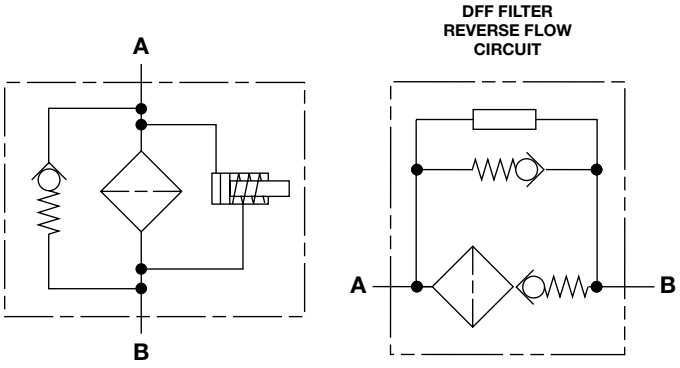
NFH Series

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 (right side of Inlet Port) SAE 12 (3/4")
- Clogging Indicator for local and/or remote signals
- Easily banked in parallel (manifolded) for high viscosity applications.

Notes: 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



Technical Specifications

Mounting Method	
NFH	2 mounting holes - filter head
NFH Manifold	Floor mounting brackets
Port Connection	SAE DN 102 Flange Code 61 *(single tower)* SAE DN 102 *(multi-tower)*
Flow Direction	Inlet: Side Outlet: Bottom
Construction Materials	
Head, Lid, Elbows, Manifolds	Ductile Iron
Housing	Steel
Flow Capacity	
1300	343 gpm (1300 lpm)
2600, 5200, 7800, 10400	450 gpm (1700 lpm) *(Flow limited by 4" pipe size)*
Housing Pressure Rating	
Max. Allowable Working Pressure	500 psi (34.5 bar)
Fatigue Pressure	500 psi (34.5 bar)
Burst Pressure	> 1440 psi (100 bar)
Element Collapse Pressure Rating	
SN, W/HC	290 psid (20 bar)
ECON2, BN4AM, AM, P/HC	145 psid (10 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	
ΔP = 29 psid (2 bar) -10% *(standard)*	
ΔP = 72 psid (5 bar) -10% *(optional)*	
Bypass Valve Cracking Pressure	
ΔP = 43 psid (3 bar) +10%	
ΔP = 87 psid (6 bar) +10%	

Model Code

NFH SN 5200 E P 5 C 1 . 1 / 16 A V T100

Filter Type
NFH = In-line Return Line Filter

Element Media
SN = Sustainmicron
ECON2 = ECOmicron®
W/HC = Wire Mesh
BN/AM = Betamicron® Aquamicron®
AM = Aquamicron®
P/HC = Polyester

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

Operating Pressure
E = 500 psi (34 bar)

Type of Connection
P = SAE DN 102 Code 61 (4") flange

Filtration Rating *(microns)*
3, 5, 10, 20 = SN
40 = AM
3, 10 = BN/AM
25, 50, 100, 200 = W/HC
3, 5, 10, 20 = ECON2
10, 20 = P/HC

Type of ΔP Clogging Indicator
A, 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
A = Left inlet, Left outlet
B = Right inlet, Right outlet
(sizes 5200 - 10400 only)
C = Left inlet, Right outlet
D = Right inlet, Left outlet
(sizes 5200 - 10400 only)

Seals
(omit) = Nitrile rubber (NBR) *(standard)*
V = Fluorocarbon elastomer (FKM)

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)*
KB = no bypass *(flushing system)*
not available with ECON2

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)*
T100 = Indicator Thermal Lockout, 100°F *(C and D only)*
SFREE = Element specially designed to minimize electrostatic charge generation
cRUus = Electrical Indictor with underwriter's recognition
SO376 = Modification of ON and W/HC elements for HFA, HFB, HFC, and HFD flame retardant liquids
SO882 = Quality Protection Design

Replacement Element Model Code

2600 R 005 SN / V

Size
1300, 2600

Type
R

Filtration Rating *(micron)*
3, 5, 10, 20 = SN
3, 5, 10, 20 = ECON2
40 = AM
25, 50, 100, 200 = W/HC
3, 5, 10, 20 = XSX
3, 10 = BN4AM
10, 20 = P/HC

Element Media
SN, XSX, BN4AM, ECON2, AM, W/HC, P/HC

Seals
(omit) = Nitrile rubber (NBR) *(standard)*
V = Fluorocarbon elastomer (FKM)

