039691
HF4RT	Buna-N	3039692
	Viton-A	3039693
HF2P	Buna-N	3039694
	Viton-A	3039695
HF3P	Buna-N	3039696
	Viton-A	3039697
HF3PS	Buna-N	3039698
	Viton-A	3039699
HF4P	Buna-N	3039700
	Viton-A	3039701
OFR60/120	Buna-N	590021 (Bowl
	Viton-A	591761 seal only)
OFR15/30	Buna-N	226214 (Bowl
	Viton-A	262422 seal only)

* Viton is a registered trademark of E.I. DuPont

Guidelines for Selecting Filters

Target Cleanliness

Using the Vickers Target Cleanliness Worksheet (#578), it is easy to determine the target ISO Cleanliness Level for a system. This target is based on the application's components and system dynamics.

Placement and Media

Use the chart below to help select the appropriate filter placement and grade of media to achieve the target cleanliness level. For more detail, consult "The Systemic Approach to Contamination Control," your Eaton representative, or the ANSI Systems Standards for Stationary Industrial Machinery.

Filter Placements

The chart below helps engineers select the grade of Vickers media and the filter placement(s) that will achieve the required target cleanliness. It assumes the system will experience "average" ingress and that maintenance of the system will be consistent with current technology.

If in operation the system is running dirtier than expected, corrective actions should be initiated. Suggested corrective actions are:

- Check the indicator to see if the filters are on by-pass.
- Check the sources of ingress and correct problems.
- Check that the filters are positioned properly to see maximum fluid flow.
- Consider using a finer Pak grade.
- Add a filter to the system.

Note

All systems need a sealed reservoir with vent port filtration.

CAUTION



Before servicing the element, the bleed plug in filter housing must be loosened to relieve pressure. This will minimize fluid overflow.

Housing

The selected housing should be rated within the required flow and pressures of the application.

Important: If the system fluid's specific gravity (SG) is greater than 0.9 (for example, water glycol), the housing pressure drop (ΔP) should be corrected for the actual application.

Specific Gravity Corrections for Pressure Drop

The filter housing flow curves in this catalog can be adjusted using the following equation:

$$\text{Adjusted } \Delta P_{\text{Housing}} = \Delta P_{\text{Curve}} \times \frac{\text{Actual SG}}{0.9}$$

Bypass Valve

Bypass valve selection is based upon system requirements. According to ANSI Standard 12.2.6, filter assemblies whose elements cannot withstand full system differential pressure without damage should be equipped with bypass valves. Generally, a higher bypass pressure setting will allow for longer element life.

Some systems require filtration with no bypass, such as servo applications. Vickers H-Pak media is recommended for non-bypass systems.

Target Cleanliness		Recommended filter placement for high ingress systems with fixed volume pumps	Recommended filter placement for systems with variable volume pumps	Recommended filter placement for high ingress systems with variable volume pumps		
	Full flow pressure line or return line	Full flow pressure line and return line	Pressure line/ recirculating loop at 20% of system volume per minute	Pressure line plus return line plus recirculating loop	Recirculating loop at 20% of system volume per minute	Recirculating loop at 10% of system volume per minute
14/12/10	–	03	03	03	–	–
15/13/11	–	03	03	05	–	–
16/14/12	03	05	05	05	03	–
17/15/13	03	05	05	05 or 10	03	03
18/16/14	05	10	05 or 10	10	05	03
19/17/15	05 or 10	10	10	10	05 or 10	05

Guidelines for Selecting Filters

Indicator

To meet ANSI Standard 12.2.5, filter assemblies should have a device to indicate when the filter requires servicing. Per ANSI Standard 12.2.6, the indicator should “trip” at approximately 80% of the bypass pressure setting. If using a non-bypass housing, an indicator setting of approximately 7 bar (100 PSI) is recommended.

Element

The Vickers element media grade should be selected to achieve the Target Cleanliness Level. The Vickers media construction should be chosen based upon system requirements such as flow characteristics, pressure surges and specific application conditions.

Important: If the system fluid’s specific gravity (SG) is greater than 0.9 (for example, water glycol), the element pressure drop (ΔP) should be corrected.

Viscosity Corrections for Pressure Drop

The element flow curves can be adjusted using the following equations:

$$\text{Adjusted Clean } \Delta P_{\text{Element}} = \begin{aligned} &\text{Actual viscosity in cP} \div 29 \times \Delta P_{\text{Curve}} \\ &\text{Actual viscosity in cSt} \div 32 \times \text{Actual SG} \\ &\div 0.9 \times \Delta P_{\text{Curve}} \\ &\text{Actual viscosity in SUS} \div 150 \times \text{Actual} \\ &\text{SG} \div 0.9 \times \Delta P_{\text{Curve}} \end{aligned}$$

A good “rule of thumb”: To ensure satisfactory element life, the clean element pressure drop should generally be less than or equal to 40 percent of the indicator’s rated differential pressure:

$$\Delta P_{\text{Element}} \leq 0.4 \times \Delta P_{\text{Indicator}}$$

The best way to extend element service life is to minimize ingress (vents, seals, cylinder rods) and maintain system cleanliness at or below the Target Cleanliness Level.

Selecting a Model Code

Note

Model codes for housings only contain eight designations; model codes for filter assemblies (housing and element) contain ten designations.

To select a filter housing with the element included, attach the Element Construction and Fluid Cleanliness Rating designators at the end of the Housing Model Code. For example:

HV6R MT 4 AN B 8 L 05
} Include

To select a filter housing only (with no element), omit the Element Construction and Fluid Cleanliness Rating designators at the end of the Housing Model Code. For example:

HV6R MT 4 AN B 8

To select a filter element only, use the Element Model Code. For example:

VO41 1 B 8 L 05

Note

Refer to page 63 for Differential Pressure Indicator Selection Chart.

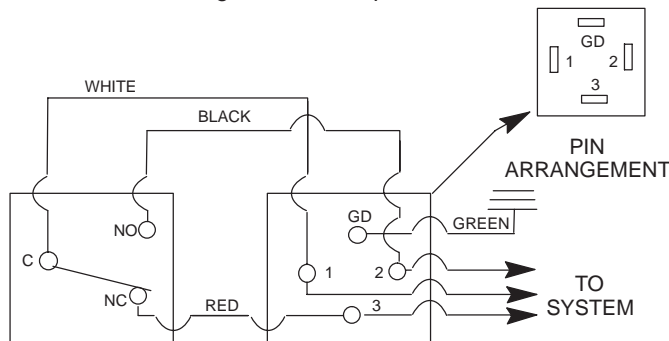
Indicator Switch Schematic Wiring Diagram

Note

The female connector is to be furnished by the customer.

Note

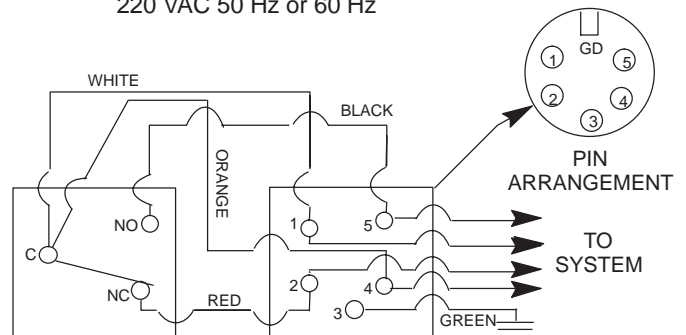
When fitting indicator, torque to 41-47 Nm.



Hirschmann (DIN 43650 Type AM) Receptacle

Electrical

Switch: SPDT
 Rating: 7 amps, resistive
 4 amps, inductive
 2 amps, lamp load
 @28 VDC, 115 VAC 60 Hz &
 220 VAC 50 Hz or 60 Hz



Brad Harrison (41512) Receptacle

HV6R Series Filters

Flows to 1100 L/min (300 USgpm) – Pressures to 25 bar (350 PSI)

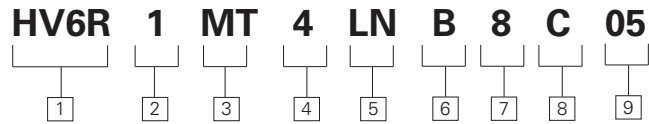
Features and Benefits

- Designed to comply with ANSI specifications and ISO cleanliness standards.
- Easy to remove cap to facilitate element change and minimize spillage.
- Vent and drain ports to facilitate maintenance and system start-up.
- Visual, electrical, and electrical indicators with lamp options for system design flexibility.
- High efficiency replacement elements in standard configurations (C-Pak) and deep pleat elements for maximum service life (L-Pak).

Design Specifications

Rated flow:	
Length 5	750 L/min (200 USgpm)
Length 8	1135 L/min (300 USgpm)
Housing & Element Compatibility:	Compatible with most petroleum oil, oil-in-water and water-in-oil fluids. Optional seals available for phosphate esters.
Temp range:	-26°C to +121°C (-15°F to +250°F)
Pressure rating:	
Operating	25 bar (360 PSI)
Proof	37 bar (540 PSI)
Burst	150 bar (2175 PSI)
Fatigue	25 bar (360 PSI)
Material:	
Head	Aluminum
Housing	Aluminum
Lid	Aluminum
Dry weight: (Approximate)	
Length 5	21kg (46lbs)
Length 8	30 kg (66lbs)

Filter Assembly Model Code



1 Filter Series - New
HV6R

2 Element Collapse Rating
1 - 150 PSI Low Collapse

3 Port options
MT - 4" SAE 4 Bolt Flange with Metric threads (M16 bolts provided)

4 Valve options
1 - Non-Bypass
2 - Bypass set at 25 PSI cracking pressure
4 - Bypass set at 43 PSI cracking pressure

5 Indicator options
First Designator - Indicator Type
A - Visual 70 PSI
J - No Indicator (plug)
K - Visual 15 PSI
L - Visual 30 PSI
Q - Electrical 15 PSI
R - Electrical 30 PSI
U - Electrical 70 PSI

Second Designator - Electrical Receptical
B - Brad Harrison
H - Hirshman
J - Hirshman with 24 volt light
K - Hirshman with 115 volt light
L - Hirshman with 230 volt light
N - No Connector - use with visual indicators and "J"

6 Seal material
B - Buna-N
V - Viton-A

Viton is a registered trademark of E.I. DuPont

7 Element length	Assembly length
5 - 407mm (16")	472mm (18.6")
8 - 981mm (39")	1056mm (41.6")

8 Element construction
C - Standard Construction
L - Deep pleat construction

9 Fluid cleanliness rating

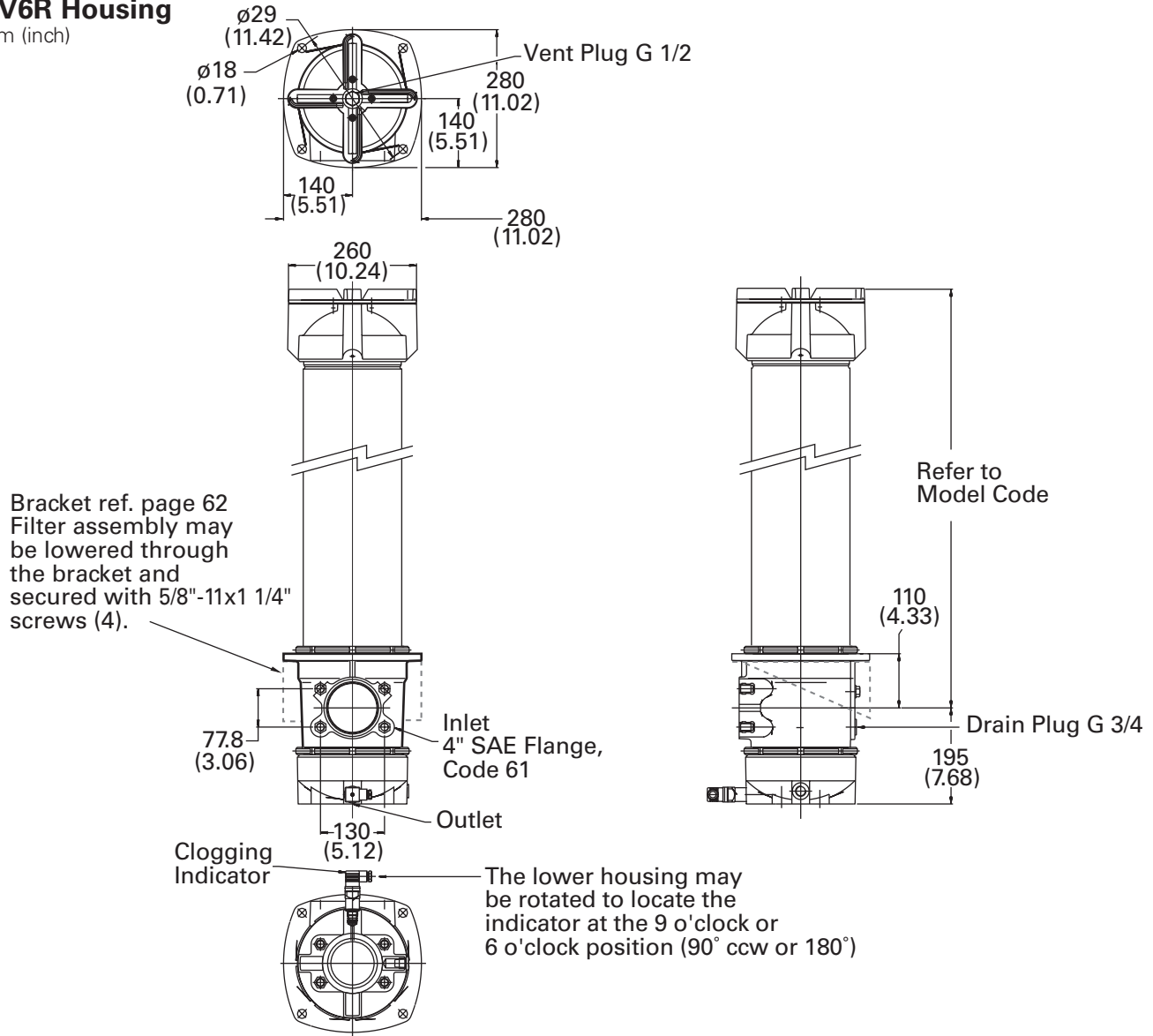
Code	Target fluid cleanliness level
03	16/ 14 /12 or better
05	18/ 16 / 14 or better
10	20/ 18 / 15 or better
20	22/ 19 / 16 or better

The table assumes limited ingress/single pass of pump flow through element. For detailed assistance, see "The Systemic Approach to Contamination Control" or contact your local Eaton representative.

Dimensions

HV6R Housing

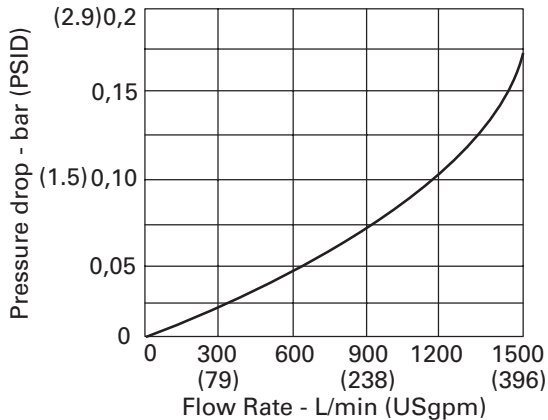
mm (inch)



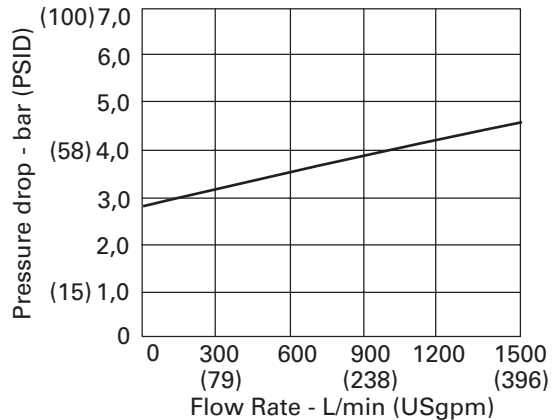
Filter Housing/Bypass Valve Flow Data

Flow versus pressure drop: 150 SUS (32 cSt) oil with specific gravity of ≤ 0.9
(See page 5 for specific gravity corrections for pressure drop.)

Housing

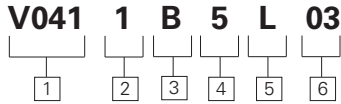


Bypass Valve



041 Series Replacement Filter Elements

Element Model Code



1 Filter element

V041 - For use with HV6R series housings

2 Element collapse rating

1 - 150 PSI Low Collapse

NOTE: L-Pak elements are rated at 100 PSI collapse. If used in a Non-Bypass housing, a monitored differential pressure indicator (70 PSI max.) should be used. (Indicator option A, B, I, U, or V)

3 Seal material

B - Buna-N

V - Viton-A

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4 Element length

mm (inch)

5 - 406 (16)

8 - 990 (39)

5 Element construction

C - C-Pak (grade 3, 5, 10, 20)

L - L-Pak (grade 3, 5, 10, 20)

6 Fluid cleanliness ratings

Code	Target fluid cleanliness level
03	16/ 14 /12 or better
05	18/ 16 /14 or better
10	20/ 18 /15 or better
20	22/ 19 /16 or better

The table assumes limited ingestion/single pass of pump flow through element. For detailed assistance, see "The Systemic Approach to Contamination Control" or contact your local Eaton representative.

Design Specifications

Rated flow: 568 L/min (150 USgpm) with bowl length 5

1135 L/min (300 USgpm) with bowl length 8

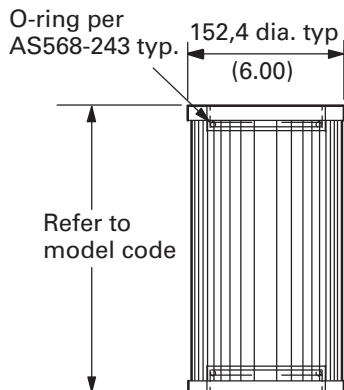
Housing & Element Compatibility: Compatible with most petroleum oil, water glycol, oil-in-water and water-in-oil fluids. Optional seals available for phosphate esters.

Construction: C-Pak or L-Pak

Temp range: -26°C to +121°C (-15°F to +250°F)

Dimensions

mm (inch)

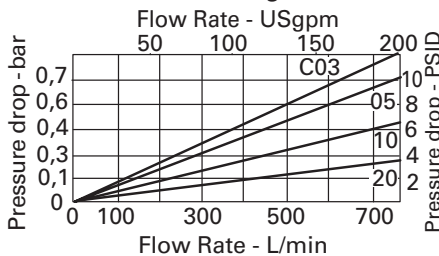


Filter Element Flow Data

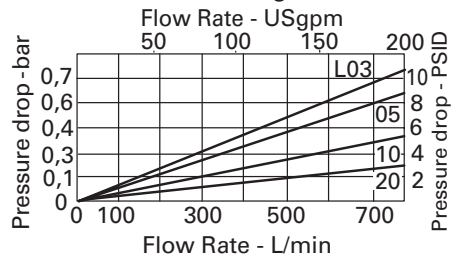
mm (inch)

Flow versus pressure drop:
150 SUS (32 cSt) oil with specific gravity of ≤ 0.9
(See page 6 for viscosity corrections for pressure drop.)

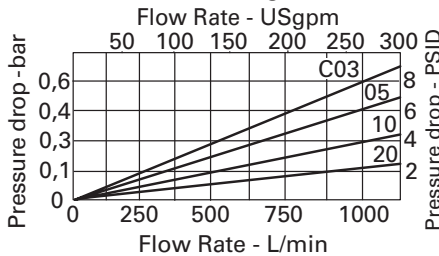
0411 C-Pak 406 (16) length



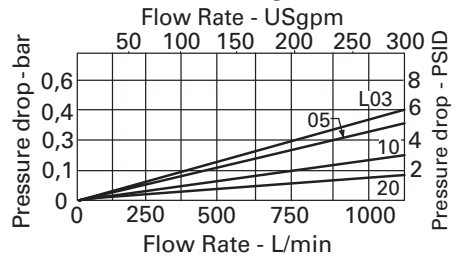
0411 L-Pak 406 (16) length



0411 C-Pak 990 (39) length



0411 L-Pak 990 (39) length



HV3R Series Filters

Flows to 280 L/min (75 USgpm) – Pressures to 50 bar (725 PSI)

Features and Benefits

- Designed to comply with ANSI specifications and ISO cleanliness standards.
- Visual, electrical, and electrical indicators with lamp options for system design flexibility
- Fully serviceable without tools
- Zero leak by-pass valve construction.
- Wide range of element lengths for maximum design flexibility
- High efficiency replacement elements in standard configurations (C-Pak) to meet Target Cleanliness Levels
- High collapse elements available for non-bypass applications.

Design Specifications

Rated flow:

Length 1	160 L/min (42 USgpm)
Length 2	240 L/min (63 USgpm)
Length 4	280 L/min (74 USgpm)

Housing & Element Compatibility: Compatible with most petroleum oil, oil-in-water and water-in-oil fluids. Optional seals available for phosphate esters.

Temp range: -26°C to +121°C (-15°F to +250°F)

Pressure rating:

Operating	50 bar (725 PSI)
Proof	75 bar (1090 PSI)
Burst	150 bar (2175 PSI)
Fatigue	50 bar (725 PSI)

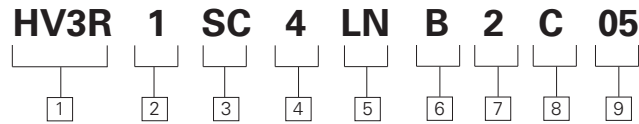
Material:

Head	Aluminum
Bowl	Carbon Steel
Collar	Carbon Steel

Dry weight: (Approximate)

Length 1	2.3 kg (5.1 lbs)
Length 2	2.5 kg (5.5 lbs)
Length 4	3.4 kg (7.5 lbs)

Filter Assembly Model Code



1 Filter Series HV3R

2 Element Collapse Rating

- 1 - 250 PSI Low Collapse
- 4 - 3000 PSI High Collapse

3 Port options

- BC - G 1-1/4 to ISO 228
- SC - 1.625 - 12UN SAE-20 str. Thd. (1 1/4" tube)

4 Valve options

- 1 - Non-Bypass
- 3 - Bypass set at 25 PSI cracking pressure
- 4 - Bypass set at 43 PSI cracking pressure

5 Indicator options

First Designator - Indicator Type

- A - Visual 70 PSI
- J - No Indicator (plug)
- K - Visual 15 PSI
- L - Visual 30 PSI
- Q - Electrical 15 PSI
- R - Electrical 30 PSI
- U - Electrical 70 PSI

Second Designator - Electrical Receptical

- B - Brad Harrison
- H - Hirshman
- J - Hirshman with 24 volt light
- K - Hirshman with 115 volt light
- L - Hirshman with 230 volt light
- N - No Connector - use with visual indicators and "J"

6 Seal material

- B - Buna-N
- V - Viton-A

Viton is a registered trademark of E.I. DuPont

7 Element length Assembly length

1 - 114mm (4.5")	207mm (8.15")
2 - 173mm (6.8")	266mm (10.47")
4 - 356mm (14")	447mm (17.6")

8 Element construction

- C - 250 PSI Low Collapse
- H - 3000 PSI High Collapse

9 Fluid cleanliness rating

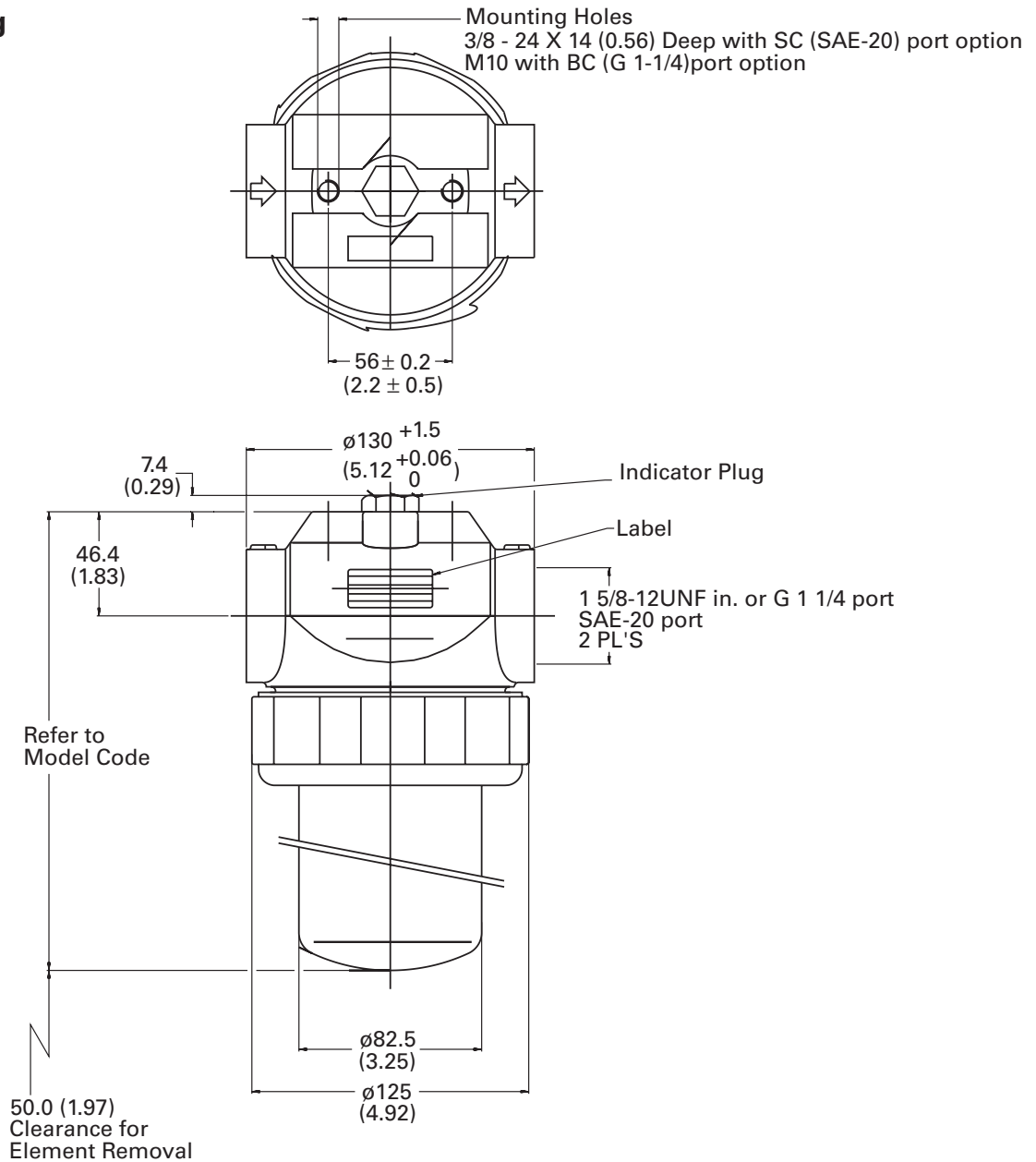
Code	Target fluid cleanliness level
03	16/14/12 or better
05	18/16/14 or better
10	20/18/15 or better
20	22/19/16 or better

The table assumes limited ingress/single pass of pump flow through element. For detailed assistance, see "The Systemic Approach to Contamination Control" or contact your local Eaton representative.

Dimensions

HV3R Housing

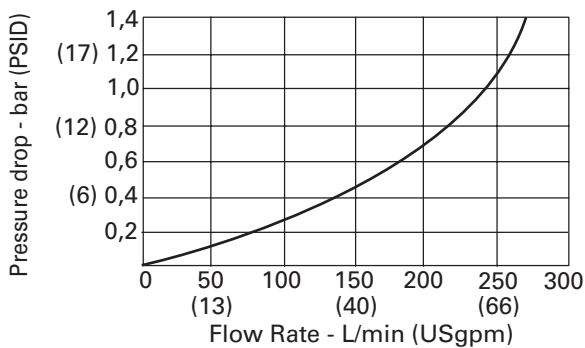
mm (inch)



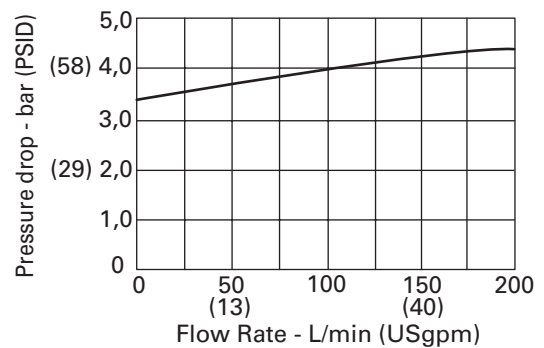
Filter Housing/Bypass Valve Flow Data

Flow versus pressure drop: 150 SUS (32 cSt) oil with specific gravity of ≤ 0.9
(See page 5 for specific gravity corrections for pressure drop.)

Housing

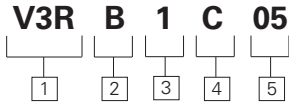


Bypass Valve



V3R Series Replacement Filter Elements

Element Model Code



1 Filter element

V3R - For use with HV3R series housings

2 Seal material

B - Buna-N

V - Viton-A

Viton is a registered trademark of E.I. DuPont

3 Element length mm (inch)

1 - 114 (4.5)

2 - 173 (6.8)

4 - 356 (14)

4 Element construction

C - C-Pak (grade 3, 5, 10, 20)

H - H-Pak (grade 3, 5, 10)

5 Fluid cleanliness ratings

Code	Target fluid cleanliness level
03	16/ 14/12 or better
05	18/ 16/14 or better
10	20/ 18/15 or better
20	22/ 19/16 or better

The table assumes limited ingress/single pass of pump flow through element. For detailed assistance, see "The Vickers Guide to Systemic Contamination Control" or contact your local Eaton representative.

Design Specifications

Rated flow:

Length 1 160 L/min (42 USgpm)

Length 2 240 L/min (63 USgpm)

Length 4 280 L/min (74 USgpm)

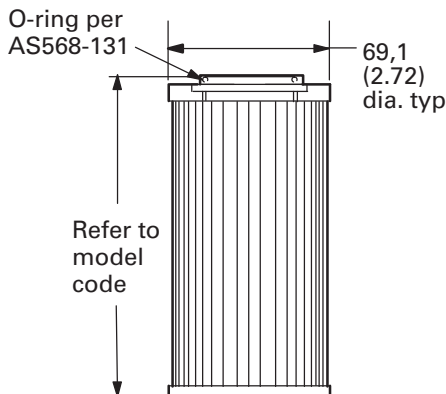
Housing & Element Compatibility: Compatible with most petroleum oil, oil-in-water and water-in-oil fluids. Optional seals available for phosphate esters.

