## **HYDAD** Low Pressure Filters

**RF Series** In-tank / Inline Filters 360 psi • up to 400 gpm



### Features

- RF 30 filters constructed of polyamide plastic.
- RF 60 330 filters constructed of aluminum material. Aluminum alloy is water tolerant anodization is not required for high water based fluids (HWBF).
- RF 660 1300 filters constructed of ductile iron.
- Non-welded housing design reduces stress concentrations and prevents fatigue failure.
- Inlet/outlet port options include NPT, SAE straight thread O-ring boss, and SAE 4-bolt flange to allow easy installation without costly adapters.
- O-ring seals are used to provide positive, reliable sealing. Choice of O-ring materials (Nitrile, Fluoroelastomer, EPDM) provides compatibility with petroleum oils, synthetic fluids, water-glycols, oil/water emulsions, and high water base fluids.
- · Bolt-on lid requires minimal clearance for removal.
- · Reusable contamination basket prevents loss of retained
- contaminants into the reservoir during element replacement.Clogging indicators can be serviced without interruption of the
- hydraulic system.
  Single piece casting provides rigidity for inline or in-tank mounting.

### Applications





Construction

io io

Gearboxes

Agricultural Automotive



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Steel / Heavy Industry



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### Technical Details

Mounting Method	4 Mounting holes	s - filter housing			
Port Connections	Inlet / Outlet				
30 60/110 160/240 330	<sup>1</sup> / <sub>2</sub> " NPT / 0.71" D SAE-12 / SAE-12 SAE-20 / SAE-20 SAE-20 / 2" NPT 2" NPT / 2" NPT	ia Smooth )			
660	2" SAE Flange, C 3" SAE Flange, C 3" SAE Flange, C 2" SAE Flange, C	Code 61 / 2" NPT Code 61 / 3" NPT Code 61 /			
950	3-1/2" SAE Flange, Code 61 / 3-1/2" SAE Flange, Code 61				
1300	4" SAE Flange, Č 4" SAE Flange, Č	code 61 / code 61			
Direction of Flow	Inlet: Side	Outlet: bottom			
Materials of Constr	uction				
30 60-330 660-1300	Housing Polyamide Aluminum Ductile Iron	Lid Polyamide Aluminum Ductile Iron			
Flow Capacity					
30 60 110 240 330 660 950 1300	8 gpm (30 lpm) 16 gpm (60 lpm) 29 gpm (110 lpm) 42 gpm (160 lpm) 63 gpm (240 lpm 87 gpm (330 lpm 174 gpm (660 lpr 251 gpm (950 lpr 343 gpm (1300 lp	) ) ) n) m) 			
Housing Pressure Rating					
Max. Oper. Press: Proof Pressure: Fatigue Pressure:	360 psi (25 bar); 217 psi (15 bar) 145 psi (10 bar) @	(size 30 - 145 psi, 10 bar) 🤉 1 million cycles			
Burst Pressure:	30 60/110 160/240 330 660-1300	580 psi (40 bar) 1080 psi (75 bar) 1230 psi (85 bar) 1440 psi (100 bar) >1440 psi (100 bar)			
Element Collapse P	ressure Rating				
BN/HC, W/HC,         290 psid (20 bar)           ECO/N, BN/AM, P/HC, AM         145 psid 10 bar)           V         3045 psid (210 bar)					
Fluid Temperature	Range	-22° to 250°F (-30° to 121°C)			
Fluid Compatability	1				
Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.					
Indicator Trip Press	ure				
P = 29 psi (2 bar) -10% (standard) P = 72 psi (5 bar) -10% (optional)					
Bypass Valve Crack	ing Pressure				

 $\Delta P = 43$  psid (3 bar) +10% (standard)  $\Delta P = 87$  psid (6 bar) +10% (optional)

### Model Code

Filter Type         RF       = Return Line Filter         Element Media         BN/HC       = Betamicron® (Low Collapse)         BN/HC       = Aquamicron®         AM       = Aquamicron®         PHC       = Polyester         BN/AM       = Betamicron® (Low Collapse)         BN       BN/AM         BN       = Betamicron® (Low Collapse)         Bit (D       = Polyester         WHC       = Wire Screen         Size       - 360 psi (25 bar)         Type of Connection       M = SAE 48 Flange (size 660)         C = SAE 12 (sizes 80, 110)       NPT available         N = SAE 48 Flange (size 660)       C = SAE 50 (sizes 60 - size)         C = SAE 12 (sizes 80, 10)       WPT available         N = SAE 48 Flange (size 660)       C = SAE 50 (sizes 60 - size)         C = SAE 50 (sizes 60 - size)       - SAE 56 Flange (size 560)         S = SAE 50 (sizes 60 - size)       - SAE 56 Flange (size 50)         S = SAE 50 (sizes 60 - size)       - SAE 56 Flange (size 50)         S = AB 72 Flange Inlet / 2" NPT Outlet (size 330)       - SAE 56 Flange (size 50)         Filtration Rating (micron)       - 3, 10 = BN/AM         3, 5 (10, 20 = BN/HC, ECO/N       10, 20 = P/HC         3, 6 (BM)	$\frac{RF}{D} = \frac{BN/HC}{330} = \frac{10}{2} + \frac{10}{1} + \frac{1}{2} + \frac{10}{2} + \frac{10}$
Element Media	Filter Type       RF       = Return Line Filter
Size       30, 60, 110, 160, 240, 330, 660, 950, 1300         Pressure Rating	Element Media         BN/HC =       Betamicron® (Low Collapse)         AM =       Aquamicron®         BN/AM =       Betamicron®/Aquamicron®1         P/HC =       Polyester         W/HC =       Wire Screen
Pressure Rating B=145 psi (10 bar) (size 30 only) D=SAE 43 psi (10 bar) (size 30 only) M = SAE 48 Plange (size 660) N= SAE 12 (sizes 60, 110) E = SAE 12 (sizes 60, 110) NPT available N= SAE 48 Plange (size 950) P = SAE 64 Plange (size 950) P = SAE 64 Plange (size 300)Filtration Rating (micron) S, 5, 10, 20 = BN/HC, ECO/N A, 5, 10, 20 = BN/HC, ECO/N 10, 20 = P/HC A, B/BM, C, D, HType of Static or $\Delta P$ Clogging Indicator A, B/BM, C, D, HType of Static or $\Delta P$ Clogging Indicator I =Signal Signal SignalModification Number (latest version always supplied) Inter Port Configuration Signal (mit) = Nitrlie (NBR) (standard)V = Fluoroelastomer (FPM)EPR = Ethylene Propylene (EPDM)Bypass Value (omit) =(omit) =A BSignal (omit) =(omit) =1 =Standard Connection Modification Number (latest version always supplied) Inter Port Configuration (mit) = NET (sizes 30 & 330) 12 =Seals (omit) =(omit) =(omit) =(omit) =NBR (sized 30 (3 bar) (return line - standard) KB =KB =KB =KB =No Bypass (flushing system) B6 =Not all (a bar) (ubrication or coolant applications) B0, 22 =B0, 22 =Supplementary	Size
Type of Connection       M = SAE 48 Flange (size 660)         C = SAE 12 (sizes 30)       NPT available       N = SAE 48 Flange (size 660)         C = SAE 12 (sizes 00, 10)       NPT available       N = SAE 48 Flange (size 950)         E = SAE 20 (sizes 160 - 330)       W/Adapter       O = SAE 56 Flange (size 950)         D = SAE 32 Flange Inlet / 2" NPT Outlet (size 330)       P = SAE 64 Flange (size 1300)         Filtration Rating (micron)       3, 5, 10, 20 = BN/HC, ECO/N       10, 20 = P/HC       3, 10 = BN/AM         25, 74, 149 = W/HC       40 = AM       40 = AM         Type of Static or $\Delta P$ Clogging Indicator       A, B/BM, C, D, H         Type Number	Pressure Rating B = 145 psi (10 bar) ( <i>size 30 only</i> ) D = 360 psi (25 bar)
Filtration Rating (micron)	Type of Connection $B = 1/2^{"}$ NPT (size 30) $M = SAE 48$ Flange (size 660) $C = SAE 12$ (sizes 60, 110)NPT available $N = SAE 48$ Flange Inlet / 3" NPT Outlet (size 660) $E = SAE 20$ (sizes 160 - 330)w/Adapter $O = SAE 56$ Flange (size 950) $G = 2^{"}$ NPT (size 330) $P = SAE 64$ Flange (size 1300) $L = SAE 32$ Flange Inlet / 2" NPT Outlet (size 330)
Type of Static or ΔP Clogging Indicator         A, B/BM, C, D, H         Type Number         1       =         Standard Connection         Modification Number (latest version always supplied)         Inlet Port Configuration         3       =         NPT (sizes 30 & 330)         12       =         SAE Straight Thread Inlet/Outlet Connections (sizes 60, 110, 160, 240)         16       =         SAE Flange Code 61 Inlet Connections (sizes 330 - 1300 only)         Seals         (omit) =       Nitrile (NBR) (standard)         V = Fluoroelastomer (FPM)       EPR = Ethylene Propylene (EPDM)         Bypass Valve         (omit) =       43 psid (3 bar) (return line - standard)         KB       =       No Bypass (flushing system)         B6       =       87 psid (6 bar) (return line)         B1       =       15 psid (1 bar) (lubrication or coolant applications)         B0.2       =       3 psid (0.20 bar) (suction line)         Supplementary	Filtration Rating (micron)           3, 5, 10, 20 = BN/HC, ECO/N         10, 20 = P/HC         3, 10 = BN/AM           25, 74, 149 = W/HC         40 = AM
Type Number         1       =       Standard Connection         Modification Number (latest version always supplied)         Inlet Port Configuration         3       =       NPT (sizes 30 & 330)         12       =       SAE Straight Thread Inlet/Outlet Connections (sizes 60, 110, 160, 240)         16       =       SAE Flange Code 61 Inlet Connections (sizes 330 - 1300 only)         Seals         (omit) = Nitrile (NBR) (standard)       V = Fluoroelastomer (FPM)         EPR = Ethylene Propylene (EPDM)         Bypass Valve	Type of Static or ∆P Clogging Indicator —
Modification Number (latest version always supplied)         Inlet Port Configuration         3       =       NPT (sizes 30 & 330)         12       =       SAE Straight Thread Inlet/Outlet Connections (sizes 60, 110, 160, 240)         16       =       SAE Flange Code 61 Inlet Connections (sizes 330 - 1300 only)         Seals         (omit) = Nitrile (NBR) (standard)         V = Fluoroelastomer (FPM)       EPR = Ethylene Propylene (EPDM)         Bypass Valve	Type Number
Seals       (omit) = Nitrile (NBR) (standard)       V = Fluoroelastomer (FPM)       EPR = Ethylene Propylene (EPDM)         Bypass Valve       (omit) = 43 psid (3 bar) (return line - standard)       (KB = No Bypass (flushing system) ont available with ECO/N         B6 = 87 psid (6 bar) (return line)       not available with ECO/N         B1 = 15 psid (1 bar) (lubrication or coolant applications)         B0.2 = 3 psid (0.20 bar) (suction line)         Supplementary	Modification Number (latest version always supplied)         Inlet Port Configuration         3       =       NPT (sizes 30 & 330)         12       =       SAE Straight Thread Inlet/Outlet Connections (sizes 60, 110, 160, 240)         16       =       SAE Flange Code 61 Inlet Connections (sizes 330 - 1300 only)
Bypass Valve         (omit) = 43 psid (3 bar) (return line - standard)         KB = No Bypass (flushing system)         B6 = 87 psid (6 bar) (return line)         Dot available with ECO/N         B1 = 15 psid (1 bar) (lubrication or coolant applications)         B0.2 = 3 psid (0.20 bar) (suction line)         Supplementary	Seals       (omit) = Nitrile (NBR) (standard)       V = Fluoroelastomer (FPM)       EPR = Ethylene Propylene (EPDM)
	Bypass Valve         (omit) = 43 psid (3 bar) (return line - standard)         KB = No Bypass (flushing system)         B6 = 87 psid (6 bar) (return line)         D not available with ECO/N         B1 = 15 psid (1 bar) (lubrication or coolant applications)         B0.2 = 3 psid (0.20 bar) (suction line)         Supplementary

SO103H = Modification of BN4HC & W/HC Elements For Phosphate Ester Fluids

L24, L48, L110, L220 = Lamp for D-type clogging indicator (LXX, XX = voltage)

DE =  $\Delta P$  Indicator (sizes 660, 950, 1300)

#### Replacement Element Model Code 0330 R 010 BN4HC / V

	<u> </u>
Size	
0030, 0060, 0110, 0160, 0 0330, 0660, 0950, 1300	)240,
Filtration Rating (micron) -	
3, 5, 10, 20 = BN4HC, EC 3, 10 = BN/AM	O/N 10, 20 = P/HC
25, 74, 149 = W/HC	40 = AM
Element Media ———	
BN4HC, ECO/N, P/HC, B	N/AM, W/HC, AM
Supplementary Details —	
(omit) = standard	
V = Fluoroelasto	omer (FPM) seals

### **Clogging Indicator Model Code**



(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

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## **HYDAD** Low Pressure Filters



Size	30	60	110	160	240	330	660	950	1300
Weight (Ibs.)	0.7	1.7	2.0	3.3	3.7	7.5	40.8	86	94.8
Dimensions shown are far general information and overall envelope size only. Weights listed are without element									

Dimensions shown are for general information and overall envelope size only. Weights listed are without element For complete dimensions please contact HYDAC to request a certified print.

### Sizing Information

Total pressure loss through the filter is as follows:

Assembly P = Housing P + Element P

#### Housing Curve:

Pressure loss through housing is as follows:

Housing P = Housing Curve P x Actual Specific Gravity

0.86

Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see sizing section on page 19)

**RF 30 HOUSING** Q in l/min 0 20 25 30 5 10 15 25 1.6 20 1.2 <sup>isd</sup> 15 <sup>d</sup> 10 oar 0.8 <sup>⊑</sup> 0.4 5 0 2 3 4 5 6 7 8 0 1 Q in gpm











, 100, 149, 200 µm

### Element K Factors

△P Elements = Elements (K) Flow Factor x Flow Rate (gpm) x (From Tables Below) x Actual Viscosity (SUS) x Actual Specific Gravity 141 SUS 0.86

0:	RBN4HC (Betamicron® Low Collapse)					
Size	3 µm	5 µm	10 µm	20 µm		
0030	3.749	2.407	1.470	0.808		
0060	1.470	1.005	0.598	0.376		
0110	0.817	0.517	0.329	0.178		
0160	0.522	0.323	0.208	0.159		
0240	0.338	0.208	0.142	0.096		
0330	0.232	0.150	0.093	0.066		
0660	0.105	0.066	0.042	0.029		
0950	0.064	0.043	0.030	0.020		
1300	0.045	0.032	0.024	0.014		

Size	RECO/N					
	3 µm	5 µm	10 µm	20 µm		
0110	-	-	0.464	0.317		
0160	0.556	0.378	0.329	0.225		
0240	-	-	0.209	-		
0330	0.228	0.156	0.135	-		
0660	0.100	0.068	0.059	0.041		
0950	0.068	0.0467	0.041	0.028		
1300	0.049	0.034	0.029	0.020		

Size	<b>RP/HC</b> (Paper)	Size	RW/HC (Wire Screen)
	10, 20 µm		25, 50, 74, 100, 149, 200 μn
0030	0.458	0030	0.110
0060	0.255	0060	0.055
0110	0.128	0110	0.030
0160	0.077	0160	0.021
0240	0.049	0240	0.015
0330	0.037	0330	0.010
0660	0.016	0660	0.005
0950	0.010	0950	0.003
1300	0.007	1300	0.003

Sizo	RE	e:	
Size	3 µm	10 µm	31/
0330	0.477	0.164	03
0660	0.192	0.066	06
0950	0.132	0.045	09
1300	0.088	0.033	13

Size	RAM 040A
0330	0.216
0660	0.095
0950	0.067
1300	0.048

All Element K Factors in psi / gpm.

## **MAD** Low Pressure Filters

### **NF Series** In-Tank / Inline Filters 360 psi • up to 450 gpm





1.0 Version

Features

- . NF Filters have an extremely large filtration area and flow capacity of 450 gpm
- NF Filters can be configured for in-tank or in-line applications • Vent and drain ports are standard •
- Aluminum alloy is water tolerant anodizing is not required • for water based fluids (HWBF)
- Screw-on lid provides easy access to filter element for replacement
- Reusable contamination basket prevents re-entry of retained • contaminants into the reservoir during element replacement
- Filters can be fitted with clogging indicators to monitor the contamination level of the element
- Single piece head design available in version 2.0 • (Contact HYDAC)

### Applications





Gearboxes

Shipbuilding



Pulp & Paper







Power Generation Hydraulic Symbol



### **Technical Details**

Mounting Method	See drawings		
Port Connection	SAE-64 Flange Code 61 (with metric bolts included on NF 1310 & 2610)		
Flow Direction			
1.0 version 2.0 version 1350 / 2650	Inlet: Side Inlet: Side Inlet: Side	Outlet: Bottom Outlet: Bottom Outlet: Side	
Construction Materials			
Head, Housing, Lid Elbows, Manifolds	Aluminum Ductile Iron		
Flow Capacity			
1310 2610, 5210, 7810, 10410	343 gpm (1300 l 450 gpm (1700 l	pm) pm)	
Housing Pressure Rating			
Max. Operating Pressure Proof Pressure Fatigue Pressure Burst Pressure	360 psi (25 bar) 540 psi (38 bar) 360 psi (25 bar) Contact HYDAC	office	
Element Collapse Pressure R	ating		
BN/HC, W/HC ECO/N, BN/AM, P/HC, AM	290 psid (20 bar 145 psid (10 bar	;) )	
Fluid Temperature Range	-22° to 250°F (-3	30° to 121°C)	
Fluid Compatability			
Compatible with all petroleum for use with Fluoroelastomer o Contact HYDAC for information constructions available for use emulsions, and HWBF.	oils and synthetic r Ethylene Propyl n on special hous with water glycc	c fluids rated lene seals. sing and element ols, oil/water	
Indicator Trip Pressure			
$\Delta P$ = 29 psid (2 bar) -10% $\Delta P$ = 72 psid (5 bar) -10%	1.0 - Static 2.0 - Differential		
<b>Bypass Valve Cracking Press</b>	ure		
$\Delta P = 15 \text{ psid (1 bar) +10\%}$ $\Delta P = 43 \text{ psid (3 bar) +10\%}$ $\Delta P = 87 \text{ psid (6 bar) +10\%}$			

### Model Code

<u>NF BN/HC 1310 D P 3 A 1.0 / </u>
Filter Type
Element Media
BN/HC = Betamicron® (Low Collapse)       ECO/N = ECOmicron® (Low Collapse)       AM = Aquamicron®         BN/AM = Betamicron®/Aquamicron®       P/HC = Polyester       W/HC = Wire Screen
Size
1310, 1350, 2610, 2650, 5210, 7810, 10410
D = 360  psi (25  bar)
Type of Connection         P       =       SAE DN 100 (4") flange
Filtration Rating (micron)
3, 5, 10, 20 = BN/HC, ECO/N 3, 10 = BN/AM 40 = AM
10, 20 = P/HC 25, 74, 149 = W/HC
Type of Static or ∆P Clogging Indicator         A, B/BM, C, D, H
Type Number / Modification Number
1.0 = In-Tank Filter - Static indicator (1310/2610 only)
2.0 = Inline Filter - $\Delta P$ indicator
Seals
(omit) = Nitrile (NBR) (standard)
V = Fluoroelastomer (FPM)
EPR = Ethylene Propylene (EPDM)
Cracking Pressure of Bypass Valve
(omit) = 43 psid (3 bar) (return line - standard)
KB = no bypass (flushing system)
B6 = 87 psid (6 bar) (return line extended service life) not available with ECU/N
B1 = 15 psid (1 bar) (lubrication or coolant applications)
Supplementary Details

S0103H = Modification of BN4HC and W/HC Elements for Phosphate Ester Fluids L24, L48, L110, L220 = Lamp for D-type clogging indicator (*LXX, XX = voltage*)



### **Clogging Indicator Model Code**

<u>VR 2 B.X/_</u>	_
Indicator Prefix VR = Return Filters (1.0 version) VMF = Mobile Filters (2.0 version)	
Trip Pressure         2       = 29 psid (2 bar) (return filters)         5       = 72 psid (5 bar) (optional)	
Type of Indicator         A       = no indicator, plugged port         B/BM =       Visual pop-up (auto/manual reset)         C       = Electric switch         D       = Electric switch and light         H       = Electric pressure switch	
Modification Number	
Supplementary Details Light Voltage (D type indicators only) L24 = 24V L110 = 110V	C
Seals (omit) = Nitrile (NBR) (standard) V = Fluoroelastomer (FPM) (For additional details and options, see Clogging Indicators section.)	

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

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### **HYDAD** Low Pressure Filters

### **Dimensions:**



Size	1310	2610				
Weight (lbs.)	37	50				
Dimensions shown are fer general information and overall envelope size only. Weights listed are without element						

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

NF 5210

2.0 Version

### **Dimensions:**

### NF 1350 / 2650 2.0 Version



Size	1350	2650	5210
Weight (lbs.)	40	55	198

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

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### **Dimensions**

### NF 7810 2.0 Version



NF 10410

2.0 Version

Size	7810	10410					
Weight (lbs.)	275	397					
Dimensions shown	Dimensions shown are for general information and overall envelope size only. Weights listed are without element						

For complete dimensions please contact HYDAC to request a certified print.

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### Sizing Information

Total pressure loss through the filter is as follows:

Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$ 

#### Housing Curve:

Pressure loss through housing is as follows:

Housing  $\Delta P$  = 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 section on page 19)





### **Element K Factors**

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

<u> </u>	RBN4HC (Betamicron® Low Collapse)						
Size	3 µm	5 µm	10 µm	20 µm			
1310	0.045	0.032	0.024	0.014			
2610	0.023	0.016	0.011	0.007			

8:	RECO/N						
Size	3 µm	5 µm	10 µm	20 µm			
1310	0.049	0.034	0.029	0.020			
2610	0.024	0.017	0.014	0.010			

Size	RBN/AM		Si-o	RAM	
	3 µm	10 µm	Size	40 µm	
1310	0.088	0.033	1310	0.048	
2610	0.052	0.019	2610	0.024	

Size	RP/HC (Polyester)		Si-o	RW/HC (Wire Screen)	
	10 µm	20 µm	Size	25, 50, 100, 200 μm	
1310	0.0070	0.0070	1310	0.0027	
2610	0.0034	0.0034	2610	0.0011	

All Element K Factors in psi / gpm.

