

DFH

High Pressure Duplex Filter Assembly

The DFH series is designed to 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. Applicable for wind turbine, boiler feed pump, mechanical/electro hydraulic control, and fuel handling systems.

Ideal for systems where filters must be serviced while continuous operation is not interrupted such as hydraulic, gearbox, and servo systems.

Max Operating Pressure: 3600 psi (248 bar)

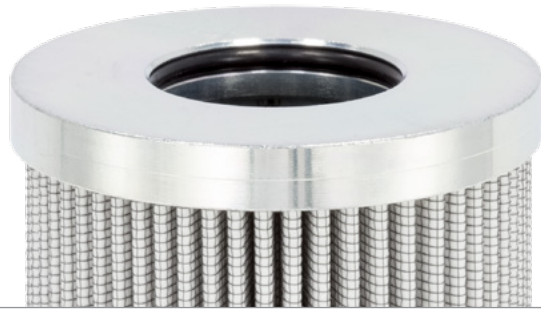


hyprofiltration.com/DFH



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 $\beta_{2.5(\mu)} = 1000$, + water absorption, you get the perfect element for your application, every time.



Two positions, one result.

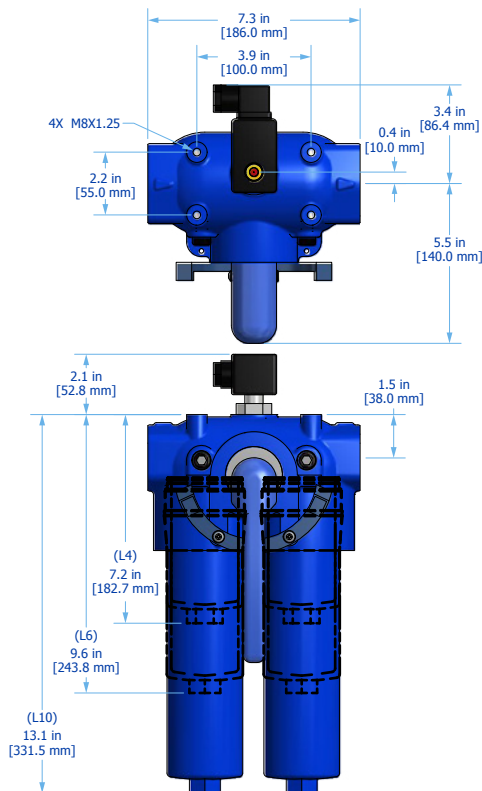
DFH housings provide unmatched in-line filtration with incredible ease of use. With a squeeze of the trigger and turn of the wrist, you'll introduce a new element to your fluid while simultaneously valving the used element out of service to easily change and replace, all while your system continues operating at full capacity.

All duplexes are not created equal.

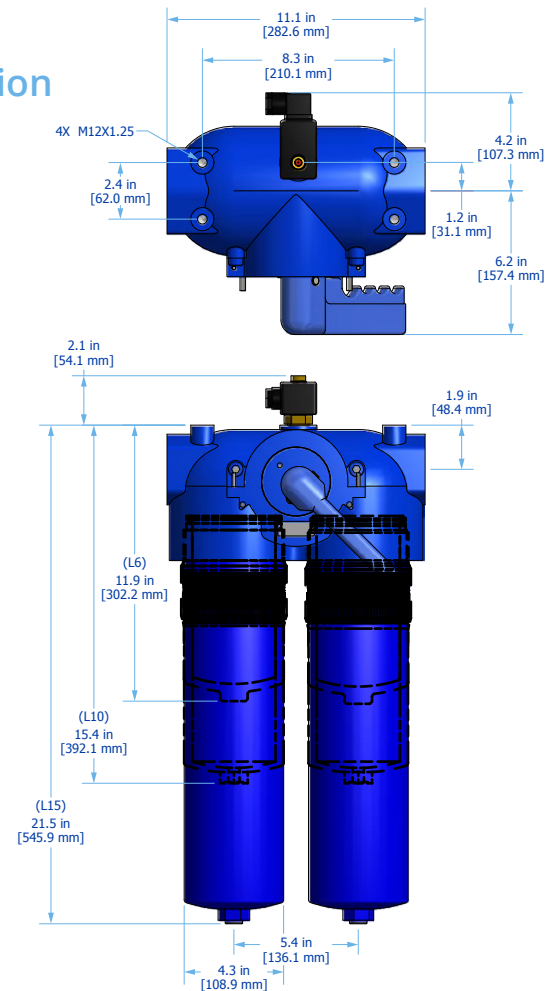
Air in any lube system can quickly cause failure and force you to take your system down for maintenance. DFH assemblies utilize internal equalization and external vent ports to automatically push oil into and purge air out from the unused housing without any added effort.