Temp range: -25°C to +120°C (-15°F to +250°F)

Construction: C-Pak or H-Pak

Dimensions

mm (inch)



Filter Element Flow Data

mm (inch)

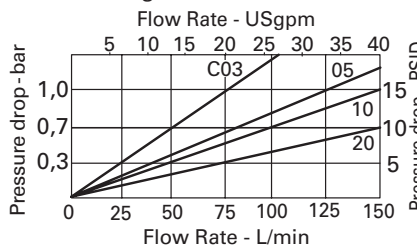
Flow versus pressure drop:

150 SUS (32 cSt) oil with specific gravity of ≤ 0.9

(See page 6 for viscosity corrections for pressure drop.)

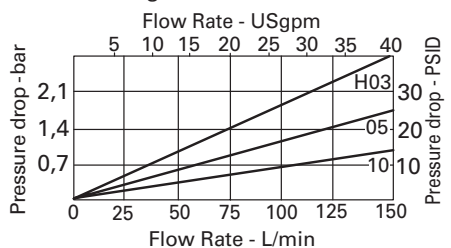
V3R C-Pak element

114 (4.5) length



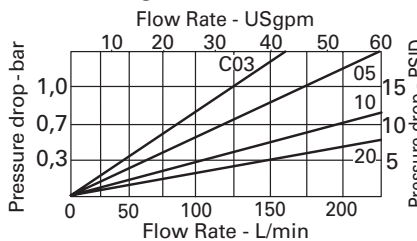
V3R H-Pak element

114 (4.5) length



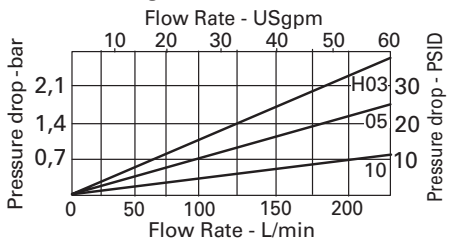
V3R C-Pak element

173 (6.8) length



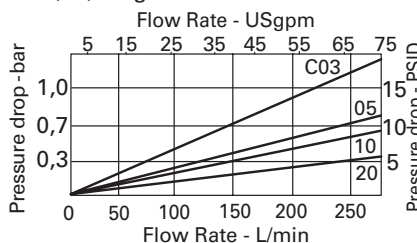
V3R H-Pak element

173 (6.8) length



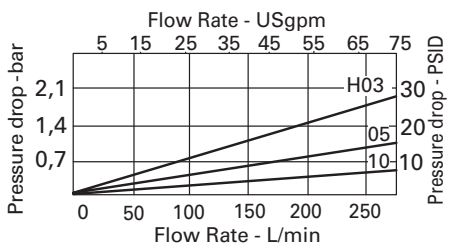
V3R C-Pak element

356 (14) length



V3R H-Pak element

356 (14) length



HF4RT Series Filters

Flows to 568 L/min (150 USgpm) – Pressures to 7 bar (100 PSI)

Features and Benefits

- Designed to comply with ANSI specifications and ISO cleanliness standards.
- Conforms to HF4 specifications
- Age and electrical switch options available to monitor element loading
- In-tank configuration minimizes space requirements and potential system leakage points.
- Optional secondary port allows filtration of a second return line without additional fittings or filtered fill port.
- High efficiency replacement elements in standard configurations (C-Pak) to meet Target Cleanliness Levels

Design Specifications

Rated flow:	
Length 3	189 L/min (50 USgpm)
Length 6	379 L/min (100 USgpm)
Length 7	568 L/min (150 USgpm)

Housing & Element Compatibility:	Compatible with most petroleum oil, water glycol, oil-in-water and water-in-oil fluids. Optional seals available for phosphate esters.
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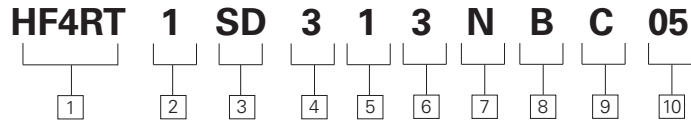
Temp range:	-26°C to +107°C (-15°F to +225°F)
-------------	--------------------------------------

Pressure rating:	
Operating	7 bar (100 PSI)
Proof	75 bar (1090 PSI)
Burst	150 bar (2175 PSI)

Material:	
Head	Aluminum
Cover	Aluminum
Bowl	Carbon Steel

Dry weight: (Approximate)	
Length 3	5.8 KG. (12.8 LBS.)
Length 6	9.2 KG. (20.3 LBS.)
Length 7	12.5 KG. (27.5 LBS.)

Filter Assembly Model Code



1 Filter Series - New
HF4RT

2 Element Collapse Rating
1 - 150 PSI Low Collapse

3 Port options
BC - G1¹/₄ to ISO 228
ME - 1¹/₂" - SAE 4 bolt Flange Code 61 (M12 x 1.75)
SD - 1.875 - 12 UN SAE-24 str. Thd. (1¹/₂" tube)
FE - 1¹/₂" - SAE 4 bolt Flange Code 61 (UNC)

4 Valve options
3 - Bypass set at 25 PSI cracking pressure
4 - Bypass set at 43 PSI cracking pressure

5 Indicator options
1 - No indicator
2 - Gauge 0-4 Bar (0-160 psi) Use with valve option "4"
4 - Gauge 0-10 Bar (0-160 psi) Use with valve option "3"
6 - Electrical switch, 15 PSI Brad Harrison connector
7 - Electrical switch, 30 PSI Brad Harrison connector
8 - Electrical switch, 15 PSI Hirshman connector
9 - Electrical switch, 30 PSI Hirshman connector

6 Element length **Assembly length**
3 - 229mm (9") 378 (14.9")
6 - 457mm (18") 584 (23")
7 - 686mm (27") 787 (31")
9 - 229mm (9") 12" Ext. tube

7 Secondary Port
BC - G1¹/₄ to ISO 228 - use with BC Inlet Port
SD - 1.875 - 12 UN SAE-24 str. Thd. (1¹/₂" tube) - use with SD Inlet Port
SZ - 2.50 - 12 UN SAE-32 str. Thd. (2" tube) - use with FE Inlet Port
N - No Secondary Port

Note: No secondary port is available with the ME inlet port option.

8 Seal material
B - Buna-N
V - Viton-A

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9 Element construction
C - Standard Construction

10 Fluid cleanliness rating

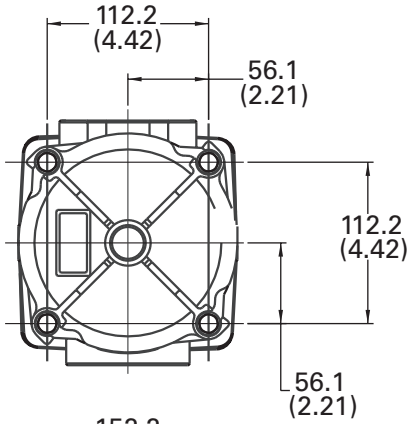
Code	Target fluid cleanliness level
03	16/ 14 / 12 or better
05	18/ 16 / 14 or better
10	20/ 18 / 15 or better
20	22/ 19 / 16 or better

The table assumes limited ingestion/single pass of pump flow through element. For detailed assistance, see "The Systemic Approach to Contamination Control" or contact your local Eaton

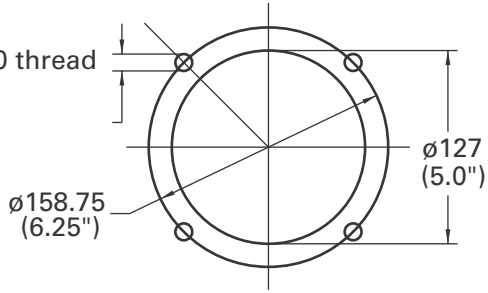
Dimensions

HF4RT Housing

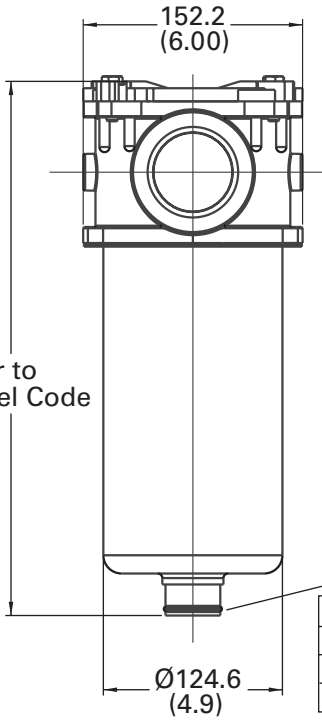
mm (inch)



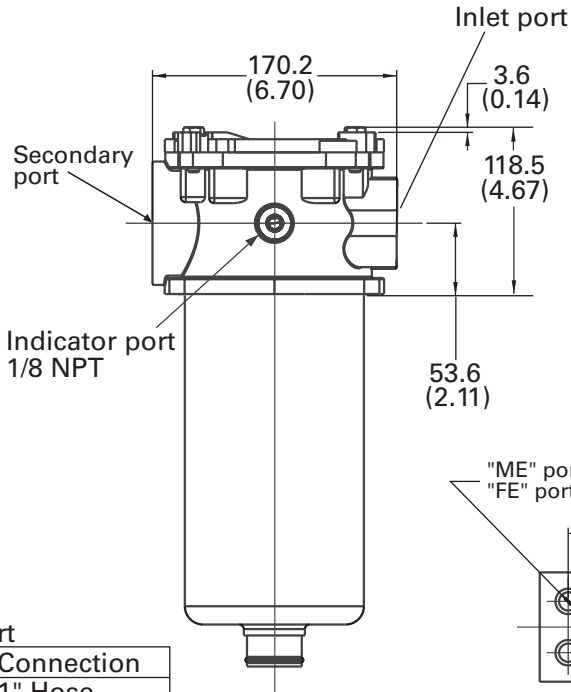
M10 or
7/16"-20 thread
4 PL'S
Equally
spaced



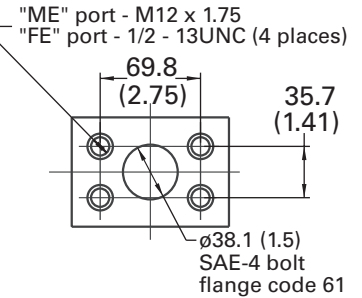
Reservoir Opening



Refer to
Model Code



Outlet port	
Length	Connection
3	1" Hose
6	1 1/2" NPT
7	1 1/2" NPT

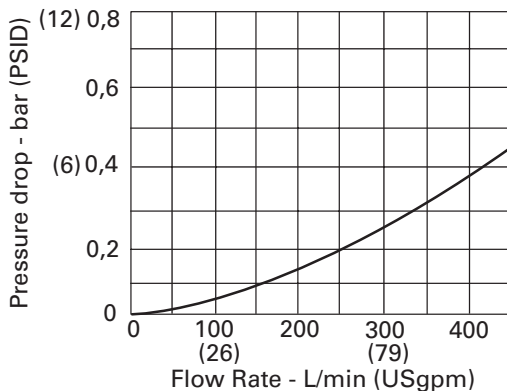


Inlet Flange

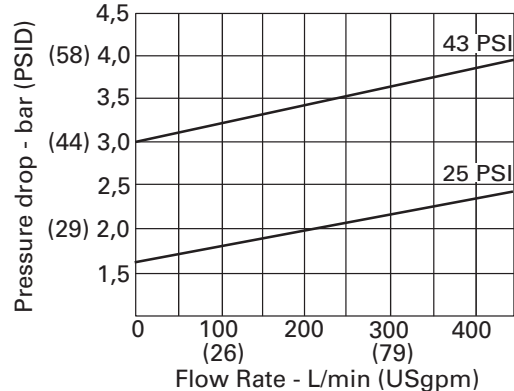
Filter Housing/Bypass Valve Flow Data

Flow versus pressure drop: 150 SUS (32 cSt) oil with specific gravity of ≤ 0.9
(See page 5 for specific gravity corrections for pressure drop.)

Housing

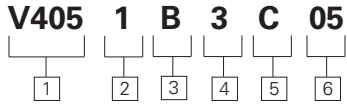


Bypass Valve



405 Series Replacement Filter Elements

Element Model Code



1 Filter element

V405 - For use with HF4RT, HF4P & OFR60

2 Element collapse rating

1 - 150 PSI Low Collapse

3 Seal material

B - Buna-N

V - Viton-A

Viton is a registered trademark of E.I. DuPont

3 Element length

mm (inch)

3 - 229 (9)

6 - 457 (18)

7 - 686 (27)

4 Element construction

C - C-Pak (grade 3, 5, 10, 20)

5 Fluid cleanliness ratings

Code	Target fluid cleanliness level
03	16/14/12 or better
05	18/16/14 or better
10	20/18/15 or better
20	22/19/16 or better

This table assumes limited ingestion/single pass of pump flow through the element. For detailed assistance, consult "The Systemic Approach to Contamination Control" or contact your local Eaton representative.

Design Specifications

Rated flow:	189 L/min (50 USgpm) (9" element)
	379 L/min (100 USgpm) (18" element)
	568 L/min (150 USgpm) (27" element)

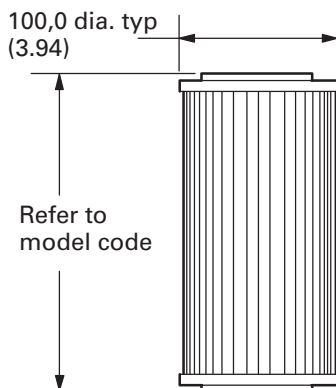
Housing & Element Compatibility: Compatible with most petroleum oil, water glycol, oil-in-water and water-in-oil fluids. Optional seals available for phosphate esters.

Temp range: -26°C to +107°C
(-15°F to +225°F)

Construction: C-Pak

Dimensions

mm (inch)

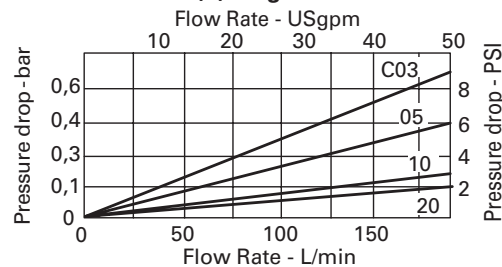


Filter Element Flow Data

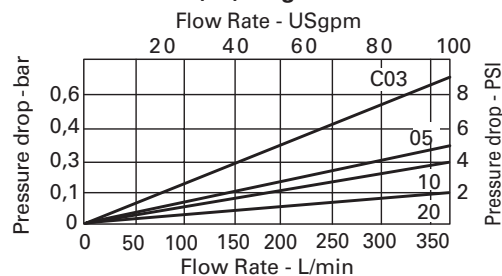
mm (inch)

Flow versus pressure drop:
150 SUS (32 cSt) oil with specific gravity of ≤ 0.9
(See page 6 for viscosity corrections for pressure drop.)

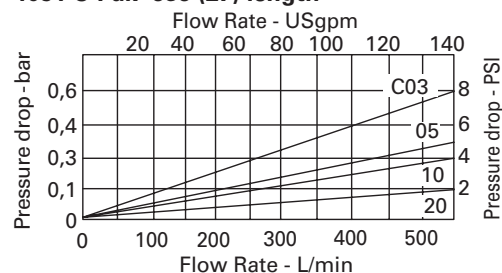
4051 C-Pak 229 (9) length



4051 C-Pak 457 (18) length



4051 C-Pak 686 (27) length



OFR-15/30 Series Filters

Flows to 115 L/min (30 USgpm) — Pressures to 40 bar (600 PSI)

Features and Benefits

- OFR-30 conforms to HF3 specifications.
- Two bowl length options.
- Flows to 30 USgpm.
- Visual indicator is standard.
- Electrical indicator also available.
- Bypass valve is standard.
- Replacement elements available in C-Pak or single layer construction.
- Accepts Eco-Pak coreless elements. (OFR30 only)

Design Specifications

Rated flow:	
OFR15	60 L/min (15 USgpm)
OFR30	115 L/min (30 US gpm)
Fluid Compatibility:	Compatible with most petroleum oil, water glycol, oil-in-water and water-in-oil fluids.
Temp range:	-40°C to +107°C (- 40°F to +225°F)
Pressure rating:	
Operating	40 bar (600 PSI)
Element collapse rating:	100 PSI
Standard bypass valve setting:	25 ± 4 PSI
Material:	
Head	Die cast aluminum
Bowl	Carbon steel
Dry weight: (Approximate)	
OFR15	4,1 kg (9lbs)
OFR30	5,4 kg (12lbs)

General Data

These filters are designed for use in the return lines of hydraulic systems. They remove particulate contaminants from the system fluid, thus improving performance and reliability of the system components while extending their service life. A bypass valve and mechanical visual indicator are standard.

Bypass Valve

An internal relief valve parallels the element to limit the pressure drop across the element. The valve is set to open at 1.7 bar (25 PSI) as standard.

Filter Elements

These return line filters are offered in C-Pak media and in single layer media.

The C-Pak media has been designed to meet the requirements of Vickers Systemic Contamination Control program and are available in 3, 5, 10 and 20 micron (99% efficient) ratings. To learn more on this program, consult Vickers brochure. Replacement elements for C-Pak are ordered by model code.

In some systems, the single layer media may offer an alternative. These are available in 15, 25 and 50 micron (99% efficient) ratings.

Refer to the model code page for further information on filter elements and cleanliness ratings.

Indicators

Mechanical

A rotary type indicator is mechanically associated with the bypass valve and indicates the condition of this valve. Visible through the transparent windows in the protecting hood, the indicator will show green for a closed bypass valve and progressively show yellow for a warning that the element pressure drop is getting into the danger zone and red for an open bypass valve. By removing the protecting hood and reassembling the rotary indicator 180 on its stem, the indicator now provides a "memory" in that it rotates to the maximum opening of the bypass and remains in this position until manually returned by rotation of the knurled projecting knob.

Electrical

A lever actuated electrical switch is mounted in the enclosure. An actuator mounted to the bypass valve depresses the switch just prior to the opening of the bypass valve to change the completion of the electrical switch circuit from the common and the normally closed terminals to the common and normally open terminals.

The 1/2 inch pipe tap is provided for connection to external conduit and lengths of color coded wires are soldered to the switch terminals for connection to the external circuit through the wires in the conduit. The switch contacts are rated for 5 amperes resistive loading up to 250 Vac.

System Pressure

The housing is suitable for greater than 10 million pressure pulsations from 0 to 600 PSI.

Mounting Position

Any mounting position is permitted. Vertical is preferred from a servicing standpoint.

Ports

Straight thread ports accept the SAE fittings. Flange ports accept the 4-bolt SAE flange.

Straight thread connections provide superior external leakage protection in applications having pulsating pressures or system vibrations.

Fluids and Seals

Hydraulic oils, water glycols and water-in-oil emulsions can be filtered with the standard unit.

Soluble oil in water fluids can also be filtered with the standard unit if the fluid pH does not exceed 8.5. A higher pH than this has an adverse effect on the aluminum components.

Synthetic fluids require special seals which can be obtained by prefixing the model number with "F3".

Refer to Vickers "Hydraulic Hints & Troubleshooting Guide" #694 for hydraulic fluid and temperature recommendations.

Performance Curves

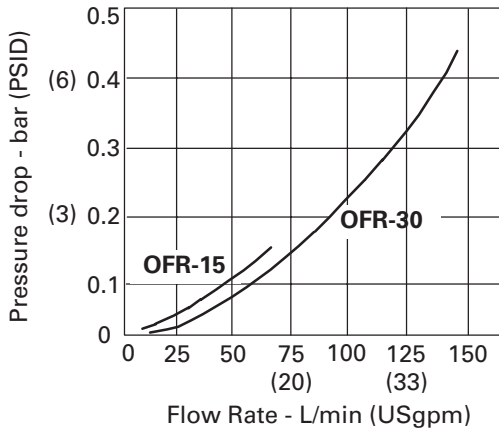
Filter Housing/Bypass Valve Flow Data

Flow versus pressure drop:

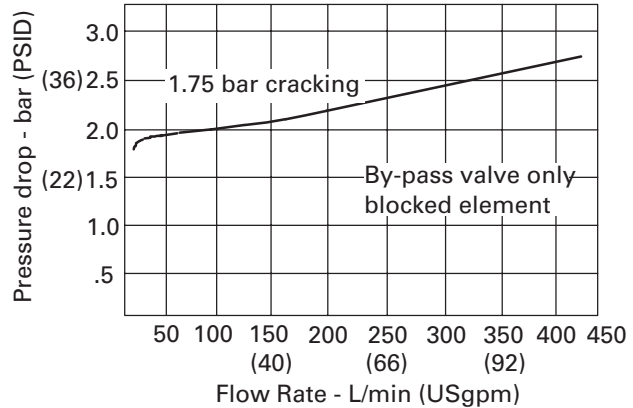
150 SUS (32 cSt) oil with specific gravity of ≤ 0.9

(See page 5 for specific gravity corrections for pressure drop.)

Housing



Bypass Valve



Filter Element Flow Data

mm (inch)

The OFR-30 with 8" element meets HF3 specifications.

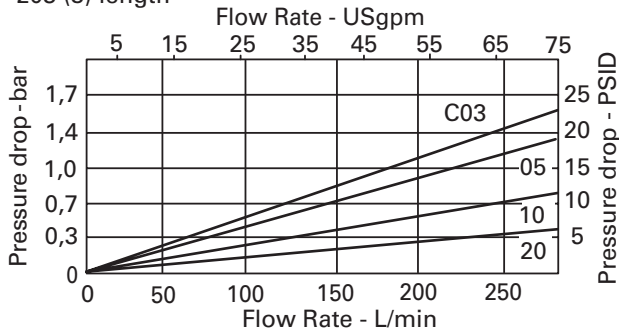
Flow versus pressure drop:

150 SUS (32 cSt) oil with specific gravity of ≤ 0.9

(See page 6 for viscosity corrections for pressure drop.)

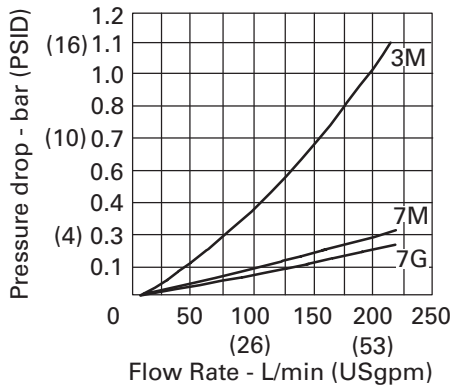
6021 C-Pak

203 (8) length



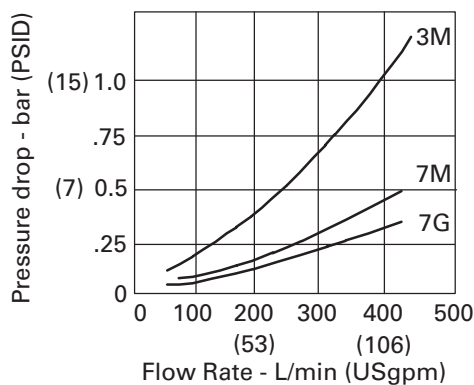
Single layer

102 (4) length



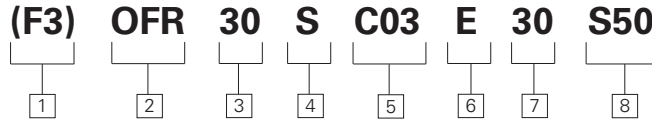
Single layer

203 (8) length



Model Codes

Filter and Element



1 Seals

Blank - Buna-N
F3 - Viton-A

Viton is a registered trademark of E.I. DuPont

2 Filter type

OFR - Oil filter return line

3 Flow capacity

15 - 60 L/min (15 USgpm)
30 - 115 L/min (30 USgpm)

4 Port options

B - G1 (formerly 1" BSPF) thread
F - 1" SAE 4-bolt flange Code 61
S - 1.3125-12 UN SAE-16 straight thread 1" O.D. tube

5 Element options

*C-Pak construction**
(For use with OFR-30 only)

Code	Fluid Cleanliness rating	Element construction
C03	16/14/12	C-Pak
C05	18/16/14	C-Pak
C10	20/18/15	C-Pak
C20	22/19/16	C-Pak

*Single layer construction***

Code	Micron
3M	Beta 15 = 100
7M	Beta 25 = 100
Blank	Beta 50 = 100

**NOTE: The C-Pak table assumes limited ingress and a single pass of pump flow through the element. For more detailed*

assistance, please consult "The Vickers Guide to Systemic Contamination Control", or contact your local Eaton representative.

***NOTE: Single layer construction elements are not assigned cleanliness codes and therefore cannot be applied toward Vickers Systemic Contamination Control Extended Warranty program.*

6 ΔP indicator options

Blank - Mechanical 25 PSI
E - Electrical 25 PSI

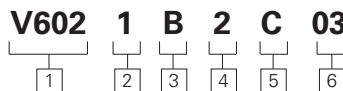
7 Design

8 Special suffix

S50 - Head sub-assembly only (No element, bowl or indicator)

C-Pak element only

(Meets HF3 Specifications)



1 Filter element

V602

2 Element collapse rating

1 - 150 PSI Low Collapse

3 Seals

B - Buna-N
V - Viton-A

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4 Element length

mm (inch)
2 - 203 (8) (HF3 length) (OFR30)

5 Element construction

C - C-Pak (grade 3, 5, 10, 20)

6 Fluid cleanliness ratings

Code	Fluid cleanliness rating	Element construction
C03	16/14/12	C-Pak
C05	18/16/14	C-Pak
C10	20/18/15	C-Pak
C20	22/19/16	C-Pak

Single layer media** replacement element kits

(OFR-30 meets HF3 standard)

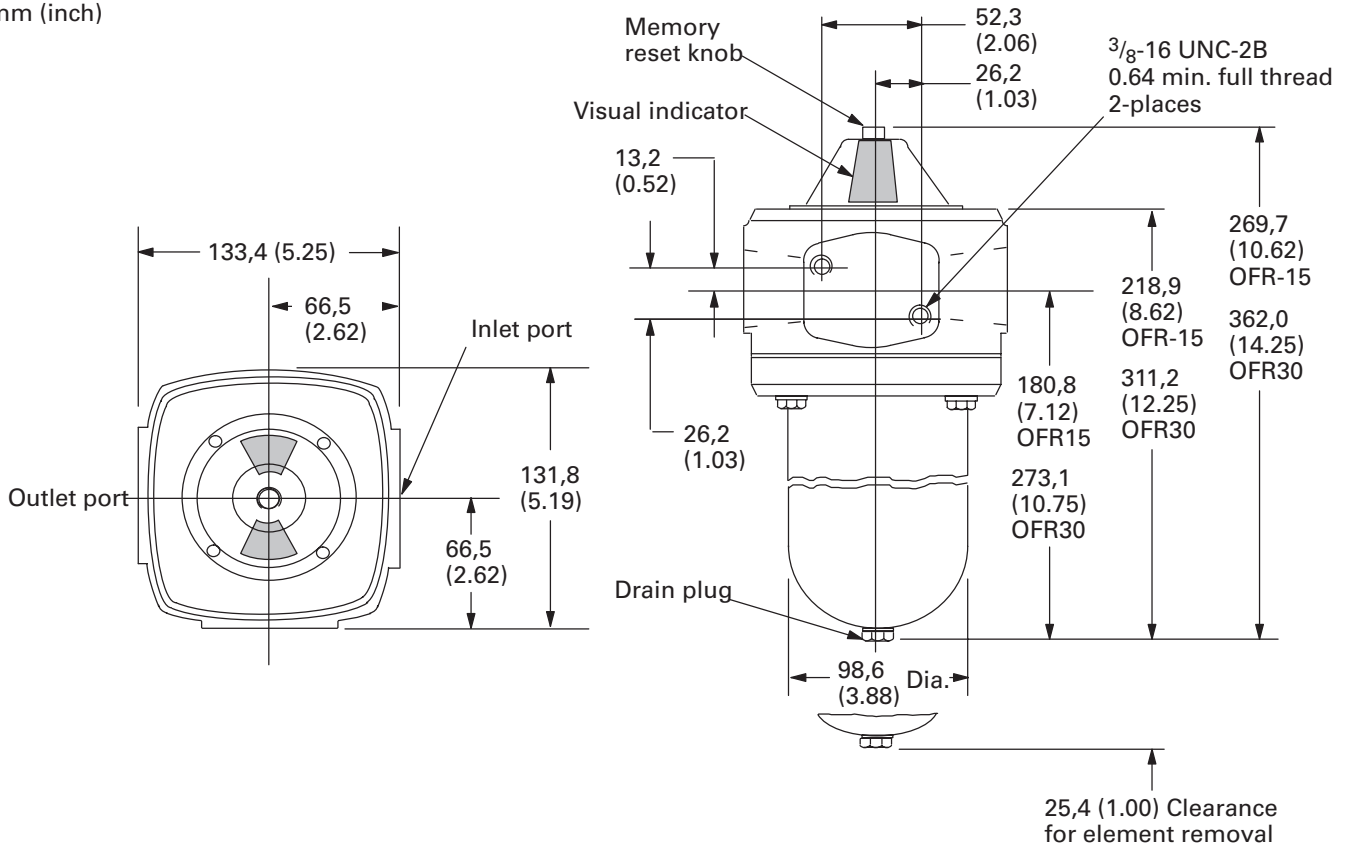
***NOTE: Single layer construction elements are not assigned cleanliness codes and therefore cannot be applied toward Vickers Systemic Contamination Control Extended Warranty program.*

Model	Element Kit	Element Code	Micron	Model	Element Kit	Element Code	Micron
OFR-15	737841	3M	15	F3-OFR-15	737844	7G	25
	737838	10M	50		737842	10M	50
OFR-30	737849	3M	15	F3-OFR-30	737852	7G	25
	737847	7M	25		737850	10M	50
	737846	10M	50				

Dimensions

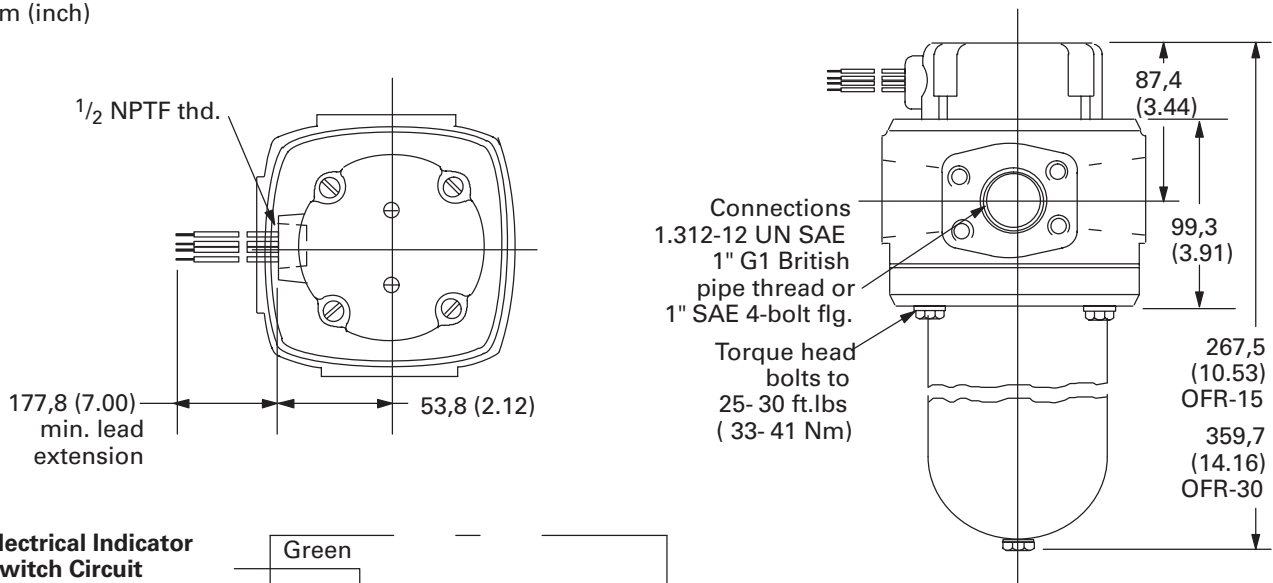
Mechanical Indicator

mm (inch)

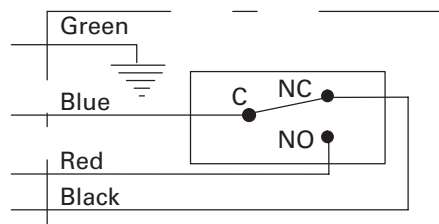


Electrical Indicator

mm (inch)



Electrical Indicator Switch Circuit



OFR-60/120 Series Filters

Flows to 450 L/min (120 USgpm)- Pressures to 27 bar (400 PSI)

Features and Benefits

- Two bowl length options.
- Visual indicator is standard.
- Electrical indicator also available.
- Bypass valve is standard.
- Replacement elements available in C-Pak or single layer construction.
- Accepts Eco-Pak coreless elements.

