

LOW & MEDIUM PRESSURE FILTERS

INSTALLATION,
SERVICE AND
MAINTENANCE
MANUAL
AND SAFETY
INSTRUCTIONS

LMP211



EN



PASSION  PERFORM



MPFILTRI[®]

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1. Description

The hydraulic filters are components used to remove the contaminants from the hydraulic fluids used in the hydraulic systems, maximum pressure up to 60 bar, flow rate up to 365 l/min.

2. General warnings

- Before the installation, use or maintenance of the filter carefully read the manual
- The system and the filter are pressurised! Be sure the system is at ambient pressure before starting any activity
- The fluid temperature inside the system and the filter can cause injuries to personnel or create a hazardous environment
- Any activity must be carried out by trained and certified specialists, they must use the correct protective equipment
- Any activity must be carried out using the correct tool
- Any activity must be carried out in accordance with the laws in force in the country where the system is in operation
- The data shown onto the nameplate must be complete and legible during the whole filter working life
- Connect the filter with an anti-loosening system and regularly check the condition of the connection
- The declared performances and the safety of the product are only guaranteed when MP Filtri original spare parts are used
- Warranty is only effective if MP Filtri original spare parts are used.

3. Tools

LMP211	TOOL	TIGHTENING TORQUE
Differential pressure indicator	Wrench A/F 27/30/32	50 N·m
Bowl	Strap wrench	40 N·m
Connection G 1	Wrench A/F 41	Max 110 N·m
Connection G 1 1/4	Wrench A/F 50	Max 170 N·m
Connection G 1 1/2	Wrench A/F 55	Max 210 N·m
Connection 1-11.5 NPT	Wrench A/F 36	Max 100 N·m
Connection 1 1/4-11.5 NPT	Wrench A/F 2"	Max 130 N·m
Connection 1 1/2-11.5 NPT	Wrench A/F 38	Max 200 N·m
Connection 1 5/16 - 12 (SAE 16)	Wrench A/F 38	Max 110 N·m
Connection 1 5/8 - 12 (SAE 20)	Wrench A/F 1 7/8"	Max 210 N·m
Connection 1 7/8-12 (SAE 24)	Wrench A/F 55	Max 230 N·m
Fastening screws M8	Socket wrench A/F 17	20 N·m
Fastening screws 5/16-18 UNC	Socket wrench A/F 1/2"	20 N·m

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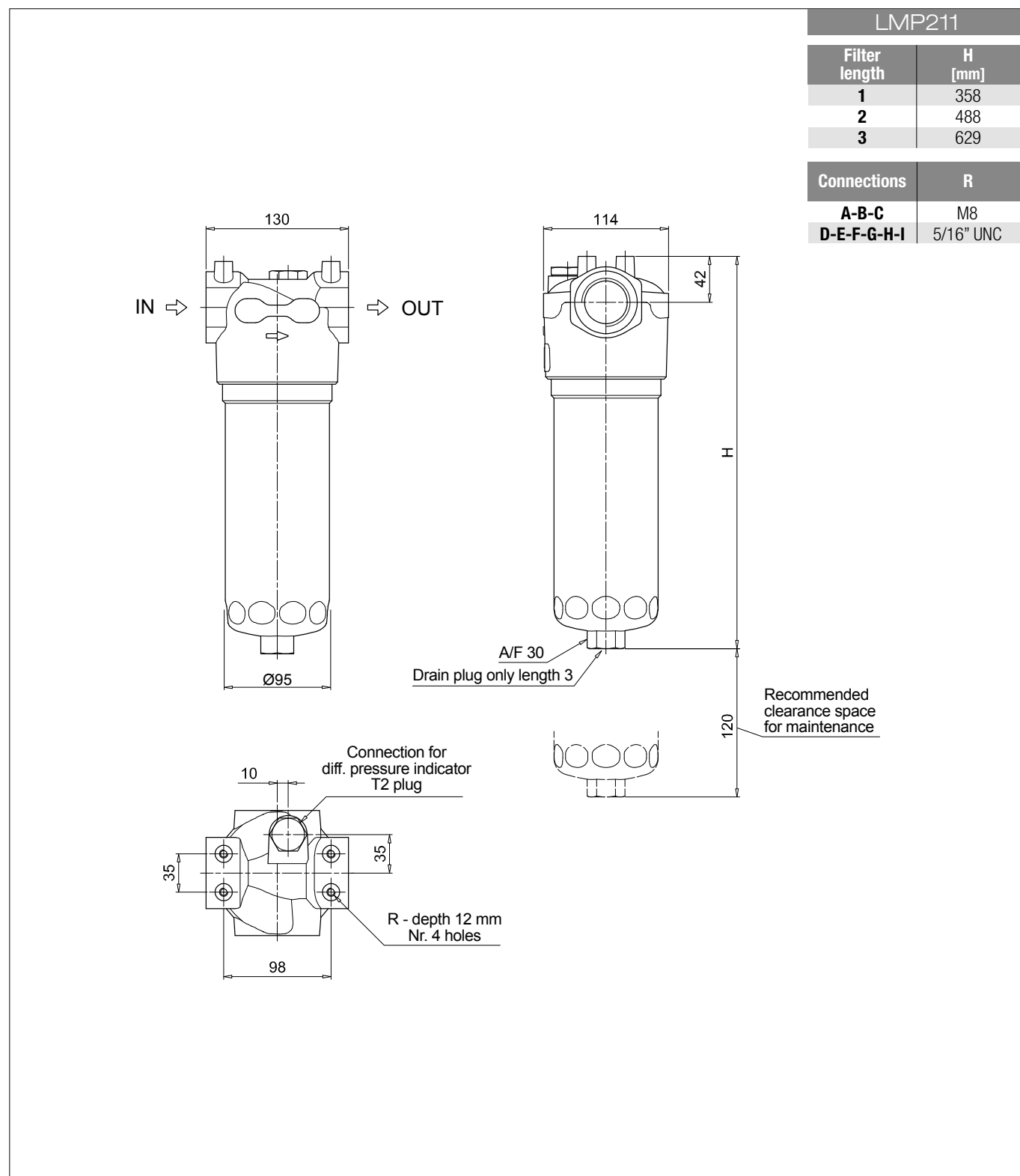
4. Handling