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

Supplementary Details
SO263 = *(same as above)*
SFREE = *(same as above)*
SO376 = *(same as above)*
SO882 = *(same as above)*

Clogging Indicator Model Code

VM 2 C . X / V

Indicator Prefix
VM = G 1/2 3000 psi

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

Type of Indicator
A = No indicator, plugged port
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)

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

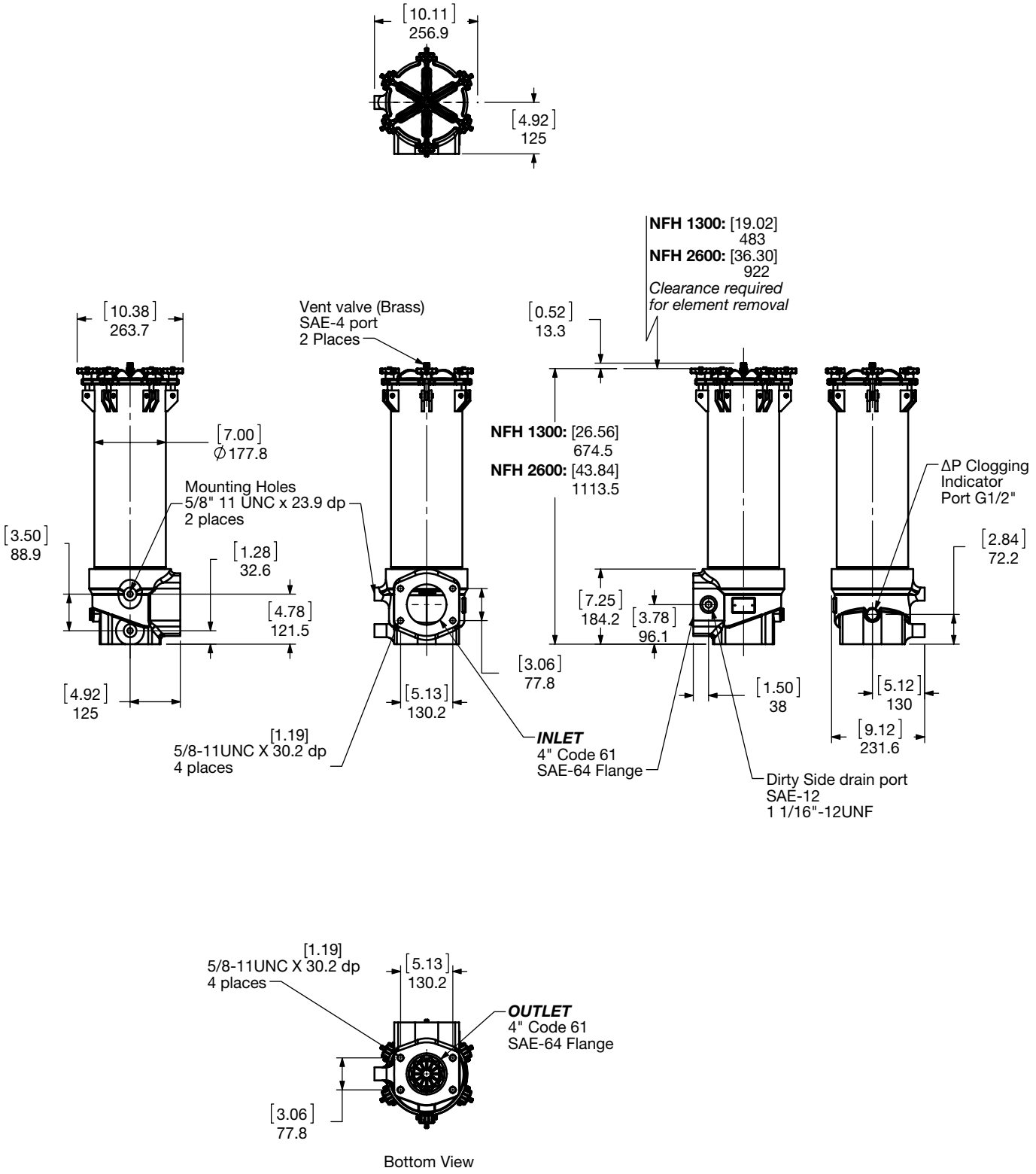
Thermal Lockout *(VM, VD types C, D, J, and J4 only)*
T100 = Lockout below 100°F

Underwriters Approval *(VM, VD types C, D, J, and J4 only)*
cRUus = Electrical Indictor with underwriter's recognition

