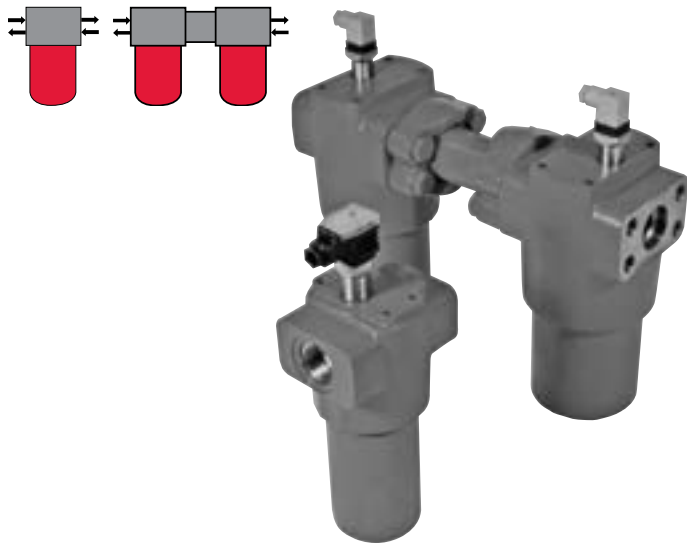


# HIGH PRESSURE FILTERS

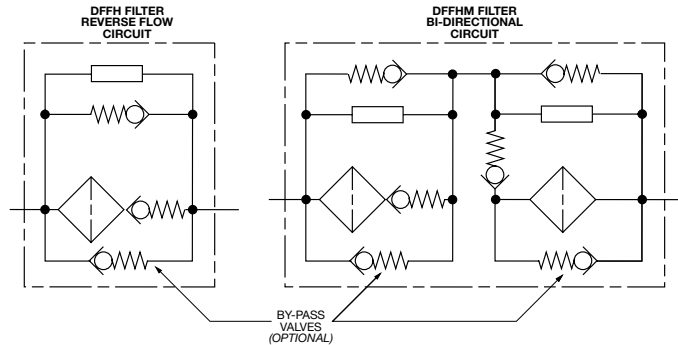
## DFFH & DFFHM Series

Reverse Flow Bypass & Bi-Directional Filters

6090 psi • up to 100 gpm



### Hydraulic Symbol



### Features

- DFFH Reverse bypass Flow models filter fluid in the forward direction and bypass the filter element when the flow direction is reversed.
- DFFHM Bi-Directional model provides fluid filtering in both directions. There are separate filter elements for each direction.
- Inlet/outlet port options include SAE 4-bolt flange code 62, or SAE ports (DFFHM flange only) to allow easy installation without costly adapters.
- O-ring seals are used to provide positive, reliable sealing. A 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, mounted below the filter head requires minimal clearance to remove the element for replacement; contaminated fluid cannot be washed downstream when element is serviced.
- Clogging indicators have no external dynamic seal. This results in high reliability due to magnetic actuation which eliminates a leak point.
- A poppet-type bypass valve, located in filter head, (optional) provides positive sealing during normal operation and fast opening during cold starts and flow surges.

### Applications



Agricultural



Automotive



Construction



Industrial



Railways

### Technical Specifications

<b>Mounting Method</b>	DFFH: 4 mounting holes DFFHM: 8 mounting holes
<b>Port Connection</b>	DFFH 160/240/280 SAE-20, 1 1/4" SAE Flange Code 62 DFFH 330/660/1320 SAE-24, 2" SAE Flange Code 62 DFFHM 160/240/280 1 1/4" SAE Flange Code 62 DFFHM 330/660/1320 2" SAE Flange Code 62
<b>Flow Direction</b>	Inlet: Side      Outlet: Side
<b>Construction Materials</b>	Head Ductile iron Single piece bowl "1.X" Steel Bowl Steel Two piece bowl "2.X" Steel Housing Steel Lid/Cap Steel
<b>Flow Capacity</b>	160 42 gpm (160 lpm) 240 63 gpm (240 lpm) 280 74 gpm (280 lpm) 330 87 gpm (330 lpm) 660/1320 100 gpm (378.5 lpm)
<b>Housing Pressure Rating</b>	Max. Allowable Working Pressure 6090 psi (420 bar) Fatigue Pressure 6000 psi (420 bar) Burst Pressure Contact HYDAC Office
<b>Element Collapse Pressure Rating</b>	BH4HC, V 3045 psid (210 bar) ON, W/HC 290 psid (20 bar)
<b>Fluid Temperature Range</b>	14°F to 212°F (-10°C to 100°C) Consult HYDAC for applications operating below 14°F (-10°C)
<b>Fluid Compatibility</b>	Compatible with all hydrocarbon based, synthetic, water glycol, oil/water emulsion, and high water based fluids when the appropriate seals are selected.
<b>Indicator Trip Pressure</b>	$\Delta P = 29$ psid (2 bar) -10% (optional) $\Delta P = 72$ psid (5 bar) -10% (standard) $\Delta P = 116$ psid (8 bar) (non-bypass application)
<b>Bypass Valve Cracking Pressure</b>	$\Delta P = 43$ psid (3 bar) +10% (optional) $\Delta P = 87$ psid (6 bar) +10% (standard)

