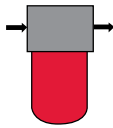


HIGH PRESSURE FILTERS

DF/DFF Series

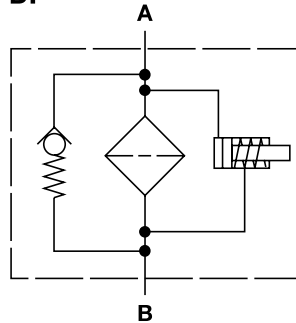
Inline Filters

6090 psi • up to 200 gpm

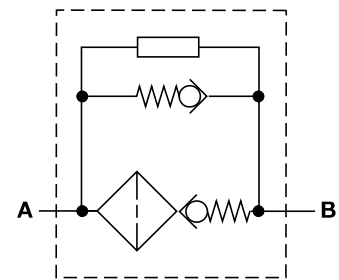


Hydraulic Symbol

DF



DFF FILTER
REVERSE FLOW
CIRCUIT



Features

- Non-welded housing design reduces stress concentrations and prevents fatigue failure.
- Choice of NPT, BSPP, SAE straight thread O-ring boss, and SAE 4-bolt flange porting (sizes 60 - 1320) to allow easy installation with maximum flexibility.
- O-ring seals are used to provide positive, reliable sealing. Choice of O-ring materials (nitrile rubber, fluorocarbon elastomer, and ethylene propylene rubber) provides compatibility with petroleum oils, synthetic fluids, water-glycols, oil/water emulsions, and high water based fluids.
- Screw-in bowl or lid (on 2-pc. bowls) 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.
- HYDAC Differential Pressure 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 located in the filter head provides positive sealing during normal operation and fast opening during cold starts and flow surges. (Optional non-bypass available)
- For special finishes and coatings – consult HYDAC for minimum quantities, availability and pricing.
- Fatigue pressure ratings equal maximum allowable working pressure rating.
- DFF filters are suitable for flow in both directions.

Note: QPD is available in sizes 160-1320 only.

Technical Specifications

Mounting Method	4 mounting holes	
Port Connection		
30	SAE-8, 1/2" NPT, 1/2" BSPP	
60/110	SAE-12, 3/4" NPT, 3/4" BSPP 3/4" SAE, Code 62	
160/240/280	SAE-20, 1 1/4" NPT, 1 1/4" BSPP 1 1/4" SAE, Code 62	
330/660/1320	SAE-24, 1 1/2" NPT, 1 1/2" BSPP 2" SAE Flange Code 62	
Flow Direction	Inlet: Side	Outlet: Side
Construction Materials		
Head	Ductile iron	
Bowl (30-660)	Steel	
Housing/Bowl (660-1320 - 2.0)	Steel	
Cap/Lid (660-1320 type)	Steel	
Flow Capacity		
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)	
280	74 gpm (280 lpm)	
330	87 gpm (330 lpm)	
660	174 gpm (660 lpm)	
1320	200 gpm (757 lpm)	
Housing Pressure Rating		
Max. Allowable Working Pressure	6090 psi (420 bar)	
Fatigue Pressure	6090 psi (420 bar) @ 1 million cycles	
Burst Pressure	30	15950 psi (1100 bar)
	60/110	17400 psi (1200 bar)
	160/240/280	17110 psi (1180 bar)
	330/660/1320	15080 psi (1040 bar)
Element Collapse Pressure Rating		
BH4HC, V	3045 psid (210 bar)	
ON, W/HC	290 psid (20 bar)	
Fluid Temp. Range	14°F to 212°F (-10°C to 100°C)	
Consult HYDAC for applications operating 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		
	ΔP = 29 psid (2 bar) -10% (optional)	
	ΔP = 72 psid (5 bar) -10% (standard)	
	ΔP = 116 psid (8 bar) -10% (optional non bypass)	
Bypass Valve Cracking Pressure		
	ΔP = 43 psid (3 bar) +10% (optional)	
	ΔP = 87 psid (6 bar) +10% (standard)	
	Non Bypass Available	

Applications



Agricultural



Automotive



Construction



Gearboxes



Industrial



Offshore



Commercial
Municipal



Power
Generation



Pulp & Paper



Railways



Shipbuilding



Steel / Heavy
Industry

Model Code

DF ON 30 T B 5 D 1 . X / 12 - V B6 QPD L24

Filter Type _____
 DF = Inline filter
 DFF = Reverse flow inline filter

Element Media _____
 ON = Optimicron® BH/HC = Betamicon® (High Collapse)
 W/HC = Wire Mesh V = Metal Fiber

Size _____
 DF: 30, 60, 110, 160, 240, 280, 330, 660, 1320
 DFF: 160, 240, 280, 330, 660, 1320

Pressure Range _____
 T = 420 bar

Size and Nominal Connection _____
 B = 1/2" Threaded (size 30 only) I = 3/4" SAE Code 62 Flange (sizes 60-140 only)
 C = 3/4" Threaded (sizes 60-140 only) J = 1 1/4" SAE Code 62 Flange (sizes 160-280 only)
 E = 1 1/4" Threaded (sizes 160-280 only) L = 2" SAE Code 62 Flange (sizes 330-1320 only)
 F = 1 1/2" Threaded (sizes 330-1320 only)

Filtration Rating (microns) _____
 1, 3, 5, 10, 15, 20 = ON 3, 5, 10, 20 = BH/HC 25, 50, 100, 200 = W/HC 3, 5, 10, 20 = V

Type of ΔP Clogging Indicator _____
 A, B, BM, C, D (Others available upon request, see Clogging Indicators section.)

