NEW

High Pressure filters

FMM 150 series

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

PASSION TO PERFORM

MP FILTRI®

THE CORRECT FILTER SIZING HAVE TO BE BASED ON THE TOTAL PRESSURE DROP DEPENDING BY THE APPLICATION.
THE MAXIMUM TOTAL PRESSURE DROP ALLOWED BY A NEW AND CLEAN HIGH PRESSURE PRESSURE FILTER HAVE TO BE IN THE RANGE 0.8 ÷ 1.5 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 Δpc of 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 Δpe is proportional to its viscosity (mm²/s), the corrective factor Y have to be used in case of an oil viscosity different than 30 mm²/s (cSt).

Sizing data for single filter element, head at top

Δpc = Filter housing pressure drop [bar]
Δpe = Filter element pressure drop [bar]
Y = Corrective factor Y (see correspondent table), depending on the filter type, on the filter element size, on the filter element lenght and on the filter media
Q = flow rate (l/min)
V1 reference oil viscosity = 30 mm²/s (cSt)
V2 = operating oil viscosity in mm²/s (cSt)

Filter element pressure drop calculation with an oil viscosity different than 30 mm²/s (cSt)

Δpe = Y : 1000 x Q x (V2:V1)
Δp Tot. = Δpc + Δpe

Verification formula

Δp Tot. ≤ Δp max allowed

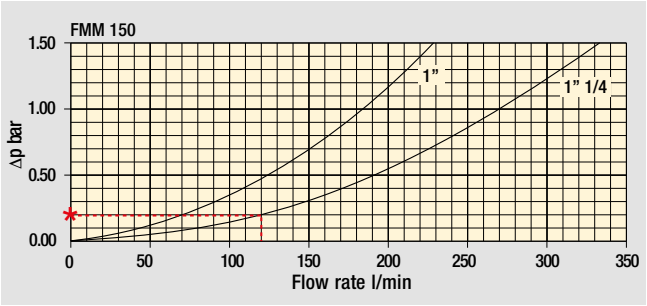
Maximum total pressure drop (Δp max) allowed by a new and clean filter

Application	Range (bar)
Suction filters	0.08 ÷ 0.10
Return filters	0.4 ÷ 0.6
Low & Medium Pressure filters	0.4 ÷ 0.6 return lines
	0.3 ÷ 0.5 lubrication lines
	0.3 ÷ 0.4 off-line in power systems
	0.1 ÷ 0.3 off-line in test benches
	0.4 ÷ 0.6 over-boost
High Pressure filters	0.8 ÷ 1.5
Stainless Steel filters	0.8 ÷ 1.5

FMM150 calculation example

Application data:
High pressure filter
Pressure Pmax = 300 bar
Flow rate Q = 120 l/min
Viscosity V2 = 46 mm²/s (cSt)
Oil density = 0.86 kg/dm³
Required filtration efficiency = 25 µm with absolute filtration
With bypass valve and 1 1/4" inlet connection

Calculation:
Δpc = 0.2 bar (see graphic below)



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.

Δpe = (5.94 : 1000) x 120 x (46:30) = 1.09 bar

FMM150 corrective factor

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 oil viscosity 30 mm²/s

Filter element		Absolute filtration N - R Series					Nominal filtration N Series
Type		A03	A06	A10	A16	A25	M25
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

Δp Tot. = 0.2 + 1.09 = 1.29 bar

The selection is correct because the total pressure drop value is inside the admissible range for high pressure filters.
In case the allowed max total pressure drop is not verified, it is necessary to repeat the calculation changing the filter lenght.