## Model Code

**DFFH BH/HC 160 T E 3 B 1 . 0 / 12**

**Filter Type** \_\_\_\_\_  
 DFFH = Reverse Flow bypass Filter    DFFHM = Bi-Directional Filter

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

**Size** \_\_\_\_\_  
 160, 240, 280, 330, 660, 1320

**Pressure Range** \_\_\_\_\_  
 T = 420 bar

**Type of Connection** \_\_\_\_\_  
 E = 1-1/4 Threaded (DFFH sizes 160-280 only)  
 F = 1-1/2 Threaded (DFFH sizes 330-1320 only)  
 J = 1-1/4 Flanged SAE Code 62 (DFFH & DFFHM sizes 160-280 only)  
 L = 2 Flanged SAE Code 62 (DFFH & DFFHM sizes 330-1320 only)

**Filtration Rating (micron)** \_\_\_\_\_  
 3, 5, 10, 20 = BH/HC, BN/HC    3, 5, 10, 20 = V    1, 3, 5, 10, 15, 20 = ON    25, 50, 100, 200 = W/HC

**Type of ΔP Clogging Indicator** \_\_\_\_\_  
 A, B, BM, C, D (Others available upon request)

**Type Number** \_\_\_\_\_  
 1  
 2 = 2 Piece Bowl (size 660/1320 only)

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

**Port Configuration** \_\_\_\_\_  
 12 = SAE Straight Thread O-Ring Boss Ports (available on DFFH only)    16 = SAE Flange Ports

**Seals** \_\_\_\_\_  
 (omit) = Nitrile rubber (NBR) (standard)    V = Fluorocarbon elastomer (FKM)    EPR = Ethylene Propylene rubber (EPR)

**Bypass Valve** \_\_\_\_\_  
 (omit) = Non-bypass - Critical applications (high collapse element required)  
 B3 = 43 psid (3 bar) - Optional  
 B6 = 87 psid (6 bar) - Standard setting for pressure filters

**Supplementary Details** \_\_\_\_\_  
 SO263 = Modification of elements for Skydrol or HYJET phosphate ester fluid  
 SO184 = G-1/2" Drain in Bowl Option For Sizes 160 - 280 (standard for sizes 330 & 660)  
 W = "VD..." indicator modified with a brass piston for use with high water based emulsions/solutions (HFA) & (HFC)  
 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 Indicator with underwriter's recognition  
 SFREE = Element specially designed to minimize electrostatic charge generation

## Replacement Element Model Code

**0160 D 003 BH4HC /**

**Size** \_\_\_\_\_  
 0160, 0240, 0280,  
 0330, 0660, 1320

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

**Element Media** \_\_\_\_\_  
 BH4HC, ON, V, W/HC

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

**Supplementary Details** \_\_\_\_\_  
 SO263 = (same as above)  
 SFREE = (same as above)

## Clogging Indicator Model Code

**VD 5 B . X /**

**Indicator Prefix** \_\_\_\_\_  
 VD = G 1/2 6000 psi

**Trip Pressure** \_\_\_\_\_  
 2 = 29 psid (2 bar) (option)  
 5 = 72 psid (5 bar) (standard)  
 Optional 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)  
 EPR = Ethylene propylene rubber (EPR)

