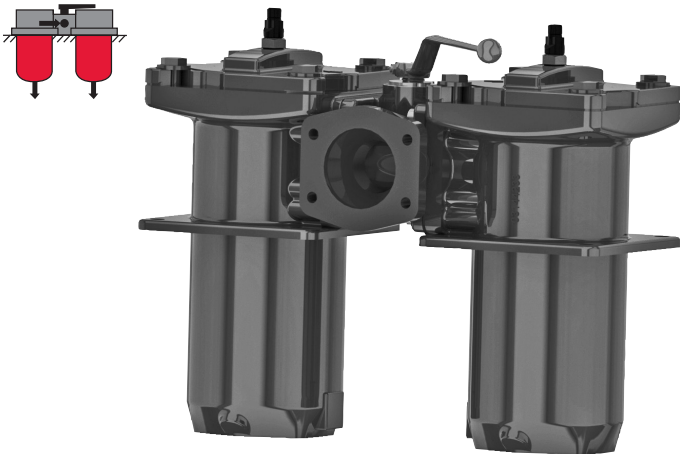


LOW PRESSURE FILTERS

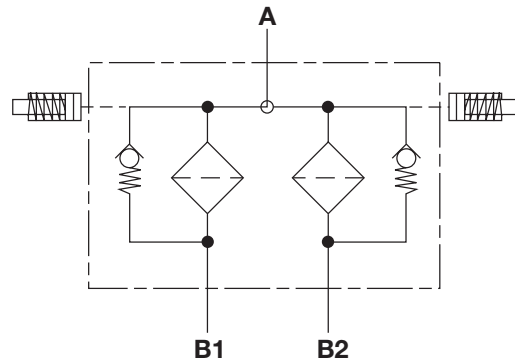
RFD Series

In-Tank / Inline Duplex Filters

360 psi • up to 400 gpm



Hydraulic Symbol



Features

- RFD 110 - 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 110-240 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 rubber, fluorocarbon elastomer, ethylene propylene rubber) 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.
- All RFD duplex filters have a ball-type selector valve to provide continuous filtration without system shut-down to change clogged elements.
- Single piece housing castings provide strength and rigidity for in-line or in-tank mounting
- Flange connection bolts included for inlet connection only. Bolts are suitable for use with split flange halves, per ISO6162-1 / SAE J518-1.

Note: This filter is configured with anR.... type (return/low pressure) element, so if the filter requires a bypass, the bypass is located in the closed end cap of the cartridge element.

Sizes 60 and 160 have been discontinued. Replacement elements, seal kits and lid assemblies are still available.

Technical Specifications

Mounting Method	4 Mounting holes in the filter housing		
Port Connections	Inlet / Outlet		
110	SAE-12 / SAE-12; 3/4"NPT (adapter) / SAE-12		
240	SAE-16 (adapter) / G-1-1/4" female; 1"NPT (adapter) / G-1-1/4" female		
330	G2" / G2"; SAE DN 51 Code 61 Flange / G2"		
660	SAE DN 76 Code 61 / SAE DN 76 Code 61		
950	SAE DN 76 Code 61 / SAE DN 89 Code 61		
1300	SAE DN 102 Code 61/ SAE DN 89 Code 61		
Direction of Flow	Side Inlet and Bottom Outlet		
Materials of Construction	Housing	Lid	Transfer Valve
110 - 240	Aluminum	Aluminum	Steel
330	Aluminum	Aluminum	Aluminum
660-1300	Ductile Iron	Ductile Iron	Ductile Iron
Flow Capacity			
110	29 gpm (110 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)		
Housing Pressure Rating			
Max. Allowable			
Working Pressure*	360 psi (25 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)	
	660-1300	>1440 psi (100 bar)	
Element Collapse Pressure Rating			
ON, W/HC,	290 psid (20 bar)		
ECON2, BN4AM, P/HC, AM	145 psid (10 bar)		
V	435 psid (30 bar)		
Fluid Temperature Range	14°F to 212°F (-10°C to 100°C)		
Consult HYDAC for applications below 14°F (-10°C)			
Fluid Compatibility	Compatible with all hydrocarbon based, synthetic, water glycol, oil/water emulsion, and high water based fluids when the appropriate seals are selected.		
Indicator Trip Pressure			
P = 29 psi (2 bar) -10% (standard)			
P = 72 psi (5 bar) -10% (optional)			
Bypass Valve Cracking Pressure			
ΔP = 43 psid (3 bar) +10% (standard)			
ΔP = 87 psid (6 bar) +10% (optional)			

