3M Filtration
Full Line Catalogue

CUNO®

High Flow Filtration

Performance in a Compact Design

- ☑ Innovative technology to achieve flow rates up to 113 m³/hr (500 gpm) per element
- ☑ Absolute-rated for consistent product quality
- ☑ Operator-friendly cartridge and housing system
- ☑ Unique design to reduce capital investment expenses

3M

The CUNO™ High Flow Filtration System

The CUNO™ High Flow Filtration System is an advanced design that uses 3M Innovation and CUNO's extensive filtration experience to deliver a high flow filter in a compact housing design. When compared to conventional cartridge systems, this system provides the following advantages:

High Flow Capability

The unique construction of CUNO™ High Flow Filters (patent pending) permits flow rates of up to 113 m³/hr (500 gpm) in a single cartridge. The result? Fewer filter elements to accommodate your flow requirements. In fact, the CUNO™ High Flow Filtration System requires as few as one-tenth the number of elements as competitive 2.5" (63,5 mm) pleated cartridges (see Figure 1).

Compact Design

Using fewer elements combined with an outside-to-in flow path enables a reduction in the size of housing required for your application. The CUNO™ High Flow Housing takes up as little as one-half the size of competitive housings for a given flow rate. The result is lower capital investment costs and a compact footprint that saves valuable plant space (see Figure 1).

Ease of Use

The CUNO™ High Flow Filtration System is designed with ease-of-use in mind. From a user-friendly, ergonomically designed handle that makes cartridge installation and removal easier without the use of special tools or other hardware, to a unique "twist-to-lock" cartridge seating mechanism that provides a positive seal, the CUNO™ High Flow System facilitates easy operation and maintenance of your filter system.

CUNO™ High Flow Filter Applications
Industrial - Municipal Water, RO Prefiltration, Reclaimed Water, Coolants, Nozzle Protection, Boiler Condensate
Chemical - Quench Water, Aqueous Salt Solutions, Final Products
Petrochemicals - Waterflooding, Produced Water, Enhanced Oil Recovery, Completion Fluids, Amine Sweetening, Final Products
Electronics - RO Prefiltration, Process Water
Food & Beverage - Process Water
Pharmaceutical - Process Water

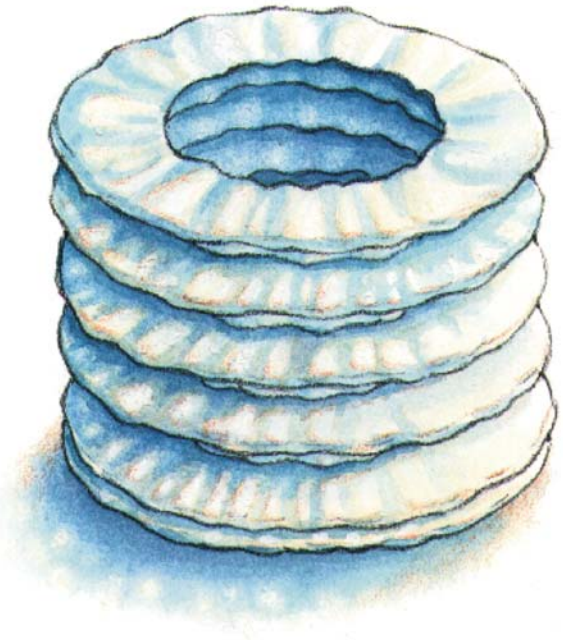
Features	Benefits
• High flow capability of up to 113 m³/hr (500 gpm) per cartridge	• Reduced Filter Usage – minimizes product loss, labour, disposal costs, operator exposure, and downtime for filter change-out
• Patent Pending Compound Radial Pleat design	• High loading capacity for long life and lower cost filtration
• Compact design	• Smaller housing minimizes capital expense requirements • Reduces system footprint
• Absolute rating	• Reproducible effluent quality throughout the filter's life
• Easy to Use	• No special tools or hardware required for filter change-out – minimizes downtime • "Twist to lock" seating mechanism provides positive seal • Ergonomically designed handle – facilitates easy cartridge installation and removal
• FDA compliant	• Compatible in applications requiring direct food contact in food and beverage processing per 21 CFR.