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

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

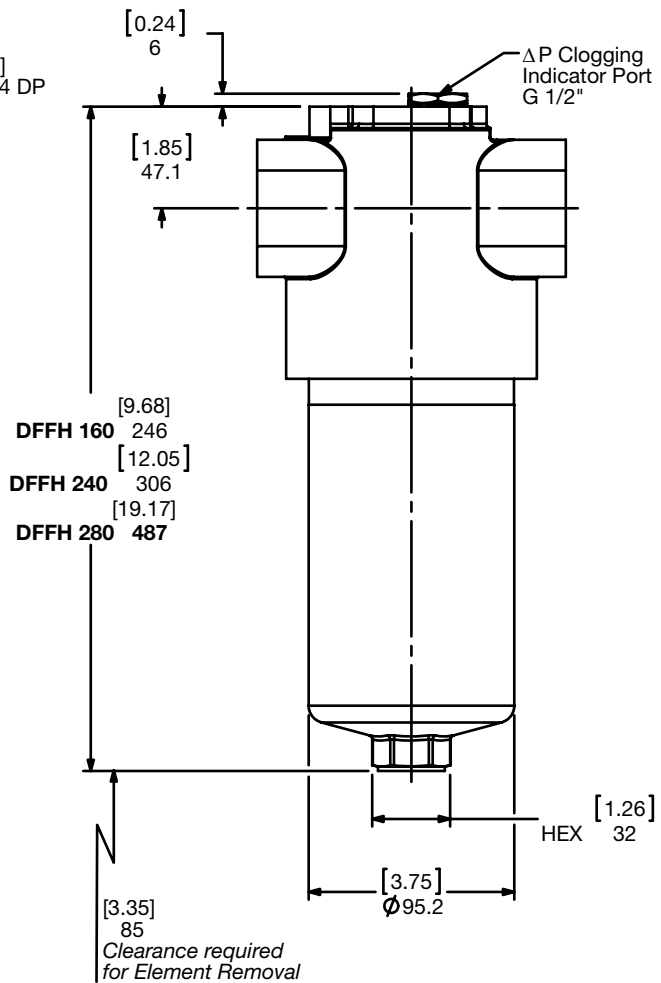
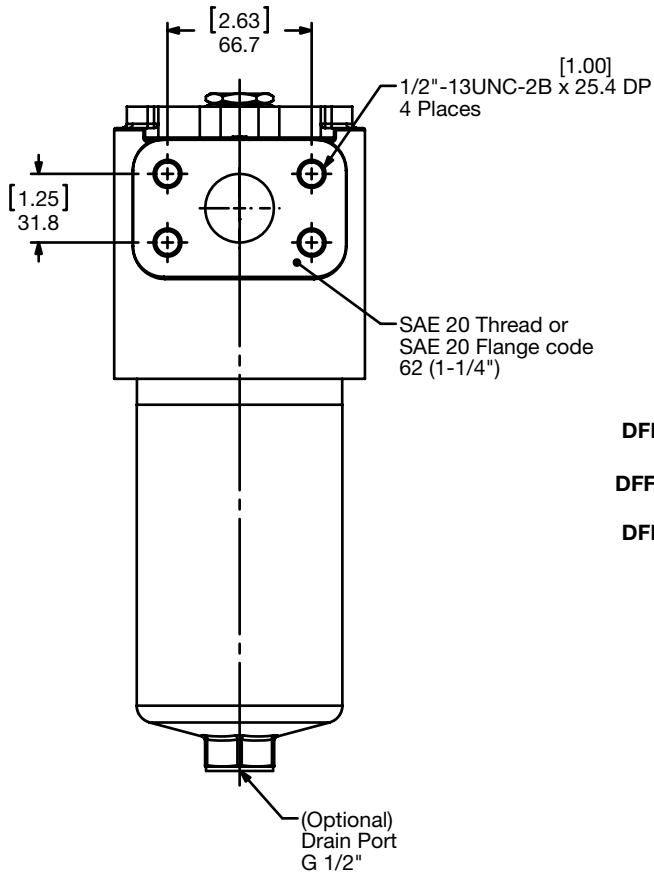
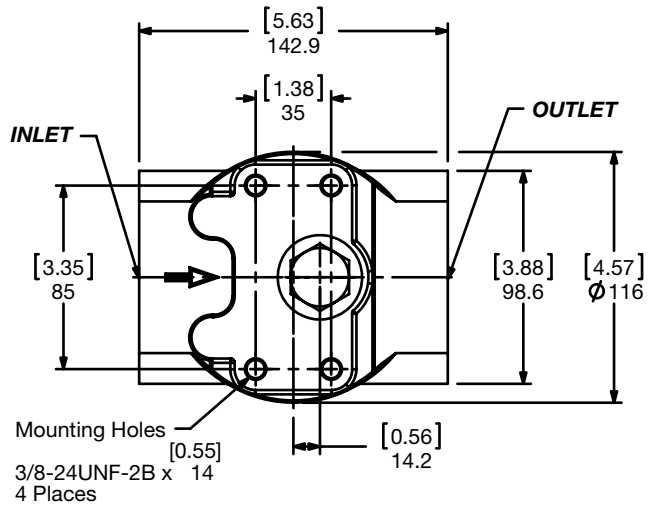
**Underwriters Recognition (VD types C, D, J, and J4 only)** \_\_\_\_\_  
 cRUus = Electrical Indicator with underwriter's recognition  
 W = "VD..." indicator modified with a brass piston for use with high water based emulsions/solutions (HFA) & (HFC)  
 (For additional details and options, see Section H - Clogging Indicators.)

