

MF, MFD, MFDS Series

Spin-On Filters

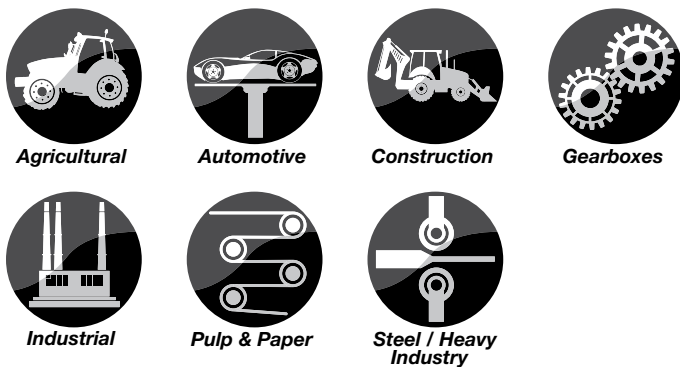
250 PSI • up to 120 GPM



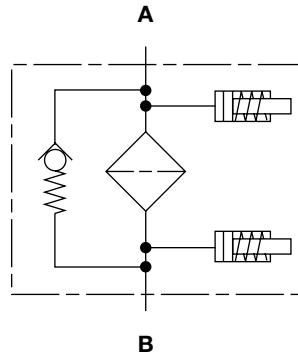
Features

- 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.

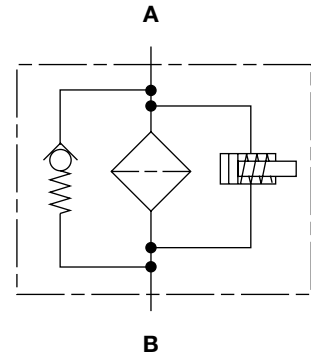
Applications



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



MF 90/95/190/195



Technical Details

Mounting Method		
MF40/80/85	2 mounting holes	
MF90/95	4 mounting holes	
MF160/180	2 or 4 mounting holes	
MF190/195	2 or 3 mounting holes	
MFD	2 mounting holes	
MFDS	4 mounting holes	
Port Connection		
MF40	SAE-6	
MF80/85/90/95	3/4" BSPP, 3/4" NPT, SAE-12, 1" NPT, SAE-16	
MF160/180/190/195	1 1/4" BSPP, 1 1/4" NPT, SAE-20, 1 1/2" NPT, SAE-24	
MFD160/180	1 1/2" NPT, SAE-24	
MFDS160/180*	2" SAE Flange Code 61, 1 1/2" NPT Comb. Port	
MFDS190/195*	2" SAE Flange Code 61, 1 1/2" NPT Comb. Port	
Flow Direction	Inlet: Side	Outlet: Side
Construc. Materials	Head: Aluminum	Can: Steel
Flow Capacity		
40	7 gpm (26 lpm)	
80	15 gpm (57 lpm)	
85	25 gpm (95 lpm)	
90	15 gpm (57 lpm)	
95	25 gpm (95 lpm)	
160,190	30 gpm (114 lpm) per can	
180,195	60 gpm (227 lpm) per can	
Housing Pressure Rating	MF40/80/85/160/180/190/195	MF90/95
Max. Oper. Pressure	120 psi (8 bar)	250 psi (17 bar)
Proof Pressure	180 psi (12.4 bar)	375 psi (26 bar)
Fatigue Pressure	Contact HYDAC	
Burst Pressure	Contact HYDAC	
Element Collapse Pressure Rating		
BN, P, A	80 psid (5.5 bar)	
Fluid Temp. Range	-22° to 250°F (-30° to 121°C)	
Fluid Compatibility		
Compatible with all petroleum oils and synthetic fluids rated for use with Buna-N.		
Indicator Trip Pressure		
ΔP = 20 psid (1.4 bar) -10%		
ΔP = 29 psid (2 bar) -10%		
ΔP = 44 psi (3 bar) (B3.4 Bypass)		
Vacuum = 2 psi (0.1 bar) (Suction)		
Bypass Valve Cracking Pressure		
ΔP = 3 psid (0.2 bar) +10% (for suction applications)		
ΔP = 25 psid (1.7 bar) +10% (standard for nominal filters)		
ΔP = 43 psid (3 bar) +10% (standard for absolute BN filters)		
ΔP = 50 psid (3.4 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)

