

Return filters

MPT 116

Maximum working pressure up to 800 kPa (8 bar) - Flow rate up to 300 l/min



PASSION TO PERFORM



MPT 116 GENERAL INFORMATION

Technical data

Return filter

Maximum working pressure up to 800 kPa (8 bar)
Flow rate up to 300 l/min

MPT is a range of return filters with integrated breather filter, for protection of the reservoir against the system contamination. They are directly fixed to the reservoir, in immersed or semi-immersed position. The filter output must be always immersed into the fluid to avoid aeration or foam generation into the reservoir.

Available features:

- Female threaded connections up to 1 1/4", for a maximum flow rate of 300 l/min
- Multiple connections, to connect several return lines or drains
- Fine filtration rating, to get a good cleanliness level into the reservoir
- Bypass valve integrated into the filter element, to relieve excessive pressure drop across the filter media
- 2, 4 or 6 fixing holes for installation, to meet any reservoir surface flatness and roughness
- O-ring or Flat seal, to meet any reservoir surface flatness and roughness
- Screw-in cover with a special shape, to allow the filter element replacement without the use of specific tools
- Oil dipstick, to easily check the level of the fluid into the reservoir (sold as separate item)
- Extension tube, to be used in deep reservoirs (sold as separate item)
- Diffuser, to reduce the risk of aeration, foaming and noise (sold as separate item)
- Integrated breather filter, to clean the air that moves into the reservoir as result of the oil level fluctuation
- Integrated breather filter with pressurization valve, to clean the air that moves into the reservoir as result of the oil level fluctuation and to guarantee the pressurization into the reservoir
- Visual, electrical and electronic clogging indicators

Common applications:

- Light industrial equipment
- Mobile application

Filter housing materials

- Head: Aluminium
- Cover: Polyamide
- Bowl: Polyamide

Bypass valve

- Opening pressure 175 kPa (1.75 bar) ±10%
- Opening pressure 300 kPa (3 bar) ±10%

Δp element type

- Microfibre filter elements - series H: 10 bar
- Fluid flow through the filter element from OUT to IN

Seals

- Standard NBR series A
- Optional FPM series V

Temperature

From -25 °C to +110 °C

Note

MPT filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

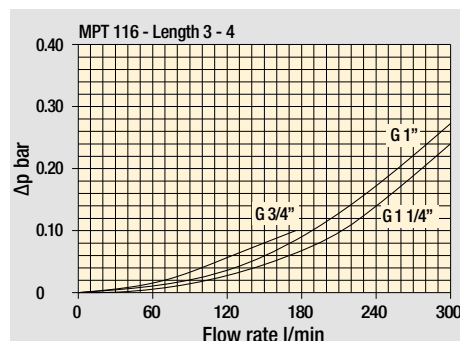
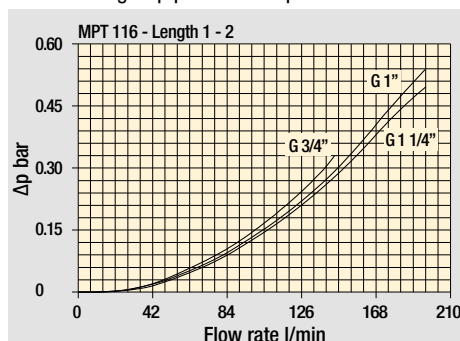
	Weights [kg]				Volumes [dm ³]					
	Length	1	2	3	4	Length	1	2	3	4
MPT 116		1.10	1.15	1.25	1.50		0.72	0.93	1.28	1.74

Hydraulic symbols

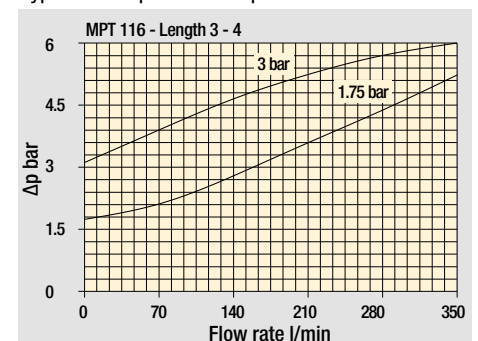
Filter series	Style 1 connection
MPT 116	•

Pressure drop

Filter housings Δp pressure drop



Bypass valve 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 SIZING

**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 RETURN FILTER 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 Δp_c of the housing is proportional to the fluid density (kg/dm^3); all the graphs in the catalogue are referred to mineral oil with density of $0.86 \text{ kg}/\text{dm}^3$.
The filter element pressure drop Δp_e is proportional to its viscosity (mm^2/s), the corrective factor Y have to be used in case of an oil viscosity different than $30 \text{ mm}^2/\text{s}$ (cSt).