Type Number _____
 1 = One piece bowl (sizes 30-660 only) 2 = Two piece bowl (sizes 660-1320 only)
 3 = Upside down mount (two-piece bowl) - (sizes 330-1320)

Modification Number (latest version always supplied) _____

Port Configuration _____
 0 = BSPP 12 = SAE straight thread O-ring boss ports
 3 = NPT ports – NPT ported filters will be SAE with adaptors in each port 16 = SAE flange ports (sizes 60-1320 only)

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

Bypass Valve _____
 (omit) = Non-bypass B3 = Bypass (3 bar) B6 = Bypass (6 bar)

Version _____
 (omit) = No quality protection QPD = Quality Protection Design

Supplementary Details _____
 SO263 = Modification of elements for Skydrol or HYJET phosphate ester fluids
 SO184 = G-1/2 Drain in Bowl Option For Sizes 60 - 280 (comes standard for sizes 330, 660, & 1320)
 SO210H = Alternate Bowl (sizes 160, 240, & 280) - 16 mm longer
 W = "VD..." indicator modified with a brass piston for use with High water based emulsions/solutions (HFA) & (HFC) or when using "V" elements
 L24, L48, L110, L220 = Lamp for D-type clogging indicator (LXX, XX = voltage)
 T100 = Indicator Thermal Lockout, 100°F (C and D indicators only)
 cRUus = Electrical Indicators with underwriter's recognition
 SFREE = Element specially designed to minimize electrostatic charge generation

Replacement Element Model Code

0030 D 005 ON / V QPD

Size _____
 0030, 0060, 0110, 0160,
 0240, 0280, 0330, 0660, 1320

Filtration Rating (micron) _____
 3, 5, 10, 20 = BH4HC
 1, 3, 5, 10, 15, 20 = ON
 25, 50, 100, 200 = W/HC
 3, 5, 10, 20 = V

Element Media _____
 BH4HC, ON, W/HC, V

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

Version _____
 (omit) = No quality protection
 QPD = Quality Protection Design

Supplementary Details _____
 SO263 = (same as above)
 W = Modification of "V" elements for use with oil water emulsions (HFA) and water polymer solutions (HFC) usually polyglycol
 SFREE = (same as above)

Clogging Indicator Model Code

VD 5 D . X / V L24

Indicator Prefix _____
 VD = G 1/2 6000 psi

Trip Pressure _____
 2 = 29 psid (2 bar) (option)
 5 = 72 psid (5 bar) (standard)
 Optional 15 psid (1 bar) & 116 psid (8 bar) available upon request

Type of Indicator _____
 A = No indicator, plugged port
 B = Pop-up indicator (auto reset)
 BM = Pop-up indicator (manual reset)
 C = Electric switch – SPDT
 D = Electric switch and LED light – SPDT

Modification Number _____

Supplementary Details _____

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

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 Recognition (VM, VD types C, D, J, and J4 only) _____
 cRUus = Electrical Indicators with underwriter's recognition
 W = "VD..." indicator modified with a brass piston for use with High water based emulsions/solutions (HFA) & (HFC)