- The unit is shipped in a cardboard box with dimensions depending on the order
- The handling must be carried out in accordance with the laws in force in the country of use of the product
- Handle the product with care, avoid impacts
- Store in a dry and frost-free room
- The unit should be stored in a suitable location away from the production area when not in use.
The unit should be stored with the caps provided on the ports and the bowl's protective net, if present.
This location should not impede any other production or personnel

Please refer to the following Weight table:

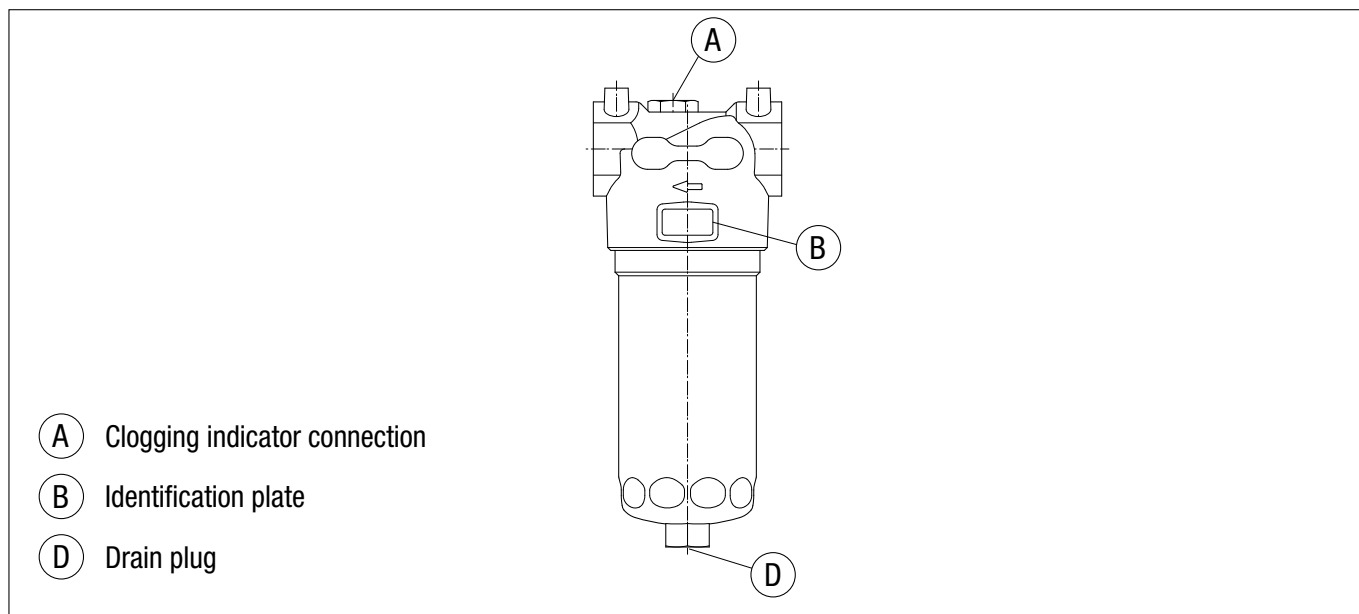
SERIES AND SIZE	WEIGHTS [kg]			
	Length	1	2	3
LMP211		3.10	4.80	6.40

5. Dimensional drawings



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6. Installation



- Check that the system working pressure does not exceed the maximum working pressure of the filter.
The maximum working pressure of the filter is shown on the identification plate
- Check that the filter is compatible with the fluid used in the system
- Remove the plastic plugs from the inlet, the outlet and the indicator connection
- Check that the correct filter elements are fitted into the filter
- Check the flow direction (the flow is indicated by an arrow on the head)
- Install the clogging indicator, if required.
In the case of using an electrical clogging indicator, follow the electrical diagram for correct installation
- Fasten the filter to the bracket with the correct bolts. Be sure to fit the filter without any tension stress
- Check that there is appropriate clearance for maintenance and the filter elements replacement.
Correct operation is only guaranteed if the filter is installed in a vertical orientation with the filter housing at the top
- Check for a good view of the clogging indicator
- Connect the filter to the hydraulic system, using the appropriate hydraulic fittings.