### Low Pressure Filters

**RFD Series** In-Tank / Inline Duplex Filters 360 psi • up to 400 gpm



### Features

- RFD 60 330 filters are constructed of aluminum.
- Aluminum alloy is water tolerant anodization is not required for water based fluids (HWBF).
- RFD 660 1300 filters are constructed of ductile iron.
- Non-welded housing design reduces stress concentrations and prevents fatigue failure.
- Inlet/outlet port options include NPT (RFD 61-241 inlet only), SAE straight thread O-ring boss, and SAE 4-bolt flange to allow easy installation without costly adapters.
- O-ring seals are used to provide positive, reliable sealing. Choice • of O-ring materials (Nitrile, Fluoroelastomer, EPDM) provides compatibility with petroleum oils, synthetic fluids, water-glycols, oil/water emulsions, and high water base fluids.
- Bolt-on lid requires minimal clearance for removal.
- Reusable contamination basket prevents loss of retained • contaminants into the reservoir during element replacement.
- Clogging indicators can be serviced without interruption of the hydraulic system.
- All RFD duplex filters have a ball-type selector valve to provide continuous filtration without system shut-down to change clogged elements.

### Applications



Agricultural

Industrial





Gearboxes

Construction



Power Generation

Pulp & Paper



Steel / Heavy Industry

### Hydraulic Symbol



### **Technical Details**

Mounting Method	4 Mounting holes in the filter housing				
Port Connections	Inlet / Outlet				
60/110 160/240 330 660 950	SAE-12 / SAE-12 SAE-16 / SAE-20 2" SAE Flange, Code 61 / 2"NPT 3" SAE Flange, Code 61 / 3"NPT 4" SAE Flange, Code 61 / 2" 10" SAE Flange, Code 61				
1300	3-1/2" SAE Flange, Code 61 4" SAE Flange, Code 61 / 4" SAE Flange, Code 61				
Direction of Flow	Side Inlet and Bottom Outlet				
Materials of Const	ruction				
60 - 240 330 660-1300	Housing Aluminum Aluminum Ductile Iron	Lid Aluminum Aluminum Ductile Iron	Transfer Valve Steel Aluminum Ductile Iron		
Flow Capacity	Duotino	Duotine	Duotionen		
60 110 240 330 660 950 1300	16 gpm (60 lpm) 29 gpm (110 lpm) 42 gpm (160 lpm) 63 gpm (240 lpm) 87 gpm (330 lpm) 174 gpm (660 lpm) 251 gpm (950 lpm)				
Housing Pressure	Rating				
Max. Oper. Press: Proof Pressure: Fatigue Pressure:	360 psi (25 bai 540 psi (38 bai 360 psi (25 bai	r) r) r) @ 700,000 <sup>,</sup>	cycles		
Burst Pressure:	60/110 160/240 330 660-1300	1080 psi (75 1230 psi (85 1440 psi (100 >1440 psi (10	bar) bar) 0 bar) 00 bar)		
Element Collapse I	Pressure Ratir	ıg			
BN/HC, W/HC, ECO/N, BN/AM, P/ V	HC, AM	290 psid (20 145 psid (10 3045 psid (2	bar) bar) 10 bar)		
Fluid Temperature	Range	-22° to 250°	F (-30° to 121°C)		
Fluid Compatabilit	У				
Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.					
Indicator Trip Pres	sure				
P = 29 psi (2 bar) -1 P = 72 psi (5 bar) -1	0% (standard) 0% (optional)				
Bypass Valve Crac	king Pressure				
$\Delta P = 43 \text{ psid} (3 \text{ bar})$ $\Delta P = 87 \text{ psid} (6 \text{ bar})$	$\Delta P = 43 \text{ psid (3 bar) +10\% (standard)}$ $\Delta P = 87 \text{ psid (6 bar) +10\% (optional)}$				

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### Model Code

	<u>RFD BN/HC 330 D A L 10 H 1 X / 16 - V - B6 _</u>
Filter Type	
RFD = Duplex In-Tank Return Line	e Filter
Element Media	
BN/HC = Betamicron <sup>®</sup> (Low Collapse)	ECO/N = ECOmicron® (Low Collapse)
AM = Aquamicron <sup>®</sup> *	BN/AM = Betamicron <sup>®</sup> /Aquamicron <sup>®</sup> *
P/HC = Polyester	W/HC = Wire Screen
Size	
<mark>60</mark> , 110, <mark>160</mark> , 240, 330, 660, 950, 1300	
Pressure Rating	
D = 360 psi (25 bar)	
Type of Changeover Valve	
A = Ball Valve	
Type of Connection ————	
C = SAE 12 (sizes 60, 110); 3/4" NPT w/ Ad	dapter data data data data data data data dat
D = SAE 16 Inlet / SAE-20 Outlet (sizes 10	50, 240); 1" NPT w/Adapter
L = 2" SAE Flange Inlet / 2"NPT Outlet (	size 330)
N = 3" SAE Flange Inlet / 3"NPT Outlet (	size 660)
O = 4" SAE Flange Inlet / 3 1/2" SAE Fla	nge Outlet (size 950)
P = 4" SAE Flange (size 1300)	
Filtration Rating (micron)	
3, 5, 10, 20 = BN/HC, ECO/N	10, 20 = P/HC 3, 10 = BN/AM
25, 74, 149 = W/HC	40 = AM
Type of Static Clogging Indicator —	
A, B/BM, C, D, H	
Type Number	
= Standard Connection	
Modification Number (latest version always	supplied)
Port Configuration	
3 = NPI (sizes 60, 110, 160, 240)	
12 = SAE Straight Thread Inlet/	Outlet Connections (sizes 60, 110, 160, 240)
= SAE Flange Code 61 Inlet	Connections (sizes 330 - 1300 only)
(omit) = Nitrile (NBR) (standard) V =	= Fluoroelastomer (FPM) EPR = Ethylene Propylene (EPDM)
Bypass Valve	
(omit) = 43  psid (3  par) (return line st	andard)
PE = No Bypass (flushing system)	
PO = O/PSIU (O Dar) (return line) P1 = 15 psid (1 bar) (hybrigation a	not available with ECO/N
$B0.2 = 3  psid (0.20 \text{ par) (subtration in$	a)
Supplementary	

SO103H = Modification of BN4HC & W/HC Elements For Phosphate Ester Fluids

L24, L48, L110, L220 = Lamp for D-type clogging indicator (LXX, XX = voltage)

\* Only available in sizes 330, 660, 950, and 1300.



### **Clogging Indicator Model Code**



V = Fluoroelastomer (FPM)

(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

### www.comosile. ATIVE FLUID POWER HYDAE 52

## **HYDAC** Low Pressure Filters

#### Dimensions RFD 60 - 240



### RFD 330 - 1300



Mounting Pattern



Size	øD1	øD5	øD6	B2
60 / 110	3.15" (80mm)	3.94" (100mm)	0.26" (6.5mm)	10.26" (260.5mm)
160 / 240	4.17" (106mm)	5.32" (135mm)	0.30" (7.5mm)	13.21" (335.5mm)
330	5.31" (135mm)	6.9" (170mm)	0.35" (9mm)	10.00" (254mm)
660	660 6.89" (175mm)		0.55" (14mm)	12.99" (330mm)
950	8.19" (208mm)	11.42" (290mm)	0.71" (18mm)	13.35" (390mm)
1300	8.19" (208mm)	11.42" (290mm)	0.71" (18mm)	16.14" (410mm)

Size	60	110	160	240	330	660	950	1300
Weight(lbs.)	7.0	8.2	13.4	15.6	29.5	112.2	215	238

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

### Sizing Information

Total pressure loss through the filter is as follows:

Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$ 

#### Housing Curve:

Pressure loss through housing is as follows:

Housing  $\Delta P$  = 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 section on page 19)







### **Element K Factors**

ΔP Elements = Elements (K) Flow Factor x Flow Rate (gpm) x (From Tables Below) x Actual Viscosity (SUS) x Actual Specific Gravity 141 SUS 0.86

Sizo	RBN4HC (Betamicron® Low Collapse)							
Size	3 µm	5 µm	10 µm	20 µm				
0110	0.817	0.517	0.329	0.178				
0160	0.522	0.323	0.208	0.159				
0240	0.338	0.208	0.142	0.096				
0330	0.232	0.150	0.093	0.066				
0660	0.105	0.066	0.042	0.029				
0950	0.064	0.043	0.030	0.020				
1300	0.045	0.032	0.024	0.014				

Sizo	SizeRECO/N				
Size	3 µm	5 µm	10 µm	20 µm	
0110	-	-	0.464	0.317	
0160	0.556	0.378	0.329	0.225	
0240	-	-	0.209	-	
0330	0.228	0.156	0.135	-	
0660	0.100	0.068	0.059	0.041	
0950	0.068	0.0467	0.041	0.028	
1300	0.049	0.034	0.029	0.020	

Size	<b>RΡ/HC</b> (Paper) 10, 20 μm		Size	RW/HC (Wire Screen) 25, 50, 74, 100, 149, 200 μm
0060	0.255		0060	0.055
0110	0.128		0110	0.030
0160	0.077		0160	0.021
0240	0.049		0240	0.015
0330	0.037		0330	0.010
0660	0.016		0660	0.005
0950	0.010		0950	0.003
1300	0.007		1300	0.003
All Element k	K Factors in psi / gpm.	•		

Sizo	RBN/AM			Sizo	RAM	
Size	<sup>5ize</sup> 3 μm 10			Size	040A	
0330	0.477	0.164		0330	0.216	
0660	0.192	0.066		0660	0.095	
0950	0.132	0.045		0950	0.067	
1300	0.088	0.033		1300	0.048	

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**NFD Series** In-Tank / Inline Duplex Filters 360 psi • up to 450 gpm



Version 2.0 pictured

#### Features

- NFD Filters have an extremely large filtration area and flow capacity of 450 gpm.
- NFD Filters can be configured for in-tank or inline applications
- Vent and drain ports are standard .
- Aluminum alloy is water tolerant anodization is not required for water based fluids (HWBF)
- Screw-on lid provides easy access to filter element for replacement
- Reusable contamination basket prevents re-entry of retained contaminants into the reservoir during element replacement
- Filters can be fitted with clogging indicators to monitor the contamination level of the element
- NFD duplex filters have a ball-type selector valve to provide continuous filtration and eliminate the need to shut-down the system during element changeout

### Applications



Agricultural

Industrial





Gearboxes

Construction



Generation



Pulp & Paper

### Hydraulic Symbol





### **Technical Details**

Mounting Method	See drawings	
Port Connection	SAE-64 Flange Co	ode 61
Flow Direction		
1.0 version 2.0 version	Inlet: Side Inlet: Side	Outlet: Bottom Outlet: Side
Construction Materials		
Head, Housing, Lid Elbows, Manifolds	Aluminum Ductile Iron	
Flow Capacity		
1310 2610, 5210, 7810, 10410	343 gpm (1300 lpr 450 gpm (1700 lpr	n) n)
Housing Pressure Rating		
Max. Operating Pressure Proof Pressure Fatigue Pressure Burst Pressure	360 psi (25 bar) 540 psi (38 bar) 360 psi (25 bar) Contact HYDAC o	ffice
Element Collapse Pressure	Rating	
BN/HC, W/HC ECO/N, BN/AM, P/HC, AM	290 psid (20 bar) 145 psid (10 bar)	
Fluid Temperature Range	-22° to 250°F (-30	° to 121°C)
Fluid Compatability		
Compatible with all petroleur with Fluoroelastomer or Ethy for information on special ho available for use with water g HWBF.	n oils and synthetic lene Propylene sea using and element lycols, oil/water em	fluids rated for use ls. Contact HYDAC constructions nulsions, and
Indicator Trip Pressure		
$\Delta P = 29 \text{ psid } (2 \text{ bar}) -10\%$ $\Delta P = 72 \text{ psid } (5 \text{ bar}) -10\%$	1.0 - Static 2.0 - Differential	
Bypass Valve Cracking Pres	sure	
$\Delta P = 43 \text{ psid } (3 \text{ bar}) + 10\%$ $\Delta P = 87 \text{ psid } (6 \text{ bar}) + 10\%$		

## Low Pressure Filters HYDAC

### Model Code

		NFD BN/HC	<u>; 1310 l</u>	<b>P P P</b>	<u>3</u> A	<u>1.0</u> / <u>/</u>	$\mathbf{A}$ $\mathbf{-}$ $\mathbf{-}$ $\mathbf{-}$
Filter Type NFD = Duplex In-Tank Return Line	Filter						
Element Media BN/HC = Betamicron® (Low Collaspe) BN/AM = Betamicron® Aquamicron® P/HC = Polyester	ECO/N = ECOmicron <sup>®</sup> (Low AM = Aquamicron <sup>®</sup> W/HC = Wire Screen	Collaspe)					
Size							
1310, 2610, 5210, 7810, 10410							
D = 360 psi (25 bar)							
Type of Change Over A = Ball valve							
<b>Type of Connection</b> P = SAE DN 100 (4") flange							
Filtration Rating (micron) 3, 5, 10, 20 = BN/HC, ECO/N 10, 20 = P/HC	3, 10 = BN/AM 25, 74, 149 = W/HC	40 = AM					
Type of Static Clogging Indicator —— A, B/BM, C, D, H							
Type Number / Modification Number — 1.0 = In-Tank Filter - Static indicator	2.0 = Inline Filter - $\Delta P$ indica	ator					
Flow Path (facing connecting manifold) (omit) = (sizes 1310 and 2610 version 1.0 A = Front inlet, Front outlet B = Rear inlet, Rear outlet (sizes C = Front inlet, Rear outlet D = Rear inlet, Front outlet (sizes)	only) 5210 - 10410 only) 5210 - 10410 only)						
Seals	V – Eluoroelastomer (EPM)	EPR - Ett	vlene Propy	lene (FPDN	<u>/)</u>		
Cracking Pressure of Bypass Valve (omit) = 43 psid (3 bar) (standard) KB = no bypass B6 = 87 psid (6 bar) not availal B1 = 15 psid (1 bar)	ble with ECO/N	L, ,, – Lu			,		
Supplementary Details							

L24, L48, L110, L220 = Lamp for D-type clogging indicator (LXX, XX = voltage)

LED = 2 light emitting diodes for up to 24V DC

S0103H = Modification of BN4HC and W/HC Elements for Phosphate Ester Fluids

#### Replacement Element Model Code 1300 R 010 BN4HC / V Size 1300 - for housings: 1310 2600 - for housings: 2610, 5210, 7810, 10410 Filtration Rating (micron) -3, 5, 10, 20 = BN4HC, ECO/N 3, 10 = BN/AM 40 = AM10, 20 = P/HC 25, 74, 149 = W/HC Element Media -BN4HC, ECO/N, BN/AM, AM, P/HC, W/HC Supplementary Details (omit) = standard Fluoroelastomer (FPM) seals =

### **Clogging Indicator Model Code**

<u>VR 2 B.X/</u>	
Indicator Prefix         VR       = Return Filters (1.0 version)         VMF       = Mobile Filters (2.0 version)	
Trip Pressure2= 29 psid (2 bar) (return filters)5= 72 psid (5 bar) (optional)	
Type of Indicator         A       = no indicator, plugged port         B/BM       Visual pop-up (auto/manual reset)         C       = Electric switch         D       = Electric switch and light         H       = Electric pressure switch	
Modification Number	
Supplementary Details	Þ
Seals (omit) = Nitrile (NBR) (standard) V = Fluoroelastomer (FPM) (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

### Dimensions NFD 1310 / 2610 – 1.0 Version



### NFD 1310 / 2610 – 2.0 Version



### Handle Enlargement – Both Versions



Size	Version 1.0	1310	2610	Version 2.0	1310	2610
Weight (lbs)		154	176		227	254
imensions shown are for general information and overall envelope size only. Weights listed are without element.						

Dimensions shown are for general information and overall envelope size only. Weights listed are without eleme For complete dimensions please contact HYDAC to request a certified print.

### NFD 5210 – 2.0 Version



Size	5210 Version 2.0		
Weight (lbs.)	610		
Dimensions shown are for general information and overall envelope size only. Weights listed are without element			

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

### **HYDAD** Low Pressure Filters

NFD 7810 – 2.0 Version



Clearance Required

for Element Removal

### NFD 10410 – 2.0 Version



Size	7810 Version 2.0	10410 Version 2.0		
Weight (lbs.)	863	1125		
Dimensions shown are for general information and overall envelope size only. Weights listed are without element				

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

### Sizing Information

Total pressure loss through the filter is as follows:

Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$ 

#### Housing Curve:

Pressure loss through housing is as follows:

Housing  $\Delta P$  = Housing Curve  $\Delta P \times \frac{Actual Specific Gravity}{2}$ 

0.86

Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see sizing section on page 19)



### **Element K Factors**

△P Elements = Elements (K) Flow Factor x Flow Rate (gpm) x (From Tables Below) x Actual Viscosity (SUS) x Actual Specific Gravity 141 SUS 0.86

<b>C</b> :	RBN4HC (Betamicron® Low Collapse)					
Size	3 µm	5 µm	10 µm	20 µm		
1300	0.045	0.032	0.024	0.014		
2600	0.023	0.016	0.011	0.007		

S:	RECO/N					
Size	3 µm	5 µm	10 µm	20 µm		
1300	0.049	0.034	0.029	0.020		
2600	0.024	0.017	0.014	0.010		

Sizo	RBN/AM		Sizo		RAM
Size	3 µm	10 µm		Size	40 µm
1300	0.088	0.033		1300	0.048
2600	0.052	0.019		2600	0.024

6:	RP/HC	(Polyester)	SizeRW/HC (W 25, 50, 100,	RW/HC (Wire Screen)		
Size	10 µm	20 µm		25, 50, 100, 200 μm		
1300	0.0070	0.0070	1300	0.0027		
2600	0.0034	0.0034	2600	0.0011		

All Element K Factors in psi / gpm.

## **YDAD** Low Pressure Filters

### **RFM Series** In-Tank Return Line Filters 145 psi • up to 224 gpm



### Features

- The compact and lightweight design make RFM filters especially • suitable for mobile applications.
- RFM filters are constructed of polyamide plastic housing and lid.
- RFM 90/150/210/270 drop replacement for "Tank Topper" filters. •
- Aluminum alloy is water tolerant anodization is not required for • water based fluids (HWBF).
- The filter bowl on models 75 270 also serves as a • contamination basket - removed to change element.
- Models 330, 500, 661, and 851 have filter elements equipped with separate, reusable contamination baskets.
- Cavities for clogging indicators are standard.



Sizes 75/90/150/165/185 available with 4- or 2-bolt tank flange.

### Applications





Automotive

Agricultural



Construction

### Hydraulic Symbol



### **Technical Details**

Mounting Method				
75/90/150/165/185 75/90/150/165/185/2	210/270/	2 mountir	ng holes - filter housing	
330/500/661/851		4 mountir	ng holes - filter housing	
Port Connections	Inlet / Outlet	t		
90/150 75/165/185 210/270 330/500	SAE-12 / 1" SAE-16 / 1.26" Smooth Port SAE-20 / Open Bottom SAE-24 / 2" NPT 1 1/2" SAE Flange, Code 61 / 2" NPT			
661/851	2 1/2" SAE F	Flange, Co	de 61 / G 2 1/2" BSPP	
Direction of Flow	Side inlet ar	nd bottom	outlet.	
Mat. of Construc.	Head	Bowl	Lid	
90/150/75/165/185 210/270 330/500/661/851	Aluminum Aluminum Aluminum	Plastic Steel Plastic	Plastic Plastic Aluminum	
Flow Capacity				
75 90 150 165 185 210 270 330 500 661 851	20 gpm (75 24 gpm (90 40 gpm (150 43 gpm (165 55 gpm (210 71 gpm (270 87 gpm (330 132 gpm (50 174 gpm (66 225 gpm (85	Ipm) Ipm) 5 Ipm) 5 Ipm) 5 Ipm) 0 Ipm) 0 Ipm) 00 Ipm) 50 Ipm) 50 Ipm)		
Housing Pressure F	lating			
Max. Oper. Press: Proof Pressure: Fatigue Pressure: Burst Pressure:	145 psi (10 k 218 psi (15 k 145 psi (10 k 60-500 660/851	oar) oar) oar) @ 1 mi >58 536	illion cycles 0 psi (40 bar) psi (37 bar)	
Element Collapse P	ressure Rat	ing		
BN/HC, W/HC ECO/N, BN/AM, P/H V	IC, AM	290 psid 145 psid ( 3045 psic	(20 bar) (10 bar) J (210 bar)	
Fluid Temperature	Range	-22° to 25	50°F (-30° to 121°C)	
Fluid Compatability	I.			
Compatible with all for use with Fluoroe Contact HYDAC for constructions availa emulsions, and HWI	petroleum oi lastomer or E information o ble for use w BF.	Is and synt Ethylene Pr on special /ith water ç	thetic fluids rated ropylene seals. housing and element glycols, oil/water	
Indicator Trip Press	ure			
P = 29 psi (2 bar) -10 P = 72 psi (5 bar) -10	)% (standard) )% (optional)			
Bypass Valve Crack	ing Pressur	°e		
$\Delta P = 43 \text{ psid (3 bar)}$ $\Delta P = 87 \text{ psid (6 bar)}$	+10% (standa +10% (option	ard) nal)		

### Model Code

RFM BN/HC 330 B F F 3 D 1 . X / 12 - V L24
Filter Type
RFM = In-Tank Return Line Filter
Element Media
BN/HC = Betamicron® (Low Collaspe) (not for sizes 90 & 150)
ECO/N = ECOmicron® (Low Collaspe) (not for sizes 210/270)
BN/AM = Betamicron® Aquamicron® MM = Mobilemicron (Low Collaspe)
Aim = Aquamicron <sup>®</sup> W/HC = Wire Screen
Size
Working Pressure
B = 145  psid (10  bar)
Optional Second Inlet Connection
(omit) = no second port
F = 1 1/2" (SAE-24) (sz. 330 & 500 only)
K = 1 1/2" SAE Flange (code 61) (sz. 330 & 500 only)
$M = 2 \frac{1}{2} (200 \text{ Flange}(\text{code 61})(\text{sz. 661 \& 851 only}))$
$V = 2 \times 1 (SAE 16) (sz. 270 & 270 only)$
C = 3/4 (SAE-12) (sz. 90 % (50 only) $R = 1.1/2$ SAE Flange (code 61) (sz. 330 % 500 only)
D = -1 (SAE - 10) (s2 - 75, 103 & 105 0 liny) = 112 (SAE - 112 (
F = 11/2 (SAF-24) (sz 210 270 330 & 500 only)
Filtration Bating (micros)
3, 5, 10, 20 = BN4HC, ÉCO/N 10, 20 = P/HC 3, 10 = BN/AM
25, 74, 149 = W/HC 40 = AM 10, 15 = MM
Type of Clogging Indicator
A, B, BM, C, E, F, FD
Type Number
0 = no indicator, no ports 1-3 = clogging indicator positions (see <i>chart</i> )
Modification Number (latest version always supplied)
Inlet Port Configuration
12 = SAE Straight Thread O-Ring Boss Ports ( <i>RFM 60-500</i> )
16 = SAE Code 61 Flange (sizes 330-851)
Seals
(omit) = Nitrile (NBR) (standard) V = Fluoroelastomer (FPM)
Bypass
(omit) = 43  psid (standard)
KB – No Bynass of psid (blar) not available with ECO/N
Supplementary
T = Filter Breather ( <i>RFM</i> 75, 90, 150, 165, & 185 only)
DTxx = Down tube (xx length in inches - up to 12 inches)
DSxx = Dip stick (xx length in inches)