CUNO™ High Flow Filter Media

High Performance Media in an Innovative Design

CUNO™ High Flow Filters are designed using state-of-the-art technology, optimizing both performance and effluent quality to ensure customer satisfaction. The elements use a unique pleat design that results in a high usable filtering surface area per filter.

Compound Radial Pleat design maximizes usable media surface area

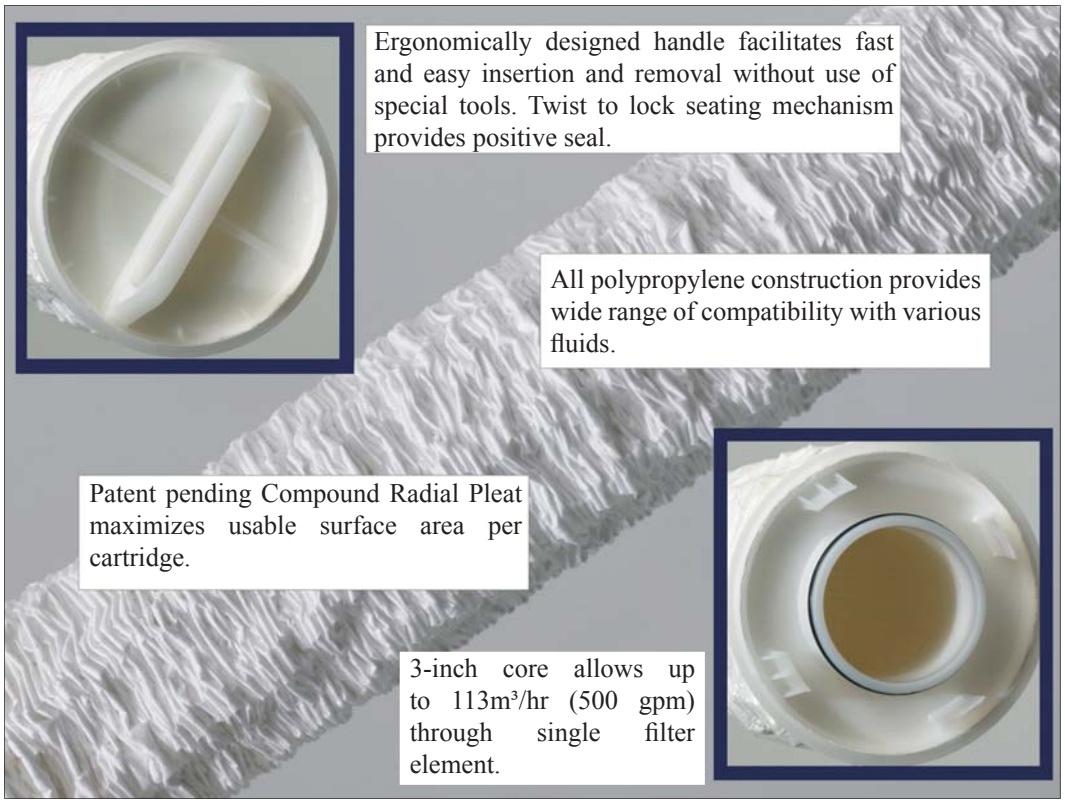


Radial pleat design

3M Innovation is at the heart of the CUNO™ High Flow Filter. A patent pending compound radial pleat design maximizes the usable surface area per filter. Blown microfibre forms the basis of the filter media, which is made to tightly controlled fibre diameter specifications to produce a media with absolute rated particle retention characteristics. Our unique manufacturing process embosses the media to produce a more uniform pleat pattern, which, in turn, allows greater utilization of the media by evenly distributing the fluid throughout the entire filter structure. This results in consistent particle retention in a compact, space-saving design.

