

MPH SERIES

RETURN FILTER



MPFILTRI
filtri per oleodinamica



Maximum working pressure 145 PSI

Flow rate from 3 gpm to 550 gpm

Description

MPH

MPH and **MPI** series filters are designed for return-line applications and provide various installation applications. The filters are installed semi-immersed or totally immersed into a reservoir. The filtration flow is from inside to outside of the filter element which ensures that all the contaminant is collected inside the element itself avoiding contact with the reservoir oil during element change. The combination of magnetic pre-filtration and high filtration efficiency results in a cost effective and versatile filtration series.

The high flow rapid response bypass valves are a standard feature with this range of filters.

The **MPH 100** series are available with an option of an air filter.

The **MPH-MPI 250, 630, 850** series can be specified with dual inlet ports.

MPH-MPI filters within this range are suitable for flow rates up to 550 gpm.

MPH-MPI series are specifically designed for heavy duty mobile machinery and process plant applications.

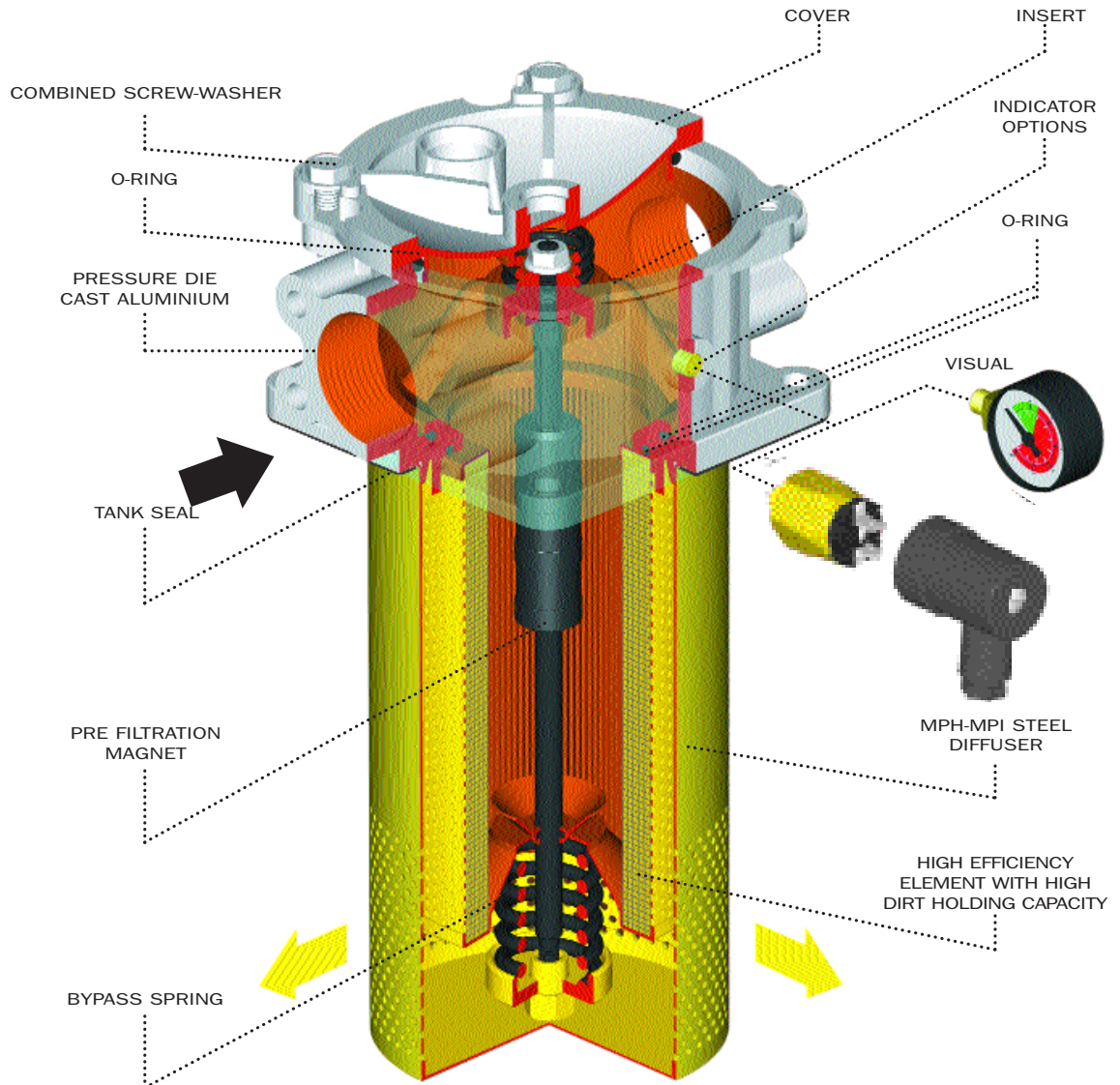
New

absolute filter elements
independently tested
in the following Institutes:

Institute of Filtration
(France)



Royal Institute of Technology



Filter element:

Materials

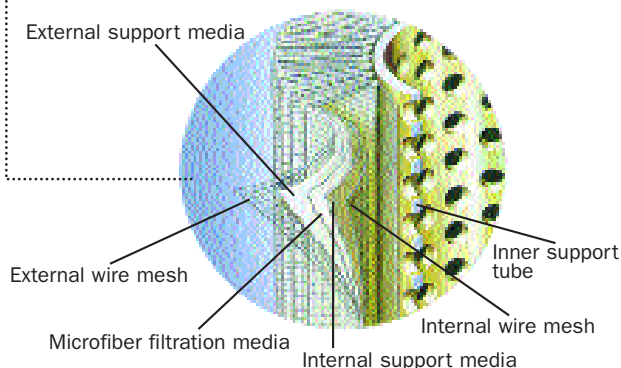
End caps:
Nylon

Support tube:
Galvanized steel

Support frames:
Galvanized steel with an epoxy coating

A Series

Inorganic microfiber



MP Filter elements - Conform to the following ISO standards

- ISO 2941 - Verification of collapse/burst resistance.
- ISO 2942 - Verification of fabrication integrity and determination of the first bubble point.
- ISO 2943 - Verification of material compatibility with fluids.
- ISO 3723 - Method for end load test.
- ISO 3724 - Verification of flow fatigue characteristics.
- ISO 3968 - Evaluation of pressure drop versus flow characteristics.
- ISO 4572 - Multi-pass method for evaluating filtration performance.

