

D Low Pressure (Return) Filters 100-600 psi

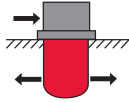
In-tank, inline, and duplex configurations provide flexibility for use in mobile, industrial, and lube applications. Light weight construction and low ΔP (cold start) options make these filters ideal for agriculture and construction vehicles. Duplex filters allow for uninterrupted operation during element change-out. Modular versions accommodate high flow requirements.

LOW PRESSURE FILTERS

RF Series

In-tank / Inline Filters

360 psi • up to 400 gpm



Features

- RF 30 filters are constructed of polyamide plastic.
- RF 60 - 330 filters are constructed of aluminum material. Aluminum alloy is water tolerant - anodization is not required for high water based fluids (HWBF).
- RF 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, 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.
- Single piece casting provides rigidity for inline or in-tank mounting.

Note: This filter is configured with an R 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.

Applications



Agricultural



Industrial



Construction



Gearboxes

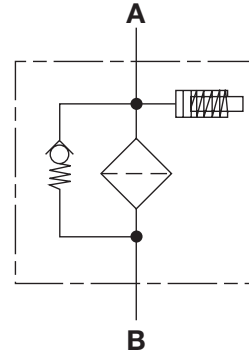


Automotive



Steel / Heavy Industry

Hydraulic Symbol



Technical Specifications

Mounting Method	4 Mounting holes - filter housing	
Port Connections	Inlet / Outlet	
30	1/2" Threaded / 0.71" Dia Smooth	
60/110	SAE-12 / SAE-12; 3/4" NPT / SAE-12	
160/240	SAE-20 / SAE-20; 1 1/4" NPT (with adapter) / SAE-20	
330	SAE-20 / 2" NPT (with flange port adapter) 2" Threaded (NPT/BSPP/SAE) / same as inlet	
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	
Direction of Flow	Inlet: Side	Outlet: bottom
Materials of Construction	Housing	Lid
30	Polyamide	Polyamide
60-330	Aluminum	Aluminum
660-1300	Ductile Iron	Ductile Iron
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)	
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	360 psi (25 bar); (size 30 - 145 psi, 10 bar)	
Working Pressure*	478 psi (33 bar) @ 700,000 cycles;	
Fatigue Pressure	478 psi (33 bar) @ 700,000 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	3045 psi (210 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 Temp. 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 RF Filters MAWP reduce to 7 bar (101.5 psi) when using the following "VMF" and "VR" indicators: B, BM, E, ES, GC, LE, LZ.

Model Code

RF ON 330 D L 10 C 1 . X / 16 - V - B6

Filter Type
RF = Return Line Filter

Element Media
ON = Optimicron® BN/AM = Betamicron®/Aquamicron®
ECON2 = ECONmicron® AM = Aquamicron®
W/HC = Wire Mesh P/HC = Polyester
V = Metal Fiber

Size
30, 60, 110, 160, 240, 330, 660, 950, 1300

Pressure Rating
B = 145 psid (10 bar) (size 30 only)
D = 360 psid (25 bar)
V = 101.5 psid (7 bar) when using following "VR" indicators: B, BM, E, ES, GC, LE, LZ

Type of Connection
B = 1/2" Threaded (size 30 - NPT / BSPP inlet/0.71" Outlet)
C = 3/4" Threaded (sizes 60, 110 - NPT / BSPP inlet/3/4" SAE Outlet)
E = 1 1/4" Threaded Inlet (SAE/NPT) / 1 1/4" threaded outlet (sizes 160 - 240)] NPT available with Adapter (to size 240)
 or 2" NPT outlet (size 330)
G = 2" Threaded (size 330 - NPT / BSPP / SAE Inlet / Outlet - same as inlet)
L = 2" SAE 32 Flange Inlet / 2" NPT Outlet (size 330)
M = SAE 48 Flange Inlet / SAE 48 Flange Outlet (size 660)
N = SAE 48 Flange Inlet / 3" NPT Outlet (size 660)
O = SAE 56 Flange (size 950) - Inlet & Outlet
P = SAE 64 Flange (size 1300) - Inlet & Outlet

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

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

Type Number
1 = Standard Connection

Modification Number (latest version always supplied)

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

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) (lube or coolant) B6 = 87 psid (6 bar) (return line extended life)] not available with ECON2
B2 = 29 psid (2 bar) KB = No Bypass (flushing systems)

