

**LOW & MEDIUM PRESSURE FILTERS**

**HYDRAULIC  
FILTRATION**

**CATALOGUE**



**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.

# HYDRAULIC FILTRATION PRODUCTS

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30	page	<b>SUCTION FILTERS</b>			up to $Q_{max}$
33	STRC & MPAC	Submerged suction filter, with bypass or magnetic filter			1000 264
40	SFEX	In-line filter with plastic bowl			100 26
51	SFMC	Semi-submerged positive head suction filter, low flow rate			160 42
61	SFSC	Semi-submerged positive head suction filter, high flow rate			700 185
715		CLOGGING INDICATORS			

72	page	<b>RETURN FILTERS</b>		up to $P_{max}$		up to $Q_{max}$
74	RFEX	Return filter, tank mounted filter suitable for all mineral oil and water glycol applications	bar	psi	l/min	gpm
84	MPFX	Tank top semi-immersed filter, standard filter element disassembly	8	116	900	238
112	MPLX	Tank top semi-immersed filter, standard filter element disassembly	10	145	1800	476
120	MPTX	Tank top semi-immersed filter, easy filter element disassembly	8	116	300	79
138	MFBX	Bowl assembly	8	116	700	185
147	MPF	Tank top semi-immersed filter, standard filter element disassembly	8	116	900	238
175	MPT	Tank top semi-immersed filter, easy filter element disassembly	8	116	300	79
193	MFB	Bowl assembly	8	116	700	185
201	MDH	Heavy industrial applications integrated in the tank - air separation	10	145	500	132
209	MPH	Tank top semi-immersed filter, standard filter element disassembly	10	145	3500	925
233	MPI	Tank top semi-immersed filter, standard filter element disassembly	10	145	3500	925
245	FRI	Tank top semi-immersed filter, easy filter element disassembly, it can be used also as in-line filter	20	290	2500	660
261	RF2	Semi-immersed under-head filter, easy filter element disassembly	20	290	615	162
268		ACCESSORIES				
716		CLOGGING INDICATORS				

270	page	<b>RETURN / SUCTION FILTERS</b>		up to $P_{max}$		up to $Q_{max}$
272	MRSX	Unique TANK TOP filter for mobile machinery, with combined filtration on return and suction to the inlet at the hydrostatic transmissions in closed circuit	bar	psi	l/min	gpm
287	LMP 124 MULTIPORT	Unique IN-LINE filter for mobile machinery, with combined filtration on return and suction to the inlet at the hydrostatic transmissions in closed circuit	80	1160	120	32
718		CLOGGING INDICATORS				

294	page	<b>SPIN-ON FILTERS</b>		up to $P_{max}$		up to $Q_{max}$
297	MPS	Low pressure filter, available with single cartridge (CS) for in-line or flange mounting or with two cartridge on the same axis on the opposite sides	bar	psi	l/min	gpm
313	MSH	In-line low and medium pressure filter available with single cartridge (CH)	35	508	195	52
720		CLOGGING INDICATORS				

320 page	LOW & MEDIUM PRESSURE FILTERS	up to P <sub>max</sub>		up to Q <sub>max</sub>		
		bar	psi	l/min	gpm	
322	LFEX	In-line filter with plastic bowl	16	232	300	79
333	LMP 110	In-line low & medium pressure filter, low to medium flow rate	80	1160	165	44
341	LMP 112 - 123 MULTIPORT	In-line filter with Multiport design for multiple choice connection	80	1160	175	46
357	LMP 210 - 211	In-line low & medium pressure filter, low flow rate	60	870	365	96
367	LPH 630	Off-line low pressure filter	10	145	1600	352
375	LMP 400 - 401	In-line low & medium pressure filter, high flow rate	60	870	780	206
383	LMP 430 - 431	In-line low & medium pressure filter, high flow rate	60	870	780	206
391	LMP 950 - 951	In-line filter, available with 2 and up to 6 different heads	30	435	2400	634
399	LMP 952 - 953 - 954	In-line low pressure filter specifically designed to be mounted in series	25	363	4500	1189
411	LMD 211	In-line duplex medium pressure filter	60	870	200	53
419	LMD 400 - 401 & 431	In-line duplex low pressure filter	16	232	600	159
435	LMD 951	In-line duplex filter, available with 2 up to 6 different heads	16	232	1200	317
443	<b>Filter elements designed according to DIN 24550</b>					
445	LDP - LDD	In-line and duplex medium pressure filter	60	870	360	95
455	LMP 900 - 901	In-line low pressure filter	30	435	2000	528
463	LMP 902 - 903	In-line filter specifically designed to be mounted in series	20	290	3000	793
472	ACCESSORIES					
722	CLOGGING INDICATORS					

474 page	HIGH PRESSURE FILTERS	up to P <sub>max</sub>		up to Q <sub>max</sub>		
		bar	psi	l/min	gpm	
476	FMMX	Typical high pressure filter for mobile applications, low flow rate	420	6092	154	41
485	FMM	Typical high pressure filter for mobile applications, low flow rate	420	6092	300	79
495	FHA	Filter optimized for use in high pressure operating systems, low flow rate	560	8122	150	40
503	FMP 039	Filter high pressure, low flow rate applications	110	1595	80	21
511	FMP	Filter high pressure, high flow rate applications	320	4641	500	132
523	FHP	Typical high pressure filter for mobile applications, high flow rate	420	6092	630	166
543	FHM	High pressure filter with intermediate manifold construction	320	4641	400	106
561	FHB	High pressure for block mounting	320	4641	485	128
575	FHF	In-line manifold top mounting according to SAE J2066	350	5076	550	145
585	FHD	In-line duplex high pressure filter	350	5076	250	66
599	HPB	Pressure filter kits for integration in control manifolds	420	6092	300	79
723	CLOGGING INDICATORS					

608 page	STAINLESS STEEL HIGH PRESSURE FILTERS	up to P <sub>max</sub>		up to Q <sub>max</sub>		
		bar	psi	l/min	gpm	
611	FZP	In-line pressure filter with threaded mount	420	6092	160	42
621	FZH	In-line pressure filter with threaded mount for higher pressure	700	10153	80	21
631	FZX	In-line pressure filter with threaded mount up to 1000 bar	1000	14504	10	3
639	FZM	Manifold top mounting	320	4641	70	18
647	FZB	Manifold side mounting	320	4641	70	18
655	FZD	Duplex pressure filter for continuous operation requirements	350	5076	60	16
724	CLOGGING INDICATORS					

666 page	FILTERS FOR POTENTIALLY EXPLOSIVE ATMOSPHERE	up to P <sub>max</sub>		up to Q <sub>max</sub>		
		bar	psi	l/min	gpm	
668	FMMX	Typical high pressure filter for mobile applications, low flow rate	420	6092	154	41
677	FZP	In-line pressure filter with threaded mount	420	6092	160	42
687	FZH	In-line pressure filter with threaded mount for higher pressure	700	10153	80	21
697	FZX	In-line pressure filter with threaded mount up to 1000 bar	1000	14504	10	3
725	CLOGGING INDICATORS					

705 page	CLOGGING INDICATORS					
710	QUICK REFERENCE GUIDE					
714	DESIGNATION AND ORDERING CODES					
726	TECHNICAL DATA					

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.

MARKET  
LEADER



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

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



### RETURN FILTERS

- Mounting:
- In-Line
  - Tank top
  - In single and duplex designs



### RETURN / SUCTION FILTERS

- Mounting:
- In-Line
  - Tank top



### SPIN-ON FILTERS

- Mounting:
- In-Line
  - Tank top



### LOW & MEDIUM PRESSURE FILTERS

- Mounting:
- In-Line
  - Parallel manifold version
  - In single and duplex designs



### HIGH PRESSURE FILTERS

- 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, ATEX filters) 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

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

## FILTERS FOR POTENTIALLY EXPLOSIVE ATMOSPHERE

- Mounting:
- In-Line

## CONTAMINATION CONTROL SOLUTIONS

- Off-line, 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 with 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



# 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 important classification system for hydraulic fluids is the one defined by International Organization for Standardization (ISO), which established a classification system within their standard: "ISO 6743-4 Lubricants, Industrial Oils and Related Products". In particular, the parts of interest for hydraulic fluids are:

- Lubricants, industrial oils and related products (class L)
- Classifications - Part 4L - Family H (Hydraulic systems)

The ISO 6743-4 classification system can be generally applied to the three primary classes of hydraulic fluids:

- Mineral Oils (i.e.: petroleum) Hydraulic Fluids (i.e.: HH: Mineral lubricants without corrosion inhibitors; HL: HH-type lubricants with oxidation reduction and anticorrosive additives; HM: HL-type lubricants with anti-wear additives; HV: HM-type lubricants with a higher viscosity grade and temperature properties; and others).
- Biodegradable Hydraulic Fluids (HExx), also defined as "Environmentally acceptable hydraulic fluids".
- Fire Resistant Hydraulic Fluids (HFxx), which could be further split into: Fire-resistant aqueous fluids (HFAx, HFB; HFC) ; Fire-resistant synthetic anhydrous fluids (HFDx).

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 FLUID COMPATIBILITY CHARTS

For more detailed information on specific fluid compatibility please refer to the fluid compatibility charts on our website:



## 4 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.

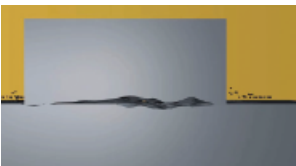
ABRASION



EROSION



ADHESION



FATIGUE



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

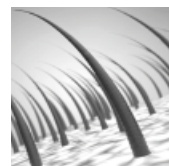
Gaseous contamination mainly results in decay of system performance.

- CUSHION SUSPENSION  
Cause of increased noise and cavitation.
- FLUID OXIDATION  
Cause of corrosion acceleration of metal parts.
- 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  
Increase maintenance activities, spare parts, machine stop costs.
- ENERGY AND EFFICIENCY  
Efficiency and performance reduction due to friction, drainage, cavitation.

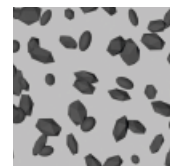
## 5 MEASURING THE SOLID CONTAMINATION LEVEL

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.

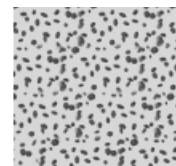
What is the size of the contaminating particles that we must handle in our hydraulic circuit?



HUMAN HAIR (75 µm)



MINIMUM DIMENSION VISIBLE WITH HUMAN EYES (40 µm)



TYPICAL CONTAMINANT DIMENSION IN A HYDRAULIC CIRCUIT (4 - 14 µm)

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.



CLEAN MEMBRANE



CONTAMINATED MEMBRANE

# 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 Contamination Monitoring Products (CMP).

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 Organization standard ISO 4406 is the preferred method of quoting the number of solid contaminant particles in a sample. The level of contamination is defined by counting the number of particles of certain dimensions per unit of volume of fluid. The measurement is performed by Contamination Monitoring Products (CMP).

The numbers represent a code which identifies the number of particles of certain sizes in 1ml of fluid. Each code number has a particular size range. The first scale number represents the number of particles equal to or larger than 4  $\mu\text{m}_{(c)}$  per millilitre of fluid; The second scale number represents the number of particles equal to or larger than 6  $\mu\text{m}_{(c)}$  per millilitre of fluid; The third scale number represents the number of particles equal to or larger than 14  $\mu\text{m}_{(c)}$  per millilitre of fluid.

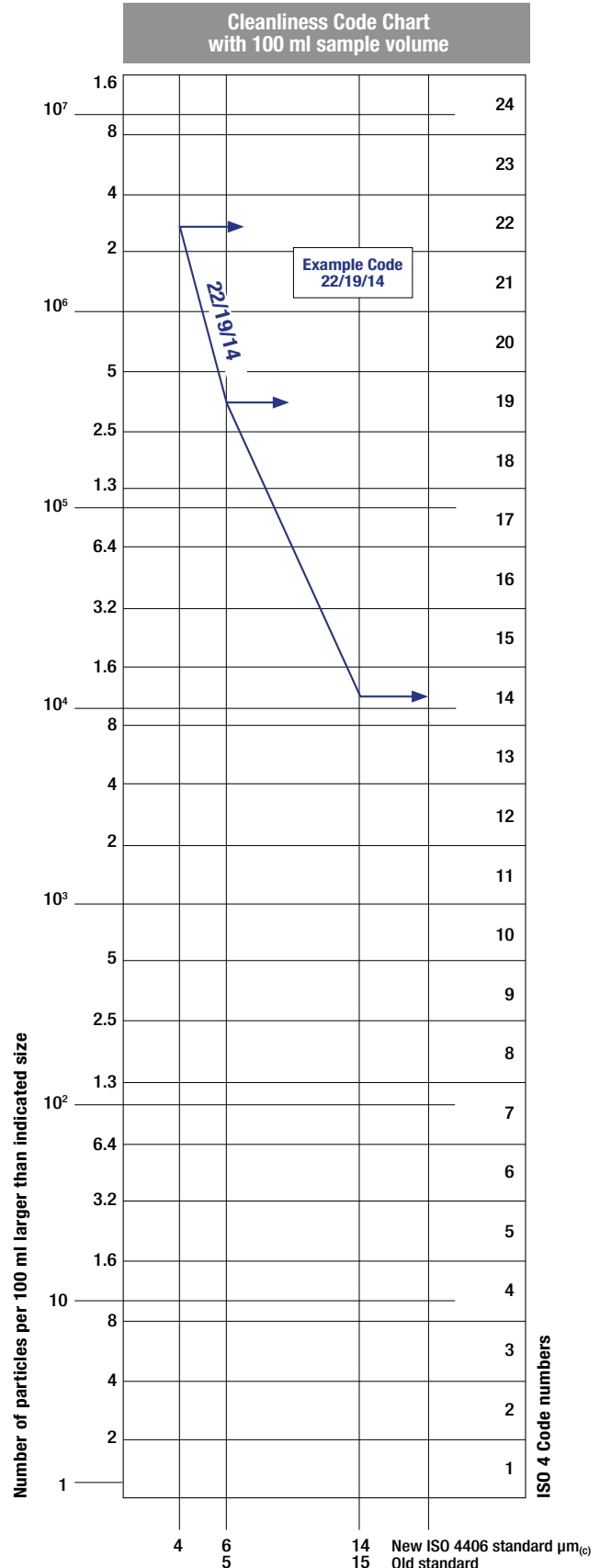
ISO 4406 - Allocation of Scale Numbers

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 Contamination Monitoring Products (CMP) 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 Contamination Monitoring Products (CMP).





- CUMULATIVE DISTRIBUTION OF THE PARTICLES SIZE  
SAE AS4059-1 and SAE AS4059-2

### Classification example according to SAE AS4059 - Rev. G

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).

This SAE Aerospace Standard (AS) defines cleanliness levels for particulate contamination of hydraulic fluids and includes methods of reporting data relating to the contamination levels. Tables 1 and 2 below provide differential and cumulative particle counts respectively for counts obtained by an automatic particle counter, e.g. LPA3.

Table 1 - Class for differential measurement

Class	Dimension of contaminant Maximum Contamination Limits per 100 ml (3)				
	5-15 µm	15-25 µm	25-50 µm	50-100 µm	>100 µm (1)
	6-14 µm(c) (2)	14-21 µm(c)	21-38 µm(c)	38-70 µm(c)	>70 µm(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 µm(c) = 15 000 particles
14 - 21 µm(c) = 2 200 particles
21 - 38 µm(c) = 200 particles
38 - 70 µm(c) = 35 particles
> 70 µm(c) = 3 particles
SAE AS4059 REV G - Class 6

(1) Size range, optical microscope, based on longest dimension as measured per AS598 or ISO 4407. (2) Size range CMP 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 (1)
	>4 µm(c) (2)	>6 µm(c)	>14 µm(c)	>21 µm(c)	>38 µm(c)	>70 µm(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 µm(c) = 45 000 particles
> 6 µm(c) = 15 000 particles
> 14 µm(c) = 1 500 particles
> 21 µm(c) = 250 particles
> 38 µm(c) = 15 particles
> 70 µm(c) = 3 particles
SAE AS4059 REV G 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, CMP 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.

- 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 Contamination Monitoring Products (CMP).

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)

Class	Maximum Contamination Limits per 100 ml				
	5-15	15-25	25-50	50-100	>100
	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

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

COMPARISON PHOTOGRAPH'S  
1 graduation = 10µm



Fig. 1



Fig. 2



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 $\mu\text{m}_{(c)}$ 6 $\mu\text{m}_{(c)}$ 14 $\mu\text{m}_{(c)}$	> 4 $\mu\text{m}_{(c)}$ 6 $\mu\text{m}_{(c)}$ 14 $\mu\text{m}_{(c)}$	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 / 9B	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

## 6 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

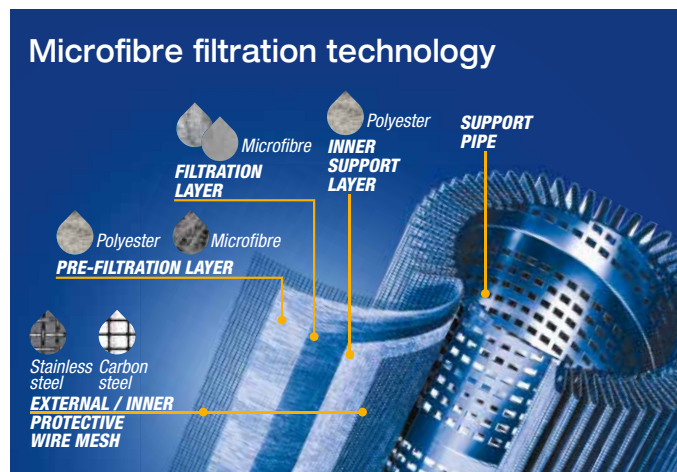
It is by direct interception. The filter prevents particles larger than the pores from continuing in the plant / system. Surface filters are generally manufactured with metal canvases or meshes.

### - 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.



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.

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



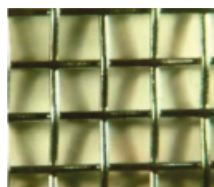
Value ( $\beta_{x(c)}$ )	2	10	75	100	200	1000
Efficiency	50%	90%	98.7%	99%	99.5%	99.9%

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 ( $\beta$  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.

### WIRE MESH FILTRATION



### PAPER FILTRATION



### MICROFIBER FILTRATION



### 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 $\mu\text{m}$	A03
7 $\mu\text{m}_{(c)}$	6 $\mu\text{m}$	A06
10 $\mu\text{m}_{(c)}$	10 $\mu\text{m}$	A10
16 $\mu\text{m}_{(c)}$	18 $\mu\text{m}$	A16
21 $\mu\text{m}_{(c)}$	25 $\mu\text{m}$	A25

## 7 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 $\beta_{x(c)} \geq 1.000$	$\beta_{21(c)} > 1000$	$\beta_{15(c)} > 1000$	$\beta_{10(c)} > 1000$	$\beta_{7(c)} > 1000$	$\beta_{7(c)} > 1000$	$\beta_{5(c)} > 1000$
MP Filtri media code	A25	A16	A10	A06	A06	A03

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

## 8 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.

## 9 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 ( $\Delta P$ )**

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.

## 10 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.

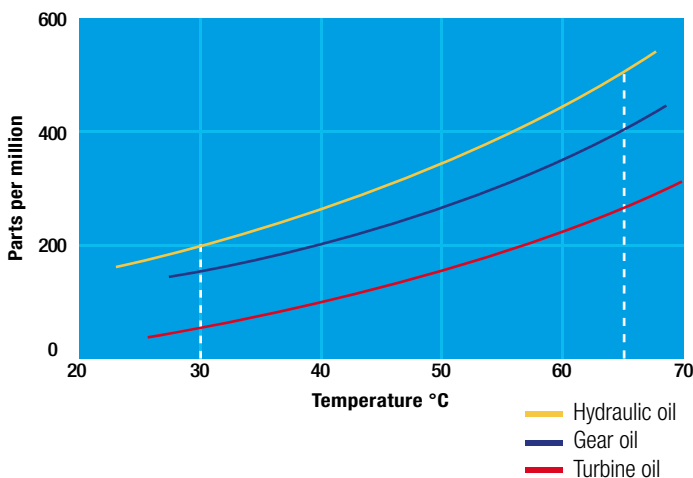
## 11 WATER IN HYDRAULIC AND LUBRICATING FLUIDS

### 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.



### 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.

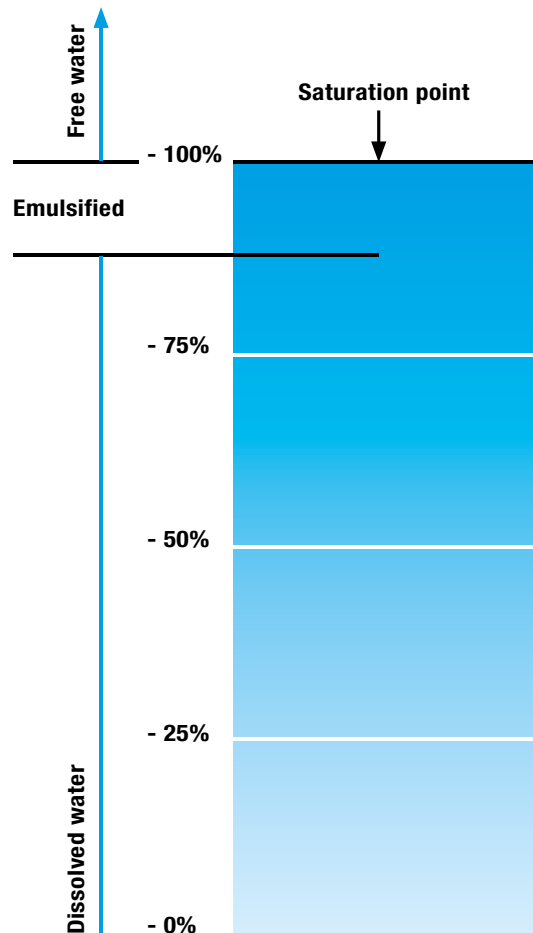
However, even water in solution can cause damage and therefore every reasonable effort should be made to keep saturation levels as low as possible. There is no such thing as too little water. As a guideline, we recommend maintaining saturation levels below 50% in all equipment.

### 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 REMOVAL

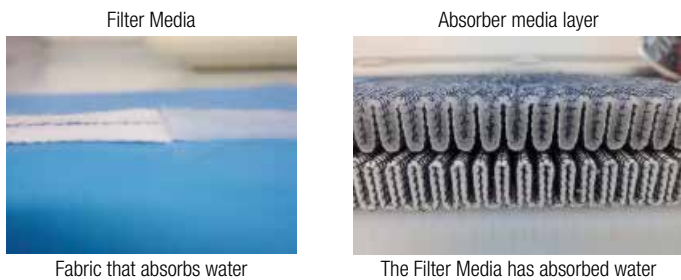
Water is present everywhere, during storage, handling and servicing.

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  $\mu\text{m}$  (therefore identified with media designation WA025), providing absolute filtration of solid particles to  $\beta_{x(c)} = 1000$ .

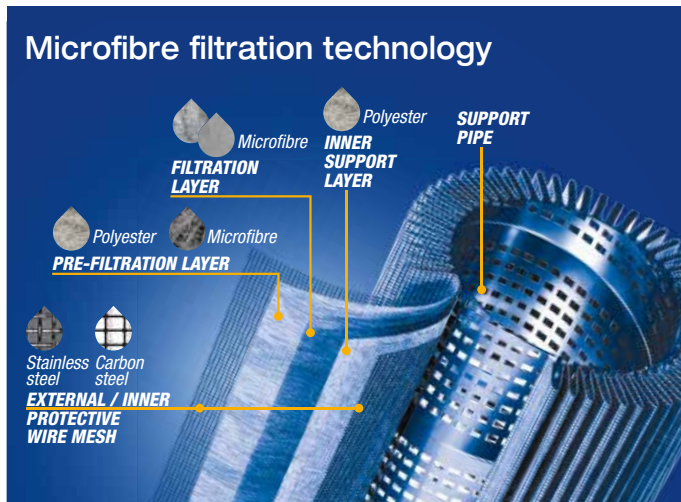
Absorbent media is made by water absorbent fibres which increase in size during the absorption process.

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



Fabric that absorbs water

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



For more details please refer to our dedicate brochure "WATER REMOVAL"



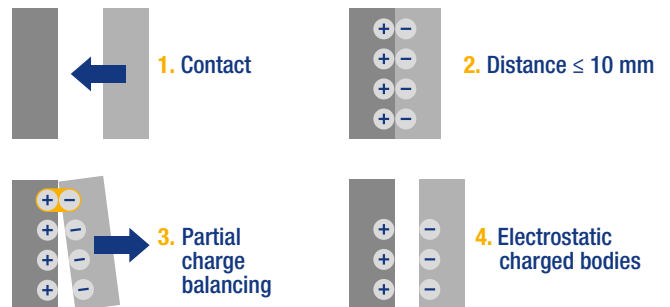
## 12 THE ANTI-STATIC FILTERS



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.



For more details please refer to our dedicate brochure "ZEROSPARK"



# FILTER SIZING

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# FILTER SIZING Calculation

## THE CORRECT FILTER SIZING HAS TO BE BASED ON THE TOTAL PRESSURE DROP DEPENDING ON THE APPLICATION.

FOR EXAMPLE, THE MAXIMUM TOTAL PRESSURE DROP ALLOWED BY A NEW AND CLEAN RETURN FILTER HAS 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  $\Delta p_c$  of the housing is proportional to the fluid density ( $\text{kg}/\text{dm}^3$  /  $\text{lb}/\text{ft}^3$ ). The filter element pressure drop  $\Delta p_e$  is proportional to its viscosity ( $\text{mm}^2/\text{s}$  / SUS), the corrective factor Y have to be used in case of an oil viscosity different than  $30 \text{ mm}^2/\text{s}$  (cSt) / 150 SUS.

### Sizing data for single filter element, head at top

$\Delta p_c$  = Filter housing pressure drop [bar / psi]

$\Delta p_e$  = 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 =  $30 \text{ mm}^2/\text{s}$  (cSt) / 150 SUS

V2 = operating oil viscosity in  $\text{mm}^2/\text{s}$  (cSt) / SUS

### Filter element pressure drop calculation with an oil viscosity different than $30 \text{ mm}^2/\text{s}$ (cSt) / 150 SUS

International system:

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

Imperial system:

$$\Delta p_e = Y : 17.2 \times Q \times (V2:V1)$$

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

### Verification formula

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

### Maximum total pressure drop ( $\Delta p_{\text{max}}$ ) allowed by a new and clean filter

Filter family	$\Delta p_{\text{max}}$	
	[ bar ]	[ psi ]
Suction	0.08 bar	1.15 psi
Return	0.50 bar	7.25 psi
Return - Suction (*)	1.50 bar	22.00 psi
Low & Medium Pressure/Duplex	0.70 bar	10.15 psi
High Pressure Pressure/Duplex	1.50 bar	22.00 psi
Stainless Steel	1.50 bar	22.00 psi
ATEX	1.50 bar	22.00 psi

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

## Filter pressure drop calculation example

Application data:

Selected filter: tank top return filter - MPT110 series with bypass valve and G 1 1/4" inlet connection.

Selected filter element: **MF100 length 4**

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

Pressure Pmax = 10 bar / 145.03 psi

Flow rate Q = 120 l/min / 31.7 gpm

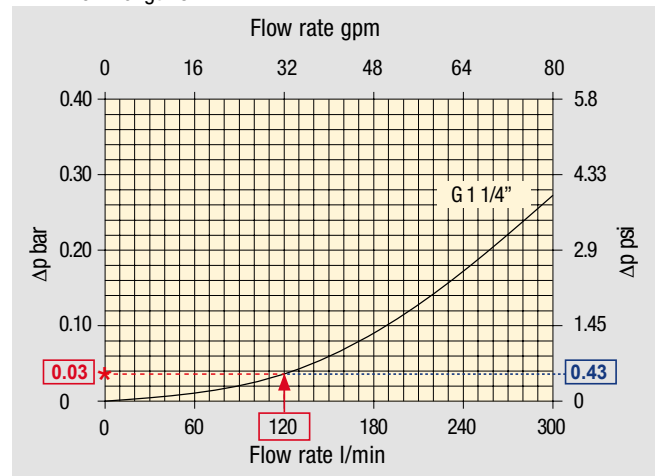
Viscosity V2 =  $46 \text{ mm}^2/\text{s}$  (cSt) / 216 SUS

Oil density =  $0.86 \text{ kg}/\text{dm}^3$  /  $53.68 \text{ lb}/\text{ft}^3$

Calculation:

$\Delta p_c$  = **0.03 bar / 0.43 psi** (see graphic below)

MPT 110 - Length 3 - 4



Filter housings  $\Delta p$  pressure drop.

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

Filter element	Absolute filtration H Series					Nominal filtration N Series		
	A03	A06	A10	A16	A25	P(00)10	P(00)25	M(00)25 M(00)60 M(00)90
<b>Return filters</b>	74.00	50.08	20.00	16.00	9.00	6.43	5.51	4.40
<b>MF 020</b>	2	29.20	24.12	8.00	7.22	5.00	3.33	2.85
	3	22.00	19.00	6.56	5.33	4.33	1.68	1.44
<b>MF 030</b>	1	74.00	50.08	20.00	16.00	9.00	6.43	5.51
<b>MFX 030</b>	1	28.20	24.40	8.67	8.17	6.88	4.62	3.96
<b>MF 100</b>	2	17.33	12.50	6.86	5.70	4.00	3.05	2.47
<b>MFX 100</b>	3	10.25	9.00	3.65	3.33	2.50	1.63	1.32
	4	6.10	5.40	2.30	2.20	2.00	1.19	0.96

$$\Delta p_e = (2.00 : 1000) \times 120 \times (46 : 30) = 0.37 \text{ bar}$$

$$\Delta p_e = (2.00 : 17.2) \times 32 \times (216 : 150) = 5.36 \text{ psi}$$

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

$$\checkmark \Delta p_{\text{Tot.}} = 0.43 + 5.36 = 5.79 \text{ psi}$$

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

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



## SUCTION FILTERS

Filter element		Nominal filtration Collapse $\Delta P : A = 1$ bar					
Type	Length	P0010	P0025	M0025	M0060	M0090	M0250
<b>SMC 250</b>	10	0.65	0.20	0.10	0.08	0.05	0.03
<b>SSC 503</b>	10	-	-	0.17	0.11	0.11	0.11
<b>SSC 504</b>	10	-	-	0.11	0.08	0.08	0.08
<b>SSC 505</b>	10	-	-	0.23	0.18	0.18	0.18
<b>SSC 510</b>	10	-	-	0.18	0.14	0.14	0.14
<b>SSC 535</b>	10	-	-	0.08	0.05	0.05	0.05
<b>SSC 540</b>	10	-	-	0.05	0.04	0.04	0.04
<b>FEX 060</b>	10	4.58	3.22	1.02	0.89	0.63	0.63
	20	1.97	1.38	0.62	0.45	0.29	0.29
<b>FEX 110</b>	10	1.33	1.12	0.22	0.18	0.14	0.14
	20	0.90	0.76	0.15	0.10	0.09	0.09

## RETURN FILTERS

Filter element		Absolute filtration H Series					Nominal filtration N Series		
Type	Length	A03	A06	A10	A16	A25	P10	P25	M25 - M60 - M90
<b>MF 020</b>	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
<b>MFX 030</b> <b>MF 030</b>	1	74.00	50.08	20.00	16.00	9.00	6.43	5.51	3.40
<b>MF 100</b> <b>MF 100</b>	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
<b>MF 180</b> <b>MF 180</b>	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
<b>MF 190</b> <b>MF 190</b>	2	1.69	1.37	0.60	0.49	0.44	0.35	0.31	0.11
<b>MF 400</b> <b>MF 400</b>	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
<b>MF 750</b> <b>MF 750</b>	1	1.08	0.84	0.49	0.36	0.26	0.21	0.19	0.06
<b>MLX 250</b>	2	3.00	3.04	1.46	1.25	1.17	-	-	M25
									0.20
<b>MLX 660</b>	2	1.29	1.26	0.52	0.44	0.38	-	-	M25
									0.10
<b>CU 025</b>		78.00	48.00	28.00	24.00	9.33	9.33	8.51	1.25
<b>CU 040</b>		25.88	20.88	10.44	10.00	3.78	3.78	3.30	1.25
<b>CU 100</b>		15.20	14.53	5.14	4.95	2.00	2.00	0.17	1.10
<b>CU 250</b>		3.25	2.55	1.55	1.35	0.71	0.71	0.59	0.25
<b>CU 630</b>		1.96	1.68	0.85	0.72	0.24	0.42	0.36	0.09
<b>CU 850</b>		1.06	0.84	0.42	0.33	0.17	0.17	0.13	0.04

TO BE CONTINUED >>

**Corrective factor Y to be used for the filter element pressure drop calculation. The values depend to the filter size and length and to the filter media.**  
Reference oil viscosity 30 mm<sup>2</sup>/s

# FILTER SIZING Corrective factor

## RETURN FILTERS

Filter element		Absolute filtration H Series					Nominal filtration N Series			
Type	Length	A03	A06	A10	A16	A25	P10	P25	M25 - M60 - M90	
MR 250	2	3.61	4.08	1.81	1.71	1.35	-	-	M25 0.55	
	4	2.10	1.70	1.14	0.77	0.53	-	-	0.60	
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	Length	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	Length	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	4.05	2.36	1.14	0.91	0.85	0.05

Corrective factor Y to be used for the filter element pressure drop calculation. The values depend to the filter size and length and to the filter media.  
Reference oil viscosity 30 mm<sup>2</sup>/s

## LOW & MEDIUM PRESSURE FILTERS

Filter element		Absolute filtration N - W Series					Nominal filtration N Series		
Type	Length	A03	A06	A10	A16	A25	P10	P25	M25
<b>CU 110</b>	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
<b>CU 210</b>	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
<b>DN</b>	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
<b>CU 400</b>	2	3.14	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	0.105
<b>CU 900</b>	1	0.86	0.63	0.32	0.30	0.21	-	-	0.05
<b>CU 950</b>	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
<b>MR 630</b>	7	0.88	0.78	0.36	0.34	0.16	0.12	0.96	0.47

## HIGH PRESSURE FILTERS

Filter element		Absolute filtration N - R Series					Nominal filtration N Series
Type	Length	A03	A06	A10	A16	A25	M25
<b>HP 010 HP 011</b>	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	-
<b>HP 039</b>	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
<b>HP 050 HPX 050</b>	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
<b>HP 065</b>	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
<b>HP 135</b>	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
<b>HP 150</b>	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

TO BE CONTINUED >>

Corrective factor Y to be used for the filter element pressure drop calculation. The values depend to the filter size and length and to the filter media.  
Reference oil viscosity 30 mm<sup>2</sup>/s

# FILTER SIZING Corrective factor

## HIGH PRESSURE FILTERS

Filter element		Absolute filtration N - R Series					Nominal filtration N Series
Type	Length	A03	A06	A10	A16	A25	M25
<b>HP 320</b>	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
<b>HP 500</b>	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
<b>HP 325</b>	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

Filter element		Absolute filtration S - H - U Series				
Type	Length	A03	A06	A10	A16	A25
<b>HP 010</b> <b>HP 011</b>	1	424.58	319.74	235.17	194.44	163.78
	2	281.06	211.25	94.35	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
<b>HP 039</b>	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
<b>HP 050</b> <b>HPX 050</b>	1	47.33	34.25	21.50	20.50	14.71
	2	29.10	25.95	10.04	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
<b>HP 135</b>	1	29.16	25.33	13.00	12.47	5.92
	2	14.28	11.04	7.86	7.90	4.44
	3	8.96	7.46	4.89	4.16	3.07
<b>HP 320</b>	1	13.00	12.19	6.80	6.40	3.32
	2	6.45	5.31	3.01	2.89	1.73
	3	4.13	3.14	1.90	1.78	1.17
	4	3.17	2.71	1.80	1.70	1.10
<b>HP 500</b>	1	9.70	8.81	4.55	4.47	2.80
	2	5.46	4.63	2.88	2.68	2.20
	3	3.90	3.74	2.22	2.07	1.53
	4	3.10	2.84	1.56	1.53	1.02
	5	1.93	1.83	1.14	1.08	0.69

Corrective factor Y to be used for the filter element pressure drop calculation. The values depend to the filter size and length and to the filter media.  
Reference oil viscosity 30 mm<sup>2</sup>/s

## STAINLESS STEEL HIGH PRESSURE FILTERS

Filter element		Absolute filtration N - R Series					Nominal filtration N Series
Type	Length	A03	A06	A10	A16	A25	M25
<b>HP 010</b> <b>HP 011</b>	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	-
<b>HP 039</b>	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
<b>HP 050</b>	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
<b>HP 135</b>	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

Filter element		Absolute filtration S - H - U Series				
Type	Length	A03	A06	A10	A16	A25
<b>HP 010</b> <b>HP 011</b>	1	424.58	319.74	235.17	194.44	163.78
	2	281.06	211.25	94.35	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
<b>HP 039</b>	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
<b>HP 050</b>	1	47.33	34.25	21.50	20.50	14.71
	2	29.10	25.95	10.04	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
<b>HP 135</b>	1	29.16	25.33	13.00	12.47	5.92
	2	14.28	11.04	7.86	7.90	4.44
	3	8.96	7.46	4.89	4.16	3.07

**Corrective factor Y to be used for the filter element pressure drop calculation. The values depend to the filter size and length and to the filter media.**  
Reference oil viscosity 30 mm<sup>2</sup>/s

# FILTER SIZING Corrective factor

## FILTERS FOR POTENTIALLY EXPLOSIVE ATMOSPHERE

Filter element		Absolute filtration N - R Series					Nominal filtration N Series
Type	Length	A03	A06	A10	A16	A25	M25
<b>HP 010</b> <b>HP 011</b>	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	-
<b>HP 039</b>	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
<b>HPX 050</b>	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
<b>HP 135</b>	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

Filter element		Absolute filtration S - H - U Series				
Type	Length	A03	A06	A10	A16	A25
<b>HP 010</b> <b>HP 011</b>	1	424.58	319.74	235.17	194.44	163.78
	2	281.06	211.25	94.35	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
<b>HP 039</b>	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
<b>HPX 050</b>	1	47.33	34.25	21.50	20.50	14.71
	2	29.10	25.95	10.04	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
<b>HP 135</b>	1	29.16	25.33	13.00	12.47	5.92
	2	14.28	11.04	7.86	7.90	4.44
	3	8.96	7.46	4.89	4.16	3.07

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.

# Filters sizing software

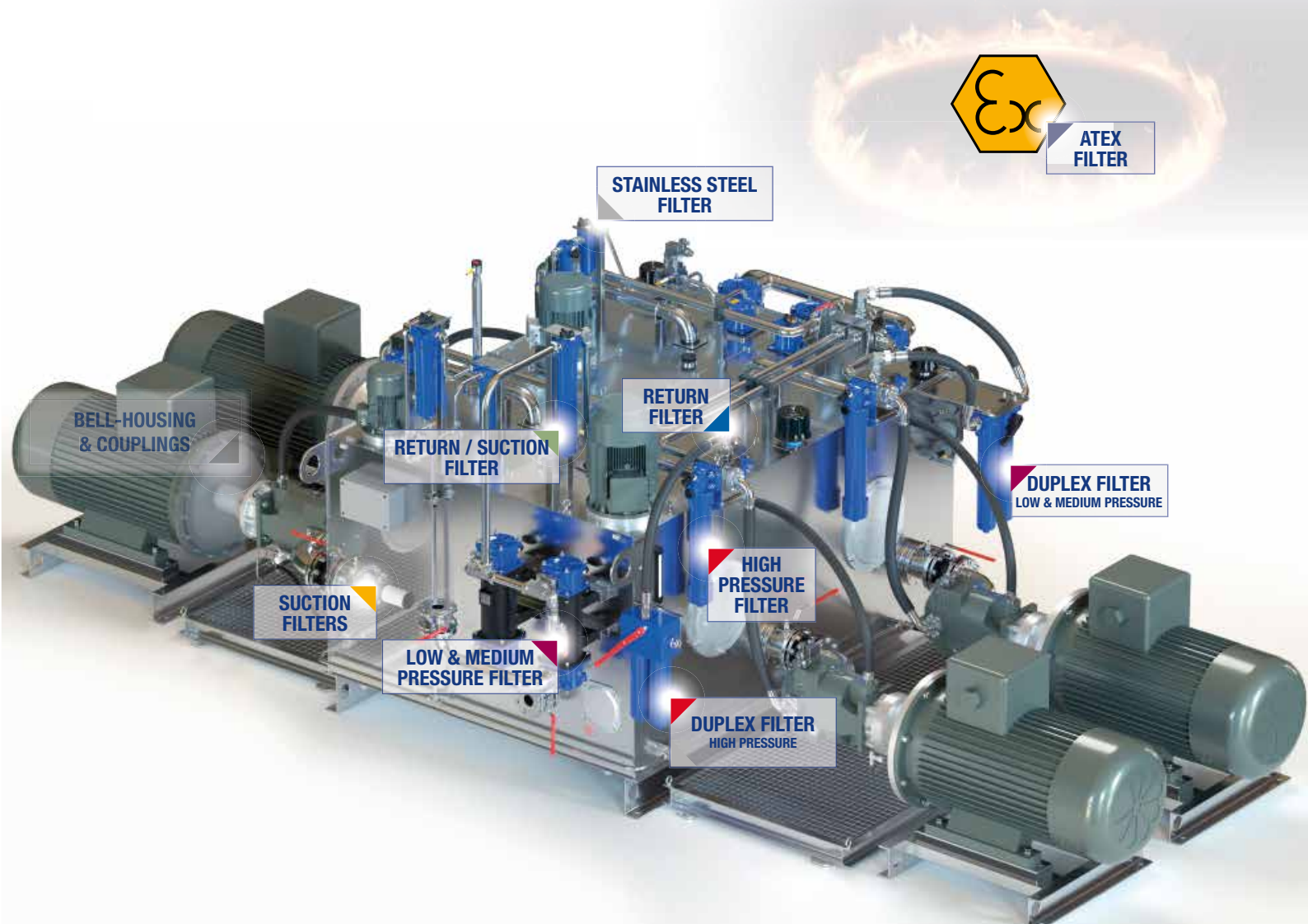
The web-based software program will allow you to select the most suitable MP Filtri's Filters, in accordance with your process design requirements.

The program will automatically check your input design process prior to propose you the acceptable solutions and create an output in PDF report style format.

The MP Filtri Selection Tool software program is easy to use with a flexible fast design method and provides improved layout formats with full descriptions.

The web-based tool is available at MP Filtri website at following link: <https://www.mpfiltri.com/tools/>

The related, complete user guide is available as Manual and downloadable from the "Download" section of MP Filtri website, as well as scanning the following QR code



**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 calculation see pag. 22



# Low & Medium Pressure filters



LFEX ELIXIR®	page 322
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THE **X** CONCEPT FOR OUR FILTERS

Protect the performance of your system with MYclean.  
Quality and efficiency are fundamental for MP Filtri:  
this exclusive new filter element possesses polygon shape geometry and specific seal  
that ensures only original spare parts can be used - ensuring correct operation and  
higher system reliability.

LFEX series

with **MYCLEAN** FEX Filter Element



- **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 LFEX are protected by:

- Italian Patent n° 102014902261205
- Canadian Patent n° 2,937,258
- European Patent n° 3 124 092 B1
- US Patent n° 20170030384 A1

# LFEX series

Maximum working pressure up to 1.6 MPa (16 bar) - Flow rate up to 300 l/min



## INSTALLATION, SERVICE AND MAINTENANCE MANUAL AND SAFETY INSTRUCTIONS



Please scan the QR codes to get updated electronic version of the related document:



LFEX060



LFEX080



LFEX110



LFEX160

## Description

## Technical data

### Low & Medium Pressure filters

**Maximum working pressure up to 1.6 MPa (16 bar)**  
**Flow rate up to 300 l/min**

LFEX is a range of low pressure filter for protection of sensitive components in low pressure hydraulic systems. 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 1/4" and SAE connections up to 1 5/8", for a maximum flow rate of 300 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
- Bypass valve, to relieve excessive pressure drop across the filter media
- NEW Visual and electrical differential clogging indicators, capable to hold the overall dimension
- MYclean interface connection for the filter element, 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:

Delivery lines, in any low pressure industrial equipment or mobile machines

### Filter housing materials

- Head: Aluminium
- Bypass valve: Polyamide - Steel
- Bowl: Polyamide

### Bypass valve

Opening pressure 350 kPa (3.5 bar)  $\pm$ 10%

### $\Delta p$ element type

- Microfibre filter elements - series N: 8 bar
- Fluid flow through the filter element from OUT to IN

### Seals

Standard NBR series A

### Temperature

From -25 °C to +110 °C

### Note

LFEX filters are provided for vertical mounting

## Weights [kg] and volumes [dm<sup>3</sup>]

Filter series	Weights [kg]	Volumes [dm <sup>3</sup> ]
<b>LFEX 060</b>	1.00	0.60
<b>LFEX 080</b>	1.15	0.80
<b>LFEX 110</b>	1.90	1.60
<b>LFEX 160</b>	2.10	2.00

## Hydraulic symbols

Filter series	Style S	Style B
<b>LFEX 060</b>	•	•
<b>LFEX 080</b>	•	•
<b>LFEX 110</b>	•	•
<b>LFEX 160</b>	•	•

Style S

Style B

Flow rates [l/min]

## Filter element design - N Series

Filter series	A03	A06	A10	A16	A25	M25	M60	M90	P10	P25
<b>LFE<sub>X</sub> 060</b>	49	51	75	77	80	104	105	107	74	95
<b>LFE<sub>X</sub> 080</b>	67	67	86	87	92	107	108	110	96	112

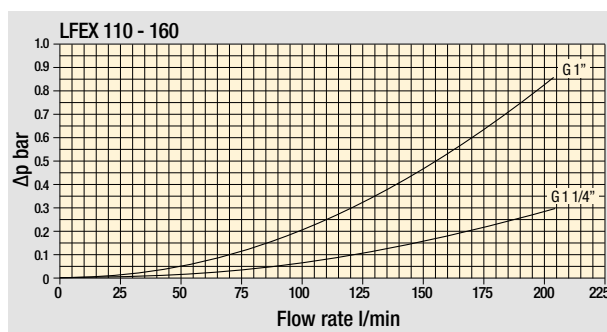
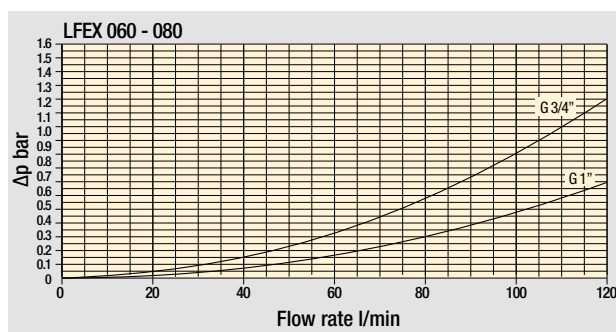
Filter series	A03	A06	A10	A16	A25	M25	M60	M90	P10	P25
<b>LFE<sub>X</sub> 110</b>	107	115	182	195	216	295	298	300	232	242
<b>LFE<sub>X</sub> 160</b>	146	150	210	212	237	300	303	304	254	262

### Maximum flow rate for a complete delivery filter with a pressure drop $\Delta p = 0.7$ bar.

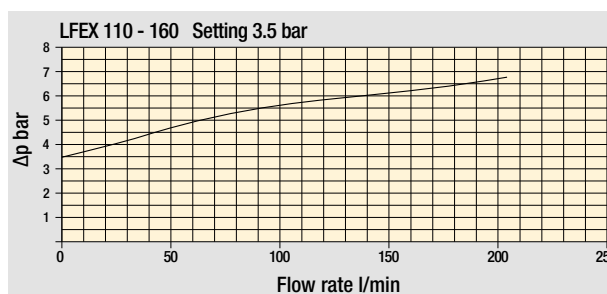
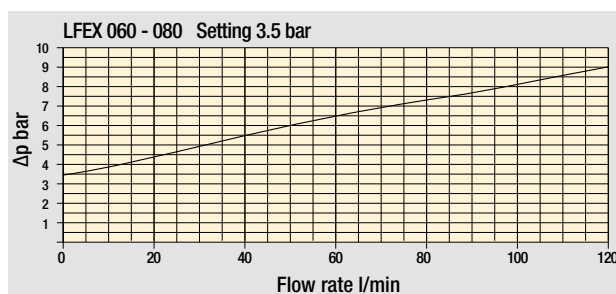
The reference fluid has a kinematic viscosity of 30 mm<sup>2</sup>/s (cSt) and a density of 0.86 kg/dm<sup>3</sup>.

For different pressure drop or fluid viscosity we recommend to use our selection software available on [www.mpfiltri.com](http://www.mpfiltri.com).

Please, contact our Sales Department for further additional information.



Pressure drop  
Filter housings  
 $\Delta p$  pressure drop



Bypass valve  
pressure drop

The curves are plotted using mineral oil with density of 0.86 kg/dm<sup>3</sup> in compliance with ISO 3968.

$\Delta p$  varies proportionally with density.

