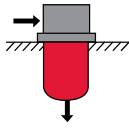


## RF Series In-tank / Inline Filters

360 psi • up to 400 gpm



### Features

- RF 30 filters constructed of polyamide plastic.
- RF 60 - 330 filters constructed of aluminum material. Aluminum alloy is water tolerant - anodization is not required for high water based fluids (HWBF).
- RF 660 - 1300 filters constructed of ductile iron.
- Non-welded housing design reduces stress concentrations and prevents fatigue failure.
- Inlet/outlet port options include NPT, SAE straight thread O-ring boss, and SAE 4-bolt flange to allow easy installation without costly adapters.
- O-ring seals are used to provide positive, reliable sealing. Choice of O-ring materials (Nitrile, Fluoroelastomer, EPDM) provides compatibility with petroleum oils, synthetic fluids, water-glycols, oil/water emulsions, and high water base fluids.
- Bolt-on lid requires minimal clearance for removal.
- Reusable contamination basket prevents loss of retained contaminants into the reservoir during element replacement.
- Clogging indicators can be serviced without interruption of the hydraulic system.
- Single piece casting provides rigidity for inline or in-tank mounting.

### Applications



Agricultural



Automotive



Construction



Gearboxes

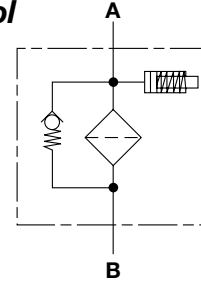


Industrial



Steel / Heavy Industry

### Hydraulic Symbol



### Technical Details

<b>Mounting Method</b>	4 Mounting holes - filter housing	
<b>Port Connections</b>	Inlet / Outlet	
30	1/2" NPT / 0.71" Dia Smooth	
60/110	SAE-12 / SAE-12	
160/240	SAE-20 / SAE-20	
330	SAE-20 / 2" NPT	
	2" NPT / 2" NPT	
660	2" SAE Flange, Code 61 / 2" NPT	
	3" SAE Flange, Code 61 / 3" NPT	
	3" SAE Flange, Code 61 / 3" SAE Flange, Code 61	
950	3-1/2" SAE Flange, Code 61 / 3-1/2" SAE Flange, Code 61	
1300	4" SAE Flange, Code 61 / 4" SAE Flange, Code 61	
<b>Direction of Flow</b>	Inlet: Side	Outlet: bottom
<b>Materials of Construction</b>	Housing	Lid
30	Polyamide	Polyamide
60-330	Aluminum	Aluminum
660-1300	Ductile Iron	Ductile Iron
<b>Flow Capacity</b>		
30	8 gpm (30 lpm)	
60	16 gpm (60 lpm)	
110	29 gpm (110 lpm)	
160	42 gpm (160 lpm)	
240	63 gpm (240 lpm)	
330	87 gpm (330 lpm)	
660	174 gpm (660 lpm)	
950	251 gpm (950 lpm)	
1300	343 gpm (1300 lpm)	
<b>Housing Pressure Rating</b>		
Max. Oper. Press:	360 psi (25 bar); (size 30 - 145 psi, 10 bar)	
Proof Pressure:	217 psi (15 bar)	
Fatigue Pressure:	145 psi (10 bar) @ 1 million cycles	
Burst Pressure:	30	580 psi (40 bar)
	60/110	1080 psi (75 bar)
	160/240	1230 psi (85 bar)
	330	1440 psi (100 bar)
	660-1300	>1440 psi (100 bar)
<b>Element Collapse Pressure Rating</b>		
BN/HC, W/HC,	290 psid (20 bar)	
ECO/N, BN/AM, P/HC, AM	145 psid (10 bar)	
V	3045 psid (210 bar)	
<b>Fluid Temperature Range</b>	-22° to 250°F (-30° to 121°C)	
<b>Fluid Compatibility</b>	Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.	
<b>Indicator Trip Pressure</b>	P = 29 psi (2 bar) -10% (standard) P = 72 psi (5 bar) -10% (optional)	
<b>Bypass Valve Cracking Pressure</b>	ΔP = 43 psid (3 bar) +10% (standard) ΔP = 87 psid (6 bar) +10% (optional)	

## Model Code

**RF BN/HC 330 D L 10 H 1 . X / 16 - V - B6**

**Filter Type** \_\_\_\_\_  
 RF = Return Line Filter

**Element Media** \_\_\_\_\_  
 BN/HC = Betamicon® (Low Collapse)    ECO/N = ECOmicron® (Low Collapse)  
 AM = Aquamicon®    BN/AM = Betamicon®/Aquamicon®<sup>1</sup>  
 P/HC = Polyester    W/HC = Wire Screen

**Size** \_\_\_\_\_  
 30, 60, 110, 160, 240, 330, 660, 950, 1300

**Pressure Rating** \_\_\_\_\_  
 B = 145 psi (10 bar) (size 30 only)  
 D = 360 psi (25 bar)

**Type of Connection** \_\_\_\_\_  
 B = 1/2" NPT (size 30)    M = SAE 48 Flange (size 660)  
 C = SAE 12 (sizes 60, 110)    N = SAE 48 Flange Inlet / 3" NPT Outlet (size 660)  
 E = SAE 20 (sizes 160 - 330)    O = SAE 56 Flange (size 950)  
 G = 2" NPT (size 330)    P = SAE 64 Flange (size 1300)  
 L = SAE 32 Flange Inlet / 2" NPT Outlet (size 330)

**Filtration Rating (micron)** \_\_\_\_\_  
 3, 5, 10, 20 = BN/HC, ECO/N    10, 20 = P/HC    3, 10 = BN/AM  
 25, 74, 149 = W/HC    40 = AM

**Type of Static or ΔP Clogging Indicator** \_\_\_\_\_  
 A, B/BM, C, D, H

**Type Number** \_\_\_\_\_  
 1 = Standard Connection

**Modification Number (latest version always supplied)** \_\_\_\_\_

**Inlet Port Configuration** \_\_\_\_\_  
 3 = NPT (sizes 30 & 330)  
 12 = SAE Straight Thread Inlet/Outlet Connections (sizes 60, 110, 160, 240)  
 16 = SAE Flange Code 61 Inlet Connections (sizes 330 - 1300 only)

**Seals** \_\_\_\_\_  
 (omit) = Nitrile (NBR) (standard)    V = Fluoroelastomer (FPM)    EPR = Ethylene Propylene (EPDM)

**Bypass Valve** \_\_\_\_\_  
 (omit) = 43 psid (3 bar) (return line - standard)  
 KB = No Bypass (flushing system)    not available with ECO/N  
 B6 = 87 psid (6 bar) (return line)  
 B1 = 15 psid (1 bar) (lubrication or coolant applications)  
 B0.2 = 3 psid (0.20 bar) (suction line)

**Supplementary** \_\_\_\_\_  
 SO103H = Modification of BN4HC & W/HC Elements For Phosphate Ester Fluids  
 L24, L48, L110, L220 = Lamp for D-type clogging indicator (LXX, XX = voltage)  
 DE = ΔP Indicator (sizes 660, 950, 1300)

## Replacement Element Model Code

**0330 R 010 BN4HC / V**

**Size** \_\_\_\_\_  
 0030, 0060, 0110, 0160, 0240,  
 0330, 0660, 0950, 1300

**Filtration Rating (micron)** \_\_\_\_\_  
 3, 5, 10, 20 = BN4HC, ECO/N    10, 20 = P/HC  
 3, 10 = BN/AM  
 25, 74, 149 = W/HC    40 = AM

**Element Media** \_\_\_\_\_  
 BN4HC, ECO/N, P/HC, BN/AM, W/HC, AM

**Supplementary Details** \_\_\_\_\_  
 (omit) = standard  
 V = Fluoroelastomer (FPM) seals

## Clogging Indicator Model Code

**VR 2 B . X /**

**Indicator Prefix** \_\_\_\_\_  
 VR = Return Filters

**Trip Pressure** \_\_\_\_\_  
 2 = 29 psid (2 bar) (return filters)  
 5 = 72 psid (5 bar) (optional)

**Type of Indicator** \_\_\_\_\_  
 A = no indicator, plugged port  
 B/BM = Visual pop-up (auto/manual reset)  
 C = Electric switch  
 D = Electric switch and light  
 H = Electric pressure switch

**Modification Number** \_\_\_\_\_

**Supplementary Details** \_\_\_\_\_  
**Light Voltage (D type indicators only)** \_\_\_\_\_  
 L24 = 24V  
 L110 = 110V

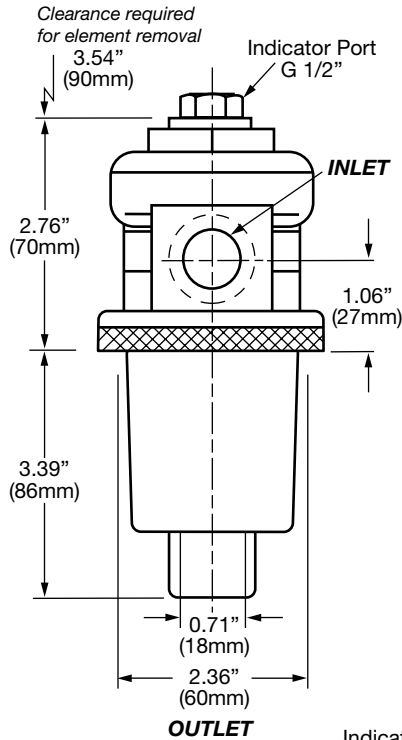
**Seals** \_\_\_\_\_  
 (omit) = Nitrile (NBR) (standard)  
 V = Fluoroelastomer (FPM)

(For additional details and options, see Clogging Indicators section.)

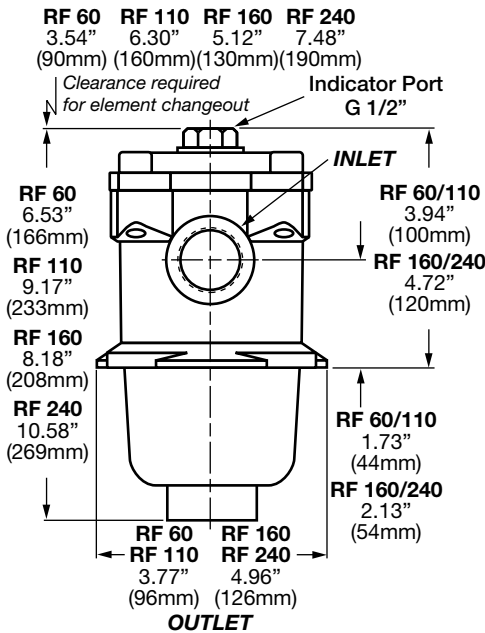
Model Codes Containing RED are non-stock items — Minimum quantities may apply — Contact HYDAC for information and availability

## Dimensions

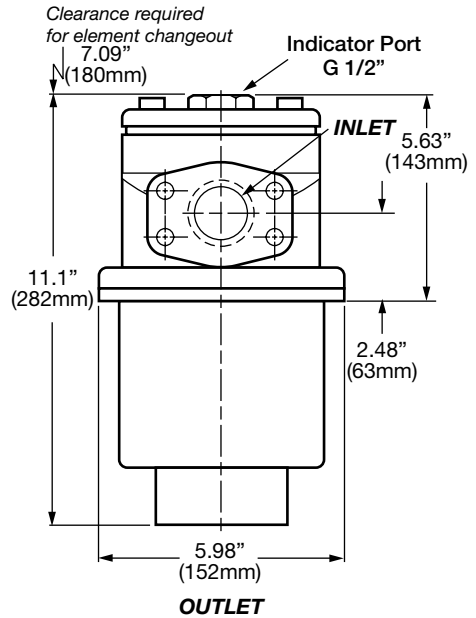
### RF 30



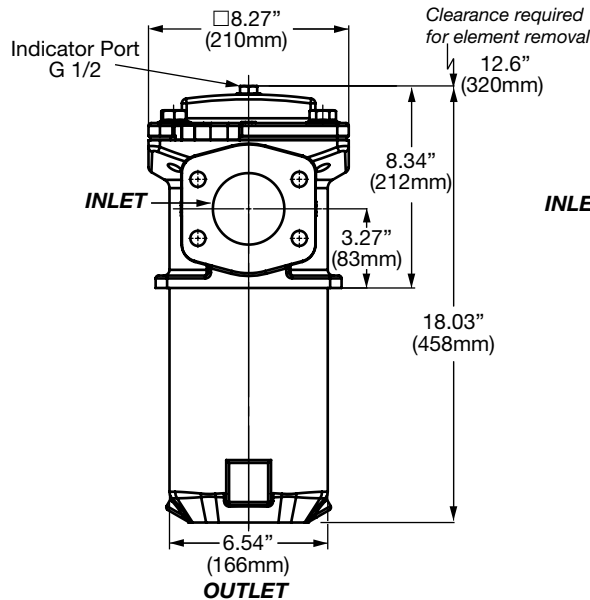
### RF 60 - 240



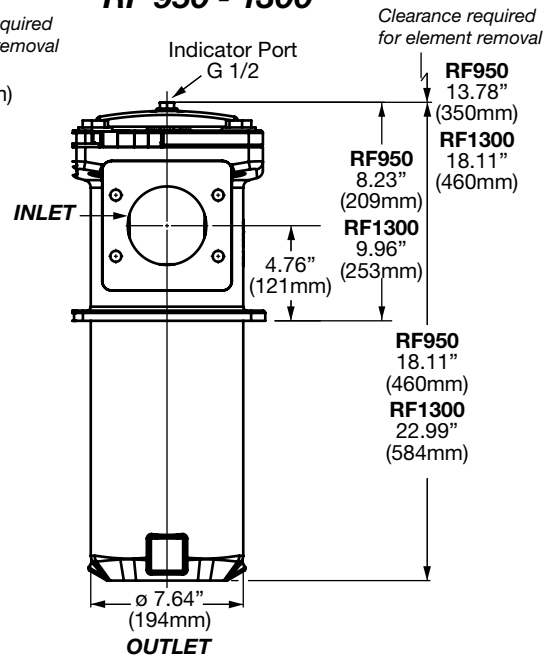
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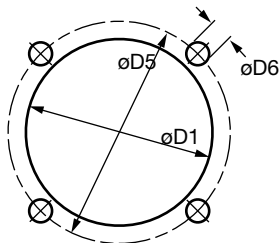
### RF 660



### RF 950 - 1300



## Mounting Pattern



Size	$\phi D1$	$\phi D5$	$\phi D6$
30	2.35" (60mm)	3.07" (78mm)	0.20" (5mm)
60 / 110	3.15" (80mm)	3.94" (100mm)	0.26" (6.5mm)
160 / 240	4.17" (106mm)	5.32" (135mm)	0.30" (7.5mm)
330	5.31" (135mm)	6.9" (170mm)	0.35" (9mm)
660	6.89" (175mm)	8.66" (220mm)	0.55" (14mm)
950 / 1300	8.19" (208mm)	11.42" (290mm)	0.71" (18mm)

Size	30	60	110	160	240	330	660	950	1300
Weight (lbs.)	0.7	1.7	2.0	3.3	3.7	7.5	40.8	86	94.8

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

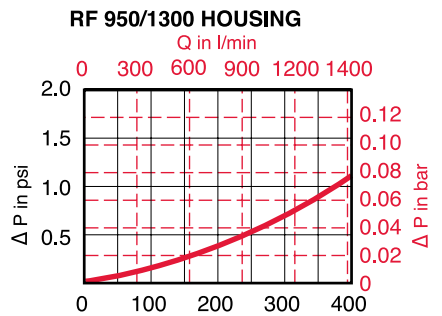
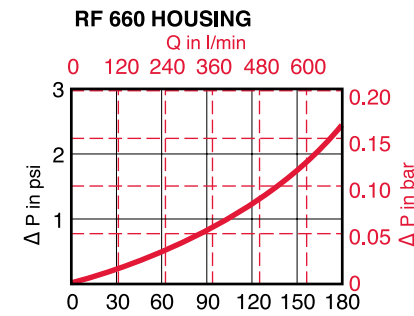
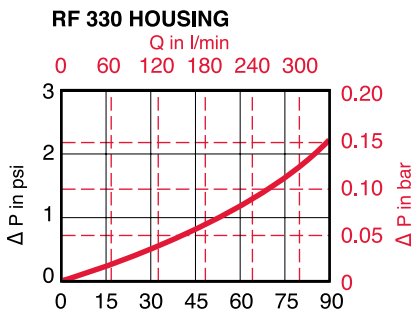
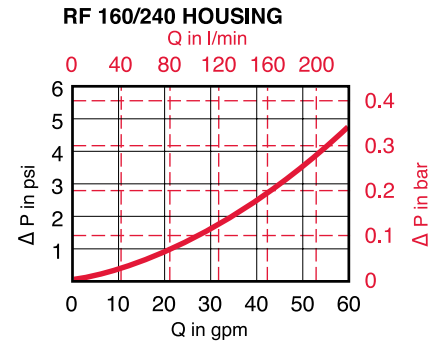
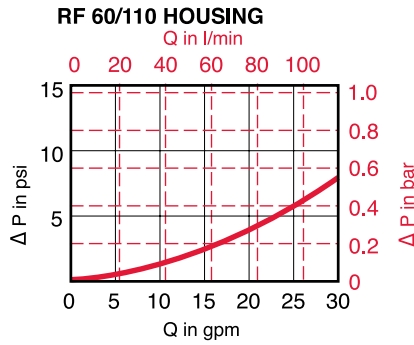
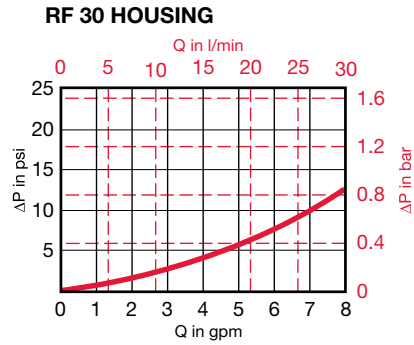
Assembly P = Housing P + Element P

### Housing Curve:

Pressure loss through housing is as follows:

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

Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see sizing section on page 19)



## Element K Factors

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

(From Tables Below)

Size	...R...BN4HC (Betamicon® Low Collapse)			
	3 µm	5 µm	10 µm	20 µm
0030	3.749	2.407	1.470	0.808
0060	1.470	1.005	0.598	0.376
0110	0.817	0.517	0.329	0.178
0160	0.522	0.323	0.208	0.159
0240	0.338	0.208	0.142	0.096
0330	0.232	0.150	0.093	0.066
0660	0.105	0.066	0.042	0.029
0950	0.064	0.043	0.030	0.020
1300	0.045	0.032	0.024	0.014

Size	...R...P/HC (Paper)	
	10, 20 µm	
0030	0.458	
0060	0.255	
0110	0.128	
0160	0.077	
0240	0.049	
0330	0.037	
0660	0.016	
0950	0.010	
1300	0.007	

Size	...R...W/HC (Wire Screen)
	25, 50, 74, 100, 149, 200 µm
0030	0.110
0060	0.055
0110	0.030
0160	0.021
0240	0.015
0330	0.010
0660	0.005
0950	0.003
1300	0.003

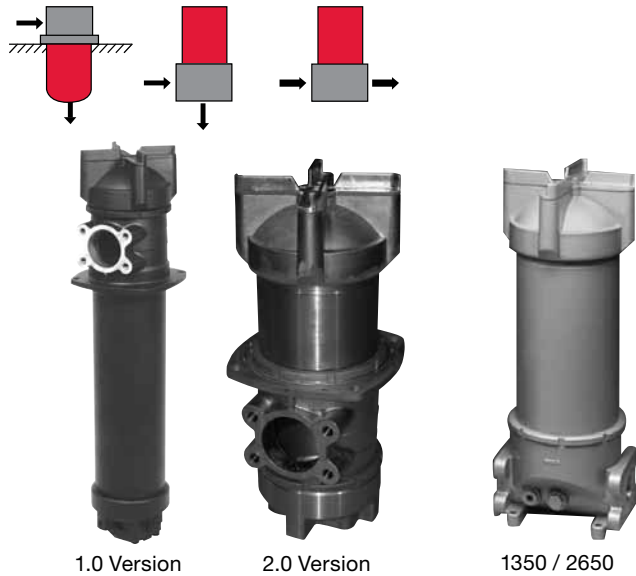
Size	...R...ECO/N			
	3 µm	5 µm	10 µm	20 µm
0110	-	-	0.464	0.317
0160	0.556	0.378	0.329	0.225
0240	-	-	0.209	-
0330	0.228	0.156	0.135	-
0660	0.100	0.068	0.059	0.041
0950	0.068	0.0467	0.041	0.028
1300	0.049	0.034	0.029	0.020

Size	...R...BN/AM	
	3 µm	10 µm
0330	0.477	0.164
0660	0.192	0.066
0950	0.132	0.045
1300	0.088	0.033

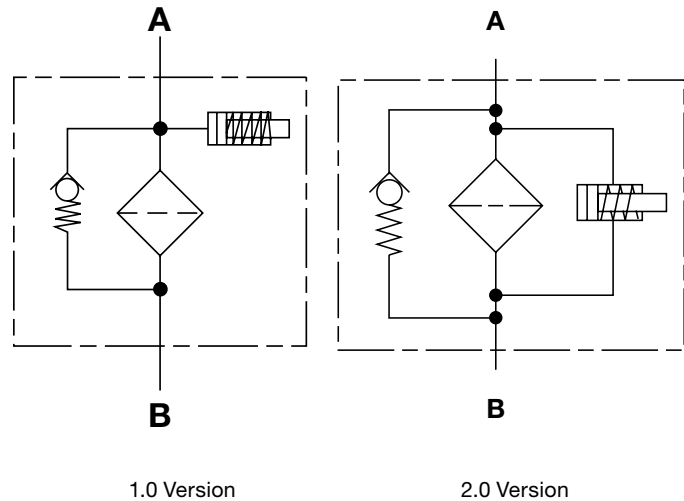
Size	...R...AM
	040A
0330	0.216
0660	0.095
0950	0.067
1300	0.048

All Element K Factors in psi / gpm.

## NF Series In-Tank / Inline Filters 360 psi • up to 450 gpm



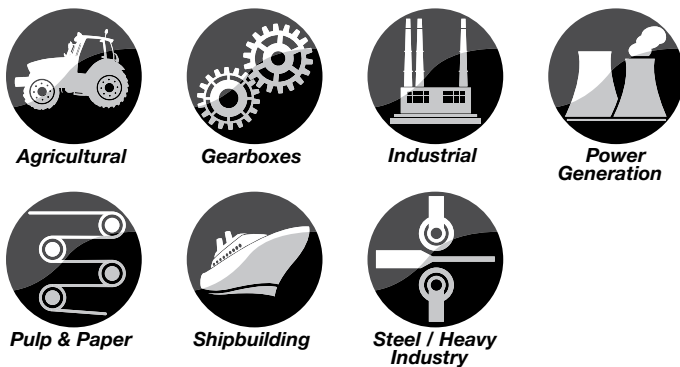
### Hydraulic Symbol



### Features

- NF Filters have an extremely large filtration area and flow capacity of 450 gpm
- NF Filters can be configured for in-tank or in-line applications
- Vent and drain ports are standard
- Aluminum alloy is water tolerant - anodizing is not required for water based fluids (HWBF)
- Screw-on lid provides easy access to filter element for replacement
- Reusable contamination basket prevents re-entry of retained contaminants into the reservoir during element replacement
- Filters can be fitted with clogging indicators to monitor the contamination level of the element
- Single piece head design available in version 2.0 (Contact HYDAC)

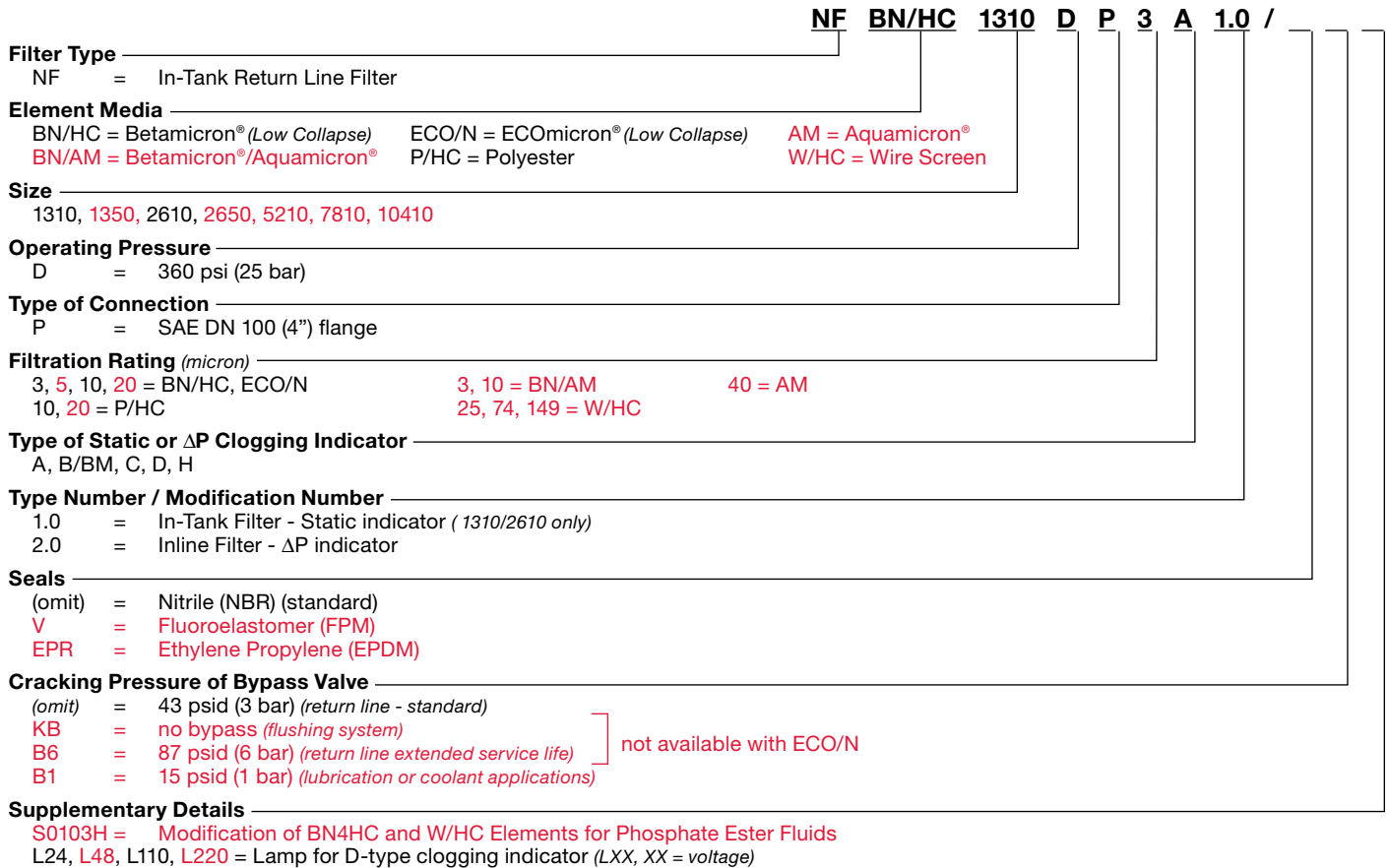
### Applications



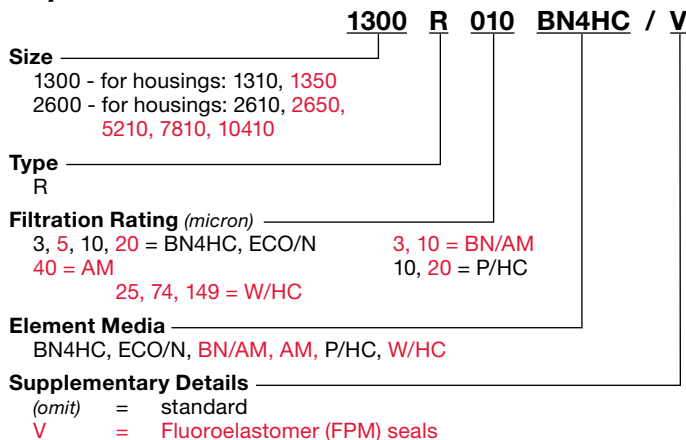
### Technical Details

<b>Mounting Method</b>	See drawings	
<b>Port Connection</b>	SAE-64 Flange Code 61 (with metric bolts included on NF 1310 & 2610)	
<b>Flow Direction</b>	1.0 version	Inlet: Side      Outlet: Bottom
	2.0 version	Inlet: Side      Outlet: Bottom
	1350 / 2650	Inlet: Side      Outlet: Side
<b>Construction Materials</b>	Head, Housing, Lid	Aluminum
	Elbows, Manifolds	Ductile Iron
<b>Flow Capacity</b>	1310	343 gpm (1300 lpm)
	2610, 5210, 7810, 10410	450 gpm (1700 lpm)
<b>Housing Pressure Rating</b>	Max. Operating Pressure	360 psi (25 bar)
	Proof Pressure	540 psi (38 bar)
	Fatigue Pressure	360 psi (25 bar)
	Burst Pressure	Contact HYDAC office
<b>Element Collapse Pressure Rating</b>	BN/HC, W/HC	290 psid (20 bar)
	ECO/N, BN/AM, P/HC, AM	145 psid (10 bar)
<b>Fluid Temperature Range</b>	-22° to 250°F (-30° to 121°C)	
<b>Fluid Compatibility</b>	Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.	
<b>Indicator Trip Pressure</b>	ΔP = 29 psid (2 bar) -10%	1.0 - Static
	ΔP = 72 psid (5 bar) -10%	2.0 - Differential
<b>Bypass Valve Cracking Pressure</b>	ΔP = 15 psid (1 bar) +10%	
	ΔP = 43 psid (3 bar) +10%	
	ΔP = 87 psid (6 bar) +10%	

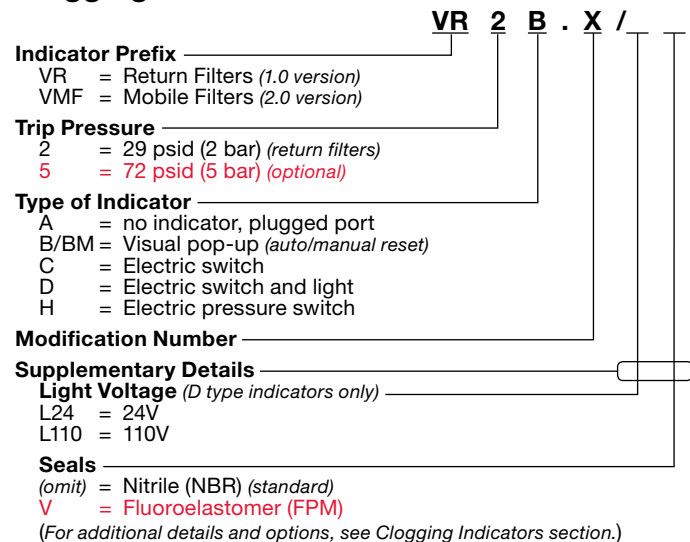
## Model Code



## Replacement Element Model Code



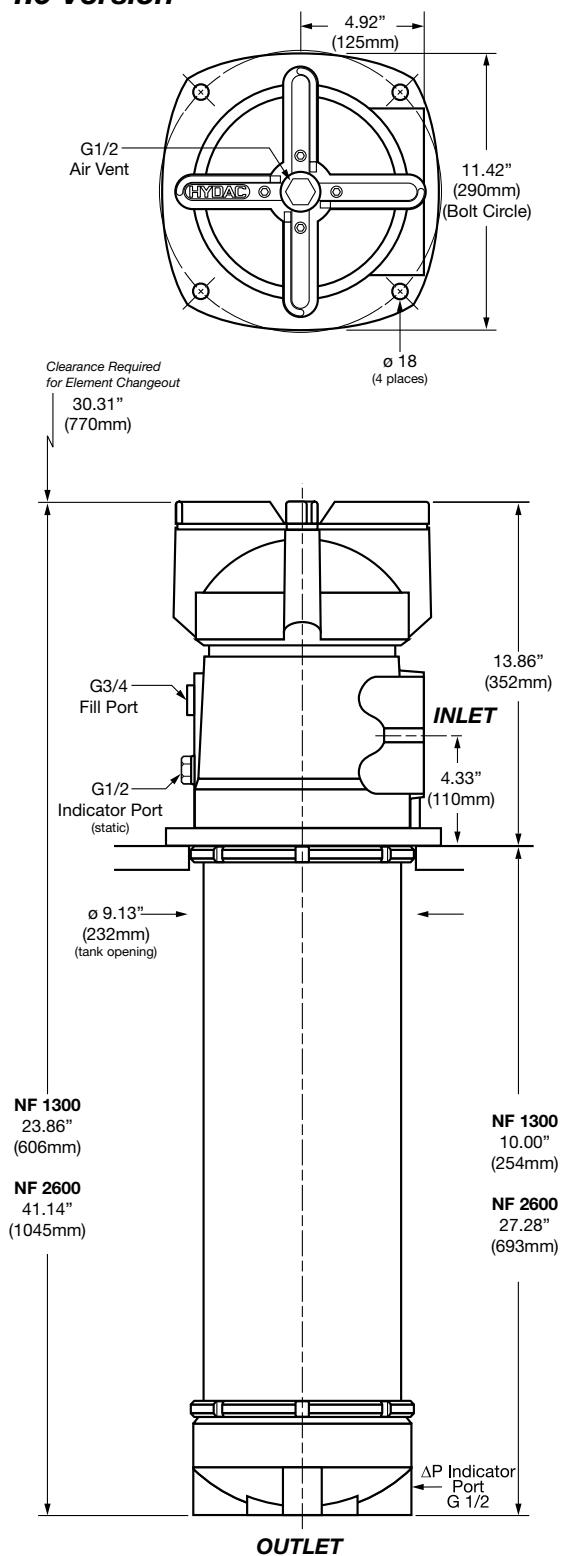
## Clogging Indicator Model Code



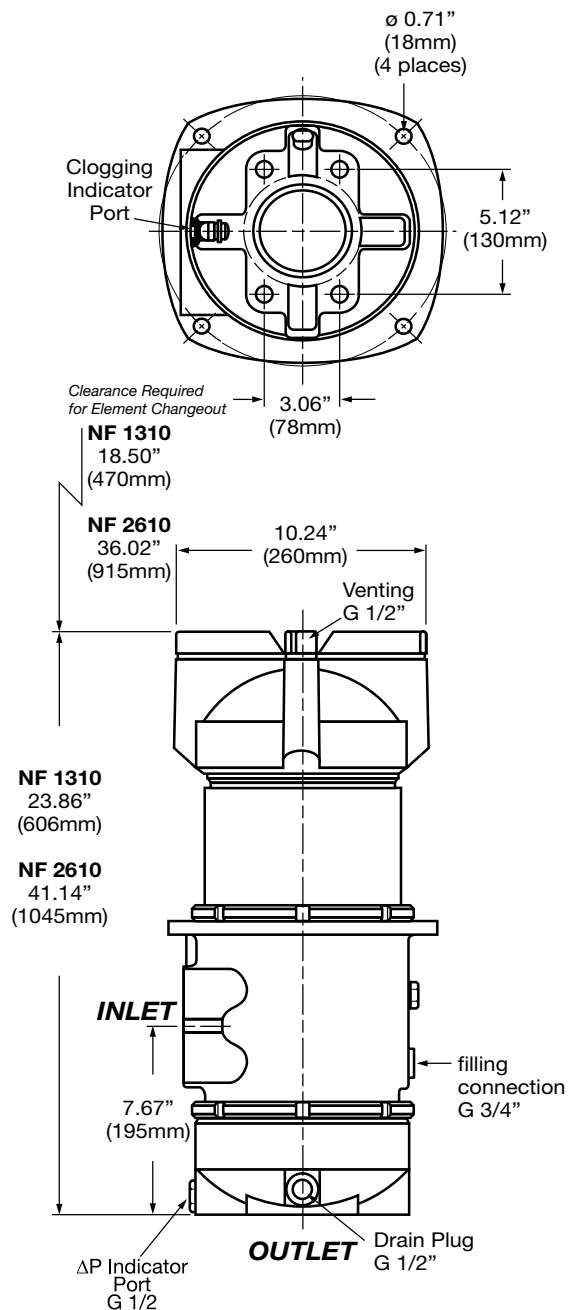
Model Codes Containing RED are non-stock items — Minimum quantities may apply — Contact HYDAC for information and availability

## Dimensions:

### NF 1310 - 2610 1.0 Version



### 2.0 Version

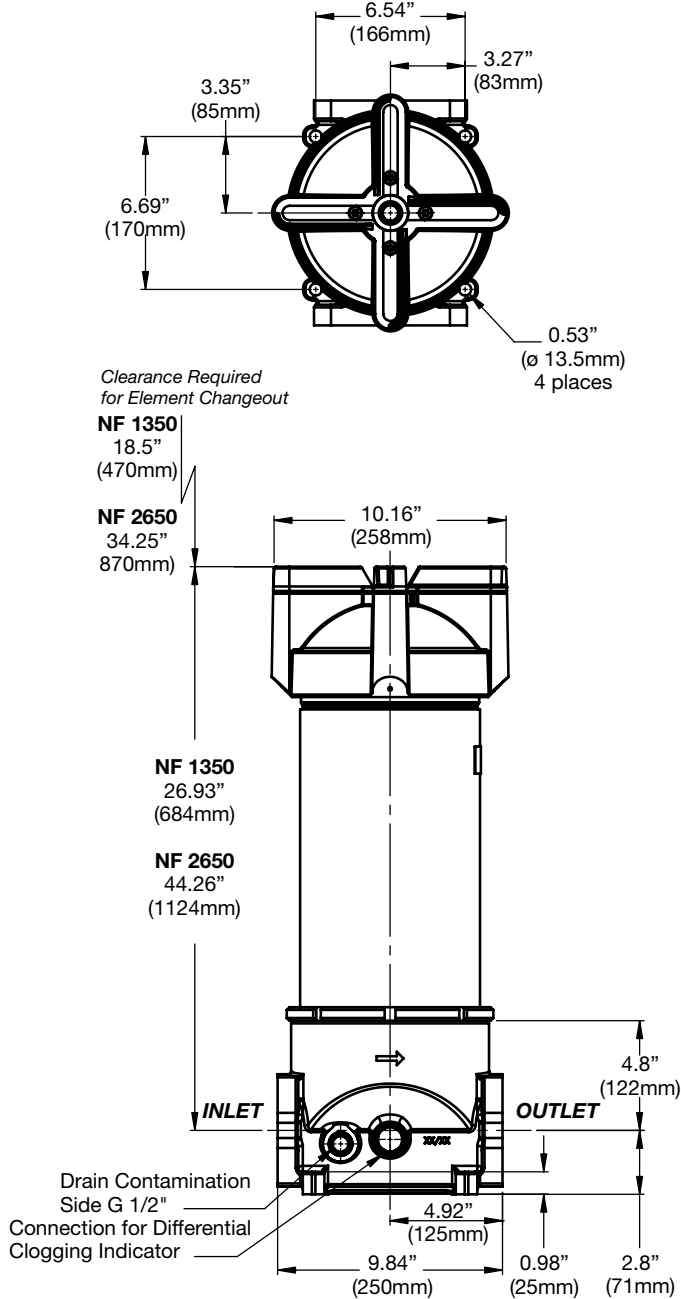


Size	1310	2610
Weight (lbs.)	37	50

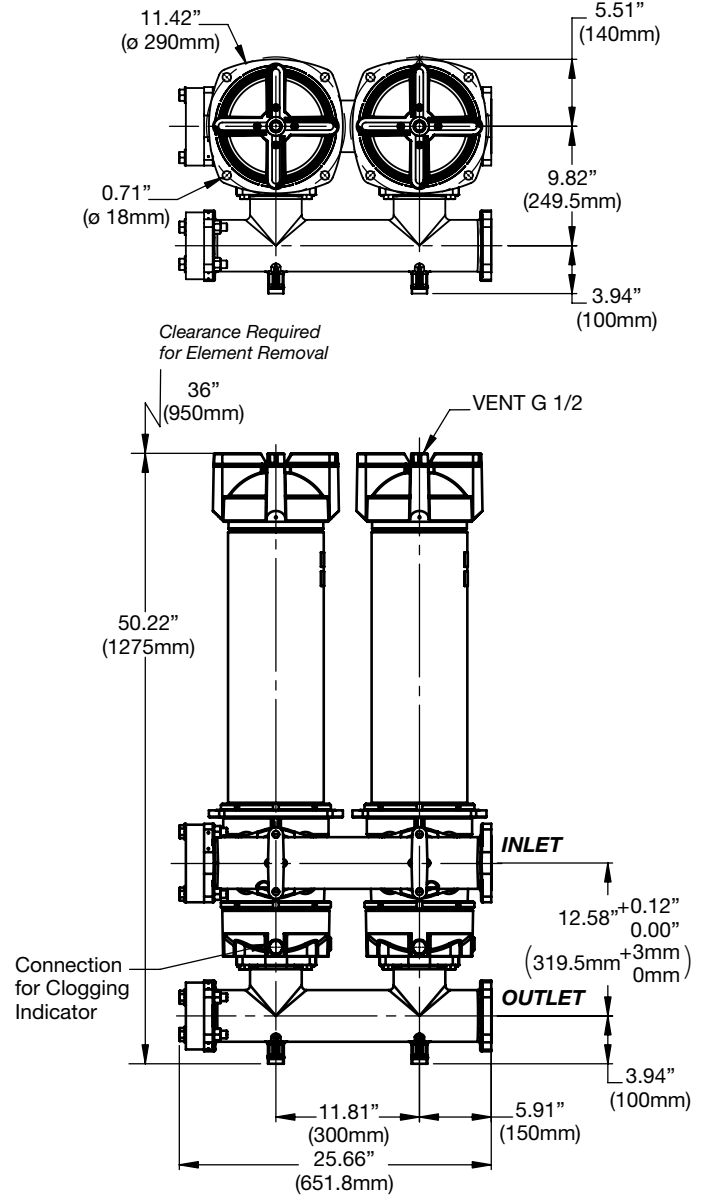
Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## Dimensions:

### NF 1350 / 2650 2.0 Version



### NF 5210 2.0 Version



Size	1350	2650	5210
Weight (lbs.)	40	55	198

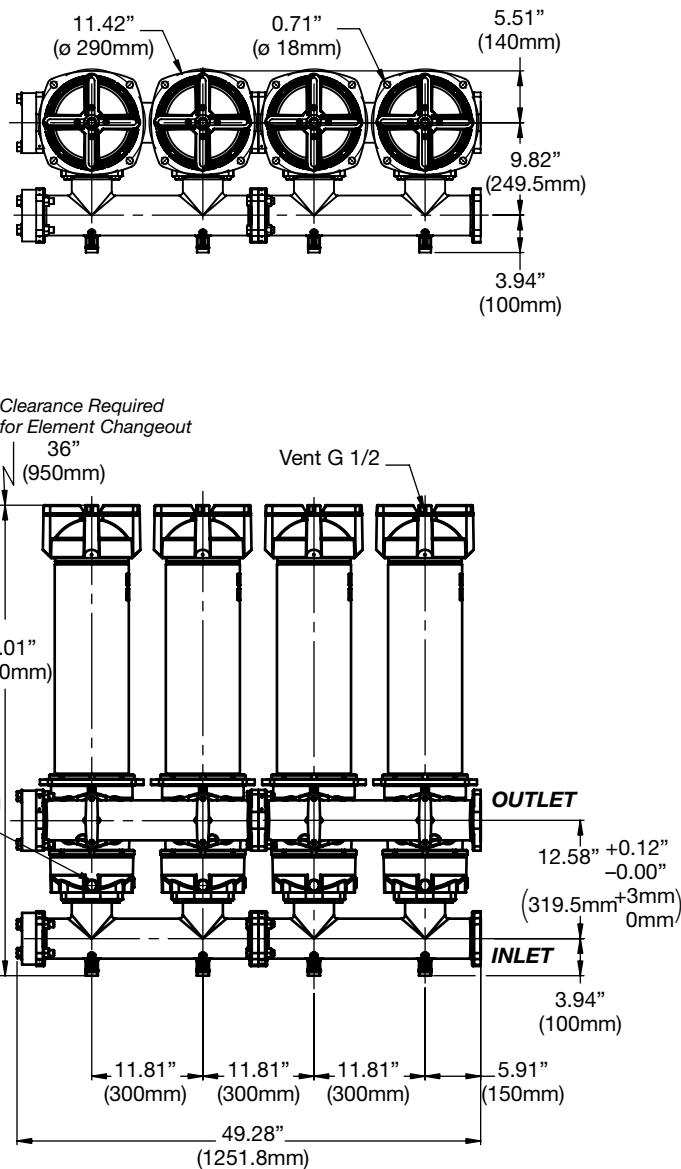
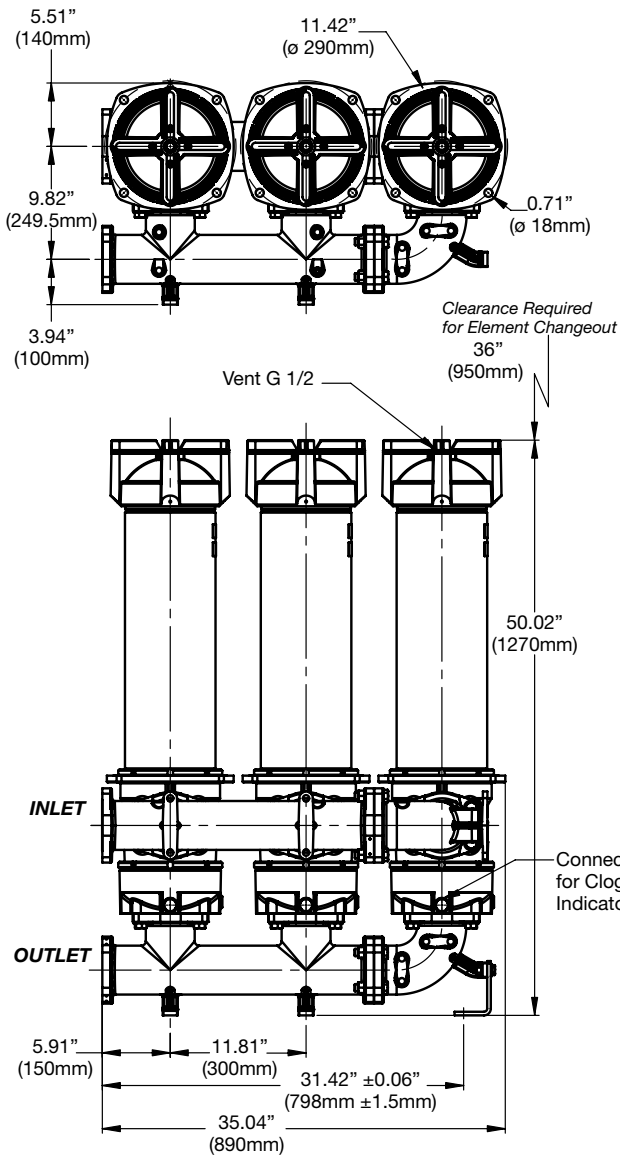
Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.



## Dimensions

### NF 7810 2.0 Version

### NF 10410 2.0 Version



Size	7810	10410
Weight (lbs.)	275	397

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

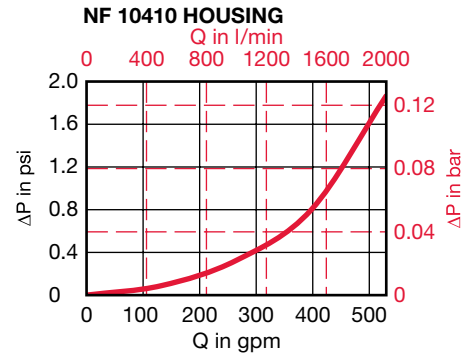
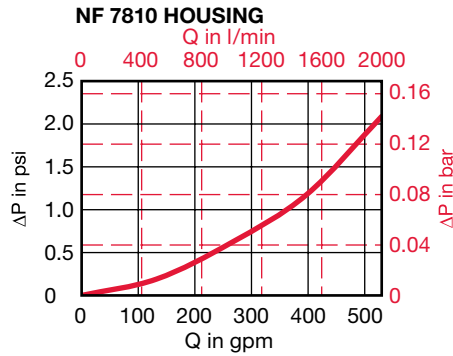
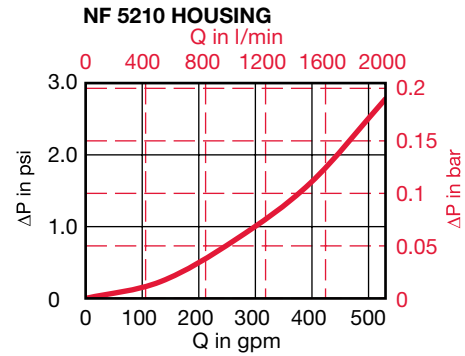
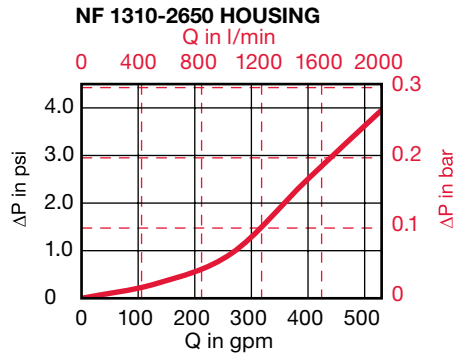
$$\text{Assembly } \Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$$

### 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 section on page 19)



## Element K Factors

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

(From Tables Below)

Size	...R...BN4HC (Betamicon® Low Collapse)			
	3 μm	5 μm	10 μm	20 μm
1310	0.045	0.032	0.024	0.014
2610	0.023	0.016	0.011	0.007

Size	...R...ECO/N			
	3 μm	5 μm	10 μm	20 μm
1310	0.049	0.034	0.029	0.020
2610	0.024	0.017	0.014	0.010

Size	...R...BN/AM	
	3 μm	10 μm
1310	0.088	0.033
2610	0.052	0.019

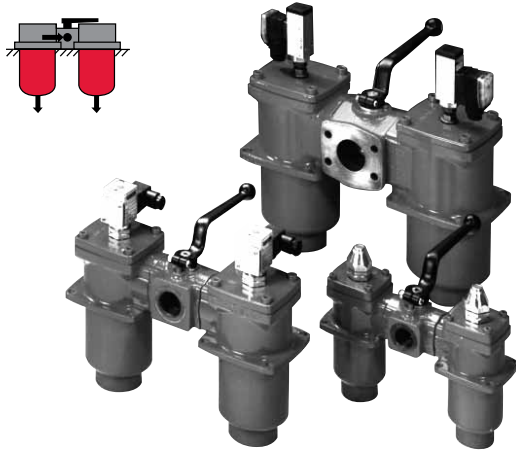
Size	...R...AM
	40 μm
1310	0.048
2610	0.024

Size	...R...P/HC (Polyester)	
	10 μm	20 μm
1310	0.0070	0.0070
2610	0.0034	0.0034

Size	...R...W/HC (Wire Screen)
	25, 50, 100, 200 μm
1310	0.0027
2610	0.0011

All Element K Factors in psi / gpm.

## RFD Series In-Tank / Inline Duplex Filters 360 psi • up to 400 gpm



### Features

- RFD 60 - 330 filters are constructed of aluminum.
- Aluminum alloy is water tolerant - anodization is not required for water based fluids (HWBF).
- RFD 660 - 1300 filters are constructed of ductile iron.
- Non-welded housing design reduces stress concentrations and prevents fatigue failure.
- Inlet/outlet port options include NPT (RFD 61-241 inlet only), SAE straight thread O-ring boss, and SAE 4-bolt flange to allow easy installation without costly adapters.
- O-ring seals are used to provide positive, reliable sealing. Choice of O-ring materials (Nitrile, Fluoroelastomer, EPDM) provides compatibility with petroleum oils, synthetic fluids, water-glycols, oil/water emulsions, and high water base fluids.
- Bolt-on lid requires minimal clearance for removal.
- Reusable contamination basket prevents loss of retained contaminants into the reservoir during element replacement.
- Clogging indicators can be serviced without interruption of the hydraulic system.
- All RFD duplex filters have a ball-type selector valve to provide continuous filtration without system shut-down to change clogged elements.