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)
DE = ΔP Indicator - For in-line applications (sizes 660, 950, 1300)
T = With tank breather (size 30 only)
W = Modification of "V" elements for use with oil water emulsions (HFA) and water polymer solutions (HFC)
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
0030, 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, ECON2, BN4AM, AM, P/HC, W/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) B6 = 87 psid (6 bar)
B1 = 14.5 psid (1 bar) KB = no bypass
B2 = 29 psid (2 bar)

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

Clogging Indicator Model Code

VR 5 C . X /

Indicator Prefix
VR = Return Filters
VM = ΔP G 1/2 Indicator (sz. 660+, w/DE opt.)
VD = ΔP LE Indicator (sz. 660+, w/DE opt.)

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
LE = Electric switch and pop-up

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.)

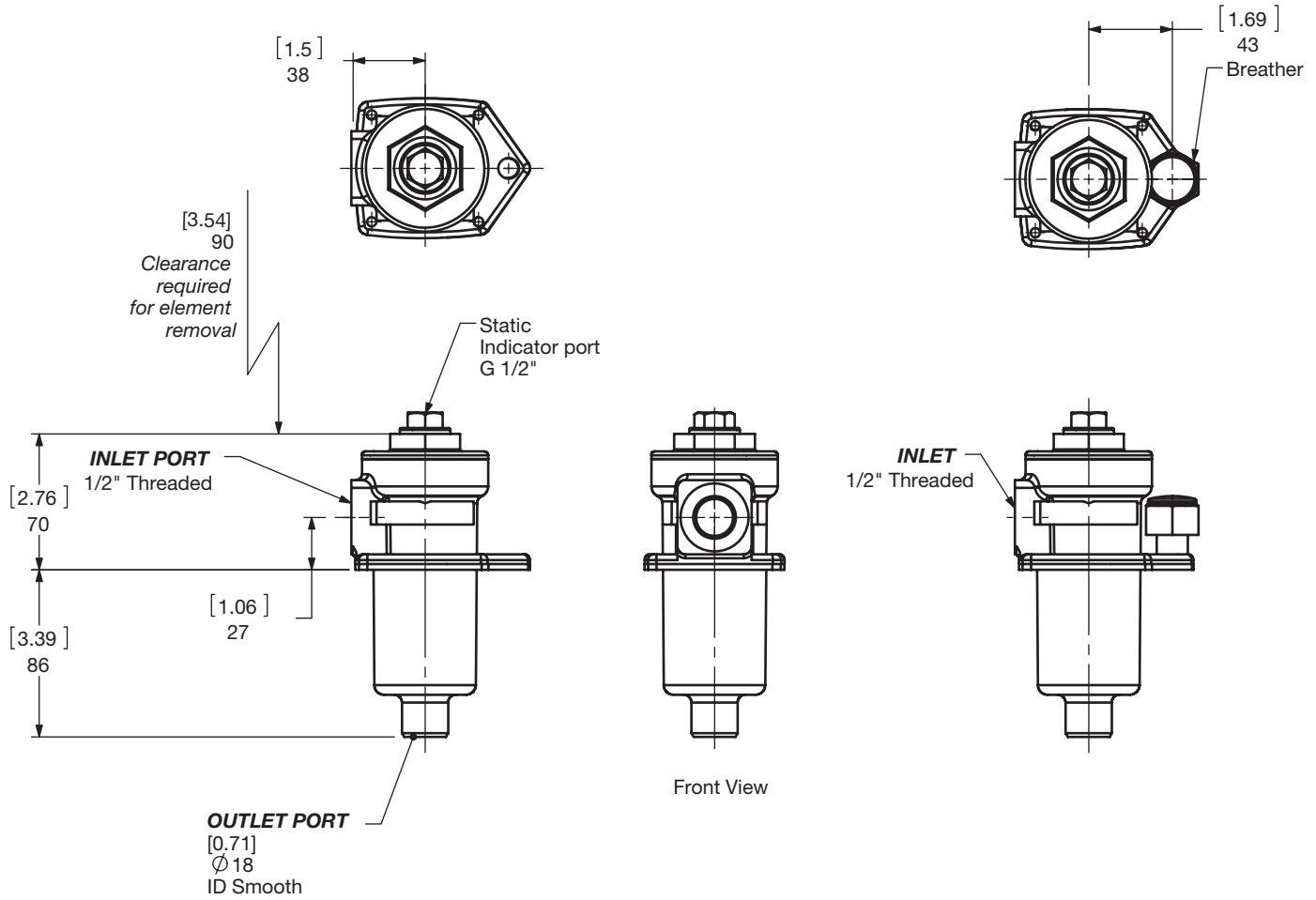
Model Codes Containing RED are non-stock items — Minimum quantities may apply — Contact HYDAC for information and availability