Design Features

The CUNO™ High Flow Filter contains several features to combine high performance with easy operation.

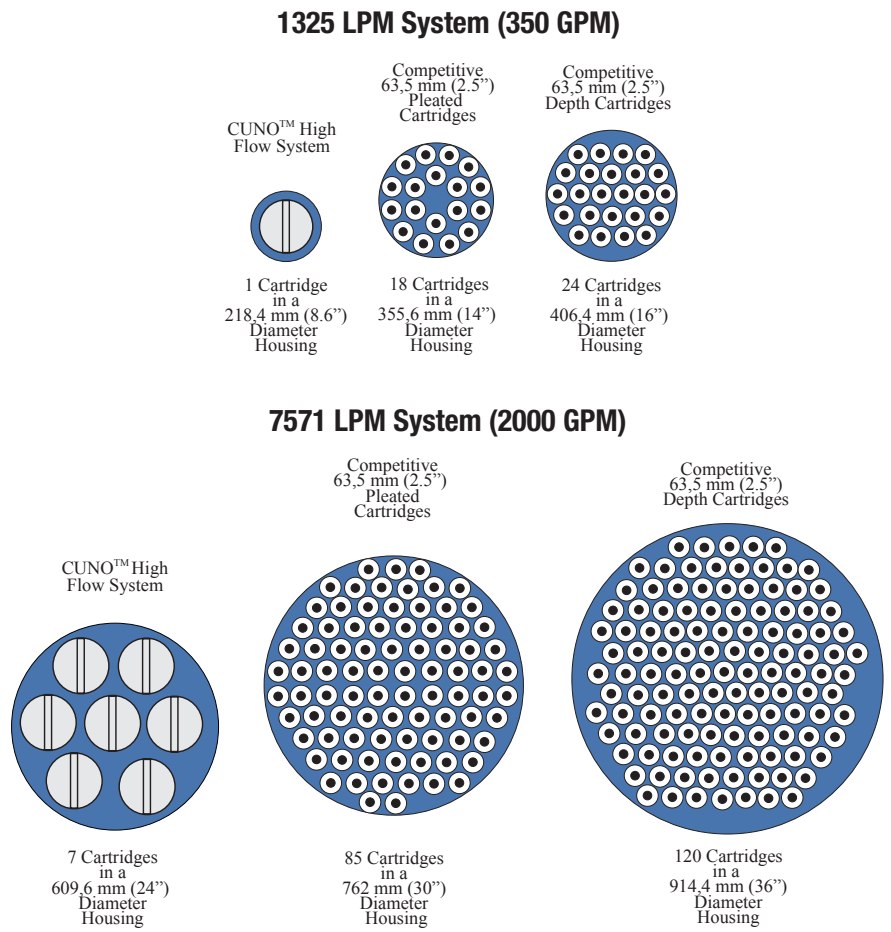


- A large diameter core allows up to 113 m³/hr (500 gpm) through a single filter element.
- An ergonomically designed handle has been designed to facilitate fast and easy insertion and removal without the use of special tools. Cartridges are simply inserted over a built-in guide tube.
- The seating mechanism uses a “twist to lock” design to provide a positive seal.