Element material Absolute filtration

A Series

Inorganic microfiber with acrylic support

Contamination retention

as per ISO 4572: Multi-pass test.

New improved $\beta \geq 200$ filter elements with greater efficiency and increased dirt holding capacity

Filter elements	Dimensions for $\beta(\mu\text{m})$ values				Filtration ratios			ΔP (psi)
	$\beta \geq 2$ (50%)	$\beta \geq 20$ (95%)	$\beta \geq 75$ (98,7%)	$\beta \geq 200$ (99,5%)	β_2	β_{10}	β_{20}	
A06	—	3	4,6	6	8	> 2.000	>10.000	100
A10	3	6	7,8	10	1,5	≥ 200	>10.000	100
A25	13	19	22	25	—	> 1,5	> 35	100

N.B. Other materials giving different degrees of filtration are available on request.

Type MR	100-1	100-2	100-3	100-4	250-1	250-2	250-3	250-4
A06	130.2	194.5	265	406.1	434	604.5	844.8	1550
A10/A25	130.2	194.5	265	406.1	434	604.5	844.8	1550

Values in sq. in

Type MR	630-1	630-2	630-3	630-4	850-1	850-2	850-3	850-4
A06	860.3	1210.6	1650.8	2031	2852	4774	7208	9564
A10/A25	860.3	1210.6	1650.8	2031	2852	4774	7208	9564

Values in sq. in

Filtering area Filter elements

Element material Nominal filtration

P Series

Resin - impregnated paper

M Series

Square wire mesh (filtration degree is defined in microns by the maximum diameter of a sphere corresponding to the mesh size)

Filtering area Filter elements

Type MR	100-1	100-2	100-3	100-4	250-1	250-2	250-3	250-4
P10/P25	202	279	409.2	589	543	744	1023	1845
M25	96.1	127.1	194.5	284	176	244.1	340	620
M60	96.1	127.1	194.5	284	176	244.1	340	620
M90	96.1	127.1	194.5	284	176	244.1	340	620

Values in sq. in

Type MR	630-1	630-2	630-3	630-4	850-1	850-2	850-3	850-4
P10/P25	1039	1457	1953	2403	3440	5775	8683.1	11550.6
M25	345.4	484.2	657.8	810.6	1028	1721	2527	3444.3
M60	345.4	484.2	657.8	810.6	1028	1721	2527	3444.3
M90	345.4	484.2	657.8	810.6	1028	1721	2527	3444.3

Values in sq. in

Filter body:

Materials	Head Pressure die cast aluminium	Seals A Series: Nitrile (Buna-N) V Series: Viton
	Cover MPH 100 Nylon MPH 250-630 Aluminium MPH 850 Steel	Bypass valve Steel
	Diffuser Steel	Indicator Brass
Working temperature		From -13°F to 230°F For temperatures outside this range, please consult our Sales and Network Organization
Pressure filter body	Maximum working pressure up to 145 psi Test pressure: 217.5 psi Minimum burst pressure: 435 psi	Fatigue test: a filter body subjected to pressure impulses from 0 to 145 psi will withstand 1.000.000 cycles
Collapse pressure filter elements		145 psi
Bypass valve Calibration pressure	Bypass valve, differential opening pressure:	B: 2 psi ± 10% C: 25 psi ± 10%
Compatibility with fluids	Filter head and bowls compatible for use with: • mineral oils (types HH-HL-HM-HR-HV-HG as per ISO 6743/4) • water-based emulsions (types HFAE-HFAS as per ISO 6743/4) • synthetic fluids (types HS-HFDR-HFDS-HFDU as per ISO 6743/4) • water-glycol (types HFC as per ISO 6743/4) Ask for anodised version	Filter elements As per ISO 2943; suitable for mineral oils (types HH-HL-HM-HR-HV-HG as per ISO 6743/4) synthetic fluids (A and M series only) (types HS-HFDR-HFDS-HFDU as per ISO 6743/4) For water-based emulsions (types HFAE-HFAS as per ISO 6743/4) and fluids other than those mentioned, please consult our Sales and Network Organization.
Types of indicators	Seals A Series Nitrile (Buna-N) compatible with mineral oils (types HH-HL-HM-HR-HV-HG as per ISO 6743/4) water - based emulsions (types HFAE-HFAS as per ISO 6743/4)	water - glycol (types HFC as per ISO 6743/4)
		V Series Viton compatible with synthetic fluids (types HS-HFDR-HFDS-HFDU as per ISO 6743/4)
Visual indicator	Description: MPH series filters are fitted with indicators switching	at a pressure of 15 psi ± 10% (with bypass 25 psi setting) at a pressure of 8.7 psi ± 10% (with bypass 12 psi setting)
	VT Series with bypass 12 psi setting VR Series with bypass 25 psi setting V1 Series (MPH 850, only)	Color coded pressure gauge scale 0-15 psi Color coded pressure gauge scale 0-30 psi
Electrical indicator	With bypass 12 psi EQ Series: Pressure switch with N.O. contacts EB Series: Pressure switch with N.C. contacts With bypass 25 psi ER Series: Pressure switch with N.O. contacts EC Series: Pressure switch with N.C. contacts	Operational information: Max voltage: 48 Vac 50÷60 Hz Max current: 0.5 A resistive, 0.2 A inductive.