7. Commissioning

- Switch on the hydraulic system
- Check the filter is free of leaks
- Check the filter for leaks at the maximum working conditions (pressure, temperature ...)
- Check the filter does not cause excessive pressure drop checking that the indicator does not show the alarm signal.

8. Standard maintenance

8.1 FILTER ELEMENT REPLACEMENT

The clogging indicator monitors the conditions of the filter element in the working section of the filter.

The alarm signal shown by the differential pressure indicator during the normal working conditions (pressure, temperatures ...) means that the filter element needs to be replaced.

- Check the availability of the right spare filter element by comparing the part number shown on the element with that shown on the filter name plate or spare parts list
- For the disassembly and the assembly of the parts, please refer to the tools table in paragraph 3
- Switch off the system
- (Fig. 1) If provided, unscrew the drain plug after placing a vessel to collect the operating fluid
- (Fig. 2) Drain the operating fluid from the bottom of the bowl into the collection vessel
- (Fig. 3) Screw the drain plug in referring to the tightening torque table in paragraph 3
- (Fig. 4) If no drain plug is provided, unscrew the filter bowl after placing a vessel to collect the operating fluid

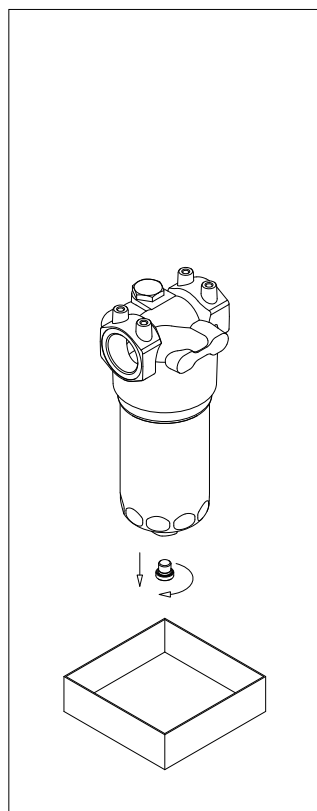


fig. 1

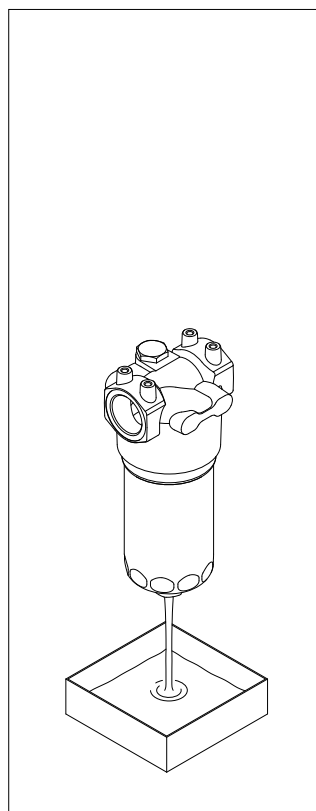


fig. 2

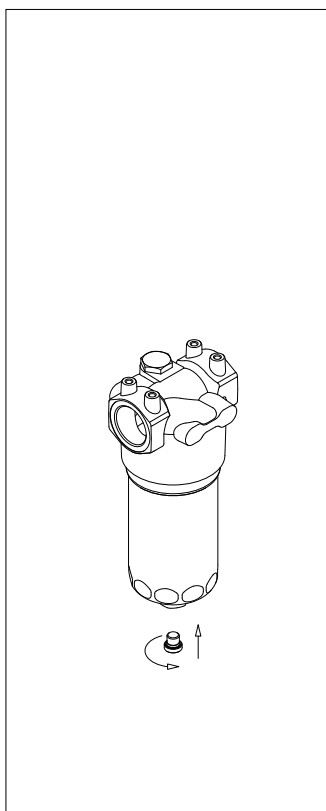


fig. 3

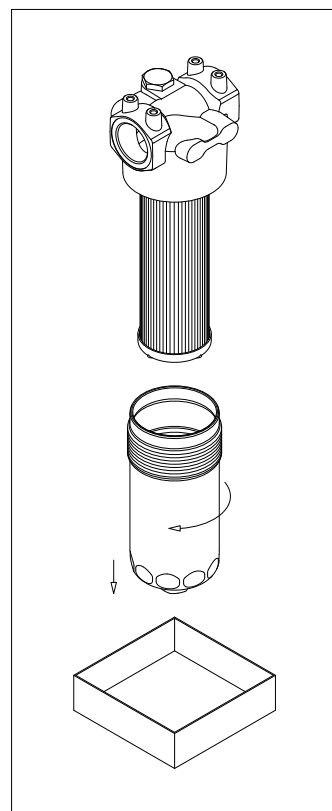


fig. 4

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- (Fig. 5) Empty the operating fluid from the bowl into the collection vessel
- (Fig. 6) Pull the filter element out.
Clean the cavity in the housing, the tap and the bowl. Check them for damage.
Check the condition of the bowl seals and, if necessary, replace them referring to the "Special maintenance" paragraph
- (Fig. 7) Lubricate with the operating fluid the filter element O-ring, the housing tap, O-ring and cavity, then fit the filter element on the tap. Pay attention not to damage the O-ring seal
- (Fig. 8) Lubricate the thread of the bowl, then screw the bowl in referring to the tightening torque table in paragraph 3
- Switch on the system and check the filter for leaks at the maximum working conditions (pressure, temperature...)
- Dispose of the replaced parts and the collected fluid in accordance with the laws in force in the country of use of the product.