Filter Comparison

Consider the following benefits of the CUNO™ High Flow System over competitive 2.5” (63,5 mm diameter) cartridges in a 1325 lpm (350 gpm) and a 7571 lpm (2000 gpm) system*:

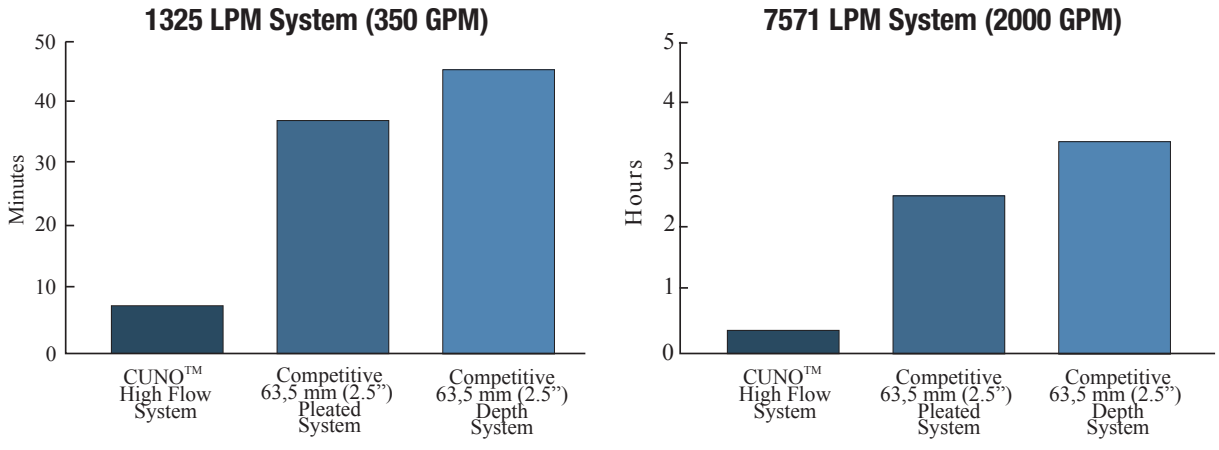
Figure 1 –
Typical Cartridges Required & Housing Footprint Comparison



- The CUNO™ High Flow System requires 90% fewer cartridges as competitive 2.5” (63,5 mm diameter) cartridge systems for a given flow rate.
- CUNO™ High Flow Housings are 33% to 50% smaller than competitively sized housings for a given flow rate.
- Fewer filters and a user-friendly housing design means faster change-outs than competitively sized systems.

** Comparison assumes fluid viscosity of 1 cP*

Figure 2 – Typical Time/Labour for Change-Out



CUNO™ High Flow Filter Specifications and Operating Parameters

Materials of Construction

Filter Media - Each grade of the CUNO™ High Flow Filter is manufactured from melt-blown FDA compliant polypropylene microfibre media, providing high particle removal efficiency with broad chemical compatibility. No adhesives, binders, or silicone are used in the manufacturing process. The raw materials composing these filters are FDA compliant according to CFR Title 21. All support layers and hardware are constructed with polypropylene.

O-rings - O-rings are available in a variety of materials to suit your applications, including the standard nitrile, Ethylene Propylene Rubber (EPR), silicone, and fluorocarbon.

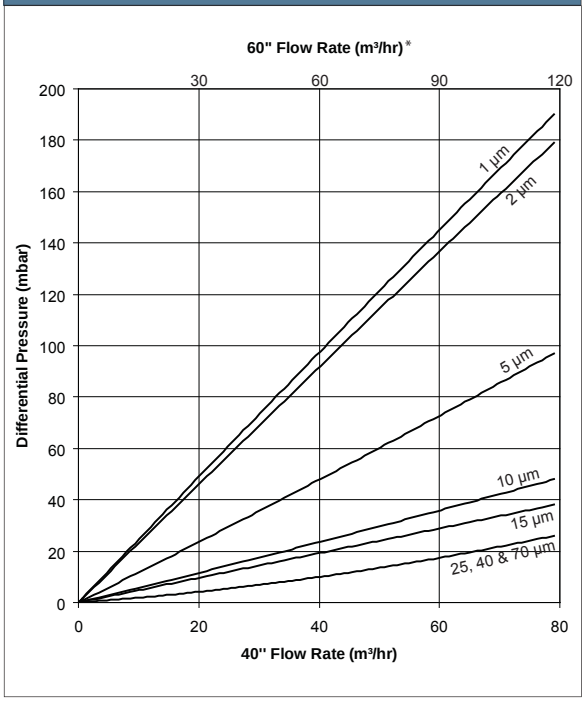
CUNO™ High Flow Filter Element Specifications