SO103H = Modification of BN4HC Elements for Phosphate Esters

- 4L = 4 bolt (sizes 90-185)
- 2M0 = Indicator with Deutsch Connector (FD indicator only)



### **Clogging Indicator Model Code**



V = Fluoroelastomer (FPM)

(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

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### Clogging Indicator Locations RFM 75/165/185 RFM 75/165/185/-4L



Type No.	Location of Clogging Indicator	Indicator Model
1.X	Clogging Indicator left back 90° to Inlet	VMF
2.X	Clogging Indicator left front 45° to Inlet	VMF
3.X	Clogging Indicator right front 45° to Inlet	VMF
4.X	Clogging Indicator left back 135° to Inlet	VMF
5.X	Clogging Indicator left front 90° to Inlet	VMF
6.X	Clogging Indicator right front	VMF

RFM 90/150	RF	M 90/150/-4L
	3.0 Plug 2.0 Standard	2.0
RFM 210/270		



### RFM 330/500



### RFM 661/851



Type No.	Location of Clogging Indicator	Indicator Model
2.X	Clogging Indicator left front 45° to Inlet	VMF
3.X	Clogging Indicator right front 45° to Inlet	VMF

Type No.	Location of Clogging Indicator	Indicator Model
1.X	Clogging Indicator left back 45° to Inlet	VMF
2.X	Clogging Indicator left front 45° to Inlet	VMF
3.X	Clogging Indicator right front 45° to Inlet	VMF
4.X	Clogging Indicator right back 45° to Inlet	VMF

Type No.	Location of Clogging Indicator	Indicator Model
1.X	Clogging Indicator left 90° to Inlet	VR
2.X	Clogging Indicator right 90° to Inlet	VR
3.X	Clogging Indicator on Top	VR

Type No.	Location of Clogging Indicator	Indicator Model
1.X	Clogging Indicator left 90° to Inlet	VR
2.X	Clogging Indicator right 90° to Inlet	VR
3.X	Clogging Indicator on Top	VR



Size	75	90	150	165	185	210	270	330	500	661	851
Weight (lbs.)	1.3	0.9	1.0	1.5	1.6	6.8	7.9	6.8	7.3	13.2	14.2

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

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## **HYDAD** Low Pressure Filters



Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

### Sizing Information

Total pressure loss through the filter is as follows:

Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$ 

#### Housing Curve:

Pressure loss through housing is as follows:

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

RFM 90/150 & RFM 90/150/-4L Housing

Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see sizing section on page 19)

Q in I/min 114 170 38 76 7 6 0.30 5 sd uid⊽ 3 bar 0.20 <sup>.⊑</sup> 2 0.10 1 0 0 45 20 30 0 10 Q in gpm RFM 210 / 270 Housing Q in I/min 303 378 Λ 76 151 227 6 5 0.30 4 isd u 0.20<sup>m</sup> ₫ 2 P P 0.10 1 0 0 0 20 40 60 80 100 Q in gpm



RFM 75/165/185 & RFM 75/165/185/-4L Housing







### **Element K Factors**

ΔP Elements = Elements (K) Flow Factor x Flow Rate (gpm) x Actual Viscosity (SUS) x Actual Specific Gravity (From Tables Below) x 141 SUS 0.86

Sizo	RBN	4HC (Betar	nicron® Low	Collapse)
Size	3 µm	5 µm	10 µm	20 µm
0075	1.209	0.780	0.445	0.241
0165	0.616	0.430	0.245	0.133
0185	0.485	0.334	0.179	0.097
0210	0.214	0.145	0.096	0.060
0270	0.138	0.094	0.062	0.039
0330	0.232	0.150	0.093	0.066
0500	0.162	0.104	0.069	0.044
0660	0.105	0.066	0.042	0.029
0850	0.082	0.055	0.036	0.023

Sizo	R.	MM
Size	10 µm	15 µm
0075	0.265	0.166
0090	0.252	0.118
0150	0.114	0.071
0165	0.146	0.091
0185	0.108	0.067
0210	0.052	0.032
0270	0.032	0.020
0330	0.078	0.049
0500	0.052	0.032
0660	0.030	0.019
0850	0.023	0.015

0:	RECO/N (ECOmicron®)					
Size	3 µm	5 µm	10 µm	20 µm		
0090	0.515	0.343	0.464	0.317		
0150	0.467	0.319	0.277	0.189		
0165	0.674	0.369	0.321	0.220		
0185	0.303	0.207	0.272	0.162		
0330	0.228	0.156	0.135	-		
0660	0.100	0.068	0.059	0.041		
0850	0.078	0.053	0.046	0.032		

0:	SinceRW/HC (Wire Screen)		SizeRP/HC (Paper)		0:	RAM	RAM		RBN/AM	
Size	25, 50, 74, 100, 149, 200 μm	Size	10, 20 µm		Size	040A		Size	3 µm	10 µm
0075	0.043	0075	0.156		0330	0 216				
0165	0.020	0110	0.128			0.210		0330	0.477	0.164
0330	0.010	0165	0.086		0500	0.138				
0000	0.010	0330	0.037							
0500	0.007	0500	0.024		0660	0.095				
0660	0.005	0660	0.016					0660	0.192	0.066
0050	0.001	0000	0.010		0850	0 074				
0850	0.004	0850	0.012		0000	0.071				
All Element	K Factors in psi / gpm.									

www.comosid.loomative fluid power (HYDAC)

### **RFMP Series** In-Tank Return Line Filters 100 psi • up to 26 gpm



### Hydraulic Symbol



### Features

- The compact and lightweight design make RFMP filters especially suitable for mobile applications.
- RFMP filters integrate head and bowl into a single one piece polyamide housing. This makes for a more leak-tight housing.
- The housing is designed so that a down tube can be attached to the outlet spout.

### **Applications**





Agricultural

### **Technical Details**

Mounting Method				
165	4 mounting	y holes - filter housing		
Port Connections	Inlet / Outle	Inlet / Outlet		
165	1" Hose Ba	arb / 1.26" smooth port		
Direction of Flow	Side inlet a	ind bottom outlet.		
Mat. of Construc.	Housing	Lid		
165	Plastic	Plastic		
Flow Capacity				
165	26 gpm (100 lpm)			
Housing Pressure	Rating			
Max. Oper. Press:	100 psi (7 k	bar)		
Element Collapse I	Pressure Ra	iting		
BN/HC		290 psid (20 bar)		
ECO/N, P/HC, MM		145 psid (10 bar)		
Fluid Temperature	Range	-22° to 212°F (-30° to 100°C)		
Fluid Compatability	y			
Compatible with all petroleum oils and synthetic fluids rated for use with NBR seals.				
Indicator Trip Pressure				
P = 29 psi (2 bar) -10% <i>(standard)</i>				
Bypass Valve Crac	king Pressu	ire		
$\Delta P = 43 \text{ psid} (3 \text{ bar})$	) +10% (stand	Jard)		

### Model Code

	<u>REMP</u>	BN/HC	<u>i 165</u>	<u> </u>	<u>HB</u>	<u>10 A</u>	<u> </u>	<u>X</u> /	- <u>4L</u>	
Filter Type										
RFMP = In-Tank Return Line Filter										
Element Media										
BN/HC = Betamicron <sup>®</sup> (Low Collaspe) (not for sizes 90 & 150)										
ECO/N = ECOmicron <sup>®</sup> (Low Collaspe) (not for sizes 210/270)										
MM = Mobilemicron (Low Collaspe)										
P/HC = Polyester										
Size										
165										
Working Pressure										
Y = 100  psid  (7  bar)										
Inlet Connection										
HB = Hose Barb										
Filtration Rating (microns)										
3, 5, 10, 20 = BN4HC, ECO/N										
10, 20 = P/HC										
10, 15 = MM										
Type of Clogging Indicator										
A, B/BM, C, F, FD										
Type Number										
1 = clogging indicator positions (see chart)										
Modification Number (latest version always supplied)										
Mounting Method										
4L = 4 hole tank flange										
Supplementary										
euppionioniu, j										

DTxx = Down tube (xx length in inches - up to 12 inches)



### **Clogging Indicator Model Code**



Note: Requires Adapter (P/N 0270244)

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

## **HYDAD** Low Pressure Filters

### **Clogging Indicator Location**



Size	165
Weight (lbs.)	1.7
<u> </u>	

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

### Sizing Information

Total pressure loss through the filter is as follows:

Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$ 

Housing Curve:

Pressure loss through housing is as follows:

Housing  $\Delta P$  = 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 section on page 19)



#### **RFMP 165 Housing**

### **Element K Factors**

ΔP Elements = Elements (K) Flow Factor x Flow Rate (gpm) x (From Tables Below) x Actual Viscosity (SUS) x Actual Specific Gravity 141 SUS 0.86

0:	R	BN4HC (Beta	micron <sup>®</sup> Low Col	lapse)	8:	R.	.MM
Size	3 µm	5 µm	10 µm	20 µm	Size	10 µm	15 µm
0165	0.616	0.430	0.245	0.133	0165	0.146	0.091
		RECO/N	(ECOmicron®)			RP/H	IC (Paper)
Size	3 µm	5 µm	10 µm	20 µm	Size	10, 2	0 μm
0165	0.674	0.369	0.321	0.220	0165	0.0	186

All Element K Factors in psi / gpm.

### HF4R(S) Series In-Tank Return Line / Suction Filters 100 psi • up to 120 gpm



### Features

- Designed to meet and comply with HF4 Automotive standard and SAE J2066 standard.
- Inlet port options include SAE straight thread O-ring boss, SAE Flange, and NPT ports to allow easy installation without costly adapters.
- O-ring seals are used to provide positive, reliable sealing. Choice of Nitrile, Fluoroelastomer or EPR O-ring material provides compatibility with petroleum oils, synthetic fluids, water-glycols, oil/water emulsions, and water base fluids.
- In-tank design requires minimal space for installation.
- Provision is made for an additional inlet port to allow two return lines to be connected to the same filter.
- 9" filters include 1 1/2" hose barb outlet.
- 18" and 27" filters include 1 1/2" threaded NPT outlet.

### Hydraulic Symbol



### **Technical Details**

Mounting Method	4 mounting holes	s - filter housing
Port Connection		
Inlet	SAE-24, 1 1/2" N 1 1/2" Flange, Co	IPT, 1 1/4" BSPP, ode 61
Outlet HF4R09 HF4R18/27	1 1/2" Hose Bark 1 1/2" NPT male	)
Flow Direction	Inlet	Outlet
HF4R HF4S	Side Bottom	Bottom Side
Construction Materials		
Head, Lid Bowl	Aluminum Steel	
Flow Capacity		
HF4R09 HF4R18 HF4R27	50 gpm (189 lpm 100 gpm (378 lpr 120 gpm (454 lpr	) m) m)
Housing Pressure Rating		
Max. Operating Pressure Proof Pressure Fatigue Pressure Burst Pressure	100 psi (7 bar) 150 psi (10.3 bar Contact HYDAC Contact HYDAC	)
Element Collapse Pressure Rat	ing	
BN, W, P/HC Fluid Temperature Range	150 psid (10 bar) -22° to 250°F (-3	0° to 121°C)
Fluid Compatability		
Compatible with all petroleum oil for use with Fluoroelastomer or E Contact HYDAC for information of constructions available for use w emulsions, and HWBF.	s and synthetic fl thylene Propylen on special housing ith water glycols,	uids rated e seals. g and element oil/water
Indicator Trip Pressure		
P = 1 psi (0.08 bar) -10% P = 10 psi (0.8 bar) -10%	P = 20 psi (1.4 ba P = 29 psi (2 bar)	ar) -10% ) -10%
Bypass Valve Cracking Pressur	e	
$\Delta P = 3 \text{ psid } (0.2 \text{ bar}) +10\%$ $\Delta P = 15 \text{ psid } (1 \text{ bar}) +10\%$	$\Delta P = 25 \text{ psid} (1.7)$ $\Delta P = 43 \text{ psid} (3 \text{ psid})$	bar) +10%

### Applications





Agricultural



Automotive

Steel / Heavy Industry



Construction

Gearboxes

71

### Model Code

Filter Type HF4R = In-tank return filter HF4S = In-tank suction filter Element Media Element Length 09 = Single Element Length (9") 18 = Double Element Length (2") 18 = Double Element Length (2") 19 = Connection G = Threaded F = Flanged FG = Flanged and Threaded FG = Flanged and Threaded FG = Flanged and Threaded FG = Flanged interference for the filter of the fil	<u>HF4R BN 09 G 3 A 11 / 3 – </u>	<u> </u>
HF45       = In-tank return filter         HF45       = In-tank suction filter         Element Media       BN = Betamicron® (Low Collapse)r       W = Wire screen         Element Length	Filter Type	
HF4S       = In-tank suction filter         Element Media       SN = Bestmicron® (Low Collapse)r       W = Wire screen         Element Length	HF4B = In-tank return filter	
Element Media BN = Betamicron® (Low Collapse)r W = Wire screen Element Length 09 = Single Element Length (9") 18 = Double Element Length (18") 27 = Triple Element Length (18") 27 = Triple Element Length (27") Type of Connection G = Threaded F = Flanged and Threaded Fitration Rating (microns) 3, 5, 10, 20 = BN 20 = BN (suction element) 149 = W (suction element) 25, 74, 149 = W Type of Clogging Indicator (static) A, C, E, G Type Modification Number 1 = Single inlets (matching threaded ports only except 1 1/2" SAE code 61 & SAE 32 Threaded) Port Configuration 0 = BSPP 1 1/4" 3 = NPT 1 1/2" 12 = SAE-24 Straight Thread O-ring Boss 16 = SAE 1 1/2" Code 61 flange 16-12 = SAE 1 1/2" Code 61 flange and SAE 32 straight thread Seals (omit) = Nitrile (NBR) (standard) V = Fluoroelastomer (FPM) Bypass Valve (mit) = Nitrile (NBR) (standard) B1 = 15 psid bypass B1.7 = 25 psid bypass B1.7 = 45	HF4S = In-tank suction filter	
BN = Betamicron® (Low Collapse)r W = Wire screen Element Length 09 = Single Element Length (9") 18 = Double Element Length (18") 27 = Triple Element Length (27") Type of Connection G = Threaded F = Flanged and Threaded Filtration Rating (microns) 3, 5, 10, 20 = BN 20 = BN (suction element) 149 = W (suction element) 25, 74, 149 = W Type of Clogging Indicator (static) A, C, E, G Type Modification Number 1 = Single inlet Connection 2 = Dual Inlets (matching threaded ports only except 1 1/2" SAE code 61 & SAE 32 Threaded) Port Configuration 0 = BSPP 1 1/4" 3 = NPT 1 1/2" 12 = SAE 1 1/2" Code 61 flange and SAE 32 straight thread Seals (omit) = Nitrile (NBR) (standard) V = Fluoroelastomer (FPM) Bypass Valve B3 = 43 psid bypass (standard) B1 = 15 psid bypass B1.7 = 25 psid bypas B1.7 = 25 psid byp	Element Media	
Element Length	BN = Betamicron <sup>®</sup> (Low Collapse)r W = Wire screen	
09       = Single Element Length (9")         18       = Double Element Length (18")         27       = Triple Element Length (18")         27       = Triple Element Length (18")         27       = Triple Element Length (18")         7       = Flanged         6       = Threaded         FG       = Flanged and Threaded         7       = Single indicator (static)         A, C, E, G	Element Length	
18       = Double Element Length (18")         27       = Triple Element Length (27")         Type of Connection	09 = Sinale Element Length (9")	
27       = Triple Element Length (27")         Type of Connection	18 = Double Element Length (18")	
Type of Connection         G       = Threaded         F       = Flanged         FG       = Flanged and Threaded         Filtration Rating (micros)       3, 5, 10, 20 = BN         3, 5, 10, 20 = BN       20 = BN (suction element)         149 = W (suction element)       25, 74, 149 = W         Type of Clogging Indicator (static)       A, C, E, G         Type Modification Number	27 = Triple Element Length (27")	
G       = Threaded         F       = Flanged and Threaded         FG       = Flanged and Threaded         Filtration Rating (microns)       20 = BN (suction element)         3, 5, 10, 20 = BN       20 = BN (suction element)         149 = W (suction element)       25, 74, 149 = W         Type of Clogging Indicator (static)	Type of Connection	
F       = Flanged         FG       = Flanged and Threaded         Filtration Rating (microns)	G = Threaded	
FG = Flanged and Threaded   Filtration Rating (microns)	F = Flanged	
Filtration Rating (microns) 3, 5, 10, 20 = BN 20 = BN (suction element) 149 = W (suction element) 25, 74, 149 = W Type of Clogging Indicator (static) A, C, E, G Type Modification Number	FG = Flanged and Threaded	
3, 5, 10, 20 = BN       20 = BN (suction element)         149 = W (suction element)       25, 74, 149 = W         Type of Clogging Indicator (static)         A, C, E, G	Filtration Rating (microns)	
149 = W (suction element)       25, 74, 149 = W         Type of Clogging Indicator (static)	3, 5, 10, 20 = BN 20 = BN (suction element)	
Type of Clogging Indicator (static)   A, C, E, G   Type Modification Number   1   =   Single inlet Connection   2   =   Dual Inlets (matching threaded ports only except 1 1/2" SAE code 61 & SAE 32 Threaded)   Port Configuration   0   =   BSPP 1 1/4"   3   =   NPT 1 1/2"   12   =   SAE-24 Straight Thread O-ring Boss   16   =   SAE 1 1/2" Code 61 flange   16-12   =   SAE 1 1/2" Code 61 flange and SAE 32 straight thread   Seals   (omit) = Nitrile (NBR) (standard)   V   B1   =   17   25 psid bypass   B1.7   =   25 psid bypass   B1.7   =   S0103H   =   Modification of BN elements for phosphate ester fluids   S0150H   =   Anodized filter head for water based fluids	149 = W (suction element) 25, 74, 149 = W	
A, C, E, G  Type Modification Number  1 = Single inlet Connection 2 = Dual Inlets (matching threaded ports only except 1 1/2" SAE code 61 & SAE 32 Threaded)  Port Configuration 0 = BSPP 1 1/4" 3 = NPT 1 1/2" 12 = SAE-24 Straight Thread O-ring Boss 16 = SAE 1 1/2" Code 61 flange 16-12 = SAE 1 1/2" Code 61 flange and SAE 32 straight thread Seals  (omit) = Nitrile (NBR) (standard) V = Fluoroelastomer (FPM) Bypass Valve B3 = 43 psid bypass (standard) B1 = 15 psid bypass B1.7 = 25 psid bypass B0.2 = 3 psid (suction application) Supplementary S0103H = Modification of BN elements for phosphate ester fluids S0150H = Anodized filter head for water based fluids Outlet Configuration	Type of Clogging Indicator (static)	
Type Modification Number   1 = Single inlet Connection   2 = Dual Inlets (matching threaded ports only except 1 1/2" SAE code 61 & SAE 32 Threaded)   Port Configuration   0 = BSPP 1 1/4"   3 = NPT 1 1/2"   12 = SAE-24 Straight Thread O-ring Boss   16 = SAE 1 1/2" Code 61 flange   16-12 = SAE 1 1/2" Code 61 flange   17 = 15 psid bypass (standard)   B1 = 15 psid bypass   B1.7 = 25 psid bypass   B0.2 = 3 psid (suction application)   Supplementary	A, C, E, G	
1       = Single inlet Connection         2       = Dual Inlets (matching threaded ports only except 1 1/2" SAE code 61 & SAE 32 Threaded)         Port Configuration	Type Modification Number	
2 = Dual Inlets (matching threaded ports only except 1 1/2" SAE code 61 & SAE 32 Threaded) Port Configuration 0 = BSPP 1 1/4" 3 = NPT 1 1/2" 12 = SAE-24 Straight Thread O-ring Boss 16 = SAE 1 1/2" Code 61 flange 16-12 = SAE 1 1/2" Code 61 flange and SAE 32 straight thread Seals (omit) = Nitrile (NBR) (standard) V = Fluoroelastomer (FPM) Bypass Valve B3 = 43 psid bypass (standard) B1 = 15 psid bypass B1.7 = 25 psid bypass B0.2 = 3 psid (suction application) Supplementary S0103H = Modification of BN elements for phosphate ester fluids S0150H = Anodized filter head for water based fluids Outlet Configuration	1 = Single inlet Connection	
Port Configuration 0 = BSPP 1 1/4" 3 = NPT 1 1/2" 12 = SAE-24 Straight Thread O-ring Boss 16 = SAE 1 1/2" Code 61 flange 16-12 = SAE 1 1/2" Code 61 flange and SAE 32 straight thread Seals (omit) = Nitrile (NBR) (standard) V = Fluoroelastomer (FPM) Bypass Valve B3 = 43 psid bypass (standard) B1 = 15 psid bypass B1.7 = 25 psid bypass B0.2 = 3 psid (suction application) Supplementary S0103H = Modification of BN elements for phosphate ester fluids S0150H = Anodized filter head for water based fluids Outlet Configuration	2 = Dual Inlets (matching threaded ports only except 1 1/2" SAE code 61 & SAE 32 Threaded)	
0 = BSPP 11/4" 3 = NPT 1 1/2" 12 = SAE-24 Straight Thread O-ring Boss 16 = SAE 1 1/2" Code 61 flange 16-12 = SAE 1 1/2" Code 61 flange and SAE 32 straight thread Seals (omit) = Nitrile (NBR) (standard) V = Fluoroelastomer (FPM) Bypass Valve B3 = 43 psid bypass (standard) B1 = 15 psid bypass B1.7 = 25 psid bypass B0.2 = 3 psid (suction application) Supplementary S0103H = Modification of BN elements for phosphate ester fluids S0150H = Anodized filter head for water based fluids Outlet Configuration	Port Configuration	
3       = NPT 1 1/2"         12       = SAE-24 Straight Thread O-ring Boss         16       = SAE 1 1/2" Code 61 flange         16-12       = SAE 1 1/2" Code 61 flange and SAE 32 straight thread         Seals         (omit) = Nitrile (NBR) (standard)         V = Fluoroelastomer (FPM)         Bypass Valve         B3       = 43 psid bypass (standard)         B1       = 15 psid bypass         B1.7       = 25 psid bypass         B0.2       = 3 psid (suction application)         Supplementary         S0103H       = Modification of BN elements for phosphate ester fluids         S0150H       = Anodized filter head for water based fluids         Outlet Configuration	0 = BSPP 1 1/4"	
12       =       SAE-24 Straight Thread O-ring Boss         16       =       SAE 1 1/2" Code 61 flange         16-12       =       SAE 1 1/2" Code 61 flange and SAE 32 straight thread         Seals         (omit) = Nitrile (NBR) (standard)       V = Fluoroelastomer (FPM)         Bypass Valve	3 = NPT 1 1/2"	
16       =       SAE 1 1/2" Code 61 flange         16-12       =       SAE 1 1/2" Code 61 flange and SAE 32 straight thread         Seals         (omit) = Nitrile (NBR) (standard)       V = Fluoroelastomer (FPM)         Bypass Valve	12 = SAE-24 Straight Thread O-ring Boss	
16-12       =       SAE 1 1/2" Code 61 flange and SAE 32 straight thread         Seals	$16 = SAE 1 1/2^{\circ}$ Code 61 flange	
Seals       (omit) = Nitrile (NBR) (standard)       V = Fluoroelastomer (FPM)         Bypass Valve	16-12 = SAE 1 1/2" Code 61 flange and SAE 32 straight thread	
(omit) = Nitrile (NBR) (standard) V = Fluoroelastomer (FPM) Bypass Valve B3 = 43 psid bypass (standard) B1 = 15 psid bypass B1.7 = 25 psid bypass B0.2 = 3 psid (suction application) Supplementary S0103H = Modification of BN elements for phosphate ester fluids S0150H = Anodized filter head for water based fluids Outlet Configuration	Seals	
Bypass Valve B3 = 43 psid bypass (standard) B1 = 15 psid bypass B1.7 = 25 psid bypass B0.2 = 3 psid (suction application) Supplementary S0103H = Modification of BN elements for phosphate ester fluids S0150H = Anodized filter head for water based fluids Outlet Configuration	(omit) = Nitrile (NBR) (standard) V = Huoroelastomer (FPM)	
B3 = 43 psid bypass (standard) B1 = 15 psid bypass B1.7 = 25 psid bypass B0.2 = 3 psid (suction application) Supplementary S0103H = Modification of BN elements for phosphate ester fluids S0150H = Anodized filter head for water based fluids Outlet Configuration	Bypass Valve	
B1 = 15 psid bypass B1.7 = 25 psid bypass B0.2 = 3 psid (suction application) Supplementary S0103H = Modification of BN elements for phosphate ester fluids S0150H = Anodized filter head for water based fluids Outlet Configuration	B3 = 43 psid bypass (standard)	
B1.7 = 25 psid bypass B0.2 = 3 psid (suction application) Supplementary S0103H = Modification of BN elements for phosphate ester fluids S0150H = Anodized filter head for water based fluids Outlet Configuration	B1 = 15 psid bypass	
B0.2       = 3 psid (suction application)         Supplementary         S0103H       = Modification of BN elements for phosphate ester fluids         S0150H       = Anodized filter head for water based fluids         Outlet Configuration	B1.7 = 25 psid bypass	
Supplementary S0103H = Modification of BN elements for phosphate ester fluids S0150H = Anodized filter head for water based fluids Outlet Configuration	b.2 = 5 psid (suction application)	
Solosh = Modification of bit elements for phosphate ester huids Solosh = Anodized filter head for water based fluids Outlet Configuration	Supplementary	
Outlet Configuration	Source = modification of BN elements for phosphate ester fluids	
() - ()pop opd outlot (1.1/9" Hose Parb) (0" model only)	Outlet Configuration	