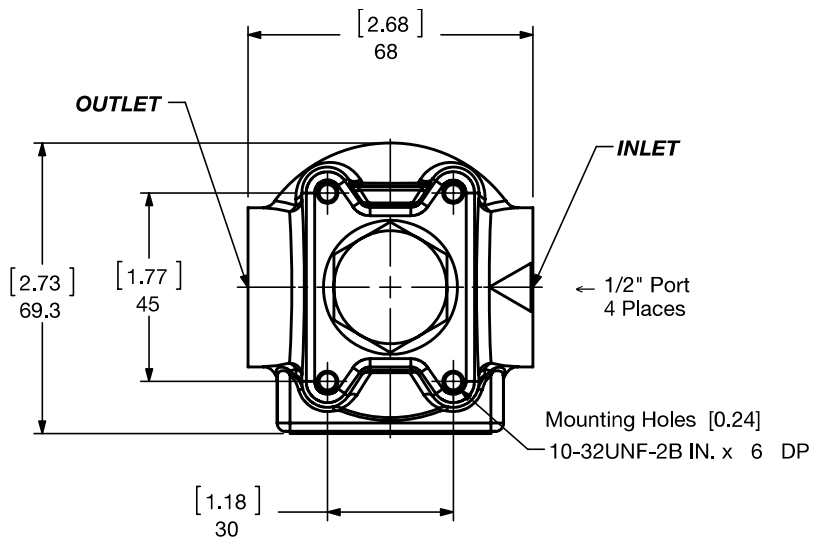
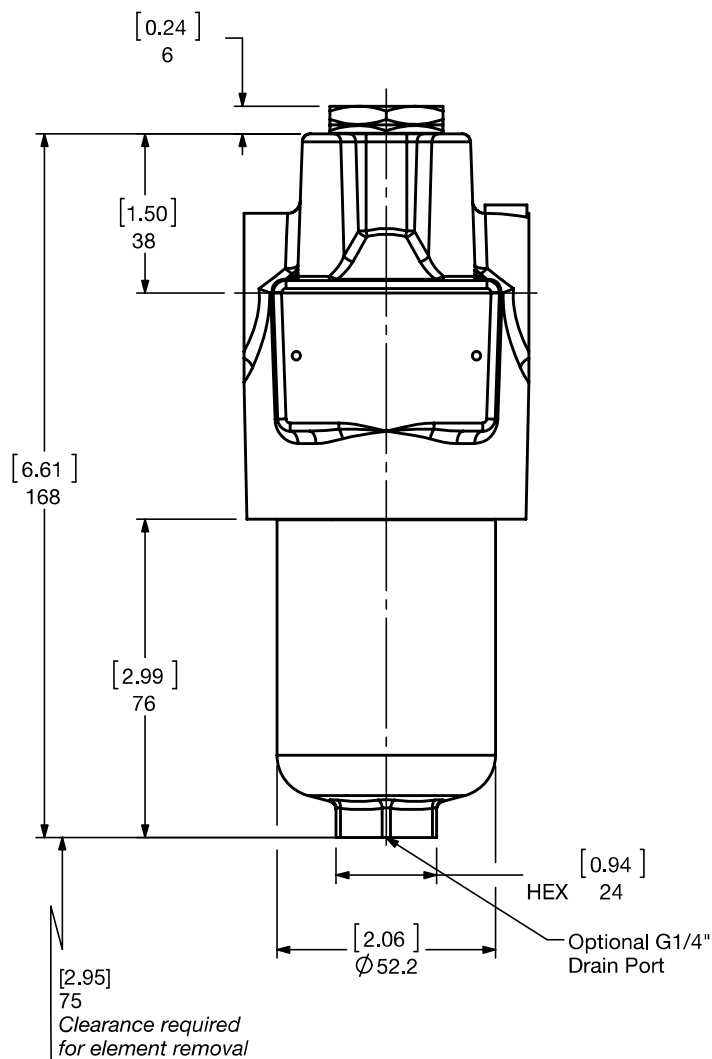
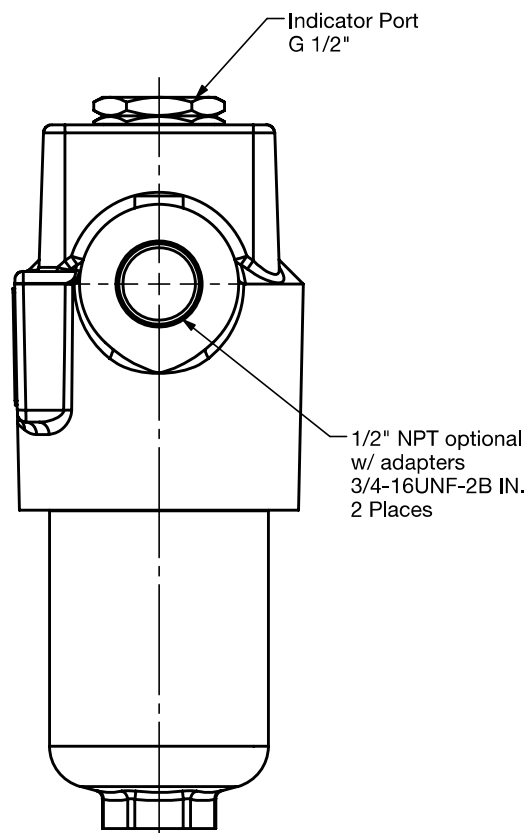
(For additional details and options, see Clogging Indicators section.)

