

HYDRAULIC FILTRATION PRODUCTS



PASSION TO PERFORM

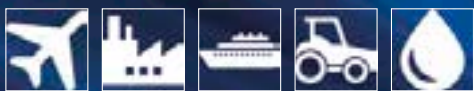




A WORLDWIDE LEADER IN THE FIELD OF HYDRAULIC FILTRATION EQUIPMENT.

Our company started life in 1964, when Bruno Pasotto decided to attempt to cater for the requests of a market still to be fully explored, with the study, design, development, production and marketing of a vast range of filters for hydraulic equipment, capable of satisfying the needs of manufacturers in all sectors. The quality of our products, our extreme competitiveness compared with major international producers and our constant activities of research, design and development has made us a worldwide leader in the field of hydraulic circuit filtering. Present for over 50 years in the market, we have played a truly decisive role in defining our sector, and by now we are a group capable of controlling our entire chain of production, monitoring all manufacturing processes to guarantee superior quality standards and to provide concrete solutions for the rapidly evolving needs of customers and the market.

MARKET LEADER



Our work is based on a skillful interaction between advanced technology and fine workmanship, **customizing products according to specific market requests**, focusing strongly on innovation and quality, and following every step in the manufacturing of both standard and special products, fully respecting customer expectations.



Our customer-oriented philosophy, which enables us to satisfy all customer requests **rapidly and with personalized products**, makes us a **dynamic and flexible enterprise**. The possibility of constantly controlling and monitoring the entire production process is essential to allow us to guarantee the quality of our products.

WORLDWIDE PRESENCE

Our foreign Branches enable us to offer a diversified range of products that allow us to successfully face the aggressive challenge of international competition, and also to maintain a stable presence at a local level.

The Group boasts **9** business branches



TECHNOLOGY

Our constant **quest for excellence in quality and technological innovation** allows us to offer only the best solutions and services for applications in many fields, including general industry, test rigs, lubrication, heavy engineering, renewable energies, naval engineering, offshore engineering, aviation systems, emerging technologies and mobile plant (i.e. tractors, excavators, concrete pumps, platforms).



AND PRODUCTION

Our high level of technological expertise means **we can rely entirely on our own resources, without resorting to external providers.** This in turn enables us to satisfy a growing number of customer requests, also exploiting our constantly updated range of machines and equipment, featuring **fully-automated workstations** capable of **24-hour production.**





SUCTION FILTERS

Flow rates
up to 875 l/min

- Mounting:
- Tank immersed
 - In-Line
 - In tank with shut off valve
 - In tank with flooded suction

RETURN FILTERS

Flow rates
up to 3000 l/min

- Pressure
up to 20 bar
- Mounting:
- In-Line
 - Tank top
 - In single and duplex designs

RETURN / SUCTION FILTERS

Flow rates
up to 300 l/min

- Pressure
up to 80 bar
- Mounting:
- In-Line
 - Tank top

SPIN-ON FILTERS

Flow rates
up to 365 l/min

- Pressure
up to 35 bar
- Mounting:
- In-Line
 - Tank top

LOW & MEDIUM PRESSURE FILTERS

Flow rates
up to 3000 l/min

- Pressure
up to 80 bar
- Mounting:
- In-Line
 - Parallel manifold version
 - In single and duplex designs

HIGH PRESSURE FILTERS

Flow rates
up to 750 l/min

- Pressure from 110 bar
up to 560 bar
- Mounting:
- In-Line
 - Manifold
 - In single and duplex designs

PRODUCT RANGE

MP Filtri can offer a vast and articulated range of products for the global market, suitable for all industrial sectors using hydraulic equipment.

This includes filters (suction, return, return/suction, spin-on, pressure, stainless steel pressure) and structural components (motor/pump bell-housings, transmission couplings, damping rings, foot brackets, aluminium tanks, cleaning covers).

We can provide all the skills and solutions required by the modern hydraulics industry to monitor contamination levels and other fluid conditions.

Mobile filtration units and a full range of accessories allow us to supply everything necessary for a complete service in the hydraulic circuits.



STAINLESS STEEL HIGH PRESSURE FILTERS

Flow rates up to 125 l/min

Pressure from 320 bar up to 1000 bar

Mounting:

- In-Line
- Manifold
- In single and duplex designs

CONTAMINATION MONITORING PRODUCTS

- Online, in-line particle counters
- Off-line bottle sampling products
- Fully calibrated using relevant ISO standards
- A wide range of variants to support fluid types and communication protocols

MOBILE FILTRATION UNITS

Flow rates from 15 l/min up to 200 l/min

POWER TRANSMISSION PRODUCTS

- Aluminium bell-housings for motors from 0.12 kW to 400 kW
- Couplings in Aluminium Cast Iron - Steel
- Damping rings
- Foot bracket
- Aluminium tanks
- Cleaning covers

TANK ACCESSORIES

- Oil filler and air breather plugs
- Optical and electrical level gauges
- Pressure gauge valve selectors
- Pipe fixing brackets
- Pressure gauges

HYDRAULIC FILTRATION PRODUCTS

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153	MPT	Tank top semi-immersed filter, easy filter element disassembly	8 116	300 79	
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363	LMP 950 - 951	In-line filter, available with 2 and up to 6 different heads	30	435	2400	634
371	LMP 952 - 953 - 954	In-line low pressure filter specifically designed to be mounted in series	25	363	4500	1189
383	LMD 211	In-line duplex medium pressure filter	60	870	200	53
391	LMD 400 - 401 & 431	In-line duplex low pressure filter	16	232	600	159
407	LMD 951	In-line duplex filter, available with 2 up to 6 different heads	16	232	1200	317
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417	LDP - LDD	In-line and duplex medium pressure filter	60	870	360	95
427	LMP 900 - 901	In-line low pressure filter	30	435	2000	528
435	LMP 902 - 903	In-line filter specifically designed to be mounted in series	20	290	3000	793
444	CLOGGING INDICATORS					
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page	HIGH PRESSURE FILTERS	up to P _{max}		up to Q _{max}		
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475	FHP	Typical high pressure filter for mobile applications, high flow rate	420	6092	630	166
493	FMM	Typical high pressure filter for mobile applications, low flow rate	420	6092	300	79
503	FHA 051	Filter optimized for use in high pressure operating systems, low flow rate	560	8122	150	40
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CONTAMINATION MANAGEMENT

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1 HYDRAULIC FLUIDS

The fluid is the vector that transmits power, energy within an oleodynamic circuit. In addition to transmitting energy through the circuit, it also performs additional functions such as lubrication, protection and cooling of the surfaces.

The classification of fluids used in hydraulic systems is coded in many regulatory references, different Standards.

The most popular classification criterion divides them into the following families:

- MINERAL OILS

Commonly used oil deriving fluids.

- FIRE RESISTANT FLUIDS

Fluids with intrinsic characteristics of incombustibility or high flash point.

- SYNTHETIC FLUIDS

Modified chemical products to obtain specific optimized features.

- ECOLOGICAL FLUIDS

Synthetic or vegetable origin fluids with high biodegradability characteristics.

The choice of fluid for an hydraulic system must take into account several parameters.

These parameters can adversely affect the performance of an hydraulic system, causing delay in the controls, pump cavitation, excessive absorption, excessive temperature rise, efficiency reduction, increased drainage, wear, jam/block or air intake in the plant.

The main properties that characterize hydraulic fluids and affect their choice are:

- DYNAMIC VISCOSITY

It identifies the fluid's resistance to sliding due to the impact of the particles forming it.

- KINEMATIC VISCOSITY

It is a widespread formal dimension in the hydraulic field.

It is calculated with the ratio between the dynamic viscosity and the fluid density.

Kinematic viscosity varies with temperature and pressure variations.

- VISCOSITY INDEX

This value expresses the ability of a fluid to maintain viscosity when the temperature changes.

A high viscosity index indicates the fluid's ability to limit viscosity variations by varying the temperature.

- FILTERABILITY INDEX

It is the value that indicates the ability of a fluid to cross the filter materials. A low filterability index could cause premature clogging of the filter material.

- WORKING TEMPERATURE

Working temperature affects the fundamental characteristics of the fluid. As already seen, some fluid characteristics, such as cinematic viscosity, vary with the temperature variation.

When choosing a hydraulic oil, must therefore be taken into account of the environmental conditions in which the machine will operate.

- COMPRESSIBILITY MODULE

Every fluid subjected to a pressure contracts, increasing its density.

The compressibility module identifies the increase in pressure required to cause a corresponding increase in density.

- HYDROLYTIC STABILITY

It is the characteristic that prevents galvanic pairs that can cause wear in the plant/system.

- ANTIOXIDANT STABILITY AND WEAR PROTECTION

These features translate into the capacity of a hydraulic oil to avoid corrosion of metal elements inside the system.

- HEAT TRANSFER CAPACITY

It is the characteristic that indicates the capacity of hydraulic oil to exchange heat with the surfaces and then cool them.

2 FLUID CONTAMINATION

Whatever the nature and properties of fluids, they are inevitably subject to contamination. Fluid contamination can have two origins:

- INITIAL CONTAMINATION

Caused by the introduction of contaminated fluid into the circuit, or by incorrect storage, transport or transfer operations.

- PROGRESSIVE CONTAMINATION

Caused by factors related to the operation of the system, such as metal surface wear, sealing wear, oxidation or degradation of the fluid, the introduction of contaminants during maintenance, corrosion due to chemical or electrochemical action between fluid and components, cavitation. The contamination of hydraulic systems can be of different nature:

- SOLID CONTAMINATION

For example rust, slag, metal particles, fibers, rubber particles, paint particles or additives

- LIQUID CONTAMINATION

For example, the presence of water due to condensation or external infiltration or acids

- GASEOUS CONTAMINATION

For example, the presence of air due to inadequate oil level in the tank, drainage in suction ducts, incorrect sizing of tubes or tanks.

3 EFFECTS OF CONTAMINATION ON HYDRAULIC COMPONENTS

Solid contamination is recognized as the main cause of malfunction, failure and early degradation in hydraulic systems. It is impossible to delete it completely, but it can be effectively controlled by appropriate devices.

CONTAMINATION IN PRESENCE OF
LARGE TOLERANCES



CONTAMINATION IN PRESENCE OF
NARROW TOLERANCES



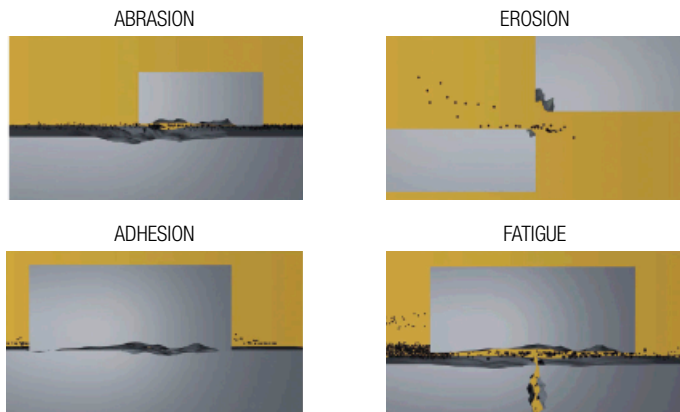
Solid contamination mainly causes surface damage and component wear.

- ABRASION OF SURFACES

Cause of leakage through mechanical seals, reduction of system performance, failures.

- SURFACE EROSION
Cause of leakage through mechanical seals, reduction of system performance, variation in adjustment of control components, failures.
- ADHESION OF MOVING PARTS
Cause of failure due to lack of lubrication.
- DAMAGES DUE TO FATIGUE
Cause of breakdowns and components breakdown.

- MODIFICATION OF FLUID PROPERTIES (COMPRESSIBILITY MODULE, DENSITY, VISCOSITY)
Cause of system's reduction of efficiency and of control.
It is easy to understand how a system without proper contamination management is subject to higher costs than a system that is provided.
- MAINTENANCE
Maintenance activities, spare parts, machine stop costs
- ENERGY AND EFFICIENCY
Efficiency and performance reduction due to friction, drainage, cavitation.



Liquid contamination mainly results in decay of lubrication performance and protection of fluid surfaces.

DISSOLVED WATER

- INCREASING FLUID ACIDITY
Cause of surface corrosion and premature fluid oxidation
- GALVANIC COUPLE AT HIGH TEMPERATURES
Cause of corrosion

FREE WATER - ADDITIONAL EFFECTS

- DECAY OF LUBRICANT PERFORMANCE
Cause of rust and sludge formation, metal corrosion and increased solid contamination
- BATTERY COLONY CREATION
Cause of worsening in the filterability feature
- ICE CREATION AT LOW TEMPERATURES
Cause damage to the surface
- ADDITIVE DEPLETION
Free water retains polar additives

Gaseous contamination mainly results in decay of system performance.

- CUSHION SUSPENSION
Cause of increased noise and cavitation.
- FLUID OXIDATION
Cause of corrosion acceleration of metal parts.

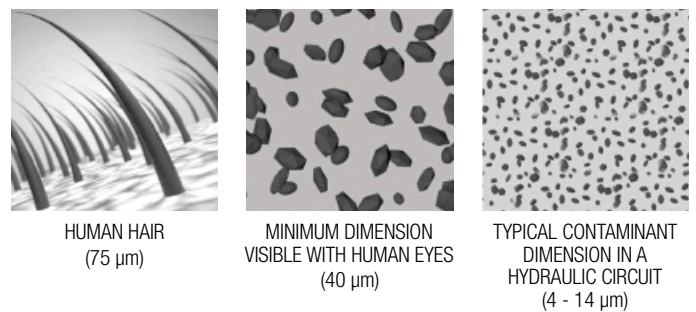
4 MEASURING THE SOLID CONTAMINATION LEVEL

The level of contamination of a system identifies the amount of contaminant contained in a fluid.

This parameter refers to a unit volume of fluid.

The level of contamination may be different at different points in the system. From the information in the previous paragraphs it is also apparent that the level of contamination is heavily influenced by the working conditions of the system, by its working years and by the environmental conditions.

What is the size of the contaminating particles that we must handle in our hydraulic circuit?



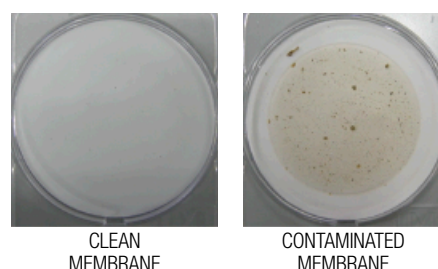
Contamination level analysis is significant only if performed with a uniform and repeatable method, conducted with standard test methods and suitably calibrated equipment.

To this end, ISO has issued a set of standards that allow tests to be conducted and express the measured values in the following ways.

- GRAVIMETRIC LEVEL - ISO 4405

The level of contamination is defined by checking the weight of particles collected by a laboratory membrane. The membrane must be cleaned, dried and desiccated, with fluid and conditions defined by the Standard.

The volume of fluid is filtered through the membrane by using a suitable suction system. The weight of the contaminant is determined by checking the weight of the membrane before and after the fluid filtration.



CONTAMINATION MANAGEMENT

- CUMULATIVE DISTRIBUTION OF THE PARTICLES SIZE - ISO 4406

The level of contamination is defined by counting the number of particles of certain dimensions per unit of volume of fluid. Measurement is performed by Automatic Particle Counters (APC).

Following the count, the contamination classes are determined, corresponding to the number of particles detected in the unit of fluid.

The most common classification methods follow ISO 4406 and SAE AS 4059 (Aerospace Sector) regulations.

NAS 1638 is still used although obsolete.

Classification example according to ISO 4406

The International Standards Organisation standard ISO 4406 is the preferred method of quoting the number of solid contaminant particles in a sample.

The code is constructed from the combination of three scale numbers selected from the following table.

The first number represents the number of particles that are larger than $4 \mu\text{m}_{(c)}$.

The second number represents the number of particles larger than $6 \mu\text{m}_{(c)}$.

The third scale number represents the number of particles in a millilitre sample of the fluid that are larger than $14 \mu\text{m}_{(c)}$.

ISO 4406 - Allocation of Scale Numbers

Class	Number of particles per ml	
	Over	Up to
28	1 300 000	2 500 000
27	640 000	1 300 000
26	320 000	640 000
25	160 000	320 000
24	80 000	160 000
23	40 000	80 000
22	20 000	40 000
21	10 000	20 000
20	5 000	10 000
19	2 500	5 000
18	1 300	2 500
17	640	1 300
16	320	640
15	160	320
14	80	160
13	40	80
12	20	40
11	10	20
10	5	10
9	2.5	5
8	1.3	2.5
7	0.64	1.3
6	0.32	0.64
5	0.16	0.32
4	0.08	0.16
3	0.04	0.08
2	0.02	0.04
1	0.01	0.02
0	0	0.01

> $4 \mu\text{m}_{(c)}$ = 350 particles

> $6 \mu\text{m}_{(c)}$ = 100 particles

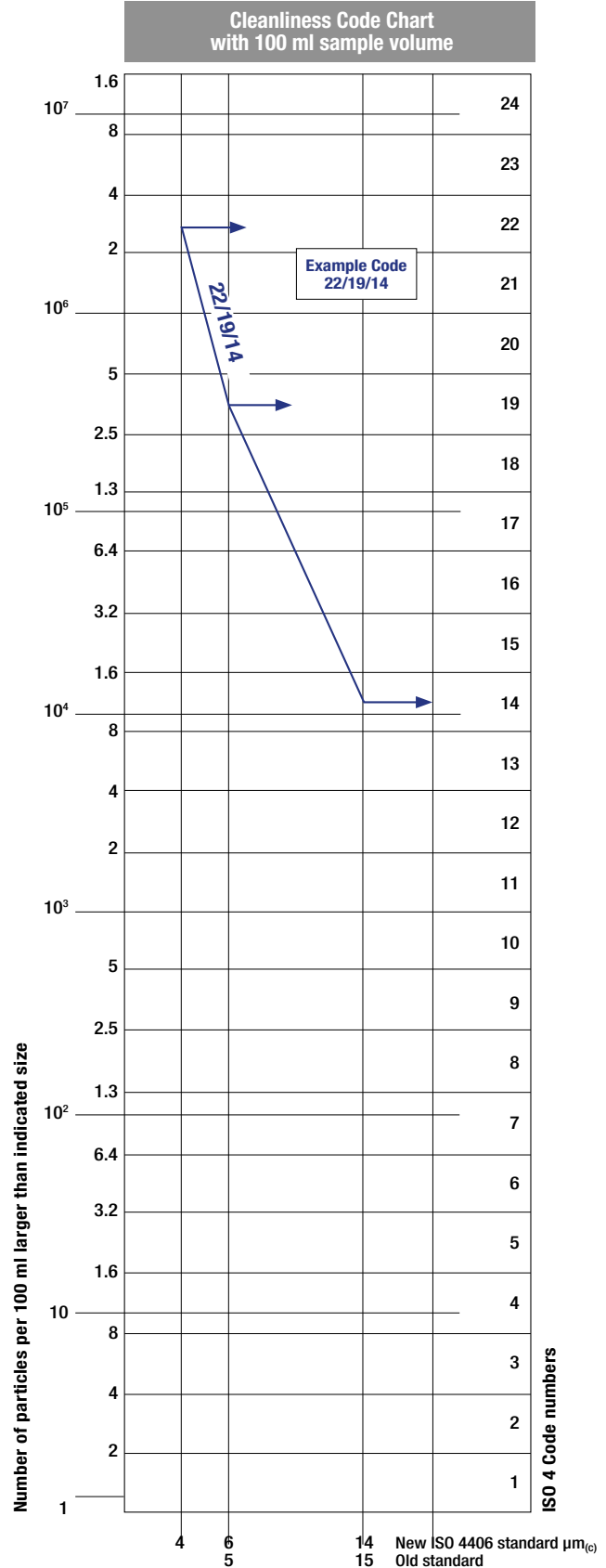
> $14 \mu\text{m}_{(c)}$ = 25 particles

16 / 14 / 12

ISO 4406 Cleanliness Code System

Microscope counting examines the particles differently to APCs and the code is given with two scale numbers only.

These are at $5 \mu\text{m}$ and $15 \mu\text{m}$ equivalent to the $6 \mu\text{m}_{(c)}$ and $14 \mu\text{m}_{(c)}$ of APCs.



- CUMULATIVE DISTRIBUTION OF THE PARTICLES SIZE - SAE AS 4059-1 and SAE AS 4059-2

Classification example according to

SAE AS4059 - Rev. E and SAE AS4059-2 - Rev. F

The code, prepared for the aerospace industry, is based on the size, quantity, and particle spacing in a 100 ml fluid sample. The contamination classes are defined by numeric codes, the size of the contaminant is identified by letters (A-F).

SAE AS4059 - REV. E

It can be made a differential measurement (Table 1) or a cumulative measurement (Table 2)

Table 1 - Class for differential measurement

Class	Dimension of contaminant Maximum Contamination Limits per 100 ml				
	6-14 $\mu\text{m}_{(c)}$	14-21 $\mu\text{m}_{(c)}$	21-38 $\mu\text{m}_{(c)}$	38-70 $\mu\text{m}_{(c)}$	>70 $\mu\text{m}_{(c)}$
00	125	22	4	1	0
0	250	44	8	2	0
1	500	89	16	3	1
2	1 000	178	32	6	1
3	2 000	356	63	11	2
4	4 000	712	126	22	4
5	8 000	1 425	253	45	8
6	16 000	2 850	506	90	16
7	32 000	5 700	1 012	180	32
8	64 000	11 400	2 025	360	64
9	128 000	22 800	4 050	720	128
10	256 000	45 600	8 100	1 440	256
11	512 000	91 200	16 200	2 880	512
12	1 024 000	182 400	32 400	5 760	1 024

6 - 14 $\mu\text{m}_{(c)}$ = 15 000 particles
14 - 21 $\mu\text{m}_{(c)}$ = 2 200 particles
21 - 38 $\mu\text{m}_{(c)}$ = 200 particles
38 - 70 $\mu\text{m}_{(c)}$ = 35 particles
> 70 $\mu\text{m}_{(c)}$ = 3 particles
SAE AS4059 REV E - Class 6

Table 2 - Class for cumulative measurement

Class	Dimension of contaminant Maximum Contamination Limits per 100 ml					
	>4 $\mu\text{m}_{(c)}$	>6 $\mu\text{m}_{(c)}$	>14 $\mu\text{m}_{(c)}$	>21 $\mu\text{m}_{(c)}$	>38 $\mu\text{m}_{(c)}$	>70 $\mu\text{m}_{(c)}$
000	195	76	14	3	1	0
00	390	152	27	5	1	0
0	780	304	54	10	2	0
1	1 560	609	109	20	4	1
2	3 120	1 217	217	39	7	1
3	6 250	2 432	432	76	13	2
4	12 500	4 864	864	152	26	4
5	25 000	9 731	1 731	306	53	8
6	50 000	19 462	3 462	612	106	16
7	100 000	38 924	6 924	1 224	212	32
8	200 000	77 849	13 849	2 449	424	64
9	400 000	155 698	27 698	4 898	848	128
10	800 000	311 396	55 396	9 796	1 696	256
11	1 600 000	622 792	110 792	19 592	3 392	512
12	3 200 000	1 245 584	221 584	39 184	6 784	1 024

> 4 $\mu\text{m}_{(c)}$ = 45 000 particles
> 6 $\mu\text{m}_{(c)}$ = 15 000 particles
> 14 $\mu\text{m}_{(c)}$ = 1 500 particles
> 21 $\mu\text{m}_{(c)}$ = 250 particles
> 38 $\mu\text{m}_{(c)}$ = 15 particles
> 70 $\mu\text{m}_{(c)}$ = 3 particle
SAE AS4059 REV E 6A/6B/5C/5D/4E/2F

The information reproduced on this page is a brief extract from SAE AS4059 Rev.E, revised in May 2005. For further details and explanations refer to the full Standard.

SAE AS4059 - REV. F

It can be made a differential measurement (Table 1) or a cumulative measurement (Table 2)

Table 1 - Class for differential measurement

Class	Dimension of contaminant Maximum Contamination Limits per 100 ml				
	5-15 μm	15-25 μm	25-50 μm	50-100 μm	>100 μm
00	125	22	4	1	0
0	250	44	8	2	0
1	500	89	16	3	1
2	1 000	178	32	6	1
3	2 000	356	63	11	2
4	4 000	712	126	22	4
5	8 000	1 425	253	45	8
6	16 000	2 850	506	90	16
7	32 000	5 700	1 012	180	32
8	64 000	11 400	2 025	360	64
9	128 000	22 800	4 050	720	128
10	256 000	45 600	8 100	1 440	256
11	512 000	91 200	16 200	2 880	512
12	1 024 000	182 400	32 400	5 760	1 024

6 - 14 $\mu\text{m}_{(c)}$ = 15 000 particles
14 - 21 $\mu\text{m}_{(c)}$ = 2 200 particles
21 - 38 $\mu\text{m}_{(c)}$ = 200 particles
38 - 70 $\mu\text{m}_{(c)}$ = 35 particles
> 70 $\mu\text{m}_{(c)}$ = 3 particles
SAE AS4059 REV F - Class 6

- (1) Size range, microscope particle counts, based on longest dimension as measured per AS598 or ISO 4407.
- (2) Size range, APC calibrated per ISO 11171 or an optical or electron microscope with image analysis software, based on projected area equivalent diameter.
- (3) Contamination classes and particle count limits are identical to NAS 1638.

Table 2 - Class for cumulative measurement

Class	Dimension of contaminant Maximum Contamination Limits per 100 ml					
	>1 μm	>5 μm	>15 μm	>25 μm	>50 μm	>100 μm
000	195	76	14	3	1	0
00	390	152	27	5	1	0
0	780	304	54	10	2	0
1	1 560	609	109	20	4	1
2	3 120	1 217	217	39	7	1
3	6 250	2 432	432	76	13	2
4	12 500	4 864	864	152	26	4
5	25 000	9 731	1 731	306	53	8
6	50 000	19 462	3 462	612	106	16
7	100 000	38 924	6 924	1 224	212	32
8	200 000	77 849	13 849	2 449	424	64
9	400 000	155 698	27 698	4 898	848	128
10	800 000	311 396	55 396	9 796	1 696	256
11	1 600 000	622 792	110 792	19 592	3 392	512
12	3 200 000	1 245 584	221 584	39 184	6 784	1 024

> 4 $\mu\text{m}_{(c)}$ = 45 000 particles
> 6 $\mu\text{m}_{(c)}$ = 15 000 particles
> 14 $\mu\text{m}_{(c)}$ = 1 500 particles
> 21 $\mu\text{m}_{(c)}$ = 250 particles
> 38 $\mu\text{m}_{(c)}$ = 15 particles
> 70 $\mu\text{m}_{(c)}$ = 3 particle
SAE AS4059 REV F cpc* Class 6 6/6/5/5/4/2

* cumulative particle count

- (1) Size range, optical microscope, based on longest dimension as measured per AS598 or ISO 4407.
- (2) Size range, APC calibrated per ISO 11171 or an optical or electron microscope with image analysis software, based on projected area equivalent diameter.

CONTAMINATION MANAGEMENT

- CLASSES OF CONTAMINATION ACCORDING TO NAS 1638 (January 1964)

The NAS system was originally developed in 1964 to define contamination classes for the contamination contained within aircraft components.

The application of this standard was extended to industrial hydraulic systems simply because nothing else existed at the time.

The coding system defines the maximum numbers permitted of 100 ml volume at various size intervals (differential counts) rather than using cumulative counts as in ISO 4406. Although there is no guidance given in the standard on how to quote the levels, most industrial users quote a single code which is the highest recorded in all sizes and this convention is used on MP Filtri APC's.

The contamination classes are defined by a number (from 00 to 12) which indicates the maximum number of particles per 100 ml, counted on a differential basis, in a given size bracket.

Size Range Classes (in microns)

Maximum Contamination Limits per 100 ml					
Class	5-15	15-25	25-50	50-100	>100
00	125	22	4	1	0
0	250	44	8	2	0
1	500	89	16	3	1
2	1 000	178	32	6	1
3	2 000	356	63	11	2
4	4 000	712	126	22	4
5	8 000	1 425	253	45	8
6	16 000	2 850	506	90	16
7	32 000	5 700	1 012	180	32
8	64 000	11 400	2 025	360	64
9	128 000	22 800	4 050	720	128
10	256 000	45 600	8 100	1 440	256
11	512 000	91 200	16 200	2 880	512
12	1 024 000	182 400	32 400	5 760	1 024

5-15 µm	= 42 000 particles
15-25 µm	= 2 200 particles
25-50 µm	= 150 particles
50-100 µm	= 18 particles
> 100 µm	= 3 particles
Class NAS 8	

- CUMULATIVE DISTRIBUTION OF THE PARTICLES SIZE - ISO 4407

The level of contamination is defined by counting the number of particles collected by a laboratory membrane per unit of fluid volume. The measurement is done by a microscope. The membrane must be cleaned, dried and desiccated, with fluid and conditions defined by the Standard. The fluid volume is filtered through the membrane, using a suitable suction system.

The level of contamination is identified by dividing the membrane into a predefined number of areas and by counting the contaminant particles using a suitable laboratory microscope.

MICROSCOPE CONTROL AND MEASUREMENT



Example figure 1 and 2
ISO 4406
SAE AS4059E Table 1
NAS 1638
SAE AS4059E Table 2

COMPARISON PHOTOGRAPH'S
1 graduation = 10µm

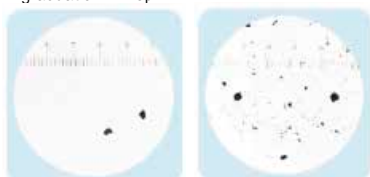


Fig. 1
Class 16/14/11
Class 5
Class 5
Class 6A/5B/5C

Fig. 2
Class 22/20/17
Class 11
Class 11
Class 12A/11B/11C

For other comparison photographs for contamination classes see the "Fluid Condition and Filtration Handbook".

- CLEANLINESS CODE COMPARISON

Although ISO 4406 standard is being used extensively within the hydraulics industry other standards are occasionally required and a comparison may be requested. The table below gives a very general comparison but often no direct comparison is possible due to the different classes and sizes involved.

ISO 4406	SAE AS4059 Table 2	SAE AS4059 Table 1	NAS 1638
> 4 µm _(c) 6 µm _(c) 14 µm _(c)	> 4 µm _(c) 6 µm _(c) 14 µm _(c)	4-6 6-14 14-21 21-38 38-70 >70	5-15 15-25 25-50 50-100 >100
23 / 21 / 18	13A / 12B / 12C	12	12
22 / 20 / 17	12A / 11B / 11C	11	11
21 / 19 / 16	11A / 10B / 10C	10	10
20 / 18 / 15	10A / 9B / 9C	9	9
19 / 17 / 14	9A / 8B / 8C	8	8
18 / 16 / 13	8A / 7B / 7C	7	7
17 / 15 / 12	7A / 6B / 6C	6	6
16 / 14 / 11	6A / 5B / 5C	5	5
15 / 13 / 10	5A / 4B / 4C	4	4
14 / 12 / 09	4A / 3B / 3C	3	3

5 FILTRATION TECHNOLOGIES

Various mechanisms such as mechanical stoppage, magnetism, gravimetric deposit, or centrifugal separation can be used to reduce the level of contamination.

The mechanical stoppage method is most effective and can take place in two ways:

- SURFACE FILTRATION

It is by direct interception. The filter prevents particles larger than the pores from continuing in the plant / system. Surface filters are generally manufactured with metal canvases or meshes.

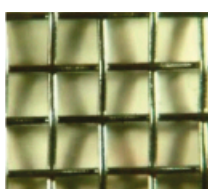
- DEPTH FILTERING

Filters are constructed by fiber interlacing. Such wraps form pathways of different shapes and sizes in which the particles remain trapped when they find smaller apertures than their diameter.

Depth filters are generally produced with papers impregnated with phenolic resins, metal fibers or inorganic fibers.

In inorganic fiber filtration, commonly called microfibre, the filtering layers are often overlapped in order to increase the ability to retain the contaminant.

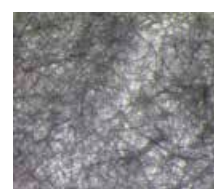
WIRE MESH FILTRATION

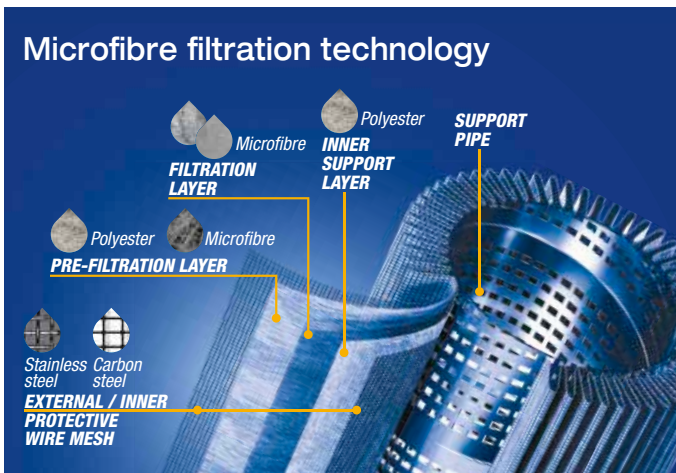


PAPER FILTRATION



MICROFIBER FILTRATION





The filtration efficiency of metallic mesh filtrations is defined as the maximum particle size that can pass through the meshes of the filtering grid. The efficiency of microfibre and paper filtration ($\beta_{x(c)}$) is defined through a lab test called Multipass Test. The efficiency value ($\beta_{x(c)}$) is defined as the ratio between the number of particles of certain dimensions detected upstream and downstream of the filter.

$$\frac{\text{Upstream particles number} > X \mu\text{m}_{(c)}}{\text{Downstream particles number} > X \mu\text{m}_{(c)}} = \beta_{x(c)}$$



Value ($\beta_{x(c)}$)	2	10	75	100	200	1000
Efficiency	50%	90%	98.7%	99%	99.5%	99.9%

Test conditions, such as type of fluid to be used (MIL-H-5606), type of contaminant to be used (ISO MTD), fluid viscosity, test temperature, are determined by ISO 16889.

In addition to the filtration efficiency value during the Multipass test, other important features, such as filtration stability (β stability) and dirt holding capacity (DHC), are also tested.

Poor filtration stability is the cause of the filtering quality worsening as the filter life rises. Low dirt holding capacity causes a reduction in the life of the filter.

Filtration ISO Standard Comparison		
$\beta_{x(c)} > 1000$ ISO 16889	$\beta_x > 200$ ISO 4572	MP Filtri Filter media code
5 $\mu\text{m}_{(c)}$	3 μm	A03
7 $\mu\text{m}_{(c)}$	6 μm	A06
10 $\mu\text{m}_{(c)}$	10 μm	A10
16 $\mu\text{m}_{(c)}$	18 μm	A16
21 $\mu\text{m}_{(c)}$	25 μm	A25

6 RECOMMENDED CONTAMINATION CLASSES

Any are the nature and the properties of fluids, they are inevitably subject to contamination. The level of contamination can be managed by using special components called filters.

Hydraulic components builders, knowing the problem of contamination, recommend the filtration level appropriate to the use of their products.

Example of recommended contamination levels for pressures below 140 bar.

Piston pumps with fixed flow rate	•					
Piston pumps with variable flow rate			•			
Vane pumps with fixed flow rate		•				
Vane pumps with variable flow			•			
Engines	•					
Hydraulic cylinders	•					
Actuators					•	
Test benches						•
Check valve	•					
Directional valves	•					
Flow regulating valves	•					
Proportional valves				•		
Servo-valves					•	
Flat bearings			•			
Ball bearings				•		
ISO 4406 CODE	20/18/15	19/17/14	18/16/13	17/15/12	16/14/11	15/13/10
Recommended filtration $\beta_{x(c)} \geq 1.000$	$\beta_{20(c)} > 1000$	$\beta_{15(c)} > 1000$	$\beta_{10(c)} > 1000$	$\beta_{7(c)} > 1000$	$\beta_{7(c)} > 1000$	$\beta_{5(c)} > 1000$

The common classification of filters is determined by their position in the plant.

7 TYPES OF FILTERS

Suction filters

They are positioned before the pump and are responsible for protecting the pump from dirty contaminants. It also provides additional flow guidance to the pump suction line.

Being subject to negligible working pressures are manufactured with simple and lightweight construction.

They are mainly produced with gross grade surface filtrations, mainly $60 \div 125 \mu\text{m}$. They can be equipped with a magnetic filter for retaining ferrous particles. They are generally placed under the fluid head to take advantage of the piezometric thrust of the fluid and reduce the risk of cavitation.

There are two types of suction filters:

- IMMERSION FILTERS
Simple filter element screwed on the suction pipe
- FILTERS WITH CONTAINER
Container filters that are more bulky, but provide easier maintenance of the tank

Delivery (or Pressure) filters

They are positioned between the pump and most sensitive regulating and controlling components, such as servo valves or proportional valves, and are designed to ensure the class of contamination required by the components used in the circuit.

Being subjected to high working pressures are manufactured with more robust and articulated construction. In particular situations of corrosive environments or aggressive fluids can be made of stainless steel.

They are mainly produced with filtering depths of $3 \div 25 \mu\text{m}$.

They can be manufactured with in-line connections, with plate or flange connections or directly integrated into the circuit control blocks / manifolds. They can also be manufactured in duplex configuration to allow the contaminated section to be maintained even when the plant / system is in operation without interruption of the working cycle.

Return filters

They are positioned on the return line to the tank and perform the task of filtering the fluid from particles entering the system from the outside or generated by the wear of the components.

They are generally fixed to the reservoir (for this reason also called top tank mounted), positioned semi-immersed or completely immersed.

The positioning of the return filters must guarantee in all operating conditions that the fluid drainage takes place in immersed condition; this is to avoid creating foams in the tank that can cause malfunctions or cavitation in the pumps.

For the sizing of the return filters, account must be taken of the presence of accumulators or cylinders that can make the return flow considerably greater than the pump suction flow rate.

Being subject to contained working pressures are manufactured with simple and lightweight construction.

Normally it is possible to extract the filter element without disconnecting the filter from the rest of the system.

Combined filters

They are designed to be applied to systems with two or more circuits. They are commonly used in hydrostatic transmission machines where they have a dual filtration function of the return line and suction line of the hydrostatic transmission pump.

The filter is equipped with a valve that keeps the 0.5 bar pressure inside the filter. A portion of the fluid that returns to the tank is filtered by the return filter element, generally produced with absolute filtration, and returns to the transmission booster pump.

Only excess fluid returns to the tank through the valve.

The internal pressure of the filter and the absolute filtration help to avoid the cavitation phenomenon inside the pump.

Off-line filters

They are generally used in very large systems / plants, placed in a closed circuit independent from the main circuit. They remain in operation regardless of the operation of the main circuit and are crossed by a constant flow rate.

They can also be manufactured in duplex configuration to allow the contaminated section to be maintained even when the unit is in operation without interruption of the work cycle.

Venting filters

During the operation of the plants, the fluid level present in the reservoir changes continuously.

The result of this continuous fluctuation is an exchange of air with the outside environment.

The venting filter function, positioned on the tank, is to filter the air that enters the tank to compensate for fluid level variations.

8 FILTER SIZING PARAMETERS

The choice of the filter system for an hydraulic system is influenced by several factors.

It is necessary to consider the characteristics of the various components present in the plant and their sensitivity to contamination.

It is also necessary to consider all the tasks that the filter will have to do within the plant:

- FLUID PROTECTION FROM CONTAMINATION
- PROTECTION OF OLEODYNAMIC COMPONENTS SENSITIVE TO CONTAMINATION
- PROTECTION OF OLEODYNAMIC PLANTS FROM ENVIRONMENTAL WASTE
- PROTECTION OF OLEODYNAMIC PLANTS FROM CONTAMINATION CAUSED BY COMPONENTS' FAILURES

The advantages of proper positioning and sizing of the filters are

- MORE RELIABILITY OF THE SYSTEM
- LONGER LIFE OF THE FLUID COMPONENTS
- REDUCTION OF STOP TIME
- REDUCTION OF FAILURE CASUALTIES

Each hydraulic filter is described by general features that identify the possibility of use in different applications.

- **MAXIMUM WORKING PRESSURE (P_{max})**

The maximum working pressure of the filter must be greater than or equal to the pressure of the circuit section in which it will be installed.

- **PRESSURE DROP (ΔP)**

The pressure drop depends on a number of factors, such as the working circuit temperature, the fluid viscosity, the filter element cleaning condition.

- **WORKING TEMPERATURE (T)**

The working temperature deeply affect the choice of materials. Excessively high or low temperatures may adversely affect the strength of the materials or the characteristics of the seals.

- **FILTRATION EFFICIENCY (%) / FILTRATION RATIO ($\beta_{x(c)}$)**

Filtration efficiency is the most important parameter to consider when selecting a filter.

When choosing the filtration performances, the needs of the most sensitive components in the system must be considered.

- **FLUID TYPE**

The type of fluid influences the choice of filters in terms of compatibility and viscosity. It is always mandatory to check the filterability.

- **PLACEMENT IN THE PLANT**

The position of the filter in the system conditions the efficiency of all filter performances.

9 APPLICABLE STANDARDS FOR FILTER DEVELOPMENT

In order to obtain unique criteria for development and verification of the filters performance, specific regulations for the filters and filter elements testing have been issued by ISO. These norms describe the target, the methodology, the conditions and the presentation methods for the test results.

ISO 2941

Hydraulic fluid power -- Filter elements -- Verification of collapse/burst pressure rating

This Standard describes the method for testing the collapse / burst resistance of the filter elements.

The test is performed by crossing the contaminated fluid filter element at a predefined flow rate. The progressive clogging of the filter element, determined by contamination, causes an increase in differential pressure.

ISO 2942

Hydraulic fluid power -- Filter elements -- Verification of fabrication integrity and determination of the first bubble point

This Standard describes the method to verify the integrity of the assembled filter elements.

It can be used to verify the quality of the production process or the quality of the materials by verifying the pressure value of the first bubble point.

ISO 2943

Hydraulic fluid power -- Filter elements -- Verification of material compatibility with fluids

This Standard describes the method to verify the compatibility of materials with certain hydraulic fluids.

The test is carried out by keeping the element (the material sample) immersed in the fluid under high or low temperature conditions for a given period of time and verifying the retention of the characteristics.

ISO 3723

Hydraulic fluid power -- Filter elements -- Method for end load test

This Standard describes the method for verifying the axial load resistance of the filter elements.

After performing the procedure described in ISO 2943, the designed axial load is applied to the filter element. To verify the test results, then the test described in ISO 2941 is performed.

ISO 3968

Hydraulic fluid power -- Filters -- Evaluation of differential pressure versus flow characteristics

This Standard describes the method for checking the pressure drop across the filter.

The test is carried out by crossing the filter from a given fluid and by detecting upstream and downstream pressures.

Some of the parameters defined by the Standard are the fluid, the test temperature, the size of the tubes, the position of the pressure detection points.

ISO 16889

Hydraulic fluid power -- Filters -- Multi-pass method for evaluating filtration performance of a filter element

This Standard describes the method to check the filtration characteristics of the filter elements.

The test is performed by constant introduction of contaminant (ISO MTD). The characteristics observed during the test are the filtration efficiency and the dirty holding capacity related to the differential pressure.

ISO 23181

Hydraulic fluid power -- Filter elements -- Determination of resistance to flow fatigue using high viscosity fluid

This Standard describes the method for testing the fatigue resistance of the filter elements. The test is carried out by subjecting the filter to continuous flow variations, thus differential pressure, using a high viscosity fluid.

ISO 11170

Hydraulic fluid power -- Sequence of tests for verifying performance characteristics of filter elements

The Standard describes the method for testing the performance of filter elements. The protocol described by the regulations provides the sequence of all the tests described above in order to verify all the working characteristics (mechanical, hydraulic and filtration).

ISO 10771-1

Hydraulic fluid power -- Fatigue pressure testing of metal pressure-containing envelopes -- Test method

This Standard describes the method to check the resistance of the hydraulic components with pulsing pressure.

It can be applied to all metal components (excluding tubes) subject to cyclic pressure used in the hydraulic field.

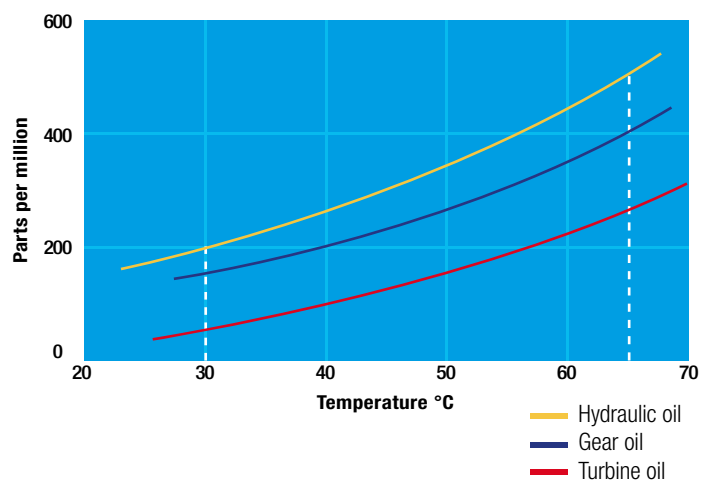
10 WATER IN HYDRAULIC AND LUBRICATING FLUIDS

Water Content

In mineral oils and non aqueous resistant fluids water is undesirable. Mineral oil usually has a water content of 50-300 ppm (@40°C) which it can support without adverse consequences.

Once the water content exceeds about 300ppm the oil starts to appear hazy. Above this level there is a danger of free water accumulating in the system in areas of low flow. This can lead to corrosion and accelerated wear.

Similarly, fire resistant fluids have a natural water which may be different to mineral oil.



CONTAMINATION MANAGEMENT

Saturation Levels

Since the effects of free (also emulsified) water is more harmful than those of dissolved water, water levels should remain well below the saturation point.

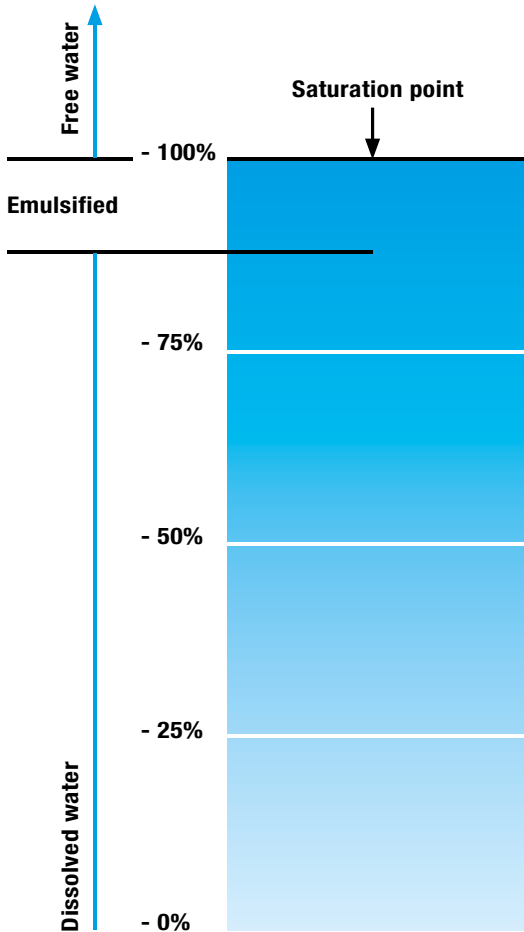
However, even water in solution can cause damage and therefore every reasonable effort should be made to keep saturation levels as low as possible. There is no such thing as too little water. As a guideline, we recommend maintaining saturation levels below 50% in all equipment.

TYPICAL WATER SATURATION LEVEL FOR NEW OILS

Examples:

Hydraulic oil @ 30°C = 200 ppm = 100% saturation

Hydraulic oil @ 65°C = 500 ppm = 100% saturation



Water absorber

Water is present everywhere, during storage, handling and servicing.

MP Filtri filter elements feature an absorbent media which protects hydraulic systems from both particulate and water contamination.

MP Filtri's filter element technology is available with inorganic microfiber media with a filtration rating 25 µm (therefore identified with media designation WA025), providing absolute filtration of solid particles to $\beta_{x(c)} = 1000$.

Absorbent media is made by water absorbent fibres which increase in size during the absorption process.

Free water is thus bonded to the filter media and completely removed from the system (it cannot even be squeezed out).

Filter Media

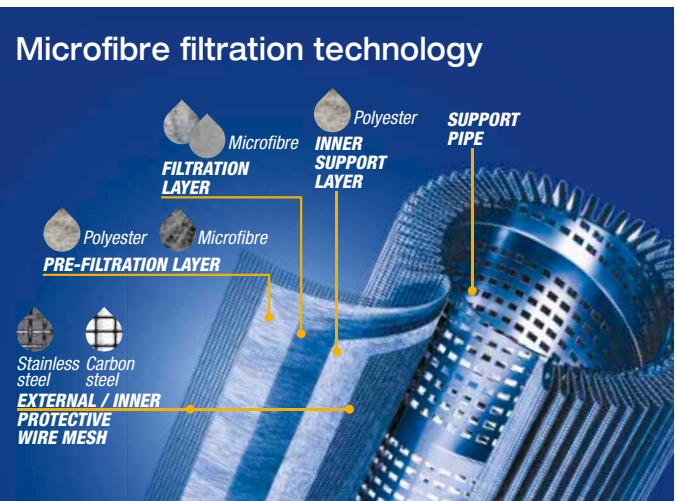


Fabric that absorbs water

Absorber media layer



The Filter Media has absorbed water



By removing water from your fluid power system, you can prevent such key problems as:

- corrosion (metal etching)
- loss of lubricant power
- accelerated abrasive wear in hydraulic components
- valve-locking
- bearing fatigue
- viscosity variance (reduction in lubricating properties)
- additive precipitation and oil oxidation
- increase in acidity level
- increased electrical conductivity (loss of dielectric strength)
- slow/weak response of control systems

Product availability:

LOW & MEDIUM PRESSURE FILTERS - LMP Series

LMP 210	LMP 900
LMP 211	LMP 901
LMP 400	LMP 902
LMP 401	LMP 903
LMP 430	LMP 950

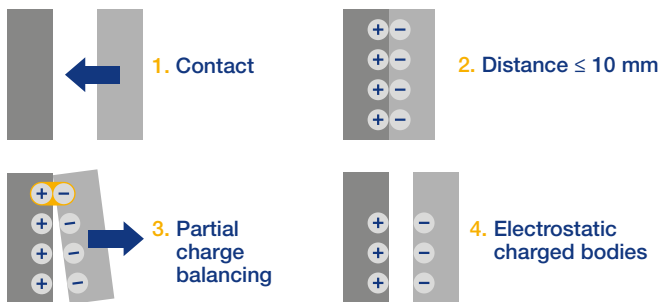
11 THE ANTI-STATIC FILTERS

zerospark

zerospark is a specialist solution designed to solve the problem of electrostatic discharge inside hydraulic filters. Caused by the electrical charge build-up due to the passage of oil through the filters, this can result in damage to filter elements, oils and circuit components. It can even cause fire hazards in environments where flammable materials are present.

THE TRIBOELECTRIC EFFECT

The body with the most electronegativity strips electrons from the other, generating a build-up of a net negative charge on itself. The other body is charged by the same amount but with the opposite sign, giving rise to very high potential differences. These, if not dissipated, can give rise to electrostatic discharges.

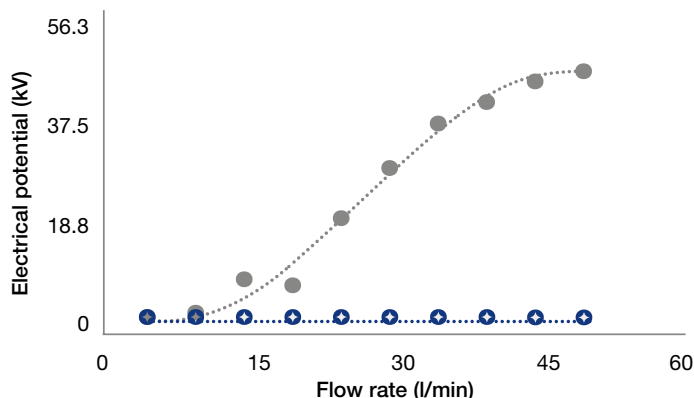


DISSIPATIVE FILTER ELEMENTS

To solve the problem of charge build-up in filters, MP Filtri has developed an innovative solution. By replacing certain insulating components with conductive zerospark versions, the charges on the media are free to move towards the head and are thus dissipated to the ground.

⊕ Dissipative elements

● Standard elements



Under standard working conditions, the potential goes from tens of kV to zero, clearly showing the effectiveness of our dissipative filters.

The following table summarises some examples of test results at the same flow rate and temperature for elements of the same size but made of different materials.

Filter element	Electrical potential (kV)	Current (μ A)
Standard glass microfibre	11	-6.0
Dissipative glass microfibre	0	-9.0
Standard cellulose	6	-1.3
Dissipative cellulose	0	-2.1
Other glass microfibre	9-15	-7.0
Other glass microfibre	3-8	-16.0

When using a synthetic oil instead of mineral oil, the values and sign of the two electrical quantities may vary.

Filter element	Electrical potential (kV)	
	Mineral oil	Synthetic oil
Standard glass microfibre	+11	+30
Dissipative glass microfibre	0	~0.0
Standard cellulose	+6	-43
Dissipative cellulose	0	~0.0

FILTER SIZING

INDEX

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CALCULATION	23
CORRECTIVE FACTOR	24

THE CORRECT FILTER SIZING HAVE TO BE BASED ON THE TOTAL PRESSURE DROP DEPENDING BY THE APPLICATION.

FOR EXAMPLE, THE MAXIMUM TOTAL PRESSURE DROP ALLOWED BY A NEW AND CLEAN RETURN FILTER HAVE TO BE IN THE RANGE 0.4 - 0.6 bar / 5.80 - 8.70 psi.

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 / lb/ft³). The filter element pressure drop Δpe is proportional to its viscosity (mm²/s / SUS), the corrective factor Y have to be used in case of an oil viscosity different than 30 mm²/s (cSt) / 150 SUS.

Sizing data for single filter element, head at top

- Δpc** = Filter housing pressure drop [bar / psi]
- Δpe** = Filter element pressure drop [bar / psi]
- 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 - gpm)
- V1** reference oil viscosity = 30 mm²/s (cSt) / 150 SUS
- V2** = operating oil viscosity in mm²/s (cSt) / SUS

Filter element pressure drop calculation with an oil viscosity different than 30 mm²/s (cSt) / 150 SUS

- International system:
Δpe = Y : 1000 x Q x (V2:V1)
- Imperial system:
Δpe = Y : 17.2 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

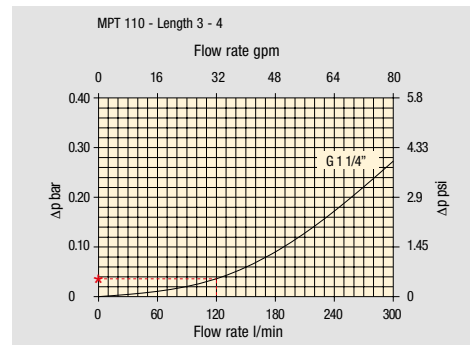
Application	Range:[bar]	[psi]
Suction filters	0.08 - 0.10 bar	1.16 - 1.45 psi
Return filters	0.4 - 0.6 bar	5.80 - 8.70 psi
Return - Suction filters (*)	0.8 - 1.0 bar	11.60 - 14.50 psi
Low & Medium Pressure filters	0.4 - 0.6 bar	5.80 - 8.70 psi return lines
	0.3 - 0.5 bar	4.35 - 7.25 psi lubrication lines
	0.3 - 0.4 bar	4.35 - 5.80 psi off-line in power systems
	0.1 - 0.3 bar	1.45 - 4.35 psi off-line in test benches
	0.4 - 0.6 bar	5.80 - 8.7 psi over-boost
High Pressure filters	0.8 - 1.5 bar	11.60 - 21.75 psi
Stainless Steel filters	0.8 - 1.5 bar	11.60 - 21.75 psi

(*)The suction flow rate should not exceed 30% of the return flow rate

Generic filter calculation example

- Application data:
- Tank top return filter
- Pressure Pmax = 10 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 G 1 1/4" inlet connection

Calculation:
Δpc = 0.03 bar / 0.43 psi (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 = (2.00 : 1000) x 120 x (46 : 30) = 0.37 bar
Δpe = (2.00 : 17.2) x 32 x (216 : 150) = 5.36 psi

Filter element	Absolute filtration H Series					Nominal filtration N Series		
	A03	A06	A10	A16	A25	P10	P25	M25 M60 M90
Return filters	74.00	50.08	20.00	16.00	9.00	6.43	5.51	4.40
MF 020	2 29.20	24.12	8.00	7.22	5.00	3.33	2.85	2.00
	3 22.00	19.00	6.56	5.33	4.33	1.68	1.44	1.30
MF 030 MX 030	1 74.00	50.08	20.00	16.00	9.00	6.43	5.51	3.40
MF 100 MX 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 + 0.37 = 0.4 bar
Δp Tot. = 0.43 + 5.36 = 5.79 psi

The selection is correct because the total pressure drop value is inside the admissible range for top tank return filters. In case the allowed max total pressure drop is not verified, it is necessary to repeat the calculation changing the filter length/size.

FILTER SIZING 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 mm²/s

Return filters

Filter element	Absolute filtration H Series					Nominal filtration N Series			
	Type	A03	A06	A10	A16	A25	P10	P25	M25 M60 M90
MF 020	1	74.00	50.08	20.00	16.00	9.00	6.43	5.51	4.40
	2	29.20	24.12	8.00	7.22	5.00	3.33	2.85	2.00
	3	22.00	19.00	6.56	5.33	4.33	1.68	1.44	1.30
MF 030 MFX 030	1	74.00	50.08	20.00	16.00	9.00	6.43	5.51	3.40
MF 100 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
MF 180 MFX 180	1	3.67	3.05	1.64	1.56	1.24	1.18	1.06	0.26
	2	1.69	1.37	0.68	0.54	0.51	0.43	0.39	0.12
MF 190 MFX 190	2	1.69	1.37	0.60	0.49	0.44	0.35	0.31	0.11
MF 400 MFX 400	1	3.20	2.75	1.39	1.33	1.06	0.96	0.87	0.22
	2	2.00	1.87	0.88	0.85	0.55	0.49	0.45	0.13
	3	1.90	1.60	0.63	0.51	0.49	0.39	0.35	0.11
MF 750 MFX 750	1	1.08	0.84	0.49	0.36	0.26	0.21	0.19	0.06
MLX 250	2	3.00	3.04	1.46	1.25	1.17	-	-	M25 0.20
MLX 660	2	1.29	1.26	0.52	0.44	0.38	-	-	M25 0.10
CU 025		78.00	48.00	28.00	24.00	9.33	9.33	8.51	1.25
CU 040		25.88	20.88	10.44	10.00	3.78	3.78	3.30	1.25
CU 100		15.20	14.53	5.14	4.95	2.00	2.00	0.17	1.10
CU 250		3.25	2.55	1.55	1.35	0.71	0.71	0.59	0.25
CU 630		1.96	1.68	0.85	0.72	0.42	0.42	0.36	0.09
CU 850		1.06	0.84	0.42	0.33	0.17	0.17	0.13	0.04
MR 100	1	19.00	17.00	6.90	6.30	4.60	2.94	2.52	1.60
	2	11.70	10.80	4.40	4.30	3.00	2.94	2.52	1.37
	3	7.80	6.87	3.70	3.10	2.70	2.14	1.84	1.34
	4	5.50	4.97	2.60	2.40	2.18	1.72	1.47	1.34
	5	4.20	3.84	2.36	2.15	1.90	1.60	1.37	1.34
MR 250	1	5.35	4.85	2.32	1.92	1.50	1.38	1.20	0.15
	2	4.00	3.28	1.44	1.10	1.07	0.96	0.83	0.13
	3	2.60	2.20	1.08	1.00	0.86	0.77	0.64	0.12
	4	1.84	1.56	0.68	0.56	0.44	0.37	0.23	0.11
MR 630	1	3.10	2.48	1.32	1.14	0.92	0.83	0.73	0.09
	2	2.06	1.92	0.82	0.76	0.38	0.33	0.27	0.08
	3	1.48	1.30	0.60	0.56	0.26	0.22	0.17	0.08
	4	1.30	1.20	0.48	0.40	0.25	0.21	0.16	0.08
	5	0.74	0.65	0.30	0.28	0.13	0.10	0.08	0.04
MR 850	1	0.60	0.43	0.34	0.25	0.13	0.12	0.09	0.03
	2	0.37	0.26	0.23	0.21	0.11	0.08	0.07	0.03
	3	0.27	0.18	0.17	0.17	0.05	0.04	0.04	0.02
	4	0.23	0.16	0.13	0.12	0.04	0.03	0.03	0.02

Return / Suction filters

Filter element	Absolute filtration			
	Type	A10	A16	A25
RSX 116	1	5.12	4.33	3.85
	2	2.22	1.87	1.22
RSX 165 RSX 166	1	2.06	1.75	1.46
	2	1.24	1.05	0.96
	3	0.94	0.86	0.61

Filter element	Absolute filtration N Series								
	Type	A03	A06	A10	A16	A25	P10	P25	M25 M60 M90
CU 110	1	16.25	15.16	8.75	8.14	5.87	2.86	2.65	0.14
	2	12.62	10.44	6.11	6.02	4.16	1.60	1.49	0.12
	3	8.57	7.95	5.07	4.07	2.40	1.24	1.15	0.11
	4	5.76	4.05	2.80	2.36	1.14	0.91	0.85	0.05

Low & Medium pressure filters

Filter element	Absolute filtration N-W Series					Nominal filtration N Series			
	Type	A03	A06	A10	A16	A25	P10	P25	M25
CU 110	1	16.25	15.16	8.75	8.14	5.87	2.86	2.65	0.14
	2	12.62	10.44	6.11	6.02	4.15	1.60	1.49	0.12
	3	8.57	7.95	5.07	4.07	2.40	1.24	1.15	0.11
	4	5.76	4.05	2.80	2.36	1.14	0.91	0.85	0.05
CU 210	1	5.30	4.80	2.00	1.66	1.32	0.56	0.43	0.12
	2	3.44	2.95	1.24	1.09	0.70	0.42	0.35	0.09
	3	2.40	1.70	0.94	0.84	0.54	0.33	0.23	0.05
DN	016	7.95	7.20	3.00	2.49	1.98	0.84	0.65	0.18
	025	5.00	4.53	1.89	1.57	1.25	0.53	0.41	0.11
	040	3.13	2.66	1.12	0.98	0.63	0.38	0.32	0.08
CU 400	2	3.13	2.55	1.46	1.22	0.78	0.75	0.64	0.19
	3	2.15	1.70	0.94	0.78	0.50	0.40	0.34	0.10
	4	1.60	1.28	0.71	0.61	0.40	0.34	0.27	0.08
	5	1.00	0.83	0.47	0.34	0.20	0.24	0.19	0.06
	6	0.82	0.58	0.30	0.27	0.17	0.22	0.18	0.05
	CU 900	1	0.86	0.63	0.32	0.30	0.21	-	-
CU 950	2	1.03	0.80	0.59	0.40	0.26	-	-	0.05
	3	0.44	0.40	0.27	0.18	0.15	-	-	0.02
MR 630	7	0.88	0.78	0.36	0.34	0.16	0.12	0.96	0.47

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 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	2	70.66	53.20	25.77	20.57	14.67	4.90
	3	36.57	32.28	18.00	13.38	8.00	2.90
	4	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
Absolute filtration - N Series							
Type	A03	A06	A10	A16	A25	M25	
HF 325	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

Suction filters

Nominal filtration - N Series						
Type	P10	P25	M25	M60	M90	M250
SF 250	0.65	0.20	0.10	0.08	0.05	0.03
SF 503	-	-	0.17	0.11	0.11	0.11
SF 504	-	-	0.11	0.08	0.08	0.08
SF 505	-	-	0.23	0.18	0.18	0.18
SF 510	-	-	0.18	0.14	0.14	0.14
SF 535	-	-	0.08	0.05	0.05	0.05
SF 540	-	-	0.05	0.04	0.04	0.04

Stainless steel high pressure filters

Filter element	Absolute filtration N Series					
	Type	A03	A06	A10	A16	A25
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	2	70.66	53.20	25.77	20.57	14.67
	3	36.57	32.28	18.00	13.38	8.00
	4	26.57	23.27	12.46	8.80	5.58
HP 050	1	31.75	30.30	13.16	12.3	7.29
	2	24.25	21.26	11.70	9.09	4.90
	3	17.37	16.25	8.90	7.18	3.63
	4	12.12	10.75	6.10	5.75	3.08
	5	7.00	6.56	3.60	3.10	2.25
HP 135	1	20.33	18.80	9.71	8.66	4.78
	2	11.14	10.16	6.60	6.38	2.22
	3	6.48	6.33	3.38	3.16	2.14
Absolute filtration H - U Series						
Type	A03	A06	A10	A16	A25	
HP 011	1	424.58	319.74	235.17	194.44	163.78
	2	281.06	211.25	94.53	75.45	47.26
	3	130.14	97.50	43.63	34.82	21.81
	4	109.39	82.25	36.79	29.37	18.40
HP 039	2	73.00	57.00	28.00	24.00	17.20
	3	40.90	36.33	21.88	18.80	11.20
	4	31.50	28.22	17.22	9.30	6.70
HP 050	1	47.33	34.25	21.50	20.50	14.71
	2	29.10	25.95	14.04	10.90	5.88
	3	20.85	19.50	10.68	8.61	4.36
	4	14.55	12.90	7.32	6.90	3.69
	5	9.86	9.34	6.40	4.80	2.50
HP 135	1	29.16	25.33	13.00	12.47	5.92
	2	14.28	11.04	7.86	7.60	4.44
	3	8.96	7.46	4.89	4.16	3.07

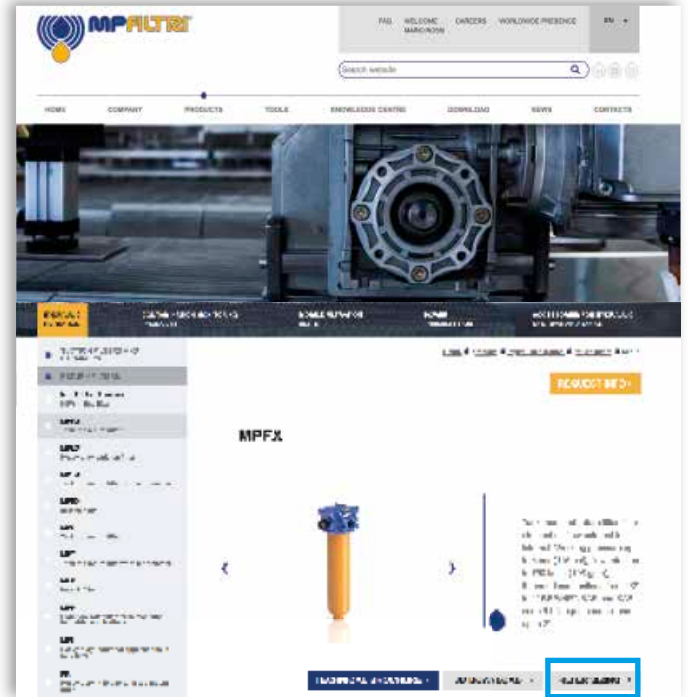
TYPICAL FILTER SIZING Selection Software

Step 1

Select "FILTER SIZING SOFTWARE" after login

OR

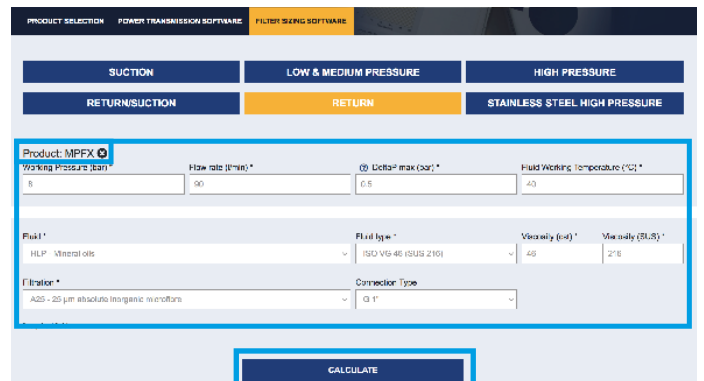
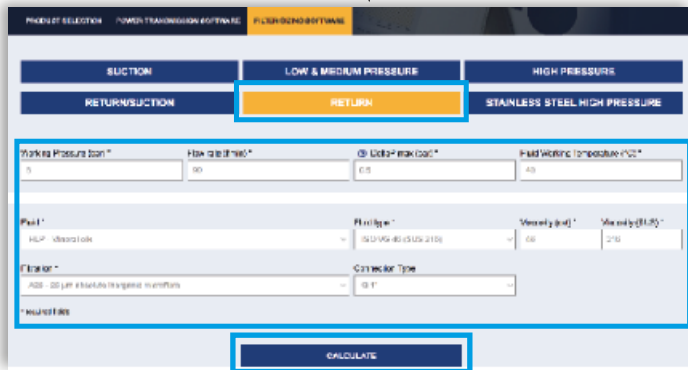
Select "FILTER SIZING" after login from a product page



Choose the type of filter family.
Enter the main data for sizing the filter
then push CALCULATE.

Step 2

Enter the main data for sizing the filter
then push CALCULATE.



Step 3

Select the desired options to choose the appropriate filter type for the application.

Working Pressure: 8 (bar) | Fluid: HLP
 Flow rate: 50 (l/min) | Fluid type: ISO VG 46 (SUS 216)
 DP max of the project: 0.5 (bar) | Seal: A - NBR
 Working Temperature: 40 (°C) | Working Temperature: -25 + 110 (°C)
 Filtration: 20 µm absolute inorganic microfine | Working Temperature with options: -20 + 110 (°C)
 Connection Type: G 1" | Viscosity: 46 (cst) - 216 (SUS)

NEW SEARCH

Filter type: MPFX: Tank lid mounting - (Pmax <= B: 1.75 bar Bypass) | Seal: A: NBR | > RESET

Option1: Single or duplex | DIN Standard: NOT APPLICABLE | Indicator: Visual

Image	Code	Press bar	Flow l/min	DP bar	Temp °C	Viscosity cSt	Filtering µm	Conn. type	Seal	Link			
	MPFX-20-B-A-02-A25-H-BF0	5	116	26.74	25.3	0.47	7	0.2	2	0.2	G 1"	A	
	MPFX-20-B-A-02-A25-H-BF0	5	116	26.74	25.3	0.47	7	0.2	2	0.2	G 1"	A	

Step 4

Choose the most suitable filter from the proposed list.

Image	Code	Press bar	Qmax l/min	AP bar	Housing AP bar	Element AP bar	Connection	Seal	Link					
	MPPX-103-A-C3-A25-H-BF0	5	110	26.74	25.3	0.47	7	0.12	2	0.32	1	C 1"	A	
	MPPX-103-A-C3-A25-H-BF0	5	110	26.74	25.3	0.47	7	0.12	2	0.32	1	C 1"	A	

Step 5

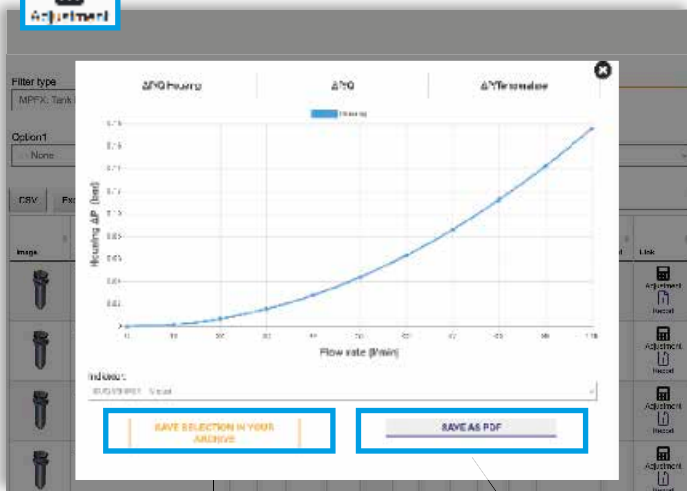
It is possible to change the filter modifying every parameter.



A SAVE YOUR FILTER'S REPORT



B MANUAL EDIT



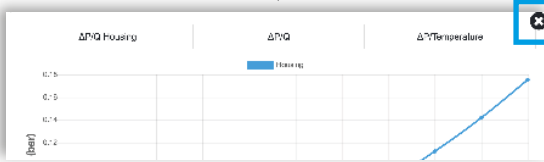
SAVE IN YOUR ARCHIVE
typing your reference data and then SAVE AS PDF



A new browser window displays the pdf

see **A**

Close the report window



By clicking your WELCOME button, the SHOW REPORTS is displayed: select it to see your filters list.

Suction filters are used as safety filters to protect pumps from gross contamination which can cause them to grip.

They are available in 2 styles:

- **Suction Strainer (STR, MPA, MPM)**
- **SF2 external filters, for mounting semi-immersed under the oil level**

SF2 semi-immersed filters, which shut-off oil flow while the filter element is being replaced, replace the butterfly valves usually used for servicing hydraulic pumps.

FILTER SIZING

For the proper corrective factor Y see chapter at page 25

Suction filters



STR & MPA - MPM	page 31
SF2 250 - 350	39
SF2 500	47
INDICATORS	57

STR & MPA - MPM series

Flow rate up to 1000 l/min



STR & MPA-MPM GENERAL INFORMATION

Description

Technical data

Suction filters

Flow rate up to 1000 l/min

STR

STR is a range of suction strainers for protection of the downstream pump against the coarse contamination.

They are placed below the oil level directly connected to the suction line of the pump.

Available features:

- Female threaded connections up to 3", for a maximum flow rate of 1000 l/min
- Bypass valve, to relieve excessive pressure drop across the filter media

Common application:

- Mobile machines (Construction and Agriculture machines)
- Industrial equipment

MPA - MPM

MPA and MPM are ranges of suction strainers for protection of the downstream pump against the coarse contamination.

They are placed below the minimum oil level, directly connected to the suction line of the pump.

The robust design allows the use of these filters in any heavy duty application.

Available features:

- Female threaded connections up to 3", for a maximum flow rate of 1000 l/min
- Magnetic filter (MPM), to hold the ferrous particles

Common application:

Industrial equipment

STR materials

- 1 - Connection: Polyamide, GF reinforced
- 2 - Core tube: Tinned Steel
- 3 - Wire mesh
- 4 - End cap: Polyamide, GF reinforced
- 5 - Bypass valve: Polyamide, GF reinforced - Steel

MPA - MPM materials

- 1 - Connection: Aluminium
- 2 - Magnetic filter
- 3 - Tie rod: Galvanized Steel
- 4 - End cap: Galvanized Steel
- 5 - Core tube: Galvanized Steel
- 6 - Filter media: Wire mesh
- 7 - Bottom: Galvanized Steel
- 8 - Washer: Galvanized Steel
- 9 - Self-locking nut: Galvanized Steel - Nylon

Bypass valve

Opening pressure 30 kPa (0.3 bar)

Elements

Fluid flow through the filter element from OUT to IN.

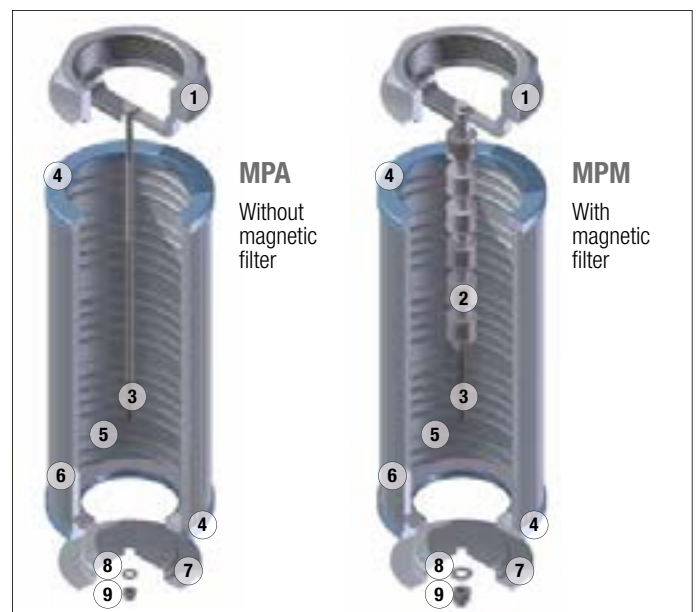


Temperature

From -25 °C to +110 °C

Weights [kg]

Filter series	
STR	see page 35
MPA - MPM	see page 37



Filter series	Thread	l/min
STR & MPA - MPM	3/8"	19
	1/2"	28
	3/4"	67
	1"	126
	1 1/4"	167
	1 1/2"	258
	2"	480
	2 1/2"	854
	2"	480
	3"	995

Maximum flow rate for a complete suction filter with a pressure drop $\Delta p = 0.08$ bar.

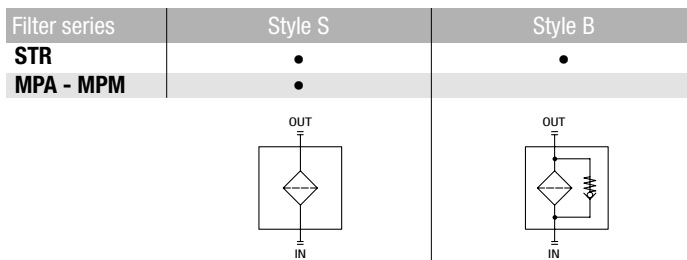
The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure.

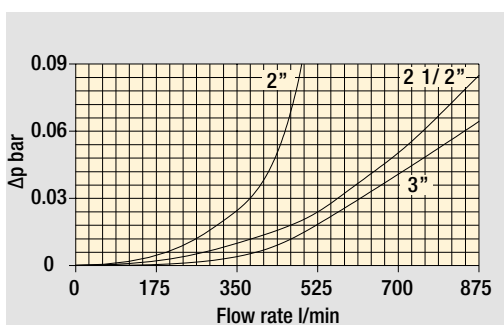
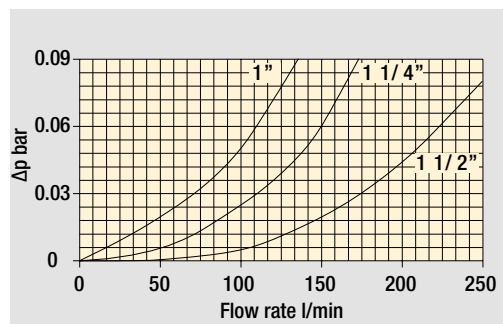
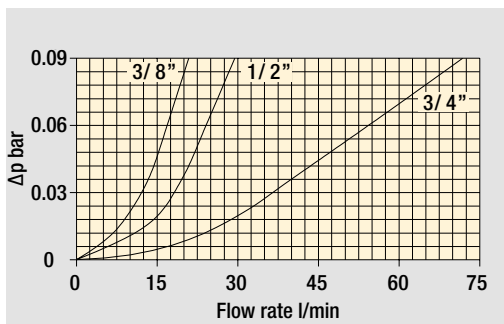
Please, contact our Sales Department for further additional information.

Hydraulic symbols



Pressure drop

Filters pressure drop Δp
in function of connection type



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

COMPLETE FILTER

Element series and size

STR045
STR050
STR065
STR070
STR086
STR100
STR140
STR150

Configuration example 1:

STR045	1	B	G1	M60	P01
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Configuration example 2:

STR100	4	S	G2	M250	P01
--------	---	---	----	------	-----

Connection type

	STR045	STR050	STR065	STR070	STR086	STR100	STR140	STR150
1	3/8"	3/8"	1/2"	1/2"	1 1/2"	1 1/4"	1 1/2"	2"
2	1/2"	1/2"	3/4"	3/4"	2"	1 1/4"	2"	2 1/2"
3	-	-	3/4"	3/4"	1 1/2"	1 1/2"	2"	3"
4	-	-	1"	1"	2"	2"	2 1/2"	-
5	-	-	-	-	1 1/2"	1 1/2"	3"	-
6	-	-	-	1/2"	2"	-	3"	-

Valves

S	Without bypass
B	With bypass 0.3 bar

Thread type

G1	Thread GAS
G2	Thread NPT

Filtration rating (filter media)

M25	Wire mesh	25 µm
M60	Wire mesh	60 µm
M90	Wire mesh	90 µm
M250	Wire mesh	250 µm

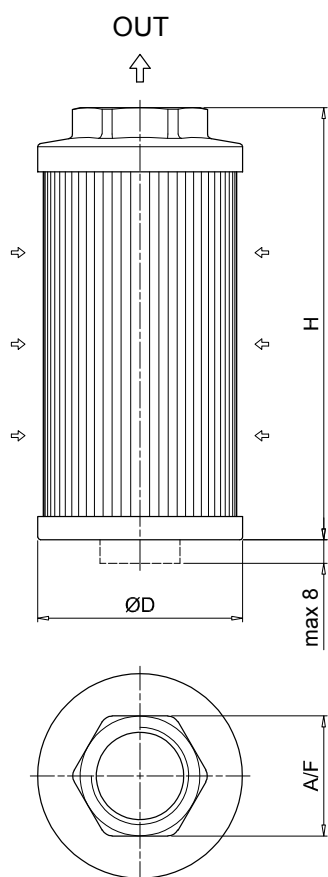
OTHER INFORMATION

Conditions of packaging

Filter size	Pcs. per box
045	12
050	12
065	6
070	6
086	6
100	6
140	1
150	1

Execution

P01	MP Filtri standard
Pxx	Customized



STR						
Filter size	Connection type	Thread	ØD [mm]	H [mm]	A / F [mm]	Weight [kg]
045	1	3/8"	46	105	30	0.15
	2	1/2"	46	105	30	0.19
050	1	3/8"	52	79	30	0.11
	2	1/2"	52	79	30	0.11
065	1	1/2"	65	110	41	0.19
	2	3/4"	65	110	41	0.22
	3	3/4"	65	144	41	0.24
	4	1"	65	144	41	0.22
070	1	1/2"	70	95	41	0.18
	2	3/4"	70	95	41	0.17
	3	3/4"	70	141	41	0.23
	4	1"	70	141	41	0.22
	6	1/2"	70	141	41	0.24
086	1	1 1/2"	86	143	69	0.33
	2	2"	86	143	69	0.30
	3	1 1/2"	86	201	69	0.43
	4	2"	86	201	69	0.40
	5	1 1/2"	86	261	69	0.53
	6	2"	86	261	69	0.50
100	1	1 1/4"	99	137	69	0.47
	2	1 1/4"	99	227	69	0.58
	3	1 1/2"	99	227	69	0.55
	4	2"	99	227	69	0.51
	5	1 1/2"	99	137	69	0.43
140	1	1 1/2"	130	160	69	0.70
	2	2"	130	160	69	0.68
	3	2"	130	262	69	0.94
	4	2 1/2"	130	272	101	1.10
	5	3"	130	272	101	1.00
	6	3"	130	330	101	1.17
150	1	2"	150	150	70	0.34
	2	2 1/2"	150	212	90	0.37
	3	3"	150	272	100	0.40

MPA-MPM

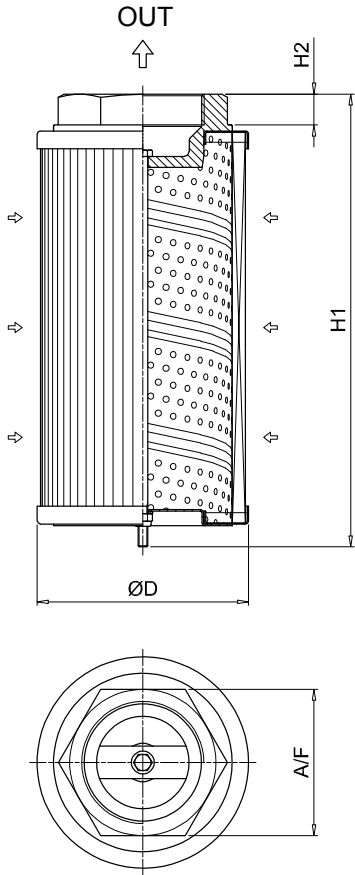
Designation & Ordering code

COMPLETE FILTER

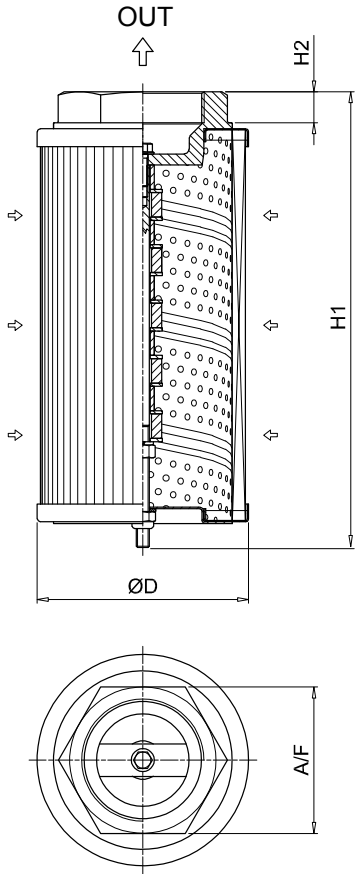
Element series		Configuration example 1:				
MPA	Without magnetic filter	MPA	030	G1	M60	P01
MPM	With magnetic filter	Configuration example 2:				
		MPM	430	G2	M250	P01
Connections						
012	3/8"					
015	1/2"					
025	1/2"					
030	3/4"					
045	3/4"					
050	1"					
075	1"					
095	1 1/4"					
120	1 1/4"					
150	1 1/2"					
180	1 1/2"					
220	2"					
280	2"					
300	2 1/2"					
380	2"					
430	3"					
Thread type						
G1	Thread GAS					
G2	Thread NPT					
Filtration rating (filter media)						
M25	Wire mesh 25 µm					
M60	Wire mesh 60 µm					
M90	Wire mesh 90 µm					
M250	Wire mesh 250 µm					
		Execution				
		P01	MP Filtri standard			
		Pxx	Customized			

OTHER INFORMATION

Conditions of packaging	
Size	Pcs. per box
012	12
015	6
025	6
030	6
045	6
050	6
075	6
095	6
120	6
150	6
180	1
220	1
280	1
300	1
380	1
430	1



MPA						
Filter size	Thread	ØD [mm]	H1 [mm]	H2 [mm]	A/F [mm]	Weight [kg]
012	3/8"	50	98	16	28	0.17
015	1/2"	50	98	16	28	0.17
025	1/2"	70	113	16	28	0.27
030	3/4"	70	115	18	42	0.36
045	3/4"	70	160	18	42	0.39
050	1"	70	160	18	42	0.35
075	1"	99	145	18	42	0.54
095	1 1/4"	99	148	20	60	0.63
120	1 1/4"	99	239	20	60	0.95
150	1 1/2"	99	239	20	60	0.91
180	1 1/2"	130	174	20	60	0.98
220	2"	130	162	13	80	1.00
280	2"	130	272	13	80	1.60
300	2 1/2"	130	281	20	90	1.67
380	2"	130	322	13	80	1.60
430	3"	130	335	22	106	1.93



MPM						
Filter size	Thread	ØD [mm]	H1 [mm]	H2 [mm]	A/F [mm]	Weight [kg]
012	3/8"	50	98	16	28	0.17
015	1/2"	50	98	16	28	0.17
025	1/2"	70	113	16	28	0.27
030	3/4"	70	115	18	42	0.36
045	3/4"	70	160	18	42	0.39
050	1"	70	160	18	42	0.35
075	1"	99	148	18	42	0.54
095	1 1/4"	99	154	20	60	0.63
120	1 1/4"	99	244	20	60	0.95
150	1 1/2"	99	244	20	60	0.91
180	1 1/2"	130	174	20	60	0.98
220	2"	130	163	13	80	1.00
280	2"	130	273	13	80	1.60
300	2 1/2"	130	282	20	90	1.67
380	2"	130	323	13	80	1.60
430	3"	130	336	22	106	1.93

SF2 250-350 series

Flow rate up to 160 l/min



SF2 250-350 GENERAL INFORMATION

Description

Technical data

Suction filters

Flow rate up to 160 l/min

SF2 250 and SF2 350 are ranges of suction filters with integrated shut-off valve for protection of the downstream pump against the coarse contamination.

They are placed below the minimum oil level, directly connected to the suction line of the pump.

They can be fitted on the side or below the tank, allowing a more flexible design of the tank.

The shut-off valve closes automatically when the cover is removed, allowing the filter element replacement without the fluid drop.

Available features:

- Female threaded connections up to 1" and flanged connections up to 1 1/2", for a maximum flow rate of 160 l/min
- Multiple connections, to connect several suction lines
- Bypass valve, to relieve excessive pressure drop across the filter media
- Magnetic filter, to hold the ferrous particles
- Visual, electrical and electronic clogging indicators

Common application:

- Mobile machines
- Industrial equipment

Filter housing materials

- Filter body: Aluminium
- Cover: Polyamide, GF reinforced
- Valve: Polyamide, GF reinforced - Steel
- Anti-Emptying valve: Steel

Bypass valve

Opening pressure 30 kPa (0.3 bar) $\pm 10\%$

Elements

Fluid flow through the filter element from IN to OUT

Seals

- Standard NBR series A
- Optional FPM series V

Temperature

From -25 °C to +110 °C

Note

SF2 250-350 filters mounting, see the drawings on page 43 and following.



Weights [kg]

Filter series	
SF2 250	2.6
SF2 350	2.6

GENERAL INFORMATION SF2 250-350

FILTER ASSEMBLY SIZING
Flow rates [l/min]

Filter series	Filter element design - N Series					
	M25	M60	M90	M250	P10	P25
SF2 250	147	151	155	160	85	132
SF2 350	147	151	155	160	85	132

Maximum flow rate for a complete suction filter with a pressure drop $\Delta p = 0.08$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

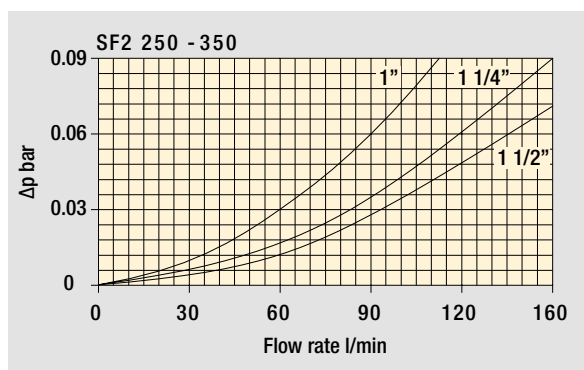
You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols

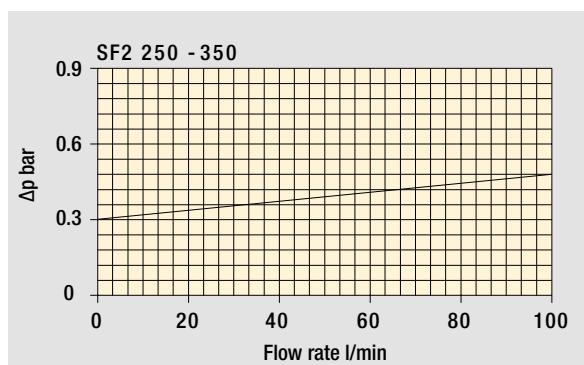
Filter series	Style R - S		Style Q - H	
SF2 250	•	•	•	•
SF2 350	•	•	•	•

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.

SF2 250-350

Designation & Ordering code

COMPLETE FILTER

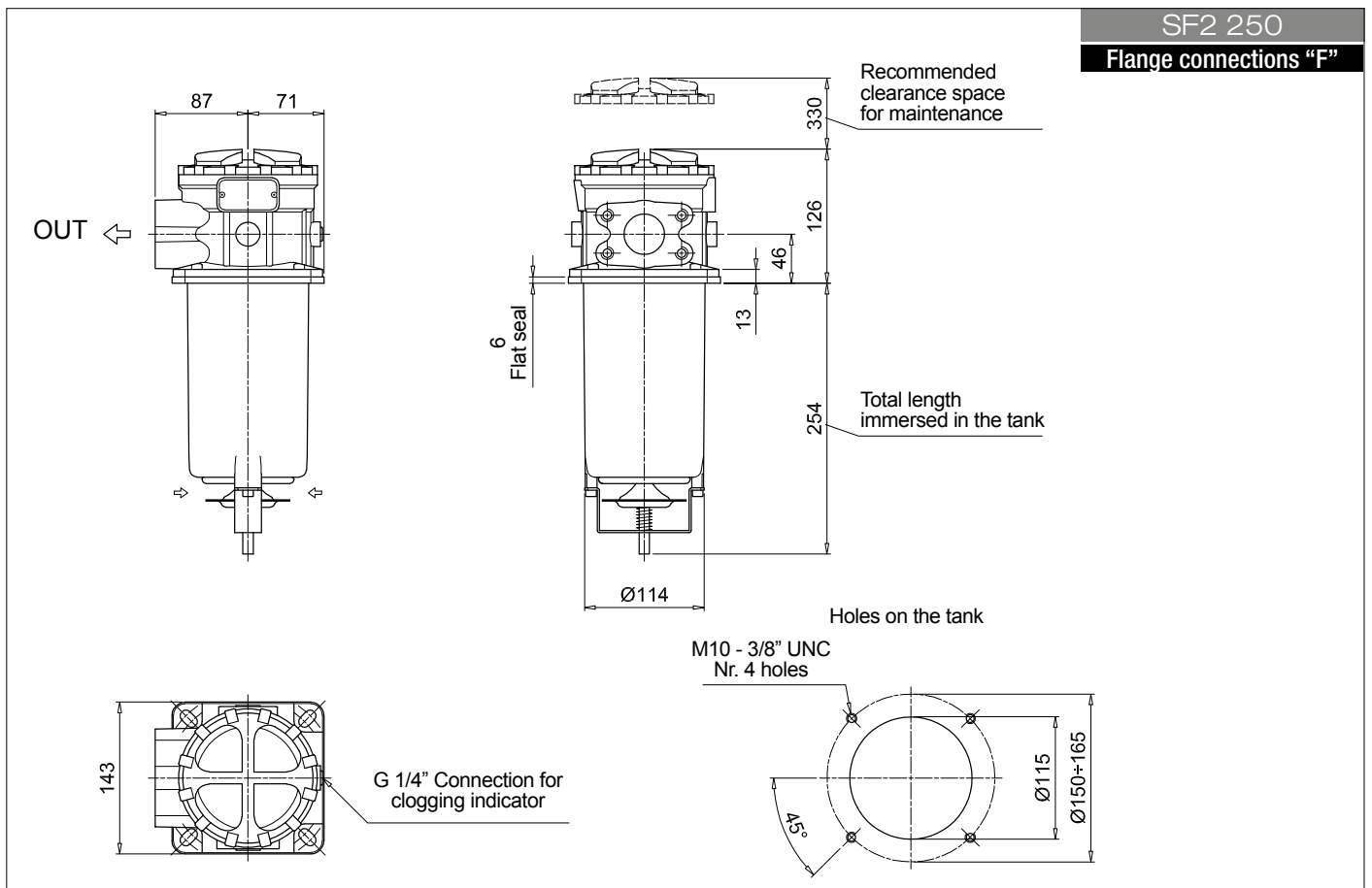
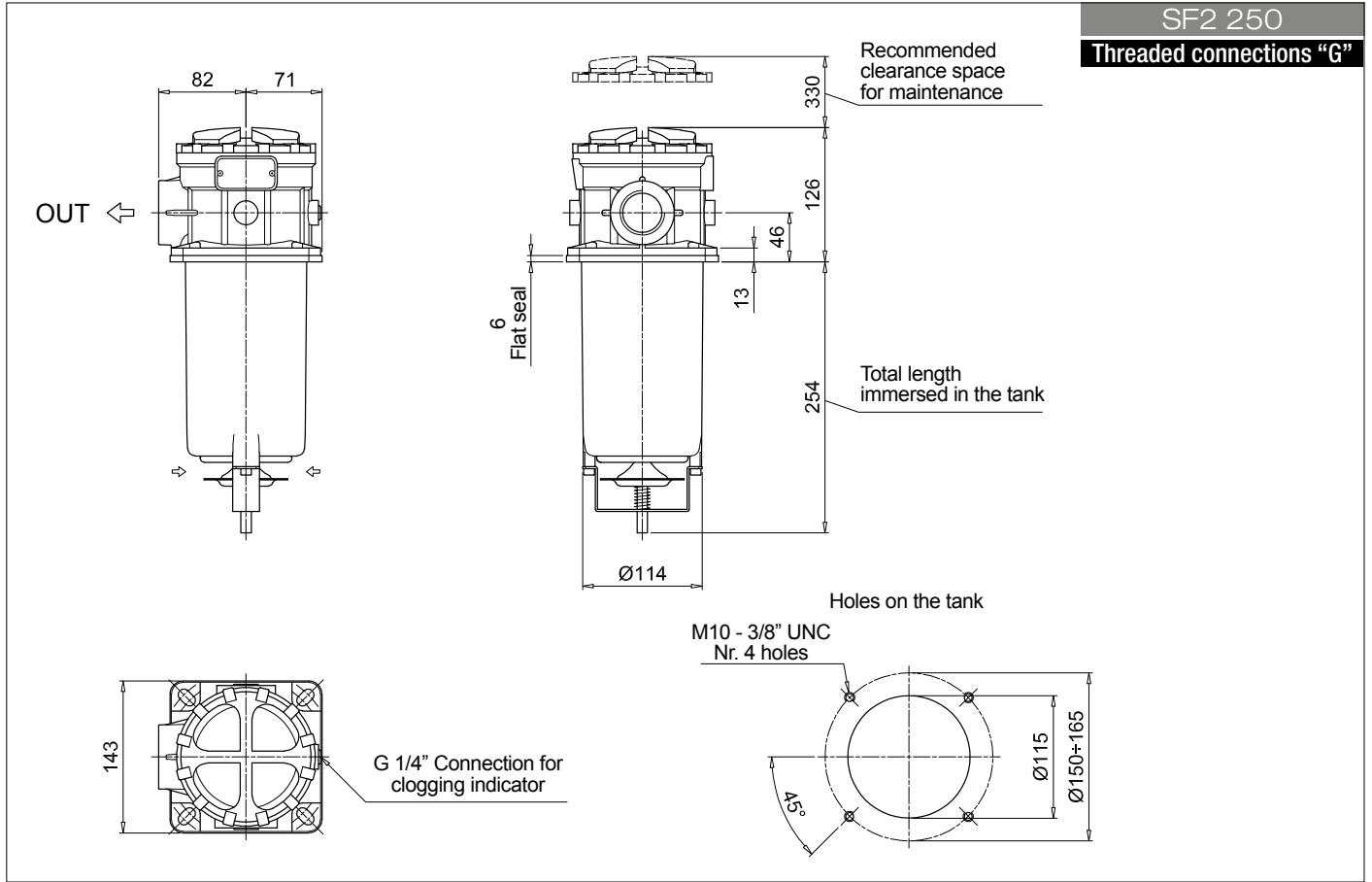
Series and size		Configuration example 1: SF2250 W F2 R M25 P01					
SF2250		Configuration example 2: SF2350 A G1 S M90 P01					
SF2350							
Seals and treatments		Filtration rating					
		Mxx	Pxx				
A	NBR	•	•				
V	FPM	•	•				
W	NBR compatible with fluids HFA-HFB-HFC	•					
Z	FPM compatible with fluids HFA-HFB-HFC	•					
Connections		Aux (only SF2350)	SF2250	SF2350			
G1	G 1 1/2"	G 1"	•	•			
G2	1 1/2" NPT	-	•				
G3	SAE 24 - 1 7/8" - 12 UN	SAE 16 - 1 5/16" - 12 UN	•	•			
G4	G 1 1/4"	-	•				
G5	1 1/4" NPT	-	•				
G6	SAE 20 - 1 5/8" - 12 UN	-	•				
G7	G 1"	-	•				
G8	1" NPT	-	•				
G9	SAE 16 - 1 5/16" - 12 UN	-	•				
F1	1 1/2" SAE 3000 psi/M	-	•				
F2	1 1/2" SAE 3000 psi/UNC	-	•				
Bypass valve and magnetic filter							
R	With bypass, with magnetic filter	Q	Without bypass, with magnetic filter				
S	With bypass, without magnetic filter	H	Without bypass, without magnetic filter				
Filtration rating (filter media)							
M25	Wire mesh 25 µm	P10	Resin impregnated paper 10 µm				
M60	Wire mesh 60 µm	P25	Resin impregnated paper 25 µm				
M90	Wire mesh 90 µm						
M250	Wire mesh 250 µm						
				Execution			
				P01 MP Filtri standard			
				Pxx Customized			

FILTER ELEMENT

Element series and size		Configuration example 1: SF250 M25 W P01			
SF250		Configuration example 2: SF250 M90 N P01			
Filtration rating (filter media)					
M25	Wire mesh 25 µm	P10	Resin impregnated paper 10 µm		
M60	Wire mesh 60 µm	P25	Resin impregnated paper 25 µm		
M90	Wire mesh 90 µm				
M250	Wire mesh 250 µm				
Seals and treatments		Filtration rating			
		Mxx	Pxx		
N	NBR	•	•		
V	FPM	•	•		
W	NBR compatible with fluids HFA-HFB-HFC	•			
Z	FPM compatible with fluids HFA-HFB-HFC	•			
				Execution	
				P01 MP Filtri standard	
				Pxx Customized	

ACCESSORIES

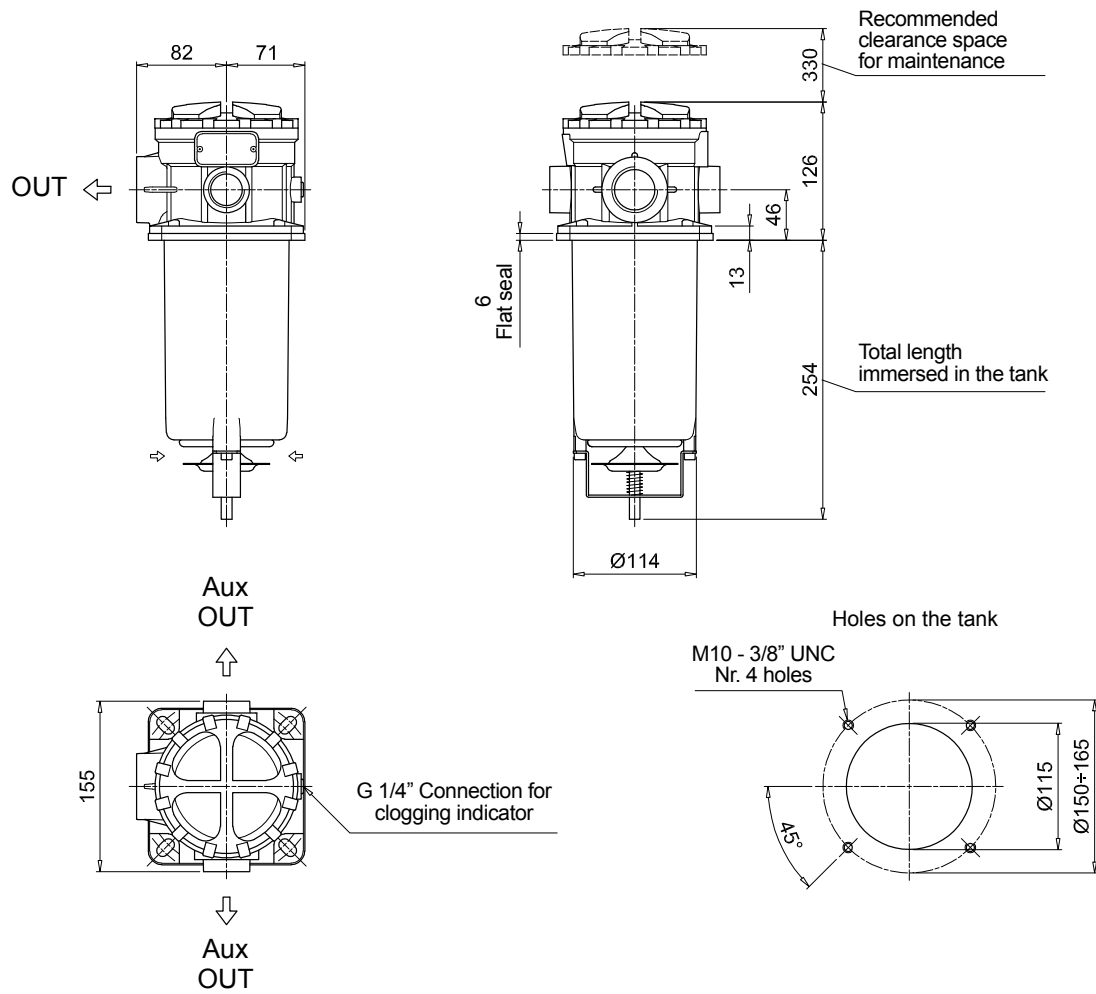
Clogging indicators		page
VVA	Axial vacuum gauge	59
VVR	Radial vacuum gauge	59
VEA	Electrical vacuum indicator	58
VLA	Electrical / visual vacuum indicator	58



SF2 250-350

Dimensions

SF2 350

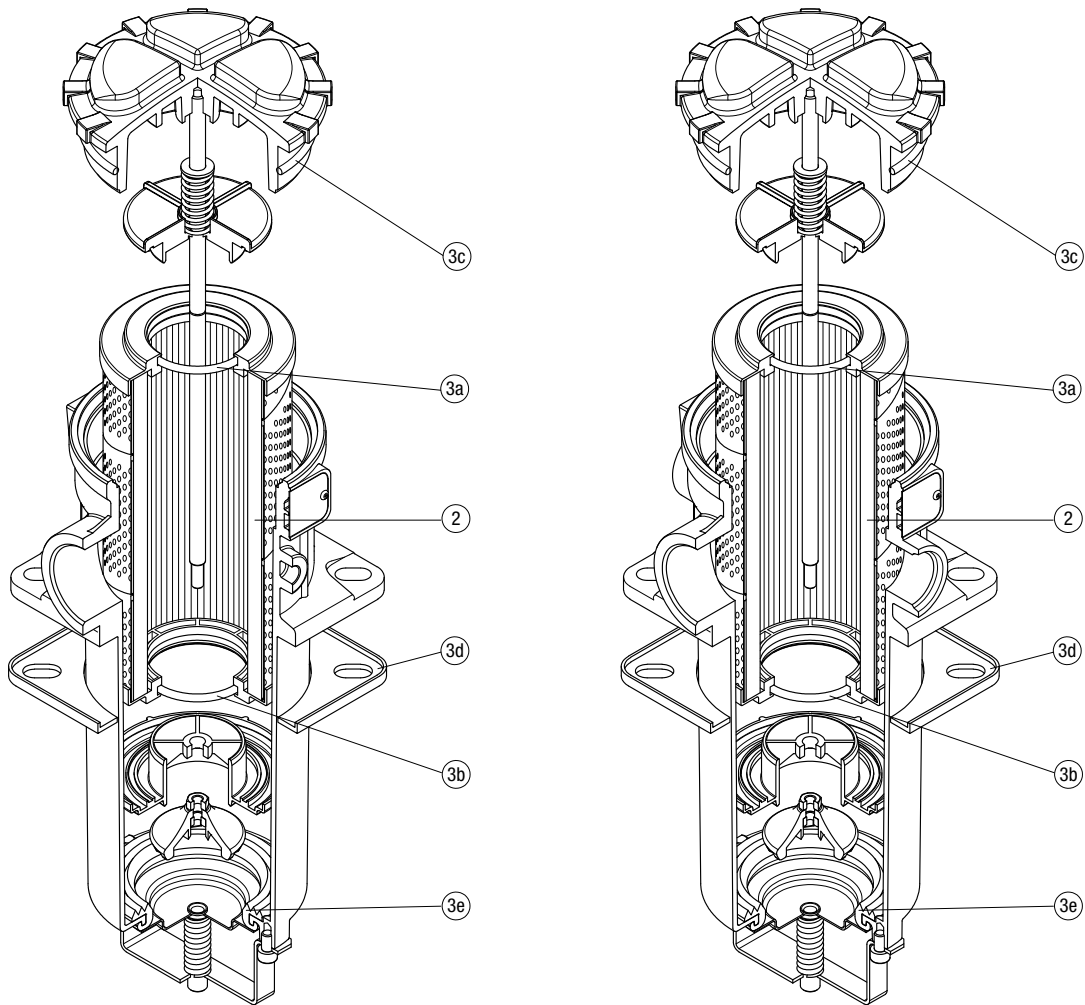


SPARE PARTS SF2 250-350

Order number for spare parts

SF2 250

SF2 350



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number	
		NBR	FPM
SF2 250 - 350	2 See order table	3 (3a ÷ 3e) 02050586	02050587

SF2 500 series

Flow rate up to 700 l/min



SF2 500 GENERAL INFORMATION

Description

Suction filters

Flow rate up to 700 l/min

SF2 500 is a range of suction filters with integrated shut-off valve for protection of the downstream pump against the coarse contamination. They are placed below the minimum oil level, directly connected to the suction line of the pump.

They can be fitted on the side or below the tank, allowing a more flexible design of the tank.

The shut-off valve closes automatically when the cover is removed, allowing the filter element replacement without the fluid drop.

Available features:

- Flanged connections up to 4", for a maximum flow rate of 700 l/min
- Optional hose fitting installed, to connect the suction line without the use of flanges
- Magnetic filter, to hold the ferrous particles
- Plastic and metal handle, to close the shut-off valve before the cover removal
- Electrical switch, to signal the closed shut-off valve
- Visual, electrical and electronic clogging indicators

Common application:

Industrial equipment

Technical data

Filter housing materials

- Housing:
 - Anodized Aluminium
 - Steel (chemical heat treatment): only for SF2 535 - 540
- Cover:
 - Anodized Aluminium
 - Steel (chemical heat treatment): only for SF2 535 - 540
- Optional flange:
 - Anodized Aluminium

Elements

Fluid flow through the filter element from IN to OUT

Seals

- Standard NBR series A
- Optional FPM series V

Temperature

From -25 °C to +110 °C

Note

SF2 500 filters mounting, see the drawings on page 51 and following



Weights [kg]

Filter series	
SF2 500-501	4.0
SF2 503	4.8
SF2 504	5.8
SF2 505	6.0
SF2 510	7.2
SF2 535	17
SF2 540	19

Filter series	Filter element design - N Series	
	M25	M60 M90 M250
SF2 500	219	234
SF2 501	259	282
SF2 503	325	390
SF2 504	484	543
SF2 505	199	221
SF2 510	259	282
SF2 535	439	479
SF2 540	644	688

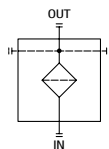
Maximum flow rate for a complete suction filter with a pressure drop $\Delta p = 0.08$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

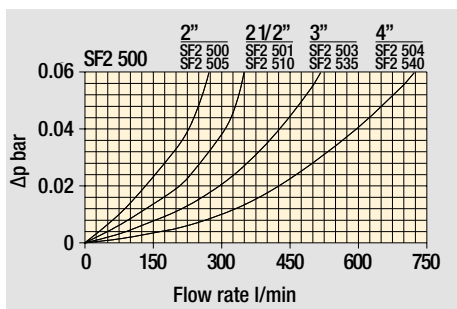
Filter series	
SF2 500	•



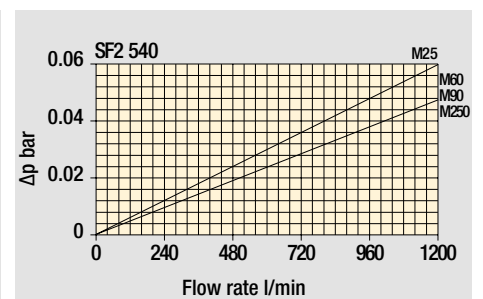
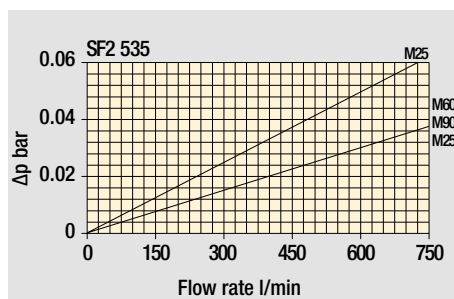
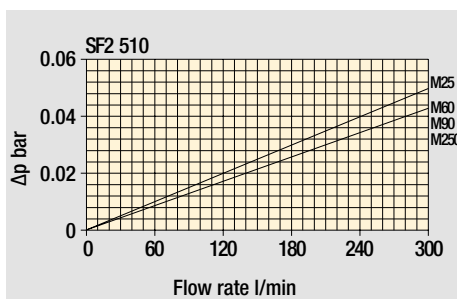
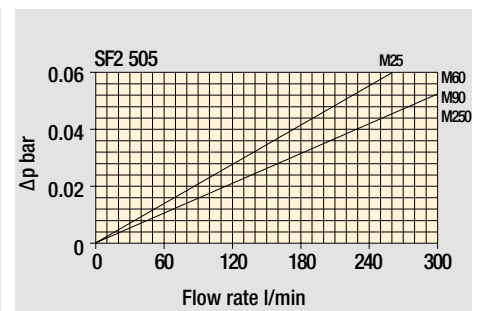
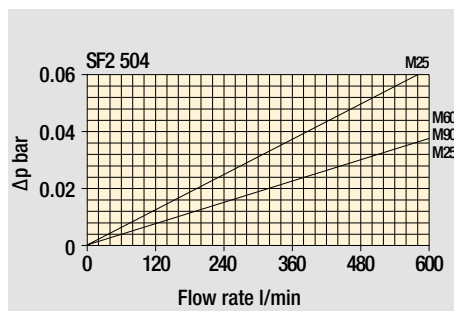
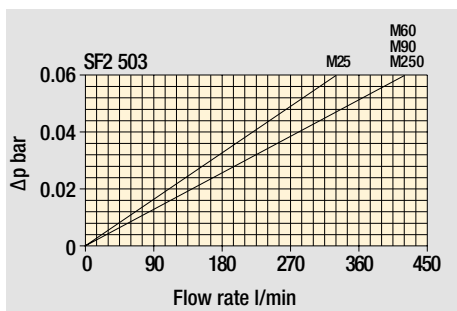
Hydraulic symbols

Pressure drop

Filter housings Δp pressure drop



Filter element 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.

Designation & Ordering code

COMPLETE FILTER

Series and size		Configuration example 1: SF2500 W F1 D M25 P01					
SF2500		Configuration example 2: SF2535 A F2 C M60 P01					
SF2501							
SF2503							
SF2504							
SF2505							
SF2510							
SF2535							
SF2540							
Seals and treatments		Filtration rating					
		Mxxx					
A	NBR	•					
V	FPM	•					
W	NBR compatible with fluids HFA-HFB-HFC	•					
Z	FPM compatible with fluids HFA-HFB-HFC	•					
Connections							
		SF2500 - SF2505	SF2501 - SF2510	SF2503 - SF2535	SF2504 - SF2540		
F1	2" SAE 3000 psi/M	2 1/2" SAE 3000 psi/M	3" SAE 3000 psi/M	4" SAE 3000 psi/M			
F2	2" SAE 3000 psi/UNC	2 1/2" SAE 3000 psi/UNC	3" SAE 3000 psi/UNC	4" SAE 3000 psi/UNC			
C1	Hose barb 2"/M	Hose barb 2 1/2"/M	Hose barb 3"/M	Hose barb 4"/M			
Microswitch and Handweel							
		SF2500 - SF2501	SF2503 - SF2504	SF2505 - SF2510	SF2535 - SF2540		
S	Without microswitch, without handweel	•	•	•	•		
C	With microswitch, without handweel			•	•		
D	With microswitch, with Nylon handweel	•	•				
K	With microswitch, with steel handweel	•	•				
M	Without microswitch, with Nylon handweel	•	•				
Filtration rating (filter media)							
M25	Wire mesh 25 µm	M90	Wire mesh 90 µm				
M60	Wire mesh 60 µm	M250	Wire mesh 250 µm				

Execution	
P01	MP Filtri standard
Pxx	Customized

FILTER ELEMENT

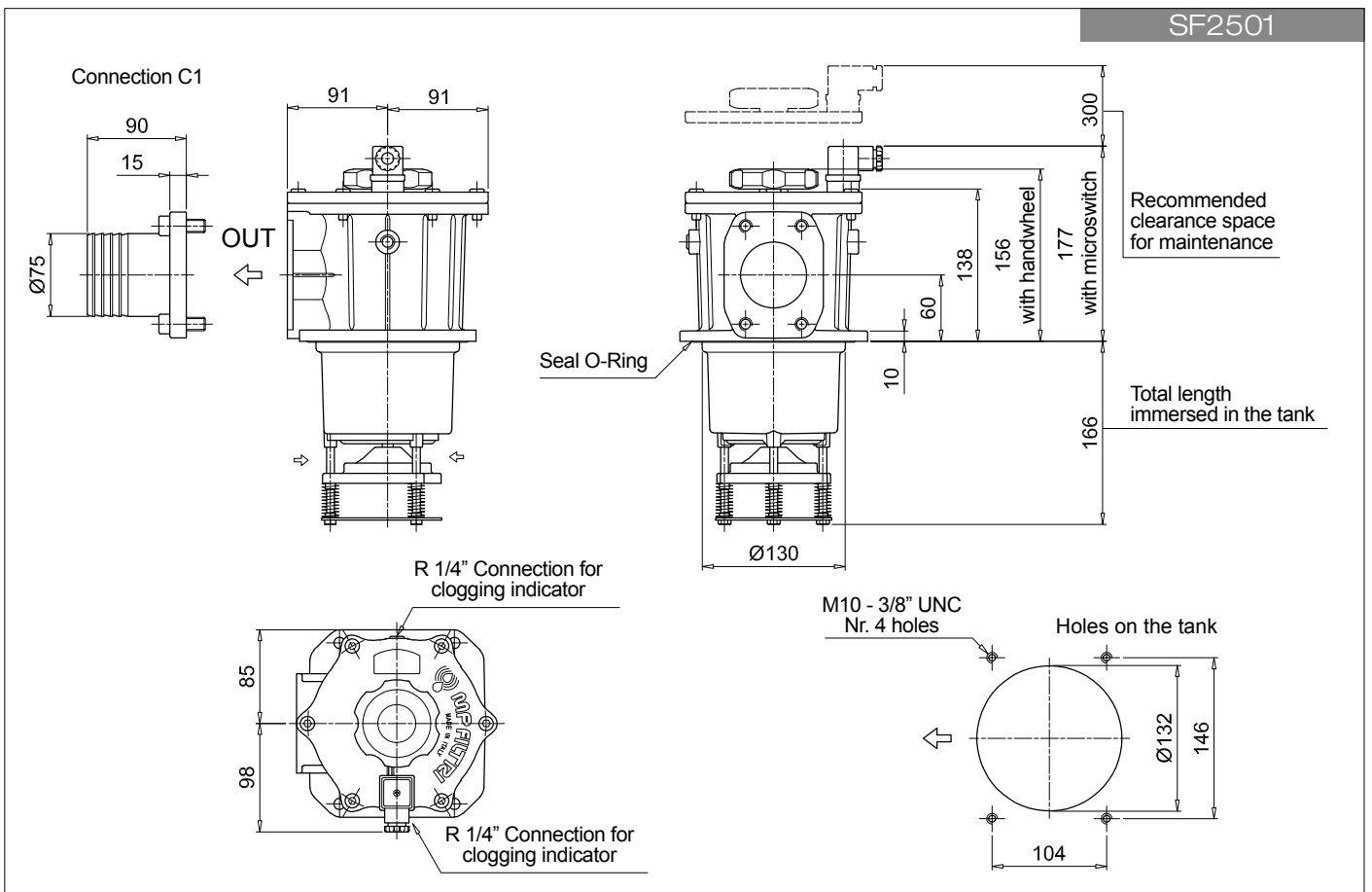
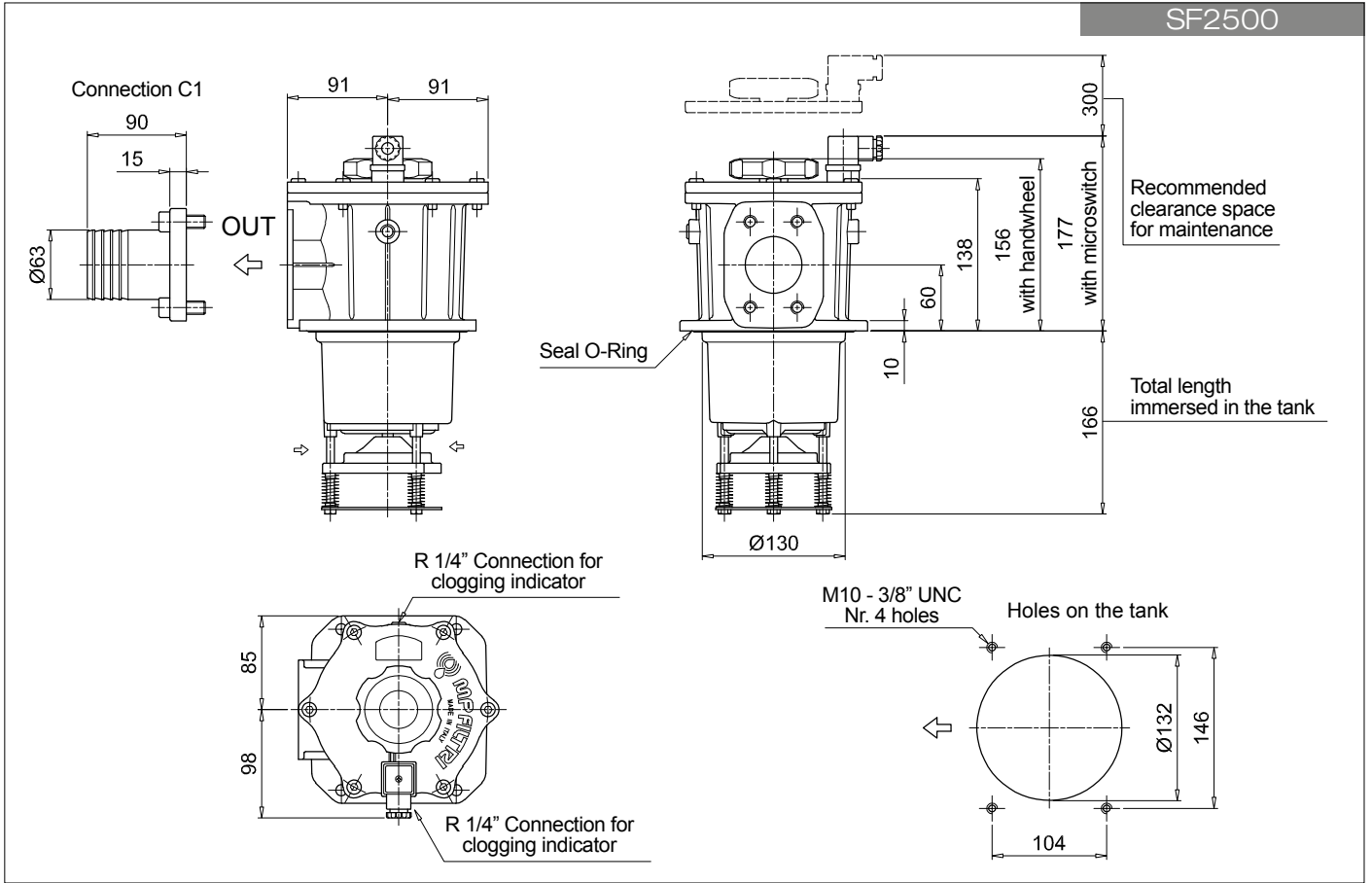
Element series and size								Configuration example 1: SF510 M25 W P01				
								Configuration example 2: SF535 M60 P01				
	SF2500	SF2501	SF2503	SF2504	SF2505	SF2510	SF2535	SF2540				
SF503			•									
SF504				•								
SF505					•							
SF510	•	•				•						
SF535							•					
SF540								•				
Filtration rating (filter media)												
M25	Wire mesh 25 µm	M90	Wire mesh 90 µm									
M60	Wire mesh 60 µm	M250	Wire mesh 250 µm									

Seals and treatments		Filtration rating	
		Mxxx	Pxxx
Standard version		•	•
W	Compatible with fluids HFA-HFB-HFC	•	

Execution	
P01	MP Filtri standard
Pxx	Customized

ACCESSORIES

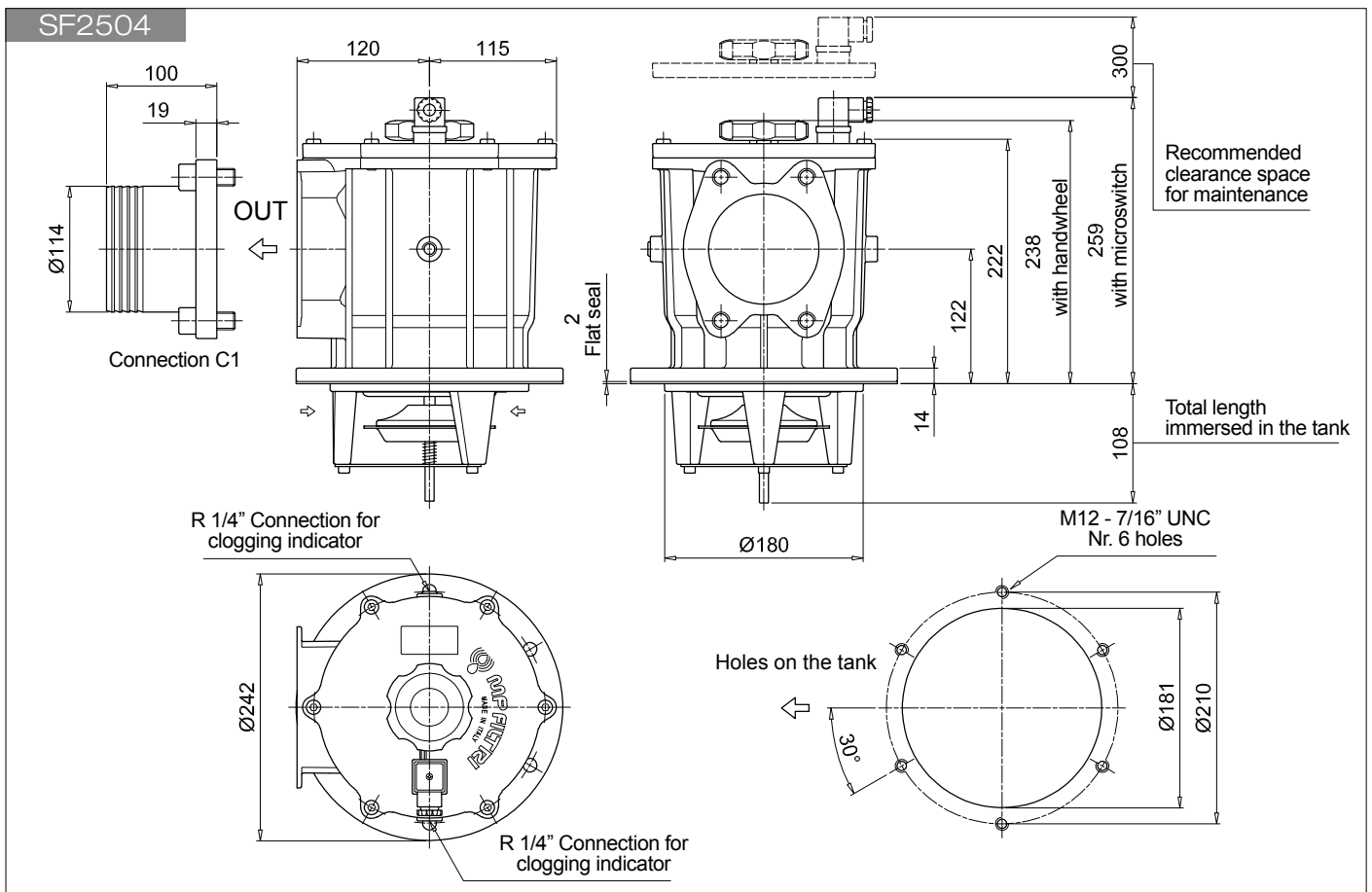
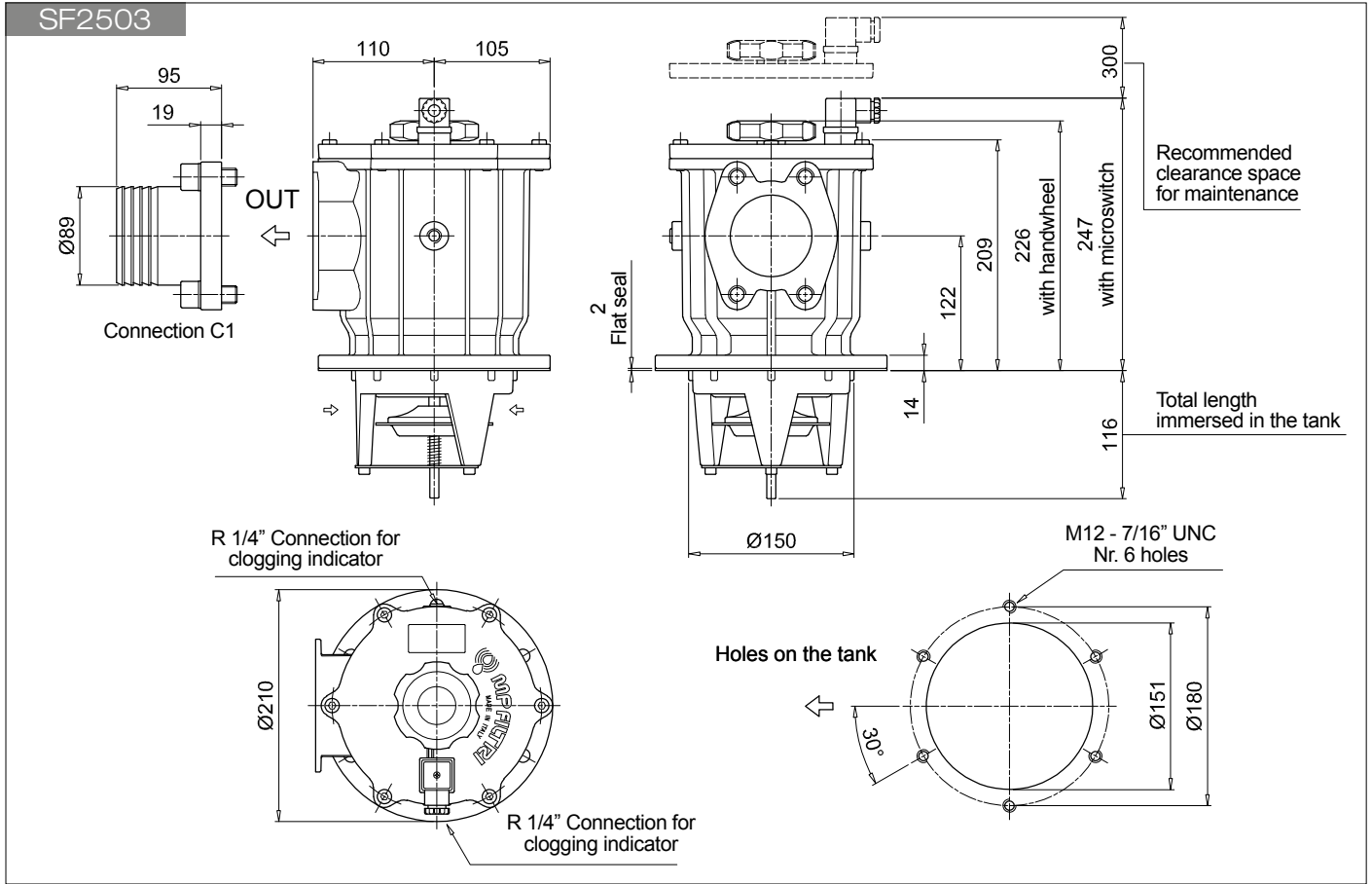
Clogging indicators		page
VVA	Axial vacuum gauge	59
VVR	Radial vacuum gauge	59
VEA	Electrical vacuum indicator	58
VLA	Electrical / visual vacuum indicator	58



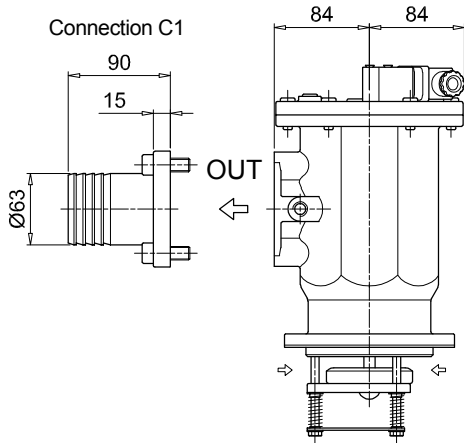
SF2 500

SF2500 - SF2501 - SF2503 - SF2504 - SF2505 - SF2510 - SF2535 - SF2540

Dimensions



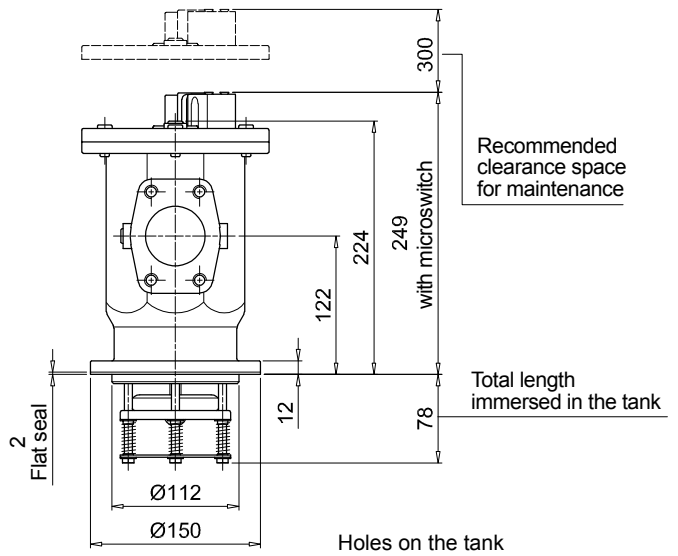
SF2505



R 1/4" Connection for clogging indicator

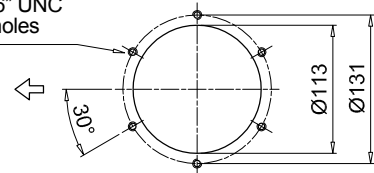
R 1/4" Connection for clogging indicator

R 1/4" Connection for clogging indicator

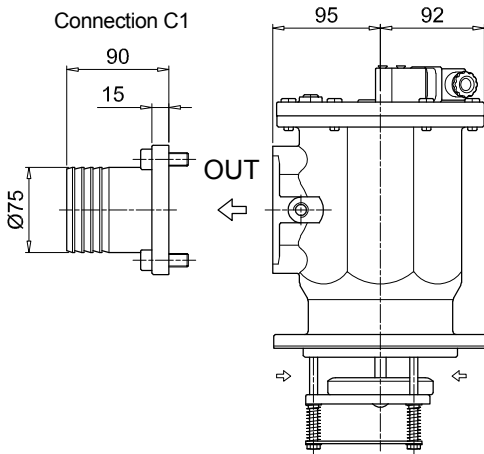


Recommended clearance space for maintenance

M8 - 5/16" UNC
Nr. 6 holes



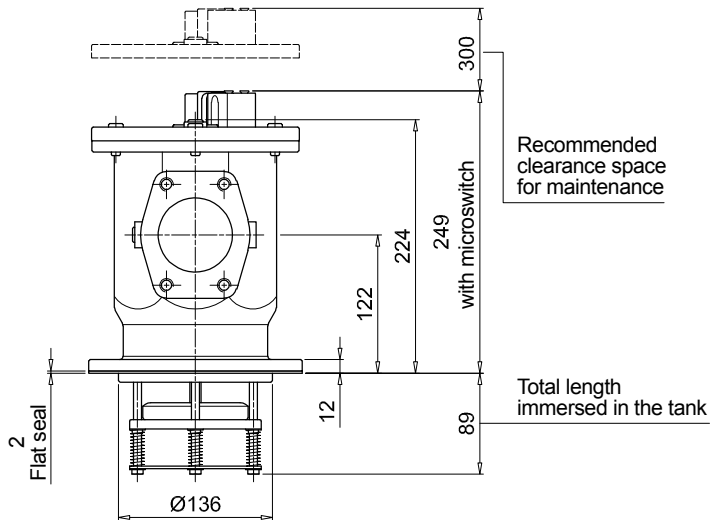
SF2510



R 1/4" Connection for clogging indicator

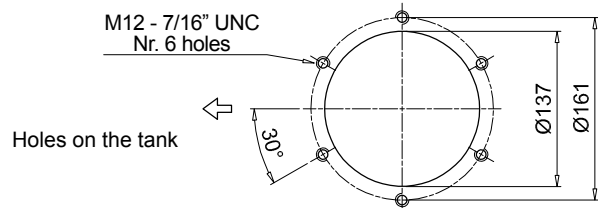
R 1/4" Connection for clogging indicator

R 1/4" Connection for clogging indicator



Recommended clearance space for maintenance

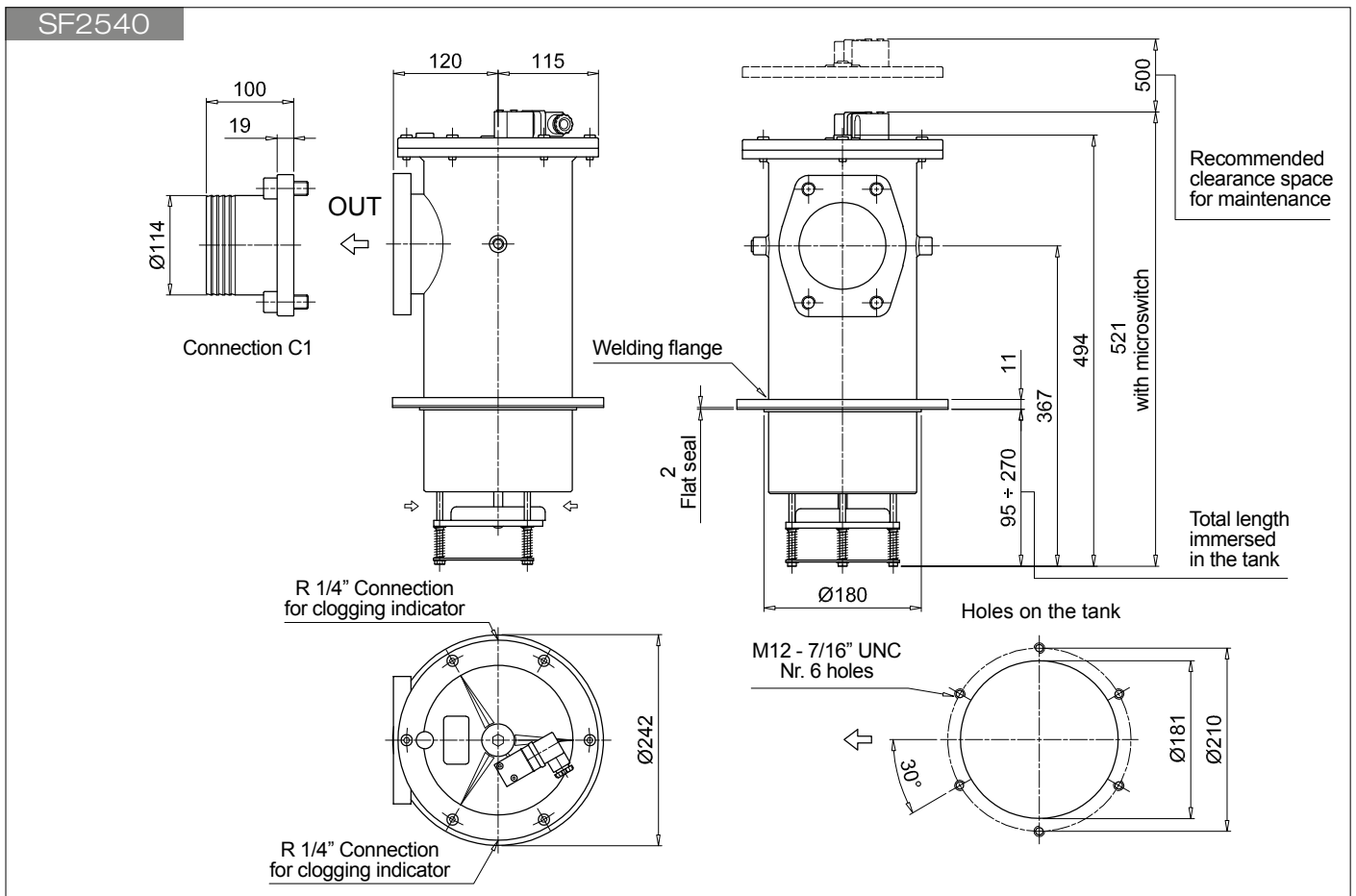
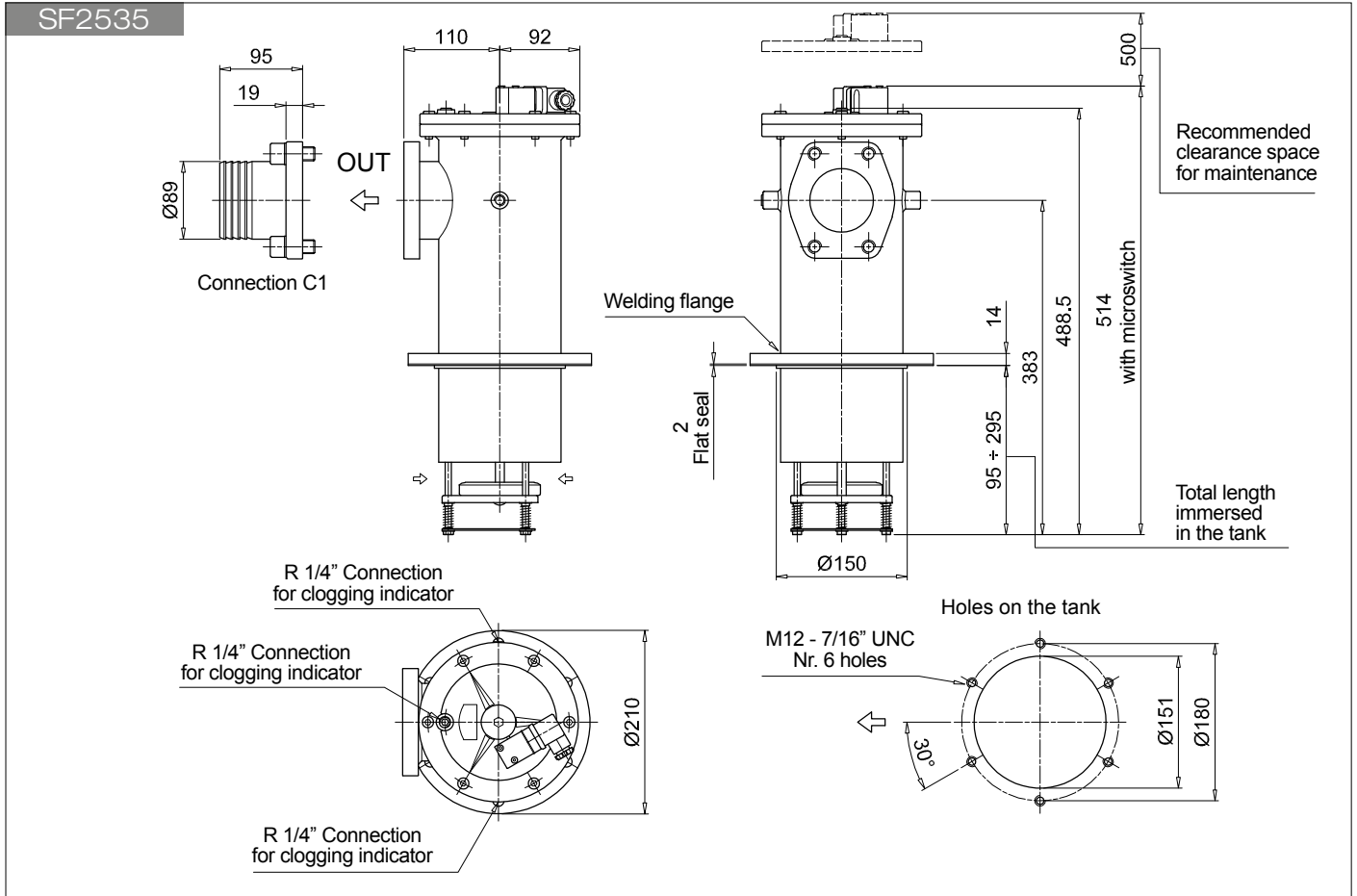
M12 - 7/16" UNC
Nr. 6 holes

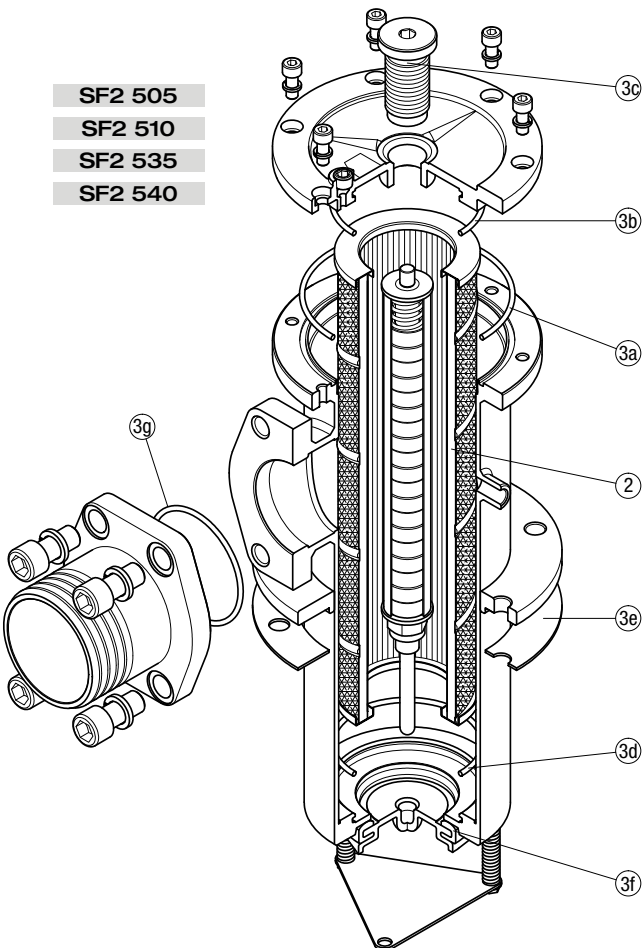
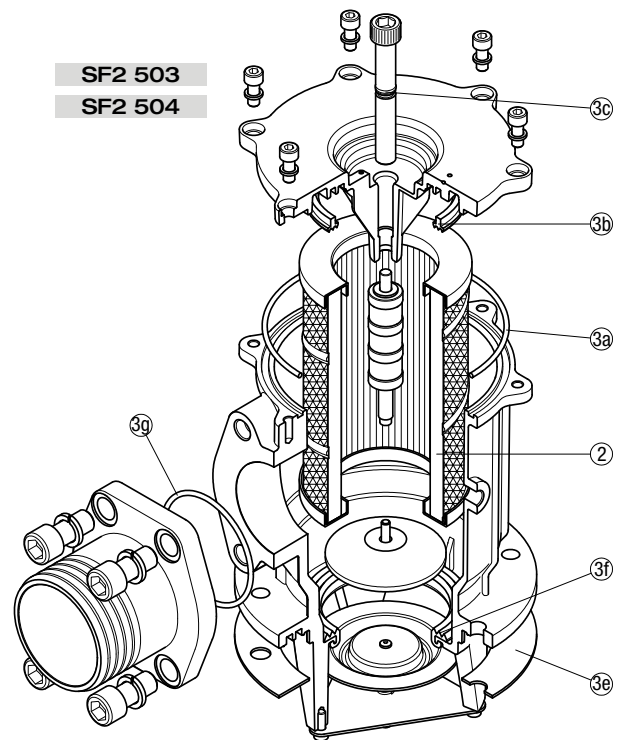
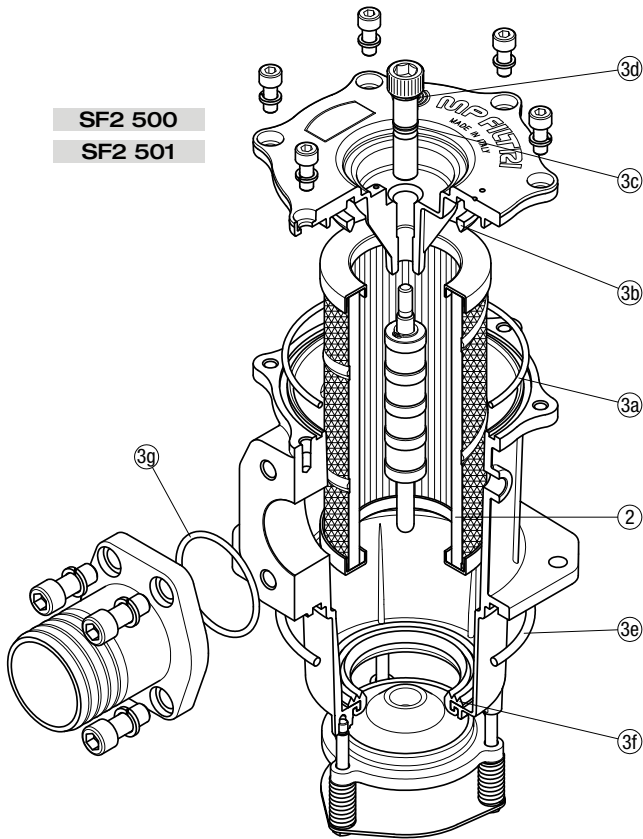


SF2 500

SF2500 - SF2501 - SF2503 - SF2504 - SF2505 - SF2510 - SF2535 - SF2540

Dimensions





Item:	Q.ty: 1 pc.		
	2	3 (3a = 3g)	
Filter series	Filter element	Seal Kit code number	
		NBR	FPM
SF2 500	See order table	02050141	02050142
SF2 501		02050143	02050144
SF2 503		02050070	02050071
SF2 504		02050072	02050073
SF2 505		02050043	02050044
SF2 510		02050045	02050046
SF2 535		02050051	02050052
SF2 540		02050053	02050054

Clogging indicators

Vacuum indicators

Introduction

Filter elements are efficient only if their Dirt Holding Capacity is fully exploited. This is achieved by using filter housings equipped with clogging indicators.

These devices trip when the clogging of the filter element causes an increase in pressure drop across the filter element.

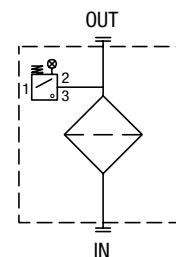
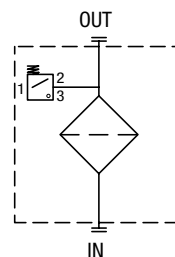
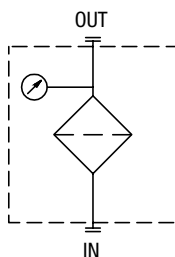
The indicator is set to alarm before the element becomes fully clogged.

MP Filtri can supply vacuum indicators with a visual, electrical or both signals.

Suitable indicator types

VACUUM INDICATORS

Vacuum indicators are used on the Suction line to check the efficiency of the filter element. They measure the pressure downstream of the filter element. Standard items are produced with R 1/4" EN 10226 connection.



Quick reference guide

Filter series	Visual indicator	Electrical indicator	Electrical / Visual indicator
SF2 250 - 350	VVA16P01		VLA21AA51P01
SF2 500 - 501 - 503 - 504 - 505	VVR16P01	VEA21AA50P01	VLA21AA52P01
SF2 510 - 535 - 540			VLA21AA53P01
			VLA21AA71P01

VACUUM INDICATORS

Dimensions

VE*50	
Electrical Vacuum Indicator	
R	Ordering code
EN 10226 - R1/4"	VE A 21 A A 50 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: NBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - Vacuum setting: -0.21 bar ±10% - Max working pressure: 10 bar - Proof pressure: 15 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP65 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: EN 175301-803 - Resistive load: <ul style="list-style-type: none"> 5 A / 14 Vdc 4 A / 30 Vdc 5 A / 125 Vac 4 A / 250 Vac <ul style="list-style-type: none"> - Available Atex product: II 1GD Ex ia IIC Tx Ex ia IIIC Tx°C X - CE certification 	

VL*51 - VL*52 - VL*53										
Electrical/Visual Vacuum Indicator										
R	Ordering code									
EN 10226 - R1/4"	VL A 21 A A xx P01									
<p>Hydraulic symbol</p>										
<p>Electrical symbol</p>										
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Transparent Nylon - Contacts: Brass - Nylon - Seal: NBR 										
<p>Technical data</p> <ul style="list-style-type: none"> - Vacuum setting: -0.21 bar ±10% - Max working pressure: 10 bar - Proof pressure: 15 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP65 according to EN 60529 										
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: EN 175301-803 - Type: <table border="0"> <tr> <td>51</td> <td>52</td> <td>53</td> </tr> <tr> <td>24 Vdc</td> <td>110 Vdc</td> <td>230 Vac</td> </tr> </table> - Lamps: <table border="0"> <tr> <td>1 A / 24 Vdc</td> <td>1 A / 110 Vdc</td> <td>1 A / 230 Vac</td> </tr> </table> - Resistive load: 		51	52	53	24 Vdc	110 Vdc	230 Vac	1 A / 24 Vdc	1 A / 110 Vdc	1 A / 230 Vac
51	52	53								
24 Vdc	110 Vdc	230 Vac								
1 A / 24 Vdc	1 A / 110 Vdc	1 A / 230 Vac								

VL*71	
Electrical/Visual Vacuum Indicator	
Connections	Indicator code
EN 10226 - R1/4"	VL A 21 A A 71 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: NBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - Vacuum setting: -0.21 bar ±10% - Max working pressure: 10 bar - Proof pressure: 15 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP65 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: IEC 61076-2-101 D (M12) - Lamps: 24 Vdc - Resistive load: 0.4 A / 24 Vdc 	

VVA									
Axial Vacuum Gauge									
R	Ordering code								
EN 10226 - R1/4"	VV A 16 P01								
<p>Hydraulic symbol</p>									
<p>Dial scale</p>									
<p>Conversion to SI units</p> <table border="1"> <thead> <tr> <th>[cmHg]</th> <th>[bar]</th> </tr> </thead> <tbody> <tr> <td>-12</td> <td>-0.16</td> </tr> <tr> <td>-18</td> <td>-0.24</td> </tr> <tr> <td>-76</td> <td>-1.01</td> </tr> </tbody> </table>		[cmHg]	[bar]	-12	-0.16	-18	-0.24	-76	-1.01
[cmHg]	[bar]								
-12	-0.16								
-18	-0.24								
-76	-1.01								
<p>Materials</p> <ul style="list-style-type: none"> - Case: Painted Steel - Window: Transparent plastic - Dial: Painted Steel - Pointer: Painted Aluminium - Pressure connection: Brass - Pressure element: Bourdon tube Cu-alloy soft soldered 									
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: Static: 7 bar Fluctuating: 6 bar Short time: 10 bar - Working temperature: From -40 °C to +60 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Accuracy: Class 2.5 according to EN 13190 - Degree of protection: IP31 according to EN 60529 									

VVR									
Radial Vacuum Gauge									
R	Ordering code								
EN 10226 - R1/4"	VV R 16 P01								
<p>Hydraulic symbol</p>									
<p>Dial scale</p>									
<p>Conversion to SI units</p> <table border="1"> <thead> <tr> <th>[cmHg]</th> <th>[bar]</th> </tr> </thead> <tbody> <tr> <td>-12</td> <td>-0.16</td> </tr> <tr> <td>-18</td> <td>-0.24</td> </tr> <tr> <td>-76</td> <td>-1.01</td> </tr> </tbody> </table>		[cmHg]	[bar]	-12	-0.16	-18	-0.24	-76	-1.01
[cmHg]	[bar]								
-12	-0.16								
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DESIGNATION & ORDERING CODE									
Series		Configuration example 1:	VE	A	21	A	A	50	P01
VE	Electrical vacuum indicator	Configuration example 2:	VL	A	21	A	A	71	P01
VL	Electrical/Visual vacuum indicator	Configuration example 3:	VV	R	16				P01
VV	Vacuum gauge								
Type VE - VL		Type VV							
A	Connection EN 10226 - R1/4"	A	Axial connection EN 10226 - R1/4"						
		R	Radial connection EN 10226 - R1/4"						
Vacuum setting		VE	VL	VV					
16	-0.16 bar			•					
21	-0.21 bar	•	•						
Seals		VE	VL	VV					
A	NBR	•	•						
Thermostat		VE	VL	VV					
A	Without	•	•						
Electrical connections		VE	VL	VV					
50	Connection EN 175301-803	•							
51	Connection EN 175301-803, transparent base with lamps 24 Vdc		•						
52	Connection EN 175301-803, transparent base with lamps 110 Vdc		•						
53	Connection EN 175301-803, transparent base with lamps 230 Vdc		•						
71	Connection IEC 61076-2-101 D (M12), black base with lamps 24 Vdc		•						
									Option
									P01 MP Filtri standard
									Pxx Customized

Return filters are used as process and safety filters to protect pumps and hydraulic circuits from contamination as per ISO 4406.

They are available in 8 styles:

- **MPFX-MPF tank top semi-immersed filter with external / internal oil flow; standard filter element disassembly**
- **MPLX tank top semi-immersed filter completely interchangeable with Pall 8420 & 8520, with external / internal oil flow; easy filter element disassembly**
- **MPTX-MPT tank top semi-immersed filter with external / internal oil flow; easy filter element disassembly without any specific tool**
- **MFBX-MFB element and bowl assembly with optional cover and hold-down spring for dirtbox or molded tank applications**
- **MPH tank top semi-immersed filter with internal / external oil flow, therefore keeping the dirt inside the bowl and not on the filter element; standard filter element disassembly, magnetic filter as option**
- **MPI semi-immersed filter element specifically designed to be mounted directly on the oil tank; magnetic filter as option**
- **FRI, the oldest tank top semi-immersed return filter manufactured by MP FILTRI, with external / internal oil flow; available in the single or duplex versions with outlet connection, it can be used also as in-line filter**
- **RF2 semi-immersed filter with shut-off valve for side tank mounting, with external / internal oil flow; easy filter element disassembly without any specific tool.**

FILTER SIZING

For the proper corrective factor Y see chapter at page 24

Return filters



MPFX	page 63
MPLX	91
MPTX	99
MFBX	117
MPF	125
MPT	153
MFB	171

MPH	page 179
MPI	203
FRI	215
RF2	231
INDICATORS	238
ACCESSORIES	248



THE NEW FILTER CONCEPT

MPFX
MPLX
MPTX
MFBX
MFX
series

NEW FILTER ELEMENT WITH EXCLUSIVE INTERFACE CONNECTION

- ◆ **Protects the machine from improper use of non-original products.**
- ◆ **Safety of constant quality protection & reliability**

With exclusive filter element you are sure that only MP Filtri filter elements can be used, ensuring the best cleaning level of the oil due to the use of originals filter elements.



Filter element featuring our UNIQUE end cap with polygonal design.



UNIQUE polygonal spigot fitting within the filter bowl.

The products identified as MPFX, MPLX, MPTX, MFBX and MFX are protected by:

- ◆ Italian Patent n° 102014902261205
- ◆ Canadian Patent n° 2,937,258
- ◆ European Patent n° 16181725.9
- ◆ US Patent n° 15/224,337

MPFX series

Maximum working pressure up to 800 kPa (8 bar) - Flow rate up to 900 l/min



Description

Technical data

Return filter

Maximum working pressure up to 800 kPa (8 bar)

Flow rate up to 900 l/min

MPFX is a range of return filters 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 2" and flanged connections up to 2", for a maximum flow rate of 900 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, 3 or 4 fixing holes for installation, to suit a variety of reservoir surfaces
- O-ring or Flat Seal to suit a variety of reservoir surfaces
- 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)
- Filler plug, to fill cleaned fluid into the tank without an additional connection
- 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

Nylon: MPFX 030-100-104-110

Aluminium: MPFX 181-182-184-191-192-194-400-410-450-451-750

- Bowl: Nylon

Bypass valve

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

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

Δp element type

- Microfiber 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

MPFX filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]				Volumes [dm ³]					
	Length	1	2	3	4	Length	1	2	3	4
MPFX 030		0.40	-	-	-		0.29	-	-	-
MPFX 100		0.61	0.64	0.67	0.74		0.64	0.85	1.20	1.65
MPFX 104		0.82	0.96	1.02	1.25		0.64	0.85	1.20	1.65
MPFX 110		0.64	0.68	0.71	0.78		-	-	-	-
MPFX 181		2.20	3.00	-	-		2.50	4.00	-	-
MPFX 182		2.30	3.10	-	-		2.50	4.00	-	-
MPFX 184		2.55	3.45	-	-		2.65	4.45	-	-
MPFX 191		-	3.00	-	-		-	4.25	-	-
MPFX 192		-	3.10	-	-		-	4.25	-	-
MPFX 194		-	3.45	-	-		-	4.45	-	-
MPFX 400		3.35	3.65	3.90	-		3.70	4.60	5.40	-
MPFX 410		3.55	3.85	4.10	-		3.70	4.60	5.40	-
MPFX 450-451		3.95	4.25	4.50	-		3.70	4.60	5.40	-
MPFX 750		6.30	-	-	-		8.45	-	-	-

Filter series	Length	Filter element design - H series					Filter element design - N series		
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
MPFX 030	1	7	10	24	29	47	84	60	66
MPFX 100-104-110	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
MPFX 181-182-184	1	127	148	235	243	278	441	285	299
	2	231	262	358	382	388	472	404	412
MPFX 191-192-194	2	261	305	489	528	546	696	583	598
MPFX 400	1	150	171	294	304	350	585	370	390
	2	237	252	454	462	589	868	619	645
	3	248	288	553	609	621	885	680	703
MPFX 410	1	146	167	277	285	325	512	341	357
	2	226	239	396	402	485	644	503	519
	3	236	269	462	497	505	653	539	553
MPFX 450-451	1	150	171	294	304	350	585	370	390
	2	237	252	454	462	589	868	619	645
	3	248	288	553	609	621	885	680	703
MPFX 750	1	392	465	623	700	769	929	804	819

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

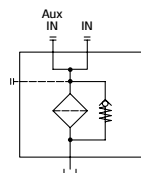
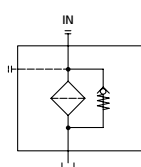
The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols

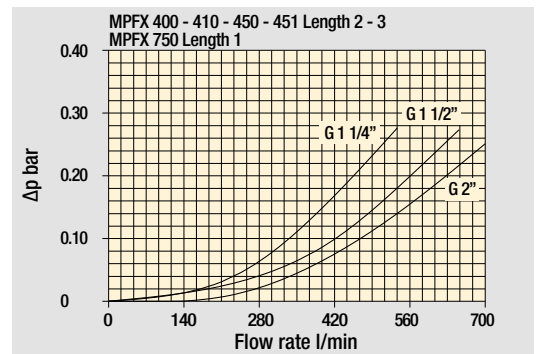
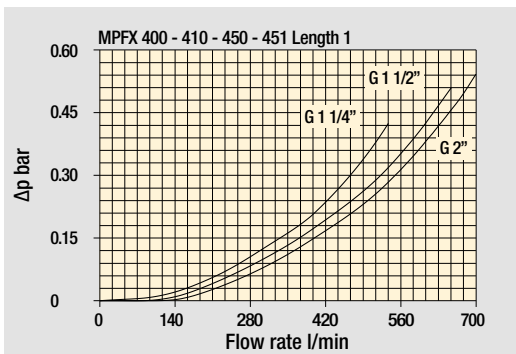
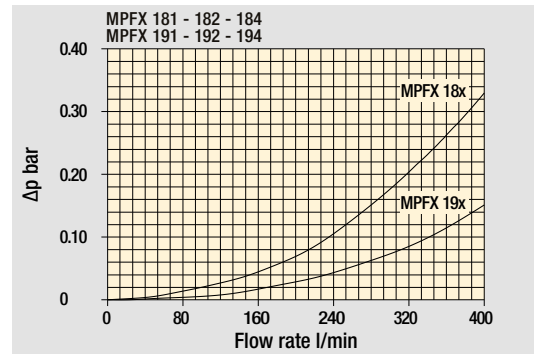
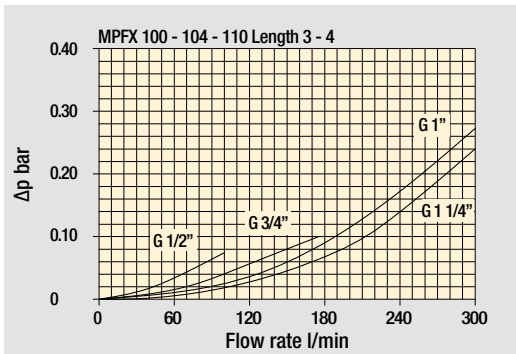
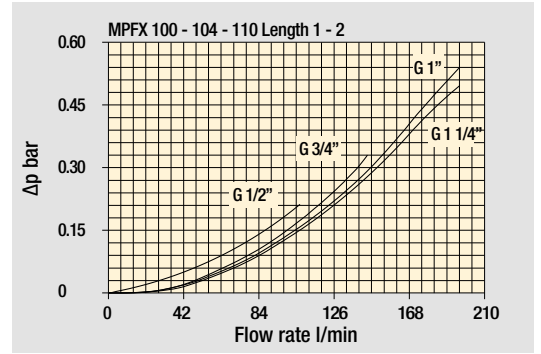
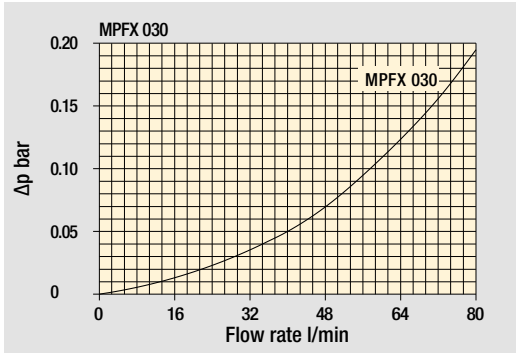
Filter series	Style 1 connection	Style 2 connections
MPFX 030	•	
MPFX 100	•	
MPFX 104	•	
MPFX 110		•
MPFX 181	•	
MPFX 182		•
MPFX 184	•	•
MPFX 191	•	
MPFX 192	•	
MPFX 194	•	•
MPFX 400	•	
MPFX 410		•
MPFX 450	•	
MPFX 451		•
MPFX 750	•	



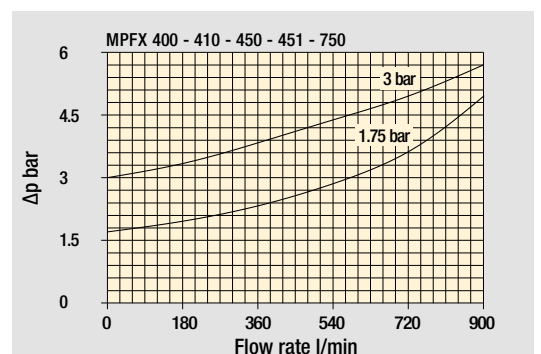
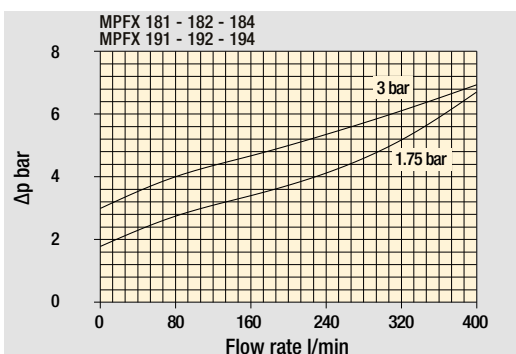
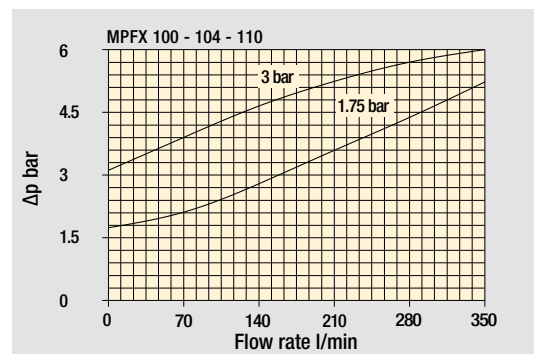
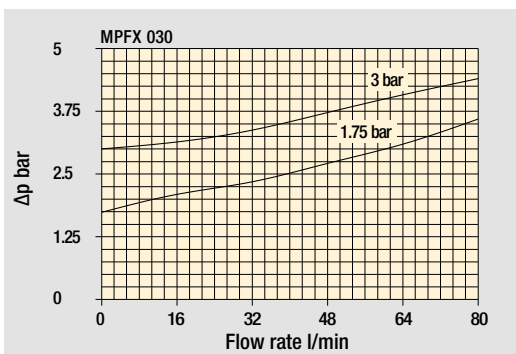
MPFX GENERAL INFORMATION

Pressure drop

Filter housings Δp pressure drop



Bypass valve pressure drop

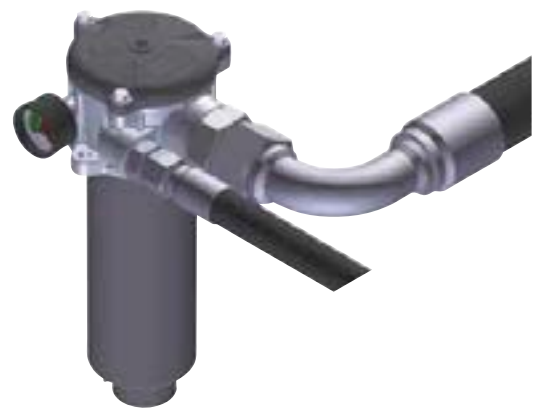


The curves are plotted using mineral oil with density of 0.86 kg/dm³ in compliance with ISO 3968. Δp varies proportionally with density.

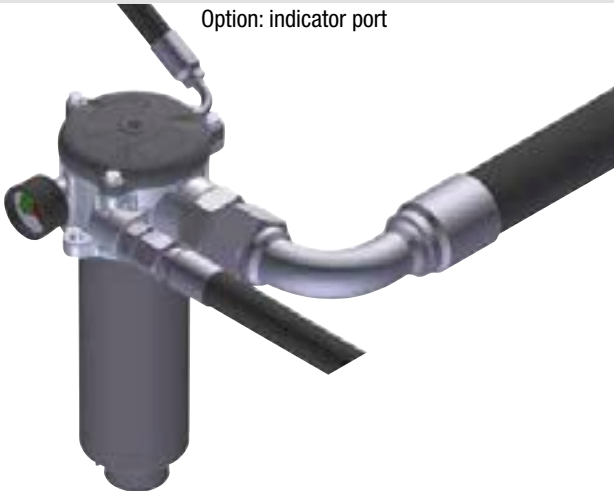
Standard - Single IN port



Double IN port
Option: double indicator port



Double IN port - Drain port
Option: indicator port



Double IN port - Double drain port



Designation & Ordering code

COMPLETE FILTER

Series and size	Configuration example 1: MPFX030	1	V	G1	M25	N	B	P01
MPFX030 Filter element with private spigot	Configuration example 2: MPFX030	1	A	G4	A10	H	E	P01
Length								
1								
Seals and treatments								
A NBR								
V FPM								
W NBR head anodized								
Z FPM head anodized								
Connections								
G1 G 1/2"								
G4 1/2" NPT								
G7 SAE 8 - 3/4" - 16 UNF								
Filtration rating (filter media)								
A03 Inorganic microfiber	M25 Wire mesh							
A06 Inorganic microfiber	M60 Wire mesh							
A10 Inorganic microfiber	M90 Wire mesh							
A16 Inorganic microfiber	P10 Resin impregnated paper 10 µm							
A25 Inorganic microfiber	P25 Resin impregnated paper							
Element Δp	Filter media							
N 10 bar	Axx	Mxx	Pxx					
H 10 bar		•	•					
W 10 bar, compatible with fluids HFA, HFB and HFC	•	•						
				Bypass valve	Execution			
				E 3 bar	P01 MP Filtri standard			
				B 1.75 bar	Pxx Customized			

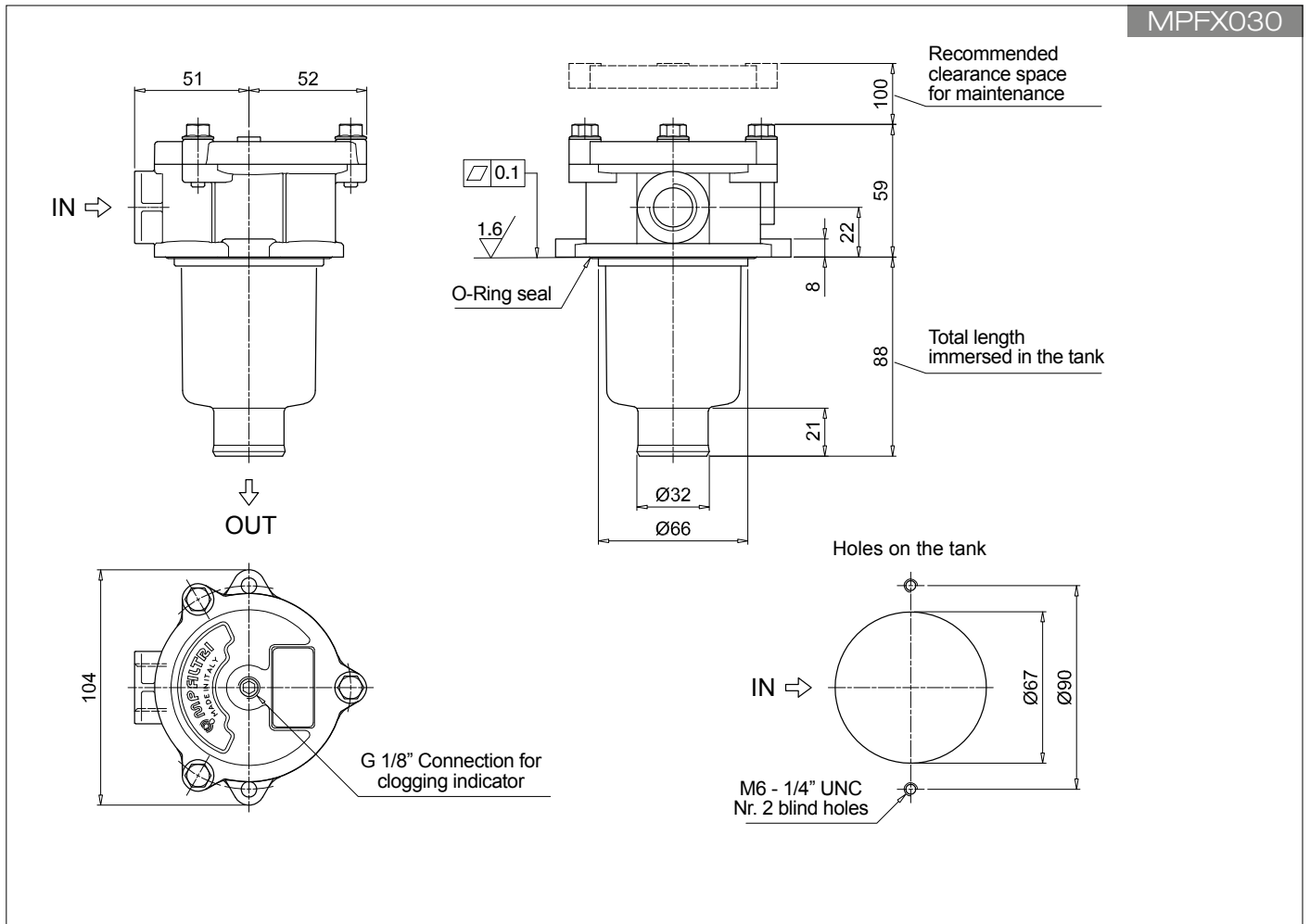
FILTER ELEMENT

Element series and size	Configuration example 1: MPFX030	1	M25	N	V		P01
MPFX030 Filter element with private spigot	Configuration example 2: MPFX030	1	A10	H	B	E	P01
Element length							
1							
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						
N 10 bar	Axx	Mxx	Pxx				
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	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		
TE Extension tube	248		
T5 Filler plug M30x1.5	249		

MPFX030



MPFX MPFX100 - MPFX104

Designation & Ordering code

COMPLETE FILTER

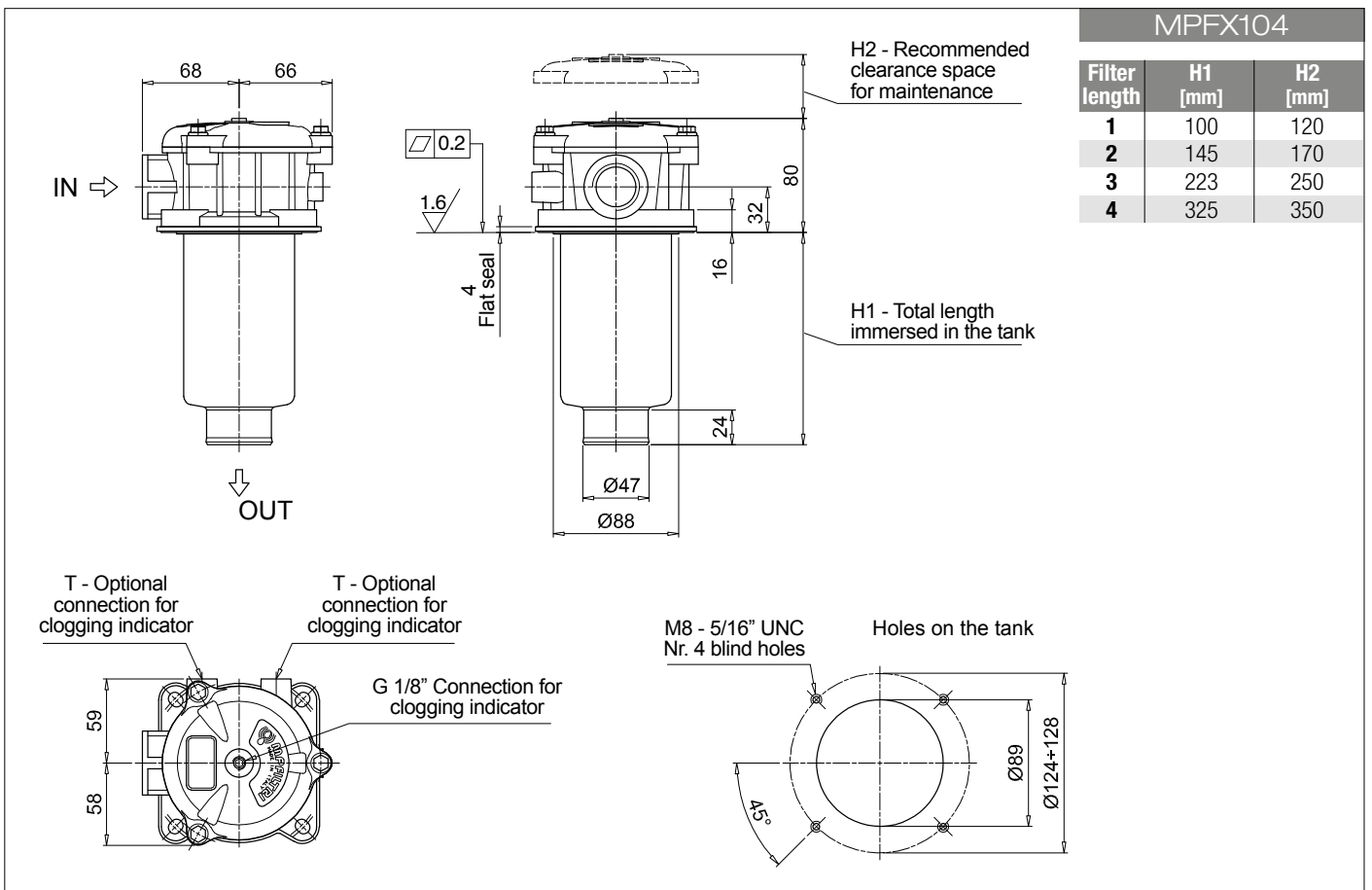
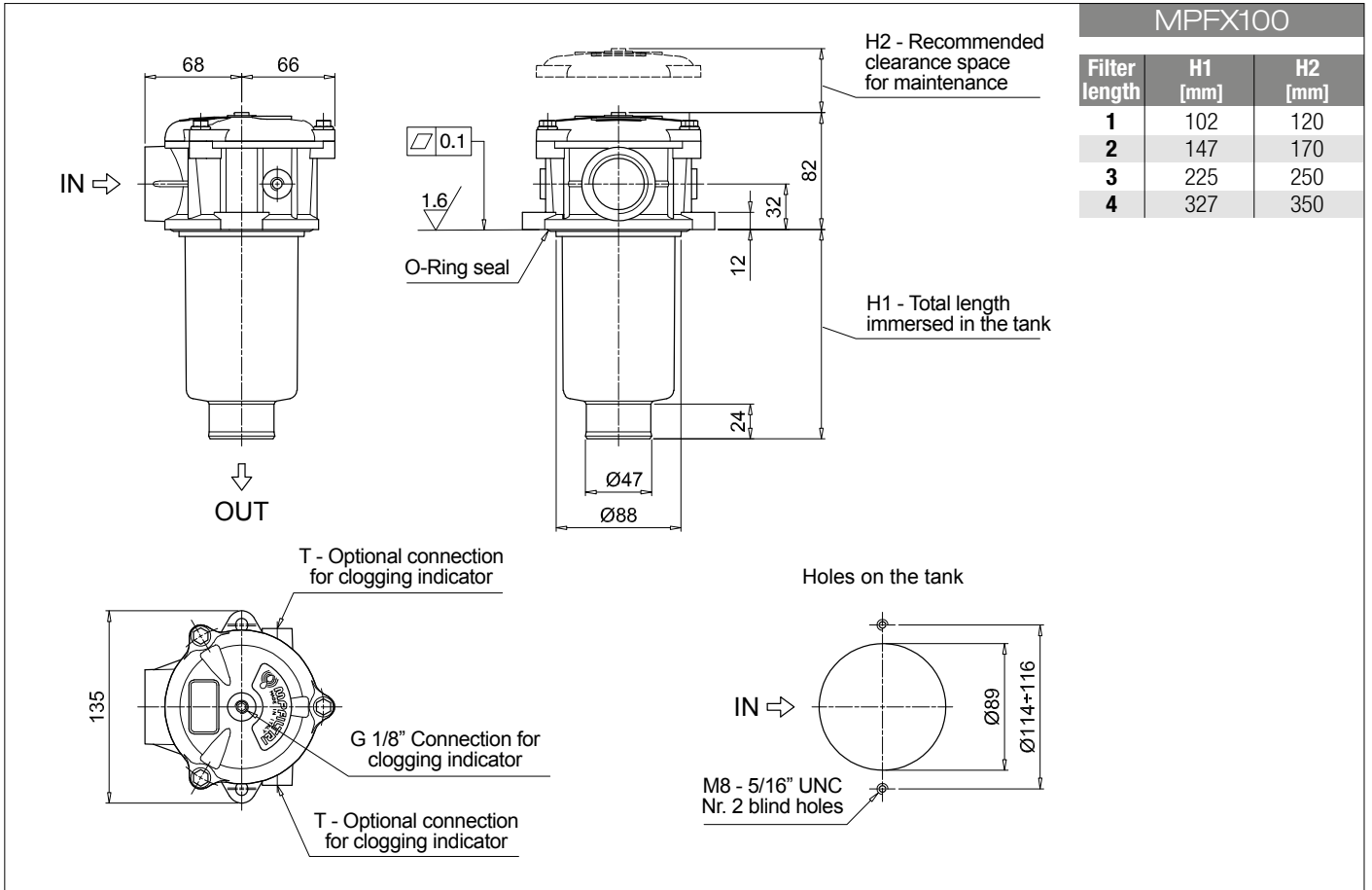
Series and size		Configuration example 1: MPFX100 2 W G3 A06 W B P01									
MPFX100 MPFX104 Filter element with private spigot		Configuration example 2: MPFX104 4 A G8 P10 N E P01									
Length											
1 2 3 4											
Seals and treatments											
A NBR											
V FPM											
W NBR head anodized											
Z FPM head anodized											
Connections		Size 100		Size 104		Connections		Size 100		Size 104	
G1 G 1/2"		•		•		G7 SAE 8 - 3/4" - 16 UNF		•		•	
G2 G 3/4"		•		•		G8 SAE 12 - 1 1/16" - 12 UN		•		•	
G3 G 1"		•		•		G9 SAE 16 - 1 5/16" - 12 UN		•		•	
G4 1/2" NPT		•		•							
G5 3/4" NPT		•		•							
G6 1" NPT		•		•							
Filtration rating (filter media)											
A03 Inorganic microfiber 3 µm											
A06 Inorganic microfiber 6 µm											
A10 Inorganic microfiber 10 µm											
A16 Inorganic microfiber 16 µm											
A25 Inorganic microfiber 25 µm											
M25 Wire mesh 25 µm											
M60 Wire mesh 60 µm											
M90 Wire mesh 90 µm											
P10 Resin impregnated paper 10 µm											
P25 Resin impregnated paper 25 µm											
Element Δp		Axx		Mxx		Pxx		Filter media			
N 10 bar				•		•					
H 10 bar				•							
W 10 bar, compatible with fluids HFA, HFB and HFC		•		•							
								Bypass valve		Execution	
								E 3 bar		P01 MP Filtri standard	
								B 1.75 bar		Pxx Customized	

FILTER ELEMENT

Element series and size		Configuration example 1: MFX100 2 A06 W B P01									
MFX100 Filter element with private spigot		Configuration example 2: MFX100 4 P10 N B E P01									
Element length											
1 2 3 4											
Filtration rating (filter media)											
A03 Inorganic microfiber 3 µm											
A06 Inorganic microfiber 6 µm											
A10 Inorganic microfiber 10 µm											
A16 Inorganic microfiber 16 µm											
A25 Inorganic microfiber 25 µm											
M25 Wire mesh 25 µm											
M60 Wire mesh 60 µm											
M90 Wire mesh 90 µm											
P10 Resin impregnated paper 10 µm											
P25 Resin impregnated paper 25 µm											
Element Δp		Axx		Mxx		Pxx		Filter media			
N 10 bar				•		•					
H 10 bar				•							
W 10 bar, compatible with fluids HFA, HFB and HFC		•		•							
								Seals		Bypass valve	
								B NBR		E 3 bar	
								V FPM		1.75 bar	
										Execution	
										P01 MP Filtri standard	
										Pxx Customized	

ACCESSORIES

Indicators		page		page	
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239		
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239		
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240		
BVQ Visual pressure indicator with manual reset	241				
Additional features		page		page	
TE Extension tube	248	T5 Filler plug M30x1.5	249		
DFS Diffuser with fast lock connection	249	DPT Dipstick	249		



Designation & Ordering code

COMPLETE FILTER

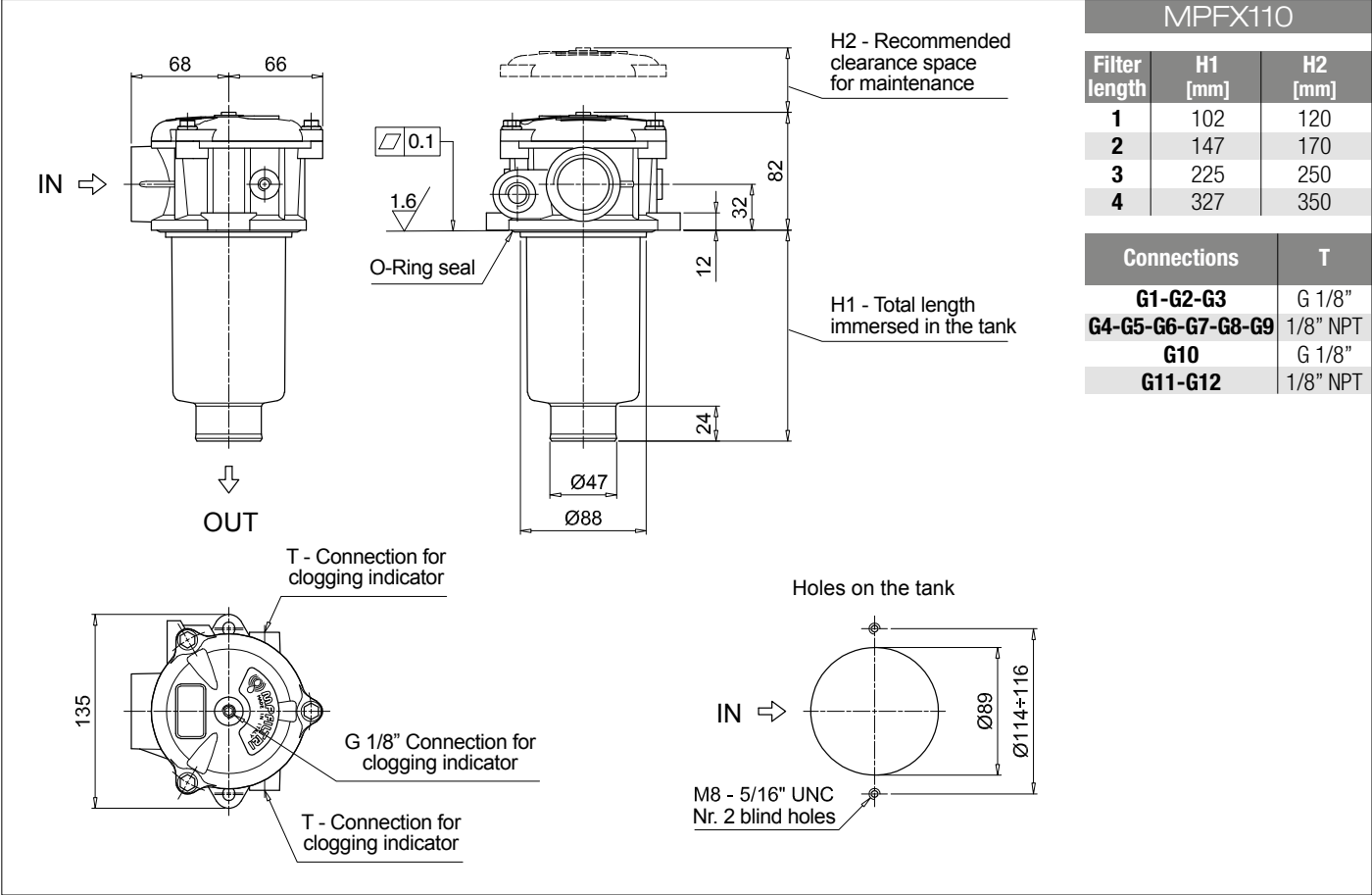
Series and size		Configuration example 1: MPFX110 3 Z G4 2 M25 W B P01													
MPFX110 Filter element with private spigot		Configuration example 2: MPFX110 4 A G8 1 P10 N E P01													
Length		1 2 3 4													
Seals and treatments		<table border="0"> <tr> <td>A NBR</td> <td>W NBR head anodized</td> </tr> <tr> <td>V FPM</td> <td>Z FPM head anodized</td> </tr> </table>										A NBR	W NBR head anodized	V FPM	Z FPM head anodized
A NBR	W NBR head anodized														
V FPM	Z FPM head anodized														
Main Connections	Aux size 1	Aux size 2	Main Connections	Aux size 1	Aux size 2										
G1 G 1/2"	G 3/8"	G 1/2"	G7 SAE 8 - 3/4" - 16 UNF	SAE 6 - 9/16" - 18 UNF	SAE 8 - 3/4" - 16 UNF										
G2 G 3/4"			G8 SAE 12 - 1 1/16" - 12 UN												
G3 G 1"	3/8" NPT	1/2" NPT	G9 SAE 16 - 1 5/16" - 12 UN	G 3/8"	G 1/2"										
G4 1/2" NPT			G10 G 1 1/4"												
G5 3/4" NPT			G11 1 1/4" NPT												
G6 1" NPT			G12 SAE 20 - 1 5/8" - 12 UN	SAE 6 - 9/16" - 18 UNF	SAE 8 - 3/4" - 16 UNF										
Aux connection - see previous table															
1 Aux size 1			2 Aux size 2												
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											
N 10 bar			Axx	Mxx	Pxx										
H 10 bar				•	•										
W 10 bar, compatible with fluids HFA, HFB and HFC			•	•											
						Bypass valve		Execution							
						E 3 bar		P01 MP Filtri standard							
						B 1.75 bar		Pxx Customized							

FILTER ELEMENT

Element series and size		Configuration example 1: MPFX100 3 M25 W V P01										
MPFX100 Filter element with private spigot		Configuration example 2: MPFX100 4 P10 N B E 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								
N 10 bar			Axx	Mxx	Pxx							
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	page			page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator		239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator		239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator		239-240
BVQ Visual pressure indicator with manual reset	241			
Additional features	page			page
TE Extension tube	248	T5 Filler plug M30x1.5		249
DFS Diffuser with fast lock connection	249	DPT Dipstick		249



MPFX110		
Filter length	H1 [mm]	H2 [mm]
1	102	120
2	147	170
3	225	250
4	327	350

Connections	T
G1-G2-G3	G 1/8"
G4-G5-G6-G7-G8-G9	1/8" NPT
G10	G 1/8"
G11-G12	1/8" NPT

MPFX MPFX181 - MPFX191

Designation & Ordering code

COMPLETE FILTER

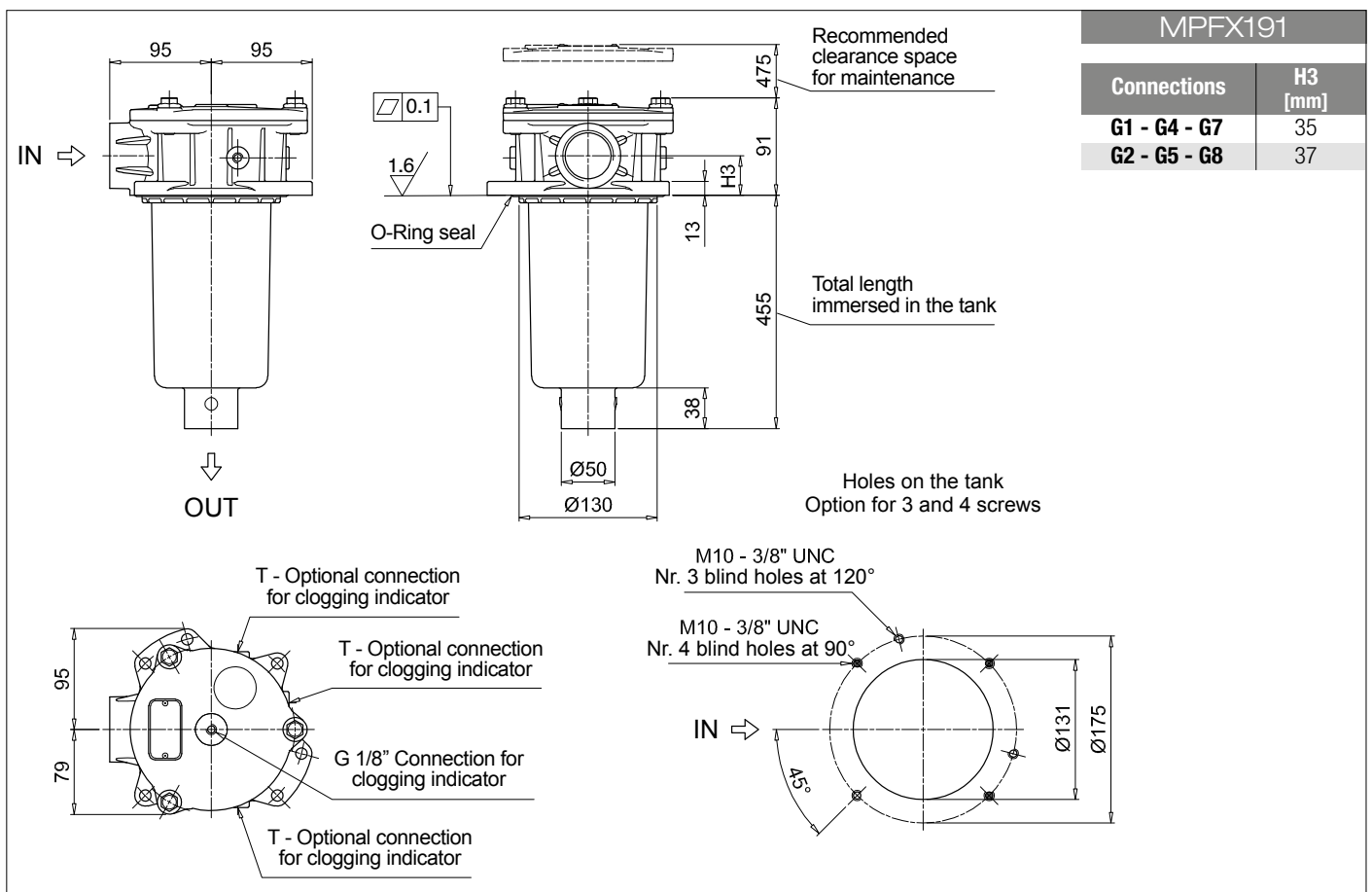
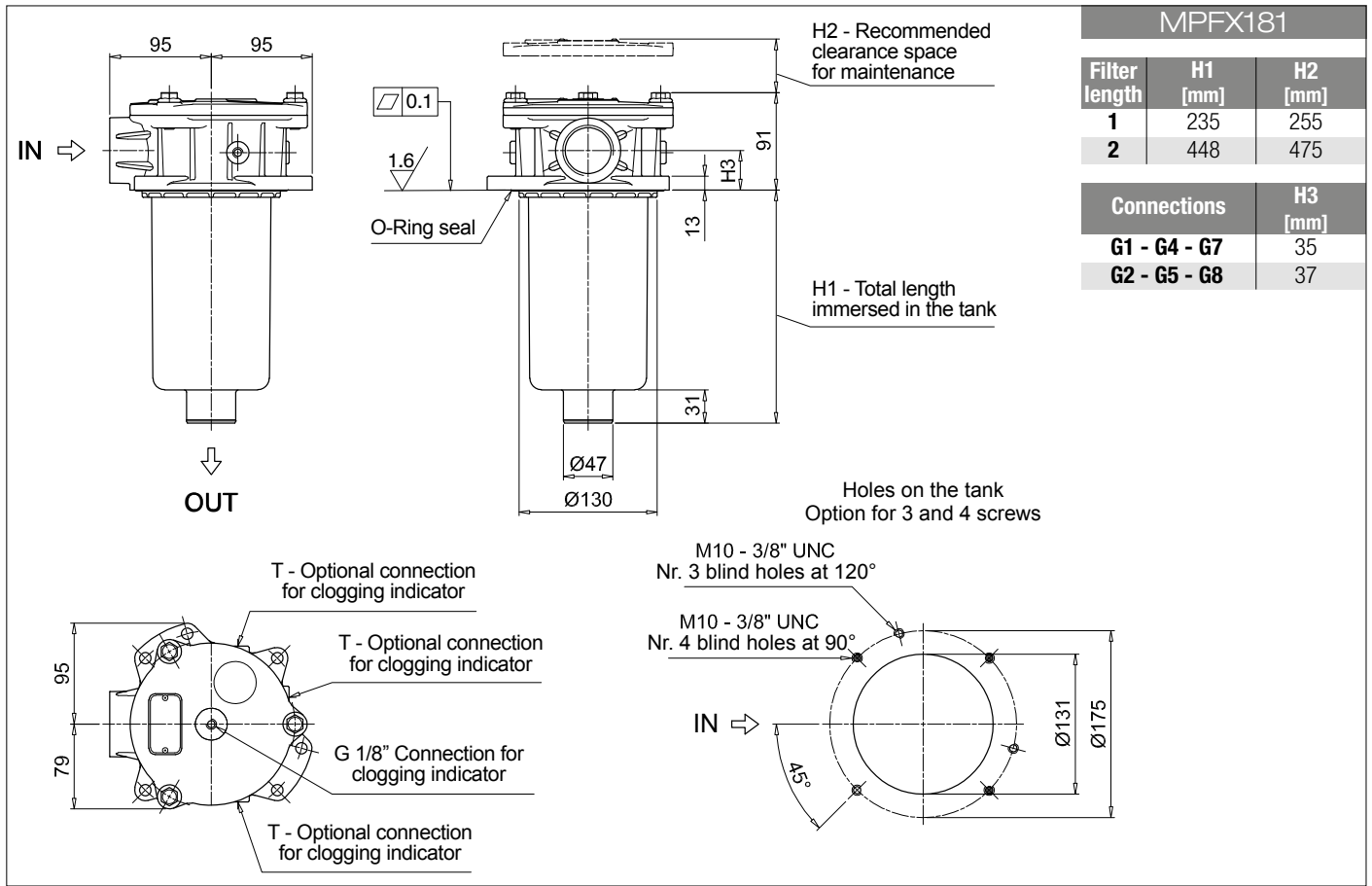
Series and size			Configuration example 1: MPFX181 1 A G1 A25 H E P01								
MPFX181 MPFX191 Filter element with private spigot			Configuration example 2: MPFX191 2 V G2 P10 N B P01								
Length											
	Size 181	Size 191									
1	•										
2	•	•									
Seals and treatments											
A	NBR	B	NBR	flat seal on head							
V	FPM	D	FPM	flat seal on head							
W	NBR	L	NBR	head anodized, flat seal on head							
Z	FPM	M	FPM	head anodized, flat seal on head							
Connections											
G1	G 1 1/4"		G5	1 1/2" NPT							
G2	G 1 1/2"		G7	SAE 20 - 1 5/8" - 12 UN							
G4	1 1/4" NPT		G8	SAE 24 - 1 7/8" - 12 UN							
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		•	•							
						Bypass valve		Execution			
						E 3 bar		P01 MP Filtri standard			
						B 1.75 bar		Pxx Customized			