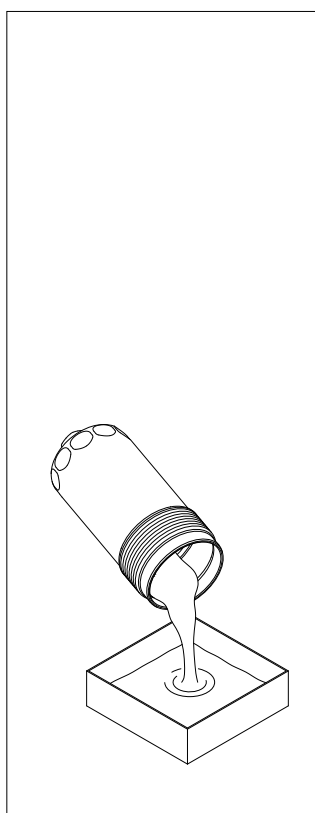


fig. 5

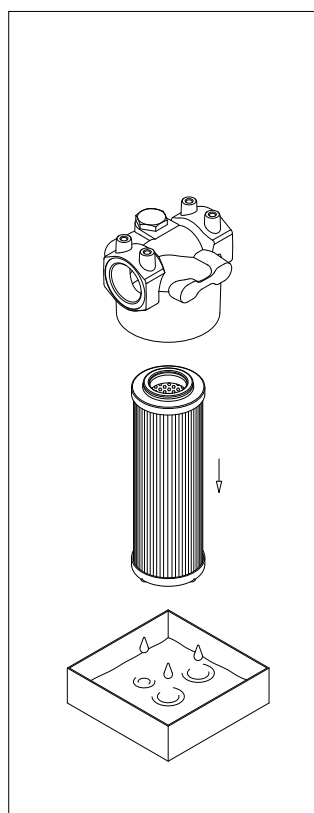


fig. 6

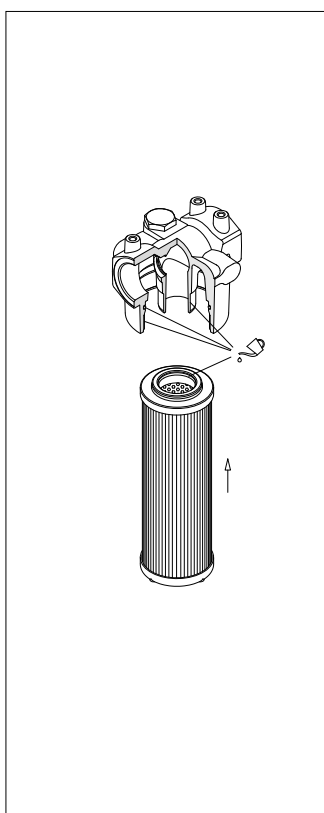


fig. 7

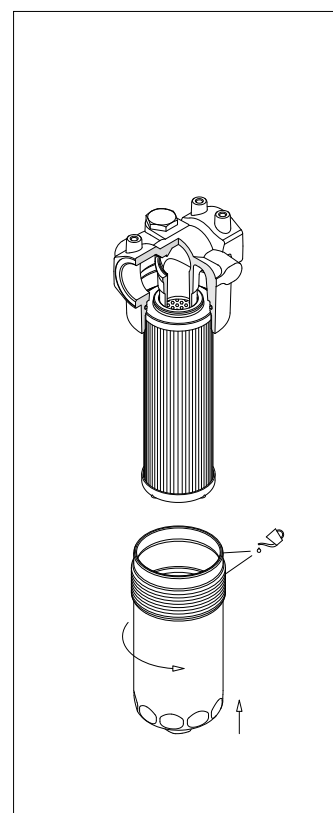


fig. 8

9. Special maintenance

9.1 CLOGGING INDICATOR (OR PLUG) REPLACEMENT

- Check the availability of the right spare parts by comparing the part numbers shown on them with that shown on the filter name plate or spare parts list
- For the disassembly and the assembly of the parts, please refer to the tools table in paragraph 3
- Switch off the system
- (Fig. 9) Remove the connector of the differential pressure indicator by unfastening the central screw (only for electrical indicators)
- (Fig. 10) Unscrew the indicator body
- (Fig. 11) Lubricate with the operating fluid the thread and the O-ring of the indicator body, then screw the indicator body in referring to the tightening torque table in paragraph 3
- (Fig. 12) Insert the connector by fastening the central screw (only for electrical indicators)
- Switch on the system and check the filter for leaks at the maximum working conditions (pressure, temperature...)
- Dispose of the replaced parts and the collected fluid in accordance with the laws in force in the country of use of the product.