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

HIGH PRESSURE FILTERS

Dimensions

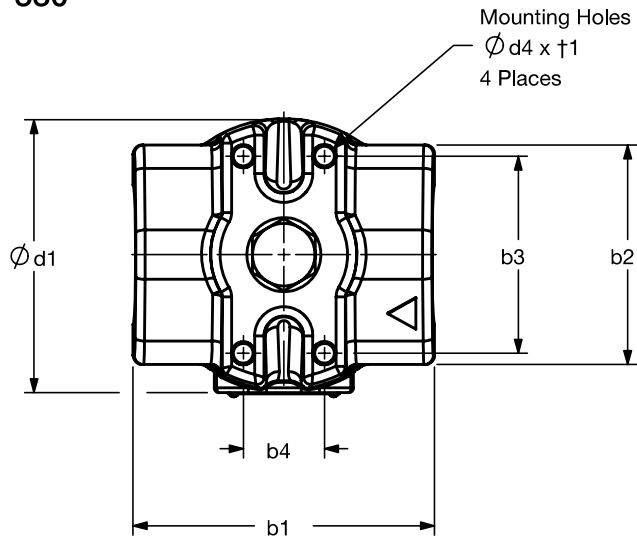
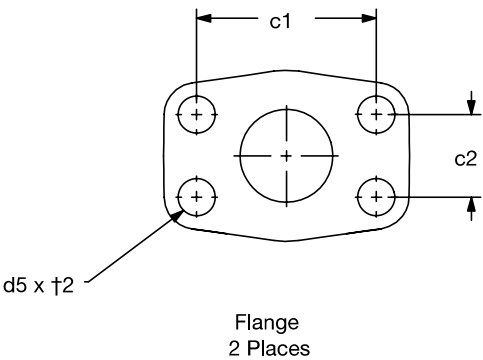
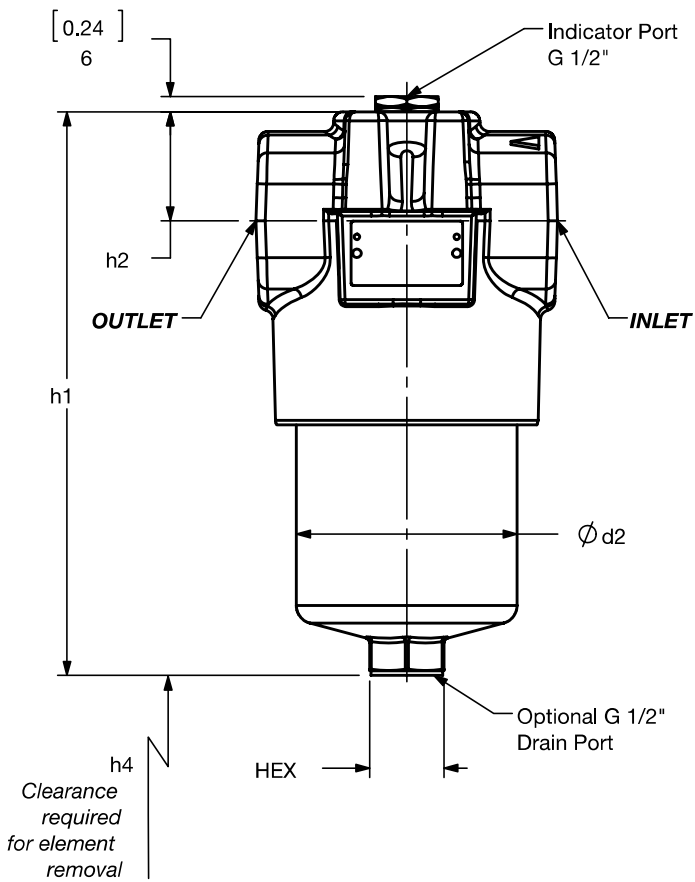
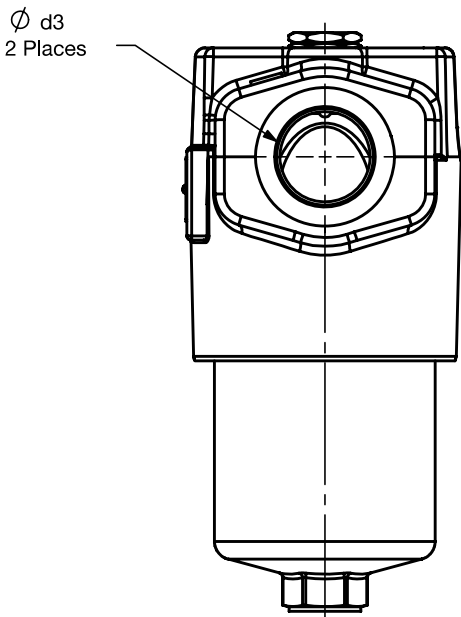
DF 30



Size	30
Weight (lbs.)	5.1

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
DF 60-330
DFF 160-330



Size	60	110	160	240	280	330
Weight (lbs.)	10	12	22.8	26.1	36	54.1

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.

HIGH PRESSURE FILTERS

Dimensions

DF 60-330 (cont'd)

DFF 160-330 (cont'd)

