

# CFU

## Compact Filter Unit

Bigger isn't always better. The Compact Filter Unit provides you with the best filtration at a size you can take anywhere. Tried and true, the CFU is the ultimate filtration system in power and mobility. And with easy to change cartridge style MF90s, you can rest easy knowing your filtration will always exceed your expectations.

Donaldson.  
HY-PRO™

[hyprofiltration.com/](http://hyprofiltration.com/)



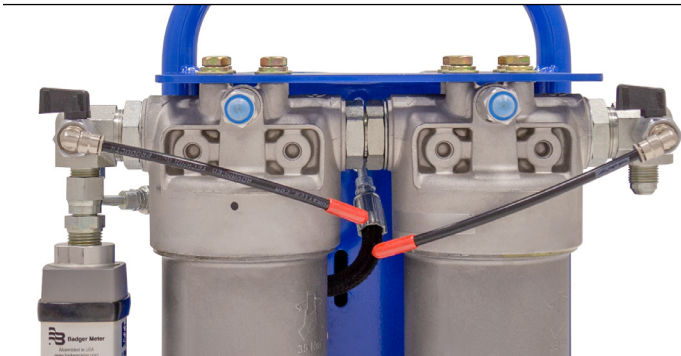
## Small size, huge results.

Designed specifically for limited space operations, the CFU maximizes power in a minimal package. Use the ergonomic handle to hoist the CFU to provide filtration directly within turbine nacelles or filter straight from the barrel to take out contaminants before they can ever reach your equipment.



## The first stage of success.

Staged filtration allows a range of media selections for particulate and water removal to deliver ISO Codes right on target. Choose from six element configurations to get the perfect CFU for your toughest contamination problems.



## Media matters.

DPE rated filter elements stay true to efficiency ratings and ensure the highest level of particulate capture and retention capabilities. And with media options down to  $\beta_{3(c)} \geq 4000$  you can be sure contamination stays exactly where you want it: out of your fluid.



## Redefines standard filtration.

Knowledge of your system is the ultimate tool in the fight against contamination. With upstream and downstream sample ports located on every machine, the standard CFUs are anything but standard.



## Different by design.

Built from lightweight aluminum and engineered for portability, the CFU is perfectly designed to filter new fluids during transfer and top-off bulk oil before use. For fluids already in service, use the CFU to flush them through the high efficiency elements for unparalleled levels of fluid cleanliness.



## Completely customizable.

Every CFU can be specifically tailored to the job at hand so you get the perfect solution to suit your needs. With a variety of flow rates and power options, even the ability to color coordinate each CFU to your existing safety standards, the possibilities are endless for what you can do with the CFU.



# CFU Quick Guide

CFUM9 model shown (2x MF90 in series)

Closed ergonomic handle for easy lifting/hoisting

Filter assembly  $\Delta$ P gauge

Inlet sample port

Outlet sample port

CFU outlet

MF90 Filter Assembly

9" bowl with HP90NL9 series filter element

Electric motor

Lightweight aluminum frame

Non-slip rubber feet



# Filter Sizing Guidelines

## Filter Sizing Guidelines and Viscosity Conversion

Effective filter sizing requires consideration of flow rate, viscosity (operating and cold start), fluid type and degree of filtration. When properly sized, bypass during cold start can be avoided/minimized and optimum element efficiency and life achieved. The filter assembly differential pressure values provided for sizing differ for each media code, and assume 32 cSt (150 SUS) viscosity and 0.86 fluid specific gravity. Use the following steps to calculate clean element assembly pressure drop.

Calculate  $\Delta P$  coefficient for actual viscosity

Using Saybolt Universal Seconds (SUS)

$$\Delta P \text{ Coefficient} = \frac{\text{Actual Operating Viscosity}^1 \text{ (SUS)}}{150} \times \frac{\text{Actual Specific Gravity}}{0.86}$$

Using Centistokes (cSt)

$$\Delta P \text{ Coefficient} = \frac{\text{Actual Operating Viscosity}^1 \text{ (cSt)}}{32} \times \frac{\text{Actual Specific Gravity}}{0.86}$$

Calculate actual clean filter assembly  $\Delta P$  at both operating and cold start viscosity

$$\text{Actual Assembly Clean } \Delta P = \text{Flow Rate} \times \frac{\Delta P \text{ Coefficient (from calculation above)}}{\text{Assembly } \Delta P \text{ Factor (from sizing table)}}$$

Sizing recommendations to optimize performance and permit future flexibility

- To avoid or minimize bypass during cold start the actual assembly clean  $\Delta P$  calculation should be repeated for start-up conditions if cold starts are frequent.
- Actual assembly clean  $\Delta P$  should not exceed 10% of bypass  $\Delta P$  gauge/indicator set point at normal operating viscosity.
- If suitable assembly size is approaching the upper limit of the recommended flow rate at the desired degree of filtration consider increasing the assembly to the next larger size if a finer degree of filtration might be preferred in the future. This practice allows the future flexibility to enhance fluid cleanliness without compromising clean  $\Delta P$  or filter element life.
- Once a suitable filter assembly size is determined consider increasing the assembly to the next larger size to optimize filter element life and avoid bypass during cold start.
- When using water glycol or other specified synthetics we recommend increasing the filter assembly by 1~2 sizes.