*Note: All RFD Filters MAWP reduce to 7 bar (101.5 psi) when using the following "VMF" and "VR" indicators: B, BM, E, ES, GC, LE, LZ.

Applications



Agricultural



Automotive



Construction



Gearboxes



Industrial



Power Generation



Pulp & Paper



Steel / Heavy Industry

Model Code

RFD ON 330 D A L 10 D 1 . X / 16 - V - B6

Filter Type _____
RFD = Duplex In-Tank Return Line Filter

Element Media _____
ON = Optimicron® BN/AM = Betamicron®/Aquamicron®
ECON2 = ECOmicron® AM* = Aquamicron®
W/HC = Wire Mesh (*Only available in sz. 330, 660, 950, & 1300)
P/HC = Polyester V = Metal Fiber

Size _____
110, 240, 330, 660, 950, 1300

Pressure Rating _____
D = 360 psi (25 bar)
V = 101.5 psi (7 bar) (When using the following "VR" indicators: B, BM, E, ES, GC, LE, LZ)

Type of Changeover Valve _____
A = Ball Valve

Type of Connection _____
C = 3/4" Threaded (size 110); SAE-12 or 3/4" NPT (w/adaptor) inlet / SAE-12 outlet
D = 1" Threaded Inlet (adapter) / G-1-1/4" female Outlet (size 240); SAE-16 or 1" NPT (w/adaptor) inlet
G = 2" Threaded (BSPP only size 330) – Inlet and Outlet
L = SAE DN 51 Code 61 Flange Inlet / 2" BSPP Outlet (size 330)
M = SAE DN 76 Code 61 Flange Inlet / SAE DN 76 Code 61 Flange Outlet (size 660)
N = SAE DN 76 Code 61 Flange Inlet / 3" BSPP Outlet (size 660)
O = SAE DN 102 Code 61 Flange Inlet / SAE DN 89 Code 61 Flange Outlet (size 950)
P = SAE DN 102 Code 61 Flange Inlet / SAE DN 102 Code 61 Flange Outlet (size 1300)

Filtration Rating (micron) _____
1, 3, 5, 10, 15, 20 = ON 3, 5, 10, 20 = ECON2 3, 10 = BN/AM 40 = AM
10, 20 = P/HC 25, 50, 100, 200 = W/HC 3, 5, 10, 20 = V

Type of Static or ΔP Clogging Indicator _____
A, B, BM, C, D, E (Others available upon request, see Clogging Indicators section.) - Note: 2 required

Type Number _____
1 = Standard Connection

Modification Number (latest version always supplied) _____

Port Configuration _____
(omit) = SAE DN Flange Inlet Connections (sizes 330 - 1300 only) 0 = BSPP Straight Thread
12 = SAE Straight Thread Inlet/Outlet Connections (sizes 110, 240) 3 = NPT (sizes 110, 240)

Seals _____
(omit) = Nitrile rubber (NBR) (standard) V = Fluorocarbon elastomer (FKM) EPR = Ethylene propylene rubber (EPR)

Bypass Valve _____
(omit) = 43 psid (3 bar) (standard) B6 = 87 psid (6 bar) (return line extended life)
B1 = 14.5 psid (1 bar) (tube or coolant) KB = no bypass (flushing system)] not available with ECON2
B2 = 29 psid (2 bar)