FILTER ELEMENT

Element series and size			Configuration example 1: MPFX180 1 A25 H B E P01								
MPFX180 Filter element with private spigot			Configuration example 2: MPFX180 2 P10 N V P01								
Element length											
1											
2											
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		B 1.75 bar		Pxx Customized	

ACCESSORIES

Indicators		page			page
BVA	Axial pressure gauge	240	BEA	Electrical pressure indicator	239
BVR	Radial pressure gauge	240	BEM	Electrical pressure indicator	239
BVP	Visual pressure indicator with automatic reset	241	BLA	Electrical / visual pressure indicator	239-240
BVQ	Visual pressure indicator with manual reset	241			
Additional features		page			
TE	Extension tube	248			
T5	Filler plug M30x1.5	249			



MPFX MPFX182 - MPFX192

Designation & Ordering code

COMPLETE FILTER

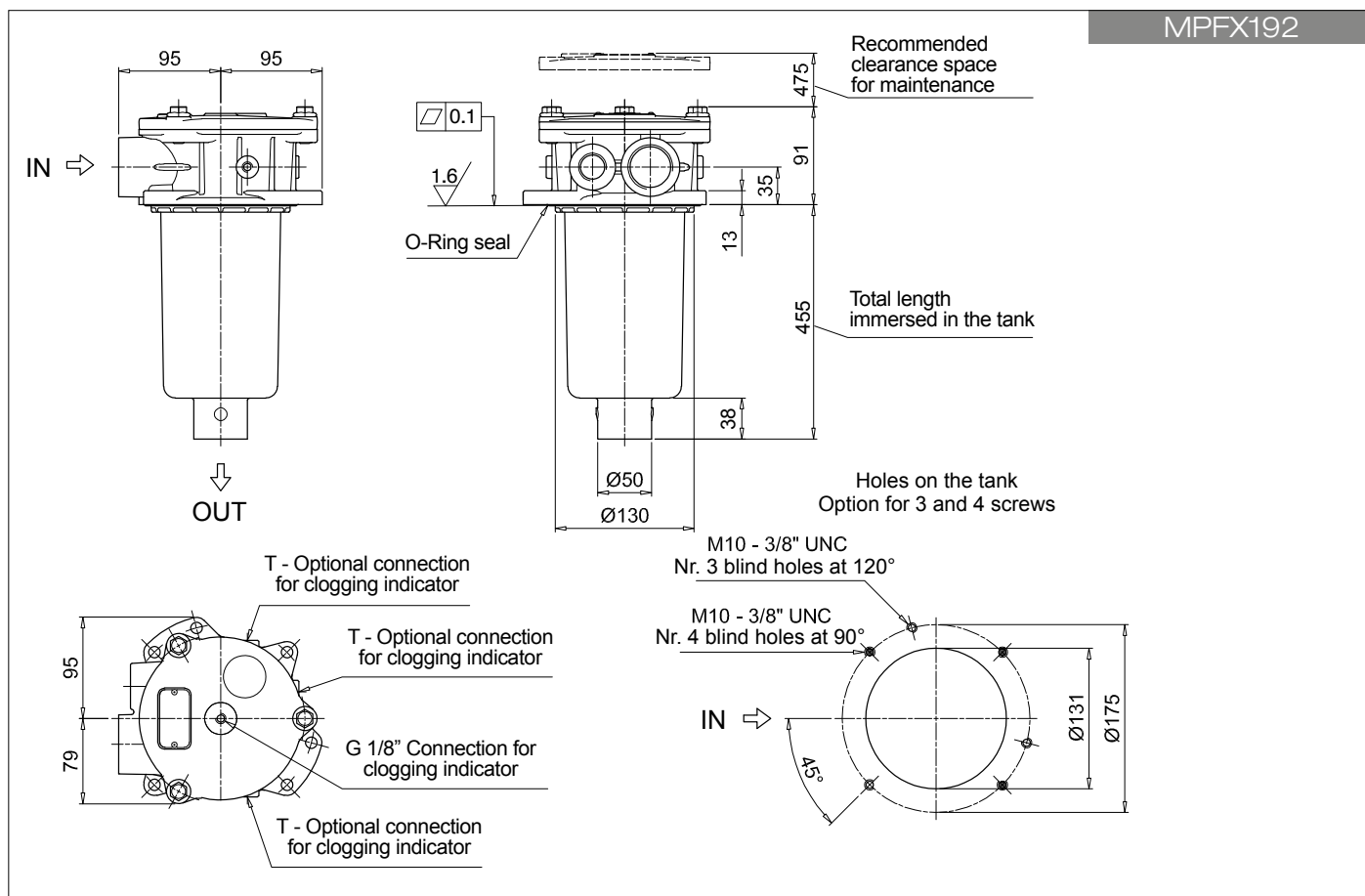
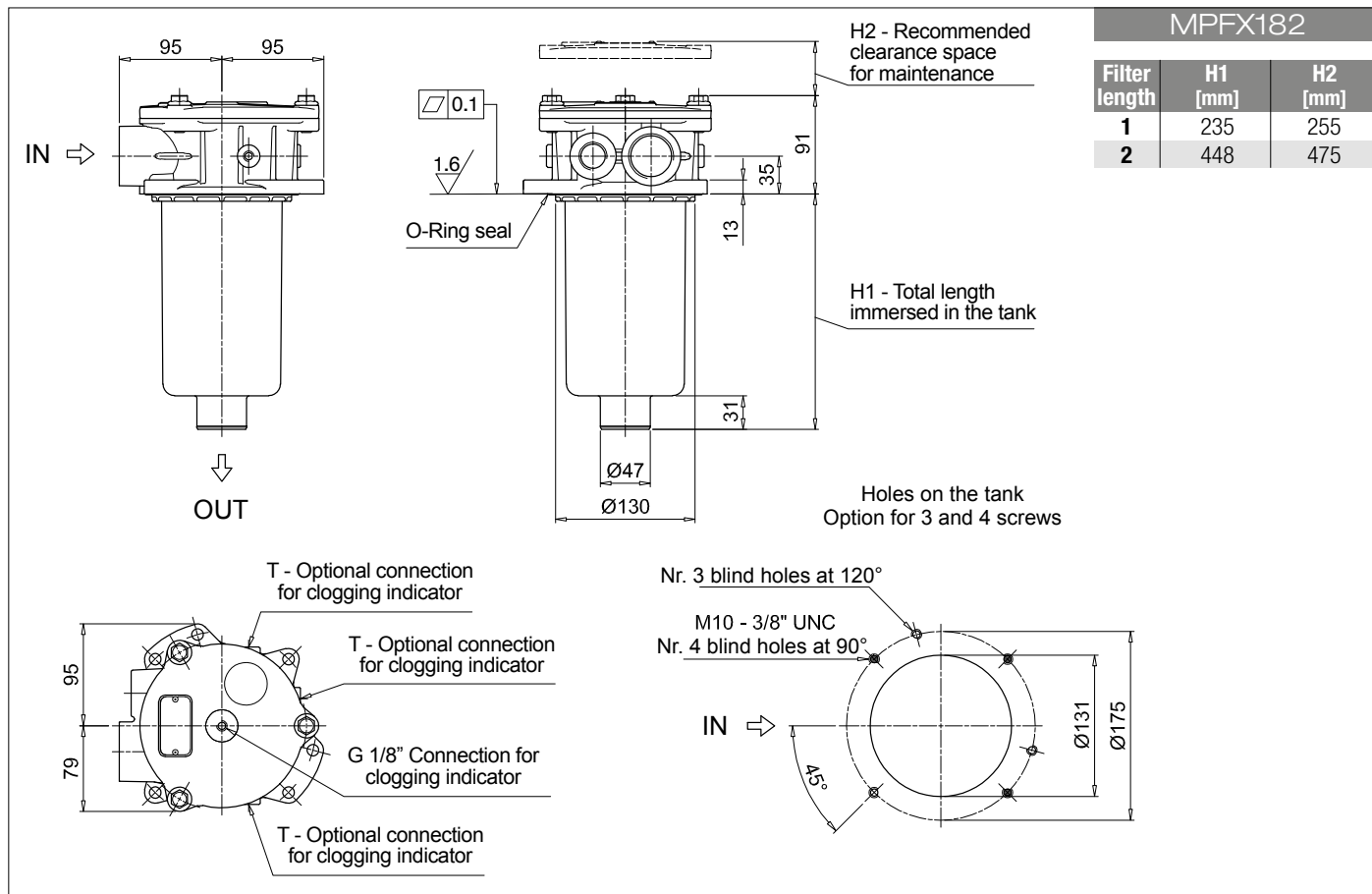
Series and size		Configuration example 1: MPFX182 1 A G1 1 A25 H E P01									
MPFX182 MPFX192 Filter element with private spigot		Configuration example 2: MPFX192 2 V G4 2 P10 N B P01									
Length	Size 182	Size 192									
1	•										
2	•	•									
Seals and treatments											
A NBR	B NBR flat seal on head										
V FPM	D FPM flat seal on head										
W NBR head anodized	L NBR head anodized, flat seal on head										
Z FPM head anodized	M FPM head anodized, flat seal on head										
Main Connections		Aux size 1	Aux size 2								
G1 G 1 1/4"	G 1/2"		G 3/4"								
G4 1 1/4" NPT	1/2" NPT		3/4" NPT								
G7 SAE 20 - 1 5/8" - 12 UN	SAE 8 - 3/16" - 16 UNF		SAE 12 - 1 1/16" - 12 UN								
Aux connection - see previous table											
1 Aux size 1	2 Aux size 2										
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			•	•							
					Bypass valve	Execution					
					E 3 bar	P01 MP Filtri standard					
					B 1.75 bar	Pxx Customized					

FILTER ELEMENT

Element series and size		Configuration example 1: MPFX180 1 A25 H B E P01									
MPFX180 Filter element with private spigot		Configuration example 2: MPFX180 2 P10 N V P01									
Element length											
1											
2											
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	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		
TE Extension tube	248		
T5 Filler plug M30x1.5	249		



MPFX MPFX184 - MPFX194

Designation & Ordering code

COMPLETE FILTER

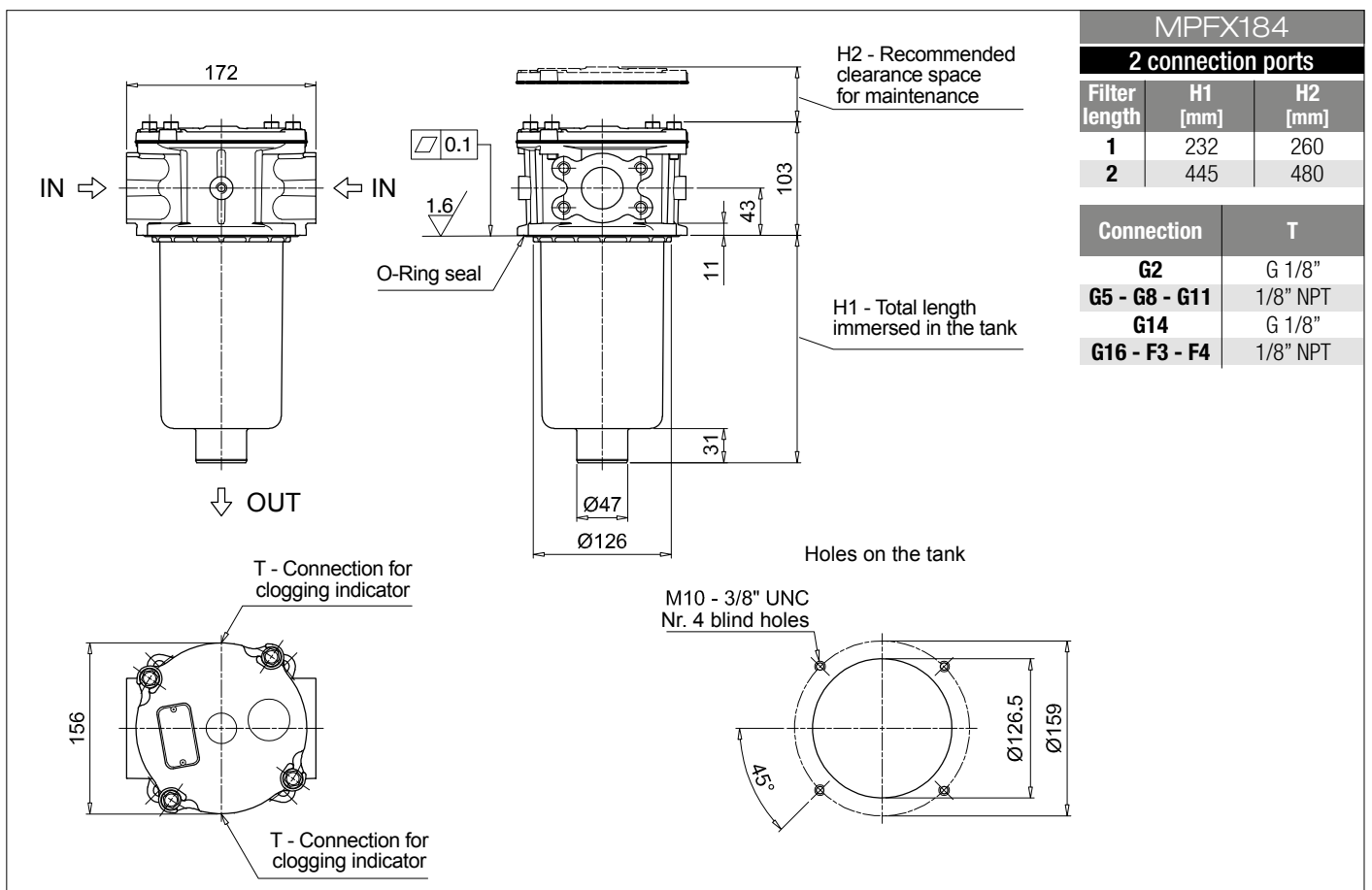
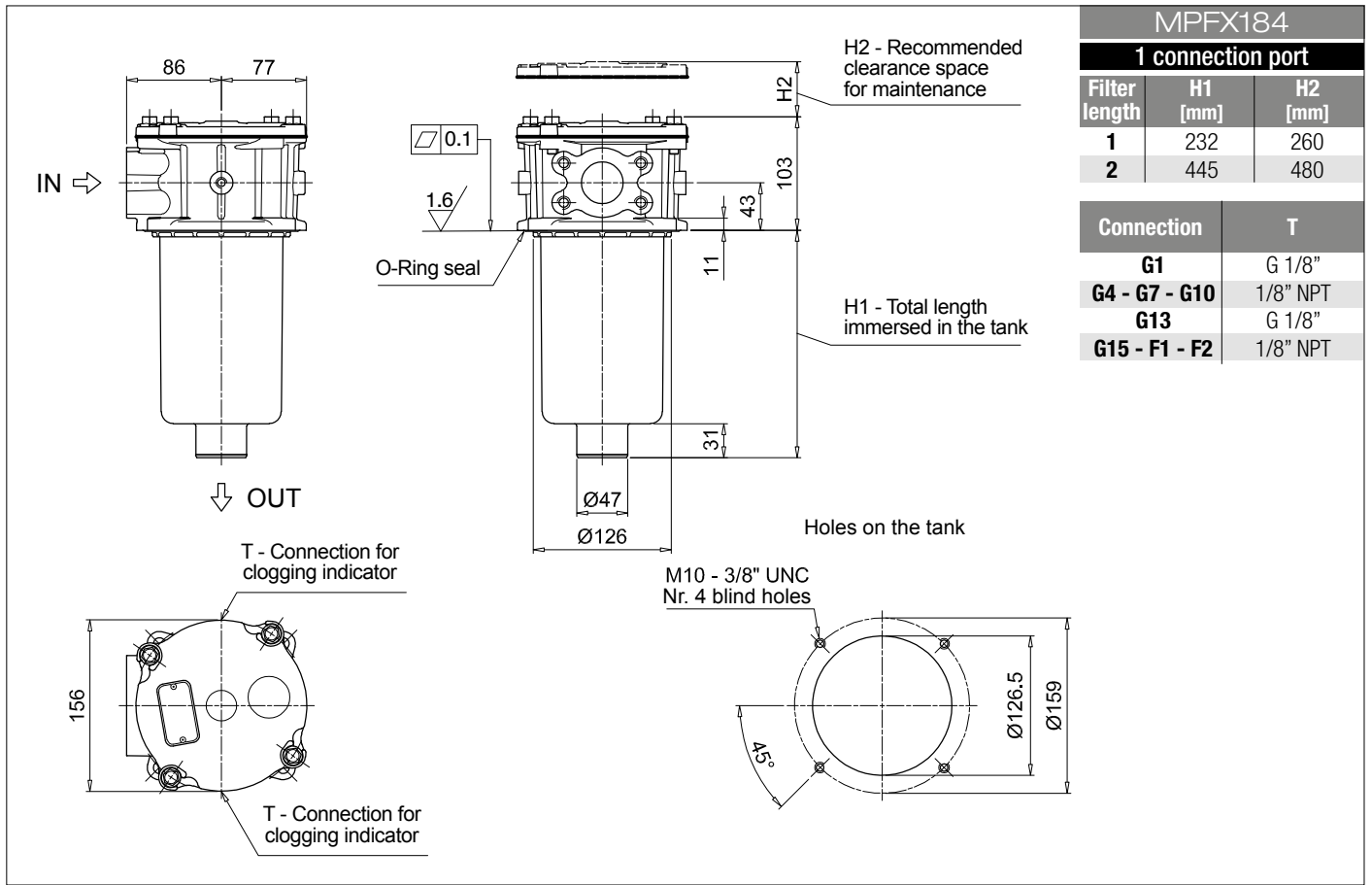
Series and size		Configuration example 1: MPFX184 1 A G1 A25 H E P01										
MPFX184 MPFX194 Filter element with private spigot		Configuration example 2: MPFX194 2 V F3 P10 N B P01										
Length	Size 184	Size 194										
1	•											
2	•	•										
Seals and treatments												
A NBR	W NBR	head anodized										
V FPM	Z FPM	head anodized										
Main Connections		Rear connections		Main Connections		Rear connections						
G1 G 1 1/4"	-		G13 G 1 1/2"	-								
G2 G 1 1/4"	G 1 1/4"		G14 G 1 1/2"	G 1 1/4"								
G4 1 1/4" NPT	-		G15 1 1/2" NPT	-								
G5 1 1/4" NPT	1 1/4" NPT		G16 1 1/2" NPT	1 1/4" NPT								
G7 SAE 20 - 1 5/8" - 12 UN	-		F1 1 1/2" SAE 3000 psi/M	-								
G8 SAE 20 - 1 5/8" - 12 UN	SAE 20 - 1 5/8" - 12 UN		F2 1 1/2" SAE 3000 psi/UNC	-								
G10 SAE 24 - 1 7/8" - 12 UN	-		F3 1 1/2" SAE 3000 psi/M	1 1/2" SAE 3000 psi/M								
G11 SAE 24 - 1 7/8" - 12 UN	SAE 20 - 1 5/8" - 12 UN		F4 1 1/2" SAE 3000 psi/UNC	1 1/2" SAE 3000 psi/UNC								
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										
N 10 bar	Axx	Mxx	Pxx									
H 10 bar		•	•									
W 10 bar, compatible with fluids HFA, HFB and HFC	•	•										
				Bypass valve		Execution						
				E 3 bar		P01 MP Filtri standard						
				B 1.75 bar		Pxx Customized						

FILTER ELEMENT

Element series and size		Configuration example 1: MPFX180 1 A25 H B E P01									
MPFX180 Filter element with private spigot		Configuration example 2: MPFX180 2 P10 N V P01									
Element length											
1											
2											
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									
N 10 bar	Axx	Mxx	Pxx								
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			

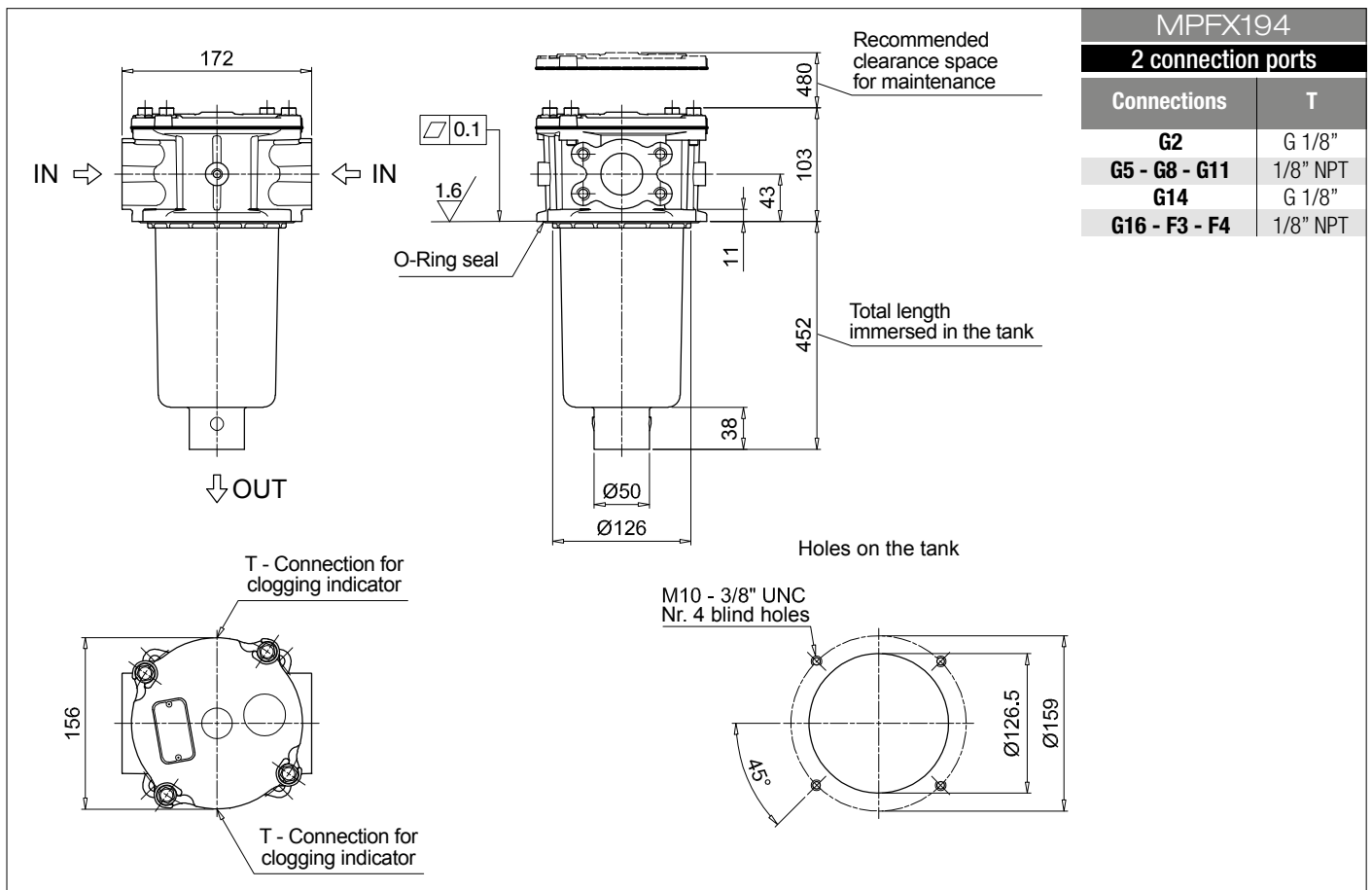
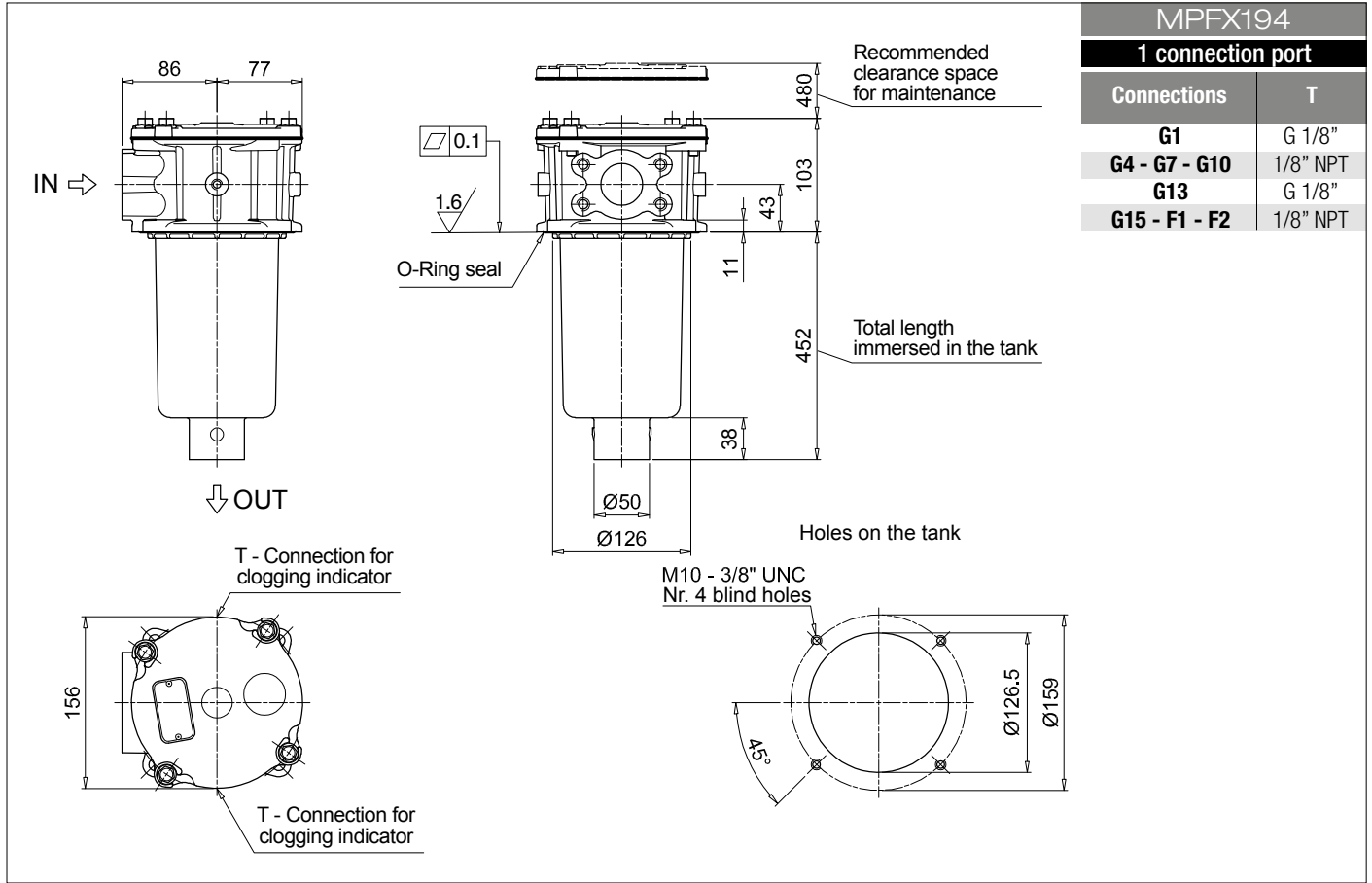
ACCESSORIES

Indicators		page			page
BVA Axial pressure gauge		240	BEA Electrical pressure indicator		239
BVR Radial pressure gauge		240	BEM Electrical pressure indicator		239
BVP Visual pressure indicator with automatic reset		241	BLA Electrical / visual pressure indicator		239-240
BVQ Visual pressure indicator with manual reset		241			
Additional features		page			
TE Extension tube		248			
T5 Filler plug M30x1.5		249			



MPFX MPFX184 - MPFX194

Dimensions



MPFX MPFX400

Designation & Ordering code

COMPLETE FILTER

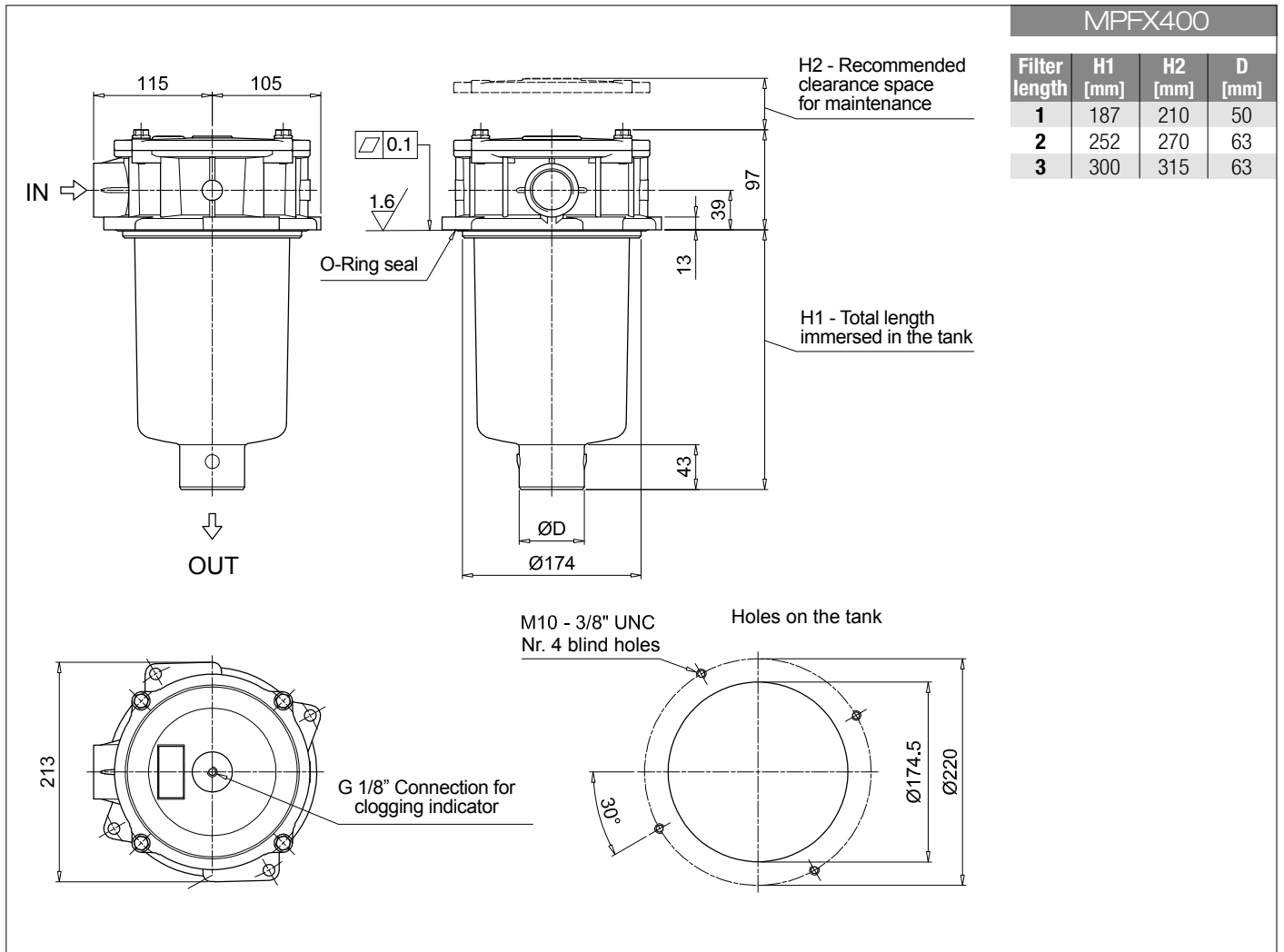
Series and size	Configuration example 1: MPFX400 1 A G9 A25 H B P01							
MPFX400 Filter element with private spigot	Configuration example 2: MPFX400 2 V G4 P10 N E P01							
Length	1 2 3							
Seals and treatments								
A NBR								
V FPM								
W NBR head anodized								
Z FPM head anodized								
Connections								
G1 G 1 1/4"	G6 2" NPT							
G2 G 1 1/2"	G7 SAE 20 - 1 5/8" - 12 UN							
G3 G 2"	G8 SAE 24 - 1 7/8" - 12 UN							
G4 1 1/4" NPT	G9 SAE 32 - 2 1/2" - 12 UN							
G5 1 1/2" 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							
Element Δp	Filter media							
	Axx	Mxx	Pxx					
N 10 bar		•	•					
H 10 bar		•						
W 10 bar, compatible with fluids HFA, HFB and HFC	•	•						
				Bypass valve	Execution			
				E 3 bar	P01 MP Filtri standard			
				B 1.75 bar	Pxx Customized			

FILTER ELEMENT

Element series and size	Configuration example 1: MFX400 1 A25 H B P01							
MFX400 Filter element with private spigot	Configuration example 2: MFX400 2 P10 N V E P01							
Element length	1 2 3							
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	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		
T5 Filler plug M30x1.5	249		



Designation & Ordering code

COMPLETE FILTER

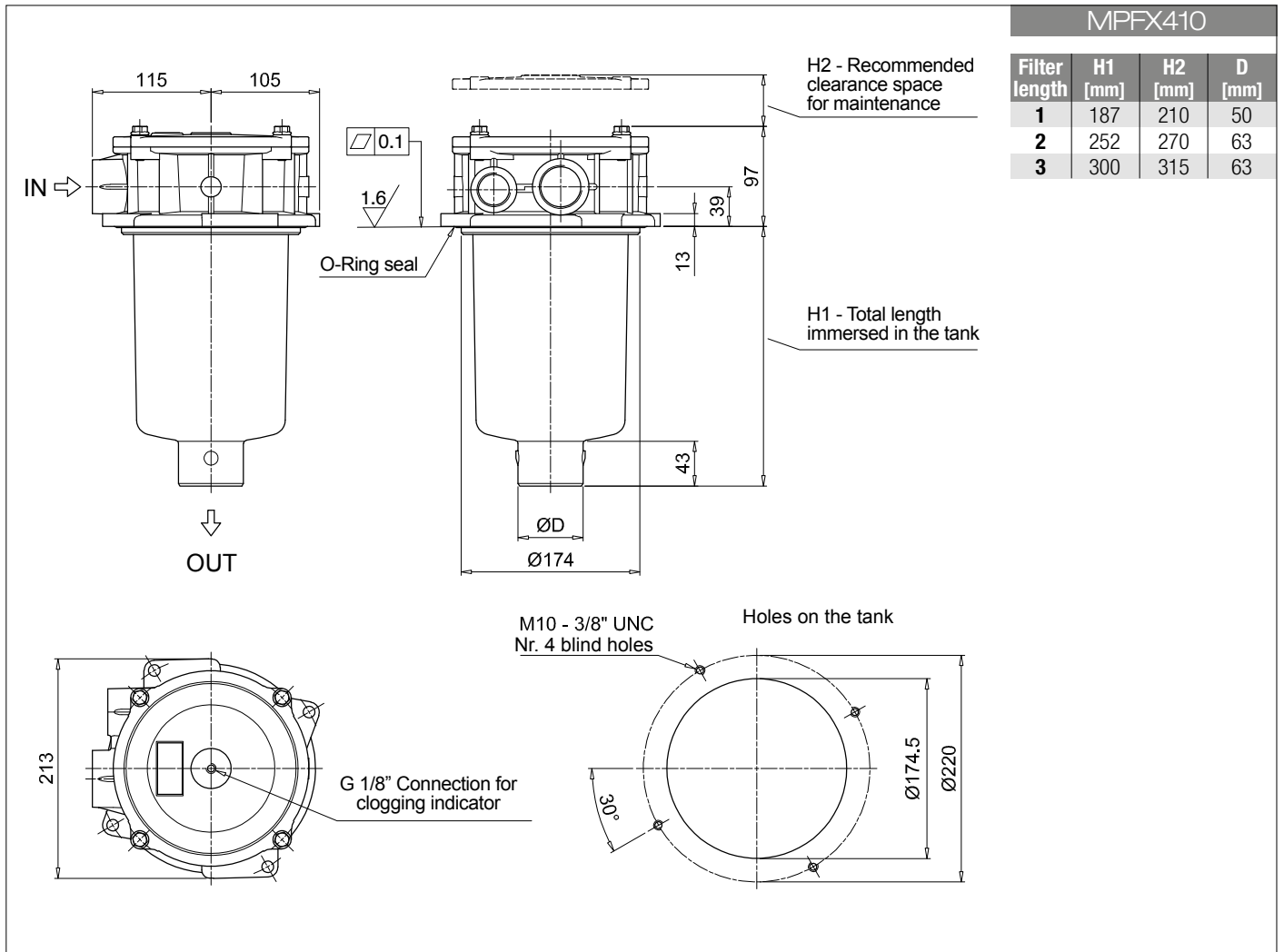
Series and size MPFX410 Filter element with private spigot	Configuration example 1: MPFX410 1 V G4 1 P10 N E P01
	Configuration example 2: MPFX410 1 A G1 1 A25 H B P01
Length 1 2 3	
Seals and treatments A NBR V FPM W NBR head anodized Z FPM head anodized	
Main Connections	Aux size 1
G1 G 1 1/4"	G 1"
G4 1 1/4" NPT	1" NPT
G7 SAE 20 - 1 5/8" - 12 UN	SAE 16 - 1 5/16" - 12 UN
Aux connection - see previous table 1 Aux size 1	
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
N 10 bar	Axx Mxx Pxx
H 10 bar	•
W 10 bar, compatible with fluids HFA, HFB and HFC	• •
	Bypass valve E 3 bar B 1.75 bar
	Execution P01 MP Filtri standard Pxx Customized

FILTER ELEMENT

Element series and size MFX400 Filter element with private spigot	Configuration example 1: MFX400 1 P10 N V E P01
	Configuration example 2: MFX400 1 A25 H B P01
Element length 1 2 3	
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
N 10 bar	Axx Mxx Pxx
H 10 bar	•
W 10 bar, compatible with fluids HFA, HFB and HFC	• •
	Seals B NBR V FPM
	Bypass valve E 3 bar B 1.75 bar
	Execution P01 MP Filtri standard Pxx Customized

ACCESSORIES

Indicators	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		
T5 Filler plug M30x1.5	249		



MPFX MPFX450 - MPFX451 - MPFX750

Designation & Ordering code

COMPLETE FILTER

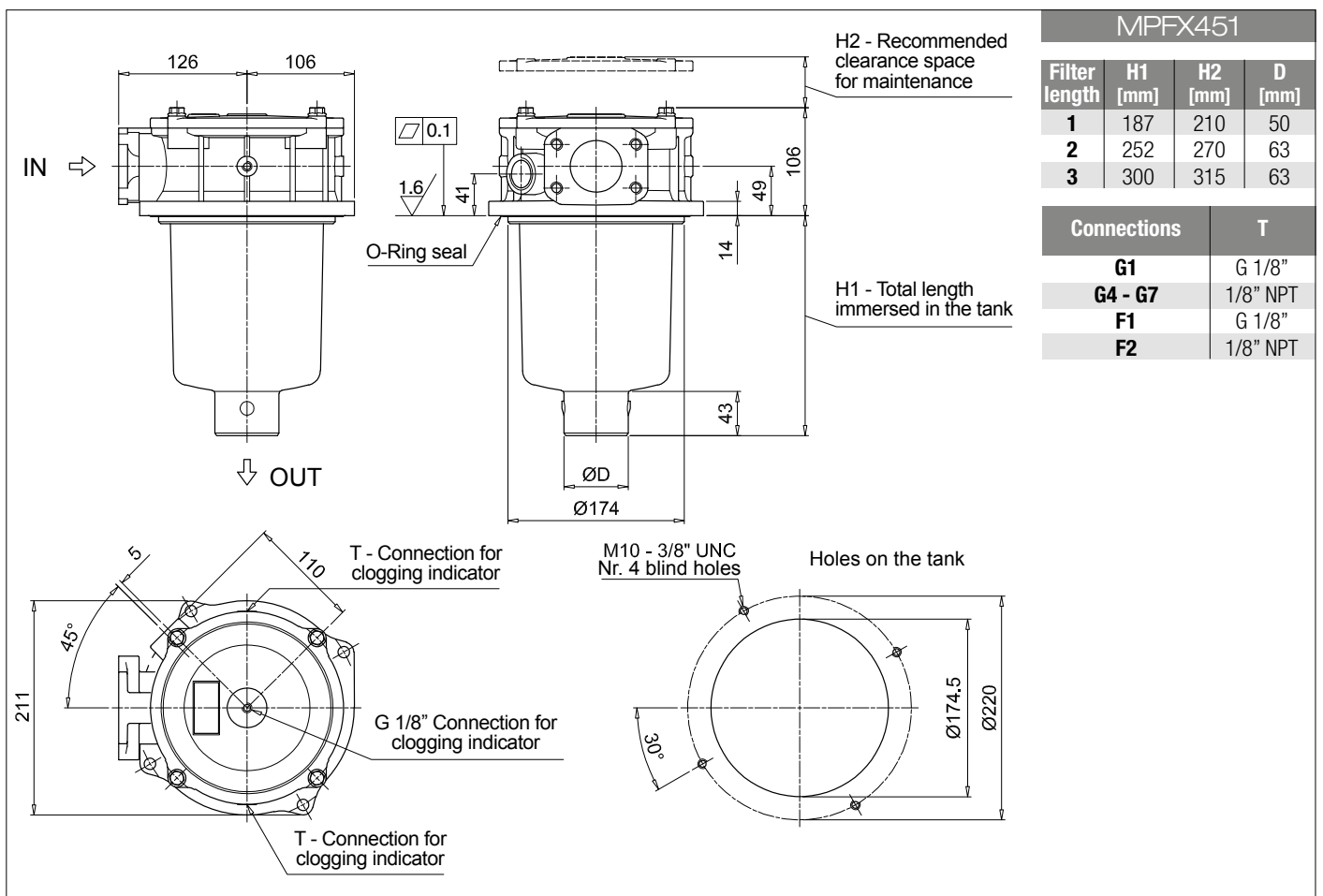
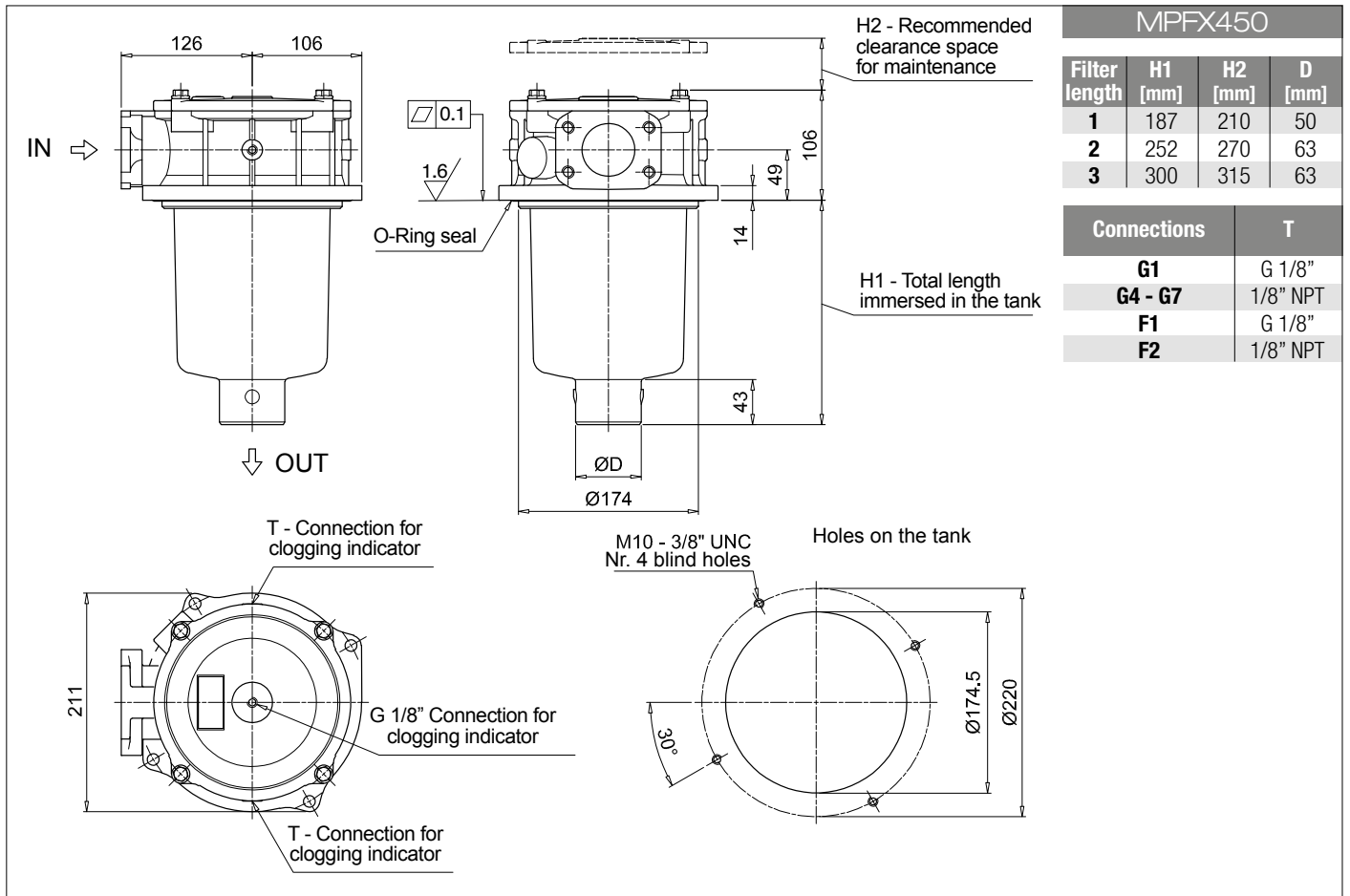
Series and size				Configuration example 1: MPFX450 1 A G1 A25 H B P01								
MPFX450 MPFX451 MPFX750 Filter element with private spigot				Configuration example 2: MPFX750 1 V F2 P10 N E P01								
Length				MPFX 450	MPFX 451	MPFX 750						
1		•	•	•								
2		•	•									
3		•	•									
Seals and treatments												
A NBR		W NBR head anodized										
V FPM		Z FPM head anodized										
Connections				Aux (only size 451)								
G1 G 2"				G 3/4"								
G4 2" NPT				3/4" NPT								
G7 SAE 32 - 2 1/2" - 12 UN				SAE 12 - 1 1/16" - 12 UN								
F1 2" SAE 3000 psi/M				G 3/4"								
F2 2" SAE 3000 psi/UN				3/4" 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								
Element Δp				Filter media								
				Axx	Mxx	Pxx						
N 10 bar					•	•						
H 10 bar					•							
W 10 bar, compatible with fluids HFA, HFB and HFC				•	•							
							Bypass valve		Execution			
							E 3 bar		P01 MP Filtri standard			
							B 1.75 bar		Pxx Customized			

FILTER ELEMENT

Element series and size				Configuration example 1: MFx400 1 A25 H B P01								
MFx400 MFx750 Filter element with private spigot				Configuration example 2: MFx750 1 P10 N V E P01								
Element length				MPFX 450	MPFX 451	MPFX 750						
1		•	•	•								
2		•	•									
3		•	•									
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		B 1.75 bar		Pxx Customized				

ACCESSORIES

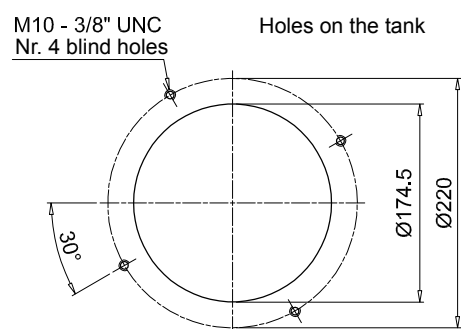
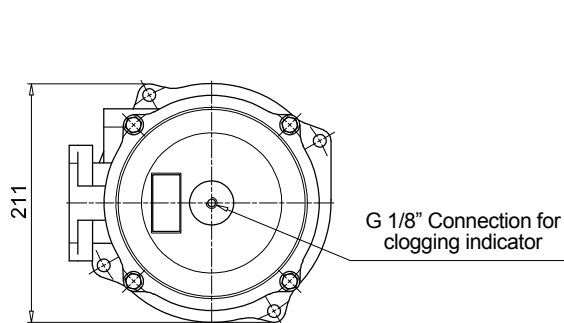
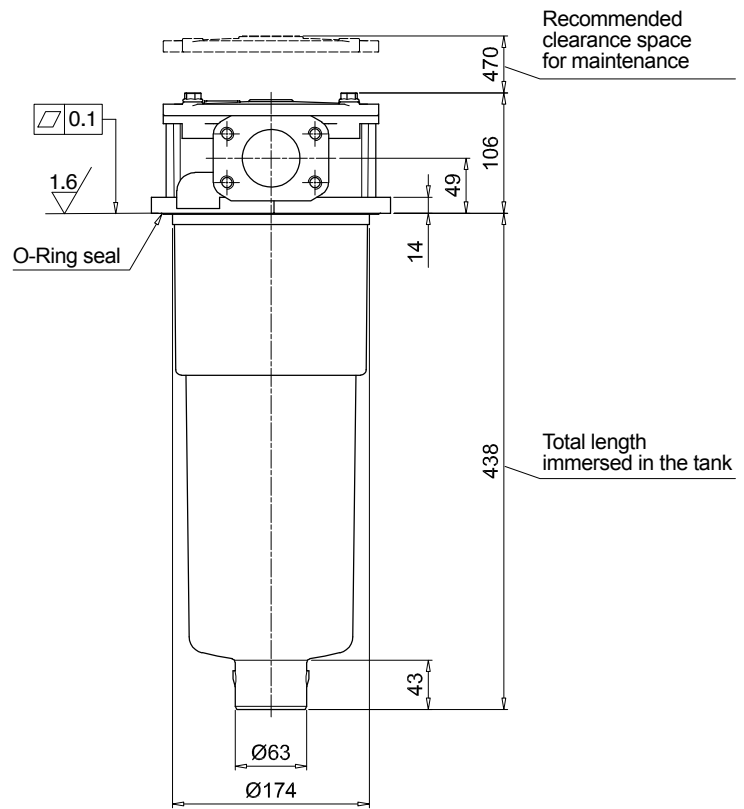
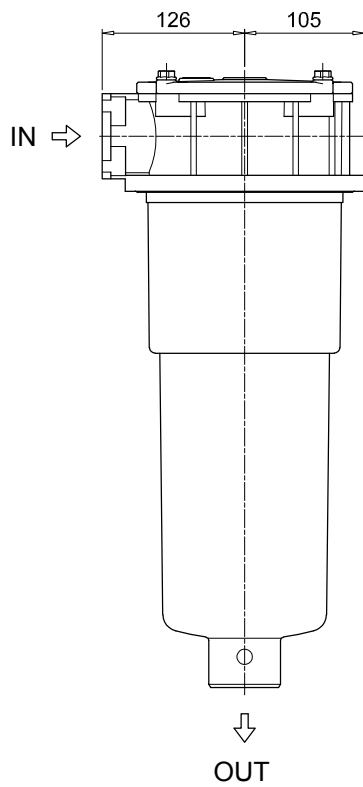
Indicators		page			page
BVA Axial pressure gauge		240	BEA Electrical pressure indicator		239
BVR Radial pressure gauge		240	BEM Electrical pressure indicator		239
BVP Visual pressure indicator with automatic reset		241	BLA Electrical / visual pressure indicator		239-240
BVQ Visual pressure indicator with manual reset		241			
Additional features		page			
T5 Filler plug M30x1.5		249			



MPFX MPFX450 - MPFX451 - MPFX750

Dimensions

MPFX750



MPFX 100

MPFX 181

O-RING SEAL

	Q.ty: 1 pc.	Q.ty: 1 pc.	
Item:	2	3 (3a ÷ 3d)	
Filter series	Filter element	Seal Kit code number	
		NBR	FPM
MPFX 030	See order table	02050675	02050676
MPFX 100-110		02050677	02050678
MPFX 181-182		02050681	02050682
MPFX 184		02050685	02050686
MPFX 191-192		02050683	02050684
MPFX 194		02050687	02050688
MPFX 400-410		02050695	02050696
MPFX 450-451		02050697	02050698
MPFX 750		02050699	02050700

MPFX 104

MPFX 181

FLAT SEAL

	Q.ty: 1 pc.	Q.ty: 1 pc.	
Item:	2	3 (3a ÷ 3d)	
Filter series	Filter element	Seal Kit code number	
		NBR	FPM
MPFX 104	See order table	02050679	02050680
MPFX 181-182		02050691	02050692
MPFX 191-192		02050691	02050692

MPLX series

Maximum working pressure up to 1 MPa (10 bar) - Flow rate up to 1800 l/min



Description

Technical data

Return filter

Maximum working pressure up to 1 MPa (10 bar)
Flow rate up to 1800 l/min

MPLX is a range of return filters for protection of the reservoir against the system contamination.

Completely interchangeable with Pall 8420 & 8520, they are directly fixed to the reservoir, in immersed or semi-immersed position.

The use of the diffuser is recommended, to place the filter output always immersed into the fluid to avoid aeration or foam generation into the reservoir.

The filter output must be always immersed into the fluid to avoid aeration or foam generation into the reservoir.

Available features:

- Flanged connections up to 3", for a maximum flow rate of 1800 l/min
- Fine filtration rating, to get a good cleanliness level into the reservoir
- Bypass valve, to relieve excessive pressure drop across the filter media
- 6 fixing holes for installation, to suit a variety of reservoir surfaces
- Diffuser, to reduce the risk of aeration, foaming and noise
- Filler plug, to fill cleaned fluid into the tank without an additional connection
- Visual, electrical and electronic differential clogging indicators

Common applications:

- Heavy duty industrial equipment
- Heavy duty mobile equipment

Filter housing materials

- Head: Anodized aluminium
- Cover: Anodized aluminium
- Bowl: Phosphatized steel
- Bypass valve: Steel

Bypass valve

- Opening pressure 450 kPa (4.5 bar) $\pm 10\%$

Δp element type

- Microfiber filter elements: 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

MPLX filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]		Volumes [dm ³]	
	Length	2	Length	2
MPLX 250		8.95		2.90
MPLX 660		20.20		11.00

Filter series	Length	Filter element design - N Series						
		A03	A06	A10	A16	A25	M25 M60 M90	P10 P25
MPLX 250	2	157	155	281	312	325	583	392
MPLX 660	2	376	384	820	925	1018	1732	1332

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

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

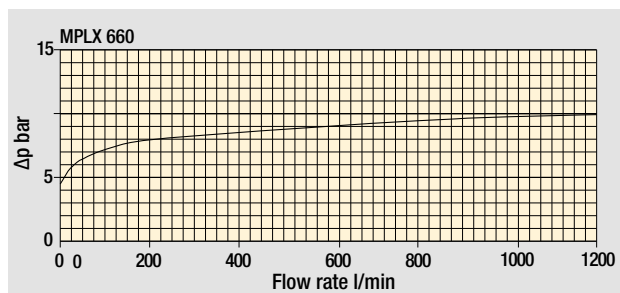
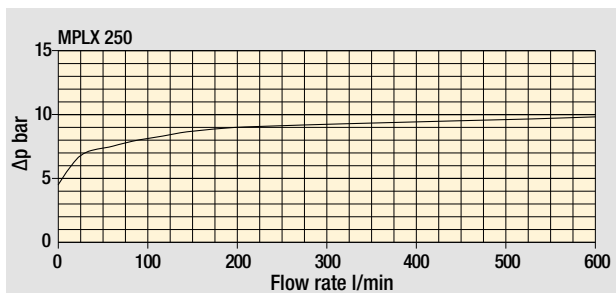
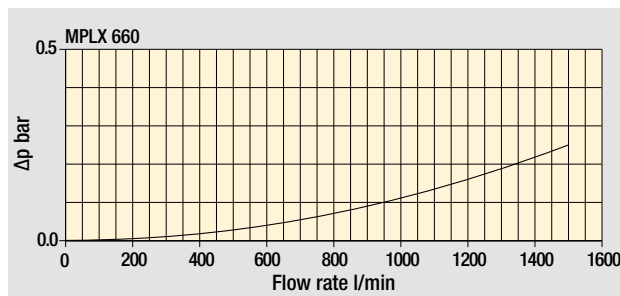
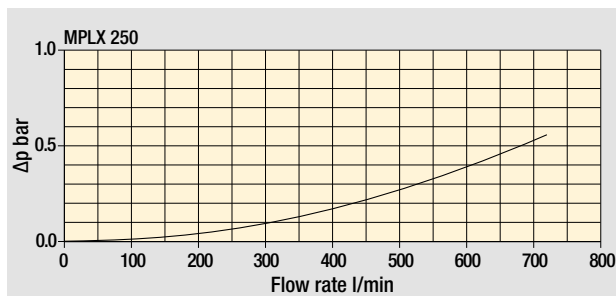
You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols

Filter series	Style 1 connection + Diff. indic.
MPLX 250	●
MPLX 660	●

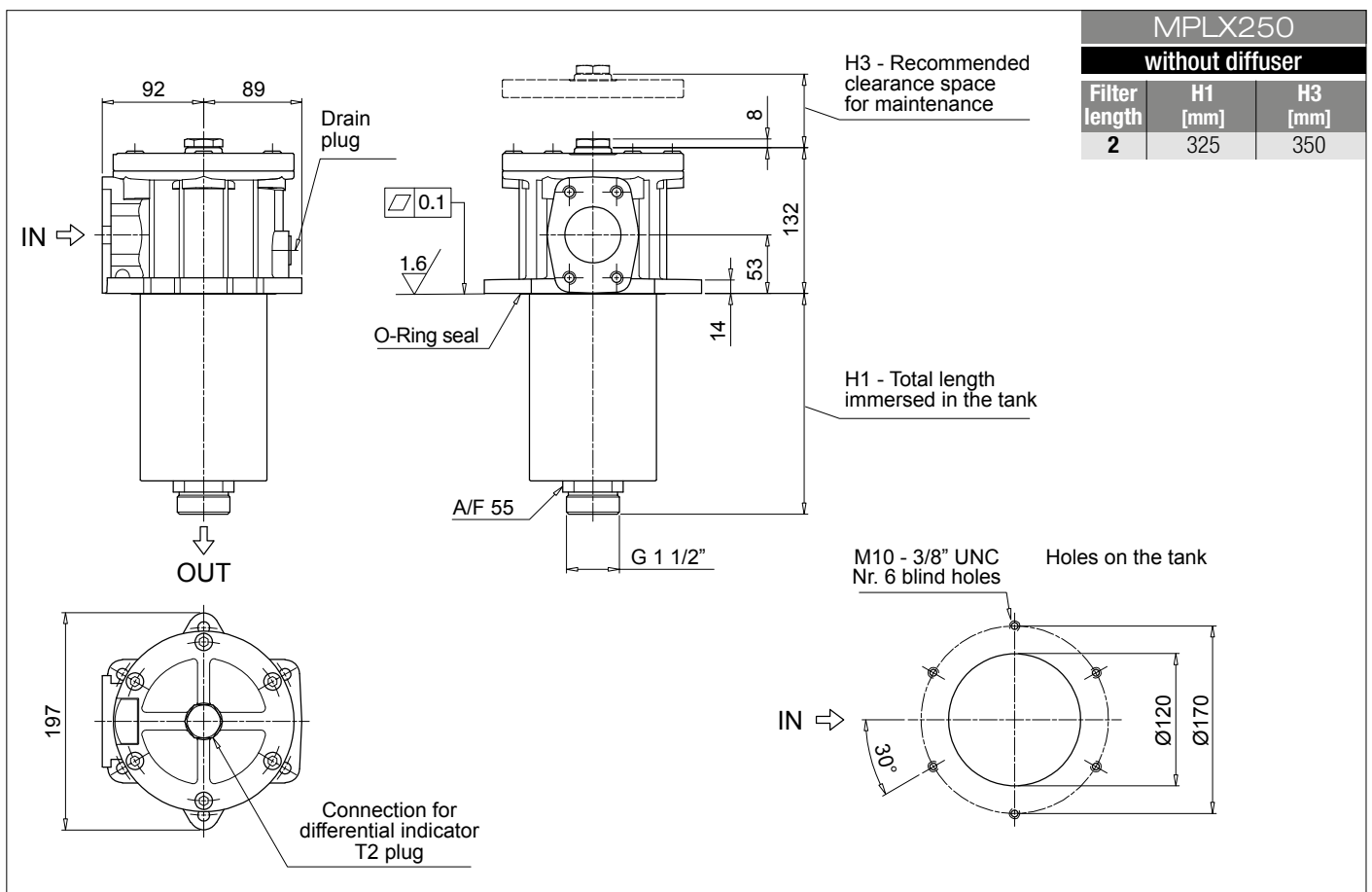
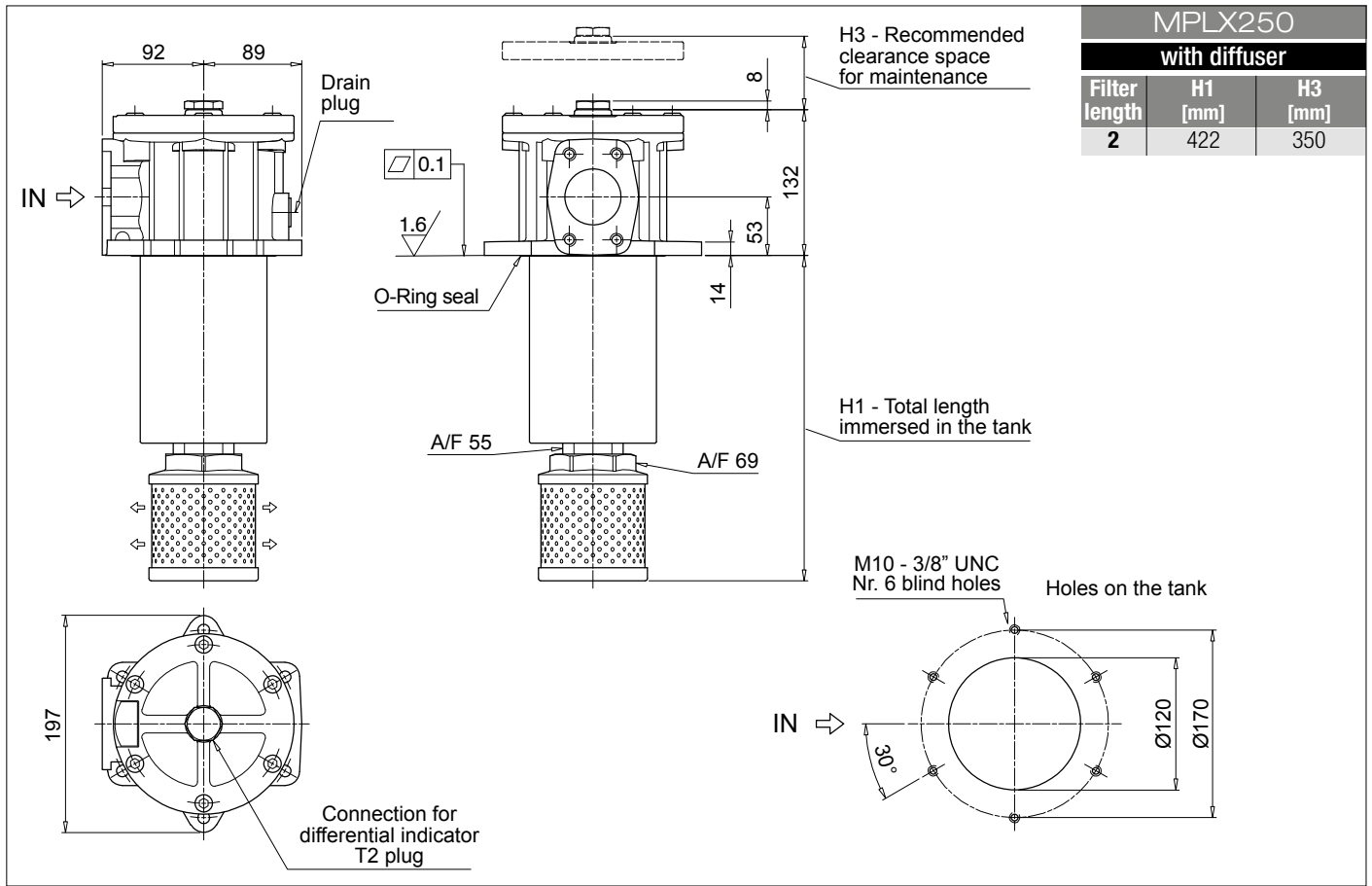
Pressure drop

Filter housings
 Δp pressure drop



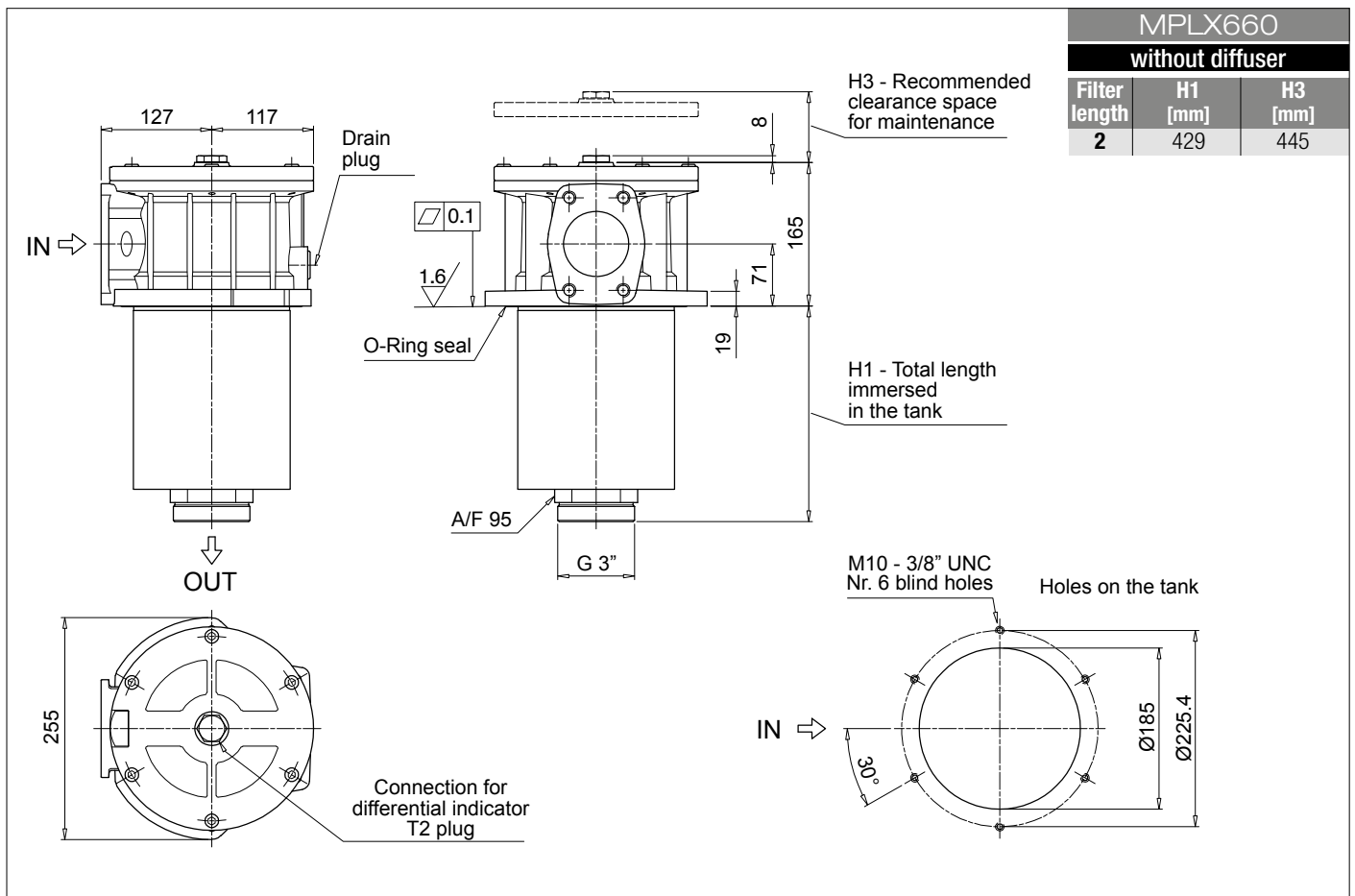
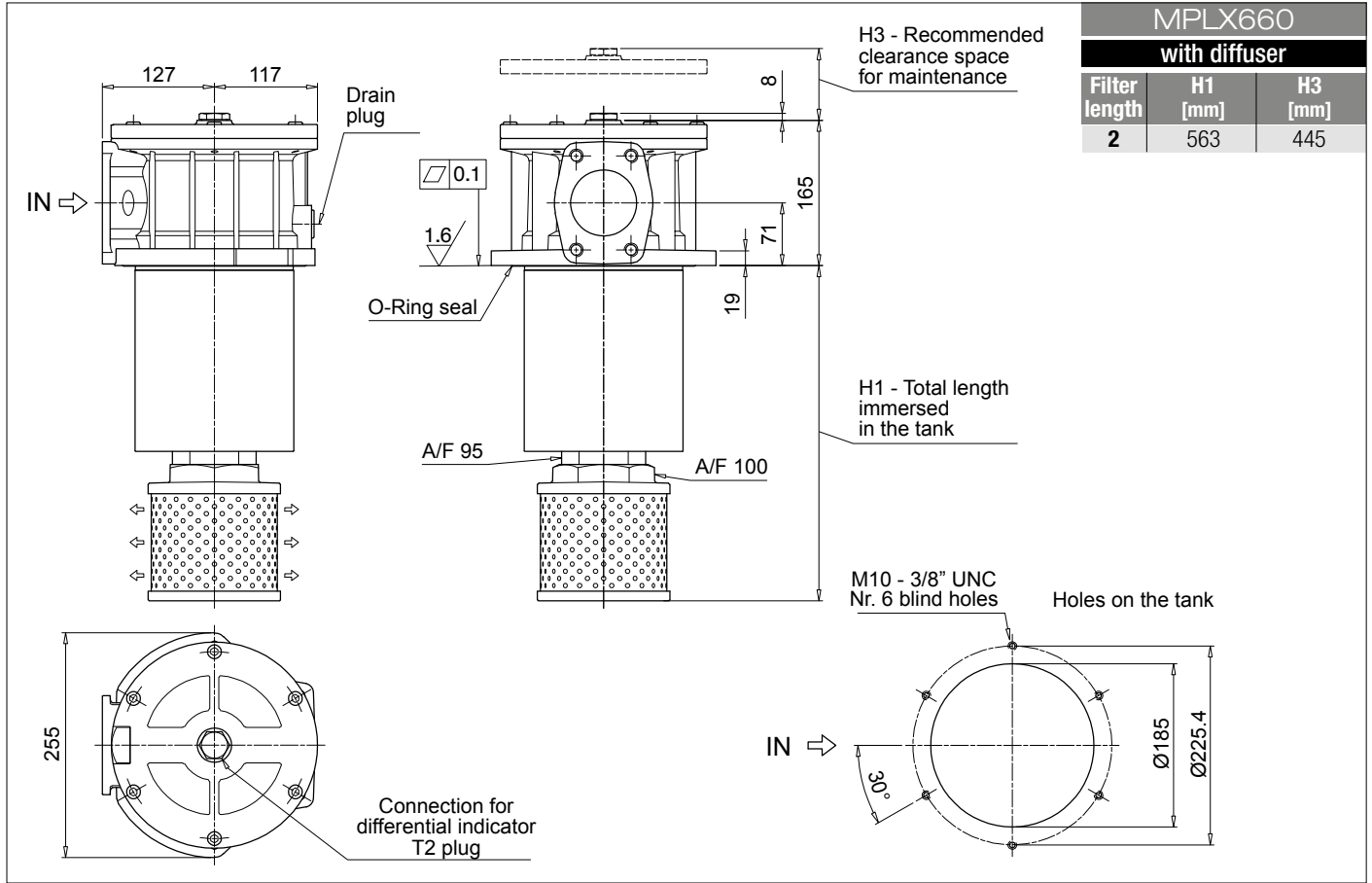
Bypass valve
pressure drop

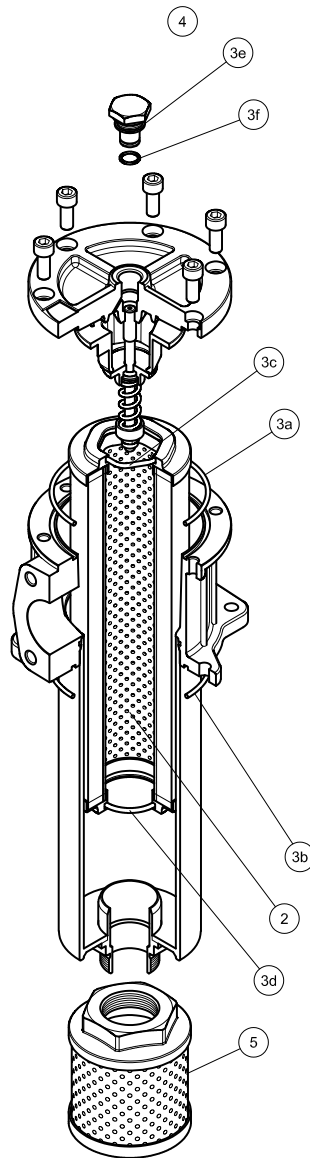
The curves are plotted using mineral oil with density of 0.86 kg/dm³ in compliance with ISO 3968. Δp varies proportionally with density.



MPLX MPLX660

Dimensions





Item:	Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 1 pc.		Q.ty: 1 pc.
Filter series	Filter element	Seal Kit code number		Indicator connection plug		Diffuser
		NBR	FPM	NBR	FPM	
MPLX 250	See order table	02050745	02050746	T2H	T2V	STD 100 C 115 P01
MPLX 660	See order table	02050747	02050748			STD 150 E 155 P01

MPTX series

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



Description

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, 3 or 6 fixing holes for installation, to suit a variety of reservoir surfaces
- O-ring or Flat Seal to suit a variety of reservoir surfaces
- 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: Nylon
- Bowl: Nylon

Bypass valve

- Opening pressure 175 kPa (1.75 bar) $\pm 10\%$
- Opening pressure 300 kPa (3 bar) $\pm 10\%$

Δp element type

- Microfiber 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]

Filter series	Weights [kg]					Volumes [dm ³]				
	Length	1	2	3	4	Length	1	2	3	4
MPTX 025		0.41	0.45	0.50	-		0.24	0.35	0.42	-
MPTX 027		0.44	0.48	0.55	-		0.24	0.35	0.42	-
MPTX 110		1.00	1.05	1.15	1.40		0.72	0.93	1.28	1.74
MPTX 114		1.10	1.15	1.25	1.50		0.72	0.93	1.28	1.74
MPTX 116		1.10	1.15	1.25	1.50		0.72	0.93	1.28	1.74
MPTX 120		1.00	1.05	1.15	1.40		0.72	0.93	1.28	1.74

Filter series	Length	Filter element design - H series					Filter element design - N series		
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
MPTX 025-027	1	7	10	23	28	42	59	51	54
	2	17	20	45	48	56	72	64	67
	3	21	24	50	55	59	76	74	75
MPTX 110-120 114-116	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 $\Delta p = 0.5$ bar.

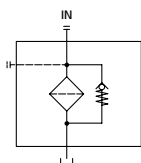
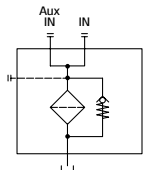
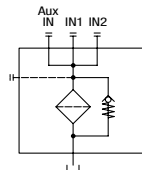
The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols

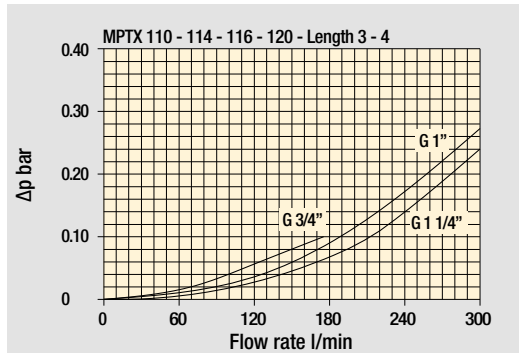
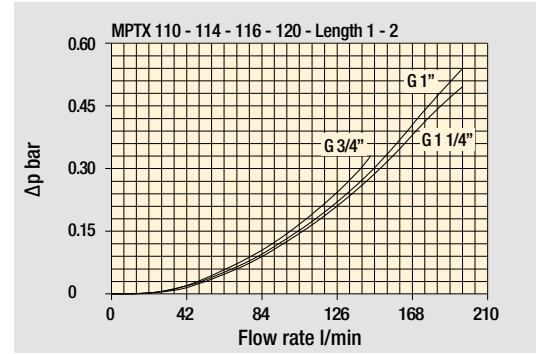
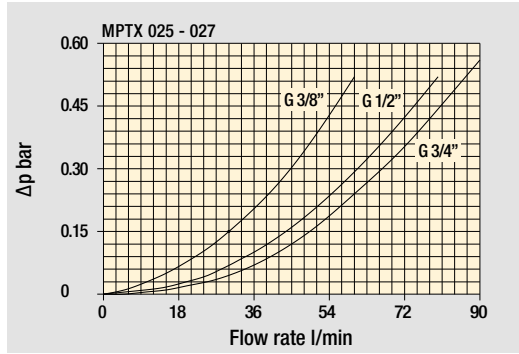
Filter series	Style 1 connection	Style 2 connections	Style 3 connections
MPTX 025	•		
MPTX 027	•		
MPTX 110		•	
MPTX 114	•		
MPTX 116	•		
MPTX 120			•

		
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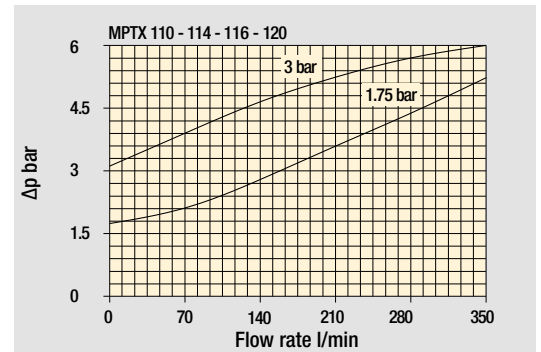
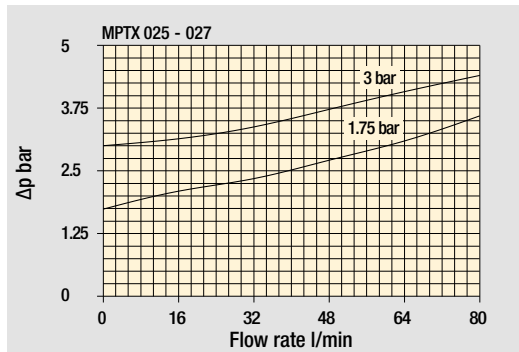
MPTX GENERAL INFORMATION

Pressure drop

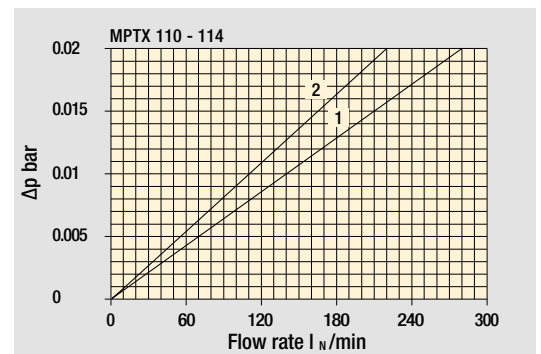
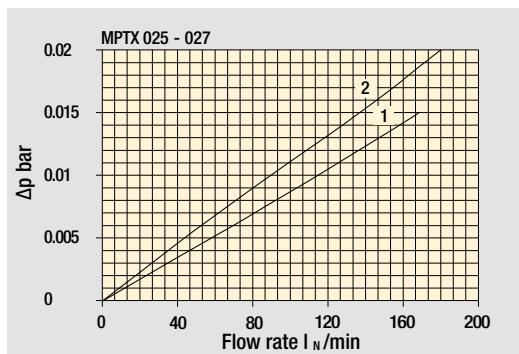
Filter housings Δp pressure drop



Bypass valve pressure drop



Air breather pressure drop







- 1 C With air breather 10 μm
- 2 D With anti-splash and SAP50 10 μm

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

MPTX 025 -027		
Air breather port plugged Indicator port	Air breather standard Indicator port	Anti-splash air breather & pressurized Double indicator port
		

Multiport - Multifunction

MPTX 110	
Standard - Single IN Port	Double IN Port - Double indicator port
	
Double IN Port Option: double drain port	Double IN Port - Indicator port Option: drain port
	

MPTX 120
Triple IN port

Option: double drain port



MPTX MPTX025 - MPTX027

Designation & Ordering code

COMPLETE FILTER

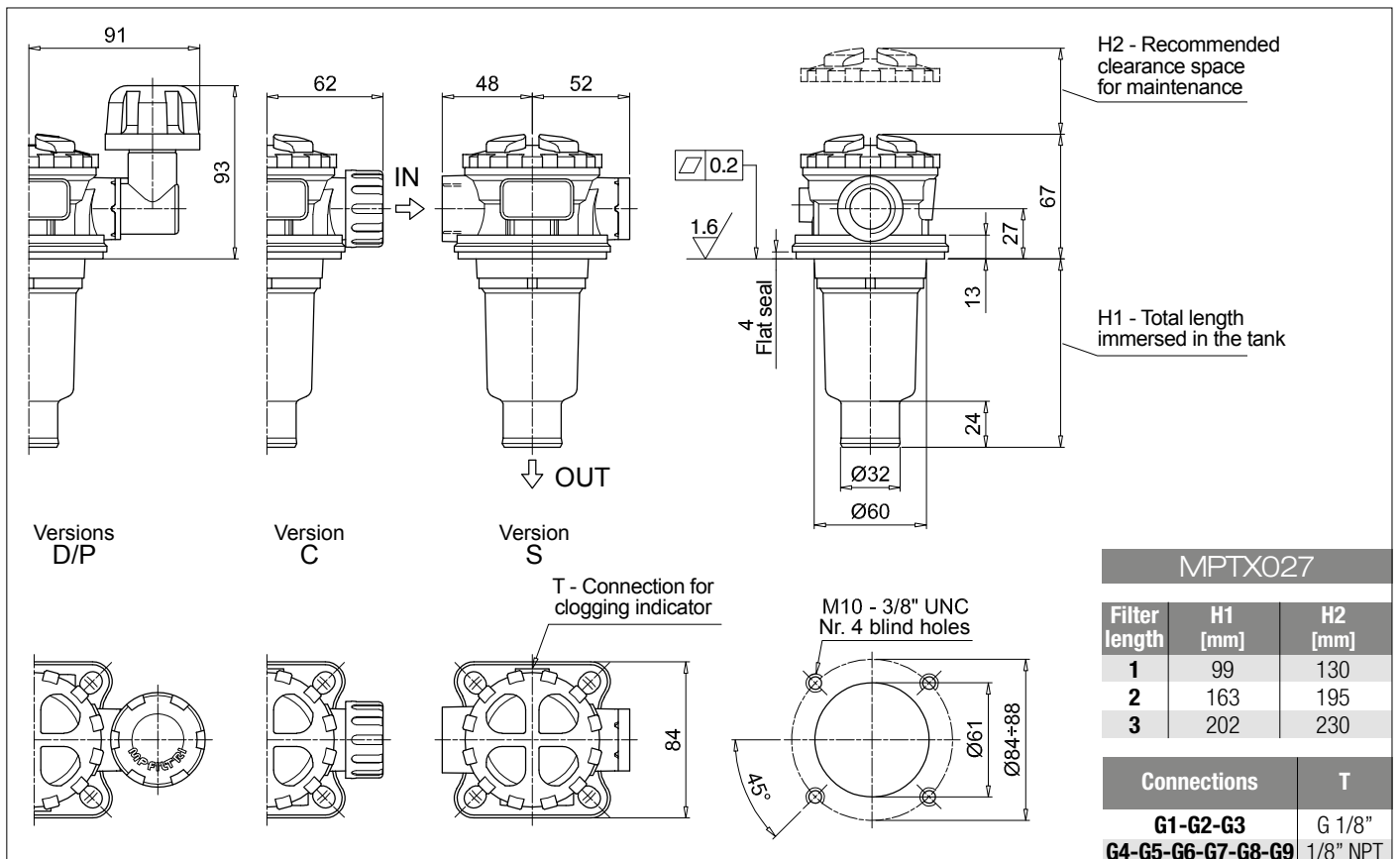
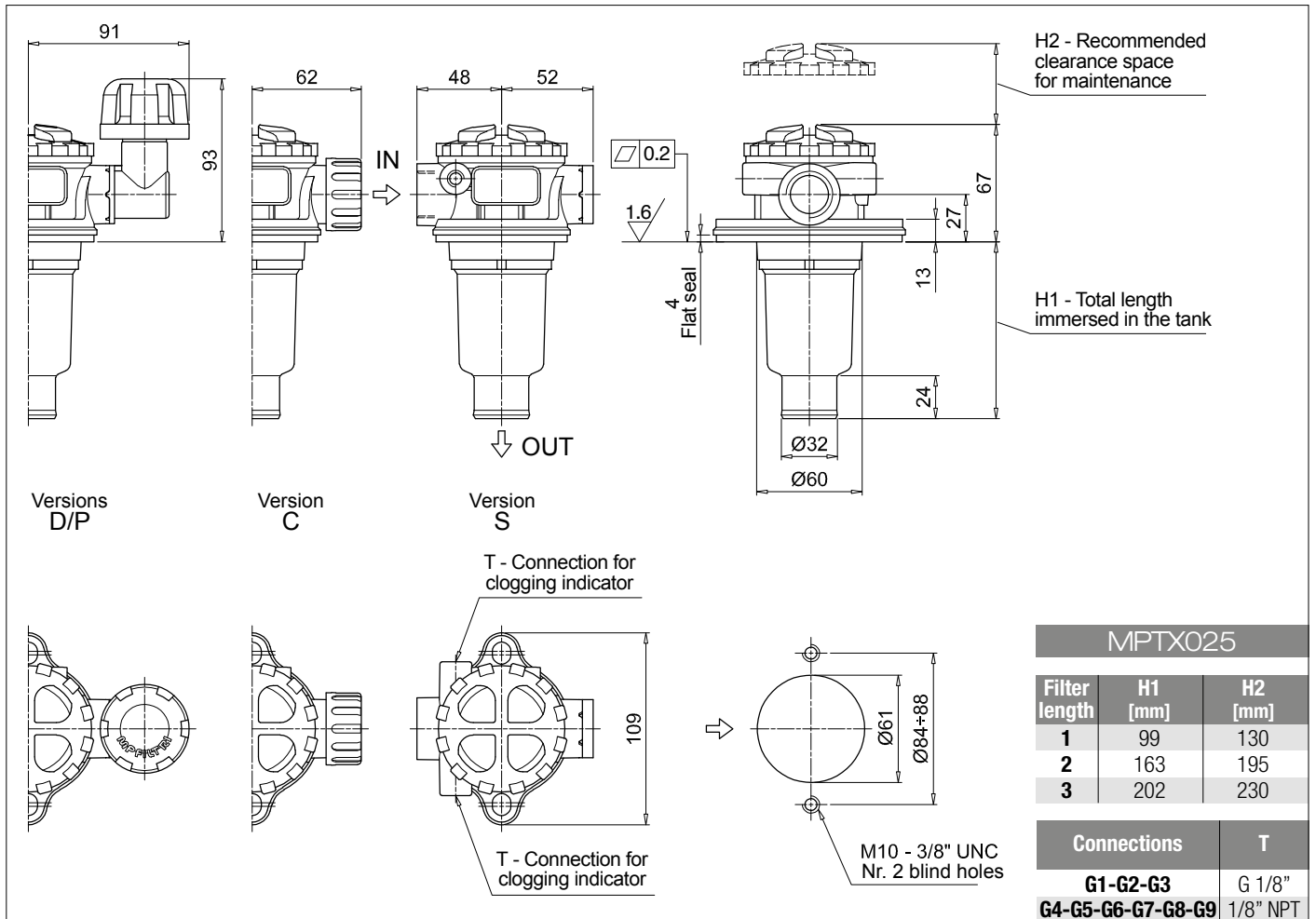
Series and size MPTX025 MPTX027 Filter element with private spigot	Configuration example 1: MPTX025 1 S A G3 A10 E P01
	Configuration example 2: MPTX027 3 C W G6 A03 B P01
Length 1 2 3	
Air breather S Without air breather C With air breather 10 µm D With anti-splash and air breather SAP050 10 µm P With anti-splash and air breather SAP050 10 µm, pressurization 0.5 bar	
Seals and treatments	Filtration rating
A NBR	Axx Mxx Pxx
V FPM	• • •
W NBR head anodized	• •
Z FPM head anodized	• •
	filter element compatible with fluids HFA-HFB-HFC
Connections	
G1 G 3/8"	G6 3/4" NPT
G2 G 1/2"	G7 SAE 6 - 9/16" - 18 UNF
G3 G 3/4"	G8 SAE 8 - 3/4" - 16 UNF
G4 3/8" NPT	G9 SAE 12 - 1 1/16" - 12 UN
G5 1/2" 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

Element series and size MFXX020 Filter element with private spigot	Configuration example 2: MFXX020 1 A10 H B E P01
	Configuration example 1: MFXX020 3 A03 W B P01
Element length 1 2 3	
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
N 10 bar	Axx Mxx Pxx
H 10 bar	• •
W 10 bar, compatible with fluids HFA, HFB and HFC	• •
	Seals B NBR V FPM
	Bypass valve E 3 bar B 1.75 bar
	Execution P01 MP Filtri standard Pxx Customized

ACCESSORIES

Indicators	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		
TE Extension tube	248		
DPT Dipstick	249		



Designation & Ordering code

COMPLETE FILTER

Series and size			Configuration example 1: MPTX110 1 S A G1 0 A06 E P01								
MPTX110 Filter element with private spigot			Configuration example 2: MPTX110 3 P V G4 1 M25 B P01								
Length											
1 2 3 4											
Air breather											
S Without air breather											
C With air breather 10 µm											
D With anti-splash and air breather SAP050 10 µm											
P With anti-splash and air breather SAP050 10 µm, pressurization 0.5 bar											
Seals and treatments			Filtration rating								
			Axx	Mxx	Pxx						
A NBR			•	•	•						
V FPM			•	•	•						
W NBR head anodized			•	•		filter element compatible with fluids HFA-HFB-HFC					
Z FPM head anodized			•	•							
Main Connections		Aux size 1	Aux size 2	Main Connections		Aux size 1	Aux size 2				
G1 G 3/4"		G 3/8"	G 1/2"	G6 1 1/4" NPT		3/8" NPT	1/2" NPT				
G2 G 1"				G7 SAE 12 - 1 1/16" - 12 UN		SAE 6 - 9/16" - 18 UNF	SAE 8 - 3/4" - 16 UNF				
G3 G 1 1/4"		3/8" NPT	1/2" NPT	G8 SAE 16 - 1 5/16" - 12 UN							
G4 3/4" NPT				G9 SAE 20 - 1 5/8" - 12 UN							
G5 1" NPT											
Aux connection - see previous table											
0 Not machined 1 Aux size 1 2 Aux size 2											
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

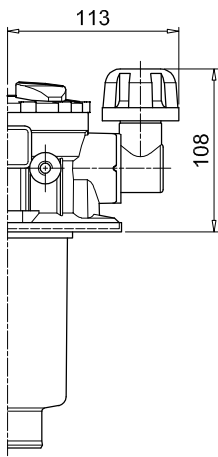
Element series and size			Configuration example 1: MFX100 1 A06 H B E P01								
MFX100 Filter element with private spigot			Configuration example 2: MFX100 3 M25 N V P01								
Element length											
1 2 3 4											
Filtration rating (filter media)											
A03 Inorganic microfiber 3 µm			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		B 1.75 bar		Pxx Customized				

ACCESSORIES

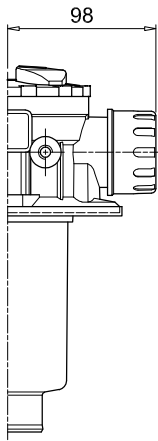
Indicators		page			page
BVA Axial pressure gauge	240		BEA Electrical pressure indicator	239	
BVR Radial pressure gauge	240		BEM Electrical pressure indicator	239	
BVP Visual pressure indicator with automatic reset	241		BLA Electrical / visual pressure indicator	239-240	
BVQ Visual pressure indicator with manual reset	241				
Additional features		page			page
TE Extension tube	248		DPT Dipstick	249	
DFS Diffuser with fast lock connection	249				

MPTX110		
Filter length	H1 [mm]	H2 [mm]
1	99	120
2	144	170
3	222	250
4	324	350

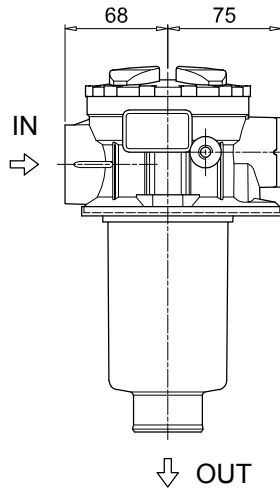
Connections	T
G1-G2-G3	G 1/8"
G4-G5-G6-G7-G8-G9	1/8" NPT



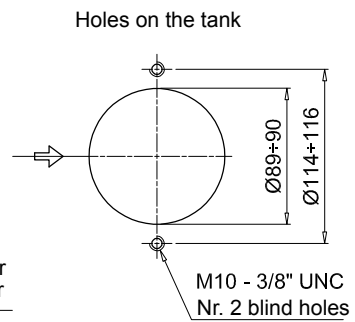
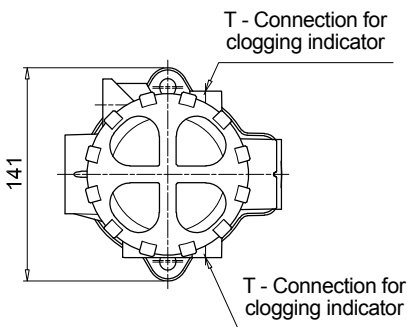
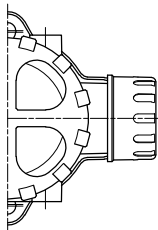
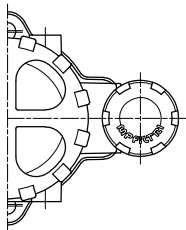
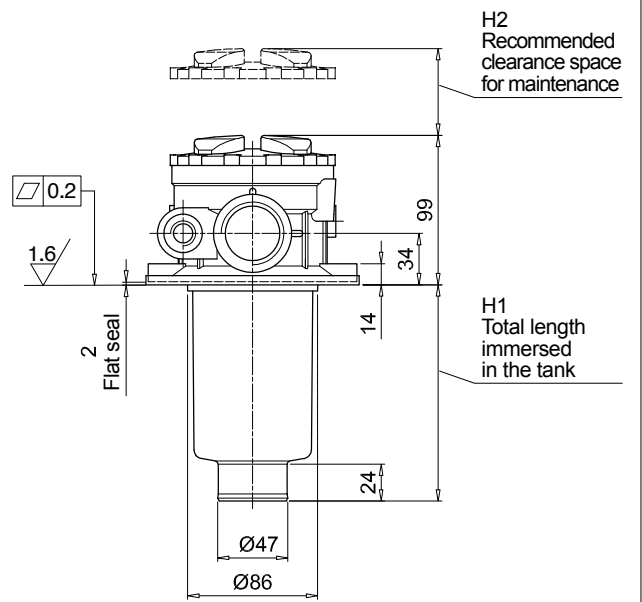
Versions D/P



Version C



Version S



Designation & Ordering code

COMPLETE FILTER

Series and size	Configuration example 1:	MPTX114	4	S	A	G3	A10	E	P01
MPTX114 Filter element with private spigot	Configuration example 2:	MPTX114	3	C	W	G6	A03	B	P01

Length	
1 2 3 4	

Air breather	
S Without air breather	
C With air breather 10 µm	
D With anti-splash and air breather SAP050 10 µm	
P With anti-splash and air breather SAP050 10 µm pressurization 0.5 bar	

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

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:	MFx100	4	A10	H	B	E	P01
MFx100 Filter element with private spigot	Configuration example 1:	MFx100	3	A03	W	B		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	•	•	

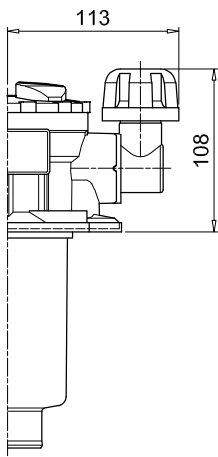
Seals	Bypass valve	Execution
B NBR	E 3 bar	P01 MP Filtri standard
V FPM	1.75 bar	Pxx Customized

ACCESSORIES

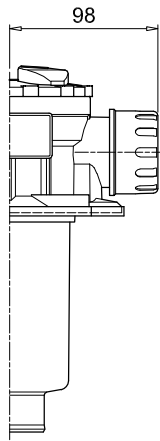
Indicators	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		page
TE Extension tube	248	DPT Dipstick	249
DFS Diffuser with fast lock connection	249		

MPTX114		
Filter length	H1 [mm]	H2 [mm]
1	99	120
2	144	170
3	222	250
4	324	350

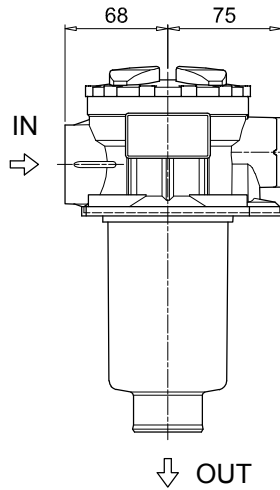
Connections	T
G1-G2-G3	G 1/8"
G4-G5-G6-G7-G8-G9	1/8" NPT



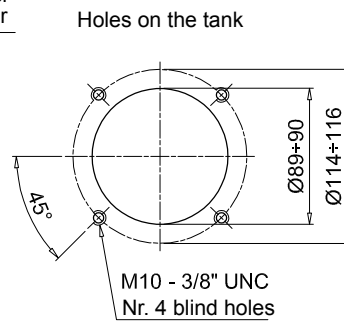
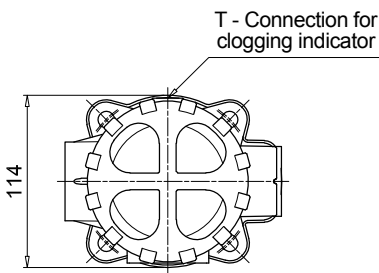
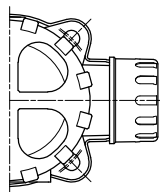
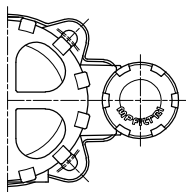
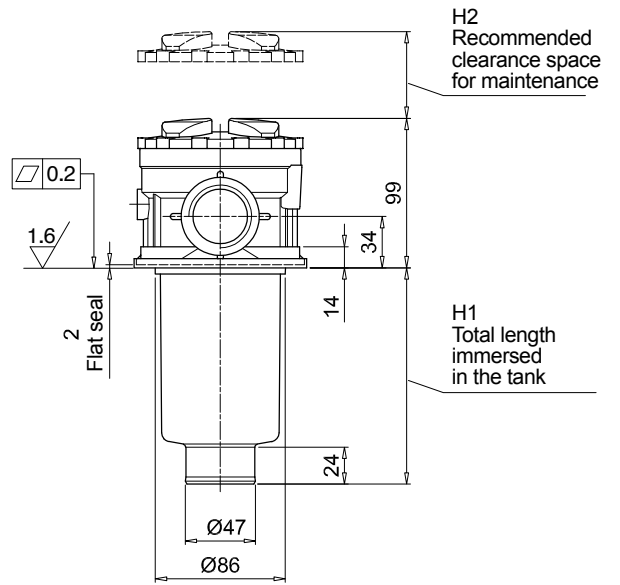
Versions D/P



Version C



Version S



Designation & Ordering code

COMPLETE FILTER

Series and size	Configuration example 1: MPTX116 1 S A G1 M90 E P01								
MPTX116 Filter element with private spigot	Configuration example 2: MPTX116 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	•	•		filter element compatible with fluids HFA-HFB-HFC					
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

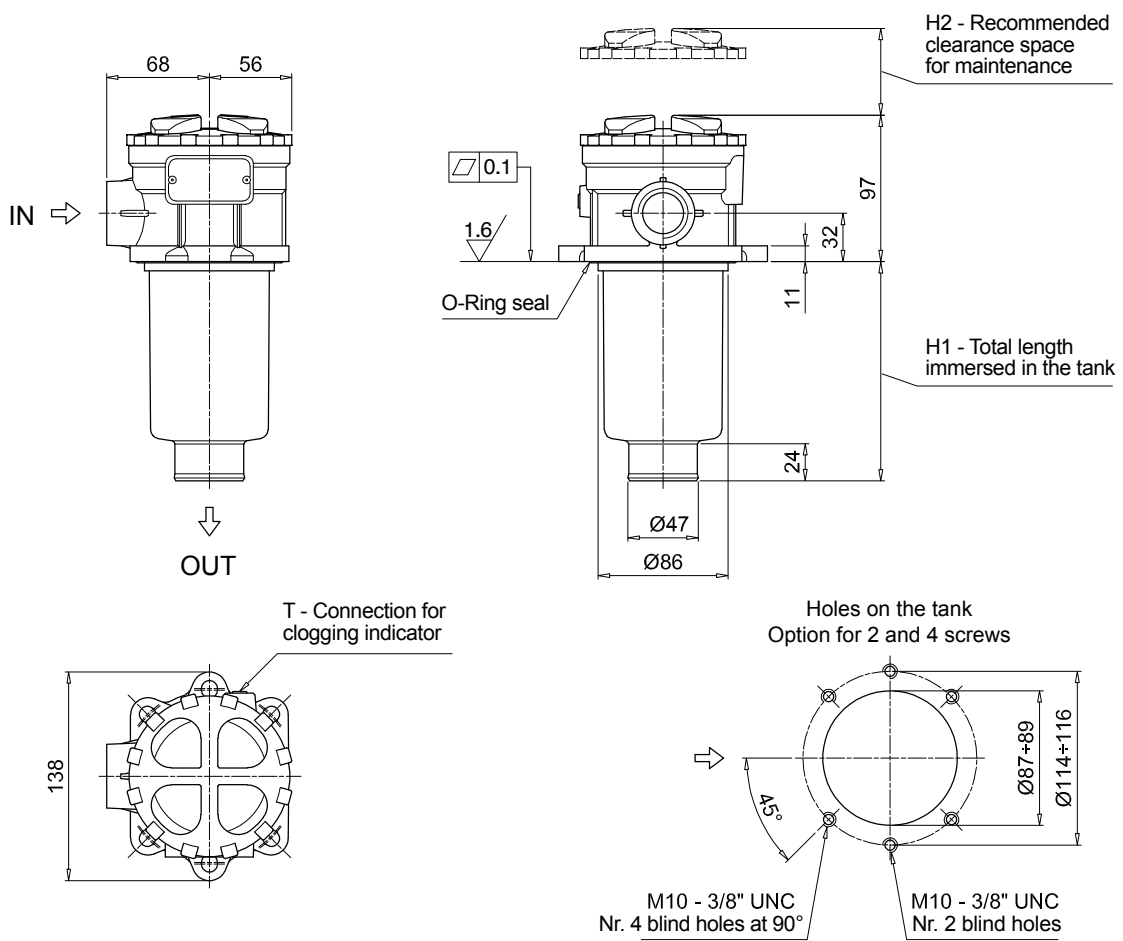
Element series and size	Configuration example 2: MFx100 1 M90 N B E P01								
MFx100 Filter element with private spigot	Configuration example 1: MFx100 2 A03 W V P01								
Element length	1 2 3 4								
Filtration rating (filter media)									
A03 Inorganic microfiber 3 µm	M25 Wire mesh 25 µm								
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		B 1.75 bar		Pxx Customized				

ACCESSORIES

Indicators	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		page
TE Extension tube	248	DPT Dipstick	249
DFS Diffuser with fast lock connection	249		

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



Designation & Ordering code

COMPLETE FILTER

Series and size	Configuration example 1:	MPTX120	1	A	G1	0	A06	E	P01
MPTX120 Filter element with private spigot	Configuration example 2:	MPTX120	3	V	G4	1	M25	B	P01

Length	
1 2 3 4	

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

Main Connections	Rear connections	Aux size 1	Aux size 2
G1 G 3/4"	G 3/4"		
G2 G 1"	G 1"	G 3/8"	G 1/2"
G3 G 1 1/4"	G 3/4"		
G4 3/4" NPT	3/4" NPT		
G5 1" NPT	1" NPT	3/8" NPT	1/2" NPT
G6 1 1/4" NPT	3/4" NPT		
G7 SAE 12 - 1 1/16" - 12 UN	SAE 12 - 1 1/16" - 12 UN		
G8 SAE 16 - 1 5/16" - 12 UN	SAE 16 - 1 5/16" - 12 UN	SAE 6 - 9/16" - 18 UNF	SAE 8 - 3/4" - 16 UNF
G9 SAE 20 - 1 5/8" - 12 UN	SAE 12 - 1 1/16" - 12 UN		

Aux connection - see previous table
0 Not machined 1 Aux size 1 2 Aux size 2

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 1:	MFx100	1	A06	H	B	E	P01
MFx100 Filter element with private spigot	Configuration example 2:	MFx100	3	M25	N	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	•	•	

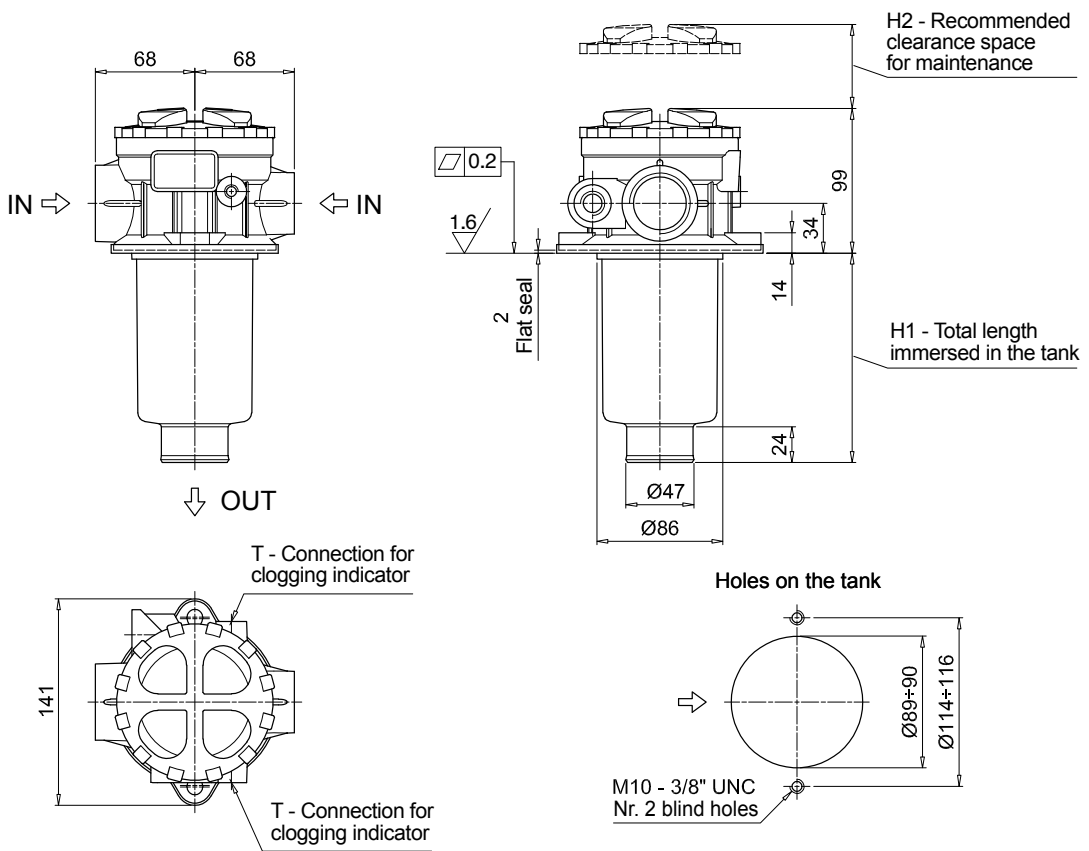
Seals	Bypass valve	Execution
B NBR	E 3 bar	P01 MP Filtri standard
V FPM	1.75 bar	Pxx Customized

ACCESSORIES

Indicators	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		page
TE Extension tube	248	DPT Dipstick	249
DFS Diffuser with fast lock connection	249		

MPTX120		
Filter length	H1 [mm]	H2 [mm]
1	99	120
2	144	170
3	222	250
4	324	350

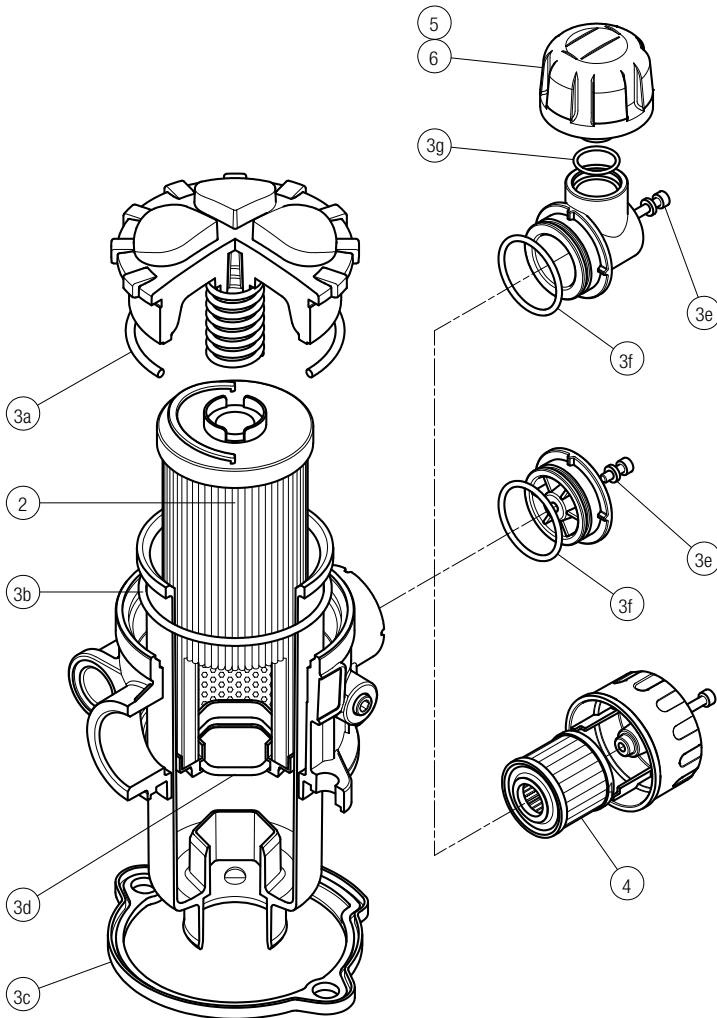
Connections	T
G1-G2-G3	G 1/8"
G4-G5-G6-G7-G8-G9	1/8" NPT



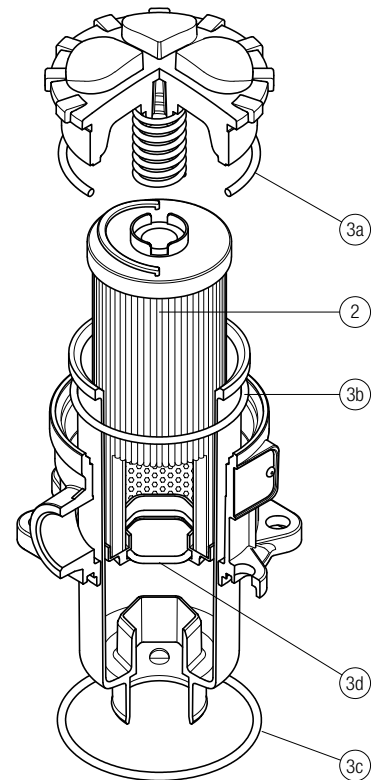
MPTX SPARE PARTS

Order number for spare parts

MPTX 025 - 027 - 110



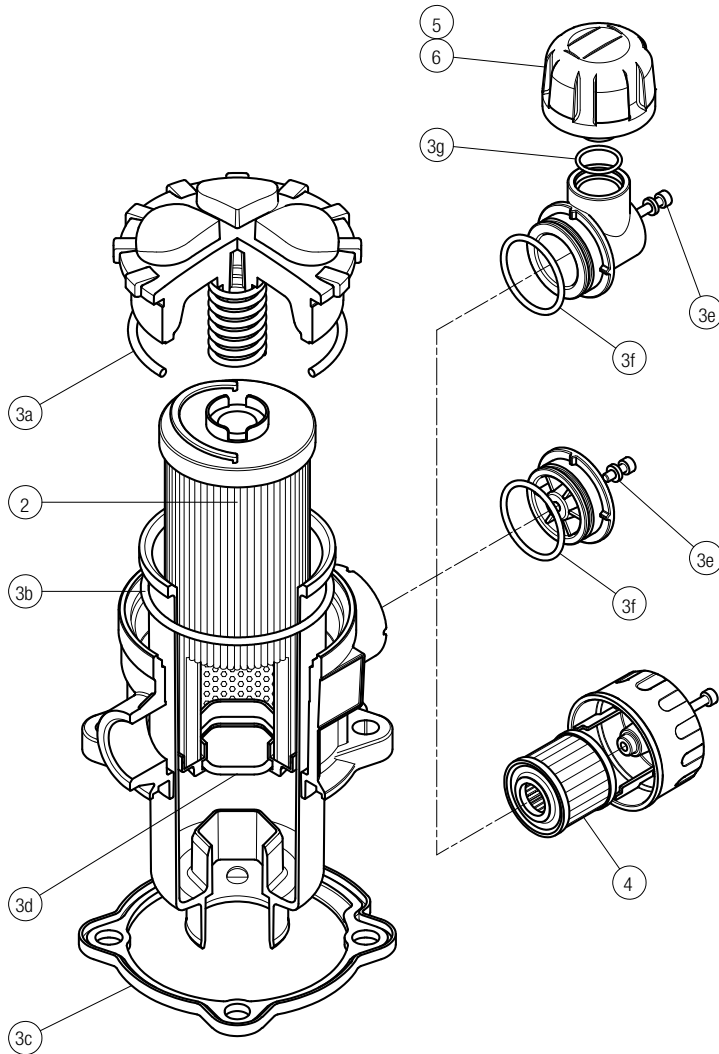
MPTX 116



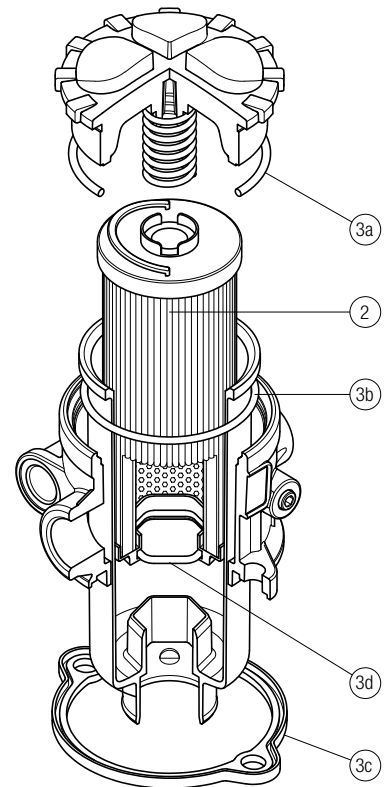
Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number NBR	FPM	Air breather filter element - version:		
				C	D	P
MPTX 025	See order table	02050701	02050702	10 µm A3L03	10 µm SAP50G3L03A0P01	10 µm SAP50G3L03A1P01
MPTX 027		02050703	02050704	10 µm A3L03	10 µm SAP50G3L03A0P01	10 µm SAP50G3L03A1P01
MPTX 110		02050709	02050710	10 µm A5L03	10 µm SAP50G3L03A0P01	10 µm SAP50G3L03A1P01

Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number NBR	FPM
MPTX 116	See order table	02050737	02050738

MPTX 114



MPTX 120



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Air breather filter element - version:		
		NBR	FPM	C	D	P
MPTX 114	See order table	02050707	02050708	10 µm A5L03	10 µm SAP50G3L03A0P01	10 µm SAP50G3L03A1P01

Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number	
		NBR	FPM
MPTX 120	See order table	02050711	02050712

MFBX series

BOWL ASSEMBLY

Maximum working pressure up to 800 kPa (8 bar) - Flow rate up to 700 l/min



Return filter Bowl assembly

Maximum working pressure up to 800 kPa (8 bar)

Flow rate up to 700 l/min

MFBX is a range of return filter kits for protection of the reservoir against the system contamination.

They are directly integrated in the moulded reservoir in immersed or semi-immersed position to save space into the tank.

Treaded or flanged covers can be provided.

The filter output must be always immersed into the fluid to avoid aeration or foam generation into the reservoir.

Available features:

- 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
- 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)
- 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:

Mobile machines

Bowl assembly materials

- Cover
Nylon: MFBX 020-030-100
Aluminium: MFBX 180-190

- Bowl: Nylon

Filter element materials

- Caps: Nylon
- Spring: Spring steel

Bypass valve

- Opening pressure 175 kPa (1.75 bar) $\pm 10\%$
- Opening pressure 300 kPa (3 bar) $\pm 10\%$

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

MFBX filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]					Volumes [dm ³]				
	Length	1	2	3	4	Length	1	2	3	4
MFBX 020		0.25	0.35	0.40	-		0.10	0.15	0.20	-
MFBX 030		0.25	-	-	-		0.15	-	-	-
MFBX 100		0.50	0.60	0.75	0.95		0.35	0.50	0.80	1.10
MFBX 180		1.60	2.40	-	-		1.50	2.90	-	-
MFBX 190		-	2.40	-	-		-	3.00	-	-

Filter series	Length	Filter element design - H series					Filter element design - N series		
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
MFBX 020	1	7	10	23	28	42	59	51	54
	2	17	20	45	48	56	72	64	67
	3	21	24	50	55	59	76	74	75
MFBX 030	1	7	10	24	29	47	84	60	66
MFBX 100	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
MFBX 180	1	127	148	235	243	278	441	285	299
	2	231	262	358	382	388	472	404	412
MFBX 190	2	261	305	489	528	546	696	583	598

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

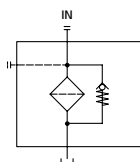
The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols

Filter series	Style 1 connection
MFBX 020	•
MFBX 030	•
MFBX 100	•
MFBX 180	•
MFBX 190	•



Designation & Ordering code

COMPLETE FILTER

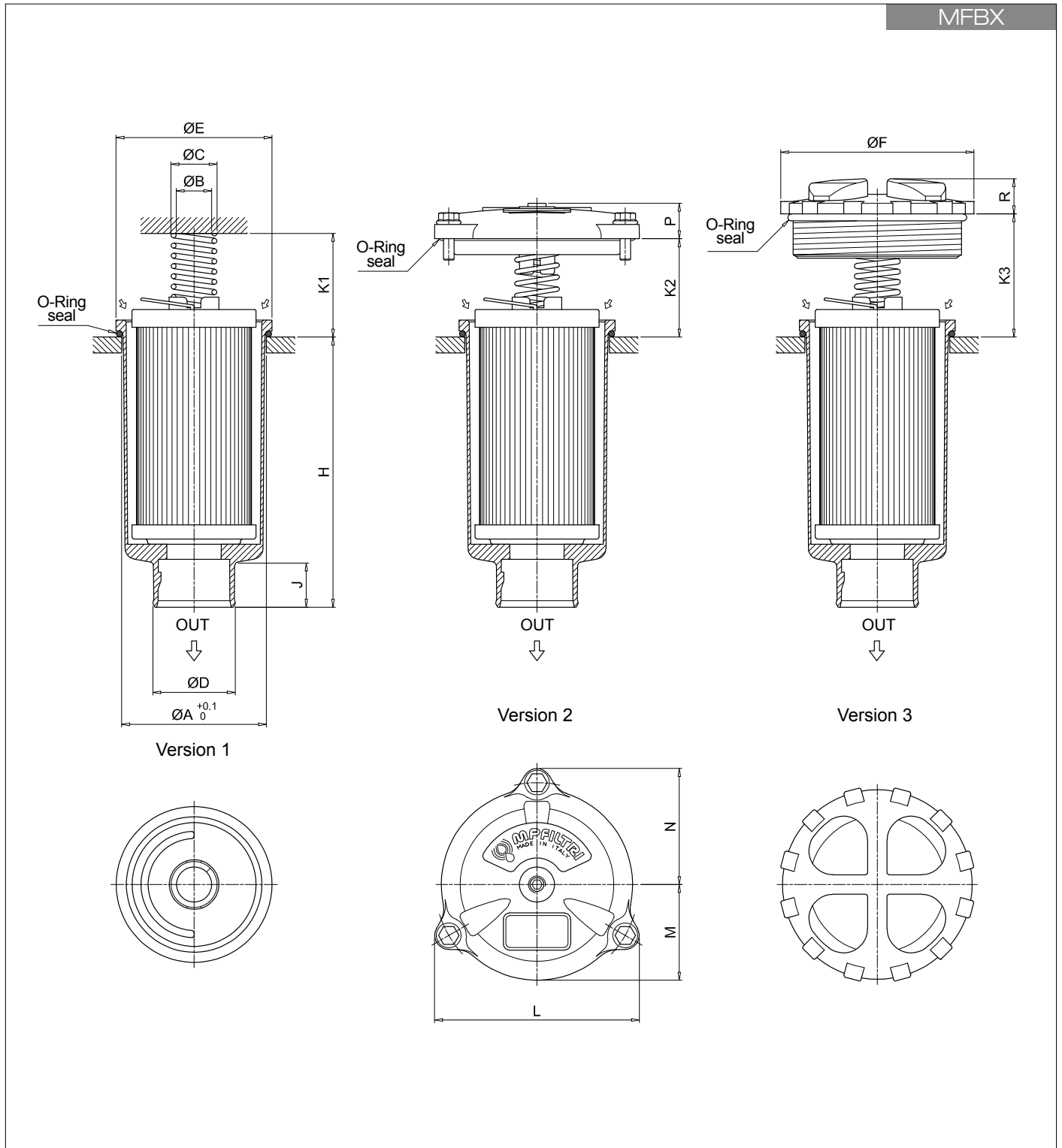
Series and size						Configuration example 1: MFBX100 1 A 2 A10 H E P01								
MFBX020 MFBX030 MFBX100 MFBX180 MFBX190						Configuration example 2: MFBX180 2 V 1 M25 N B P01								
Filter element with private spigot														
Length		MFBX020	MFBX030	MFBX100	MFBX180	MFBX190								
1		•	•	•	•									
2		•		•	•	•								
3		•		•										
4				•										
Seals														
A NBR														
V FPM														
Version		MFBX020	MFBX030	MFBX100	MFBX180	MFBX190								
1	Without cover	•	•	•	•	•								
2	With flanged cover type MPF		•	•	•	•								
3	With threaded cover type MPT	•		•										
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												
Filter media														
Element Δp		Axx			Mxx			Pxx						
N	10 bar					•								
H	10 bar				•									
W	10 bar, compatible with fluids HFA, HFB and HFC			•	•									
						Bypass valve		Execution						
						E 3 bar		P01 MP Filtri standard						
						B 1.75 bar		Pxx Customized						

FILTER ELEMENT

Element series and size						Configuration example 1: MFX180 2 M25 H V P01								
MFX020 MFX030 MFX100 MFX180						Configuration example 2: MFX100 1 A10 N B E P01								
Filter element with private spigot														
Element length		MFX020	MFX030	MFX100	MFX180	MFX190								
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												
Filter media														
Element Δp		Axx			Mxx			Pxx						
N	10 bar					•								
H	10 bar				•									
						Seals		Bypass valve		Execution				
						B NBR		E 3 bar		P01 MP Filtri standard				
						V FPM		 1.75 bar		Pxx Customized				

ACCESSORIES

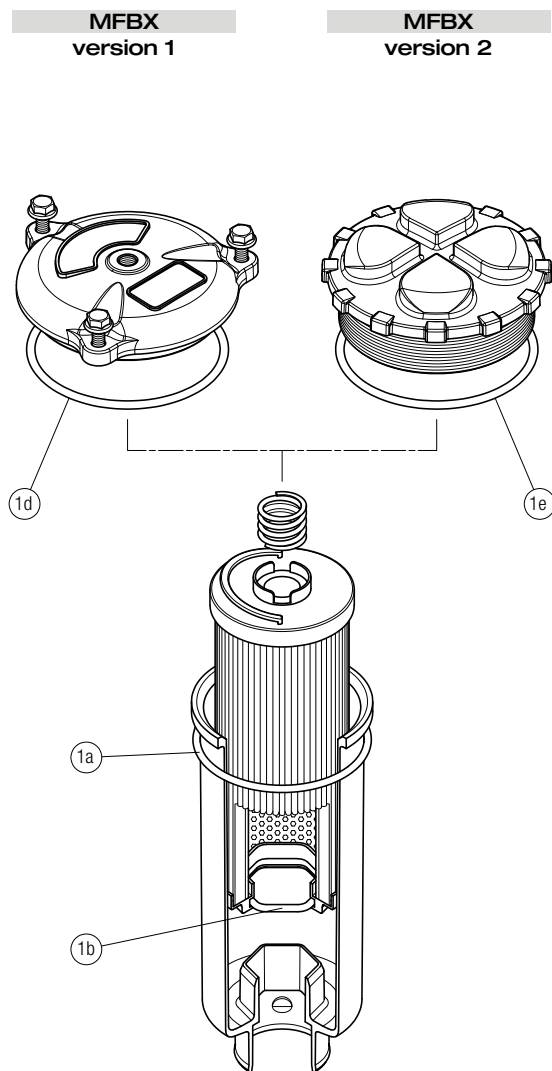
Additional features											page	
		MFBX020	MFBX030	MFBX100	MFBX180	MFBX190						
TE	Extension tube	•	•	•	•	•						248
DFS	Diffuser with fast lock connection			•								249



Filter size	Filter Length	ø A [mm]	ø B [mm]	ø C [mm]	ø D [mm]	ø E [mm]	ø F [mm]	H [mm]	J [mm]	K1 [mm]	K2 [mm]	K3 [mm]	L [mm]	M [mm]	N [mm]	P [mm]	R [mm]
020	1	52	20.5	26	32	56	75	111	24	42	-	36	-	-	-	-	18
	2	52	20.5	26	32	56	75	175	24	42	-	36	-	-	-	-	18
	3	52	20.5	26	32	56	75	214	24	42	-	36	-	-	-	-	18
030	1	60.5	20	25.5	32	68	-	93	21	33	35	-	92	42	52	18	-
	2	80.5	20	26	47	88	111	109	24	58	55	69	116	54	66	20	20
100	1	80.5	20	26	47	88	111	154	24	58	55	69	116	54	66	20	20
	2	80.5	20	26	47	88	111	232	24	58	55	69	116	54	66	20	20
	3	80.5	20	26	47	88	111	334	24	58	55	69	116	54	66	20	20
180	1	112.5	26	33.5	47	121	-	234	31	58	69	-	159	76	95	21	-
	2	112.5	26	33.5	47	121	-	447	31	58	69	-	159	76	95	21	-
190	2	112.5	26	33.5	50	121	-	454	38	58	69	-	159	76	95	21	-

MFBX SPARE PARTS

Order number for spare parts



Item: Q.ty: 1 pc.		
1 (1a ÷ 1d)		
Filter series	Seal Kit code number	
	NBR	FPM
MFBX 020	02050713	02050714
MFBX 030	02050715	02050716
MFBX 100	02050717	02050718
MFBX 180-190	02050719	02050720

MPF series

Maximum working pressure up to 800 kPa (8 bar) - Flow rate up to 900 l/min



Description

Technical data

Return filter

Maximum working pressure up to 800 kPa (8 bar)

Flow rate up to 900 l/min

MPF is a range of return filters 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 2" and flanged connections up to 2", for a maximum flow rate of 900 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, 3 or 4 fixing holes for installation, to suit a variety of reservoir surfaces
- O-ring or Flat Seal to suit a variety of reservoir surfaces
- 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)
- Filler plug, to fill cleaned fluid into the tank without an additional connection
- Visual, electrical and electronic clogging indicators

Common applications:

- Light industrial equipment
- Mobile application

Filter housing materials

- Head: Aluminium

- Cover

Nylon: MPF 020-030-100-104-110

Aluminium: MPF 181-182-184-191-192-194-400-410-450-451-750

- Bowl: Nylon

Bypass valve

- Opening pressure 175 kPa (1.75 bar) $\pm 10\%$

- Opening pressure 300 kPa (3 bar) $\pm 10\%$

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

MPF filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]				Volumes [dm ³]					
	Length	1	2	3	4	Length	1	2	3	4
MPF 020		0.30	-	-	-		0.26	-	-	-
MPF 030		0.40	-	-	-		0.29	-	-	-
MPF 100		0.61	0.64	0.67	0.74		0.64	0.85	1.20	1.65
MPF 104		0.82	0.96	1.02	1.25		0.64	0.85	1.20	1.65
MPF 110		0.64	0.68	0.71	0.78		-	-	-	-
MPF 181		2.20	3.00	-	-		2.50	4.00	-	-
MPF 182		2.30	3.10	-	-		2.50	4.00	-	-
MPF 184		2.55	3.45	-	-		2.65	4.45	-	-
MPF 191		-	3.00	-	-		-	4.25	-	-
MPF 192		-	3.10	-	-		-	4.25	-	-
MPF 194		-	3.45	-	-		-	4.45	-	-
MPF 400		3.35	3.65	3.90	-		3.70	4.60	5.40	-
MPF 410		3.55	3.85	4.10	-		3.70	4.60	5.40	-
MPF 450-451		3.95	4.25	4.50	-		3.70	4.60	5.40	-
MPF 750		6.30	-	-	-		8.45	-	-	-

Filter series	Length	Filter element design - H series					Filter element design - N series		
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
MPF 020	1	7	10	23	28	42	59	51	54
MPF 030	1	7	10	24	29	47	84	60	66
MPF 100-104-110	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
MPF 181-182-184	1	127	148	235	243	278	441	285	299
	2	231	262	358	382	388	472	404	412
MPF 191-192-194	2	261	305	489	528	546	696	583	598
MPF 400	1	150	171	294	304	350	585	370	390
	2	237	252	454	462	589	868	619	645
	3	248	288	553	609	621	885	680	703
MPF 410	1	146	167	277	285	325	512	341	357
	2	226	239	396	402	485	644	503	519
	3	236	269	462	497	505	653	539	553
MPF 450-451	1	150	171	294	304	350	585	370	390
	2	237	252	454	462	589	868	619	645
	3	248	288	553	609	621	885	680	703
MPF 750	1	392	465	623	700	769	929	804	819

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

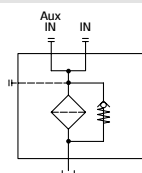
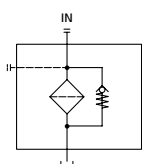
The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

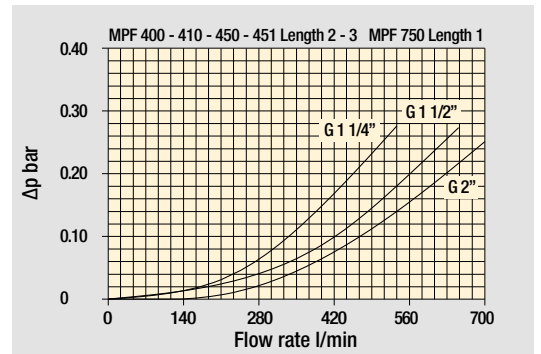
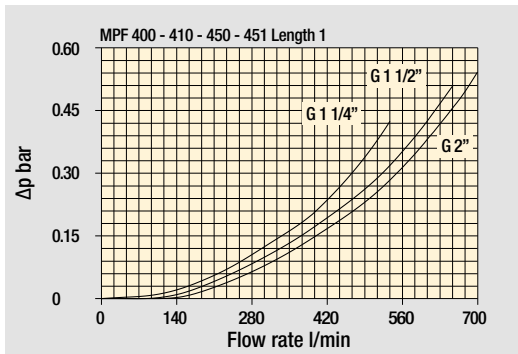
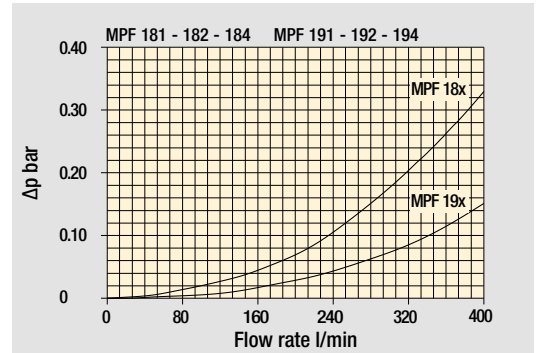
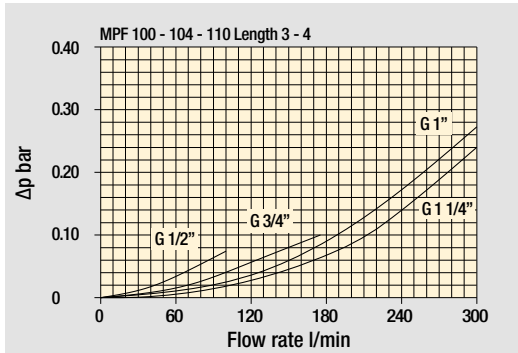
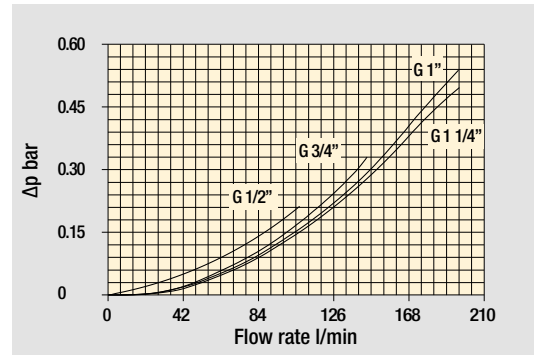
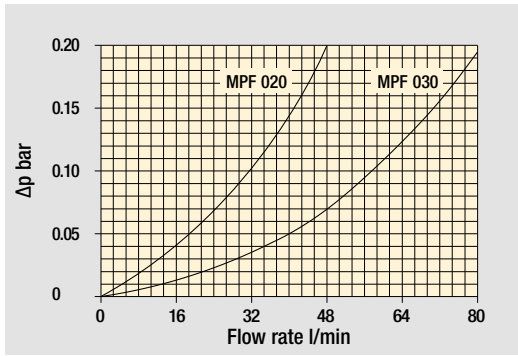
Hydraulic symbols

Filter series	Style 1 connection	Style 2 connections
MPF 020	•	
MPF 030	•	
MPF 100	•	
MPF 104	•	
MPF 110		•
MPF 181	•	
MPF 182		•
MPF 184	•	•
MPF 191	•	
MPF 192	•	
MPF 194	•	•
MPF 400	•	
MPF 410		•
MPF 450	•	
MPF 451		•
MPF 750	•	

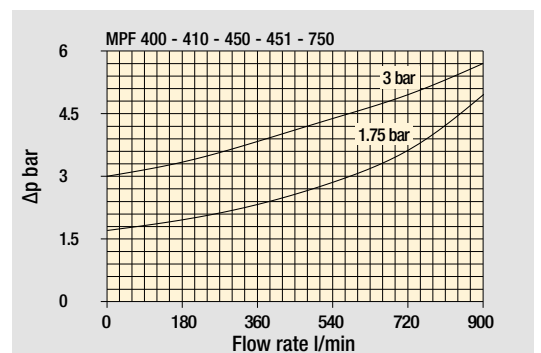
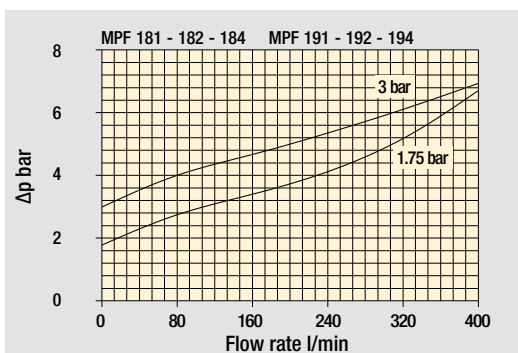
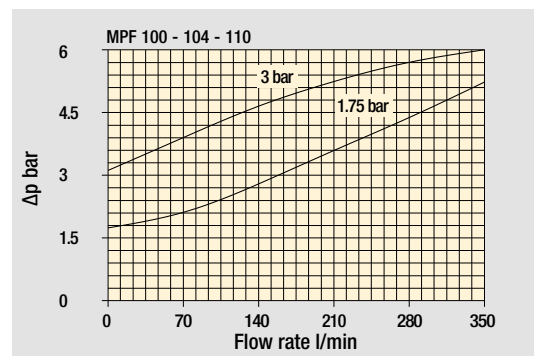
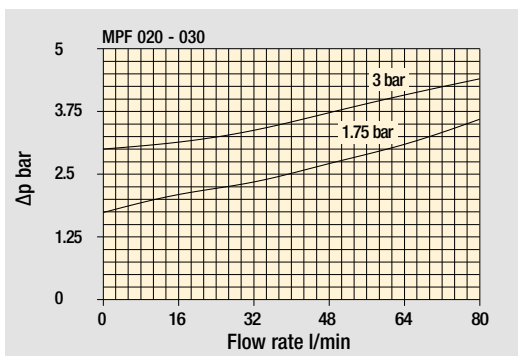


Pressure drop

Filter housings Δp pressure drop



Bypass valve pressure drop

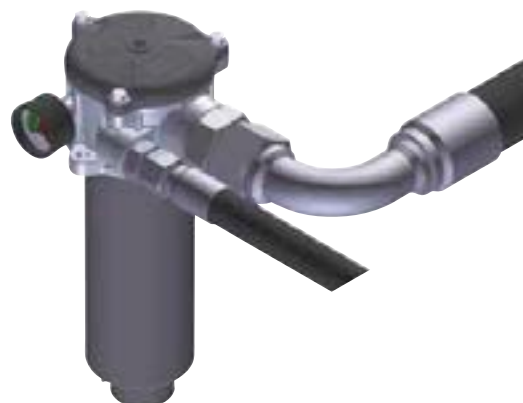


The curves are plotted using mineral oil with density of 0.86 kg/dm³ in compliance with ISO 3968. Δp varies proportionally with density.

Standard - Single IN port



Double IN port
Option: double indicator port



Double IN port - Drain port
Option: indicator port



Double IN port - Double drain port



MPF MPF020 - MPF030

Designation & Ordering code

COMPLETE FILTER

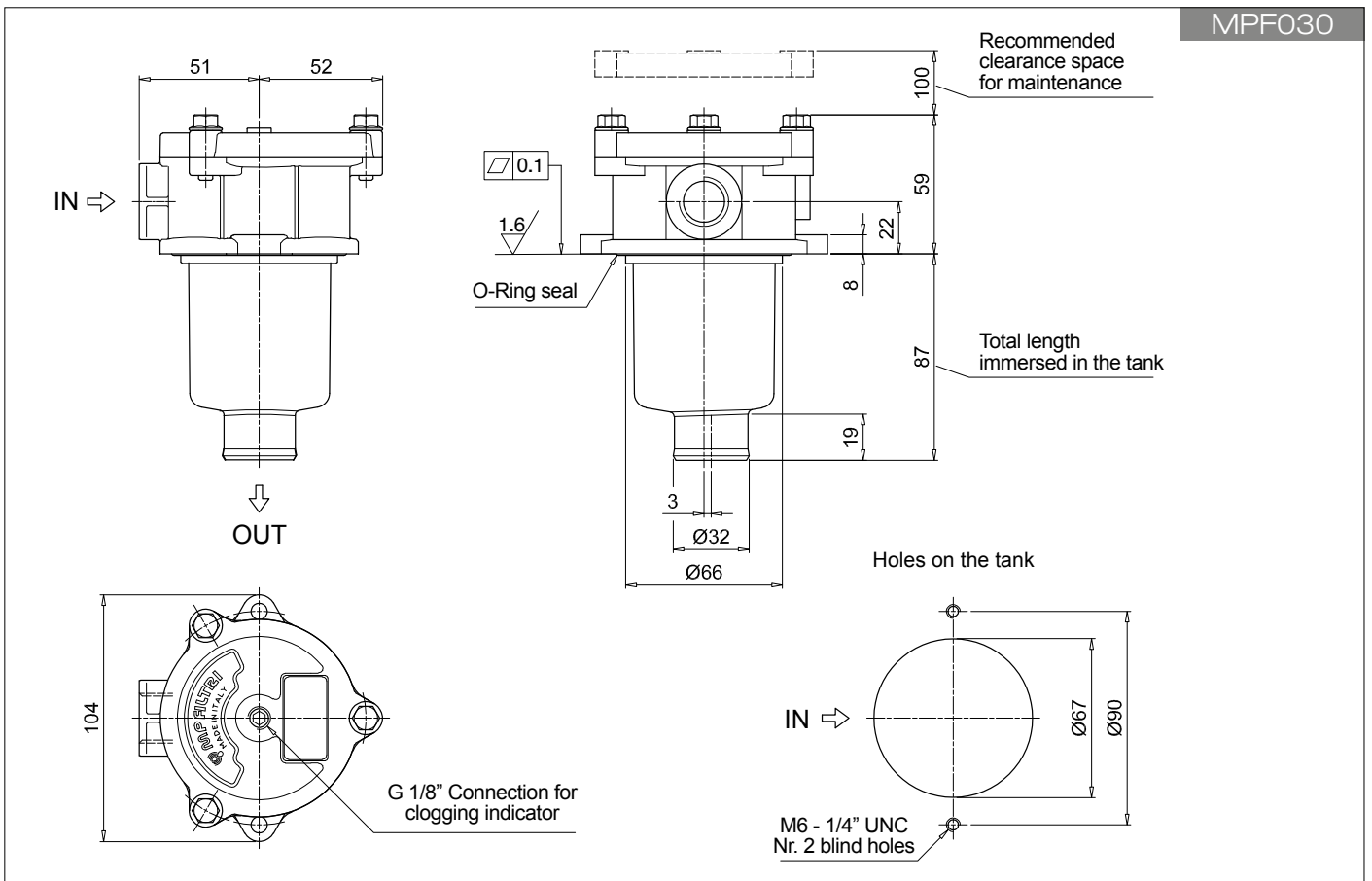
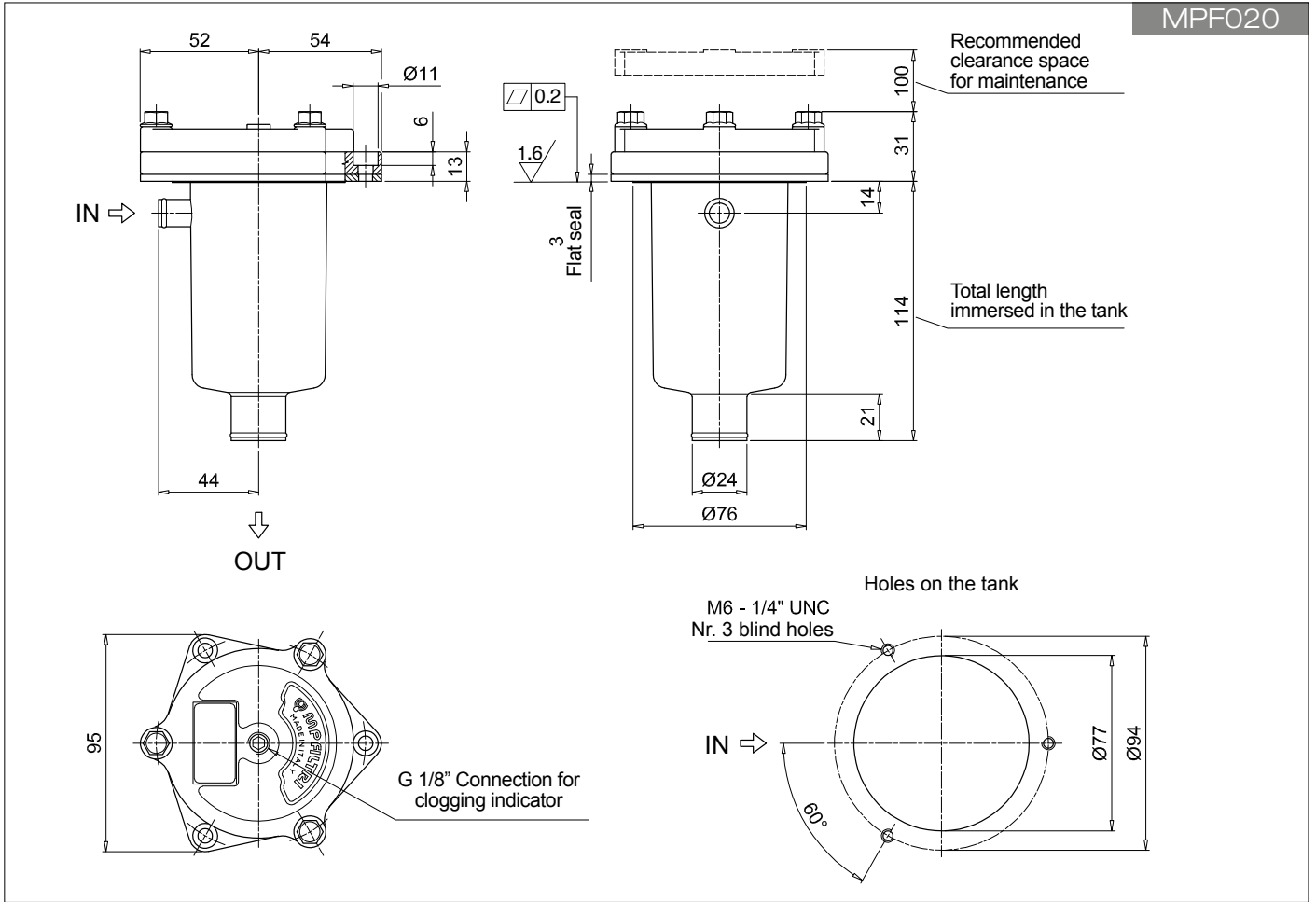
Series and size	Configuration example 1:	MPF020	1	A	P1	A10	H	E	P01
MPF020 MPF030 Filter element with standard spigot	Configuration example 2:	MPF030	1	V	G1	M25	N	B	P01
Length									
1									
Seals and treatments									
A NBR									
V FPM									
W NBR head anodized									
Z FPM head anodized									
Connections	Size 20	Size 30							
P1 Hose barb ø12	•								
G1 G 1/2"		•							
G4 1/2" NPT		•							
G7 SAE 8 - 3/4" - 16 UNF		•							
Filtration rating (filter media)									
A03 Inorganic microfiber 3 µm									
A06 Inorganic microfiber 6 µm									
A10 Inorganic microfiber 10 µm									
A16 Inorganic microfiber 16 µm									
A25 Inorganic microfiber 25 µm									
M25 Wire mesh 25 µm									
M60 Wire mesh 60 µm									
M90 Wire mesh 90 µm									
P10 Resin impregnated paper 10 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	•	•							
				Bypass valve	Execution				
				E 3 bar	P01 MP Filtri standard				
				B 1.75 bar	Pxx Customized				

FILTER ELEMENT

Element series and size	Configuration example 1:	MF030	1	A10	H	B	E	P01
MF030 Filter element with standard spigot	Configuration example 2:	MF030	1	M25	N	V		P01
Element length								
1								
Filtration rating (filter media)								
A03 Inorganic microfiber 3 µm								
A06 Inorganic microfiber 6 µm								
A10 Inorganic microfiber 10 µm								
A16 Inorganic microfiber 16 µm								
A25 Inorganic microfiber 25 µm								
M25 Wire mesh 25 µm								
M60 Wire mesh 60 µm								
M90 Wire mesh 90 µm								
P10 Resin impregnated paper 10 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	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		
TE Extension tube	248		
T5 Filler plug M30x1.5	249		



MPF MPF100 - MPF104

Designation & Ordering code

COMPLETE FILTER

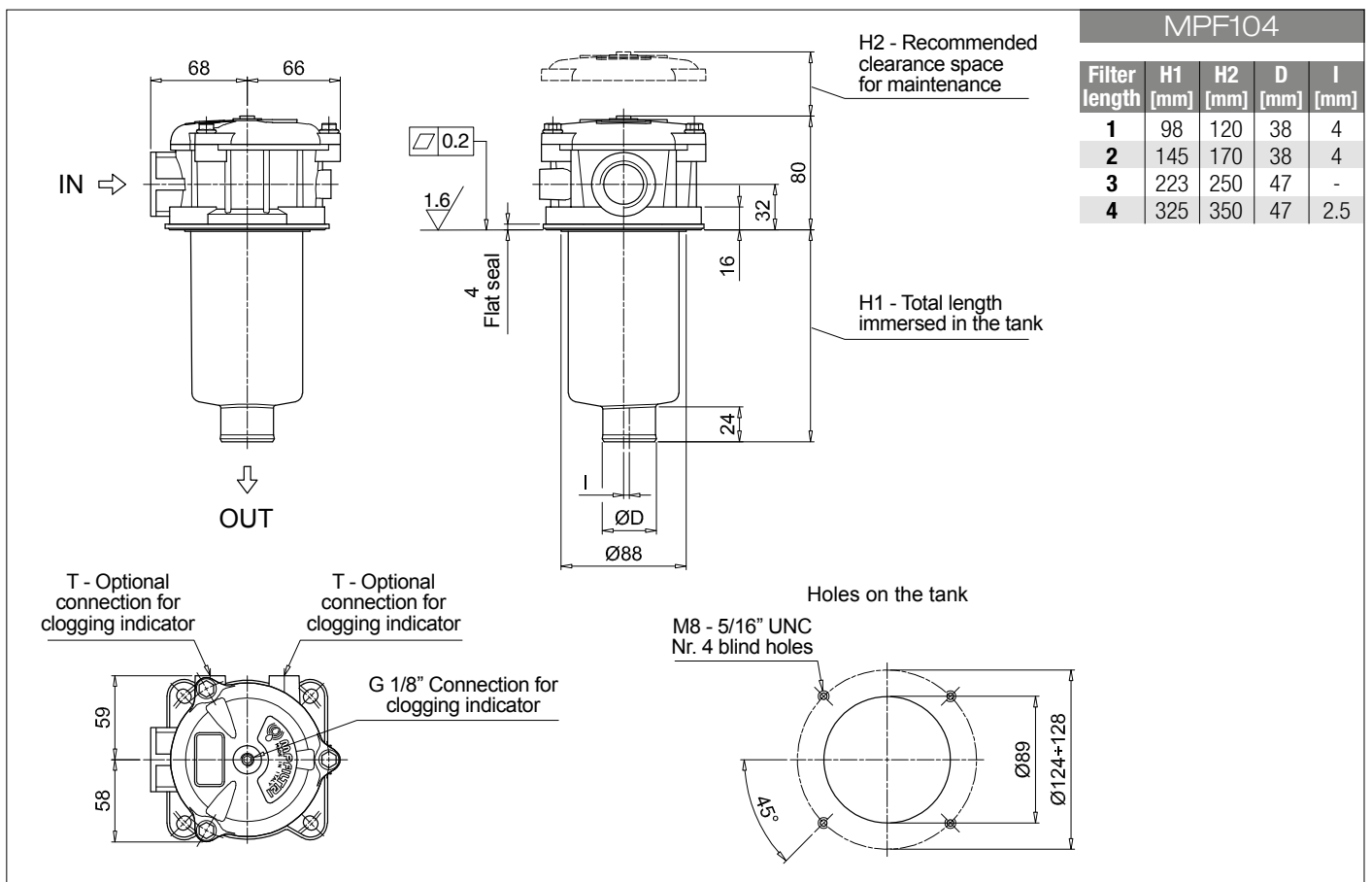
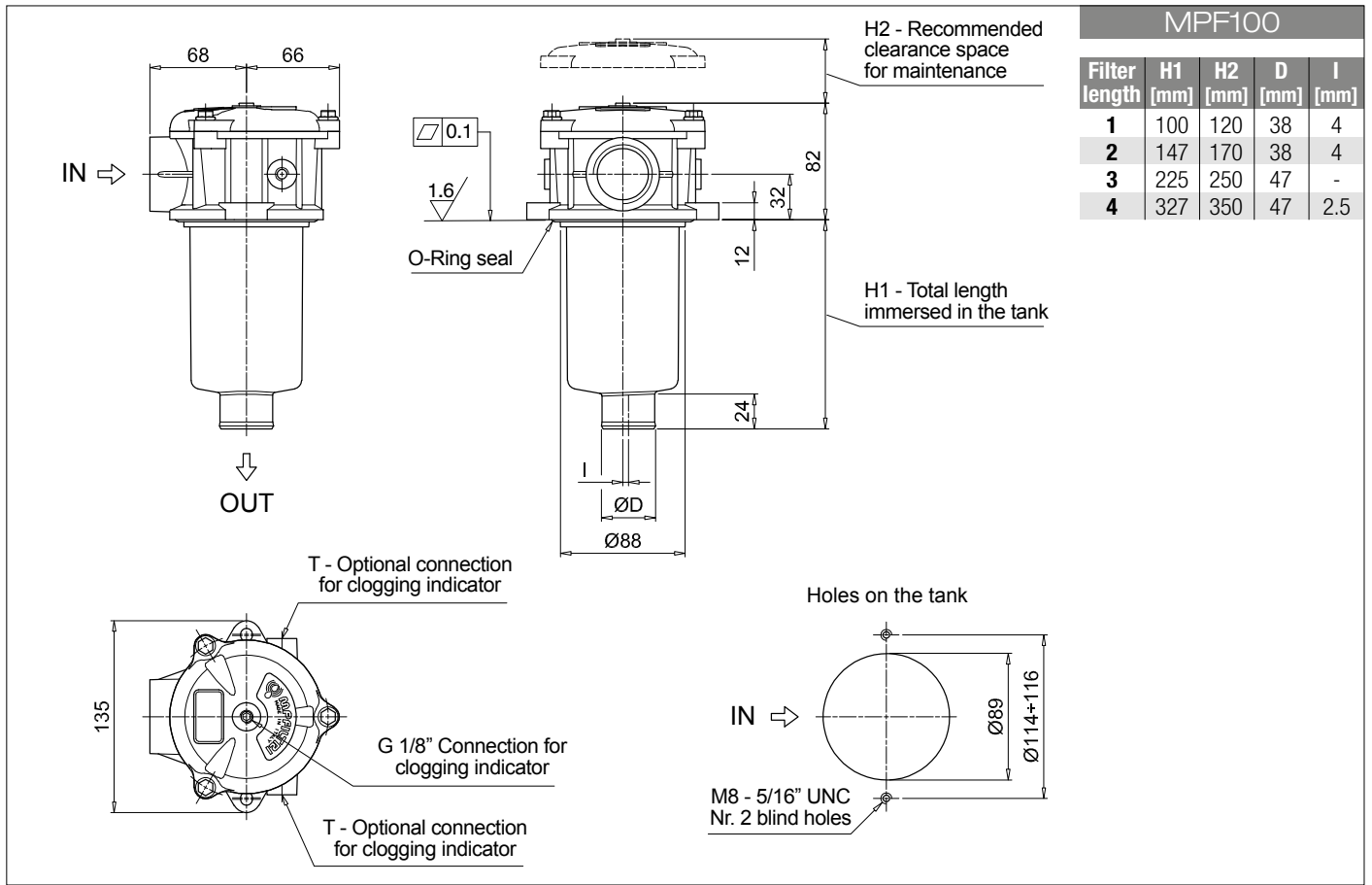
Series and size		Configuration example 1: MPF100 2 W G3 A06 W B P01									
MPF100 MPF104 Filter element with standard spigot		Configuration example 2: MPF104 4 A G8 P10 N E P01									
Length											
1 2 3 4											
Seals and treatments											
A NBR											
V FPM											
W NBR head anodized											
Z FPM head anodized											
Connections		Size 100		Size 104		Connections		Size 100		Size 104	
G1 G 1/2"		•		•		G7 SAE 8 - 3/4" - 16 UNF		•		•	
G2 G 3/4"		•		•		G8 SAE 12 - 1 1/16" - 12 UN		•		•	
G3 G 1"		•		•		G9 SAE 16 - 1 5/16" - 12 UN		•		•	
G4 1/2" NPT		•		•							
G5 3/4" NPT		•		•							
G6 1" NPT		•		•							
Filtration rating (filter media)											
A03 Inorganic microfiber 3 µm											
A06 Inorganic microfiber 6 µm											
A10 Inorganic microfiber 10 µm											
A16 Inorganic microfiber 16 µm											
A25 Inorganic microfiber 25 µm											
M25 Wire mesh 25 µm											
M60 Wire mesh 60 µm											
M90 Wire mesh 90 µm											
P10 Resin impregnated paper 10 µm											
P25 Resin impregnated paper 25 µm											
Element Δp		Axx		Mxx		Pxx		Filter media			
N 10 bar				•		•					
H 10 bar				•							
W 10 bar, compatible with fluids HFA, HFB and HFC		•		•							
								Bypass valve		Execution	
								E 3 bar		P01 MP Filtri standard	
								B 1.75 bar		Pxx Customized	

FILTER ELEMENT

Element series and size		Configuration example 1: MF100 2 A06 W B P01									
MF100 Filter element with standard spigot		Configuration example 2: MF100 4 P10 N B E P01									
Element length											
1 2 3 4											
Filtration rating (filter media)											
A03 Inorganic microfiber 3 µm											
A06 Inorganic microfiber 6 µm											
A10 Inorganic microfiber 10 µm											
A16 Inorganic microfiber 16 µm											
A25 Inorganic microfiber 25 µm											
M25 Wire mesh 25 µm											
M60 Wire mesh 60 µm											
M90 Wire mesh 90 µm											
P10 Resin impregnated paper 10 µm											
P25 Resin impregnated paper 25 µm											
Element Δp		Axx		Mxx		Pxx		Filter media			
N 10 bar				•		•					
H 10 bar				•							
W 10 bar, compatible with fluids HFA, HFB and HFC		•		•							
								Seals		Bypass valve	
								B NBR		E 3 bar	
								V FPM		1.75 bar	
										Execution	
										P01 MP Filtri standard	
										Pxx Customized	

ACCESSORIES

Indicators		page		page	
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239		
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239		
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240		
BVQ Visual pressure indicator with manual reset	241				
Additional features		page		page	
TE Extension tube	248	T5 Filler plug M30x1.5	249		
DFS Diffuser with fast lock connection	249	DPT Dipstick	249		



Designation & Ordering code

COMPLETE FILTER

Series and size	Configuration example 1:	MPF110	2	A	G2	1	A16	H	E	P01
MPF110 Filter element with standard spigot	Configuration example 2:	MPF110	4	V	G12	1	M60	N	B	P01

Length	1	2	3	4
---------------	---	---	---	---

Seals and treatments	A NBR	W NBR head anodized
	V FPM	Z FPM head anodized

Main Connections	Aux size 1	Aux size 2	Main Connections	Aux size 1	Aux size 2
G1 G 1/2"	G 3/8"	G 1/2"	G7 SAE 8 - 3/4" - 16 UNF	SAE 6 - 9/16" - 18 UNF	SAE 8 - 3/4" - 16 UNF
G2 G 3/4"			G8 SAE 12 - 1 1/16" - 12 UN		
G3 G 1"			G9 SAE 16 - 1 5/16" - 12 UN		
G4 1/2" NPT	3/8" NPT	1/2" NPT	G10 G 1 1/4"	G 3/8"	G 1/2"
G5 3/4" NPT			G11 1 1/4" NPT	3/8" NPT	1/2" NPT
G6 1" NPT			G12 SAE 20 - 1 5/8" - 12 UN	SAE 6 - 9/16" - 18 UNF	SAE 8 - 3/4" - 16 UNF

Aux connection - see previous table	1 Aux size 1	2 Aux size 2
--	---------------------	---------------------

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	•	•	

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

FILTER ELEMENT

Element series and size	Configuration example 1:	MF100	2	A16	H	B	E	P01
MF100 Filter element with standard spigot	Configuration example 2:	MF100	4	M60	N	V		P01

Element length	1	2	3	4
-----------------------	---	---	---	---

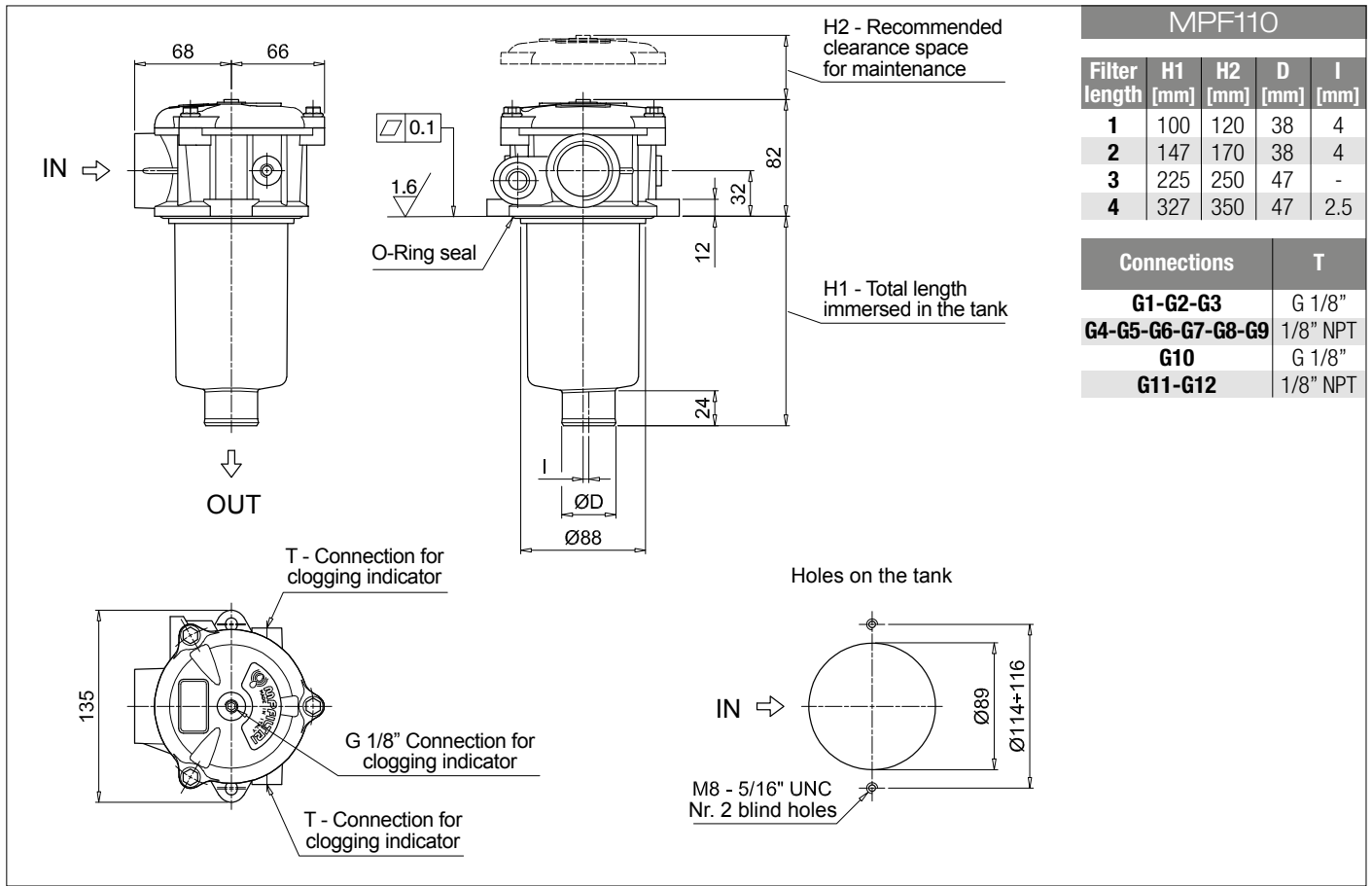
Filtration rating (filter media)	A03 Inorganic microfiber 3 µm	M25 Wire mesh 25 µm
	A06 Inorganic microfiber 6 µm	M60 Wire mesh 60 µm
	A10 Inorganic microfiber 10 µm	M90 Wire mesh 90 µm
	A16 Inorganic microfiber 16 µm	P10 Resin impregnated paper 10 µm
	A25 Inorganic microfiber 25 µm	P25 Resin impregnated 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	B 1.75 bar	Pxx Customized

ACCESSORIES

Indicators	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		page
TE Extension tube	248	T5 Filler plug M30x1.5	249
DFS Diffuser with fast lock connection	249	DPT Dipstick	249



MPF110				
Filter length	H1 [mm]	H2 [mm]	D [mm]	I [mm]
1	100	120	38	4
2	147	170	38	4
3	225	250	47	-
4	327	350	47	2.5

Connections	T
G1-G2-G3	G 1/8"
G4-G5-G6-G7-G8-G9	1/8" NPT
G10	G 1/8"
G11-G12	1/8" NPT

MPF MPF181 - MPF191

Designation & Ordering code

COMPLETE FILTER

Series and size MPF181 MPF191 Filter element with standard spigot	Configuration example 1:	MPF181	1	A	G1	A25	H	E	P01
	Configuration example 2:	MPF191	2	V	G2	P10	N	B	P01

Length	Size 181	Size 191
1	•	
2	•	•

Seals and treatments	
A NBR	B NBR flat seal on head
V FPM	D FPM flat seal on head
W NBR head anodized	L NBR head anodized, flat seal on head
Z FPM head anodized	M FPM head anodized, flat seal on head

Connections	
G1 G 1 1/4"	G5 1 1/2" NPT
G2 G 1 1/2"	G7 SAE 20 - 1 5/8" - 12 UN
G4 1 1/4" NPT	G8 SAE 24 - 1 7/8" - 12 UN

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	•	•	

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

FILTER ELEMENT

Element series and size MF180 MF190 Filter element with standard spigot	Configuration example 1:	MF180	1	A25	H	B	E	P01
	Configuration example 2:	MF190	2	P10	N	V		P01

Element length	Size 180	Size 190
1	•	
2	•	•

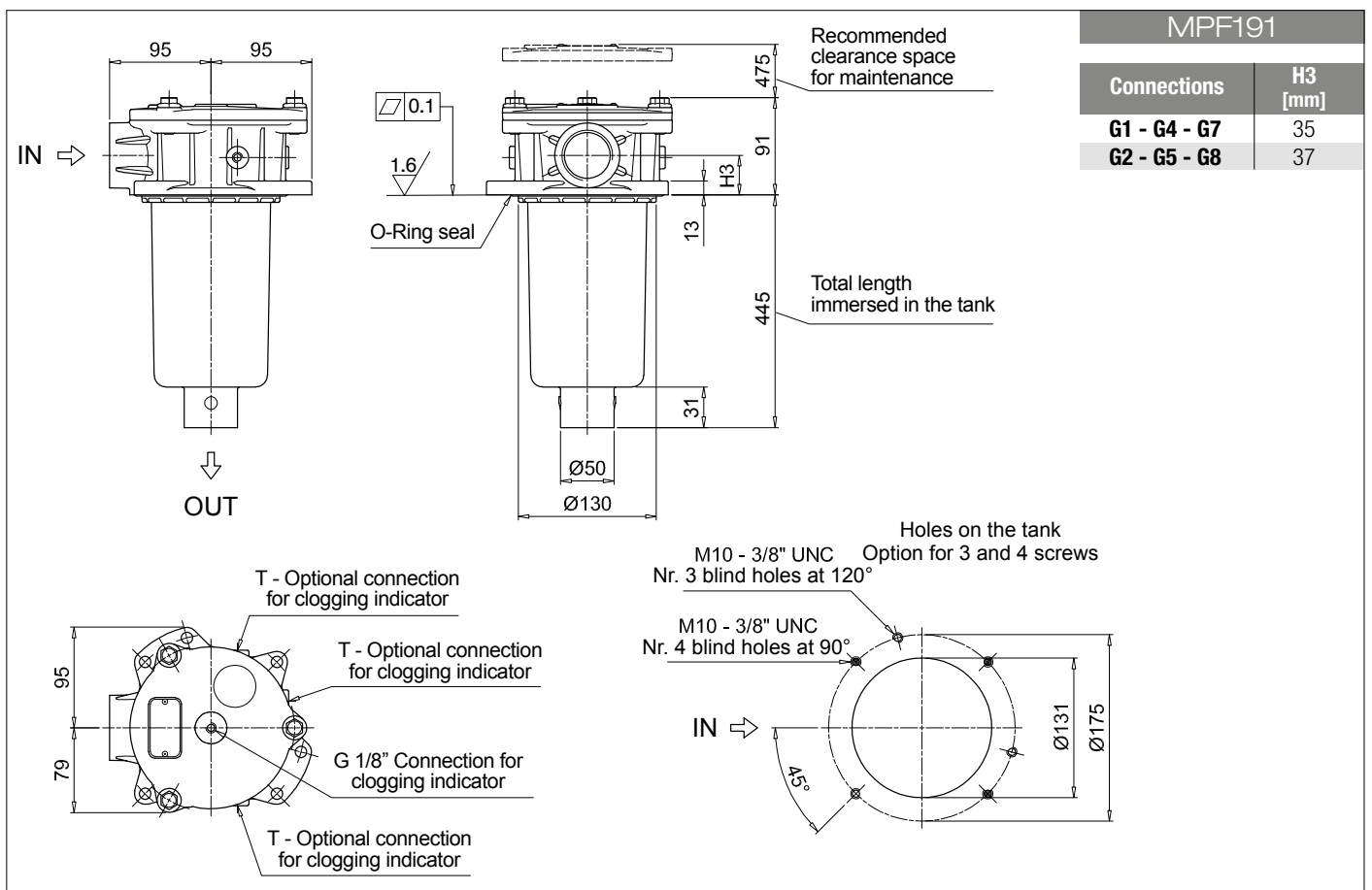
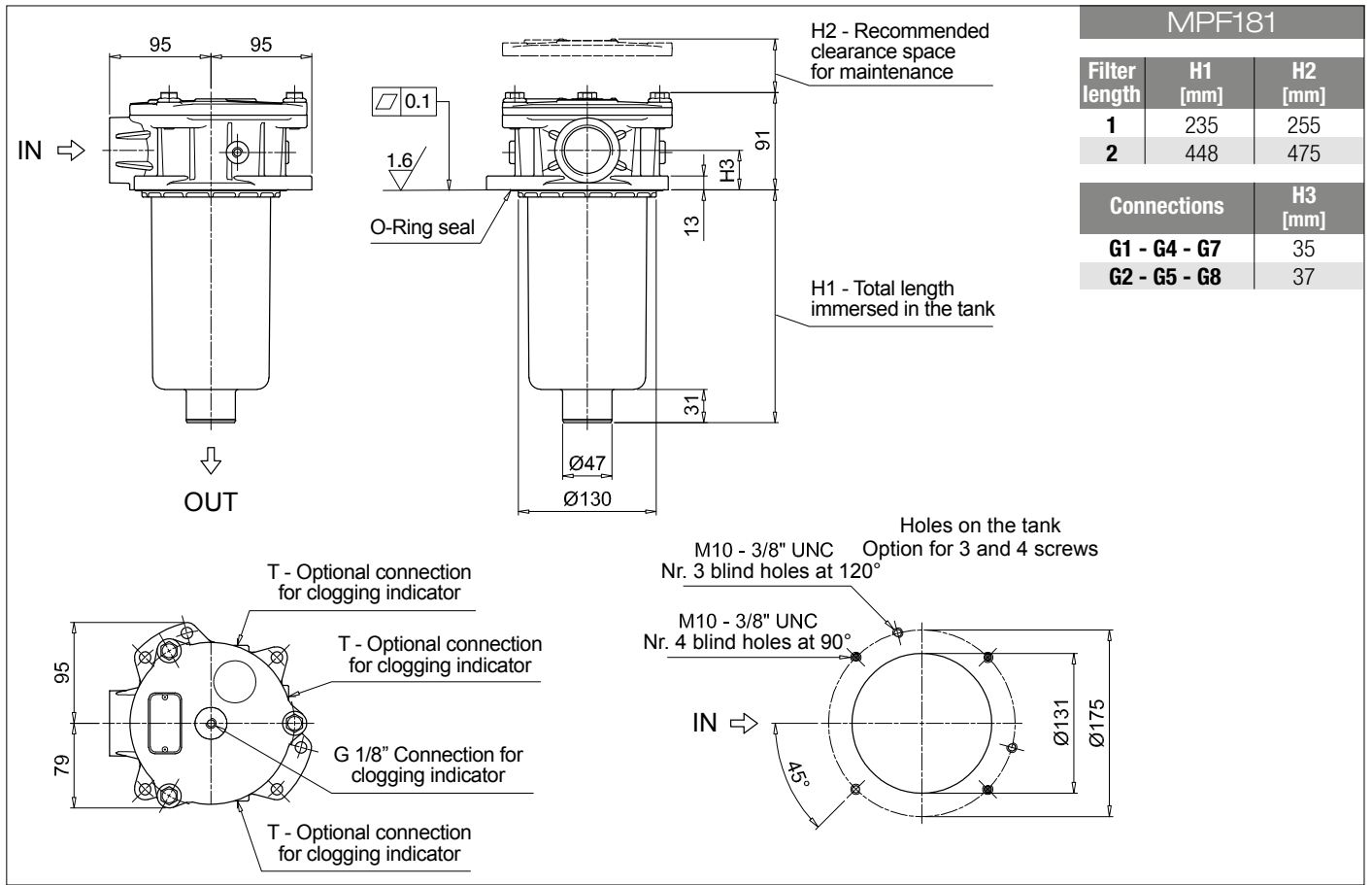
Filtration rating (filter media)	
A03 Inorganic microfiber 3 µm	M25 Wire mesh 25 µm
A06 Inorganic microfiber 6 µm	M60 Wire mesh 60 µm
A10 Inorganic microfiber 10 µm	M90 Wire mesh 90 µm
A16 Inorganic microfiber 16 µm	P10 Resin impregnated paper 10 µm
A25 Inorganic microfiber 25 µm	P25 Resin impregnated 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	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		
TE Extension tube	248		
Sxx Extension tube	248		
T5 Filler plug M30x1.5	249		



MPF MPF182 - MPF192

Designation & Ordering code

COMPLETE FILTER

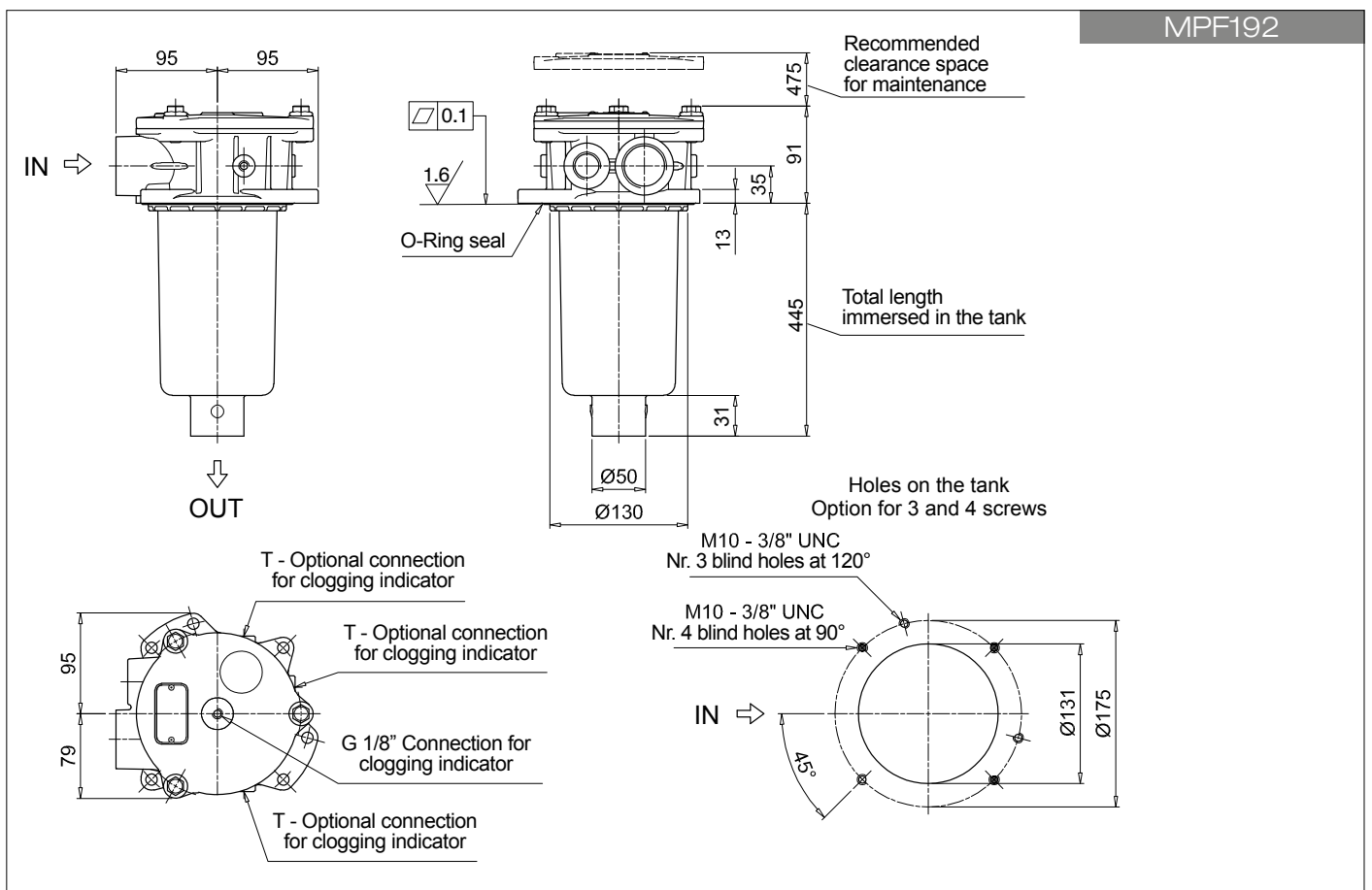
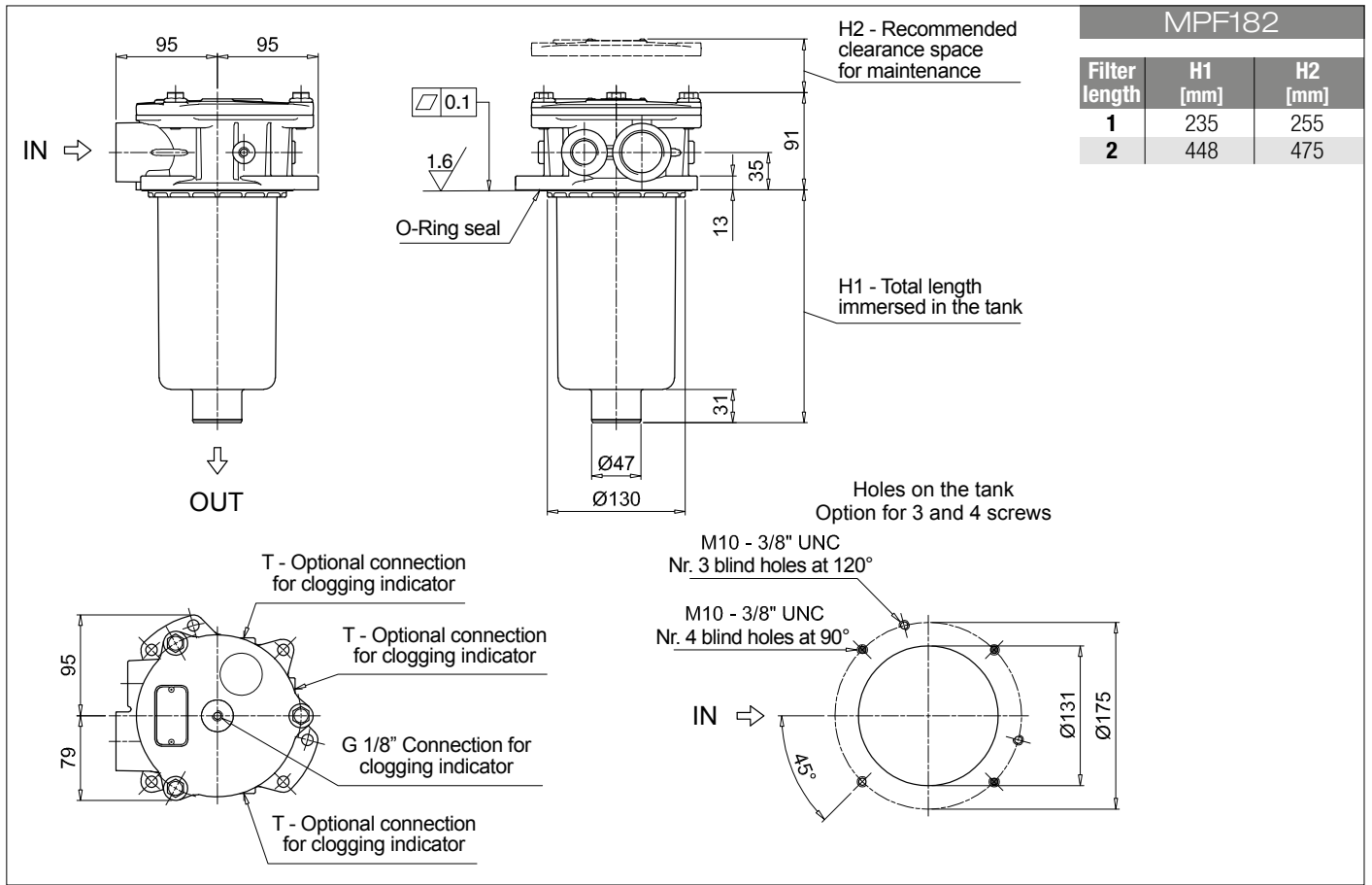
Series and size		Configuration example 1: MPF182 1 A G1 1 A25 H E P01									
MPF182 MPF192 Filter element with standard spigot		Configuration example 2: MPF192 2 V G4 2 P10 N B P01									
Length		Size 182		Size 192							
1		•									
2		•		•							
Seals and treatments											
A NBR		B NBR flat seal on head									
V FPM		D FPM flat seal on head									
W NBR head anodized		L NBR head anodized, flat seal on head									
Z FPM head anodized		M FPM head anodized, flat seal on head									
Main Connections			Aux size 1			Aux size 2					
G1 G 1 1/4"			G 1/2"			G 3/4"					
G4 1 1/4" NPT			1/2" NPT			3/4" NPT					
G7 SAE 20 - 1 5/8" - 12 UN			SAE 8 - 3/16" - 16 UNF			SAE 12 - 1 1/16" - 12 UN					
Aux connection - see previous table											
1 Aux size 1			2 Aux size 2								
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								
N 10 bar			Axx Mxx Pxx			• • •					
H 10 bar			•								
W 10 bar, compatible with fluids HFA, HFB and HFC			• •								
						Bypass valve		Execution			
						E 3 bar		P01 MP Filtri standard			
						B 1.75 bar		Pxx Customized			

FILTER ELEMENT

Element series and size		Configuration example 1: MF180 1 A25 H B E P01									
MF180 MF190 Filter element with standard spigot		Configuration example 2: MF190 2 P10 N V P01									
Element length		Size 180		Size 190							
1		•									
2		•		•							
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								
N 10 bar			Axx Mxx Pxx			• • •					
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		page				page	
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239				
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239				
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240				
BVQ Visual pressure indicator with manual reset	241						
Additional features		page					
TE Extension tube	248						
Sxx Extension tube	248						
T5 Filler plug M30x1.5	249						



MPF MPF184 - MPF194

Designation & Ordering code

COMPLETE FILTER

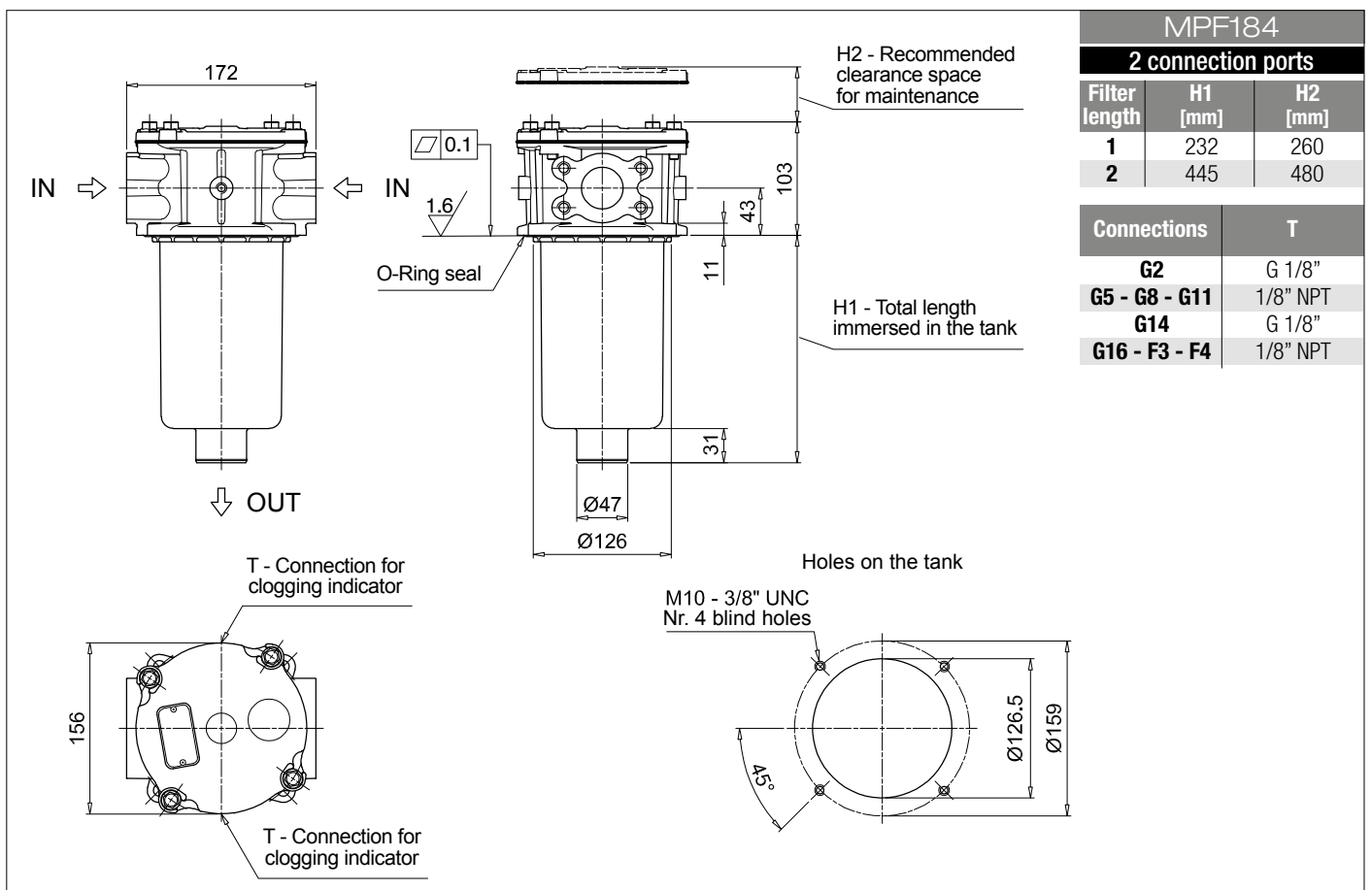
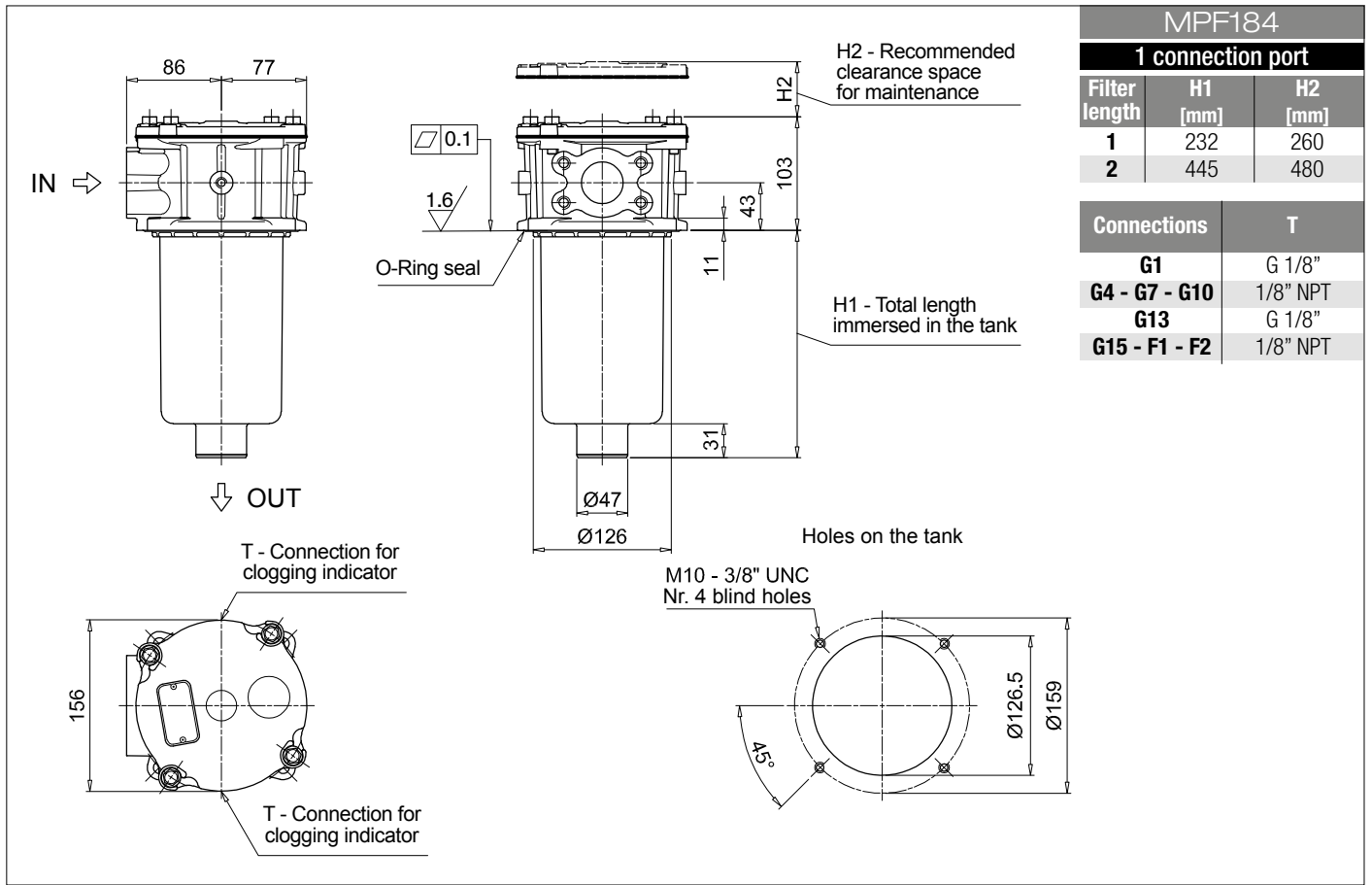
Series and size			Configuration example 1: MPF184 1 A G1 A25 H E P01									
MPF184 MPF194 Filter element with standard spigot			Configuration example 2: MPF194 2 V F3 P10 N B P01									
Length		Size 184	Size 194									
1		•										
2		•	•									
Seals and treatments												
A NBR		W NBR head anodized										
V FPM		Z FPM head anodized										
Main Connections		Rear connections		Main Connections		Rear connections						
G1 G 1 1/4"		-		G13 G 1 1/2"		-						
G2 G 1 1/4"		G 1 1/4"		G14 G 1 1/2"		G 1 1/4"						
G4 1 1/4" NPT		-		G15 1 1/2" NPT		-						
G5 1 1/4" NPT		1 1/4" NPT		G16 1 1/2" NPT		1 1/4" NPT						
G7 SAE 20 - 1 5/8" - 12 UN		-		F1 1 1/2" SAE 3000 psi/M		-						
G8 SAE 20 - 1 5/8" - 12 UN		SAE 20 - 1 5/8" - 12 UN		F2 1 1/2" SAE 3000 psi/UNC		-						
G10 SAE 24 - 1 7/8" - 12 UN		-		F3 1 1/2" SAE 3000 psi/M		1 1/2" SAE 3000 psi/M						
G11 SAE 24 - 1 7/8" - 12 UN		SAE 20 - 1 5/8" - 12 UN		F4 1 1/2" SAE 3000 psi/UNC		1 1/2" SAE 3000 psi/UNC						
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			•	•								
						Bypass valve		Execution				
						E 3 bar		P01 MP Filtri standard				
						B 1.75 bar		Pxx Customized				

FILTER ELEMENT

Element series and size			Configuration example 1: MF180 1 A25 H B E P01									
MF180 MF190 Filter element with standard spigot			Configuration example 2: MF190 2 P10 N V P01									
Element length		Size 180	Size 190									
1		•										
2		•	•									
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		

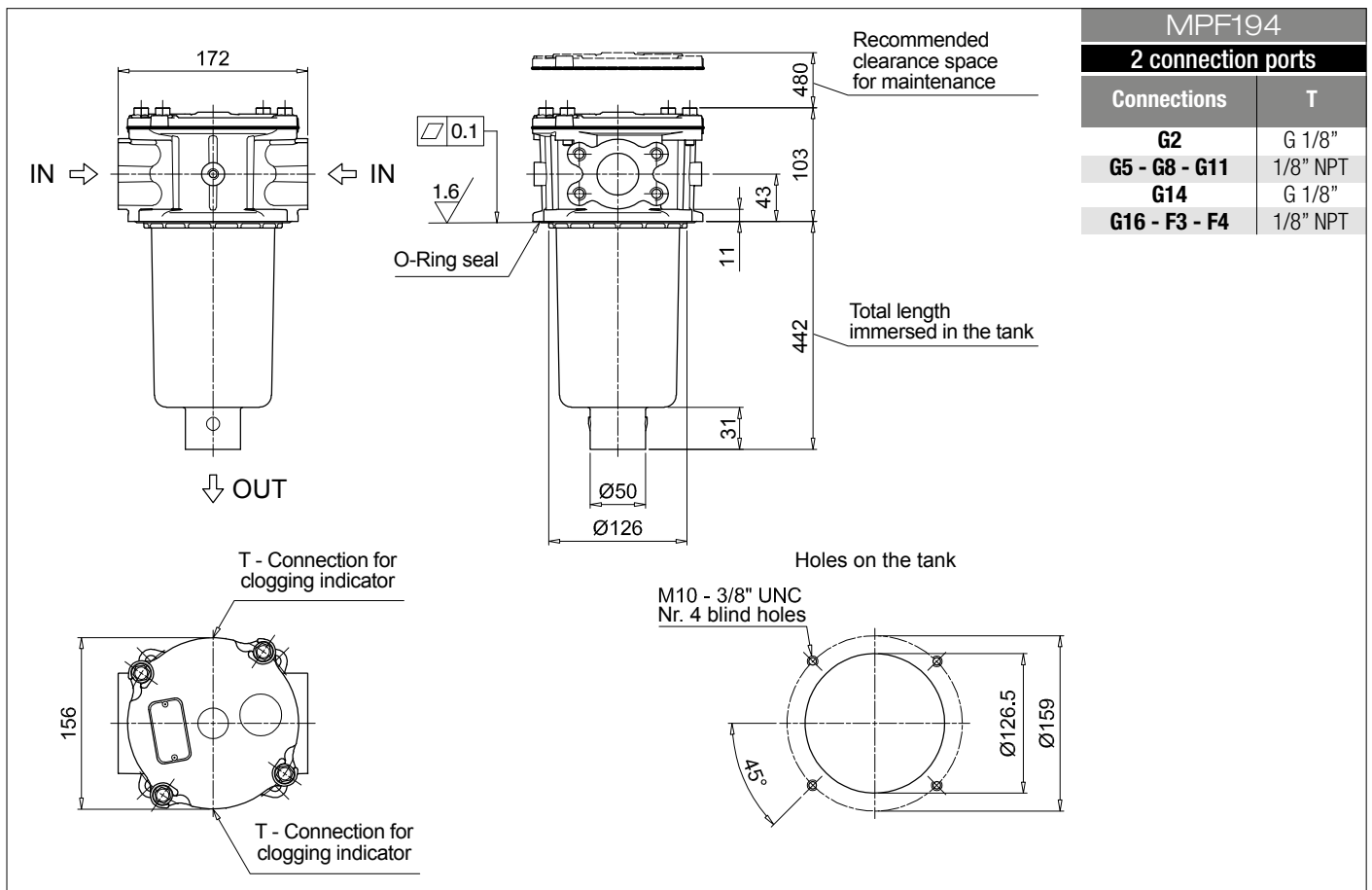
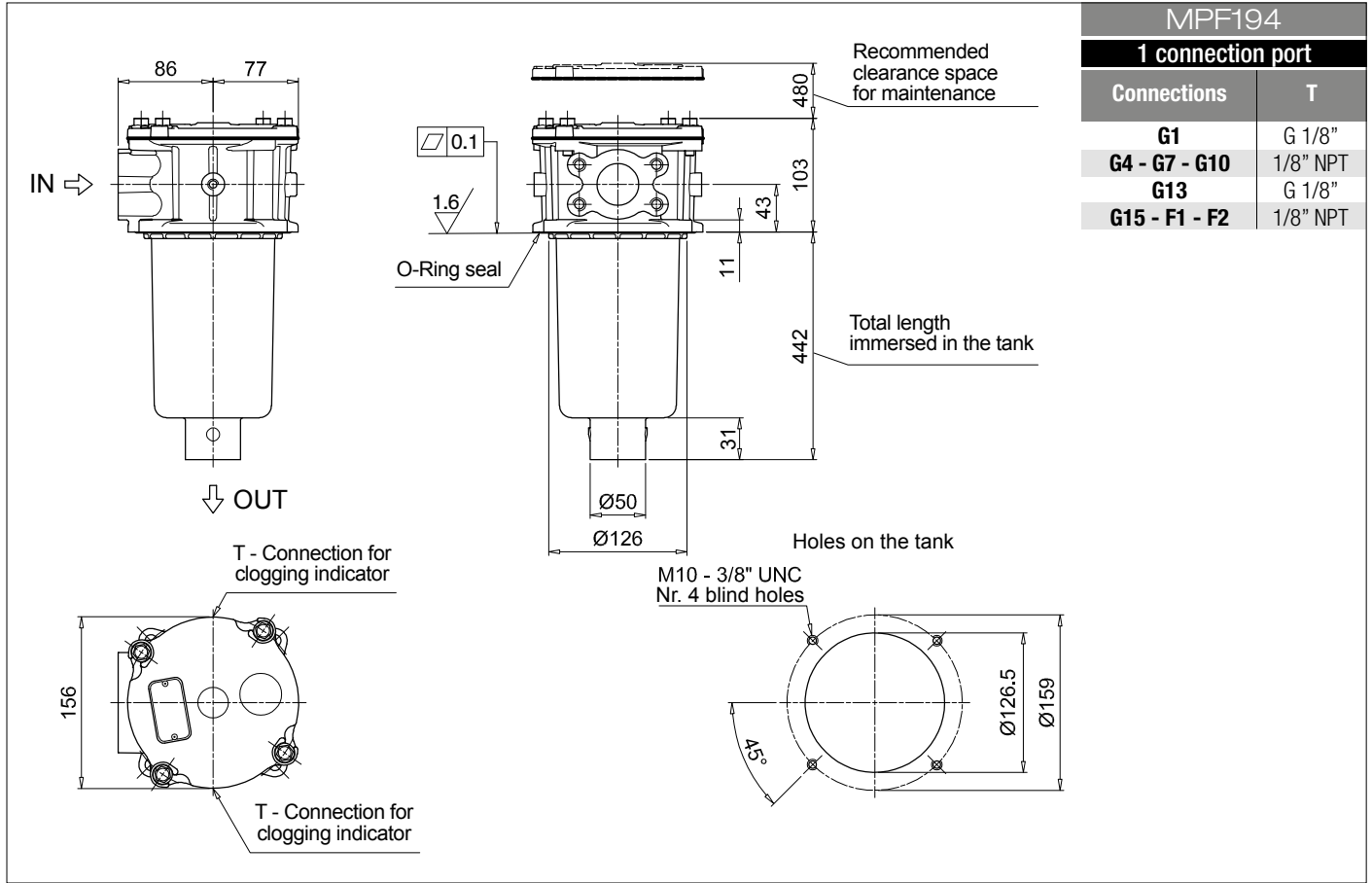
ACCESSORIES

Indicators		page			page
BVA Axial pressure gauge		240	BEA Electrical pressure indicator		239
BVR Radial pressure gauge		240	BEM Electrical pressure indicator		239
BVP Visual pressure indicator with automatic reset		241	BLA Electrical / visual pressure indicator		239-240
BVQ Visual pressure indicator with manual reset		241			
Additional features		page			
TE Extension tube		248			
Sxx Extension tube		248			
T5 Filler plug M30x1.5		249			



MPF MPF184 - MPF194

Dimensions



Designation & Ordering code

COMPLETE FILTER

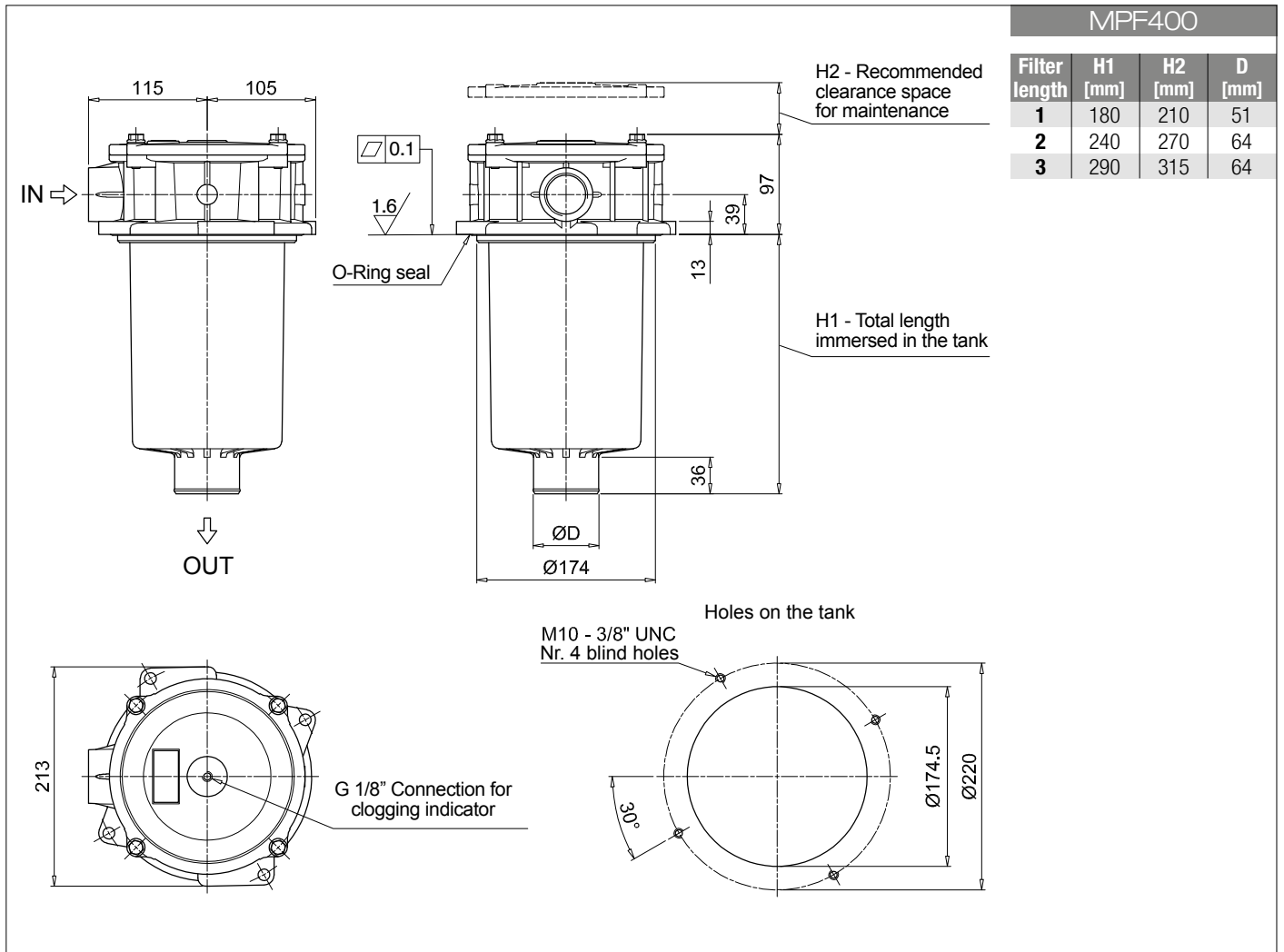
Series and size	Configuration example 1:	MPF400	1	A	G9	A25	H	B	P01
MPF400 Filter element with standard spigot	Configuration example 2:	MPF400	2	V	G4	P10	N	E	P01
Length									
1 2 3									
Seals and treatments									
A NBR									
V FPM									
W NBR head anodized									
Z FPM head anodized									
Connections									
G1 G 1 1/4" G6 2" NPT									
G2 G 1 1/2" G7 SAE 20 - 1 5/8" - 12 UN									
G3 G 2" G8 SAE 24 - 1 7/8" - 12 UN									
G4 1 1/4" NPT G9 SAE 32 - 2 1/2" - 12 UN									
G5 1 1/2" 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									
Filter media									
Element Δp Axx Mxx Pxx									
N 10 bar • • •									
H 10 bar •									
W 10 bar, compatible with fluids HFA, HFB and HFC • •									
Bypass valve									
E 3 bar									
B 1.75 bar									
Execution									
P01 MP Filtri standard									
Pxx Customized									

FILTER ELEMENT

Element series and size	Configuration example 1:	MF400	1	A25	H	B		P01
MF400 Filter element with standard spigot	Configuration example 2:	MF400	2	P10	N	V	E	P01
Element length								
1 2 3								
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								
Filter media								
Element Δp 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	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		
Sxx Extension tube	248		
T5 Filler plug M30x1.5	249		



Designation & Ordering code

COMPLETE FILTER

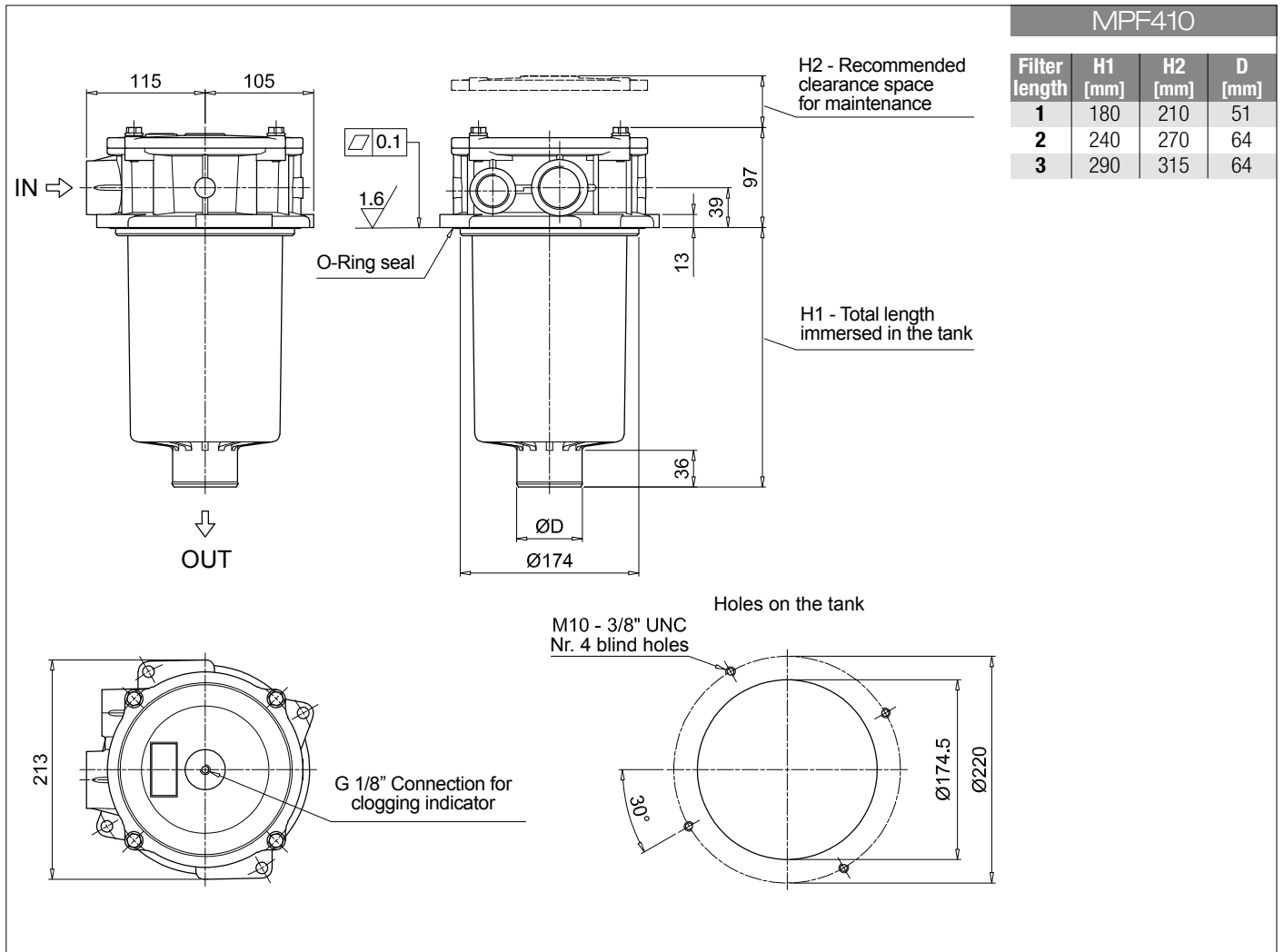
Series and size	Configuration example 1:	MPF410	1	A	G1	1	A25	H	B	P01
MPF410 Filter element with standard spigot	Configuration example 2:	MPF410	1	V	G4	1	P10	N	E	P01
Length										
1 2 3										
Seals and treatments										
A NBR										
V FPM										
W NBR head anodized										
Z FPM head anodized										
Main Connections					Aux size 1					
G1 G 1 1/4"					G 1"					
G4 1 1/4" NPT					1" NPT					
G7 SAE 20 - 1 5/8" - 12 UN					SAE 16 - 1 5/16" - 12 UN					
Aux connection - see previous table										
1 Aux size 1										
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										
N 10 bar										
H 10 bar										
W 10 bar, compatible with fluids HFA, HFB and HFC										
Filter media										
Axx Mxx Pxx										
N 10 bar										
H 10 bar										
W 10 bar, compatible with fluids HFA, HFB and HFC										
Bypass valve										
E 3 bar										
B 1.75 bar										
Execution										
P01 MP Filtri standard										
Pxx Customized										

FILTER ELEMENT

Element series and size	Configuration example 1:	MF400	1	A25	H	B		P01
MF400 Filter element with standard spigot	Configuration example 2:	MF400	1	P10	N	V	E	P01
Element length								
1 2 3								
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								
N 10 bar								
H 10 bar								
W 10 bar, compatible with fluids HFA, HFB and HFC								
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	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features		page	
Sxx Extension tube	248		
T5 Filler plug M30x1.5	249		



MPF MPF450 - MPF451 - MPF750

Designation & Ordering code

COMPLETE FILTER

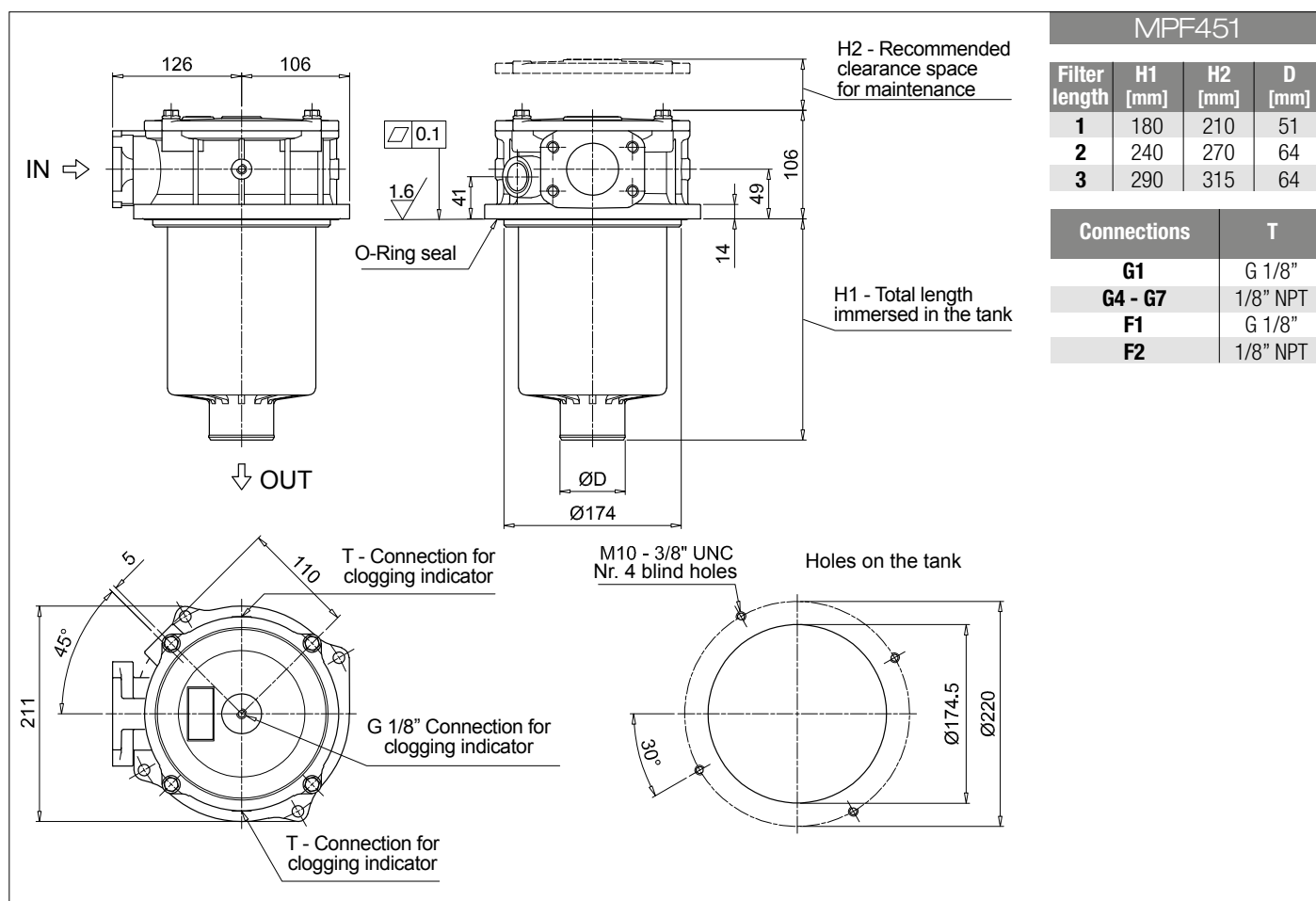
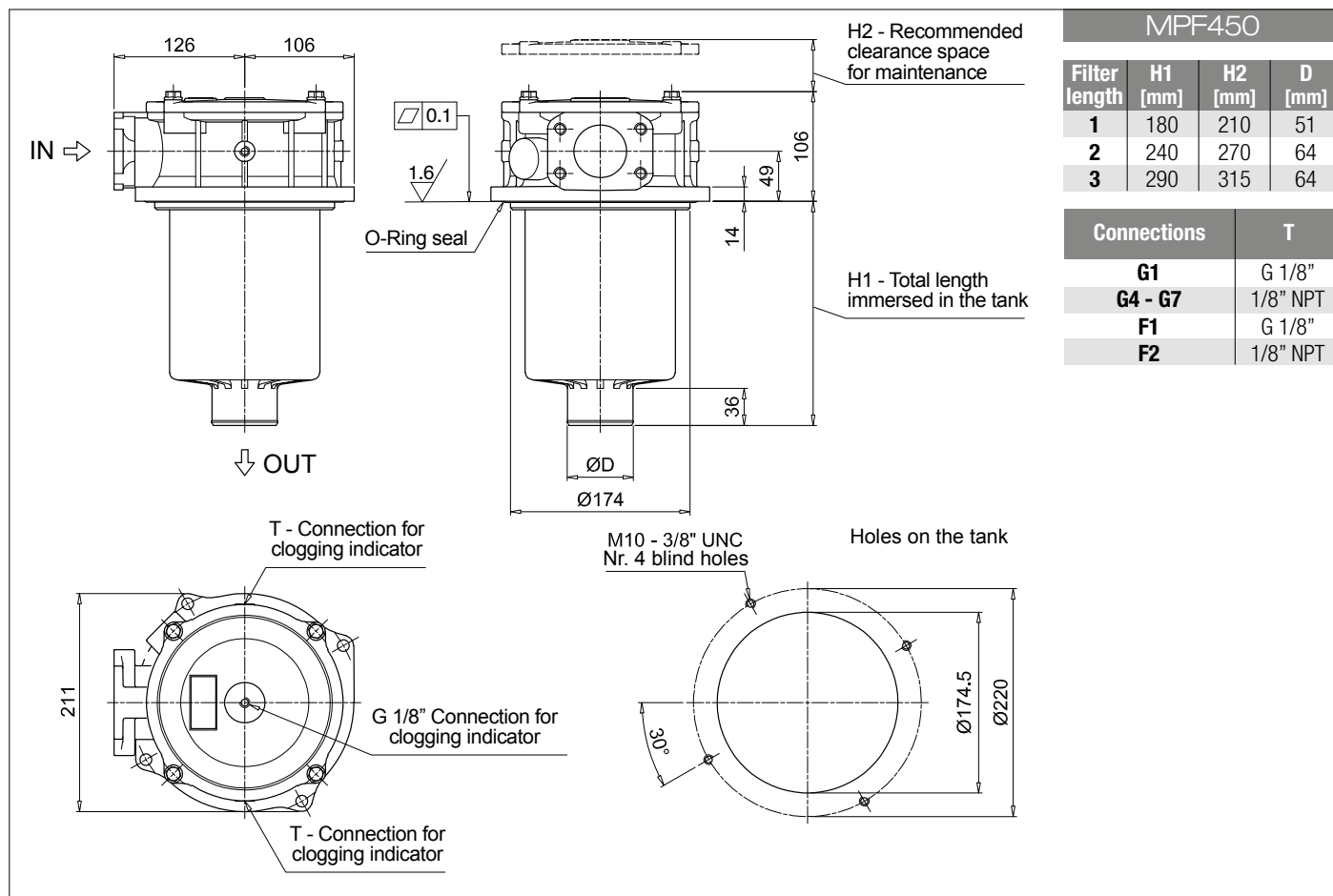
Series and size			Configuration example 1: MPF450 1 A G1 A25 H B P01								
MPF450 MPF451 MPF750	Filter element with standard spigot		Configuration example 2: MPF750 1 V F2 P10 N E P01								
Length			MPF 450	MPF 451	MPF 750						
1			•	•	•						
2			•	•							
3			•	•							
Seals and treatments											
A NBR	W NBR	head anodized									
V FPM	Z FPM	head anodized									
Connections			Aux (only size 451)								
G1 G 2"	G 3/4"										
G4 2" NPT	3/4" NPT										
G7 SAE 32 - 2 1/2" - 12 UN	SAE 12 - 1 1/16" - 12 UN										
F1 2" SAE 3000 psi/M	G 3/4"										
F2 2" SAE 3000 psi/UN	3/4" 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										
Element Δp			Filter media								
			Axx	Mxx	Pxx						
N 10 bar				•	•						
H 10 bar				•							
W 10 bar, compatible with fluids HFA, HFB and HFC				•	•						
						Bypass valve		Execution			
						E 3 bar		P01 MP Filtri standard			
						B 1.75 bar		Pxx Customized			

FILTER ELEMENT

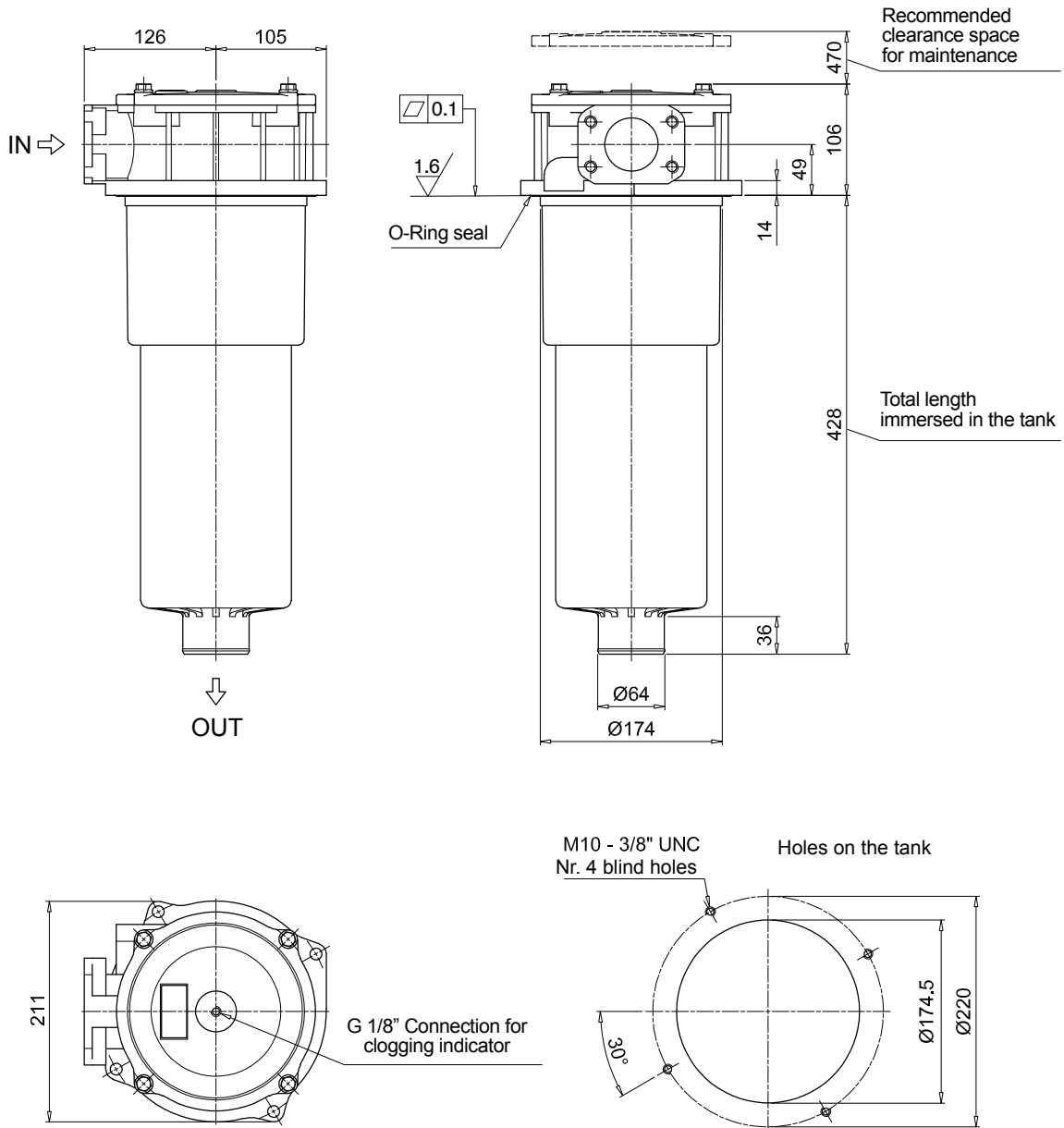
Element series and size			Configuration example 1: MF400 1 A25 H B P01								
MF400 MF750	Filter element with standard spigot		Configuration example 2: MFX750 1 P10 N V E P01								
Element length			MPF 450	MPF 451	MPF 750						
1			•	•	•						
2			•	•							
3			•	•							
Filtration rating (filter 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		B 1.75 bar		Pxx Customized	

ACCESSORIES

Indicators		page			page
BVA Axial pressure gauge		240	BEA Electrical pressure indicator		239
BVR Radial pressure gauge		240	BEM Electrical pressure indicator		239
BVP Visual pressure indicator with automatic reset		241	BLA Electrical / visual pressure indicator		239-240
BVQ Visual pressure indicator with manual reset		241			
Additional features		page			
Sxx Extension tube		248			
T5 Filler plug M30x1.5		249			



MPF750



MPF 100

MPF 181

O-RING SEAL

	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3 (3a ÷ 3d)	
Item:			
Filter series	Filter element	Seal Kit code number NBR	Seal Kit code number FPM
MPF 030	See order table	02050055	02050056
MPF 100-110		02050057	02050058
MPF 181-182		02050059	02050060
MPF 184		02050455	02050456
MPF 191-192		02050457	02050458
MPF 194		02050459	02050460
MPF 400-410		02050061	02050062
MPF 450-451		02050461	02050462
MPF 750		02050106	02050107

MPF 104

MPF 181

FLAT SEAL

	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3 (3a ÷ 3d)	
Item:			
Filter series	Filter element	Seal Kit code number NBR	Seal Kit code number FPM
MPF 020	See order table	02050438	02050439
MPF 104		02050350	02050408
MPF 181-182		02050659	02050660
MPF 191-192		02050661	02050662

MPT series

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



Description

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, 3 or 6 fixing holes for installation, to suit a variety of reservoir surfaces
- O-ring or Flat Seal to suit a variety of reservoir surfaces
- 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: Nylon
- Bowl: Nylon

Bypass valve

- Opening pressure 175 kPa (1.75 bar) $\pm 10\%$
- Opening pressure 300 kPa (3 bar) $\pm 10\%$

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]

Filter series	Weights [kg]					Volumes [dm ³]				
	Length	1	2	3	4	Length	1	2	3	4
MPT 025		0.41	0.45	0.50	-		0.24	0.35	0.42	-
MPT 027		0.44	0.48	0.55	-		0.24	0.35	0.42	-
MPT 110		1.00	1.05	1.15	1.40		0.72	0.93	1.28	1.74
MPT 114		1.10	1.15	1.25	1.50		0.72	0.93	1.28	1.74
MPT 116		1.10	1.15	1.25	1.50		0.72	0.93	1.28	1.74
MPT 120		1.00	1.05	1.15	1.40		0.72	0.93	1.28	1.74

Filter series	Length	Filter element design - H series					Filter element design - N series		
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
MPT 025-027	1	7	10	23	28	42	59	51	54
	2	17	20	45	48	56	72	64	67
	3	21	24	50	55	59	76	74	75
MPT 110-114 116-120	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 $\Delta p = 0.5$ bar.