Size	b1	b2	b3	b4	c1	c2	d1	d2	d3 NOM	d4*	d5	h1	h2	h4	HEX	†1	†2
60...C... 1.X	(3.54) 90	(2.8) 71	(2.2) 56	(1.26) 32	-	-	(3.39) 86	(2.68) 68	3/4"	1/4- 28UNF- 2B M6x1.0	-	(7.22) 183.5	(1.57) 40	(3.35) 85	(1.06) 27	(0.35) 9	-
60...I... 1.X	(3.50) 89	(2.8) 71	(2.2) 56	(1.26) 32	(2.00) 50.8	(0.94) 23.8	(3.39) 86	(2.68) 68			3/8- 16UNC- 2B M10 X 1.5	(7.22) 183.5	(1.57) 40	(3.35) 85	(1.06) 27	(0.35) 9	(0.59) 15
110...C... 1.X	(3.54) 90	(2.8) 71	(2.2) 56	(1.26) 32	-	-	(3.39) 86	(2.68) 68	3/4"	1/4- 28UNF- 2B M6x1.0	-	(9.88) 251	(1.57) 40	(3.35) 85	(1.06) 27	(0.35) 9	-
110...I... 1.X	(3.50) 89	(2.8) 71	(2.2) 56	(1.26) 32	(2.00) 50.8	(0.94) 23.8	(3.39) 86	(2.68) 68			3/8- 16UNC- 2B M10 X 1.5	(9.88) 251	(1.57) 40	(3.35) 85	(1.06) 27	(0.35) 9	(0.59) 15
160...E... 1.X	(4.92) 125	(3.74) 95	(3.35) 85	(1.38) 35	-	-	(4.69) 119	(3.74) 95	1- 1/4"	3/8- 24UNF- 2B M10x1.5	-	(9.57) 243	(1.85) 47	(4.13) 105	(1.26) 32	(0.55) 14	-
160...J... 1.X	(4.92) 125	(3.74) 95	(3.35) 85	(1.38) 35	(2.63) 66.7	(1.25) 31.8	(4.69) 119	(3.74) 95			1/2- 13UNC- 2B M14 X 2	(9.57) 243	(1.85) 47	(4.13) 105	(1.26) 32	(0.55) 14	(0.75) 19
240...E... 1.X	(4.92) 125	(3.74) 95	(3.35) 85	(1.38) 35	-	-	(4.69) 119	(3.74) 95	1- 1/4"	3/8- 24UNF- 2B M10x1.5	-	(11.91) 302.5	(1.85) 47	(4.13) 105	(1.26) 32	(0.55) 14	-
240...J... 1.X	(4.92) 125	(3.74) 95	(3.35) 85	(1.38) 35	(2.63) 66.7	(1.25) 31.8	(4.69) 119	(3.74) 95			1/2- 13UNC- 2B M14 X 2	(11.91) 302.5	(1.85) 47	(4.13) 105	(1.26) 32	(0.55) 14	(0.75) 19
280...E... 1.X	(4.92) 125	(3.74) 95	(3.35) 85	(1.38) 35	-	-	(4.69) 119	(3.74) 95	1- 1/4"	3/8- 24UNF- 2B M10x1.5	-	(19.06) 484	(1.85) 47	(4.13) 105	(1.26) 32	(0.55) 14	-
280...J... 1.X	(4.92) 125	(3.74) 95	(3.35) 85	(1.38) 35	(2.63) 66.7	(1.25) 31.8	(4.69) 119	(3.74) 95			1/2- 13UNC- 2B M14 X 2	(19.06) 484	(1.85) 47	(4.13) 105	(1.26) 32	(0.55) 14	(0.75) 19
330...F... 1.X	(6.30) 160	(5.24) 133	(4.53) 115	(2.36) 60	-	-	(6.42) 163	(5.12) 130	2"	1/2- 20UNF- 2B M12x1.75	-	(12.16) 309	(2.05) 52	(4.53) 115	(1.42) 36	(0.67) 17	-
330...L... 1.X	(6.30) 160	(5.24) 133	(4.53) 115	(2.36) 60	(3.81) 96.8	(1.75) 44.5	(6.42) 163	(5.12) 130			3/4- 10UNC- 2B M2O X 2.5	(12.16) 309	(2.05) 52	(4.53) 115	(1.42) 36	(0.67) 17	(0.98) 25
330...F... 2.X	(6.30) 160	(5.24) 133	(4.53) 115	(2.36) 60	-	-	(6.42) 163	(5.12) 130	2"	1/2- 20UNF- 2B M12x1.75	-	(12.16) 309	(2.05) 52	(7.09) 180	(1.42) 36	(0.67) 17	-
330...L... 2.X	(6.30) 160	(5.24) 133	(4.53) 115	(2.36) 60	(3.81) 96.8	(1.75) 44.5	(6.42) 163	(5.12) 130			3/4- 10UNC- 2B M2O X 2.5	(12.16) 309	(2.05) 52	(7.09) 180	(1.42) 36	(0.67) 17	(0.98) 25

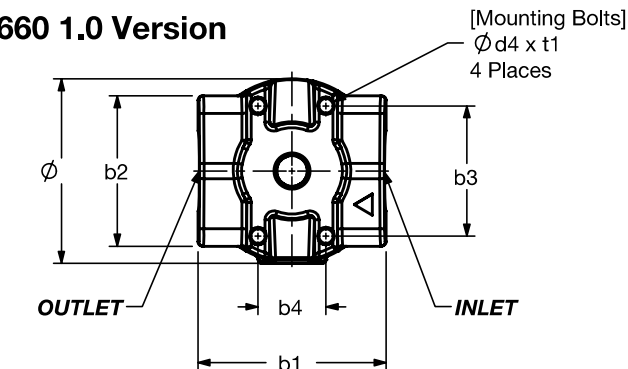
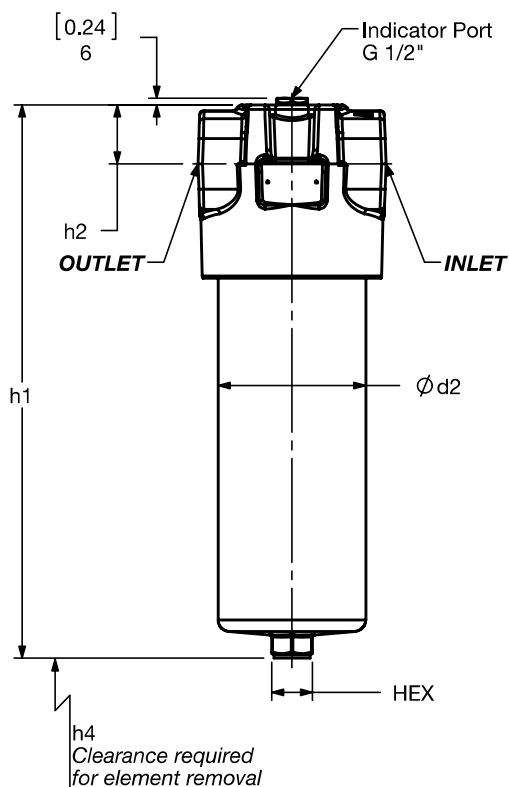
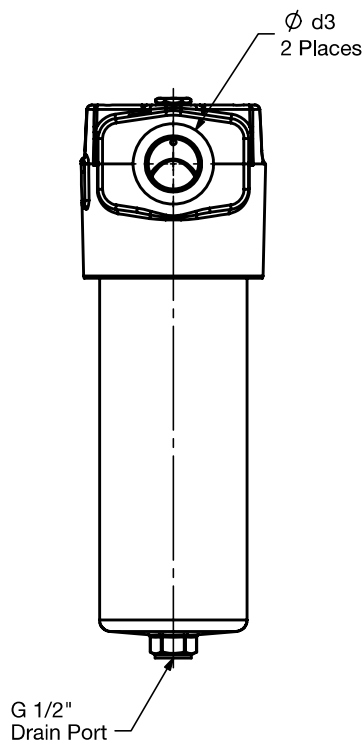
***d4** - UN Threads for SAE (/12) & Flanged (/16) ports
- M Threads for BSPP ports & Flanged metric ports

