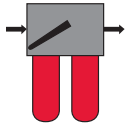


HIGH PRESSURE FILTERS

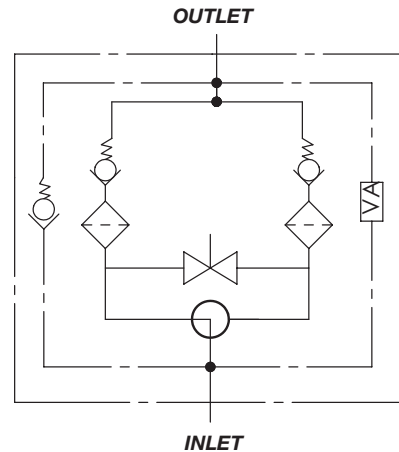
FMND Series

Inline Duplex Filters

3000 psi • up to 100 gpm



Hydraulic Symbol



Features

- The FMND filter consists of a ductile iron filter head with built-in changeover valve and three different lengths of screw-in filter bowls.
- The FMND filter can be supplied with or without bypass valve, (located in head assembly) but includes vent and drain screws, and also a connection for a differential pressure clogging indicator.
- Pressure equalization requirement is achieved by raising the changeover lever prior to switching it to the relevant filter side.
- Fatigue pressure rating = maximum allowable working pressure rating.
- Germanischer Lloyd (GL) approved
- This filter can be modified to meet the requirements of DIN 24550* as follows:
 - Filter size 0160 with G 1-1/4" port selection
 - Filter size 0250 with G 1-1/2" port selection
 - Filter size 0400 with SAE-DN 38 1-1/2" Flange

*Note - SO882 design does not meet DIN 24550.

Applications



Agricultural



Automotive



Construction



Industrial



Power Generation



Railways



Steel / Heavy Industry

Technical Specifications

Mounting Method	4 Mounting holes
Port Connections	Inlet / Outlet 1-1/4" Threaded – SAE 20, 1-1/4" BSPP 1-1/2" Threaded – SAE 24, 1-1/2" BSPP 1-1/2" Flange-SAE-DN 38 Code 61
Flow Direction	Inlet: Side Outlet: Opposite Side
Construction Materials	Head Ductile iron Bowl Steel
Flow Capacity	160 42 gpm (160 lpm) 250 66 gpm (250 lpm) 400 100 gpm (400 lpm)
Housing Pressure Rating	Max. Allowable Working Pressure 3000 psi (207 bar) Fatigue Pressure 3000 psi (210 bar) @ 1 million cycles Burst Pressure 10,650 psi (735 bar)
Element Collapse Pressure Rating	BH4HC 3045 psid (210 bar) BN4HC, W/HC 290 psid (20 bar)
Fluid Temperature Range	14°F to 212°F (-10°C to 100°C) Consult HYDAC for applications operating below 14°F (-10°C)
Fluid Compatibility	Compatible with all hydrocarbon based, synthetic, water glycol, oil/water emulsion, and high water based fluids when the appropriate seals are selected.
Indicator Trip Pressure	$\Delta P = 36.25$ psid (2.5 bar) -10% (optional) $\Delta P = 50.75$ psid (3.5 bar) +10% (optional) $\Delta P = 72$ psid (5 bar) -10% (standard) $\Delta P = 116$ psid (8 bar) -10% (optional) [Used with non-bypass]
Bypass Valve Cracking Pressure	$\Delta P = 102$ psid (7 bar) +10%