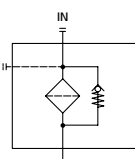
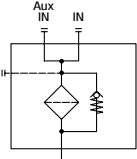
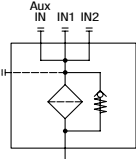
The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

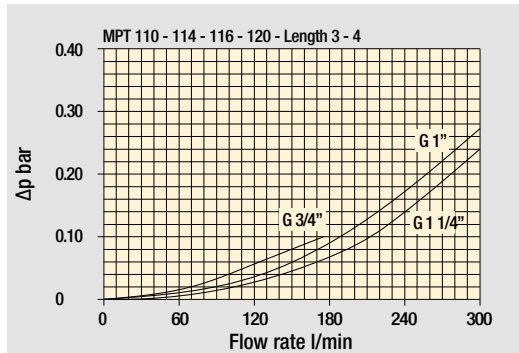
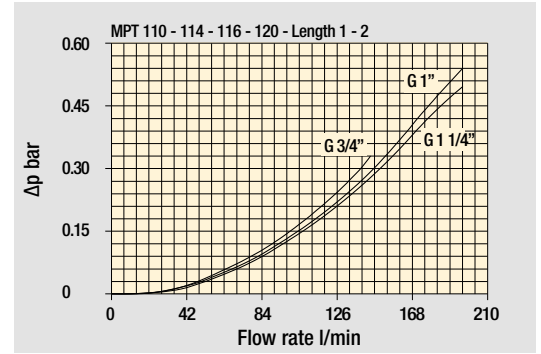
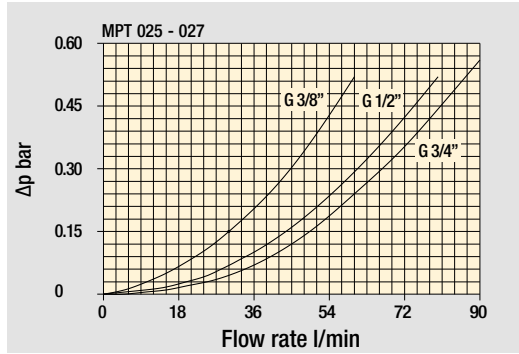
Hydraulic symbols

Filter series	Style 1 connection	Style 2 connections	Style 3 connections
MPT 025	•		
MPT 027	•		
MPT 110		•	
MPT 114	•		
MPT 116	•		
MPT 120			•

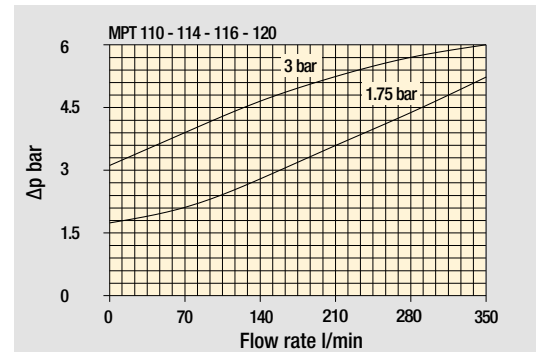
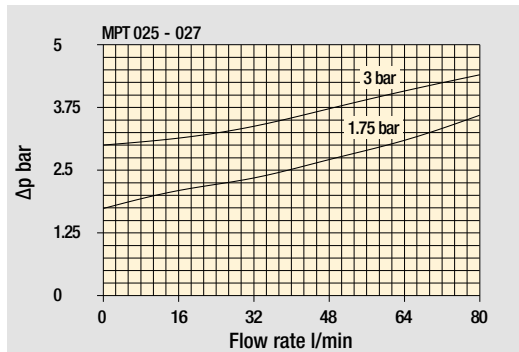
		
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Pressure drop

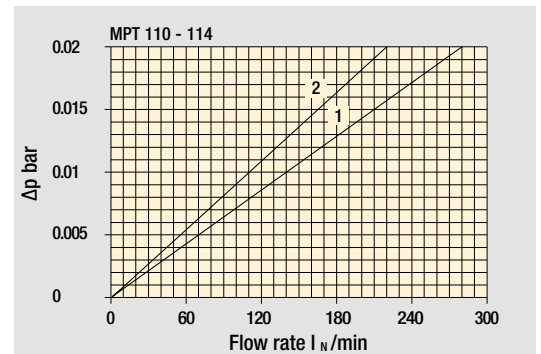
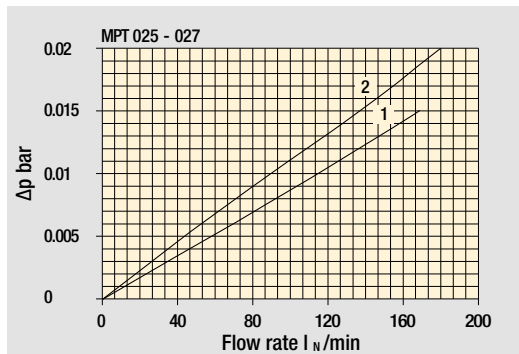
Filter housings Δp pressure drop



Bypass valve pressure drop



Air breather pressure drop







- 1 C With air breather 10 μ m
- 2 D With anti-splash and SAP50 10 μ m

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

MPT 025 -027		
Air breather port plugged Indicator port	Air breather standard Indicator port	Anti-splash air breather & pressurized Double indicator port
		

Multiport - Multifunction

MPT 110	
Standard - Single IN Port	Double IN Port - Double indicator port
	
Double IN Port Option: double drain port	Double IN Port - Indicator port Option: drain port
	

MPT 120

Triple IN port

Option: double drain port



MPT MPT025 - MPT027

Designation & Ordering code

COMPLETE FILTER

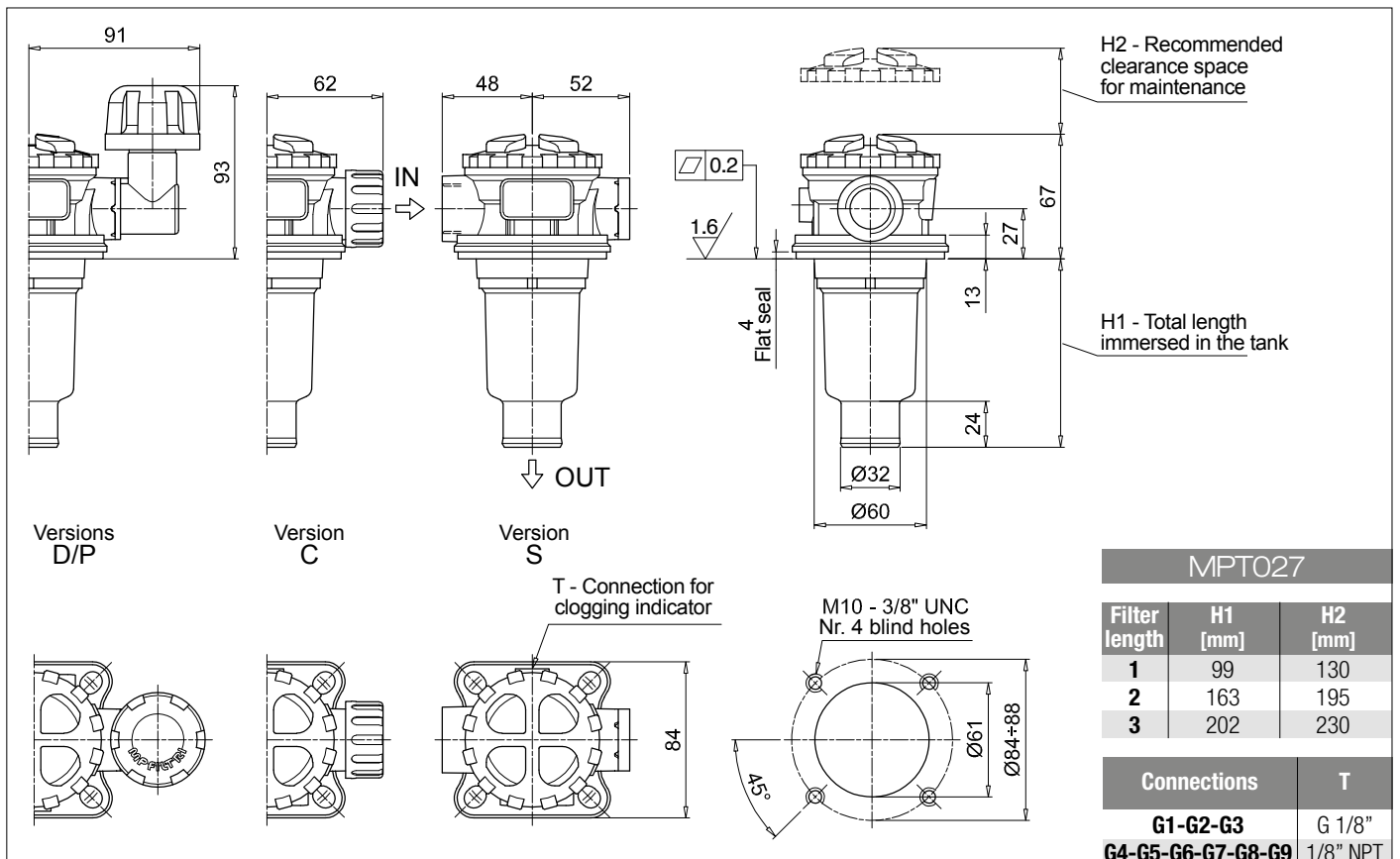
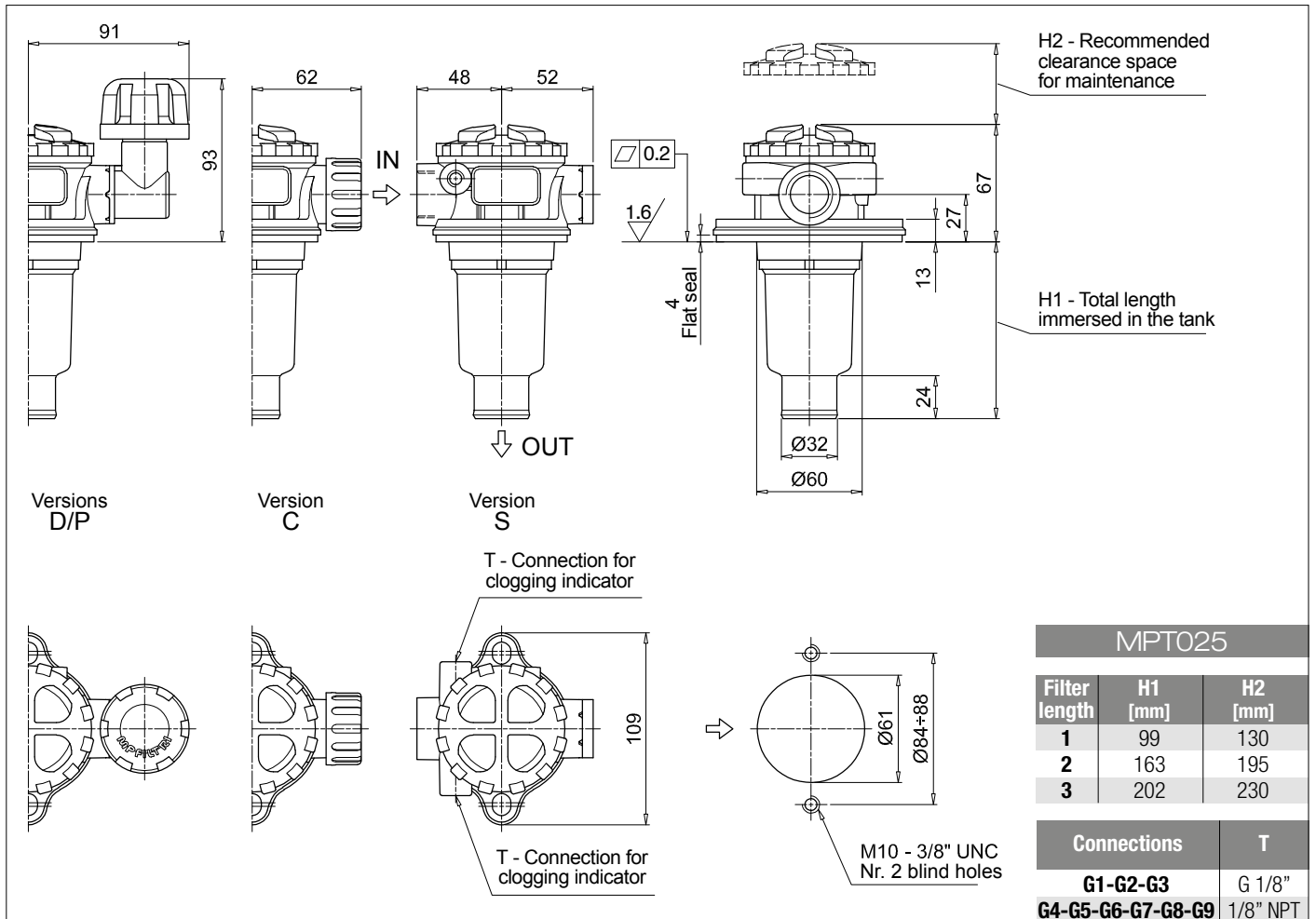
Series and size MPT025 MPT027 Filter element with standard spigot	Configuration example 1: MPT025 1 S A G3 A10 E P01
	Configuration example 2: MPT027 3 C W G6 A03 B P01
Length 1 2 3	
Air breather S Without air breather C With air breather 10 µm D With anti-splash and air breather SAP050 10 µm P With anti-splash and air breather SAP050 10 µm, pressurization 0.5 bar	
Seals and treatments	Filtration rating
A NBR	Axx Mxx Pxx
V FPM	• • •
W NBR head anodized	• • •
Z FPM head anodized	• • •
	filter element compatible with fluids HFA-HFB-HFC
Connections	
G1 G 3/8"	G6 3/4" NPT
G2 G 1/2"	G7 SAE 6 - 9/16" - 18 UNF
G3 G 3/4"	G8 SAE 8 - 3/4" - 16 UNF
G4 3/8" NPT	G9 SAE 12 - 1 1/16" - 12 UN
G5 1/2" 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

Element series and size MF020 Filter element with standard spigot	Configuration example 1: MF020 1 A10 H B E P01
	Configuration example 2: MF020 3 A03 W B P01
Element length 1 2 3	
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
N 10 bar	Axx Mxx Pxx
H 10 bar	• • •
W 10 bar, compatible with fluids HFA, HFB and HFC	• • •
	Seals B NBR V FPM
	Bypass valve E 3 bar B 1.75 bar
	Execution P01 MP Filtri standard Pxx Customized

ACCESSORIES

Indicators	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		
TE Extension tube	248		
DPT Dipstick	249		



Designation & Ordering code

COMPLETE FILTER

Series and size			Configuration example 1: MPT110 1 S A G1 0 A06 E P01								
MPT110 Filter element with standard spigot			Configuration example 2: MPT110 3 P V G4 1 M25 B P01								
Length											
1 2 3 4											
Air breather											
S Without air breather											
C With air breather 10 µm											
D With anti-splash and air breather SAP050 10 µm											
P With anti-splash and air breather SAP050 10 µm, pressurization 0.5 bar											
Seals and treatments			Filtration rating								
			Axx	Mxx	Pxx						
A NBR			•	•	•						
V FPM			•	•	•						
W NBR head anodized			•	•		filter element compatible with fluids HFA-HFB-HFC					
Z FPM head anodized			•	•							
Main Connections		Aux size 1	Aux size 2	Main Connections		Aux size 2	Aux size 2				
G1 G 3/4"		G 3/8"	G 1/2"	G6 1 1/4" NPT		3/8" NPT	1/2" NPT				
G2 G 1"				G7 SAE 12 - 1 1/16" - 12 UN		SAE 6 - 9/16" - 18 UNF	SAE 8 - 3/4" - 16 UNF				
G3 G 1 1/4"				G8 SAE 16 - 1 5/16" - 12 UN							
G4 3/4" NPT		3/8" NPT	1/2" NPT	G9 SAE 20 - 1 5/8" - 12 UN							
G5 1" NPT											
Aux connection - see previous table											
0 Not machined			1 Aux size 1	2 Aux size 2							
Filtration rating (filter media)											
A03 Inorganic microfiber 3 µm			M25 Wire mesh 25 µm						Bypass valve		Execution
A06 Inorganic microfiber 6 µm			M60 Wire mesh 60 µm						E 3 bar		P01 MP Filtri standard
A10 Inorganic microfiber 10 µm			M90 Wire mesh 90 µm						B 1.75 bar		Pxx Customized
A16 Inorganic microfiber 16 µm			P10 Resin impregnated paper 10 µm								
A25 Inorganic microfiber 25 µm			P25 Resin impregnated paper 25 µm								

FILTER ELEMENT

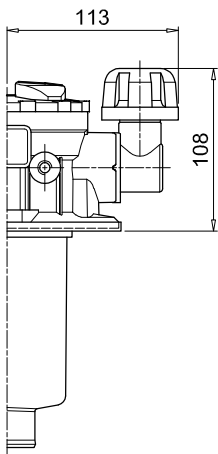
Element series and size			Configuration example 1: MF100 1 A06 H B E P01								
MF100 Filter element with standard spigot			Configuration example 2: MF100 3 M25 N V P01								
Element length											
1 2 3 4											
Filtration rating (filter media)											
A03 Inorganic microfiber 3 µm			M25 Wire mesh 25 µm						Seals		Execution
A06 Inorganic microfiber 6 µm			M60 Wire mesh 60 µm						B NBR		P01 MP Filtri standard
A10 Inorganic microfiber 10 µm			M90 Wire mesh 90 µm						V FPM		Pxx Customized
A16 Inorganic microfiber 16 µm			P10 Resin impregnated paper 10 µm						Bypass valve		
A25 Inorganic microfiber 25 µm			P25 Resin impregnated paper 25 µm						E 3 bar		
Element Δp			Filter media								
			Axx	Mxx	Pxx						
N 10 bar			•	•	•						
H 10 bar			•								
W 10 bar, compatible with fluids HFA, HFB and HFC			•	•							

ACCESSORIES

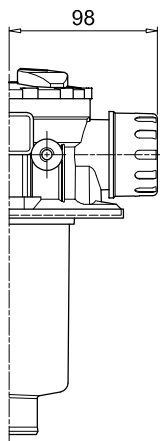
Indicators		page			page
BVA Axial pressure gauge	240		BEA Electrical pressure indicator	239	
BVR Radial pressure gauge	240		BEM Electrical pressure indicator	239	
BVP Visual pressure indicator with automatic reset	241		BLA Electrical / visual pressure indicator	239-240	
BVQ Visual pressure indicator with manual reset	241				
Additional features		page			page
TE Extension tube	248		DPT Dipstick	249	
DFS Diffuser with fast lock connection	249				

MPT110				
Filter length	H1 [mm]	H2 [mm]	D [mm]	I [mm]
1	97	120	38	4
2	144	170	38	4
3	222	250	47	-
4	324	350	47	2.5

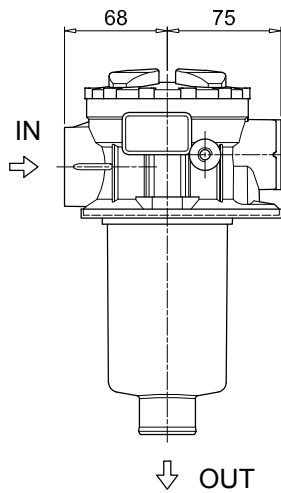
Connections	T
G1-G2-G3	G 1/8"
G4-G5-G6-G7-G8-G9	1/8" NPT



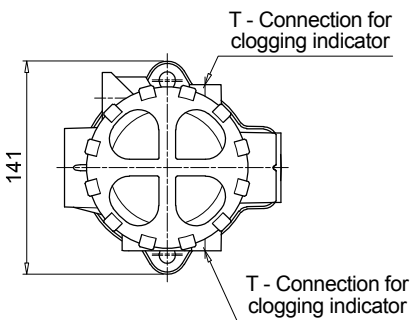
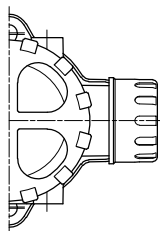
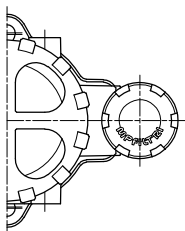
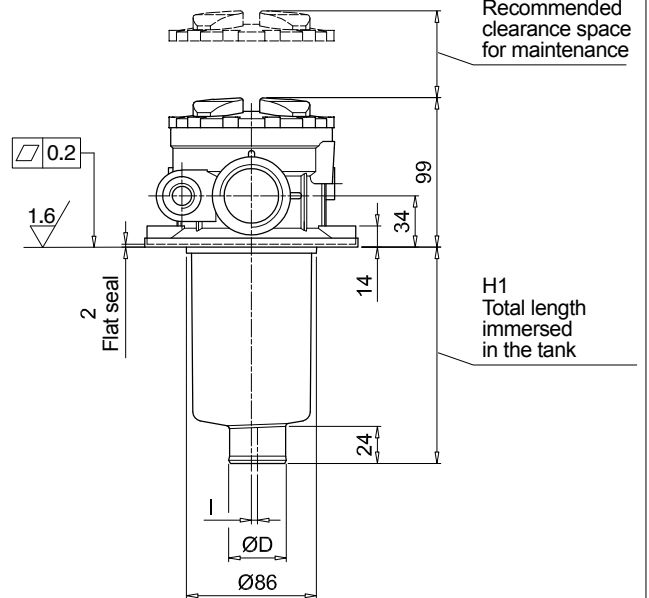
Versions D/P



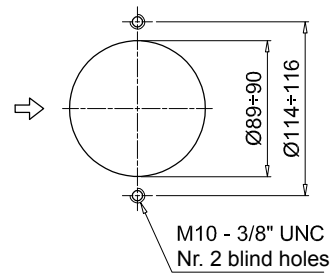
Version C



Version S



Holes on the tank



Designation & Ordering code

COMPLETE FILTER

Series and size	Configuration example 1:	MPT114	4	S	A	G3	A10	E	P01
MPT114 Filter element with standard spigot	Configuration example 2:	MPT114	3	C	W	G6	A03	B	P01

Length	
1 2 3 4	

Air breather	
S Without air breather	
C With air breather 10 µm	
D With anti-splash and air breather SAP050 10 µm	
P With anti-splash and air breather SAP050 10 µm pressurization 0.5 bar	

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

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	4	A10	H	B	E	P01
MF100 Filter element with standard spigot	Configuration example 1:	MF100	3	A03	W	B		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	•	•	

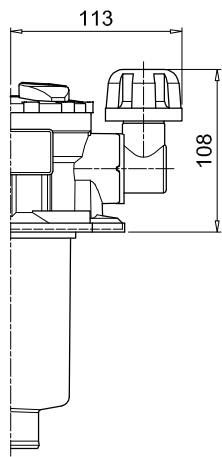
Seals	Bypass valve	Execution
B NBR	E 3 bar	P01 MP Filtri standard
V FPM	1.75 bar	Pxx Customized

ACCESSORIES

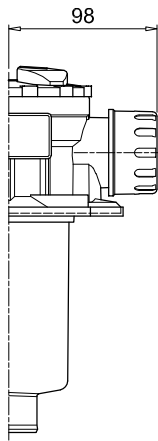
Indicators	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		page
TE Extension tube	248	DPT Dipstick	249
DFS Diffuser with fast lock connection	249		

MPT114				
Filter length	H1 [mm]	H2 [mm]	D [mm]	I [mm]
1	97	120	38	4
2	144	170	38	4
3	222	250	47	-
4	324	350	47	2.5

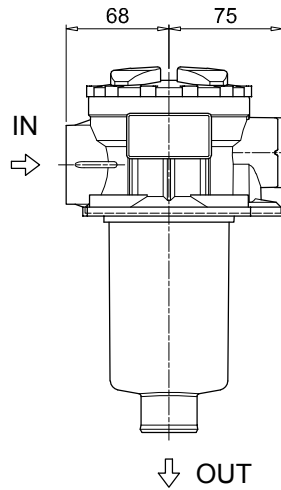
Connections	T
G1-G2-G3	G 1/8"
G4-G5-G6-G7-G8-G9	1/8" NPT



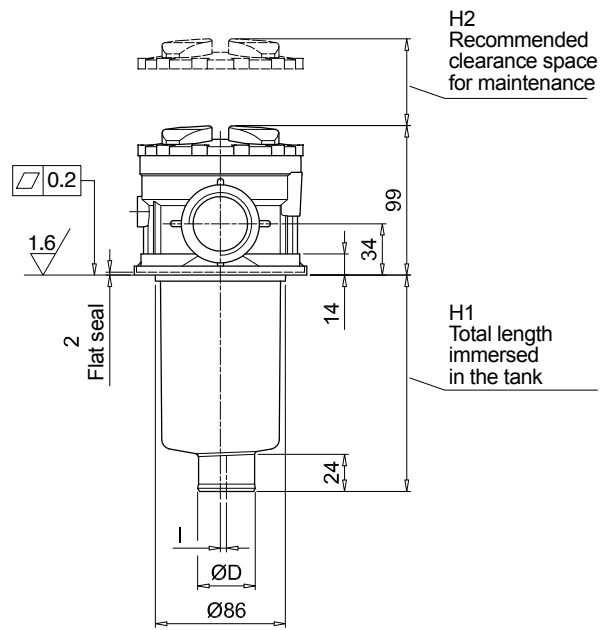
Versions D/P



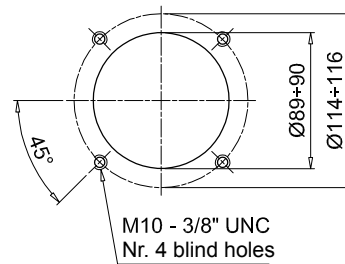
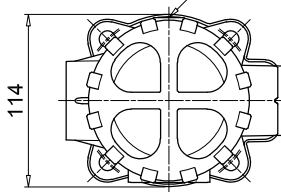
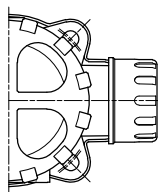
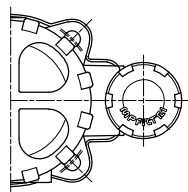
Version C



Version S



Holes on the tank



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	•	•	

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	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	•	•	

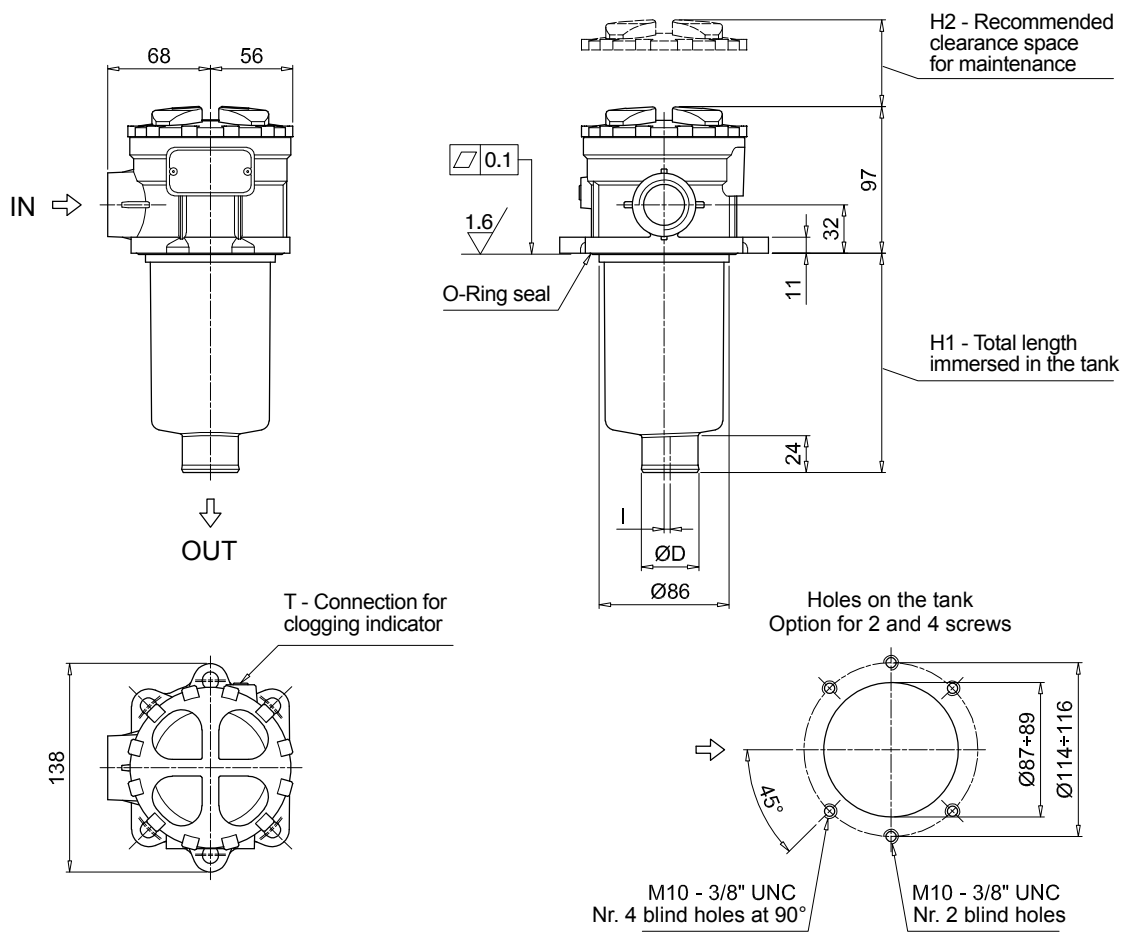
Seals	Bypass valve	Execution
B NBR	E 3 bar	P01 MP Filtri standard
V FPM	1.75 bar	Pxx Customized

ACCESSORIES

Indicators	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		page
TE Extension tube	248	DPT Dipstick	249
DFS Diffuser with fast lock connection	249		

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



Designation & Ordering code

COMPLETE FILTER

Series and size	Configuration example 1:	MPT120	1	A	G1	0	A06	E	P01
MPT120 Filter element with standard spigot	Configuration example 2:	MPT120	3	V	G4	1	M25	B	P01

Length	
1 2 3 4	

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

Main Connections	Rear connections	Aux size 1	Aux size 2
G1 G 3/4"	G 3/4"	G 3/8"	G 1/2"
G2 G 1"	G 1"		
G3 G 1 1/4"	G 3/4"		
G4 3/4" NPT	3/4" NPT	3/8" NPT	1/2" NPT
G5 1" NPT	1" NPT		
G6 1 1/4" NPT	3/4" NPT	SAE 6 - 9/16" - 18 UNF	SAE 8 - 3/4" - 16 UNF
G7 SAE 12 - 1 1/16" - 12 UN	SAE 12 - 1 1/16" - 12 UN		
G8 SAE 16 - 1 5/16" - 12 UN	SAE 16 - 1 5/16" - 12 UN		
G9 SAE 20 - 1 5/8" - 12 UN	SAE 12 - 1 1/16" - 12 UN		

Aux connection - see previous table	
0 Not machined	1 Aux size 1
	2 Aux size 2

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 1:	MF100	1	A06	H	B	E	P01
MF100 Filter element with standard spigot	Configuration example 2:	MF100	3	M25	N	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	•	•	

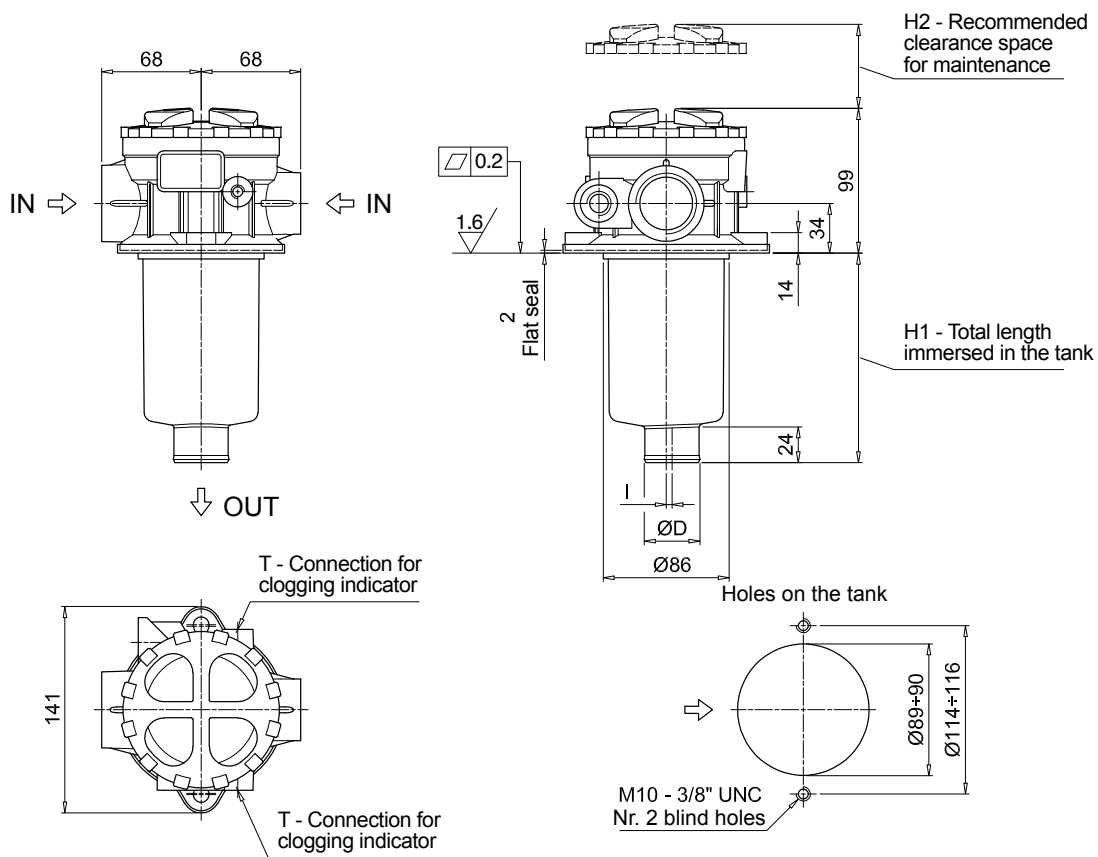
Seals	Bypass valve	Execution
B NBR	E 3 bar	P01 MP Filtri standard
V FPM	1.75 bar	Pxx Customized

ACCESSORIES

Indicators	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		page
TE Extension tube	248	DPT Dipstick	249
DFS Diffuser with fast lock connection	249		

MPT120				
Filter length	H1 [mm]	H2 [mm]	D [mm]	I [mm]
1	97	120	38	4
2	147	170	38	4
3	222	250	47	-
4	324	350	47	2.5

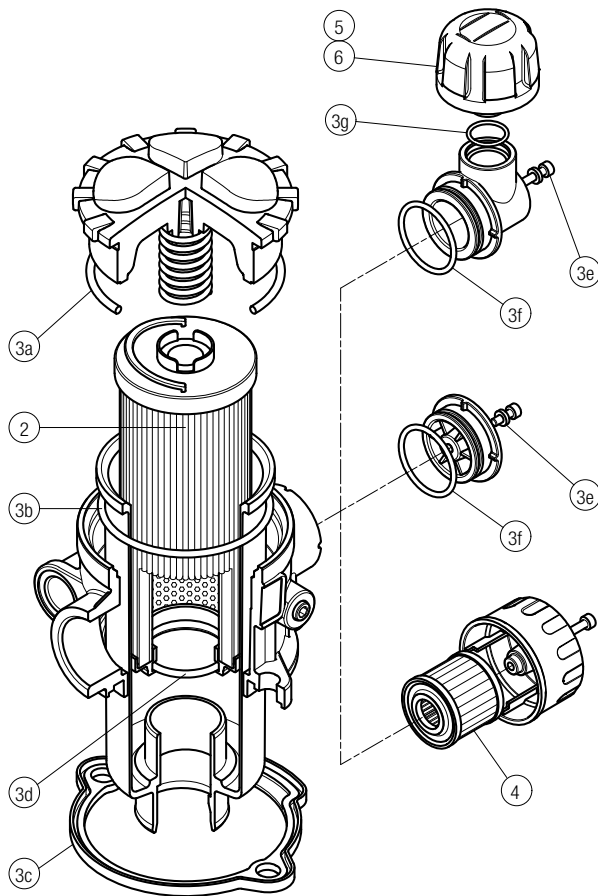
Connections	T
G1-G2-G3	G 1/8"
G4-G5-G6-G7-G8-G9	1/8" NPT



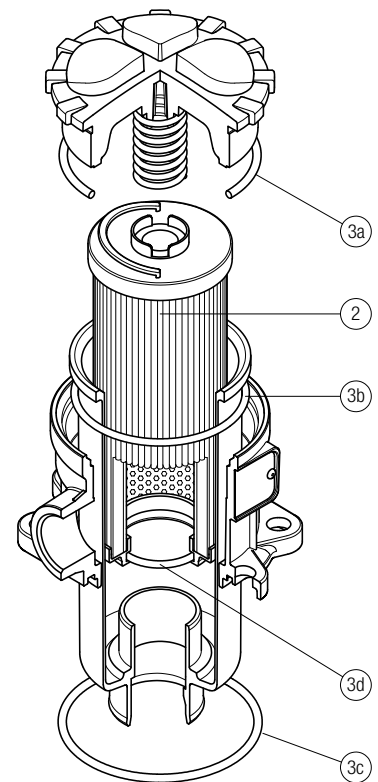
MPT SPARE PARTS

Order number for spare parts

MPT 025 - 027 - 110



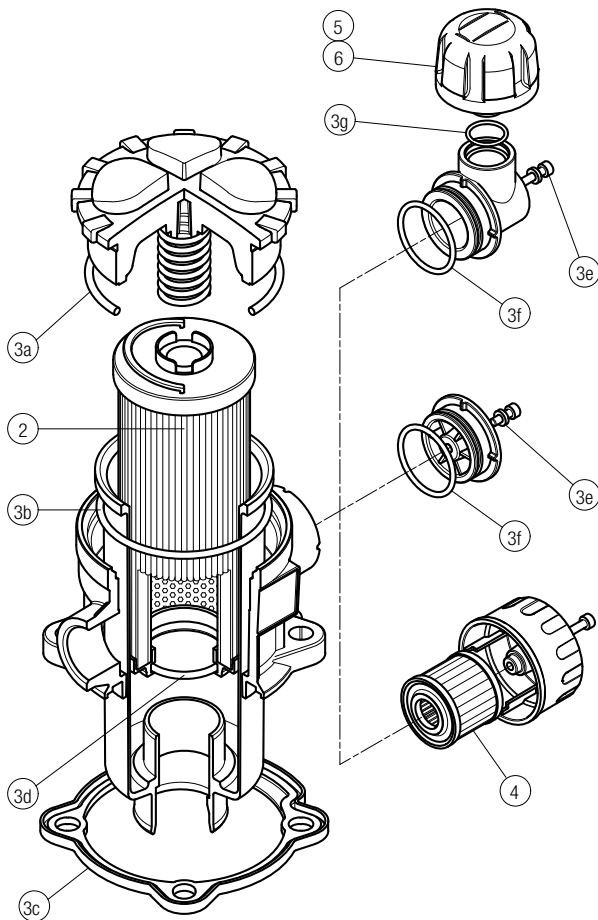
MPT 116



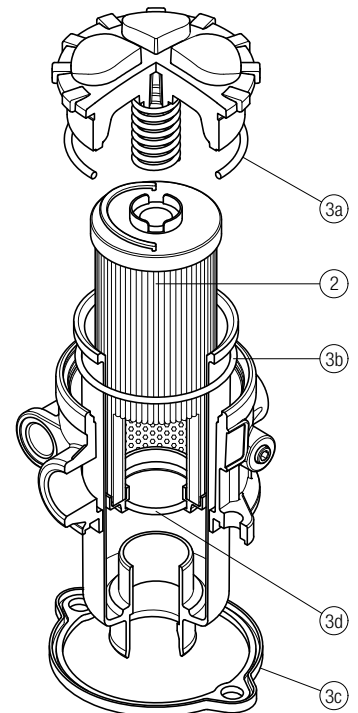
Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		C	D	P
		NBR	FPM			
MPT 025	See order table	02050557	02050558	10 µm A3L03	10 µm SAP50G3L03A0P01	10 µm SAP50G3L03A1P01
MPT 027		02050559	02050560	10 µm A3L03	10 µm SAP50G3L03A0P01	10 µm SAP50G3L03A1P01
MPT 110		02050561	02050562	10 µm A5L03	10 µm SAP50G3L03A0P01	10 µm SAP50G3L03A1P01

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

MPT 114



MPT 120



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 1 pc.
Filter series	Filter element	Seal Kit code number	Air breather filter element - version:		
MPT 114	See order table	NBR	FPM	C	D
		02050580	02050581	10 µm A5L03	10 µm SAP50G3L03A0P01
					10 µm SAP50G3L03A1P01

Item:	Q.ty: 1 pc.	Q.ty: 1 pc.
Filter series	Filter element	Seal Kit code number
MPT 120	See order table	NBR
		02050563
		FPM
		02050564

MFB series

BOWL ASSEMBLY

Maximum working pressure up to 800 kPa (8 bar) - Flow rate up to 700 l/min



Return filter Bowl assembly

Maximum working pressure up to 800 kPa (8 bar)
Flow rate up to 700 l/min

MFB is a range of return filter kits for protection of the reservoir against the system contamination.

They are directly integrated in the moulded reservoir in immersed or semi-immersed position to save space into the tank.

Treaded or flanged covers can be provided.

The filter output must be always immersed into the fluid to avoid aeration or foam generation into the reservoir.

Available features:

- 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
- 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)

Common applications:

Mobile machines

Bowl assembly materials

- Cover
Nylon: MFB 020-030-100
Aluminium: MFB 180-190

- Bowl: Nylon

Filter element materials

- Caps: Nylon
- Spring: Spring steel

Bypass valve

- Opening pressure 175 kPa (1.75 bar) $\pm 10\%$
- Opening pressure 300 kPa (3 bar) $\pm 10\%$

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

MFB filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]					Volumes [dm ³]				
	Length	1	2	3	4	Length	1	2	3	4
MFB 020		0.25	0.35	0.40	-		0.10	0.15	0.20	-
MFB 030		0.25	-	-	-		0.15	-	-	-
MFB 100		0.50	0.60	0.75	0.95		0.35	0.50	0.80	1.10
MFB 180		1.60	2.40	-	-		1.50	2.90	-	-
MFB 190		-	2.40	-	-		-	3.00	-	-

Filter series	Length	Filter element design - H series					Filter element design - N series		
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
MFB 020	1	7	10	23	28	42	59	51	54
	2	17	20	45	48	56	72	64	67
	3	21	24	50	55	59	76	74	75
MFB 030	1	7	10	24	29	47	84	60	66
MFB 100	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
MFB 180	1	127	148	235	243	278	441	285	299
	2	231	262	358	382	388	472	404	412
MFB 190	2	261	305	489	528	546	696	583	598

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

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

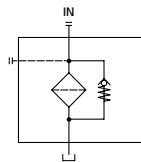
For different pressure drop or fluid viscosity we recommend to use our selection software available on www.mpfiltri.com.

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure.

Please, contact our Sales Department for further additional information.

Hydraulic symbols

Filter series	Style 1 connection
MFB 020	•
MFB 030	•
MFB 100	•
MFB 180	•
MFB 190	•



MFB MFB020 - MFB030 - MFB100 - MFB180 - MFB190

Designation & Ordering code

COMPLETE FILTER

Series and size						Configuration example 1: MFB100 1 A 2 A10 H E P01						
MFB020 MFB030 MFB100 MFB180 MFB190						Configuration example 2: MFB180 2 V 1 M25 N B P01						
Filter element with private spigot												
Length	MFB020	MFB030	MFB100	MFB180	MFB190							
1	•	•	•	•								
2	•		•	•	•							
3	•		•									
4			•									
Seals												
A NBR												
V FPM												
Version												
1	Without cover	•	•	•	•							
2	With flanged cover type MPF		•	•	•							
3	With threaded cover type MPT	•		•								
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												
N	10 bar											
H	10 bar			•								
W	10 bar, compatible with fluids HFA, HFB and HFC			•	•							
Filter media												
Axx Mxx Pxx												
						Bypass valve		Execution				
						E 3 bar		P01 MP Filtri standard				
						B 1.75 bar		Pxx Customized				

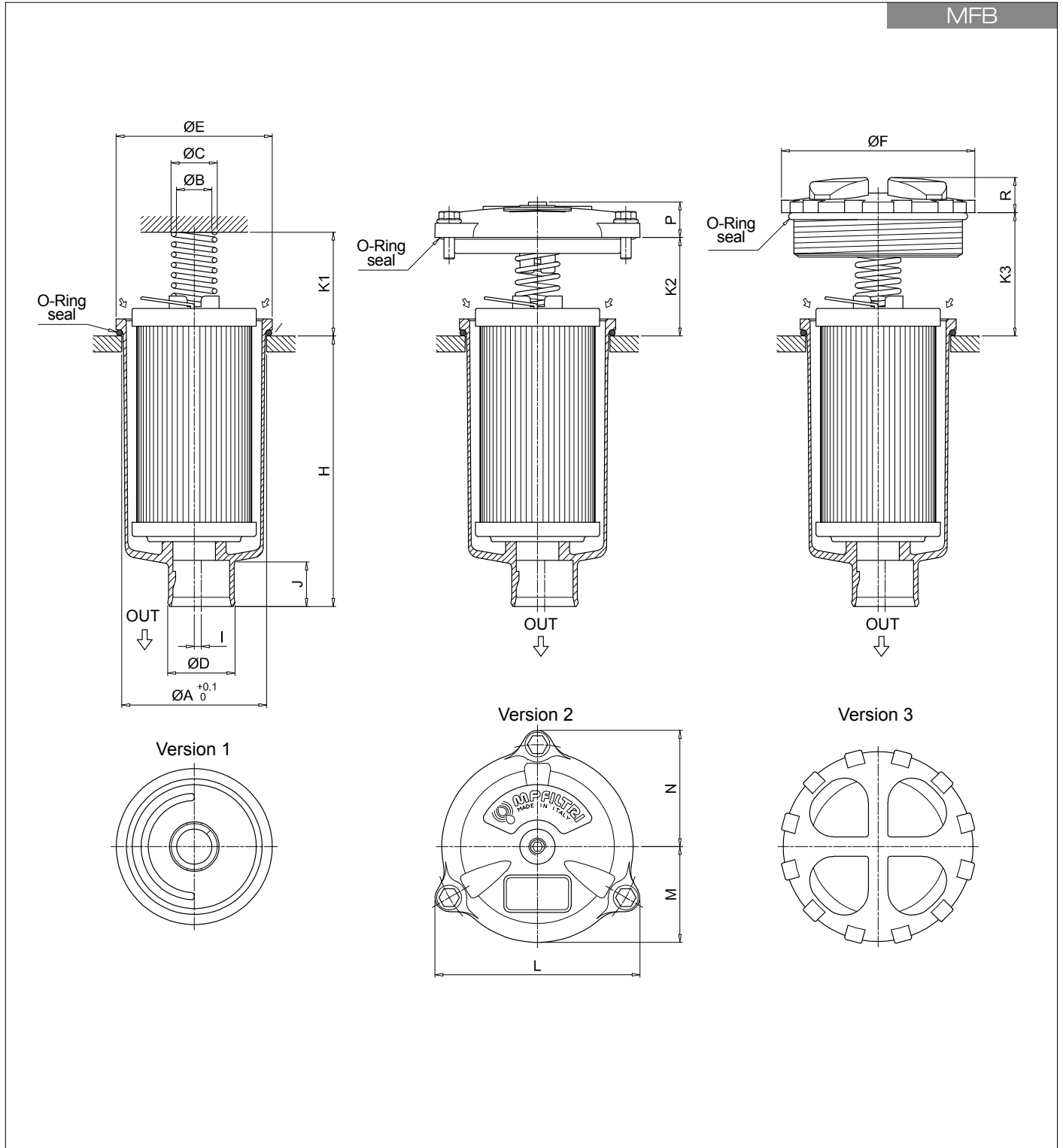
FILTER ELEMENT

Element series and size						Configuration example 1: MF100 1 A10 H B E P01						
MF020 MF030 MF100 MF180 MF190						Configuration example 2: MF180 2 M25 N V P01						
Filter element with private spigot												
Element length	MF020	MF030	MF100	MF180	MF190							
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												
N	10 bar											
H	10 bar			•								
Filter media												
Axx Mxx Pxx												
						Seals		Bypass valve				
						B NBR		E 3 bar				
						V FPM		 1.75 bar				
								P01 MP Filtri standard				
								Pxx Customized				

ACCESSORIES

Additional features											page
TE	Extension tube	MFB020	MFB030	MFB100	MFB180	MFB190					248
DFS	Diffuser with fast lock connection			•							249

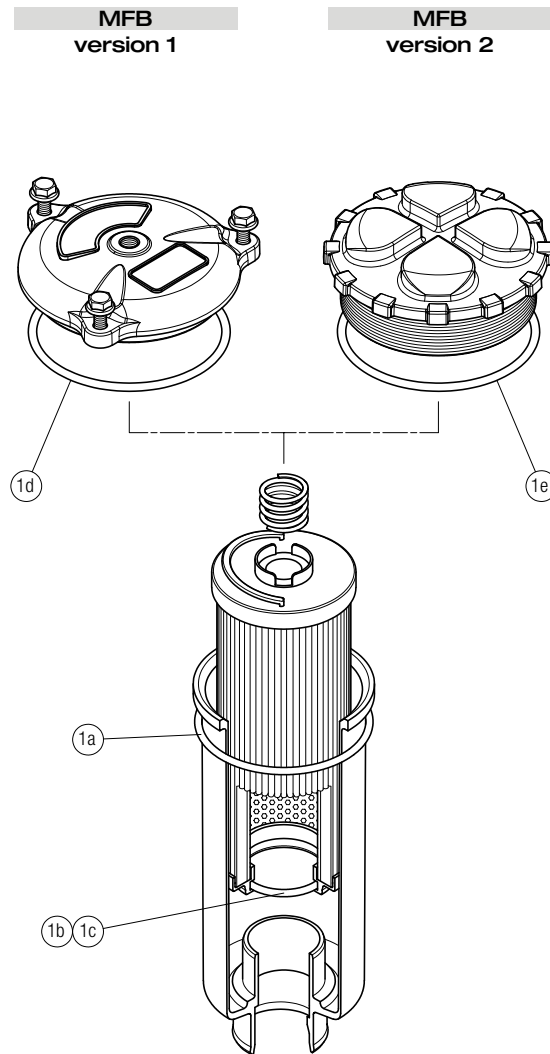
MFB



Filter size	Filter Length	ø A [mm]	ø B [mm]	ø C [mm]	ø D [mm]	ø E [mm]	ø F [mm]	H [mm]	I [mm]	J [mm]	K1 [mm]	K2 [mm]	K3 [mm]	L [mm]	M [mm]	N [mm]	P [mm]	R [mm]
020	1	52	20.5	26	32	56	75	111	0	24	42	-	36	-	-	-	-	18
	2	52	20.5	26	32	56	75	175	0	24	42	-	36	-	-	-	-	18
	3	52	20.5	26	32	56	75	214	0	24	42	-	36	-	-	-	-	18
030	1	60.5	20	25.5	32	68	-	92	3	21	33	35	-	92	42	52	18	-
	1	80.5	20	26	38	88	111	107	4	24	58	55	69	116	54	66	20	20
	2	80.5	20	26	38	88	111	154	4	24	58	55	69	116	54	66	20	20
	3	80.5	20	26	47	88	111	232	0	24	58	55	69	116	54	66	20	20
180	4	80.5	20	26	47	88	111	334	2.5	24	58	55	69	116	54	66	20	20
	1	112.5	26	33.5	47	121	-	234	0	31	58	58	69	159	76	95	21	-
	2	112.5	26	33.5	47	121	-	447	0	31	58	58	69	159	76	95	21	-
	2	112.5	26	33.5	50	121	-	454	0	38	58	58	69	159	76	95	21	-

MFB SPARE PARTS

Order number for spare parts



Item: Q.ty: 1 pc.		
1 (1a ÷ 1e)		
Filter series	Seal Kit code number	
	NBR	FPM
MFB 020	02050572	02050573
MFB 030	02050574	02050575
MFB 100	02050555	02050556
MFB 180	02050576	02050577
MFB 190	02050578	02050579

MPH series

Maximum working pressure up to 1 MPa (10 bar) - Flow rate up to 3500 l/min



Return filter

Maximum working pressure up to 1 MPa (10 bar)

Flow rate up to 3500 l/min

MPH is a range of return filters for protection of the reservoir against the system contamination.

They are directly fixed to the reservoir, in immersed or semi-immersed position.

The use of the diffuser is recommended, to place the filter output always immersed into the fluid to avoid aeration or foam generation into the reservoir.

The filtration from inside to outside allows a cleaner filter element replacement, the dirty remains into the filter element.

Available features:

- Female threaded connections up to 1 1/2" and flanged connections up to 4", for a maximum flow rate of 3500 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, to relieve excessive pressure drop across the filter media
- Magnetic filter, to hold the ferrous particles
- 2, 3, 4 or 8 fixing holes for installation, to suit a variety of reservoir surfaces
- Flat Seal to suit a variety of reservoir surfaces
- Oil dipstick, to easily check the level of the fluid into the reservoir (separate item)
- Diffuser, to reduce the risk of aeration, foaming and noise
- Filler plug, to fill cleaned fluid into the tank without an additional plug
- Integrated breather filter, to clean the air that moves into the reservoir as result of the oil level fluctuation (MPH110/114)
- 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 (MPH110/114)
- Visual, electrical and electronic clogging indicators

Common applications:

Heavy duty industrial equipment

Filter housing materials

- Head
 - Aluminium: MPH 110-114-116-120-250
 - Anodized Aluminium: MPH 630-850
 - Painted Aluminium: MPH 660
- Cover
 - Nylon: MPH 110-114-116-120
 - Aluminium: MPH 250
 - Anodized Aluminium: MPH 630
 - Painted Aluminium: MPH 660
 - Steel: MPH 850
- Insert assembly
 - Nylon: MPH 110-114-116-120
 - Aluminium: MPH 250-630-660-850
- Diffuser: Tinned Steel
- Valve: Phosphatized Steel

Bypass valve

- Opening pressure 175 kPa (1.75 bar)±10%
- Opening pressure 250 kPa (2.5 bar) ±10%, except for MPH 850

Δp element type

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

Seals

- Standard NBR series A
- Optional FPM series V

Temperature

From -25 °C to +110 °C

Note

MPH filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]					Volumes [dm ³]						
	Length	1	2	3	4	5	Length	1	2	3	4	5
MPH 110	1.60	1.70	1.80	2.20	2.60	1.60	1.70	1.80	2.20	2.60		
MPH 114	1.60	1.70	1.80	2.20	2.60	1.60	1.70	1.80	2.20	2.60		
MPH 116	1.60	1.70	1.80	2.20	2.60	1.60	1.70	1.80	2.20	2.60		
MPH 120	1.60	1.70	1.80	2.20	2.60	1.60	1.70	1.80	2.20	2.60		
MPH 250	3.60	3.90	4.20	5.60	-	4.40	4.40	5.40	8.00	-		
MPH 630	6.50	7.00	7.40	8.50	10.50	7.30	9.00	11.00	13.00	19.20		
MPH 660	-	-	-	11.50	14.00	-	-	-	14.60	21.00		
MPH 850	32.00	35.00	38.00	42.00	-	13.00	16.50	21.00	25.00	-		

Filter series	Length	A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
MPH 110-114 116-120	1	26	29	72	79	107	282	164	190
	2	43	46	112	114	161	318	164	190
	3	64	72	132	156	178	324	219	251
	4	90	99	184	198	216	324	266	302
	5	117	128	201	219	244	324	282	318
MPH 250	1	93	102	210	251	315	1093	339	383
	2	124	151	327	412	421	1122	460	514
	3	189	221	418	445	500	1137	544	616
	4	261	304	592	670	766	1166	832	923
MPH 630	1	160	200	369	423	518	1894	565	632
	2	240	257	571	611	1045	1929	1137	1285
	3	330	374	745	788	1308	1938	1416	1577
	4	374	403	887	1010	1348	1956	1448	1612
	5	625	698	1210	1257	1723	2121	1839	1929
MPH 660	4	370	399	903	1042	1460	2376	1596	1830
	5	624	699	1282	1343	1997	2663	2182	2331
MPH 850	1	775	1041	1246	1568	2242	3311	2371	2625
	2	1176	1522	1682	1747	2449	3378	2684	2886
	3	1490	1914	1995	2014	3035	3405	3144	3220
	4	1668	2088	2305	2363	3169	3517	3272	3378

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

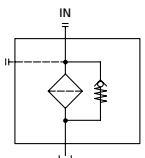
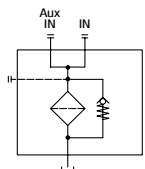
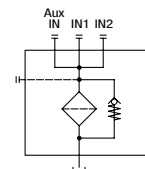
The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols

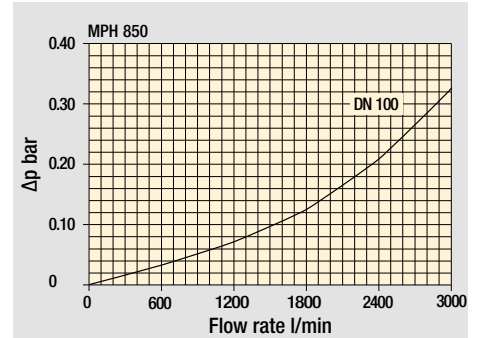
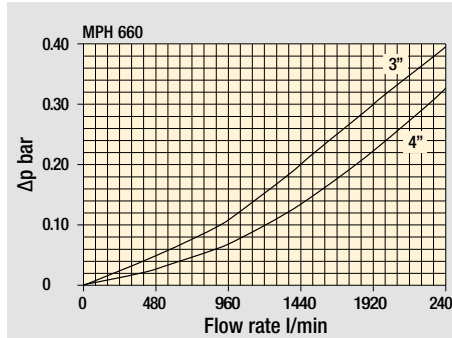
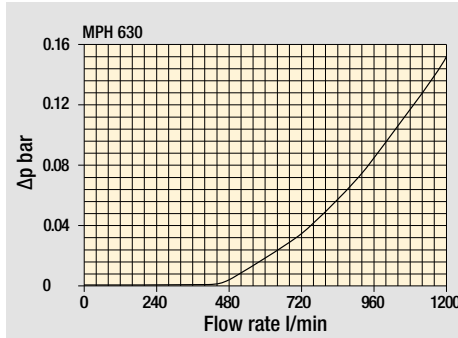
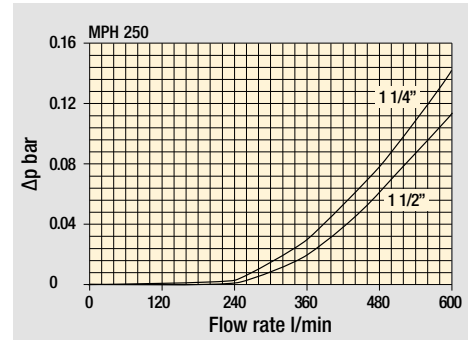
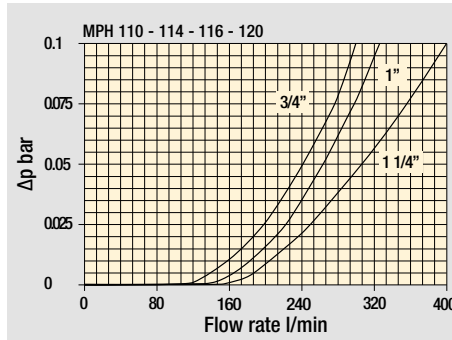
Filter series	Style 1 connection	Style 2 connections	Style 3 connections
MPH 110		•	
MPH 114	•		
MPH 116	•		
MPH 120			•
MPH 250	•	•	
MPH 630	•	•	
MPH 660	•		
MPH 850		•	

		
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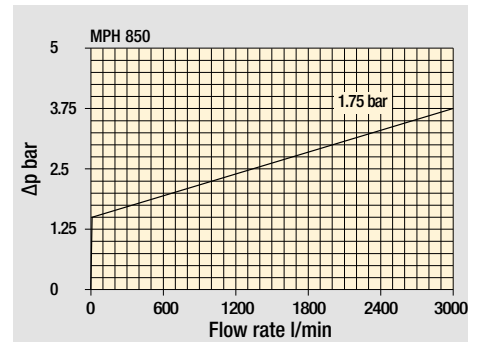
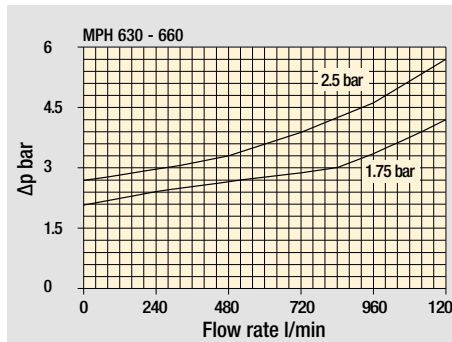
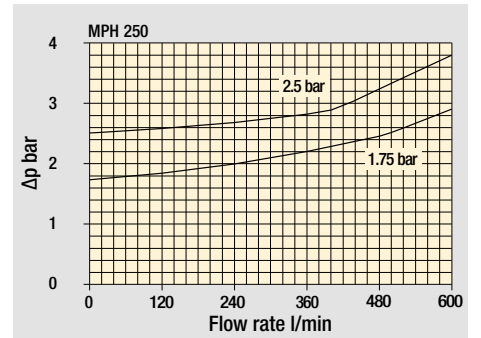
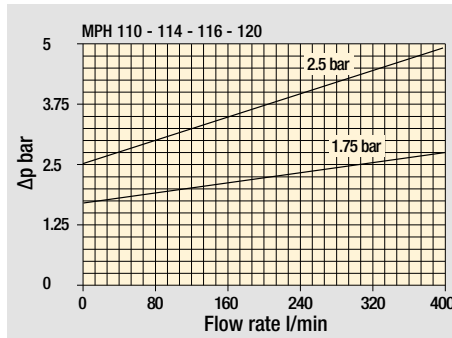
MPH GENERAL INFORMATION

Pressure drop

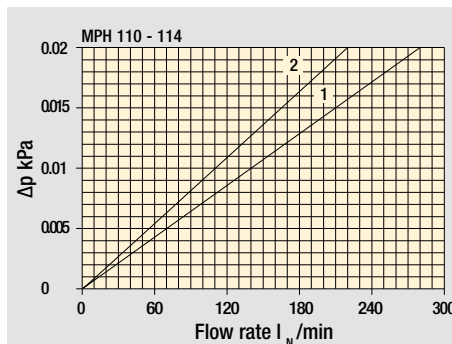
Filter housings Δp pressure drop



Bypass valve pressure drop



Air breather pressure drop



- 1 C With air breather 10 μ m
- 2 D With anti-splash and SAP50 10 μ m

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

Designation & Ordering code

COMPLETE FILTER

Series and size **MPH110** Configuration example: **MPH110** | **1** | **S** | **D** | **S** | **A** | **G1** | **1** | **A10** | **P01**

Length
1 | 2 | 3 | 4 | 5 |

Bypass valve
S Without bypass | **C** 1.75 bar | **E** 2.5 bar

Diffuser and magnetic filter
D With diffuser, with magnetic filter
F With diffuser, without magnetic filter
O Without diffuser, with magnetic filter
E Without diffuser, without magnetic filter

Air breather
S Without air breather
C With air breather 10 µm
D With anti-splash and air breather SAP050 10 µm
P With anti-splash and air breather SAP050 10 µm pressurization 0.5 bar

Seals and treatments	Filtration rating		
	Axx	Mxx	Pxx
A NBR	•	•	•
V FPM	•	•	•
W NBR head anodized filter element compatible with fluids HFA-HFB-HFC	•	•	
Z FPM head anodized	•	•	

Main Connections	Aux size 1	Aux size 2	Main Connections	Aux size 1	Aux size 2		
G1 G 3/4"	G 3/8"	G 1/2"	G7 SAE 12 - 1 1/16" - 12 UN	SAE 6 - 9/16" - 18 UNF	SAE 8 - 3/4" - 16 UNF		
G2 G 1"			G8 SAE 16 - 1 5/16" - 12 UN				
G3 G 1 1/4"			G9 SAE 20 - 1 5/8" - 12 UN				
G4 3/4" NPT			3/8" NPT	1/2" NPT			
G5 1" NPT							
G6 1 1/4" NPT							

Aux connection - see previous table
0 Not machined | **1** Aux size 1 | **2** Aux size 2

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

Execution
P01 MP Filtri standard
Pxx Customized

FILTER ELEMENT

Element series and size **MR100** Configuration example: **MR100** | **1** | **A10** | **A** | **P01**

Element length
1 | 2 | 3 | 4 | 5 |

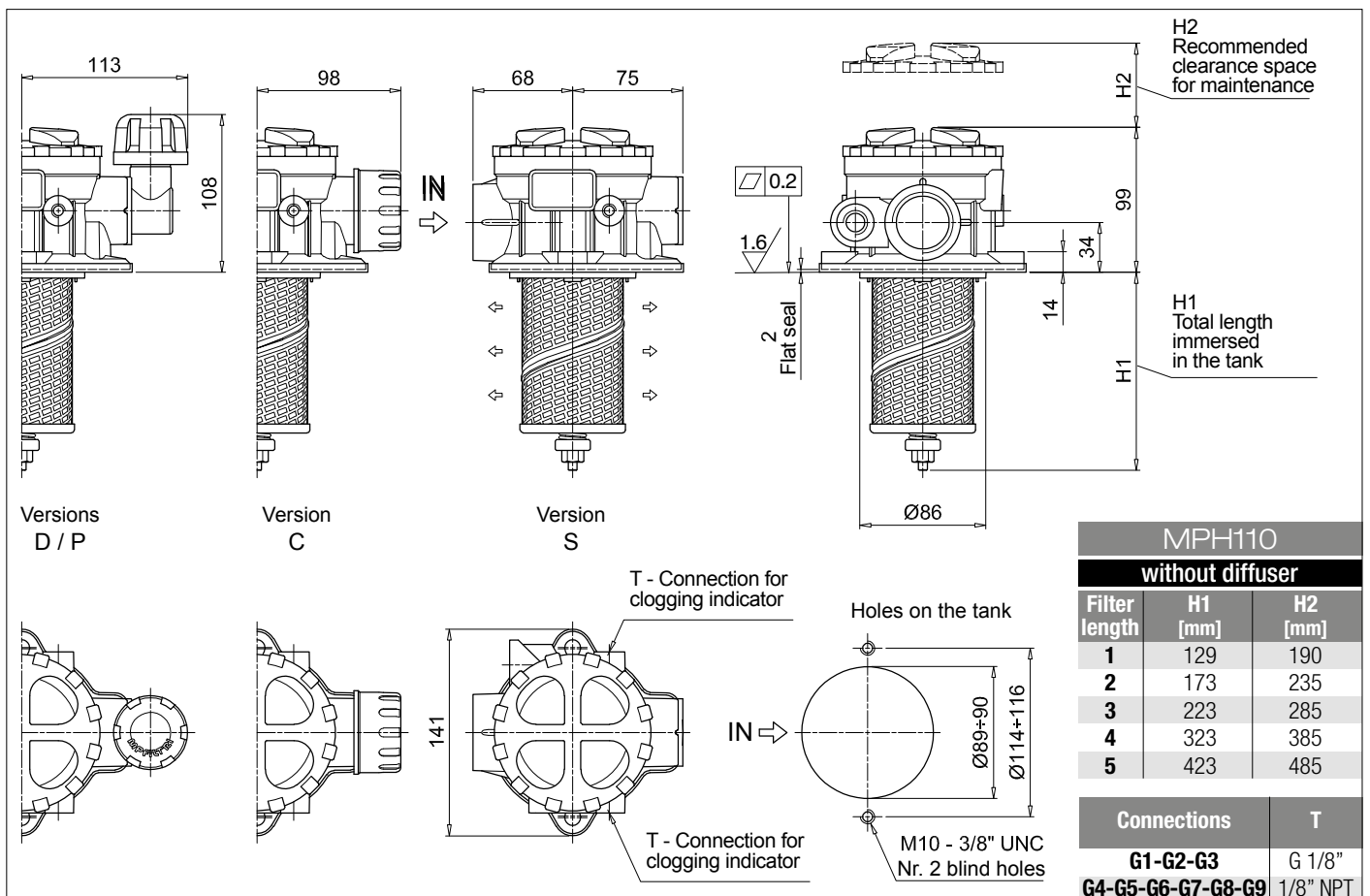
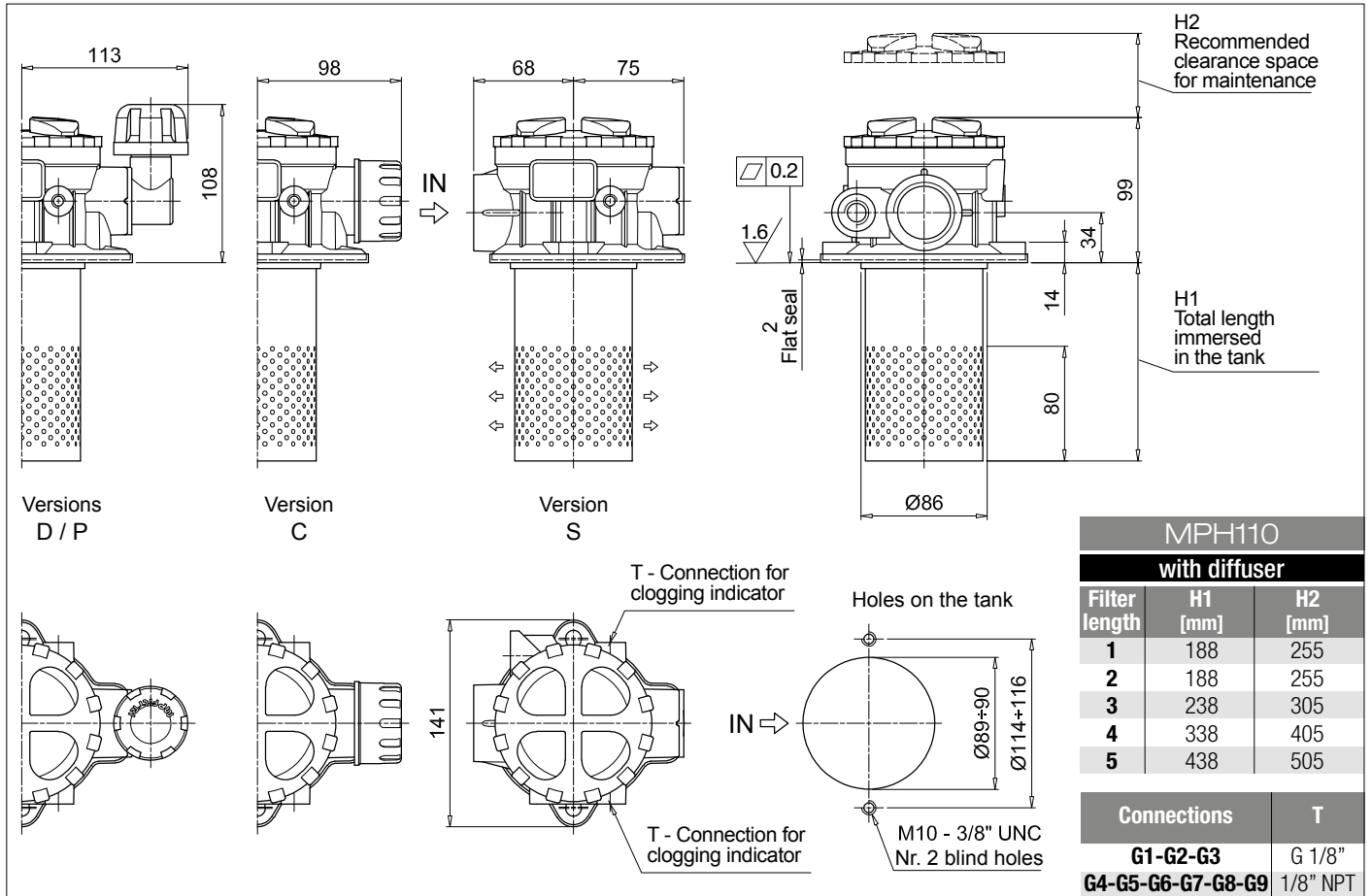
Filtration rating (filter media)
A03 Inorganic microfiber 3 µm | **M25** Wire mesh 25 µm
A06 Inorganic microfiber 6 µm | **M60** Wire mesh 60 µm
A10 Inorganic microfiber 10 µm | **M90** Wire mesh 90 µm
A16 Inorganic microfiber 16 µm | **P10** Resin impregnated paper 10 µm
A25 Inorganic microfiber 25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

Seals
A NBR
V FPM

Execution
P01 MP Filtri standard
Pxx Customized

ACCESSORIES

Indicators	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		
DPT Dipstick	249		



Designation & Ordering code

COMPLETE FILTER

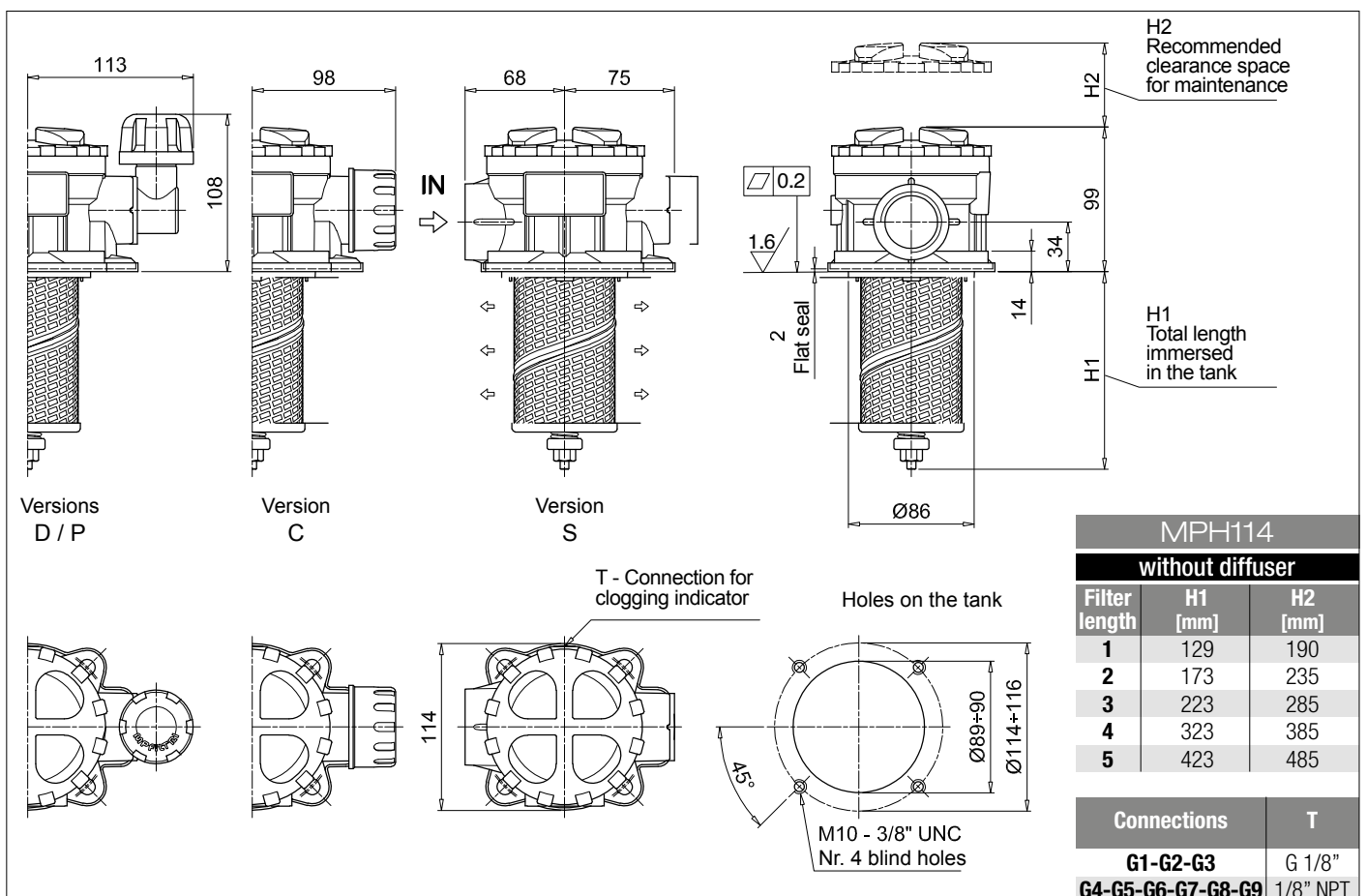
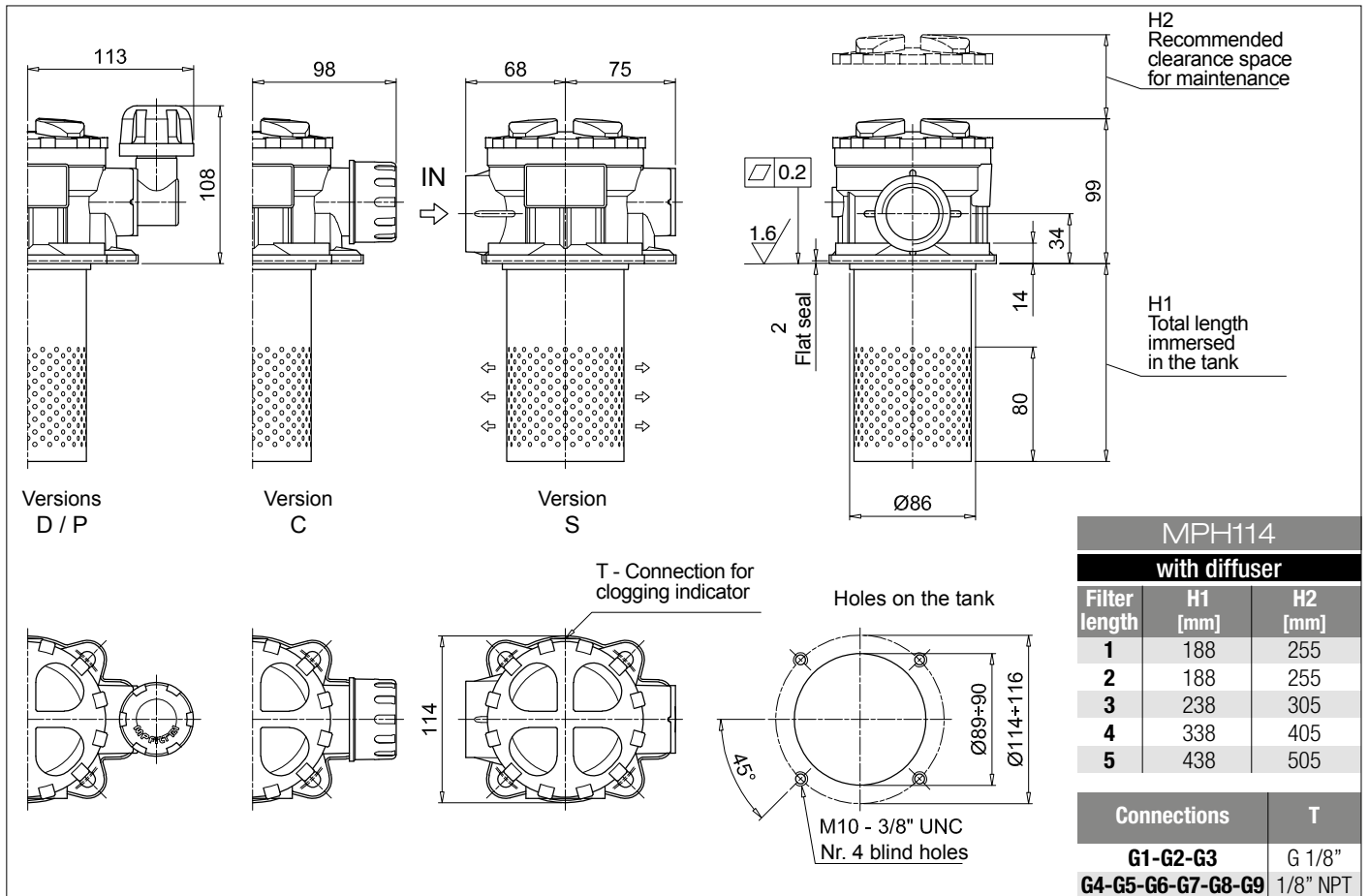
Series and size MPH114	Configuration example: MPH114 3 C E C Z G6 M60 P01									
Length	1 2 3 4 5									
Bypass valve	S Without bypass C 1.75 bar E 2.5 bar									
Diffuser and magnetic filter	D With diffuser, with magnetic filter F With diffuser, without magnetic filter O Without diffuser, with magnetic filter E Without diffuser, without magnetic filter									
Air breather	S Without air breather C With air breather 10 µm D With anti-splash and air breather SAP050 10 µm P With anti-splash and air breather SAP050 10 µm pressurization 0.5 bar									
Seals and treatments	Filtration rating									
	Axx	Mxx	Pxx							
A NBR	•	•	•							
V FPM	•	•	•							
W NBR head anodized	•	•		filter element compatible with fluids HFA-HFB-HFC						
Z FPM head anodized	•	•								
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									
	Execution									
	P01 MP Filtri standard									
	Pxx Customized									

FILTER ELEMENT

Element series and size MR100	Configuration example: MR100 3 M60 V P01			
Element length	1 2 3 4 5			
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			
	Seals		Execution	
	A NBR		P01 MP Filtri standard	
	V FPM		Pxx Customized	

ACCESSORIES

Indicators	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		
DPT Dipstick	249		



Designation & Ordering code

COMPLETE FILTER

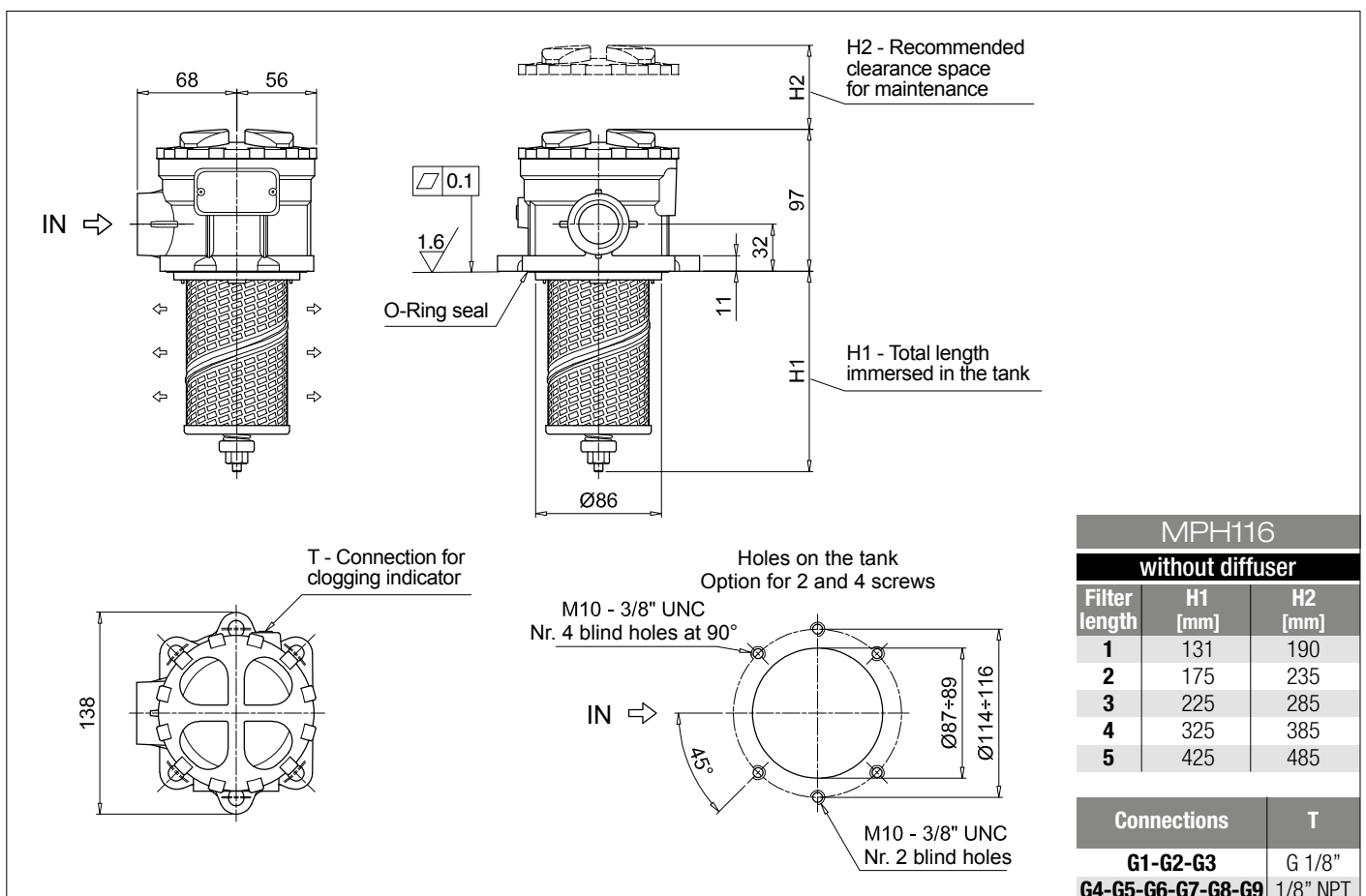
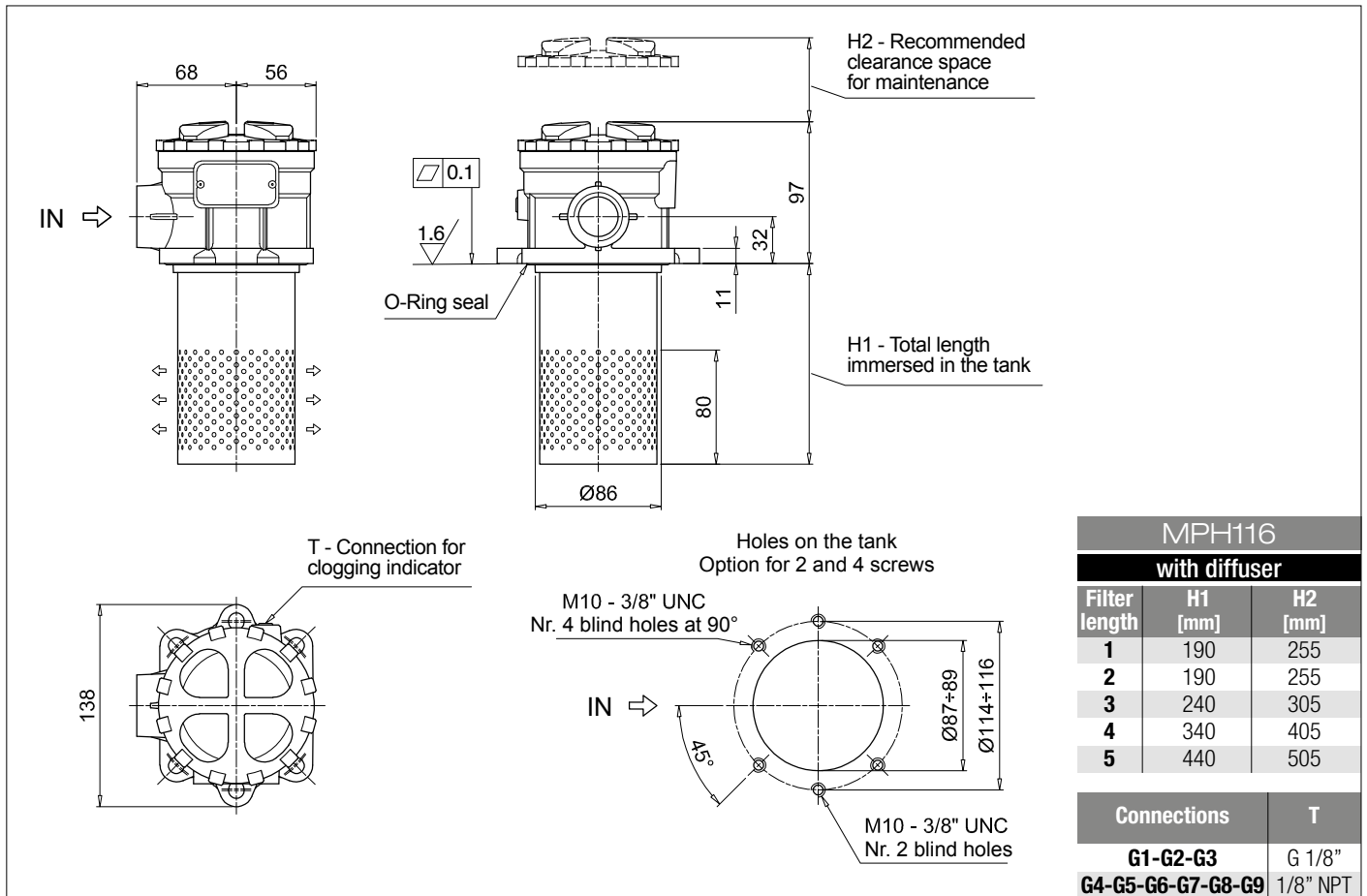
Series and size MPH116	Configuration example: MPH116 5 S D S A G1 A10 P01									
Length 1 2 3 4 5										
Bypass valve S Without bypass C 1.75 bar E 2.5 bar										
Diffuser and magnetic filter D With diffuser, with magnetic filter F With diffuser, without magnetic filter O Without diffuser, with magnetic filter E Without diffuser, without magnetic filter										
Air breather S Without air breather										
Seals and treatments	Filtration rating									
A NBR	Axx	Mxx	Pxx							
V FPM										
W NBR head anodized				filter element compatible with fluids HFA-HFB-HFC						
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									
										Execution
										P01 MP Filtri standard
										Pxx Customized

FILTER ELEMENT

Element series and size MR100	Configuration example: MR100 5 A10 A P01			
Element length 1 2 3 4 5				
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			
		Seals	Execution	
		A NBR	P01 MP Filtri standard	
		V FPM	Pxx Customized	

ACCESSORIES

Indicators	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		
DPT Dipstick	249		



Designation & Ordering code

COMPLETE FILTER

Series and size **MPH120** Configuration example: **MPH120** | **1** | **S** | **D** | **A** | **G1** | **1** | **A10** | **P01**

Length

1 | 2 | 3 | 4 | 5 |

Bypass valve

S Without bypass | **C** 1.75 bar | **E** 2.5 bar

Diffuser and magnetic filter

D With diffuser, with magnetic filter
F With diffuser, without magnetic filter
O Without diffuser, with magnetic filter
E Without diffuser, without magnetic filter

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

Main Connections	Rear connections	Aux size 1	Aux size 2
G1 G 3/4"	G 3/4"	G 3/8"	G 1/2"
G2 G 1"	G 1"		
G3 G 1 1/4"	G 3/4"		
G4 3/4" NPT	3/4" NPT	3/8" NPT	1/2" NPT
G5 1" NPT	1" NPT		
G6 1 1/4" NPT	3/4" NPT		
G7 SAE 12 - 1 1/16" - 12 UN	SAE 12 - 1 1/16" - 12 UN	SAE 6 - 9/16" - 18 UNF	SAE 8 - 3/4" - 16 UNF
G8 SAE 16 - 1 5/16" - 12 UN	SAE 16 - 1 5/16" - 12 UN		
G9 SAE 20 - 1 5/8" - 12 UN	SAE 12 - 1 1/16" - 12 UN		

Aux connection - see previous table

0 Not machined | **1** Aux size 1 | **2** Aux size 2

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

Execution

P01 MP Filtri standard
Pxx Customized

FILTER ELEMENT

Element series and size

MR100 Configuration example: **MR100** | **1** | **A10** | **A** | **P01**

Element length

1 | 2 | 3 | 4 | 5 |

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

Seals

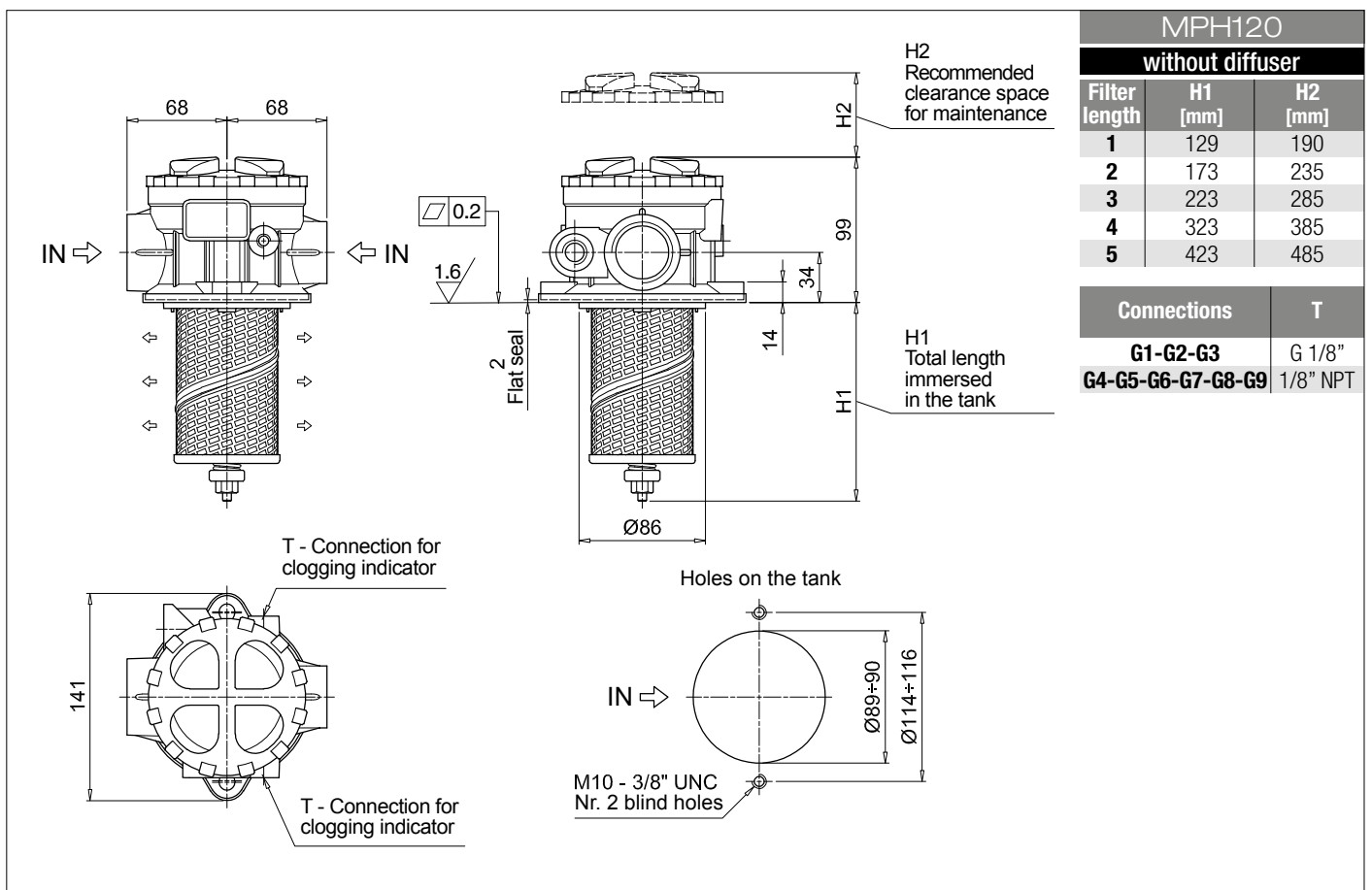
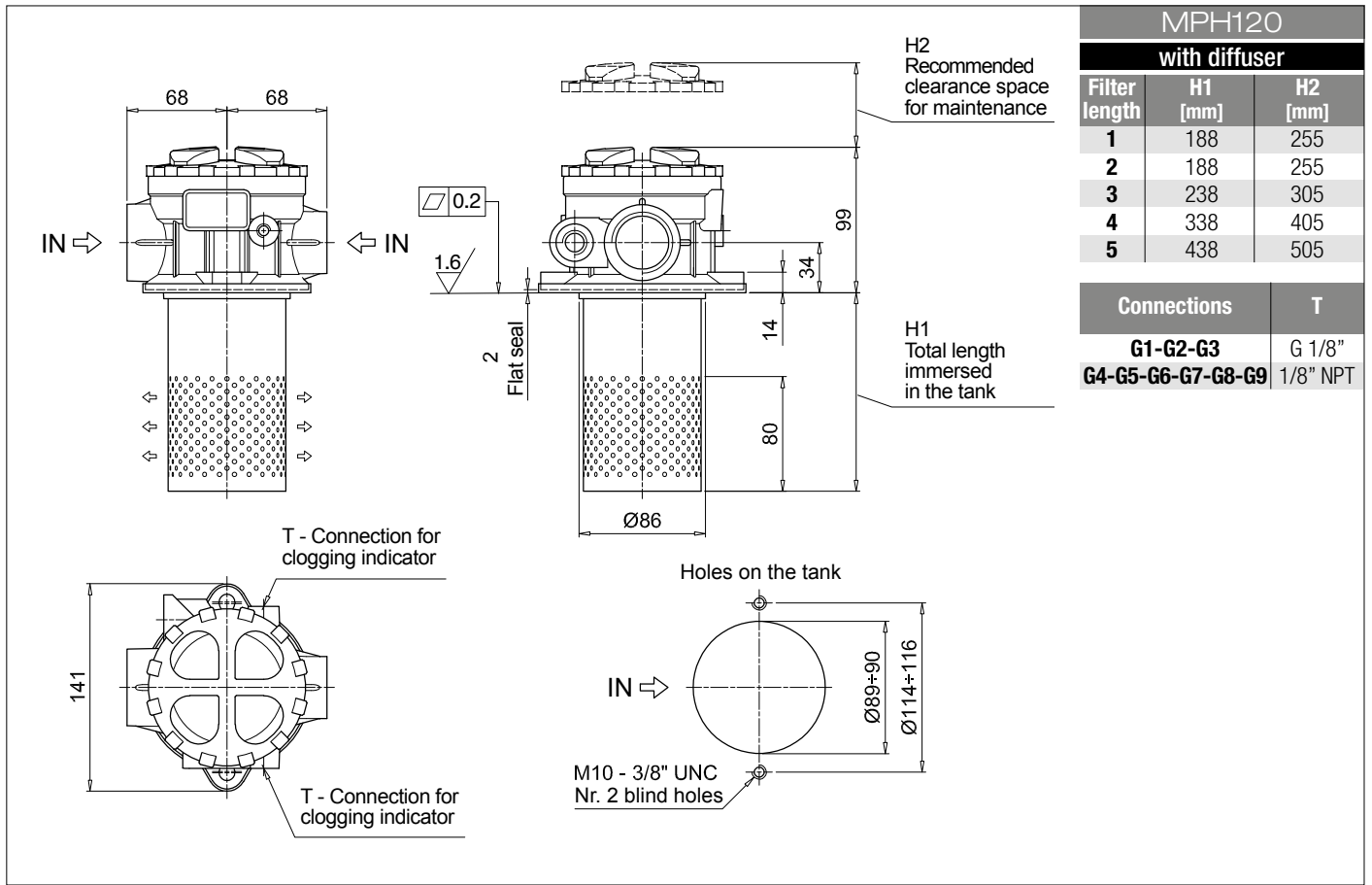
A NBR
V FPM

Execution

P01 MP Filtri standard
Pxx Customized

ACCESSORIES

Indicators	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		
Additional features	page		
DPT Dipstick	249		



Designation & Ordering code

COMPLETE FILTER

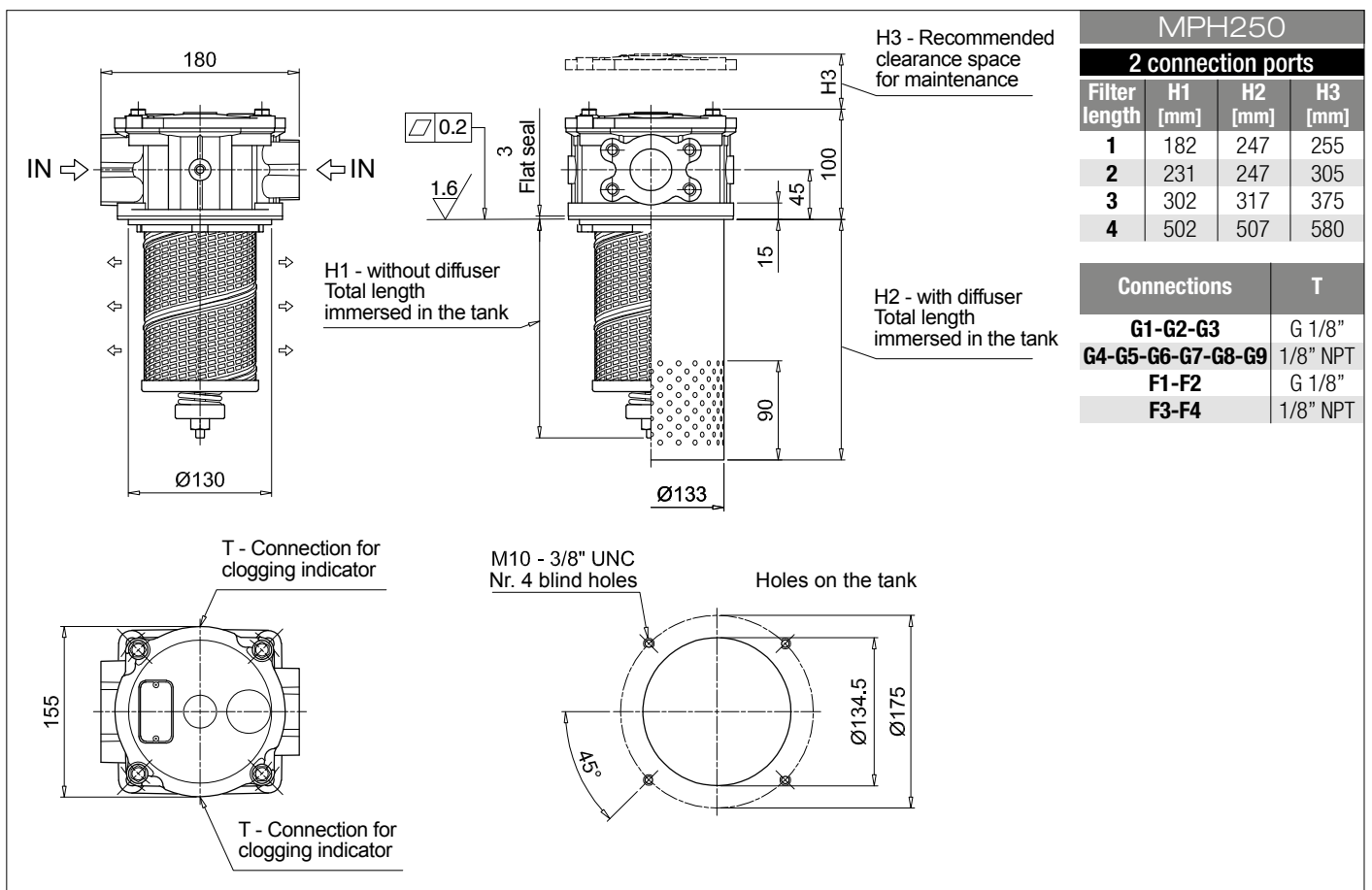
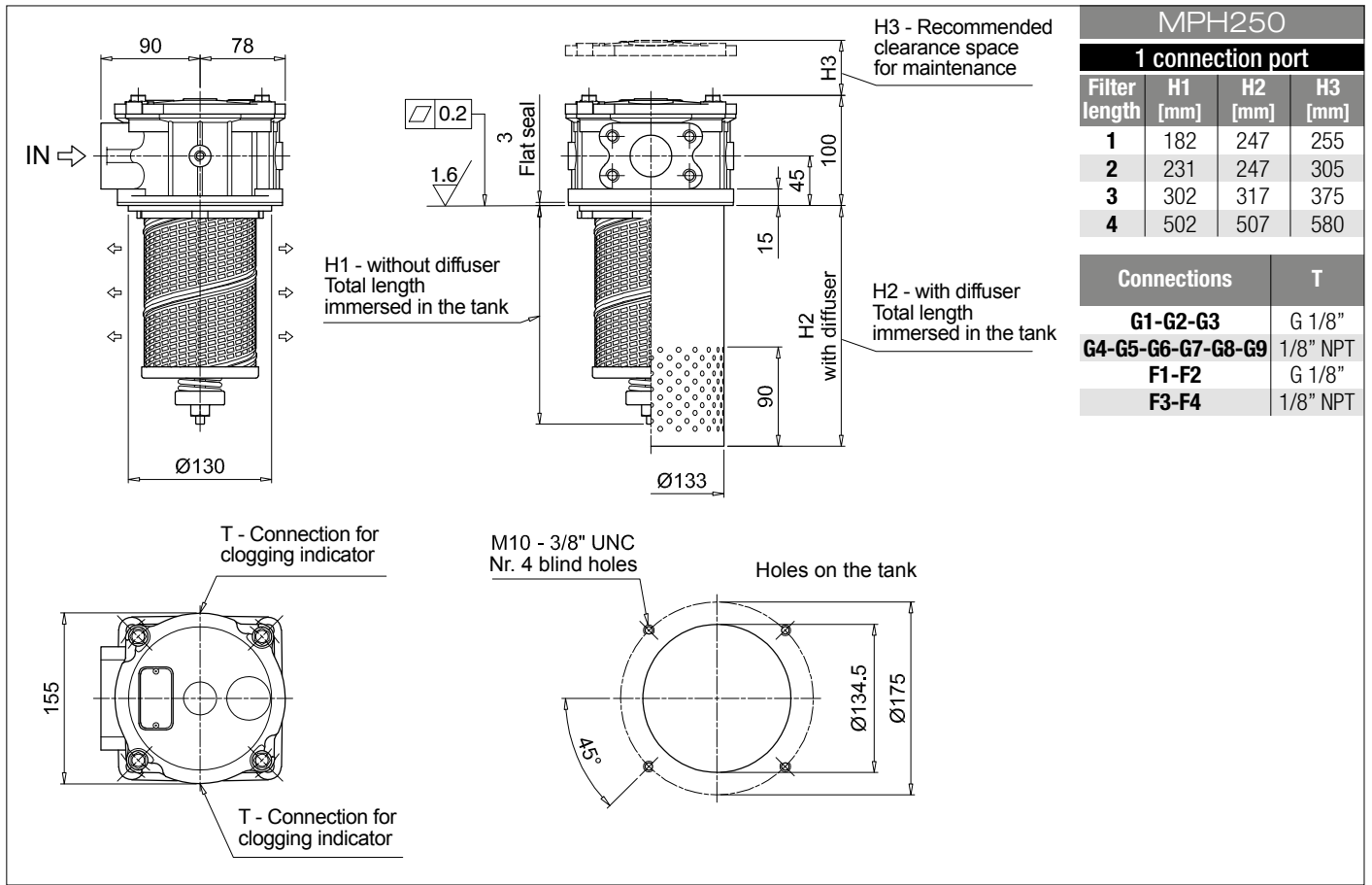
Series and size		Configuration example: MPH250 1 C D S A G1 A10 P01									
MPH250											
Length		1 2 3 4									
Bypass valve		S Without bypass C 1.75 bar E 2.5 bar									
Diffuser and magnetic filter		D With diffuser, with magnetic filter F With diffuser, without magnetic filter O Without diffuser, with magnetic filter E Without diffuser, without magnetic filter									
Air breather		S Without air breather									
Seals and treatments		Filtration rating									
		Axx	Mxx	Pxx							
A	NBR	•	•	•							
V	FPM	•	•	•							
W	NBR head anodized	•	•		filter element compatible with fluids HFA-HFB-HFC						
Z	FPM head anodized	•	•								
Main Connections		Rear connections									
G1	G 1 1/2"	-									
G2	G 1 1/2"	G 1 1/4"									
G4	1 1/2" NPT	-									
G5	1 1/2" NPT	1 1/4" NPT									
G7	SAE 24 - 1 7/8" - 12 UN	-									
G8	SAE 24 - 1 7/8" - 12 UN	SAE 20 - 1 5/8" - 12 UN									
F1	1 1/2" SAE 3000 psi/M	-									
F2	1 1/2" SAE 3000 psi/M	1 1/4" SAE 3000 psi/M									
F3	1 1/2" SAE 3000 psi/UNC	-									
F4	1 1/2" SAE 3000 psi/UNC	1 1/4" SAE 3000 psi/UNC									
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									
		Execution									
		P01 MP Filtri standard									
		Pxx Customized									

FILTER ELEMENT

Element series and size		Configuration example: MR250 1 A10 A P01			
MR250					
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			
		Seals		Execution	
		A NBR		P01 MP Filtri standard	
		V FPM		Pxx Customized	

ACCESSORIES

Indicators	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		



Designation & Ordering code

COMPLETE FILTER

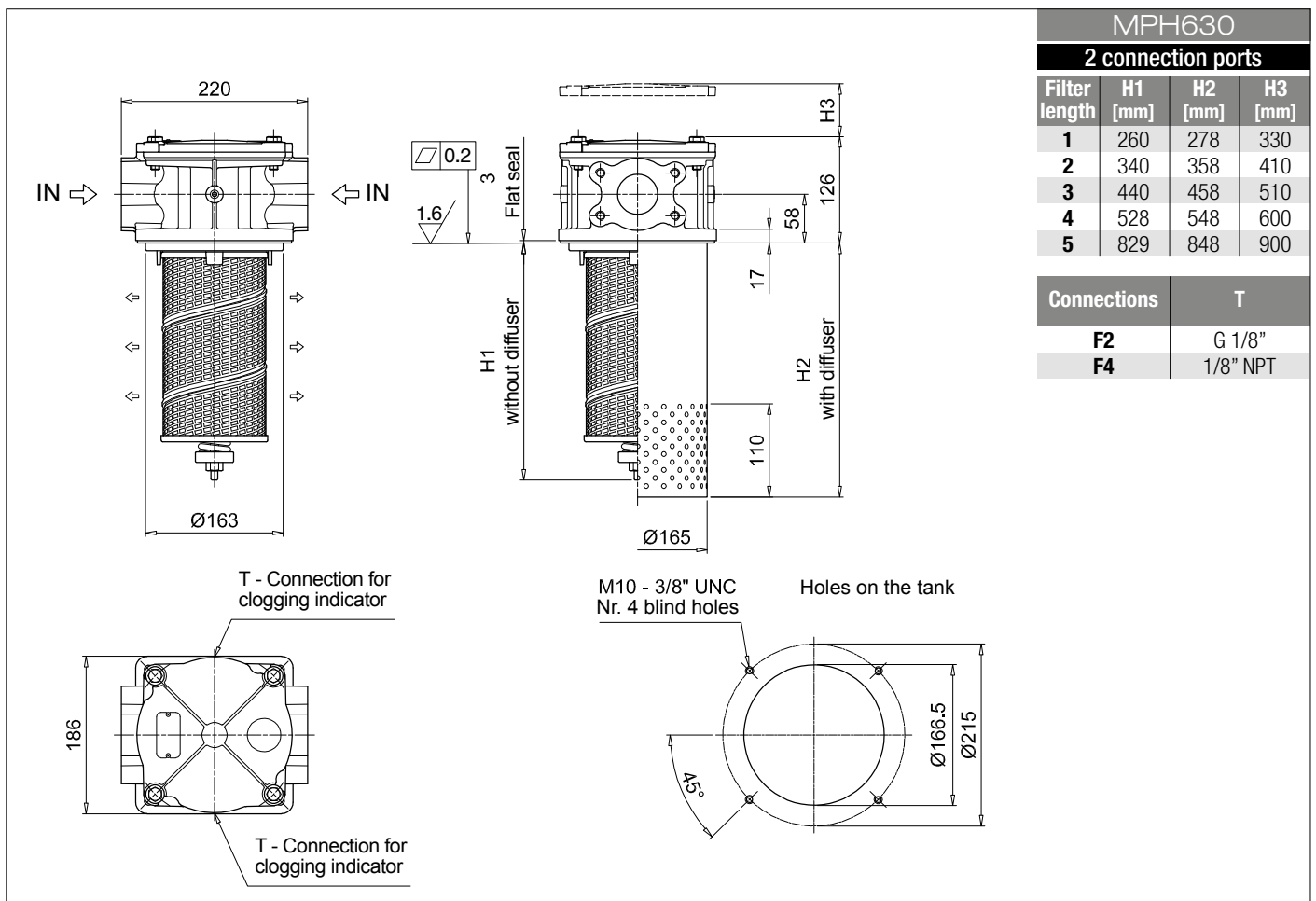
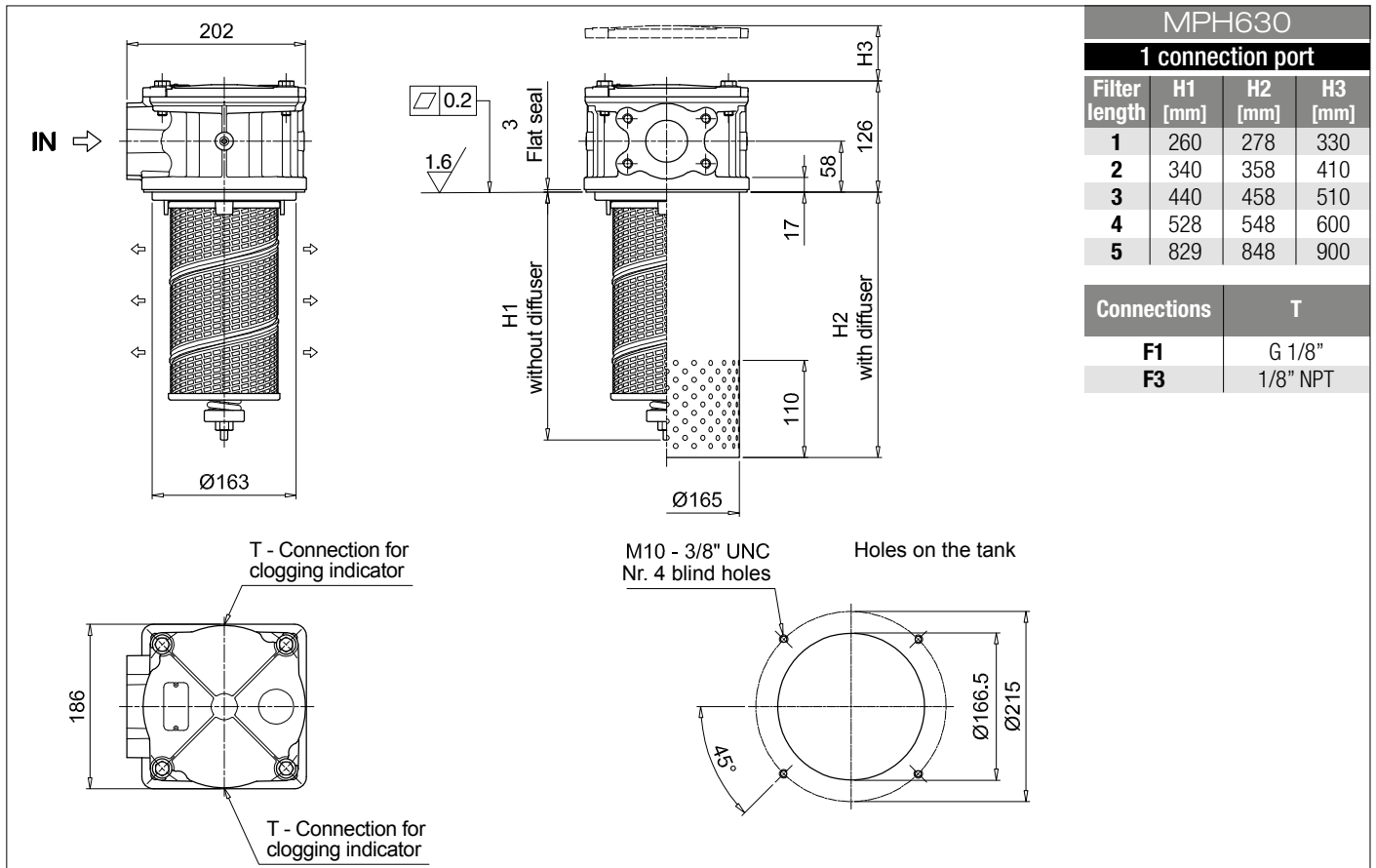
Series and size	Configuration example: MPH630 1 S E S W F1 M25 P01									
MPH630										
Length										
1 2 3 4 5										
Bypass valve										
S Without bypass C 1.75 bar E 2.5 bar										
Diffuser and magnetic filter										
D With diffuser, with magnetic filter										
F With diffuser, without magnetic filter										
O Without diffuser, with magnetic filter										
E Without diffuser, without magnetic filter										
Air breather										
S Without air breather										
Seals and treatments	Filtration rating									
	Axx	Mxx	Pxx							
A NBR	•	•	•							
V FPM	•	•	•							
W NBR head anodized	•	•		filter element compatible with fluids HFA-HFB-HFC						
Z FPM head anodized	•	•								
Main Connections	Rear connections									
F1 2 1/2" SAE 3000 psi/M	-									
F2 2 1/2" SAE 3000 psi/M	2" SAE 3000 psi/M									
F3 2 1/2" SAE 3000 psi/UNC	-									
F4 2 1/2" SAE 3000 psi/UNC	2" SAE 3000 psi/UNC									
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									
	Execution									
	P01 MP Filtri standard									
	Pxx Customized									

FILTER ELEMENT

Element series and size	Configuration example: MR630 1 M25 A P01				
MR630					
Element length					
1 2 3 4 5					
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				
	Seals		Execution		
	A NBR		P01 MP Filtri standard		
	V FPM		Pxx Customized		

ACCESSORIES

Indicators	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		



Designation & Ordering code

COMPLETE FILTER

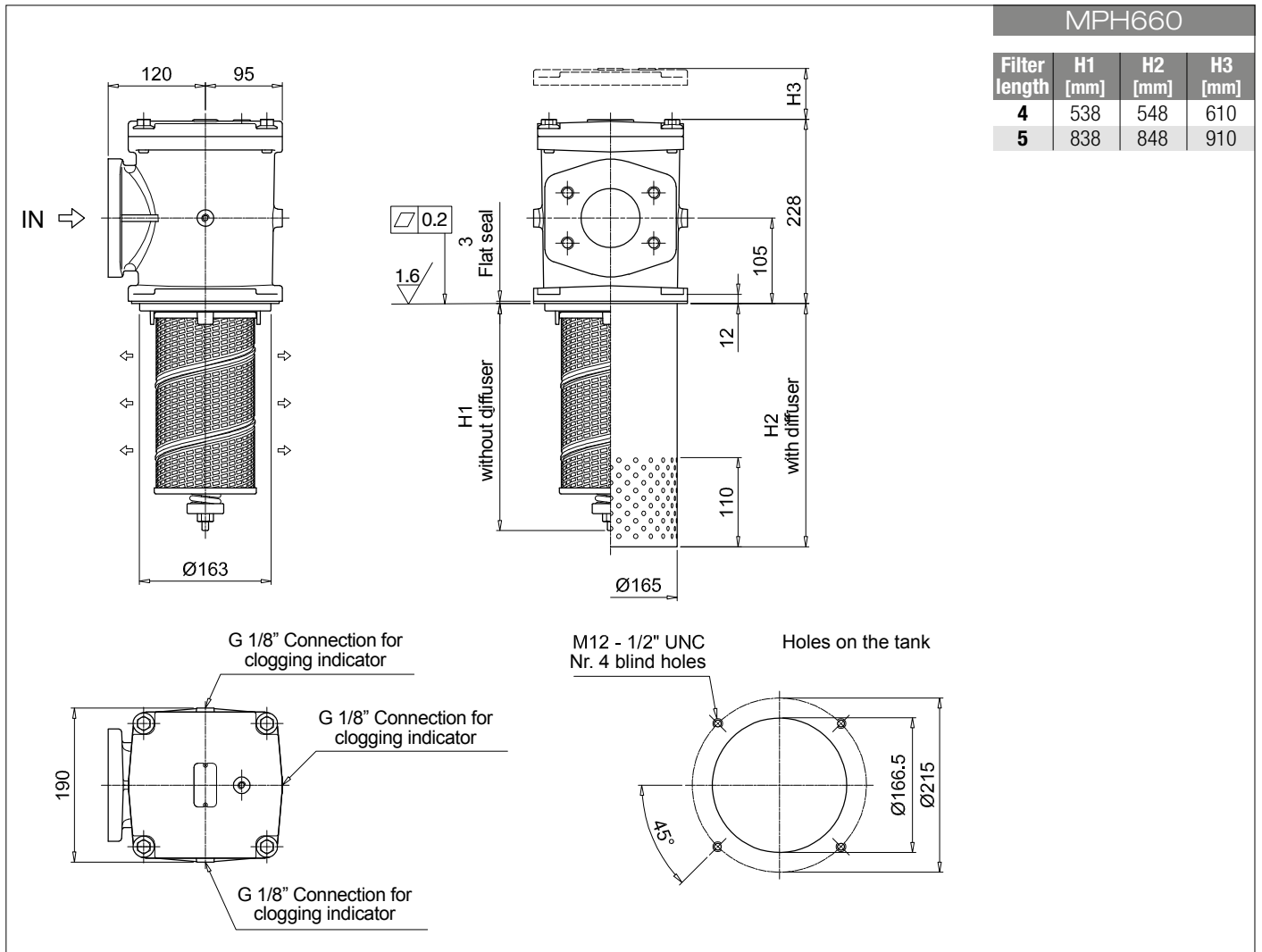
Series and size	Configuration example: MPH660 4 C D S A F2 A10 P01																			
MPH660																				
Length	4 5																			
Bypass valve	S Without bypass C 1.75 bar E 2.5 bar																			
Diffuser and magnetic filter	D With diffuser, with magnetic filter F With diffuser, without magnetic filter O Without diffuser, with magnetic filter E Without diffuser, without magnetic filter																			
Air breather	S Without air breather																			
Seals and treatments	Filtration rating																			
	Axx	Mxx	Pxx																	
A NBR	•	•	•																	
V FPM	•	•	•																	
W NBR head anodized	•	•		filter element compatible with fluids HFA-HFB-HFC																
Z FPM head anodized	•	•																		
Main Connections	F1 3" SAE 3000 psi/M F2 4" SAE 3000 psi/M																			
Filtration rating (filter media)	<table border="0"> <tr> <td>A03 Inorganic microfiber 3 µm</td> <td>M25 Wire mesh 25 µm</td> </tr> <tr> <td>A06 Inorganic microfiber 6 µm</td> <td>M60 Wire mesh 60 µm</td> </tr> <tr> <td>A10 Inorganic microfiber 10 µm</td> <td>M90 Wire mesh 90 µm</td> </tr> <tr> <td>A16 Inorganic microfiber 16 µm</td> <td>P10 Resin impregnated paper 10 µm</td> </tr> <tr> <td>A25 Inorganic microfiber 25 µm</td> <td>P25 Resin impregnated paper 25 µm</td> </tr> </table>										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
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																			
								Execution												
								P01 MP Filtri standard												
								Pxx Customized												

FILTER ELEMENT

Element series and size	Configuration example: MR630 5 M25 A P01														
MR630															
Element length	4 5														
Filtration rating (filter media)	<table border="0"> <tr> <td>A03 Inorganic microfiber 3 µm</td> <td>M25 Wire mesh 25 µm</td> </tr> <tr> <td>A06 Inorganic microfiber 6 µm</td> <td>M60 Wire mesh 60 µm</td> </tr> <tr> <td>A10 Inorganic microfiber 10 µm</td> <td>M90 Wire mesh 90 µm</td> </tr> <tr> <td>A16 Inorganic microfiber 16 µm</td> <td>P10 Resin impregnated paper 10 µm</td> </tr> <tr> <td>A25 Inorganic microfiber 25 µm</td> <td>P25 Resin impregnated paper 25 µm</td> </tr> </table>					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
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														
	Seals		Execution												
	A NBR		P01 MP Filtri standard												
	V FPM		Pxx Customized												

ACCESSORIES

Indicators	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		



Designation & Ordering code

COMPLETE FILTER

Series and size **MPH850** Configuration example: **MPH850** | **1** | **C** | **D** | **S** | **A** | **F1** | **A10** | **P01**

Length **1** | **2** | **3** | **4**

Bypass valve **S** Without bypass | **C** 1.75 bar

Diffuser and magnetic filter
D With diffuser, with magnetic filter
F With diffuser, without magnetic filter
O Without diffuser, with magnetic filter
E Without diffuser, without magnetic filter

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

Main Connections	Rear connections
F1 UNI 2223 DN 100 PN 10/16	3" SAE 3000 psi/M
F2 UNI 2223 DN 100 PN 10/16	3" SAE 3000 psi/UNC
F5 Not machined	3" SAE 3000 psi/M
F6 Not machined	3" SAE 3000 psi/UNC
F7 4" SAE 3000 psi/M	3" SAE 3000 psi/M
F8 4" SAE 3000 psi/UNC	3" SAE 3000 psi/UNC

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

Execution
P01 MP Filtri standard
Pxx Customized

FILTER ELEMENT

Element series and size **MR850** Configuration example: **MR850** | **1** | **A10** | **A** | **P01**

Element length **1** | **2** | **3** | **4**

Filtration rating (filter media)

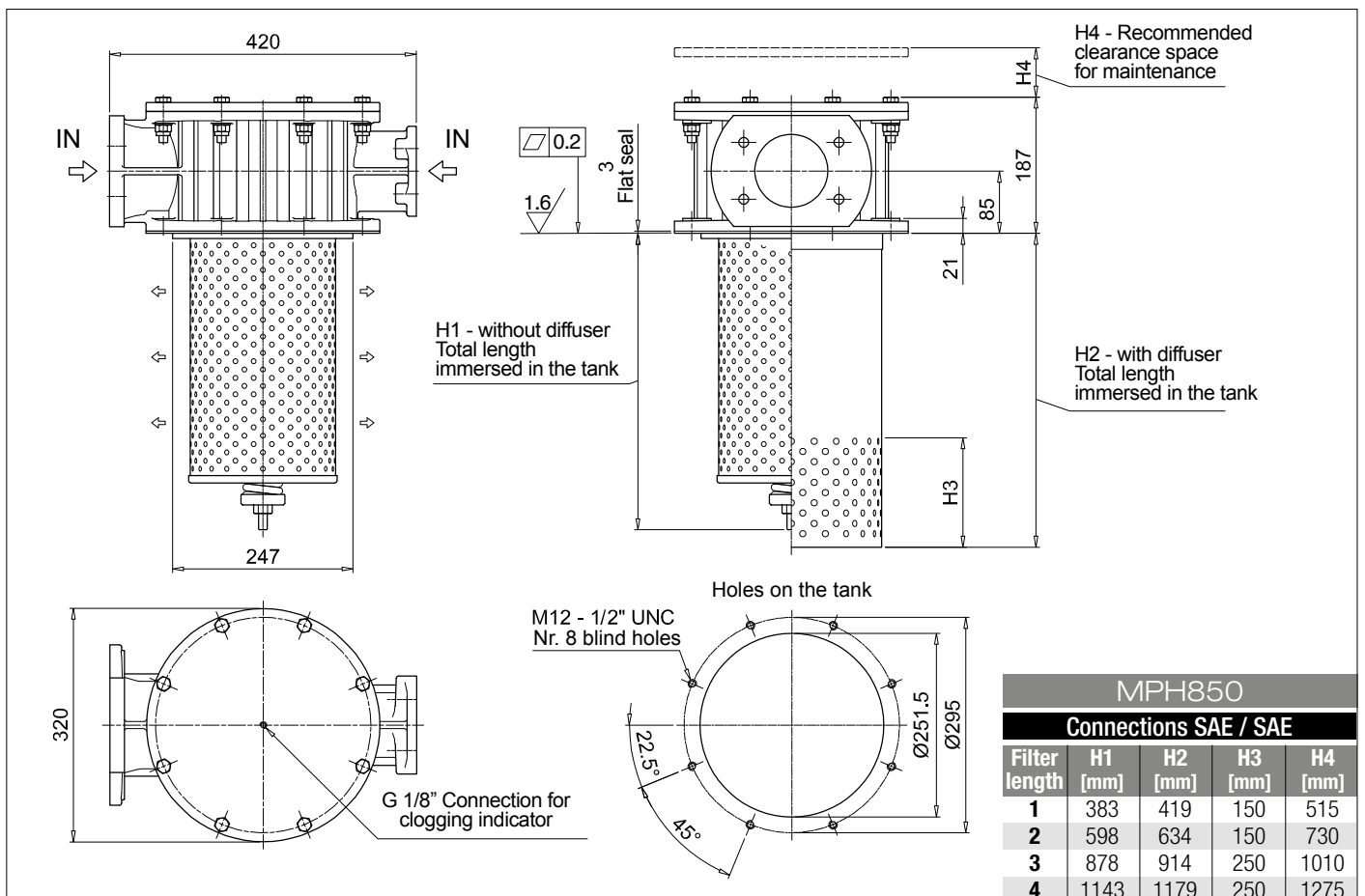
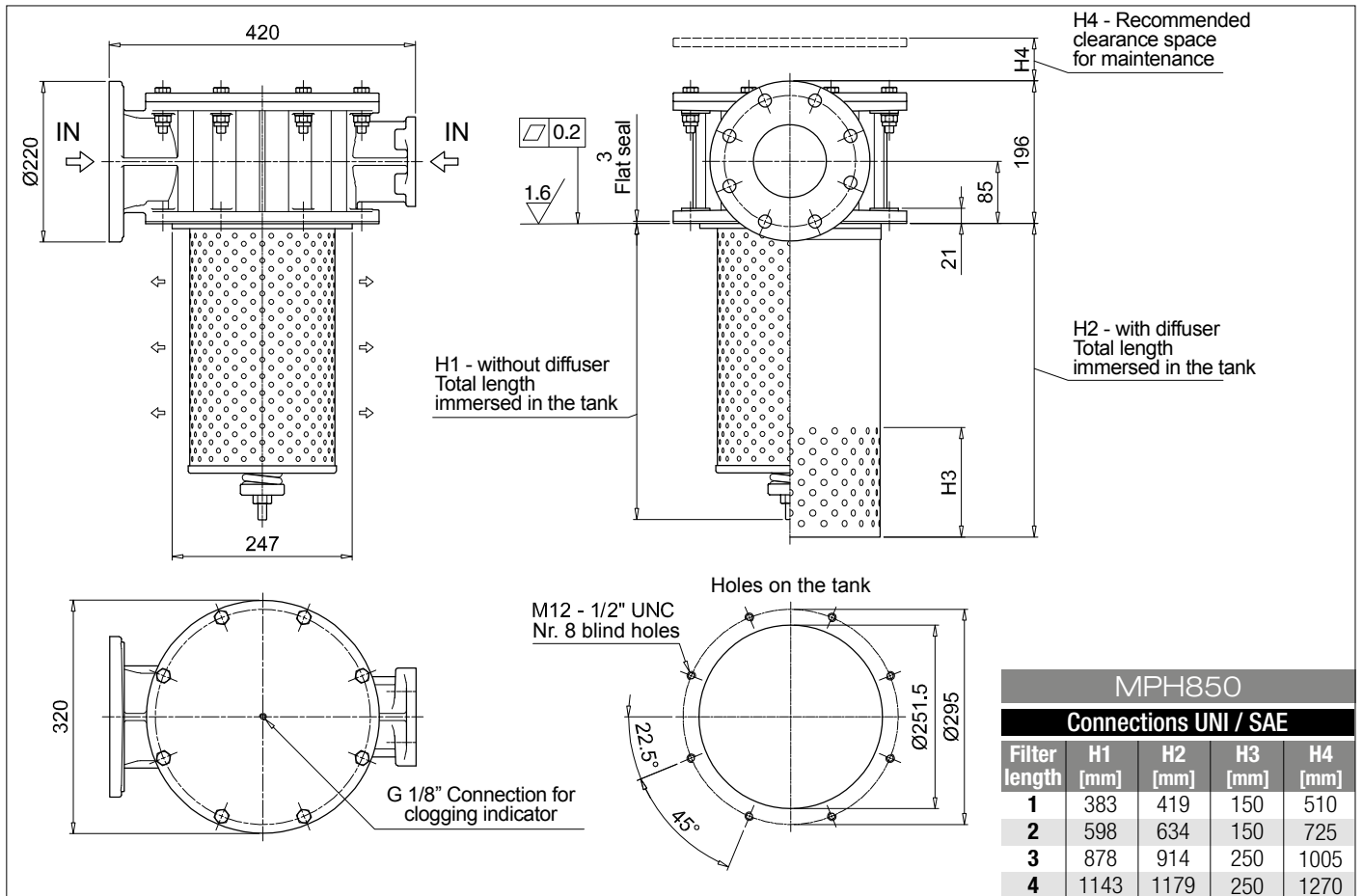
A03 Inorganic microfiber 3 µm	M25 Wire mesh 25 µm
A06 Inorganic microfiber 6 µm	M60 Wire mesh 60 µm
A10 Inorganic microfiber 10 µm	M90 Wire mesh 90 µm
A16 Inorganic microfiber 16 µm	P10 Resin impregnated paper 10 µm
A25 Inorganic microfiber 25 µm	P25 Resin impregnated paper 25 µm

Seals
A NBR
V FPM

Execution
P01 MP Filtri standard
Pxx Customized

ACCESSORIES

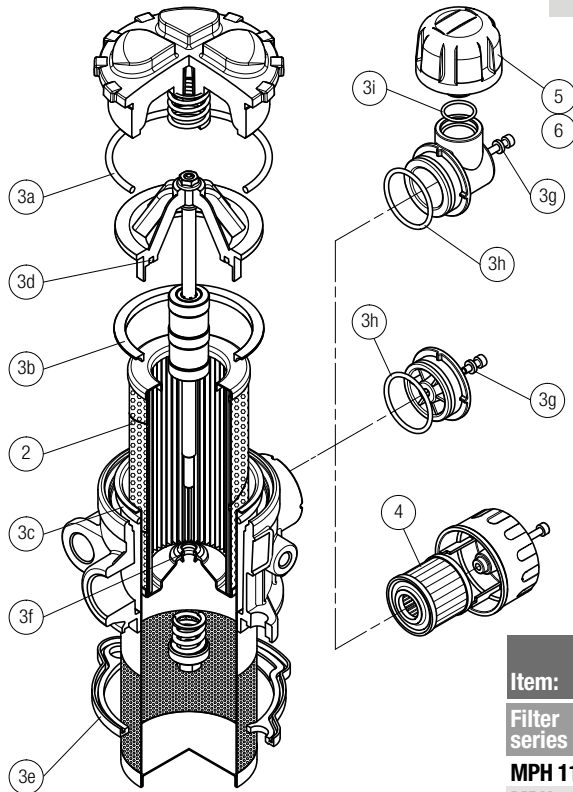
Indicators	page		page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator	239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator	239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator	239-240
BVQ Visual pressure indicator with manual reset	241		



MPH SPARE PARTS

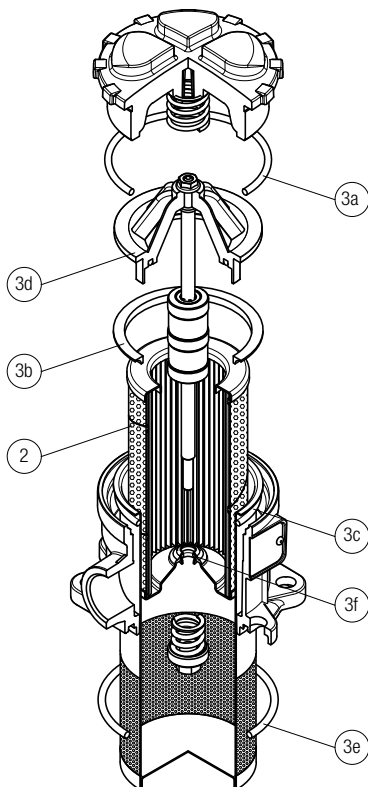
Order number for spare parts

MPH 110 - 114



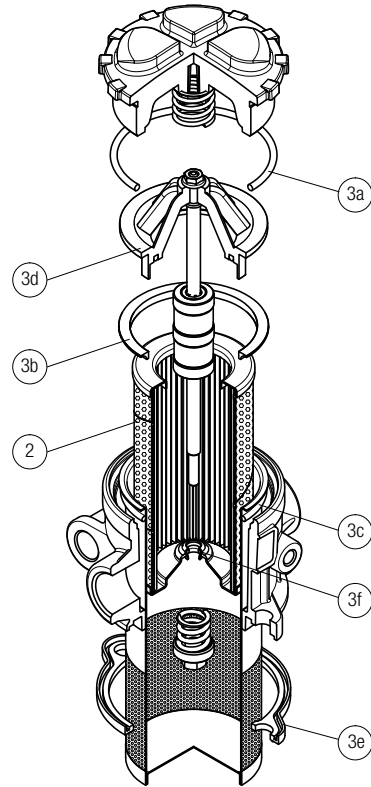
Item:	Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 1 pc.
Filter series	Filter element	Seal Kit code number		Air breather filter element - version:			
		NBR	FPM	C	D	P	
MPH 110	See order table	02050565	02050566	10 µm A3L03	10 µm SAP50G3L03A0P01	10 µm SAP50G3L03A1P01	
MPH 114	See order table	02050582	02050583				

MPH 116



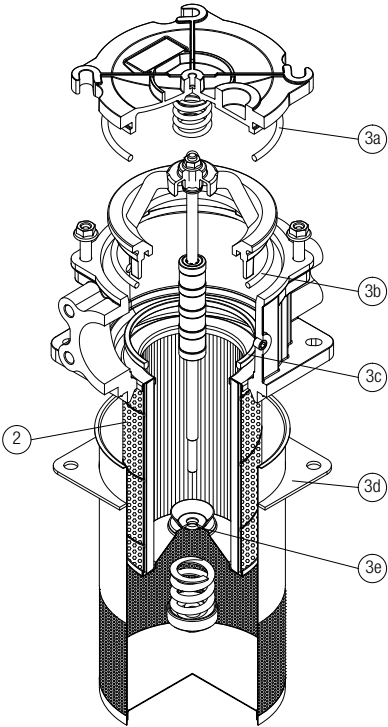
Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number	
		NBR	FPM
MPH 116	See order table	02050741	02050742

MPH 120



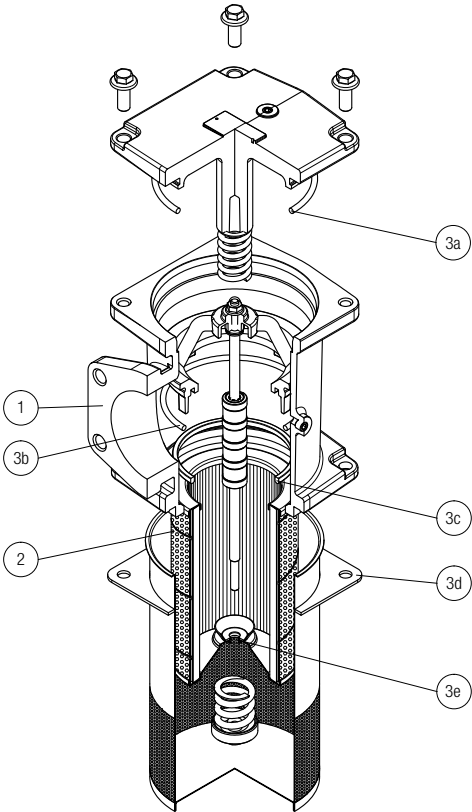
Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number	
		NBR	FPM
MPH 120	See order table	02050567	02050568

MPH 250 - 630



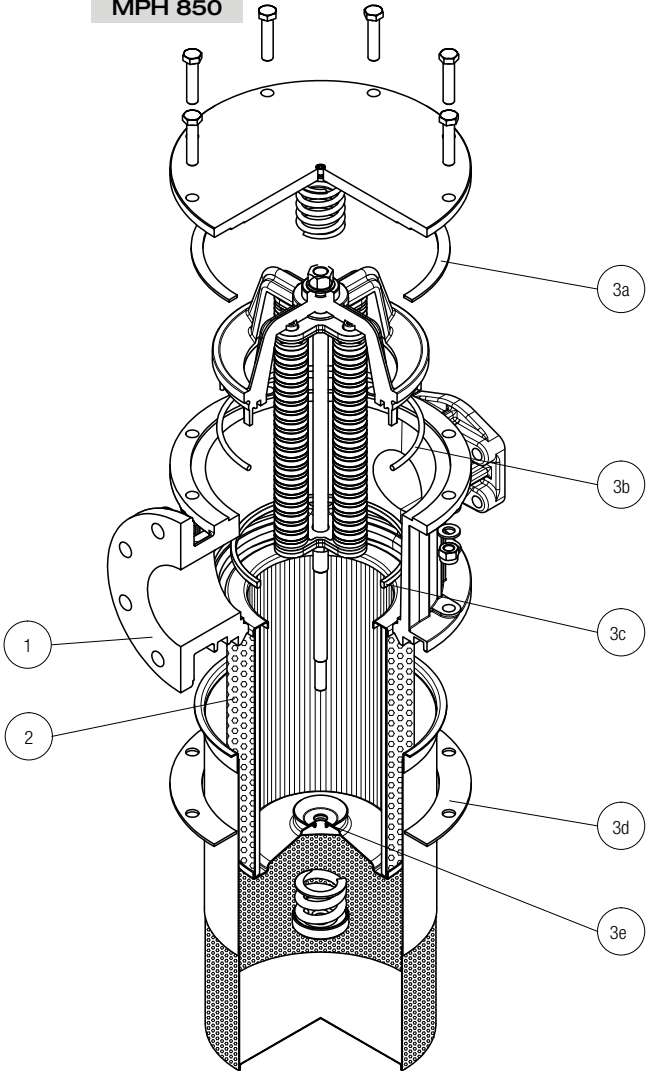
Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number	
MPH 250	MPH 630	NBR	FPM
	2	3 (3a ÷ 3e)	
	See order table	02050151	02050152
	See order table	02050153	02050154

MPH 660



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number	
MPH 660	MPH 850	NBR	FPM
	2	3 (3a ÷ 3e)	
	See order table	02050153	02050154
	See order table	02050155	02050156

MPH 850



MPI series

Maximum working pressure up to 1 MPa (10 bar) - Flow rate up to 3500 l/min



Description

Technical data

Return filter

Maximum working pressure up to 1 MPa (10 bar)

Flow rate up to 3500 l/min

MPI is a range of return filter kits for protection of the reservoir against the system contamination.

They are directly integrated in the reservoir in immersed or semi-immersed position to save space into the tank.

The use of the diffuser is recommended, to place the filter output always immersed into the fluid to avoid aeration or foam generation into the reservoir.

The filtration from inside to outside allows a cleaner filter element replacement, the dirty remains into the filter element.

Available features:

- Fine filtration rating, to get a good cleanliness level into the reservoir
- Bypass valve, to relieve excessive pressure drop across the filter media
- Magnetic filter, to hold the ferrous particles
- Oil dipstick, to easily check the level of the fluid into the reservoir (separate item)
- Diffuser, to reduce the risk of aeration, foaming and noise

Common applications:

Heavy duty industrial equipment

Filter housing materials

- Insert assembly
Polyamide, GF reinforced: MPI 100
Aluminium: MPI 250-630-850

- Diffuser: Tinned Steel

- Valve: Steel

Bypass valve

- Opening pressure 175 kPa (1.75 bar) $\pm 10\%$
- Opening pressure 250 kPa (2.5 bar) $\pm 10\%$, except for MPI 850

Δp element type

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

Seals

- Standard NBR series A
- Optional FPM series V

Temperature

From -25 °C to +110 °C

Note

MPI filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]					Volumes [dm ³]						
	Length	1	2	3	4	5	Length	1	2	3	4	5
MPI 100		0.90	1.00	1.20	1.50	1.80		0.90	0.90	1.20	1.60	1.80
MPI 250		2.20	2.50	2.90	4.30	-		3.50	3.50	4.50	7.00	-
MPI 630		3.40	3.90	4.30	5.40	6.60		5.80	7.40	9.50	11.40	13.50
MPI 850		15.20	18.20	21.20	25.20	-		8.80	12.20	16.70	20.80	-

FILTER ASSEMBLY SIZING Flow rates [l/min]

Filters series	Length	A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
MPI 100	1	26	29	72	79	107	282	164	190
	2	43	46	112	114	161	318	164	190
	3	64	72	132	156	178	324	219	251
	4	90	99	184	198	216	324	266	302
	5	117	128	201	219	244	324	282	318
MPI 250	1	93	102	210	251	315	1093	339	383
	2	124	151	327	412	421	1122	460	514
	3	189	221	418	445	500	1137	544	616
	4	261	304	592	670	766	1166	832	923
MPI 630	1	160	200	369	423	518	1894	565	632
	2	240	257	571	611	1045	1929	1137	1285
	3	330	374	745	788	1308	1938	1416	1577
	4	374	403	887	1010	1348	1956	1448	1612
	5	625	698	1210	1257	1723	2121	1839	1929
MPI 850	1	775	1041	1246	1568	2242	3311	2371	2625
	2	1176	1522	1682	1747	2449	3378	2684	2886
	3	1490	1914	1995	2014	3035	3405	3144	3220
	4	1668	2088	2305	2363	3169	3517	3272	3378

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

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

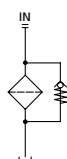
For different pressure drop or fluid viscosity we recommend to use our selection software available on www.mpfiltri.com.

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure.

Please, contact our Sales Department for further additional information.

Hydraulic symbol

Filter series	Style 1 connection
MPI 100	•
MPI 250	•
MPI 630	•
MPI 850	•



MPI MPI100 - MPI250 - MPI630 - MPI850

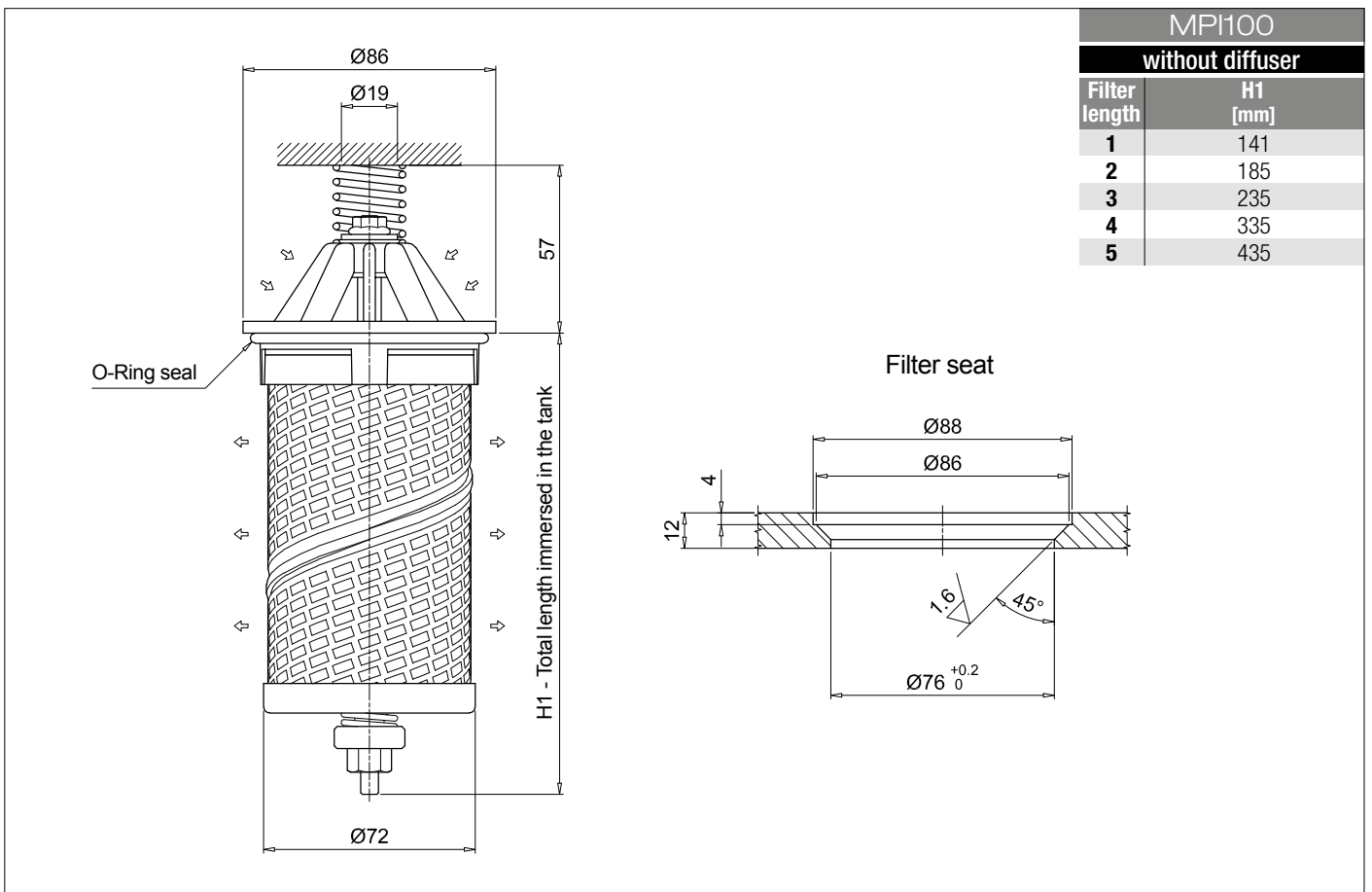
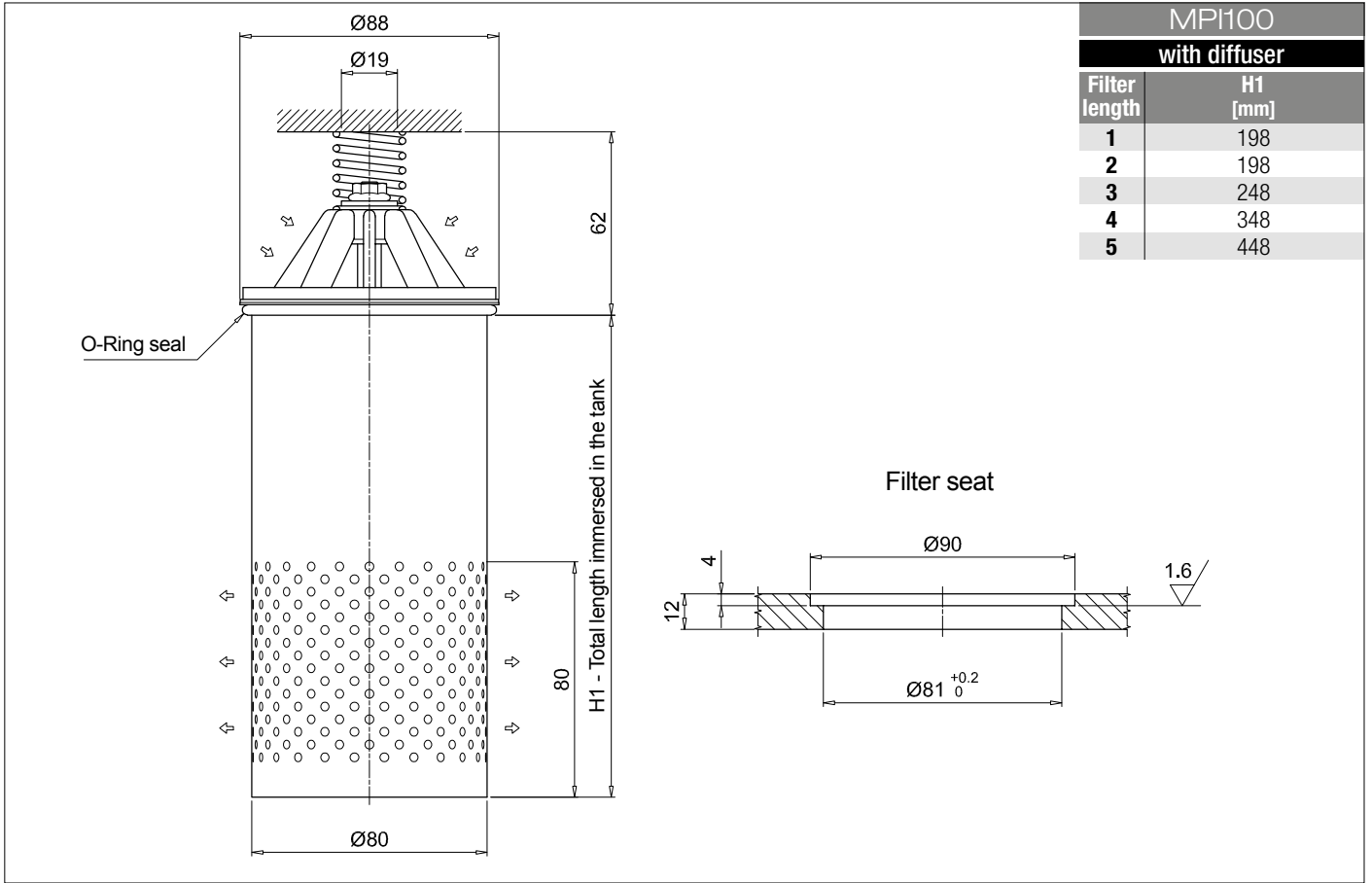
Designation & Ordering code

COMPLETE FILTER

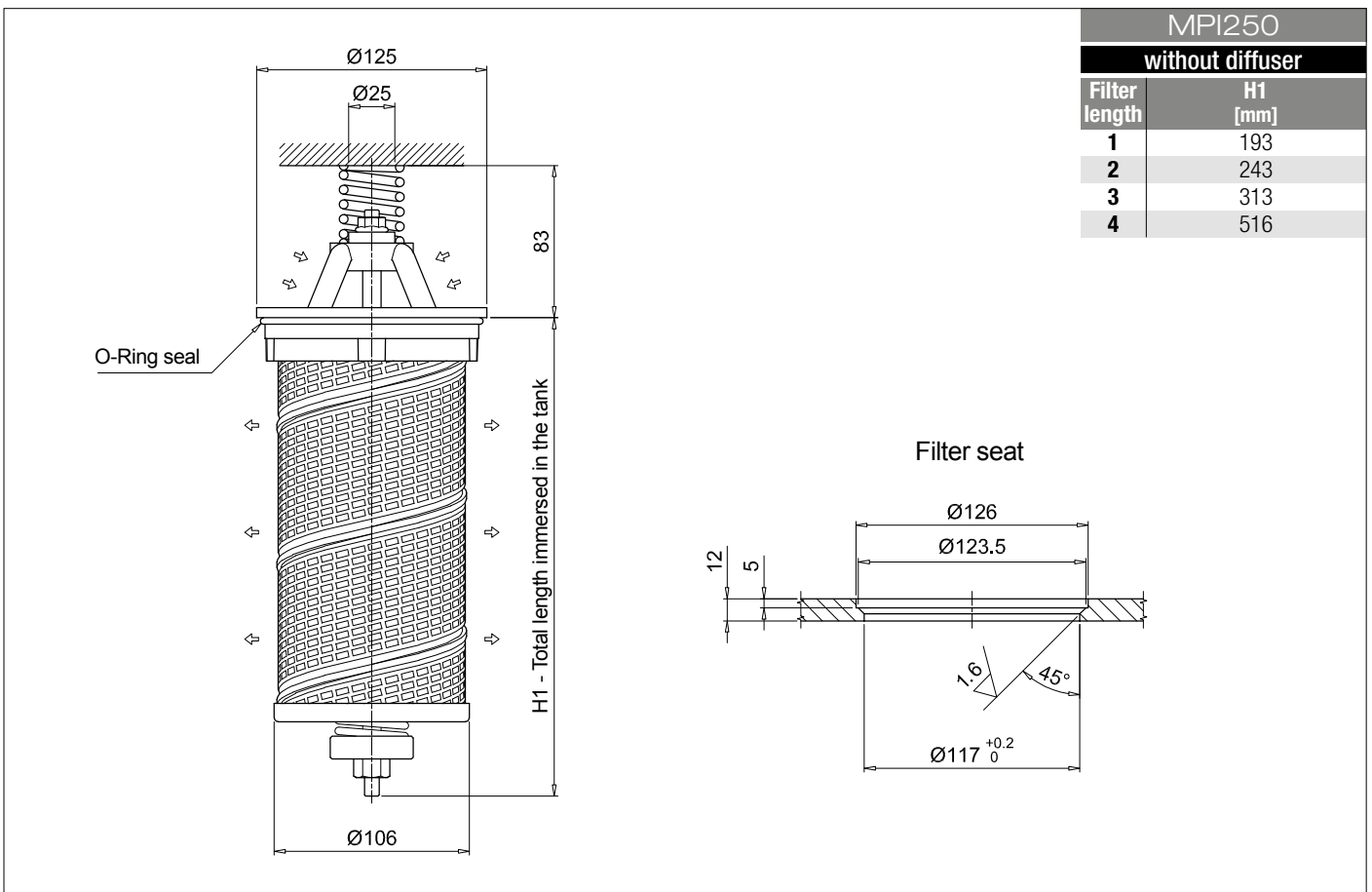
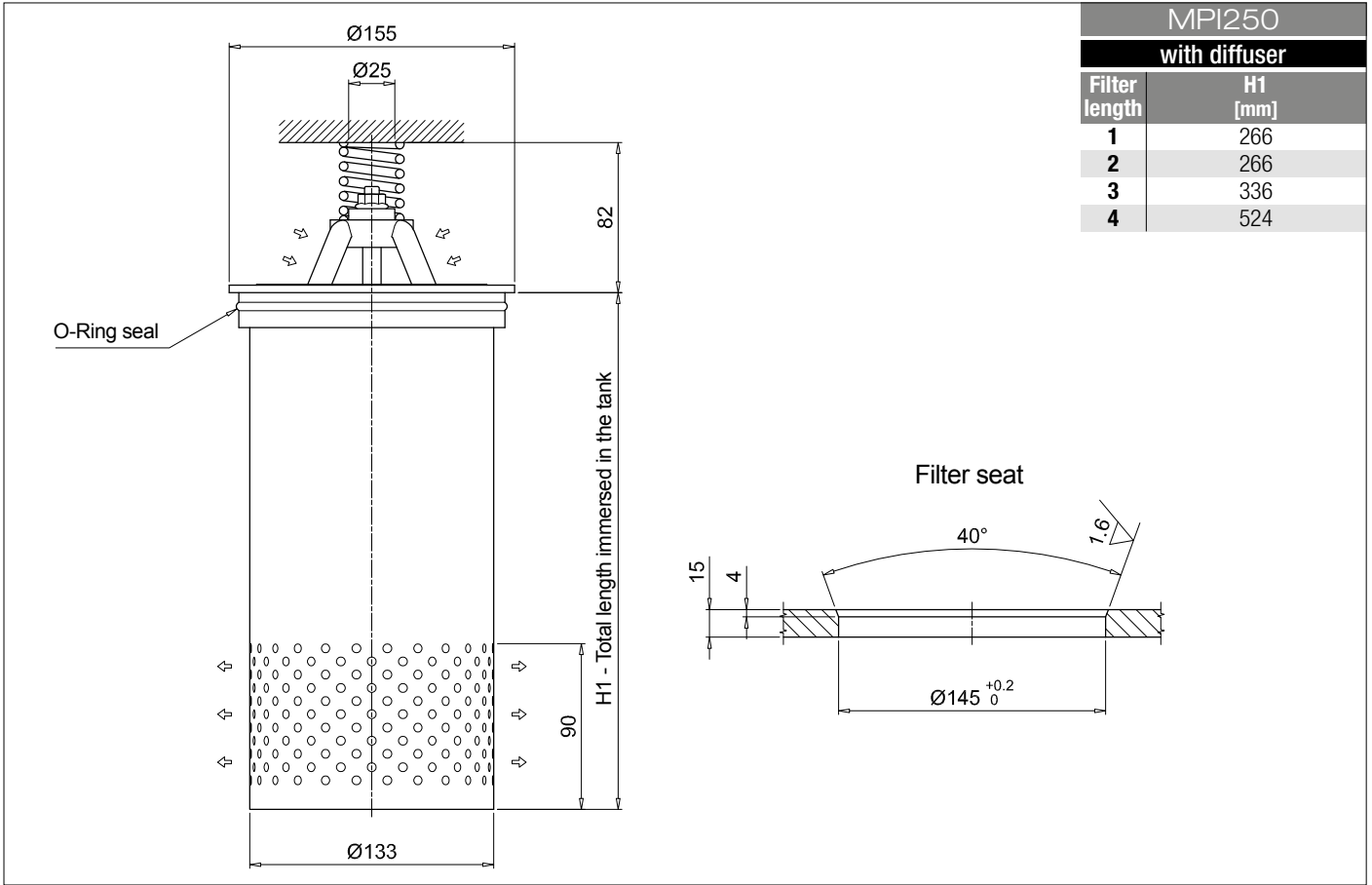
Series and size					Configuration example 1: MPI100 1 C D A A10 P01							
MPI100					Configuration example 2: MPI630 5 E D Z M25 P01							
MPI250												
MPI630												
MPI850												
Length					MPI100	MPI250	MPI630	MPI850				
1					•	•	•	•				
2					•	•	•	•				
3					•	•	•	•				
4					•	•	•	•				
5					•	•	•	•				
Bypass valve					MPI100	MPI250	MPI630	MPI850				
S Without					•	•	•	•				
C 1.75 bar					•	•	•	•				
E 2.5 bar					•	•	•	•				
Diffuser and magnetic filter												
D With diffuser, with magnetic filter												
F With diffuser, without magnetic filter												
O Without diffuser, with magnetic filter												
E Without diffuser, without magnetic filter												
Seals and treatments					Filtration rating							
					Axx	Mxx	Pxx					
A NBR					•	•	•					
V FPM					•	•	•					
W NBR head anodized					filter element compatible with fluids HFA-HFB-HFC		•	•				
Z FPM head anodized					filter element compatible with fluids HFA-HFB-HFC		•	•				
Filtration rating (filter media)												
A03 Inorganic microfiber 3 µm												
A06 Inorganic microfiber 6 µm												
A10 Inorganic microfiber 10 µm												
A16 Inorganic microfiber 16 µm												
A25 Inorganic microfiber 25 µm												
M25 Wire mesh 25 µm												
M60 Wire mesh 60 µm												
M90 Wire mesh 90 µm												
P10 Resin impregnated paper 10 µm												
P25 Resin impregnated paper 25 µm												
					Execution							
					P01 MP Filtri standard							
					Pxx Customized							

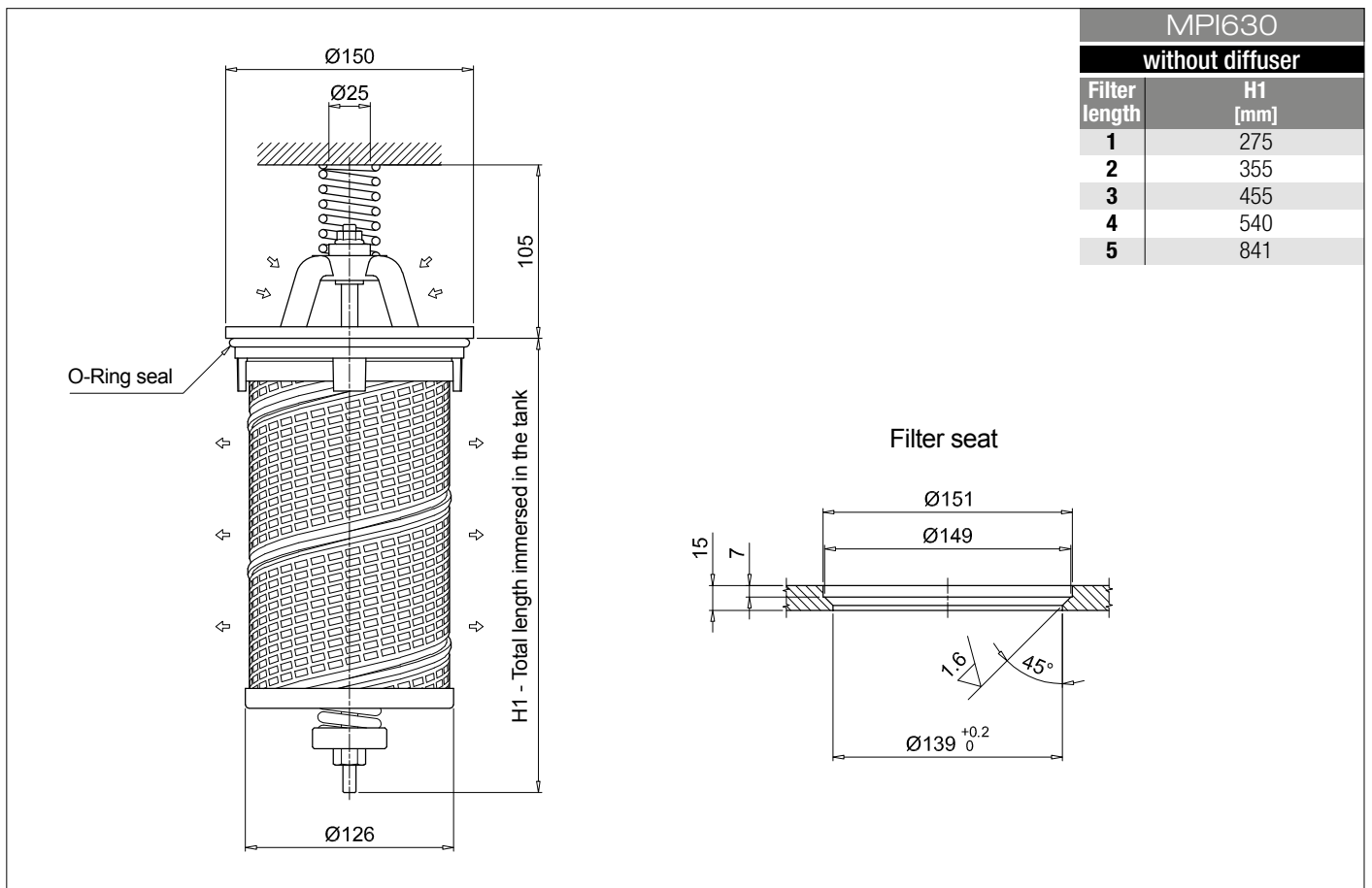
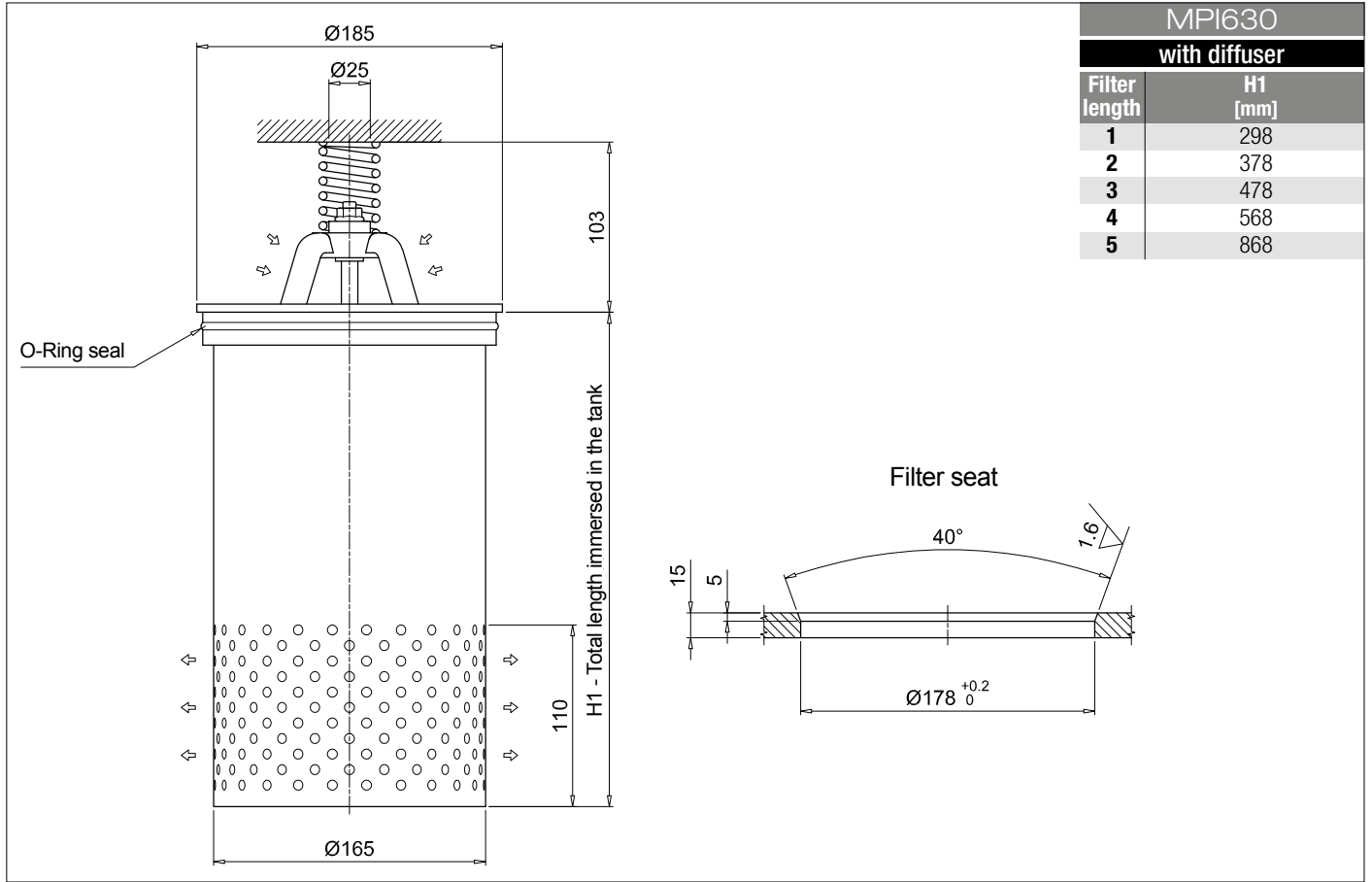
FILTER ELEMENT

Element series and size					Configuration example 1: MR100 1 A10 A P01					
MR100					Configuration example 2: MR630 5 M25 V P01					
MR250										
MR630										
MR850										
Element length					Size 100	Size 250	Size 630	Size 850		
1					•	•	•	•		
2					•	•	•	•		
3					•	•	•	•		
4					•	•	•	•		
5					•	•	•	•		
Filtration rating (filter media)										
A03 Inorganic microfiber 3 µm										
A06 Inorganic microfiber 6 µm										
A10 Inorganic microfiber 10 µm										
A16 Inorganic microfiber 16 µm										
A25 Inorganic microfiber 25 µm										
M25 Wire mesh 25 µm										
M60 Wire mesh 60 µm										
M90 Wire mesh 90 µm										
P10 Resin impregnated paper 10 µm										
P25 Resin impregnated paper 25 µm										
					Seals					
					A NBR					
					V FPM					
					Execution					
					P01 MP Filtri standard					
					Pxx Customized					



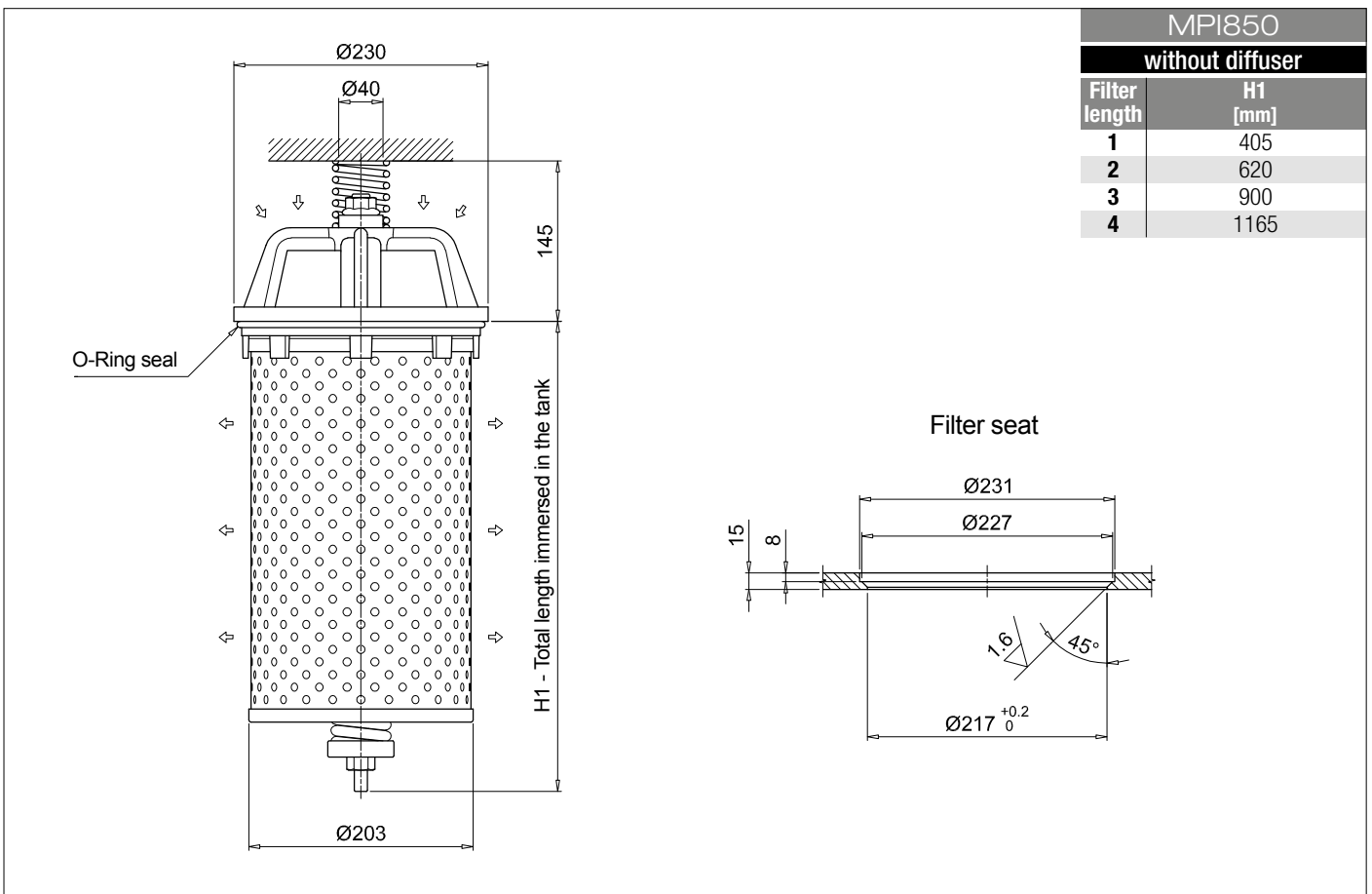
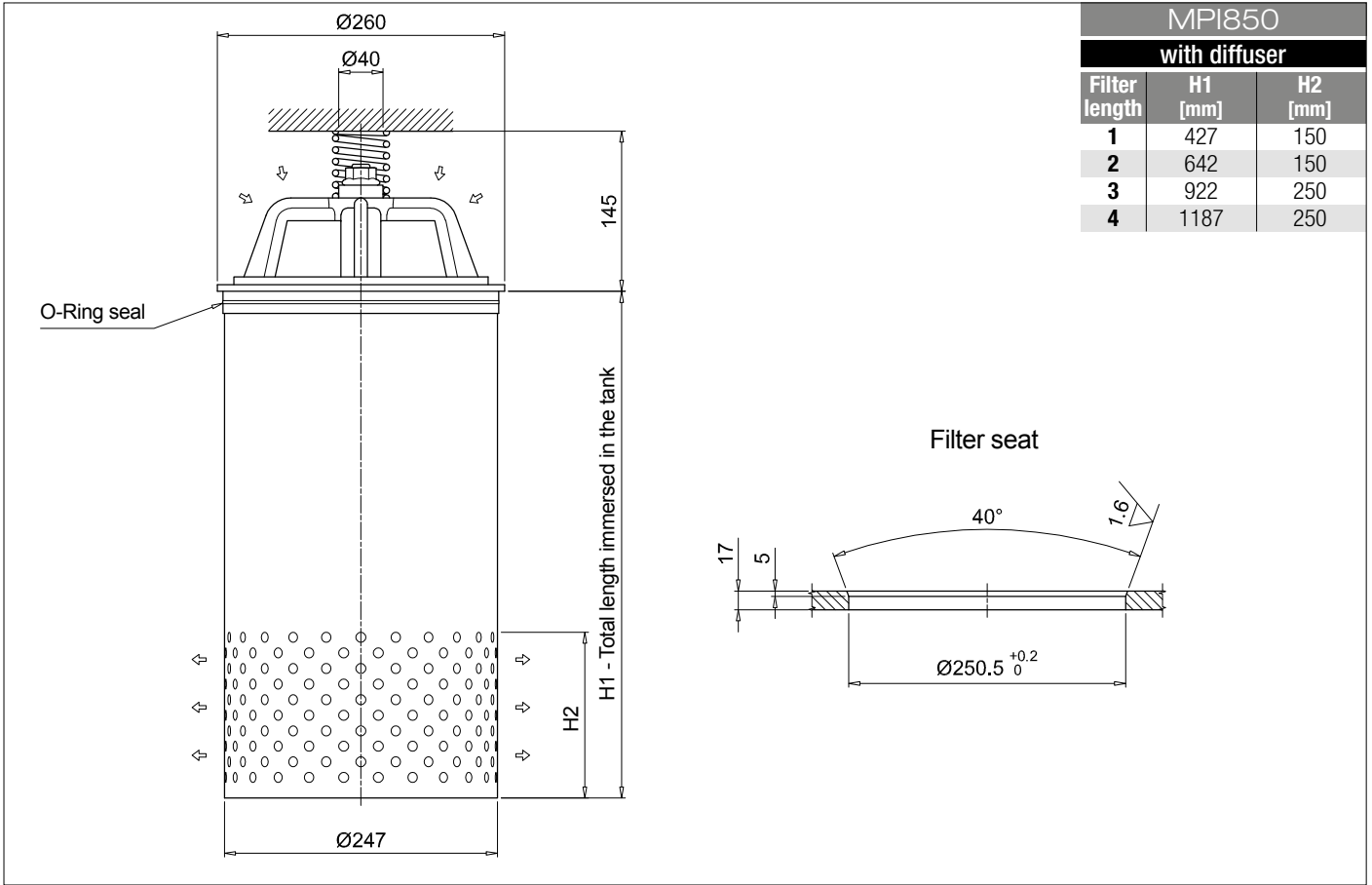
Dimensions





MPI MPI100 - MPI250 - MPI630 - MPI850

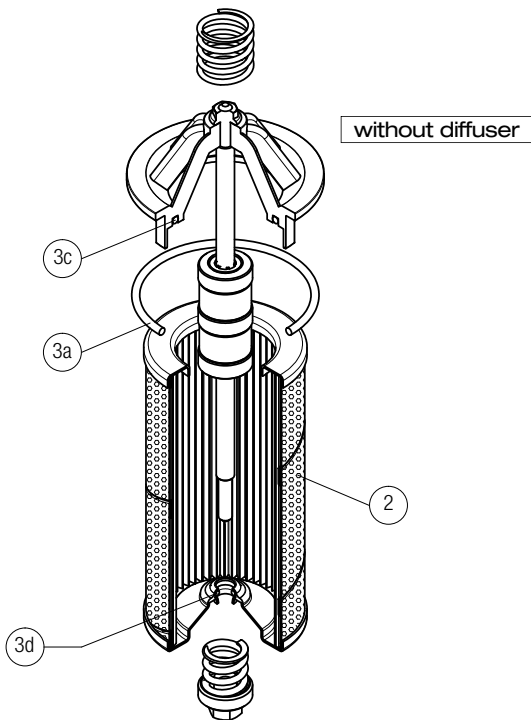
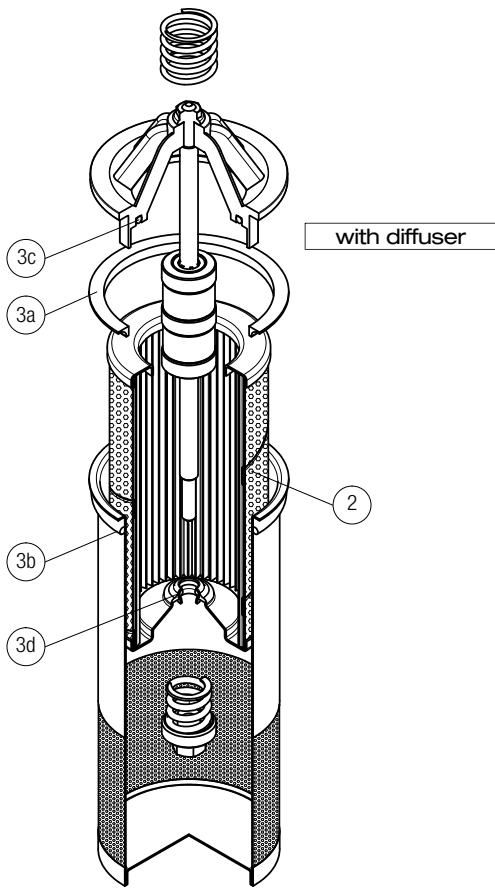
Dimensions



MPI SPARE PARTS

Order number for spare parts

MPI 100



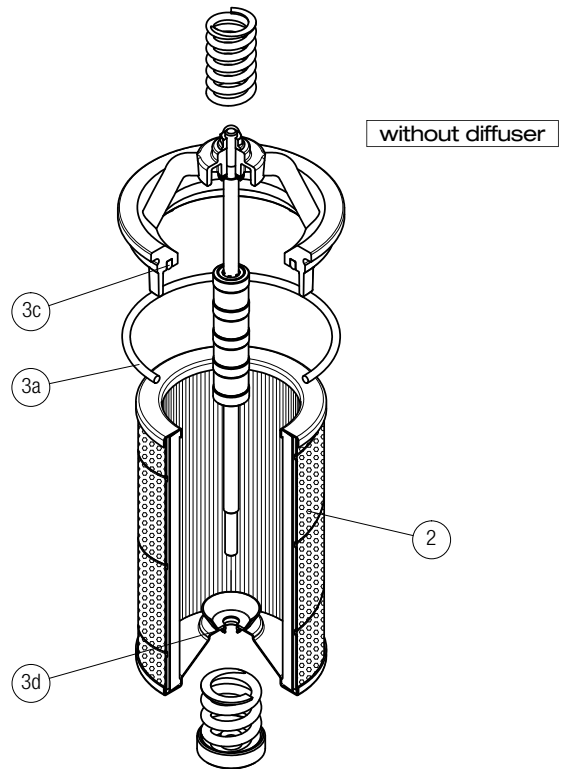
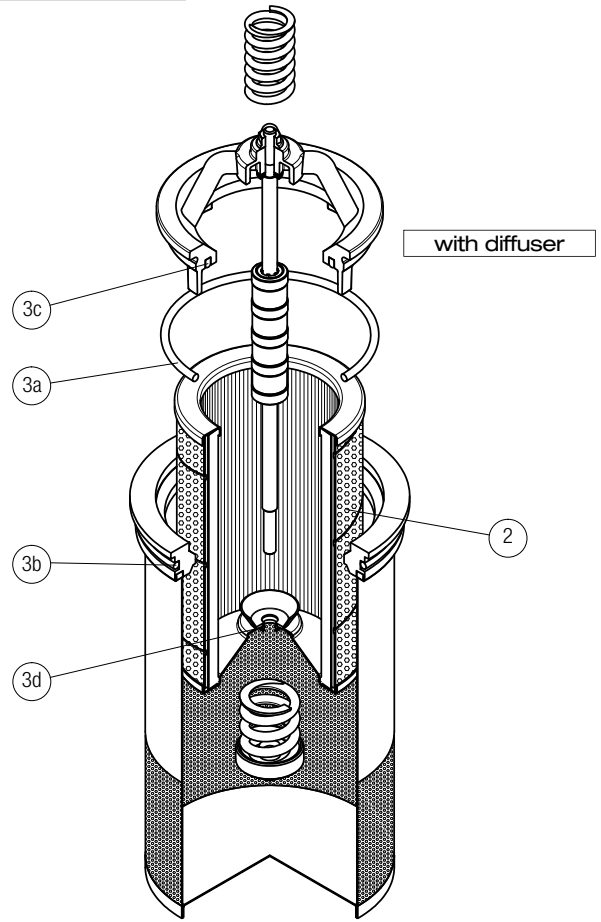
Q.ty: 1 pc.

