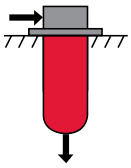
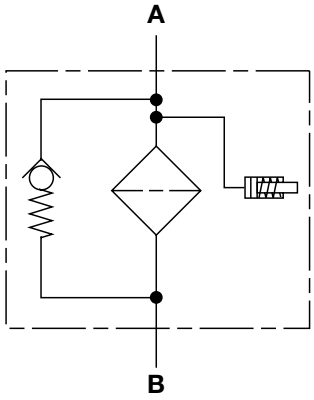
HF4R Series

In-Tank Return Line Filters

100 psi • up to 100 gpm



Hydraulic Symbol



Features

- Designed to meet and comply with HF4 Automotive standard and SAE J2066 standard.
- Inlet port options include SAE straight thread O-ring boss, SAE Flange, BSPP and NPT ports to allow easy installation without costly adapters.
- O-ring seals are used to provide positive, reliable sealing. Choice of Nitrile rubber *(NBR)*, or Fluorocarbon elastomer *(FKM)* O-ring material provides compatibility with petroleum oils, synthetic fluids, water-glycols, oil/water emulsions, and water based fluids.
- In-tank design requires minimal space for installation.
- Provision is made for an additional inlet port to allow two return lines to be connected to the same filter.
- Filters include 1 1/2" threaded NPT outlet connection.

Applications


Agricultural


Automotive


Construction


Gearboxes


Industrial


Steel / Heavy Industry

Technical Specifications

Mounting Method	4 mounting holes - filter housing	
Port Connection		
Inlet	SAE-24, 1 1/2" NPT, 1 1/2" BSPP, 1 1/2" Flange, Code 61	
Outlet HF4R 09/18/27	1 1/2" NPT male	
Flow Direction	Inlet	Outlet
HF4R	Side	Bottom
Construction Materials		
Head, Lid	Aluminum	
Bowl	Carbon Steel	
Flow Capacity		
HF4R09	50 gpm (189 lpm)	
HF4R18	75 gpm (378 lpm)	
HF4R27	100 gpm (454 lpm)	
Housing Pressure Rating		
Max. Allowable Working Pressure*	100 psi (7 bar)	
Fatigue Pressure	Contact HYDAC	
Burst Pressure	Contact HYDAC	
Element Collapse Pressure Rating		
BN, BN4AM, AM, W, P/HC	145 psid (10 bar)	
Fluid Temperature Range	14°F to 212°F (-10°C to 100°C)	
Consult HYDAC for applications below 14°F (-10°C)		
Fluid Compatibility		
Compatible with all hydrocarbon based, synthetic, water glycol, oil/water emulsion, and high water based fluids when the appropriate seals are selected.		
Indicator Trip Pressure		
All Other Indicators	**Gauges (E / ES)**	
P = 14.5 psi (1 bar) -10%	P = 11.6 psi (0.8 bar)	
P = 29 psi (2 bar) -10%	P = 20 psi (1.4 bar)	
P = 36 psi (2.5 bar) -10%	P = 29 psi (2 bar)	
Bypass Valve Cracking Pressure		
ΔP = 25 psid (1.7 bar) +10% *(optional)*		
ΔP = 40 psid (2.7 bar) +10% *(standard)*		
ΔP = 50 psid (3.4 bar) +10% *(contact factory)*		

*Note: All HF4R Filters MAWP reduce to 101.5 psi (7 bar) when using the following "VR" indicators: B, BM, E, ES, GC, LE, LZ.
Any filters incorporating a VMFXE.X/3 or VMFXES.X/3 static gauge indicator (1/8" NPT thread) will be de-rated to an MAWP of 60 psi (4 bar).

PN#02081318 / 07.19 / FIL1907-2109

Model Code

HF4R BN 09 V F 3 C 1.X / 3 B2.7 C T

Filter Type
HF4R = In-tank return filter

Element Media
BN = Betamicron® *(Low Collapse)* BN/AM= Betamicron® Aquamicron®
AM = Aquamicron® W = Wire Mesh
P = Polyester

Element Length
09 = Single Element Length (9")
18 = Double Element Length (18")
27 = Triple Element Length (27")

Pressure Rating
V = 100 psi (7 bar)
Y = 60 psi (4.1 bar), when "E" type static pressure gauge is used with a B1.7 bypass setting

Type of Connection
F = 1 ½" Threaded (SAE-24 , 1 ½" NPT, or G/BSPP 1 ½")
K = 1 ½" Flanged (1 ½" SAE Code 61)

Filtration Rating *(microns)*
3, 5, 10, 20 = BN 25, 50, 100, 200 = W 3, 10, 25 = P
40 = AM 3, 10 = BN/AM *(9" only)*

Type of Static Clogging Indicator
A, B, BM,
C, D, E, ES, J, J4

Type Code
1 = Single inlet Connection 2 = Dual Inlets *(matching ports only)*

Modification Number *(latest version always supplied)*

Port Configuration
0 = G/BSPP Straight Thread Ports
3 = NPT Tapered Thread Ports
12 = SAE O-Ring Boss Straight Thread Ports
16 = SAE Code 61 Flanges