Model Code

MF BN 80 G 5 A 1 . X / 5.2

Filter Type

- MF = Single Element
- MFD = Dual Filter Heads & Elements (*End to End*) (sizes 160, 180, 190, & 195 only)
- MFDS = Dual Filter Heads & Elements (*Side by Side*) (sizes 160, 180, 190, & 195 only)

Element Media

- BN = Betamicon® (*Low Collapse*)
- P = Paper
- AM = Water Removal

Size

- 40*, 80*, 85[§], 90, 95[†], 160, 180, 190 (*uses size 160 element*), 195 (*uses size 180 element*)

Type of Connection

- G = Threaded
- GF = Combination Threaded/Flanged (*MFDS 160/180 only*)

Filtration Rating (micron)

- 3, 5, 10, 20 = BN/HC
- 3, 10 25 = P
- 10 = AM

Type of Clogging Indicator

- A, C, E, LE
- (*Static* - sizes 80, 85, 160, 180); (*Differential* - sizes 90, 95, 190, 195)

Type Number

Modification Number (*latest version 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	0.2	3/4" BSPP (<i>use MA elements</i>)	5.1	1" NPT
	5.2	3/4" NPT	12.1	SAE 16 Thread
	12.2	SAE 12 Thread		
MF 160/180, MF 190/195	0.2	1 1/4" BSPP (<i>use MA elements</i>)	5.1	1 1/2" NPT
	5.2	1 1/4" NPT	12.1	SAE 24 Thread
	12.2	SAE 20 Thread		MF 160/180 only
MFD 160/180	5.1	1 1/2" NPT	12.1	SAE 24 Thread
MFDS 160/180	5.1	1 1/2" NPT / 2" SAE Flange Combo (<i>Code 61</i>)		
MFDS 190/195	5.1	1 1/2" NPT / 2" SAE Flange Combo (<i>Code 61</i>)		

Bypass Valve Cracking Pressure

- 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

0080 MA 005 BN

Size

- 0040, 0080 - **(not available with 3 µm BN elements)*
- 0085 - *§(not available with BN, AM and 3 µm P elements)*
- 0095 - *†(not available with 20 µm BN elements)*
- 0090, 0160, 0180

Filtration Rating (microns)

- 3, 5, 10, 20 = BN
- 3, 10, 25 = P
- 10 = AM (*not available with size 0085*)

Element Media

- BN, P, AM

Supplementary Details

- Bypass settings for element 0040 only (*bypass valve is inside element*)
- B1.3 = 18 PSID Bypass (P)
- B1.7 = 25 PSID Bypass (BN)
- (*Spin-on elements available with NBR seals only*)

Clogging Indicator Model Code

VMF 2 B . X /

Indicator Prefix

- VMF = Mobile Filters

Trip Pressure

- 2 = 29 psid (2 bar)
- 1.7 = 25 psid (1.7 bar) (*optional*)

Type of Indicator

- A = no indicator, plugged port
- C = Electric switch
- E = Gauge
- LE = Electric pressure switch