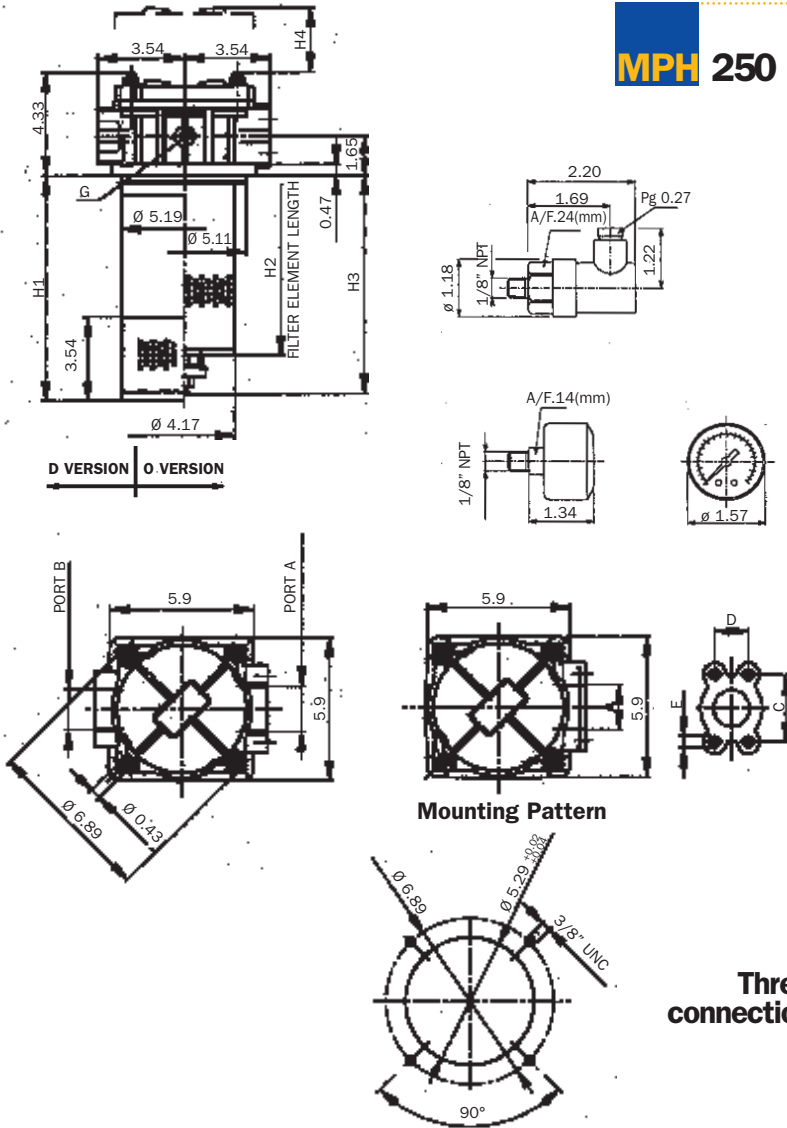
Selection & installation information

Please refer to individual pressure drop curves to obtain filter assembly pressure drop information

The following filter sizing recommendations are based using a mineral oil fluid at 150 SUS with a maximum total filter assembly (housing and filter element) pressure drop of 30% of the filter condition indicator 5.8 psi (bypass type C)

MPH 250

MPH SERIES 250 SIZE



Filter assembly	Flow rate gpm *	Bowl length	Port size BSP/NPT/SAE	Weight lb **
A06	26.4	1	1 1/2"	8.6
A10	30.4			1 port
A25	52.8			9.5
P10	47.5			2 ports
A06	32	2	1 1/2"	9
A10	42.2			1 port
A25	58.1			9.9
P10	52.8			2 ports
A06	45	3	1 1/2"	10.1
A10	54.1			1 port
A25	74			11
P10	68.6			2 ports
A06	79.2	4	1 1/2"	10.5
A10	95			1 port
A25	132			11.5
P10	118			2 ports

* Flow rates with 150 SUS fluid

** Weight including filter element and diffuser

Lengths

Type	H1	H2	H3	H4
1	9.44	5.51	6.89	10.24
2	9.44	7.48	8.86	12.20
3	12.2	10.23	11.61	14.96
4	20.27	18.3	19.69	22.83

Thread connections

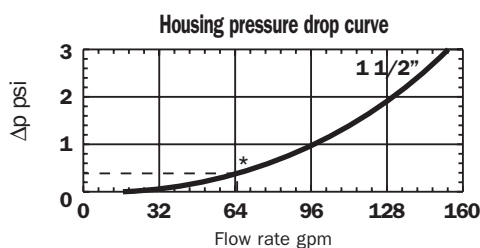
Type	Port A	Port B	G
G1	1 1/2" BSP	Not available	1/8" BSP
G2	1 1/2" BSP	1 1/4" BSP	1/8" BSP
G3	Not available	—	—
G4	1 1/2" NPT	Not available	1/8" NPT
G5	1 1/2" NPT	1 1/4" NPT	1/8" NPT
G6	Not available	—	—
G7	SAE 24 - 1 7/8" - 12 UN	Not available	1/8" NPT
G8	SAE 24 - 1 7/8" - 12 UN	SAE 20 - 1 5/8" - 12 UN	1/8" NPT

Flange connections (1 port)

Type	A	C	D	E
F1	1 1/2" SAE - 3000 PSI/M	2.75	14.06	M12
F3	1 1/2" SAE - 3000 PSI/UNC	2.75	14.06	1/2" UNC

Flange connections (2 ports)

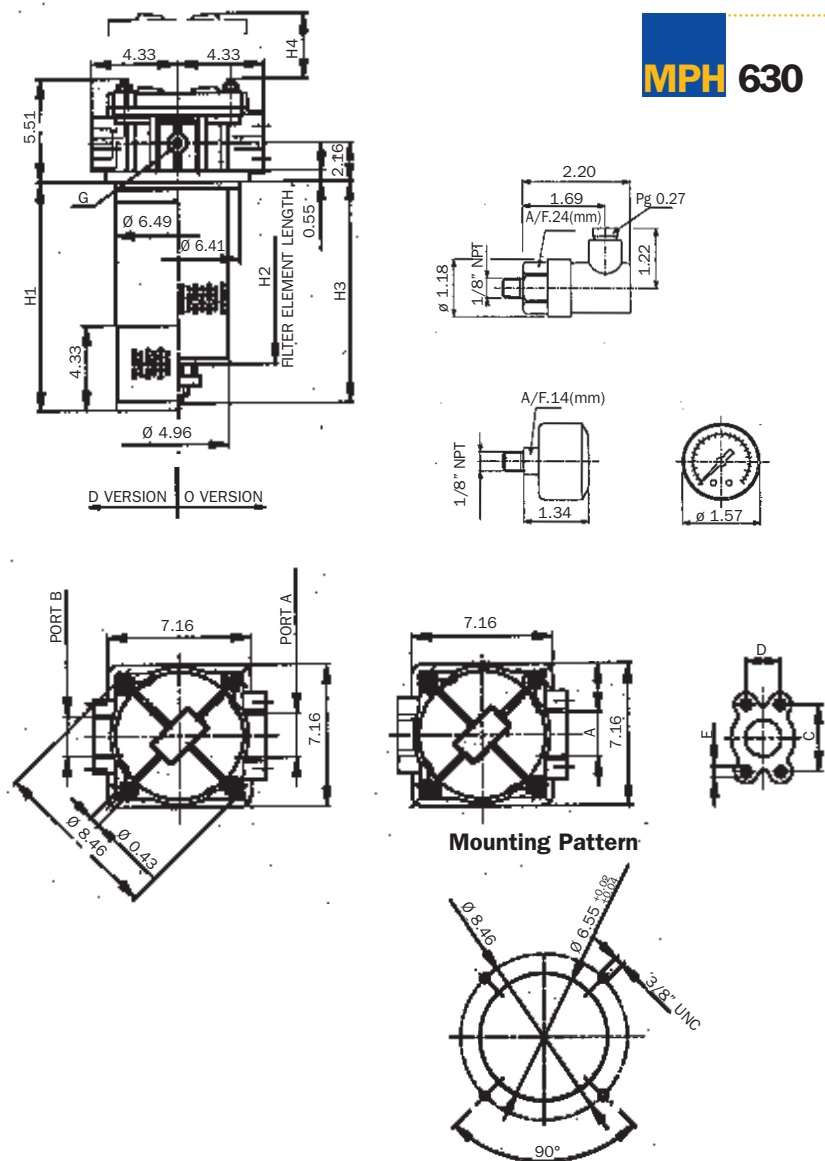
Type	Port A/B	C	D	E
F2	A: 1 1/2" SAE - 3000 PSI/M B: 1 1/4" SAE - 3000 PSI/M	2.75	14.06	M12
F4	A: 1 1/2" SAE - 3000 PSI/UNC B: 1 1/4" SAE - 3000 PSI/UNC	2.75	14.06	1/2" UNC