Q.ty: 1 pc.

Item: **2** **3** (3a ÷ 3d)

Filter series	Filter element	Seal Kit code number	
		NBR	FPM
MPI 100	See order table	02050145	02050146

MPI 250 - 630



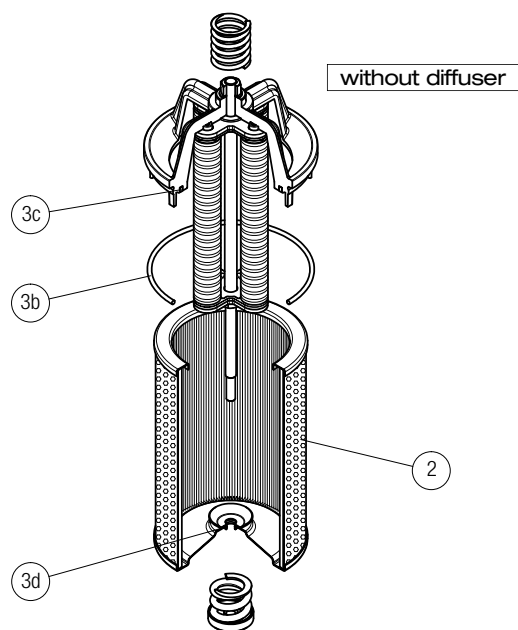
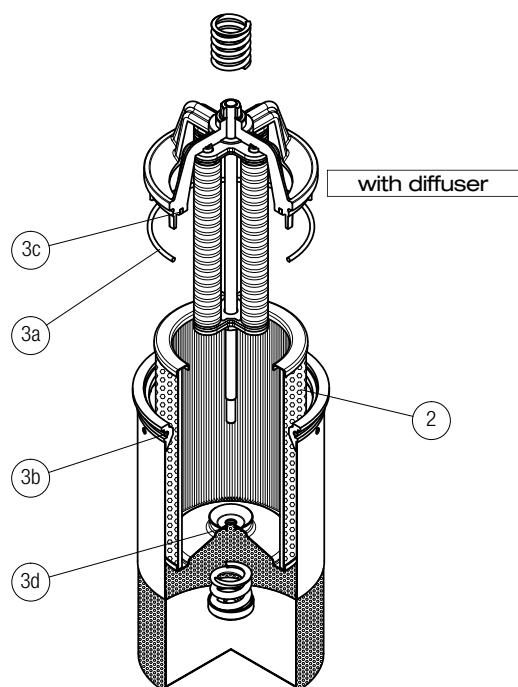
Q.ty: 1 pc.

Q.ty: 1 pc.

Item: **2** **3** (3a ÷ 3d)

Filter series	Filter element	Seal Kit code number	
		NBR	FPM
MPI 250	See order table	02050147	02050148
MPI 630		02050112	02050113

MPI 850



Item:	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3 (3a ÷ 3d)
Filter series	Filter element	Seal Kit code number NBR FPM
MPI 850	See order table	02050114 02050115

FRI series

Maximum working pressure up to 2 MPa (20 bar) - Flow rate up to 2500 l/min



Description

Technical data

Return filter

Maximum working pressure up to 2 MPa (20 bar)

Flow rate up to 2500 l/min

FRI is a range of return filters for protection of the reservoir against the system contamination.

They could be directly fixed to the reservoir in immersed or semi-immersed position or connected to the lines of the system through the hydraulic fittings.

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 2 1/2" and flanged connections up to 3 1/2", for a maximum flow rate of 2500 l/min
- Double input connections, to connect several return lines or drains
- Fine filtration rating, to get a good cleanliness level into the reservoir
- Bypass valve, to relieve excessive pressure drop across the filter media
- Visual, electrical and electronic differential clogging indicators

Common applications:

Heavy duty industrial equipment

Filter housing materials

- Filter body
 - Aluminium: FRI 255
 - Anodized Aluminium: FRI 025-040-100-250-630
 - Phosphatized Steel: FRI 850
- Cover
 - Polyamide, GF reinforced: FRI 255
 - Anodized Aluminium: FRI 025-040-100-250-630-850
- Valve: Polyamide, GF reinforced - Steel

Bypass valve

Opening pressure 240 kPa (2.4 bar) ±10%

Δp element type

- Microfibre filter elements - series N: 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

FRI filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]		Volumes [dm ³]	
	Length	1	Length	1
FRI 025		1.0		0.28
FRI 040		2.0		0.70
FRI 100		3.8		1.09
FRI 250		6.3		2.60
FRI 255		4.2		3.20
FRI 630		13.8		7.05
FRI 850		48.0		21.50

Filter series	Length	Filter element design - N Series							
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
FRI 025	1	6	10	17	19	43	122	43	47
FRI 040	1	19	23	43	45	94	155	94	102
FRI 100	1	32	34	89	92	187	260	187	206
FRI 250	1	144	179	271	300	448	645	448	490
FRI 255	1	144	179	271	300	448	645	448	490
FRI 630	1	242	279	508	577	834	1446	834	911
FRI 850	1	440	541	971	1143	1705	2528	1705	1880

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

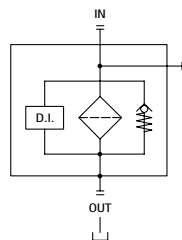
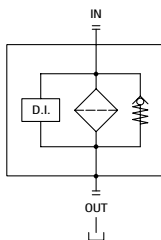
The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

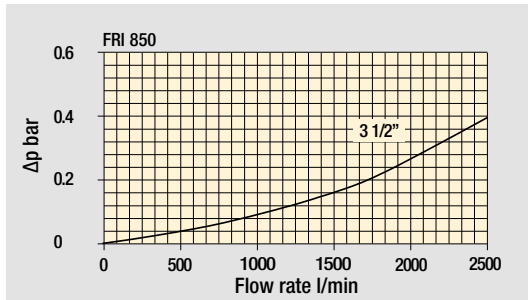
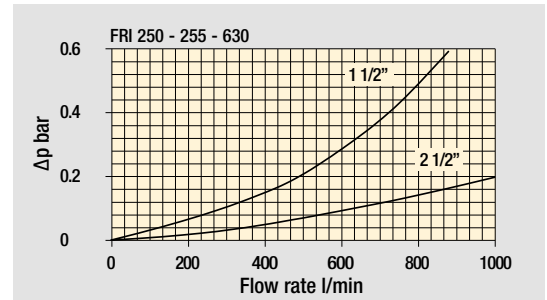
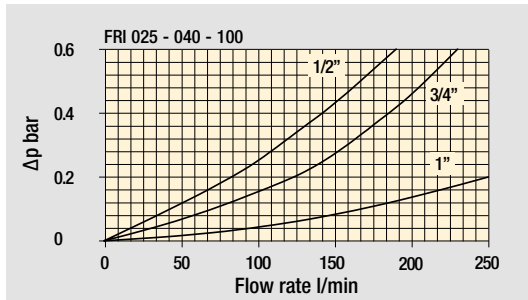
Hydraulic symbols

Filter series	Style 1 connection + Diff. indic.	Style 2 connections + Diff. indic.
FRI 025		•
FRI 040		•
FRI 100		•
FRI 250		•
FRI 255	•	
FRI 630		•
FRI 850	•	

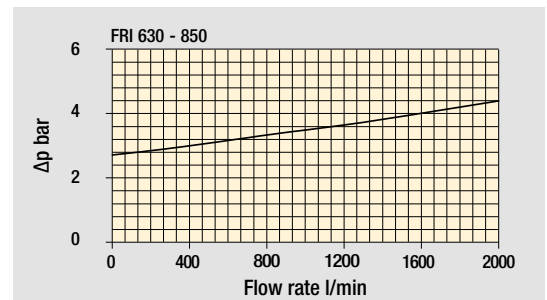
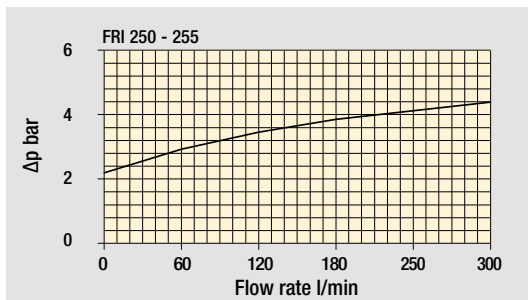
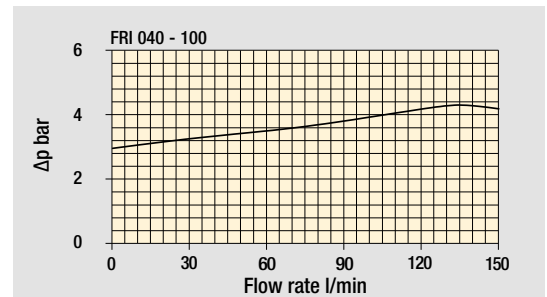
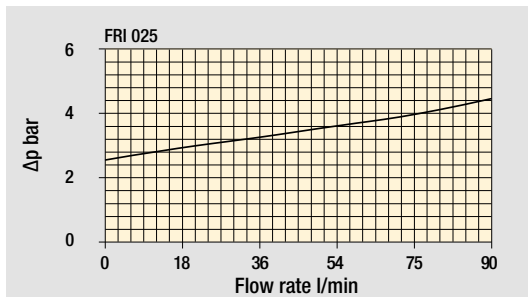


Pressure drop

Filter housings Δp pressure drop



Bypass valve 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.

Designation & Ordering code

COMPLETE FILTER

Series and size	Configuration example 1: FRI025 B A G1 A25 N P01						
FRI025	Configuration example 2: FRI040 S W G2 M25 N P01						
FRI040							
Bypass valve							
B With bypass							
S Without bypass							
Seals and treatments	Filtration rating						
A NBR	Axx	Mxx	Pxx				
V FPM	•	•	•				
W NBR head anodized	•	•					
Z FPM head anodized	•	•					
	filter element compatible with fluids HFA-HFB-HFC						
Connections for FRI025	Connections for FRI040						
G1 G 1/2"	G 3/4"						
G2 1/2" NPT	3/4" NPT						
G3 SAE 8 - 3/4" - 16 UNF	SAE 12 - 1 1/16" - 12 UN						
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			Execution			
	N 10 bar			P01 MP Filtri standard			
				Pxx Customized			

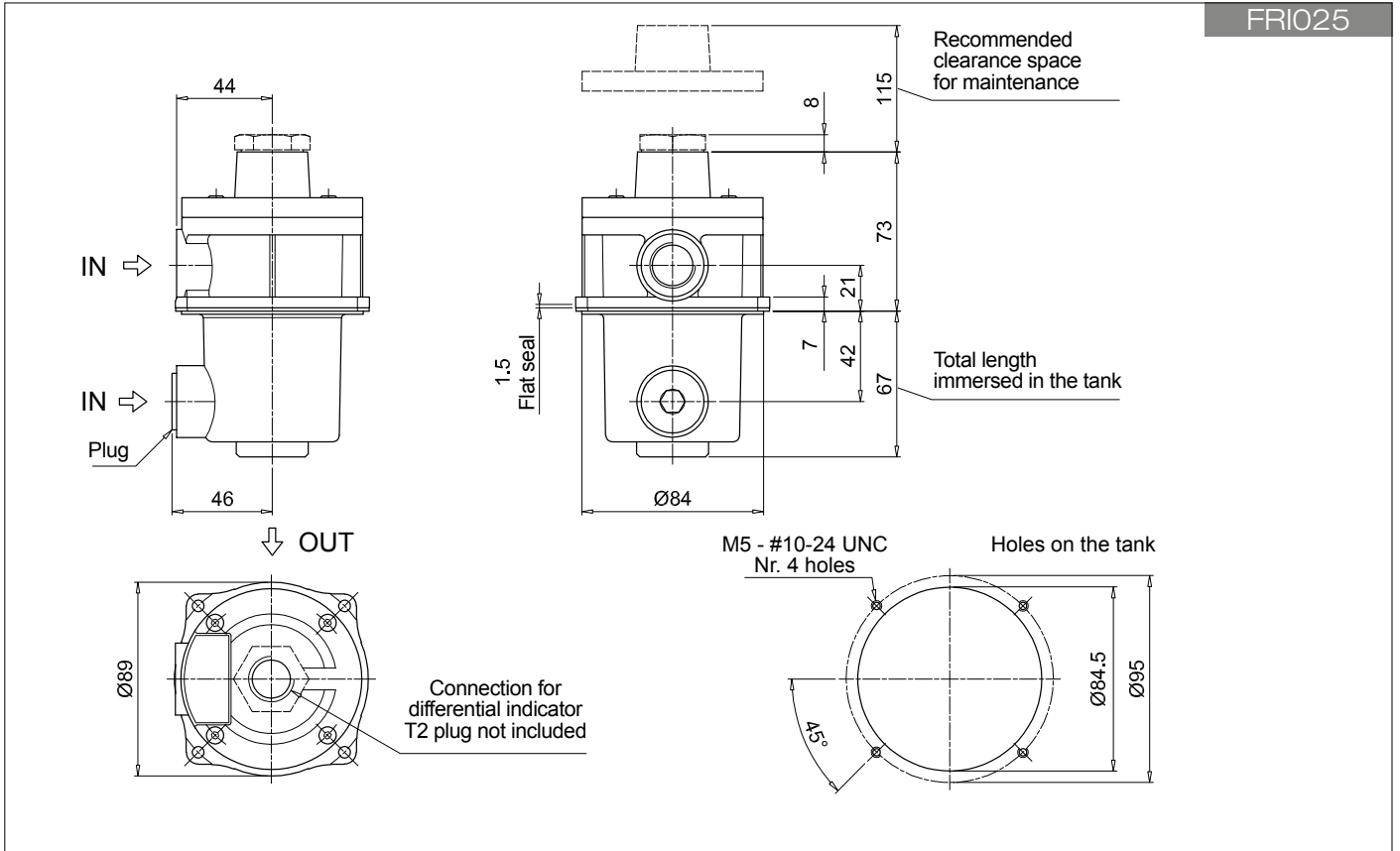
FILTER ELEMENT

Element series and size	Configuration example 1: CU025 A25 N P01						
CU025	Configuration example 2: CU040 M25 W P01						
CU040							
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						
Seals and treatments	Filtration rating						
N NBR	Axx	Mxx	Pxx				
V FPM	•	•	•				
W NBR	•	•					
Z FPM	•	•					
	filter element compatible with fluids HFA-HFB-HFC						
	Execution			P01 MP Filtri standard			
				Pxx Customized			

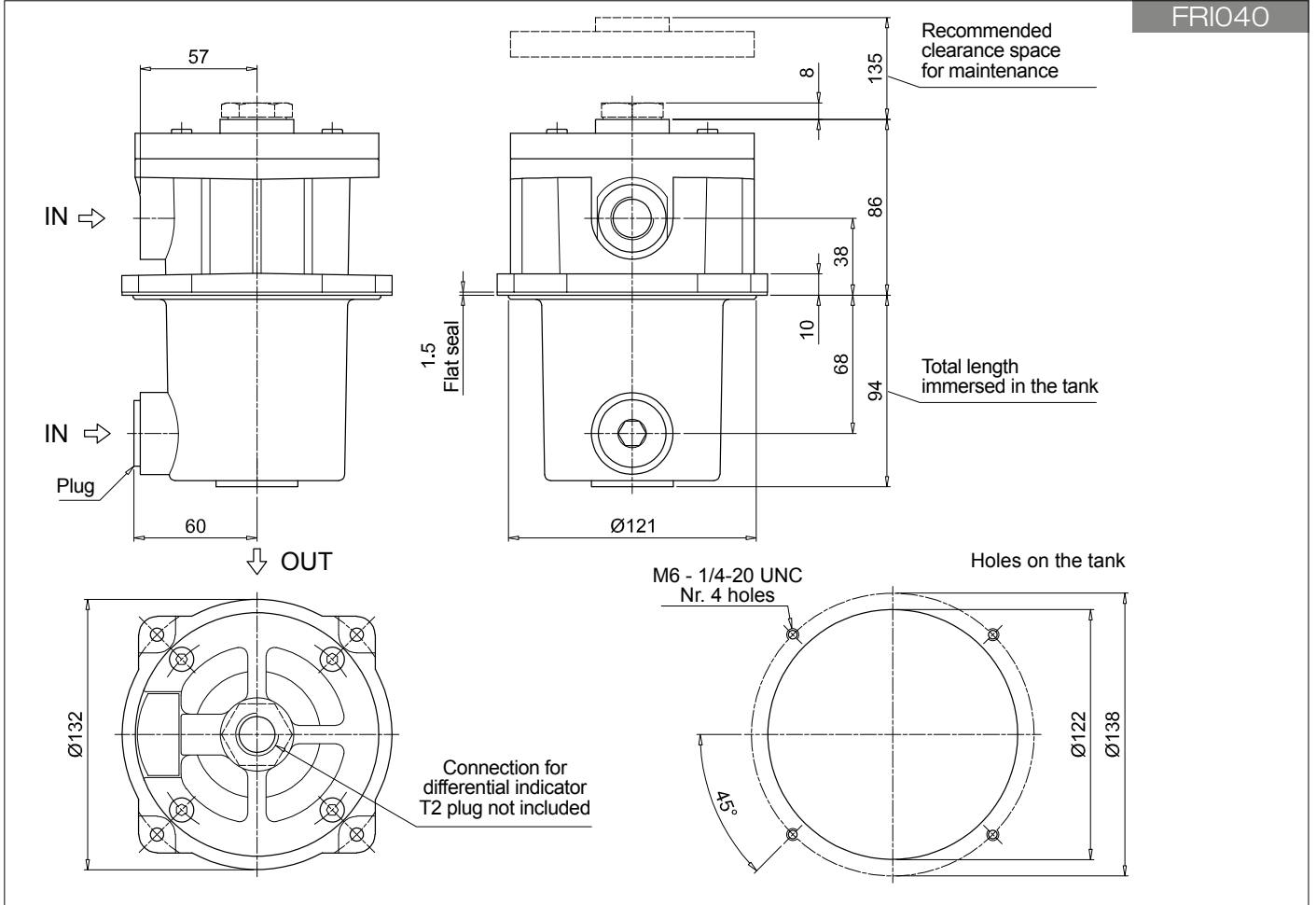
ACCESSORIES

Indicators	page		page
DEA Electrical differential indicator	242	DTA Electronic differential indicator	245
DEM Electrical differential indicator	242-243	DVA Visual differential indicator	245
DLA Electrical / visual differential indicator	243-244	DVM Visual differential indicator	245
DLE Electrical / visual differential indicator	244		
Additional features	page		
T2 Plug	246		

FRI025



FRI040



FRI FRI100 - FRI250 - FRI630

Designation & Ordering code

COMPLETE FILTER

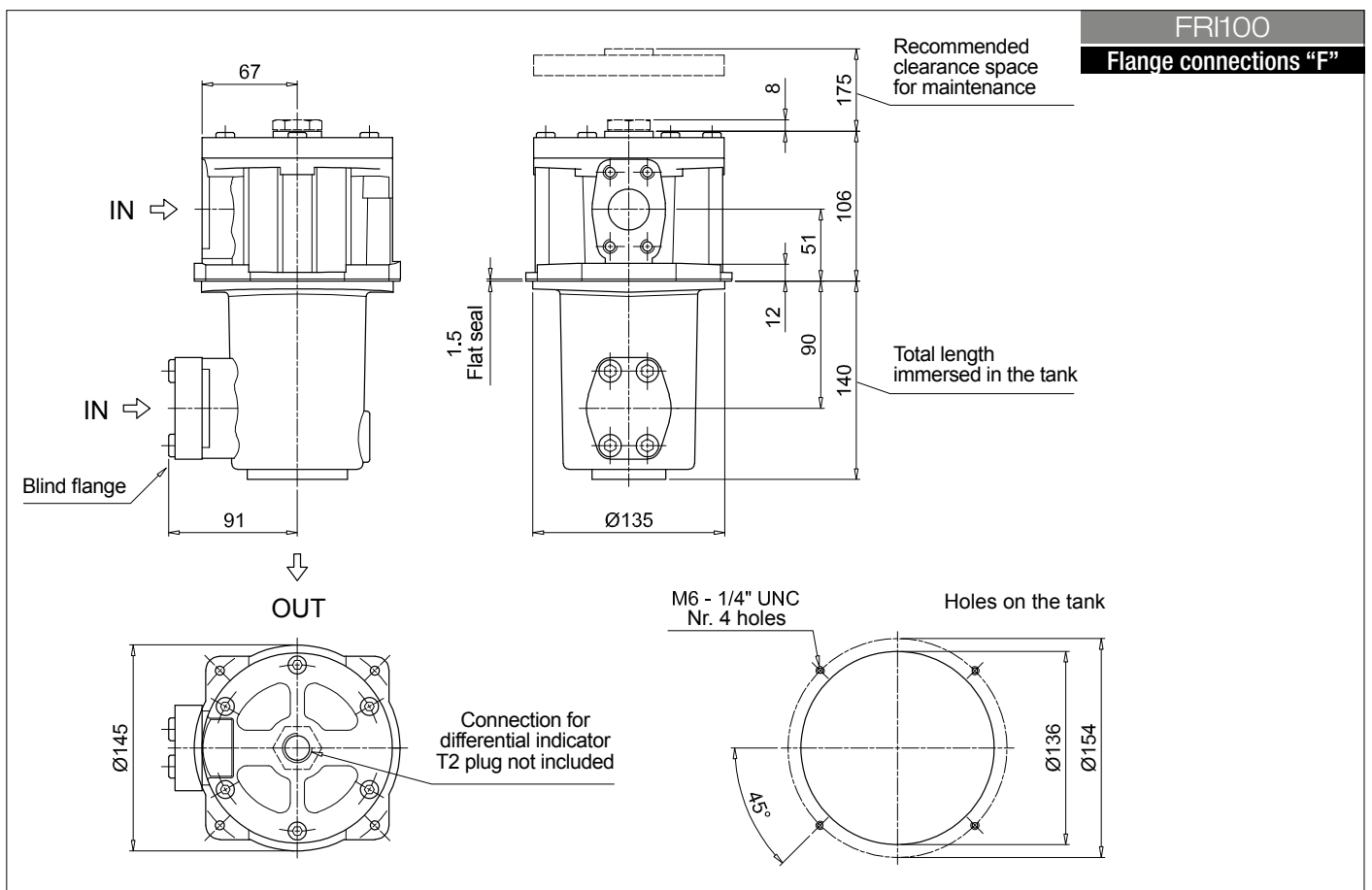
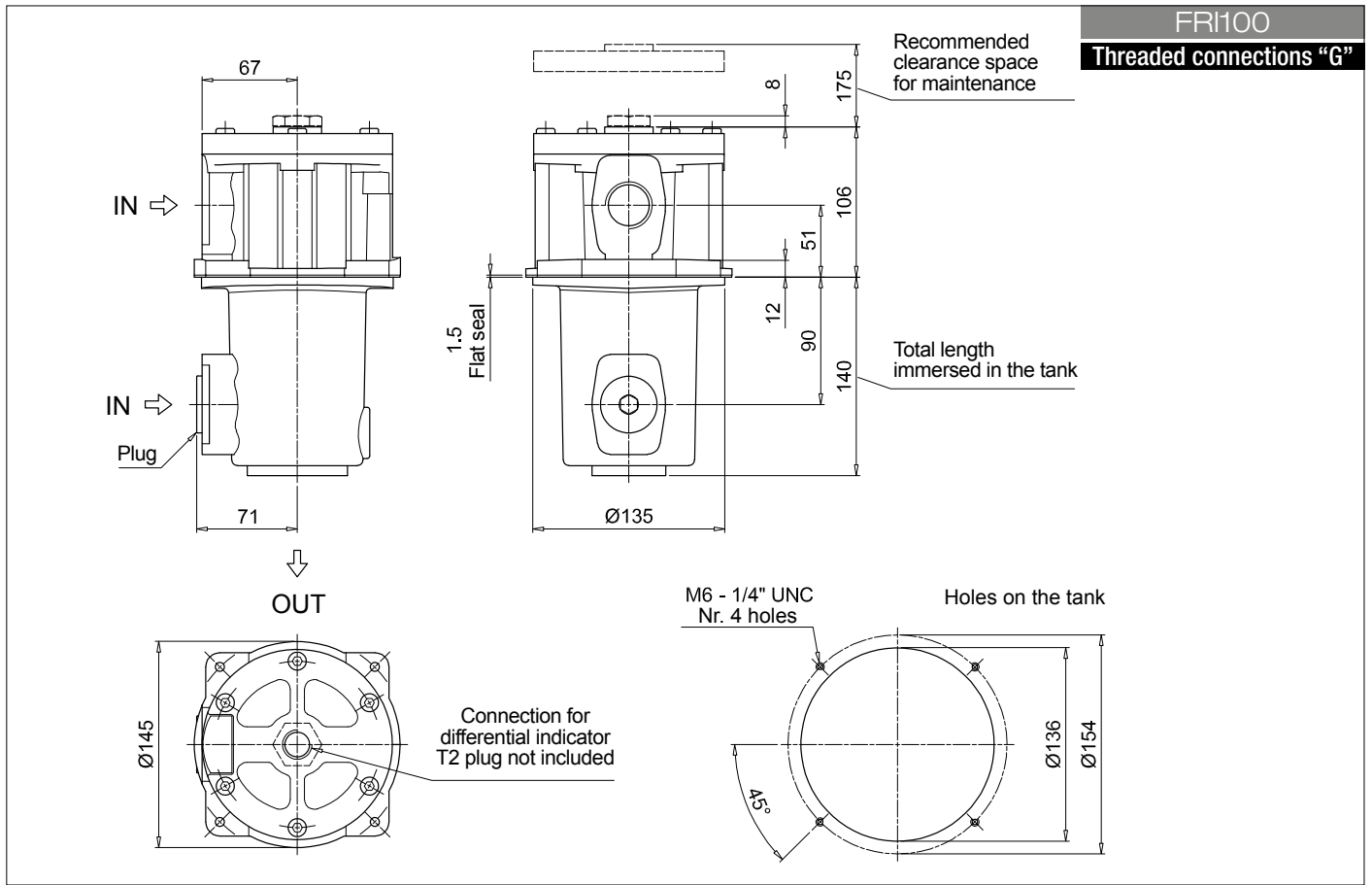
Series and size	Configuration example 1: FRI100 B A G1 A25 N P01						
FRI100	Configuration example 2: FRI630 S W F2 M25 N P01						
FRI250							
FRI630							
Bypass valve							
B	With bypass						
S	Without bypass						
Seals and treatments							
		Filtration rating					
A	NBR	Axx	Mxx	Pxx			
V	FPM						
W	NBR head anodized				filter element compatible with fluids HFA-HFB-HFC		
Z	FPM head anodized						
Connections for FRI100		Connections for FRI250		Connections for FRI630			
G1	G 1"	G1	G 1 1/2"	G2 2 1/2"			
G2	1" NPT	G2	1 1/2" NPT	G3 SAE 32 - 2 1/2" - 12 UN			
G3	SAE 16 - 1 5/16" - 12 UN	G3	SAE 24 - 1 7/8" - 12 UN	F1 1" SAE 3000 psi/M			
F1	1" SAE 3000 psi/M	F1	1 1/2" SAE 3000 psi/M	F2 1" SAE 3000 psi/UNC			
F2	1" SAE 3000 psi/UNC	F2	1 1/2" SAE 3000 psi/UNC				
Filtration rating (filter media)							
A03	Inorganic microfiber	3 µm	M25	Wire mesh	25 µm	Element Δp	Execution
A06	Inorganic microfiber	6 µm	M60	Wire mesh	60 µm	N	10 bar
A10	Inorganic microfiber	10 µm	M90	Wire mesh	90 µm	P01	MP Filtri standard
A16	Inorganic microfiber	16 µm	P10	Resin impregnated paper	10 µm	Pxx	Customized
A25	Inorganic microfiber	25 µm	P25	Resin impregnated paper	25 µm		

FILTER ELEMENT

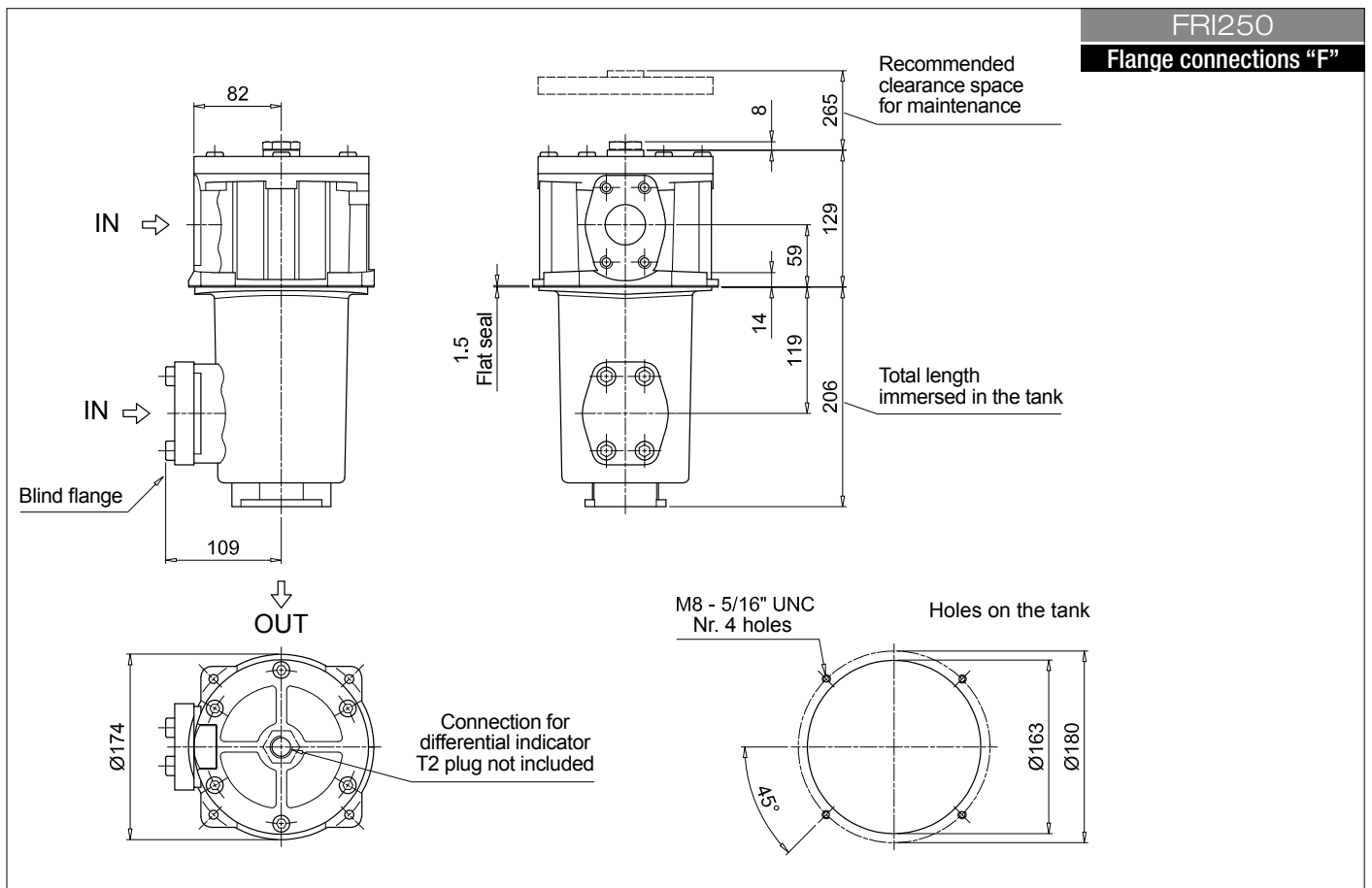
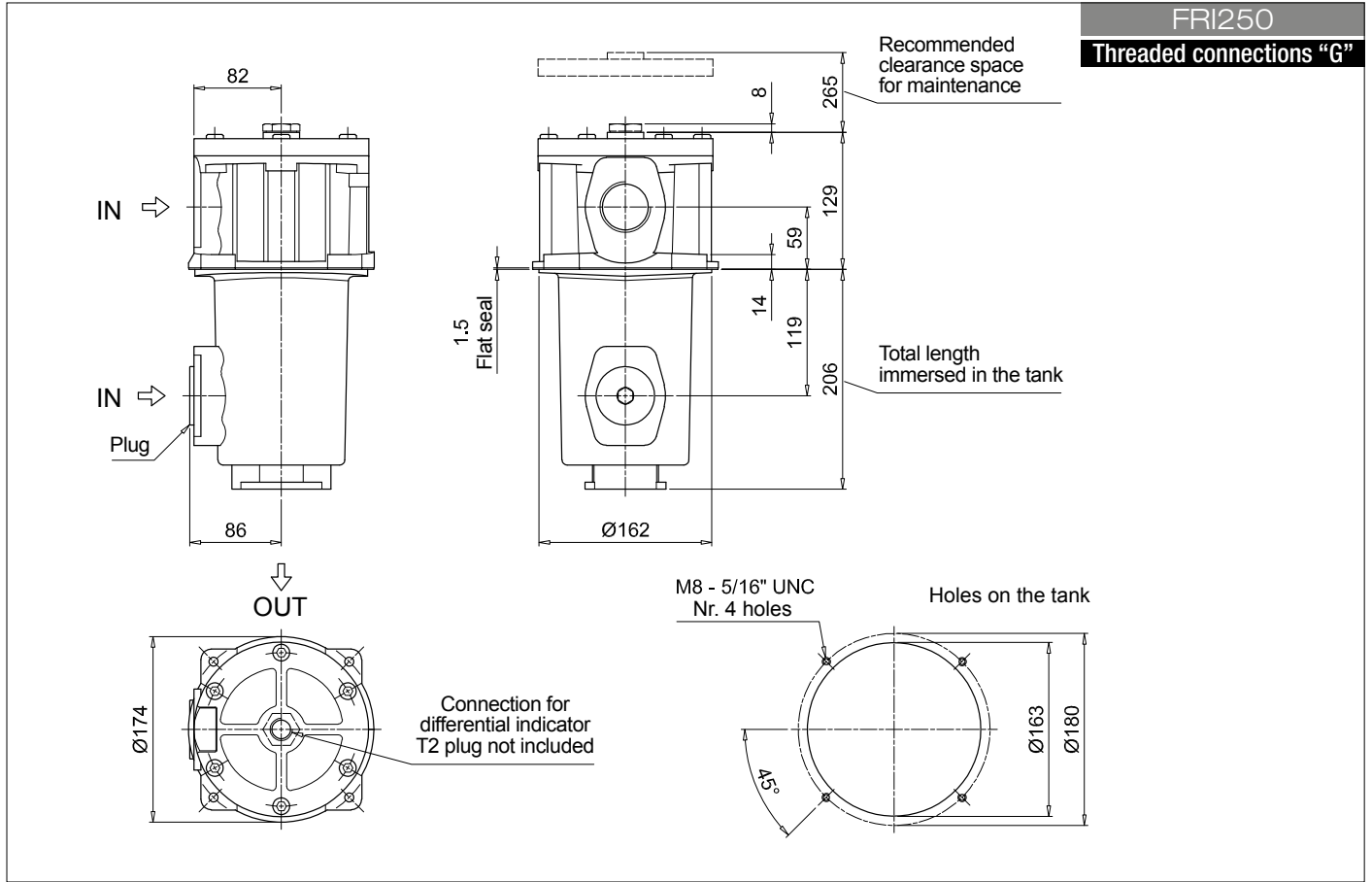
Element series and size	Configuration example 1: CU100 A25 N P01			
CU100	Configuration example 2: CU630 M25 W P01			
CU250				
CU630				
Filtration rating (filter media)				
A03	Inorganic microfiber	3 µm	M25	Wire mesh 25 µm
A06	Inorganic microfiber	6 µm	M60	Wire mesh 60 µm
A10	Inorganic microfiber	10 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
Seals and treatments				
		Filtration rating		
N	NBR	Axx	Mxx	Pxx
V	FPM			
W	NBR			
Z	FPM			
				filter element compatible with fluids HFA-HFB-HFC
Execution				
P01	MP Filtri standard			
Pxx	Customized			

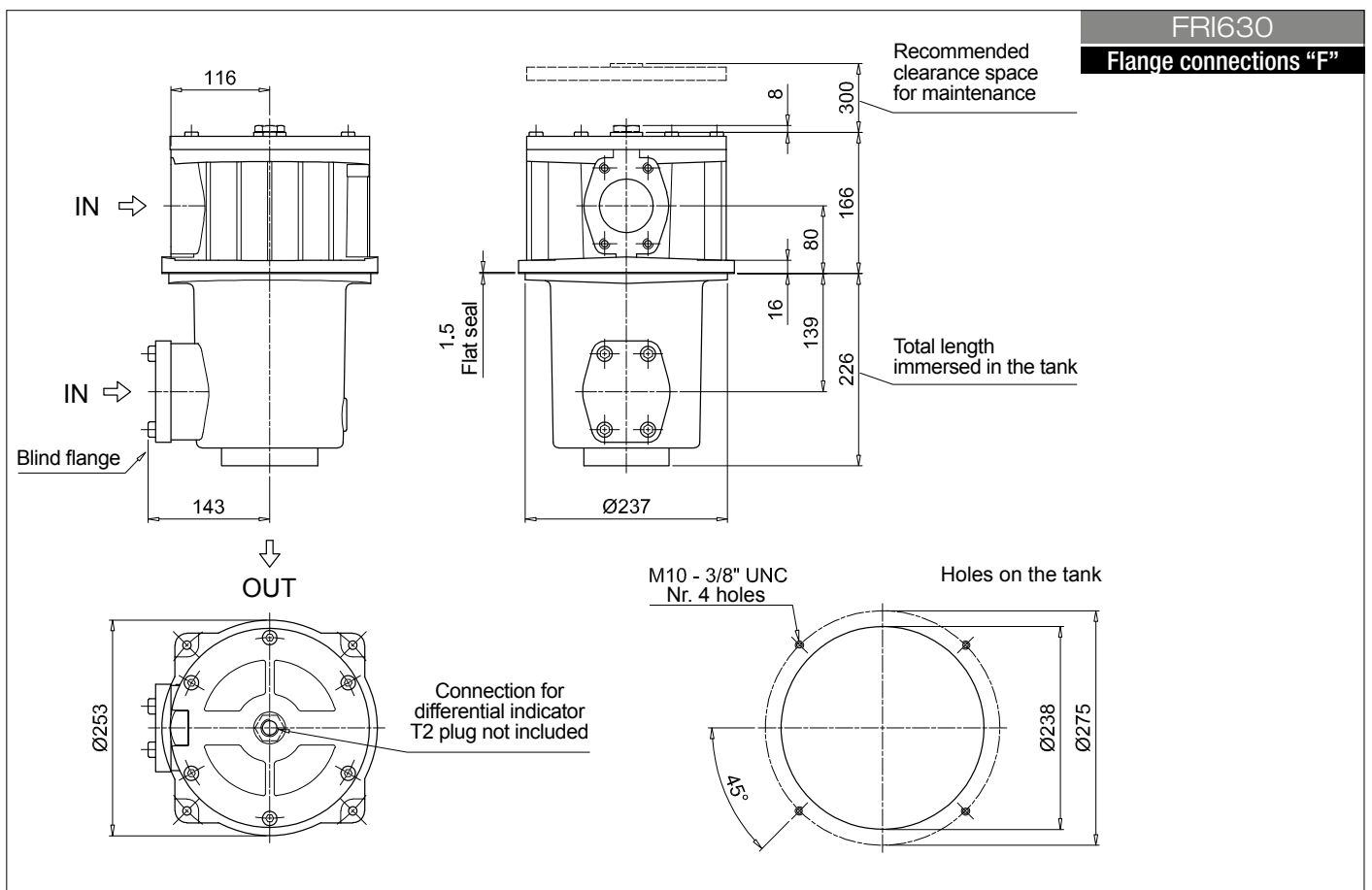
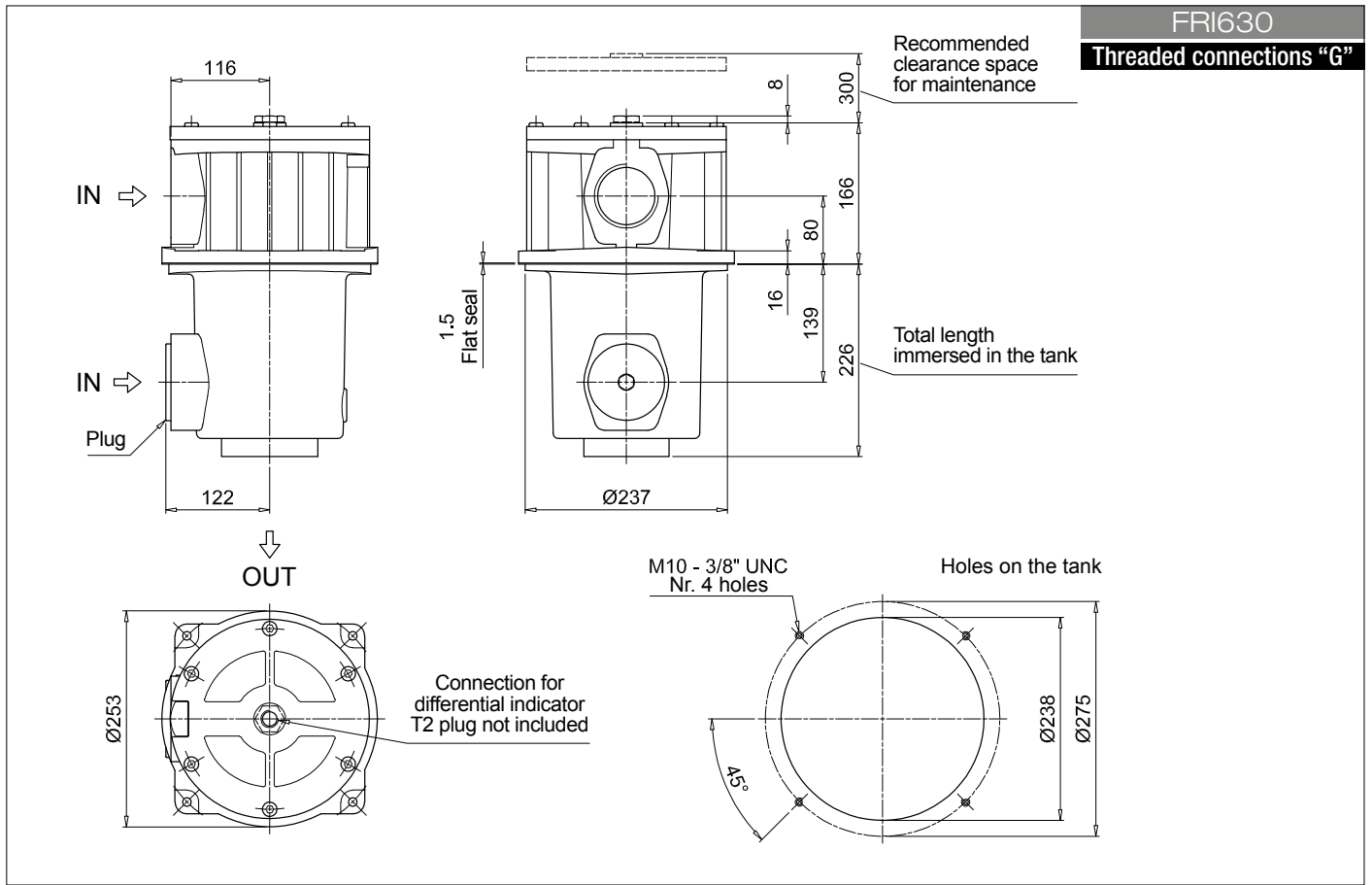
ACCESSORIES

Indicators	page		page
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DEM Electrical differential indicator	242-243	DVA Visual differential indicator	245
DLA Electrical / visual differential indicator	243-244	DVM Visual differential indicator	245
DLE Electrical / visual differential indicator	244		
Additional features		page	
T2 Plug	246		



Dimensions





FRI FRI255 - FRI850

Designation & Ordering code

COMPLETE FILTER

Series and size	Configuration example 1: FRI255 S W F2 M25 N P01						
FRI255	Configuration example 2: FRI850 B A F1 A25 N P01						
FRI850							
Bypass valve							
B With bypass							
S Without bypass							
Seals and treatments	Filtration rating						
A NBR	Axx	Mxx	Pxx				
V FPM	•	•	•				
W NBR head anodized	•	•		filter element compatible with fluids HFA-HFB-HFC			
Z FPM head anodized	•	•					
Connections for FRI255	Connections for FRI850						
G1 G 1 1/2"				F1 3 1/2" SAE 3000 psi/M			
G2 1 1/2" NPT				F2 3 1/2" SAE 3000 psi/UNC			
G3 SAE 24 - 1 7/8" - 12 UN							
G4 G 1 1/4"							
G5 1 1/4" NPT							
G6 SAE 20 - 1 5/8" - 12 UN							
F1 1 1/2" SAE 3000 psi/M							
F2 1 1/2" SAE 3000 psi/UNC							
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	Execution		
				N 10 bar	P01 MP Filtri standard		
					Pxx Customized		

FILTER ELEMENT

Element series and size	Configuration example 1: CU250 M25 W P01						
CU250	Configuration example 2: CU850 A25 N P01						
CU850							
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			
Seals and treatments	Filtration rating						
N NBR	Axx	Mxx	Pxx				
V FPM	•	•	•				
W NBR	•	•		filter element compatible with fluids HFA-HFB-HFC			
Z FPM	•	•					
				Execution			
				P01 MP Filtri standard			
				Pxx Customized			

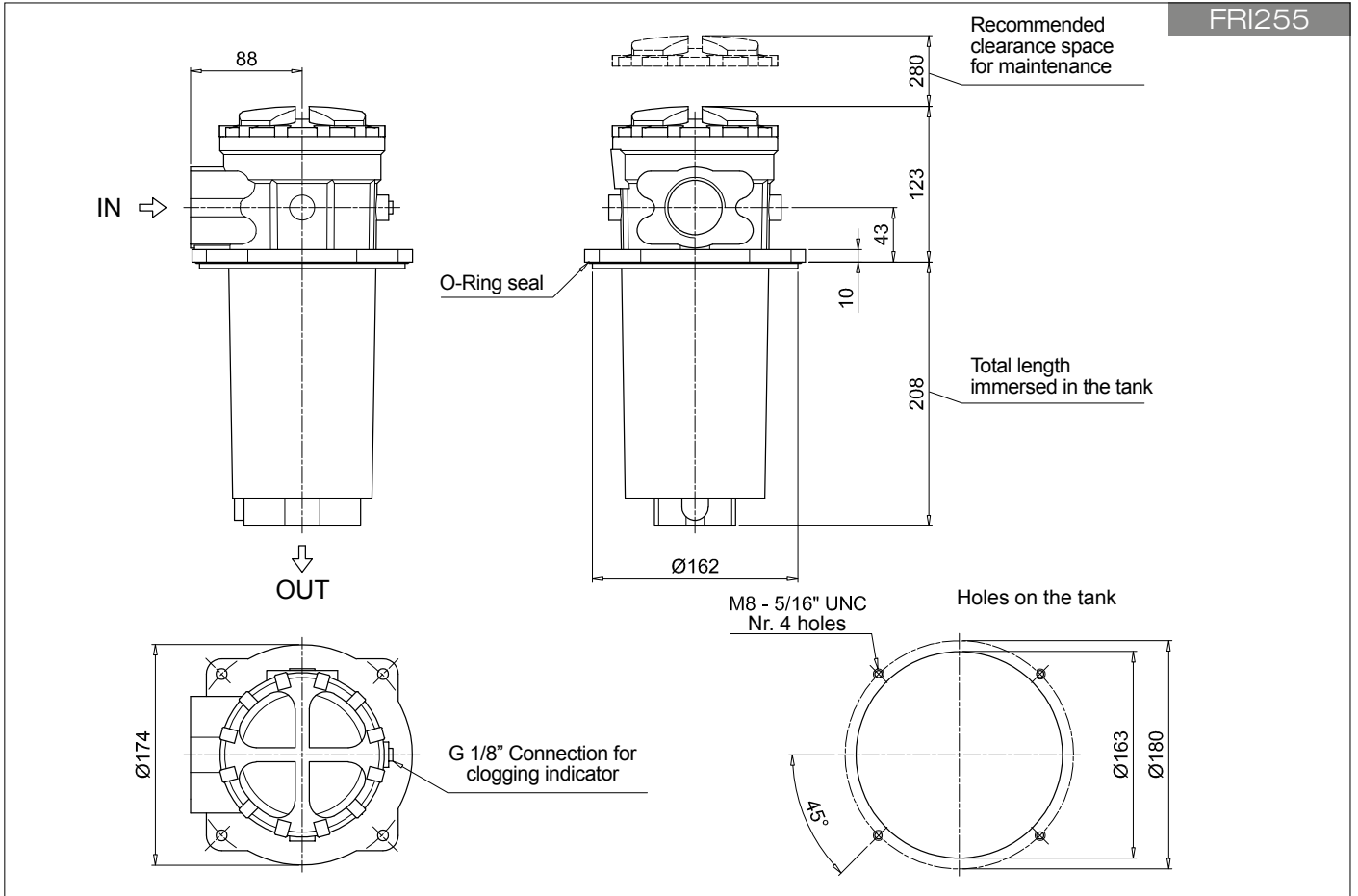
FRI255 ACCESSORIES

Indicators	page			page
BVA Axial pressure gauge	240	BEA Electrical pressure indicator		239
BVR Radial pressure gauge	240	BEM Electrical pressure indicator		239
BVP Visual pressure indicator with automatic reset	241	BLA Electrical / visual pressure indicator		239-240
BVQ Visual pressure indicator with manual reset	241			

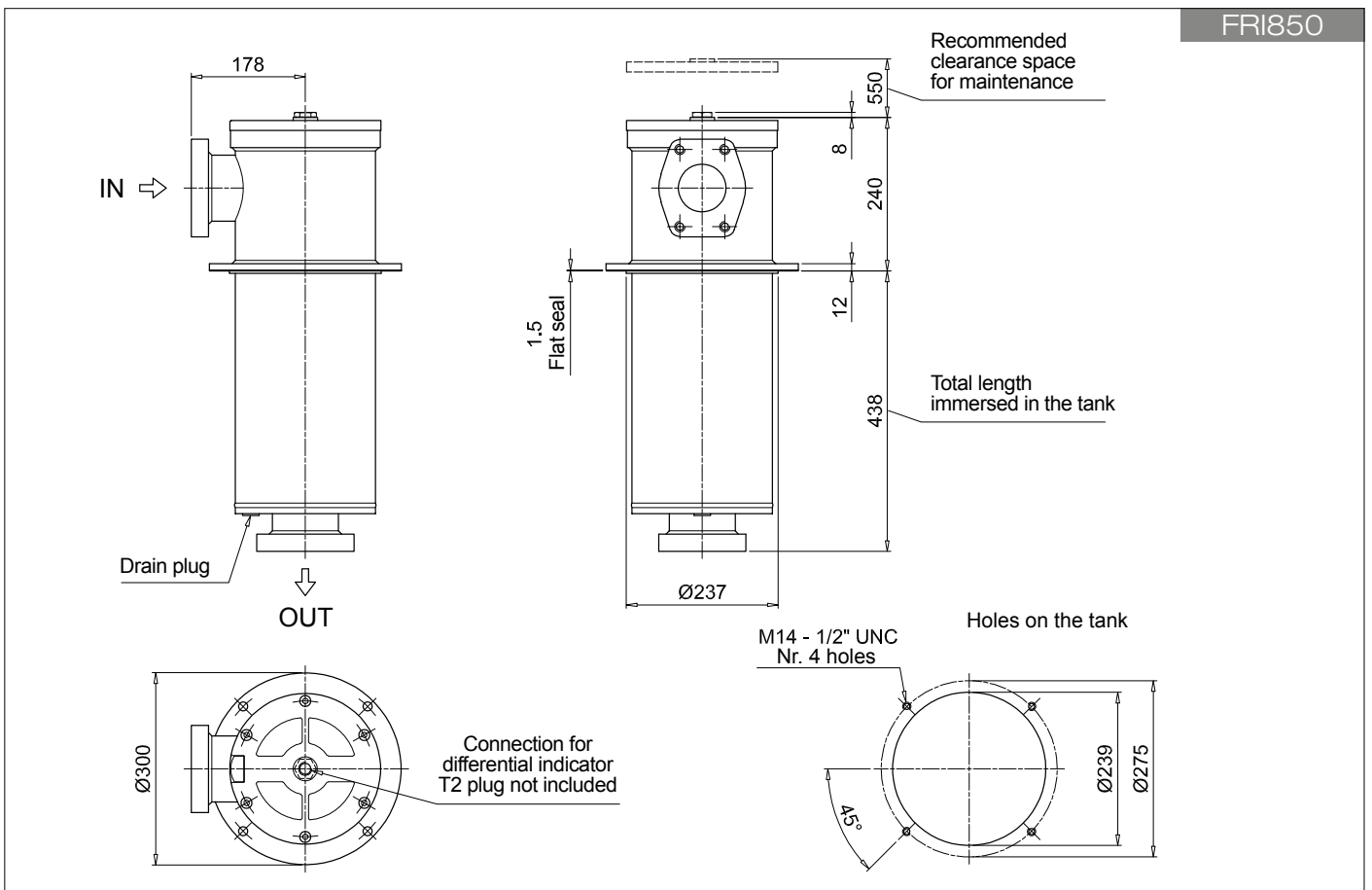
FRI850 ACCESSORIES

Indicators	page			page
DEA Electrical differential indicator	242	DTA Electronic differential indicator		245
DEM Electrical differential indicator	242-243	DVA Visual differential indicator		245
DLA Electrical / visual differential indicator	243-244	DVM Visual differential indicator		245
DLE Electrical / visual differential indicator	244			
Additional features	page			
T2 Plug	246			

FRI255



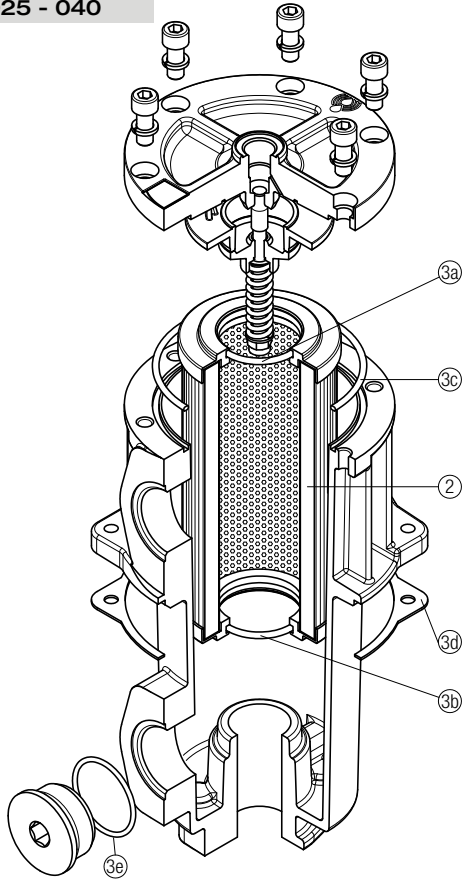
FRI850



FRI SPARE PARTS

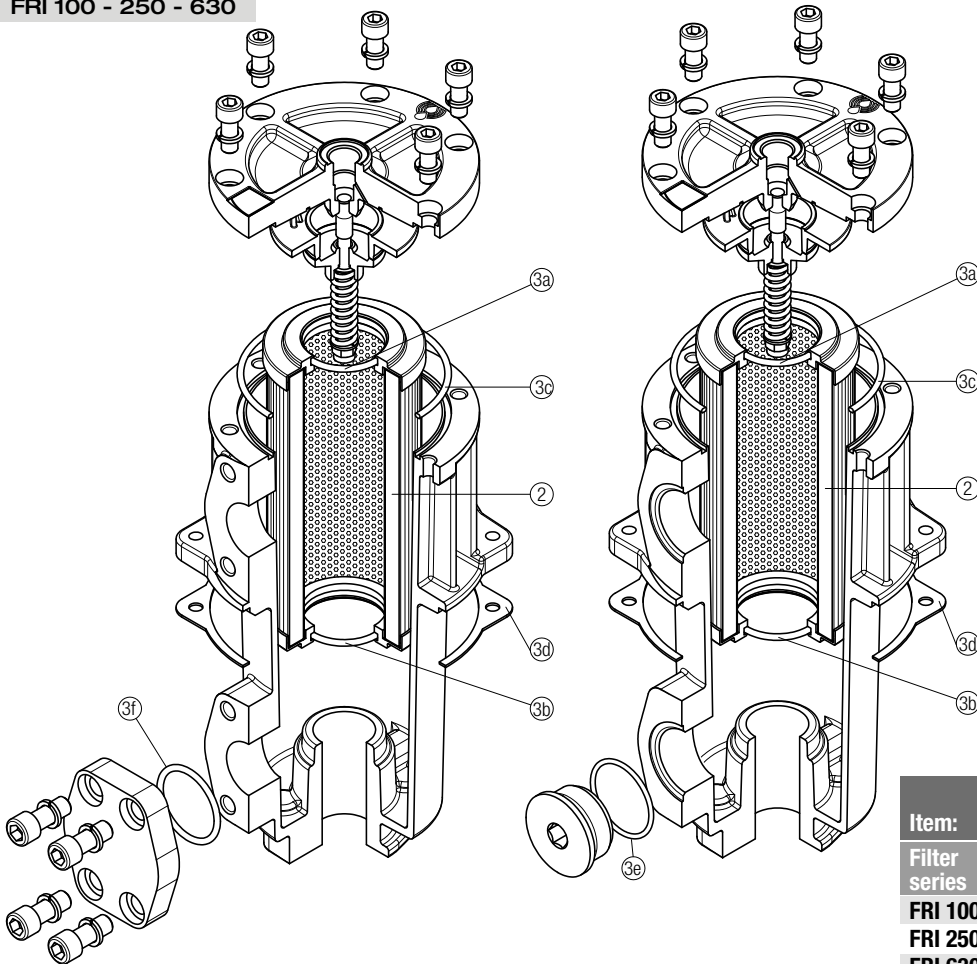
Order number for spare parts

FRI 025 - 040



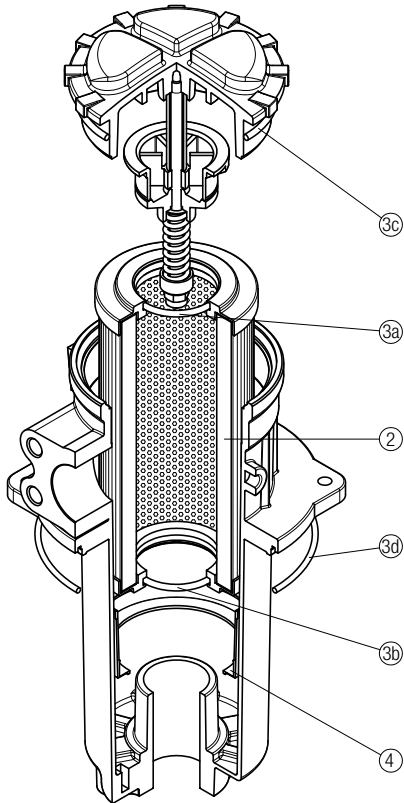
Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	
	2	3 (3a ÷ 3e)	
Filter series	Filter element	Seal Kit code number	
		NBR	FPM
FRI 025	See order table	02050213	02050220
FRI 040		02050214	02050221

FRI 100 - 250 - 630



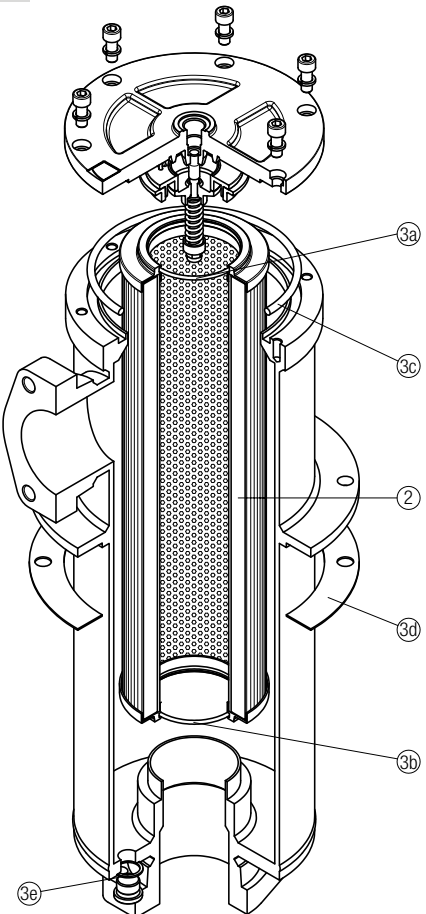
Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	
	2	3 (3a ÷ 3f)	
Filter series	Filter element	Seal Kit code number	
		NBR	FPM
FRI 100	See order table	02050215	02050222
FRI 250		02050216	02050223
FRI 630		02050217	02050224

FRI 255



Item:	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3 (3a ÷ 3d)	Q.ty: 1 pc. 4
Filter series	Filter element See order table	Seal Kit code number NBR	Contamination retainer binder FPM
FRI 255		02050013	02050014 01060301

FRI 850



Item:	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3 (3a ÷ 3e)
Filter series	Filter element See order table	Seal Kit code number NBR
FRI 850		02050218 02050225

RF2 series

Maximum working pressure up to 2 MPa (20 bar) - Flow rate up to 615 l/min



Description

Technical data

Return filter

Maximum working pressure up to 2 MPa (20 bar)
Flow rate up to 615 l/min

RF2250 and RF2350 are ranges of return filters for side tank mounting with integrated shut-off valve for protection of the reservoir against the system contamination.

They are placed below the minimum oil level, directly connected to the return line of the system.

The shut-off valve closes automatically when the cover is removed, allowing the filter element replacement without the fluid drop.

Available features:

- Female threaded connections up to 1" and flanged connections up to 1 1/2", for a maximum flow rate of 615 l/min
- Bypass valve, to relieve excessive pressure drop across the filter media
- Magnetic filter, to hold the ferrous particles
- Visual, electrical and electronic clogging indicators

Common applications:

- Compact mobile machines
- Compact industrial equipment

Filter housing materials

- Filter body: Aluminium
- Cover: Polyamide, GF reinforced
- Valve: Polyamide, GF reinforced - Steel
- Anti-Emptying valve: Steel

Bypass valve

Opening pressure 175 kPa (1.75 bar) \pm 10%

Δp element type

- Microfibre filter elements - series CU: 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

RF2 250-350 filters mounting, see the drawings on page 235 and following



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]		Volumes [dm ³]	
	Length	1	Length	1
RF2 250		2.6		2.0
RF2 350		2.8		2.0

Filter series	Length	Filter element design - N Series							
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
RF2 250	1	148	184	278	307	447	615	447	485
RF2 350	1	148	184	278	307	447	615	447	485

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

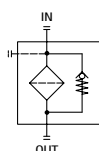
The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

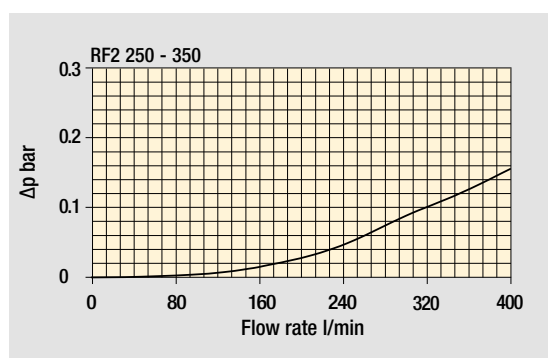
Filter series	Style B - E
RF2 250	•
RF2 350	•

Hydraulic symbols

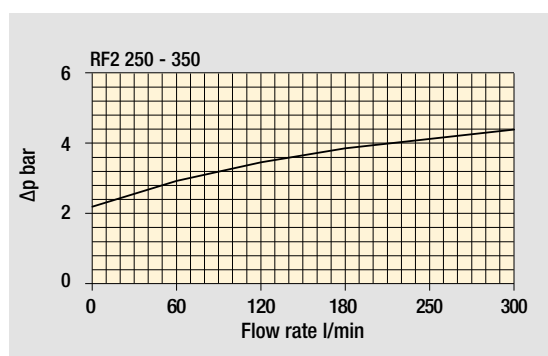


Pressure drop

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.

RF2 RF2250 - RF2350

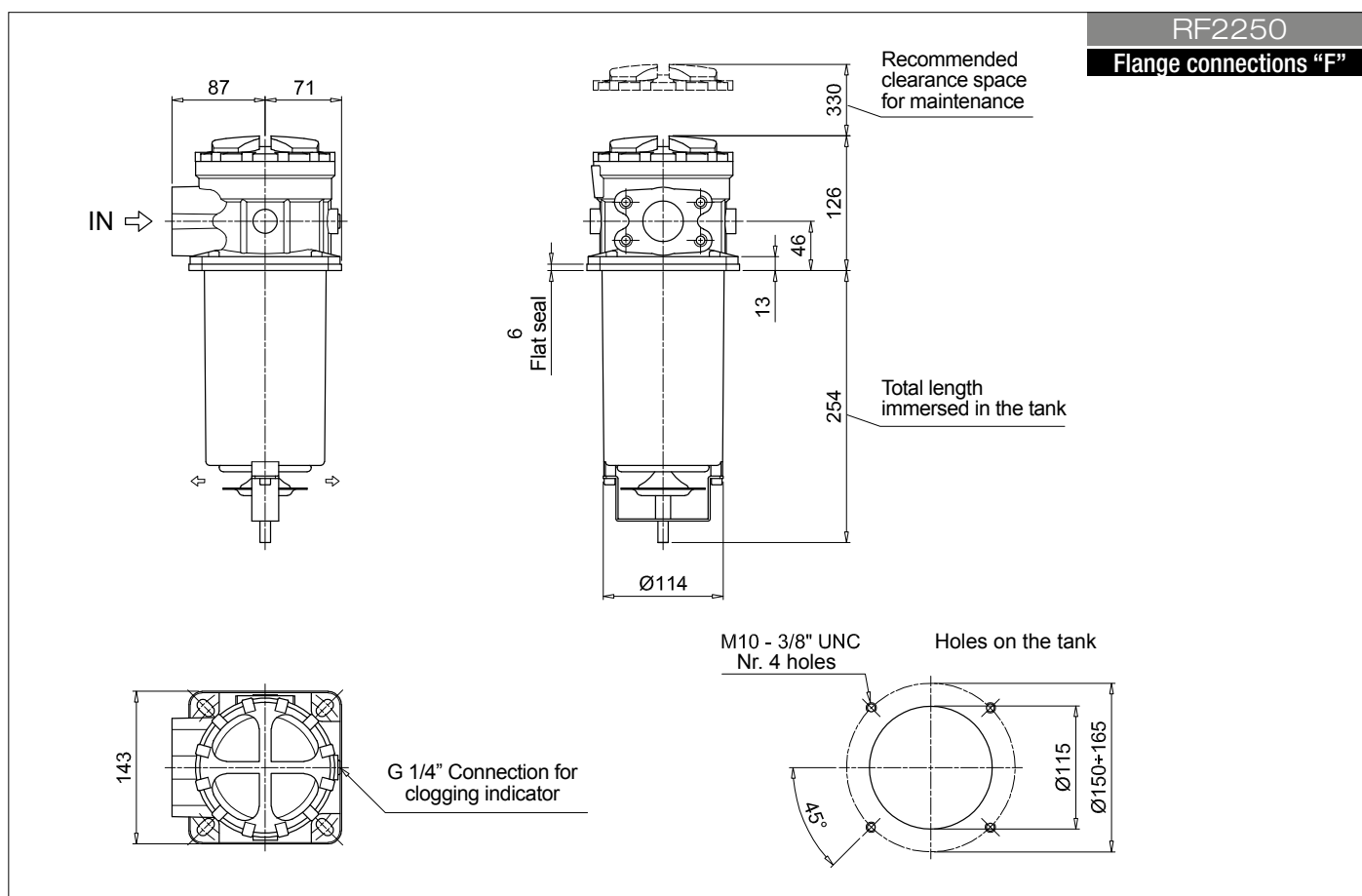
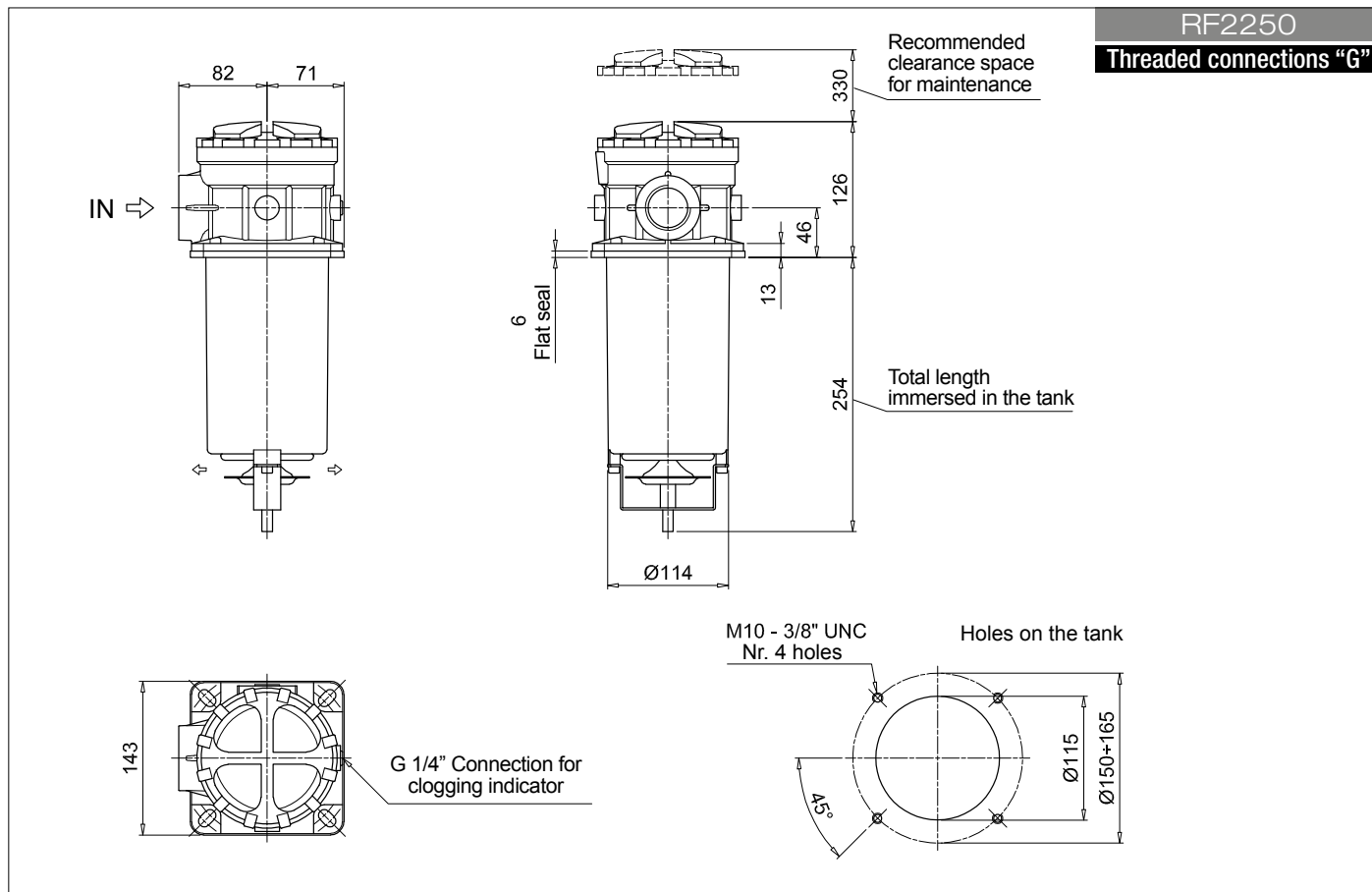
Designation & Ordering code

COMPLETE FILTER

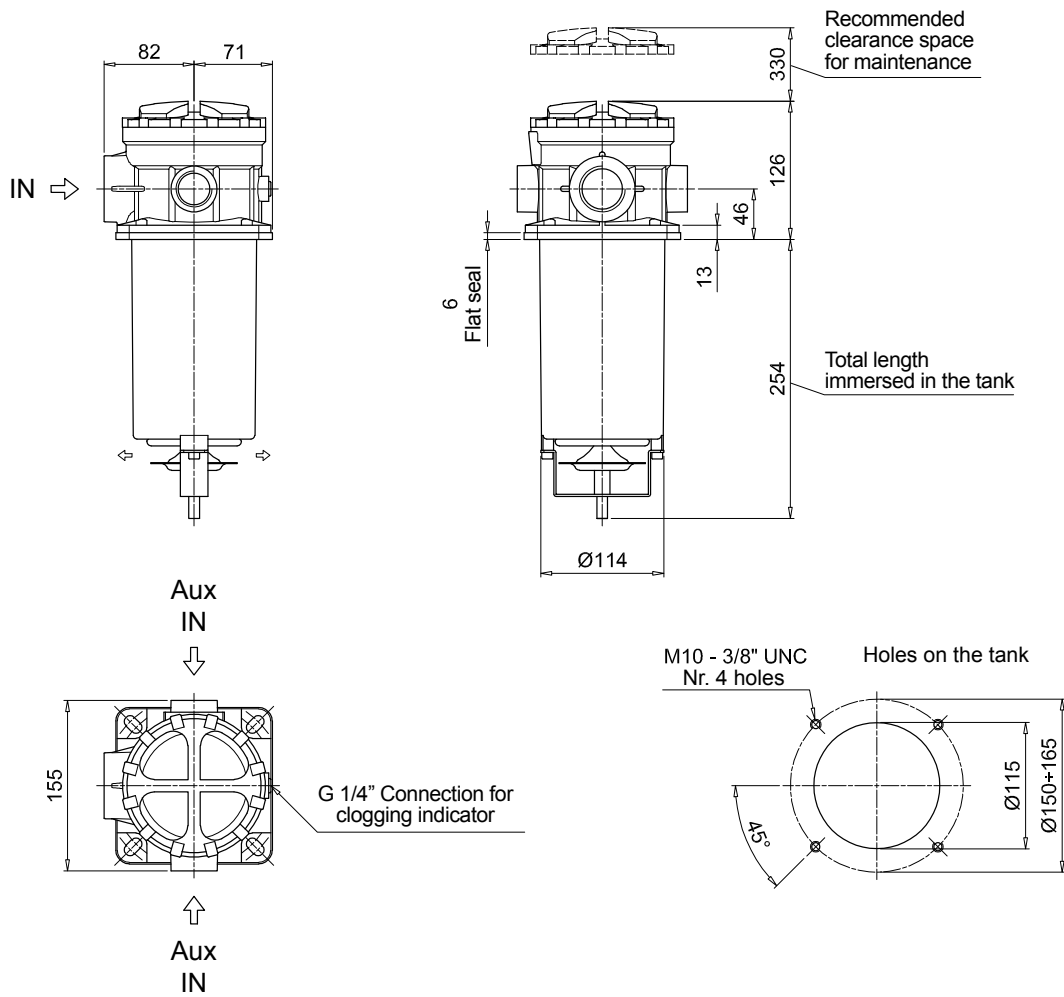
Series and size				Configuration example 1: RF2250 W F2 E M25 P01					
RF2250				Configuration example 2: RF2350 A G1 B A25 P01					
RF2350									
				Filtration rating					
Seals and treatments				Axx	Mxx	Pxx			
A	NBR			•	•	•			
V	FPM			•	•	•			
W	NBR compatible with fluids HFA-HFB-HFC			•	•				
Z	FPM compatible with fluids HFA-HFB-HFC			•	•				
Connections				Aux (only RF2350)		Mxx	Pxx		
G1	G 1 1/2"			G 1"		•	•		
G2	1 1/2" NPT			-		•			
G3	SAE 24 - 1 7/8" - 12 UN			SAE 16 - 1 5/16" - 12 UN		•	•		
G4	G 1 1/4"			-		•			
G5	1 1/4" NPT			-		•			
G6	SAE 20 - 1 5/8" - 12 UN			-		•			
G7	G 1"			-		•			
G8	1" NPT			-		•			
G9	SAE 16 - 1 5/16" - 12 UN			-		•			
F1	1 1/2" SAE 3000 psi/M			-		•			
F2	1 1/2" SAE 3000 psi/UNC			-		•			
Bypass valve									
B	1.75 bar								
E	3 bar								
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			
				Execution					
				P01 MP Filtri standard					
				Pxx Customized					

FILTER ELEMENT

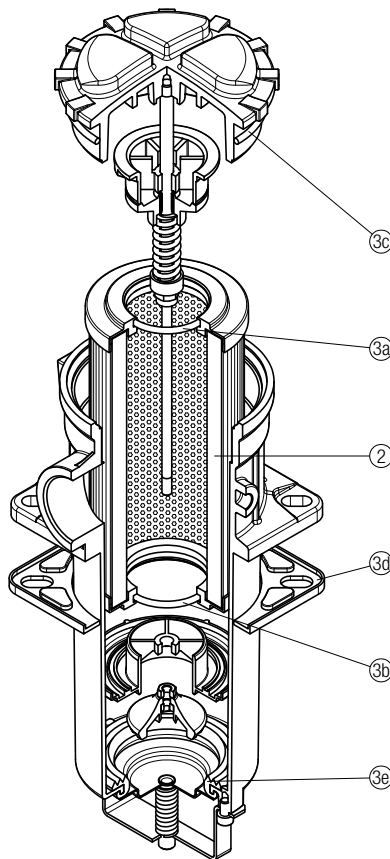
Element series and size				Configuration example 1: CU250 M25 W P01					
CU250				Configuration example 2: CU250 A25 N P01					
Filtration rating (filter media)									
A03	Inorganic microfiber	3 µm		M25	Wire mesh	25 µm			
A06	Inorganic microfiber	6 µm		M60	Wire mesh	60 µm			
A10	Inorganic microfiber	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			
Seals and treatments				Filtration rating					
				Axx	Mxx	Pxx			
N	NBR			•	•	•			
V	FPM			•	•	•			
W	NBR head anodized	filter element compatible with fluids HFA-HFB-HFC		•	•				
Z	FPM head anodized	filter element compatible with fluids HFA-HFB-HFC		•	•				
				Execution					
				P01 MP Filtri standard					
				Pxx Customized					



RF2350



RF2 250 - 350



Item:	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3 (3a ÷ 3e)
Filter series	Filter element	Seal Kit code number
RF2 250	See order table	NBR
RF2 350		FPM
		02050586
		02050587

Clogging indicators

Barometric indicators
Differential indicators

Introduction

Filter elements are efficient only if their Dirt Holding Capacity is fully exploited. This is achieved by using filter housings equipped with clogging indicators.

These devices trip when the clogging of the filter element causes an increase in pressure drop across the filter element.

The indicator is set to alarm before the element becomes fully clogged.

MP Filtri can supply indicators of the following designs:

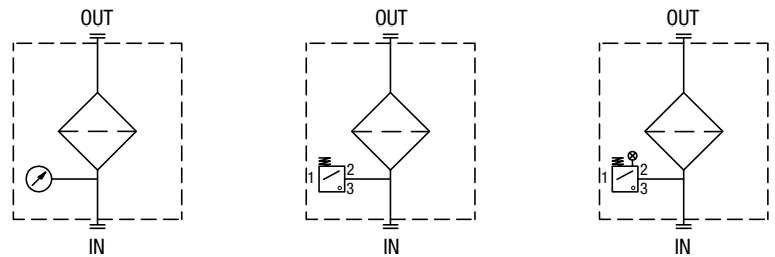
- Vacuum switches and gauges
- Pressure switches and gauges
- Differential pressure indicators

These type of devices can be provided with a visual, electrical or both signals.

Suitable indicator types

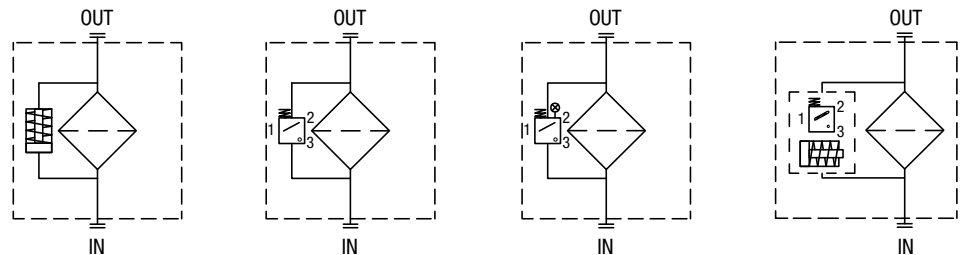
BAROMETRIC INDICATORS

Pressure indicators are used on the Return line to check the efficiency of the filter element. They measure the pressure upstream of the filter element. Standard items are produced with R 1/8" EN 10226 connection.



DIFFERENTIAL INDICATORS

Differential indicators are used on the Pressure line to check the efficiency of the filter element. They measure the pressure upstream and downstream of the filter element (differential pressure). Standard items are produced with special connection G 1/2" size. Also available in Stainless Steel models.



Quick reference guide

Filter series	Visual indicator	Electrical indicator	Electrical / Visual indicator	Electronic indicator
MPFX-MPTX-MPF-MPT with bypass 1.75 bar MPH with bypass 1.75 bar	BVA14P01 BVR14P01 BVP20HP01 BVQ20HP01	BEA15HA50P01 BEM15HA41P01	BLA15HA51P01 BLA15HA52P01 BLA15HA53P01 BLA15HA71P01	
MPFX-MPTX-MPF-MPT with bypass 3 bar MPH with bypass 2.5 bar FRI 255	BVA25P01 BVR25P01 BVP20HP01 BVQ20HP01	BEA20HA50P01 BEM20HA41P01	BLA20HA51P01 BLA20HA52P01 BLA20HA53P01 BLA20HA71P01	
MPLX FRI 025 - 040 - 100 - 250 - 630 - 850	DVA20xP01 DVM20xP01	DEA20xA50P01 DEM20xAxxP01	DLA20xA51P01 DLA20xA52P01 DLA20xA71P01 DLE20xA50P01 DLE20xF50P01	DTA20xF70P01

BEA*50	
Electrical Pressure Indicator	
Settings	Ordering code
1.5 bar ±10%	BE A 15 HA 50 P01
2.0 bar ±10%	BE A 20 HA 50 P01

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR

Technical data

- Max working pressure: 40 bar
- Proof pressure: 60 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree of protection: IP65 according to EN 60529

Electrical data

- Electrical connection: EN 175301-803
- Resistive load: 5 A / 14 Vdc, 4 A / 30 Vdc, 5 A / 125 Vac, 4 A / 250 Vac

- Available Atex product: II 1GD Ex ia IIC Tx Ex ia IIIC Tx°C X

- CE certification

BEM*41	
Electrical Pressure Indicator	
Settings	Ordering code
1.5 bar ±10%	BE M 15 HA 41 P01
2.0 bar ±10%	BE M 20 HA 41 P01

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR

Technical data

- Max working pressure: 40 bar
- Proof pressure: 60 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree of protection: IP67 according to EN 60529

Electrical data

- Electrical connection: Four-core cable
- Resistive load: 5 A / 14 Vdc, 4 A / 30 Vdc, 5 A / 125 Vac, 4 A / 250 Vac

- CE certification
On request this indicator can be provided with main connectors in use for wirings.

BL*51 - BL*52 - BL*53	
Electrical/Visual Pressure Indicator	
Settings	Ordering code
1.5 bar ±10%	BL A 15 HA xx P01
2.0 bar ±10%	BL A 20 HA xx P01

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Transparent Nylon
- Contacts: Silver
- Seal: HNBR

Technical data

- Max working pressure: 40 bar
- Proof pressure: 60 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree of protection: IP65 according to EN 60529

Electrical data

- Electrical connection: EN 175301-803
- Type: 51, 52, 53
- Lamps: 24 Vdc, 110 Vdc, 230 Vac
- Resistive load: 1 A / 24 Vdc, 1 A / 110 Vdc, 1 A / 230 Vac

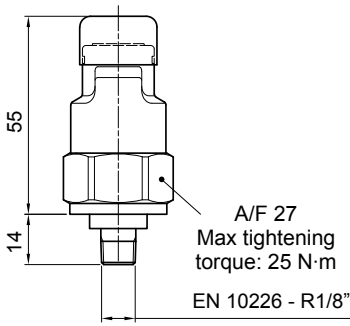
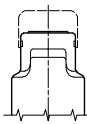
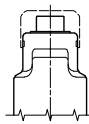
BAROMETRIC INDICATORS

Dimensions

BL*71	
Electrical/Visual Pressure Indicator	
Settings	Ordering code
1.5 bar $\pm 10\%$	BL A 15 HA 71 P01
2.0 bar $\pm 10\%$	BL A 20 HA 71 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 40 bar - Proof pressure: 60 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP65 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: IEC 61076-2-101 D (M12) - Lamps: 24 Vdc - Resistive load: 0.4 A / 24 Vdc 	

BVA	
Axial Pressure Gauge	
Settings	Ordering code
1.4 bar $\pm 10\%$	BV A 14 P01
2.5 bar $\pm 10\%$	BV A 25 P01
<p>Hydraulic symbol</p>	
<p>Dial scale</p> <p>BV A 14 P01</p>	
<p>BV A 25 P01</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Case: Painted Steel - Window: Transparent plastic - Dial: Painted Steel - Pointer: Painted Aluminium - Pressure connection: Brass - Pressure element: Bourdon tube Cu-alloy soft soldered 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: Static: 7 bar Fluctuating: 6 bar Short time: 10 bar - Working temperature: From -40 °C to +60 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Accuracy: Class 2.5 according to EN 13190 - Degree of protection: IP31 according to EN 60529 	

BVR	
Radial Pressure Gauge	
Settings	Ordering code
1.4 bar $\pm 10\%$	BV R 14 P01
2.5 bar $\pm 10\%$	BV R 25 P01
<p>Hydraulic symbol</p>	
<p>Dial scale</p> <p>BV R 14 P01</p>	
<p>BV R 25 P01</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Case: Painted Steel - Window: Transparent plastic - Dial: Painted Steel - Pointer: Painted Aluminium - Pressure connection: Brass - Pressure element: Bourdon tube Cu-alloy soft soldered 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: Static: 7 bar Fluctuating: 6 bar Short time: 10 bar - Working temperature: From -40 °C to +60 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Accuracy: Class 2.5 according to EN 13190 - Degree of protection: IP31 according to EN 60529 	

BVP - BVQ		Hydraulic symbol	Materials
Visual Pressure Indicator			
Setting	Ordering code		
1.5 bar ±10%	BV P 15 H P01		Technical data - Reset: BVP - Automatic reset BVQ - Manual reset - Max working pressure: 10 bar - Proof pressure: 15 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP45 according to EN 60529
	2.0 bar ±10%		
		Signals	
			

DESIGNATION & ORDERING CODE

Series	Configuration example 1:	BE	M	15	H	A	41	P01
BE Electrical pressure indicator	Configuration example 2:	BL	A	20	H	A	71	P01
BL Electrical/Visual pressure indicator	Configuration example 3:	BV	R	14				P01
BV Visual pressure indicator	Configuration example 4:	BV	P	20	H			P01

Type	BE	BL	BV
A Standard type	•	•	A Axial connection pressure gauge
M With wired electrical connection	•		R Radial connection pressure gauge
			P Visual indicator with automatic reset
			Q Visual indicator with manual reset

Pressure setting	BEA-BEM	BLA	BVA-BVR	BVP-BVQ
14 1.4 bar			•	
15 1.5 bar	•	•		
20 2.0 bar	•	•		•
25 2.5 bar			•	

Seals	BE	BLA	BVA-BVR	BVP-BVQ
H HNBR	•	•		•

Thermostat	BEA-BEM	BLA	BV
A Without	•	•	

Electrical connections	BEA	BEM	BL	BV
41 Connection via four-core cable		•		
50 Connection EN 175301-803	•			
51 Connection EN 175301-803, transparent base with lamps 24 Vdc			•	
52 Connection EN 175301-803, transparent base with lamps 110 Vdc			•	
53 Connection EN 175301-803, transparent base with lamps 230 Vdc			•	
71 Connection IEC 61076-2-101 D (M12), black base with lamps 24 Vdc			•	

Option
P01 MP Filtri standard
Pxx Customized

DIFFERENTIAL INDICATORS

Dimensions

DEA*50		Hydraulic symbol	Materials
Electrical Differential Indicator			
Settings	Ordering code		
2.0 bar ±10%	DE A 20 x A 50 P01	Electrical symbol 	Technical data <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids
Electrical data <ul style="list-style-type: none"> - Electrical connection: EN 175301-803 - Resistive load: 0.2 A / 115 Vdc 			

DEM*10		Hydraulic symbol	Materials
Electrical Differential Indicator			
Settings	Ordering code		
2.0 bar ±10%	DE M 20 xx 10 P01	Electrical symbol 	Technical data <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids
Electrical data <ul style="list-style-type: none"> - Electrical connection: AMP Superseal series 1.5 - Resistive load: 0.2 A / 115 Vdc - Switching type: Normally open contacts (NC on request) - Thermal lockout: Normally open up to 30 °C (option "F") 			

DEM*20		Hydraulic symbol	Materials
Electrical Differential Indicator			
Settings	Ordering code		
2.0 bar ±10%	DEM20xx20P01	Electrical symbol 	Technical data <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids
Electrical data <ul style="list-style-type: none"> - Electrical connection: AMP Time junior - Resistive load: 0.2 A / 115 Vdc - Switching type: Normally open contacts (NC on request) - Thermal lockout: Normally open up to 30 °C (option "F") 			

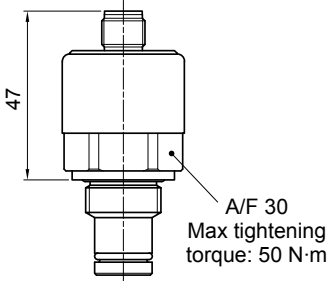
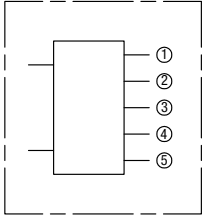
DIFFERENTIAL INDICATORS

Dimensions

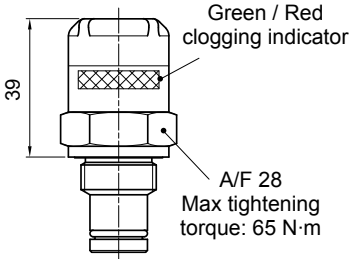
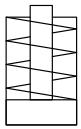
DLA*71	
Electrical/Visual Differential Indicator	
Settings 2.0 bar \pm 10%	Ordering code DL A 20 x A 71 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP65 according to EN 60529 IP69K according to ISO 20653 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: IEC 61076-2-101 D (M12) - Lamps: 24 Vdc - Resistive load: 0.4 A / 24 Vdc 	

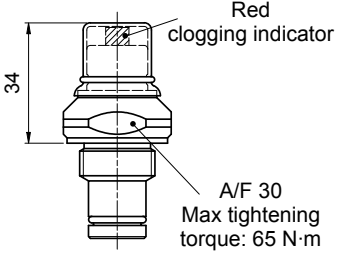
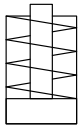
DLE*A50	
Electrical/Visual Differential Indicator	
Settings 2.0 bar \pm 10%	Ordering code DL E 20 x A 50 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP65 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connections: EN 175301-803 - Resistive load: 5 A / 250 Vac - Available the connector with lamps 	

DLE*F50	
Electrical/Visual Differential Indicator	
Settings 2.0 bar \pm 10%	Ordering code DL E 20 x F 50 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP65 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connections: EN 175301-803 - Resistive load: 5 A / 250 Vac - Thermal lockout setting: +30 °C 	

DTA*70																					
Electronic Differential Indicator																					
Settings 2.0 bar ±10%	Ordering code DT A 20 x x 70 P01																				
																					
<p>Hydraulic symbol</p> 																					
<p>Electrical symbol</p> <table border="0"> <tr> <td>①</td> <td>○</td> <td>○</td> <td>+24 Vdc</td> </tr> <tr> <td>②</td> <td>○</td> <td>○</td> <td>4 ÷ 20 mA</td> </tr> <tr> <td>③</td> <td>○</td> <td>○</td> <td>75% - N.O. Digital output</td> </tr> <tr> <td>④</td> <td>○</td> <td>○</td> <td>100% - N.O. Digital output</td> </tr> <tr> <td>⑤</td> <td>○</td> <td>○</td> <td>0 Vdc</td> </tr> </table>		①	○	○	+24 Vdc	②	○	○	4 ÷ 20 mA	③	○	○	75% - N.O. Digital output	④	○	○	100% - N.O. Digital output	⑤	○	○	0 Vdc
①	○	○	+24 Vdc																		
②	○	○	4 ÷ 20 mA																		
③	○	○	75% - N.O. Digital output																		
④	○	○	100% - N.O. Digital output																		
⑤	○	○	0 Vdc																		
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Internal parts: Brass - Nylon - Contacts: Silver - Seal: HNBR - FPM 																					
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP67 according to EN 60529 																					
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: IEC 61076-2-101 D (M12) - Power supply: 24 Vdc - Analogue output: From 4 to 20 mA - Thermal lockout: 30 °C (all output signals stalled up to 30 °C) 																					



DVA	
Visual Differential Indicator	
Settings 2.0 bar ±10%	Ordering code DV A 20 x P01
	
<p>Hydraulic symbol</p> 	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Internal parts: Brass - Nylon - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Reset: Automatic reset - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP65 according to EN 60529 	

DVM	
Visual Differential Indicator	
Settings 2.0 bar ±10%	Ordering code DV M 20 x P01
	
<p>Hydraulic symbol</p> 	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Internal parts: Brass - Nylon - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Reset: Manual reset - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP65 according to EN 60529 	

DIFFERENTIAL INDICATORS

Dimensions

T2		Materials - Body: Phosphatized steel - Seal: HNBR / FPM
Indicator plug		
Seal	Ordering code	
HNBR	T2 H	
FPM	T2 V	

A/F 30
Max tightening torque: 50 N·m

DESIGNATION & ORDERING CODE - DIFFERENTIAL INDICATORS

Series	Configuration example 1:						
DE Electrical differential indicator	DE	M	20	H	F	50	P01
DL Electrical/Visual differential indicator	DL	E	20	V	A	71	P01
DT Electronic differential indicator	DT	A	20	H	F	70	P01
DV Visual differential indicator	DV	M	20	V			P01

Type	DE	DL	DT	DV
A Standard type	•	•	•	A With automatic reset
M With wired electrical connection	•			M With manual reset
E For high power supply		•		

Pressure setting	DEA	DEM	DLA	DLE	DT	DV
20 2.0 bar						

Seals	DEA	DEM	DLA	DLE	DT	DV
H HNBR	•	•	•	•		
V FPM		•		•	•	

Thermostat	DEA	DEM	DLA	DLE	DT	DV
A Without	•	•	•	•		
F With thermostat		•		•	•	

Electrical connections	DEA	DEM	DLA	DLE	DT	DV
10 Connection AMP Superseal series 1.5		•				
20 Connection AMP Timer Junior		•				
30 Connection Deutsch DT-04-2-P		•				
35 Connection Deutsch DT-04-3-P		•				
50 Connection EN 175301-803	•			•		
51 Connection EN 175301-803, transparent base with lamps 24 Vdc			•			
52 Connection EN 175301-803, transparent base with lamps 110 Vdc			•			
70 Connection IEC 61076-2-101 D (M12)					•	
71 Connection IEC 61076-2-101 D (M12), black base with lamps 24 Vdc			•			

Option
P01 MP Filtri standard
Pxx Customized

DESIGNATION & ORDERING CODE - DIFFERENTIAL INDICATOR PLUG

Series	Configuration example	
T2 Indicator plug	T2	H

Seals
H HNBR
V FPM

Accessories

NYLON EXTENSION TUBE

H1 - Total length immersed in the tank

Configuration example: **TE** **40** **A** **250**

Series	Size	Material	Length	H [mm]
TE			200	200
			250	250
			300	300
			350	350
			400	400
			450	450
			500	500

Size	Ø D [mm]	Material
25	25	A Nylon
32	32	
40	40	

COMPATIBILITY TABLE																		
Filter series	Filter size			Filter length	Tube length													
					TE25	TE32	TE40	200	250	300	350	400	450	500				
MPF - MPFX	30			1	•				266	316	366	416	466	516	566			
MPF	100	104	110	1		•			275	325	375	425	475	525	575			
				2					322	372	422	472	522	572	622			
				3			•			400	450	500	550	600	650	700		
				4						502	552	602	652	702	752	802		
MPFX	100	104	110	1					277	327	377	427	477	527	577			
				2			•			322	372	422	472	522	572	622		
				3						400	450	500	550	600	650	700		
				4						502	552	602	652	702	752	802		
MPF MPFX	181	182	184	1					410	460	510	560	610	660	710			
				2			•			623	673	723	773	823	873	923		
MPT MPTX	025		027		1				278	328	378	428	478	528	578			
					2	•				342	392	442	492	542	592	642		
					3					380	430	480	530	580	630	680		
MPT	101	104	110	114	120	1				273	323	373	423	473	523	573		
						2					320	370	420	470	520	570	620	
						3						396	446	496	546	596	646	696
						4				•		498	548	598	648	698	748	798
MPTX	101	104	110	114	120	1				273	323	373	423	473	523	573		
						2						318	368	418	468	518	568	618
						3				•		396	446	496	546	596	646	696
						4						498	548	598	648	698	748	798

STEEL EXTENSION TUBE

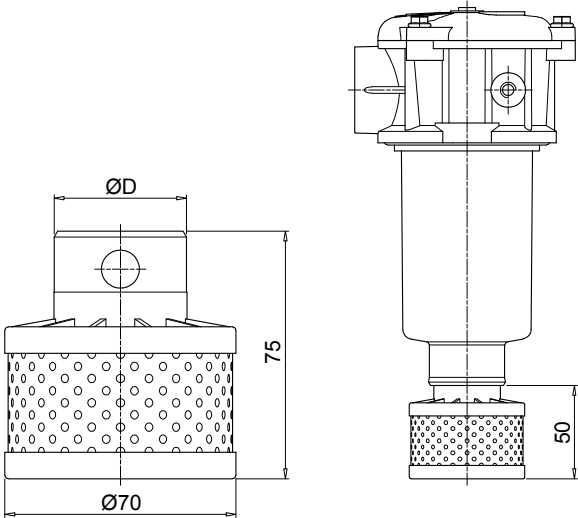
H1 - Total length immersed in the tank

Configuration example: **MPF191** **2** **A** **F1** **A10** **H** **B** **S60**

Length	H1 [mm]
S30	300
S35	350
S40	400
S45	450
S50	500
S60	600
S70	700
S80	800
S90	900

COMPATIBILITY TABLE							
Filter series	Filter size			Filter length	Ø D [mm]		
					52	65	
MPF	191	192	194	2	•		
				1	•		
	400	410	450	451	2		•
					3		
		750			1		•

DIFFUSER WITH FAST LOCK CONNECTION

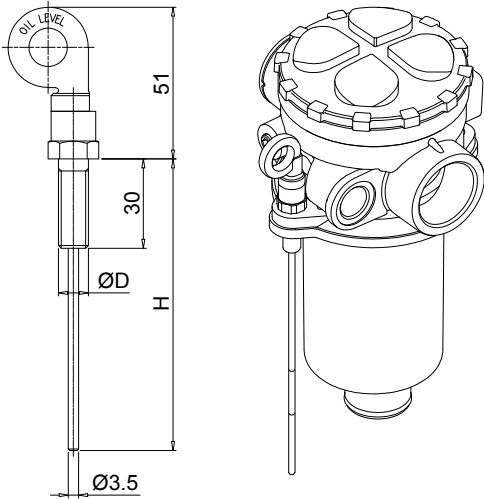


Configuration example: **DFS 32 A 075**

Series		DFS
Size		32
Size	ø D [mm]	32
40	40	
Version		A Standard
Length		075 Standard

COMPATIBILITY TABLE								
Filter series	Filter size			Filter Length	DFS32	DFS40		
MPF	100	104	110	1	•			
				2				
				3		•		
				4				
MPFX	100	104	110	1		•		
				2		•		
				3				
				4				
MPT	101	104	110	114	120	1	•	
						2		
						3		
						4		•
MPTX	101	104	110	114	120	1		•
						2		•
						3		
						4		

DIPSTICK



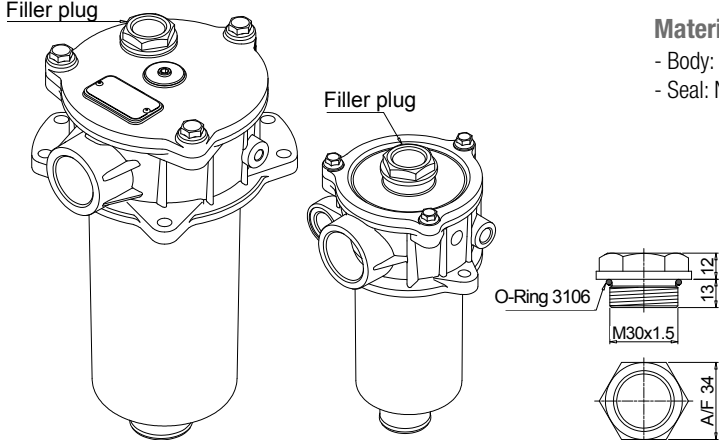
Configuration example: **DPT 20 M10 A P01**

Series		DPT
Length	H [mm]	20
15	134	
20	184	
25	234	
30	284	
35	334	
Fastening		M8 Fastening with screws ø D = M8
		M10 Fastening with screws ø D = M10
Seals		A NBR
		V FPM
Execution		P01 MP Filtri standard
		Pxx Customized

Materials
 - Screw: phosphatized steel
 - Stick: phosphatized steel
 - Handle: Nylon

Technical data
 Working temperature: from -25 °C to +110 °C

FILLER PLUG



Configuration example: **DPT 20 M10 A P01**

Series		DPT
Length	H [mm]	20
15	134	
20	184	
25	234	
30	284	
35	334	
Fastening		M8 Fastening with screws ø D = M8
		M10 Fastening with screws ø D = M10
Seals		A NBR
		V FPM
Execution		P01 MP Filtri standard
		Pxx Customized

Materials
 - Body: Nylon
 - Seal: NBR

Technical data
 Tightening torque: 15 N·m

O-Ring 3106 / M30x1.5 / 13 / 12 / A/F 34

For any further information, please, contact our commercial dept.

Hydraulic combined filters for installation on the return and suction lines of hydrostatic transmissions (HSTs) for commercial vehicles, construction machinery, agricultural vehicles, and mobile work equipment with hydrostatic drive.

Advantage for the installation:

- **Space-saving assembly**
- **Reduced assembly time**
- **Fewer connections to the tank**
- **Protection from the pollution of the tank**

Advantages for the operativity:

- **Absolute filtration of the oil for the hydrostatic drive**
- **Fulfilment of the purity requirements according to ISO 4406, as specified by the manufacturer of the driving drives.**
- **Protection against damages from cavitation even under adverse conditions, i.e. cold start**
- **Less formation of free air in the system**
- **Easier maintenance operations (one spare filter element instead of two)**

FILTER SIZING

For the proper corrective factor Y see chapter at page 24

Return / Suction filters



MRSX	page 253
LMP 124 MULTIPORT	265
INDICATORS	273



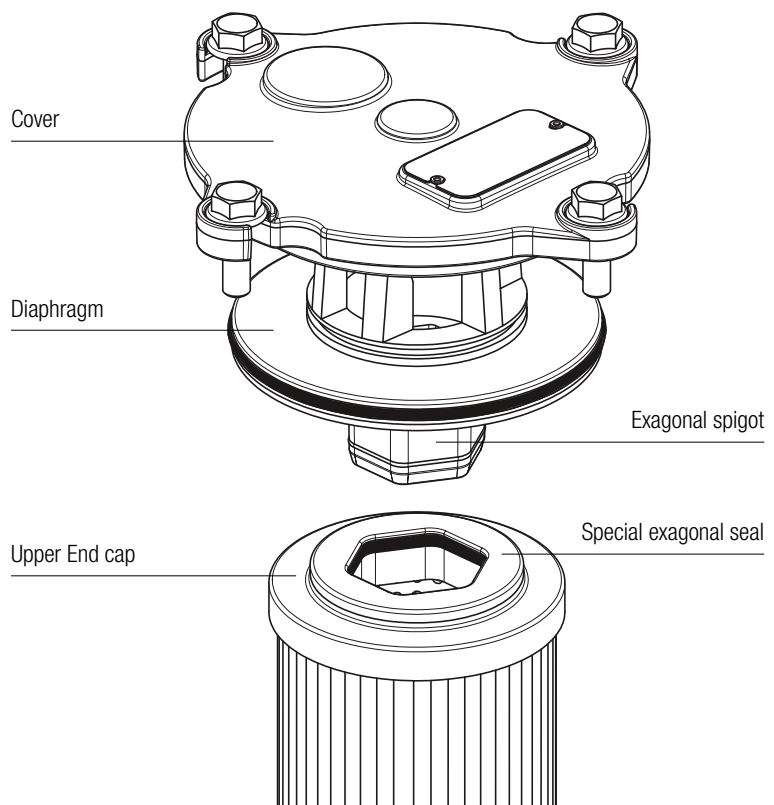
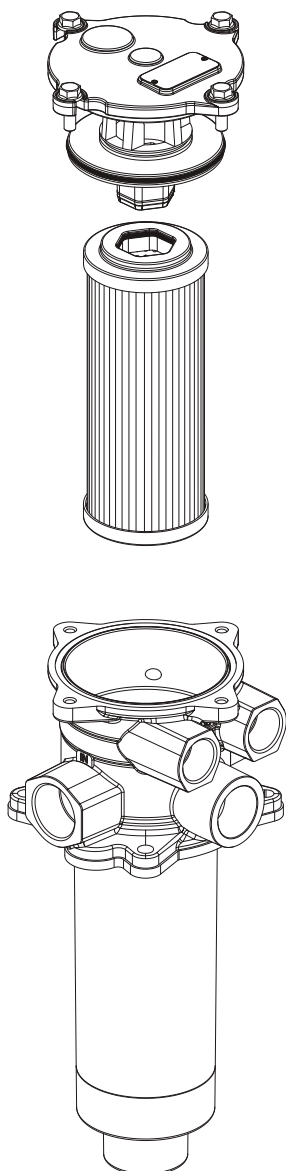
THE NEW FILTER CONCEPT

MRSX
RSX
series

NEW FILTER ELEMENT WITH EXCLUSIVE INTERFACE CONNECTION

- ◆ **Protects the machine from improper use of non-original products.**
- ◆ **Safety of constant quality protection & reliability**

With exclusive filter element you are sure that only MP Filtri filter elements can be used, ensuring the best cleaning level of the oil due to the use of originals filter elements.



The products identified as MRSX and RSX are protected by:

- ◆ Italian Patent n° 102014902261205
- ◆ Canadian Patent n° 2,937,258
- ◆ European Patent n° 16181725.9
- ◆ US Patent n° 15/224,337

MRSX series

Maximum working pressure up to 1 MPa (10 bar) - Flow rate up to 250 l/min



Description

Technical data

Return / Suction filter

Tank mounted

Maximum working pressure up to 1 MPa (10 bar)
Flow rate up to 250 l/min

MRSX is a range of suction/return filters for hydraulic systems with two or more circuits (both open and closed loops). They are able to provide pressurized oil cleaned by fine filtration to the feed pump of the hydrostatic systems.

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 return connections up to 1 1/4", for a maximum return flow rate of 250 l/min
- Multiple connections, to connect several return and suction lines
- Fine filtration rating, to get a good cleanliness level into the reservoir
- Bypass valve to the tank, to relieve excessive pressure drop across the filter media when the return flow is enough higher than the suction flow
- Bypass valve to the suction line with additional suction filter element, to relieve excessive pressure drop across the filter media when the return flow is not enough higher than the suction flow
- De-pressurization valve, to reduce the pressure inside the filter during the maintenance operations
- Anti-cavitation valve with additional suction filter element, to ensure fluid to the feed pump of the hydrostatic systems during cold starts or initial filling
- O-ring or Flat Seal to suit a variety of reservoir surfaces
- Reservoir side mounting, to save space in the machines
- 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:

Mobile machines with hydrostatic systems on board
 (i.e. skid steer loaders, telehandlers, dumpers, road sweepers)

Filter housing materials

- Head: Aluminium
- Cover
 Nylon: MRSX 116
 Aluminium: MRSX 165-166
- Bowl: Nylon

Δp element type

- RSX: 10 bar
- Oil flow from exterior to interior.

Seals

- Standard NBR series A
- Optional FPM series V

Temperature

From -25 °C to +110 °C



FILTER ASSEMBLY SIZING

Flow rates [l/min]

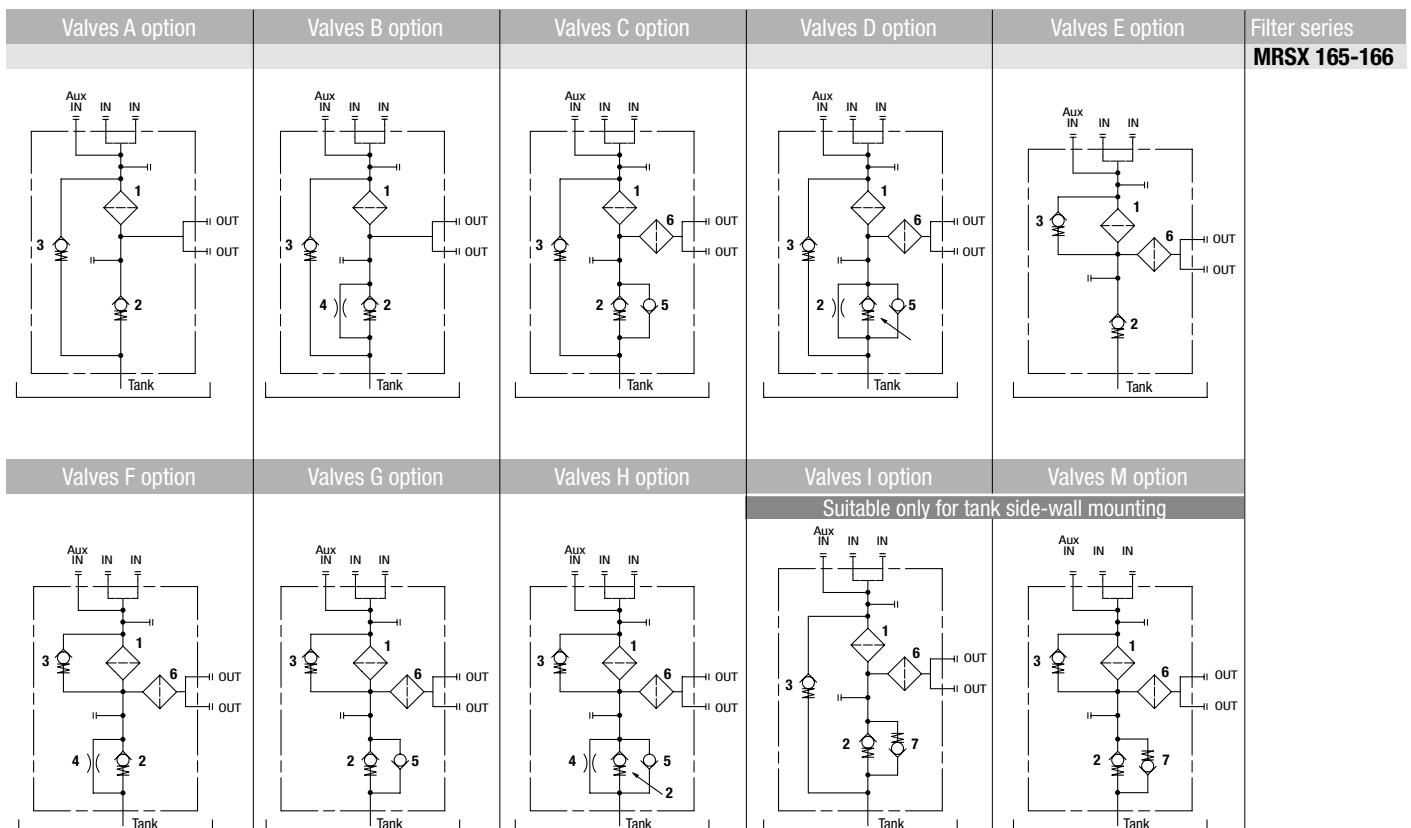
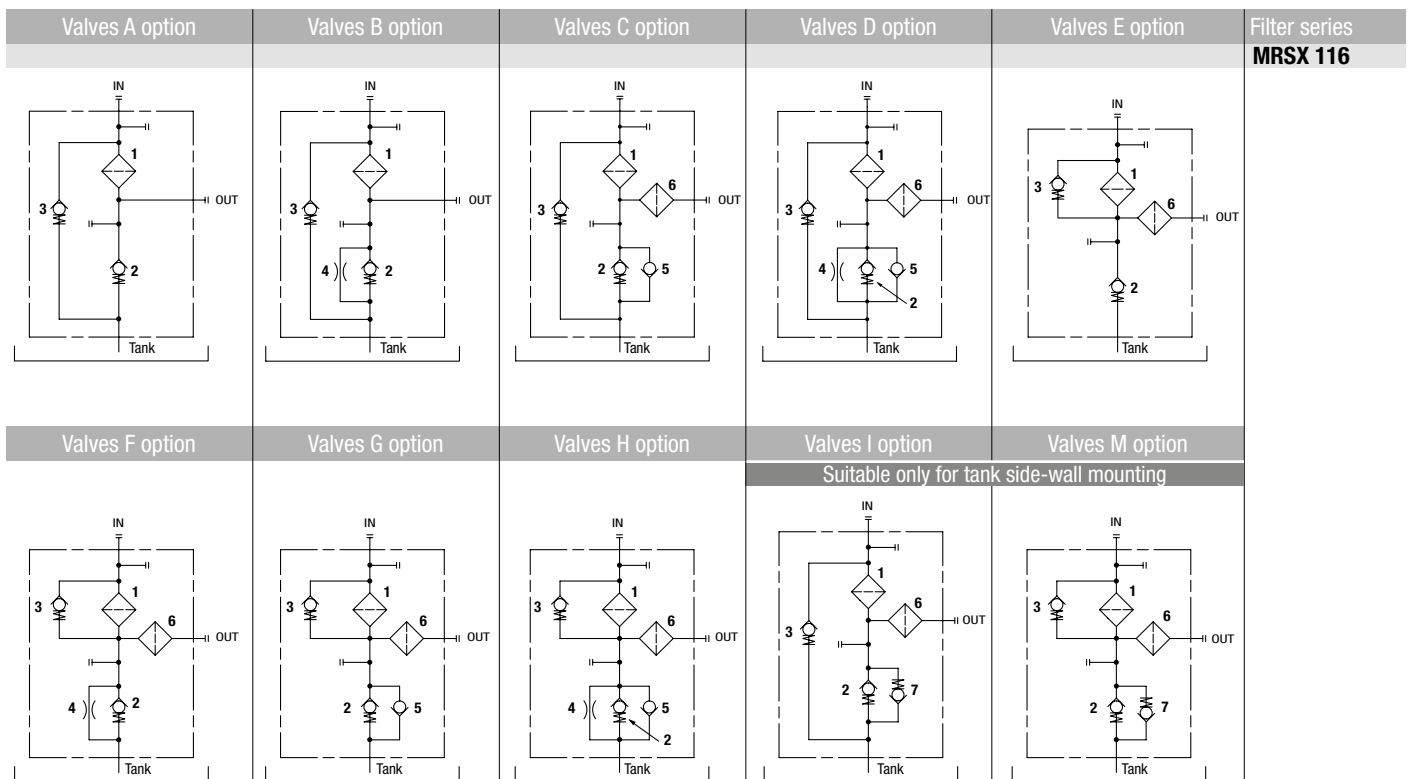
Filter series	Length	A10	A16	A25
MRSX 116	1	74	82	87
	2	108	113	124
MRSX 165 - 166	1	155	166	178
	2	187	196	200
	3	201	205	217

Maximum flow rate for a complete return/suction filter with a pressure drop Δp = 1 bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.



LEGEND

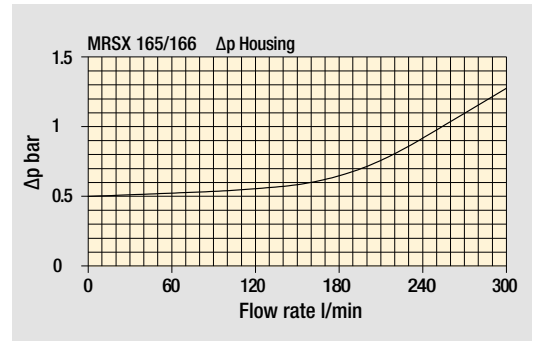
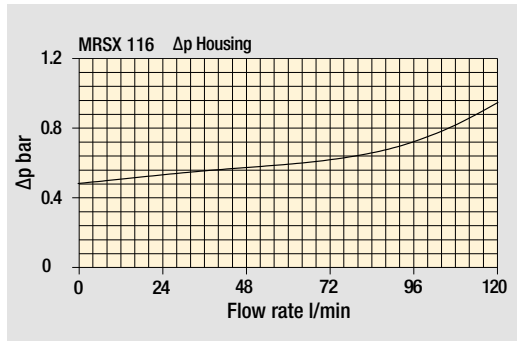
- 1 - Filter element
- 2 - Back-Pressure valve: opening pressure 0.5 bar \pm 10%
- 3 - Bypass valve: opening pressure 2.5 bar \pm 10%
- 4 - Depressurization valve

- 5 - Anti-Cavitation valve
- 6 - Safety filter element (wire mesh 60 μ m)
- 7 - Anti-Cavitation valve / Anti-Emptying valve

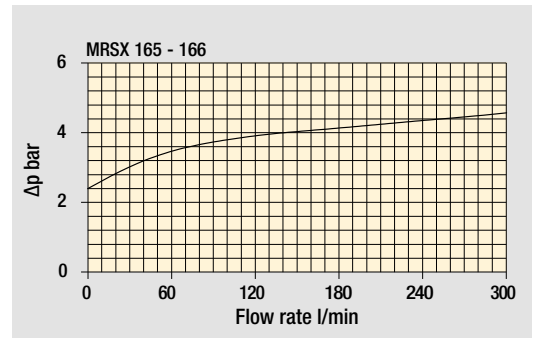
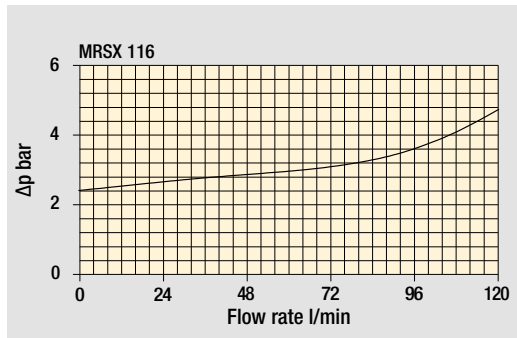
MRSX GENERAL INFORMATION

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.

Weights [kg] and volumes [dm³]

Filter series	Weights [kg]				Volumes [dm ³]			
	Length	1	2	3	Length	1	2	3
MRSX 116		1.30	1.40	-		0.80	1.00	-
MRSX 165		3.40	3.80	4.10		2.00	2.60	3.00
MRSX 166		3.40	3.80	4.10		2.00	2.60	3.00

Designation & Ordering code

COMPLETE FILTER

Configuration example: **MRSX116** | **1** | **B** | **A** | **G1** | **0** | **A16** | **B** | **P01**

Series and size
MRSX116 Filter element with private spigot

Length
1 | **2** |

Hydraulic diagram configuration - see page 257

Bypass valve to tank				Bypass valve to OUT			
A	B	C	D				
E	F	G	H				
I							
M							

Seals and treatments

A NBR, O-Ring on head	B NBR, flat seal on head
V FPM, O-Ring on head	D FPM, flat seal on head

Connections IN

G1 G 3/4"
G2 G 1"
G3 3/4" NPT
G4 1" NPT
G5 SAE 12 - 1 1/16" - 12 UN
G6 SAE 16 - 1 5/16" - 12 UN
D1 G 1"
D2 1" NPT
D3 SAE 16 - 1 5/16" - 12 UN

Connections OUT

G 3/4"
G 1"
3/4" NPT
1" NPT
SAE 12 - 1 1/16" - 12 UN
SAE 16 - 1 5/16" - 12 UN
G 3/4"
3/4" NPT
SAE 12 - 1 1/16" - 12 UN

Aux IN connection
0 Without aux IN connection

Filtration rating (filter media)

A10 Inorganic microfiber 10 µm
A16 Inorganic microfiber 16 µm
A25 Inorganic microfiber 25 µm

Valves configuration

Mounting position	A	B	C	D	E	F	G	H	I	M
S Standard	•	•	•	•	•	•	•	•		
B Tank side-wall mounting	•	•			•	•			•	•

Execution
P01 MP Filtri standard
Pxx Customized

FILTER ELEMENT

Configuration example: **RSX116** | **1** | **A16** | **A** | **P01**

Element series and size
RSX116 Filter element with private spigot

Element length
1 | **2** |

Filtration rating (filter media)

A10 Inorganic microfiber 10 µm
A16 Inorganic microfiber 16 µm
A25 Inorganic microfiber 25 µm

Seals

A NBR
V FPM

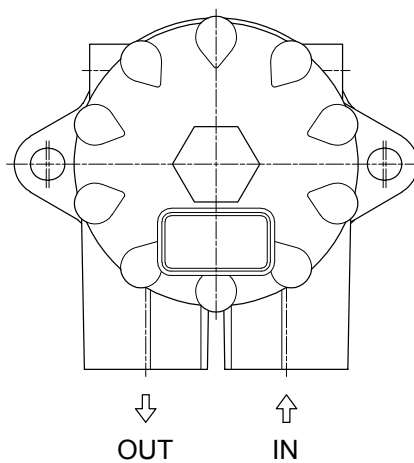
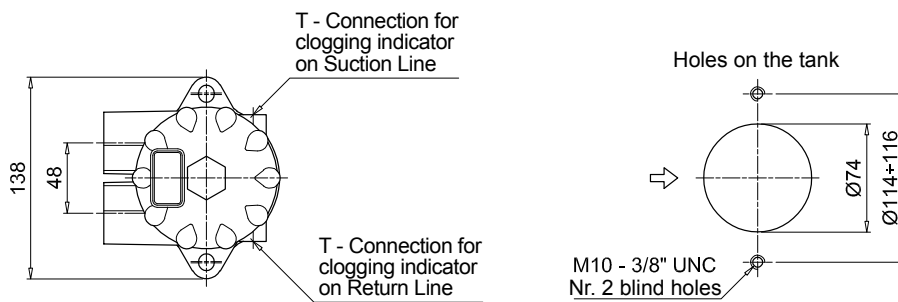
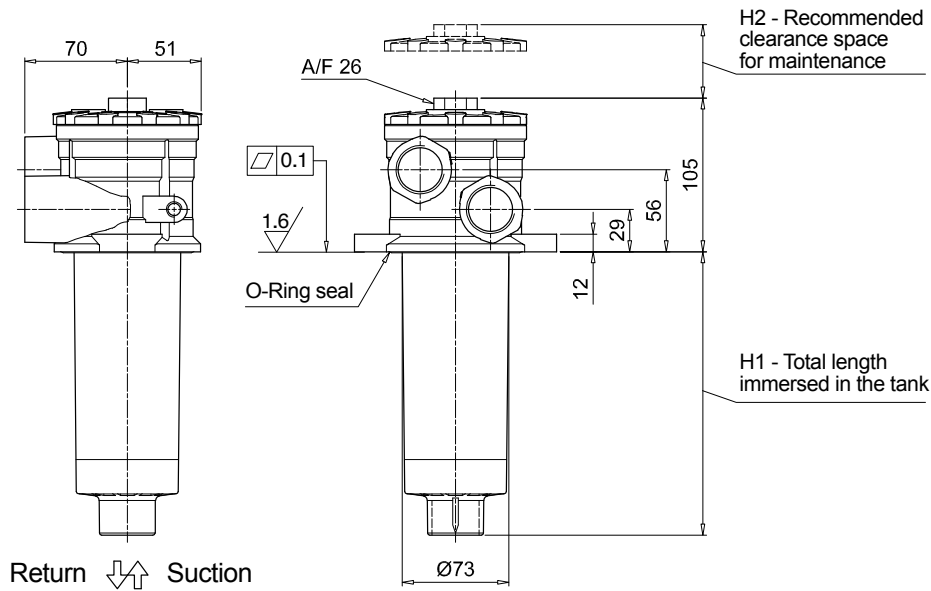
Execution
P01 MP Filtri standard
Pxx Customized

ACCESSORIES

Indicators on Return Line		page	Indicators on Suction Line		page
BVA Axial pressure gauge		278	BEA Electrical pressure indicator		276
BVR Radial pressure gauge		278	BEM Electrical pressure indicator		276
BVP Visual pressure indicator with automatic reset		279	BET Electrical pressure indicator		276-277
BVQ Visual pressure indicator with manual reset		279	BLA Electrical / visual pressure indicator		277-278
VVB Axial vacuum gauge		275	VEB Electrical vacuum indicator		274
VVS Radial vacuum gauge		275	VLB Electrical / visual vacuum indicator		274

MRSX116		
Filter length	H1 [mm]	H2 [mm]
1	203	240
2	263	300

Connections	T
G1 - G2	G 1/8"
G3 - G4	1/8" NPT
G5 - G6	1/8" NPT
D1	G 1/8"
D2 - D3	1/8" NPT



MRSX MRSX165 - MRSX166

Designation & Ordering code

COMPLETE FILTER

Series and size **MRSX165** | **MRSX166** Filter element with private spigot

Configuration example: **MRSX166** | **2** | **C** | **V** | **G3** | **1** | **A10** | **S** | **P01**

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

Hydraulic diagram configuration - see page 257

A	B	C	D	Bypass valve to tank	Bypass valve to OUT
				•	
					•
				•	
					•

Seals and treatments

A	B
NBR, O-Ring on head	NBR, flat seal on head
FPM, O-Ring on head	FPM, flat seal on head

Connections

	IN (size 165)	IN (size 166)	Aux IN	OUT
G1	G 1 1/4"	G 1"	G 1 1/4"	G 1"
G2	1 1/4" NPT	1" NPT	1 1/4" NPT	1" NPT
G3	SAE 20 - 1 5/8" - 12 UN	SAE 16 - 1 5/16" - 12 UN	SAE 20 - 1 5/8" - 12 UN	SAE 16 - 1 5/16" - 12 UN

Aux IN connection

	MRSX 165	MRSX 166
0 Without aux IN connection	•	-
1 With aux IN connection - see previous table	•	•

Filtration rating (filter media)

A10 Inorganic microfiber 10 µm
A16 Inorganic microfiber 16 µm
A25 Inorganic microfiber 25 µm

Valves configuration

Mounting position	A	B	C	D	E	F	G	H	I	M
S Standard	•	•	•	•	•	•	•	•		
B Tank side-wall mounting	•	•			•	•			•	•

Execution

P01 MP Filtri standard
Pxx Customized

FILTER ELEMENT

Element series and size **RSX165** Filter element with private spigot

Configuration example: **RSX165** | **2** | **A10** | **V** | **P01**

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

Filtration rating (filter media)

A10 Inorganic microfiber 10 µm
A16 Inorganic microfiber 16 µm
A25 Inorganic microfiber 25 µm

Seals

A	V
NBR	
FPM	

Execution

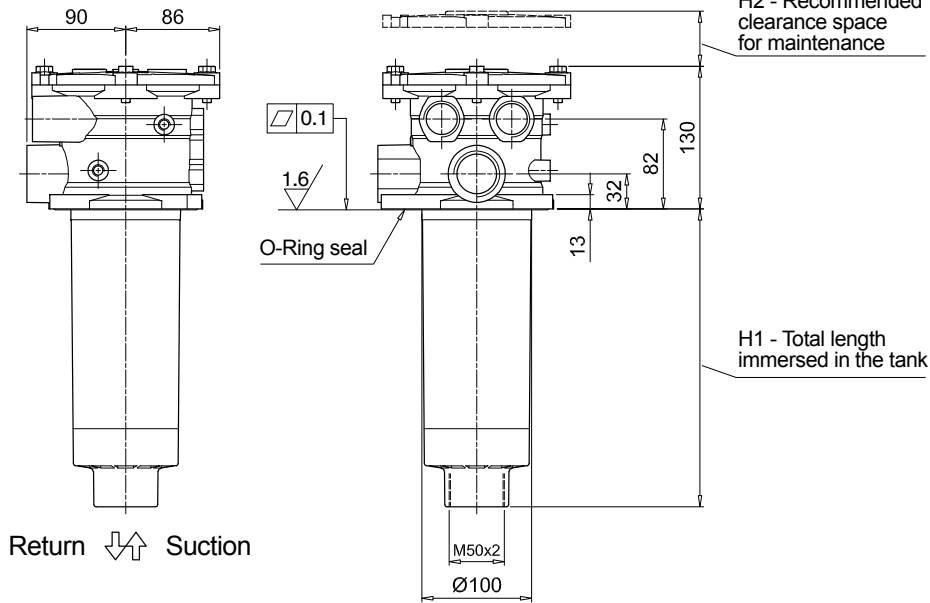
P01 MP Filtri standard
Pxx Customized

ACCESSORIES

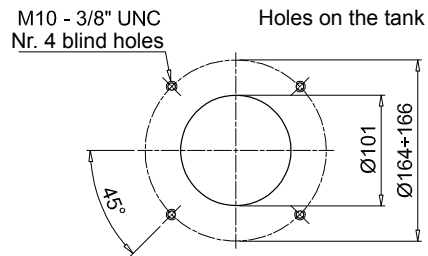
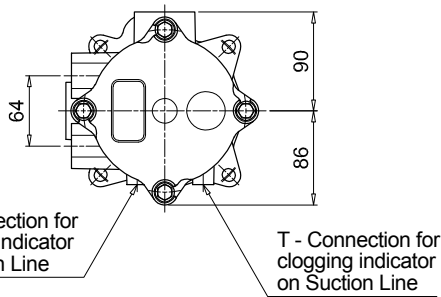
Indicators on Return Line	page		page
BVA Axial pressure gauge	278	BEA Electrical pressure indicator	276
BVR Radial pressure gauge	278	BEM Electrical pressure indicator	276
BVP Visual pressure indicator with automatic reset	279	BET Electrical pressure indicator	276-277
BVQ Visual pressure indicator with manual reset	279	BLA Electrical / visual pressure indicator	277-278
Indicators on Suction Line	page		page
VVB Axial vacuum gauge	275	VEB Electrical vacuum indicator	274
VVS Radial vacuum gauge	275	VLB Electrical / visual vacuum indicator	274

MRSX165		
Filter length	H1 [mm]	H2 [mm]
1	270	320
2	378	430
3	445	500

Connections	T
G1	G 1/8"
G2 - G3	1/8" NPT

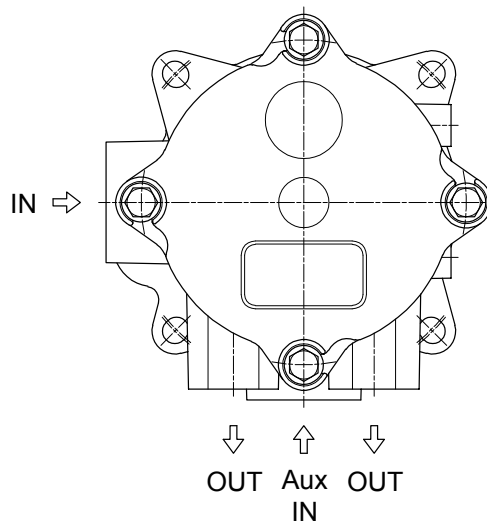
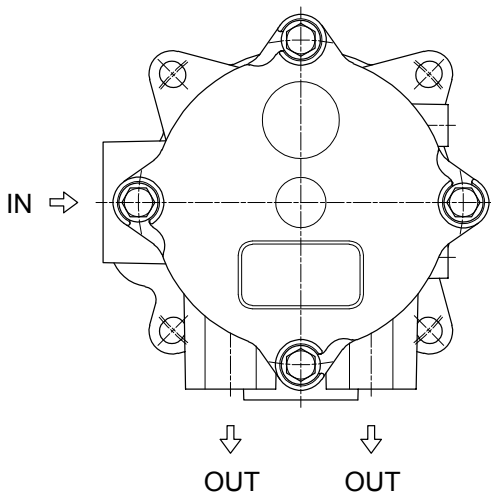


Return ↕ Suction



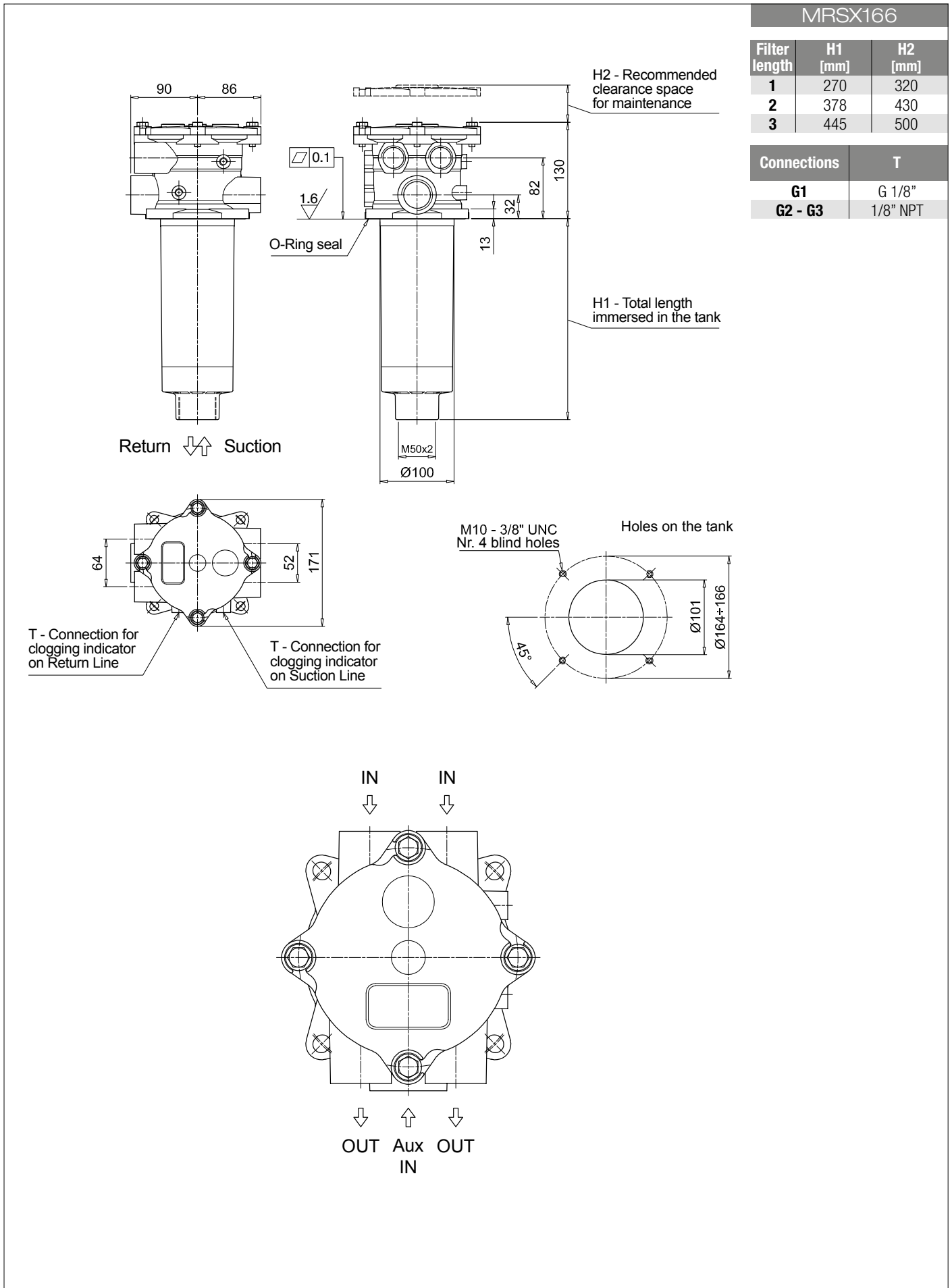
Without
Aux IN connection

With
Aux IN connection

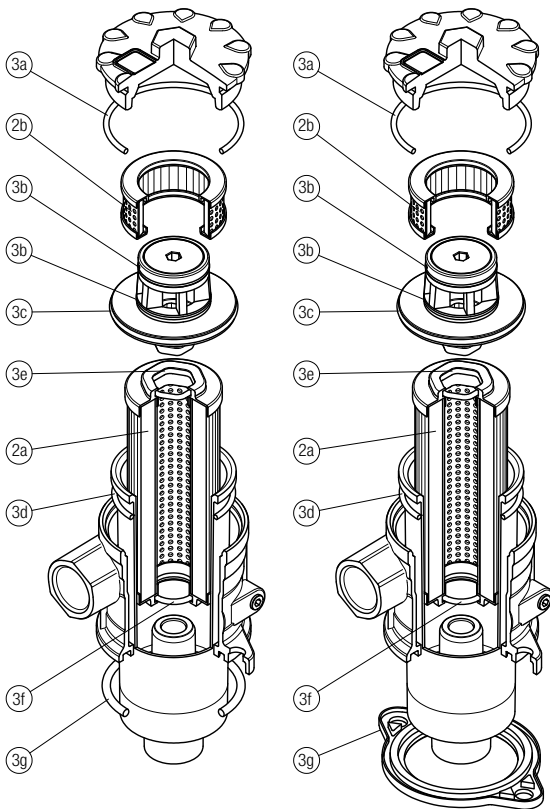


MRSX MRSX165 - MRSX166

Dimensions

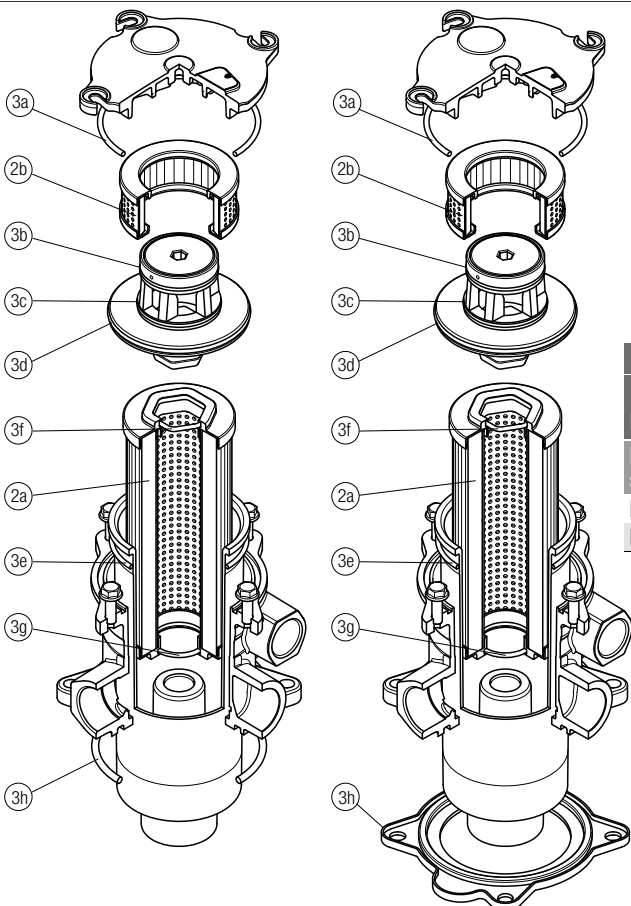


MRSX 116



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	O-RING SEAL		FLAT SEAL	
	2a	2b	Q.ty: 1 pc. 3 (3a ÷ 3g)		Q.ty: 1 pc. 3 (3a ÷ 3g)	
Filter series	Filter element	Safety filter element	Seal Kit code number		Seal Kit code number	
MRSX 116	See order table	S116M60P01	NBR	FPM	NBR	FPM
			02050617	02050619	02050618	02050620

MRSX 165 - 166



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	O-RING SEAL		FLAT SEAL	
	2a	2b	Q.ty: 1 pc. 3 (3a ÷ 3h)		Q.ty: 1 pc. 3 (3a ÷ 3h)	
Filter series	Filter element	Safety filter element	Seal Kit code number		Seal Kit code number	
MRSX 165	See order table	S165M60P01	NBR	FPM	NBR	FPM
MRSX 166			02050627	02050630	02050628	02050631
			02050627	02050630	02050629	02050632

LMP 124 series

MULTI PORT

Maximum working pressure up to 8 MPa (80 bar) - Flow rate up to 120 l/min



Description

Technical data

Return / Suction filter

In-line

Maximum working pressure up to 8 MPa (80 bar)
Flow rate up to 120 l/min

LMP124 is a range of return/suction filters for hydraulic systems with two or more circuits (both open and closed loops). They are able to provide pressurized oil cleaned by fine filtration to the feed pump of the hydrostatic systems.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Female threaded connections up to 1", for a maximum return flow rate of 120 l/min
- Fine filtration rating, to get a good cleanliness level into the reservoir
- Bypass valve to the tank, to relieve excessive pressure drop across the filter media when the return flow is enough higher than the suction flow
- Bypass valve to the suction line with additional suction filter element, to relieve excessive pressure drop across the filter media when the return flow is not enough higher than the suction flow
- De-pressurization valve, to reduce the pressure inside the filter during the maintenance operations
- Visual, electrical and electronic differential clogging indicators

Common applications:

Mobile machines with hydrostatic systems on board.
 (i.e. skid steer loaders, telehandlers, dumpers, road sweepers)

Filter housing materials

- Head: Aluminium
- Housing: Cathaphoresis - Painted Steel
- Bypass valve: Brass - Aluminium

Pressure

- Test pressure: 12MPa (120 bar)
- Burst pressure: 38 MPa (380 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 80 bar (8 MPa)

Bypass valve

- Opening pressure 250 kPa (2.5 bar) ±10%
- Other opening pressures on request.

Δp element type

- Microfibre filter elements - series N - W: 20 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

LMP124 filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]				Volumes [dm ³]					
	Length	1	2	3	4	Length	1	2	3	4
LMP 124		1.70	1.90	2.20	2.70		0.75	0.81	1.11	1.53

Filter series	Length	Filter element design - N series							
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
LMP 124	1	39	41	58	60	69	99	84	85
	2	47	53	68	69	77	99	90	91
	3	59	61	73	77	86	99	92	93
	4	70	78	84	86	93	100	94	95


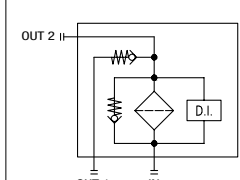
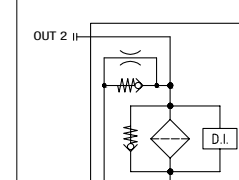
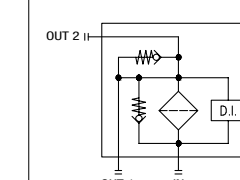
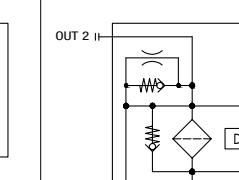

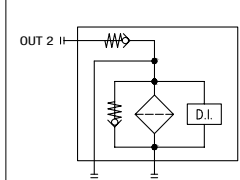
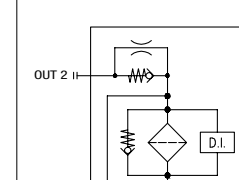
Maximum flow rate for a complete return/suction filter with a pressure drop $\Delta p = 1.2$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

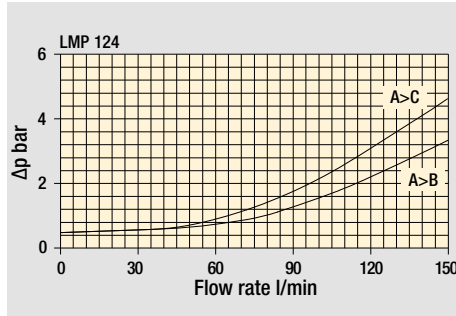
You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols - Multiport styles

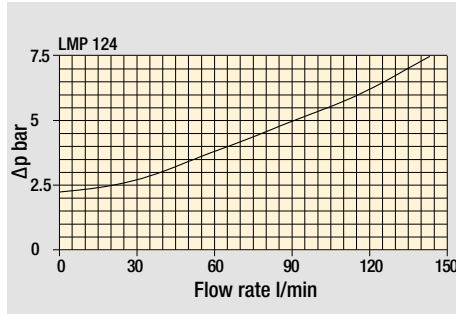
Multiport	Valves C option	Valves D option	Valves E option	Valves F option
 <p style="text-align: center;">IN - Return OUT 1 - Tank OUT 2 - Pump</p>				
 <p style="text-align: center;">IN - Return OUT 1 - Tank OUT 2 - Pump</p>				

Pressure drop

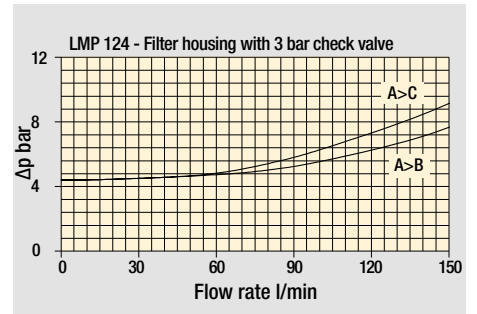
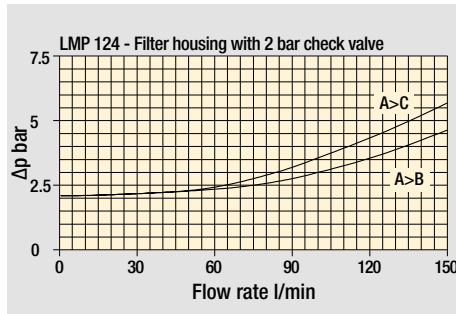
Filter housings Δp pressure drop



Bypass valve pressure drop

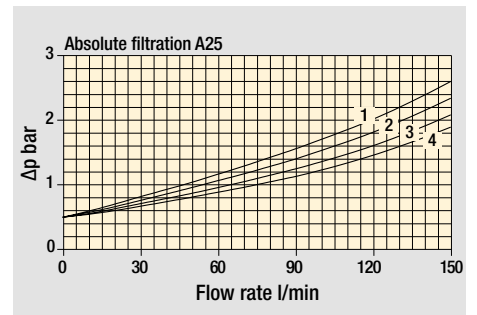
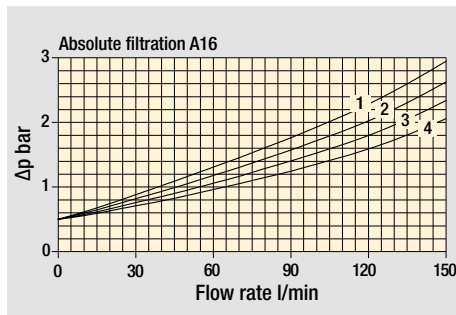
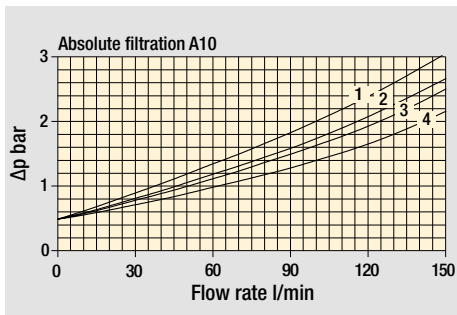


Valves

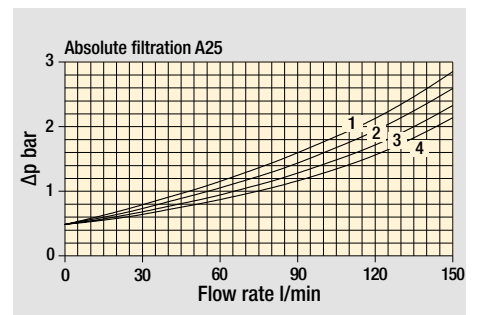
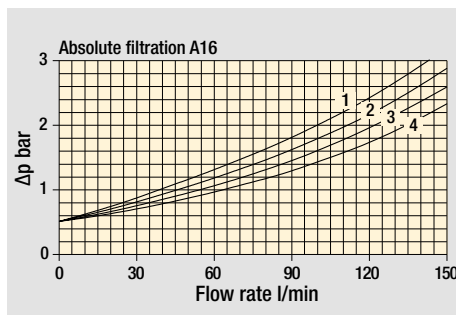
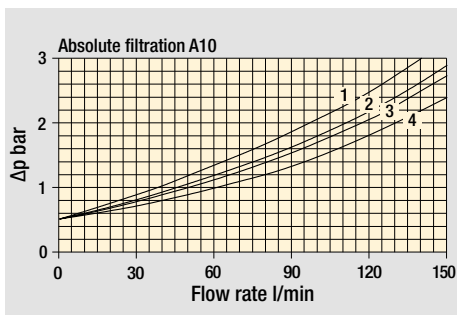


Filter length: 1 - 2 - 3 - 4

STYLE C - D - E - F



STYLE G - H



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.

Designation & Ordering code

COMPLETE FILTER

Series and size	Configuration example: LMP124 4 C A F 1 A10 N P01									
LMP124										
Filter length	1 2 3 4									
Hydraulic diagram configuration - see page 268	C D E F G H									
Seals and treatments	Filtration rating									
A NBR	Axx	Mxx	Pxx							
V FPM	•	•	•							
W NBR compatible with fluids HFA-HFB-HFC	•	•								
Connections										
B G 1"										
F SAE 16 - 1 5/16" - 12 UN										
Connection for indicator										
1 Without										
2 With connection G 1/8" for clogging indicator										
3 With connection G 1/4" for clogging indicator										
4 With connection for differential indicator										
Filtration rating (filter media)										
A03 Inorganic microfiber 3 µm										
A06 Inorganic microfiber 6 µm										
A10 Inorganic microfiber 10 µm										
A16 Inorganic microfiber 16 µm										
A25 Inorganic microfiber 25 µm										
M25 Wire mesh 25 µm										
M60 Wire mesh 60 µm										
M90 Wire mesh 90 µm										
P10 Resin impregnated paper 10 µm										
P25 Resin impregnated paper 25 µm										
			Element Δp	Execution						
			N 20 bar	P01 MP Filtri standard						
				Pxx Customized						

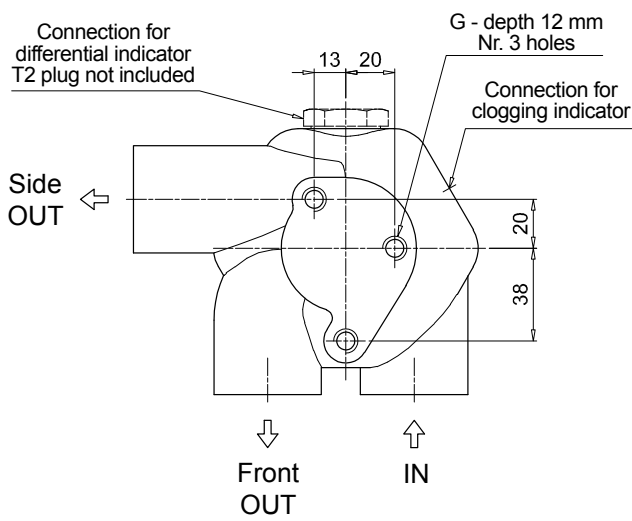
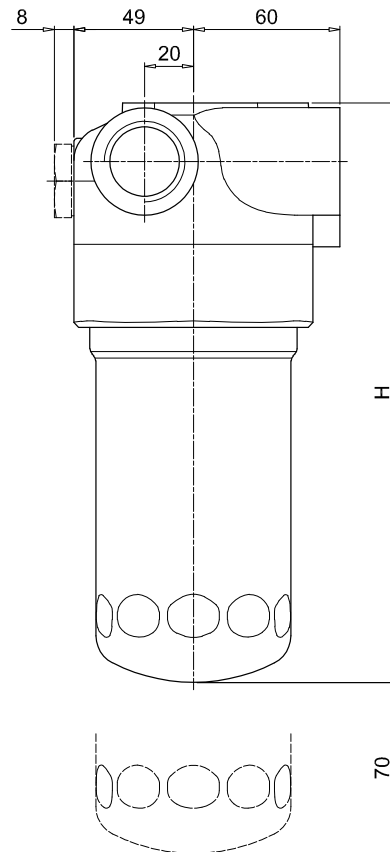
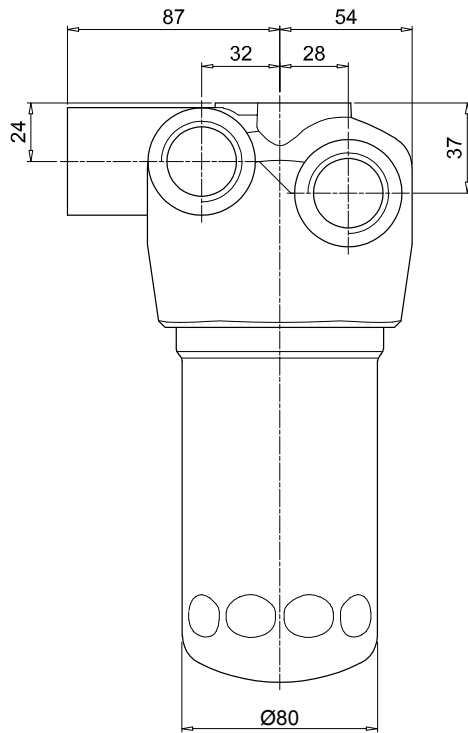
FILTER ELEMENT

Element series and size	Configuration example: CU110 4 A10 A N P01						
CU110							
Element length	1 2 3 4						
Filtration rating (filter media)							
A03 Inorganic microfiber 3 µm							
A06 Inorganic microfiber 6 µm							
A10 Inorganic microfiber 10 µm							
A16 Inorganic microfiber 16 µm							
A25 Inorganic microfiber 25 µm							
M25 Wire mesh 25 µm							
M60 Wire mesh 60 µm							
M90 Wire mesh 90 µm							
P10 Resin impregnated paper 10 µm							
P25 Resin impregnated paper 25 µm							
Seals	Filtration rating						
A NBR	Axx	Mxx	Pxx				
V FPM	•	•	•				
W NBR compatible with fluids HFA-HFB-HFC	•	•					
			Element Δp	Execution			
			N 20 bar	P01 MP Filtri standard			
				Pxx Customized			

ACCESSORIES

Indicators on Return Line	page			page
BVA Axial pressure gauge	278	BEA Electrical pressure indicator		276
BVR Radial pressure gauge	278	BEM Electrical pressure indicator		276
BVP Visual pressure indicator with automatic reset	279	BET Electrical pressure indicator		276-277
BVQ Visual pressure indicator with manual reset	279	BLA Electrical / visual pressure indicator		277-278
Differential indicators	page			page
DEA Electrical differential indicator	280	DTA Electronic differential indicator		283
DEM Electrical differential indicator	280-281	DVA Visual differential indicator		283
DLA Electrical / visual differential indicator	281-282	DVM Visual differential indicator		283
DLE Electrical / visual differential indicator	282			
Additional features	page			
T2 Plug	284			

LMP 124	
MULTIPORT	
Filter length	H [mm]
1	182
2	215
3	265
4	365
Connections	R
B	M10
F	3/8" UNC

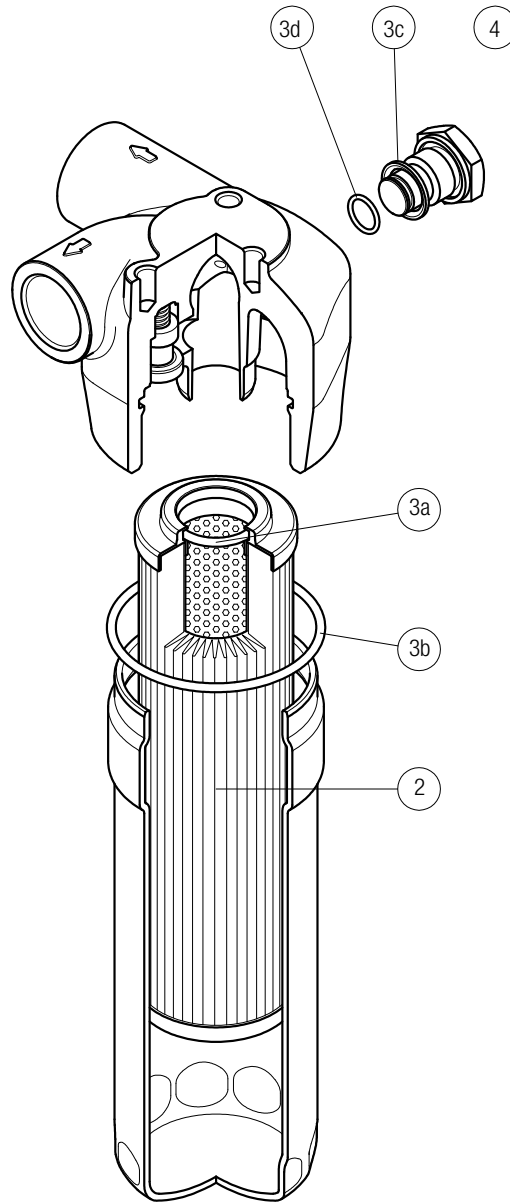


LMP 124 MULTIPORT

MULTIPORT

Order number for spare parts

LMP 124 MULTIPORT



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug	
LMP 124 MULTIPORT	See order table	NBR	FPM	NBR	FPM
	2	3 (3a ÷ 3c)		4	
		02050478	02050479	T2H	T2V

Clogging indicators

Introduction

Filter elements are efficient only if their Dirt Holding Capacity is fully exploited. This is achieved by using filter housings equipped with clogging indicators.

These devices trip when the clogging of the filter element causes an increase in pressure drop across the filter element.

The indicator is set to alarm before the element becomes fully clogged.

MP Filtri can supply indicators of the following designs:

- Vacuum switches and gauges
- Pressure switches and gauges
- Differential pressure indicators

These type of devices can be provided with a visual, electrical or both signals.

Vacuum indicators
Barometric indicators
Differential indicators

Suitable indicator types

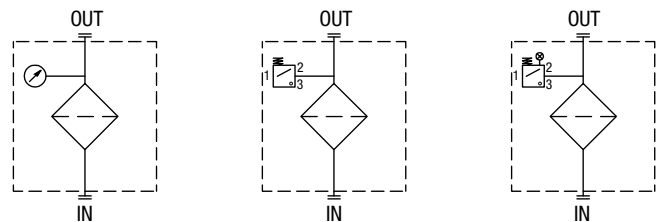
VACUUM INDICATORS

Vacuum indicators are used on the Suction line to check the efficiency of the filter element.

They measure the pressure downstream of the filter element.

Standard items are produced with R 1/4" EN 10226 connection.

Available products with R 1/8" EN 10226 to be fitted on MPS series.

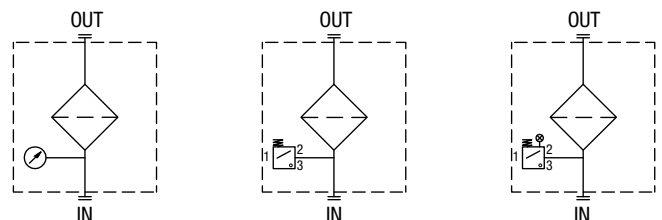


BAROMETRIC INDICATORS

Pressure indicators are used on the Return line to check the efficiency of the filter element.

They measure the pressure upstream of the filter element.

Standard items are produced with R 1/8" EN 10226 connection.



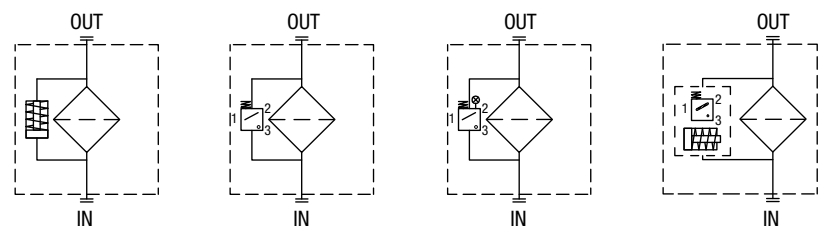
DIFFERENTIAL INDICATORS

Differential indicators are used on the Pressure line to check the efficiency of the filter element.

They measure the pressure upstream and downstream of the filter element (differential pressure).

Standard items are produced with special connection G 1/2" size.

Also available in Stainless Steel models.



Quick reference guide

Filter series		Visual indicator	Electrical indicator	Electrical / Visual indicator
Suction line	MRSX 116 - 165 - 166	VVB16P01	VEB21AA50P01	VLB21AA51P01
		VVS16P01		VLB21AA52P01
				VLB21AA53P01
				VLB21AA71P01
Return line	MRSX 116 - 165 - 166 LMP 124 MULTIPORT	BVA25P01	BEA25HA50P01	BLA25HA51P01
		BVR25P01	BEM25HA41P01	BLA25HA52P01
		BVP20HP01	BET25HF10P01	BLA25HA53P01
		BVQ20HP01	BET25HF30P01	BLA25HA71P01
			BET25HF50P01	

VACUUM INDICATORS

Dimensions

VE*50	
Electrical Vacuum Indicator	
R	Ordering code
EN 10226 - R1/4"	VE A 21 A A 50 P01
EN 10226 - R1/8"	VE B 21 A A 50 P01

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: NBR

Technical data

- Vacuum setting: -0.21 bar \pm 10%
- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree of protection: IP65 according to EN 60529

Electrical data

- Electrical connection: EN 175301-803
- Resistive load: 5 A / 14 Vdc
4 A / 30 Vdc
5 A / 125 Vac
4 A / 250 Vac
- Available Atex product: II 1GD Ex ia IIC Tx Ex ia IIIC Tx°C X
- CE certification

VL*51 - VL*52 - VL*53	
Electrical/Visual Vacuum Indicator	
R	Ordering code
EN 10226 - R1/4"	VL A 21 A A xx P01
EN 10226 - R1/8"	VL B 21 A A xx P01

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Transparent Nylon
- Contacts: Brass - Nylon
- Seal: NBR

Technical data

- Vacuum setting: -0.21 bar \pm 10%
- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree of protection: IP65 according to EN 60529

Electrical data

- Electrical connection: EN 175301-803
- Type: 51 52 53
- Lamps: 24 Vdc 110 Vdc 230 Vac
- Resistive load: 1 A / 24 Vdc 1 A / 110 Vdc 1 A / 230 Vac

VL*71	
Electrical/Visual Vacuum Indicator	
Connections	Indicator code
EN 10226 - R1/4"	VL A 21 A A 71 P01
EN 10226 - R1/8"	VL B 21 A A 71 P01

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: NBR

Technical data

- Vacuum setting: -0.21 bar \pm 10%
- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree of protection: IP65 according to EN 60529

Electrical data

- Electrical connection: IEC 61076-2-101 D (M12)
- Lamps: 24 Vdc
- Resistive load: 0.4 A / 24 Vdc

VVA - VVB	
Axial Vacuum Gauge	
R	Ordering code
EN 10226 - R1/4"	VV A 16 P01
EN 10226 - R1/8"	VV B 16 P01

Hydraulic symbol

Dial scale

Conversion to SI units

[cmHg]	[bar]
-12	-0.16
-18	-0.24
-76	-1.01

Materials

- Case: Painted Steel
- Window: Transparent plastic
- Dial: Painted Steel
- Pointer: Painted Aluminium
- Pressure connection: Brass
- Pressure element: Bourdon tube Cu-alloy soft soldered

Technical data

- Max working pressure: Static: 7 bar
Fluctuating: 6 bar
Short time: 10 bar
- Working temperature: From -40 °C to +60 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Accuracy: Class 2.5 according to EN 13190
- Degree of protection: IP31 according to EN 60529

VVR - VVS		
Radial Vacuum Gauge		
R	A/F	Ordering code
EN 10226 - R1/4"	14	VV R 16 P01
EN 10226 - R1/8"	11	VV S 16 P01

Hydraulic symbol

Dial scale

Conversion to SI units

[cmHg]	[bar]
-12	-0.16
-18	-0.24
-76	-1.01

Materials

- Case: Painted Steel
- Window: Transparent plastic
- Dial: Painted Steel
- Pointer: Painted Aluminium
- Pressure connection: Brass
- Pressure element: Bourdon tube Cu-alloy soft soldered

Technical data

- Max working pressure: Static: 7 bar
Fluctuating: 6 bar
Short time: 10 bar
- Working temperature: From -40 °C to +60 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Accuracy: Class 2.5 according to EN 13190
- Degree of protection: IP31 according to EN 60529

DESIGNATION & ORDERING CODE									
Series		Configuration example 1:	VE	A	21	A	A	50	P01
VE Electrical vacuum indicator		Configuration example 2:	VL	B	21	A	A	71	P01
VL Electrical/Visual vacuum indicator		Configuration example 3:	VV	R	16				P01
VV Vacuum gauge									
Type VE - VL		Type VV							
A Connection EN 10226 - R1/4"		A Axial connection EN 10226 - R1/4"							
B Connection EN 10226 - R1/8"		B Axial connection EN 10226 - R1/8"							
		R Radial connection EN 10226 - R1/4"							
		S Radial connection EN 10226 - R1/8"							
Vacuum setting			VE	VL	VV				
16 -0.16 bar					•				
21 -0.21 bar			•	•					
Seals			VE	VL	VV				
A NBR			•	•					
Thermostat			VE	VL	VV				
A Without			•	•					
Electrical connections			VE	VL	VV				
50 Connection EN 175301-803			•						
51 Connection EN 175301-803, transparent base with lamps 24 Vdc					•				
52 Connection EN 175301-803, transparent base with lamps 110 Vdc					•				
53 Connection EN 175301-803, transparent base with lamps 230 Vdc					•				
71 Connection IEC 61076-2-101 D (M12), black base with lamps 24 Vdc					•				
		Option							
		P01 MP Filtri standard							
		Pxx Customized							

BAROMETRIC INDICATORS

Dimensions

BEA*50	
Electrical Pressure Indicator	
Settings	Ordering code
1.5 bar \pm 10%	BE A 15 H A 50 P01
2.0 bar \pm 10%	BE A 20 H A 50 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 40 bar - Proof pressure: 60 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP65 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: EN 175301-803 - Resistive load: 5 A / 14 Vdc 4 A / 30 Vdc 5 A / 125 Vac 4 A / 250 Vac - Available Atex product: II 1GD Ex ia IIC Tx Ex ia IIIC Tx °C X - CE certification 	

BEM*41	
Electrical Pressure Indicator	
Settings	Ordering code
1.5 bar \pm 10%	BE M 15 H A 41 P01
2.0 bar \pm 10%	BE M 20 H A 41 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 40 bar - Proof pressure: 60 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP67 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: Four-core cable - Resistive load: 5 A / 14 Vdc 4 A / 30 Vdc 5 A / 125 Vac 4 A / 250 Vac - CE certification On request this indicator can be provided with main connectors in use for wirings. 	

BET*10	
Electrical Pressure Indicator	
Settings	Ordering code
2.0 bar \pm 10%	BET 20 H F 10 P01
2.5 bar \pm 10%	BET 25 H F 10 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 10 bar - Proof pressure: 15 bar - Working temperature: From -25 °C to +100 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP65 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: AMP Superseal series 1.5 - Resistive load: 0.5 A / 48 Vdc - Thermostat condition: Open up to 30 °C - CE certification 	

BET*30	
Electrical Pressure Indicator	
Settings	Ordering code
2.0 bar $\pm 10\%$	BET 20 H F 30 P01
2.5 bar $\pm 10\%$	BET 25 H F 30 P01
<p style="text-align: right;">A/F 27 Max tightening torque: 25 N·m</p> <p style="text-align: right;">EN 10226 - R1/8"</p>	
<p>Hydraulic symbol</p> <p>Electrical symbol</p> <p style="text-align: center;">Thermal lockout</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR <p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 10 bar - Proof pressure: 15 bar - Working temperature: From -25 °C to +100 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP65 according to EN 60529 <p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: Deutsch DT-04-2-P - Resistive load: 0.5 A / 48 Vdc - Thermostat condition: Open up to 30 °C - CE certification 	

BET*50	
Electrical Pressure Indicator	
Settings	Ordering code
2.0 bar $\pm 10\%$	BET 20 H F 50 P01
2.5 bar $\pm 10\%$	BET 25 H F 50 P01
<p style="text-align: right;">A/F 27 Max tightening torque: 25 N·m</p> <p style="text-align: right;">EN 10226 - R1/8"</p>	
<p>Hydraulic symbol</p> <p>Electrical symbol</p> <p style="text-align: center;">Thermal lockout</p> <p style="text-align: right;">Not connected</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR <p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 10 bar - Proof pressure: 15 bar - Working temperature: From -25 °C to +100 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP65 according to EN 60529 <p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: EN 175301-803 - Resistive load: 0.5 A / 48 Vdc - Thermostat condition: Open up to 30 °C - CE certification 	

BL*51 - BL*52 - BL*53	
Electrical/Visual Pressure Indicator	
Settings	Ordering code
1.5 bar $\pm 10\%$	BL A 15 H A xx P01
2.0 bar $\pm 10\%$	BL A 20 H A xx P01
<p style="text-align: right;">A/F 27 Max tightening torque: 25 N·m</p> <p style="text-align: right;">EN 10226 - R1/8"</p>	
<p>Hydraulic symbol</p> <p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Transparent Nylon - Contacts: Silver - Seal: HNBR <p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 40 bar - Proof pressure: 60 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP65 according to EN 60529 <p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: EN 175301-803 - Type: 51 52 53 - Lamps: 24 Vdc 110 Vdc 230 Vac - Resistive load: 1 A / 24 Vdc 1 A / 110 Vdc 1 A / 230 Vac 	

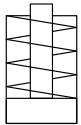
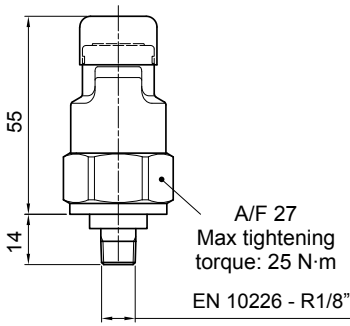
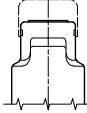
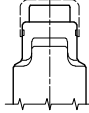
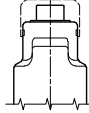
BAROMETRIC INDICATORS

Dimensions

BL*71	
Electrical/Visual Pressure Indicator	
Settings	Ordering code
1.5 bar $\pm 10\%$	BL A 15 HA 71 P01
2.0 bar $\pm 10\%$	BL A 20 HA 71 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 40 bar - Proof pressure: 60 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP65 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: IEC 61076-2-101 D (M12) - Lamps: 24 Vdc - Resistive load: 0.4 A / 24 Vdc 	

BVA	
Axial Pressure Gauge	
Settings	Ordering code
1.4 bar $\pm 10\%$	BVA 14 P01
2.5 bar $\pm 10\%$	BVA 25 P01
<p>Hydraulic symbol</p>	
<p>Dial scale</p> <p>BVA 14 P01</p> <p>BVA 25 P01</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Case: Painted Steel - Window: Transparent plastic - Dial: Painted Steel - Pointer: Painted Aluminium - Pressure connection: Brass - Pressure element: Bourdon tube Cu-alloy soft soldered 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: Static: 7 bar Fluctuating: 6 bar Short time: 10 bar - Working temperature: From -40 °C to +60 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Accuracy: Class 2.5 according to EN 13190 - Degree of protection: IP31 according to EN 60529 	

BVR	
Radial Pressure Gauge	
Settings	Ordering code
1.4 bar $\pm 10\%$	BV R 14 P01
2.5 bar $\pm 10\%$	BV R 25 P01
<p>Hydraulic symbol</p>	
<p>Dial scale</p> <p>BV R 14 P01</p> <p>BV R 25 P01</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Case: Painted Steel - Window: Transparent plastic - Dial: Painted Steel - Pointer: Painted Aluminium - Pressure connection: Brass - Pressure element: Bourdon tube Cu-alloy soft soldered 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: Static: 7 bar Fluctuating: 6 bar Short time: 10 bar - Working temperature: From -40 °C to +60 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Accuracy: Class 2.5 according to EN 13190 - Degree of protection: IP31 according to EN 60529 	

BVP - BVQ		Hydraulic symbol	Materials	
Visual Pressure Indicator				
Setting	Ordering code			
1.5 bar ±10%	BV P 15 H P01		Technical data - Reset: BVP - Automatic reset BVQ - Manual reset - Max working pressure: 10 bar - Proof pressure: 15 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP45 according to EN 60529	
	BV Q 15 H P01			
2.0 bar ±10%	BV P 20 H P01			
	BV Q 20 H P01			
		Signals		
		 Absence of pressure (no indicator)	 Presence of pressure (green button rises gradually)	 Clogged filter element (red button risen)

DESIGNATION & ORDERING CODE

Series	Configuration example 1:	BE	M	15	H	A	41	P01
BE Electrical pressure indicator	Configuration example 2:	BL	A	20	H	A	71	P01
BL Electrical/Visual pressure indicator	Configuration example 3:	BV	R	14				P01
BV Visual pressure indicator	Configuration example 4:	BV	P	20	H			P01

Type	BE	BL	BV
A Standard type	•	•	A Axial connection pressure gauge
M With wired electrical connection	•		R Radial connection pressure gauge
T With thermal switch	•		P Visual indicator with automatic reset
			Q Visual indicator with manual reset

Pressure setting	BEA-BEM	BET	BLA	BVA-BVR	BVP-BVQ
14 1.4 bar				•	
15 1.5 bar	•		•		
20 2.0 bar	•	•	•		•
25 2.5 bar		•		•	

Seals	BE	BLA	BVA-BVR	BVP-BVQ
H HNBR	•	•		•

Thermostat	BEA-BEM	BET	BLA	BV
A Without	•		•	
F With		•		

Electrical connections	BEA	BEM	BET	BL	BV
10 Connection AMP Superseal series 1.5			•		
30 Connection Deutsch DT-04-2-P			•		
41 Connection via four-core cable		•			
50 Connection EN 175301-803	•		•		
51 Connection EN 175301-803, transparent base with lamps 24 Vdc				•	
52 Connection EN 175301-803, transparent base with lamps 110 Vdc				•	
53 Connection EN 175301-803, transparent base with lamps 230 Vdc				•	
71 Connection IEC 61076-2-101 D (M12), black base with lamps 24 Vdc				•	

Option
P01 MP Filtri standard
Pxx Customized

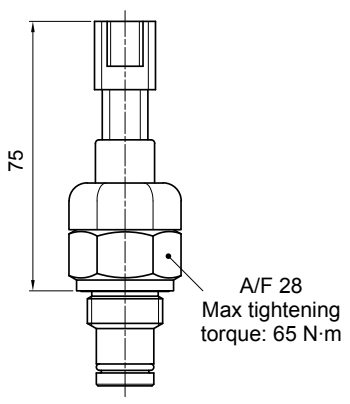
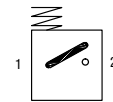
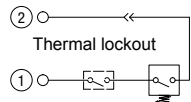
DIFFERENTIAL INDICATORS

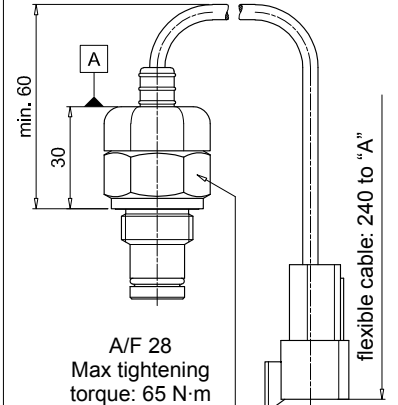
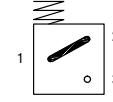
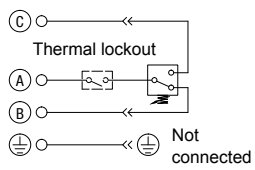
Dimensions

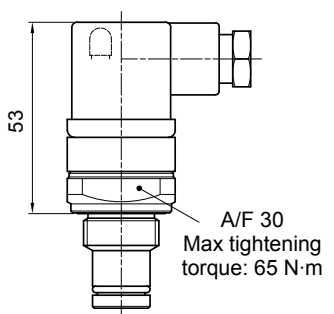
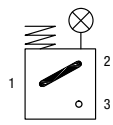
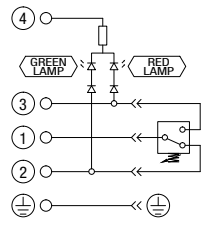
DEA*50	
Electrical Differential Indicator	
Settings 2.0 bar ±10%	Ordering code DE A 20 x A 50 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP66 according to EN 60529 IP69K according to ISO 20653 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: EN 175301-803 - Resistive load: 0.2 A / 115 Vdc 	

DEM*10	
Electrical Differential Indicator	
Settings 2.0 bar ±10%	Ordering code DE M 20 xx 10 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP66 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: AMP Superseal series 1.5 - Resistive load: 0.2 A / 115 Vdc - Switching type: Normally open contacts (NC on request) - Thermal lockout: Normally open up to 30 °C (option "F") 	

DEM*20	
Electrical Differential Indicator	
Settings 2.0 bar ±10%	Ordering code DEM20xx20P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP66 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: AMP Time junior - Resistive load: 0.2 A / 115 Vdc - Switching type: Normally open contacts (NC on request) - Thermal lockout: Normally open up to 30 °C (option "F") 	

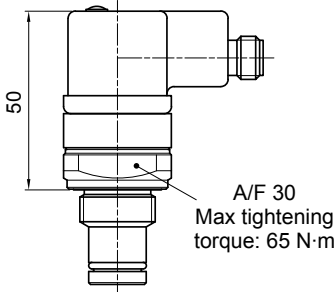
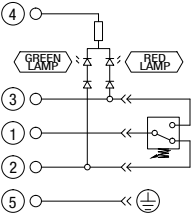
DEM*30	
Electrical Differential Indicator	
Settings 2.0 bar ±10%	Ordering code DE M 20 xx 30 P01
	
<p>Hydraulic symbol</p> 	
<p>Electrical symbol</p> 	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP66 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: Deutsch DT-04-2-P - Resistive load: 0.2 A / 115 Vdc - Switching type: Normally open contacts (NC on request) - Thermal lockout: Normally open up to 30 °C (option "F") 	

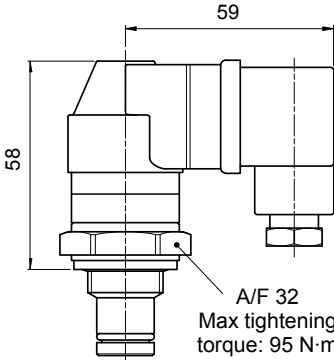
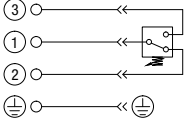
DEM*35	
Electrical Differential Indicator	
Settings 2.0 bar ±10%	Ordering code DE M 20 xx 35 P01
	
<p>Hydraulic symbol</p> 	
<p>Electrical symbol</p> 	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP66 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: Deutsch DT-04-3-P - Resistive load: 0.2 A / 115 Vdc - Switching type: SPDT contact - Thermal lockout: Normally open up to 30 °C (option "F") 	

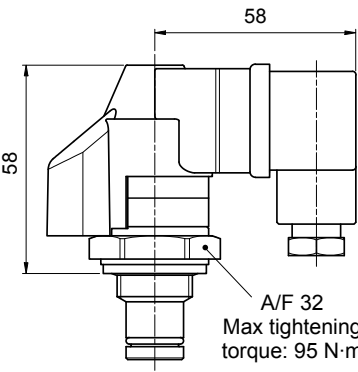
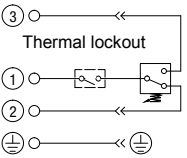
DLA*51 - DLA*52	
Electrical/Visual Differential Indicator	
Settings 2.0 bar ±10%	Ordering code DL A 20 x A xx P01
	
<p>Hydraulic symbol</p> 	
<p>Electrical symbol</p> 	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Transparent Nylon - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP66 according to EN 60529 IP69K according to ISO 20653 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: EN 175301-803 - Type: 51 52 - Lamps: 24 Vdc 110 Vdc - Resistive load: 1 A / 24 Vdc 1 A / 110 Vdc 	

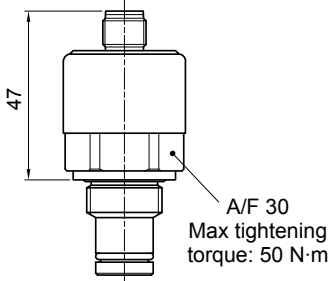
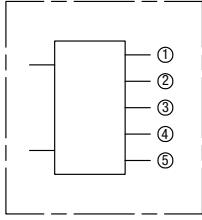
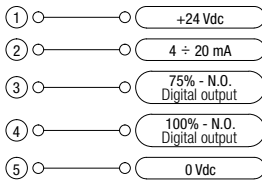
DIFFERENTIAL INDICATORS

Dimensions

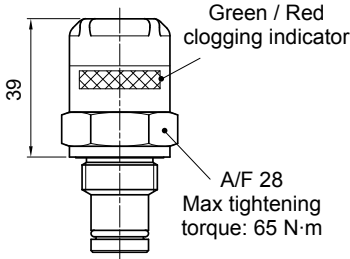
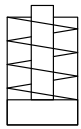
DLA*71		Hydraulic symbol	Materials
Electrical/Visual Differential Indicator			
Settings 2.0 bar ±10%	Ordering code DLA 20 x A 71 P01	Technical data <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids - Degree protection: IP65 according to EN 60529 	
			Electrical symbol 

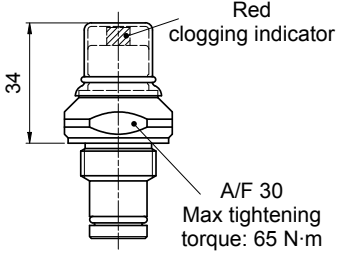
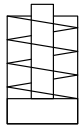
DLE*A50		Hydraulic symbol	Materials
Electrical/Visual Differential Indicator			
Settings 2.0 bar ±10%	Ordering code DLE 20 x A 50 P01	Technical data <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids - Degree protection: IP65 according to EN 60529 	
			Electrical symbol 

DLE*F50		Hydraulic symbol	Materials
Electrical/Visual Differential Indicator			
Settings 2.0 bar ±10%	Ordering code DLE 20 x F 50 P01	Technical data <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids - Degree protection: IP65 according to EN 60529 	
			Electrical symbol 

DTA*70	
Electronic Differential Indicator	
Settings	Ordering code
2.0 bar \pm 10%	DT A 20 x x 70 P01
	
<p>Hydraulic symbol</p> 	
<p>Electrical symbol</p> 	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Internal parts: Brass - Nylon - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP67 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: IEC 61076-2-101 D (M12) - Power supply: 24 Vdc - Analogue output: From 4 to 20 mA - Thermal lockout: 30 °C (all output signals stalled up to 30 °C) 	



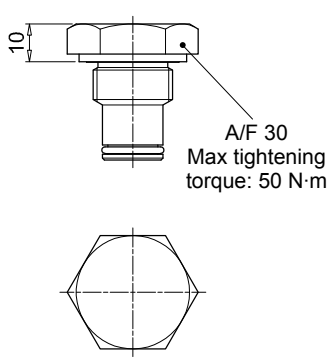
DVA	
Visual Differential Indicator	
Settings	Ordering code
2.0 bar \pm 10%	DV A 20 x P01
	
<p>Hydraulic symbol</p> 	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Internal parts: Brass - Nylon - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Reset: Automatic reset - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP65 according to EN 60529 	

DVM	
Visual Differential Indicator	
Settings	Ordering code
2.0 bar \pm 10%	DV M 20 x P01
	
<p>Hydraulic symbol</p> 	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Internal parts: Brass - Nylon - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Reset: Manual reset - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP65 according to EN 60529 	

DIFFERENTIAL INDICATORS

Dimensions

T2	
Indicator plug	
Seal	Ordering code
HNBR	T2 H
FPM	T2 V



Materials

- Body: Phosphatized steel
- Seal: HNBR / FPM

DESIGNATION & ORDERING CODE - DIFFERENTIAL INDICATORS

Series	Configuration example 1:						
DE Electrical differential indicator	DE	M	20	H	F	50	P01
DL Electrical/Visual differential indicator	DL	E	20	V	A	71	P01
DT Electronic differential indicator	DT	A	20	H	F	70	P01
DV Visual differential indicator	DV	M	20	V			P01

Type	DE	DL	DT	DV
A Standard type	•	•	•	A With automatic reset
M With wired electrical connection	•			M With manual reset
E For high power supply		•		

Pressure setting	DEA	DEM	DLA	DLE	DT	DV
20 2.0 bar						

Seals	DEA	DEM	DLA	DLE	DT	DV
H HNBR	•	•	•	•		
V FPM		•		•	•	

Thermostat	DEA	DEM	DLA	DLE	DT	DV
A Without		•	•	•		
F With thermostat				•	•	

Electrical connections	DEA	DEM	DLA	DLE	DT	DV
10 Connection AMP Superseal series 1.5		•				
20 Connection AMP Timer Junior		•				
30 Connection Deutsch DT-04-2-P		•				
35 Connection Deutsch DT-04-3-P		•				
50 Connection EN 175301-803	•			•		
51 Connection EN 175301-803, transparent base with lamps 24 Vdc			•			
52 Connection EN 175301-803, transparent base with lamps 110 Vdc			•			
70 Connection IEC 61076-2-101 D (M12)					•	
71 Connection IEC 61076-2-101 D (M12), black base with lamps 24 Vdc			•			

Option
P01 MP Filtri standard
Pxx Customized

DESIGNATION & ORDERING CODE - DIFFERENTIAL INDICATOR PLUG

Series	Configuration example	
T2 Indicator plug	T2	H

Seals
H HNBR
V FPM

Spin-On filters are used as process and safety filters to protect individual pumps, valves or the entire hydraulic circuit from contamination as per ISO 4406.

In-line Spin-On filters can be used for the following purposes:

- **Suction filters**
- **On the return circuit, for mounting on the line or on the tank cover**
- **In-line for low and medium pressure applications**

Spin-On filters are available in 4 configurations:

- **Single cartridge in-line**
- **In-line with two parallel cartridges on the same axis**
- **In-line with two parallel cartridges mounted side by side**

All versions may be equipped with visual and/or electrical blockage indicators.

Spin-on filters



MPS	page 289
MSH	305
INDICATORS	311

MPS series

Maximum working pressure up to 1.2 MPa (12 bar) - Flow rate up to 365 l/min



Spin-on filters

Maximum working pressure up to 1.2 MPa (12 bar)

Flow rate up to 365 l/min

MPS is a range of spin-on filters suitable to be used in suction, return and low pressure lines.