Model Code

	FMND	BN/HC	250	L	D	F	10	C	1	.	X	/	12	-	V	-	SO882	B7
Filter Type																		
FMND	= Inline Duplex Filter																	
Element Media																		
BH/HC	= Betamicon® (High Collapse) W/HC = Wire Mesh																	
BN/HC	= Betamicon® (Low Collapse)																	
Size																		
160, 250, 400																		
Operating Pressure																		
L	= 3000 psi (210 bar)																	
Type of Changeover																		
D	= segment valve																	
Type and Size of Port																		
E	= 1-1/4" Threaded – SAE 20, 1-1/4" BSPP																	
F	= 1-1/2" Threaded – SAE 24, 1-1/2" BSPP																	
K	= 1-1/2" Flange-SAE-DN 38 Code 61																	
Filtration Rating (micron)																		
3, 6, 10, 25	= BH/HC 3, 6, 10, 25 = BN/HC 25, 50, 100, 200 = W/HC																	
Type of ΔP Clogging Indicator																		
A, B, BM, C, D	(Others available upon request, see Clogging Indicators section.)																	
Type Code																		
1																		
Modification Number	(the latest version is always supplied)																	
Port Configuration																		
(omit)	= SAE DN Flange 0 = BSPP Threaded 12 = SAE Straight Threaded																	
Seals																		
(omit)	= Nitrile rubber (NBR) V = Fluorocarbon elastomer (FKM) (standard)																	
Version																		
DIN	= meets DIN 24550 SO882 = Quality Protection Design (standard)																	
Bypass Valve																		
(omit)	= no bypass (optional)																	
B3.5	= 50.75 psid (3.5 bar) (optional)																	
B7	= 101.5 psid (7 bar) (standard)																	
Supplementary Details																		
L24, L48, L110, L220	= Lamp for D-type clogging indicator (LXX, XX = voltage)																	
RL	= Flow Path reversed - Right inlet/Left outlet																	
SO263	= Modification of elements for Skydrol or HYJET phosphate ester fluids																	
W	= "VD..." indicator modified with a brass piston for use with High water based emulsions/solutions (HFA) & (HFC) or when using "V" elements																	
cRUus	= Electrical Indicator with underwriter's recognition																	
SFREE	= Element specially designed to minimize electrostatic charge generation																	
SO376	= Modification of ON and W/HC elements for HFA, HFB, HFC, and HFD flame retardant liquids																	

Replacement Element Model Code

	0250	DN	010	BN4HC	/	V	SO882
Size							
0160, 0250, 0400							
Type							
DN							
Filtration Rating (micron)							
3, 6, 10, 25	= BH/HC 3, 6, 10, 25 = BN4HC 25, 50, 100, 200 = W/HC						
Element Media							
BH/HC, BN4HC, W/HC							
Seals							
(omit)	= Nitrile rubber (NBR)						
V	= Fluorocarbon elastomer (FKM) (standard)						
Version							
(omit)	= meets DIN 24550						
SO882	= Quality Protection Design						
Supplementary Details							
SO263	= (same as above)						
SFREE	= (same as above)						
SO376	= (same as above)						

Clogging Indicator Model Code

	VM	8	C	.	X	/	V
Indicator Prefix							
VM	= G 1/2 3000 psi						
Trip Pressure							
2	= 29 psid (2 bar) (optional)						
5	= 72 psid (5 bar) (standard)						
8	= 116 psid (8 bar) (optional)						
Type of Indicator							
A	= No indicator, plugged port						
B	= Pop-up indicator (auto reset)						
BM	= Pop-up indicator (manual reset)						
C	= Electric switch - SPDT						
D	= Electric switch and LED light - SPDT						
Modification Number							
Supplementary Details							
Seals							
(omit)	= Nitrile rubber (NBR) (standard)						
V	= Fluorocarbon elastomer (FKM)						
Light Voltage	(D type indicators only)						
L24	= 24V L110 = 110V						
Thermal Lockout	(VM types C, D, J, and J4 only)						
T100	= Lockout below 100°F						
Underwriters Recognition	(VM types C, D, J, and J4 only)						
cRUus	= Electrical Indicator with underwriter's recognition						
W	= "VD..." indicator modified with a brass piston for use with High water based emulsions/solutions (HFA) & (HFC) or when using "V" elements						

(For additional details and options, see Clogging Indicators Section.)