# CFU Filter Sizing Guidelines

$\Delta P$ Factors <sup>1</sup>	Model	Length	Units	Media						
				1M	3M	6M	10M	16M	25M	**W
	MF90	L9	psid/gpm bard/lpm	0.270 0.005	0.228 0.004	0.177 0.003	0.159 0.003	0.155 0.003	0.149 0.003	0.027 0.000
	MF110	L8	psid/gpm bard/lpm	0.250 0.005	0.211 0.004	0.164 0.003	0.147 0.003	0.144 0.003	0.138 0.003	0.025 0.000
		L11	psid/gpm bard/lpm	0.176 0.003	0.149 0.003	0.115 0.002	0.103 0.002	0.101 0.002	0.097 0.002	0.018 0.000

<sup>1</sup>Max flow rates and  $\Delta P$  factors assume = 150 SUS, 32 cSt. See filter assembly sizing guideline for viscosity conversion formula for viscosity change.



# CFU Specifications

<b>Dimensions<sup>1</sup></b>	<b>Height</b> 21" (54 cm)	<b>Length</b> 21" (54 cm)	<b>Width</b> 12" (31 cm)	<b>Weight</b> 47 lbs (21 kg)	
<b>Connections</b>	<b>Inlet</b> ¾" male JIC with 37° flare	<b>Outlet</b> ½" male JIC with 37° flare	<b>Hoses</b> ¾" x 8 ft (2.4 m) suction female JIC or BSPP swivel ½" x 8 ft (2.4 m) discharge female JIC or BSPP swivel		
<b>Operating Temperature</b>	<b>Fluid Temperature</b> 30°F to 225°F (0°C to 105°C)		<b>Ambient Temperature</b> -4°F to 104°F (-20C to 40C)		
<b>ΔP Indicator Trigger</b>	22 psi (1.5 bar). Consult factory for other options.				
<b>Filter Assembly Bypass</b>	25 psid (1.7 bard). Consult factory for other options.				
<b>Materials of Construction</b>	<b>Frame</b> Powder coated aluminum	<b>Filter Assembly</b> Aluminum head	<b>Hoses</b> Reinforced synthetic	<b>Wands</b> Stainless steel	<b>Element Bypass Valve</b> Nylon
<b>Electric Motor</b>	TEFC, 56C frame 7/16 hp, 1450-1750 RPM				
<b>Electric Connection</b>	15' (4.6 m) cord included installed on machine. <sup>2</sup>				
<b>Pump</b>	Positive displacement gear pump with relief valve. Maximum pressure on pump inlet 15 psi (1 bar). Consult factory for higher pressures.				
<b>Pneumatic Option Air Consumption</b>	~15 cfm @ 60 psi <sup>3</sup>				
<b>Media Description</b>	<b>M</b> G8 Dualglass, our latest generation of DFE rated, high performance glass media for all hydraulic & lubrication fluids. $\beta_{x_{(c)}} \geq 4000$ ( $\beta_x \geq 200$ )	<b>A</b> G8 Dualglass high performance media combined with water removal scrim. $\beta_{x_{(c)}} \geq 4000$ ( $\beta_x \geq 200$ )	<b>W</b> Stainless steel wire mesh media $\beta_{x_{(c)}} \geq 2$ ( $\beta_x \geq 2$ )		
<b>Replacement Elements</b>	<b>To determine replacement elements, use corresponding codes from your equipment part number:</b>				
	<b>Model</b>	<b>Filter Element Part Number</b>	<b>Example</b>		
	CFUD	HP75L8 – [Media Selection Code] [Seal Code]	HP75L8–12MB		
	CFUM9	HP90L9 – [Media Selection Code] [Seal Code]	HP90NL9–16MB		
	CFUM2	HP110L11 – [Media Selection Code] [Seal Code]	HP110NL11–6AV		
<b>Viscosity</b>	Max viscosity rated for 200 cSt. <sup>4</sup>				
<b>Fluid Compatibility</b>	Petroleum and mineral based fluids (standard). For specified synthetics contact factory for compatibility with fluorocarbon seal option. For phosphate ester (P9) or skydrol fluid (S9) compatibility select fluid compatibility from special options.				
<b>Hazardous Environment Options</b>	Select pneumatic powered unit (Power Option 00) or explosion proof NEC Article 501, Class 1, Division 1, Group C+D. Call for IEC, Atex or other requirements. If Explosion Proof option (X--) selected, no electrical cord will be included.				

