

DLF(M)

Low Pressure High Flow Duplex Filter Assembly

Designed to maintain continuous filtration, even throughout element servicing, the DLF series filter assemblies provide two high efficiency, high capacity filter housings coupled by a user-friendly 6-way, 3 position valve that completely seals the system from the atmosphere. Use the DLF(M) to remove particulate and water from a variety of fluids and maximize your uptime.

Ideal for systems where filters must be serviced without system interruption such as hydraulic, gearbox, pulp and paper, rolling mill oil, bulk oil handling, and high flow return-line filtration.

Max Operating Pressure: 150 psi (10 bar)
Available options up to 450 psi (31 bar)



hyprofiltration.com/DLF



One assembly, twice the filtration.

DLF assemblies combine two powerful LF housings to deliver lower ISO Codes faster than ever. With a turn of the lever, you'll introduce a new element to your fluid while simultaneously valving the used element out of service to easily change and replace, all while your system continues operating at full capacity.



Built for industrial use.

Constructed from heavy duty carbon steel (standard) or the optional 304 or 316 stainless steel, the DLF filter housings are designed to excel in even the toughest industrial conditions. Multi-round units go even further to provide increased capacity whether you're operating with incredibly high viscosity oils or extreme flow rates.

Filtration starts with the filter.

The oversized coreless filter element in every DLF delivers lower ISO Codes over a long element lifespan to ensure low disposal impact, simultaneously reducing your environmental footprint and your bottom line. To top it off, select elements come standard with an integral zero-leak bypass so with every filter change you get a new bypass along with peace of mind.

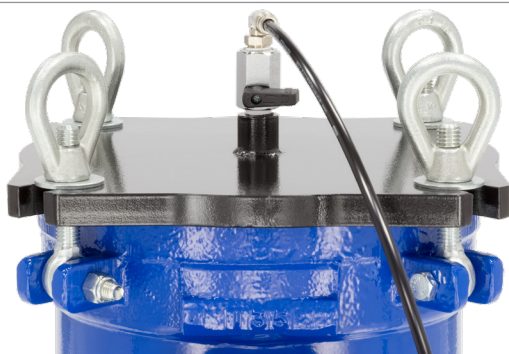
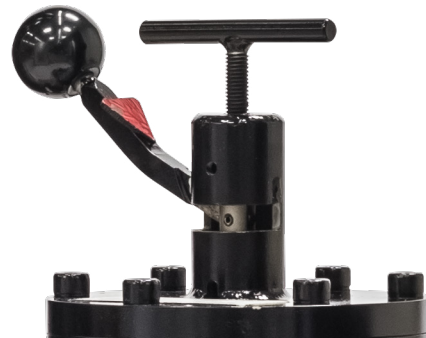


Seamlessly integrated into your systems.

Multiple connection options provide you with the ability to integrate the DLF directly in-line on your systems and get the most impact from your filtration directly where you need it.

Inherently safe.

