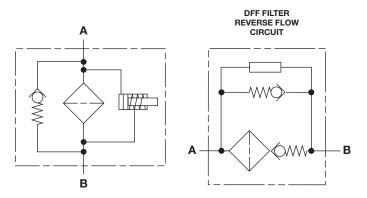
NFH Series

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 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.

Applications



Automotive



Pulp & Paper



Gearboxes



Shipbuilding



Industrial



Generation



Technical Specifications

roominoar opcome	ationio
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 Housing	Ductile Iron 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	

500 psi (34.5 bar) Pressure Fatigue Pressure 500 psi (34.5 bar) > 1440 psi (100 bar) **Burst Pressure**

Element Collapse Pressure Rating

ON. W/HC 290 psid (20 bar) ECON2, BN4AM, AM, 145 psid (10 bar) P/HC

Fluid Temperature 14°F to 212°F (-10°C to 100°C) Range

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.

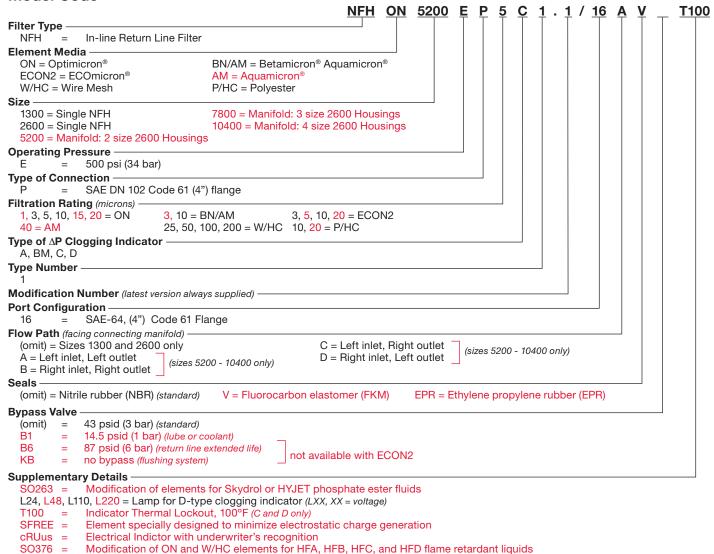
Indicator Trip Pressure

 $\Delta P = 29 \text{ psid } (2 \text{ bar}) -10\% \text{ (standard)}$ $\Delta P = 72 \text{ psid (5 bar) -10\% (optional)}$

Bypass Valve Cracking Pressure

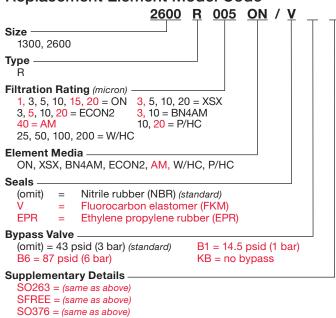
 $\Delta P = 43 \text{ psid (3 bar) } +10\%$

Model Code



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

Replacement Element Model Code



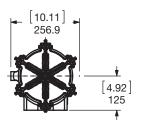
Clogging Indicator Model Code **Indicator Prefix** VM = G 1/2 3000 psi**Trip Pressure** = 29 psid (2 bar) (optional) = 72 psid (5 bar) Type of Indicator = No indicator, plugged port BM = Pop-up indicator (manual reset) = Electric switch - SPDT = Electric switch and LED light - SPDT **Modification Number Supplementary Details** Seals (omit) = Nitrile rubber (NBR) (standard) = Fluorocarbon elastomer (FKM) EPR = Ethylene Propylene rubber (EPR) Light Voltage (D type indicators only) L110 = 110VThermal 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)

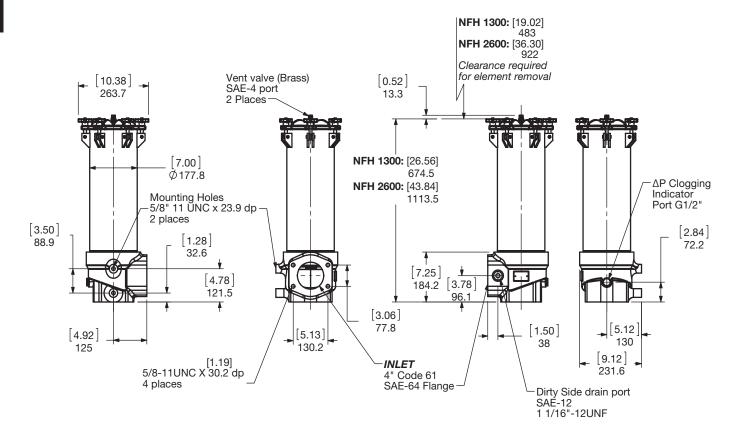
cRUus = Electrical Indictor with underwriter's recognition