Parameter	Element Length (nominal)	
	40”	60”
Removal Ratings (microns)	1, 2, 5, 10, 15, 25, 40, and 70	
Flow vs. Differential Pressure	See Figure 3	
Filter Diameter (cm/inches)	16.5 / 6.5	
Filter Length (cm/inches)	101.6 / 40	152.4 / 60

Operating Parameters by Cartridge Length

Operating Conditions	Elements Length (nominal)	
	40”	60”
Maximum Operating Temperature (ºC/ºF)	71 / 160	
Maximum Recommended Flow Rate in water @ 21°C/70°F (m³ per hr / gpm)	80 / 350	113 / 500
Maximum Forward Differential Pressure	3.4 bar @ 20°C (50 psid @ 68°F)	
Recommended Change-out Differential Pressure	2.4 bar @ 20°C (35 psid @ 68°F)	
Regulatory Status - All component materials of the CUNO™ High Flow polypropylene element are listed for food contact per 21 CFR.		

Figure 3 – Typical Cartridge Flow Rates

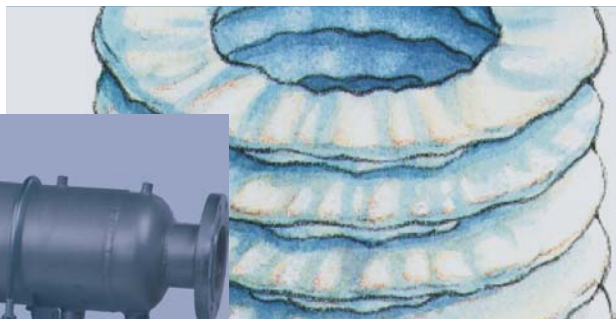


** estimated*

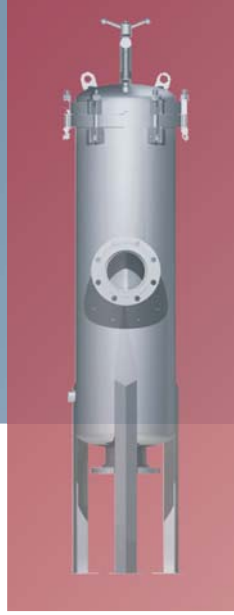
Fluid Compatibility

Chemical	Temperature	Chemical	Temperature	Chemical	Temperature
Acetic Acid 20%	71°C (160°F)	Hydrogen Peroxide	38°C (100°F)	Sodium Carbonate	71°C (160°F)
Alkanolamines	60°C (140°F)	Methyl Ethyl Ketone	21°C (70°F)	Sodium Hydroxide 70%	71°C (160°F)
Ammonium Hydroxide 10%	71°C (160°F)	Mineral Oil	21°C (70°F)	Sulfuric Acid 20%	71°C (160°F)
Bleach 5.5%	49°C (120°F)	Nitric Acid 20%	49°C (120°F)	Sulfuric Acid 70%	71°C (160°F)
Ethylene Glycol	71°C (160°F)	Potassium Hydroxide	60°C (140°F)	Urea	71°C (160°F)

The thermal and chemical resistance data presented in this brochure is for guidance only. Factors such as duration of exposure, fluid concentration, and temperature should also be considered. Thermal and chemical resistance should also be considered when choosing all materials exposed to fluids.



