

NEW

High Pressure filters

FMM 150 series

Maximum pressure up to 420 bar - Flow rate up to 250 l/min



PASSION TO PERFORM



FILTER SIZING

The correct filter sizing have to be based on the variable pressure drop depending by the application. For example, for the return filter the pressure drop have to be in the range 0.4 - 0.6 bar.

The pressure drop calculation is performed by adding together the value of the housing with the value of the filter element. The pressure drop in the housing is proportional to the fluid density (kg/dm³); all the graphs in the catalogue are referred to mineral oil with density of 0.86 kg/dm³.

The filter element pressure drop is proportional to its viscosity (mm²/s), the corrective factor Y is related to an oil viscosity different than 30 mm²/s.

Sizing data for single cartridge, head at top

Δp_c = Filter housing pressure drop [bar]

Δp_e = Filter element pressure drop [bar]

Y = Multiplication factor Y (see correspondent table), depending on the filter element size, on the filter element lenght and on the filter media

Q = flow rate (l/min)

V1 reference viscosity = 30 mm²/s (cSt)

V2 = operating viscosity in mm²/s (cSt)

$\Delta p_e = Y : 1000 \times Q \times (V2/V1)$

$\Delta p_{Tot.} = \Delta p_c + \Delta p_e$

GENERIC FILTER CALCULATION EXAMPLE

Application data:

Top tank return filter

Filter with in-line connections

Pressure P_{max} = 10 bar

Flow rate Q = 120 l/min

Viscosity V2 = 46 mm²/s (cSt)

Oil viscosity = 0.86 kg/dm³

Required filtration efficiency = 25 µm with absolute filtration

With bypass valve and 1 1/4" inlet connection

From the working pressure and the flow rate we understand it should be possible using the following top tank return filter series: MPT, MPH and FRI. Let's proceed with MPT series.

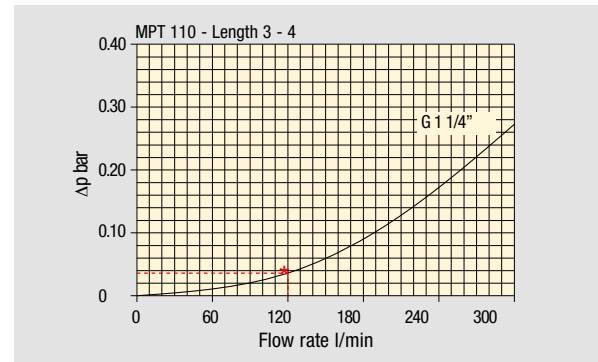
The size 20 doesn't achieve the required flow rate, therefore we have to consider the size 100. The final version of size 100 (101, 104, 110, 120 and 114) will be then defined in function of the mounting characteristics.

$\Delta p_c = 0.03 \text{ bar}$ (* see graphic below, considering size 100 with the max available lenght to get the lowest pressure drop)

$\Delta p_e = (2.0 : 1000) \times 120 \times (46/30) = 0.37 \text{ bar}$

$\Delta p_{Tot.} = 0.03 + 0.37 = 0.4 \text{ bar}$

The selection is correct because the total pressure drop value is inside the admissible range for top tank return filters. It is of course possible trying to find a different solution, according to the mounting position or to other commercial need, repeating the previous steps while using a different series or lenght.



Filter housings Δp pressure drop.

The curves are plotted using mineral oil with density of 0.86 kg/dm³ in compliance with ISO 3968. Δp varies proportionally with density.

**Corrective factor Y, to be used for the filter element pressure drop calculation.
The values depend to the filter size and lenght and to the filter media.**