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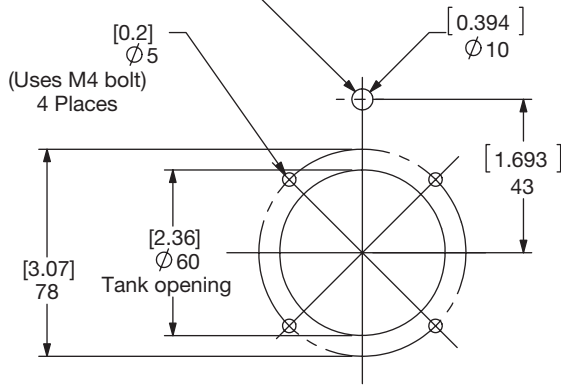
Dimensions

RF 30 (No Breather)

RF 30...T (With Breather)



Hole drilled in tank top only with RF30 including breather

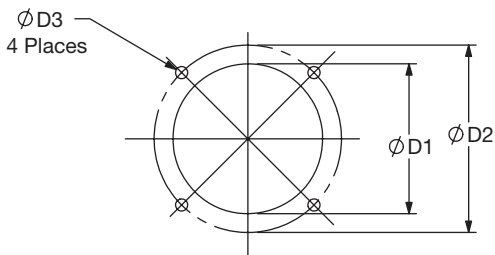
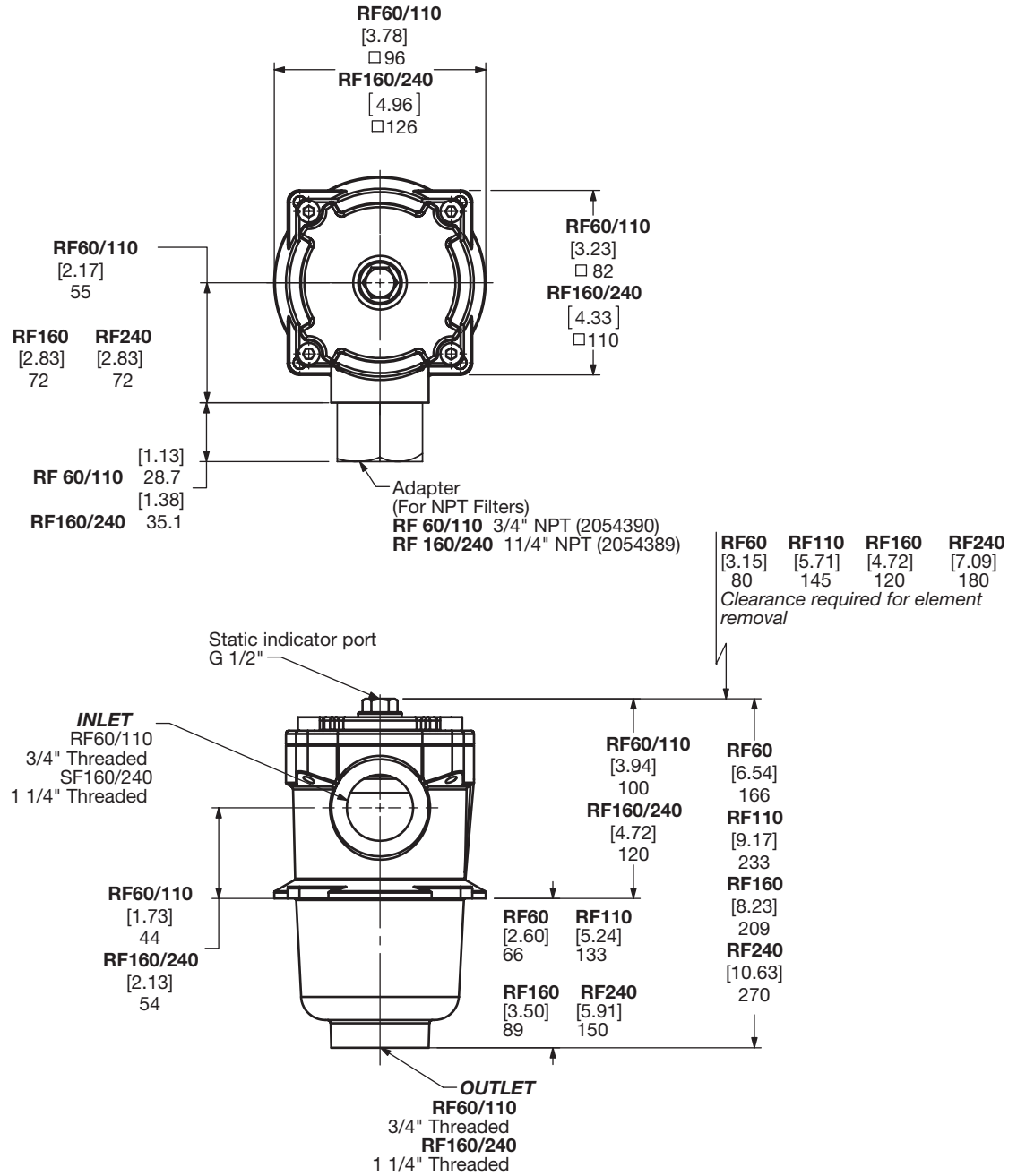