Sizing data for single filter element, head at top

Δp_c = Filter housing pressure drop [bar]

Δp_e = 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 length and on the filter media

Q = flow rate (l/min)

V1 reference oil viscosity = $30 \text{ mm}^2/\text{s}$ (cSt)

V2 = operating oil viscosity in mm^2/s (cSt)

Filter element pressure drop calculation with an oil viscosity different than $30 \text{ mm}^2/\text{s}$ (cSt)

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

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

Verification formula

$$\Delta p_{\text{Tot.}} \leq \Delta p_{\text{max allowed}}$$

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

MPT calculation example

Application data:

Tank top return filter

Pressure $P_{\text{max}} = 8 \text{ bar}$

Flow rate $Q = 120 \text{ l}/\text{min}$

Viscosity $V2 = 46 \text{ mm}^2/\text{s}$ (cSt)

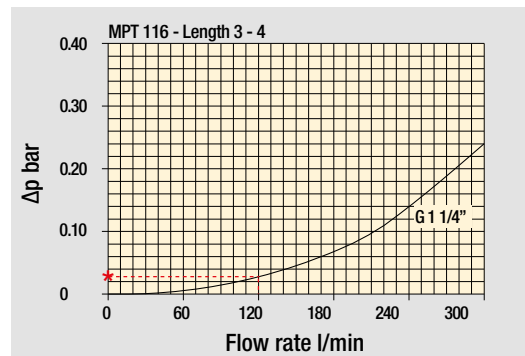
Oil density = $0.86 \text{ kg}/\text{dm}^3$

Required filtration efficiency = $25 \mu\text{m}$ with absolute filtration

With bypass valve and G1 1/4" inlet connection

Calculation:

$\Delta p_c = 0.03 \text{ bar}$ (see graphic below)



Filter housings Δp pressure drop.

The curves are plotted using mineral oil with density of $0.86 \text{ kg}/\text{dm}^3$ in compliance with ISO 3968. Δp varies proportionally with density.

$$\Delta p_e = (2.50 : 1000) \times 120 \times (46 : 30) = 0.46 \text{ bar}$$

MPT corrective factor

Corrective factor Y to be used for the filter element pressure drop calculation.

The values depend to the filter size and length and to the filter media.

Reference oil viscosity $30 \text{ mm}^2/\text{s}$

Filter element	Absolute filtration H Series					Nominal filtration N Series			
	A03	A06	A10	A16	A25	P10	P25	M25 M60 M90	
MF 100	1	28.20	24.40	8.67	8.17	6.88	4.62	3.96	1.25
	2	17.33	12.50	6.86	5.70	4.00	3.05	2.47	1.10
	3	10.25	9.00	3.65	3.33	2.50	1.63	1.32	0.96
	4	6.10	5.40	2.30	2.20	2.00	1.19	0.96	0.82

$$\Delta p_{\text{Tot.}} = 0.03 + 0.46 = 0.49 \text{ bar}$$

The selection is correct because the total pressure drop value is inside the admissible range for tank top return filters.

In case the allowed max total pressure drop is not verified, it is necessary to repeat the calculation changing the filter size.

Flow rates [l/min]

Filter series	Length	Filter element design - H series					Filter element design - N series		
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
MPT 116	1	18	20	53	56	65	153	87	96
	2	28	38	65	75	95	158	111	123
	3	48	55	125	135	169	289	224	251
	4	79	89	180	185	198	306	264	289

Maximum flow rate for a complete return filter with a pressure drop $\Delta p = 0.5 \text{ bar}$.

Connections of filter under test: G 1 1/4"

The reference fluid has a kinematic viscosity of $30 \text{ mm}^2/\text{s}$ (cSt) and a density of $0.86 \text{ kg}/\text{dm}^3$.

For different pressure drop or fluid viscosity we recommend to use our selection software available on www.mpfiltri.com.

Please, contact our Sales Department for further additional information.