Reference viscosity 30 mm²/s

High pressure filters

Filter element	Type	Absolute filtration N - R Series					Nominal filtration N Series
		A03	A06	A10	A16	A25	M25
HP 011	1	332.71	250.07	184.32	152.36	128.36	-
	2	220.28	165.56	74.08	59.13	37.05	-
	3	123.24	92.68	41.48	33.08	20.72	-
	4	77.76	58.52	28.37	22.67	16.17	-
HP 039	1	70.66	53.20	25.77	20.57	14.67	4.90
	2	36.57	32.28	18.00	13.38	8.00	2.90
	3	26.57	23.27	12.46	8.80	5.58	2.20
HP 050	1	31.75	30.30	13.16	12.3	7.29	1.60
	2	24.25	21.26	11.70	9.09	4.90	1.40
	3	17.37	16.25	8.90	7.18	3.63	1.25
	4	12.12	10.75	6.10	5.75	3.08	1.07
	5	7.00	6.56	3.60	3.10	2.25	0.80
HP 065	1	58.50	43.46	23.16	19.66	10.71	1.28
	2	42.60	25.64	16.22	13.88	7.32	1.11
	3	20.50	15.88	8.18	6.81	3.91	0.58
HP 135	1	20.33	18.80	9.71	8.66	4.78	2.78
	2	11.14	10.16	6.60	6.38	2.22	1.11
	3	6.48	6.33	3.38	3.16	2.14	1.01
HP 150	1	17.53	15.91	7.48	6.96	5.94	1.07
	2	8.60	8.37	3.54	3.38	3.15	0.58
	3	6.53	5.90	2.93	2.79	2.12	0.49
HP 320	1	10.88	9.73	5.02	3.73	2.54	1.04
	2	4.40	3.83	1.75	1.48	0.88	0.71
	3	2.75	2.11	1.05	0.87	0.77	0.61
	4	2.12	1.77	0.98	0.78	0.55	0.47
HP 500	1	4.44	3.67	2.30	2.10	1.65	0.15
	2	3.37	2.77	1.78	1.68	1.24	0.10
	3	2.22	1.98	1.11	1.09	0.75	0.08
	4	1.81	1.33	0.93	0.86	0.68	0.05
	5	1.33	1.15	0.77	0.68	0.48	0.04

Filter element	Type	Absolute filtration N Series					Nominal filtration N Series
		A03	A06	A10	A16	A25	M25
HF 320	1	3.65	2.95	2.80	1.80	0.90	0.38
	2	2.03	1.73	1.61	1.35	0.85	0.36
	3	1.84	1.42	1.32	1.22	0.80	0.35

FMM150 GENERAL INFORMATION

Technical data

High Pressure filters Maximum pressure up to 420 bar - Flow rate up to 250 l/min

Filter housing materials

- Head: Painted cast iron
- Housing: Painted steel
- Bypass valve: Steel

Bypass valve

- Opening pressure 600 kPa (6 bar)
- Other opening pressures on request.

Seals

- Standard NBR series A
- Optional FPM series V

Pressure

- Working pressure: 42 MPa (420 bar)
- Test pressure: 63 MPa (630 bar)
- Burst pressure: 126 MPa (1260 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 42 MPa (420 bar)

Δp element type

- Microfibre filter elements - series N: 20 bar
- Wire mesh filter elements - series N: 20 bar
- Fluid flow through the filter element from OUT to IN

Temperature

From -25 °C to +110 °C

Connections

In-line Inlet/Outlet

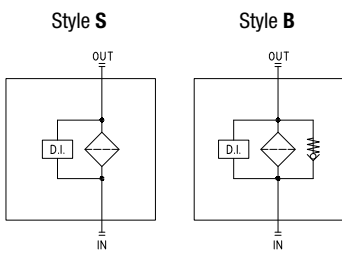
Note

FMM 150 filters are provided for vertical mounting

Weights [kg] and volumes [dm³]

	Weights [kg]					Volumes [dm ³]						
	Lenght	1	2	3	4	5	Lenght	1	2	3	4	5
FMM 150		7.50	9.50	10.90	-	-		0.60	1.00	1.25	-	-