Seals
(omit) = Nitrile rubber (NBR) *(standard)*
V = Fluorocarbon elastomer (FKM)

Bypass Valve
B1.7 = 25 psid bypass (1.7 bar) B2.7 = 40 psid bypass (2.7 bar) - Standard bypass setting B3.4 = 50 psid bypass (3.4 bar)

Supplementary Details
SFREE= Element specially designed to minimize electrostatic charge generation

Outlet Configuration
C = Outlet check valve *(1/2 psid cracking pressure)* DF = Diffuser DT = 13" Down Tube *(outlet)*
T = Threaded outlet connection *(1 1/2" NPT male) (standard)* LI = Lid-mounted Indicator

Replacement Element Model Code

5 . 03 . 09 D 03 BN / V

Length *(nominal inches)*
09, 18, 27

Type
D = HF4R *(return)*

Filtration Rating *(micron)*
3, 5, 10, 20 = BN 3, 10 = BN4AM *(9" only)*
40 = AM 25, 50, 100, 200 = W
3, 10, 25 = P

Element Media
BN, W , AM, BN4AM, P

Seals
(omit) = Nitrile rubber (NBR) *(standard)*
V = Fluorocarbon elastomer (FKM)

Supplementary Details
SFREE = *(same as above)*
Element Stacking Interconnecter (PN2056730)

Clogging Indicator Model Code

VMF 2 C . X / 3 V

Indicator Prefix
VMF = 1/8" NPT Static Indicator
VR = G1/2" Static Indicator *(lid mount)*

Trip Pressure

All Other Indicators	Gauges E/ES
P = 14.5 psi (1 bar)	P = 11.6 psi (0.8 bar)
P = 29 psi (2 bar)	P = 20 psi (1.4 bar)
P = 36 psi (2.5 bar)	P = 29 psi (2 bar)

Type of Indicator
A = No indicator, plugged port
B = Pop-up indicator *(auto reset - static only)*
BM = Pop-up indicator *(manual reset)*
C = Electric switch - SPDT
D = Electric switch and LED light - SPDT
E/ES = Visual pressure gauge
J = Electric switch
(Brad Harrison 5-pin mini connector)
J4 = Electric switch - M12
(Brad Harrison 4-pin micro connector)

Modification Number

Supplementary Details
3 = Includes 1/8" NPT Threads

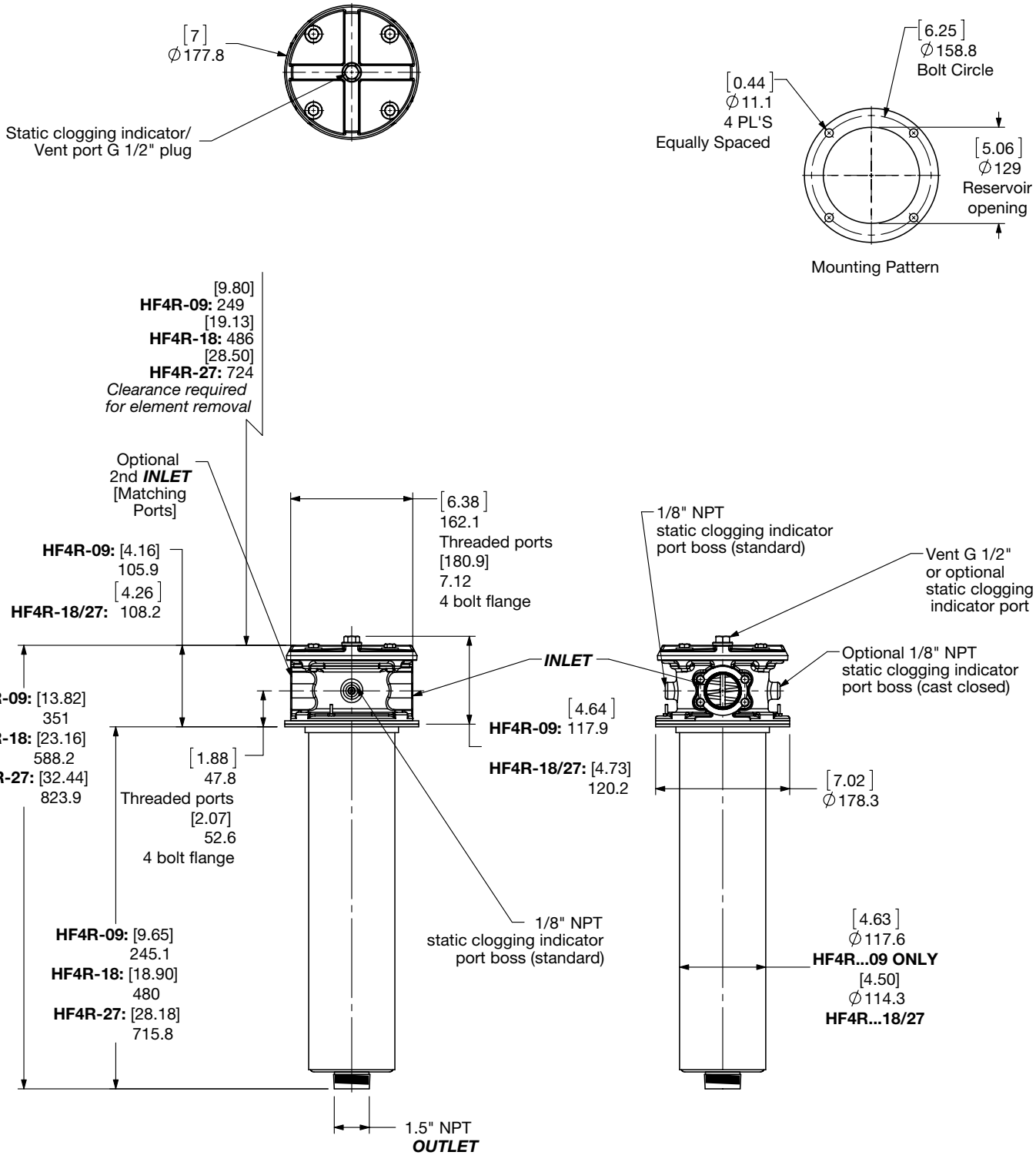
Seals
(omit) = Nitrile rubber (NBR) *(standard)*
V = Fluorocarbon elastomer (FKM)