## Designation & Ordering code

### COMPLETE FILTER

Series and size Configuration example: **LFEX060** **B** **A** **A** **6** **A10** **N** **P01**

**LFEX060** | **LFEX080** Filter featuring  Filter Element

#### Bypass valve

- S** Without bypass
- B** With bypass 3.5 bar

#### Seals and treatments

- A** NBR

#### Connections

- 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 clogging indicator

- 1** Without
- 6** With plugged connections

#### Filtration rating

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

**WA025** Water absorber inorganic microfiber 25 µm

#### Element Δp

**N** 8 bar

#### Execution

**P01** MP Filtri standard  
**Pxx** Customized

### FILTER ELEMENT

Element series and size Configuration example: **FEX060** **A10** **A** **N** **P01**

**FEX060** | **FEX080** Filter Element with  feature

#### Filtration rating

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

**WA025** Water absorber inorganic microfiber 25 µm

#### Seals and treatments

- A** NBR

#### Element Δp

**N** 8 bar

#### Execution

**P01** MP Filtri standard  
**Pxx** Customized

### CLOGGING INDICATORS

See page 722

**DES** Electrical differential pressure indicator

**DVS** Visual differential pressure indicator

### PLUGS

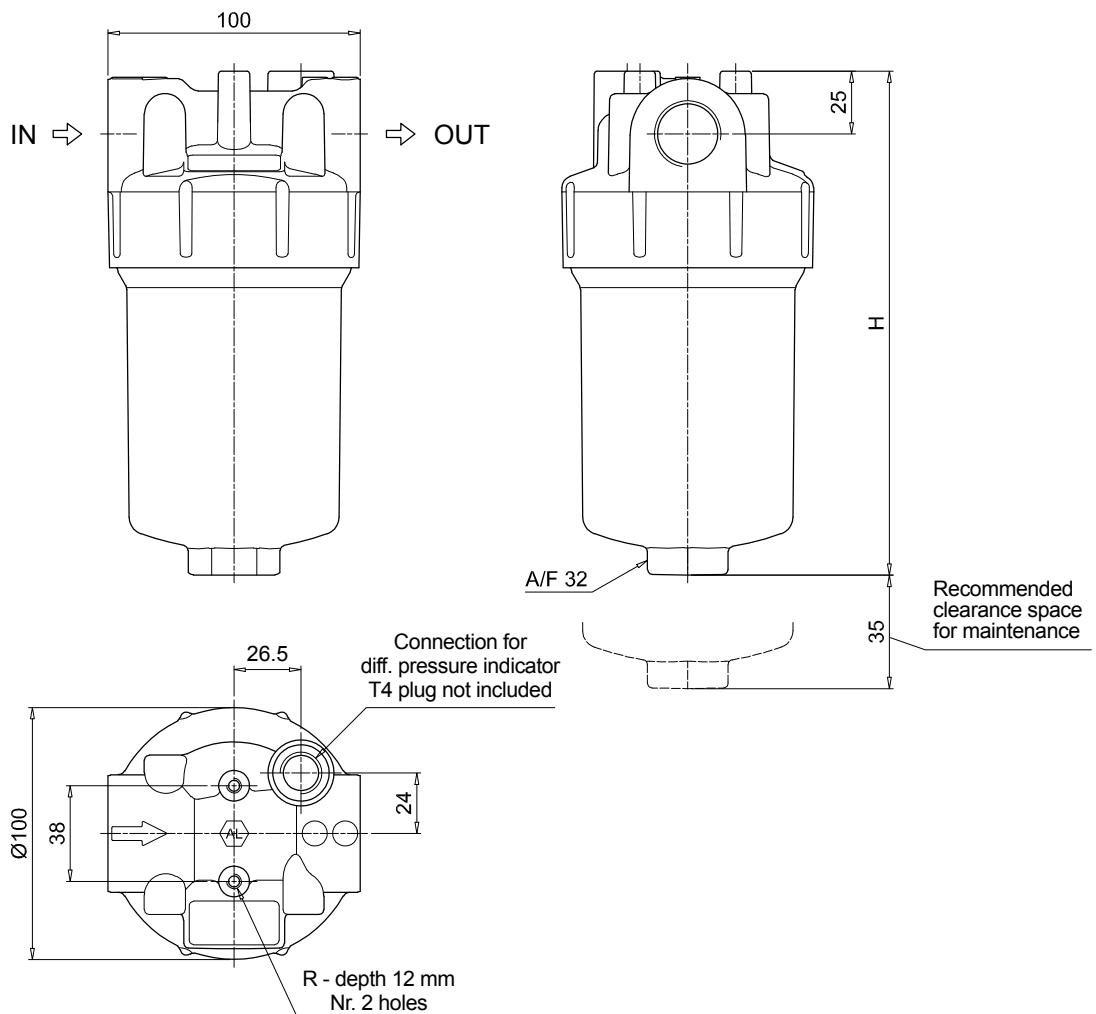
See page 743

**T4** Plug

Filter size	H [mm]
<b>060</b>	202
<b>080</b>	265

Connections	R
<b>A</b>	M6
<b>B</b>	M6
<b>C</b>	1/4" UNC
<b>D</b>	1/4" UNC
<b>E</b>	1/4" UNC
<b>F</b>	1/4" UNC



# LFEX LFEX110 - LFEX160

## Designation & Ordering code

### COMPLETE FILTER

Series and size Configuration example: **LFEX110** **B** **A** **A** **6** **A10** **N** **P01**

**LFEX110** | **LFEX160** Filter featuring **MY CLEAN** Filter Element

#### Bypass valve

- S** Without bypass
- B** With bypass 3.5 bar

#### Seals and treatments

- A** NBR

#### Connections

- A** G 1"
- B** G 1 1/4"
- C** 1" NPT
- D** 1 1/4" NPT
- E** SAE 16 - 1 5/16" - 12 UN
- F** SAE 20 - 1 5/8" - 12 UN

#### Connection for clogging indicator

- 1** Without
- 6** With plugged connections

#### Filtration rating

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

**WA025** Water absorber inorganic microfiber 25 µm

Element Δp  
**N** 8 bar

Execution  
**P01** MP Filtri standard  
**Pxx** Customized

### FILTER ELEMENT

Element series and size Configuration example: **FEX110** **A10** **A** **N** **P01**

**FEX110** | **FEX160** Filter Element with **MY CLEAN** feature

#### Filtration rating

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

**WA025** Water absorber inorganic microfiber 25 µm

#### Seals and treatments

- A** NBR

Element Δp  
**N** 8 bar

Execution  
**P01** MP Filtri standard  
**Pxx** Customized

### CLOGGING INDICATORS

See page 722

**DES** Electrical differential pressure indicator

**DVS** Visual differential pressure indicator

### PLUGS

See page 743

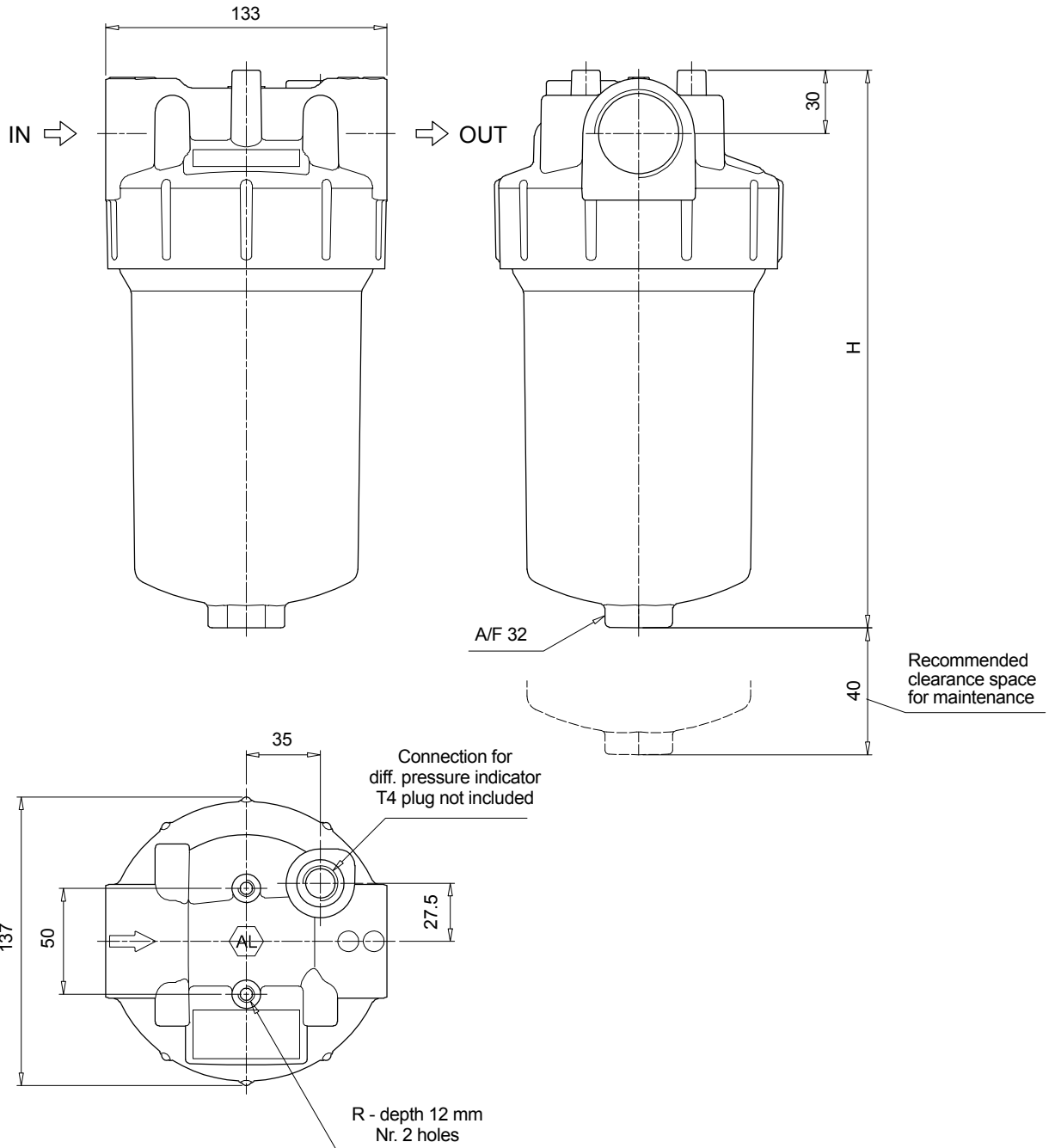
**T4** Plug



Filter size	H [mm]
<b>110</b>	266
<b>160</b>	315

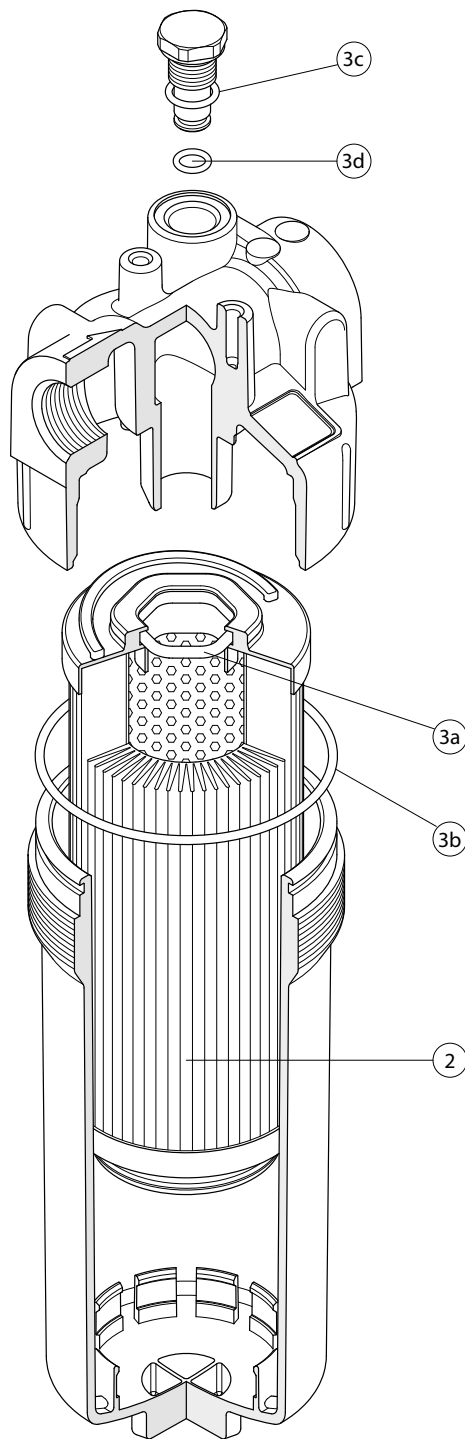
  

Connections	R
<b>A</b>	M8
<b>B</b>	M8
<b>C</b>	5/16" UNC
<b>D</b>	5/16" UNC
<b>E</b>	5/16" UNC
<b>F</b>	5/16" UNC



# LFEX SPARE PARTS

Order number for spare parts



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 1 pc.
	<b>2</b>	<b>3</b> (3a ÷ 3d)	<b>4</b>
Filter series	Filter element	Seal Kit code number NBR	Indicator connection plug NBR
<b>LFEX 060-080</b>	See order table	02050771	T4A
<b>LFEX 110-160</b>		02050772	





# LMP 110 series

Maximum working pressure up to 8 MPa (80 bar) - Flow rate up to 165 l/min



# LMP 110 GENERAL INFORMATION

## Description

## Technical data

### Low & Medium Pressure filters

**Maximum working pressure up to 8 MPa (80 bar)**  
**Flow rate up to 165 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 165 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.

#### Common applications:

Delivery lines, in any low pressure industrial equipment or mobile machines

### Filter housing materials

- Head: Aluminium
- Housing: Cathaphoresis - Painted steel
- Bypass valve: Brass - Aluminium

### Pressure

- Test pressure: 12 MPa (120 bar)
- Burst pressure: 29 MPa (290 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)  $\pm 10\%$
- Other opening pressures on request.

### $\Delta p$ 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 filters are provided for vertical mounting

## Weights [kg] and volumes [dm<sup>3</sup>]

Filter series	Weights [kg]				Volumes [dm <sup>3</sup> ]					
	Length	1	2	3	4	Length	1	2	3	4
<b>LMP 110</b>		1.60	1.80	2.10	2.60		0.75	0.81	1.11	1.53

Flow rates [l/min]

Filter series	Length	Filter element design - N Series							
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
<b>LMP 110</b>	<b>1</b>	40	42	65	69	85	163	117	120
	<b>2</b>	49	57	83	83	101	163	136	138
	<b>3</b>	66	70	92	102	124	164	142	144
	<b>4</b>	86	102	118	124	144	165	148	149

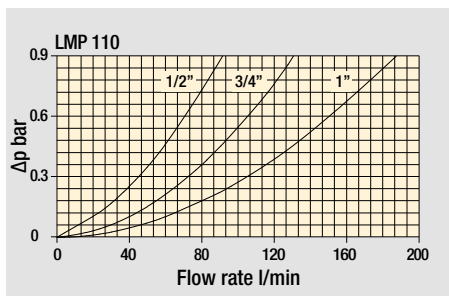
**Maximum flow rate for a complete low and medium pressure filter with a pressure drop  $\Delta p = 0.7$  bar.**

The reference fluid has a kinematic viscosity of 30 mm<sup>2</sup>/s (cSt) and a density of 0.86 kg/dm<sup>3</sup>.

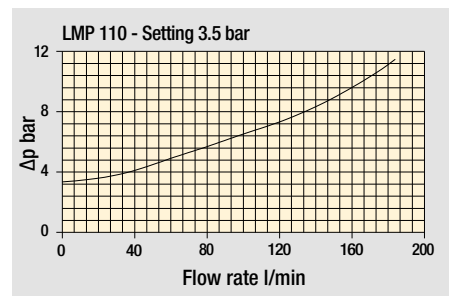
For different pressure drop or fluid viscosity we recommend to use our selection software available on [www.mpfiltri.com](http://www.mpfiltri.com).

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  $\Delta p$  pressure drop



Bypass valve pressure drop

The curves are plotted using mineral oil with density of 0.86 kg/dm<sup>3</sup> in compliance with ISO 3968.  $\Delta p$  varies proportionally with density.

Hydraulic symbols

Filter series	In-Line filter
<b>LMP 110</b>	

# LMP 110

## Designation & Ordering code

### COMPLETE FILTER

Series and size **LMP110** Configuration example: **LMP110** **4** **B** **A** **D** **1** **A10** **N** **P01**

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

**Bypass valve**  
**S** Without bypass | **B** With bypass 3.5 bar

**Seals and treatments**  
**A** NBR  
**V** FPM

**Connections**

	Aux (only LMP 112 - 116)
<b>A</b> G 3/4"	G 3/4"
<b>B</b> G 1"	G 3/4"
<b>C</b> 3/4" NPT	3/4" NPT
<b>D</b> 1" NPT	3/4" NPT
<b>E</b> SAE 12 - 1 1/16" - 12 UN	SAE 12 - 1 1/16" - 12 UN
<b>F</b> SAE 16 - 1 5/16" - 12 UN	SAE 12 - 1 1/16" - 12 UN

**Connection for differential pressure 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)**

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

**Element Δp**  
**N** 20 bar

**Execution**  
**P01** MP Filtri standard  
**Pxx** Customized

### FILTER ELEMENT

Element series and size **CU110** Configuration example: **CU110** **4** **A10** **A** **N** **P01**

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

**Filtration rating (filter media)**

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

**Seals and treatments**  
**A** NBR  
**V** FPM

**Element Δp**  
**N** 20 bar

**Execution**  
**P01** MP Filtri standard  
**Pxx** Customized

### CLOGGING INDICATORS

See page 722

**DEA** Electrical differential pressure indicator  
**DEM** Electrical differential pressure indicator  
**DEU** Electrical differential pressure indicator  
**DLA** Electrical / visual differential pressure indicator

**DLE** Electrical / visual differential pressure indicator  
**DTA** Electronic differential pressure indicator  
**DVA** Visual differential pressure indicator  
**DVM** Visual differential pressure indicator

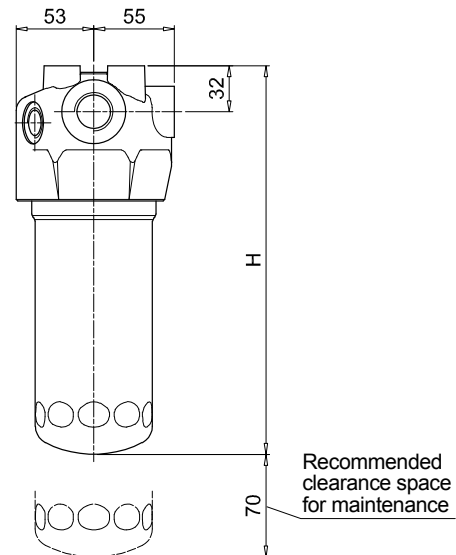
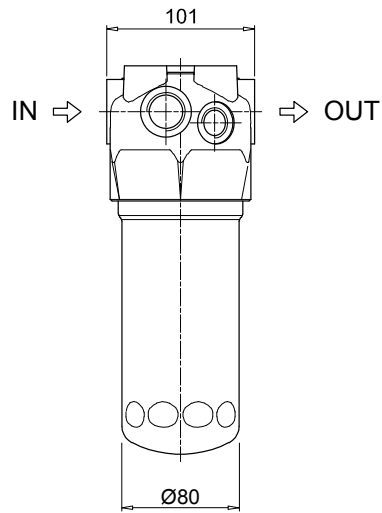
### PLUGS

See page 743

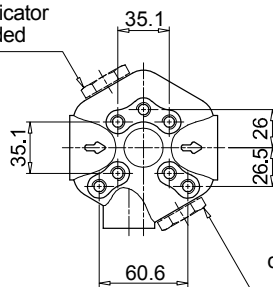
**T2** Plug (not included)



LMP110	
Filter length	H [mm]
1	182
2	215
3	265
4	365

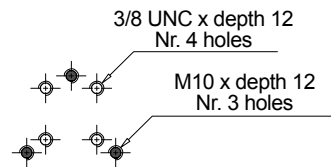


2 - Standard connection for diff. pressure indicator  
T2 plug not included

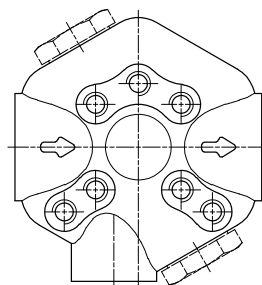


3 - Connection for diff. pressure indicator on the opposite side  
T2 plug not included

Fixing holes  
Option for Metric and UNC screws

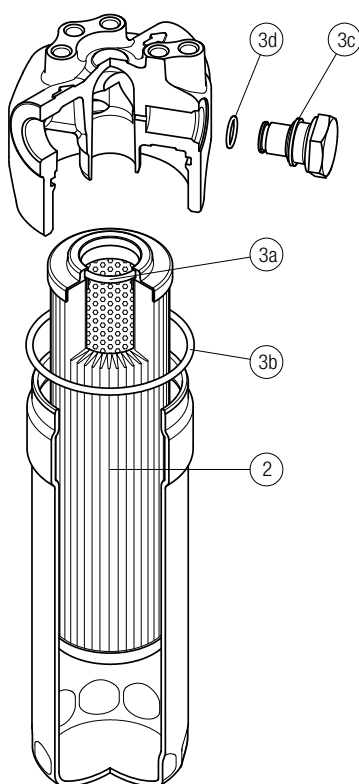


LMP 110



Order number for spare parts

**LMP 110**



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
<b>LMP 110</b>	See order table	02050478	02050479	T2H	T2V





# LMP 112 / 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**

LMP MULTIPOINT filters 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
- Multiport 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 112/119: 29 MPa (290 bar)
  - LMP 120/123: 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 [dm<sup>3</sup>]

Filter series	Weights [kg]				Volumes [dm <sup>3</sup> ]					
	Length	1	2	3	4	Length	1	2	3	4
<b>LMP 112-116-118-119</b>		1.60	1.80	2.10	2.60		0.75	0.81	1.11	1.53
<b>LMP 120-122</b>		1.90	2.10	2.40	2.90		0.75	0.81	1.11	1.53
<b>LMP 123</b>		1.70	1.90	2.20	2.70		0.75	0.81	1.11	1.53

Flow rates [l/min]

Filter series	Length	Filter element design - N Series							
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
<b>LMP 112</b>	<b>1</b>	36	38	55	57	67	105	84	86
	<b>2</b>	44	49	66	66	76	105	93	94
	<b>3</b>	56	58	71	77	87	106	96	97
	<b>4</b>	67	77	85	88	97	106	99	99
<b>LMP 116</b>	<b>1</b>	36	38	54	56	64	96	79	80
	<b>2</b>	43	49	63	64	72	96	86	87
	<b>3</b>	54	57	68	73	82	96	88	89
	<b>4</b>	65	73	79	82	89	96	91	91
<b>LMP 118</b>	<b>1</b>	40	42	65	69	85	163	117	120
	<b>2</b>	49	57	83	83	101	163	136	138
<b>LMP 119</b>	<b>3</b>	66	70	92	102	124	164	142	144
	<b>4</b>	86	102	118	124	144	165	148	149
<b>LMP 120</b>	<b>1</b>	40	43	66	70	87	172	121	125
	<b>2</b>	50	58	85	85	104	172	142	144
	<b>3</b>	67	71	94	105	129	173	149	151
	<b>4</b>	88	106	122	129	151	174	155	157
<b>LMP 122</b>	<b>1</b>	39	42	64	67	81	146	109	111
	<b>2</b>	49	56	80	80	96	146	124	126
	<b>3</b>	65	68	88	96	114	146	129	130
	<b>4</b>	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 mm<sup>2</sup>/s (cSt) and a density of 0.86 kg/dm<sup>3</sup>.

For different pressure drop or fluid viscosity we recommend to use our selection software available on [www.mpfiltri.com](http://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
<b>LMP 123</b>	<b>1</b>	35	37	50	52	59	83	70	71
	<b>2</b>	41	46	58	58	65	83	76	76
	<b>3</b>	51	53	62	65	72	83	77	78
	<b>4</b>	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 mm<sup>2</sup>/s (cSt) and a density of 0.86 kg/dm<sup>3</sup>.

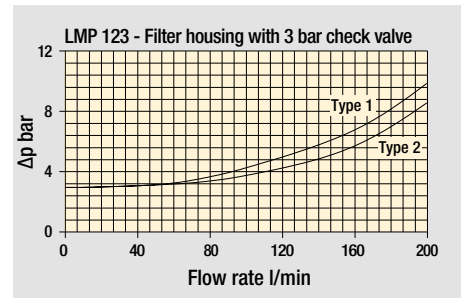
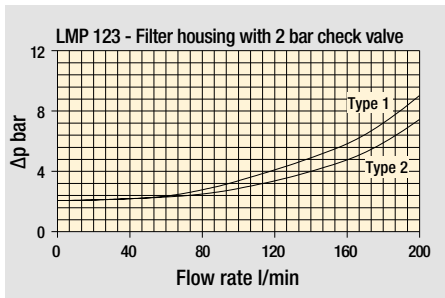
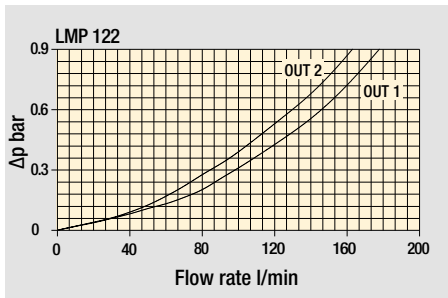
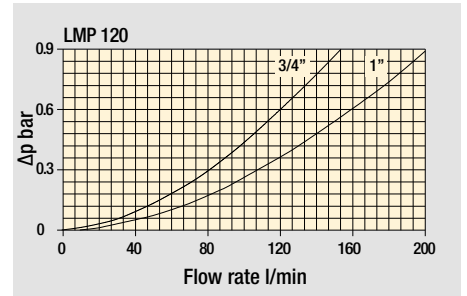
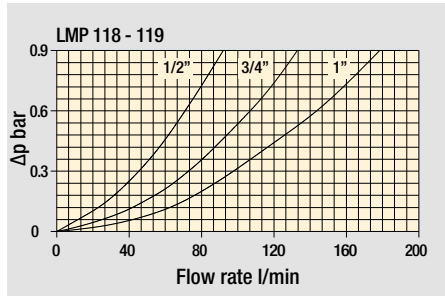
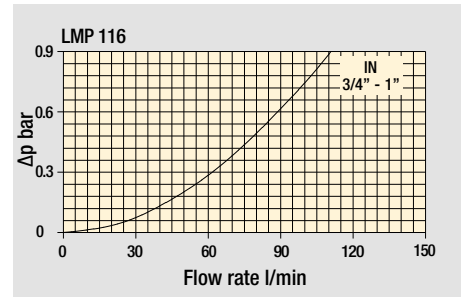
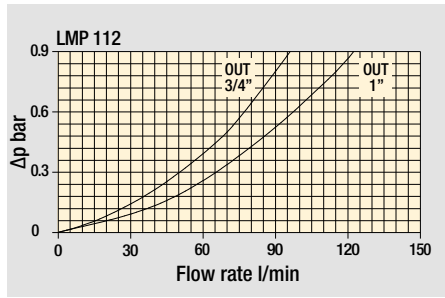
For different pressure drop or fluid viscosity we recommend to use our selection software available on [www.mpfiltri.com](http://www.mpfiltri.com).

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.

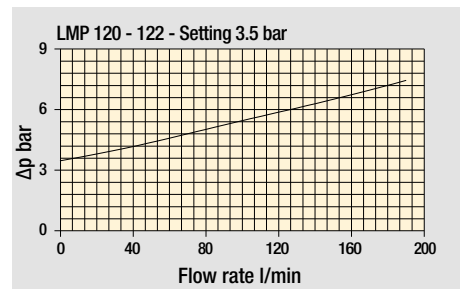
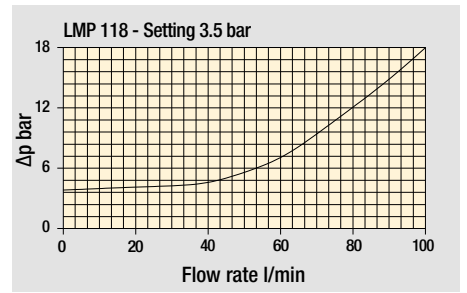
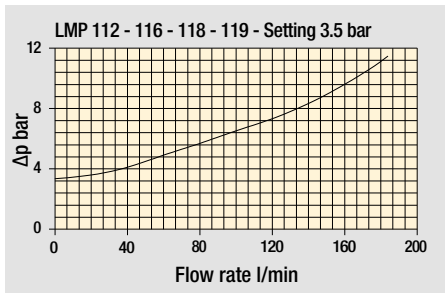
Please, contact our Sales Department for further additional information.

## Pressure drop

### Filter housings $\Delta p$ pressure drop



### Bypass valve pressure drop



The curves are plotted using mineral oil with density of 0.86 kg/dm<sup>3</sup> in compliance with ISO 3968.  $\Delta p$  varies proportionally with density.



**LMP 112** Double IN port

**LMP 120** Port IN-OUT on the same side

**LMP 116** Double OUT port

**LMP 122** Lateral OUT port high flow

OUT 1 Plug not provided

**LMP 118** Bypass lateral  
Always cleaning fluid in OUT port

**LMP 123** Bypass valve  
Type 1 for heat exchanger high flow

**LMP 119** Safety valve 6 bar  
for heat exchanger

**LMP 123** Type 2

Designation & Ordering code

**COMPLETE FILTER**

Series and size **LMP112 | LMP116** Configuration example: **LMP112** **4** **B** **A** **D** **1** **A10** **N** **P01**

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

Bypass valve **S** Without bypass **B** With bypass 3.5 bar

Seals and treatments **A** NBR **V** FPM

Connections		Aux (only LMP 112 - 116)
<b>A</b> G 3/4"	G 3/4"	G 3/4"
<b>B</b> G 1"	G 3/4"	G 3/4"
<b>C</b> 3/4" NPT	3/4" NPT	3/4" NPT
<b>D</b> 1" NPT	3/4" NPT	3/4" NPT
<b>E</b> SAE 12 - 1 1/16" - 12 UN	SAE 12 - 1 1/16" - 12 UN	SAE 12 - 1 1/16" - 12 UN
<b>F</b> SAE 16 - 1 5/16" - 12 UN	SAE 12 - 1 1/16" - 12 UN	SAE 12 - 1 1/16" - 12 UN

Connection for differential pressure 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)	
<b>A03</b> Inorganic microfiber 3 µm	<b>M25</b> Wire mesh 25 µm
<b>A06</b> Inorganic microfiber 6 µm	<b>M60</b> Wire mesh 60 µm
<b>A10</b> Inorganic microfiber 10 µm	<b>M90</b> Wire mesh 90 µm
<b>A16</b> Inorganic microfiber 16 µm	<b>P10</b> Resin impregnated paper 10 µm
<b>A25</b> Inorganic microfiber 25 µm	<b>P25</b> Resin impregnated paper 25 µm

Element Δp **N** 20 bar Execution **P01** MP Filtri standard **Pxx** Customized

**FILTER ELEMENT**

Element series and size **CU110** Configuration example: **CU110** **4** **A10** **A** **N** **P01**

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

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

Seals and treatments **A** NBR **V** FPM Element Δp **N** 20 bar Execution **P01** MP Filtri standard **Pxx** Customized

**CLOGGING INDICATORS**

See page 722

<b>DEA</b> Electrical differential pressure indicator	<b>DLE</b> Electrical / visual differential pressure indicator
<b>DEM</b> Electrical differential pressure indicator	<b>DTA</b> Electronic differential pressure indicator
<b>DEU</b> Electrical differential pressure indicator	<b>DVA</b> Visual differential pressure indicator
<b>DLA</b> Electrical / visual differential pressure indicator	<b>DVM</b> Visual differential pressure indicator

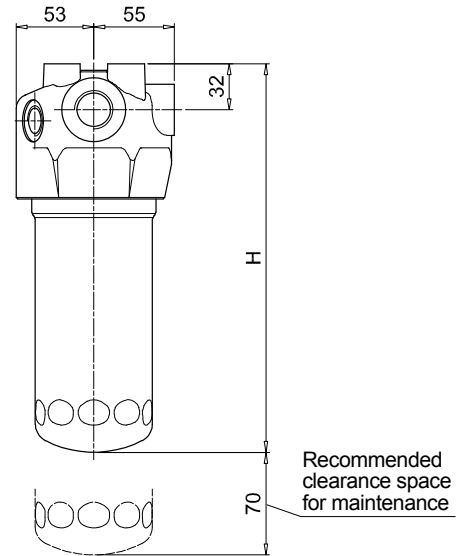
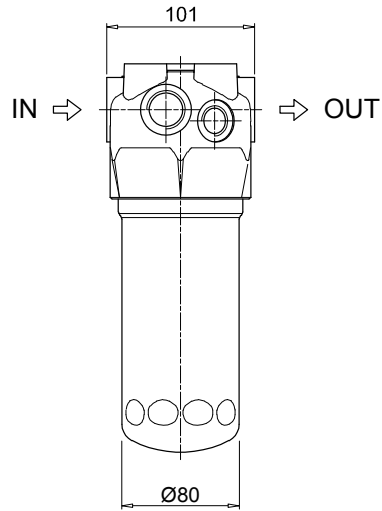
**PLUGS**

See page 743

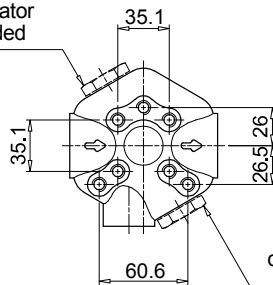
<b>T2</b> Plug (not included)
-------------------------------

LMP112 - LMP116

Filter length	H [mm]
1	182
2	215
3	265
4	365

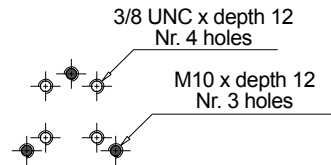


2 - Standard connection for diff. pressure indicator  
T2 plug not included

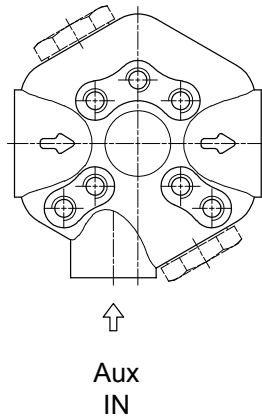


3 - Connection for diff. pressure indicator  
on the opposite side  
T2 plug not included

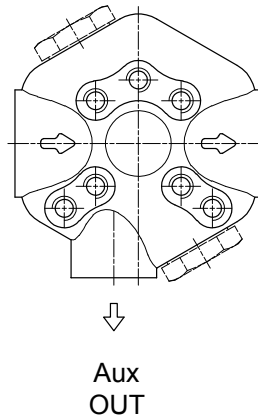
Fixing holes  
Option for Metric and UNC screws



LMP 112



LMP 116



Designation & Ordering code

**COMPLETE FILTER**

Series and size **LMP118 | LMP119** Configuration example: **LMP118** **4** **B** **A** **D** **1** **A10** **N** **P01**

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

**Bypass valve**  
**B** With bypass 3.5 bar

**Seals and treatments**  
**A** NBR  
**V** FPM

**Connections**

	Aux OUT
<b>A</b> G 3/4"	G 3/4"
<b>B</b> G 1"	G 3/4"
<b>C</b> 3/4" NPT	3/4" NPT
<b>D</b> 1" NPT	3/4" NPT
<b>E</b> SAE 12 - 1 1/16" - 12 UN	SAE 12 - 1 1/16" - 12 UN
<b>F</b> SAE 16 - 1 5/16" - 12 UN	SAE 12 - 1 1/16" - 12 UN

**Connection for differential pressure indicator**  
**1** Without  
**2** With standard connection

**Filtration rating (filter media)**

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

**Element Δp**  
**N** 20 bar

**Execution**  
**P01** MP Filtri standard  
**Pxx** Customized

**FILTER ELEMENT**

Element series and size **CU110** Configuration example: **CU110** **4** **A10** **A** **N** **P01**

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

**Filtration rating (filter media)**

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

**Seals and treatments**  
**A** NBR  
**V** FPM

**Element Δp**  
**N** 20 bar

**Execution**  
**P01** MP Filtri standard  
**Pxx** Customized

**CLOGGING INDICATORS**

See page 722

<b>DEA</b> Electrical differential pressure indicator	<b>DLE</b> Electrical / visual differential pressure indicator
<b>DEM</b> Electrical differential pressure indicator	<b>DTA</b> Electronic differential pressure indicator
<b>DEU</b> Electrical differential pressure indicator	<b>DVA</b> Visual differential pressure indicator
<b>DLA</b> Electrical / visual differential pressure indicator	<b>DVM</b> Visual differential pressure indicator

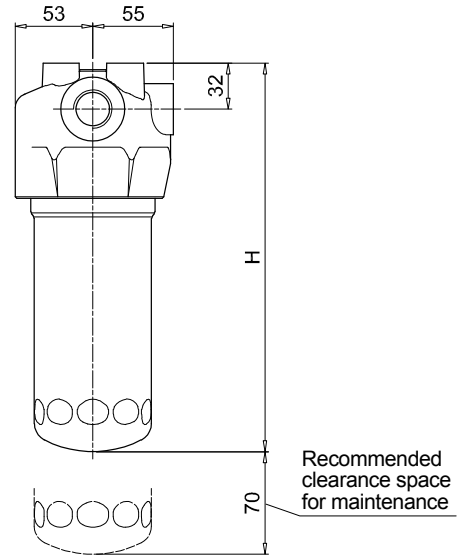
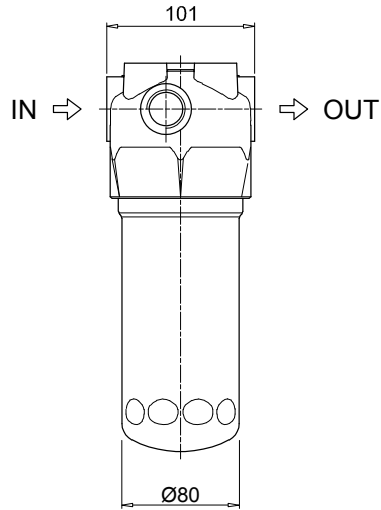
**PLUGS**

See page 743

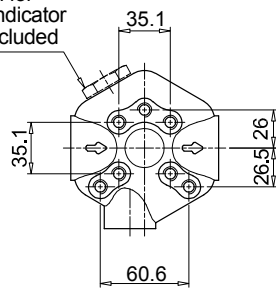
<b>T2</b> Plug (not included)
-------------------------------

LMP118 - LMP119

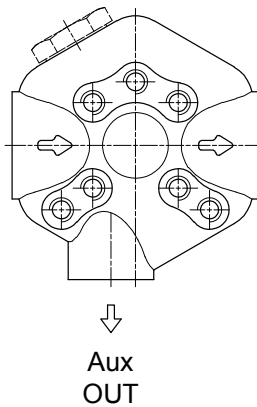
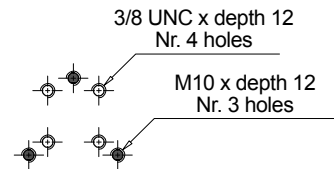
Filter length	H [mm]
1	182
2	215
3	265
4	365



Connection for diff. pressure indicator  
T2 plug not included



Fixing holes  
Option for Metric and UNC screws



Designation & Ordering code

**COMPLETE FILTER**

Series and size **LMP120 | LMP122** Configuration example: **LMP120** **4** **B** **A** **D** **1** **A10** **N** **P01**

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

**Bypass valve**  
**S** Without bypass | **B** With bypass 3.5 bar

**Seals and treatments**  
**A** NBR  
**V** FPM

Connections	LMP120	LMP122
<b>A</b> G 3/4"	•	-
<b>B</b> G 1"	•	•
<b>C</b> 3/4" NPT	•	-
<b>D</b> 1" NPT	•	•
<b>E</b> SAE 12 - 1 1/16" - 12 UN	•	-
<b>F</b> SAE 16 - 1 5/16" - 12 UN	•	•

**Connection for differential pressure indicator**  
1 Without  
2 With standard connection

**Filtration rating (filter media)**

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

**Element Δp**  
**N** 20 bar

**Execution**  
**P01** MP Filtri standard  
**Pxx** Customized

**FILTER ELEMENT**

Element series and size **CU110** Configuration example: **CU110** **4** **A10** **A** **N** **P01**

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

**Filtration rating (filter media)**

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

**Seals and treatments**  
**A** NBR  
**V** FPM

**Element Δp**  
**N** 20 bar

**Execution**  
**P01** MP Filtri standard  
**Pxx** Customized

**CLOGGING INDICATORS**

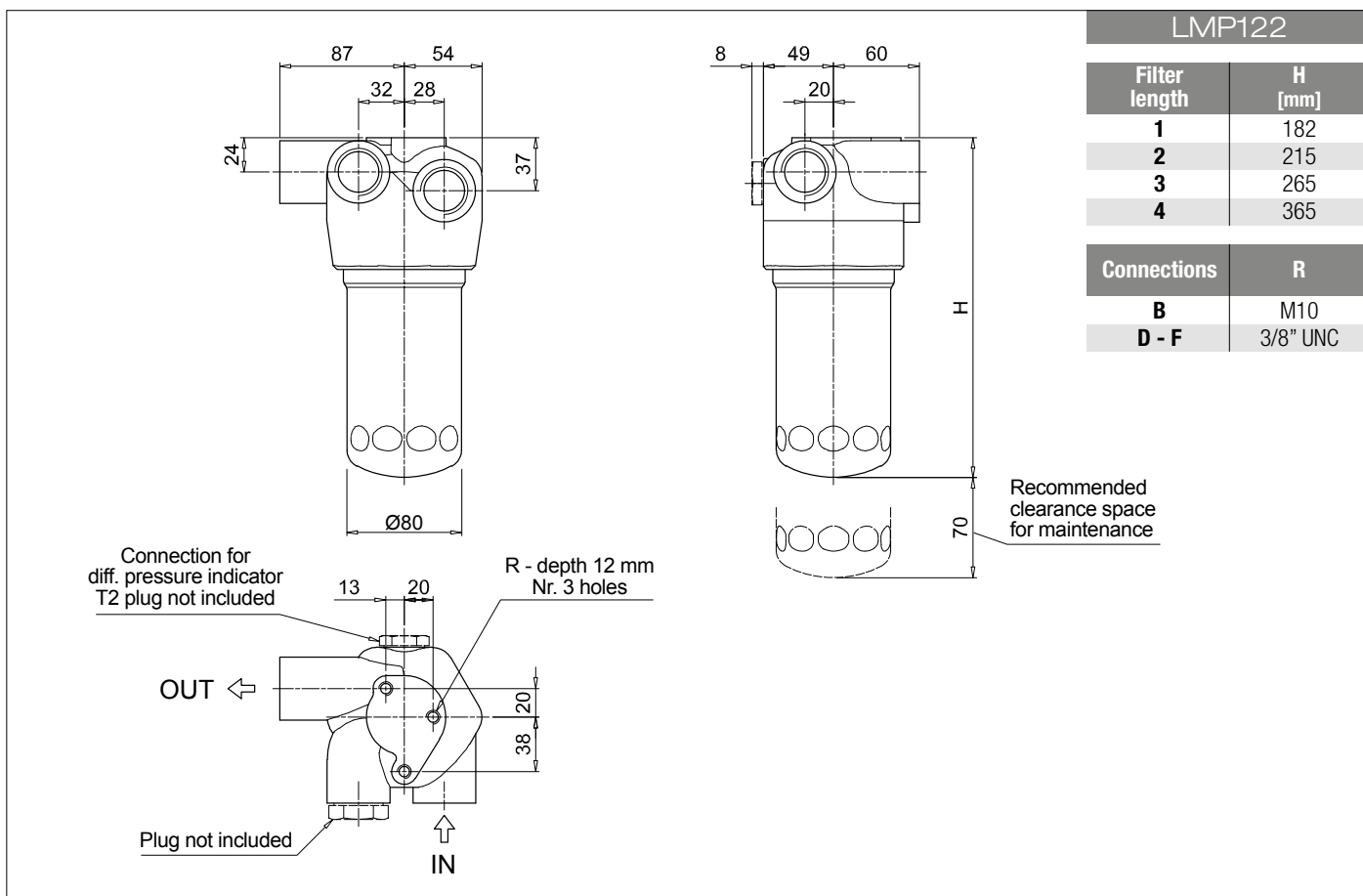
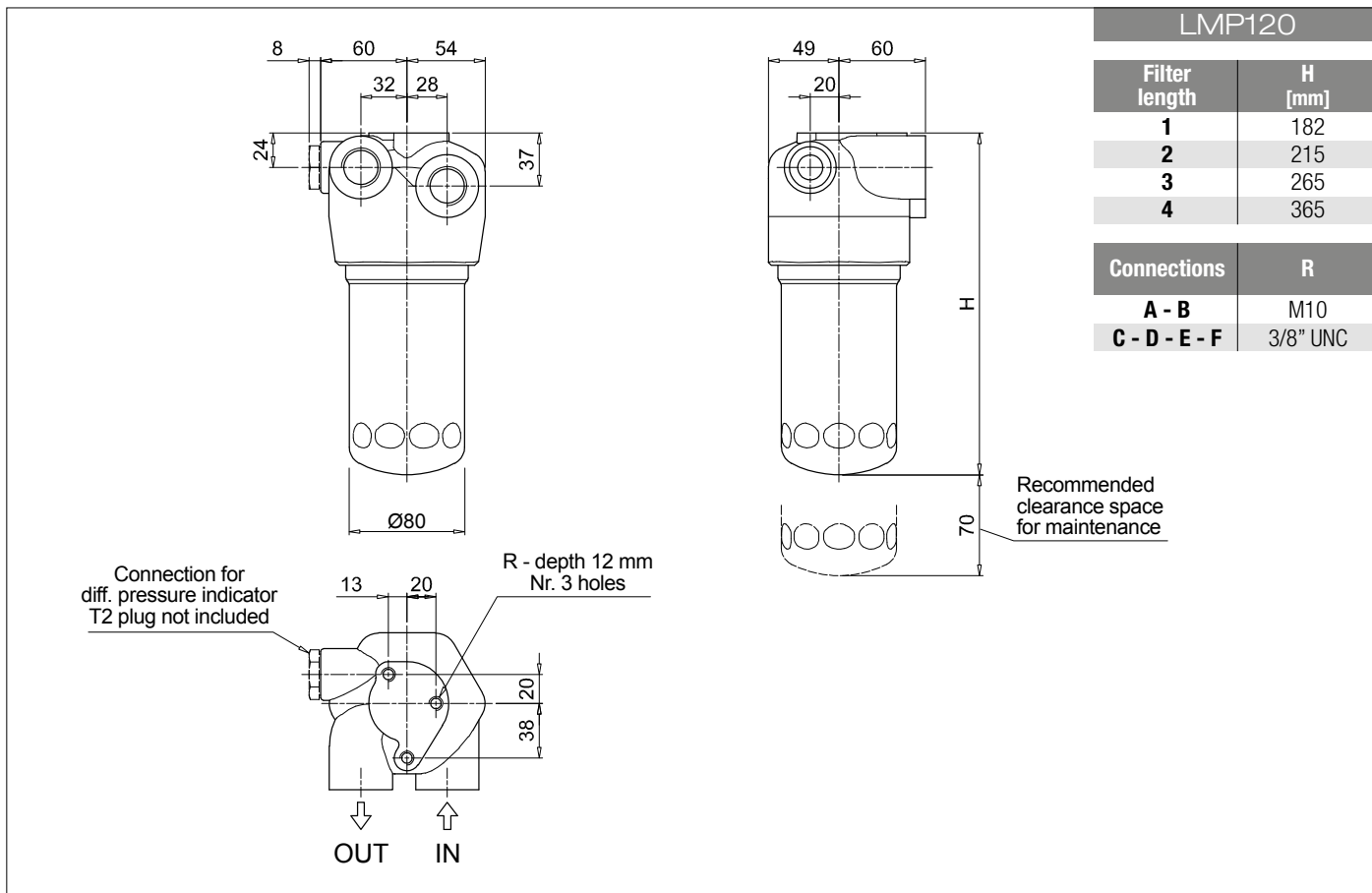
See page 722

<b>DEA</b> Electrical differential pressure indicator	<b>DLE</b> Electrical / visual differential pressure indicator
<b>DEM</b> Electrical differential pressure indicator	<b>DTA</b> Electronic differential pressure indicator
<b>DEU</b> Electrical differential pressure indicator	<b>DVA</b> Visual differential pressure indicator
<b>DLA</b> Electrical / visual differential pressure indicator	<b>DVM</b> Visual differential pressure indicator

**PLUGS**

See page 743

<b>T2</b> Plug
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Designation & Ordering code

**COMPLETE FILTER**

Series and size **LMP123** Configuration example: **LMP123** **4** **R** **A** **F** **1** **A10** **N** **P01**

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

Valves	Bypass	OUT to cooler	Check valve
<b>C</b>	without	front	2 bar
<b>D</b>			3 bar
<b>G</b>		side	2 bar
<b>H</b>			3 bar
<b>M</b>	With bypass 3.5 bar	front	2 bar
<b>N</b>			3 bar
<b>Q</b>		side	2 bar
<b>R</b>			3 bar

Seals and treatments  
**A** NBR  
**V** FPM

Connections  
**B** G 1"  
**F** SAE 16 - 1 5/16" - 12 UN

Connection for differential pressure indicator  
**1** Without  
**2** With standard connection

Filtration rating (filter media)

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

Element Δp  
**N** 20 bar

Execution  
**P01** MP Filtri standard  
**Pxx** Customized

**FILTER ELEMENT**

Element series and size **CU110** Configuration example: **CU110** **4** **A10** **A** **N** **P01**

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

Filtration rating (filter media)

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

Seals and treatments  
**A** NBR  
**V** FPM

Element Δp  
**N** 20 bar

Execution  
**P01** MP Filtri standard  
**Pxx** Customized

**CLOGGING INDICATORS**

See page 722

- DEA** Electrical differential pressure indicator
- DEM** Electrical differential pressure indicator
- DEU** Electrical differential pressure indicator
- DLA** Electrical / visual differential pressure indicator

- DLE** Electrical / visual differential pressure indicator
- DTA** Electronic differential pressure indicator
- DVA** Visual differential pressure indicator
- DVM** Visual differential pressure indicator

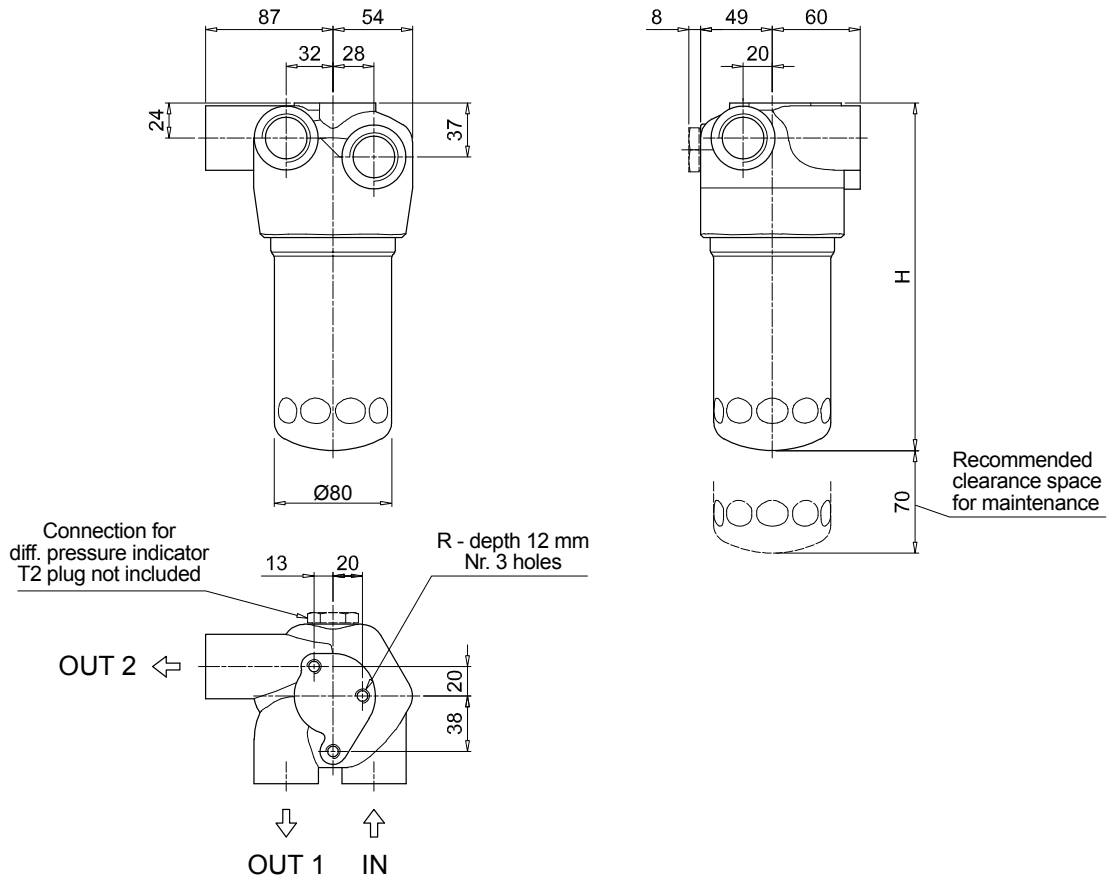
**PLUGS**

See page 743

- T2** Plug



LMP123	
Filter length	H [mm]
<b>1</b>	182
<b>2</b>	215
<b>3</b>	265
<b>4</b>	365
Connections	R
<b>B</b>	M10
<b>F</b>	3/8" UNC

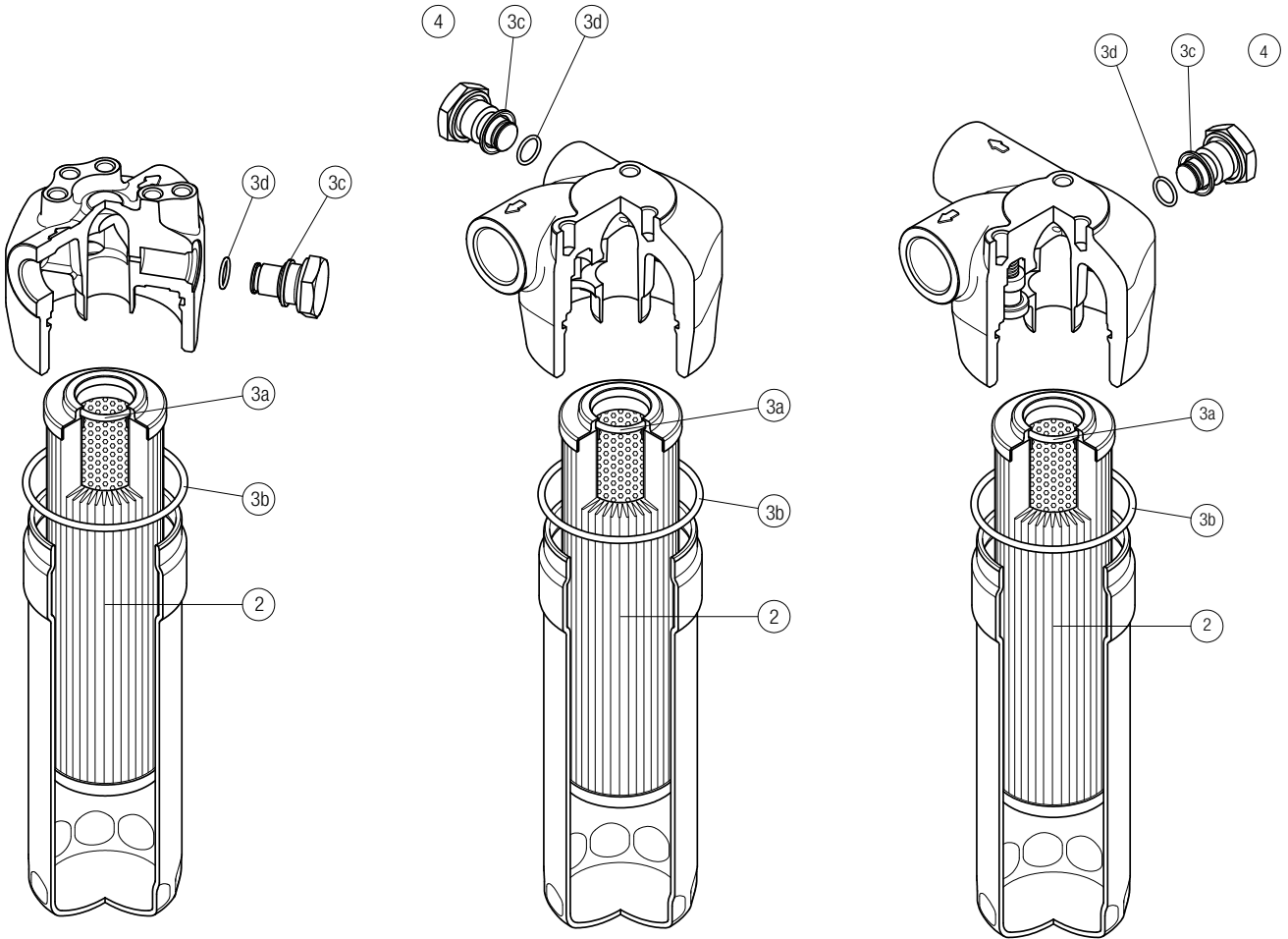


Order number for spare parts

LMP 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 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 - Polyamide

### 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) ±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 [dm<sup>3</sup>]

Filter series	Weights [kg]			Volumes [dm <sup>3</sup> ]				
	Length	1	2	3	Length	1	2	3
<b>LMP 210-211</b>		3.10	4.80	6.40		1.60	2.10	2.80

# GENERAL INFORMATION LMP 210-211

Flow rates [l/min]

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

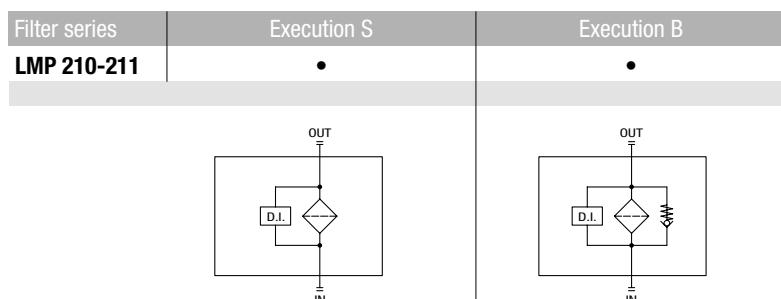
## Maximum flow rate for a complete low and medium pressure filter with a pressure drop $\Delta p = 0.7$ bar.

