

# FC

## Filter Cart

A fully self-contained mobile solution for bulk oil handling, fluid transfer and reservoir or gearbox conditioning.

Ideal for lower viscosity hydraulic oil, lube oil and diesel fuel.

**HY-PRO**

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



## Engineered for industrial use.

Rugged construction and attention to the smallest of details come together remarkably so that nothing holds you or your equipment back. The easy to maneuver hand-truck style design with never-flat pneumatic tires and cast iron gear pump with internal relief mean you get powerful filtration exactly when and where you need it.



## Set the stage for your success.

Staged filtration allows a range of media selections for particulate and water removal to deliver ISO Codes right on target. Choose between dual MF110 cartridge (standard) or up to four Spin-On elements to tackle the most viscous fluids and achieve unimaginably low ISO Codes in a single pass.



## Media matters.

DFE 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  $\beta_{3,C1} \geq 4000$ , you can be sure contamination stays exactly where you want it: out of your systems.



## Your standard Filter Cart, reimagined.

Sample ports in the right locations arm you with access to consistently accurate system conditions which is why every FC comes standard with up- and downstream sample ports in their proper positions. And with the 35' (11m) retractable cord reel or 35' air hose for pneumatic models, it's easy to see why the standard FC isn't so standard after all.



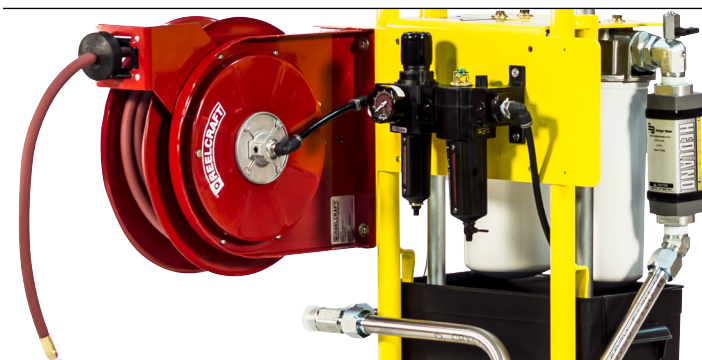
## With options to make your job easier.

With the optional filter bypass line, cold starts, gearbox pump-outs, and even element change outs become easier than ever. Add the optional PM-1 particle monitor for real time cleanliness data and know exactly how your filtration is performing without the need for a bottle.



## Completely customizable.

The FC comes in a variety of flow rates and with electric options that range from 120 to 575 V ac, single or three phase. Or choose the pneumatic and explosion proof models to take your filtration into hazardous zones like you never thought possible. Even color coordinate each FC to your existing safety standards. With thousands of combinations to choose from, the possibilities are endless for what you can do with the FC.



# FC Quick Guide

## Standard FC

Ergonomic handle

Inlet sample port

35' (11m) retractable electric cord reel

MSP with short circuit and overload protection

MF110 filter assemblies with HP110NL11 filter elements

Cast iron gear pump with internal relief

System inlet with Y-Strainer

Removable spill retention pan

Electric motor

Never-flat foam filled tires

Industrial coated steel frame



# 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.



# FC Filter Sizing Guidelines

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

S75D Options $\Delta P$ Factors <sup>1</sup>	Series	Length	Units	Media						
				1M	3M	6M	12M	16M	25M	**W
S75D	L8		psid/gpm	0.092	0.077	0.060	0.054	0.053	0.051	0.009
			bard/lpm	0.002	0.001	0.001	0.001	0.001	0.001	0.000
	Series	Length	Units	Media						
				3A	6A	12A	25A	3C	10C	25C
S75D	L8		psid/gpm	0.086	0.067	0.060	0.056	0.124	0.081	0.078
			bard/lpm	0.002	0.001	0.001	0.001	0.002	0.001	0.001

Max flow rates and  $\Delta P$  factors assume  $\mu = 150$  SUS, 32 cSt. See filter assembly sizing guideline for viscosity conversion formula.