MPT 116

Designation & Ordering code

COMPLETE FILTER

Series and size	Configuration example 1:	MPT116	1	S	A	G1	M90	E	P01
MPT116 Filter element with standard spigot	Configuration example 2:	MPT116	2	S	Z	G9	A03	B	P01

Length	
1 2 3 4	

Air breather	
S Without air breather	

Seals and treatments	Filtration rating		
	Axx	Mxx	Pxx
A NBR	•	•	•
V FPM	•	•	•
W NBR head anodized	•	•	
Z FPM head anodized	•	•	

Flat seal on the head on request

Connections	
G1 G 3/4"	G6 1 1/4" NPT
G2 G 1"	G7 SAE 12 - 1 1/16" - 12 UN
G3 G 1 1/4"	G8 SAE 16 - 1 5/16" - 12 UN
G4 3/4" NPT	G9 SAE 20 - 1 5/8" - 12 UN
G5 1" NPT	

Filtration rating (filter media)	
A03 Inorganic microfiber 3 µm	M25 Wire mesh 25 µm
A06 Inorganic microfiber 6 µm	M60 Wire mesh 60 µm
A10 Inorganic microfiber 10 µm	M90 Wire mesh 90 µm
A16 Inorganic microfiber 16 µm	P10 Resin impregnated paper 10 µm
A25 Inorganic microfiber 25 µm	P25 Resin impregnated paper 25 µm

Bypass valve	Execution
E 3 bar	P01 MP Filtri standard
B 1.75 bar	Pxx Customized

FILTER ELEMENT

Element series and size	Configuration example 2:	MF100	1	M90	N	B	E	P01
MF100 Filter element with standard spigot	Configuration example 1:	MF100	2	A03	W	V		P01

Element length	
1 2 3 4	

Filtration rating (filter media)	
A03 Inorganic microfiber 3 µm	M25 Wire mesh 25 µm
A06 Inorganic microfiber 6 µm	M60 Wire mesh 60 µm
A10 Inorganic microfiber 10 µm	M90 Wire mesh 90 µm
A16 Inorganic microfiber 16 µm	P10 Resin impregnated paper 10 µm
A25 Inorganic microfiber 25 µm	P25 Resin impregnated paper 25 µm

Element Δp	Filter media		
	Axx	Mxx	Pxx
N 10 bar		•	•
H 10 bar	•		
W 10 bar, compatible with fluids HFA, HFB and HFC	•	•	

Seals	Bypass valve	Execution
B NBR	E 3 bar	P01 MP Filtri standard
V FPM	1.75 bar	Pxx Customized

ACCESSORIES

Indicators	
BVA Axial pressure gauge	
BVR Radial pressure gauge	
BVP Visual pressure indicator with automatic reset	
BVQ Visual pressure indicator with manual reset	

BEA Electrical pressure indicator	
BEM Electrical pressure indicator	
BLA Electrical / visual pressure indicator	

Additional features	
TE Extension tube	
DFS Diffuser with fast lock connection	

DPT Dipstick	
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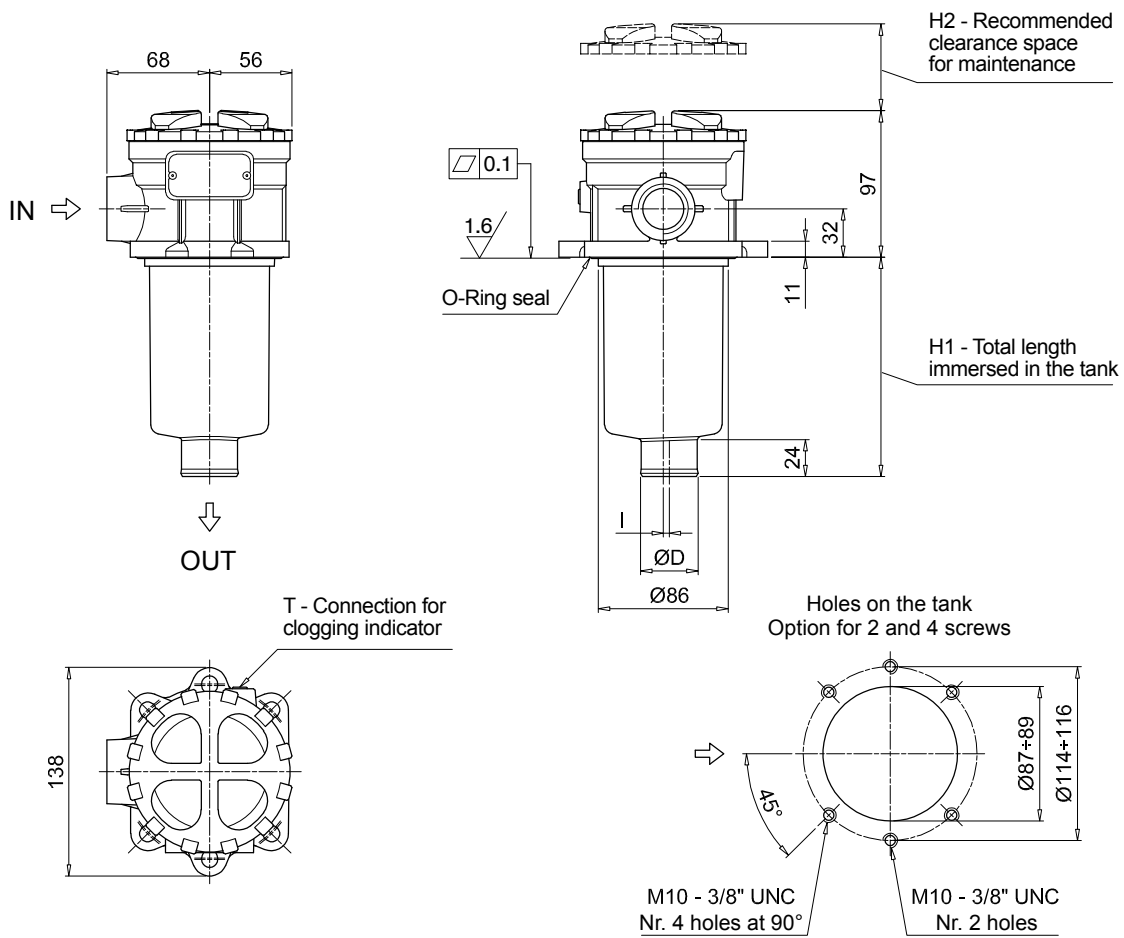
MPT 116