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

# HIGH PRESSURE FILTERS

## Dimensions

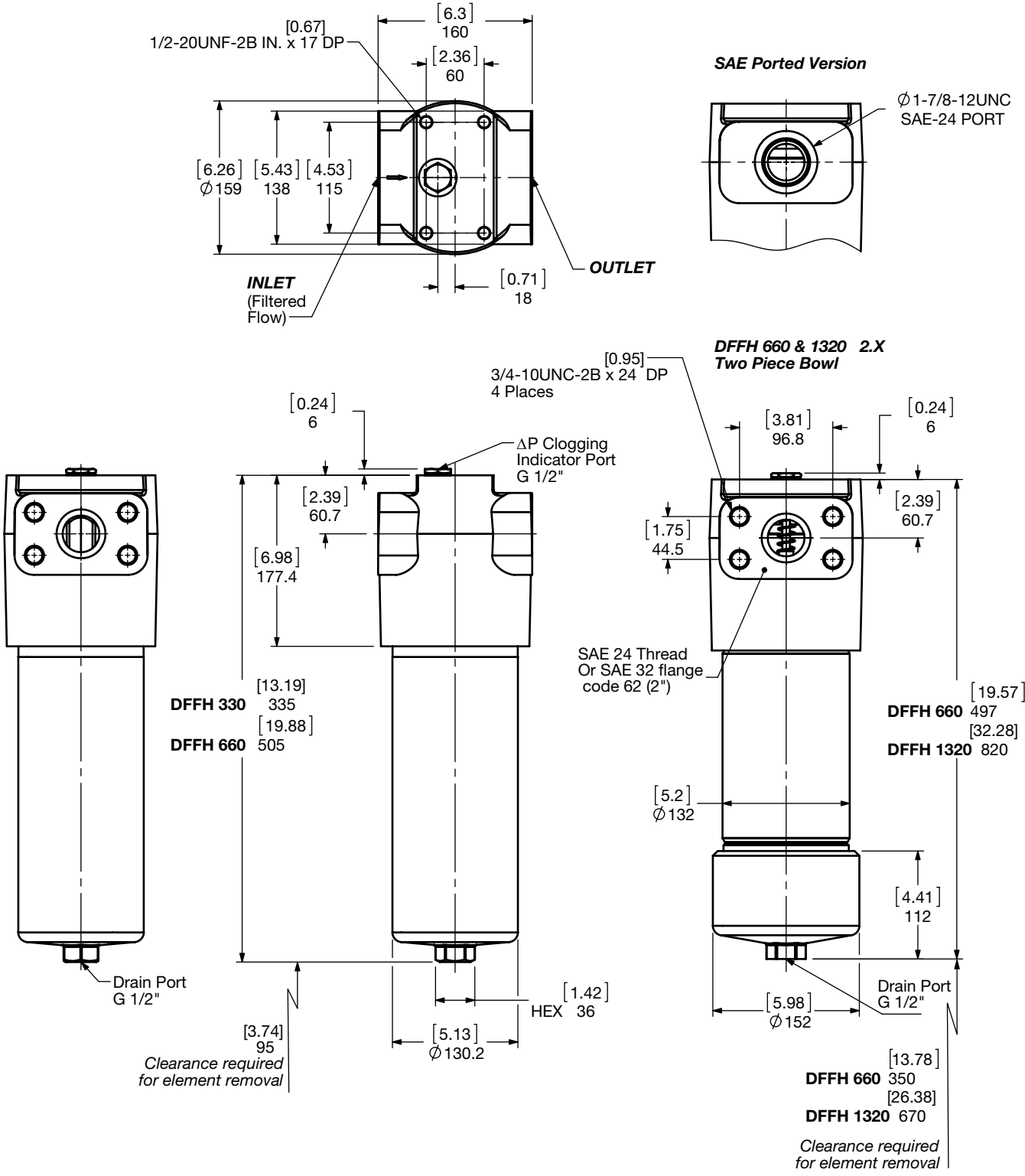
DFFH 160 / 240 / 280



Size - DFFH	160	240	280
Weight (lbs.)	25.6	29.2	39.6

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.