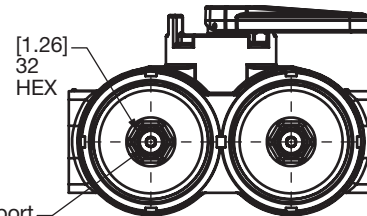
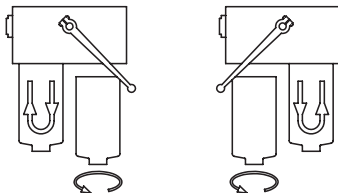
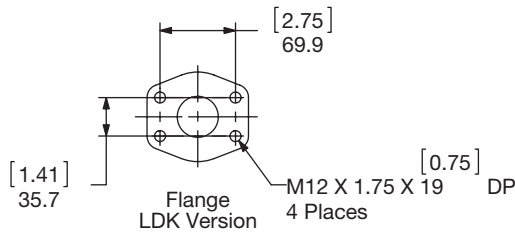
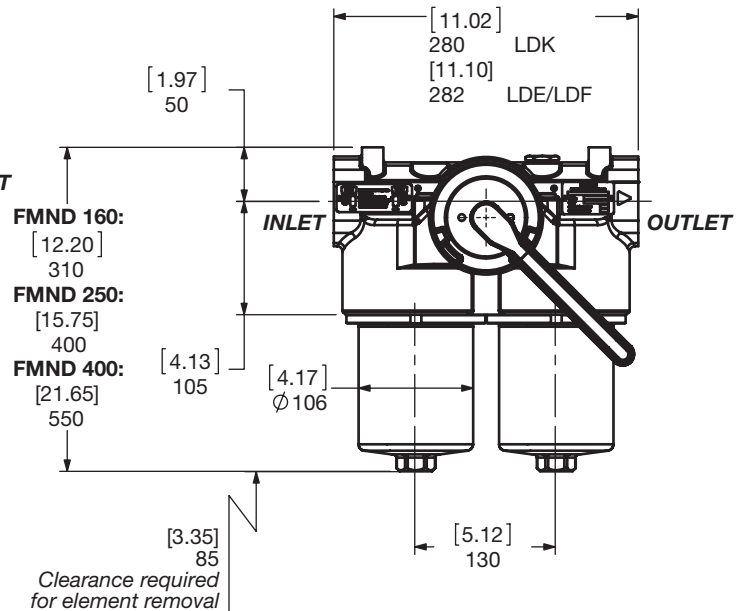
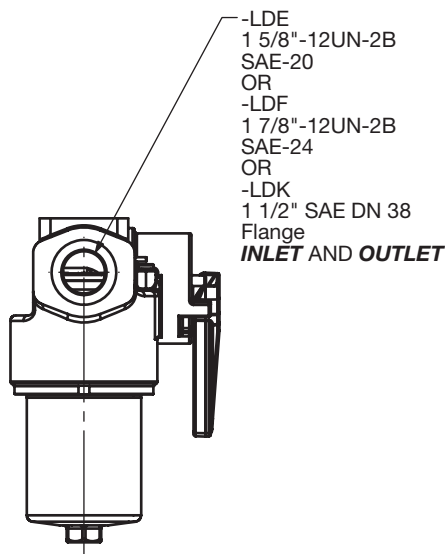
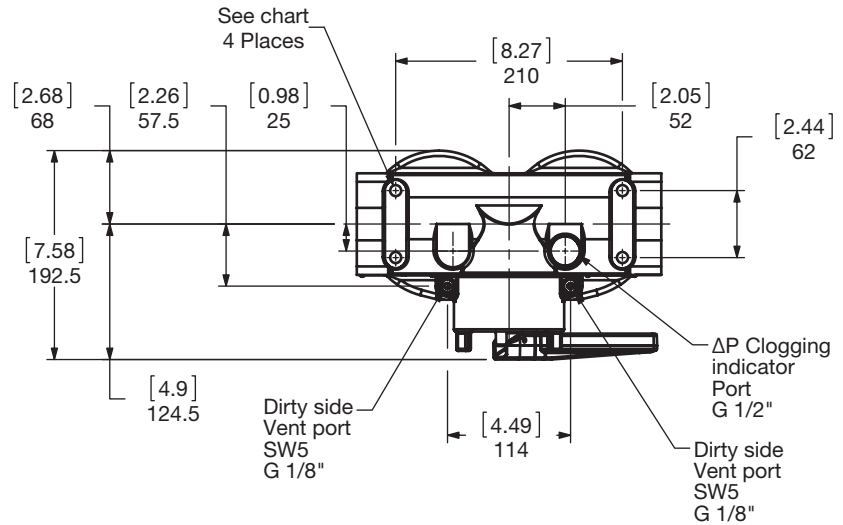
Model Codes Containing RED are non-stock items — Minimum quantities may apply — Contact HYDAC for information and availability