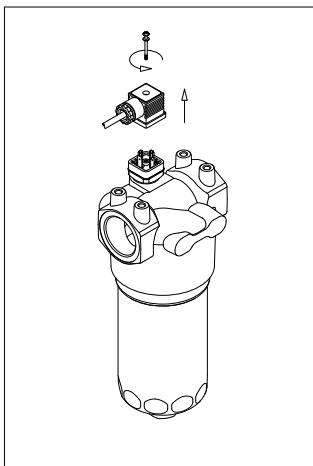


fig. 9

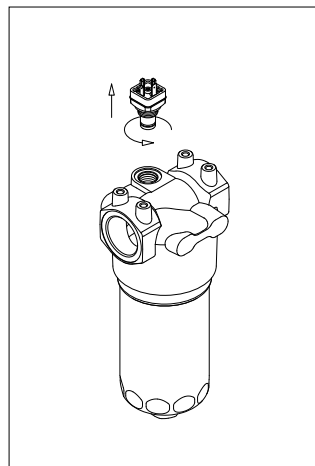


fig. 10

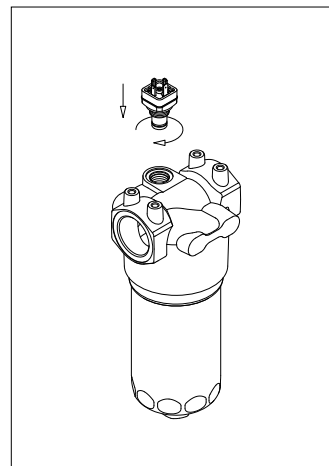


fig. 11

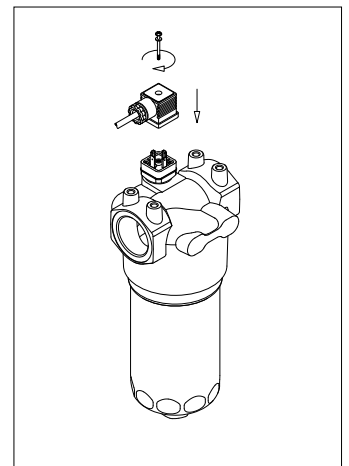


fig. 12

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9.2 SEALS REPLACEMENT

- Check the availability of the right spare parts by comparing the part numbers shown on them with that shown on the filter name plate or spare parts list
- For the disassembly and the assembly of the parts, please refer to the tools table in paragraph 3
- Switch off the system
- (Fig. 13) If provided, unscrew the drain plug after placing a vessel to collect the operating fluid
- (Fig. 14) Drain the operating fluid from the bottom of the bowl into the collection vessel
- (Fig. 15) Screw the drain plug in referring to the tightening torque table in paragraph 3
- (Fig. 16) If no drain plug is provided, unscrew the filter bowl after placing a vessel to collect the operating fluid