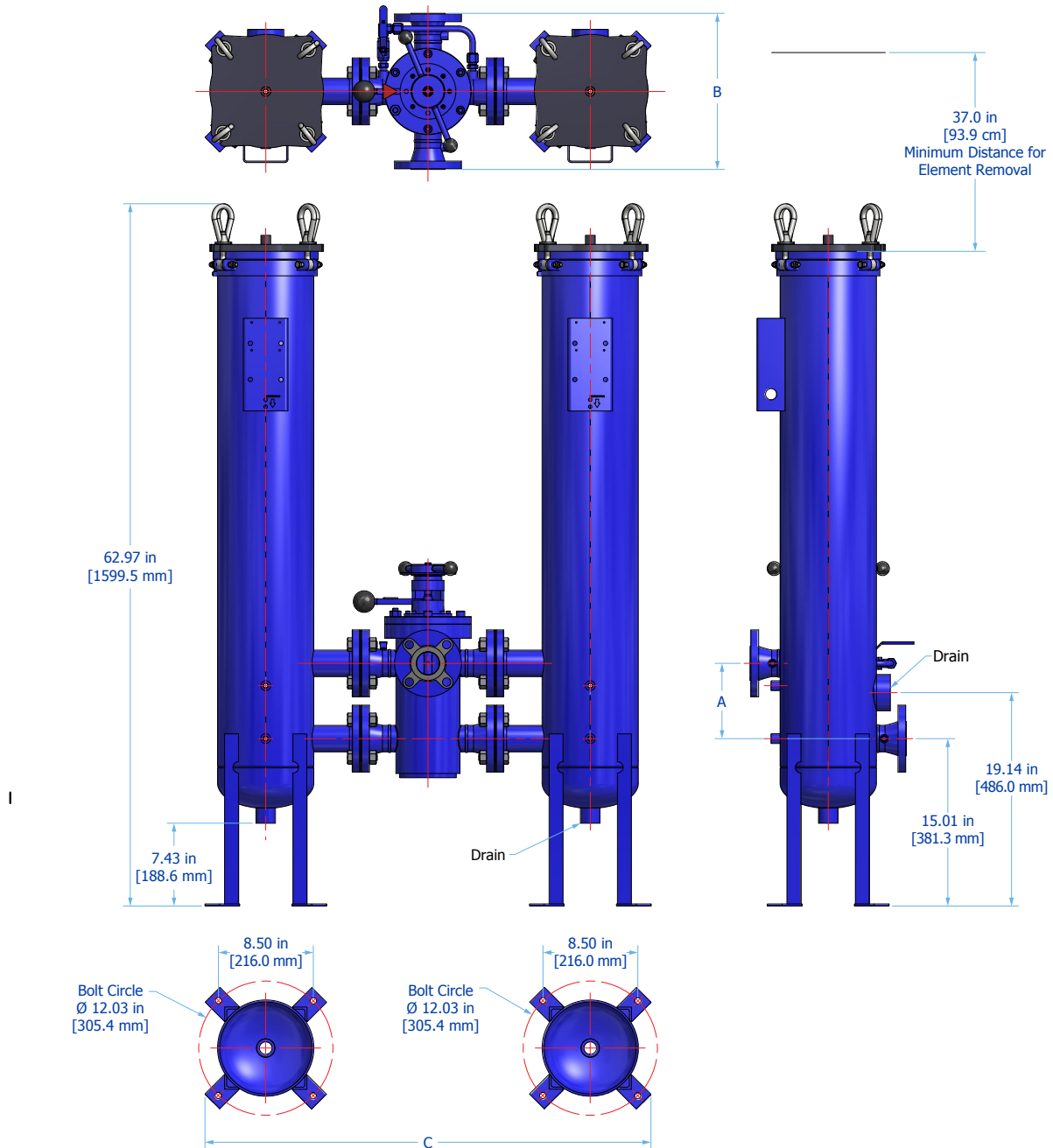
The true 6-way valve with internal pressure equalization and fill line allows for seamless transition of flow from one housing to the other. As the valve is repositioned, oil from the in-service housing is redistributed to the out-of-service housing to purge air before it can move downstream - meaning you maintain fluid levels, preserve system control and prevent cavitation of your components, all while ensuring your fluid stays remarkably clean.



Clean oil has never been easier.

Designed to combine incredible capacity and low maintenance, the oversized housing with secure swivel bolts allow for effortless element changes with all the parts kept right where they need to be. The top loading housing and post/nipple system provide incredible ease of use and make element installation and maintenance easier than ever.