CUNO™ High Flow Filter Housings

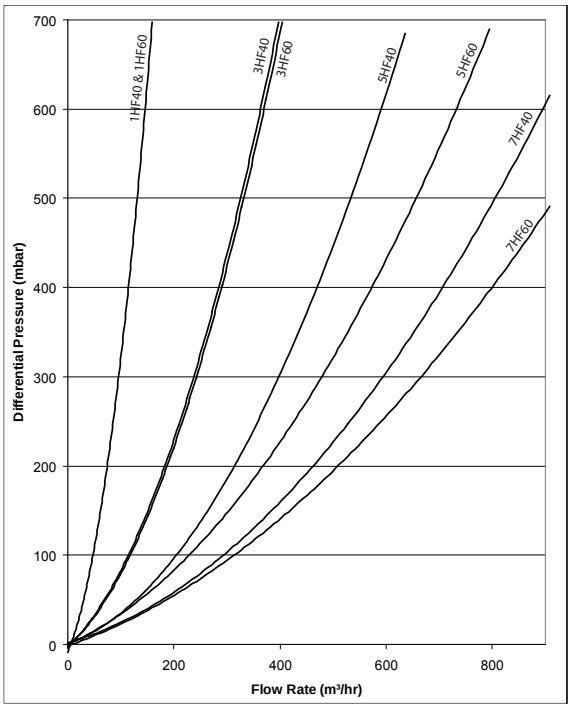


The CUNO™ High Flow Housings are specifically designed to deliver all of the system's benefits in a compact footprint. Housings are available in standard designs, as well as customizable configurations to suit your specific needs. All standard CUNO™ High Flow Housings are designed, manufactured, tested, and code stamped in accordance with ATEX Group II, Category 3, T5 and PED 97/23/EC rated Category I. Stainless steel housing external surfaces are glass-bead blasted for a consistent, easy care finish.

The CUNO™ High Flow Housing is available in a variety of sizes to accommodate from 1 to 7 filter elements in both 40-inch and 60-inch lengths. Larger housings are available upon request. Housings are also available in horizontal or vertical configurations, depending on your needs. Choose the horizontal option to maximize ease of operation, or the vertical to minimize the system's footprint.

Features	
Horizontal	**Vertical**
• ATEX Code design	
• Robust cartridge centre-post design eliminates bulky support plates providing easy access to housing internals	
• Hinged cover for easy element change-outs	• User-friendly cover lifting device for easy element change-outs
• Handles liquid at pressures and temperatures of up to 10 bar and 121 ºC	
• Manufactured from 304 or 316L stainless steel for excellent corrosion protection (carbon steel option available in multi-element housing)	
• Available for 40" and 60" element lengths	• Available for 40" element lengths
• Upstream and downstream gauge ports and drains	
Options	
• Corrosion allowance for carbon steel housing – consult factory	
• Choice of inlet/outlet flange size	

Figure 4 – Typical Housing Flow Rates



Housing Specifications

CUNO™ High Flow Housing Specification

Model	Nominal Diameter (mm)	Material	Inlet & Outlet Connection (DIN)		Recommended Maximum Flow m³/hr*		Maximum Pressure & Temperature	Vent & Drain Connections	
			40"	60"	40"	60"		Vent	Drain
1HF	220	316L SS or 304L SS	DN100	DN100	80	113	10 bar 110 ºC	1/4" ***	1/2" ***
3HF	450		DN150	DN200	198**	339		1/2"	1"
5HF	500		DN200	DN250	352**	556**		1/2"	1"
7HF	600		DN250	DN300	556	791		1"	2"

** Pressure drop across cartridge not included (see figure 3)*
*** Maximum flow rate based on nozzle size*
**** Only for Vertical Housings*

Housing Dimensions

CUNO™ High Flow Housing Specifications

Materials of Construction	316L (1.4404 or equivalent) 304 (1.4307 or equivalent) This applies to materials in contact with the product. Other non contact items (including bolts etc.) may vary from this.
Pressure Equipment Directive 97/23/CE Operating Conditions	All vessels have been designed in accordance with the PED 97/23/CE for Group 1 and Group 2 fluids up to a maximum of 10 bar g and 90 degrees C. Restrictions will apply for gas or vapour applications. Please refer to supplier for specific cases.
ATEX 94/9/CE	Group II Category 3 – G&D (Other ratings are possible please refer to vendor)
Recommended Maximum Flow per Cartridge: m³/hour	40" – 80 60" – 113 (60" elements are available in horizontal vessel configuration only)