Selection & installation information

Please refer to individual pressure drop curves to obtain filter assembly pressure drop information

The following filter sizing recommendations are based using a mineral oil fluid at 150 SUS with a maximum total filter assembly (housing and filter element) pressure drop of 30% of the filter condition indicator 5.8 psi (bypass type C)



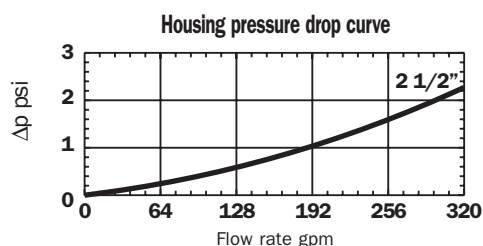
MPH SERIES 630 SIZE

Filter assembly	Flow rate gpm *	Bowl length	Port size BSP/NPT/SAE	Weight lb **
A06	58	1	2 1/2"	18
A10	84.5			
A25	132			
P10	85			
A06	66	2	2 1/2"	19.1
A10	105.6			
A25	158.4			
P10	116.2			
A06	74	3	2 1/2"	19.8
A10	116.2			
A25	237.6			
P10	142.6			
A06	86	4	2 1/2"	20.9
A10	126.8			
A25	264			
P10	211.2			

* Flow rates with 150 SUS fluid
** Weight including filter element and diffuser

Lengths

Type	H1	H2	H3	H4
1	11	8.26	10.23	13.78
2	14.17	11.41	13.38	16.93
3	18.1	15.35	17.32	20.86
4	21.65	18.81	20.86	24.41



Flange connections (1 port)

Type	A	C	D	E	G
F1	2 1/2" SAE - 3000 PSI/M	3.54	2	M12	1/8" BSP
F3	2 1/2" SAE - 3000 PSI/UNC	3.54	2	1/2" UNC	1/8" NPT

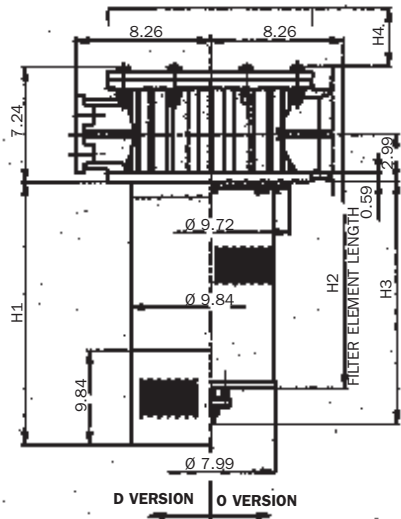
Flange connections (2 ports)

Type	Port A/B	C	D	E	G
F2	A: 2 1/2" SAE - 3000 PSI/M	3.54	2	M12	1/8" BSP
	B: 2" SAE - 3000 PSI/M	3.06	1.68	M12	
F4	A: 2 1/2" SAE - 3000 PSI/UNC	3.54	2	1/2" UNC	1/8" NPT
	B: 2" SAE - 3000 PSI/UNC	3.06	1.68	1/2" UNC	

Selection & installation information

Please refer to individual pressure drop curves to obtain filter assembly pressure drop information

The following filter sizing recommendations are based using a mineral oil fluid at 150 SUS with a maximum total filter assembly (housing and filter element) pressure drop of 30% of the filter condition indicator 5.8 psi (bypass type C)



MPH 850

MPH SERIES 850 SIZE

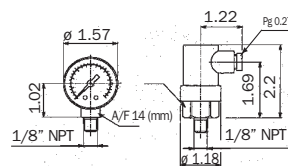
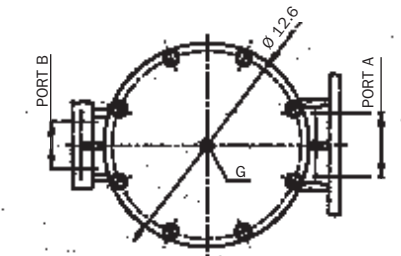
Filter assembly	Flow rate gpm	Bowl length	Port size BSP/NPT/SAE	Weight lb **
A06	118.8	1	4"	66
A10	171.6			
A25	264			
P10	211.2			
A06	185	2	4"	74.8
A10	264			
A25	396			
P10	264			
A06	225	3	4"	81.4
A10	317			
A25	462			
P10	396			
A06	264	4	4"	90.2
A10	396			
A25	554.4			
P10	475.2			

* Flow rates with 150 SUS fluid

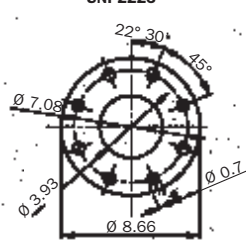
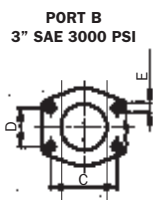
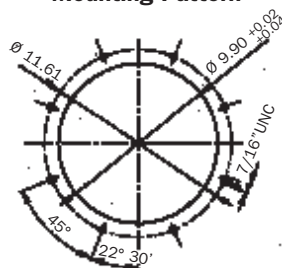
** Weight including filter element and diffuser

Lengths

Type	H1	H2	H3	H4
1	16.53	12.99	15.27	20.47
2	25	21.45	23.74	29.13
3	36.02	32.48	34.76	40.15
4	46.45	42.91	45.19	50.78