Modification Number

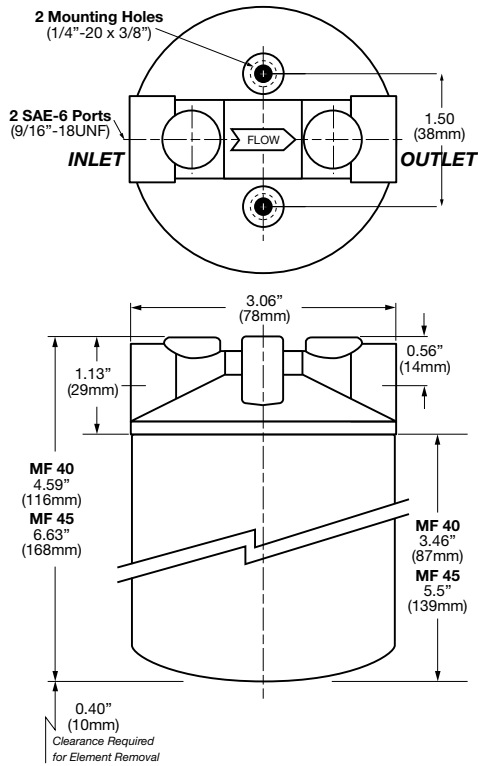
Supplementary Details

Seals

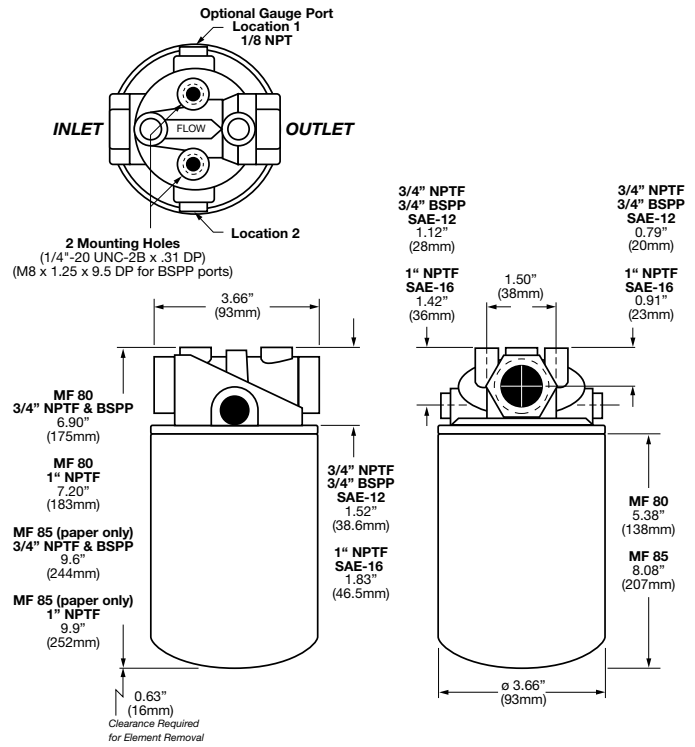
- (omit) = Nitrile (NBR) (*standard*)
- V = Fluoroelastomer (FPM)

