Return filters

MPTX 116

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

PASSION TO PERFORM

MPFILTRI®

MPTX 116 GENERAL INFORMATION

Technical data

Return filter

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

MPTX 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
- MYclean interface connection, to protect the product against non-original spare parts
- External protective wrap, to optimize the flow through the element and to save the element efficiency against non-proper handling

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

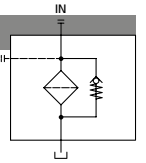
Note
MPTX filters are provided for vertical mounting

Weights [kg] and volumes [dm³]

	Weights [kg]					Volumes [dm³]				
	Length	1	2	3	4	Length	1	2	3	4
MPTX 116		1.10	1.15	1.25	1.50		0.72	0.93	1.28	1.74

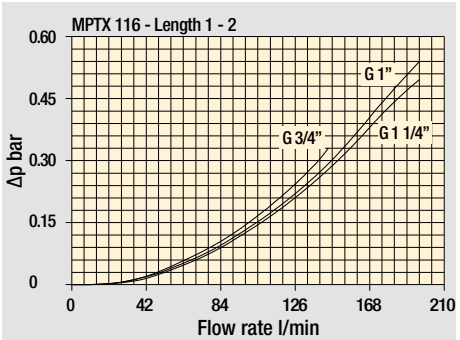
Hydraulic symbols

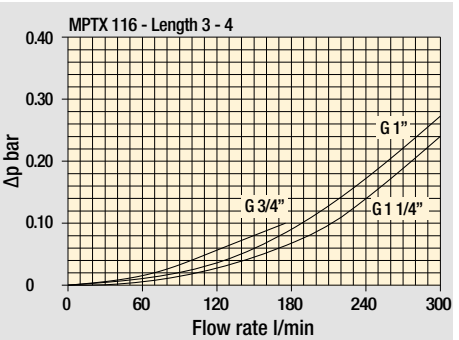
Filter series	Style 1 connection
MPTX 116	•



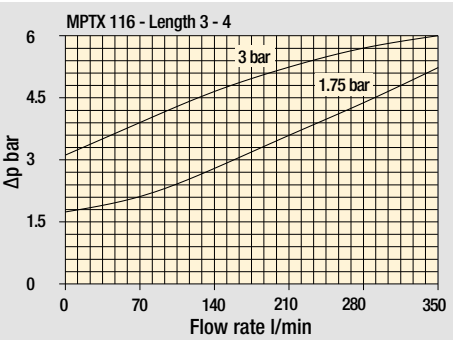
Pressure drop

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 Δpc 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 kg/dm^3.
The filter element pressure drop Δpe 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 mm^2/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 length and on the filter media
Q = flow rate (l/min)
V1 reference oil viscosity = 30 mm^2/s (cSt)
V2 = operating oil viscosity in mm^2/s (cSt)

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

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

Verification formula

Δp Tot. ≤ Δp max allowed

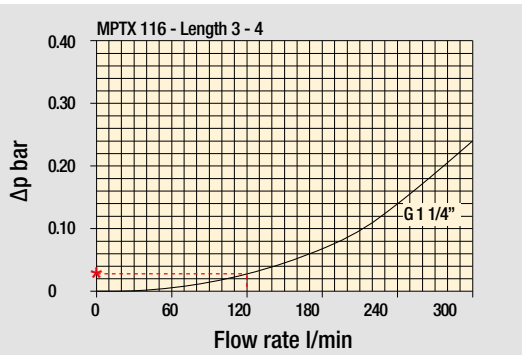
Maximum total pressure drop (Δp max) allowed by a new and clean filter

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

MPTX calculation example

Application data:
Tank top return filter
Pressure Pmax = 8 bar
Flow rate Q = 120 l/min
Viscosity V2 = 46 mm^2/s (cSt)
Oil density = 0.86 kg/dm^3
Required filtration efficiency = 25 µm with absolute filtration
With bybass valve and G1 1/4" inlet connection

Calculation:
Δpc = 0.03 bar (see graphic below)



Filter housings Δp pressure drop.
The curves are plotted using mineral oil with density of 0.86 kg/dm^3 in compliance with ISO 3968. Δp varies proportionally with density.

Δpe = (2.50 : 1000) x 120 x (46 : 30) = 0.46 bar

MPTX 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 mm^2/s

Filter element		Absolute filtration H Series					Nominal filtration N Series		
Type		A03	A06	A10	A16	A25	P10	P25	M25 M60 M90
MFX 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

Δp Tot. = 0.03 + 0.46 = 0.49 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
MPTX 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 Δp = 0.5 bar.
Connections of filter under test: G 1 1/4"
The reference fluid has a kinematic viscosity of 30 mm^2/s (cSt) and a density of 0.86 kg/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.