## Dimensions DFFH 330 / 660 / 1320



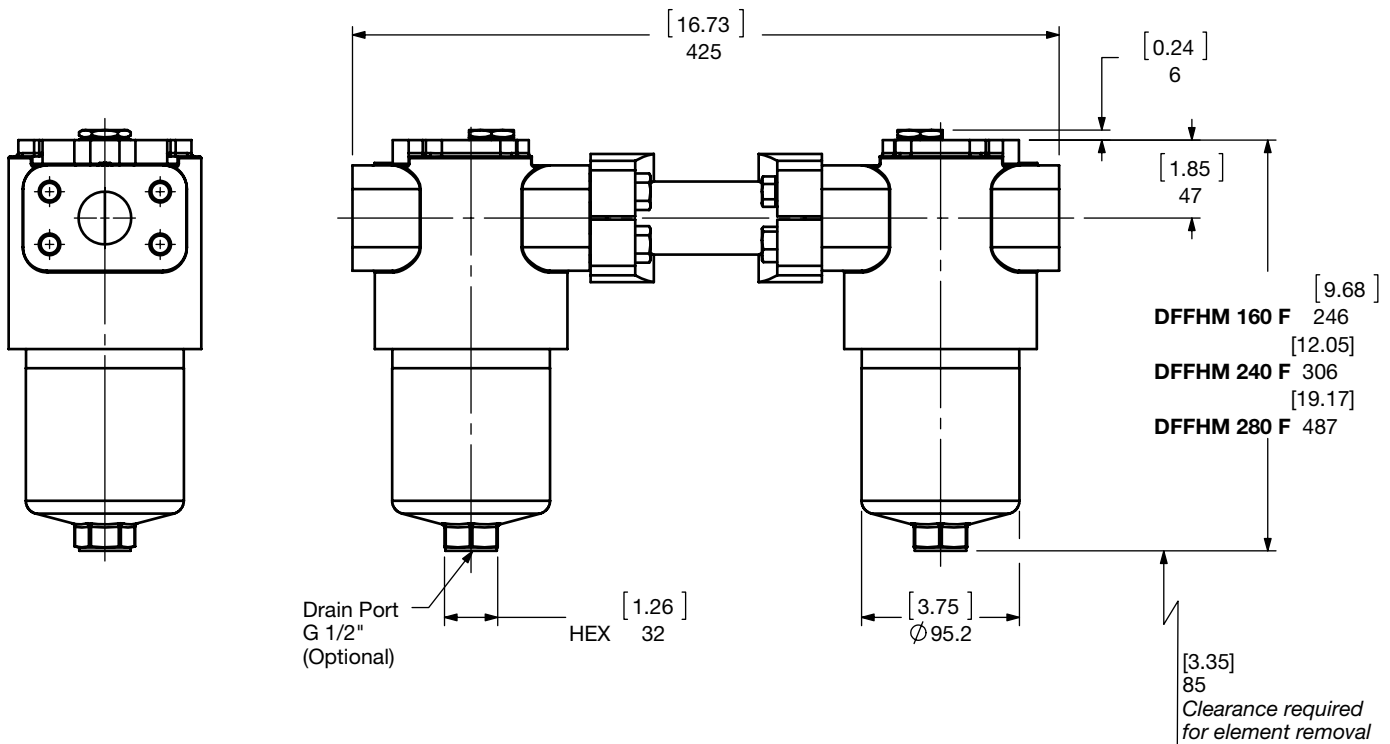
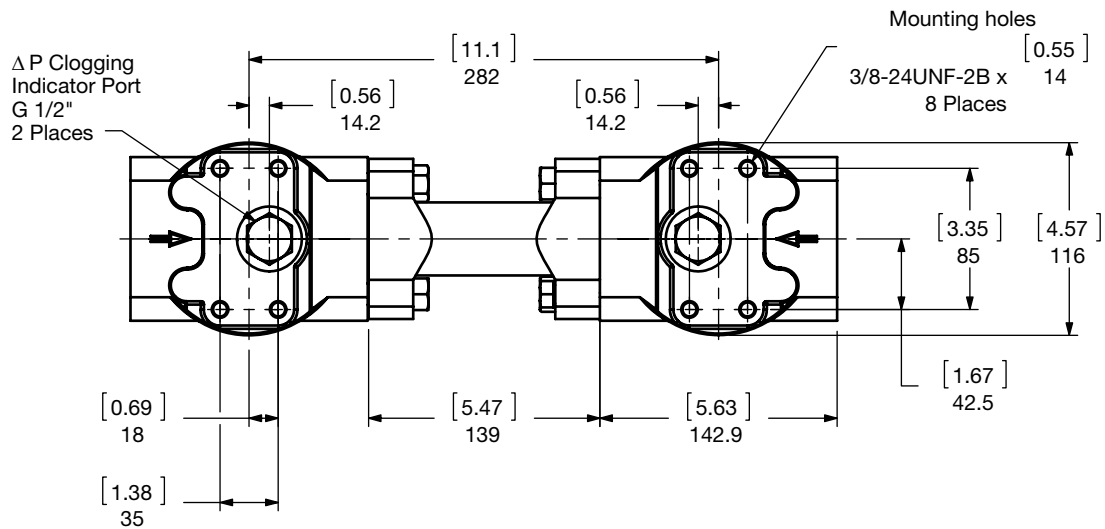
Size - DFFH	330	660	1320
Weight (lbs.)	61.3	78.7	127

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.