Light Voltage *(D type indicators only)*
L24 = 24V L110 = 110V

(For additional details and options, see Section H - Clogging Indicators.)

Model Codes Containing RED are non-stock items — Minimum quantities may apply – Contact HYDAC for information and availability

Dimensions
HF4R



Size	09	18	27
Weight (lbs.)	13	17.5	23.2

Dimensions shown are [inches] millimeters for general information and overall envelope size only. Weights listed include element.
For complete dimensions please contact HYDAC to request a certified print.

Sizing Information

Total pressure loss through the filter is as follows:

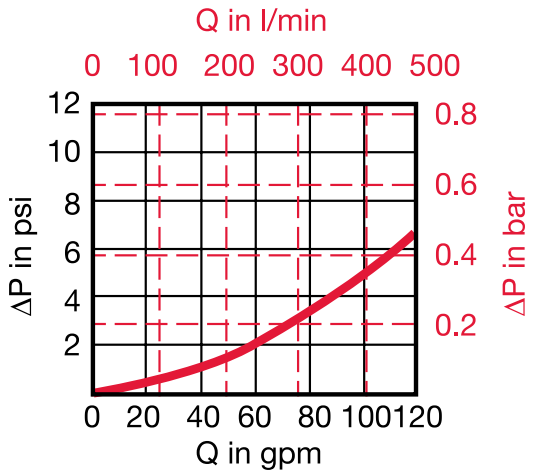
Assembly ΔP = Housing ΔP + Element ΔP

Housing Curve:

Pressure loss through housing is as follows:

$$\text{Housing } \Delta P = \text{Housing Curve } \Delta P \times \frac{\text{Actual Specific Gravity}}{0.86}$$

Adjustments must be made for viscosity & specific gravity of the fluid to be used! *(see "Sizing HYDAC Filter Assemblies" in Section B - Overview)*



Element K Factors

$$\Delta P \text{ Elements} = \underset{\text{(From Tables Below)}}{\text{Elements (K) Flow Factor}} \times \text{Flow Rate (gpm)} \times \frac{\text{Actual Viscosity (SUS)}}{141 \text{ SUS}} \times \frac{\text{Actual Specific Gravity}}{0.86}$$

Autospec HF4 Depth	5.03.XXDXXBN Low Collapse			
Size	3 µm	5 µm	10 µm	20 µm
5.03.09DXXBN	0.168	0.141	0.079	0.044
5.03.18DXXBN	0.080	0.067	0.038	0.021
5.03.27DXXBN	0.052	0.043	0.024	0.014

Autospec HF4 Paper	5.03.XXDXXP Low Collapse		
Size	3 µm	10 µm	25 µm
5.03.09DXXP	0.250	0.120	0.080
5.03.18DXXP	0.090	0.050	0.030
5.03.27DXXP	0.020	0.010	0.010

Autospec HF4 Water	5.03.09DXXAM & BN/AM		
Size	3 µm	10 µm	40 µm
5.03.09DXXAM	N/A	N/A	0.125
5.03.09DXXBN/AM	0.320	0.230	N/A

Notes: Requires stacking for 18" and 27" configurations.
Water retention (per 9" section) 500ml at 2 gpm; 150 ml at 20 gpm

Autospec HF4 Wire Mesh	5.03.XXDXXW
Size	25, 50, 100, 200 µm
5.03.09DXXW	0.007
5.03.18DXXW	0.004
5.03.27DXXW	0.002

All Element K Factors in psi / gpm.