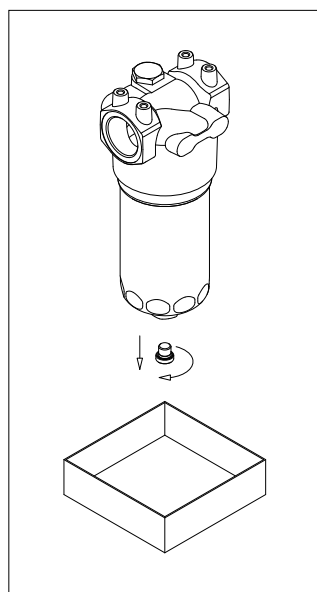


fig. 13

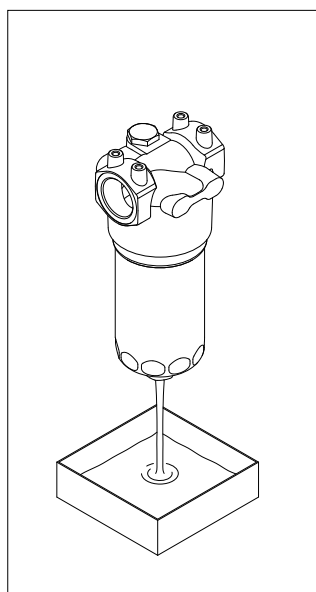


fig. 14

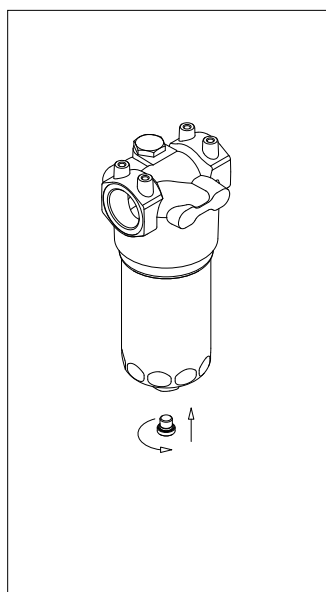


fig. 15

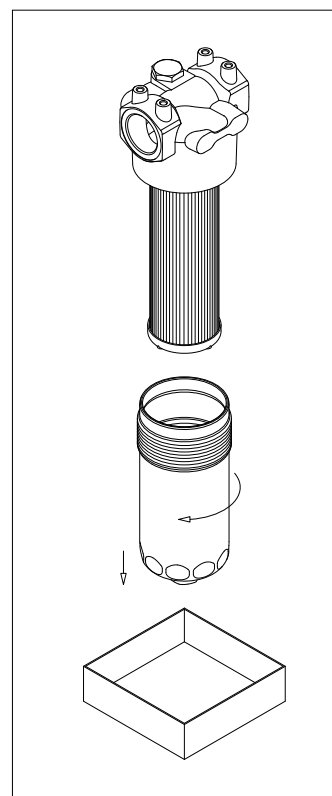


fig. 16

- (Fig. 17) Empty the operating fluid from the bowl into the collection vessel
- (Fig. 18) Pull the filter element out
- Remove all the seal from the bowl and the filter element and prepare the spare parts referring to the list in paragraph 12
- Clean the cavity in the housing, the tap and the bowl. Check them for damage
- (Fig. 19) Fit the O-ring in the head groove, insert the O-ring in the filter element cap.
- (Fig. 20) Lubricate with the operating fluid the filter element O-ring, the housing tap, O-ring and cavity, then fit the filter element on the tap. Pay attention not to damage the O-ring seal.

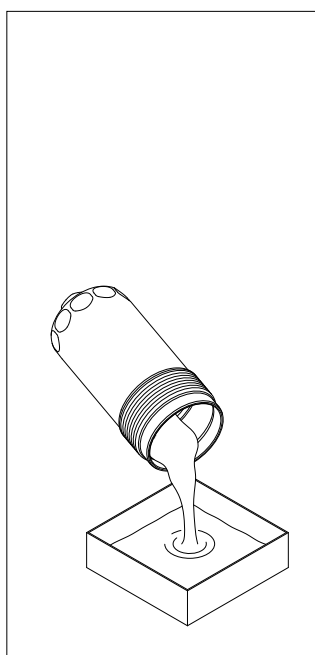


fig. 17

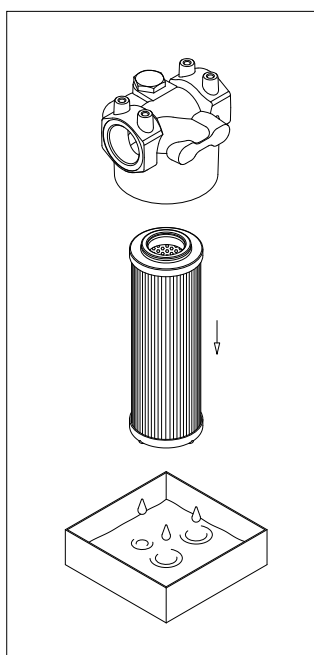


fig. 18

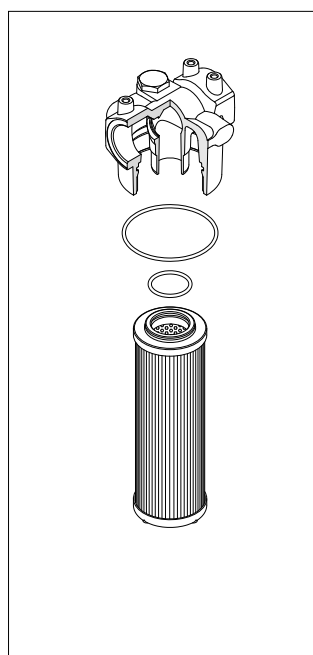


fig. 19

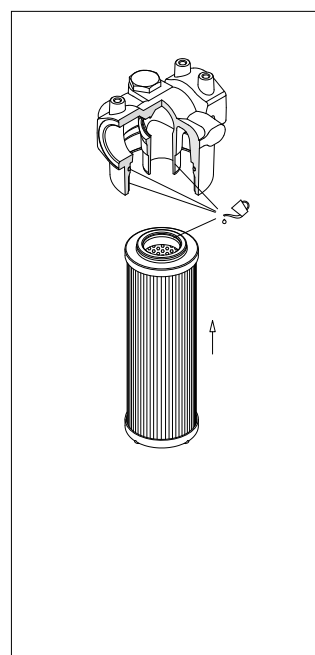


fig. 20

- (Fig. 21) Lubricate the thread and the O-ring of the bowl, then screw the bowl in referring to the tightening torque table in paragraph 3.
- (Fig. 22) Replace the O-rings of the indicator body. For the mounting/dismounting of the indicator, please refer to the paragraph "Clogging indicator replacement" above (Fig. 9÷12)
- Switch on the system and check the filter for leaks at the maximum working conditions (pressure, temperature...)
- Dispose of the replaced parts and the collected fluid in accordance with the laws in force in the country of use of the product.