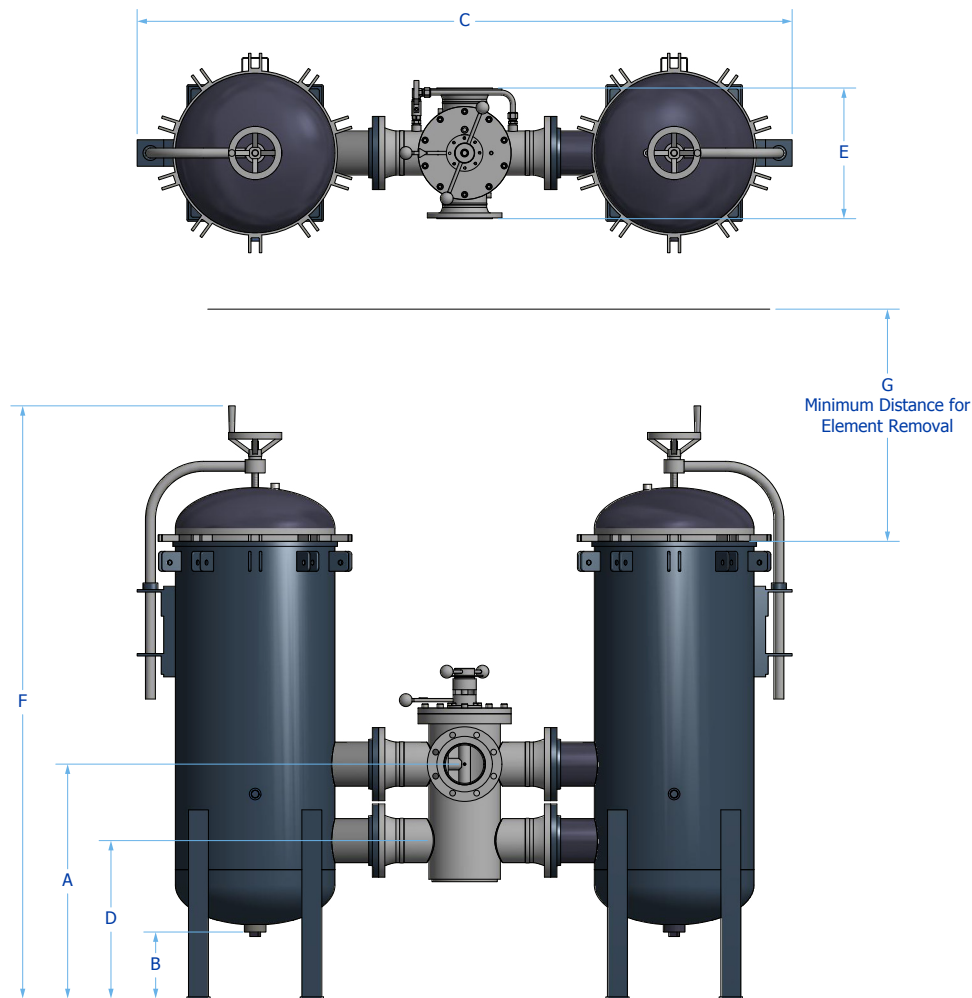
DLF Installation Drawing



Series	Port Size	Vessel Diameter	A	B	C	Weight
DLF	2	8.0 in	11.7 in	14.0 in	41.4 in	389.0 lb
		20.3 cm	29.7 cm	35.6 cm	105.2 cm	176.4 kg
	3	8.0 in	11.7 in	14.0 in	43.4 in	451.0 lb
20.3 cm		29.7 cm	35.6 cm	110.2 cm	204.6 kg	
4	8.0 in	15.2 in	17.0 in	50.7 in	544.0 lb	
	20.3 cm	38.6 cm	43.2 cm	128.8 cm	246.8 kg	

*Dimensions are approximations taken from base model and will vary according to options chosen and customer sizing requirements.

DLFM Installation Drawing



Series	Number of Elements	Port Size	Vessel Diameter	A	B	C	D	E	F	G	Weight
DLFM	3	2	16.0 in 40.6 cm	28.7 in 72.9 cm	13.0 in 33.0 cm	60.0 in 152.4 cm	17.0 in 43.2 cm	14.0 in 35.6 cm	78.5 in 199.4 cm	37.0 in 94.0 cm	1190.0 lb 539.8 kg
		3	16.0 in 40.6 cm	29.7 in 75.4 cm	13.0 in 33.0 cm	63.0 in 160.0 cm	17.0 in 43.2 cm	14.0 in 35.6 cm	78.5 in 199.4 cm	37.0 in 94.0 cm	1251.0 lb 567.4 kg
		4	16.0 in 40.6 cm	32.2 in 81.8 cm	13.0 in 33.0 cm	70.0 in 177.8 cm	17.0 in 43.2 cm	17.0 in 43.2 cm	78.5 in 199.4 cm	37.0 in 94.0 cm	1344.0 lb 609.6 kg
	4	2	18.0 in 45.7 cm	29.1 in 73.9 cm	13.0 in 33.0 cm	66.0 in 167.6 cm	17.5 in 44.5 cm	14.0 in 35.6 cm	83.0 in 210.8 cm	37.0 in 94.0 cm	1360.0 lb 616.9 kg
		3	18.0 in 45.7 cm	30.7 in 78.0 cm	13.0 in 33.0 cm	68.0 in 172.7 cm	17.5 in 44.5 cm	14.0 in 35.6 cm	83.0 in 210.8 cm	37.0 in 94.0 cm	1421.0 lb 644.6 kg
		4	18.0 in 45.7 cm	27.6 in 70.1 cm	13.0 in 33.0 cm	75.0 in 190.5 cm	17.5 in 44.5 cm	17.0 in 43.2 cm	83.0 in 210.8 cm	37.0 in 94.0 cm	1514.0 lb 686.7 kg
	9	3	24.0 in 61.0 cm	31.6 in 80.3 cm	13.0 in 33.0 cm	87.0 in 221.0 cm	17.5 in 44.5 cm	14.0 in 35.6 cm	89.0 in 226.1 cm	37.0 in 94.0 cm	1811.0 lb 821.5 kg
		4	24.0 in 61.0 cm	34.1 in 86.6 cm	13.0 in 33.0 cm	94.0 in 238.8 cm	17.5 in 44.5 cm	17.0 in 43.2 cm	89.0 in 226.1 cm	37.0 in 94.0 cm	1904.0 lb 863.6 kg
		6	24.0 in 61.0 cm	35.3 in 89.7 cm	13.0 in 33.0 cm	99.0 in 251.5 cm	17.5 in 44.5 cm	20.0 in 50.8 cm	89.0 in 226.1 cm	37.0 in 94.0 cm	2081.0 lb 943.9 kg