# FC Specifications

Dimensions <sup>1</sup>	<b>Height</b> 45" (114 cm)	<b>Width</b> 20" (50 cm)	<b>Depth</b> 23" (58 cm)	<b>Weight</b> 125 lbs (57 kg)	
Connections	<b>Inlet</b> FC05-FC5: 1" male JIC (37° flare) FC10: 1.25" male JIC (37° flare) FC20: 1.5" male JIC (37° flare)	<b>Outlet</b> FC05-FC10 1" male JIC (37° flare) FC20: 1.25" male JIC (37° flare)	<b>Hoses</b> FC05-FC5: 1" x 10 ft (2.4 m) FC10: 1.25" x 10 ft (2.4 m) suction 1" x 10 ft (2.4 m) discharge FC20: 1.5" x 10 ft (2.4 m) suction		
Operating Temperature	<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)			
ΔP Indicator Trigger	22 psi (1.5 bar). Consult factory for other options.				
Filter Assembly Bypass	25 psid (1.7 bard). Consult factory for other options.				
Materials of Construction	<b>Frame</b> Industrial coated steel	<b>Filter Assembly</b> Aluminum head & canister	<b>Hoses</b> Reinforced synthetic	<b>Wands</b> Stainless Steel	<b>Element Bypass Valve</b> Nylon
Electric Motor	TEFC, 56-215 frame 0.5-3 hp, 1450-1750 RPM				
Motor Starter	MSP (motor starter/protector) in an IP65, aluminum enclosure with short circuit and overload protection.				
Electric Connection	Voltages 230 V ac and under, single phase: 35' (11 m) retractable cord reel included. NEMA 5-15 plug installed on Power Option 12. Voltages over 230 V ac: 35' (11 m) power cord included.				
Pump	Cast iron, positive displacement gear pump with internal relief. Maximum pressure on pump inlet 15 psi (1 bar). Consult factory for higher pressures.				
Pump Bypass	Full bypass at 150 psi (10 bar) <sup>2</sup>				
Pneumatic Option Air Consumption	~40 cfm @ 80 psi <sup>3</sup> 35' (11 m) retractable air hose included when pneumatic option selected (replaces electric cord reel).				
Media Description	<b>M</b> G8 Dualglass, our latest generation of DFE rated, high performance glass media for all hydraulic & lubrication fluids. $\beta_{x_{Cl}} \geq 4000$ ( $\beta_x \geq 200$ )	<b>A</b> G8 Dualglass high performance media combined with water removal scrim. $\beta_{x_{Cl}} \geq 4000$ ( $\beta_x \geq 200$ )	<b>W</b> Stainless steel wire mesh media $\beta_{x_{Cl}} \geq 2$ ( $\beta_x \geq 2$ )		
Replacement Elements	<b>To determine replacement elements, use corresponding codes from your equipment part number:</b>				
	<b>Model</b> Standard FC (2x MF110 11" bowls) Special Option D1	<b>Filter Element Part Number</b> HP110NL11 – [Media Selection Code] [Seal Code] HP75L8 – [Media Selection Code] [Seal Code]	<b>Example</b> HP110NL11-12MV HP75L8-25MB		
Viscosity	2-5000 cSt <sup>4</sup>				
Fluid Compatibility	Petroleum and mineral based fluids, #2 diesel fuels (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.				
Hazardous Environment Options	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.

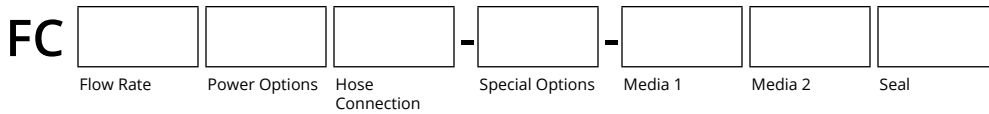
<sup>2</sup>10 GPM pump is rated for intermittent duty only at pressures above 100 psi. Continual operation with dual clogged filters resulting in operating pressures over 100 psi will reduce pump life and/or cause premature pump failure.

<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 800 cSt for sizing requirements.