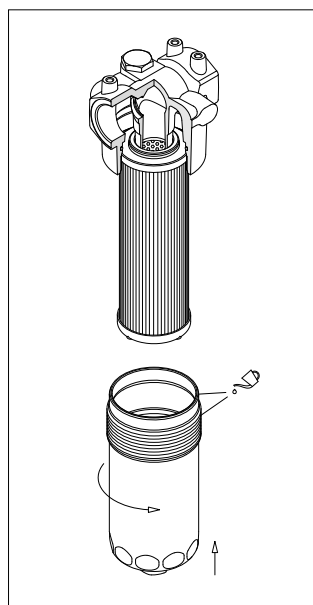


fig. 21

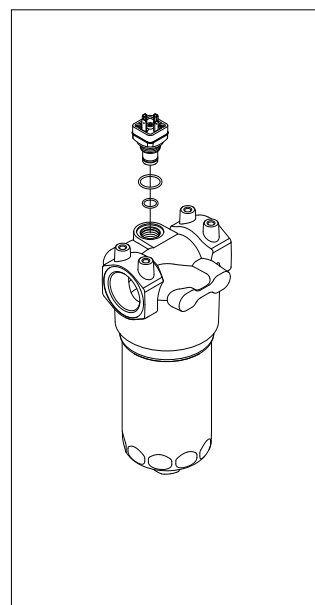


fig. 22

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10. Instructions for use in explosive atmospheres

Hydraulic filters should be installed in applications in which special safety measures are required to prevent the triggering of explosive atmospheres, such as use in environments classified according to directive 1999/92/CE (ATEX) or the use of flammable fluids.

Conditions like the use of low conductivity fluids, which could cause electrostatic discharges, or installation near hot components, which could cause surfaces heating, could alter the safety of the filters.

MP FILTRI has carried out a voluntary certification of a part of the product range in compliance with directive 2014/34/EU, in order to guarantee an appropriate degree of safety in these particular conditions.

The content of the certification and the relative marking make them suitable for use in environments classified in accordance with directive 1999/92/CE (ATEX - ZONE 2).

11. Regulations

Hydraulic filters are not machines, but simple components.

Hydraulic filters are excluded from the scope of the Machinery Directive 2006/42/EC, they don't need the CE mark.

Hydraulic filters are designed to be fitted within a hydraulic system designed in accordance with the Machinery Directive 2006/42/EC.

Hydraulic filters are pressurized components. The maximum working pressure PS is over 0.5 bar, so they are subject to the Directive 2014/68/EU (PED)

LMP filters are designed and manufactured for fluids included into the Group 2 defined by the Directive 2014/68/EU.

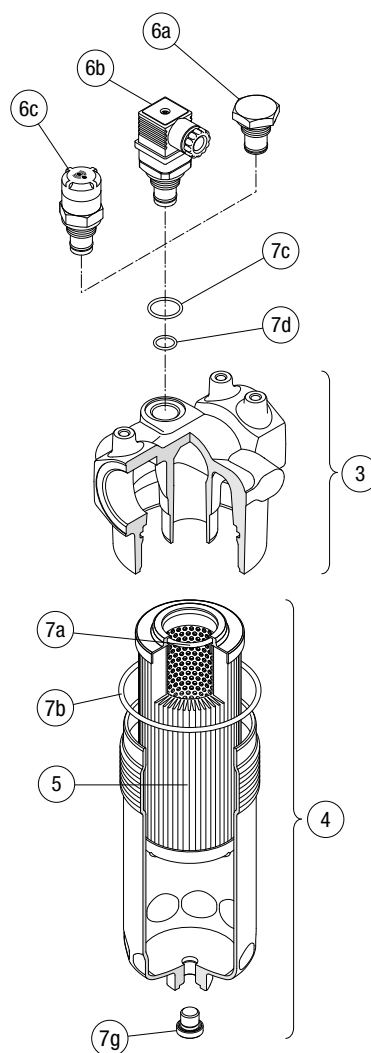
LMP filters do not need the CE marking in accordance with the Directive 2014/68/UE Article 4, Section 3.

LMP filters do not contain any substance of very high concern (SVHC) in percentage higher than 0.1% in accordance with the Regulation (EC) No 1907/2006 (REACH)

LMP filters are designed and manufactured in accordance with the Commission Delegated Directive (EU) 2015/863 (RoHS).

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12. Spare parts list



Item	Quantity	Description	Designation / Ordering code			
1	1	Complete filter	See "Ordering Code" table			
3	1	Housing				
4	1	Bowl assembly				
5	1	Filter element				
6	1	Clogging indicator				
7	1	Seals kit	NBR	FPM	EPDM	CR
			AK021000275	AK021000276	AK021000488	AK021000337
7a	1	Filter element seal	O-Ring 144 - di = 39.69 - d ₂ = 3.53			
7b	1	Bowl seal	O-Ring 4375 - di = 98.84 - d ₂ = 3.53			
7c	1	Indicator seal	ORM 0210-20 - di = 21.00 - d ₂ = 2.00			
7d	1	Indicator seal	O-Ring 2050 - di = 12.42 - d ₂ = 1.78			
7g	1	Drain plug	DIN 908-ST-G1/4-A + seal DIN EN 3869			