The reference fluid has a kinematic viscosity of 30 mm<sup>2</sup>/s (cSt) and a density of 0.86 kg/dm<sup>3</sup>.

For different pressure drop or fluid viscosity we recommend to use our selection software available on [www.mpfiltri.com](http://www.mpfiltri.com).

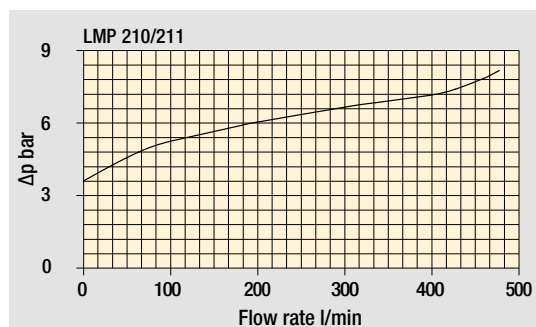
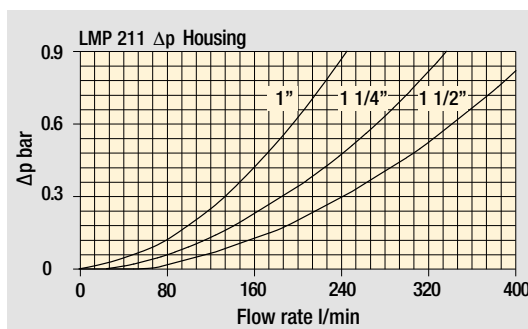
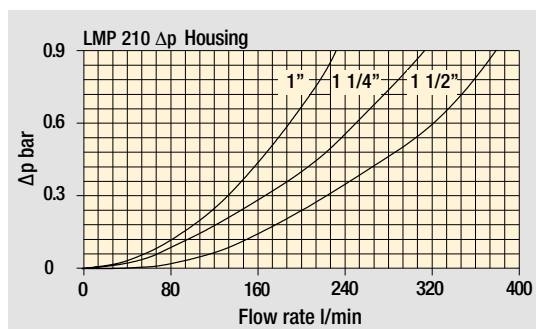
You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

## Hydraulic symbols



## Pressure drop

Filter housings  
 $\Delta p$  pressure drop



Bypass valve  
pressure drop

The curves are plotted using mineral oil with density of 0.86 kg/dm<sup>3</sup> in compliance with ISO 3968.  $\Delta p$  varies proportionally with density.

# LMP 210

## Designation & Ordering code

### COMPLETE FILTER

Configuration example: **LMP210** **3** **B** **A** **F1** **A10** **N** **P01**

**Series and size**  
**LMP210**

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

**Bypass valve**  
**S** Without bypass | **B** With bypass 3.5 bar

**Seals and treatments**  
**A** NBR  
**V** FPM

**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**  
**N** 20 bar

**Execution**  
**P01** MP Filtri standard  
**Pxx** Customized

### FILTER ELEMENT

Configuration example: **CU210** **3** **A10** **A** **N** **P01**

**Element series and size**  
**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 and treatments**  
**A** NBR  
**V** FPM

**Element Δp**  
**N** 20 bar

**Execution**  
**P01** MP Filtri standard  
**Pxx** Customized

### CLOGGING INDICATORS

See page 722

**DEA** Electrical differential pressure indicator  
**DEM** Electrical differential pressure indicator  
**DEU** Electrical differential pressure indicator  
**DLA** Electrical / visual differential pressure indicator

**DLE** Electrical / visual differential pressure indicator  
**DTA** Electronic differential pressure indicator  
**DVA** Visual differential pressure indicator  
**DVM** Visual differential pressure indicator

### PLUGS

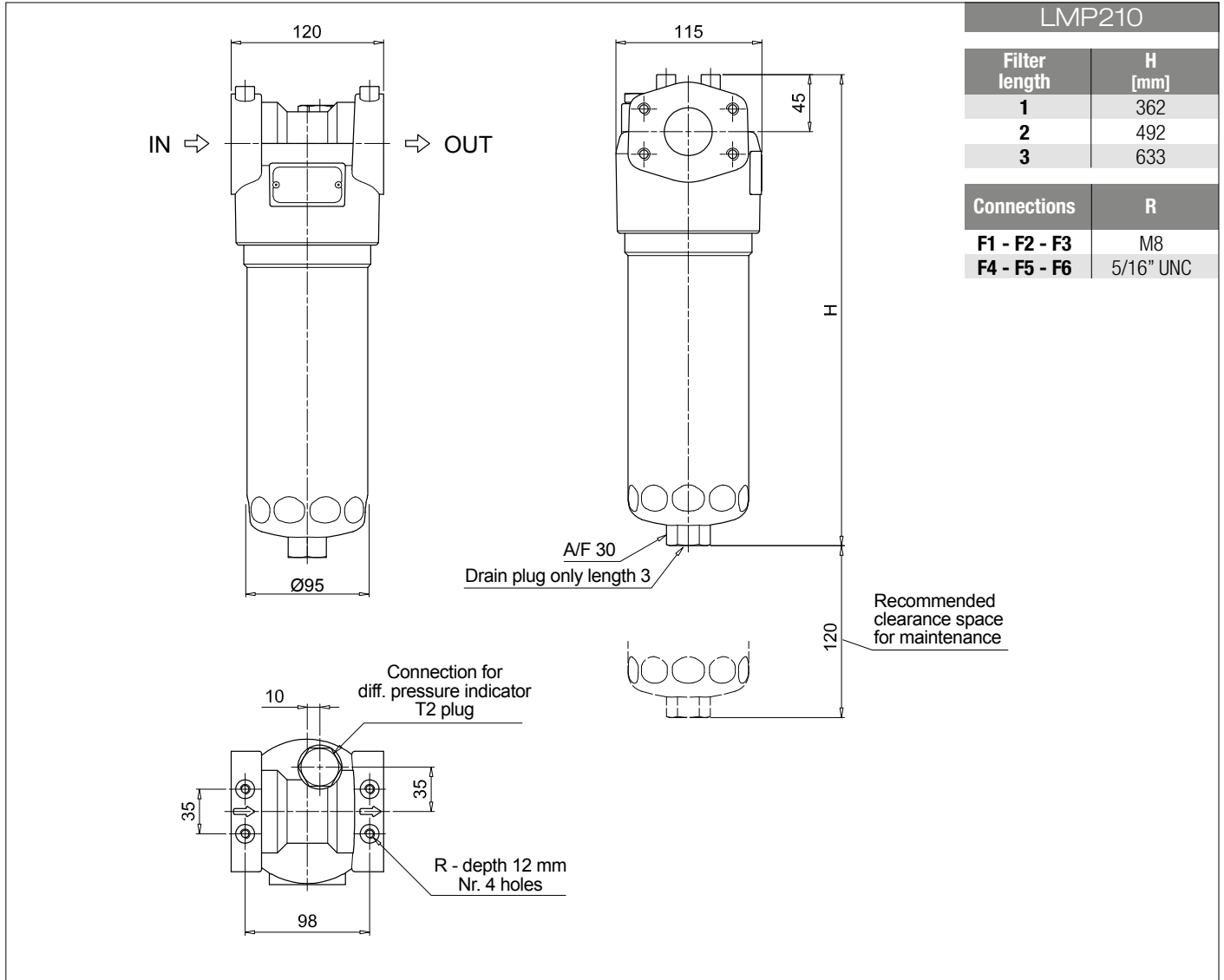
See page 743

**T2** Plug



# LMP 210

## Dimensions



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 **LMP211** Configuration example: **LMP211** **3** **B** **A** **D** **6** **A10** **N** **P01**

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

**Bypass valve**  
**S** Without bypass | **B** With bypass 3.5 bar

**Seals and treatments**  
**A** NBR  
**V** FPM

**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 pressure 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 **CU210** Configuration example: **CU210** **3** **A10** **A** **N** **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  
**WA025** Water absorber inorganic microfiber 25 µm

**Seals and treatments**  
**A** NBR  
**V** FPM

**Element Δp**  
**N** 20 bar

**Execution**  
**P01** MP Filtri standard  
**Pxx** Customized

### CLOGGING INDICATORS

See page 722

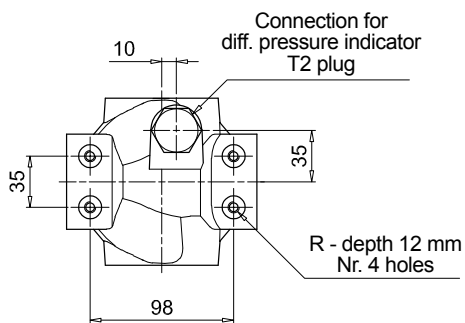
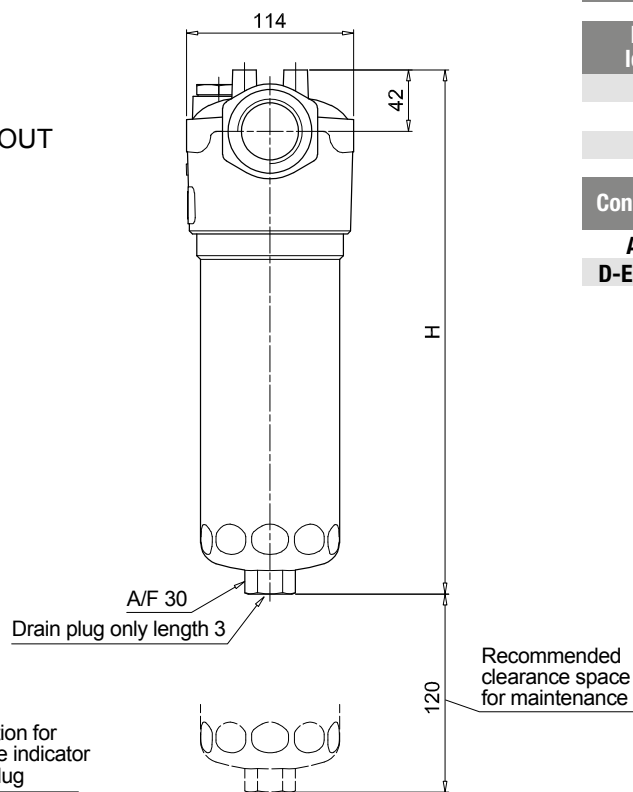
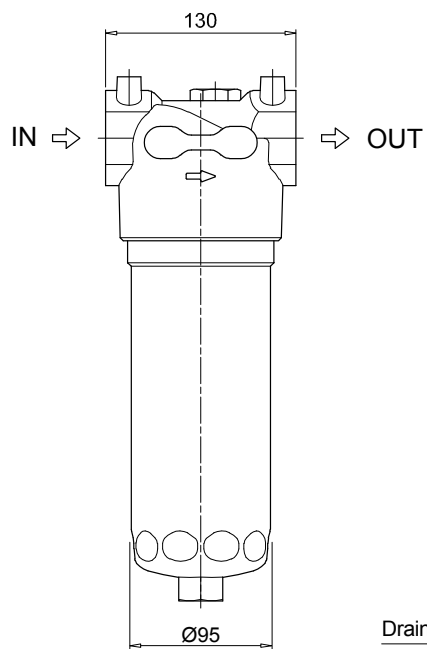
**DEA** Electrical differential pressure indicator  
**DEM** Electrical differential pressure indicator  
**DEU** Electrical differential pressure indicator  
**DLA** Electrical / visual differential pressure indicator

**DLE** Electrical / visual differential pressure indicator  
**DTA** Electronic differential pressure indicator  
**DVA** Visual differential pressure indicator  
**DVM** Visual differential pressure indicator

### PLUGS

See page 743

**T2** Plug



### LMP211

Filter length	H [mm]
1	358
2	488
3	629

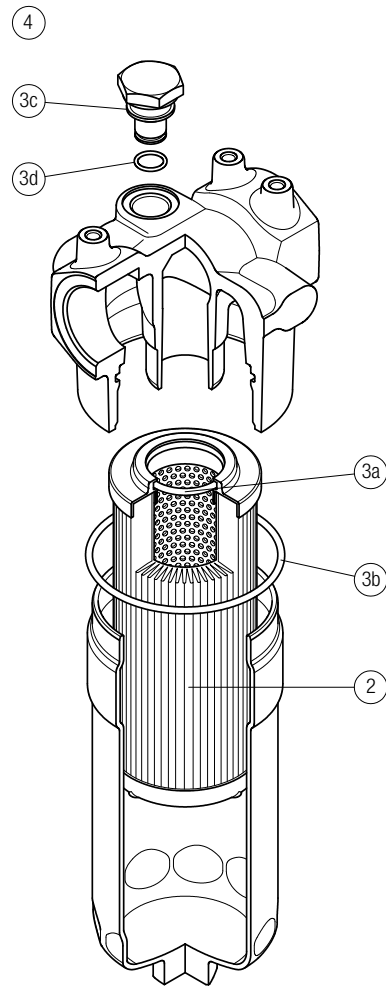
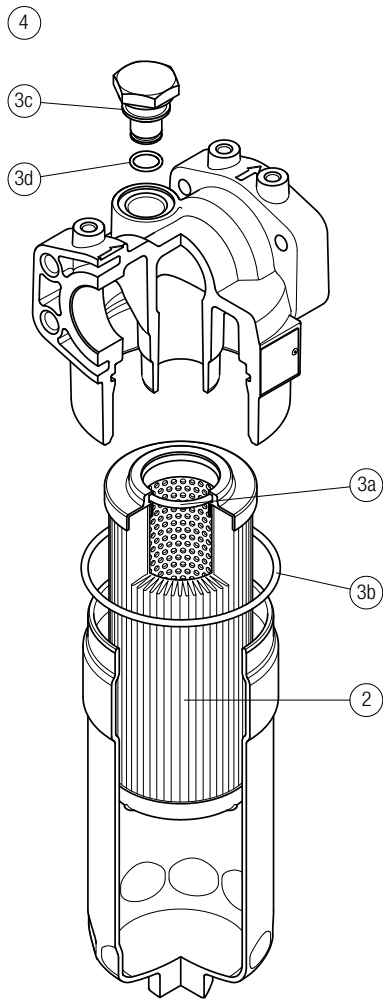
Connections	R
A-B-C	M8
D-E-F-G-H-I	5/16" UNC

# 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





# LPH 630 series

Maximum working pressure up to 1 MPa (10 bar) Flow rate up to 1600 l/min



# LPH 630 GENERAL INFORMATION

## Description

## Technical data

### Low & Medium Pressure filters

**Maximum working pressure up to 1 MPa (10 bar)**  
**Flow rate up to 1600 l/min**

LPH630 is a high capacity low pressure filter with large filtration surface particularly suitable for industrial applications and off-line filtration of the lubrication system reservoirs.

#### Available features:

- 2 1/2" flanged connection connections, for a maximum flow rate of 1600 l/min
- Versatile orientation of the connections, to suite a variety of hydraulic systems
- Fine filtration rating, to get a good cleanliness level into the system
- Water removal elements, to remove the free water from the hydraulic fluid.
- Bypass valve, to relieve excessive pressure drop across the filter media
- Magnetic filter, to hold the ferrous particles
- Visual, electrical and electronic differential clogging indicators.

#### Common applications:

- Lubrication
- Off-line filtration of reservoirs
- Filtration systems

### Filter housing materials

- Head & Cover: Anodized Aluminium
- Bypass valve: Phosphatized steel
- Bowl: Phosphatized steel

### Bypass valve

- Opening pressure 175 kPa (1.75 bar)  $\pm 10\%$
- Opening pressure 250 kPa (2.5 bar)  $\pm 10\%$

### $\Delta p$ 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

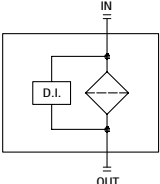
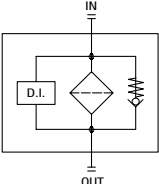
### Note

LPH filters are provided for vertical mounting

## Weights [kg] and volumes [dm<sup>3</sup>]

Filter series	Weights [kg]	Volumes [dm <sup>3</sup> ]
	Length 7	Length 7
<b>LPH 630</b>	1.50	0.60

## Hydraulic symbols

Filter series	Style S	Style C-E
<b>LPH 630</b>		



Flow rates [l/min]

Filter series	Length	Filter element design - N Series							
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
<b>LPH 630</b>	<b>7</b>	633	671	1091	1130	1217	1669	1518	1602

**Maximum flow rate for a complete delivery filter with a pressure drop  $\Delta p = 0.7$  bar.**

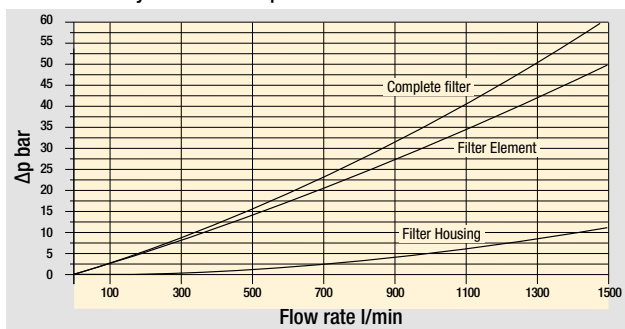
The reference fluid has a kinematic viscosity of 30 mm<sup>2</sup>/s (cSt) and a density of 0.86 kg/dm<sup>3</sup>.

For different pressure drop or fluid viscosity we recommend to use our selection software available on [www.mpfiltri.com](http://www.mpfiltri.com).

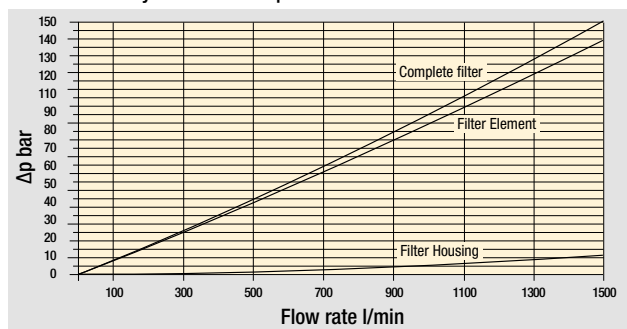
Please, contact our Sales Department for further additional information.

Filter housings  
 $\Delta p$  pressure drop

**MR630**  
Viscosity at the test temperature: 30 cSt



**MR630**  
Viscosity at the test temperature: 90 cSt



The curves are plotted using mineral oil with density of 0.86 kg/dm<sup>3</sup> in compliance with ISO 3968.  
 $\Delta p$  varies proportionally with density.

# LPH 630

## Designation & Ordering code

### COMPLETE FILTER

Configuration example: **LPH630** **7** **C** **E** **1** **1** **A** **F1** **A10** **P01**

**Series and size**  
LPH630

**Length**  
7

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

**Diffuser and magnetic filter**  
O With magnetic filter  
E Without magnetic filter

**Port IN position**  
1 On the left of the bracket

**Port OUT position**  
1 On the left of the bracket

**Seals and treatments**  
A NBR  
V FPM

**Connection**  
F1 2 1/2" SAE 3000 psi/M  
F3 2 1/2" SAE 3000 psi/UNC

**Filtration rating (filter media)**

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

**WA025** Water absorber inorganic microfiber 25 µm

**Execution**  
P01 MP Filtri standard  
Pxx Customized

### FILTER ELEMENT

Configuration example: **MR630** **7** **M25** **A** **P01**

**Element series and size**  
MR630

**Element length**  
7

**Filtration rating (filter media)**

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

**WA025** Water absorber inorganic microfiber 25 µm

**Seals and treatments**  
A NBR  
V FPM

**Execution**  
P01 MP Filtri standard  
Pxx Customized

### CLOGGING INDICATORS

See page 722

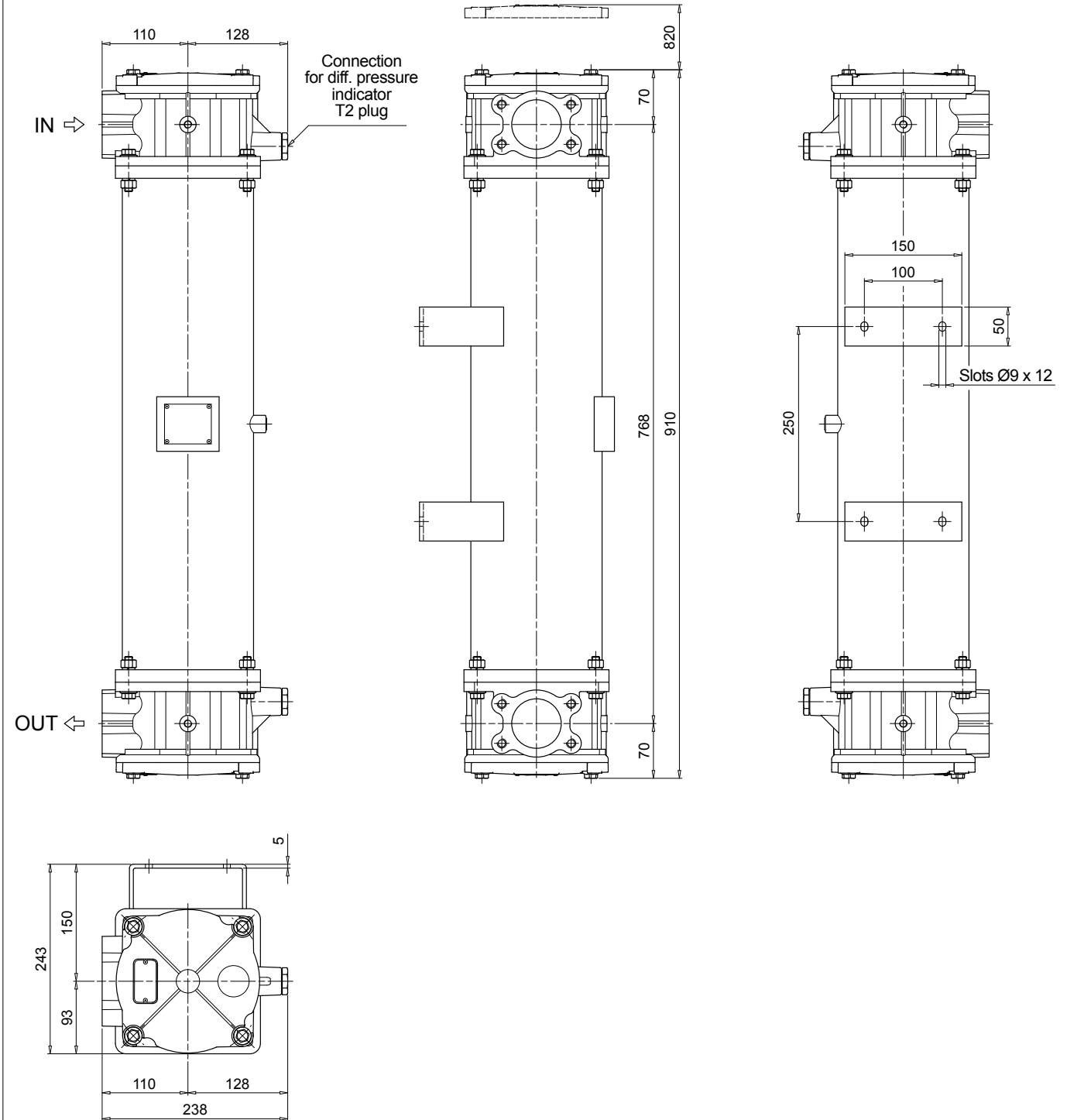
<b>DEA</b> Electrical differential pressure indicator	<b>DLE</b> Electrical / visual differential pressure indicator
<b>DEM</b> Electrical differential pressure indicator	<b>DTA</b> Electronic differential pressure indicator
<b>DEU</b> Electrical differential pressure indicator	<b>DVA</b> Visual differential pressure indicator
<b>DLA</b> Electrical / visual differential pressure indicator	<b>DVM</b> Visual differential pressure indicator

### PLUGS

See page 743

T2 Plug

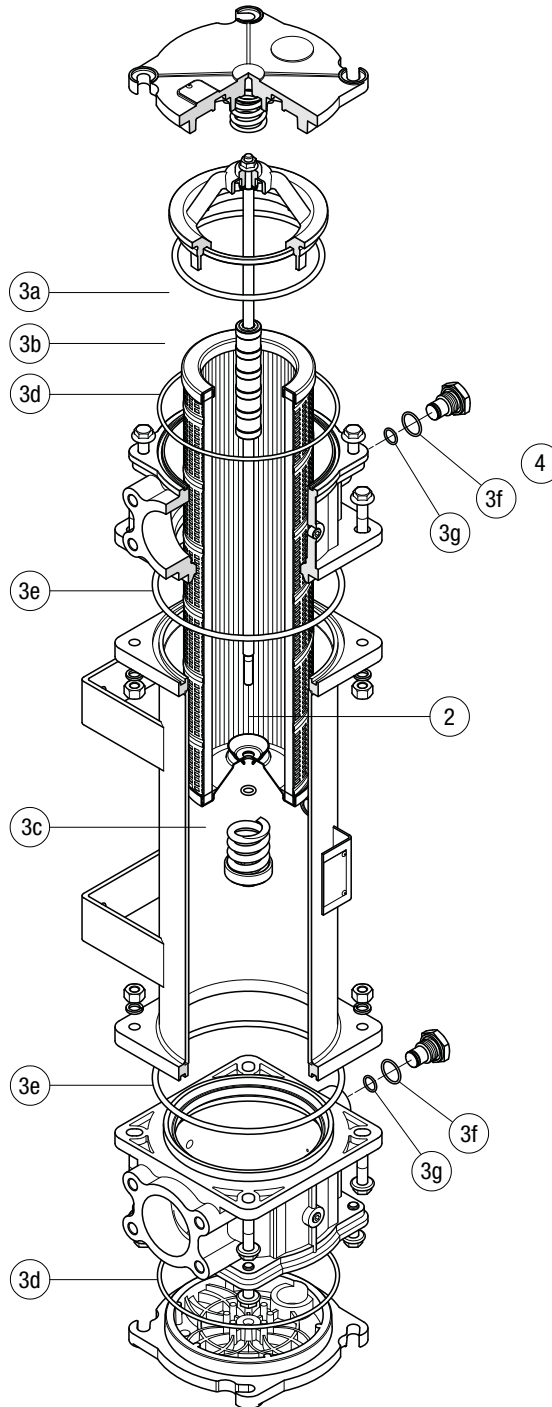
LPH630



# LPH 630

Order number for spare parts

LPH 630



Item:	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3 (3a ÷ 3g)	Q.ty: 2 pc. 4
Filter series	Filter element	Seal Kit code number	
LPH 630	See order table	NBR 02050640	FPM 02050641
		Indicator connection plug	
		NBR T2H	FPM T2V





# LMP 400-401 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 400-401 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 400-401 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: In-line Inlet/Outlet  
 LMP 401: 90° Inlet/Outlet

### Note

LMP 400 filters are provided for vertical mounting

## Weights [kg] and volumes [dm<sup>3</sup>]

Filter series	Weights [kg]						Volumes [dm <sup>3</sup> ]					
	Length	2	3	4	5	6	Length	2	3	4	5	6
<b>LMP 400-401</b>		7.20	8.10	8.80	11.90	14.40		3.50	5.00	6.50	9.50	13.50



Flow rates [l/min]

Filter series	Length	Filter element design - N Series							
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
<b>LMP 400</b>	<b>2</b>	205	244	370	411	515	720	524	556
	<b>3</b>	280	333	474	515	602	760	637	660
	<b>4</b>	347	400	535	564	637	769	660	688
	<b>5</b>	459	501	610	660	717	781	700	721
	<b>6</b>	504	575	676	689	728	783	708	727
<b>LMP 401</b>	<b>2</b>	200	236	347	382	468	628	475	501
	<b>3</b>	268	315	434	468	537	659	565	582
	<b>4</b>	328	373	484	507	565	665	582	603
	<b>5</b>	423	456	544	582	626	674	613	629
	<b>6</b>	459	516	594	604	634	676	619	633

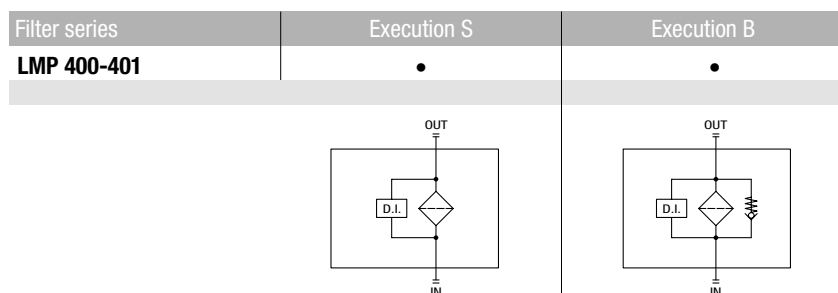
**Maximum flow rate for a complete low and medium pressure filter with a pressure drop  $\Delta p = 0.7$  bar.**

The reference fluid has a kinematic viscosity of 30 mm<sup>2</sup>/s (cSt) and a density of 0.86 kg/dm<sup>3</sup>.

For different pressure drop or fluid viscosity we recommend to use our selection software available on [www.mpfiltri.com](http://www.mpfiltri.com).

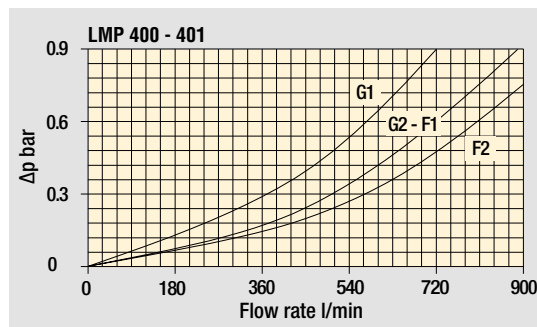
You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols

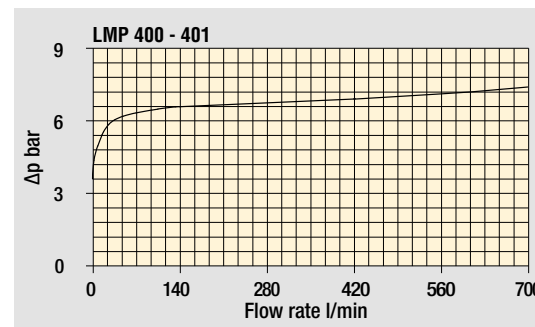


Pressure drop

Filter housings  $\Delta p$  pressure drop



Bypass valve pressure drop



The curves are plotted using mineral oil with density of 0.86 kg/dm<sup>3</sup> in compliance with ISO 3968.  $\Delta p$  varies proportionally with density.

# LMP 400-401

## Designation & Ordering code

### COMPLETE FILTER

Series and size **LMP400 | LMP401** Configuration example: **LMP401** **3** **B** **A** **G1** **A10** **N** **P01**

Length **2** | **3** | **4** | **5** | **6** |

Bypass valve **S** Without bypass **B** With bypass 3.5 bar

Seals and treatments	Filtration rating		
	Axx	Mxx	Pxx
<b>A</b> NBR	•	•	•
<b>V</b> FPM	•	•	•
<b>W</b> NBR	•	•	-

Connections

<b>G1</b> G 1 1/2"	<b>F1</b> 2" SAE 3000 psi/M
<b>G2</b> G 2"	<b>F2</b> 2 1/2" SAE 3000 psi/M
<b>G3</b> 1 1/2" NPT	<b>F3</b> 2" SAE 3000 psi/UNC
<b>G4</b> 2" NPT	<b>F4</b> 2 1/2" SAE 3000 psi/UNC
<b>G5</b> SAE 24 - 1 7/8" - 12 UN	
<b>G6</b> SAE 32 - 2 1/2" - 12 UN	

Filtration rating (filter media)	
<b>A03</b> Inorganic microfiber 3 µm	<b>M25</b> Wire mesh 25 µm
<b>A06</b> Inorganic microfiber 6 µm	<b>M60</b> Wire mesh 60 µm
<b>A10</b> Inorganic microfiber 10 µm	<b>M90</b> Wire mesh 90 µm
<b>A16</b> Inorganic microfiber 16 µm	<b>P10</b> Resin impregnated paper 10 µm
<b>A25</b> Inorganic microfiber 25 µm	<b>P25</b> Resin impregnated paper 25 µm
<b>WA025</b> Water absorber inorganic microfiber 25 µm	

Element Δp	Execution					
	2	3	4	5	6	Filter length
<b>N</b> 20 bar	•	•	•	•	•	
						<b>P01</b> MP Filtri standard
						<b>P02</b> Maintenance from the bottom of the housing
						<b>Pxx</b> Customized

### FILTER ELEMENT

Element series and size **CU400** Configuration example: **CU400** **3** **A10** **A** **N** **P01**

Element length **2** | **3** | **4** | **5** | **6** |

Filtration rating (filter media)	
<b>A03</b> Inorganic microfiber 3 µm	<b>M25</b> Wire mesh 25 µm
<b>A06</b> Inorganic microfiber 6 µm	<b>M60</b> Wire mesh 60 µm
<b>A10</b> Inorganic microfiber 10 µm	<b>M90</b> Wire mesh 90 µm
<b>A16</b> Inorganic microfiber 16 µm	<b>P10</b> Resin impregnated paper 10 µm
<b>A25</b> Inorganic microfiber 25 µm	<b>P25</b> Resin impregnated paper 25 µm
<b>WA025</b> Water absorber inorganic microfiber 25 µm	

Seals	Filtration rating		
	Axx	Mxx	Pxx
<b>A</b> NBR	•	•	•
<b>V</b> FPM	•	•	•
<b>W</b> NBR	•	•	-

Element Δp	Execution	
	20 bar	MP Filtri standard
<b>N</b> 20 bar	•	•
		<b>P01</b> MP Filtri standard
		<b>Pxx</b> Customized

### CLOGGING INDICATORS

See page 722

**DEA** Electrical differential pressure indicator

**DEM** Electrical differential pressure indicator

**DEU** Electrical differential pressure indicator

**DLA** Electrical / visual differential pressure indicator

**DLE** Electrical / visual differential pressure indicator

**DTA** Electronic differential pressure indicator

**DVA** Visual differential pressure indicator

**DVM** Visual differential pressure indicator

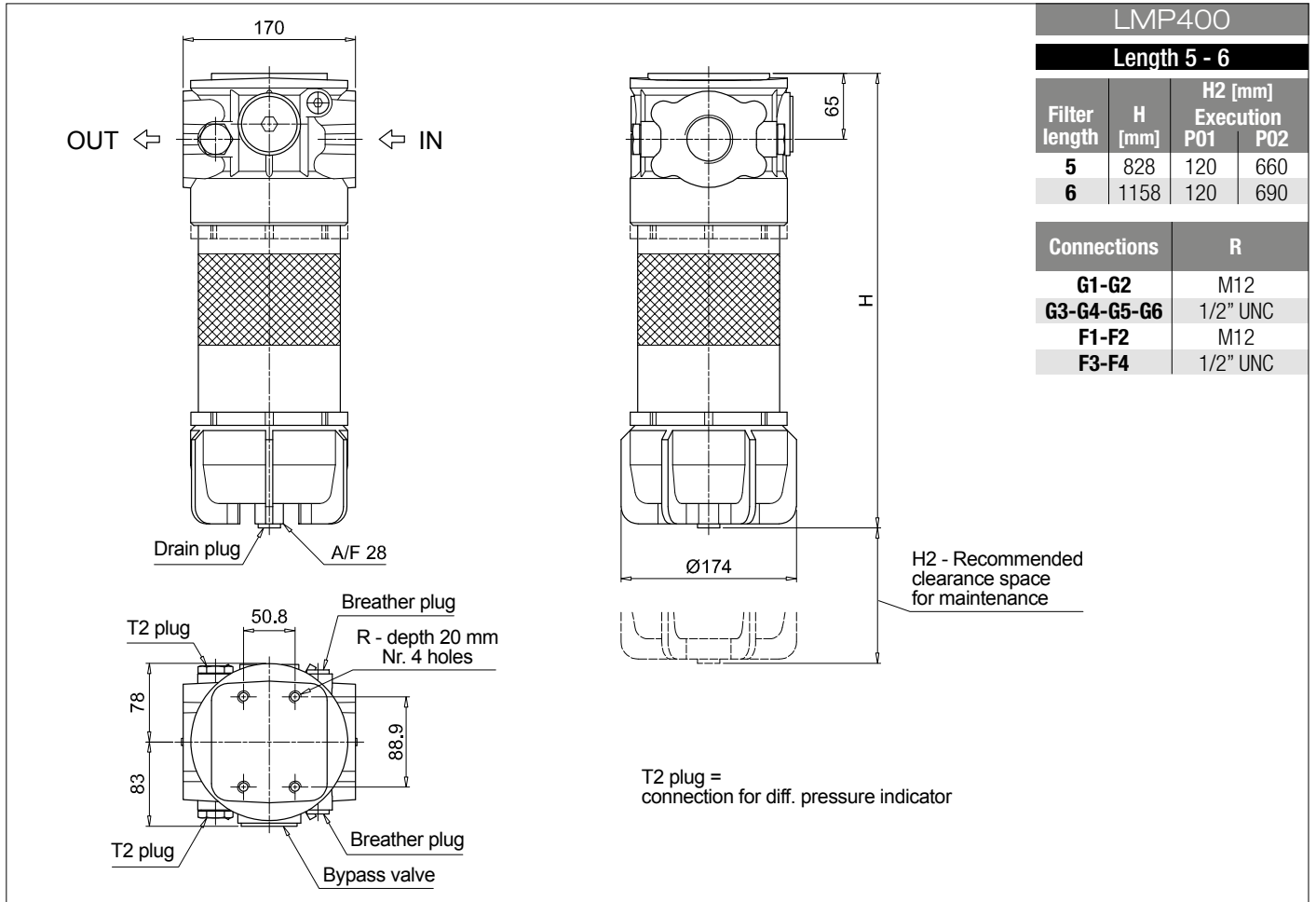
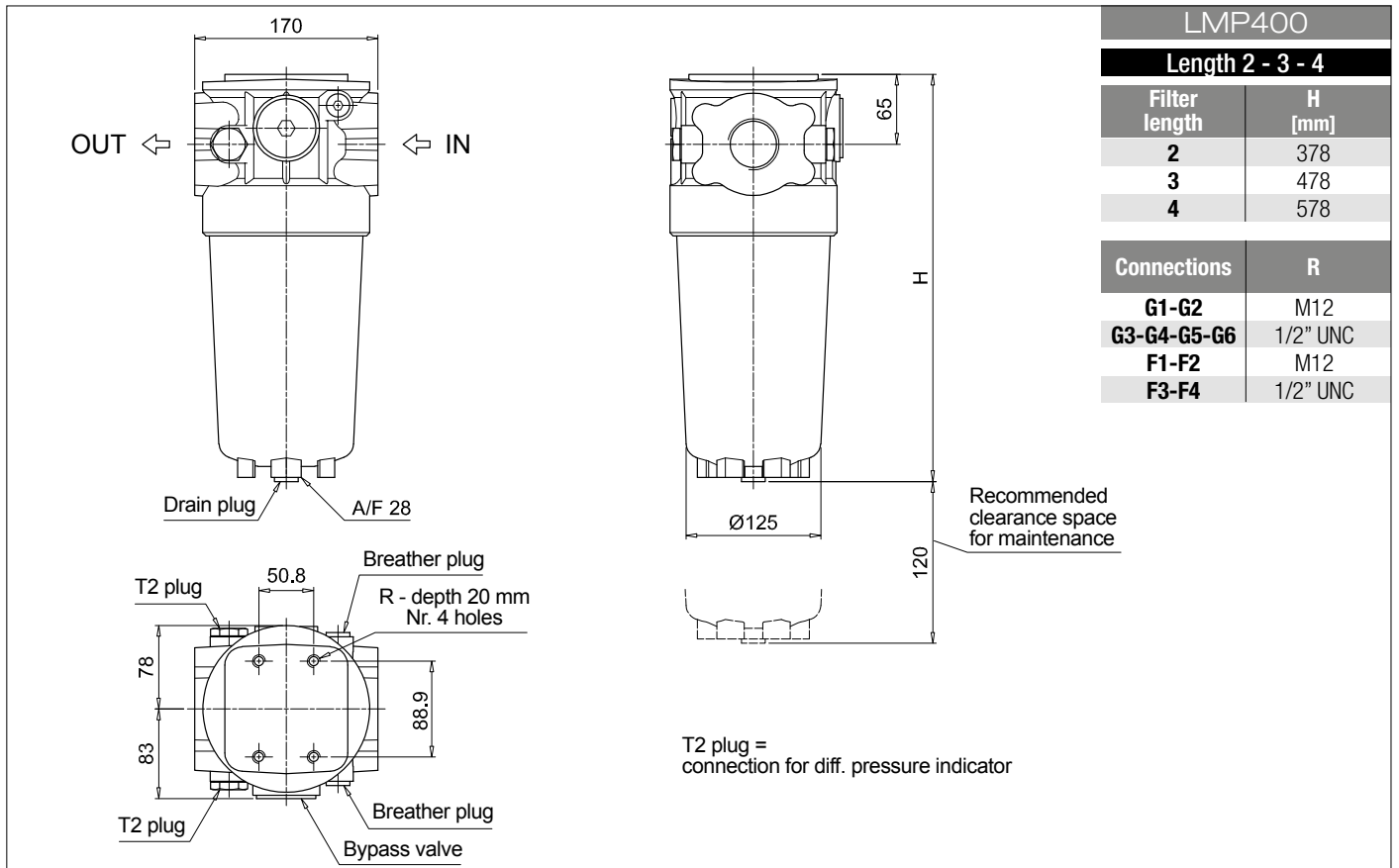
### PLUGS

See page 743

**T2** Plug

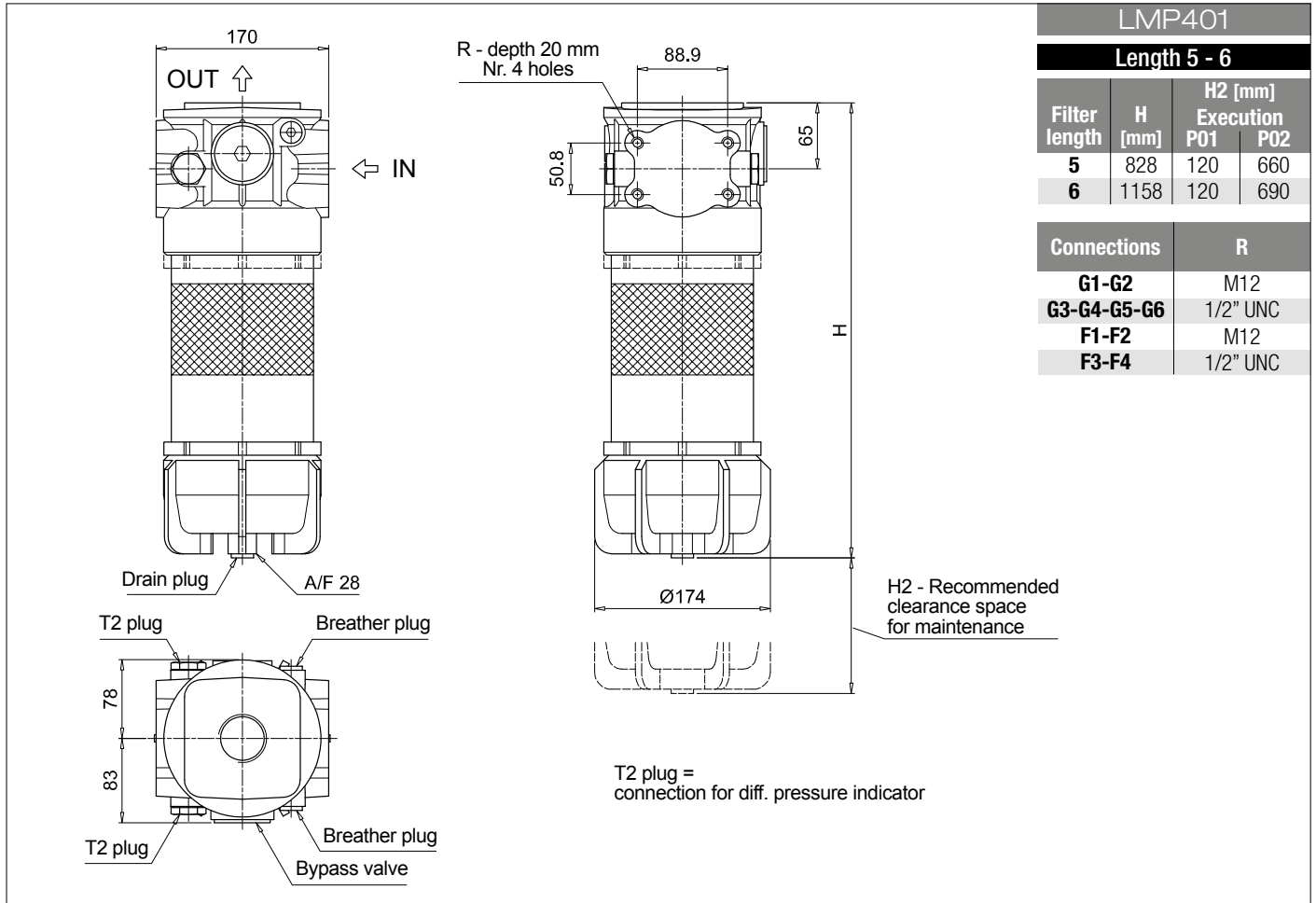
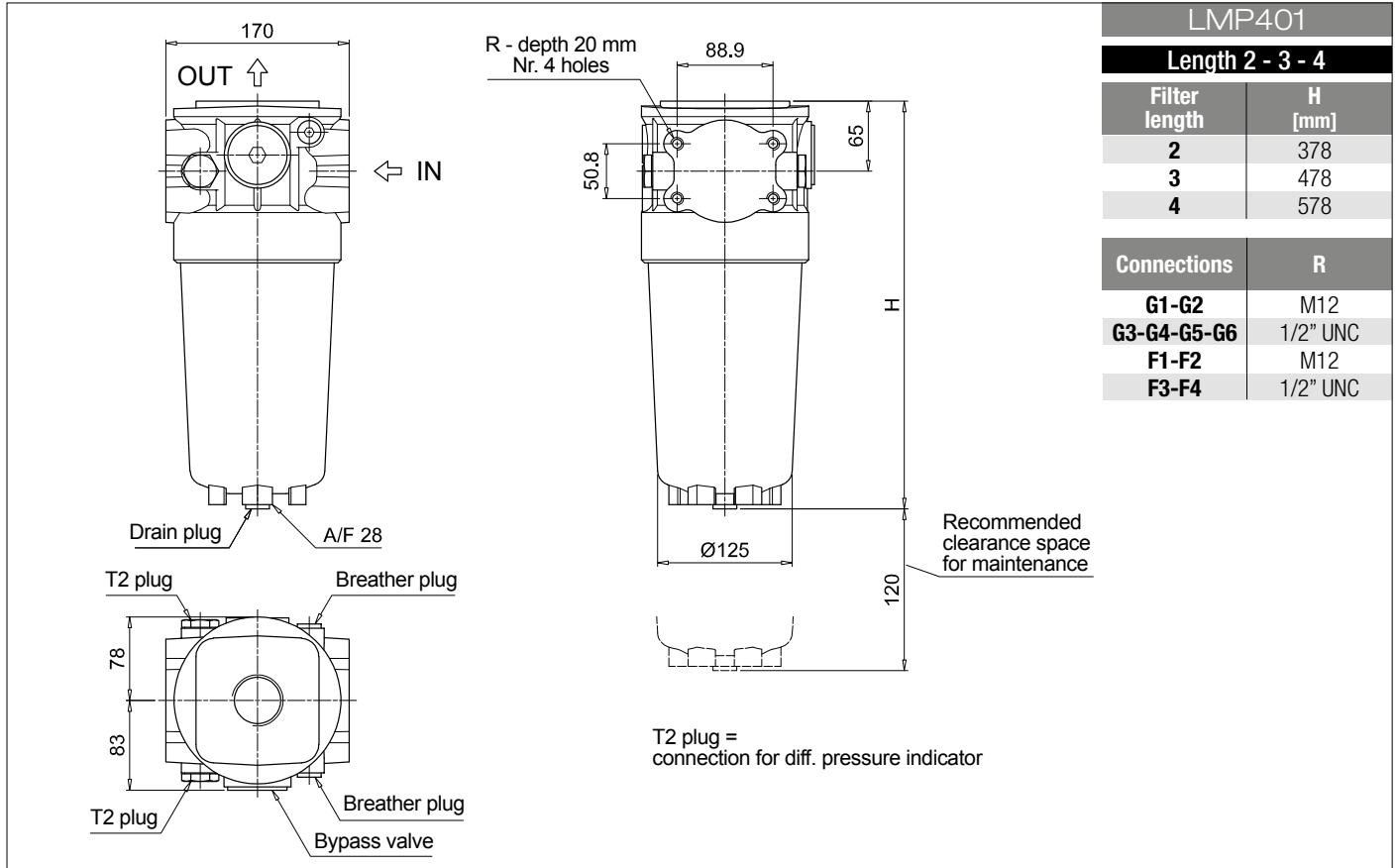
# LMP 400-401

## Dimensions



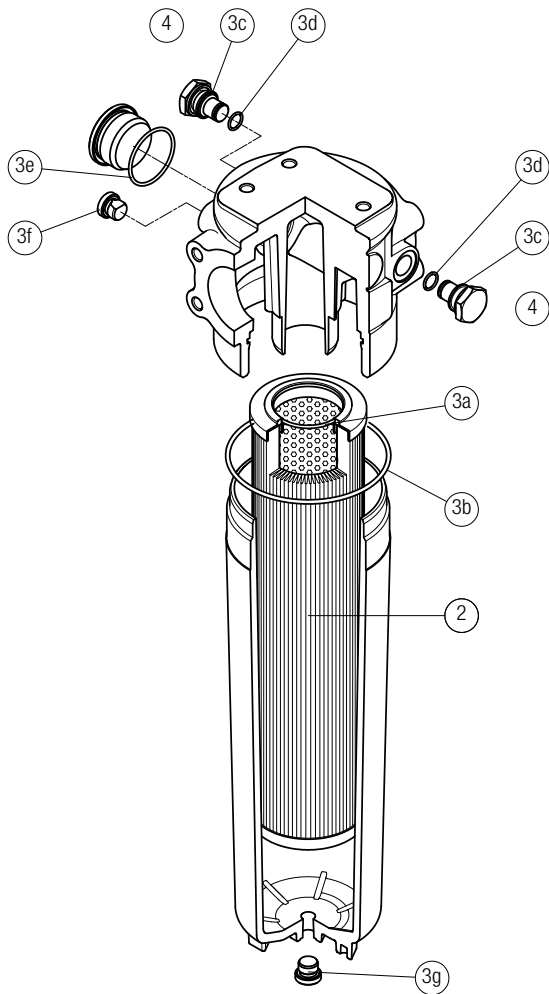
# LMP 400-401

## Dimensions

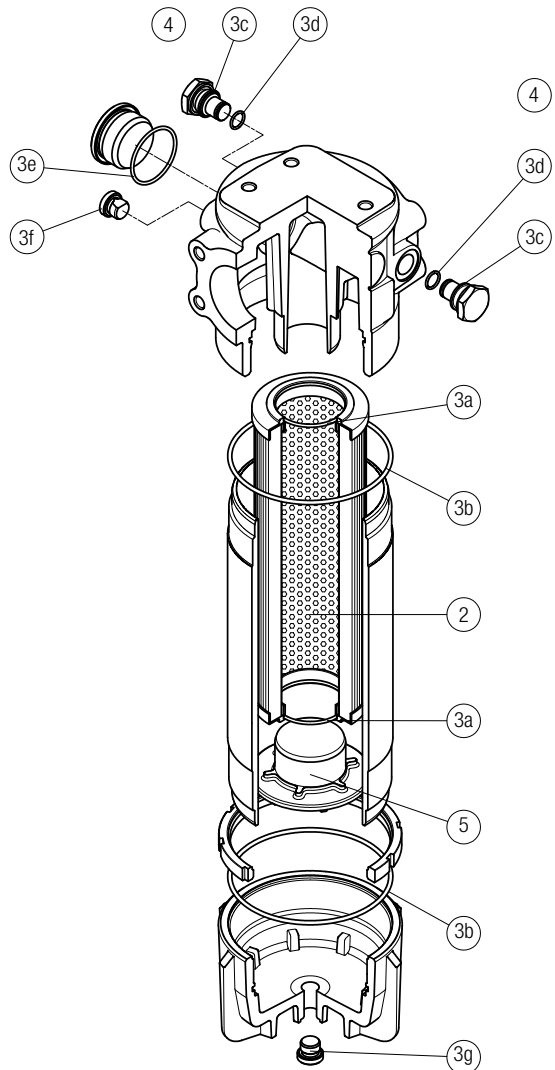


LMP 400 - 401

length 2 - 3 - 4



length 5 - 6

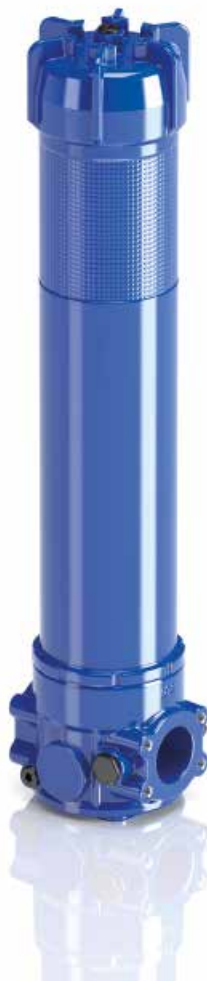


Item:	Q.ty: 1 pc. <b>2</b>	Q.ty: 1 pc. <b>3</b> (3a ÷ 3g)	Q.ty: 2 pcs. <b>4</b>	Q.ty: 2 pcs. <b>5</b>
Filter series	Filter element	Seal Kit code number NBR FPM	Indicator connection plug NBR FPM	Housing spigot no bypass
LMP 400-401 length 2-3-4	See order table	02050391 02050392	T2H T2V	-
LMP 400-401 length 5-6		02050393 02050394		01044108



# LMP 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**

LMP431-431 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 430-431 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 [dm<sup>3</sup>]

Filter series	Length	Weights [kg]		Length	Volumes [dm <sup>3</sup> ]	
		5	6		5	6
<b>LMP 430 - 431</b>		11.90	14.40		9.50	13.50



Flow rates [l/min]

Filter series	Length	Filter element design - N Series							
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
<b>LMP 430</b>	<b>5</b>	459	501	610	660	717	781	700	721
	<b>6</b>	504	575	676	689	728	783	708	727
<b>LMP 431</b>	<b>5</b>	423	456	544	582	626	674	613	629
	<b>6</b>	459	516	594	604	634	676	619	633

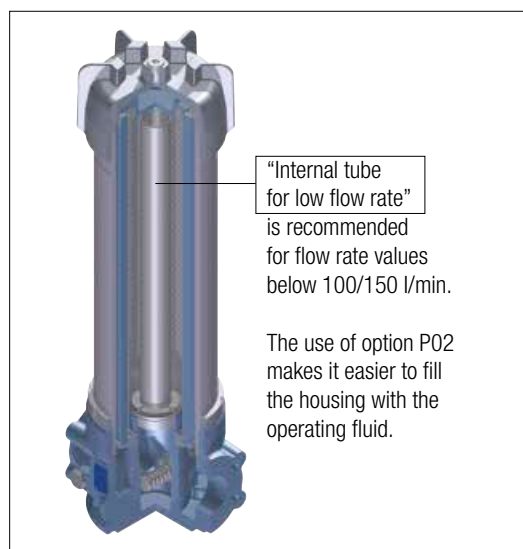
**Maximum flow rate for a complete low and medium pressure filter with a pressure drop  $\Delta p = 0.7$  bar.**

The reference fluid has a kinematic viscosity of 30 mm<sup>2</sup>/s (cSt) and a density of 0.86 kg/dm<sup>3</sup>.