They offer a good balance between performances, dimensions and prices. They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Female threaded connections up to 1 1/2" and flanged connections up to 1 1/2", for a maximum flow rate of 365 l/min
- Fine filtration rating, to get a good cleanliness level into the reservoir
- Water removal elements (CW), to remove the free water from the hydraulic fluid
- Double connection for the cans, to fit both European and American standard elements
- Double cans fitting, to increase the life time of the filter
- Bypass valve, to relieve excessive pressure drop across the filter media
- Visual, electrical and electronic clogging indicators for suction and return applications
- Visual, electrical and electronic differential clogging indicators for low pressure applications

Common applications:

- Suction lines, Return lines, Delivery lines, in economic industrial equipment or mobile machines.
- Off-line filtration tank in economic industrial equipment or mobile machines

Filter housing materials

- Head: Aluminium
- Bypass valve: Nylon - Steel
- Element: Zinc-Plated Steel - Painted Steel

Bypass valve

- Return filter opening pressure: 175 kPa (1.75 bar) $\pm 10\%$
- Suction filter opening pressure: 30 kPa (0.3 bar) $\pm 10\%$

Δp element type

- Δp : 5 bar
- Fluid flow through the filter element from OUT to IN

Seals

Standard NBR - series A

Temperature

From -20 °C to +110 °C

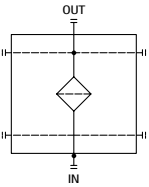
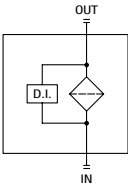
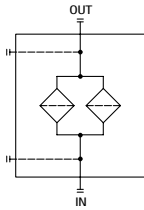
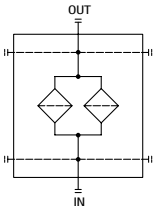
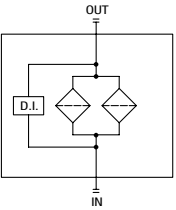
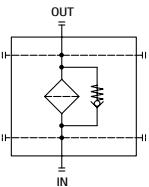
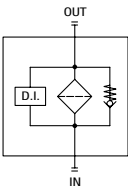
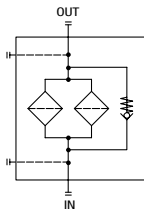
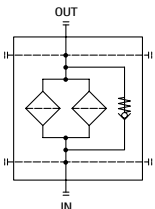
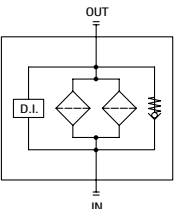
Note

MPS filters are provided for vertical mounting



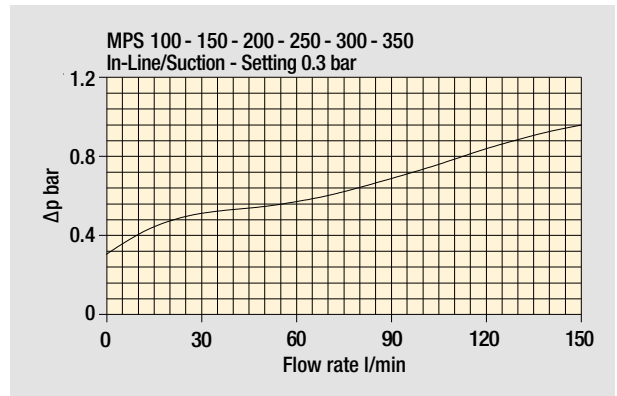
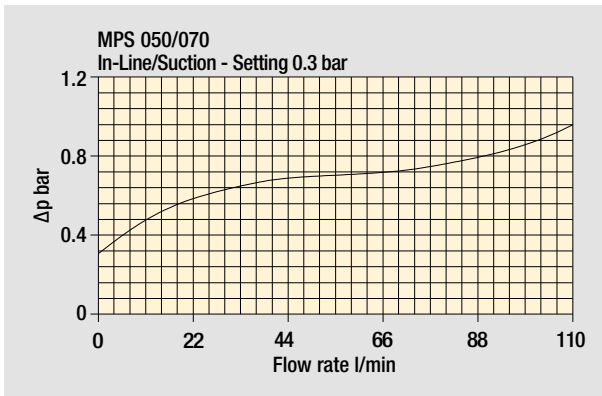
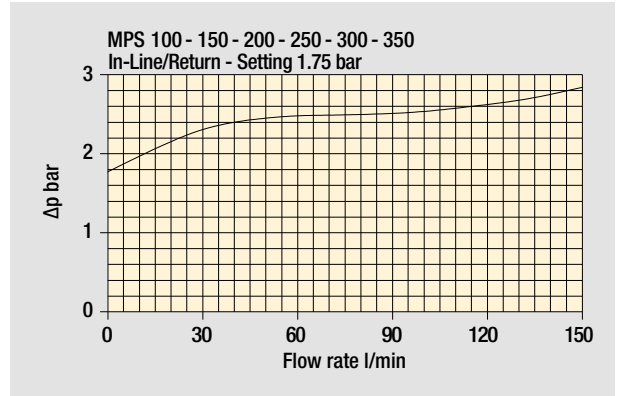
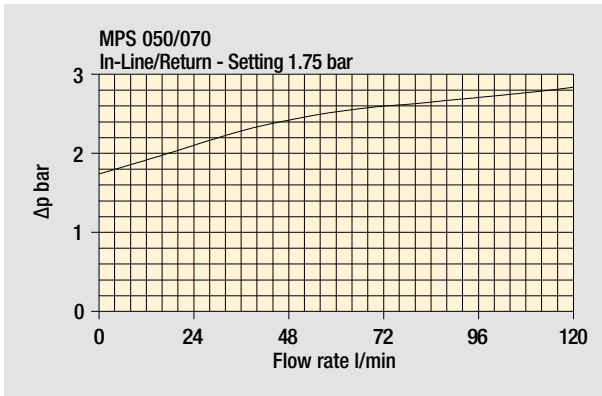
Weights [kg] and volumes [dm³]

Filter series	Weights [kg]	Volumes [dm ³]
MPS 050	1.00	0.70
MPS 051	1.05	0.70
MPS 070	1.20	0.95
MPS 071	1.25	0.95
MPS 100	2.10	1.65
MPS 101	2.20	1.65
MPS 150	2.40	2.00
MPS 151	2.50	2.00
MPS 200	3.90	3.00
MPS 250	4.60	3.70
MPS 300-301	5.30	3.40
MPS 350-351	6.00	4.10

Filter series					
MPS 050	•				
MPS 051		•			
MPS 070	•				
MPS 071		•			
MPS 100	•				
MPS 101		•			
MPS 150	•				
MPS 151		•			
MPS 200			•		
MPS 250			•		
MPS 300				•	
MPS 301				•	•
MPS 350				•	
MPS 351					•
	Style U/P	Style U/P	Style U	Style U/P	Style U/P
					
	Style R/S	Style R/S	Style R/S	Style R/S	Style R/S
					

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.

CS 050 - 070 - 100 - 150

CG - CW 050 - 070



CG - CW 100 - 150



CW

This series of cartridge removes water from oil while filtering the oil at the same time.

Water absorbent polymers up to 800 times their own weight provide this major feature.

Water holding capacities:

CW 050= 240 ml

Ordering code: **CW050P10AP01**

CW 150= 788 ml

Ordering code: **CW150P10AP01**

Thread connections

Element	Connection
CS 050 - 070	G 3/4"
CS 100 - 150	G 1 1/4"
CG / CW 050 - 070	1" - 12 UNF
CG / CW 100 - 150	1 1/2" - 16 UN

Water holding capacities CW

	good	poor
Viscosity	30/46 mm ² /s (cSt)	> 46 mm ² /s (cSt)
H₂O p.p.m.	600/800 p.p.m.	> 800 p.p.m.
Flow rate	CW050 7/15 l/min CW150 20/40 l/min	CW050 > 20 l/min CW150 > 50 l/min
Temperature	40/60 °C	< 30 °C

Heads



CG / CW
1" - 12 UNF

CS
G 3/4"



CG / CW
1 1/2" - 16 UN

CS
G 1 1/4"

MPS MPS050 - MPS070 MPS051 - MPS071

Designation & Ordering code

COMPLETE FILTER

Series and size

MPS050 | **MPS070** With connections for clogging indicators

MPS051 | **MPS071** With connections for differential indicators

Configuration example: **MPS050** **R** **G1** **A10** **A** **P01**

Bypass valve

	MPS 050 - 070	MPS 051 - 071
R Return: 1.75 bar	•	•
S Suction: 30 kPa	•	
U Without bypass	•	
P Without bypass		•

Connections

G1 G 3/4"
G2 3/4" NPT
G3 SAE 12 - 1 1/16" - 12 UN

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
A25 Inorganic microfiber 25 µm	P10 Resin impregnated paper 10 µm
	P25 Resin impregnated paper 25 µm

Seal
A NBR

Execution
P01 MP Filtri standard

CARTRIDGE

Cartridge series and size

CS050 | **CS070**

Configuration example: **CS050** **A10** **A** **P01**

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
A25 Inorganic microfiber 25 µm	P10 Resin impregnated paper 10 µm
	P25 Resin impregnated paper 25 µm

Seals
A NBR

Execution
P01 MP Filtri standard
Pxx Customized

ACCESSORIES

Clogging indicators on RETURN line

	page
BVA Axial pressure gauge	315
BVR Radial pressure gauge	315
BVP Visual pressure indicator with automatic reset	316
BVQ Visual pressure indicator with manual reset	316

	page
BEA Electrical pressure indicator	314
BEM Electrical pressure indicator	314
BLA Electrical / visual pressure indicator	314-315

Clogging indicators on SUCTION line

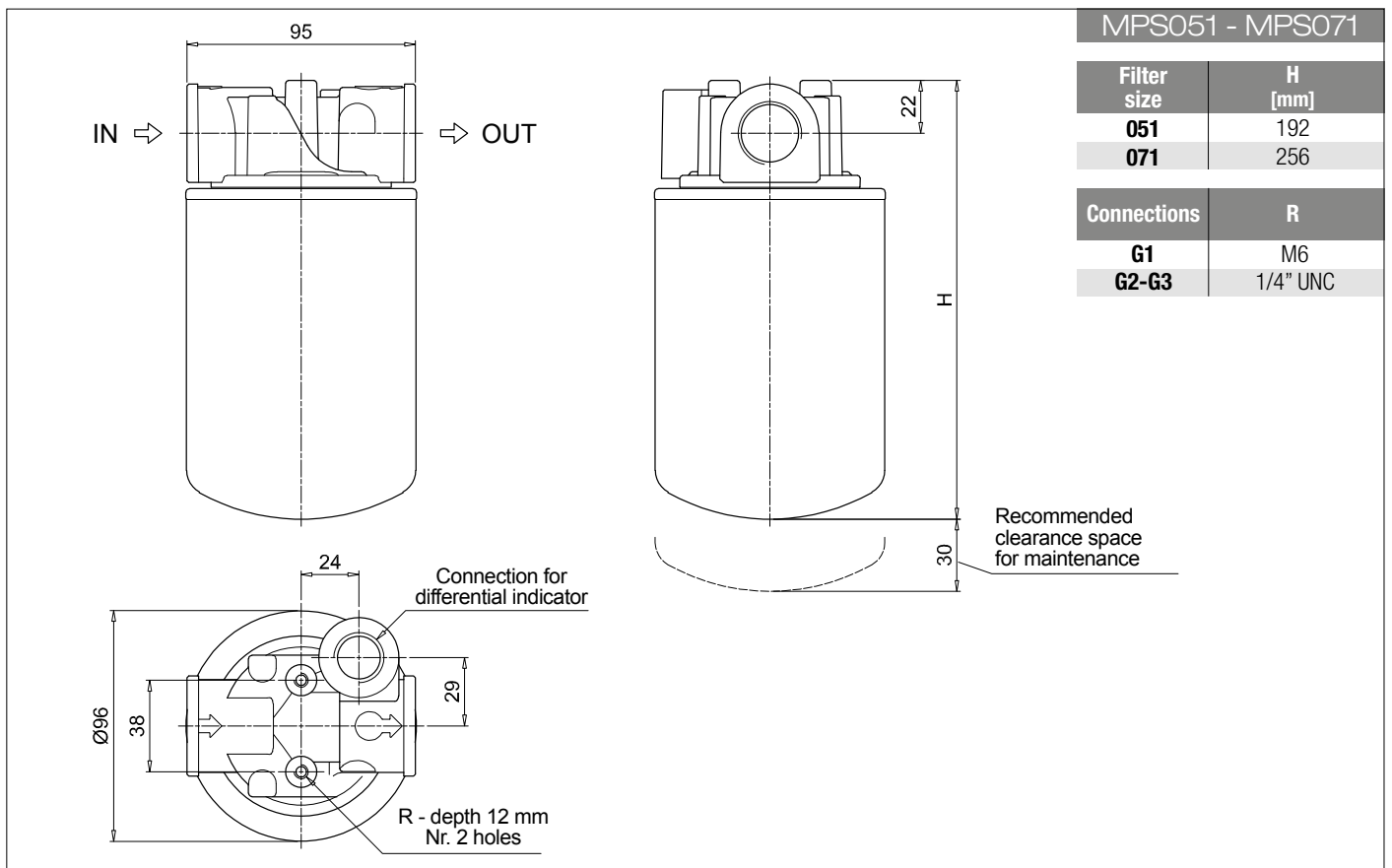
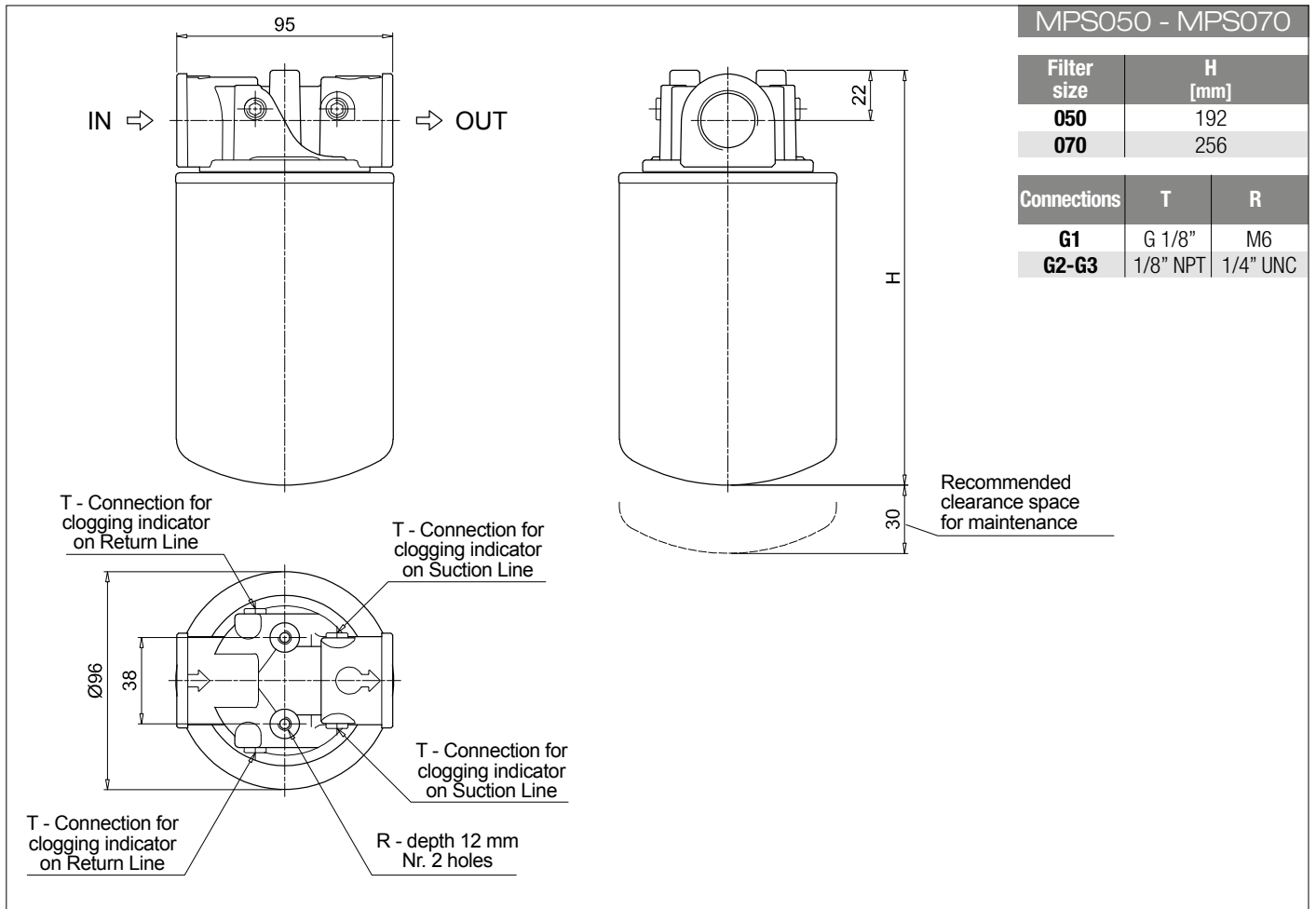
	page
VVB Axial pressure gauge	313
VVS Radial pressure gauge	313

	page
VEB Electrical vacuum indicator	312
VLB Electrical/visual vacuum indicator	312

Differential indicators

	page
DEA Electrical differential indicator	317
DEM Electrical differential indicator	317-318
DLA Electrical / visual differential indicator	318-319
DLE Electrical / visual differential indicator	319

	page
DTA Electronic differential indicator	320
DVA Visual differential indicator	320
DVM Visual differential indicator	320



MPS MPS100 - MPS150 MPS101 - MPS151

Designation & Ordering code

COMPLETE FILTER

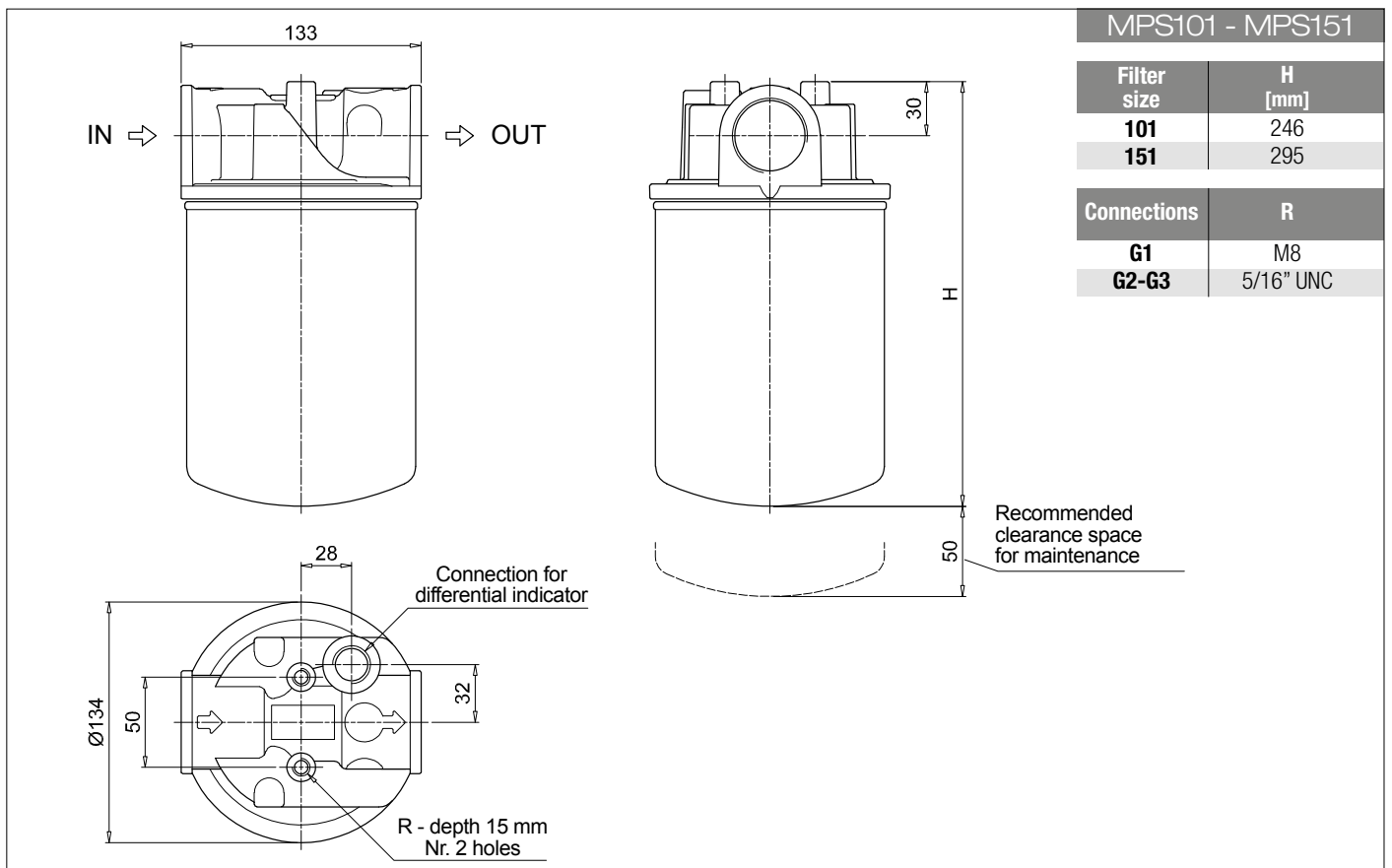
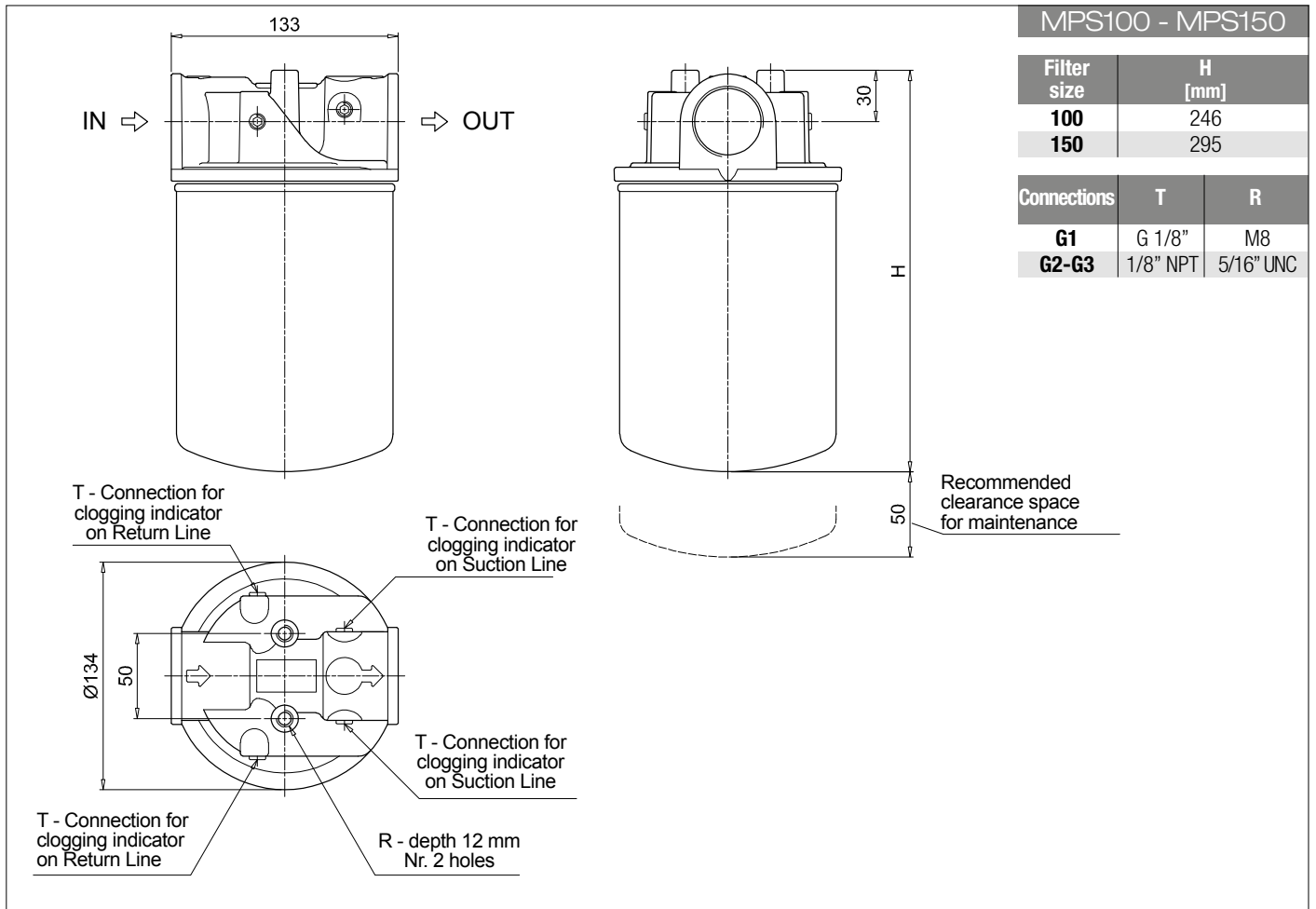
Series and size		Configuration example: MPS100 R G1 A10 A P01				
MPS100 MPS150	With connections for clogging indicators					
MPS101 MPS151	With connections for differential indicators					
Bypass valve		MPS 100 - 150	MPS 101 - 151			
R	Return: 1.75 bar	•	•			
S	Suction: 30 kPa	•				
U	Without bypass	•				
P	Without bypass		•			
Connections						
G1	G 1 1/4"					
G2	1 1/4" NPT					
G3	SAE 20 - 1 5/8" - 12 UN					
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	
A25	Inorganic microfiber 25 µm			P10	Resin impregnated paper 10 µm	
				P25	Resin impregnated paper 25 µm	
				Seal	A NBR	
				Execution	P01 MP Filtri standard	

CARTRIDGE

Cartridge series and size		Configuration example: CS100 A10 A P01			
CS100 CS150					
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
A25	Inorganic microfiber 25 µm			P10	Resin impregnated paper 10 µm
				P25	Resin impregnated paper 25 µm
				Seals	A NBR
				Execution	P01 MP Filtri standard Pxx Customized

ACCESSORIES

Clogging indicators on RETURN line		page	Clogging indicators on SUCTION line		page
BVA	Axial pressure gauge	315	BEA	Electrical pressure indicator	314
BVR	Radial pressure gauge	315	BEM	Electrical pressure indicator	314
BVP	Visual pressure indicator with automatic reset	316	BLA	Electrical / visual pressure indicator	314-315
BVQ	Visual pressure indicator with manual reset	316			
Clogging indicators on SUCTION line		page	Clogging indicators on SUCTION line		page
VVB	Axial pressure gauge	313	VEB	Electrical vacuum indicator	312
VVS	Radial pressure gauge	313	VLB	Electrical/visual vacuum indicator	312
Differential indicators		page	Differential indicators		page
DEA	Electrical differential indicator	317	DTA	Electronic differential indicator	320
DEM	Electrical differential indicator	317-318	DVA	Visual differential indicator	320
DLA	Electrical / visual differential indicator	318-319	DVM	Visual differential indicator	320
DLE	Electrical / visual differential indicator	319			



MPS MPS200 - MPS250

Designation & Ordering code

COMPLETE FILTER

Series and size MPS200 MPS250	Configuration example: MPS200	R	G1	A10	A	P01
Bypass valve						
R Return: 1.75 bar						
S Suction: 30 kPa						
U Without bypass						
Connections						
G1 G 1 1/2"						
G2 1 1/2" NPT						
G3 SAE 24 - 1 7/8" - 12 UN						
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					
A25 Inorganic microfiber 25 µm	P10 Resin impregnated paper 10 µm					
	P25 Resin impregnated paper 25 µm					
		Seal A NBR		Execution P01 MP Filtri standard		

CARTRIDGE

Cartridge series and size CS100 CS150	Configuration example: CS100	A10	A	P01
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			
A25 Inorganic microfiber 25 µm	P10 Resin impregnated paper 10 µm			
	P25 Resin impregnated paper 25 µm			
		Seals A NBR		Execution P01 MP Filtri standard Pxx Customized

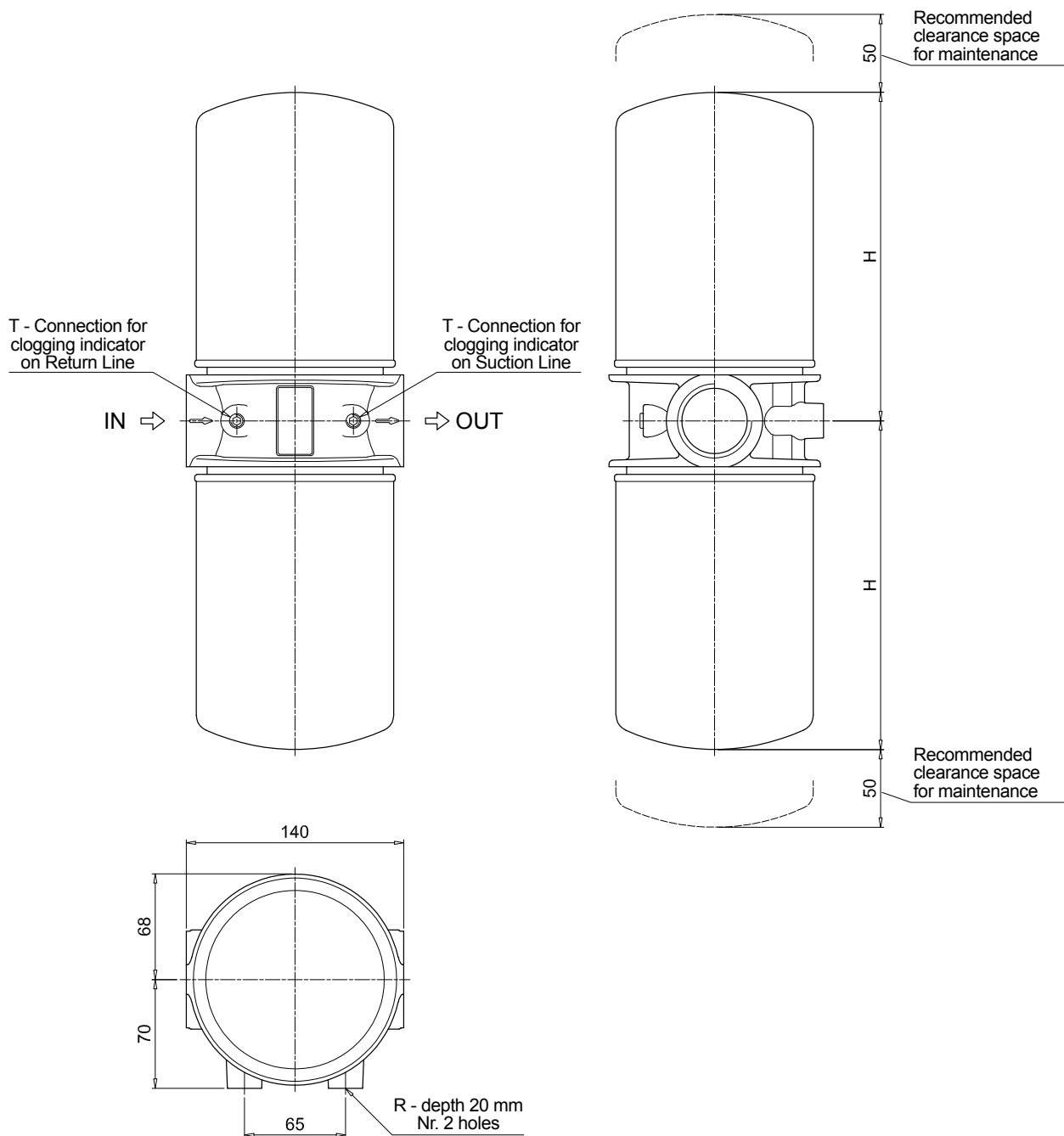
ACCESSORIES

Clogging indicators on RETURN line		page			page
BVA	Axial pressure gauge	315	BEA	Electrical pressure indicator	314
BVR	Radial pressure gauge	315	BEM	Electrical pressure indicator	314
BVP	Visual pressure indicator with automatic reset	316	BLA	Electrical / visual pressure indicator	314-315
BVQ	Visual pressure indicator with manual reset	316			
Clogging indicators on SUCTION line		page			page
VVB	Axial pressure gauge	313	VEB	Electrical vacuum indicator	312
VVS	Radial pressure gauge	313	VLB	Electrical/visual vacuum indicator	312

MPS200 - MPS250

Filter size	H [mm]
200	213
250	262

Connections	T	R
G1	G 1/8"	M10
G2-G3	1/8" NPT	7/16" UNC



MPS MPS300 - MPS350 MPS301 - MPS351

Designation & Ordering code

COMPLETE FILTER

Series and size

MPS300 | **MPS350** With connections for clogging indicators

MPS301 | **MPS351** With connections for differential indicators

Configuration example: **MPS300** **R** **F1** **A10** **A** **P01**

Bypass valve

	MPS 300 - 350	MPS 301 - 351
R Return: 1.75 bar	•	•
S Suction: 30 kPa	•	
U Without bypass	•	
P Without bypass		•

Connections

G1 G 1 1/2"
G2 1 1/2" NPT
G3 SAE 24 - 1 7/8" - 12 UN
F1 1 1/2" SAE 3000 psi/M
F2 1 1/2" SAE 3000 psi/UNC

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
A25 Inorganic microfiber 25 µm	P10 Resin impregnated paper 10 µm
	P25 Resin impregnated paper 25 µm

Seal
A NBR

Execution
P01 MP Filtri standard

CARTRIDGE

Cartridge series and size

CS100 | **CS150**

Configuration example: **CS100** **A10** **A** **P01**

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
A25 Inorganic microfiber 25 µm	P10 Resin impregnated paper 10 µm
	P25 Resin impregnated paper 25 µm

Seals
A NBR

Execution
P01 MP Filtri standard
Pxx Customized

ACCESSORIES

Clogging indicators on RETURN line

	page
BVA Axial pressure gauge	315
BVR Radial pressure gauge	315
BVP Visual pressure indicator with automatic reset	316
BVQ Visual pressure indicator with manual reset	316

	page
BEA Electrical pressure indicator	314
BEM Electrical pressure indicator	314
BLA Electrical / visual pressure indicator	314-315

Clogging indicators on SUCTION line

	page
VVB Axial pressure gauge	313
VVS Radial pressure gauge	313

	page
VEB Electrical vacuum indicator	312
VLB Electrical/visual vacuum indicator	312

Differential indicators

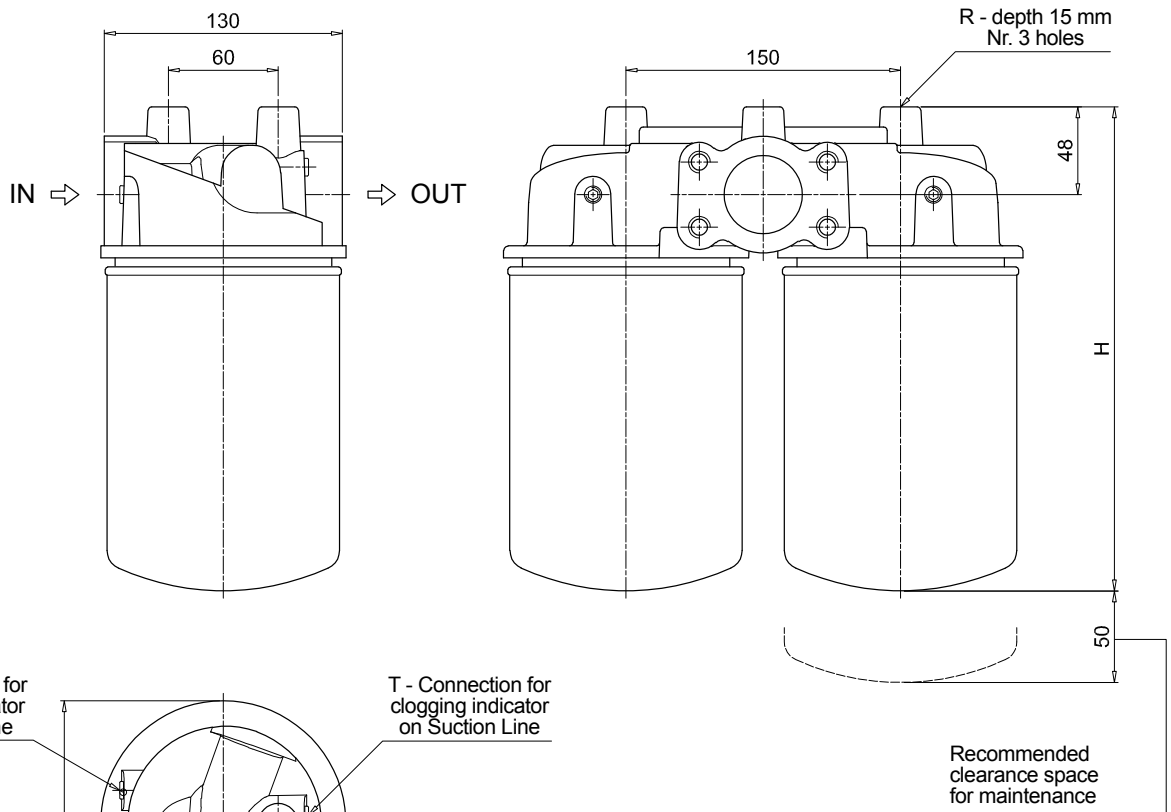
	page
DEA Electrical differential indicator	317
DEM Electrical differential indicator	317-318
DLA Electrical / visual differential indicator	318-319
DLE Electrical / visual differential indicator	319

	page
DTA Electronic differential indicator	320
DVA Visual differential indicator	320
DVM Visual differential indicator	320

MPS300 - MPS350

Filter size	H [mm]
300	266
350	315

Connections	T	R
G1	G 1/8"	M10
G2-G3	1/8" NPT	7/16" UNC
F1	G 1/8"	M10
F2	1/8" NPT	7/16" UNC



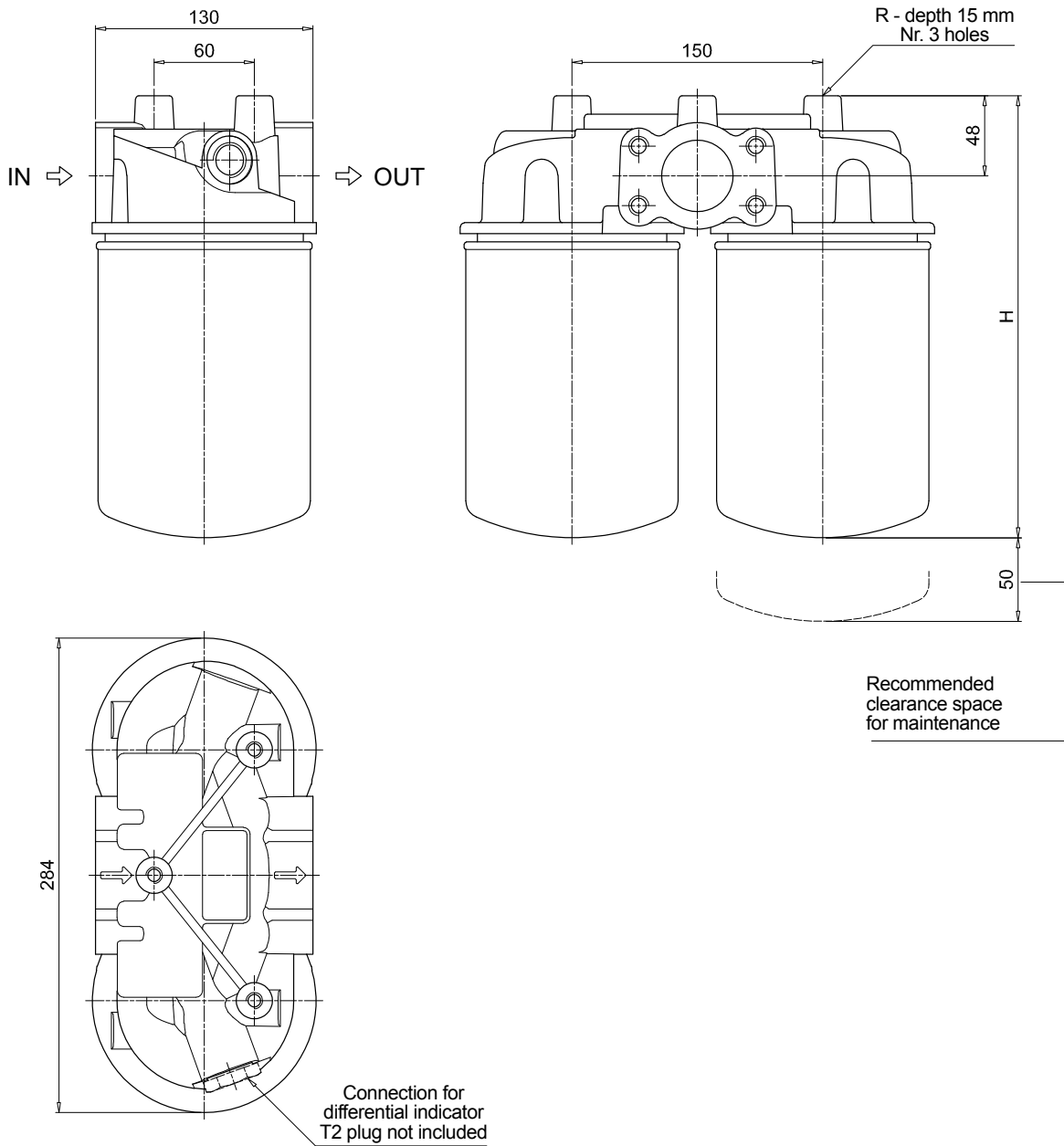
MPS MPS300 - MPS350 MPS301 - MPS351

Dimensions

MPS301 - MPS351

Filter size	H [mm]
301	266
351	315

Connections	R
G1	M10
G2-G3	7/16" UNC
F1	M10
F2	7/16" UNC



MSH series

Maximum working pressure up to 3.5 MPa (35 bar) - Flow rate up to 195 l/min



Description

Technical data

Spin-on filters

Maximum working pressure up to 3.5 MPa (35 bar)

Flow rate up to 195 l/min

MSH is a range of spin-on filters suitable to be used in low pressure lines. They offer a good balance between performances, dimensions and prices. They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Female threaded connections up to 1 1/4", for a maximum flow rate of 195 l/min
- Fine filtration rating, to get a good cleanliness level into the reservoir
- Strong sealing between the housing and cans, to be used in heavy applications
- Bypass valve, to relieve excessive pressure drop across the filter media
- Visual, electrical and electronic differential clogging indicators for low pressure applications

Common applications:

- Delivery lines, in economic industrial equipment or mobile machines

Filter housing materials

- Head: Anodized Aluminium
- Bypass valve: Nylon - Steel
- Element: Aluminium - Painted Steel

Bypass valve

Opening pressure: 250 kPa (2.5 bar) ±10%

Δp element type

- Δp: 5 bar
- Oil flow from OUT to IN

Seals

- Standard NBR - series A
- Optional FPM - series V

Temperature

From -20 °C to +110 °C

Note

MSH filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

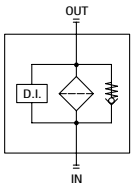
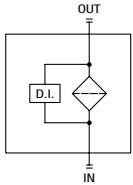
Filter series	Weights [kg]	Volumes [dm ³]
MSH 050	1.50	0.65
MSH 070	1.90	0.95
MSH 100	3.30	1.80
MSH 150	3.80	2.20

Cartridge

CH

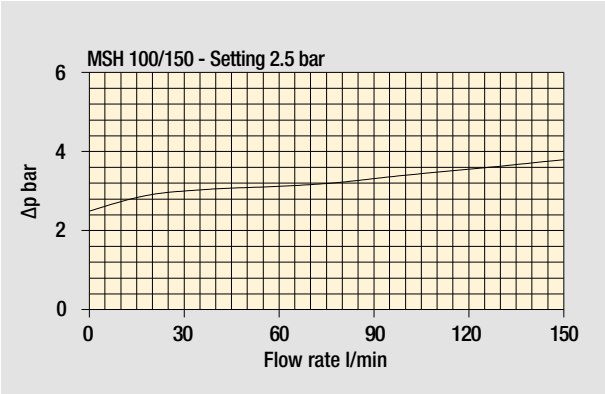
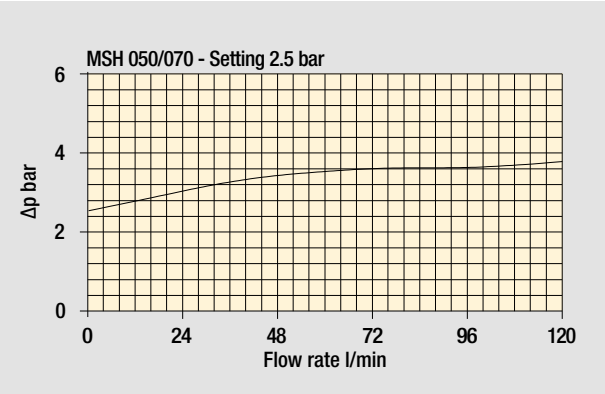
Thread connections	
Type	Connection
CH 050 - 070	M32 x 2
CH 100 - 150	M45 x 2

Filter series	Style S	Style B
MSH 050	•	•
MSH 070	•	•
MSH 100	•	•
MSH 150	•	•



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.

MSH MSH050 - MSH070 MSH100 - MSH150

Designation & Ordering code

COMPLETE FILTER

Series and size		Configuration example: MSH050 B A G1 A10 P01				
MSH050 MSH070 MSH100 MSH150						
Bypass valve						
S	Without bypass					
B	2.5 bar					
Seal						
A	NBR					
Connections	MSH 050 - 070	MSH 100 - 150				
G1	G 1"	G 1 1/2"				
G2	G 3/4"	G 1 1/4"				
G3	1" NPT	1 1/2" NPT				
G4	3/4" NPT	1 1/4" NPT				
G5	SAE 16 - 1 5/16" - 12 UN	SAE 24 - 1 7/8" - 12 UN				
G6	SAE 12 - 1 1/16" - 12 UN	SAE 20 - 1 5/8" - 12 UN				
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			
A25	Inorganic microfiber 25 µm	P10	Resin impregnated paper 10 µm			
		P25	Resin impregnated paper 25 µm			
			Execution			
			P01 MP Filtri standard			

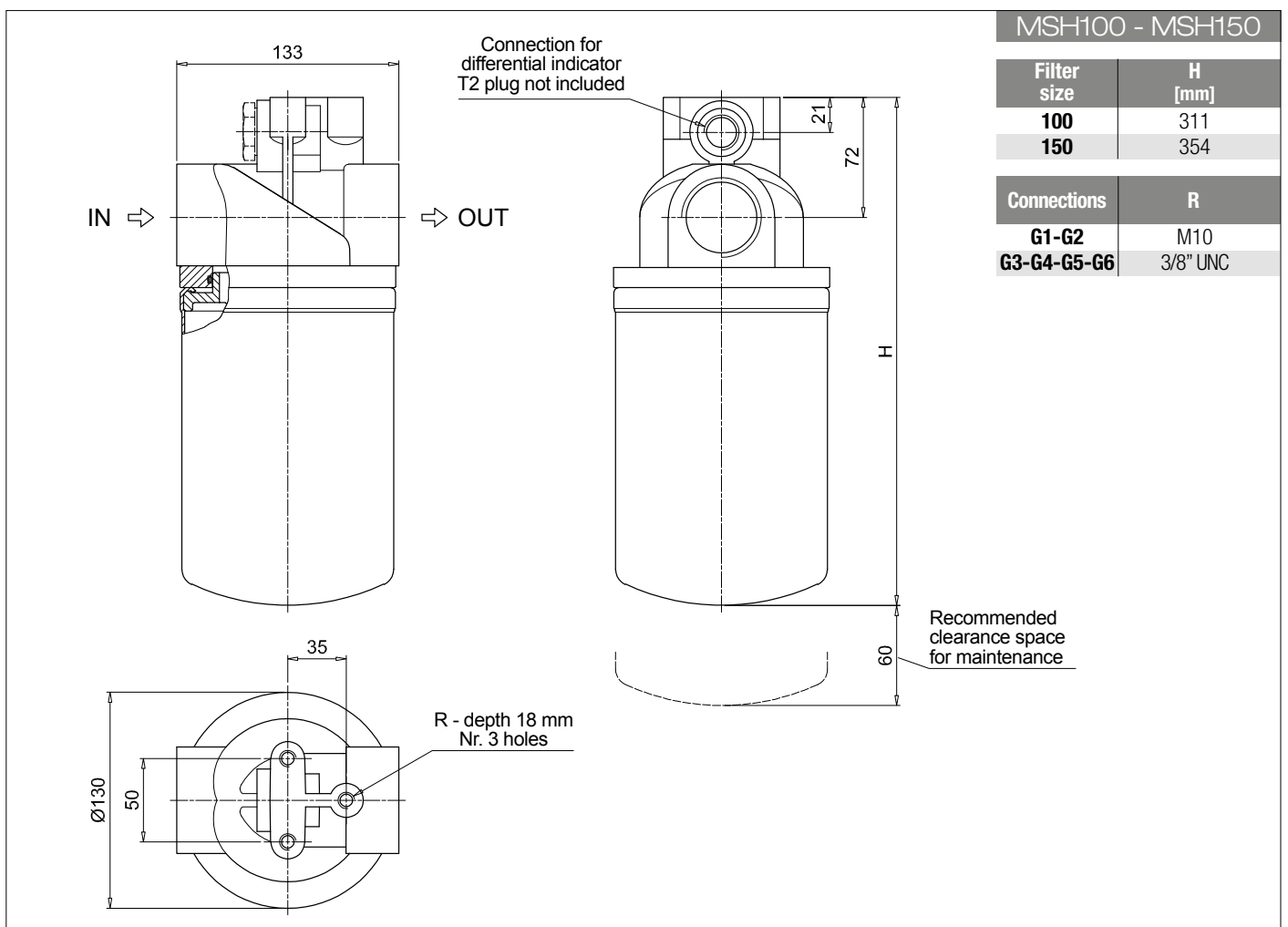
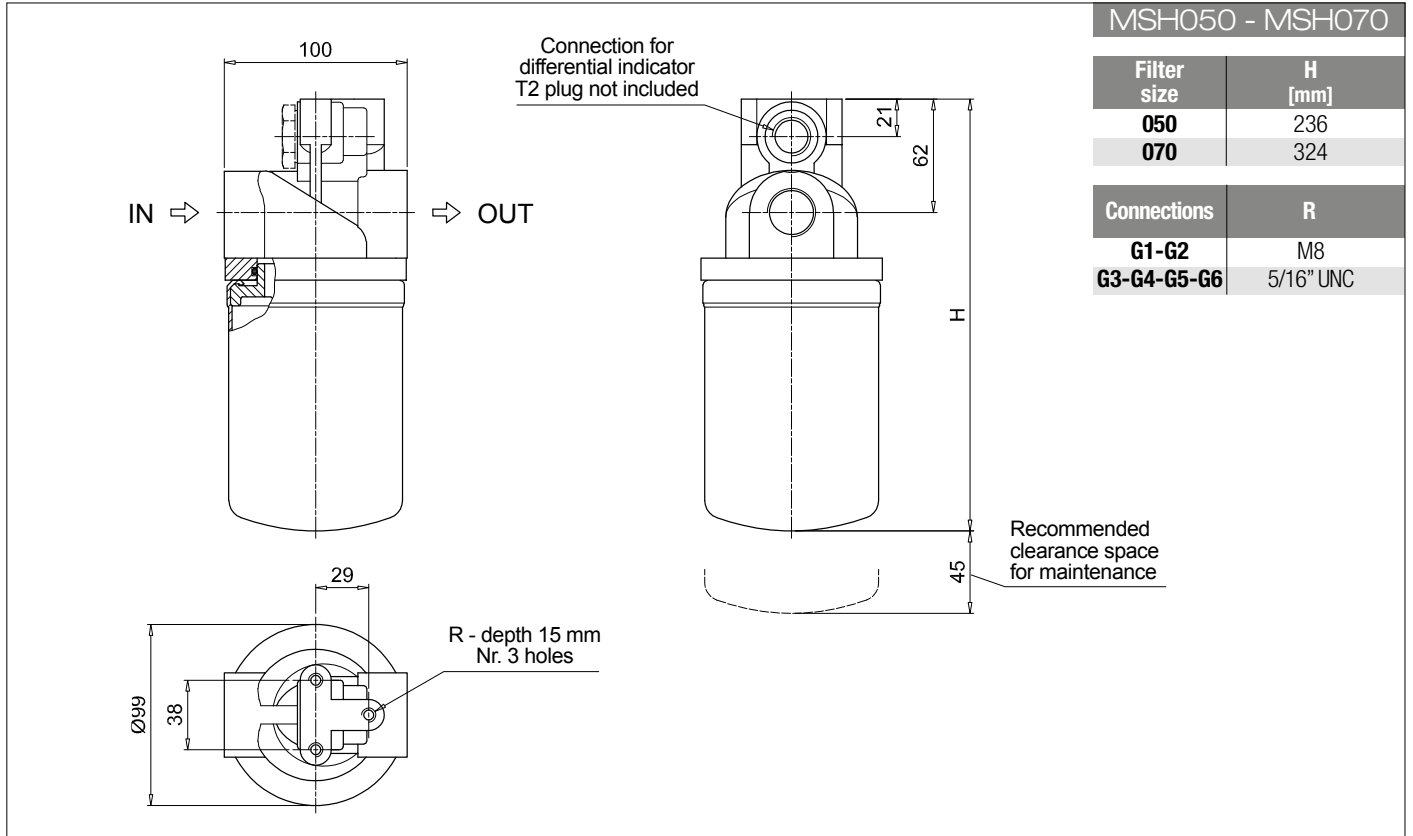
CARTRIDGE

Cartridge series and size		Configuration example: CH050 A10 A P01			
CH050 CH070 CH100 CH150					
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		
A25	Inorganic microfiber 25 µm	P10	Resin impregnated paper 10 µm		
		P25	Resin impregnated paper 25 µm		
		Seal		Execution	
		A NBR		P01 MP Filtri standard	
				Pxx Customized	

ACCESSORIES

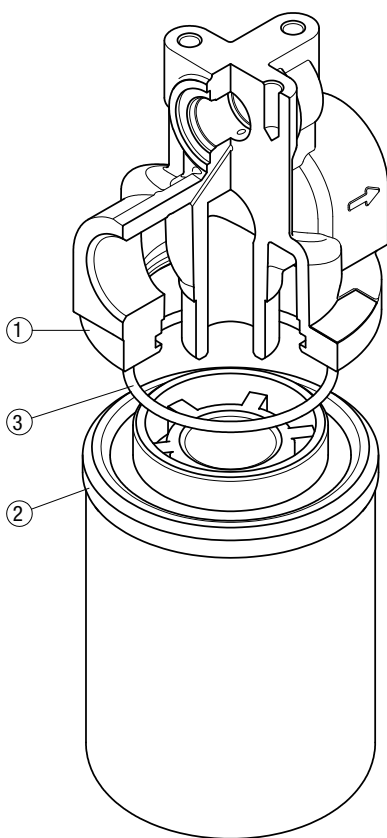
Differential indicators	page		page
DEA Electrical differential indicator	317	DTA Electronic differential indicator	320
DEM Electrical differential indicator	317-318	DVA Visual differential indicator	320
DLA Electrical / visual differential indicator	318-319	DVM Visual differential indicator	320
DLE Electrical / visual differential indicator	319		

Additional features	page
T2 Plug	321



MSH SPARE PARTS

Order number for spare parts



Item:	Q.ty: 1 pc. 1	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3
Filter series	Filter assembly	Cartridge	Seal code number
MSH 050-070	See order table	See order table	0-R 167 (ø 63.50 x 3.53)
MSH 100-150	See order table	See order table	0-R 4362 (ø 91.67 x 3.53)

Clogging indicators

Introduction

Filter elements are efficient only if their Dirt Holding Capacity is fully exploited. This is achieved by using filter housings equipped with clogging indicators. These devices trip when the clogging of the filter element causes an increase in pressure drop across the filter element.

The indicator is set to alarm before the element becomes fully clogged.

MP Filtri can supply indicators of the following designs:

- Vacuum switches and gauges
- Pressure switches and gauges
- Differential pressure indicators

These type of devices can be provided with a visual, electrical or both signals.

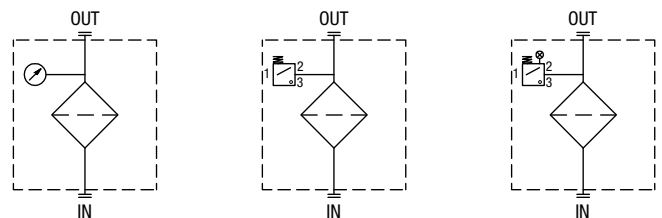
Barometric indicators
Vacuum indicators
Differential indicators

Suitable indicator types

VACUUM INDICATORS

Vacuum indicators are used on the Suction line to check the efficiency of the filter element.

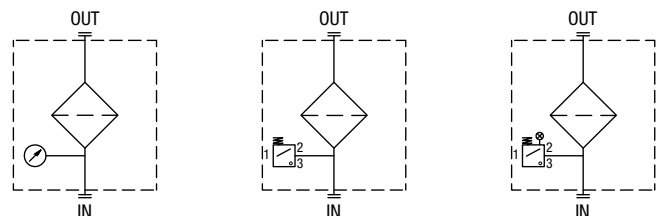
They measure the pressure downstream of the filter element. Standard items are produced with R 1/4" EN 10226 connection. Available products with R 1/8" EN 10226 to be fitted on MPS series.



BAROMETRIC INDICATORS

Pressure indicators are used on the Return line to check the efficiency of the filter element.

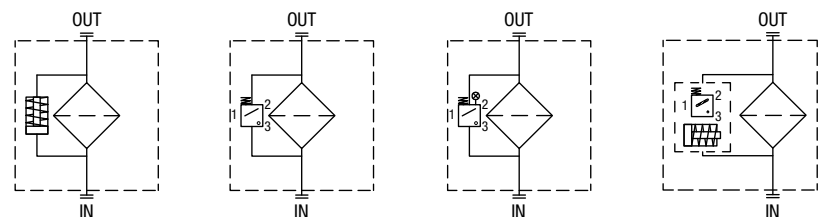
They measure the pressure upstream of the filter element. Standard items are produced with R 1/8" EN 10226 connection.



DIFFERENTIAL INDICATORS

Differential indicators are used on the Pressure line to check the efficiency of the filter element.

They measure the pressure upstream and downstream of the filter element (differential pressure). Standard items are produced with special connection G 1/2" size. Also available in Stainless Steel models.



Quick reference guide

	Filter series	Visual indicator	Electrical indicator	Electrical / Visual indicator
Suction line	MPS 050 - 070 - 100 - 150 MPS 200 - 250 - 300 - 350	VVB16P01 VVS16P01	VEB21AA50P01	VLB21AA51P01 VLB21AA52P01 VLB21AA53P01 VLB21AA71P01
Return line	MPS 050 - 070 - 100 - 150 MPS 200 - 250 - 300 - 350	BVA14P01 BVR14P01 BVP20HP01 BVQ20HP01	BEA15HA50P01 BEM15HA41P01	BLA15HA51P01 BLA15HA52P01 BLA15HA53P01 BLA15HA71P01
In-line	MPS 051 - 071 - 101 - 151 MPS 301 - 351 MSH 050 - 070 - 100 - 150	DVA12xP01 DVM12xP01	DEA12xA50P01 DEM12xAxxP01	DLA12xA51P01 DLA12xA52P01 DLA12xA71P01 DLE12xA50P01 DLE12xF50P01


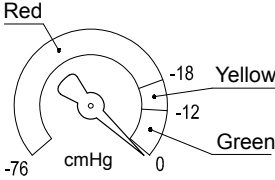
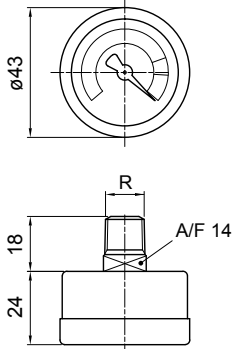
VACUUM INDICATORS


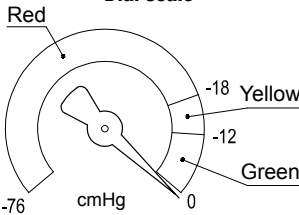
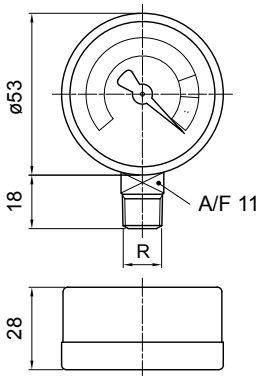
Dimensions

VE*50	
Electrical Vacuum Indicator	
R	Ordering code
EN 10226 - R1/8"	VE B 21 A A 50 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: NBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - Vacuum setting: -0.21 bar ±10% - Max working pressure: 10 bar - Proof pressure: 15 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP65 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: EN 175301-803 - Resistive load: 5 A / 14 Vdc 4 A / 30 Vdc 5 A / 125 Vac 4 A / 250 Vac - Available Atex product: II 1GD Ex ia IIC Tx Ex ia IIIC Tx°C X - CE certification 	

VL*51 - VL*52 - VL*53	
Electrical/Visual Vacuum Indicator	
R	Ordering code
EN 10226 - R1/8"	VL B 21 A A xx P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Transparent Nylon - Contacts: Brass - Nylon - Seal: NBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - Vacuum setting: -0.21 bar ±10% - Max working pressure: 10 bar - Proof pressure: 15 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP65 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: EN 175301-803 - Type: 51 52 53 - Lamps: 24 Vdc 110 Vdc 230 Vac - Resistive load: 1 A / 24 Vdc 1 A / 110 Vdc 1 A / 230 Vac 	

VL*71	
Electrical/Visual Vacuum Indicator	
Connections	Ordering code
EN 10226 - R1/8"	VL B 21 A A 71 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: NBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - Vacuum setting: -0.21 bar ±10% - Max working pressure: 10 bar - Proof pressure: 15 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP65 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: IEC 61076-2-101 D (M12) - Lamps: 24 Vdc - Resistive load: 0.4 A / 24 Vdc 	

VVB		Hydraulic symbol	Materials								
Axial Vacuum Gauge					- Case: Painted Steel - Window: Transparent plastic - Dial: Painted Steel - Pointer: Painted Aluminium - Pressure connection: Brass - Pressure element: Bourdon tube Cu-alloy soft soldered						
R	Ordering code										
EN 10226 - R1/8"	VV B 16 P01	Dial scale 	Technical data - Max working pressure: Static: 7 bar Fluctuating: 6 bar Short time: 10 bar - Working temperature: From -40 °C to +60 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Accuracy: Class 2.5 according to EN 13190 - Degree of protection: IP31 according to EN 60529								
											
		Conversion to SI units									
		<table border="1"> <thead> <tr> <th>[cmHg]</th> <th>[bar]</th> </tr> </thead> <tbody> <tr> <td>-12</td> <td>-0.16</td> </tr> <tr> <td>-18</td> <td>-0.24</td> </tr> <tr> <td>-76</td> <td>-1.01</td> </tr> </tbody> </table>	[cmHg]	[bar]	-12	-0.16	-18	-0.24	-76	-1.01	
[cmHg]	[bar]										
-12	-0.16										
-18	-0.24										
-76	-1.01										

VVS		Hydraulic symbol	Materials								
Radial Vacuum Gauge					- Case: Painted Steel - Window: Transparent plastic - Dial: Painted Steel - Pointer: Painted Aluminium - Pressure connection: Brass - Pressure element: Bourdon tube Cu-alloy soft soldered						
R	Ordering code										
EN 10226 - R1/8"	VV S 16 P01	Dial scale 	Technical data - Max working pressure: Static: 7 bar Fluctuating: 6 bar Short time: 10 bar - Working temperature: From -40 °C to +60 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Accuracy: Class 2.5 according to EN 13190 - Degree of protection: IP31 according to EN 60529								
											
		Conversion to SI units									
		<table border="1"> <thead> <tr> <th>[cmHg]</th> <th>[bar]</th> </tr> </thead> <tbody> <tr> <td>-12</td> <td>-0.16</td> </tr> <tr> <td>-18</td> <td>-0.24</td> </tr> <tr> <td>-76</td> <td>-1.01</td> </tr> </tbody> </table>	[cmHg]	[bar]	-12	-0.16	-18	-0.24	-76	-1.01	
[cmHg]	[bar]										
-12	-0.16										
-18	-0.24										
-76	-1.01										

DESIGNATION & ORDERING CODE									
Series		Configuration example 1:	VE	B	21	A	A	50	P01
VE	Electrical vacuum indicator	Configuration example 2:	VL	B	21	A	A	71	P01
VL	Electrical/Visual vacuum indicator	Configuration example 3:	VV	S	16				P01
VV	Vacuum gauge								
Type VE - VL		Type VV							
B	Connection EN 10226 - R1/8"	B	Axial connection EN 10226 - R1/8"						
		S	Radial connection EN 10226 - R1/8"						
Vacuum setting		VE	VL	VV					
16	-0.16 bar			•					
21	-0.21 bar	•	•						
Seals		VE	VL	VV					
A	NBR	•	•						
Thermostat		VE	VL	VV					
A	Without	•	•						
Electrical connections		VE	VL	VV					
50	Connection EN 175301-803	•							
51	Connection EN 175301-803, transparent base with lamps 24 Vdc		•						
52	Connection EN 175301-803, transparent base with lamps 110 Vdc		•						
53	Connection EN 175301-803, transparent base with lamps 230 Vdc		•						
71	Connection IEC 61076-2-101 D (M12), black base with lamps 24 Vdc		•						
									Option
									P01 MP Filtri standard
									Pxx Customized

BAROMETRIC INDICATORS

Dimensions

BEA*50	
Electrical Pressure Indicator	
Settings	Ordering code
1.5 bar ±10%	BE A 15 H A 50 P01
2.0 bar ±10%	BE A 20 H A 50 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 40 bar - Proof pressure: 60 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP65 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: EN 175301-803 - Resistive load: 5 A / 14 Vdc 4 A / 30 Vdc 5 A / 125 Vac 4 A / 250 Vac <p>- Available Atex product: II 1GD Ex ia IIC Tx Ex ia IIIC Tx°C X </p> <p>- CE certification</p>	

BEM*41	
Electrical Pressure Indicator	
Settings	Ordering code
1.5 bar ±10%	BE M 15 H A 41 P01
2.0 bar ±10%	BE M 20 H A 41 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 40 bar - Proof pressure: 60 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP67 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: Four-core cable - Resistive load: 5 A / 14 Vdc 4 A / 30 Vdc 5 A / 125 Vac 4 A / 250 Vac <p>- CE certification On request this indicator can be provided with main connectors in use for wirings.</p>	

BL*51 - BL*52 - BL*53	
Electrical/Visual Pressure Indicator	
Settings	Ordering code
1.5 bar ±10%	BL A 15 H A xx P01
2.0 bar ±10%	BL A 20 H A xx P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Transparent Nylon - Contacts: Silver - Seal: HNBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 40 bar - Proof pressure: 60 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP65 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: EN 175301-803 - Type: 51 52 53 - Lamps: 24 Vdc 110 Vdc 230 Vac - Resistive load: 1 A / 24 Vdc 1 A / 110 Vdc 1 A / 230 Vac 	

BL*71	
Electrical/Visual Pressure Indicator	
Settings	Ordering code
1.5 bar $\pm 10\%$	BL A 15 HA 71 P01
2.0 bar $\pm 10\%$	BL A 20 HA 71 P01

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR

Technical data

- Max working pressure: 40 bar
- Proof pressure: 60 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree of protection: IP65 according to EN 60529

Electrical data

- Electrical connection: IEC 61076-2-101 D (M12)
- Lamps: 24 Vdc
- Resistive load: 0.4 A / 24 Vdc

BVA	
Axial Pressure Gauge	
Settings	Ordering code
1.4 bar $\pm 10\%$	BV A 14 P01
2.5 bar $\pm 10\%$	BV A 25 P01

Hydraulic symbol

Dial scale

BV A 14 P01

BV A 25 P01

Materials

- Case: Painted Steel
- Window: Transparent plastic
- Dial: Painted Steel
- Pointer: Painted Aluminium
- Pressure connection: Brass
- Pressure element: Bourdon tube Cu-alloy soft soldered

Technical data

- Max working pressure: Static: 7 bar
Fluctuating: 6 bar
Short time: 10 bar
- Working temperature: From -40 °C to +60 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Accuracy: Class 2.5 according to EN 13190
- Degree of protection: IP31 according to EN 60529

BVR	
Radial Pressure Gauge	
Settings	Ordering code
1.4 bar $\pm 10\%$	BV R 14 P01
2.5 bar $\pm 10\%$	BV R 25 P01

Hydraulic symbol

Dial scale

BV R 14 P01

BV R 25 P01

Materials

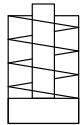
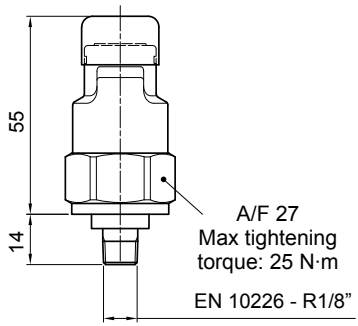
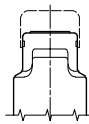
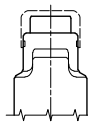
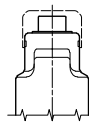
- Case: Painted Steel
- Window: Transparent plastic
- Dial: Painted Steel
- Pointer: Painted Aluminium
- Pressure connection: Brass
- Pressure element: Bourdon tube Cu-alloy soft soldered

Technical data

- Max working pressure: Static: 7 bar
Fluctuating: 6 bar
Short time: 10 bar
- Working temperature: From -40 °C to +60 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Accuracy: Class 2.5 according to EN 13190
- Degree of protection: IP31 according to EN 60529

BAROMETRIC INDICATORS

Dimensions

BVP - BVQ		Hydraulic symbol	Materials	
Visual Pressure Indicator				
Setting	Ordering code			
1.5 bar ±10%	BV P 15 H P01		Technical data - Reset: BVP - Automatic reset BVQ - Manual reset - Max working pressure: 10 bar - Proof pressure: 15 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree of protection: IP45 according to EN 60529	
	BV Q 15 H P01			
2.0 bar ±10%	BV P 20 H P01			
	BV Q 20 H P01			
		Signals		
		 Absence of pressure (no indicator)	 Presence of pressure (green button rises gradually)	 Clogged filter element (red button risen)

DESIGNATION & ORDERING CODE

Series
BE Electrical pressure indicator
BL Electrical/Visual pressure indicator
BV Visual pressure indicator

Configuration example 1:	BE	M	15	H	A	41	P01
Configuration example 2:	BL	A	20	H	A	71	P01
Configuration example 3:	BV	R	14				P01
Configuration example 4:	BV	P	20	H			P01

Type	BE	BL	BV
A Standard type	•	•	A Axial connection pressure gauge
M With wired electrical connection	•		R Radial connection pressure gauge
			P Visual indicator with automatic reset
			Q Visual indicator with manual reset

Pressure setting	BEA-BEM	BLA	BVA-BVR	BVP-BVQ
14 1.4 bar			•	
15 1.5 bar	•	•		
20 2 bar	•	•		•
25 2.5 bar			•	

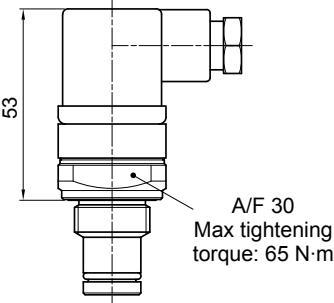
Seals	BE	BLA	BVA-BVR	BVP-BVQ
H HNBR	•	•		•

Thermostat	BEA-BEM	BLA	BV
A Without	•	•	

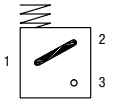
Electrical connections	BEA	BEM	BL	BV
10 Connection AMP Superseal series 1.5				
30 Connection Deutsch DT-04-2-P				
41 Connection via four-core cable		•		
50 Connection EN 175301-803	•			
51 Connection EN 175301-803, transparent base with lamps 24 Vdc			•	
52 Connection EN 175301-803, transparent base with lamps 110 Vdc			•	
53 Connection EN 175301-803, transparent base with lamps 230 Vdc			•	
71 Connection IEC 61076-2-101 D (M12), black base with lamps 24 Vdc			•	

Option
P01 MP Filtri standard
Pxx Customized

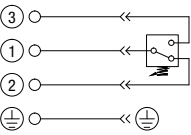
DEA*50	
Electrical Differential Indicator	
Settings	Ordering code
1.2 bar $\pm 10\%$	DE A 12 x A 50 P01
2.0 bar $\pm 10\%$	DE A 20 x A 50 P01



Hydraulic symbol



Electrical symbol



Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

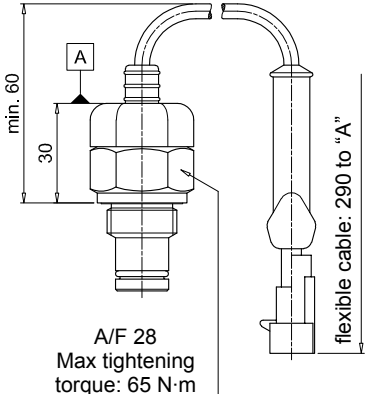
Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree protection: IP66 according to EN 60529
IP69K according to ISO 20653

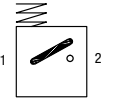
Electrical data

- Electrical connection: EN 175301-803
- Resistive load: 0.2 A / 115 Vdc

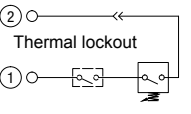
DEM*10	
Electrical Differential Indicator	
Settings	Ordering code
1.2 bar $\pm 10\%$	DE M 12 x x 10 P01
2.0 bar $\pm 10\%$	DE M 20 x x 10 P01



Hydraulic symbol



Electrical symbol



Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

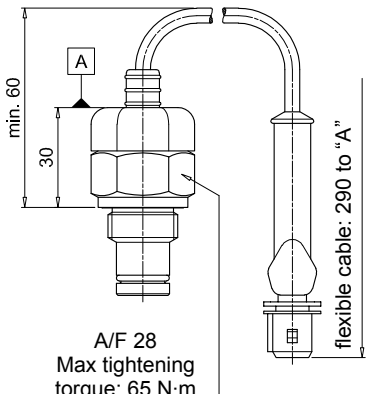
Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree protection: IP66 according to EN 60529

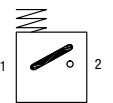
Electrical data

- Electrical connection: AMP Superseal series 1.5
- Resistive load: 0.2 A / 115 Vdc
- Switching type: Normally open contacts (NC on request)
- Thermal lockout: Normally open up to 30 °C (option "F")

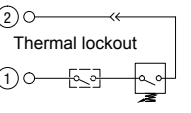
DEM*20	
Electrical Differential Indicator	
Settings	Ordering code
1.2 bar $\pm 10\%$	DE M 12 x x 20 P01
2.0 bar $\pm 10\%$	DE M 20 x x 20 P01



Hydraulic symbol



Electrical symbol



Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree protection: IP66 according to EN 60529

Electrical data

- Electrical connection: AMP Time junior
- Resistive load: 0.2 A / 115 Vdc
- Switching type: Normally open contacts (NC on request)
- Thermal lockout: Normally open up to 30 °C (option "F")

DLA*71	
Electrical/Visual Differential Indicator	
Settings	Ordering code
1.2 bar $\pm 10\%$	DL A 12 x A 71 P01
2.0 bar $\pm 10\%$	DL A 20 x A 71 P01

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529
IP69K according to ISO 20653

Electrical data

- Electrical connection: IEC 61076-2-101 D (M12)
- Lamps: 24 Vdc
- Resistive load: 0.4 A / 24 Vdc

DLE*A50	
Electrical/Visual Differential Indicator	
Settings	Ordering code
1.2 bar $\pm 10\%$	DL E 12 x A 50 P01
2.0 bar $\pm 10\%$	DL E 20 x A 50 P01

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529

Electrical data

- Electrical connections: EN 175301-803
- Resistive load: 5 A / 250 Vac
- Available the connector with lamps

DLE*F50	
Electrical/Visual Differential Indicator	
Settings	Ordering code
1.2 bar $\pm 10\%$	DL E 12 x F 50 P01
2.0 bar $\pm 10\%$	DL E 20 x F 50 P01

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529

Electrical data

- Electrical connections: EN 175301-803
- Resistive load: 5 A / 250 Vac
- Thermal lockout setting: +30 °C

DIFFERENTIAL INDICATORS

Dimensions

DTA*70	
Electronic Differential Indicator	
Settings	Ordering code
1.2 bar \pm 10%	DT A 12 x x 70 P01
2.0 bar \pm 10%	DT A 20 x x 70 P01

47

A/F 30
Max tightening torque: 50 N-m

Hydraulic symbol

Electrical symbol

①	○	○	+24 Vdc
②	○	○	4 \div 20 mA
③	○	○	75% - N.O. Digital output
④	○	○	100% - N.O. Digital output
⑤	○	○	0 Vdc

Materials

- Body: Brass
- Internal parts: Brass - Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree protection: IP67 according to EN 60529

Electrical data

- Electrical connection: IEC 61076-2-101 D (M12)
- Power supply: 24 Vdc
- Analogue output: From 4 to 20 mA
- Thermal lockout: 30 °C (all output signals stalled up to 30 °C)

DVA	
Visual Differential Indicator	
Settings	Ordering code
1.2 bar \pm 10%	DV A 12 x P01
2.0 bar \pm 10%	DV A 20 x P01

39

Green / Red clogging indicator

A/F 28
Max tightening torque: 65 N-m

Hydraulic symbol

Materials

- Body: Brass
- Internal parts: Brass - Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Reset: Automatic reset
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529

DVM	
Visual Differential Indicator	
Settings	Ordering code
1.2 bar \pm 10%	DV M 12 x P01
2.0 bar \pm 10%	DV M 20 x P01

34

Red clogging indicator

A/F 30
Max tightening torque: 65 N-m

Hydraulic symbol

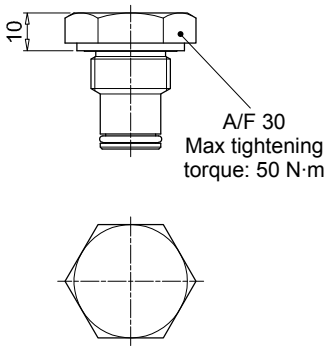
Materials

- Body: Brass
- Internal parts: Brass - Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Reset: Manual reset
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529

T2	
Indicator plug	
Seal	Ordering code
HNBR	T2 H
FPM	T2 V



Materials

- Body: Phosphatized steel
- Seal: HNBR / FPM

DESIGNATION & ORDERING CODE - DIFFERENTIAL INDICATORS

Series	Configuration example 1:	DE	M	12	H	F	50	P01
DE Electrical differential indicator	Configuration example 2:	DL	E	20	V	A	71	P01
DL Electrical/Visual differential indicator	Configuration example 3:	DT	A	12	H	F	70	P01
DT Electronic differential indicator	Configuration example 4:	DV	M	20	V			P01
DV Visual differential indicator								

Type	DE	DL	DT	DV	
A Standard type	•	•	•	•	A With automatic reset
M With wired electrical connection	•				M With manual reset
E For high power supply		•			

Pressure setting	
12 1.2 bar	
20 2.0 bar	

Seals	
H HNBR	
V FPM	

Thermostat	DEA	DEM	DLA	DLE	DT	DV
A Without	•	•	•	•		
F With thermostat		•		•	•	

Electrical connections	DEA	DEM	DLA	DLE	DT	DV
10 Connection AMP Superseal series 1.5		•				
20 Connection AMP Timer Junior		•				
30 Connection Deutsch DT-04-2-P		•				
35 Connection Deutsch DT-04-3-P		•				
50 Connection EN 175301-803	•			•		
51 Connection EN 175301-803, transparent base with lamps 24 Vdc			•			
52 Connection EN 175301-803, transparent base with lamps 110 Vdc			•			
70 Connection IEC 61076-2-101 D (M12)					•	
71 Connection IEC 61076-2-101 D (M12), black base with lamps 24 Vdc			•			

Option	
P01 MP Filtri standard	
Pxx Customized	

DESIGNATION & ORDERING CODE - DIFFERENTIAL INDICATOR PLUG

Series	Configuration example	T2	H
T2 Indicator plug			

Seals	
H HNBR	
V FPM	

LMP - low and medium pressure filters are used as process filters to protect pumps, pressure reducers and hydraulic circuits from damage due to oil contamination as per ISO 4406.

LMP series is available in 5 different sizes: 100, 200, 400, 900 and 950 and a wide range of versions.

LMP filters are available with several working pressures suitable for all hydraulic circuits as:

- **return filters in external tank mounting construction for medium and high flow rates in single and duplex versions**
- **in-line filters for low and medium pressures for off-line applications**
- **in-line process filters for medium pressures, for example, for forced lubrication applications, in single or duplex versions**
- **in-line filters for medium pressures for filtering hydraulic boost circuits**
- **in-line filters as high holding capacity filters on test beds**

LMP filters are thus specifically designed to be suitable for a wide range of application: from steel plants to mobile equipments, from test benches to naval application, providing the right solution for filtering requirements in all sectors.

LMP filters are available in single, manifold and duplex versions (LMD series).

FILTER SIZING

For the proper corrective factor Y see chapter at page 24

Low & Medium Pressure filters



LMP 110 - 120 - 123 MULTIPORT	page 325
LMP 210 - 211	341
LMP 400 - 401 & 430 - 431	351
LMP 950 - 951	363
LMP 952 - 953 - 954	371
LMD 211	383
LMD 400 - 401 & 431	391
LMD 951	407

Filter element according to DIN 24550	page 415
LDP - LDD	417
LMP 900 - 901	427
LMP 902 - 903	435

INDICATORS	page 444
ACCESSORIES	page 450

LMP 110-120-123 series

MULTIPOINT

Maximum working pressure up to 8 MPa (80 bar) - Flow rate up to 175 l/min



Description

Technical data

Low & Medium Pressure filters

Maximum working pressure up to 8 MPa (80 bar)
Flow rate up to 175 l/min

LMP110 is a range of versatile low pressure filter for transmission, protection of sensitive components in low pressure hydraulic systems and filtration of the coolant into the machine tools.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Female threaded connections up to 1", for a maximum return flow rate of 175 l/min
- Fine filtration rating, to get a good cleanliness level into the system
- Bypass valve, to relieve excessive pressure drop across the filter media
- Visual, electrical and electronic differential clogging indicators
- Multipoint and multifunction schemes, to meet any type of application.
- LMP112: 3/4" additional input port
- LMP116: 3/4" additional output port
- LMP118: 3/4" bypass port, to send the bypass flow to the reservoir instead of the system
- LMP119: 3/4" relief port, to relief the input pressure in the filter, protecting the components downstream the filter against back pressure caused by the pressure drop (cold starts)
- LMP120: connections placed in the same side
- LMP122: connections placed in the same side and 1" additional output port
- LMP123: 2 and 3 bar integrated relief valve

Common applications:

Delivery lines, in any low pressure industrial equipment or mobile machines

Filter housing materials

- Head: Aluminium
- Housing: Cataphoresis - Painted Steel
- Bypass valve: Brass - Aluminium

Pressure

- Test pressure: 12 MPa (120 bar)
- Burst pressure:
 - LMP 110: 29 MPa (290 bar)
 - LMP 120/130: 38 MPa (380 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 8 MPa (80 bar)

Bypass valve

- Opening pressure 350 kPa (3.5 bar) ±10%
- Other opening pressures on request.

Δp element type

- Microfibre filter elements - series N - W: 20 bar
- Wire mesh filter elements - series N: 20 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

LMP MULTIPOINT filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]				Volumes [dm ³]					
	Length	1	2	3	4	Length	1	2	3	4
LMP 110-112-116-118-119		1.60	1.80	2.10	2.60		0.75	0.81	1.11	1.53
LMP 120-122		1.90	2.10	2.40	2.90		0.75	0.81	1.11	1.53
LMP 123		1.70	1.90	2.20	2.70		0.75	0.81	1.11	1.53

Filter series	Length	Filter element design - N Series							
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
LMP 110	1	40	42	65	69	85	163	117	120
	2	49	57	83	83	101	163	136	138
	3	66	70	92	102	124	164	142	144
	4	86	102	118	124	144	165	148	149
LMP 112	1	36	38	55	57	67	105	84	86
	2	44	49	66	66	76	105	93	94
	3	56	58	71	77	87	106	96	97
	4	67	77	85	88	97	106	99	99
LMP 116	1	36	38	54	56	64	96	79	80
	2	43	49	63	64	72	96	86	87
	3	54	57	68	73	82	96	88	89
	4	65	73	79	82	89	96	91	91
LMP 118	1	40	42	65	69	85	163	117	120
	2	49	57	83	83	101	163	136	138
	3	66	70	92	102	124	164	142	144
	4	86	102	118	124	144	165	148	149
LMP 120	1	40	43	66	70	87	172	121	125
	2	50	58	85	85	104	172	142	144
	3	67	71	94	105	129	173	149	151
	4	88	106	122	129	151	174	155	157
LMP 122	1	39	42	64	67	81	146	109	111
	2	49	56	80	80	96	146	124	126
	3	65	68	88	96	114	146	129	130
	4	82	97	110	115	131	147	134	135

Maximum flow rate for a complete low and medium pressure filter with a pressure drop $\Delta p = 0.7$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Filter series	Length	Filter element design - N Series							
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
LMP 123	1	35	37	50	52	59	83	70	71
	2	41	46	58	58	65	83	76	76
	3	51	53	62	65	72	83	77	78
	4	59	65	70	72	78	83	79	79

Maximum flow rate for a complete low and medium pressure filter with a pressure drop $\Delta p = 2.7$ bar.

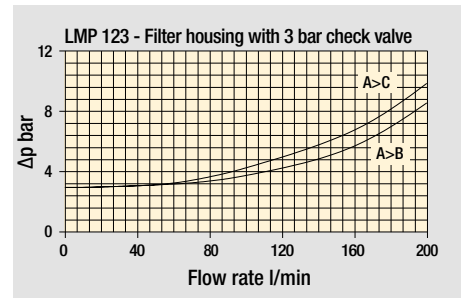
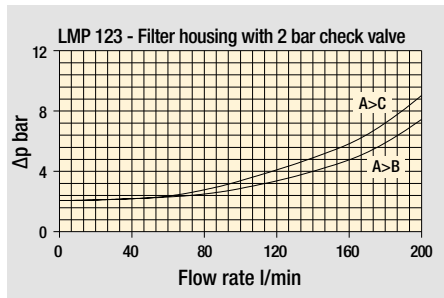
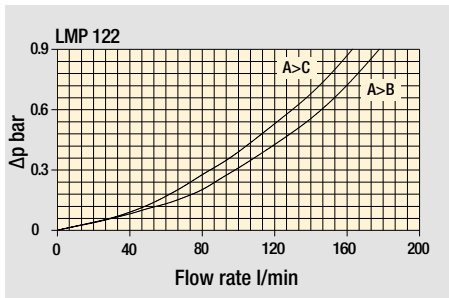
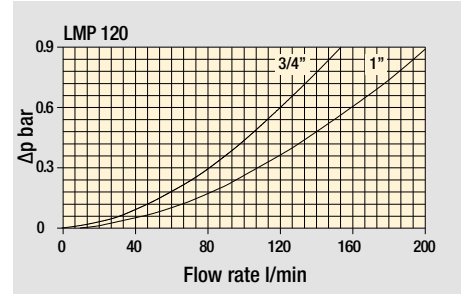
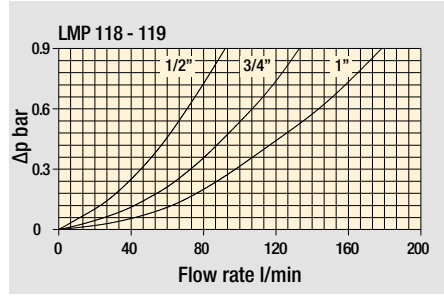
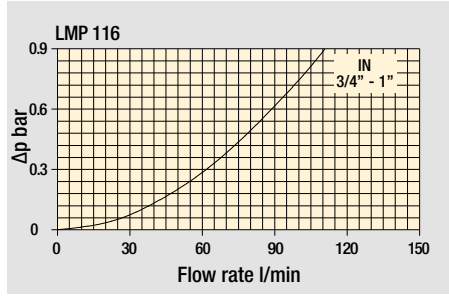
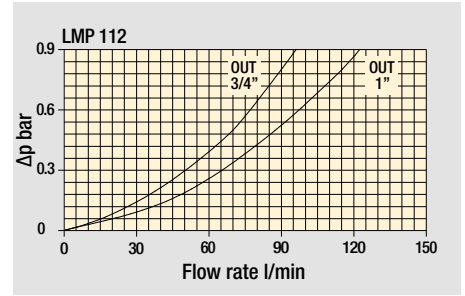
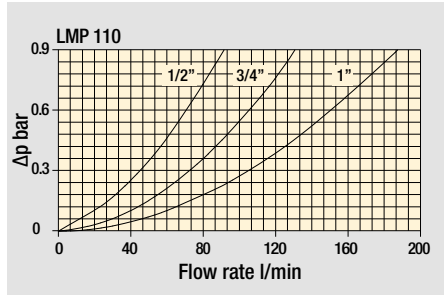
The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

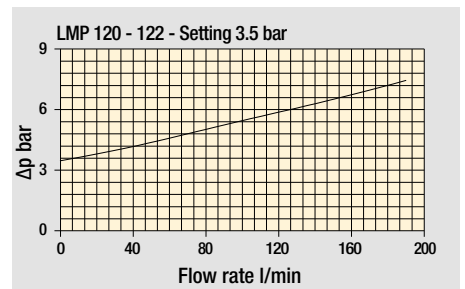
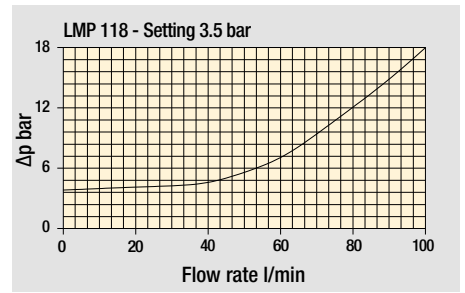
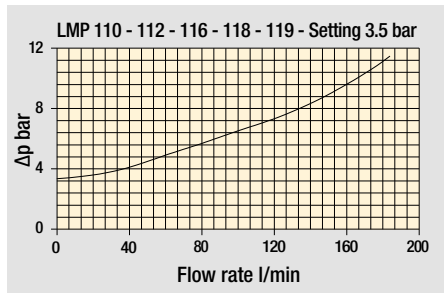
You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Pressure drop

Filter housings Δp pressure drop


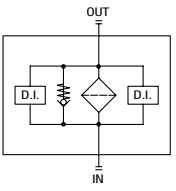


Bypass valve pressure drop




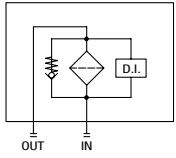
The curves are plotted using mineral oil with density of 0.86 kg/dm³ in compliance with ISO 3968. Δp varies proportionally with density.

LMP 110 In-Line filter


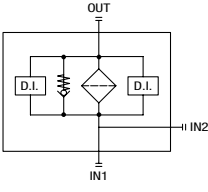
The hydraulic symbol shows a central diamond-shaped filter element connected in series between the IN and OUT ports. Two D.I. (Direct Inlet) ports are shown on either side of the filter element.

LMP 120 Port IN-OUT on the same side


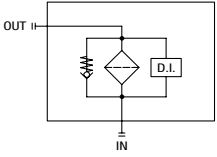
The hydraulic symbol shows a diamond-shaped filter element with a D.I. port on the right side. The IN and OUT ports are located on the bottom of the filter element.

LMP 112 Double IN port


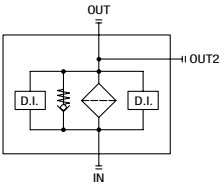
The hydraulic symbol shows a diamond-shaped filter element with two D.I. ports on the left side. The IN1 and IN2 ports are on the right side, and the OUT port is at the top.

LMP 122 Lateral OUT port high flow


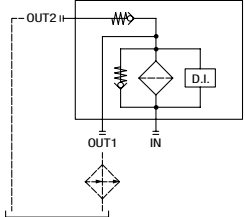
The hydraulic symbol shows a diamond-shaped filter element with a D.I. port on the right side. The IN port is at the bottom, and the OUT port is on the left side.

LMP 116 Double OUT port


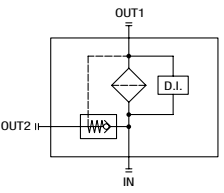
The hydraulic symbol shows a diamond-shaped filter element with two D.I. ports on the left side. The IN port is at the bottom, and the OUT and OUT2 ports are at the top.

LMP 123 Bypass valve for heat exchanger high flow
Type 1


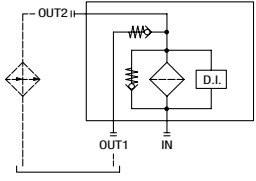
The hydraulic symbol shows a diamond-shaped filter element with a D.I. port on the right side. The IN port is at the bottom. The OUT1 port is at the top, and the OUT2 port is on the left. A bypass valve is shown between the IN and OUT2 ports.

LMP 118 Bypass lateral
Always cleaning fluid in OUT port


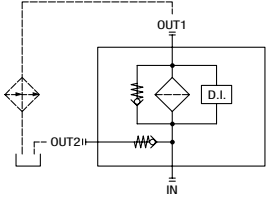
The hydraulic symbol shows a diamond-shaped filter element with a D.I. port on the right side. The IN port is at the bottom. The OUT1 port is at the top, and the OUT2 port is on the left. A bypass valve is shown between the IN and OUT2 ports.

LMP 123 Bypass valve for heat exchanger high flow
Type 2

The hydraulic symbol shows a diamond-shaped filter element with a D.I. port on the right side. The IN port is at the bottom. The OUT1 port is at the top, and the OUT2 port is on the left. A bypass valve is shown between the IN and OUT2 ports.

LMP 119 Safety valve 6 bar for heat exchanger

The hydraulic symbol shows a diamond-shaped filter element with a D.I. port on the right side. The IN port is at the bottom. The OUT1 port is at the top, and the OUT2 port is on the left. A safety valve is shown between the IN and OUT2 ports.

Designation & Ordering code

COMPLETE FILTER

Series and size Configuration example: **LMP112** | **4** | **B** | **A** | **D** | **1** | **A10** | **N** | **P01**
LMP110 | **LMP112** | **LMP116**

Length **1** | **2** | **3** | **4**

Bypass valve **S** Without bypass | **B** 3.5 bar

Seals and treatments	Filtration rating		
	Axx	Mxx	Pxx
A NBR	•	•	•
V FPM	•	•	•
W NBR compatible with fluids HFA-HFB-HFC	•	•	

Connections	Aux (only LMP 112 - 116)	
	A G 3/4"	G 3/4"
B G 1"	G 3/4"	
C 3/4" NPT	3/4" NPT	
D 1" NPT	3/4" NPT	
E SAE 12 - 1 1/16" - 12 UN	SAE 12 - 1 1/16" - 12 UN	
F SAE 16 - 1 5/16" - 12 UN	SAE 12 - 1 1/16" - 12 UN	

Connection for differential indicator **1** Without | **2** With standard connection | **3** With connection on the opposite side | **6** With two connections on both sides

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 **N** 20 bar | Execution **P01** MP Filtri standard | **Pxx** Customized

FILTER ELEMENT

Element series and size Configuration example: **CU110** | **4** | **A10** | **A** | **N** | **P01**
CU110

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

Seals	Filtration rating		
	Axx	Mxx	Pxx
A NBR	•	•	•
V FPM	•	•	•
W NBR compatible with fluids HFA-HFB-HFC	•	•	

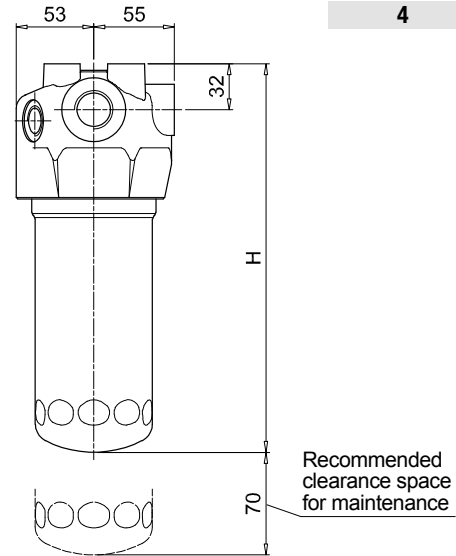
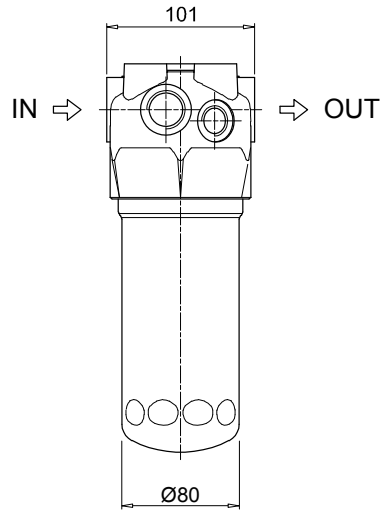
Element Δp **N** 20 bar | Execution **P01** MP Filtri standard | **Pxx** Customized

ACCESSORIES

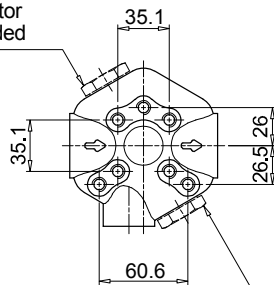
Differential indicators	page		page
DEA Electrical differential indicator	445	DTA Electronic differential indicator	448
DEM Electrical differential indicator	445-446	DVA Visual differential indicator	448
DLA Electrical / visual differential indicator	446-447	DVM Visual differential indicator	448
DLE Electrical / visual differential indicator	447		
Additional features	page		
T2 Plug	449		

LMP110 - LMP112
LMP116

Filter length	H [mm]
1	182
2	215
3	265
4	365

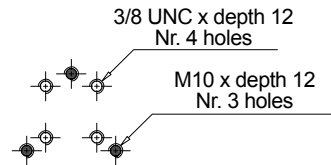


2 - Standard connection for differential indicator
T2 plug not included

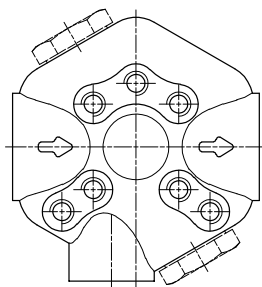


3 - Connection for differential indicator on the opposite side
T2 plug not included

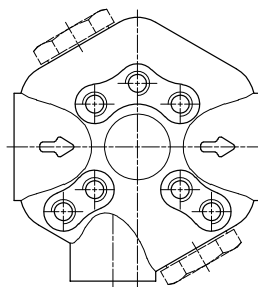
Fixing holes
Option for Metric and UNC screws



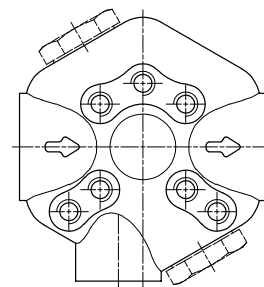
LMP 110



LMP 112



LMP 116



↑
Aux
IN

↓
Aux
OUT

Designation & Ordering code

COMPLETE FILTER

Series and size		Configuration example: LMP118 4 B A D 1 A10 N P01									
LMP118 LMP119											
Length		1 2 3 4									
Bypass valve		B 3.5 bar									
Seals and treatments		Filtration rating									
		Axx	Mxx	Pxx							
A NBR		•	•	•							
V FPM		•	•	•							
W NBR compatible with fluids HFA-HFB-HFC		•	•								
Connections		Aux OUT									
A	G 3/4"	G 3/4"									
B	G 1"	G 3/4"									
C	3/4" NPT	3/4" NPT									
D	1" NPT	3/4" NPT									
E	SAE 12 - 1 1/16" - 12 UN	SAE 12 - 1 1/16" - 12 UN									
F	SAE 16 - 1 5/16" - 12 UN	SAE 12 - 1 1/16" - 12 UN									
Connection for differential indicator											
1 Without											
2 With standard connection											
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			Execution						
		N 20 bar			P01 MP Filtri standard						
					Pxx Customized						

FILTER ELEMENT

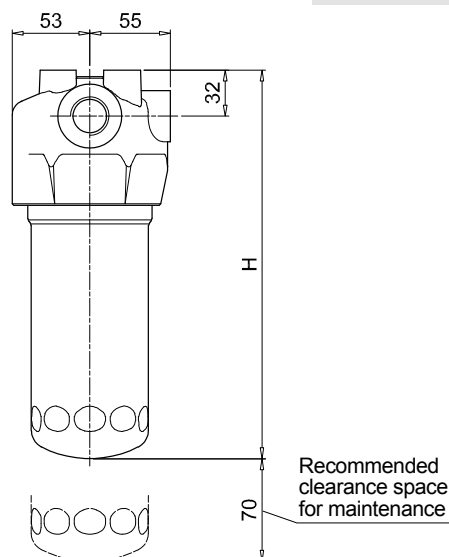
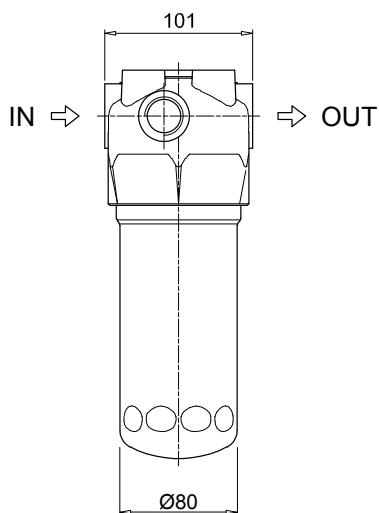
Element series and size		Configuration example: CU110 4 A10 A N P01								
CU110										
Element length		1 2 3 4								
Filtration rating (filter media)										
A03 Inorganic microfiber 3 µm		M25 Wire mesh 25 µm								
A06 Inorganic microfiber 6 µm		M60 Wire mesh 60 µm								
A10 Inorganic microfiber 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								
Seals		Filtration rating								
		Axx	Mxx	Pxx						
A NBR		•	•	•						
V FPM		•	•	•						
W NBR compatible with fluids HFA-HFB-HFC		•	•							
		Element Δp			Execution					
		N 20 bar			P01 MP Filtri standard					
					Pxx Customized					

ACCESSORIES

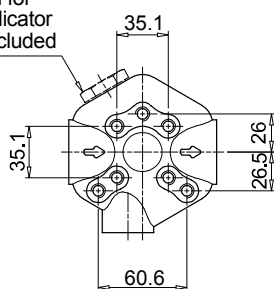
Differential indicators		page			page
DEA	Electrical differential indicator	445	DTA	Electronic differential indicator	448
DEM	Electrical differential indicator	445-446	DVA	Visual differential indicator	448
DLA	Electrical / visual differential indicator	446-447	DVM	Visual differential indicator	448
DLE	Electrical / visual differential indicator	447			
Additional features		page			
T2	Plug	449			

LMP118 - LMP119

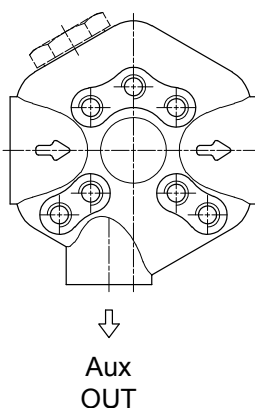
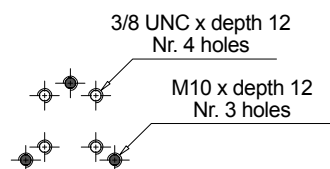
Filter length	H [mm]
1	182
2	215
3	265
4	365



Connection for differential indicator
T2 plug not included



Fixing holes
Option for Metric and UNC screws



Designation & Ordering code

COMPLETE FILTER

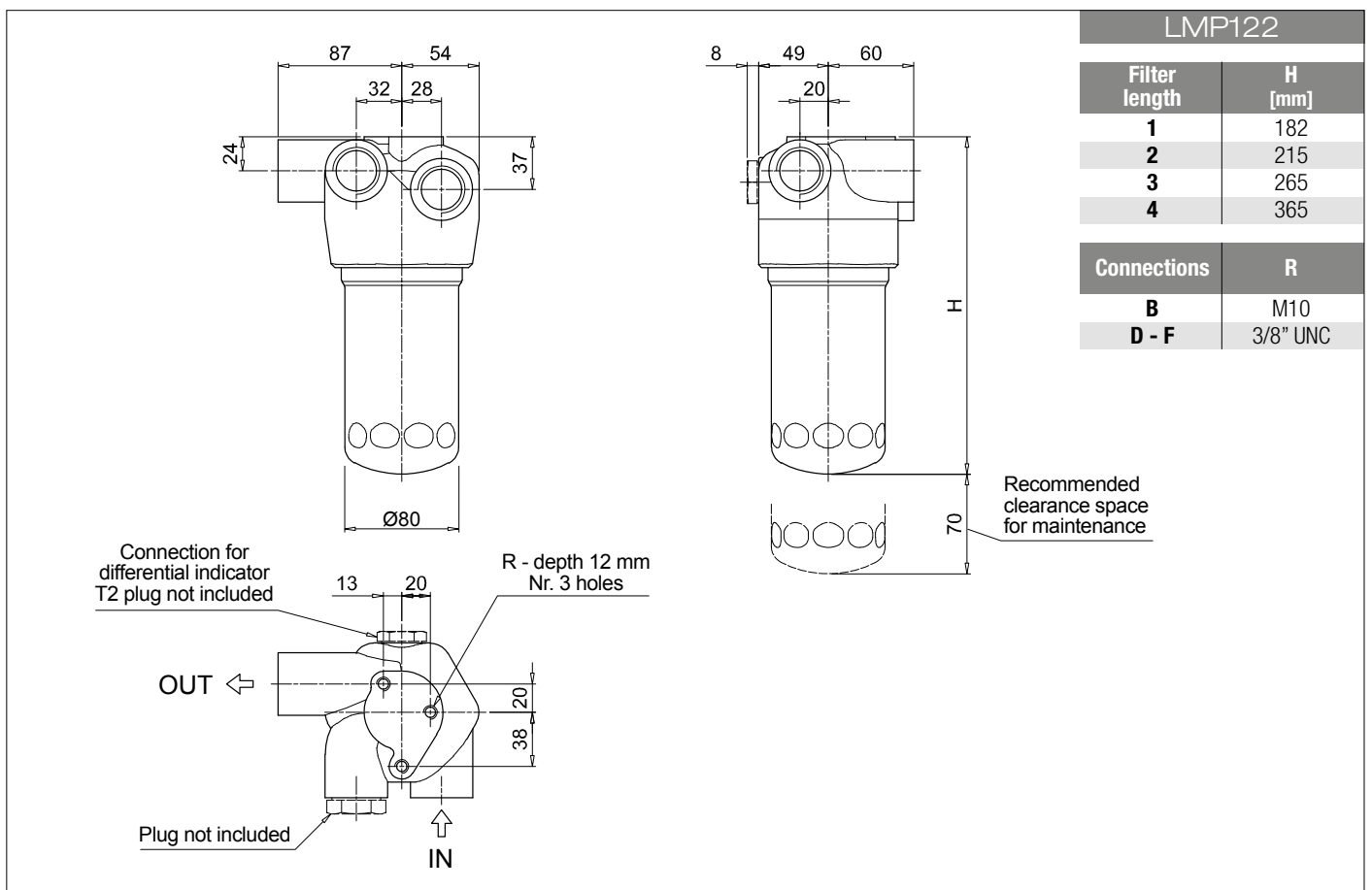
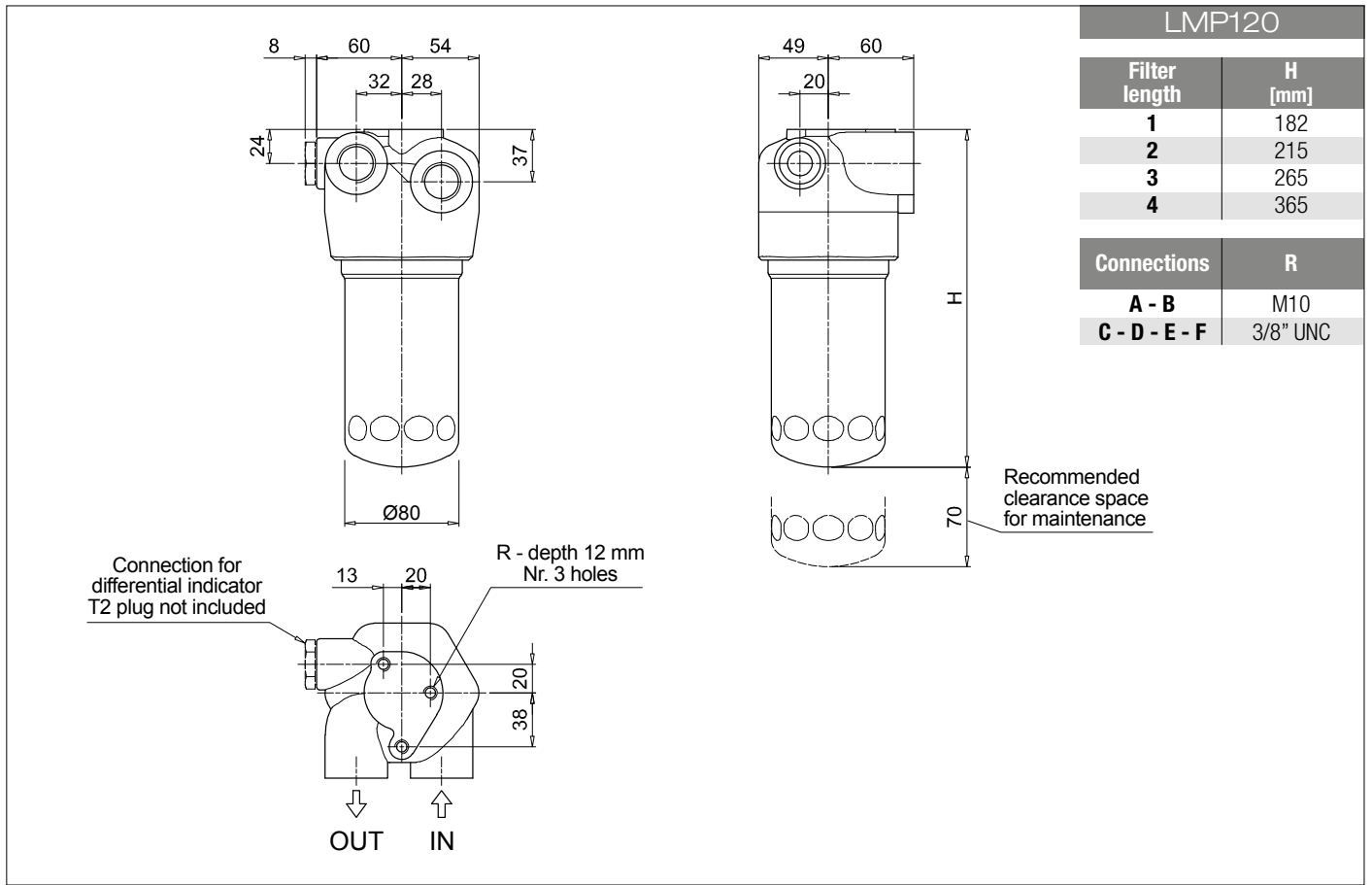
Series and size		Configuration example: LMP120 4 B A D 1 A10 N P01									
LMP120 LMP122											
Length											
1 2 3 4											
Bypass valve											
S Without bypass		B 3.5 bar									
Seals and treatments		Filtration rating									
		Axx	Mxx	Pxx							
A NBR		•	•	•							
V FPM		•	•	•							
W NBR compatible with fluids HFA-HFB-HFC		•	•								
Connections		LMP120		LMP122							
A G 3/4"		•									
B G 1"		•		•							
C 3/4" NPT		•									
D 1" NPT		•		•							
E SAE 12 - 1 1/16" - 12 UN		•									
F SAE 16 - 1 5/16" - 12 UN		•		•							
Connection for differential indicator											
1 Without											
2 With standard connection											
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		Execution					
				N 20 bar		P01 MP Filtri standard					
						Pxx Customized					

FILTER ELEMENT

Element series and size		Configuration example: CU110 4 A10 A N P01									
CU110											
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									
Seals		Filtration rating									
		Axx	Mxx	Pxx							
A NBR		•	•	•							
V FPM		•	•	•							
W NBR compatible with fluids HFA-HFB-HFC		•	•								
				Element Δp		Execution					
				N 20 bar		P01 MP Filtri standard					
						Pxx Customized					

ACCESSORIES

Differential indicators		page			page
DEA Electrical differential indicator		445	DTA Electronic differential indicator		448
DEM Electrical differential indicator		445-446	DVA Visual differential indicator		448
DLA Electrical / visual differential indicator		446-447	DVM Visual differential indicator		448
DLE Electrical / visual differential indicator		447			
Additional features		page			
T2 Plug		449			



Designation & Ordering code

COMPLETE FILTER

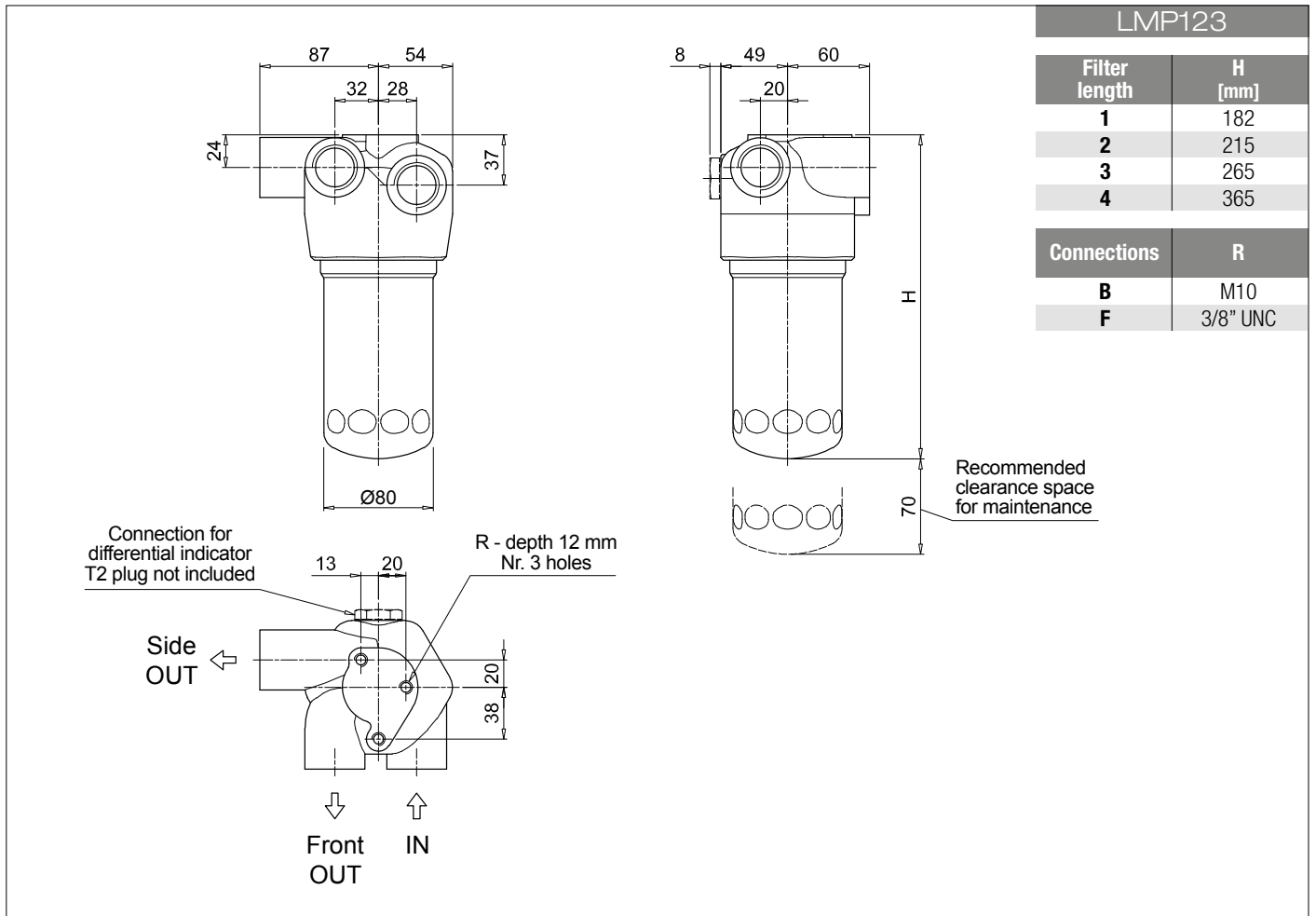
Series and size		Configuration example: LMP123 4 R A F 1 A10 N P01									
LMP123											
Length		1 2 3 4									
Valves	Bypass	OUT to cooler	Check valve								
C	without	front	2 bar								
D			3 bar								
G		side	2 bar								
H			3 bar								
M	3.5 bar	front	2 bar								
N			3 bar								
Q		side	2 bar								
R			3 bar								
Seals and treatments		Filtration rating									
		Axx	Mxx	Pxx							
A	NBR	•	•	•							
V	FPM	•	•	•							
W	NBR compatible with fluids HFA-HFB-HFC	•	•								
Connections											
B	G 1"										
F	SAE 16 - 1 5/16" - 12 UN										
Connection for differential indicator											
1	Without										
2	With standard connection										
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		Execution							
		N 20 bar		P01 MP Filtri standard Pxx Customized							

FILTER ELEMENT

Element series and size		Configuration example: CU110 4 A10 A N P01									
CU110											
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							
Seals		Filtration rating									
		Axx	Mxx	Pxx							
A	NBR	•	•	•							
V	FPM	•	•	•							
W	NBR compatible with fluids HFA-HFB-HFC	•	•								
		Element Δp		Execution							
		N 20 bar		P01 MP Filtri standard Pxx Customized							

ACCESSORIES

Differential indicators		page			page
DEA	Electrical differential indicator	445	DTA	Electronic differential indicator	448
DEM	Electrical differential indicator	445-446	DVA	Visual differential indicator	448
DLA	Electrical / visual differential indicator	446-447	DVM	Visual differential indicator	448
DLE	Electrical / visual differential indicator	447			
Additional features		page			
T2	Plug	449			

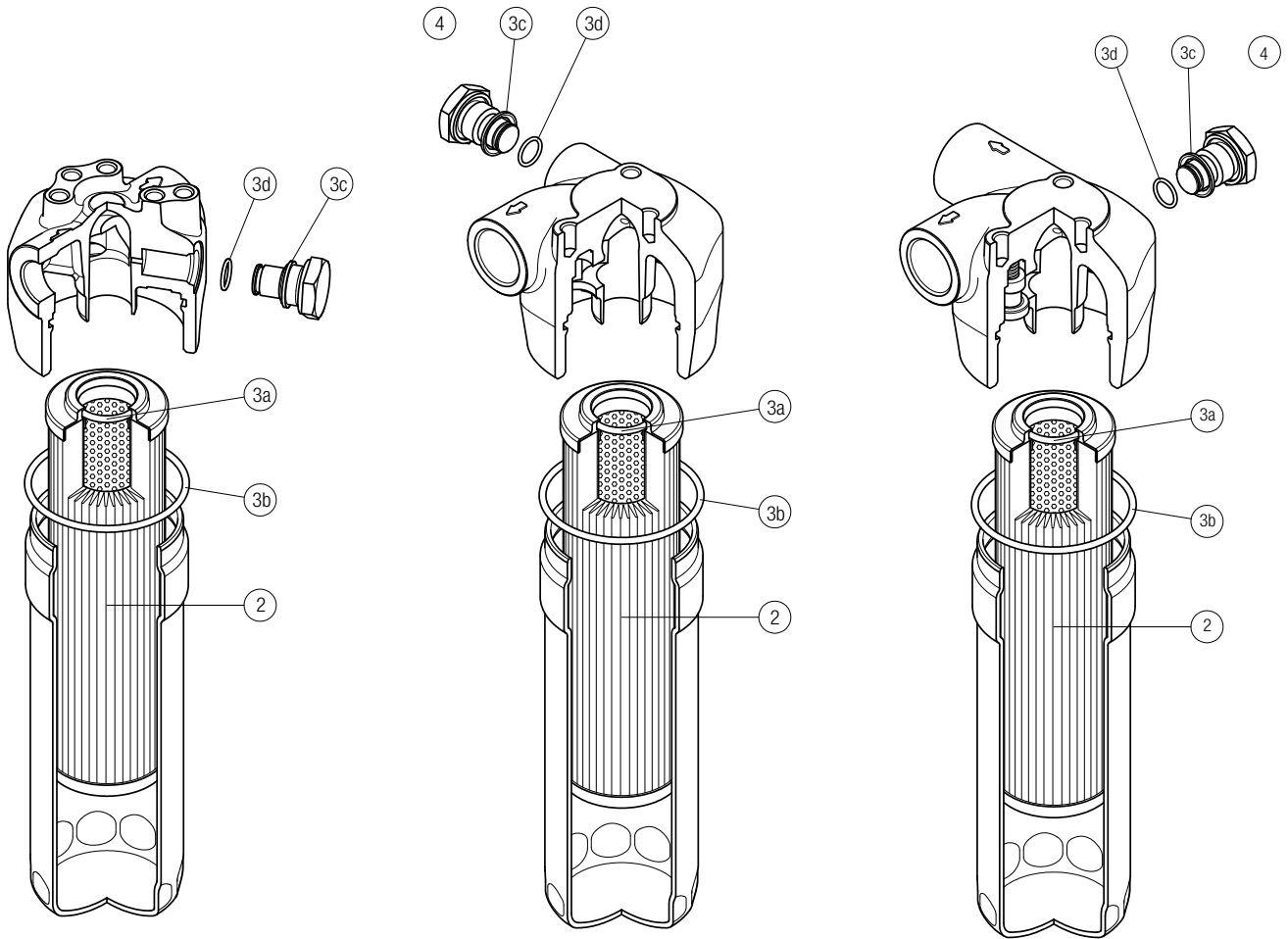


Order number for spare parts

LMP 110 - 112 - 116 - 118 - 119

LMP 120

LMP 122 - 123



Item:	Q.ty: 1 pc.		Q.ty: 1 pc.		Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug		
LMP 110-112-116 -118-119	See order table	NBR	FPM	NBR	FPM	
LMP 120		02050478	02050479	T2H	T2V	
LMP 122-123						

LMP 210-211

Maximum working pressure up to 6 MPa (60 bar) - Flow rate up to 365 l/min



LMP 210-211 GENERAL INFORMATION

Description

Technical data

Low & Medium Pressure filters

Maximum working pressure up to 6 MPa (60 bar)
Flow rate up to 365 l/min

LMP210 is a range of versatile low pressure filter for transmission, protection of sensitive components in low pressure hydraulic systems and filtration of the coolant into the machine tools. They are also suitable for the off-line filtration of small reservoirs. They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Flanged connections up to 1 1/2", for a maximum flow rate of 365 l/min (LMP210)
- Female threaded connections up to 1 1/2", for a maximum return flow rate of 365 l/min (LMP211)
- Fine filtration rating, to get a good cleanliness level into the system
- Water removal elements, to remove the free water from the hydraulic fluid. For further information, see the Contamination Management document and the dedicate leaflet.
- Bypass valve, to relieve excessive pressure drop across the filter media
- Visual, electrical and electronic differential clogging indicators

Common applications:

Delivery lines, in any low pressure industrial equipment or mobile machines

Filter housing materials

- Head: Aluminium
- Bowl: Cataphoretic Painted Steel
- Bypass valve: AISI 304 - Nylon

Pressure

- Test pressure: 9 MPa (90 bar)
- Burst pressure: 21 MPa (210 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 6 MPa (60 bar)

Bypass valve

- Opening pressure 350 kPa (3.5 bar) \pm 10%
- Other opening pressures on request.

Δp element type

- Microfibre filter elements - series N: 20 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

Connections

Inlet/Outlet In-Line

Note

LMP 210 - 211 filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]			Volumes [dm ³]				
	Length	1	2	3	Length	1	2	3
LMP 210-211		3.10	4.80	6.40		1.60	2.10	2.80

Filter series	Length	Filter element design - N Series									
		A03	A06	A10	A16	A25	M25	M60	M90	P10	P25
LMP 210	1	106	130	190	200	221	286	287	287	261	265
	2	153	175	220	237	249	288	289	290	265	269
	3	204	214	248	260	265	289	290	291	277	281
LMP 211	1	118	149	227	240	269	358	359	360	324	330
	2	178	207	268	292	307	361	362	363	329	335
	3	247	260	306	323	329	362	363	364	345	351

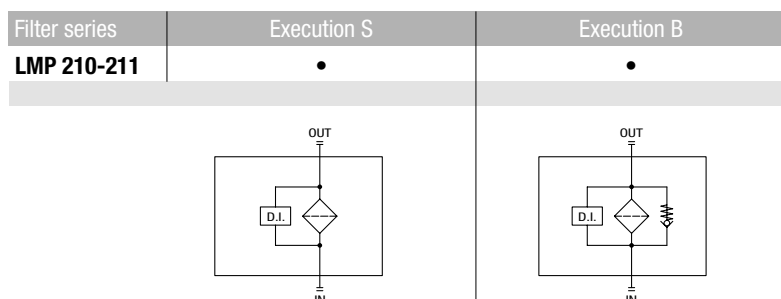
Maximum flow rate for a complete low and medium pressure filter with a pressure drop $\Delta p = 0.7$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

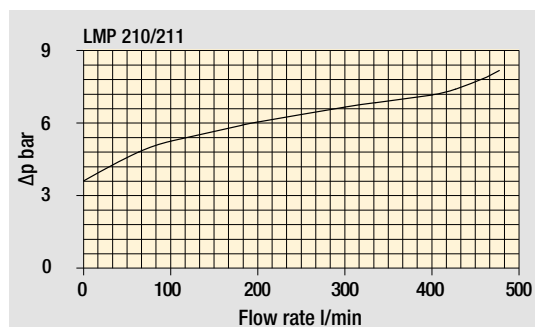
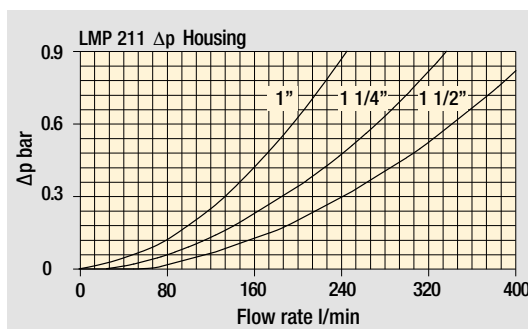
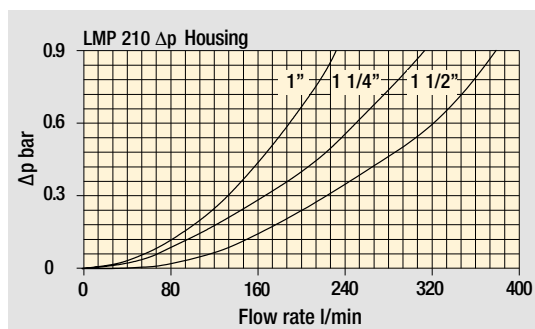
You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols



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.

LMP 210

Designation & Ordering code

COMPLETE FILTER

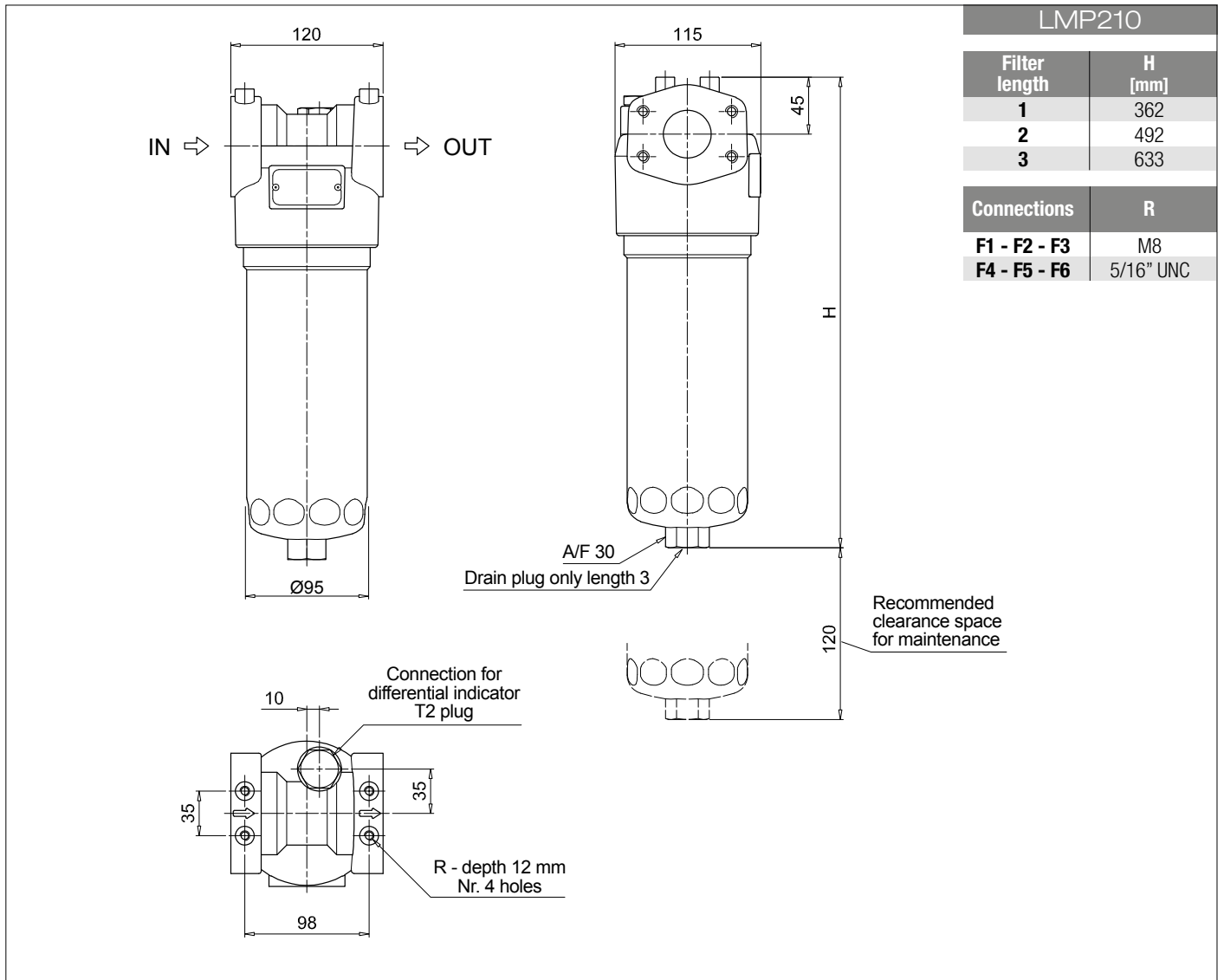
Series and size	Configuration example: LMP210 3 B A F1 A10 N P01									
LMP210										
Length	1 2 3									
Bypass valve	S Without bypass B 3.5 bar									
Seals and treatments	Filtration rating									
	Axx	Mxx	Pxx							
A NBR	•	•	•							
V FPM	•	•	•							
W NBR compatible with fluids HFA-HFB-HFC	•	•								
Connections										
F1 1" SAE 3000 psi/M										
F2 1 1/4" SAE 3000 psi/M										
F3 1 1/2" SAE 3000 psi/M										
F4 1" SAE 3000 psi/UNC										
F5 1 1/4" SAE 3000 psi/UNC										
F6 1 1/2" SAE 3000 psi/UNC										
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									
WA025 Water absorber inorganic microfiber 25 µm										
	Element Δp			Execution						
	N 20 bar			P01 MP Filtri standard Pxx Customized						

FILTER ELEMENT

Element series and size	Configuration example: CU210 3 A10 A N P01						
CU210							
Element length	1 2 3						
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						
WA025 Water absorber inorganic microfiber 25 µm							
Seals	Filtration rating						
	Axx	Mxx	Pxx				
A NBR	•	•	•				
V FPM	•	•	•				
W NBR compatible with fluids HFA-HFB-HFC	•	•					
	Element Δp			Execution			
	N 20 bar			P01 MP Filtri standard Pxx Customized			

ACCESSORIES

Differential indicators	page		page
DEA Electrical differential indicator	445	DTA Electronic differential indicator	448
DEM Electrical differential indicator	445-446	DVA Visual differential indicator	448
DLA Electrical / visual differential indicator	446-447	DVM Visual differential indicator	448
DLE Electrical / visual differential indicator	447		
Additional features	page		
T2 Plug	449		



LMP210	
Filter length	H [mm]
1	362
2	492
3	633
Connections	R
F1 - F2 - F3	M8
F4 - F5 - F6	5/16" UNC

LMP 211

Designation & Ordering code

COMPLETE FILTER

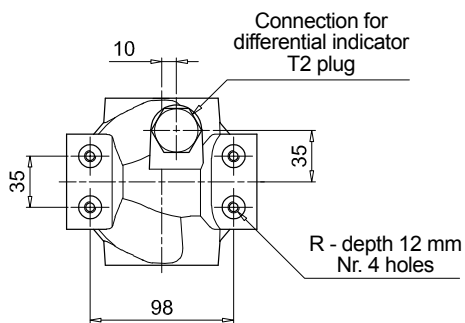
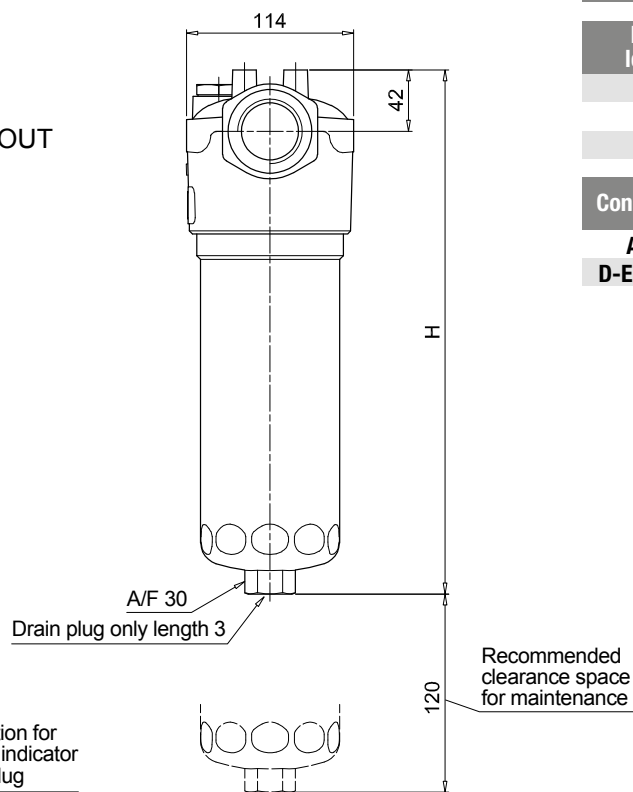
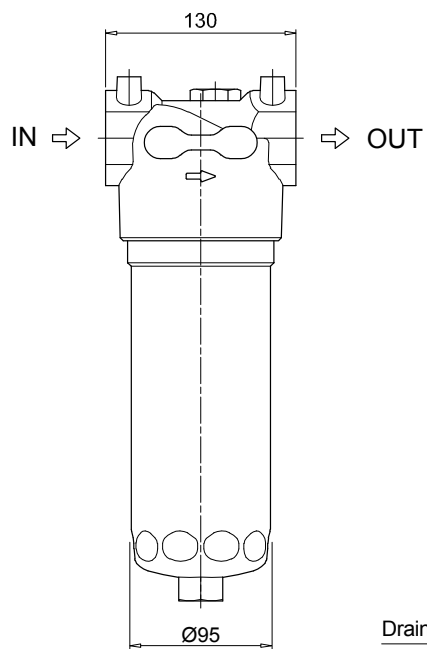
Series and size	Configuration example: LMP211 3 B A D 6 A10 N P01									
LMP211										
Length	1 2 3									
Bypass valve	S Without bypass B 3.5 bar									
Seals and treatments	Filtration rating									
A NBR	Axx	Mxx	Pxx							
V FPM	•	•	•							
W NBR compatible with fluids HFA-HFB-HFC	•	•								
Connections										
A G 1"										
B G 1 1/4"										
C G 1 1/2"										
D 1" NPT										
E 1 1/4" NPT										
F 1 1/2" NPT										
G SAE 16 - 1 5/16" - 12 UN										
H SAE 20 - 1 5/8" - 12 UN										
I SAE 24 - 1 7/8" - 12 UN										
Connection for differential indicator	6 With plugged connection									
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									
WA025 Water absorber inorganic microfiber 25 µm										
			Element Δp	N 20 bar						
						Execution	P01 MP Filtri standard Pxx Customized			

FILTER ELEMENT

Element series and size	Configuration example: CU210 3 A10 A N P01							
CU210								
Element length	1 2 3							
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							
WA025 Water absorber inorganic microfiber 25 µm								
Seals	Filtration rating							
A NBR	Axx	Mxx	Pxx					
V FPM	•	•	•					
W NBR compatible with fluids HFA-HFB-HFC	•	•						
			Element Δp	N 20 bar				
						Execution	P01 MP Filtri standard Pxx Customized	

ACCESSORIES

Differential indicators	page		page
DEA Electrical differential indicator	445	DTA Electronic differential indicator	448
DEM Electrical differential indicator	445-446	DVA Visual differential indicator	448
DLA Electrical / visual differential indicator	446-447	DVM Visual differential indicator	448
DLE Electrical / visual differential indicator	447		
Additional features	page		
T2 Plug	449		



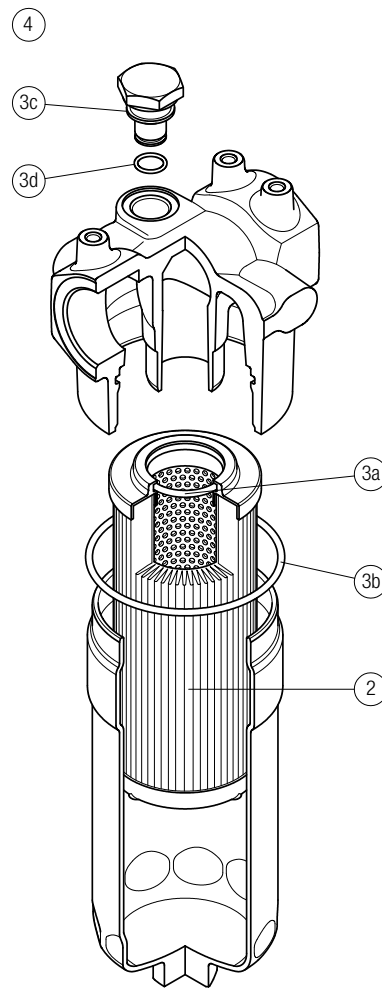
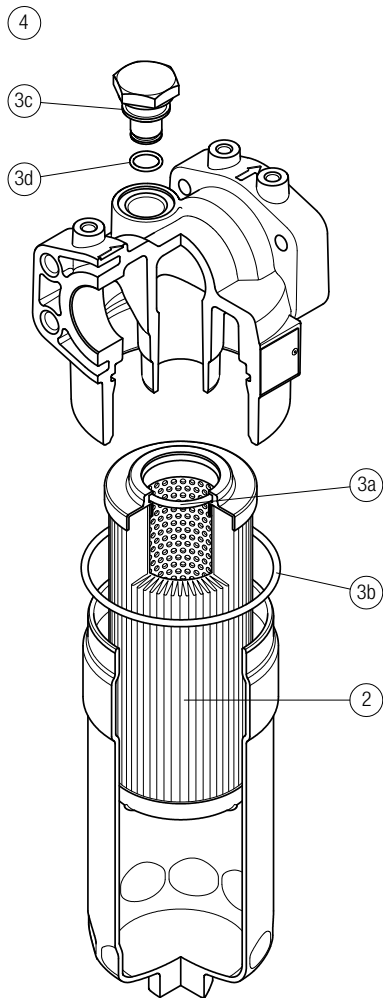
LMP211	
Filter length	H [mm]
1	358
2	488
3	629
Connections	R
A-B-C	M8
D-E-F-G-H-I	5/16" UNC

LMP 210-211 SPARE PARTS

Order number for spare parts

LMP 210

LMP 211



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug	
LMP 210-211	See order table	NBR	FPM	NBR	FPM
	2	02050435	02050436	T2H	T2V

LMP 400-401 & 430-431 series

Maximum working pressure up to 6 MPa (60 bar) - Flow rate up to 780 l/min



Description

Technical data

Low & Medium Pressure filters

Maximum working pressure up to 6 MPa (60 bar)
Flow rate up to 780 l/min

LMP400 is a range of low pressure filter with large filtration surface mainly suitable for lubrication, off-line filtration of the reservoirs and filtration equipment.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Female threaded connections up to 2" and flanged connections up to 2 1/2", for a maximum flow rate of 780 l/min
- In line or 90° connections, to meet any type of application
- Base-mounting design also available, for ease of the replacement of the filter element
- Fine filtration rating, to get a good cleanliness level into the system
- Water removal elements, to remove the free water from the hydraulic fluid. For further information, see the Contamination Management document and the dedicate leaflet.
- Bypass valve, to relieve excessive pressure drop across the filter media
- Vent ports, to avoid air trapped into the filter going into the system
- Drain ports, to remove the fluid from the housing prior the maintenance work
- Visual, electrical and electronic differential clogging indicators

Common applications:

- Off-line filtration of reservoirs
- Filtration systems

Filter housing materials

- Head: Anodized Aluminium
- Housing: Anodized Aluminium
- Bypass valve: Steel

Pressure LMP 400 length 2 -3 - 4

- Working pressure: 6 MPa (60 bar)
- Test pressure: 9 MPa (90 bar)
- Burst pressure: 21 MPa (210 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 6 MPa (60 bar)

Pressure LMP 400 length 5 - 6

- Working pressure: 5 MPa (50 bar)
- Test pressure: 7.5 MPa (75 bar)
- Burst pressure: 15 MPa (150 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 5 MPa (50 bar)

Bypass valve

- Opening pressure 350 kPa (3.5 bar) ±10%
- Other opening pressures on request.

Δp element type

- Microfibre filter elements - series N - W: 20 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

Connections

LMP 400 - 430: In-line Inlet/Outlet
 LMP 401 - 431: 90° Inlet/Outlet

Note

LMP 400 filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]						Volumes [dm ³]					
	Length	2	3	4	5	6	Length	2	3	4	5	6
LMP 400-401 & 430-431		7.20	8.10	8.80	11.90	14.40		3.50	5.00	6.50	9.50	13.50

Filter series	Length	Filter element design - N Series							
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
LMP 400	2	205	244	370	411	515	720	524	556
	3	280	333	474	515	602	760	637	660
	4	347	400	535	564	637	769	660	688
	5	459	501	610	660	717	781	700	721
	6	504	575	676	689	728	783	708	727
LMP 401	2	200	236	347	382	468	628	475	501
	3	268	315	434	468	537	659	565	582
	4	328	373	484	507	565	665	582	603
	5	423	456	544	582	626	674	613	629
	6	459	516	594	604	634	676	619	633
LMP 430	5	459	501	610	660	717	781	700	721
	6	504	575	676	689	728	783	708	727
LMP 431	5	423	456	544	582	626	674	613	629
	6	459	516	594	604	634	676	619	633

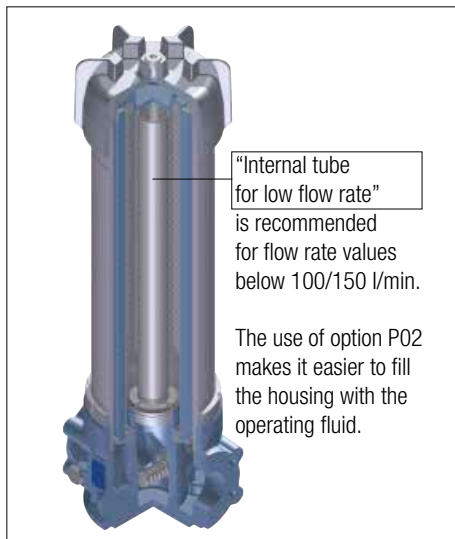
Maximum flow rate for a complete low and medium pressure filter with a pressure drop $\Delta p = 0.7$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

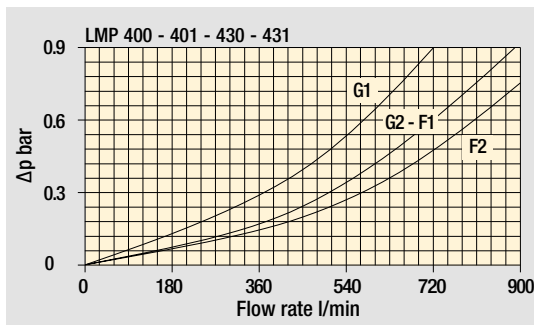
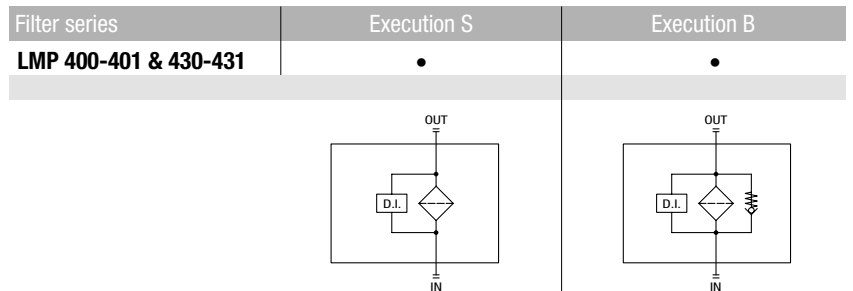
For different pressure drop or fluid viscosity we recommend to use our selection software available on www.mpfiltri.com.

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

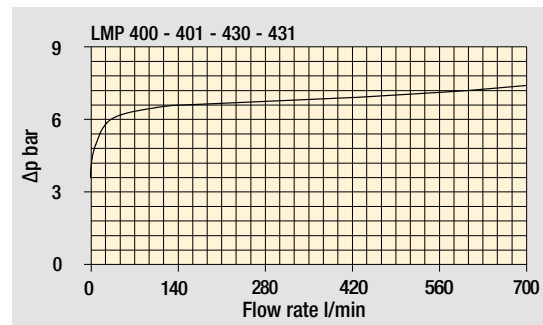
LMP 430-431: execution P02



Hydraulic symbols



Filter housings Δp pressure drop



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.

LMP 400-401

Designation & Ordering code

COMPLETE FILTER

Series and size		Configuration example: LMP401 3 B A G1 A10 N P01									
LMP400 LMP401											
Length											
2 3 4 5 6											
Bypass valve											
S Without bypass		B 3.5 bar									
Seals and treatments		Filtration rating									
		Axx	Mxx	Pxx							
A NBR		•	•	•							
V FPM		•	•	•							
W NBR compatible with fluids HFA-HFB-HFC		•	•								
Connections											
G1 G 1 1/2"		F1 2" SAE 3000 psi/M									
G2 G 2"		F2 2 1/2" SAE 3000 psi/M									
G3 1 1/2" NPT		F3 2" SAE 3000 psi/UNC									
G4 2" NPT		F4 2 1/2" SAE 3000 psi/UNC									
G5 SAE 24 - 1 7/8" - 12 UN											
G6 SAE 32 - 2 1/2" - 12 UN											
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									
WA025 Water absorber inorganic microfiber 25 µm											
Element Δp		Execution									
N 20 bar		Filter length									
		2 3 4 5 6									
		P01 MP Filtri standard									
		P02 Maintenance from the bottom of the housing									
		Pxx Customized									

FILTER ELEMENT

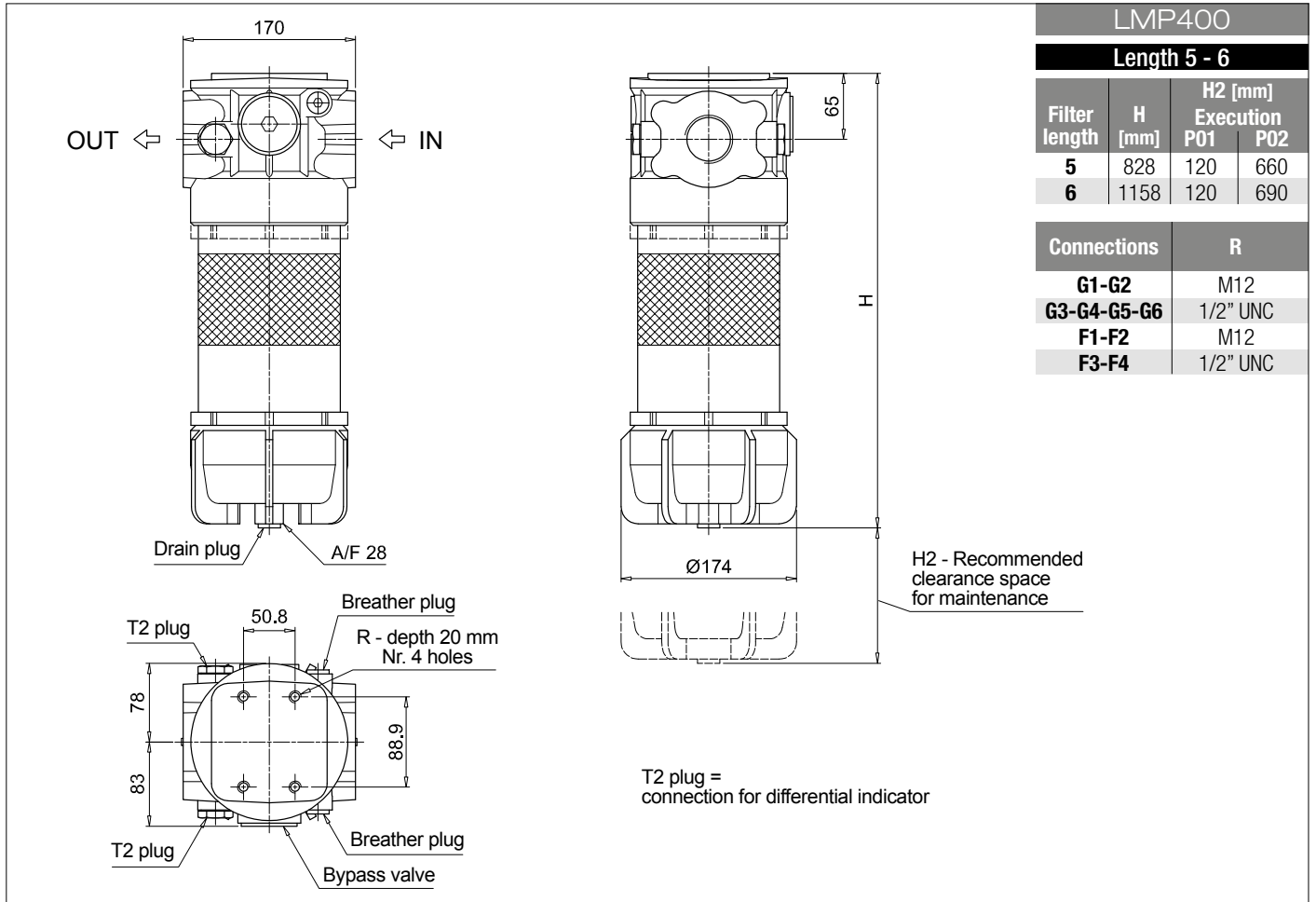
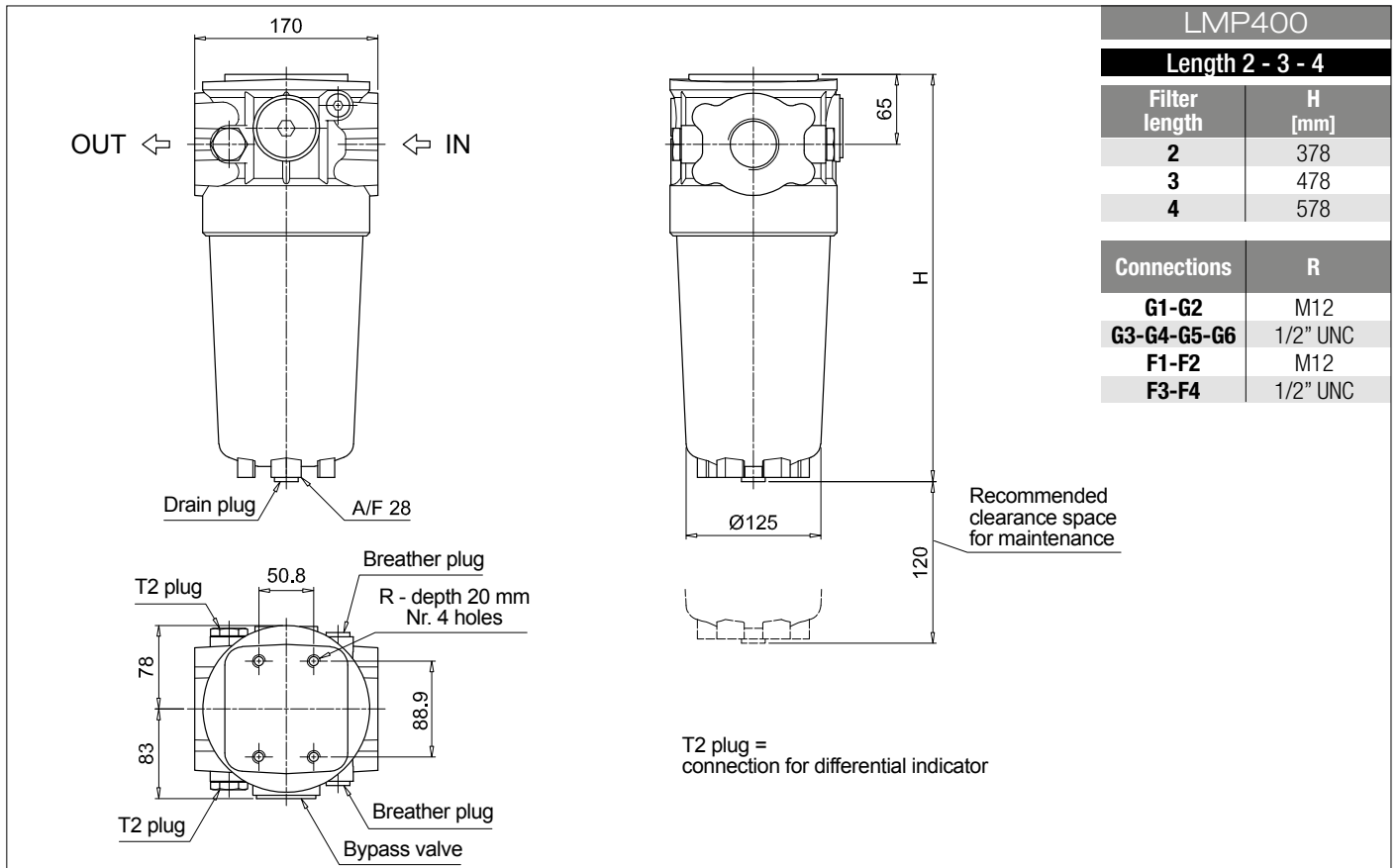
Element series and size		Configuration example: CU400 3 A10 A N P01									
CU400											
Element length											
2 3 4 5 6											
Filtration rating (filter media)											
A03 Inorganic microfiber 3 µm		M25 Wire mesh 25 µm									
A06 Inorganic microfiber 6 µm		M60 Wire mesh 60 µm									
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									
WA025 Water absorber inorganic microfiber 25 µm											
Seals		Filtration rating									
		Axx	Mxx	Pxx							
A NBR		•	•	•							
V FPM		•	•	•							
W NBR compatible with fluids HFA-HFB-HFC		•	•								
Element Δp		Execution									
N 20 bar		Filter length									
		2 3 4 5 6									
		P01 MP Filtri standard									
		Pxx Customized									

ACCESSORIES

Differential indicators		page			page
DEA Electrical differential indicator		445	DTA Electronic differential indicator		448
DEM Electrical differential indicator		445-446	DVA Visual differential indicator		448
DLA Electrical / visual differential indicator		446-447	DVM Visual differential indicator		448
DLE Electrical / visual differential indicator		447			
Additional features		page			
T2 Plug		449			

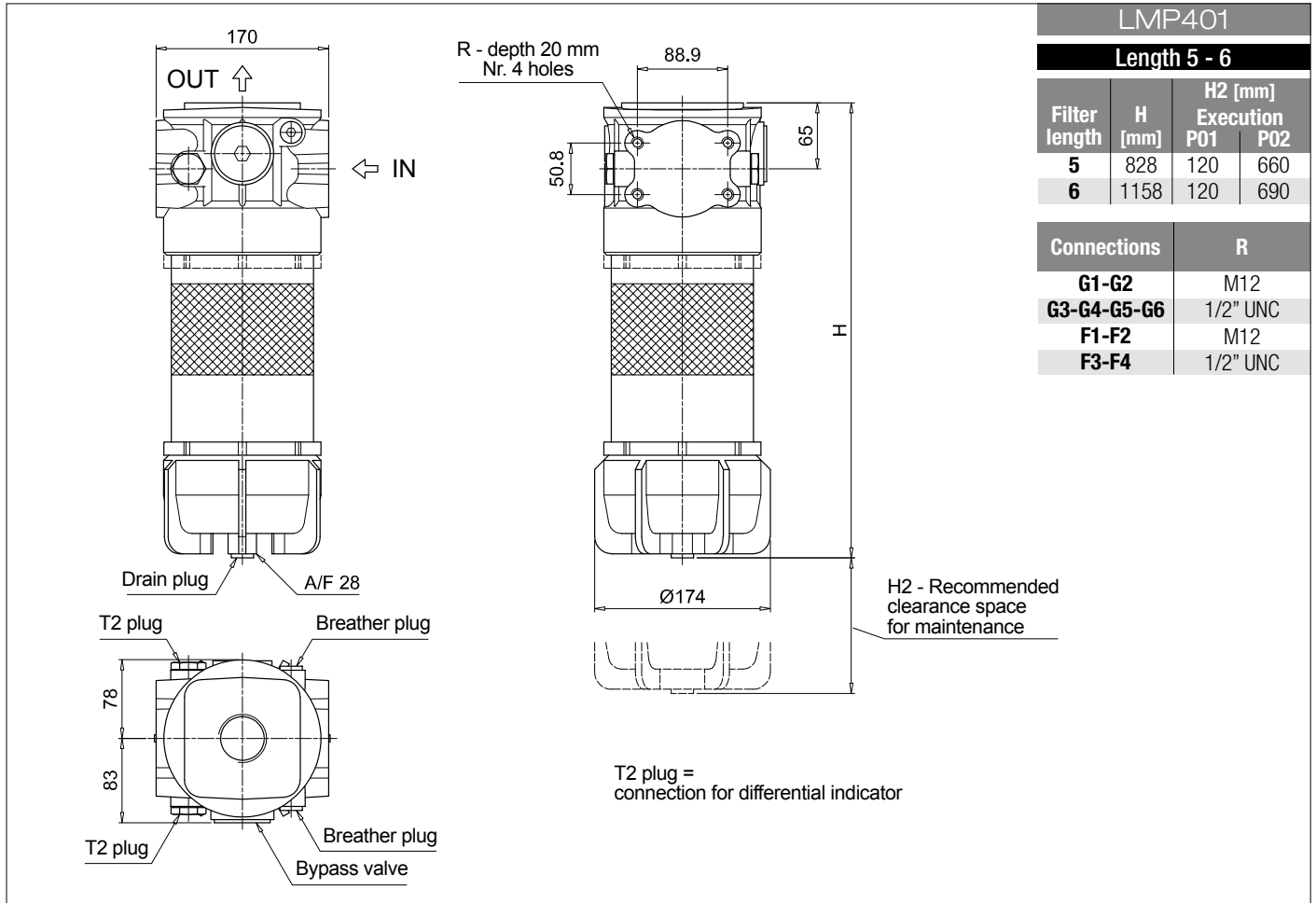
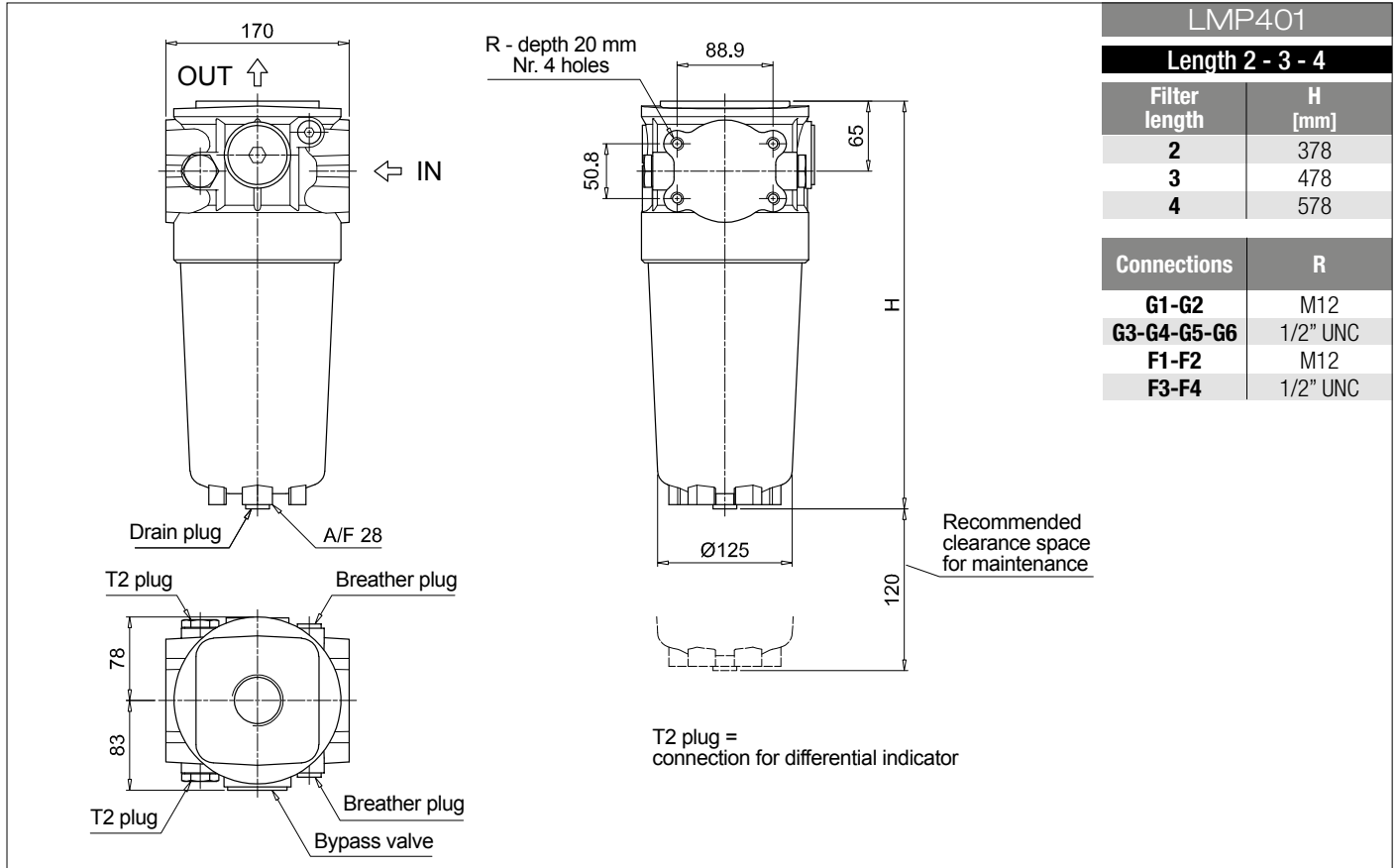
LMP 400-401

Dimensions



LMP 400-401

Dimensions



LMP 430-431

Designation & Ordering code

COMPLETE FILTER

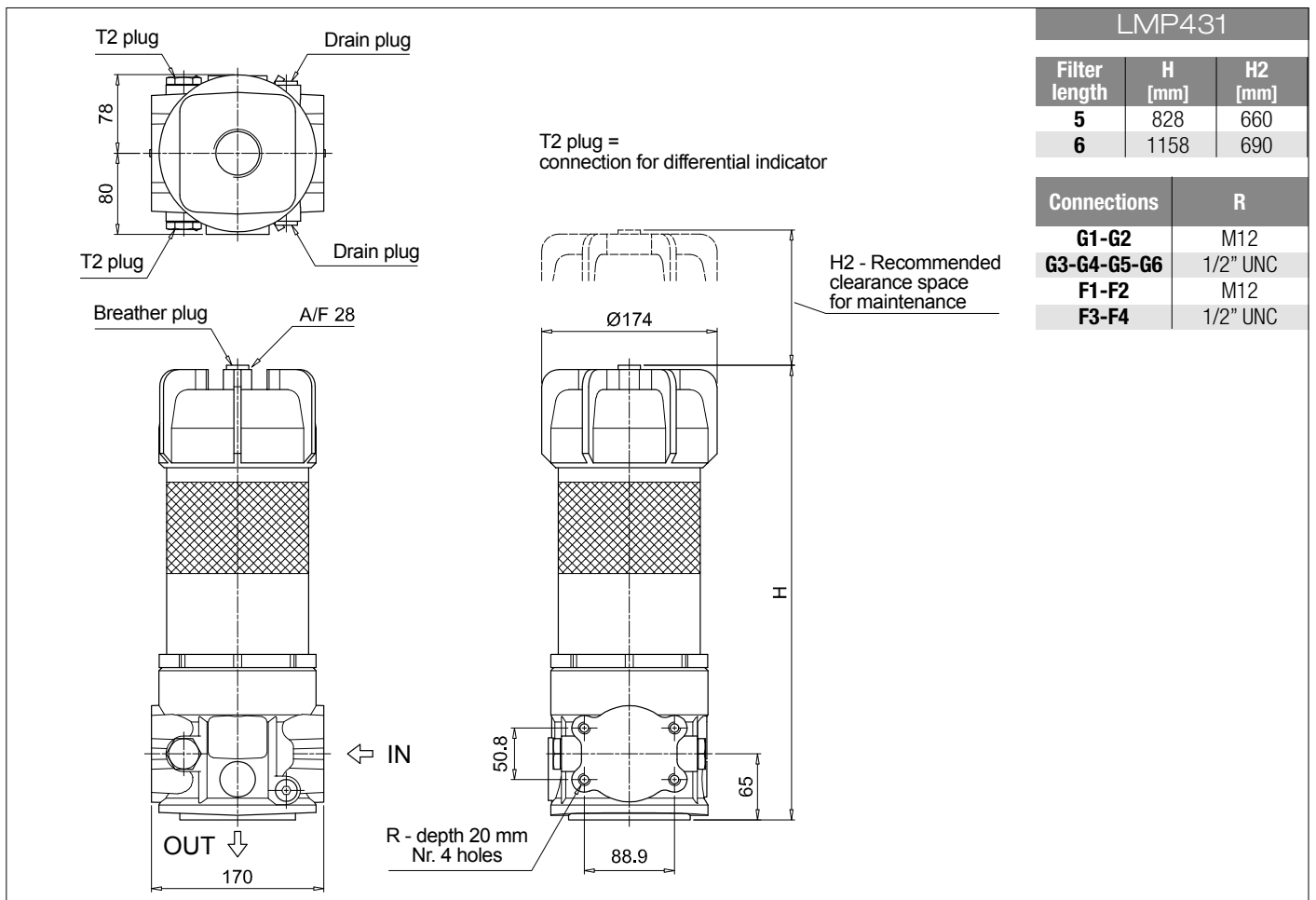
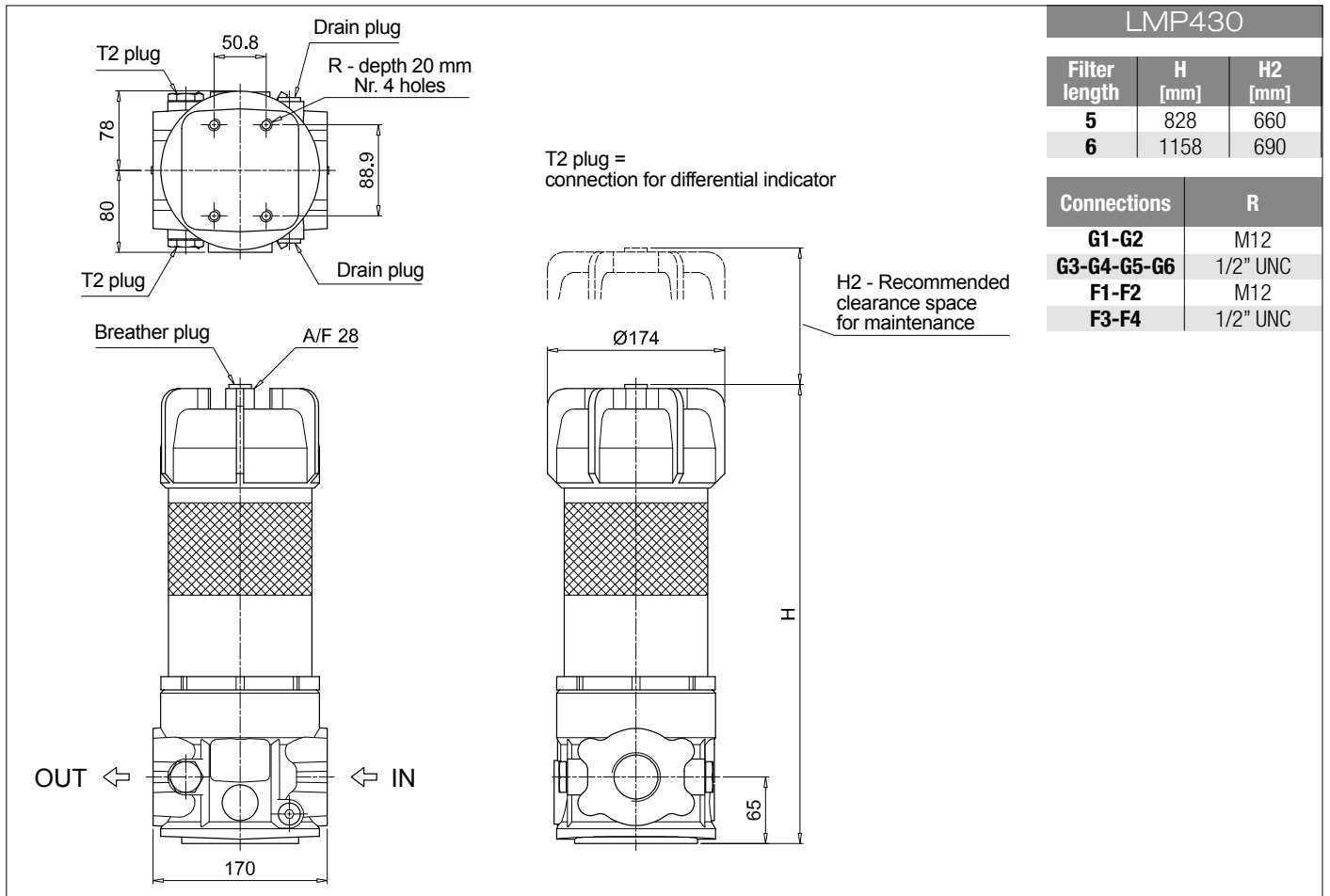
Series and size		Configuration example: LMP431 5 B A G1 A10 N P01									
LMP430 LMP431											
Length											
5 6											
Bypass valve											
S Without bypass		B 3.5 bar									
Seals and treatments		Filtration rating									
		Axx	Mxx	Pxx							
A NBR		•	•	•							
V FPM		•	•	•							
W NBR compatible with fluids HFA-HFB-HFC		•	•								
Connections											
G1 G 1 1/2"		F1 2" SAE 3000 psi/M									
G2 G 2"		F2 2 1/2" SAE 3000 psi/M									
G3 1 1/2" NPT		F3 2" SAE 3000 psi/UNC									
G4 2" NPT		F4 2 1/2" SAE 3000 psi/UNC									
G5 SAE 24 - 1 7/8" - 12 UN											
G6 SAE 32 - 2 1/2" - 12 UN											
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									
WA025 Water absorber inorganic microfiber 25 µm											
Element Δp		Execution									
N 20 bar		P01 MP Filtri standard									
		P02 With internal tube for low flow rate									
		Pxx Customized									

FILTER ELEMENT

Element series and size		Configuration example: CU400 5 A10 A N P01									
CU400											
Element length											
5 6											
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									
WA025 Water absorber inorganic microfiber 25 µm											
Seals		Filtration rating									
		Axx	Mxx	Pxx							
A NBR		•	•	•							
V FPM		•	•	•							
W NBR compatible with fluids HFA-HFB-HFC		•	•								
Element Δp		Execution									
N 20 bar		P01 MP Filtri standard									
		Pxx Customized									

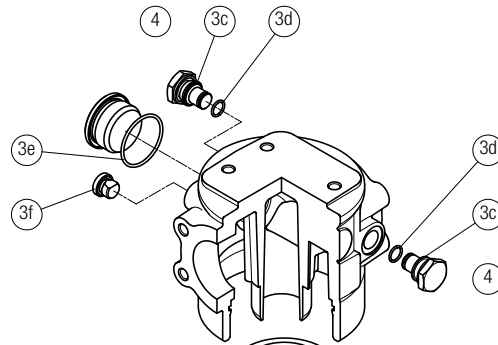
ACCESSORIES

Differential indicators	page		page
DEA Electrical differential indicator	445	DTA Electronic differential indicator	448
DEM Electrical differential indicator	445-446	DVA Visual differential indicator	448
DLA Electrical / visual differential indicator	446-447	DVM Visual differential indicator	448
DLE Electrical / visual differential indicator	447		
Additional features		page	
T2 Plug	449		

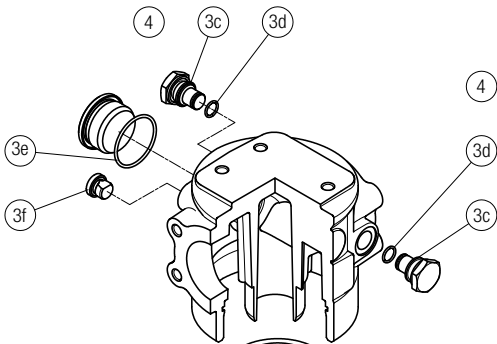


Order number for spare parts

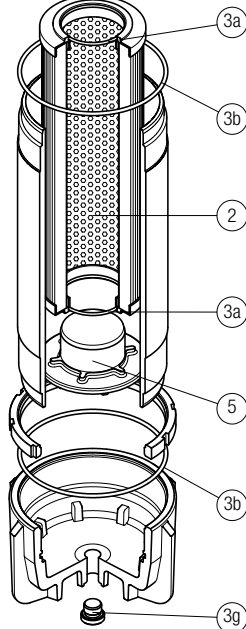
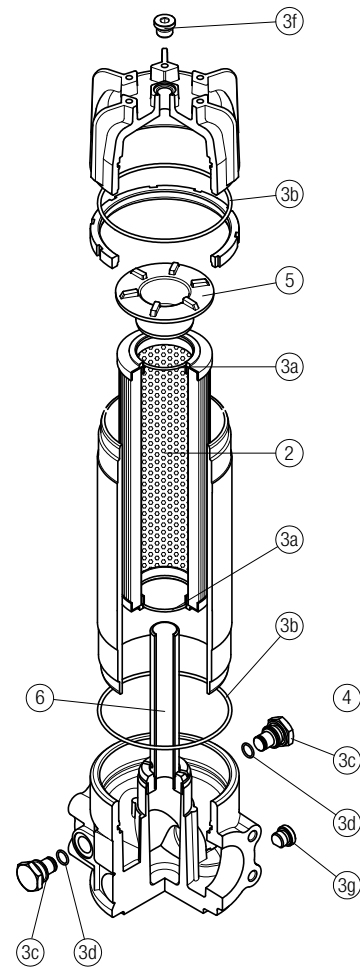
LMP 400 - 401
length 2 - 3 - 4



LMP 400 - 401
length 5 - 6



LMP 430 - 431
length 5 - 6



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 2 pcs.	Q.ty: 2 pcs.	Q.ty: 1 pc.
Filter series	2	3 (3a ÷ 3g)	4	5	6
Filter element	See order table				
Seal Kit code number		NBR FPM	Indicator connection plug	Housing spigot	Internal tube for low flow rate, execution P02
LMP 400-401 length 2-3-4		02050391 02050392	NBR FPM	no bypass with bypass	
LMP 400-401 length 5-6		02050393 02050394	T2H T2V	01044108	
LMP 430-431 length 5-6		02050393 02050394		01044108 02001414	Length 5: 02025041 Length 6: 02025042

LMP 950-951 series

Maximum working pressure up to 3 MPa (30 bar) - Flow rate up to 2400 l/min



LMP 950-951 GENERAL INFORMATION

Description

Technical data

Low & Medium Pressure filters

Maximum working pressure up to 3 MPa (30 bar)
Flow rate up to 2400 l/min

LMP950 is a range of low pressure filter with large filtration surface mainly suitable for lubrication, off-line filtration of the reservoirs and filtration equipment.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Flanged connections up to 4", for a maximum flow rate of 2400 l/min
- In line or 90° connections, to meet any type of application
- Base-mounting design, for ease of the replacement of the filter element
- Fine filtration rating, to get a good cleanliness level into the system
- Water removal elements, to remove the free water from the hydraulic fluid. For further information, see the Contamination Management document and the dedicate leaflet.
- Bypass valve, to relieve excessive pressure drop across the filter media
- Vent ports, to avoid air trapped into the filter going into the system
- Drain ports, to remove the fluid from the housing prior the maintenance work
- Visual, electrical and electronic differential clogging indicators

Common applications:

- Off-line filtration of reservoirs
- Filtration systems
- Lubrication systems

Filter housing materials

- Head: Anodized Aluminium
- Housing: Anodized Aluminium
- Bypass valve: Anodized Aluminium

Pressure

- Test pressure: 4,5 MPa (45 bar)
- Burst pressure: 12 MPa (120 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 3 MPa (30 bar)

Bypass valve

- Opening pressure 350 kPa (3.5 bar) ±10%
- Other opening pressures on request.

Δp element type

- Microfibre filter elements - series N: 20 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

Connections

LMP 950: In-line Inlet/Outlet
 LMP 951: 90° Inlet/Outlet

Note

LMP 950 - 951 filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]			Volumes [dm ³]		
	Length	2	3	Length	2	3
LMP 950-951		25.1	33.5		15	28

Filter series	Length	Filter element design - N Series					
		A03	A06	A10	A16	A25	M25 M60 M90
LMP 950	2	613	756	953	1219	1515	2170
	3	1148	1219	1502	1713	1808	2293
LMP 951	2	635	789	1007	1308	1649	2420
	3	1226	1308	1634	1881	1993	2566

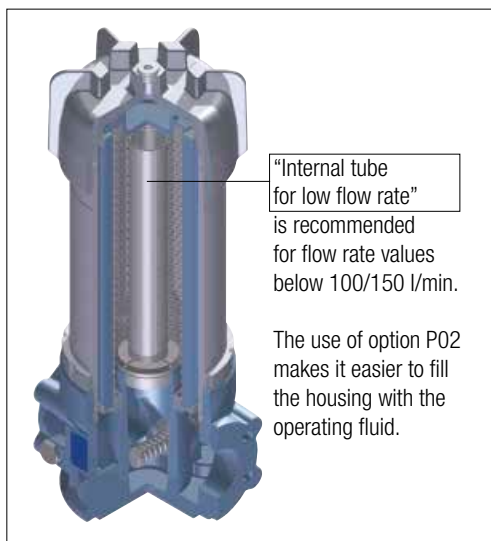
Maximum flow rate for a complete low and medium pressure filter with a pressure drop $\Delta p = 0.7$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

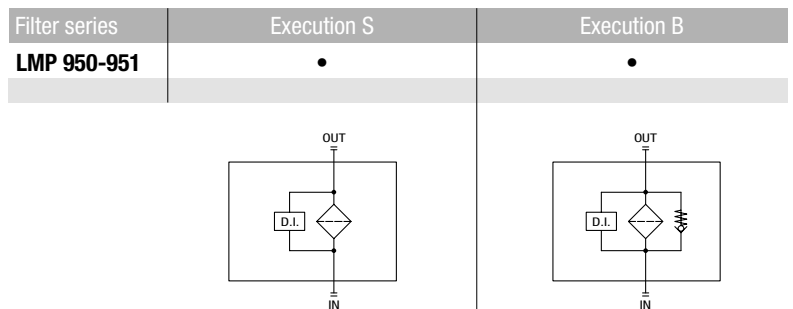
For different pressure drop or fluid viscosity we recommend to use our selection software available on www.mpfiltri.com.

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Execution P02

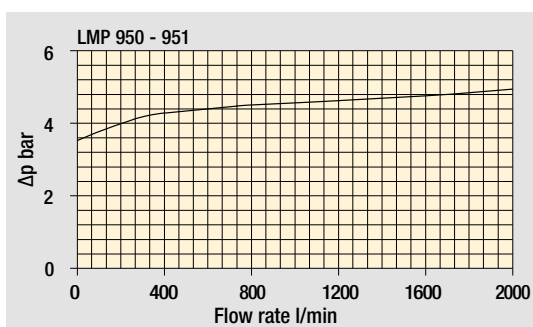
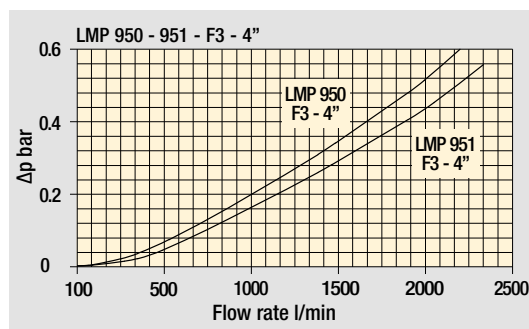
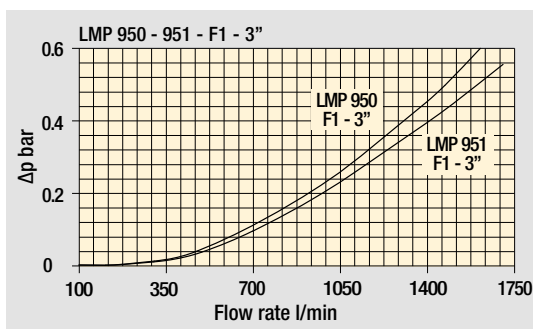


Hydraulic symbols



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.

LMP 950-951

Designation & Ordering code

COMPLETE FILTER

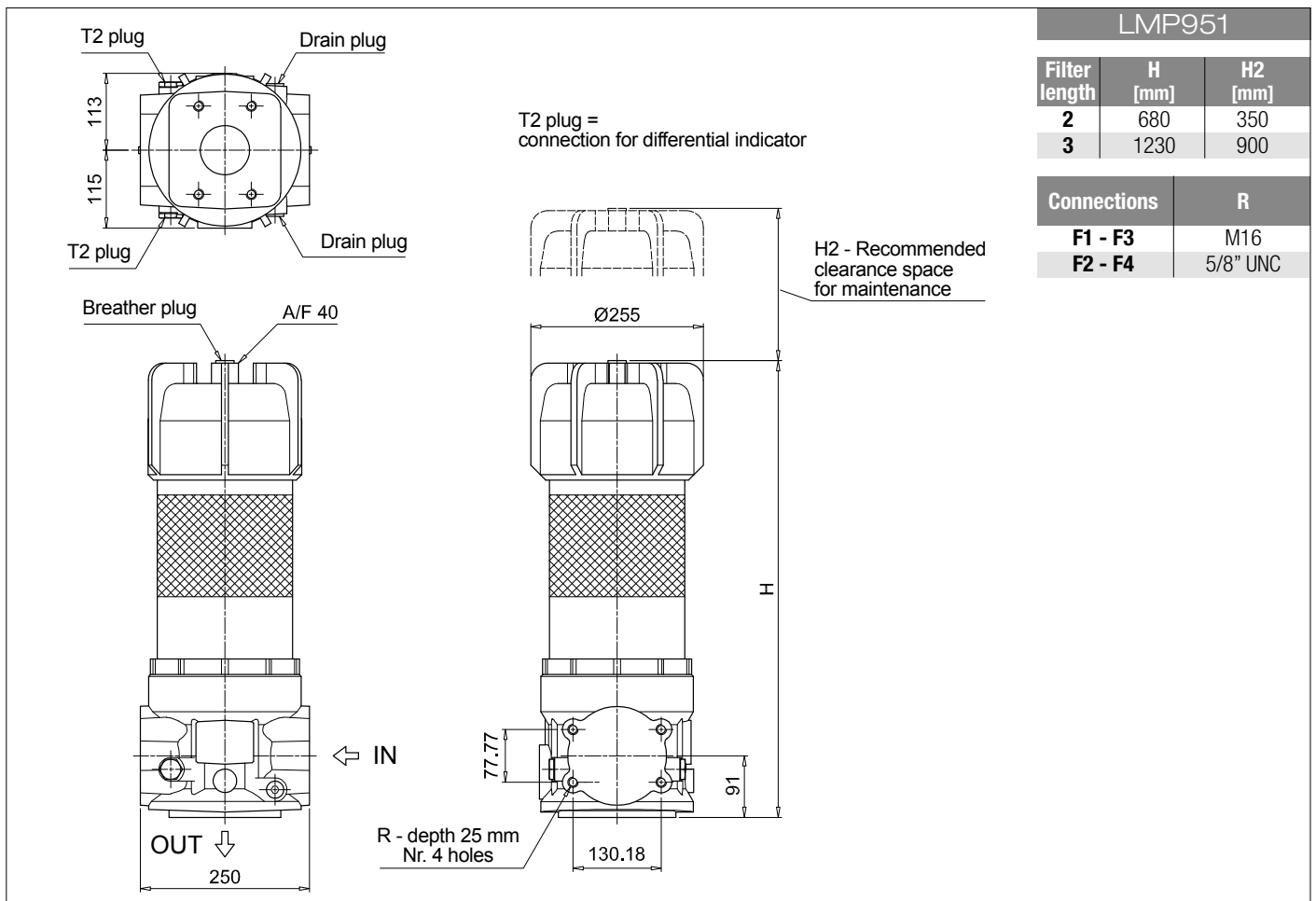
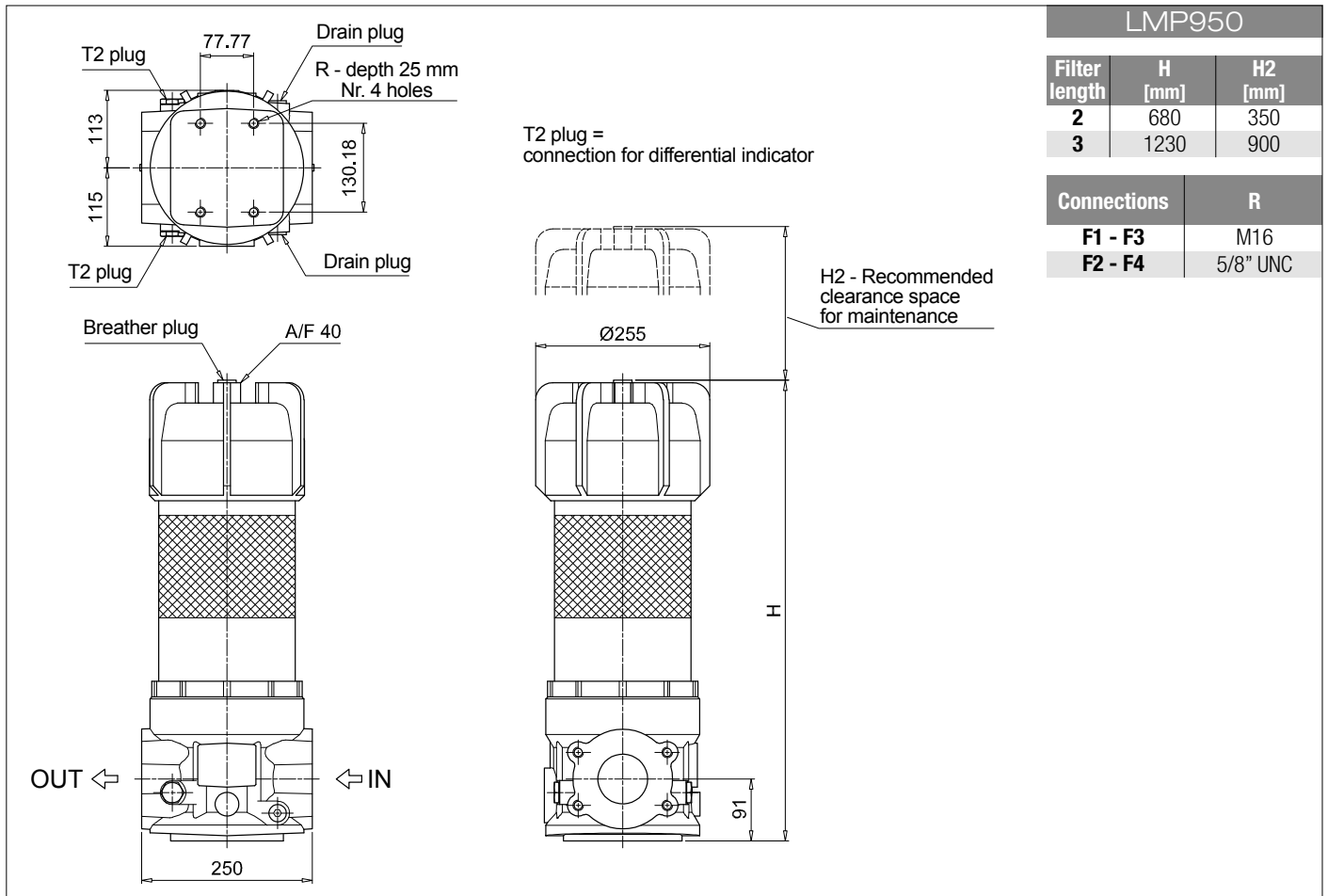
Series and size LMP950 LMP951	Configuration example: LMP951 2 B A F2 A10 N P01								
Length 2 3									
Bypass valve S Without bypass B 3.5 bar									
Seals and treatments A NBR V FPM									
Connections F1 3" SAE 3000 psi/M F2 3" SAE 3000 psi/UNC F3 4" SAE 3000 psi/M F4 4" SAE 3000 psi/UNC									
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 A25 Inorganic microfiber 25 µm WA025 Water absorber inorganic microfiber 25 µm									
	<table border="1"> <tr> <th>Element Δp</th> <th>Execution</th> </tr> <tr> <td>N 20 bar</td> <td>P01 MP Filtri standard</td> </tr> <tr> <td></td> <td>P02 With internal tube for low flow rate</td> </tr> <tr> <td></td> <td>Pxx Customized</td> </tr> </table>	Element Δp	Execution	N 20 bar	P01 MP Filtri standard		P02 With internal tube for low flow rate		Pxx Customized
Element Δp	Execution								
N 20 bar	P01 MP Filtri standard								
	P02 With internal tube for low flow rate								
	Pxx Customized								

FILTER ELEMENT

Element series and size CU950	Configuration example: CU950 2 A10 A N P01						
Element length 2 3							
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 A25 Inorganic microfiber 25 µm WA025 Water absorber inorganic microfiber 25 µm							
Seals A NBR V FPM							
	<table border="1"> <tr> <th>Element Δp</th> <th>Execution</th> </tr> <tr> <td>N 20 bar</td> <td>P01 MP Filtri standard</td> </tr> <tr> <td></td> <td>Pxx Customized</td> </tr> </table>	Element Δp	Execution	N 20 bar	P01 MP Filtri standard		Pxx Customized
Element Δp	Execution						
N 20 bar	P01 MP Filtri standard						
	Pxx Customized						

ACCESSORIES

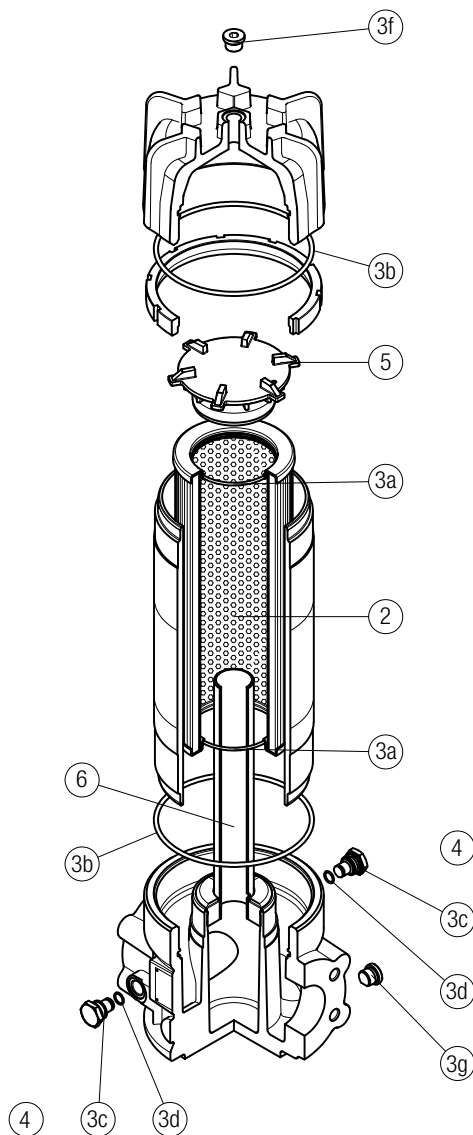
Differential indicators	page		page
DEA Electrical differential indicator	445	DTA Electronic differential indicator	448
DEM Electrical differential indicator	445-446	DVA Visual differential indicator	448
DLA Electrical / visual differential indicator	446-447	DVM Visual differential indicator	448
DLE Electrical / visual differential indicator	447		
Additional features	page		page
T2 Plug	449	CFA Retaining clamp	450



LMP 950-951 SPARE PARTS

Order number for spare parts

LMP 950 - 951



Item:	Q.ty: 2 pcs.		Q.ty: 1 pc.		Q.ty: 2 pcs.		Q.ty: 1 pc.		Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug		Housing spigot		Internal tube for low flow rate, exec. P02		
LMP 950-951 length 2-3	See order table	NBR	FPM	NBR	FPM	no bypass	with bypass	length 2	length 3	
		02050367	02050368	T2H	T2V	01044106	02001379	02025032	02025033	

LMP 952-953-954 series

Maximum working pressure up to 2.5 MPa (25 bar) - Flow rate up to 4500 l/min



Description

Technical data

Low & Medium Pressure filters

Maximum working pressure up to 2.5 MPa (25 bar)
Flow rate up to 4500 l/min

LMP952, LMP953 and LMP954 are ranges of low pressure filter with large filtration surface mainly suitable for lubrication, off-line filtration of the reservoirs and filtration equipment.

Multiple LMP950 filters are connected to a manifold to reduce the pressure drop caused by the filter media and to increase the life time of the filter element.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- 4" flanged connections, for a maximum flow rate of 4500 l/min
- Base-mounting design, for ease of the replacement of the filter element
- Fine filtration rating, to get a good cleanliness level into the system
- Water removal elements, to remove the free water from the hydraulic fluid. For further information, see the Contamination Management document and the dedicate leaflet.
- Bypass valve, to relieve excessive pressure drop across the filter media
- Vent ports, to avoid air trapped into the filter going into the system
- Drain ports, to remove the fluid from the housing prior the maintenance work
- Visual, electrical and electronic differential clogging indicators

Common applications:

- Off-line filtration of reservoirs
- Filtration systems

Filter housing materials

- Head: Anodized Aluminium
- Housing: Anodized Aluminium
- Manifolds: Welded - Phosphatized Steel
- Bypass valve: Anodized Aluminium

Pressure

Test pressure: 3.5 MPa (35 bar)

Bypass valve

- Opening pressure 350 kPa (3.5 bar) \pm 10%
- Other opening pressures on request.