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

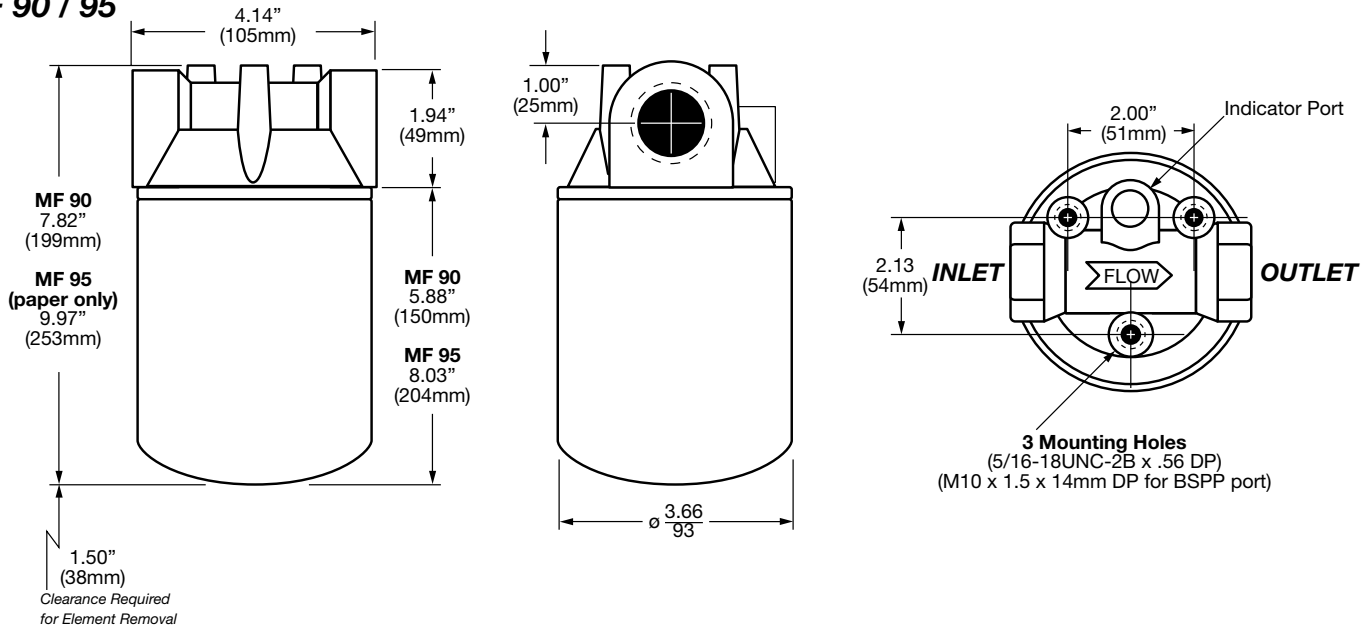
Dimensions MF 40



MF 80 / 85



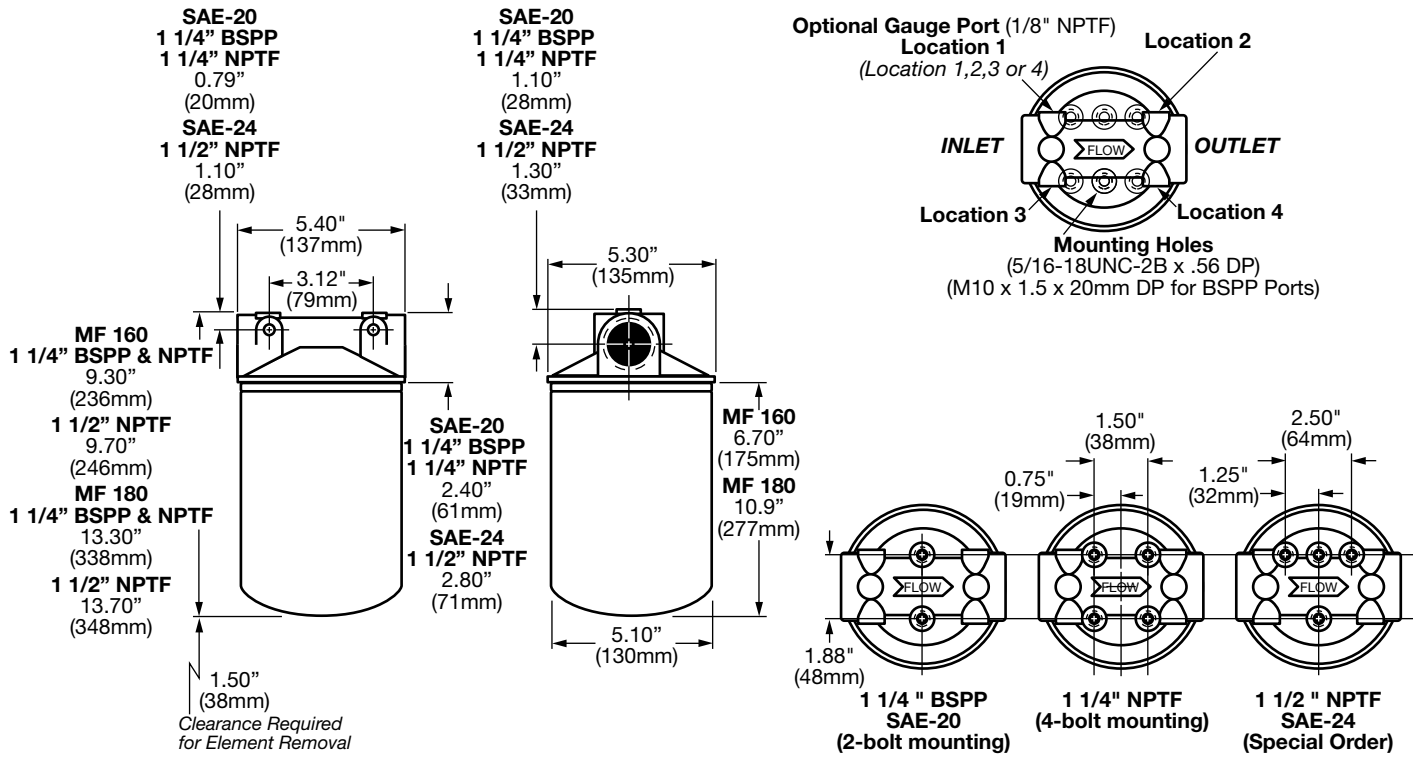
MF 90 / 95



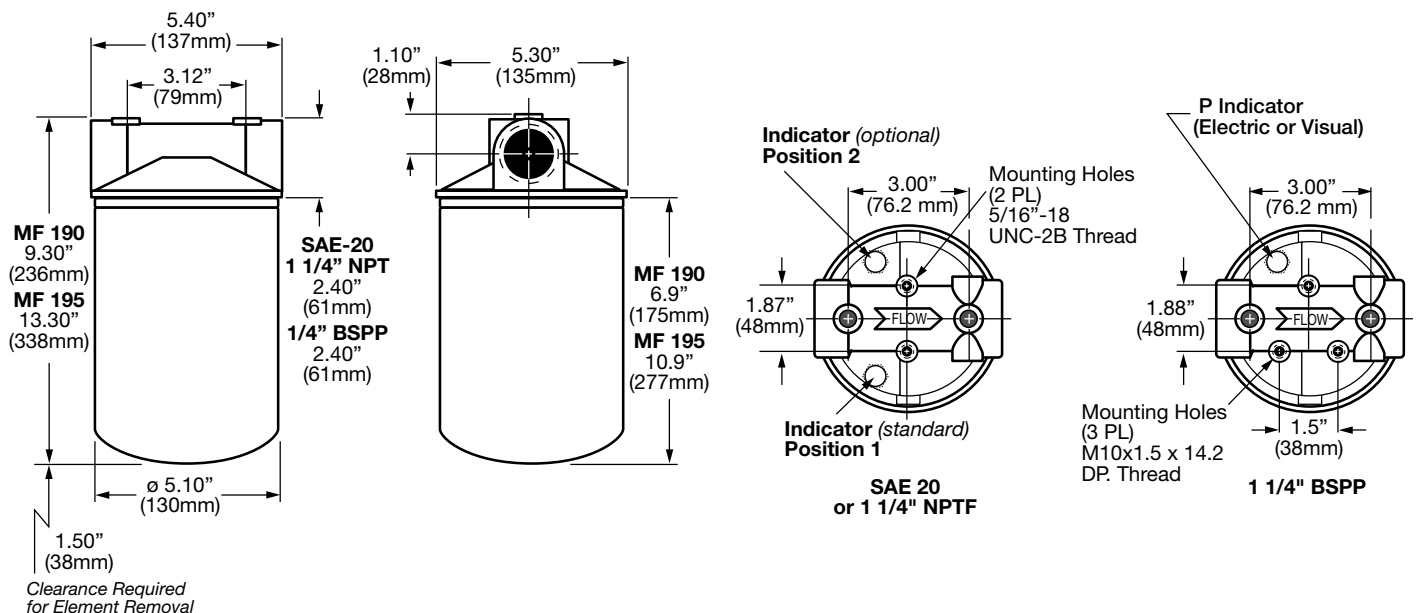
Size	40 Head	40 Can (BN)	40 Can (P)		
Weight (lbs.)	0.24	0.73	0.6		
Size	80 / 85 Head	80 Can (BN)	80 Can (P)	85 Can (P)	
Weight (lbs.)	0.41	1.35	1.08	1.42	
Size	90 / 95 Head	90 Can (BN)	90 Can (P)	95 Can (BN)	95 Can (P)
Weight (lbs.)	1.12	1.5	1.29	2.04	1.47

Dimensions shown 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.