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 oil viscosity 30 mm²/s

High pressure filters

Filter element		Absolute filtration N - R Series					Nominal filtration N Series
Type		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		Absolute filtration N Series					Nominal filtration N Series
Type		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

Recommended maximum flow rate for complete FMM150 filter
- Pressure drop of complete filter = Δp 1.5 bar
- Reference oil viscosity 30 mm²/s (cSt)
- Oil density 0.86 kg/dm³
- Connections of filter under test G1 1/4"

Flow rate (l/min)					
Filter lenght	Filtration rating N Series				
	A03	A06	A10	A16	A25
1	80	88	157	164	180
2	142	145	226	231	238
3	170	180	241	245	263

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

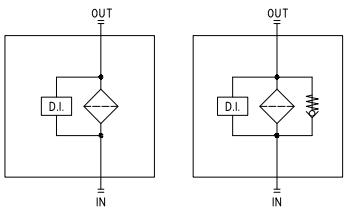
Note
FMM 150 filters are provided for vertical mounting

Weights [kg] and volumes [dm³]

	Weights [kg]						Volumes [dm³]					
	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

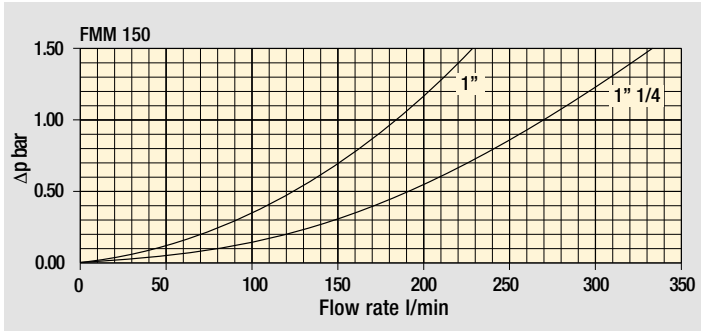
Style **S** Style **B**



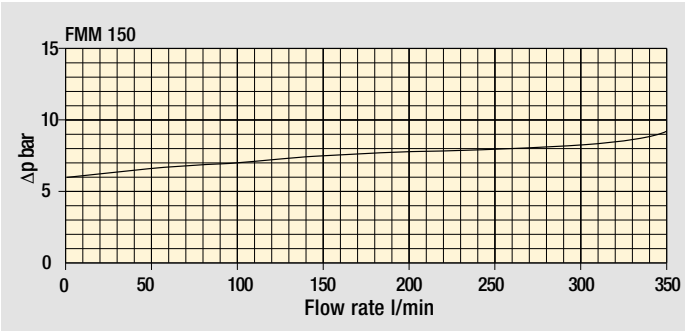
Pressure drop

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

Designation & Ordering code

COMPLETE FILTER

Configuration example: FMM150 | 2 | B | A | D | 2 | M25 | N | P01

Series and size
FMM150

Length
1 | **2** | **3**

Valves
S Without bypass
B With bypass 6 bar

Seals
A NBR
V FPM

Connections
C G1”
D G1 1/4”
E 1” NPT
F 1 1/4” NPT
G SAE 16 - 1 5/16” - 12 UN
H SAE 20 - 1 5/8” - 12 UN

Connection for differential indicator
1 Without connection
2 Upper connection
3 Frontal connection

Filtration rating (filter media)

A03	Inorganic microfiber	3 µm	**A16**	Inorganic microfiber	16 µm
A06	Inorganic microfiber	6 µm	**A25**	Inorganic microfiber	25 µm
A10	Inorganic microfiber	10 µm	**M25**	Wire mesh	25 µm

Element Δp
N 20 bar

Execution
P01 MP Filtri standard
Pxx Customized

FILTER ELEMENT

Configuration example: HP150 | 2 | M25 | A | N | P01

Element series and size
HP150

Element length
1 | **2** | **3**

Filtration rating (filter media)

A03	Inorganic microfiber	3 µm	**A16**	Inorganic microfiber	16 µm
A06	Inorganic microfiber	6 µm	**A25**	Inorganic microfiber	25 µm
A10	Inorganic microfiber	10 µm	**M25**	Wire mesh	25 µm

Seals
A NBR
V FPM

Element Δp
N 20 bar

Execution
P01 MP Filtri standard
Pxx Customized

ACCESSORIES

Differential indicators

		page
DEA	Electrical differential indicator	537
DEM	Electrical differential indicator	537-538
DLA	Electrical / visual differential indicator	538-539
DLE	Electrical / visual differential indicator	539
DTA	Electronic differential indicator	540
DVA	Visual differential indicator	540
DVM	Visual differential indicator	540