For different pressure drop or fluid viscosity we recommend to use our selection software available on [www.mpfiltri.com](http://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**

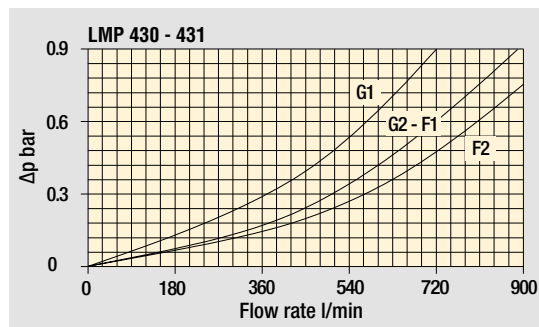


**Hydraulic symbols**

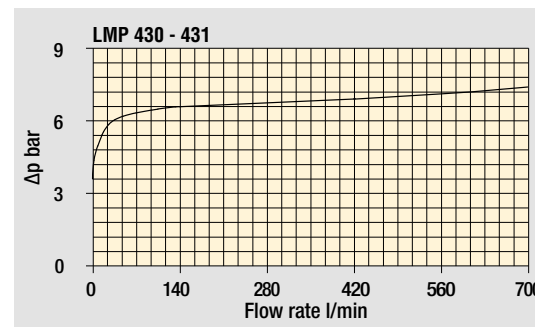
Filter series	Execution S	Execution B
<b>LMP 430-431</b>	•	•

**Pressure drop**

Filter housings  $\Delta p$  pressure drop



Bypass valve pressure drop



The curves are plotted using mineral oil with density of 0.86 kg/dm<sup>3</sup> in compliance with ISO 3968.  $\Delta p$  varies proportionally with density.

# LMP 430-431

## Designation & Ordering code

### COMPLETE FILTER

Series and size		Configuration example: <b>LMP431</b>   <b>5</b>   <b>B</b>   <b>A</b>   <b>G1</b>   <b>A10</b>   <b>N</b>   <b>P01</b>									
<b>LMP430</b>   <b>LMP431</b>											
Length		5   6									
Bypass valve		S Without bypass   B With bypass 3.5 bar									
Seals and treatments		Filtration rating									
		Axx	Mxx	Pxx							
A NBR		•	•	•							
V FPM		•	•	•							
W NBR		•	•	-							
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: <b>CU400</b>   <b>5</b>   <b>A10</b>   <b>A</b>   <b>N</b>   <b>P01</b>									
<b>CU400</b>											
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		•	•	-							
		Element Δp		Execution							
		N 20 bar		P01 MP Filtri standard							
				Pxx Customized							

### CLOGGING INDICATORS

See page 722

<b>DEA</b> Electrical differential pressure indicator	<b>DLE</b> Electrical / visual differential pressure indicator
<b>DEM</b> Electrical differential pressure indicator	<b>DTA</b> Electronic differential pressure indicator
<b>DEU</b> Electrical differential pressure indicator	<b>DVA</b> Visual differential pressure indicator
<b>DLA</b> Electrical / visual differential pressure indicator	<b>DVM</b> Visual differential pressure indicator

### PLUGS

See page 737

T2 Plug
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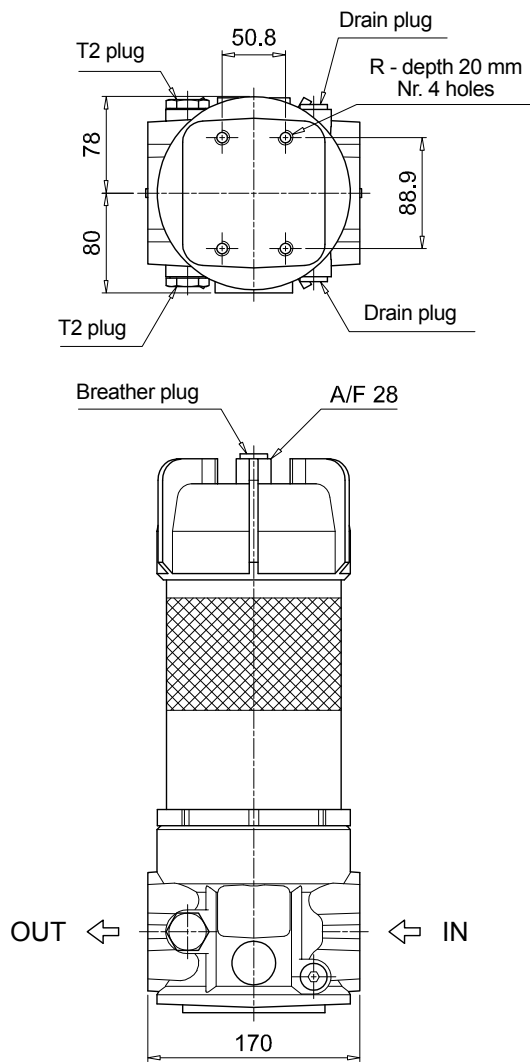
# LMP 430-431

## Dimensions

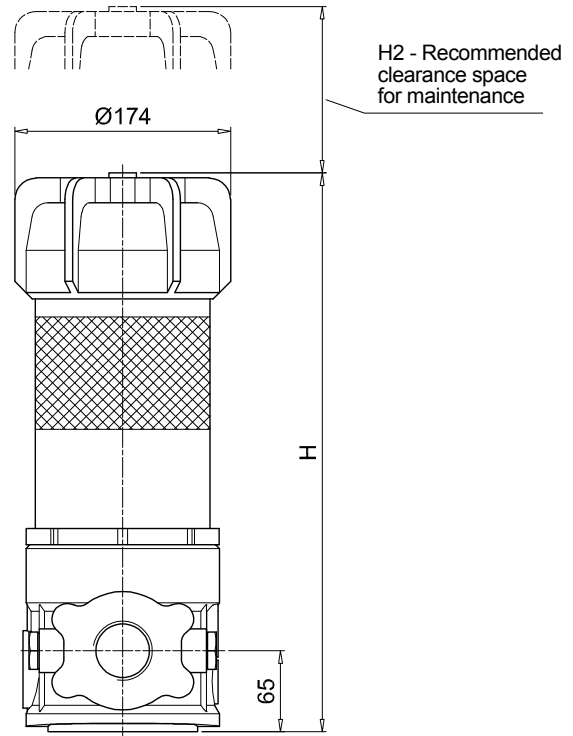
LMP430		
Filter length	H [mm]	H2 [mm]
<b>5</b>	828	660
<b>6</b>	1158	690

Connections	R
<b>G1-G2</b>	M12
<b>G3-G4-G5-G6</b>	1/2" UNC
<b>F1-F2</b>	M12
<b>F3-F4</b>	1/2" UNC



T2 plug =  
connection for diff. pressure indicator



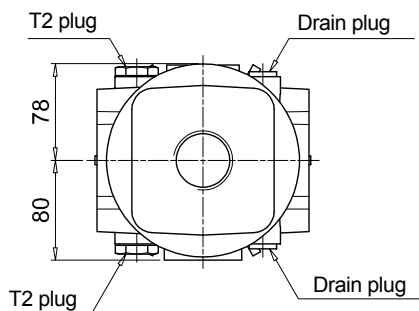
# LMP 430-431

## Dimensions

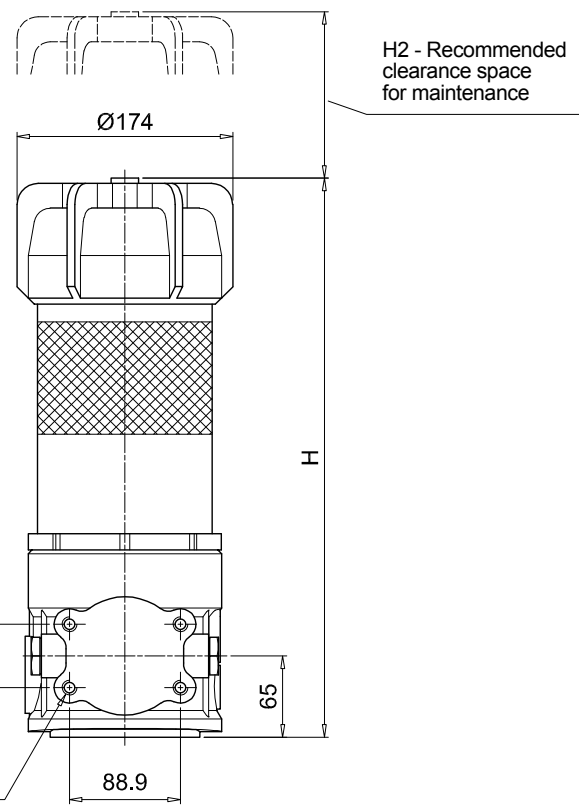
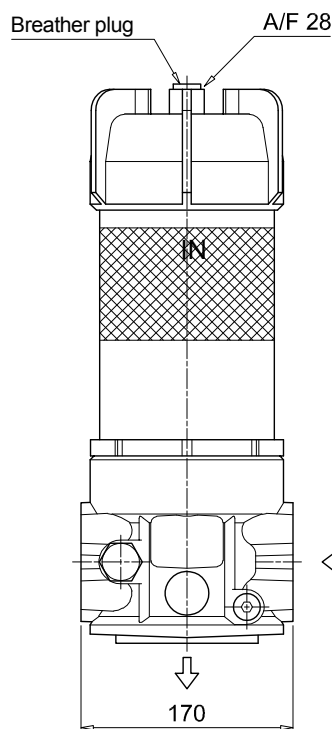
### LMP431

Filter length	H [mm]	H2 [mm]
<b>5</b>	828	660
<b>6</b>	1158	690

Connections	R
<b>G1-G2</b>	M12
<b>G3-G4-G5-G6</b>	1/2" UNC
<b>F1-F2</b>	M12
<b>F3-F4</b>	1/2" UNC

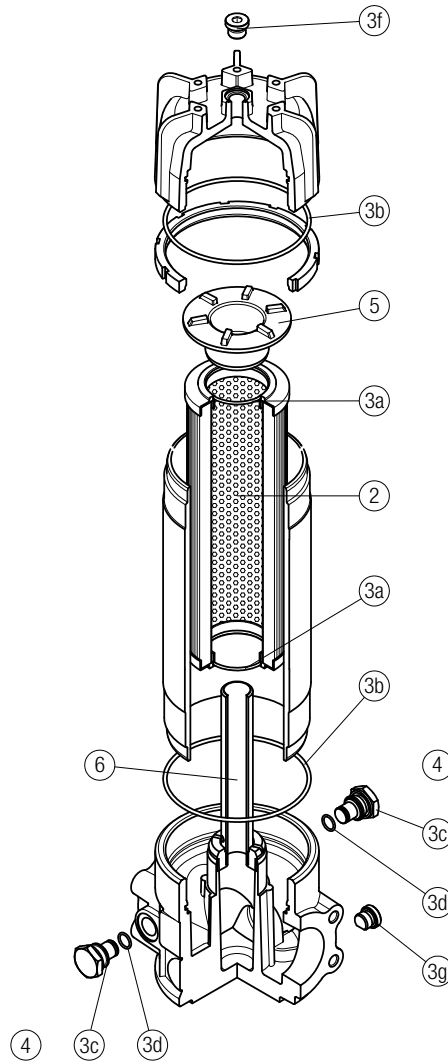


T2 plug =  
connection for diff. pressure indicator



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	Filter element	Seal Kit code number NBR	Seal Kit code number FPM	Indicator connection plug NBR	Indicator connection plug FPM	Housing spigot no bypass	Housing spigot with bypass	Internal tube for low flow rate, execution P02		
<b>LMP 430-431 length 5-6</b>	See order table	02050393	02050394	T2H	T2V	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 [dm<sup>3</sup>]

Filter series	Weights [kg]			Volumes [dm <sup>3</sup> ]		
	Length	2	3	Length	2	3
<b>LMP 950-951</b>		25.1	33.5		15	28



# GENERAL INFORMATION LMP 950-951

Flow rates [l/min]

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

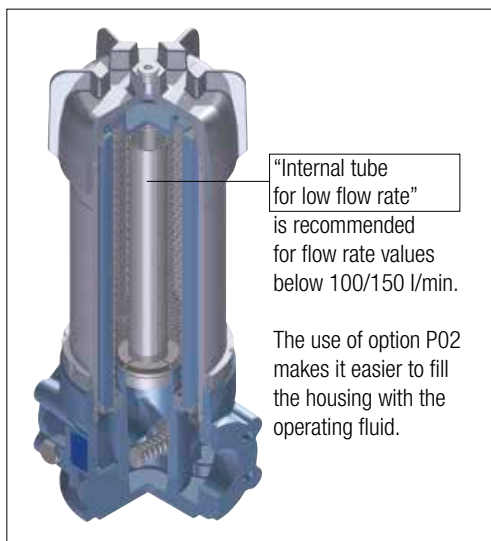
## Maximum flow rate for a complete low and medium pressure filter with a pressure drop $\Delta p = 0.7$ bar.

The reference fluid has a kinematic viscosity of 30 mm<sup>2</sup>/s (cSt) and a density of 0.86 kg/dm<sup>3</sup>.

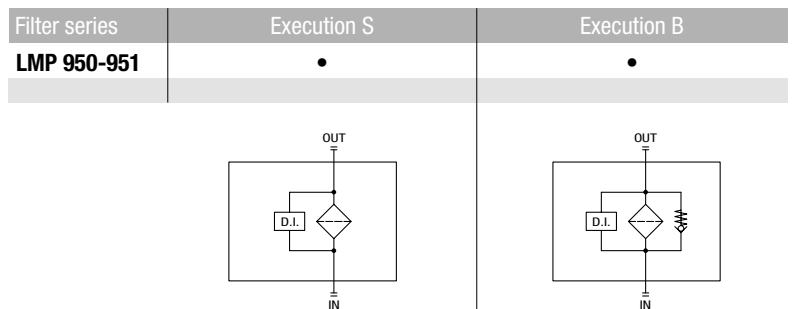
For different pressure drop or fluid viscosity we recommend to use our selection software available on [www.mpfiltri.com](http://www.mpfiltri.com).

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

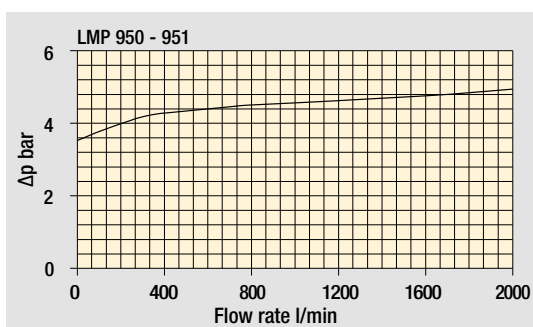
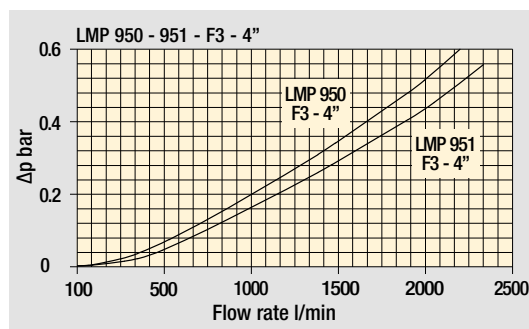
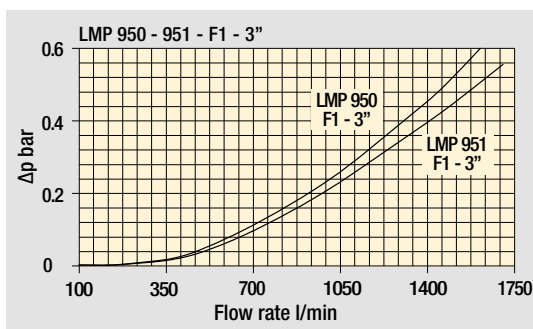


## Hydraulic symbols



## Pressure drop

Filter housings  $\Delta p$  pressure drop



Bypass valve pressure drop

The curves are plotted using mineral oil with density of 0.86 kg/dm<sup>3</sup> in compliance with ISO 3968.  $\Delta p$  varies proportionally with density.

# LMP 950-951

## Designation & Ordering code

### COMPLETE FILTER

<b>Series and size</b> <b>LMP950   LMP951</b>	Configuration example: <b>LMP951</b>   <b>2</b>   <b>B</b>   <b>A</b>   <b>F2</b>   <b>A10</b>   <b>N</b>   <b>P01</b>								
<b>Length</b> <b>2</b>   <b>3</b>									
<b>Bypass valve</b> <b>S</b> Without bypass   <b>B</b> With bypass 3.5 bar									
<b>Seals and treatments</b> <b>A</b> NBR <b>V</b> FPM									
<b>Connections</b> <b>F1</b> 3" SAE 3000 psi/M <b>F2</b> 3" SAE 3000 psi/UNC <b>F3</b> 4" SAE 3000 psi/M <b>F4</b> 4" SAE 3000 psi/UNC									
<b>Filtration rating (filter media)</b> <b>A03</b> Inorganic microfiber 3 µm   <b>M25</b> Wire mesh 25 µm <b>A06</b> Inorganic microfiber 6 µm   <b>M60</b> Wire mesh 60 µm <b>A10</b> Inorganic microfiber 10 µm   <b>M90</b> Wire mesh 90 µm <b>A16</b> Inorganic microfiber 16 µm <b>A25</b> Inorganic microfiber 25 µm <b>WA025</b> Water absorber inorganic microfiber 25 µm									
	<table border="1"> <tr> <th>Element Δp</th> <th>Execution</th> </tr> <tr> <td><b>N</b> 20 bar</td> <td><b>P01</b> MP Filtri standard</td> </tr> <tr> <td></td> <td><b>P02</b> With internal tube for low flow rate</td> </tr> <tr> <td></td> <td><b>Pxx</b> Customized</td> </tr> </table>	Element Δp	Execution	<b>N</b> 20 bar	<b>P01</b> MP Filtri standard		<b>P02</b> With internal tube for low flow rate		<b>Pxx</b> Customized
Element Δp	Execution								
<b>N</b> 20 bar	<b>P01</b> MP Filtri standard								
	<b>P02</b> With internal tube for low flow rate								
	<b>Pxx</b> Customized								

### FILTER ELEMENT

<b>Element series and size</b> <b>CU950</b>	Configuration example: <b>CU950</b>   <b>2</b>   <b>A10</b>   <b>A</b>   <b>N</b>   <b>P01</b>						
<b>Element length</b> <b>2</b>   <b>3</b>							
<b>Filtration rating (filter media)</b> <b>A03</b> Inorganic microfiber 3 µm   <b>M25</b> Wire mesh 25 µm <b>A06</b> Inorganic microfiber 6 µm   <b>M60</b> Wire mesh 60 µm <b>A10</b> Inorganic microfiber 10 µm   <b>M90</b> Wire mesh 90 µm <b>A16</b> Inorganic microfiber 16 µm <b>A25</b> Inorganic microfiber 25 µm <b>WA025</b> Water absorber inorganic microfiber 25 µm							
<b>Seals</b> <b>A</b> NBR <b>V</b> FPM							
	<table border="1"> <tr> <th>Element Δp</th> <th>Execution</th> </tr> <tr> <td><b>N</b> 20 bar</td> <td><b>P01</b> MP Filtri standard</td> </tr> <tr> <td></td> <td><b>Pxx</b> Customized</td> </tr> </table>	Element Δp	Execution	<b>N</b> 20 bar	<b>P01</b> MP Filtri standard		<b>Pxx</b> Customized
Element Δp	Execution						
<b>N</b> 20 bar	<b>P01</b> MP Filtri standard						
	<b>Pxx</b> Customized						

### CLOGGING INDICATORS

See page 722

<b>DEA</b> Electrical differential pressure indicator	<b>DLE</b> Electrical / visual differential pressure indicator
<b>DEM</b> Electrical differential pressure indicator	<b>DTA</b> Electronic differential pressure indicator
<b>DEU</b> Electrical differential pressure indicator	<b>DVA</b> Visual differential pressure indicator
<b>DLA</b> Electrical / visual differential pressure indicator	<b>DVM</b> Visual differential pressure indicator

### PLUGS

See page 743

<b>T2</b> Plug
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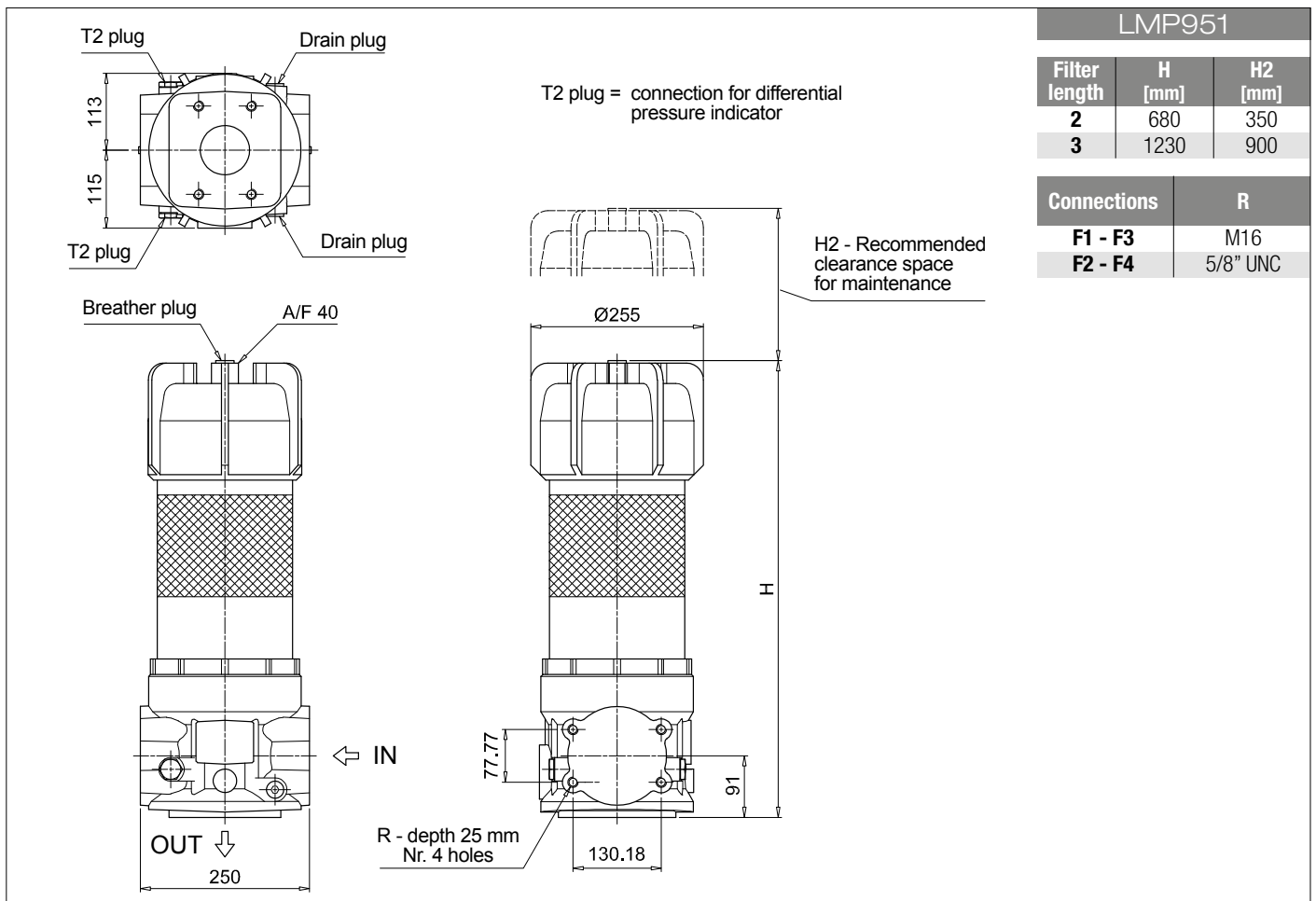
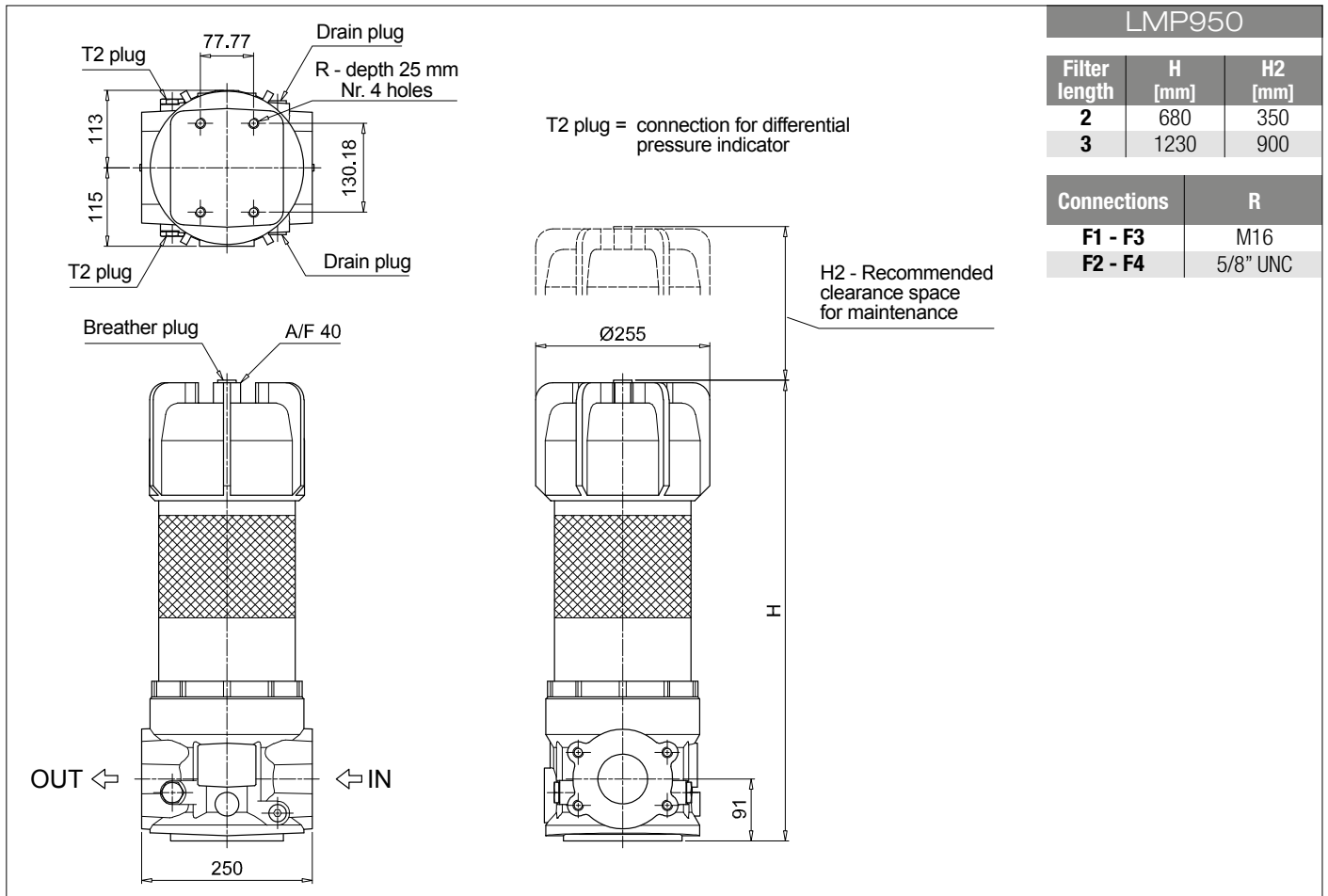
### ACCESSORIES

See page 472

<b>CFA</b> Retaining clamp
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# LMP 950-951

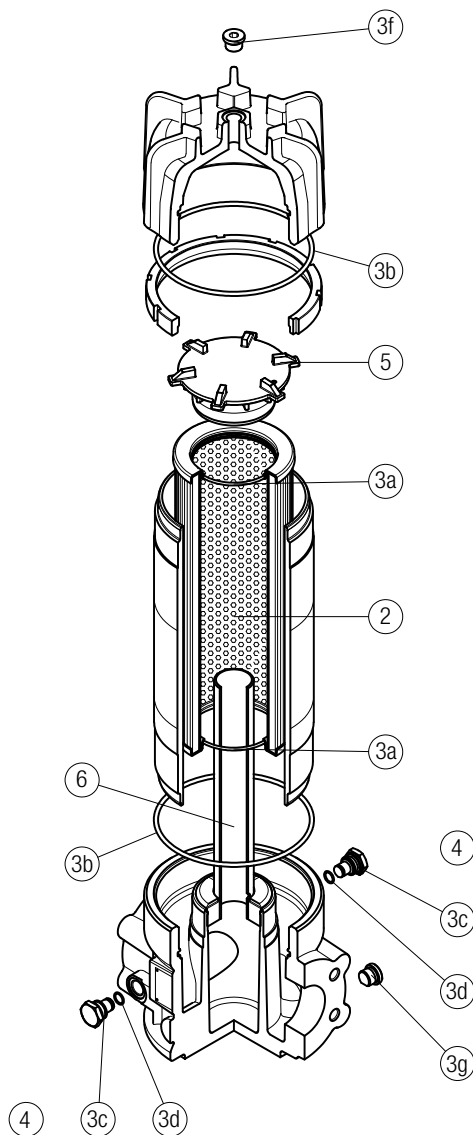
## Dimensions



# 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. PO2		
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



# LMP 952-953-954 GENERAL INFORMATION

## 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.

#### $\Delta p$ 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 [dm<sup>3</sup>]

Filter series	Weights [kg]		Volumes [dm <sup>3</sup> ]	
	Length	3	Length	3
<b>LMP 952</b>		96		66
<b>LMP 953</b>		138		99
<b>LMP 954</b>		192		132



Flow rates [l/min]

Filter series	Length	Filter element design - N Series					
		A03	A06	A10	A16	A25	M25 M60 M90
<b>LMP 952</b>	<b>3</b>	2172	2294	2766	3106	3256	3998
<b>LMP 953</b>	<b>3</b>	2842	2964	3403	3696	3820	4395
<b>LMP 954</b>	<b>3</b>	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 mm<sup>2</sup>/s (cSt) and a density of 0.86 kg/dm<sup>3</sup>.

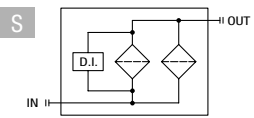
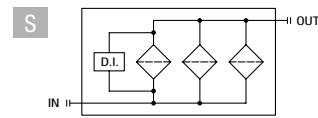
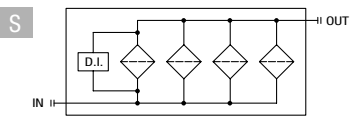
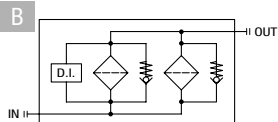
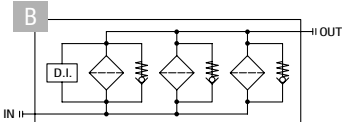
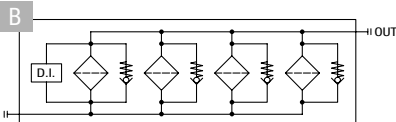
For different pressure drop or fluid viscosity we recommend to use our selection software available on [www.mpfiltri.com](http://www.mpfiltri.com).

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
<b>LMP 952</b>	•	-	-
<b>LMP 953</b>	-	•	-
<b>LMP 954</b>	-	-	•

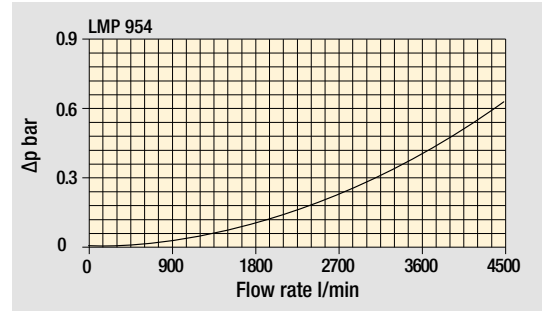
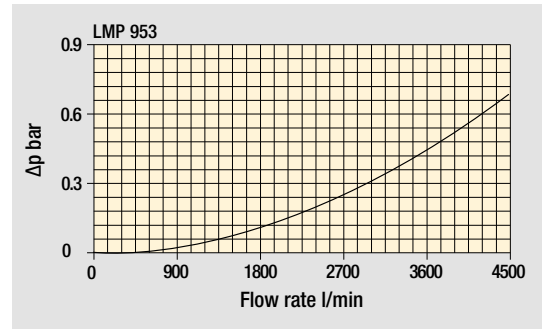
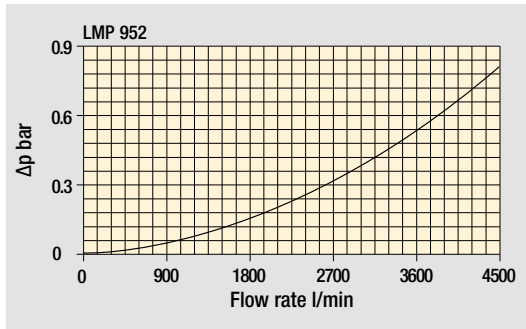
  

S		S		S	
B		B		B	

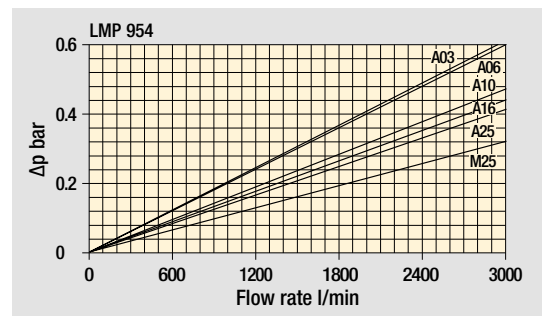
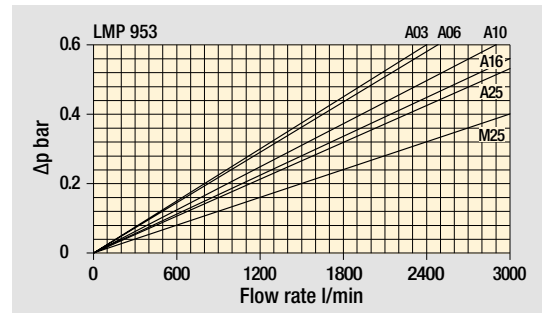
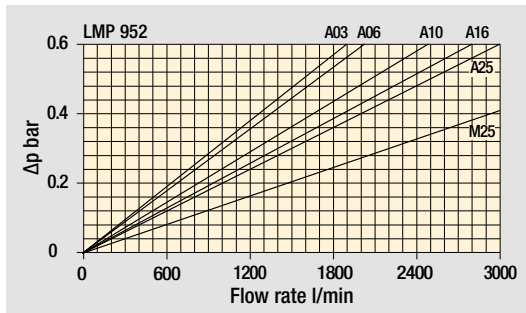
# LMP 952-953-954 GENERAL INFORMATION

## Pressure drop

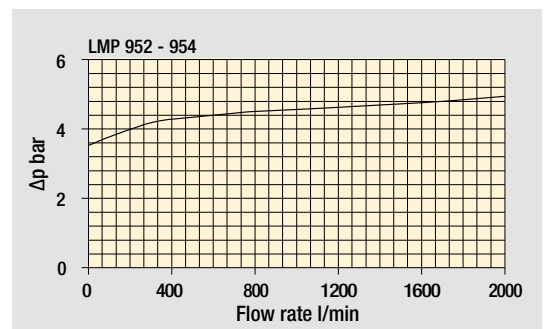
### Filter housings $\Delta p$ pressure drop



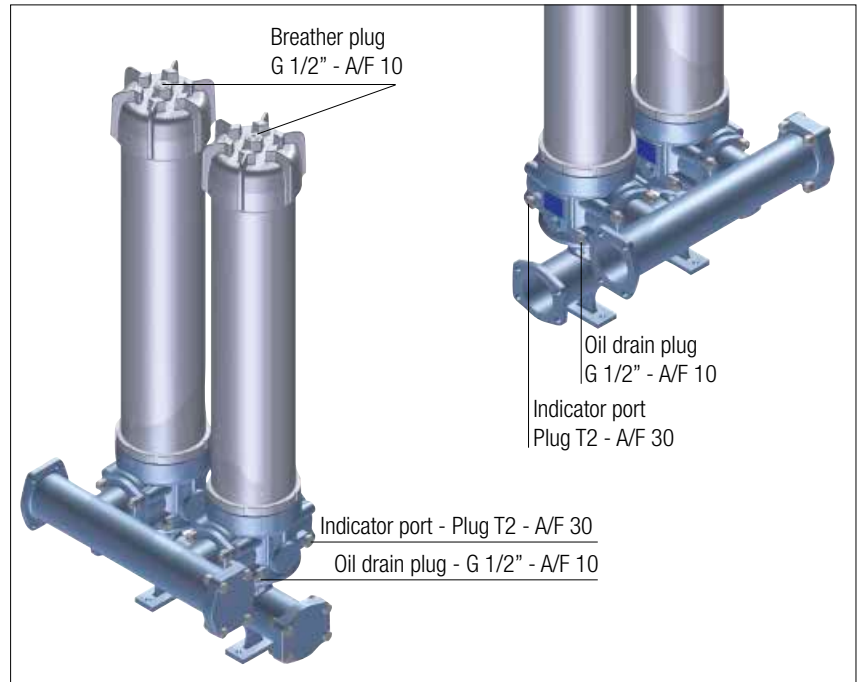
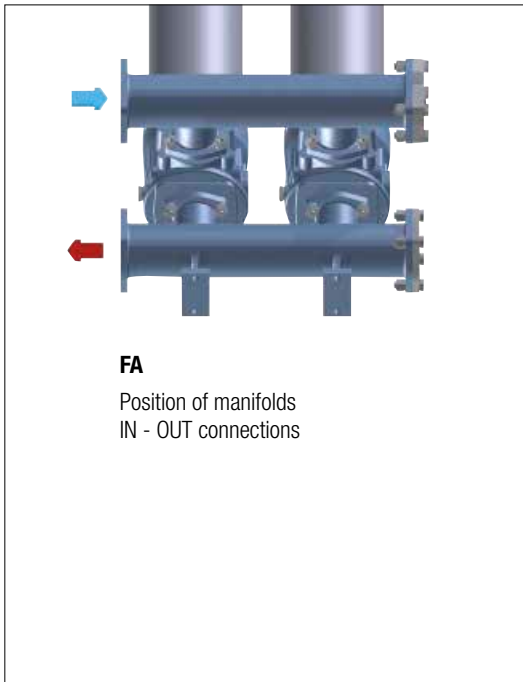
### Pressure drop of filter complete with cartridge, oil viscosity 30 mm<sup>2</sup>/s (cSt)



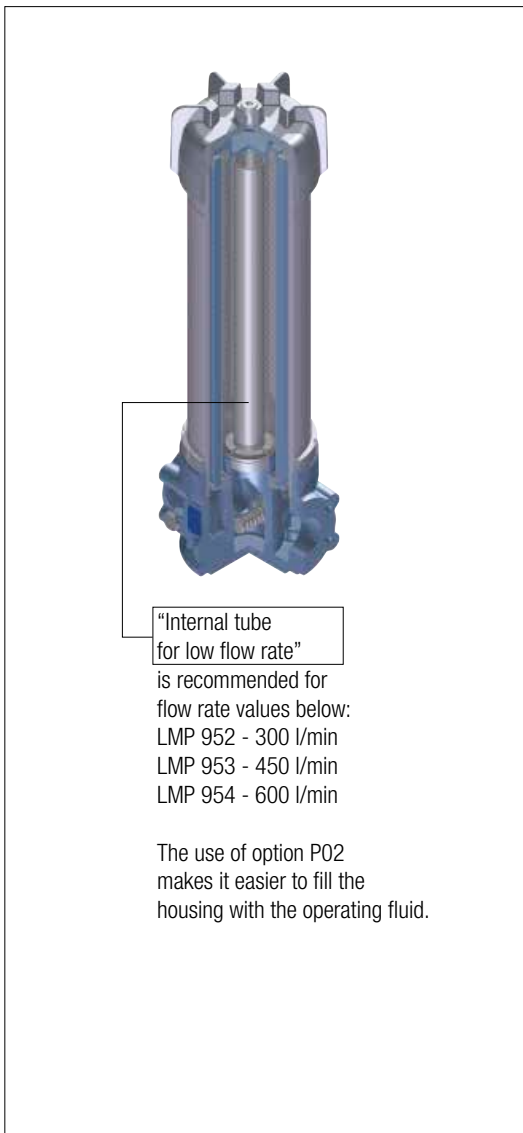
### Bypass valve pressure drop



The curves are plotted using mineral oil with density of 0.86 kg/dm<sup>3</sup> in compliance with ISO 3968.  $\Delta p$  varies proportionally with density.

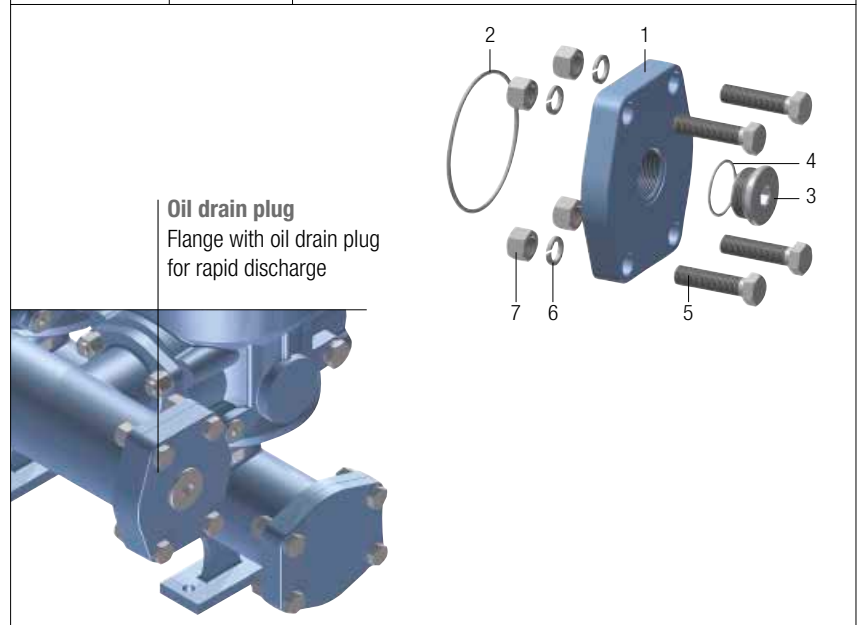


Execution P02



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 **LMP952 | LMP953 | LMP954** Configuration example: **LMP952** **3** **B** **A** **FA** **A10** **N** **P01**

Length **3**

Bypass valve **S** Without bypass **B** With bypass 3.5 bar

Seals and treatments **A** NBR **V** FPM

Connections **FA** 4" SAE 3000 psi

Filtration rating (filter media)

<b>A03</b> Inorganic microfiber 3 µm	<b>M25</b> Wire mesh 25 µm
<b>A06</b> Inorganic microfiber 6 µm	<b>M60</b> Wire mesh 60 µm
<b>A10</b> Inorganic microfiber 10 µm	<b>M90</b> Wire mesh 90 µm
<b>A16</b> Inorganic microfiber 16 µm	
<b>A25</b> Inorganic microfiber 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 **CU950** Configuration example: **CU950** **3** **A10** **A** **N** **P01**

Element length **3**

Filter series and size

<b>LMP952</b> Nr. 2 filter elements
<b>LMP953</b> Nr. 3 filter elements
<b>LMP954</b> Nr. 4 filter elements

Filtration rating (filter media)

<b>A03</b> Inorganic microfiber 3 µm	<b>M25</b> Wire mesh 25 µm
<b>A06</b> Inorganic microfiber 6 µm	<b>M60</b> Wire mesh 60 µm
<b>A10</b> Inorganic microfiber 10 µm	<b>M90</b> Wire mesh 90 µm
<b>A16</b> Inorganic microfiber 16 µm	
<b>A25</b> Inorganic microfiber 25 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

## CLOGGING INDICATORS

See page 722

<b>DEA</b> Electrical differential pressure indicator	<b>DLE</b> Electrical / visual differential pressure indicator
<b>DEM</b> Electrical differential pressure indicator	<b>DTA</b> Electronic differential pressure indicator
<b>DEU</b> Electrical differential pressure indicator	<b>DVA</b> Visual differential pressure indicator
<b>DLA</b> Electrical / visual differential pressure indicator	<b>DVM</b> Visual differential pressure indicator