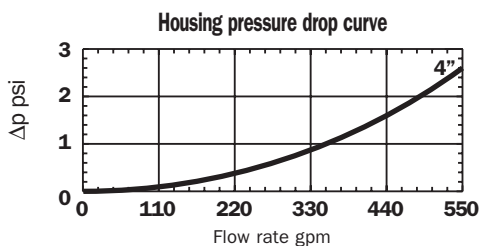


Mounting Pattern



Flange connections

Type	Port A/B	C	D	E	G
F1	A: DN 100 PN 10/16	4.26	2.43	M16	1/8" BSP
	B: 3" SAE - 3000 PSI/M				
F2	A: DN 100 PN 10/16	4.18	2.43	5/8" UNC	1/8" NPT
	B: 3" SAE - 3000 PSI/UNC				



General

Pressure drop versus flow rate curve information for both housing and filter elements is in accordance with ISO 3968

Filter assembly pressure drop - $\Delta p_{\text{Total}} = \Delta p_{\text{Housing}} + \Delta p_{\text{Filter element}}$

Housing pressure drop - The housing pressure drop is proportional to the fluid density

Filter element pressure drop - Filter element pressure drop is proportional to kinematic viscosity therefore always check the fluid operating temperature and fluid type to obtain the working viscosity according to the following formula:

$$\Delta p_1 \text{ Filter element} = (\text{working viscosity} / \text{brochure viscosity}) \times \Delta p \text{ filter element}$$

Brochure viscosity 150 SUS

Filter assembly sizing example

- Customer requires a 66 gpm filter assembly (with bypass valve setting at 5.8 psi type C)
- Mineral oil fluid: 230 SUS at 104°F
- A25 - 25 micron absolute filtration

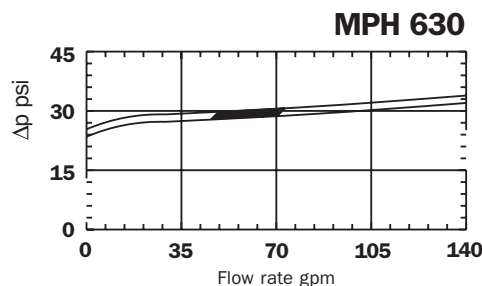
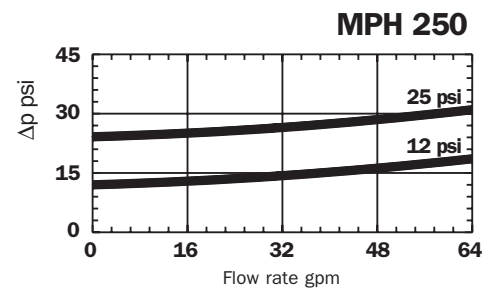
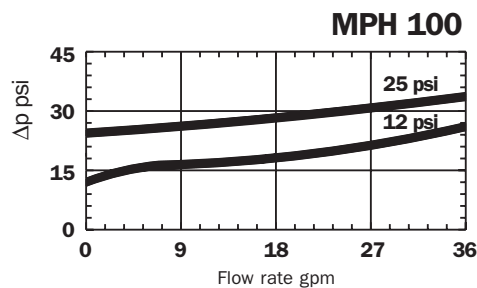
Selection :

- **Housing pressure drop** - MPH 250-3 with 66 gpm $\Delta p = 0.38$ psi (see curve on page 6)
- **Filter element pressure drop** (brochure viscosity) - MR 250-3 A25 with 66 gpm $\Delta p = 3.25$ psi (see curve on page 10)
- **Filter element pressure drop** (working viscosity) - With 230 SUS $\Delta p_1 = 3.25 \times (230/150) = 4.98$ psi
- **Filter assembly pressure drop** $\Delta p_{\text{Total}} = \Delta p_{\text{Housing}} + \Delta p_1 \text{ Filter element} = 0.38 + 4.98 = 5.36 \text{ psi}^*$ { Acceptable pressure drop value, as per our recommendations