= Outlet check valve (1/2 psid cracking pressure) (available on 18" & 27" models only)

= Threaded outlet connection (1 1/2" NPT male) (standard 18" & 27" models only)

DT = 12" Down Tube (outlet) (9" model only)

С

Т



### **Clogging Indicator Model Code**



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

### www.comosileentative fluid power (HYDAC) 72

# **HYDAD** Low Pressure Filters

### Dimensions HF4R...09



### Mounting Pattern



Size	09	18	27		
Weight (lbs.)	10.0	14.5	18.6		
Dimensional charge are far general information and overall envelope size only. Weights listed are without element					

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

### Sizing Information

Total pressure loss through the filter is as follows:

Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$ 

#### **Housing Curve:**

Pressure loss through housing is as follows:

Housing  $\Delta P$  = Housing Curve  $\Delta P \times \frac{Actual Specific Gravity}{2.22}$ 

0.86

Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see sizing section on page 19)



### **Element K Factors**

ΔP Elements = Elements (K) Flow Factor x Flow Rate (gpm) x Actual Viscosity (SUS) x Actual Specific Gravity (From Tables Below) x 141 SUS 0.86

Sino	5.03.XXDBN					
Size	3 µm	5 µm	10 µm	20 µm		
09	0.1680	0.1405	0.0788	0.0443		
18	0.0800	0.0669	0.0375	0.0211		
27	0.0517	0.0432	0.0242	0.0136		

Size	5.03.XXD W/HC 25, 50, 74, 100, 149, 200 μm
09	0.007
18	0.004
27	0.002

All Element K Factors in psi / gpm.

## Low Pressure Filters

### **RKM Series Multi-functional Filters** 145 psi • up to 210 gpm



### Features

- RKM is a combination open loop return and closed loop suction boost filter in one housing.
- The return line flow of the operating hydraulics is fed to the filter via port A (inlet) and is cleaned by the filter element (full flow return line filtration). A pressure (standard = 7psi) is applied by the back-pressure valve V1. This insures that the filtered, precharged return line flow is available to the hydrostatic feed pump via ports B (full flow suction boost filtration). Excess fluid drained via the back-pressure valve to the tank (port T).
- A bypass valve V2 (standard = 36 psi) is incorporated to relieve excessive back-pressures in the element (important on cold starts). Flow from the tank can be drawn via the anti-cavitation valve to the suction side for a short time (emergency function).
- Full flow finest filtration (10  $\mu$ m, 15  $\mu$ m absolute) of return line and hydrostatic feed pump which extends the service life of your components.
- Outstanding cold start characteristics due to precharge via back pressure valve (standard = 7 psi).
- Due to the advanced RKM element technology and specially developed bypass valves, the lowest back-pressures can be achieved across the filter even at very low temperatures.
- One tank cutout for up to 6 suction and 3 return lines.
- Aluminum alloy is water tolerant anodization is not required for water based fluids (HWBF).

### Applications





Agricultural

I MA	
$\circ$ $ \circ$ $-$	

Construction

### Hydraulic Symbol



### **Technical Details**

Mounting Method	100 201 - 800	2 mounting holes 4 mounting holes					
Port Connection	Inlet / Outlet						
100 201/251 300	SAE-12 or 16 / SAE-12 or 16 SAE-20 / 2 x SAE-16 1 1/2" CS, Code 61-Split Flange (SF) (2 x 1 1/4" CS, Code 61 (SE)						
350 400/800	SAE-16 Suction / SAE-24 Return 2 1/2" SAE Flange, Code 61 / Various						
Flow Direction	Inlet: Side	Outlet: Side & bottom					
<b>Construction Mate</b>	rials						
Head Housing Lid	Aluminum Steel (100/201/251/350/400/800) Plastic (300) Plastic (100/201/251/350) Alum. (300/400/800)						
Flow Capacity							
100 201 251 300 350 400 800	26 gpm (100 lp 52 gpm (200 lp 66 gpm (250 lp 79 gpm (300 lp 92 gpm (350 lp 105 gpm (400 211 gpm (800	אח) ארס ארס ארס ארס ארס ארס ווווווווווווווו					
Housing Pressure	Rating						
Max. Oper. Press. Proof Pressure Fatigue Pressure Burst Pressure	145 psi (10 bai 218 psi (15 bai Contact HYDA Contact HYDA	) ) \C \C					
Element Collapse I	Pressure Ratin	g					
MM	145 psid (10 b	ar)					
Fluid Temp. Range	-22° to 250°F	(-30° to 121°C)					
Fluid Compatability Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.							
Indicator Trip Pres P = 29 psi (2 bar) -	sure 10% (standard)						
<b>Bypass Valve Crac</b> $\Delta P = 36 \text{ psid } (2.5 \text{ b})$ $\Delta P = 87 \text{ psid } (6 \text{ bar})$	king Pressure ar) +10% (standa ) +10% (optional)	ard) )					
Back Pressure Val $\Delta P = 7 \text{ psid } (0.5 \text{ back})$ $\Delta P = 43 \text{ psid } (3 \text{ back})$	ve Cracking Pr r) +10% (standar ) +10% (optional	essure d) )					

### Model Code

	$\frac{\mathbf{R}\mathbf{N}\mathbf{M}}{\mathbf{M}\mathbf{M}} = \frac{\mathbf{N}\mathbf{M}\mathbf{M}}{\mathbf{N}\mathbf{M}} = \frac{\mathbf{N}\mathbf{M}\mathbf{M}}{\mathbf{N}} = \mathbf{$
Filter Type	
Flement Media	
MM = Mobilemicron <sup>®</sup> (Low Collaspe)	
Size	
100, 201, 251, 300, 350, 400, 800	
Operating Pressure	
B = 145 psi	
Type of Port / Size of Suction Line Port	
T = 2x CS 1 1/4" Code 61 Split Flange (size 300 only)	Y = 1x SAE-12 (size 100 only)
V = 2x SAE-16 (sizes 201 & 251 only)	Z = According to customer specification
X = 1x SAE-16 (size 100 & 350 only)	
Type of Port / Size of Return Line Port —	
C = SAE-12 (size 100 only)	F = CS 1 1/2" (Code 61) (size 300 only)
D = SAE-16 (size 100 only)	G = SAE-24 (size 350 only)
E = SAE-20 (sizes 201 & 251 only)	Z = According to customer specification
For Sizes 400/800, see below. Other port sizes on request.	
Filtration Rating (microns)	
Type of Clogging Indicator	
0 = no indicator 1-8 = see Clogging Indica	tor Locations (next page)
Modification Number (the latest version is always supplied)	
Supplementary Details	
(omit) = standard (without anti-cavitation valve; seals	in NBR, bypass valve 2.5 bar, back-pressure valve 0.5 bar)
12 = SAE O-Ring Boss Ports	
NR = with anti-cavitation valve	
ND = with pressure release orifice	

NRD with anti-cavitation valve and with pressure release valve

- NRF125 with anti-cavitation valve and course filter strainer 125µm =
- UT = suitable for use when submersed in oil
- Fluroelastomer (FPM) =

RKM Multi-port 2x SAE-16 + 1x SAE-20 Return Ports, 2x SAE-Suction Ports MP4 =



Nitrile (NBR) (standard) Fluoroelastomer (FPM)

(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

#### Sizes 400/800

The identification of the port configuration is done by a nine digit code in the supplementary details. You determine the requested ports by entering an "X" for the required port in the individual cells of the table below, which has been illustrated with an example. Not configured (closed) ports are indicated by a "0". R = Return Line; S = Suction Line (Contact factory for availability). S4 R2 S5

Position in Code	1	2	3	4	5	6	7	8	9	
Port	R1	R2	R3	<b>S</b> 4	S5	S6	<b>S</b> 7	<b>S</b> 8	S9	•
SAE 2"	1									Ì
SAE 2 1/2"	2									R1 +
1"		1	1	А	А	1	1	А	А	l U
1 1/4"		2	2	В	В	2	2	В	В	
1 1/2"		3	3	С	С	3	3	С	С	4
Example according to	the table a	hove <b>Rk</b>		C 400 B7	7 15 Δ 1	0 / -12-1	0200220	0		-

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# **HYDAD** Low Pressure Filters

#### **Clogging Indicator Locations**













Type Code **Mounting Position of** Type of Clogging Measuring the Clogging Indicator Indicator on the filter inlet -1.0 return line before the filter element right-hand side, bottom on the filter inlet -2.0 before the filter element return line left-hand side, bottom on the filter outlet -3.0 after the filter element vacuum right-hand side, top on the filter outlet -4.0 after the filter element vacuum left-hand side, top Туре **Mounting Position of** Type of Clogging

Cod	le the Clogging Indicator	Indicator	modouring
1.0	on the filter inlet – opposite side	return line	before the filter element
2.0	on the filter inlet – left-hand side	return line	before the filter element
3.0	on the filter outlet – right-hand side	vacuum	after the filter element

Type Code	Mounting Position of the Clogging Indicator	Type of Clogging Indicator	Measuring
1.0	on the filter outlet – right-hand side	return line	before the filter element
2.0	on the filter outlet – left-hand side	return line	before the filter element

Type Code	Mounting Position of the Clogging Indicator	Type of Clogging Indicator	Measuring
1.0	on the filter inlet – left-hand side	return line	before the filter element
2.0	on the filter inlet – right-hand side	return line	before the filter element
3.0	on the filter outlet – left-hand side	vacuum	after the filter element
4.0	on the filter outlet – right-hand side	vacuum	after the filter element

Type Code	Mounting Position of the Clogging Indicator	Type of Clogging Indicator	Measuring
1.0	on the filter inlet – right-hand side	differential pressure	before and after element
2.0	on the filter inlet – left-hand side	return line	before and after element

Type Code	Mounting Position of the Clogging Indicator	Type of Clogging Indicator	Measuring
1.0	on the filter inlet – left-hand side, bottom	return line	before the filter element
2.0	on the filter inlet – right-hand side, bottom	return line	before the filter element
3.0	on the filter inlet – left-hand side, top	vacuum	after the filter element
4.0	on the filter inlet – right-hand side, top	vacuum	after the filter element

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#### **Function Diagram**

#### Anti-cavitation



# **HYDAD** Low Pressure Filters

#### **Dimensions RKM 100**



#### RKM 201 / 251



Size	100	201	251			
Weight (lbs.)	3.7	8.2	8.8			

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

**RKM 300** 

RKM 201 / 251 / -MP1



Size	201	251	300
Weight (lbs.)	8.2	8.8	10.1

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

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# **HYDAD** Low Pressure Filters

#### RKM 350

06.89" (Ø175mm) Hex 3.94" (100mm) 4 Places

Clearance Required for Element Removal 25' (635mm) 1-5/16-12UN per HN 28-05 1 7/8-12UN per HN 28-05 1.1' (28mm) Clogging Indicator Port 5.91" (150mm) 3.35" 3.39" (86mm) (85mm) ¥  $\Box$ 1.65" 1.73" (42mm) (44mm) Thermo Sensor Port 23.9" M14 x 1.5 (607mm) to ISO 6149 3.78" (96mm) 0.98" 3.52" (25mm) (89.5mm)

#### RKM 400 / 800



Size	350	400	800			
Weight (lbs.)	13.9	14.3	16.5			

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

Total pressure loss through the filter is as follows:

Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$ 

#### Housing Curve:

Pressure loss through housing is as follows:

Housing  $\Delta P$  = 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 section on page 19)



#### **Element K Factors**

△P Elements = Elements (K) Flow Factor x Flow Rate (gpm) x (From Tables Below) x Actual Specific Gravity 141 SUS 0.86

Size	RKMM				
Size	10 µm	15 µm			
0100	0.0964	0.0544			
0201	0.0398	0.0268			
0251	0.0379	0.0248			
0300	0.0324	0.0161			
0350	0.0165	0.0110			
0400	0.0299	0.0195			
0800	0.0207	0.0162			

All Element K Factors in psi / gpm.

## RFM...S & RFM...Set Series Inside Tank Return Line Filters

145 psi • up to 132 gpm





Typical Installation of Both Models

#### Features

- Unique design allows filter to be installed completely inside of the reservoir tank. This saves space, protects the filter, reduces leak points and reduces overall installation cost.
- Lightweight unit requiring no filter head reduces pressure drop while decreasing cost.
- Excellent option for low overhead clearance applications.
- Allows pre-filtration of new make-up oil assuring cleanliness of system.
- Contamination Basket prevents filtered contamination from re-entering the tank during element changeout on 330 & 500 size models.
- Simplifies element changeout procedure in the field.
- RFM Set configuration (tank plenum) allows for multiple returns to enter plenum without manifolding.

#### Installation

**RFM...SET:** Inside Tank Filters are installed into a separate chamber (see tank cutaway to the right) built into the reservoir tank via the filter ring and 4 bolts. More than one filter may be installed in the chamber if required for capacity. This procedure will require a hole to be cut into the top of the reservoir tank and an access cover fastened to the tank for each filter installed. The inlet piping for return should be connected through the tank wall into the separate chamber. A clip installed on the filter ring holds the element in place during filtration operations, and facilitates easy removal for element change out. A static pressure clogging indicator, to warn of high upstream pressure (element clogged), can be attached to the access cover. For additional information, consult factory.

RFM...S: Inside Tank Filters are installed to the top of the tank by welding the inner chamber to the tank cover (see tank cutaway to the right). This procedure will require a hole to be cut into the top of the reservoir tank and an access cover fastened to the tank. A smaller hole must be cut somewhere in the tank for the return line piping to pass through. The hole located in the side of the inner chamber must be directed towards the return line piping. The inlet piping for return should then be welded through the tank wall and to the inner chamber. The spring located between the element and the access cover provides force to hold element in place during filter operation. A static pressure indicator to warn of high upstream pressure, and if element is clogged can be attached to the access cover. Multiple filters can be installed in the tank. For additional installation information, consult factory.



#### **Technical Details**

Mounting Method	See Installation at le	əft
Port Connection	Outlet	
75/165/185 330/500	1.26" Smooth Port 2" NPT	
Flow Direction	Inlet: Side	Outlet: Bottom
<b>Construction Materials</b>		
Chamber Bowl Ring	Steel (75/165/185) Plastic Aluminum (330/500	)
Flow Capacity		
75 165 185 330 500	20 gpm (75 lpm) 43 gpm (165 lpm) 49 gpm (185 lpm) 87 gpm (330 lpm) 132 gpm (500 lpm)	
Housing Pressure Rating		
Max. Operating Pressure Proof Pressure Fatigue Pressure Burst Pressure	145 psi (10 bar) 218 psi (15 bar) 145 psi (10 bar) > 580 psi (40 bar)	
Element Collapse Pressure F	Rating	
BN/HC, W/HC ECO/N, BN/AM, P/HC, AM	290 psid (20 bar) 145 psid (10 bar)	
Fluid Temperature Range	-22° to 250°F (-30°	to 121°C)
Fluid Compatability		
Compatible with all petroleum with Fluoroelastomer or Ethyle for information on special hou	oils and synthetic flu one Propylene seals. sing and element co	uids rated for use Contact HYDAC Instructions

available for use with water glycols, oil/water emulsions, and HWBF.

#### Bypass Valve Cracking Pressure

 $\Delta P = 43 \text{ psid} (3 \text{ bar}) + 10\%$ 

 $\Delta P = 87 \text{ psid (6 bar)} + 10\%$ 

#### Model Code

	<u>RFM</u>	<u>BN/</u>	HC	<u>75</u>	<u>S</u>	<u>3</u> <u>N</u>	<u>/ 1.</u>	0
Series RFM = In-Tank Return Line Filter								
Element Media         BN/HC = Betamicron® (Low Collapse)         MM = Mobilemicron (Low Collapse)         W/HC = Wire Screen								
Size 75 165 330 500								
S       =       Inside Tank with shroud for welding and spring for element hold-down         SET       =       Inside Tank with Ring for bolt mounting and clip for element hold-down								
Filtration Rating (micron) 3, 5, 10, 20 = BN/HC, ECO/N 10, 15 = MM 10, 20 = P/HC 25, 74, 141 = W/HC								
Clogging Indicator W = Without Indicator (Indicators are installed on access cover on top of tank) (For additional details and options, see Clogging Indicators section.)								
Modification Number (latest version always supplied)								
Seals (omit) = Nitrile (NBR) (standard) V = Fluoroelastomer (FPM)								
SUpplementary Details SO103H= Modification of Elements for use with Phosphate Ester Fluids								

#### **Replacement Element Model Code**

Size	<u>0330</u> R <u>010</u> <u>BN4</u>	<u>HC</u> / <u>V</u>
0075, 0165, 0330, 0500		
Filtration Rating (micron) 3, 5, 10, 20 = BN4HC, ECO/N 10, 15 = MM 25, 74, 141 = W/HC		
Element Media BN4HC, ECO/N, P/HC, W/HC, MM		
Supplementary Details		

(omit) standard Fluoroelastomer (FPM) seals

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

# **HYDAD** Low Pressure Filters



Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

Total pressure loss through the filter is as follows: Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$  **Housing Curve:** Pressure loss through housing is as follows: Housing  $\Delta P$  = 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 section on page 19)

#### **Element K Factors**

ΔP Elements = Elements (K) Flow Factor x Flow Rate (gpm) x Actual Viscosity (SUS) x Actual Specific Gravity (From Tables Below) x 141 SUS 0.86

0:	RBN4HC (Betamicron <sup>®</sup> Low Collapse)					
Size	3 µm	5 µm	10 µm	20 µm		
0075	1.209	0.780	0.445	0.241		
0165	0.616	0.430	0.245	0.133		
0330	0.232	0.150	0.093	0.066		
0500	0.162	0.104	0.069	0.044		

Ci	RECO/N					
Size	3 µm	5 µm	10 µm	20 µm		
0165	0.674	0.369	0.321	0.220		
0330	0.228	0.156	0.135	_		

Size	RΡ/HC (Paper) 10, 20 μm
0075	0.156
0165	0.086
0330	0.037
0500	0.024

Size	RW/HC (Wire Screen) 25, 50, 74, 100, 149, 200 μm
0075	0.043
0165	0.020
0330	0.010
0500	0.007

Sizo	ВММ					
Size	10 µm	15 µm				
0075	0.265	0.166				
0165	0.146	0.091				
0330	0.078	0.049				
0500	0.052	0.032				

All Element K Factors in psi / gpm.

**RFL Cast Series Inline Filters** 360 psi • up to 350 gpm



#### Hydraulic Symbol



#### Features

- Models 851 and 1301 are made of ductile cast iron and consist • of a two part filter housing with bolt-on cast iron lid. The two part construction makes it possible to arrange the inlet and outlet either one above the other on one side or, by turning the base part 180°, on opposite sides of the housing.
- Inlet/outlet ports for models 851 and 1301 comply with SAE 4-bolt flange Code 61 configuration.
- Clogging indicators have no external dynamic seal. High reliability is achieved and magnetic actuation eliminates a leak point.