Design Specifications

Meets HF4 specifications

Rated flow:	
OFR60	225 L/min (60 USgpm)
OFR120	450 L/min (120 USgpm)
Fluid compatibility:	Compatible with most petroleum oil, water glycol, oil-in-water and water-in-oil fluids.
Temp range:	-40°C to +107°C (-40°F to +225°F)
Pressure rating:	
Operating	27 bar (400 PSI)
Standard bypass valve setting:	25 ± 4 PSI
Material:	
Head	Die cast aluminum
Bowl	Carbon steel
Dry weight:	(Approximate)
OFR60	6,8 kg (15 lbs)
OFR120	9,5 kg (21 lbs)

General Data

These filters are designed for use in the return lines of hydraulic systems. They remove particulate contaminants from the system fluid, thus improving performance and reliability of the system components while extending their service life. A bypass valve and mechanical visual indicator are standard.

Bypass Valve

An internal relief valve parallels the element to limit the pressure drop across the element. The valve is set to open at 1.7 bar (25 PSI) as standard.

Filter Elements

These return line filters are offered in C-Pak media and in single layer media.

The C-Pak media has been designed to meet the requirements of Vickers Systemic Contamination Control program and are available in 3, 5, 10 and 20 micron (99% efficient) ratings. To learn more on this program, consult Vickers brochure. Replacement elements for C-Pak are ordered by model code.

In some systems, the single layer media may offer an alternative. These are available in 15, 25 and 50 micron (99% efficient) ratings.

Refer to the model code page for further information on filter elements and cleanliness ratings.

Indicators

Mechanical

A rotary type indicator is mechanically associated with the bypass valve and indicates the condition of this valve. Visible through the transparent windows in the protecting hood, the indicator will show green for a closed bypass valve and progressively show yellow for a warning that the element pressure drop is getting into the danger zone and red for an open bypass valve. By removing the protecting hood and reassembling the rotary indicator 180 on its stem, the indicator now provides a "memory" in that it rotates to the maximum opening of the bypass and remains in this position until manually returned by rotation of the knurled projecting knob.

Electrical

A lever actuated electrical switch is mounted in the enclosure. An actuator mounted to the bypass valve depresses the switch just prior to the opening of the bypass valve to change the completion of the electrical switch circuit from the common and the normally closed terminals to the common and normally open terminals.

Cover can be rotated at 90 increments to four different positions. The 1/2 inch pipe tap is provided for connection to external conduit and lengths of color

coded wires are soldered to the switch terminals for connection to the external circuit through the wires in the conduit. The switch contacts are rated for 5 amperes resistive loading up to 250 Vac.

Mounting Position

Any mounting position is permitted. Vertical is preferred from a servicing standpoint.

Ports

Straight thread ports accept the SAE fittings. Flange ports accept the 4-bolt SAE flange.

Straight thread connections provide superior external leakage protection in applications having pulsating pressures or system vibrations.

Fluids and Seals

Hydraulic oils, water glycols and water-in-oil emulsions can be filtered with the standard unit.

Soluble oil in water fluids can also be filtered with the standard unit if the fluid pH does not exceed 8.5. A higher pH than this has an adverse effect on the aluminum components.

Synthetic fluids require special seals which can be obtained by prefixing the model number with "F3".

Refer to Vickers "Hydraulic Hints & Troubleshooting Guide" #694 for hydraulic fluid and temperature recommendations.

Performance Curves

Filter Housing/Bypass Valve Flow Data

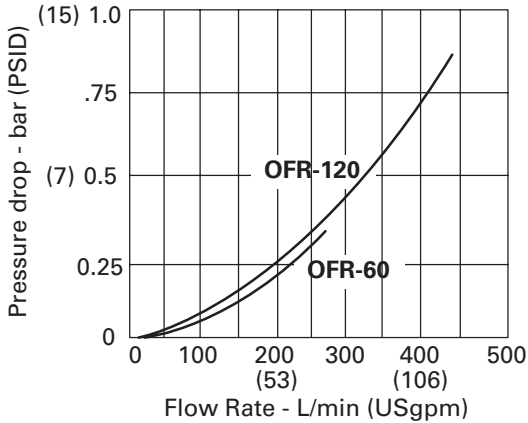
mm (inch)

Flow versus pressure drop:

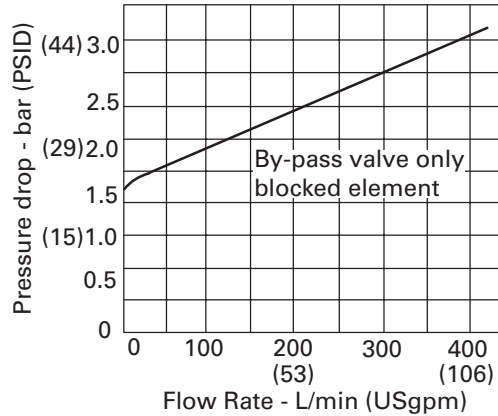
150 SUS (32 cSt) oil with specific gravity of ≤ 0.9

(See page 6 for viscosity corrections for pressure drop.)

Housing



Bypass Valve



Filter Element Flow Data

mm (inch)

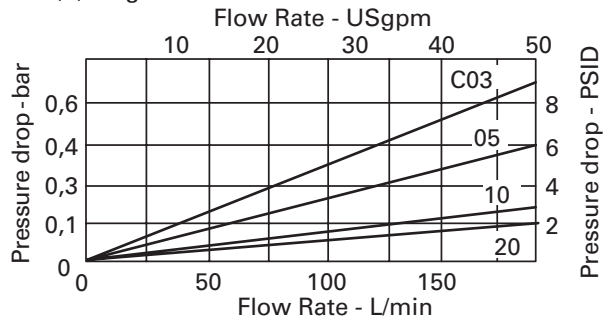
Flow versus pressure drop:

150 SUS (32 cSt) oil with specific gravity of ≤ 0.9

(See page 6 for viscosity corrections for pressure drop.)

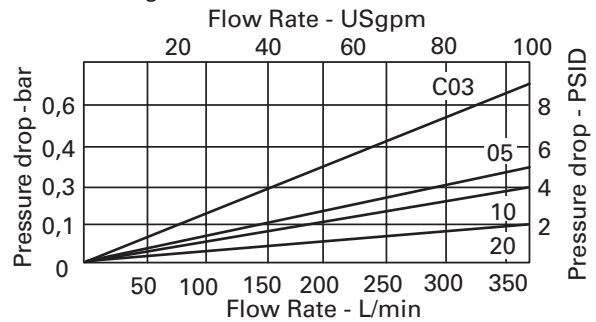
4051 C-Pak

229 (9) length



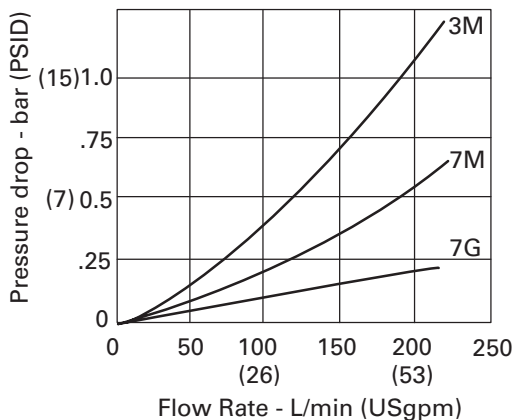
4051 C-Pak

457 (18) length



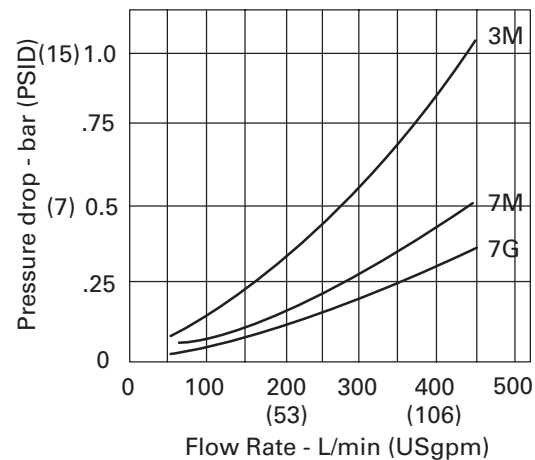
Single layer

229 (9) length



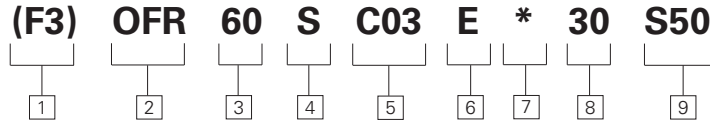
Single layer

457 (18) length



Model Codes

Filter and Element



1 Seals

Blank - Buna-N
F3 - Viton-A

Viton is a registered trademark of E.I. DuPont

2 Filter type

OFR - Oil filter return line

3 Flow capacity

60 - 227 L/min (60 USgpm)
120 - 454 L/min (120 USgpm)

4 Port options

F - 1 1/2" SAE 4-bolt flange Code 61
S - 1.875-12 UN SAE-24 straight thread for 1 1/2" O.D. tube

5 Element options

*C-Pak construction**

Code	Fluid Cleanliness rating	Element construction
C03	16/14/12	C-Pak
C05	18/16/14	C-Pak
C10	20/18/15	C-Pak
C20	22/19/16	C-Pak

*Single layer construction***

Code	Micron
3M	Beta 15 = 100
7M	Beta 25 = 100
7G	Beta 25 = 100
Blank	Beta 50 = 100

**NOTE: The C-Pak table assumes limited ingress and a single pass of pump flow through the element. For more detailed assistance, please consult "The Systemic Approach to Contamination Control," or contact your local Eaton representative.*

***NOTE: Single layer construction elements are not assigned cleanliness codes and therefore cannot be applied toward Vickers Systemic Contamination Control Extended Warranty program.*

6 ΔP indicator options

Blank - Mechanical
E - Electrical

7 Bypass setting

Blank - 25 PSI Standard
35 - 35 PSI
50 - 50 PSI***

8 Design

9 Special suffix

(Omit if not required.)

S50 - Filter housing minus element (Omit element options designation.)

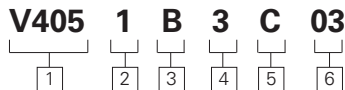
***CAUTION



Applications involving high flow surges may cause element collapse due to instantaneous pressure spikes.

C-Pak element only

(Meets HF4 Standard)



1 Filter element

V405

2 Element collapse rating

1 - 150 PSI

3 Seals

B - Buna-N
V - Viton-A

Viton is a registered trademark of E.I. DuPont

4 Element length

mm (inch)

3 - 229 (9) (Use in OFR-60)
6 - 457 (18) (Use in OFR-120)

5 Element construction

C - C-Pak (grade 3, 5, 10, 20)

6 Fluid cleanliness ratings

Code	Fluid Cleanliness rating	Element construction
C03	16/14/12	C-Pak
C05	18/16/14	C-Pak
C10	20/18/15	C-Pak
C20	22/19/16	C-Pak

**NOTE: Two 9 inch elements and a P-227567-01 reusable connector can also be used in the OFR-120 housing. This arrangement meets HF4 specifications.*

Single layer media** replacement element kits

(Meets HF4 Standard)

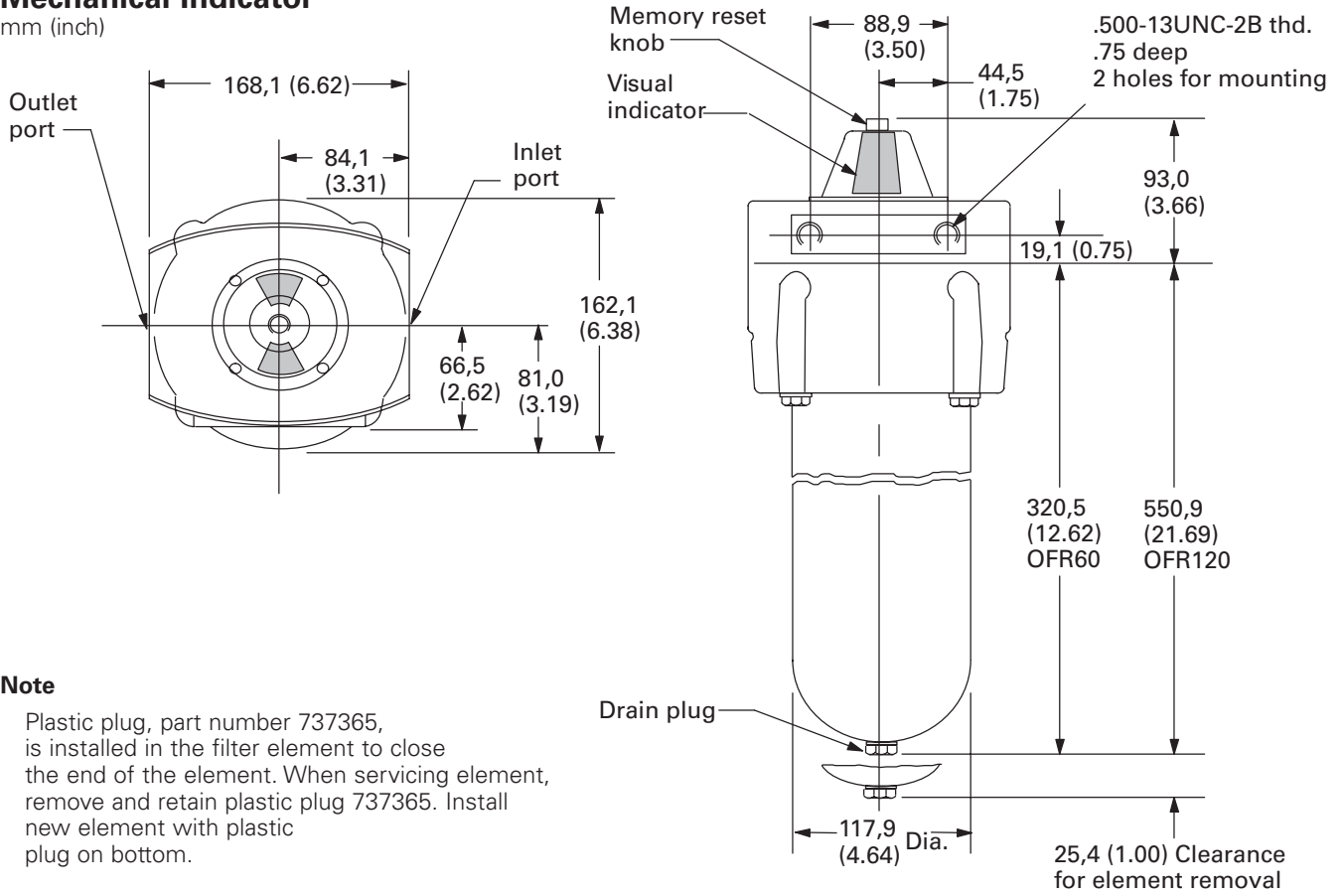
***NOTE: Single layer construction elements are not assigned cleanliness codes and therefore cannot be applied toward Vickers Systemic Contamination Control Extended Warranty program.*

Model	Element Kit	Element Code	Element Micron	Model	Element Kit	Element Code	Element Micron
OFR-60	737825	3M	15	F3-OFR-60	737829	3M	15
	737823	7M	25		737826	10M	50
	737822	10M	50				
OFR-120	737833	3M	15	F3-OFR-120	737834	10M	50
	737831	7M	25				
	737830	10M	25				

Dimensions

Mechanical Indicator

mm (inch)

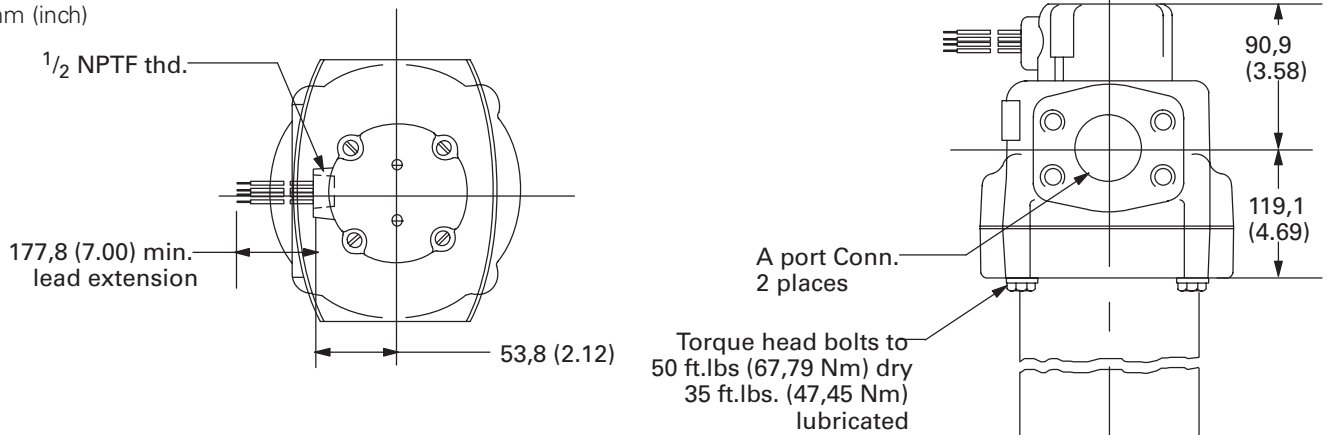


Note

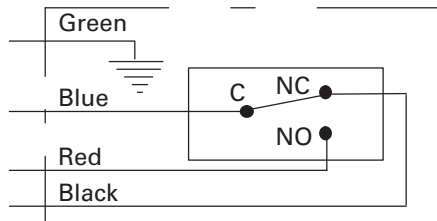
Plastic plug, part number 737365, is installed in the filter element to close the end of the element. When servicing element, remove and retain plastic plug 737365. Install new element with plastic plug on bottom.

Electrical Indicator

mm (inch)



Electrical Indicator Switch Circuit



Manifolds

Design Specifications

Maximum flow capacity:
946 L/min (250 USgpm)

Pressure rating:
Operating 27 bar (400 PSI)

Temp range: -40°C to +107°C
(-40°F to +225°F)

Weight assembly:
OFRM-12-20-10 2,7 kg (6.0 lbs)

General Data

This SAE flange manifold assembly is designed for use with OFR-60 and OFR-120 large return line filters

The manifold assembly includes the following:

- (2) Cast aluminum manifolds
- (4) Seals
- (8) Bolts

Pressure Drop

Pressure drop (ΔP) across manifolds is approximately 2 PSI when passing 240 gpm flow (Q) of 100 SUS fluid(s) having .865 flow rate.

For any other flow rate (Q_1), the pressure drop (ΔP_1) will be approximately:

$$\Delta P_1 = \Delta P (Q_1/Q)^2$$

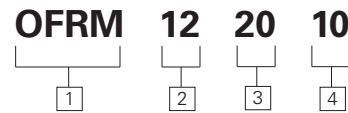
For any other specific gravity (G_1), the pressure drop (ΔP_1) will be approximately:

$$\Delta P_1 = \Delta P (G_1/G)$$

For any other viscosity(s), the pressure drop (ΔP) will change as follows:

Other viscosity(s)	% of (ΔP) (Approx.)
75	93
150	111
200	119
250	126
300	132
350	137
400	141

Model Code



1 Type

OFRM - Oil filter, return line manifold

2 Filter Connection Size

12 - 1 1/2" SAE flange Code 61

3 Line Connection Size

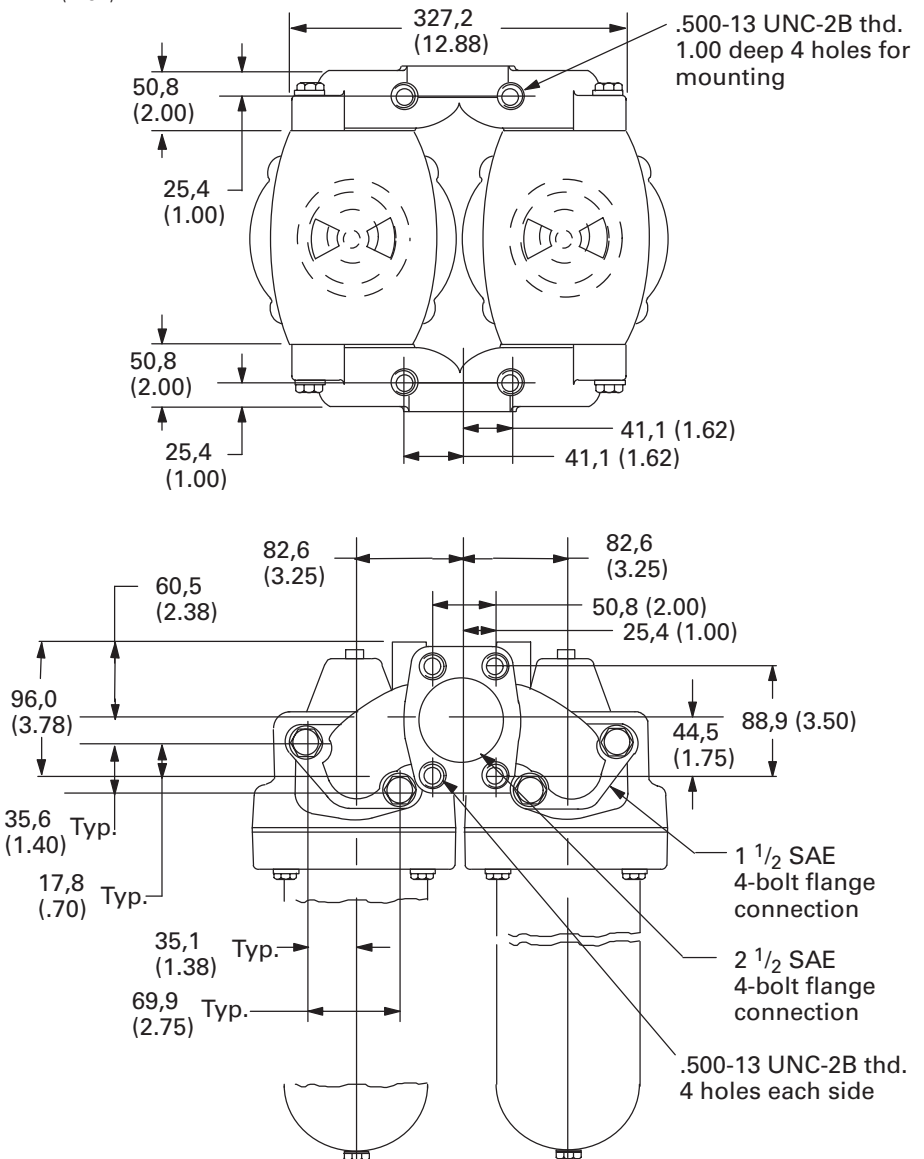
20 - 2 1/2" SAE flange Code 61

4 Design

Subject to change. Installation dimensions remain the same for designs 10 through 19.

Dimensions

mm (inch)



OFRS-15 Series Filters

Flows to 60 L/min (15 USgpm) — Pressures to 7 bar (100 PSI)

Features and Benefits

- Simple spin-on element design for easy maintenance.
- Bypass valves prevent excessive pressure drop and accidental element collapse.
- Two available ports for use as gauge and/or diagnostic ports.

Design Specifications

Rated flow:	57 L/min (15 USgpm)
Fluid compatibility:	Compatible with most petroleum oil, water glycol, oil-in-water and water-in-oil fluids.
Temp range:	-40°C to +107°C (-40°F to +225°F)
Pressure rating:	
Operating	7 bar (100 PSI)
Material:	
Head	Die cast aluminum
Bowl	Carbon steel
Dry weight: (Approximate)	
	1,0 kg (2.2 lbs.)

General Data

These filters are designed for use in the return lines of hydraulic systems. They remove particulate contaminants from the fluid, thus improving performance and reliability of the system components while extending their service life. R-Pak and single layer filter elements are available. The elements are of the disposable spin-on cartridge type for ease of maintenance.

Integral Bypass Valve

This bypass valve prevents excessive pressure drop and prevents the element from collapsing and releasing retained contaminants back into the hydraulic system. The valve starts to open when pressure drop across the element exceeds the valve setting due to flow surges, high viscosity oil, a clogged element, or a combination of these factors.

Filter Elements

These return line filters are offered with two types of elements.

When system requirements call for flow to 15 USgpm and pressure drops to 30 PSI, the 5 layer high pressure R-Pak construction meets these demands. Replacement elements for R-Pak are ordered by model code.

In applications where less demands are placed on the system, the single layer element may offer a more practical alternative. Replacement kits are available for servicing the single layer element.

Refer to the model code page for further information on filter elements and cleanliness ratings.

Gauge Ports and Pressure Gauge

An optional port in the filter head allows installation of a pressure gauge (P/N 736129) to indicate the element's condition. This optional gauge is shipped uninstalled from the filter.

Spin-On Cartridge

The disposable cartridge screws onto the filter head and should be hand tightened per instructions printed on the cartridge.

Refer to the model code page for further information on filter cartridges and cleanliness ratings.

Mounting Position

Any mounting position is permitted. Vertical is preferred from a servicing standpoint.

Fluids and Seals

These filters are suitable for petroleum based, oil-water emulsions, high water base, and most water glycol fluids.

Performance Curves

Filter Assembly and Element Flow Data

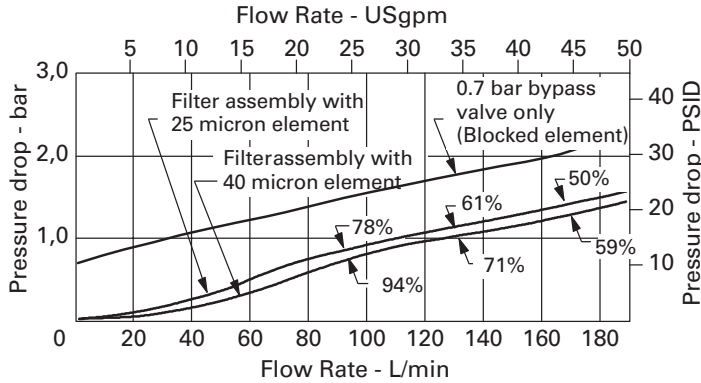
mm (inch)

Flow versus pressure drop:

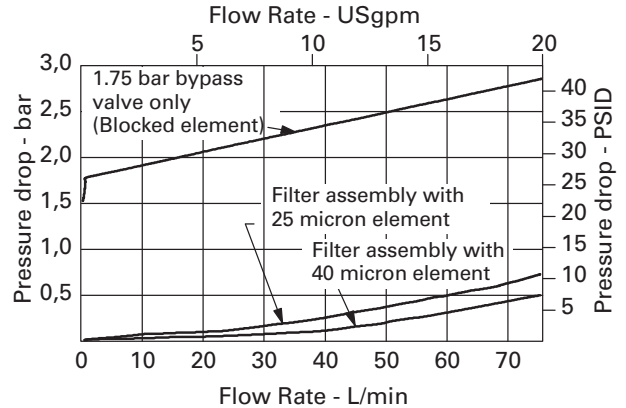
150 SUS (32 cSt) oil with specific gravity of ≤ 0.9

(See page 5 for specific gravity corrections for pressure drop.)

Single Layer with 0.7 bar (10 psi) Bypass Valve



Single Layer with 1.75 bar (25 psi) Bypass Valve

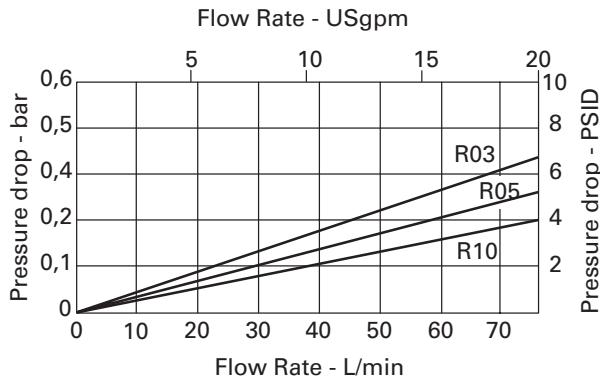


Note:

The % shown is the % of flow which passes thru a clean element with 150 SUS fluid. The remaining flow will pass thru the bypass valve without filtration.