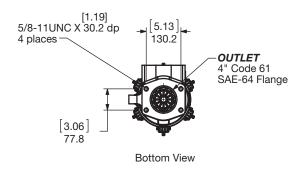
(For additional details and options, see Clogging Indicators section.)

(HYDAC)

Dimensions NFH 1300 / 2600



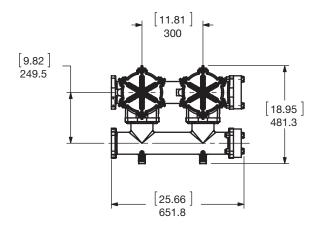


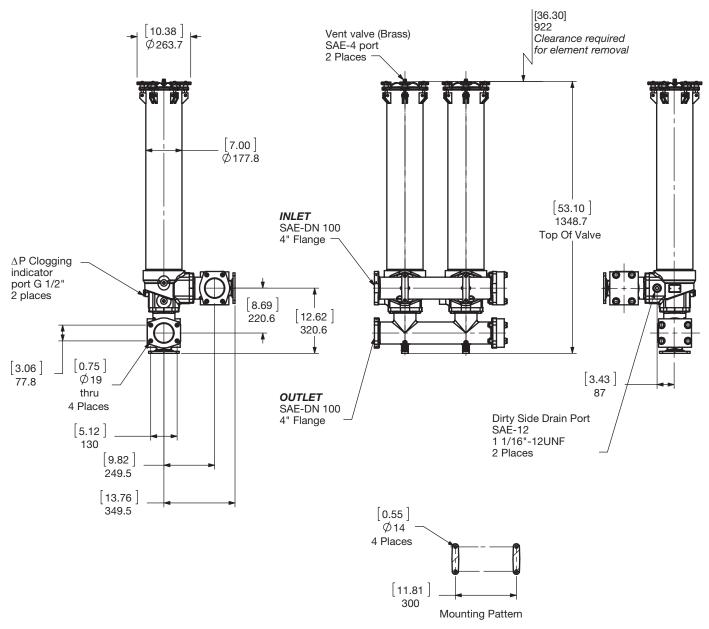


Size	1300	2600
Weight (lbs.)	87.1	115.5

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

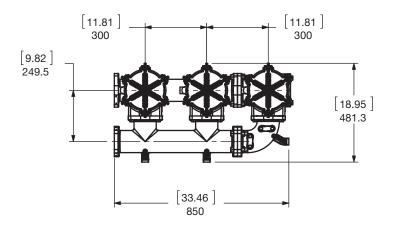


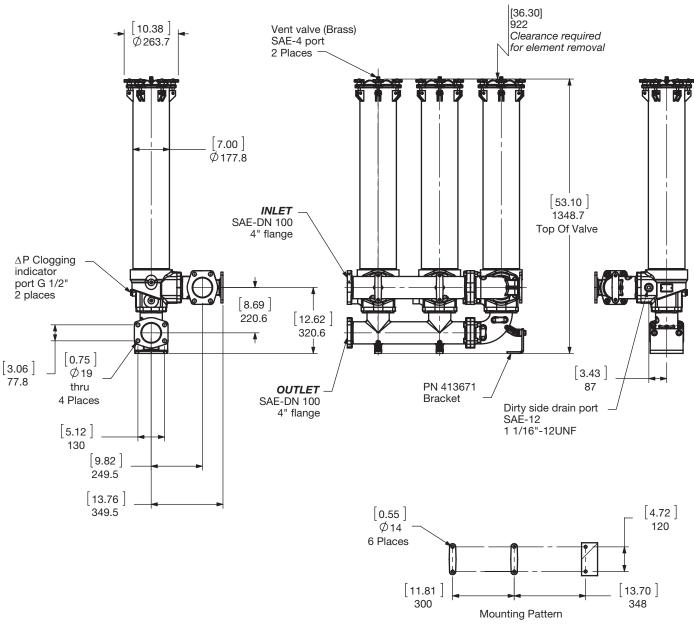


Size	5200
Weight (lbs.)	356

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.