MF 160 / 180



MF 190 / 195



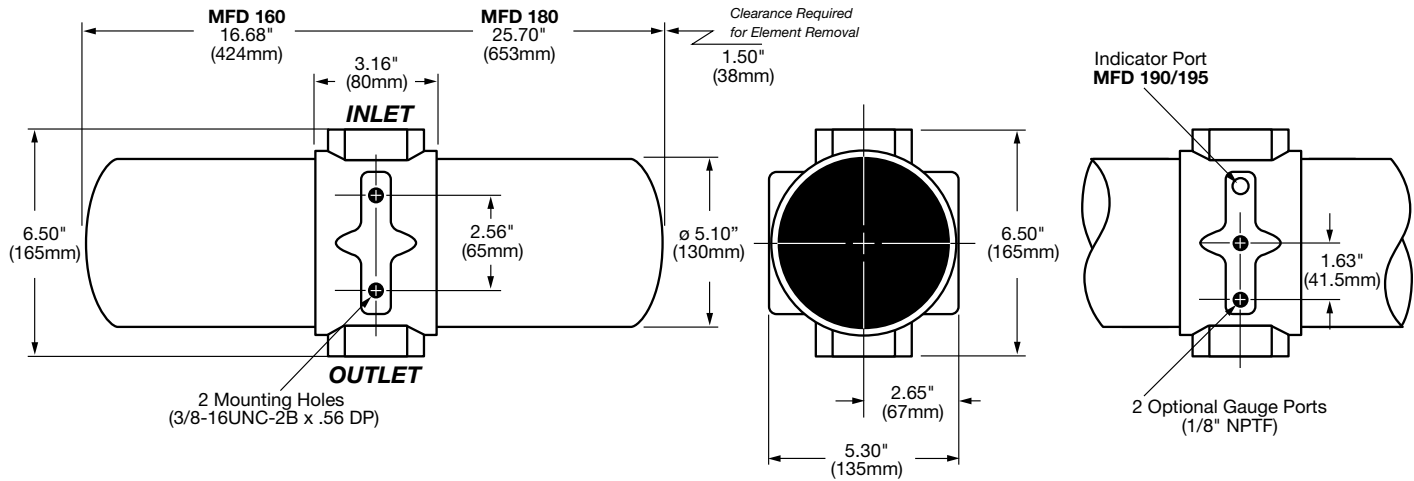
Size	160 / 180 Head	160 Can (BN)	160 Can (P)	180 Can (BN)	180 Can (P)
Weight (lbs.)	1.31	2.56	2.15	3.69	2.68

Size	190 / 195 Head	190 Can (BN)	190 Can (P)	195 Can (BN)	195 Can (P)
Weight (lbs.)	1.68	2.56	2.15	3.69	2.68

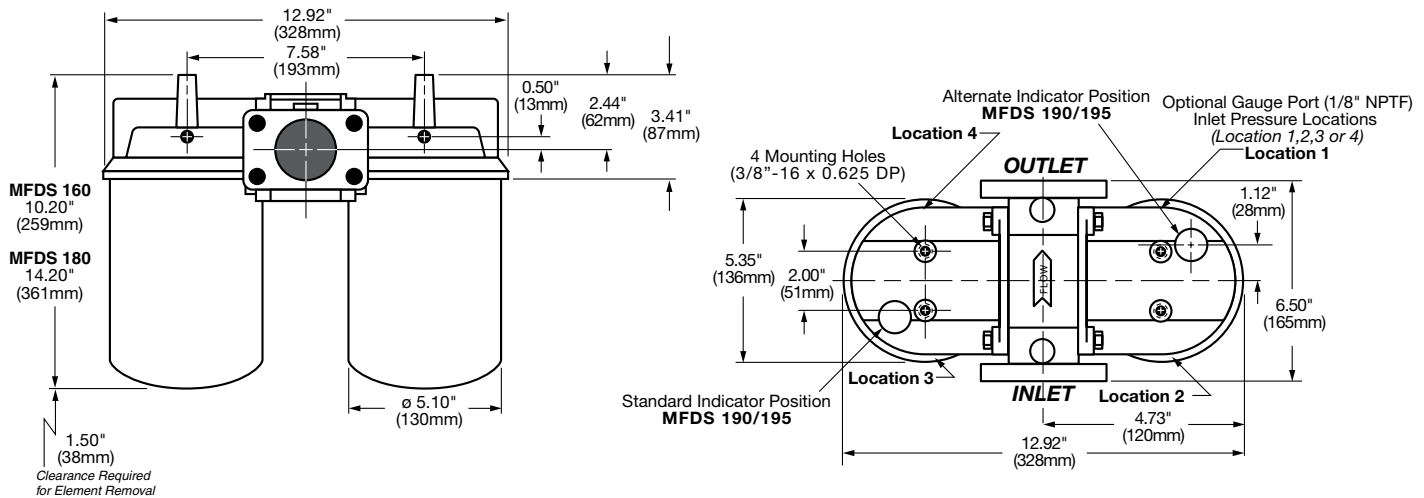
Dimensions shown are for general information and overall envelope size only. Weights listed are without element. For complete dimensions please contact HYDAC to request a certified print.