Δp element type

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

Number of filter elements

- LMP 952: 2 filter elements CU950-3
- LMP 953: 3 filter elements CU950-3
- LMP 954: 4 filter elements CU950-3

Seals

- Standard NBR series A
- Optional FPM series V

Temperature

From -25 °C to +110 °C

Connections

LMP 952-953-954:
In-line Inlet/Outlet

Note

LMP 952 - 953 - 954 filters
are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]		Volumes [dm ³]	
	Length	3	Length	3
LMP 952		96		66
LMP 953		138		99
LMP 954		192		132

Filter series	Length	Filter element design - N Series					
		A03	A06	A10	A16	A25	M25 M60 M90
LMP 952	3	2172	2294	2766	3106	3256	3998
LMP 953	3	2842	2964	3403	3696	3820	4395
LMP 954	3	3259	3372	3770	4026	4133	4618

Maximum flow rate for a complete low and medium pressure filter with a pressure drop $\Delta p = 0.7$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

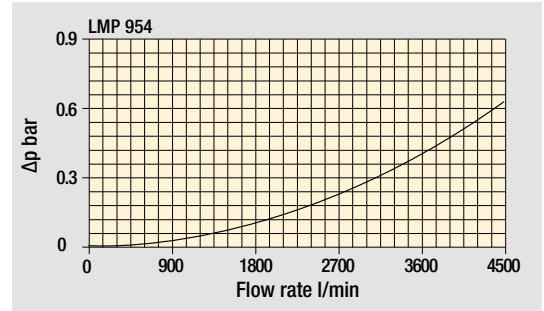
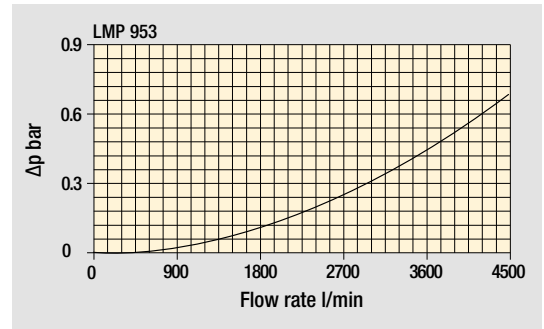
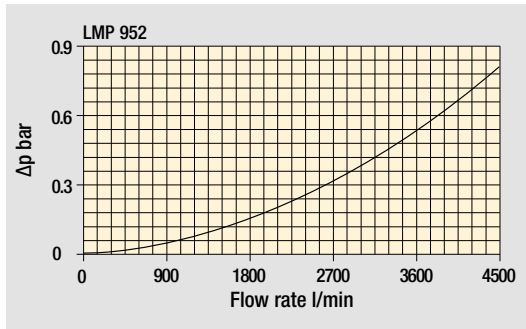
Hydraulic symbols

Filter series	Execution S - Execution B	Execution S - Execution B	Execution S - Execution B
LMP 952	•	•	•
LMP 953	•	•	•
LMP 954	•	•	•

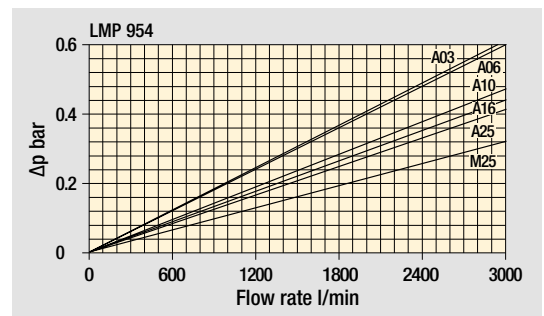
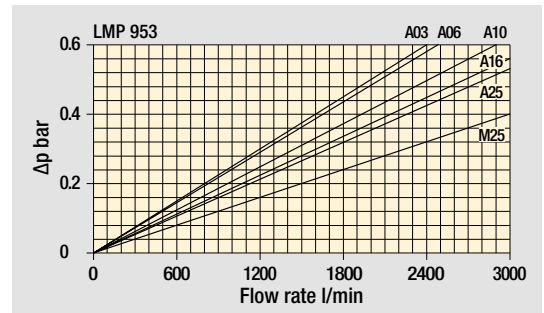
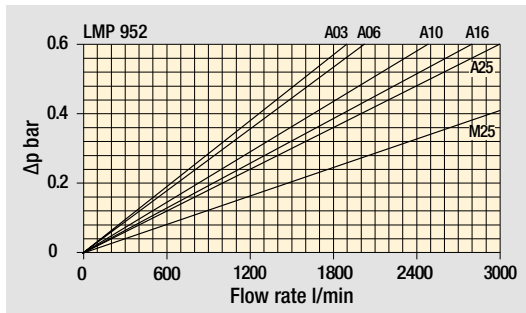
LMP 952-953-954 GENERAL INFORMATION

Pressure drop

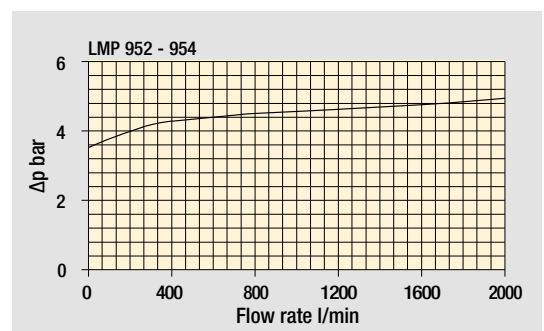
Filter housings Δp pressure drop



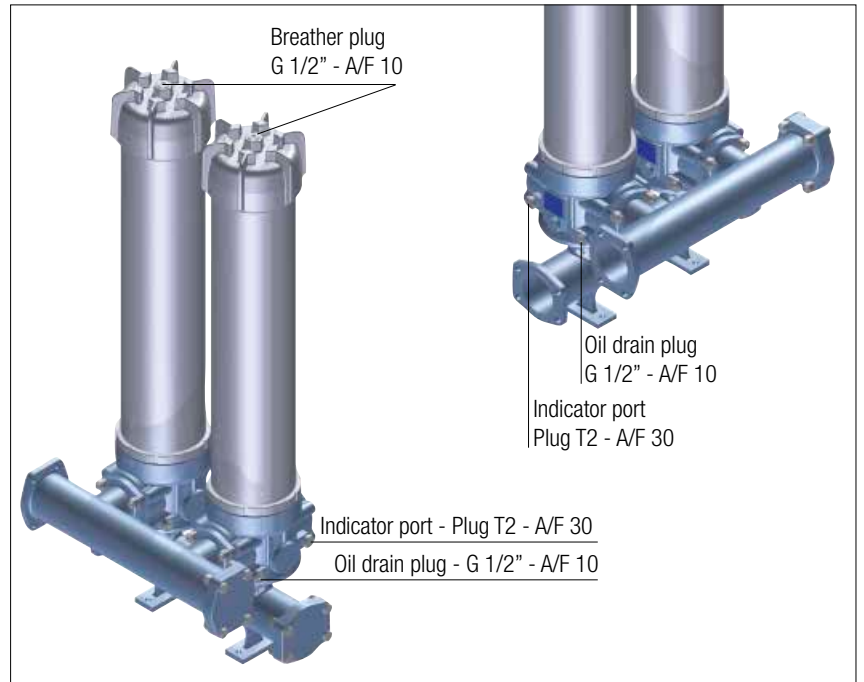
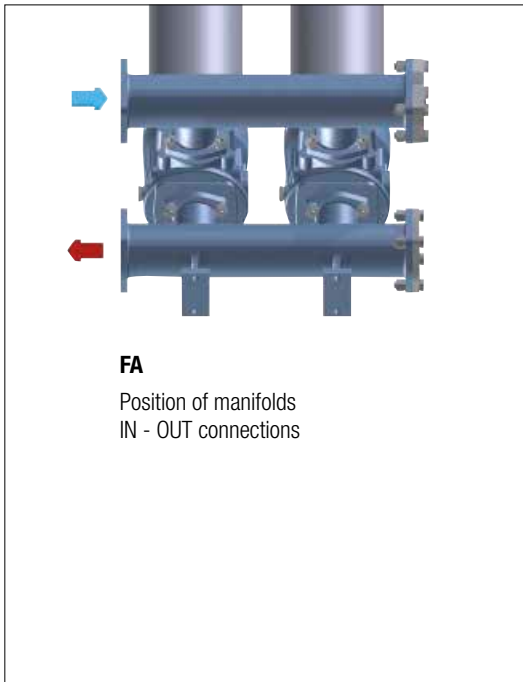
Pressure drop of filter complete with cartridge, oil viscosity 30 mm²/s (cSt)



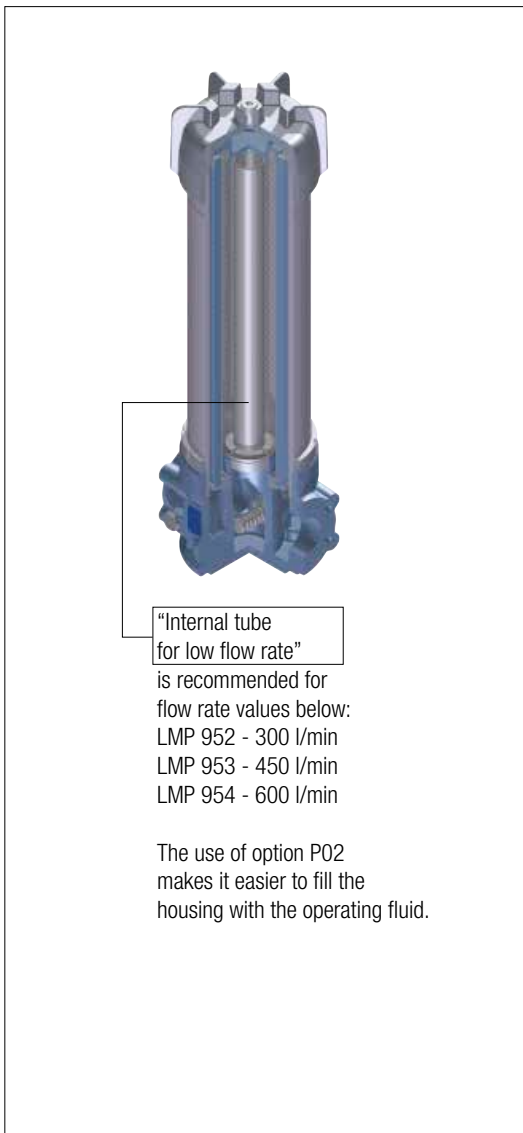
Bypass valve pressure drop



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

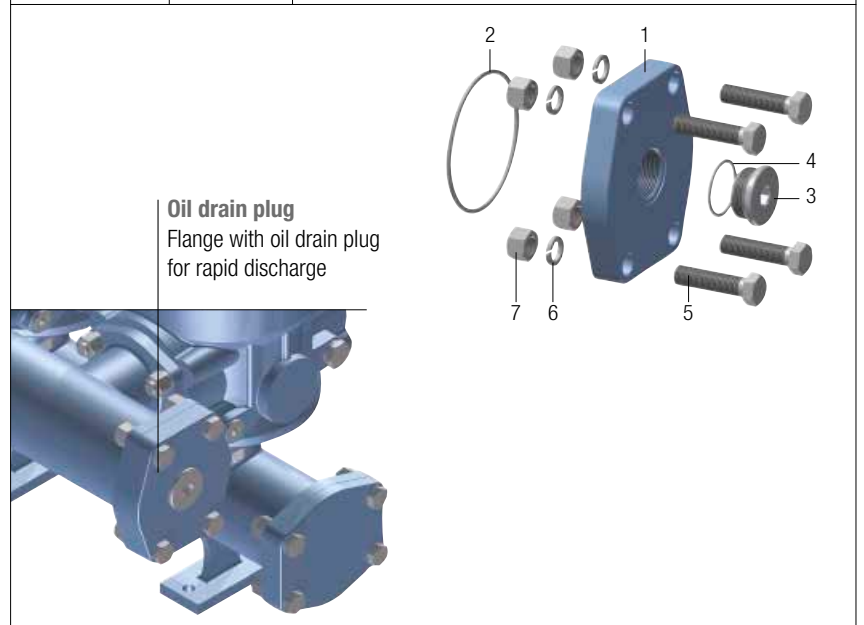


Execution P02



CMV4 & CUV4 Flange options

Code	Thread	Materials
CMV4	G 1 1/4"	1 - 4" SAE flange 2 - O-R 4437 (FPM) for flange 3 - Plug G 1-1/4" 4 - O-R 3168 for plug (FPM) 5 - No. 4 Hex bolt screws UNI-EN 24017 M16 x 65-10.9 6 - No. 4 Spring washers UNI 1751-B 16 7 - No. 4 Nuts UNI 5587 - M16
CUV4	SAE 20	1 - 4" SAE flange 2 - O-R 4437 (FPM) for flange 3 - Plug SAE 20 1 5/8" - 12 UN 4 - 1147 O-R for plug (FPM) 5 - No. 4 Hex bolt screws 5/8" UNC x 2 1/2" 6 - No. 4 Spring washers UNI 1751-B 16 7 - No. 4 Nuts 5/8" UNC



LMP 952-953-954

Designation & Ordering code

COMPLETE FILTER

Series and size	Configuration example: LMP952 3 B A FA A10 N P01																	
LMP952 LMP953 LMP954																		
Length	3																	
Bypass valve	S Without bypass B 3.5 bar																	
Seals and treatments	A NBR V FPM																	
Connections	FA 4" SAE 3000 psi																	
Filtration rating (filter media)	<table border="0"> <tr> <td>A03 Inorganic microfiber 3 µm</td> <td>M25 Wire mesh 25 µm</td> </tr> <tr> <td>A06 Inorganic microfiber 6 µm</td> <td>M60 Wire mesh 60 µm</td> </tr> <tr> <td>A10 Inorganic microfiber 10 µm</td> <td>M90 Wire mesh 90 µm</td> </tr> <tr> <td>A16 Inorganic microfiber 16 µm</td> <td></td> </tr> <tr> <td>A25 Inorganic microfiber 25 µm</td> <td></td> </tr> </table>								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		A25 Inorganic microfiber 25 µm	
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																		
A25 Inorganic microfiber 25 µm																		
WA025 Water absorber inorganic microfiber 25 µm																		
	Element Δp				Execution													
	N 20 bar				P01 MP Filtri standard P02 With internal tube for low flow rate Pxx Customized													

FILTER ELEMENT

Element series and size	Configuration example: CU950 3 A10 A N P01																
CU950																	
Element length	3																
Filter series and size	LMP952 Nr. 2 filter elements LMP953 Nr. 3 filter elements LMP954 Nr. 4 filter elements																
Filtration rating (filter media)	<table border="0"> <tr> <td>A03 Inorganic microfiber 3 µm</td> <td>M25 Wire mesh 25 µm</td> </tr> <tr> <td>A06 Inorganic microfiber 6 µm</td> <td>M60 Wire mesh 60 µm</td> </tr> <tr> <td>A10 Inorganic microfiber 10 µm</td> <td>M90 Wire mesh 90 µm</td> </tr> <tr> <td>A16 Inorganic microfiber 16 µm</td> <td></td> </tr> <tr> <td>A25 Inorganic microfiber 25 µm</td> <td></td> </tr> </table>							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		A25 Inorganic microfiber 25 µm	
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																	
A25 Inorganic microfiber 25 µm																	
WA025 Water absorber inorganic microfiber 25 µm																	
Seals	A NBR V FPM																
	Element Δp				Execution												
	N 20 bar				P01 MP Filtri standard Pxx Customized												

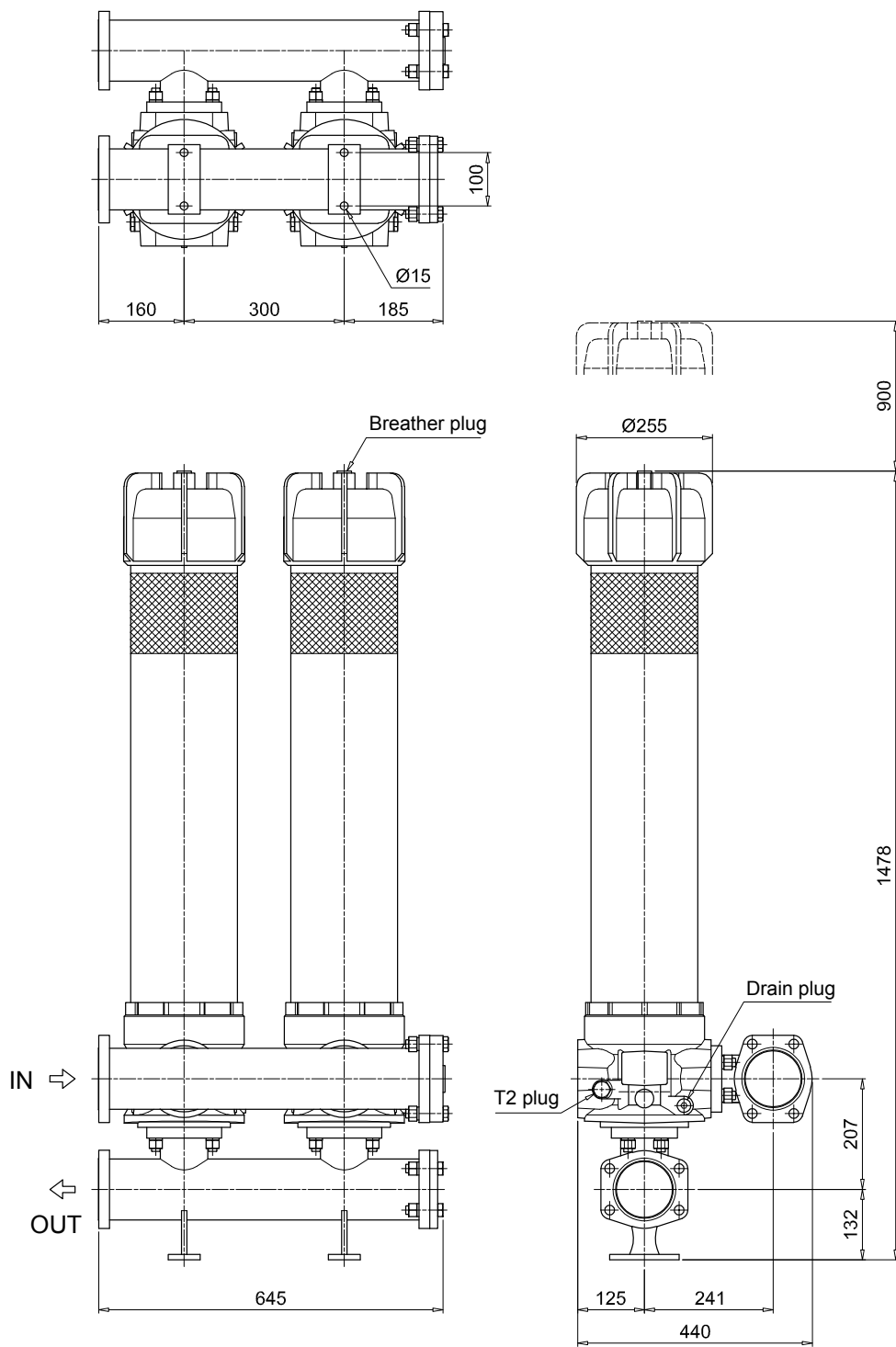
ACCESSORIES

Differential indicators	page		page
DEA Electrical differential indicator	445	DTA Electronic differential indicator	448
DEM Electrical differential indicator	445-446	DVA Visual differential indicator	448
DLA Electrical / visual differential indicator	446-447	DVM Visual differential indicator	448
DLE Electrical / visual differential indicator	447		
Additional features	page		
T2 Plug	449		

LMP 952-953-954

Dimensions

LMP952

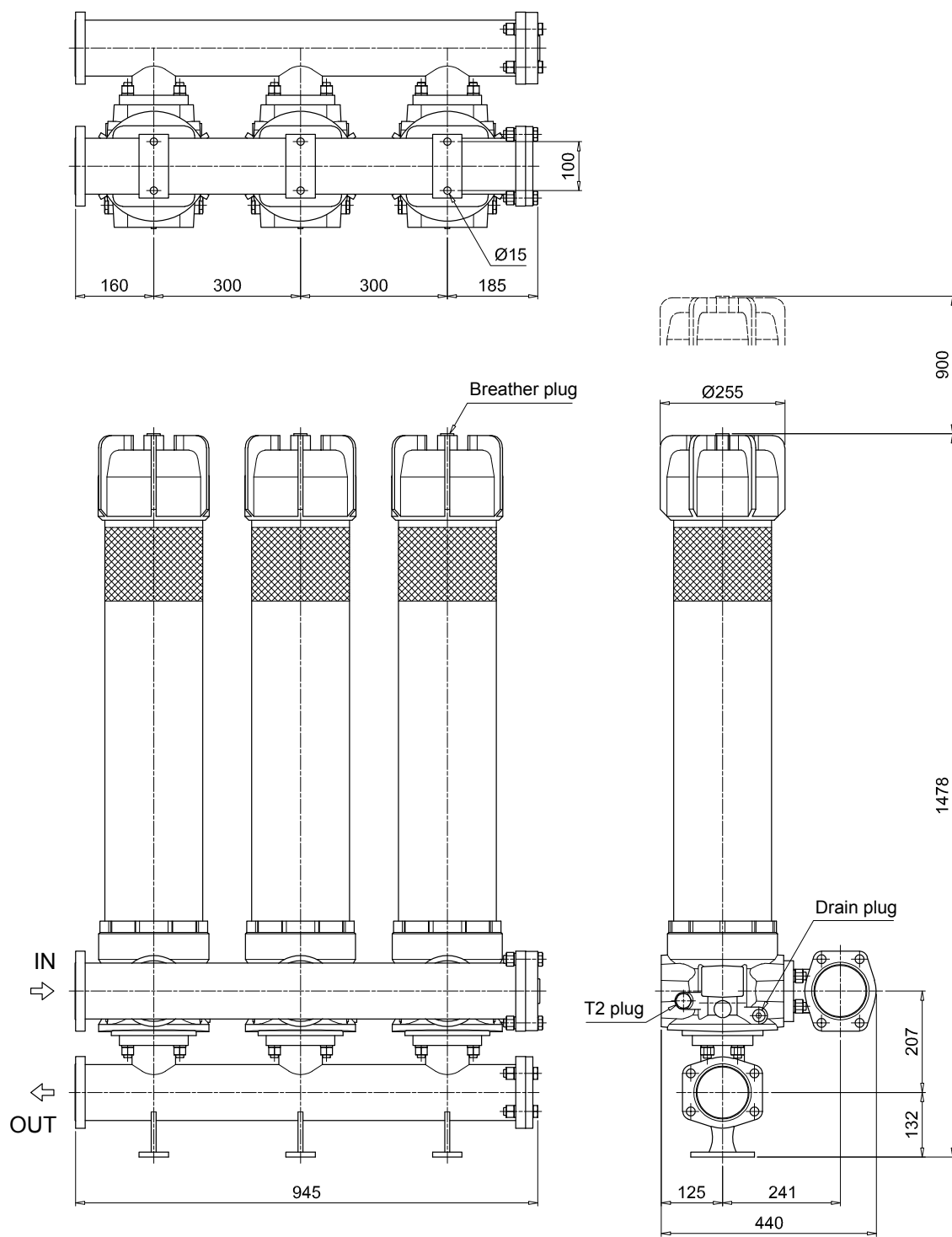


T2 plug =
connection for differential indicator

LMP 952-953-954

Dimensions

LMP953

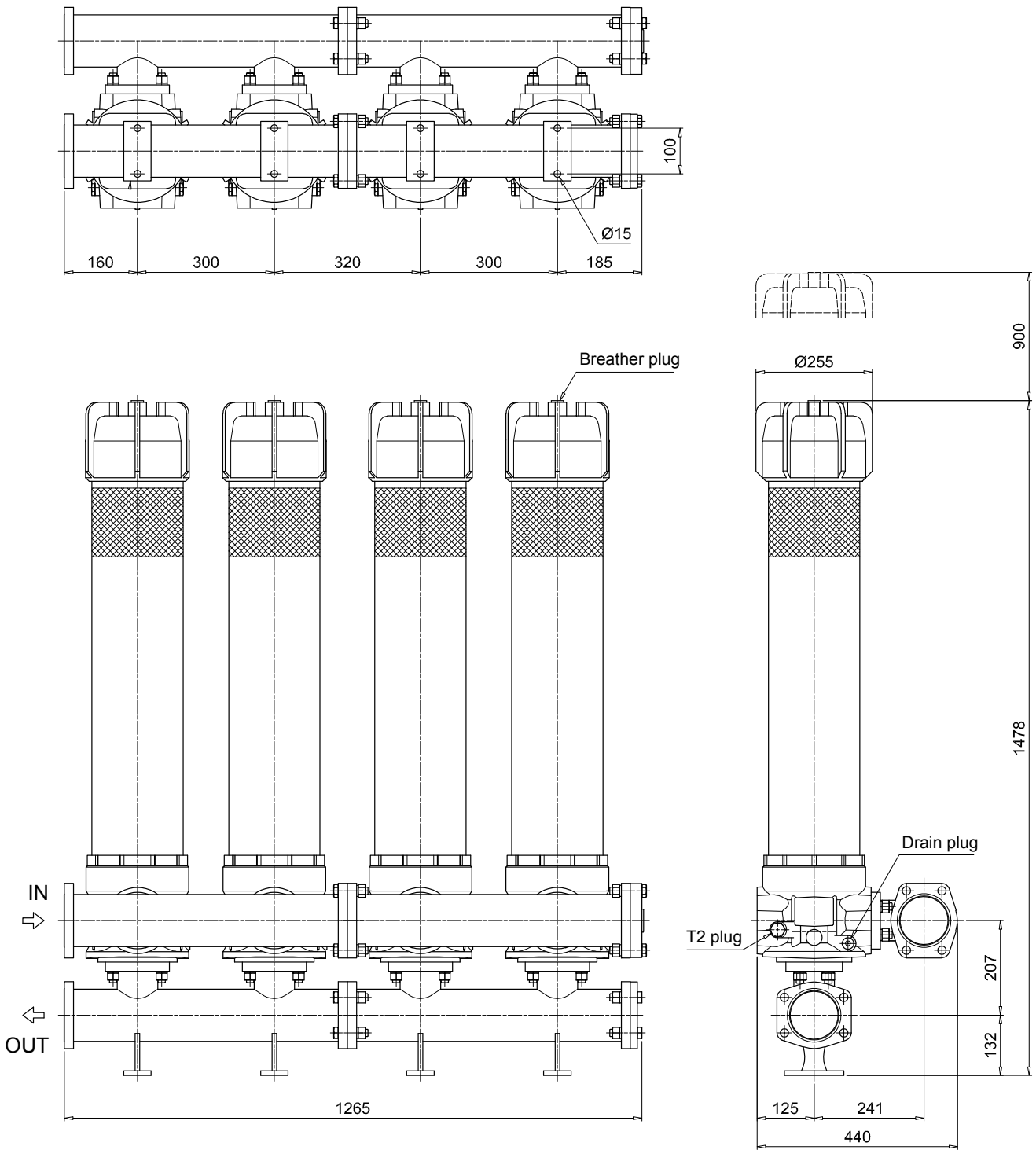


T2 plug =
connection for differential indicator

LMP 952-953-954

Dimensions

LMP954

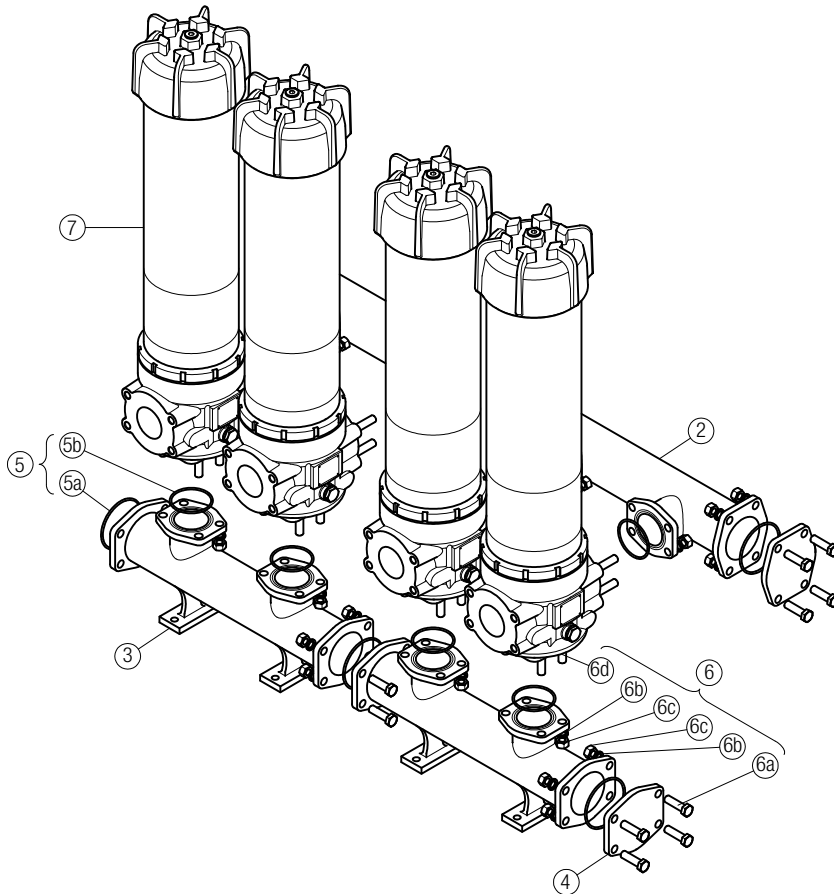


T2 plug =
connection for differential indicator

LMP 952-953-954 SPARE PARTS

Order number for spare parts

LMP 952 - 953 - 954



Item 7:
for complete filter code and
spare parts, see
LMP 950 - 951 series chapter

Quantity:
- filter spare parts:
LMP 952 - 2 pcs.
LMP 953 - 3 pcs.
LMP 954 - 4 pcs.

- filter seal kit:
LMP 952 - 2 pcs.
LMP 953 - 3 pcs.
LMP 954 - 4 pcs.

Item:	2		3		4		5 (5a-5b)		6 (6a ÷ 6d)		7	
Filter series	Q.ty	Manifold IN	OUT	4" SAE 3000 psi plugged flange Q.ty	Q.ty	Manifolds seal kit		Q.ty	Threaded fasteners kit		Q.ty	Filter
LMP 952	1 pc.	01039270	01039271	2 pcs.	01042012	1 pc.	02050404	02050405	1 pc.	02049051	2 pcs.	LMP9513xxF1xxxNP0x
LMP 953	1 pc.	01039337	01039338	2 pcs.		1 pc.	02050404	02050405	1 pc.	02049052	3 pcs.	
LMP 954	2 pcs.	01039270	01039271	2 pcs.		1 pc.	02050406	02050407	1 pc.	02049053	4 pcs.	

LMD 211 series

Maximum working pressure up to 6 MPa (60 bar) - Flow rate up to 200 l/min



LMD 211 GENERAL INFORMATION

Description

Technical data

Low & Medium Pressure filters

Duplex

Maximum working pressure up to 6 MPa (60 bar)

Flow rate up to 200 l/min

LMD211 is a range of versatile low pressure duplex filter with integrated changeover function to allow the filter element replacement without the system shut-down.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Female threaded connections up to 1 1/2" and flanged connections up to 1 1/2", for a maximum flow rate of 200 l/min
- Fine filtration rating, to get a good cleanliness level into the system
- Water removal elements, to remove the free water from the hydraulic fluid. For further information, see the Contamination Management document and the dedicate leaflet.
- Balancing valve integrated in the changeover lever, to equalize the housing pressure before the switch
- Bypass valve, to relieve excessive pressure drop across the filter media
- Vent ports, to avoid air trapped into the filter going into the system
- Drain ports, to remove the fluid from the housing prior the maintenance work
- Optional sampling ports, to get samples of fluid or to connect additional instrument to the system
- Visual, electrical and electronic differential clogging indicators

Common applications:

- Systems where shut-down causes high costs
- Systems where shut-down causes safety issues

Filter housing materials

- Head: Aluminium
- Bowl: Cataphoretic Painted Steel
- Bypass valve: AISI 304 - Nylon

Pressure

- Test pressure: 9 MPa (90 bar)
- Burst pressure: 21 MPa (210 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 6 MPa (60 bar)

Bypass valve

- Opening pressure 350 kPa (3.5 bar) $\pm 10\%$
- Other opening pressures on request.

Δp element type

- Microfibre filter elements - series N: 20 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

Connections

Inlet/Outlet In-Line

Note

LMD 211 filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]				Volumes [dm ³]			
	Length	1	2	3	Length	1	2	3
LMD 211		9.5	11.2	12.8		4.1	4.6	5.3

Filter series	Length	Filter element design - N Series									
		A03	A06	A10	A16	A25	M25	M60	M90	P10	P25
LMD 211	1	90	95	140	147	156	191	192	192	177	181
	2	113	121	158	162	173	192	192	193	181	183
	3	131	146	166	169	177	193	194	194	184	187

Maximum flow rate for a complete low and medium pressure filter with a pressure drop $\Delta p = 0.7$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

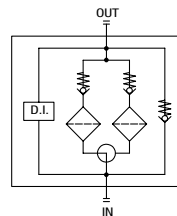
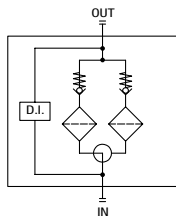
For different pressure drop or fluid viscosity we recommend to use our selection software available on www.mpfiltri.com.

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure.

Please, contact our Sales Department for further additional information.

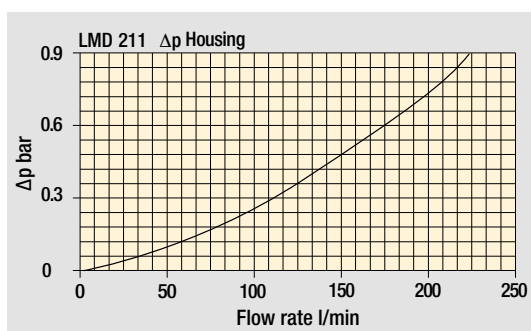
Hydraulic symbols

Filter series	Style S	Style B
LMD 211	•	•

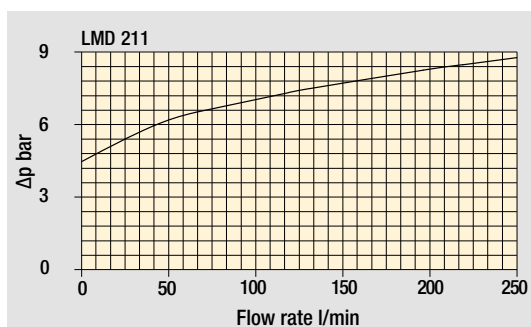


Pressure drop

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.

LMD 211

Designation & Ordering code

COMPLETE FILTER

Series and size	Configuration example: LMD211 3 B A C 6 A10 N P01									
LMD211										
Length	1 2 3									
Bypass valve	S Without bypass B 3.5 bar									
Seals and treatments	Filtration rating									
A NBR	Axx	Mxx	Pxx							
V FPM	•	•	•							
W NBR compatible with fluids HFA-HFB-HFC	•	•								
Connections	C G 1 1/2"									
F 1 1/2" NPT										
I SAE 24 - 1 7/8" - 12 UN										
L 1 1/2" SAE 3000 psi/M + G 1 1/4"										
M 1 1/2" SAE 3000 psi/UNC + 1 1/4" NPT										
N 1 1/2" SAE 3000 psi/UNC + SAE 20 - 1 5/8" UN										
Connection for differential indicator	6 With plugged connection									
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									
WA025 Water absorber inorganic microfiber 25 µm										
Element Δp	N 20 bar									
Execution	P01 MP Filtri standard Pxx Customized									

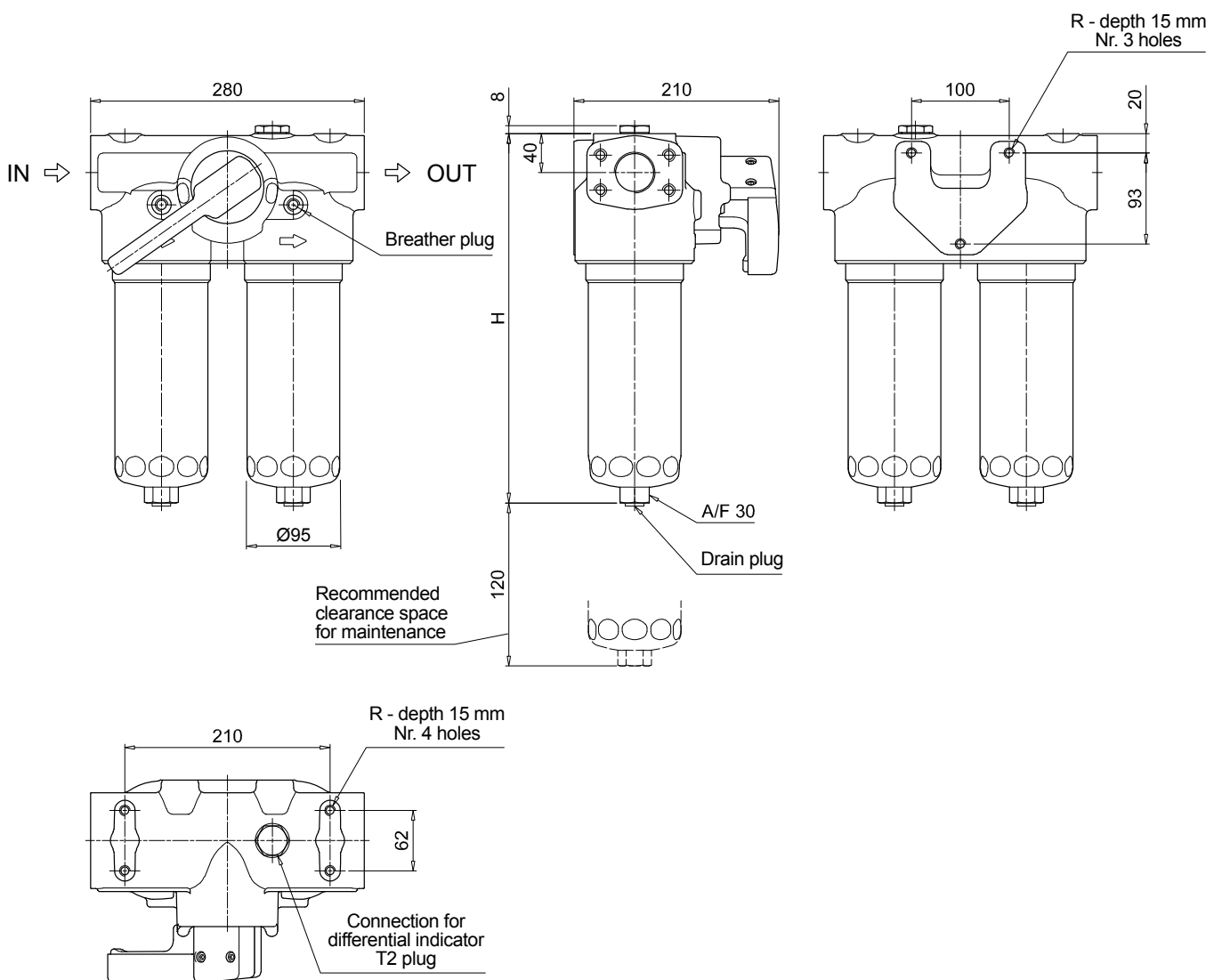
FILTER ELEMENT

Element series and size	Configuration example: CU210 3 A10 A N P01							
CU210								
Element length	1 2 3							
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							
WA025 Water absorber inorganic microfiber 25 µm								
Seals	Filtration rating							
A NBR	Axx	Mxx	Pxx					
V FPM	•	•	•					
W NBR compatible with fluids HFA-HFB-HFC	•	•						
Element Δp	N 20 bar							
Execution	P01 MP Filtri standard Pxx Customized							

ACCESSORIES

Differential indicators	page		page
DEA Electrical differential indicator	445	DTA Electronic differential indicator	448
DEM Electrical differential indicator	445-446	DVA Visual differential indicator	448
DLA Electrical / visual differential indicator	446-447	DVM Visual differential indicator	448
DLE Electrical / visual differential indicator	447		
Additional features	page		
T2 Plug	449		

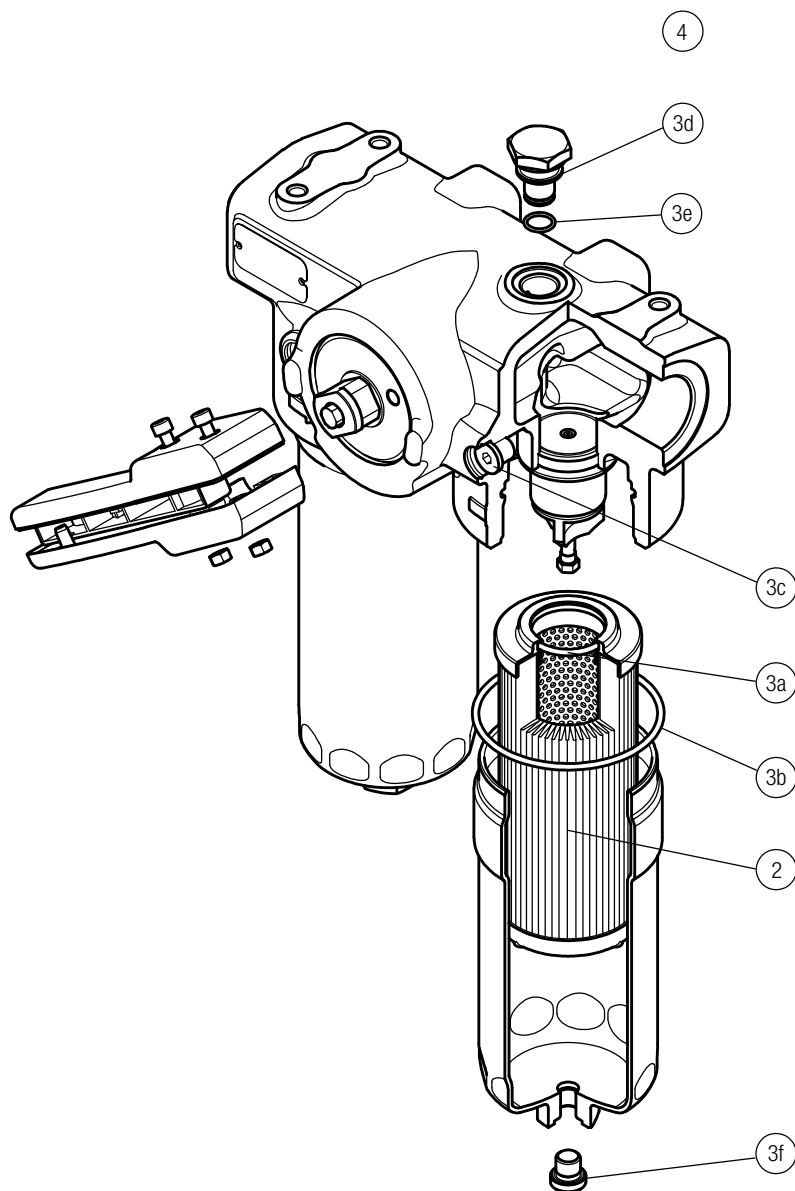
LMD211	
Filter length	H [mm]
1	383
2	513
3	651
Connections	R
C	M10
F - I	3/8" UNC
L	M10
M - N	3/8" UNC



LMD 211 SPARE PARTS

Order number for spare parts

LMD 211



Item:	Q.ty: 1 pc.		Q.ty: 1 pc.		Q.ty: 2 pcs.	
Filter series	Filter element	Seal Kit code number NBR	FPM	Indicator connection plug NBR	FPM	
LDD	See order table	02050671	02050672	T2H	T2V	

LMD 400-401 & 431 series

Maximum working pressure up to 1.6 MPa (16 bar) - Flow rate up to 600 l/min



Description

Technical data

Low & Medium Pressure filters**Duplex****Maximum working pressure up to 1.6 MPa (16 bar)****Flow rate up to 600 l/min**

LMD400 is a range of versatile low pressure duplex filter with integrated changeover function to allow the filter element replacement without the system shut-down.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- 2 1/2" flanged connections, for a maximum flow rate of 600 l/min
- LMD400: In-line connections
- LMD401: In-line connections with compact design
- LMD431: In-line connections with compact design and base mounting
- Base-mounting design also available, for ease of the replacement of the filter element
- Fine filtration rating, to get a good cleanliness level into the system
- Water removal elements, to remove the free water from the hydraulic fluid. For further information, see the Contamination Management document and the dedicate leaflet.
- Balancing valve, to equalize the housing pressure before the switch
- Bypass valve, to relieve excessive pressure drop across the filter media
- Vent ports, to avoid air trapped into the filter going into the system
- Drain ports, to remove the fluid from the housing prior the maintenance work
- Visual, electrical and electronic differential clogging indicators

Common applications:

- Systems where shut-down causes high costs
- Systems where shut-down causes safety issues

Filter housing materials

- Head: Anodized Aluminium
- Housing: Anodized Aluminium
- Manifolds: Steel - Painted black
- Bypass valve: Steel
- 3-way ball valve: Steel housings - Stainless Steel ball
- Valve: Phosphatized Steel - Stainless Steel

Pressure

Test pressure: 2.5 MPa (25 bar)

Bypass valve

- Opening pressure 350 kPa (3.5 bar) $\pm 10\%$
- Other opening pressures on request.

 Δp element type

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

Seals

FPM series V

Temperature

From -25° C to +110° C

Connections

- LMD 400-401: In-line Inlet/Outlet
- LMD 401: Same side
- LMD 400-401-431: In-Line

Note

LMP 400 - 401 - 431 filters are provided for vertical mounting

Weights [kg] and volumes [dm³]

Filter series	Weights [kg]				Volumes [dm ³]			
	Length	4	5	6	Length	4	5	6
LMD 400 - 401	60	65	72		20	28	33	
LMD 431	-	68	78		-	28	33	

Filter series	Length	Filter element design - N Series							
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
LMD 400 - 401	4	308	349	453	474	530	628	547	567
	5	395	427	509	547	589	637	577	592
	6	429	483	558	568	597	639	583	597
LMD 431	5	395	427	509	547	589	637	577	592
	6	429	483	558	568	597	639	583	597

Maximum flow rate for a complete low and medium pressure filter with a pressure drop $\Delta p = 0.7$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

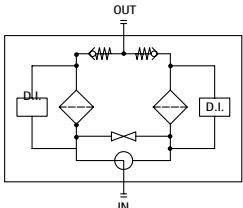
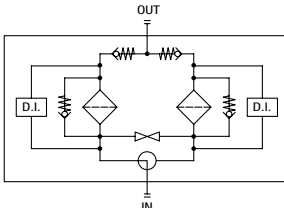
For different pressure drop or fluid viscosity we recommend to use our selection software available on www.mpfiltri.com.

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure.

Please, contact our Sales Department for further additional information.

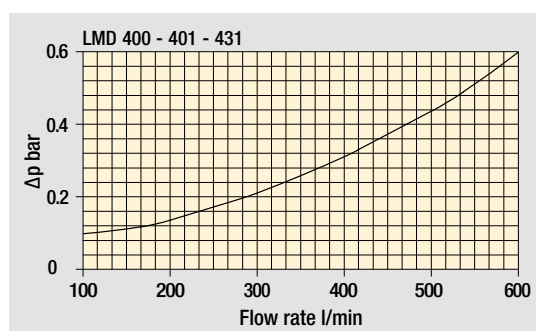
Hydraulic symbols

Filter series	Execution S	Execution B
LMD 400 - 401	•	•
LMD 431	•	•

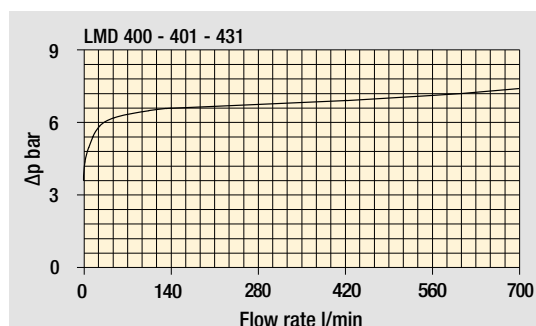



Pressure drop

Filter housings Δp pressure drop

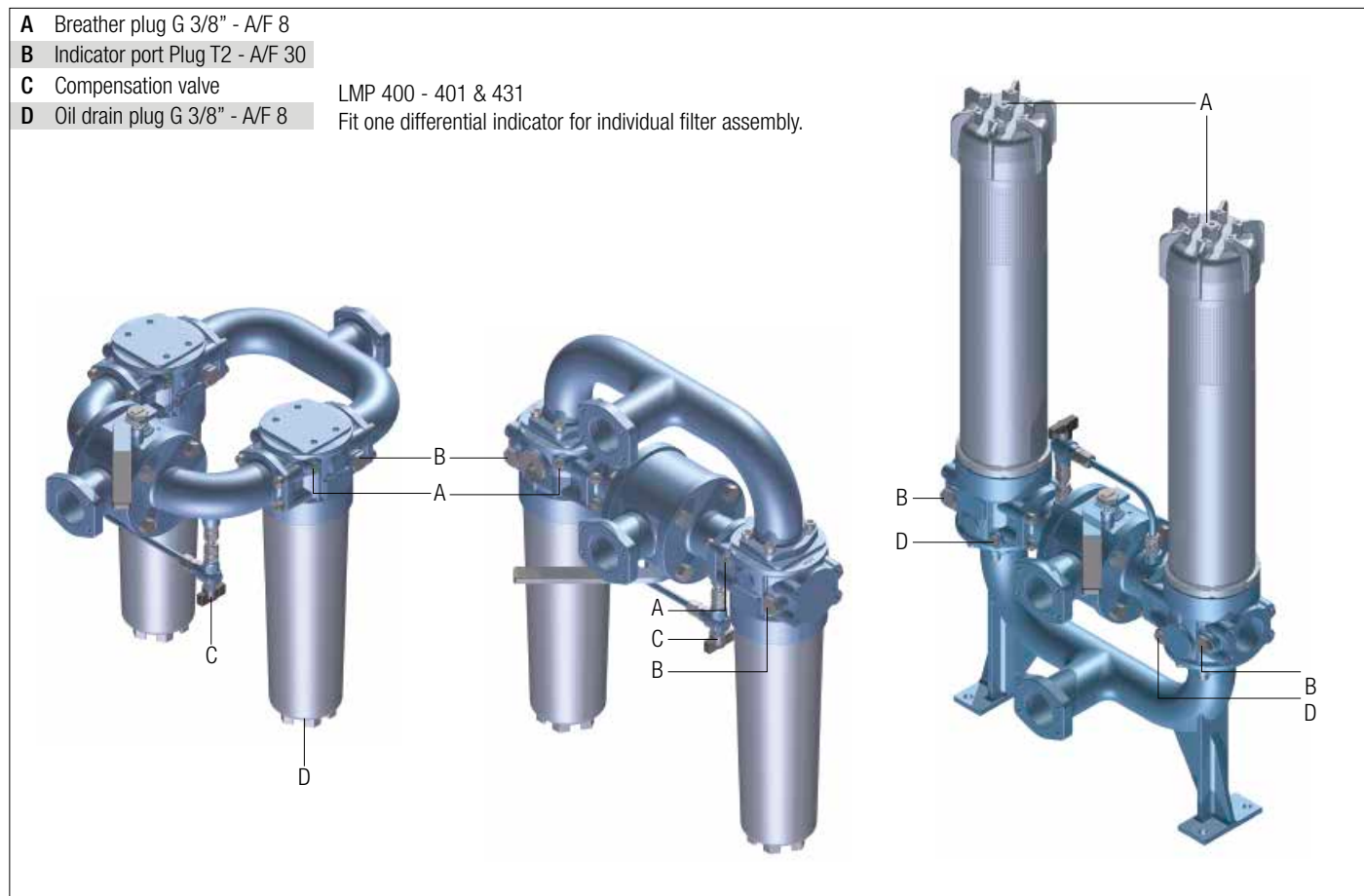


Bypass valve pressure drop

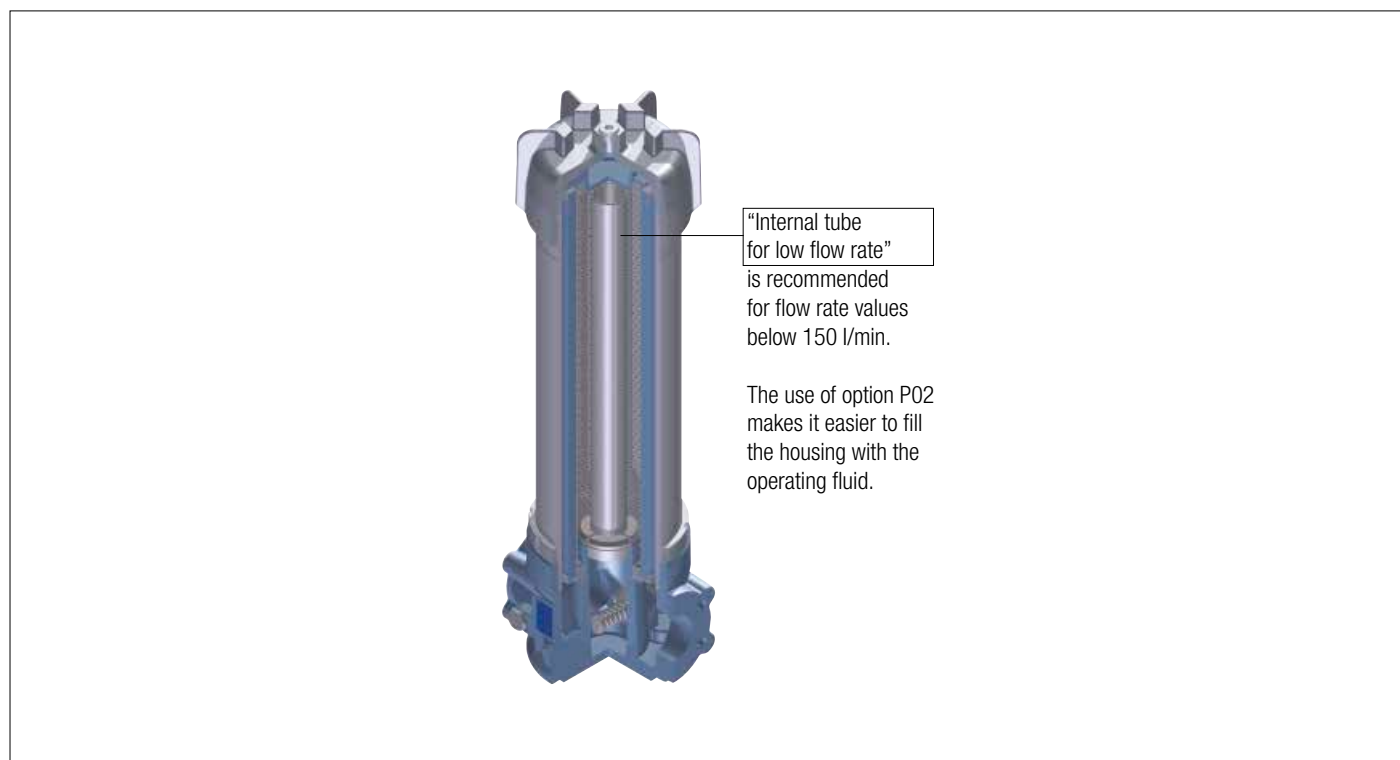


The curves are plotted using mineral oil with density of 0.86 kg/dm³ in compliance with ISO 3968. Δp varies proportionally with density.

Focus on



LMD 431: Execution P02



LMD 400-401

Designation & Ordering code

COMPLETE FILTER

Series and size		Configuration example: LMD401 4 B V F1 A10 N P01									
LMD400 LMD401											
Length											
4 5 6											
Bypass valve											
S Without bypass		B 3.5 bar									
Seals and treatments		Filtration rating									
V FPM		Axx Mxx Pxx									
Connections		LMD400		LMD401							
F1 2 1/2" SAE 3000 psi/M											
F2 2 1/2" SAE 3000 psi/UNC											
F3 2 1/2" SAE 3000 psi/M, In-line connections											
F4 2 1/2" SAE 3000 psi/UNC, In-line connections											
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									
WA025 Water absorber inorganic microfiber 25 µm											
Element Δp		Execution								Filter length	
N 20 bar		P01 MP Filtri standard								4 5 6	
		P02 Maintenance from the bottom of the housing									
		Pxx Customized									

FILTER ELEMENT

Element series and size		Configuration example: CU400 4 A10 V N P01									
CU400											
Element length											
4 5 6											
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									
WA025 Water absorber inorganic microfiber 25 µm											
Seals		Filtration rating									
V FPM		Axx Mxx Pxx									
Element Δp		Execution									
N 20 bar		P01 MP Filtri standard									
		Pxx Customized									

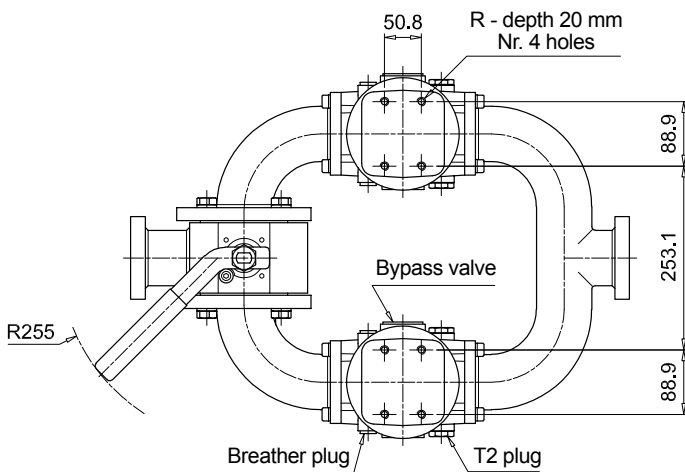
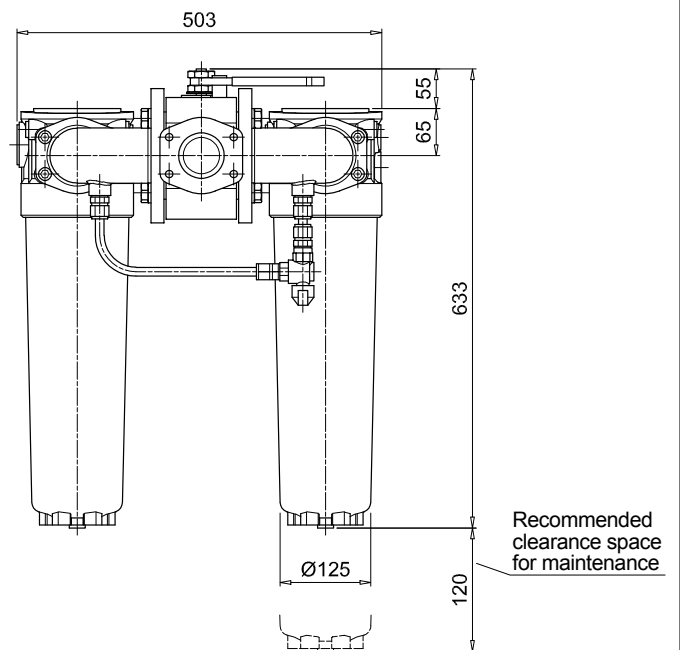
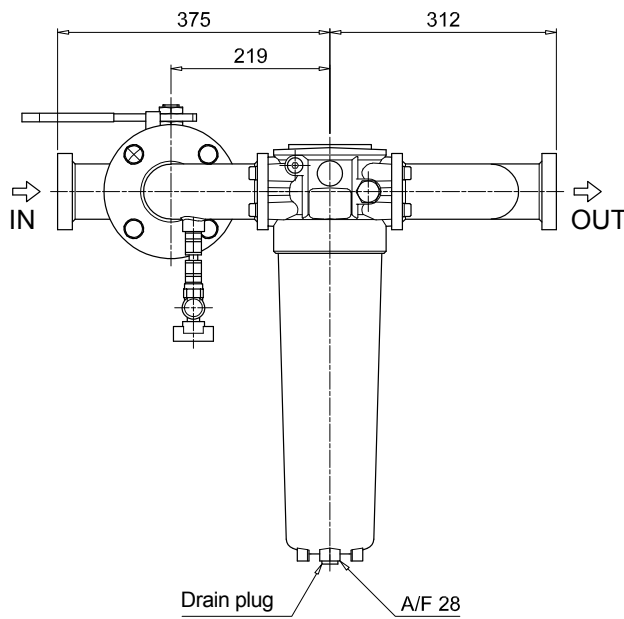
ACCESSORIES

Differential indicators		page		page	
DEA Electrical differential indicator		445	DTA Electronic differential indicator		448
DEM Electrical differential indicator		445-446	DVA Visual differential indicator		448
DLA Electrical / visual differential indicator		446-447	DVM Visual differential indicator		448
DLE Electrical / visual differential indicator		447			
Additional features		page			
T2 Plug		449			

LMD 400-401

Dimensions

LMD400	
Length 4	
Connections	R
F1	M12
F2	1/2" UNC
F3	M12
F4	1/2" UNC



T2 plug =
Connection for differential indicator

LMD 400-401

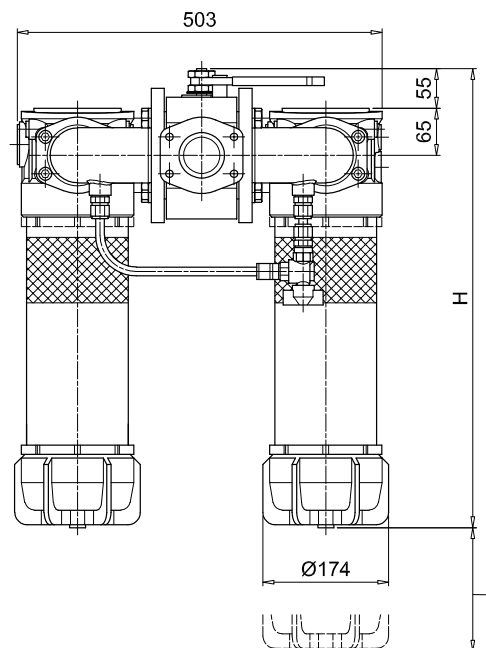
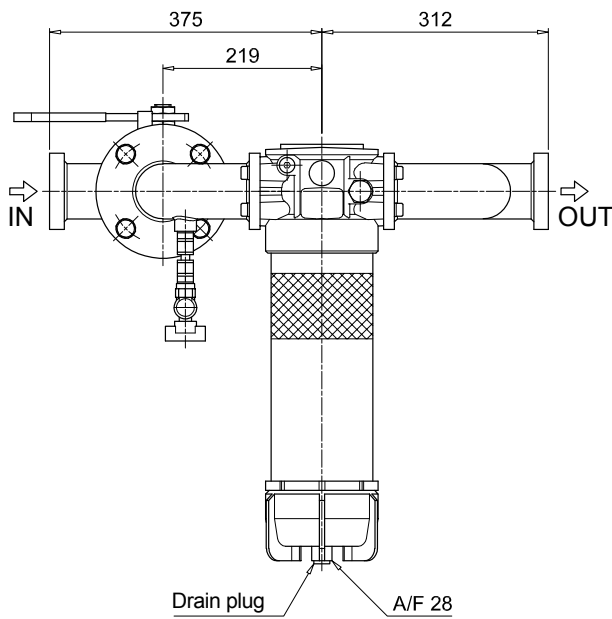
Dimensions

LMD400

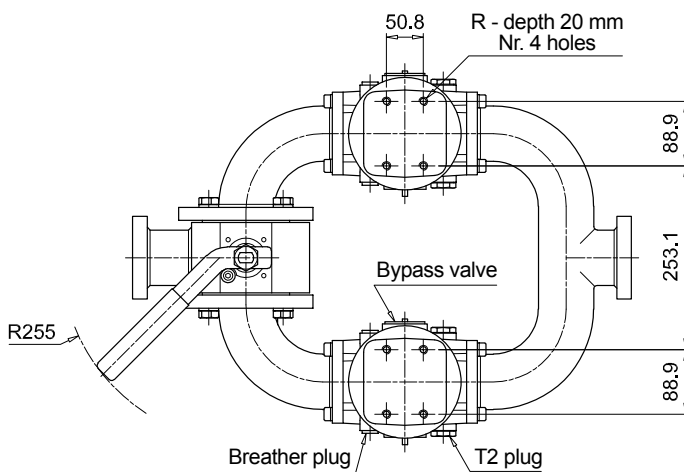
Length 5 - 6

Filter length	H [mm]	H2 [mm] Execution	
		P01	P02
5	883	120	660
6	1213	120	690

Connections	R
F1	M12
F2	1/2" UNC
F3	M12
F4	1/2" UNC



H2 - Recommended clearance space for maintenance

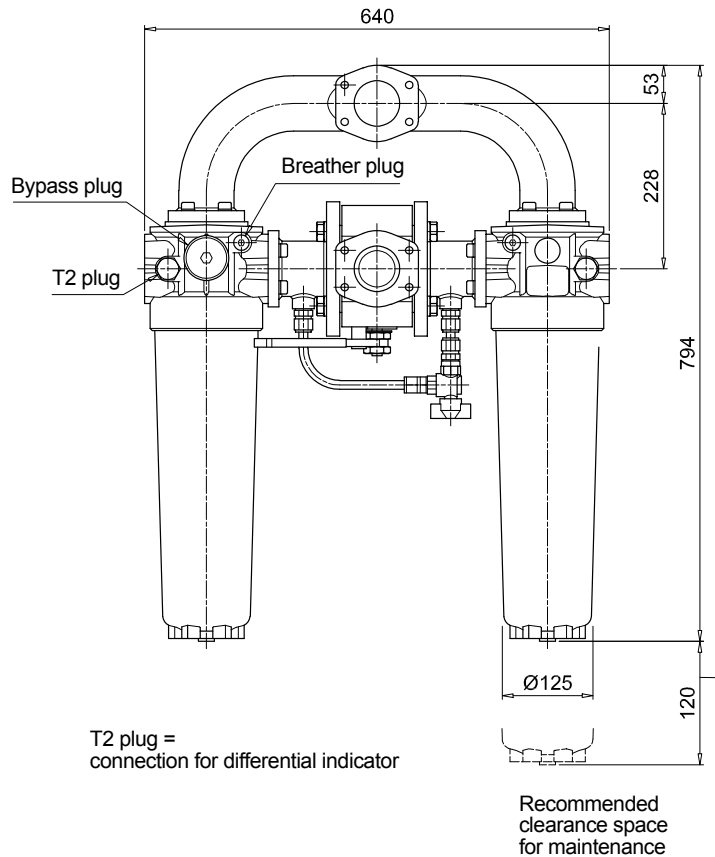
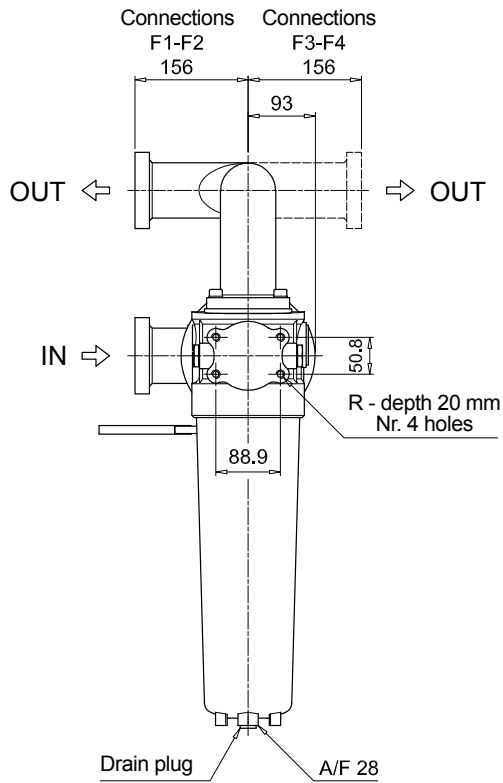


T2 plug =
Connection for differential indicator

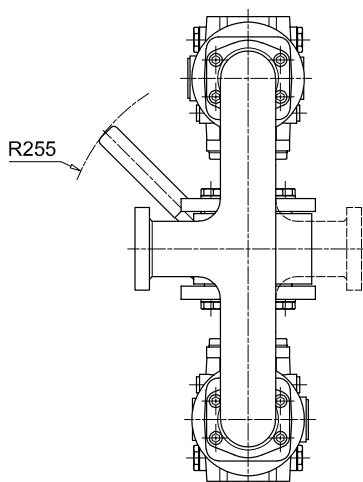
LMD 400-401

Dimensions

LMD401	
Length 4	
Connections	R
F1	M12
F2	1/2" UNC
F3	M12
F4	1/2" UNC



T2 plug =
connection for differential indicator



LMD 400-401

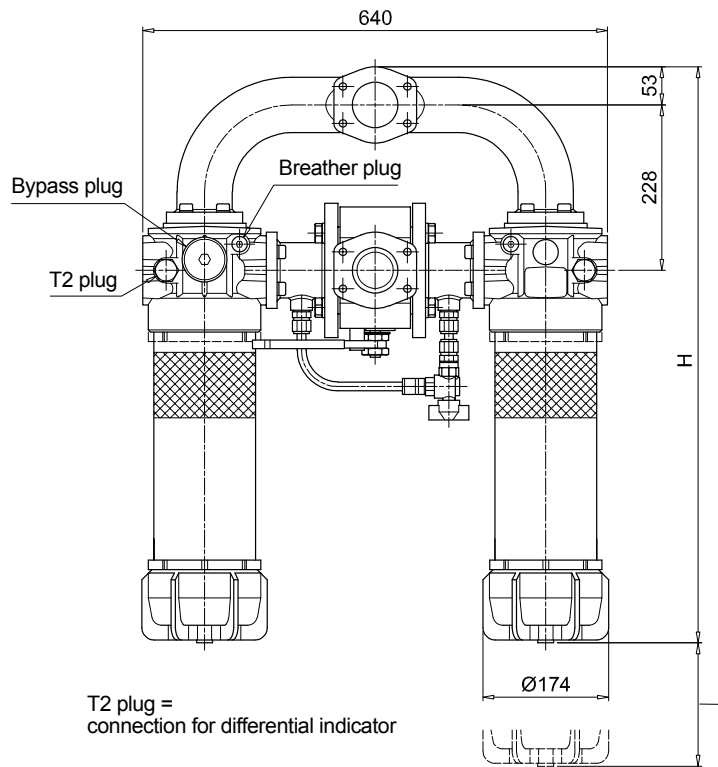
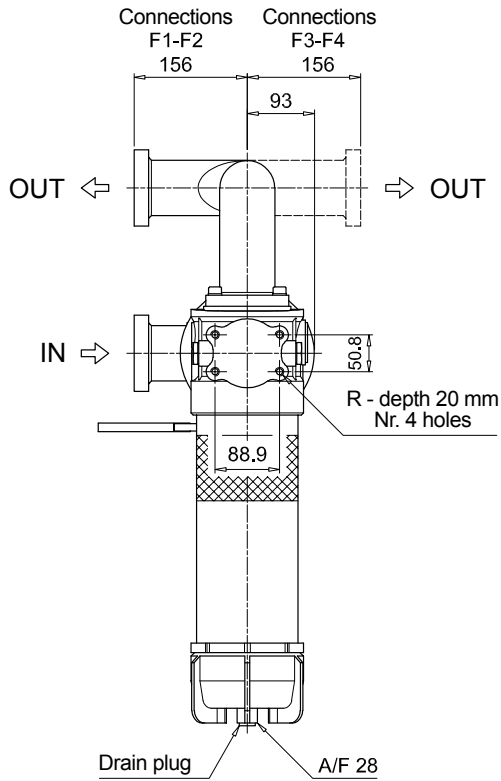
Dimensions

LMD401

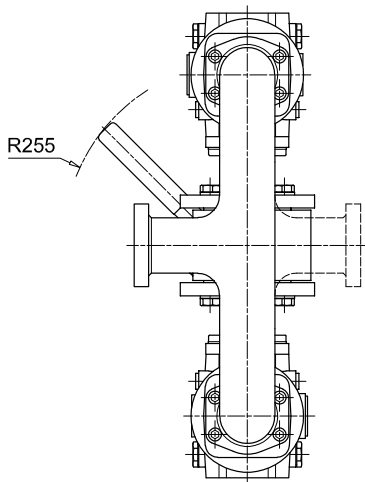
Length 5 - 6

Filter length	H [mm]	H2 [mm] Execution	
		P01	P02
5	1044	120	660
6	1374	120	690

Connections	R
F1	M12
F2	1/2" UNC
F3	M12
F4	1/2" UNC



H2 - Recommended clearance space for maintenance



LMD 431

Designation & Ordering code

COMPLETE FILTER

Series and size	Configuration example: LMD431 5 B V F1 A10 N P01									
LMD431										
Length	5 6									
Bypass valve	S Without bypass B 3.5 bar									
Seals and treatments	Filtration rating									
V FPM	Axx	Mxx	Pxx							
	•	•	•							
Connections										
F1	2 1/2" SAE 3000 psi/M									
F2	2 1/2" SAE 3000 psi/UNC									
F3	2 1/2" SAE 3000 psi/M, In-line connections									
F4	2 1/2" SAE 3000 psi/UNC, In-line connections									
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						
WA025	Water absorber inorganic microfiber 25 µm									
Element Δp	N 20 bar									
Execution	P01 MP Filtri standard									
	P02 With internal tube for low flow rate									
	Pxx Customized									

FILTER ELEMENT

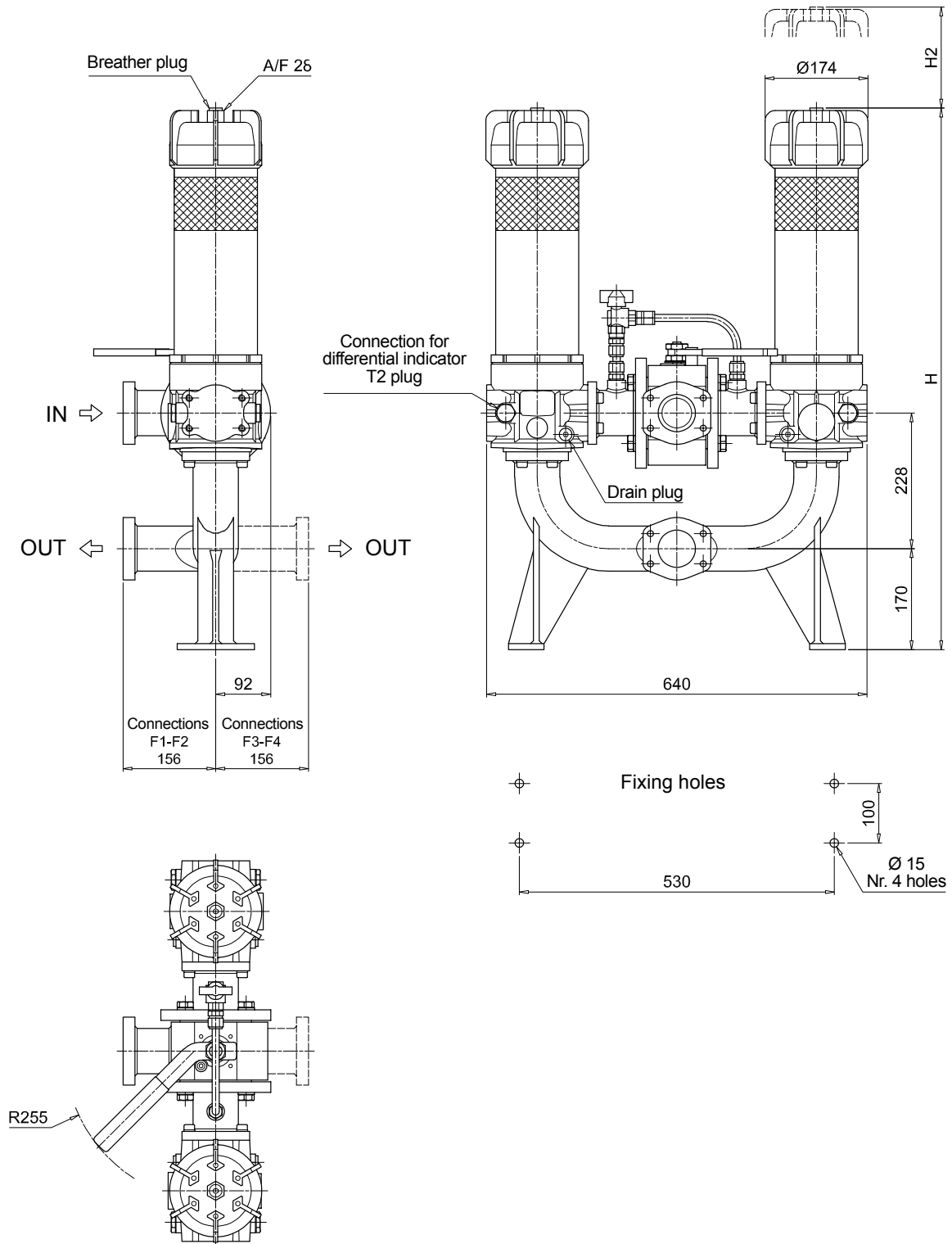
Element series and size	Configuration example: CU400 5 A10 V N P01						
CU400							
Element length	5 6						
Filtration rating (filter media)							
A03	Inorganic microfiber 3 µm		M25	Wire mesh 25 µm			
A06	Inorganic microfiber 6 µm		M60	Wire mesh 60 µm			
A10	Inorganic microfiber 10 µm		M90	Wire mesh 90 µm			
A16	Inorganic microfiber 16 µm		P10	Resin impregnated paper 10 µm			
A25	Inorganic microfiber 25 µm		P25	Resin impregnated paper 25 µm			
WA025	Water absorber inorganic microfiber 25 µm						
Seals	Filtration rating						
V FPM	Axx	Mxx	Pxx				
	•	•	•				
Element Δp	N 20 bar						
Execution	P01 MP Filtri standard						
	Pxx Customized						

ACCESSORIES

Differential indicators	page		page
DEA Electrical differential indicator	445	DTA Electronic differential indicator	448
DEM Electrical differential indicator	445-446	DVA Visual differential indicator	448
DLA Electrical / visual differential indicator	446-447	DVM Visual differential indicator	448
DLE Electrical / visual differential indicator	447		
Additional features	page		
T2 Plug	449		

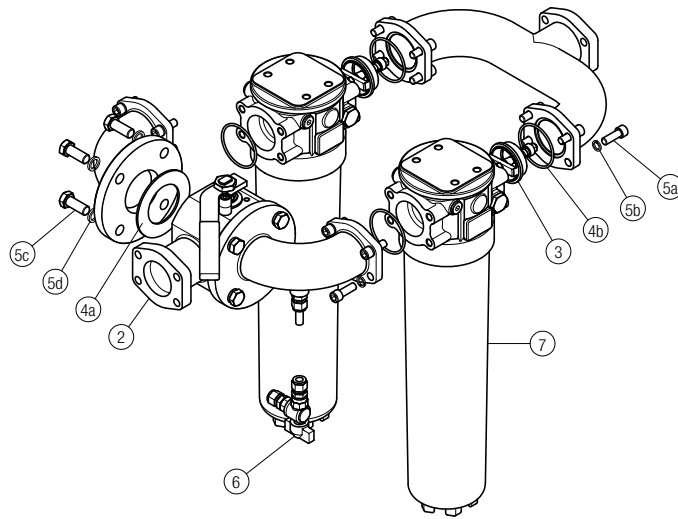
LMD431

Filter length	H [mm]	H2 [mm]
5	1161	660
6	1491	690



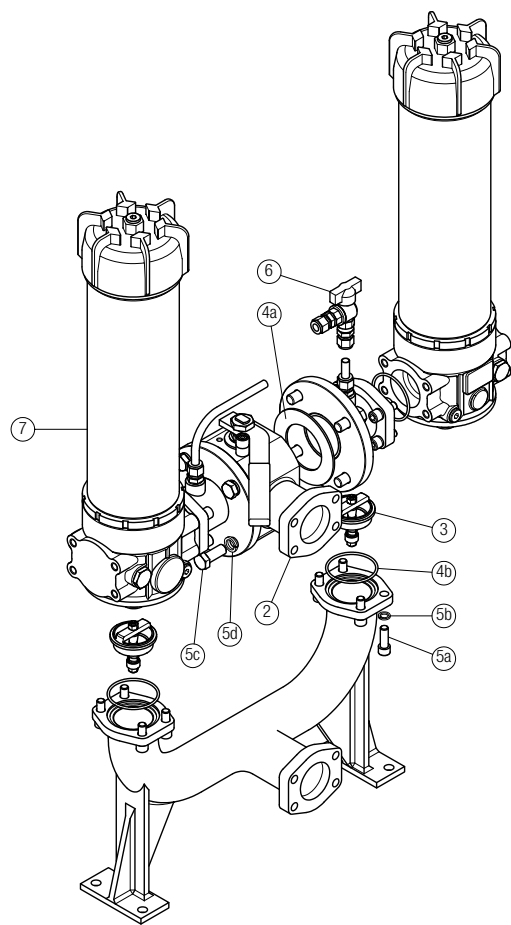
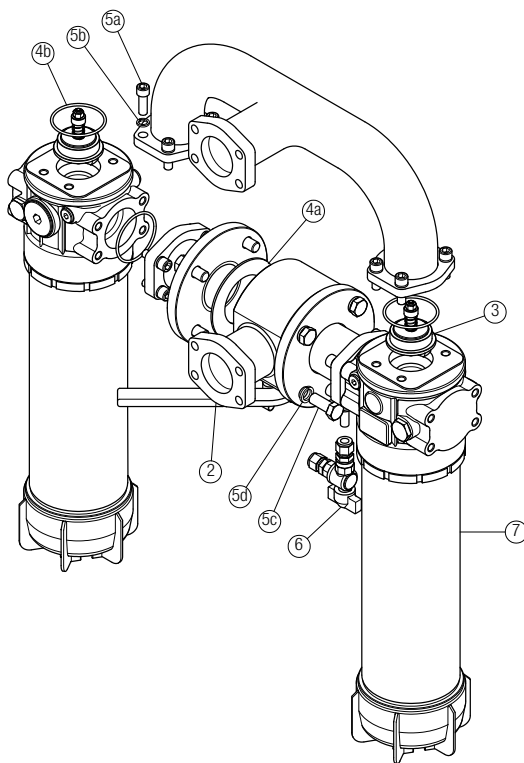
Order number for spare parts

LMD 400



LMD 401

LMD 431



Item:	Q.ty: 1 pc.		Q.ty: 2 pcs.	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 2 pcs.
Filter series	3-way ball valve PN 16 2 1/2" SAE 3000 psi/M 2 1/2" SAE 3000 psi/UNC		One-way valve	Seal Kit	Threaded fasteners kit	Kit ball valve with hose fitting	Filter See order table
LMD 400-401-431	02001440	02001441	02001429	02050399	02049062	02025043	LMP400xF2.....

LMD 951 series

Maximum working pressure up to 1.6 MPa (16 bar) - Flow rate up to 1200 l/min



LMD 951 GENERAL INFORMATION

Description

Technical data

Low & Medium Pressure filters

Duplex

Maximum working pressure up to 1.6 MPa (16 bar)

Flow rate up to 1200 l/min

LMD950 is a range of versatile low pressure duplex filter with integrated changeover function to allow the filter element replacement without the system shut-down.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Flanged connections up to 4", for a maximum flow rate of 1200 l/min
- Base-mounting design, for ease of the replacement of the filter element
- Fine filtration rating, to get a good cleanliness level into the system
- Water removal elements, to remove the free water from the hydraulic fluid. For further information, see the Contamination Management document and the dedicate leaflet.
- Balancing valve, to equalize the housing pressure before the switch
- Bypass valve, to relieve excessive pressure drop across the filter media
- Drain ports, to remove the fluid from the housing prior the maintenance work
- Visual, electrical and electronic differential clogging indicators

Common applications:

- Systems where shut-down causes high costs
- Systems where shut-down causes safety issues

Filter housing materials

- Head: Anodized Aluminium
- Housing: Anodized Aluminium
- Manifolds: Welded - Painted black
- Bypass valve: Steel
- 3-way ball valve: Steel body - Stainless Steel ball
- Check valve: Cast Iron body - AISI 304 leaf

Pressure

- SAE + DIN Flange
- Test pressure: 2.5 MPa (25 bar)

Bypass valve

- Opening pressure 350 kPa (3.5 bar) $\pm 10\%$
- Other opening pressures on request.

Number of filter elements

LMD 951: 2 filter elements CU950-3

Δp element type

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

Seals

FPM series V

Temperature

From -25° C to +110° C

Connections

- LMD 951: In-line Inlet/Outlet
- Same side

Note

LMD 951 filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]		Volumes [dm ³]	
	DN 80	DN 100	DN 80	DN 100
LMD 951	102	130	62	66

Filter series	Length	Filter element design - N Series					
		A03	A06	A10	A16	A25	M25 M60 M90
LMD 951	3	853	884	995	1066	1096	1233

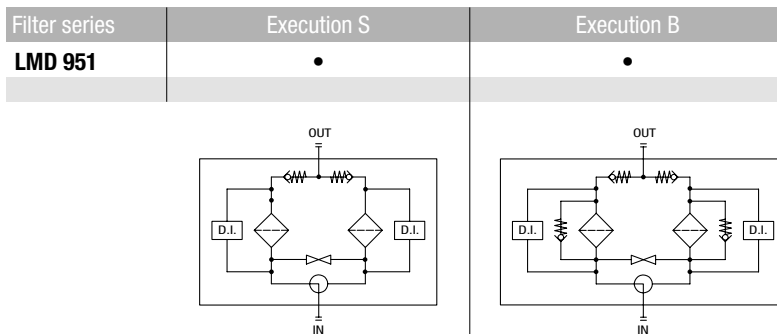
Maximum flow rate for a complete low and medium pressure filter with a pressure drop $\Delta p = 0.7$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

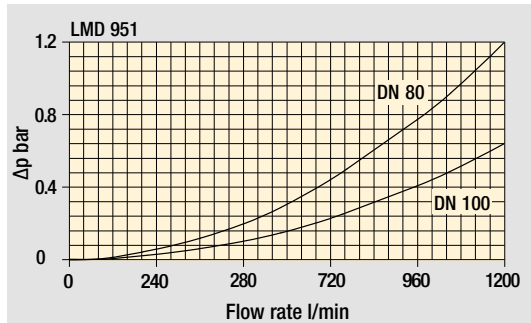
For different pressure drop or fluid viscosity we recommend to use our selection software available on www.mpfiltri.com.

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

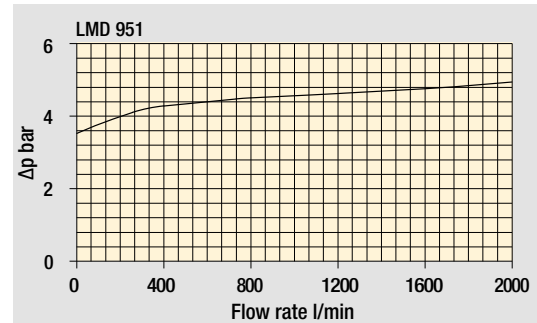
Hydraulic symbols



Pressure drop



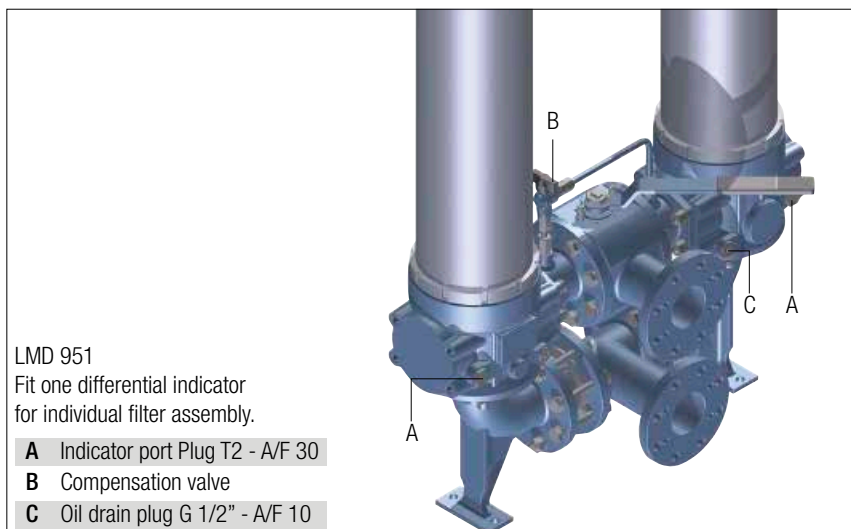
Filter housings
 Δp pressure drop



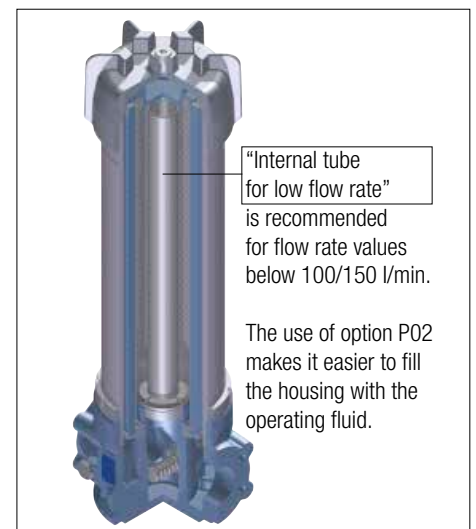
Bypass valve
pressure drop

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

Focus on



Execution P02



LMD 951

Designation & Ordering code

COMPLETE FILTER

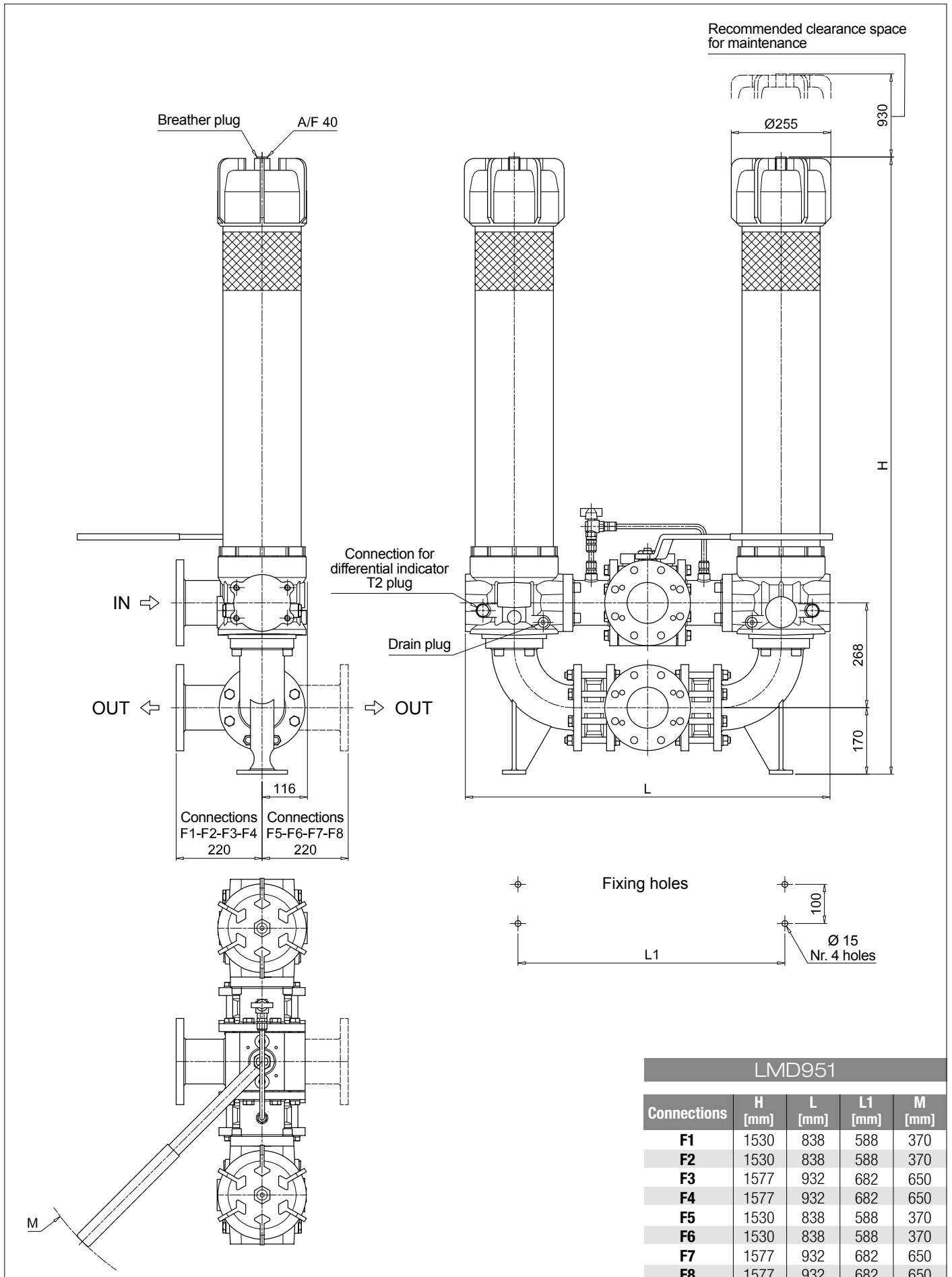
Series and size	Configuration example: LMD951 3 B V F1 A10 N P01							
LMD951								
Length	3							
Bypass valve	S Without bypass B 3.5 bar							
Seals and treatments	V FPM							
Connections	F1 3" SAE 3000 psi/M F2 3" SAE 3000 psi/UNC F3 4" SAE 3000 psi/M F4 4" SAE 3000 psi/UNC F5 3" SAE 3000 psi/M, In-line connections F6 3" SAE 3000 psi/UNC, In-line connections F7 4" SAE 3000 psi/M, In-line connections F8 4" SAE 3000 psi/UNC, In-line connections							
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 A25 Inorganic microfiber 25 µm WA025 Water absorber inorganic microfiber 25 µm							
	Element Δp				Execution			
	N 20 bar				P01 MP Filtri standard P02 With internal tube for low flow rate Pxx Customized			

FILTER ELEMENT

Element series and size	Configuration example: CU950 3 A10 V N P01							
CU950								
Element length	3							
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 A25 Inorganic microfiber 25 µm WA025 Water absorber inorganic microfiber 25 µm							
Seals	V FPM							
	Element Δp				Execution			
	N 20 bar				P01 MP Filtri standard Pxx Customized			

ACCESSORIES

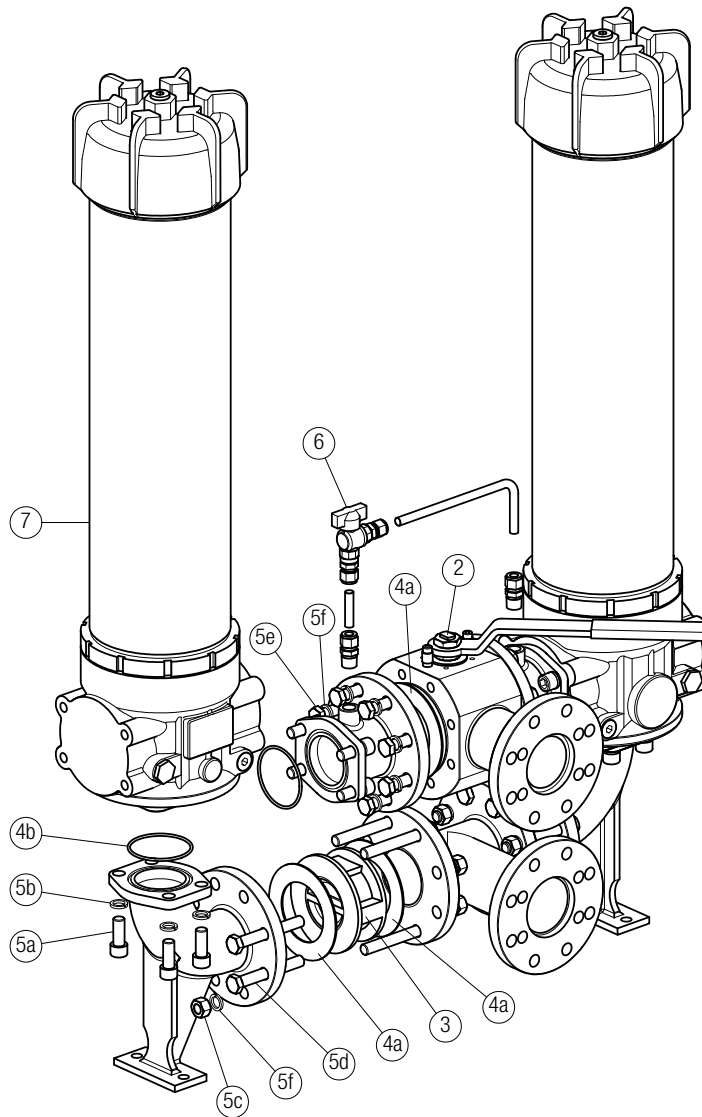
Differential indicators	page		page
DEA Electrical differential indicator	445	DTA Electronic differential indicator	448
DEM Electrical differential indicator	445-446	DVA Visual differential indicator	448
DLA Electrical / visual differential indicator	446-447	DVM Visual differential indicator	448
DLE Electrical / visual differential indicator	447		
Additional features	page		
T2 Plug	449		



LMD 951 SPARE PARTS

Order number for spare parts

LMD 951



Item 7:
for complete filter code and
spare parts, see
LMP 950 - 951 series chapter

Quantity:
- filter spare parts: 2 pcs.
- filter seal kit: 2 pcs.

Item:	Q.ty: 1 pc. 2		Q.ty: 2 pcs. 3	Q.ty: 1 pc. 4	Q.ty: 1 pc. 5 (5a ÷ 5f)	Q.ty: 1 pc. 6	Q.ty: 2 pcs. 7
Filter series LMD 951	3-way ball valve PN 16		One-way valve	Seal Kit	Threaded fasteners kit	G 1/2" Ball Valve Kit with straight fittings	Filter
F1 - F2 - F5 - F6 / D1 - D3 (3" SAE / DIN PN16 DN 80)	3" SAE 3000 psi/M 02001135	3" SAE 3000 psi/UNC 02001438	02001418	02050388	02049056	02025043	LMP9513xVF1xxxNP01
F3 - F4 - F7 - F8 / D2 - D4 (4" SAE / DIN PN16 DN 100)	4" SAE 3000 psi/M 02001162	4" SAE 3000 psi/UNC 02001439	02001419	02050389	02049057		LMP9513xVF3xxxNP01

DIN 24550 **Filter element according to DIN 24550**

LDP & LDD series

Maximum working pressure up to 6 MPa (60 bar) - Flow rate up to 360 l/min

LMP 900-901 series

Maximum working pressure up to 3 MPa (30 bar) - Flow rate up to 2000 l/min

LMP 902-903 series

Maximum working pressure up to 2 MPa (20 bar) - Flow rate up to 3000 l/min

LDP & LDD series

Filter element according to DIN 24550

Maximum working pressure up to 6 MPa (60 bar) - Flow rate up to 360 l/min

LDP & LDD GENERAL INFORMATION

Filter element according to DIN 24550

Descriptions

Low & Medium Pressure filters

Maximum working pressure up to 6 MPa (60 bar)
Flow rate up to 360 l/min

LDP is a range of versatile low pressure filter for transmission, protection of sensitive components in low pressure hydraulic systems and filtration of the coolant into the machine tools.

They are also suitable for the off-line filtration of small reservoirs. They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Female threaded connections up to 1 1/2", for a maximum return flow rate of 360 l/min
- Filter element designed in accordance with DIN 24550 regulation
- Fine filtration rating, to get a good cleanliness level into the system
- Water removal elements, to remove the free water from the hydraulic fluid. For further information, see the Contamination Management document and the dedicate leaflet.
- Bypass valve, to relieve excessive pressure drop across the filter media
- Visual, electrical and electronic differential clogging indicators

Common applications:

Delivery lines, in low pressure industrial equipment or mobile machines

LDD is a range of versatile low pressure duplex filter with integrated changeover function to allow the filter element replacement without the system shut-down.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Female threaded connections up to 1 1/2" and flanged connections up to 1 1/2", for a maximum flow rate of 360 l/min
- Filter element designed in accordance with DIN 24550 regulation
- Fine filtration rating, to get a good cleanliness level into the system
- Water removal elements, to remove the free water from the hydraulic fluid. For further information, see the Contamination Management document and the dedicate leaflet.
- Balancing valve integrated in the changeover lever, to equalize the housing pressure before the switch
- Bypass valve, to relieve excessive pressure drop across the filter media
- Vent ports, to avoid air trapped into the filter going into the system
- Drain ports, to remove the fluid from the housing prior the maintenance work
- Optional sampling ports, to get samples of fluid or to connect additional instrument to the system
- Visual, electrical and electronic differential clogging indicators

Common applications:

- Systems where shut-down causes high costs
- Systems where shut-down causes safety issues

Technical data

Filter housing materials

- Head: Aluminium
- Bowl: Cataphoretic Painted Steel
- Bypass valve: AISI 304 - Nylon

Pressure

- Test pressure: 9 MPa (90 bar)
- Burst pressure: 21 MPa (210 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 6 MPa (60 bar)

Bypass valve

- Opening pressure 350 kPa (3.5 bar) \pm 10%
- Other opening pressures on request.

Δp element type

- Microfibre filter elements - series N: 20 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

Connections

Inlet/Outlet In-Line

Note

LDP - LDD filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]	Volumes [dm ³]
LDP 016	2.0	1.2
LDP 025	3.0	1.6
LDP 040	5.0	2.2
LDD 016	9.3	3.6
LDD 025	9.5	4.1
LDD 040	11.3	4.8

GENERAL INFORMATION LDP & LDD

Filter element according to DIN 24550

FILTER ASSEMBLY SIZING
Flow rates [l/min]

Filter series	Filter element design - N Series									
	A03	A06	A10	A16	A25	M25	M60	M90	P10	P25
LDP 016	83	91	178	198	222	350	353	358	295	309
LDP 025	124	134	227	245	265	357	358	358	319	330
LDP 040	173	191	274	284	311	359	360	361	332	337
LDD 016	68	73	120	130	140	189	190	192	169	174
LDD 025	93	98	142	149	157	191	192	192	178	181
LDD 040	118	126	161	165	175	192	192	193	182	184

Maximum flow rate for a complete low and medium pressure filter with a pressure drop $\Delta p = 0.7$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

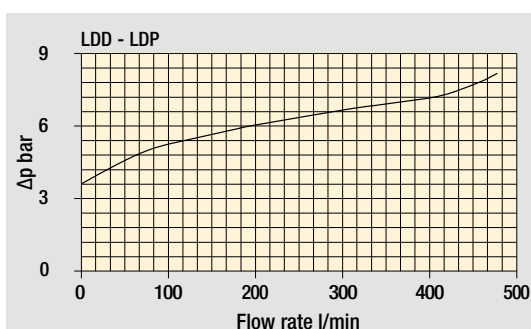
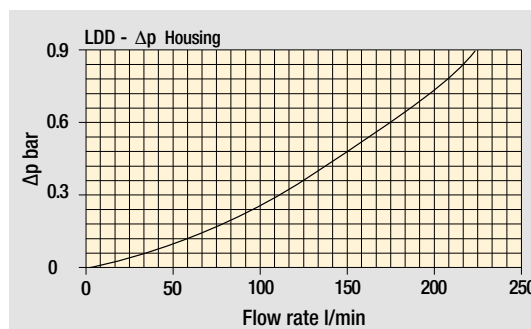
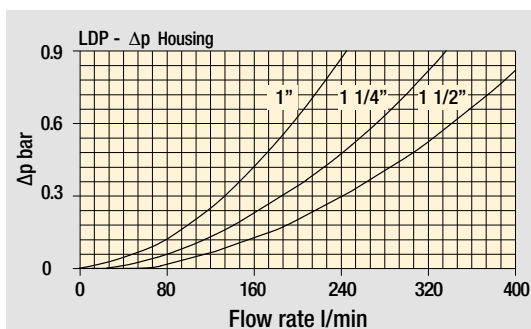
Hydraulic symbols

Filter series	Execution S	Execution B	Execution S	Execution B
LDP 016	•	•		
LDP 025	•	•		
LDP 040	•	•		
LDD 016			•	•
LDD 025			•	•
LDD 040			•	•

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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.

LDP Filter element according to DIN 24550

Designation & Ordering code

COMPLETE FILTER

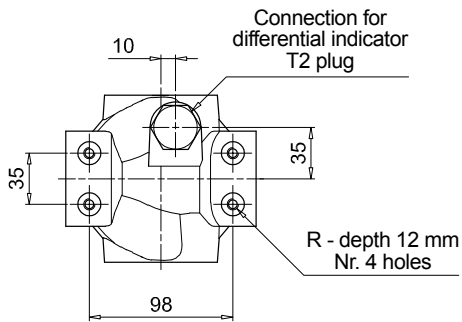
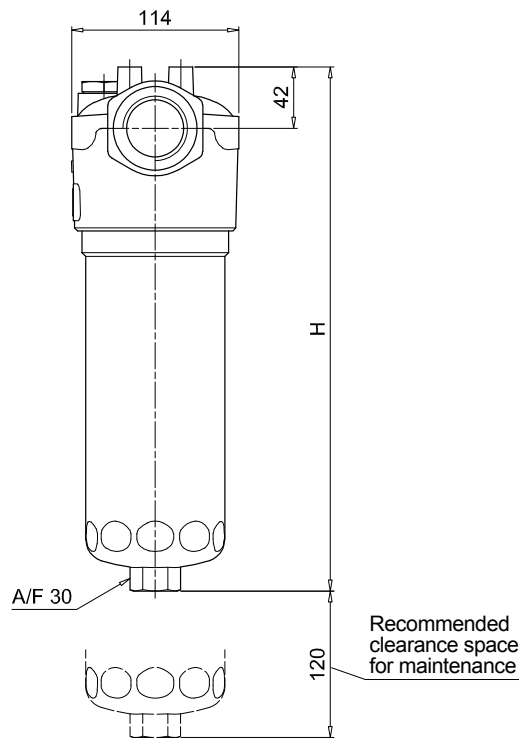
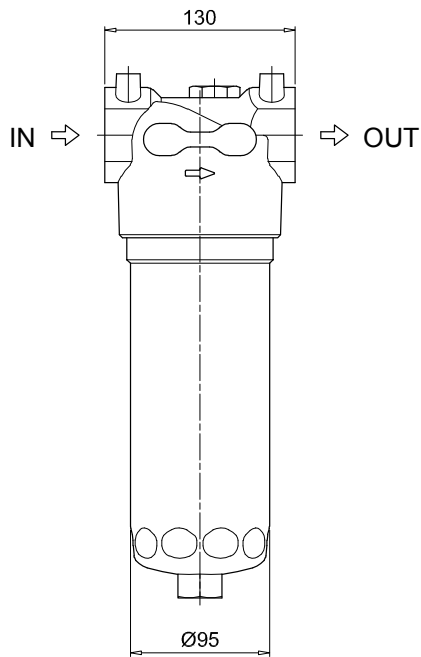
Series	Configuration example: LDP 025 B A D 6 A10 N P01										
LDP											
Size											
016	Element according to DIN 24550 - T3 DN160										
025	Element according to DIN 24550 - T3 DN250										
040	Element according to DIN 24550 - T3 DN400										
Bypass valve											
S	Without bypass					B	3.5 bar				
Seals and treatments				Filtration rating							
A	NBR			Axx	Mxx	Pxx					
V	FPM			•	•	•					
W	NBR compatible with fluids HFA-HFB-HFC			•	•						
Connections											
A	G 1"					F	1 1/2" NPT				
B	G 1 1/4"					G	SAE 16 - 1 5/16" - 12 UN				
C	G 1 1/2"					H	SAE 20 - 1 5/8" - 12 UN				
D	1" NPT					I	SAE 24 - 1 7/8" - 12 UN				
E	1 1/4" NPT										
Connection for differential indicator											
6	With plugged connection										
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				
WA025	Water absorber inorganic microfiber 25 µm										
Element Δp	N					20 bar					
Execution	P01					MP Filtri standard					
Pxx	Customized										

FILTER ELEMENT

Element series	Configuration example: DN 025 A10 A N P01										
DN											
Element size											
016	Element according to DIN 24550 - T3 DN160										
025	Element according to DIN 24550 - T3 DN250										
040	Element according to DIN 24550 - T3 DN400										
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				
WA025	Water absorber inorganic microfiber 25 µm										
Seals				Filtration rating							
A	NBR			Axx	Mxx	Pxx					
V	FPM			•	•	•					
W	NBR compatible with fluids HFA-HFB-HFC			•	•						
Element Δp	N					20 bar					
Execution	P01					MP Filtri standard					
Pxx	Customized										

ACCESSORIES

Differential indicators	page		page
DEA	Electrical differential indicator	445	DTA Electronic differential indicator 448
DEM	Electrical differential indicator	445-446	DVA Visual differential indicator 448
DLA	Electrical / visual differential indicator	446-447	DVM Visual differential indicator 448
DLE	Electrical / visual differential indicator	447	
Additional features	page		
T2	Plug	449	



LDP	
Filter size	H [mm]
016	268
025	358
040	508
Connections	R
A-B-C	M8
D-E-F-G-H-I	5/16" UNC

LDD Filter element according to DIN 24550

Designation & Ordering code

COMPLETE FILTER

Series	Configuration example: LDD 025 B A C 6 A10 N P01									
LDD										
Size										
016	Element according to DIN 24550 - T3 DN160									
025	Element according to DIN 24550 - T3 DN250									
040	Element according to DIN 24550 - T3 DN400									
Bypass valve										
S	Without bypass			B 3.5 bar						
Seals and treatments				Filtration rating						
A	NBR	Axx	Mxx	Pxx						
V	FPM	•	•	•						
W	NBR compatible with fluids HFA-HFB-HFC	•	•							
Connections										
C	G 1 1/2"									
F	1 1/2" NPT									
I	SAE 24 - 1 7/8" - 12 UN									
L	1 1/2" SAE 3000 psi/M + G 1 1/4"									
M	1 1/2" SAE 3000 psi/UNC + 1 1/4" NPT									
N	1 1/2" SAE 3000 psi/UNC + SAE 20 - 1 5/8" UN									
Connection for differential indicator										
6	With plugged connection									
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					
WA025	Water absorber inorganic microfiber 25 µm									
Element Δp	N 20 bar					Execution				
						P01 MP Filtri standard				
						Pxx Customized				

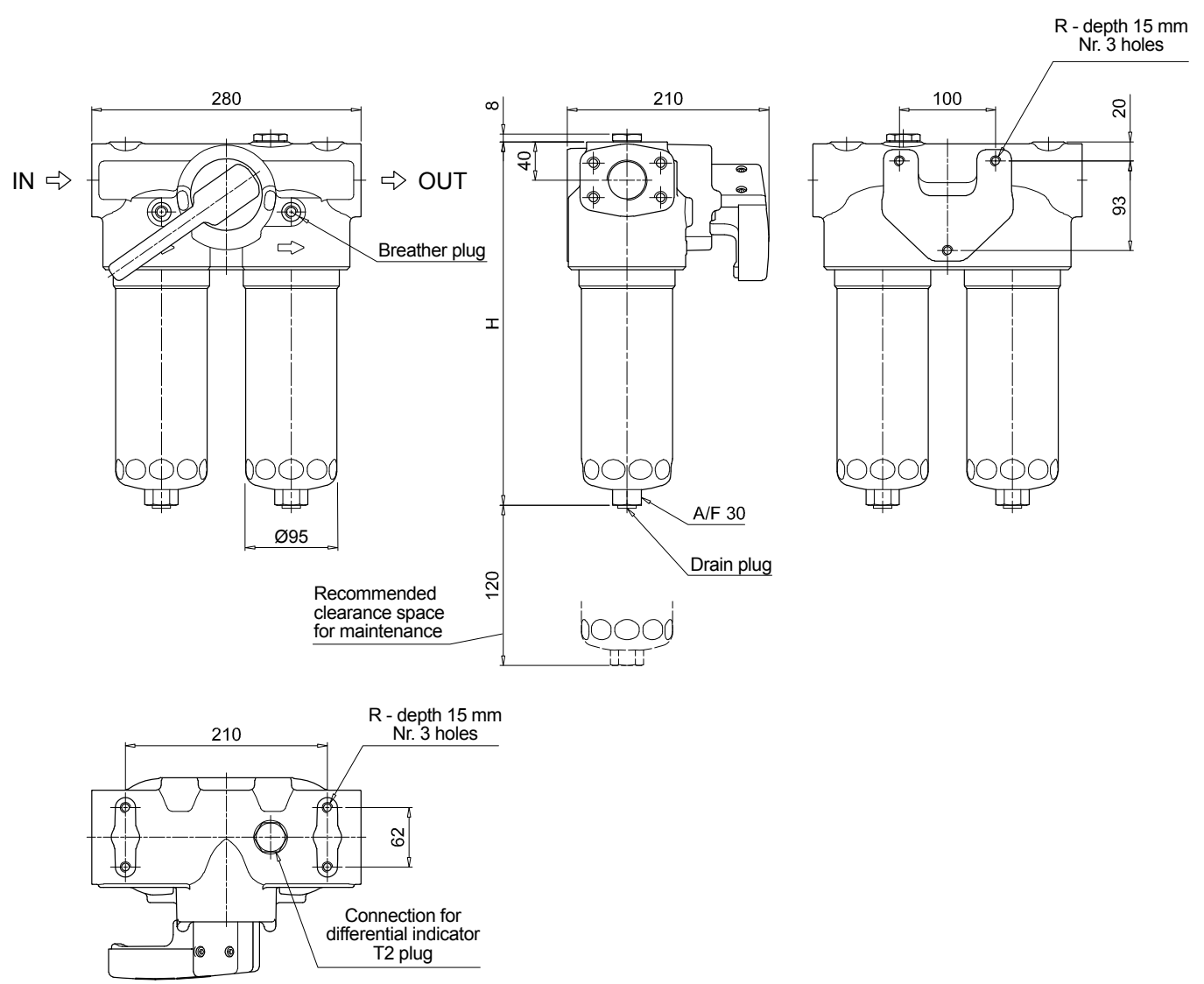
FILTER ELEMENT

Element series	Configuration example: DN 025 A10 A N P01								
DN									
Element size									
016	Element according to DIN 24550 - T3 DN160								
025	Element according to DIN 24550 - T3 DN250								
040	Element according to DIN 24550 - T3 DN400								
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				
WA025	Water absorber inorganic microfiber 25 µm								
Seals				Filtration rating					
A	NBR	Axx	Mxx	Pxx					
V	FPM	•	•	•					
W	NBR compatible with fluids HFA-HFB-HFC	•	•						
Element Δp	N 20 bar					Execution			
						P01 MP Filtri standard			
						Pxx Customized			

ACCESSORIES

Differential indicators	page		page
DEA	Electrical differential indicator	445	DTA Electronic differential indicator 448
DEM	Electrical differential indicator	445-446	DVA Visual differential indicator 448
DLA	Electrical / visual differential indicator	446-447	DVM Visual differential indicator 448
DLE	Electrical / visual differential indicator	447	
Additional features	page		
T2	Plug	449	

LDD	
Filter size	H [mm]
016	293
025	383
040	533
Connections	R
C	M10
F - I	3/8" UNC
L	M10
M - N	3/8" UNC

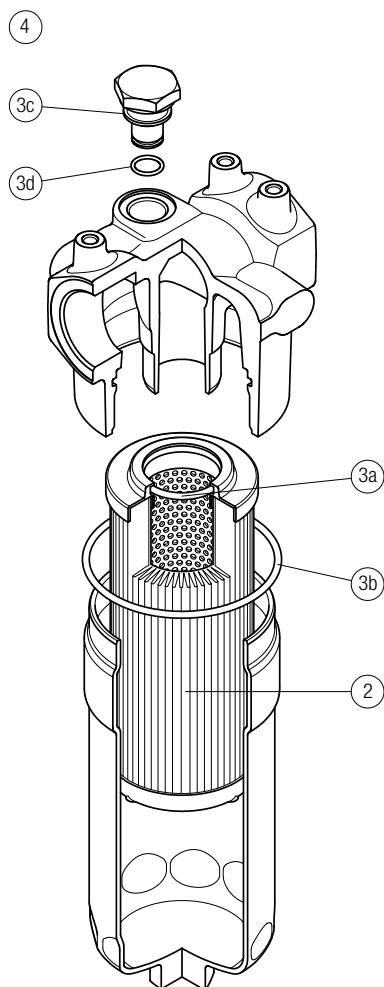


LDP SPARE PARTS

Filter element according to DIN 24550

Order number for spare parts

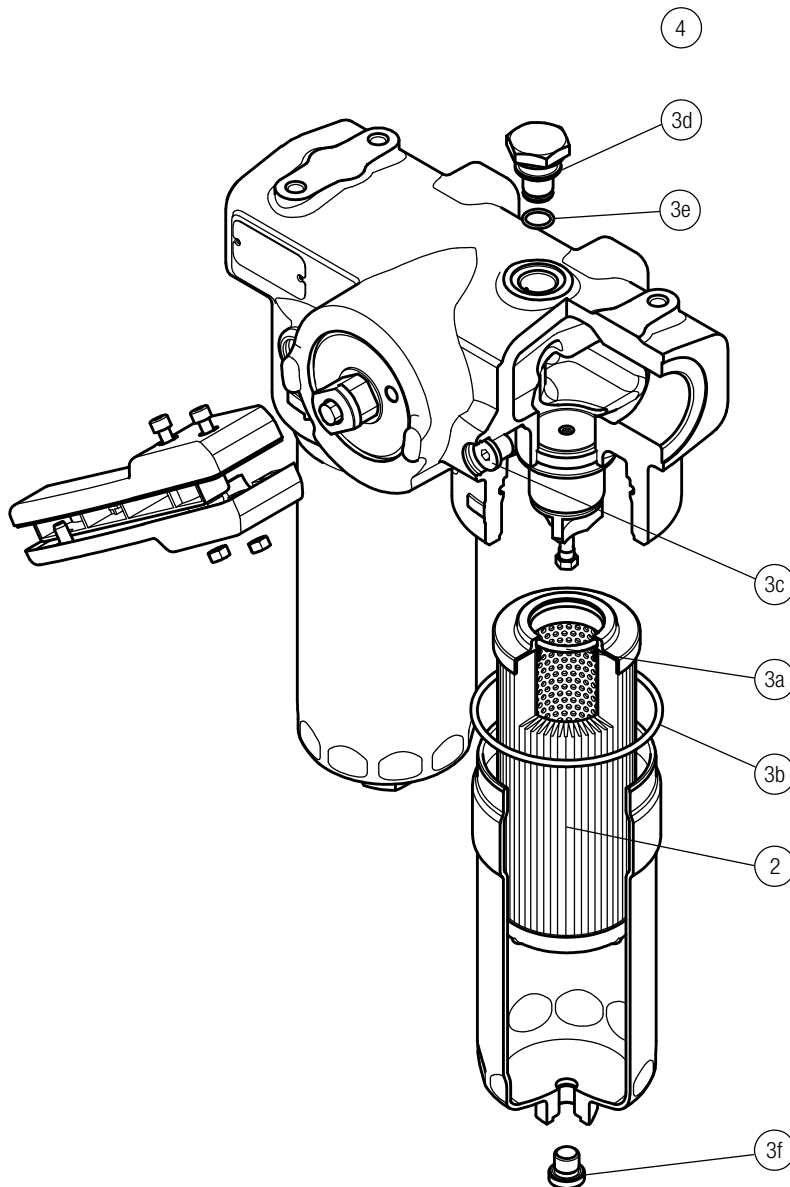
LDP



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug	
LDP	See order table	NBR	FPM	NBR	FPM
	2	3 (3a ÷ 3d)		4	
		02050435	02050436	T2H	T2V

Order number for spare parts

LDD



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 2 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug	
LDD	See order table	NBR	FPM	NBR	FPM
	2	3 (3a ÷ 3i)		4	
		02050671	02050672	T2H	T2V

LMP 900-901 series

Filter element according to DIN 24550

Maximum working pressure up to 3 MPa (30 bar) - Flow rate up to 2000 l/min



LMP 900-901 GENERAL INFORMATION

Filter element according to DIN 24550

Description

Low & Medium Pressure filters

Maximum working pressure up to 3 MPa (30 bar)

Flow rate up to 2000 l/min

LMP900 is a range of low pressure filter with large filtration surface mainly suitable for lubrication, off-line filtration of the reservoirs and filtration equipment.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Flanged connections up to 4", for a maximum flow rate of 2000 l/min
- In line or 90° connections, to meet any type of application
- Filter element designed in accordance with DIN 24550 regulation
- Fine filtration rating, to get a good cleanliness level into the system
- Water removal elements, to remove the free water from the hydraulic fluid. For further information, see the Contamination Management document and the dedicate leaflet.
- Bypass valve, to relieve excessive pressure drop across the filter media
- Vent ports, to avoid air trapped into the filter going into the system
- Drain ports, to remove the fluid from the housing prior the maintenance work
- Visual, electrical and electronic differential clogging indicators

Common applications:

- Off-line filtration of reservoirs
- Filtration systems
- Lubrication systems

Technical data

Filter housing materials

- Head: Anodized Aluminium
- Housing: Anodized Aluminium
- Manifolds: Anodized Aluminium
- Bypass valve: Steel

Pressure

- Test pressure: 4.5 MPa (45 bar)
- Burst pressure: 12 MPa (120 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 3 MPa (30 bar)

Bypass valve

- Opening pressure 350 kPa (3.5 bar) \pm 10%
- Other opening pressures on request.

Number of filter elements

LMP 900-1: 1 filter element CU900

LMP 900-2: 2 filter elements CU900

Filter elements

Filter element according to DIN 24550

Size: 1000

Δp element type

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

Connections

LMP 900: In-line Inlet/Outlet

LMP 901: 90° Inlet/Outlet

Seals

- Standard NBR series A
- Optional FPM series V

Temperature

From -25 °C to +110 °C

Note

LMP 900 - 901 filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]			Volumes [dm ³]		
	Length	1	2	Length	1	2
LMP 900-901		19.2	30.4		16	24

GENERAL INFORMATION LMP 900-901

Filter element according to DIN 24550

FILTER ASSEMBLY SIZING
Flow rates [l/min]

Filter series	Length	Filter element design - N Series					
		A03	A06	A10	A16	A25	M25 M60 M90
LMP 900	1	706	877	1264	1291	1444	1803
	2	1100	1264	1556	1573	1668	1867
LMP 901	1	715	899	1337	1369	1552	2000
	2	1147	1337	1689	1710	1828	2081

Maximum flow rate for a complete low and medium pressure filter with a pressure drop $\Delta p = 0.7$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

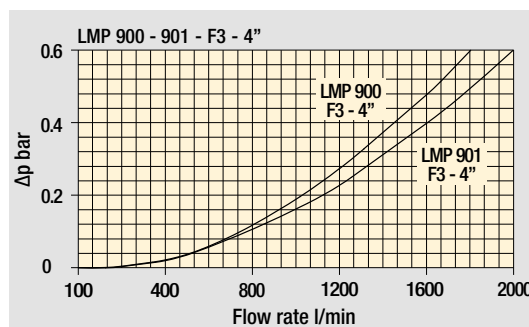
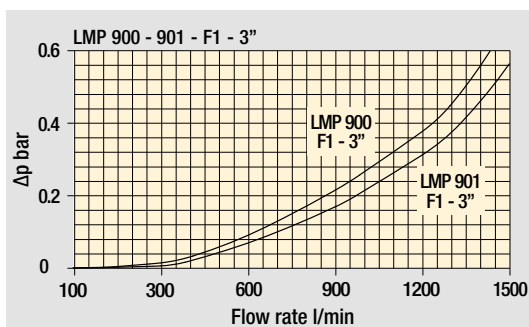
LMP 900-901 Length 2



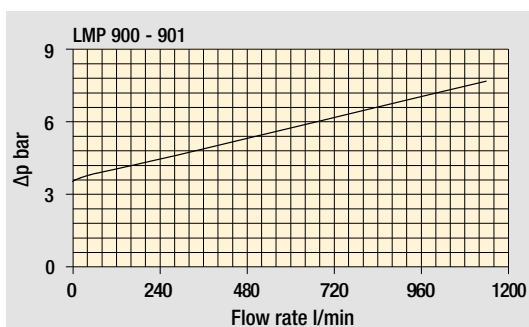
Hydraulic symbols

Filter series	Execution S	Execution B
LMP 900-901	●	●

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.

LMP 900-901 Filter element according to DIN 24550

Designation & Ordering code

COMPLETE FILTER

Series and size LMP900 LMP901	Configuration example: LMP901 2 B A F2 A10 N P01							
Length 1 2								
Bypass valve S Without bypass B 3.5 bar								
Seals and treatments A NBR V FPM								
Connections F1 3" SAE 3000 psi/M F2 3" SAE 3000 psi/UNC F3 4" SAE 3000 psi/M F4 4" SAE 3000 psi/UNC								
Filtration rating (filter media) A03 Inorganic microfiber 3 µm A06 Inorganic microfiber 6 µm A10 Inorganic microfiber 10 µm A16 Inorganic microfiber 16 µm A25 Inorganic microfiber 25 µm M25 Wire mesh 25 µm M60 Wire mesh 60 µm M90 Wire mesh 90 µm WA025 Water absorber inorganic microfiber 25 µm								
Element Δp N 20 bar	Execution						Filter length	
	P01 MP Filtri standard						1	2
	P02 Maintenance from the bottom of the housing							•
	Pxx Customized							

FILTER ELEMENT

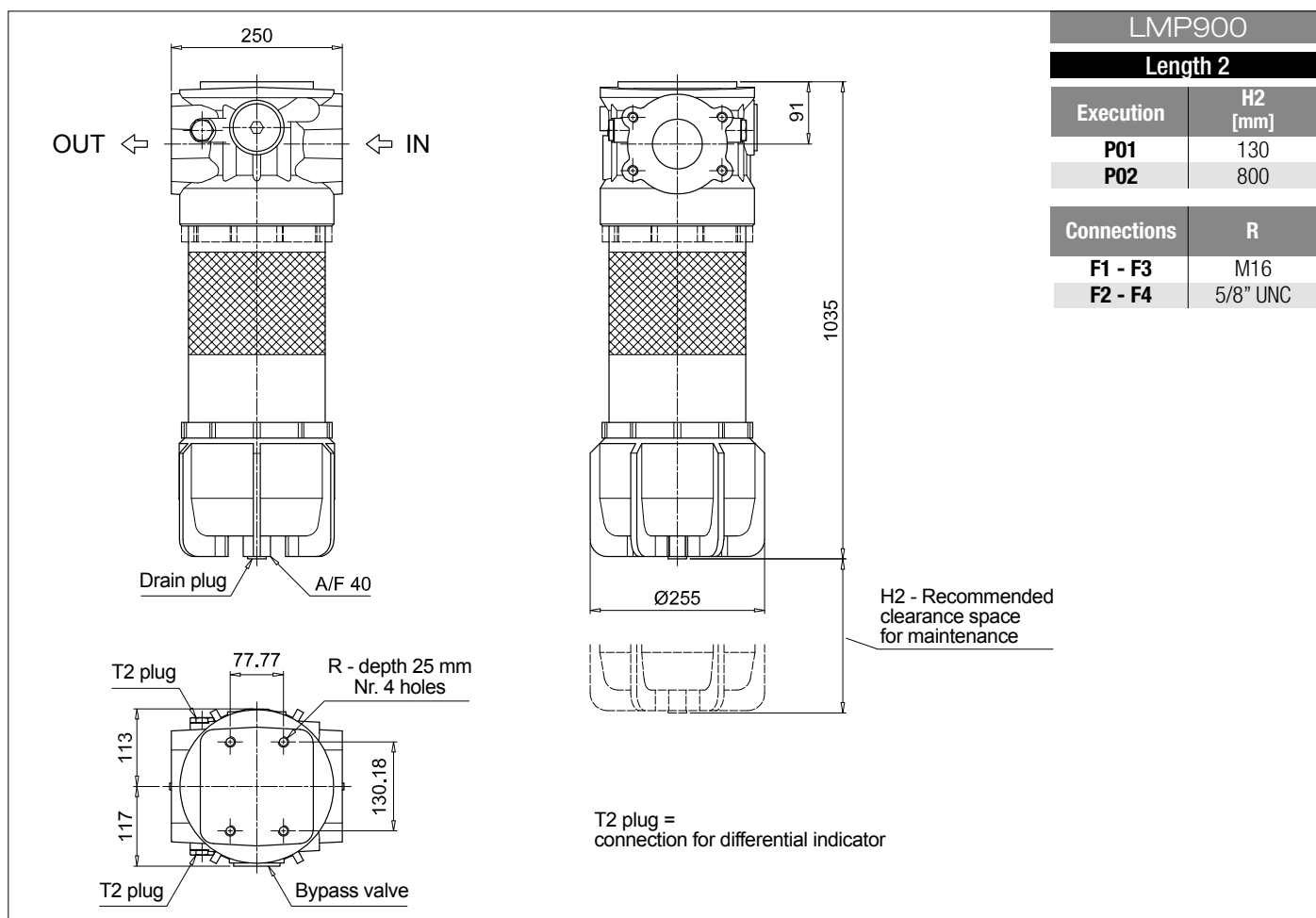
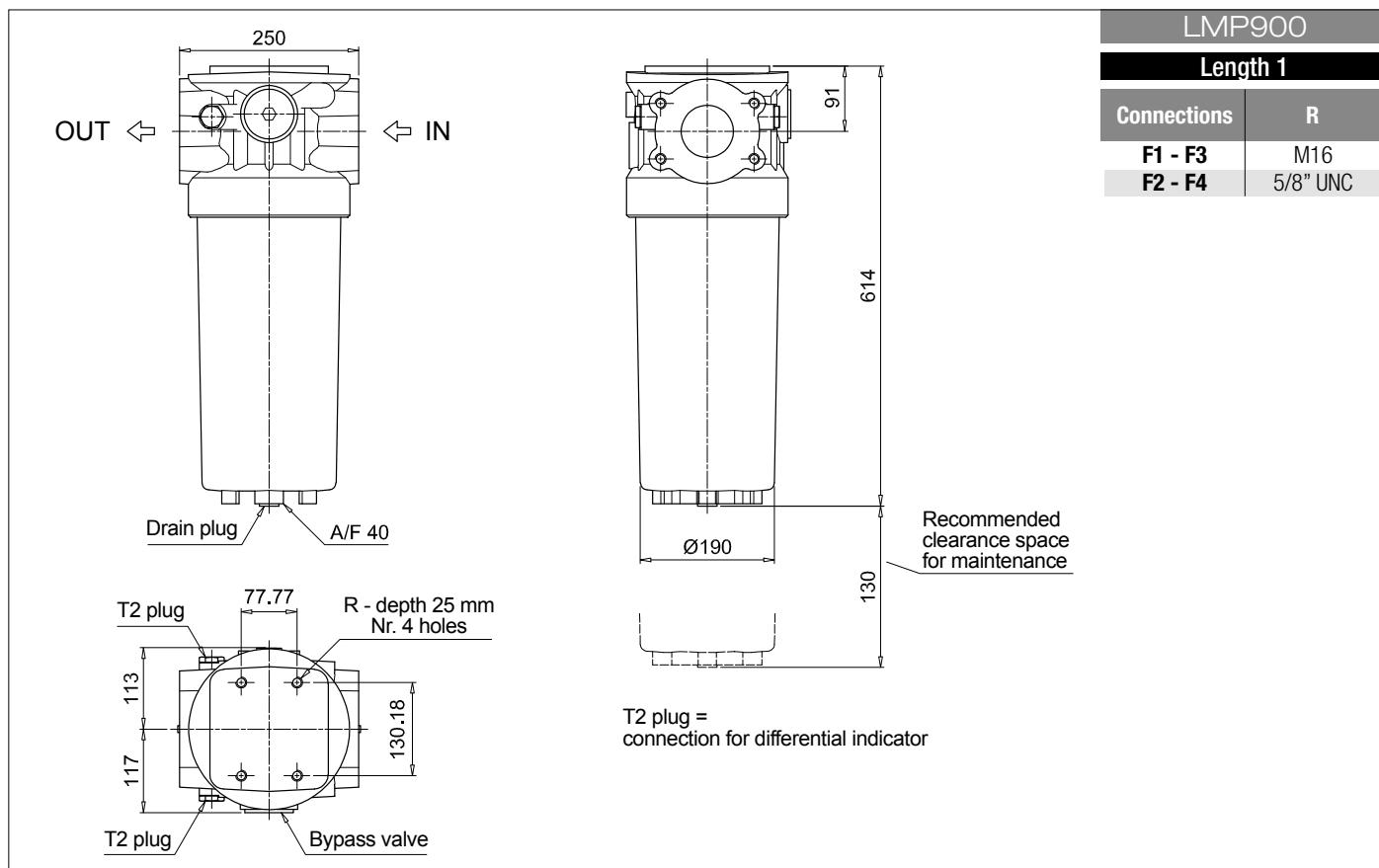
Element series and size CU900	Configuration example: CU900 A10 A N P01			
Length 1 Nr. 1 filter element 2 Nr. 2 filter elements				
Filtration rating (filter media) A03 Inorganic microfiber 3 µm A06 Inorganic microfiber 6 µm A10 Inorganic microfiber 10 µm A16 Inorganic microfiber 16 µm A25 Inorganic microfiber 25 µm M25 Wire mesh 25 µm M60 Wire mesh 60 µm M90 Wire mesh 90 µm WA025 Water absorber inorganic microfiber 25 µm				
Seals A NBR V FPM				
Element Δp N 20 bar	Execution			
	P01 MP Filtri standard			
	Pxx Customized			

ACCESSORIES

Differential indicators	page				page
DEA Electrical differential indicator	445	DTA Electronic differential indicator			448
DEM Electrical differential indicator	445-446	DVA Visual differential indicator			448
DLA Electrical / visual differential indicator	446-447	DVM Visual differential indicator			448
DLE Electrical / visual differential indicator	447				
Additional features	Filter length		page	Filter length	
T2 Plug	1	2	449	1	2
	•	•			
CFA Retaining clamp				•	450

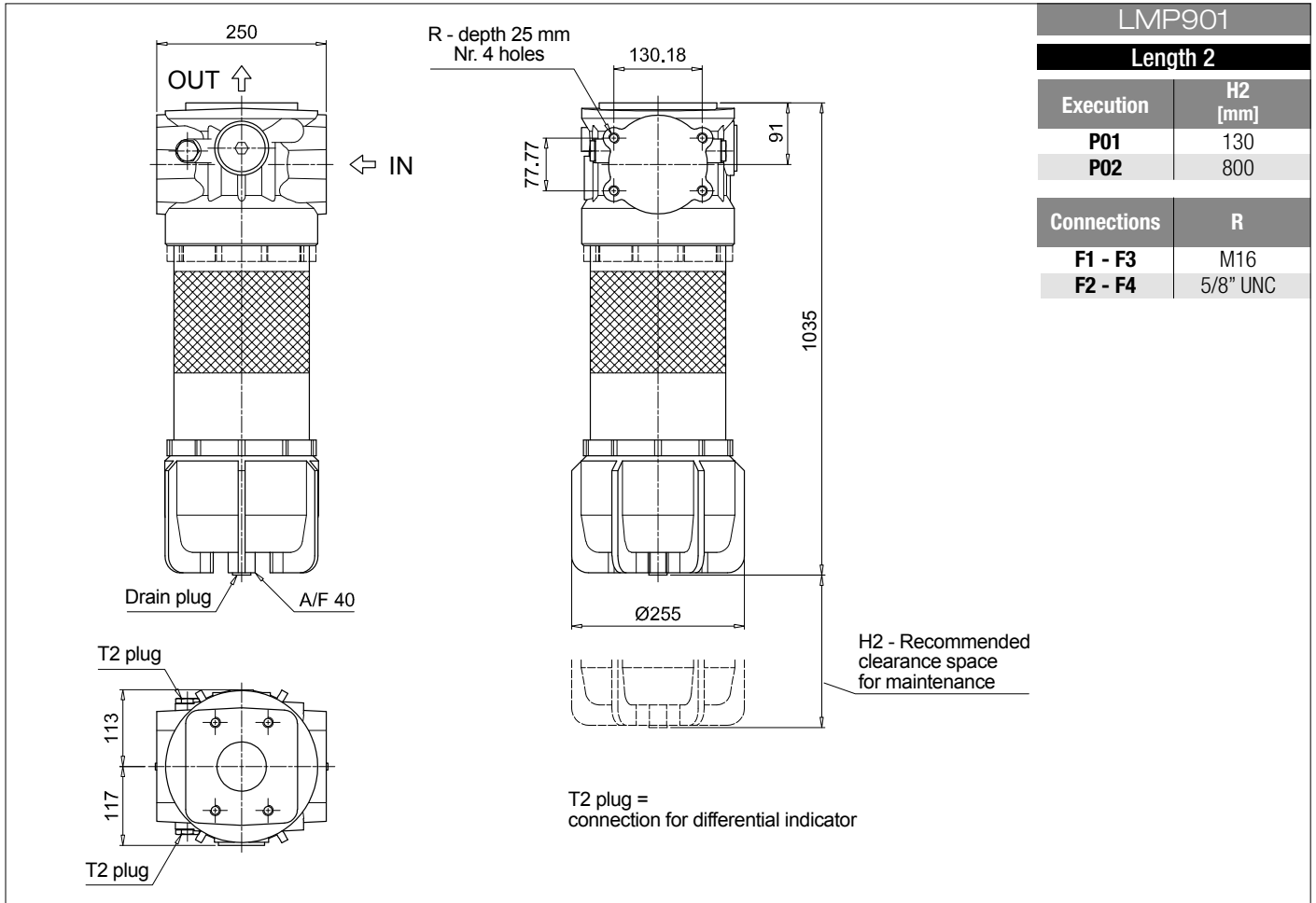
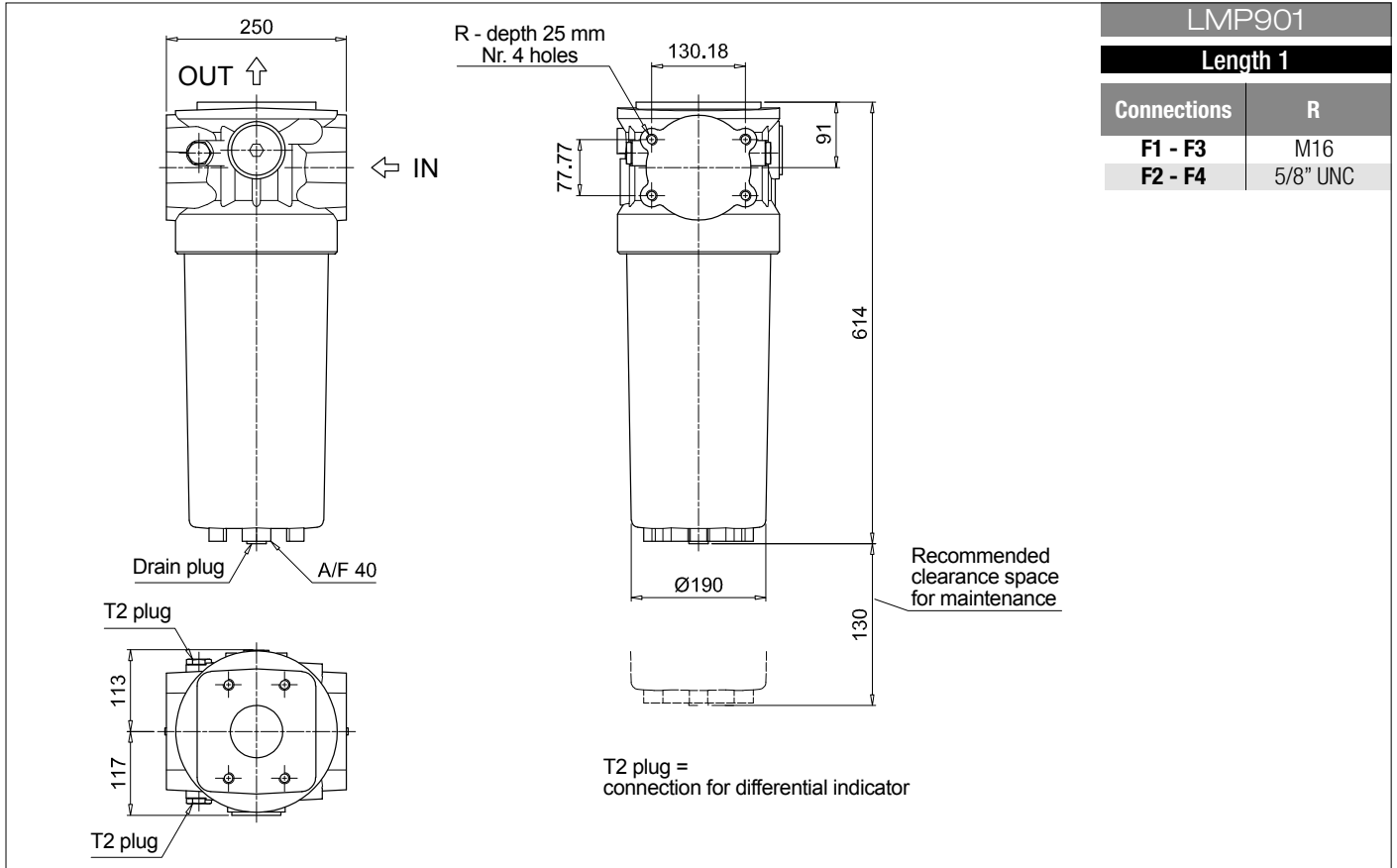
Filter element according to DIN 24550 LMP 900-901

Dimensions



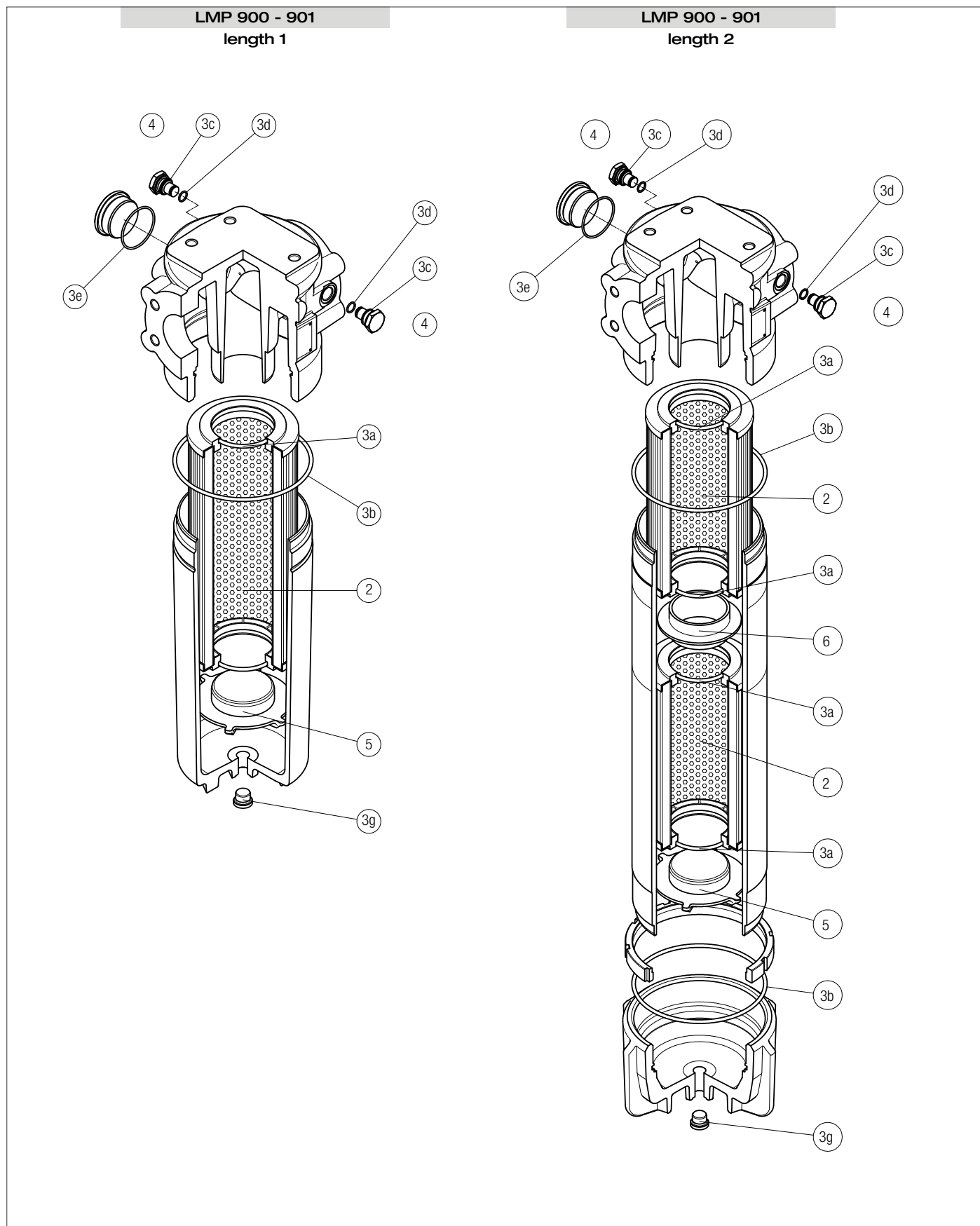
LMP 900-901 Filter element according to DIN 24550

Dimensions



SPARE PARTS LMP 900-901

Order number for spare parts



Item:	2		3 (3a ÷ 3g)			4		5		6	
Filter series	Filter element		Seal Kit code number		Indicator connection plug		Housing spigot		Coupling spigot		
	Q.ty		Q.ty	NBR	FPM	Q.ty	NBR	FPM	Q.ty	Q.ty	
LMP 900-901 length 1	1 pc.	See order table	1 pc.	02050363	02050364	2 pcs.	T2H	T2V	1 pc.	01044104	-
LMP 900-901 length 2	2 pcs.		1 pc.	02050365	02050366	2 pcs.			1 pc.		01044099

LMP 902-903 series

Filter element according to DIN 24550

Maximum working pressure up to 2 MPa (20 bar) - Flow rate up to 3000 l/min



LMP 902-903 GENERAL INFORMATION

Filter element according to DIN 24550

Description

Low & Medium Pressure filters

Maximum working pressure up to 2 MPa (20 bar)

Flow rate up to 3000 l/min

LMP902 and LMP903 are ranges of low pressure filter with large filtration surface mainly suitable for lubrication, off-line filtration of the reservoirs and filtration equipment.

Multiple LMP950 filters are connected to a manifold to reduce the pressure drop caused by the filter media and to increase the life time of the filter element.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- 4" flanged connections, for a maximum flow rate of 3000 l/min
- Filter element designed in accordance with DIN 24550 regulation
- Fine filtration rating, to get a good cleanliness level into the system
- Water removal elements, to remove the free water from the hydraulic fluid.
For further information, see the Contamination Management document and the dedicate leaflet.
- Bypass valve, to relieve excessive pressure drop across the filter media
- Vent ports, to avoid air trapped into the filter going into the system
- Drain ports, to remove the fluid from the housing prior the maintenance work
- Visual, electrical and electronic differential clogging indicators

Common applications:

- Off-line filtration of reservoirs
- Filtration systems

Technical data

Filter housing materials

- Head: Anodized Aluminium
- Housing: Anodized Aluminium
- Manifolds: Welded - Phosphatized Steel
- Bypass valve: Steel
- Size 1000 filter elements complying with DIN 24550 standard

Pressure

- Test pressure: 3.5 MPa (35 bar)

Bypass valve

- Opening pressure 350 kPa (3.5 bar) $\pm 10\%$
- Other opening pressures on request.

Number of filter elements

LMP 902: 4 filter elements CU900

LMP 903: 6 filter elements CU900

Filter elements

Filter element according to DIN 24550

Size: 1000

Δp element type

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

Connections

LMP 902-903: In-line Inlet/Outlet

Seals

- Standard NBR series A
- Optional FPM series V

Temperature

From -25 °C to +110 °C

Note

LMP 902 - 903 filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]		Volumes [dm ³]	
	Length	2	Length	2
LMP 902		89.6		58
LMP 903		129.2		87

GENERAL INFORMATION LMP 902-903

Filter element according to DIN 24550

FILTER ASSEMBLY SIZING
Flow rates [l/min]

Filter series	Length	Filter element design - N Series					
		A03	A06	A10	A16	A25	M25 M60 M90
LMP 902	2	2217	2576	3241	3282	3506	3987
LMP 903	2	2838	3170	3720	3755	3926	4278

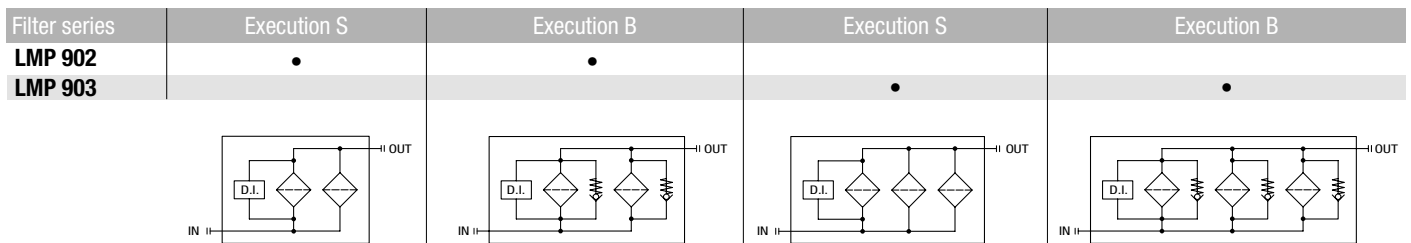
Maximum flow rate for a complete low and medium pressure filter with a pressure drop $\Delta p = 0.7$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

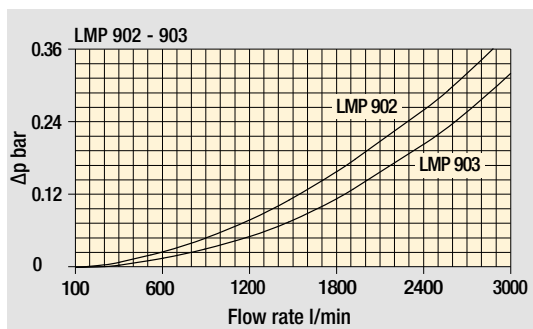
You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols

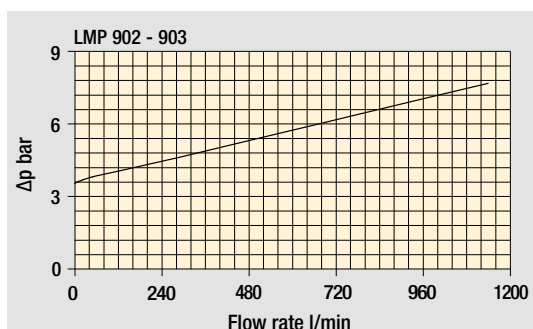


Pressure drop

Filter housings Δp pressure drop



Bypass valve pressure drop

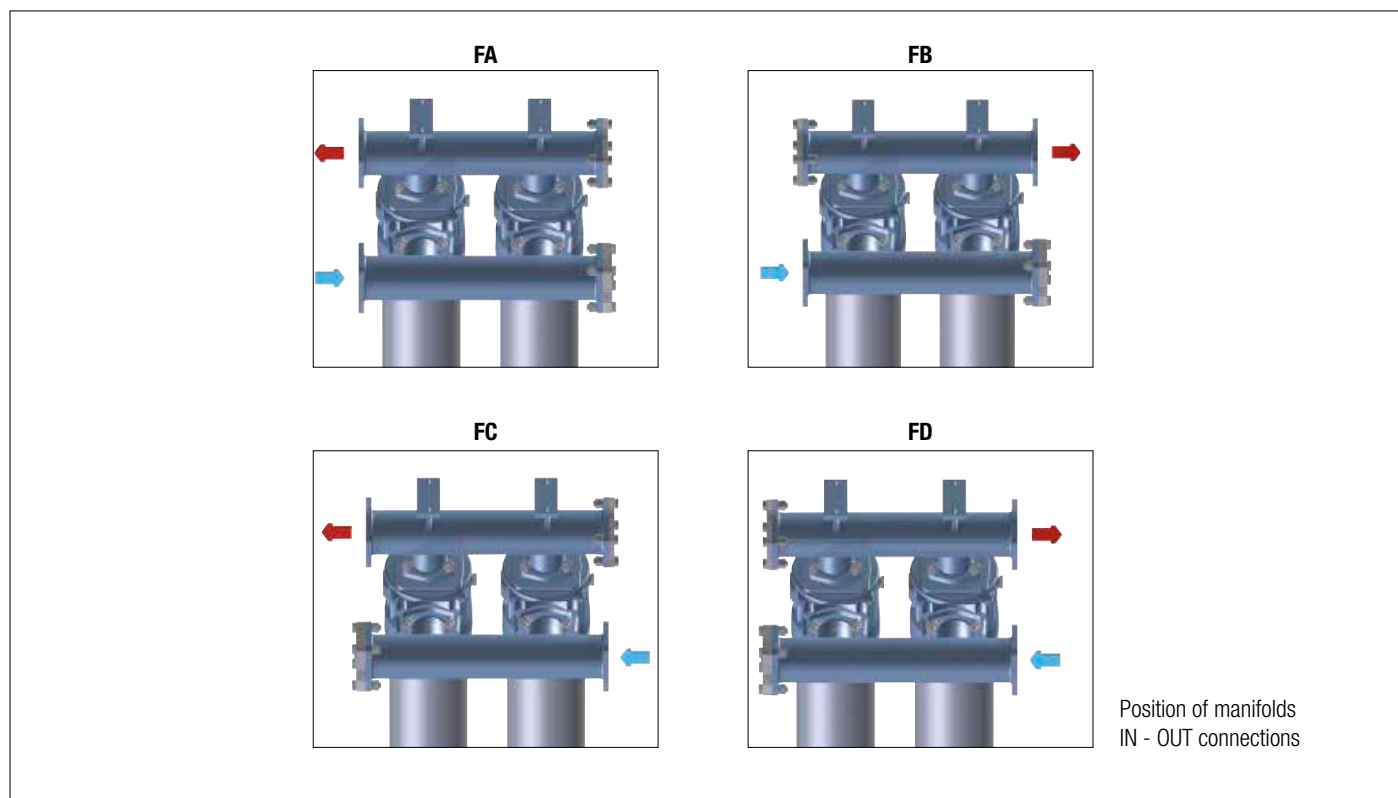


The curves are plotted using mineral oil with density of 0.86 kg/dm³ in compliance with ISO 3968. Δp varies proportionally with density.

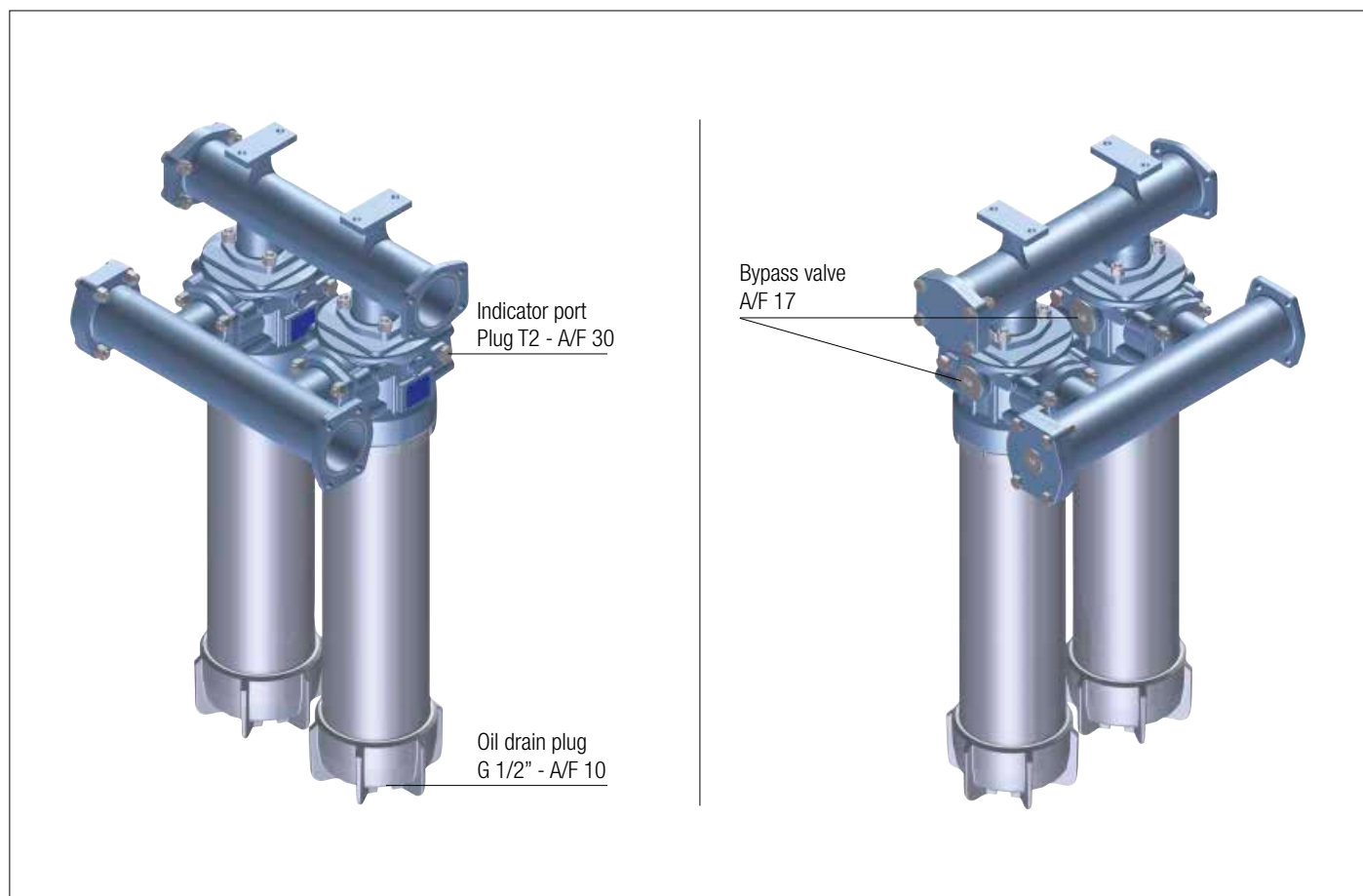
LMP 902-903 GENERAL INFORMATION

Filter element according to DIN 24550

Manifolds



Focus on



LMP 902-903 Filter element according to DIN 24550

Designation & Ordering code

COMPLETE FILTER

Series and size		Configuration example: LMP902 2 B A FA A10 N P01							
LMP902 LMP903									
Length		2							
Bypass valve		S Without bypass B 3.5 bar							
Seals and treatments		A NBR V FPM							
Connections		IN	OUT						
FA	4" SAE 3000 psi	left	left						
FB	4" SAE 3000 psi	left	right						
FC	4" SAE 3000 psi	right	left						
FD	4" SAE 3000 psi	right	right						
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								
A25	Inorganic microfiber 25 µm								
WA025		Water absorber inorganic microfiber 25 µm							
		Element Δp			Execution				
		N 20 bar			P01 MP Filtri standard Pxx Customized				

FILTER ELEMENT

Element series and size		Configuration example: CU900 A10 A N P01					
CU900							
Filter series and size							
LMP902	Nr. 4 filter elements						
LMP903	Nr. 6 filter elements						
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						
A25	Inorganic microfiber 25 µm						
WA025		Water absorber inorganic microfiber 25 µm					
Seals		A NBR V FPM					
		Element Δp			Execution		
		N 20 bar			P01 MP Filtri standard Pxx Customized		

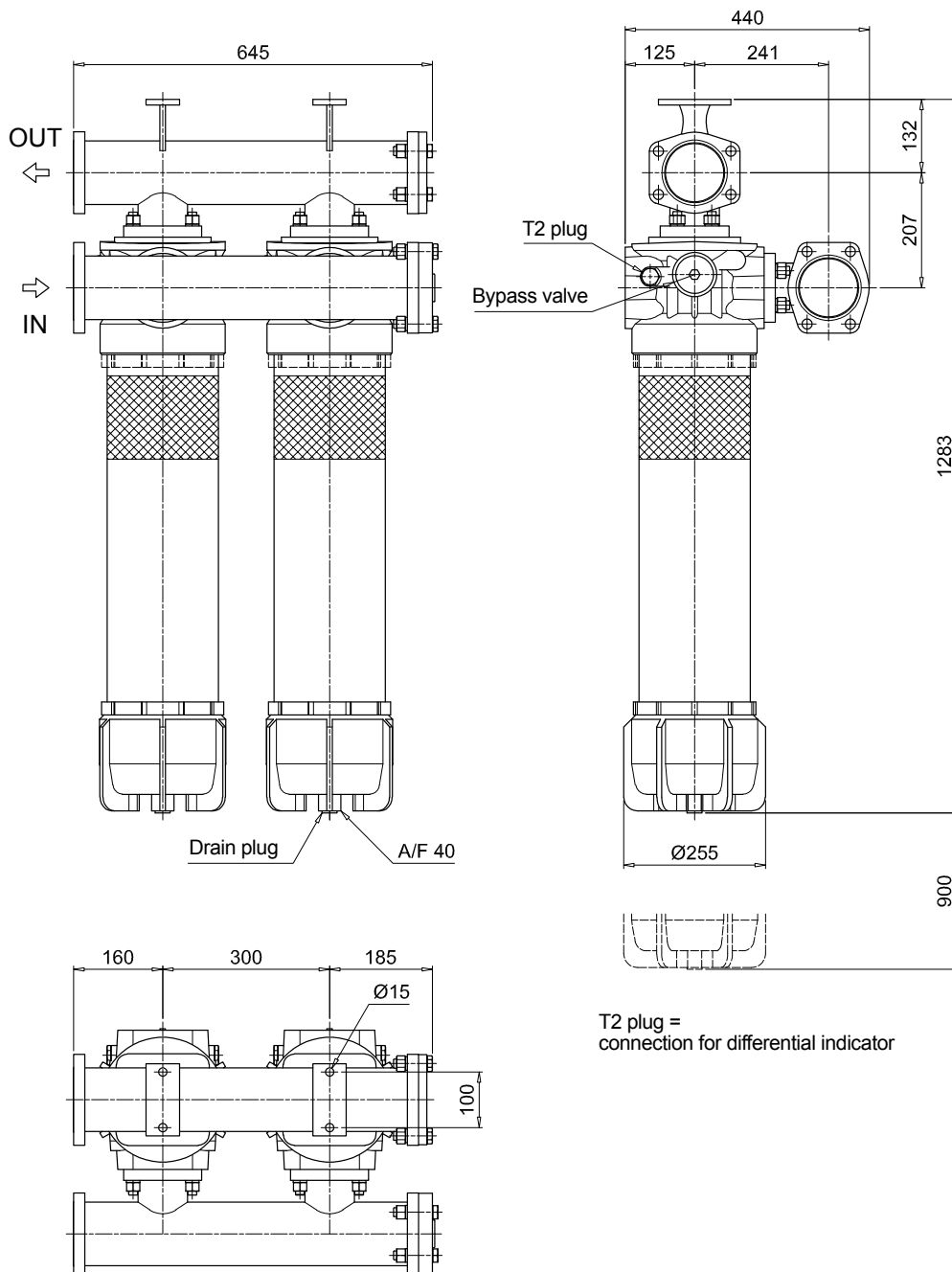
ACCESSORIES

Differential indicators		page		page
DEA	Electrical differential indicator	445	DTA	Electronic differential indicator 448
DEM	Electrical differential indicator	445-446	DVA	Visual differential indicator 448
DLA	Electrical / visual differential indicator	446-447	DVM	Visual differential indicator 448
DLE	Electrical / visual differential indicator	447		
Additional features		page		
T2	Plug	449		

Filter element according to DIN 24550 LMP 902-903

Dimensions

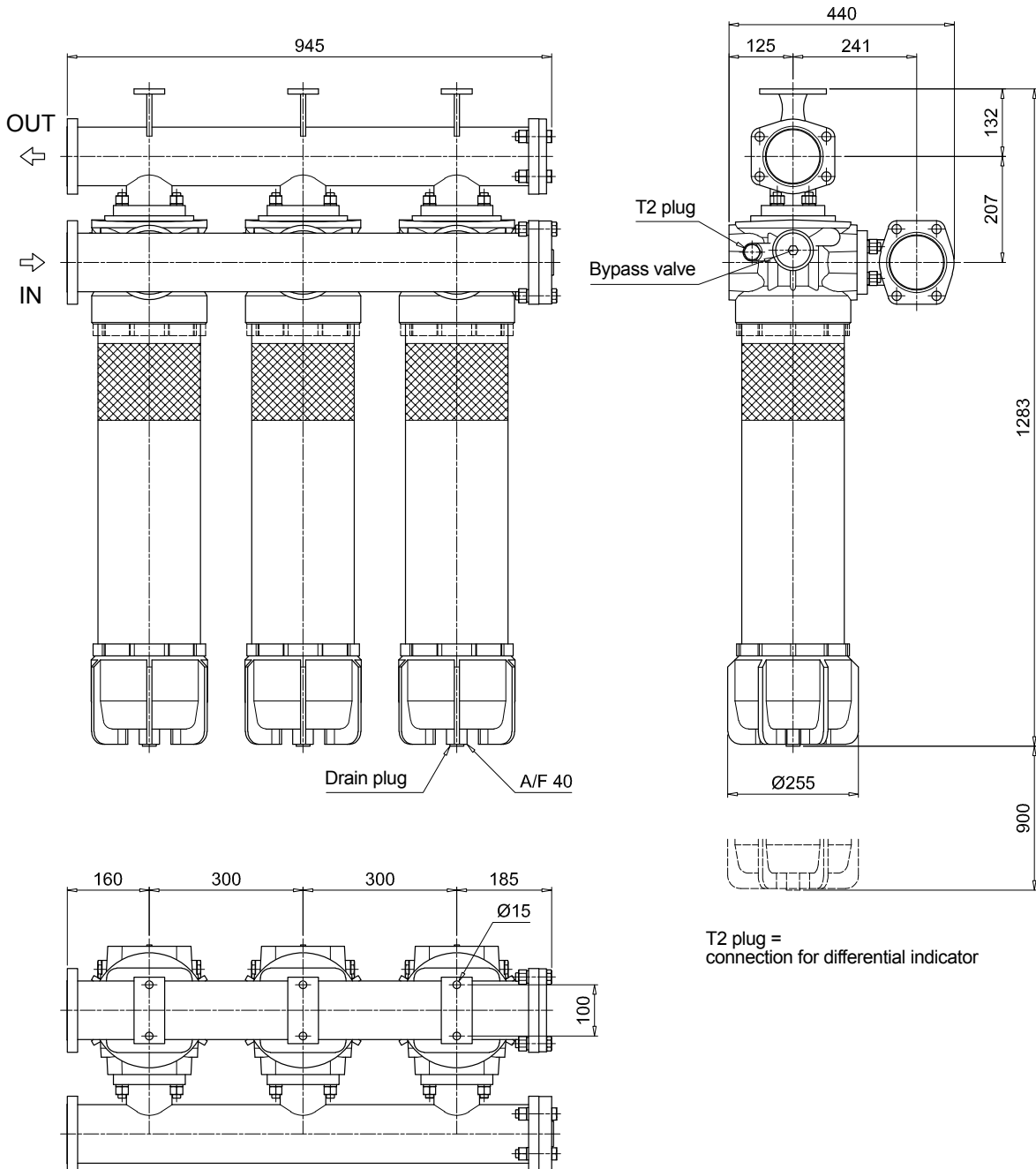
LMP902



LMP 902-903 Filter element according to DIN 24550

Dimensions

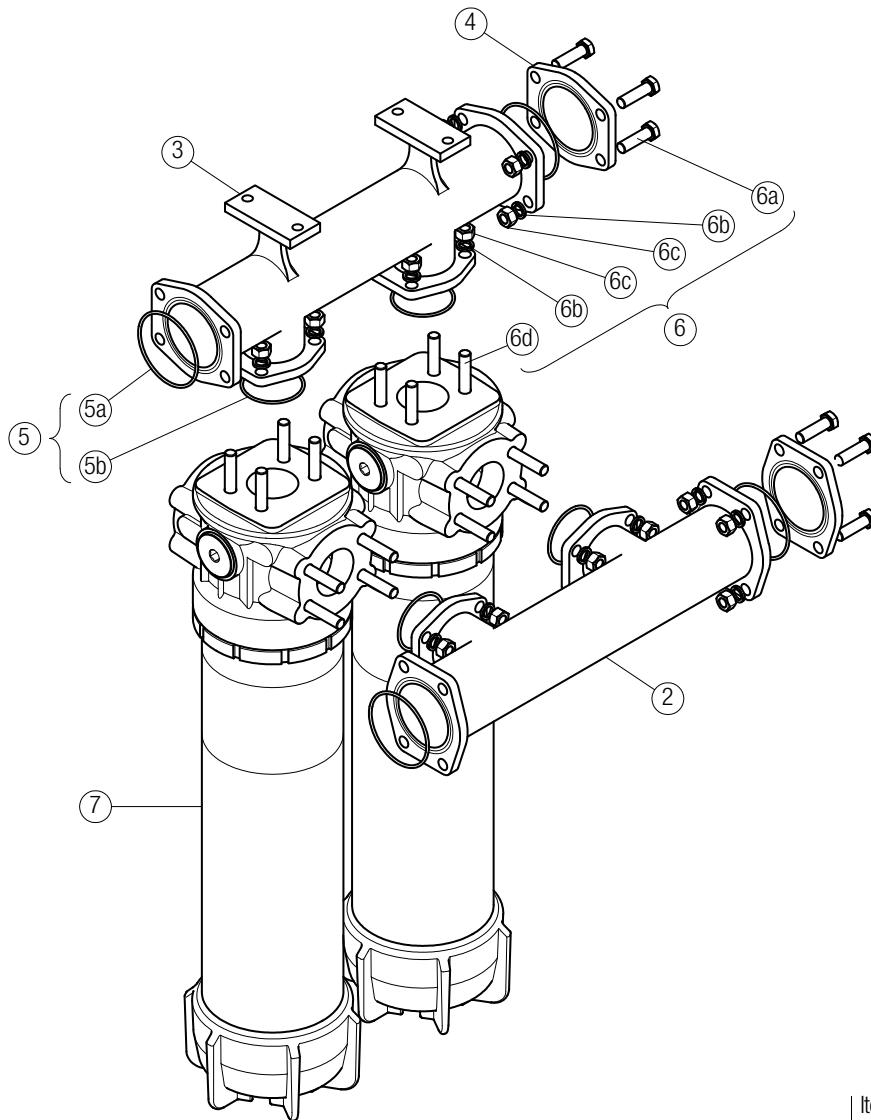
LMP903



SPARE PARTS LMP 902-903

Order number for spare parts

LMP 902 - 903



Item 7:
for complete filter code and
spare parts, see
LMP 900 - 901 series chapter

Quantity:
- filter spare parts:
LMP 902 - 2 pcs.
LMP 903 - 3 pcs.

- filter seal kit:
LMP 902 - 2 pcs.
LMP 903 - 3 pcs.

Item:	2		3	4		5 (5a-5b)			6 (6a ÷ 6d)		7	
Filter series	Q.ty	Manifold IN	OUT	Q.ty	4" SAE 3000 psi plugged flange	Q.ty	Manifolds seal kit NBR	FPM	Q.ty	Threaded fasteners kit	Q.ty	Filter
LMP 902	1 pc.	01039270	01039271	2 pcs.	01042012	1 pc.	02050404	02050405	1 pc.	02049051	2 pcs.	LMP9012xxF1xxxNP02
LMP 903	1 pc.	01039337	01039338	2 pcs.		1 pc.	02050404	02050405	1 pc.	02049052	3 pcs.	

Clogging indicators

Differential indicators

Introduction

Filter elements are efficient only if their Dirt Holding Capacity is fully exploited. This is achieved by using filter housings equipped with clogging indicators.

These devices trip when the clogging of the filter element causes an increase in pressure drop across the filter element.

The indicator is set to alarm before the element becomes fully clogged.

MP Filtri can supply differential pressure indicators with a visual, electrical or both signals.

Suitable indicator types

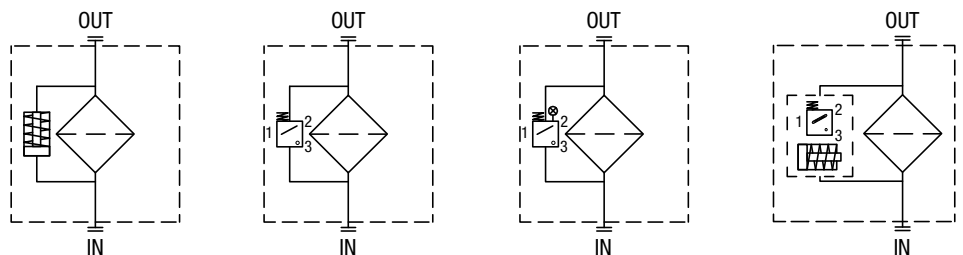
DIFFERENTIAL INDICATORS

Differential indicators are used on the Pressure line to check the efficiency of the filter element.

They measure the pressure upstream and downstream of the filter element (differential pressure).

Standard items are produced with special connection G 1/2" size.

Also available in Stainless Steel models.



Quick reference guide

Filter series	Visual indicator	Electrical indicator	Electrical / Visual indicator	Electronic indicator
With bypass valve LMP 110 - 112 - 116 - 118 - 119 MULTIPORT LMP 120 - 122 - 123 MULTIPORT LMP 210 - 211 - LDP LMP 400 - 401 & 430 - 431 LMP 900 - 901 LMP 902 - 903 LMP 950 - 951 LMP 952 - 953 - 954 LMD 211 - 400 - 401 - 431 - 951 - LDD	DVA20xP01 DVM20xP01	DEA20xA50P01 DEM20xAxxP01	DLA20xA51P01 DLA20xA52P01 DLA20xA71P01 DLE20xA50P01 DLE20xF50P01	DTA20xF70P01
Without bypass valve LMP 110 - 112 - 116 - 118 - 119 MULTIPORT LMP 120 - 122 - 123 MULTIPORT LMP 210 - 211 - LDP LMP 400 - 401 & 430 - 431 LMP 900 - 901 LMP 902 - 903 LMP 950 - 951 LMP 952 - 953 - 954 LMD 211 - 400 - 401 - 431 - 951 - LDD	DVA50xP01 DVM50xP01	DEA50xA50P01 DEM50xAxxP01	DLA50xA51P01 DLA50xA52P01 DLA50xA71P01 DLE50xA50P01 DLE50xF50P01	DTA50xF70P01

DEA*50	
Electrical Differential Indicator	
Settings	Ordering code
2.0 bar $\pm 10\%$	DE A 20 x A 50 P01
5.0 bar $\pm 10\%$	DE A 50 x A 50 P01

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree protection: IP66 according to EN 60529
IP69K according to ISO 20653

Electrical data

- Electrical connection: EN 175301-803
- Resistive load: 0.2 A / 115 Vdc

DEM*10	
Electrical Differential Indicator	
Settings	Ordering code
2.0 bar $\pm 10\%$	DE M 20 x x 10 P01
5.0 bar $\pm 10\%$	DE M 50 x x 10 P01

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree protection: IP66 according to EN 60529

Electrical data

- Electrical connection: AMP Superseal series 1.5
- Resistive load: 0.2 A / 115 Vdc
- Switching type: Normally open contacts (NC on request)
- Thermal lockout: Normally open up to 30 °C (option "F")

DEM*20	
Electrical Differential Indicator	
Settings	Ordering code
2.0 bar $\pm 10\%$	DE M 20 x x 20 P01
5.0 bar $\pm 10\%$	DE M 50 x x 20 P01

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree protection: IP66 according to EN 60529

Electrical data

- Electrical connection: AMP Time junior
- Resistive load: 0.2 A / 115 Vdc
- Switching type: Normally open contacts (NC on request)
- Thermal lockout: Normally open up to 30 °C (option "F")

DLA*71	
Electrical/Visual Differential Indicator	
Settings	Ordering code
2.0 bar $\pm 10\%$	DL A 20 x A 71 P01
5.0 bar $\pm 10\%$	DL A 50 x A 71 P01

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529
IP69K according to ISO 20653

Electrical data

- Electrical connection: IEC 61076-2-101 D (M12)
- Lamps: 24 Vdc
- Resistive load: 0.4 A / 24 Vdc

DLE*A50	
Electrical/Visual Differential Indicator	
Settings	Ordering code
2.0 bar $\pm 10\%$	DL E 20 x A 50 P01
5.0 bar $\pm 10\%$	DL E 50 x A 50 P01

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529

Electrical data

- Electrical connections: EN 175301-803
- Resistive load: 5 A / 250 Vac
- Available the connector with lamps

DLE*F50	
Electrical/Visual Differential Indicator	
Settings	Ordering code
2.0 bar $\pm 10\%$	DL E 20 x F 50 P01
5.0 bar $\pm 10\%$	DL E 50 x F 50 P01

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529

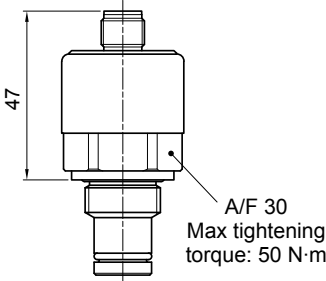
Electrical data

- Electrical connections: EN 175301-803
- Resistive load: 5 A / 250 Vac
- Thermal lockout setting: +30 °C

DIFFERENTIAL INDICATORS

Dimensions

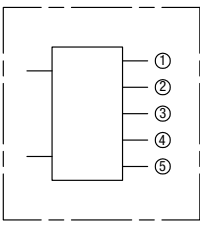
DTA*70	
Electronic Differential Indicator	
Settings	Ordering code
2.0 bar $\pm 10\%$	DT A 20 x x 70 P01
5.0 bar $\pm 10\%$	DT A 50 x x 70 P01



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A/F 30
Max tightening torque: 50 N-m

Hydraulic symbol



Electrical symbol

①	○	○	+24 Vdc
②	○	○	4 \div 20 mA
③	○	○	75% - N.O. Digital output
④	○	○	100% - N.O. Digital output
⑤	○	○	0 Vdc

Materials

- Body: Brass
- Internal parts: Brass - Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

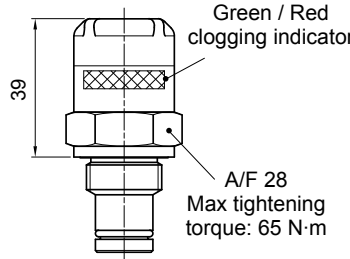
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree protection: IP67 according to EN 60529

Electrical data

- Electrical connection: IEC 61076-2-101 D (M12)
- Power supply: 24 Vdc
- Analogue output: From 4 to 20 mA
- Thermal lockout: 30 °C (all output signals stalled up to 30 °C)



DVA	
Visual Differential Indicator	
Settings	Ordering code
2.0 bar $\pm 10\%$	DV A 20 x P01
5.0 bar $\pm 10\%$	DV A 50 x P01

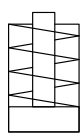


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Green / Red clogging indicator

A/F 28
Max tightening torque: 65 N-m

Hydraulic symbol



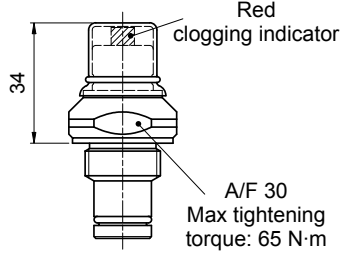
Materials

- Body: Brass
- Internal parts: Brass - Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Reset: Automatic reset
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529

DVM	
Visual Differential Indicator	
Settings	Ordering code
2.0 bar $\pm 10\%$	DV M 20 x P01
5.0 bar $\pm 10\%$	DV M 50 x P01

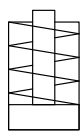


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Red clogging indicator

A/F 30
Max tightening torque: 65 N-m

Hydraulic symbol



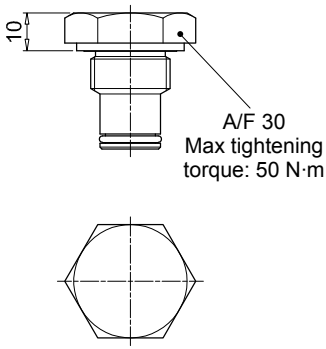
Materials

- Body: Brass
- Internal parts: Brass - Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Reset: Manual reset
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529

T2	
Indicator plug	
Seal	Ordering code
HNBR	T2 H
FPM	T2 V



Materials

- Body: Phosphatized steel
- Seal: HNBR / FPM

DESIGNATION & ORDERING CODE - DIFFERENTIAL INDICATORS

Series	Configuration example 1:	DE	M	20	H	F	50	P01
DE Electrical differential indicator	Configuration example 2:	DL	E	50	V	A	71	P01
DL Electrical/Visual differential indicator	Configuration example 3:	DT	A	20	H	F	70	P01
DT Electronic differential indicator	Configuration example 4:	DV	M	50	V			P01
DV Visual differential indicator								

Type	DE	DL	DT	DV
A Standard type	•	•	•	A With automatic reset
M With wired electrical connection	•			M With manual reset
E For high power supply		•		

Pressure setting	DEA	DEM	DLA	DLE	DT	DV
20 2.0 bar	•					
50 5.0 bar		•				

Seals	DEA	DEM	DLA	DLE	DT	DV
H HNBR	•					
V FPM		•				

Thermostat	DEA	DEM	DLA	DLE	DT	DV
A Without	•					
F With thermostat		•				

Electrical connections	DEA	DEM	DLA	DLE	DT	DV
10 Connection AMP Superseal series 1.5		•				
20 Connection AMP Timer Junior		•				
30 Connection Deutsch DT-04-2-P		•				
35 Connection Deutsch DT-04-3-P		•				
50 Connection EN 175301-803	•					
51 Connection EN 175301-803, transparent base with lamps 24 Vdc			•			
52 Connection EN 175301-803, transparent base with lamps 110 Vdc			•			
70 Connection IEC 61076-2-101 D (M12)					•	
71 Connection IEC 61076-2-101 D (M12), black base with lamps 24 Vdc			•			

Option	DEA	DEM	DLA	DLE	DT	DV
P01 MP Filtri standard						
Pxx Customized						

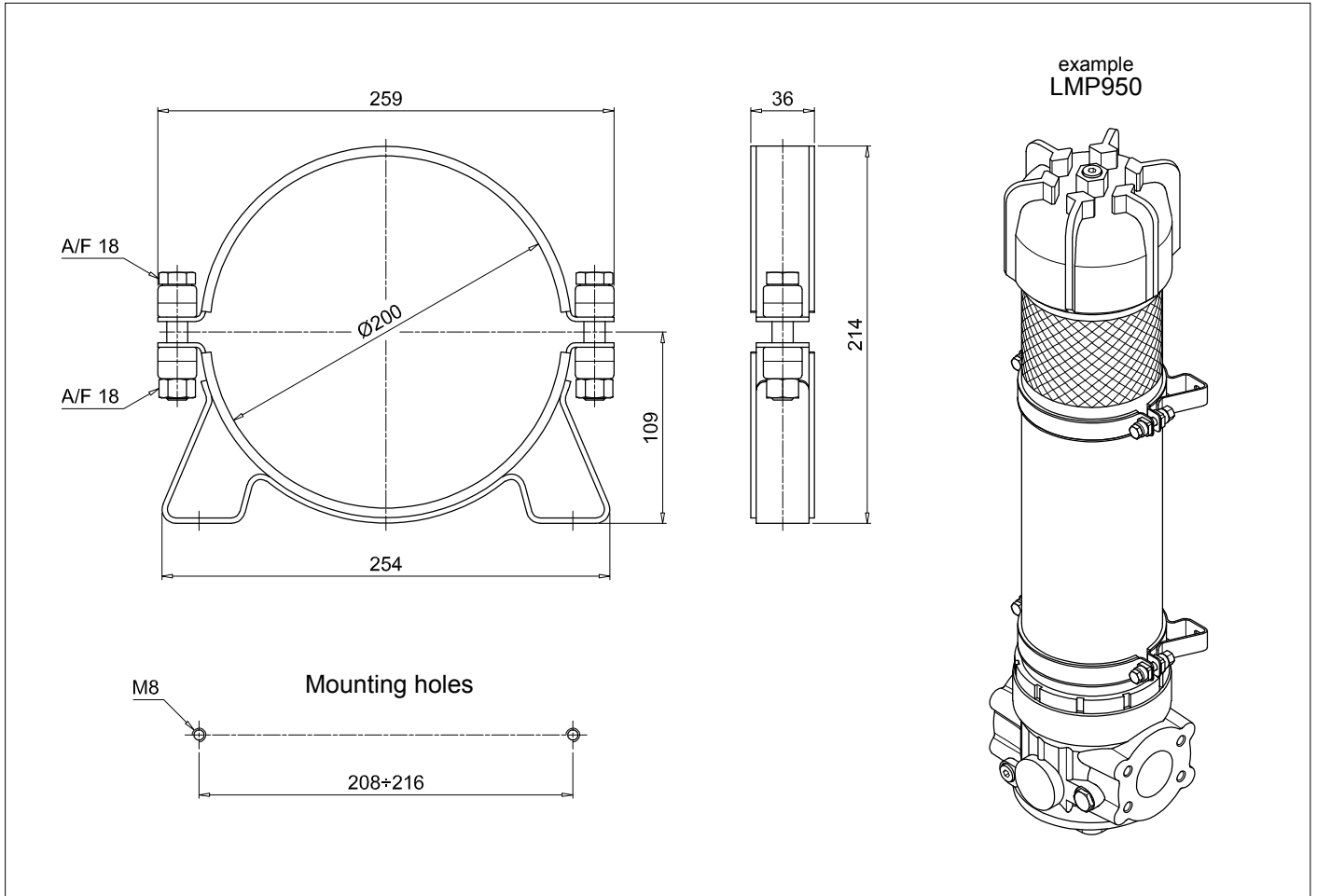
DESIGNATION & ORDERING CODE - DIFFERENTIAL INDICATOR PLUG

Series	Configuration example	T2	H
T2 Indicator plug			

Seals	DEA	DEM	DLA	DLE	DT	DV
H HNBR	•					
V FPM		•				

Accessories

RETAINING CLAMP



Series
CFA Retaining clamp

Configuration example: **CFA** **20** **M** **P01**

Size
20

Screw
M Metric

Execution
P01 MP Filtri standard

High pressure filters are used as process filters to protect individual valves or the entire hydraulic circuit from contamination as per ISO 4406.

9 versions are available with operating pressures range from 110 bar up to 560 bar.

A range of products is available to resolve all filter mounting problems, in the following configurations:

- In-line, with threaded and flange mounting
- Manifold top mounting
- Manifold side mounting
- Manifold mounting, to DIN 24340 CETOP R 35 H
- Manifold threaded/flange mounting in the top extraction filter cartridge version
- Duplex versions for continuous operation requirements

FMP series is specifically designed and suitable for:

- feed pumps of hydrostatic drives
- pressure lubrication
- hydraulic systems in the high pressure range

FMM series is optimized for the protection of servo and proportional hydraulics:

- in agricultural machinery
- in construction machinery
- in commercial vehicles

HPB are kits designed for the direct integration into the control block; they can be easily integrated into the block through a simple cavity.

FHP & FHA series are the typical high-pressure filters optimized for industrial applications.

FHM series is designed for intermediate plate construction, CETOP design.

FHB series is designed for block mounting; the filter head can be screwed in from the outside.

FHF series is designed to assemble HF4 filter element according to SAE J2066.

FHD series is the duplex high pressure filter; with two independent filter heads, the flow can be switched without interruption during operation.

The range includes a complete set of valves:

- Bypass valve
- Check valve
- Bypass + check valve
- Reverse-flow valve
- Reverse-flow + bypass valve

FILTER SIZING

For the proper corrective factor Y see chapter at page 25

High pressure filters



FMP 039	page 455
FMP	463
FHP	475
FMM	493
FHA 051	503
FHM	511

FHB	page 529
FHF 325	543
FHD	553
HPB	567
INDICATORS	576

FMP 039 series

Maximum working pressure up to 11 MPa (110 bar) - Flow rate up to 80 l/min



FMP 039 GENERAL INFORMATION

Description

Technical data

High Pressure filters

In-line

Maximum working pressure up to 11 MPa (110 bar)
Flow rate up to 80 l/min

FMP039 is a range of versatile medium pressure filter for transmission, protection of sensitive components in medium pressure hydraulic systems and filtration of the coolant into the machine tools. They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- 1/2" female threaded connections, for a maximum flow rate of 80 l/min
- Fine filtration rating, to get a good cleanliness level into the system
- Bypass valve, to relieve excessive pressure drop across the filter media
- Low collapse filter element "N", for use with filters provided with bypass valve
- Visual, electrical and electronic differential clogging indicators

Common applications:

Delivery lines, in any medium pressure industrial equipment or mobile machines

Filter housing materials

- Head: Anodized aluminium
- Housing: Anodized aluminium
- Bypass valve: Steel

Pressure

- Test pressure: 17 MPa (170 bar)
- Burst pressure: 33 MPa (330 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 11 MPa (110 bar)

Bypass valve

- Opening pressure 600 kPa (6 bar) $\pm 10\%$
- Other opening pressures on request.

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.

Seals

- Standard NBR series A
- Optional FPM series V

Temperature

From -25 °C to +110 °C

Connections

In-line Inlet/Outlet

Note

FMP 039 filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]				Volumes [dm ³]			
	Length	2	3	4	Length	2	3	4
FMP 039		0.60	0.70	0.80		0.19	0.26	0.34

Executions

Execution 1:
without indicator connection

Execution 6:
double indicator connection (A - B)

A: Closure cap with standard T2 steel. The position of the cap is reversible.

B: Standard closure cap with plastic thread protection. If necessary, a second T2 plug is available, see ordering information.

Special connections on request

Filter series	Length	Filter element design - N Series					
		A03	A06	A10	A16	A25	M25
FMP 039	2	20	26	45	52	61	97
	3	35	39	56	64	76	98
	4	44	48	66	71	82	92

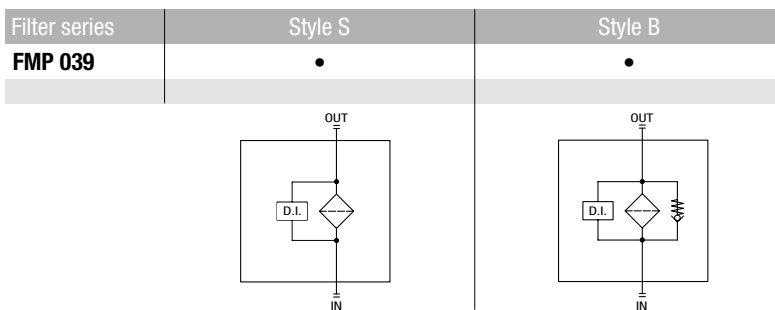
Maximum flow rate for a complete pressure filter with a pressure drop $\Delta p = 1.5$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

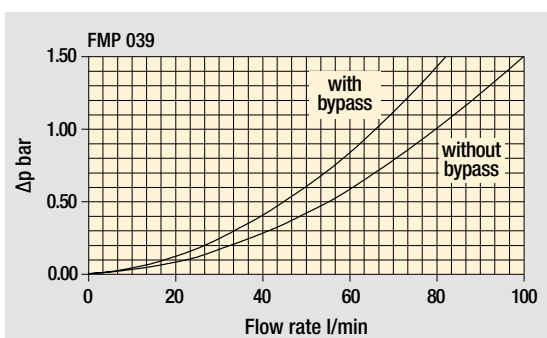
You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols

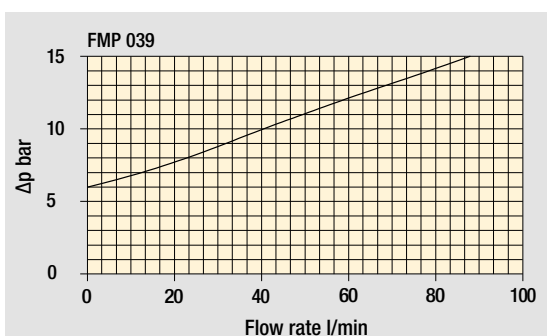


Pressure drop

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.

FMP 039

Designation & Ordering code

COMPLETE FILTER

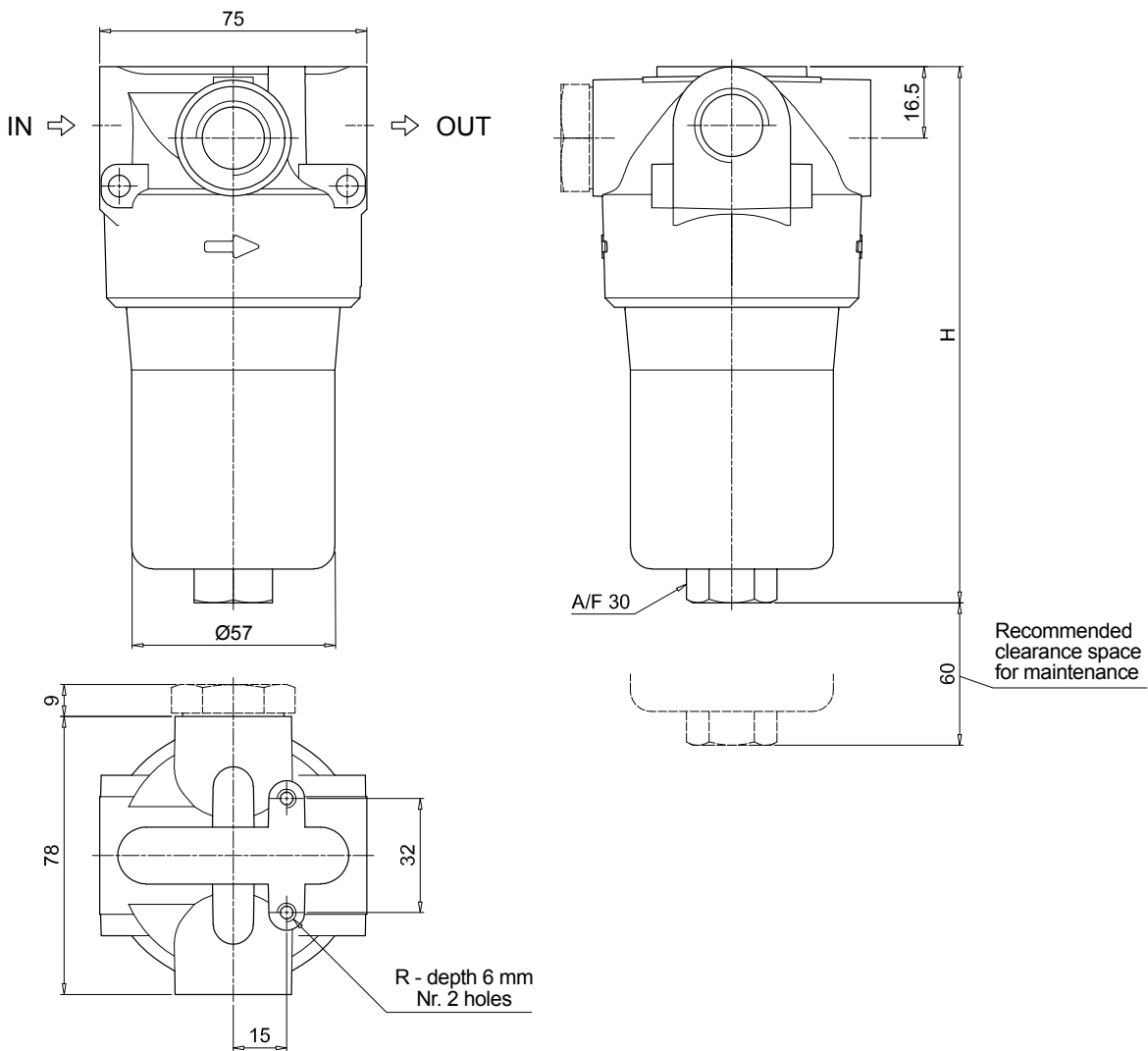
Series and size	Configuration example: FMP039 3 B A B 6 A03 N P01															
FMP039																
Length	2 3 4															
Valves	S Without bypass B 6 bar															
Seals	A NBR V FPM															
Connections	A G 1/2" B 1/2" NPT C SAE 8 - 3/4" - 16 UNF															
Connection for differential indicator	1 Without 6 With two connections on both sides															
Filtration rating (filter media)	<table border="0"> <tr> <td>A03 Inorganic microfiber 3 µm</td> <td>A16 Inorganic microfiber 16 µm</td> </tr> <tr> <td>A06 Inorganic microfiber 6 µm</td> <td>A25 Inorganic microfiber 25 µm</td> </tr> <tr> <td>A10 Inorganic microfiber 10 µm</td> <td>M25 Wire mesh 25 µm</td> </tr> </table>										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
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					Execution										
	N 20 bar					P01 MP Filtri standard Pxx Customized										

FILTER ELEMENT

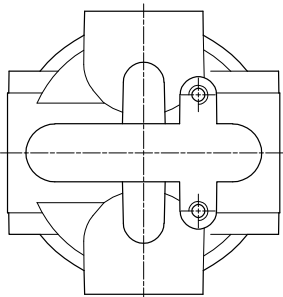
Element series and size	Configuration example: HP039 3 A03 A N P01												
HP039													
Element length	2 3 4												
Filtration rating (filter media)	<table border="0"> <tr> <td>A03 Inorganic microfiber 3 µm</td> <td>A16 Inorganic microfiber 16 µm</td> </tr> <tr> <td>A06 Inorganic microfiber 6 µm</td> <td>A25 Inorganic microfiber 25 µm</td> </tr> <tr> <td>A10 Inorganic microfiber 10 µm</td> <td>M25 Wire mesh 25 µm</td> </tr> </table>							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
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			Execution									
	N 20 bar			P01 MP Filtri standard Pxx Customized									

ACCESSORIES

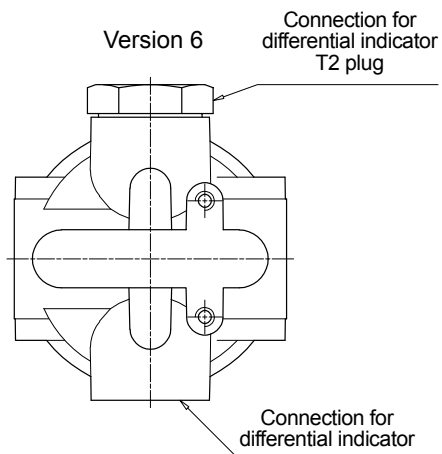
Differential indicators	page		page
DEA Electrical differential indicator	577	DLE Electrical / visual differential indicator	580
DEH Hazardous area electronic differential indicator	577-578	DTA Electronic differential indicator	581
DEM Electrical differential indicator	578-579	DVA Visual differential indicator	581
DLA Electrical / visual differential indicator	579-580	DVM Visual differential indicator	581
Additional features	page		
T2 Plug	582		



Version 1



Version 6



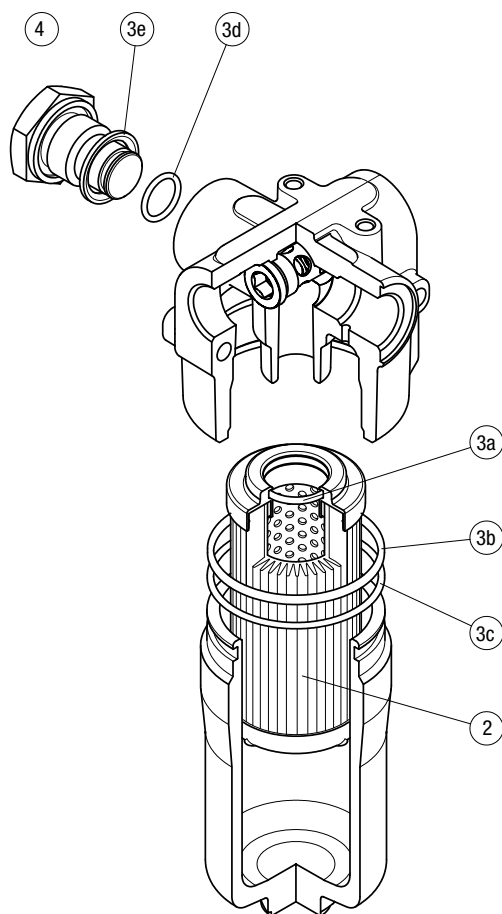
The position of the T2 plug is reversible

FMP039	
Filter length	H [mm]
2	151
3	194
4	238
Connections	R
A	M6
B - C	1/4" UNC

FMP 039 SPARE PARTS

Order number for spare parts

FMP 039



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number	
		NBR	FPM
FMP 039	See order table	02050509	02050510

FMP series

Maximum working pressure up to 32 MPa (320 bar) - Flow rate up to 500 l/min



Description

Technical data

High Pressure filters

In-line

Maximum working pressure up to 32 MPa (320 bar)

Flow rate up to 500 l/min

FMP is a range of versatile high pressure filter for protection of sensitive components in high pressure hydraulic systems in the industrial equipment.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Female threaded connections up to 1 1/2" and flanged connections up to 1 1/2", for a maximum flow rate of 500 l/min
- Fine filtration rating, to get a good cleanliness level into the system
- Bypass valve, to relieve excessive pressure drop across the filter media
- Check valve, to protect the system against reverse flow
- Low collapse filter element "N", for use with filters provided with bypass valve
- High collapse filter element "H", for use with filters not provided with bypass valve
- Low collapse filter element with external support "R", for filter element protection against the back pressure caused by the check valve in filters provided with the bypass valve
- High collapse filter element with external support "S", for filter element protection against the back pressure caused by the check valve in filters not provided with the bypass valve
- Visual, electrical and electronic differential clogging indicators

Common applications:

Delivery lines, in any high pressure industrial equipment or mobile machines

Filter housing materials

- Head: Phosphatized cast iron
- Housing: Phosphatized steel
- Bypass valve: Brass
- Reverse Flow: Steel (only for series FMP 320)
- Check valve: Steel

Pressure

- Test pressure: 48 MPa (480 bar)
- Burst pressure: 96 MPa (960 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 32 MPa (320 bar)

Bypass valve

- Opening pressure 600 kPa (6 bar) ±10%
- Other opening pressures on request.