## PLUGS

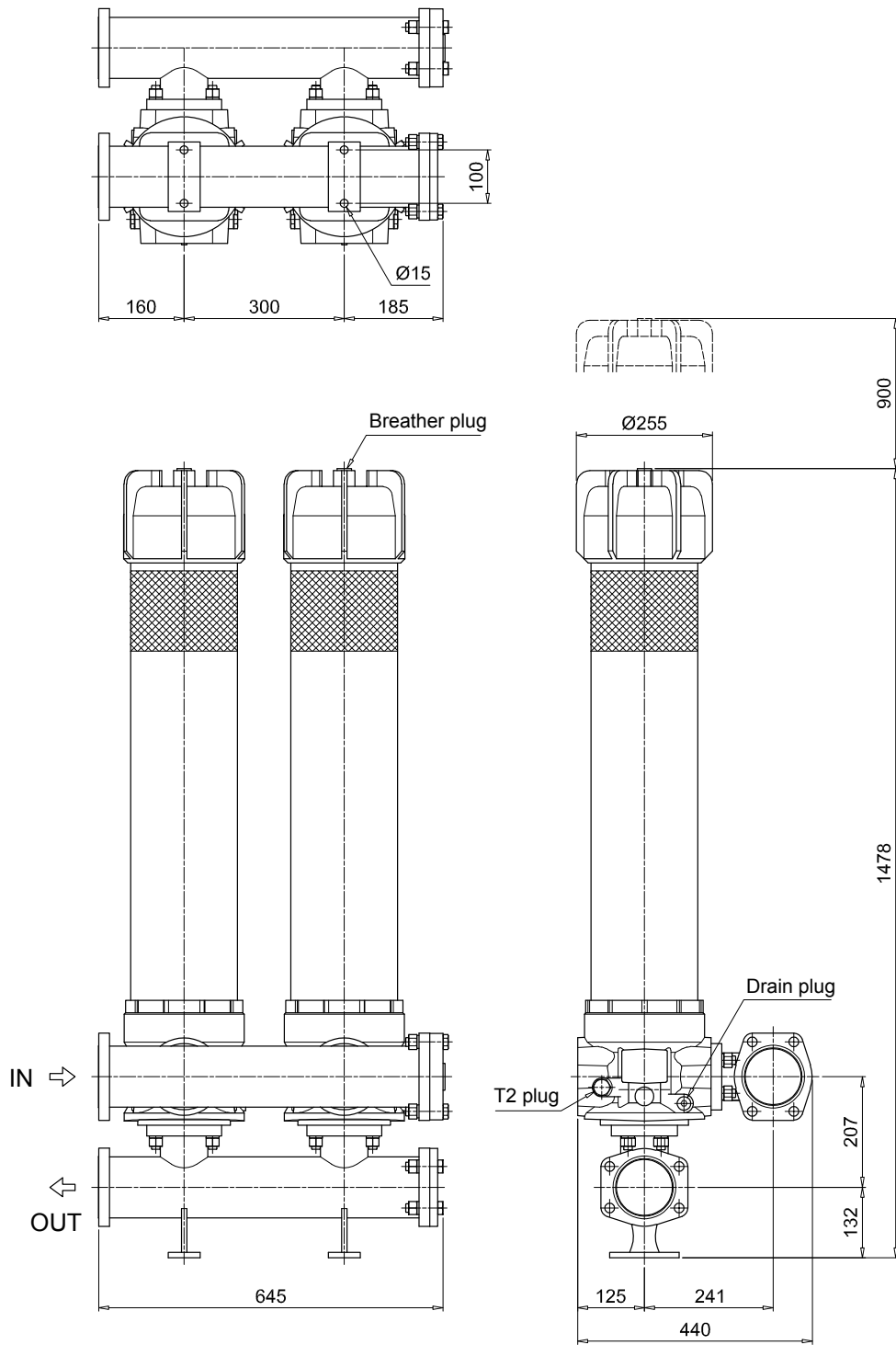
See page 743

**T2** Plug

# LMP 952-953-954

Dimensions

LMP952

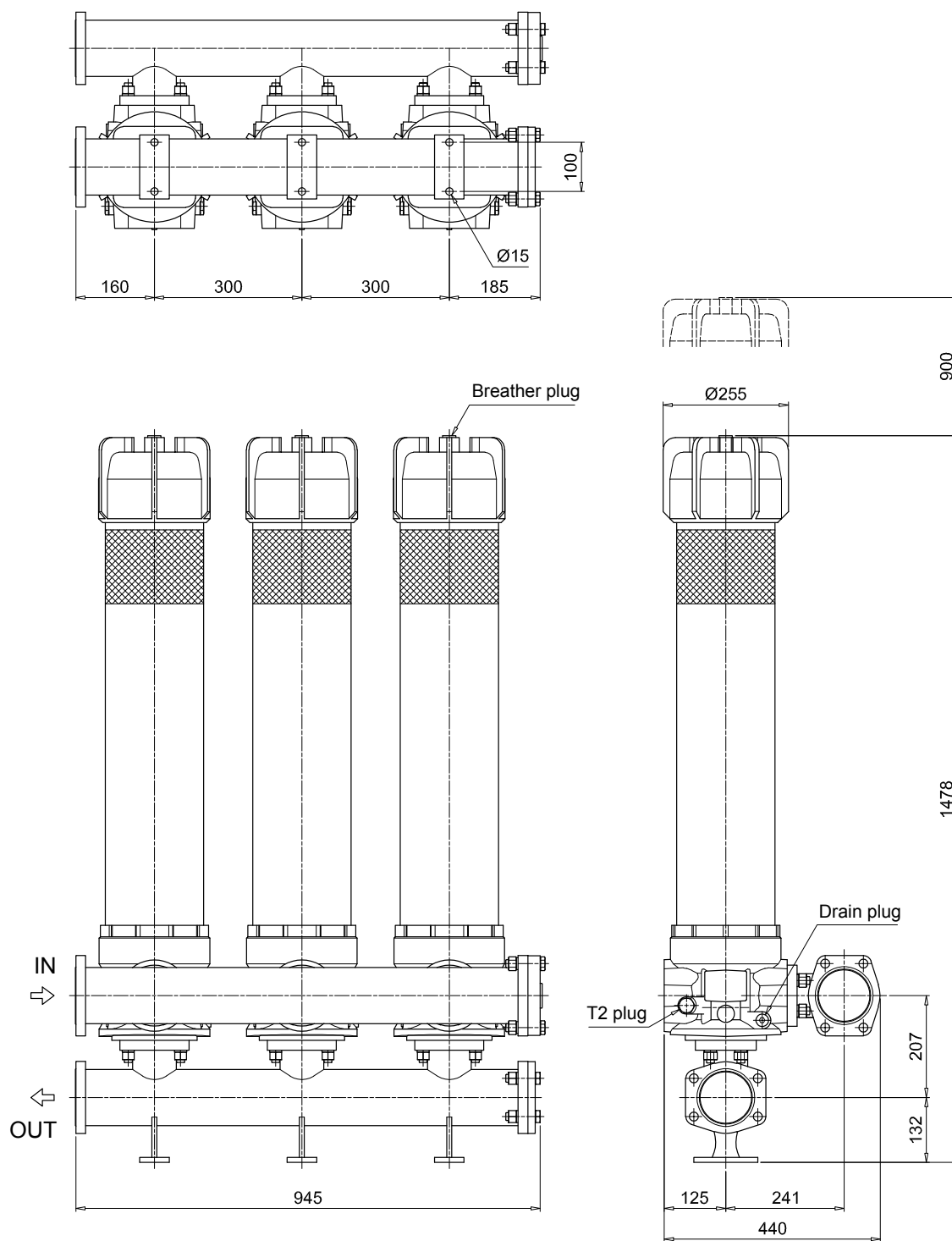


T2 plug = connection for differential pressure indicator

# LMP 952-953-954

## Dimensions

LMP953

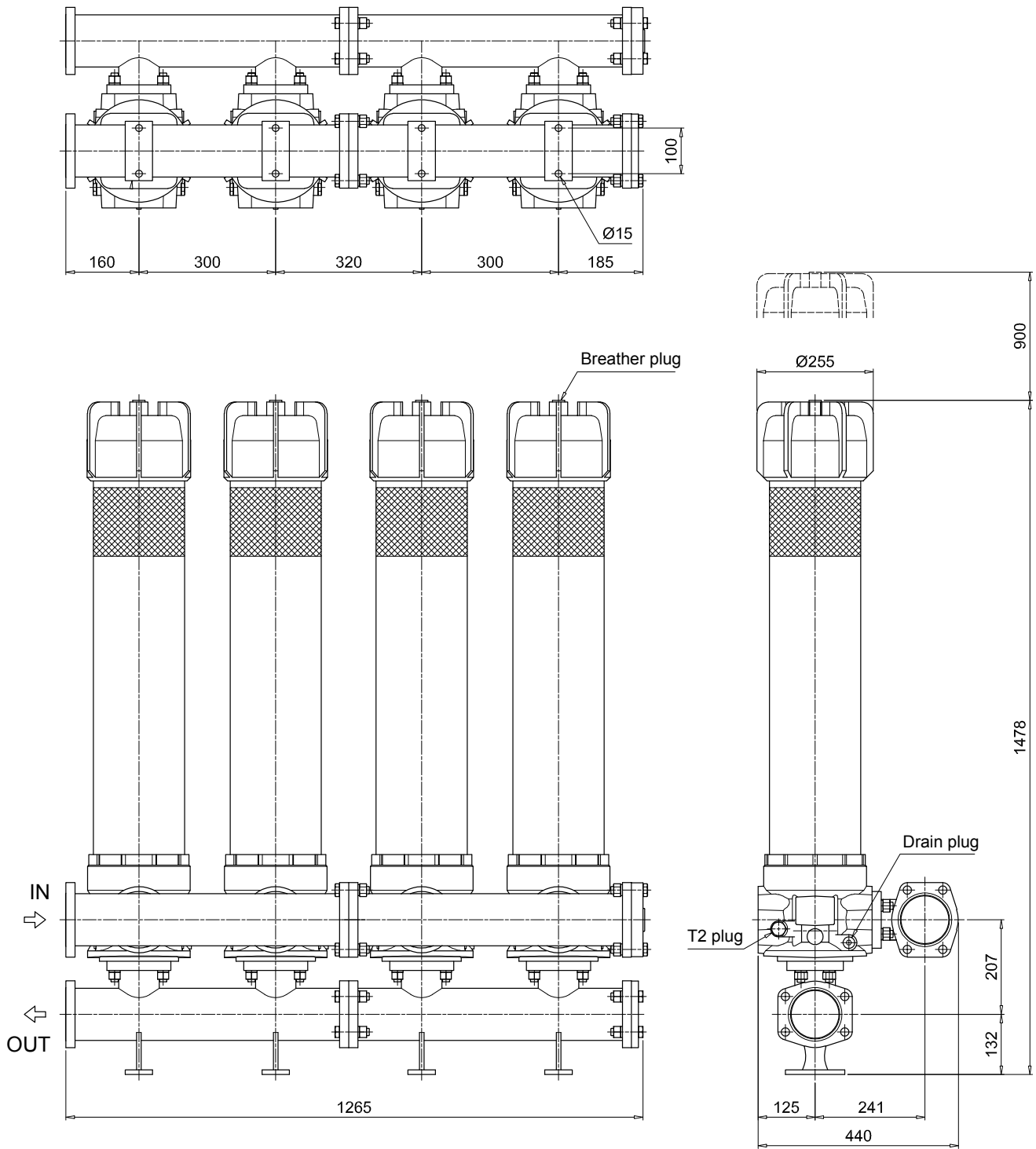


T2 plug = connection for differential pressure indicator

# LMP 952-953-954

Dimensions

LMP954

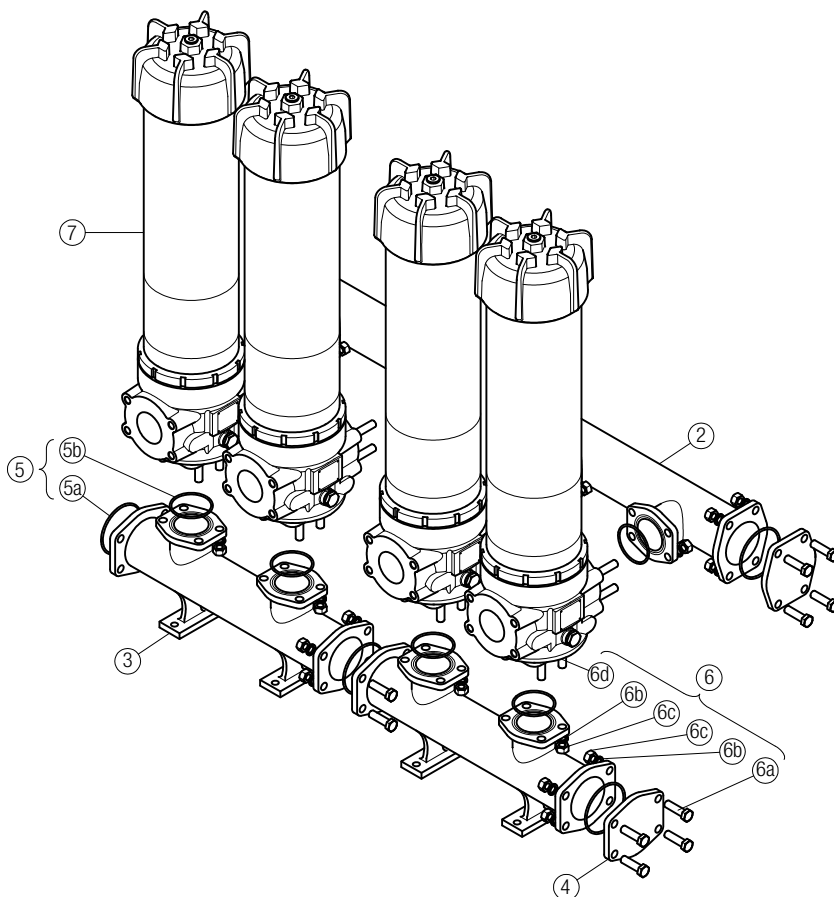


T2 plug = connection for differential pressure indicator

# 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 NBR FPM		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 - Polyamide

#### 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.

#### $\Delta p$ 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 [dm<sup>3</sup>]

Filter series	Weights [kg]			Volumes [dm <sup>3</sup> ]				
	Length	1	2	3	Length	1	2	3
<b>LMD 211</b>		9.5	11.2	12.8		4.1	4.6	5.3

# GENERAL INFORMATION LMD 211

Flow rates [l/min]

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 mm<sup>2</sup>/s (cSt) and a density of 0.86 kg/dm<sup>3</sup>.

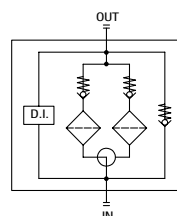
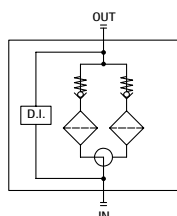
For different pressure drop or fluid viscosity we recommend to use our selection software available on [www.mpfiltri.com](http://www.mpfiltri.com).

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.

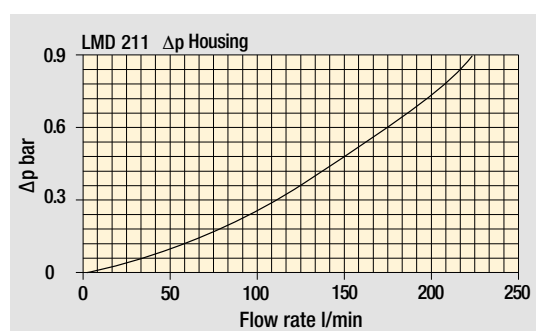
Hydraulic symbols

Filter series	Style S	Style B
LMD 211	•	•

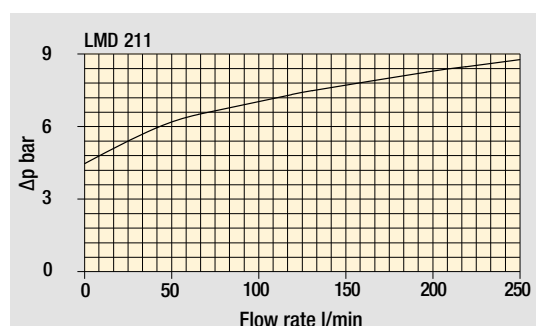


Pressure drop

Filter housings  $\Delta p$  pressure drop



Bypass valve pressure drop



The curves are plotted using mineral oil with density of 0.86 kg/dm<sup>3</sup> in compliance with ISO 3968.  $\Delta p$  varies proportionally with density.

# LMD 211

## Designation & Ordering code

### COMPLETE FILTER

Series and size **LMD211** Configuration example: **LMD211** | **3** | **B** | **A** | **C** | **6** | **A10** | **N** | **P01**

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

**Bypass valve**  
**S** Without bypass | **B** With bypass 3.5 bar

**Seals and treatments**  
**A** NBR  
**V** FPM

**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 pressure indicator**  
**6** With plugged connection

**Filtration rating (filter media)**

<b>A03</b> Inorganic microfiber 3 µm	<b>M25</b> Wire mesh 25 µm
<b>A06</b> Inorganic microfiber 6 µm	<b>M60</b> Wire mesh 60 µm
<b>A10</b> Inorganic microfiber 10 µm	<b>M90</b> Wire mesh 90 µm
<b>A16</b> Inorganic microfiber 16 µm	<b>P10</b> Resin impregnated paper 10 µm
<b>A25</b> Inorganic microfiber 25 µm	<b>P25</b> 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 **CU210** Configuration example: **CU210** | **3** | **A10** | **A** | **N** | **P01**

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

**Filtration rating (filter media)**

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

**WA025** Water absorber inorganic microfiber 25 µm

**Seals and treatments**  
**A** NBR  
**V** FPM

**Element Δp**  
**N** 20 bar

**Execution**  
**P01** MP Filtri standard  
**Pxx** Customized

### CLOGGING INDICATORS

See page 722

**DEA** Electrical differential pressure indicator  
**DEM** Electrical differential pressure indicator  
**DEU** Electrical differential pressure indicator  
**DLA** Electrical / visual differential pressure indicator

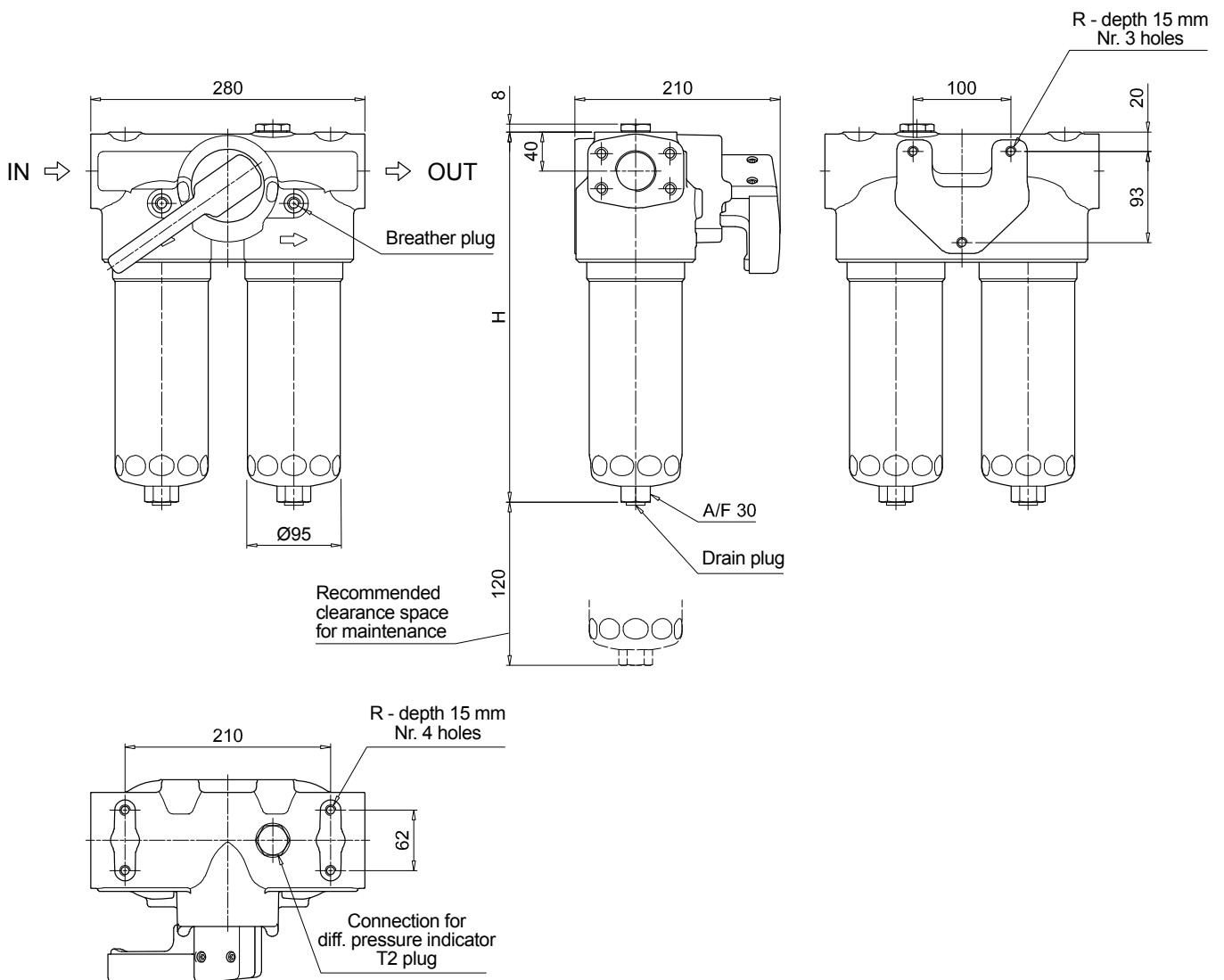
**DLE** Electrical / visual differential pressure indicator  
**DTA** Electronic differential pressure indicator  
**DVA** Visual differential pressure indicator  
**DVM** Visual differential pressure indicator

### PLUGS

See page 743

**T2** Plug

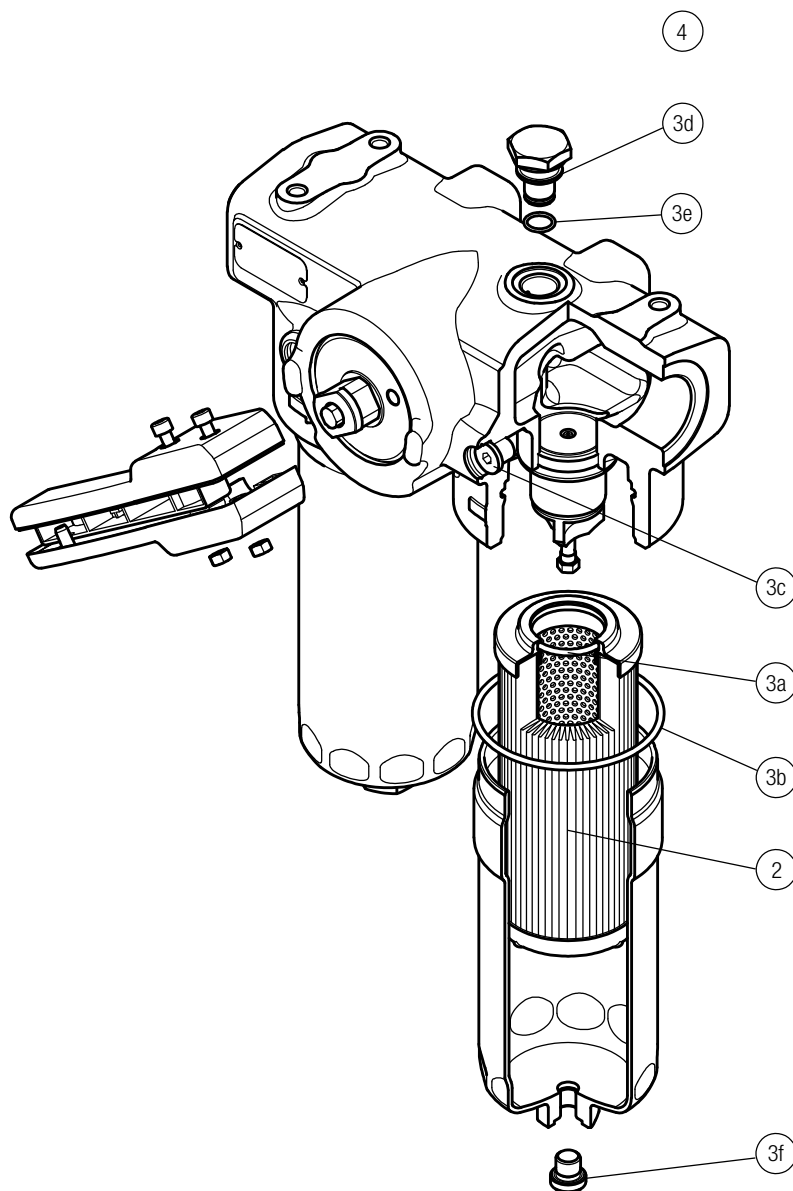
LMD211	
Filter length	H [mm]
<b>1</b>	383
<b>2</b>	513
<b>3</b>	651
Connections	R
<b>C</b>	M10
<b>F - I</b>	3/8" UNC
<b>L</b>	M10
<b>M - N</b>	3/8" UNC



# 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	
<b>LDD</b>	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.

#### $\Delta p$ 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

LMD 400 - 401 - 431 filters are provided for vertical mounting

## Weights [kg] and volumes [dm<sup>3</sup>]

Filter series	Weights [kg]				Volumes [dm <sup>3</sup> ]			
	Length	4	5	6	Length	4	5	6
<b>LMD 400 - 401</b>	60	65	72		20	28	33	
<b>LMD 431</b>	-	68	78		-	28	33	

Flow rates [l/min]

Filter series	Length	Filter element design - N Series							
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
<b>LMD 400 - 401</b>	<b>4</b>	308	349	453	474	530	628	547	567
	<b>5</b>	395	427	509	547	589	637	577	592
	<b>6</b>	429	483	558	568	597	639	583	597
<b>LMD 431</b>	<b>5</b>	395	427	509	547	589	637	577	592
	<b>6</b>	429	483	558	568	597	639	583	597

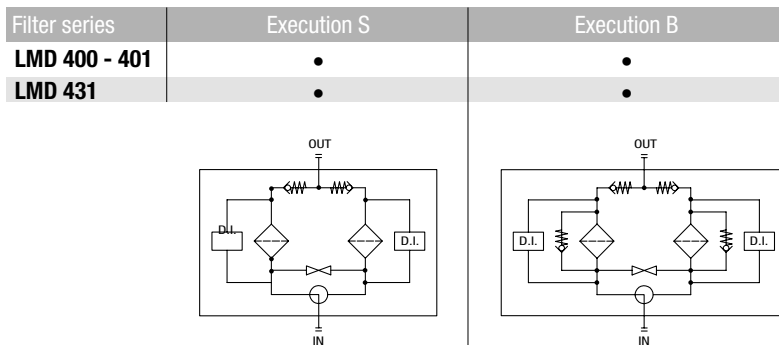
**Maximum flow rate for a complete low and medium pressure filter with a pressure drop  $\Delta p = 0.7$  bar.**

The reference fluid has a kinematic viscosity of 30 mm<sup>2</sup>/s (cSt) and a density of 0.86 kg/dm<sup>3</sup>.

For different pressure drop or fluid viscosity we recommend to use our selection software available on [www.mpfiltri.com](http://www.mpfiltri.com).

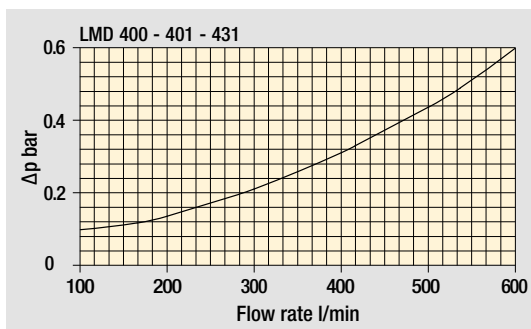
You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols

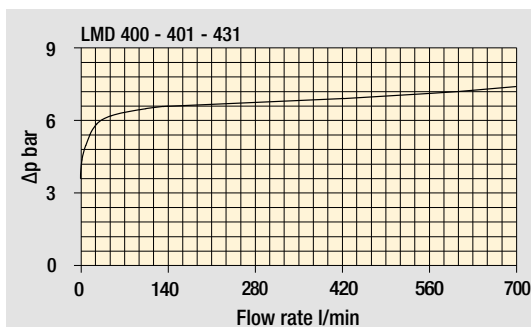


Pressure drop

Filter housings  $\Delta p$  pressure drop



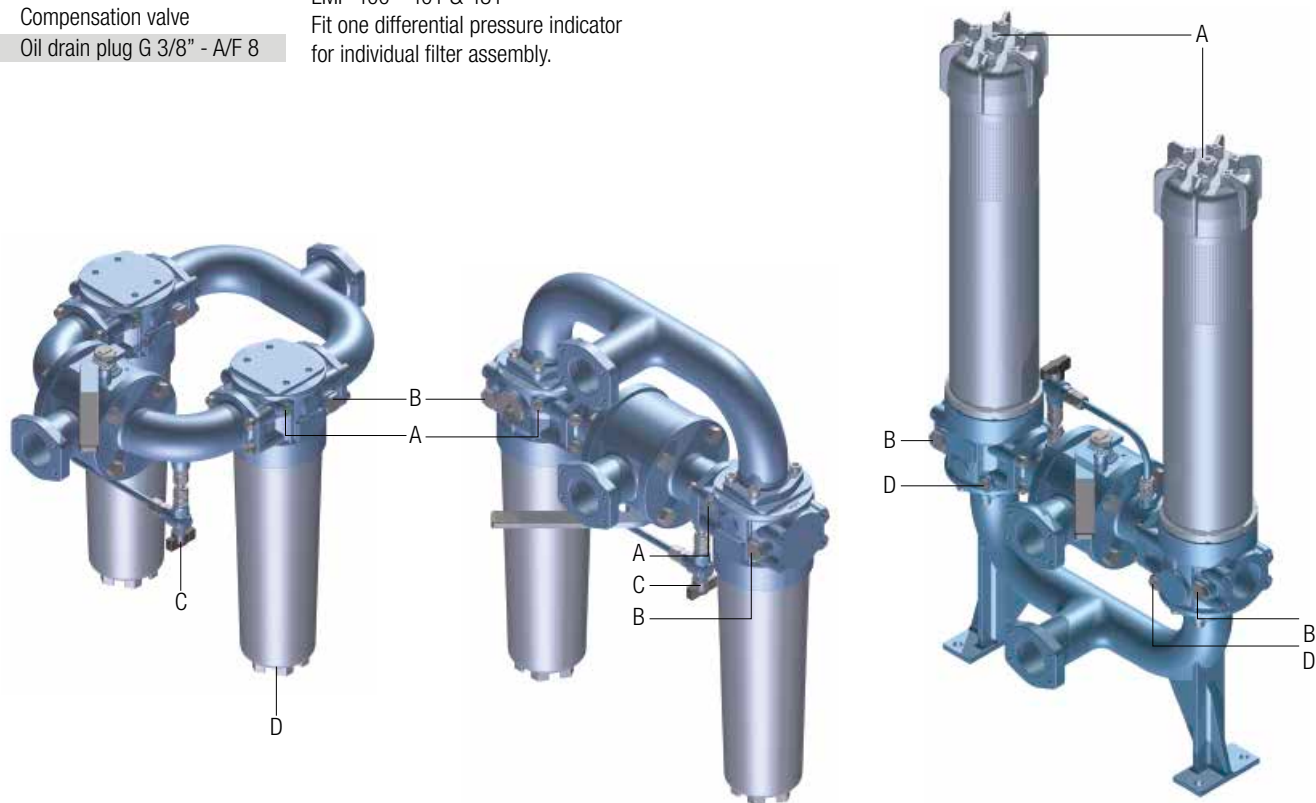
Bypass valve pressure drop



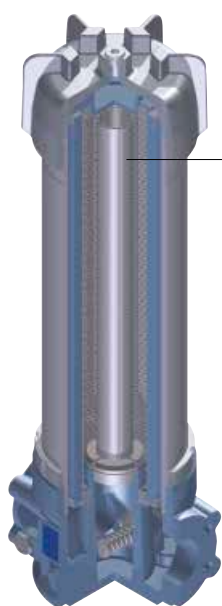
The curves are plotted using mineral oil with density of 0.86 kg/dm<sup>3</sup> in compliance with ISO 3968.  $\Delta p$  varies proportionally with density.

Focus on

- A** Breather plug G 3/8" - A/F 8
  - B** Indicator port Plug T2 - A/F 30
  - C** Compensation valve
  - D** Oil drain plug G 3/8" - A/F 8
- LMP 400 - 401 & 431  
Fit one differential pressure indicator  
for individual filter assembly.



## LMD 431: Execution P02



"Internal tube for low flow rate" is recommended for flow rate values below 150 l/min.

The use of option P02 makes it easier to fill the housing with the operating fluid.



# LMD 400-401

## Designation & Ordering code

### COMPLETE FILTER

Series and size **LMD400 | LMD401** Configuration example: **LMD401** **4** **B** **V** **F1** **A10** **N** **P01**

Length **4** | **5** | **6**

Bypass valve **S** Without bypass | **B** With bypass 3.5 bar

Seals and treatments **V** FPM

Connections	LMD400	LMD401
<b>F1</b> 2 1/2" SAE 3000 psi/M	•	•
<b>F2</b> 2 1/2" SAE 3000 psi/UNC	•	•
<b>F3</b> 2 1/2" SAE 3000 psi/M, In-line connections	-	•
<b>F4</b> 2 1/2" SAE 3000 psi/UNC, In-line connections	-	•

Filtration rating (filter media)

<b>A03</b> Inorganic microfiber 3 µm	<b>M25</b> Wire mesh 25 µm
<b>A06</b> Inorganic microfiber 6 µm	<b>M60</b> Wire mesh 60 µm
<b>A10</b> Inorganic microfiber 10 µm	<b>M90</b> Wire mesh 90 µm
<b>A16</b> Inorganic microfiber 16 µm	<b>P10</b> Resin impregnated paper 10 µm
<b>A25</b> Inorganic microfiber 25 µm	<b>P25</b> Resin impregnated paper 25 µm
<b>WA025</b> Water absorber inorganic microfiber 25 µm	

Element Δp	Execution	Filter length		
		4	5	6
<b>N</b> 20 bar	<b>P01</b> MP Filtri standard	•	•	•
	<b>P02</b> Maintenance from the bottom of the housing	-	•	•
	<b>Pxx</b> Customized	-	-	-

### FILTER ELEMENT

Element series and size **CU400** Configuration example: **CU400** **4** **A10** **V** **N** **P01**

Element length **4** | **5** | **6**

Filtration rating (filter media)

<b>A03</b> Inorganic microfiber 3 µm	<b>M25</b> Wire mesh 25 µm
<b>A06</b> Inorganic microfiber 6 µm	<b>M60</b> Wire mesh 60 µm
<b>A10</b> Inorganic microfiber 10 µm	<b>M90</b> Wire mesh 90 µm
<b>A16</b> Inorganic microfiber 16 µm	<b>P10</b> Resin impregnated paper 10 µm
<b>A25</b> Inorganic microfiber 25 µm	<b>P25</b> Resin impregnated paper 25 µm
<b>WA025</b> Water absorber inorganic microfiber 25 µm	

Seals **V** FPM

Element Δp	Execution
<b>N</b> 20 bar	<b>P01</b> MP Filtri standard
	<b>Pxx</b> Customized

### CLOGGING INDICATORS

See page 722

**DEA** Electrical differential pressure indicator

**DEM** Electrical differential pressure indicator

**DEU** Electrical differential pressure indicator

**DLA** Electrical / visual differential pressure indicator

**DLE** Electrical / visual differential pressure indicator

**DTA** Electronic differential pressure indicator

**DVA** Visual differential pressure indicator

**DVM** Visual differential pressure indicator

### PLUGS

See page 743

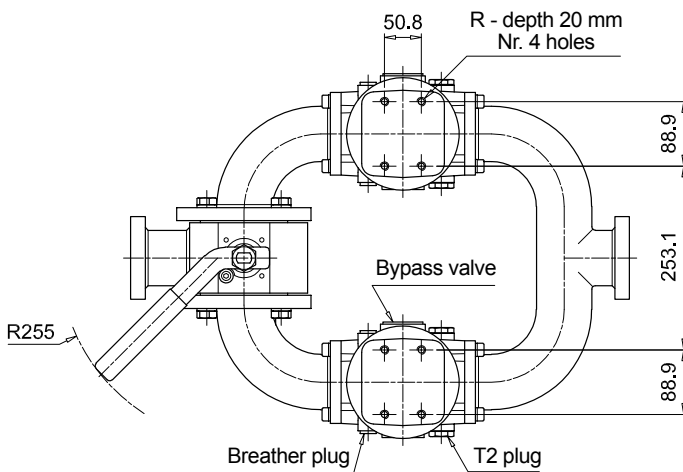
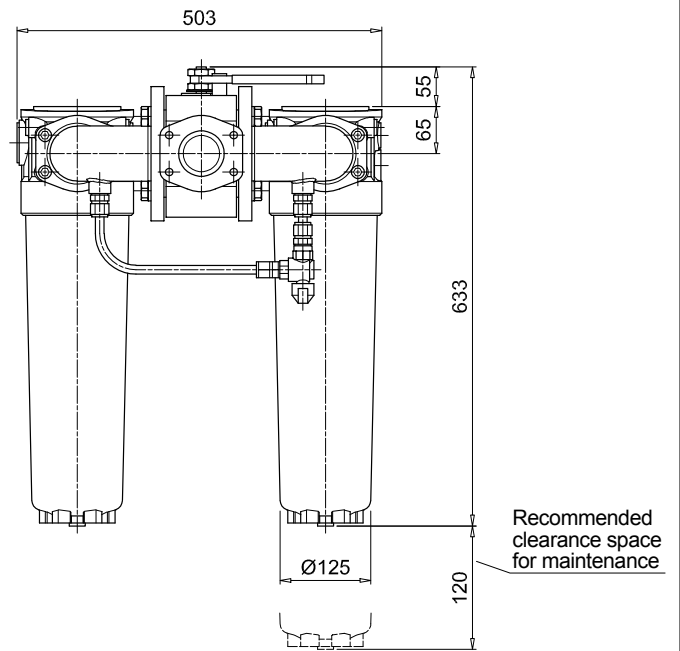
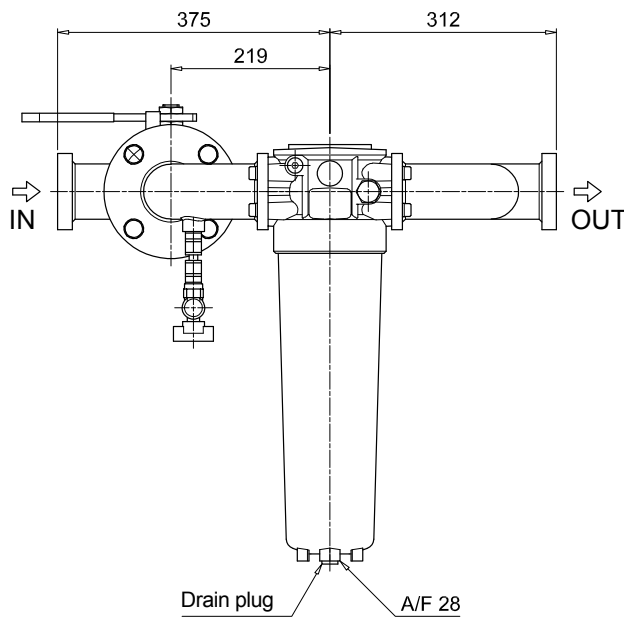
**T2** Plug



# 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 pressure indicator

# LMD 400-401

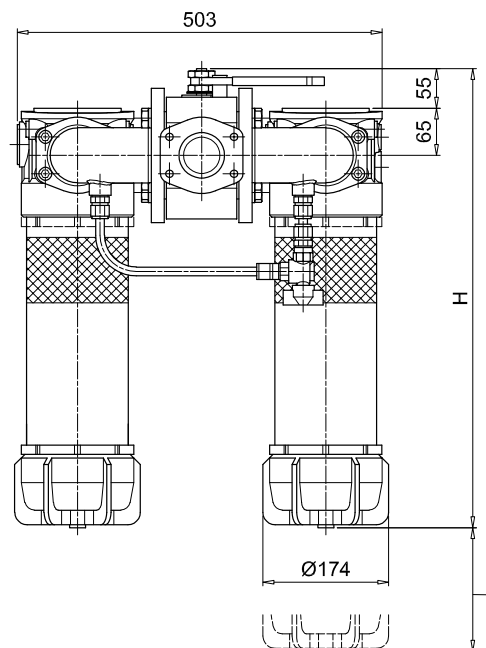
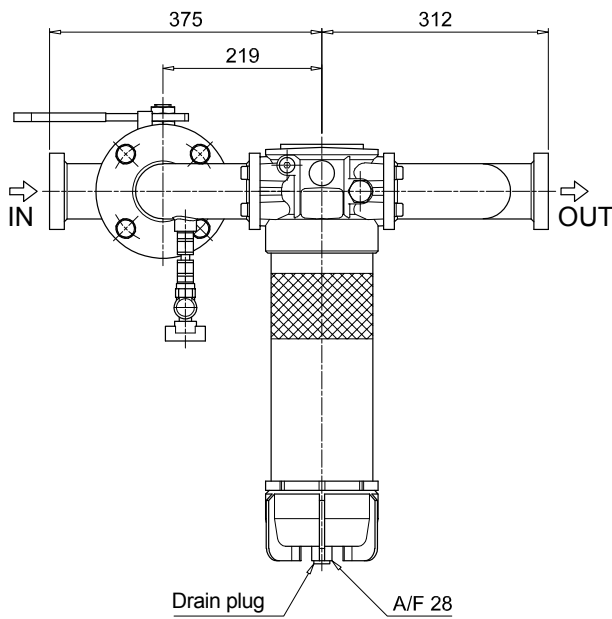
## Dimensions

LMD400

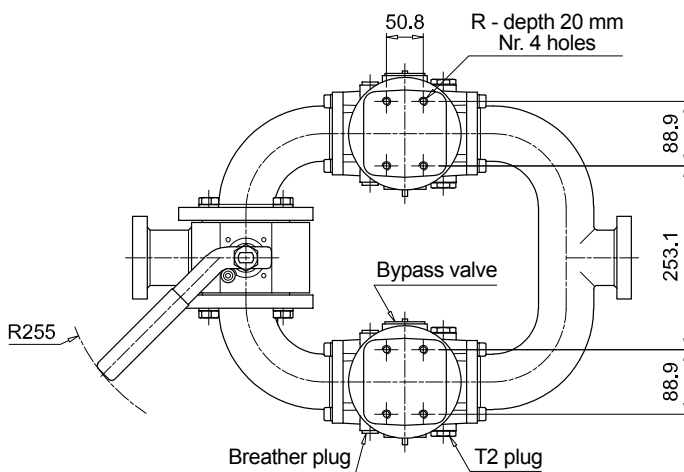
Length 5 - 6

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

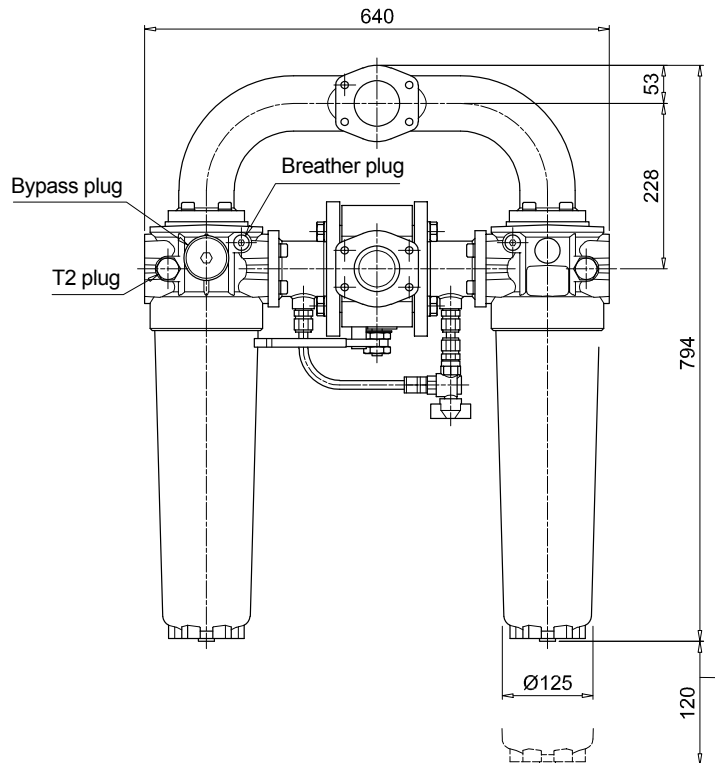
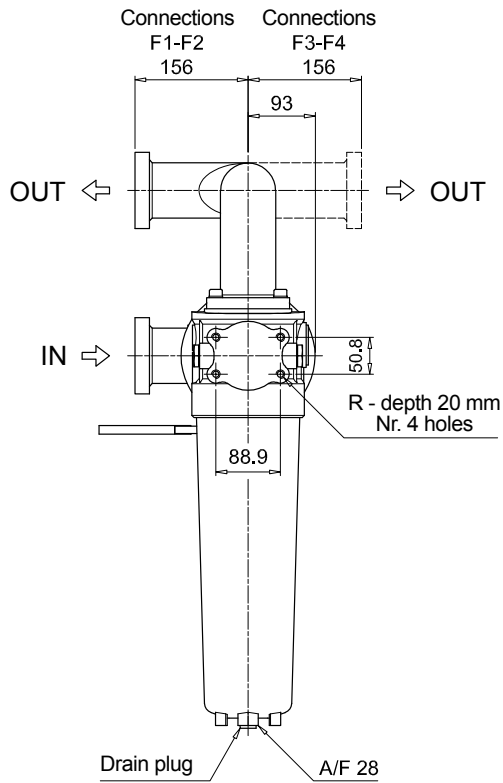


T2 plug = connection for differential pressure indicator

# LMD 400-401

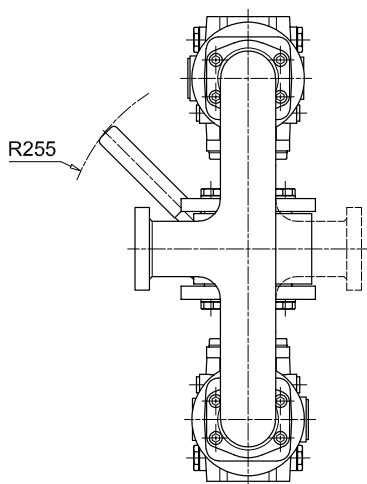
## Dimensions

LMD401	
Length 4	
Connections	R
<b>F1</b>	M12
<b>F2</b>	1/2" UNC
<b>F3</b>	M12
<b>F4</b>	1/2" UNC



T2 plug = connection for differential pressure indicator

Recommended clearance space for maintenance



# LMD 400-401

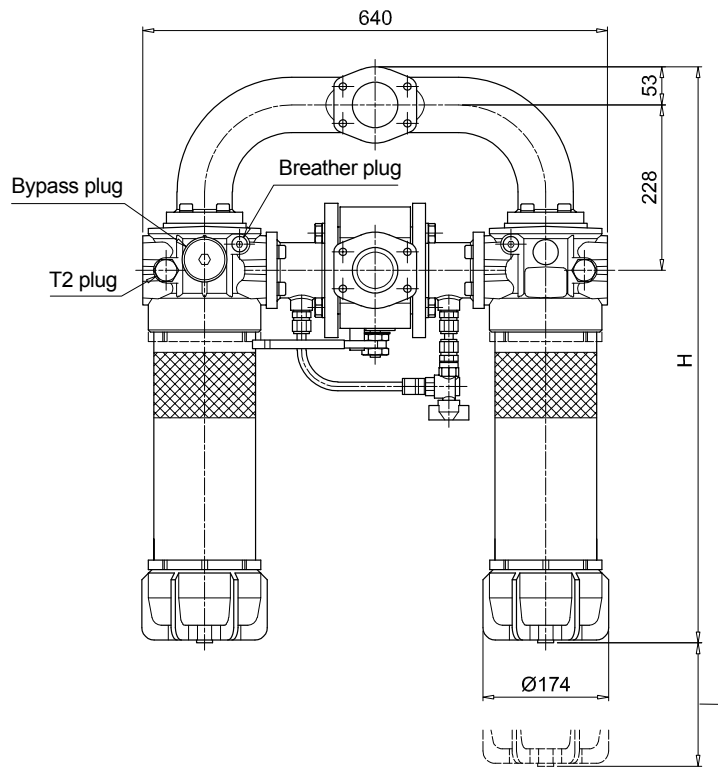
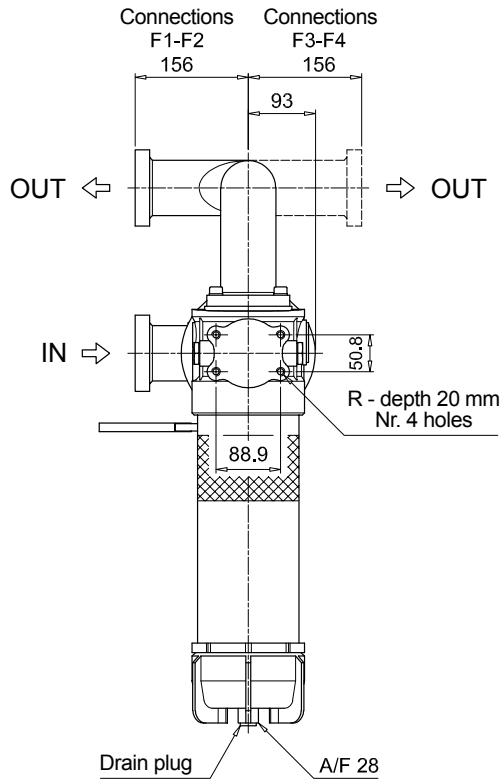
## Dimensions

LMD401

Length 5 - 6

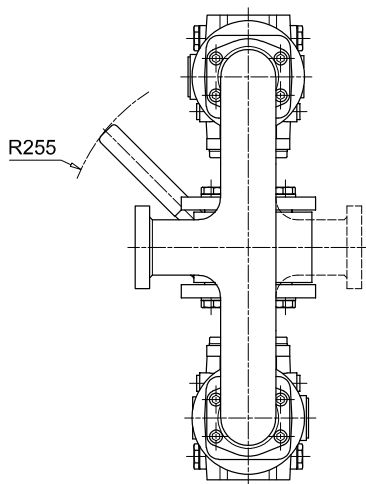
Filter length	H [mm]	H2 [mm] Execution	
		P01	P02
5	1044	120	660
6	1374	120	690

Connections	R
F1	M12
F2	1/2" UNC
F3	M12
F4	1/2" UNC



T2 plug = connection for differential pressure indicator

H2 - Recommended clearance space for maintenance





# LMD 431

## Designation & Ordering code

### COMPLETE FILTER

<b>Series and size</b>	Configuration example: <b>LMD431</b>   <b>5</b>   <b>B</b>   <b>V</b>   <b>F1</b>   <b>A10</b>   <b>N</b>   <b>P01</b>									
<b>LMD431</b>										
<b>Length</b>	5   6									
<b>Bypass valve</b>	<b>S</b> Without bypass   <b>B</b> With bypass 3.5 bar									
<b>Seals and treatments</b>	<b>V</b> FPM									
<b>Connections</b>	<b>F1</b> 2 1/2" SAE 3000 psi/M <b>F2</b> 2 1/2" SAE 3000 psi/UNC <b>F3</b> 2 1/2" SAE 3000 psi/M, In-line connections <b>F4</b> 2 1/2" SAE 3000 psi/UNC, In-line connections									
<b>Filtration rating (filter media)</b>	<b>A03</b> Inorganic microfiber 3 µm   <b>M25</b> Wire mesh 25 µm <b>A06</b> Inorganic microfiber 6 µm   <b>M60</b> Wire mesh 60 µm <b>A10</b> Inorganic microfiber 10 µm   <b>M90</b> Wire mesh 90 µm <b>A16</b> Inorganic microfiber 16 µm   <b>P10</b> Resin impregnated paper 10 µm <b>A25</b> Inorganic microfiber 25 µm   <b>P25</b> Resin impregnated paper 25 µm <b>WA025</b> Water absorber inorganic microfiber 25 µm									
<b>Element Δp</b>	<b>N</b> 20 bar									
<b>Execution</b>	<b>P01</b> MP Filtri standard <b>P02</b> With internal tube for low flow rate <b>Pxx</b> Customized									

### FILTER ELEMENT

<b>Element series and size</b>	Configuration example: <b>CU400</b>   <b>5</b>   <b>A10</b>   <b>V</b>   <b>N</b>   <b>P01</b>						
<b>CU400</b>							
<b>Element length</b>	5   6						
<b>Filtration rating (filter media)</b>	<b>A03</b> Inorganic microfiber 3 µm   <b>M25</b> Wire mesh 25 µm <b>A06</b> Inorganic microfiber 6 µm   <b>M60</b> Wire mesh 60 µm <b>A10</b> Inorganic microfiber 10 µm   <b>M90</b> Wire mesh 90 µm <b>A16</b> Inorganic microfiber 16 µm   <b>P10</b> Resin impregnated paper 10 µm <b>A25</b> Inorganic microfiber 25 µm   <b>P25</b> Resin impregnated paper 25 µm <b>WA025</b> Water absorber inorganic microfiber 25 µm						
<b>Seals</b>	<b>V</b> FPM						
<b>Element Δp</b>	<b>N</b> 20 bar						
<b>Execution</b>	<b>P01</b> MP Filtri standard <b>Pxx</b> Customized						

### CLOGGING INDICATORS

See page 722

<b>DEA</b> Electrical differential pressure indicator	<b>DLE</b> Electrical / visual differential pressure indicator
<b>DEM</b> Electrical differential pressure indicator	<b>DTA</b> Electronic differential pressure indicator
<b>DEU</b> Electrical differential pressure indicator	<b>DVA</b> Visual differential pressure indicator
<b>DLA</b> Electrical / visual differential pressure indicator	<b>DVM</b> Visual differential pressure indicator

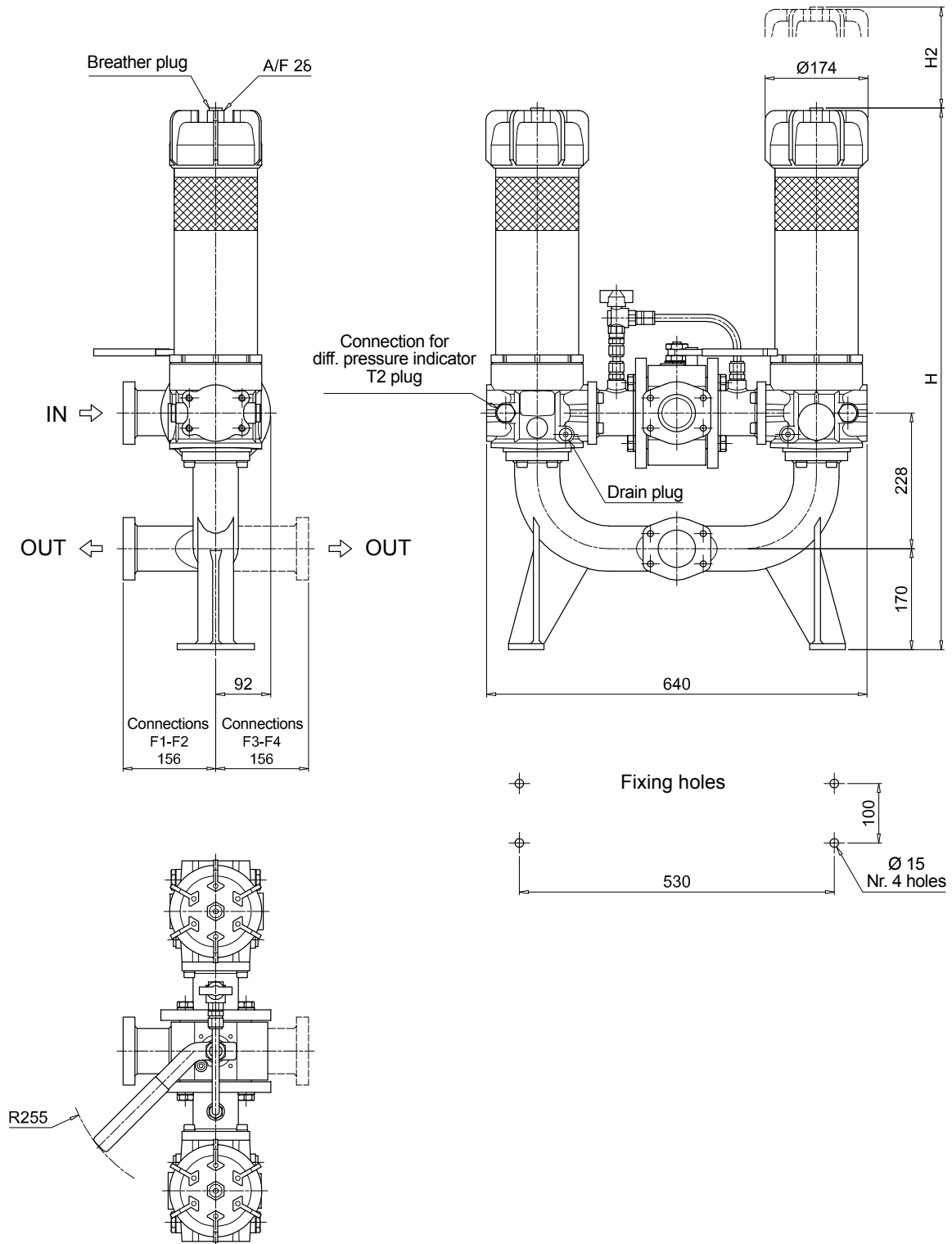
### PLUGS

See page 743

<b>T2</b> Plug
----------------

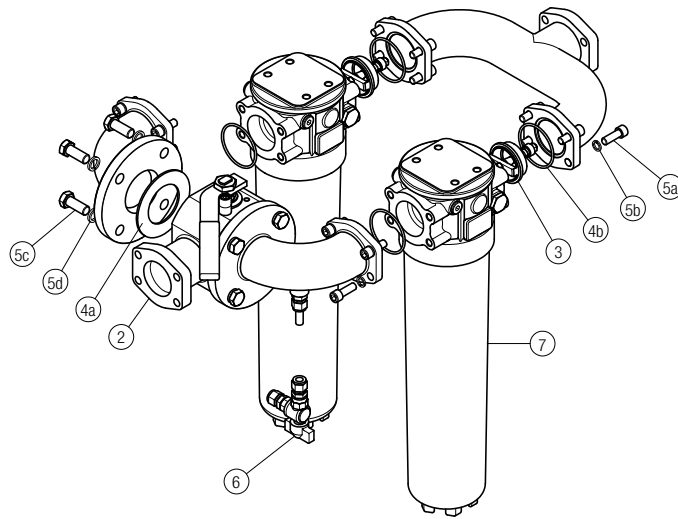
### LMD431

Filter length	H [mm]	H2 [mm]
5	1161	660
6	1491	690



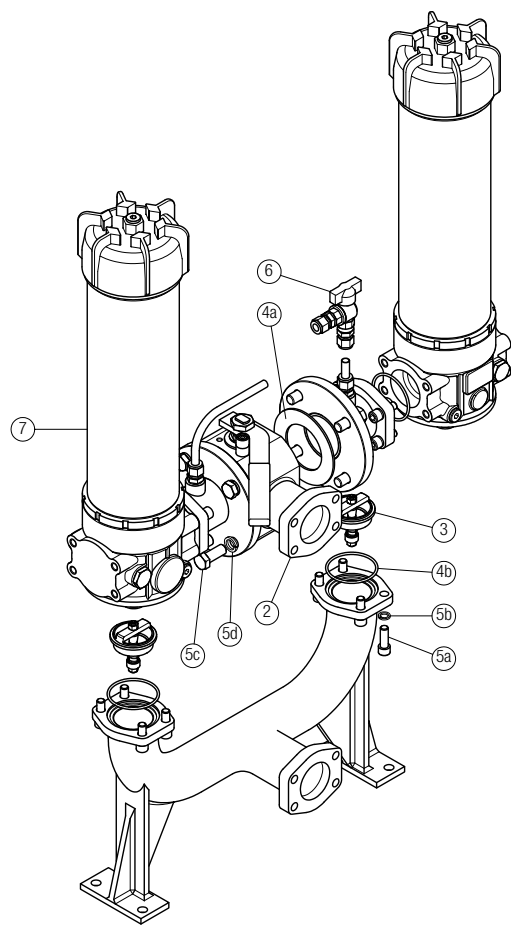
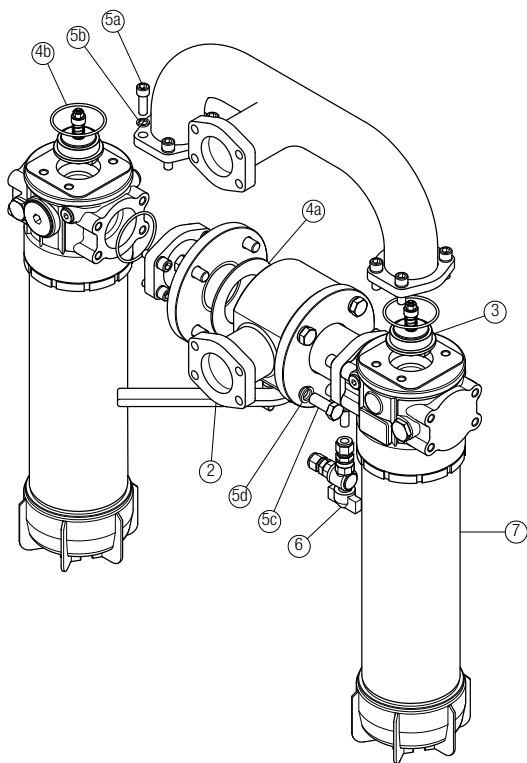
Order number for spare parts

**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
<b>LMD 400-401-431</b>	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

#### $\Delta p$ 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 [dm<sup>3</sup>]

Filter series	Weights [kg]		Volumes [dm <sup>3</sup> ]	
	DN 80	DN 100	DN 80	DN 100
<b>LMD 951</b>	102	130	62	66

Flow rates [l/min]

Filter series	Length	Filter element design - N Series					
		A03	A06	A10	A16	A25	M25 M60 M90
<b>LMD 951</b>	<b>3</b>	853	884	995	1066	1096	1233

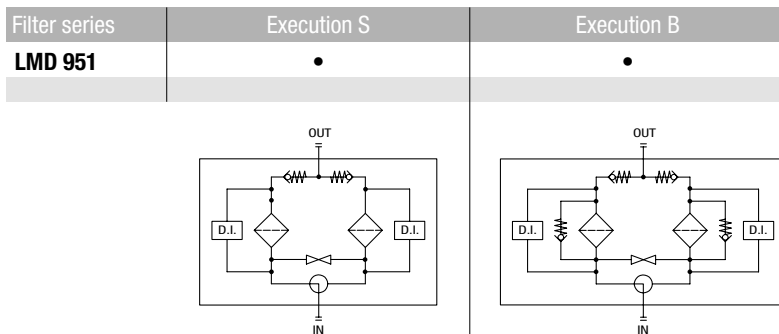
### Maximum flow rate for a complete low and medium pressure filter with a pressure drop $\Delta p = 0.7$ bar.