CUNO™ High Flow Model Housing

Dimensions (mm)

Vertical Housing Models (available for 40" cartridges only)

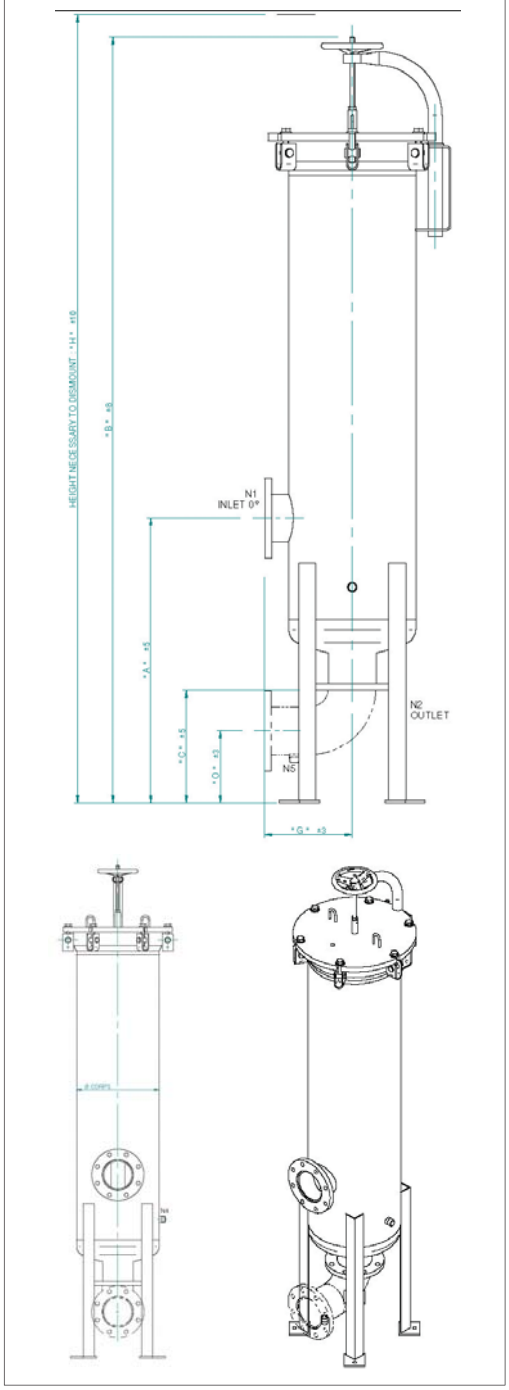
Model	A	B	C	G	H	O (option)
01HBF1V	680	1850	-	200	2900	555
03HBF1V	1010	2715	400	310	3500	255
05HBF1V	1115	2815	500	350	3600	300
07HBF1V	1210	2995	600	410	3700	345