(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

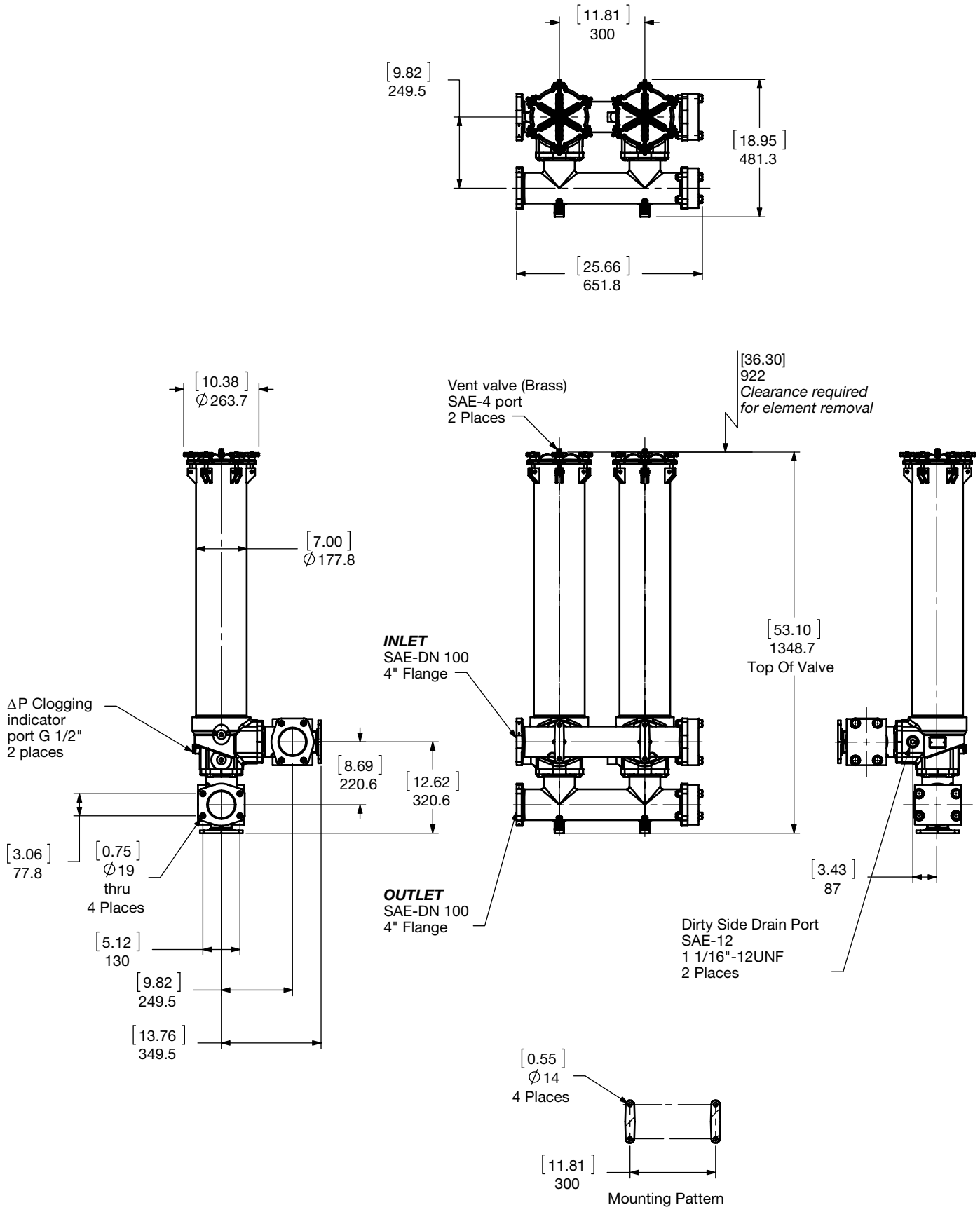
Dimensions
NFH 1300 / 2600



Size	1300	2600
Weight (lbs.)	87.1	115.5

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.