### Applications



Agricultural



Automotive



Construction



Gearboxes



Industrial



Power Generation

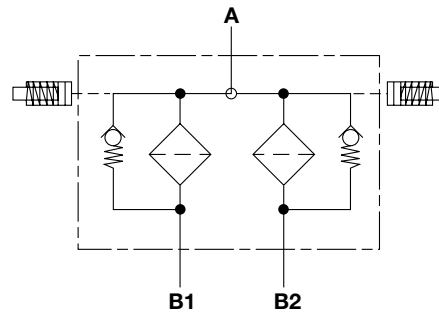


Pulp & Paper



Steel / Heavy Industry

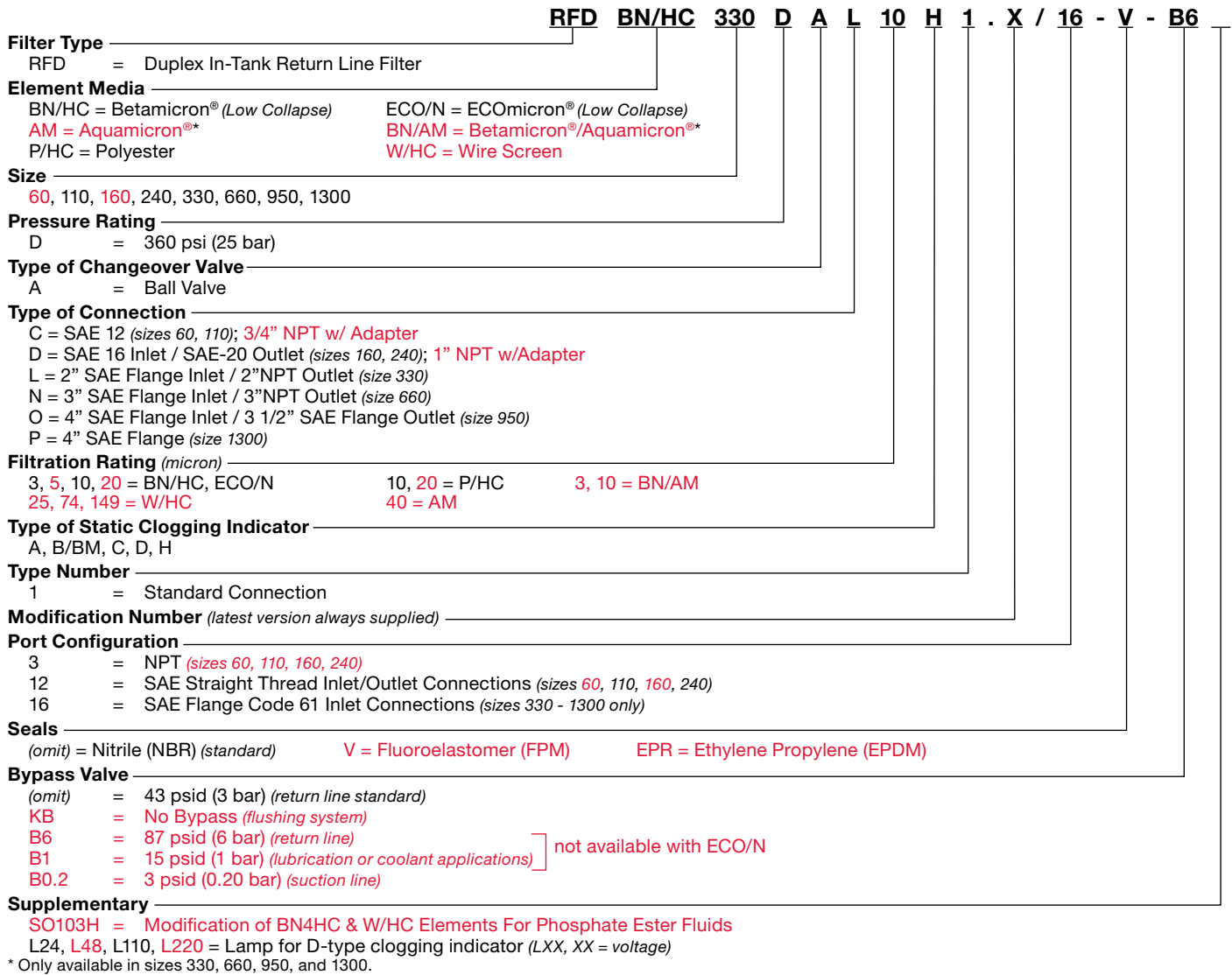
### Hydraulic Symbol



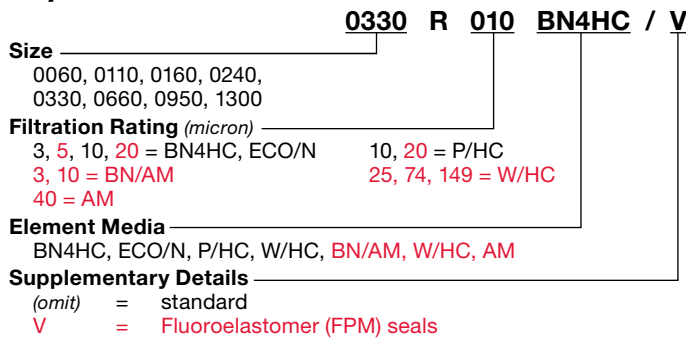
### Technical Details

<b>Mounting Method</b>	4 Mounting holes in the filter housing		
<b>Port Connections</b>	Inlet / Outlet		
60/110	SAE-12 / SAE-12		
160/240	SAE-16 / SAE-20		
330	2" SAE Flange, Code 61 / 2"NPT		
660	3" SAE Flange, Code 61 / 3"NPT		
950	4" SAE Flange, Code 61 / 3-1/2" SAE Flange, Code 61		
1300	4" SAE Flange, Code 61 / 4" SAE Flange, Code 61		
<b>Direction of Flow</b>	Side Inlet and Bottom Outlet		
<b>Materials of Construction</b>	Housing	Lid	Transfer Valve
60 - 240	Aluminum	Aluminum	Steel
330	Aluminum	Aluminum	Aluminum
660-1300	Ductile Iron	Ductile Iron	Ductile Iron
<b>Flow Capacity</b>			
60	16 gpm (60 lpm)		
110	29 gpm (110 lpm)		
160	42 gpm (160 lpm)		
240	63 gpm (240 lpm)		
330	87 gpm (330 lpm)		
660	174 gpm (660 lpm)		
950	251 gpm (950 lpm)		
1300	343 gpm (1300 lpm)		
<b>Housing Pressure Rating</b>			
Max. Oper. Press:	360 psi (25 bar)		
Proof Pressure:	540 psi (38 bar)		
Fatigue Pressure:	360 psi (25 bar) @ 700,000 cycles		
Burst Pressure:	60/110	1080 psi (75 bar)	
	160/240	1230 psi (85 bar)	
	330	1440 psi (100 bar)	
	660-1300	>1440 psi (100 bar)	
<b>Element Collapse Pressure Rating</b>			
BN/HC, W/HC,	290 psid (20 bar)		
ECO/N, BN/AM, P/HC, AM	145 psid (10 bar)		
V	3045 psid (210 bar)		
<b>Fluid Temperature Range</b>	-22° to 250°F (-30° to 121°C)		
<b>Fluid Compatibility</b>	Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.		
<b>Indicator Trip Pressure</b>	P = 29 psi (2 bar) -10% (standard) P = 72 psi (5 bar) -10% (optional)		
<b>Bypass Valve Cracking Pressure</b>	ΔP = 43 psid (3 bar) +10% (standard) ΔP = 87 psid (6 bar) +10% (optional)		

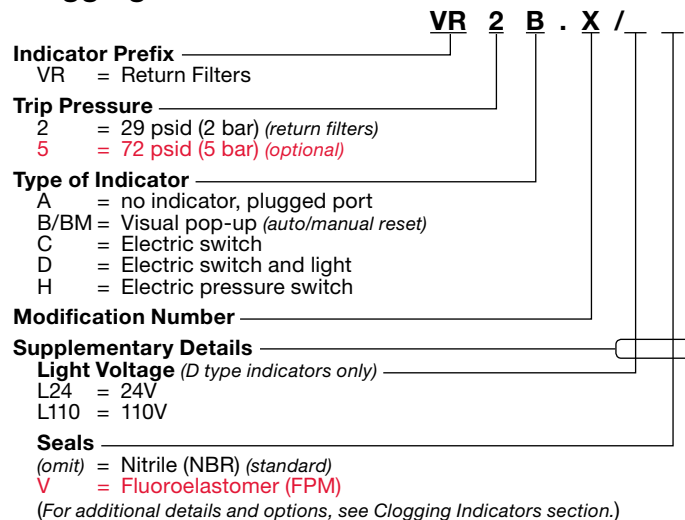
## Model Code



## Replacement Element Model Code

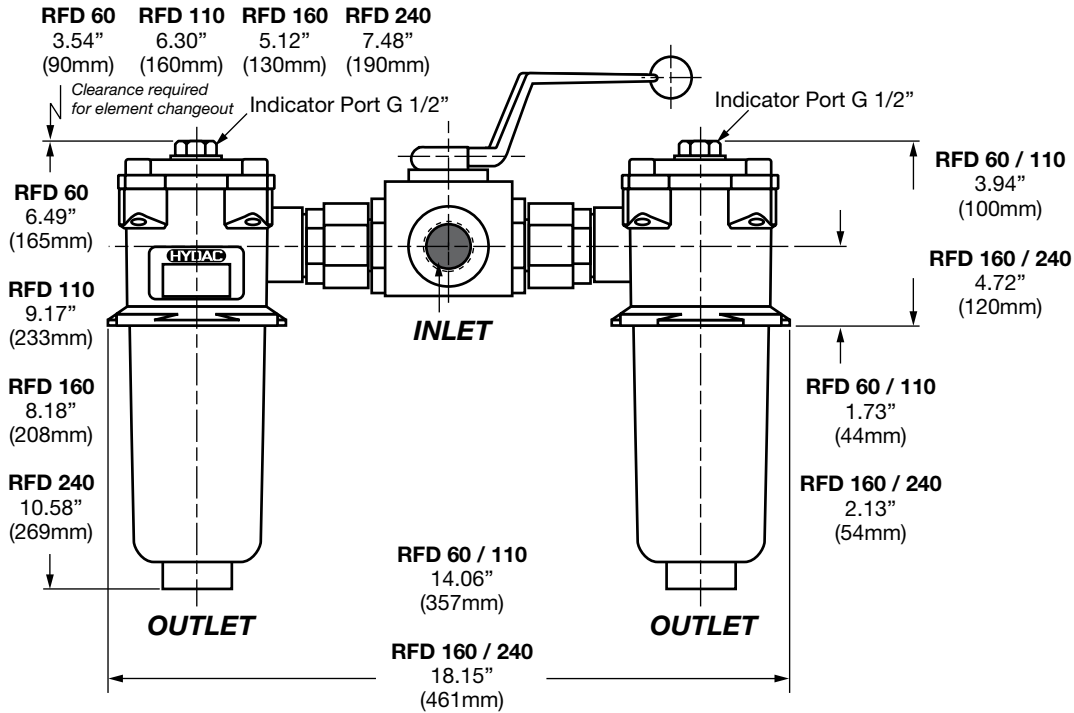


## Clogging Indicator Model Code

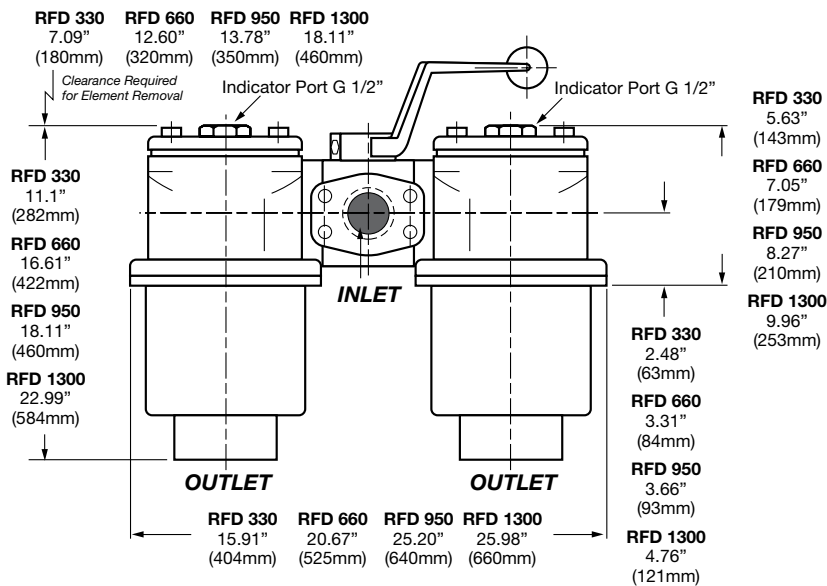


Model Codes Containing RED are non-stock items — Minimum quantities may apply — Contact HYDAC for information and availability

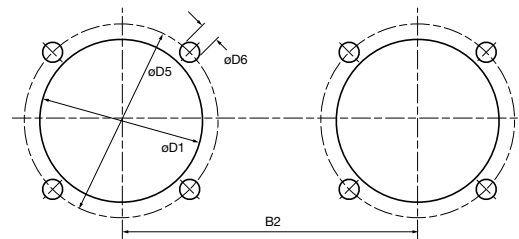
## Dimensions RFD 60 - 240



## RFD 330 - 1300



## Mounting Pattern



Size	$\phi D1$	$\phi D5$	$\phi D6$	$B2$
60 / 110	3.15" (80mm)	3.94" (100mm)	0.26" (6.5mm)	10.26" (260.5mm)
160 / 240	4.17" (106mm)	5.32" (135mm)	0.30" (7.5mm)	13.21" (335.5mm)
330	5.31" (135mm)	6.9" (170mm)	0.35" (9mm)	10.00" (254mm)
660	6.89" (175mm)	8.66" (220mm)	0.55" (14mm)	12.99" (330mm)
950	8.19" (208mm)	11.42" (290mm)	0.71" (18mm)	13.35" (390mm)
1300	8.19" (208mm)	11.42" (290mm)	0.71" (18mm)	16.14" (410mm)

Size	60	110	160	240	330	660	950	1300
Weight (lbs.)	7.0	8.2	13.4	15.6	29.5	112.2	215	238

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

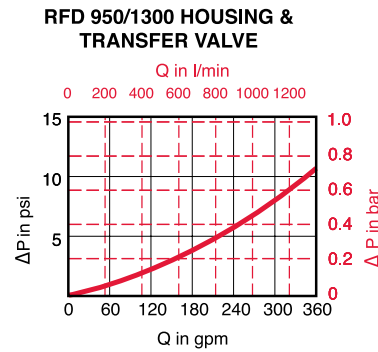
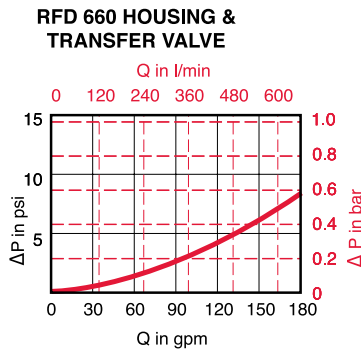
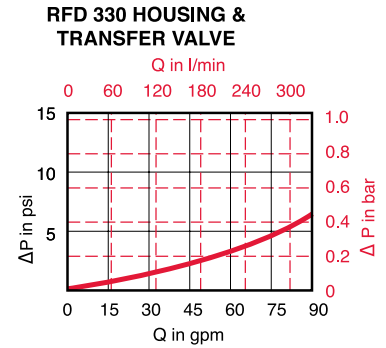
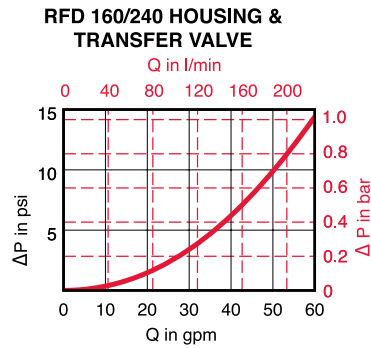
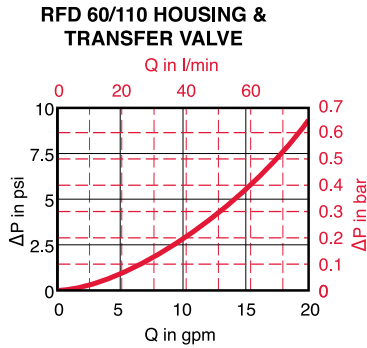
$$\text{Assembly } \Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$$

### 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 section on page 19)



## Element K Factors

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

(From Tables Below)

Size	...R...BN4HC (Betamicon® Low Collapse)			
	3 μm	5 μm	10 μm	20 μm
0110	0.817	0.517	0.329	0.178
0160	0.522	0.323	0.208	0.159
0240	0.338	0.208	0.142	0.096
0330	0.232	0.150	0.093	0.066
0660	0.105	0.066	0.042	0.029
0950	0.064	0.043	0.030	0.020
1300	0.045	0.032	0.024	0.014

Size	...R...ECO/N			
	3 μm	5 μm	10 μm	20 μm
0110	-	-	0.464	0.317
0160	0.556	0.378	0.329	0.225
0240	-	-	0.209	-
0330	0.228	0.156	0.135	-
0660	0.100	0.068	0.059	0.041
0950	0.068	0.0467	0.041	0.028
1300	0.049	0.034	0.029	0.020

Size	...R...P/HC (Paper)
	10, 20 μm
0060	0.255
0110	0.128
0160	0.077
0240	0.049
0330	0.037
0660	0.016
0950	0.010
1300	0.007

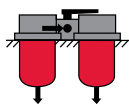
Size	...R...W/HC (Wire Screen)
	25, 50, 74, 100, 149, 200 μm
0060	0.055
0110	0.030
0160	0.021
0240	0.015
0330	0.010
0660	0.005
0950	0.003
1300	0.003

Size	...R...BN/AM	
	3 μm	10 μm
0330	0.477	0.164
0660	0.192	0.066
0950	0.132	0.045
1300	0.088	0.033

Size	...R...AM
	040A
0330	0.216
0660	0.095
0950	0.067
1300	0.048

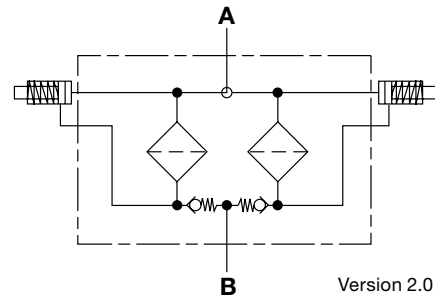
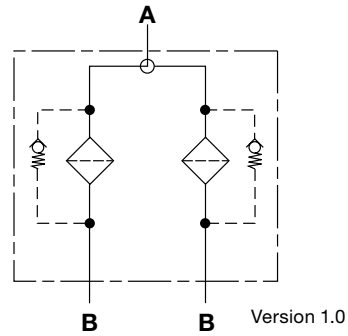
All Element K Factors in psi / gpm.

## NFD Series In-Tank / Inline Duplex Filters 360 psi • up to 450 gpm



Version 2.0 pictured

### Hydraulic Symbol



### Features

- NFD Filters have an extremely large filtration area and flow capacity of 450 gpm.
- NFD Filters can be configured for in-tank or inline applications
- Vent and drain ports are standard
- Aluminum alloy is water tolerant - anodization is not required for water based fluids (HWBF)
- Screw-on lid provides easy access to filter element for replacement
- Reusable contamination basket prevents re-entry of retained contaminants into the reservoir during element replacement
- Filters can be fitted with clogging indicators to monitor the contamination level of the element
- NFD duplex filters have a ball-type selector valve to provide continuous filtration and eliminate the need to shut-down the system during element changeout

### Applications



Agricultural



Automotive



Construction



Gearboxes



Industrial



Offshore



Power Generation

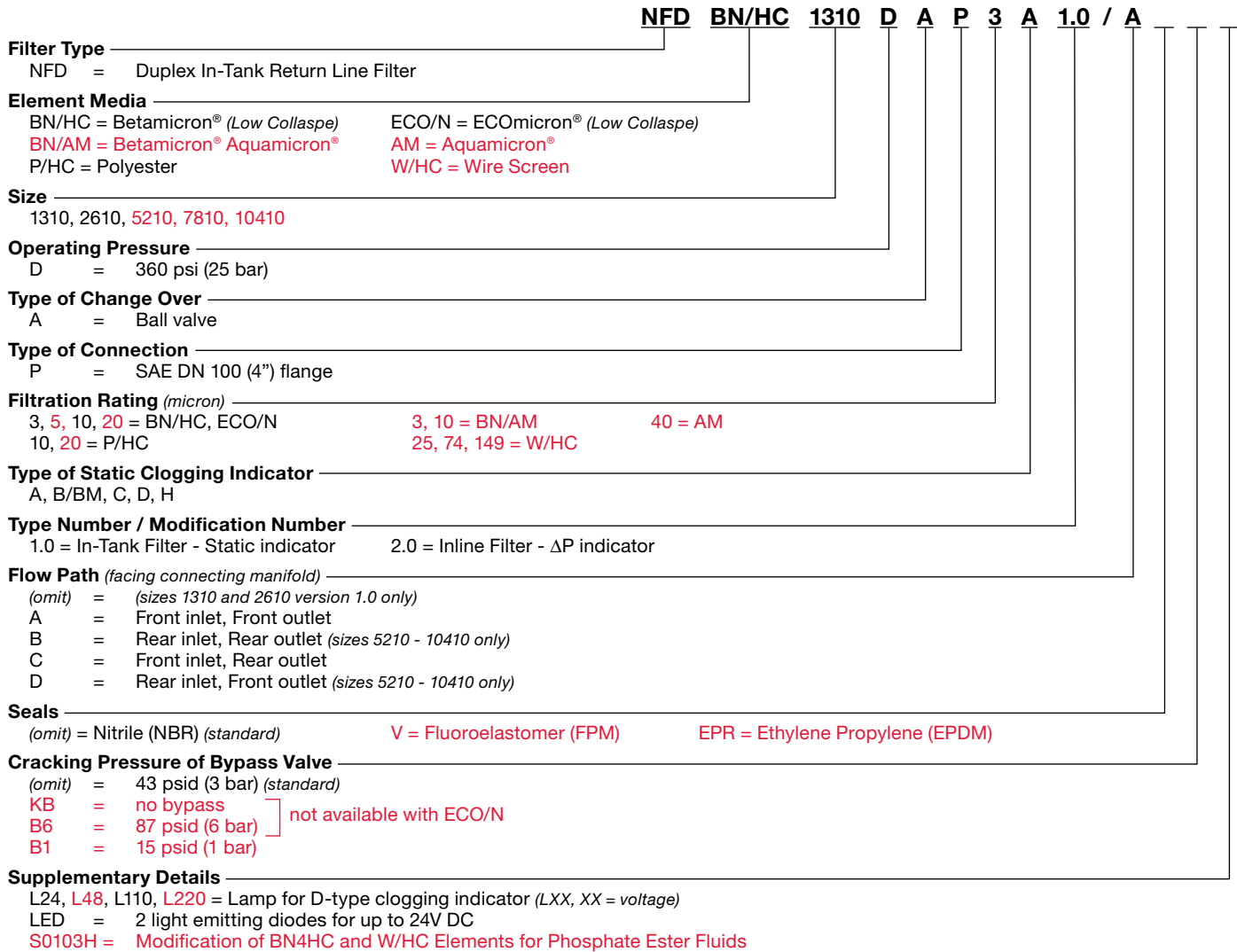


Pulp & Paper

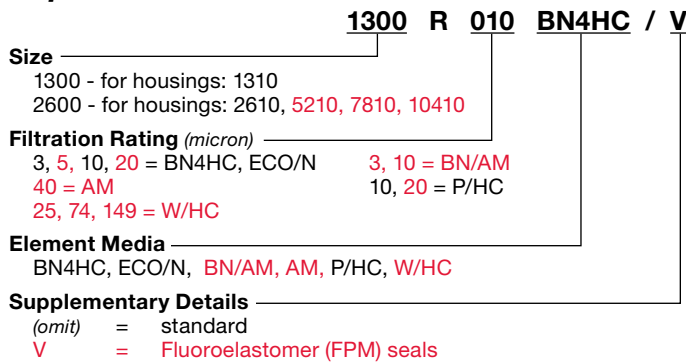
### Technical Details

<b>Mounting Method</b>	See drawings	
<b>Port Connection</b>	SAE-64 Flange Code 61	
<b>Flow Direction</b>		
<b>1.0 version</b>	Inlet: Side	Outlet: Bottom
<b>2.0 version</b>	Inlet: Side	Outlet: Side
<b>Construction Materials</b>		
Head, Housing, Lid	Aluminum	
Elbows, Manifolds	Ductile Iron	
<b>Flow Capacity</b>		
1310	343 gpm (1300 lpm)	
2610, 5210, 7810, 10410	450 gpm (1700 lpm)	
<b>Housing Pressure Rating</b>		
Max. Operating Pressure	360 psi (25 bar)	
Proof Pressure	540 psi (38 bar)	
Fatigue Pressure	360 psi (25 bar)	
Burst Pressure	Contact HYDAC office	
<b>Element Collapse Pressure Rating</b>		
BN/HC, W/HC	290 psid (20 bar)	
ECO/N, BN/AM, P/HC, AM	145 psid (10 bar)	
<b>Fluid Temperature Range</b>	-22° to 250°F (-30° to 121°C)	
<b>Fluid Compatibility</b>	Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.	
<b>Indicator Trip Pressure</b>		
$\Delta P = 29$ psid (2 bar) -10%	1.0 - Static	
$\Delta P = 72$ psid (5 bar) -10%	2.0 - Differential	
<b>Bypass Valve Cracking Pressure</b>		
$\Delta P = 43$ psid (3 bar) +10%		
$\Delta P = 87$ psid (6 bar) +10%		

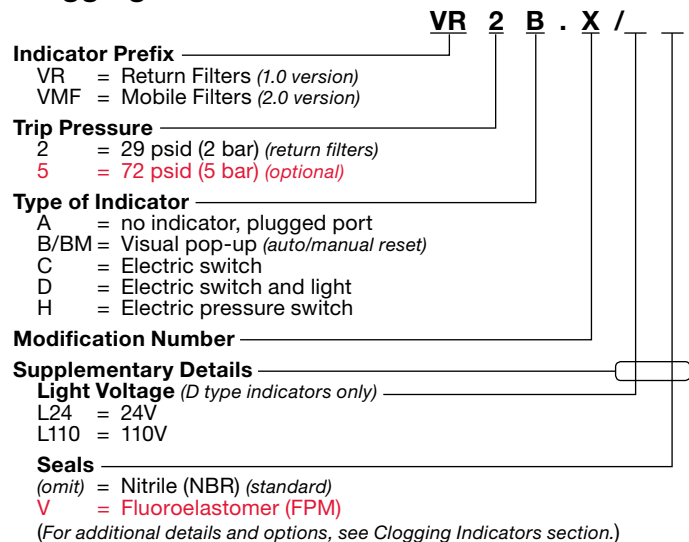
## Model Code



## Replacement Element Model Code



## Clogging Indicator Model Code

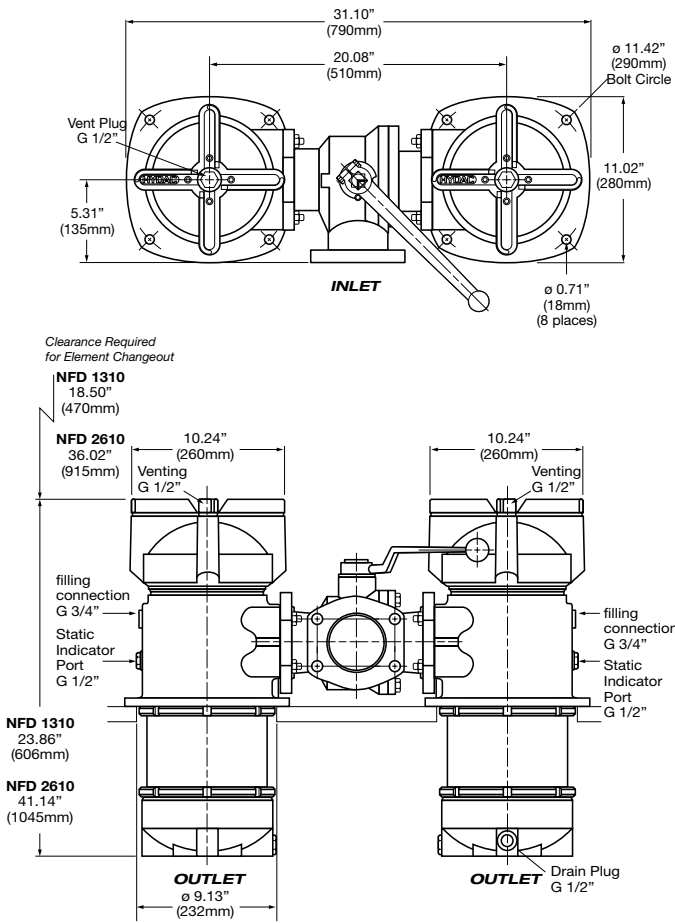


Model Codes Containing RED are non-stock items — Minimum quantities may apply — Contact HYDAC for information and availability

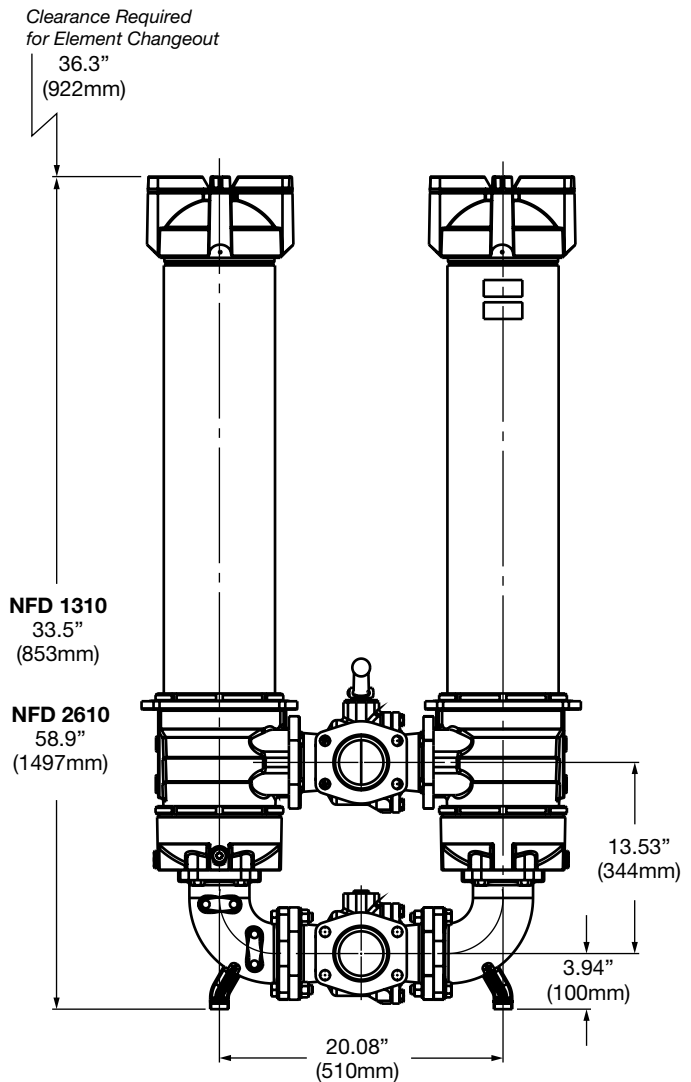


## Dimensions

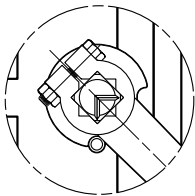
### NFD 1310 / 2610 – 1.0 Version



### NFD 1310 / 2610 – 2.0 Version



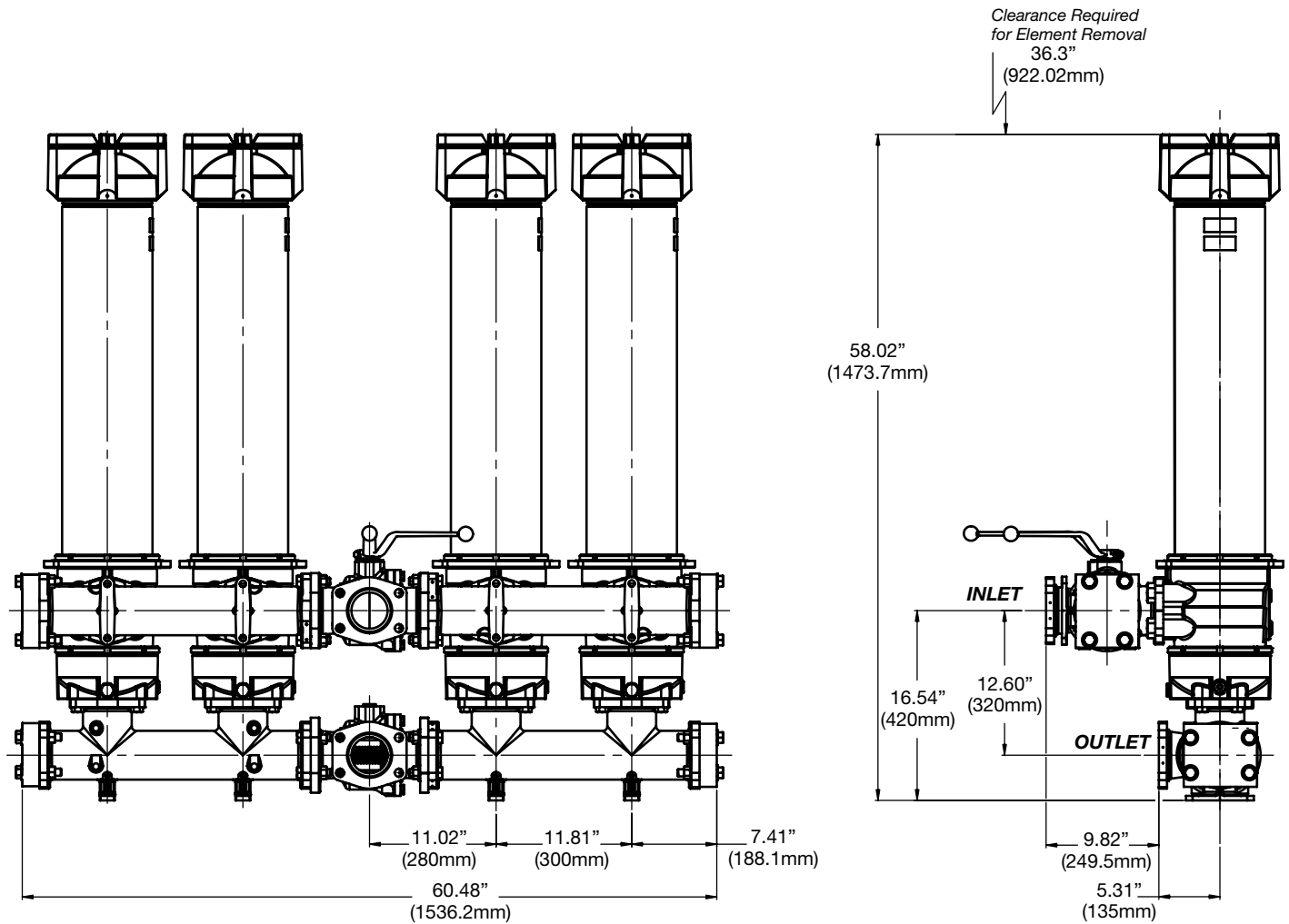
## Handle Enlargement – Both Versions



Size	Version 1.0	1310	2610	Version 2.0	1310	2610
Weight (lbs)		154	176		227	254

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

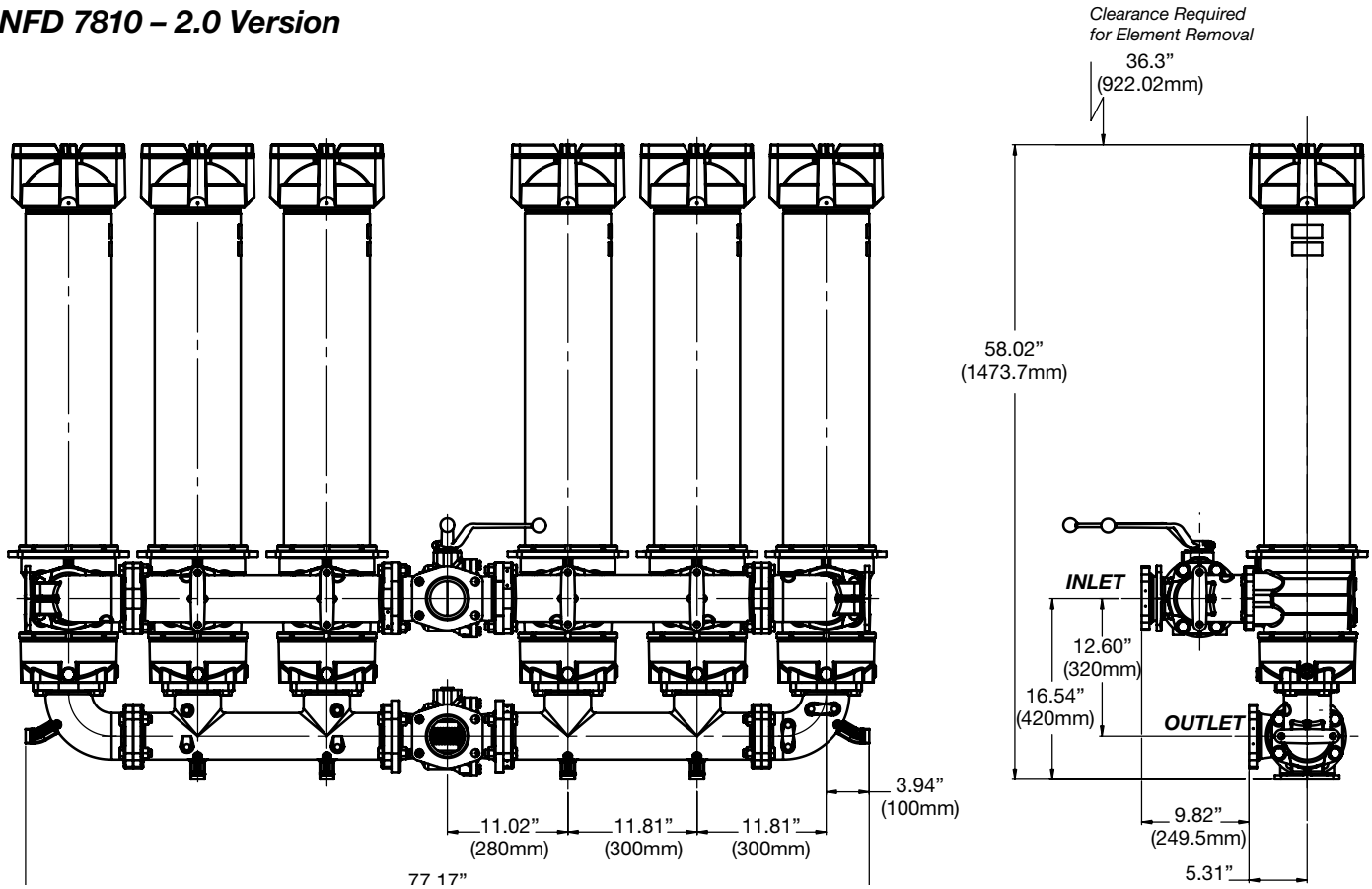
## NFD 5210 – 2.0 Version



<b>Size</b>	5210 Version 2.0
<b>Weight (lbs.)</b>	610

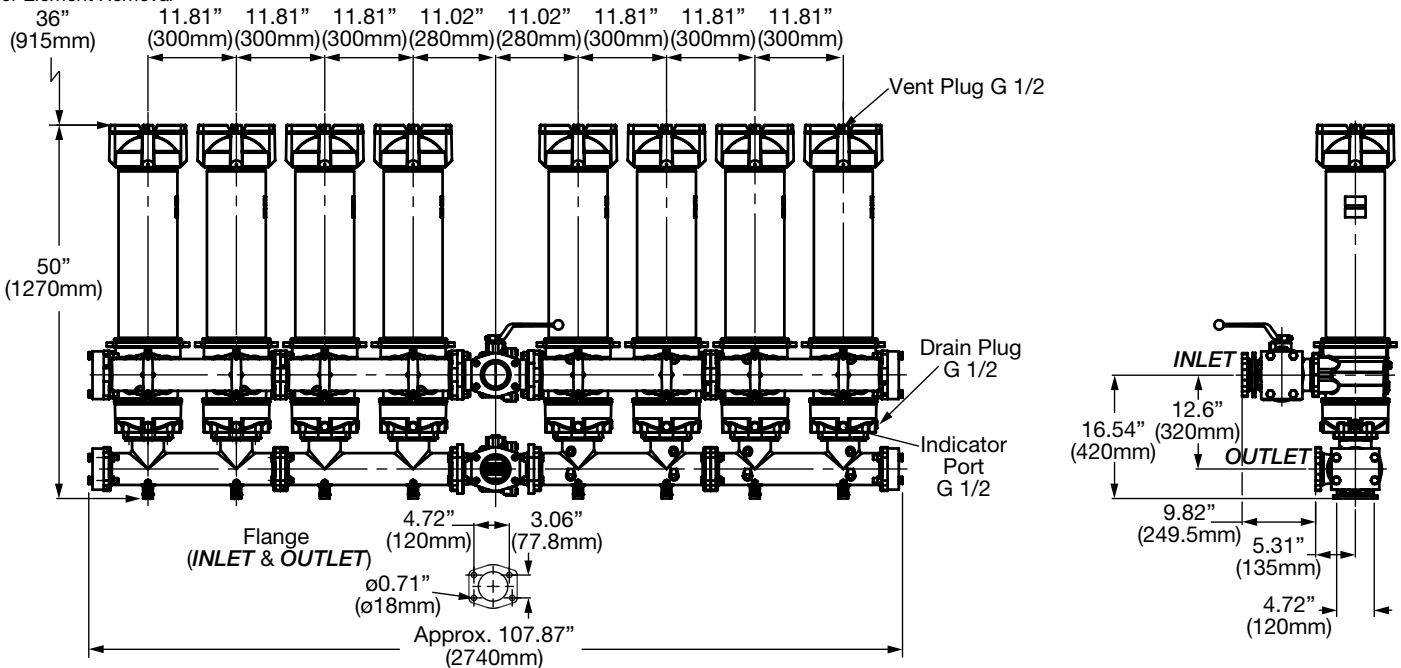
Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## NFD 7810 – 2.0 Version



## NFD 10410 – 2.0 Version

Clearance Required for Element Removal



Size	7810 Version 2.0	10410 Version 2.0
Weight (lbs.)	863	1125

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

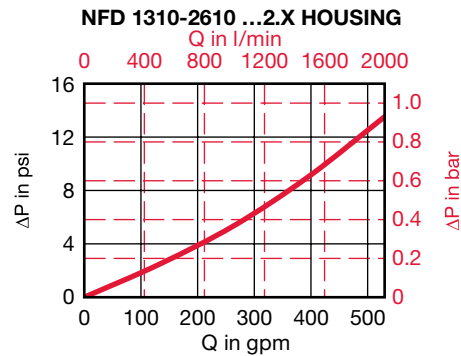
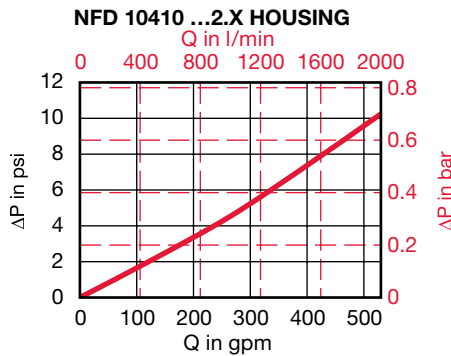
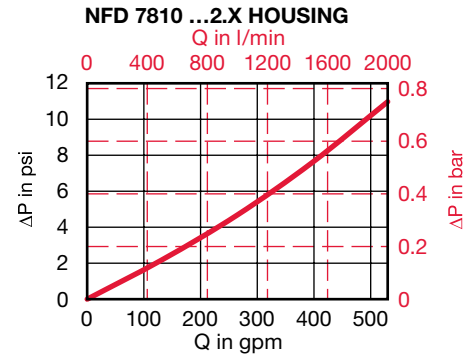
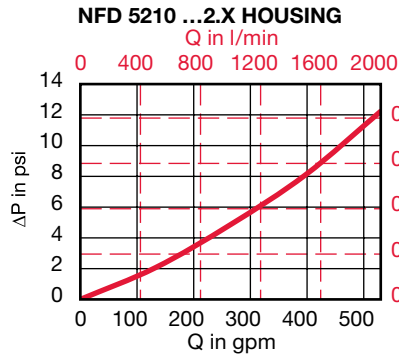
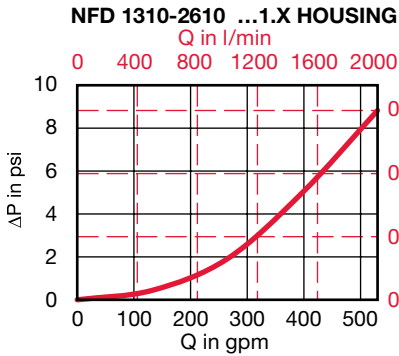
$$\text{Assembly } \Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$$

### 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 section on page 19)



## Element K Factors

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

(From Tables Below)

Size	...R...BN4HC (Betamicon® Low Collapse)			
	3 μm	5 μm	10 μm	20 μm
1300	0.045	0.032	0.024	0.014
2600	0.023	0.016	0.011	0.007

Size	...R...ECO/N			
	3 μm	5 μm	10 μm	20 μm
1300	0.049	0.034	0.029	0.020
2600	0.024	0.017	0.014	0.010

Size	...R...BN/AM	
	3 μm	10 μm
1300	0.088	0.033
2600	0.052	0.019

Size	...R...AM
	40 μm
1300	0.048
2600	0.024

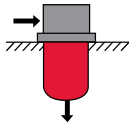
Size	...R...P/HC (Polyester)	
	10 μm	20 μm
1300	0.0070	0.0070
2600	0.0034	0.0034

Size	...R...W/HC (Wire Screen)
	25, 50, 100, 200 μm
1300	0.0027
2600	0.0011

All Element K Factors in psi / gpm.

## RFM Series In-Tank Return Line Filters

145 psi • up to 224 gpm



### Features

- The compact and lightweight design make RFM filters especially suitable for mobile applications.
- RFM filters are constructed of polyamide plastic housing and lid.
- RFM 90/150/210/270 drop replacement for “Tank Topper” filters.
- Aluminum alloy is water tolerant - anodization is not required for water based fluids (HWBF).
- The filter bowl on models 75 - 270 also serves as a contamination basket - removed to change element.
- Models 330, 500, 661, and 851 have filter elements equipped with separate, reusable contamination baskets.
- Cavities for clogging indicators are standard.



- Sizes 75/90/150/165/185 available with 4- or 2-bolt tank flange.

### Applications



Agricultural

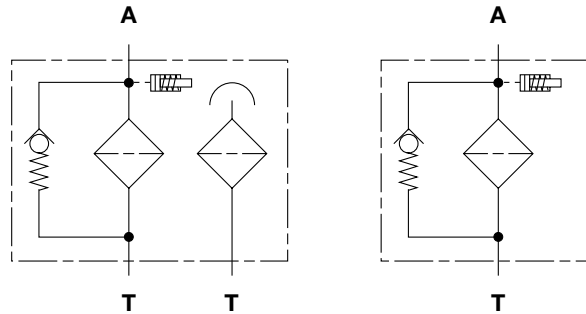


Automotive



Construction

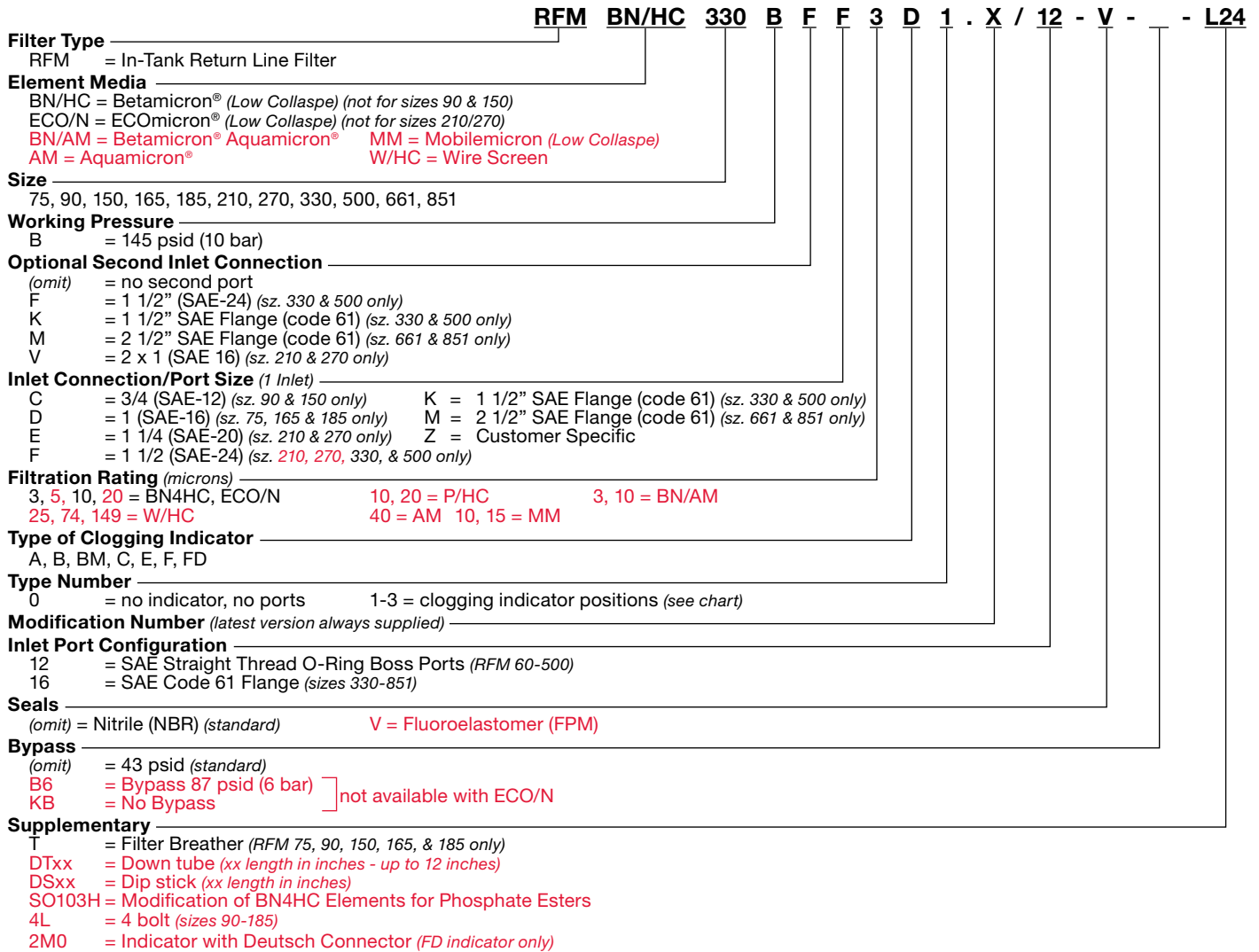
### Hydraulic Symbol



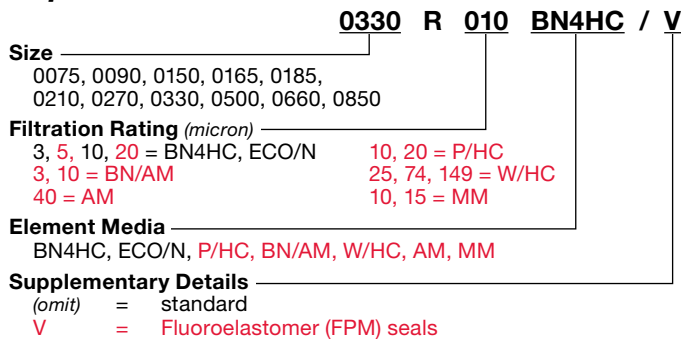
### Technical Details

<b>Mounting Method</b>			
75/90/150/165/185	2 mounting holes - filter housing		
75/90/150/165/185/210/270/ 330/500/661/851	4 mounting holes - filter housing		
<b>Port Connections</b> Inlet / Outlet			
90/150	SAE-12 / 1"		
75/165/185	SAE-16 / 1.26" Smooth Port		
210/270	SAE-20 / Open Bottom		
330/500	SAE-24 / 2" NPT		
	1 1/2" SAE Flange, Code 61 / 2" NPT		
661/851	2 1/2" SAE Flange, Code 61 / G 2 1/2" BSPP		
<b>Direction of Flow</b> Side inlet and bottom outlet.			
<b>Mat. of Construc.</b>			
	Head	Bowl	Lid
90/150/75/165/185	Aluminum	Plastic	Plastic
210/270	Aluminum	Steel	Plastic
330/500/661/851	Aluminum	Plastic	Aluminum
<b>Flow Capacity</b>			
75	20 gpm (75 lpm)		
90	24 gpm (90 lpm)		
150	40 gpm (150 lpm)		
165	43 gpm (165 lpm)		
185	49 gpm (185 lpm)		
210	55 gpm (210 lpm)		
270	71 gpm (270 lpm)		
330	87 gpm (330 lpm)		
500	132 gpm (500 lpm)		
661	174 gpm (660 lpm)		
851	225 gpm (850 lpm)		
<b>Housing Pressure Rating</b>			
Max. Oper. Press:	145 psi (10 bar)		
Proof Pressure:	218 psi (15 bar)		
Fatigue Pressure:	145 psi (10 bar) @ 1 million cycles		
Burst Pressure:	60-500	>580 psi (40 bar)	
	660/851	536 psi (37 bar)	
<b>Element Collapse Pressure Rating</b>			
BN/HC, W/HC	290 psid (20 bar)		
ECO/N, BN/AM, P/HC, AM	145 psid (10 bar)		
V	3045 psid (210 bar)		
<b>Fluid Temperature Range</b> -22° to 250°F (-30° to 121°C)			
<b>Fluid Compatibility</b>			
Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.			
<b>Indicator Trip Pressure</b>			
P = 29 psi (2 bar) -10% (standard)			
P = 72 psi (5 bar) -10% (optional)			
<b>Bypass Valve Cracking Pressure</b>			
ΔP = 43 psid (3 bar) +10% (standard)			
ΔP = 87 psid (6 bar) +10% (optional)			

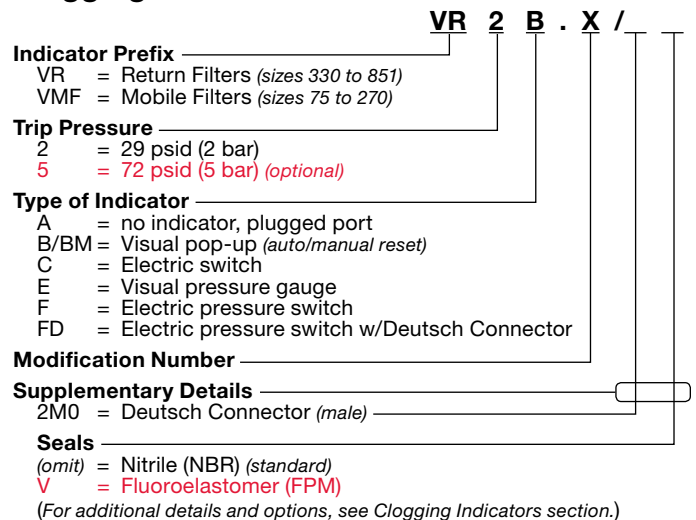
## Model Code



## Replacement Element Model Code



## Clogging Indicator Model Code

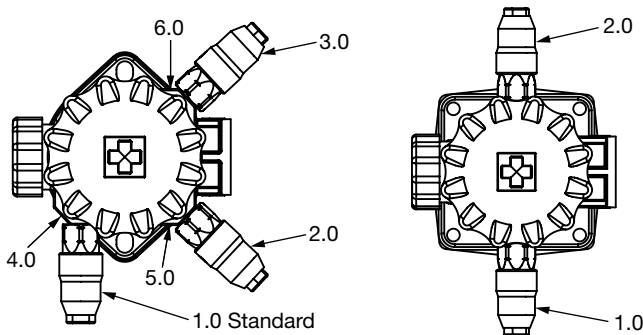


Model Codes Containing RED are non-stock items — Minimum quantities may apply — Contact HYDAC for information and availability

## Clogging Indicator Locations

### RFM 75/165/185

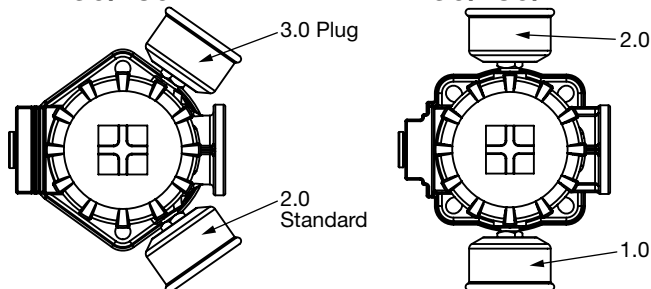
### RFM 75/165/185/-4L



Type No.	Location of Clogging Indicator	Indicator Model
1.X	Clogging Indicator left back 90° to Inlet	VMF...
2.X	Clogging Indicator left front 45° to Inlet	VMF...
3.X	Clogging Indicator right front 45° to Inlet	VMF...
4.X	Clogging Indicator left back 135° to Inlet	VMF...
5.X	Clogging Indicator left front 90° to Inlet	VMF...
6.X	Clogging Indicator right front 90° to Inlet	VMF...