Horizontal Housing Models

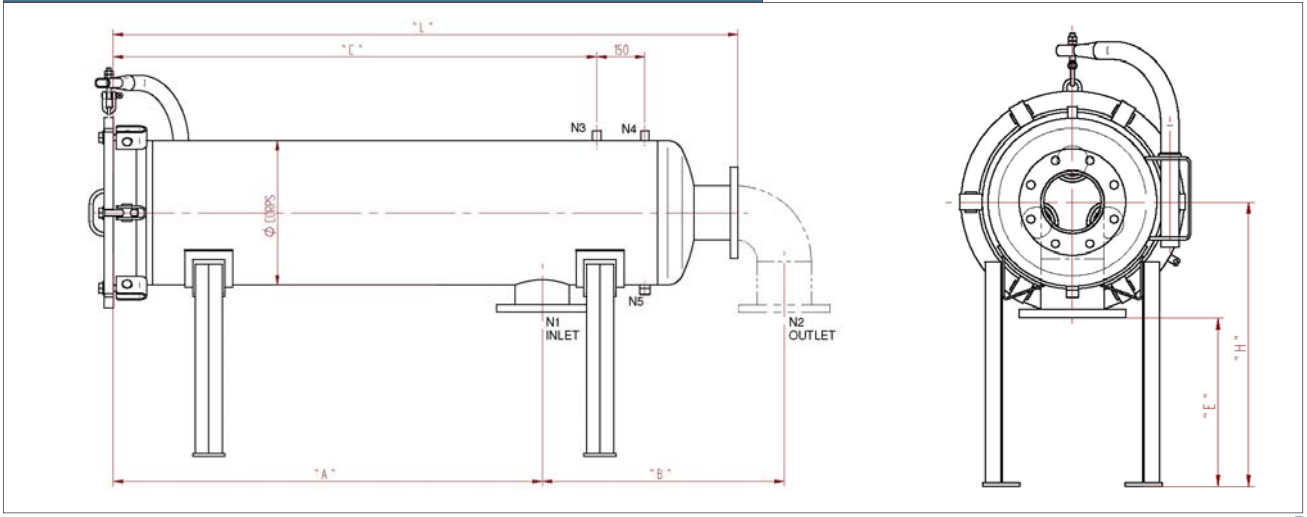
Model	A	C	E	H	L	B (option)
01HBF1H	1170	-	614	814	1420	345
01HBF2H	1680	-	614	814	1930	345
03HBF1H	1340	1510	500	810	1950	755
03HBF2H	1850	2020	500	810	2500	855
05HBF1H	1340	1510	550	900	1950	815
05HBF2H	1850	2020	550	900	2500	905
07HBF1H	1340	1510	650	1060	1950	865
07HBF2H	1850	2020	650	1060	2500	955

Note: All Dimensions approximately for guidance only

CUNO™ High Flow Vertical Housing



CUNO™ High Flow Horizontal Housing



CUNO™ High Flow Filter Element Ordering Guide

Filter Designation	Element Length (inches)	Material	Absolute Removal Rating (Microns)	O-Ring	Packaging Options (Per Box)
HF – High Flow	**40** – 40” **60** – 60”	**PP** - Polypropylene	**001** – 1 µm **002** – 2 µm **005** – 5 µm **010** – 10 µm **015** – 15 µm **025** – 25 µm **040** – 40 µm **070** – 70 µm	**A** – Silicone **B** – Fluorocarbon **C** – EPR **D** – Nitrile	**01** - 1 pack

CUNO™ High Flow Housing Ordering Guide

Number of Filter Elements	Model	Closing	Size *	Configuration	Housing Material	Gasket Material	Surface Finish	Connec-tions**	Bottom Outlet	Elbow***
01 **03** **05** **07**	**HF**	**B** – Bolted	**1** – 40 “ **2** – 60 “	**H** – Horizontal **V** – Vertical	**4** – 304 L **6** – 316 L	**MV** – Silicone **EP** – Ethylene Propylene **NB** – Nitrile **FP** – Fluorocarbon	**FO** - Acid Pickled & Passivated/ Glass Bead Blasted	**BP** - Flanged (ISO PN16)	**D** - Bottom	**N** - None **1** - At 0° **2** - At 90° **3** - At 180° **4** - At 270°

** 60” Elements are available for horizontal housings only*
*** Flange size will vary with number of filter elements and element length (refer to table on page 6)*
**** Options 2, 3 and 4 only available on multi-element vertical housings. All others are only available with option N or 1.*

Examples: *03 HFB 2 H 6 NB F0 BP D N*
or *05 HFB 1 V 6 NB F0 BP D N*

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