HYDAC | 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:

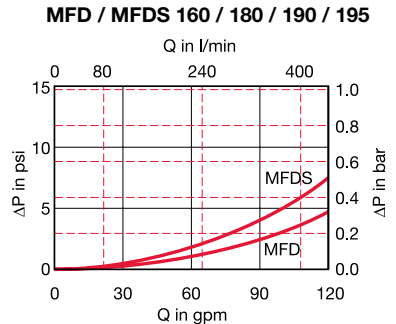
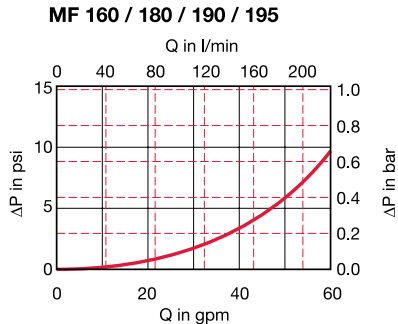
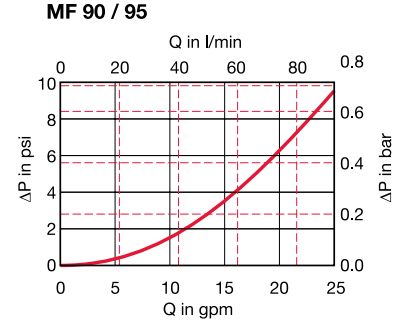
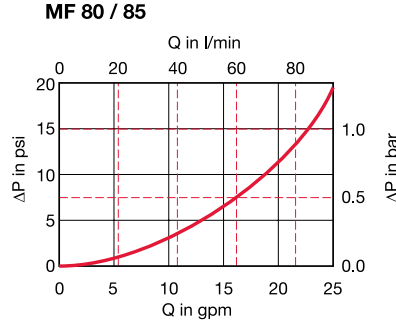
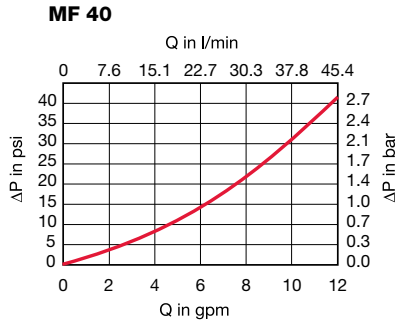
$$\text{Assembly } \Delta P = \text{Housing } \Delta P + \text{Element } \Delta P$$

Housing Curve:

Pressure loss through housing is as follows:

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

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



Aquamicon Water Removal Element Capacity vs. Flow

Spin-On Element	Optimum Flow Rate		Maximum Flow Rate	
	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

Size	Can Connection Thread		
	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

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

(From Tables Below)

Size	...MA...BN			
	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

Size	...MA...P		
	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	...MA...AM
	010 μm
0080	0.513
0085	0.367
0090	0.507
0095	0.284
0160	0.233
0180	0.136

All Element K Factors in psi / gpm.