Δp element type

- Microfibre filter elements - series N-R: 20 bar
- Microfibre filter elements - series H-S: 210 bar
- Wire mesh filter elements - series N: 20 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

Connections

In-line Inlet/Outlet

Note

FMP filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]					Volumes [dm ³]				
	Length	1	2	3	4	Length	1	2	3	4
FMP 065		3.26	3.62	4.83	-		0.36	0.47	0.84	-
FMP 135		5.61	7.21	8.27	-		0.45	0.78	1.00	-
FMP 320		10.95	13.08	15.37	17.85		1.03	1.75	2.52	3.35

Filter series	Length	Filter element design - N Series					
		A03	A06	A10	A16	A25	M25
FMP 065	1	23	30	48	54	72	105
	2	31	45	60	65	82	106
	3	52	60	80	84	94	108
FMP 135	1	69	73	120	129	171	201
	2	110	117	149	152	211	232
	3	151	152	192	195	212	233
FMP 320	1	130	144	244	296	361	477
	2	267	291	417	438	492	509
	3	348	390	476	493	503	519
	4	389	415	483	502	525	534

Maximum flow rate for a complete pressure filter with a pressure drop $\Delta p = 1.5$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

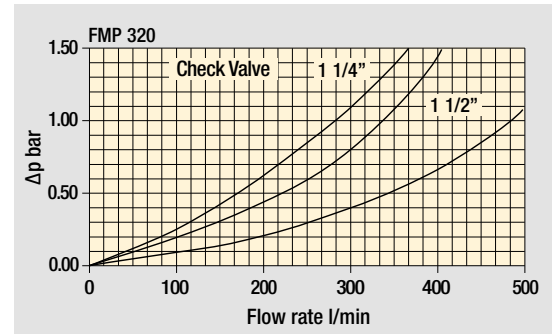
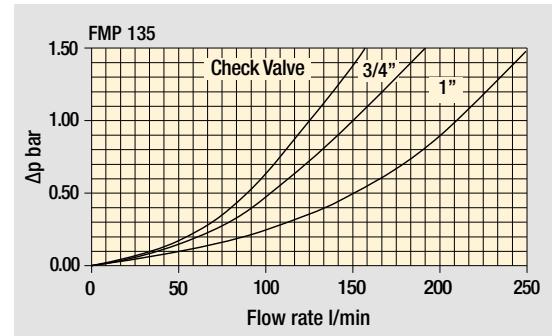
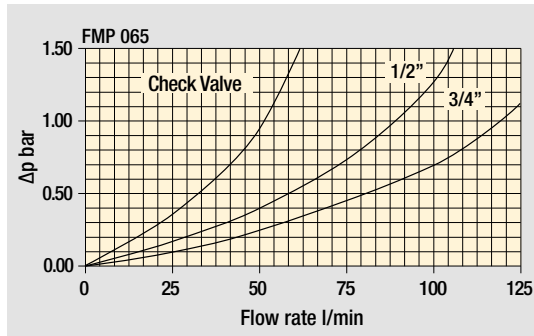
Hydraulic symbols

Filter series	Style S - E	Style B - C	Style T	Style D
FMP 065	•	•	•	•
FMP 135	•	•	•	•
FMP 320	•	•	•	•

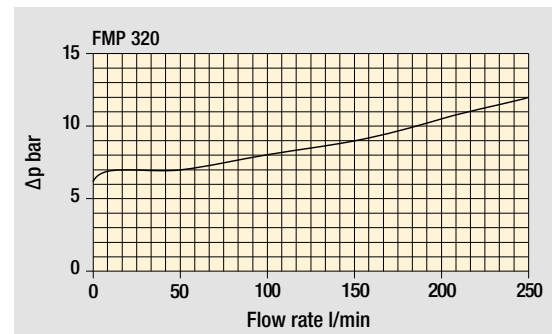
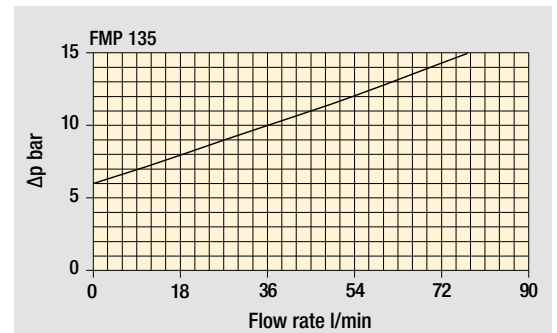
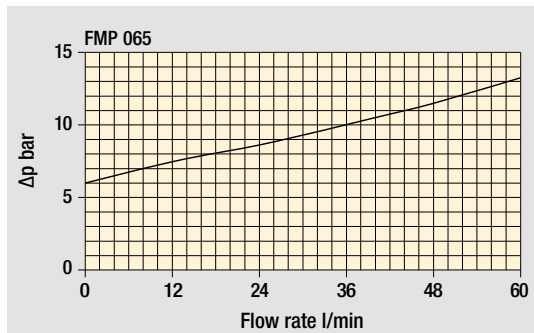
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Pressure drop

Filter housings Δp pressure drop



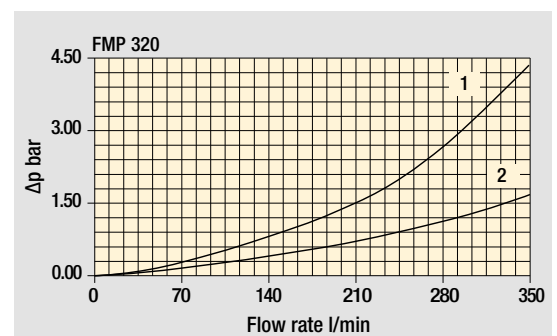
Bypass valve pressure drop



Valves

Filter housing with check valve

- 1 - Reverse flow
- 2 - In filter direction



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

FMP FMP065 - FMP135 - FMP320

Designation & Ordering code

COMPLETE FILTER

Series and size Configuration example: **FMP065** | **3** | **T** | **A** | **G1** | **M25** | **S** | **P01**

FMP065 | **FMP135** | **FMP320**

Length	FMP065	FMP135	FMP320
1	•	•	•
2	•	•	•
3	•	•	•
4			•

Valves	
S Without bypass	C With bypass 6 bar, plug on the opposite side
E Without bypass, plug on the opposite side	T With check valve, without bypass
B With bypass 6 bar	D With check valve, with bypass

Seals	
A NBR	V FPM

Connections	FMP065	FMP135	FMP320
G1	G 1/2"	G 3/4"	G 1 1/4"
G2	G 3/4"	G 1"	G 1 1/2"
G3	1/2" NPT	3/4" NPT	1 1/4" NPT
G4	3/4" NPT	1" NPT	1 1/2" NPT
G5	SAE 8 - 3/4" - 16 UNF	SAE 12 - 1 1/16" - 12 UN	SAE 20 - 1 5/8" - 12 UN
G6	SAE 12 - 1 1/16" - 12 UN	SAE 16 - 1 5/16" - 12 UN	SAE 24 - 1 7/8" - 12 UN
F1	-	3/4" SAE 3000 psi/M	1 1/4" SAE 3000 psi/M
F2	-	1" SAE 3000 psi/M	1 1/2" SAE 3000 psi/M
F3	-	3/4" SAE 3000 psi/UNC	1 1/4" SAE 3000 psi/UNC
F4	-	1" SAE 3000 psi/UNC	1 1/2" SAE 3000 psi/UNC

Filtration rating (filter media)	
A03 Inorganic microfiber	3 µm
A06 Inorganic microfiber	6 µm
A10 Inorganic microfiber	10 µm
A16 Inorganic microfiber	16 µm
A25 Inorganic microfiber	25 µm
M25 Wire mesh	25 µm

Element Δp	Valves					
	S	E	B	C	T	D
N 20 bar			•	•		
R 20 bar					•	
H 210 bar	•	•				
S 210 bar					•	

Execution	Filter length			
	1	2	3	4
P01 MP Filtri standard	•	•	•	•
P02 Maintenance from the bottom of the housing				•
Pxx Customized				

FILTER ELEMENT

Element series and size Configuration example: **HP065** | **3** | **M25** | **A** | **S** | **P01**

HP065 | **HP135** | **HP320**

Element length	HP065	HP135	HP320
1	•	•	•
2	•	•	•
3	•	•	•
4			•

Filtration rating (filter media)	
A03 Inorganic microfiber	3 µm
A06 Inorganic microfiber	6 µm
A10 Inorganic microfiber	10 µm
A16 Inorganic microfiber	16 µm
A25 Inorganic microfiber	25 µm
M25 Wire mesh	25 µm

Seals	
A NBR	
V FPM	

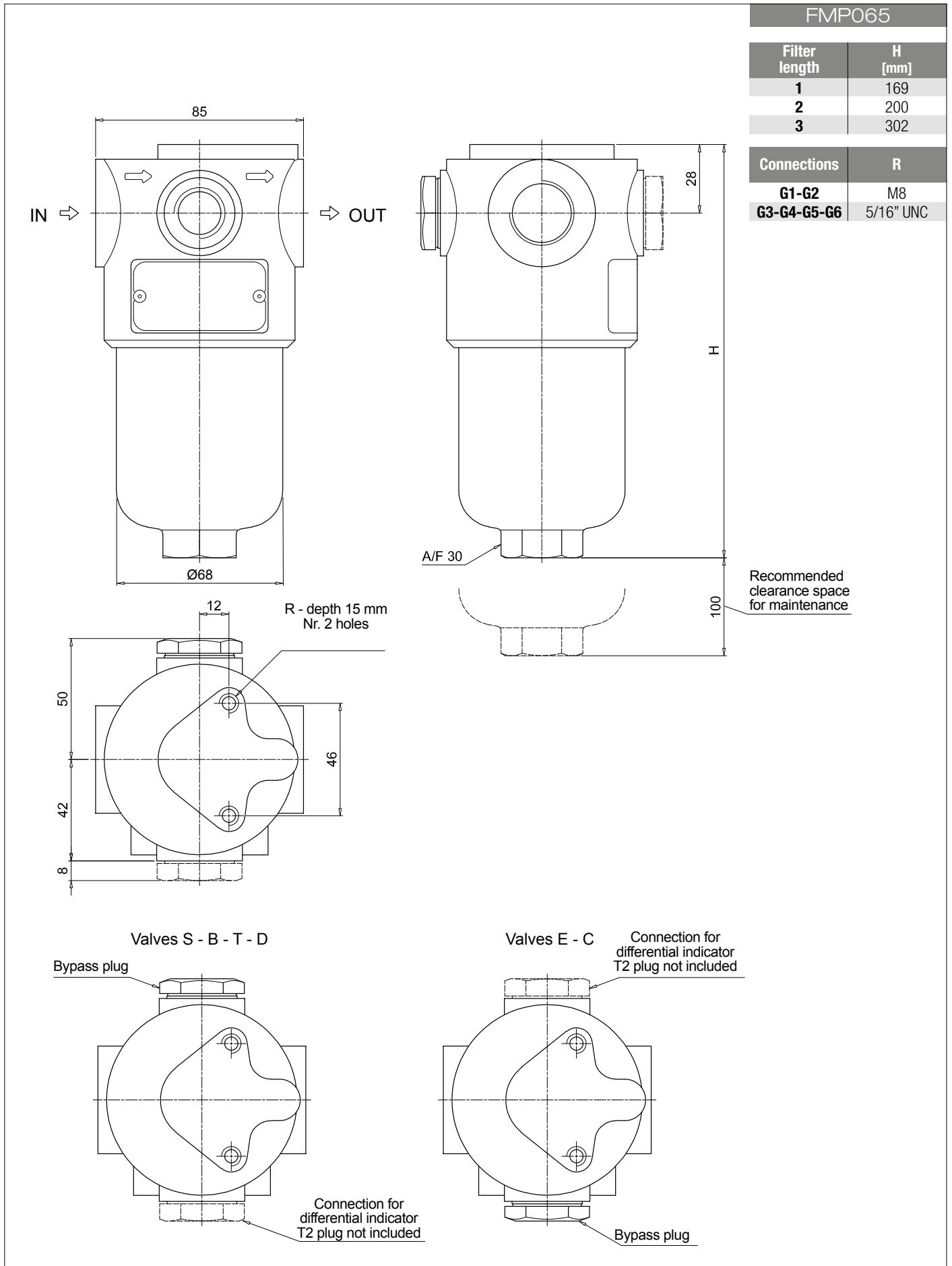
Element Δp	
N 20 bar	
R 20 bar	
H 210 bar	
S 210 bar	

Execution	
P01 MP Filtri standard	
Pxx Customized	

ACCESSORIES

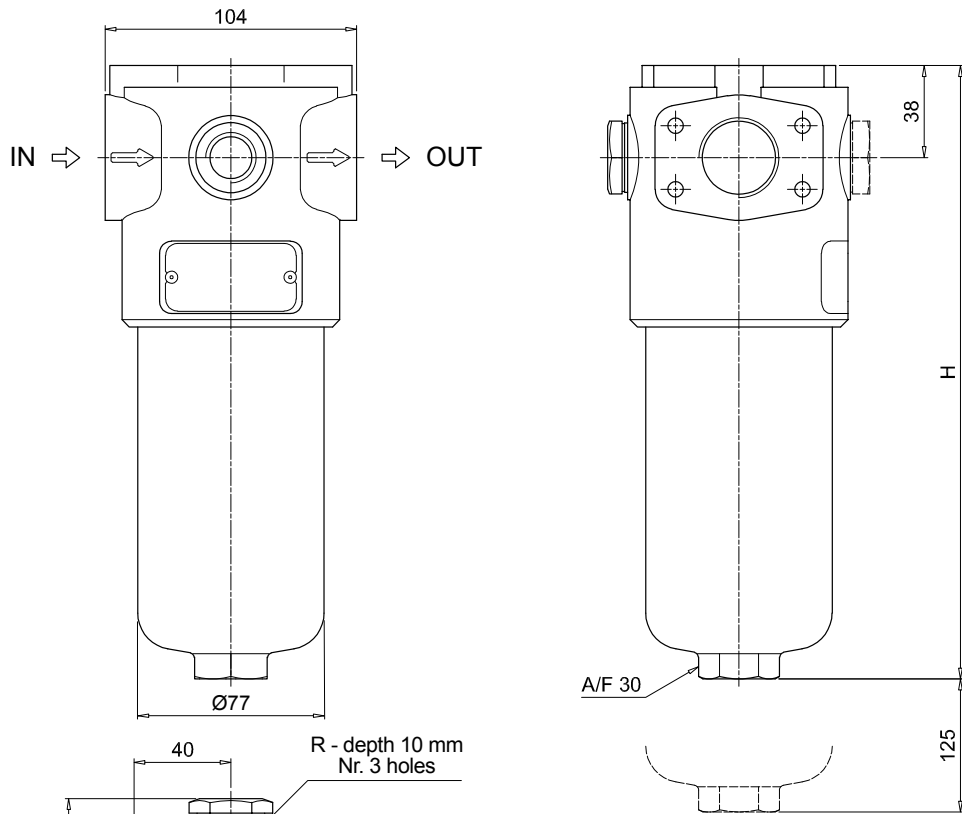
Differential indicators	page	Differential indicators	page
DEA Electrical differential indicator	577	DLE Electrical / visual differential indicator	580
DEH Hazardous area electronic differential indicator	577-578	DTA Electronic differential indicator	581
DEM Electrical differential indicator	578-579	DVA Visual differential indicator	581
DLA Electrical / visual differential indicator	579-580	DVM Visual differential indicator	581

Additional features	page
T2 Plug	582

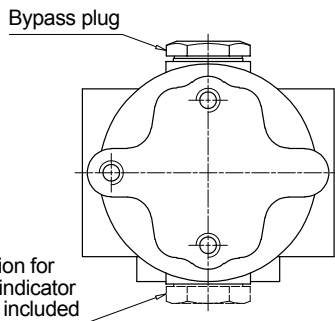


FMP FMP065 - FMP135 - FMP320

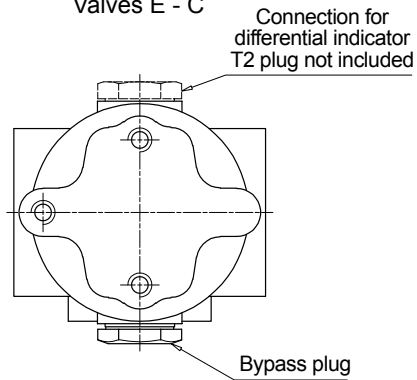
Dimensions



Valves S - B - T - D



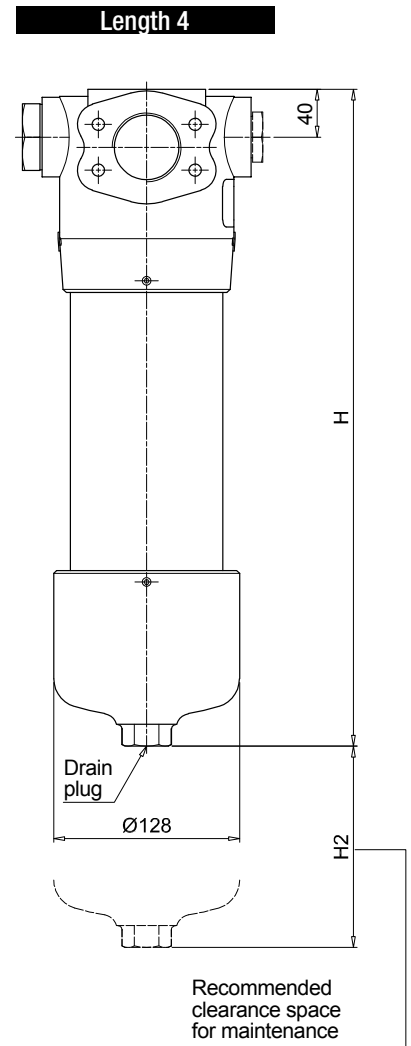
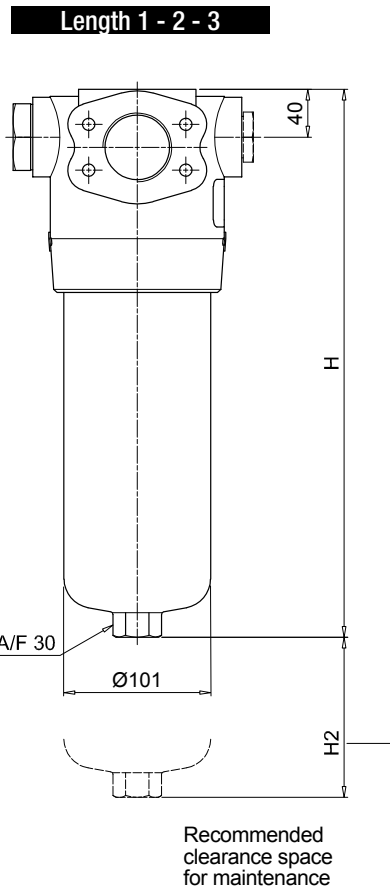
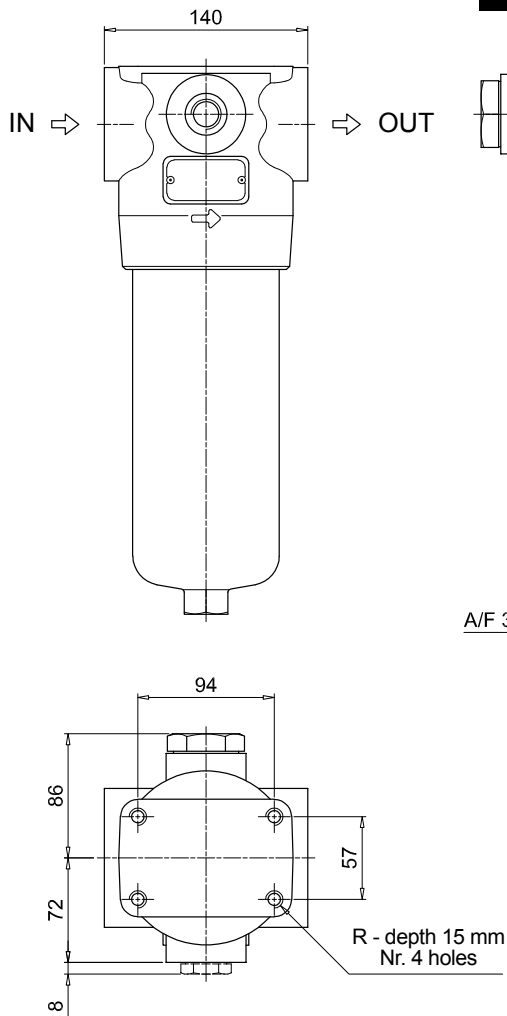
Valves E - C



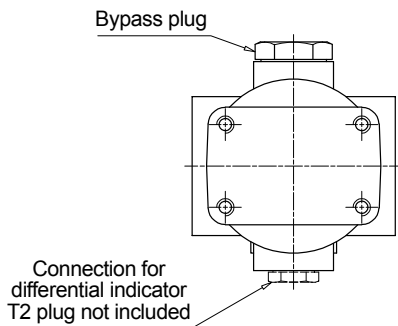
FMP135

Filter length	H [mm]
1	221
2	334
3	409

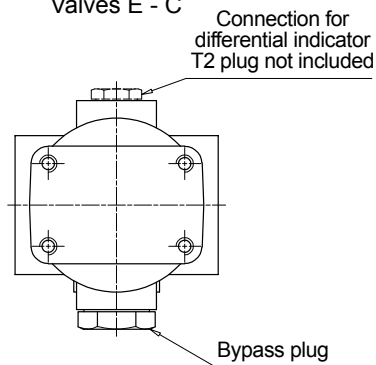
Connections	R
G1-G2	M10
G3-G4-G5-G6	3/8" UNC
F1-F2	M10
F3-F4	3/8" UNC



Valves S - B - T - D



Valves E - C



FMP320

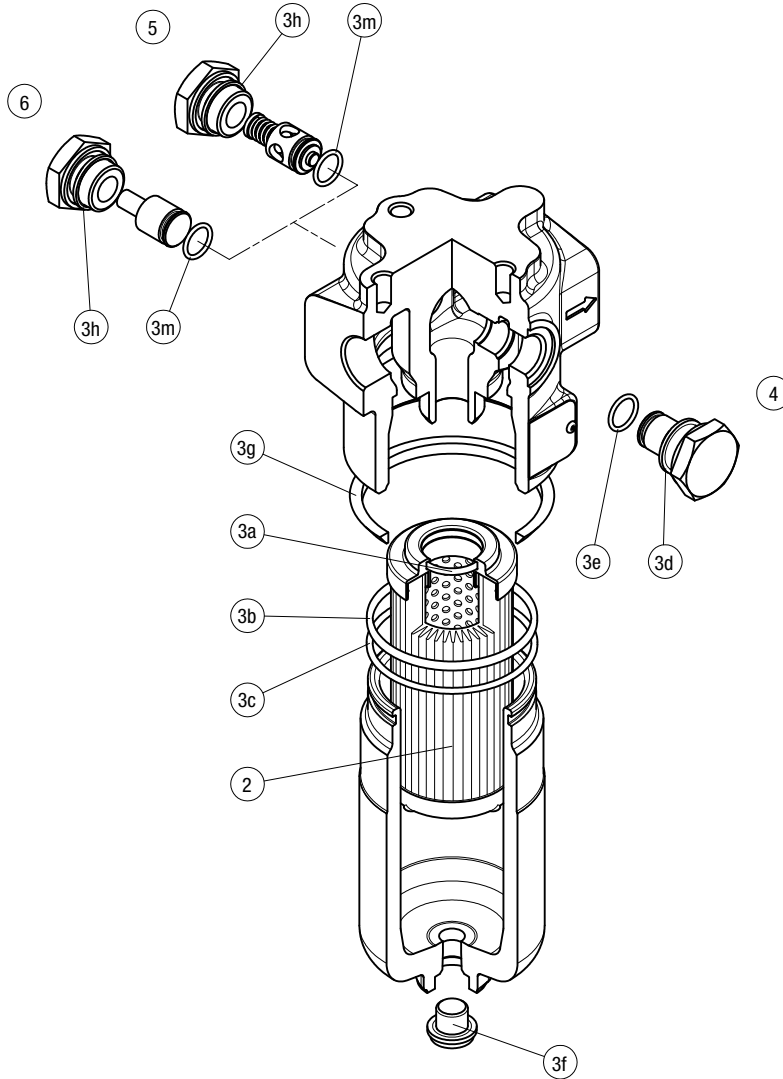
Filter length	H [mm]	H2 [mm]	
		Execution P01	Execution P02
1	263	150	-
2	386	150	-
3	518	150	-
4	671	150	550

Connections	R
G1-G2	M12
G3-G4-G5-G6	1/2" UNC
F1-F2	M12
F3-F4	1/2" UNC

FMP SPARE PARTS

Order number for spare parts

FMP 065 - 135 - 320



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 1 pc.		Q.ty: 1 pc.		Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug		Bypass assembly		Non-bypass assembly	
		NBR	FPM	NBR	FPM	NBR	FPM	NBR	FPM
FMP 065	See order table	02050267	02050278			02001312	02001385	02001314	02001386
FMP 135		02050293	02050294	T2H	T2V	02001312	02001385	02001314	02001386
FMP 320		02050274	02050285			02001396	02001397	02001398	02001399

FHP series

Maximum working pressure up to 42 MPa (420 bar) - Flow rate up to 630 l/min



High Pressure filters

In-line

Maximum working pressure up to 42 MPa (420 bar)

Flow rate up to 630 l/min

FHP is a range of versatile high pressure filter for protection of sensitive components in high pressure hydraulic systems in the industrial equipment.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Female threaded connections up to 1 1/2" and flanged connections up to 2", for a maximum return flow rate of 630 l/min
- Fine filtration rating, to get a good cleanliness level into the system
- Bypass valve, to relieve excessive pressure drop across the filter media
- Check valve, to protect the system against reverse flow
- Reverse flow valve, to allow bidirectional flow through the filter housing. The back flow is not filtered. The filter requires the use of internal check valves to direct the flow through the element in one direction and around the element in the other
- Low collapse filter element "N", for use with filters provided with bypass valve
- High collapse filter element "H", for use with filters not provided with bypass valve
- Low collapse filter element with external support "R", for filter element protection against the back pressure caused by the check valve or the reverse flow in filters provided with the bypass valve
- High collapse filter element with external support "S", for filter element protection against the back pressure caused by the check valve or the reverse flow in filters not provided with the bypass valve
- Visual, electrical and electronic differential clogging indicators

Common applications:

Delivery lines, in any high pressure industrial equipment or mobile machines

Filter housing materials

- Head: Phosphatized cast iron
- Housing: Phosphatized steel
- Bypass valve
 - AISI 316L: FHP 010 - 011
 - Brass: FHP 065 - 135
 - Brass / AISI 304: FHP 350
 - Steel: FHP 500
- Reverse Flow
 - Steel: FHP 350 - FHP 500
- Check valve: Steel

Pressure

- 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)

Bypass valve

- Opening pressure 600 kPa (6 bar) ±10%
- Other opening pressures on request.

Δp element type

- Microfibre filter elements - series N: 20 bar
- Microfibre filter elements - series R: 20 bar (not available for FHP 010-011 and FHP 500)
- Microfibre filter elements - series H: 210 bar
- Microfibre filter elements - series S: 210 bar (only for FHP 500)
- Wire mesh filter elements - series N: 20 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

Connections

FHP 010 - 065 - 135 - 350 - 500:

In-line Inlet/Outlet

FHP 011:

90° Inlet/Outlet

Note

FHP filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]					Volumes [dm ³]						
	Length	1	2	3	4	5	Length	1	2	3	4	5
FHP 010 - 011		2.05	2.18	2.64	3.13	-		0.10	0.12	0.15	0.20	-
FHP 065		4.26	4.62	5.83	-	-		0.25	0.30	0.50	-	-
FHP 135		7.11	8.71	9.76	-	-		0.43	0.76	0.97	-	-
FHP 350		13.95	16.08	18.37	20.85	-		1.00	1.72	2.49	3.32	-
FHP 500		27.00	31.17	34.69	46.70	52.5		1.71	2.43	3.04	5.18	6.51

Filter series	Length	Filter element design - H Series					Filter element design - N Series					
		A03	A06	A10	A16	A25	A03	A06	A10	A16	A25	M25
FHP 010	1	3	5	6	7	8	4	6	8	9	10	37
	2	5	7	13	16	22	6	8	16	19	24	40
	3	10	13	22	25	30	11	14	23	26	31	41
	4	12	15	25	27	32	16	19	27	30	33	41
FHP 011	1	3	5	6	7	9	4	6	8	9	11	47
	2	5	7	14	17	24	7	9	17	21	28	52
	3	11	14	25	29	36	11	14	26	30	37	53
	4	12	16	28	32	38	17	21	32	36	40	54
FHP 065	1	24	25	50	59	84	25	33	56	63	90	142
	2	33	38	68	77	98	34	52	72	79	106	143
	3	61	70	100	107	123	61	73	101	108	125	147
FHP 135	1	49	55	95	98	147	67	72	115	122	159	184
	2	89	106	129	131	163	105	111	140	142	192	209
	3	120	132	158	166	180	141	143	176	179	193	211
FHP 350	1	108	115	188	197	301	127	140	234	282	343	451
	2	196	225	317	323	396	256	278	394	415	465	480
	3	266	310	384	392	440	331	370	450	466	475	490
	4	308	333	391	398	445	369	393	456	474	495	503
FHP 500	1	144	157	265	268	355	269	305	390	406	444	612
	2	232	262	350	363	398	321	357	433	441	484	619
	3	293	301	398	408	455	396	416	497	499	537	622
	4	336	377	452	455	507	430	475	516	524	545	626
	5	420	428	494	500	544	475	493	535	545	569	627

Maximum flow rate for a complete pressure filter with a pressure drop $\Delta p = 1.5$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure.

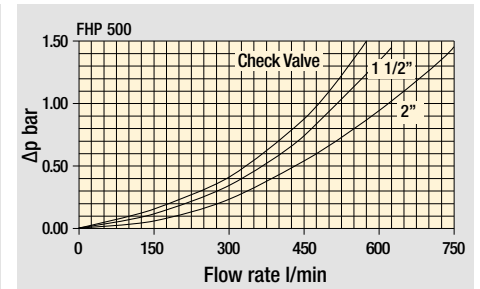
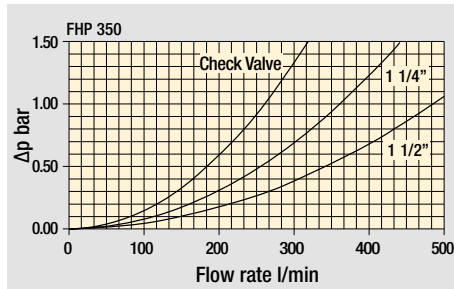
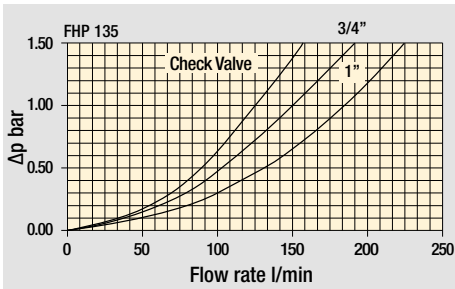
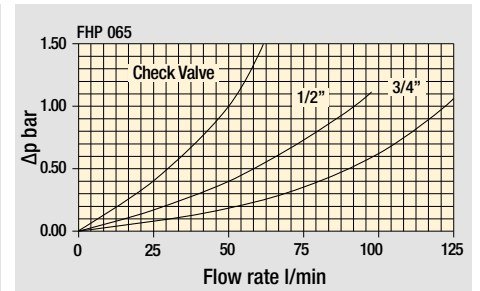
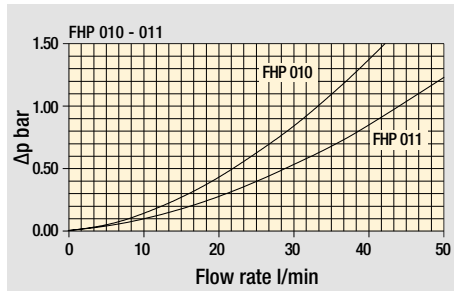
Please, contact our Sales Department for further additional information.

Hydraulic symbols

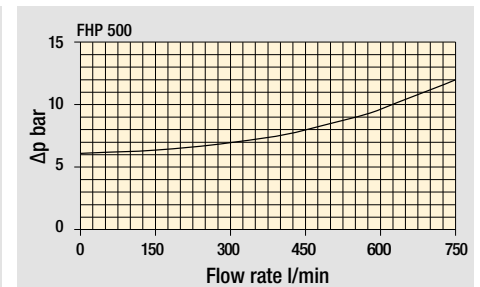
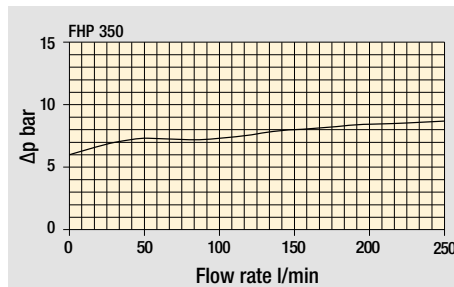
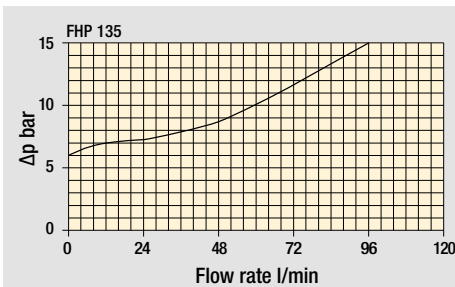
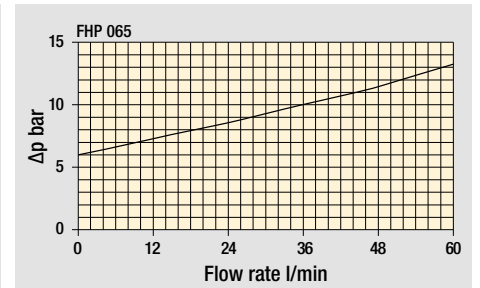
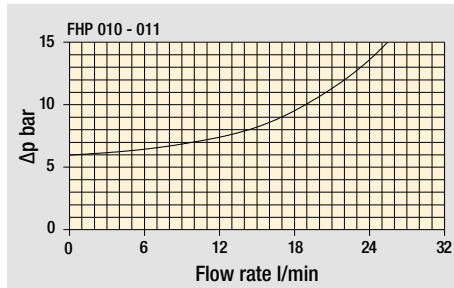
Filter series	Style S	Style B	Style T	Style D	Style V	Style Z
FHP 010 - 011	•	•			•	•
FHP 065	•	•	•			
FHP 135	•	•	•			
FHP 350	•	•	•	•	•	•
FHP 500	•	•	•	•	•	•

Pressure drop

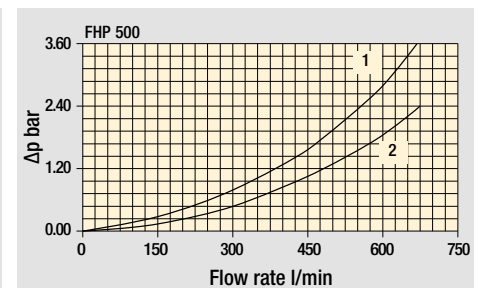
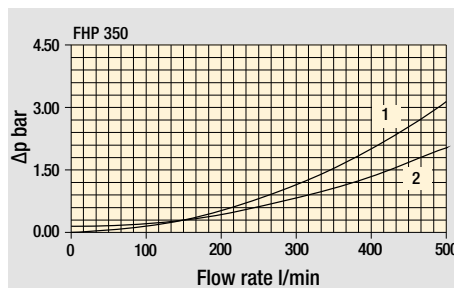
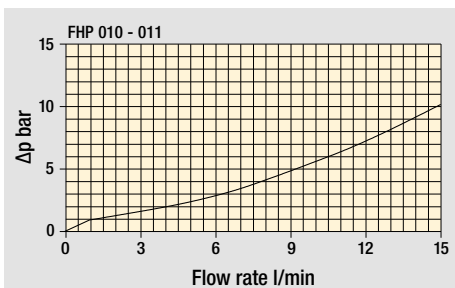
Filter housings Δp pressure drop



Bypass valve pressure drop



Valves



Filter housing with check valve

Pressure drop with reverse flow valve in
1 - Filtering direction
2 - Opposite direction

Pressure drop with reverse flow valve in
1 - Opposite direction
2 - Filtering direction

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.

FHP FHP010 - FHP011

Designation & Ordering code

COMPLETE FILTER

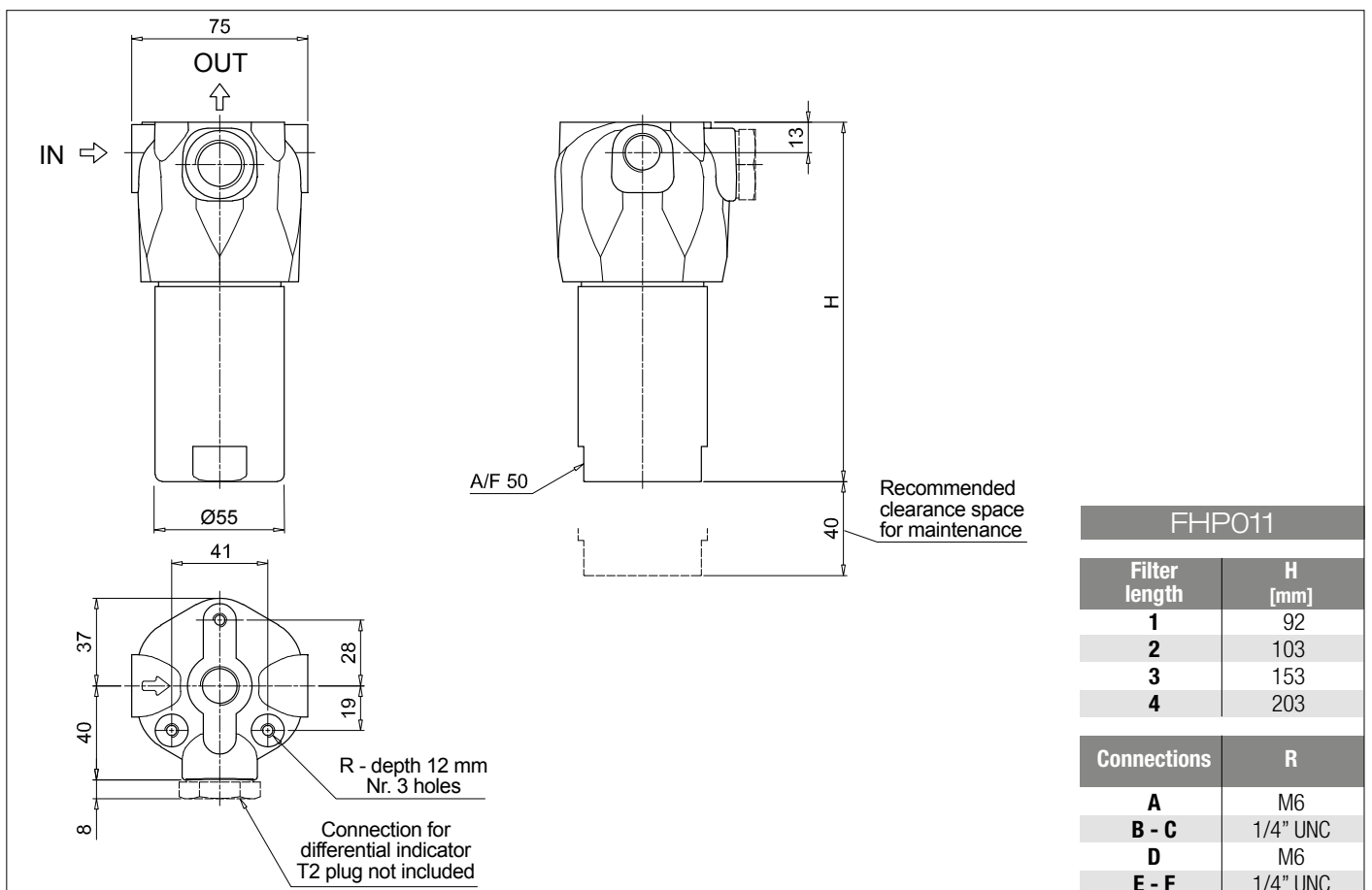
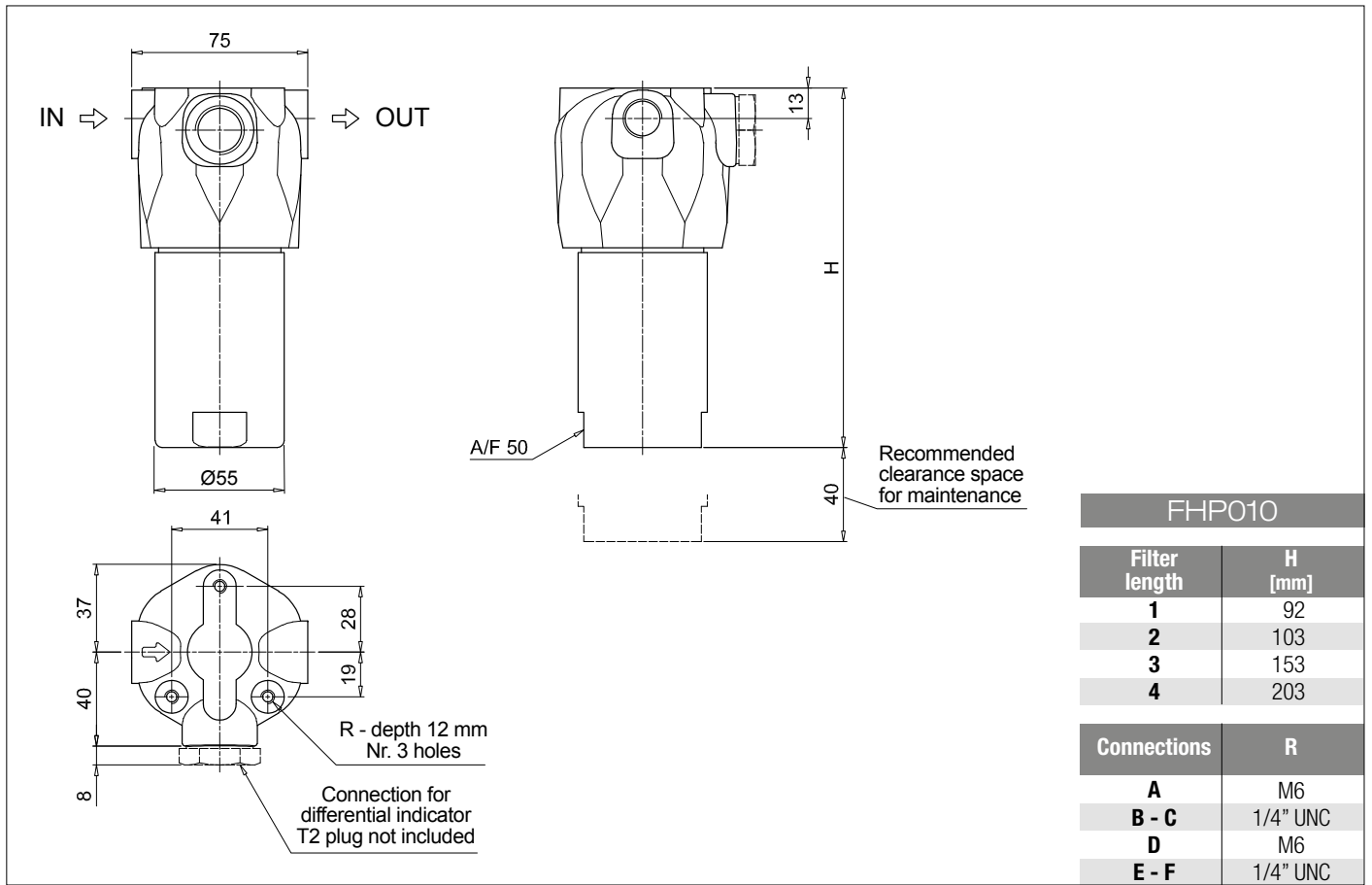
Series and size	Configuration example: FHP010 2 B A B 2 A03 N P01									
FHP010 FHP011										
Length										
1 2 3 4										
Valves										
S Without bypass										
B With bypass 6 bar										
V With reverse flow, without bypass										
Z With reverse flow, with bypass 6 bar										
Seals										
A NBR										
V FPM										
Connections										
A G 1/4"										
B 1/4" NPT										
C SAE 5 - 1/2" - 20 UNF										
D G 3/8"										
E 3/8" NPT										
F SAE 6 - 9/16" - 18 UNF										
Connection for differential indicator										
1 Without										
2 With 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									
		Valves								
Element Δp	S	B	V	Z	Execution					
N 20 bar		•		•	P01 MP Filtri standard					
H 210 bar	•		•		Pxx Customized					

FILTER ELEMENT

Element series and size	Configuration example: HP011 2 A03 A N P01						
HP011							
Element length							
1 2 3 4							
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		Execution			
N	20 bar				P01 MP Filtri standard		
H	210 bar				Pxx Customized		

ACCESSORIES

Differential indicators		page			page
DEA	Electrical differential indicator	577	DLE	Electrical / visual differential indicator	580
DEH	Hazardous area electronic differential indicator	577-578	DTA	Electronic differential indicator	581
DEM	Electrical differential indicator	578-579	DVA	Visual differential indicator	581
DLA	Electrical / visual differential indicator	579-580	DVM	Visual differential indicator	581
Additional features		page			
T2	Plug	582			



FHP FHP065 - FHP135

Designation & Ordering code

COMPLETE FILTER

Series and size **FHP065** | **FHP135** Configuration example: **FHP135** **2** **B** **A** **G3** **A06** **S** **P01**

Length
1
2
3

Valves
S Without bypass
B With bypass 6 bar
T With check valve, without bypass

Seals
A NBR
V FPM

Connections	FHP065	FHP135
G1	G 1/2"	G 3/4"
G2	G 3/4"	G 1"
G3	1/2" NPT	3/4" NPT
G4	3/4" NPT	1" NPT
G5	SAE 8 - 3/4" - 16 UNF	SAE 12 - 1 1/16" - 12 UN
G6	SAE 12 - 1 1/16" - 12 UN	SAE 16 - 1 5/16" - 12 UN
F1	-	3/4" SAE 3000 psi/M
F2	-	1" SAE 3000 psi/M
F3	-	3/4" SAE 3000 psi/UNC
F4	-	1" SAE 3000 psi/UNC
F5	-	3/4" SAE 6000 psi/M
F6	-	3/4" SAE 6000 psi/UNC

Filtration rating (filter media)

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

Element Δp	S	B	T	D	V	Z
N 20 bar		•				
R 20 bar				•		•
H 210 bar	•					
S 210 bar			•		•	

Valves

Execution	
P01	MP Filtri standard
Pxx	Customized

FILTER ELEMENT

Element series and size **HP065** | **HP135** Configuration example: **HP135** **2** **A06** **A** **S** **P01**

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
R	20 bar
H	210 bar
S	210 bar

Execution

P01	MP Filtri standard
Pxx	Customized

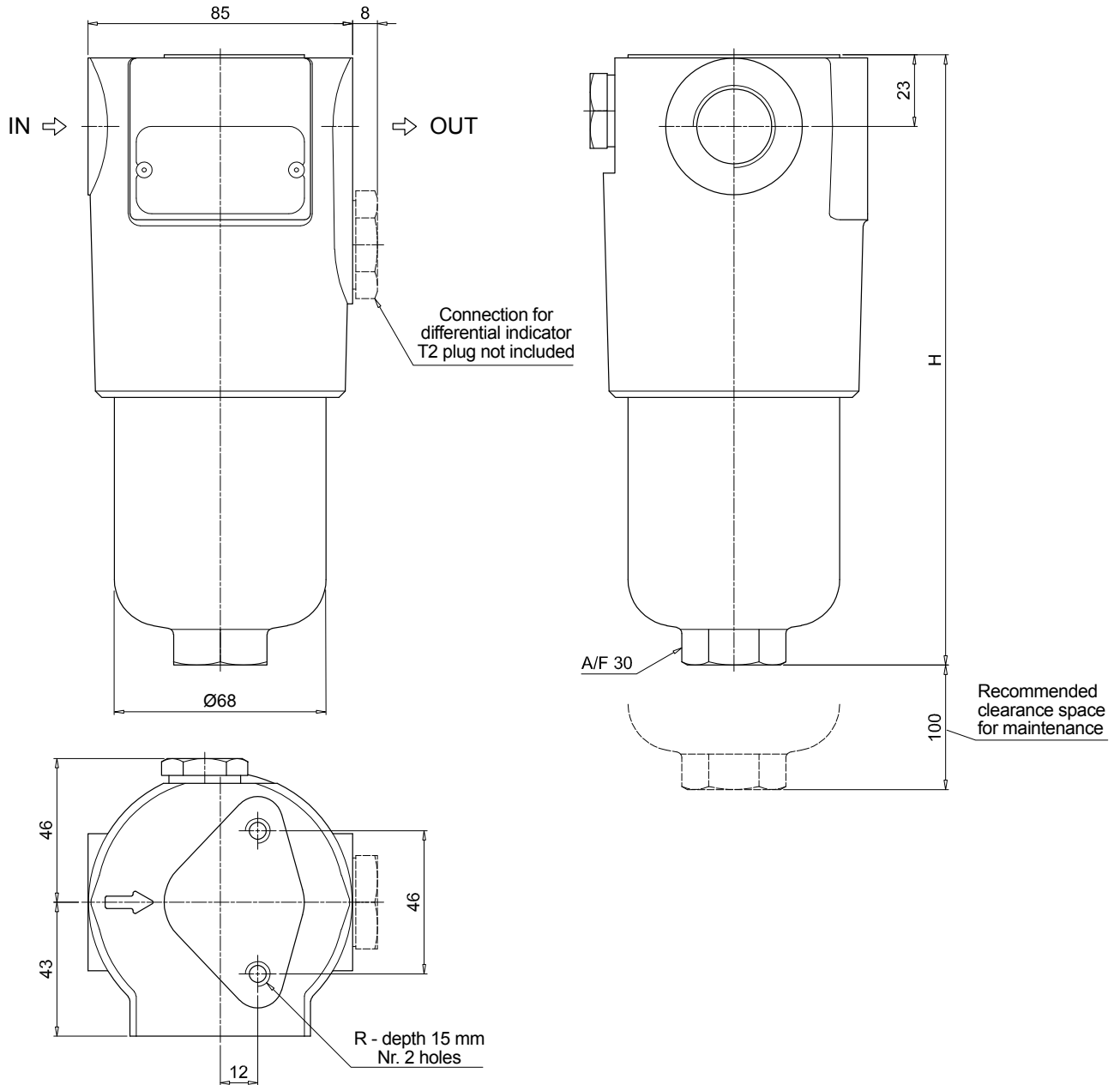
ACCESSORIES

Differential indicators	page
DEA Electrical differential indicator	577
DEH Hazardous area electronic differential indicator	577-578
DEM Electrical differential indicator	578-579
DLA Electrical / visual differential indicator	579-580

	page
DLE Electrical / visual differential indicator	580
DTA Electronic differential indicator	581
DVA Visual differential indicator	581
DVM Visual differential indicator	581

Additional features

T2 Plug	582
----------------	-----



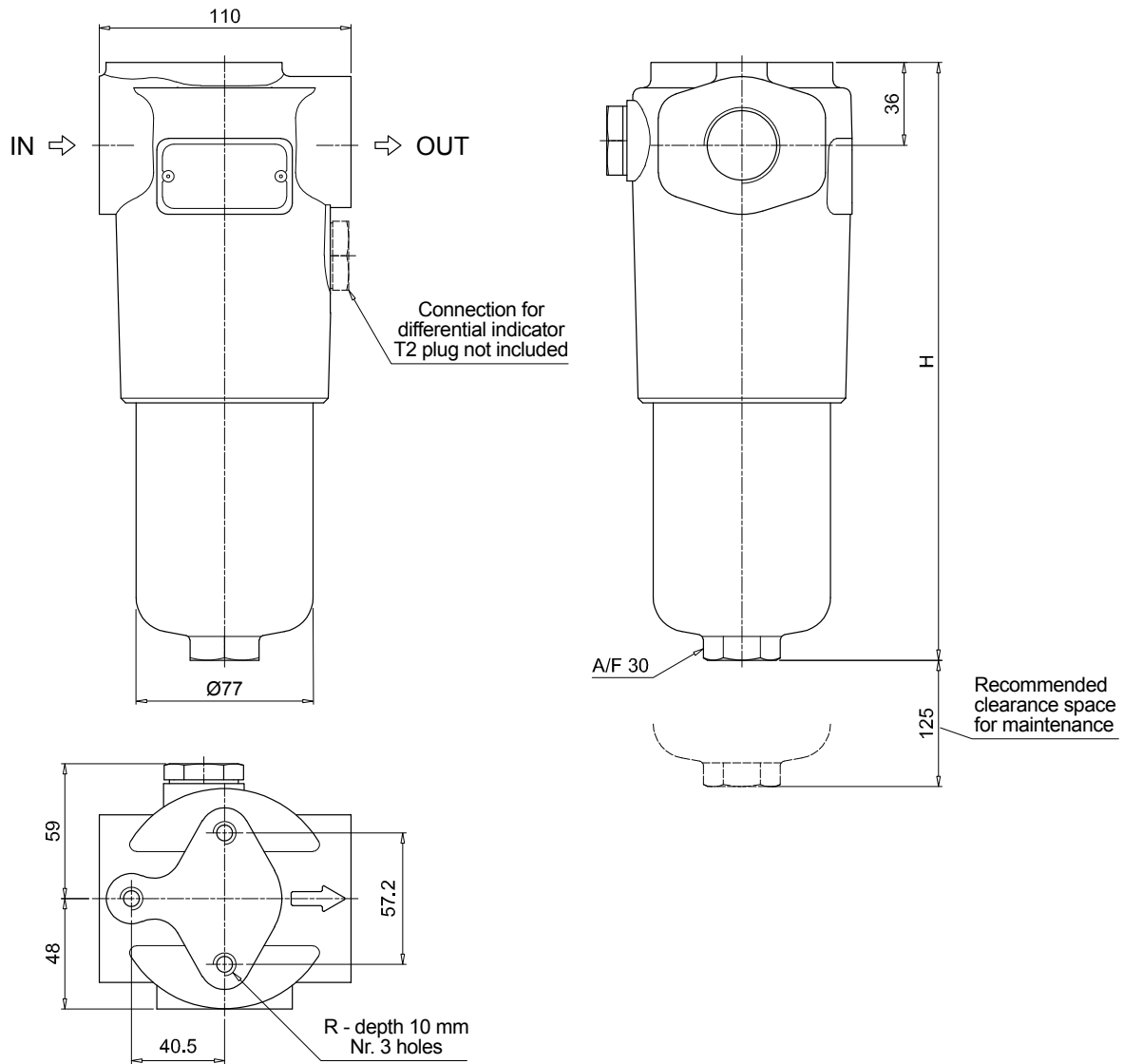
FHP065

Filter length	H [mm]
1	196
2	227
3	329

Connections	R
G1-G2	M8
G3-G4-G5-G6	5/16" UNC

FHP FHP065 - FHP135

Dimensions



FHP135

Filter length	H [mm]
1	260
2	373
3	448

Connections	R
G1-G2	M10
G3-G4-G5-G6	3/8" UNC
F1-F2	M10
F3-F4	3/8" UNC
F5	M10
F6	3/8" UNC

Designation & Ordering code

COMPLETE FILTER

Series and size **FHP350** Configuration example: **FHP350** **4** **B** **A** **D** **2** **A06** **N** **P01**

Length
1 | 2 | 3 | 4

Valves
S Without bypass
B With bypass 6 bar
T With check valve, without bypass
D With check valve, with bypass 6 bar
V With reverse flow, without bypass
Z With reverse flow, with bypass 6 bar

Seals
A NBR
V FPM

Connections
A G 1 1/2"
B 1 1/2" NPT
C SAE 24 - 1 7/8" - 12 UN
D 1 1/2" SAE 3000 psi/M + G 1 1/4"
E 1 1/2" SAE 3000 psi/UNC + 1 1/4" NPT
F 1 1/2" SAE 3000 psi/UNC + SAE 20 - 1 5/8" - 12 UN
G 1 1/4" SAE 3000 psi/M
H 1 1/4" SAE 3000 psi/UNC
I 1 1/4" SAE 6000 psi/M
L 1 1/4" SAE 6000 psi/UNC

Connection for differential indicator
2 With connection

Filtration rating (filter media)
A03 Inorganic microfiber 3 µm
A06 Inorganic microfiber 6 µm
A10 Inorganic microfiber 10 µm
A16 Inorganic microfiber 16 µm
A25 Inorganic microfiber 25 µm
M25 Wire mesh 25 µm

Element Δp	Valves					
	S	B	T	D	V	Z
N 20 bar		•				
R 20 bar				•		•
H 210 bar	•					
S 210 bar			•		•	

Execution	Filter length			
	1	2	3	4
P01 MP Filtri standard	•	•	•	•
P02 Maintenance from the bottom of the housing				•
Pxx Customized				

FILTER ELEMENT

Element series and size **HP320** Configuration example: **HP320** **4** **A06** **A** **N** **P01**

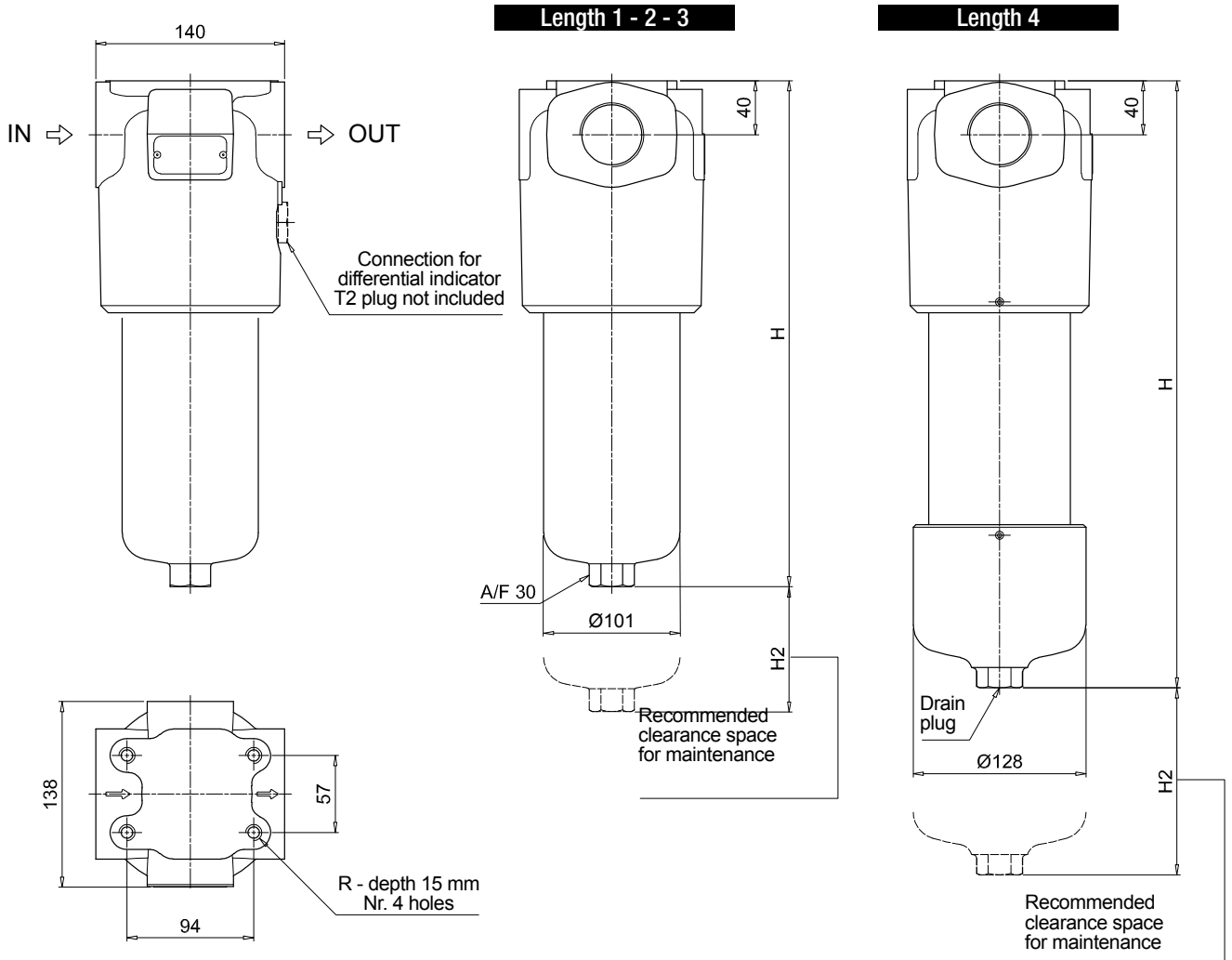
Element length
1 | 2 | 3 | 4

Filtration rating (filter media)
A03 Inorganic microfiber 3 µm
A06 Inorganic microfiber 6 µm
A10 Inorganic microfiber 10 µm
A16 Inorganic microfiber 16 µm
A25 Inorganic microfiber 25 µm
M25 Wire mesh 25 µm

Seals	Element Δp	Execution
A NBR	N 20 bar	P01 MP Filtri standard
V FPM	R 20 bar	Pxx Customized
	H 210 bar	
	S 210 bar	

ACCESSORIES

Differential indicators	page		page
DEA Electrical differential indicator	577	DLE Electrical / visual differential indicator	580
DEH Hazardous area electronic differential indicator	577-578	DTA Electronic differential indicator	581
DEM Electrical differential indicator	578-579	DVA Visual differential indicator	581
DLA Electrical / visual differential indicator	579-580	DVM Visual differential indicator	581
Additional features	page		
T2 Plug	582		



FHP350

Filter length	H [mm]	H2 [mm]	
		Execution P01	Execution P02
1	295	150	-
2	418	150	-
3	550	150	-
4	703	150	550

Connections	R
A	M12
B - C	1/2" UNC
D	M12
E - F	1/2" UNC
G	M12
H	1/2" UNC
I	M12
L	1/2" UNC

Designation & Ordering code

COMPLETE FILTER

Series and size **FHP500** Configuration example: **FHP500** **4** **V** **A** **F1** **A06** **S** **P01**

Length

1 | 2 | 3 | 4 | 5

Valves

- S** Without bypass
- B** With bypass 6 bar
- T** With check valve, without bypass
- D** With check valve, with bypass 6 bar
- V** With reverse flow, without bypass
- Z** With reverse flow, with bypass 6 bar

Seals

- A** NBR
- V** FPM

Connections

- F1** 1 1/2" SAE 3000 psi/M
- F2** 1 1/2" SAE 3000 psi/UNC
- F3** 2" SAE 3000 psi/M
- F4** 2" SAE 3000 psi/UNC + 1 1/2" NPT
- F5** 1 1/2" SAE 6000 psi/M
- F6** 1 1/2" SAE 6000 psi/UNC
- F7** 2" SAE 6000 psi/M + G 1 1/2"
- F8** 2" SAE 6000 psi/UNC + SAE 24 - 1 7/8" - 12 UN

Filtration rating (filter media)

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

Element Δp	Valves					
	S	B	T	D	V	Z
N 20 bar		•				
R 20 bar				•		•
S 210 bar	•		•		•	

Execution	Filter length				
	1	2	3	4	5
P01 MP Filtri standard	•	•	•	•	•
P02 Maintenance from the bottom of the housing				•	•
P03 Drain plug	•	•			
Pxx Customized	•	•	•	•	•

FILTER ELEMENT

Element series and size **HP500** Configuration example: **HP500** **4** **A06** **A** **S** **P01**

Element length

1 | 2 | 3 | 4 | 5

Filtration rating (filter media)

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

Seals	
A	NBR
V	FPM

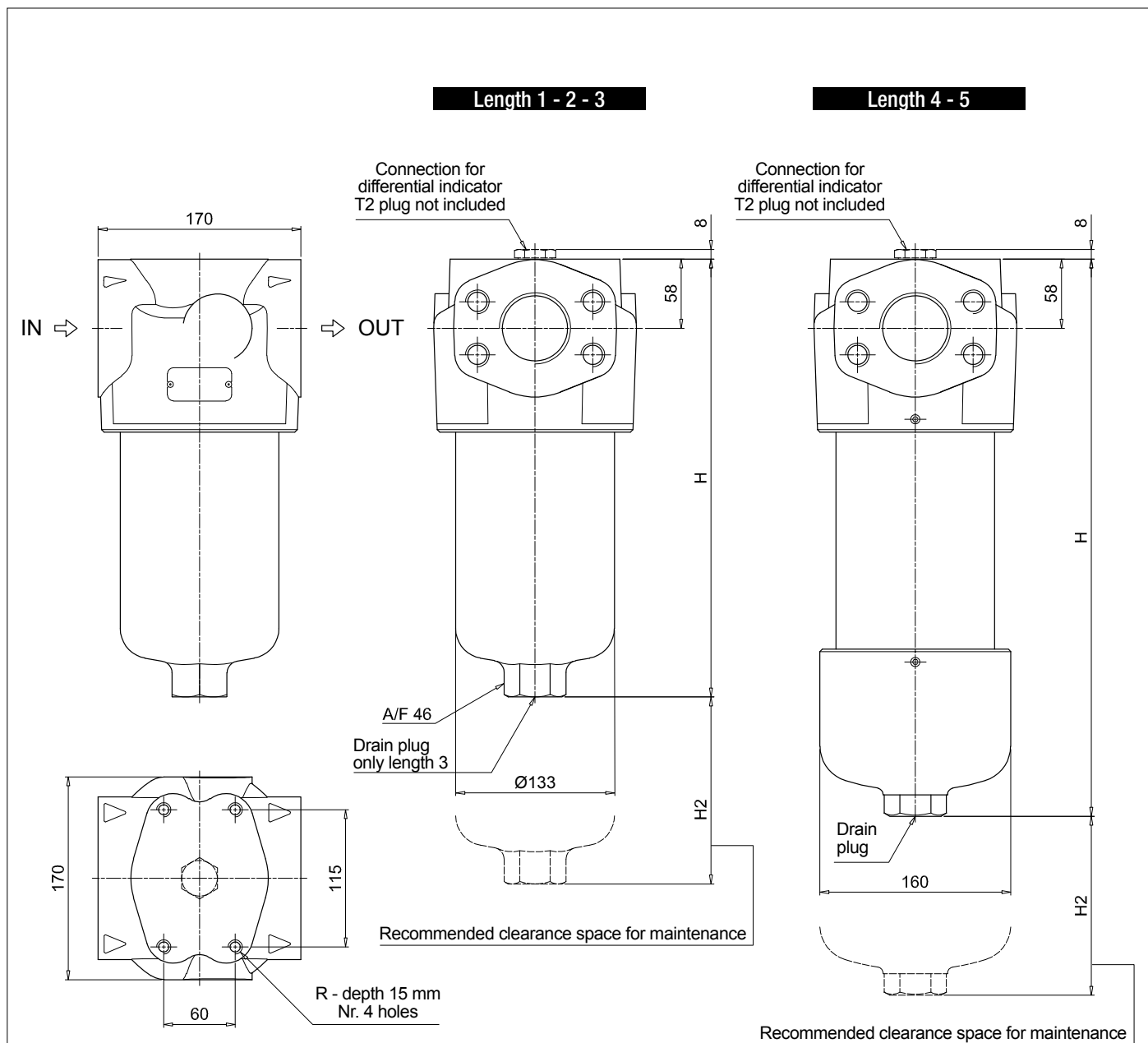
Element Δp	
N	20 bar
R	20 bar
S	210 bar

Execution	
P01	MP Filtri standard
Pxx	Customized

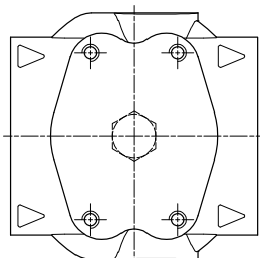
ACCESSORIES

Differential indicators	page	Differential indicators	page
DEA Electrical differential indicator	577	DLE Electrical / visual differential indicator	580
DEH Hazardous area electronic differential indicator	577-578	DTA Electronic differential indicator	581
DEM Electrical differential indicator	578-579	DVA Visual differential indicator	581
DLA Electrical / visual differential indicator	579-580	DVM Visual differential indicator	581

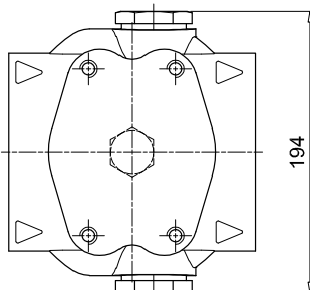
Additional features	page
T2 Plug	582



Valves S - B - T - D



Valves V - Z



FHP500

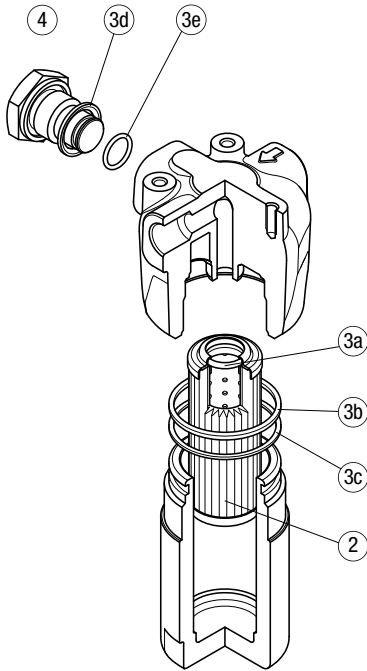
Filter length	H [mm]	H2 [mm]	
		Execution P01	P02
1	330	150	-
2	420	150	-
3	496	150	-
4	654	150	480
5	820	150	650

Connections	R
F1	M12
F2	1/2" UNC
F3	M12
F4	1/2" UNC
F5	M12
F6	1/2" UNC
F7	M12
F8	1/2" UNC

FHP SPARE PARTS

Order number for spare parts

FHP 010 - 011

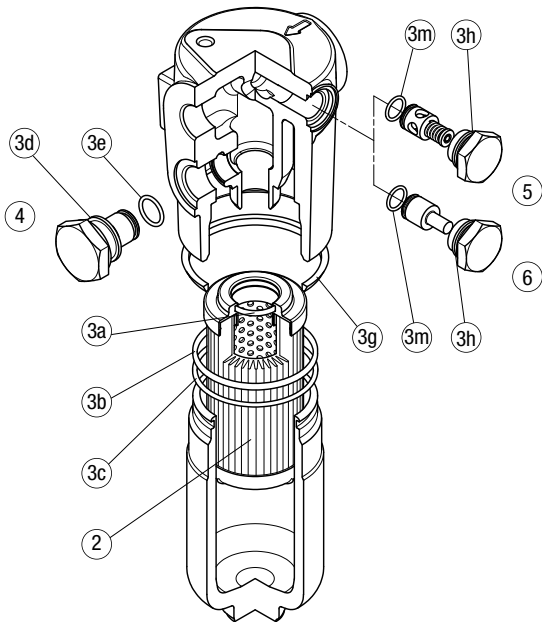


Q.ty:
nr. 0 pcs. for version 1
(without indicator port)

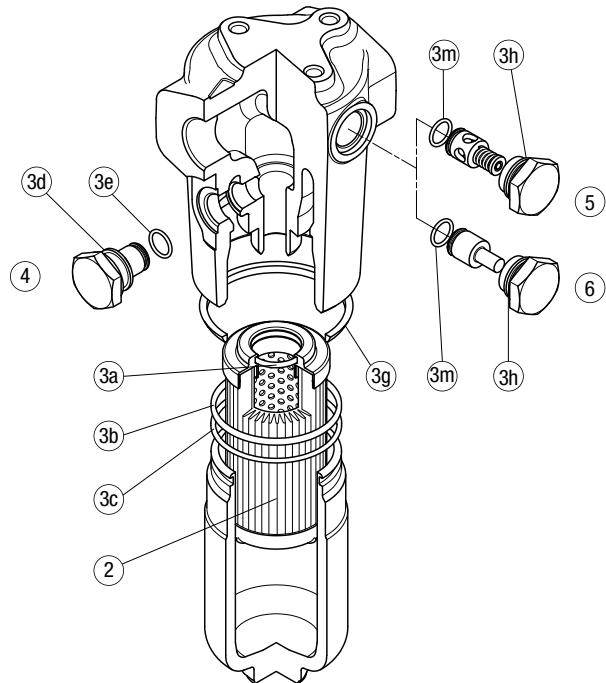
nr. 1 pc. for version 2
(with indicator port)

Item:	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3 (3a ÷ 3e)		Q.ty: 1 pc. 4	
Filter series	Filter element	Seal Kit code number		Indicator connection plug	
		NBR	FPM	NBR	FPM
FHP 010-011	See order table	02050501	02050492	T2H	T2V

FHP 065



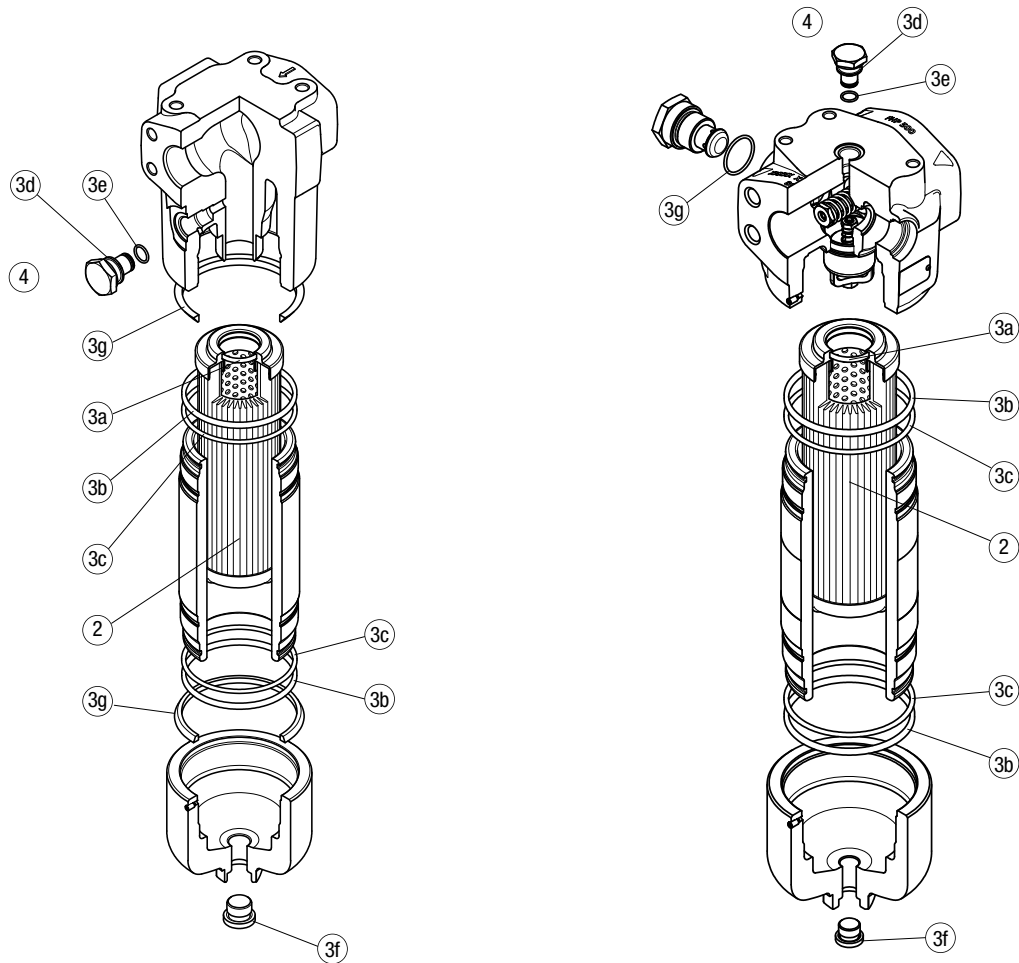
FHP 135



Item:	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3 (3a ÷ 3m)		Q.ty: 1 pc. 4		Q.ty: 1 pc. 5		Q.ty: 1 pc. 6	
Filter series	Filter element	Seal Kit code number		Indicator connection plug		Bypass assembly		Non-bypass assembly	
		NBR	FPM	NBR	FPM	NBR	FPM	NBR	FPM
FHP 065	See order table	02050265	02050276	T2H	T2V	02001116	02001136	02001142	02001139
FHP 135	See order table	02050269	02050280			02001117	02001137	02001143	02001392

FHP 350

FHP 500



Item:	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3 (3a ÷ 3g for FHP 350) (3a ÷ 3f for FHP 500)		Q.ty: 1 pc. 4	
Filter series	Filter element	Seal Kit code number		Indicator connection plug	
		NBR	FPM	NBR	FPM
FHP 350	See order table	02050272	02050283	T2H	T2V
FHP 500		02050330	02050331		

FMM series

Maximum working pressure up to 42 MPa (420 bar) - Flow rate up to 300 l/min



Description

Technical data

High Pressure filters

In-line

Maximum working pressure up to 42 MPa (420 bar)

Flow rate up to 300 l/min

FMM is a range of versatile high pressure filter for protection of sensitive components in high pressure hydraulic systems in the mobile machines.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Female threaded connections up to 1 1/4", for a maximum flow rate of 250 l/min
- Fine filtration rating, to get a good cleanliness level into the system
- Bypass valve, to relieve excessive pressure drop across the filter media
- Low collapse filter element "N", for use with filters provided with bypass valve
- Low collapse filter element with external support "R", for filter element protection against the back pressure caused by the check valve in filters provided with the bypass valve
- High collapse filter element with external support "S", for filter element protection against the back pressure caused by the check valve in filters not provided with the bypass valve
- Visual, electrical and electronic differential clogging indicators

Common applications:

- Agricultural machines
- Mobile machines

Filter housing materials

- Head: Painted cast iron, black RAL 9005
- Housing: Phosphatized steel
- Bypass valve: Steel

Pressure

- 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)

Bypass valve

- Opening pressure 600 kPa (6 bar) ±10%
- Other opening pressures on request.

Δp element type

- Microfiber filter elements - series N-R: 20 bar
- Microfiber filter elements - series S: 210 bar
- Wire mesh filter elements - series N: 20 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

Connections

In-line Inlet/Outlet

Note

FMM filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]					Volumes [dm ³]						
	Length	1	2	3	4	5	Length	1	2	3	4	5
FMM 050		3.11	3.48	3.90	4.36	5.54		0.34	0.48	0.63	0.81	1.23
FMM 150		7.50	9.50	10.90	-	-		0.60	1.00	1.25	-	-

Filter series	Length	Filter element design - N Series						Filter element design - S Series				
		A03	A06	A10	A16	A25	M25	A03	A06	A10	A16	A25
FMM 050	1	42	43	79	82	106	147	29	39	57	59	74
	2	52	57	85	96	121	149	45	49	76	88	114
	3	66	69	97	106	130	150	58	61	89	99	125
	4	83	89	113	115	134	152	74	80	106	108	129
	5	107	110	130	134	141	154	93	95	111	121	139
FMM 150	1	81	88	156	163	179	295					
	2	142	145	227	230	236	312					
	3	170	180	242	245	263	315					

Maximum flow rate for a complete pressure filter with a pressure drop $\Delta p = 1.5$ bar.

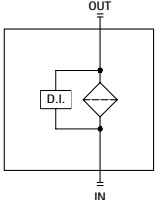
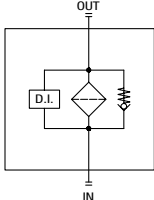
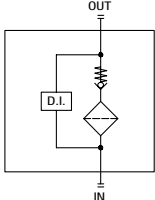
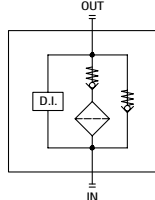
The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

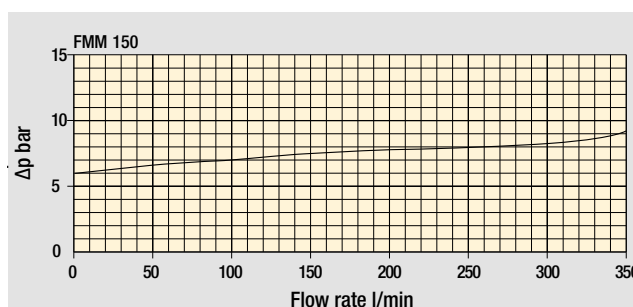
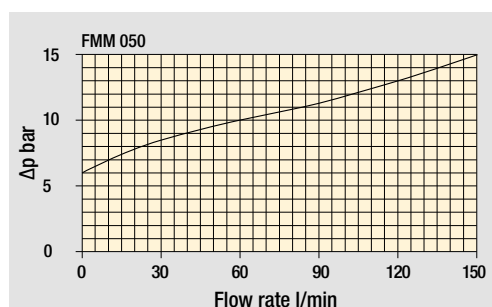
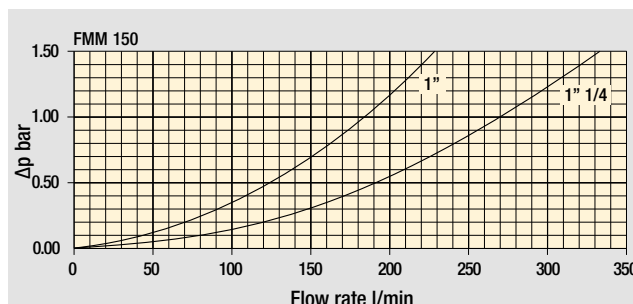
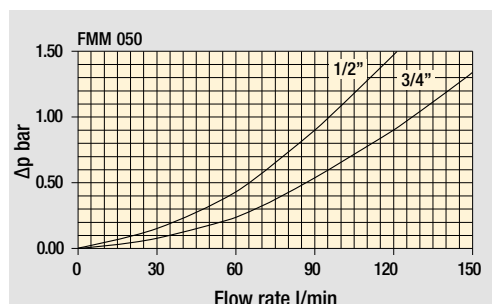
You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols

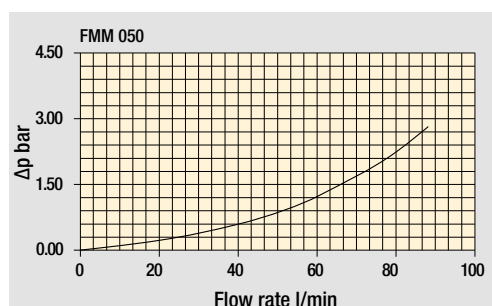
Filter series	Style S	Style B	Style T	Style D
FMM 050	•	•	•	•
FMM 150	•	•	•	•

Pressure drop
Filter housings
 Δp pressure drop



Bypass valve
pressure drop



Filter housing
with check valve

Valves

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

Designation & Ordering code

COMPLETE FILTER

Series and size **FMM050** Configuration example: **FMM050** **3** **B** **A** **G** **A10** **N** **P01**

Length

1 | 2 | 3 | 4 | 5

Valves

- S** Without bypass
- B** With bypass 6 bar
- T** With check valve, without bypass
- D** With check valve, with bypass 6 bar

Seals

- A** NBR
- V** FPM

Connections

- A** M18x1.5 - ISO 6149
- B** M22x1.5 - ISO 6149
- C** G 1/2"
- D** G 3/4"
- E** 1/2" NPT
- F** 3/4" NPT
- G** SAE 8 - 3/4" - 16 UNF
- H** SAE 12 - 1 1/16" - 12 UN

Filtration rating (filter media)

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

Element Δp	Valves				
	S	B	T	D	
N 20 bar		•			
R 20 bar				•	
S 210 bar	•		•		

Execution

- P01** Upper connection for clogging indicator
- P02** Without connection for clogging indicator
- P03** Frontal connection for clogging indicator
- Pxx** Customized

FILTER ELEMENT

Element series and size **HP050** Configuration example: **HP050** **3** **A10** **A** **N** **P01**

Element length

1 | 2 | 3 | 4 | 5

Filtration rating (filter media)

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

Seals

- A** NBR
- V** FPM

Element Δp

- N** 20 bar
- R** 20 bar
- S** 210 bar

Execution

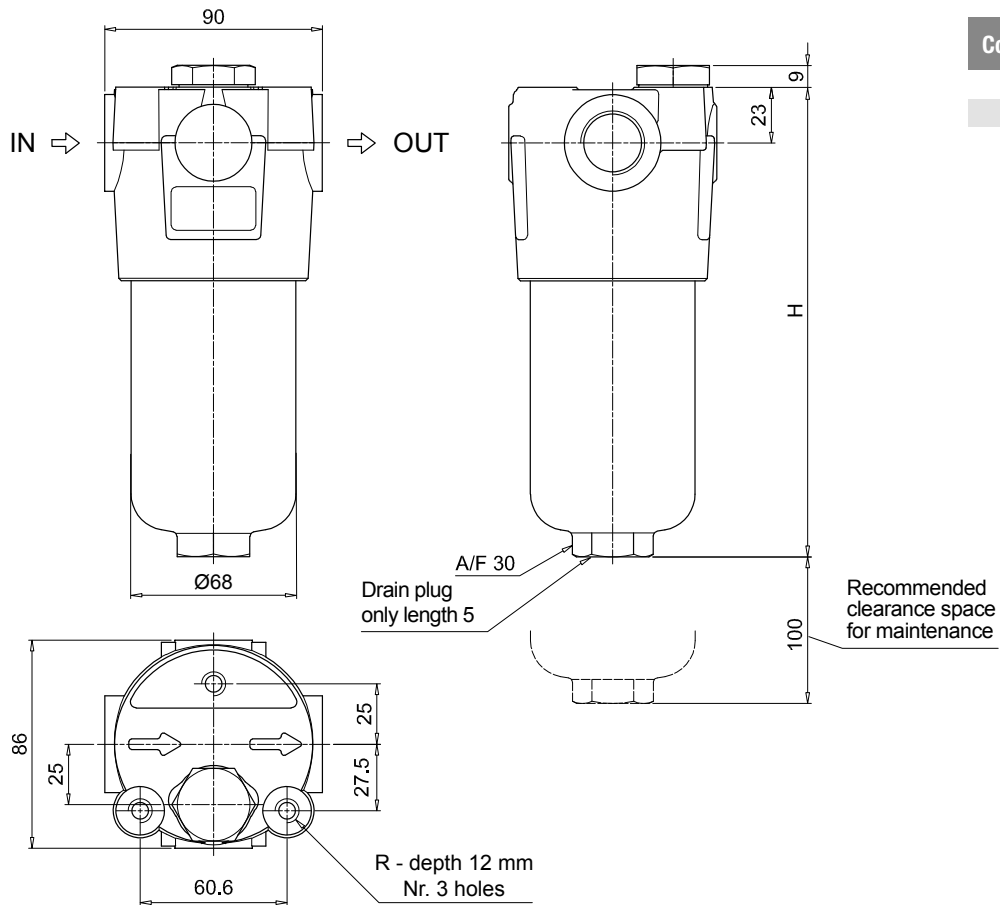
- P01** MP Filtri standard
- Pxx** Customized

ACCESSORIES

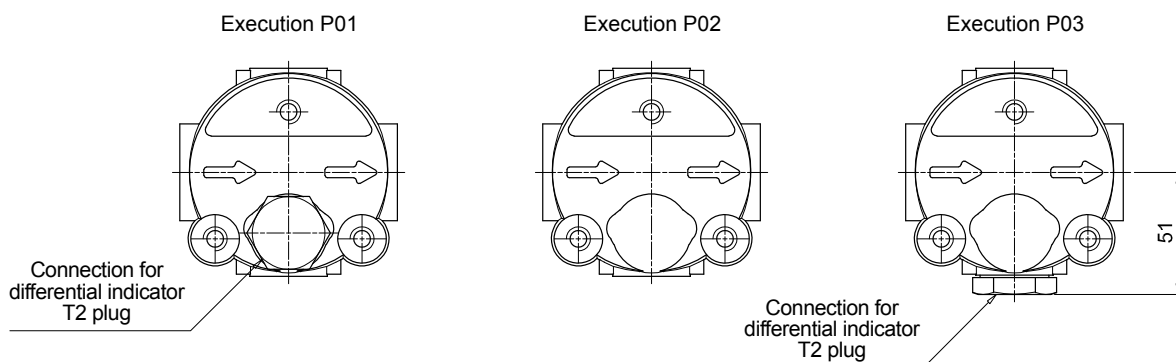
Differential indicators	page		page
DEA Electrical differential indicator	577	DLE Electrical / visual differential indicator	580
DEH Hazardous area electronic differential indicator	577-578	DTA Electronic differential indicator	581
DEM Electrical differential indicator	578-579	DVA Visual differential indicator	581
DLA Electrical / visual differential indicator	579-580	DVM Visual differential indicator	581

Additional features

- T2** Plug 582



FMM050	
Filter length	H [mm]
1	158
2	195
3	237
4	285
5	407
Connections	R
A-B-C-D	M10
E-F-G-H	3/8" UNC



Designation & Ordering code

COMPLETE FILTER

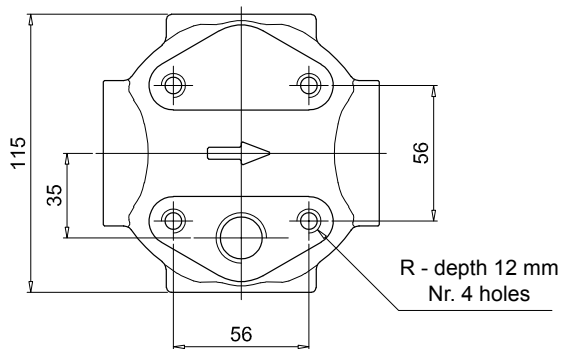
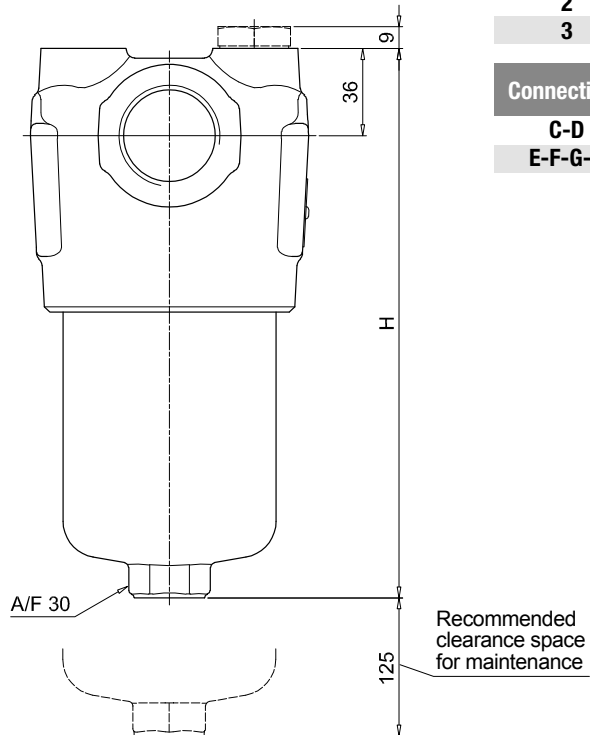
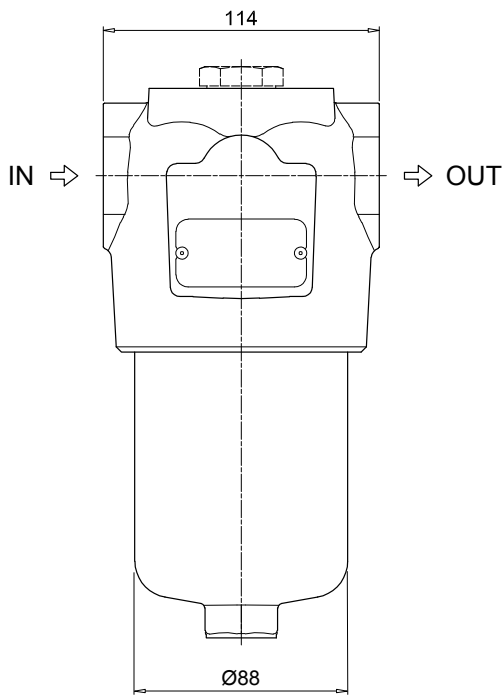
Series and size	Configuration example: FMM150 2 B A D 2 M25 N P01															
FMM150																
Length	1 2 3															
Valves	S Without bypass B With bypass 6 bar															
Seals	A NBR V FPM															
Connections	C G 1" D G 1 1/4" E 1" NPT F 1 1/4" NPT G SAE 16 - 1 5/16" - 12 UN 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)	<table border="0"> <tr> <td>A03 Inorganic microfiber 3 µm</td> <td>A16 Inorganic microfiber 16 µm</td> </tr> <tr> <td>A06 Inorganic microfiber 6 µm</td> <td>A25 Inorganic microfiber 25 µm</td> </tr> <tr> <td>A10 Inorganic microfiber 10 µm</td> <td>M25 Wire mesh 25 µm</td> </tr> </table>										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
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					Execution										
	N 20 bar					P01 MP Filtri standard Pxx Customized										

FILTER ELEMENT

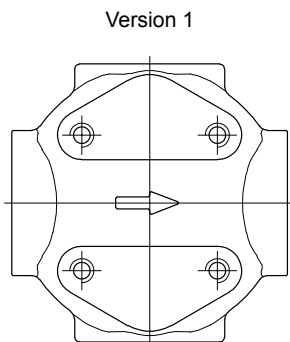
Element series and size	Configuration example: HP150 2 M25 A N P01												
HP150													
Element length	1 2 3												
Filtration rating (filter media)	<table border="0"> <tr> <td>A03 Inorganic microfiber 3 µm</td> <td>A16 Inorganic microfiber 16 µm</td> </tr> <tr> <td>A06 Inorganic microfiber 6 µm</td> <td>A25 Inorganic microfiber 25 µm</td> </tr> <tr> <td>A10 Inorganic microfiber 10 µm</td> <td>M25 Wire mesh 25 µm</td> </tr> </table>							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
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		Element Δp		Execution								
	A NBR V FPM		N 20 bar		P01 MP Filtri standard Pxx Customized								

ACCESSORIES

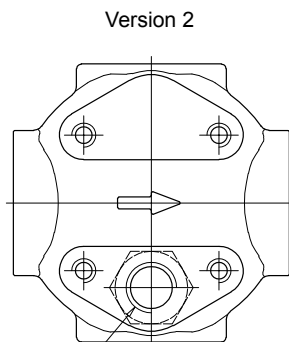
Differential indicators	page		page
DEA Electrical differential indicator	577	DLE Electrical / visual differential indicator	580
DEH Hazardous area electronic differential indicator	577-578	DTA Electronic differential indicator	581
DEM Electrical differential indicator	578-579	DVA Visual differential indicator	581
DLA Electrical / visual differential indicator	579-580	DVM Visual differential indicator	581
Additional features	page		
T2 Plug	582		



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

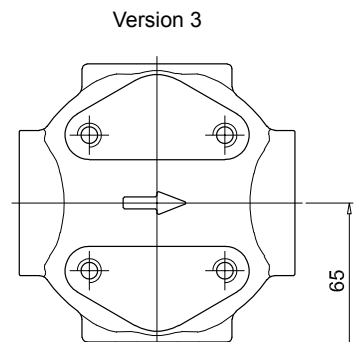


Version 1



Version 2

Connection for differential indicator
T2 plug not included



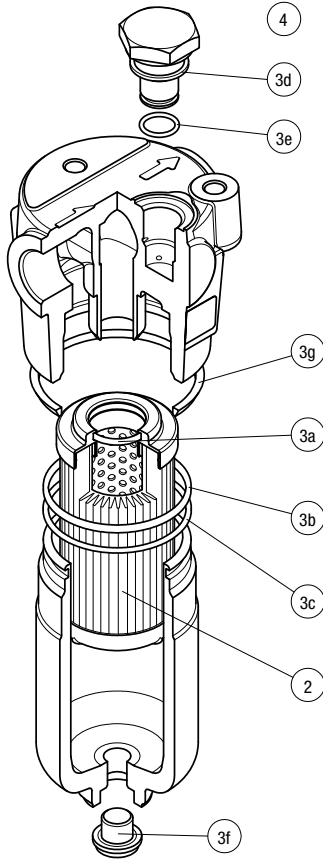
Version 3

Connection for differential indicator
T2 plug not included

FMM SPARE PARTS

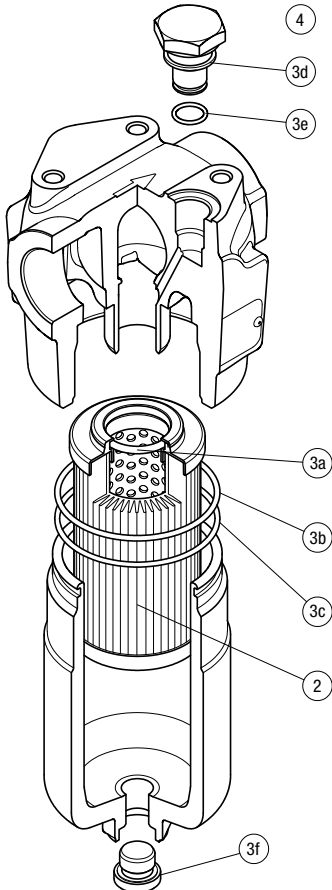
Order number for spare parts

FMM 050



Item:	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3 (3a ÷ 3g)	Q.ty: 1 pc. 4		
Filter series	Filter element	Seal Kit code number		Indicator connection plug	
		NBR	FPM	NBR	FPM
FMM 050	See order table	02050314	02050315	T2H	T2V

FMM 150



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		Indicator connection plug	
		NBR	FPM	NBR	FPM
FMM 150	See order table	02050731	02050732	T2H	T2V

FHA 051 series

Maximum working pressure up to 56 MPa (560 bar) - Flow rate up to 150 l/min



Description

Technical data

High Pressure filters

In-line

Maximum working pressure up to 56 MPa (560 bar)

Flow rate up to 150 l/min

FHA is a range of high pressure filter for protection of sensitive components in high pressure hydraulic systems in the mobile machines. They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Female threaded connections up to 3/4", for a maximum flow rate of 150 l/min
- Fine filtration rating, to get a good cleanliness level into the system
- Bypass valve, to relieve excessive pressure drop across the filter media
- Check valve, to protect the system against reverse flow
- Reverse flow valve, to allow bidirectional flow through the filter housing. The back flow is not filtered
- Low collapse filter element "N", for use with filters provided with bypass valve
- Low collapse filter element with external support "R", for filter element protection against the back pressure caused by the check valve or the reverse flow in filters provided with the bypass valve
- High collapse filter element with external support "S", for filter element protection against the back pressure caused by the check valve or the reverse flow in filters not provided with the bypass valve
- Visual, electrical and electronic differential clogging indicators

Common applications:

Delivery lines, in any heavy duty industrial equipment or mobile machines

Filter housing materials

- Head: Steel (chemical heat treatment)
- Housing: Steel (chemical heat treatment)
- Bypass valve: Steel

Pressure

- Test pressure: 84 MPa (840 bar)
- Burst pressure: 168 MPa (1680 bar)
- Pulse pressure fatigue test: 1 00 000 cycles with pressure from 0 to 56 MPa (560 bar)

Bypass valve

- Opening pressure 600 kPa (6 bar) ±10%
- Other opening pressures on request.

Δp element type

- Microfibre filter elements - series N-R: 20 bar
- Microfibre filter elements - series S: 210 bar
- Wire mesh filter elements - series N: 20 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

Connections

In-line Inlet/Outlet

Note

FHA filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]					Volumes [dm ³]						
	Length	1	2	3	4	5	Length	1	2	3	4	5
FHA 051		3.28	3.65	4.06	4.54	5.74		0.33	0.47	0.62	0.79	1.23

Filter series	Length	Filter element design - N Series						Filter element design - R Series					Filter element design - S Series				
		A03	A06	A10	A16	A25	M25	A03	A06	A10	A16	A25	A03	A06	A10	A16	A25
FHA 051	1	42	41	82	85	110	156	42	41	82	85	110	30	40	58	60	76
	2	53	58	87	100	127	158	53	58	87	100	127	45	50	78	91	120
	3	68	71	101	111	137	160	68	71	101	111	137	59	62	92	103	131
	4	86	92	118	121	142	162	86	92	118	121	142	77	83	110	113	137
	5	112	115	137	142	150	165	112	115	137	142	150	96	99	116	128	147

Maximum flow rate for a complete pressure filter with a pressure drop $\Delta p = 1.5$ bar.

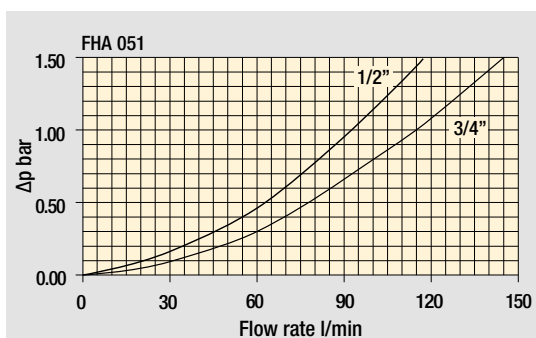
The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

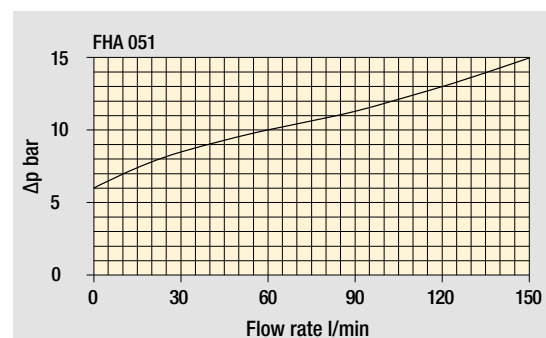
You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols

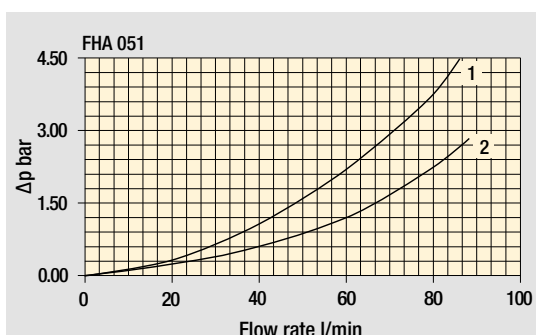
Filter series	Style S	Style B	Style T	Style D	Style V	Style Z
FHA 051						



Filter housings
 Δp pressure drop



Pressure drop
Bypass valve
pressure drop



Pressure drop in reverse flow valves

- 1 - Reverse flow
- 2 - In filter direction

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

FHA 051

Designation & Ordering code

COMPLETE FILTER

Series and size **FHA051** Configuration example: **FHA051** **3** **B** **A** **G** **A10** **N** **P01**

Series and size

Length

1 | 2 | 3 | 4 | 5

Valves

- S** Without bypass
- B** With bypass 6 bar
- T** With check valve, without bypass
- D** With check valve, with bypass 6 bar
- V** With reverse flow, without bypass
- Z** With reverse flow, with bypass 6 bar

Seals

- A** NBR
- V** FPM

Connections

- | | |
|-----------------------------|-----------------------------------|
| A M18x1.5 - ISO 6149 | E 1/2" NPT |
| B M22x1.5 - ISO 6149 | F 3/4" NPT |
| C G 1/2" | G SAE 8 - 3/4" - 16 UNF |
| D G 3/4" | H SAE 12 - 1 1/16" - 12 UN |

Filtration rating (filter media)

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

Element Δp	Valves						
	S	B	T	D	V	Z	
N 20 bar		•					
R 20 bar				•		•	
S 210 bar	•		•		•		

Execution

- P01** Upper connection for clogging indicator
- P02** Without connection for clogging indicator
- P03** Frontal connection for clogging indicator
- Pxx** Customized

FILTER ELEMENT

Element series and size **HP050** Configuration example: **HP050** **3** **A10** **A** **N** **P01**

Element series and size

Element length

1 | 2 | 3 | 4 | 5

Filtration rating (filter media)

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

Seals

- A** NBR
- V** FPM

Element Δp

- N** 20 bar
- R** 20 bar
- S** 210 bar

Execution

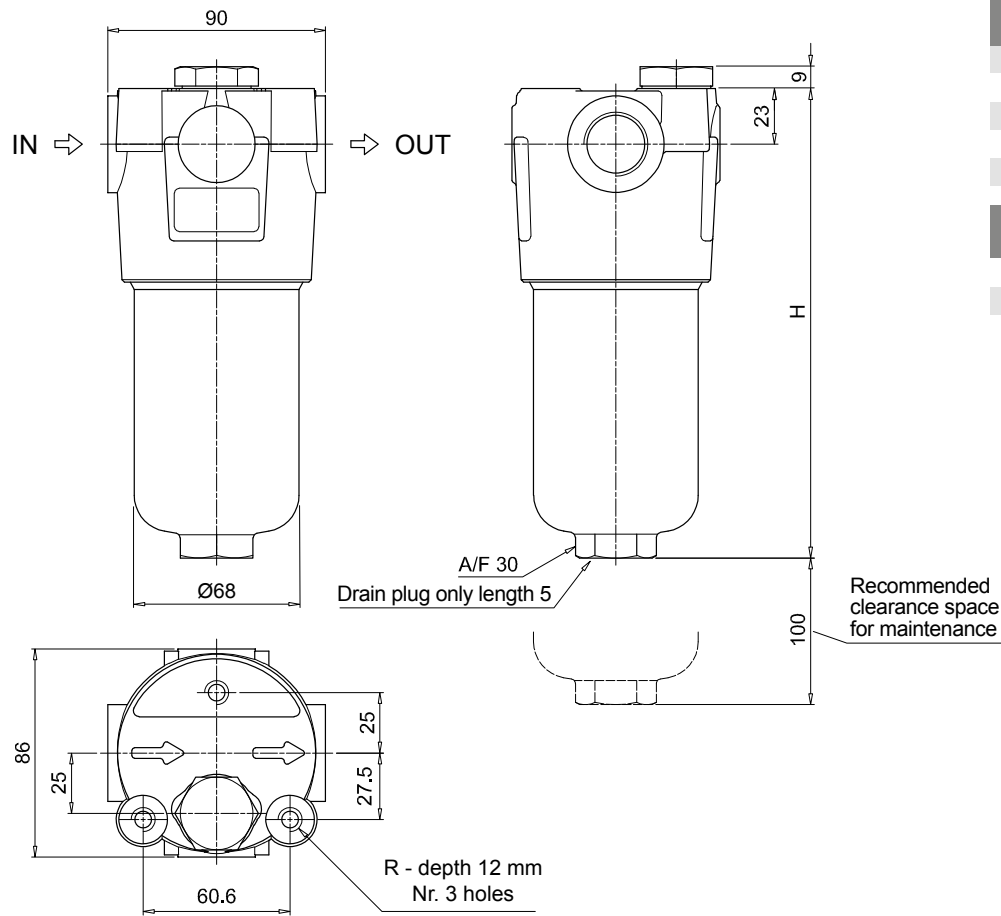
- P01** MP Filtri standard
- Pxx** Customized

ACCESSORIES

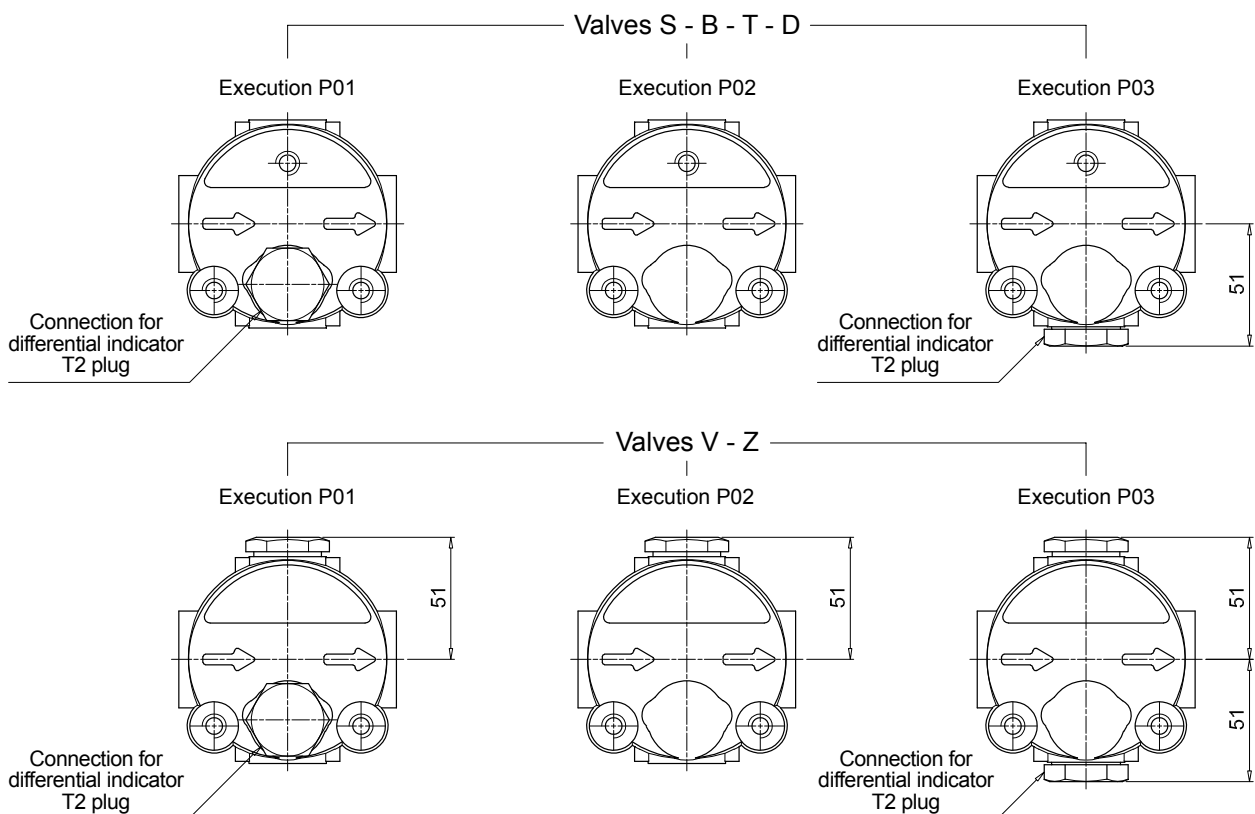
Differential indicators	page	Differential indicators	page
DEA Electrical differential indicator	577	DLE Electrical / visual differential indicator	580
DEH Hazardous area electronic differential indicator	577-578	DTA Electronic differential indicator	581
DEM Electrical differential indicator	578-579	DVA Visual differential indicator	581
DLA Electrical / visual differential indicator	579-580	DVM Visual differential indicator	581

Additional features

- T2** Plug 582



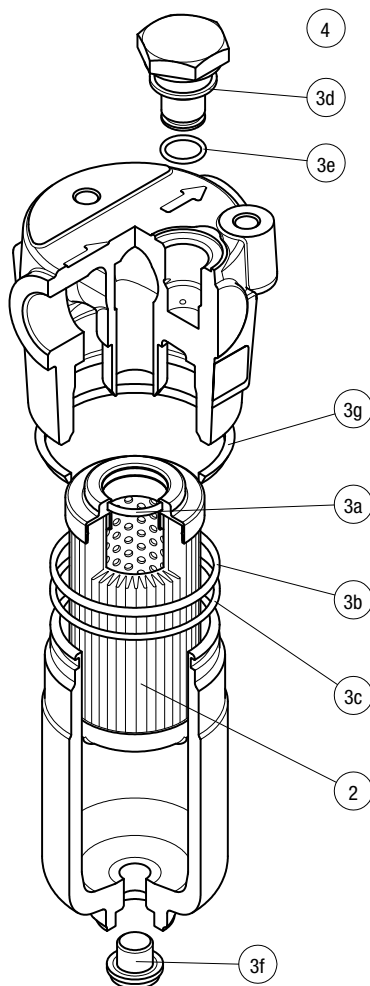
FHA051	
Filter length	H [mm]
1	158
2	195
3	237
4	285
5	407
Connections	R
A-B-C-D	M10
E-F-G-H	3/8" UNC



FHA 051 SPARE PARTS

Order number for spare parts

FHA 051



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug	
FHA 051	See order table	NBR	FPM	NBR	FPM
	2	3 (3a ÷ 3g)		4	
		02050288	02050305	T2H	T2V

FHM series

Maximum working pressure up to 32 MPa (320 bar) - Flow rate up to 400 l/min



Description

Technical data

High Pressure filters

Manifold

Maximum working pressure up to 32 MPa (320 bar)

Flow rate up to 400 l/min

FHM is a range of high pressure filter for protection of sensitive components in high pressure hydraulic systems in the mobile machines. They are directly connected to the top of the manifold, through the proper flanged interface.

Available features:

Available features:

- Manifold connections up to Ø30 mm, for a maximum flow rate of 400 l/min
- ISO 4401 CETOP 3 and CETOP 5 interface, for direct mounting on the CETOP valves
- Fine filtration rating, to get a good cleanliness level into the system
- Bypass valve, to relieve excessive pressure drop across the filter media
- Check valve, to protect the system against reverse flow
- Low collapse filter element "N", for use with filters provided with bypass valve
- High collapse filter element "H", for use with filters not provided with bypass valve
- High collapse filter element with external support "S", for filter element protection against the back pressure caused by the check valve in filters not provided with the bypass valve
- Visual, electrical and electronic differential clogging indicators

Common applications:

Delivery lines, in any high pressure industrial equipment

Filter housing materials

- Head
Phosphatized cast iron: FHM 006-007-010
Phosphatized steel: FHM 050-065-135-320-500
- Housing: Phosphatized steel
- Bypass valve: Steel
- Check valve: Steel

Pressure

- Test pressure: 48 MPa (480 bar)
- Burst pressure: 96 MPa (960 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 32 MPa (320 bar)

Bypass valve

- Opening pressure 600 kPa (6 bar) ±10%
- Other opening pressures on request.

Δp element type

- Microfibre filter elements - series N: 20 bar (not available for FHM 006, FHM 007 and FHM 010)
- Microfibre filter elements - series H: 210 bar (not available for FHM 050 and FHM 500)
- Microfibre filter elements - series S: 210 bar (only for FHM 050 and FHM 500)
- Wire mesh filter elements - series N: 20 bar (not available for FHM 006)
- Wire mesh filter elements - series H: 210 bar (not available for FHM 050 and FHM 500)
- 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

Connections

Manifold mounting

Note

FHM filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]					Volumes [dm ³]						
	Length	1	2	3	4	5	Length	1	2	3	4	5
FHM 006		2.17	-	-	-	-		0.12	-	-	-	-
FHM 007		-	4.74	5.95	-	-		-	0.30	0.50	-	-
FHM 010		-	4.74	5.95	-	-		-	0.30	0.50	-	-
FHM 050		5.31	5.68	6.09	6.56	7.74		0.29	0.38	0.48	0.60	0.89
FHM 065		5.47	5.83	7.04	-	-		0.27	0.34	0.56	-	-
FHM 135		8.78	10.38	11.43	-	-		0.49	0.82	1.03	-	-
FHM 320		19.80	21.93	24.22	26.70	-		1.04	1.76	2.53	3.36	-
FHM 500		35.00	39.17	42.69	54.70	60.50		1.63	2.35	2.96	5.11	6.44

Filter series	Length	Filter element design - H Series					
		A03	A06	A10	A16	A25	M25
FHM 006	1	9	10	13	14	15	16
	2	13	13	15	16	16	16
FHM 007	3	15	15	16	16	17	17
	2	23	25	32	34	37	38
FHM 010	3	31	33	37	38	39	40

Filter series	Length	Filter element design - N Series						Filter element design - S Series				
		A03	A06	A10	A16	A25	M25	A03	A06	A10	A16	A25
FHM 050	1	38	37	65	67	81	101	28	36	50	52	62
	2	46	50	69	75	89	102	41	44	63	71	85
	3	57	59	76	81	93	103	51	53	71	77	90
	4	68	71	84	86	95	103	62	66	81	82	93
	5	82	83	93	95	98	105	73	75	83	89	97

Filter series	Length	Filter element design - N Series						Filter element design - H Series				
		A03	A06	A10	A16	A25	M25	A03	A06	A10	A16	A25
FHM 065	1	23	30	48	53	71	102	22	23	43	50	67
	2	30	45	59	64	81	103	30	34	56	62	76
	3	52	60	78	82	92	105	51	58	77	81	91
FHM 135	1	61	65	99	104	131	149	46	51	83	86	122
	2	91	96	118	119	155	167	79	92	109	111	134
	3	118	119	144	146	156	168	103	112	130	137	146
FHM 320	1	112	121	187	217	252	312	97	102	156	162	228
	2	200	214	281	293	320	328	161	181	237	241	282
	3	245	267	312	320	325	333	207	233	275	280	306
	4	267	281	315	325	336	341	232	247	279	283	309

Filter series	Length	Filter element design - N Series						Filter element design - S Series				
		A03	A06	A10	A16	A25	M25	A03	A06	A10	A16	A25
FHM 500	1	211	232	281	289	309	394	126	135	208	210	261
	2	242	262	303	308	330	397	187	206	258	266	285
	3	284	294	336	338	357	399	226	230	285	290	315
	4	302	325	346	350	361	401	251	273	314	315	341
	5	325	334	356	361	373	401	296	301	335	338	360

Maximum flow rate for a complete pressure filter with a pressure drop $\Delta p = 1.5$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure.

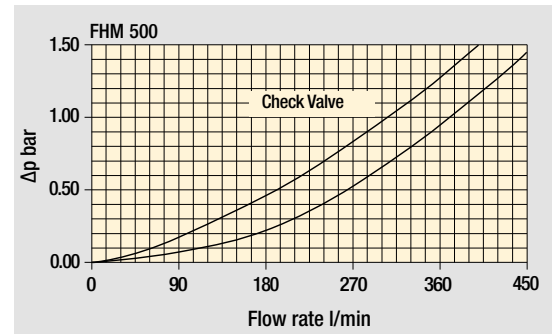
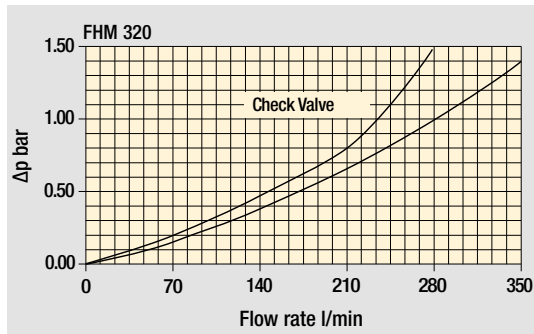
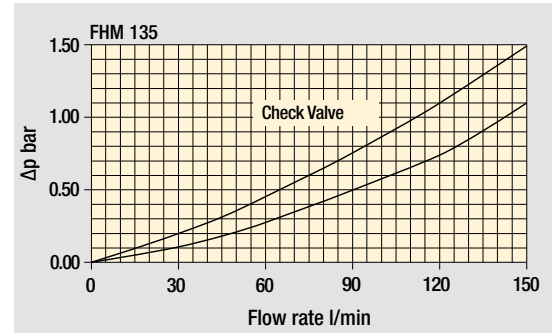
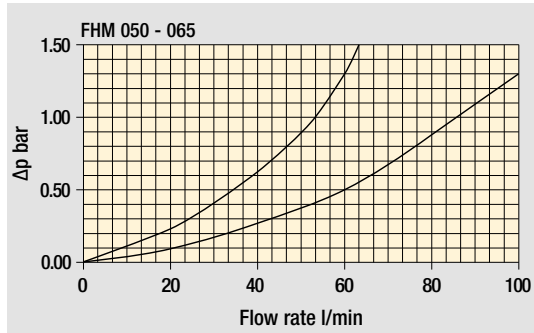
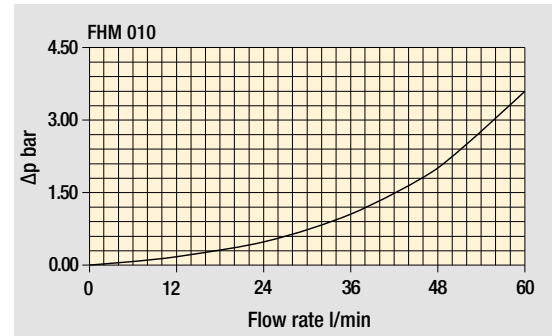
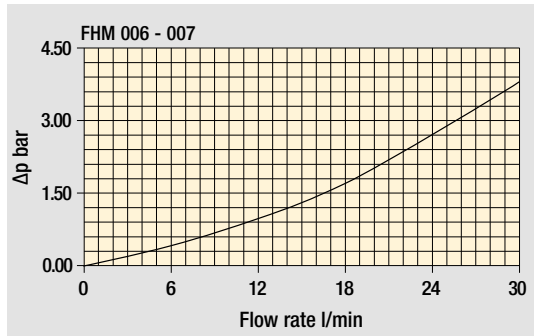
Please, contact our Sales Department for further additional information.

Hydraulic symbols

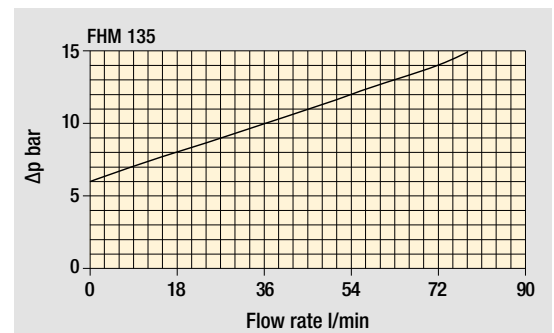
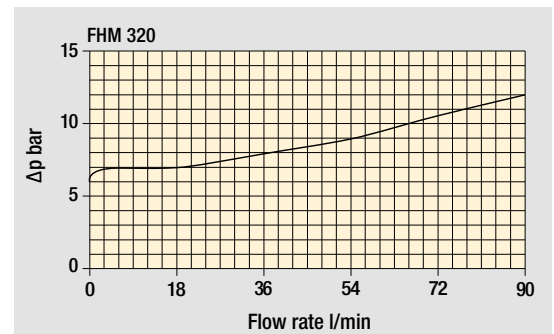
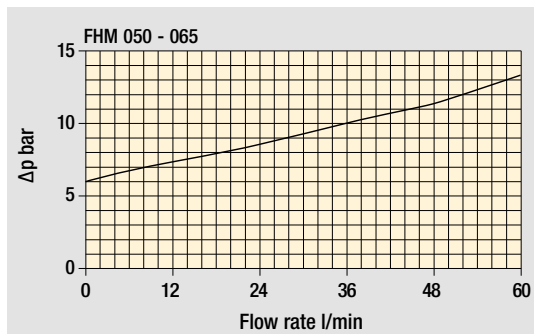
Filter series	Stile S	Stile S	Stile S	Stile B	Stile T	Stile D
FHM 006	•					
FHM 007	•					
FHM 010		•				
FHM 050			•	•	•	•
FHM 065			•	•	•	•
FHM 135			•	•	•	•
FHM 320			•	•	•	•
FHM 500			•	•	•	•

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.

Designation & Ordering code

COMPLETE FILTER

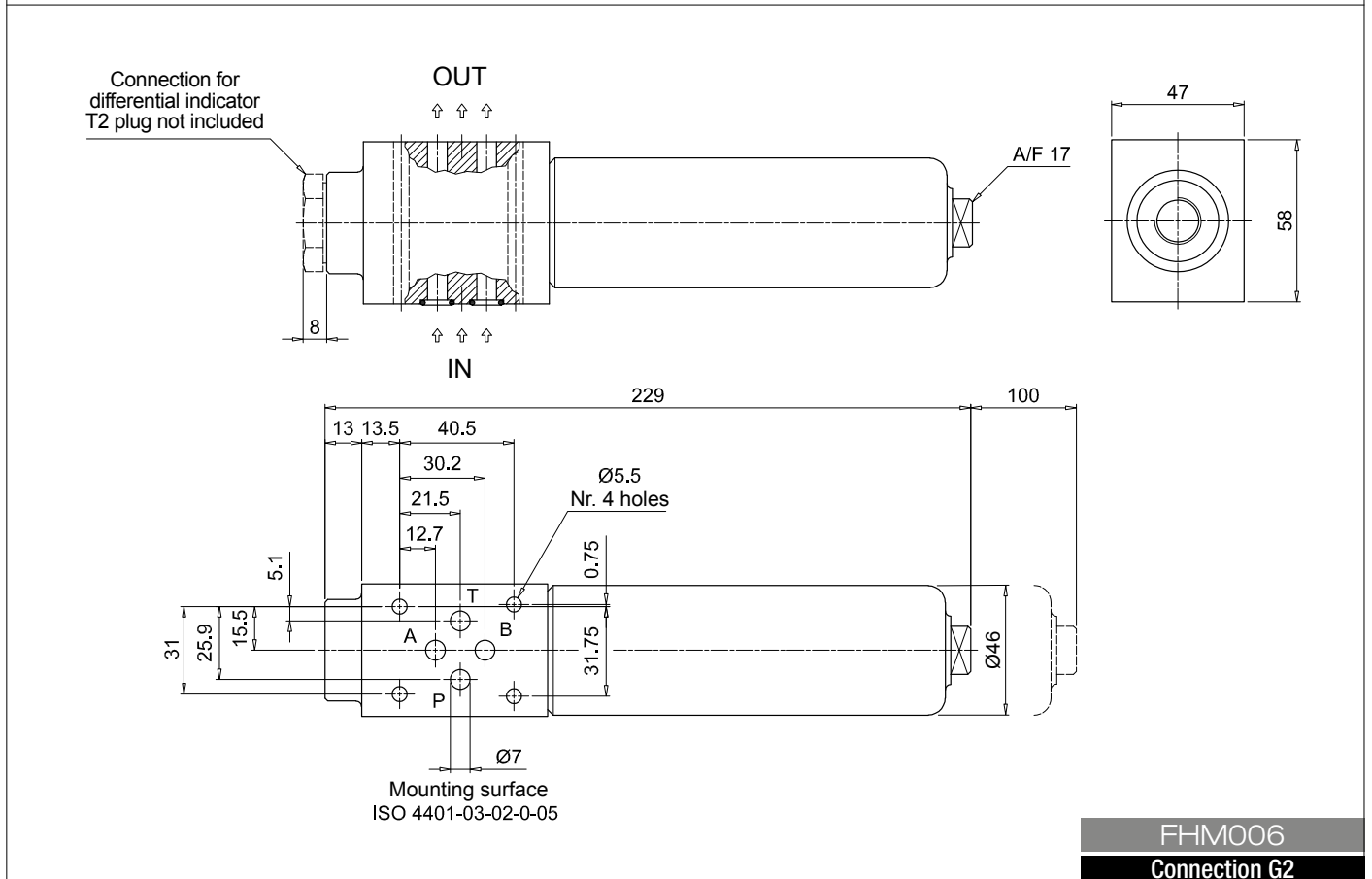
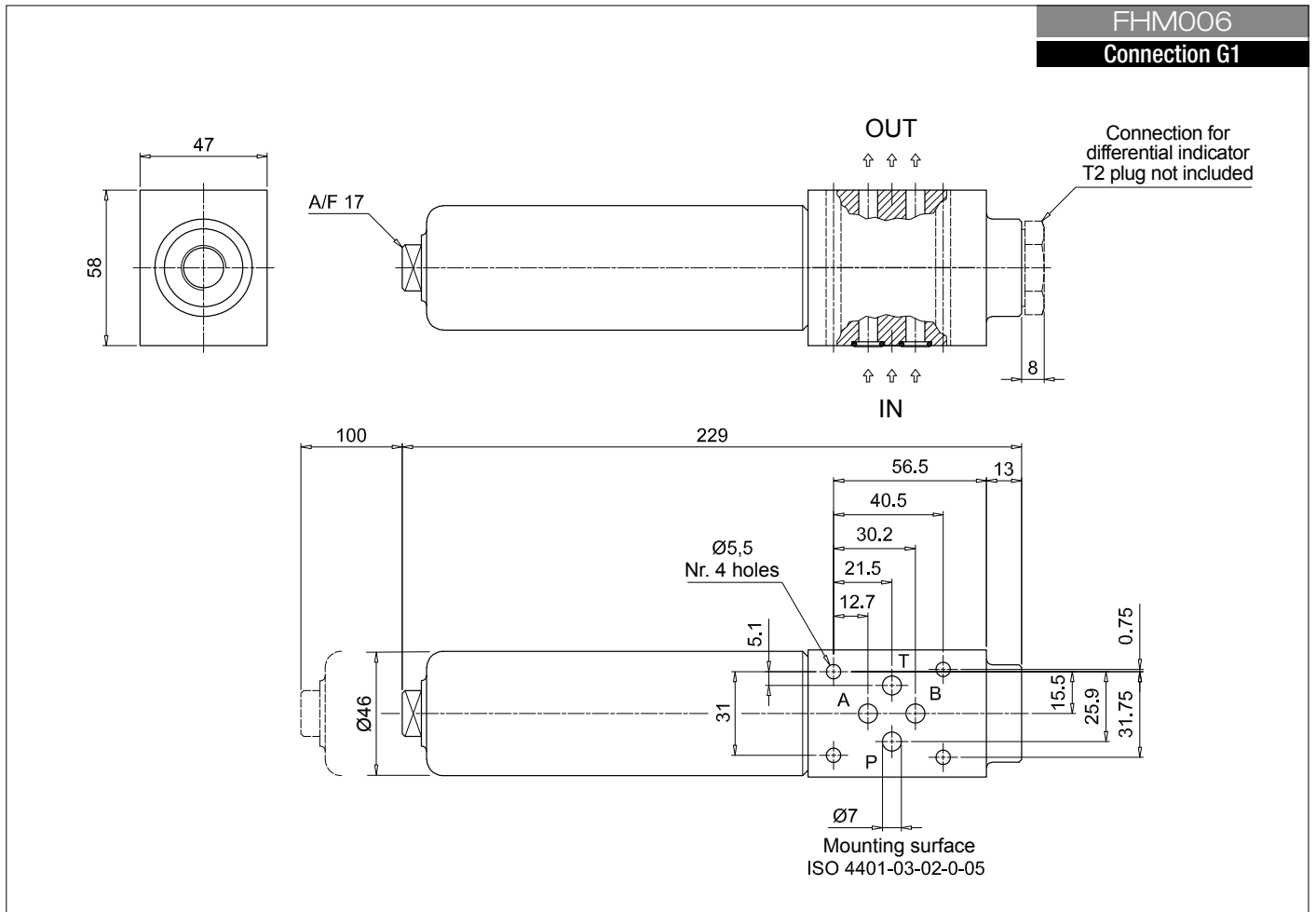
Series and size				Configuration example: FHM010 2 S V G1 A03 H P01						
FHM006 FHM007 FHM010										
Length	FHM006	FHM007	FHM010							
1	•									
2		•	•							
3		•	•							
Valves										
S Without bypass										
Seals										
A NBR										
V FPM										
Connections										
G1 Manifold side "A"										
G2 Manifold side "B"										
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		Execution				
				H 210 bar		P01 MP Filtri standard				
						Pxx Customized				

FILTER ELEMENT

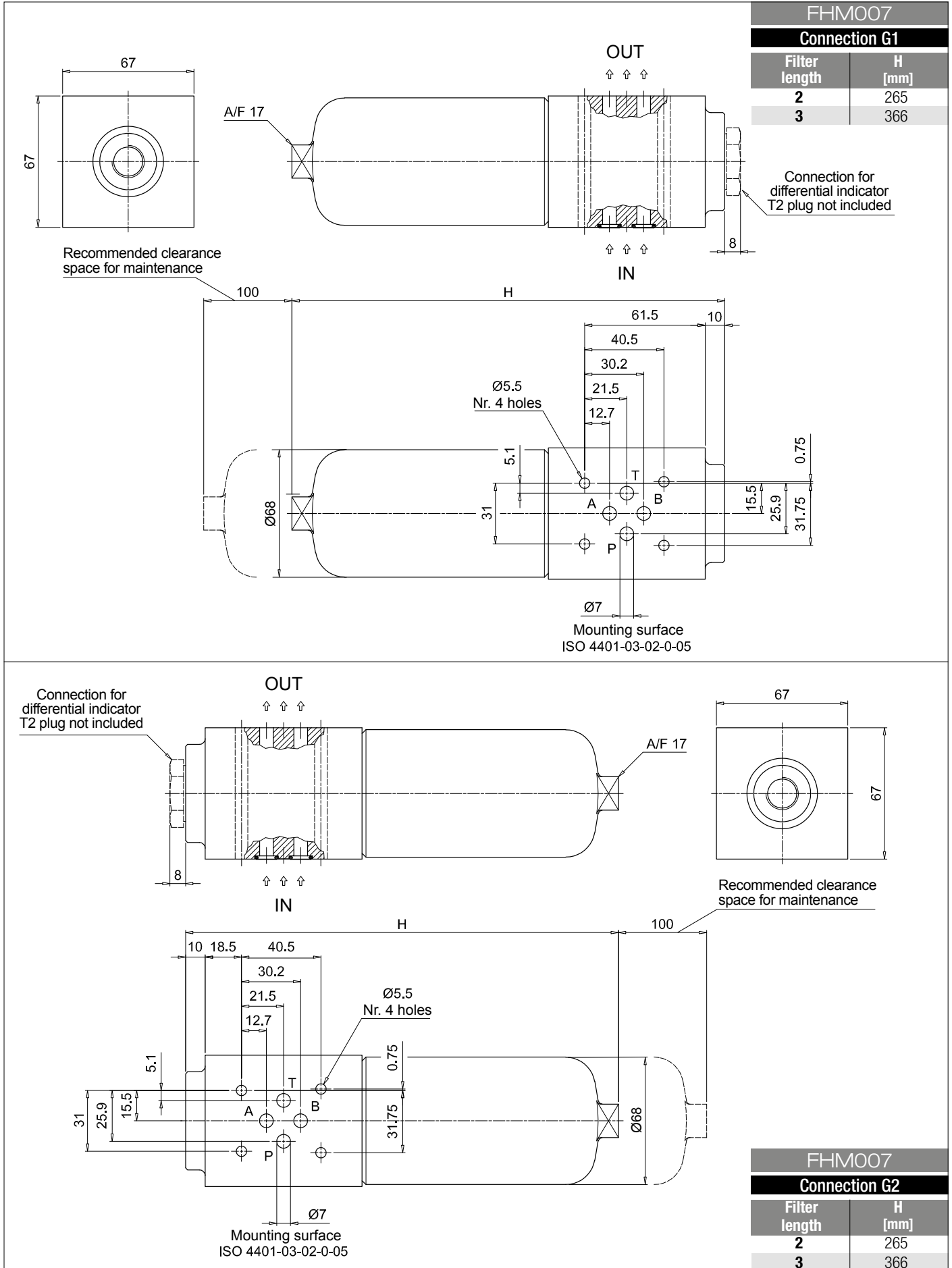
Element series and size				Configuration example: HP065 2 A03 A H P01						
FHM006 FHM007 FHM010										
Element length	FHM006	FHM007	FHM010							
2		•	•							
3	•	•	•							
Filtration rating (filter media)										
A03	Inorganic microfiber	3 µm	A16	Inorganic microfiber	16 µm					
A06	Inorganic microfiber	6 µm	A25	Inorganic microfiber	25 µm					
A10	Inorganic microfiber	10 µm	M25	Wire mesh	25 µm					
				Seals		Element Δp		Execution		
				A NBR		H 210 bar		P01 MP Filtri standard		
				V FPM				Pxx Customized		

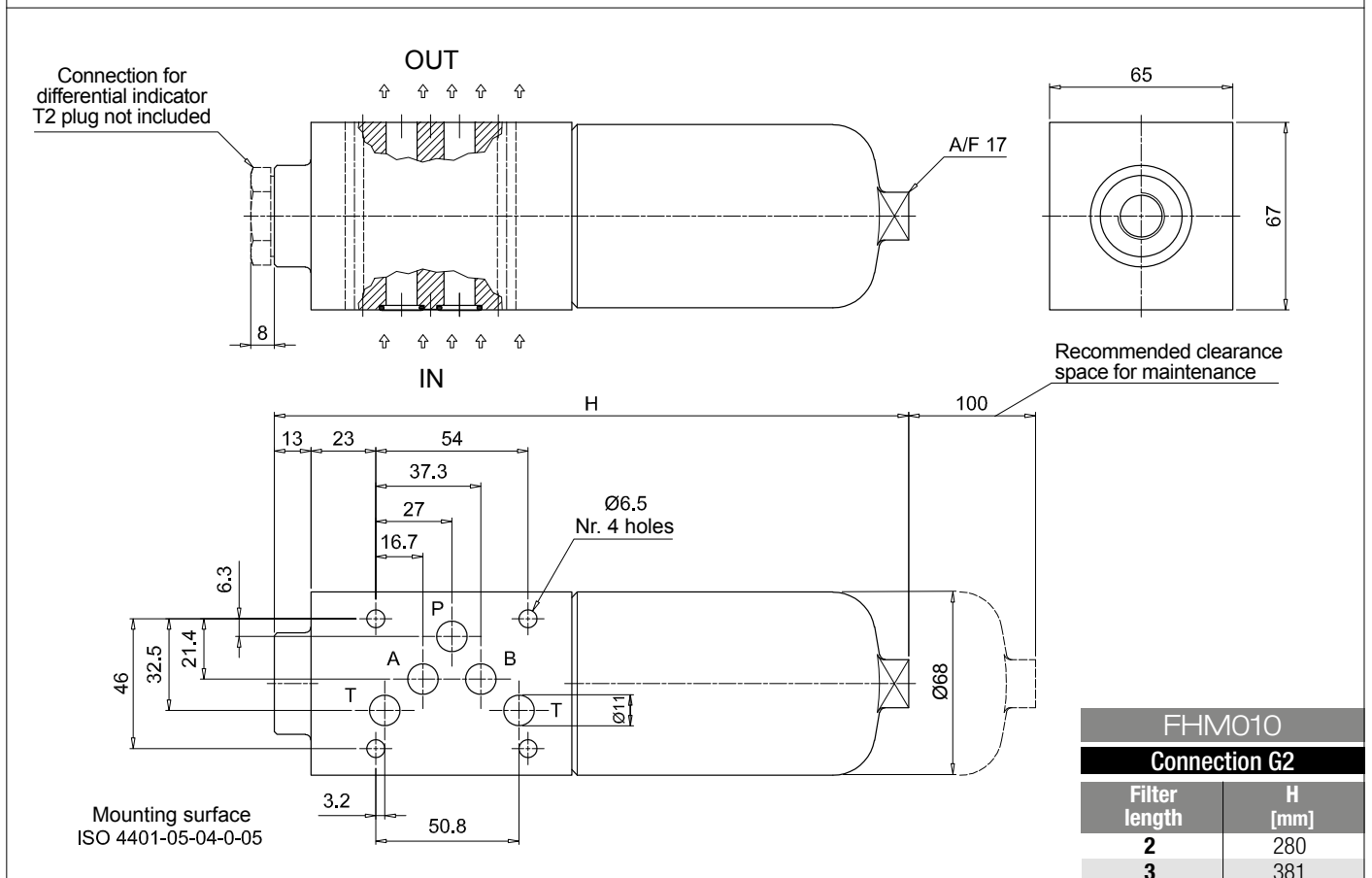
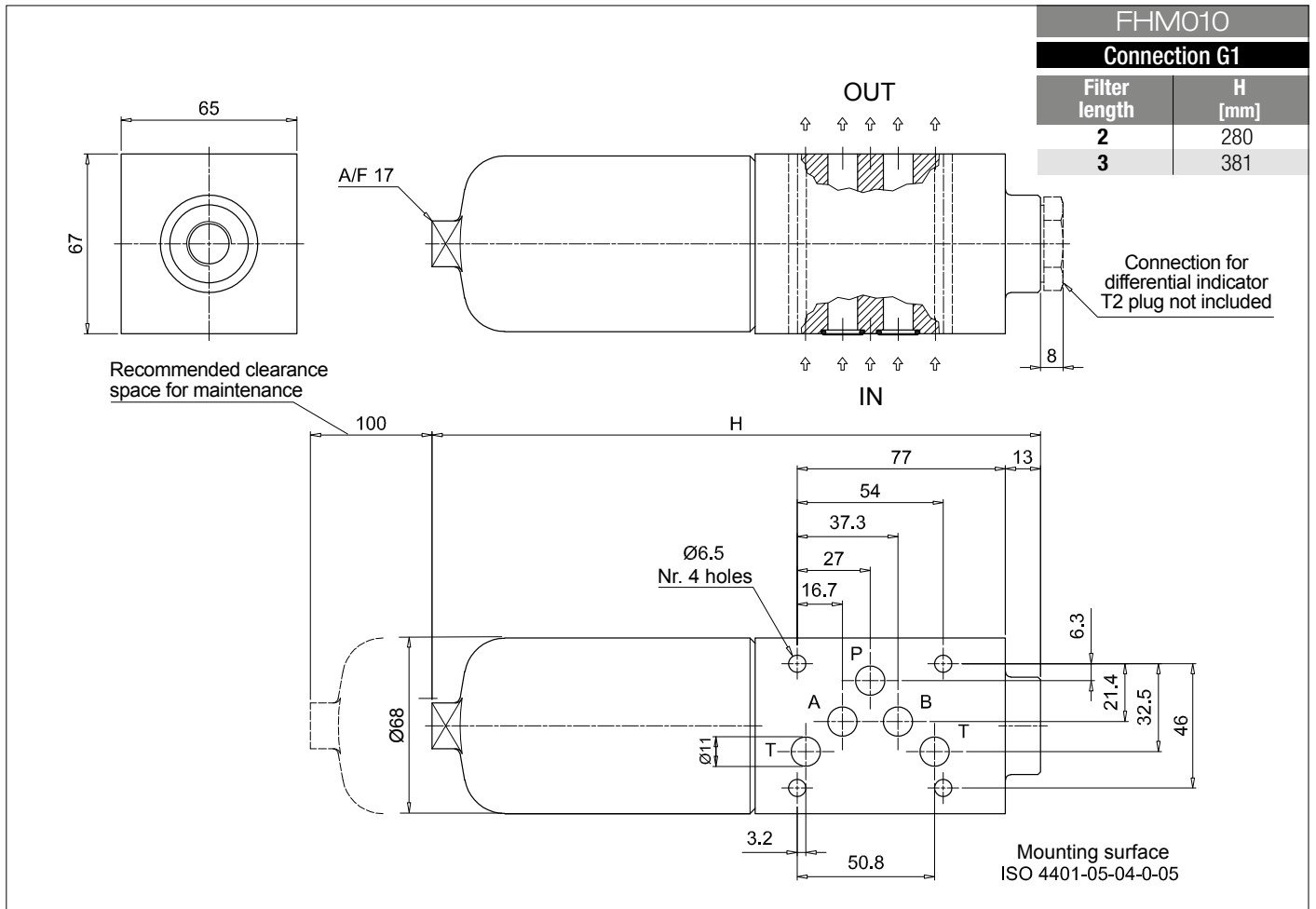
ACCESSORIES

Differential indicators		page			page
DEA	Electrical differential indicator	577	DLE	Electrical / visual differential indicator	580
DEH	Hazardous area electronic differential indicator	577-578	DTA	Electronic differential indicator	581
DEM	Electrical differential indicator	578-579	DVA	Visual differential indicator	581
DLA	Electrical / visual differential indicator	579-580	DVM	Visual differential indicator	581
Additional features		page			
T2	Plug	582			



Dimensions





FHM FHM050 - FHM065 - FHM135

Designation & Ordering code

COMPLETE FILTER

Series and size Configuration example: **FHM135** **3** **S** **A** **F1** **A10** **H** **P01**

FHM050 | **FHM065** | **FHM135**

Length	FHM050	FHM065	FHM135
1	•	•	•
2	•	•	•
3	•	•	•
4	•		
5	•		

Valves

S	Without bypass
B	With bypass 6 bar
T	With check valve, without bypass
D	With check valve, with bypass 6 bar

Seals

A	NBR
V	FPM

Connections

F1	Manifold
-----------	----------

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

Valves: **FHM050** **FHM065-135**

Element	Δp	S	B	T	D	S	B	T	D	Execution
N	20 bar		•		•		•		•	P01 MP Filtri standard
H	210 bar							•	•	Pxx Customized
S	210 bar	•			•					

FILTER ELEMENT

Element series and size Configuration example: **HP135** **3** **A10** **A** **H** **P01**

HP050 | **HP065** | **HP135**

Element length	HP050	HP065	HP135
1	•	•	•
2	•	•	•
3	•	•	•
4	•		
5	•		

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

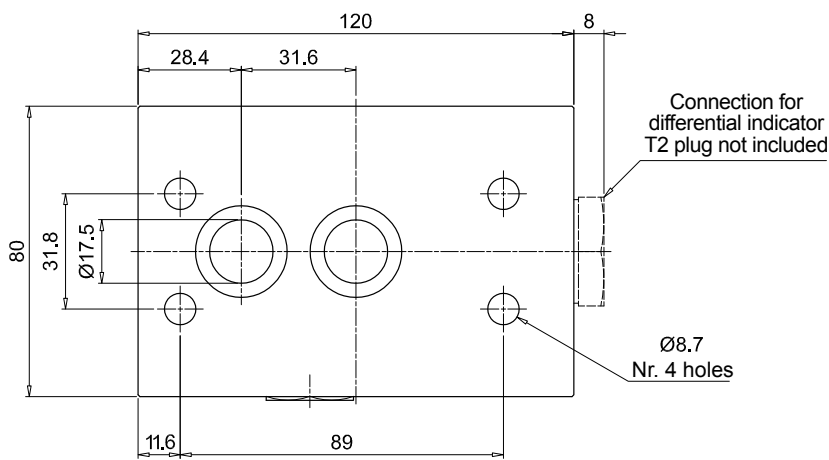
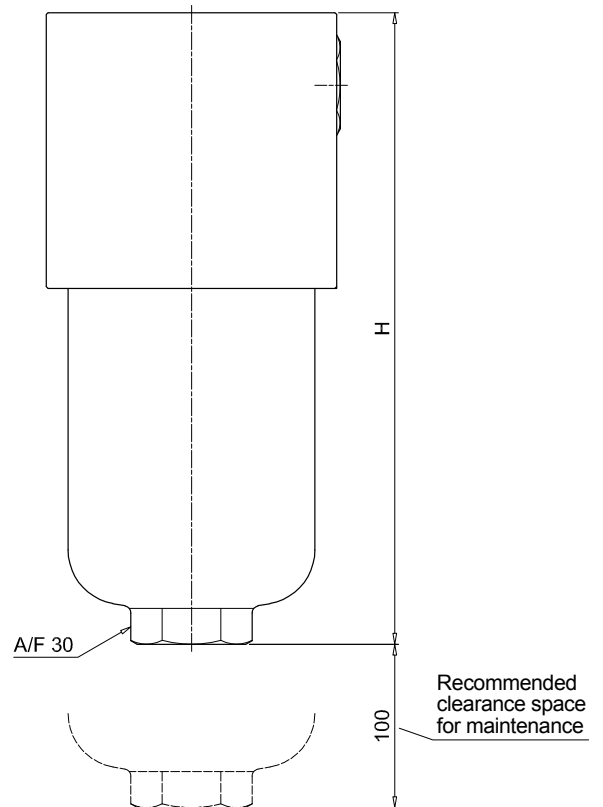
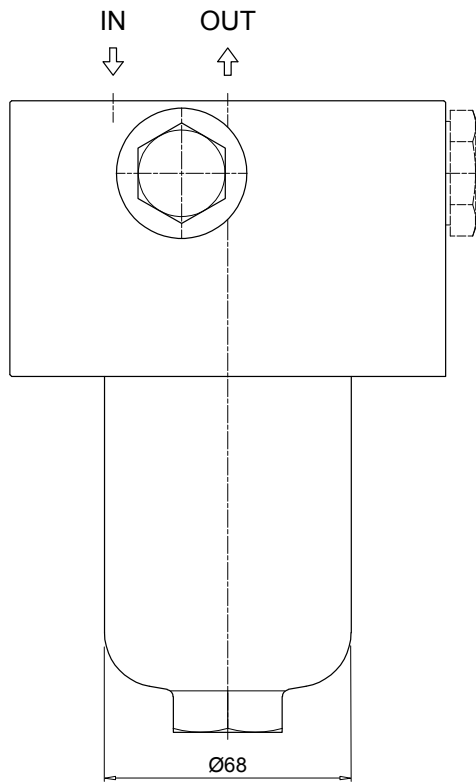
Seals	Element	Δp	HP050	HP065	HP135	Execution
A NBR	N	20 bar	•	•	•	P01 MP Filtri standard
V FPM	H	210 bar		•	•	Pxx Customized
	S	210 bar	•			

ACCESSORIES

Differential indicators	page	Differential indicators	page
DEA Electrical differential indicator	577	DLE Electrical / visual differential indicator	580
DEH Hazardous area electronic differential indicator	577-578	DTA Electronic differential indicator	581
DEM Electrical differential indicator	578-579	DVA Visual differential indicator	581
DLA Electrical / visual differential indicator	579-580	DVM Visual differential indicator	581

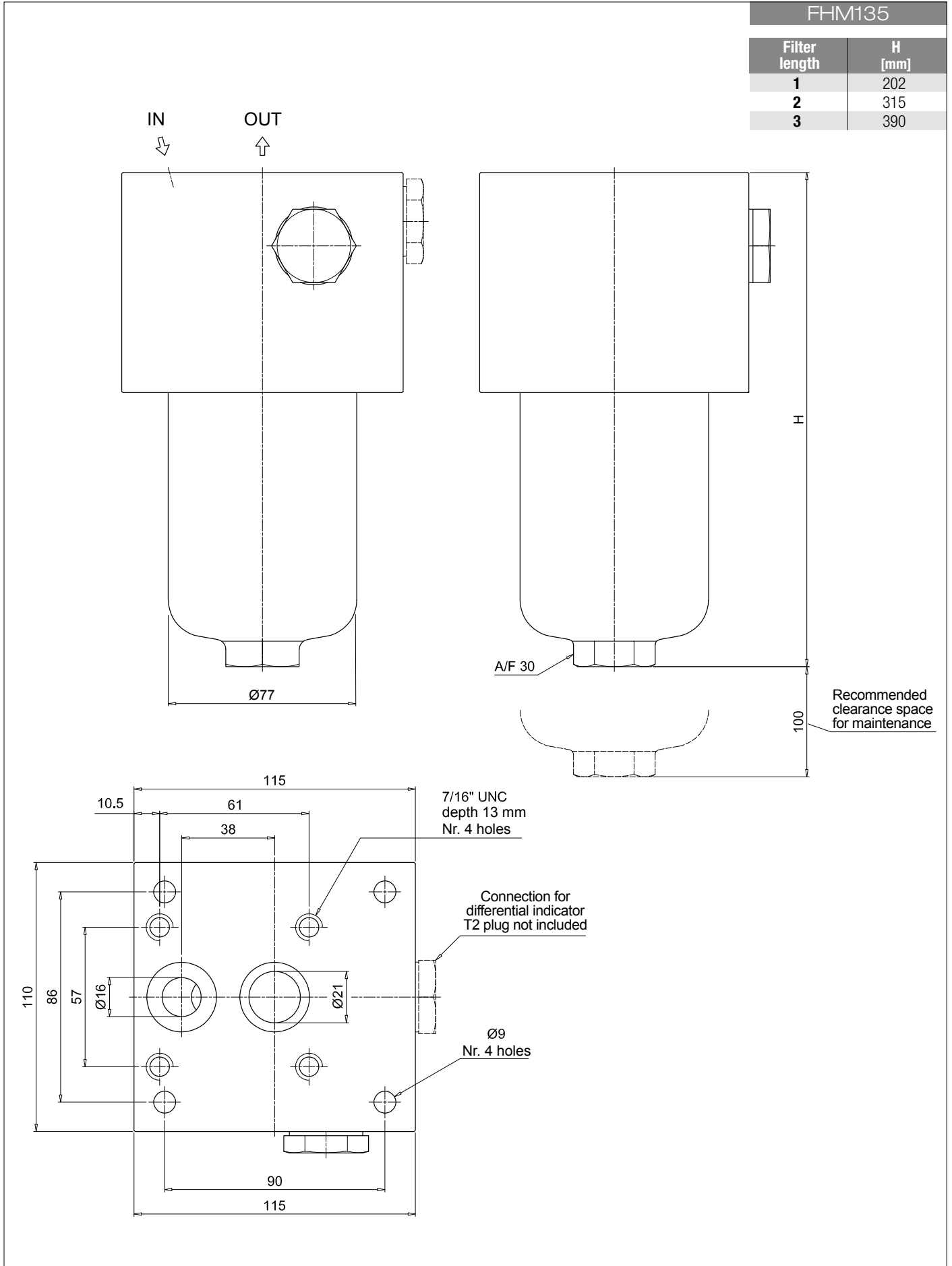
Additional features	page
T2 Plug	582

FHM050		FHM065	
Filter length	H [mm]	Filter length	H [mm]
1	154	1	162
2	191	2	193
3	233	3	295
4	281		
5	403		



FHM FHM050 - FHM065 - FHM135

Dimensions



FHM FHM320 - FHM500

Designation & Ordering code

COMPLETE FILTER

Series and size **FHM320 | FHM500** Configuration example: **FHM320** **4** **D** **A** **F1** **A06** **N** **P01**

Length	FHM320	FHM500
1	•	•
2	•	•
3	•	•
4	•	•
5		•

Valves	
S	Without bypass
B	With bypass 6 bar
T	With check valve, without bypass
D	With check valve, with bypass 6 bar

Seals	
A	NBR
V	FPM

Connections	
F1	Manifold

Filtration rating (filter media)			
A03	Inorganic microfiber	3 µm	
A06	Inorganic microfiber	6 µm	
A10	Inorganic microfiber	10 µm	
A16	Inorganic microfiber	16 µm	
A25	Inorganic microfiber	25 µm	
M25	Wire mesh	25 µm	

Element Δp		Valves: FHM320				FHM500			
		S	B	T	D	S	B	T	D
N	20 bar		•		•		•		•
H	210 bar	•		•					
S	210 bar					•		•	

Execution	Filter length				
	1	2	3	4	5
P01	•	•	•	•	•
P02				•	•
Pxx					

FILTER ELEMENT

Element series and size **HP320 | HP500** Configuration example: **HP320** **4** **A06** **A** **N** **P01**

Element length	HP320	HP500
1	•	•
2	•	•
3	•	•
4	•	•
5		•

Filtration rating (filter media)			
A03	Inorganic microfiber	3 µm	
A06	Inorganic microfiber	6 µm	
A10	Inorganic microfiber	10 µm	
A16	Inorganic microfiber	16 µm	
A25	Inorganic microfiber	25 µm	
M25	Wire mesh	25 µm	

Seals	
A	NBR
V	FPM

Element Δp	HP320		HP500	
	HP320	HP500	HP320	HP500
N	20 bar	•	•	
H	210 bar	•		
S	210 bar		•	

Execution	
P01	MP Filtri standard
Pxx	Customized

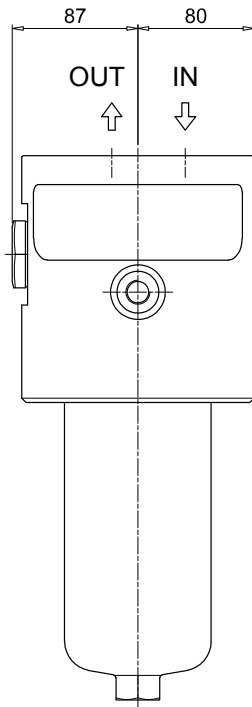
ACCESSORIES

Differential indicators	page	Differential indicators	page
DEA Electrical differential indicator	577	DLE Electrical / visual differential indicator	580
DEH Hazardous area electronic differential indicator	577-578	DTA Electronic differential indicator	581
DEM Electrical differential indicator	578-579	DVA Visual differential indicator	581
DLA Electrical / visual differential indicator	579-580	DVM Visual differential indicator	581

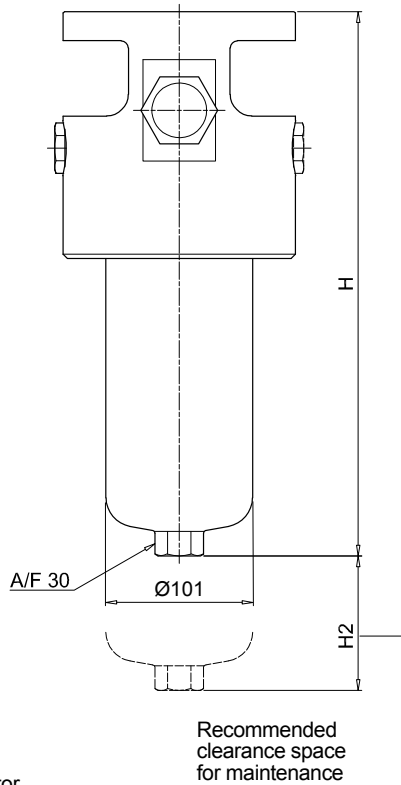
Additional features	page
T2 Plug	582

FHM320

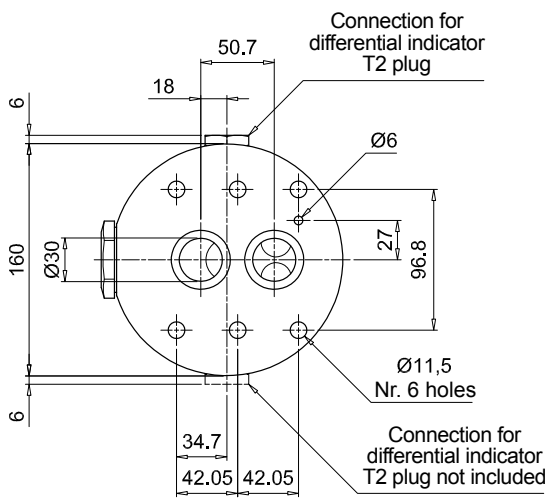
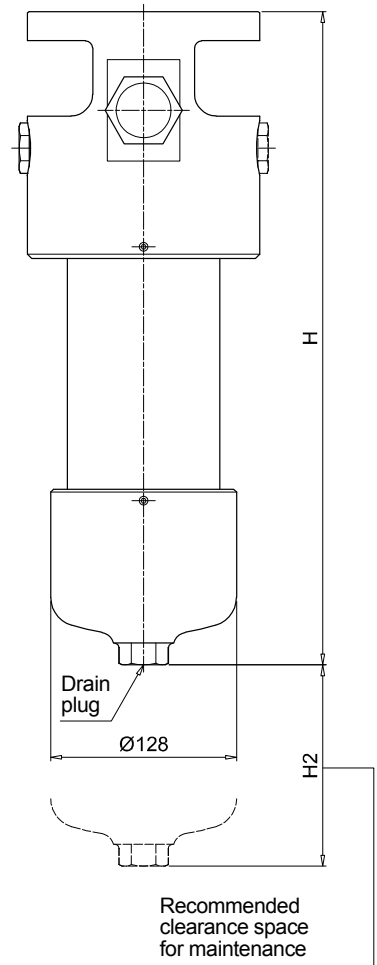
Filter length	H [mm]	H2 [mm]	
		Execution P01	Execution P02
1	293	150	-
2	416	150	-
3	548	150	-
4	702	150	550



Length 1 - 2 - 3



Length 4

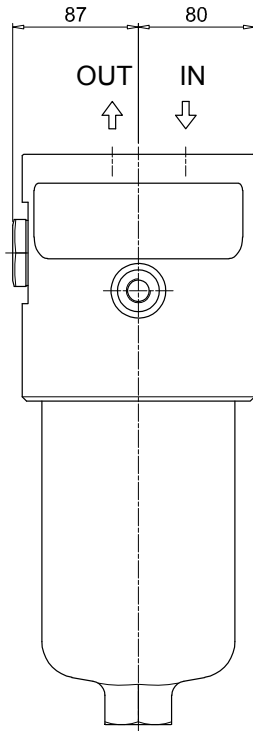


FHM FHM320 - FHM500

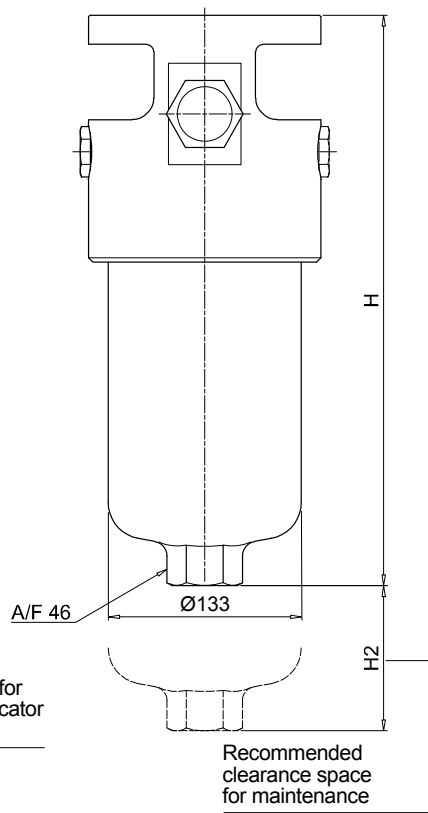
Dimensions

FHM500

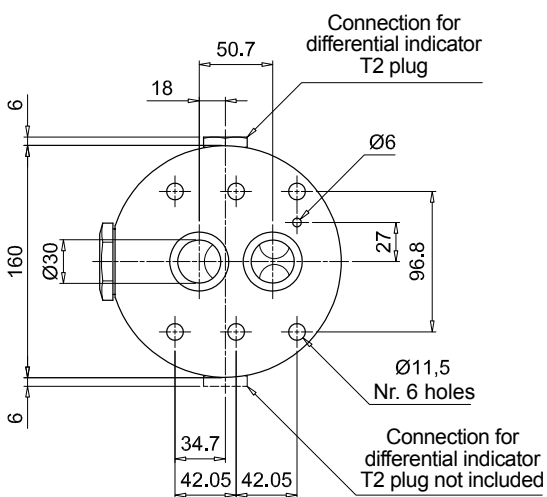
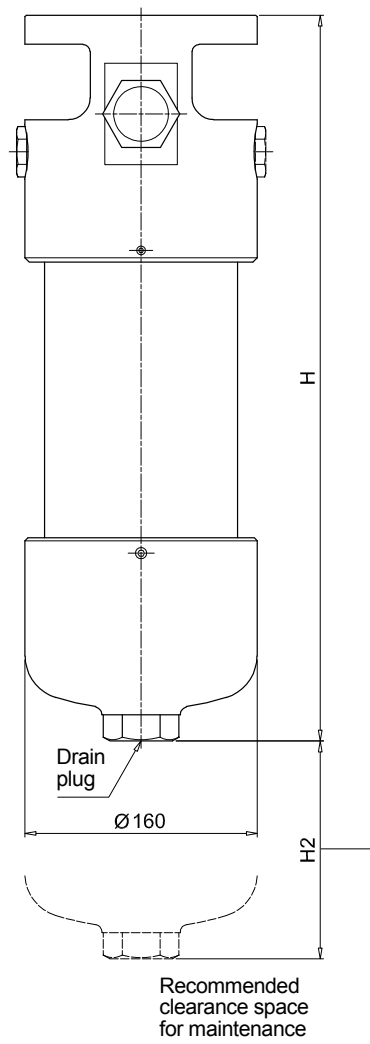
Filter length	H [mm]	H2 [mm]	
		Execution P01	Execution P02
1	355	150	-
2	445	150	-
3	521	150	-
4	679	150	480
5	845	150	650



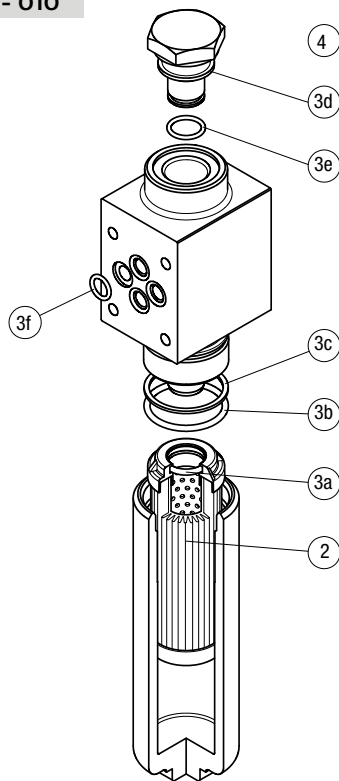
Length 1 - 2 - 3



Length 4 - 5

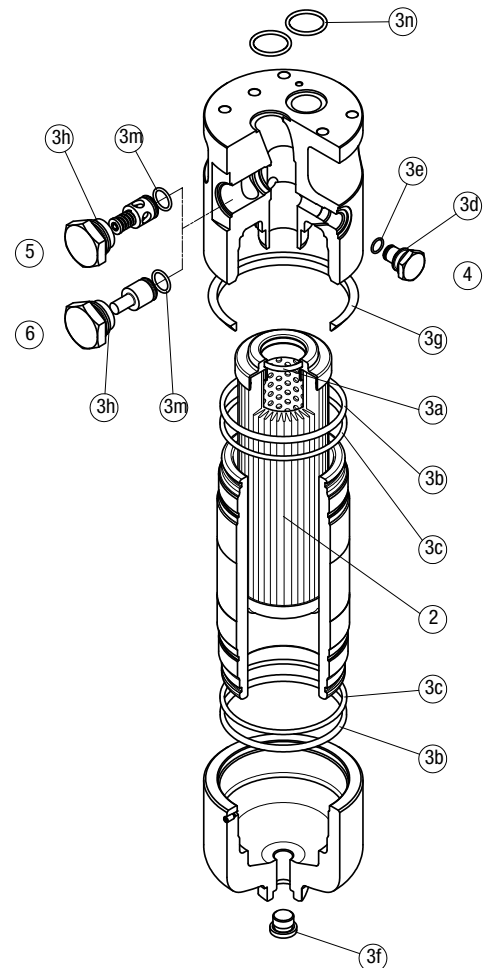


FHM 006 - 007 - 010



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug	
FHM 006	See order table	NBR	FPM	NBR	FPM
FHM 006	See order table	02050324	02050325		
FHM 007	See order table	02050600	02050601	T2H	T2V
FHM 010	See order table	02050320	02050321		

FHM 050 - 065 - 135 - 320 - 500



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 1 pc.		Q.ty: 1 pc.		Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug		Bypass assembly		Non-bypass assembly	
FHM 050	See order table	NBR	FPM	NBR	FPM	NBR	FPM	NBR	FPM
FHM 050	See order table	02050410	02050411			02001400	02001401	02001402	02001403
FHM 065	See order table	02050268	02050279			02001400	02001401	02001402	02001403
FHM 135	See order table	02050271	02050282	T2H	T2V	02001404	02001405	02001406	02001407
FHM 320	See order table	02050275	02050286			02001408	02001409	02001410	02001411
FHM 500	See order table	02050332	02050333			02001408	02001409	02001410	02001411

FHB series

Maximum working pressure up to 32 MPa (320 bar) - Flow rate up to 485 l/min



High Pressure filters

Manifold

Maximum working pressure up to 32 MPa (320 bar)

Flow rate up to 485 l/min

FHB is a range of high pressure filter for protection of sensitive components in high pressure hydraulic systems in the mobile machines. They are directly connected to the side of the manifold, through the proper flanged interface.

Available features:

- Manifold connections up to Ø30 mm, for a maximum flow rate of 485 l/min
- Fine filtration rating, to get a good cleanliness level into the system
- Bypass valve, to relieve excessive pressure drop across the filter media
- Check valve, to protect the system against reverse flow
- Low collapse filter element "N", for use with filters provided with bypass valve
- High collapse filter element "H", for use with filters not provided with bypass valve
- High collapse filter element with external support "S", for filter element protection against the back pressure caused by the check valve in filters not provided with the bypass valve
- Visual, electrical and electronic differential clogging indicators

Common applications:

Delivery lines, in any high pressure industrial equipment or mobile machines

Filter housing materials

- Head: Phosphatized cast iron
- Housing: Phosphatized steel
- Bypass valve: Steel
- Check valve: Steel

Pressure

- Working pressure: 32 MPa (320 bar)
- Test pressure: 48 MPa (480 bar)
- Burst pressure: 96 MPa (960 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 32 MPa (320 bar)

Bypass valve

- Opening pressure 600 kPa (6 bar) ±10%
- Other opening pressures on request.

Δp element type

- Microfibre filter elements - series N: 20 bar
- Microfibre filter elements - series H: 210 bar (not available for FHB050)
- Microfibre filter elements - series S: 210 bar (only for FHB050)
- Wire mesh filter elements - series N: 20 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

Connections

Manifold mounting

Note

FHB filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]					Volumes [dm ³]						
	Length	1	2	3	4	5	Length	1	2	3	4	5
FHB 050		2.61	2.98	3.39	3.86	5.04		0.21	0.30	0.40	0.52	0.81
FHB 065		3.33	3.69	4.90	-	-		0.20	0.27	0.49	-	-
FHB 135		6.61	8.21	9.21	-	-		0.40	0.73	0.94	-	-
FHB 320		12.95	15.08	17.37	26.77	-		0.91	1.63	2.40	3.59	-

Filter series	Length	Filter element design - N Series						Filter element design - S Series				
		A03	A06	A10	A16	A25	M25	A03	A06	A10	A16	A25
FHB 050	1	43	42	79	81	101	131	30	40	58	60	74
	2	53	58	84	93	112	132	46	50	76	86	108
	3	67	70	94	101	119	133	59	62	87	95	115
	4	82	87	106	108	122	134	74	80	101	103	119
	5	102	104	119	122	127	136	90	92	105	113	126

Filter series	Length	Filter element design - N Series						Filter element design - H Series				
		A03	A06	A10	A16	A25	M25	A03	A06	A10	A16	A25
FHB 065	1	25	33	55	62	87	133	23	25	49	58	81
	2	33	51	70	76	101	134	33	38	66	75	94
	3	60	71	97	103	118	138	60	68	95	102	116
FHB 135	1	67	72	120	129	177	212	49	55	97	100	160
	2	109	116	152	154	224	250	90	110	137	140	182
	3	153	155	201	205	226	253	126	142	175	187	207
FHB 320	1	130	143	238	286	343	442	110	117	192	201	304
	2	259	281	391	409	454	468	200	230	319	325	392
	3	332	368	441	455	463	476	269	312	381	389	432
	4	368	390	446	462	481	488	311	334	388	394	437

Maximum flow rate for a complete pressure filter with a pressure drop $\Delta p = 1.5$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure.

Please, contact our Sales Department for further additional information.

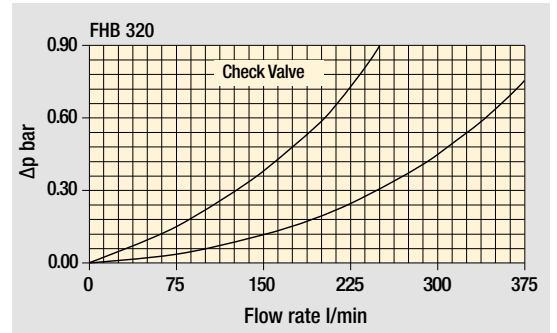
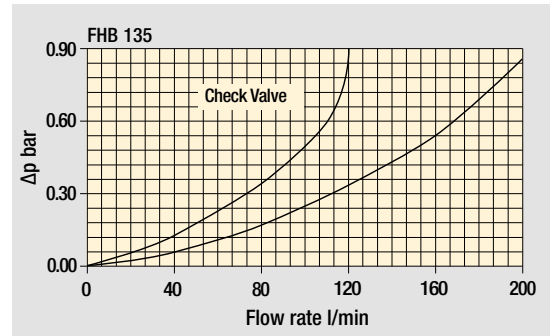
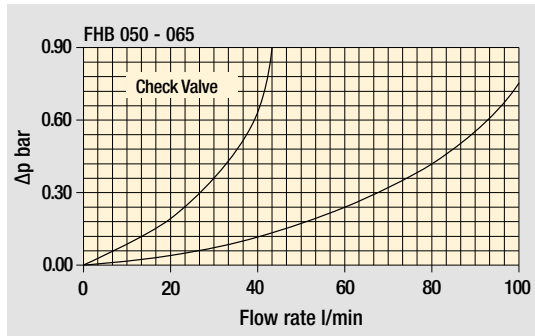
Hydraulic symbols

Filter series	Style S	Style B	Style T	Style D
FHB 050	•	•	•	•
FHB 065	•	•	•	•
FHB 135	•	•	•	•
FHB 320				

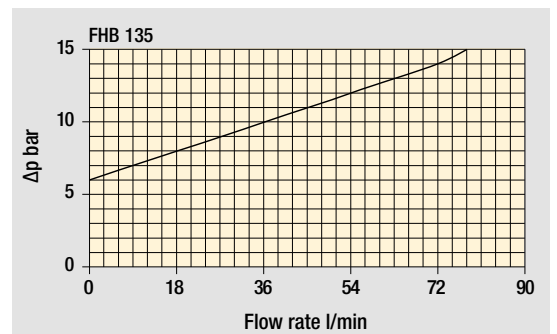
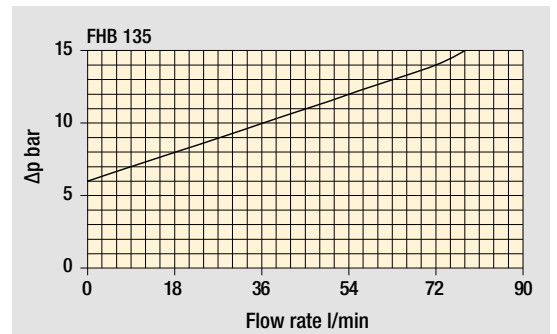
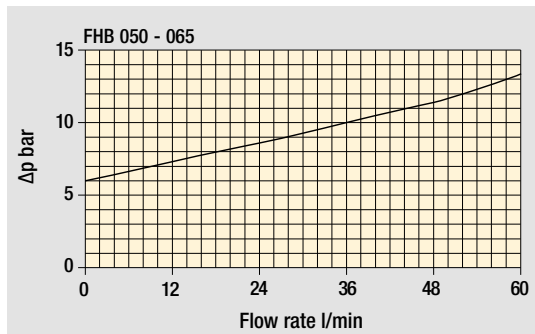
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Pressure drop

Filter housings Δp pressure drop

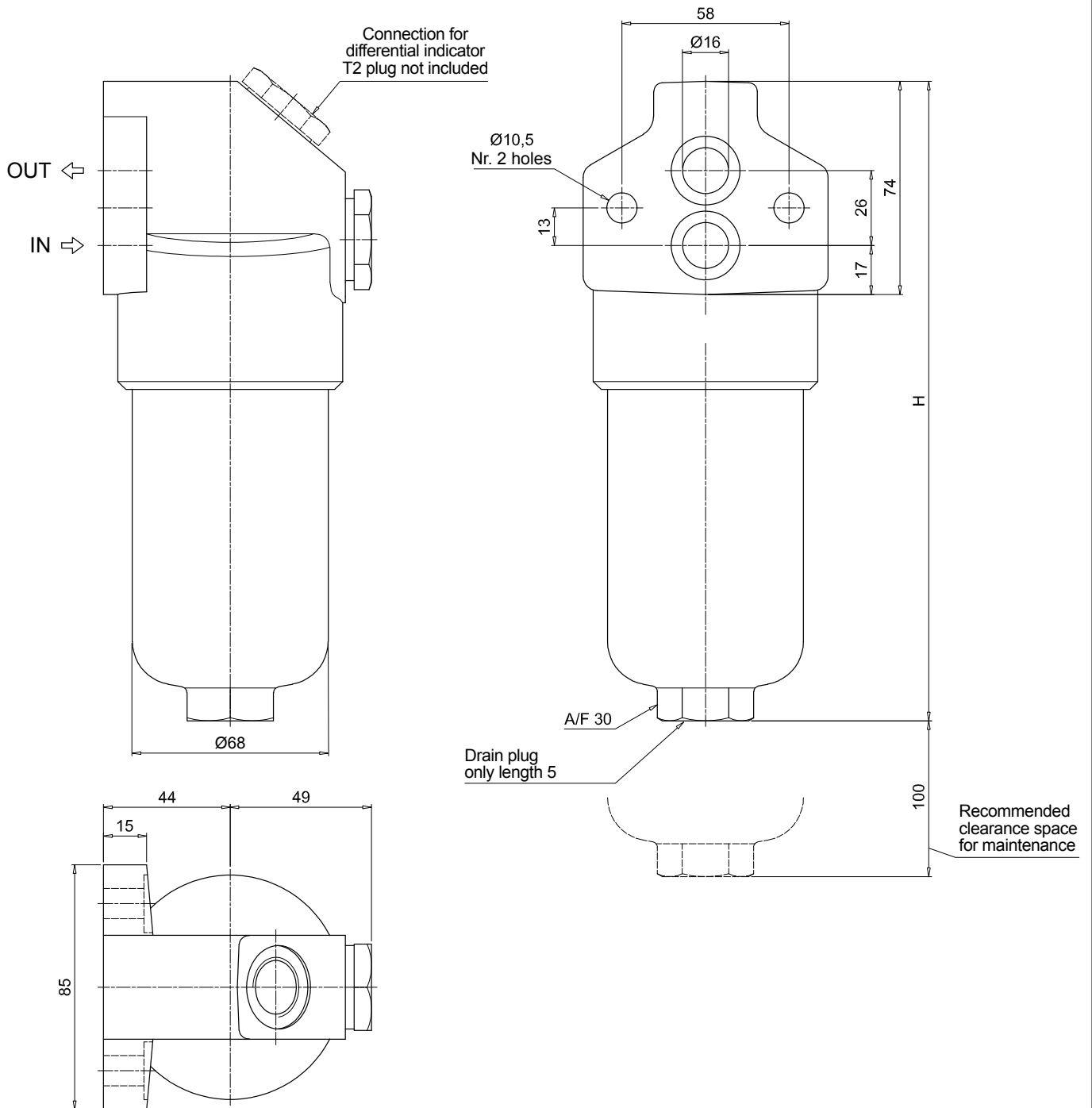


Bypass valve pressure drop



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.

FHB050	
Filter length	H [mm]
1	185
2	222
3	264
4	312
5	434



FHB FHB065 - FHB135 - FHB320

Designation & Ordering code

COMPLETE FILTER

Series and size Configuration example: **FHB320** | **4** | **S** | **A** | **F1** | **A06** | **H** | **P01**

FHB065 | **FHB135** | **FHB320**

Length	FHB065	FHB135	FHB320
1	•	•	•
2	•	•	•
3	•	•	•
4			•

Valves

S	Without bypass
B	With bypass 6 bar
T	With check valve, without bypass
D	With check valve, with bypass 6 bar

Seals

A	NBR
V	FPM

Connections

F1	Manifold
-----------	----------

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	S	B	T	D
N 20 bar		•		•
H 210 bar	•		•	

Execution	1	2	3	4
P01 MP Filtri standard	•	•	•	•
P02 Maintenance from the bottom of the housing				•
Pxx Customized				

FILTER ELEMENT

Element series and size Configuration example: **HP320** | **4** | **A06** | **A** | **H** | **P01**

HP065 | **HP135** | **HP320**

Element length	HP065	HP135	HP320
1	•	•	•
2	•	•	•
3	•	•	•
4			•

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
H 210 bar

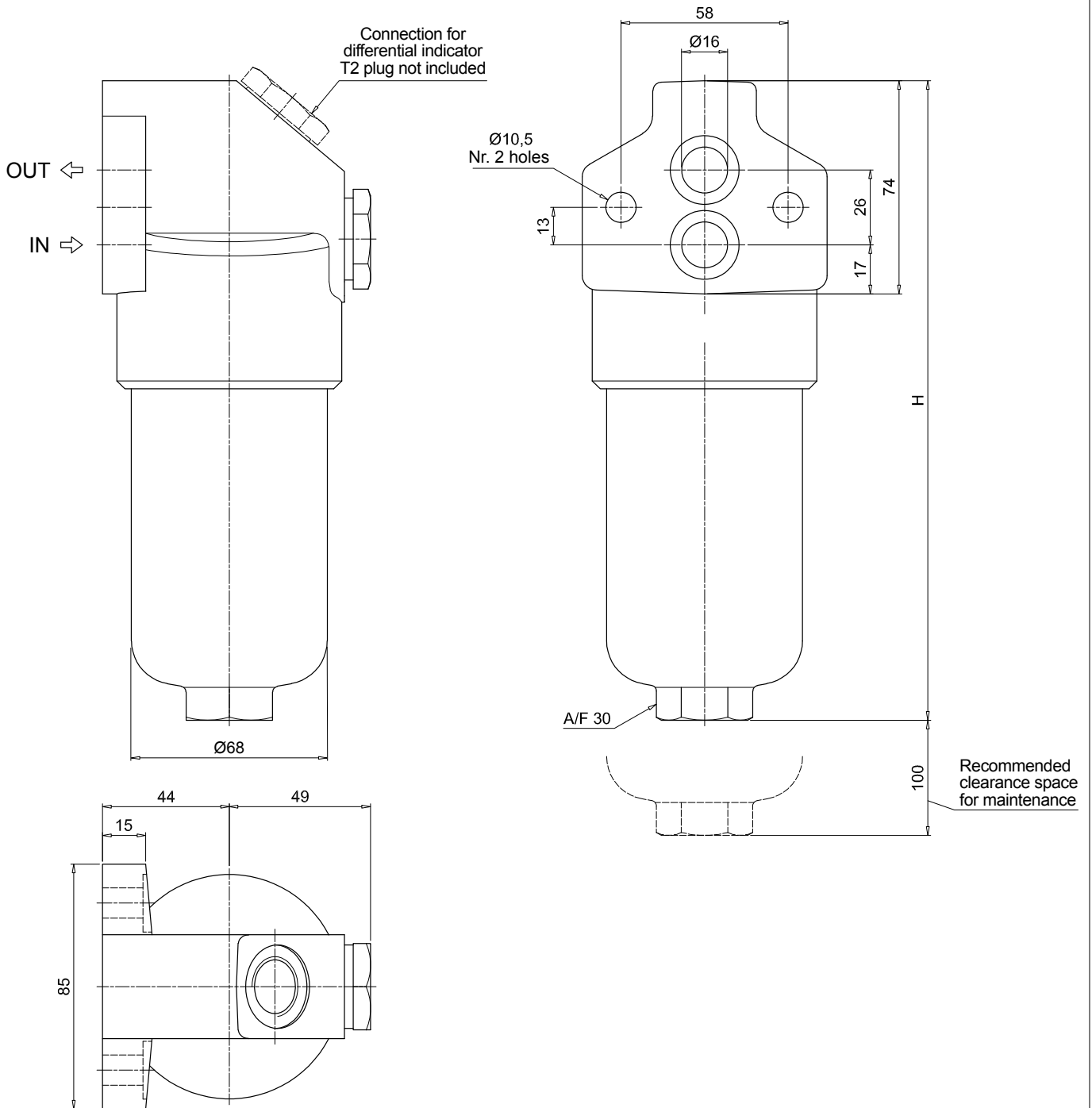
Execution
P01 MP Filtri standard
Pxx Customized

ACCESSORIES

Differential indicators	page	Differential indicators	page
DEA Electrical differential indicator	577	DLE Electrical / visual differential indicator	580
DEH Hazardous area electronic differential indicator	577-578	DTA Electronic differential indicator	581
DEM Electrical differential indicator	578-579	DVA Visual differential indicator	581
DLA Electrical / visual differential indicator	579-580	DVM Visual differential indicator	581

Additional features	page
T2 Plug	582

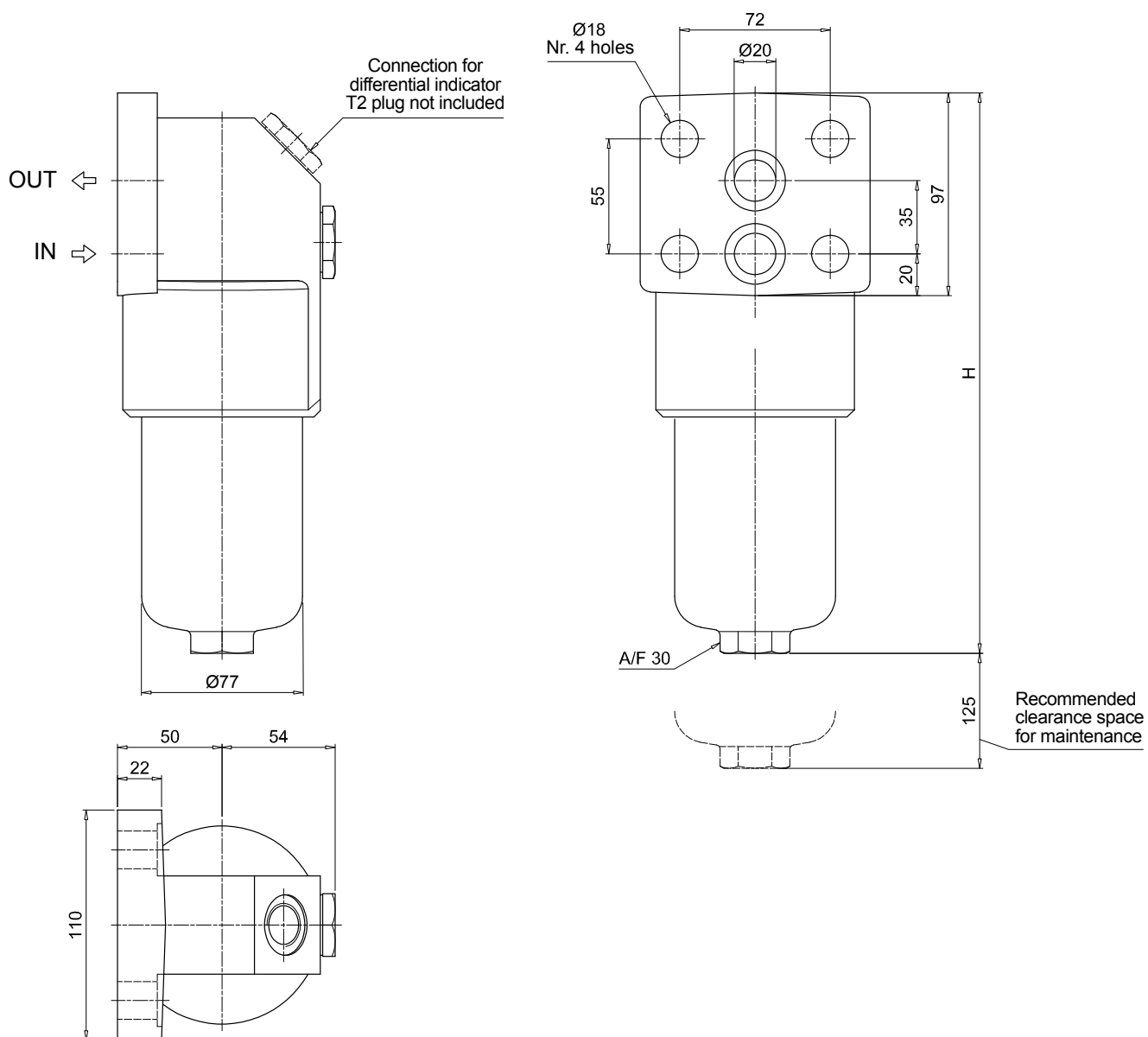
FHB065	
Filter length	H [mm]
1	194
2	225
3	327



Dimensions

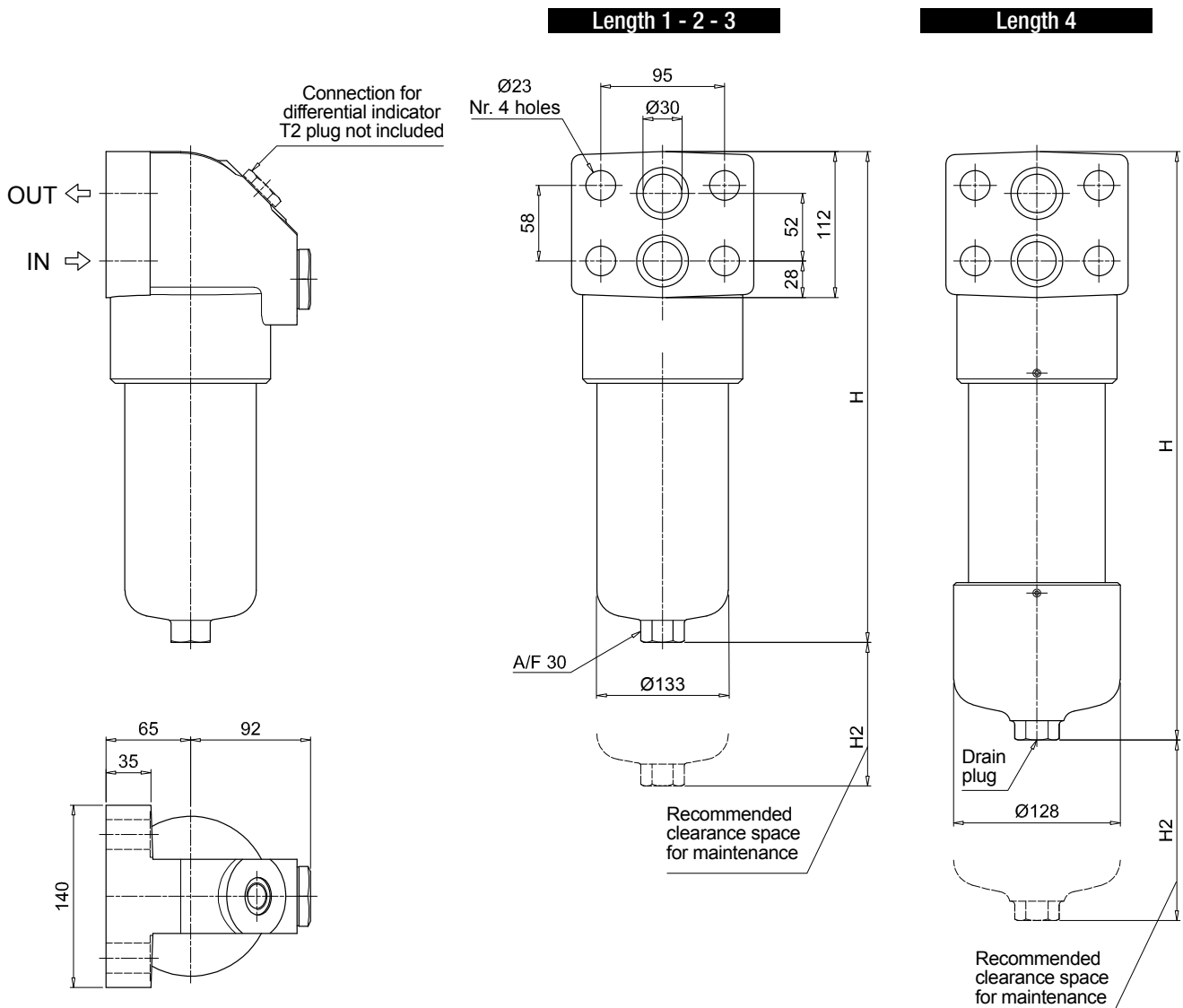
FHB135

Filter length	H [mm]
1	268
2	381
3	456



FHB320

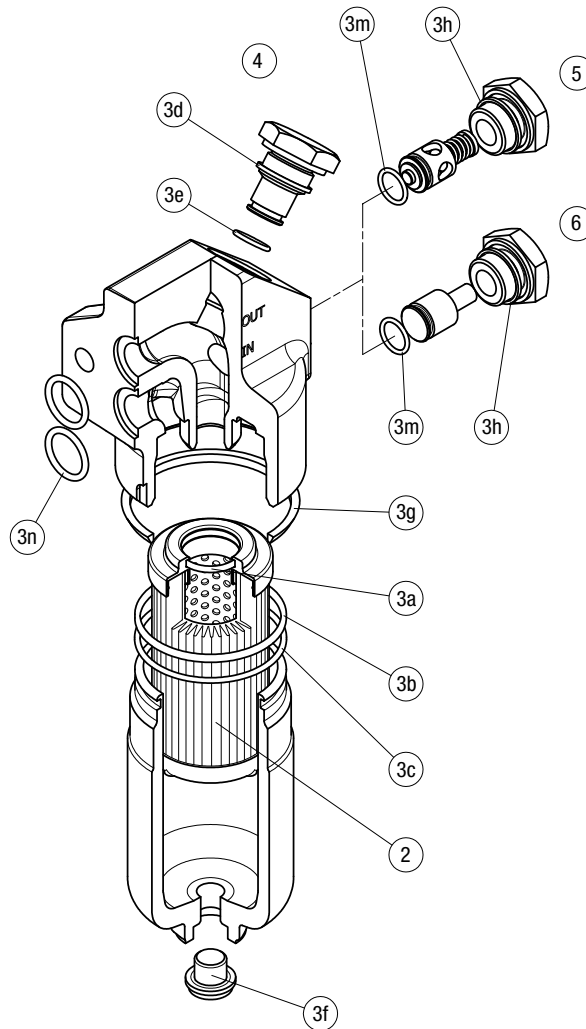
Filter length	H [mm]	H2 [mm]	
		Execution P01	Execution P02
1	301	150	-
2	424	150	-
3	556	150	-
4	709	150	550



FHB SPARE PARTS

Order number for spare parts

FHB 050 - 065 - 135 - 320



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 1 pc.		Q.ty: 1 pc.		Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug		Bypass assembly		Non-bypass assembly	
		NBR	FPM	NBR	FPM	NBR	FPM	NBR	FPM
FHB 050	See order table	02050412	02050413	T2H	T2V	02001312	02001385	02001314	02001386
FHB 065		02050266	02050277			02001312	02001385	02001314	02001386
FHB 135		02050270	02050281			02001312	02001385	02001314	02001386
FHB 320		02050273	02050284			02001381	02001382	02001383	02001384

FHF 325 series

Maximum working pressure up to 35 MPa (350 bar) - Flow rate up to 550 l/min

Filter housing according to SAE J2066 for HF4 filter elements



FHF 325 GENERAL INFORMATION

Filter housing according to SAE J2066 for HF4 filter elements

Description

High Pressure filters

Manifold

Maximum working pressure up to 35 MPa (350 bar)

Flow rate up to 550 l/min

FHF is a range of high pressure filter for protection of sensitive components in high pressure hydraulic systems in the mobile machines. They are directly connected to the lines of the system through the hydraulic fittings or the proper flanged interface.

Available features:

- 1 1/2" female threaded connections, 1 1/2" flanged connections and manifold connections up to 1 1/2", for a maximum flow rate of 550 l/min
- Base-mounting design, for ease of the replacement of the filter element
- Filter element designed in accordance with SAE J2066 HF4 regulation
- Fine filtration rating, to get a good cleanliness level into the system
- Bypass valve, to relieve excessive pressure drop across the filter media
- Low collapse filter element "N", for use with filters provided with bypass valve
- Visual, electrical and electronic differential clogging indicators

Common applications:

Delivery lines, in any high pressure industrial equipment

Technical data

Filter housing materials

- Head: Phosphatized cast iron
- Housing: Phosphatized steel
- Cover: Cast iron (chemical heat treatment)
- Bypass valve: Brass - Steel

Pressure

- Working pressure: 35 MPa (350 bar)
- Test pressure: 52.5 MPa (525 bar)
- Burst pressure: 105 MPa (1050 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 35 MPa (350 bar)

Bypass valve

- Opening pressure 600 kPa (6 bar) $\pm 10\%$
- Other opening pressures on request.

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

Seals

- Standard NBR series A
- Optional FPM series V

Temperature

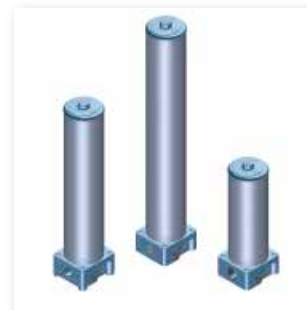
From -25 °C to +110 °C

Connections

- FHF 325: In-line threaded connection
- FHF 325: In-line flanged connection
- FHF 325: Manifold mounting

Note

FHF filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]				Volumes [dm ³]			
	Length	1	2	3	Length	1	2	3
FHF 325		23.90	32.68	41.47		3.50	5.80	8.11

GENERAL INFORMATION FHF 325

Filter housing according to SAE J2066 for HF4 filter elements

FILTER ASSEMBLY SIZING
Flow rates [l/min]

Filter series	Length	Filter element design - N Series					
		A03	A06	A10	A16	A25	M25
FHF 325	1	302	339	348	419	500	556
	2	401	424	434	457	505	557
	3	416	451	460	469	510	559

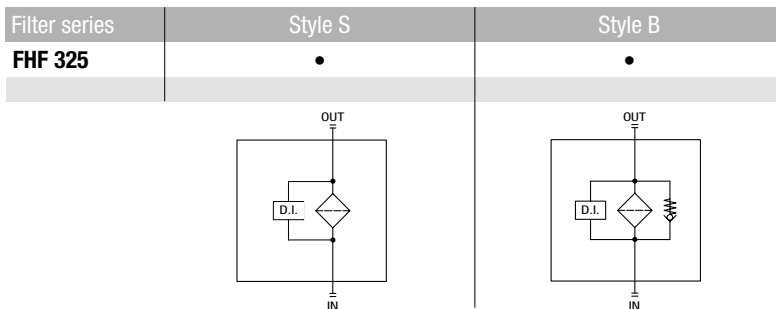
Maximum flow rate for a complete pressure filter with a pressure drop $\Delta p = 1.5$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

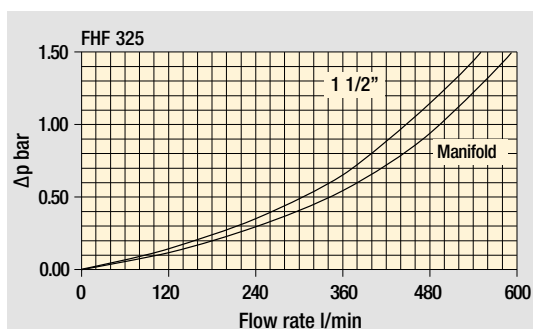
For different pressure drop or fluid viscosity we recommend to use our selection software available on www.mpfiltri.com.

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols



Pressure drop 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.