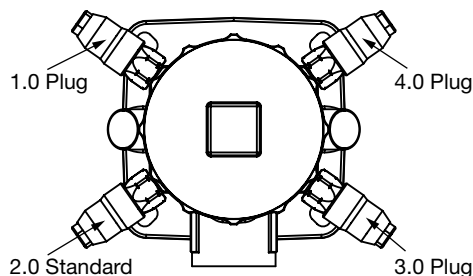
### RFM 90/150

### RFM 90/150/-4L



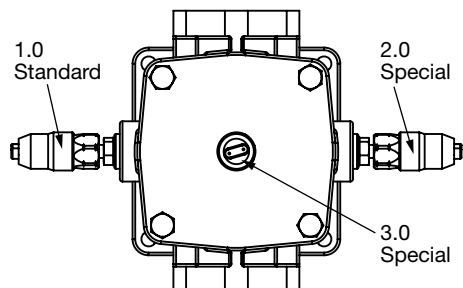
Type No.	Location of Clogging Indicator	Indicator Model
2.X	Clogging Indicator left front 45° to Inlet	VMF...
3.X	Clogging Indicator right front 45° to Inlet	VMF...

### RFM 210/270



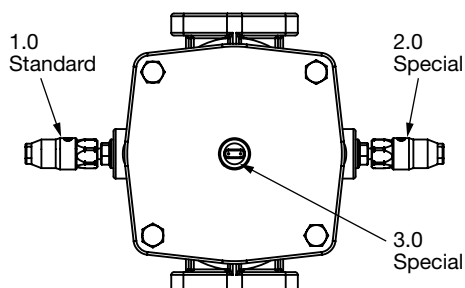
Type No.	Location of Clogging Indicator	Indicator Model
1.X	Clogging Indicator left back 45° to Inlet	VMF...
2.X	Clogging Indicator left front 45° to Inlet	VMF...
3.X	Clogging Indicator right front 45° to Inlet	VMF...
4.X	Clogging Indicator right back 45° to Inlet	VMF...

### RFM 330/500



Type No.	Location of Clogging Indicator	Indicator Model
1.X	Clogging Indicator left 90° to Inlet	VR...
2.X	Clogging Indicator right 90° to Inlet	VR...
3.X	Clogging Indicator on Top	VR...

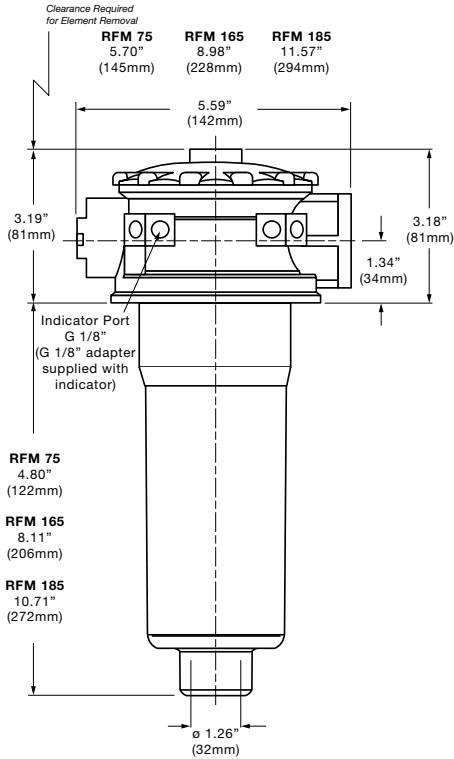
### RFM 661/851



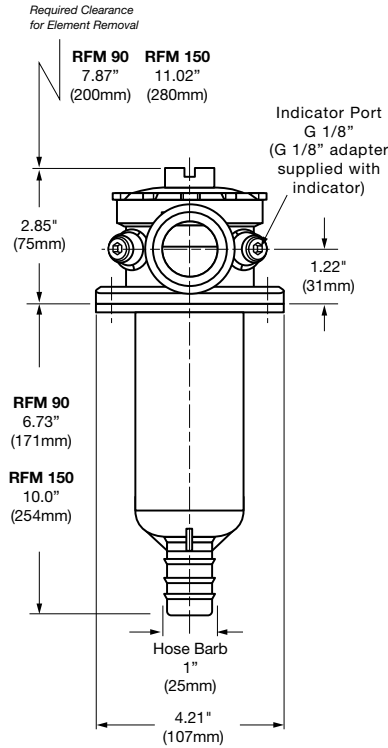
Type No.	Location of Clogging Indicator	Indicator Model
1.X	Clogging Indicator left 90° to Inlet	VR...
2.X	Clogging Indicator right 90° to Inlet	VR...
3.X	Clogging Indicator on Top	VR...

## Dimensions

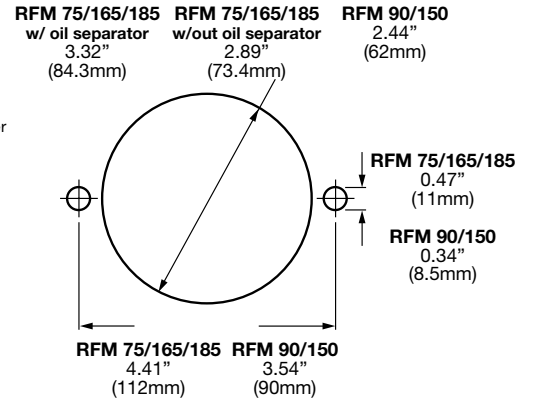
### RFM 75/165/185



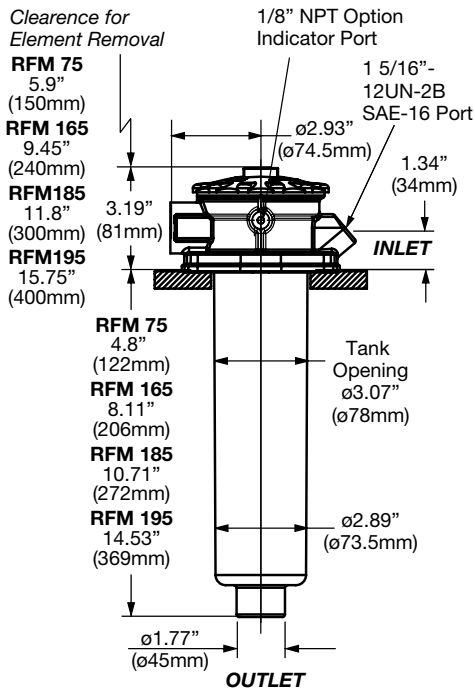
### RFM 90/150



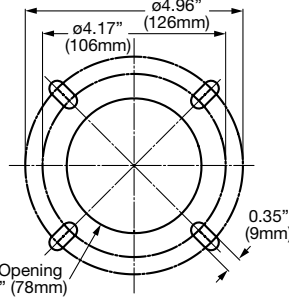
## Mounting Pattern



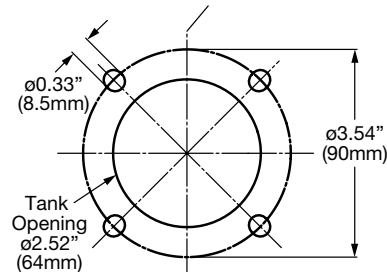
### RFM 75/165/185/-4L



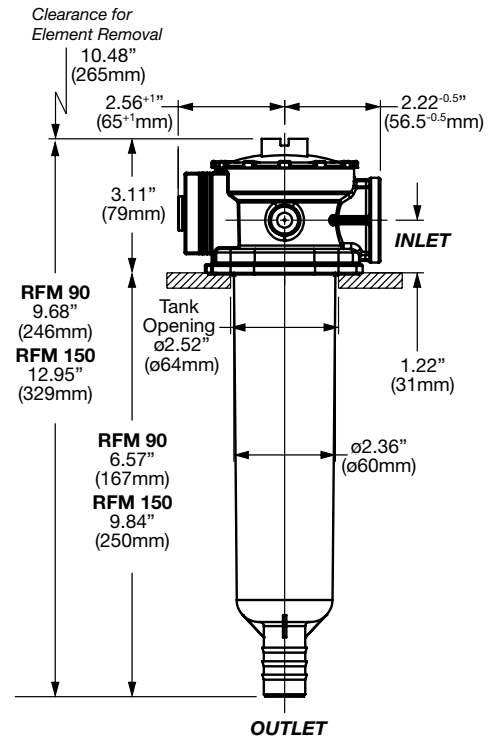
## Mounting Pattern RFM 75/165/185/-4L



## Mounting Pattern RFM 90/150/-4L



### RFM 90/150/-4L

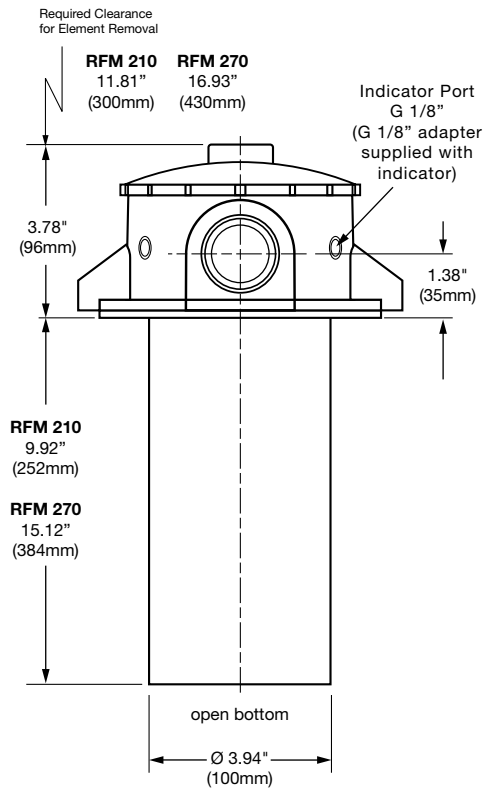


Size	75	90	150	165	185	210	270	330	500	661	851
Weight (lbs.)	1.3	0.9	1.0	1.5	1.6	6.8	7.9	6.8	7.3	13.2	14.2

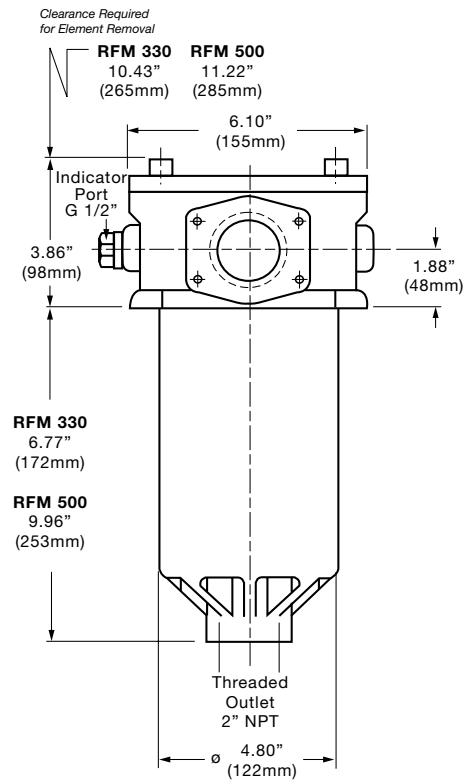
Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.



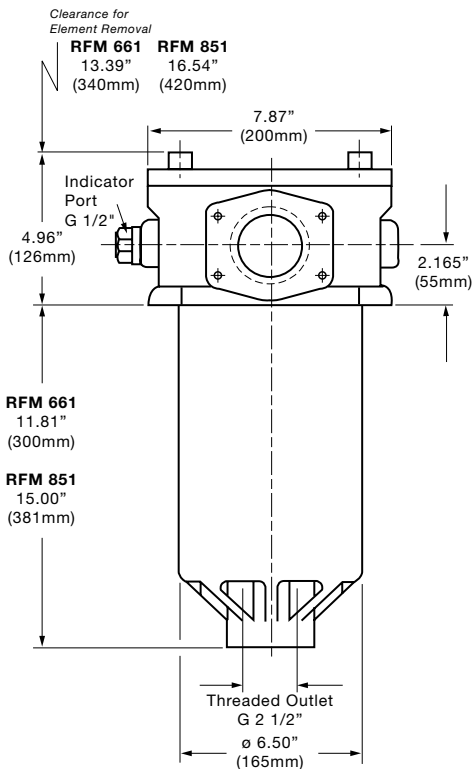
## Dimensions RFM 210/270



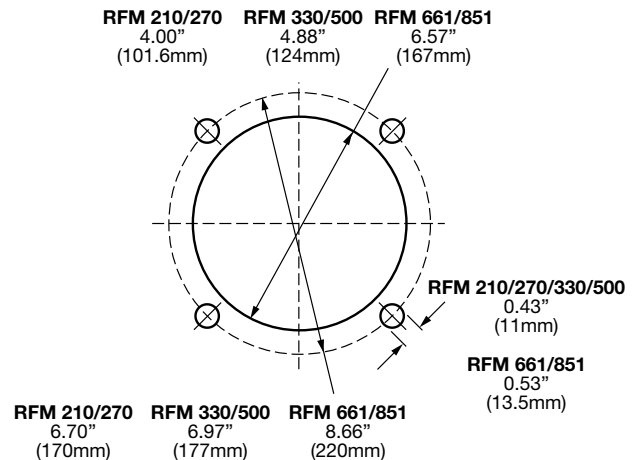
## RFM 330/500



## RFM 661/851



## Mounting Pattern



Size	75	90	150	165	185	210	270	330	500	661	851
Weight (lbs.)	1.3	0.9	1.0	1.5	1.6	6.8	7.9	6.8	7.3	13.2	14.3

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$

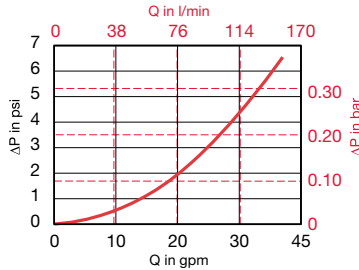
### Housing Curve:

Pressure loss through housing is as follows:

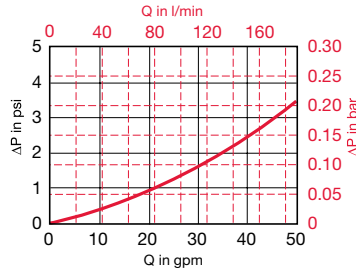
Housing  $\Delta P$  = Housing Curve  $\Delta P$  x  $\frac{\text{Actual Specific Gravity}}{0.86}$

Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see sizing section on page 19)

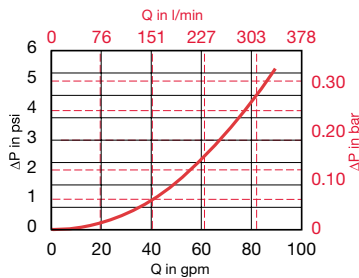
**RFM 90/150 & RFM 90/150/-4L Housing**



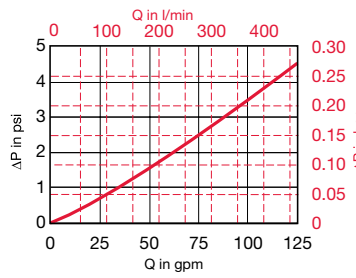
**RFM 75/165/185 & RFM 75/165/185/-4L Housing**



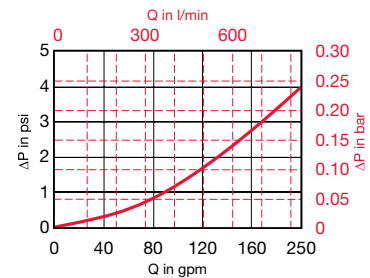
**RFM 210 / 270 Housing**



**RFM 330/500 Housing**



**RFM 661/851 Housing**



## Element K Factors

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

Size	...R...BN4HC (Betamicon® Low Collapse)			
	3 $\mu\text{m}$	5 $\mu\text{m}$	10 $\mu\text{m}$	20 $\mu\text{m}$
0075	1.209	0.780	0.445	0.241
0165	0.616	0.430	0.245	0.133
0185	0.485	0.334	0.179	0.097
0210	0.214	0.145	0.096	0.060
0270	0.138	0.094	0.062	0.039
0330	0.232	0.150	0.093	0.066
0500	0.162	0.104	0.069	0.044
0660	0.105	0.066	0.042	0.029
0850	0.082	0.055	0.036	0.023

Size	...R...MM	
	10 $\mu\text{m}$	15 $\mu\text{m}$
0075	0.265	0.166
0090	0.252	0.118
0150	0.114	0.071
0165	0.146	0.091
0185	0.108	0.067
0210	0.052	0.032
0270	0.032	0.020
0330	0.078	0.049
0500	0.052	0.032
0660	0.030	0.019
0850	0.023	0.015

Size	...R...ECO/N (ECOmicron®)			
	3 $\mu\text{m}$	5 $\mu\text{m}$	10 $\mu\text{m}$	20 $\mu\text{m}$
0090	0.515	0.343	0.464	0.317
0150	0.467	0.319	0.277	0.189
0165	0.674	0.369	0.321	0.220
0185	0.303	0.207	0.272	0.162
0330	0.228	0.156	0.135	-
0660	0.100	0.068	0.059	0.041
0850	0.078	0.053	0.046	0.032

Size	...R...W/HC (Wire Screen)
	25, 50, 74, 100, 149, 200 $\mu\text{m}$
0075	0.043
0165	0.020
0330	0.010
0500	0.007
0660	0.005
0850	0.004

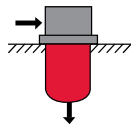
Size	...R...P/HC (Paper)
	10, 20 $\mu\text{m}$
0075	0.156
0110	0.128
0165	0.086
0330	0.037
0500	0.024
0660	0.016
0850	0.012

Size	...R...AM
	040A
0330	0.216
0500	0.138
0660	0.095
0850	0.074

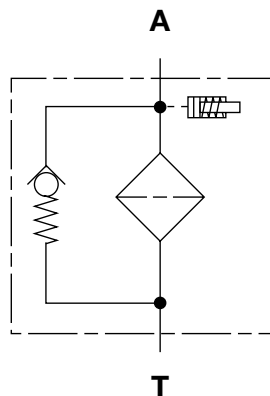
Size	...R...BN/AM	
	3 $\mu\text{m}$	10 $\mu\text{m}$
0330	0.477	0.164
0660	0.192	0.066

All Element K Factors in psi / gpm.

## RFMP Series In-Tank Return Line Filters 100 psi • up to 26 gpm



### Hydraulic Symbol



### Features

- The compact and lightweight design make RFMP filters especially suitable for mobile applications.
- RFMP filters integrate the head and bowl into a single one piece polyamide housing. This makes for a more leak-tight housing.
- The housing is designed so that a down tube can be attached to the outlet spout.

### Applications



Agricultural

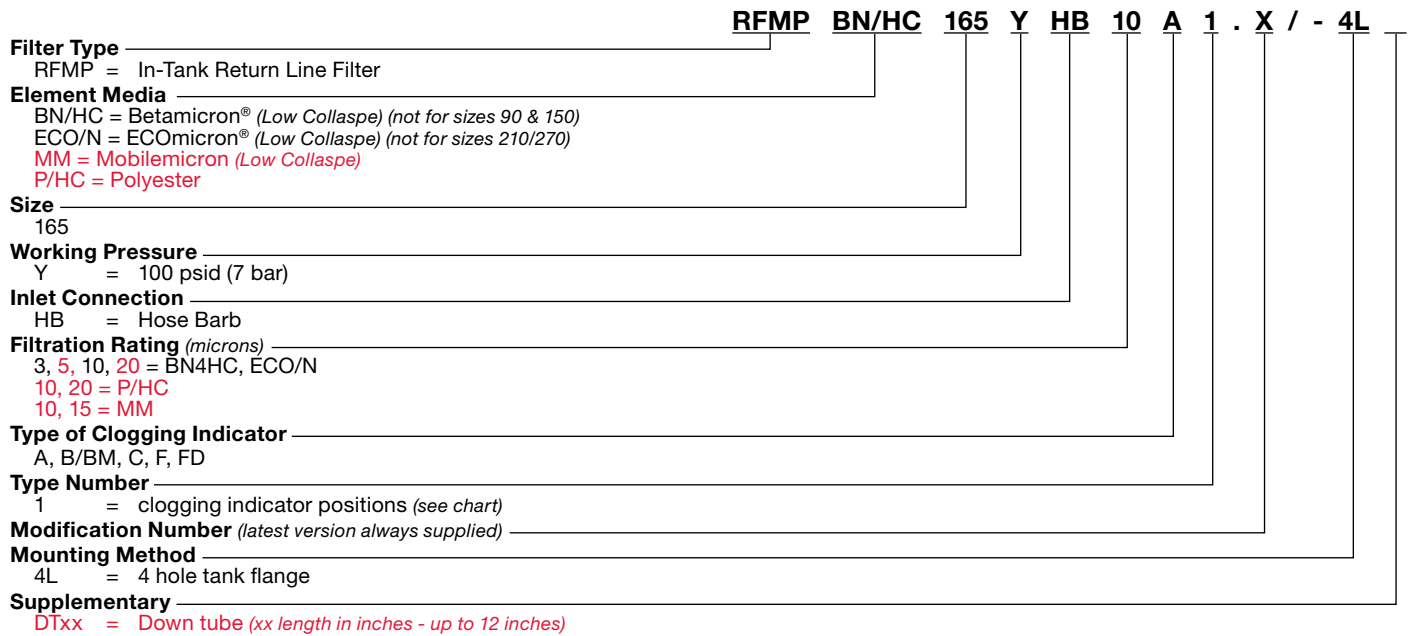


Construction

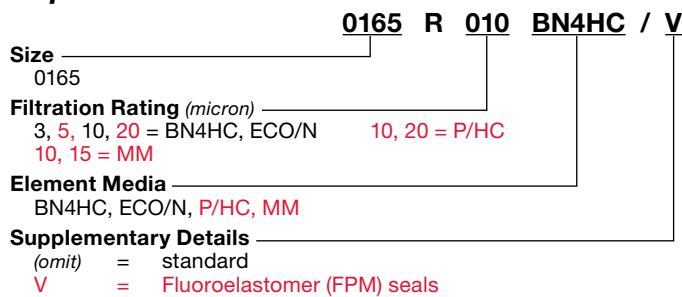
### Technical Details

<b>Mounting Method</b>	
165	4 mounting holes - filter housing
<b>Port Connections</b>	
Inlet / Outlet	
165	1" Hose Barb / 1.26" smooth port
<b>Direction of Flow</b>	
Side inlet and bottom outlet.	
<b>Mat. of Construc.</b>	
Housing	Lid
165	Plastic Plastic
<b>Flow Capacity</b>	
165	26 gpm (100 lpm)
<b>Housing Pressure Rating</b>	
Max. Oper. Press: 100 psi (7 bar)	
<b>Element Collapse Pressure Rating</b>	
BN/HC	290 psid (20 bar)
ECO/N, P/HC, MM	145 psid (10 bar)
<b>Fluid Temperature Range</b>	
-22° to 212°F (-30° to 100°C)	
<b>Fluid Compatability</b>	
Compatible with all petroleum oils and synthetic fluids rated for use with NBR seals.	
<b>Indicator Trip Pressure</b>	
P = 29 psi (2 bar) -10% (standard)	
<b>Bypass Valve Cracking Pressure</b>	
ΔP = 43 psid (3 bar) +10% (standard)	

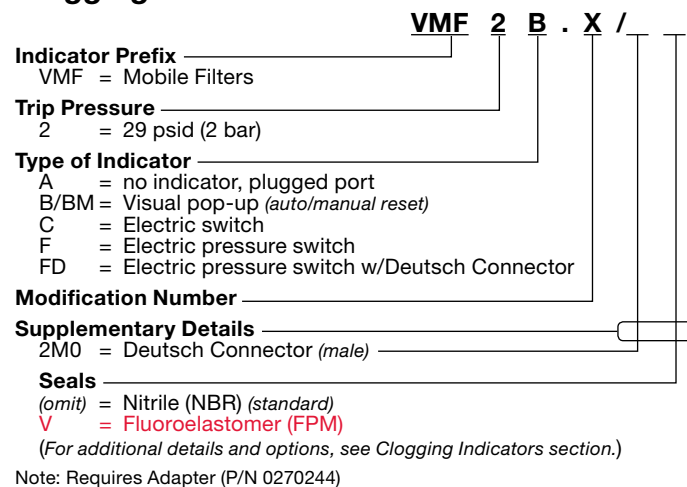
## Model Code



## Replacement Element Model Code

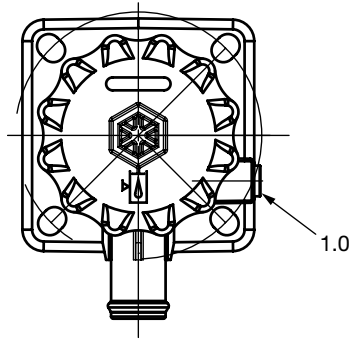


## Clogging Indicator Model Code



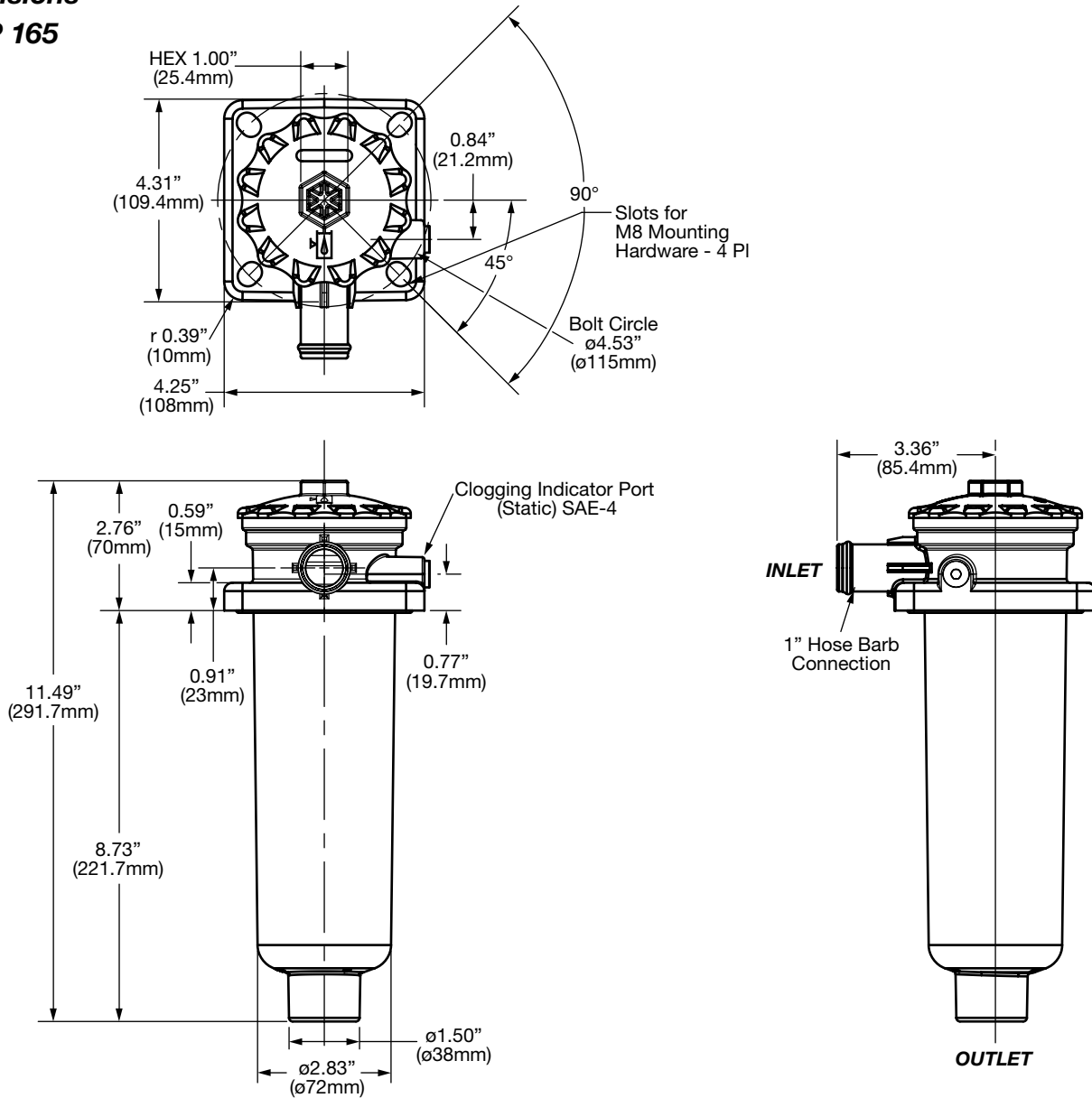
Model Codes Containing RED are non-stock items — Minimum quantities may apply — Contact HYDAC for information and availability

## Clogging Indicator Location



Type No.	Location of Clogging Indicator	Indicator Model
1.X	Clogging Indicator right front with adapter 90° to Inlet	VMF...

## Dimensions RFMP 165



Size	165
Weight (lbs.)	1.7

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

$$\text{Assembly } \Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$$

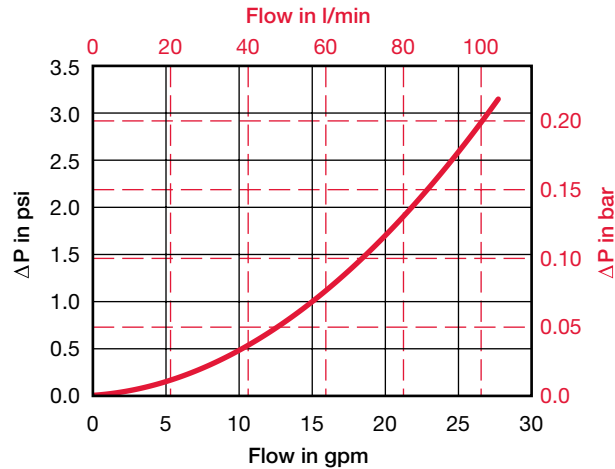
### Housing Curve:

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 section on page 19)

## RFMP 165 Housing



## Element K Factors

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

(From Tables Below)

Size	...R...BN4HC (Betamicon® Low Collapse)			
	3 μm	5 μm	10 μm	20 μm
0165	0.616	0.430	0.245	0.133

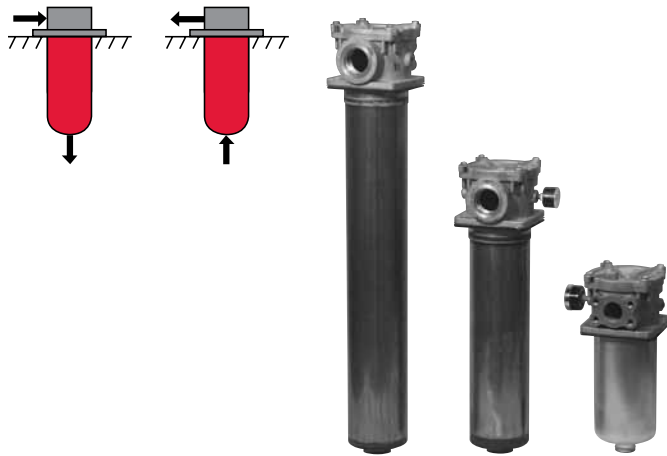
Size	...R...MM	
	10 μm	15 μm
0165	0.146	0.091

Size	...R...ECO/N (ECOmicron®)			
	3 μm	5 μm	10 μm	20 μm
0165	0.674	0.369	0.321	0.220

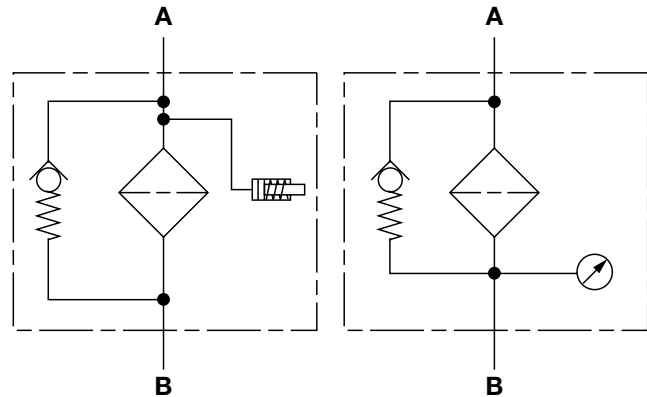
Size	...R...P/HC (Paper)
	10, 20 μm
0165	0.086

All Element K Factors in psi / gpm.

## HF4R(S) Series In-Tank Return Line / Suction Filters 100 psi • up to 120 gpm



### Hydraulic Symbol



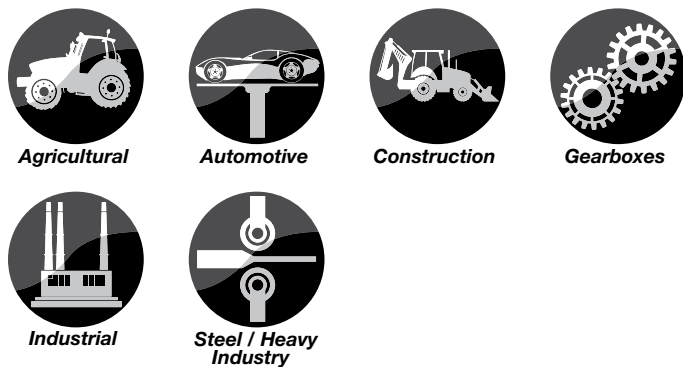
### Features

- 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, and NPT ports to allow easy installation without costly adapters.
- O-ring seals are used to provide positive, reliable sealing. Choice of Nitrile, Fluoroelastomer or EPDM O-ring material provides compatibility with petroleum oils, synthetic fluids, water-glycols, oil/water emulsions, and water base 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.
- 9" filters include 1 1/2" hose barb outlet.
- 18" and 27" filters include 1 1/2" threaded NPT outlet.

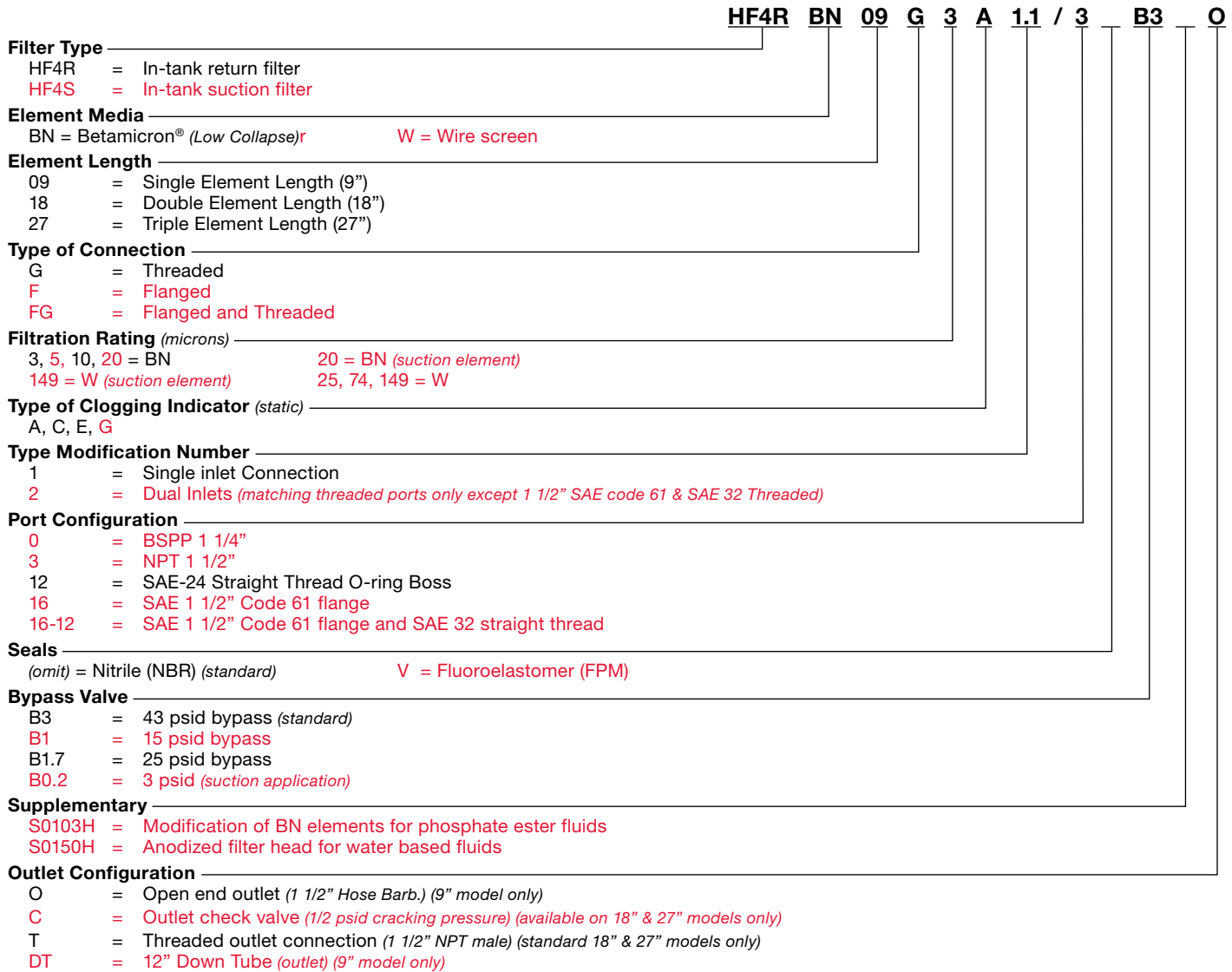
### Technical Details

<b>Mounting Method</b>	4 mounting holes - filter housing	
<b>Port Connection</b>		
Inlet	SAE-24, 1 1/2" NPT, 1 1/4" BSPP, 1 1/2" Flange, Code 61	
Outlet		
HF4R09	1 1/2" Hose Barb	
HF4R18/27	1 1/2" NPT male	
<b>Flow Direction</b>	Inlet	Outlet
HF4R	Side	Bottom
HF4S	Bottom	Side
<b>Construction Materials</b>		
Head, Lid	Aluminum	
Bowl	Steel	
<b>Flow Capacity</b>		
HF4R09	50 gpm (189 lpm)	
HF4R18	100 gpm (378 lpm)	
HF4R27	120 gpm (454 lpm)	
<b>Housing Pressure Rating</b>		
Max. Operating Pressure	100 psi (7 bar)	
Proof Pressure	150 psi (10.3 bar)	
Fatigue Pressure	Contact HYDAC	
Burst Pressure	Contact HYDAC	
<b>Element Collapse Pressure Rating</b>		
BN, W, P/HC	150 psid (10 bar)	
Fluid Temperature Range	-22° to 250°F (-30° to 121°C)	
<b>Fluid Compatibility</b>		
Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.		
<b>Indicator Trip Pressure</b>		
P = 1 psi (0.08 bar) -10%	P = 20 psi (1.4 bar) -10%	
P = 10 psi (0.8 bar) -10%	P = 29 psi (2 bar) -10%	
<b>Bypass Valve Cracking Pressure</b>		
ΔP = 3 psid (0.2 bar) +10%	ΔP = 25 psid (1.7 bar) +10%	
ΔP = 15 psid (1 bar) +10%	ΔP = 43 psid (3 bar) +10%	

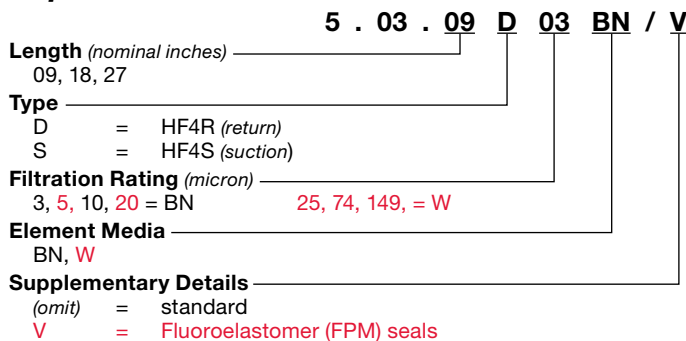
### Applications



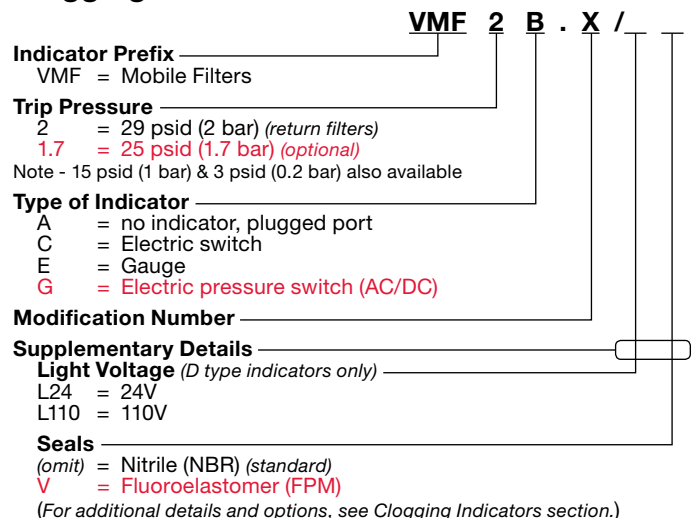
## Model Code



## Replacement Element Model Code



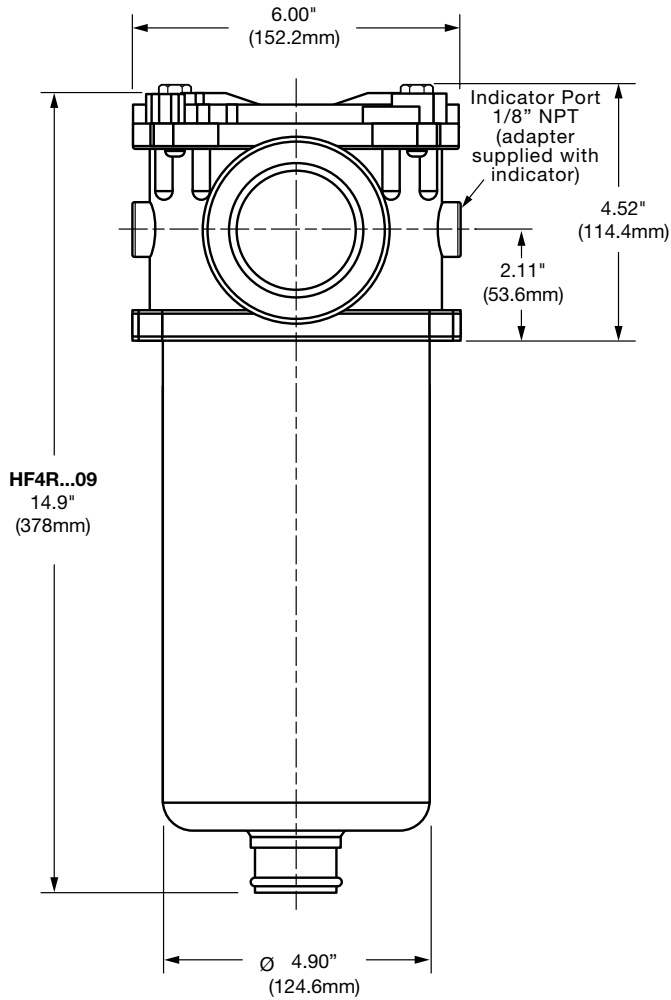
## Clogging Indicator Model Code



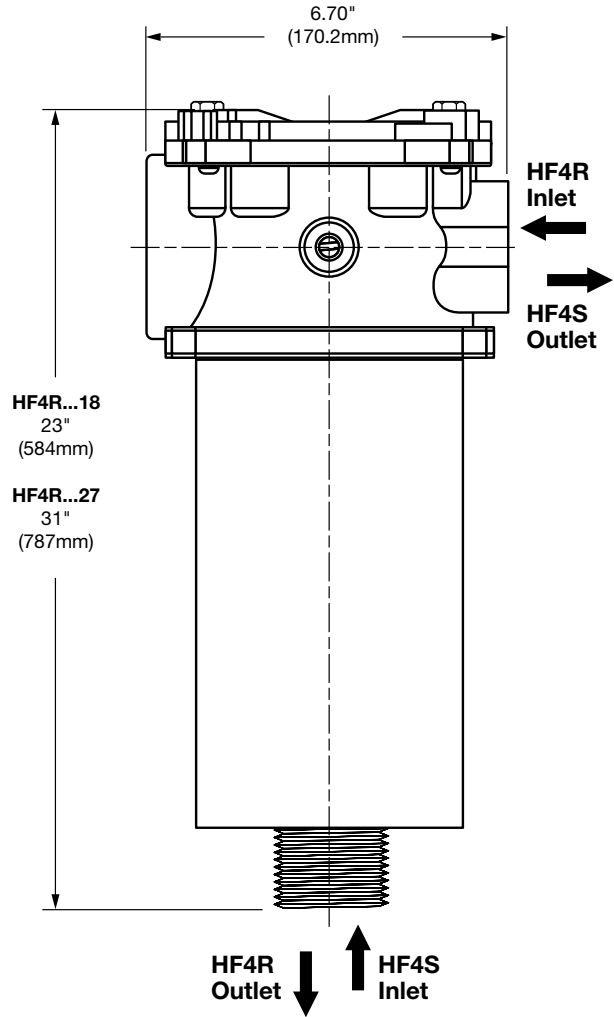
Model Codes Containing RED are non-stock items — Minimum quantities may apply – Contact HYDAC for information and availability



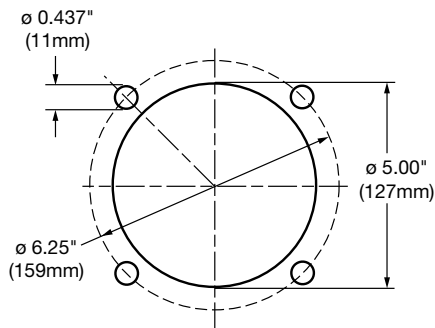
## Dimensions HF4R...09



## HF4R...18 / 27



## Mounting Pattern



Size	09	18	27
Weight (lbs.)	10.0	14.5	18.6

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

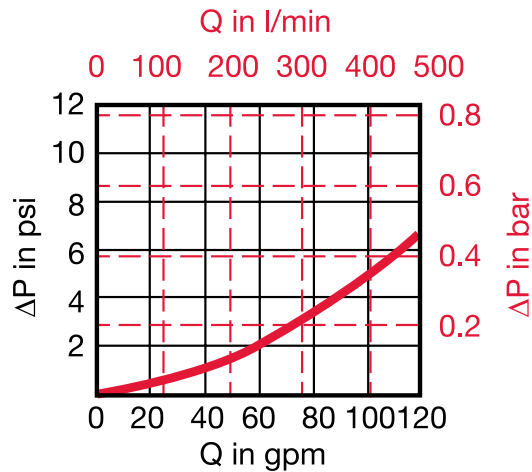
$$\text{Assembly } \Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$$

### 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 section on page 19)



## Element K Factors

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

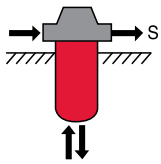
(From Tables Below)

Size	5.03.XXDBN			
	3 μm	5 μm	10 μm	20 μm
09	0.1680	0.1405	0.0788	0.0443
18	0.0800	0.0669	0.0375	0.0211
27	0.0517	0.0432	0.0242	0.0136

Size	5.03.XXD W/HC
	25, 50, 74, 100, 149, 200 μm
09	0.007
18	0.004
27	0.002

All Element K Factors in psi / gpm.

## RKM Series Multi-functional Filters 145 psi • up to 210 gpm



### Features

- RKM is a combination open loop return and closed loop suction boost filter in one housing.
- The return line flow of the operating hydraulics is fed to the filter via port A (inlet) and is cleaned by the filter element (full flow return line filtration). A pressure (standard = 7psi) is applied by the back-pressure valve V1. This insures that the filtered, precharged return line flow is available to the hydrostatic feed pump via ports B (full flow suction boost filtration). Excess fluid drained via the back-pressure valve to the tank (port T).
- A bypass valve V2 (standard = 36 psi) is incorporated to relieve excessive back-pressures in the element (important on cold starts). Flow from the tank can be drawn via the anti-cavitation valve to the suction side for a short time (emergency function).
- Full flow finest filtration (10 µm, 15 µm absolute) of return line and hydrostatic feed pump which extends the service life of your components.
- Outstanding cold start characteristics due to precharge via back pressure valve (standard = 7 psi).
- Due to the advanced RKM element technology and specially developed bypass valves, the lowest back-pressures can be achieved across the filter even at very low temperatures.
- One tank cutout for up to 6 suction and 3 return lines.
- Aluminum alloy is water tolerant - anodization is not required for water based fluids (HWBF).

### Applications

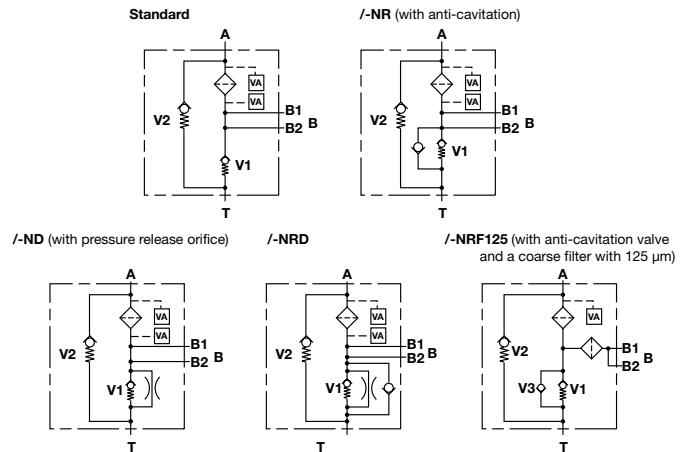


Agricultural



Construction

### Hydraulic Symbol



### Technical Details

<b>Mounting Method</b>	100 201 - 800	2 mounting holes 4 mounting holes
<b>Port Connection</b>	Inlet / Outlet	
100	SAE-12 or 16 / SAE-12 or 16	
201/251	SAE-20 / 2 x SAE-16	
300	1 1/2" CS, Code 61-Split Flange (SF) / 2 x 1 1/4" CS, Code 61-(SF)	
350	SAE-16 Suction / SAE-24 Return	
400/800	2 1/2" SAE Flange, Code 61 / Various	
<b>Flow Direction</b>	Inlet: Side	Outlet: Side & bottom
<b>Construction Materials</b>		
Head	Aluminum	
Housing	Steel (100/201/251/350/400/800) Plastic (300)	
Lid	Plastic (100/201/251/350) Alum. (300/400/800)	
<b>Flow Capacity</b>		
100	26 gpm (100 lpm)	
201	52 gpm (200 lpm)	
251	66 gpm (250 lpm)	
300	79 gpm (300 lpm)	
350	92 gpm (350 lpm)	
400	105 gpm (400 lpm)	
800	211 gpm (800 lpm)	
<b>Housing Pressure Rating</b>		
Max. Oper. Press.	145 psi (10 bar)	
Proof Pressure	218 psi (15 bar)	
Fatigue Pressure	Contact HYDAC	
Burst Pressure	Contact HYDAC	
<b>Element Collapse Pressure Rating</b>		
MM	145 psid (10 bar)	
<b>Fluid Temp. Range</b> -22° to 250°F (-30° to 121°C)		
<b>Fluid Compatibility</b>		
Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.		
<b>Indicator Trip Pressure</b>		
P = 29 psi (2 bar) -10% (standard)		
P = 72 psi (5 bar) -10% (optional)		
<b>Bypass Valve Cracking Pressure</b>		
ΔP = 36 psid (2.5 bar) +10% (standard)		
ΔP = 87 psid (6 bar) +10% (optional)		
<b>Back Pressure Valve Cracking Pressure</b>		
ΔP = 7 psid (0.5 bar) +10% (standard)		
ΔP = 43 psid (3 bar) +10% (optional)		

## Model Code

**RKM MM 300 B T F 10 A 0 . X / 12-NR**

**Filter Type** \_\_\_\_\_  
RKM = Low pressure multifunction

**Element Media** \_\_\_\_\_  
MM = Mobilemicon® (Low Collaspe)

**Size** \_\_\_\_\_  
100, 201, 251, 300, 350, 400, 800

**Operating Pressure** \_\_\_\_\_  
B = 145 psi

**Type of Port / Size of Suction Line Port** \_\_\_\_\_  
T = 2x CS 1 1/4" Code 61 Split Flange (size 300 only)    Y = 1x SAE-12 (size 100 only)  
V = 2x SAE-16 (sizes 201 & 251 only)    Z = According to customer specification  
X = 1x SAE-16 (size 100 & 350 only)

**Type of Port / Size of Return Line Port** \_\_\_\_\_  
C = SAE-12 (size 100 only)    F = CS 1 1/2" (Code 61) (size 300 only)  
D = SAE-16 (size 100 only)    G = SAE-24 (size 350 only)  
E = SAE-20 (sizes 201 & 251 only)    Z = According to customer specification

For Sizes 400/800, see below. Other port sizes on request.