Mounting Pattern

Size	30
Weight (lbs.)	0.9

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 RF 60 - 240



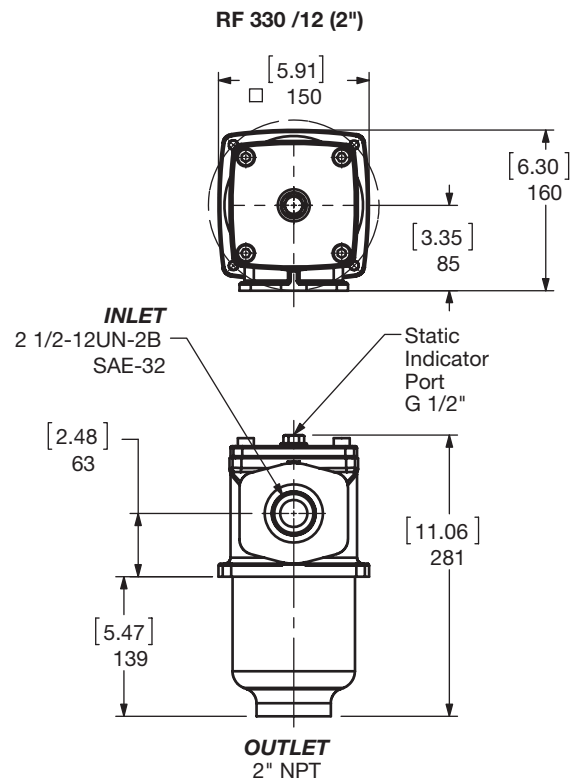
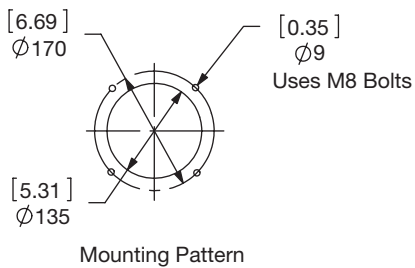
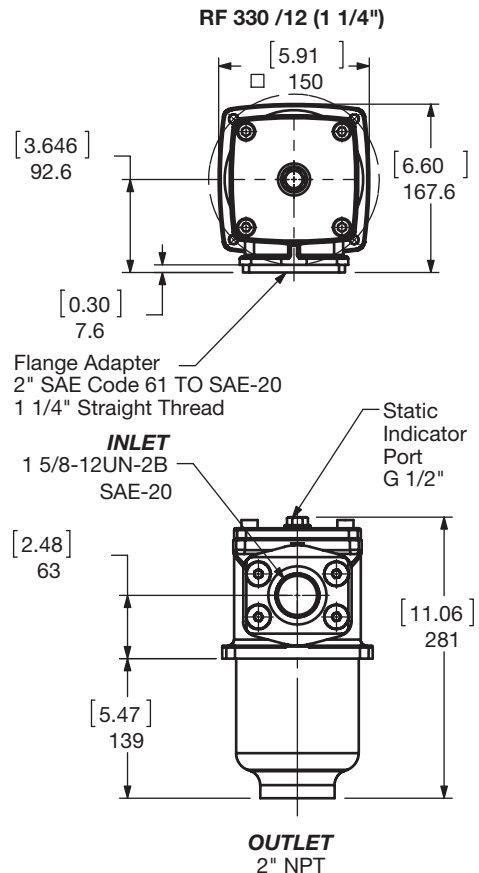
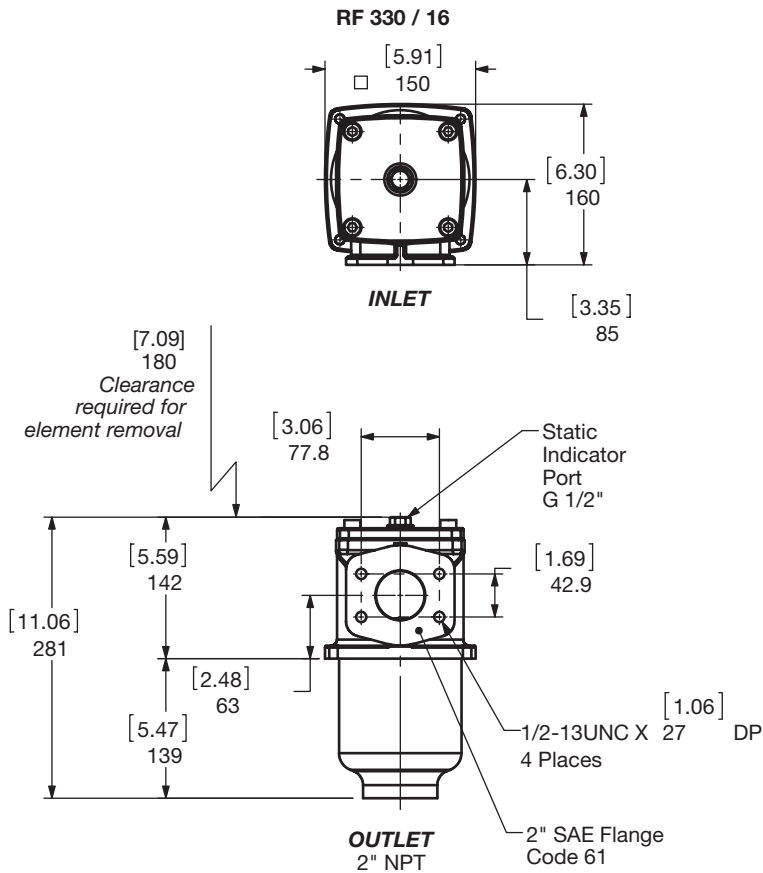
Size	øD1	øD2	øD3	Bolts
60 / 110	3.15" (80mm)	3.94" (100mm)	0.26" (6.5mm)	M5
160 / 240	4.17" (106mm)	5.32" (135mm)	0.30" (7.5mm)	M6