HIGH PRESSURE FILTERS

Dimensions

FMND 160/250/400

Model	Mounting Hole
FMND160-400LDE	M12X1.75 x 19mm Deep
FMND160-400LDE/12	3/8-24UNF x 14mm Deep
FMND160-400LDF	M12X1.75 x 19mm Deep
FMND160-400LDF/12	3/8-24UNF x 14mm Deep
FMND160-400LDK	M12X1.75 x 19mm Deep



Before changing the element, relieve pressure in the filter housing.

Size	160	250	400
Weight (lbs.)	52.7	59.8	71.0

Dimensions shown are [inches] millimeters for general information and overall envelope size only. Weights listed include element. For complete dimensions please contact HYDAC to request a certified print.

Sizing Information

Total pressure loss through the filter is as follows:

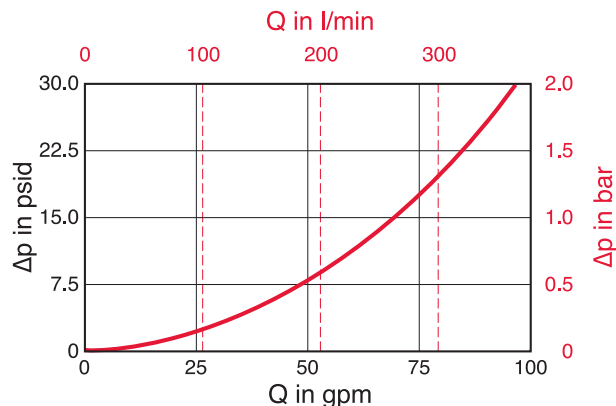
Assembly ΔP = Housing ΔP + Element ΔP

Housing Curve:

Pressure loss through housing is as follows:

Housing ΔP = Housing Curve $\Delta P \times \frac{\text{Actual Specific Gravity}}{0.86}$

Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see "Sizing HYDAC Filter Assemblies" in Section B - Overview)



Element K Factors

$\Delta P \text{ Elements} = \text{Elements (K) Flow Factor} \times \text{Flow Rate (gpm)} \times \frac{\text{Actual Viscosity (SUS)}}{141 \text{ SUS}} \times \frac{\text{Actual Specific Gravity}}{0.86}$
(From Tables Below)

Betamicon	...DN...BN/HC Elements (Low Collapse)			
Size	3 μm	6 μm	10 μm	25 μm
0160 DN XXX BN4HC	0.434	0.280	0.187	0.143
0250 DN XXX BN4HC	0.280	0.176	0.115	0.099
0400 DN XXX BN4HC	0.176	0.110	0.071	0.055

Wire Mesh	...DN...W/HC Elements			
Size	25 μm	50 μm	100 μm	200 μm
0160 DN XXX W/HC	0.009	0.009	0.009	0.009
0250 DN XXX W/HC	0.006	0.006	0.006	0.006
0400 DN XXX W/HC	0.004	0.004	0.004	0.004

Betamicon	...DN...BH/HC Elements (High Collapse)			
Size	3 μm	6 μm	10 μm	25 μm
0160 DN XXX BH4HC	0.439	0.280	0.209	0.137
0250 DN XXX BH4HC	0.296	0.187	0.154	0.104
0400 DN XXX BH4HC	0.187	0.115	0.093	0.060

All Element K Factors in psi / gpm.

FMND 160/250/400 LDK