Notes



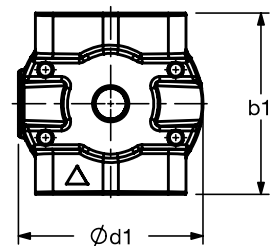
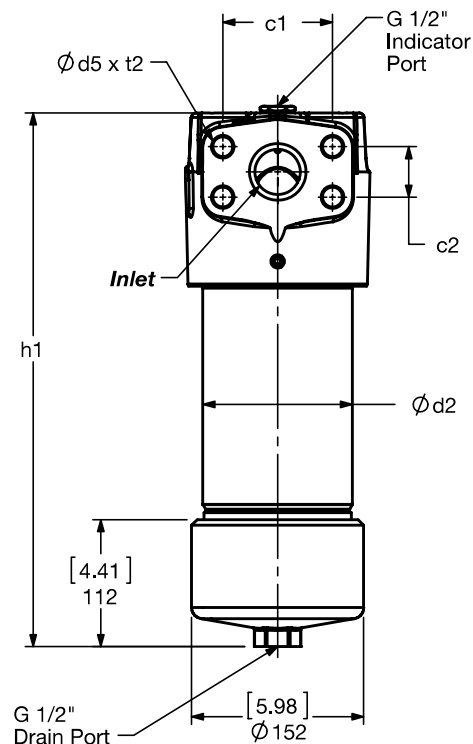
Dimensions DF 660-1320 DFF 660-1320