Supplementary Details _____
SO263 = Modification of elements for Skydrol or HYJET phosphate ester fluids
L24, L48, L110, L220 = Lamp for D-type clogging indicator (LXX, XX = voltage)
SFREE = Element specially designed to minimize electrostatic charge generation
SO376 = Modification of ON and W/HC elements for HFA, HFB, HFC, and HFD flame retardant liquids

Replacement Element Model Code

0330 R 010 ON / V B6

Size _____
0060, 0110, 0160, 0240,
0330, 0660, 0950, 1300

Filtration Rating (micron) _____
1, 3, 5, 10, 15, 20 = ON 3, 5, 10, 20 = XSX
3, 10 = BN4AM 3, 5, 10, 20 = ECON2
40 = AM 25, 50, 100, 200 = W/HC
10, 20 = P/HC 3, 5, 10, 20 = V

Element Media _____
ON, XSX, BN4AM, ECON2, AM, W/HC, P/HC, V

Seals _____
(omit) = Nitrile rubber (NBR) (standard)
V = Fluorocarbon elastomer (FKM)
EPR = Ethylene propylene rubber (EPR)

Bypass Valve _____
(omit) = 43 psid (3 bar) (standard) B1 = 14.5 psid (1 bar)
B2 = 29 psid (2 bar) B6 = 87 psid (6 bar) KB = no bypass

Supplementary Details _____
SO263 = (same as above) SFREE = (same as above)
SO376 = (same as above)

Clogging Indicator Model Code

VR 5 D . X / V

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 = Pop-up indicator (auto reset - static only)
BM = Pop-up indicator (manual reset)
C = Electric switch - SPDT
D = Electric switch and LED light - SPDT
E = Visual pressure gauge

Modification Number _____

Supplementary Details _____

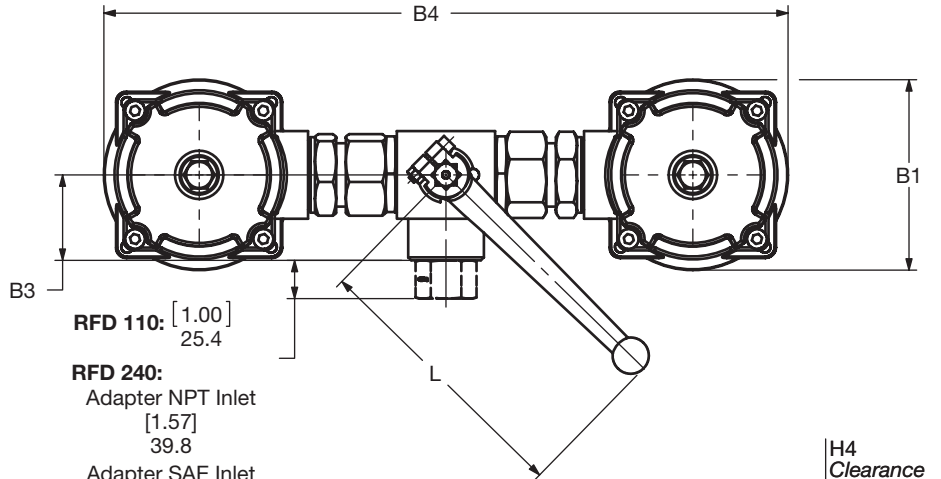
Seals _____
(omit) = Nitrile rubber (NBR) (standard)
V = Fluorocarbon elastomer (FKM)
EPR = Ethylene propylene rubber (EPR)

Light Voltage (D type indicators only) _____
L24 = 24V L48 = 48V L110 = 110V L220 = 220V
(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