Size	60	110	160	240
Weight (lbs.)	2.0	2.5	4.0	5.0

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LOW PRESSURE FILTERS

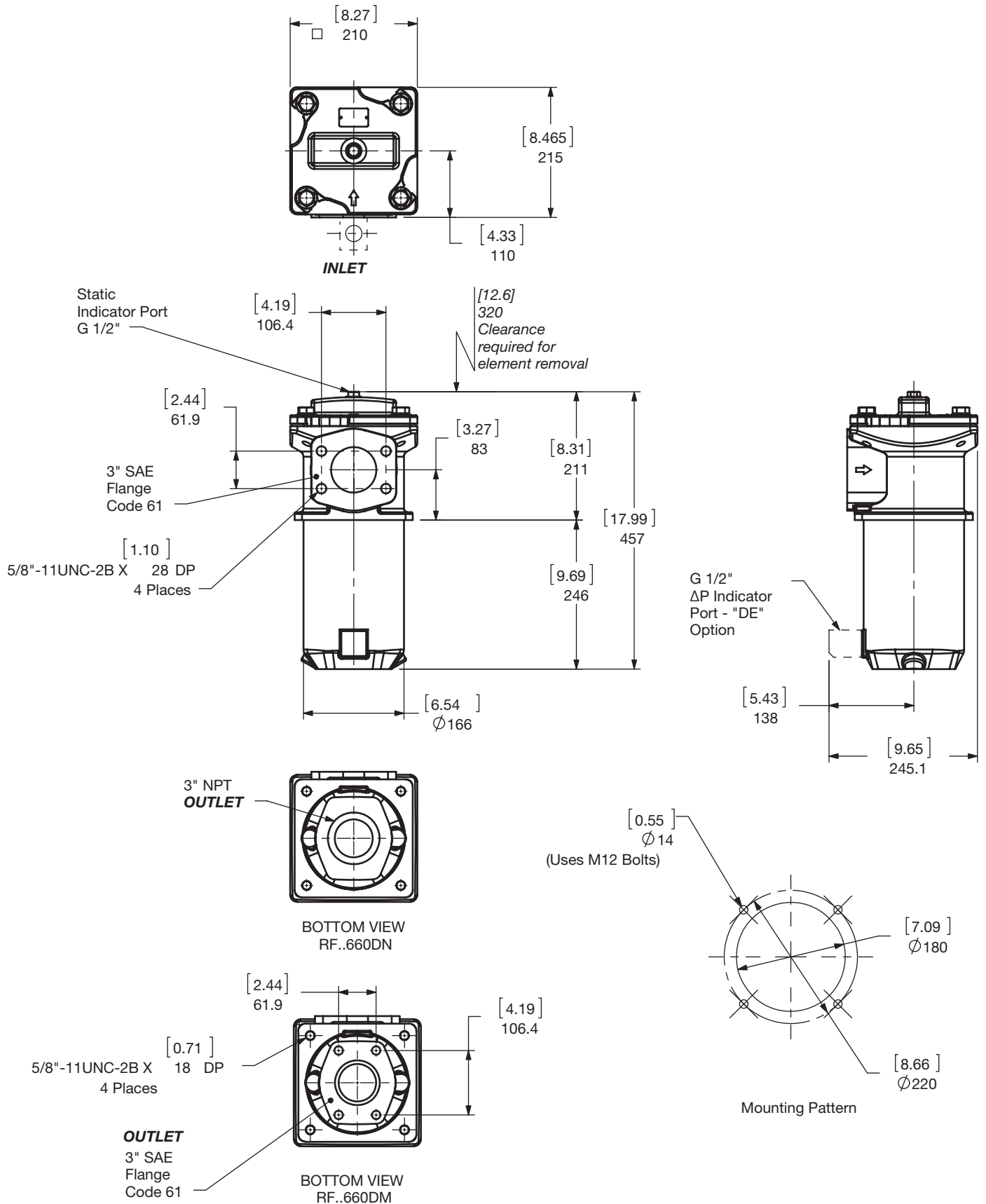
Dimensions RF 330



Size	330
Weight (lbs.)	9.0

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.