#### **Technical Details**

Mounting Method	Support by means of pipe clamps
Port Connection	
851 1301	SAE-48 Flange, Code 61 SAE-64 Flange, Code 61
Flow Direction	Inlet: Side Outlet: Side
Construction Materials	
Head, Lid, Elbow	Ductile iron
Flow Capacity	
851 1301	225 gpm (850 lpm) 343 gpm (1300 lpm)
Housing Pressure Rating	
Max. Operating Pressure Proof Pressure Fatigue Pressure Burst Pressure	360 psi (25 bar) 540 psi (38 bar) 360 psi (25 bar) > 1440 psi (100 bar)
Element Collapse Pressure Ra	ating
BN/HC, W/HC ECO/N, BN/AM, P/HC, AM	290 psid (20 bar) 145 psid (10 bar)
Fluid Temperature Range	-22° to 250°F (-30° to 121°C)
Fluid Compatability	
Compatible with all petroleum of for use with Fluoroelastomer of Contact HYDAC for information constructions available for use emulsions, and HWBF.	bils and synthetic fluids rated Ethylene Propylene seals. In on special housing and element with water glycols, oil/water
Indicator Trip Pressure	
$\Delta P$ = 29 psid (2 bar) -10% $\Delta P$ = 72 psid (5 bar) -10%	
Bypass Valve Cracking Press	ure
$\Delta P = 43 \text{ psid } (3 \text{ bar}) +10\%$ $\Delta P = 87 \text{ psid } (6 \text{ bar}) +10\%$	

#### Applications



Automotive



Pulp & Paper



Shipbuilding



Industrial

Power Generation



Steel / Heavy Industry



#### Model Code

		<u>RFL</u>	<u>BN/HC</u>	<u>851</u>	<u>D</u> <u>P</u>	<u>3 A</u>	<u>1.X</u>	<u>( / )</u>	!
Filter Type RFL = Inline Filter									
Element Media BN/HC = Betamicron® (Low Collapse) AM = Aquamicron® P/HC = Polyester	ECO/N = ECOmicron <sup>®</sup> (Low Collapse) BN/AM = Betamicron <sub>®</sub> /Aquamicron <sup>®</sup> W/HC =Wire Screen								
851 = SAE 48 Flange with m 1301 = SAE 64 Flange	etric threads								
Operating Pressure D = 363 psi (25 bar)									
N         =         SAE DN 80 3" (size 851)           P         =         SAE DN 100 4" (size 1301)									
Filtration Rating (microns) 3, 5, 10, 20 = BN/HC, ECO/N 10, 20, = P/HC	3, 10 = BN/AM 40 = 7 25, 74, 149 = W/HC	۹M							
<b>Type of</b> ∆ <b>P Clogging Indicator</b> A, B/BM, C, D									
Type Code1									
Modification Number (latest version alway	rs supplied) —————————								
Seals (omit) = Buna N (NBR)(standard) V = Fluoroelastomer (FPM) EPR = Ethylene Propylene (EPDM)									
Bypass Valve Cracking Pressure(omit) =43 psid (3 bar) (return lineKB =no bypass (flushing systemB6 =87 psid (6 bar) (return lineB1 =15 psid (1 bar) (lubricationB0.2 =3 psid (0.2 bar) (pump inle	- standard) )) - extended service life)not available wit or coolant application) t)	¦h ECO∕№	N						
Supplementary									

W = Indictor with brass piston (for water base fluids)

SO103H = Modification of BN4HC Elements for Phosphate Ester Fluids

L24, L48, L110, L220 = Lamp for D-type clogging indicator (LXX, XX = voltage)



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# **YDAC** Low Pressure Filters

#### **Dimensions**



		ы	H	H1	H2	H3	H4	D	D1	(lbs)
RFL 7.56" 851 (192mm)	10.47" (266mm)	4.18" (106.4mm)	24.1" (612mm)	16.5" (420mm)	2.66" (67.5mm)	9" (230mm)	2.44" (61.9mm)	6.77" (172mm)	M16	84.7
RFL 8.78" 1301 (223mm)	11.26" (286mm)	5.13" (130.2mm)	27.99" (711mm)	19.69" (500mm)	3.18" (81mm)	9.84" (250mm)	3.06" (77.8mm)	8.66" (220mm)	M16	122.1

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

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Total pressure loss through the filter is as follows: Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$  **Housing Curve:** Pressure loss through housing is as follows: Housing  $\Delta P$  = Housing Curve  $\Delta P \ge \frac{\text{Actual Specific Gravity}}{0.86}$ Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see sizing section on page 19)





#### **Element K Factors**

△P Elements = Elements (K) Flow Factor x Flow Rate (gpm) x Actual Viscosity (SUS) x Actual Specific Gravity (From Tables Below) x 141 SUS 0.86

0:	RBN4HC (Betamicron <sup>®</sup> Low Collapse)					
Size	3 µm	5 µm	10 µm	20 µm		
0850	0.082	0.055	0.036	0.023		
1300	0.045	0.032	0.024	0.014		

<b>C</b> i=0	RECO/N (ECOmicron®)						
Size	3 µm	5 µm	10 µm	20 µm			
0850	0.078	0.053	0.046	0.032			
1300	0.049	0.034	0.029	0.020			

Sizo	RP/H0	C (Polyester)	Size	SizeRW/HC (Wire Screen)		RBN/AM		
0120	10 µm	20 µm	0120	25, 74, 149 µm	Size	(Betamicron	<sup>®</sup> /Aquamicron <sup>®</sup> )	
0850	0.012	0.012	0850	0.0038		3 µm	10 µm	
1300	0.007	0.007	1300	0.0027	1300F	0.088	0.033	

All Element K Factors in psi / gpm.

## **RFL Welded Series**

**Inline Filters** 





#### Features

- Models 1300 to 15000 are made of rolled steel housings with bolt-on steel lids; Stainless steel models are available.
- ANSI flange connections for each filter size provide maximum connection flexibility eliminating additional adapters and intermediate flanges.
- Inlet and outlet connections are located on opposite sides • of the housings.
- Clogging indicators have no external dynamic seal. High • reliability is achieved and magnetic actuation eliminates a leak point.

#### Hydraulic Symbol



#### **Technical Details**

Mounting Method	Floor mounted legs				
Port Connection					
1300/1320 2500/2520 4000/4020 5200 - 7820 15000/15020	4" ANSI 150# Flange 6" ANSI 150# Flange 8" ANSI 150# Flange 10" ANSI 150# Flange 12" ANSI 150# Flange				
Flow Direction	Inlet & Outlet: Side				
Construction Materials					
Housing, Lid Note: Please contact factory for availa	Steel able stainless steel models.				
Flow Capacity					
1300/1320 2500/2520 4000/4020 5200/5220 6500/6520 7800/7820 15000/15020	350 gpm (1300 lpm) 650 gpm (2500 lpm) 1050 gpm (4000 lpm) 1400 gpm (5200 lpm) 1700 gpm (6500 lpm) 2050 gpm (7800 lpm) 4000 gpm (15000 lpm)				
Housing Pressure Rating					
Max. Operating Pressure Proof Pressure Fatigue Pressure Burst Pressure	150 psi (10 bar) <i>(standard)</i> 230 psi (16 bar) <i>(optional)</i> 345 psi (24 bar) Contact HYDAC Contact HYDAC				
Element Collapse Pressure Rat	ing				
BN/HC, W/HC ECO/N	290 psid (20 bar) 145 psid (10 bar)				
Fluid Temperature Range	-22° to 250°F (-30° to 121°C)				
Fluid Compatability					
Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.					
Indicator Trip Pressure					
$\Delta P$ = 29 psid (2 bar) -10% (standard) $\Delta P$ = 72 psid (5 bar) -10% (optional)					
Bypass Valve Cracking Pressur	e				
$\Delta P = 43 \text{ psid} (3 \text{ bar}) +10\% (standa)$ $\Delta P = 87 \text{ psid} (6 \text{ bar}) +10\% (option)$	rd) al)				

#### Applications





Industrial





Pulp & Paper







Steel / Heavy Industry

#### Model Code

<u>RFL BN/HC 1300 C T 10 D 1 . 1 / S 150</u>	<u>V</u> _ DH
Filter Type	
Element Media	
BN/HC = Betamicron <sup>®</sup> (Low Collapse) ECO/N = ECOmicron <sup>®</sup> (Low Collapse)	
AM = Aquamicron <sup>®</sup> BN/AM = Betamicron <sup>®</sup> /Aquamicron <sup>®</sup>	
P/HC = Polyester W/HC = Wire Screen	
Size	
1300/ 1320/ 2520/ 4000/ 4020/ 5220/ 5220/ 6500/ 6520/ 7800/ 7820/ 15000/ 15020	
Operating Pressure	
B = 150 psi (10 bar)	
C = 230  psi (16  bar)	
Type of Connection	
2 = 2" ANSI Flange (sizes 1300) L = DN 50 (sizes 1300 - 2520)	
4 = 3" ANSI Flange (sizes 1300 & 1320) S = SAE/DIN DN 80 (sizes 1300 - 5220)	
5 = 4" ANSI Flange (sizes 1320 & 2520) T = SAE/DIN DN 100 (sizes 1300 - 7820)	
7 = 6" ANSI Flange (sizes 2500 & 2520) V = DN 150 (sizes 2500 - 7820)	
8 = 8" ANSI Flange (sizes 4000 & 4020) W = DN 200 (sizes 4000 - 15020)	
9 = 10" ANSI Flange (sizes 5000 - 7820) X = DN 250 (sizes 5200 - 15020)	
10 = 12" ANSI Flange (sizes 15000 & 15020) Y = DN 300 (sizes 15000 & 15020)	
Filtration Rating (microns)	
3, 5, 10, 20 = BN/HC, ECO/N 3, 10 = BN/AM 40 = AM 10, 20 = P/HC 25, 74, 149 = W/HC	
Type of ΔP Clogging Indicator	
Type Code	
In a second	
Country of lostallation	
(mit) - standard (non coded)	
S = ASME Coded with "1" Stamp	
(mit) – DIN Elange Connection to DIN 2501/1	
150 = 150  lbs ANSI Flange	
(mit) = Buna-N V = Fluoroelastomer (FPM)	
Rynass Value Cracking Pressure	
(mit) - 43 psid (3 bar) (return line - standard)	
B6 = 87 psid (6 bar) (return line - extended service life)	
KB = no bypass	
Supplementary	
(omit) = Cover Lifting Device (Handle only)	
DH = Cover Lifting Device (David lifting mechanism for sizes 4000 and larger, style may vary)	

L24, L48, L110, L220 = Lamp for D-type clogging indicator (LXX, XX = voltage)

W = Indictor with brass piston (for water base fluids) SO103H = Modification of BN4HC Elements for Phosphate Ester Fluids

**Replacement Element Model Code** 1300 R 010 BN4HC / V Size 0850, 1300, 1700, 2600 Filtration Rating (micron) -3, 5, 10, 20 = BN4HC, ECO/N 10, 20 = P/HC 3, 10 = BN/AM 25, 74, 149 = W/HC 40 = AMElement Media -BN4HC, ECO/N, P/HC, BN/AM, W/HC, AM Supplementary Details (omit) = standard V = Fluoroelastomer (FPM) seals



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# **HYDAD** Low Pressure Filters

#### Dimensions RFL 1300 - 1320

Vent









Size	Weight	В	D1	D2	H1	H3	H4	H5
2500 / 2520	340 / 400	18.3" (466mm)	9.8" (250mm)	10.7" (273mm)	47.98/63.33" (1218.6/1608.6mm)	17.2" (438mm)	14.4" (365mm)	6.9/25.8" (175/565mm)
4000 / 4020	570 / 675	23.6" (600mm)	13.0" (330mm)	14.0" (356mm)	54.04/69.39" (1372.6/1762.6mm)	20.7" (525mm)	14.4" (365mm)	9.3/24.6" (235/625mm)
5200 / 5220	790 / 970	26.0" (660mm)	15.0" (380mm)	16.0" (406mm)	58.6/76.09" (1492.6/1932.6mm)	22.0" (560mm)	17.7" (450mm)	9.3/26.6" (236/676mm)
6500 / 6520 7800 / 7820	1040 / 1255 1055 / 1290	30.7" (780mm)	18.9" (480mm)	20.0" (508mm)	60.97/78.29" (1548.6/1988.6mm)	23.6" (600mm)	17.7" (450mm)	9.8/27.2" (250/690mm)
15000 / 15020	2085 / 2470	39.4" (1000mm)	27.2" (690mm)	28.0" (711mm)	65.5/82.82" (1663.6/2103.6mm)	26.4" (670mm)	20.3" (515mm)	9.3/26.6" (235/675mm)
Dimonoiono obourn ara	for according	action and aver	المعاملة بمعامد	a anh Mainh	to listed and with suit slams.			

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

Total pressure loss through the filter is as follows:

Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$ 

#### Housing Curve:

Pressure loss through housing is as follows:

Housing  $\Delta P$  = 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 section on page 19)



#### **Required Element Per Housing**

Housing Size	Element Size	Elements per Side
1300 / 1320	1300 / 2600	1/1
2500 / 2520	0850 / 1700	3/3
4000 / 4020	0850 / 1700	5/5
5200 / 5220	1300 / 2600	4 / 4
6500 / 6520	1300 / 2600	5/5
7800 / 7820	1300 / 2600	6 / 6
15000 / 15020	1300 / 2600	10 / 10

#### **Element K Factors**

ΔP Elements = Elements (K) Flow Factor x Flow Rate (gpm) x (From Tables Below) x Actual Viscosity (SUS) x Actual Specific Gravity 141 SUS 0.86

0:	RBN4HC (Betamicron <sup>®</sup> Low Collapse)			Sizo		RECO/N				
Size	3 µm	5 µm	10 µm	20 µm		Size	3 µm	5 µm	10 µm	20 µm
0850	0.082	0.055	0.036	0.023		0850	0.078	0.053	0.046	0.032
1300	0.045	0.032	0.024	0.014		1300	0.049	0.034	0.029	0.020
1700	0.040	0.029	0.018	0.011		1700	0.038	0.026	0.023	-
2600	0.023	0.016	0.011	0.007		2600	0.024	0.017	0.014	0.010
			Saraa	n)			D D/U	C (Papar)		

Size	RBN/AM		SizeRW/HC (Wire Screen)		RAM	Size	RP/HC (Paper)	
Oize	3 µm	10 µm	0120	25, 50, 74, 100, 149, 200 μm	OIZC	040A	0120	10, 20 µm
1200	0 000	0.022	0850	0.004	0850	0.074	0850	0.012
1300	1300 0.088		1300	0.003	1200	0.049	1300	0.007
0000	0.050	0.010	1700	0.002	1300	0.046	1700	0.006
2600	0.052	0.019	2600 0.	0.001	2600	0.024	2600	0.003

All Element K Factors in psi / gpm.

# **YDAE** Low Pressure Filters

**FLN Series Inline Filters** 360 psi • up to 100 gpm



#### Hydraulic Symbol



#### Features

- Aluminum alloy is water tolerant anodization is not required for • high water based fluids (HWBF).
- Non-welded housing design reduces stress concentrations and • prevents fatigue failure.
- SAE straight thread O-ring boss porting to allow easy installation without costly adapters.
- O-ring seals are used to provide positive, reliable sealing.
- Screw-in bowl mounted below the filter head requires minimal clearance to remove the element for replacement. and contaminated fluid cannot be washed downstream when element is serviced.
- Differential Pressure Indicators. HYDAC indicators have no external dynamic seal. This results in a high system reliability due to magnetic actuation, thus eliminating a potential leak point.
- A poppet-type bypass valve (optional) is mounted in-line between the inlet and outlet ports to provide positive sealing during normal operation and fast opening during cold starts and flow surges.

#### Applications





Agricultural



Automotive











Gearboxes

#### **Technical Details**

Mounting Method	2 mounting holes in th	ne filter head				
Port Connection	SAE-20 (1-5/8-12UN)					
Flow Direction	Inlet: Side	Outlet: Side				
Construction Materials						
Head, Bowl	Aluminum					
Flow Capacity						
160 250 400	43 gpm (160 lpm) 66 gpm (250 lpm) 150 gpm (400 lpm)					
Housing Pressure Rating						
Max. Operating Pressure Proof Pressure Fatigue Pressure Burst Pressure	360 psi (25 bar) 540 psi (38 bar) 360 psi (25 bar) Contact HYDAC office	e				
Element Collapse Pressur	e Rating					
BN/HC, W/HC Fluid Temperature Range	290 psid (20 bar) -22° to 250°F (-30° to	121°C)				
Fluid Compatability						
Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBE						
Indicator Trip Pressure						
$\Delta P = 29 \text{ psid } (2 \text{ bar}) -10\%$ $\Delta P = 72 \text{ psid } (5 \text{ bar}) -10\%$ $\Delta P = 116 \text{ psid } (8 \text{ bar}) -10\%$						
Bypass Valve Cracking Pr	essure					
$\Delta P = 43 \text{ psid} (3 \text{ bar}) +10\%$						

 $\Delta P = 102 \text{ psid} (7 \text{ bar}) + 10\%$ 

# Low Pressure Filters HYDAC

#### Model Code

<u>FLN BN/HC 250 D E 10 A 1 . X / 12 - V - B3 </u>
Filter Type       FLN = Inline filter
Element Media
Size
160, 250, 400
D = 360 psi (25 bar)
Port Type / Size E = SAE-20 (1 1/4")
Filtration Rating (micron)           3, 6, 10, 25 = BN/HC           25, 50, 100, 200 = W/HC
Type of ∆P Clogging Indicator         A, B/BM, C, D
Type Code
Modification Number (the latest version is always supplied)
Port Configuration
12 = SAE straight thread inlet/outlet connections
V = Fluoroelastomer (FPM) (standard)
Bypass Valve         (omit)       =       no bypass (optional)         B3       =       43 psid (3 bar) (standard)         B7       =       101.5 psid (7 bar) (optional)
Supplementary Details

- W = suitable for oil-water emulsions (HFA, HFC), NBR seals, *(refers exc* A2.2 = 32 psi (2.2 bar) Indicator trip setting
- $30C = 86^{\circ}F(30^{\circ}C)$  Indicator thermal lockout

**Replacement Element Model Code** 

SO184 = Bowl drain plug

#### 



V

- (omit) = standard
  - = Fluoroelastomer (FPM) seals



**Underwrighters Approval** (VM, VD types C, D, J, and J4 only) – CRUUS = Electrical Indicators (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

## www.comosile. WATIVE FLUID POWER (HYDAD) 96

# **HYDAC** Low Pressure Filters

#### Dimensions



Size	160	250	400				
Weight (lbs.)	4.3	4.9	5.9				
Dimensions shown are for general information and overall envelope size only. Weights listed are without element							

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

Total pressure loss through the filter is as follows: Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$ Housing Curve:

Pressure loss through housing is as follows:

Housing  $\Delta P$  = Housing Curve  $\Delta P \times \frac{Actual Specific Gravity}{2.22}$ 

Housing  $\Delta P$  = Housing Curve  $\Delta P \times 0.86$ Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see sizing section on page 19)



#### **Element K Factors**

ΔP Elements = Elements (K) Flow Factor x Flow Rate (gpm) x Actual Viscosity (SUS) x Actual Specific Gravity (From Tables Below) x 141 SUS 0.86

Size	DNBN/HC							
	3 µm	5 µm	10 µm	25 µm				
0160	0.439	0.306	0.202	0.143				
0250	0.275	0.178	0.111	0.091				
0400	0.178	0.110	0.073	0.055				

All Element K Factors in psi / gpm.

#### **NFH Series Modular Inline Return Line Filters** 500 psi • up to 450 gpm





#### Features

- Top access for easy element changeout. •
- All models have an air bleed valve (vent) installed in the lid. •
- Single large element with no leak points for highest efficiency • and dirt capacity
- Lid with swing bolts for fast servicing without tools •
- Drain port (Far side) SAE 12 (3/4") •
- Clogging Indicator for local and/or remote signals •
- Easily banked in parallel (manifolded) for high viscosity • applications.
- Available with Betafit elements consult HYDAC.`



#### **Technical Details**

Mounting Method						
NFH 2 mounting holes - filter head						
NFH Manifold	Floor mounting brackets					
Port Connection	SAE-64 Flange Code 61					
Flow Direction	Inlet: Side Outlet: Bottom					
Construction Materials						
Head, Lid, Elbows, Manifolds Housing	Ductile Iron Steel					
Flow Capacity						
1300 2600, 5200, 7800, 10400	343 gpm (1300 lpm) 450 gpm (1700 lpm)					
Housing Pressure Rating						
Max. Operating Pressure Proof Pressure Fatigue Pressure Burst Pressure	500 psi (35 bar) 750 psi (52 bar) 500 psi (35 bar) > 1440 psi (100 bar)					
Element Collapse Pressure Ra	ting					
BN/HC. W/HC	290 psid (20 bar)					
ECO/N, BN/AM, P/HC, AM	145 psid (10 bar)					
Fluid Temperature Range	-22° to 250°F (-30° to 121°C)					
Fluid Compatability						
Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.						
Indicator Trip Pressure						
$\Delta P$ = 29 psid (2 bar) -10% (standard) $\Delta P$ = 72 psid (5 bar) -10% (optional)						
<b>Bypass Valve Cracking Pressu</b>	re					
$\Delta P = 43 \text{ psid } (3 \text{ bar}) +10\%$ $\Delta P = 87 \text{ psid } (6 \text{ bar}) +10\%$						

#### **Applications**



Pulp & Paper



Gearboxes

Shipbuilding







Industrial



Power Generation



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#### Model Code

	1	<u>NFH BN/HC</u>	<u>5200</u>	ĘΡ	<u>5 C</u>	1.1	<u> </u> / <u>16</u>	Ą	<u>V</u> <u>B</u> 1	<u> </u>
Filter Type NFH = In-line Return Line Filter										
Element Media										
BN/HC = Betamicron <sup>®</sup> (Low Collapse)	ECO/N = ECOmicron <sup>®</sup> (l	ow Collapse)								
AM = Aquamicron <sup>®</sup>	BN/AM = Betamicron <sup>®</sup> A	Aquamicron®								
P/HC = Polyester	W/HC = Wire Screen									
Size										
1300 = Single NFH	7800 = Manifold: 3 size	2600 Housings								
2600 = Single NFH	10400 = Manifold: 4 size	e 2600 Housings								
5200 = Manifold: 2 size 2600 Housings										
<b>Operating Pressure</b> F = 500 psi (34 bar)										
Type of Connection										
P = SAE DN 100 (4") flange										
Filtration Rating (microns)										
3, 5, 10, 20 = BN/HC, ECO/N	10, <u>20</u> = P/HC 3,	, 10 = BN/AM								
25, 74, 149 = W/HC	40 = AM									
Type of ∆P Clogging Indicator ———										
A, B/BM, C, D										
Type Number										
1										
Modification Number (latest version alway	s supplied) ————									
Port Configuration										
16 = SAE-64, (4'') Code 61 Fla	nge									
Flow Path (facing connecting manifold) —				1						
(omit) = Sizes 1300 and 2600 only	C	= Left inlet, Right	outlet	(sizes 5	200 - 104	00 only)				
A = Left Inlet, Left Outlet (sizes 52)	)0 - 10400 only) D	= Right Inlet, Left	outlet							
Seals	V - Elugraplastomor (EB			nylono					-	
Bypass Valvo			yleneric	pyierie						
(omit) – 43 nsid Bypass (standard)										
B1 – 15 psid Bypass (standard)										
B6 = 87  psid Bypass										
KB = No Bypass not ava	ilable with ECO/N									
Supplementary Details										
L24, L48, L110, L220 = Lamp for D-typ	e clogging indicator (LXX,	XX = voltage)								

- T100 = Indicator Thermal Lockout, 100°F (*C and D only*) S0103H - Modification of BN/HC and P/HC Elements for Phosphate Este
- S0103H = Modification of BN4HC and P/HC Elements for Phosphate Esters



**Clogging Indicator Model Code** <u>VM 2 B.X</u>/ Indicator Prefix -= G 1/2 3000 psi VM **Trip Pressure** -= 29 psid (2 bar) = 72 psid (5 bar) 2 5 (optional) Type of Indicator -= no indicator, plugged port Visual pop-up (auto/manual reset)
 Electric switch B/BM С Ď = Electric switch and light **Modification Number** Supplementary Details Seals (omit) = Nitrile (NBR) (standard)

 V
 = Fluoroèlastômer (FPM)

 Light Voltage (D type indicators only)

 L24
 = 24V

 L10
 = 110V

 Thermal Lockout (VM, VD types C, D, J, and J4 only)

#### T100 = Lockout below 100°F Underwrighters Approval (VM, VD types C, D, J, and J4 only)

CRUUS = Electrical Indicators (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

## www.comosoloomATIVE FLUID POWER (HYDAC) 100

# **YDAC** Low Pressure Filters

#### **Dimensions** NFH 1300 / 2600



(922mm) 哥 ħ Ø 伯 LT i 52.75" (1340mm) 8 69" (221mm) 3 94" (100mm) Ρģ DQ 5.90" 11.81' (300mm) \_\_\_\_\_25.12" (150mm) (638mm)



NFH 7800

36.30" (922mm) P C C Ż 偂 Ø 52.75" (1340mm) 8.69 (221mm) 3.94" (100mm) μι Щ 5.90" 11.81 13.70" (150mm) (300mm) (348mm) 34.21' (869.2mm)

#### NFH 10400 (Consult HYDAC)

Size	1300	2600	5200	7800	10400
Weight (lbs.)	83	109	343	458	658

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

Clearance Required for Element Removal

# NFH 5200 Clearance Required for Element Removal 36.30"

#### HYDAC INNOVATIVE FLUID POWERomoso.com 101

Total pressure loss through the filter is as follows:

Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$ 

#### **Housing Curve:**

Pressure loss through housing is as follows:

Housing  $\Delta P$  = Housing Curve  $\Delta P \times \frac{Actual Specific Gravity}{2}$ 

0.86

The curve below shows the clean  $\Delta P$  through the Housing for a single filter. To determine Clean  $\Delta P$  for manifolds with multiple housings, multiply the Clean  $\Delta P$  curve value by the percentage values in the table.