FHF 325

Designation & Ordering code

COMPLETE FILTER

Series and size	Configuration example: FHF325 2 S A H 7 A10 N P01									
FHF325										
Length	1 2 3									
Valves										
S Without bypass										
B With bypass 6 bar										
Seals										
A NBR										
V FPM										
Connections										
A G 1 1/2"										
B 1 1/2" NPT										
C SAE 24 - 1 7/8" - 12 UN										
G 1 1/2" SAE 6000 psi/M										
H 1 1/2" SAE 6000 psi/UNC										
M Manifold ø1.38"										
N Manifold ø1.50"										
Connection for differential indicator										
7 With two connections plugged on both sides										
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		Execution						
		N 20 bar		P01 MP Filtri standard						
				Pxx Customized						

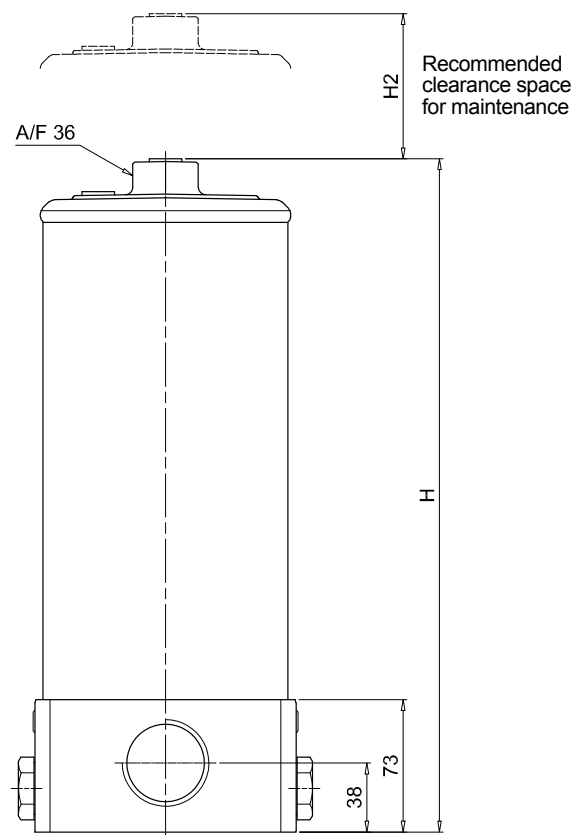
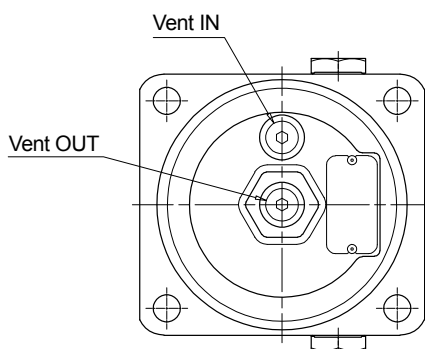
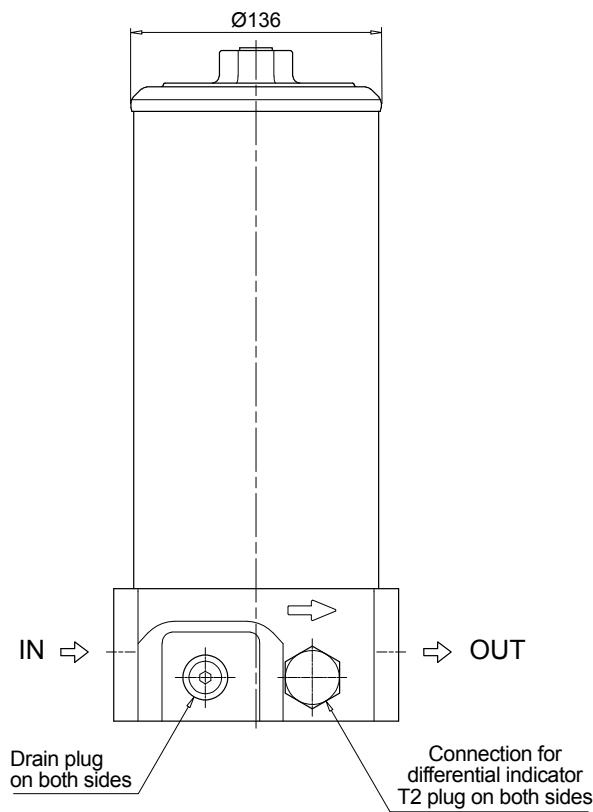
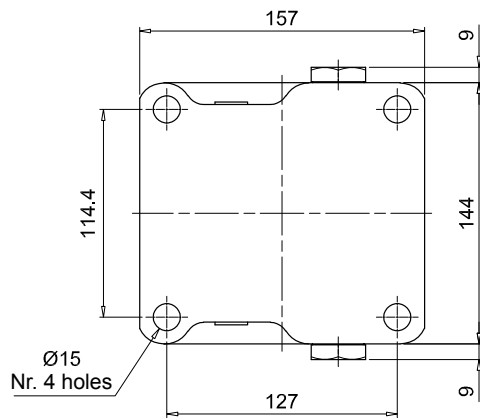
FILTER ELEMENT

Element series and size	Configuration example: HF325 2 A10 A N P01						
HF325							
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		Element Δp		Execution	
		A NBR		N 20 bar		P01 MP Filtri standard	
		V FPM				Pxx Customized	

ACCESSORIES

Differential indicators		page			page
DEA	Electrical differential indicator	577	DLE	Electrical / visual differential indicator	580
DEH	Hazardous area electronic differential indicator	577-578	DTA	Electronic differential indicator	581
DEM	Electrical differential indicator	578-579	DVA	Visual differential indicator	581
DLA	Electrical / visual differential indicator	579-580	DVM	Visual differential indicator	581
Additional features		page			
T2	Plug	582			

FHF325		
Connection A - B - C		
Filter length	H [mm]	H2 [mm]
1	452	250
2	690	485
3	928	725



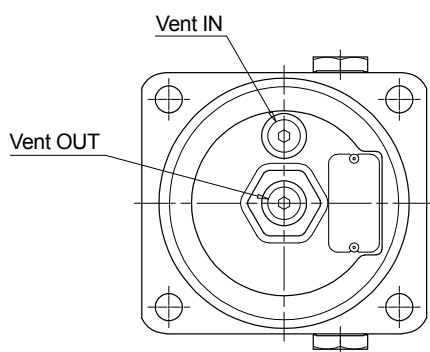
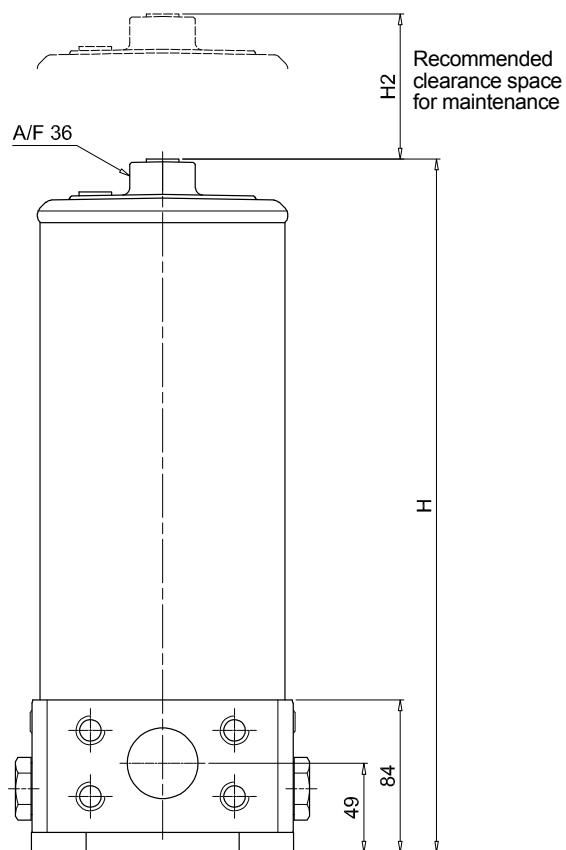
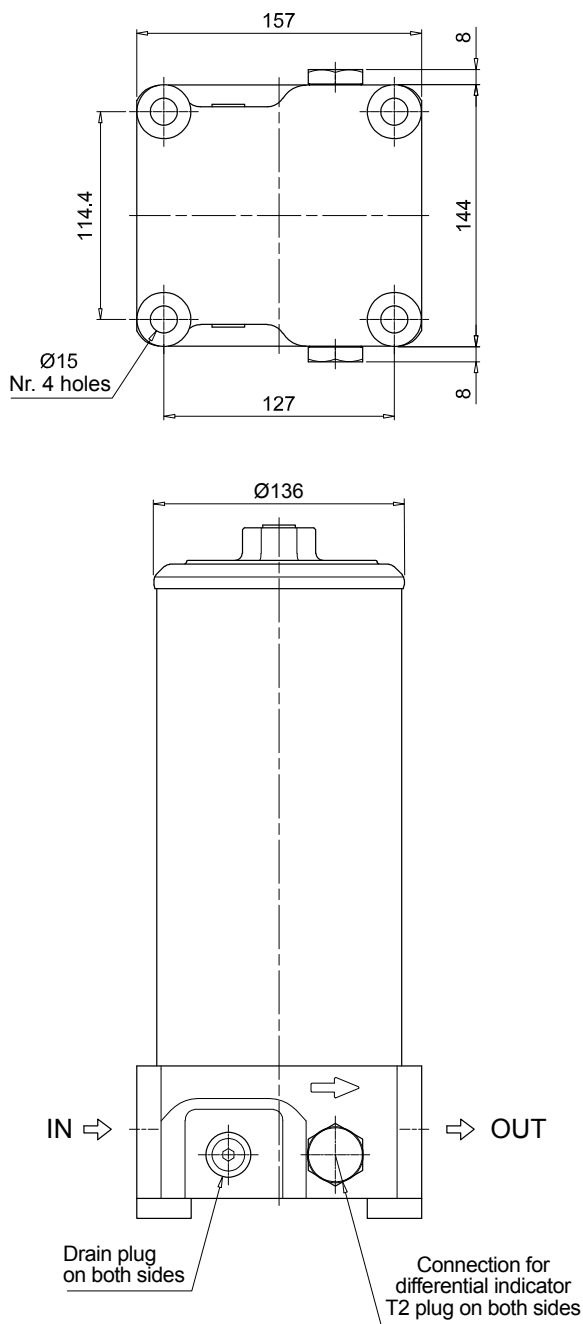
FHF 325

Dimensions

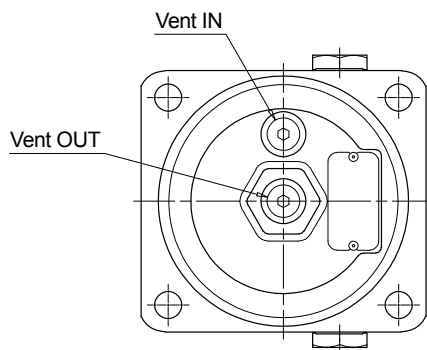
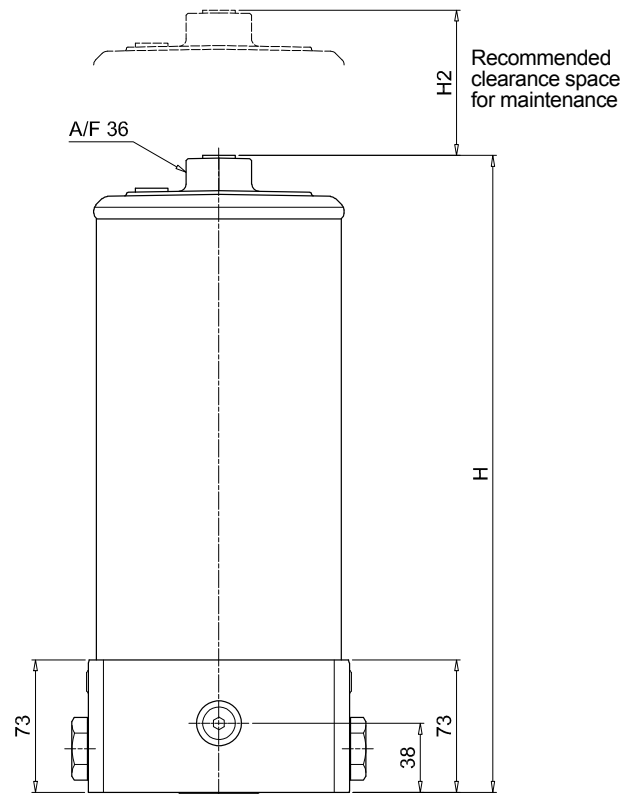
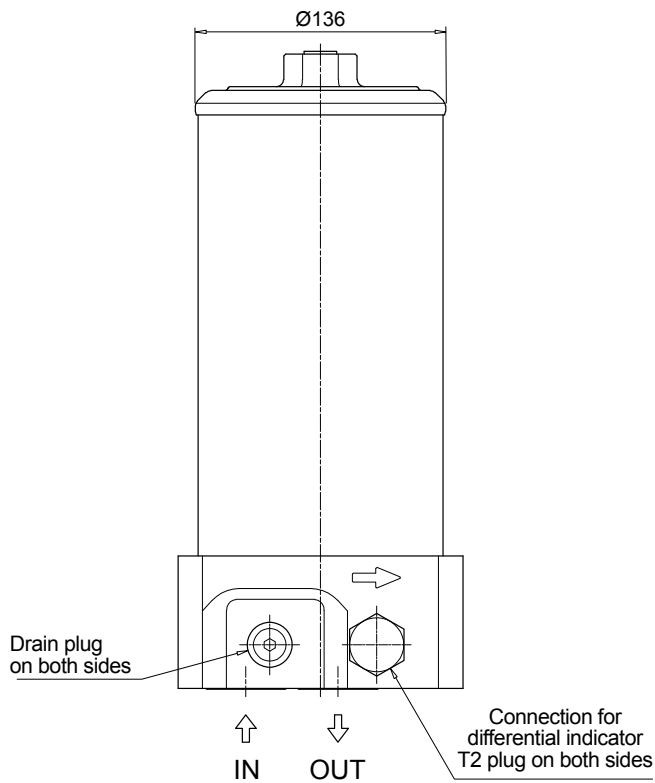
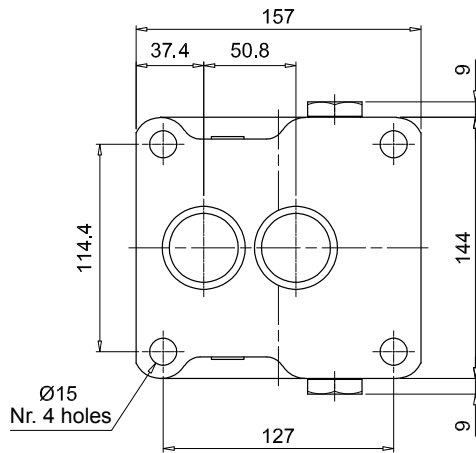
FHF325

Connection G - H

Filter length	H [mm]	H2 [mm]
1	463	250
2	701	485
3	939	725



FHF325		
Connection M - N		
Filter length	H [mm]	H2 [mm]
1	452	250
2	690	485
3	928	725



FHF 325 SPARE PARTS

Filter housing according to SAE J2066 for HF4 filter elements

Order number for spare parts

FHF 325
Connections
A - B - C - G - H

Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 2 pc.		
Filter series	Filter element	Seal Kit code number	Indicator connection plug		
		NBR	FPM	NBR	FPM
FHF 325 A-B-C-G-H	See order table	02050588	02050589	T2H	T2V

FHF 325
Connections
M - N

Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 2 pc.		
Filter series	Filter element	Seal Kit code number	Indicator connection plug		
		NBR	FPM	NBR	FPM
FHF 325 M-N	See order table	02050590	02050591	T2H	T2V

FHD series

Maximum working pressure up to 35 MPa (350 bar) - Flow rate up to 250 l/min



High Pressure filters

Duplex

Maximum working pressure up to 35 MPa (350 bar)

Flow rate up to 250 l/min

FHD is a range of high pressure duplex filter with integrated changeover function to allow the filter element replacement without the system shut-down.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Female threaded connections up to 1 1/4" and flanged connections up to 1 1/2", for a maximum flow rate of 345 l/min
- Fine filtration rating, to get a good cleanliness level into the system
- Balancing valve, available for FHD051, FHD326 and FHD333, to equalize the housing pressure before the switch.
- Bypass valve, to relieve excessive pressure drop across the filter media
- Vent ports, to avoid air trapped into the filter going into the system
- Drain ports, to remove the fluid from the housing prior the maintenance work
- Low collapse filter element "N", for use with filters provided with bypass valve
- High collapse filter element "H", for use with filters not provided with bypass valve
- Low collapse filter element with external support "R", for filter element protection against the back pressure caused by the check valve or the reverse flow in filters provided with the bypass valve
- High collapse filter element with external support "S", for filter element protection against the back pressure caused by the check valve or the reverse flow in filters not provided with the bypass valve
- Visual, electrical and electronic differential clogging indicators

Common applications:

- System where shut-down causes high costs
- System where shut-down causes safety issues

Filter housing materials

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

Pressure

- Test pressure: 52.5 MPa (525 bar)
- Burst pressure: 105 MPa (1050 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 35 MPa (350 bar)

Bypass valve

- Opening pressure 600 kPa (6 bar) ±10%
- Other opening pressures on request.

Δp element type

- Microfibre filter elements - series N: 20 bar
- Microfibre filter elements - series R: 20 bar (not available for FHD 021)
- Microfibre filter elements - series H: 210 bar (only for FHD 021)
- Microfibre filter elements - series S: 210 bar (not available for FHD 021)
- Wire mesh filter elements - series N: 20 bar
- Fluid flow through the filter element from OUT to IN

Seals

- Standard NBR series A
- Optional FPM series V

Temperature

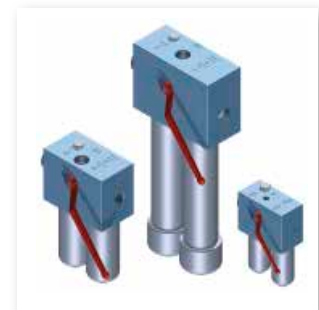
From -25 °C to +110 °C

Connections

In-line Inlet/Outlet 90°

Note

FHD filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]						Volumes [dm ³]					
	Length	1	2	3	4	5	Length	1	2	3	4	5
FHD 021	-	8.0	9.0	9.9	-	-	-	0.06	0.12	0.22	-	-
FHD 051	-	16.9	17.5	18.5	19.8	-	-	0.31	0.41	0.53	0.83	-
FHD 326	43.0	50.0	54.0	-	-	-	0.88	1.60	2.37	-	-	-
FHD 333	-	74.0	79.0	98.0	-	-	-	1.75	2.52	3.35	-	-

Filter series	Length	Filter element design - H Series					
		A03	A06	A10	A16	A25	M25
FHD 021	2	6	8	14	16	19	26
	3	10	12	18	20	22	27
	4	13	16	21	22	24	27

Filter series	Length	Filter element design - R Series						N Series	Filter element design - S Series				
		A03	A06	A10	A16	A25	M25		A03	A06	A10	A16	A25
FHD 051	2	39	41	51	54	59	64	35	37	48	51	58	
	3	45	46	54	56	61	65	41	43	52	54	60	
	4	50	52	58	58	62	65	47	49	56	56	61	
	5	56	57	61	62	63	65	53	53	57	59	63	
FHD 326	1	93	99	131	142	154	171	83	87	117	120	146	
	2	136	141	163	166	173	176	119	128	149	151	163	
	3	152	159	171	174	175	177	139	148	161	163	170	
FHD 333	2	175	184	224	230	245	249	147	162	199	201	225	
	3	204	217	241	245	247	252	179	196	221	224	238	
	4	216	224	242	247	253	255	196	204	223	225	239	

Maximum flow rate for a complete pressure filter with a pressure drop $\Delta p = 1.5$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

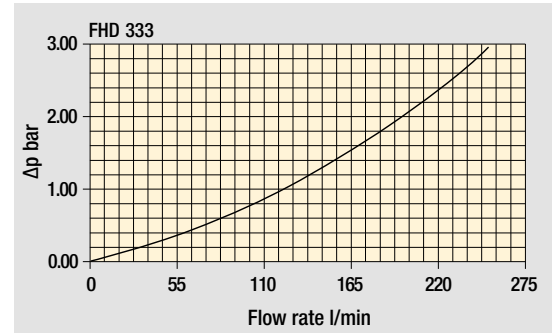
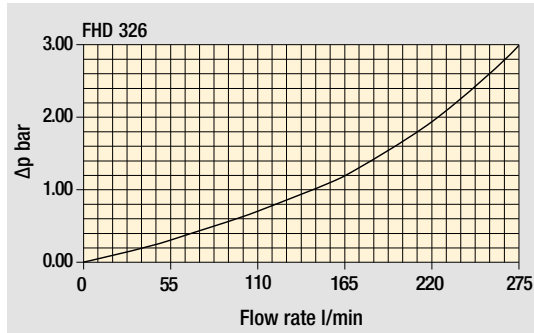
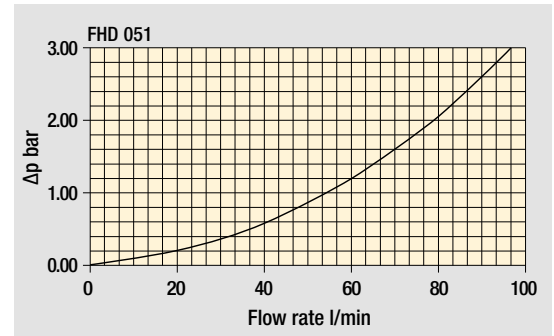
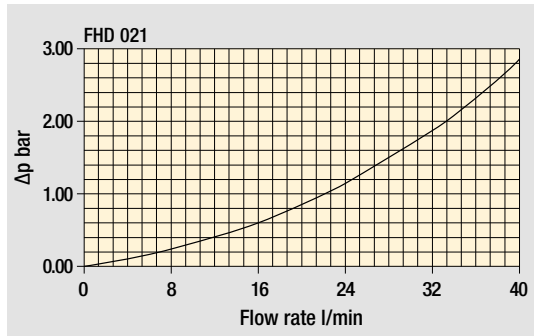
You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols

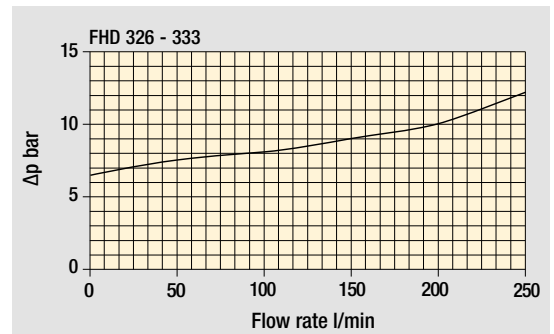
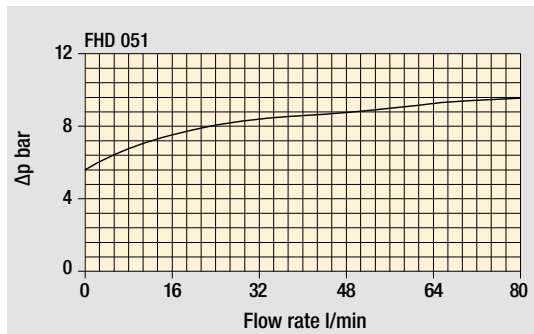
Filter series	Style S	Style B	Style B
FHD 021	•		
FHD 051	•	•	
FHD 326	•		•
FHD 333	•		•

Pressure drop

Filter housings Δp pressure drop



Bypass valve 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.

Designation & Ordering code

COMPLETE FILTER

Series and size FHD021	Configuration example: FHD021 4 S A G1 A06 H P01									
Length 2 3 4										
Valves S Without bypass										
Seals A NBR V FPM										
Connections G1 G 1/2" G2 1/2" NPT G3 SAE 8 - 3/4" - 16 UNF										
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	Filtration rating		Execution
	Axx	M25	
N 20 bar		•	P01 MP Filtri standard
H 210 bar	•		Pxx Customized

FILTER ELEMENT

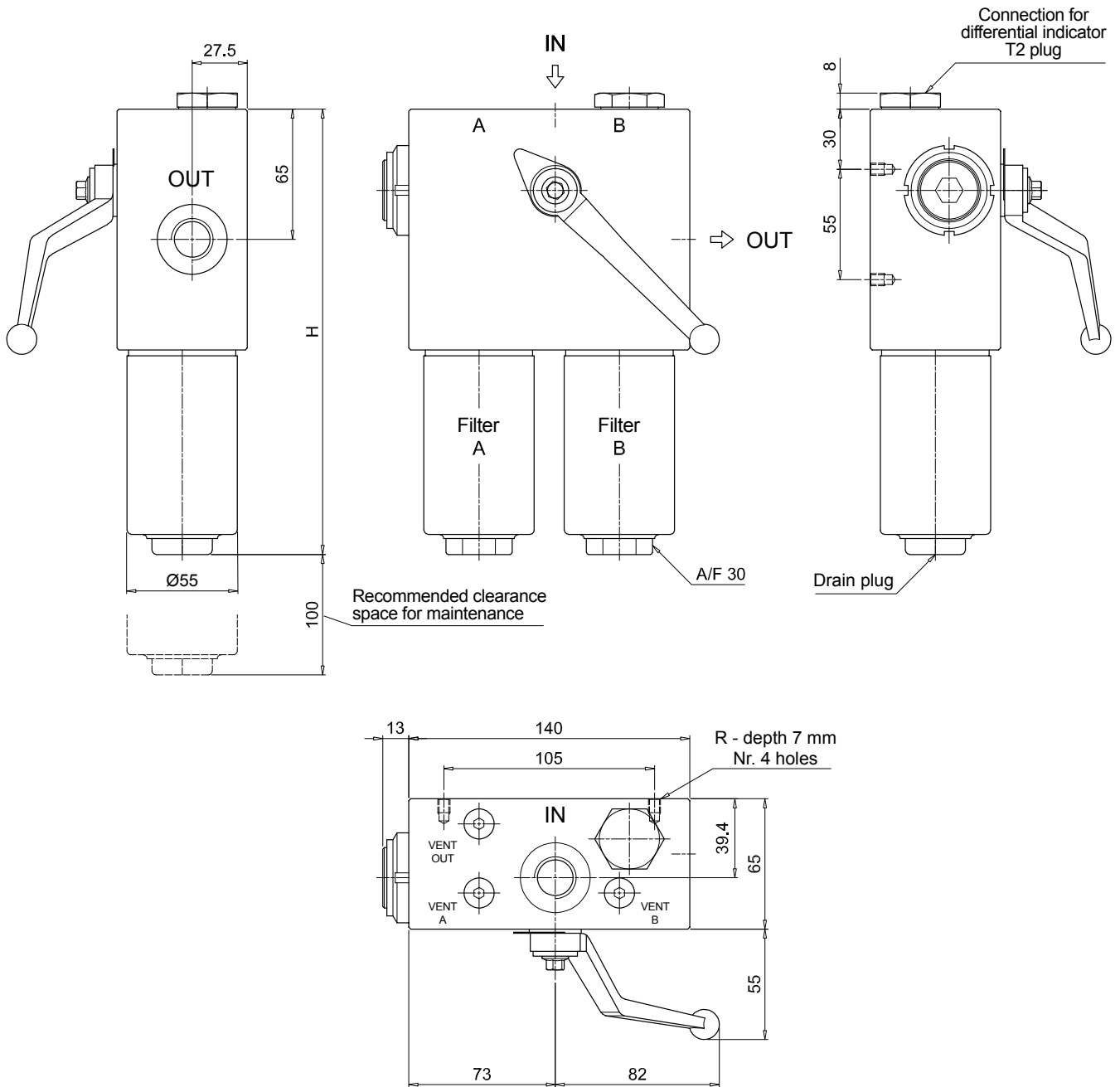
Element series and size HP011	Configuration example: HP011 4 A06 A H P01					
Element length 2 3 4						
Filtration rating (filter media)						
A03 Inorganic microfiber 3 µm	A16 Inorganic microfiber 16 µm					
A06 Inorganic microfiber 6 µm	A25 Inorganic microfiber 25 µm					
A10 Inorganic microfiber 10 µm	M25 Wire mesh 25 µm					

Seals	Element Δp	Filtration rating		Execution
		Axx	M25	
A NBR	N 20 bar		•	P01 MP Filtri standard
V FPM	H 210 bar	•	•	Pxx Customized

ACCESSORIES

Differential indicators	page		page
DEA Electrical differential indicator	577	DLE Electrical / visual differential indicator	580
DEH Hazardous area electronic differential indicator	577-578	DTA Electronic differential indicator	581
DEM Electrical differential indicator	578-579	DVA Visual differential indicator	581
DLA Electrical / visual differential indicator	579-580	DVM Visual differential indicator	581
Additional features			
T2 Plug	582		

FHDO21	
Filter length	H [mm]
2	172
3	222
4	272
Connections	R
G1	M6
G2 - G3	1/4" UNC



FHD FHD051 - FHD326 - FHD333

Designation & Ordering code

COMPLETE FILTER

Series and size Configuration example: **FHD326** **3** **S** **A** **G1** **M25** **N** **P01**

FHD051 | **FHD326** | **FHD333**

Length	FHD051	FHD326	FHD333
1		•	
2	•	•	•
3	•	•	•
4	•		•
5	•		

Valves

S Without bypass
B With bypass 6 bar

Seals

A NBR
V FPM

Connections	FHD051	FHD326	FHD333
G1	G 3/4"	G 1 1/4"	-
G2	3/4" NPT	-	-
G3	G 1/2"	1 1/4" NPT	-
G4	1/2" NPT	SAE 20 - 1 5/8" - 12 UN	-
G5	SAE 8 - 3/4" - 16 UNF	-	-
G6	SAE 12 - 1 1/16" - 12 UN	-	-
F1	-	-	1 1/2" SAE 6000 psi/M
F2	-	-	1 1/2" SAE 6000 psi/UNC

Filtration rating (filter media)

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

Element Δp	Filtration rating		Execution
	Axx	M25	
N 20 bar		•	P01 MP Filtri standard
R 20 bar	•	•	Pxx Customized
S 210 bar	•	•	

FILTER ELEMENT

Element series and size Configuration example: **HP320** **3** **M25** **A** **N** **P01**

HP050 | **HP320**

Element length	HP050	HP320
1		•
2	•	•
3	•	•
4	•	•
5	•	

Element length	HP050	HP320
1		•
2	•	•
3	•	•
4	•	•
5	•	

Filtration rating (filter media)

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

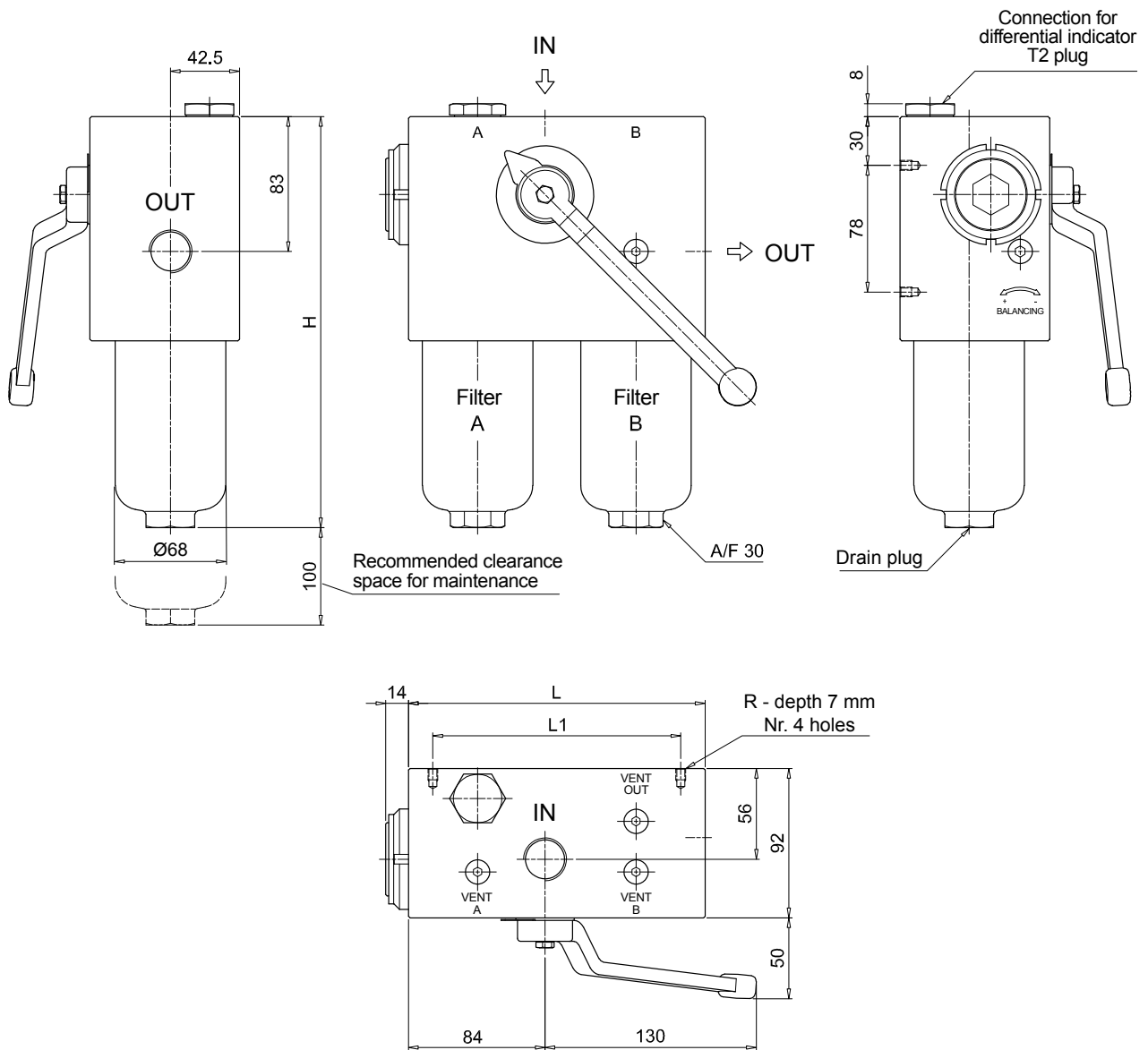
Element Δp	Filtration rating		Execution
	Axx	M25	
N 20 bar		•	P01 MP Filtri standard
R 20 bar	•	•	Pxx Customized
S 210 bar	•	•	

ACCESSORIES

Differential indicators	page		page
DEA Electrical differential indicator	577	DLE Electrical / visual differential indicator	580
DEH Hazardous area electronic differential indicator	577-578	DTA Electronic differential indicator	581
DEM Electrical differential indicator	578-579	DVA Visual differential indicator	581
DLA Electrical / visual differential indicator	579-580	DVM Visual differential indicator	581

Additional features	page
T2 Plug	582

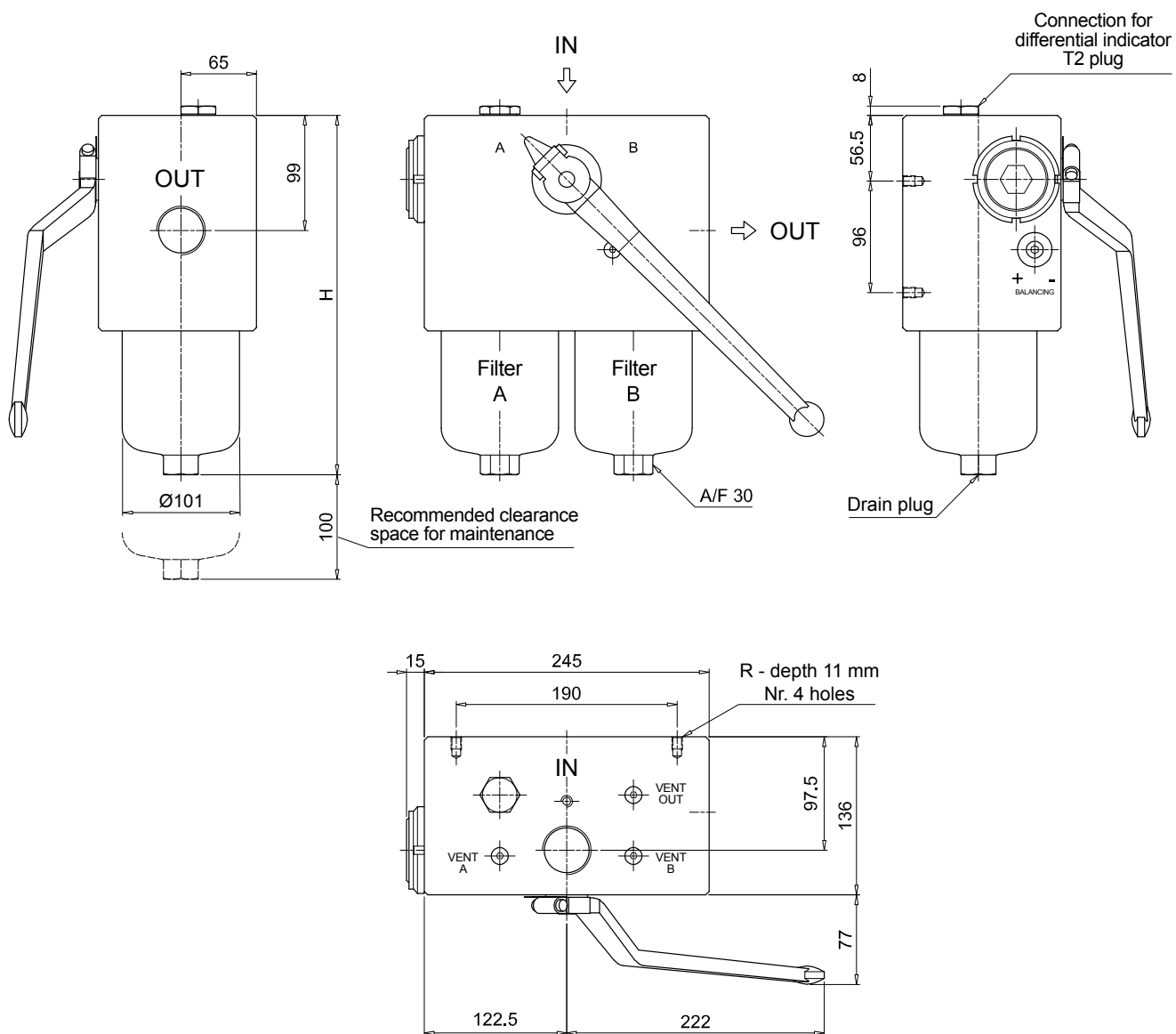
FHD051		
Filter length	H [mm]	
2	253	
3	295	
4	343	
5	465	
Connections	R	
G1	M6	
G2	1/4" UNC	
G3	M6	
G4-G5-G6	1/4" UNC	
Valves	L [mm]	L1 [mm]
S	168	138
B	182.5	152.5



FHD FHD051 - FHD326 - FHD333

Dimensions

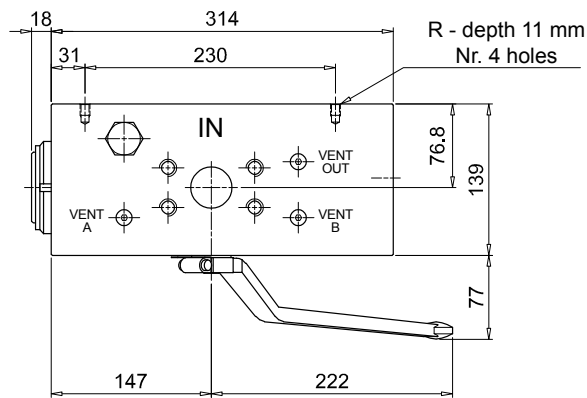
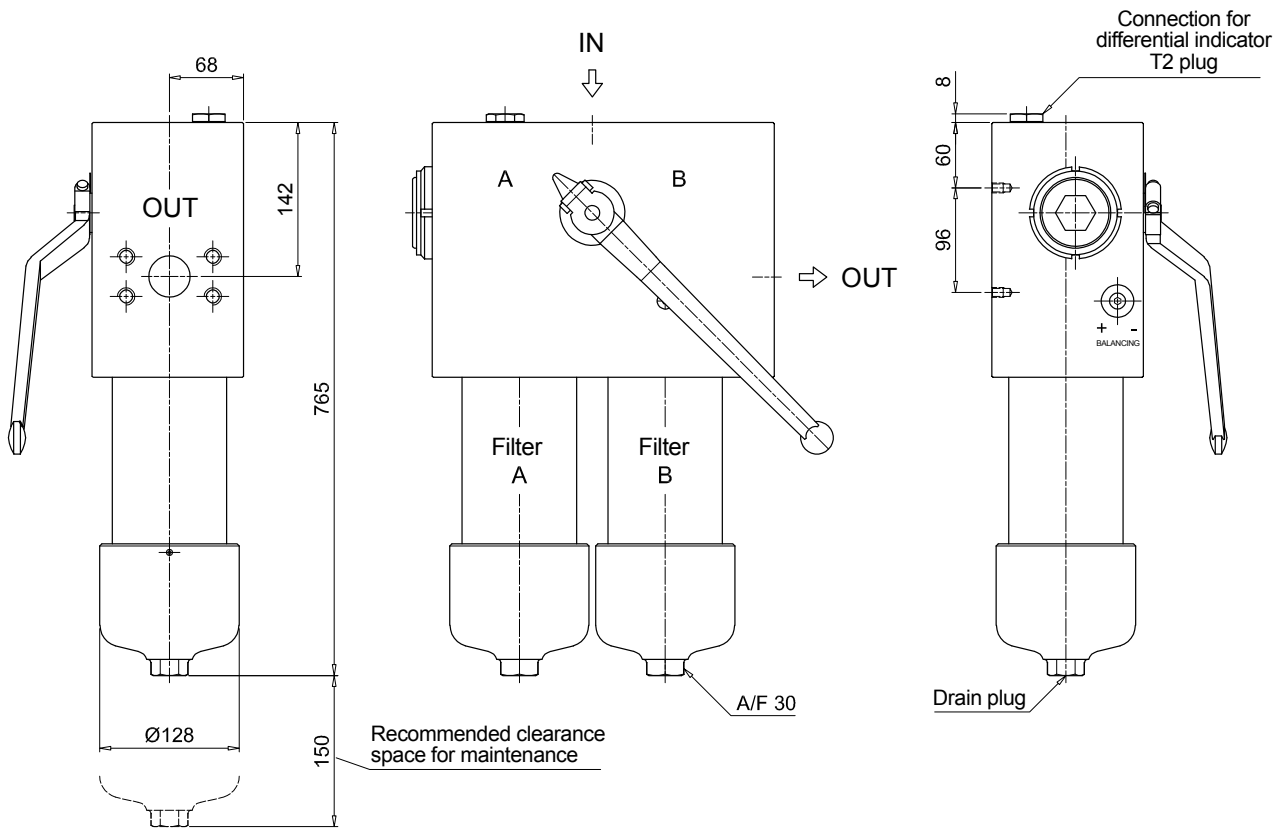
FHD326	
Filter length	H [mm]
1	309
2	432
3	564
Connections	R
G1	M10
G2 - G3	3/8" UNC



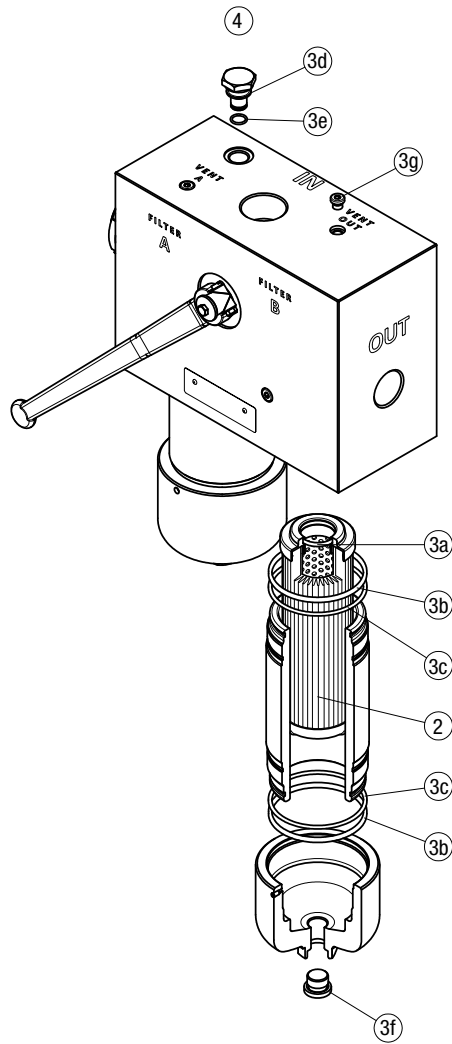
FHD FHD051 - FHD326 - FHD333

Dimensions

FHD333	
Length 4	
Connections	R
F1	M10
F2	3/8" UNC



FHD 021 - 051 - 326 - 333



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug	
FHD 021	See order table	NBR	FPM	NBR	FPM
FHD 051	See order table	02050511	02050512	T2H	T2V
FHD 326-333	See order table	02050420	02050421		
		02050377	02050378		

HPB series

BOWL KIT

Maximum working pressure up to 42 MPa (420 bar) - Flow rate up to 300 l/min



Description

Technical data

High Pressure Bowl Kit

Maximum working pressure up to 42 MPa (420 bar)
Flow rate up to 300 l/min

HPB is a range of high pressure bowl kits for protection of sensitive components in high pressure hydraulic systems in the mobile machines. They are directly integrated in the control blocks.

Available features:

- Fine filtration rating, to get a good cleanliness level into the system
- Low collapse filter element "N", for use with blocks provided with bypass valve
- High collapse filter element with external support "S", for use with blocks not provided with the bypass valve

Filter housing materials

- Housing: Phosphatized steel

Pressure

- 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 / Wire mesh filter elements - series N: 20 bar
- Microfibre / Wire mesh filter elements - series S: 210 bar
- Fluid flow through the filter element from OUT to IN

Seals

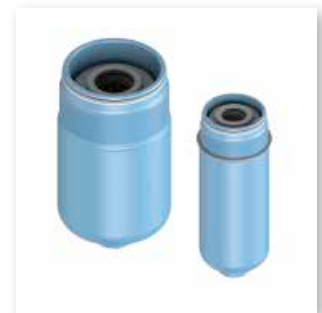
- Standard NBR series A
- Optional FPM series V

Temperature

From -25 °C to +110 °C

Note

HPB filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]					Volumes [dm ³]						
	Length	1	2	3	4	5	Length	1	2	3	4	5
HPB 050		1.10	1.50	1.90	2.40	3.50		0.30	0.45	0.60	0.80	1.20
HPB 150		2.90	4.90	6.30	-	-		0.45	0.85	1.10	-	-

FILTER ASSEMBLY SIZING Flow rates [l/min]

Filter series	Length	Filter element design - N Series						Filter element design - S Series				
		A03	A06	A10	A16	A25	M25	A03	A06	A10	A16	A25
HPB 050	1	42	43	79	82	106	147	29	39	57	59	74
	2	52	57	85	96	121	149	45	49	76	88	114
	3	66	69	97	106	130	150	58	61	89	99	125
	4	83	89	113	115	134	152	74	80	106	108	129
	5	107	110	130	134	141	154	93	95	111	121	139
HPB 150	1	81	88	156	163	179	295					
	2	142	145	227	230	236	312					
	3	170	180	242	245	263	315					

Maximum flow rate for a complete pressure filter with a pressure drop $\Delta p = 1.5$ bar.

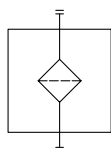
The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Filter series	Style S
HPB 050	•
HPB 150	•

Hydraulic symbols



Designation & Ordering code

COMPLETE FILTER

Series and size **HPB050** Configuration example: **HPB050** **3** **A** **A10** **N** **P01**

Length **1** | **2** | **3** | **4** | **5** |

Seals **A** NBR
V FPM

Filtration rating (filter media)		
A03	Inorganic microfiber	3 µm
A06	Inorganic microfiber	6 µm
A10	Inorganic microfiber	10 µm
A16	Inorganic microfiber	16 µm
A25	Inorganic microfiber	25 µm
M25	Wire mesh	25 µm

Element Δp	
N	20 bar
S	210 bar

Execution	
P01	MP Filtri standard
Pxx	Customized

FILTER ELEMENT

Element series and size **HP050** Configuration example: **HP050** **3** **A10** **A** **N** **P01**

Element length **1** | **2** | **3** | **4** | **5** |

Seals **A** NBR
V FPM

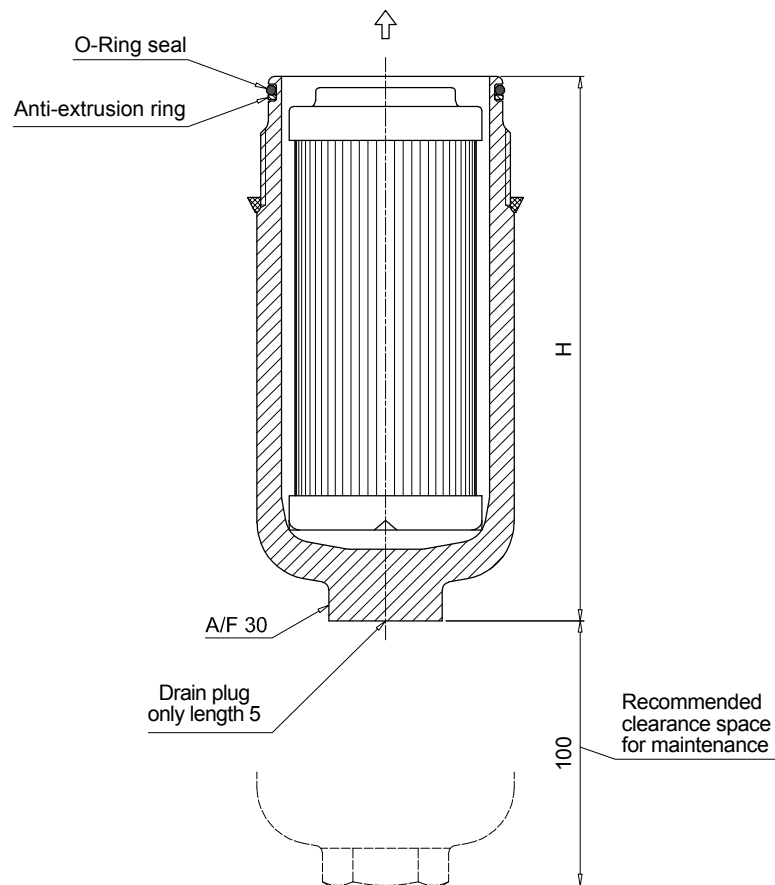
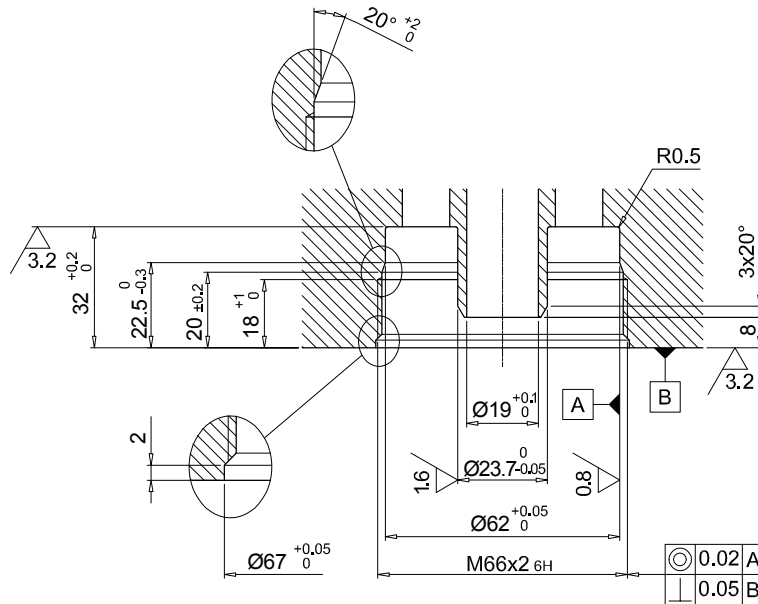
Filtration rating (filter media)		
A03	Inorganic microfiber	3 µm
A06	Inorganic microfiber	6 µm
A10	Inorganic microfiber	10 µm
A16	Inorganic microfiber	16 µm
A25	Inorganic microfiber	25 µm
M25	Wire mesh	25 µm

Seals	
A	NBR
V	FPM

Element Δp	
N	20 bar
S	210 bar

Execution	
P01	MP Filtri standard
Pxx	Customized

HPB050	
Filter length	H [mm]
1	107
2	144
3	186
4	234
5	356



Designation & Ordering code

COMPLETE FILTER

Series and size **HPB150** Configuration example: **HPB150** | **3** | **A** | **A10** | **N** | **P01**

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

Seals **A** NBR
V FPM

Filtration rating (filter media)		
A03	Inorganic microfiber	3 µm
A06	Inorganic microfiber	6 µm
A10	Inorganic microfiber	10 µm
A16	Inorganic microfiber	16 µm
A25	Inorganic microfiber	25 µm
M25	Wire mesh	25 µm

Element Δp	
N	20 bar

Execution	
P01	MP Filtri standard
Pxx	Customized

FILTER ELEMENT

Element series and size **HP150** Configuration example: **HP150** | **3** | **A10** | **A** | **N** | **P01**

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

Seals **A** NBR
V FPM

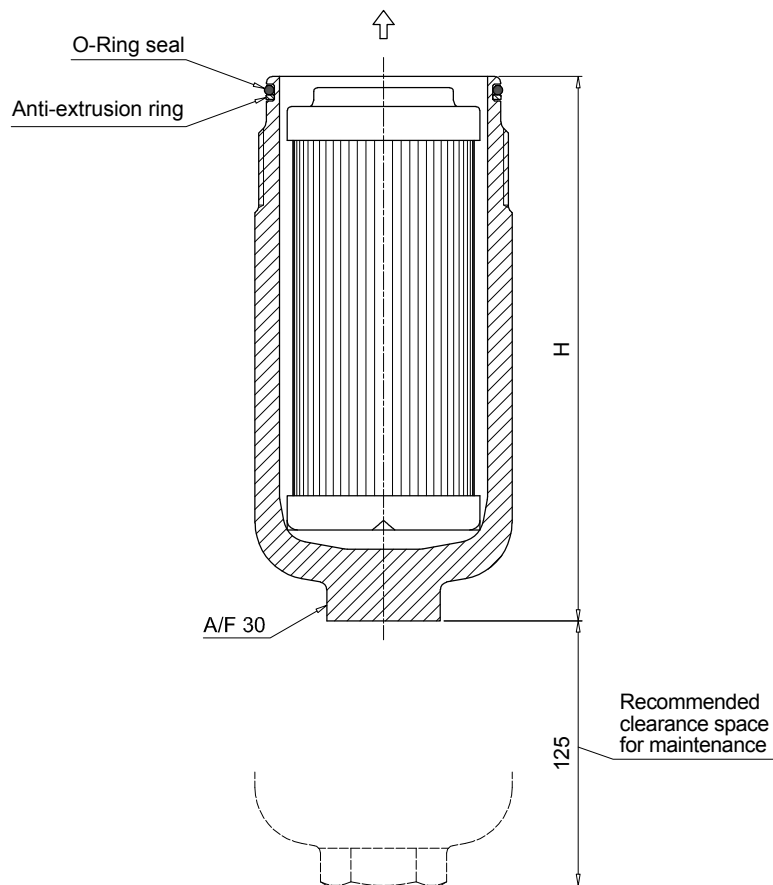
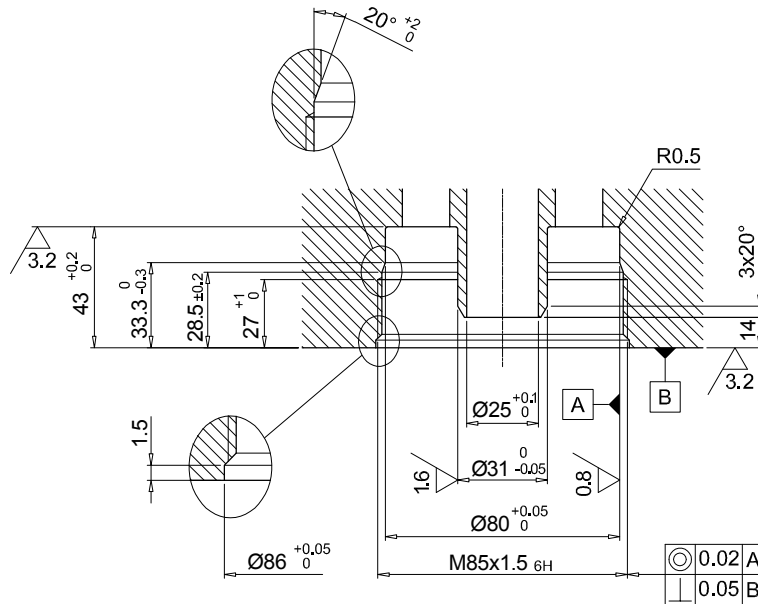
Filtration rating (filter media)		
A03	Inorganic microfiber	3 µm
A06	Inorganic microfiber	6 µm
A10	Inorganic microfiber	10 µm
A16	Inorganic microfiber	16 µm
A25	Inorganic microfiber	25 µm
M25	Wire mesh	25 µm

Seals	
A	NBR
V	FPM

Element Δp	
N	20 bar

Execution	
P01	MP Filtri standard
Pxx	Customized

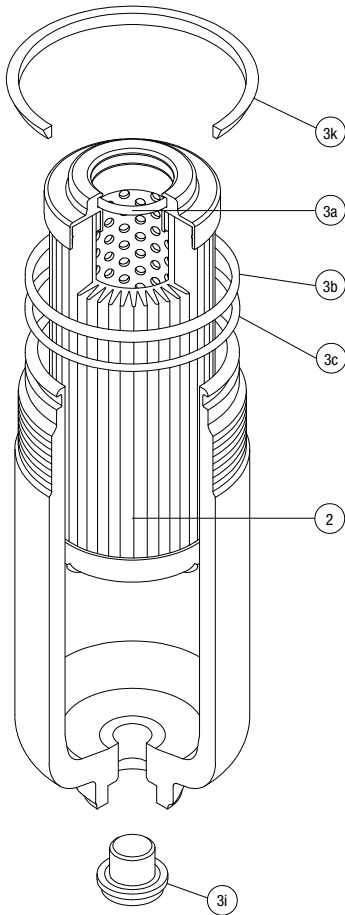
HPB150	
Filter length	H [mm]
1	161
2	271
3	346



HPB SPARE PARTS

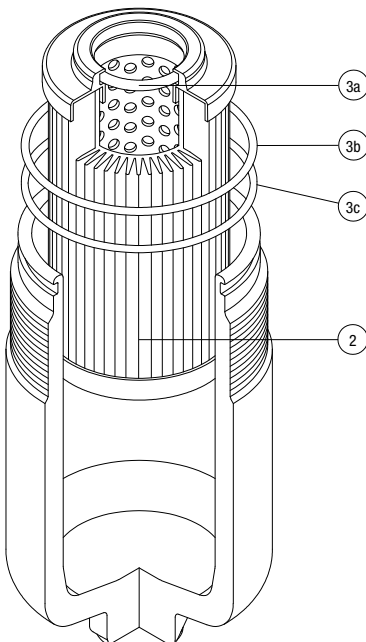
Order number for spare parts

HPB 050



Item:	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3 (3a ÷ 3i)
Filter series	Filter element	Seal Kit code number
		NBR FPM
HPB 050	See order table	02050813 02050823

HPB 150



Item:	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3 (3a ÷ 3c)
Filter series	Filter element	Seal Kit code number
		NBR FPM
HPB 150	See order table	02050816 02050826

Clogging indicators

Differential indicators

Introduction

Filter elements are efficient only if their Dirt Holding Capacity is fully exploited. This is achieved by using filter housings equipped with clogging indicators.

These devices trip when the clogging of the filter element causes an increase in pressure drop across the filter element.

The indicator is set to alarm before the element becomes fully clogged.

MP Filtri can supply indicators of the following designs:

- Vacuum switches and gauges
- Pressure switches and gauges
- Differential pressure indicators

These type of devices can be provided with a visual, electrical or both signals.

The electronic model (only available for differential type indicators) with warning signals (75% of clogging) and alarm (clogging).

Suitable indicator types

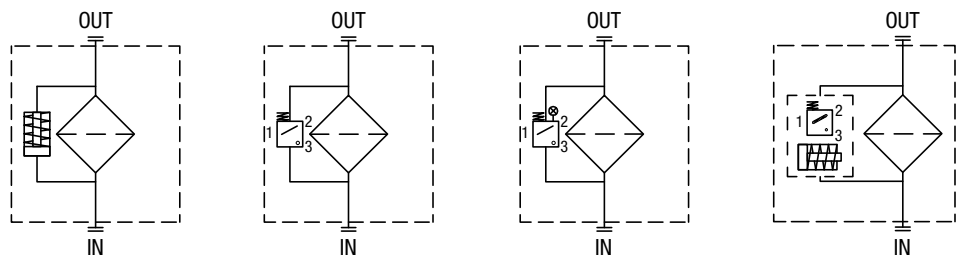
DIFFERENTIAL INDICATORS

Differential indicators are used on the Pressure line to check the efficiency of the filter element.

They measure the pressure upstream and downstream of the filter element (differential pressure).

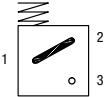
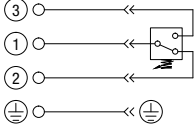
Standard items are produced with special connection G 1/2" size.

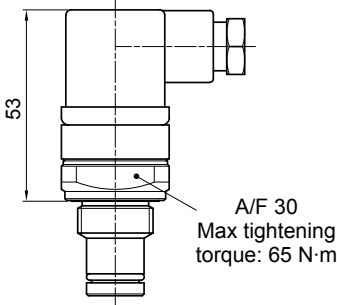
Also available in Stainless Steel models.


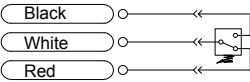
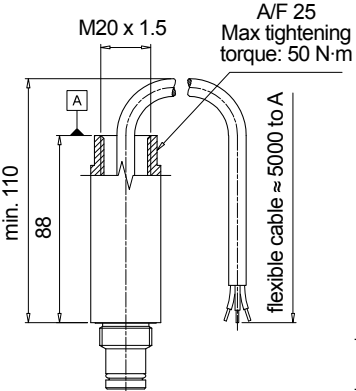



Quick reference guide


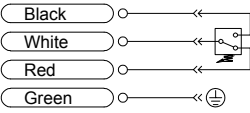
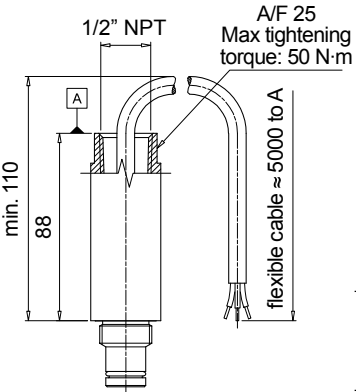
Filter series	Visual indicator	Electrical indicator	Electrical / Visual indicator	Electronic indicator	Hazardous area electronic indicator NEW
With bypass valve FMP 039 - 065 - 135 - 320 FHP 010 - 011 - 065 - 135 - 350 - 500 FMM 050 - 150 FHA 051 FHM 006 - 007 - 010 - 050 - 065 - 135 - 320 - 500 FHB 050 - 135 - 320 FHF 325 FHD 021 - 051 - 326 - 333	DVA50xP01 DVM50xP01	DEA50xA50P01 DEM50xAxxP01	DLA50xA51P01 DLA50xA52P01 DLA50xA71P01 DLE50xA50P01 DLE50xF50P01	DTA50xF70P01	DEH50xA48P01 DEH50xA49P01 DEH50xA70P01 DEH70xA48P01 DEH70xA49P01 DEH70xA70P01
Without bypass valve FMP 039 - 065 - 135 - 320 FHP 010 - 011 - 065 - 135 - 350 - 500 FMM 050 - 150 FHA 051 FHM 006 - 007 - 010 - 050 - 065 - 135 - 320 - 500 FHB 050 - 135 - 320 FHF 325 FHD 021 - 051 - 326 - 333	DVA70xP01 DVM70xP01	DEA70xA50P01 DEM70xAxxP01	DLA70xA51P01 DLA70xA52P01 DLA70xA71P01 DLE70xA50P01 DLE70xF50P01	DTA70xF70P01	DEH50xA48P01 DEH50xA49P01 DEH50xA70P01 DEH70xA48P01 DEH70xA49P01 DEH70xA70P01


DEA*50		Hydraulic symbol 	Materials - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR - FPM
Electrical Differential Indicator			
Settings	Ordering code	Electrical symbol 	Technical data - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP66 according to EN 60529 IP69K according to ISO 20653
5.0 bar ±10%	DE A 50 x A 50 P01		
7.0 bar ±10%	DE A 70 x A 50 P01		
9.5 bar ±10%	DE A 95 x A 50 P01		Electrical data - Electrical connection: EN 175301-803 - Resistive load: 0.2 A / 115 Vdc



DEH*48		Hydraulic symbol 	Materials - Body: AISI 316L - Contacts: Rhodium - Seal: FPM - MFQ
Hazardous Area Electronic Differential Indicator			
Settings	Ordering code	Electrical symbol 	Technical data - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -60 °C to +125 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Protection class: EX ia IIC T4/T6: Intrinsically safe - Temperature class: T4 (135 °C) and T6 (85 °C) - Degree of protection: IP 66/67/68 according to EN 60529 - Connection type: Three-core cable, fitting M20x1.5 - Contact type: SPCO/SPDT (Hermetically sealed - Volt-free contacts)
5.0 bar ±10%	DE H 50 x A 48 P01		
7.0 bar ±10%	DE H 70 x A 48 P01		
			Electrical data - Resistive Load: 830 mA / 24 Vdc - 180 mA / 110 Vac - Electrical Ratings: Ui = 30 Vdc Ii = 250 mA Pi = 1.3 W


 - Certification / Approvals: ATEX, IECEx, EAC TR CU, INMETRO
 - Certification included as standard

DEH*49		Hydraulic symbol 	Materials - Body: AISI 316L - Contacts: Rhodium - Seal: FPM - MFQ
Hazardous Area Electronic Differential Indicator			
Settings	Ordering code	Electrical symbol 	Technical data - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -60 °C to +120 °C : ATEX, IECEx, EAC TR CU, INMETRO From -60 °C to +105 °C : UL/CSA - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Protection class: Ex d IIC T4/T6: Flameproof - Temperature class: T4 (135 °C) and T6 (85 °C) - Degree of protection: IP 66/67/68 according to EN 60529 - Connection type: Four-core cable, fitting 1/2" NPT - Contact type: SPCO/SPDT (Hermetically sealed - Volt-free contacts)
5.0 bar ±10%	DE H 50 x A 49 P01		
7.0 bar ±10%	DE H 70 x A 49 P01		
			Electrical data - Resistive Load: 830 mA / 24 Vdc - 180 mA / 110 Vac - Max voltage: 150 Vac/dc - Power: 20 W


 - Certification / Approvals: ATEX, IECEx, EAC TR CU, INMETRO, UL/CSA Class I Division 1 Groups A-D, UL/CSA Class II Division 1 Groups E-G
 - Certification included as standard

DIFFERENTIAL INDICATORS

Dimensions

DEH*70	
Hazardous Area Electronic Differential Indicator	
Settings	Ordering code
5.0 bar $\pm 10\%$	DE H 50 x A 70 P01
7.0 bar $\pm 10\%$	DE H 70 x A 70 P01

A/F 25
Max tightening torque: 50 N·m

Hydraulic symbol

Electrical symbol

Materials

- Body: AISI 316L with internal engineered resin switch
- Contacts: Rhodium
- Seal: FPM - MFQ

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -60 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids

- Protection class: EX ia IIC T6: Intrinsically safe

- Temperature class: T6 (85 °C)

- Degree of protection: IP 66/67 according to EN 60529

- Connection type: IEC 61076-2-101 D (M12)

- Contact type: SPCO/SPDT (Hermetically sealed - Volt-free contacts)

Electrical data

- Resistive Load: 830 mA / 24 Vdc - 180 mA / 110 Vdc
- Electrical Ratings: $U_i = 30$ Vdc, $I_i = 250$ mA, $P_i = 1.3$ W

- Certification / Approvals: ATEX, IECEx, EAC TR CU, INMETRO

- Certification included as standard

DEM*10	
Electrical Differential Indicator	
Settings	Ordering code
5.0 bar $\pm 10\%$	DE M 50 x x 10 P01
7.0 bar $\pm 10\%$	DE M 70 x x 10 P01
9.5 bar $\pm 10\%$	DE M 95 x x 10 P01

A/F 28
Max tightening torque: 65 N·m

flexible cable: 290 to "A"

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids

- Degree protection: IP66 according to EN 60529

Electrical data

- Electrical connection: AMP Superseal series 1.5
- Resistive load: 0.2 A / 115 Vdc
- Switching type: Normally open contacts (NC on request)
- Thermal lockout: Normally open up to 30 °C (option "F")

DEM*20	
Electrical Differential Indicator	
Settings	Ordering code
5.0 bar $\pm 10\%$	DE M 50 x x 20 P01
7.0 bar $\pm 10\%$	DE M 70 x x 20 P01
9.5 bar $\pm 10\%$	DE M 95 x x 20 P01

A/F 28
Max tightening torque: 65 N·m

flexible cable: 290 to "A"

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids

- Degree protection: IP66 according to EN 60529

Electrical data

- Electrical connection: AMP Time junior
- Resistive load: 0.2 A / 115 Vdc
- Switching type: Normally open contacts (NC on request)
- Thermal lockout: Normally open up to 30 °C (option "F")

DEM*30	
Electrical Differential Indicator	
Settings	Ordering code
5.0 bar ±10%	DE M 50 x x 30 P01
7.0 bar ±10%	DE M 70 x x 30 P01
9.5 bar ±10%	DE M 95 x x 30 P01

A/F 28
Max tightening torque: 65 N-m

Hydraulic symbol

Electrical symbol

Thermal lockout

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree protection: IP66 according to EN 60529

Electrical data

- Electrical connection: Deutsch DT-04-2-P
- Resistive load: 0.2 A / 115 Vdc
- Switching type: Normally open contacts (NC on request)
- Thermal lockout: Normally open up to 30 °C (option "F")

DEM*35	
Electrical Differential Indicator	
Settings	Ordering code
5.0 bar ±10%	DE M 50 x x 35 P01
7.0 bar ±10%	DE M 70 x x 35 P01
9.5 bar ±10%	DE M 95 x x 35 P01

min. 60
30
flexible cable: 240 to "A"

A/F 28
Max tightening torque: 65 N-m

Hydraulic symbol

Electrical symbol

Thermal lockout

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree protection: IP66 according to EN 60529

Electrical data

- Electrical connection: Deutsch DT-04-3-P
- Resistive load: 0.2 A / 115 Vdc
- Switching type: SPDT contact
- Thermal lockout: Normally open up to 30 °C (option "F")

DLA*51 - DLA*52	
Electrical/Visual Differential Indicator	
Settings	Ordering code
5.0 bar ±10%	DL A 50 x A xx P01
7.0 bar ±10%	DL A 70 x A xx P01
9.5 bar ±10%	DL A 95 x A xx P01

53
A/F 30
Max tightening torque: 65 N-m

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Transparent Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree protection: IP66 according to EN 60529 IP69K according to ISO 20653

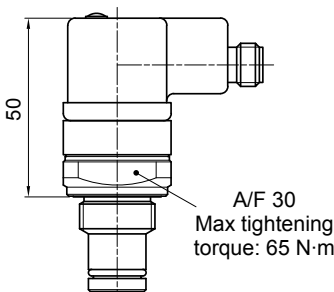
Electrical data

- Electrical connection: EN 175301-803
- Type: 51 52
- Lamps: 24 Vdc 110 Vdc
- Resistive load: 1 A / 24 Vdc 1 A / 110 Vdc

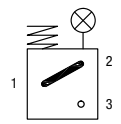
DIFFERENTIAL INDICATORS

Dimensions

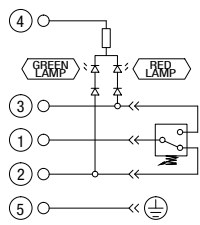
DLA*71	
Electrical/Visual Differential Indicator	
Settings	Ordering code
5.0 bar ±10%	DL A 50 x A 71 P01
7.0 bar ±10%	DL A 70 x A 71 P01
9.5 bar ±10%	DL A 95 x A 71 P01



Hydraulic symbol



Electrical symbol



Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

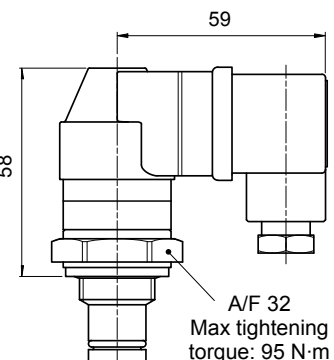
Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529
IP69K according to ISO 20653

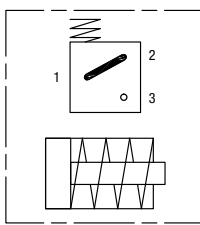
Electrical data

- Electrical connection: IEC 61076-2-101 D (M12)
- Lamps: 24 Vdc
- Resistive load: 0.4 A / 24 Vdc

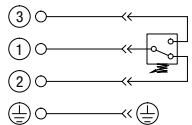
DLE*A50	
Electrical/Visual Differential Indicator	
Settings	Ordering code
5.0 bar ±10%	DL E 50 x A 50 P01
7.0 bar ±10%	DL E 70 x A 50 P01
9.5 bar ±10%	DL E 95 x A 50 P01



Hydraulic symbol



Electrical symbol



Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

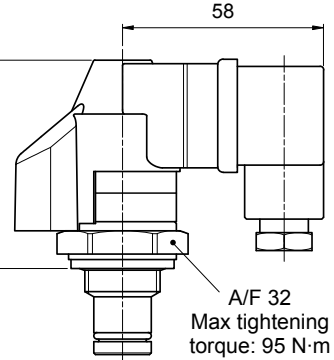
Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529

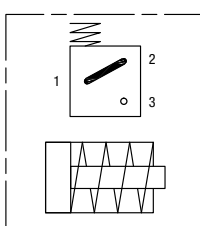
Electrical data

- Electrical connections: EN 175301-803
- Resistive load: 5 A / 250 Vac
- Available the connector with lamps

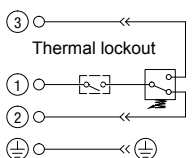
DLE*F50	
Electrical/Visual Differential Indicator	
Settings	Ordering code
5.0 bar ±10%	DL E 50 x F 50 P01
7.0 bar ±10%	DL E 70 x F 50 P01
9.5 bar ±10%	DL E 95 x F 50 P01



Hydraulic symbol



Electrical symbol



Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR - FPM

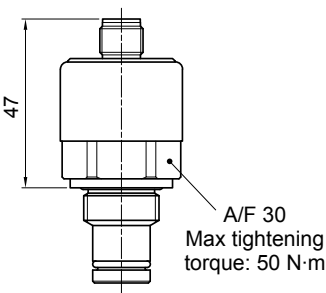
Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529

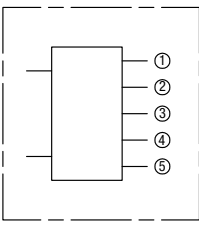
Electrical data

- Electrical connections: EN 175301-803
- Resistive load: 5 A / 250 Vac
- Thermal lockout setting: +30 °C

DTA*70	
Electronic Differential Indicator	
Settings	Ordering code
5.0 bar ±10%	DT A 50 x x 70 P01
7.0 bar ±10%	DT A 70 x x 70 P01
9.5 bar ±10%	DT A 95 x x 70 P01



Hydraulic symbol



Electrical symbol

①	○	○	+24 Vdc
②	○	○	4 ÷ 20 mA
③	○	○	75% - N.O. Digital output
④	○	○	100% - N.O. Digital output
⑤	○	○	0 Vdc

Materials

- Body: Brass
- Internal parts: Brass - Nylon
- Contacts: Silver
- Seal: HNBR - FPM

Technical data

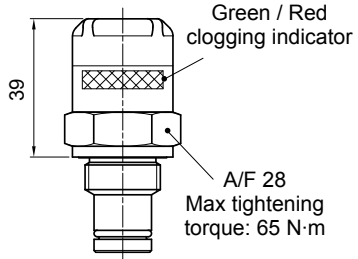
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree protection: IP67 according to EN 60529

Electrical data

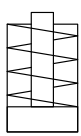
- Electrical connection: IEC 61076-2-101 D (M12)
- Power supply: 24 Vdc
- Analogue output: From 4 to 20 mA
- Thermal lockout: 30 °C (all output signals stalled up to 30 °C)



DVA	
Visual Differential Indicator	
Settings	Ordering code
5.0 bar ±10%	DV A 50 x P01
7.0 bar ±10%	DV A 70 x P01
9.5 bar ±10%	DV A 95 x P01



Hydraulic symbol



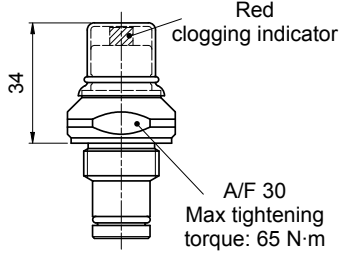
Materials

- Body: Brass
- Internal parts: Brass - Nylon
- Contacts: Silver
- Seal: HNBR - FPM

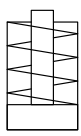
Technical data

- Reset: Automatic reset
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529

DVM	
Visual Differential Indicator	
Settings	Ordering code
5.0 bar ±10%	DV M 50 x P01
7.0 bar ±10%	DV M 70 x P01
9.5 bar ±10%	DV M 95 x P01



Hydraulic symbol



Materials

- Body: Brass
- Internal parts: Brass - Nylon
- Contacts: Silver
- Seal: HNBR - FPM

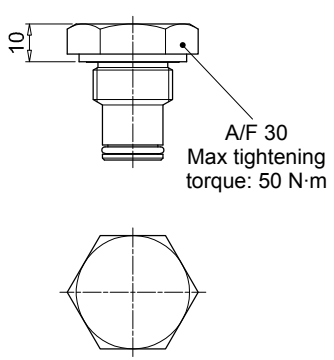
Technical data

- Reset: Manual reset
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529

DIFFERENTIAL INDICATORS

Dimensions

T2	
Indicator plug	
Seal	Ordering code
HNBR	T2 H
FPM	T2 V



A/F 30
Max tightening torque: 50 N·m

Materials

- Body: Phosphatized steel
- Seal: HNBR / FPM

DESIGNATION & ORDERING CODE - DIFFERENTIAL INDICATORS

Series	Configuration example 1:						
DE Electrical or Electronic differential indicator	DE	M	50	H	F	50	P01
DL Electrical / Visual differential indicator	Configuration example 2:						
DT Electronic differential indicator	DL	H	50	F	A	70	P01
DV Visual differential indicator	Configuration example 3:						
	DL	E	70	V	A	71	P01
	Configuration example 4:						
	DT	A	50	H	F	70	P01
	Configuration example 5:						
	DV	M	95	V			P01

Type	DE	DL	DT	DV
A Standard type	•	•	•	A With automatic reset
M With wired electrical connection	•			M With manual reset
E For high power supply		•		
H Hazardous area	•			

Pressure setting	DEA	DEH	DEM	DLA	DLE	DT	DV
50 5 bar	•	•	•	•	•	•	•
70 7 bar	•	•	•	•	•	•	•
95 9.5 bar	•		•	•	•	•	•

Seals	DEA	DEH	DEM	DLA	DLE	DT	DV
F MFQ		•					
H HNBR	•		•	•	•	•	•
V FPM	•	•	•	•	•	•	•

Thermostat	DEA	DEH	DEM	DLA	DLE	DT	DV
A Without	•	•	•	•	•		
F With thermostat			•		•	•	

Electrical connections	DEA	DEH	DEM	DLA	DLE	DT	DV
10 Connection AMP Superseal series 1.5			•				
20 Connection AMP Timer Junior			•				
30 Connection Deutsch DT-04-2-P			•				
35 Connection Deutsch DT-04-3-P			•				
48 Connection via three-core cable - fitting M20x1.5		•					
49 Connection via four-core cable - fitting 1/2" NPT		•					
50 Connection EN 175301-803	•				•		
51 Connection EN 175301-803, transparent base with lamps 24 Vdc				•			
52 Connection EN 175301-803, transparent base with lamps 110 Vdc				•			
70 Connection IEC 61076-2-101 D (M12)		•				•	
71 Connection IEC 61076-2-101 D (M12), black base with lamps 24 Vdc				•			

Option
P01 MP Filtri standard
Pxx Customized

DESIGNATION & ORDERING CODE - DIFFERENTIAL INDICATOR PLUG

Series	Configuration example	
T2 Indicator plug	T2	H
Seals		
H HNBR		
V FPM		

Stainless steel high pressure filters are used as process filters to protect individual valves or the entire hydraulic circuit from contamination as per ISO 4406.

6 versions are available with operating pressures ranging from 320 bar up to 1000 bar.

A range of products is available to resolve all filter mounting problems, in the following configurations:

- **FZP In-line pressure filter with threaded mount**
- **FZH In-line pressure filter with threaded mount for higher pressure**
- **FZX In-line pressure filter with threaded mount up to 1000 bar**
- **FZB Manifold side mounting**
- **FZM Manifold top mounting**
- **FZD Duplex pressure filter for continuous operation requirements**

FZ stainless steel filters are specifically designed for applications in the:

- **Process engineering**
- **Water hydraulics**
- **Offshore technology**
- **Marine technology**
- **High pressure hydraulics**
- **Any application in harsh or aggressive environment**

FILTER SIZING

For the proper corrective factor Y see chapter at page 25

Stainless steel high pressure filters



FZP	page 587
FZH	597
FZX	607
FZM	615
FZB	623
FZD	631
INDICATORS	641

FZP series

Maximum working pressure up to 42 Mpa (420 bar) - Flow rate up to 160 l/min



Description

Technical data

Stainless steel high pressure filters

In-line

Maximum working pressure up to 42 Mpa (420 bar)
Flow rate up to 160 l/min

FZP is a range of stainless steel high pressure filter for protection of sensitive components in high pressure hydraulic systems placed in difficult environmental conditions.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- 1 1/4" female threaded connections, for a maximum flow rate of 160 l/min
- Fine filtration rating, to get a good cleanliness level into the system
- Bypass valve, to relieve excessive pressure drop across the filter media
- Low collapse filter element with external support "R", for filter element protection against the back pressure caused by the check valve or the reverse flow in filters provided with the bypass valve
- High collapse filter element with external support "S", for filter element protection against the back pressure caused by the check valve or the reverse flow in filters not provided with the bypass valve
- High collapse filter element "U", for use with aggressive fluids
- Visual, electrical and electronic differential clogging indicators

Common applications:

- Off-shore equipment
- Water filtration systems
- Systems with strong or corrosive environmental conditions
- Systems with corrosive fluids

Filter housing materials

- Head: AISI 316L
- Housing: AISI 316L
- Bypass valve: AISI 316L

Seals

- Standard NBR series A (-25 °C to +110 °C)
- Optional FPM series V (-20 °C to +120 °C)
- Optional MFQ series F (-50 °C to +120 °C)

Bypass valve

Opening pressure 6 bar ±10%

Temperature

From -50 °C to +120 °C

Note

FZP filters are provided for vertical mounting

Δp element type

Fluid flow through the filter element from OUT to IN

Microfibre filter elements - series R: 20 bar.

Element series "R":

- End cap: Nylon
- Core tube: Tinned Steel
- External/Internal support: Wire mesh Epox painted
- Media/Support/Pre-filter: Microfibre/Syntetic

Microfibre filter elements - series S: 210 bar.

Element series "S":

- End cap: Tinned Steel
- Core tube: Tinned Steel
- External support: Wire mesh Epox painted
- Internal support: Wire mesh Stainless Steel
- Media/Support/Pre-filter: Microfibre/Syntetic

Stainless Steel Microfibre filter elements series U: 210 bar.

Element series "U":

- End cap: Stainless Steel
- Core tube: Stainless Steel
- External support: Stainless Steel
- Internal support: Stainless Steel
- Media/Support/Pre-filter: Microfibre/Syntetic



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]				Volumes [dm³]					
	Length	1	2	3	4	Length	1	2	3	4
FZP 039	-	-	4.5	5.1	5.6	-	-	0.19	0.26	0.34
FZP 136	8.3	8.3	10.2	11.5	-	0.45	0.78	1.00	-	-

Filter series	Length	Filter element design - R Series					Filter element design - S-U Series				
		A03	A06	A10	A16	A25	A03	A06	A10	A16	A25
FZP 039	2	19	25	43	50	59	19	23	41	45	55
	3	34	37	53	62	74	31	34	48	52	66
	4	42	46	63	72	81	38	41	55	71	78
FZP 136	1	63	67	102	108	136	47	53	87	89	127
	2	95	100	122	123	159	81	95	113	115	138
	3	122	124	148	150	160	106	116	135	141	151

Maximum flow rate for a complete stainless steel high pressure filter with a pressure drop $\Delta p = 1.5$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

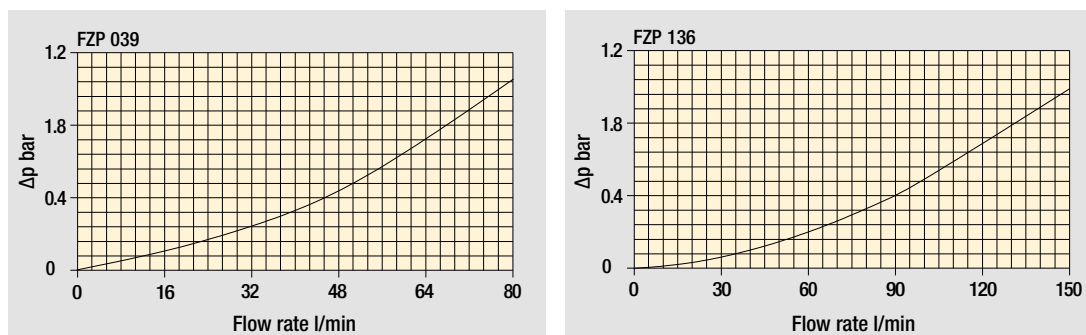
You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols

Filter series	Style S	Style B	Style T	Style D	Style V	Style Z
FZP 039	•	•	•	•	•	•
FZP 136	•	•	•	•	•	•

Pressure drop

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.

Designation & Ordering code

COMPLETE FILTER

Series and size	Configuration example: FZP039	2	B	F	B	2	A03	U	P01
FZP039									
Length									
2 3 4									
Valves									
S Without bypass									
B With bypass 6 bar									
T With check valve, without bypass									
D With check valve, with bypass 6 bar									
V With reverse flow, without bypass									
Z With reverse flow, with bypass 6 bar									
Seals									
A NBR									
V FPM									
F MFQ									
Connections									
A G 1/2"									
B 1/2" NPT									
C SAE 8 - 3/4" - 16 UNF									
Connections for differential indicators									
1 Without									
2 With connection									
Filtration rating (filter media)									
A03 Inorganic microfiber 3 µm									
A06 Inorganic microfiber 6 µm									
A10 Inorganic microfiber 10 µm									
A16 Inorganic microfiber 16 µm									
A25 Inorganic microfiber 25 µm									

Element Δp	Valves						Execution
	S	B	T	D	V	Z	
R 20 bar		•		•		•	P01 MP Filtri standard
S 210 bar	•		•		•		Pxx Customized
U 210 bar, stainless steel filter element	•	•	•	•	•	•	

FILTER ELEMENT

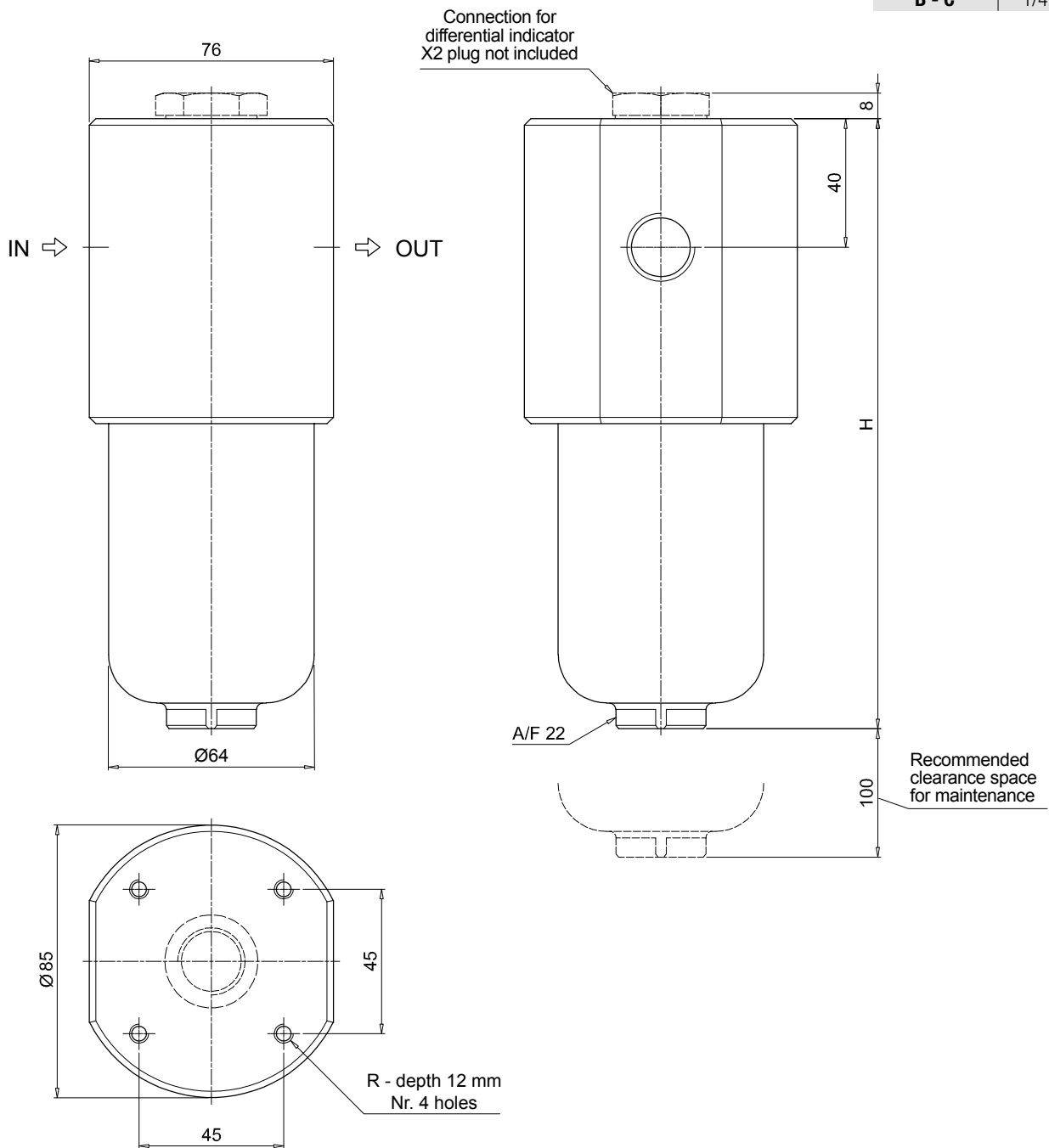
Element series and size	Configuration example: HP039	2	A03	F	U	P01
HP039						
Element length						
2 3 4						
Filtration rating (filter media)						
A03 Inorganic microfiber 3 µm						
A06 Inorganic microfiber 6 µm						
A10 Inorganic microfiber 10 µm						
A16 Inorganic microfiber 16 µm						
A25 Inorganic microfiber 25 µm						

Seals	Element Δp	Valves						Execution
		S	B	T	D	V	Z	
A NBR	R 20 bar		•		•		•	P01 MP Filtri standard
V FPM	S 210 bar	•		•		•		Pxx Customized
F MFQ	U 210 bar, stainless steel filter element	•	•	•	•	•	•	

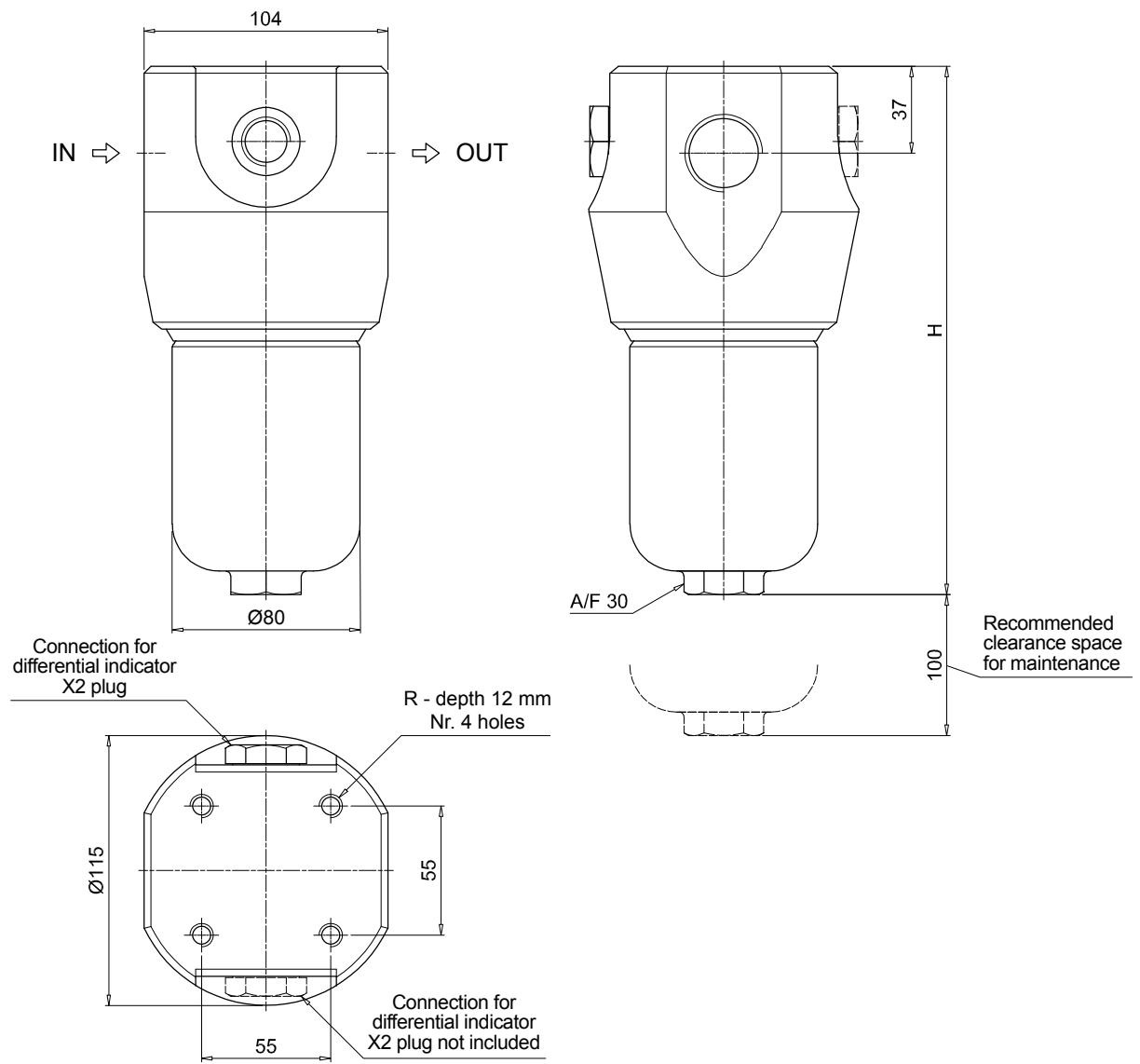
ACCESSORIES

Differential indicators	page		page
DEH Hazardous area electronic differential indicator	642	DVX Visual differential indicator	643
DEX Electrical differential indicator	643	DVY Visual differential indicator	644
DLX Electrical / visual differential indicator	643		
Additional features	page		
X2 Plug	644		

FZP039	
Filter length	H [mm]
2	179
3	222
4	266
Connections	R
A	M6
B - C	1/4" UNC



FZP136	
Filter length	H [mm]
1	222
2	335
3	410
Connections	R
A	M10
B - C	3/8" UNC
D	M10
E - F	3/8" UNC
G	M10
H - I	3/8" UNC



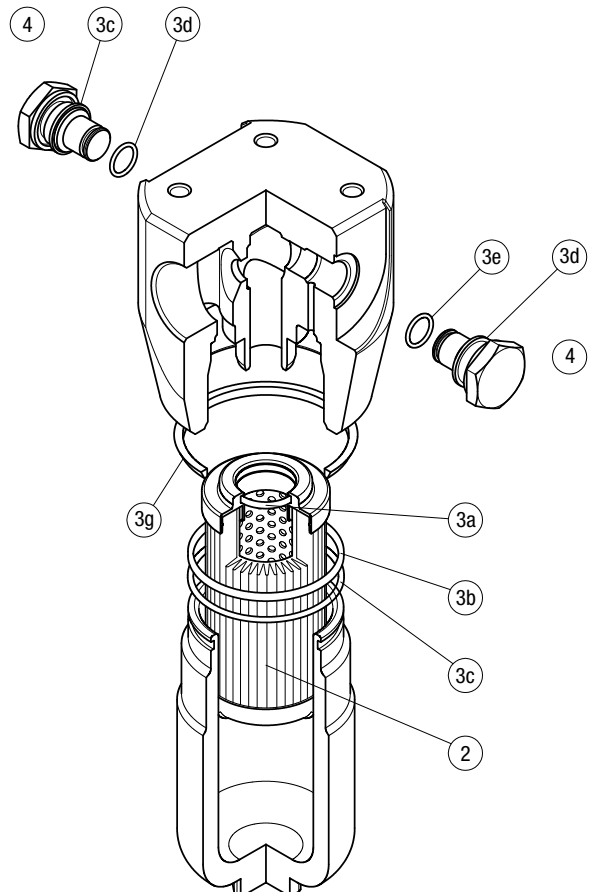
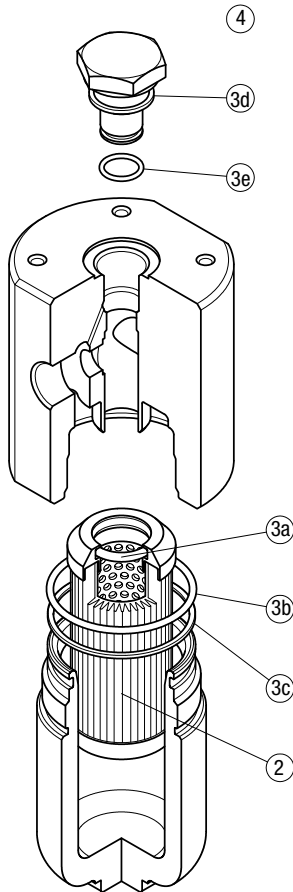
The position of the X2 plug is reversible

FZP SPARE PARTS

Order number for spare parts

FZP 039

FZP 136



Item:	Q.ty: 1 pc.		Q.ty: 1 pc.		Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug		
FZP 039	See order table	NBR	FPM	NBR	FPM	
FZP 136		02050299	02050300	X2H	X2V	
		02050636	02050637			

FZH series

Maximum working pressure up to 70 Mpa (700 bar) - Flow rate up to 80 l/min



Description

Technical data

Stainless steel high pressure filters

In-line

Maximum working pressure up to 80 Mpa (700 bar)

Flow rate up to 80 l/min

FZH is a range of stainless steel high pressure filter for protection of sensitive components in high pressure hydraulic systems placed in difficult environmental conditions.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- 1/2" female threaded connections, for a maximum flow rate of 80 l/min
- Fine filtration rating, to get a good cleanliness level into the system
- Bypass valve, to relieve excessive pressure drop across the filter media
- Low collapse filter element "N", for use with filters provided with bypass valve
- High collapse filter element "H", for use with filters not provided with bypass valve
- Low collapse filter element with external support "R", for filter element protection against the back pressure caused by the check valve or the reverse flow in filters provided with the bypass valve
- High collapse filter element with external support "S", for filter element protection against the back pressure caused by the check valve or the reverse flow in filters not provided with the bypass valve
- High collapse filter element "U", for use with aggressive fluids
- Visual, electrical and electronic differential clogging indicators

Common applications:

- Off-shore equipment
- Water filtration systems
- Systems with strong or corrosive environmental conditions
- Systems with corrosive fluids

Filter housing materials

- Head: AISI 316L
- Housing: AISI 316L
- Bypass valve: AISI 316L

Seals

- Standard NBR series A (-25 °C to +110 °C)
- Optional FPM series V (-20 °C to +120 °C)
- Optional MFQ series F (-50 °C to +120 °C)

Bypass valve

Opening pressure 6 bar \pm 10%

Temperature

From -50 °C to +120 °C

Note

FZH filters are provided for vertical mounting

Δp element type

Fluid flow through the filter element from OUT to IN

Microfibre filter elements - series N-R: 20 bar.

Element series "N - R":

- End cap: Nylon
- Core tube: Tinned Steel
- External/Internal support: Wire mesh Epox painted
- Media/Support/Pre-filter: Microfibre/Syntetic

Microfibre filter elements - series H-S: 210 bar.

Element series "H - S":

- End cap: Tinned Steel
- Core tube: Tinned Steel
- External support: Wire mesh Epox painted
- Internal support: Wire mesh Stainless Steel
- Media/Support/Pre-filter: Microfibre/Syntetic

Stainless Steel Microfibre filter elements series U: 210 bar.

Element series "U":

- End cap: Stainless Steel
- Core tube: Stainless Steel
- External support: Stainless Steel
- Internal support: Stainless Steel
- Media/Support/Pre-filter: Microfibre/Syntetic



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]					Volumes [dm ³]				
	Length	1	2	3	4	Length	1	2	3	4
FZH 010-011		2.1	2.2	2.7	3.3		0.10	0.12	0.15	0.20
FZH 039		-	7.8	8.9	10.1		-	0.19	0.26	0.34

Filter series	Length	Filter element design - R Series					Filter element design - S-U Series				
		A03	A06	A10	A16	A25	A03	A06	A10	A16	A25
FZH 010	1	4	6	8	9	11	4	5	6	7	9
	2	7	9	17	20	26	5	7	14	17	23
	3	11	14	25	27	32	11	14	24	27	32
	4	17	20	29	31	34	13	16	26	29	33
FZH 011	1	4	6	8	9	11	3	5	6	7	9
	2	7	9	17	21	28	5	7	14	17	24
	3	11	14	26	30	37	11	14	25	29	36
	4	17	21	32	36	40	12	16	28	32	38
FZH 039	2	19	25	43	50	59	19	23	41	45	55
	3	34	37	53	62	74	31	34	48	52	66
	4	42	46	63	72	81	38	41	55	71	78

Maximum flow rate for a complete stainless steel high pressure filter with a pressure drop $\Delta p = 1.5$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

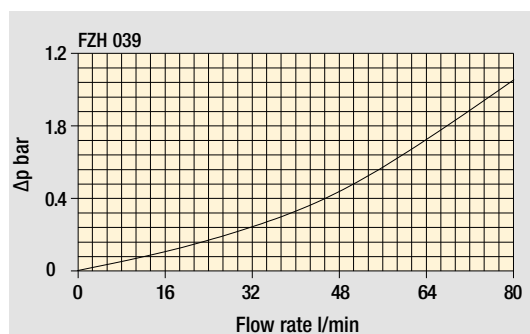
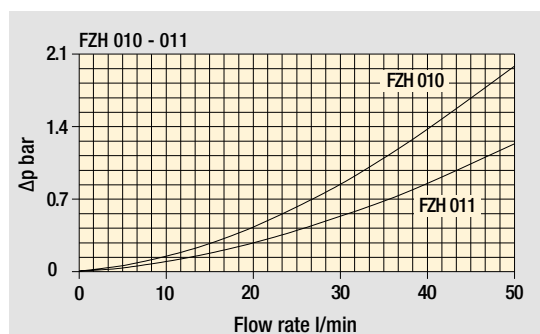
You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols

Filter series	Style S	Style B	Style T	Style D	Style V	Style Z
FZH 010-011	•	•			•	•
FZH 039	•	•	•	•	•	•

Pressure drop

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.

Designation & Ordering code

COMPLETE FILTER

Series and size **FZH010** | **FZH011** Configuration example: **FZH010** **2** **B** **F** **B** **2** **A03** **U** **P01**

Length
1 | **2** | **3** | **4** |

Valves
S Without bypass
B With bypass 6 bar
V With reverse flow, without bypass
Z With reverse flow, with bypass 6 bar

Seals
A NBR
V FPM
F MFQ

Connections
A G 1/4"
B 1/4" NPT
C SAE 5 - 1/2" - 20 UNF
D G 3/8"
E 3/8" NPT
F SAE 6 - 9/16" - 18 UNF

Connections for differential indicator
1 Without
2 With connection on the top

Filtration rating (filter media)	
A03 Inorganic microfiber	3 µm
A06 Inorganic microfiber	6 µm
A10 Inorganic microfiber	10 µm
A16 Inorganic microfiber	16 µm
A25 Inorganic microfiber	25 µm

Element Δp	Valves			
	S	B	V	Z
N 20 bar		•		•
H 210 bar		•	•	
U 210 bar, stainless steel filter element	•	•	•	•

Execution	
P01 MP Filtri standard	
Pxx Customized	

FILTER ELEMENT

Element series and size **HP011** Configuration example: **HP011** **2** **A03** **F** **U** **P01**

Element length
1 | **2** | **3** | **4** |

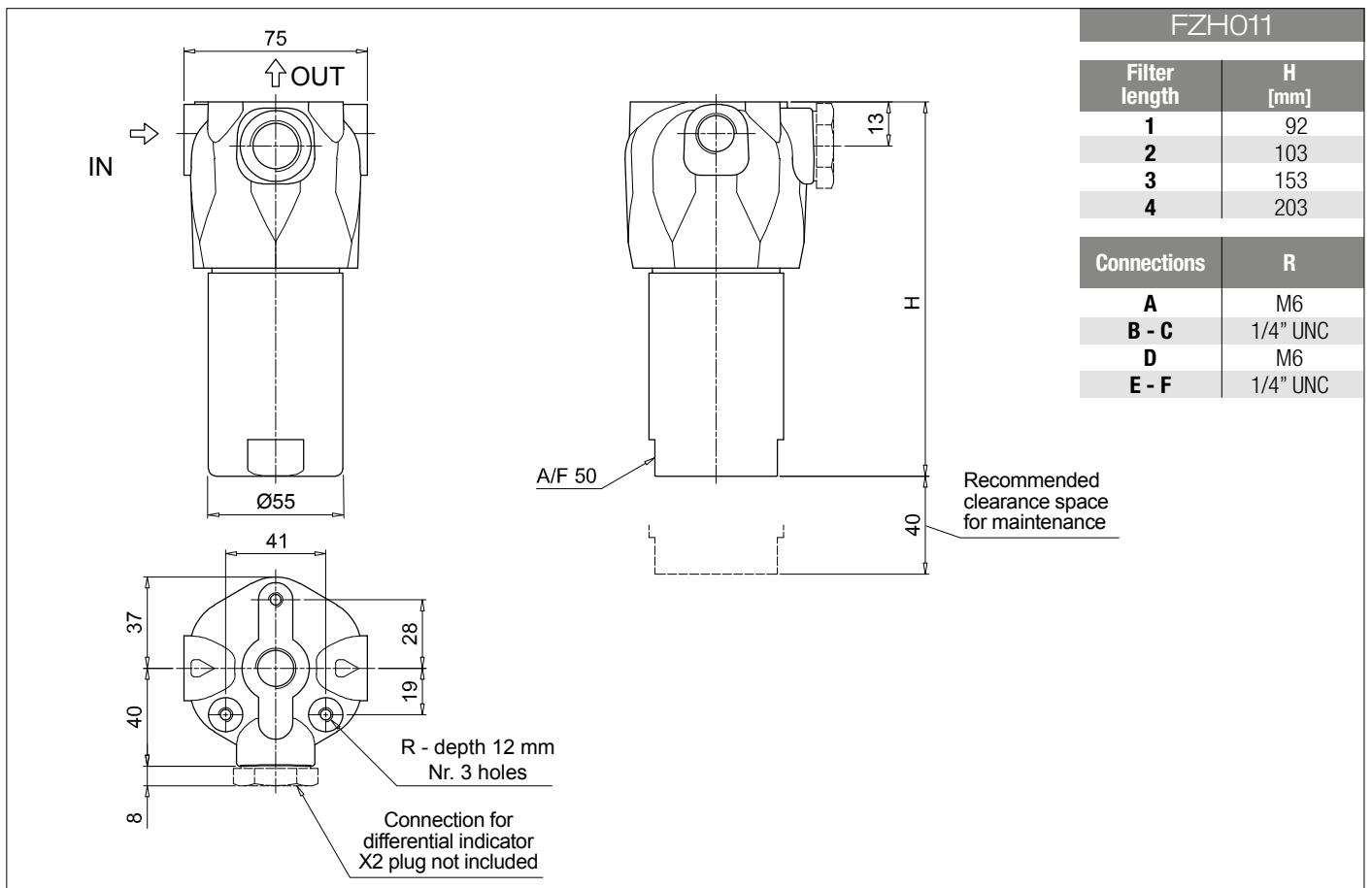
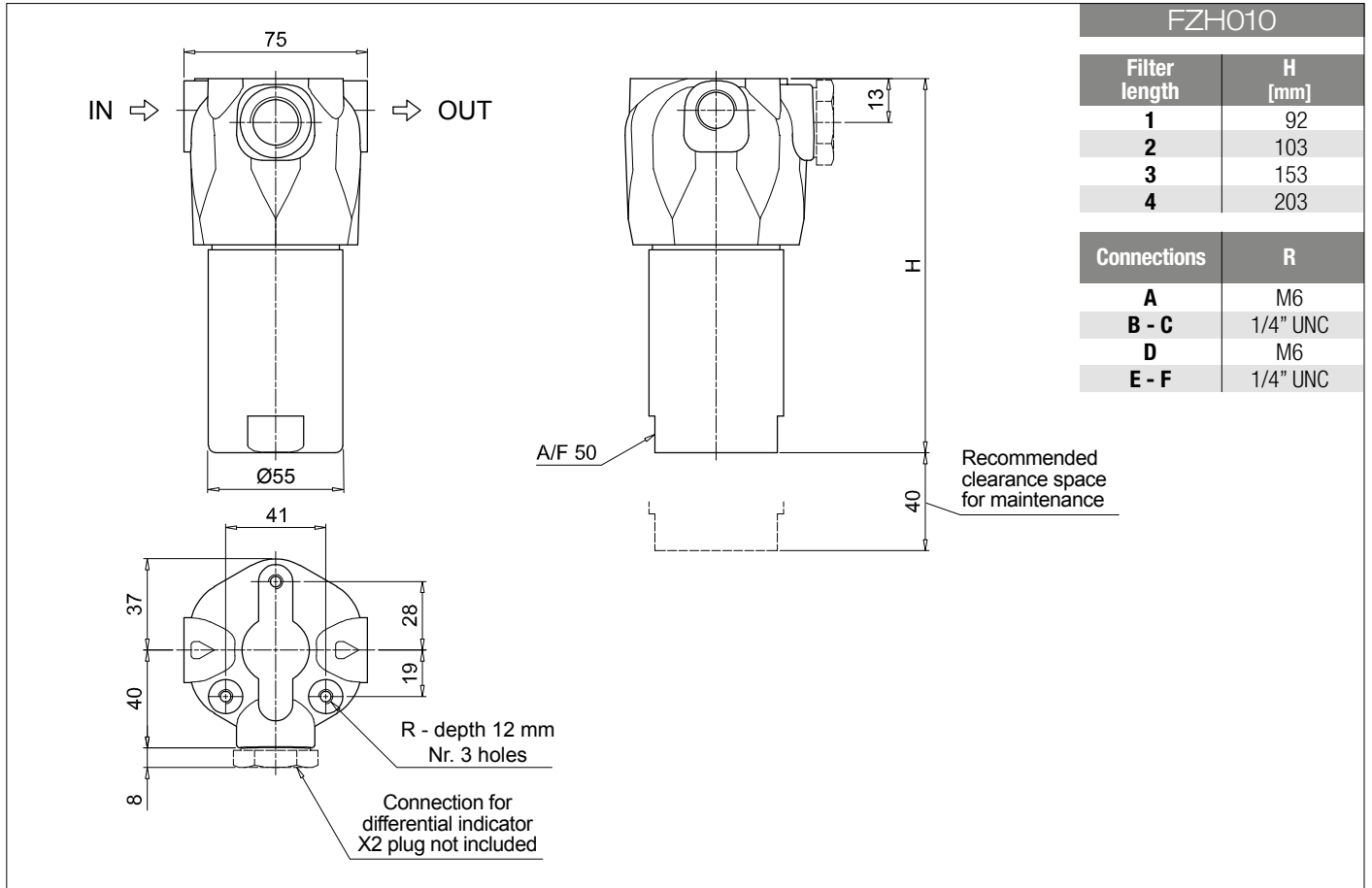
Filtration rating (filter media)	
A03 Inorganic microfiber	3 µm
A06 Inorganic microfiber	6 µm
A10 Inorganic microfiber	10 µm
A16 Inorganic microfiber	16 µm
A25 Inorganic microfiber	25 µm

Seals	Element Δp	Valves			
		S	B	V	Z
A NBR	N 20 bar		•		•
V FPM	H 210 bar		•	•	
F MFQ	U 210 bar, stainless steel filter element	•	•	•	•

Execution	
P01 MP Filtri standard	
Pxx Customized	

ACCESSORIES

Differential indicators	page		page
DEH Hazardous area electronic differential indicator	642	DVX Visual differential indicator	643
DEX Electrical differential indicator	643	DVY Visual differential indicator	644
DLX Electrical / visual differential indicator	643		
Additional features	page		
X2 Plug	644		



Designation & Ordering code

COMPLETE FILTER

Series and size **FZH039** Configuration example: **FZH039** **2** **T** **A** **A** **2** **A03** **S** **P01**

Length **2** | **3** | **4** |

Valves
S Without bypass
B With bypass 6 bar
T With check valve, without bypass
D With check valve, with bypass 6 bar
V With reverse flow, without bypass
Z With reverse flow, with bypass 6 bar

Seals
A NBR
V FPM
F MFQ

Connections
A G 1/2"
B 1/2" NPT
C SAE 8 - 3/4" - 16 UNF

Connections for differential indicator
1 Without
2 With connection on the top

Filtration rating (filter media)	
A03 Inorganic microfiber	3 µm
A06 Inorganic microfiber	6 µm
A10 Inorganic microfiber	10 µm
A16 Inorganic microfiber	16 µm
A25 Inorganic microfiber	25 µm

Element Δp	Valves					
	S	B	T	D	V	Z
R 20 bar		•		•		•
S 210 bar	•		•		•	
U 210 bar, stainless steel filter element	•	•	•	•	•	•

Execution	
P01	MP Filtri standard
Pxx	Customized

FILTER ELEMENT

Element series and size **HP039** Configuration example: **HP039** **2** **A03** **A** **S** **P01**

Element length **2** | **3** | **4** |

Filtration rating (filter media)	
A03 Inorganic microfiber	3 µm
A06 Inorganic microfiber	6 µm
A10 Inorganic microfiber	10 µm
A16 Inorganic microfiber	16 µm
A25 Inorganic microfiber	25 µm

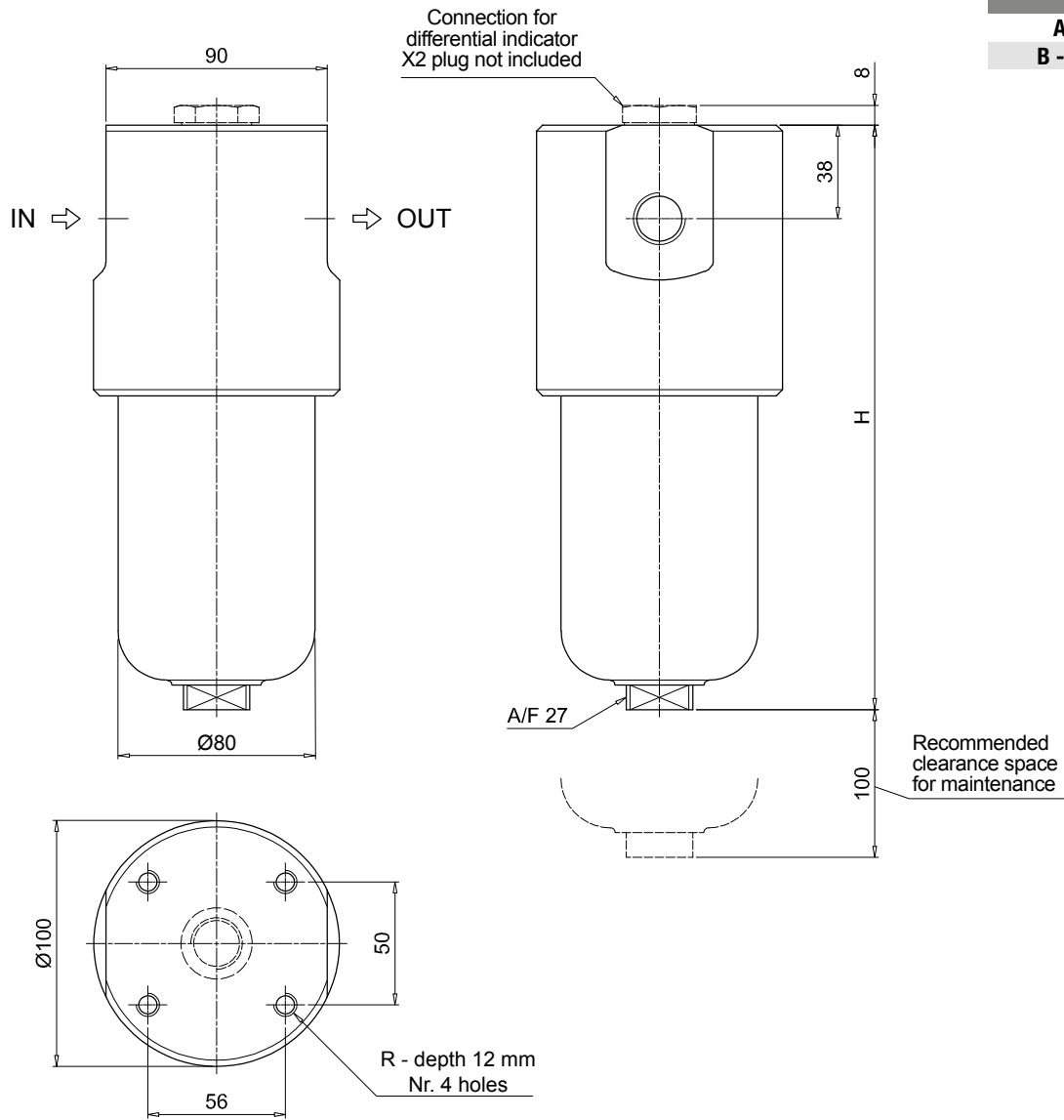
Seals	Element Δp	Valves					
		S	B	T	D	V	Z
A NBR	R 20 bar		•		•		•
V FPM	S 210 bar	•		•		•	
F MFQ	U 210 bar, stainless steel filter element	•	•	•	•	•	•

Execution	
P01	MP Filtri standard
Pxx	Customized

ACCESSORIES

Differential indicators		page			page
DEH Hazardous area electronic differential indicator	642	DVX Visual differential indicator	643		
DEX Electrical differential indicator	643	DVY Visual differential indicator	644		
DLX Electrical / visual differential indicator	643				
Additional features		page			
X2 Plug	644				

FZH039	
Filter length	H [mm]
2	200
3	243
4	287
Connections	R
A	M10
B - C	3/8" UNC

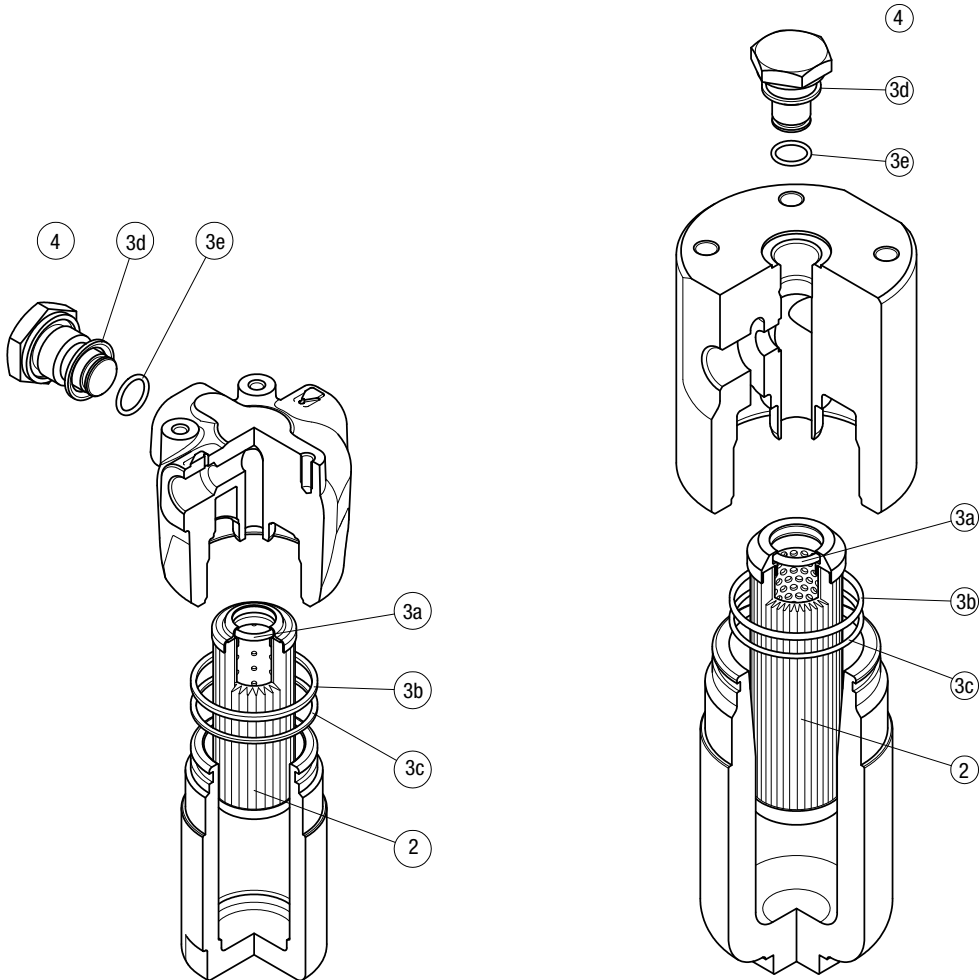


FZH SPARE PARTS

Order number for spare parts

FZH 010 - 011

FZH 039



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug	
FZH 010-011	See order table	NBR	FPM	NBR	FPM
FZH 039	See order table	02050501	02050492	X2H	X2V
		02050335	02050336		

FZX series

Maximum working pressure up to 100 Mpa (1000 bar) - Flow rate up to 10 l/min



Description

Technical data

Stainless steel high pressure filters

In-line

Maximum working pressure up to 100 Mpa (1000 bar)
Flow rate up to 10 l/min

FZX is a range of stainless steel high pressure filter for protection of sensitive components in high pressure hydraulic systems placed in difficult environmental conditions.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- 1/2" female threaded connections, for a maximum flow rate of 10 l/min
- Fine filtration rating, to get a good cleanliness level into the system
- High collapse filter element "H", for use with filters not provided with bypass valve
- High collapse filter element "U", for use with aggressive fluids
- Visual, electrical and electronic differential clogging indicators

Common applications:

- Off-shore equipment
- Water filtration systems
- Systems with strong or corrosive environmental conditions
- Systems with corrosive fluids

Filter housing materials

- Head: AISI 316L
- Housing: AISI 316L
- Bypass valve: AISI 316L

Seals

- Standard NBR series A (-25 °C to +110 °C)
- Optional FPM series V (-20 °C to +120 °C)
- Optional MFQ series F (-50 °C to +120 °C)

Bypass valve

Opening pressure 6 bar \pm 10%

Temperature

From -50 °C to +120 °C

Note

FZX filters are provided for vertical mounting

Δp element type

Fluid flow through the filter element from OUT to IN

Microfibre filter elements - series H: 210 bar.

Element series "H":

- End cap: Tinned Steel
- Core tube: Tinned Steel
- External support: Wire mesh Epoxy painted
- Internal support: Wire mesh Stainless Steel
- Media/Support/Pre-filter: Microfibre/Synthetic

Stainless Steel Microfibre filter elements series U: 210 bar.

Element series "U":

- End cap: Stainless Steel
- Core tube: Stainless Steel
- External support: Stainless Steel
- Internal support: Stainless Steel
- Media/Support/Pre-filter: Microfibre/Synthetic



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]					Volumes [dm ³]				
	Length	1	2	3	4	Length	1	2	3	4
FZX 011	-	-	6.5	-	-	-	-	0.15	-	-

Filter series	Length	Filter element design - H-U Series				
		A03	A06	A10	A16	A25
FZX 011	3	1.57	1.63	1.73	1.74	1.77

Maximum flow rate for a complete stainless steel high pressure filter with a pressure drop $\Delta p = 1.5$ bar.

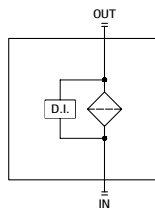
The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

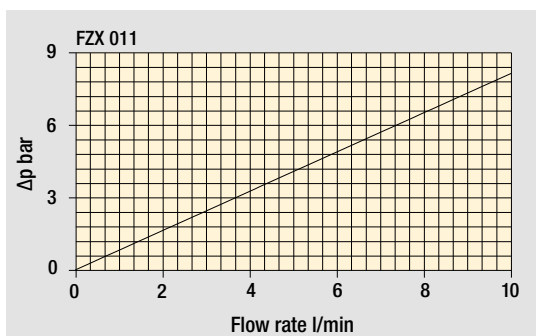
Hydraulic symbols

Filter series	Style S
FZX 011	•

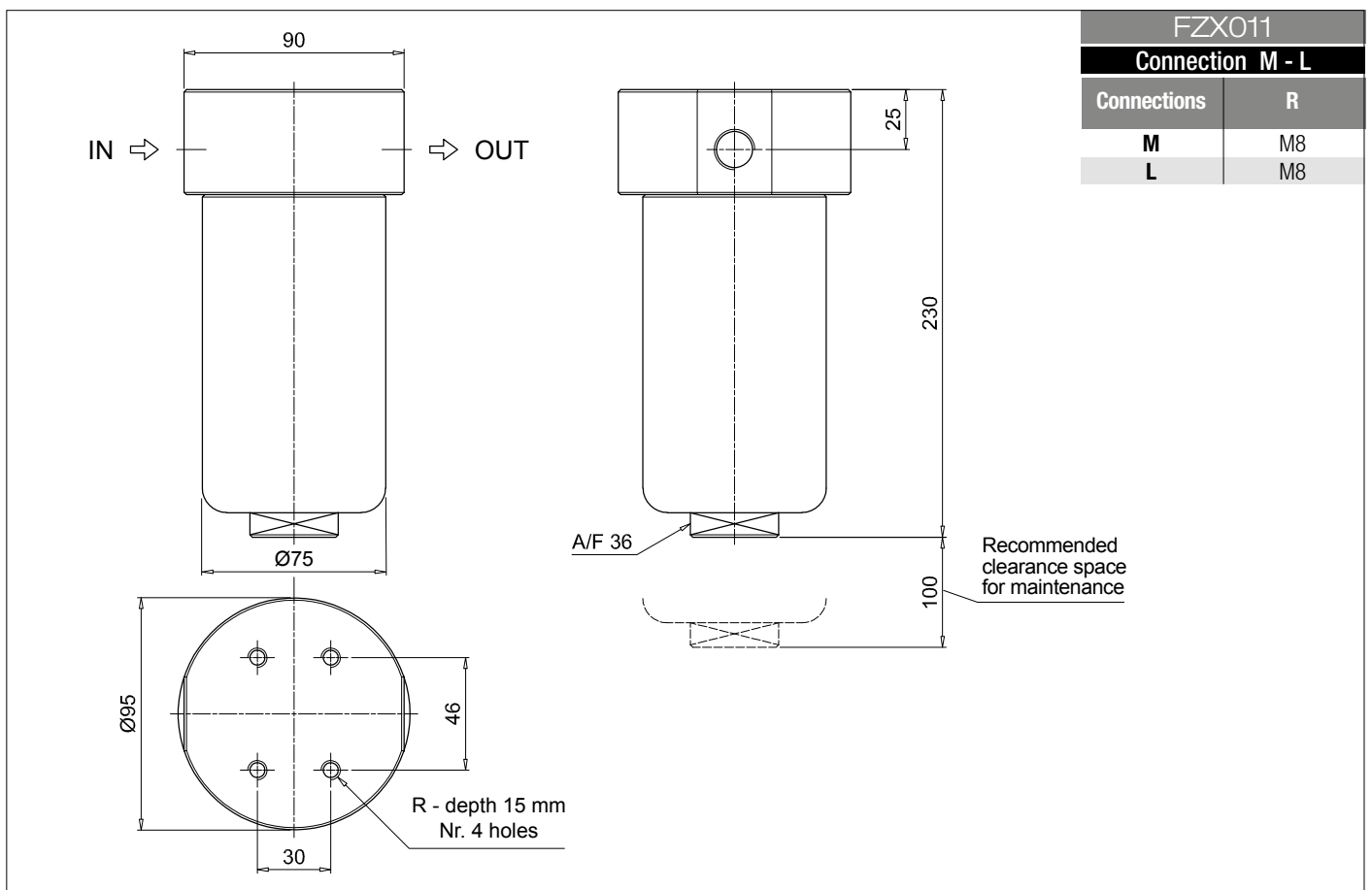
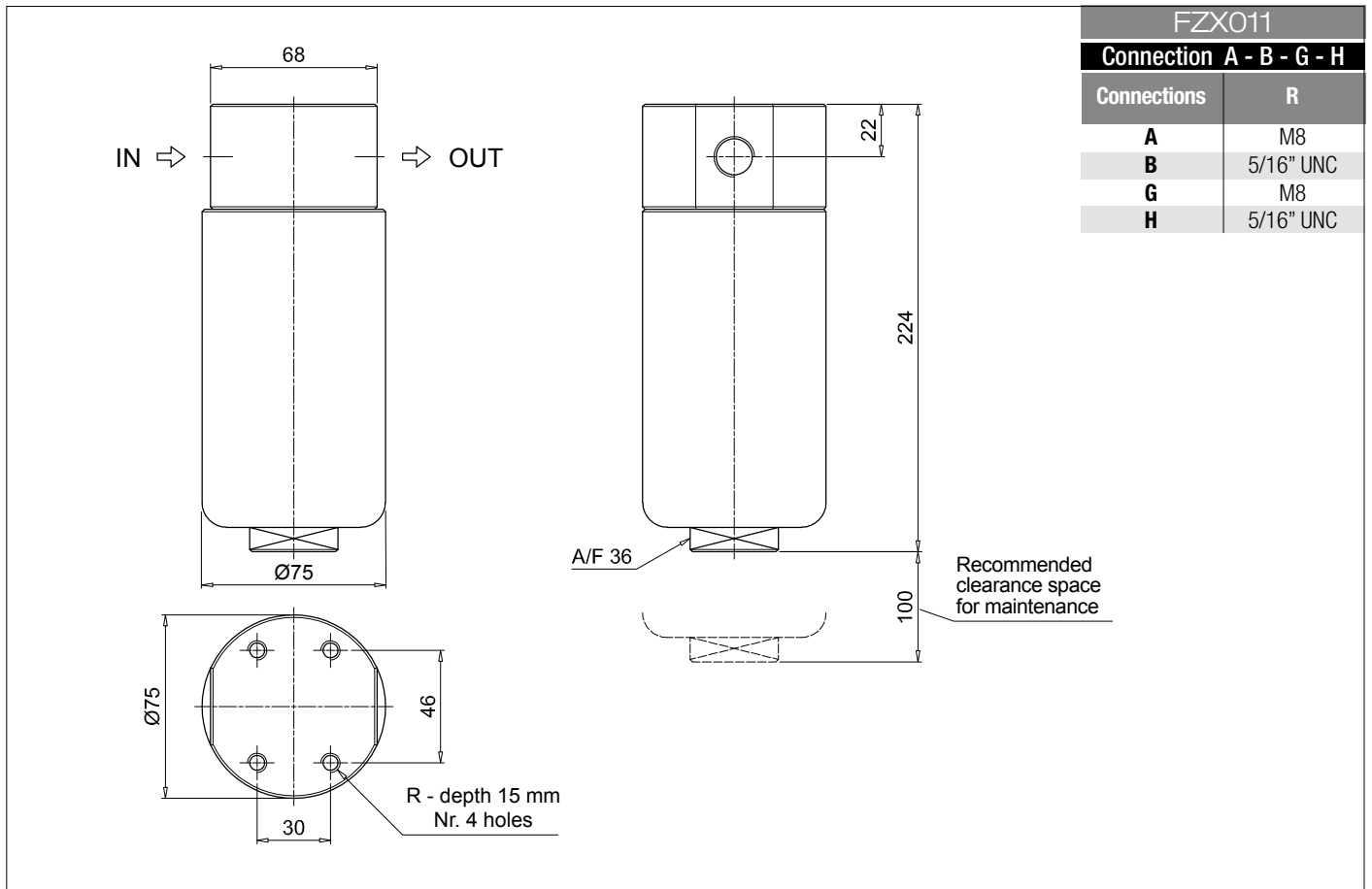


Pressure drop

Filter housings Δp pressure drop

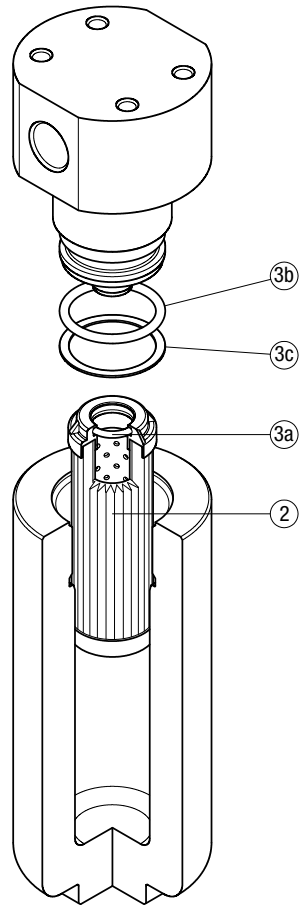


The curves are plotted using mineral oil with density of 0.86 kg/dm³ in compliance with ISO 3968. Δp varies proportionally with density.



Order number for spare parts

FZX 011



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number	
FZX 011	See order table	NBR	FPM
	2	02050643	02050644
		3 (3a ÷ 3c)	

FZM series

Maximum working pressure up to 32 Mpa (320 bar) - Flow rate up to 70 l/min



Description

Technical data

Stainless steel high pressure filters

Manifold

Maximum working pressure up to 32 Mpa (320 bar)
Flow rate up to 70 l/min

FZM is a range of stainless steel high pressure filter for protection of sensitive components in high pressure hydraulic systems placed in difficult environmental conditions.

They are directly connected to the top of the manifold, through the proper flanged interface.

Available features:

- Manifold connections up to Ø15 mm, for a maximum flow rate of 70 l/min
- ISO 4401 CETOP 3 and CETOP 5 interface, for direct mounting on the CETOP valves.
- Fine filtration rating, to get a good cleanliness level into the system
- Bypass valve, to relieve excessive pressure drop across the filter media
- Low collapse filter element with external support "R", for filter element protection against the back pressure caused by the check valve or the reverse flow in filters provided with the bypass valve
- High collapse filter element with external support "S", for filter element protection against the back pressure caused by the check valve or the reverse flow in filters not provided with the bypass valve
- High collapse filter element "U", for use with aggressive fluids
- Visual, electrical and electronic differential clogging indicators

Common applications:

- Off-shore equipment
- Water filtration systems
- Systems with strong or corrosive environmental conditions
- Systems with corrosive fluids

Filter housing materials

- Head: AISI 316L
- Housing: AISI 316L
- Bypass valve: AISI 316L

Seals

- Standard NBR series A (-25 °C to +110 °C)
- Optional FPM series V (-20 °C to +120 °C)
- Optional MFQ series F (-50 °C to +120 °C)

Bypass valve

Opening pressure 6 bar ±10%

Temperature

From -50 °C to +120 °C

Note

FZM filters are provided for vertical mounting

Δp element type

Fluid flow through the filter element from OUT to IN

Microfibre filter elements - series R: 20 bar.

Element series "R":

- End cap: Nylon
- Core tube: Tinned Steel
- External/Internal support: Wire mesh Epox painted
- Media/Support/Pre-filter: Microfibre/Syntetic

Microfibre filter elements - series S: 210 bar.

Element series "S":

- End cap: Tinned Steel
- Core tube: Tinned Steel
- External support: Wire mesh Epox painted
- Internal support: Wire mesh Stainless Steel
- Media/Support/Pre-filter: Microfibre/Syntetic

Stainless Steel Microfibre filter elements series U: 210 bar.

Element series "U":

- End cap: Stainless Steel
- Core tube: Stainless Steel
- External support: Stainless Steel
- Internal support: Stainless Steel
- Media/Support/Pre-filter: Microfibre/Syntetic



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]					Volumes [dm ³]				
	Length	1	2	3	4	Length	1	2	3	4
FZM 039	-	5.0	5.6	6.1		-	0.19	0.26	0.34	

Filter series	Length	Filter element design - R Series					Filter element design - S-U Series				
		A03	A06	A10	A16	A25	A03	A06	A10	A16	A25
FZM 039	2	19	25	41	47	54	19	23	39	43	51
	3	33	36	50	56	65	30	33	45	49	60
	4	41	44	58	64	70	37	39	51	63	68

Maximum flow rate for a complete stainless steel high pressure filter with a return drop $\Delta p = 1.5$ bar.

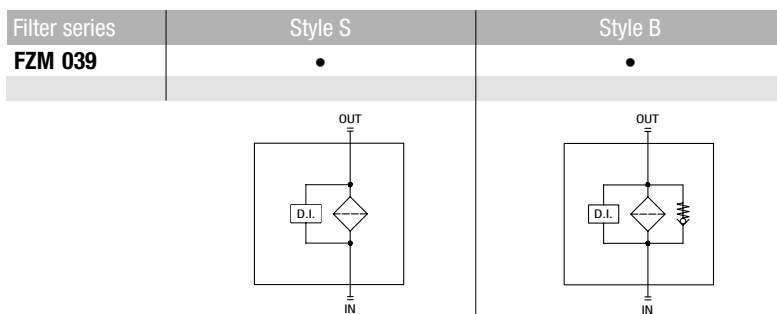
The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

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

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure.

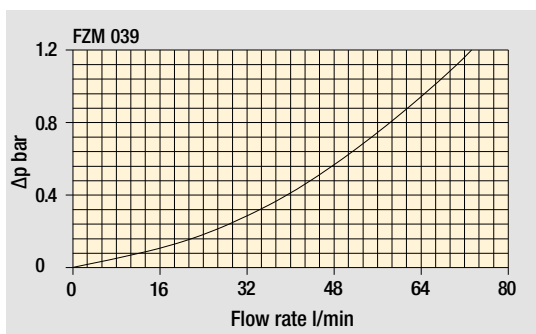
Please, contact our Sales Department for further additional information.

Hydraulic symbols



Pressure drop

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.

Designation & Ordering code

COMPLETE FILTER

Series and size FZM039	Configuration example: FZM039	2	S	A	M	1	A10	H	P01
Length		2 3 4							
Valves									
S	Without bypass								
B	With bypass 6 bar								
Seals									
A	NBR								
V	FPM								
F	MFQ								
Connections									
M	Manifold								
Connection for differential indicator									
1	Without								
2	With connection								
Filtration rating (filter media)									
A03	Inorganic microfiber 3 µm								
A06	Inorganic microfiber 6 µm								
A10	Inorganic microfiber 10 µm								
A16	Inorganic microfiber 16 µm								
A25	Inorganic microfiber 25 µm								

Element Δp	Valves		Execution
	S	B	
R 20 bar		•	P01 MP Filtri standard
S 210 bar	•		Pxx Customized
U 210 bar, stainless steel filter element	•	•	

FILTER ELEMENT

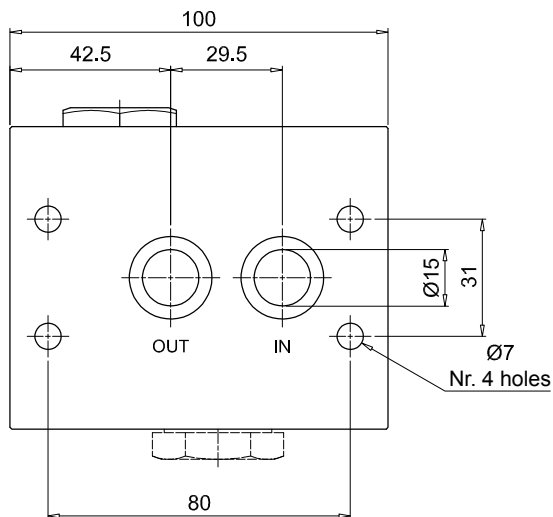
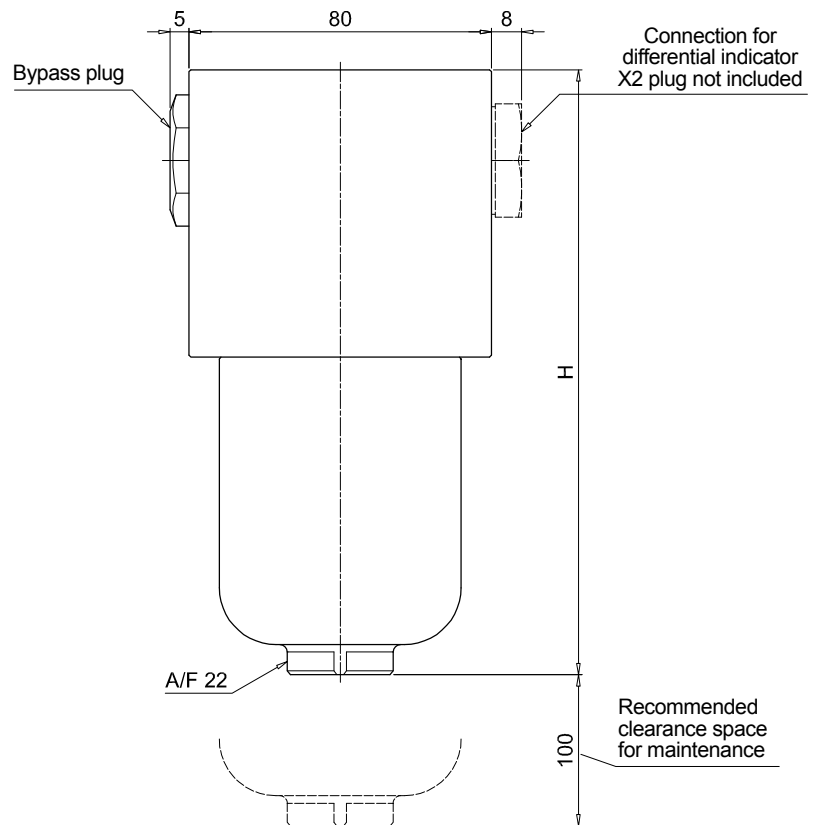
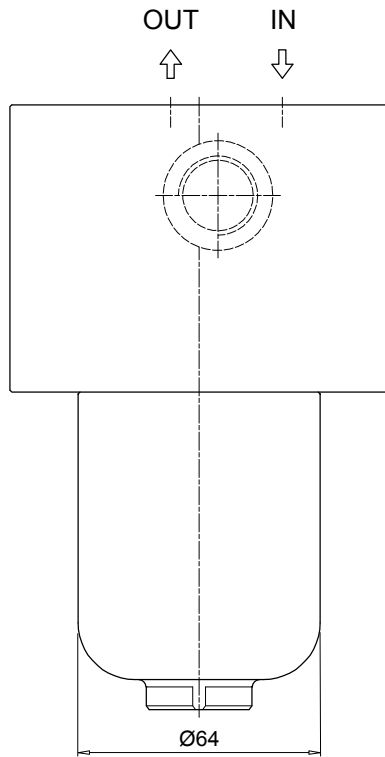
Element series and size HP039	Configuration example: HP039	3	A10	A	S	P01
Element length		2 3 4				
Filtration rating (filter media)						
A03	Inorganic microfiber 3 µm					
A06	Inorganic microfiber 6 µm					
A10	Inorganic microfiber 10 µm					
A16	Inorganic microfiber 16 µm					
A25	Inorganic microfiber 25 µm					

Seals	Element Δp	Execution
A NBR	R 20 bar	P01 MP Filtri standard
V FPM	S 210 bar	Pxx Customized
F MFQ	U 210 bar, stainless steel filter element	

ACCESSORIES

Differential indicators	page		page
DEH Hazardous area electronic differential indicator	642	DVX Visual differential indicator	643
DEX Electrical differential indicator	643	DVY Visual differential indicator	644
DLX Electrical / visual differential indicator	643		
Additional features	page		
X2 Plug	644		

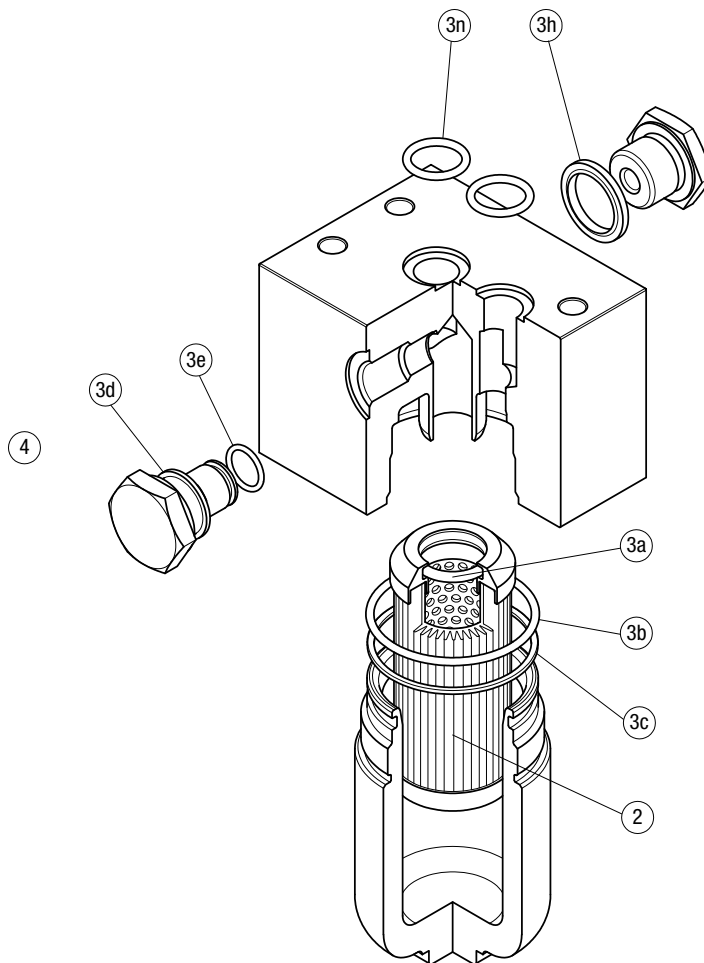
FZM039	
Filter length	H [mm]
2	160
3	203
4	247



FZM SPARE PARTS

Order number for spare parts

FZM 039



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
FZM 039	See order table	02050651	02050652	X2H	X2V

FZB series

Maximum working pressure up to 32 Mpa (320 bar) - Flow rate up to 70 l/min



Description

Technical data

Stainless steel high pressure filters

Manifold

Maximum working pressure up to 32 Mpa (320 bar)
Flow rate up to 70 l/min

FZB is a range of stainless steel high pressure filter for protection of sensitive components in high pressure hydraulic systems placed in difficult environmental conditions.

They are directly connected to the side of the manifold, through the proper flanged interface.

Available features:

- Manifold connections up to Ø16 mm, for a maximum flow rate of 70 l/min
- Fine filtration rating, to get a good cleanliness level into the system
- Bypass valve, to relieve excessive pressure drop across the filter media
- Low collapse filter element with external support "R", for filter element protection against the back pressure caused by the check valve or the reverse flow in filters provided with the bypass valve
- High collapse filter element with external support "S", for filter element protection against the back pressure caused by the check valve or the reverse flow in filters not provided with the bypass valve
- High collapse filter element "U", for use with aggressive fluids
- Visual, electrical and electronic differential clogging indicators

Common applications:

- Off-shore equipment
- Water filtration systems
- Systems with strong or corrosive environmental conditions
- Systems with corrosive fluids

Filter housing materials

- Head: AISI 316L
- Housing: AISI 316L
- Bypass valve: AISI 316L

Seals

- Standard NBR series A (-25 °C to +110 °C)
- Optional FPM series V (-20 °C to +120 °C)
- Optional MFQ series F (-50 °C to +120 °C)

Bypass valve

Opening pressure 6 bar ±10%

Temperature

From -50 °C to +120 °C

Note

FZB filters are provided for vertical mounting

Δp element type

Fluid flow through the filter element from OUT to IN

Microfibre filter elements - series R: 20 bar.

Element series "R":

- End cap: Nylon
- Core tube: Tinned Steel
- External/Internal support: Wire mesh Epox painted
- Media/Support/Pre-filter: Microfibre/Syntetic

Microfibre filter elements - series S: 210 bar.

Element series "S":

- End cap: Tinned Steel
- Core tube: Tinned Steel
- External support: Wire mesh Epox painted
- Internal support: Wire mesh Stainless Steel
- Media/Support/Pre-filter: Microfibre/Syntetic

Stainless Steel Microfibre filter elements series U: 210 bar.

Element series "U":

- End cap: Stainless Steel
- Core tube: Stainless Steel
- External support: Stainless Steel
- Internal support: Stainless Steel
- Media/Support/Pre-filter: Microfibre/Syntetic



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]				Volumes [dm ³]					
	Length	1	2	3	4	Length	1	2	3	4
FZB 039	-	4.6	5.2	5.7	-	0.19	0.26	0.34		

Filter series	Length	Filter element design - R Series					Filter element design - S Series					Filter element design - U Series				
		A03	A06	A10	A16	A25	A03	A06	A10	A16	A25	A03	A06	A10	A16	A25
FZB 039	2	18	23	39	44	52	18	22	37	40	48	18	22	37	40	48
	3	31	33	47	54	65	28	31	43	46	84	28	31	43	46	84
	4	38	41	56	63	71	34	36	48	62	68	34	36	48	62	68

Maximum flow rate for a complete stainless steel high pressure filter with a pressure drop $\Delta p = 1.5$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

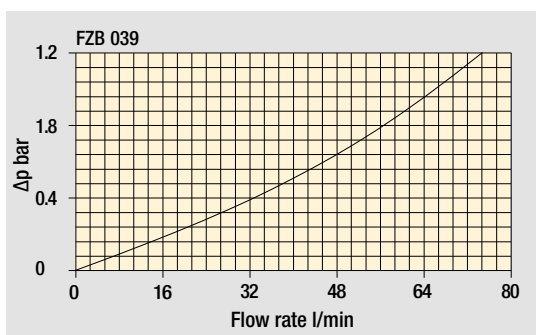
For different pressure drop or fluid viscosity we recommend to use our selection software available on www.mpfiltri.com.

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure.

Please, contact our Sales Department for further additional information.

Hydraulic symbols

Filter series	Style S	Style B	Style T	Style D
FZB 039	•	•	•	•



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

Pressure drop
Filter housings Δp pressure drop

Designation & Ordering code

COMPLETE FILTER

Configuration example: **FZB039** | **2** | **T** | **A** | **F** | **2** | **A06** | **S** | **P01**

Series and size
FZB039

Length
2 | 3 | 4

Valves
S Without bypass
B With bypass 6 bar
T With check valve, without bypass
D With check valve, with bypass 6 bar

Seals
A NBR
V FPM
F MFQ

Connections
F Manifold

Connections for differential indicator
1 Without
2 With connection on the top

Filtration rating (filter media)
A03 Inorganic microfiber 3 µm
A06 Inorganic microfiber 6 µm
A10 Inorganic microfiber 10 µm
A16 Inorganic microfiber 16 µm
A25 Inorganic microfiber 25 µm

Element Δp	Valves				Execution
	S	B	T	D	
R 20 bar		•		•	P01 MP Filtri standard
S 210 bar	•		•		Pxx Customized
U 210 bar, stainless steel filter element	•	•	•	•	

FILTER ELEMENT

Configuration example: **HP039** | **2** | **A06** | **A** | **S** | **P01**

Element series and size
HP039

Element length
2 | 3 | 4

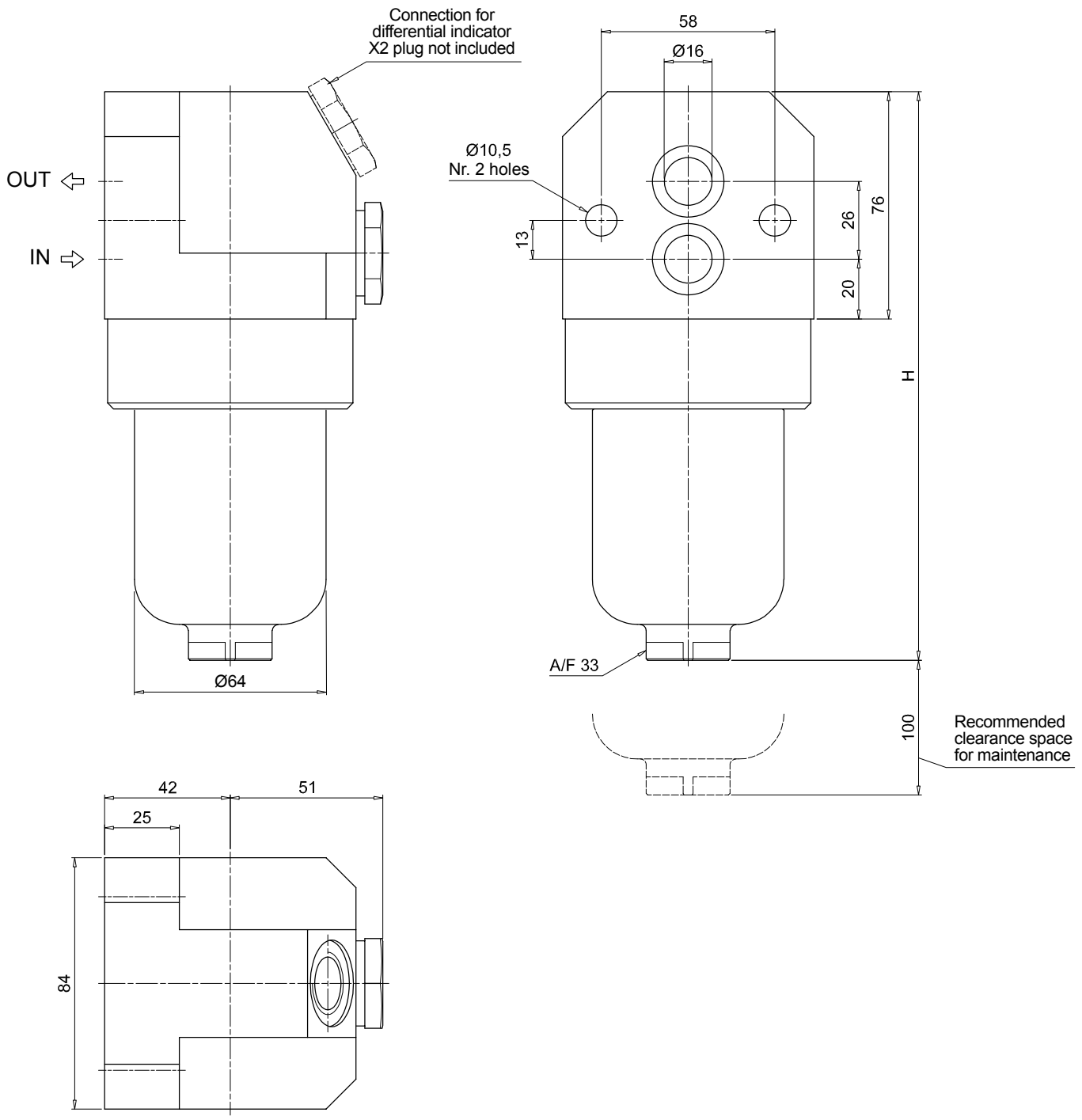
Filtration rating (filter media)
A03 Inorganic microfiber 3 µm
A06 Inorganic microfiber 6 µm
A10 Inorganic microfiber 10 µm
A16 Inorganic microfiber 16 µm
A25 Inorganic microfiber 25 µm

Seals	Element Δp	Execution
V FPM	S 210 bar	Pxx Customized
F MFQ	U 210 bar, stainless steel filter element	

ACCESSORIES

Differential indicators	page		page
DEH Hazardous area electronic differential indicator	642	DVX Visual differential indicator	643
DEX Electrical differential indicator	643	DVY Visual differential indicator	644
DLX Electrical / visual differential indicator	643		
Additional features	page		
X2 Plug	644		

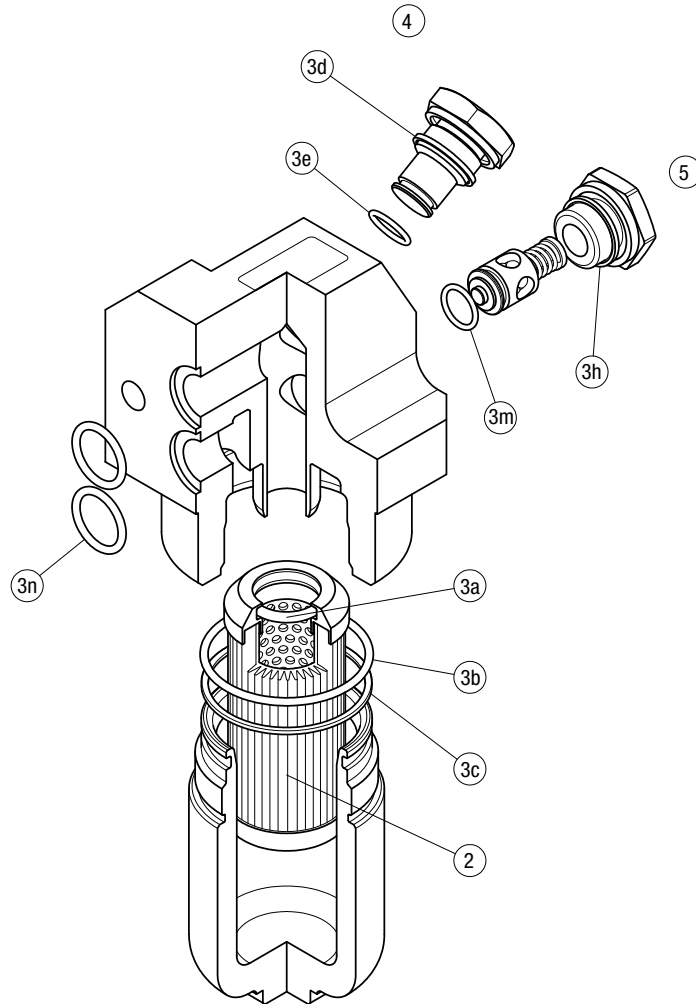
FZB039	
Filter length	H [mm]
2	190
3	233
4	277



FZB SPARE PARTS

Order number for spare parts

FZB 039



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 1 pc.		Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug		Bypass assembly / plug	
		NBR	FPM	NBR	FPM	NBR	FPM
FZB 039	See order table	02050647	02050648	X2H	X2V	02001286	02001295

FZD series

Maximum working pressure up to 35 Mpa (350 bar) - Flow rate up to 60 l/min



Description

Technical data

Stainless steel high pressure filters

Duplex

Maximum working pressure up to 35 Mpa (350 bar)
Flow rate up to 60 l/min

FZD is a range of stainless steel high pressure duplex filter with integrated changeover function to allow the filter element replacement without the system shut-down. They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Female threaded connections up to 3/4", for a maximum flow rate of 60 l/min
- Fine filtration rating, to get a good cleanliness level into the system
- Balancing valve, available for FZD051, to equalize the housing pressure before the switch.
- Bypass valve, to relieve excessive pressure drop across the filter media
- Vent ports, to avoid air trapped into the filter going into the system
- Drain ports, to remove the fluid from the housing prior the maintenance work
- High collapse filter element "H", for use with filters not provided with bypass valve
- Low collapse filter element with external support "R", for filter element protection against the back pressure caused by the check valve or the reverse flow in filters provided with the bypass valve
- High collapse filter element with external support "S", for filter element protection against the back pressure caused by the check valve or the reverse flow in filters not provided with the bypass valve
- High collapse filter element "U", for use with aggressive fluids
- Visual, electrical and electronic differential clogging indicators

Common applications:

- System where shut-down causes high costs
- System where shut-down causes safety issues

Filter housing materials

- Head: AISI 316L
- Housing: AISI 316L
- Bypass valve: AISI 316L

Seals

- Standard NBR series A (-25 °C to +110 °C)
- Optional FPM series V (-20 °C to +120 °C)
- Optional MFQ series F (-50 °C to +120 °C)

Bypass valve

Opening pressure 6 bar \pm 10%

Temperature

From -50 °C to +120 °C

Note

FZD filters are provided for vertical mounting

Δp element type

Fluid flow through the filter element from OUT to IN

Microfibre filter elements - series R: 20 bar.

Element series "R":

- End cap: Nylon
- Core tube: Tinned Steel
- External/Internal support: Wire mesh Epoxy painted
- Media/Support/Pre-filter: Microfibre/Synthetic

Microfibre filter elements - series H-S: 210 bar.

Element series "H - S":

- End cap: Tinned Steel
- Core tube: Tinned Steel
- External support: Wire mesh Epoxy painted
- Internal support: Wire mesh Stainless Steel
- Media/Support/Pre-filter: Microfibre/Synthetic

Stainless Steel Microfibre filter elements series U: 210 bar.

Element series "U":

- End cap: Stainless Steel
- Core tube: Stainless Steel
- External support: Stainless Steel
- Internal support: Stainless Steel
- Media/Support/Pre-filter: Microfibre/Synthetic



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]					Volumes [dm ³]							
	Length	1	2	3	4	5	Length	1	2	3	4	4	
FZD 010	-	-	7.9	-	-	-	-	-	0.10	-	-	-	-
FZD 021	-	-	9.6	9.8	10.3	-	-	-	0.06	0.12	0.22	-	-
FZD 051	-	-	17.4	18.0	19.0	20.3	-	-	0.31	0.41	0.53	0.83	-

Filter series	Length	Filter element design - H Series					Filter element design - U Series				
		A03	A06	A10	A16	A25	A03	A06	A10	A16	A25
FZD 010	2	4	5	7	8	11	4	5	7	8	11
	3	5	6	11	12	16	5	6	11	12	16
FZD 021	3	9	11	16	18	20	9	11	16	18	20
	4	10	12	17	19	21	10	12	17	19	21

Filter series	Length	Filter element design - R Series					Filter element design - S Series					Filter element design - U Series				
		A03	A06	A10	A16	A25	A03	A06	A10	A16	A25	A03	A06	A10	A16	A25
FZD 051	2	39	41	51	54	59	35	37	48	51	58	35	37	48	51	58
	3	45	46	54	56	61	41	43	52	54	60	41	43	52	54	60
	4	50	52	58	58	62	47	49	56	56	61	47	49	56	56	61
	5	56	57	61	62	63	53	53	57	59	63	53	53	57	59	63

Maximum flow rate for a complete stainless steel high pressure filter with a pressure drop $\Delta p = 1.5$ bar.

The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) and a density of 0.86 kg/dm³.

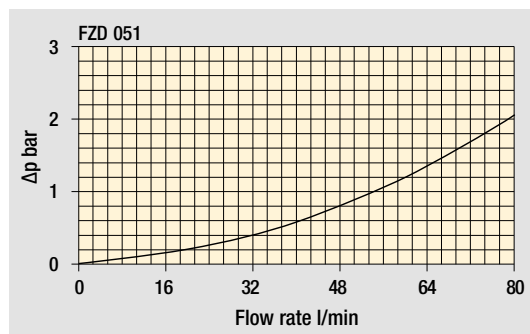
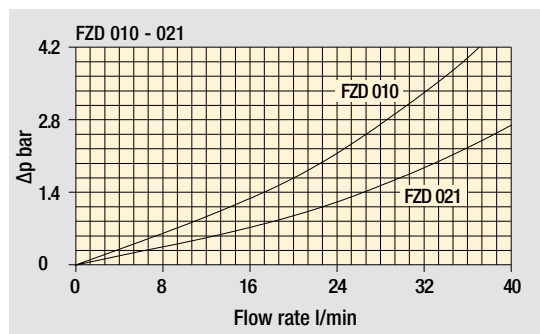
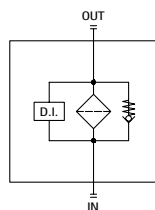
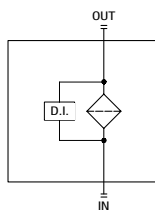
For different pressure drop or fluid viscosity we recommend to use our selection software available on www.mpfiltri.com.

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure.

Please, contact our Sales Department for further additional information.

Hydraulic symbols

Filter series	Style S	Style B
FZD 010	•	
FZD 021	•	
FZD 051	•	•



Pressure drop 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.

Designation & Ordering code

COMPLETE FILTER

Series and size		Configuration example: FZD021 4 S A G1 A06 H P01									
FZD010 FZD021											
Length	FZD010	FZD021									
2	•	•									
3		•									
4		•									
Valves											
S Without bypass											
Seals											
A NBR											
V FPM											
Connections	FZD010	FZD021									
G1	G 3/8"	G 1/2"									
G2	3/8" NPT	1/2" NPT									
G3	-	SAE 8 - 3/4" - 16 UNF									
Filtration rating (filter media)											
A03	Inorganic microfiber	3 µm									
A06	Inorganic microfiber	6 µm									
A10	Inorganic microfiber	10 µm									
A16	Inorganic microfiber	16 µm									
A25	Inorganic microfiber	25 µm									
Element Δp											
H 210 bar											
U 210 bar, stainless steel filter element											
Execution											
P01 MP Filtri standard											
Pxx Customized											

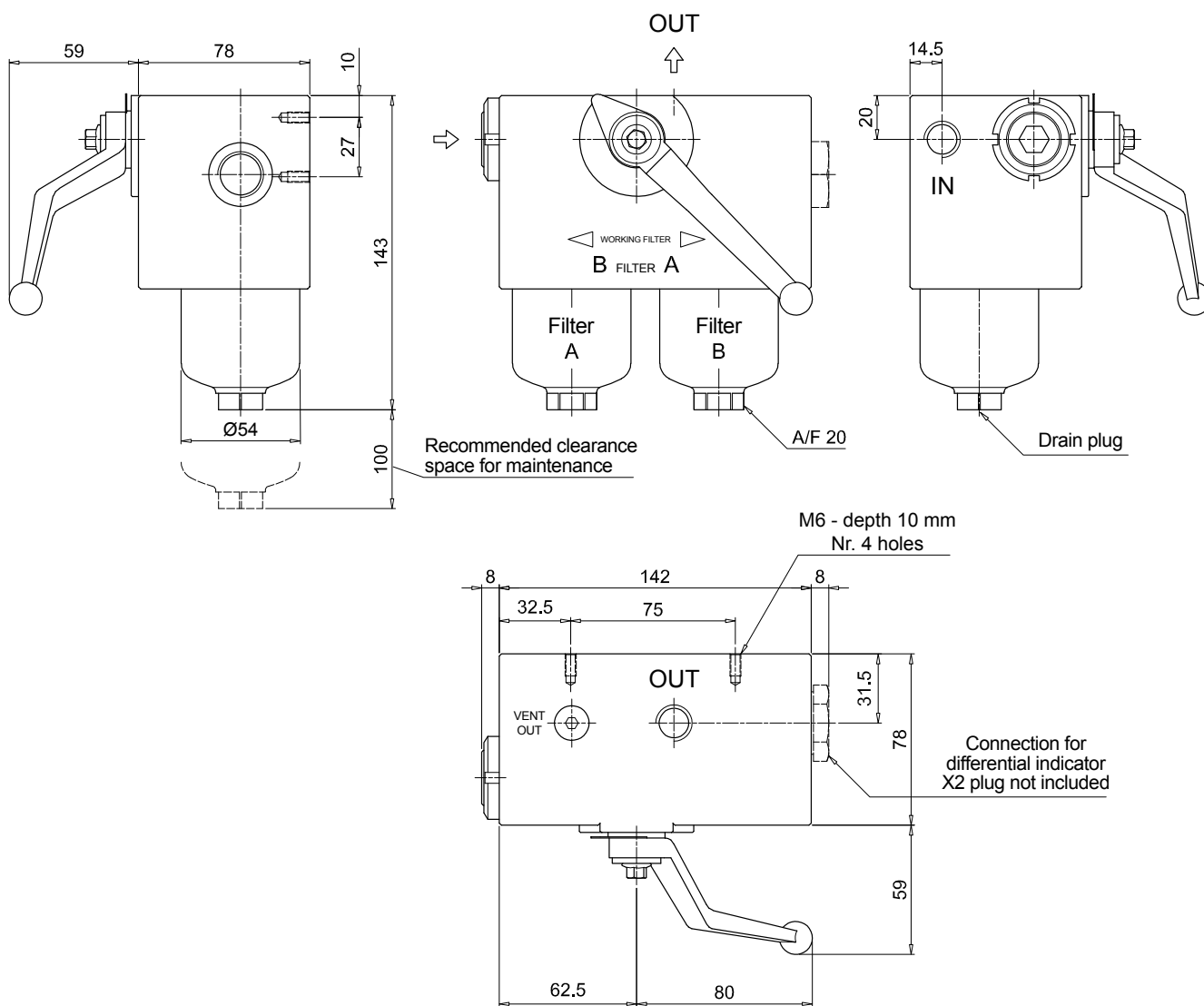
FILTER ELEMENT

Element series and size		Configuration example: HP011 4 A06 A H P01									
Element length	HP010	HP011									
2	•	•									
3		•									
4		•									
Filtration rating (filter media)											
A03	Inorganic microfiber	3 µm									
A06	Inorganic microfiber	6 µm									
A10	Inorganic microfiber	10 µm									
A16	Inorganic microfiber	16 µm									
A25	Inorganic microfiber	25 µm									
Seals											
A NBR											
V FPM											
Element Δp											
H 210 bar											
U 210 bar, stainless steel filter element											
Execution											
P01 MP Filtri standard											
Pxx Customized											

ACCESSORIES

Differential indicators	page		page
DEH Hazardous area electronic differential indicator	642	DVX Visual differential indicator	643
DEX Electrical differential indicator	643	DVY Visual differential indicator	644
DLX Electrical / visual differential indicator	643		
Additional features	page		
X2 Plug	644		

FZD010

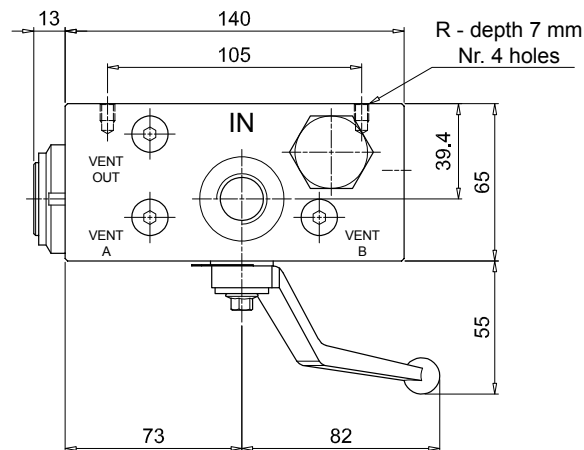
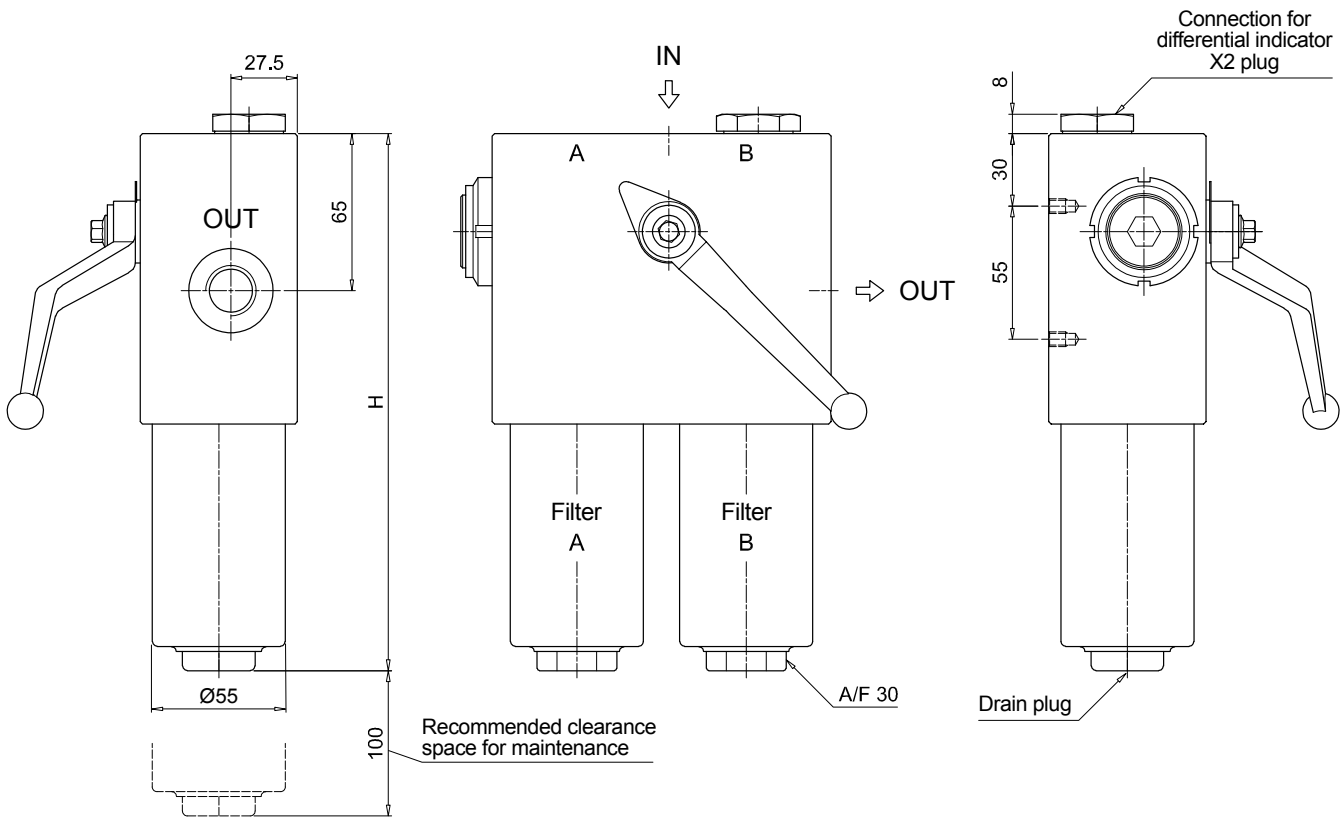


Dimensions

FZD021

Filter length	H [mm]
2	172
3	222
4	272

Connections	R
G1	M6
G2 - G3	1/4" UNC



Designation & Ordering code

COMPLETE FILTER

Series and size FZD051	Configuration example: FZD051 3 B A G3 A03 U P01																		
Length 2 3 4 5																			
Valves S Without bypass B With bypass 6 bar																			
Seals A NBR V FPM																			
Connections G1 G 3/4" G2 3/4" NPT G3 G 1/2" G4 1/2" NPT G5 SAE 8 - 3/4" - 16 UNF G6 SAE 12 - 1 1/16" - 12 UN																			
Filtration rating (filter media) A03 Inorganic microfiber 3 µm A06 Inorganic microfiber 6 µm A10 Inorganic microfiber 10 µm A16 Inorganic microfiber 16 µm A25 Inorganic microfiber 25 µm																			
	<table border="1"> <thead> <tr> <th rowspan="2">Element Δp</th> <th colspan="2">Valves</th> <th rowspan="2">Execution</th> </tr> <tr> <th>S</th> <th>B</th> </tr> </thead> <tbody> <tr> <td>R 20 bar</td> <td></td> <td>•</td> <td>P01 MP Filtri standard</td> </tr> <tr> <td>S 210 bar</td> <td>•</td> <td></td> <td>Pxx Customized</td> </tr> <tr> <td>U 210 bar, stainless steel filter element</td> <td>•</td> <td>•</td> <td></td> </tr> </tbody> </table>	Element Δp	Valves		Execution	S	B	R 20 bar		•	P01 MP Filtri standard	S 210 bar	•		Pxx Customized	U 210 bar, stainless steel filter element	•	•	
Element Δp	Valves		Execution																
	S	B																	
R 20 bar		•	P01 MP Filtri standard																
S 210 bar	•		Pxx Customized																
U 210 bar, stainless steel filter element	•	•																	

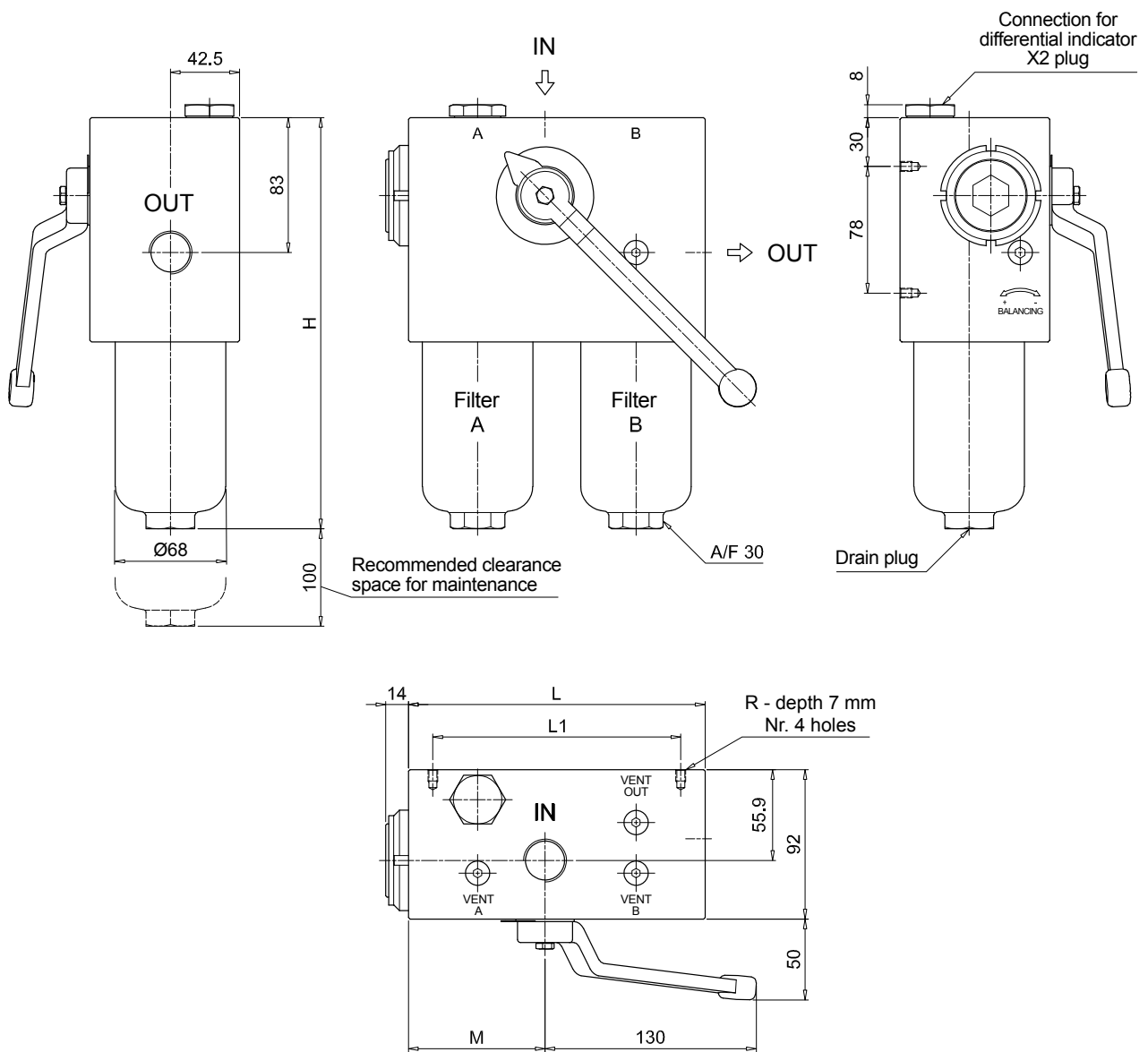
FILTER ELEMENT

Element series and size HP050	Configuration example: HP050 3 A03 A U P01												
Element length 2 3 4 5													
Filtration rating (filter media) A03 Inorganic microfiber 3 µm A06 Inorganic microfiber 6 µm A10 Inorganic microfiber 10 µm A16 Inorganic microfiber 16 µm A25 Inorganic microfiber 25 µm													
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Seals	Element Δp				Execution								
		A NBR	R 20 bar	P01 MP Filtri standard									
V FPM	S 210 bar	Pxx Customized											
	U 210 bar, stainless steel filter element												

ACCESSORIES

Differential indicators	page		page
DEH Hazardous area electronic differential indicator	642	DVX Visual differential indicator	643
DEX Electrical differential indicator	643	DVY Visual differential indicator	644
DLX Electrical / visual differential indicator	643		
Additional features	page		
X2 Plug	644		

FZD051			
Filter length	H [mm]		
2	253		
3	295		
4	343		
5	465		
Connections	R		
G1	M6		
G2	1/4" UNC		
G3	M6		
G4-G5-G6	1/4" UNC		
Valves	L [mm]	L1 [mm]	M [mm]
S	168	138	84
B	182.5	152.5	98.5

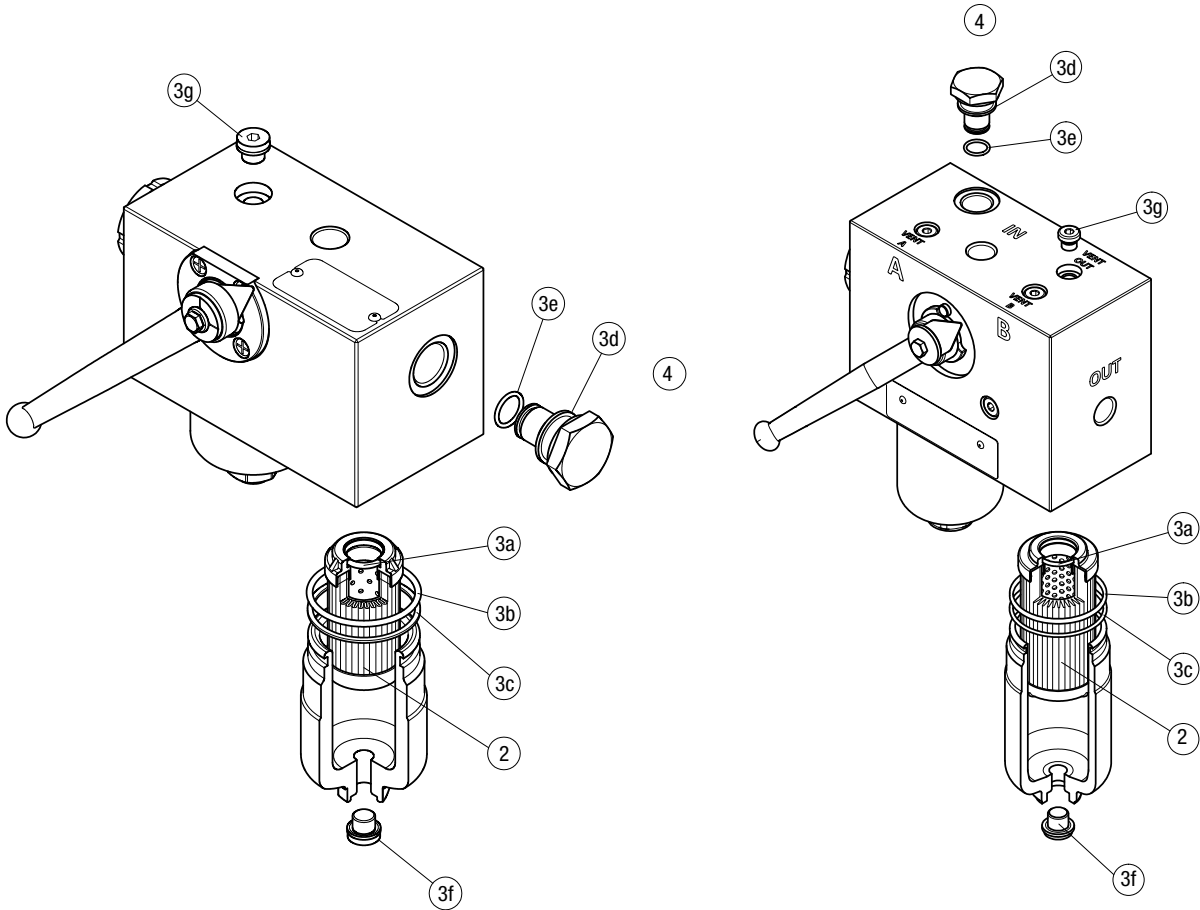


FZD SPARE PARTS

Order number for spare parts

FZD 010

FZD 021 - FZD 051



Item:	Q.ty: 1 pc.		Q.ty: 1 pc.		Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug		
FZD 010	See order table	NBR	FPM	NBR	FPM	
		02050613	02050655			
FZD 021		02050796	02050797	X2H	X2V	
FZD 051		02050800	02050801			

Clogging indicators

Differential indicators

Introduction

Filter elements are efficient only if their Dirt Holding Capacity is fully exploited. This is achieved by using filter housings equipped with clogging indicators.

These devices trip when the clogging of the filter element causes an increase in pressure drop across the filter element.

The indicator is set to alarm before the element becomes fully clogged.

MP Filtri can supply indicators of the following designs:

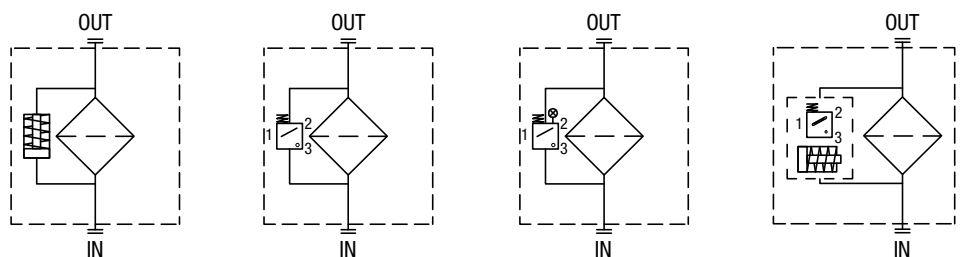
- Vacuum switches and gauges
- Pressure switches and gauges
- Differential pressure indicators

These type of devices can be provided with a visual, electrical or both signals.

Suitable indicator types

DIFFERENTIAL INDICATORS

Differential indicators are used on the Pressure line to check the efficiency of the filter element. They measure the pressure upstream and downstream of the filter element (differential pressure). Standard items are produced with special connection G 1/2" size. Also available in Stainless Steel models.



Quick reference guide

Filter series	Visual indicator	Electrical indicator	Electrical / Visual indicator	Hazardous area electronic indicator NEW
With bypass valve FZH 010 - 011 - 039 FZP 039 - 136 FZX 011 FZB 039 FZM 039 FZD 051	DVX50xP01 DVY50xP01	DEX50xA50P01	DLX50xA51P01 DLX50xA52P01	DEH50xA48P01 DEH50xA49P01 DEH50xA70P01 DEH70xA48P01 DEH70xA49P01 DEH70xA70P01 DEH95xA48P01 DEH95xA49P01 DEH95xA70P01
Without bypass valve FZH 010 - 011 - 039 FZP 039 - 136 FZB 039 FZM 039 FZD 010 - 021 - 051	DVX70xP01 DVY70xP01	DEX70xA50P01	DLX70xA51P01 DLX70xA52P01	DEH50xA48P01 DEH50xA49P01 DEH50xA70P01 DEH70xA48P01 DEH70xA49P01 DEH70xA70P01 DEH95xA48P01 DEH95xA49P01 DEH95xA70P01

DIFFERENTIAL INDICATORS

Dimensions

DEH*48	
Hazardous Area Electronic Differential Indicator	
Settings	Ordering code
5.0 bar ±10%	DE H 50 x A 48 P01
7.0 bar ±10%	DE H 70 x A 48 P01

Hydraulic symbol

Electrical symbol

Certification / Approvals:
ATEX, IECEx, EAC TR CU, INMETRO
- Certification included as standard

Materials

- Body: AISI 316L
- Contacts: Rhodium
- Seal: FPM - MFQ

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -60 °C to +125 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Protection class: EX ia IIC T4/T6: Intrinsically safe
- Temperature class: T4 (135 °C) and T6 (85 °C)
- Degree of protection: IP 66/67/68 according to EN 60529
- Connection type: Three-core cable, fitting M20x1.5
- Contact type: SPCO/SPDT (Hermetically sealed - Volt-free contacts)

Electrical data

- Resistive Load: 830 mA / 24 Vdc - 180 mA / 110 Vac
- Electrical Ratings: Ui = 30 Vdc
li = 250 mA
Pi = 1.3 W

DEH*49	
Hazardous Area Electronic Differential Indicator	
Settings	Ordering code
5.0 bar ±10%	DE H 50 x A 49 P01
7.0 bar ±10%	DE H 70 x A 49 P01

Hydraulic symbol

Electrical symbol

Certification / Approvals:
ATEX, IECEx, EAC TR CU, INMETRO, UL/CSA Class I Division 1 Groups A-D, UL/CSA Class II Division 1 Groups E-G
- Certification included as standard

Materials

- Body: AISI 316L
- Contacts: Rhodium
- Seal: FPM - MFQ

Technical data

- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -60 °C to +120 °C :
ATEX, IECEx, EAC TR CU, INMETRO
From -60 °C to +105 °C : UL/CSA
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Protection class: Ex d IIC T4/T6: Flameproof
- Temperature class: T4 (135 °C) and T6 (85 °C)
- Degree of protection: IP 66/67/68 according to EN 60529
- Connection type: Four-core cable, fitting 1/2" NPT
- Contact type: SPCO/SPDT (Hermetically sealed - Volt-free contacts)

Electrical data

- Resistive Load: 830 mA / 24 Vdc - 180 mA / 110 Vac
- Max voltage: 150 Vac/dc
- Power: 20 W

DEH*70	
Hazardous Area Electronic Differential Indicator	
Settings	Ordering code
5.0 bar ±10%	DE H 50 x A 70 P01
7.0 bar ±10%	DE H 70 x A 70 P01

Hydraulic symbol

Electrical symbol

Certification / Approvals:
ATEX, IECEx, EAC TR CU, INMETRO
- Certification included as standard

Materials

- Body: AISI 316L with internal engineered resin switch
- Contacts: Rhodium
- Seal: FPM - MFQ

Technical data

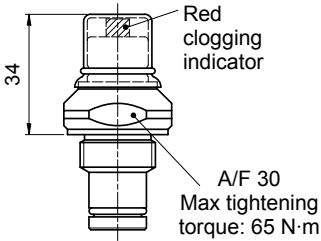
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -60 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Protection class: EX ia IIC T6: Intrinsically safe
- Temperature class: T6 (85 °C)
- Degree of protection: IP 66/67 according to EN 60529
- Connection type: IEC 61076-2-101 D (M12)
- Contact type: SPCO/SPDT (Hermetically sealed - Volt-free contacts)

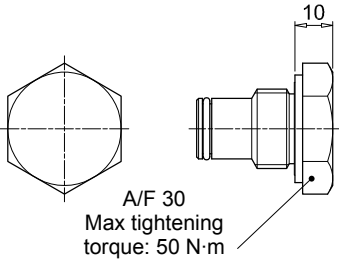
Electrical data

- Resistive Load: 830 mA / 24 Vdc - 180 mA / 110 Vdc
- Electrical Ratings: Ui = 30 Vdc
li = 250 mA
Pi = 1.3 W

DIFFERENTIAL INDICATORS

Dimensions

DVY		Hydraulic symbol	Materials - Body: AISI 316L - Internal parts: AISI 316L - Nylon - Contacts: Silver - Seal: HNBR - MFQ Technical data - Reset: Manual reset - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP65 according to EN 60529
Visual Differential Indicator			
Settings	Ordering code		
5.0 bar ±10%	DV Y 50 x P01		
7.0 bar ±10%	DV Y 70 x P01		
9.5 bar ±10%	DV Y 95 x P01		
			

X2		Materials
Indicator plug		
Seal	Ordering code	
HNBR	X2 H	
MFQ	X2 F	
		

DESIGNATION & ORDERING CODE - DIFFERENTIAL INDICATORS

Series
DE Electrical differential indicator
DL Electrical / Visual differential indicator
DV Visual differential indicator

Configuration example 1:	DE	H	50	F	A	48	P01
Configuration example 2:	DL	X	50	H	A	51	P01
Configuration example 3:	DV	Y	70	V			P01

Type	DE	DL	DV
H Hazardous area	•		
X Standard type	•	•	•
Y Optional type			•

Pressure setting	DEH	DEX	DL	DV
50 5.0 bar	•	•	•	•
70 7.0 bar	•	•	•	•
95 9.5 bar		•	•	•

Seals	DEH	DEX	DL	DV
H HNBR		•	•	•
V FPM	•	•	•	•
F MFQ	•			

Thermostat	DEH	DEX	DL	DV
A Without	•	•	•	

Electrical connections	DEH	DEX	DL	DV
48 Connection via three-core cable - fitting M20x1.5				•
49 Connection via four-core cable - fitting 1/2" NPT				•
50 Connection EN 175301-803		•		
51 Connection EN 175301-803, transparent base with lamps 24 Vdc			•	
52 Connection EN 175301-803, transparent base with lamps 110 Vdc			•	
70 Connection IEC 61076-2-101 D (M12)	•			

Option
P01 MP Filtri standard
Pxx Customized

DESIGNATION & ORDERING CODE - DIFFERENTIAL INDICATOR PLUG

Series
X2 Indicator plug

Configuration example: X2 H

Seals
H HNBR
V FPM
F MFQ

Clogging indicators are devices that check the life time of the filter elements. They measure the pressure drop through the filter element directly connected to the filter housing.

These devices trip when the clogging of the filter element causes a pressure drop increasing across the filter element.

Filter elements are efficient only if their Dirt Holding Capacity is fully exploited.

This is achieved by using filter housings equipped with clogging indicators.

The indicator is set to alarm before the element becomes fully clogged.

MP Filtri can supply indicators of the following designs:

- Vacuum switches and gauges**
- Pressure switches and gauges**
- Differential pressure indicators**

These type of devices can be provided with a visual, electrical or both signals.

The electronic differential pressure clogging indicator is also available.

It provides both analogical 4-20 mA output and digital warning (75% of clogging) and alarm (clogging) outputs.

Clogging Indicators



Clogging indicators



Suitable indicator types

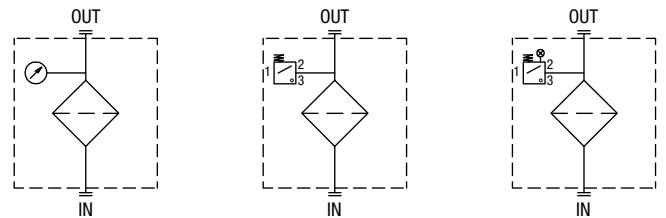
VACUUM INDICATORS

Vacuum indicators are used on the Suction line to check the efficiency of the filter element.

They measure the pressure downstream of the filter element.

Standard items are produced with R 1/4" EN 10226 connection.

Available products with R 1/8" EN 10226 to be fitted on MPS series.

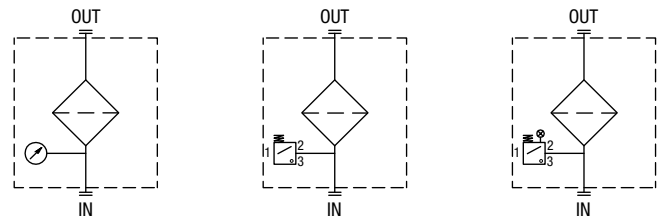


BAROMETRIC INDICATORS

Pressure indicators are used on the Return line to check the efficiency of the filter element.

They measure the pressure upstream of the filter element.

Standard items are produced with R 1/8" EN 10226 connection.



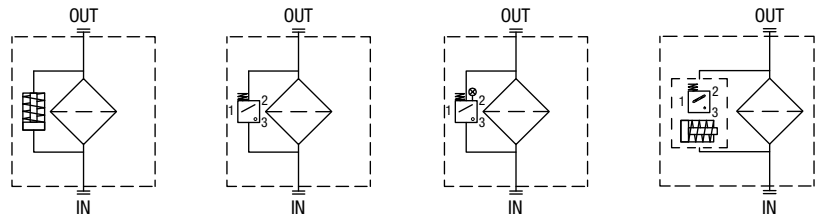
DIFFERENTIAL INDICATORS

Differential indicators are used on the Pressure line to check the efficiency of the filter element.


They measure the pressure upstream and downstream of the filter element (differential pressure).

Standard items are produced with special connection G 1/2" size.

Also available in Stainless Steel models.



Filter family	Filter series	Electrical indicator	Electrical / Visual indicator	Electronic indicator	Visual indicator
SUCTION FILTERS	ELIXIR® SFEX060-080-110-160	VEB21AA50P01	VLB21AA51P01 VLB21AA52P01 VLB21AA53P01 VLB21AA71P01		VVB16P01 VVS16P01
	SF2 250 - 350 SF2 500 - 501 - 503 - 504 - 505 SF2 510 - 535 - 540	VEA21AA50P01	VLA21AA51P01 VLA21AA52P01 VLA21AA53P01 VLA21AA71P01		VVA16P01 VVR16P01
RETURN FILTERS	With bypass valve ELIXIR® RFEX060-080-110-160	BEA15HA50P01 BEM15HA41P01	BLA15HA51P01 BLA15HA52P01 BLA15HA53P01 BLA15HA71P01		BVA14P01 BVR14P01 BVP15HP01 BVQ15HP01
	Without bypass valve ELIXIR® RFEX060-080-110-160	BEA20HA50P01 BEM20HA41P01	BLA20HA51P01 BLA20HA52P01 BLA20HA53P01 BLA20HA71P01		BVA25P01 BVR25P01 BVP20HP01 BVQ20HP01
	With bypass valve MPFX-MPTX-MPF-MPT - bypass 1.75 bar MPH - bypass 1.75 bar RF2250 - RF2350 - bypass 1.75 bar	BEA15HA50P01 BEM15HA41P01	BLA15HA51P01 BLA15HA52P01 BLA15HA53P01 BLA15HA71P01		BVA14P01 BVR14P01 BVP15HP01 BVQ15HP01
	With bypass valve MPFX-MPTX-MPF-MPT - bypass 3 bar MPH - bypass 2.5 bar FRI 255 RF2250 - RF2350 - bypass 3 bar	BEA20HA50P01 BEM20HA41P01	BLA20HA51P01 BLA20HA52P01 BLA20HA53P01 BLA20HA71P01		BVA25P01 BVR25P01 BVP20HP01 BVQ20HP01
MPLX FRI 025 - 040 - 100 - 250 - 630 - 850	DEA20xA50P01 DEM20xA10P01 DEM20xA20P01 DEM20xA30P01 DEM20xA35P01	DLA20xA51P01 DLA20xA52P01 DLA20xA71P01 DLE20xA50P01 DLE20xF50P01	DTA20xF70P01	DVA20xP01 DVM20xP01	
RETURN / SUCTION FILTERS	Suction line MRSX 116 - 165 - 166	VEB21AA50P01	VLB21AA51P01 VLB21AA52P01 VLB21AA53P01 VLB21AA71P01		VVB16P01 VVS16P01
	Return line MRSX 116 - 165 - 166 LMP 124 MULTIPORT	BEA25HA50P01 BEM25HA41P01 BET25HF10P01 BET25HF30P01 BET25HF50P01	BLA25HA51P01 BLA25HA52P01 BLA25HA53P01 BLA25HA71P01		BVA25P01 BVR25P01 BVP20HP01 BVQ20HP01
SPIN-ON FILTERS	Suction line MPS 050 - 070 - 100 - 150 MPS 200 - 250 - 300 - 350	VEB21AA50P01	VLB21AA51P01 VLB21AA52P01 VLB21AA53P01 VLB21AA71P01		VVB16P01 VVS16P01
	Return line MPS 050 - 070 - 100 - 150 MPS 200 - 250 - 300 - 350	BEA15HA50P01 BEM15HA41P01	BLA15HA51P01 BLA15HA52P01 BLA15HA53P01 BLA15HA71P01		BVA14P01 BVR14P01 BVP20HP01 BVQ20HP01
	In-line MPS 051 - 071 - 101 - 151 MPS 301 - 351 MSH 050 - 070 - 100 - 150	DEA12xA50P01 DEM12xAxxP01	DLA12xA51P01 DLA12xA52P01 DLA12xA71P01 DLE12xA50P01 DLE12xF50P01 DLE20xF50P01 DLE20xF50P01	DTA12xA70P01 DTA12xF70P01 DTA20xA70P01 DTA20xF70P01	DVA12xP01 DVM12xP01

Filter family	Filter series	Electrical indicator	Electrical / Visual indicator	Electronic indicator	Visual indicator	Hazardous area electronic indicator 		
LOW & MEDIUM PRESSURE FILTERS	With bypass valve	ELIXIR® LFEX060-080-110-160	DES25HA10P01 DES25HA30P01 DES25HA80P01			DVS25HP01		
	Without bypass valve	ELIXIR® LFEX060-080-110-160	DES40HA10P01 DES40HA30P01 DES40HA80P01			DVS40HP01		
		LMP 110 - 112 - 116 - 118 - 119 MULTIPORT LMP 120 - 122 - 123 MULTIPORT LMP 210 - 211 - LDP				DVS25HP01 DVS40HP01		
	With bypass valve	LMP 400 - 401 & 430 - 431 LMP 900 - 901 LMP 902 - 903 LMP 950 - 951 LMP 952 - 953 - 954 LMD 211 - 400 - 401 - 431 - 951 - LDD	DEA20xA50P01 DEM20xAxxP01	DLA20xA51P01 DLA20xA52P01 DLA20xA71P01 DLE20xA50P01 DLE20xF50P01	DTA20xF70P01	DVA20xP01 DVM20xP01		
	Without bypass valve	LMP 110 - 112 - 116 - 118 - 119 MULTIPORT LMP 120 - 122 - 123 MULTIPORT LMP 210 - 211 - LDP LMP 400 - 401 & 430 - 431 LMP 900 - 901 LMP 902 - 903 LMP 950 - 951 LMP 952 - 953 - 954 LMD 211 - 400 - 401 - 431 - 951 - LDD	DEA50xA50P01 DEM50xAxxP01	DLA50xA51P01 DLA50xA52P01 DLA50xA71P01 DLE50xA50P01 DLE50xF50P01	DTA50xF70P01	DVA50xP01 DVM50xP01		
	HIGH PRESSURE FILTERS	With bypass valve	FMP 039 - 065 - 135 - 320 FHP 010 - 011 - 065 - 135 - 350 - 500 FMM 050 - 150 FHA 051 FHM 006 - 007 - 010 - 050 - 065 - 135 - 320 - 500 FHB 050 - 065 - 135 - 320 FHF 325 FHD 021 - 051 - 326 - 333	DEA50xA50P01 DEM50xAxxP01	DLA50xA51P01 DLA50xA52P01 DLA50xA71P01 DLE50xA50P01 DLE50xF50P01	DTA50xF70P01	DVA50xP01 DVM50xP01	DEH50xA48P01 DEH50xA49P01 DEH50xA70P01 DEH70xA48P01 DEH70xA49P01 DEH70xA70P01
		Without bypass valve	FMP 039 - 065 - 135 - 320 FHP 010 - 011 - 065 - 135 - 350 - 500 FMM 050 - 150 FHA 051 FHM 006 - 007 - 010 - 050 - 065 - 135 - 320 - 500 FHB 050 - 065 - 135 - 320 FHF 325 FHD 021 - 051 - 326 - 333	DEA70xA50P01 DEM70xAxxP01 DEA95xA50P01 DEM95xAxxP01	DLA70xA51P01 DLA70xA52P01 DLA70xA71P01 DLE70xA50P01 DLE70xF50P01 DLA95xA51P01 DLA95xA52P01 DLE95xA50P01 DLE95xF50P01	DTA70xF70P01 DTA95xF70P01	DVA70xP01 DVM70xP01 DVA95xP01 DVM95xP01	DEH50xA48P01 DEH50xA49P01 DEH50xA70P01 DEH70xA48P01 DEH70xA49P01 DEH70xA70P01
		With bypass valve	FZH 010 - 011 - 039 FZP 039 - 136 FZX 011 FZB 039 FZM 039 FZD 051	DEX50xA50P01	DLX50xA51P01 DLX50xA52P01		DVX50xP01 DVG50xP01	DEH50xA48P01 DEH50xA49P01 DEH50xA70P01 DEH70xA48P01 DEH70xA49P01 DEH70xA70P01
			Without bypass valve	FZH 010 - 011 - 039 FZP 039 - 136 FZB 039 FZM 039 FZD 010 - 021 - 051	DEX70xA50P01 DEX95xA50P01	DLX70xA51P01 DLX70xA52P01 DLX95xA51P01		DVX70xP01 DVG70xP01 DVG95xP01

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