¹Dimensions are approximations taken from base model and will vary according to options chosen and customer sizing requirements. Contact factory to request model specific drawings or for any models not listed above.

Filter Assembly Sizing

Filter Assembly Sizing Guidelines

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 ΔP 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 ΔP 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 ΔP calculation should be repeated for start-up conditions if cold starts are frequent.
- Actual assembly clean ΔP should not exceed 10% of bypass ΔP 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 ΔP 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.

DLF(M) Specifications

Dimensions	See Installation Drawing on pages 3-4 for model specific dimensions.										
Operating Temperature	Fluid Temperature 30°F to 225°F (0°C to 105°C)					Ambient Temperature -4°F to 140°F (-20C to 60C)					
Operating Pressure	150 psi (10.3 bar) standard. See special options for additional pressure ratings.										
Element Collapse Rating	HP105 150 psi (10.3 bar)		HP106 150 psi (10.3 bar)		HP107 150 psi (10.3 bar)		HP8314 (All Codes) 150 psi (10.3 bar)				
Integral Element Bypass Setting	HP106 25 psid (1.7 bard)		HP107 50 psid (3.4 bard)		HP8314 (Code 82) 25 psid (1.7 bard)		HP8314 (Code 83) 50 psid (3.4 bard)				
Materials of Construction	Housing Industrial coated carbon steel										
Media Description	M G8 Dualglass, our latest generation of DFE rated, high performance glass media for all hydraulic & lubrication fluids. $\beta_{x_{Cj}} = 1000$ ($\beta_x = 200$)			A G8 Dualglass high performance media combined with water removal scrim. $\beta_{x_{Cj}} = 1000$ ($\beta_x = 200$)			W Stainless steel wire mesh media $\beta_{x_{Cj}} = 2$ ($\beta_x = 2$)				
Replacement Elements	To determine replacement elements, use corresponding codes from your assembly part number:										
	Element Type Code	Filter Element Part Number					Example				
	5	HP105L[Length Code] - [Media Selection Code][Seal Code]					HP105L36-6AB				
	6	HP106L[Length Code] - [Media Selection Code][Seal Code]					HP106L18-10MV				
	7	HP107L[Length Code] - [Media Selection Code][Seal Code]					HP107L36-25MB				
	8X	HP8314L[Length Code] - [Media Selection Code][Seal Code]					HP8314L39-25WV				
	82	HP8314L[Length Code] - [Media Selection Code][Seal Code]					HP8314L16-12MB				
	85	HP8314L[Length Code] - [Media Selection Code][Seal Code]					HP8314L39-16ME-WS				
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 or skydrol fluid compatibility select fluid compatibility from special options.										
Filter Sizing ¹	Filter assembly clean element ΔP after actual viscosity correction should not exceed 10% of filter assembly bypass setting. See previous page for filter assembly sizing guidelines & examples. For applications with extreme cold start condition contact Hy-Pro for sizing recommendations.										
ΔP Factors ¹	Model	Length	Units	Media							
				1M	3M	6M	10M	16M	25M	**W	
	DLF	L36/L39	psid/gpm	0.0324	0.0273	0.0212	0.0190	0.0186	0.0179	0.0032	
			bard/lpm	0.0009	0.0008	0.0007	0.0007	0.0007	0.0007	0.0006	
	DLFM3	L36/L39	psid/gpm	0.0081	0.0055	0.0051	0.0045	0.0041	0.0035	0.0029	
			bard/lpm	0.00015	0.0001	0.00009	0.00008	0.00007	0.00006	0.00005	
	DLFM4	L36/L39	psid/gpm	0.0067	0.0048	0.0044	0.004	0.0037	0.0032	0.0025	
			bard/lpm	0.00012	0.00009	0.00008	0.00007	0.00007	0.00006	0.00005	
	DLFM9	L36/L39	psid/gpm	0.0034	0.0025	0.0022	0.002	0.0019	0.0016	0.0013	
			bard/lpm	0.00006	0.00005	0.00004	0.00004	0.00003	0.00003	0.00002	

¹Max flow rates and ΔP factors assume $u = 150$ SUS, 32 cSt. See filter assembly sizing guideline for viscosity conversion formula.