Bypass valves pressure drop

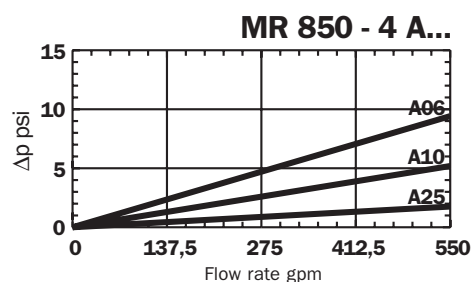
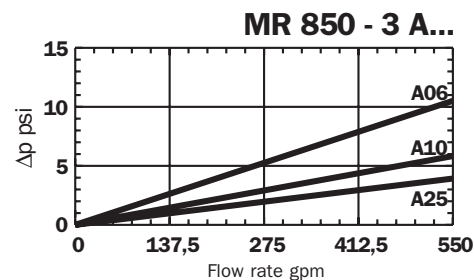
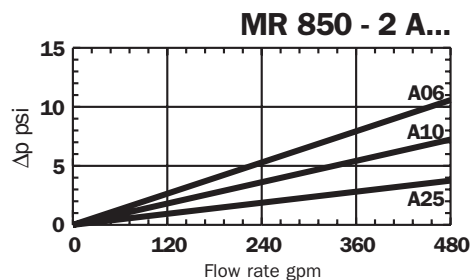
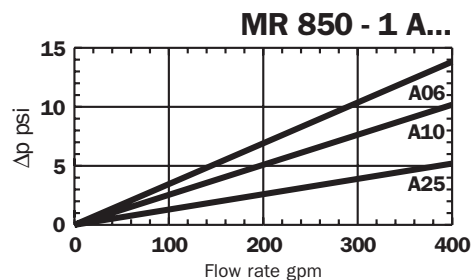
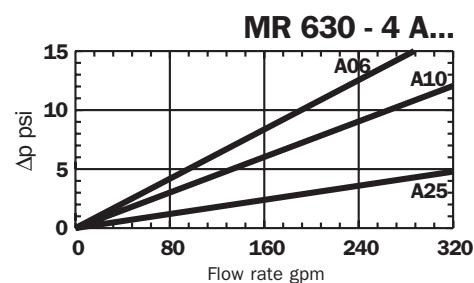
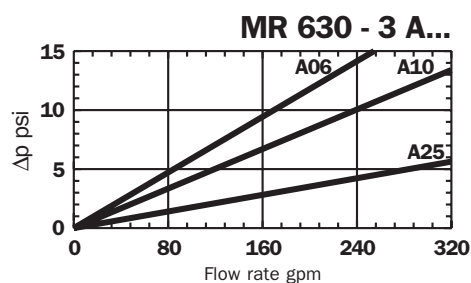
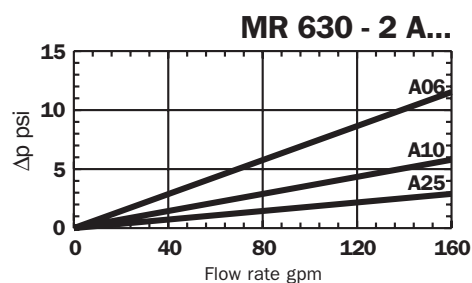
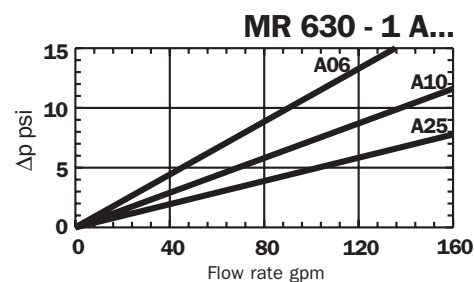
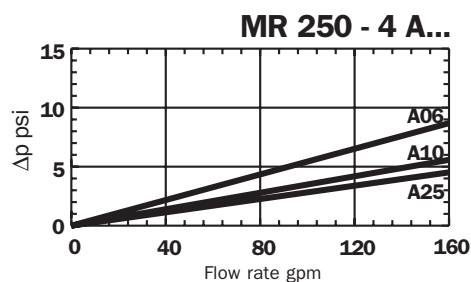
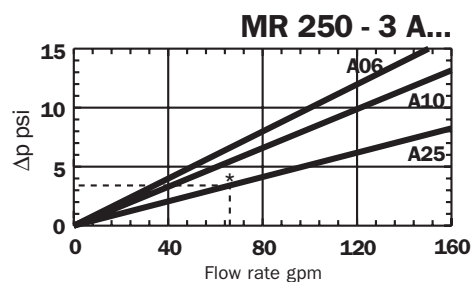
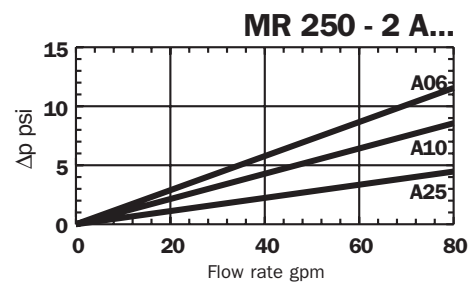
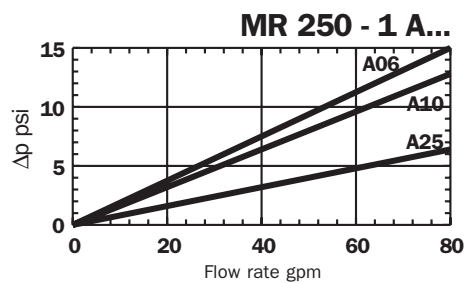
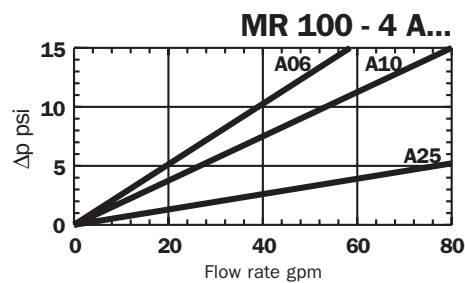
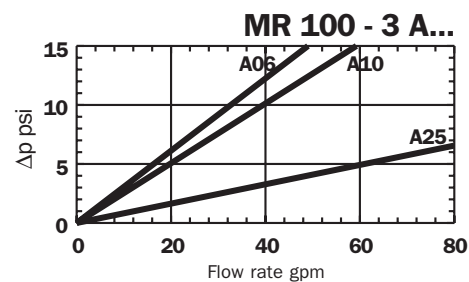
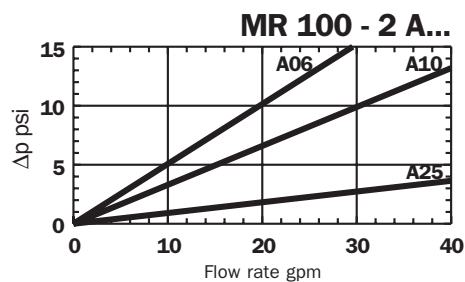
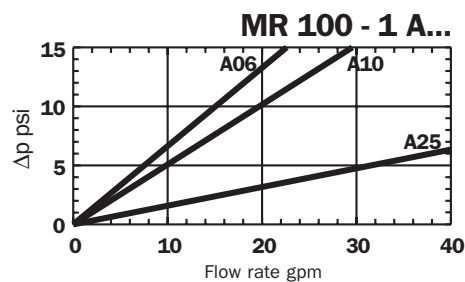
The curves were obtained using a mineral oil with a density of 0,86.

The Δp varies proportionally to the density.