Additional features

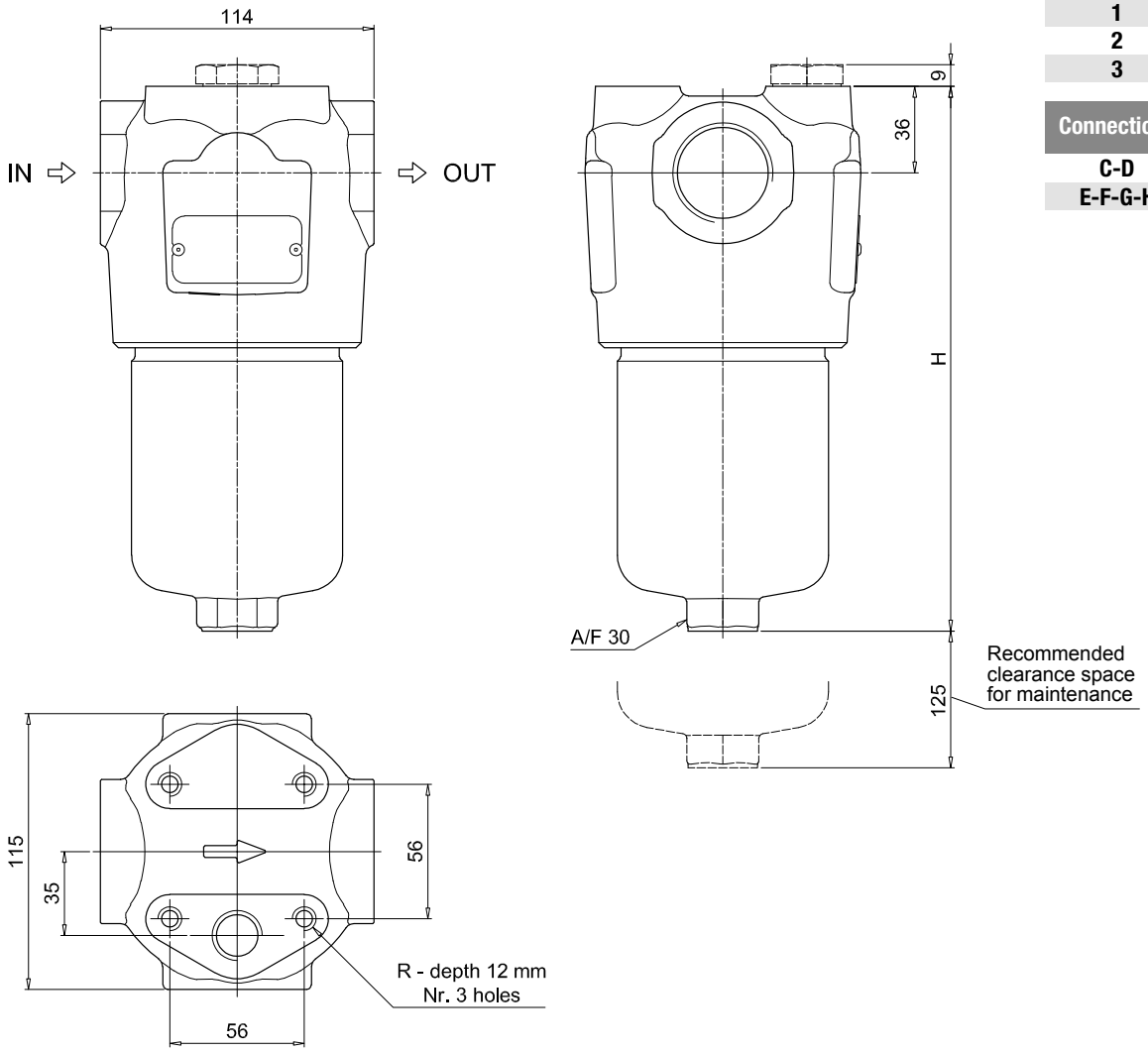
		page
T2	Plug	541

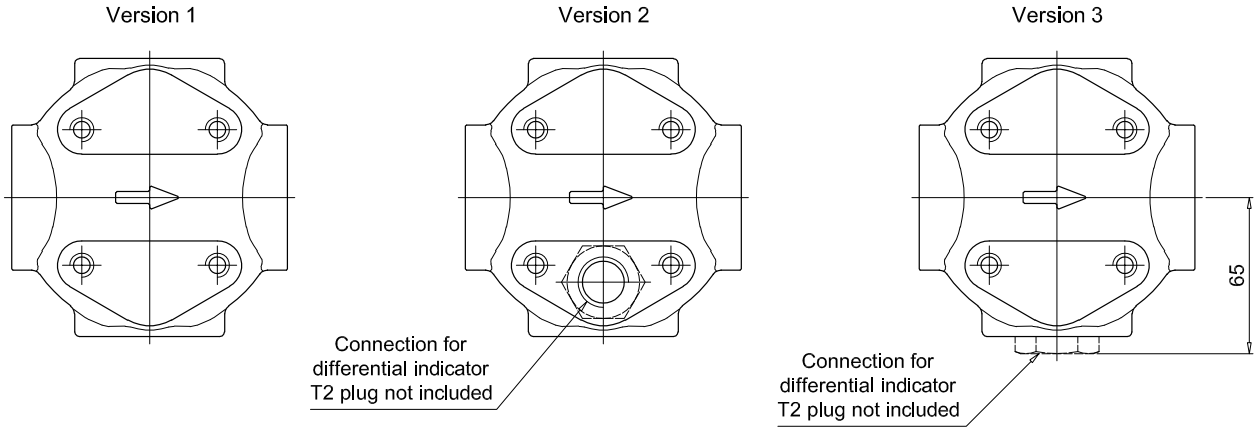
FMM150

Dimensions

FMM150	
Filter length	**H [mm]**
1	230
2	340
3	415

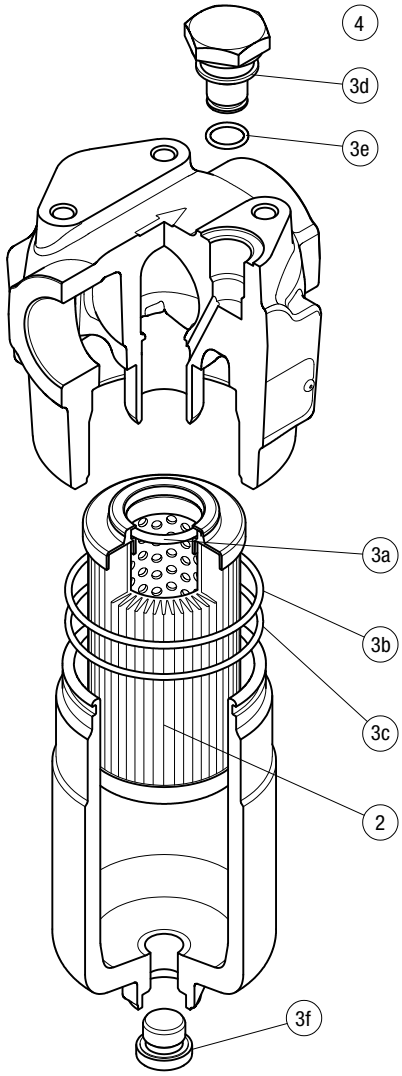
Connections	**R**
C-D	M10
E-F-G-H	3/8" UNC





FMM150 SPARE PARTS

Order number for spare parts



Item:	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3 (3a ÷ 3f)		Q.ty: 1 pc. 4	
Filter series	Filter element	Seal Kit code number NBR	FPM	Indicator connection plug NBR	FPM
FMM 150	See order table	02050731	02050732	T2H	T2V

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