Dimensions NFH 7800

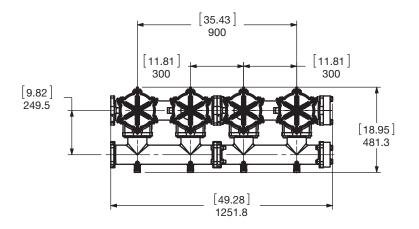


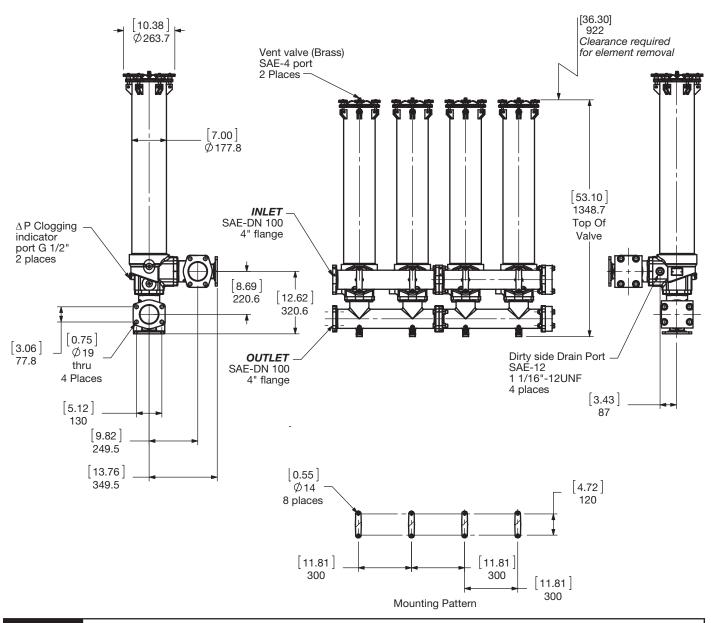


Size	7800
Weight (lbs.)	477.5

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 1040	0
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 $\Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$

Housing Curve:

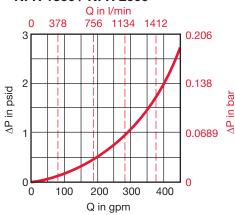
Pressure loss through housing is as follows:

Housing ΔP = Housing Curve ΔP x $\frac{Actual\ Specific\ Gravity}{0.86}$

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.

△P Housing

NFH 1300 / NFH 2600



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

Example

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

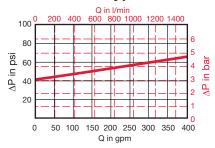
Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see "Sizing HYDAC Filter Assemblies" in Section B - Overview)

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.

 ΔP Valve = ΔP Curve x $\frac{Actual Specific Gravity}{0.86}$

1300 / 2600 Bypass Valve



Element $\triangle P$ 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 $\Delta P = 75$ gpm x 0.01 = 0.75 psid

Clean $\Delta P_{adj.} = 0.75 \times \frac{500}{141} \times \frac{0.86}{0.86} = 2.7 \text{ psid}$

Housing $\Delta P = "0"$ (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) β (beta) = 1000

K Factor = 3 μm Optimicron® filter element = 0.04

Selection - NEH 7800 Filte

Element $\Delta P = (350 \div 3 \text{ housings}) \times 0.04 \times \frac{220}{141} \times \frac{0.86}{0.86} = 7.28 \text{ psid}$

Housing $\Delta P = 1.05$ (curve) $\times 0.61 \times \frac{0.86}{0.86} \times = 0.64$ psid

Assembly $\Delta P = 7.28 \text{ psid} + 0.64 \text{ psid} = 7.92 \text{ psid}$

Element K Factors

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

Optimicron	RON					
Size	1 µm	3 μm	5 μm	10 µm	15 µm	20 μm
1300 R XXX ON	0.094	0.04	0.032	0.019	0.018	0.012
2600 R XXX ON	0.046	0.02	0.016	0.01	0.009	0.006

Stat-X	RXSX			
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	RECON2			
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	RE	BN4AM
Size	3 μm	10 µm
1300 R XXX BN4AM	0.088	0.033
2600 R XXX BN4AM	0.055	0.016

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

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

Polyester	RP/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