**Filtration Rating (microns)** \_\_\_\_\_  
10, 15 = MM

**Type of Clogging Indicator** \_\_\_\_\_  
A, E, F

**Type Code** \_\_\_\_\_  
0 = no indicator    1-8 = see Clogging Indicator Locations (next page)

**Modification Number (the latest version is always supplied)** \_\_\_\_\_

**Supplementary Details** \_\_\_\_\_  
(omit) = standard (without anti-cavitation valve; seals in NBR, bypass valve 2.5 bar, back-pressure valve 0.5 bar)  
12 = SAE O-Ring Boss Ports  
NR = with anti-cavitation valve  
ND = with pressure release orifice  
NRD = with anti-cavitation valve and with pressure release valve  
NRF125 = with anti-cavitation valve and coarse filter strainer 125µm  
UT = suitable for use when submersed in oil  
V = Fluoroelastomer (FPM)  
MP4 = RKM Multi-port 2x SAE-16 + 1x SAE-20 Return Ports, 2x SAE-Suction Ports

## Replacement Element Model Code

**0300 RK 010 MM / V**

**Size** \_\_\_\_\_  
0100, 0201, 0251, 0300,  
0350, 0400, 0800

**Type** \_\_\_\_\_  
RK

**Filtration Rating (micron)** \_\_\_\_\_  
10, 15 = MM

**Supplementary Details** \_\_\_\_\_  
(omit) = standard  
V = Fluoroelastomer (FPM) seals

## Clogging Indicator Model Code

**VMF 2 B . X /**

**Indicator Prefix** \_\_\_\_\_  
VMF = Mobile Filters  
VM = Differential pressure indicators (size 350)

**Trip Pressure** \_\_\_\_\_  
2 = 29 psid (2 bar) (return filters)  
1.7 = 25 psid (1.7 bar) (optional)  
Note: 15 psid (1 bar) & 3 psid (0.2 bar) also available

**Type of Indicator** \_\_\_\_\_  
A = no indicator, plugged port  
E = Pressure gauge  
F = Pressure switch

**Modification Number** \_\_\_\_\_

**Supplementary Details** \_\_\_\_\_  
**Seals**  
(omit) = Nitrile (NBR) (standard)  
V = Fluoroelastomer (FPM)  
(For additional details and options, see Clogging Indicators section.)

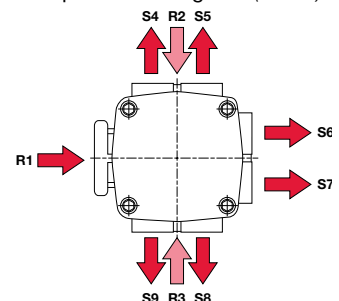
Model Codes Containing RED are non-stock items — Minimum quantities may apply – Contact HYDAC for information and availability

## Sizes 400/800

The identification of the port configuration is done by a nine digit code in the supplementary details. You determine the requested ports by entering an "X" for the required port in the individual cells of the table below, which has been illustrated with an example. Not configured (closed) ports are indicated by a "0". R = Return Line; S = Suction Line (Contact factory for availability).

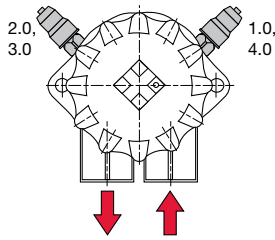
Position in Code	1	2	3	4	5	6	7	8	9
Port	R1	R2	R3	S4	S5	S6	S7	S8	S9
SAE 2"	1								
SAE 2 1/2"	2								
1"		1	1	A	A	1	1	A	A
1 1/4"		2	2	B	B	2	2	B	B
1 1/2"		3	3	C	C	3	3	C	C

Example according to the table above: **RKM BN/HC 400 BZZ 15 A 1.0 / -12-102CC2200**



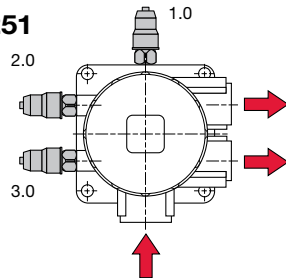
## Clogging Indicator Locations

### Size 100



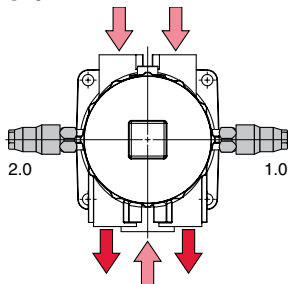
Type Code	Mounting Position of the Clogging Indicator	Type of Clogging Indicator	Measuring
1.0	on the filter inlet – right-hand side, bottom	return line	before the filter element
2.0	on the filter inlet – left-hand side, bottom	return line	before the filter element
3.0	on the filter outlet – right-hand side, top	vacuum	after the filter element
4.0	on the filter outlet – left-hand side, top	vacuum	after the filter element

### Size 201/251



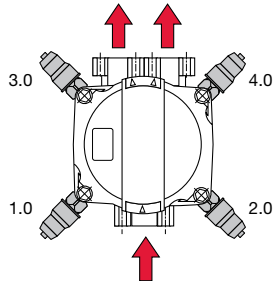
Type Code	Mounting Position of the Clogging Indicator	Type of Clogging Indicator	Measuring
1.0	on the filter inlet – opposite side	return line	before the filter element
2.0	on the filter inlet – left-hand side	return line	before the filter element
3.0	on the filter outlet – right-hand side	vacuum	after the filter element

### Size 201/251-MP1



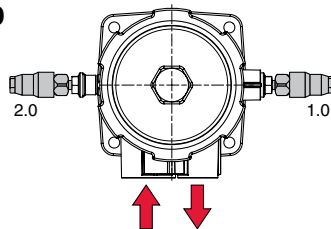
Type Code	Mounting Position of the Clogging Indicator	Type of Clogging Indicator	Measuring
1.0	on the filter outlet – right-hand side	return line	before the filter element
2.0	on the filter outlet – left-hand side	return line	before the filter element

### Size 300



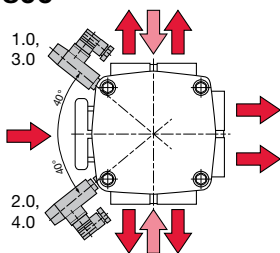
Type Code	Mounting Position of the Clogging Indicator	Type of Clogging Indicator	Measuring
1.0	on the filter inlet – left-hand side	return line	before the filter element
2.0	on the filter inlet – right-hand side	return line	before the filter element
3.0	on the filter outlet – left-hand side	vacuum	after the filter element
4.0	on the filter outlet – right-hand side	vacuum	after the filter element

### Size 350



Type Code	Mounting Position of the Clogging Indicator	Type of Clogging Indicator	Measuring
1.0	on the filter inlet – right-hand side	differential pressure	before and after element
2.0	on the filter inlet – left-hand side	return line	before and after element

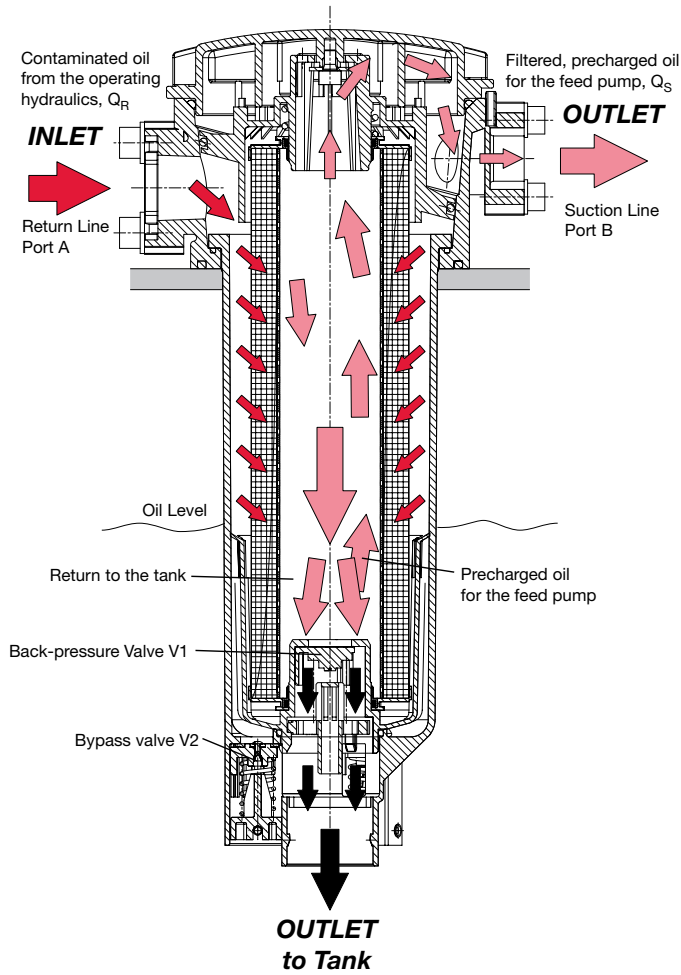
### Size 400 / 800



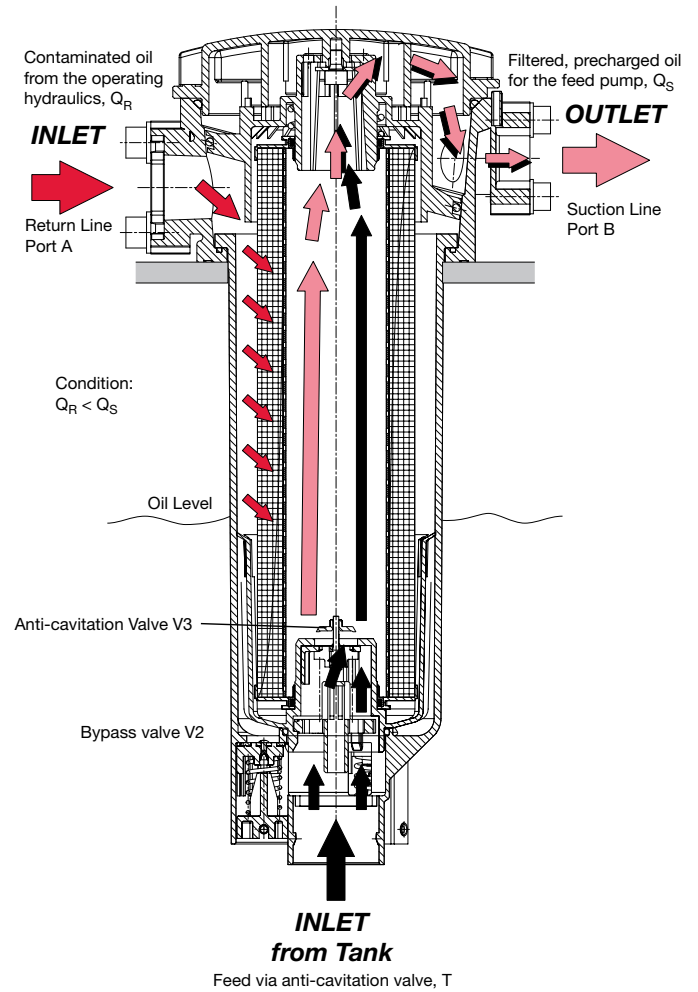
Type Code	Mounting Position of the Clogging Indicator	Type of Clogging Indicator	Measuring
1.0	on the filter inlet – left-hand side, bottom	return line	before the filter element
2.0	on the filter inlet – right-hand side, bottom	return line	before the filter element
3.0	on the filter inlet – left-hand side, top	vacuum	after the filter element
4.0	on the filter inlet – right-hand side, top	vacuum	after the filter element

For other configurations, please consult factory.

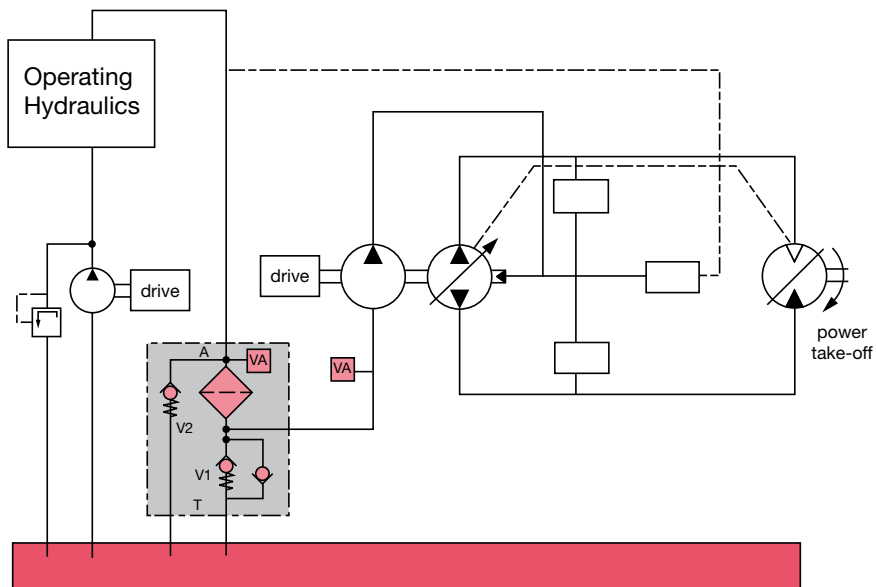
## Function Diagram



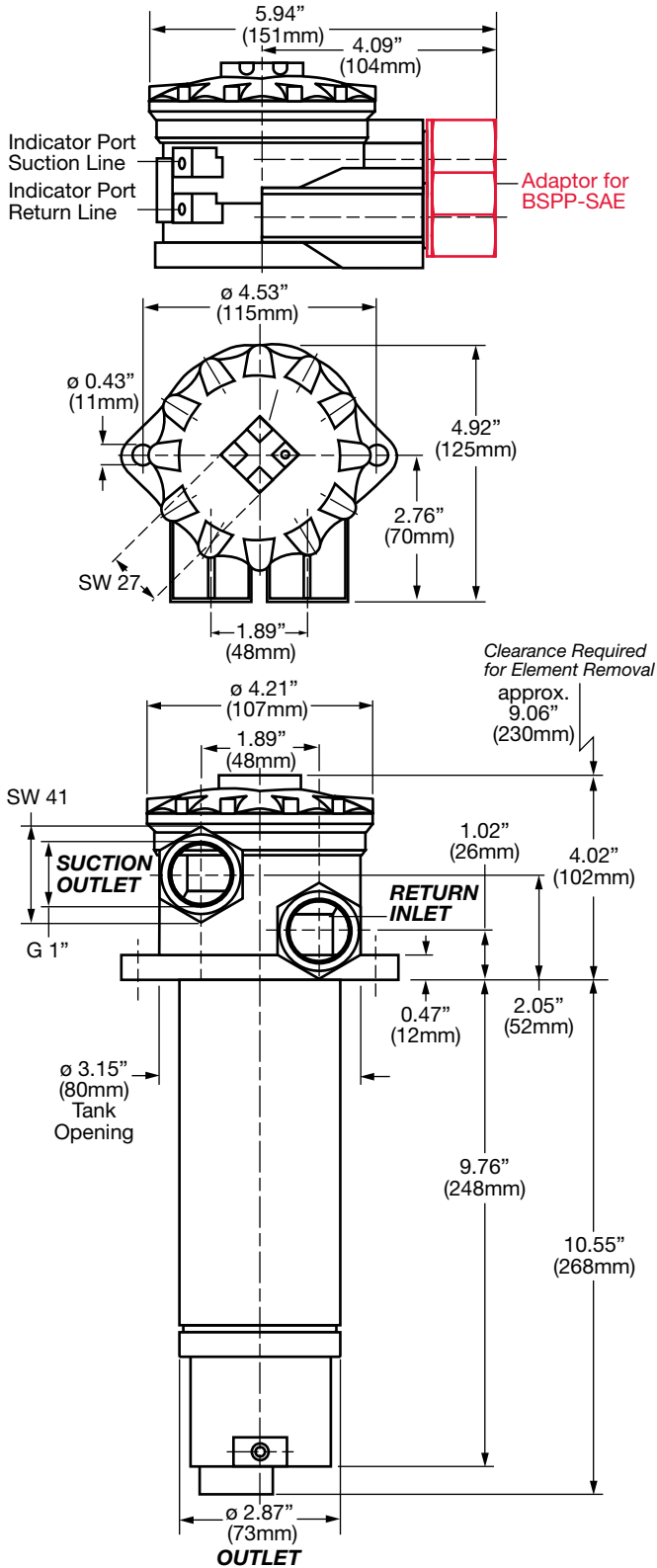
## Anti-cavitation



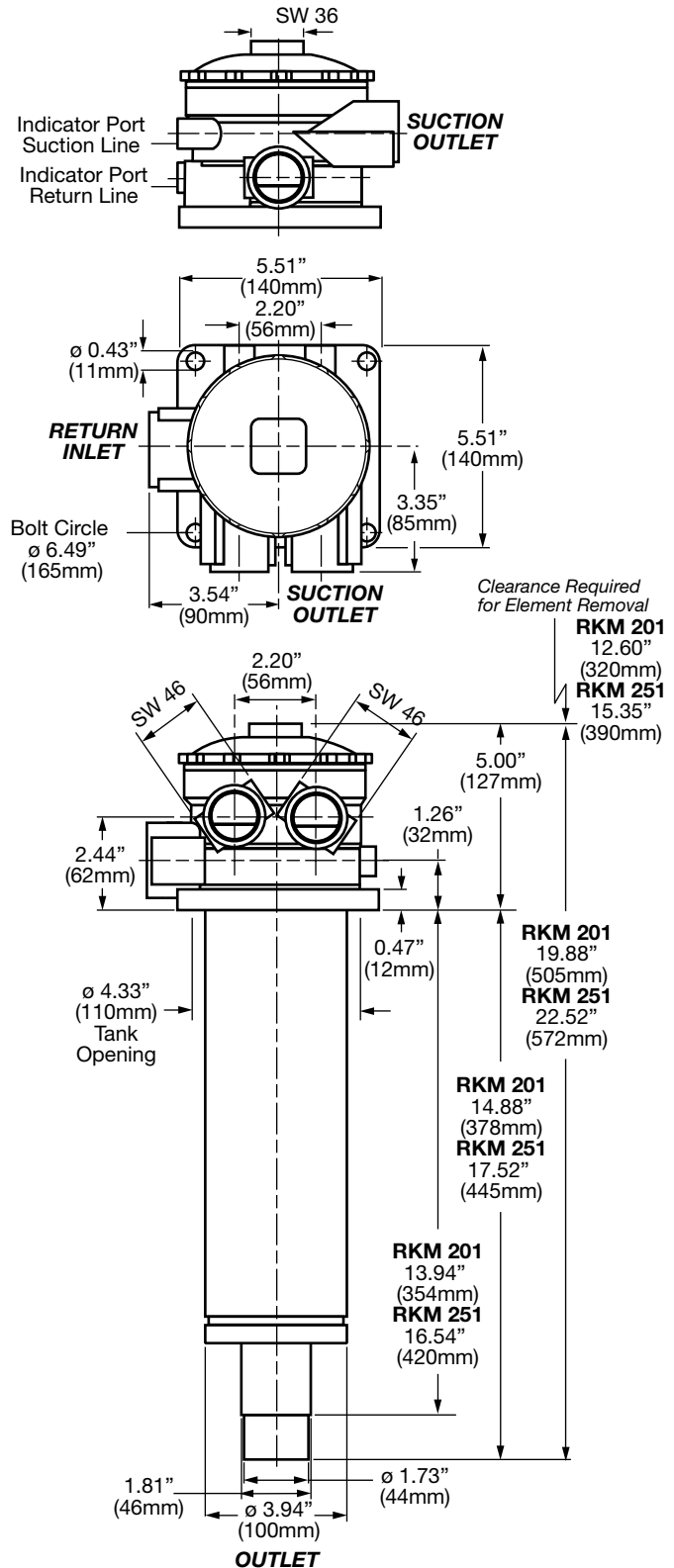
## Circuit Example:



## Dimensions RKM 100



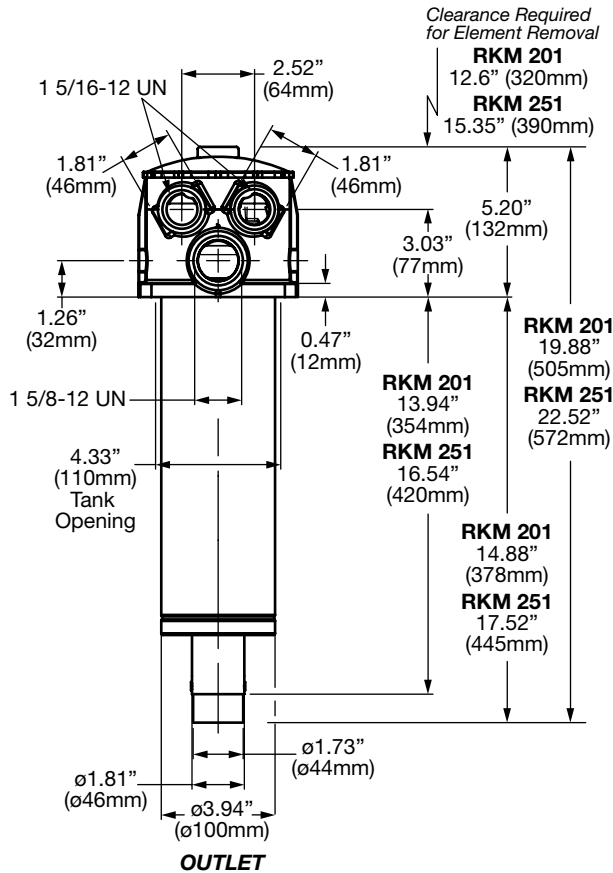
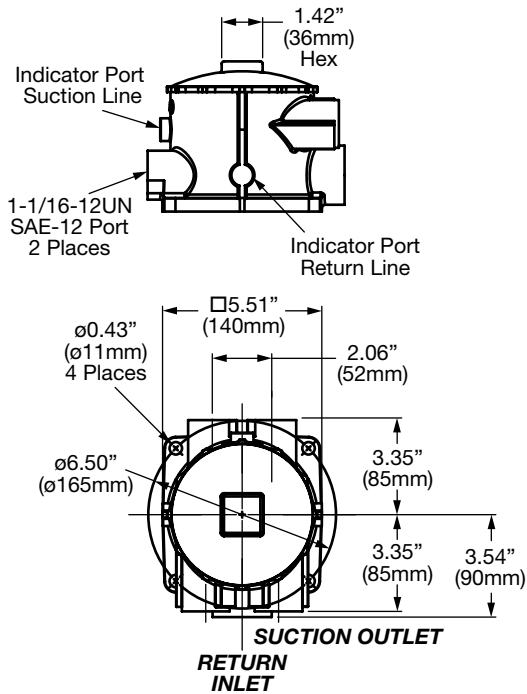
## RKM 201 / 251



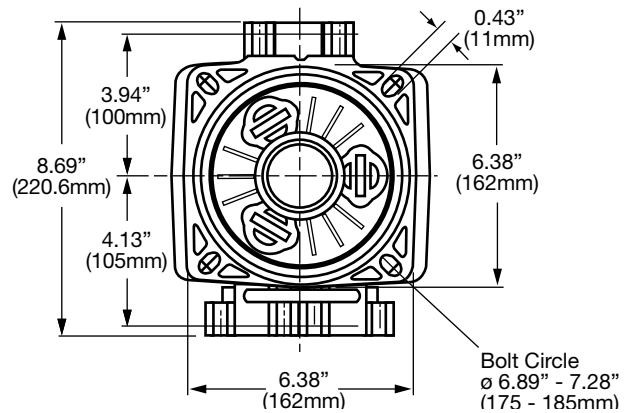
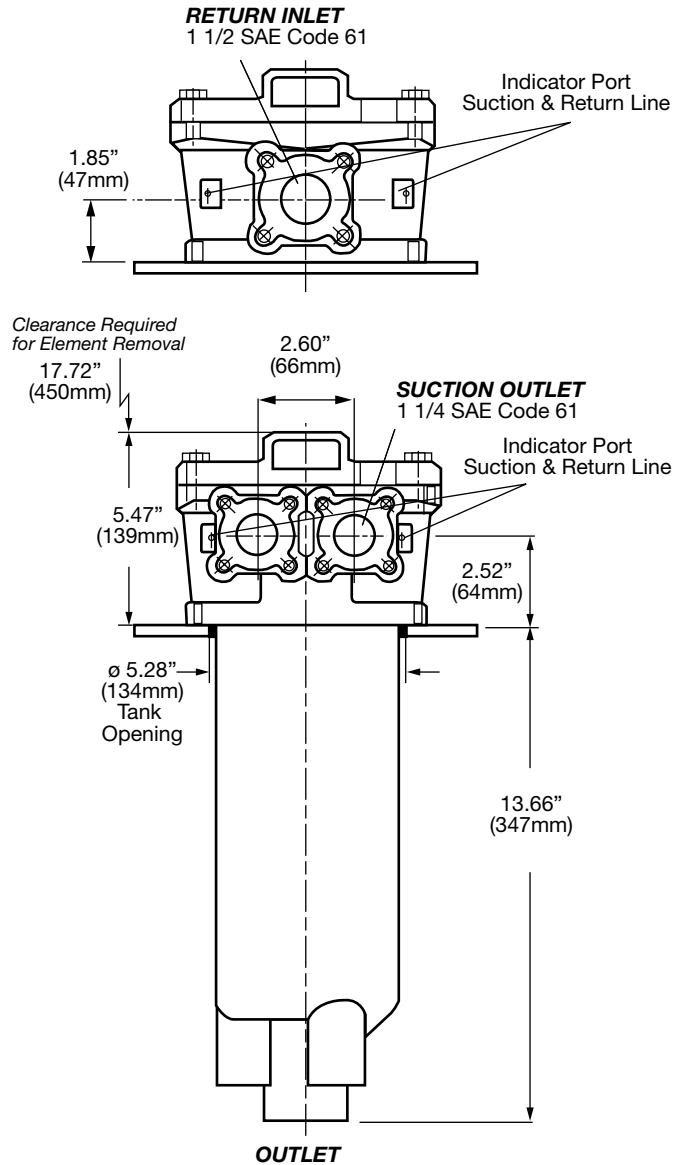
Size	100	201	251
Weight (lbs.)	3.7	8.2	8.8

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## RKM 201 / 251 / -MP1



## RKM 300

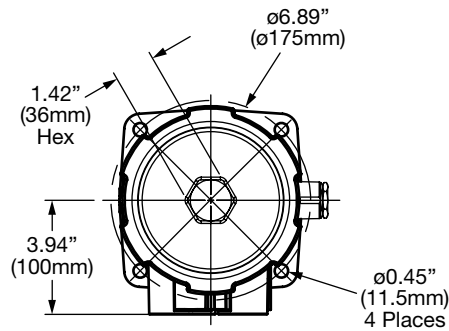


Size	201	251	300
Weight (lbs.)	8.2	8.8	10.1

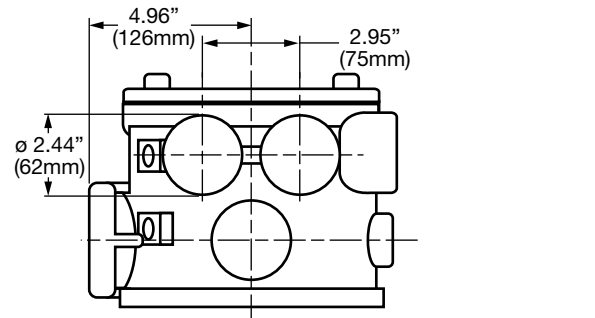
Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.



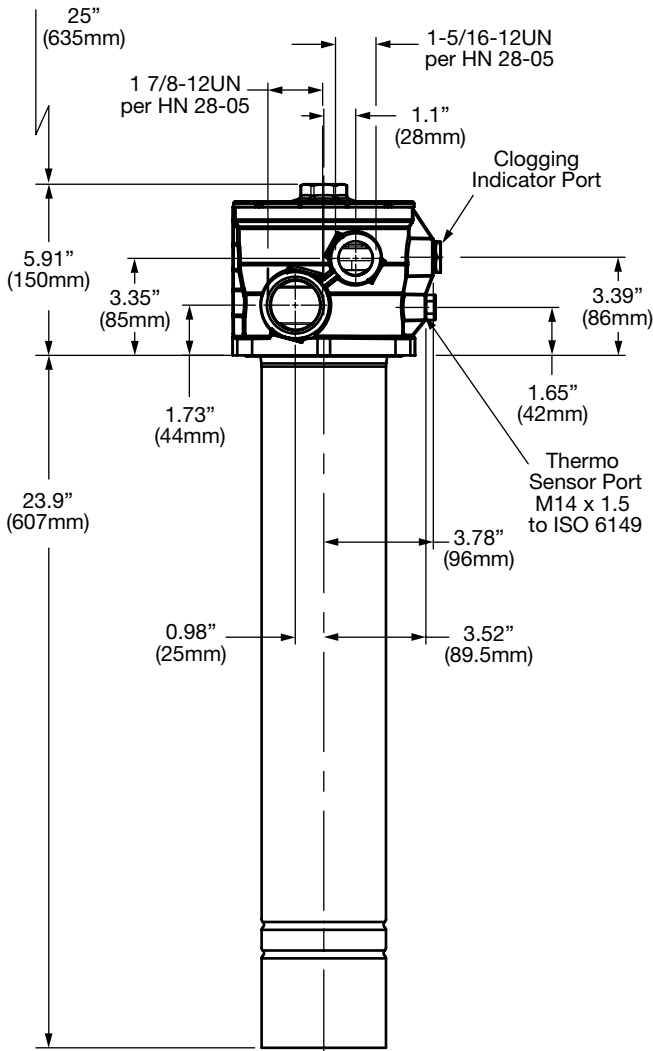
## RKM 350



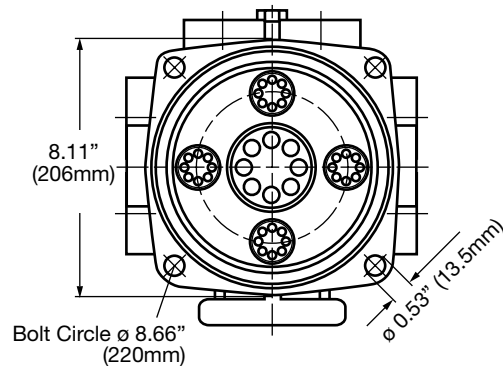
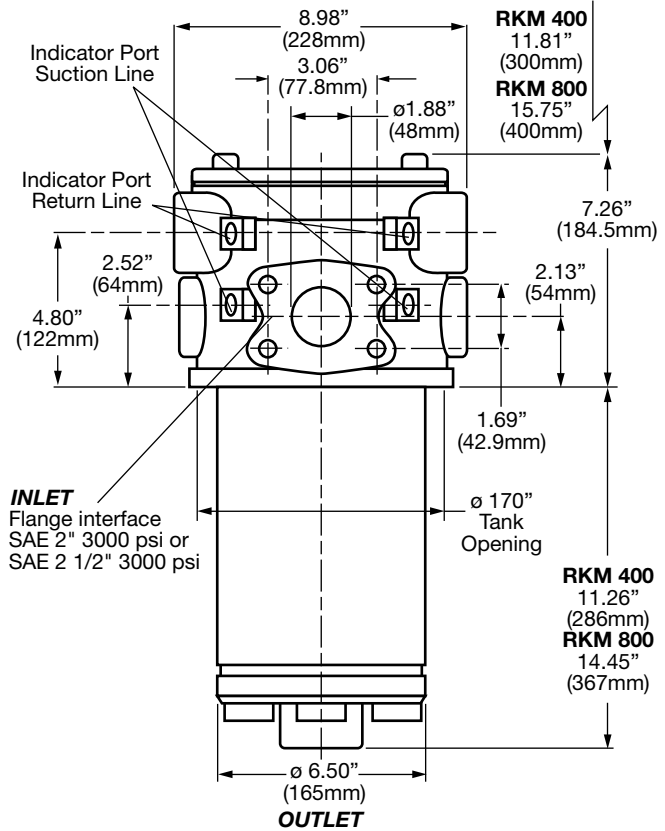
## RKM 400 / 800



Clearance Required for Element Removal



Clearance Required for Element Removal



Size	350	400	800
Weight (lbs.)	13.9	14.3	16.5

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

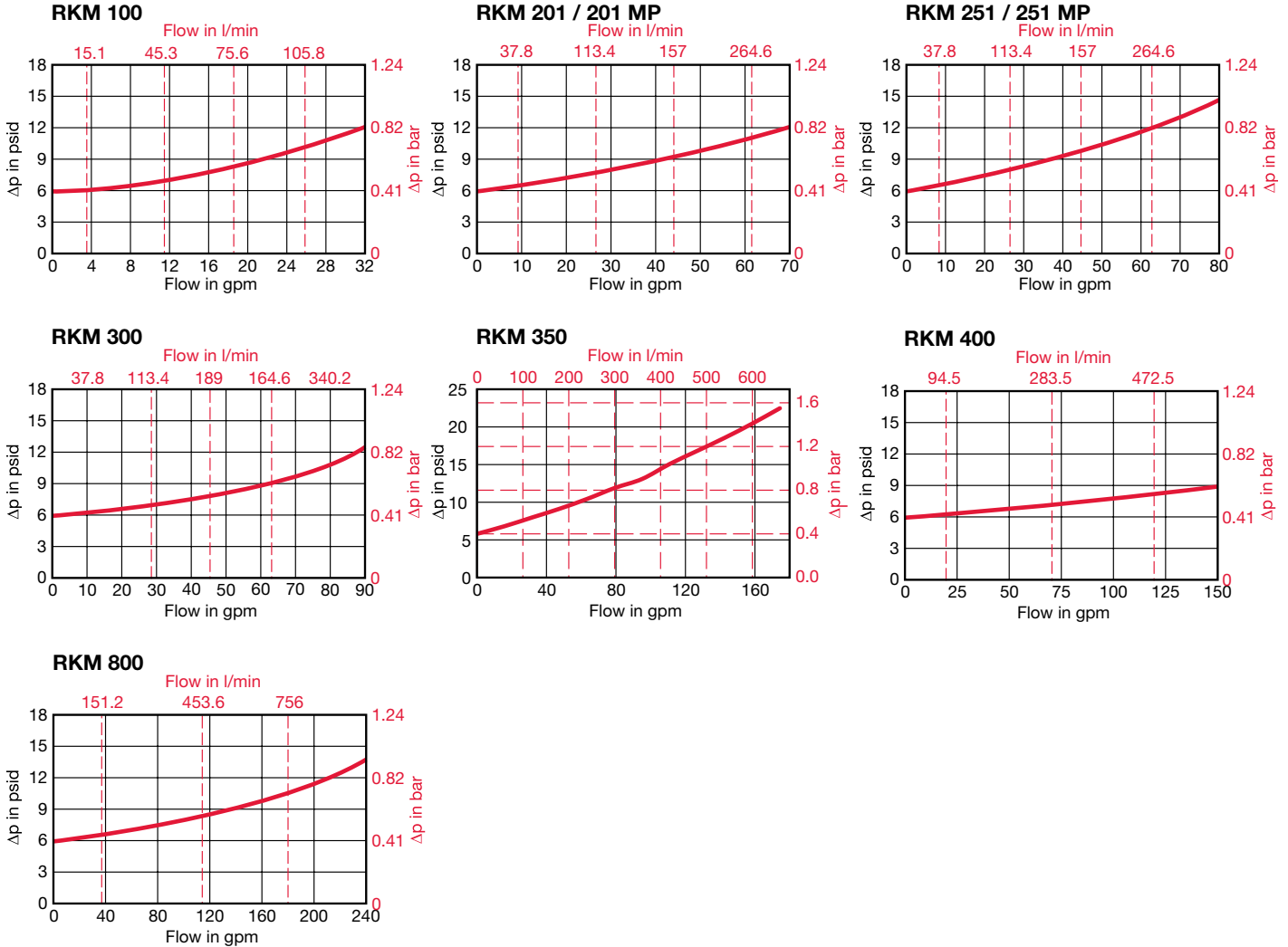
Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$

### Housing Curve:

Pressure loss through housing is as follows:

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

Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see sizing section on page 19)



## Element K Factors

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

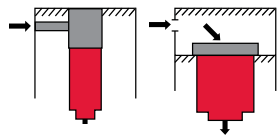
Size	...RK...MM	
	10 $\mu\text{m}$	15 $\mu\text{m}$
0100	0.0964	0.0544
0201	0.0398	0.0268
0251	0.0379	0.0248
0300	0.0324	0.0161
0350	0.0165	0.0110
0400	0.0299	0.0195
0800	0.0207	0.0162

All Element K Factors in psi / gpm.

## RFM...S & RFM...Set Series

### Inside Tank Return Line Filters

145 psi • up to 132 gpm



RFM...S



RFM...Set



Typical Installation of Both Models

### Features

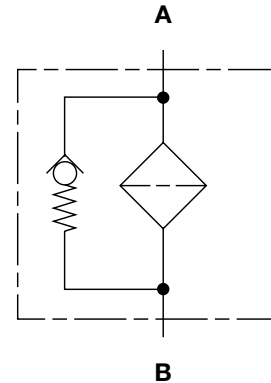
- Unique design allows filter to be installed completely inside of the reservoir tank. This saves space, protects the filter, reduces leak points and reduces overall installation cost.
- Lightweight unit requiring no filter head reduces pressure drop while decreasing cost.
- Excellent option for low overhead clearance applications.
- Allows pre-filtration of new make-up oil assuring cleanliness of system.
- Contamination Basket prevents filtered contamination from re-entering the tank during element changeout on 330 & 500 size models.
- Simplifies element changeout procedure in the field.
- RFM Set configuration (tank plenum) allows for multiple returns to enter plenum without manifolding.

### Installation

**RFM...SET:** Inside Tank Filters are installed into a separate chamber (see *tank cutaway to the right*) built into the reservoir tank via the filter ring and 4 bolts. More than one filter may be installed in the chamber if required for capacity. This procedure will require a hole to be cut into the top of the reservoir tank and an access cover fastened to the tank for each filter installed. The inlet piping for return should be connected through the tank wall into the separate chamber. A clip installed on the filter ring holds the element in place during filtration operations, and facilitates easy removal for element change out. A static pressure clogging indicator, to warn of high upstream pressure (*element clogged*), can be attached to the access cover. For additional information, consult factory.

**RFM...S:** Inside Tank Filters are installed to the top of the tank by welding the inner chamber to the tank cover (see *tank cutaway to the right*). This procedure will require a hole to be cut into the top of the reservoir tank and an access cover fastened to the tank. A smaller hole must be cut somewhere in the tank for the return line piping to pass through. The hole located in the side of the inner chamber must be directed towards the return line piping. The inlet piping for return should then be welded through the tank wall and to the inner chamber. The spring located between the element and the access cover provides force to hold element in place during filter operation. A static pressure indicator to warn of high upstream pressure, and if element is clogged can be attached to the access cover. Multiple filters can be installed in the tank. For additional installation information, consult factory.

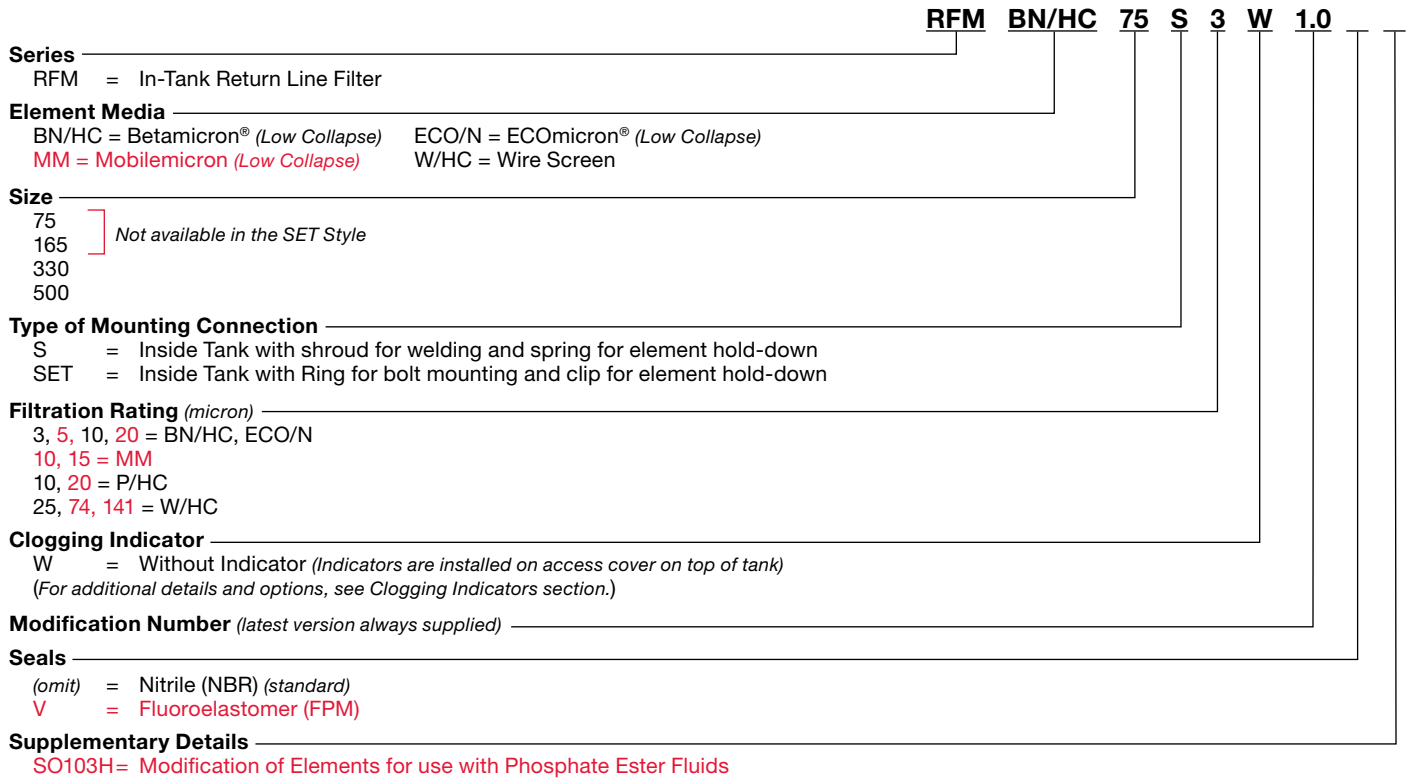
### Hydraulic Symbol



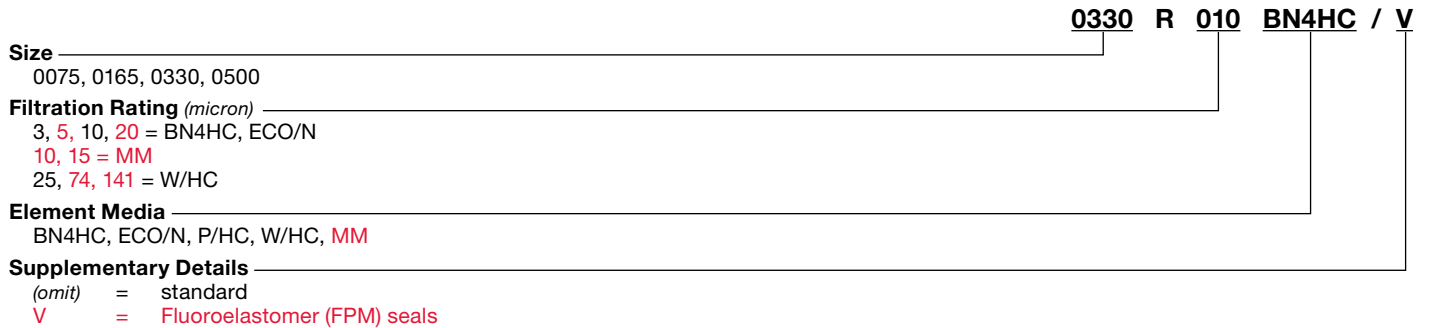
### Technical Details

<b>Mounting Method</b>	See Installation at left	
<b>Port Connection</b>	Outlet	
75/165/185	1.26" Smooth Port	
330/500	2" NPT	
<b>Flow Direction</b>	Inlet: Side	Outlet: Bottom
<b>Construction Materials</b>		
Chamber	Steel (75/165/185)	
Bowl	Plastic	
Ring	Aluminum (330/500)	
<b>Flow Capacity</b>		
75	20 gpm (75 lpm)	
165	43 gpm (165 lpm)	
185	49 gpm (185 lpm)	
330	87 gpm (330 lpm)	
500	132 gpm (500 lpm)	
<b>Housing Pressure Rating</b>		
Max. Operating Pressure	145 psi (10 bar)	
Proof Pressure	218 psi (15 bar)	
Fatigue Pressure	145 psi (10 bar)	
Burst Pressure	> 580 psi (40 bar)	
<b>Element Collapse Pressure Rating</b>		
BN/HC, W/HC	290 psid (20 bar)	
ECO/N, BN/AM, P/HC, AM	145 psid (10 bar)	
<b>Fluid Temperature Range</b>		
-22° to 250°F (-30° to 121°C)		
<b>Fluid Compatibility</b>		
Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.		
<b>Bypass Valve Cracking Pressure</b>		
ΔP = 43 psid (3 bar) +10%		
ΔP = 87 psid (6 bar) +10%		

## Model Code



## Replacement Element Model Code

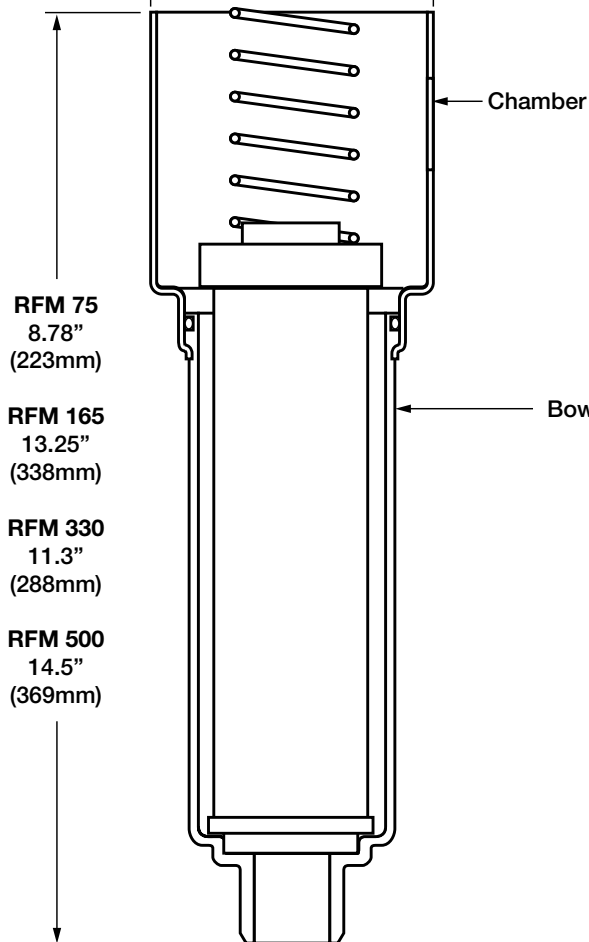


## Dimensions

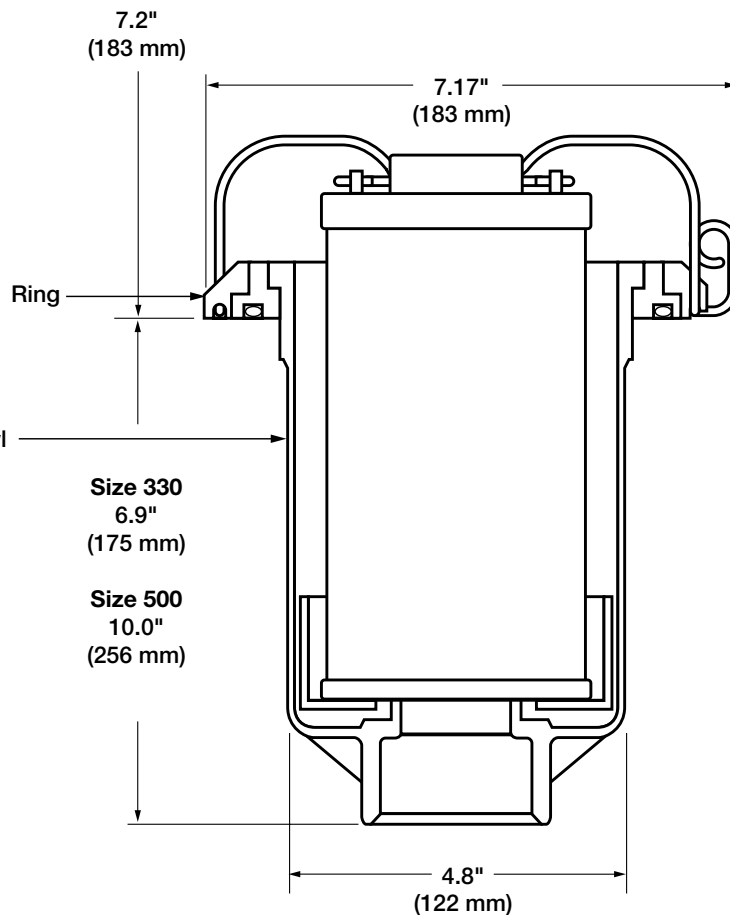
### RFM...S

RFM 75 / 165  
 ø 4.0"  
 (102.5mm)

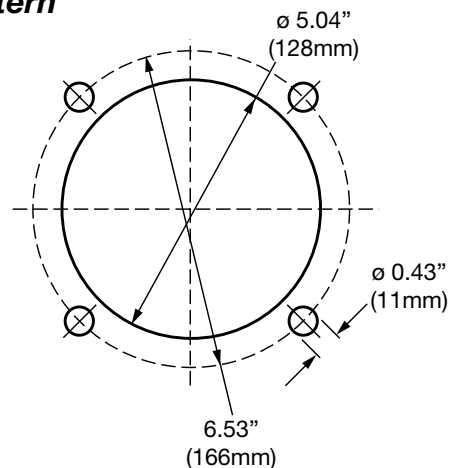
RFM 330 / 500  
 ø 6.10"  
 (155mm)



### RFM...Set



### Mounting Pattern



Size	75 S	165 S	330 S	500 S	330 Set	500 Set
Weight (lbs.)	1.81	2.24	4.42	4.88	4.41	4.85

Dimensions shown are for general information and overall envelope size only. Weights listed are without element.  
 For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

$$\text{Assembly } \Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$$

### 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 section on page 19)

## Element K Factors

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

(From Tables Below)

Size	...R...BN4HC (Betamicon® Low Collapse)			
	3 µm	5 µm	10 µm	20 µm
0075	1.209	0.780	0.445	0.241
0165	0.616	0.430	0.245	0.133
0330	0.232	0.150	0.093	0.066
0500	0.162	0.104	0.069	0.044

Size	...R...ECO/N			
	3 µm	5 µm	10 µm	20 µm
0165	0.674	0.369	0.321	0.220
0330	0.228	0.156	0.135	-

Size	...R...P/HC (Paper)	
	10, 20 µm	
0075	0.156	
0165	0.086	
0330	0.037	
0500	0.024	

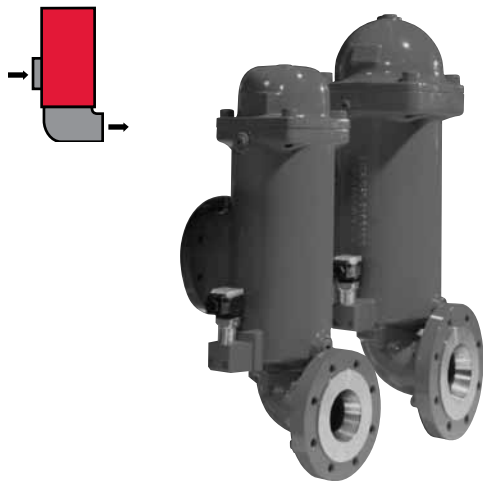
Size	...R...W/HC (Wire Screen)
	25, 50, 74, 100, 149, 200 µm
0075	0.043
0165	0.020
0330	0.010
0500	0.007

Size	...R...MM	
	10 µm	15 µm
0075	0.265	0.166
0165	0.146	0.091
0330	0.078	0.049
0500	0.052	0.032

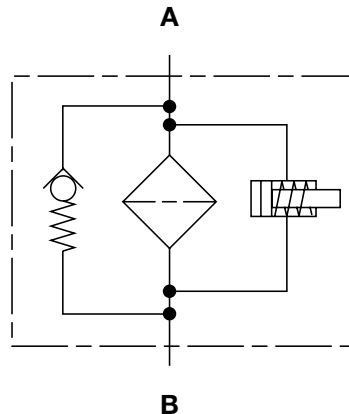
All Element K Factors in psi / gpm.

## RFL Cast Series Inline Filters

360 psi • up to 350 gpm



### Hydraulic Symbol



### Features

- Models 851 and 1301 are made of ductile cast iron and consist of a two part filter housing with bolt-on cast iron lid. The two part construction makes it possible to arrange the inlet and outlet either one above the other on one side or, by turning the base part 180°, on opposite sides of the housing.
- Inlet/outlet ports for models 851 and 1301 comply with SAE 4-bolt flange Code 61 configuration.
- Clogging indicators have no external dynamic seal. High reliability is achieved and magnetic actuation eliminates a leak point.

