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)

HY-PRO

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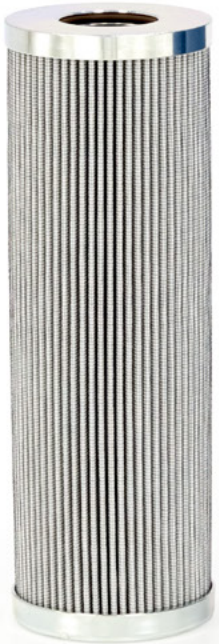


Elements that go beyond industry standard.

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.

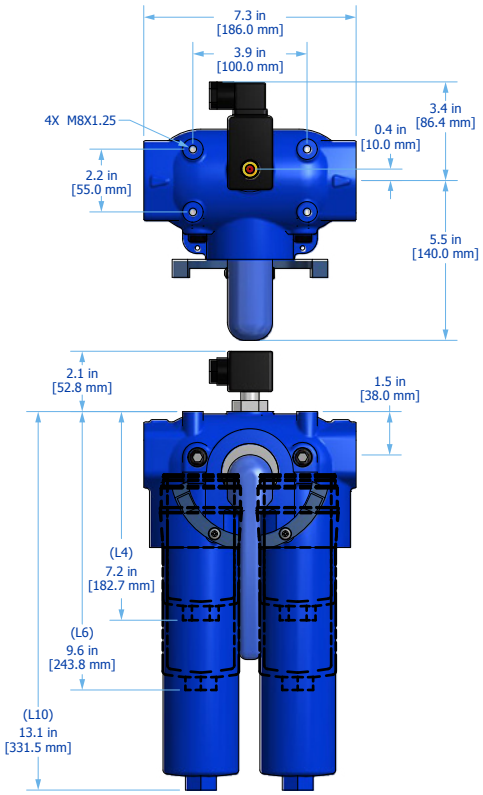
Two positions, one result.

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.

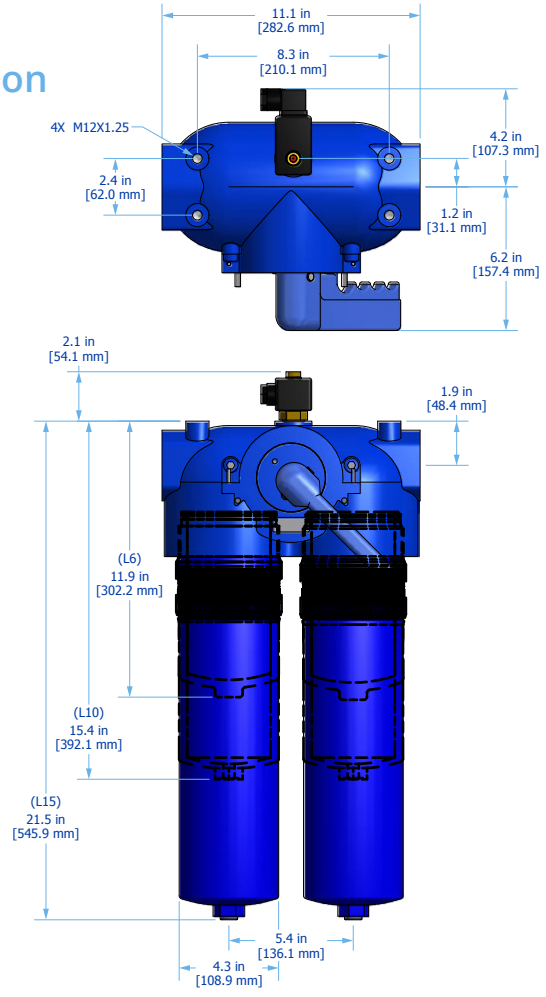
All duplexes are not created equal.

Air in any lube system can quickly cause failure and force you to take your system down for maintenance. 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.

DFH19 Installation Drawing



DFH39 Installation Drawing



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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)

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

Using Centistokes (cSt)

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

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

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

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
30°F to 225°F
(0°C to 105°C)

Ambient Temperature
-4°F to 140°F
(-20C to 60C)

Operating Pressure

DFH19
3600 psi (248.2 bar) max

DFH39
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
Cast steel

Bowl
Cast steel

Housing Bypass Valve
Steel

Media Description

M
G8 Dualglass, our latest generation of DFE rated, high performance glass media for all hydraulic & lubrication fluids. $\beta x_{[C]} = 1000$ ($\beta x = 200$)

A
G8 Dualglass high performance media combined with water removal scrim. $\beta x_{[C]} = 1000$ ($\beta x = 200$)

W
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 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
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

[1]Max flow rates and ΔP factors assume υ = 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 rate[1]
39	70 gpm (265 lpm) max flow rate[1]

Connection

DFH19

F16[2]	1" Code 61 flange
G16	1" G thread (BSPP)

DFH39

F24[2]	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

1M	$\beta 2.5_{[C]} = 1000$, $\beta 1 = 200$
3M	$\beta 5_{[C]} = 1000$, $\beta 3 = 200$
6M	$\beta 7_{[C]} = 1000$, $\beta 6 = 200$
10M	$\beta 12_{[C]} = 1000$, $\beta 12 = 200$
16M	$\beta 17_{[C]} = 1000$, $\beta 17 = 200$
25M	$\beta 22_{[C]} = 1000$, $\beta 25 = 200$

G8 Dualglass + water removal

3A	$\beta 5_{[C]} = 1000$, $\beta 3 = 200$
6A	$\beta 7_{[C]} = 1000$, $\beta 6 = 200$
10A	$\beta 12_{[C]} = 1000$, $\beta 12 = 200$
25A	$\beta 22_{[C]} = 1000$, $\beta 25 = 200$

Stainless wire mesh

25W	25µ nominal
40W	40µ nominal
74W	74µ nominal
149W	149µ nominal

Seals

B	Nitrile (Buna)
V	Fluorocarbon

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