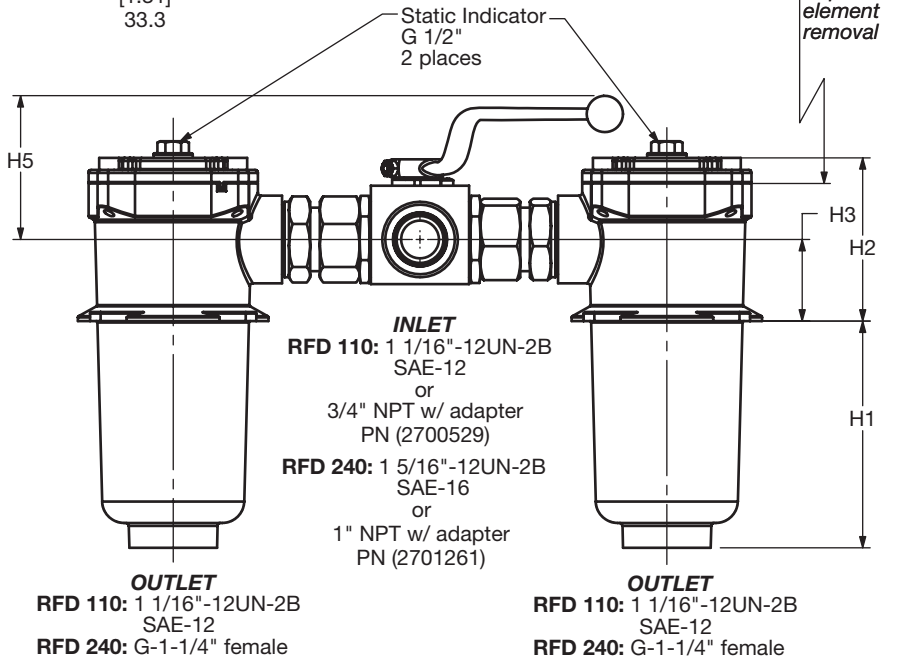
LOW PRESSURE FILTERS

Dimensions RFD 110 - 240

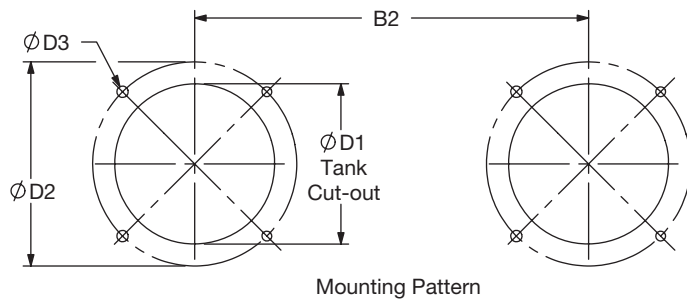


RFD 110: [1.00]
25.4

RFD 240:
Adapter NPT Inlet
[1.57]
39.8
Adapter SAE Inlet
[1.31]
33.3



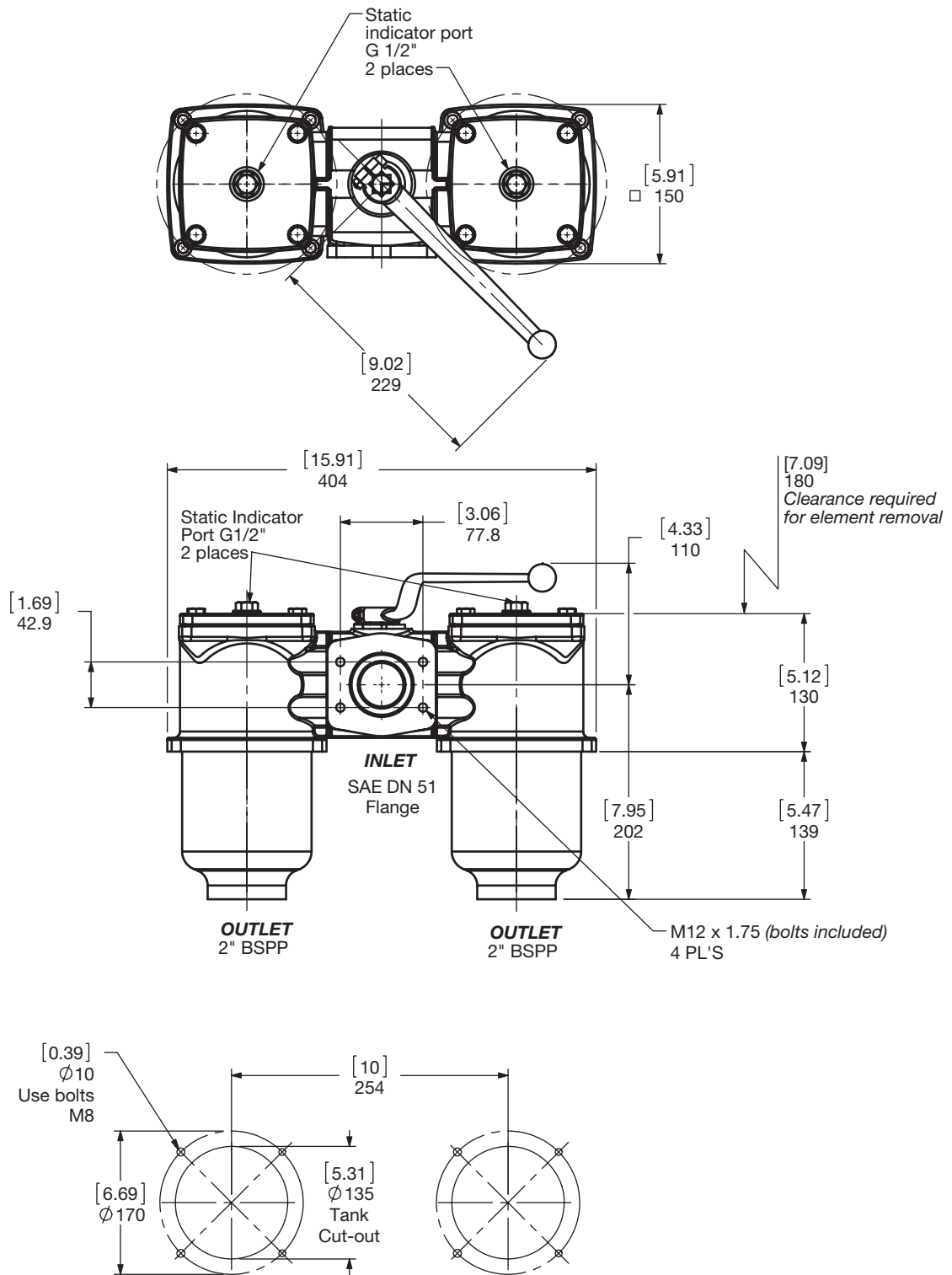
Size	110	240
B1	[3.77] 96	[4.96] 126
B2	[10.26] 260.5	[13.2] 335.5
B3	[1.87] 47.5	[2.22] 56.5
B4	[14] 357	[18.14] 461
D1	[3.15] 80	[4.17] 106
D2	[3.9] 100	[5.3] 135
D3	[0.315] 8	[0.374] 9.5
H1	[5.24] 133	[5.91] 150
H2	[3.46] 88	[4.25] 108
H3	[1.73] 44	[2.13] 54
H4	[5.71] 145	[7.1] 180
H5	[3.62] 92	[3.74] 95
L	[6.81] 173	[6.81] 173
Reservoir bolts	M5	M6