The reference fluid has a kinematic viscosity of 30 mm<sup>2</sup>/s (cSt) and a density of 0.86 kg/dm<sup>3</sup>.

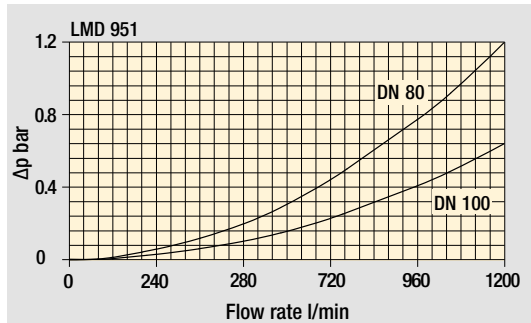
For different pressure drop or fluid viscosity we recommend to use our selection software available on [www.mpfiltri.com](http://www.mpfiltri.com).

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.

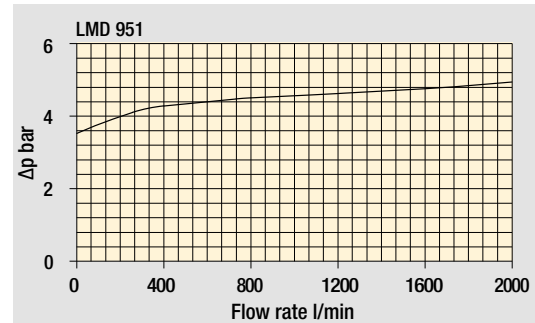
Hydraulic symbols



Pressure drop



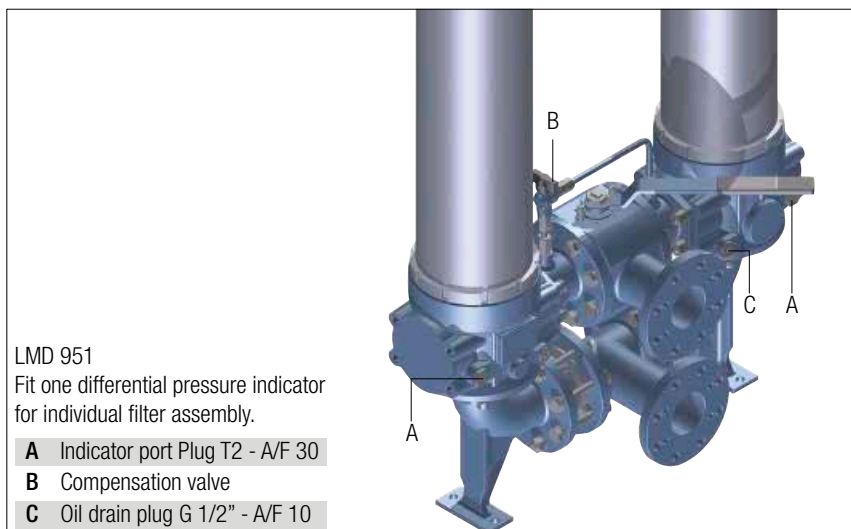
Filter housings  
 $\Delta p$  pressure drop



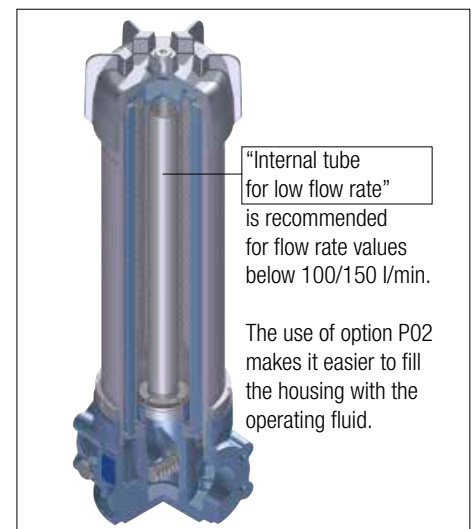
Bypass valve  
pressure drop

The curves are plotted using mineral oil with density of 0.86 kg/dm<sup>3</sup> in compliance with ISO 3968.  $\Delta p$  varies proportionally with density.

Focus on



Execution P02



# LMD 951

## Designation & Ordering code

### COMPLETE FILTER

<b>Series and size</b> <b>LMD951</b>	Configuration example: <b>LMD951</b> <b>3</b> <b>B</b> <b>V</b> <b>F1</b> <b>A10</b> <b>N</b> <b>P01</b>							
<b>Length</b> <b>3</b>								
<b>Bypass valve</b> <b>S</b> Without bypass <b>B</b> With bypass 3.5 bar								
<b>Seals and treatments</b> <b>V</b> FPM								
<b>Connections</b> <b>F1</b> 3" SAE 3000 psi/M <b>F2</b> 3" SAE 3000 psi/UNC <b>F3</b> 4" SAE 3000 psi/M <b>F4</b> 4" SAE 3000 psi/UNC <b>F5</b> 3" SAE 3000 psi/M, In-line connections <b>F6</b> 3" SAE 3000 psi/UNC, In-line connections <b>F7</b> 4" SAE 3000 psi/M, In-line connections <b>F8</b> 4" SAE 3000 psi/UNC, In-line connections								
<b>Filtration rating (filter media)</b> <b>A03</b> Inorganic microfiber 3 µm <b>M25</b> Wire mesh 25 µm <b>A06</b> Inorganic microfiber 6 µm <b>M60</b> Wire mesh 60 µm <b>A10</b> Inorganic microfiber 10 µm <b>M90</b> Wire mesh 90 µm <b>A16</b> Inorganic microfiber 16 µm <b>A25</b> Inorganic microfiber 25 µm <b>WA025</b> Water absorber inorganic microfiber 25 µm								
	<b>Element Δp</b> <b>N</b> 20 bar				<b>Execution</b> <b>P01</b> MP Filtri standard <b>P02</b> With internal tube for low flow rate <b>Pxx</b> Customized			

### FILTER ELEMENT

<b>Element series and size</b> <b>CU950</b>	Configuration example: <b>CU950</b> <b>3</b> <b>A10</b> <b>V</b> <b>N</b> <b>P01</b>							
<b>Element length</b> <b>3</b>								
<b>Filtration rating (filter media)</b> <b>A03</b> Inorganic microfiber 3 µm <b>M25</b> Wire mesh 25 µm <b>A06</b> Inorganic microfiber 6 µm <b>M60</b> Wire mesh 60 µm <b>A10</b> Inorganic microfiber 10 µm <b>M90</b> Wire mesh 90 µm <b>A16</b> Inorganic microfiber 16 µm <b>A25</b> Inorganic microfiber 25 µm <b>WA025</b> Water absorber inorganic microfiber 25 µm								
<b>Seals</b> <b>V</b> FPM								
	<b>Element Δp</b> <b>N</b> 20 bar				<b>Execution</b> <b>P01</b> MP Filtri standard <b>Pxx</b> Customized			

### CLOGGING INDICATORS

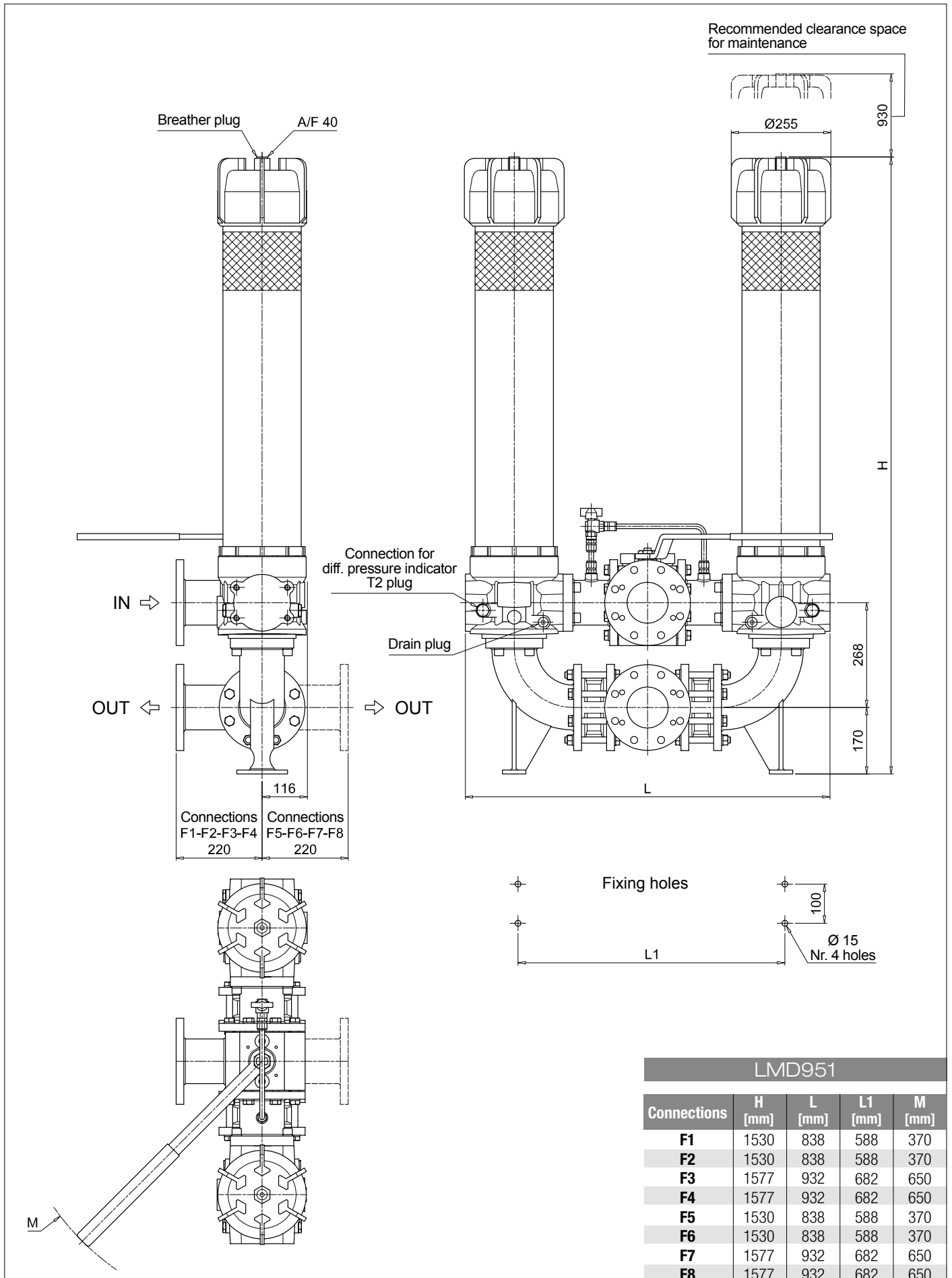
See page 722

<b>DEA</b> Electrical differential pressure indicator	<b>DLE</b> Electrical / visual differential pressure indicator
<b>DEM</b> Electrical differential pressure indicator	<b>DTA</b> Electronic differential pressure indicator
<b>DEU</b> Electrical differential pressure indicator	<b>DVA</b> Visual differential pressure indicator
<b>DLA</b> Electrical / visual differential pressure indicator	<b>DVM</b> Visual differential pressure indicator

### PLUGS

See page 743

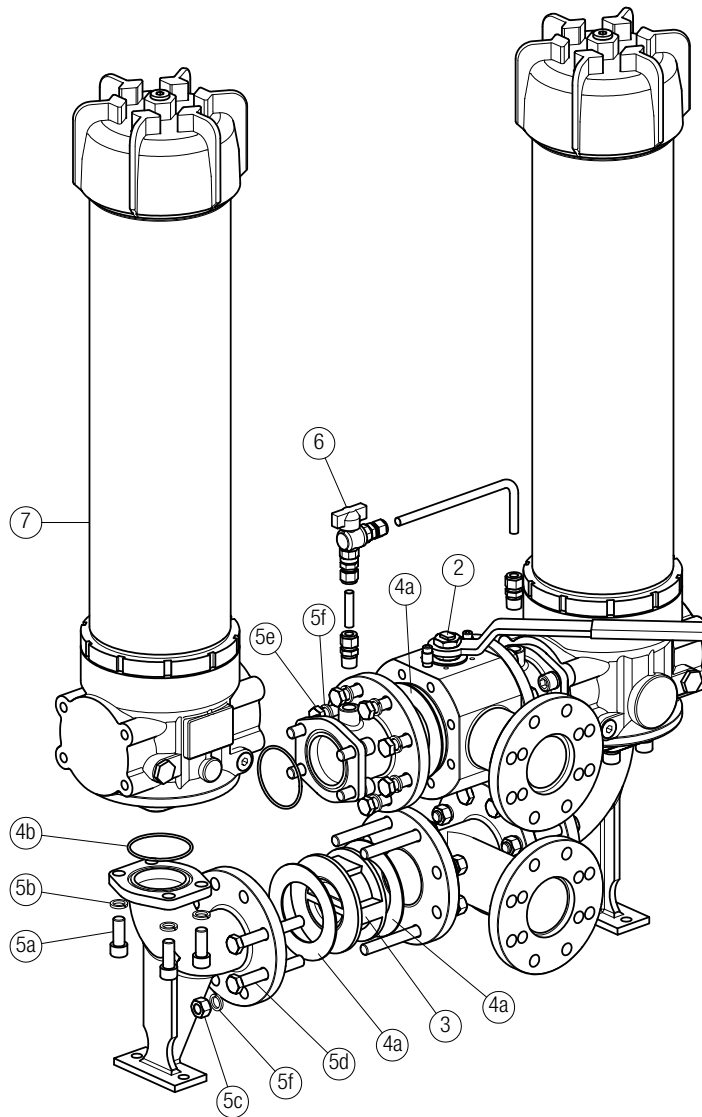
<b>T2</b> Plug
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# LMD 951 SPARE PARTS

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. <b>2</b>		Q.ty: 2 pcs. <b>3</b>	Q.ty: 1 pc. <b>4</b>	Q.ty: 1 pc. <b>5</b> (5a ÷ 5f)	Q.ty: 1 pc. <b>6</b>	Q.ty: 2 pcs. <b>7</b>
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
<b>F1 - F2 - F5 - F6 / D1 - D3 (3" SAE / DIN PN16 DN 80)</b>	3" SAE 3000 psi/M 02001135	3" SAE 3000 psi/UNC 02001438	02001418	02050388	02049056	02025043	LMP9513xVF1xxxNP01
<b>F3 - F4 - F7 - F8 / D2 - D4 (4" SAE / DIN PN16 DN 100)</b>	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: Cathaphoretic painted steel
- Bypass valve: AISI 304 - Polyamide

#### 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.

#### $\Delta p$ 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 [dm<sup>3</sup>]

Filter series	Weights [kg]	Volumes [dm <sup>3</sup> ]
<b>LDP 016</b>	2.0	1.2
<b>LDP 025</b>	3.0	1.6
<b>LDP 040</b>	5.0	2.2
<b>LDD 016</b>	9.3	3.6
<b>LDD 025</b>	9.5	4.1
<b>LDD 040</b>	11.3	4.8

# GENERAL INFORMATION LDP & LDD

Filter element according to DIN 24550

Flow rates [l/min]

Filter series	Filter element design - N Series									
	A03	A06	A10	A16	A25	M25	M60	M90	P10	P25
<b>LDP 016</b>	83	91	178	198	222	350	353	358	295	309
<b>LDP 025</b>	124	134	227	245	265	357	358	358	319	330
<b>LDP 040</b>	173	191	274	284	311	359	360	361	332	337
<b>LDD 016</b>	68	73	120	130	140	189	190	192	169	174
<b>LDD 025</b>	93	98	142	149	157	191	192	192	178	181
<b>LDD 040</b>	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 mm<sup>2</sup>/s (cSt) and a density of 0.86 kg/dm<sup>3</sup>.

For different pressure drop or fluid viscosity we recommend to use our selection software available on [www.mpfiltri.com](http://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

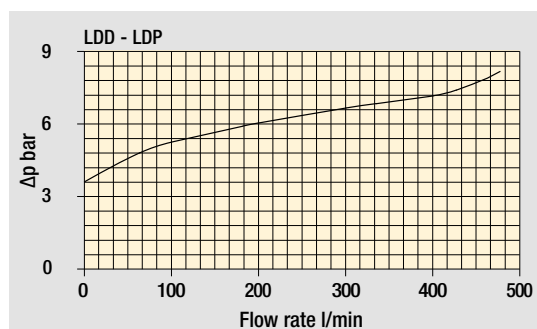
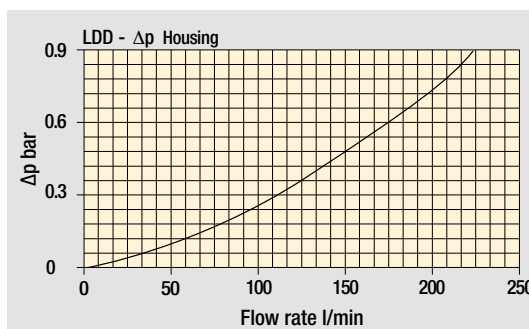
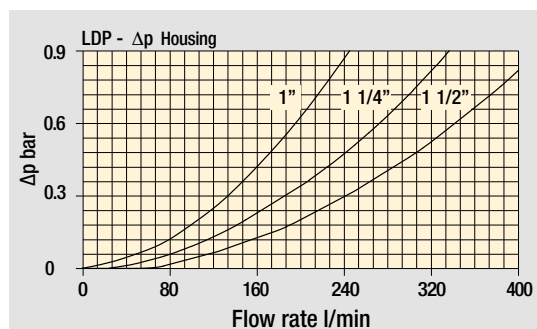
Filter series	Execution S	Execution B	Execution S	Execution B
<b>LDP 016</b>	•	•	-	-
<b>LDP 025</b>	•	•	-	-
<b>LDP 040</b>	•	•	-	-
<b>LDD 016</b>	-	-	•	•
<b>LDD 025</b>	-	-	•	•
<b>LDD 040</b>	-	-	•	•

Filter series	Execution S	Execution B	Execution S	Execution B
<b>LDP 016</b>				
<b>LDP 025</b>				
<b>LDP 040</b>				

## Pressure drop

Filter housings  $\Delta p$  pressure drop



Bypass valve pressure drop

The curves are plotted using mineral oil with density of 0.86 kg/dm<sup>3</sup> in compliance with ISO 3968.  $\Delta p$  varies proportionally with density.

# LDP Filter element according to DIN 24550

## Designation & Ordering code

### COMPLETE FILTER

Configuration example: **LDP** **025** **B** **A** **D** **6** **A10** **N** **P01**

**Series**  
**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** With bypass 3.5 bar

**Seals and treatments**  
**A** NBR  
**V** FPM

**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 pressure 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

Configuration example: **DN** **025** **A10** **A** **N** **P01**

**Element series**  
**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 and treatments**  
**A** NBR  
**V** FPM

**Element Δp**  
**N** 20 bar

**Execution**  
**P01** MP Filtri standard  
**Pxx** Customized

### CLOGGING INDICATORS

See page 722

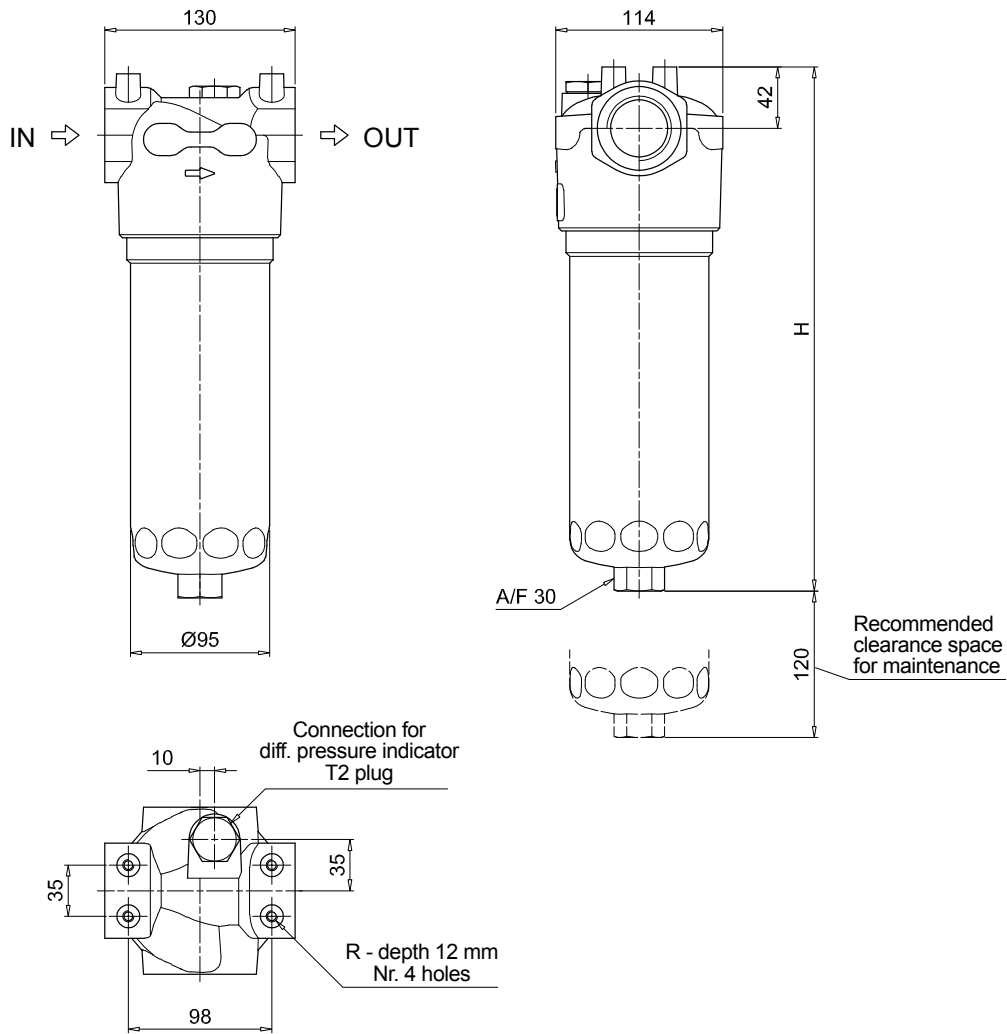
<b>DEA</b> Electrical differential pressure indicator	<b>DLE</b> Electrical / visual differential pressure indicator
<b>DEM</b> Electrical differential pressure indicator	<b>DTA</b> Electronic differential pressure indicator
<b>DEU</b> Electrical differential pressure indicator	<b>DVA</b> Visual differential pressure indicator
<b>DLA</b> Electrical / visual differential pressure indicator	<b>DVM</b> Visual differential pressure indicator

### PLUGS

See page 743

<b>T2</b> Plug
----------------





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 **LDD** Configuration example: **LDD 025 B A C 6 A10 N P01**

**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** With bypass 3.5 bar

**Seals and treatments**

**A** NBR  
**V** FPM

**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 pressure 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 **DN** Configuration example: **DN 025 A10 A N P01**

**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 and treatments**

**A** NBR  
**V** FPM

**Element Δp**  
**N** 20 bar

**Execution**  
**P01** MP Filtri standard  
**Pxx** Customized

### CLOGGING INDICATORS

See page 722

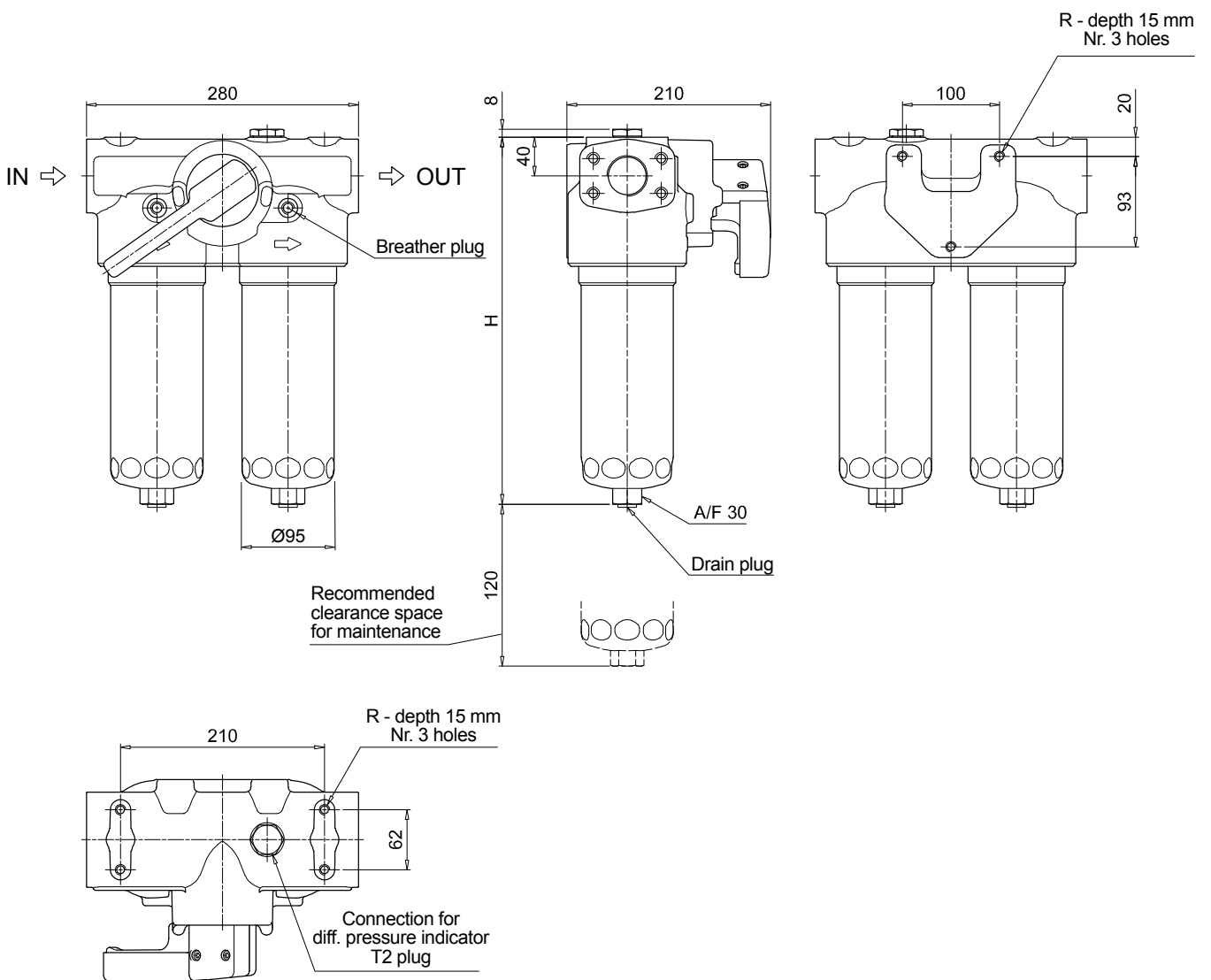
<b>DEA</b> Electrical differential pressure indicator	<b>DLE</b> Electrical / visual differential pressure indicator
<b>DEM</b> Electrical differential pressure indicator	<b>DTA</b> Electronic differential pressure indicator
<b>DEU</b> Electrical differential pressure indicator	<b>DVA</b> Visual differential pressure indicator
<b>DLA</b> Electrical / visual differential pressure indicator	<b>DVM</b> Visual differential pressure indicator

### PLUGS

See page 743

<b>T2</b> Plug
----------------

LDD	
Filter size	H [mm]
<b>016</b>	293
<b>025</b>	383
<b>040</b>	533
Connections	R
<b>C</b>	M10
<b>F - I</b>	3/8" UNC
<b>L</b>	M10
<b>M - N</b>	3/8" UNC

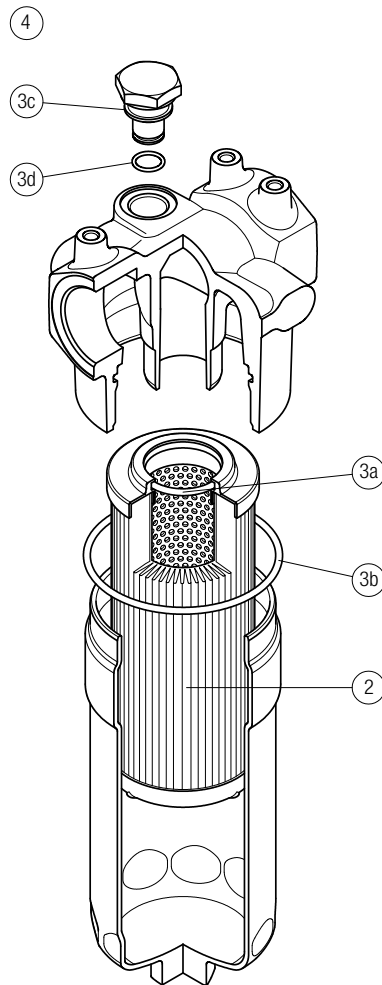


# LDP SPARE PARTS

Filter element according to DIN 24550

Order number for spare parts

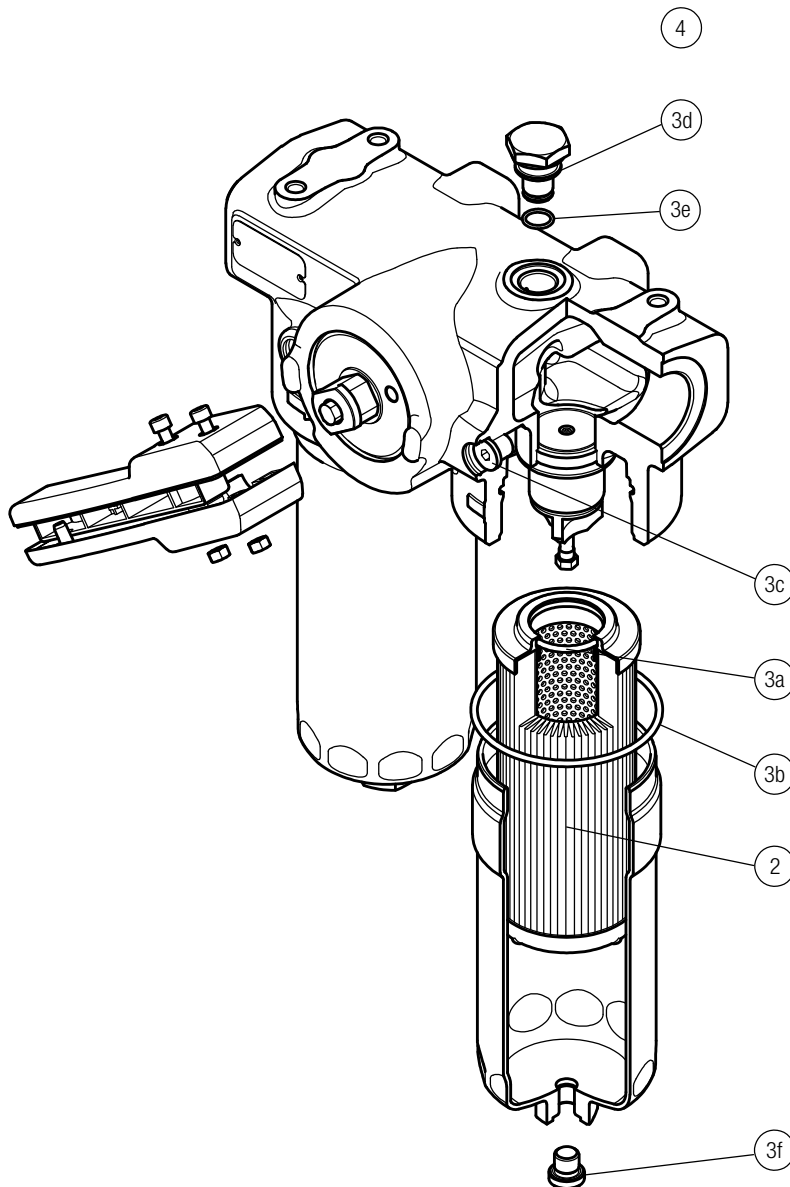
LDP



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
	<b>2</b>	<b>3</b> (3a ÷ 3d)		<b>4</b>	
		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
	<b>2</b>	<b>3</b> (3a ÷ 3i)		<b>4</b>	
		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) ±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 [dm<sup>3</sup>]

Filter series	Weights [kg]			Volumes [dm <sup>3</sup> ]		
	Length	1	2	Length	1	2
<b>LMP 900-901</b>		19.2	30.4		16	24



# GENERAL INFORMATION LMP 900-901

Filter element according to DIN 24550

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 mm<sup>2</sup>/s (cSt) and a density of 0.86 kg/dm<sup>3</sup>.

For different pressure drop or fluid viscosity we recommend to use our selection software available on [www.mpfiltri.com](http://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.

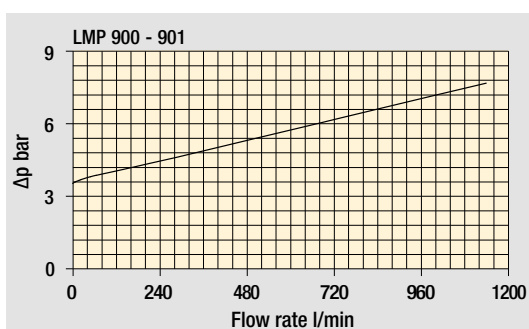
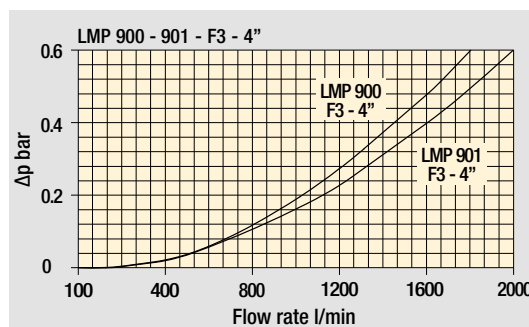
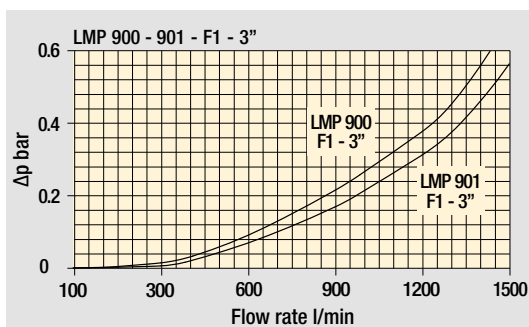
## LMP 900-901 Length 2



## Hydraulic symbols

Filter series	Execution S	Execution B
LMP 900-901	●	●

## Pressure drop Filter housings $\Delta p$ pressure drop



## Bypass valve pressure drop

The curves are plotted using mineral oil with density of 0.86 kg/dm<sup>3</sup> in compliance with ISO 3968.  $\Delta p$  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** With bypass 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)

<b>A03</b> Inorganic microfiber 3 µm	<b>M25</b> Wire mesh 25 µm
<b>A06</b> Inorganic microfiber 6 µm	<b>M60</b> Wire mesh 60 µm
<b>A10</b> Inorganic microfiber 10 µm	<b>M90</b> Wire mesh 90 µm
<b>A16</b> Inorganic microfiber 16 µm	
<b>A25</b> Inorganic microfiber 25 µm	

**WA025** Water absorber inorganic microfiber 25 µm

Element Δp	Execution	Filter length	
		1	2
<b>N</b> 20 bar	<b>P01</b> MP Filtri standard	•	•
	<b>P02</b> Maintenance from the bottom of the housing	-	•
	<b>Pxx</b> 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)

<b>A03</b> Inorganic microfiber 3 µm	<b>M25</b> Wire mesh 25 µm
<b>A06</b> Inorganic microfiber 6 µm	<b>M60</b> Wire mesh 60 µm
<b>A10</b> Inorganic microfiber 10 µm	<b>M90</b> Wire mesh 90 µm
<b>A16</b> Inorganic microfiber 16 µm	
<b>A25</b> Inorganic microfiber 25 µm	

**WA025** Water absorber inorganic microfiber 25 µm

Seals **A** NBR | **V** FPM

Element Δp	Execution
	<b>Pxx</b> Customized

## CLOGGING INDICATORS

See page 722

**DEA** Electrical differential pressure indicator

**DEM** Electrical differential pressure indicator

**DEU** Electrical differential pressure indicator

**DLA** Electrical / visual differential pressure indicator

**DLE** Electrical / visual differential pressure indicator

**DTA** Electronic differential pressure indicator

**DVA** Visual differential pressure indicator

**DVM** Visual differential pressure indicator

## PLUGS

See page 743

**T2** Plug - Filter length 1 - 2

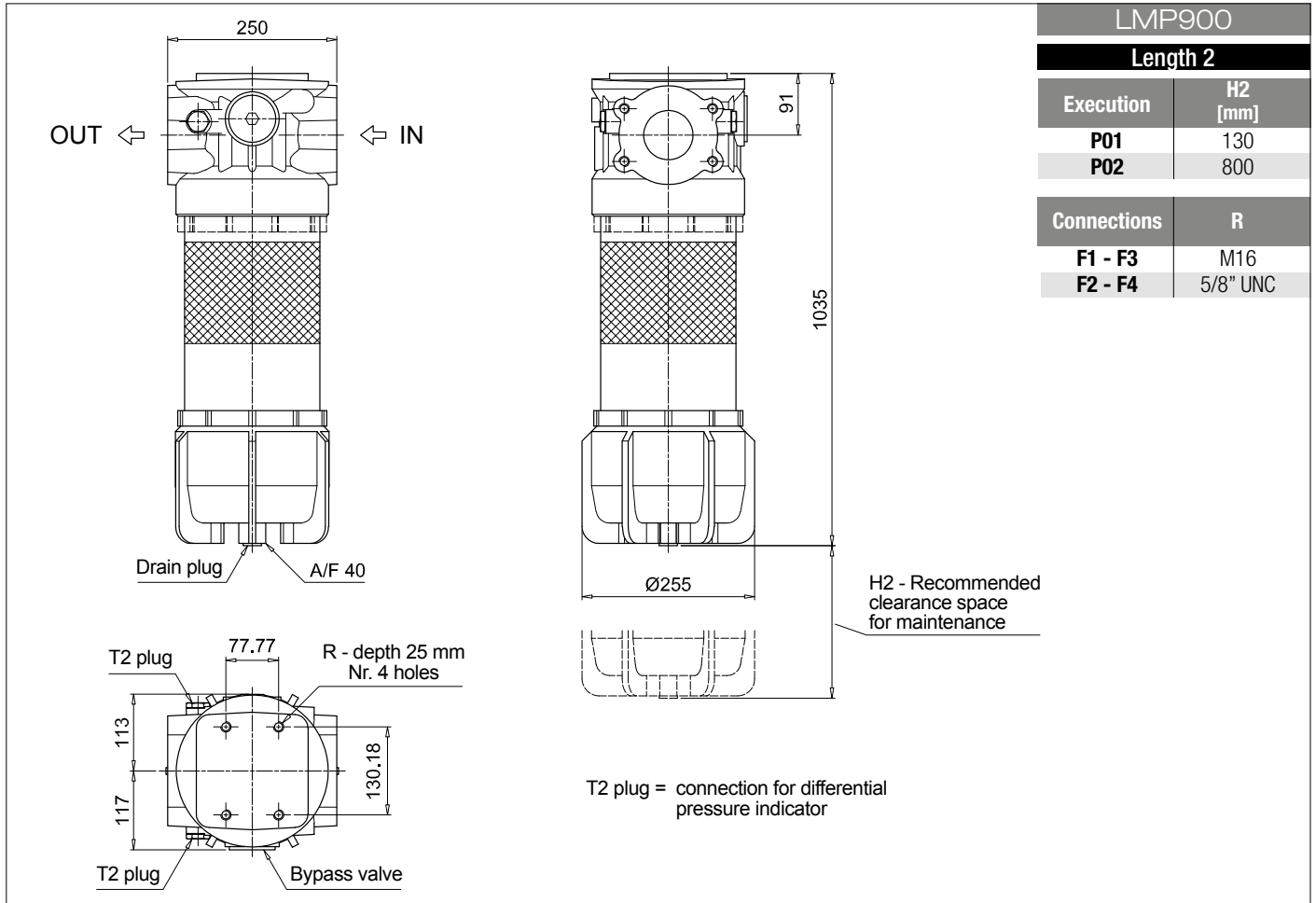
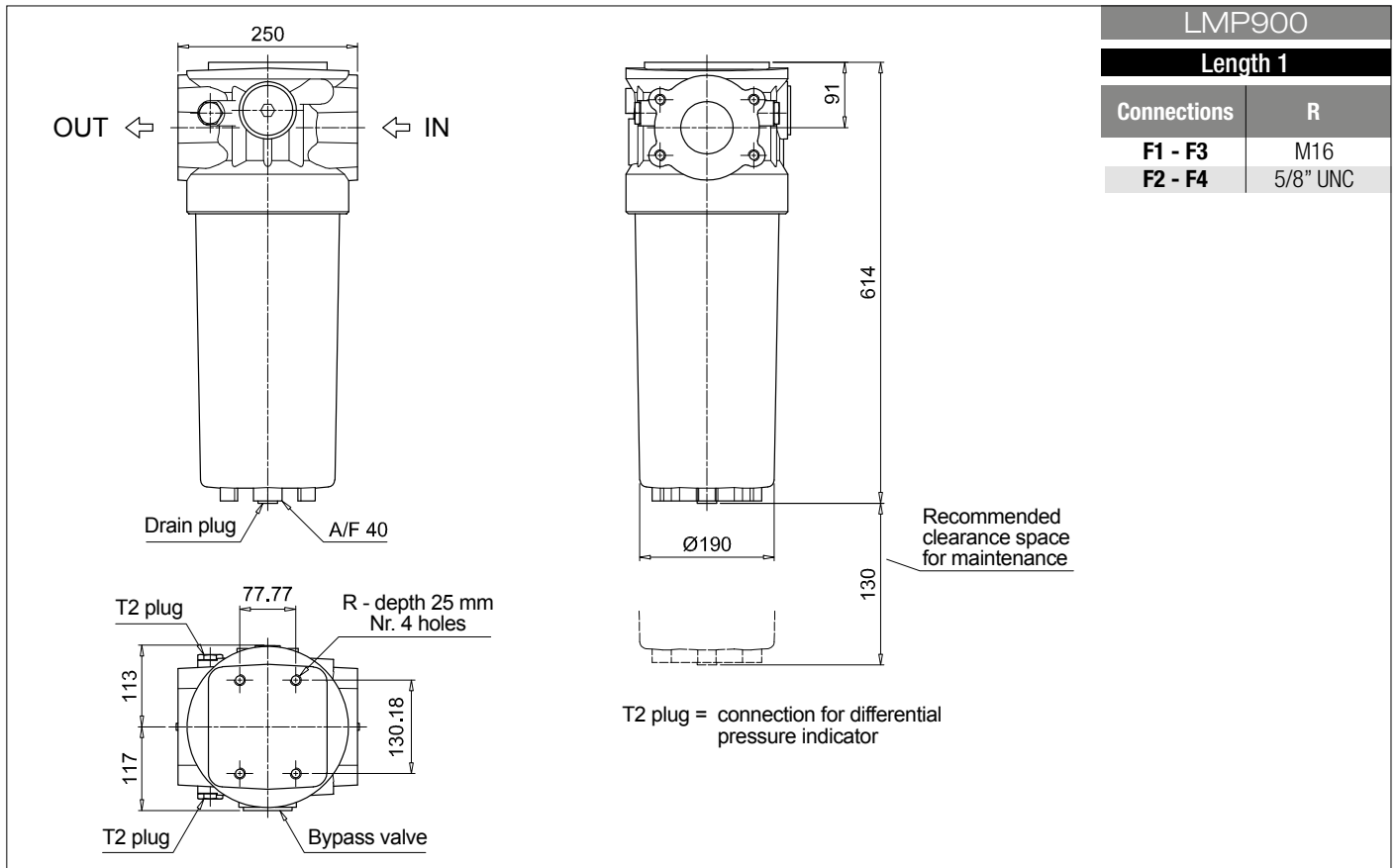
## ACCESSORIES

See page 472

**CFA** Retaining clamp - Filter length 2

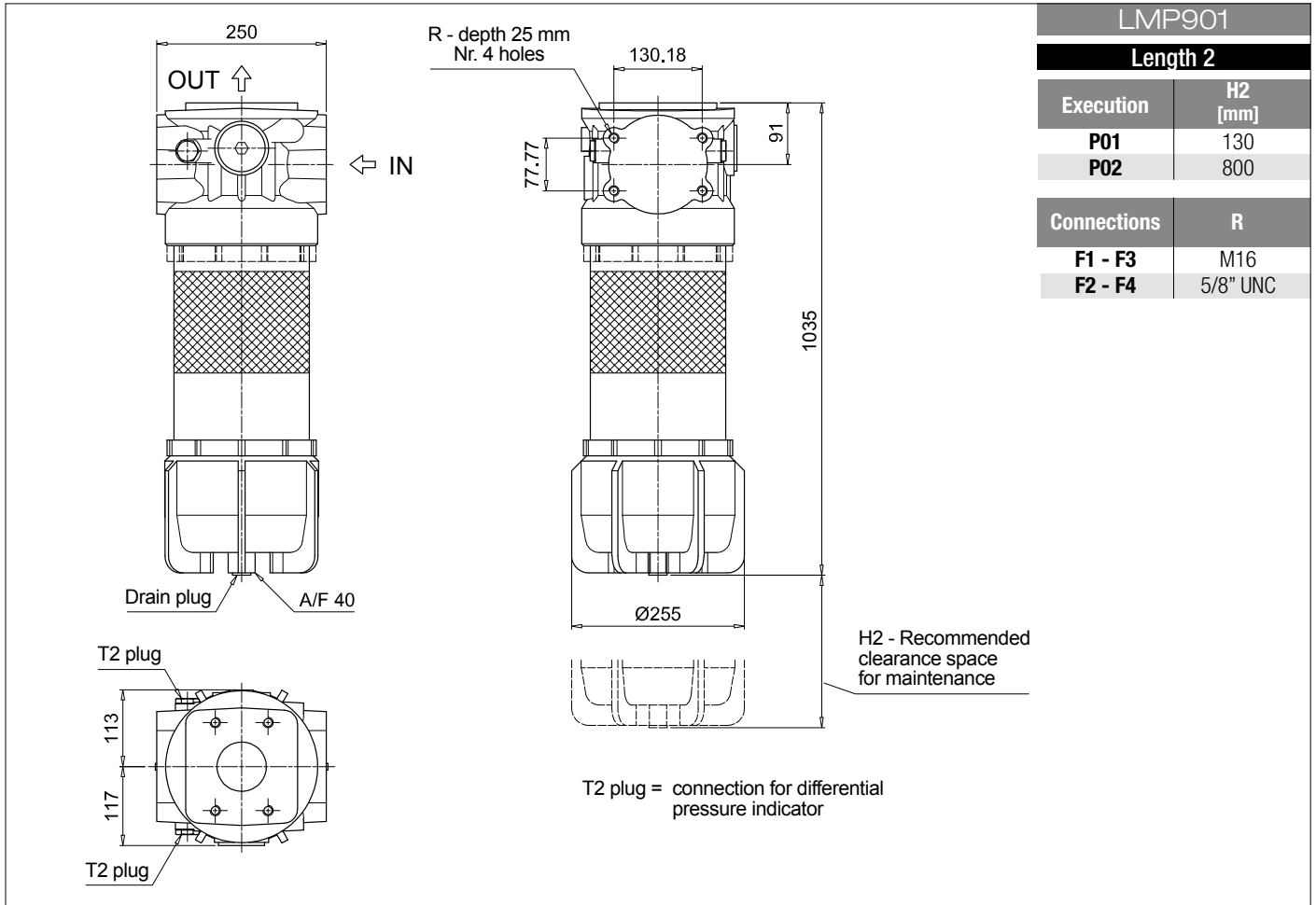
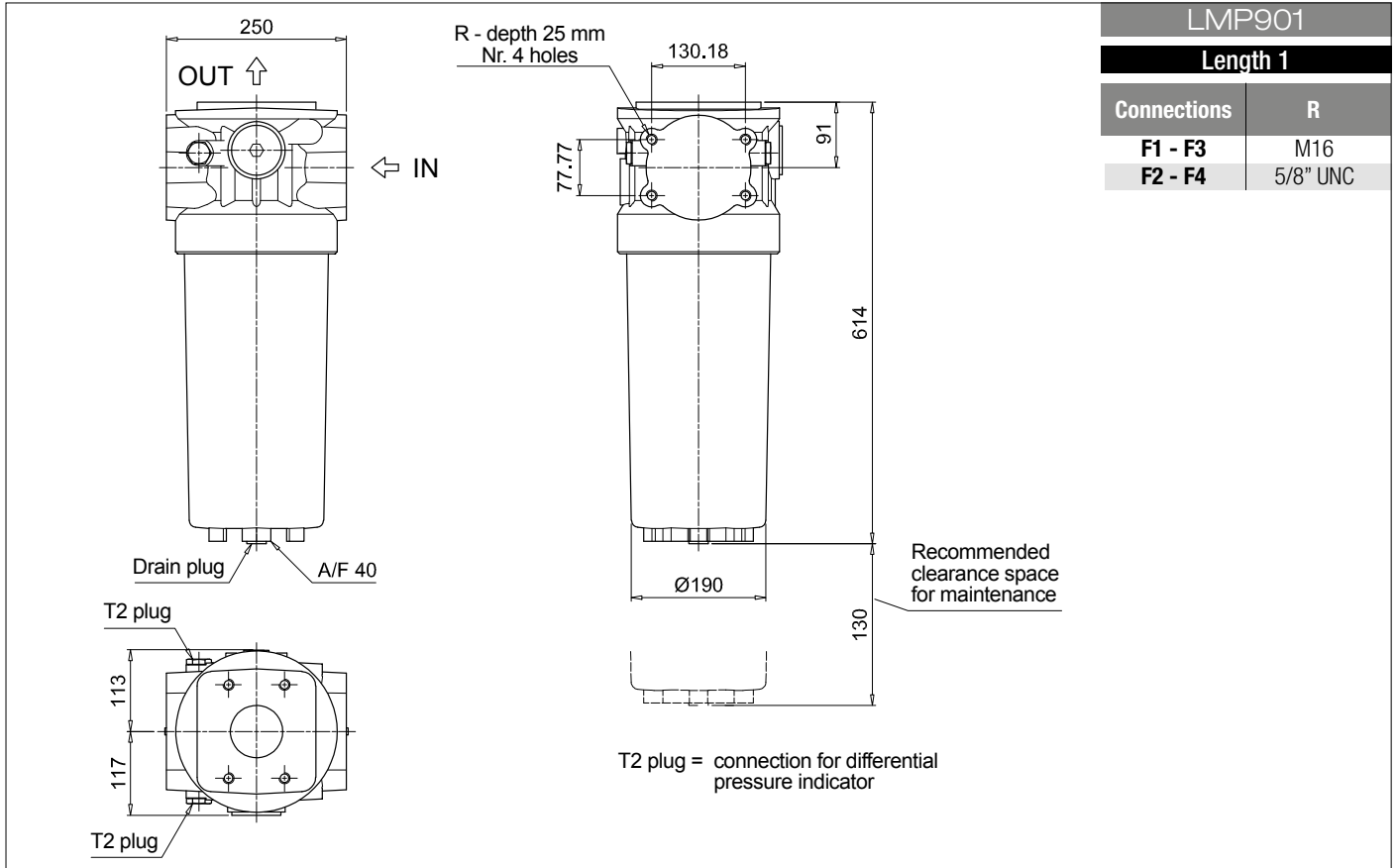
# Filter element according to DIN 24550 LMP 900-901

Dimensions



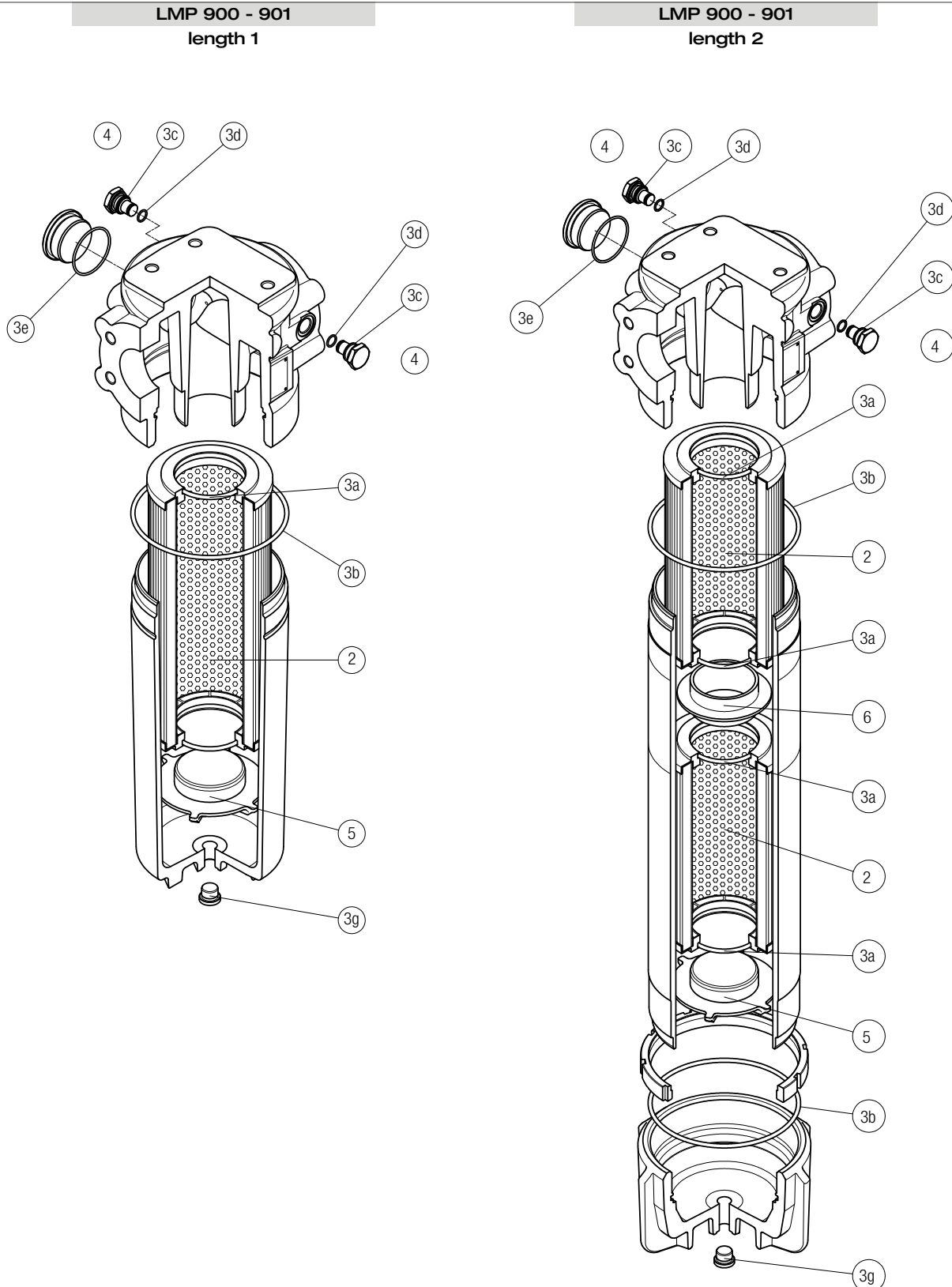
# LMP 900-901 Filter element according to DIN 24550

## 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	NBR	FPM	Q.ty	Q.ty
LMP 900-901 length 1	1 pc. See order table	1 pc. 02050363	2 pcs. T2H	1 pc. 01044104	-	1 pc.	02050363	02050364	2 pcs.	01044099
LMP 900-901 length 2	2 pcs.	1 pc. 02050365	2 pcs. T2V	1 pc.	1 pc.	2 pcs.	02050365	02050366	2 pcs.	1 pc.