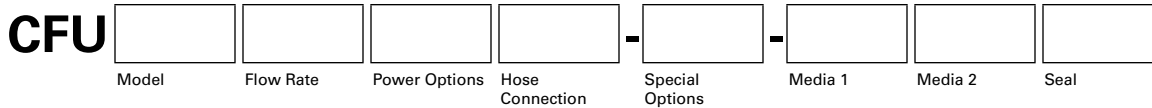
<sup>1</sup>Dimensions are approximations taken from base model and will vary according to options chosen.

<sup>2</sup>Selecting pneumatic power option removes electric cord.

<sup>3</sup>Air consumption values are estimated maximums and will vary with regulator setting.

<sup>4</sup>When sized and installed appropriately. Contact factory for applications above 200 cSt for sizing requirements.

# CFU Part Number Builder



<b>Model</b>	<b>Filter Assemblies</b> <b>D</b> 1 x S75D Spin-On filter assembly <b>M2</b> 1 x MF110 cartridge housing <b>M9</b> <sup>1</sup> 2 x MF90 cartridge housings	<b>Filter Elements</b> 2 x HP75L8-*** filter elements in parallel flow 1 x HP110NL11-*** filter element 2 x HP90NL9-*** filter elements in series flow	
<b>Flow Rate</b> <sup>2</sup>	<b>05</b> 0.5 gpm (1.7 lpm) <b>1</b> 1 gpm (3.7 lpm) <b>2</b> 2 gpm (7.5 lpm) <b>5</b> 5 gpm (18.9 lpm)		
<b>Power Options</b> Contact factory for options not listed	<b>Electrical - Dual Rated</b> <b>11</b> 110V, 1 P, 50Hz, 1450 RPM <b>12</b> 120V, 1 P, 60Hz, 1750 RPM <b>21</b> 220V, 1 P, 50Hz, 1450 RPM <b>22</b> 208-230V, 1 P, 60Hz, 1750 RPM	<b>Explosion Proof</b> <b>X11</b> 110 V ac, 1P , 50Hz, 1450 RPM <b>X12</b> 120 V ac, 1P , 60Hz, 1750 RPM <b>X21</b> 220 V ac, 1P , 50Hz, 1450 RPM <b>X22</b> 208-230 V ac, 1P , 60Hz, 1750 RPM	<b>Pneumatic</b> <b>00</b> Pneumatically driven air motor & PD pump. FRI & flow meter included.
Explosion proof - Class 1, Division 1, Group C+D per NEC 501 – Ready for outdoor use			
<b>Hose Connection</b>	<b>G</b> Female BSPP swivel hose ends, no wands <b>S</b> Female JIC swivel hose ends, no wands <b>W</b> Female JIC swivel hose ends, with wands		
<b>Special Options</b>	<b>B</b> Complete filter bypass line <b>C</b> CE marked for machinery safety directive 2006/42/EC <b>G</b> Spill Retention Pan - Industrial Coated Steel <b>J</b> Add pressure gauge between pump & filter assembly	<b>M</b> Total system flow meter (120 cSt max) <b>P9</b> <sup>3</sup> Phosphate ester fluid compatibility modification <b>S9</b> <sup>4</sup> Skydrol fluid compatibility modification <b>Z</b> On site start-up training	
<b>Media Selection</b>	<b>G8 Dualglass</b> <b>1M</b> $\beta_{3(c)} \geq 4000$ <b>3M</b> $\beta_{4(c)} \geq 4000$ <b>6M</b> $\beta_{6(c)} \geq 4000$ <b>10M</b> $\beta_{11(c)} \geq 4000$ <b>16M</b> $\beta_{16(c)} \geq 4000$ <b>25M</b> $\beta_{22(c)} \geq 4000$	<b>G8 Dualglass + water removal</b> <b>3A</b> $\beta_{4(c)} \geq 4000$ <b>6A</b> $\beta_{6(c)} \geq 4000$ <b>10A</b> $\beta_{11(c)} \geq 4000$ <b>25A</b> $\beta_{22(c)} \geq 4000$	<b>Stainless wire mesh</b> <b>25W</b> 25 $\mu$ nominal <b>40W</b> 40 $\mu$ nominal <b>74W</b> 74 $\mu$ nominal <b>149W</b> 149 $\mu$ nominal
<b>Seals</b>	<b>B</b> Nitrile (Buna) <b>V</b> Fluorocarbon <b>E-WS</b> <sup>5</sup> EPR seals + stainless steel support mesh		

<sup>1</sup>When selected, omit Media 2 option from part number builder.