Dimensions
NFH 5200

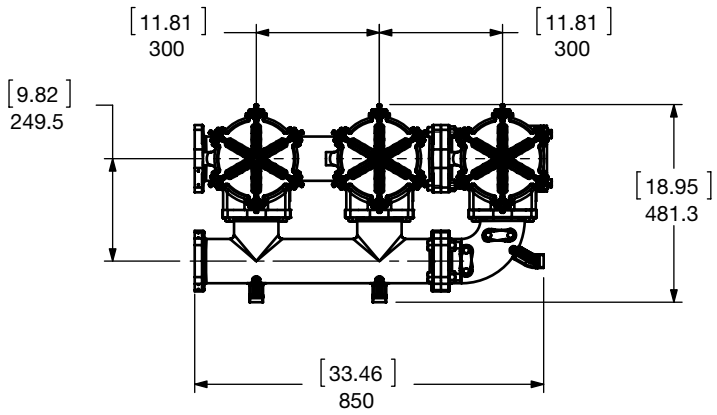


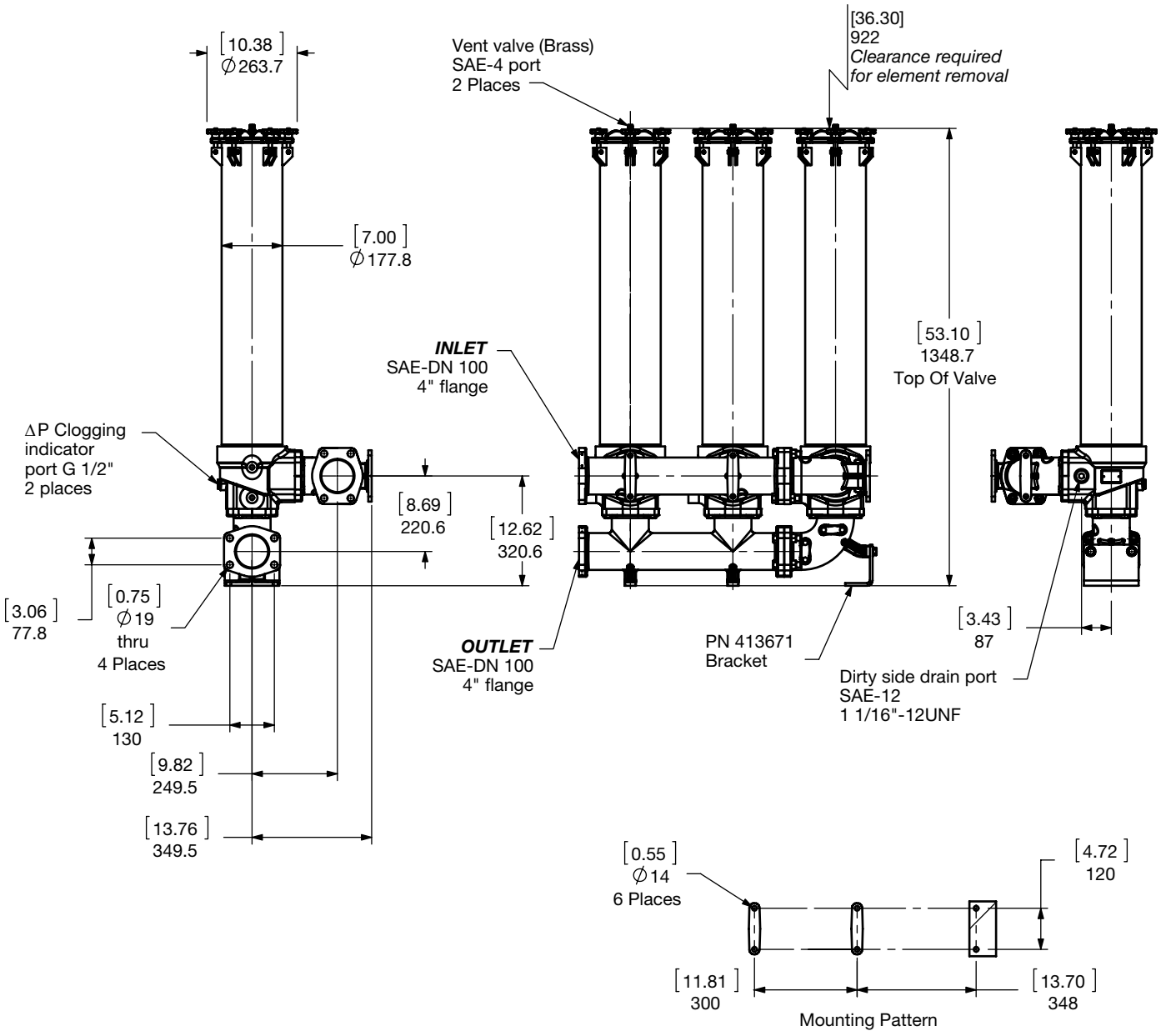
Size	5200
Weight (lbs.)	356

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