Filter elements - A Series -

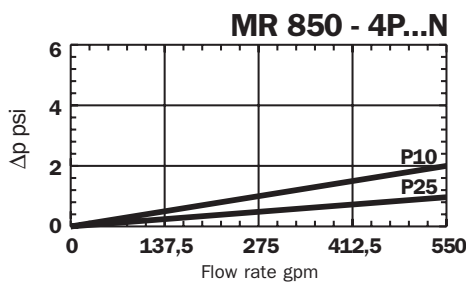
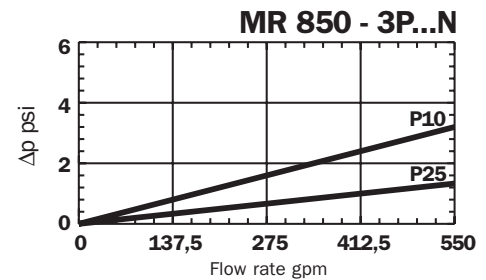
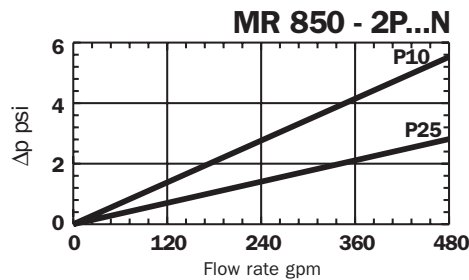
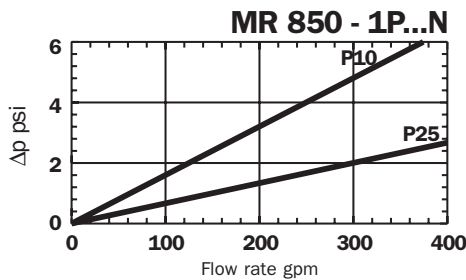
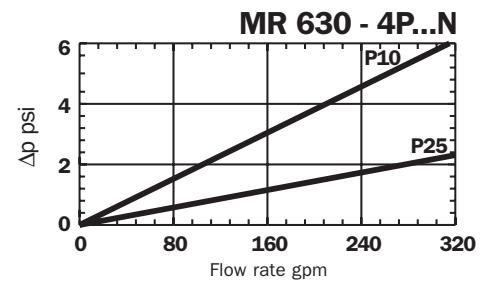
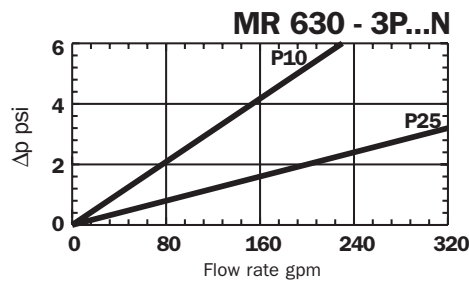
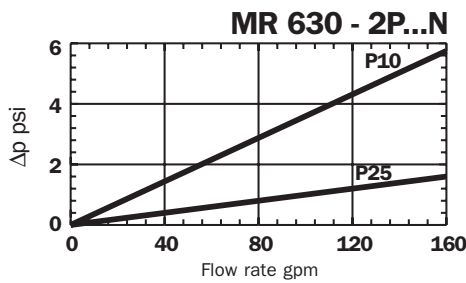
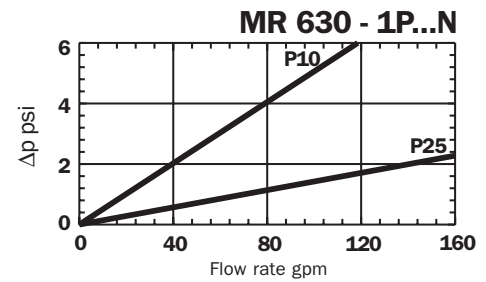
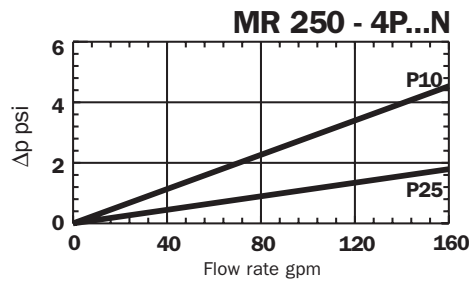
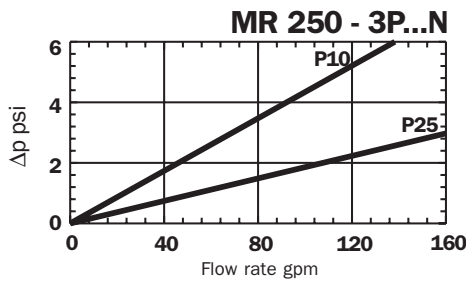
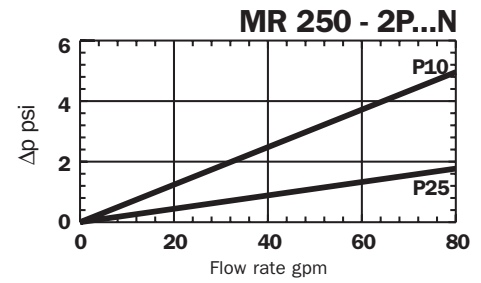
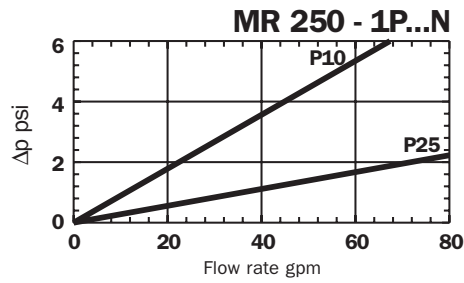
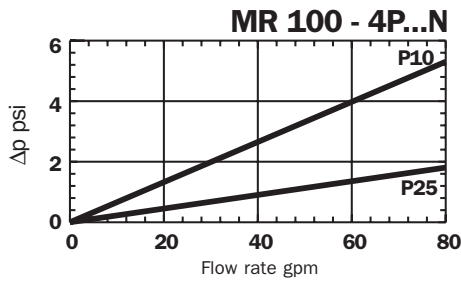
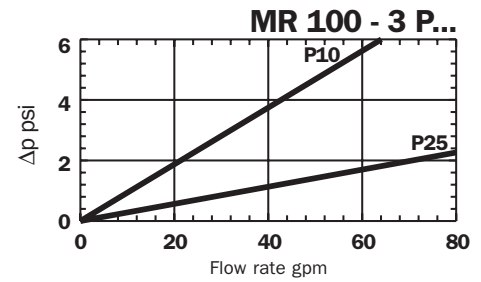
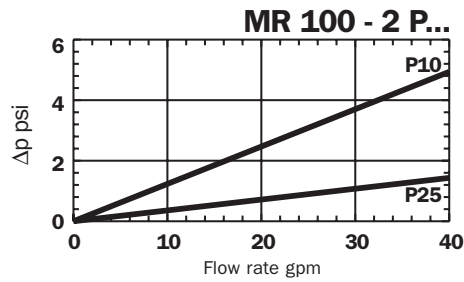
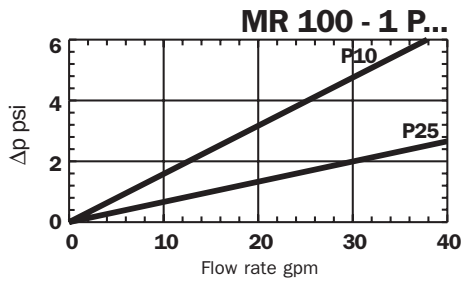
The curves were obtained using a mineral oil with a kinematic viscosity of 150 SUS.
The Δp varies proportionally to the fluid kinematic viscosity.