### Technical Details

<b>Mounting Method</b>	Support by means of pipe clamps
<b>Port Connection</b>	851 SAE-48 Flange, Code 61 1301 SAE-64 Flange, Code 61
<b>Flow Direction</b>	Inlet: Side      Outlet: Side
<b>Construction Materials</b>	Head, Lid, Elbow      Ductile iron
<b>Flow Capacity</b>	851 225 gpm (850 lpm) 1301 343 gpm (1300 lpm)
<b>Housing Pressure Rating</b>	Max. Operating Pressure 360 psi (25 bar) Proof Pressure 540 psi (38 bar) Fatigue Pressure 360 psi (25 bar) Burst Pressure > 1440 psi (100 bar)
<b>Element Collapse Pressure Rating</b>	BN/HC, W/HC 290 psid (20 bar) ECO/N, BN/AM, P/HC, AM 145 psid (10 bar)
<b>Fluid Temperature Range</b>	-22° to 250°F (-30° to 121°C)
<b>Fluid Compatibility</b>	Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.
<b>Indicator Trip Pressure</b>	$\Delta P = 29 \text{ psid (2 bar) } -10\%$ $\Delta P = 72 \text{ psid (5 bar) } -10\%$
<b>Bypass Valve Cracking Pressure</b>	$\Delta P = 43 \text{ psid (3 bar) } +10\%$ $\Delta P = 87 \text{ psid (6 bar) } +10\%$

### Applications



Automotive



Gearboxes



Industrial



Power Generation



Pulp & Paper



Shipbuilding



Steel / Heavy Industry

## Model Code

**RFL BN/HC 851 D P 3 A 1 . X / V**

**Filter Type** \_\_\_\_\_  
 RFL = Inline Filter

**Element Media** \_\_\_\_\_  
 BN/HC = Betamicon® (Low Collapse)    ECO/N = ECOMicon® (Low Collapse)  
 AM = Aquamicon®    BN/AM = Betamicon®/Aquamicon®  
 P/HC = Polyester    W/HC = Wire Screen

**Size** \_\_\_\_\_  
 851 = SAE 48 Flange  
 1301 = SAE 64 Flange ] with metric threads

**Operating Pressure** \_\_\_\_\_  
 D = 363 psi (25 bar)

**Type of Connection** \_\_\_\_\_  
 N = SAE DN 80 3" (size 851)  
 P = SAE DN 100 4" (size 1301)

**Filtration Rating (microns)** \_\_\_\_\_  
 3, 5, 10, 20 = BN/HC, ECO/N    3, 10 = BN/AM    40 = AM  
 10, 20, = P/HC    25, 74, 149 = W/HC

**Type of ΔP Clogging Indicator** \_\_\_\_\_  
 A, B/BM, C, D

**Type Code** \_\_\_\_\_  
 1

**Modification Number (latest version always supplied)** \_\_\_\_\_

**Seals** \_\_\_\_\_  
 (omit) = Buna N (NBR)(standard)  
 V = Fluoroelastomer (FPM)  
 EPR = Ethylene Propylene (EPDM)

**Bypass Valve Cracking Pressure** \_\_\_\_\_  
 (omit) = 43 psid (3 bar) (return line - standard)  
 KB = no bypass (flushing system)  
 B6 = 87 psid (6 bar) (return line - extended service life) ] not available with ECO/N  
 B1 = 15 psid (1 bar) (lubrication or coolant application)  
 B0.2 = 3 psid (0.2 bar) (pump inlet)

**Supplementary** \_\_\_\_\_  
 W = Indicator with brass piston (for water base fluids)  
 SO103H = Modification of BN4HC Elements for Phosphate Ester Fluids  
 L24, L48, L110, L220 = Lamp for D-type clogging indicator (LXX, XX = voltage)

## Replacement Element Model Code

**0850 R 010 BN4HC / V**

**Size** \_\_\_\_\_  
 0850, 1300

**Filtration Rating (micron)** \_\_\_\_\_  
 3, 5, 10, 20 = BN4HC, ECO/N  
 3, 10 = BN/AM  
 40 = AM 10, 20, = P/HC  
 25, 74, 149 = W/HC

**Element Media** \_\_\_\_\_  
 BN4HC, ECO/N, BN/AM, AM, P/HC, W/HC

**Supplementary Details** \_\_\_\_\_  
 (omit) = standard  
 V = Fluoroelastomer (FPM) seals

## Clogging Indicator Model Code

**VM 2 B . X /**

**Indicator Prefix** \_\_\_\_\_  
 VM = G 1/2 3000 psi

**Trip Pressure** \_\_\_\_\_  
 2 = 29 psid (2 bar) ] (optional)  
 5 = 72 psid (5 bar)

**Type of Indicator** \_\_\_\_\_  
 A = no indicator, plugged port  
 B/BM = Visual pop-up (auto/manual reset)  
 C = Electric switch  
 D = Electric switch and light

**Modification Number** \_\_\_\_\_

**Supplementary Details** \_\_\_\_\_

**Seals** \_\_\_\_\_  
 (omit) = Nitrile (NBR) (standard)  
 V = Fluoroelastomer (FPM)

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

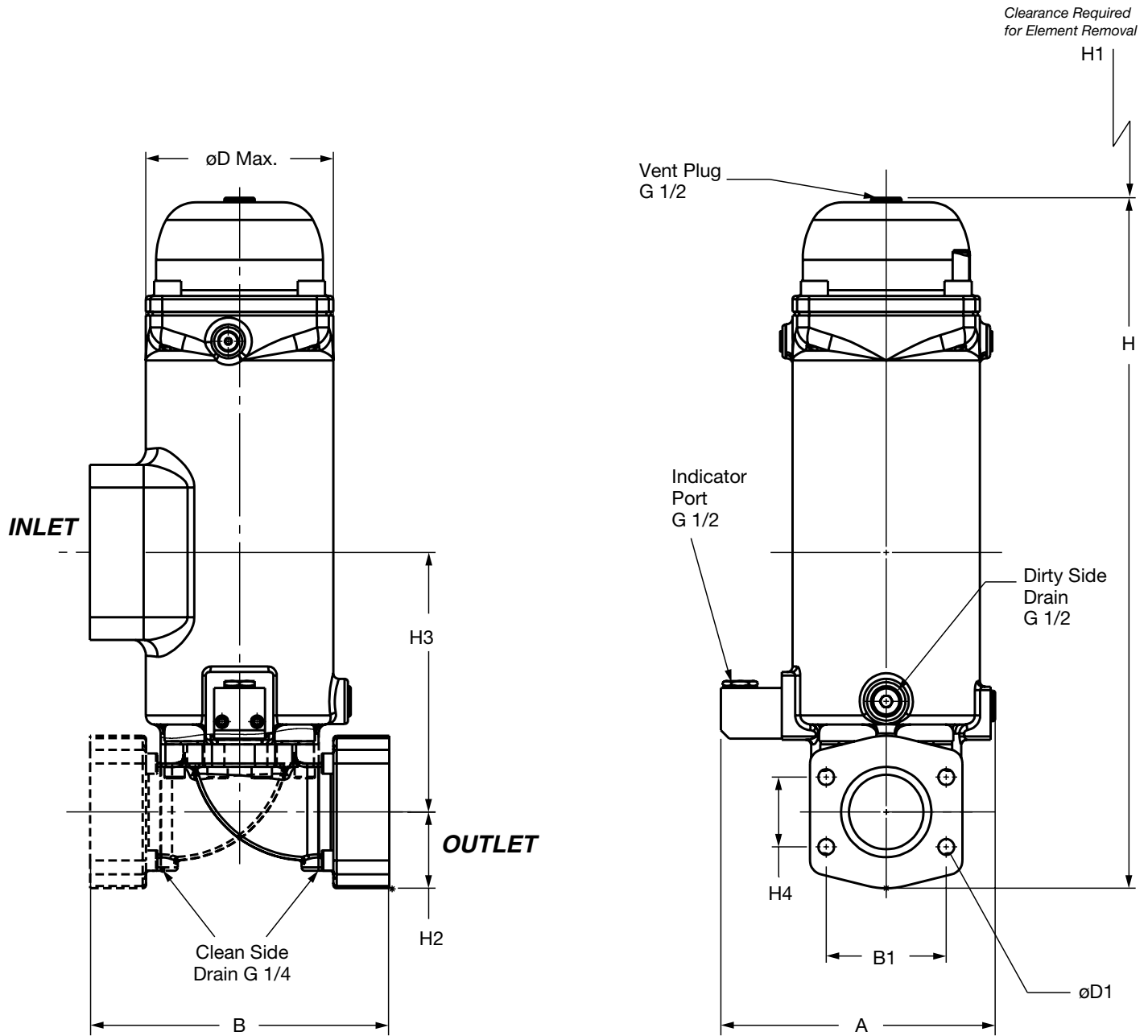
**Thermal Lockout (VM, VD types C, D, J, and J4 only)** \_\_\_\_\_  
 T100 = Lockout below 100°F

**Underwriters Approval (VM, VD types C, D, J, and J4 only)** \_\_\_\_\_  
 CRUUS = Electrical Indicators  
 (For additional details and options, see Clogging Indicators section.)

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



## Dimensions



Size	A	B	B1	H	H1	H2	H3	H4	D	D1	Weight (lbs)
RFL 851	7.56" (192mm)	10.47" (266mm)	4.18" (106.4mm)	24.1" (612mm)	16.5" (420mm)	2.66" (67.5mm)	9" (230mm)	2.44" (61.9mm)	6.77" (172mm)	M16	84.7
RFL 1301	8.78" (223mm)	11.26" (286mm)	5.13" (130.2mm)	27.99" (711mm)	19.69" (500mm)	3.18" (81mm)	9.84" (250mm)	3.06" (77.8mm)	8.66" (220mm)	M16	122.1

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

$$\text{Assembly } \Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$$

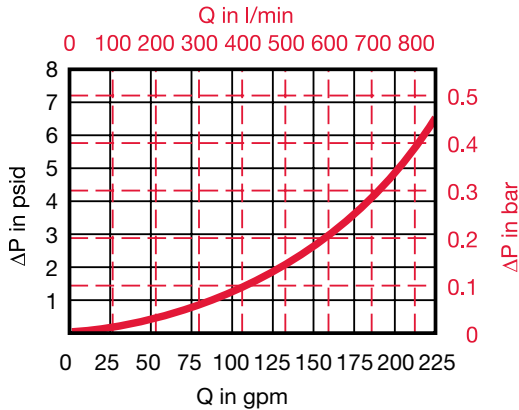
### Housing Curve:

Pressure loss through housing is as follows:

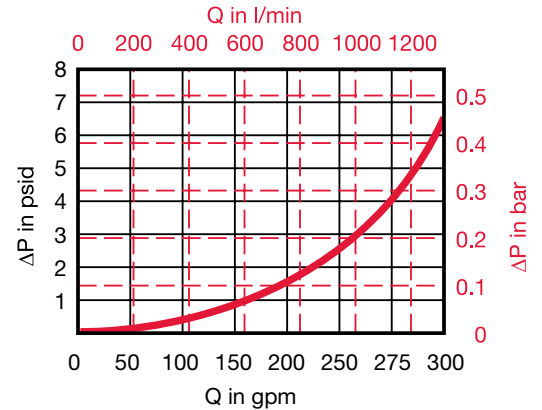
$$\text{Housing } \Delta P = \text{Housing Curve } \Delta P \times \frac{\text{Actual Specific Gravity}}{0.86}$$

Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see sizing section on page 19)

### RFL 851 HOUSING



### RFL 1301 HOUSING



## Element K Factors

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

(From Tables Below)

Size	...R...BN4HC (Betamicon® Low Collapse)			
	3 μm	5 μm	10 μm	20 μm
0850	0.082	0.055	0.036	0.023
1300	0.045	0.032	0.024	0.014

Size	...R...ECO/N (ECOMICRON®)			
	3 μm	5 μm	10 μm	20 μm
0850	0.078	0.053	0.046	0.032
1300	0.049	0.034	0.029	0.020

Size	...R...P/HC (Polyester)	
	10 μm	20 μm
0850	0.012	0.012
1300	0.007	0.007

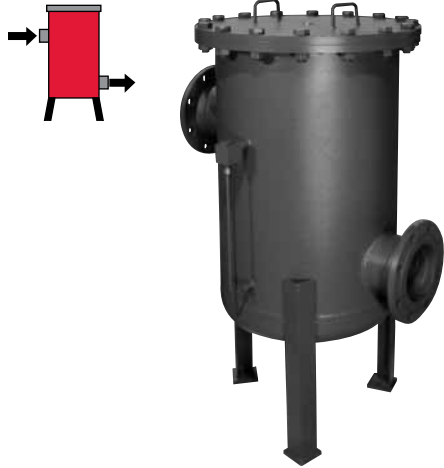
Size	...R...W/HC (Wire Screen)
	25, 74, 149 μm
0850	0.0038
1300	0.0027

Size	...R...BN/AM (Betamicon®/Aquamicron®)	
	3 μm	10 μm
1300R	0.088	0.033

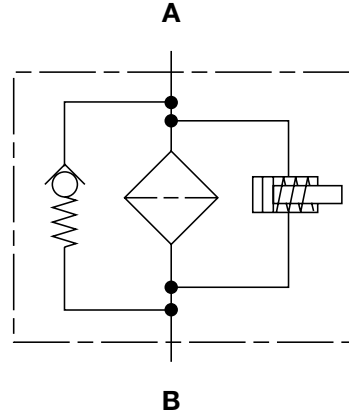
All Element K Factors in psi / gpm.

## RFL Welded Series Inline Filters

230 psi • up to 3900 gpm



### Hydraulic Symbol



### Features

- Models 1300 to 15000 are made of rolled steel housings with bolt-on steel lids; Stainless steel models are available.
- ANSI flange connections for each filter size provide maximum connection flexibility eliminating additional adapters and intermediate flanges.
- Inlet and outlet connections are located on opposite sides of the housings.
- Clogging indicators have no external dynamic seal. High reliability is achieved and magnetic actuation eliminates a leak point.

### Technical Details

<b>Mounting Method</b>	Floor mounted legs
<b>Port Connection</b>	
1300/1320	4" ANSI 150# Flange
2500/2520	6" ANSI 150# Flange
4000/4020	8" ANSI 150# Flange
5200 - 7820	10" ANSI 150# Flange
15000/15020	12" ANSI 150# Flange
<b>Flow Direction</b>	Inlet & Outlet: Side
<b>Construction Materials</b>	
Housing, Lid	Steel
Note: Please contact factory for available stainless steel models.	
<b>Flow Capacity</b>	
1300/1320	350 gpm (1300 lpm)
2500/2520	650 gpm (2500 lpm)
4000/4020	1050 gpm (4000 lpm)
5200/5220	1400 gpm (5200 lpm)
6500/6520	1700 gpm (6500 lpm)
7800/7820	2050 gpm (7800 lpm)
15000/15020	4000 gpm (15000 lpm)
<b>Housing Pressure Rating</b>	
Max. Operating Pressure	150 psi (10 bar) <i>(standard)</i> 230 psi (16 bar) <i>(optional)</i>
Proof Pressure	345 psi (24 bar)
Fatigue Pressure	Contact HYDAC
Burst Pressure	Contact HYDAC
<b>Element Collapse Pressure Rating</b>	
BN/HC, W/HC	290 psid (20 bar)
ECO/N	145 psid (10 bar)
<b>Fluid Temperature Range</b>	-22° to 250°F (-30° to 121°C)
<b>Fluid Compatibility</b>	Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.
<b>Indicator Trip Pressure</b>	
$\Delta P = 29$ psid (2 bar) -10% <i>(standard)</i>	
$\Delta P = 72$ psid (5 bar) -10% <i>(optional)</i>	
<b>Bypass Valve Cracking Pressure</b>	
$\Delta P = 43$ psid (3 bar) +10% <i>(standard)</i>	
$\Delta P = 87$ psid (6 bar) +10% <i>(optional)</i>	

### Applications



Gearboxes



Industrial



Power Generation



Pulp & Paper



Shipbuilding



Steel / Heavy Industry

## Model Code

**RFL BN/HC 1300 C T 10 D 1 . 1 / S 150 V DH**

**Filter Type** \_\_\_\_\_

**Element Media** \_\_\_\_\_  
 BN/HC = Betamicon® (Low Collapse)      ECO/N = ECOmicon® (Low Collapse)  
 AM = Aquamicon®      BN/AM = Betamicon®/Aquamicon®  
 P/HC = Polyester      W/HC = Wire Screen

**Size** \_\_\_\_\_  
 1300/ 1320/ 2500/ 2520/ 4000/ 4020/ 5200/ 5220/  
 6500/ 6520/ 7800/ 7820/ 15000/ 15020

**Operating Pressure** \_\_\_\_\_  
 B = 150 psi (10 bar)  
 C = 230 psi (16 bar)

**Type of Connection** \_\_\_\_\_  
 2 = 2" ANSI Flange (sizes 1300)      L = DN 50 (sizes 1300 - 2520)  
 4 = 3" ANSI Flange (sizes 1300 & 1320)      S = SAE/DIN DN 80 (sizes 1300 - 5220)  
 5 = 4" ANSI Flange (sizes 1320 & 2520)      T = SAE/DIN DN 100 (sizes 1300 - 7820)  
 7 = 6" ANSI Flange (sizes 2500 & 2520)      V = DN 150 (sizes 2500 - 7820)  
 8 = 8" ANSI Flange (sizes 4000 & 4020)      W = DN 200 (sizes 4000 - 15020)  
 9 = 10" ANSI Flange (sizes 5000 - 7820)      X = DN 250 (sizes 5200 - 15020)  
 10 = 12" ANSI Flange (sizes 15000 & 15020)      Y = DN 300 (sizes 15000 & 15020)

**Filtration Rating (microns)** \_\_\_\_\_  
 3, 5, 10, 20 = BN/HC, ECO/N      3, 10 = BN/AM      40 = AM  
 10, 20 = P/HC      25, 74, 149 = W/HC

**Type of ΔP Clogging Indicator** \_\_\_\_\_  
 A, B/BM, C, D

**Type Code** \_\_\_\_\_  
 1

**Modification Number (latest version always supplied)** \_\_\_\_\_

**Country of Installation** \_\_\_\_\_  
 (omit) = standard (non coded)  
 S = ASME Coded with "U" Stamp

**Flange** \_\_\_\_\_  
 (omit) = DIN Flange Connection to DIN 2501/1  
 150 = 150 lbs ANSI Flange

**Seals** \_\_\_\_\_  
 (omit) = Buna-N      V = Fluoroelastomer (FPM)

**Bypass Valve Cracking Pressure** \_\_\_\_\_  
 (omit) = 43 psid (3 bar) (return line - standard)  
 B6 = 87 psid (6 bar) (return line - extended service life)      not available with ECO/N  
 KB = no bypass

**Supplementary** \_\_\_\_\_  
 (omit) = Cover Lifting Device (Handle only)  
 DH = Cover Lifting Device (Davit lifting mechanism for sizes 4000 and larger, style may vary)  
 L24, L48, L110, L220 = Lamp for D-type clogging indicator (LXX, XX = voltage)  
 W = Indicator with brass piston (for water base fluids)  
 SO103H = Modification of BN4HC Elements for Phosphate Ester Fluids

## Replacement Element Model Code

**1300 R 010 BN4HC / V**

**Size** \_\_\_\_\_  
 0850, 1300, 1700, 2600

**Filtration Rating (micron)** \_\_\_\_\_  
 3, 5, 10, 20 = BN4HC, ECO/N      10, 20 = P/HC  
 3, 10 = BN/AM      25, 74, 149 = W/HC  
 40 = AM

**Element Media** \_\_\_\_\_  
 BN4HC, ECO/N, P/HC, BN/AM, W/HC, AM

**Supplementary Details** \_\_\_\_\_  
 (omit) = standard  
 V = Fluoroelastomer (FPM) seals

## Clogging Indicator Model Code

**VM 2 B . X /**

**Indicator Prefix** \_\_\_\_\_  
 VM = G 1/2 3000 psi

**Trip Pressure** \_\_\_\_\_  
 2 = 29 psid (2 bar)      (optional)  
 5 = 72 psid (5 bar)

**Type of Indicator** \_\_\_\_\_  
 A = no indicator, plugged port  
 B/BM = Visual pop-up (auto/manual reset)  
 C = Electric switch  
 D = Electric switch and light

**Modification Number** \_\_\_\_\_

**Supplementary Details** \_\_\_\_\_

**Seals** \_\_\_\_\_  
 (omit) = Nitrile (NBR) (standard)  
 V = Fluoroelastomer (FPM)

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

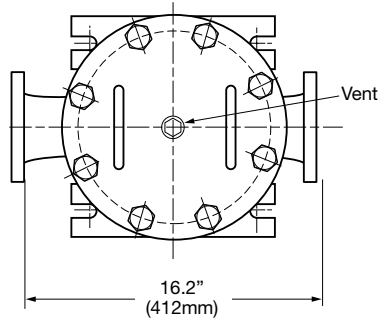
**Thermal Lockout (VM, VD types C, D, J, and J4 only)** \_\_\_\_\_  
 T100 = Lockout below 100°F

**Underwriters Approval (VM, VD types C, D, J, and J4 only)** \_\_\_\_\_  
 CRUUS = Electrical Indicators  
 (For additional details and options, see Clogging Indicators section.)

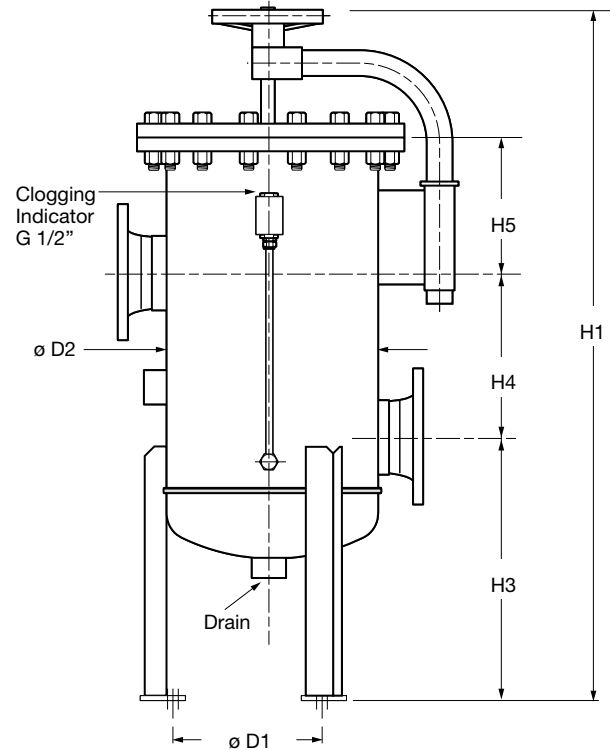
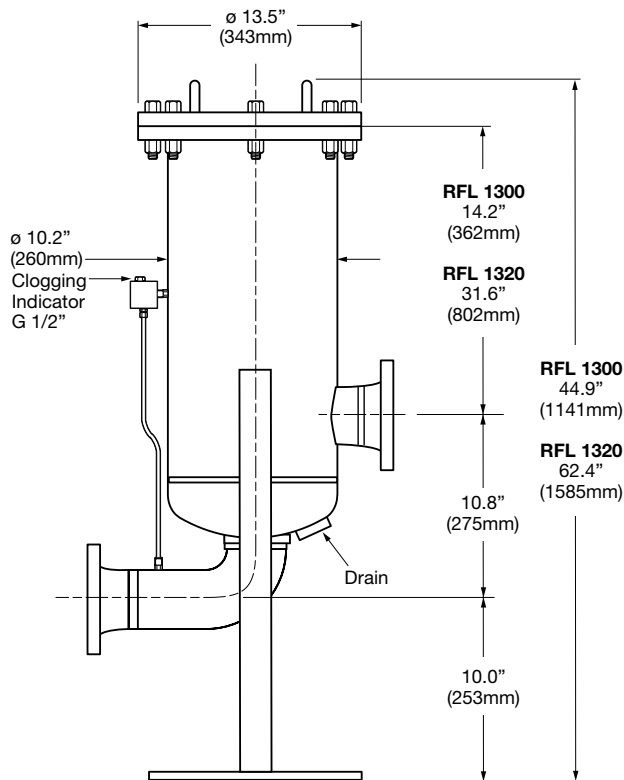
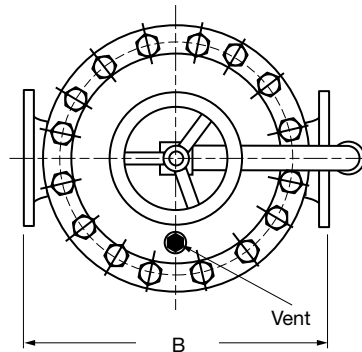
Model Codes Containing RED are non-stock items — Minimum quantities may apply — Contact HYDAC for information and availability

## Dimensions

### RFL 1300 - 1320



### RFL 2500 - 15020



Size	Weight	B	D1	D2	H1	H3	H4	H5
2500 / 2520	340 / 400	18.3" (466mm)	9.8" (250mm)	10.7" (273mm)	47.98/63.33" (1218.6/1608.6mm)	17.2" (438mm)	14.4" (365mm)	6.9/25.8" (175/565mm)
4000 / 4020	570 / 675	23.6" (600mm)	13.0" (330mm)	14.0" (356mm)	54.04/69.39" (1372.6/1762.6mm)	20.7" (525mm)	14.4" (365mm)	9.3/24.6" (235/625mm)
5200 / 5220	790 / 970	26.0" (660mm)	15.0" (380mm)	16.0" (406mm)	58.6/76.09" (1492.6/1932.6mm)	22.0" (560mm)	17.7" (450mm)	9.3/26.6" (236/676mm)
6500 / 6520 7800 / 7820	1040 / 1255 1055 / 1290	30.7" (780mm)	18.9" (480mm)	20.0" (508mm)	60.97/78.29" (1548.6/1988.6mm)	23.6" (600mm)	17.7" (450mm)	9.8/27.2" (250/690mm)
15000 / 15020	2085 / 2470	39.4" (1000mm)	27.2" (690mm)	28.0" (711mm)	65.5/82.82" (1663.6/2103.6mm)	26.4" (670mm)	20.3" (515mm)	9.3/26.6" (235/675mm)

Dimensions shown are for general information and overall envelope size only. Weights listed are without element.  
For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

$$\text{Assembly } \Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$$

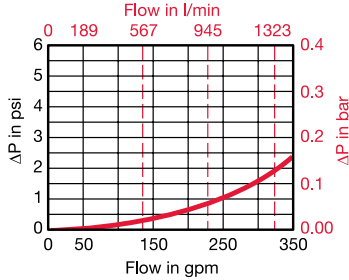
### Housing Curve:

Pressure loss through housing is as follows:

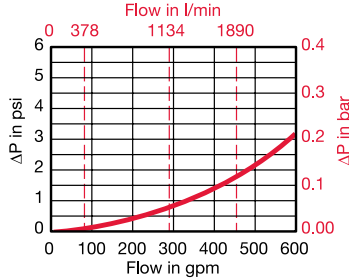
$$\text{Housing } \Delta P = \text{Housing Curve } \Delta P \times \frac{\text{Actual Specific Gravity}}{0.86}$$

Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see sizing section on page 19)

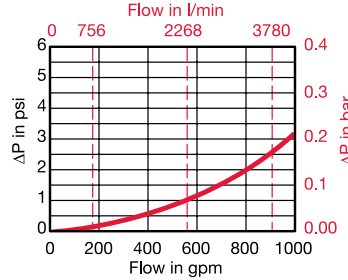
**RFL 1300/1320 Housing w/ ANSI 4" Flange**



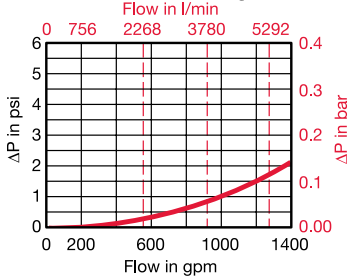
**RFL 2500/2520 Housing w/ ANSI 6" Flange**



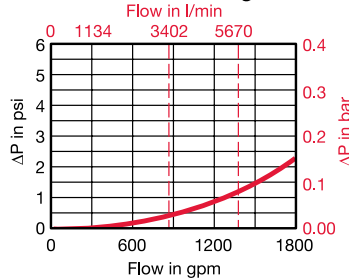
**RFL 4000/4020 Housing w/ ANSI 8" Flange**



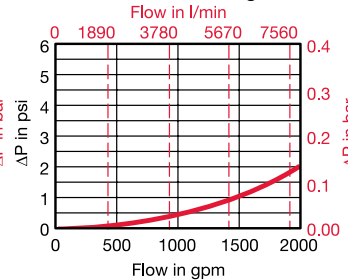
**RFL 5200/5220 Housing w/ ANSI 10" Flange**



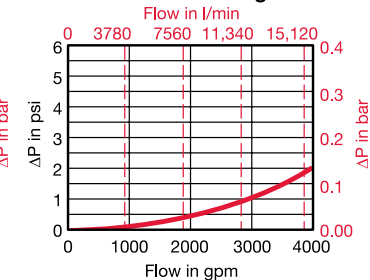
**RFL 6500/6520 Housing w/ ANSI 10" Flange**



**RFL 7800/7820 Housing w/ ANSI 10" Flange**



**RFL 15000/15020 Housing w/ ANSI 12" Flange**



## Required Element Per Housing

Housing Size	Element Size	Elements per Side
1300 / 1320	1300 / 2600	1 / 1
2500 / 2520	0850 / 1700	3 / 3
4000 / 4020	0850 / 1700	5 / 5
5200 / 5220	1300 / 2600	4 / 4
6500 / 6520	1300 / 2600	5 / 5
7800 / 7820	1300 / 2600	6 / 6
15000 / 15020	1300 / 2600	10 / 10

## Element K Factors

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

(From Tables Below)

Size	...R...BN4HC (Betamicron® Low Collapse)			
	3 μm	5 μm	10 μm	20 μm
0850	0.082	0.055	0.036	0.023
1300	0.045	0.032	0.024	0.014
1700	0.040	0.029	0.018	0.011
2600	0.023	0.016	0.011	0.007

Size	...R...ECO/N			
	3 μm	5 μm	10 μm	20 μm
0850	0.078	0.053	0.046	0.032
1300	0.049	0.034	0.029	0.020
1700	0.038	0.026	0.023	—
2600	0.024	0.017	0.014	0.010

Size	...R...BN/AM	
	3 μm	10 μm
1300	0.088	0.033
2600	0.052	0.019

Size	...R...W/HC (Wire Screen)	
	25, 50, 74, 100, 149, 200 μm	
0850	0.004	
1300	0.003	
1700	0.002	
2600	0.001	

Size	...R...AM	
	040A	
0850	0.074	
1300	0.048	
2600	0.024	

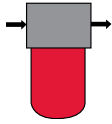
Size	...R...P/HC (Paper)	
	10, 20 μm	
0850	0.012	
1300	0.007	
1700	0.006	
2600	0.003	

All Element K Factors in psi / gpm.

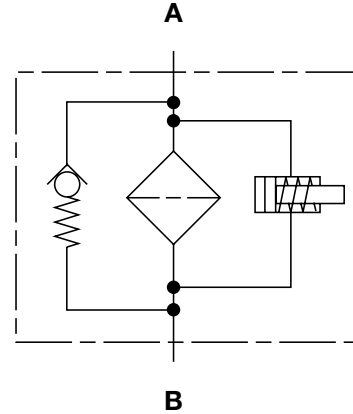
## FLN Series

### Inline Filters

360 psi • up to 100 gpm



### Hydraulic Symbol



### Features

- Aluminum alloy is water tolerant - anodization is not required for high water based fluids (HWBF).
- Non-welded housing design reduces stress concentrations and prevents fatigue failure.
- SAE straight thread O-ring boss porting to allow easy installation without costly adapters.
- O-ring seals are used to provide positive, reliable sealing.
- Screw-in bowl mounted below the filter head requires minimal clearance to remove the element for replacement, and contaminated fluid cannot be washed downstream when element is serviced.
- Differential Pressure Indicators. HYDAC indicators have no external dynamic seal. This results in a high system reliability due to magnetic actuation, thus eliminating a potential leak point.
- A poppet-type bypass valve (optional) is mounted in-line between the inlet and outlet ports to provide positive sealing during normal operation and fast opening during cold starts and flow surges.

### Applications



Agricultural



Automotive



Construction



Gearboxes



Industrial



Power Generation

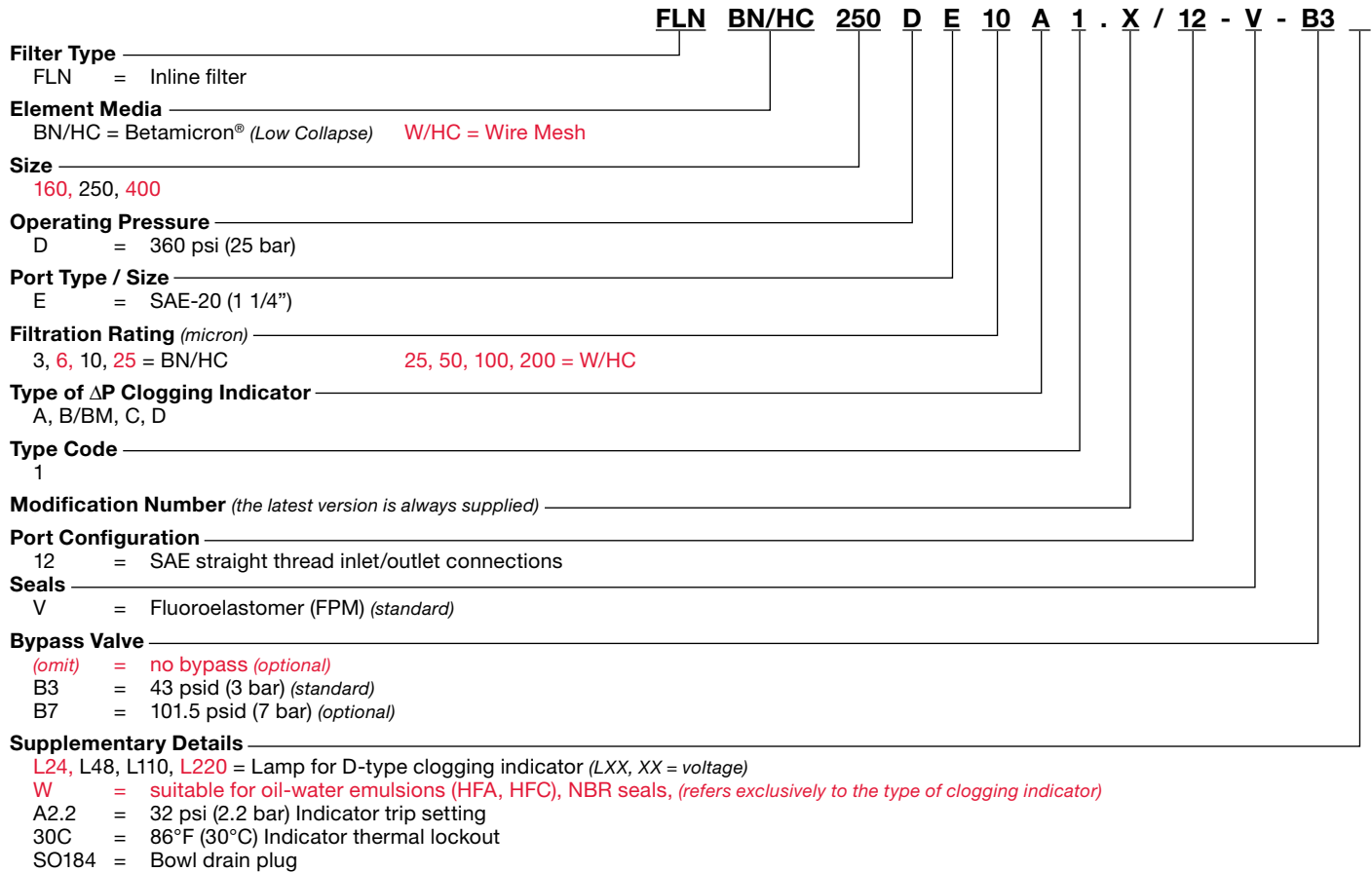


Pulp & Paper

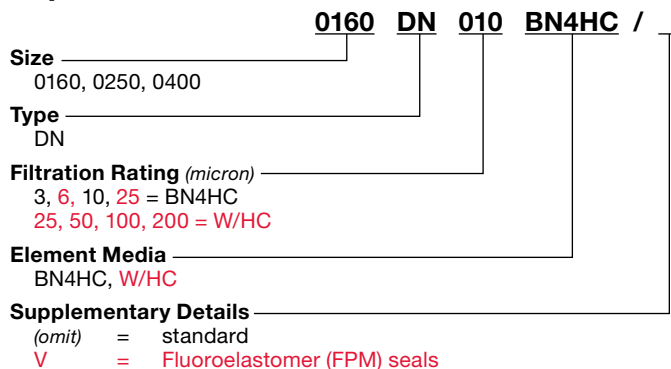
### Technical Details

<b>Mounting Method</b>	2 mounting holes in the filter head	
<b>Port Connection</b>	SAE-20 (1-5/8-12UN)	
<b>Flow Direction</b>	Inlet: Side	Outlet: Side
<b>Construction Materials</b>	Aluminum	
<b>Flow Capacity</b>	160 43 gpm (160 lpm) 250 66 gpm (250 lpm) 400 150 gpm (400 lpm)	
<b>Housing Pressure Rating</b>	Max. Operating Pressure 360 psi (25 bar) Proof Pressure 540 psi (38 bar) Fatigue Pressure 360 psi (25 bar) Burst Pressure Contact HYDAC office	
<b>Element Collapse Pressure Rating</b>	BN/HC, W/HC 290 psid (20 bar) Fluid Temperature Range -22° to 250°F (-30° to 121°C)	
<b>Fluid Compatibility</b>	Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.	
<b>Indicator Trip Pressure</b>	$\Delta P = 29$ psid (2 bar) -10% $\Delta P = 72$ psid (5 bar) -10% $\Delta P = 116$ psid (8 bar) -10%	
<b>Bypass Valve Cracking Pressure</b>	$\Delta P = 43$ psid (3 bar) +10% $\Delta P = 102$ psid (7 bar) +10%	

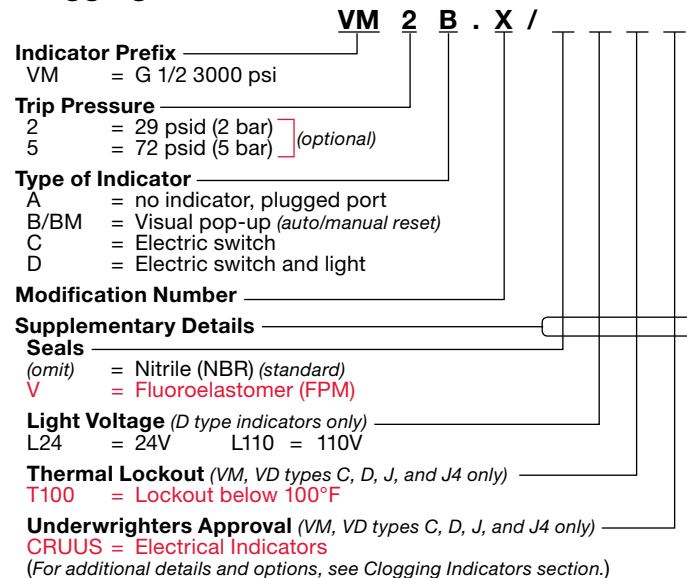
## Model Code



## Replacement Element Model Code



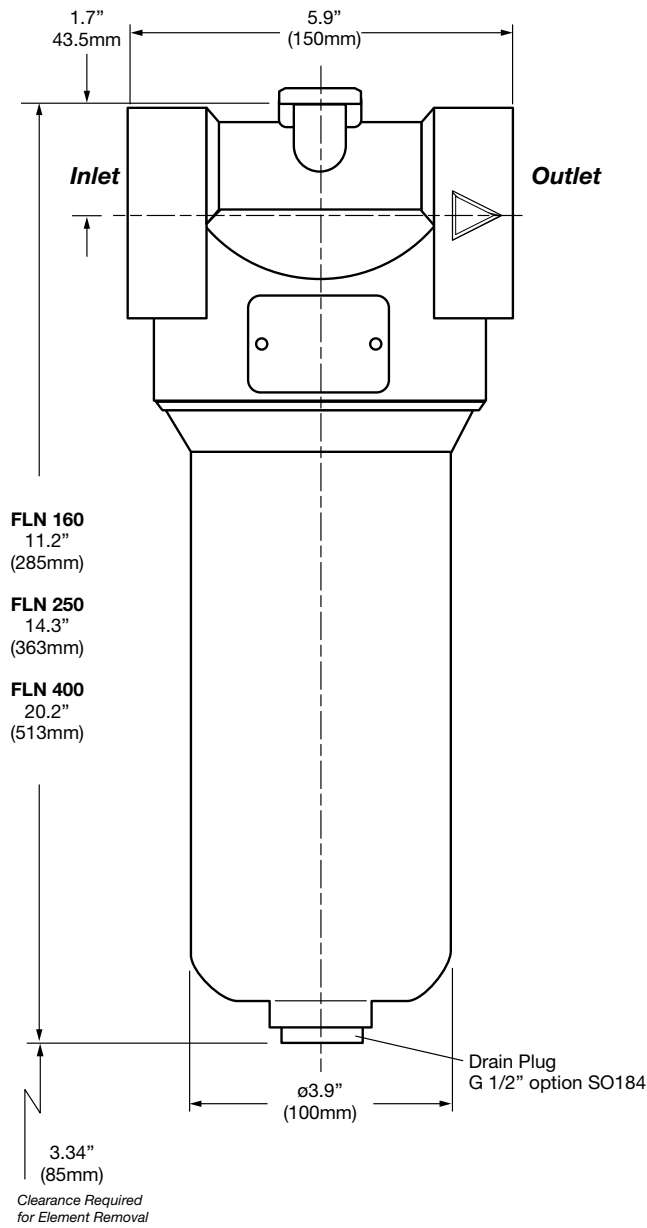
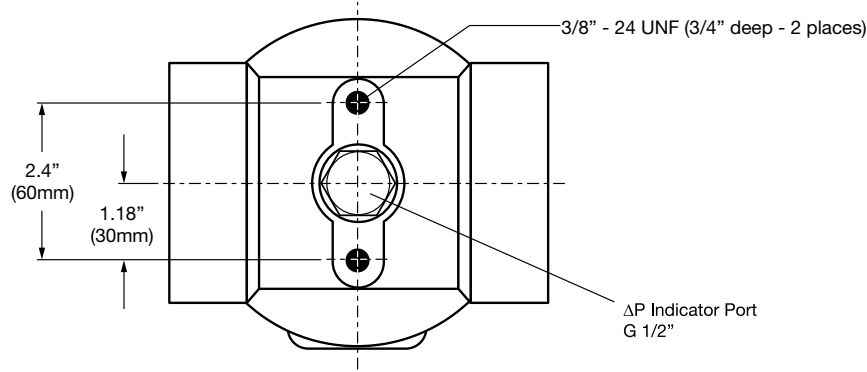
## Clogging Indicator Model Code



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



## Dimensions



Size	160	250	400
Weight (lbs.)	4.3	4.9	5.9

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

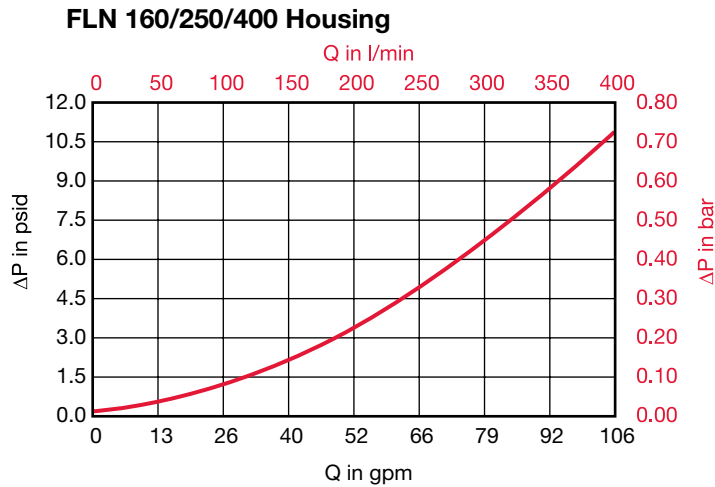
$$\text{Assembly } \Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$$

### 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 section on page 19)



## Element K Factors

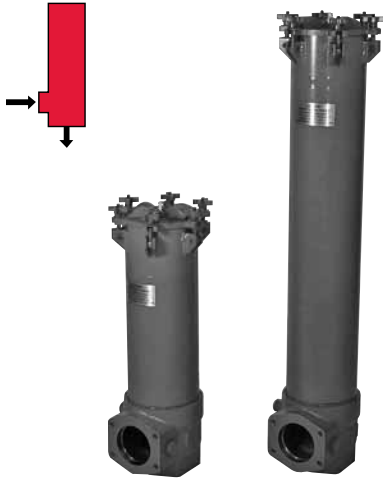
$$\Delta P \text{ Elements} = \text{Elements (K) Flow Factor} \times \text{Flow Rate (gpm)} \times \frac{\text{Actual Viscosity (SUS)}}{141 \text{ SUS}} \times \frac{\text{Actual Specific Gravity}}{0.86}$$

(From Tables Below)

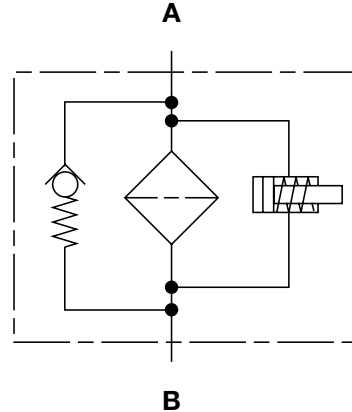
Size	...DN...BN/HC			
	3 μm	5 μm	10 μm	25 μm
0160	0.439	0.306	0.202	0.143
0250	0.275	0.178	0.111	0.091
0400	0.178	0.110	0.073	0.055

All Element K Factors in psi / gpm.

## NFH Series Modular Inline Return Line Filters 500 psi • up to 450 gpm



### Hydraulic Symbol



### Features

- Top access for easy element changeout.
- All models have an air bleed valve (vent) installed in the lid.
- Single large element with no leak points for highest efficiency and dirt capacity
- Lid with swing bolts for fast servicing without tools
- Drain port (Far side) SAE 12 (3/4")
- Clogging Indicator for local and/or remote signals
- Easily banked in parallel (manifolded) for high viscosity applications.
- Available with Betafit elements - consult HYDAC.

### Technical Details

<b>Mounting Method</b>	
NFH	2 mounting holes - filter head
NFH Manifold	Floor mounting brackets
<b>Port Connection</b>	
SAE-64 Flange Code 61	
<b>Flow Direction</b>	
Inlet: Side	Outlet: Bottom
<b>Construction Materials</b>	
Head, Lid, Elbows, Manifolds	Ductile Iron
Housing	Steel
<b>Flow Capacity</b>	
1300	343 gpm (1300 lpm)
2600, 5200, 7800, 10400	450 gpm (1700 lpm)
<b>Housing Pressure Rating</b>	
Max. Operating Pressure	500 psi (35 bar)
Proof Pressure	750 psi (52 bar)
Fatigue Pressure	500 psi (35 bar)
Burst Pressure	> 1440 psi (100 bar)
<b>Element Collapse Pressure Rating</b>	
BN/HC, W/HC	290 psid (20 bar)
ECO/N, BN/AM, P/HC, AM	145 psid (10 bar)
<b>Fluid Temperature Range</b>	
-22° to 250°F (-30° to 121°C)	
<b>Fluid Compatibility</b>	
Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.	
<b>Indicator Trip Pressure</b>	
$\Delta P = 29$ psid (2 bar) -10% (standard)	
$\Delta P = 72$ psid (5 bar) -10% (optional)	
<b>Bypass Valve Cracking Pressure</b>	
$\Delta P = 43$ psid (3 bar) +10%	
$\Delta P = 87$ psid (6 bar) +10%	

### Applications



Automotive



Gearboxes



Industrial



Power Generation



Pulp & Paper



Shipbuilding



Steel / Heavy Industry

## Model Code

**NFH BN/HC 5200 E P 5 C 1 . 1 / 16 A V B1 T70**

**Filter Type** \_\_\_\_\_  
 NFH = In-line Return Line Filter

**Element Media** \_\_\_\_\_  
 BN/HC = Betamicon® (Low Collapse)    ECO/N = ECOmicron® (Low Collapse)  
 AM = Aquamicron®    BN/AM = Betamicon® Aquamicron®  
 P/HC = Polyester    W/HC = Wire Screen

**Size** \_\_\_\_\_  
 1300 = Single NFH    7800 = Manifold: 3 size 2600 Housings  
 2600 = Single NFH    10400 = Manifold: 4 size 2600 Housings  
 5200 = Manifold: 2 size 2600 Housings

**Operating Pressure** \_\_\_\_\_  
 E = 500 psi (34 bar)

**Type of Connection** \_\_\_\_\_  
 P = SAE DN 100 (4") flange

**Filtration Rating (microns)** \_\_\_\_\_  
 3, 5, 10, 20 = BN/HC, ECO/N    10, 20 = P/HC    3, 10 = BN/AM  
 25, 74, 149 = W/HC    40 = AM

**Type of ΔP Clogging Indicator** \_\_\_\_\_  
 A, B/BM, C, D

**Type Number** \_\_\_\_\_  
 1

**Modification Number (latest version always supplied)** \_\_\_\_\_

**Port Configuration** \_\_\_\_\_  
 16 = SAE-64, (4") Code 61 Flange

**Flow Path (facing connecting manifold)** \_\_\_\_\_  
 (omit) = Sizes 1300 and 2600 only    C = Left inlet, Right outlet ] (sizes 5200 - 10400 only)  
 A = Left inlet, Left outlet    D = Right inlet, Left outlet ]  
 B = Right inlet, Right outlet ] (sizes 5200 - 10400 only)

**Seals** \_\_\_\_\_  
 (omit) = Nitrile (NBR) (standard)    V = Fluoroelastomer (FPM)    EPR = Ethylene Propylene (EPDM)

**Bypass Valve** \_\_\_\_\_  
 (omit) = 43 psid Bypass (standard)  
 B1 = 15 psid Bypass  
 B6 = 87 psid Bypass ] not available with ECO/N  
 KB = No Bypass ]

**Supplementary Details** \_\_\_\_\_  
 L24, L48, L110, L220 = Lamp for D-type clogging indicator (LXX, XX = voltage)  
 T100 = Indicator Thermal Lockout, 100°F (C and D only)  
 S0103H = Modification of BN4HC and P/HC Elements for Phosphate Esters

## Replacement Element Model Code

**1300 R 010 BN4HC / V**

**Size** \_\_\_\_\_  
 1300, 2600

**Type** \_\_\_\_\_  
 R

**Filtration Rating (micron)** \_\_\_\_\_  
 3, 5, 10, 20 = BN4HC, ECO/N    3, 10 = BN/AM  
 40 = AM    10, 20 = P/HC  
 25, 74, 149 = W/HC

**Element Media** \_\_\_\_\_  
 BN4HC, ECO/N, BN/AM, AM, P/HC, W/HC

**Supplementary Details** \_\_\_\_\_  
 (omit) = standard  
 V = Fluoroelastomer (FPM) seals

## Clogging Indicator Model Code

**VM 2 B . X /**

**Indicator Prefix** \_\_\_\_\_  
 VM = G 1/2 3000 psi

**Trip Pressure** \_\_\_\_\_  
 2 = 29 psid (2 bar) ] (optional)  
 5 = 72 psid (5 bar) ]

**Type of Indicator** \_\_\_\_\_  
 A = no indicator, plugged port  
 B/BM = Visual pop-up (auto/manual reset)  
 C = Electric switch  
 D = Electric switch and light

**Modification Number** \_\_\_\_\_

**Supplementary Details** \_\_\_\_\_

**Seals** \_\_\_\_\_  
 (omit) = Nitrile (NBR) (standard)  
 V = Fluoroelastomer (FPM)

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

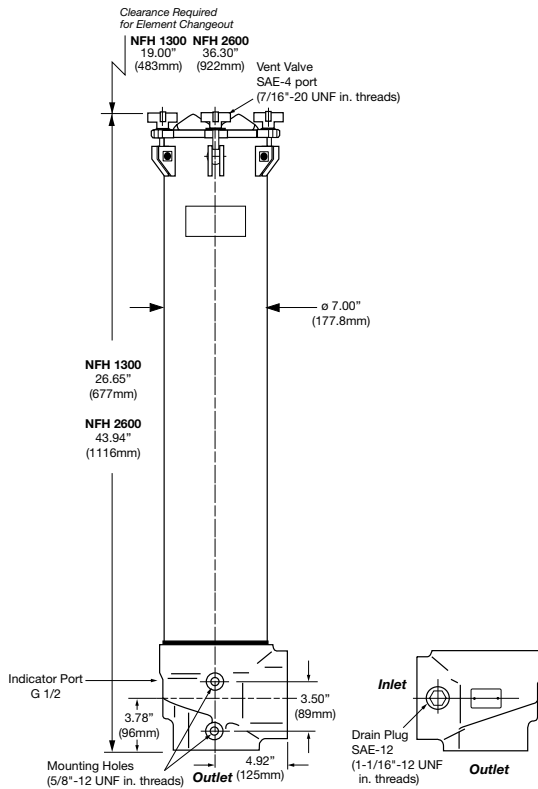
**Thermal Lockout (VM, VD types C, D, J, and J4 only)** \_\_\_\_\_  
 T100 = Lockout below 100°F

**Underwriters Approval (VM, VD types C, D, J, and J4 only)** \_\_\_\_\_  
 CRUUS = Electrical Indicators  
 (For additional details and options, see Clogging Indicators section.)