NFH 7800

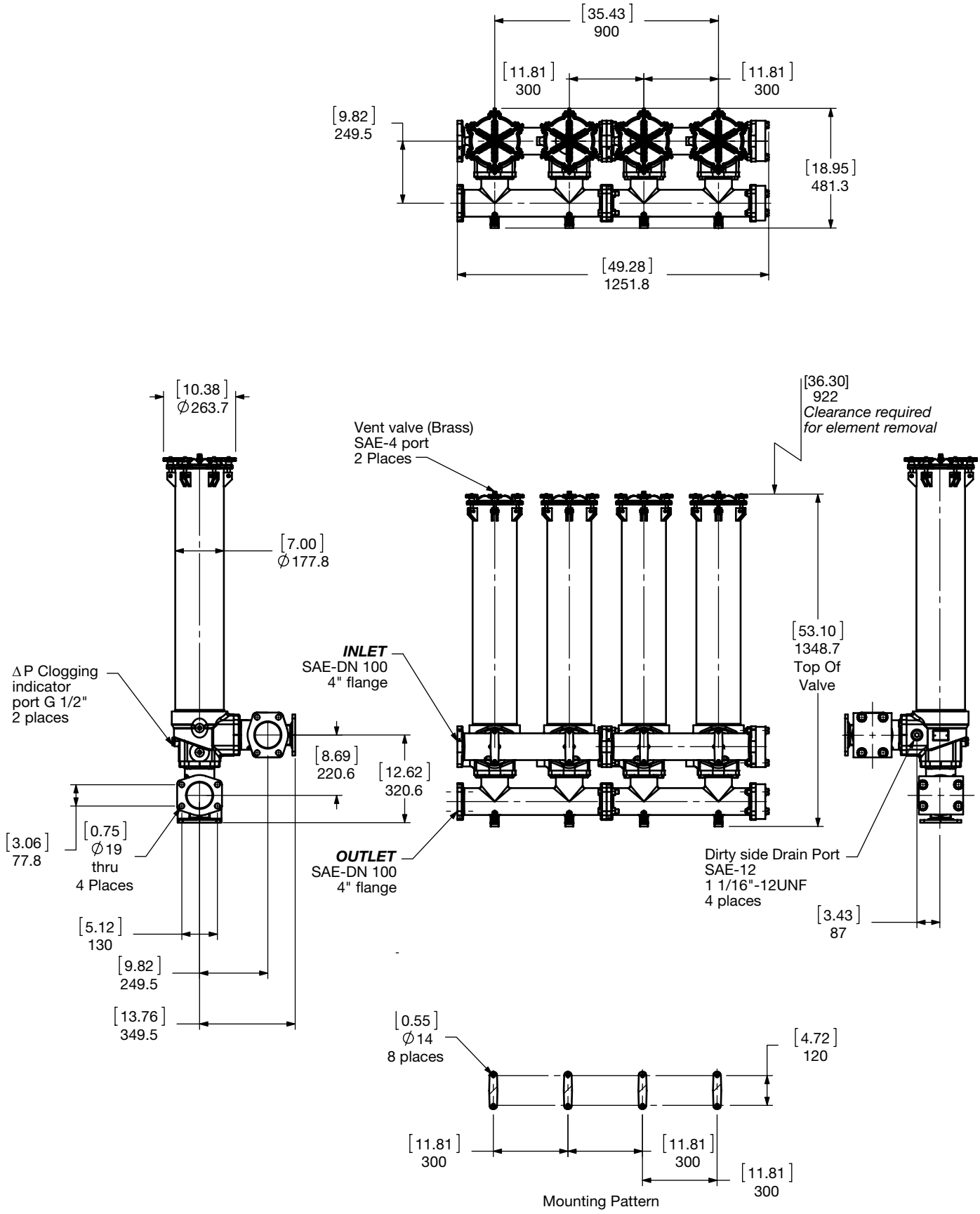




Size	7800
Weight (lbs.)	477.5

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.