Hydraulic symbols

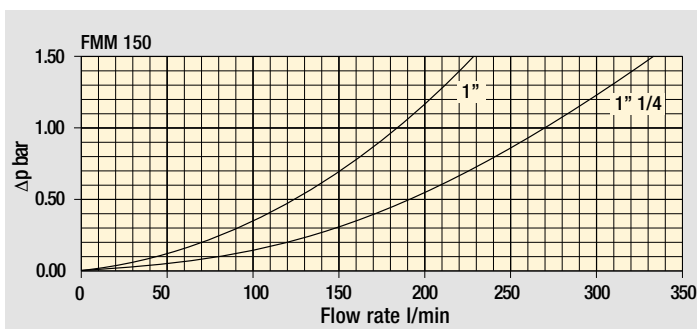


Pressure drop

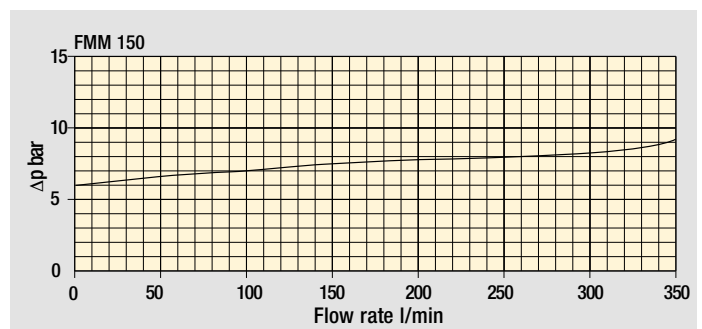
The curves are plotted using mineral oil with density of 0.86 kg/dm³ in compliance with ISO 3968.

Δp varies proportionally with density.

Filter housings Δp pressure drop

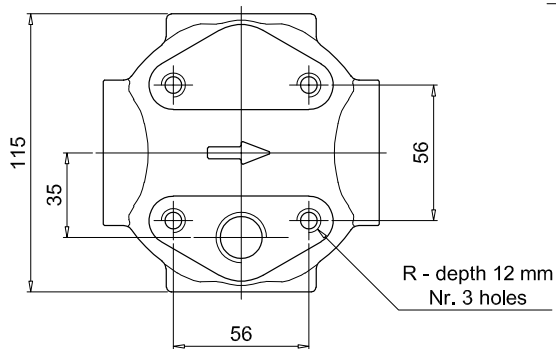
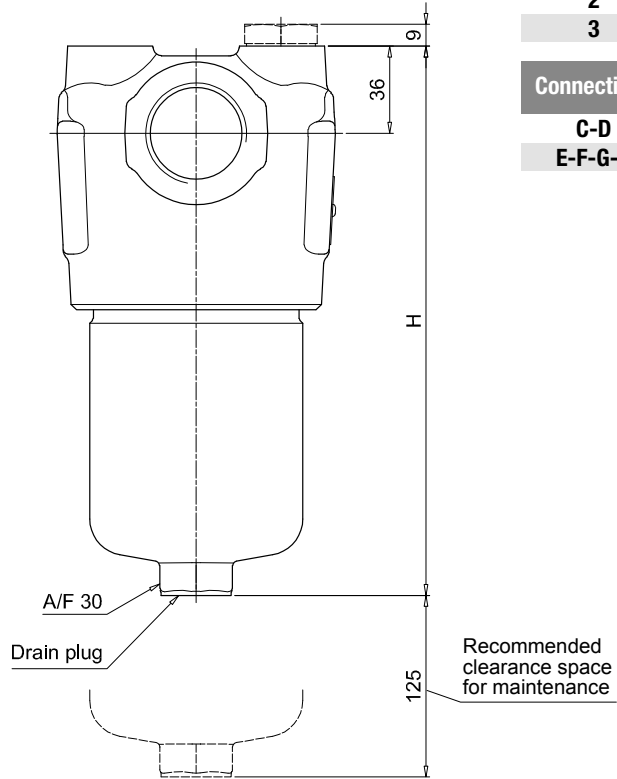
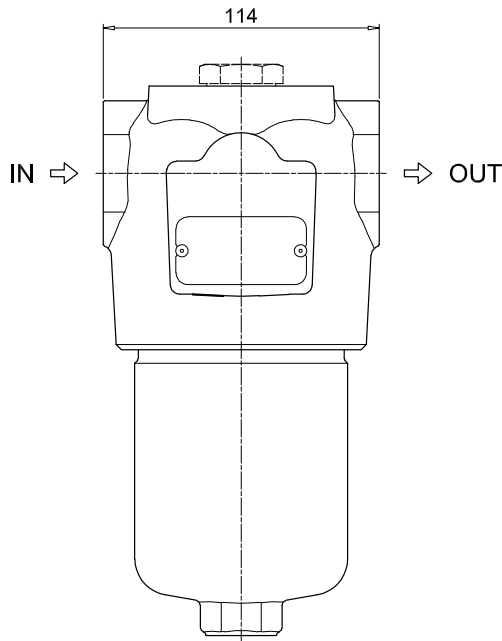