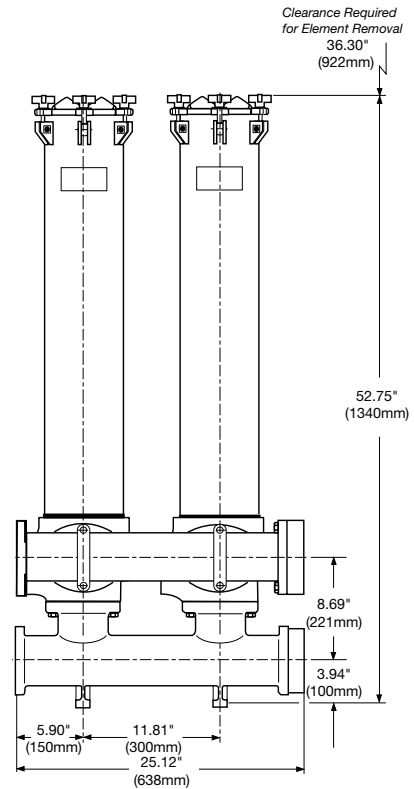
Model Codes Containing RED are non-stock items — Minimum quantities may apply — Contact HYDAC for information and availability

## Dimensions

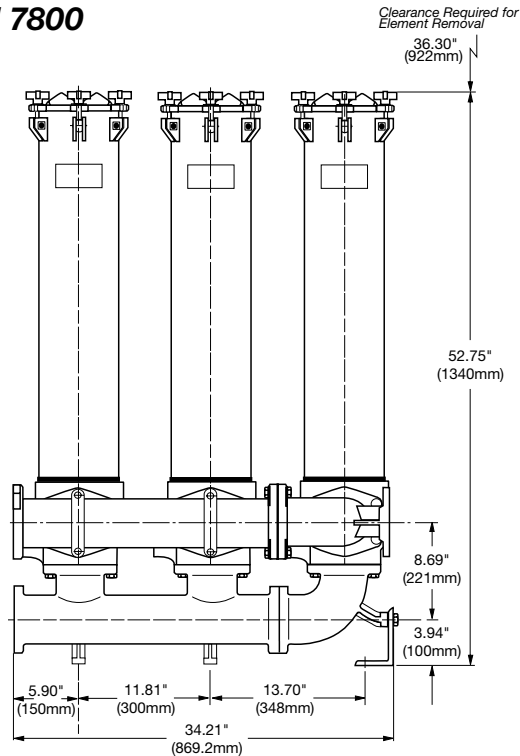
### NFH 1300 / 2600



### NFH 5200



### NFH 7800



### NFH 10400 (Consult HYDAC)

Size	1300	2600	5200	7800	10400
Weight (lbs.)	83	109	343	458	658

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

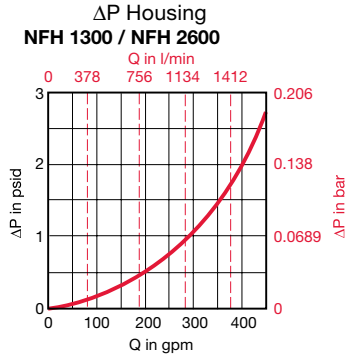
$$\text{Assembly } \Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$$

### Housing Curve:

Pressure loss through housing is as follows:

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

The curve below shows the clean  $\Delta P$  through the Housing for a single filter. To determine Clean  $\Delta P$  for manifolds with multiple housings, multiply the Clean  $\Delta P$  curve value by the percentage values in the table.



NFH System	Multiplier
5200	73%
7800	61%
10400	48%

### Example

Conditions	
400 gpm flow	
NFH 5200 manifold specified	
$\Delta P$ Curve	= 2 psid
$\Delta P$ 5200	= 2 psid X 0.73
	= 1.5 psid <small>Piping &amp; Housing</small>
$\Delta P$ Total System = 1.5 psid + $\Delta P$ Element	

### Bypass Valve Curve:

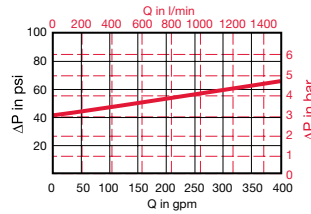
Curves shown are applicable for mineral oil with a specific gravity of 0.86. Differential pressure increases in proportion to the specific gravity of the fluid.

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

### Element $\Delta P$ Calculations:

Sizing (K) Flow Factors below show the pressure drops across clean elements (excluding housings and piping). (K) Factors are calculated from mineral based fluid at viscosity of 141 SUS and specific gravity of 0.86. To determine clean  $\Delta P$  for NFH manifolds with more than one housing, use the adjusted (K) factors below and multiply by total flow rate.

### 1300 / 2600 Bypass Valve



### Example

Conditions	
Lube system	
Viscosity of 1,000 SUS	
Specific gravity 0.86	
75 gpm flow	
Low pressure drop essential	
10 $\mu\text{m}$ Betamicon® filter element	
Selection	
An NFH 2600 filter gives an Adjusted Clean element $\Delta P$ as follows:	
Clean $\Delta P$ = 75 gpm x 0.011 = 0.825 psid	
Clean $\Delta P_{\text{adj.}}$ = 0.825 x $\frac{1000}{141}$ = 5.85 psid	
141	

## Element K Factors

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

(From Tables Below)

Housing Size	# of Elements	Size	...R...BN4HC (Betamicon® Low Collapse)				...R...ECO/N (ECOmicron®)			
			3 $\mu\text{m}$	5 $\mu\text{m}$	10 $\mu\text{m}$	20 $\mu\text{m}$	3 $\mu\text{m}$	5 $\mu\text{m}$	10 $\mu\text{m}$	20 $\mu\text{m}$
1300	1	1300	0.045	0.032	0.024	0.014	0.049	0.034	0.029	0.020
2600	1	2600	0.023	0.016	0.011	0.007	0.024	0.017	0.014	0.010
5200	2	2600	0.012	0.008	0.006	0.004	0.012	0.009	0.007	0.005
7800	3	2600	0.008	0.006	0.004	0.002	0.008	0.006	0.005	0.003
10400	4	2600	0.006	0.004	0.003	0.002	0.006	0.004	0.004	0.003

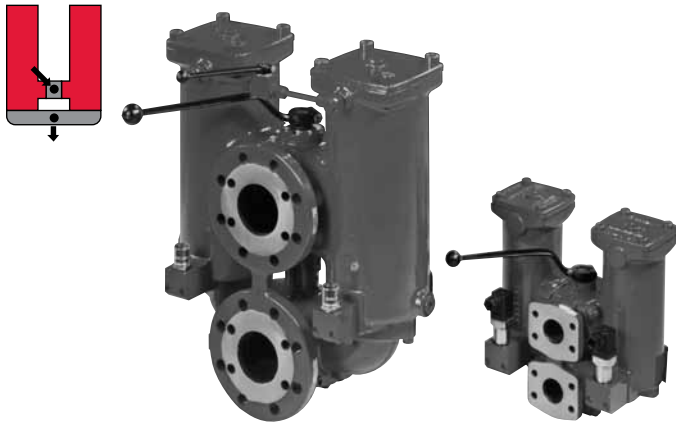
Housing Size	# of Elements	Size	...R...BN/AM		...R...P/HC (Paper)	...R...W/HC (Wire Screen)
			3 $\mu\text{m}$	10 $\mu\text{m}$	10 $\mu\text{m}$	25, 50, 100, 200 $\mu\text{m}$
1300	1	1300	0.088	0.033	0.007	0.0027
2600	1	2600	0.052	0.019	0.003	0.0011
5200	2	2600	0.026	0.010	0.002	0.0005
7800	3	2600	0.017	0.006	0.001	0.0004
10400	4	2600	0.013	0.005	0.0008	0.0003

All Element K Factors in psi / gpm.

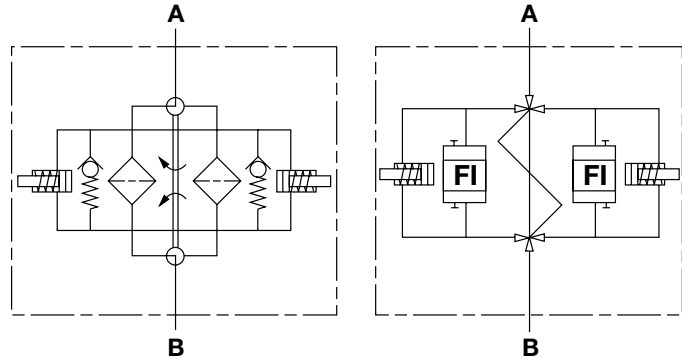
## RFLD Cast Series

### Inline Duplex Filters

580 psi • up to 340 gpm



### Hydraulic Symbol



### Features

- Inlet and outlet connections are located on the same side of the transfer valve. Inlet on top and the outlet on bottom.
- Inlet and outlet connections are available with SAE flanged or NPT connections (sizes 111 & 241 only).
- Transfer valve and pressure equalization line allows easy changeover between filter housings without costly system shutdown. (standard with 851 & 1301)
- Clogging indicators have no external dynamic seal. High reliability is achieved and magnetic actuation eliminates a leak point.

### Technical Details

<b>Mounting Method</b>	Mounting holes on rear of transfer valve	
<b>Port Connection</b>	With metric threads	
111	1" SAE 16 (DN25)	
241	1 1/2" SAE 24 (DN40)	
501	2" SAE 32 (DN50)	
851	2 1/2" SAE 40 (DN65)	
1301	3" SAE 48 (DN80)	
	3" SAE 48 (DN80)	
	4" SAE 64 (DN100)	
<b>Flow Direction</b>	Inlet: Front Top	Outlet: Front Bottom
<b>Construction Materials</b>		
Head, Lid, Elbow	Ductile iron	
<b>Flow Capacity</b>		
111	29 gpm (110 lpm)	
241	63 gpm (240 lpm)	
501	132 gpm (500 lpm)	
851	225 gpm (850 lpm)	
1301	343 gpm (1300 lpm)	
<b>Housing Press. Rating</b>	<b>111 - 241</b>	<b>501 - 1301</b>
Max. Oper. Pressure	580 psi (40 bar)	360 psi (25 bar)
Proof Pressure	870 psi (60 bar)	540 psi (38 bar)
Fatigue Pressure	580 psi (40 bar)	360 psi (25 bar)
Burst Pressure	>2320 psi (160 bar)	>1440 psi (100 bar)
<b>Element Collapse Pressure Rating</b>		
BN/HC, W/HC	290 psid (20 bar)	
ECO/N, BN/AM, P/HC, AM	145 psid (10 bar)	
<b>Fluid Temp. Range</b>	-22° to 250°F (-30° to 121°C)	
<b>Fluid Compatibility</b>		
Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.		
<b>Indicator Trip Pressure</b>		
ΔP = 29 psid (2 bar) -10%		
ΔP = 72 psid (5 bar) -10%		
<b>Bypass Valve Cracking Pressure</b>		
ΔP = 43 psid (3 bar) +10%		
ΔP = 87 psid (6 bar) +10%		

### Applications



Automotive



Gearboxes



Industrial



Power Generation



Pulp & Paper



Railways



Shipbuilding



Steel / Heavy Industry

## Model Code

**Filter Type** \_\_\_\_\_ **RFLD** **BN/HC** **1301** **D** **A** **T** **10** **D** **1** **. X / V**

RFLD = Duplex Inline Filter

**Element Media** \_\_\_\_\_

BN/HC = Betamicon® (Low Collapse)    ECO/N = ECOmicron® (Low Collapse)  
 AM = Aquamicon®    BN/AM = Betamicon®/Aquamicon®  
 P/HC = Polyester    W/HC = Wire Screen

**Sizes** \_\_\_\_\_

111, 241, 501, 851, 1301

**Operating Pressure** \_\_\_\_\_

D = 25 bar (sizes 501, 851, 1301)  
 E = 40 bar (sizes 111, 241)

**Type of Change-over** \_\_\_\_\_

A = ball type change-over valve

**Type of Connection / Connection Sizes** \_\_\_\_\_

I = SAE DN 25 1" (size 111 only)    M = SAE DN 65 2 1/2" (size 851 only)  
 K = SAE DN 40 1 1/2" (sizes 241, 501)    S = SAE DN 80 3" (sizes 851, 1301)  
 L = SAE DN 50 2" (sizes 501 only)    T = SAE DN 100 4" (size 1301 only)

**Filtration Rating (microns)** \_\_\_\_\_

3, 5, 10, 20 = BN/HC, ECO/N    3, 10 = BN/AM    10, 20 = P/HC  
 40 = AM    25, 74, 149 = W/HC

**Type of ΔP Clogging Indicator** \_\_\_\_\_

A, B/BM, C, D

**Type Code** \_\_\_\_\_

1

**Modification Number (latest version always supplied)** \_\_\_\_\_

**Seals** \_\_\_\_\_

(omit) = Nitrile (NBR) (standard)    V = Fluoroelastomer (FPM)    EPR = Ethylene Propylene Rubber (EPDM)

**Bypass Valve Cracking Pressure** \_\_\_\_\_

(omit) = 43 psid (3 bar) (return line - standard)  
 KB = no bypass (flushing system)    ] not available with ECO/N  
 B6 = 87 psid (6 bar) (return line - extended service life)  
 B1 = 15 psid (1 bar) (lubrication or coolant application)  
 B0.2 = 3 psid (0.2 bar) (pump inlet)

**Supplementary** \_\_\_\_\_

W = Indicator with brass piston (for high water base fluids)  
 L24, L48, L110, L220 = Lamp for D-type clogging indicator (LXX, XX = voltage)  
 SO103H = Modification of BN4HC Elements for Phosphate Ester Fluids  
 DE = Dual Indicator Option (one indicator per duplex side)

## Replacement Element Model Code

\_\_\_\_\_ **0110 R 010 BN4HC / V**

**Size** \_\_\_\_\_

0110, 0240, 0500, 0850, 1300

**Filtration Rating (micron)** \_\_\_\_\_

3, 5, 10, 20 = BN4HC, ECO/N    3, 10 = BN/AM  
 40 = AM    10, 20 = P/HC  
 25, 74, 149 = W/HC

**Element Media** \_\_\_\_\_

BN4HC, ECO/N, BN/AM, AM, P/HC, W/HC

**Supplementary Details** \_\_\_\_\_

(omit) = standard  
 V = Fluoroelastomer (FPM) seals

## Clogging Indicator Model Code

\_\_\_\_\_ **VM 2 B . X /**

**Indicator Prefix** \_\_\_\_\_

VM = G 1/2 3000 psi

**Trip Pressure** \_\_\_\_\_

2 = 29 psid (2 bar)    ] (optional)  
 5 = 72 psid (5 bar)

**Type of Indicator** \_\_\_\_\_

A = no indicator, plugged port  
 B/BM = Visual pop-up (auto/manual reset)  
 C = Electric switch  
 D = Electric switch and light

**Modification Number** \_\_\_\_\_

**Supplementary Details** \_\_\_\_\_

**Seals** \_\_\_\_\_

(omit) = Nitrile (NBR) (standard)  
 V = Fluoroelastomer (FPM)

**Light Voltage (D type indicators only)** \_\_\_\_\_

L24 = 24V    L110 = 110V

**Thermal Lockout (VM, VD types C, D, J, and J4 only)** \_\_\_\_\_

T100 = Lockout below 100°F

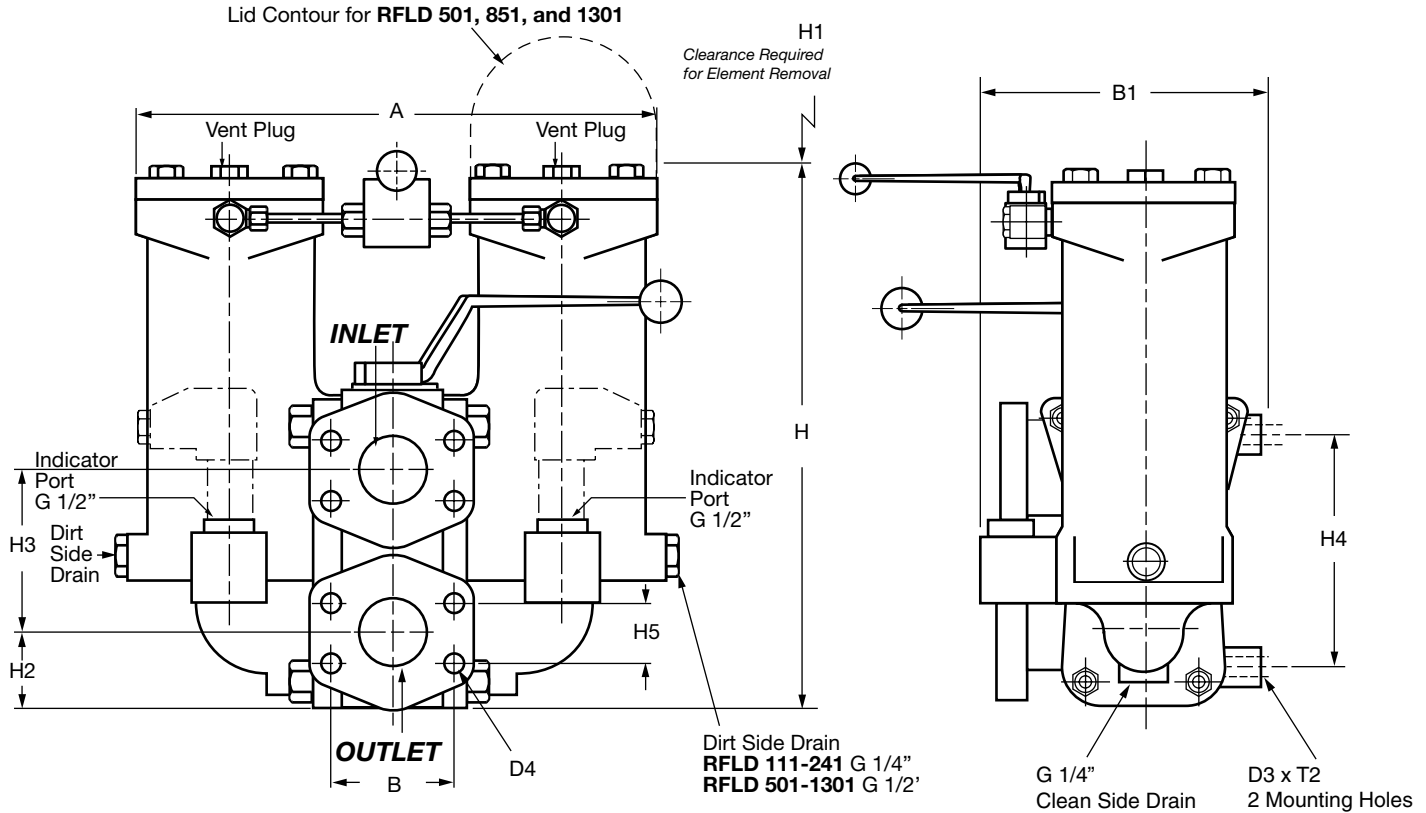
**Underwriters Approval (VM, VD types C, D, J, and J4 only)** \_\_\_\_\_

CRUUS = Electrical Indicators  
 (For additional details and options, see Clogging Indicators section.)

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



## Dimensions



Size	A	B	B1	H	H1	H2	H3	H4	H5	D3	D4	T2	Wgt. (lbs)
RFLD 111 EAI	9.17" (233mm)	2.06" (52mm)	6.30" (160mm)	10.55" (268mm)	7.28" (185mm)	1.30" (33mm)	3.15" (80mm)	3.15" (80mm)	1.03" (26mm)	M 12	M 10	0.98" (25mm)	35
RFLD 241 EAK	11.89" (302mm)	2.75" (70mm)	7.09" (180mm)	12.48" (317mm)	8.46" (215mm)	1.73" (44mm)	3.74" (95mm)	5.51" (140mm)	1.41" (36mm)	M 12	M12	0.71" (18mm)	57
RFLD 501 DAL	14.57" (370mm)	3.06" (78mm)	8.07" (205mm)	16.14" (410mm)	11.22" (285mm)	2.09" (53mm)	4.33" (110mm)	6.50" (165mm)	1.69" (43mm)	M 12	M 12	0.71" (18mm)	82
RFLD 851 DAS	19.52" (496mm)	4.19" (106mm)	9.64" (245mm)	25.67" (652mm)	16.93" (430mm)	3.94" (100mm)	9.06" (230mm)	9.06" (230mm)	2.44" (62mm)	M 12	M 16	0.91" (23mm)	185
RFLD 1301 DAT	21.85" (555mm)	5.13" (130mm)	10.83" (275mm)	29.76" (756mm)	19.68" (500mm)	4.65" (118mm)	9.84" (250mm)	9.84" (250mm)	3.06" (78mm)	M 16	M 16	0.91" (23mm)	262

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

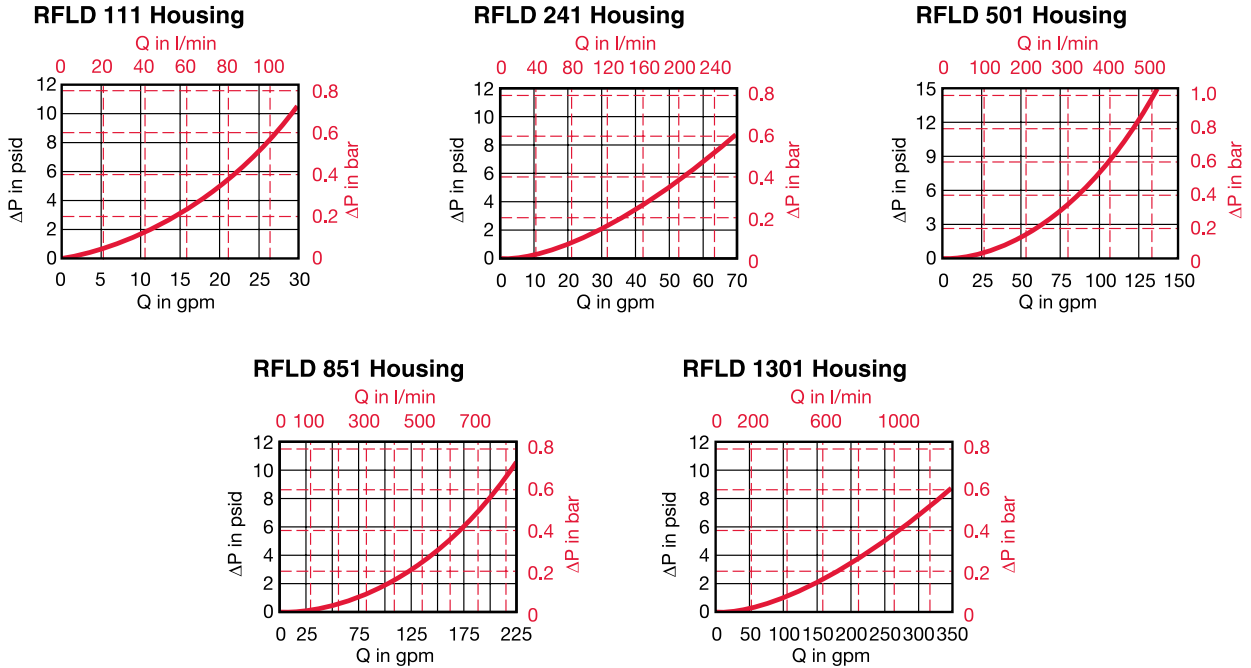
Assembly  $\Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$

### Housing Curve:

Pressure loss through housing is as follows:

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 section on page 19)



## Required Element Per Housing

Housing Size	Element Size	Elements per Side
111	0110	2
241	0240	2
501	0500	2
851	0850	2
1301	1300	2

## Element K Factors

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

Size	...R...BN4HC (Betamicon® Low Collapse)			
	3 μm	5 μm	10 μm	20 μm
0110	0.817	0.517	0.329	0.178
0240	0.338	0.208	0.142	0.096
0500	0.162	0.104	0.069	0.044
0850	0.082	0.055	0.036	0.023
1300	0.045	0.032	0.024	0.014

Size	...R...P/HC (Paper)
	10, 20 μm
110	0.128
240	0.049
500	0.024
850	0.012
1300	0.007

Size	...R...W/HC (Wire Screen)
	25, 50, 100, 200 μm
110	0.0301
240	0.0137
500	0.0066
850	0.0038
1300	0.0027

Size	...R...ECO/N			
	3 μm	5 μm	10 μm	20 μm
0110	-	-	0.464	0.317
0240	-	-	0.209	-
0850	0.078	0.053	0.046	0.032
1300	0.049	0.034	0.029	0.020

Size	...R...P/HC (Paper)
	10, 20 μm
0110	0.128
0240	0.049
0500	0.024
0850	0.012
1300	0.007

Size	...R...BN/AM	
	3 μm	10 μm
1300	0.088	0.033

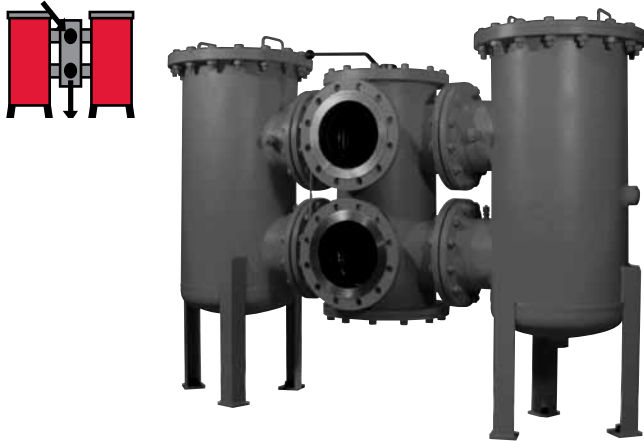
Size	...R...AM
	040A
0500	0.138
0850	0.074
1300	0.048

All Element K Factors in psi / gpm.

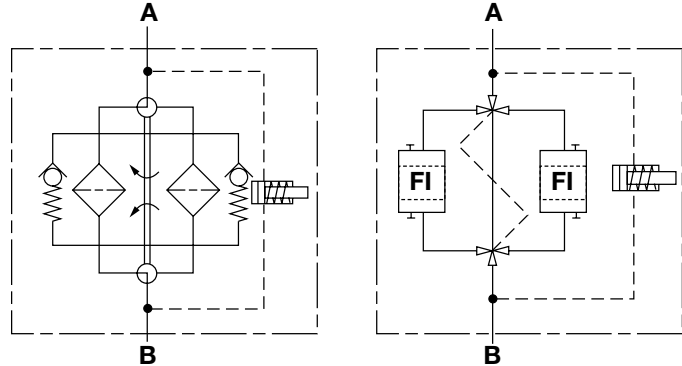
## RFLD Welded Series

### Inline Duplex Filters

230 psi • up to 3900 gpm



### Hydraulic Symbol



### Features

- Models 1300 to 15000 are made of rolled steel housings with bolt-on steel lids; Stainless steel models are available.
- ANSI flange connections for each filter size provide maximum connection flexibility eliminating additional adapters and intermediate flanges.
- Inlet and outlet connections are located on the same side of the transfer valve.
- Transfer valve and pressure equalization line allow easy changeover between filter housings without costly system shutdown.
- Models 5200 to 15000 use the same filter element size (1300 R) allowing maximum standardization in multiple filter element housing.
- Clogging indicators have no external dynamic seal. High reliability is achieved and magnetic actuation eliminates a leak point.

### Technical Details

<b>Mounting Method</b>	Floor mounted legs <i>(Filters must not be used as pipe support)</i>
<b>Port Connection</b>	1300/1320 4" ANSI 150# Flange 2500/2520 6" ANSI 150# Flange 4000/4020 8" ANSI 150# Flange 5200 - 15020 10" ANSI 150# Flange
<b>Flow Direction</b>	Inlet: Front top    Outlet: Front Bottom
<b>Construction Materials</b>	Head, Lid                      Steel Note: Please inquire to the factory for available stainless steel models.
<b>Flow Capacity</b>	1300/1320                      350 gpm (1300 lpm) 2500/2520                      650 gpm (2500 lpm) 4000/4020                      1050 gpm (4000 lpm) 5200/5220                      1400 gpm (5200 lpm) 6500/6520                      1700 gpm (6500 lpm) 7800/7820                      2050 gpm (7800 lpm) 15000/15020                    3900 gpm (15000 lpm)
<b>Housing Pressure Rating</b>	Max. Operating Pressure    150 psi (10 bar) standard 230 psi (16 bar) optional Proof Pressure                345 psi (24 bar) Fatigue Pressure              Contact HYDAC office Burst Pressure                 Contact HYDAC office
<b>Element Collapse Pressure Rating</b>	BN/HC, W/HC                 290 psid (20 bar)
<b>Fluid Temperature Range</b>	-22° to 250°F (-30° to 121°C)
<b>Fluid Compatibility</b>	Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.
<b>Indicator Trip Pressure</b>	$\Delta P = 29$ psid (2 bar) -10% (standard) $\Delta P = 72$ psid (5 bar) -10% (standard)
<b>Bypass Valve Cracking Pressure</b>	$\Delta P = 43$ psid (3 bar) +10% $\Delta P = 87$ psid (6 bar) +10%

### Applications



Automotive



Gearboxes



Industrial



Power Generation



Pulp & Paper



Shipbuilding



Steel / Heavy Industry

## Model Code

**RFLD BN/HC 1300 C A T 3 A 1 . 1 / S 150 V DH**

**Filter Type** \_\_\_\_\_

**Element Media** \_\_\_\_\_

BN/HC = Betamicon® (Low Collapse)      ECO/N = ECOMicon® (Low Collapse)  
 AM = Aquamicron®      BN/AM = Betamicon®/Aquamicron®  
 P/HC = Polyester      W/HC = Wire Screen

**Size** \_\_\_\_\_

1300, 1320, 2500, 2520, 4000, 4020, 5200, 5220, 6500, 6520, 7800, 7820, 15000, 15020

**Operating Pressure** \_\_\_\_\_

B = 150 psi (10 bar)      C = 230 psi (16 bar)

**Type of Change Over Valve** \_\_\_\_\_

A = Ball Valve – ANSI 2", 3", 4", 6" / DN 50, 80, 100, 150 (sizes 1300 - 2520)  
 B = Segment Valve – ANSI 6", 8", 9", 13" / DN 150, 200, 250, 300 (sizes 2500 - 15020)  
 C = Butterfly – ANSI (same as Segment sizes) / DN (same as Segment sizes) (sizes 2500 - 15020)

**Type of Connection** \_\_\_\_\_

2 = 2" ANSI Flange (sizes 1300)	L = DN 50 (sizes 1300 - 2520)
4 = 3" ANSI Flange (sizes 2500)	S = SAE/DIN DN 80 (sizes 1300 - 5220)
5 = 4" ANSI Flange (sizes 1320 & 2520)	T = SAE/DIN DN 100 (sizes 1300 - 7820)
7 = 6" ANSI Flange (sizes 2500 & 2520)	V = DN 150 (sizes 2500 - 7820)
8 = 8" ANSI Flange (sizes 4000 & 4020)	W = DN 200 (sizes 4000 - 15020)
9 = 10" ANSI Flange (sizes 5200 - 7820)	X = DN 250 (sizes 5200 - 15020)
10 = 12" ANSI Flange (sizes 15000 & 15020)	Y = DN 300 (sizes 15000 & 15020)

**Filtration Rating (microns)** \_\_\_\_\_

3, 5, 10, 20 = BN/HC, ECO/N      3, 10 = BN/AM      10, 20 = P/HC  
 40 = AM      25, 74, 149 = W/HC

**Type of ΔP Clogging Indicator** \_\_\_\_\_

A, B/BM, C, D

**Type Code** \_\_\_\_\_

1

**Modification Number (latest version always supplied)** \_\_\_\_\_

**Country of Installation** \_\_\_\_\_

(omit) = standard (non coded)      S = ASME Coded with "U" Stamp

**Flange** \_\_\_\_\_

(omit) = DIN Flange Connection to DIN 2501/1      150 = 150 lbs ANSI Flange

**Seals** \_\_\_\_\_

(omit) = Buna-N      V = Fluoroelastomer (FPM)

**Bypass Valve Cracking Pressure** \_\_\_\_\_

(omit) = 43 psid (3 bar) (return line - standard)  
 B6 = 87 psid (6 bar) (return line - extended service life) ] not available with ECO/N  
 KB = no bypass

**Supplementary** \_\_\_\_\_

(omit) = Cover Lifting Device (Handle only)  
 DH = Cover Lifting Device (Davit lifting mechanism for sizes 4000 and larger, style may vary)  
 L24, L48, L110, L220 = Lamp for D-type clogging indicator (LXX, XX = voltage)  
 W = Indicator with brass piston (for water base fluids)  
 SO103H = Modification of BN4HC Elements for Phosphate Ester Fluids

## Replacement Element Model Code

**0850 R 010 BN4HC / V**

**Size** \_\_\_\_\_

0850, 1300, 1700, 2600

**Filtration Rating (micron)** \_\_\_\_\_

3, 5, 10, 20 = BN4HC, ECO/N      3, 10 = BN/AM  
 25, 74, 149 = W/HC      10, 20 = P/HC  
 40 = AM

**Element Media** \_\_\_\_\_

BN4HC, ECO/N, BN/AM, AM, P/HC, W/HC

**Supplementary Details** \_\_\_\_\_

(omit) = standard  
 V = Fluoroelastomer (FPM) seals

## Clogging Indicator Model Code

**VM 2 B . X /**

**Indicator Prefix** \_\_\_\_\_

VM = G 1/2 3000 psi

**Trip Pressure** \_\_\_\_\_

2 = 29 psid (2 bar) ] (optional)  
 5 = 72 psid (5 bar)

**Type of Indicator** \_\_\_\_\_

A = no indicator, plugged port  
 B/BM = Visual pop-up (auto/manual reset)  
 C = Electric switch  
 D = Electric switch and light

**Modification Number** \_\_\_\_\_

**Supplementary Details** \_\_\_\_\_

**Seals** \_\_\_\_\_

(omit) = Nitrile (NBR) (standard)  
 V = Fluoroelastomer (FPM)

**Light Voltage (D type indicators only)** \_\_\_\_\_

L24 = 24V      L110 = 110V

**Thermal Lockout (VM, VD types C, D, J, and J4 only)** \_\_\_\_\_

T100 = Lockout below 100°F

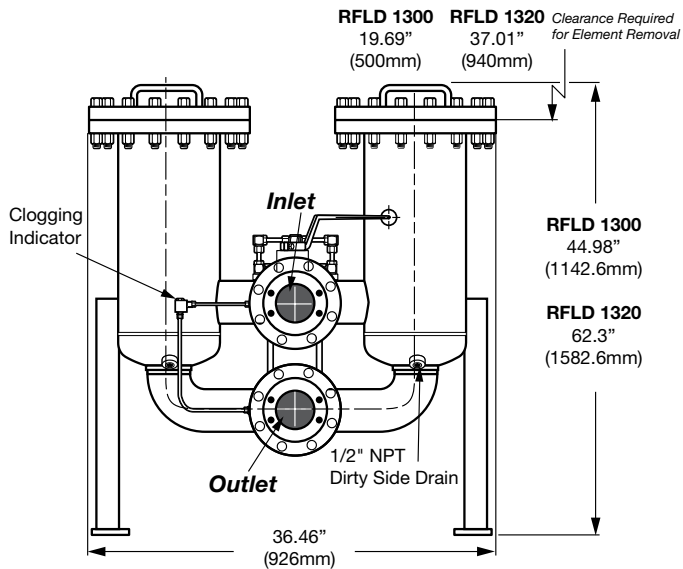
**Underwriters Approval (VM, VD types C, D, J, and J4 only)** \_\_\_\_\_

CRUUS = Electrical Indicators  
 (For additional details and options, see Clogging Indicators section.)

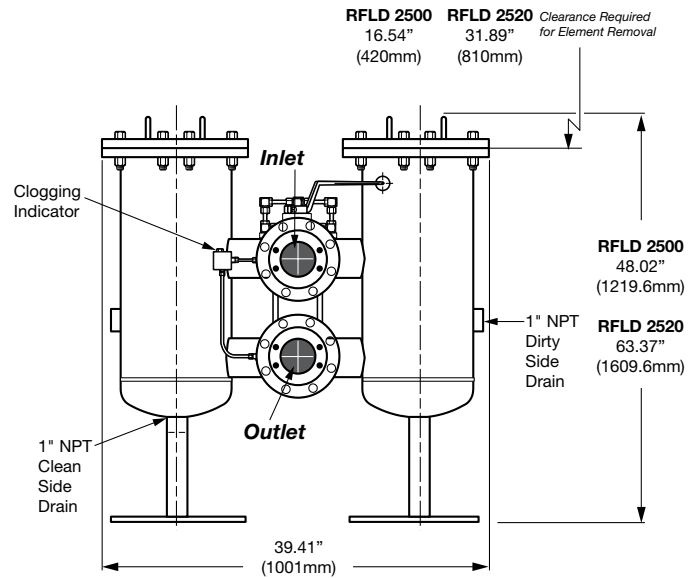
Model Codes Containing RED are non-stock items — Minimum quantities may apply — Contact HYDAC for information and availability

## Dimensions

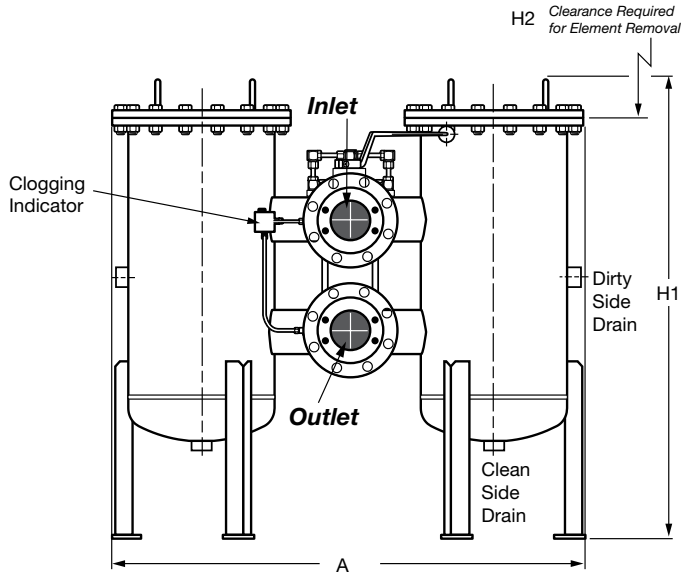
### RFLD 1300 / 1320



### RFLD 2500 / 2520



### RFLD 2500 - 15020 Butterfly Change-Over (Change-Over Type C)



Size	Connection	A	H1
2500/2520	DN 150	54.25/1378	73.62/1108 58.98/1498
4000/4020	DN 150	63.62/1616	46.06/1170 61.42/1560
	DN 200	67.87/1724	47.44/1205 62.80/1595
5200/5220	DN 150	65.59/1666	49.57/1259 66.77/1696
	DN 200	70.63/1794	49.57/1259 66.77/1696
	DN250	79.13/2010	52.20/1326 69.53/1766
6500/6520	DN 150	75.43/1916	49.61/1260 66.93/1700
	DN 200	78.90/2004	54.33/1380 71.65/1820
	DN250	87.01/2210	54.33/1380 71.65/1820
7800/7820	DN 150	75.43/1916	49.61/1260 66.93/1700
	DN 200	78.90/2004	54.33/1380 71.65/1820
	DN250	87.01/2210	54.33/1380 71.65/1820
15000/15020	DN 200	96.46/2450	56.10/1425 73.43/1865
	DN 250	104.17/2646	56.10/1425 73.43/1865
	DN 300	109.69/2786	59.06/1500 76.38/1940

Dimensions are in inches/millimeters.

Size	1300	1320	2500	2520	4000	4020	5200	5220	6500	6520	7800	7820	15000	15020
Weight (lbs.)	330	403	577	643	1023	1111	1962	2204	2471	2826	2490	2861	3205	3578

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

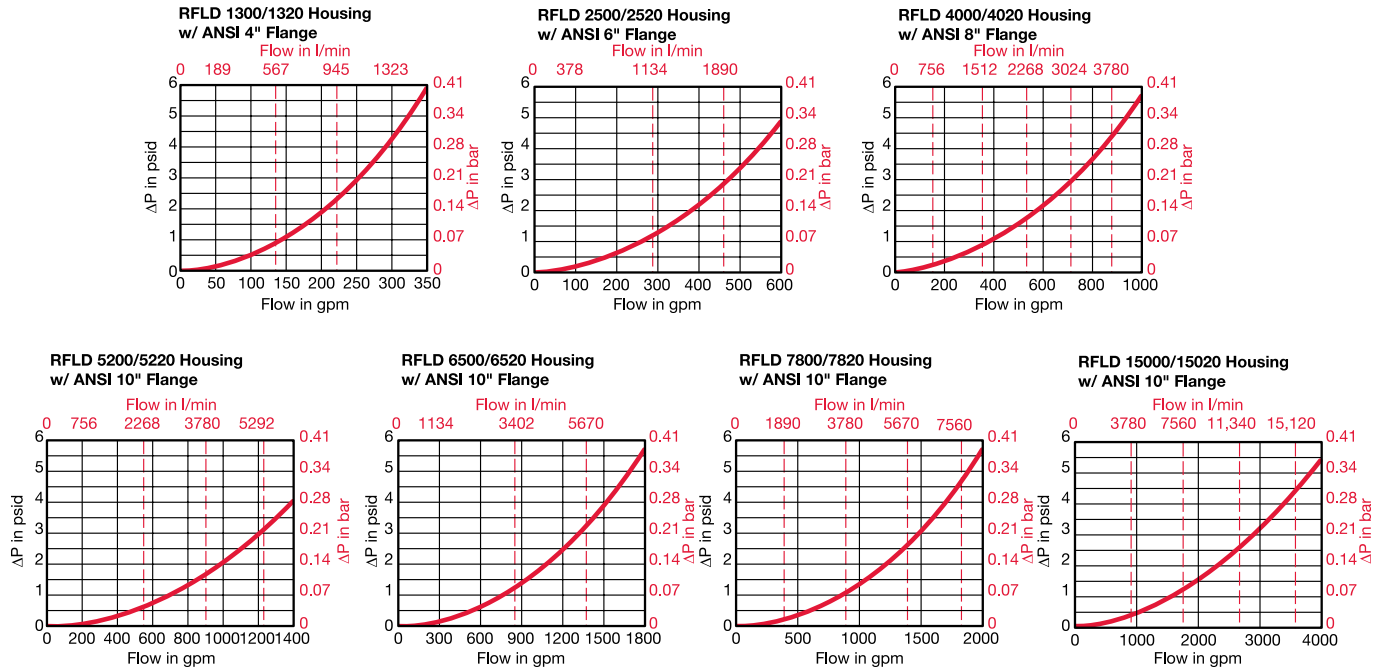
$$\text{Assembly } \Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$$

### 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 section on page 21)



## Required Element Per Housing

Housing Size	Element Size	Elements per Side
1300 / 1320	1300 / 2600	1 / 1
2500 / 2520	0850 / 1700	3 / 3
4000 / 4020	0850 / 1700	5 / 5
5200 / 5220	1300 / 2600	4 / 4
6500 / 6520	1300 / 2600	5 / 5
7800 / 7820	1300 / 2600	6 / 6
15000 / 15020	1300 / 2600	10 / 10

## Element K Factors

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

(From Tables Below)

Size	...R...BN4HC (Betamicron® Low Collapse)			
	3 μm	5 μm	10 μm	20 μm
0850	0.082	0.055	0.036	0.023
1300	0.045	0.032	0.024	0.014
1700	0.040	0.029	0.018	0.011
2600	0.023	0.016	0.011	0.007

Size	...R...W/HC (Wire Screen)	
	25, 50, 74, 100, 149, 200 μm	
850		0.0038
1300		0.0027
1700		0.0019
2600		0.0011

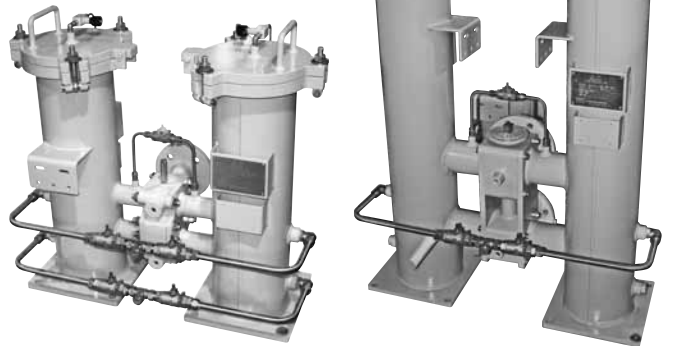
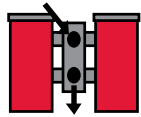
Size	...R...ECO/N			
	3 μm	5 μm	10 μm	20 μm
0850	0.078	0.053	0.046	0.032
1300	0.049	0.034	0.029	0.020
1700	0.038	0.026	0.023	-
2600	0.024	0.017	0.014	0.010

All Element K Factors in psi / gpm.

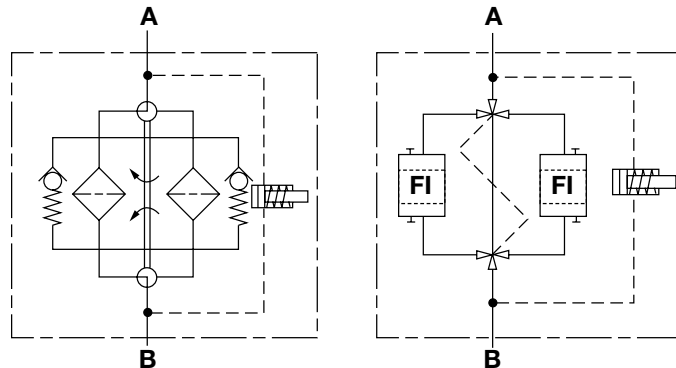
## RFLDH Welded Series

### Inline Duplex Filters

150 psi • up to 700 gpm



### Hydraulic Symbol



### Features

- Models are available in carbon and stainless steel versions. Lids are swing bolt mounted.
- ANSI flange connections.
- Inlet and outlet connections are located on the same side of the transfer valve.
- Transfer valve and pressure equalization line allow easy changeover between filter housings without costly system shutdown.
- Clogging indicators have no external dynamic seal. High reliability is achieved and magnetic actuation eliminates a leak point.
- Stainless drain piping with ball valves available.
- Air bleed line available.
- ASME coded with U-stamp available.
- API Compliant versions available

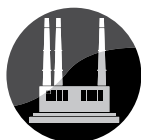
### Applications



Automotive



Gearboxes



Industrial



Power Generation



Pulp & Paper



Shipbuilding



Steel / Heavy Industry

### Technical Details

<b>Mounting Method</b>	Floor mounted legs <i>(Filters must not be used as pipe support)</i>
<b>Port Connection</b>	1300/1303 2" ANSI 150# Flange 2500/2503 3" ANSI 150# Flange 1320/1323, 2520/2523 4" ANSI 150# Flange 4020/4023 6" ANSI 150# Flange
<b>Flow Direction</b>	Inlet: Front top Outlet: Front Bottom
<b>Construction Materials</b>	1300, 1320, 2500, 2520, 4020 - Carbon Steel 1303, 1323, 2503, 2523, 4023 - Stainless Steel
<b>Flow Capacity</b>	1300/1303 167 gpm (650 lpm) 1320/1323 304 gpm (1150 lpm) 2500/2503 270 gpm (1050 lpm) 2520/2523 525 gpm (2000 lpm) 4020/4023 700 gpm (2650 lpm)
<b>Housing Pressure Rating</b>	Max. Operating Pressure 150 psi (10 bar) standard Proof Pressure 345 psi (24 bar) Fatigue Pressure Contact HYDAC office Burst Pressure Contact HYDAC office
<b>Element Collapse Pressure Rating</b>	BN/HC, W/HC 290 psid (20 bar)
<b>Fluid Temperature Range</b>	-22° to 250°F (-30° to 121°C)
<b>Fluid Compatibility</b>	Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.
<b>Indicator Trip Pressure</b>	$\Delta P = 29$ psid (2 bar) -10% $\Delta P = 72$ psid (5 bar) -10%
<b>Bypass Valve Cracking Pressure</b>	$\Delta P = 43$ psid (3 bar) +10% $\Delta P = 87$ psid (6 bar) +10%

## Model Code

**RFLDH BN/HC 1300 C A T 3 A 1 . X / S 150 V DH**

**Filter Type** \_\_\_\_\_

**Element Media** \_\_\_\_\_

BN/HC = Betamicon® (Low Collapse)      ECO/N = ECOMicon® (Low Collapse)  
 AM = Aquamicon®      BN/AM = Betamicon®/Aquamicon®  
 P/HC = Polyester      W/HC = Wire Screen

**Size** \_\_\_\_\_

1300 / 1303 / 1320 / 1323 / 2500 / 2503 / 2520 / 2523 / 4020 / 4023

**Operating Pressure** \_\_\_\_\_

B = 150 psi (10 bar)

**Type of Change Over Valve** \_\_\_\_\_

A = Ball Valve (other ratings available, consult factory)

**Type of Connection** \_\_\_\_\_

3 = 2" ANSI Flange (sizes 1300/1303)  
 4 = 3" ANSI Flange (sizes 2500/2503)  
 5 = 4" ANSI Flange (sizes 1320/1323 & 2520/2523)  
 7 = 6" ANSI Flange (sizes 4020/4023)

**Filtration Rating (microns)** \_\_\_\_\_

3, 5, 10, 20 = BN/HC, ECO/N      3, 10 = BN/AM      10, 20 = P/HC  
 40 = AM      25, 74, 149 = W/HC

**Type of ΔP Clogging Indicator** \_\_\_\_\_

A, B/BM, C, D

**Type Code** \_\_\_\_\_

1

**Modification Number (latest version always supplied)** \_\_\_\_\_

**Country of Installation** \_\_\_\_\_

(omit) = (non coded)      S = ASME Coded with "U" Stamp

**Flange** \_\_\_\_\_

150 = 150 lbs ANSI Flange

**Seals** \_\_\_\_\_

(omit) = Buna-N      V = Fluoroelastomer (FPM)

**Bypass Valve Cracking Pressure** \_\_\_\_\_

(omit) = 43 psid (3 bar) (return line - standard)  
 B6 = 87 psid (6 bar) (return line - extended service life) ] not available with ECO/N  
 KB = no bypass

**Supplementary** \_\_\_\_\_

(omit) = Cover Lifting Device (Handle only)  
 DH = Cover Lifting Device (Davit lifting mechanism for sizes 4020 and larger, style may vary)  
 L24, L48, L110, L220 = Lamp for D-type clogging indicator (LXX, XX = voltage)  
 W = Indicator with brass piston (for water base fluids)  
 SO103H = Modification of BN4HC Elements for Phosphate Ester Fluids  
 SB = Equalization lines (standard)  
 VKD = Drain piping  
 EM = Air bleed valves

## Replacement Element Model Code

**0850 R 010 BN4HC / V**

**Size** \_\_\_\_\_

0850, 1300, 1700, 2600

**Filtration Rating (micron)** \_\_\_\_\_

3, 5, 10, 20 = BN4HC, ECO/N      3, 10 = BN/AM  
 25, 74, 149 = W/HC      10, 20 = P/HC  
 40 = AM

**Element Media** \_\_\_\_\_

BN4HC, ECO/N, BN/AM, AM, P/HC, W/HC

**Supplementary Details** \_\_\_\_\_

(omit) = standard  
 V = Fluoroelastomer (FPM) seals

## Clogging Indicator Model Code

**VM 2 B . X /**

**Indicator Prefix** \_\_\_\_\_

VM = G 1/2 3000 psi

**Trip Pressure** \_\_\_\_\_

2 = 29 psid (2 bar) ] (optional)  
 5 = 72 psid (5 bar)

**Type of Indicator** \_\_\_\_\_

A = no indicator, plugged port  
 B/BM = Visual pop-up (auto/manual reset)  
 C = Electric switch  
 D = Electric switch and light

**Modification Number** \_\_\_\_\_

**Supplementary Details** \_\_\_\_\_

**Seals** \_\_\_\_\_

(omit) = Nitrile (NBR) (standard)  
 V = Fluoroelastomer (FPM)

**Light Voltage (D type indicators only)** \_\_\_\_\_

L24 = 24V      L110 = 110V

**Thermal Lockout (VM, VD types C, D, J, and J4 only)** \_\_\_\_\_

T100 = Lockout below 100°F

**Underwriters Approval (VM, VD types C, D, J, and J4 only)** \_\_\_\_\_

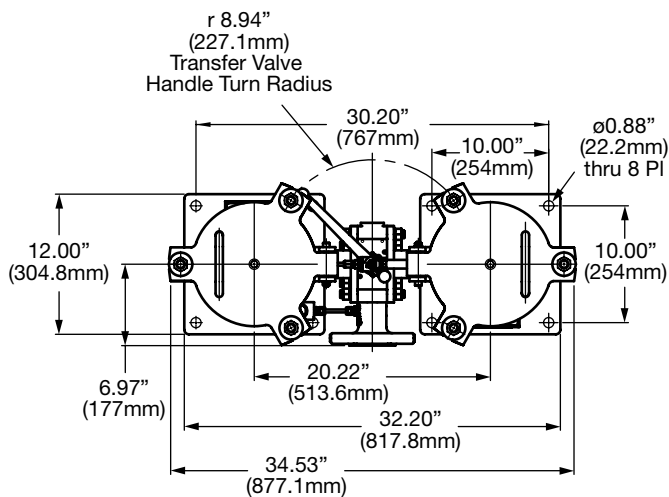
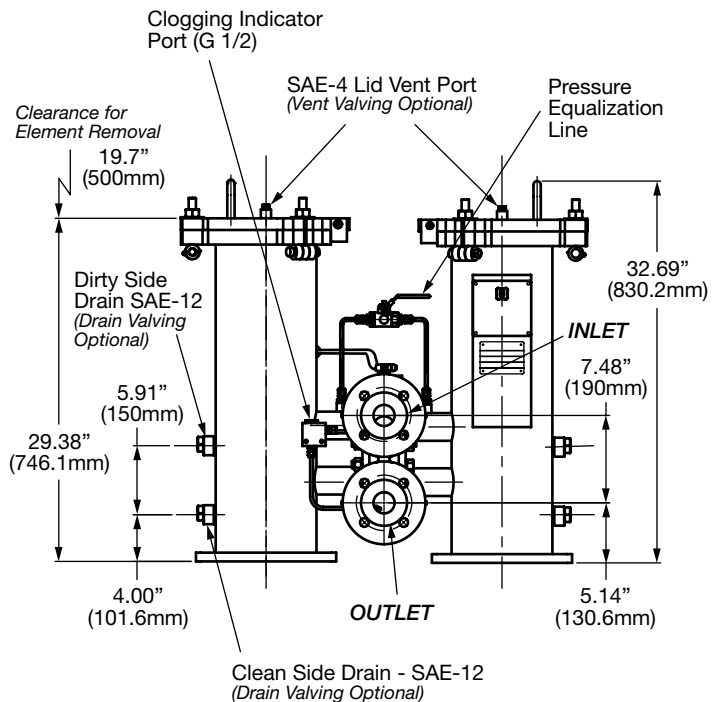
CRUUS = Electrical Indicators  
 (For additional details and options, see Clogging Indicators section.)