Multiplier
73%
61%
48%

Evample

Livallible				
Conditions				
400 gpm flow NFH 5200 manifold specified				
∆P Curve	= 2 psid			
ΔP 5200	= 2 psid X 0.73			
	= 1.5 psid Piping & Housing			
$\Delta P$ Total System = 1.5 psid + $\Delta P$ Element				

#### 1300 / 2600 Bypass Valve



#### **Bypass Valve Curve:**

Curves shown are applicable for mineral oil with a specific gravity of 0.86. Differential pressure increases in proportion to the specific gravity of the fluid.

 $\Delta P$  Valve =  $\Delta P$  Curve x Actual Specific Gravity 0.86

#### Element $\Delta P$ Calculations:

Sizing (K) Flow Factors below show the pressure drops across clean elements (excluding housings and piping). (K) Factors are calculated from mineral based fluid at viscosity of 141 SUS and specific gravity of 0.86. To determine clean  $\Delta P$  for NFH manifolds with more than one housing, use the adjusted (K) factors below and multiply by total flow rate.

#### Example

Conditions Lube system Viscosity of 1,000 SUS Specific gravity 0.86 75 gpm flow Low pressure drop essential 10 µm Betamicron® filter element

Selection

An NFH 2600 filter gives an Adjusted Clean element  $\Delta P$ as follows: Clean  $\Delta P$  = 75 gpm x 0.011 = 0.825 psid Clean  $\Delta P_{adj} = 0.825 \text{ x } 1000 = 5.85 \text{ psid}$ 141

#### **Element K Factors**

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

Housing	# of	Sizo	RBl	N4HC (Betam	nicron® Low C	ollapse)	RECO/N (ECOmicron®)				
Size	Elements	Size	3 µm	5 µm	10 µm	20 µm	3 µm	5 µm	10 µm	20 µm	
1300	1	1300	0.045	0.032	0.024	0.014	0.049	0.034	0.029	0.020	
2600	1	2600	0.023	0.016	0.011	0.007	0.024	0.017	0.014	0.010	
5200	2	2600	0.012	0.008	0.006	0.004	0.012	0.009	0.007	0.005	
7800	3	2600	0.008	0.006	0.004	0.002	0.008	0.006	0.005	0.003	
10400	4	2600	0.006	0.004	0.003	0.002	0.006	0.004	0.004	0.003	

Housing	# of	0:	RE	BN/AM	RP/HC (Paper)	RW/HC (Wire Screen)
Size	Elements	Size	3 µm 10 µm		10 µm	25, 50, 100, 200 µm
1300	1	1300	0.088	0.033	0.007	0.0027
2600	1	2600	0.052	0.019	0.003	0.0011
5200	2	2600	0.026	0.010	0.002	0.0005
7800	3	2600	0.017	0.006	0.001	0.0004
10400	4	2600	0.013	0.005	0.0008	0.0003

All Element K Factors in psi / gpm.

## www.comosileenvative fluid power (HYDAC) 102

**RFLD Cast Series** Inline Duplex Filters 580 psi • up to 340 gpm



#### Hydraulic Symbol



#### Features

- Inlet and outlet connections are located on the same side of the transfer valve. Inlet on top and the outlet on bottom.
- Inlet and outlet connections are available with SAE flanged or NPT connections (sizes 111 & 241 only).
- Transfer valve and pressure equalization line allows easy changeover between filter housings without costly system shutdown. (standard with 851 & 1301)
- Clogging indicators have no external dynamic seal. High reliability is achieved and magnetic actuation eliminates a leak point.

#### **Technical Details**

Mounting Method Mounting holes on rear of transfer valve					
Port Connection	With metric threads				
111	1" SAE 16 (DN25)				
241	1 1/2" SAE 24 (DN40	))			
501	2" SAE 32 (DN50)				
851	2 1/2" SAE 40 (DN6	5)			
1001	3" SAE 48 (DN80)				
1301	3" SAE 48 (DN80)				
	4" SAE 64 (DIN100)				
Flow Direction	Inlet: Front Top	Outlet: Front Bottom			
Construction Materials	5				
Head, Lid, Elbow	Ductile iron				
Flow Capacity					
111	29 gpm (110 lpm)				
241	63 gpm (240 lpm)				
501	132 gpm (500 lpm)				
851	225 gpm (850 lpm)				
1301	343 gpm (1300 lpm)				
Housing Press. Rating	111 - 241	501 - 1301			
Max. Oper. Pressure	580 psi (40 bar)	360 psi (25 bar)			
Proof Pressure	870 psi (60 bar)	540 psi (38 bar			
Patigue Pressure	580 psi (40 bar)	360 psi (25 bar)			
	>2320 psi (100 bai)	>1440 psi (100 bai)			
Element Collapse Pres	sure Rating				
BN/HC, W/HC		290 psid (20 bar)			
ECO/N, BN/AM, P/HC, A	۹M	145 psid (10 bar)			
Fluid Temp. Range	-22° to 250°F (-30° t	o 121°C)			
Fluid Compatability					
Compatible with all petr	oleum oils and synth	etic fluids rated			
for use with Fluoroelast	omer or Ethylene Pro	pylene seals.			
Contact HYDAC for info	rmation on special he	ousing and element			
constructions available	for use with water gly	cols, oil/water			
emulsions, and HWBF.					
Indicator Trip Pressure	•				
$\Delta P = 29 \text{ psid} (2 \text{ bar}) - 10$	%				
$\Delta P = 72 \text{ psid} (5 \text{ bar}) - 10^{\circ}$	%				
Bypass Valve Cracking	Pressure				
$\Delta P = 43 \text{ psid} (3 \text{ bar}) + 10$	%				
$\Delta P = 87 \text{ psid} (6 \text{ bar}) + 10$	%				

#### **Applications**



Automotive



Pulp & Paper





Railways



Steel / Heavy Industry

Power Generation

Industrial

#### Model Code

		<u>RFLD</u> <u>BN/HC</u>	<u>1301 D /</u>	<u>A T 10 D</u>	<u>1 . X / Y</u>
Filter Type					
RFLD = Duplex Inline Filter					
Element Media					
BN/HC = Betamicron <sup>®</sup> (Low Collapse)	ECO/N = ECOmicron® (Lo	w Collapse)			
AM = Aquamicron <sup>®</sup>	BN/AM = Betamicron®/Aq	uamicron®			
P/HC = Polyester	W/HC = Wire Screen				
Sizes					
111, 241, 501, 851, 1301					
Operating Pressure					
D = 25 bar (sizes 501, 851, 1301	)				
E = 40  bar (sizes 111, 241)					
Type of Change-over				j	
A = ball type change-over va	lve				
Type of Connection / Connection Size	·s				
I = SAF DN 25 1" (size 111 only)	M = SAF DN 65 2 1/2	" (size 851 only)			
K = SAF DN 40.1 1/2" (sizes 241, 501)	S = SAF DN 80.3" (si	zes 851, 1301)			
L = SAE DN 50 2" (sizes 501 only)	T = SAE DN 100 4" (s	size 1301 only)			
Filtration Bating (microns)					
3.5.10.20 = BN/HC FCO/N	3 10 = BN/AM	10.20 = P/HC			
40 = AM	25. 74. 149 =W/HC	10, 20 - 17110			
Type of AP Clogging Indicator	,,				
Type Code					
Modification Number (latest service star					
	/s supplied) —————				
			Dua mula ma Dud		
(omit) = NITrile (NBR) (standard)	V = Fluoroelastomer (FPIM	i) EPR = Ethylene	e Propylene Rul	ober (EPDIVI)	
Bypass Valve Cracking Pressure —					
(omit) = 43  psid (3  bar) (return line)	- standard)				
KB = no bypass (flushing system	9	not available with ECC	/N		
B6 = 87  psid (6 bar) (return line)	- extended service life)				
$B1 = 15 \text{ psid } (1 \text{ bar}) (lubrication}$	or coolant application)				
B0.2 = 3  psid (0.2  bar) (pump inle)	<i>t</i> )				
Supplementary					
W = Indicator with brass pisto	on (for high water base fluids)				
L24, L48, L110, L220 = Lamp for D-typ	e clogging indicator (LXX, X	X = voltage)			
SU103H= Modification of BN4HC E	lements for Phosphate Este	er Fluids			

DE = Dual Indicator Option (one indicator per duplex side)

Replacement Element Model Code

	<u>0110</u> R <u>010</u> <u>BN4HC</u> / <u>V</u>
Size	
0110, 0240, 0500, 0850, 1300	
Filtration Rating (micron) 3, 5, 10, 20 = BN4HC, ECO/N 40 = AM 25, 74, 149 = W/HC	3, 10 = BN/AM 10, 20, = P/HC
Element Media BN4HC, ECO/N, BN/AM, AM, F	Р/НС, <mark>W/НС</mark>
Supplementary Details (omit) = standard V = Fluoroelastomer (	FPM) seals
Madal Cadaa Cantaini	ng RED are non stock itoms Minimum



## www.comosoloomATIVE FLUID POWER HYDAE 104

#### Dimensions



Size	А	В	B1	н	H1	H2	НЗ	H4	<b>H</b> 5	D3	D4	Т2	Wgt. (Ibs)
RFLD 111 EAI	9.17" (233mm)	2.06" (52mm)	6.30" (160mm)	10.55" (268mm)	7.28" (185mm)	1.30" (33mm)	3.15" (80mm)	3.15" (80mm)	1.03" (26mm)	M 12	M 10	0.98" (25mm)	35
RFLD 241 EAK	11.89" (302mm)	2.75" (70mm)	7.09" (180mm)	12.48" (317mm)	8.46" (215mm)	1.73" (44mm)	3.74" (95mm)	5.51" (140mm)	1.41" (36mm)	M 12	M12	0.71" (18mm)	57
RFLD 501 DAL	14.57" (370mm)	3.06" (78mm)	8.07" (205mm)	16.14" (410mm)	11.22" (285mm)	2.09" (53mm)	4.33" (110mm)	6.50" (165mm)	1.69" (43mm)	M 12	M 12	0.71" (18mm)	82
RFLD 851 DAS	19.52" (496mm)	4.19" (106mm)	9.64" (245mm)	25.67" (652mm)	16.93" (430mm)	3.94" (100mm)	9.06" (230mm)	9.06" (230mm)	2.44" (62mm)	M 12	M 16	0.91" (23mm)	185
RFLD 1301 DAT	21.85" (555mm)	5.13" (130mm)	10.83" (275mm)	29.76" (756mm)	19.68" (500mm)	4.65" (118mm)	9.84" (250mm)	9.84" (250mm)	3.06" (78mm)	M 16	M 16	0.91" (23mm)	262
Dimensions : For complete	Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.												

## 105 HYDAC INNOVATIVE FLUID POWERomoso.com

Total pressure loss through the filter is as follows:

Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$ 

#### Housing Curve:

Pressure loss through housing is as follows:

Housing  $\Delta P$  = Housing Curve  $\Delta P \times \frac{Actual Specific Gravity}{2.22}$ 0.86

Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see sizing section on page 19)







#### **Required Element Per Housing**

Housing Size	Element Size	Elements per Side
111	0110	2
241	0240	2
501	0500	2
851	0850	2
1301	1300	2

#### **Element K Factors**

Actual Viscosity (SUS) x Actual Specific Gravity  $\Delta P$  Elements = Elements (K) Flow Factor x Flow Rate (gpm) x 141 SUS 0.86 (Fróm Tables Below)

C:	RBN4	<b>4HC</b> (Betam	nicron® Low	Collapse)	0:		RP/HC (	⊃aper)			2:	RW/H	C (Wire Screen)	
Size	3 µm	5 µm	10 µm	20 µm	Size		10, 20 µm				Size	25, 50, 100, 200 μm		
0110	0.817	0.517	0.329	0.178	110		0.128		][		110	C	.0301	
0240	0.338	0.208	0.142	0.096	240		0.049				240	C	0.0137	
0500	0.162	0.104	0.069	0.044	500		0.024				500	0	.0066	
0850	0.082	0.055	0.036	0.023	850		0.012		][		850	C	.0038	
1300	0.045	0.032	0.024	0.014	1300	)	0.007		][	1	300	C	.0027	
					D D	<b>P/HC</b> (Paper)			B BN/AM			D AM		
Size		n			Size	<b>n</b>		Size		n		Size		
	3 µm	5 µm	10 µm	20 µm			10, 20 µm		31	Im	10 µm		040A	
0110	-	-	0.464	0.317	0110		0.128					0500	0.138	
0240	_	_	0 209	_	0240		0.049							
0210			0.200		0500		0.024	1300	0.0	88	0.033	0850	0.074	
0850	0.078	0.053	0.046	0.032	0850		0.012							
1300	0.049	0.034	0.029	0.020	1300		0.007					1300	0.048	
All Element I	K Factors in p	osi / gpm.												

## www.comoslewATIVE FLUID POWER (HYDAC) 106

# **YDAD** Low Pressure Filters

#### **RFLD Welded Series Inline Duplex Filters** 230 psi • up to 3900 gpm



#### Features

- Models 1300 to 15000 are made of rolled steel housings with bolt-on steel lids; Stainless steel models are available.
- ANSI flange connections for each filter size provide maximum • connection flexibility eliminating additional adapters and intermediate flanges.
- Inlet and outlet connections are located on the same side • of the transfer valve.
- Transfer valve and pressure equalization line allow easy • changeover between filter housings without costly system shutdown.
- Models 5200 to 15000 use the same filter element size • (1300 R) allowing maximum standardization in multiple filter element housing.
- Clogging indicators have no external dynamic seal. High reliability is acheived and magnetic actuation eliminates a leak point.

#### Hydraulic Symbol



#### **Technical Details**

Mounting Method	Floor mounted legs
	(Filters must not be used as pipe support)
Port Connection	
1300/1320	4" ANSI 150# Flange
2500/2520	6" ANSI 150# Flange
4000/4020	8" ANSI 150# Flange
5200 - 15020	10" ANSI 150# Flange
Flow Direction	Inlet: Front top Outlet: Front Bottom
Construction Materials	
Head, Lid	Steel
Note: Please inquire to the facto	ry for available stainless steel models.
Flow Capacity	
1300/1320	350 gpm (1300 lpm)
2500/2520	650 gpm (2500 lpm)
4000/4020	1050 gpm (4000 lpm)
5200/5220	1400 gpm (5200 lpm)
6500/6520	1700 gpm (6500 lpm)
7800/7820	2050 gpm (7800 lpm)
15000/15020	3900 gpm (15000 lpm)
Housing Pressure Rating	
Max. Operating Pressure	150 psi (10 bar) standard
	230 psi (16 bar) optional
Proof Pressure	345 psi (24 bar)
Fatigue Pressure	Contact HYDAC office
Burst Pressure	Contact HYDAC office
Element Collapse Pressure	Rating
BN/HC, W/HC	290 psid (20 bar)
Fluid Temperature Range	-22° to 250°F (-30° to 121°C)
Fluid Compatability	
Compatible with all petroleu	m oils and synthetic fluids rated
for use with Fluoroelastome	r or Ethylene Propylene seals.
Contact HYDAC for information	tion on special housing and element
constructions available for u	se with water glycols, oil/water
emulsions, and HWBF.	
Indicator Trip Pressure	
$\Delta P = 29 \text{ psid} (2 \text{ bar}) - 10\% \text{ (st}$	andard)
$\Delta P = 72 \text{ psid } (5 \text{ bar}) -10\% \text{ (st})$	andard)
<b>Bypass Valve Cracking Pre</b>	ssure
$\Delta P = 43 \text{ psid} (3 \text{ bar}) + 10\%$	
$\Delta P = 87 \text{ psid (6 bar) +10\%}$	

#### **Applications**





Gearboxes

Shipbuilding



Pulp & Paper







Power Generation

#### Model Code

	<u>RFLD BN/HC 1300 C A T 3 A 1 . 1 / S 150 V _ D</u>
Filter Type ————————————————————————————————————	
Element Media	
BN/HC = Betamicron <sup>®</sup> (Low Collapse)	ECU/N = ECUMICION® (Low Collapse)
P/HC = Polyester	W/HC = Wire Screen
Size	
1300, 1320, 2500, 2520, 4000, 4020, 520	0, 5220, 6500, 6520, 7800, 7820, 15000, 15020
B = 150 psi (10 bar)	C = 230 psi (16 bar)
Type of Change Over Valve	
A = Ball Valve - ANSI 2", 3", 4",	6" / DN 50, 80, 100, 150 (sizes 1300 - 2520)
B = Segment Valve – ANSI 6", 8	, 9", 13" / DN 150, 200, 250, 300 (sizes 2500 - 15020)
C = Butterfly – ANSI (same as Seg	ment sizes) / DN (same as Segment sizes) (sizes 2500 - 15020)
2 – 2" ANSI Flance (sizes 1300)	
$4 = 3^{\circ} \text{ ANSI Flange (sizes 2500)}$	S = SAE/DIN DN 80 (sizes 1300 - 5220)
5 = 4" ANSI Flange (sizes 1320 &	(520) T = SAE/DIN DN 100 (sizes 1300 - 7820)
$7 = 6^{\circ}$ ANSI Flange (sizes 2500 & 8 = 8 <sup>\circ</sup> ANSI Flange (sizes 4000 &	2520) V = DN 150 (sizes 2500 - 7820) (1020) W = DN 200 (sizes 4000, 15020)
9 = 10" ANSI Flange (sizes 5200 -	$\begin{array}{cccc} 7820 \\ X &= DN 250 (sizes 5200 - 15020) \\ \hline \end{array}$
10 = 12" ANSI Flange (sizes 15000	& 15020) Y = DN 300 (sizes 15000 & 15020)
Filtration Rating (microns)	
3, 5, 10, 20 = BN/HC, ECO/N $3, -$	0 = BN/AM 10, 20 = P/HC 74 149 - W/HC
Type of AP Clogging Indicator —	
A, B/BM, C, D	
Type Code	
1 Medification Number (Istarturnian shurra	
Modification Number (latest version always	uppilea)
(omit) = standard (non coded)	S = ASME Coded with "U" Stamp
Flange	· · · · · · · · · · · · · · · · · · ·
(omit) = DIN Flange Connection to D	N 2501/1 150 = 150 lbs ANSI Flange
Seals	V - Eluoroolostomor (EPM)
Bypass Valve Cracking Pressure	
(omit) = 43 psid (3 bar) (return line - st	undard)
B6 = 87 psid (6 bar) (return line - ex	ended service life)not available with ECO/N
KB = no bypass	
(omit) = Cover Lifting Device (Handle	
DH = Cover Lifting Device (Davit lif	ing mechanism for sizes 4000 and larger, style may vary)
L24, L48, L110, L220 = Lamp for D-type	clogging indicator (LXX, XX = voltage)
W = Indictor with brass piston (to SO103H = Modification of BN4HC Flen	<sup>r</sup> water base fluids) ients for Phosphate Ester Fluids
Replacement Element Mod	el Code Clogging Indicator Model Code
0850	
Size	
0850 1300 1700 2600	
Filtration Bating (micron)	
3. 5. 10. 20 = BN4HC, ECO/N 3. 10	= BN/AM $2 = 29 \text{ psid} (2 \text{ par})$
25, 74, 149 = W/HC 10, 20	, = P/HC 5 = 72 psid (5 bar)(optional)
40 = AM	Type of Indicator
Element Media	A = no indicator, plugged port
BN4HC, ECO/N, BN/AM, AM, P/HC, W/F	C = Electric switch
Supplementary Details	D = Electric switch and light
(omit) = standard	Modification Number
V = Fluoroelastomer (FPN) sea	Supplementary Details
	Seals
	V = Fluoroelastomer (FPM)
	Light Voltage (D type indicators only)
	L24 = 24V L110 = 110V
	Thermal Lockout (VM, VD types C, D, J, and J4 only)
	I 100 = Lockout below 100°F
	Underwrighters Approval (VM, VD types C, D, J, and J4 only) ———— CRUUS = Flectrical Indicators
	(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

## www.comosoloomATIVE FLUID POWER HYDAE 108

# **HYDAD** Low Pressure Filters

#### Dimensions RFLD 1300 / 1320



#### RFLD 2500 / 2520



## RFLD 2500 - 15020 Butterfly Change-Over (Change-Over Type C)



Size	Connection	Α	H1
2500/2520	DN 150	54.25/1378	73.62/1108 58.98/1498
4000/4020	DN 150	63.62/1616	46.06/1170 61.42/1560
	DN 200	67.87/1724	47.44/1205 62.80/1595
5200/5220	DN 150	65.59/1666	49.57/1259 66.77/1696
	DN 200	70.63/1794	49.57/1259 66.77/1696
	DN250	79.13/2010	52.20/1326 69.53/1766
6500/6520	DN 150	75.43/1916	49.61/1260 66.93/1700
	DN 200	78.90/2004	54.33/1380 71.65/1820
	DN250	87.01/2210	54.33/1380 71.65/1820
7800/7820	DN 150	75.43/1916	49.61/1260 66.93/1700
	DN 200	78.90/2004	54.33/1380 71.65/1820
	DN250	87.01/2210	54.33/1380 71.65/1820
15000/15020	DN 200	96.46/2450	56.10/1425 73.43/1865
	DN 250	104.17/2646	56.10/1425 73.43/1865
	DN 300	109.69/2786	59.06/1500 76.38/1940

Dimensions are in inches/millimeters.