DLF(M) Part Number Builder



Series	Number of Elements	Max Flow Rate
omit	1 element	200 gpm (757 lpm) ¹
M3	3 elements	600 gpm (2271 lpm) ¹
M4	4 elements	800 gpm (3028 lpm) ¹
M9	9 elements	1800 gpm (6814 lpm) ¹
M14	14 elements	2800 gpm (10,600 lpm) ¹
M22	22 elements	4400 gpm (16,656 lpm) ¹

Port Configuration	Code	Description
	K	Opposite side porting (180°), same center line
	O	Opposite side porting (180°), in-line (different center line)
	S	Same side porting (standard)

Connections	Code	Description
	A15	1.5" ANSI flange
	A2	2" ANSI flange
	A3	3" ANSI flange
	A4	4" ANSI flange
	A6	6" ANSI flange
	A8	8" ANSI flange
	D15	DN40 DIN flange
	D2	DN50 DIN flange
	D3	DN80 DIN flange
	D4	DN100 DIN flange
	D6	DN150 DIN flange
	D8	DN200 DIN flange
	F15	1.5" Code 61 flange
	F2	2" Code 61 flange
	F3	3" Code 61 flange

Element Type	Code	Description
	5	HP105 – no bypass
	6	HP106 – 25 psid (1.7 bard) integral element bypass
	7	HP107 – 50 psid (3.4 bard) integral element bypass
	8X	HP8314 – no bypass
	82	HP8314 – 25 psid (1.7 bard) integral housing bypass
	85	HP8314 – 50 psid (3.4 bard) integral housing bypass

ΔP Indicator	Code	Description
	D	22 psid visual gauge + electric switch
	E	22 psid visual gauge
	F	45 psid visual gauge + electric switch
	G	45 psid visual gauge
	H	65 psid visual gauge + electric switch
	J	65 psid visual gauge (elements 5 or 8* only)
	P	2 pressure gages (industrial liquid filled)
	X	None (ports plugged)

Special Options	Code	Description
	omit	150 psi (10.3 bar) max operating pressure, carbon steel
	F	Filter element ΔP gauge with tattle tale follower needle
	G	Spill retention pan with fork guides (industrial coated steel)
	P9²	Phosphate ester fluid compatibility modification
	S1³	150 psi (10.3 bar) max oper. pressure, 304 stainless steel
	S2³	250 psi (17.2 bar) max oper. pressure, 304 stainless steel
	S3³	450 psi (31.0 bar) max oper. pressure, 304 stainless steel
	S9⁴	Skydrol fluid compatibility modification
	U1	U Code (ASME U code certified)
	W	Automatic air bleed valve
	X	250 psi (17.2 bar) max oper. pressure, carbon steel
	Y	450 psi (31.0 bar) max oper. pressure, carbon steel

Media Selection	Code	Description
	G8 Dualglass	
	1M	β _{2.5} (_{CQ}) = 1000, β ₁ = 200
	3M	β ₅ (_{CQ}) = 1000, β ₃ = 200
	6M	β ₇ (_{CQ}) = 1000, β ₆ = 200
	10M⁵	β ₁₂ (_{CQ}) = 1000, β ₁₂ = 200
	16M	β ₁₇ (_{CQ}) = 1000, β ₁₇ = 200
	25M	β ₂₂ (_{CQ}) = 1000, β ₂₅ = 200
	G8 Dualglass + water removal	
	3A	β ₅ (_{CQ}) = 1000, β ₃ = 200
	6A	β ₇ (_{CQ}) = 1000, β ₆ = 200
	10A⁵	β ₁₂ (_{CQ}) = 1000, β ₁₂ = 200
	25A	β ₂₂ (_{CQ}) = 1000, β ₂₅ = 200
	Stainless wire mesh	
	25W	25μ nominal
	40W	40μ nominal
	74W	74μ nominal
	149W	149μ nominal

Seals	Code	Description
	B	Nitrile (Buna)
	V	Fluorocarbon

¹Maximum recommended flow rate based on velocity through port and internal flow path. Consult sizing guidelines or consult factory for sizing based on flow rate, viscosity, temperature, filter media selection.

²When selected, must be paired with Seal option "V." Contact factory for more information or assistance in fluid compatibility.

³Lid closure hardware is plated carbon steel.

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

⁵For elements HP8314, use 12M or 12A for respective media code in place of 10M or 10A.