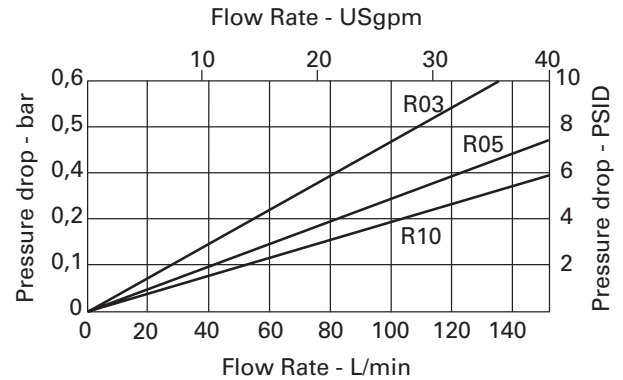
V0191 R-Pak Filter Element

147 (5.8) length



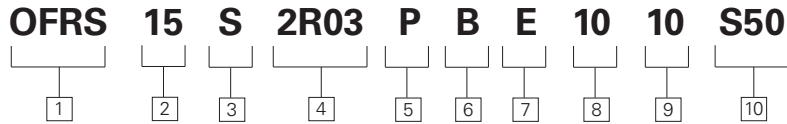
V0191 R-Pak Filter Element

203 (8) length



Model Codes

Filter and Element



1 Series designation

OFRS - Oil Filter, Return line, Spin-on

2 Flow rating

15 - 15 USgpm (57 L/min)

3 Port type

B - G1 (formerly 1" BSPF) thd.
P - 1" NPTF
S - 1.312-12 UN SAE-16 straight thd. for 1" OD tube

4 Element type

Code	Canister	
	Length mm (inch)	Fluid Cleanliness
1R03	147 (5.8)	16/ 14/12
1R05	147 (5.8)	18/ 16/14
1R10	147 (5.8)	20/ 18/15
2R03	203 (8.0)	16/ 14/12
2R05	203 (8.0)	18/ 16/14
2R10	203 (8.0)	20/ 18/15

The table assumes limited ingress/single pass of pump flow through element. For detailed assistance, see Vickers Guide to Systemic Contamination Control or contact your local Eaton representative.

Code Filtration Rating Element Construction

25M 40 micron Single layer
 Blank 25 micron Single layer

NOTE: Because single layer elements are not assigned Fluid Cleanliness Codes, they are not eligible for Vickers Systemic Contamination Control Extended Warranty program.

5 Pressure gauge option

P - Pressure gauge 0-120 PSI (0-8 bar)
Blank - Omit if not required.

6 Inlet gauge port location (1/8" NPTF)

B - Location B
Blank - Omit if not required.

7 Outlet gauge port location (1/8" NPTF)

E - Location E
Blank - Omit if not required.

8 Bypass valve

10 - Bypass valve set at 10 PSI
Blank - Bypass valve set at 25 PSI

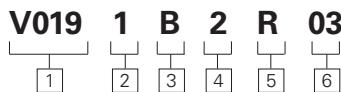
9 Design number

Subject to change. Dimensions remain the same for designs 10 through 19.

10 Special suffix (Omit if not required.)

S50 - Filter housing minus element (Omit element options designation.)

R-Pak element



1 Series designation

V019 - Filter element for use with **OFRS15/OFRS25** - series filters (R-Pak construction only)

2 Element collapse rating

1 - 150 PSI

3 Seal material

B - Buna-N

4 Element length

mm (inch)
1 - 147 (5.8)
2 - 203 (8.0)

5 Element construction

R - R-Pak

6 Element type

Code	Fluid Cleanliness rating	Element construction
03	16/ 14/12	R-Pak
05	18/ 16/14	R-Pak
10	20/ 18/15	R-Pak

The table assumes limited ingress/single pass of pump flow through element. For detailed assistance, see "The Vickers Guide to Systemic Contamination Control" or contact your local Eaton representative.

Single Layer Media Element

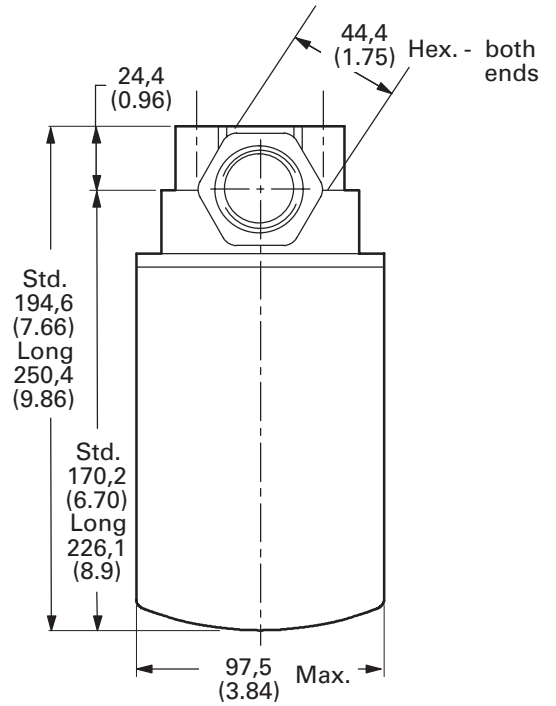
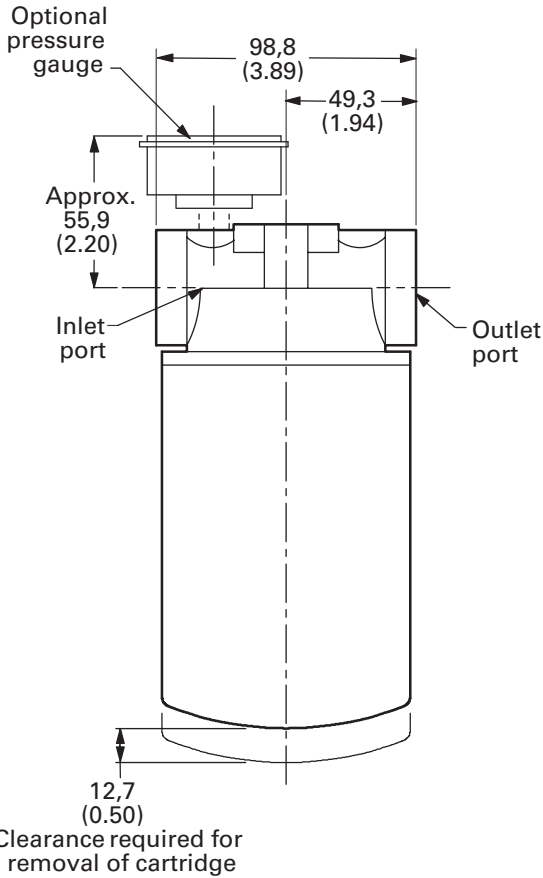
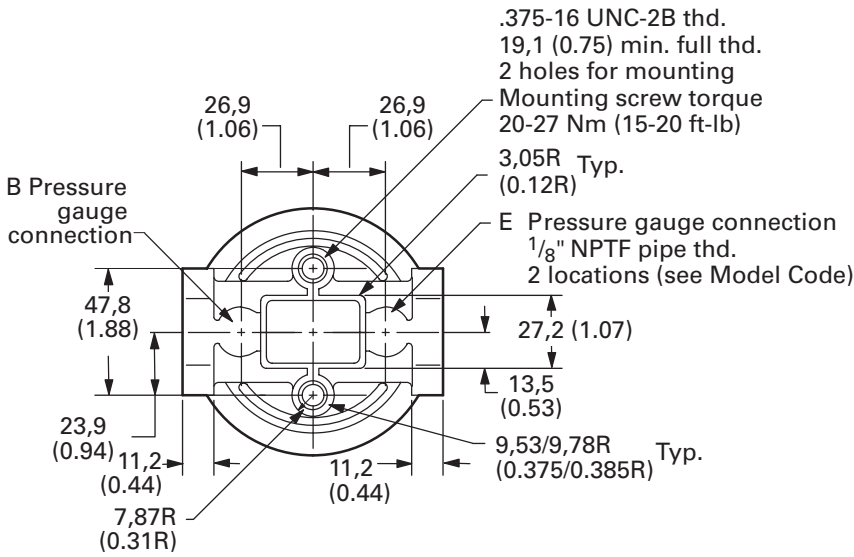
Replacement element	Micron	Rating	Nominal Rating
573082	25	B ₂₅ = 100	10 micron
573083	40	B ₄₀ = 100	25 micron

NOTE: Because single layer elements are not assigned Fluid Cleanliness Codes, they are not eligible for Vickers Systemic Contamination Control Extended Warranty program.

Dimensions

Filter Housing

mm (inch)



OFRS-25 Series Filters

Flows to 95 L/min (25 USgpm) — Pressures to 7 bar (100 PSI)

Features and Benefits

- Simple spin-on element design for easy maintenance.
- Bypass valve prevents excessive pressure drop and accidental element collapse.
- Six available ports for use as gauge and/or diagnostic ports.

Design Specifications

Rated flow:	95 L/min (25 USgpm)
Fluid compatibility:	Suitable for use with petroleum based, oil-water emulsions, high water based and most water-glycol fluids.
Temp range:	-40°C to +107°C (-40°F to +225°F)
Pressure rating:	
Operating	7 bar (100 PSI)
Material:	
Head	Die cast aluminum
Canister	Carbon steel
Dry weight: (Approximate)	0,9 kg (2.0 lbs)

General Data

These filters are designed for use in the return lines of hydraulic systems. They remove particulate contaminants from the fluid, thus improving performance and reliability of the system components while extending their service life. R-Pak and single layer filter elements are available. The elements are of the disposable spin-on cartridge type for ease of maintenance.

Integral Bypass Valve

This bypass valve prevents excessive pressure drop and prevents the element from collapsing and releasing retained contaminants back into the hydraulic system. The valve starts to open when pressure drop across the element exceeds the valve setting due to flow surges, high viscosity oil, a clogged element, or a combination of these factors.

Filter Elements

These return line filters are offered with two types of elements.

When system requirements call for flow to 25 USgpm and pressure drops to 30 PSI, the 5 layer high pressure R-Pak construction meets these demands. Replacement elements for R-Pak are ordered by model code.

In applications where less demands are placed on the system, the single layer element may offer a more practical alternative. Replacement kits are available for servicing the single layer element.

Refer to the model code page for further information on filter elements and cleanliness ratings.

Gauge Ports and Pressure Gauge

An optional port in the filter head allows installation of a pressure gauge (P/N 736129) to indicate the element's condition. This optional gauge is shipped uninstalled from the filter.

Spin-On Cartridge

The disposable cartridge screws onto the filter head and should be hand tightened per instructions printed on the cartridge.

Refer to the model code page for further information on filter cartridges and cleanliness ratings.

Mounting Position

Any mounting position is permitted. Vertical is preferred from a servicing standpoint.

Fluids and Seals

These filters are suitable for petroleum based, oil-water emulsions, high water base, and most water glycol fluids.

Performance Curves

Filter Assembly and Element Flow Data

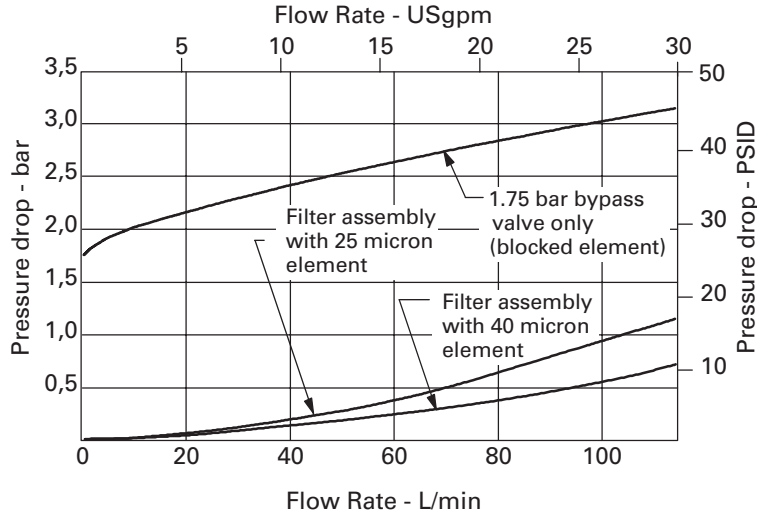
mm (inch)

Flow versus pressure drop:

150 SUS (32 cSt) oil with specific gravity of ≤ 0.9

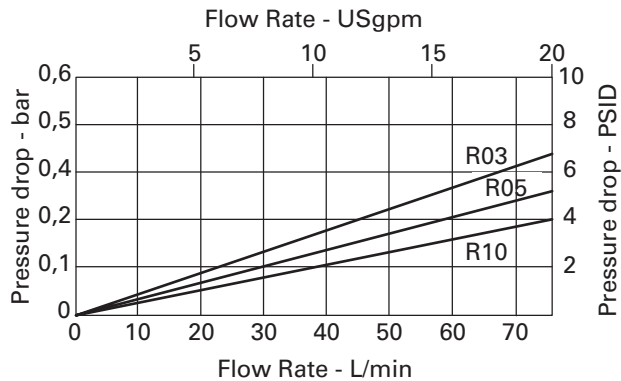
(See page 5 for specific gravity corrections and page 6 for viscosity corrections for pressure drop.)

Single Layer with 1.75 bar (25 psi) Bypass Valve



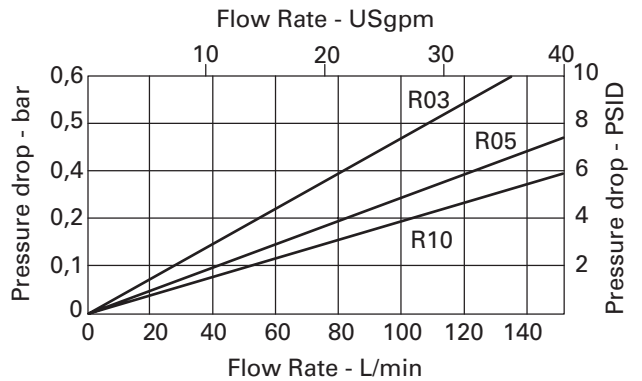
V0191 R-Pak Filter Element

147 (5.8) length

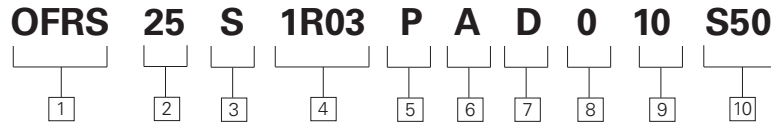


V0191 R-Pak Filter Element

203 (8.0) length



Model Codes



1 Series designation

OFRS - Oil Filter, Return line, Spin-on

2 Flow rating

25 - 25 USgpm (95 L/min)

3 Port type

- B** - G1 (formerly 1" BSPF) thd.
- F** - 1" SAE- 4-bolt flange Code 61
- P** - 1" NPTF
- S** - 1.312-12 UN SAE-16 straight thd. for 1" OD tube

4 Element type

Code	Canister Length mm (inch)	Fluid Cleanliness Code
1R03	147 (5.8)	16/14/12
1R05	147 (5.8)	18/16/14
1R10	147 (5.8)	20/18/15
2R03	203 (8.0)	16/14/12
2R05	203 (8.0)	18/16/14
2R10	203 (8.0)	20/18/15

The table assumes limited ingress/single pass of pump flow through element. For detailed assistance, see Vickers Guide to Systemic Contamination Control or contact your local Eaton representative.

Code	Filtration Rating	Element Construction
25M	40 micron	Single layer
Blank	25 micron	Single layer

NOTE: Because single layer elements are not assigned Fluid Cleanliness Codes, they are not eligible for Vickers Systemic Contamination Control Extended Warranty program.

Single Layer Media Element

Replacement element	Micron	Rating	Nominal Rating
573082	25	B ₂₅ = 100	10 micron
573083	40	B ₄₀ = 100	25 micron

5 Pressure gauge option

P - Pressure gauge 0-120 PSI (0-8 bar)
Blank - Omit if not required.

6 Inlet gauge port location (1/8" NPTF)

- A** - Location A
- B** - Location B
- C** - Location C
- Blank** - Omit if not required.

7 Outlet gauge port location (1/8" NPTF)

- D** - Location D
- E** - Location E
- F** - Location F
- Blank** - Omit if not required.

NOTE: Gauges cannot be mounted side by side. If inlet and outlet gauges are required, specify non-adjacent ports such as A and E.

8 Bypass valve

- 0** - Non-bypass
- Blank** - Bypass valve set at 25 PSI

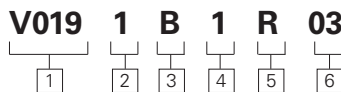
9 Design number

Subject to change. Dimensions remain the same for designs 10 through 19.

10 Special suffix

(Omit if not required.)
S50 - Filter housing minus element (Omit element options designation.)

R-Pak element



1 Series designation

V019 - Filter element for use with **OFRS15/OFRS25** – series filters (R-Pak construction only)

2 Element collapse rating

1 - 150 PSI

3 Seal material

B - Buna-N

4 Element length

- 1** - 147 (5.8)
- 2** - 203 (8.0)

5 Element construction

R - R-Pak

6 Element type

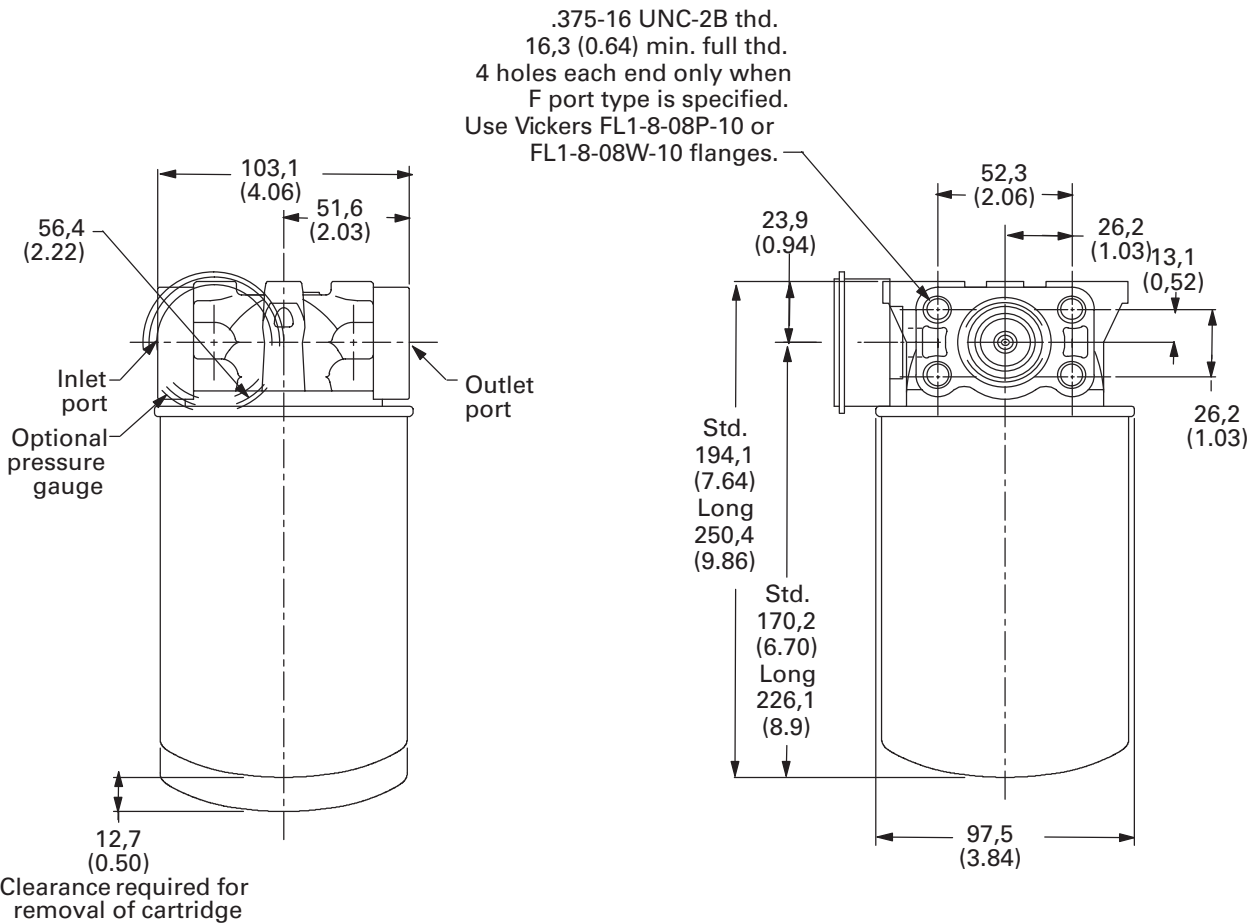
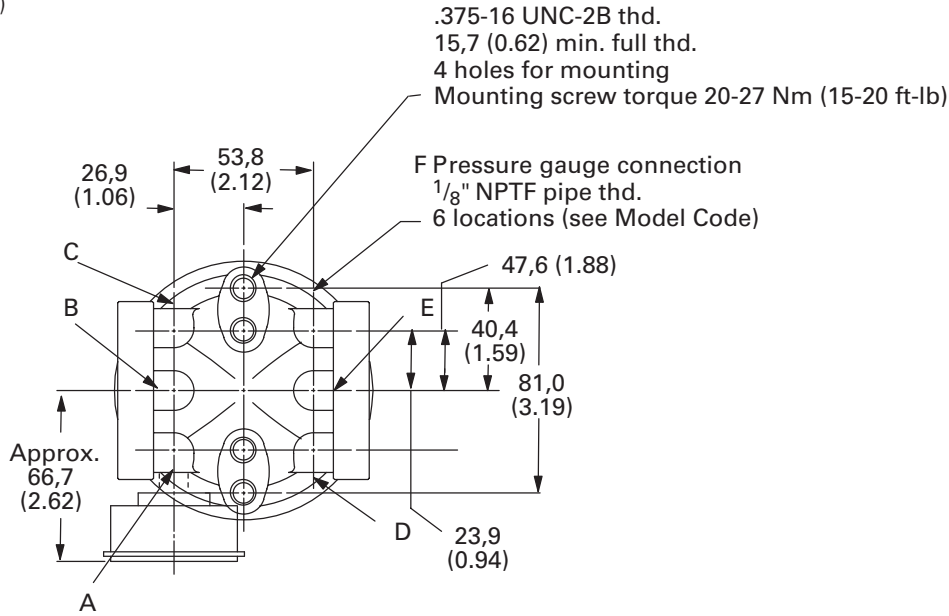
Code	Fluid Cleanliness Code	Element Construction
03	16/14/12	R-Pak
05	18/16/14	R-Pak
10	20/18/15	R-Pak

The table assumes limited ingress/single pass of pump flow through element. For detailed assistance, see "The Vickers Guide to Systemic Contamination Control" or contact your local Eaton representative.

Dimensions

Filter Housing

mm (inch)



OFRS-60 Series Filters

Flows to 227 L/min (60 USgpm) – Pressures to 7 bar (100 PSI)

Features and Benefits

- Available with Vickers proprietary R-Pak media.
- Simple spin-on element design for easy maintenance.
- Optional bypass valves prevent excessive pressure drop and accidental element collapse.
- Six available ports for use as gauge and/or diagnostic ports.
- H₂O-Pro Water Removing Element available.

Design Specifications

Rated flow: 227 L/min (60 USgpm)

Fluid compatibility: Compatible with most petroleum oil, water glycol, oil-in-water and water-in-oil fluids.

Temp range: -40°C to +107°C (-40F to +225F)

Pressure rating:
Operating 7 bar (100 PSI)

Material:
Head Die cast aluminum
Bowl Carbon steel

Dry weight: (Approximate)

Bowl length 1 4,4 kg (5.0 lbs)
Bowl length 2 5,6 kg (6.5 lbs)

General Data

These filters are designed for use in the return lines of hydraulic systems. They remove particulate contaminants from the fluid, thus improving performance and reliability of the system components while extending their service life. R-Pak and single layer filter elements are available. The elements are of the disposable spin-on cartridge type for ease of maintenance.

Integral Bypass Valve

This option prevents excessive pressure drop and prevents the element from collapsing and releasing retained contaminants back into the hydraulic system. The valve starts to open when pressure drop across the element exceeds 25 PSI due to flow surges, high viscosity oil, a clogged element, or a combination of these factors.

Gauge Ports/ Pressure Gauge

Optional ports in the filter head allow installation of a pressure gauge (part 736129) to indicate the element's condition. The optional gauge is shipped uninstalled from the filter.

Filter Elements

These return line filters are offered with two types of elements.

When system requirements call for flow to 60 USgpm and pressure drops to 30 PSI the high pressure R-Pak construction meets these demands. Replacement elements for R-Pak are ordered by model code.

In applications where less demands are placed on the system the single layer

element may offer a more practical alternative. Replacement kits are available for servicing the single layer element. Refer to the model code page for further information on filter elements and cleanliness ratings.

Spin-On Cartridge

The disposable cartridge screws onto the filter head and should be tightened per instructions on the cartridge.

Mounting Position

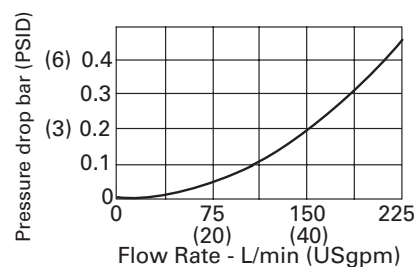
Any mounting position is permitted. Vertical is preferred for servicing.

Fluids and Seals

These filters are suitable for petroleum based, oil-water emulsions, high water base, and most water glycol fluids.

Filter Housing Flow Data

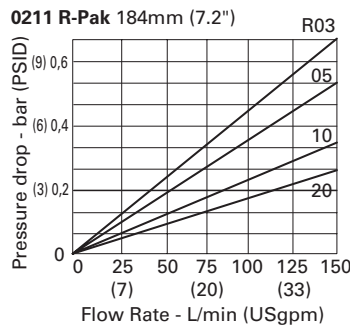
Flow versus pressure drop: 150 SUS (32 cSt) oil with specific gravity of ≤ 0.9 (See page 5 for specific gravity corrections for pressure drop.)



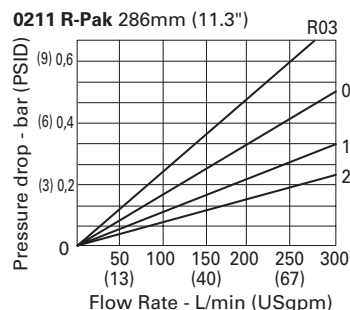
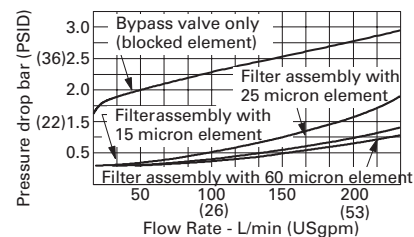
Filter Element

Flow versus pressure drop: 150 SUS (32 cSt) oil with specific gravity of ≤ 0.9 (See page 5 for specific gravity corrections for pressure drop.)