660 1.0 Version



660-1320 2.0 Version

Note - See 1.X Version for mounting



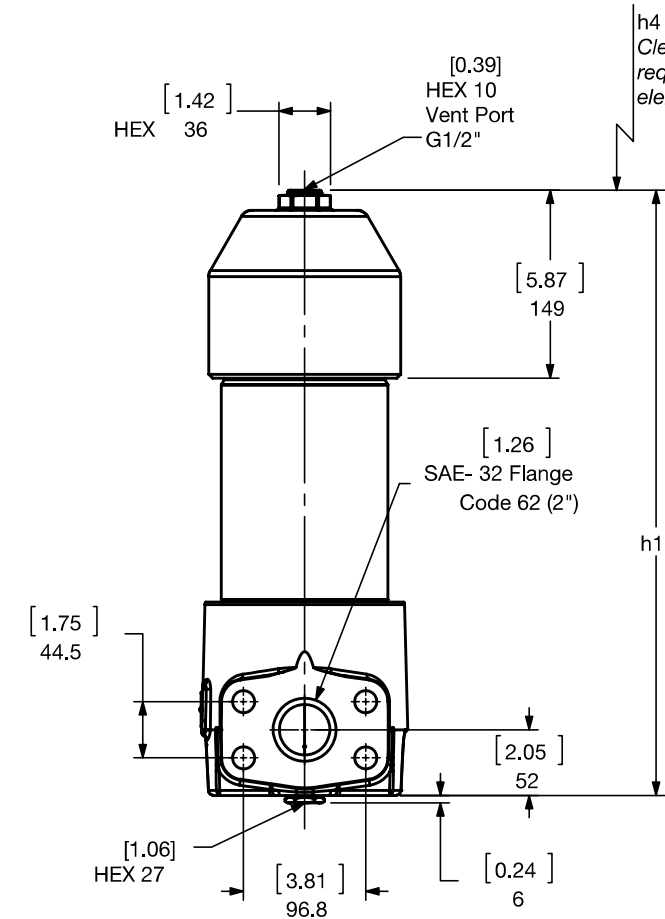
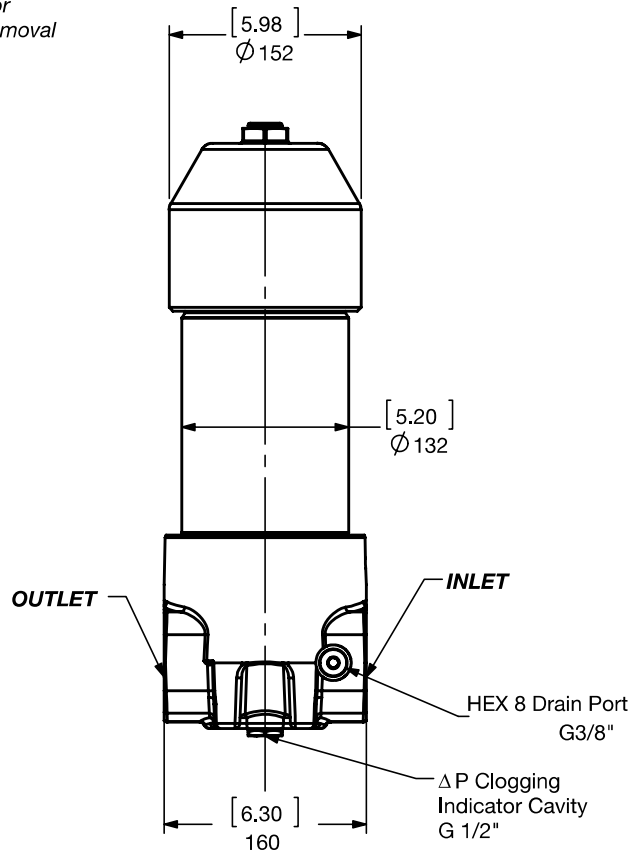
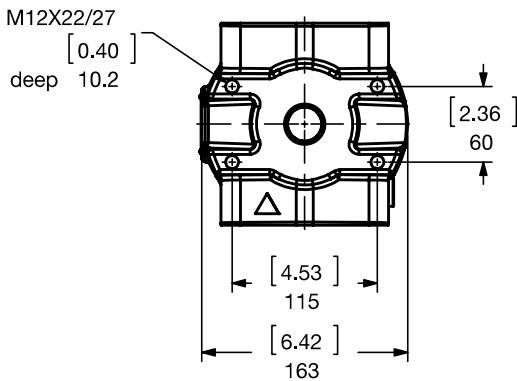
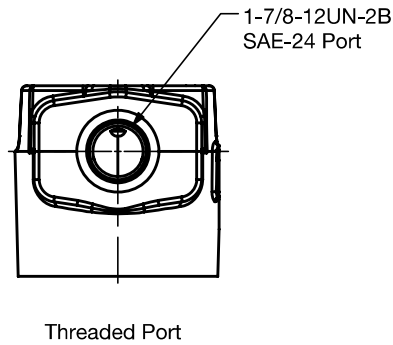
Size	b1	b2	b3	b4	c1	c2	d1	d2	d3 NOM	d4*	d5	h1	h2	h4	HEX	†1	†2
660...F... 1.X	(6.3) 160	(5.24) 133	(4.53) 115	(2.36) 60	-	-	(6.42) 163	(5.12) 130	1- 1/2"	1/2- 20UNF- 2B M12x1.75	-	(18.93) 481	(2.05) 52	(4.53) 115	(1.42) 36	(0.67) 17	-
660...L... 1.X	(6.3) 160	(5.24) 133	(4.53) 115	(2.36) 60	(3.81) 96.8	(1.75) 44.5	(6.42) 163	(5.12) 130	2"		3/4- 10UNC- 2B M20x2.5	(18.93) 481	(2.05) 52	(4.53) 115	(1.42) 36	(0.67) 17	(0.98) 25
660...F... 2.X	(6.3) 160	(5.24) 133	(4.53) 115	(2.36) 60	-	-	(6.42) 163	(5.12) 130	1- 1/2"	1/2- 20UNF- 2B M12x1.75	-	(18.54) 471	(2.05) 52	(13.78) 350	(1.42) 36	(0.67) 17	-
660...L... 2.X	(6.3) 160	(5.24) 133	(4.53) 115	(2.36) 60	(3.81) 96.8	(1.75) 44.5	(6.42) 163	(5.12) 130	2"		3/4- 10UNC- 2B M20x2,5	(18.54) 471	(2.05) 52	(13.78) 350	(1.42) 36	(0.67) 17	(0.98) 25
1320...F... 2.X	(6.3) 160	(5.24) 133	(4.53) 115	(2.36) 60	-	-	(6.42) 163	(5.12) 130	1- 1/2"	1/2- 20UNF- 2B M12x1.75	-	(29.25) 743	(2.05) 52	(26.38) 670	(1.42) 36	(0.67) 17	-
1320...L... 2.X	(6.3) 160	(5.24) 133	(4.53) 115	(2.36) 60	(3.81) 96.8	(1.75) 44.5	(6.42) 163	(5.12) 130	2"		3/4- 10UNC- 2B M20x2,5	(29.25) 743	(2.05) 52	(26.38) 670	(1.42) 36	(0.67) 17	(0.98) 25

Size	660 1.0	660 2.0	1320 2.0
Weight (lbs.)	70	75.9	112.7

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.

HIGH PRESSURE FILTERS

Dimensions
DF 330/660/1320 3.0 Version
DFF 330/660/1320 3.0 Version



Size	h1	h4
330...F..3.X	[10.35]	[3.15]
330...L..3.X	263	80
660...F..3.x	[16.85]	[9.84]
660...L..3.x	428	250
1320...F..3.x	[29.49]	[22.44]
1320...L..3,x	749	570

Size	330	660	1320
Weight (lbs.)	61.5	74.8	112.0

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

Sizing Information

Total pressure loss through the filter is as follows:

Assembly ΔP = Housing ΔP + Element ΔP

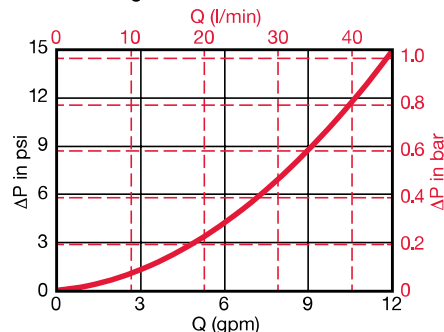
Housing Curve:

Pressure loss through housing is as follows:

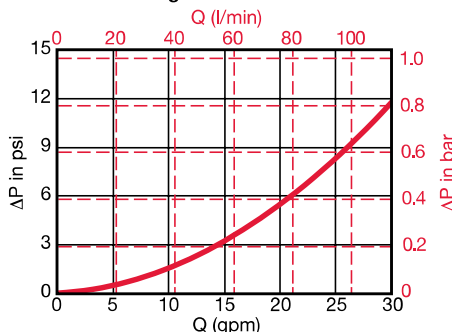
Housing ΔP = Housing Curve $\Delta P \times \frac{\text{Actual Specific Gravity}}{0.86}$

