DFN

Low Pressure Duplex Filter Assembly

Designed to maintain continuous filtration, even throughout element servicing, the DFN series filter assemblies provide a compact and user-friendly 4-way, 2 position housing completely sealed from the atmosphere. Remove particulate and water from a variety of fluids including hydrogen seal, oil, turbine lube oil, bearing lube oil, and FD-ID-PA fan lube.

Ideal for systems where filters must be serviced without system interruption such as hydraulic, gearbox, wind turbine, boiler feed pump, mechanical/ electro hydraulic control, and servo systems.

Max Operating Pressure: 888 psi (61.2 bar)

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Two positions, one result.

DFN housings provide unmatched in-line filtration with incredible ease of use. With a squeeze of the trigger and turn of the wrist, 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.

All duplexes are not created equal.

Air in any lube system can quickly cause failure and force you to take your system down for maintenance. DFN assemblies utilize internal equalization and external vent ports to automatically push oil into and purge air out from the unused housing without any added effort.
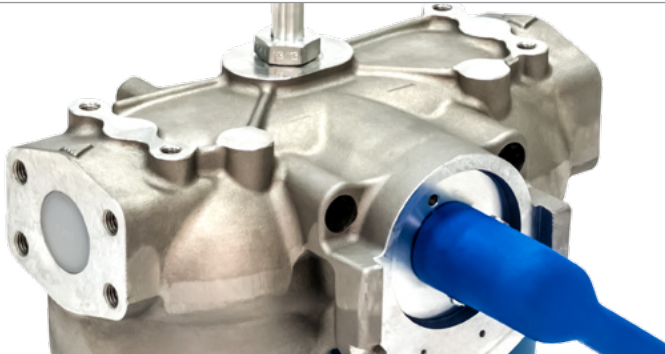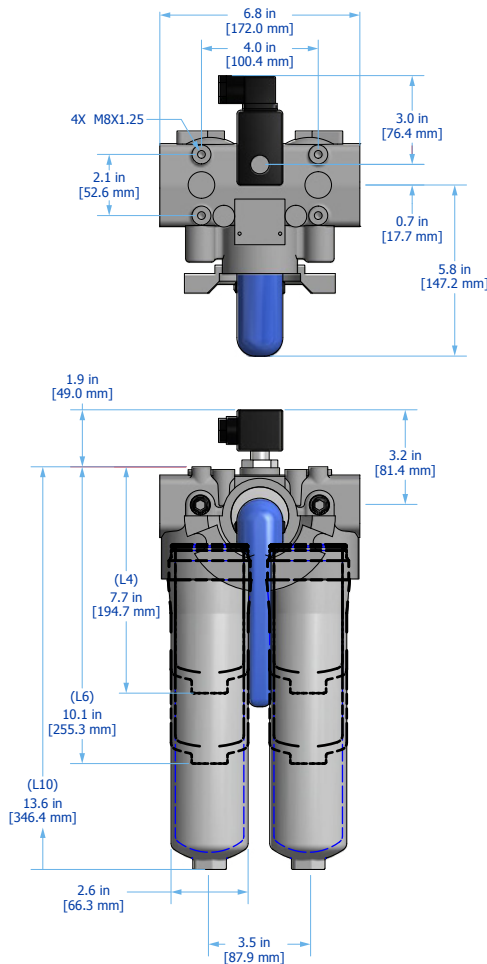
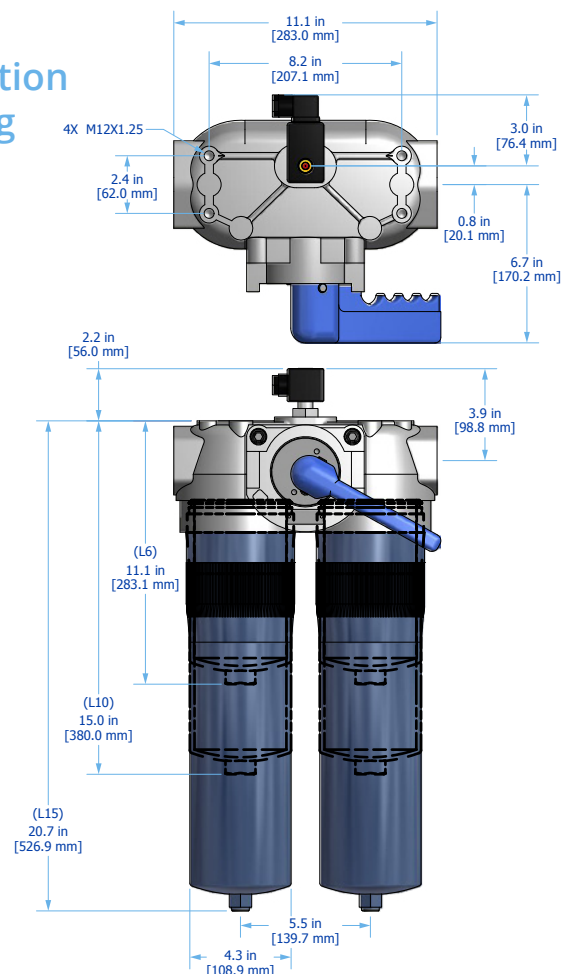## Elements that go beyond industry standard.