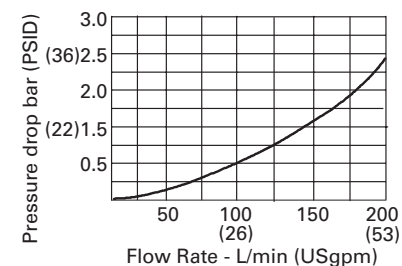
R-Pak Elements



Single Layer Elements



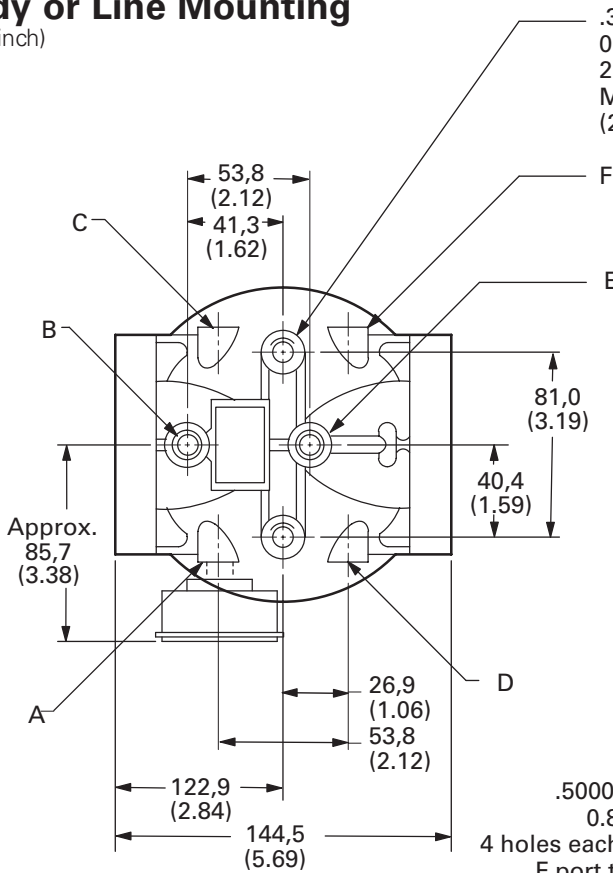
H₂O-Pro Water Removing Element W0211B2W10 287MM



Dimensions

OFRS-60 Body or Line Mounting

mm (inch)



.375-16 UNC-2B thd.
0.75 min. full thd.
2 holes for mounting
Mounting screw torque 15-20 lb. ft
(20-27 Nm)

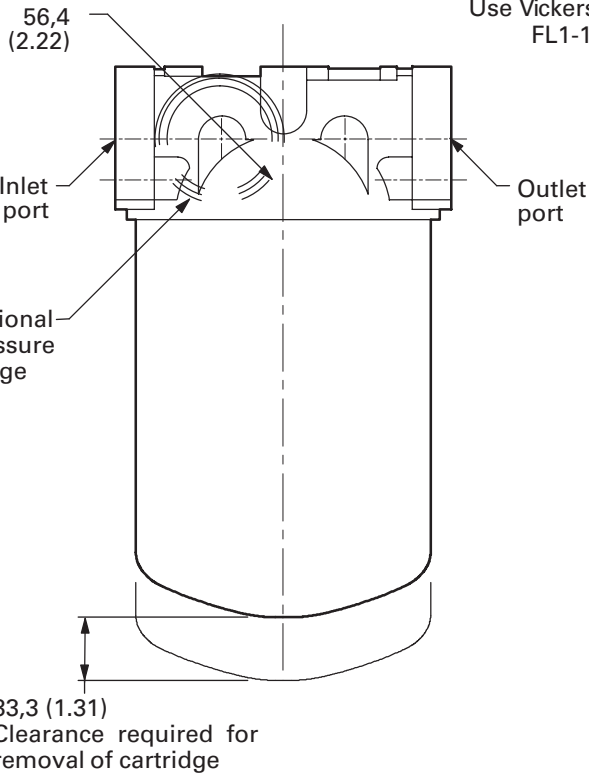
F Pressure gauge connection
1/8" NPTF pipe thd.
6 locations (see Model Code)

Element	Dimension	
	G	H
Standard	211,1 (8.31)	242,8 (9.56)
Long	312,7 (12.31)	344,4 (13.56)

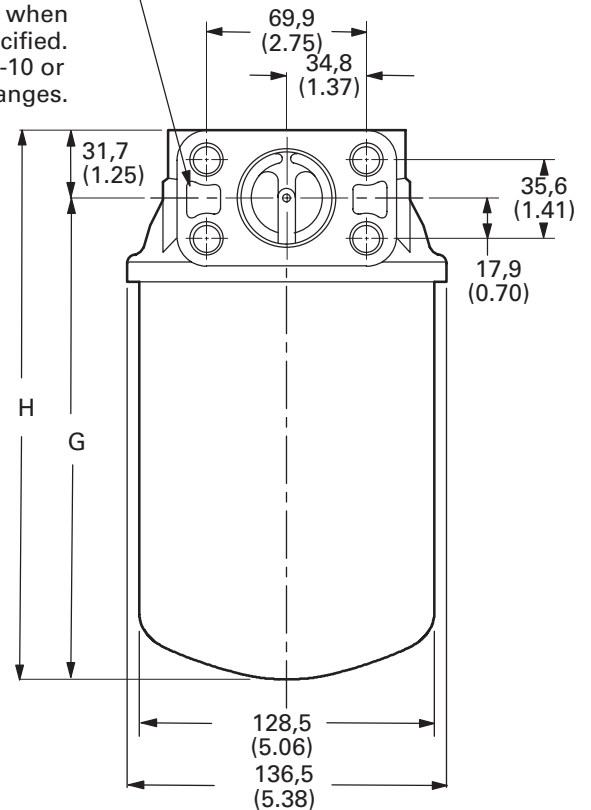
NOTE

A, B, C Inlet gauge port locations

D, E, F Outlet gauge port locations



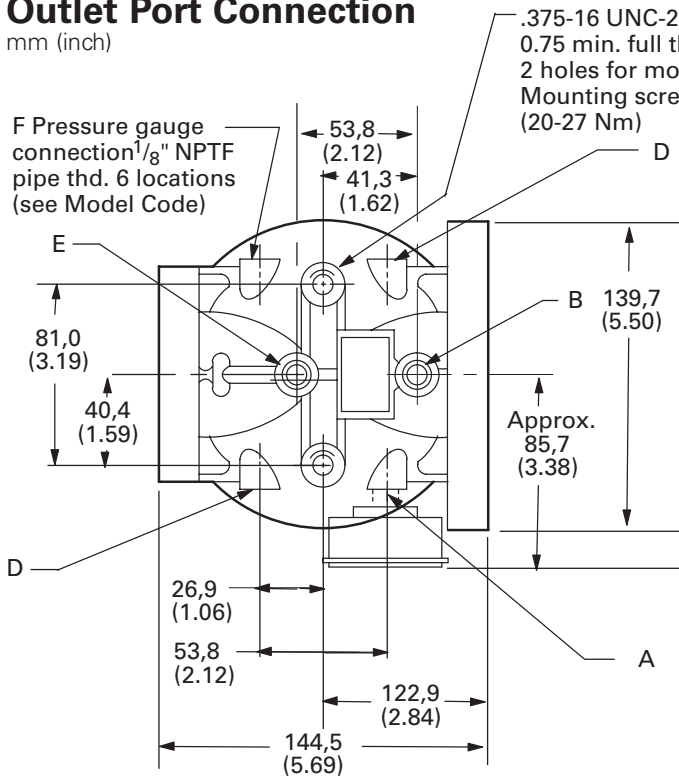
.5000-13 UNC-2B thd.
0.875 min. full thd.
4 holes each end only when
F port type is specified.
Use Vickers FL1-12-12P-10 or
FL1-12-12W-10 flanges.



Dimensions

OFRS-60-2 Manifold Mounting Outlet Port Connection

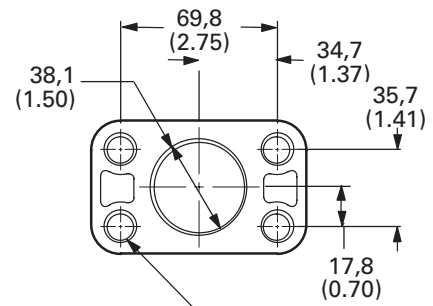
mm (inch)



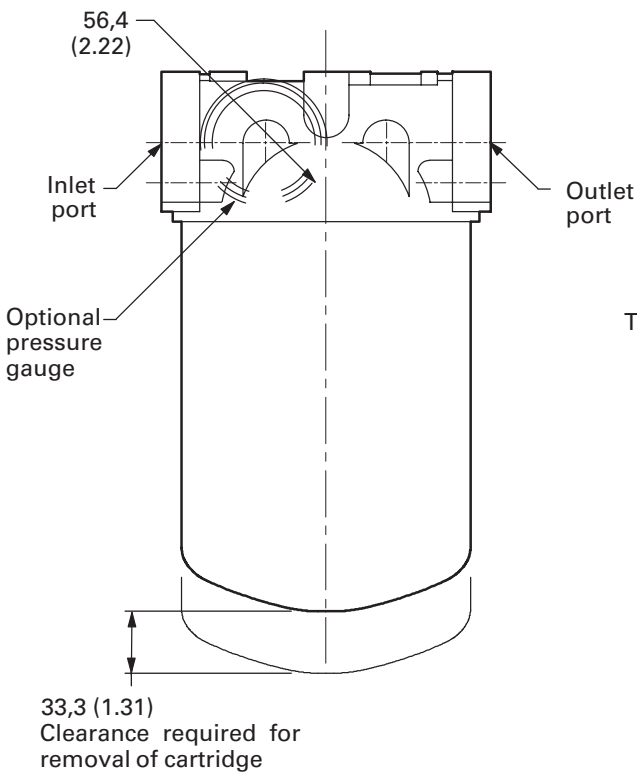
Note

A, B, C	Inlet gauge port locations
D, E, F	Outlet gauge port locations

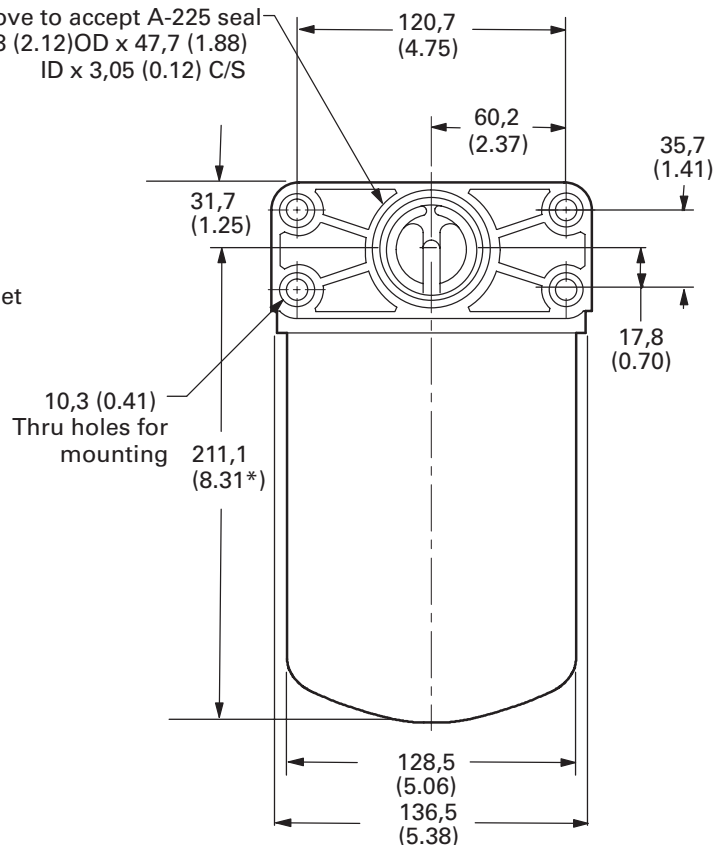
Pressure gauge in locations D and F will require additional fitting to clear mounting bolt hex nuts. Use Aeroquip No. 2040-2-25 or equivalent.



.5000-13 UNC-2B thd.
0.875 min. full thd.
4 holes each end only when
F port type is specified.
Use Vickers FL1-12-12P-10 or
FL1-12-12W-10 flanges.



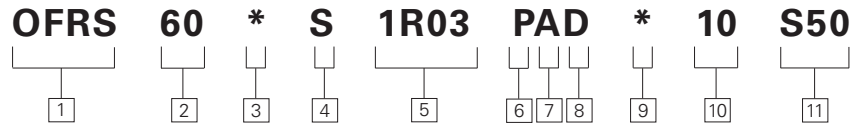
Seal groove to accept A-225 seal
5,38 (2.12)OD x 47,7 (1.88)
ID x 3,05 (0.12) C/S



* Add 101,6 (4.00) for long 10mm element.

Model Codes

Filter and Element



1 Series designation

OFRS - Oil Filter, Return line, Spin-on

2 Flow rating

60 - 60 USgpm (227 L/min)

3 Mounting

2 - Reservoir mount flange (outlet)
Blank - Body or line mounting

4 Port type

B - G1 $\frac{1}{2}$ (formerly 1 $\frac{1}{2}$ " BSPF) thd.
F - 1 $\frac{1}{2}$ " SAE 4-bolt flange
P - 1 $\frac{1}{2}$ " NPTF
S - 1.875-12 UN SAE-24 straight thd. for 1 $\frac{1}{2}$ " OD tube

5 Element type

Code	Canister Length mm (inch)	Fluid Cleanliness Code
1R03	184 (7)	16/ 14/12
1R05	184 (7)	18/ 16/14
1R10	184 (7)	20/ 18/15
1R20	184 (7)	22/ 19/16
2R03	286 (11)	16/ 14/12
2R05	286 (11)	18/ 16/14
2R10	286 (11)	20/ 18/15
2R20	286 (11)	22/ 19/16
2W10	286 (11)	Water Removal

The table assumes limited ingresson/single pass of pump flow through element. For detailed assistance, see "The Vickers Guide to Systemic Contamination Control" or contact your local Eaton representative.

Other element options:

Code	Filtration rating	Element construction
3M	15 micron	Single layer
25M	60 micron	Single layer
Blank	25 micron	Single layer

NOTE: Because single layer elements are not assigned Fluid Cleanliness Codes, they are not eligible for Vickers Systemic Contamination Control Extended Warranty program.

6 Pressure gauge option

P - Pressure gauge
Blank - Omit if not required

7 Inlet gauge port location (1/8" NPTF)

A - Location A
B - Location B
C - Location C
Blank - Omit if not required

8 Outlet gauge port location (1/8" NPTF)

D - Location D
E - Location E
F - Location F
Blank - Omit if not required

NOTE: Gauges cannot be mounted side by side. If inlet and outlet gauges are required, specify non-adjacent ports such as A and E.

9 Bypass valve

0 - No bypass valve
Blank - Bypass valve set at 25 PSI

10 Design number

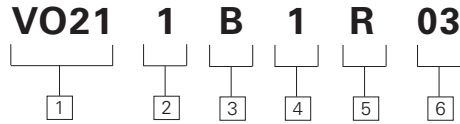
Subject to change. Dimensions remain the same for designs 10 through 19.

11 Special feature suffix

S14 - Long 25 micron element
S50 - Housing without element (omit code for element type)
Blank - Omit if not required

Model Codes

R-Pak Element Only



1 Series designation

V021 - Filter element for use with H021, H022, H023 and OFRS-60 series filters (R-Pak construction only)

W021 - Water Removal element for use with H021, H022, H023 and OFRS-60 series filters

2 Element collapse rating

1 - 150 PSI Low Pressure

3 Seal material

B - Buna-N

4 Canister length

mm (inch)

1 - 184 (7)

2 - 286 (11)

NOTE: Water removal element only available in length 2.

5 Element construction

R - R-Pak (grade 3,5,10,20)

W - W-Pak (Water Removal) (grade 10)

6 Fluid cleanliness rating

Code	Fluid Cleanliness Code	Element construction
03	16/14/12	R-Pak
05	18/16/14	R-Pak
10	20/18/15	R-Pak, W-Pak
20	22/19/16	R-Pak

The table assumes limited ingress/single pass of pump flow through element. For detailed assistance, see "The Vickers Guide to Systemic Contamination Control" or contact your local Eaton representative.

Single Layer Media Element Only

Replacement Element Number	Micron	Rating	Nominal Rating
941190 Std. Length	15	B ₁₅ = 100	3 micron
941107 Std. Length	25	B ₂₅ = 100	10 micron
926388 Long Length	25	B ₂₅ = 100	10 micron
941191 Std. Length	60	B ₆₀ = 100	25 micron

NOTE

Because single layer elements are not assigned Fluid Cleanliness Codes, they are not eligible for Vickers Systemic Contamination Control Extended Warranty program.

HS22 Series Filters

Flows to 450 L/min (120 USgpm) – Pressures to 14 bar (200 PSI)

Features and Benefits

- Designed to comply with ANSI specifications and ISO cleanliness standards.
- Dual flow path design maximizes flow capability and service life.
- Spin-on element make servicing fast and easy
- High efficiency replacement elements in standard configurations (R-Pak) to meet Target Cleanliness Levels
- Water removal element (W-Pak) available

Design Specifications

Rated flow:	
Length 1	227 L/min (60 USgpm)
Length 2	454 L/min (120 USgpm)

Housing & Element Compatibility:	Compatible with most petroleum oil, water glycol, oil-in-water and water-in-oil fluids.
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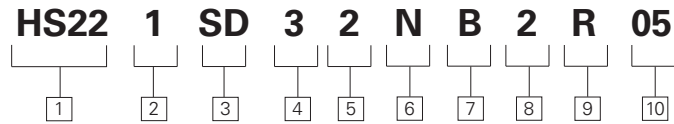
Temp range:	-32°C to +107°C (-25°F to +225°F)
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Pressure rating:	Operating 14 bar (200 PSI)
------------------	----------------------------

Material:	Head Aluminum
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Dry weight: (Approximate)	
Length 1	7.3 kg (16 lbs)
Length 2	8.6 kg (19 lbs)

Filter Assembly Model Code



1 Filter Series
HS22

2 Element Collapse Rating
1 - 150 PSID Low Pressure

3 Port options
BD - G1¹/₂ to ISO 228
ME - 1¹/₂" SAE 4 bolt Flange Code 61 (M12 x 1.75)
SD - 1.875 - 12 UN sae-24 str. Thd (1¹/₂ tube)
FE - 1¹/₂" SAE 4 bolt Flange Code 61 (UNC)

4 Valve options
3 - 25 PSI bypass
4 - 50 PSI bypass

5 Indicator options
1 - No indicator
2 - 0 - 200 PSI gauge
4 - 0 - 60 PSI gauge

6 Receptical
N - None

7 Seal material
B - Buna-N

8 Canister length	Assembly length
1 - 184mm (7")	253mm (10")
2 - 286mm (11")	355mm (14")

S50 - Head Sub-Assembly Only (no element or gauge)

9 Element construction
R - Standard construction (3, 5, 10, 20 Micron)
W - Water removal (10 Micron only)

10 Fluid cleanliness rating

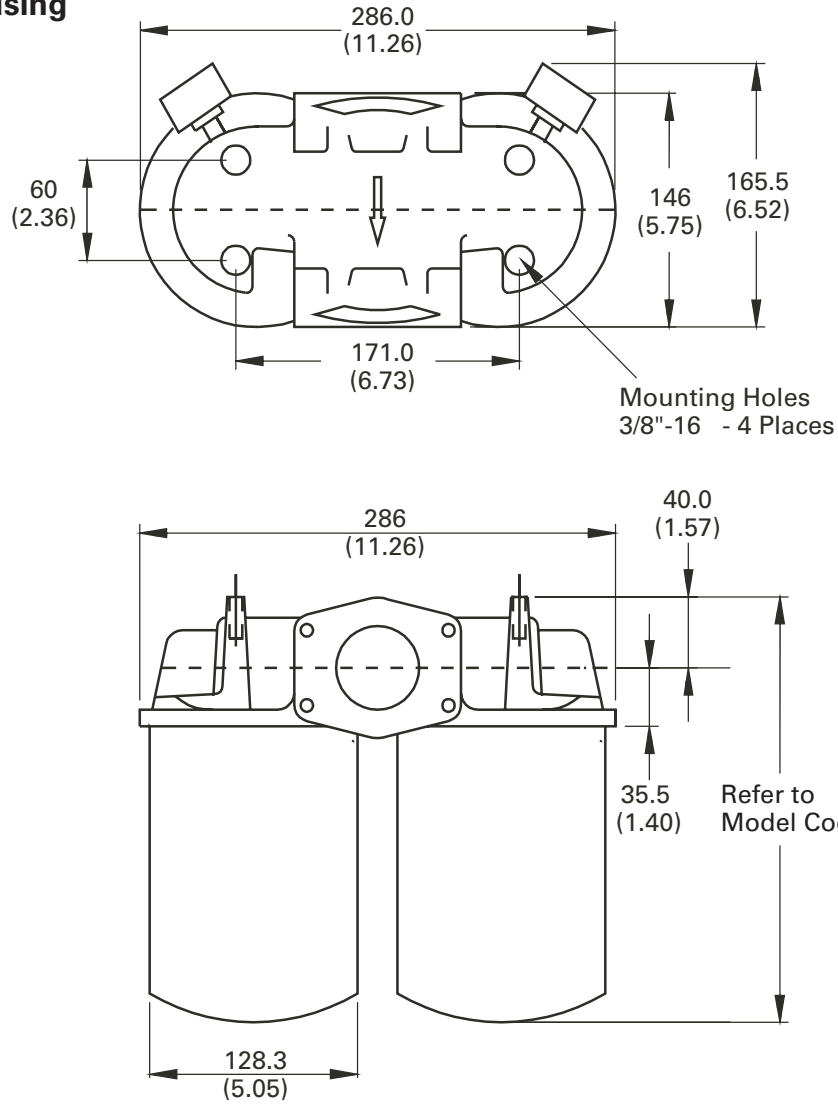
Code	Target fluid cleanliness level
03	16/ 14 / 12 or better
05	18/ 16 / 14 or better
10	20/ 18 / 15 or better
20	22/ 19 / 16 or better

The table assumes limited ingress/single pass of pump flow through element. For detailed assistance, see "The Systemic Approach to Contamination Control" or contact your local Eaton representative.

Dimensions

HS22 Series Housing

mm (inch)



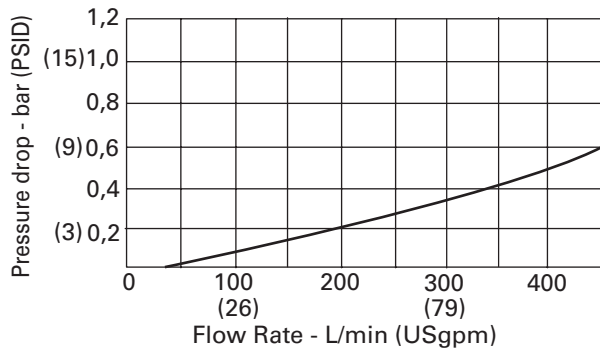
Filter Housing/Bypass Valve Flow Data

Flow versus pressure drop:

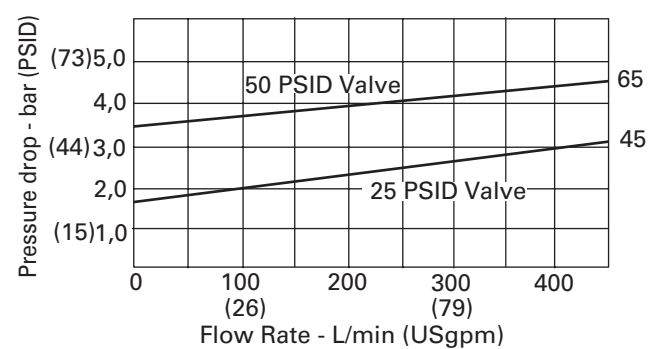
150 SUS (32 cSt) oil with specific gravity of ≤ 0.9

(See page 5 for specific gravity corrections for pressure drop.)

Housing

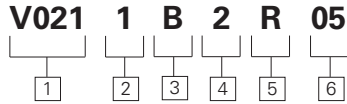


Bypass Valve



021 Series Replacement Filter Elements

Element Model Code



1 Filter element

V021 - For use with HS22 and OFR-S60 series filters
W021 - Water Removal Element for use with HS22 and OFR-S60 series filters

2 Element collapse rating

1 - 150 PSI

3 Seal material

B - Buna-N

4 Canister length

mm (inch)

- 1 - 184 (7)
- 2 - 286 (11)

NOTE: Water removal element only available in length 2.

5 Element construction

R - R-Pak (grade 3, 5, 10, 20)
W - W-Pak, Water Removal (grade 10)

6 Fluid cleanliness ratings

Code	Fluid Cleanliness Code	Element construction
03	16/14/12	R-Pak
05	18/16/14	R-Pak
10	20/18/15	R-Pak, W-Pak
20	22/19/16	R-Pak

The table assumes limited ingress/single pass of pump flow through element. For detailed assistance, see "The Vickers Guide to Systemic Contamination Control" or contact your local Eaton representative.

Design Specifications

Rated flow: 227 L/min (60 USgpm) canister length 1
454 L/min (120 USgpm) canister length 2

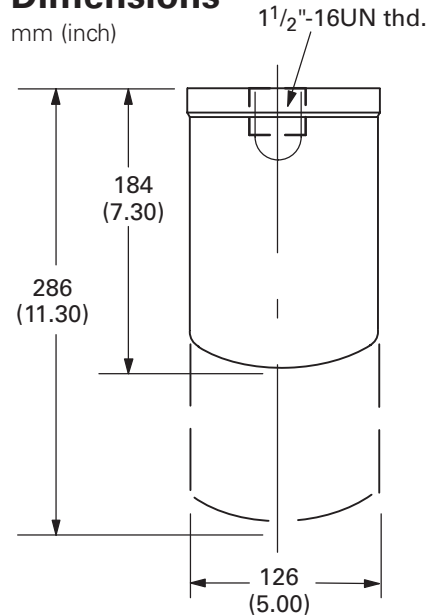
Fluid Compatibility: Compatible with most petroleum oil, water glycol, oil-in-water and water-in-oil fluids.

Construction: R-Pak, W-Pak

Temp range: -32°C to +107°C (-25°F to +225°F)

Dimensions

mm (inch)



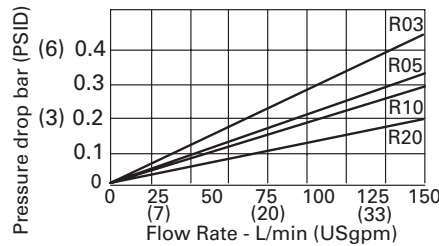
Filter Element Flow Data

mm (inch)

Flow versus pressure drop:
150 SUS (32 cSt) oil with specific gravity of ≤ 0.9
(See page 6 for viscosity corrections for pressure drop.)

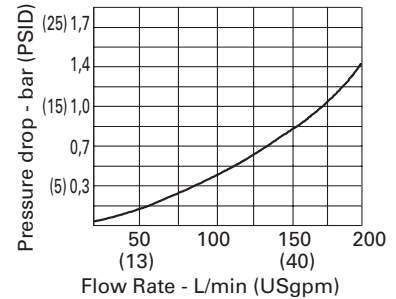
R-Pak Elements

0211 R-Pak element 184mm (7.2")

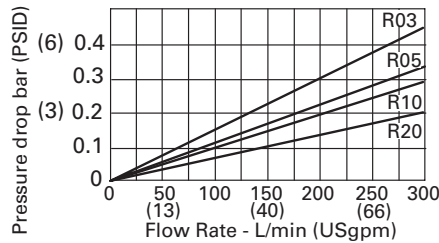


H₂O-Pro Water Removing Element

W0211B2W10 286 (11) length



0211 R-Pak element 286mm (11.3")



Note

The HS22 assembly uses two filter elements in parallel. The pressure drop information is for two elements in parallel.

OF3 Series Inlet Strainers

Flows to 379 L/min (100 USgpm)

Features and Benefits

- Stainless steel elements have 149 micron (100 mesh) screen to protect hydraulic pumps from solid contaminants.
- Available flow rates to 379 L/min (100 USgpm). Higher rates can be achieved by using multiple strainers.
- Bypass valve available to prevent system shutdown.
- Element media is pleated for long life.
- Elements can be cleaned and reused.

General Data

These Vickers inlet strainers protect hydraulic pumps and control systems from solid contaminants. They should be used as immersion suction strainers on pump inlet lines.

Bypass Valve

An available integral relief valve parallels the element and is preset to open at a 3 PSI pressure drop across the element. Element bypassing can be caused by excess flow rates, high fluid viscosity, dirt-loaded elements, or a combination of these.

Element Selection

The size and number of elements selected should be based on the maximum flow ratings listed on this page. The ratings are conservative, and a change in fluid viscosity should not significantly affect capacity.

Cleaning

The strainer elements should be cleaned periodically. Remove the elements from the reservoir, wash thoroughly in a suitable solvent, and blow dry with air from inside to outside.

Design Specifications

Rated flow:

OF3-08	38 L/min (10 USgpm)
OF3-10	76 L/min (20 USgpm)
OF3-12	114 L/min (30 USgpm)
OF3-16	189 L/min (50 USgpm)
OF3-20	284 L/min (75 USgpm)
OF3-24	379 L/min (100 USgpm)

Fluid compatibility:

These strainers are compatible with all commonly used hydraulic fluids, including phosphate esters and water based fluids.

Temp range: -40°C to +107°C
(-40°F to +225°F)

Filtration: Unit is supplied with 149 micron (100 mesh) wire cloth element.

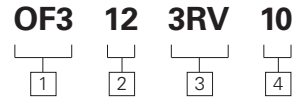
Material:

Head	Nylon
Element	Pleated stainless steel

Dry weight: (Approximate)

OF3-08	0,3 kg (0.7 lbs)
OF3-10	0,4 kg (1.0 lbs)
OF3-12	0,6 kg (1.4 lbs)
OF3-16	0,8 kg (1.8 lbs)
OF3-20	1,0 kg (2.3 lbs)
OF3-24	1,4 kg (3.0 lbs)

Model Code



1 Model Series

OF3 - Inlet strainers

2 Port Size (NPTF)

08 - 1"
10 - 1 1/4"
12 - 1 1/2"
16 - 2"
20 - 2 1/2"
24 - 3"

3 Bypass Valve

3RV - 3 PSI differential opening pressure
Blank - Omit if not required

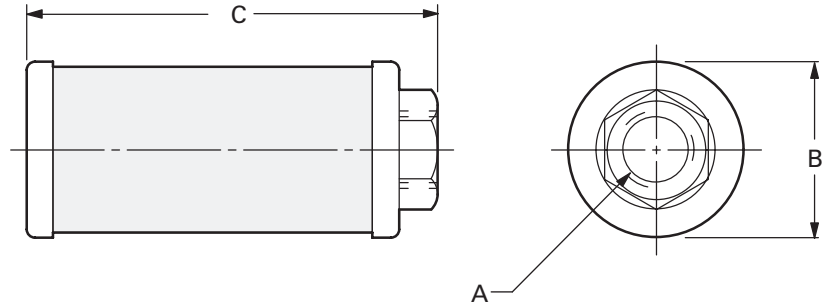
4 Design number

Subject to change. Dimensions remain the same for designs 10 through 19.

Installation Dimensions

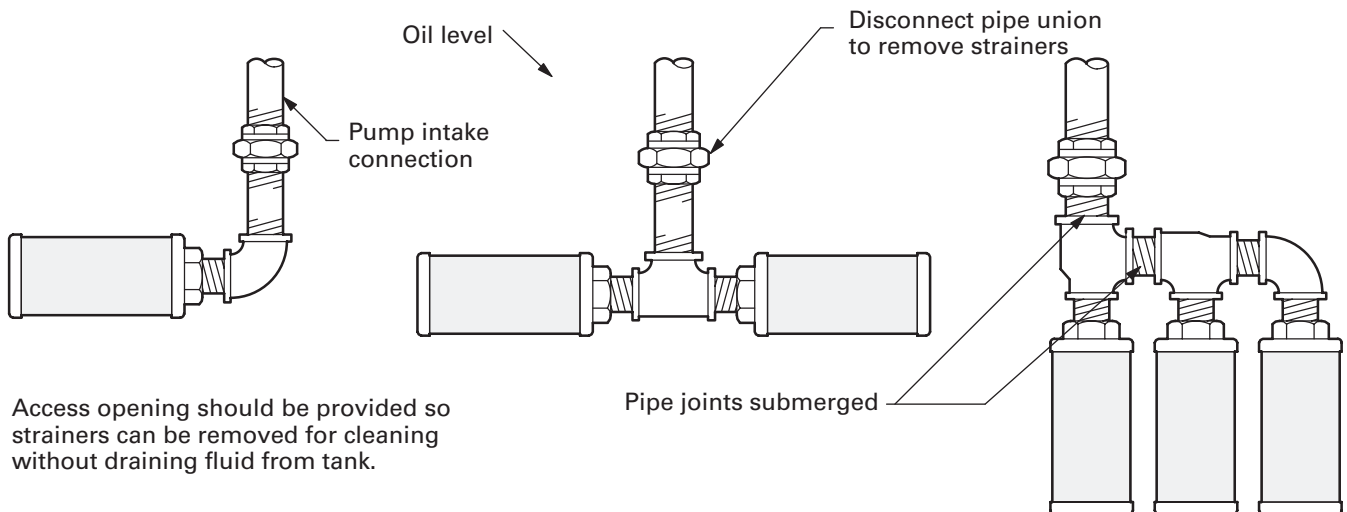
Inlet Strainer

mm (inch)



Model Series	Minimum Screen Area cm ² (in ²)	A (NPTF pipe thread)	B	C ±3,2 (±0.125)
OF3-08	710 (110)	1"	67,8 (2.67)	135,9 (5.35)
OF3-10	1032 (160)	1 1/4"	88,1 (3.47)	174,0 (6.85)
OF3-12	2194 (340)	1 1/2"	101,6 (4.00)	250,2 (9.85)
OF3-16	2194 (340)	2"	101,6 (4.00)	250,2 (9.85)
OF3-20	2581 (400)	2 1/2"	131,3 (5.17)	256,5 (10.10)
OF3-24	3226 (500)	3"	131,3 (5.17)	299,2 (11.78)

Typical Installations



10F, 50F and 100F Series – Indicating Inlet Strainers

Flows to 700 L/min (185 USgpm) – Pressures to 0,3 bar (5 PSI) vacuum to 20 bar (300 PSI) positive

Features and Benefits

- Stainless elements have 149 micron (100 mesh) screen to protect pumps from solid contaminants.
- Available flows to 700 L/min (185 USgpm) on pressure inlets and 530 L/min (140 USgpm) on vacuum inlets.
- Standard integral air bleed feature prevents formation of large bubbles. This provides faster priming of pumps at startup and prevents pump damage.
- Housing can be adapted to handle most hydraulic fluids.
- Large, easy to read, standard visual indicator (or optional electrical indicator) informs operator when element needs to be cleaned.
- Elements can be cleaned and reused.
- Standard bypass valve protects against pump damage.