Dimensions

MPT116

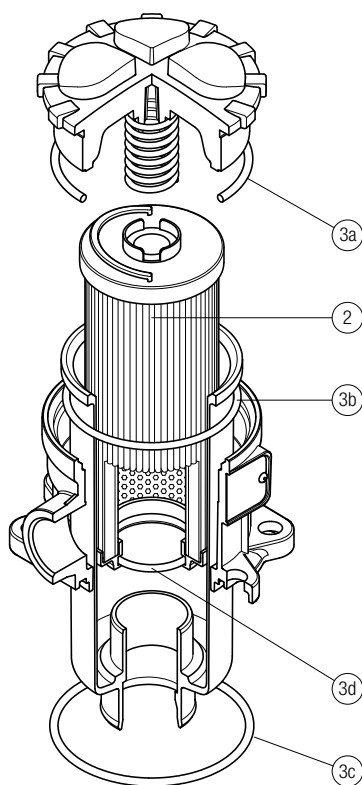
Filter length	H1 [mm]	H2 [mm]	D [mm]	I [mm]
1	99	120	38	4
2	146	170	38	4
3	224	250	47	-
4	326	350	47	2.5

Connections	T
G1-G2-G3	G 1/8"
G4-G5-G6-G7-G8-G9	1/8" NPT



MPT 116 SPARE PARTS

Order number for spare parts



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number	
		NBR	FPM
MPT 116	See order table	02050466	02050467

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WORLDWIDE NETWORK

HEADQUARTERS

MP Filtri S.p.A.
Pessano con Bornago
Milano
Italy
sales@mpfiltri.com

BRANCH OFFICES

ITALFILTRI LLC
Moscow
Russia
mpfiltrirussia@yahoo.com

MP Filtri SEA PTE Ltd.
Singapore
sales-sea@mpfiltri.com

MP Filtri Canada Inc.
Concord, Ontario
Canada
sales@mpfiltricanada.com

MP Filtri (Shanghai) Co., Ltd.
Shanghai
P.R. China
sales@mpfiltrishanghai.com

MP Filtri France SAS
Lyon
AURA
France
sales@mpfiltrifrance.com

MP Filtri U.K. Ltd.
Vale Park
Evesham
United Kingdom
sales@mpfiltri.co.uk

MP Filtri Germany GmbH
St. Ingbert
Germany
sales@mpfiltri.de

MP Filtri U.S.A. Inc.
Quakertown, PA
U.S.A.
sales@mpfiltriusa.com

MP Filtri India Pvt. Ltd.
Bangalore
India
sales@mpfiltri.co.in

MP Filtri Middle East FZCO
Dubai
U.A.E.
sales-me@mpfiltri.com

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