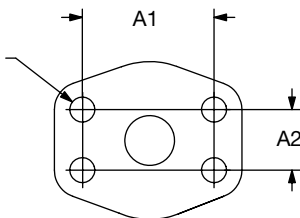
# HIGH PRESSURE FILTERS

## Dimensions

### DFFHM 160 / 240 / 280



$\phi A3$   
Flange bolt holes  
(4 Places)

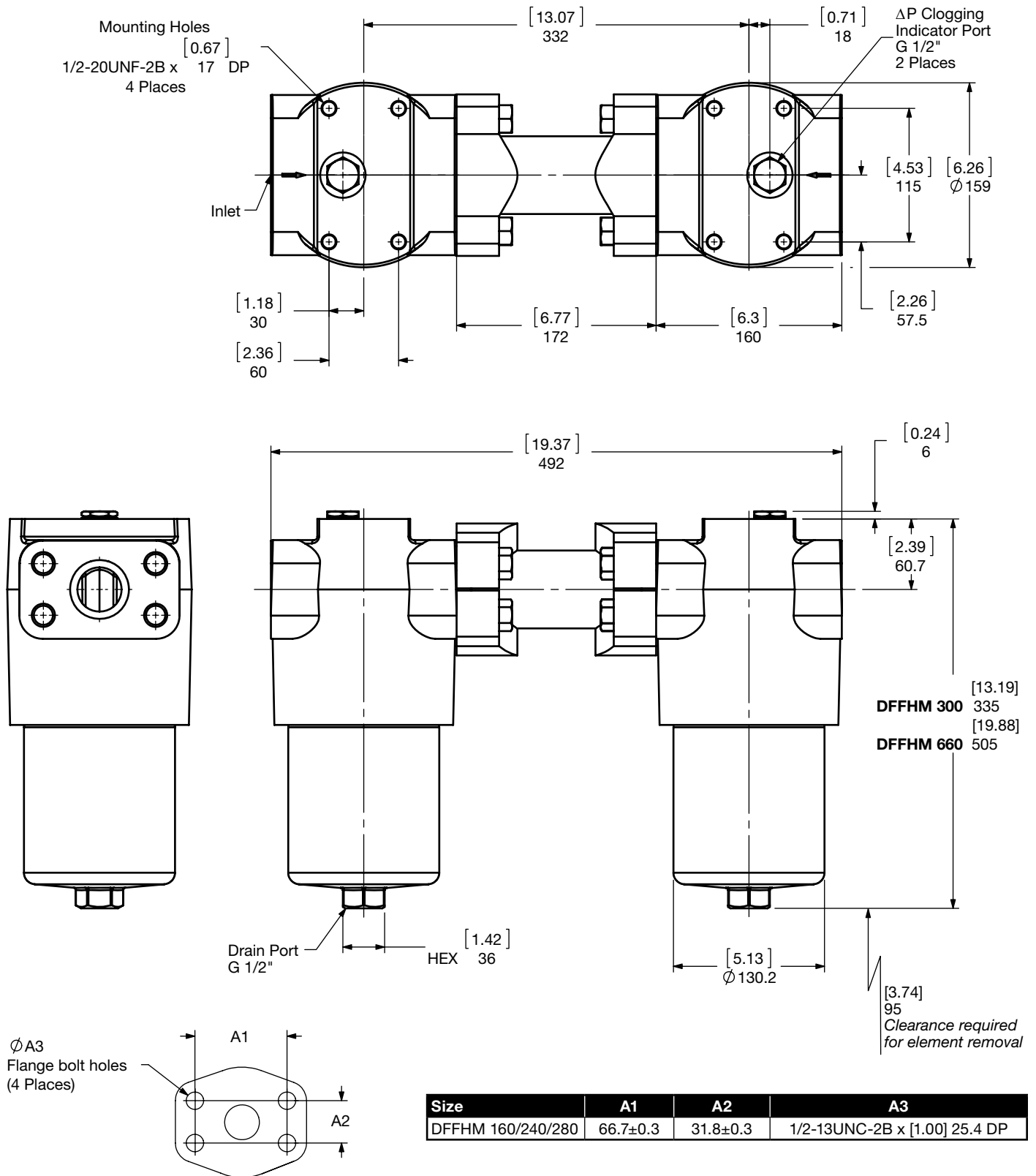


Size	A1	A2	A3
DFFHM 160/240/280	66.7±0.3	31.8±0.3	1/2-13UNC-2B x [1.00] 25.4 DP