# FC Part Number Builder



**Flow Rate<sup>1</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>10</b>	10 gpm (37.9 lpm)
<b>20<sup>2</sup></b>	20 gpm (75.7 lpm)

<b>Power Options</b> Contact factory for options not listed	<b>60 Hz, 1750 RPM</b>	<b>50 Hz, 1450 RPM</b>	<b>Pneumatic</b>
	<b>12</b> 120 V ac, 1P	<b>11</b> 110 V ac, 1P	<b>00</b> Pneumatically driven air motor & PD pump. FRL & flow meter included.
	<b>22</b> 208-230 V ac, 1P	<b>21</b> 220 V ac, 1P	
	<b>23</b> 208-230 V ac, 3P	<b>40</b> 380-440 V ac, 3P	
	<b>46</b> 460-480 V ac, 3P	<b>52</b> 525 V ac, 3P	
<b>57</b> 575 V ac, 3P			

**Explosion proof - Class 1, Division 1, Group C+D per NEC 501 – Ready for outdoor use**

**X** Add X prefix to power option listed above. Not available with (00) Pneumatic Option

**Hose Connection**

<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

**Special Options**

<b>B</b>	Complete filter bypass line	<b>K</b>	HP75L8-149W Spin-On suction strainer (Can't be paired with K option)
<b>C</b>	CE marked for machinery safety directive 2006/42/EC	<b>M</b>	Total system flow meter (120 cSt max)
<b>D1<sup>3</sup></b>	2 x S75DL8 filter assemblies in series	<b>O</b>	On-board PM-1 particle monitor & clean oil indicator light
<b>D3</b>	True differential pressure gauge, visual green to red	<b>P9<sup>4</sup></b>	Phosphate ester fluid compatibility modification
<b>E</b>	100 mesh cast iron basket strainer (Can't be paired with K option)	<b>S9<sup>5</sup></b>	Skydrol fluid compatibility modification
<b>H1</b>	10' (3 m) return line hose extension	<b>U</b>	CUL and/or CSA marked starter enclosure for Canada
<b>H2</b>	20' (6 m) return line hose extension	<b>Z</b>	On site start-up training
<b>J</b>	Add pressure gauge between pump & filter assembly		

<b>Media Selection</b>	<b>G8 Dualglass</b>	<b>G8 Dualglass + water removal</b>	<b>Stainless wire mesh</b>
	<b>1M</b> $\beta_{3, [c]} \geq 4000$	<b>3A</b> $\beta_{4, [c]} \geq 4000$	<b>25W</b> 25μ nominal
	<b>3M</b> $\beta_{4, [c]} \geq 4000$	<b>6A</b> $\beta_{6, [c]} \geq 4000$	<b>40W</b> 40μ nominal
	<b>6M</b> $\beta_{6, [c]} \geq 4000$	<b>10A</b> $\beta_{11, [c]} \geq 4000$	<b>74W</b> 74μ nominal
	<b>10M</b> $\beta_{11, [c]} \geq 4000$	<b>25A</b> $\beta_{22, [c]} \geq 4000$	<b>149W</b> 149μ nominal
	<b>16M</b> $\beta_{16, [c]} \geq 4000$		
<b>25M</b> $\beta_{22, [c]} \geq 4000$			

**Seals**

<b>B</b>	Nitrile (Buna)
<b>V</b>	Fluorocarbon
<b>E-WS<sup>6</sup></b>	EPR seals + stainless steel support mesh

<sup>1</sup>Nominal flow rates at 60 Hz motor speeds.

<sup>2</sup>Contact factory for sizing assistance on all viscosities.

<sup>3</sup>Replaces standard MF110 housings.

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

<sup>5</sup>When selected, must be paired with Seal option "E-WS." Contact factory for more information or assistance in fluid compatibility.

<sup>6</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** 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.

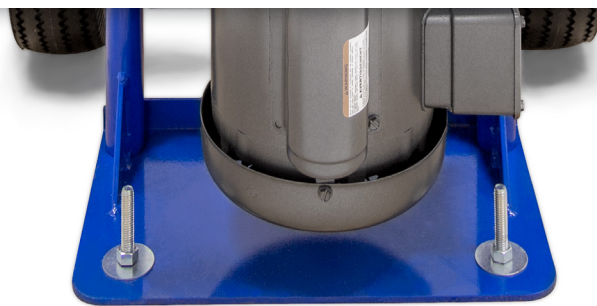
**DFE Rated Filter Elements** DFE is Hy-Pro's proprietary testing process which extends ISO 16889 Multi Pass testing to include real world, dynamic conditions and ensures that our filter elements excel in your most demanding hydraulic and lube applications.

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

**Advanced Media Options** DFE glass media maintaining efficiency to  $\beta_{3, \mu} > 4000$ , 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, 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 Hy-Pro filter elements means you not only get the best filters, you also get the unrivaled support, training, knowledge and expertise of the 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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