Dimensions RF 660

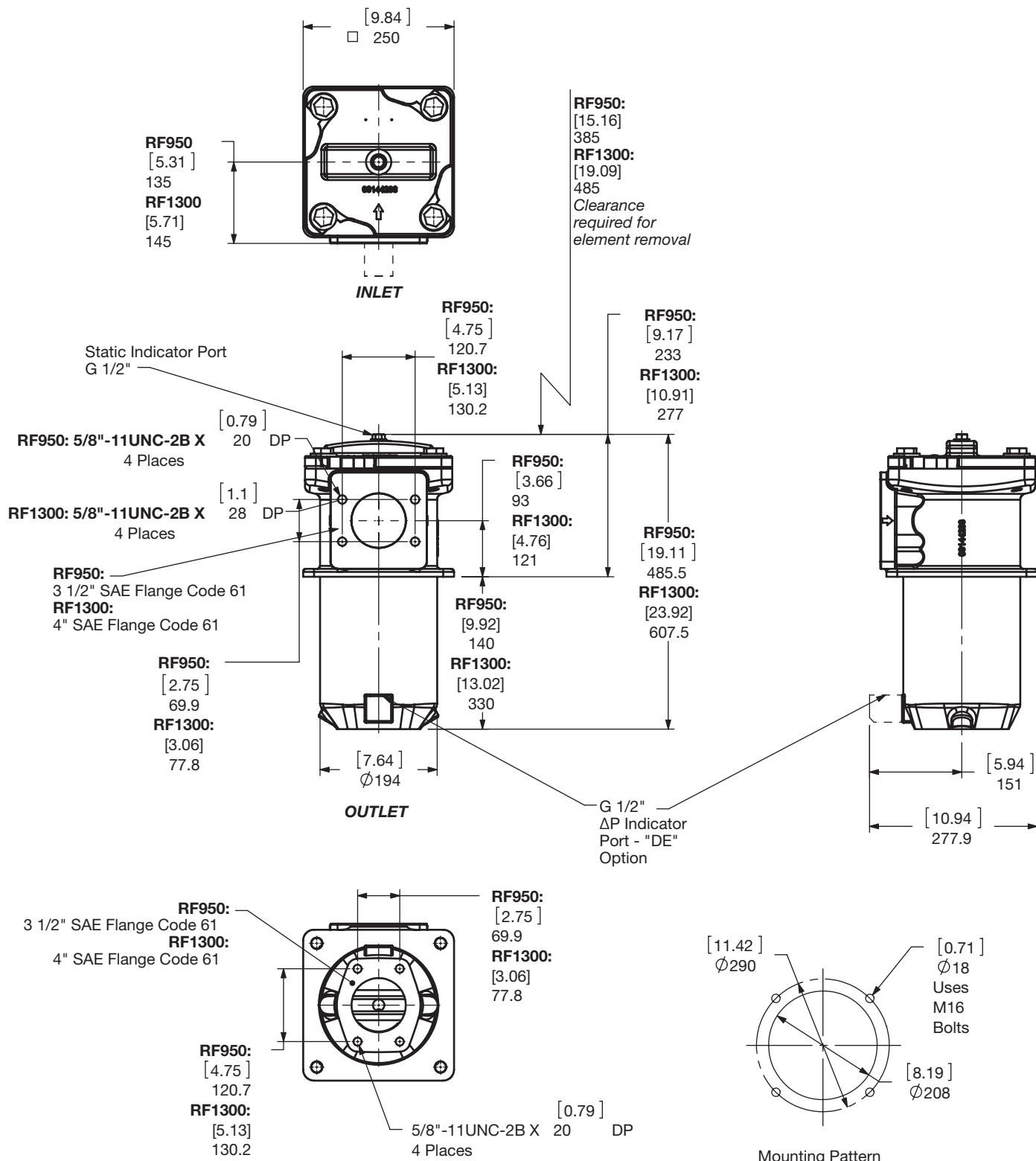


Size	660
Weight (lbs.)	68.5

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.

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Dimensions RF 950 - 1300



Size	950	1300
Weight (lbs.)	98.1	115.7

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.

Sizing Information