Size - DFFHM	160	240	280
Weight (lbs.)	59.1	66.3	77

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 DFFHM 330 / 660

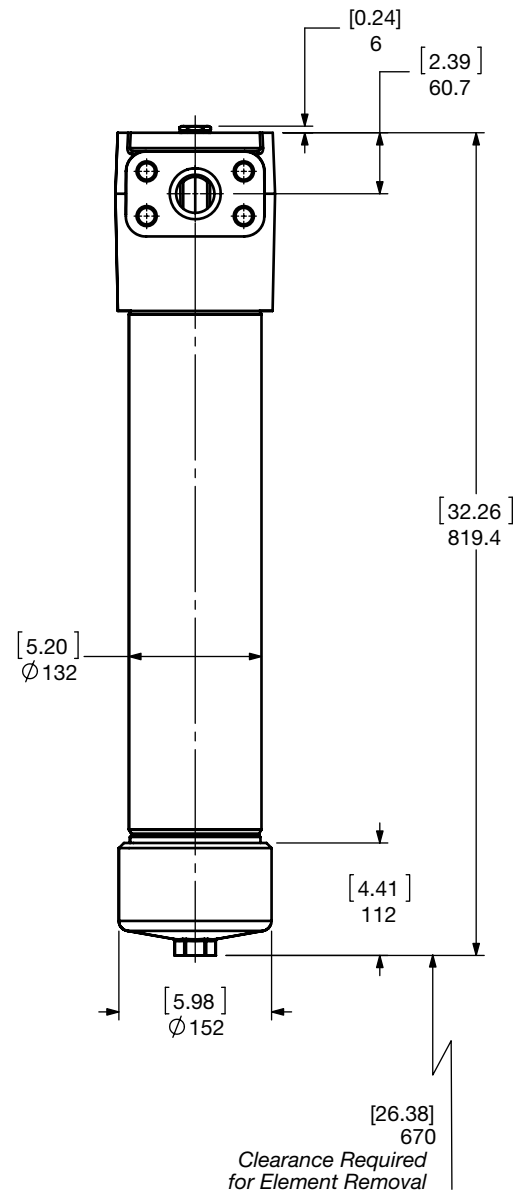
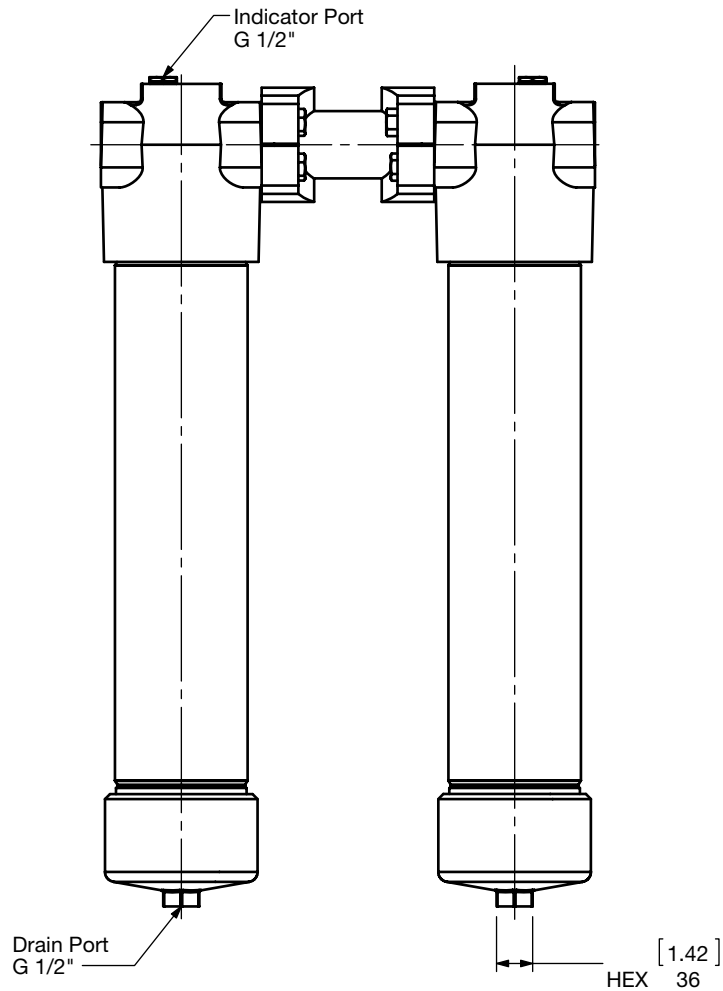
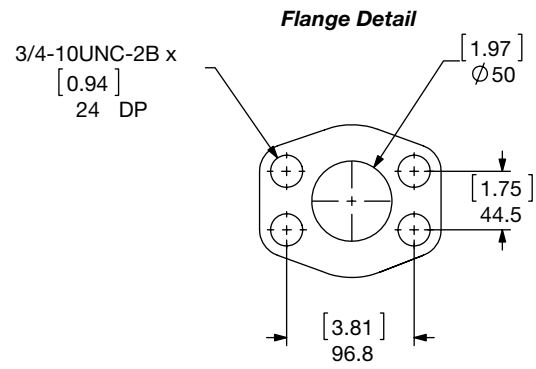
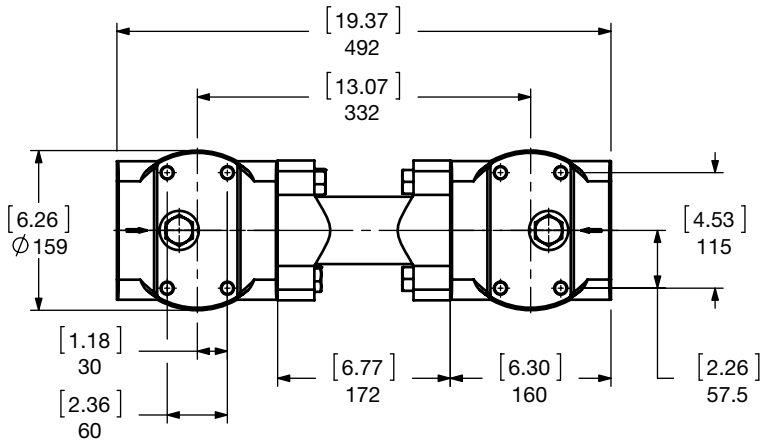