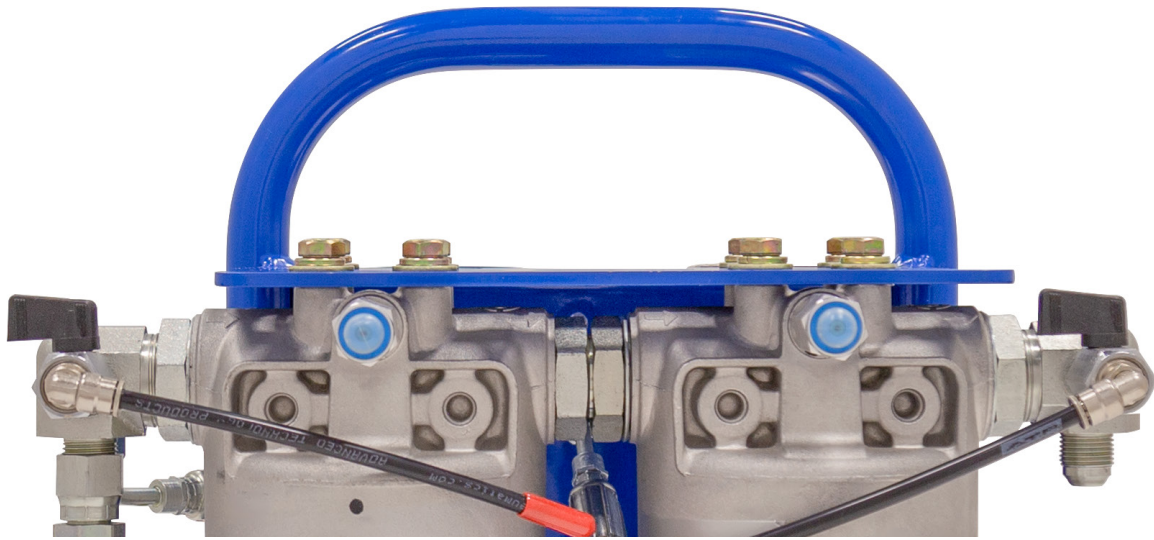
<sup>2</sup>Nominal flow rates at 60 Hz motor speeds.

<sup>3</sup>When selected, must be paired with Seal option "V." Contact factory for more information or assistance in fluid compatibility.

<sup>4</sup>When selected, must be paired with Seal option "E-WS." Contact factory for more information or assistance in fluid compatibility.

<sup>5</sup>Only available in 3M media for HP75L8 series elements.

For all up to date option details and compatibilities, please reference our Contamination Solutions Price List or contact customer service.



# Filtration starts with the filter.

## **Lower ISO Codes: Lower Total Cost of Ownership**

Donaldson Hy-Pro filter elements deliver lower operating ISO Codes so you know your fluids are always clean, meaning lower total cost of ownership and reducing element consumption, downtime, repairs, and efficiency losses.

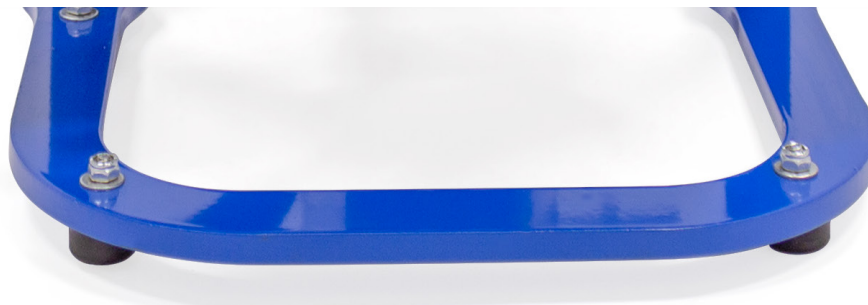
**DFE Rated Filter Elements** DFE is Donaldson Hy-Pro's proprietary testing process which extends ISO 16889 Multi Pass testing to include real world, dynamic conditions and ensures that our filter elements excel in your most demanding hydraulic and lube applications.

**Upgrade Your Filtration** Keeping fluids clean results in big reliability gains and upgrading to Donaldson Hy-Pro filter elements is the first step to clean oil and improved efficiency.

**Advanced Media Options** DFE glass media maintaining efficiency to  $\beta_{3[\text{c}]} > 4000$ , Dualglass + water removal media to remove free and emulsified water, stainless wire mesh for coarse filtration applications, and Dynafuzz stainless fiber media for EHC and aerospace applications.

**Delivery in days, not weeks** From a massive inventory of ready-to-ship filter elements to flexible manufacturing processes, Donaldson Hy-Pro is equipped for incredibly fast response time to ensure you get your filter elements and protect your uptime.

**More than just filtration** Purchasing Donaldson Hy-Pro filter elements means you not only get the best filters, you also get the unrivaled support, training, knowledge and expertise of the Donaldson Hy-Pro team working shoulder-to-shoulder with you to eliminate fluid contamination.



## **Want to find out more? Get in touch.**

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