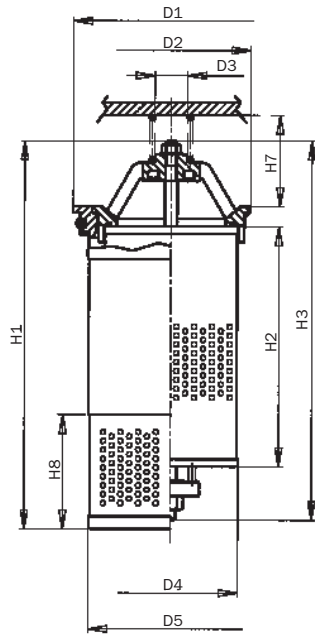
Filter elements - P Series -

The curves were obtained using a mineral oil with a kinematic viscosity of 150 SUS.
The Δp varies proportionally to the fluid kinematic viscosity.

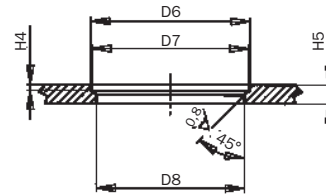
For the metal mesh filter elements curves (M series), please consult our Sales and Network Organization



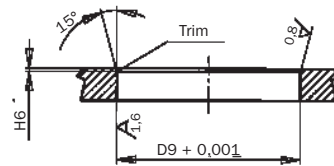
MPI Filters



Tank internal plate without diffuser



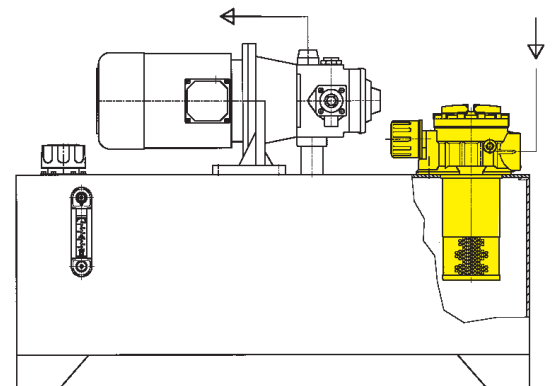
Tank internal plate with diffuser



Type	H1	H2	H3	H4	H5	H6	H7	H8	D1	D2	D3	D4	D5	D6	D7	D8	D9
100-1	9.64	4.17	7.08	0.15	0.47	0.09	1.77	3.15	4.72	3.42	0.78	2.83	3.50	3.46	3.25	2.99	4.33
100-2	9.64	5.9	8.81														
100-3	11.61	7.87	10.78														
100-4	11.55	11.81	14.72														
250-1	12.08	5.51	9.84	0.19	0.59	0.09	3.07	3.54	6.10	4.94	0.98	4.17	5.19	4.96	4.86	4.60	5.71
250-2	12.08	7.48	11.81														
250-3	14.84	10.23	14.57														
250-4	22.91	18.3	22.71														
630-1	13.97	8.26	13.42	0.19	0.7	0.09	3.93	4.33	7.28	5.91	0.98	4.96	6.50	5.94	5.87	5.47	7.01
630-2	17.52	11.41	16.57														
630-3	22.45	11.35	20.51														
630-4	25	18.82	23.97														
850-1	20.88	12.99	20.27	0.23	0.78	0.09	5.51	9.85	10.24	9.06	1.57	7.99	9.64	9.10	8.84	8.54	9.86
850-2	29.35	21.45	28.74														
850-3	40.37	32.48	38.76														
850-4	50.8	42.91	50.19														

Applications

Example of application



MPI

Nominal sizes

100
250
630
850

Lengths

MPH 100 = 1,2,3,4
MPH 250 = 1,2,3,4
MPH 630 = 1,2,3,4
MPH 850 = 1,2,3,4

Integral bypass valve

B	Setting: 12 psi
C	Setting: 25 psi

Filter elements

A06	Inorganic microfiber Bx ≥ 200
A10	
A25	
P10	Resin-impregnated paper Bx ≥ 2
P25	
M25	Square wire mesh
M60	
M90	

Seals

A	Nitrile (Buna-N)
V	Viton

Models

O	Without diffuser
D	With diffuser

MR

MPH

Nominal sizes

100
250
630
850

Lengths

MPH 100 = 1,2,3,4
MPH 250 = 1,2,3,4
MPH 630 = 1,2,3,4
MPH 850 = 1,2,3,4

Integral bypass valve

B Setting: 12 psi
C Setting: 25 psi

Models

O Without diffuser
D With diffuser

Air breather

S Without air breather
C With 10 µm air breather (100 series only)
M With 40 µm air breather (100 series only)

Seals

A Nitrile (Buna-N)
V Viton

Filter condition indicator

S With threaded hole only
T With plug
VT Visual (setting at 8.7 psi)
VR Visual (setting at 15 psi)
V1 Visual MPH 850 only (setting at 15 psi)
EQ Electrical: N.O.contacts (setting at 8.7 psi)
EB Electrical: N.C.contacts (setting at 8.7 psi)
ER Electrical: N.O.contacts (setting at 15 psi)
EC Electrical: N.C.contacts (setting at 15 psi)

Filter elements

A06 Inorganic microfiber Bx ≥ 200
A10
A25
P10 Resin-impregnated paper Bx ≥ 2
P25
M25
M60 Square wire mesh
M90

Ports option

Type	100	250	630	850
G1	3/4" BSP	1 1/2" BSP	=====	=====
G2	1" BSP	1 1/2" BSP 1 1/4" BSP	=====	=====
G3	1 1/4" BSP	=====	=====	=====
G4	3/4" NPT	1 1/2" NPT	=====	=====
G5	1" NPT	1 1/2" NPT 1 1/4" NPT	=====	=====
G6	1 1/4" NPT	=====	=====	=====
G7	SAE 12	SAE 24	=====	=====
G8	SAE 16	SAE 24 SAE 20	=====	=====
G9	SAE 20	=====	=====	=====
F1 (M)	=====	1 1/2" SAE	2 1/2" SAE	DN 100 PN 10/16 3" SAE
F2 (M)	=====	1 1/2" SAE 1 1/4" SAE	2 1/2" SAE 2" SAE	=====
F3 (UNC)	=====	1 1/2" SAE	2 1/2" SAE	DN 100 PN 10/16 3" SAE
F4 (UNC)	=====	1 1/2" SAE 1 1/4" SAE	2 1/2" SAE 2" SAE	=====

MPH 250, G2-G5-G8 options have double port connection.
MPH 250-630, F2-F4 options have double port connection.
MPH 850 options, only available with double port connection.

3000 PSI

MR

Replacement element

MP Filtri - Filtration products will only be guaranteed if original MP Filtri replacement elements and spares are used

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