Design Specifications

Rated flow:	See table
Temp range:	-40°C to +107°C (-40°F to +225°F)
Pressure rating:	
10F and 50F:	0,3 bar (5 PSI) vacuum to 3 bar (50 PSID) positive
100F:	20 bar (300 PSI)
Filtration:	Filter is supplied with 149 micron (100 mesh) wire cloth element.
Fluid and seals:	Standard model is compatible with most petroleum oil, water glycol, and water-in-oil fluids. Optional seals sand coatings are available for use in phosphate esters and oil-water emulsions. See fluids and seals note in Model Code.
Material:	
Cover	Die cast aluminum
Housing	Cast aluminum
Dry weight: (Approximate)	
10F:	2,5 kg (5.5 lb)
50F:	5,7 kg (12.5 lb)
100F:	16,3 kg (36.0 lb)

Maximum Flow Ratings

This table presents recommendations for use in both pressurized inlet systems and the more common vacuum inlet systems. The effects of fluid viscosity, specific gravity, and fluid flow rate on the pump inlet system (including the filter) have been taken into consideration. Even with a bypass condition in effect due to element dirt loading, a margin of pump protection is still afforded.

Model Series	Vacuum Inlet*		Pressurized Inlet**	
	Normal Service† L/min (USgpm)	Special Service†† L/min (USgpm)	Normal Service† L/min (USgpm)	Special Service†† L/min (USgpm)
10FA	45 (12)	30 (8)	61 (16)	42 (11)
50FB	106 (28)	76 (20)	140 (37)	95 (25)
50FC	178 (47)	125 (33)	257 (68)	167 (44)
50FD	254 (67)	178 (47)	329 (87)	238 (63)
100FE	367 (97)	284 (75)	492 (130)	367 (97)
100FF	530 (140)	367 (97)	700 (185)	492 (130)

* 0,3 bar (5 PSI) vacuum to 0 bar (0 PSI)

** 0 bar (0 PSI) to 50 bar (3.5 PSI)

† For use with petroleum oil up to 48 cSt (225 SUS) with less than 457mm (18") lift on vacuum applications.

†† For use with petroleum oils above 48 cSt (225 SUS) and fire resistant fluids.

Indicating Inlet Strainers

General Data

These units have been designed for use in the intake lines of hydraulic pumps to afford a degree of protection from contaminants to the pump and other components in the hydraulic system.

Bypass Valve

An integral relief valve parallels the element and is preset to open at a 2 PSI (standard) or 3 PSI (optional) pressure drop across the element. Element bypassing can be caused by excess flow rates, high fluid viscosity, dirt-loaded elements, or a combination of these.

Air Bleed

These strainers include a standard integral air bleed. It provides faster pump priming on startup and limits the agglomeration of small air bubbles into larger ones. Large air bubbles are detrimental to pump operation.

The unit may be mounted in any position desired. To ensure proper operation of the air bleed feature, however, the inlet port must be pointed down.

Magnets

Magnets are available as an accessory and are installed in the filter on the outside of the element. They act to attract and retain ferrous particles of all sizes, some of which could be small enough to pass through the element mesh and into the pump if no magnets were present.

Indicators

Visual

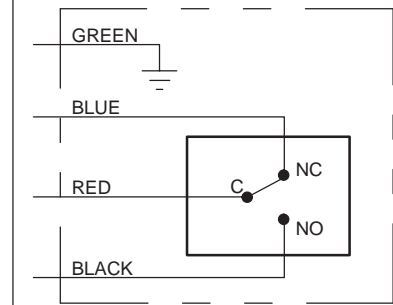
A highly visible mechanical indicator is linked to the bypass valve. The indicator shows green when the bypass valve is closed and progressively more yellow as a warning when the element pressure drop gets into the danger zone. Red indicates an open bypass valve. The indicator will also automatically show red, (bypass condition) if the unit is accidentally operated without an element.

The visual indicator can also be reassembled to provide a "memory" function. If the protecting hood is removed and the rotary indicator turned 180° on its stem, the unit will indicate the maximum opening of the bypass and remain in that position until reset by rotating the knurled projecting knob.

Electrical

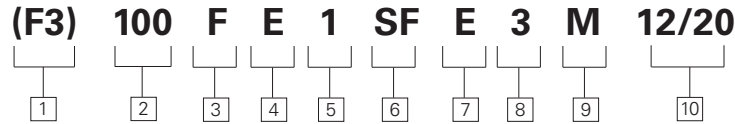
A lever-actuated electric switch is mounted in the indicator enclosure. The switch is depressed by a cam mounted to the bypass valve just prior to the opening of the valve. This changes the completion of the electrical switch circuit from the common and the normally closed terminals to the common and normally open terminals. Switch actuation will also occur when the unit is accidentally operated without an element.

Switch Circuit



A 1/2" pipe tap is provided for connecting a conduit, and lengths of color coded wires are soldered to the switch terminals for connecting to the external circuit through the conduit wires. The switch contacts are rated for 5 amps resistive loading up to 250V AC.

Model Code



1 Fluid Compatibility*

F3 - Special seals
F6 - For oil-in-water emulsions
Blank - Omit if not required.

* Use of synthetic, fire-resistant fluids requires filter with special seals. Add prefix F3 to model number when phosphate esters or their blends are to be used. Oil-in-water emulsions require corrosion protection of aluminum parts. Add prefix F6 when using such fluids. Water glycol, water-in-oil emulsions, and petroleum oil fluids may be used with standard seals.

2 Package Size

10 - 10 size
50 - 50 size
100 - 100 size

3 Model Series

F - Indicating type inlet filter

4 Port Size

A - 1" (10F)
B - 1 1/2" (50F)
C - 2" (50F)
D - 2 1/2" (50F)
E - 3" (100F)
F - 3 1/2" (100F)

5 Mean Filtration Rating

1 - 149 micron (100 mesh)

6 Port Type

B - G1 (formerly 1" BSPF) thd. (10F only)
F - 4-bolt SAE flange
P - NPTF pipe thd. in housing**†
S - SAE straight thd. in housing (except 50FD and 100 F)
PF - Inlet: NPTF pipe thd. in housing
 Outlet: 4-bolt SAE flange
SF - Inlet: SAE straight thd. in housing
 Outlet: 4-bolt SAE flange

** Not recommended

†CAUTION



Use pipe sealant to ensure airtight connections on pipe threaded models. See tag on unit.

7 Indicator

E - Electrical
L - Less (without) indicator parts
Blank - Omit for mechanical.

8 Bypass Valve

3 - 3 PSI differential opening pressure
Blank - Omit for 2 PSI differential opening pressure.

9 Option

M - Magnets
Blank - Omit if not required.

10 Design number

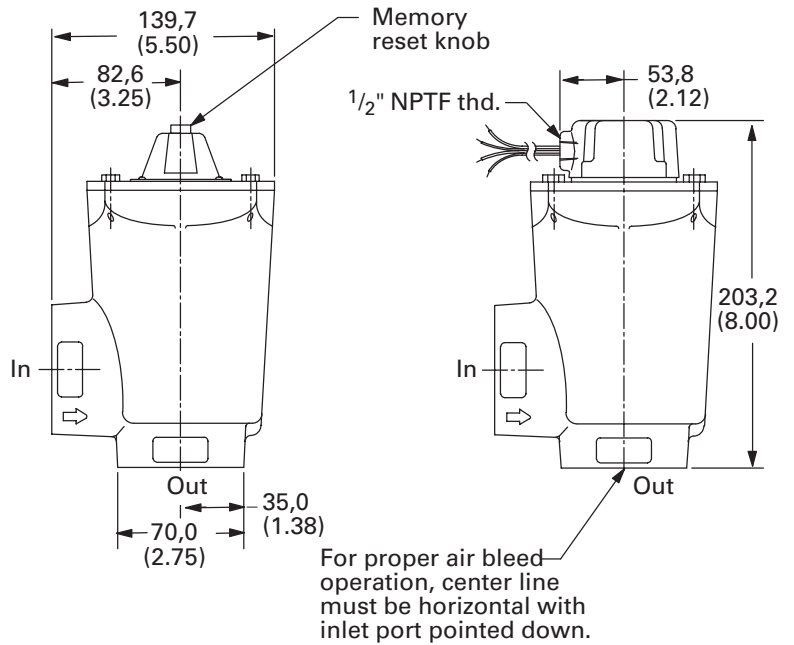
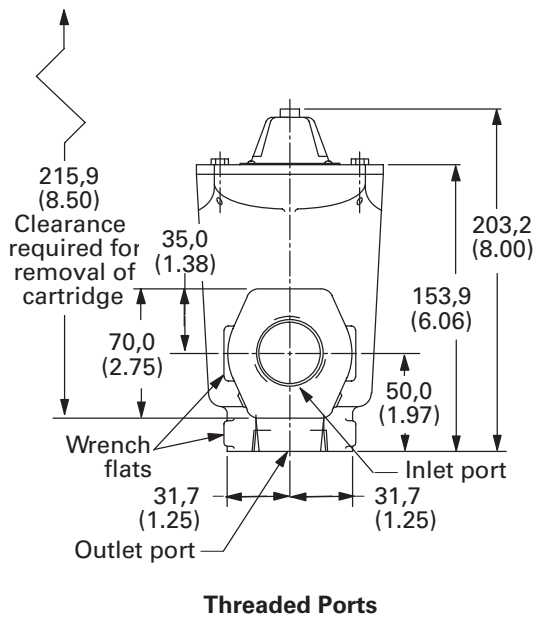
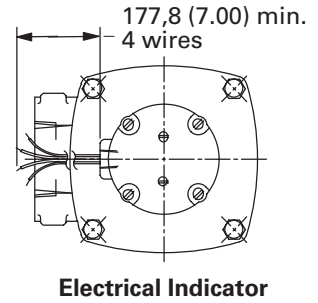
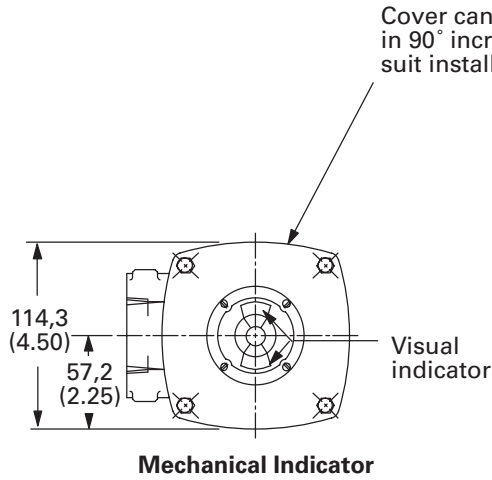
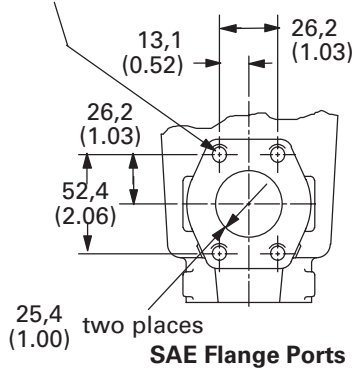
Subject to change. Dimensions remain the same for designs 12 and 20.
12 - Mechanical indicator or no indicator
20 - Electrical indicator

Dimensions

10FA Model Series

mm (inch)

.375-16 UNC 2B thd.
22,5 (0.88) deep
4 holes, 2 places



Inlet and Outlet Port Threads

Element Area cm ² (in ²)	Pipe Thread*	SAE Straight Thread	Tube Size	NPTF Flange*	Welded Flange
419.4 (65)	1" NPTF G1 (1" BSPF)	1.312-12 UN	1.000	FLI-8-08P-10	FLI-8-08W-10

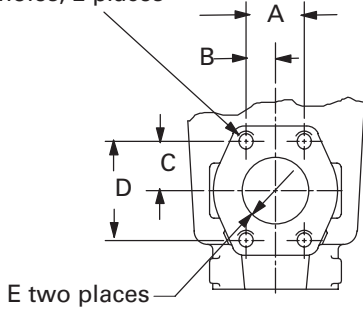
*Not recommended

Dimensions

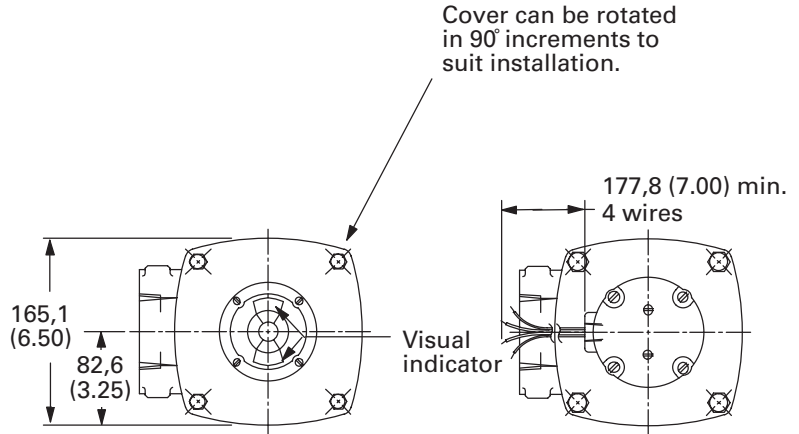
50F* Model Series

mm (inch)

.500-13 UNC 2B thd.
26,9 (1.06) deep
4 holes, 2 places

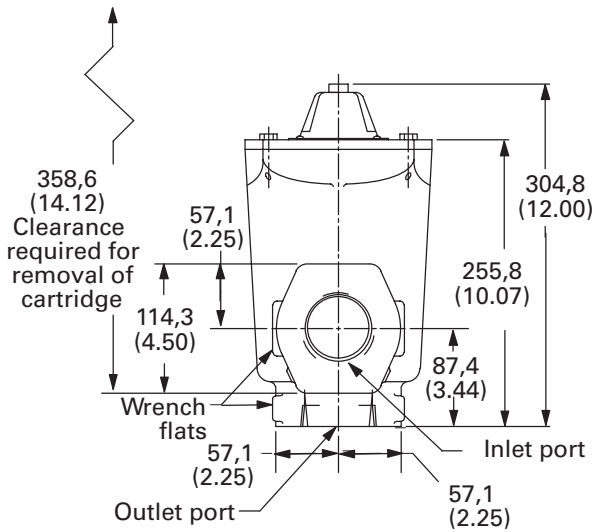


SAE Flange Ports

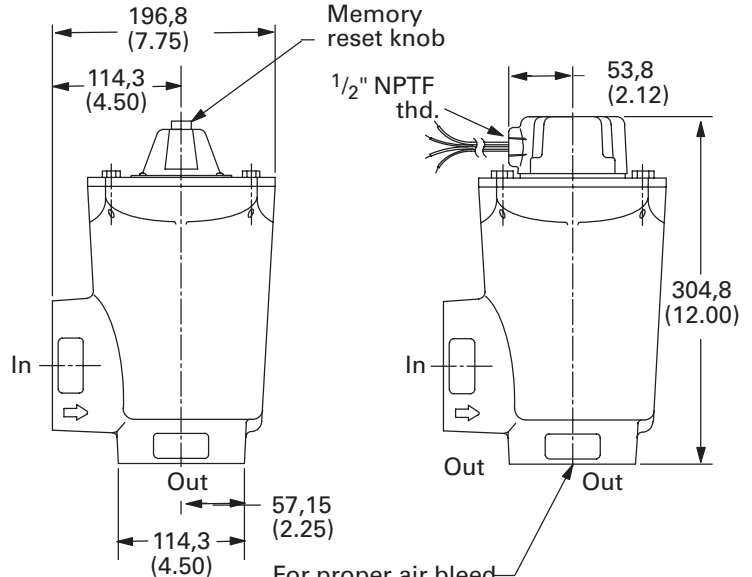


Mechanical Indicator

Electrical Indicator



Threaded Ports



For proper air bleed operation, center line must be horizontal with inlet port pointed down.

Inlet and Outlet Port Threads

SAE Flange Port Dimensions

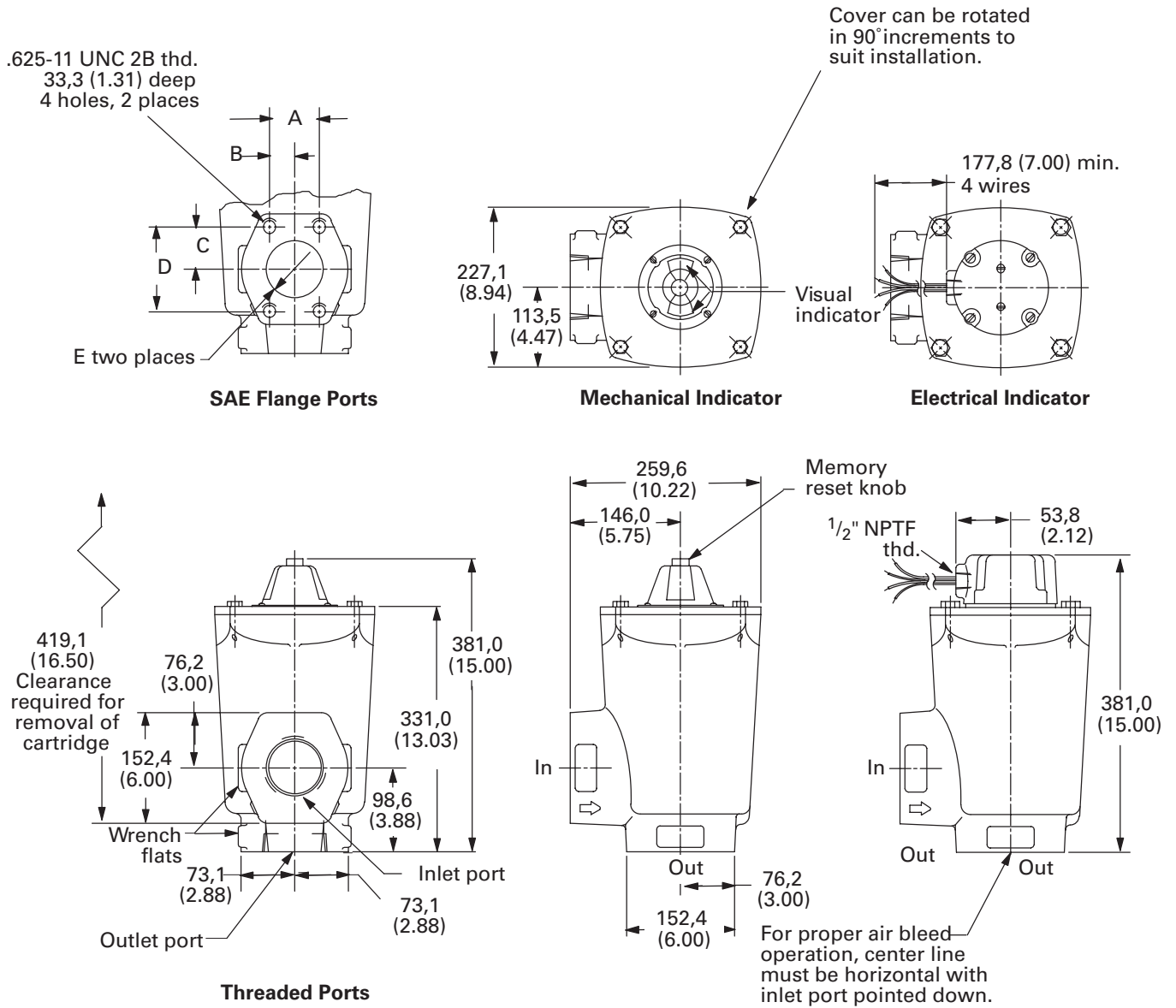
Model	Element Area cm ² (in ²)	Inlet and Outlet Port Threads				SAE Flange Port Dimensions					
		Pipe Thread*	SAE Straight Thread	Tube Size	NPTF Flange*	Welded Flange	A	B	C	D	E
50FB	645,2 (100)	1 1/2"	1.875-12 UN	1.50	FLI-12-12P-10	FLI-12-12W-10	35,7 (1.41)	17,8 (0.70)	35,1 (1.38)	69,8 (2.75)	38,1 (1.50)
50FC	1419,4 (220)	2"	2.500-12 UN	2.00	FLI-16-16P-10	FLI-16-16W-10	42,9 (1.68)	21,3 (0.84)	38,9 (1.53)	77,8 (3.06)	50,8 (2.00)
50FD	1419,3 (220)	2 1/2"	-	-	FLI-20-20P-10	FLI-20-20W-10	50,8 (2.00)	25,4 (1.00)	44,4 (1.75)	88,9 (3.50)	63,5 (2.50)

*Not recommended

Dimensions

100F* Model Series

mm (inch)



Inlet and Outlet Port Threads

SAE Flange Port Dimensions

Model	Element Area cm ² (in ²)	Pipe Thread*	SAE			Welded Flange	A	B	C	D	E
			Straight Thread	Tube Size	NPTF Flange*						
100FE	2580,6 (400)	3"	-	-	FLI-24-24P-10	FLI-24-24W-10	62,0 (2.44)	31,0 (1.22)	53,1 (2.09)	106,4 (4.19)	76,2 (3.00)
100FF	2580,6 (400)	3 1/2"	-	-	-	FLI-28-28W-10	69,8 (2.75)	35,1 (1.38)	60,4 (2.38)	120,6 (4.75)	88,9 (3.50)

*Not recommended

HF2P Series Filters

Flows to 90 L/min (24 USgpm) – Pressures to 210 bar (3000 PSI)

Features and Benefits

- Designed to comply with ANSI specifications and ISO cleanliness standards.
- Visual, electrical, and electrical indicators with lamp options for system design flexibility
- Conforms to HF2 specifications
- Compact design for use with servo and proportional valves
- Manifold mounting option for system flexibility
- Fatigue rated to 3000 PSI for maximum reliability in broad application
- High efficiency replacement elements in standard configurations (C-Pak) to meet Target Cleanliness Levels
- High collapse elements available for non-bypass applications.

Design Specifications

Rated flow:

Length 1	45 L/min (12 USgpm)
Length 2	91 L/min (24 USgpm)

Housing & Element Compatibility: Compatible with most petroleum oil, water glycol, oil-in-water and water-in-oil fluids. Optional seals available for phosphate esters.

Temp range: -26°C to +121°C (-15°F to +250°F)

Pressure rating:

Operating	210 bar (3000 PSI)
Proof	310 bar (4500 PSI)
Burst	621 bar (9000 PSI)
Fatigue	210 bar (3000 PSI)

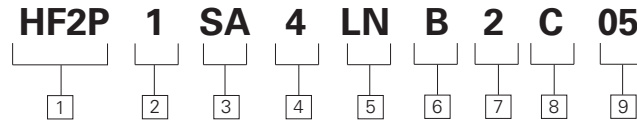
Material:

Head	Ductile Iron
Bowl	Carbon Steel

Dry weight: (Approximate)

Length 1	4.6 kg (10.1lbs)
Length 2	5.9 kg (13.4lbs)

Filter Assembly Model Code



1 Filter Series HF2P

2 Element Collapse Rating

- 1 - 150 PSI Low Collapse
- 4 - 3000 PSI High Collapse

3 Port options

- BA - G^{3/4} to ISO 228
- SA - 1.062 - 12UN SAE-12 (3/4" tube)
- WS - Subplate mounting

4 Valve options

- 1 - Non-Bypass
- 4 - Bypass set at 43 PSI cracking pressure
- 6 - Bypass set at 90 PSI cracking pressure

5 Indicator options

First Designator - Indicator Type

- A - Visual 70 PSI
- J - No Indicator (plug)
- L - Visual 30 PSI
- O - Visual 115 PSI
- R - Electrical 30 PSI
- T - Electrical 115 PSI
- U - Electrical 70 PSI

Second Designator - Electrical Receptical

- B - Brad Harrison
- H - Hirshman
- J - Hirshman with 24 volt light
- K - Hirshman with 115 volt light
- L - Hirshman with 230 volt light
- N - No Connector - use with visual indicators and "J"

6 Seal material

- B - Buna-N
- V - Viton-A

Viton is a registered trademark of E.I. DuPont

7 Element length Assembly length

- 1 - 101mm (4") 211.9mm (8.3")
- 2 - 203mm (8") 304.9mm (12.0")

8 Element construction

- C - 150 PSI Low Collapse
- H - 3000 PSI High Collapse

9 Fluid cleanliness rating

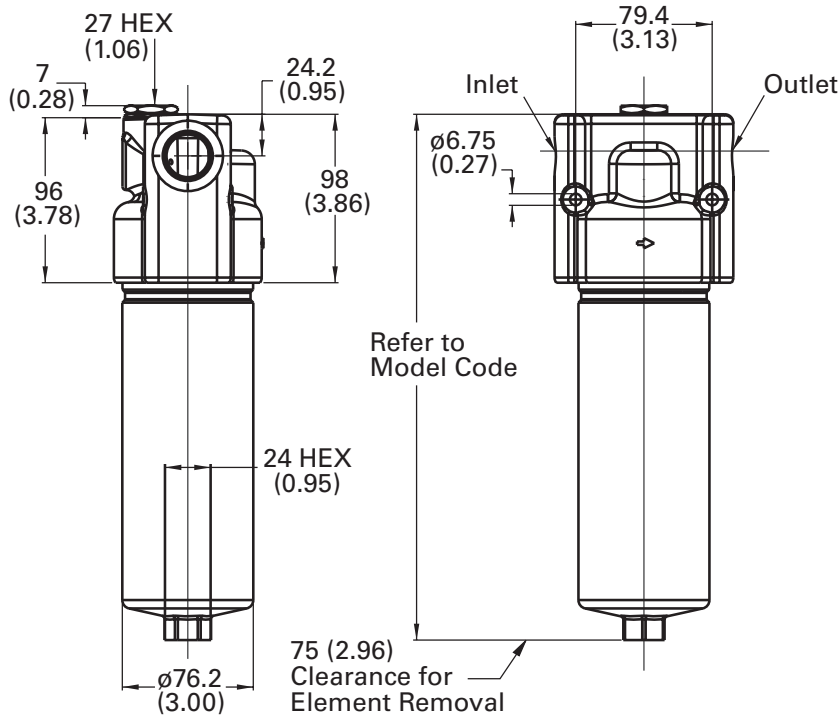
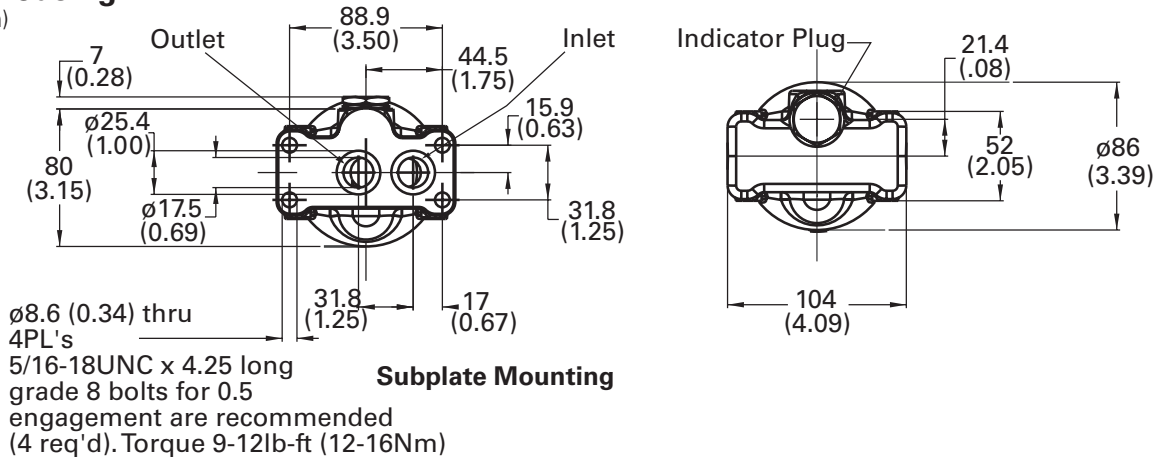
Code	Target fluid cleanliness level
03	16/14/12 or better
05	18/16/14 or better
10	20/18/15 or better
20	22/19/16 or better

The table assumes limited ingress/single pass of pump flow through element. For detailed assistance, see "The Systemic Approach to Contamination Control" or contact your local Eaton representative.

Dimensions

HF2P Housing

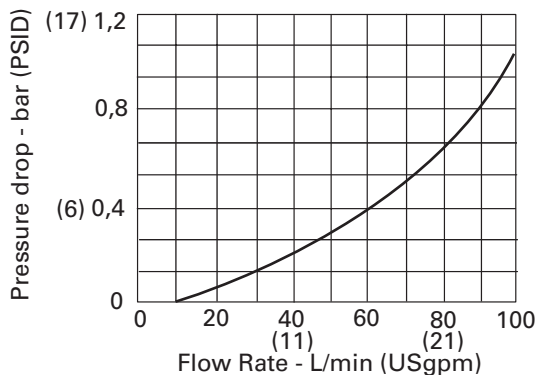
mm (inch)



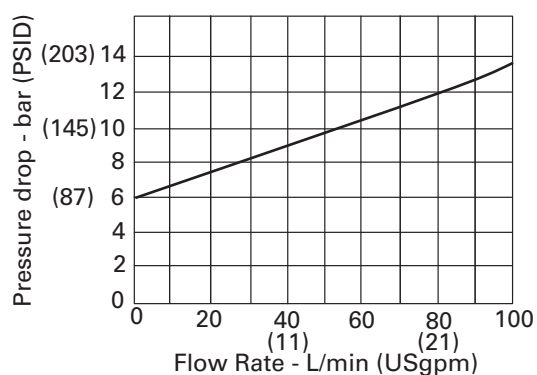
Filter Housing/Bypass Valve Flow Data

Flow versus pressure drop: 150 SUS (32 cSt) oil with specific gravity of ≤ 0.9
 (See page 5 for specific gravity corrections for pressure drop.)