MPTX 116

Designation & Ordering code

COMPLETE FILTER

Configuration example 1:	MPTX116	1	S	A	G1	M90	E	P01
Configuration example 2:	MPTX116	2	S	Z	G9	A03	B	P01

Series and size

MPTX116 Filter element with private spigot

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	•	•	

filter element compatible with fluids HFA-HFB-HFC

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

E	3 bar
B	1.75 bar

Execution

P01	MP Filtri standard
Pxx	Customized

FILTER ELEMENT

Configuration example 2:	MFX100	1	M90	N	B	E	P01
Configuration example 1:	MFX100	2	A03	W	V		P01

Element series and size

MFX100 Filter element with private spigot

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

B	NBR
V	FPM

Bypass valve

E	3 bar
	1.75 bar

Execution

P01	MP Filtri standard
Pxx	Customized

ACCESSORIES

Indicators

BVA	Axial pressure gauge	**BEA**	Electrical pressure indicator
BVR	Radial pressure gauge	**BEM**	Electrical pressure indicator
BVP	Visual pressure indicator with automatic reset	**BLA**	Electrical / visual pressure indicator
BVQ	Visual pressure indicator with manual reset		

Additional features

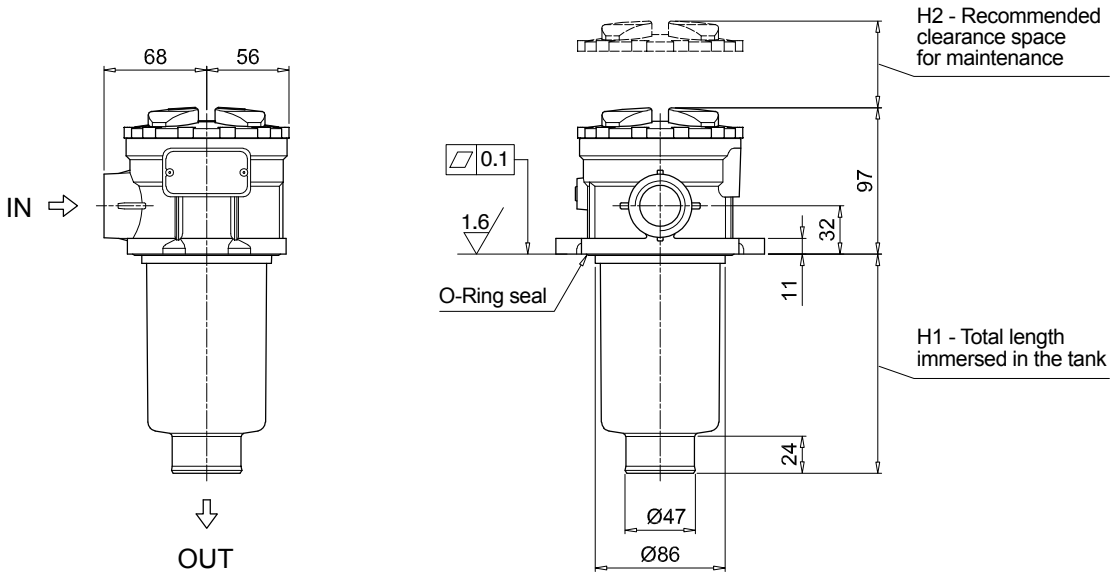
TE	Extension tube	**DPT**	Dipstick
DFS	Diffuser with fast lock connection		

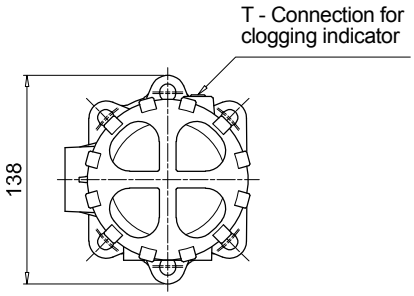
MPTX 116

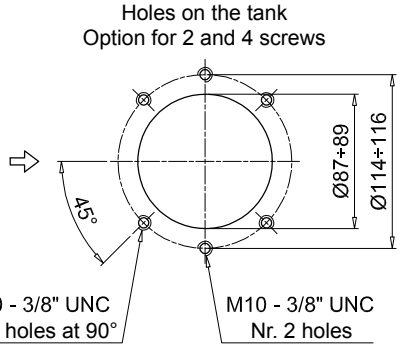
Dimensions

MPTX116		
Filter length	**H1 [mm]**	**H2 [mm]**
1	99	120
2	146	170
3	224	250
4	326	350

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

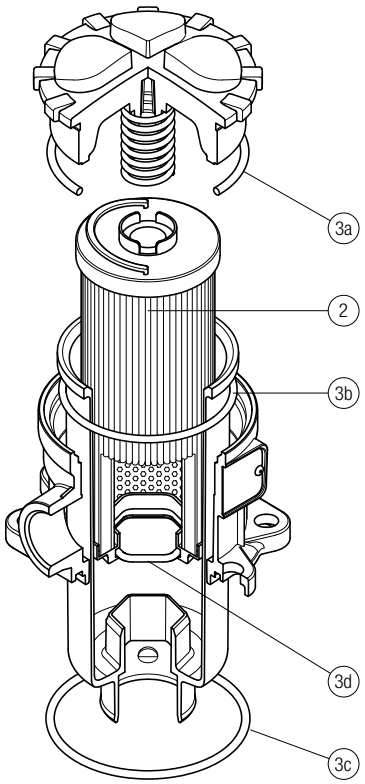






MPTX 116 SPARE PARTS

Order number for spare parts



Item:	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3 (3a ÷ 3d)	
Filter series	**Filter element**	**Seal Kit code number NBR**	**FPM**
MPTX 116	See order table	02050737	02050738

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