DFH19 Installation Drawing



DFH39 Installation Drawing



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.

DFH Specifications

Dimensions See Installation Drawing on page 221 for model specific dimensions.

Operating Temperature	Fluid Temperature	Ambient Temperature
	30°F to 225°F (0°C to 105°C)	-4°F to 140°F (-20C to 60C)

Operating Pressure	DFH19	DFH39
	3600 psi (248.2 bar) max	3000 psi (206.8 bar) max

ΔP Indicator Trigger 73 psid (5 bard)

Element Collapse Rating 450 psid (31.0 bard)

Materials of Construction	Head	Bowl	Housing Bypass Valve
	Cast steel	Cast steel	Steel

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

Replacement Elements To determine replacement elements, use corresponding codes from your assembly part number:

Series Code	Filter Element Part Number	Example
19	HP19[Collapse Code] L [Length Code] – [Media Selection Code][Seal Code]	HP19HL6-10MB
39	HP39[Collapse Code] L [Length Code] – [Media Selection Code][Seal Code]	HP39NL6-6AV

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

Filter Sizing¹ 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						**W
				1M	3M	6M	10M	16M	25M	
DFH19	L4		psid/gpm	3.402	2.871	1.927	1.303	0.920	0.886	0.470
			bard/lpm	0.0620	0.0523	0.0351	0.0237	0.0168	0.0161	0.0086
	L6		psid/gpm	2.099	1.771	1.198	1.042	0.866	0.834	0.417
			bard/lpm	0.0382	0.0323	0.0218	0.0190	0.0158	0.0152	0.0076
	L10		psid/gpm	1.494	1.261	1.042	0.782	0.649	0.625	0.313
			bard/lpm	0.0272	0.0230	0.0190	0.0142	0.0118	0.0114	0.0057
DFH39	L6		psid/gpm	0.654	0.552	0.417	0.344	0.271	0.261	0.155
			bard/lpm	0.0119	0.0101	0.0076	0.0063	0.0049	0.0048	0.0028
	L10		psid/gpm	0.519	0.438	0.323	0.287	0.243	0.234	0.135
			bard/lpm	0.0095	0.0080	0.0059	0.0052	0.0044	0.0043	0.0025
	L15		psid/gpm	0.463	0.391	0.301	0.266	0.218	0.210	0.117
			bard/lpm	0.0084	0.0071	0.0055	0.0048	0.0040	0.0038	0.0021

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



DFH Part Number Builder

DFH -

Series Connection Collapse Length Bypass ΔP Indicator Media Seal

Series

19 25 gpm (95 lpm) max flow rate¹
39 70 gpm (265 lpm) max flow rate¹

Connection

DFH19
F16² 1" Code 61 flange
G16 1" G thread (BSPP)

DFH39
F24² 1½" Code 61 flange
G24 1½" G thread (BSPP)

Collapse

H 3000 psid (206.8 bard)
N 450 psid (31.0 bard)

Element Length

DFH19
4 4" (10 cm) nominal length filter element and housing
6 6" (15 cm) nominal length filter element and housing
10 10" (25 cm) nominal length filter element and housing

DFH39
6 6" (15 cm) nominal length filter element and housing
10 10" (25 cm) nominal length filter element and housing
15 15" (38 cm) nominal length filter element and housing

Bypass

7 102 psid (7 bard) bypass
X No bypass

ΔP Indicator

D Visual with electric switch (DIN connection)
V Visual/Mechanical
X No indicator (port plugged)

Media Selection

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

Seals

B Nitrile (Buna)
V Fluorocarbon

¹When selected, must be paired with Seal option "V." Contact factory for more information or assistance in fluid compatibility.
²Metric threads for flange connection bolts. See Appendix for exact connection sizes and specifications.