Size	110	240
Weight (lbs.)	8.2	17.2

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

Dimensions RFD 330



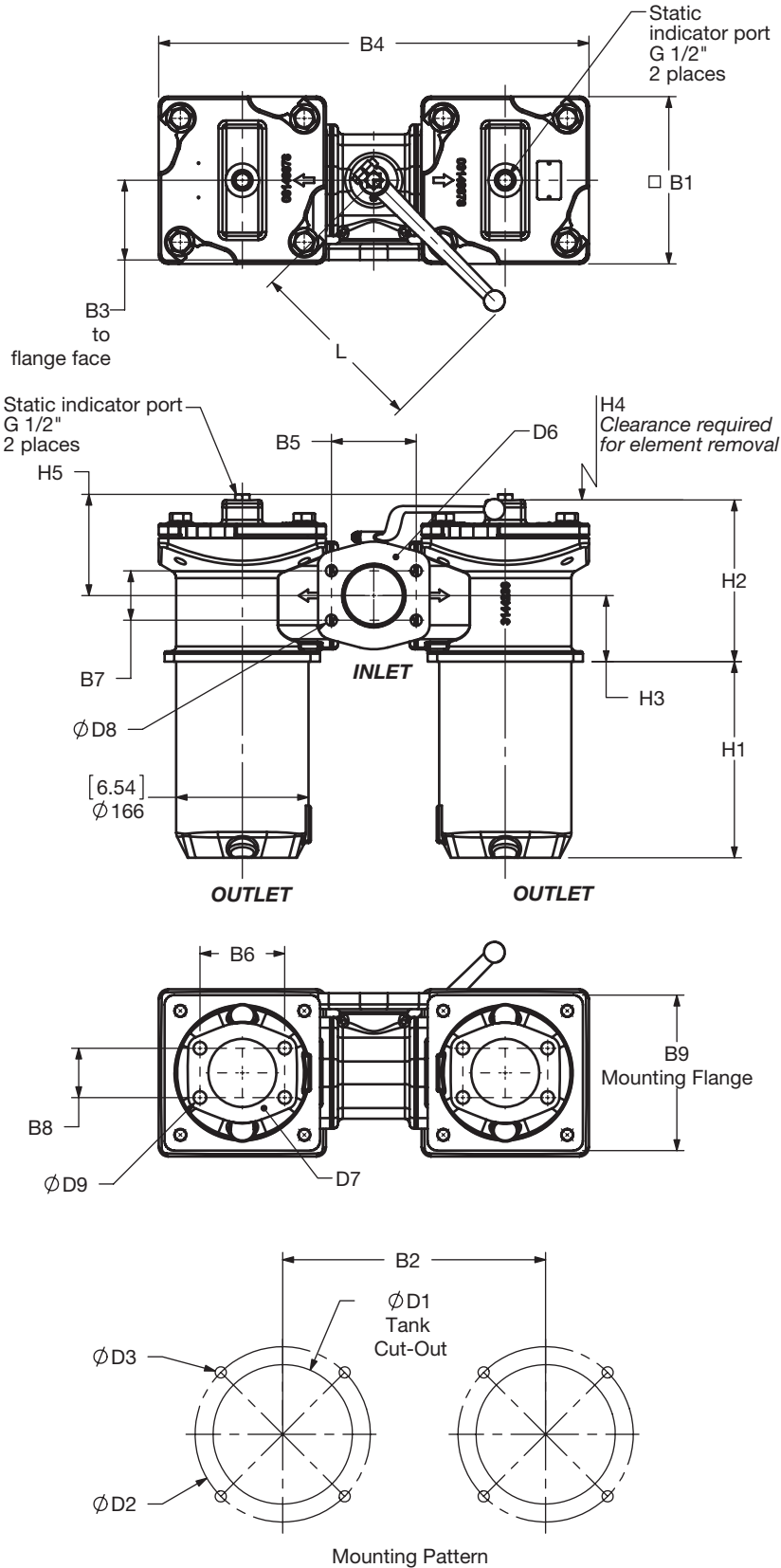
Mounting Pattern

Size	330
Weight (lbs.)	29.6

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

LOW PRESSURE FILTERS

Dimensions RFD 660 - 1300



Size	660	950	1300
B1	[8.27] 210	[9.61] 244	[9.61] 244
B2	[12.99] 330	[15.35] 390	[16.14] 410
B3	[3.9] 100	[5.51] 140	[5.51] 140
B4	[21.26] 540	[25.2] 640	[25.98] 660
B5	[4.19] 106.5	[5.13] 130.2	[5.13] 130.2
B6	[4.19] 106.4	[4.75] 120.7	[5.13] 130.2
B7	[2.43] 61.9	[3.06] 77.8	[3.06] 77.8
B8	[2.43] 61.9	[2.75] 69.9	[3.06] 77.8
B9	[7.68] 195	[9.84] 250	[9.84] 250
D1	[7.1] 180	[8.19] 208	[8.19] 208
D2	[8.66] 220	[11.42] 290	[11.42] 290
D3	[0.55] 14	[0.71] 18	[0.63] 16
D6	SAE DN 76 Flange	SAE DN 102 Flange	SAE DN 102 Flange
D7	3" BSPP or SAE DN 76 Flange	SAE DN 89	SAE DN 102