Size - DFFHM	330	660
Weight (lbs.)	139.4	175.5

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 DFFHM 1320



Size - DFFHM

1320

Weight (lbs.)

271.2

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

## Sizing Information

Total pressure loss through the filter is as follows:

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

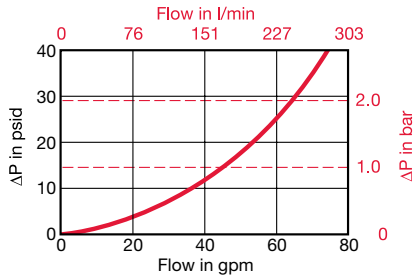
### Housing Curve:

Pressure loss through housing is as follows:

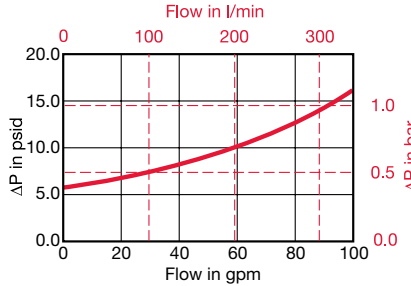
Housing  $\Delta P = \text{Housing Curve } \Delta P \times \frac{\text{Actual Specific Gravity}}{0.86}$

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

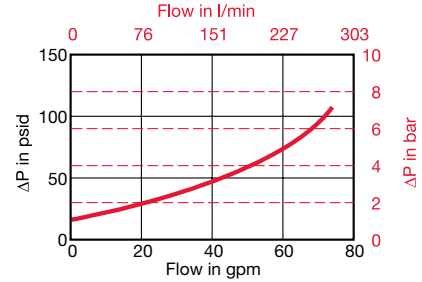
**DFFH 160/240/280 Forward Flow**



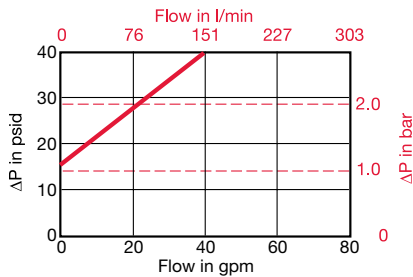
**DFFH 330/660/1320 Forward Flow**



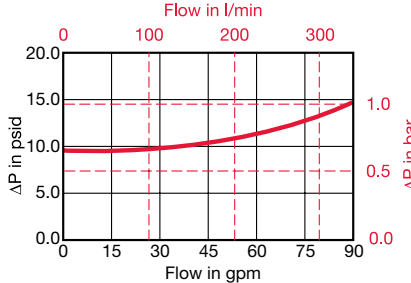
**DFFHM 160/240/280 Forward & Reverse Flow**



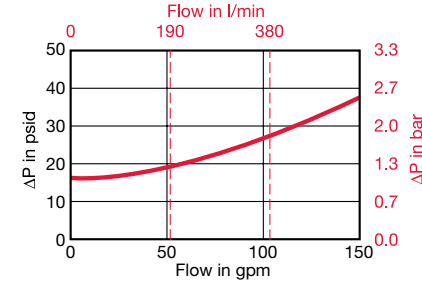
**DFFH 160/240/280 Reverse Flow**



**DFFH 330/660/1320 Reverse Flow**



**DFFHM 330/660/1320 Forward & Reverse Flow**



## 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)

Optimicon	...D...ON Elements					
Size	1 μm	3 μm	5 μm	10 μm	15 μm	20 μm
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

Betamicon	...D...BH4HC (High Collapse)			
Size	3 μm	5 μm	10 μm	20 μm
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

Wire Mesh	...D...W/HC Elements	
Size	25, 50, 100, 200 μm	
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
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.