Total pressure loss through the filter is as follows:

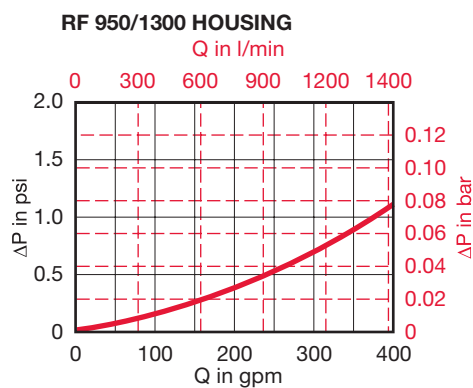
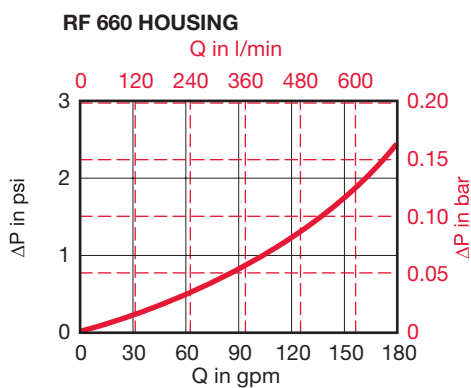
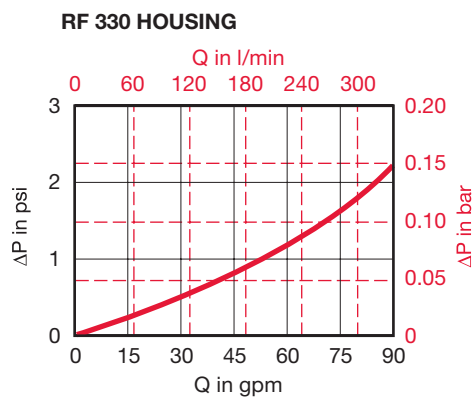
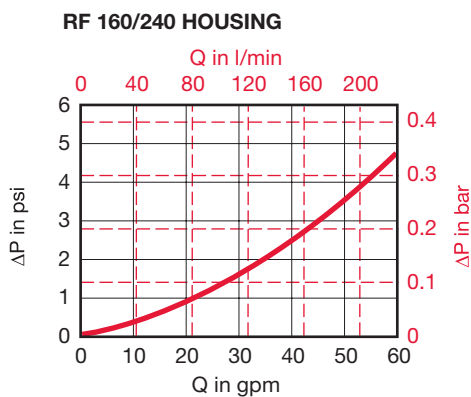
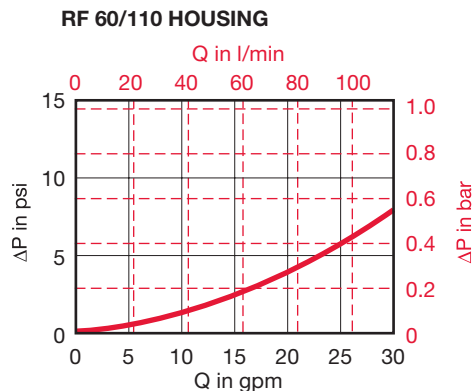
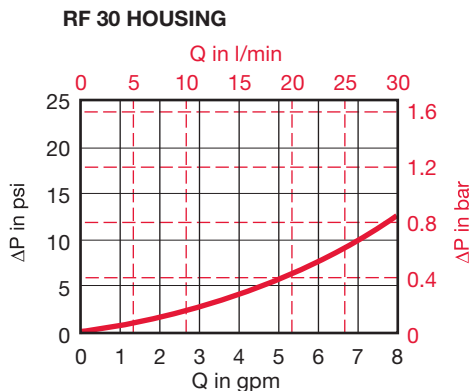
$$\text{Assembly P} = \text{Housing P} + \text{Element P}$$