DFE rated advanced media technologies provide the highest level of particulate capture and retention capabilities so your equipment operates unimpeded by contamination. With media options down to $\beta 2.5_{[C]} = 1000$ + water absorption, you get the perfect element for your application, every time.

DFN19 Installation Drawing

6.8 in [172.0 mm]
4.0 in [100.4 mm]
4X M8X1.25
2.1 in [52.6 mm]
3.0 in [76.4 mm]
0.7 in [17.7 mm]
5.8 in [147.2 mm]
1.9 in [49.0 mm]
3.2 in [81.4 mm]
(L4) 7.7 in [194.7 mm]
(L6) 10.1 in [255.3 mm]
(L10) 13.6 in [346.4 mm]
2.6 in [66.3 mm]
3.5 in [87.9 mm]

DFN39 Installation Drawing

11.1 in [283.0 mm]
8.2 in [207.1 mm]
4X M12X1.25
2.4 in [62.0 mm]
3.0 in [76.4 mm]
0.8 in [20.1 mm]
6.7 in [170.2 mm]
2.2 in [56.0 mm]
3.9 in [98.8 mm]
(L6) 11.1 in [283.1 mm]
(L10) 15.0 in [380.0 mm]
(L15) 20.7 in [526.9 mm]
5.5 in [139.7 mm]
4.3 in [108.9 mm]

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)

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

Using Centistokes (cSt)

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

Calculate actual clean filter assembly ΔP at both operating and cold start viscosity

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

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.

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DFN Specifications

Dimensions	See Installation Drawing on page 217 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	**DFN19** 888 psi (61.2 bar) max	**DFN39** 350 psi (24.1 bar) max

ΔP Indicator Trigger	32 psid (2.21 bard)

Element Collapse Rating	450 psid (31.0 bard)

Materials of Construction	**Head** Aluminum	**Bowl** Aluminum	**Interior Coating** Anodized

Media Description	**M** G8 Dualglass, our latest generation of DFE rated, high performance glass media for all hydraulic & lubrication fluids. $\beta x_{[C]}$ = 1000 (βx = 200)	**A** G8 Dualglass high performance media combined with water removal scrim. $\beta x_{[C]}$ = 1000 (βx = 200)	**W** Stainless steel wire mesh media $\beta x_{[C]}$ = 2 (βx = 2)

Replacement Elements	To determine replacement elements, use corresponding codes from your assembly part number:		
	Series Code 19 39	**Filter Element Part Number** HP19[Collapse Code] L [Length Code] – [Media Selection Code][Seal Code] HP39[Collapse Code] L [Length Code] – [Media Selection Code][Seal Code]	**Example** HP19HL6-10MB HP39NL6-6AV

Fluid Compatibility	Biodegradable and mineral based fluids. For high water based of specified synthetics, consult factory.

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
DFN19N	L4	psid/gpm bard/lpm	3.4021 0.0620	2.8710 0.0523	1.9270 0.0351	1.3030 0.0237	0.9198 0.0168	0.8860 0.0161	0.4700 0.0086
	L6	psid/gpm bard/lpm	2.0986 0.0382	1.7710 0.0323	1.1980 0.0218	1.0420 0.0190	0.8658 0.0158	0.8340 0.0152	0.4170 0.0076
	L10	psid/gpm bard/lpm	1.4943 0.0272	1.2610 0.0230	1.0420 0.0190	0.7820 0.0142	0.6489 0.0118	0.6250 0.0114	0.3130 0.0057
DFN39N	L6	psid/gpm bard/lpm	0.6541 0.0119	0.5520 0.0101	0.4170 0.0076	0.3440 0.0063	0.2710 0.0049	0.2610 0.0048	0.1550 0.0028
	L10	psid/gpm bard/lpm	0.5190 0.0095	0.4380 0.0080	0.3230 0.0059	0.2870 0.0052	0.2429 0.0044	0.2340 0.0043	0.1350 0.0025
	L15	psid/gpm bard/lpm	0.4633 0.0084	0.3910 0.0071	0.3010 0.0055	0.2660 0.0048	0.2180 0.0040	0.2100 0.0038	0.1170 0.0021

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