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

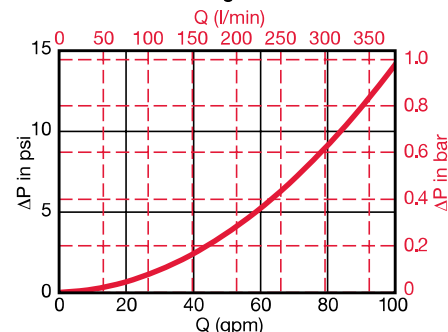
DF 30 Housing



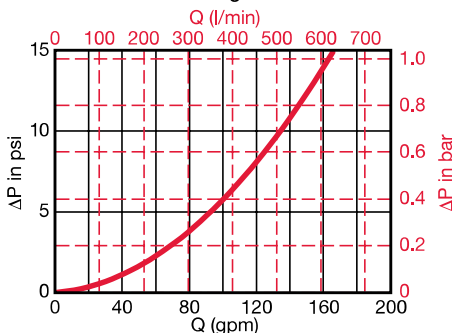
DF 60/110 Housing



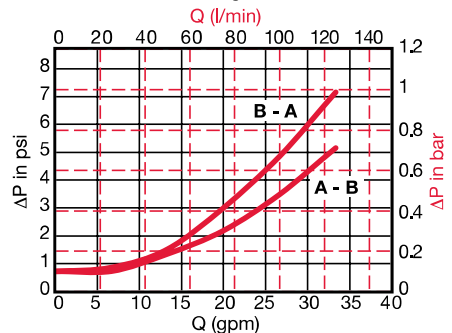
DF 160/240/280 Housing



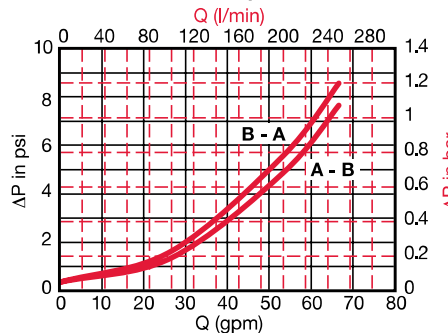
DF 330/660/1320 Housing



DFF 160/240/280 Housing



DFF 330/660/1320 Housing



Element K Factors

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

Betamicon®	...D...BH4HC Elements (High Collapse)			
Size	3 μm	5 μm	10 μm	20 μm
0030 D XXX BH4HC	5.005	2.782	1.992	1.043
0060 D XXX BH4HC	3.216	1.789	0.993	0.670
0110 D XXX BH4HC	1.394	0.818	0.489	0.307
0160 D XXX BH4HC	0.922	0.571	0.324	0.241
0240 D XXX BH4HC	0.582	0.373	0.214	0.159
0280 D XXX BH4HC	0.313	0.187	0.099	0.088
0330 D XXX BH4HC	0.423	0.247	0.154	0.110
0660 D XXX BH4HC	0.181	0.104	0.055	0.049
1320 D XXX BH4HC	0.088	0.055	0.033	0.022

Optimicon	...D...ON Elements					
Size	1 μm	3 μm	5 μm	10 μm	15 μm	20 μm
0030 D XXX ON	4.27	3.507	2.376	1.251	0.768	0.62
0060 D XXX ON	2.936	1.427	1.004	0.664	0.537	0.347
0110 D XXX ON	1.416	0.735	0.527	0.333	0.254	0.164
0160 D XXX ON	1.015	0.604	0.423	0.225	0.204	0.175
0240 D XXX ON	0.631	0.379	0.293	0.175	0.134	0.115
0280 D XXX ON	0.304	0.185	0.15	0.082	0.075	0.064
0330 D XXX ON	0.452	0.23	0.185	0.135	0.085	0.067
0660 D XXX ON	0.207	0.106	0.086	0.051	0.039	0.031
1320 D XXX ON	0.102	0.053	0.042	0.025	0.019	0.015

Wire Mesh	...D...W/HC Elements	
Size	25, 50, 100, 200 μm	
0030 D XXX W/HC	0.166	
0060 D XXX W/HC	0.042	
0110 D XXX W/HC	0.023	
0160 D XXX W/HC	0.016	
0240 D XXX W/HC	0.010	
0280 D XXX W/HC	0.005	
0330 D XXX W/HC	0.008	
0660 D XXX W/HC	0.004	
1320 D XXX W/HC	0.002	

Metal Fiber	...D...V Elements (High Collapse)			
Size	3 μm	5 μm	10 μm	20 μm
0030 D XXX V	1.011	0.740	0.411	0.200
0060 D XXX V	0.877	0.511	0.296	0.183
0110 D XXX V	0.452	0.304	0.182	0.118
0160 D XXX V	0.251	0.177	0.123	0.079
0240 D XXX V	0.169	0.137	0.093	0.062
0280 D XXX V	0.126	0.093	0.064	0.041
0330 D XXX V	0.121	0.097	0.065	0.043
0660 D XXX V	0.063	0.050	0.034	0.021
1320 D XXX V	0.032	0.026	0.018	0.012

All Element K Factors in psi / gpm.