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 HYDAC Filter Assemblies" in Section B - Overview)



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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
0030 R XXX ON	4.928	3.754	2.409	1.471	0.922	0.807
0060 R XXX ON	2.59	1.295	0.944	0.539	0.494	0.376
0110 R XXX ON	1.224	0.719	0.487	0.296	0.234	0.178
0160 R XXX ON	0.878	0.439	0.312	0.177	0.148	0.182
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...XSX			
Size	3 µm	5 µm	10 µm	20 µm
0030 R XXX XSX	3.754	2.409	1.471	0.807
0060 R XXX XSX	1.295	0.944	0.539	0.376
0110 R XXX XSX	0.719	0.487	0.296	0.178
0160 R XXX XSX	0.439	0.312	0.177	0.182
0240 R XXX XSX	0.284	0.201	0.125	0.077
0330 R XXX XSX	0.204	0.15	0.081	0.056
0660 R XXX XSX	0.093	0.066	0.037	0.025
0950 R XXX XSX	0.057	0.043	0.026	0.017
1300 R XXX XSX	0.04	0.032	0.019	0.012

ECOMICRON	...R...ECON2			
Size	3 µm	5 µm	10 µm	20 µm
0160 R XXX ECON2	0.521	0.324	0.209	0.159
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
0030 R XXX W/HC	0.067
0060 R XXX W/HC	0.034
0110 R XXX W/HC	0.016
0160 R XXX W/HC	0.011
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
0030 R XXX P/HC	0.181	0.092
0060 R XXX P/HC	0.092	0.046
0110 R XXX P/HC	0.050	0.025
0160 R XXX P/HC	0.035	0.017
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

All Element K Factors in psi / gpm.

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S.S. Wire Mesh "R"	...R...V US UNITS			
	Size	3 µm	5 µm	10 µm
0030 R XXX V	1.065	0.779	0.434	0.209
0060 R XXX V	0.873	0.510	0.296	0.181
0110 R XXX V	0.417	0.280	0.165	0.110
0160 R XXX V	0.269	0.192	0.132	0.082
0240 R XXX V	0.176	0.143	0.093	0.066
0330 R XXX V	0.115	0.093	0.060	0.044
0660 R XXX V	0.055	0.044	0.033	0.022
0950 R XXX V	0.038	0.033	0.022	0.011
1300 R XXX V	0.027	0.022	0.016	0.011

Notes

A large grid area for writing notes, consisting of approximately 20 columns and 40 rows of empty cells.