Size	1300	1320	2500	2520	4000	4020	5200	5220	6500	6520	7800	7820	15000	15020
Weight (lbs.)	330	403	577	643	1023	1111	1962	2204	2471	2826	2490	2861	3205	3578
Dimensions shown are for general information and overall envelope size only. Weights listed are without element														

Dimensions shown are for general information and overall envelope size only. Weights listed are without elemen For complete dimensions please contact HYDAC to request a certified print.

## 109 HYDAC INNOVATIVE FLUID POWERomoso.com

Total pressure loss through the filter is as follows:

Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$ 

#### Housing Curve:

Pressure loss through housing is as follows:

Housing  $\Delta P$  = Housing Curve  $\Delta P \times \frac{Actual Specific Gravity}{2}$ 0.86

Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see sizing section on page 21)











Flow in gpm

#### **Required Element Per Housing**

Housing Size	Element Size	Elements per Side
1300 / 1320	1300 / 2600	1/1
2500 / 2520	0850 / 1700	3/3
4000 / 4020	0850 / 1700	5/5
5200 / 5220	1300 / 2600	4 / 4
6500 / 6520	1300 / 2600	5/5
7800 / 7820	1300 / 2600	6 / 6
15000 / 15020	1300 / 2600	10 / 10

#### **Element K Factors**

ΔP Elements = Elements (K) Flow Factor x Flow Rate (gpm) x (From Tables Below) x Actual Viscosity (SUS) x Actual Specific Gravity 141 SUS 0.86

	,	,				
0:		RBN4HC (Betam	Sizo	RW/HC (Wire Screen)		
Size	3 µm	5 µm	10 µm	20 µm	Size	25, 50, 74, 100, 149, 200 μm
0850	0.082	0.055	0.036	0.023	850	0.0038
1300	0.045	0.032	0.024	0.014	1300	0.0027
1700	0.040	0.029	0.018	0.011	1700	0.0019
2600	0.023	0.016	0.011	0.007	2600	0.0011

Sizo	RECO/N							
Size	3 µm	5 µm	10 µm	20 µm				
0850	0.078	0.053	0.046	0.032				
1300	0.049	0.034	0.029	0.020				
1700	0.038	0.026	0.023	-				
2600	0.024	0.017	0.014	0.010				

All Element K Factors in psi / gpm.

## www.comoslewATIVE FLUID POWER (HYDAC) 110

# **MDAD** Low Pressure Filters

## **RFLDH Welded Series Inline Duplex Filters**

150 psi • up to 700 gpm



#### Features

- Models are available in carbon and stainless steel versions. Lids are swing bolt mounted.
- ANSI flange connections.
- Inlet and outlet connections are located on the same side • of the transfer valve.
- Transfer valve and pressure equalization line allow easy changeover between filter housings without costly system shutdown.
- Clogging indicators have no external dynamic seal. High • reliability is acheived and magnetic actuation eliminates a leak point.
- Stainless drain piping with ball valves available.
- Air bleed line available. •
- ASME coded with U-stamp available. •
- API Compliant versions available

#### **Applications**





Automotive



Pulp & Paper



Shipbuilding





Power Generation

Industry

## Hydraulic Symbol





#### **Technical Details**

Mounting Method	Floor mounted legs					
	(Filters must not be used as pipe support)					
Port Connection						
1300/1303 2500/2503 1320/1323, 2520/2523 4020/4023	2" ANSI 150# Flange 3" ANSI 150# Flange 4" ANSI 150# Flange 6" ANSI 150# Flange					
Flow Direction	Inlet: Front top Outlet: Front Bottom					
Construction Materials						
1300, 1320, 2500, 2520, 402 1303, 1323, 2503, 2523, 402	0 - Carbon Steel 3 - Stainless Steel					
Flow Capacity						
1300/1303 1320/1323 2500/2503 2520/2523 4020/4023	167 gpm (650 lpm) 304 gpm (1150 lpm) 270 gpm (1050 lpm) 525 gpm (2000 lpm) 700 gpm (2650 lpm)					
Housing Pressure Rating						
Max. Operating Pressure Proof Pressure Fatigue Pressure Burst Pressure	150 psi (10 bar) standard 345 psi (24 bar) Contact HYDAC office Contact HYDAC office					
Element Collapse Pressure	Rating					
BN/HC, W/HC	290 psid (20 bar)					
Fluid Temperature Range	-22° to 250°F (-30° to 121°C)					
Fluid Compatability						
Compatible with all petroleu for use with Fluoroelastome Contact HYDAC for informa constructions available for u emulsions, and HWBF.	m oils and synthetic fluids rated r or Ethylene Propylene seals. tion on special housing and element ise with water glycols, oil/water					
Indicator Trip Pressure						
$\Delta P = 29 \text{ psid } (2 \text{ bar}) -10\%$ $\Delta P = 72 \text{ psid } (5 \text{ bar}) -10\%$						
Bypass Valve Cracking Pre	ssure					
$\Delta P = 43 \text{ psid } (3 \text{ bar}) +10\%$ $\Delta P = 87 \text{ psid } (6 \text{ bar}) +10\%$						

#### Model Code

RFL	<u>.DH BN/HC</u>	<u>1300</u>	<u>C</u>	<b>₽</b> Ţ	<u>3</u>	<u>4</u> 1	. <u>X</u> /	<u>\$ 150</u>	<u>v</u>	_ <b>D</b> H
Filter Type										
Element Media		,								
AM=Aquamicron®BN/AM=ECO/N = ECO/INC/OP/HC=PolyesterW/HC = Wire Scree	on <sup>®</sup> /Aquamicror on <sup>®</sup> /Aquamicror	<i>?)</i> 1 <sup>®</sup>								
Size	4023									
Operating Pressure										
Type of Change Over Valve										
Type of Connection										
3 = 2" ANSI Flange (sizes 1300/1303) 4 = 3" ANSI Flange (sizes 2500/2503) 5 = 4" ANSI Flange (sizes 1320/1323 & 2520/2523)										
7 = 6" ANSI Flange (sizes 4020/4023)										
Signal         Signal<	10, <mark>20</mark> = P/HC									
Type of ∆P Clogging Indicator — A, B/BM, C, D										
<b>Type Code</b> 1										
Modification Number (latest version always supplied) ————————————————————————————————————										
(omit) = (non coded) S = ASME Coded w	/ith "U" Stamp									
Flange										
Seals										
(omit) = Buna-N V = Fluoroelastome	r (FPM)									
(omit) = 43 psid (3 bar) (return line - standard) B6 = 87 psid (6 bar) (return line - extended service life) KB = no bypass	ot available with	n ECO/N								
(omit) = Cover Lifting Device (Handle only) DH = Cover Lifting Device (Davit lifting mechanism for sizes L24, L48, L110, L220 = Lamp for D-type clogging indicator (LX: W = Indictor with brass piston (for water base fluids) SO103H = Modification of BN4HC Elements for Phosphate E SB = Equalization lines (standard) VKD = Drain piping EM = Air bleed valves	s 4020 and larger, 'X, XX = voltage) Ester Fluids	style may	vary)							
Replacement Element Model Code 0850 B 010 BN4HC	Clo	ogging	Ind	icato	or M	odel	Code	e v /		
Size         Size <th< td=""><td>/ ⊻ India VM Trip 2 5 Trip</td><td>cator Pre = G Pressure = 29 = 72</td><td>fix — 1/2 30 9 — 9 psid 2 psid 2 psid</td><td>000 ps (2 bar) (5 bar)</td><td>i (opti</td><td><b>VM</b> ional)</td><td></td><td>• <u>×</u> / .</td><td></td><td></td></th<>	/ ⊻ India VM Trip 2 5 Trip	cator Pre = G Pressure = 29 = 72	fix — 1/2 30 9 — 9 psid 2 psid 2 psid	000 ps (2 bar) (5 bar)	i (opti	<b>VM</b> ional)		• <u>×</u> / .		
Element Media BN4HC, ECO/N, BN/AM, AM, P/HC, W/HC	A B/E C	= no BM = Vi = Fl	o indic isual p lectric	ator, p op-up switch	luggeo <i>(auto/n</i>	d port nanual r	eset)			
Supplementary Details (omit) = standard	Ď Moc	= E	lectric Numb	switch	and li	ight				
V = Fluoroelastomer (FPM) seals	Sup	plementa	ary De	tails -						
	Sea (om V	als — <i>it)</i> = N = Fl	itrile (l	NBR) <i>(</i> s	tandaro	d) M)				
	Lig L24	ht Voltag = 24	l <b>e</b> (D ty 4V	pe indio L110	cators $c = 11$	only) — IOV				
	The T10	ermal Loc 0 = Lo	ckout ockou	(VM, VI t belov	D types v 100°l	C, D, J,	and J4 c	only) —		
	Un CR (For	derwrigh UUS = El	ters A lectric	al India	al (VM	, VD typ	es C, D, . aging Ind	J, and J4	only) —	
Model Codes Containing RED are non-stock items — Min	nimum quantities i	nay apply -	- Conta	and op act HYD	AC for	informat	ion and	availabilit	<u>y</u>	

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#### Dimensions RFLDH 1300 / 1303





#### RFLDH 1320 / 1323





#### Dimensions RFLDH 2500 / 2503



#### RFLDH 2520 / 2523



www.comosileenvative fluid power (HYDAC) 114

### **HYDAD** Low Pressure Filters

#### Dimensions RFLDH 4020



#### Sizing Information

Total pressure loss through the filter is as follows: Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$  **Housing Curve:** Pressure loss through housing is as follows: Housing  $\Delta P$  = Housing Curve  $\Delta P$  x  $\frac{Actual Specific Gravity}{2.22}$ 

Housing  $\Delta P$  = Housing Curve  $\Delta P \times 0.86$ Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see sizing section on page 19)

#### **Required Element Per Housing**

Housing Size	Element Size	Elements per Side
1300 / 1303	1300	1
1320 / 1323	2600	1
2500 / 2503	0850	3
2520 / 2523	1700	3
4020 / 4023	1700	5



Notes:

#### **FLND Series Inline Duplex Filters** 360 psi • up to 100 gpm



#### Features

- Lightweight duplex filter constructed of aluminum.
- Aluminum alloy is water tolerant anodization is not required for • high water based fluids (HWBF).
- The filter housings are designed to withstand pressure surges as • well as high static pressure loads.
- The screw-in bowl allows the filter element to be easily removed • for replacement or cleaning.
- A visual (pop-up), electrical, electrical/visual (lamp), or electronic differential type clogging indicator
- The standard model is supplied with vent and drain plugs, and also a connection for differential clogging indicator.
- The pressure is equalized between chambers by raising the • change-over lever prior to switching it to the relevant filter side. Thus, the filter contains an integrated equalization valve.

#### Hydraulic Symbol



#### **Technical Details**

Mounting Method	4 mounting holes	- filter head			
Port Connection	SAE-24 (1-7/8-12U	IN)			
Flow Direction	Inlet: Side	Outlet: Side			
Construction Materials					
Head, Bowl	Aluminum				
Flow Capacity					
160 250 400	42 gpm (160 lpm) 66 gpm (250 lpm) 105 gpm (400 lpm)	)			
Housing Pressure Rating					
Max. Operating Pressure Proof Pressure Fatigue Pressure Burst Pressure	360 psi (25 bar) 540 psi (38 bar) 360 psi (25 bar) Contact HYDAC o	ffice			
Element Collapse Pressure Rating					
BN/HC, W/HC	290 psid (20 bar)				
Fluid Temperature Range	-22° to 250°F (-30°	° to 121°C)			
Fluid Compatability					
Compatible with all petroleum oil for use with Fluoroelastomer or E Contact HYDAC for information of constructions available for use w emulsions, and HWBF.	s and synthetic fluid thylene Propylene s on special housing a ith water glycols, oi	ds rated seals. and element I/water			
Indicator Trip Pressure					
$\Delta P = 29 \text{ psid } (2 \text{ bar}) -10\%$ $\Delta P = 72 \text{ psid } (5 \text{ bar}) -10\%$ $\Delta P = 116 \text{ psid } (8 \text{ bar}) -10\%$					
Bypass Valve Cracking Pressur	e				
$\Delta P = 43 \text{ psid } (3 \text{ bar}) +10\%$ $\Delta P = 102 \text{ psid } (7 \text{ bar}) +10\%$					

#### Applications





Gearboxes



Shipbuilding





Industrial

Power





#### Model Code

<u>FLND BN/HC 250 D D F 10</u>	<u>A</u> <u>1</u> . <u>X</u> / <u>12</u> - <u>V</u> - <u>B7</u>
Filter Type       FLND = Inline duplex filter	
Element Media	
Size	
160, 250, 400	
Operating Pressure	
D = 360 psi (25 bar)	
Type of Change-Over	
D = segment valve	
Port Type / Size	
F = SAE-24 (1 1/2'')	
K = SAE DN 38 Flange	
Filtration Bating (micron)	
3, 6, 10, 25 = BN/HC 25, 50, 100, 200 = W/HC	
Type of ∆P Clogging Indicator A, B/BM, C, D	
Type Code1	
Modification Number (latest version is always supplied)	
Port Configuration	
(omit) = SAE DN Flange	
12 = SAE straight thread inlet/outlet connections	
Seals	
V = Fluoroelastomer (FPM) <i>(standard)</i>	
Bypass Valve	
(omit) = no bypass (optional - consult factory)	
B3 = 43  psig (3  pair) (optional) $B3 = 1015  psig (7  psi) (optional)$	
$B_{1} = 101.5 \text{ psi}(7 \text{ bar}) (standard)$	
Supplementary Details	
$L_{24}$ , $L_{40}$ , $L_{110}$ , $L_{220} = Lamp for D-type clogging indicator (LXX, XX = voltage)W = suitable for oil-water emulsions (HEA_HEC) NBR seals (refers evolutionally to the type of clogging$	ng indicator)

EV = knurled air bleed valve (replaces standard socket head plug)





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

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#### Dimensions



Size	160	250	400
Weight (lbs.)	22.7	25.6	28.7

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

#### Sizing Information

Total pressure loss through the filter is as follows:

Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$ 

Housing Curve:

Pressure loss through housing is as follows:

Housing  $\Delta P$  = 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 section on page 19)



#### **Element K Factors**

△P Elements = Elements (K) Flow Factor x Flow Rate (gpm) x Actual Viscosity (SUS) x Actual Specific Gravity (From Tables Below) x 141 SUS 0.86

<u> </u>	DNBN4HC (Betamicron <sup>®</sup> Low Collapse)							
Size	3 µm	6 µm	10 µm	25 µm				
0160	0.439	0.280	0.190	0.143				
0250	0.280	0.177	0.117	0.093				
0400	0.178	0.111	0.071	0.055				

All Element K Factors in psi / gpm.

#### **NFHD Series Modular Inline Duplex Filters** 360 psi • up to 450 gpm





#### **Features**

- Top access for easy element changeout. •
- All models have an air bleed valve (vent) installed in the lid. •
- Single large element with no leak points for highest efficiency • and dirt capacity
- Lid with swing bolts for fast servicing without tools •
- Drain port (Far side) SAE 12 (3/4") •
- Clogging Indicator for local and remote signals •
- Easily banked in parallel (manifolded) for high viscosity • applications.
- Available with Betafit elements consult HYDAC.

#### Hydraulic Symbol



#### **Technical Details**

Mounting Method Floor mounting brackets				
Port Connection	t Connection SAE-64 Flange Code 61			
Flow Direction	Inlet: Side	Outlet: Side		
Construction Materials				
Head, Lid, Elbows, Manifolds Housing	Ductile Iron Steel			
Flow Capacity				
1300 2600, 5200, 7800, 10400	343 gpm (1300 450 gpm (1700	lpm) lpm)		
Housing Pressure Rating				
Max. Operating Pressure Proof Pressure Fatigue Pressure Burst Pressure	360 psi (25 bar) 540 psi (37 bar) 360 psi (25 bar) > 1440 psi (100	bar)		
Element Collapse Pressure Rating				
BN/HC, W/HC ECO/N, BN/AM, P/HC, AM	290 psid (20 ba 145 psid (10 ba	r) r)		
Fluid Temperature Range	-22° to 250°F (-30° to 121°C)			
Fluid Compatability				
Compatible with all petroleum oils and for use with Fluoroelastomer or Ethyle Contact HYDAC for information on sp constructions available for use with w emulsions, and HWBF.	d synthetic fluids ene Propylene se ecial housing ar ater glycols, oil/	s rated eals. nd element water		
Indicator Trip Pressure				
$\Delta P$ = 29 psid (2 bar) -10% (standard) $\Delta P$ = 72 psid (5 bar) -10% (optional)				
Bypass Valve Cracking Pressure				
$\Delta P = 43 \text{ psid } (3 \text{ bar}) +10\%$ $\Delta P = 87 \text{ psid } (6 \text{ bar}) +10\%$				

#### **Applications**



Shipbuilding

Automotive



Pulp & Paper









Power Generation

#### Model Code

	<u>NFHD</u> B	<u>N/HC 1300</u>	<u>D</u> <u>A</u> <u>P</u>	<u>3 A 1</u> .	<u>0</u> / <u>16</u>	<u>i A</u>	
Filter Type NFHD = In-line Duplex Return Lin	ne Filter						
Element Media							
BN/HC = Betamicron <sup>®</sup> (Low Collapse) AM = Aquamicron <sup>®</sup> P/HC = Polyester	ECO/N = ECOmicron® (Low Collaps BN/AM = Betamicron® Aquamicron W/HC = Wire Screen	ie) In®					
Size							
1300, 2600, <mark>5200, 7800, 10400</mark>							
Operating Pressure D = 360 psi (25 bar)							
Type of Change Over A = Ball valve							
Type of Connection P = SAE DN 100 (4") flange							
Filtration Rating (micron) 3, 5, 10, 20 = BN/HC, ECO/N 10, 20 = P/HC	3, 10 = BN/AM 25, 74, 149 = W/HC	40 = AM					
Type of ∆P Clogging Indicator —— A, B/BM, C, D							
Type Number1							
Modification Number (latest version alway	ays supplied) —————————						
Port Configuration 16 = SAE-64, (4") Code 61 Fla	ange						
Flow Path (Facing Indicator) A = Front Inlet and Front Outlet (stand B = Front Inlet and Back Outlet	ard) C = Back Inlet and Back D = Back Inlet and From	k Outlet it Outlet					
Seals							
(omit) = Nitrile (NBR) (standard)	V = Fluoroelastomer (FPM)	EPR = Ethyle	ene Propylene	e (EPDM)			
Bypass Valve (omit) = 43 psid Bypass (standard) B1 = 15 psid Bypass	B6 = 87 psid Bypassnot availal KB = No Bypassnot availal	ble with ECO/N					
Supplementary Details	pe cloaging indicator ( $I XX XX = voltage$						

Indicator Thermal Lockout, 100°F (C & D indicators only) T100 =

S0103H = Modification of BN4HC and P/HC Elements for Phosphate Esters



### **Clogging Indicator Model Code** <u>VM 2 B.X</u>/ (optional) = no indicator, plugged port = Visual pop-up (auto/manual reset) = Electric switch and light

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#### Dimensions NFHD 1300 / 2600



Size	1300	2600						
Weight (lbs.)	294	344						
Dimensions shown	Dimensions shown are for general information and overall envelope size only. Weights listed are without element							

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

#### NFHD 5200 / 10400



Size	5200	10400				
Weight (lbs.)	777	1407				
<u>.</u>						

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

### www.comosoloon ATIVE FLUID POWER HYDAC 124

NFHD 7800



Size	7800					
Weight (lbs.)	1008					
Dimensions shows are few general information and systell any along airs only. Weighte listed are without along at						

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

#### Sizing Information

Total pressure loss through the filter is as follows:

Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$ 

#### **Housing Curve:**

Pressure loss through housing is as follows:

Housing  $\Delta P$  = Housing Curve  $\Delta P \times \frac{Actual Specific Gravity}{2}$ 

0.86

The curve below shows the clean  $\Delta P$  through the Housing for a single filter. To determine Clean  $\Delta P$  for manifolds with multiple housings, multiply the Clean  $\Delta P$  curve value by the percentage values in the table.

∆P Housing NFHD 1300 & NFHD 2600 Q in I/min 756 113 12 0.8 10 AP in psid 0.4300 400 100 200 0 Q in gpm

Multiplier
93%
83%
74%

Example Conditions 400 gpm flow NFHD 5200 manifold specified  $\Delta P$  Curve = 9 psid  $\Delta P 5200$ = 9 psid X 0.73 = 8.4 psid Piping & Housing  $\Delta P$  Total System = 8.4 psid +  $\Delta P$  Element

۵,

3

400

#### **Bypass Valve Curve:**

Curves shown are applicable for mineral oil with a specific gravity of 0.86. Differential pressure increases in proportion to the specific gravity of the fluid.

 $\Delta P$  Valve =  $\Delta P$  Curve x Actual Specific Gravity 0.86

#### Element $\Delta P$ Calculations:

Sizing (K) Flow Factors below show the pressure drops across clean elements (excluding housings and piping). (K) Factors are calculated from mineral based fluid at viscosity of 141 SUS and specific gravity of 0.86. To determine clean  $\Delta P$  for NFH manifolds with more than one housing, use the adjusted (K) factors below and multiply by total flow rate.