D8	M16 x 2*	M16 x 2*	M16 x 2*
D9	M16 X 2, 18 mm deep	M16 X 2, 20 mm deep	M16 X 2, 20 mm deep
H1	[9.68] 246	[9.94] 252.5	[13.01] 330.5
H2	[7.99] 203	[8.85] 225	[10.6] 269
H3	[3.27] 83	[[3.66] 93	[4.76] 121
H4	[12.6] 320	[15.16] 385	[19.09] 485
H5	[4.48] 114	[6.69] 170	[6.69] 170
L	[9.02] 229	[12.52] 318	[12.52] 318
Bolts**	M12 x 1.75	M16 x 2	M16 x 2

*Bolts included

** Recommended reservoir mounting bolts

Size	660	950	1300
Weight (lbs.)	158.8	231.5	260.2

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

Sizing Information

Total pressure loss through the filter is as follows:

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

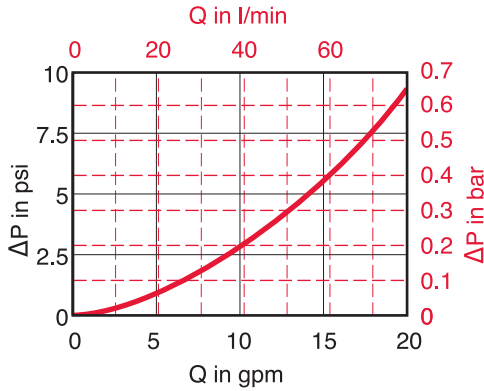
Housing Curve:

Pressure loss through housing is as follows:

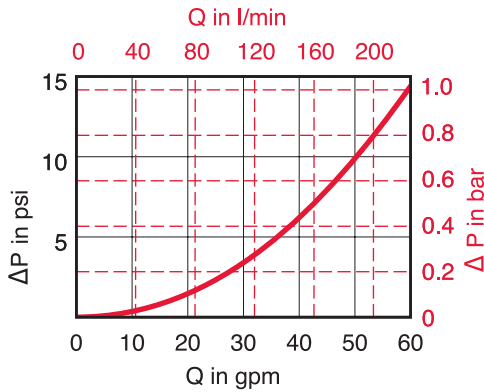
$$\text{Housing } \Delta P = \text{Housing Curve } \Delta P \times \frac{\text{Actual Specific Gravity}}{0.86}$$