Bypass valve pressure drop

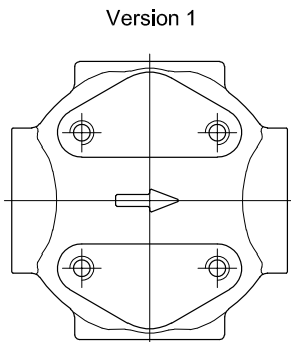


FMM150

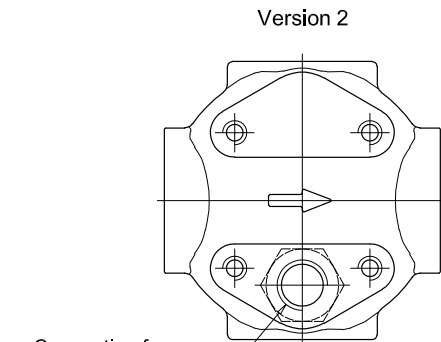
Dimensions



FMM150	
Filter length	H [mm]
1	230
2	340
3	415
Connections	R
C-D	M10
E-F-G-H	3/8" UNC

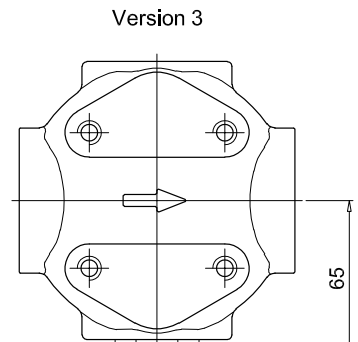


Version 1



Version 2

Connection for differential indicator
T2 plug not included

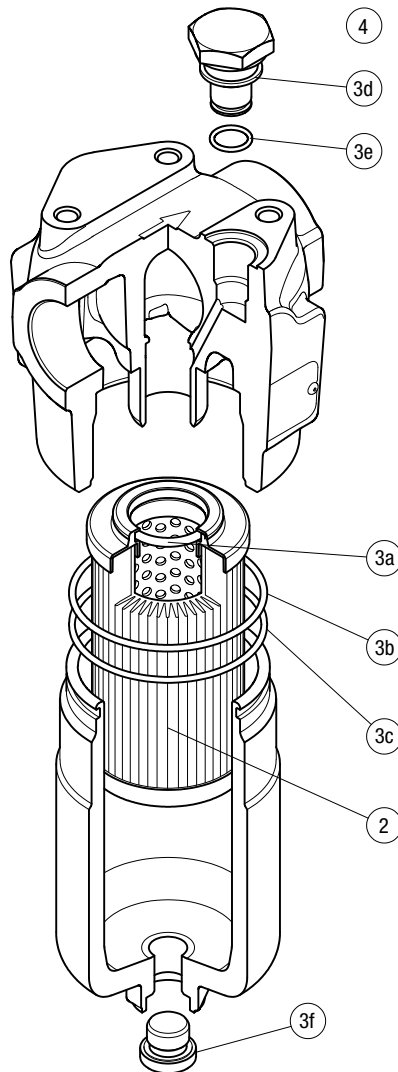


Version 3

Connection for differential indicator
T2 plug not included

FMM150 SPARE PARTS

Order number for spare parts



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug	
		NBR	FPM	NBR	FPM
FMM 150	See order table	02050731	02050732	T2H	T2V

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WORLDWIDE NETWORK

HEADQUARTERS

MP Filtri S.p.A.
Via 1° Maggio, 3
20060 Pessano con Bornago
Milano - Italy

BRANCH OFFICES

MP Filtri U.K. Ltd.
Bourton Industrial Park
Bourton on the Water
GL54-2HQ Gloucestershire

MP Filtri Canada Inc.
8831 Keele Street
Concord, Ontario
L4K 2N1 - Canada

MP Filtri Germany GmbH
Hans-Wilhelmi-Straße
DE-66386 St. Ingbert

ITALFILTRI LLC
Russian Federation
Yurievsky Pereulok 13 a, Building 1
111020 Moscow - Russia

MP Filtri France SAS
Parc d'activités des Chanteraines
8 rue du Commandant d'Estienne d'Orves
Immeuble D3
92390 Villeneuve la Garenne

MP Filtri (Shanghai) Co., Ltd.
1280 Lianxi Road, Bld 8 - 2nd Floor
Shanghai - Pudong
201204 China

MP Filtri U.S.A. Inc.
2055 Quaker Pointe
PA 18951 Drive Quakertown

MP Filtri India Pvt. Ltd.
Plot-7F, Raj Pinnacle,
Beside RMZ Centennial
Brookefield Road, Whitefield
560048 Bangalore

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