Dimensions
NFH 10400



Size	10400
Weight (lbs.)	684

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:

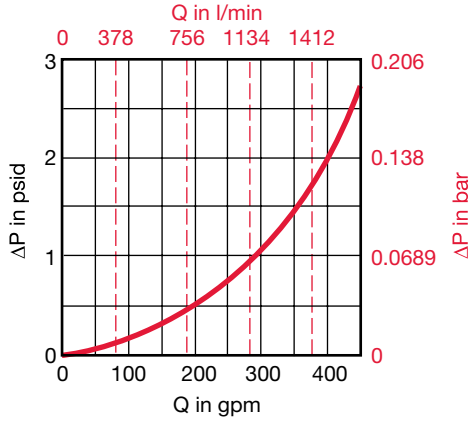
Pressure loss through housing is as follows:

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

The curve below shows the clean ΔP through the housing for a single filter. To determine clean housing ΔP for manifolds with multiple housings, multiply the clean ΔP curve value by the percentage values in the table.

ΔP Housing

NFH 1300 / NFH 2600



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

Example

Conditions
400 gpm flow NFH 5200 manifold specified ΔP Curve = 2 psid ΔP 5200 = 2 psid X 0.73 = 1.5 psid $_{\text{Piping \& Housing}}$
ΔP Total System = 1.5 psid + ΔP Element

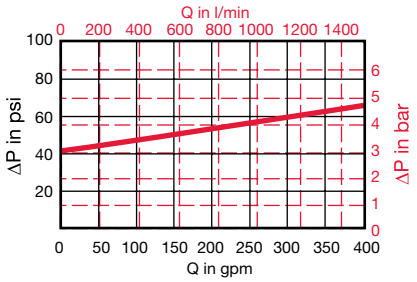
Adjustments must be made for viscosity & specific gravity of the fluid to be used! *(see "Sizing HYDAC Filter Assemblies" in Section B - Overview)*

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.

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

1300 / 2600 Bypass Valve



Element ΔP 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 ΔP for NFH manifolds with more than one housing, use the appropriate sized single element (K) factor and multiply (total assembly flow rate divided by the number of housings in the manifold), then correct for viscosity.

Example 1: Lube System

Conditions
Viscosity = 500 SUS @ 120˚F Specific gravity = 0.86 Flow = 75 gpm Low pressure drop essential K Factor = 10 µm Optimicron® filter element
Selection - NFH 2600 Filter
An NFH 2600 filter gives an Adjusted Clean Element ΔP as follows: Clean ΔP = 75 gpm x 0.01 = 0.75 psid Clean $\Delta P_{adj.} = 0.75 \times \frac{500}{141} \times \frac{0.86}{0.86} = 2.7$ psid
Housing ΔP = "0" *(negligible)*

Example 2: System Return Filter

Conditions
Viscosity = ISO 68 Fluid 220 SUS @ 120˚F Specific gravity = 0.86 Flow = 350 gpm 3µm Filtration *(depth)* ß *(beta)* = 1000 K Factor = 3 µm Optimicron® filter element = 0.04
Selection - NFH 7800 Filter
Element ΔP = (350 ÷ 3 housings) $\times$ 0.04 $\times \frac{220}{141} \times \frac{0.86}{0.86} = 7.28$ psid
Housing ΔP = 1.05 *(curve)* $\times$ 0.61 $\times \frac{0.86}{0.86} \times = 0.64$ psid
Assembly ΔP = 7.28 psid + 0.64 psid = 7.92 psid

Element K Factors

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

Sustainmicron	...R...SN Elements			
Size	3 µm	5 µm	10 µm	20 µm
1300 R XXX SN	0.0338	0.0306	0.0169	0.0092
2600 R XXX SN	0.0169	0.0152	0.0085	0.0046

Stat-X	...R...XSX			
Size	3 µm	5 µm	10 µm	20 µm
1300 R XXX XSX	0.04	0.032	0.019	0.012
2600 R XXX XSX	0.02	0.016	0.01	0.006

ECOmicron	...R...ECON2			
Size	3 µm	5 µm	10 µm	20 µm
1300 R XXX ECON2	0.044	0.033	0.022	0.016
2600 R XXX ECON2	0.022	0.016	0.011	0.005

Betamicron/Aquamicron	...R...BN4AM	
Size	3 µm	10 µm
1300 R XXX BN4AM	0.088	0.033
2600 R XXX BN4AM	0.055	0.016

Aquamicron	...R...AM
Size	40 µm
1300 R 040 AM	0.026
2600 R 040 AM	0.013

Wire Mesh	...R...W/HC
Size	25, 50, 100, 200 µm
1300 R XXX W/HC	0.002
2600 R XXX W/HC	0.001

Polyester	...R...P/HC	
Size	10 µm	20 µm
1300 R XXX P/HC	0.004	0.002
2600 R XXX P/HC	0.002	0.001

All Element K Factors in psi / gpm.

Notes