Housing



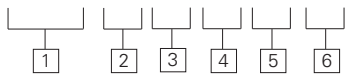
Bypass Valve



304 Series Replacement Filter Elements

Element Model Code

V304 1 B 1 C 05



1 Filter element

V304 - For use with HF2P series filters

2 Element collapse rating

1 - 150 PSI (C-Pak only)
5 - 3000 PSI (H-Pak only)

NOTE: Use 1 use only with bypass valve or monitored ΔP indicator.

3 Seal material

B - Buna-N
V - Viton-A

Viton is a registered trademark of E.I. DuPont

4 Element length

mm (inch)

1 - 101 (4)
2 - 203 (8)*
 *HF2

5 Element construction

C - C-Pak (grade 3, 5, 10, 20)
H - H-Pak (grade 3, 5, 10)

6 Fluid cleanliness ratings

Code **Target fluid cleanliness level**

03 16/14/12 or better

05 18/16/14 or better

10 20/18/15 or better

This table assumes limited ingress/single pass of pump flow through the element. For detailed assistance, consult "The Vickers Guide to Systemic Contamination Control" or contact your local Eaton representative.

Design Specifications

Rated flow: 45 L/min (12 USgpm) (with bowl length Code 1)
 91 L/min (24 USgpm) (with bowl length Code 2)

Fluid Compatibility: Compatible with most petroleum oil, water glycol, oil-in-water and water-in-oil fluids. Optional seals available for phosphate esters.

Temp range: -26°C to +121°C (-15°F to +250°F)

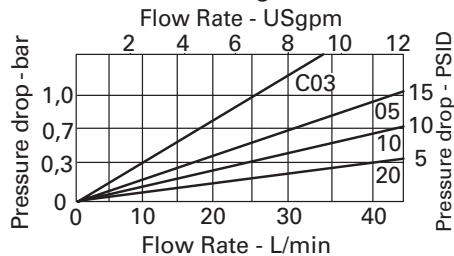
Construction: C-Pak or H-Pak

Filter Element Flow Data

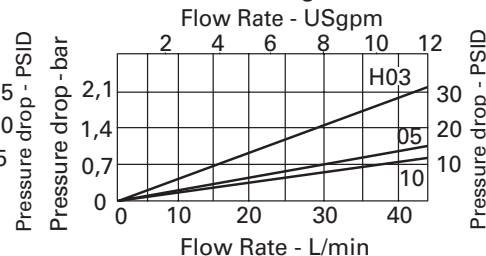
mm (inch)

Flow versus pressure drop:
 150 SUS (32 cSt) oil with specific gravity of ≤ 0.9
 (See page 6 for viscosity corrections for pressure drop.)

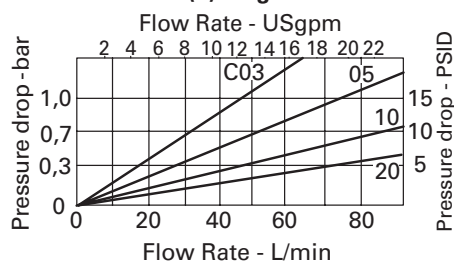
3041 C-Pak 101 (4) length



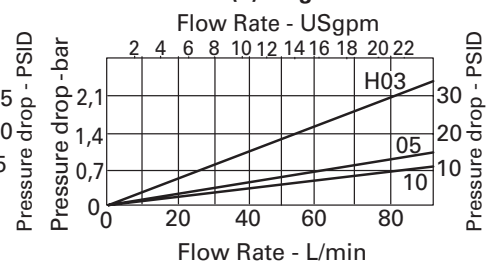
3045 H-Pak 101 (4) length



3041 C-Pak 203 (8) length



3045 H-Pak 203 (8) length



Dimensions

mm (inch)

O-ring per AS568-214

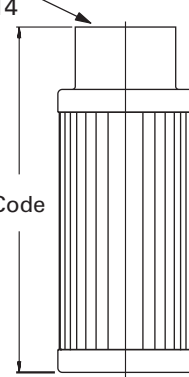
Refer to Model Code



Low Collapse

O-ring per AS568-214

Refer to Model Code



High Collapse

HF3P Series Filters

Flows to 570 L/min (150 USgpm) — Pressures to 420 bar (6000 PSI)

Features and Benefits

- Designed to comply with ANSI specifications and ISO cleanliness standards.
- Visual, electrical, and electrical indicators with lamp options for system design flexibility
- Conforms to HF3 specifications
- Fatigue rated to 6000 PSI for maximum reliability in the most rugged applications
- Reverse flow valve option for hydrostatic transmission applications.
- Multiple filter element lengths for design flexibility.
- High efficiency replacement elements in standard configurations (C-Pak) to meet Target Cleanliness Levels
- High collapse elements available for non-bypass applications.

Design Specifications

Meets HF4 Specifications

Rated flow:

4" Element:	151 L/min (40 USgpm)
8" Element:	265 L/min (70 USgpm)
13" Element:	454 L/min (120 USgpm)
16" Element:	565 L/min (150 USgpm)

Housing & Element Compatibility: Compatible with most petroleum oil, water glycol, oil-in-water and water-in-oil fluids. Optional seals available for phosphate esters.

Temp range: -26°C to +121°C (-15°F to +250°F)

Pressure rating:

Operating	414 bar (6000 PSI)
Proof	621 bar (9000 PSI)
Burst	1040 bar (15,080 PSI)
Fatigue	414 bar (6000 PSI)

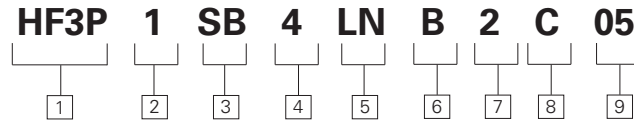
Material:

Head	Ductile Iron
Bowl	Carbon Steel

Dry weight: (Approximate)

4" Element:	20.3 kg (44.8 lbs)
8" Element:	23.8 kg (52.4 lbs)
13" Element:	30.5 kg (67.2 lbs)
16" Element:	43.4 kg (95.7 lbs)

Filter Assembly Model Code



1 Filter Series HF3P

2 Element Collapse Rating

- 1 - 150 PSI Low Collapse
- 4 - 3000 PSI High Collapse

3 Port options

- BB - G1 to ISO 228
- BD - G1 1/2 to ISO 228
- ME - 1 1/2" SAE 4 bolt Flange Code 61 (M12 x 1.75)
- MJ - 2" SAE 4 bolt Flange Code 61 (M12 x 1.75)
- MU - 2" SAE 4 bolt Flange Code 62 (M20 x 2.5)
- SB - 1.312 - 12 UN SAE-16 str. Thd. (1" tube)
- SD - 1.875 - 12 UN SAE-24 str. Thd. (1 1/2" tube)
- FE - 1 1/2" SAE 4 bolt Flange Code 61 (UNC)
- FJ - 2" SAE 4 bolt Flange Code 61 (UNC)
- FU - 2" SAE 4 bolt Flange Code 62 (UNC)

4 Valve options

- 1 - Non-Bypass
- 4 - Bypass set at 43 PSI cracking pressure
- 6 - Bypass set at 90 PSI cracking pressure
- 8 - Reverse Flow Valve Non-Bypass
- 9 - Reverse Flow Valve 43 PSI Bypass

5 Indicator options

First Designator - Indicator Type

- A - Visual 70 PSI
- J - No Indicator (plug)
- K - Visual 15 PSI
- L - Visual 30 PSI
- O - Visual 115 PSI
- R - Electrical 30 PSI
- T - Electrical 115 PSI
- U - Electrical 70 PSI

Second Designator - Electrical Receptacle

- B - Brad Harrison
- H - Hirshman
- J - Hirshman with 24 volt light
- K - Hirshman with 115 volt light
- L - Hirshman with 230 volt light
- N - No Connector - use with visual indicators and "J"

6 Seal material

- B - Buna-N
- V - Viton-A

Viton is a registered trademark of E.I. DuPont

7 Element length

Element length	Assembly length
1 - 101mm (4")	230mm (9.1")
2 - 203mm (8")	293mm (11.5")
4 - 330mm (13")	413.7mm (16.3")
5 - 406mm (16")	569mm (22.4")

8 Element construction

- C - 150 PSI Low Collapse
- H - 3000 PSI High Collapse

9 Fluid cleanliness rating

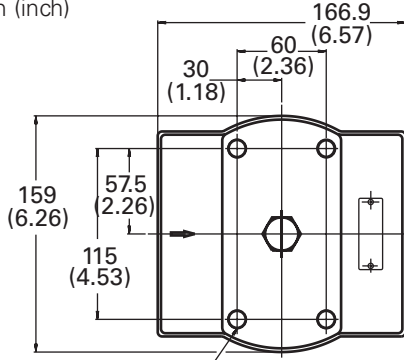
Code	Target fluid cleanliness level
03	16/14/12 or better
05	18/16/14 or better
10	20/18/15 or better
20	22/19/16 or better

The table assumes limited ingress/single pass of pump flow through element. For detailed assistance, see "The Systemic Approach to Contamination Control" or contact your local Eaton representative.

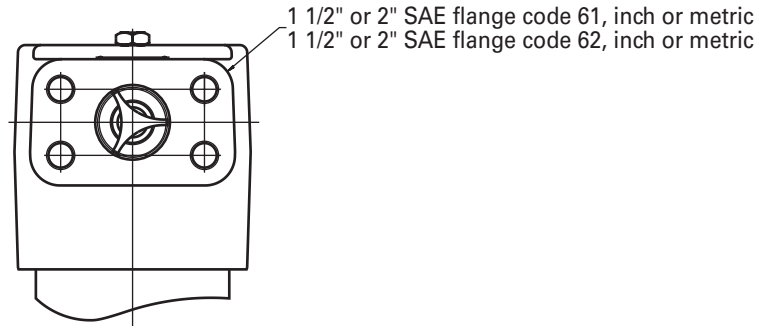
Dimensions

HF3P Housing

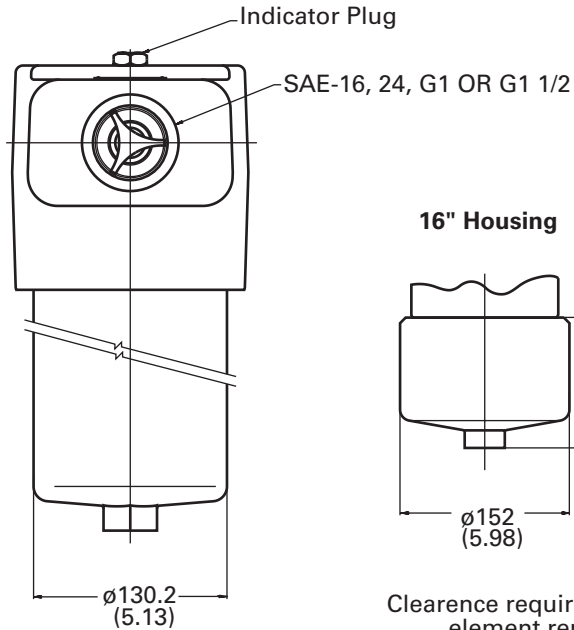
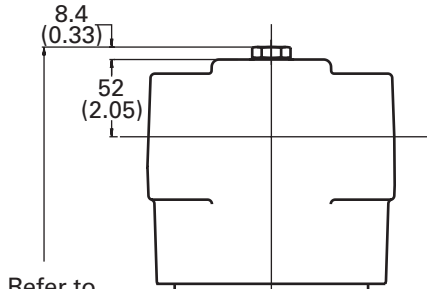
mm (inch)



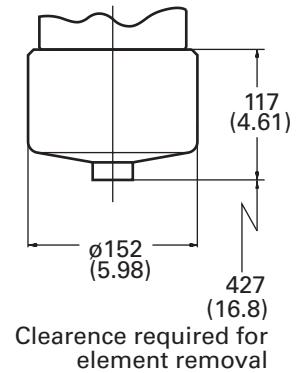
Inlet & Outlet Porting



1/2-20UNF-2B in. X 17 (0.67) deep
4 Places



16" Housing



Refer to Model Code

Drain Plug G 1/2

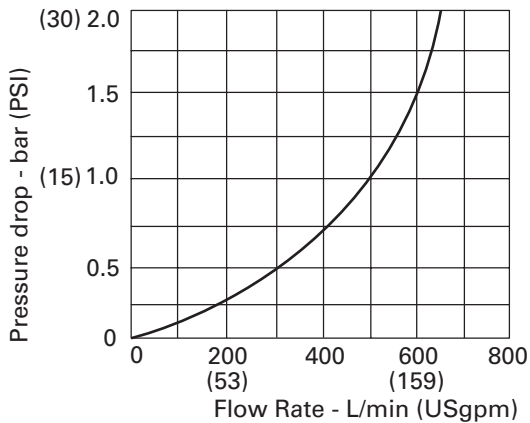
95 (3.74)

Clearence required for element removal

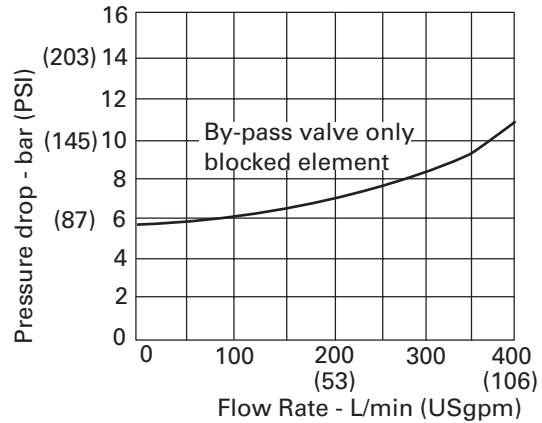
Filter Housing/Bypass Valve Flow Data

Flow versus pressure drop: 150 SUS (32 cSt) oil with specific gravity of ≤ 0.9
(See page 5 for specific gravity corrections for pressure drop.)

Housing

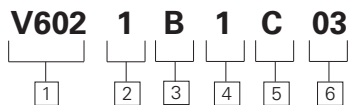


Bypass Valve



602 Series Replacement Filter Elements

Element Model Code



1 Filter element

V602 - For use with HF3P, HF3PS and OFR30 series filters

2 Element collapse rating

1 - 150 PSI Low Collapse
4 - 3000 PSI High Collapse

NOTE: Use **1** only with bypass valve.

3 Seal material

B - Buna-N
V - Viton-A

Viton is a registered trademark of E.I. DuPont

4 Element length

mm (inch)
1 - 101 (4)
2 - 203 (8)*
4 - 330 (13)
5 - 406 (16)
 *HF3

5 Element construction

C - C-Pak (grade 3, 5, 10, 20)
H - H-Pak (grade 3, 5, 10)

6 Fluid cleanliness ratings

Code	Fluid cleanliness
03	16/14/12 or better
05	18/16/14 or better
10	20/18/15 or better
20	22/19/16 or better

The table assumes limited ingress/single pass of pump flow through element. For detailed assistance, see "The Vickers Guide to Systemic Contamination Control" or contact your local Eaton representative.

Design Specifications

Meets or exceeds HF3 element specifications when used with bowl length No. 2.

Rated flow: 157 L/min (40 USgpm) with bowl length 1
 284 L/min (74 USgpm) with bowl length 2
 454 L/min (120 USgpm) with bowl length 4
 568 L/min (150 USgpm) with bowl length 5

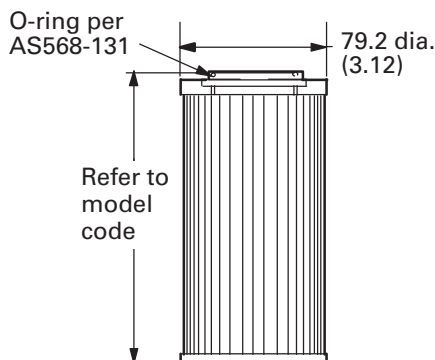
Fluid compatibility: Compatible with most petroleum oil, water glycol, oil-in-water and water-in-oil fluids. Optional seals available for phosphate esters.

Temp range: -26°C to +121°C (-15°F to +250°F)

Construction: C-Pak or H-Pak

Dimensions

mm (inch)

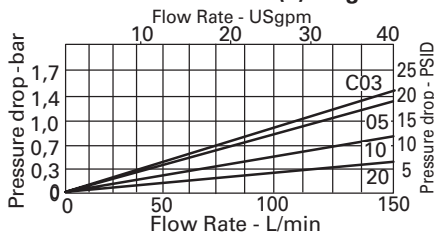


Filter Element Flow Data

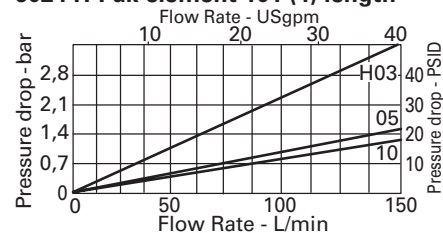
mm (inch)

Flow versus pressure drop: 150 SUS (32 cSt) oil with specific gravity of $3 \leq 0.9$ (See page 6 for viscosity corrections for pressure drop.)

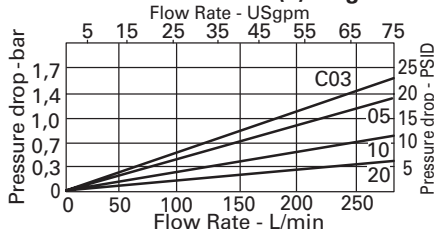
6021 C-Pak element 101 (4) length



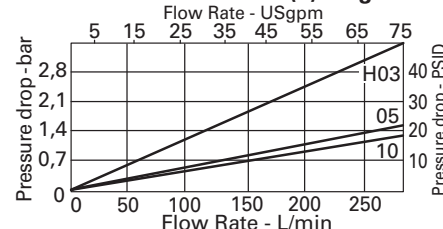
6024 H-Pak element 101 (4) length



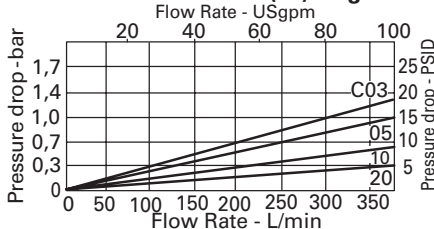
6021 C-Pak element 203 (8) length



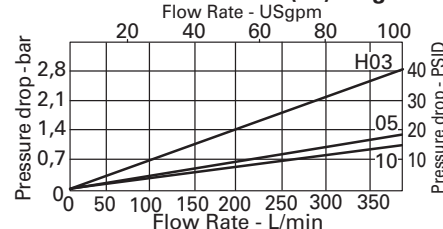
6024 H-Pak element 203 (8) length



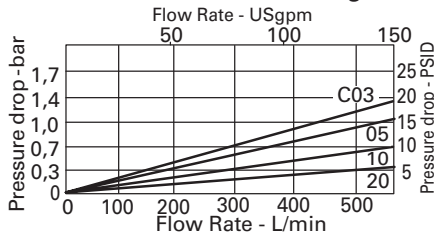
6021 C-Pak element 330 (13) length



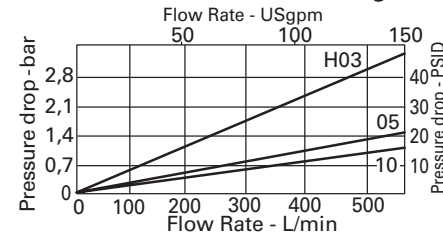
6024 H-Pak element 330 (13) length



6021 C-Pak element 406 (16) length



6024 H-Pak element 406 (16) length



HF3PS Series Filters

Flows to 570 L/min (150 USgpm) – Pressures to 310 bar (4500 PSI)

Features and Benefits

- Designed to comply with ANSI specifications and ISO cleanliness standards.
- Visual, electrical, and electrical indicators with lamp options for system design flexibility
- Conforms to HF3 specifications
- Fatigue rated to 4500 PSI for maximum reliability in rugged applications
- Side manifold mounting for ease of maintenance in many applications.
- Multiple filter element lengths for design flexibility.
- High efficiency replacement elements in standard configurations (C-Pak) to meet Target Cleanliness Levels
- High collapse elements available for non-bypass applications.

Design Specifications Meets HF4 Specifications

Rated flow:	
Length 2	265 L/min (70 USgpm)
Length 4	454 L/min (120 USgpm)
Length 5	565 L/min (150 USgpm)

Housing & Element Compatibility:	Compatible with most petroleum oil, water glycol, oil-in-water and water-in-oil fluids. Optional seals available for phosphate esters.
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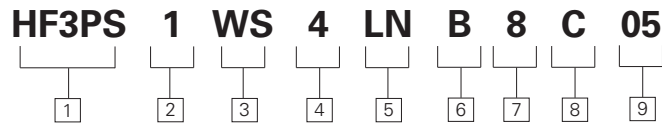
Temp range:	-26°C to +121°C (-15°F to +250°F)
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Pressure rating:	
Operating	310 bar (4500 PSI)
Proof	472 bar (6850 PSI)
Burst	1080 bar (15,660 PSI)
Fatigue	315 bar (4500 PSI)

Material:	
Head	Ductile Iron
Bowl	Carbon Steel

Dry weight: (Approximate)	
Length 2	21.8 kg (48.0 lbs)
Length 4	28.5 kg (62.8 lbs)
Length 5	41.4 kg (91.3 lbs)

Filter Assembly Model Code



1 Filter Series HF3PS

2 Element Collapse Rating

- 1 - 150 PSI Low Collapse
- 4 - 3000 PSI High Collapse

3 Port options

- WS - Subplate mounting

4 Valve options

- 1 - Non-Bypass
- 4 - Bypass set at 43 PSI cracking pressure
- 6 - Bypass set at 90 PSI cracking pressure

5 Indicator options

First Designator - Indicator Type

- A - Visual 70 PSI
- J - No Indicator (plug)
- L - Visual 30 PSI
- O - Visual 115 PSI
- R - Electrical 30 PSI
- T - Electrical 115 PSI
- U - Electrical 70 PSI

Second Designator - Electrical Receptacle

- B - Brad Harrison
- H - Hirshman
- J - Hirshman with 24 volt light
- K - Hirshman with 115 volt light
- L - Hirshman with 230 volt light
- N - No Connector - use with visual indicators and "J"

6 Seal material

- B - Buna-N
- V - Viton-A

Viton is a registered trademark of E.I. DuPont

7 Element length

Element length	Assembly length
2 - 203mm (8")	340mm (13.3")
4 - 330mm (13")	461mm (18.1")
5 - 406mm (16")	614mm (24.2")

8 Element construction

- C - 150 PSI Low Collapse
- H - 3000 PSI High Collapse

9 Fluid cleanliness rating

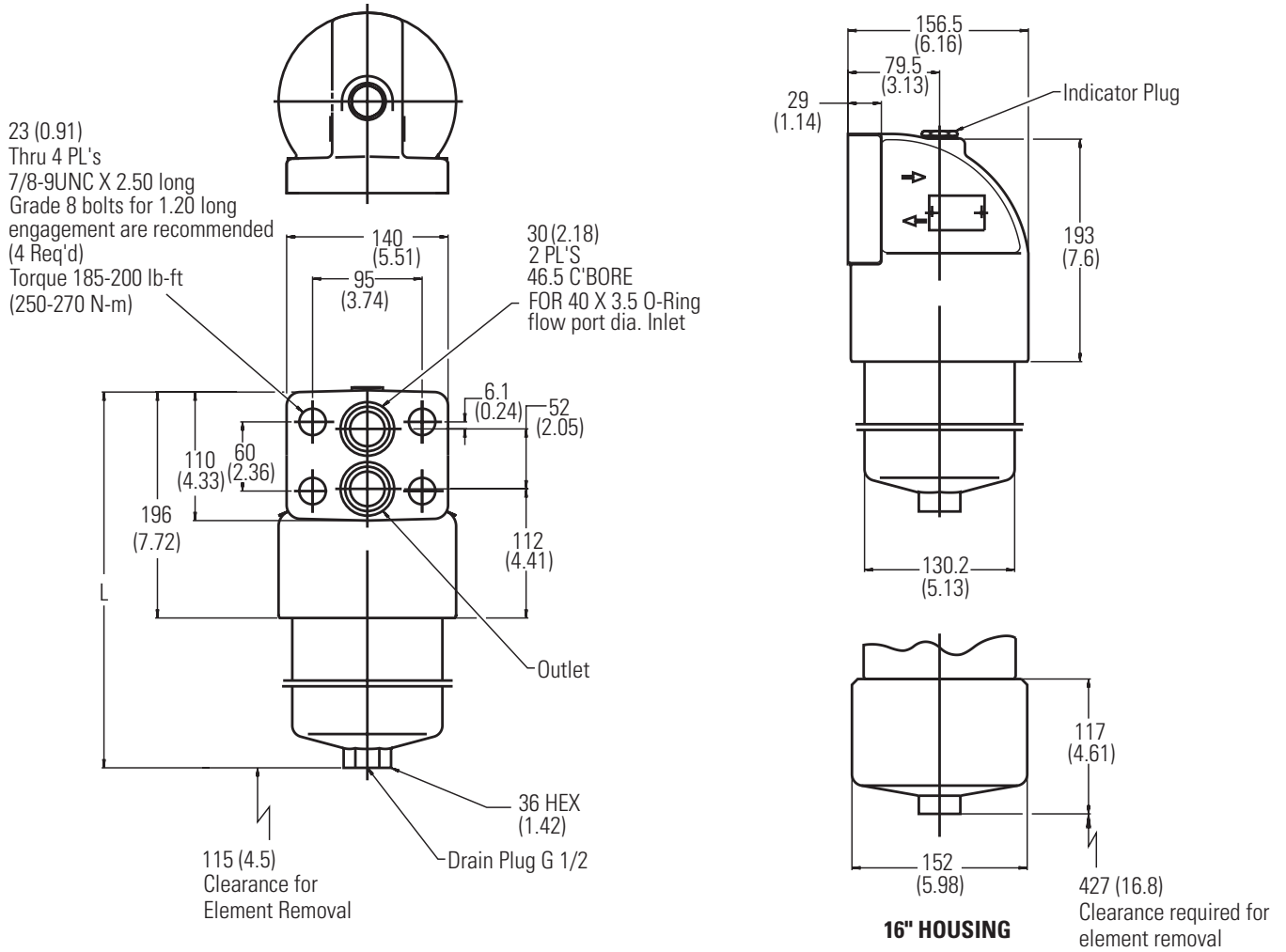
Code	Target fluid cleanliness level
03	16/14/12 or better
05	18/16/14 or better
10	20/18/15 or better
20	22/19/16 or better

The table assumes limited ingestion/single pass of pump flow through element. For detailed assistance, see "The Systemic Approach to Contamination Control" or contact your local Eaton representative.

Dimensions

HF3PS Housing

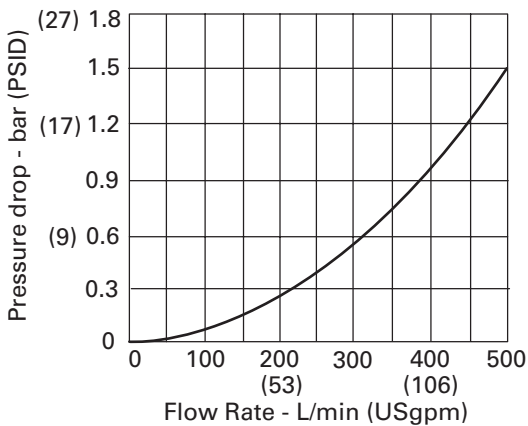
mm (inch)



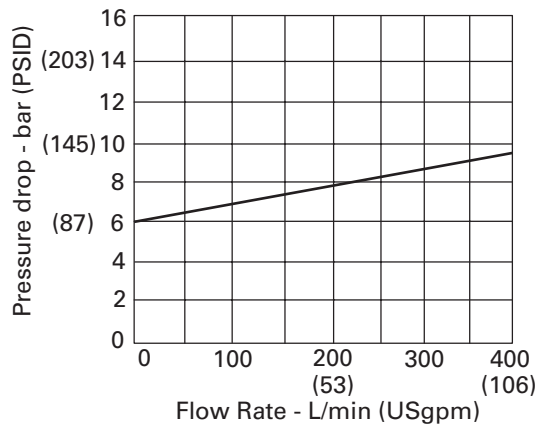
Filter Housing/Bypass Valve Flow Data

Flow versus pressure drop: 150 SUS (32 cSt) oil with specific gravity of ≤ 0.9
(See page 5 for specific gravity corrections for pressure drop.)

Housing

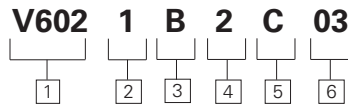


Bypass Valve



602 Series Replacement Filter Elements

Element Model Code



1 Filter element

V602 - For use with HF3P, HF3PS and OFR30 series filters

2 Element collapse rating

- 1 - 150 PSI Low Collapse
- 4 - 3000 PSI High Collapse

NOTE: Use **1** only with bypass valve.

3 Seal material

- B** - Buna-N
- V** - Viton-A

Viton is a registered trademark of E.I. DuPont

4 Element length

- mm (inch)
- 2 - 203 (8)*
- 4 - 330 (13)
- 5 - 406 (16)
- *HF3

5 Element construction

- C** - C-Pak (grade 3, 5, 10, 20)
- H** - H-Pak (grade 3, 5, 10)

6 Fluid cleanliness ratings

Code	Fluid cleanliness
03	16/14/12 or better
05	18/16/14 or better
10	20/18/15 or better
20	22/19/16 or better

The table assumes limited ingress/single pass of pump flow through element. For detailed assistance, see "The Vickers Guide to Systemic Contamination Control" or contact your local Eaton representative.

Design Specifications

Meets or exceeds HF3 element specifications when used with bowl length No. 2.

Rated flow:	
Length 2	284 L/min (74 USgpm)
Length 4	454 L/min (120 USgpm)
Length 5	568 L/min (150 USgpm)

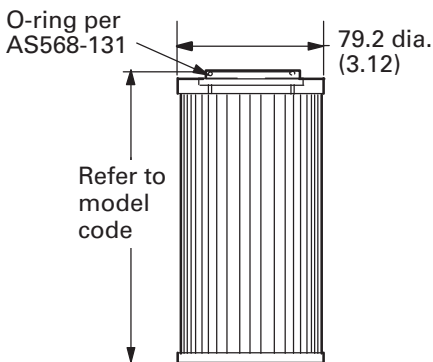
Fluid compatibility: Compatible with most petroleum oil, water glycol, oil-in-water and water-in-oil fluids. Optional seals available for phosphate esters.