#### Example

0

100

80

40

20

in psi 60

ΔP

#### Conditions

100

Lube system Viscosity of 1,000 SUS Specific gravity 0.86 75 gpm flow Low pressure drop essential 10 µm Betamicron® filter element

Q in I/min 400

800

200

Q in gpm

1200

300

#### Selection

An NFHD 2600 filter gives an Adjusted Clean element  $\Delta P$ as follows: Clean  $\Delta P$  = 75 gpm x 0.017 = 1.275 psid Clean  $\Delta P_{adj} = 1.275 \text{ x } 1000 = 9.04 \text{ psid}$ 141

#### **Element K Factors**

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

Housing # of		Sizo	RBN4HC (Betamicron <sup>®</sup> Low Collapse)			RECO/N (ECOmicron®)					
Size	Elements	Size	3 µm	5 µm	10 µm	20 µm	3 µm	5 µr	n	10 µm	20 µm
1300	2	1300	0.045	0.032	0.024	0.014	0.049	0.03	4	0.029	0.020
2600	2	2600	0.023	0.016	0.011	0.007	0.024	0.01	7	0.014	0.010
5200	4	2600	0.012	0.008	0.006	0.004	0.012	0.00	9	0.007	0.005
7800	6	2600	0.008	0.006	0.004	0.002	0.008	0.00	6	0.005	0.003
10400	8	2600	0.006	0.004	0.003	0.002	0.006	0.00	4	0.004	0.003
Housing	# of	0	RBN/AM			R	.P/HC (Paper)			RW/HC (Wi	re Screen)

Housing	# of	Sizo	RE	3N/AM	<b>RP/HC</b> (Paper)	RW/HC (Wire Screen)
Size	Elements	Size	3 µm	10 µm	10 µm	25, 50, 100, 200 μm
1300	2	1300	0.088	0.033	0.007	0.0027
2600	2	2600	0.052	0.019	0.003	0.0011
5200	4	2600	0.026	0.010	0.002	0.0005
7800	6	2600	0.017	0.006	0.001	0.0004
10400	8	2600	0.013	0.005	0.0008	0.0003

All Element K Factors in psi / gpm.

### www.comosile. ATIVE FLUID POWER (HYDAD) 126

# **MDAD** Low Pressure Filters

#### **MFX Series Inline Filters** 725 psi • up to 35 gpm



#### Features

- Eco-friendly, cost-effective alternative to spin-on filters •
- Integrated retrofit protection •
- Longer service life of the filter bowl because of fatigue resistant • up to 725 psi
- High level operating safety. Bowl seal and bypass valve are • integrated in the filter element and therefore renewed at every element change.
- "Missing Element Protection" •
- High diversity of clogging indicators
- Various connection types (SAE-12, G 3/4, SAE-16, G 1, M33x2)

#### **Clogging Indicator Assignment**



#### Applications



Agricultural





Railways

# Α

В

#### **Technical Details**

Hydraulic Symbol

Mounting Method	4 Mounting holes (3/8-16UNC)			
Port Connection	SAE-12, G 3/4 SAE-16, G 1, M33x2			
Flow Direction	Inlet: Side Outlet: Side			
	(opposite each other)			
Construction Materials				
Head	Die Cast Aluminum			
Bowl	Extruded Aluminum			
Flow Capacity				
100 200	26 gpm (100lpm) 35 gpm (130 lpm)			
Housing Pressure Rating				
Max. Operating Pressure	725 psi (50 bar)			
Proof Pressure	870 psi (60 bar)			
Fatigue Pressure	725 psi (50 bar) @ 1 million cycles			
Burst Pressure	2600 psi (183 bar)			
Element Collapse Pressure	Rating			
BN/HC	290 psid (20 bar)			
ECO/N, MM	145 psid (10 bar)			
Fluid Temperature Range	-22° to 250°F (-30° to 121°C)			
Fluid Compatability				
Compatible with all petrole for use with Fluoro-Rubber Contact HYDAC for informa constructions available for emulsions, and HWBF.	um oils and synthetic fluids rated or Ethylene Propylene seals. ation on special housing and element use with water glycols, oil/water			
Indicator Trip Pressure				
ΔP = 35 psi (2.4 bar) -10%				
Bypass Valve Cracking Pre	ssure			
$\Delta P = 50 \text{ psid} (35 \text{ bar}) + 10\%$				

**BN1/110** 

#### Model Code

	BN/	HC	100	<u>G</u>	<u> </u>	10	A	<u>4</u>	. <u>0</u>	\ <u>₿</u>	3.5
Filter Type MFX = In-Line Medium Pressure Filter											
Filter Media BN/HC, ECO/N, MM		]									
Size	 										
Operating Pressure G = 725 psi (50 bar)	 										
Type of Connection         H       =       G 3/4         I       =       1 1/16-16UNF (SAE 12)         J       =       G 1         K       =       1 5/16-12UNF (SAE 16)         L       =       M33x2											
Filtration Rating (microns)           3, 5, 10, 20 = BN/HC, ECO/N         10, 15 = MM	 										
Type of Clogging Indicator           A, W, B/BM, C, M, D, BF											
Indicator Location 1-4 = 3 + 4 BF Indicator only 1 + 2 not with BF indicato											
Type Modification Number (latest version always supplied)											
Supplementary Details											
B1.7 = Cracking pressure of the bypass valve 25 psi (1.7) bar B3.5 = Standard, cracking pressure of the bypass valve 50 psi (3.5 bar)											

- Fluoroelasromer (FPM) seals, filter suitable for fast bio-degradable fluids and phosphate esters (HFD-R) V =
- Lamp for relevant voltage (24V, 48V, 110V, 220V) L... =
- LED 2 LEDs up to a voltage of 24 Volt =

#### **Replacement Element Model Code**

<u>0100 MX 010 BN4HC</u> / - <u>B3.5</u>
Size
Туре МХ
Filtration Rating (micron) 003, 005, 010, 020 = BN4HC, ECO/N 010, 015 = MM
Filter Material BN4HC, ECO/N, MM
Supplementary Details         (omit)       = standard         V       = Fluoroelastomer (FPM) seals         B1.7       = Cracking pressure of the bypass valve 25 psi (1.7) bar         B3.5       = Standard, cracking pressure of the bypass valve 50 psi (3.5 bar)





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#### **MFX Series** Dimensions



Size	100	200
Weight (lbs.)	3.2	3.9

Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

#### Sizing Information

Total pressure loss through the filter is as follows:

Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$ 

Housing Curve: Pressure loss through housing is as follows:

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

Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see sizing section on page 19)



### MFX 100/200 Housing

#### **Element K Factors**

ΔP Elements = Elements (K) Flow Factor x Flow Rate (gpm) x *(From Tables Below)* x *Actual Specific Gravity* 141 SUS 0.86

<b>C</b> :	MXBN4HC (Betamicron® Low Collapse)					
Size	5 µm	10 µm	20 µm			
100	0.4941	0.2196	0.1867			
200	0.3459	0.1482	0.1098			

0:	MXECO/N					
Size	5 µm	10 µm	20 µm			
100	0.5490	0.3569	0.2635			
200	0.3239	0.2086	0.1537			

Size	MXMM				
Size	10 µm	15 µm			
100	0.1482	0.1208			
200	0.0878	0.0714			

All Element K Factors in psi / gpm.

## **MDAC** Low Pressure Filters

#### MF, MFD, MFDS Series Spin-On Filters 250 PSI • up to 120 GPM



#### **Features**

- MF Filters are manufactured with an aluminum head. •
- Choice of NPT, SAE straight thread O-ring boss, BSPP, and SAE • 4-bolt flange porting to allow easy installation without costly adapters.
- Quick easy element changeouts. •
- MF Filters designed to be used with hydrocarbon based fluids • only
- MF Filters are available in static and differential pressure sensing configurations.

### Applications



Agricultural



Industrial





Gearboxes





Construction

#### Hydraulic Symbol MF 40/80/85/160/180



#### **Technical Details**

в

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Mounting Method		
MF40/80/85 MF90/95 MF160/180 MF190/195 MFD MFDS	2 mounting holes 4 mounting holes 2 or 4 mounting holes 2 or 3 mounting holes 2 mounting holes 4 mounting holes	
Port Connection		
MF40 MF80/85/90/95 MF160/180/190/195 MFD160/180 MFDS160/180* MFDS190/195*	SAE-6 3/4" BSPP, 3/4" NPT, SAE 1 1/4" BSPP, 1 1/4" NPT, SAE- 1 1/2" NPT, SAE-24 2" SAE Flange Code 61, 1 2" SAE Flange Code 61, 1	-12, 1" NPT, SAE-16 -20, 1 1/2" NPT, SAE-24 1/2" NPT Comb. Port 1/2" NPT Comb. Port
Flow Direction	Inlet: Side	Outlet: Side
Construc. Materials	Head: Aluminum	Can: Steel
Flow Capacity		
40 80 85 90 95 160,190 180,195	7 gpm (26 lpm) 15 gpm (57 lpm) 25 gpm (95 lpm) 15 gpm (57 lpm) 25 gpm (95 lpm) 30 gpm (114 lpm) per car 60 gpm (227 lpm) per car	n n
Housing Pressure Rating	MF40/80/85/160/ 180/190/195	MF90/95
Max. Oper. Pressure Proof Pressure Fatigue Pressure Burst Pressure	120 psi (8 bar) 180 psi (12.4 bar) Contact HYDAC Contact HYDAC	250 psi (17 bar) 375 psi (26 bar)
Element Collapse Pre	essure Rating	
BN, P, A	80 psid (5.5 bar)	
Fluid Temp. Range	-22° to 250°F (-30° to 12	1°C)
Fluid Compatability Compatible with all pe with Buna-N.	etroleum oils and synthet	ic fluids rated for use
Indicator Trip Pressu $\Delta P = 20 \text{ psid} (1.4 \text{ bar})$ $\Delta P = 29 \text{ psid} (2 \text{ bar}) -1$ $\Delta P = 44 \text{ psi} (3 \text{ bar}) (B3)$ Vacuum = 2 psi (0.1 b	<b>re</b> -10% 10% 3.4 Bypass) ar) (Suction)	
Bypass Valve Crackin $\Delta P = 3 \text{ psid } (0.2 \text{ bar}) + \Delta P = 25 \text{ psid } (1.7 \text{ bar})$ $\Delta P = 43 \text{ psid } (3 \text{ bar}) + 23 \text{ psid } (3 \text{ bar}) + 33 \text{ psid } (3 \text{ bar}) + 33$	<b>Ig Pressure</b> +10% (for suction application +10% (standard for nomina 10% (standard for absolute	ns) I filters) BN filters)

 $\Delta P = 50 \text{ psid} (3.4 \text{ bar}) + 10\%$ 

(standard for absolute BN filters, MF 80/90/95/160/180/190/195,

MFD 160/180, MFDS 160/180)

\*Note: Maximum allowable torque for flanged ports is 26 ft-lbs (1/2" - 13 UNC bolts)

DN

00

#### Model Code

					<u>, , , , ,</u>	_ <u>+</u> • 4	<u>^ / <u>J.</u>Z _</u>
Filter Type MF = Single E MFD = Dual Fil MFDS = Dual Fil	Element ter Heads ter Heads	& Elements (End to End) (sizes 160, 180, 190, & 195 & Elements (Side by Side) (sizes 160, 180, 190, & 193	only) 5 only)				
Element Media	Collona	N D - Deper					
	w conapse						
40*, 80*, 85 <sup>§</sup> , 90, 95 <sup>†</sup> ,	160, 180,	190 (uses size 160 element), 195 (uses size 180 eleme	ent)				
Type of Connection —G=ThreadeGF=Combin	ed nation Thre	eaded/Flanged (MFDS 160/180 only)					
Filtration Rating (micro 3, 5, 10, 20 = BN/HC	n)	3, 10 25 = P 10 = AM					
Type of Clogging India A, C, E, LE (Static - sizes 80, 85, 160	ator — 0, 180); (Dif	ferential - sizes 90, 95, 190, 195)					
Type Number ———							
Modification Number	latest versi	ion always supplied) —————————————————					
Port Configuration —							
Assembly	Code	Port	Code	Port			
MF 40	12.1	SAE 6	5.1	3/8" NPT			
MF 80/85, 90/95	<mark>0.2</mark> 5.2 12.2	<mark>3/4" BSPP (use MA elements)</mark> 3/4" NPT SAE 12 Thread	5.1 12.1	1" NPT SAE 16 Thread			_
MF 160/180, MF 190/195	<mark>0.2</mark> 5.2 12.2	1 1/4" BSPP (use MA elements) 1 1/4" NPT SAE 20 Thread	5.1 12.1	1 1/2" NPT SAE 24 Thread	MF 160/180	) only	-
MFD 160/180 MFDS 160/180 MFDS 190/195	5.1 5.1 5.1	1 1/2" NPT 1 1/2" NPT / 2" SAE Flange Combo ( <i>Code 61</i> ) 1 1/2" NPT / 2" SAE Flange Combo ( <i>Code 61</i> )	12.1	SAE 24 Thread			-
<b>Bypass Valve Cracking</b>	g Pressui	re	•				

B1.7 = 25 psid/1.7 bar (Standard on paper filters sizes 80 - 195 and size 40 BN)

B0.2 = 3 psid/0.2 bar (For Suction Applications)

B1.3 = 18 psid/1.3 bar (size 40 paper only)

B3.4 = 50 psid/3.4 bar (Standard on BN & AM Series) (sizes MF 80/90/95/160/180/190/195 & MFD 160/180 only)

- KB = No Bypass
- IP2 = Alternate Indicator Position 2 (sizes MF190/195 or MFDS 190/195)

#### Replacement Element Model Code



(Spin-on elements available with NBR seals only)

#### **Clogging Indicator Model Code**



(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

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## **HYDAD** Low Pressure Filters



Weight (lbs.)	0.24		0.73		0.6
Size	80 / 85 Head	80 Can (BN)		80 Can (P)	85 Can (P)
Weight (lbs.)	0.41	1.35		1.08	1.42
Size	90 / 95 Head	90 Can (BN)	90 Can (P)	95 Can (BN)	95 Can (P)
Weight (lbs.)	1.12	1.5	1.29	2.04	1.47
Dimensions shown ar	e for general information and	l overall envelope size only. Weig	hts listed are witho	ut element.	

For complete dimensions please contact HYDAC to request a certified print.

### Low Pressure Filters HYDAC



MF 190 / 195



Size	160 / 180 Head	160 Can (BN)	160 Can (P)	180 Can (BN)	180 Can (P)
Weight (lbs.)	1.31	2.56	2.15	3.69	2.68
0.	400 / 405 11	100 Con (RNI)	100 Can (D)	105 Con (BN)	195 Can (P)
Size	190 / 195 Head	190 Call (DN)	190 Gall (P)	195 Call (DN)	195 Oan (F)
Size Weight (Ibs.)	1907 195 Head 1.68	2.56	2.15	3.69	2.68

For complete dimensions please contact HYDAC to request a certified print.

### www.comoslowATIVE FLUID POWER HYDAC 134

## **HYDAD** Low Pressure Filters

#### MFD 160 /180



MFDS 160 / 180 / 190 / 195



Size - MFD	160 / 180 Head	160 Can (BN)	160 Can (P)	180 Can (BN)	180 Can (P)		
Weight (lbs.)	3.66	2.56	2.15	3.69	2.68		
Size - MFDS	160 / 180 Head	160 Can (BN)	160 Can (P)	180 Can (BN)	180 Can (P)		
Weight (lbs.)	6.4	2.56	2.15	3.69	2.68		
Dimensions shown are for general information and overall envelope size only. Weights listed are without element.							
For complete dimensions please contact HYDAC to request a certified print.							

#### Sizing Information

Total pressure loss through the filter is as follows:

Assembly  $\Delta P$  = Housing  $\Delta P$  + Element  $\Delta P$ 

#### Housing Curve:

Pressure loss through housing is as follows:

Housing  $\Delta P$  = Housing Curve  $\Delta P \times \frac{Actual Specific Gravity}{2.22}$ 0.86

Adjustments must be made for viscosity & specific gravity of the fluid to be used! (see sizing section on page 19)



30 60 90 Q in gpm

#### Aquamicron Water Removal Element Capacity vs. Flow

Q in gpm

Spin-On	Optimum	Flow Rate	Maximum Flow Rate		
Element	Flow (gpm)	Capacity (quarts)	Flow (gpm)	Capacity (quarts)	
0080MA010AM	2	0.12	6	0.08	
0090MA010AM	2	0.12	6	0.08	
0095MA010AM	4	0.17	8	0.11	
0160MA010AM	4	0.23	8	0.16	
0180MA010AM	6	0.45	15	0.32	

#### **Spin-on Connection Chart**

<b>S</b> i-o	Can Connection Thread				
Size	MA	MG	MU		
0040	3/4" - 16 UN - 2B	—	—		
0080	—	3/4" BSPP			
0080/0085	1" - 12 UN -2B	—	_		
0090/0095	1-1/2" - 16 UN - 2B	—	—		
0160	_	1-1/4" BSPP	_		
0160/0180	1-1/2" - 16 UN - 2B	_	_		

MA = UN Tap Plate Thread (standard); MG = BSPP Tap Plate Thread (special); MU = Metric Tap Plate Thread (special - consult HYDAC)

#### **Element K Factors**

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

Sizo	MABN					
Size	3 µm	5 µm	10 µm	20 µm		
0040	1.3914	1.1799	0.6289	0.3613		
0080	0.5216	0.4423	0.2357	0.1354		
0090	0.4841	0.3702	0.3451	0.1911		
0095	0.2762	0.2112	0.1969	0.1090		
0160	0.2372	0.1983	0.1113	0.0625		
0180	0.1231	0.1029	0.0577	0.0325		
All Element K Factors in psi / gpm.						

<u> Sino</u>	МАР			
Size	3 µm	10 µm	25 µm	
0040	7.763	2.348	1.516	
0080	1.606	0.486	0.314	
0085	_	0.351	0.227	
0090	1.594	0.482	0.311	
0095	0.894	0.270	0.174	
0160	0.839	0.192	0.145	
0180	0.443	0.134	0.087	

Size	MAAM 010 μm
0080	0.513
0085	0.367
0090	0.507
0095	0.284
0160	0.233
0180	0.136

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## **MAD** Low Pressure Filters

#### **SF** Series **In-tank Suction Filters** 360 psi • up to 300 gpm



#### Features

- Non-welded housing design reduces stress concentrations and prevents fatigue failure.
- Inlet/Outlet port options include NPT port or SAE 4-bolt flange to • allow easy installation without costly adapters.
- O-ring seals are used to provide positive, reliable sealing. Choice of O-ring materials (Nitrile, Fluoroelastomer, or Ethylene Propylene) provides compatibility with oil/water emulsions, high water base fluids, and synthetic fluids.
- Bolt-on lid requires minimal clearance for removal.
- A mechanically actuated, electrical, electrical / visual (lamp), or • vacuum gauge bypass indicator can be installed.
- Bypass valve with low cracking pressure prevents pump • cavitation.

### Hydraulic Symbol



#### **Technical Details**

Mounting Method 4 mounting holes - filter head					
Port Connection	Inlet	Outlet			
110	SAE-12	SAE-12			
240	SAE-20	SAE-20			
330	SAE-20 2" NPT 2" NPT	2" NPT 2" NPT 2" SAE Flange, Code 61			
950	3 1/2" SAE Flange, Code 61	3 1/2" SAE Flange, Code 61			
1300	4" SAE Flange, Code 61	4" SAE Flange, Code 61			
Flow Direction	Inlet: Bottom	Outlet: Side			
Construc. Materials	Housing	Lid			
SF 110-330 SF 950-1300	Aluminum Ductile Iron	Aluminum Ductile iron			
Flow Capacity					
110 240 330 950 1300	5 gpm (20 lpm) 20 gpm (80 lpm) 40 gpm (150 lpm) 200 gpm (757 lpm) 300 gpm (1135 lpm)	)			
Housing Pressure Ra	ting				
Max. Oper. Press. Proof Pressure Fatigue Pressure	360 psi (25 bar) 540 psi (38 bar) 360 psi (25 bar) @ 7	700,000 cycles			
Burst Pressure	110 240 330 950-1300	1080 psi (75 bar) 1230 psi (85 bar) 1440 psi (100 bar) >1440 psi (100 bar)			
Element Collapse Pre	essure Rating				
W/HC P/HC	290 psid (20 bar) 145 psid (10 bar)				
Fluid Temp. Range	-22° to 250°F (-30°	to 121°C)			
Fluid Compatability					
Compatible with all petroleum oils and synthetic fluids rated for use with Fluoroelastomer or Ethylene Propylene seals. Contact HYDAC for information on special housing and element constructions available for use with water glycols, oil/water emulsions, and HWBF.					
Indicator Trip Pressure					
$\Delta P = 3 \text{ psi} (0.2 \text{ bar}) -10\%$ (standard)					
Bypass Valve Cracking Pressure					

### Applications



Agricultural



Automotive



Construction

Steel / Heavy Industry



Gearboxes

 $\Delta P = 3 \text{ psi} (0.2 \text{ bar}) + 10\% \text{ (standard)}$ 

#### Model Code

$\underbrace{SF} W/HC} 330 \Psi G 25 UE 1.1/3 - E$	<u>su.2</u>
Filter Type       SF = In-Tank Inlet Suction Filter	
Element Media W/HC = Wire Screen	
Size	
Operating Pressure W = suction operation	
Type of Connection $C = SAE 12$ (sizes 110)NPT available $L = 2"$ NPT Inlet / SAE 32 Flange Outlet (size 330) $E = SAE 20$ (sizes 240 - 330)w/Adapter $O = SAE 56$ Flange (size 950) $G = 2"$ NPT (size 330) $P = SAE 64$ Flange (size 1300)	
Filtration Rating (micron)	
Type of Clogging Indicator (static) A, UE, UF	
Type Number	
Modification Number (latest version always supplied)	
Outlet Port Configuration         3       =       NPT (size 330)         12       =       SAE Straight Thread Inlet/Outlet Connection (sizes 110 & 240 only)         16       =       SAE Code 61 Flange (sizes 330-1300)	
Seals (omit) = Nitrile (NBR) (standard) V = Fluoroelastomer (FPM) EPR = Ethylene Propylene (EPR)	
Cracking Pressure of Bypass Valve	

B0.2 = 3 psid (0.2 bar) (standard)

#### **Replacement Element Model Code** 0330 DC 35

		<u>U</u>	330	no	<u>25</u>	VV/	/
Size	0660.	0950. 1300					
<b>Filtration</b> 25, 74,	<b>Rat</b> 149 :	ing (micron) ———— = W/HC					
Element W/HC	Med	ia ————					
Supplem (omit) V	ienta = =	ry Details standard Fluoroelastomer (FPM) s	seals	;			 

#### **Clogging Indicator Model Code**



(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