# 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

#### $\Delta p$ 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 [dm<sup>3</sup>]

Filter series	Weights [kg]		Volumes [dm <sup>3</sup> ]	
	Length	2	Length	2
<b>LMP 902</b>		89.6		58
<b>LMP 903</b>		129.2		87



# GENERAL INFORMATION LMP 902-903

Filter element according to DIN 24550

Flow rates [l/min]

Filter series	Length	Filter element design - N Series					
		A03	A06	A10	A16	A25	M25 M60 M90
<b>LMP 902</b>	<b>2</b>	2217	2576	3241	3282	3506	3987
<b>LMP 903</b>	<b>2</b>	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 mm<sup>2</sup>/s (cSt) and a density of 0.86 kg/dm<sup>3</sup>.

For different pressure drop or fluid viscosity we recommend to use our selection software available on [www.mpfiltri.com](http://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.

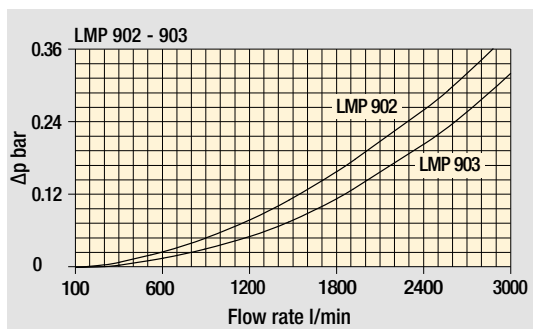
## Hydraulic symbols

Filter series	Execution S	Execution B	Execution S	Execution B
<b>LMP 902</b>	•	•	-	-
<b>LMP 903</b>	-	-	•	•

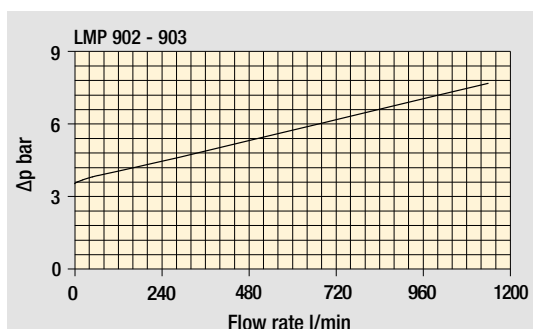
  

## Pressure drop

Filter housings  $\Delta p$  pressure drop



Bypass valve pressure drop

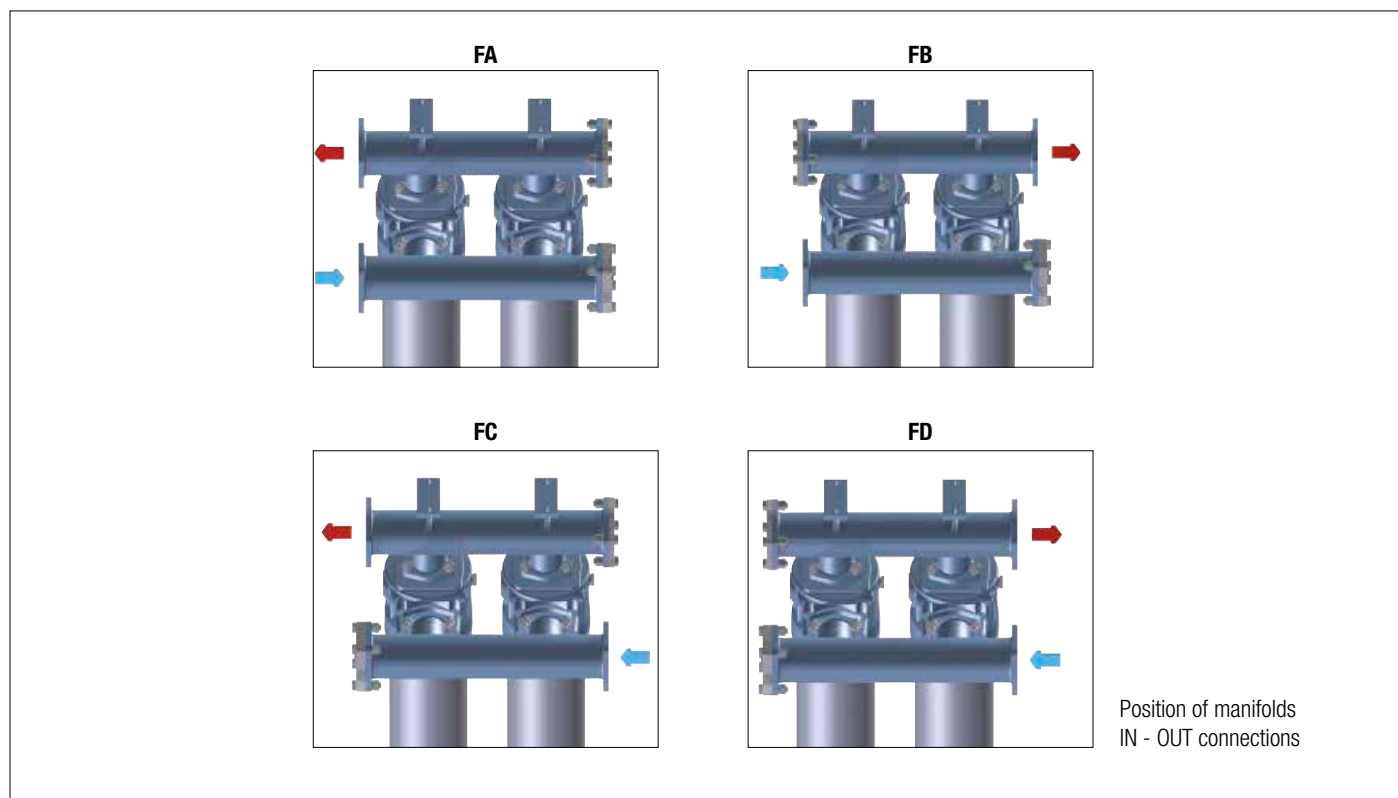


The curves are plotted using mineral oil with density of 0.86 kg/dm<sup>3</sup> in compliance with ISO 3968.  $\Delta p$  varies proportionally with density.

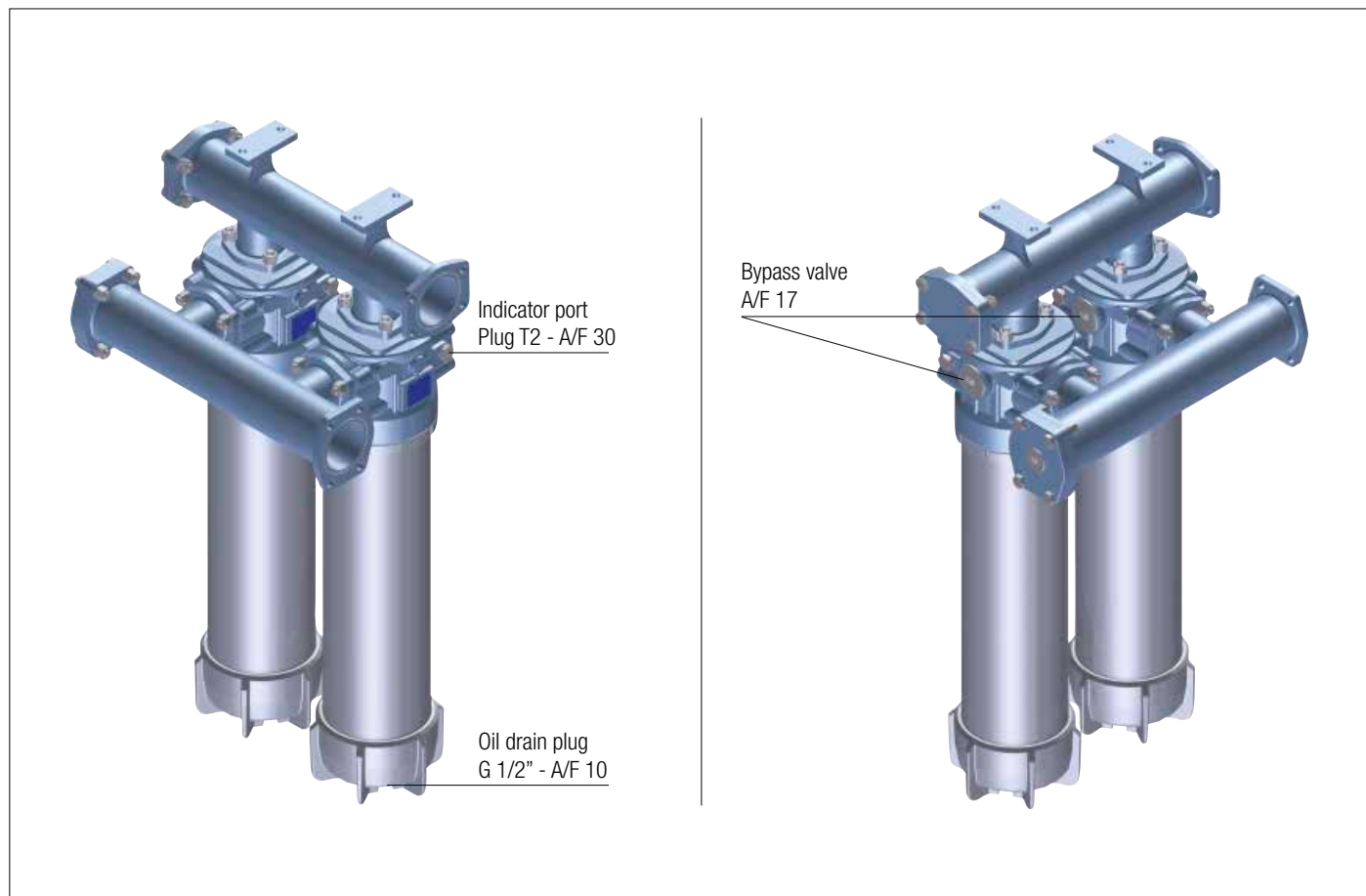
# LMP 902-903 GENERAL INFORMATION

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 **LMP902 | LMP903** Configuration example: **LMP902** **2** **B** **A** **FA** **A10** **N** **P01**

Length **2**

Bypass valve **S** Without bypass **B** With bypass 3.5 bar

Seals and treatments **A** NBR **V** FPM

Connections	IN	OUT
<b>FA</b> 4" SAE 3000 psi	left	left
<b>FB</b> 4" SAE 3000 psi	left	right
<b>FC</b> 4" SAE 3000 psi	right	left
<b>FD</b> 4" SAE 3000 psi	right	right

Filtration rating (filter media)

<b>A03</b> Inorganic microfiber 3 µm	<b>M25</b> Wire mesh 25 µm
<b>A06</b> Inorganic microfiber 6 µm	<b>M60</b> Wire mesh 60 µm
<b>A10</b> Inorganic microfiber 10 µm	<b>M90</b> Wire mesh 90 µm
<b>A16</b> Inorganic microfiber 16 µm	
<b>A25</b> Inorganic microfiber 25 µm	

**WA025** Water absorber inorganic microfiber 25 µm

Element Δp	Execution
<b>N</b> 20 bar	<b>P01</b> MP Filtri standard
	<b>Pxx</b> Customized

## FILTER ELEMENT

Element series and size **CU900** Configuration example: **CU900** **A10** **A** **N** **P01**

Filter series and size **LMP902** Nr. 4 filter elements **LMP903** Nr. 6 filter elements

Filtration rating (filter media)

<b>A03</b> Inorganic microfiber 3 µm	<b>M25</b> Wire mesh 25 µm
<b>A06</b> Inorganic microfiber 6 µm	<b>M60</b> Wire mesh 60 µm
<b>A10</b> Inorganic microfiber 10 µm	<b>M90</b> Wire mesh 90 µm
<b>A16</b> Inorganic microfiber 16 µm	
<b>A25</b> Inorganic microfiber 25 µm	

**WA025** Water absorber inorganic microfiber 25 µm

Seals **A** NBR **V** FPM

Element Δp	Execution
<b>N</b> 20 bar	<b>P01</b> MP Filtri standard
	<b>Pxx</b> Customized

## CLOGGING INDICATORS

See page 722

**DEA** Electrical differential pressure indicator  
**DEM** Electrical differential pressure indicator  
**DEU** Electrical differential pressure indicator  
**DLA** Electrical / visual differential pressure indicator

**DLE** Electrical / visual differential pressure indicator  
**DTA** Electronic differential pressure indicator  
**DVA** Visual differential pressure indicator  
**DVM** Visual differential pressure indicator

## PLUGS

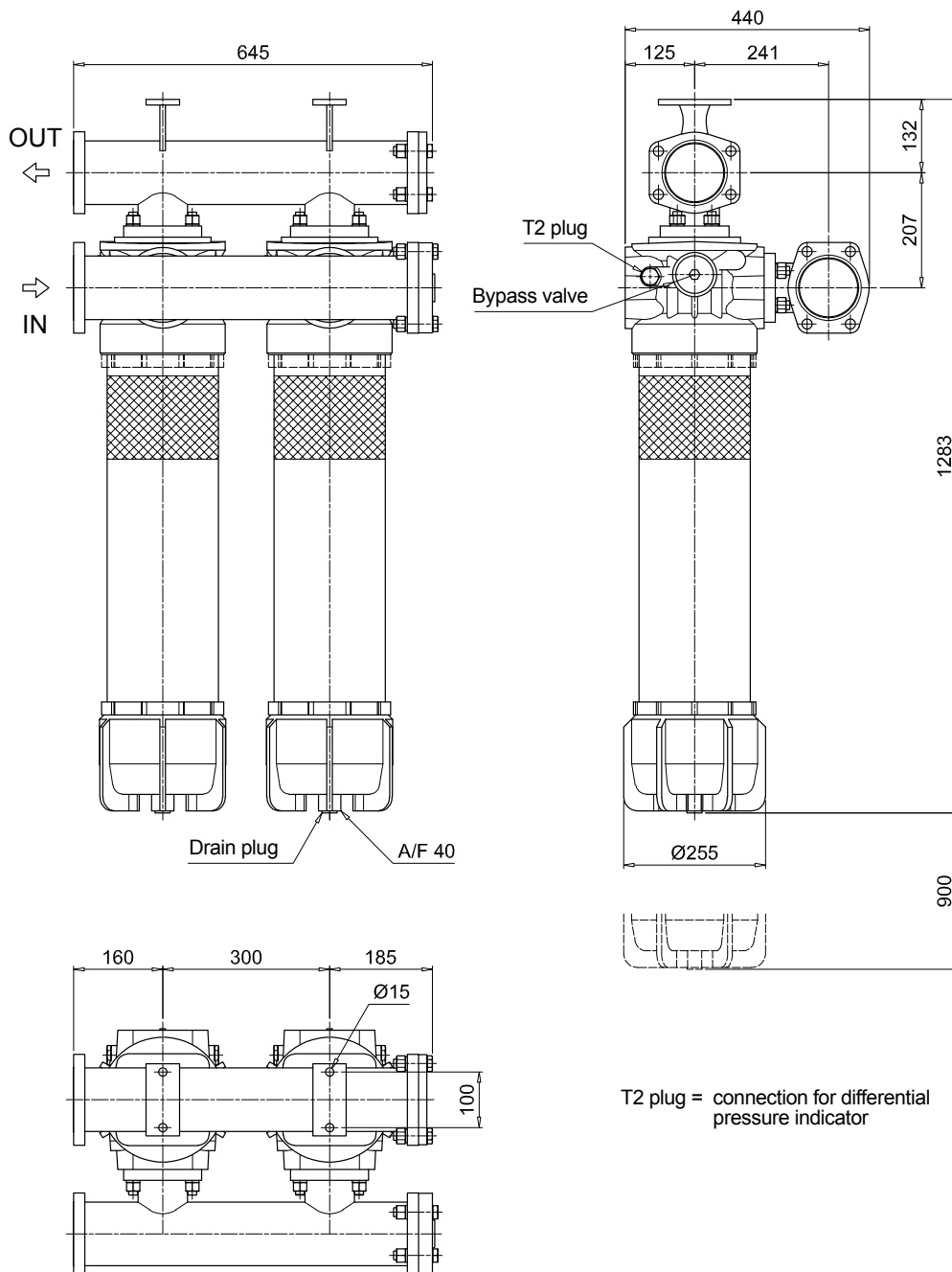
See page 743

**T2** Plug

# Filter element according to DIN 24550 LMP 902-903

Dimensions

LMP902

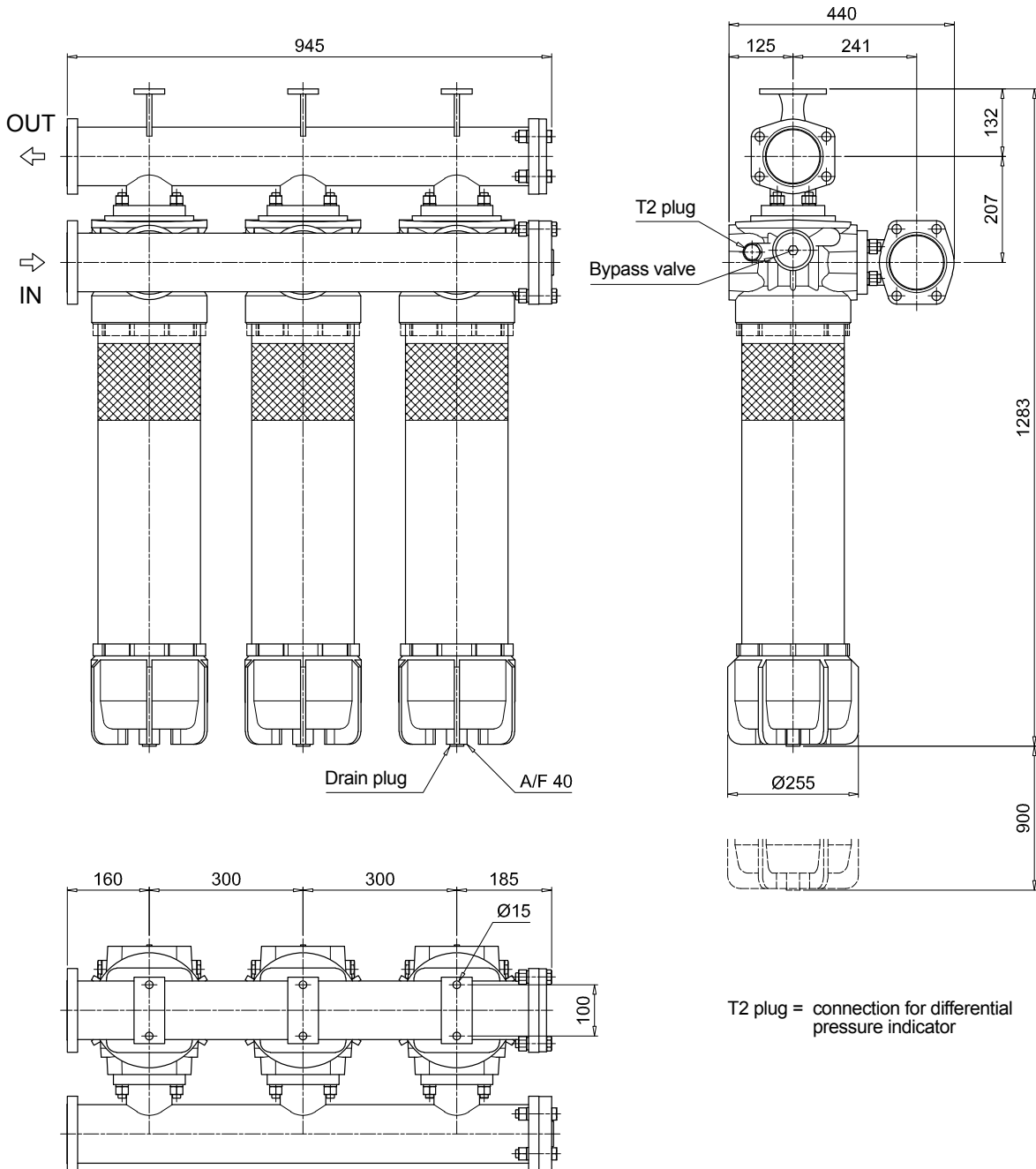


T2 plug = connection for differential pressure indicator

# LMP 902-903 Filter element according to DIN 24550

## Dimensions

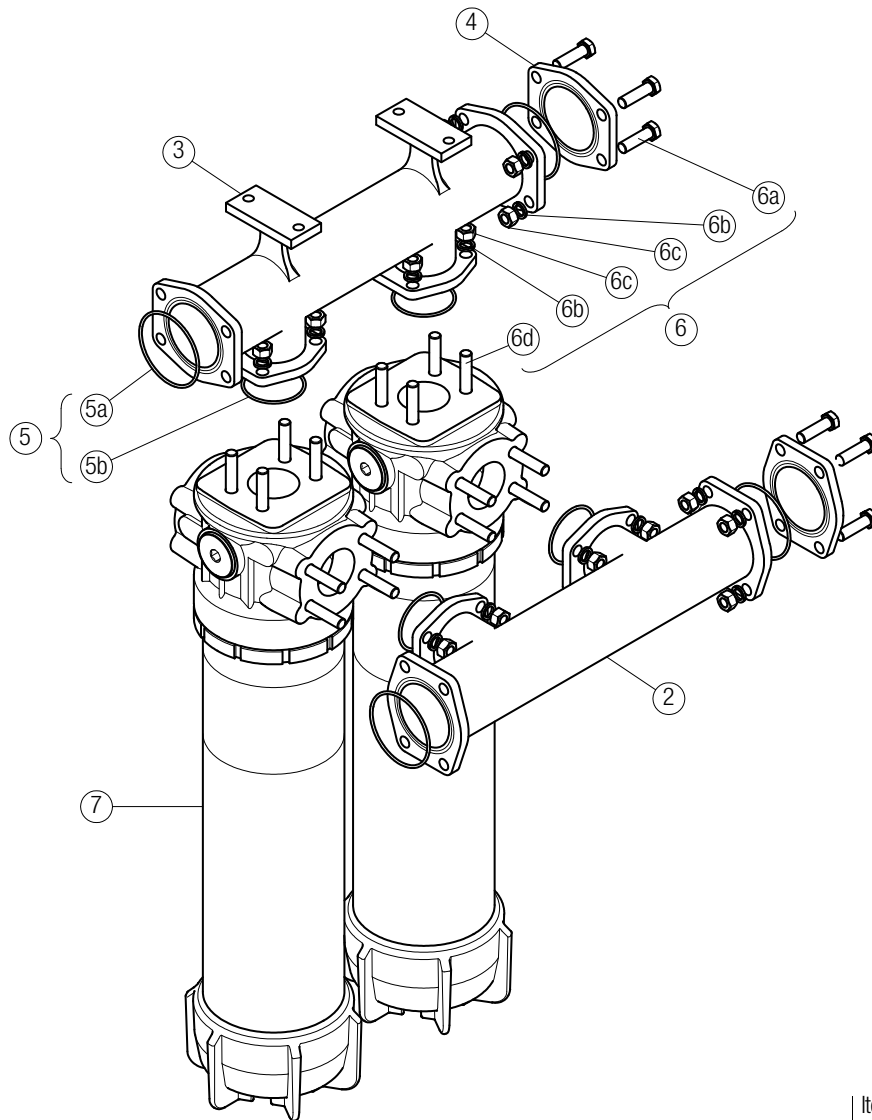
LMP903



# 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

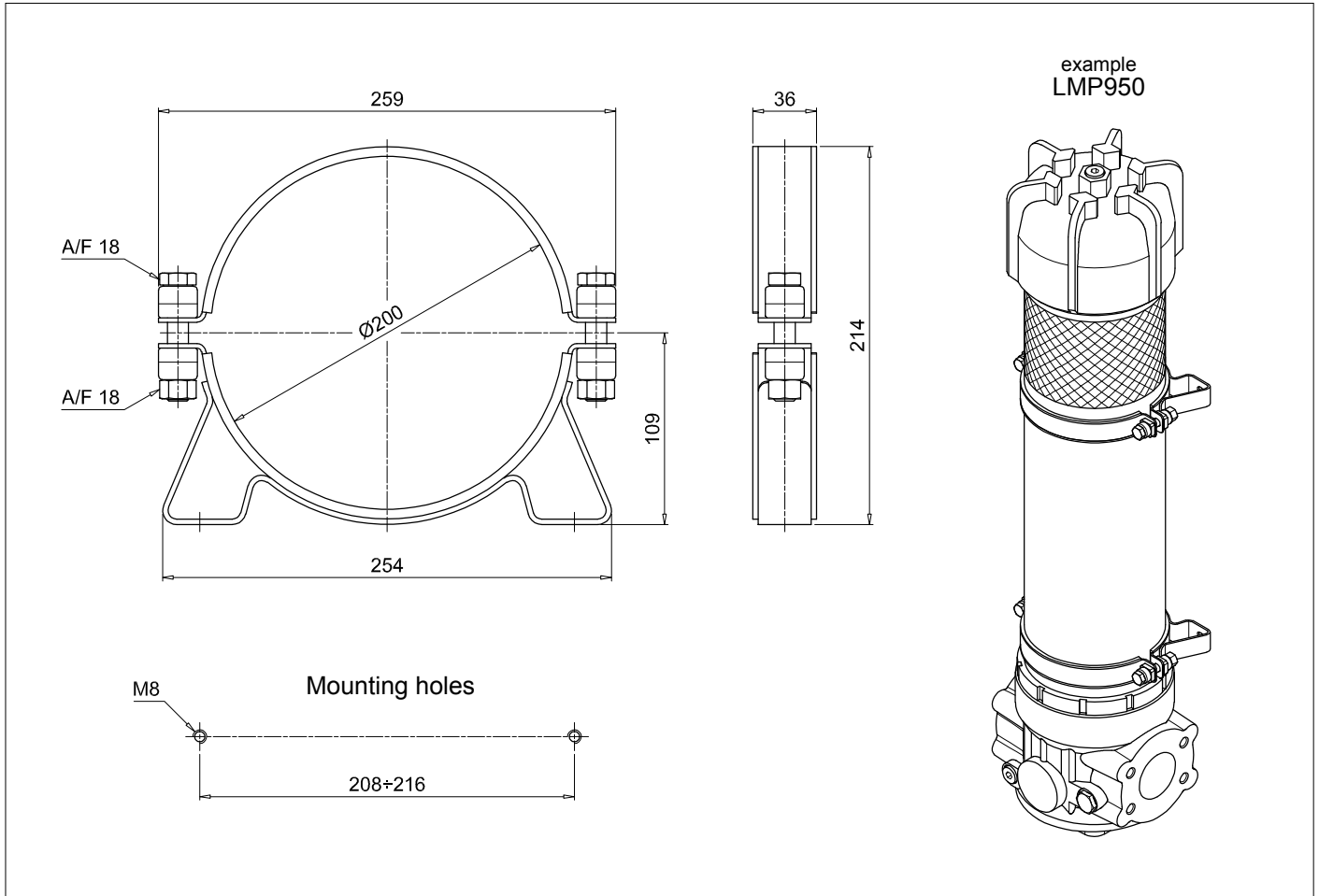
Quantity:  
- filter spare parts:  
LMP 902 - 2 pcs.  
LMP 903 - 3 pcs.

- 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.	

# Accessories

## RETAINING CLAMP

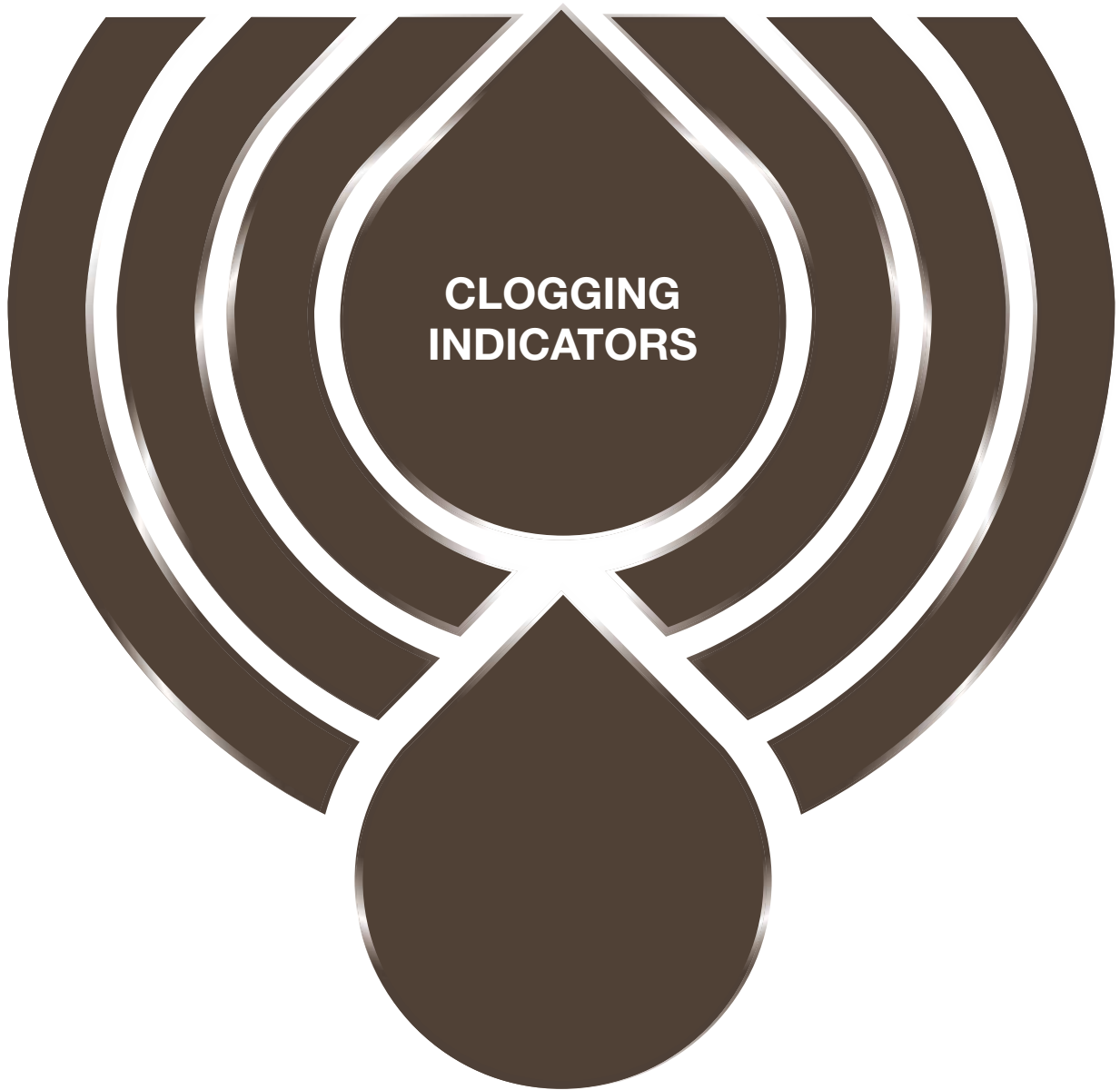


<b>Series</b>		Configuration example:	<b>CFA</b>	<b>20</b>	<b>M</b>	<b>P01</b>
<b>CFA</b>	Retaining clamp					
<b>Size</b>						
<b>20</b>						
<b>Screw</b>						
<b>M</b>	Metric					
<b>Execution</b>						
<b>P01</b>	MP Filtri standard					









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:

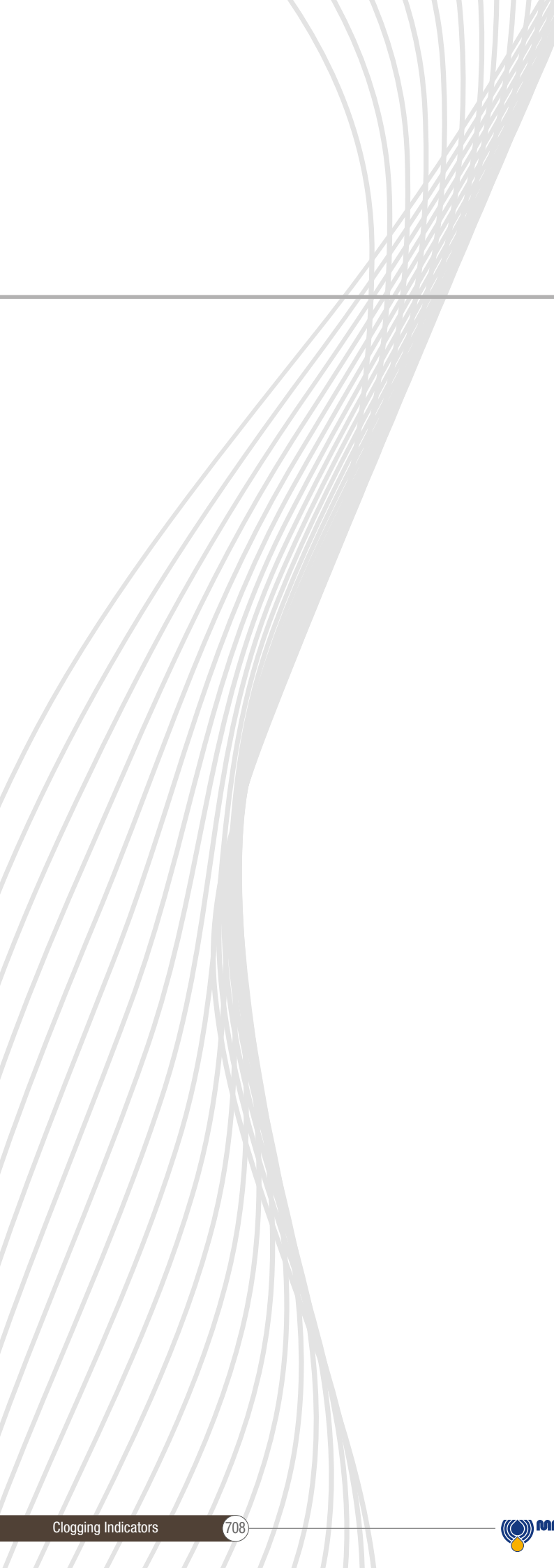
- Vacuum switches and gauges
- Pressure switches and gauges
- Differential pressure indicators

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.

In the following pages you can find a reference guide about the types of clogging indicators available in the different families of MP Filtri's Hydraulic Filtration range of products.

# Clogging Indicators





# DESIGNATION, ORDERING CODES & TECHNICAL DATA

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# QUICK REFERENCE GUIDE

## Ordering codes

Filter family	Filter series	Visual indicators	Electrical indicators	Electronic / Electrical-Visual indicators	
SUCTION FILTERS	ELIXIR® SFEX060-110	VVB20P01	VEB21AA50P01	VLB21AA51P01	
		VVS20P01		VLB21AA52P01	
	Suction Line	SFMC250	VVA20P01	VEA21xA50P01 VEA21xA50P01UL	VLA21xA51P01
			WR20P01		VLA21xA52P01
	Without bypass	SFSC 500 - 503 - 504 - 505 SFSC 510 - 535 - 540	VVA20P01	VEA21xA50P01 VEA21xA50P01UL	VLA21xA51P01
			WR20P01		VLA21xA52P01
With bypass 1.75 bar	ELIXIR® RFEX060-080-110-160	BVA14P01	BEA15HA50P01 BEA15HA50P01UL	BLA15HA51P01	
		BVR14P01		BLA15HA52P01	
Without bypass	ELIXIR® RFEX060-080-110-160	BVP15HP01	BEM15HA41P01	BLA15HA53P01	
		BVQ15HP01		BLA15HA71P01	
RETURN FILTERS	MDH 250	BVA14P01	BEA15HA50P01 BEA15HA50P01UL	BLA15HA51P01	
		BVR14P01		BLA15HA52P01	
	With bypass 1.75 bar	MDH 250	BVP15HP01	BEM15HA41P01	BLA15HA53P01
			BVQ15HP01		BLA15HA71P01
	With bypass 3 bar	MDH 250	DVS12HP01	DES12HA10P01 DES12HA30P01 DES12HA80P01	
With bypass 3 bar	MDH 250	BVA25P01	BEA20HA50P01 BEA20HA50P01UL	BLA20HA51P01	
		BVR25P01		BLA20HA52P01	
With bypass 2.5 bar	MPH	BVP20HP01	BEM20HA41P01	BLA20HA53P01	
		BVQ20HP01		BLA20HA71P01	
With bypass 1.75 bar	MPFX MPTX MPF MPT MPH	BVA14P01	BEA15HA50P01 BEA15HA50P01UL	BLA15HA51P01	
		BVR14P01		BLA15HA52P01	
With bypass 3 bar	MPFX MPTX MPF MPT	BVP15HP01	BEM15HA41P01	BLA15HA53P01	
		BVQ15HP01		BLA15HA71P01	
With bypass 4.5 bar	MPLX	BVA25P01	BEA20HA50P01 BEA20HA50P01UL	BLA20HA51P01	
		BVR25P01		BLA20HA52P01	
With bypass 2.4 bar	FRI	BVP20HP01	BEM20HA41P01	BLA20HA53P01	
		BVQ20HP01		BLA20HA71P01	
With bypass 4.5 bar	MPLX	DVA20xP01	DEA20xA50P01 DEA20xA50P01UL	DLA20xA51P01	
				DLA20xA52P01	
With bypass 2.4 bar	FRI	DVM20xP01	DEM20xx10P01 DEM20xx20P01 DEM20xx30P01 DEM20xx35P01	DLE20xA50P01	
				DLE20xF50P01	
			DEU20VA50P01UL	DTA20xF70P01	



Filter family	Filter series	Visual indicators	Electrical indicators	Electronic / Electrical-Visual indicators	
RETURN / SUCTION FILTERS	MRSX 116 - 165 - 166 Suction line	VVB20P01	VEB21AA50P01	VLB21AA51P01	
		VVS20P01		VLB21AA52P01	
	With bypass valve 2.5 bar	MRSX 116 - 165 - 166 Return line	BVA25P01	BEA20HA50P01	VLB21AA53P01
			BVR25P01	BEA20HA50P01UL	VLB21AA71P01
	With bypass valve 2.5 bar	LMP 124 MULTIPORT	BVP20HP01	BEM20HA41P01	BLA20HA51P01
			BVQ20HP01	BET25HF10P01	BLA20HA52P01
			DVA20xP01	BET25HF30P01	BLA20HA53P01
			DVM20xP01	BET25HF50P01	BLA20HA71P01
			BVA25P01	BEA20HA50P01	BLA20HA51P01
			BVR25P01	BEA20HA50P01UL	BLA20HA52P01
BVP20HP01			BEM20HA41P01	BLA20HA53P01	
BVQ20HP01			BET25HF10P01	BLA20HA71P01	
SPIN-ON FILTERS	Suction line	WB20P01	VEB21AA50P01	DLA20xA51P01	
		VVS20P01		DLA20xA52P01	
	Return line	MPS 050 - 070 - 100 - 150	BVA14P01	BEA15HA50P01	DLA20xA71P01
		MPS 200 - 250 - 300 - 350	BVR14P01	BEA15HA50P01UL	DLA20xA51P01
		MST 050 - 070 - 100 - 150	BVP15HP01	BEM15HA41P01	DLA20xA52P01
	In-line	MPS 051 - 071 - 101 - 151 MPS 301 - 351 MSH 050 - 070 - 100 - 150	DVA12xP01	DEA12xA50P01	DLA20xA53P01
			DVM12xP01	DEM12xAxxP01	DLA20xA71P01
			DVA20xP01	DEA20xA50P01	DLE12xA50P01
			DVM20xP01	DEM20xAxxP01	DLE12xF50P01
				DEU20VA50P01UL	DLE20xF50P01
				DLE20xF50P01	
		DTA12xF70P01			
		DTA20xF70P01			

# QUICK REFERENCE GUIDE

## Ordering codes

Filter family	Filter series	Visual indicators	Electrical indicators	Electronic / Electrical-Visual indicators	
LOW & MEDIUM PRESSURE FILTERS	ELIXIR® LFEX060-080-110-160	DVS25HP01	DES25HA10P01 DES25HA30P01 DES25HA80P01		
	With bypass valve 3.5 bar	LMP 110 LMP 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	DVA20XP01 DVM20XP01	DEA20xA50P01 DEM20xx10P01 DEM20xx20P01 DEM20xx30P01 DEM20xx35P01 DEU20VA50P01UL	DLA20xA51P01 DLA20xA52P01 DLA20xA71P01 DLE20xA50P01 DLE20xF50P01 DTA20xF70P01
	With bypass valve 2.5 bar	LPH 630	DVA20XP01 DVM20XP01	DEA20xA50P01 DEM20xx10P01 DEM20xx20P01 DEM20xx30P01 DEM20xx35P01 DEU20VA50P01UL	DLA20xA51P01 DLA20xA52P01 DLA20xA71P01 DLE20xA50P01 DLE20xF50P01 DTA20xF70P01
	With bypass valve 1.75 bar	LPH 630	DVA12XP01 DVM12XP01 DVS12HP01	DEA12xA50P01 DEM12xx10P01 DEM12xx20P01 DEM12xx30P01 DEM12xx35P01	DLA12xA51P01 DLA12xA52P01 DLA12xA71P01 DLE12xA50P01 DLE12xF50P01 DTA12xF70P01
	Without bypass valve	ELIXIR® LFEX060-080-110-160	DVS40HP01	DES40HA10P01 DES40HA30P01 DES40HA80P01	
	Without bypass valve	LMP 110 LMP 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 LPH 630	DVA50XP01 DVM50XP01	DEA50xA50P01 DEM50xx10P01 DEM50xx20P01 DEM50xx30P01 DEM50xx35P01 DEU50VA50P01UL	DLA50xA51P01 DLA50xA52P01 DLA50xA71P01 DLE50xA50P01 DLE50xF50P01 DTA50xF70P01
	With bypass valve 6 bar	FMP 039 - 065 - 135 - 320 FHP 010 - 011 - 065 - 135 - 350 - 351 - 500 FMMX 050 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 DEM50xx10P01 DEM50xx20P01 DEM50xx30P01 DEM50xx35P01 DEU50VA50P01UL	DLA50xA51P01 DLA50xA52P01 DLA50xA71P01 DLE50xA50P01 DLE50xF50P01
	Without bypass valve	FMP 039 - 065 - 135 - 320 FHP 010 - 011 - 065 - 135 - 350 - 351 - 500 FMMX 050 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 DVA95XP01 DVM70XP01 DVM95XP01	DEA70xA50P01 DEA95xA50P01 DEM70xx10P01 DEM70xx20P01 DEM70xx30P01 DEM70xx35P01 DEU70VA50P01UL DEM95xx10P01 DEM95xx20P01 DEM95xx30P01 DEM95xx35P01	DLA70xA51P01 DLA70xA52P01 DLA70xA71P01 DLA95xA51P01 DLA95xA52P01 DLA95xA71P01 DLE70xA50P01 DLE70xF50P01 DLE95xA50P01 DLE95xF50P01 DTA70xF70P01 DTA95xF70P01

Filter family	Filter series	Visual indicators	Electrical indicators	Electronic / Electrical-Visual indicators
STAINLESS STEEL HIGH PRESSURE FILTERS	With bypass valve 6 bar	FZH 012 - 040	DVZ50xP01	DEZ50xA50P01 DLZ50xA51P01 DLZ50xA52P01
	Without bypass valve	FZH 012 - 040	DVZ70xP01 DVZ95xP01	DEZ70xA50P01 DEZ95xA50P01 DLZ70xA51P01 DLZ70xA52P01 DLZ95xA51P01 DLZ95xA52P01
	With bypass valve 6 bar	FZP 039 - 136 FZB 039 FZM 039 FZD 051	DVX50xP01 DZY50xP01	DEX50xA50P01 DLX50xA51P01 DLX50xA52P01
	Without bypass valve	FZP 039 - 136 FZB 039 FZM 039 FZD 010 - 021 - 051	DVX70xP01 DVX95xP01 DZY70xP01 DZY95xP01	DEX70xA50P01 DEX95xA50P01 DLX70xA51P01 DLX70xA52P01 DLX95xA51P01 DLX95xA52P01
FILTERS FOR POTENTIALLY EXPLOSIVE ATMOSPHERE	With bypass valve 6 bar	FMMX 050	DVA50xP01 DVM50xP01	DEH50xA48P01 DEH50xA49P01 DEH50xA70P01
	Without bypass valve	FMMX 050	DVA70xP01 DVA95xP01 DVM70xP01 DVM95xP01	DEH70xA48P01 DEH70xA49P01 DEH70xA70P01
	With bypass valve 6 bar	FZP 039 - 136	DVX50xP01 DZY50xP01	DEH50xA48P01 DEH50xA49P01 DEH50xA70P01
	Without bypass valve	FZP 039 - 136	DVX70xP01 DVX95xP01 DZY70xP01 DZY95xP01	DEH70xA48P01 DEH70xA49P01 DEH70xA70P01
	With bypass valve 6 bar	FZH 012 - 040	DVZ50xP01	
	Without bypass valve	FZH 012 - 040	DVZ70xP01 DVZ95xP01	

Suitable indicator types

**V ACUUM 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.

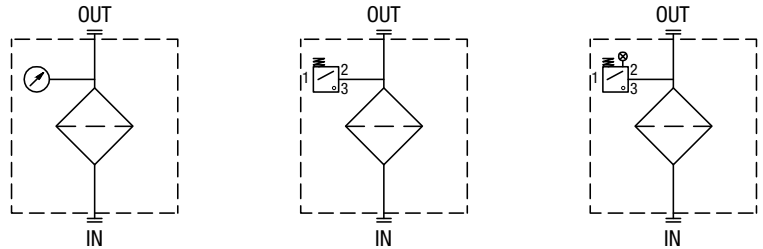
Standard items are produced with R 1/4" EN 10226 connection.

Available products with R 1/8" EN 10226 to be fitted on MPS series.

Vacuum indicators are identified in the Hydraulic Filtration catalogue and in the Quick Reference Guide table by the letter "V".

Example:

**V** VVB20P01



**B BAROMETRIC (PRESSURE) INDICATORS**

Pressure indicators are used on the Return line to check the efficiency of the filter element.

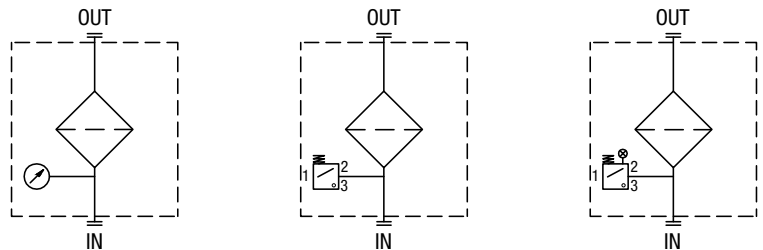
They measure the pressure upstream of the filter element.

Standard items are produced with R 1/8" EN 10226 connection.

Barometric (pressure) indicators are identified in the Hydraulic Filtration catalogue and in the Quick Reference Guide table by the letter "B".

Example:

**B** BVA14P01



**D DIFFERENTIAL PRESSURE INDICATORS**

Differential pressure indicators are used on the Pressure line to check the efficiency of the filter element.