Temp range: -26°C to +121°C (-15°F to +250°F)

Construction: C-Pak or H-Pak

Dimensions

mm (inch)

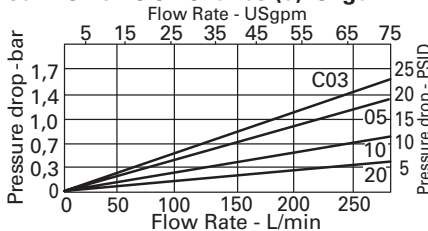


Filter Element Flow Data

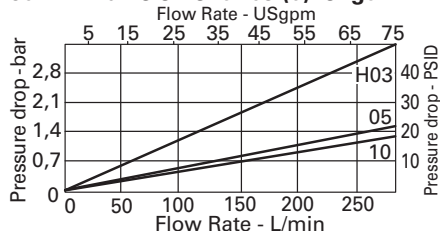
mm (inch)

Flow versus pressure drop: 150 SUS (32 cSt) oil with specific gravity of $3 \leq 0.9$ (See page 6 for viscosity corrections for pressure drop.)

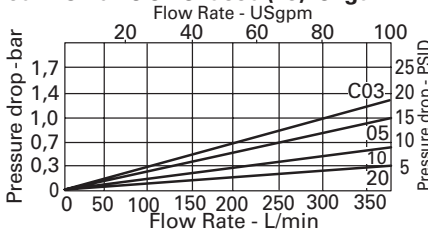
6021 C-Pak element 203 (8) length



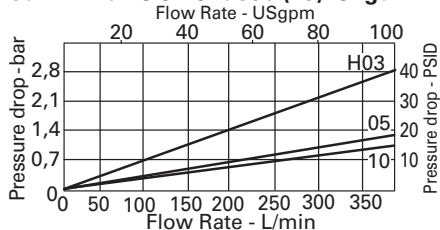
6024 H-Pak element 203 (8) length



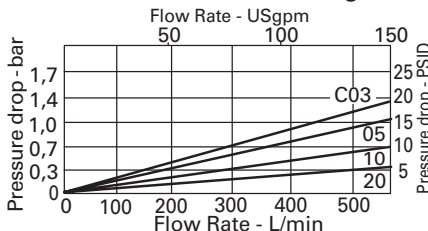
6021 C-Pak element 330 (13) length



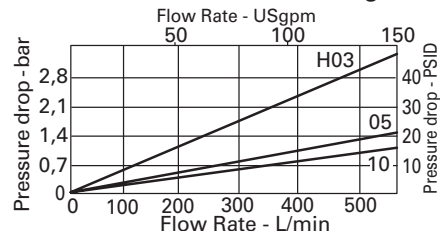
6024 H-Pak element 330 (13) length



6021 C-Pak element 406 (16) length



6024 H-Pak element 406 (16) length



HF4P Series Filters

Flows to 570 L/min (150 USgpm) – Pressures to 345 bar (5000 PSI)

Features and Benefits

- Designed to comply with ANSI specifications and ISO cleanliness standards.
- Visual, electrical, and electrical indicators with lamp options for system design flexibility
- Conforms to HF4 specifications
- Fatigue rated to 5000 PSI for maximum reliability in rugged applications
- Top loading design to ease maintenance and minimize spillage
- Multiple filter element lengths for design flexibility.
- High efficiency replacement elements in standard configurations (C-Pak) to meet Target Cleanliness Levels
- High collapse elements available for non-bypass applications.

Design Specifications

Rated flow:

9" Element:	189 L/min (50 USgpm)
18" Element:	379 L/min (100 USgpm)
27" Element:	568 L/min (150 USgpm)

Housing & Element Compatibility:	Compatible with most petroleum oil, water glycol, oil-in-water and water-in-oil fluids. Optional seals available for phosphate esters.
----------------------------------	--

Temp range:	-26°C to +121°C (-15°F to +250°F)
-------------	--------------------------------------

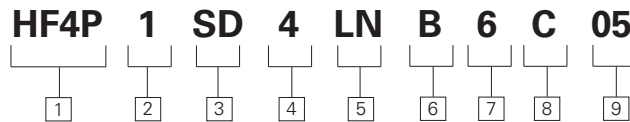
Pressure rating:	
Operating	345 bar (5000 PSI)
Proof	517 bar (7500 PSI)
Burst	1034 bar (15,000 PSI)
Fatigue	345 bar (5000 PSI)

Material:	
Head	Ductile Iron
Bowl	Carbon Steel
Lid	Ductile Iron

Dry weight: (Approximate)

9" Element:	28.8 kg (63.4 lbs)
18" Element:	38.7 kg (85.3 lbs)
27" Element:	51.5 kg (113.6 lbs)

Filter Assembly Model Code



1 Filter Series HF4P

2 Element Collapse Rating

- 1 - 150 PSI Low Collapse
- 4 - 3000 PSI High Collapse

3 Port options

- BD - G1 1/2 to ISO 228
- ME - 1 1/2" SAE 4 bolt Flange Code 61 (M12 x 1.75)
- MR - 1 1/2" SAE 4 bolt Flange Code 62 (M16 x 2.0)
- SD - 1.875 - 12 UN SAE-24 str. Thd. (1 1/2" tube)
- FE - 1 1/2" SAE 4 bolt Flange Code 61 (UNC)
- FR - 1 1/2" SAE 4 bolt Flange Code 62 (UNC)
- WS - Subplate mounting

4 Valve options

- 1 - Non-Bypass
- 4 - Bypass set at 43 PSI cracking pressure
- 6 - Bypass set at 90 PSI cracking pressure

5 Indicator options

First Designator - Indicator Type

- A - Visual 70 PSI
- J - No Indicator (plug)
- L - Visual 30 PSI
- O - Visual 115 PSI
- R - Electrical 30 PSI
- T - Electrical 115 PSI
- U - Electrical 70 PSI

Second Designator - Electrical Receptacle

- B - Brad Harrison
- H - Hirshman
- J - Hirshman with 24 volt light
- K - Hirshman with 115 volt light
- L - Hirshman with 230 volt light
- N - No Connector - use with visual indicators and "J"

6 Seal material

- B - Buna-N
 - V - Viton-A
- Viton is a registered trademark of E.I. DuPont*

7 Element length Assembly length

3 - 228mm (9")	447mm (17.6")
6 - 457mm (18")	685.3mm (27")
7 - 685mm (27")	923.5mm (36.4")

8 Element construction

- C - 150 PSI Low Collapse
- H - 3000 PSI High Collapse

9 Fluid cleanliness rating

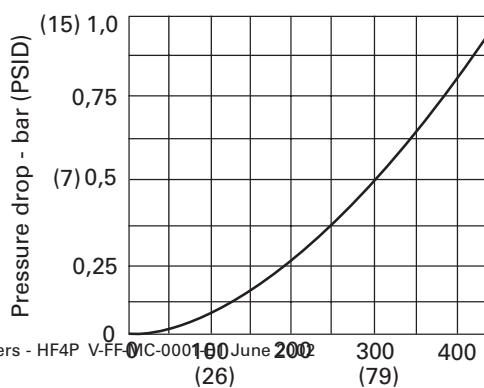
Code	Target fluid cleanliness level
03	16/14/12 or better
05	18/16/14 or better
10	20/18/15 or better
20	22/19/16 or better

The table assumes limited ingress/single pass of pump flow through element. For detailed assistance, see "The Systemic Approach to Contamination Control" or contact your local Eaton representative.

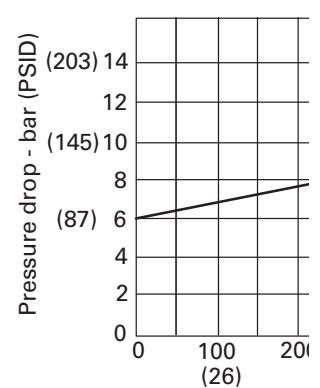
Filter Housing/Bypass Valve Flow Data

Flow versus pressure drop: 150 SUS (32 cSt) oil with specific gravity of ≤ 0.9 (See page 5 for specific gravity corrections for pressure drop.)

Housing

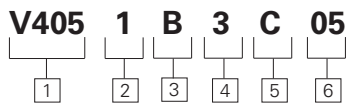


Bypass Valve



405 Series Replacement Filter Elements

Element Model Code



1 Filter element

405 - For use with OFR 60-120, HF4P and HF4RT series filters

2 Element collapse rating

1 - 150 PSI Low Collapse
4 - 3000 PSI High Collapse

NOTE: Use 1 only with bypass valve or monitored ΔP indicator.

3 Seal material

B - Buna-N
V - Viton-A

Viton is a registered trademark of E.I. DuPont

4 Element length

3 - 229 (9)
6 - 457 (18)
7 - 686 (27)

5 Element construction

C - C-Pak (grade 3, 5, 10, 20)
H - H-Pak (grade 3, 5, 10)

6 Fluid cleanliness ratings

Code	Target fluid cleanliness level
03	16/ 14/12 or better
05	18/ 16/14 or better
10	20/ 18/15 or better
20	22/ 19/16 or better

The table assumes limited ingestion/single pass of pump flow through element. For detailed assistance, see "The Vickers Guide to Systemic Contamination Control" or contact your local Eaton representative.

Design Specifications

Rated flow: 189 L/min (50 USgpm) with bowl length 3
 379 L/min (100 USgpm) with bowl length 6
 568 L/min (150 USgpm) with bowl length 7

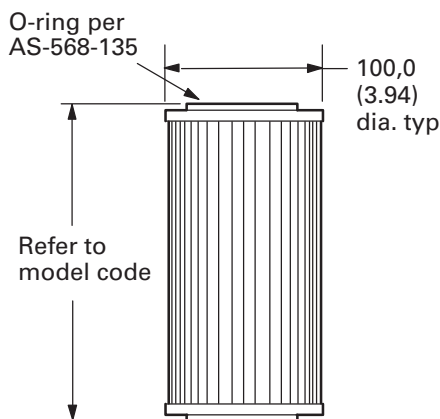
Fluid compatibility: Compatible with most petroleum oil, water glycol, oil-in-water and water-in-oil fluids. Optional seals available for phosphate esters.

Temp range: -26°C to +121°C (-15°F to +250°F)

Construction: C-Pak or H-Pak

Dimensions

mm (inch)

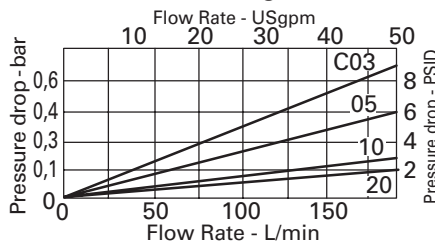


Filter Element Flow Data

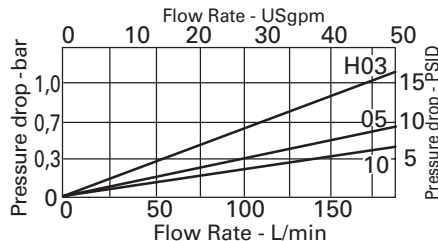
mm (inch)

Flow versus pressure drop:
 150 SUS (32 cSt) oil with specific gravity of ≤ 0.9
 (See page 6 for viscosity corrections for pressure drop.)

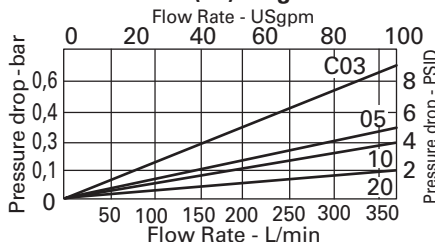
4051 C-Pak 229 (9) length



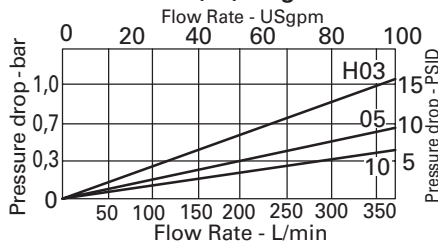
4054 H-Pak 229 (9) length



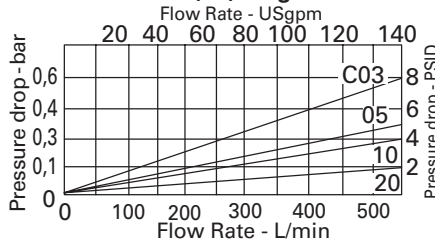
4051 C-Pak 457 (18) length



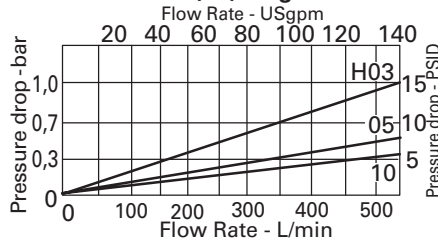
4054 H-Pak 457 (18) length



4051 C-Pak 686 (27) length



4054 H-Pak 686 (27) length



Replacement Element Connector

Vickers 228 mm (9 inch), 457 mm (18 inch) and 686 mm (27 inch) elements are single elements. This eases handling and element replacement. 228 mm (9 inch) elements may be

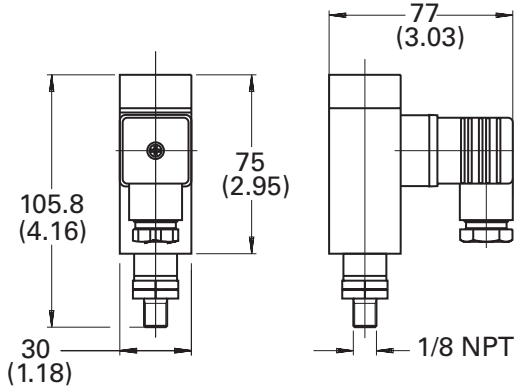
stacked rather than using one 457 mm (18 inch) or 686 mm (27 inch) element. Order P-227567-01 replacement element connector when stacking two or more 228 mm (9 inch) elements.

Accessories

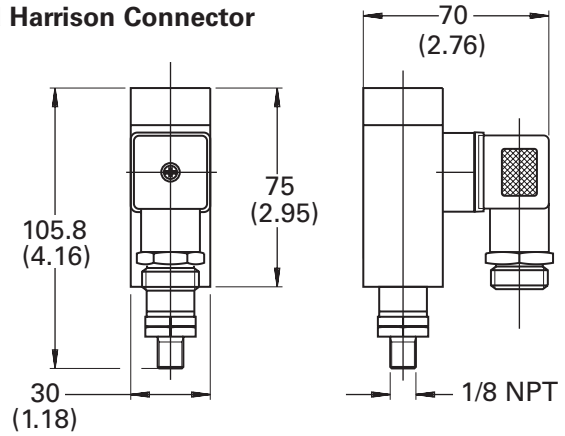
Electrical Pressure Switch

(See page 6 for electrical diagram.)

Hirshman Connector



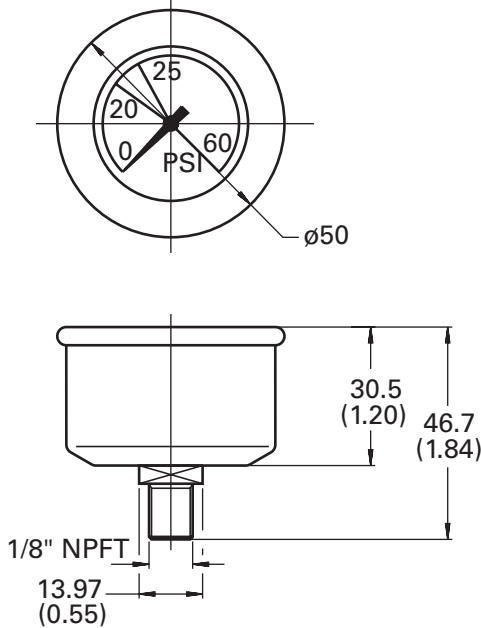
Brad Harrison Connector



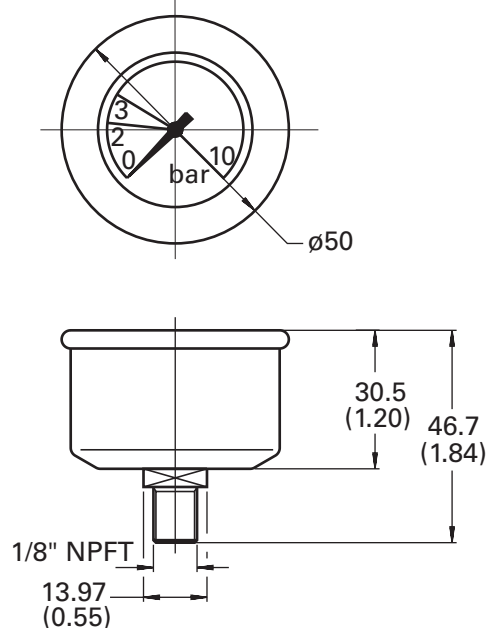
Housing	Part Number
HF4RT	3039705 Electrical Switch 15 PSI Brad Harrison Connector 3039707 Electrical Switch 15 PSI Hirshman Connector
HF4RT	3039706 Electrical Switch 30 PSI Brad Harrison Connector 3039708 Electrical Switch 30 PSI Hirshman Connector

Gauge

0-4 Bar (0-60 PSI) Gauge



0-10 Bar (0-160 PSI) Gauge



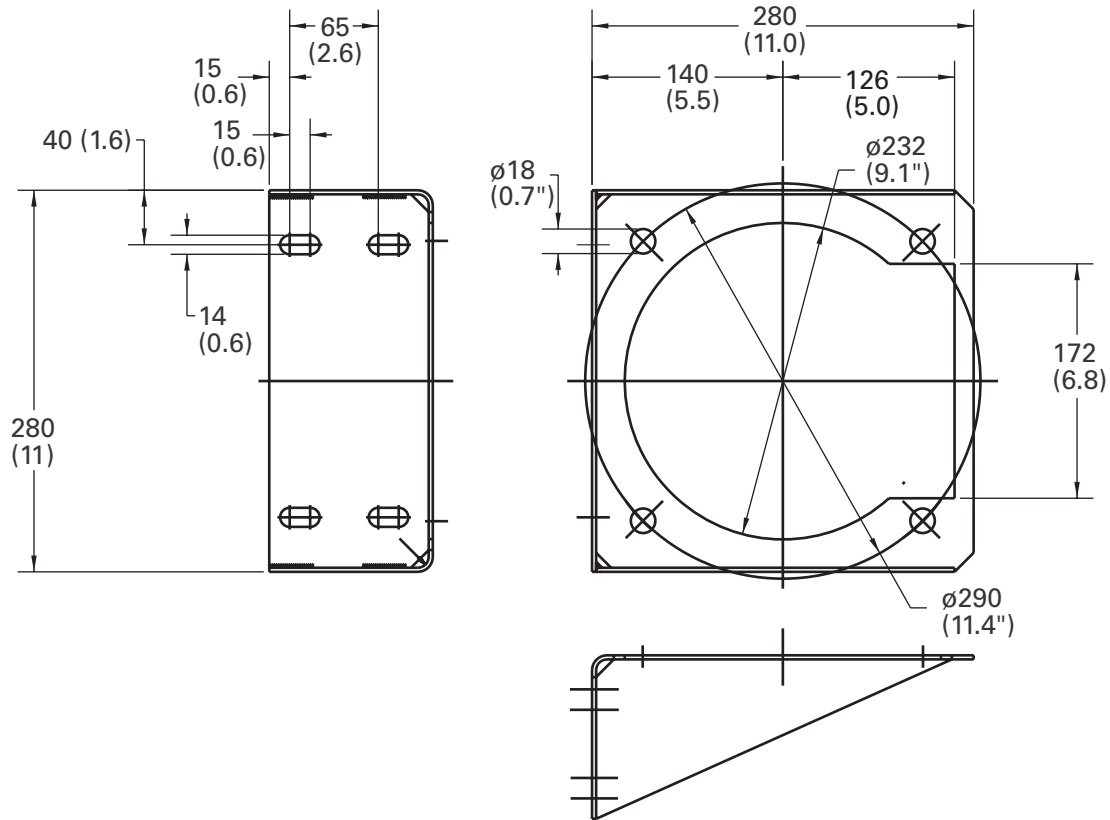
Note: Gauges indicate pressure in both bar and PSI

Housing	Part Number
HF4RT	3039703 Gauge 0-160 PSI (use with 43 PSI Bypass Valve) 3039704 Gauge 0-60 PSI (use with 25 PSI Bypass Valve)

Mounting Bracket HV6R Housing

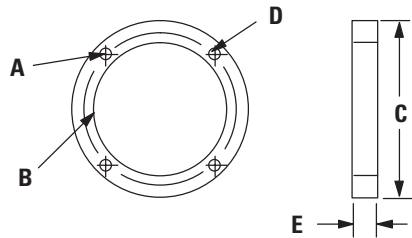
mm (inch)

Order part number
3039702



Weld Flange

For use with HF4RT
P-232964-01



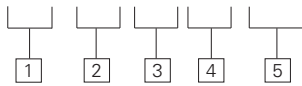
Dimensions					
Housing	A	B	C	D	E
HL 15, HL 16 P-232964-01	7/16 - 20 UNF thru (4) on 6.25 dia. BC equally spaced	ø127,0 (5.00)	181,0 dia. (7.12)	7/16 - 20 UNF x 0.75 long ■	12,7 (0.50)

■ Recommended bolts

Accessories

Indicator Model Code

PE 2B V H L24



1 Indicator type and pressure rating

- PV - visual 210 bar (3000PSI)
- PE - electrical 210 bar (3000PSI)
- PHV - visual 420 bar (6000PSI)
- PVE - electrical 420 bar (6000PSI)

2 Pressure setting

- 1B - 1 bar (15PSID)
- 2B - 2 bar (30PSID)
- 5B - 5 bar (75PSID)
- 8B - 8 bar (115PSID)

3 Seal material

V - Viton-A

Viton is a registered trademark of E.I. DuPont

4 Connector

- B - Brad Harrison 5 Pin
- H - Hirshman
- N - None (use with PV indicators)

5 Light option

- L24 - 24 Volt Lamp
- L115 - 115 Volt Lamp
- L230 - 230 Volt Lamp

Indicator Options

DESCRIPTION	MODEL	FILTER ASSEMBLY CODE LETTERS
3000 PSI - USE WITH FILTER MODELS HV6R, HV3R		
POPUP VISUAL 15PSI	PV 1B VN	KN
POPUP VISUAL 30PSI	PV 2B VN	LN
POPUP VISUAL 70 PSI	PV 5B VN	AN
BRAD HARRISON 5 PIN ELECTRICAL 15 PSI	PE 1B V B	QB
BRAD HARRISON 5 PIN ELECTRICAL 30 PSI	PE 2B V B	RB
BRAD HARRISON 5 PIN ELECTRICAL 70 PSI	PE 5B V B	UB
HIRSCHMAN ELECTRICAL 15 PSI	PE 1B V H	QH
HIRSCHMAN ELECTRICAL 30 PSI	PE 2B V H	RH
HIRSCHMAN ELECTRICAL 70 PSI	PE 5B V H	UH
HIRSCHMAN VISUAL ELECTRICAL 15 PSI - L24	PE 1B V H L24	QJ
HIRSCHMAN VISUAL ELECTRICAL 30 PSI - L24	PE 2B V H L24	RJ
HIRSCHMAN VISUAL ELECTRICAL 70 PSI - L24	PE 5B V H L24	UJ
HIRSCHMAN VISUAL ELECTRICAL 15 PSI - L115	PE 1B V H L115	QK
HIRSCHMAN VISUAL ELECTRICAL 30 PSI - L115	PE 2B V H L115	RK
HIRSCHMAN VISUAL ELECTRICAL 70 PSI - L115	PE 5B V H L115	UK
HIRSCHMAN VISUAL ELECTRICAL 15 PSI - L230	PE 1B V H L230	QL
HIRSCHMAN VISUAL ELECTRICAL 30 PSI - L230	PE 2B V H L230	RL
HIRSCHMAN VISUAL ELECTRICAL 70 PSI - L230	PE 5B V H L230	UL

6000 PSI - USE WITH FILTER MODELS HF2P, HF3P, HF3PS, HF4P

POPUP VISUAL 30PSI	PHV 2B VN	LN
POPUP VISUAL 70 PSI	PHV 5B VN	AN
POPUP VISUAL 115 PSI	PHV 8B VN	ON
BRAD HARRISON 5 PIN ELECTRICAL 30 PSI	PHE 2B V B	RB
BRAD HARRISON 5 PIN ELECTRICAL 70 PSI	PHE 5B V B	UB
BRAD HARRISON 5 PIN ELECTRICAL 115 PSI	PHE 8B V B	TB
HIRSCHMAN ELECTRICAL 30 PSI	PHE 2B V H	RH
HIRSCHMAN ELECTRICAL 70 PSI	PHE 5B V H	UH
HIRSCHMAN ELECTRICAL 115 PSI	PHE 8B V H	TH
HIRSCHMAN VISUAL ELECTRICAL 30 PSI - L24	PHE 2B V H L24	RJ
HIRSCHMAN VISUAL ELECTRICAL 70 PSI - L24	PHE 5B V H L24	UJ
HIRSCHMAN VISUAL ELECTRICAL 115 PSI - L24	PHE 8B V H L24	TJ
HIRSCHMAN VISUAL ELECTRICAL 30 PSI - L115	PHE 2B V H L115	RK
HIRSCHMAN VISUAL ELECTRICAL 70 PSI - L115	PHE 5B V H L115	UK
HIRSCHMAN VISUAL ELECTRICAL 115 PSI - L115	PHE 8B V H L115	TK
HIRSCHMAN VISUAL ELECTRICAL 30 PSI - L230	PHE 2B V H L230	RL
HIRSCHMAN VISUAL ELECTRICAL 70 PSI - L230	PHE 5B V H L230	UL
HIRSCHMAN VISUAL ELECTRICAL 115 PSI - L230	PHE 8B V H L230	TL

Differential Indicators

Design Specifications

Fluid Compatibility

- Compatible with most petroleum oil, oil-in-water and water-in-oil fluids.
- Optional seals available for phosphate esters.

Temp range: -26°C to +120°C
(-15°F to +250°F)

Pressure Rating:

PV/PE Series	210 bar (3000PSI)
PHV/PHE Series	420 bar (6000PSI)

Housing Material:

PV/PE Series	Aluminum
PHV/PHE Series	Stainless Steel

Installation Torque:

PV/PE Series	33 Nm (24 lbs-ft)
PHV/PHE Series	100 Nm (74 lbs-ft)

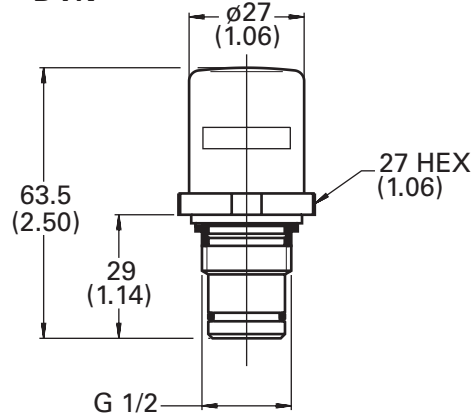
Switch Rating (all models):

3A@24VDC
5A@250VAC

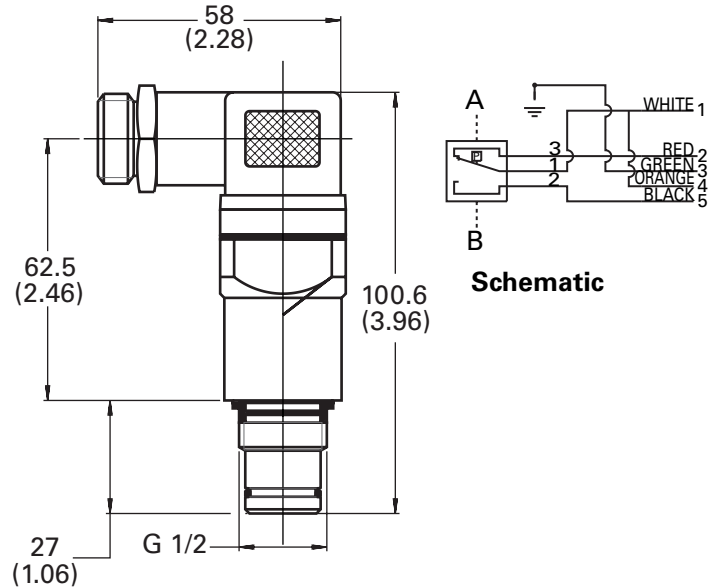
Dry weight: (Approximate)

PV	55g (0.1lbs)
PHV	110g (0.2lbs)
PE	150g (0.3lbs)
PHE	250g (0.6lbs)

PV * BVN

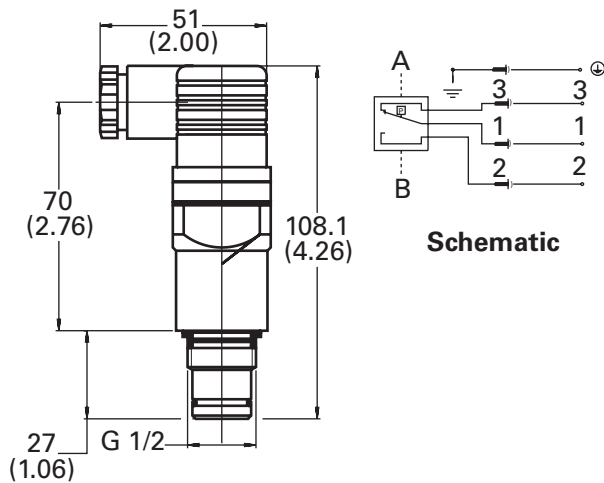


PE * BV B PHE * BV B



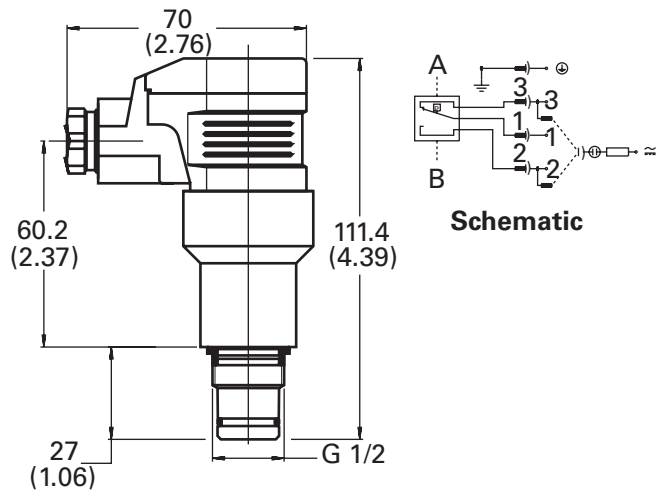
Schematic

PE * BV H PHE * BV H



Schematic

PE * BV H L ** PHE * BV H L **



Schematic

Notes

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Vickers

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