13. Ordering code

13.1 FILTER / HOUSING / BOWL

FILTER / HOUSING / BOWL											
Filter Series and size		Filter:	LMP211	3	B	A	D	6	A10	N	P01
LMP211 Filter / housing		Housing:	LMP211		B	A	D	6			P01
CUB210 Bowl assembly		Bowl:	CUB210	3		A			A10	N	P01
Filter length											
1 2 3											
Bypass valve											
S Without bypass											
B With bypass 3.5 bar											
Seals		Filtration rating									
		Axx	Mxx	Pxx							
A	NBR	•	•	•							
V	FPM	•	•	•							
E	EPDM	•	•	•							
C	CR	•	•	•							
W	NBR, compatible with fluids HFB and HFC	•	•	-							
Z	FPM, compatible with fluids HFB and HFC	•	•	-							
Connections											
A	G 1"	D	1" NPT	G	SAE 16 - 1 5/16" - 12 UN						
B	G 1 1/4"	E	1 1/4" NPT	H	SAE 20 - 1 5/8" - 12 UN						
C	G 1 1/2"	F	1 1/2" NPT	I	SAE 24 - 1 7/8" - 12 UN						
Connection for differential pressure indicator											
6 With plugged connection											
Filtration rating (filter media)				Element Δp				Execution			
A03	Inorganic microfiber	3 μm	M25	Stainless steel wire mesh	25 μm	N	20 bar	P01	MP Filtri standard		
A06	Inorganic microfiber	6 μm	M60	Stainless steel wire mesh	60 μm						
A10	Inorganic microfiber	10 μm	M90	Stainless steel 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							

CLOGGING INDICATORS

DEA Electrical differential pressure indicator	DTA Electronic differential pressure indicator
DEM Electrical differential pressure indicator	DTI I-O Link electronic differential pressure indicator
DEU Electrical differential pressure indicator	DVA Visual differential pressure indicator
DLA Electrical / visual differential pressure indicator	DVM Visual differential pressure indicator
DLE Electrical / visual differential pressure indicator	
T2 Plug	

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13.2 FILTER ELEMENT

FILTER ELEMENT			
Element series and size CU210		Configuration example: CU210	
Element length 1 2 3		3	A10
Filtration rating (filter media)		A	N
A03 Inorganic microfiber 3 µm A06 Inorganic microfiber 6 µm A10 Inorganic microfiber 10 µm A16 Inorganic microfiber 16 µm A25 Inorganic microfiber 25 µm WA025 Water absorber inorganic microfibre 25 µm M25 Stainless steel wire mesh 25 µm M60 Stainless steel wire mesh 60 µm M90 Stainless steel wire mesh 90 µm P10 Resin-impregnated paper 10 µm P25 Resin-impregnated paper 25 µm		P01	
Seals	Filtration rating	Element Δp	Execution
A NBR	Axx Mxx Pxx	N 20 bar	P01 MP Filtri standard
V FPM	• • •		Pxx Customized
E EPDM	• • •		
C CR	• • •		
W NBR, compatible with fluids HFB and HFC	• • -		
Z FPM, compatible with fluids HFB and HFC	• • -		

14. Troubleshooting

14.1 MISUSE OF THE PRODUCT

This product should be connected to a hydraulic line; this must not exceed upper pressure limit of the product. This product should follow all standard operating procedures previously set at the operating location as well as the procedures required by the manufacturer.

Over-tighten of test points/hoses can damage threads causing the unit to fail.

The product is designed with no components in motion.

14.2 CLOGGING INDICATOR ALARM

In normal functioning of the system, the clogging of the filter by contaminants will result in a gradual increase in the pressure drop through the filter.

The filter element should be replaced before it is completely clogged and anyways before the pressure exceeds the setting value of the bypass valve. For this reason, we recommended using a clogging indicator (visual or electrical), that advises the appropriate timing for replacing the cartridge.

Should the clogging indicator be in alarm mode, it means that the pressure has already exceeded the guard threshold, and the cartridge has to be replaced.

14.3 LEAKS OF WORKING FLUID

Leaks from the connections with normal tightening may indicate seal damage during the warehousing process, fluid incompatibility, or unsuitable work conditions.

15. End-of-Life and Product Disposal

At the end of its service life, the hydraulic filter must be dismantled and disposed of properly, in compliance with applicable regulations regarding safety, environmental protection, and hazardous waste.

15.1 DISASSEMBLY

- **Depressurize the system** and remove the filter using appropriate personal protective equipment (PPE).
- Collect and dispose of **any residual oil** in accordance with local regulations.
- If the filter is of the **spin-on** type, dispose of it as hazardous waste due to the presence of residual oil and contaminated filter media.
- If the filter has a **replaceable cartridge**, separate the metal/plastic housing from the internal cartridge, where applicable.

15.2 WASTE CLASSIFICATION

The components of the used filter (cartridge, seals, metal/plastic parts) must be classified according to the **European Waste Catalogue (EWC)**. Generally:

- **15 02 02** - Absorbents and filter materials contaminated by hazardous substances
- **13 01 10 (*)** - Mineral hydraulic oils containing PCBs or other hazardous substances
- **13 01 11 (*)** - Other hydraulic oils

(*) Always check with the local waste management authority for the correct assignment of codes and disposal procedures.

15.3 ENVIRONMENTAL RECOMMENDATIONS

- Do not dispose of filter components into the environment.
- Dispose of only through authorized operators, in compliance with current environmental regulations, in accordance (for European countries) with Directive 2008/98/EC, as well as applicable national legislations.
- Any metal components may be sent for recycling after appropriate treatment.



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