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

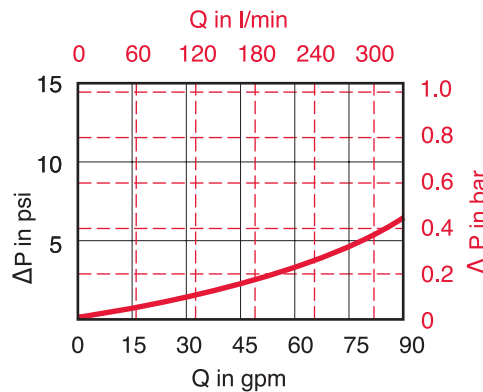
RFD 110 HOUSING & TRANSFER VALVE



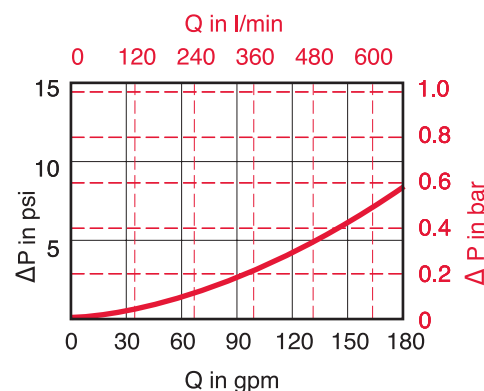
RFD 240 HOUSING & TRANSFER VALVE



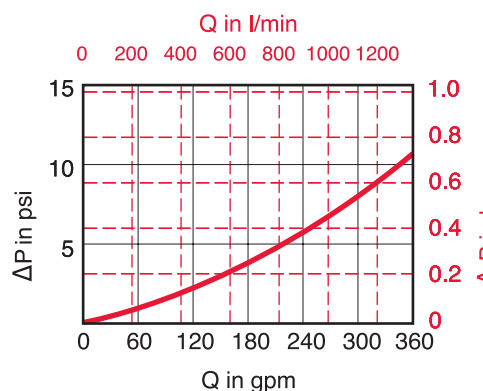
RFD 330 HOUSING & TRANSFER VALVE



RFD 660 HOUSING & TRANSFER VALVE



RFD 950/1300 HOUSING & TRANSFER VALVE



LOW PRESSURE FILTERS

Element K Factors

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

(From Tables Below)

Optimicron	...R...ON					
Size	1 µm	3 µm	5 µm	10 µm	15 µm	20 µm
0110 R XXX ON	1.224	0.719	0.487	0.296	0.234	0.178
0240 R XXX ON	0.571	0.284	0.201	0.125	0.101	0.077
0330 R XXX ON	0.444	0.204	0.15	0.081	0.07	0.056
0660 R XXX ON	0.196	0.093	0.066	0.037	0.031	0.025
0950 R XXX ON	0.131	0.057	0.043	0.026	0.021	0.017
1300 R XXX ON	0.094	0.04	0.032	0.019	0.018	0.012

Stat-X	...R...X SX			
Size	3 µm	5 µm	10 µm	20 µm
0110 R XXX X SX	0.719	0.487	0.296	0.178
0240 R XXX X SX	0.284	0.201	0.125	0.077
0330 R XXX X SX	0.204	0.15	0.081	0.056
0660 R XXX X SX	0.093	0.066	0.037	0.025
0950 R XXX X SX	0.057	0.043	0.026	0.017
1300 R XXX X SX	0.04	0.032	0.019	0.012

ECOMICRON	...R...ECON2			
Size	3 µm	5 µm	10 µm	20 µm
0240 R XXX ECON2	0.340	0.209	0.143	0.099
0330 R XXX ECON2	0.230	0.148	0.093	0.066
0660 R XXX ECON2	0.104	0.066	0.044	0.027
0950 R XXX ECON2	0.066	0.044	0.027	0.022
1300 R XXX ECON2	0.044	0.033	0.022	0.016

Betamicron/Aquamicron	...R...BN4AM	
Size	3 µm	10 µm
0330 R XXX BN4AM	0.477	0.165
0660 R XXX BN4AM	0.192	0.066
0950 R XXX BN4AM	0.132	0.044
1300 R XXX BN4AM	0.088	0.033

Aquamicron	...R...AM
Size	40 µm
0330 R 040 AM	0.115
0660 R 040 AM	0.051
0950 R 040 AM	0.036
1300 R 040 AM	0.026

Wire Mesh	...R...W/HC
Size	25, 50, 100, 200 µm
0110 R XXX W/HC	0.016
0240 R XXX W/HC	0.007
0330 R XXX W/HC	0.011
0660 R XXX W/HC	0.004
0950 R XXX W/HC	0.003
1300 R XXX W/HC	0.002

Polyester	...R...P/HC	
Size	10 µm	20 µm
0110 R XXX P/HC	0.050	0.025
0240 R XXX W/HC	0.023	0.012
0330 R XXX W/HC	0.016	0.008
0660 R XXX W/HC	0.008	0.004
0950 R XXX W/HC	0.006	0.003
1300 R XXX W/HC	0.004	0.002