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

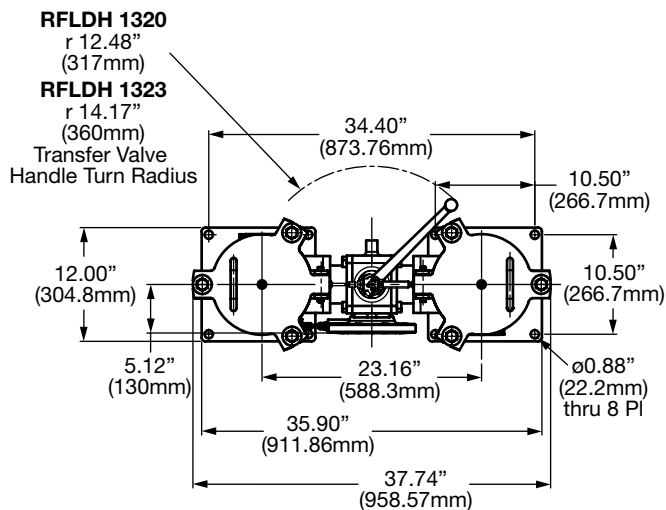
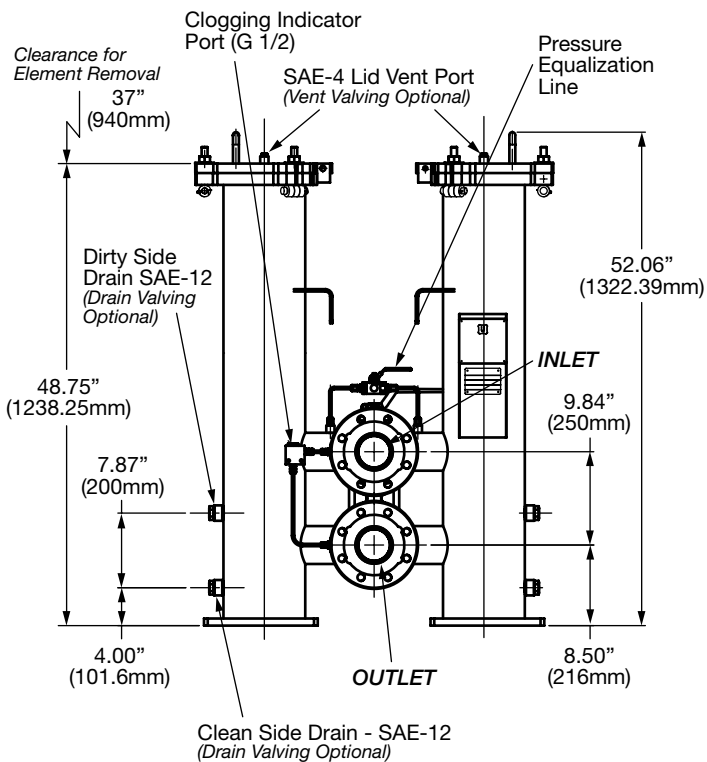


## Dimensions

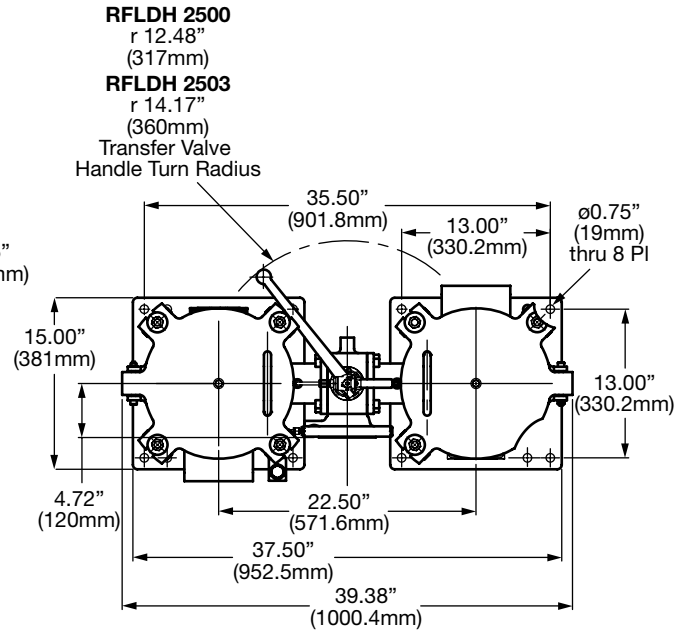
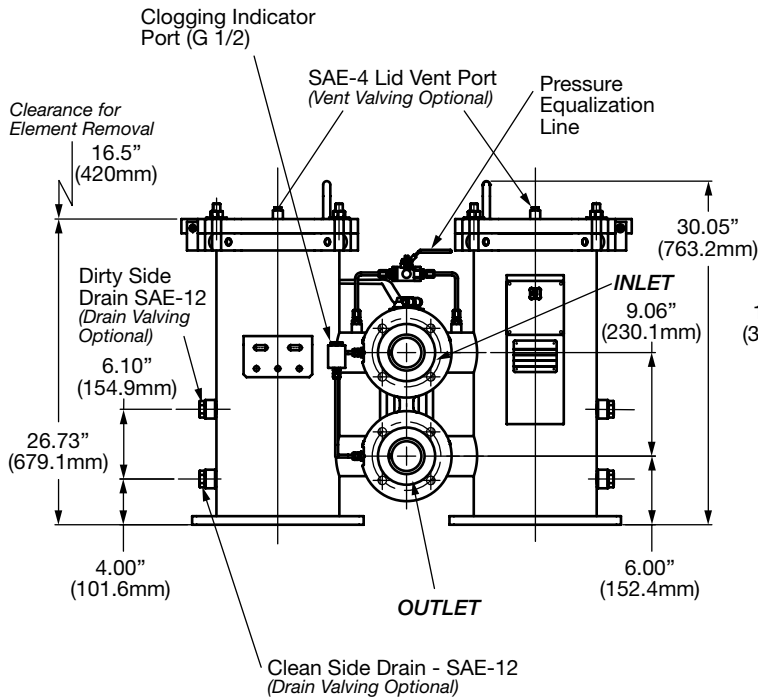
### RFLDH 1300 / 1303



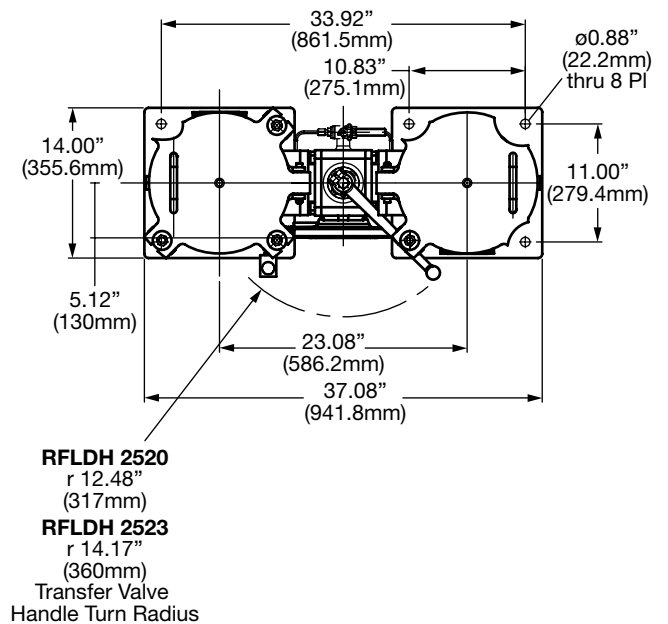
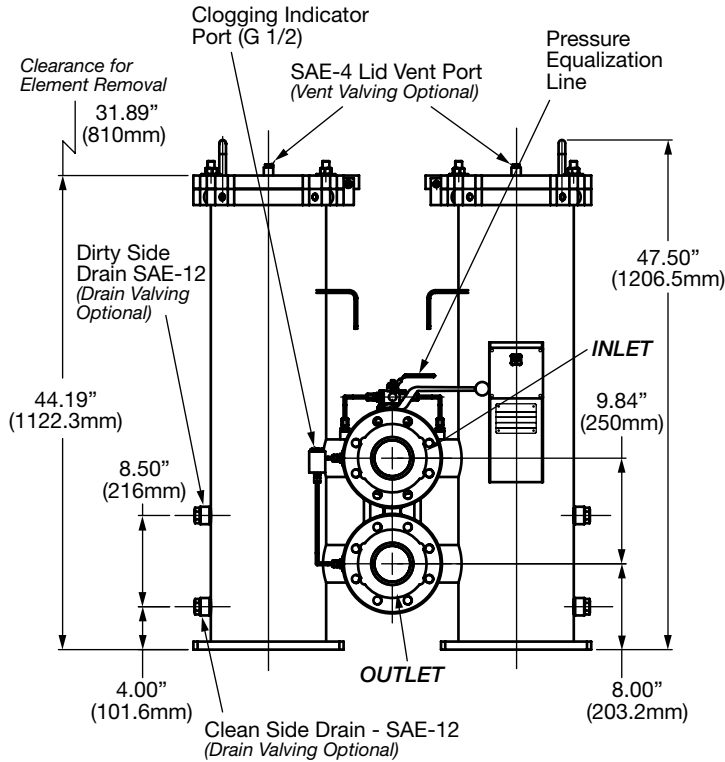
### RFLDH 1320 / 1323



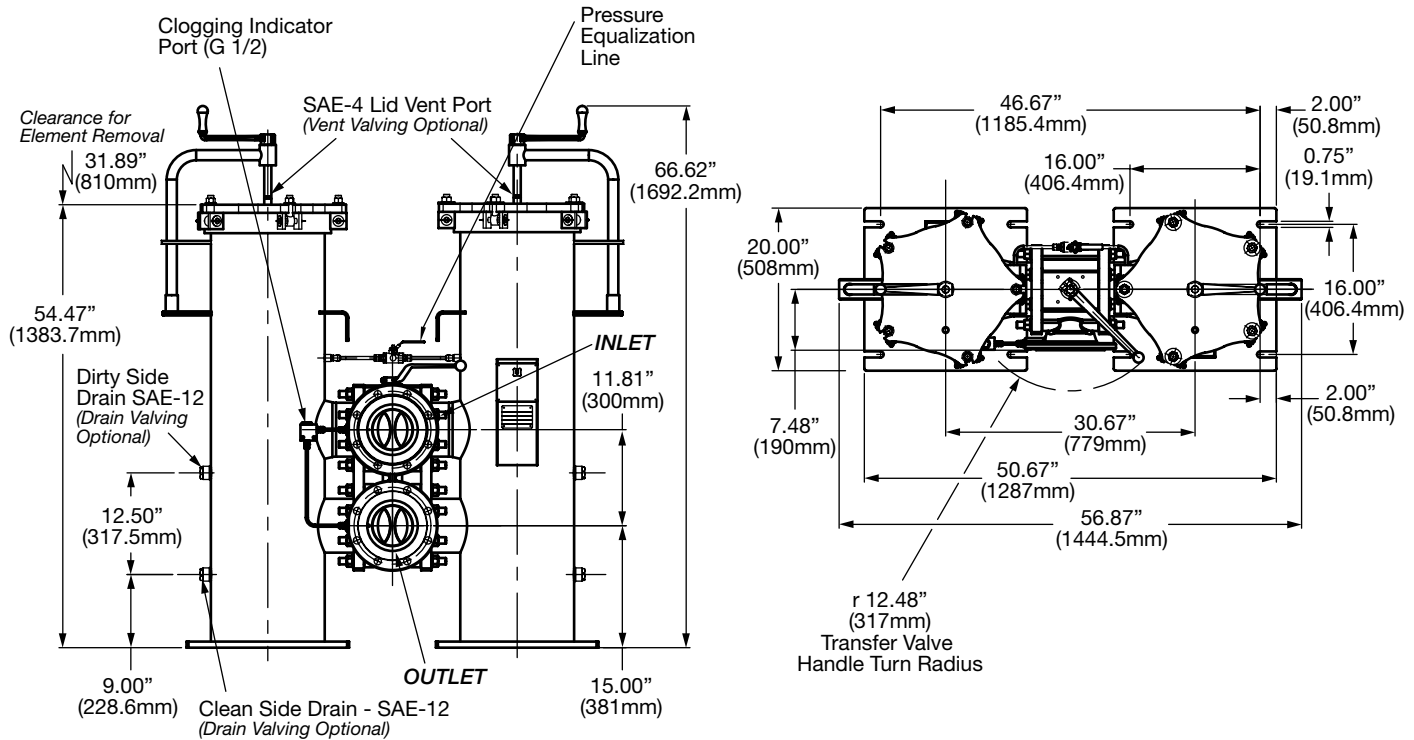
## Dimensions RFLDH 2500 / 2503



## RFLDH 2520 / 2523



## Dimensions RFLDH 4020



## Sizing Information

Total pressure loss through the filter is as follows:

$$\text{Assembly } \Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$$

### Housing Curve:

Pressure loss through housing is as follows:

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

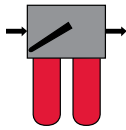
Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see sizing section on page 19)

## Required Element Per Housing

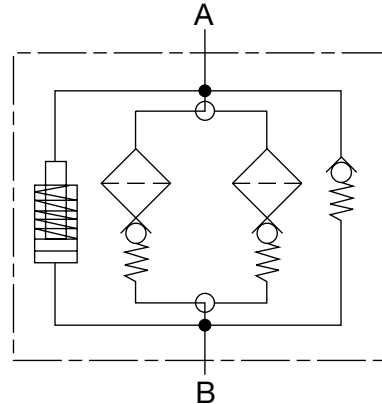
Housing Size	Element Size	Elements per Side
1300 / 1303	1300	1
1320 / 1323	2600	1
2500 / 2503	0850	3
2520 / 2523	1700	3
4020 / 4023	1700	5

**Notes:**

## FLND Series Inline Duplex Filters 360 psi • up to 100 gpm



### Hydraulic Symbol



### Features

- Lightweight duplex filter constructed of aluminum.
- Aluminum alloy is water tolerant - anodization is not required for high water based fluids (HWBF).
- The filter housings are designed to withstand pressure surges as well as high static pressure loads.
- The screw-in bowl allows the filter element to be easily removed for replacement or cleaning.
- A visual (pop-up), electrical, electrical/visual (lamp), or electronic differential type clogging indicator
- The standard model is supplied with vent and drain plugs, and also a connection for differential clogging indicator.
- The pressure is equalized between chambers by raising the change-over lever prior to switching it to the relevant filter side. Thus, the filter contains an integrated equalization valve.

### Technical Details

<b>Mounting Method</b>	4 mounting holes - filter head	
<b>Port Connection</b>	SAE-24 (1-7/8-12UN)	
<b>Flow Direction</b>	Inlet: Side	Outlet: Side
<b>Construction Materials</b>	Aluminum	
<b>Flow Capacity</b>		
160	42 gpm (160 lpm)	
250	66 gpm (250 lpm)	
400	105 gpm (400 lpm)	
<b>Housing Pressure Rating</b>		
Max. Operating Pressure	360 psi (25 bar)	
Proof Pressure	540 psi (38 bar)	
Fatigue Pressure	360 psi (25 bar)	
Burst Pressure	Contact HYDAC office	
<b>Element Collapse Pressure Rating</b>		
BN/HC, W/HC	290 psid (20 bar)	
<b>Fluid Temperature Range</b>	-22° to 250°F (-30° to 121°C)	
<b>Fluid Compatibility</b>	Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.	
<b>Indicator Trip Pressure</b>		
$\Delta P = 29$ psid (2 bar) -10%		
$\Delta P = 72$ psid (5 bar) -10%		
$\Delta P = 116$ psid (8 bar) -10%		
<b>Bypass Valve Cracking Pressure</b>		
$\Delta P = 43$ psid (3 bar) +10%		
$\Delta P = 102$ psid (7 bar) +10%		

### Applications



Automotive



Gearboxes



Industrial



Power Generation



Pulp & Paper

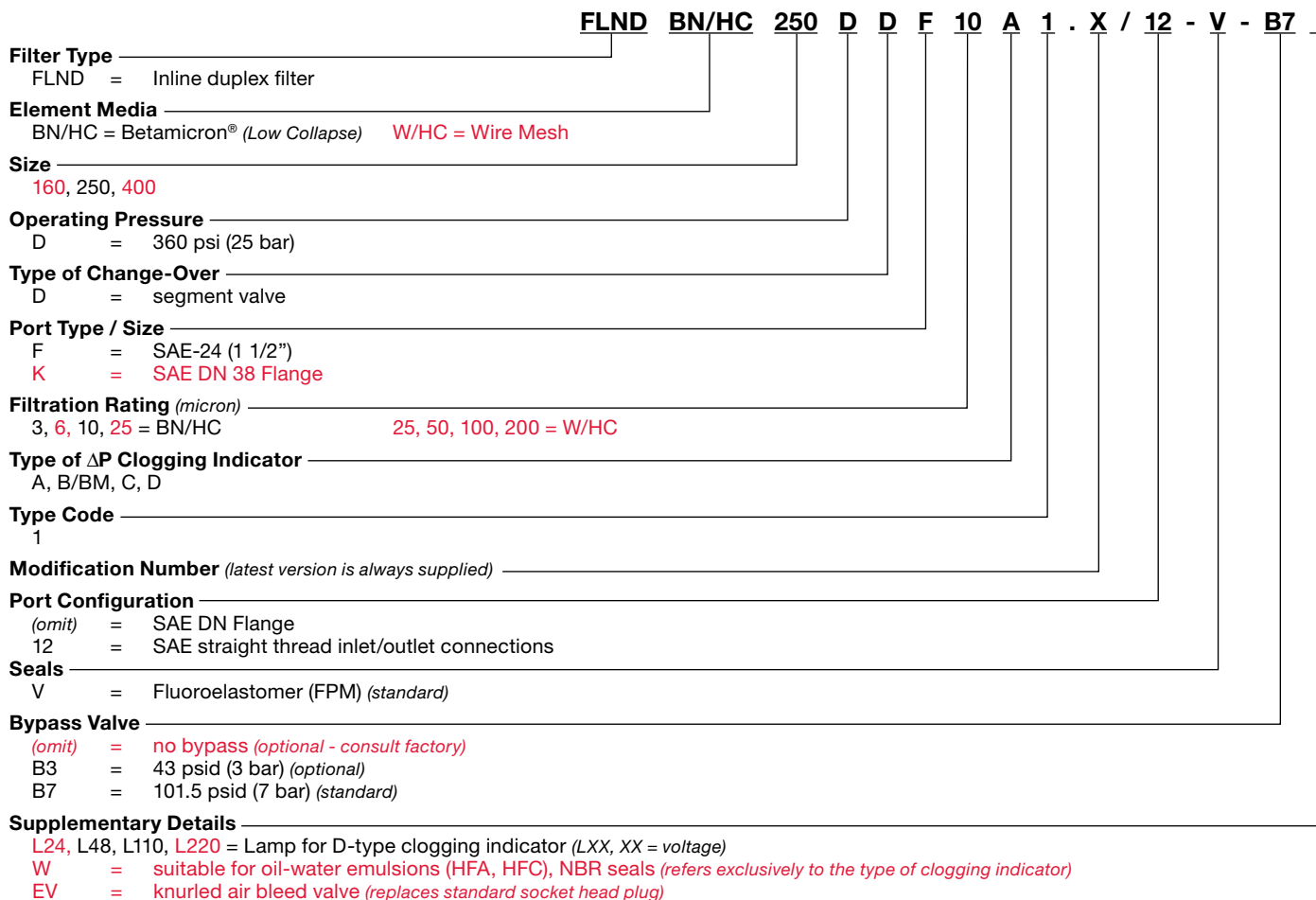


Shipbuilding

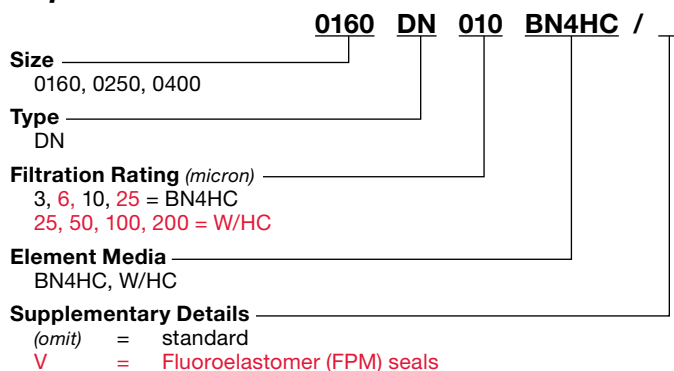


Steel / Heavy Industry

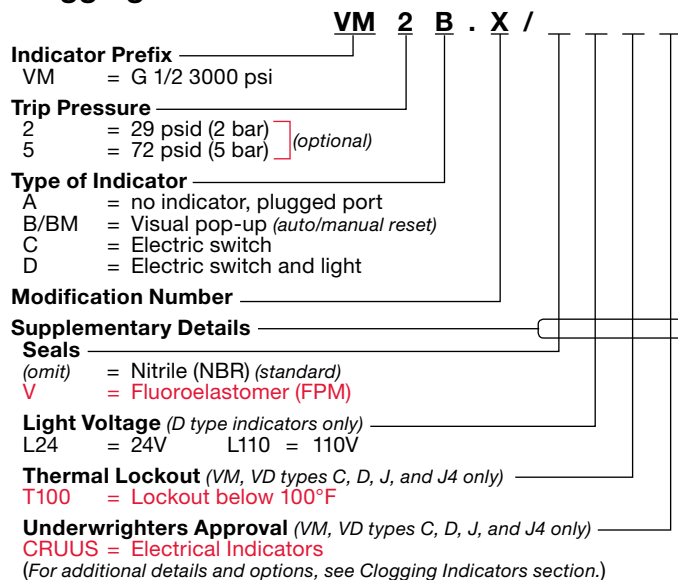
## Model Code



## Replacement Element Model Code

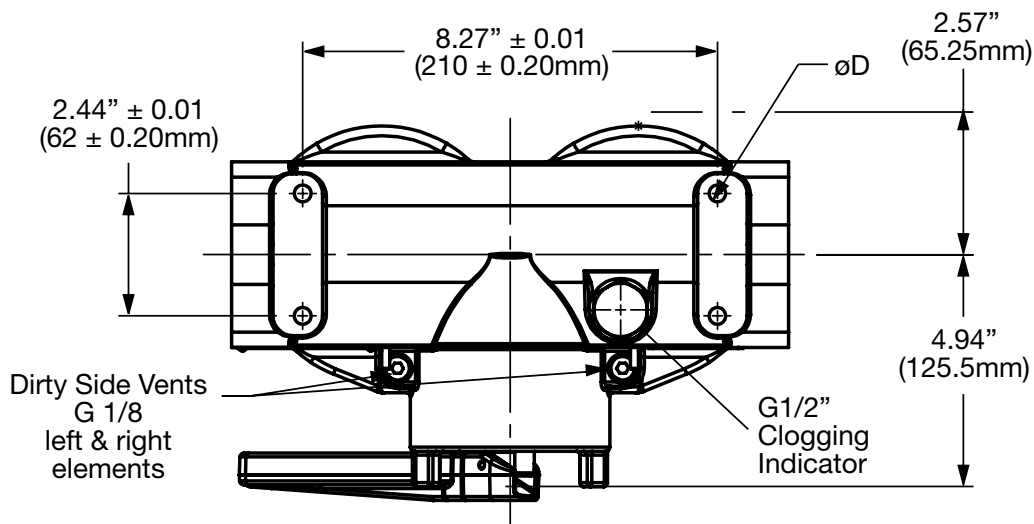


## Clogging Indicator Model Code

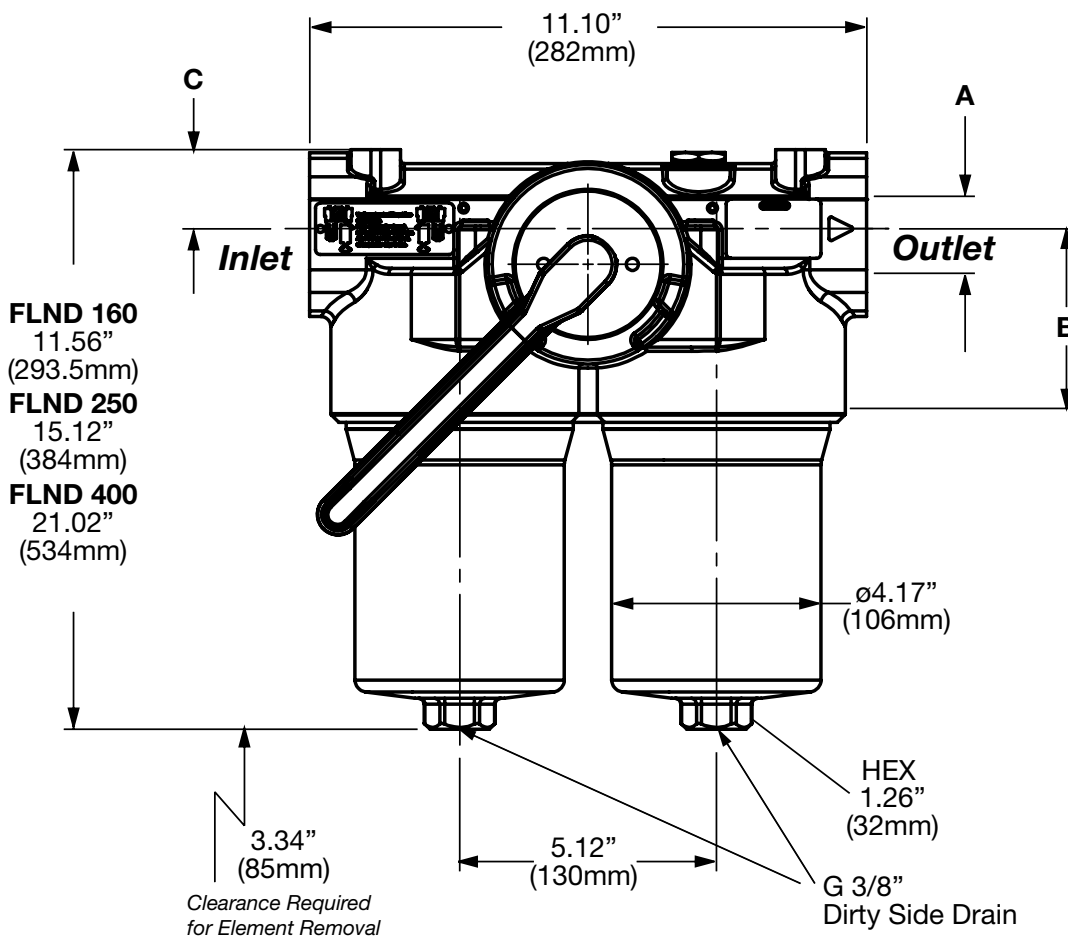


Model Codes Containing RED are non-stock items — Minimum quantities may apply — Contact HYDAC for information and availability

## Dimensions



A	B	C
SAE-24	3.622" (92)	1.575" (40)
DN 38	3.504" (89)	1.693" (43)



Size	160	250	400
Weight (lbs.)	22.7	25.6	28.7

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

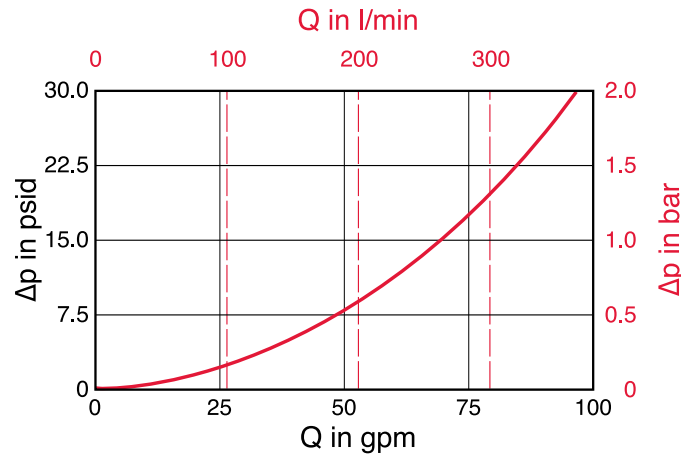
$$\text{Assembly } \Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$$

### 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 section on page 19)



## Element K Factors

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

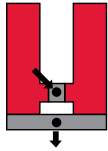
(From Tables Below)

Size	...DN...BN4HC (Betamicon® Low Collapse)			
	3 μm	6 μm	10 μm	25 μm
0160	0.439	0.280	0.190	0.143
0250	0.280	0.177	0.117	0.093
0400	0.178	0.111	0.071	0.055

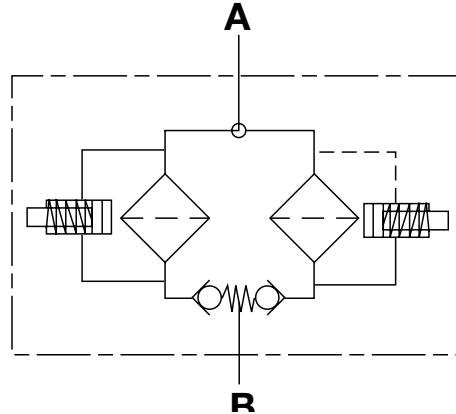
All Element K Factors in psi / gpm.



## NFHD Series Modular Inline Duplex Filters 360 psi • up to 450 gpm



### Hydraulic Symbol



### Features

- Top access for easy element changeout.
- All models have an air bleed valve (vent) installed in the lid.
- Single large element with no leak points for highest efficiency and dirt capacity
- Lid with swing bolts for fast servicing without tools
- Drain port (Far side) SAE 12 (3/4")
- Clogging Indicator for local and remote signals
- Easily banked in parallel (manifolded) for high viscosity applications.
- Available with Betafit elements - consult HYDAC.

### Technical Details

<b>Mounting Method</b>	Floor mounting brackets
<b>Port Connection</b>	SAE-64 Flange Code 61
<b>Flow Direction</b>	Inlet: Side    Outlet: Side
<b>Construction Materials</b>	
Head, Lid, Elbows, Manifolds	Ductile Iron
Housing	Steel
<b>Flow Capacity</b>	
1300	343 gpm (1300 lpm)
2600, 5200, 7800, 10400	450 gpm (1700 lpm)
<b>Housing Pressure Rating</b>	
Max. Operating Pressure	360 psi (25 bar)
Proof Pressure	540 psi (37 bar)
Fatigue Pressure	360 psi (25 bar)
Burst Pressure	> 1440 psi (100 bar)
<b>Element Collapse Pressure Rating</b>	
BN/HC, W/HC	290 psid (20 bar)
ECO/N, BN/AM, P/HC, AM	145 psid (10 bar)
<b>Fluid Temperature Range</b>	-22° to 250°F (-30° to 121°C)
<b>Fluid Compatibility</b>	
Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.	
<b>Indicator Trip Pressure</b>	
$\Delta P = 29$ psid (2 bar) -10% (standard)	
$\Delta P = 72$ psid (5 bar) -10% (optional)	
<b>Bypass Valve Cracking Pressure</b>	
$\Delta P = 43$ psid (3 bar) +10%	
$\Delta P = 87$ psid (6 bar) +10%	

### Applications



Automotive



Gearboxes



Industrial



Power Generation



Pulp & Paper

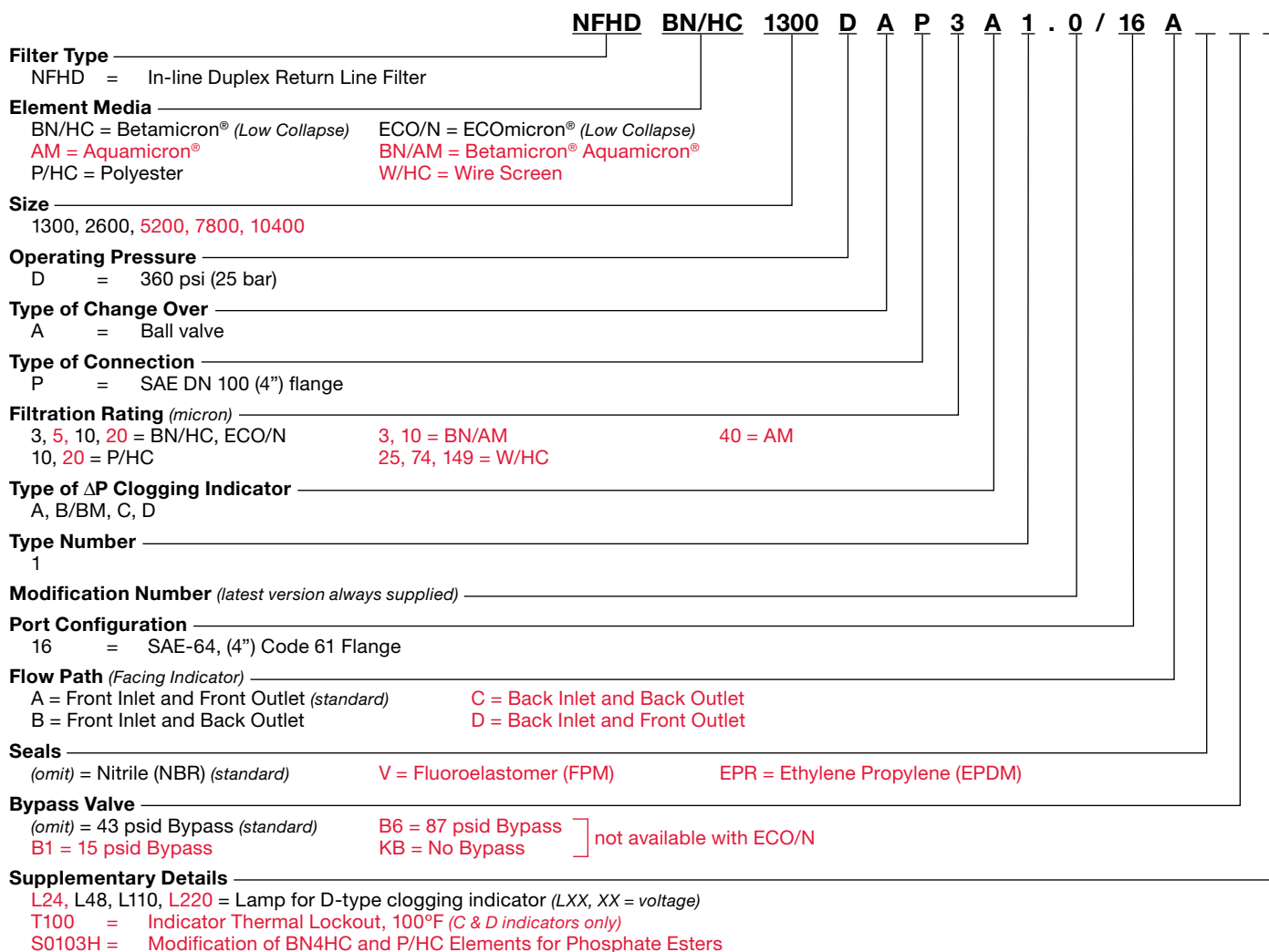


Shipbuilding

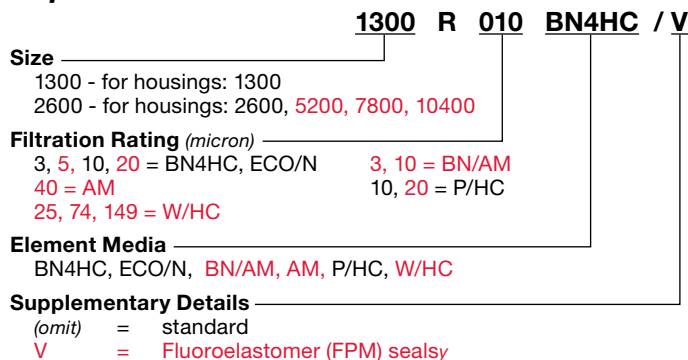


Steel / Heavy Industry

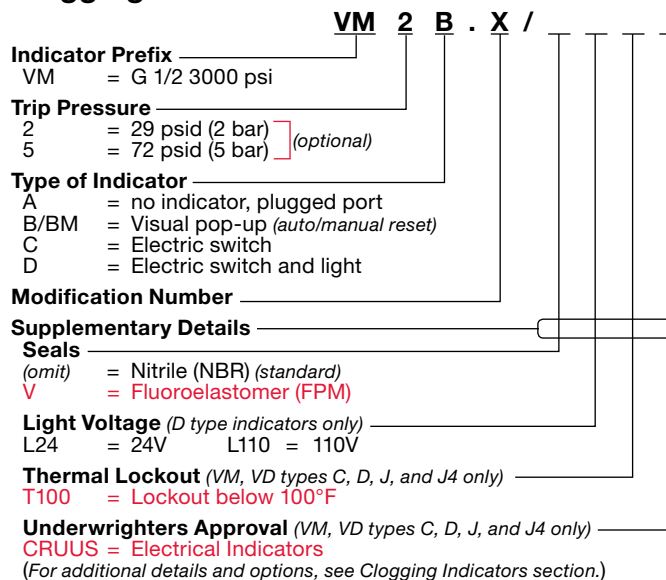
## Model Code



## Replacement Element Model Code



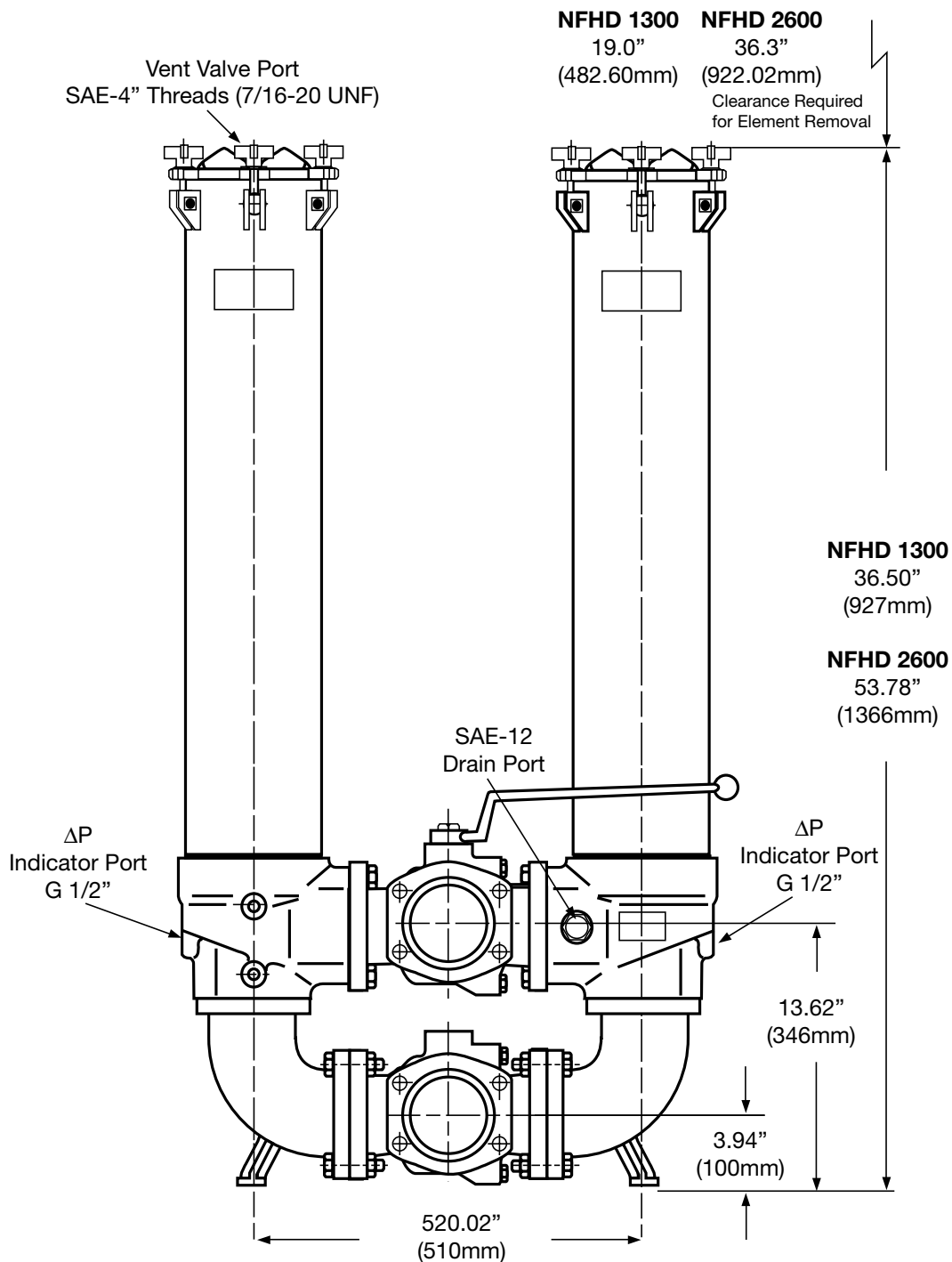
## Clogging Indicator Model Code



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

# HYDAC | Low Pressure Filters

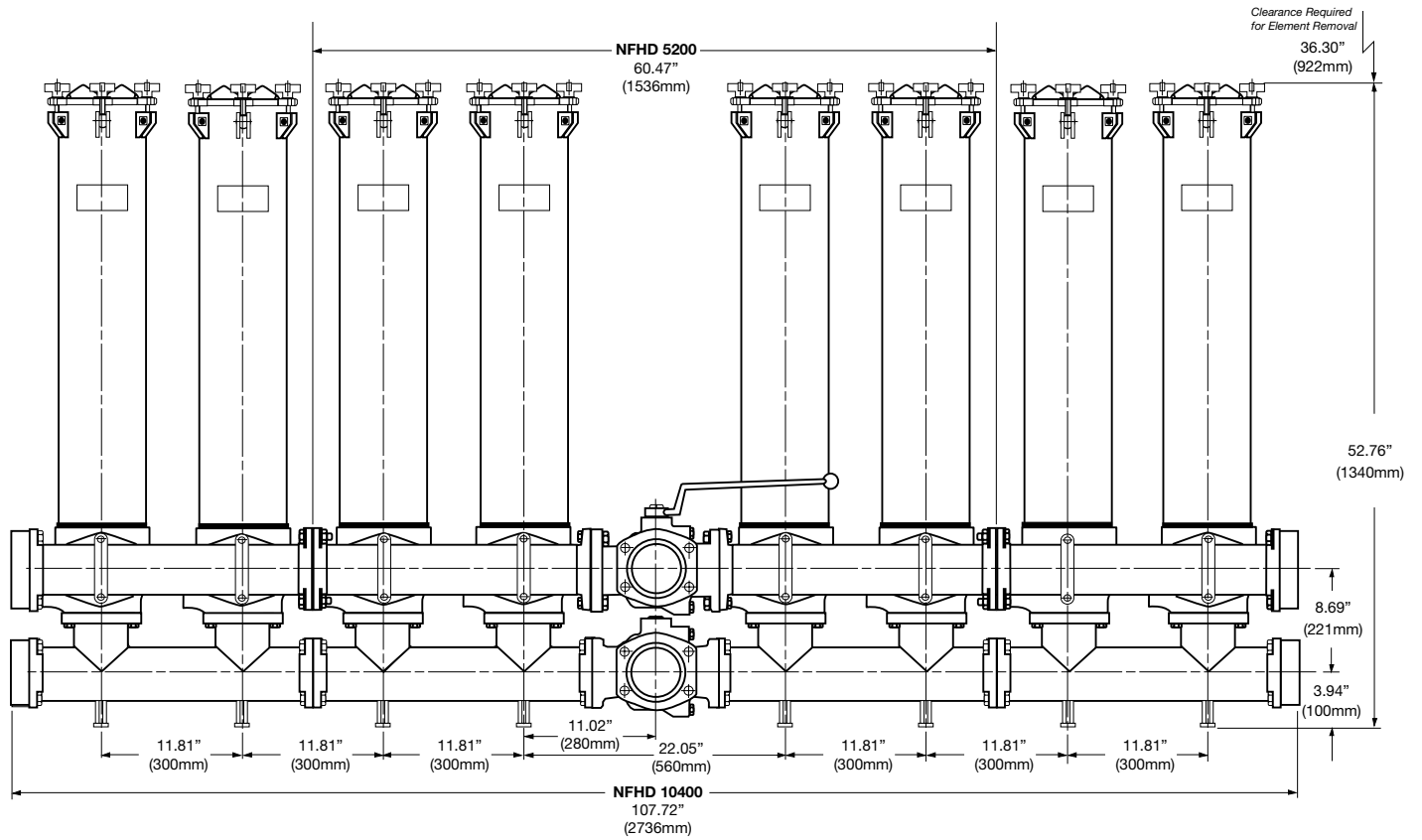
## Dimensions NFHD 1300 / 2600



Size	1300	2600
Weight (lbs.)	294	344

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## NFHD 5200 / 10400

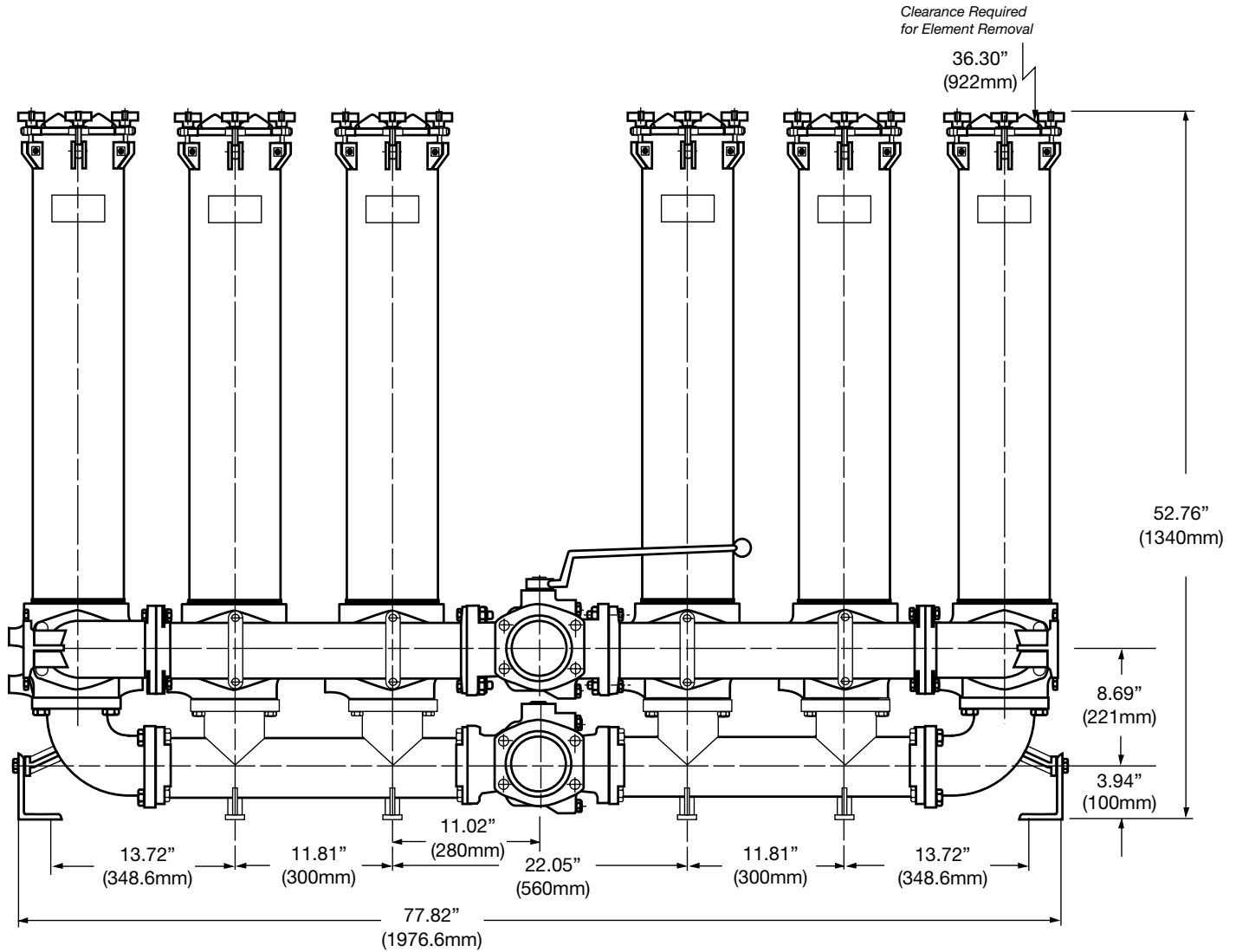


Size	5200	10400
Weight (lbs.)	777	1407

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

# HYDAC | Low Pressure Filters

## NFHD 7800



Size	7800
Weight (lbs.)	1008

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

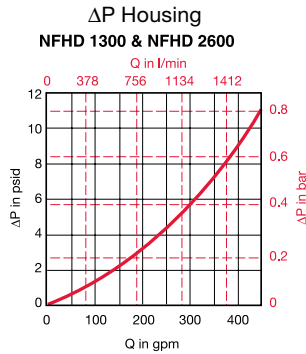
$$\text{Assembly } \Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$$

### Housing Curve:

Pressure loss through housing is as follows:

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

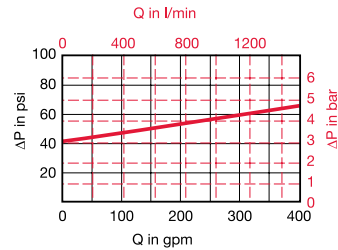
The curve below shows the clean  $\Delta P$  through the Housing for a single filter. To determine Clean  $\Delta P$  for manifolds with multiple housings, multiply the Clean  $\Delta P$  curve value by the percentage values in the table.



NFHD System	Multiplier
5200	93%
7800	83%
10400	74%

### Example

Conditions	
400 gpm flow	
NFHD 5200 manifold specified	
$\Delta P$ Curve	= 9 psid
$\Delta P$ 5200	= 9 psid X 0.73
	= 8.4 psid <small>Piping &amp; Housing</small>
$\Delta P$ Total System = 8.4 psid + $\Delta P$ Element	



### Bypass Valve Curve:

Curves shown are applicable for mineral oil with a specific gravity of 0.86. Differential pressure increases in proportion to the specific gravity of the fluid.

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

### Element $\Delta P$ Calculations:

Sizing (K) Flow Factors below show the pressure drops across clean elements (excluding housings and piping). (K) Factors are calculated from mineral based fluid at viscosity of 141 SUS and specific gravity of 0.86. To determine clean  $\Delta P$  for NFH manifolds with more than one housing, use the adjusted (K) factors below and multiply by total flow rate.

### Example

Conditions	
Lube system	
Viscosity of 1,000 SUS	
Specific gravity 0.86	
75 gpm flow	
Low pressure drop essential	
10 $\mu\text{m}$ Betamicon® filter element	
Selection	
An NFHD 2600 filter gives an Adjusted Clean element $\Delta P$ as follows:	
Clean $\Delta P$ = 75 gpm x 0.017 = 1.275 psid	
Clean $\Delta P_{\text{adj.}}$ = 1.275 x $\frac{1000}{141}$ = 9.04 psid	

## Element K Factors

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

(From Tables Below)

Housing Size	# of Elements	Size	...R...BN4HC (Betamicon® Low Collapse)				...R...ECO/N (ECOmicron®)			
			3 $\mu\text{m}$	5 $\mu\text{m}$	10 $\mu\text{m}$	20 $\mu\text{m}$	3 $\mu\text{m}$	5 $\mu\text{m}$	10 $\mu\text{m}$	20 $\mu\text{m}$
1300	2	1300	0.045	0.032	0.024	0.014	0.049	0.034	0.029	0.020
2600	2	2600	0.023	0.016	0.011	0.007	0.024	0.017	0.014	0.010
5200	4	2600	0.012	0.008	0.006	0.004	0.012	0.009	0.007	0.005
7800	6	2600	0.008	0.006	0.004	0.002	0.008	0.006	0.005	0.003
10400	8	2600	0.006	0.004	0.003	0.002	0.006	0.004	0.004	0.003

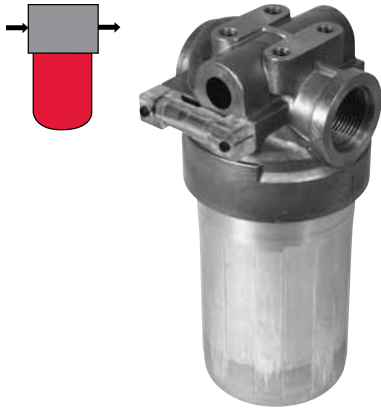
Housing Size	# of Elements	Size	...R...BN/AM		...R...P/HC (Paper)	...R...W/HC (Wire Screen)
			3 $\mu\text{m}$	10 $\mu\text{m}$	10 $\mu\text{m}$	25, 50, 100, 200 $\mu\text{m}$
1300	2	1300	0.088	0.033	0.007	0.0027
2600	2	2600	0.052	0.019	0.003	0.0011
5200	4	2600	0.026	0.010	0.002	0.0005
7800	6	2600	0.017	0.006	0.001	0.0004
10400	8	2600	0.013	0.005	0.0008	0.0003

All Element K Factors in psi / gpm.