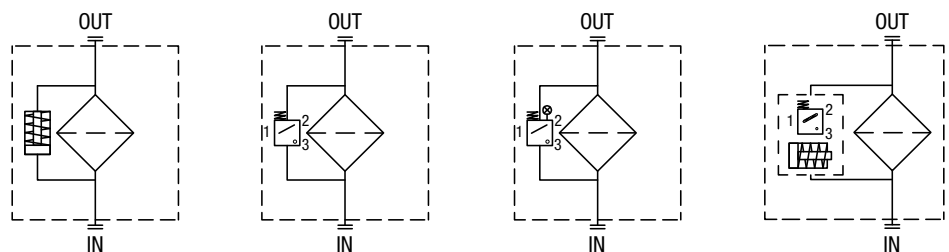
They measure the pressure upstream and downstream of the filter element (differential pressure).

Standard items are produced with special connection G 1/2" size.

Also available in Stainless Steel models. Differential pressure indicators are identified in the Hydraulic Filtration catalogue and in the Quick Reference Guide table by the letter "D".

Example:

**D** DVA20xP01



# CLOGGING INDICATORS LOW & MEDIUM PRESS. FILTERS

## Designation & Ordering code

### DIFFERENTIAL PRESSURE INDICATORS

Series	Configuration example 1:	DE	M	20	H	F	50	P01	
<b>DE</b> Electrical differential pressure indicator	Configuration example 2:	DE	U	50	H	A	50	P01	UL
<b>DL</b> Electrical/Visual differential pressure indicator	Configuration example 3:	DL	E	50	V	A	71	P01	
<b>DT</b> Electronic differential pressure indicator	Configuration example 4:	DT	A	20	H	F	70	P01	
<b>DV</b> Visual differential pressure indicator	Configuration example 5:	DV	M	50	V			P01	

Type	DE	DL	DT	DV
<b>A</b> Standard type	•	•	•	<b>A</b> With automatic reset
<b>M</b> With wired electrical connection	•	-	-	<b>M</b> With manual reset
<b>U</b> Standard type 210 bar, UL certified	•	-	-	<b>S</b> With automatic reset
<b>E</b> For high power supply	-	•	-	
<b>S</b> Compact version	•	-	-	

Pressure setting	DEA	DEM	DEU	DES	DLA	DLE	DTA	DVA	DVM	DVS
<b>12</b> 1.2 bar	•	•	-	•	•	•	•	•	•	•
<b>20</b> 2.0 bar	•	•	•	-	•	•	•	•	•	-
<b>25</b> 2.5 bar	-	-	-	-	-	-	-	-	-	•
<b>40</b> 4.0 bar	-	-	-	•	-	-	-	-	-	•
<b>50</b> 5.0 bar	•	•	•	-	•	•	•	•	•	-

Seals	DEA	DEM	DEU	DES	DL	DT	DVA	DVM	DVS
<b>H</b> HNBR	•	•	-	•	•	•	•	•	•
<b>V</b> FPM	•	•	•	-	•	•	•	•	-

Thermostat	DEA	DEM	DEU	DES	DLA	DLE	DT
<b>A</b> Without thermostat	•	•	•	•	•	•	-
<b>F</b> With thermostat	-	•	-	-	-	•	•

Electrical connections	DEA	DEM	DEU	DES	DLA	DLE	DT
<b>10</b> Connection AMP Superseal series 1.5	-	•	-	•	-	-	-
<b>20</b> Connection AMP Timer Junior	-	•	-	-	-	-	-
<b>30</b> Connection Deutsch DT-04-2-P	-	•	-	•	-	-	-
<b>35</b> Connection Deutsch DT-04-3-P	-	•	-	-	-	-	-
<b>50</b> Connection EN 175301-803	•	-	•	-	-	•	-
<b>51</b> Connection EN 175301-803, transparent base with lamps 24 Vdc	-	-	-	-	•	-	-
<b>52</b> Connection EN 175301-803, transparent base with lamps 110 Vdc	-	-	-	-	•	-	-
<b>70</b> Connection IEC 61076-2-101 D (M12)	-	-	-	-	-	-	•
<b>71</b> Connection IEC 61076-2-101 D (M12), black base with lamps 24 Vdc	-	-	-	-	•	-	-
<b>80</b> Connection Stud #10-32 UNF	-	-	-	•	-	-	-

Option
<b>P01</b> MP Filtri standard
<b>Pxx</b> Customized

Certifications	DEU	OTHERS
Without	-	•
<b>UL</b> UL certification	•	-

### PLUGS

Series	Configuration example	T2	H
<b>T2</b> Plug			
<b>T4</b> Plug			

Seals	T2	T4
<b>A</b> NBR	-	•
<b>H</b> HNBR	•	-
<b>V</b> FPM	•	-

# VACUUM INDICATORS

## Technical data

VE*50 (EX)	
<b>Electrical Vacuum Indicator</b> Connection: EN 175301-803	
R	Ordering code
EN 10226 - R1/4"	VE A 21 x A 50 P01 VE A 21 x A 50 P01 EX
EN 10226 - R1/8"	VE B 21 A A 50 P01 VE B 21 A A 50 P01 EX

A/F 27  
Max tightening torque:  
**25 N·m**

**Hydraulic symbol**

**Electrical symbol**

**Materials**

- Body: Brass
- Base: Black polyamide
- Contacts: Silver
- Seal: VEA: NBR/FPM  
VEB: NBR

**Technical data**

- 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  
HFB and 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

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

**Certification:** ATEX, IECEx  
- Certification included in EX version

VEA50 UL	
<b>Electrical Vacuum Indicator</b> Connection: EN 175301-803	
R	Ordering code
EN 10226 - R1/4"	VE A 21 A A 50 P01 UL

A/F 27  
Max tightening torque:  
**25 N·m**

**Hydraulic symbol**

**Electrical symbol**

**Materials**

- Body: Brass
- Base: Black polyamide
- Contacts: Silver
- Seal: VEA: NBR/FPM  
VEB: NBR

**Technical data**

- 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  
HFB and 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

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

**Certification:** UL  
- Certification included in EX version

VL*51 - VL*52 - VL*53	
<b>Electrical/Visual Vacuum Indicator</b> Connection: EN 175301-803	
51: Transparent base with lamps 24 Vdc 52: Transparent base with lamps 110 Vdc 53: Transparent base with lamps 230 Vac	
R	Ordering code
EN 10226 - R1/4"	VL A 21 x A xx P01
EN 10226 - R1/8"	VL B 21 A A xx P01

A/F 27  
Max tightening torque:  
**25 N·m**

**Hydraulic symbol**

**Electrical symbol**

**Materials**

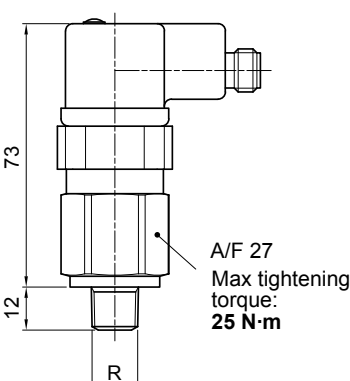
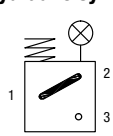
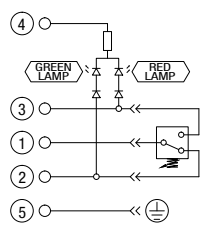
- Body: Brass
- Base: Transparent polyamide
- Contacts: Brass - Polyamide
- Seal: VLA: NBR/FPM  
VLB: NBR

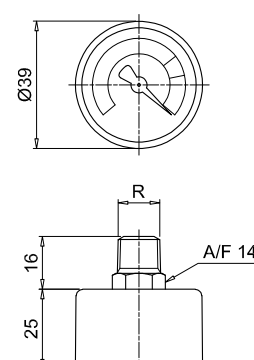

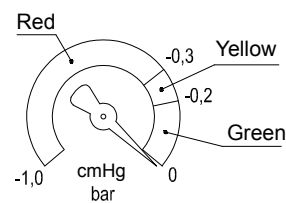
**Technical data**

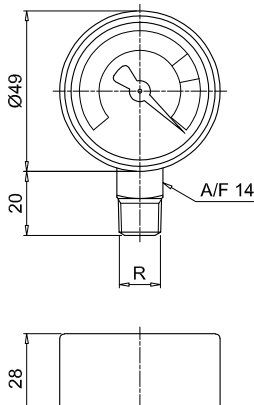

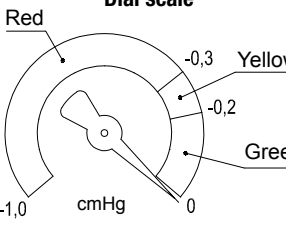
- Vacuum setting: 0.21 bar ±10%
- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFB and HFC according to ISO 2943
- Degree of protection: IP65 according to EN 60529

**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	
<b>Electrical/Visual Vacuum Indicator</b> Connection IEC 61076-2-101 D (M12), black base with lamps 24 Vdc	
Connections	Indicator code
EN 10226 - R1/4"	VL A 21 x A 71 P01
EN 10226 - R1/8"	VL B 21 A A 71 P01
	
<b>Hydraulic symbol</b> 	
<b>Electrical symbol</b> 	
<b>Materials</b> - Body: Brass - Base: Black polyamide - Contacts: Silver - Seal: VLA: NBR/FPM VL B: NBR	
<b>Technical data</b> - 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 HFB and HFC according to ISO 2943 - Degree of protection: IP65 according to EN 60529	
<b>Electrical data</b> - Electrical connection: IEC 61076-2-101 D (M12) - Lamps: 24 Vdc (black base) - Resistive load: 0.4 A / 24 Vdc	

VVA - VVB									
<b>Axial Vacuum Gauge</b>									
R	Ordering code								
EN 10226 - R1/4"	VVA 20 P01								
EN 10226 - R1/8"	VVB 20 P01								
									
<b>Hydraulic symbol</b> 									
<b>Dial scale</b> 									
<b>Conversion to SI units</b> <table border="1" style="margin: auto;"> <thead> <tr style="background-color: #cccccc;"> <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								
<b>Materials</b> - Case: Black plastic - Window: Clear plastic - Dial: White plastic - Pointer: Black plastic - Pressure connection: Cu-alloy - Pressure element: Bourdon tube Cu-alloy soft soldered, C type - Movement: Cu-alloy									
<b>Technical data</b> - Max working pressure: Steady: -0.7 bar Fluctuating: -0.6 bar Short time: -1.0 bar - Working temperature: Ambienti from -40 °C to +60 °C Fluid max + 60 °C Storage from -40 °C to +60 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFB and HFC according to ISO 2943 - Accuracy: Class 2.5 according to EN 13190 - Degree of protection: IP31 according to EN 60529									

VVR - VVS										
<b>Radial Vacuum Gauge</b>										
R	A/F	Ordering code								
EN 10226 - R1/4"	14	VVR 20 P01								
EN 10226 - R1/8"	11	VVS 20 P01								
										
<b>Hydraulic symbol</b> 										
<b>Dial scale</b> 										
<b>Conversion to SI units</b> <table border="1" style="margin: auto;"> <thead> <tr style="background-color: #cccccc;"> <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									
<b>Materials</b> - Case: Black plastic - Window: Clear plastic - Dial: White plastic - Pointer: Black plastic - Pressure connection: Cu-alloy - Pressure element: Bourdon tube Cu-alloy soft soldered, C type - Movement: Cu-alloy										
<b>Technical data</b> - Max working pressure: Steady: -0.7 bar Fluctuating: -0.6 bar Short time: -1.0 bar - Working temperature: Ambienti from -40 °C to +60 °C Fluid max + 60 °C Storage from -40 °C to +60 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFB and HFC according to ISO 2943 - Accuracy: Class 2.5 according to EN 13190 - Degree of protection: IP31 according to EN 60529										

# BAROMETRIC (PRESSURE) INDICATORS

## Dimensions

BEA*50 (EX)	
<b>Electrical Pressure Indicator</b> Connection EN 175301-803	
Settings	Ordering code
1.5 bar ±10%	BE A 15 HA 50 P01 BE A 15 HA 50 P01 EX
2.0 bar ±10%	BE A 20 HA 50 P01 BE A 20 HA 50 P01 EX

A/F 27  
Max tightening torque: 25 N·m

EN 10226 - R1/8"

**Hydraulic symbol**

**Electrical symbol**

- Certification: ATEX, IECEx
- Certification included in EX version

**Materials**

- Body: Brass
- Base: Black polyamide
- 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  
HFB and 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

- CE certification
- Available Atex product: I M1 Ex ia I Ma  
II 1GD Ex ia IIC Tx Ex ia IIIC Tx °C X

BEA*50 UL	
<b>Electrical Pressure Indicator</b> Connection EN 175301-803	
Settings	Ordering code
1.5 bar ±10%	BE A 15 HA 50 P01 UL
2.0 bar ±10%	BE A 20 HA 50 P01 UL

A/F 27  
Max tightening torque: 25 N·m

EN 10226 - R1/8"

**Hydraulic symbol**

**Electrical symbol**

- Certification: UL
- Certification included in EX version

**Materials**

- Body: Brass
- Base: Black polyamide
- 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  
HFB and 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

- CE certification
- Available Atex product: I M1 Ex ia I Ma  
II 1GD Ex ia IIC Tx Ex ia IIIC Tx °C X

BEM*41	
<b>Electrical Pressure Indicator</b> Connection via four-core cable	
Settings	Ordering code
1.5 bar ±10%	BE M 15 HA 41 P01
2.0 bar ±10%	BE M 20 HA 41 P01

A/F 27  
Max tightening torque: 25 N·m

EN 10226 - R1/8"

**Hydraulic symbol**

**Electrical symbol**

**Materials**

- Body: Brass
- Base: Black polyamide
- 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  
HFB and 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.



BET*F10	
<b>Electrical Pressure Indicator</b> Connection AMP Superseal series 1.5	
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

**Hydraulic symbol**

**Electrical symbol**

**Materials**

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

**Technical data**

- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25 °C to +100 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFB and HFC according to ISO 2943
- Degree of protection: IP65 according to EN 60529

**Electrical data**

- Electrical connection: AMP Superseal series 1.5
- Resistive load: 0.5 A / 48 Vdc
- Thermostat condition: Open up to 30 °C
- CE certification

BET*F30	
<b>Electrical Pressure Indicator</b> Deutsch DT-04-2-P	
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

**Hydraulic symbol**

**Electrical symbol**

**Materials**

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

**Technical data**

- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25 °C to +100 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFB and HFC according to ISO 2943
- Degree of protection: IP65 according to EN 60529

**Electrical data**

- Electrical connection: Deutsch DT-04-2-P
- Resistive load: 0.5 A / 48 Vdc
- Thermostat condition: Open up to 30 °C
- CE certification

BET*F50	
<b>Electrical Pressure Indicator</b> Connection EN 175301-803	
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

**Hydraulic symbol**

**Electrical symbol**

**Materials**

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

**Technical data**

- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25 °C to +100 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFB and HFC according to ISO 2943
- Degree of protection: IP65 according to EN 60529

**Electrical data**

- Electrical connection: EN 175301-803
- Resistive load: 0.5 A / 48 Vdc
- Thermostat condition: Open up to 30 °C
- CE certification

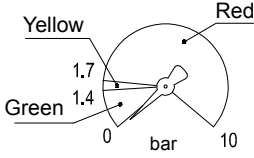
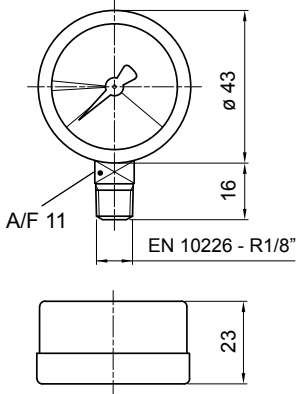
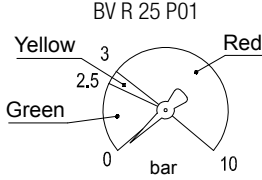
# BAROMETRIC (PRESSURE) INDICATORS

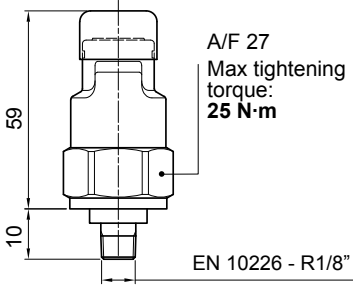
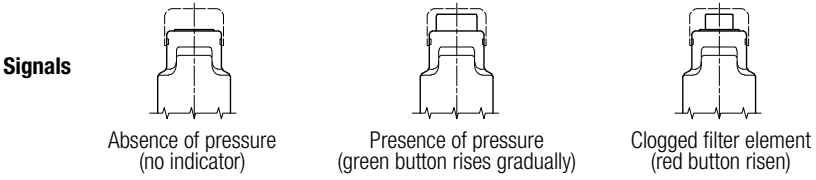
## Dimensions

BL*51 - BL*52 - BL*53	
<b>Electrical/Visual Pressure Indicator</b> Connection: EN 175301-803	
51: Transparent base with lamps 24 Vdc 52: Transparent base with lamps 110 Vdc 53: Transparent base with lamps 230 Vac	
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
<b>Hydraulic symbol</b> 	
<b>Electrical symbol</b> 	
<b>Materials</b> - Body: Brass - Base: Transparent polyamide - Contacts: Silver - Seal: HNBR	
<b>Technical data</b> - Max working pressure: 40 bar - Proof pressure: 60 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFB and HFC according to ISO 2943 - Degree of protection: IP65 according to EN 60529	
<b>Electrical data</b> - 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	
<b>Electrical/Visual Pressure Indicator</b> Connection IEC 61076-2-101 D (M12), black base with lamps 24 Vdc	
Settings	Ordering code
1.5 bar $\pm$ 10%	BL A 15 H A 71 P01
2.0 bar $\pm$ 10%	BL A 20 H A 71 P01
<b>Hydraulic symbol</b> 	
<b>Electrical symbol</b> 	
<b>Materials</b> - Body: Brass - Base: Black polyamide - Contacts: Silver - Seal: HNBR	
<b>Technical data</b> - Max working pressure: 40 bar - Proof pressure: 60 bar - Working temperature: From -25 °C to +80 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFB and HFC according to ISO 2943 - Degree of protection: IP65 according to EN 60529	
<b>Electrical data</b> - Electrical connection: IEC 61076-2-101 D (M12) - Lamps: 24 Vdc (black base) - Resistive load: 0.4 A / 24 Vdc	

BVA	
<b>Axial Pressure Gauge</b>	
Settings	Ordering code
1.4 bar $\pm$ 10%	BV A 14 P01
2.5 bar $\pm$ 10%	BV A 25 P01
<b>Hydraulic symbol</b> 	
<b>Dial scale</b> BV A 14 P01 	
<b>Materials</b> - Case: Painted Steel - Window: Clear plastic - Dial: Painted Steel - Pointer: Black plastic - Pressure connection: Brass - Pressure element: Bourdon tube Cu-alloy soft soldered, C type	
<b>Technical data</b> - Max working pressure: Static: 7 bar Fluctuating: 6 bar Short time: 10 bar - Working temperature: Ambient from -40 °C to +60 °C Fluid max +60 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFB and HFC according to ISO 2943 - Accuracy: Class 2.5 according to EN 13190 - Degree of protection: IP31 according to EN 60529	

BVR		Hydraulic symbol	Materials
<b>Radial Pressure Gauge</b>			
Settings	Ordering code		
1.4 bar ±10%	BV R 14 P01	<b>Dial scale</b> BV R 14 P01 	
2.5 bar ±10%	BV R 25 P01		
			<b>Technical data</b> <ul style="list-style-type: none"> <li>- Max working pressure: Static: 7 bar Fluctuating: 6 bar Short time: 10 bar</li> <li>- Working temperature: Ambient from -40 °C to +60 °C Fluid max +60 °C</li> <li>- Compatibility with fluids: Mineral oils, Synthetic fluids HFB and HFC according to ISO 2943</li> <li>- Accuracy: Class 2.5 according to EN 13190</li> <li>- Degree of protection: IP31 according to EN 60529</li> </ul>

BVP - BVQ		Hydraulic symbol	Materials
<b>Visual Pressure Indicator</b>			
Setting	Ordering code		
1.5 bar ±10%	BV P 15 H P01	<b>Technical data</b> <ul style="list-style-type: none"> <li>- Reset: BVP - Automatic reset BVQ - Manual reset</li> <li>- Max working pressure: 10 bar</li> <li>- Proof pressure: 15 bar</li> <li>- Working temperature: From -25 °C to +80 °C</li> <li>- Compatibility with fluids: Mineral oils, Synthetic fluids HFB and HFC according to ISO 2943</li> <li>- Degree of protection: IP45 according to EN 60529</li> </ul>	
	BV Q 15 H P01		
2.0 bar ±10%	BV P 20 H P01		
	BV Q 20 H P01		
			

# DIFFERENTIAL PRESSURE INDICATORS

## Dimensions

DEA*50	
<b>Electrical Differential Pressure Indicator</b> Connection: EN 175301-803	
Settings	Ordering code
1.2 bar ±10%	DE A 12 x A 50 P01
2.0 bar ±10%	DE A 20 x A 50 P01
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

A/F 30  
Max tightening torque: 65 N·m

**Hydraulic symbol**

**Electrical symbol**

**Materials**

- Body: Brass
- Base: Black polyamide
- 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  
HFB and 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

DEH*48	
<b>Hazardous Area</b> <b>Electrical Differential Pressure Indicator</b> Connection via three-core cable - fitting M20x1.5	
Settings	Ordering code
2.0 bar ±10%	DE H 20 x A 48 P01
5.0 bar ±10%	DE H 50 x A 48 P01
7.0 bar ±10%	DE H 70 x A 48 P01

A/F 25  
Max tightening torque: 100 N·m

flexible cable ≈ 5000 to A

**Hydraulic symbol**

**Electrical symbol**

**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  
HFB and HFC according to ISO 2943
- 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**

- Connection via three-core cable - fitting M20x1.5
- Resistive Load: 830 mA / 24 Vdc - 180 mA / 110 Vac
- Electrical Ratings:  $U_i = 30 \text{ Vdc} / I_i = 250 \text{ mA} / P_i = 1.3 \text{ W}$
- Available ATEX product: II 1 GD Ex ia IIC T6 Ga -60°C ≤ Ta ≤ 80°C  
Ex ia IIC T4 Ga -60°C ≤ Ta ≤ 125°C  
II 2 GD Ex db IIC T6\* Gb Ex tb IIIC T85°C\* Db  
(Tamb : = -60°C to +70°C)\* IP66/67  
\* alternative T/Class and ambients T4, T135°C  
(Tamb = -60°C to +120°C)

**Certification / Approvals:**  
ATEX, IECEx, EAC TR CU, INMETRO  
- Certification included as standard

DEH*49	
<b>Hazardous Area</b> <b>Electrical Differential Pressure Indicator</b> Connection via four-core cable - fitting 1/2" NPT	
Settings	Ordering code
2.0 bar ±10%	DE H 20 x A 49 P01
5.0 bar ±10%	DE H 50 x A 49 P01
7.0 bar ±10%	DE H 70 x A 49 P01

A/F 25  
Max tightening torque: 100 N·m

flexible cable ≈ 5000 to A

**Hydraulic symbol**

**Electrical symbol**

**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  
HFB and HFC according to ISO 2943
- 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**

- Connection via four-core cable - fitting 1/2" NPT
- Resistive Load: 830 mA / 24 Vdc - 180 mA / 110 Vac
- Max voltage: 150 Vac/dc
- Power: 20 W
- Available ATEX product: II 1 GD Ex ia IIC T6 Ga -60°C ≤ Ta ≤ 80°C  
Ex ia IIC T4 Ga -60°C ≤ Ta ≤ 125°C  
II 2 GD Ex db IIC T6\* Gb Ex tb IIIC T85°C\* Db  
(Tamb : = -60°C to +70°C)\* IP66/67  
\* alternative T/Class and ambients T4, T135°C  
(Tamb = -60°C to +120°C)

**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

DEH*70		Hydraulic symbol	Materials
<b>Hazardous Area</b> <b>Electrical Differential Pressure Indicator</b> Connection IEC 61076-2-101 D (M12)			
Settings	Ordering code		
2.0 bar ±10%	DE H 20 x A 70 P01	<b>Electrical symbol</b> 	<b>Technical data</b> - 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 HFB and HFC according to ISO 2943 - 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)
5.0 bar ±10%	DE H 50 x A 70 P01		
7.0 bar ±10%	DE H 70 x A 70 P01		
		<b>Electrical data</b> - Connection IEC 61076-2-101 D (M12) - Resistive Load: 830 mA / 24 Vdc - 180 mA / 110 Vdc - Electrical Ratings: <i>U</i> <sub>i</sub> = 30 Vdc <i>I</i> <sub>i</sub> = 250 mA <i>P</i> <sub>i</sub> = 1.3 W - Available ATEX product: II 1 GD Ex ia IIC T6 Ga -60°C ≤ <i>T</i> <sub>a</sub> ≤ 80°C Ex ia IIC T4 Ga -60°C ≤ <i>T</i> <sub>a</sub> ≤ 125°C II 2 GD Ex db IIC T6* Gb Ex tb IIIC T85°C* Db ( <i>T</i> <sub>amb</sub> = -60°C to +70°C)* IP66/67 * alternative T/Class and ambients T4, T135°C ( <i>T</i> <sub>amb</sub> = -60°C to +120°C)	
Certification / Approvals: ATEX, IECEx, EAC TR CU, INMETRO - Certification included as standard			

DEM*F10		Hydraulic symbol	Materials
<b>Electrical Differential Pressure Indicator</b> Connection: AMP Superseal series 1.5			
Settings	Ordering code		
1.2 bar ±10%	DE M 12 x F 10 P01	<b>Electrical symbol</b> 	<b>Technical data</b> - 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 HFB and HFC according to ISO 2943 - Degree protection: IP66 according to EN 60529
2.0 bar ±10%	DE M 20 x F 10 P01		
5.0 bar ±10%	DE M 50 x F 10 P01		
7.0 bar ±10%	DE M 70 x F 10 P01		
9.5 bar ±10%	DE M 95 x F 10 P01		
		<b>Electrical data</b> - 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*F20		Hydraulic symbol	Materials
<b>Electrical Differential Pressure Indicator</b> AMP Time junior			
Settings	Ordering code		
1.2 bar ±10%	DE M 12 x F 20 P01	<b>Electrical symbol</b> 	<b>Technical data</b> - 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 HFB and HFC according to ISO 2943 - Degree protection: IP66 according to EN 60529
2.0 bar ±10%	DE M 20 x F 20 P01		
5.0 bar ±10%	DE M 50 x F 20 P01		
7.0 bar ±10%	DE M 70 x F 20 P01		
9.5 bar ±10%	DE M 95 x F 20 P01		
		<b>Electrical data</b> - 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 PRESSURE INDICATORS

## Dimensions

DEM*F30	
<b>Electrical Differential Pressure Indicator</b> Deutsch DT-04-2-P	
Settings	Ordering code
1.2 bar ±10%	DE M 12 x F 30 P01
2.0 bar ±10%	DE M 20 x F 30 P01
5.0 bar ±10%	DE M 50 x F 30 P01
7.0 bar ±10%	DE M 70 x F 30 P01
9.5 bar ±10%	DE M 95 x F 30 P01

A/F 28  
Max tightening torque: 65 N·m

flexible cable: 240 to "A"

**Hydraulic symbol**

**Electrical symbol**

Thermal lockout

**Materials**

- Body: Brass
- Base: Black polyamide
- 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  
HFB and 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*F35	
<b>Electrical Differential Pressure Indicator</b> Deutsch DT-04-3-P	
Settings	Ordering code
1.2 bar ±10%	DE M 12 x F 35 P01
2.0 bar ±10%	DE M 20 x F 35 P01
5.0 bar ±10%	DE M 50 x F 35 P01
7.0 bar ±10%	DE M 70 x F 35 P01
9.5 bar ±10%	DE M 95 x F 35 P01

A/F 28  
Max tightening torque: 65 N·m

flexible cable: 240 to "A"

**Hydraulic symbol**

**Electrical symbol**

Thermal lockout

**Materials**

- Body: Brass
- Base: Black polyamide
- 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  
HFB and 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")

DEM*A10	
<b>Electrical Differential Pressure Indicator</b> Connection: AMP Superseal series 1.5	
Settings	Ordering code
1.2 bar ±10%	DE M 12 x A 10 P01
2.0 bar ±10%	DE M 20 x A 10 P01
5.0 bar ±10%	DE M 50 x A 10 P01
7.0 bar ±10%	DE M 70 x A 10 P01
9.5 bar ±10%	DE M 95 x A 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 polyamide
- 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  
HFB and 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)

**DEM\*A20**  
**Electrical Differential Pressure Indicator**  
AMP Time junior

Settings	Ordering code
1.2 bar ±10%	DE M 12 x A 20 P01
2.0 bar ±10%	DE M 20 x A 20 P01
5.0 bar ±10%	DE M 50 x A 20 P01
7.0 bar ±10%	DE M 70 x A 20 P01
9.5 bar ±10%	DE M 95 x A 20 P01

A/F 28  
Max tightening torque: **65 N·m**

**Hydraulic symbol**

**Electrical symbol**

**Materials**

- Body: Brass
- Base: Black polyamide
- 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  
HFB and 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)

**DEM\*A30**  
**Electrical Differential Pressure Indicator**  
Deutsch DT-04-2-P

Settings	Ordering code
1.2 bar ±10%	DE M 12 x A 30 P01
2.0 bar ±10%	DE M 20 x A 30 P01
5.0 bar ±10%	DE M 50 x A 30 P01
7.0 bar ±10%	DE M 70 x A 30 P01
9.5 bar ±10%	DE M 95 x A 30 P01

A/F 28  
Max tightening torque: **65 N·m**

**Hydraulic symbol**

**Electrical symbol**

**Materials**

- Body: Brass
- Base: Black polyamide
- 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  
HFB and 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)

**DEM\*A35**  
**Electrical Differential Pressure Indicator**  
Deutsch DT-04-3-P

Settings	Ordering code
1.2 bar ±10%	DE M 12 x A 35 P01
2.0 bar ±10%	DE M 20 x A 35 P01
5.0 bar ±10%	DE M 50 x A 35 P01
7.0 bar ±10%	DE M 70 x A 35 P01
9.5 bar ±10%	DE M 95 x A 35 P01

A/F 28  
Max tightening torque: **65 N·m**

**Hydraulic symbol**

**Electrical symbol**

**Materials**

- Body: Brass
- Base: Black polyamide
- 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  
HFB and HFC according to ISO 2943
- Degree protection: IP66 according to EN 60529

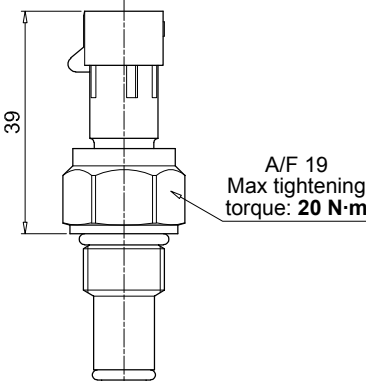
**Electrical data**

- Electrical connection: Deutsch DT-04-3-P
- Resistive load: 0.2 A / 115 Vdc
- Switching type: SPDT contact

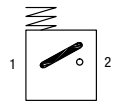
# DIFFERENTIAL PRESSURE INDICATORS

## Dimensions

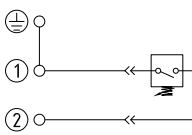
DES*10	
<b>Electrical Differential Pressure Indicator</b> AMP Superseal series 1.5	
Settings	Ordering code
1.2 bar ±10%	DE S 12 H A 10 P01
2.5 bar ±10%	DE S 25 H A 10 P01
4.0 bar ±10%	DE S 40 H A 10 P01



**Hydraulic symbol**



**Electrical symbol**



**Materials**

- Body: Brass
- Internal parts: Brass - Polyamide
- Contacts: Silver
- Seal: HNBR

**Technical data**

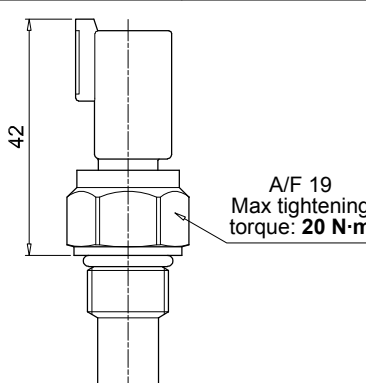
- Max working pressure: 16 bar
- Proof pressure: 24 bar
- Burst pressure: 48 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids

- Degree protection: IP67 according to EN 60529

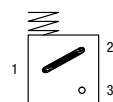
**Electrical data**

- Electrical connection: AMP Superseal series 1.5
- Resistive load: 0.2 A / 24 Vdc
- Switching type: Normally open contacts (NC on request)

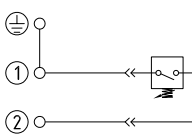
DES*30	
<b>Electrical Differential Pressure Indicator</b> Deutsch DT-04-2-P	
Settings	Ordering code
1.2 bar ±10%	DE S 12 H A 30 P01
2.5 bar ±10%	DE S 25 H A 30 P01
4.0 bar ±10%	DE S 40 H A 30 P01



**Hydraulic symbol**



**Electrical symbol**



**Materials**

- Body: Brass
- Internal parts: Brass - Polyamide
- Contacts: Silver
- Seal: HNBR

**Technical data**

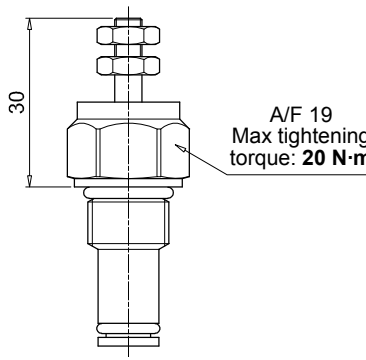
- Max working pressure: 16 bar
- Proof pressure: 24 bar
- Burst pressure: 48 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids

- Degree protection: IP67 according to EN 60529

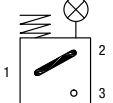
**Electrical data**

- Electrical connection: Deutsch DT-04-2-P
- Resistive load: 0.2 A / 24 Vdc
- Switching type: Normally open contacts (NC on request)

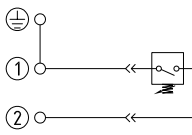
DES*80	
<b>Electrical Differential Pressure Indicator</b> Stud #10-32 UNF	
Settings	Ordering code
1.2 bar ±10%	DE S 12 H A 80 P01
2.5 bar ±10%	DE S 25 H A 80 P01
4.0 bar ±10%	DE S 40 H A 80 P01



**Hydraulic symbol**



**Electrical symbol**



**Materials**

- Body: Brass
- Internal parts: Brass - Polyamide
- Contacts: Silver
- Seal: HNBR

**Technical data**

- Max working pressure: 16 bar
- Proof pressure: 24 bar
- Burst pressure: 48 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids

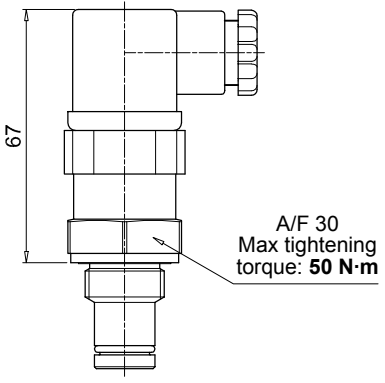
- Degree protection: IP67 according to EN 60529

**Electrical data**

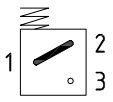
- Electrical connection: Stud #10-32 UNF
- Resistive load: 0.2 A / 24 Vdc
- Switching type: Normally open contacts (NC on request)



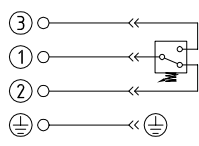
DEU*50 UL	
<b>Electrical Differential Pressure Indicator</b> Connection EN 175301-803	
Settings	Ordering code
2.0 bar ±10%	DE U 20 V A 50 P01 UL
5.0 bar ±10%	DE U 50 V A 50 P01 UL
7.0 bar ±10%	DE U 70 V A 50 P01 UL



**Hydraulic symbol**



**Electrical symbol**



**Materials**

- Body: Brass
- Base: Black Polyamide
- Contacts: Silver
- Seal: FPM

**Technical data**

- Max working pressure: 210 bar
- Proof pressure: 220 bar
- Burst pressure: 880 bar
- Working temperature: From -25 °C to +85 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFB and HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529

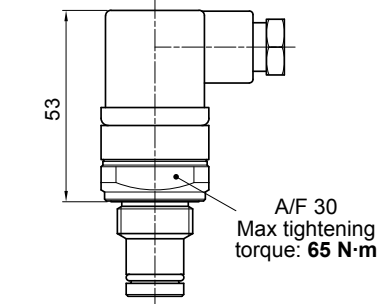
**Electrical data**

- Electrical connection: EN 175301-803
- Resistive load: 3 A / 30 Vdc  
3 A / 125 Vac  
3 (3) A / 250 Vac

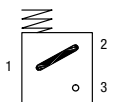
**UL**

- Certification: UL
- Certification included as standard

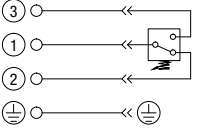
DEX*50	
<b>Electrical Differential Pressure Indicator</b> Connection: EN 175301-803	
Settings	Ordering code
1.2 bar ±10%	DE X 12 x A 50 P01
2.0 bar ±10%	DE X 20 x A 50 P01
5.0 bar ±10%	DE X 50 x A 50 P01
7.0 bar ±10%	DE X 70 x A 50 P01
9.5 bar ±10%	DE X 95 x A 50 P01



**Hydraulic symbol**



**Electrical symbol**



**Materials**

- Body: AISI 316L
- Base: Black polyamide
- Contacts: Silver
- Seal: HNBR - MFQ

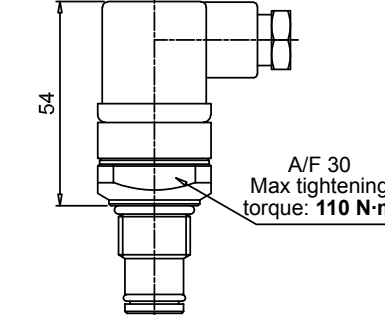
**Technical data**

- 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  
HFB and HFC according to ISO 2943
- Degree protection: IP66 according to EN 60529  
IP69K according to ISO 20653

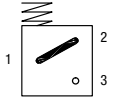
**Electrical data**

- Electrical connection: EN 175301-803
- Resistive load: 0.2 A / 115 Vdc

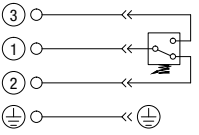
DEZ*50	
<b>Electrical Differential Pressure Indicator</b> Connection: EN 175301-803	
Settings	Ordering code
1.2 bar ±10%	DE Z 12 x A 50 P01
2.0 bar ±10%	DE Z 20 x A 50 P01
5.0 bar ±10%	DE Z 50 x A 50 P01
7.0 bar ±10%	DE Z 70 x A 50 P01
9.5 bar ±10%	DE Z 95 x A 50 P01



**Hydraulic symbol**



**Electrical symbol**



**Materials**

- Body: AISI 316L
- Base: Black polyamide
- Contacts: Silver
- Seal: HNBR - MFQ

**Technical data**

- Max working pressure: 700 bar
- Proof pressure: 1050 bar
- Burst pressure: 2100 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

# DIFFERENTIAL PRESSURE INDICATORS

## Dimensions

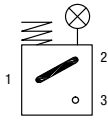
**DLA\*51 - DLA\*52**  
**Electrical/Visual Differential Pressure Indicator**  
 Connection: EN 175301-803

**51:** Transparent base with lamps 24 Vdc  
**52:** Transparent base with lamps 110 Vdc

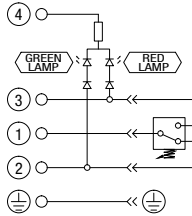
Settings	Ordering code
1.2 bar $\pm 10\%$	DL A 12 x A xx P01
2.0 bar $\pm 10\%$	DL A 20 x A xx P01
5.0 bar $\pm 10\%$	DL A 50 x A xx P01
7.0 bar $\pm 10\%$	DL A 70 x A xx P01
9.5 bar $\pm 10\%$	DL A 95 x A xx P01

A/F 30  
Max tightening torque: **65 N·m**

### Hydraulic symbol



### Electrical symbol



### Materials

- Body: Brass
- Base: Transparent polyamide
- 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  
HFB and HFC according to ISO 2943
- Degree protection: IP66 according to EN 60529  
IP69K according to ISO 20653

### Electrical data

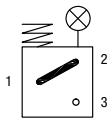
- Electrical connection: EN 175301-803
- Type: 51 52
- Lamps: 24 Vdc 110 Vdc
- Resistive load: 1 A / 24 Vdc 1 A / 110 Vdc

**DLA\*71**  
**Electrical/Visual Differential pressure indicator**  
 Connection IEC 61076-2-101 D (M12),  
 black base with lamps 24 Vdc

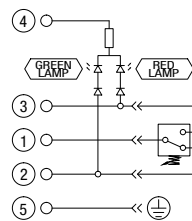
Settings	Ordering code
1.2 bar $\pm 10\%$	DL A 12 x A 71 P01
2.0 bar $\pm 10\%$	DL A 20 x A 71 P01
5.0 bar $\pm 10\%$	DL A 50 x A 71 P01
7.0 bar $\pm 10\%$	DL A 70 x A 71 P01
9.5 bar $\pm 10\%$	DL A 95 x A 71 P01

A/F 30  
Max tightening torque: **65 N·m**

### Hydraulic symbol



### Electrical symbol



### Materials

- Body: Brass
- Base: Black polyamide
- 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  
HFB and HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529  
IP69K according to ISO 20653

### Electrical data

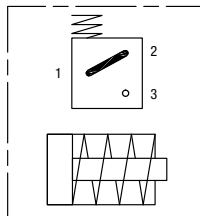
- Electrical connection: IEC 61076-2-101 D (M12)
- Lamps: 24 Vdc (black base)
- Resistive load: 0.4 A / 24 Vdc

**DLE\*A50**  
**Electrical/Visual Differential Pressure Indicator**  
 Without term. Connections: EN 175301-803

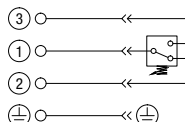
Settings	Ordering code
1.2 bar $\pm 10\%$	DL E 12 x A 50 P01
2.0 bar $\pm 10\%$	DL E 20 x A 50 P01
5.0 bar $\pm 10\%$	DL E 50 x A 50 P01
7.0 bar $\pm 10\%$	DL E 70 x A 50 P01
9.5 bar $\pm 10\%$	DL E 95 x A 50 P01

A/F 32  
Max tightening torque: **95 N·m**

### Hydraulic symbol



### Electrical symbol



### Materials

- Body: Brass
- Base: Black polyamide
- 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  
HFB and 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

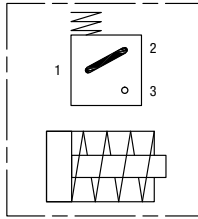
**DLE\*F50**

**Electrical/Visual Differential Pressure Indicator**  
With term. Connections: EN 175301-803

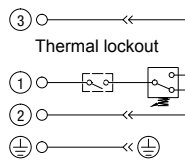
Settings	Ordering code
1.2 bar ±10%	DL E 12 x F 50 P01
2.0 bar ±10%	DL E 20 x F 50 P01
5.0 bar ±10%	DL E 50 x F 50 P01
7.0 bar ±10%	DL E 70 x F 50 P01
9.5 bar ±10%	DL E 95 x F 50 P01

A/F 32  
Max tightening torque: 95 N·m

### Hydraulic symbol



### Electrical symbol



### Materials

- Body: Brass
- Base: Black polyamide
- 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  
HFB and HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529

### Electrical data

- Electrical connections: EN 175301-803
- Resistive load: 5 A / 250 Vdc
- Thermal lockout setting: +30 °C

**DLX\*51 - DLX\*52**

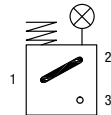
**Electrical/Visual Differential Pressure Indicator**  
Connection: EN 175301-803

**51:** Transparent base with lamps 24 Vdc  
**52:** Transparent base with lamps 110 Vdc

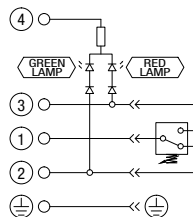
Settings	Ordering code
1.2 bar ±10%	DL X 12 x A 5x P01
2.0 bar ±10%	DL X 20 x A 5x P01
5.0 bar ±10%	DL X 50 x A 5x P01
7.0 bar ±10%	DL X 70 x A 5x P01
9.5 bar ±10%	DL X 95 x A 5x P01

A/F 30  
Max tightening torque: 65 N·m

### Hydraulic symbol



### Electrical symbol



### Materials

- Body: AISI 316L
- Base: Transparent polyamide
- Contacts: Silver
- Seal: HNBR - MFQ

### 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  
HFB and 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

**DLZ\*51 - DLZ\*52**

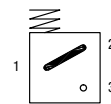
**Electrical/Visual Differential Pressure Indicator**  
Connection: EN 175301-803

**51:** Transparent base with lamps 24 Vdc  
**52:** Transparent base with lamps 110 Vdc

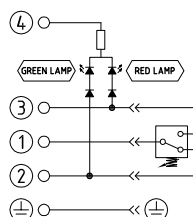
Settings	Ordering code
1.2 bar ±10%	DL Z 12 x A 5x P01
2.0 bar ±10%	DL Z 20 x A 5x P01
5.0 bar ±10%	DL Z 50 x A 5x P01
7.0 bar ±10%	DL Z 70 x A 5x P01
9.5 bar ±10%	DL Z 95 x A 5x P01

A/F 30  
Max tightening torque: 110 N·m

### Hydraulic symbol



### Electrical symbol



### Materials

- Body: AISI 316L
- Base: Transparent polyamide
- Contacts: Silver
- Seal: HNBR - MFQ

### Technical data

- Max working pressure: 700 bar
- Proof pressure: 1050 bar
- Burst pressure: 2100 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFB and HFC according to ISO 2943
- Degree protection: IP66 according to EN 60529  
IP69K according to ISO 20653

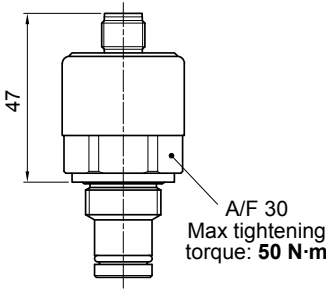
### Electrical data

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

# DIFFERENTIAL PRESSURE INDICATORS

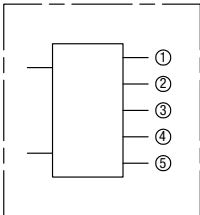
## Dimensions

DTA*F70	
<b>Electronic Differential Pressure Indicator</b> Connection: IEC 61076-2-101 D (M12)	
Settings	Ordering code
1.2 bar ±10%	DT A 12 x F 70 P01
2.0 bar ±10%	DT A 20 x F 70 P01
5.0 bar ±10%	DT A 50 x F 70 P01
7.0 bar ±10%	DT A 70 x F 70 P01
9.5 bar ±10%	DT A 95 x F 70 P01



A/F 30  
Max tightening torque: **50 N·m**

**Hydraulic symbol**



**Materials**

- Body: Brass
- Internal parts: Brass - Polyamide
- 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  
HFB and HFC according to ISO 2943
- Degree protection: IP67 according to EN 60529

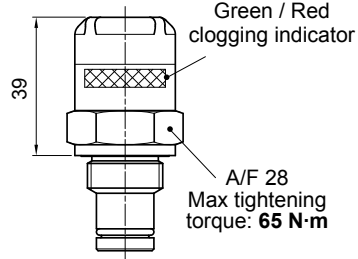
**Electrical data**

- 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)

**Electrical symbol**

①	○	○	+24 Vdc
②	○	○	4 ÷ 20 mA
③	○	○	75% - N.O. Digital output
④	○	○	100% - N.O. Digital output
⑤	○	○	0 Vdc

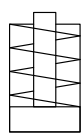
DVA	
<b>Visual Differential Pressure Indicator</b>	
Settings	Ordering code
1.2 bar ±10%	DV A 12 x P01
2.0 bar ±10%	DV A 20 x P01
5.0 bar ±10%	DV A 50 x P01
7.0 bar ±10%	DV A 70 x P01
9.5 bar ±10%	DV A 95 x P01



Green / Red  
clogging indicator

A/F 28  
Max tightening torque: **65 N·m**

**Hydraulic symbol**



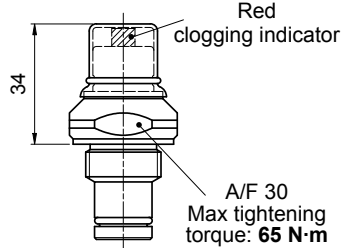
**Materials**

- Body: Brass
- Internal parts: Brass - Polyamide
- 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  
HFB and HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529

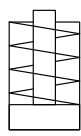
DVM	
<b>Visual Differential Pressure Indicator</b>	
Settings	Ordering code
1.2 bar ±10%	DV M 12 x P01
2.0 bar ±10%	DV M 20 x P01
5.0 bar ±10%	DV M 50 x P01
7.0 bar ±10%	DV M 70 x P01
9.5 bar ±10%	DV M 95 x P01



Red  
clogging indicator

A/F 30  
Max tightening torque: **65 N·m**

**Hydraulic symbol**

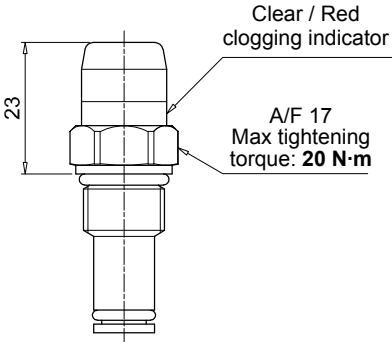


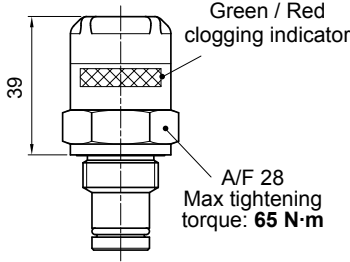
**Materials**

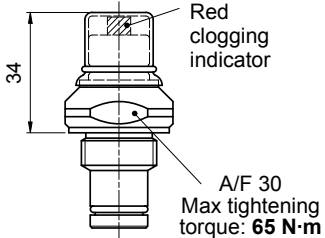
- Body: Brass
- Internal parts: Brass - Polyamide
- Seal: HNBR - FPM

**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  
HFB and HFC according to ISO 2943
- Degree protection: IP65 according to EN 60529

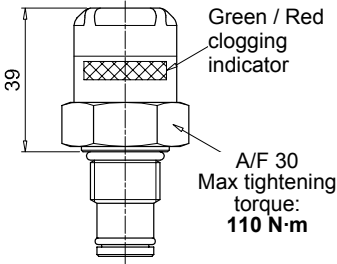
DVS		Hydraulic symbol	<b>Materials</b> - Body: Brass - Internal parts: Brass - Polyamide - Seal: HNBR
<b>Visual Differential Pressure Indicator</b>			
Settings	Ordering code		
1.2 bar ±10%	DV S 12 H P01		
2.5 bar ±10%	DV S 25 H P01		
4.0 bar ±10%	DV S 40 H P01		
			

DVX		Hydraulic symbol	<b>Materials</b> - Body: AISI 316L - Internal parts: AISI 316L - Polyamide - Seal: HNBR - MFQ
<b>Visual Differential Pressure Indicator</b>			
Settings	Ordering code		
1.2 bar ±10%	DV X 12 x P01		
2.0 bar ±10%	DV X 20 x P01		
5.0 bar ±10%	DV X 50 x P01		
7.0 bar ±10%	DV X 70 x P01		
9.5 bar ±10%	DV X 95 x P01		
			

DVY		Hydraulic symbol	<b>Materials</b> - Body: AISI 316L - Internal parts: AISI 316L - Polyamide - Seal: HNBR - MFQ
<b>Visual Differential Pressure Indicator</b>			
Settings	Ordering code		
1.2 bar ±10%	DV Y 12 x P01		
2.0 bar ±10%	DV Y 20 x P01		
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		
			

# DIFFERENTIAL PRESSURE INDICATORS

## Dimensions

DVZ		Hydraulic symbol	Materials
<b>Visual Differential Pressure Indicator</b>			
Settings	Ordering code	Technical data	
1.2 bar ±10%	DV Z 12 x P01	- Reset: Automatic reset - Max working pressure: 700 bar - Proof pressure: 1050 bar - Burst pressure: 2100 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFB and HFC according to ISO 2943 - Degree protection: IP65 according to EN 60529	
2.0 bar ±10%	DV Z 20 x P01		
5.0 bar ±10%	DV Z 50 x P01		
7.0 bar ±10%	DV Z 70 x P01		
9.5 bar ±10%	DV Z 95 x P01		
			

T2	
<b>Plug</b>	
Seal	Ordering code
HNBR	T2 H
FPM	T2 V

**Materials**

- Body: Phosphatized steel
- Seal: HNBR / FPM

A/F 30  
Max tightening torque: 50 N·m

T4	
<b>Plug</b>	
Seal	Ordering code
NBR	T4 A

**Materials**

- Body: Anodized aluminium
- Seal: NBR

A/F 19  
Max tightening torque: 20 N·m

X2	
<b>Stainless Steel plug 420 bar</b>	
Seal	Ordering code
HNBR	X2 H
FPM	X2 V
MFQ	X2 F

**Materials**

- Body: AISI 316L
- Seal: HNBR / FPM / MFQ

A/F 30  
Max tightening torque: 50 N·m

X3	
<b>Stainless Steel plug 700 bar (only for FZH)</b>	
Seal	Ordering code
HNBR	X3 H
FPM	X3 V
MFQ	X3 F

**Materials**

- Body: AISI 316L
- Seal: HNBR / FPM / MFQ

A/F 30  
Max tightening torque: 110 N·m





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