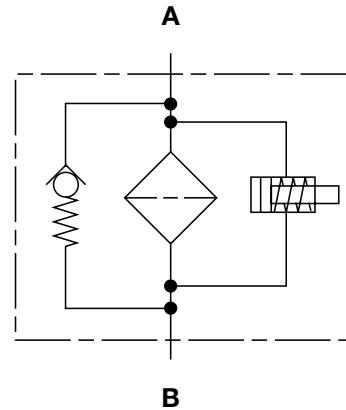
## MFX Series

### Inline Filters

725 psi • up to 35 gpm



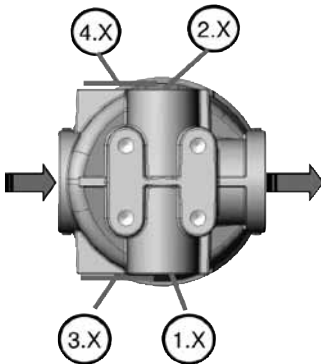
### Hydraulic Symbol



### Features

- Eco-friendly, cost-effective alternative to spin-on filters
- Integrated retrofit protection
- Longer service life of the filter bowl because of fatigue resistant up to 725 psi
- High level operating safety. Bowl seal and bypass valve are integrated in the filter element and therefore renewed at every element change.
- “Missing Element Protection”
- High diversity of clogging indicators
- Various connection types (SAE-12, G 3/4, SAE-16, G 1, M33x2)

### Clogging Indicator Assignment



### Applications



Agricultural



Automotive



Construction



Commercial  
Municipal

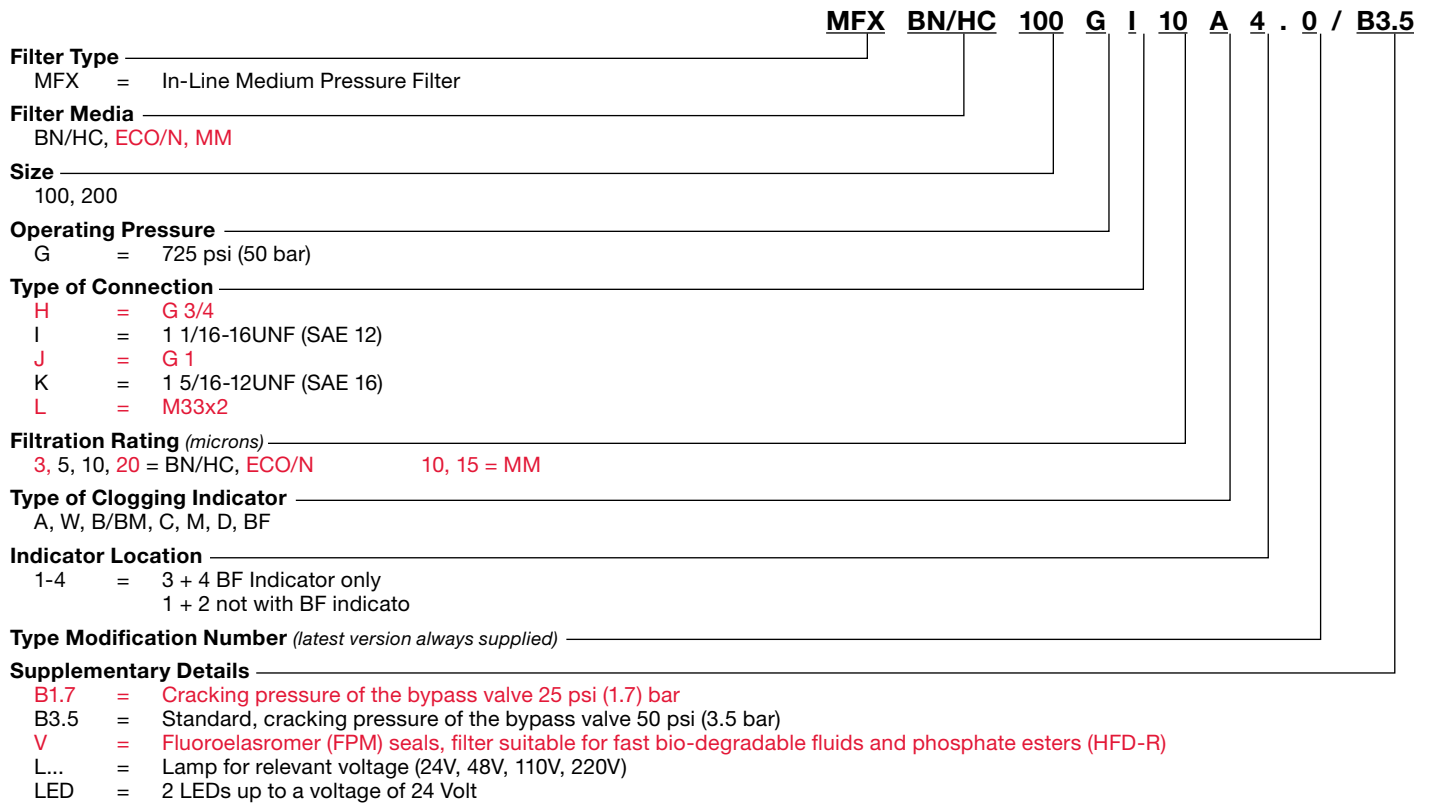


Railways

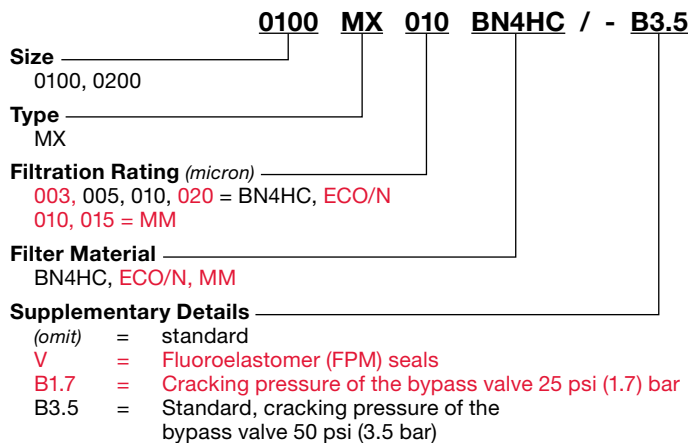
### Technical Details

<b>Mounting Method</b>	4 Mounting holes (3/8-16UNC)
<b>Port Connection</b>	SAE-12, G 3/4 SAE-16, G 1, M33x2
<b>Flow Direction</b>	Inlet: Side      Outlet: Side (opposite each other)
<b>Construction Materials</b>	Head: Die Cast Aluminum Bowl: Extruded Aluminum
<b>Flow Capacity</b>	100: 26 gpm (100lpm) 200: 35 gpm (130 lpm)
<b>Housing Pressure Rating</b>	Max. Operating Pressure: 725 psi (50 bar) Proof Pressure: 870 psi (60 bar) Fatigue Pressure: 725 psi (50 bar) @ 1 million cycles Burst Pressure: 2600 psi (183 bar)
<b>Element Collapse Pressure Rating</b>	BN/HC: 290 psid (20 bar) ECO/N, MM: 145 psid (10 bar)
<b>Fluid Temperature Range</b>	-22° to 250°F (-30° to 121°C)
<b>Fluid Compatability</b>	Compatible with all petroleum oils and synthetic fluids rated for use with Fluoro-Rubber or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.
<b>Indicator Trip Pressure</b>	$\Delta P = 35 \text{ psi (2.4 bar) } -10\%$
<b>Bypass Valve Cracking Pressure</b>	$\Delta P = 50 \text{ psid (35 bar) } +10\%$

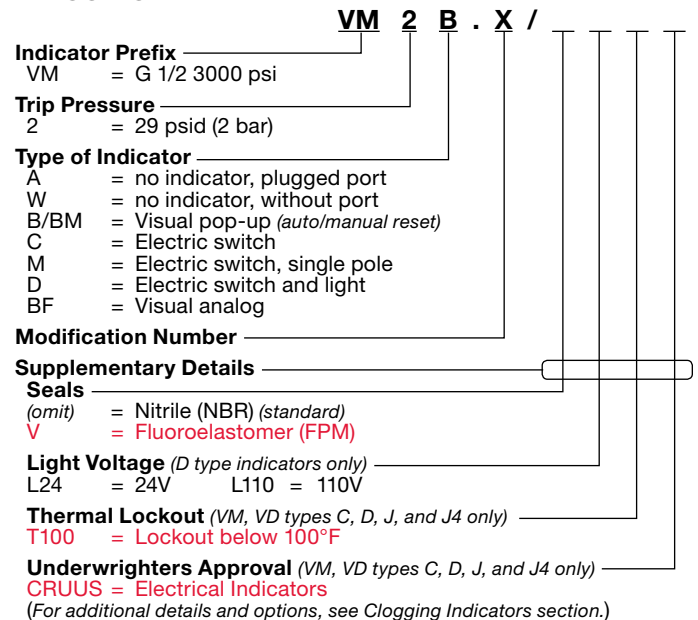
## Model Code



## Replacement Element Model Code



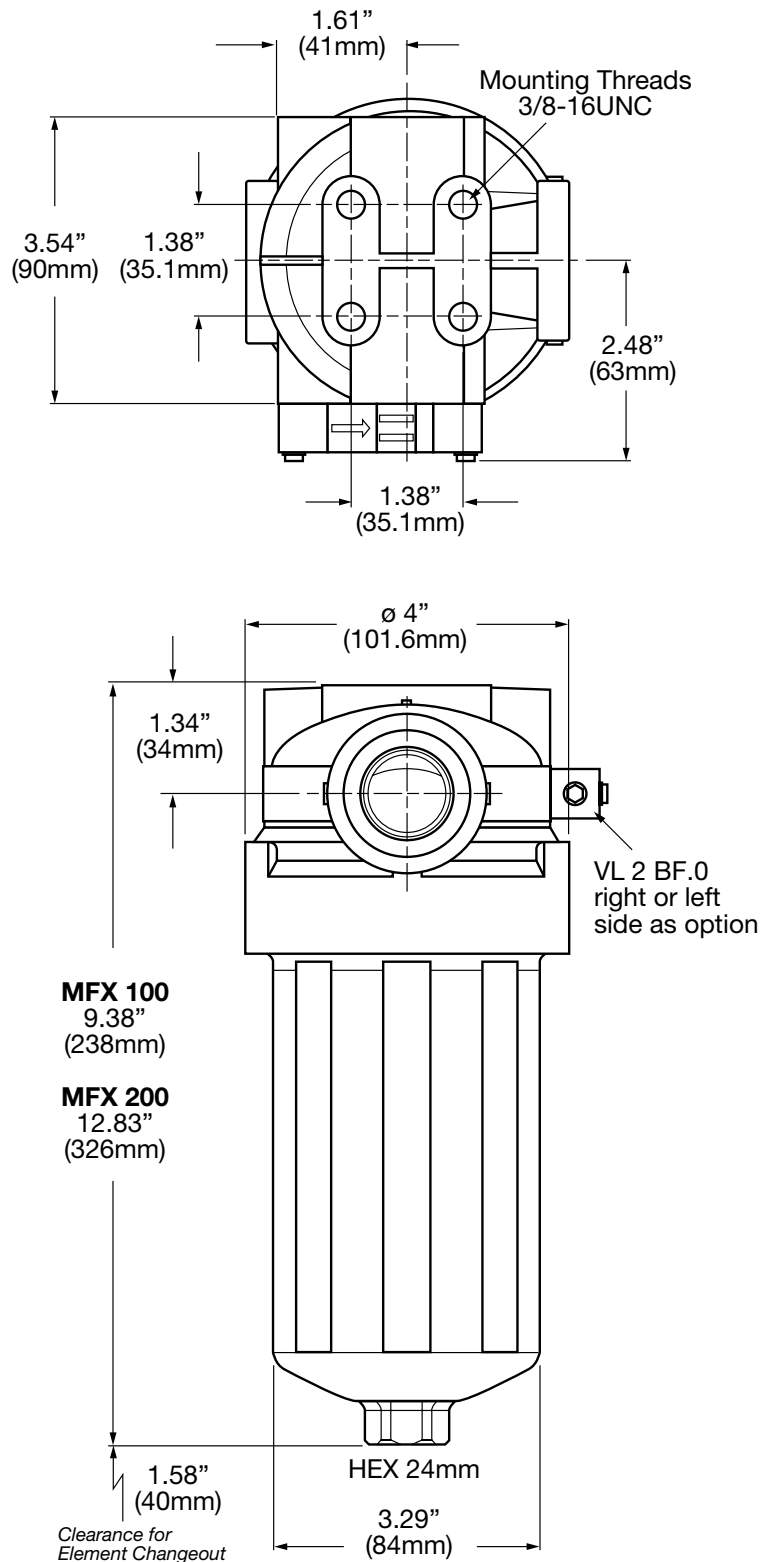
## Clogging Indicator Model Code



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



## MFX Series Dimensions



Size	100	200
Weight (lbs.)	3.2	3.9

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

$$\text{Assembly } \Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$$

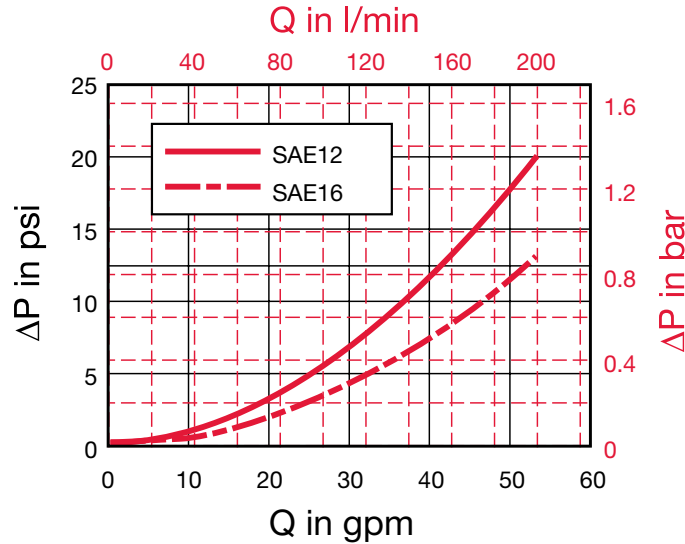
### Housing Curve:

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 section on page 19)

## MFX 100/200 Housing



## Element K Factors

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

(From Tables Below)

Size	...MX...BN4HC (Betamicon® Low Collapse)		
	5 μm	10 μm	20 μm
100	0.4941	0.2196	0.1867
200	0.3459	0.1482	0.1098

Size	...MX...ECO/N		
	5 μm	10 μm	20 μm
100	0.5490	0.3569	0.2635
200	0.3239	0.2086	0.1537

Size	...MX...MM	
	10 μm	15 μm
100	0.1482	0.1208
200	0.0878	0.0714

All Element K Factors in psi / gpm.

## MF, MFD, MFDS Series

### Spin-On Filters

250 PSI • up to 120 GPM



### Features

- MF Filters are manufactured with an aluminum head.
- Choice of NPT, SAE straight thread O-ring boss, BSPP, and SAE 4-bolt flange porting to allow easy installation without costly adapters.
- Quick easy element changeouts.
- MF Filters designed to be used with hydrocarbon based fluids only
- MF Filters are available in static and differential pressure sensing configurations.

### Applications



Agricultural



Automotive



Construction



Gearboxes



Industrial

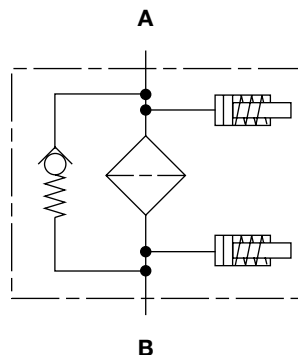


Pulp & Paper

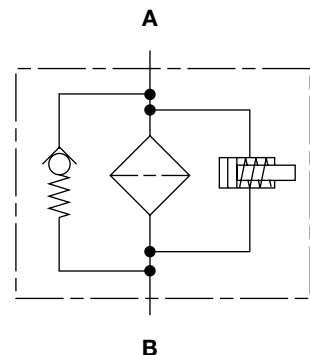


Steel / Heavy Industry

### Hydraulic Symbol MF 40/80/85/160/180



### MF 90/95/190/195



### Technical Details

<b>Mounting Method</b>		
MF40/80/85	2 mounting holes	
MF90/95	4 mounting holes	
MF160/180	2 or 4 mounting holes	
MF190/195	2 or 3 mounting holes	
MFD	2 mounting holes	
MFDS	4 mounting holes	
<b>Port Connection</b>		
MF40	SAE-6	
MF80/85/90/95	3/4" BSPP, 3/4" NPT, SAE-12, 1" NPT, SAE-16	
MF160/180/190/195	1 1/4" BSPP, 1 1/4" NPT, SAE-20, 1 1/2" NPT, SAE-24	
MFD160/180	1 1/2" NPT, SAE-24	
MFDS160/180*	2" SAE Flange Code 61, 1 1/2" NPT Comb. Port	
MFDS190/195*	2" SAE Flange Code 61, 1 1/2" NPT Comb. Port	
<b>Flow Direction</b>	Inlet: Side	Outlet: Side
<b>Construc. Materials</b>	Head: Aluminum	Can: Steel
<b>Flow Capacity</b>		
40	7 gpm (26 lpm)	
80	15 gpm (57 lpm)	
85	25 gpm (95 lpm)	
90	15 gpm (57 lpm)	
95	25 gpm (95 lpm)	
160,190	30 gpm (114 lpm) per can	
180,195	60 gpm (227 lpm) per can	
<b>Housing Pressure Rating</b>	MF40/80/85/160/180/190/195	MF90/95
Max. Oper. Pressure	120 psi (8 bar)	250 psi (17 bar)
Proof Pressure	180 psi (12.4 bar)	375 psi (26 bar)
Fatigue Pressure	Contact HYDAC	
Burst Pressure	Contact HYDAC	
<b>Element Collapse Pressure Rating</b>		
BN, P, A	80 psid (5.5 bar)	
<b>Fluid Temp. Range</b>	-22° to 250°F (-30° to 121°C)	
<b>Fluid Compatibility</b>		
Compatible with all petroleum oils and synthetic fluids rated for use with Buna-N.		
<b>Indicator Trip Pressure</b>		
ΔP = 20 psid (1.4 bar) -10%		
ΔP = 29 psid (2 bar) -10%		
ΔP = 44 psi (3 bar) (B3.4 Bypass)		
Vacuum = 2 psi (0.1 bar) (Suction)		
<b>Bypass Valve Cracking Pressure</b>		
ΔP = 3 psid (0.2 bar) +10% (for suction applications)		
ΔP = 25 psid (1.7 bar) +10% (standard for nominal filters)		
ΔP = 43 psid (3 bar) +10% (standard for absolute BN filters)		
ΔP = 50 psid (3.4 bar) +10%		
(standard for absolute BN filters, MF 80/90/95/160/180/190/195, MFD 160/180, MFDS 160/180)		

\*Note: Maximum allowable torque for flanged ports is 26 ft-lbs (1/2" - 13 UNC bolts)

## Model Code

**MF BN 80 G 5 A 1 . X / 5.2**

### Filter Type

- MF = Single Element
- MFD = Dual Filter Heads & Elements (*End to End*) (sizes 160, 180, 190, & 195 only)
- MFDS = Dual Filter Heads & Elements (*Side by Side*) (sizes 160, 180, 190, & 195 only)

### Element Media

- BN = Betamicon® (*Low Collapse*)
- P = Paper
- AM = Water Removal

### Size

- 40\*, 80\*, 85<sup>§</sup>, 90, 95<sup>†</sup>, 160, 180, 190 (*uses size 160 element*), 195 (*uses size 180 element*)

### Type of Connection

- G = Threaded
- GF = Combination Threaded/Flanged (*MFDS 160/180 only*)

### Filtration Rating (micron)

- 3, 5, 10, 20 = BN/HC
- 3, 10 25 = P
- 10 = AM

### Type of Clogging Indicator

- A, C, E, LE
- (*Static* - sizes 80, 85, 160, 180); (*Differential* - sizes 90, 95, 190, 195)

### Type Number

### Modification Number (*latest version always supplied*)

### Port Configuration

Assembly	Code	Port	Code	Port
MF 40	12.1	SAE 6	5.1	3/8" NPT
MF 80/85, 90/95	0.2	3/4" BSPP ( <i>use MA elements</i> )	5.1	1" NPT
	5.2	3/4" NPT	12.1	SAE 16 Thread
	12.2	SAE 12 Thread		
MF 160/180, MF 190/195	0.2	1 1/4" BSPP ( <i>use MA elements</i> )	5.1	1 1/2" NPT
	5.2	1 1/4" NPT	12.1	SAE 24 Thread
	12.2	SAE 20 Thread		MF 160/180 only
MFD 160/180	5.1	1 1/2" NPT	12.1	SAE 24 Thread
MFDS 160/180	5.1	1 1/2" NPT / 2" SAE Flange Combo ( <i>Code 61</i> )		
MFDS 190/195	5.1	1 1/2" NPT / 2" SAE Flange Combo ( <i>Code 61</i> )		

### Bypass Valve Cracking Pressure

- B1.7 = 25 psid/1.7 bar (*Standard on paper filters sizes 80 - 195 and size 40 BN*)
- B0.2 = 3 psid/0.2 bar (*For Suction Applications*)
- B1.3 = 18 psid/1.3 bar (*size 40 paper only*)
- B3.4 = 50 psid/3.4 bar (*Standard on BN & AM Series*) (sizes MF 80/90/95/160/180/190/195 & MFD 160/180 only)
- KB = No Bypass
- IP2 = Alternate Indicator Position 2 (sizes MF190/195 or MFDS 190/195)

## Replacement Element Model Code

**0080 MA 005 BN**

### Size

- 0040, 0080 - *\*(not available with 3 µm BN elements)*
- 0085 - *§(not available with BN, AM and 3 µm P elements)*
- 0095 - *†(not available with 20 µm BN elements)*
- 0090, 0160, 0180

### Filtration Rating (microns)

- 3, 5, 10, 20 = BN
- 3, 10, 25 = P
- 10 = AM (*not available with size 0085*)

### Element Media

- BN, P, AM

### Supplementary Details

- Bypass settings for element 0040 only (*bypass valve is inside element*)
- B1.3 = 18 PSID Bypass (P)
- B1.7 = 25 PSID Bypass (BN)
- (*Spin-on elements available with NBR seals only*)

## Clogging Indicator Model Code

**VMF 2 B . X /**

### Indicator Prefix

- VMF = Mobile Filters

### Trip Pressure

- 2 = 29 psid (2 bar)
- 1.7 = 25 psid (1.7 bar) (*optional*)

### Type of Indicator

- A = no indicator, plugged port
- C = Electric switch
- E = Gauge
- LE = Electric pressure switch

### Modification Number

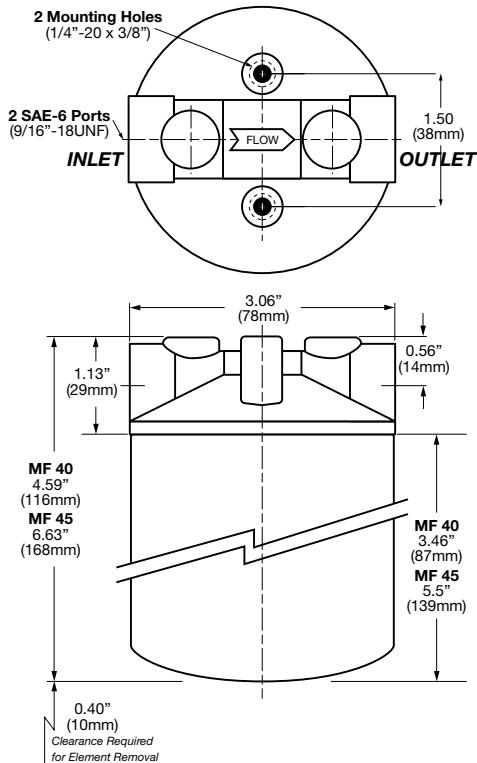
### Supplementary Details

#### Seals

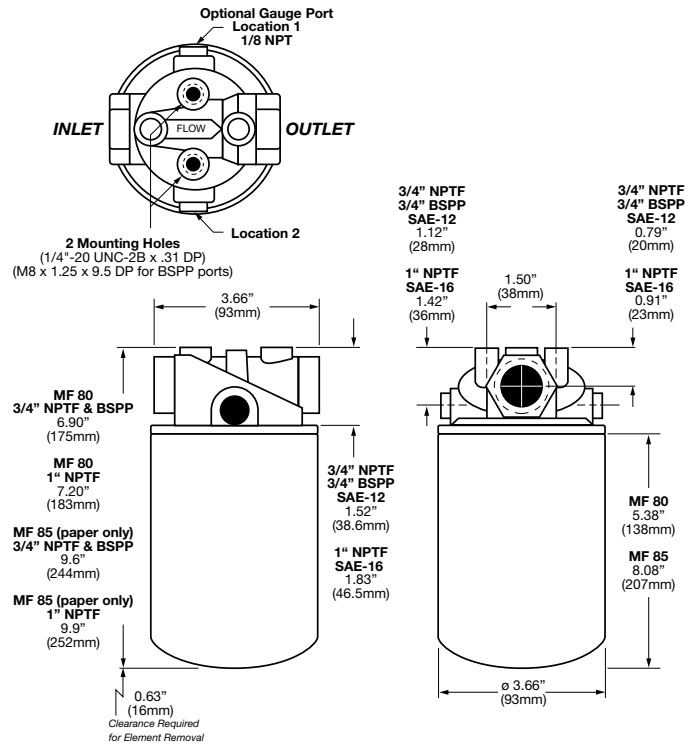
- (omit) = Nitrile (NBR) (*standard*)
- V = Fluoroelastomer (FPM)

(*For additional details and options, see Clogging Indicators section.*)

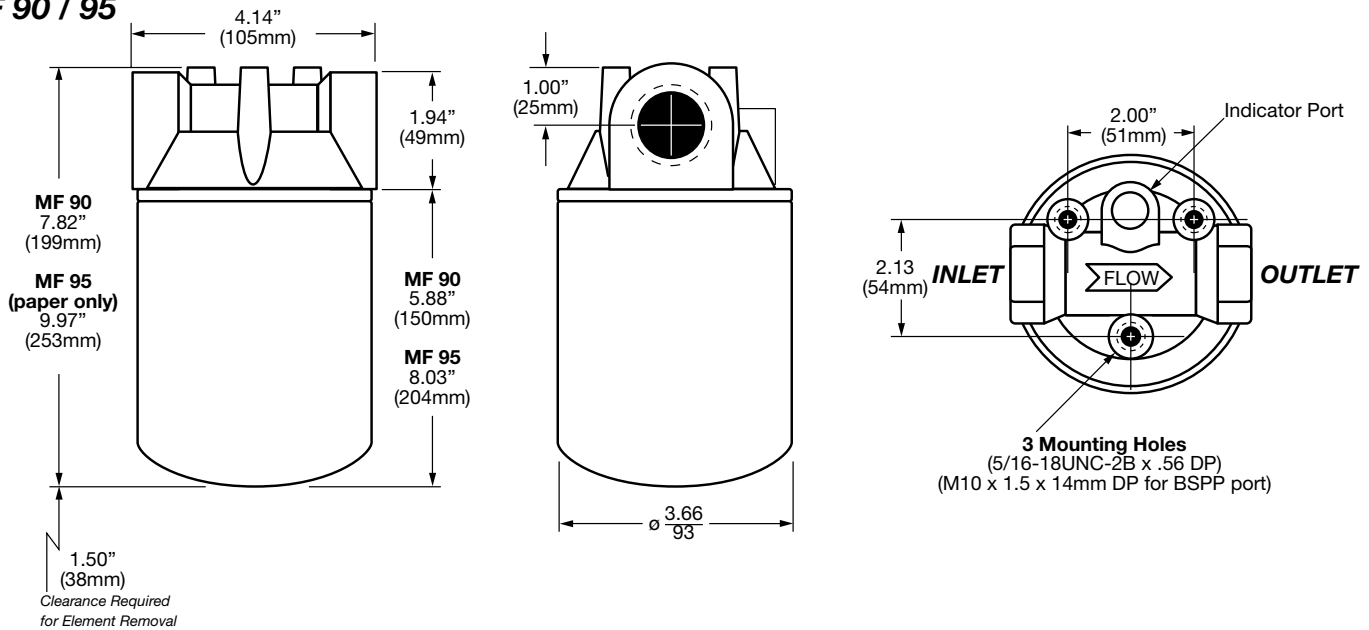
## Dimensions MF 40



## MF 80 / 85



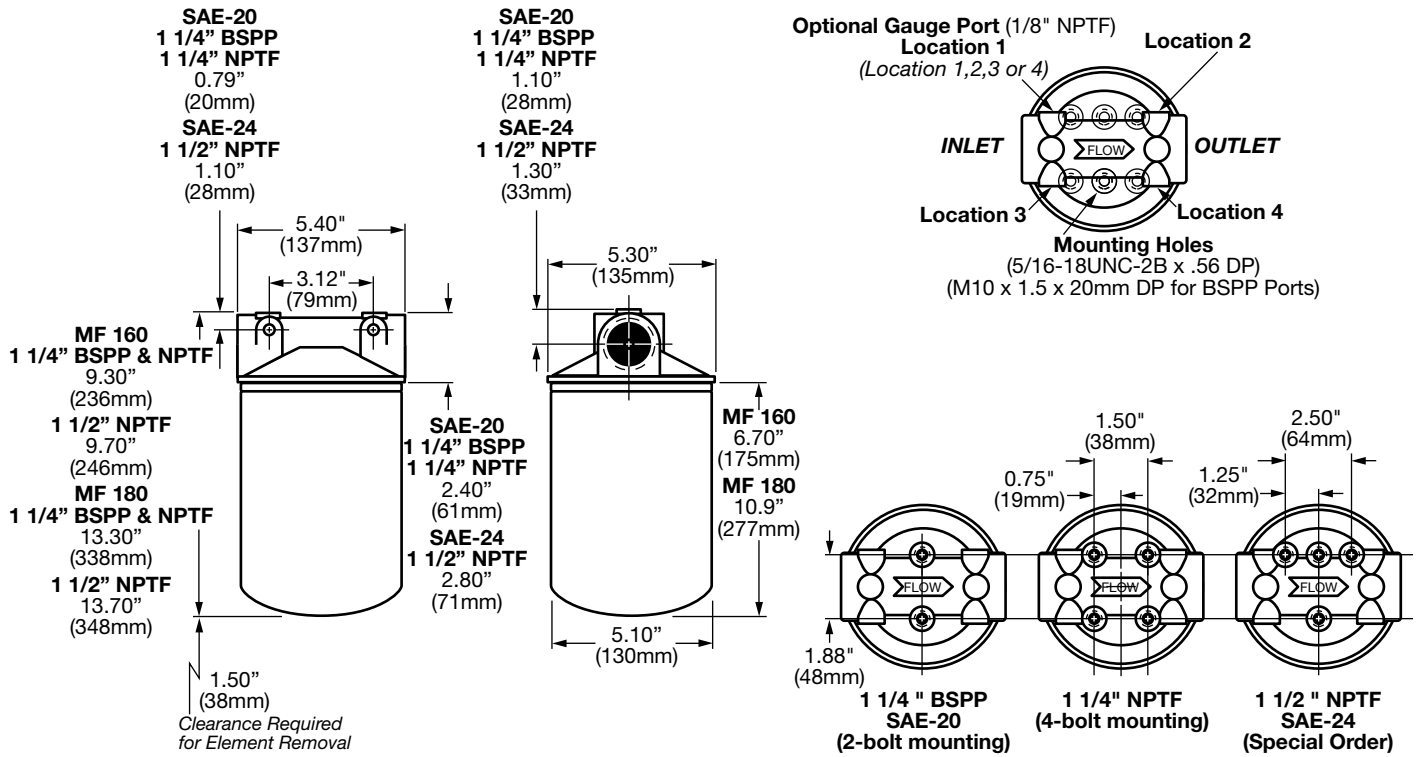
## MF 90 / 95



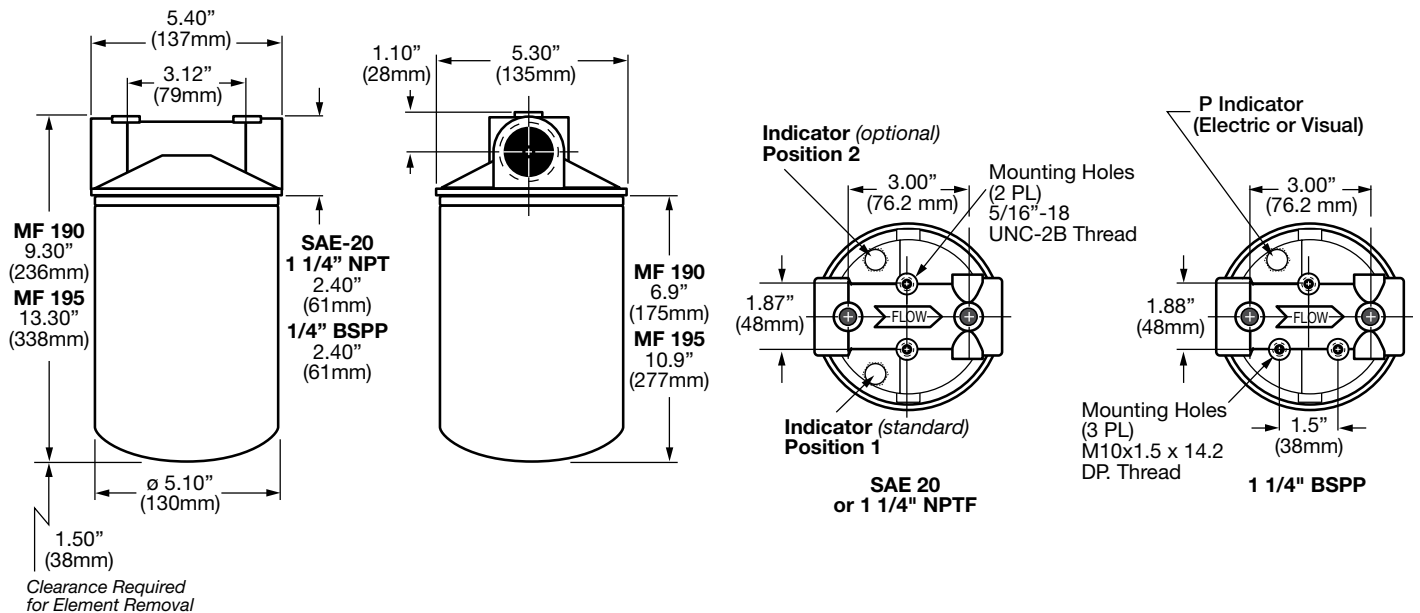
<b>Size</b>	<b>40 Head</b>	<b>40 Can (BN)</b>	<b>40 Can (P)</b>		
<b>Weight (lbs.)</b>	0.24	0.73	0.6		
<b>Size</b>	<b>80 / 85 Head</b>	<b>80 Can (BN)</b>	<b>80 Can (P)</b>	<b>85 Can (P)</b>	
<b>Weight (lbs.)</b>	0.41	1.35	1.08	1.42	
<b>Size</b>	<b>90 / 95 Head</b>	<b>90 Can (BN)</b>	<b>90 Can (P)</b>	<b>95 Can (BN)</b>	<b>95 Can (P)</b>
<b>Weight (lbs.)</b>	1.12	1.5	1.29	2.04	1.47

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## MF 160 / 180



## MF 190 / 195



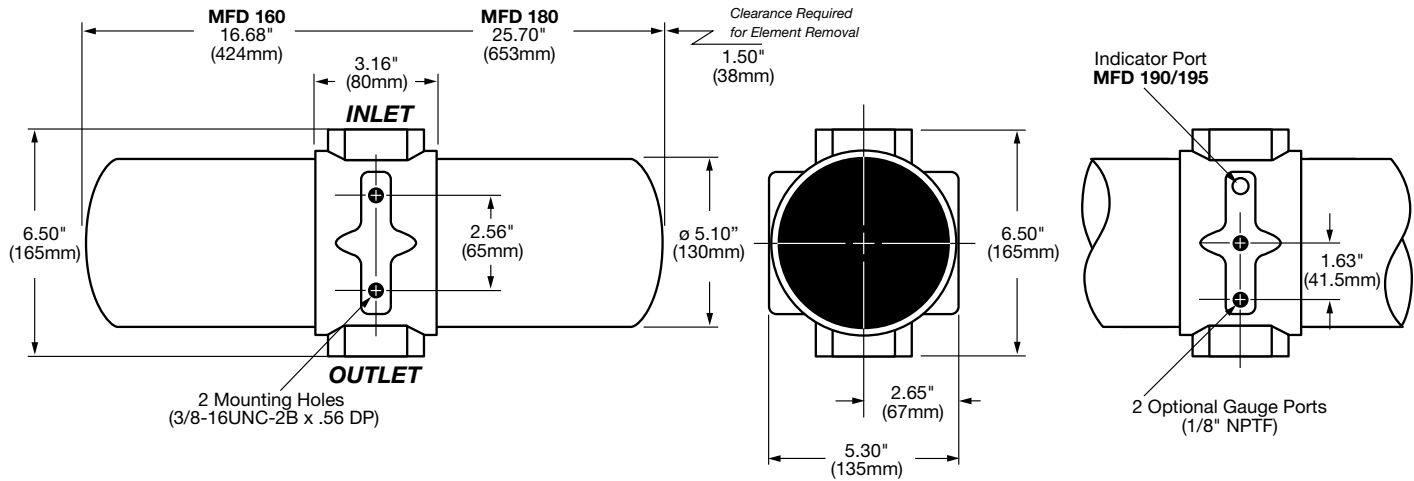
Size	160 / 180 Head	160 Can (BN)	160 Can (P)	180 Can (BN)	180 Can (P)
Weight (lbs.)	1.31	2.56	2.15	3.69	2.68

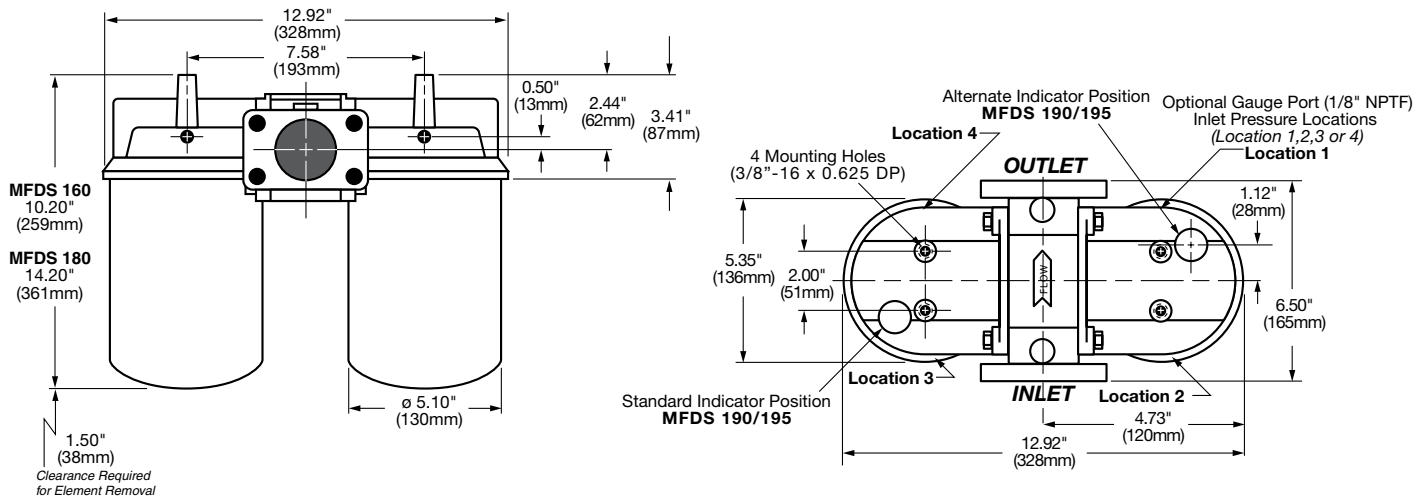
Size	190 / 195 Head	190 Can (BN)	190 Can (P)	195 Can (BN)	195 Can (P)
Weight (lbs.)	1.68	2.56	2.15	3.69	2.68

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## MFD 160 / 180



## MFDS 160 / 180 / 190 / 195



<b>Size - MFD</b>	<b>160 / 180 Head</b>	<b>160 Can (BN)</b>	<b>160 Can (P)</b>	<b>180 Can (BN)</b>	<b>180 Can (P)</b>
<b>Weight (lbs.)</b>	3.66	2.56	2.15	3.69	2.68

<b>Size - MFDS</b>	<b>160 / 180 Head</b>	<b>160 Can (BN)</b>	<b>160 Can (P)</b>	<b>180 Can (BN)</b>	<b>180 Can (P)</b>
<b>Weight (lbs.)</b>	6.4	2.56	2.15	3.69	2.68

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

## Sizing Information

Total pressure loss through the filter is as follows:

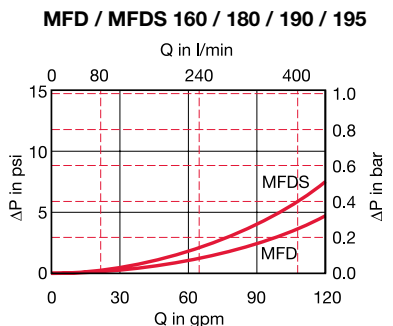
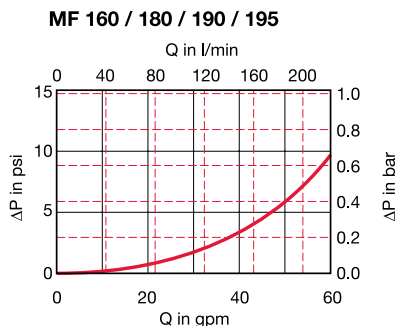
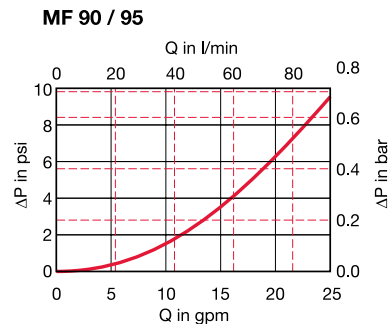
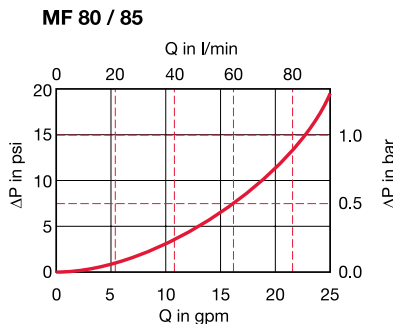
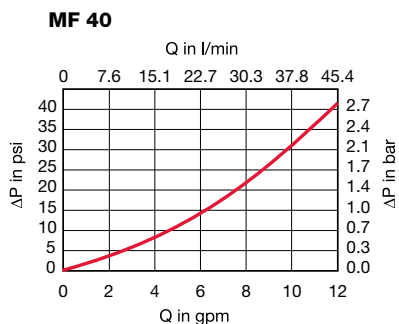
Assembly  $\Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$

### Housing Curve:

Pressure loss through housing is as follows:

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 section on page 19)



## Aquamicron Water Removal Element Capacity vs. Flow

Spin-On Element	Optimum Flow Rate		Maximum Flow Rate	
	Flow (gpm)	Capacity (quarts)	Flow (gpm)	Capacity (quarts)
0080MA010AM	2	0.12	6	0.08
0090MA010AM	2	0.12	6	0.08
0095MA010AM	4	0.17	8	0.11
0160MA010AM	4	0.23	8	0.16
0180MA010AM	6	0.45	15	0.32

## Spin-on Connection Chart

Size	Can Connection Thread		
	MA	MG	MU
0040	3/4" - 16 UN - 2B	—	—
0080	—	3/4" BSPP	—
0080/0085	1" - 12 UN - 2B	—	—
0090/0095	1-1/2" - 16 UN - 2B	—	—
0160	—	1-1/4" BSPP	—
0160/0180	1-1/2" - 16 UN - 2B	—	—

MA = UN Tap Plate Thread (standard); MG = BSPP Tap Plate Thread (special); MU = Metric Tap Plate Thread (special - consult HYDAC)

## Element K Factors

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

Size	...MA...BN			
	3 $\mu\text{m}$	5 $\mu\text{m}$	10 $\mu\text{m}$	20 $\mu\text{m}$
0040	1.3914	1.1799	0.6289	0.3613
0080	0.5216	0.4423	0.2357	0.1354
0090	0.4841	0.3702	0.3451	0.1911
0095	0.2762	0.2112	0.1969	0.1090
0160	0.2372	0.1983	0.1113	0.0625
0180	0.1231	0.1029	0.0577	0.0325

Size	...MA...P		
	3 $\mu\text{m}$	10 $\mu\text{m}$	25 $\mu\text{m}$
0040	7.763	2.348	1.516
0080	1.606	0.486	0.314
0085	—	0.351	0.227
0090	1.594	0.482	0.311
0095	0.894	0.270	0.174
0160	0.839	0.192	0.145
0180	0.443	0.134	0.087

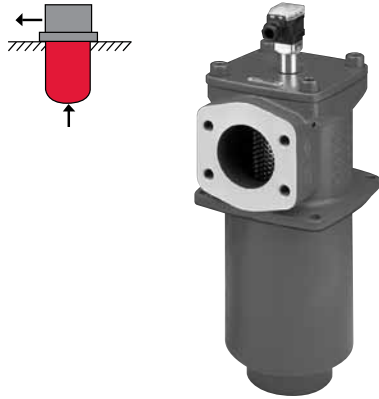
Size	...MA...AM
	010 $\mu\text{m}$
0080	0.513
0085	0.367
0090	0.507
0095	0.284
0160	0.233
0180	0.136

All Element K Factors in psi / gpm.

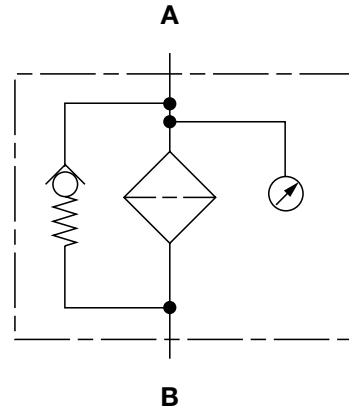


## SF Series In-tank Suction Filters

360 psi • up to 300 gpm



### Hydraulic Symbol



### Features

- Non-welded housing design reduces stress concentrations and prevents fatigue failure.
- Inlet/Outlet port options include NPT port or SAE 4-bolt flange to allow easy installation without costly adapters.
- O-ring seals are used to provide positive, reliable sealing. Choice of O-ring materials (Nitrile, Fluoroelastomer, or Ethylene Propylene) provides compatibility with oil/water emulsions, high water base fluids, and synthetic fluids.
- Bolt-on lid requires minimal clearance for removal.
- A mechanically actuated, electrical, electrical / visual (lamp), or vacuum gauge bypass indicator can be installed.
- Bypass valve with low cracking pressure prevents pump cavitation.

### Technical Details

<b>Mounting Method</b>	4 mounting holes - filter head	
<b>Port Connection</b>	Inlet	Outlet
110	SAE-12	SAE-12
240	SAE-20	SAE-20
330	SAE-20 2" NPT 2" NPT	2" NPT 2" NPT 2" SAE Flange, Code 61
950	3 1/2" SAE Flange, Code 61	3 1/2" SAE Flange, Code 61
1300	4" SAE Flange, Code 61	4" SAE Flange, Code 61
<b>Flow Direction</b>	Inlet: Bottom	Outlet: Side
<b>Construc. Materials</b>	Housing	Lid
SF 110-330	Aluminum	Aluminum
SF 950-1300	Ductile Iron	Ductile iron
<b>Flow Capacity</b>		
110	5 gpm (20 lpm)	
240	20 gpm (80 lpm)	
330	40 gpm (150 lpm)	
950	200 gpm (757 lpm)	
1300	300 gpm (1135 lpm)	
<b>Housing Pressure Rating</b>		
Max. Oper. Press.	360 psi (25 bar)	
Proof Pressure	540 psi (38 bar)	
Fatigue Pressure	360 psi (25 bar) @ 700,000 cycles	
Burst Pressure	110	1080 psi (75 bar)
	240	1230 psi (85 bar)
	330	1440 psi (100 bar)
	950-1300	>1440 psi (100 bar)
<b>Element Collapse Pressure Rating</b>		
W/HC	290 psid (20 bar)	
P/HC	145 psid (10 bar)	
<b>Fluid Temp. Range</b>	-22° to 250°F (-30° to 121°C)	
<b>Fluid Compatability</b>	Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.	
<b>Indicator Trip Pressure</b>	ΔP = 3 psi (0.2 bar) -10% (standard)	
<b>Bypass Valve Cracking Pressure</b>	ΔP = 3 psi (0.2 bar) +10% (standard)	

### Applications



Agricultural



Automotive



Construction



Gearboxes

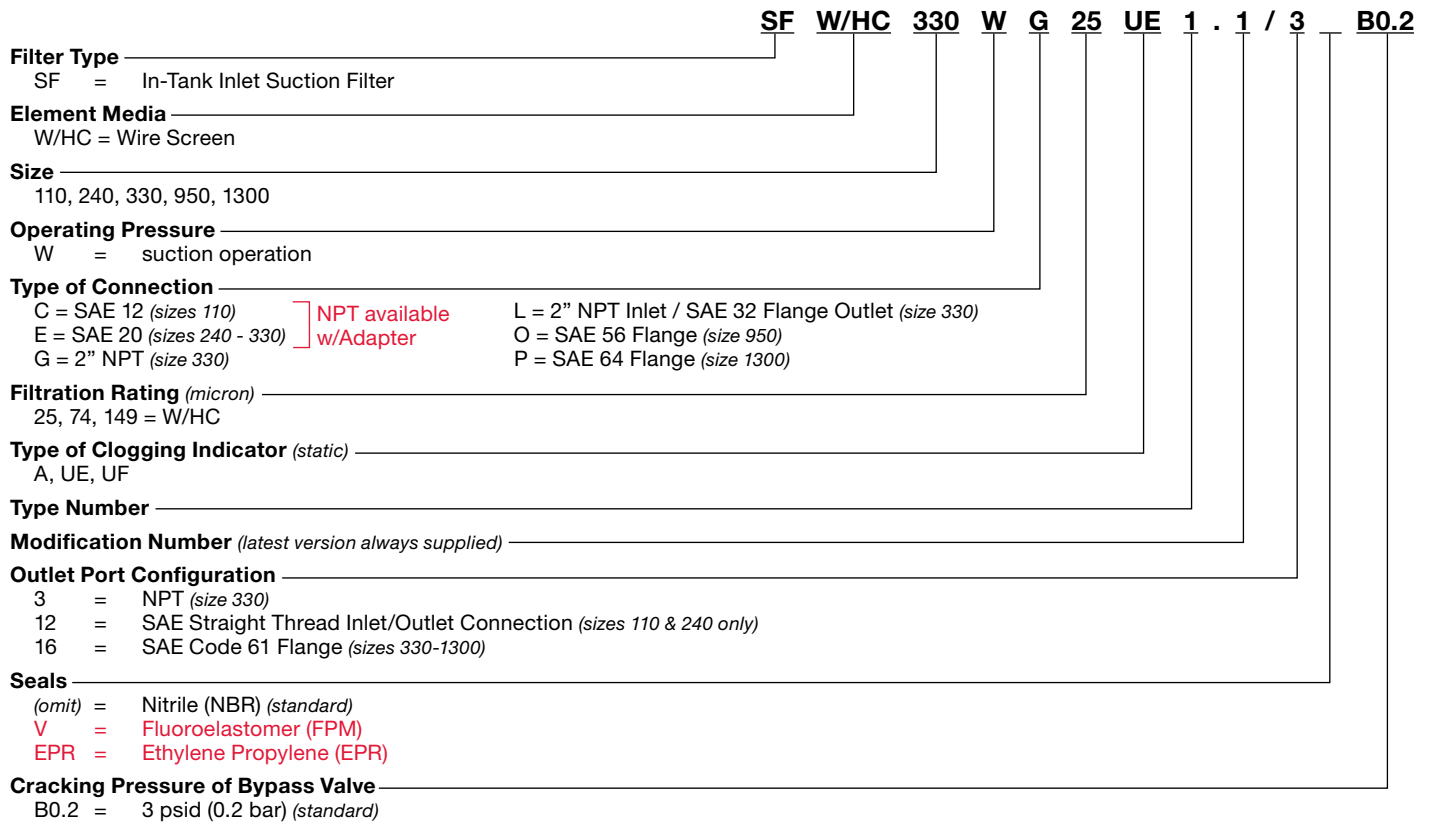


Industrial

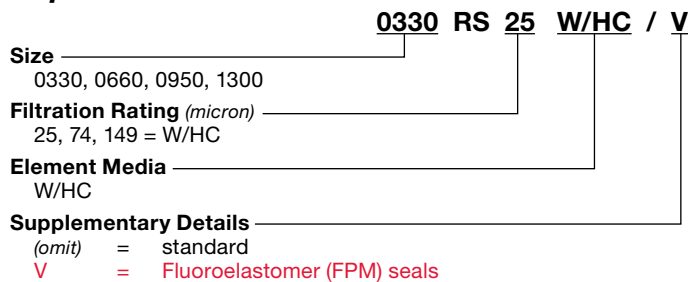


Steel / Heavy Industry

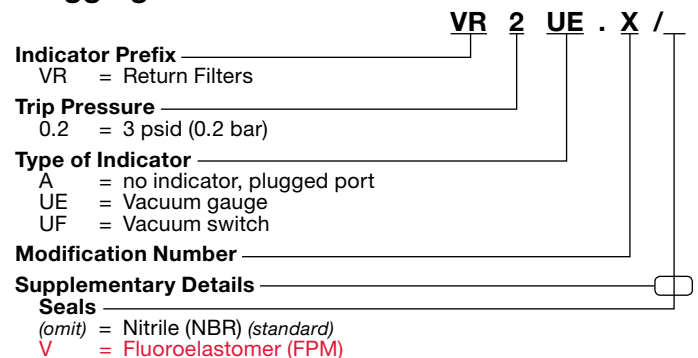
## Model Code



## Replacement Element Model Code



## Clogging Indicator Model Code



(For additional details and options, see Clogging Indicators section.)

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