

**S**ERIES

# FMP 039



**Maximum pressure 110 bar**  
**Flow rates to 95 l/min**



# Technical data

## FMP 039

### Filter housing (Materials)

- Head: Anodized aluminium
- Housing: Anodized aluminium
- Bypass valve: Steel

### Pressure

- Working pressure: 110 bar (11 MPa)
- Test pressure: 160 bar (16 MPa)
- Burst pressure: 390 bar (39 MPa)
- Pulse pressure fatigue test: 1.000.000 cycles with pressure from 0 to 110 bar (11 Mpa)

### Temperature

- From -25 °C to +110 °C

### Bypass valve

- Opening pressure 6 bar  $\pm$ 10%
- Other opening pressures on request

### $\Delta p$ Elements type

- Microfibre filter elements series N: 20 bar
- Stainless steel mesh elements series N: 20 bar

### Seals

- Standard NBR series A
- Optional FPM series V

### Weights (kg)

Length	2	3	4
• FMP 039	0,63	0,72	0,82

### Volumes (dm<sup>3</sup>)

Length	2	3	4
• FMP 039	0,28	0,35	0,43

### Connections

- Inlet/Outlet in Line

## Compatibility

- Housings compatible with: Mineral oils to ISO 2943 - aqueous emulsions synthetic fluids, water and glycol.
- The filter elements are compatible with: Mineral oils to ISO 2943, Synthetic fluids Aqueous emulsions, water and glycol (series W required).
- NBR seals series A, compatible with: Mineral oils to ISO 2943 - aqueous emulsions synthetic fluids, water and glycol.
- V series FPM seals, compatible with: Synthetic fluids type HS-HFDR-HFDS-HFDU To ISO 2943

## Filter Element Area

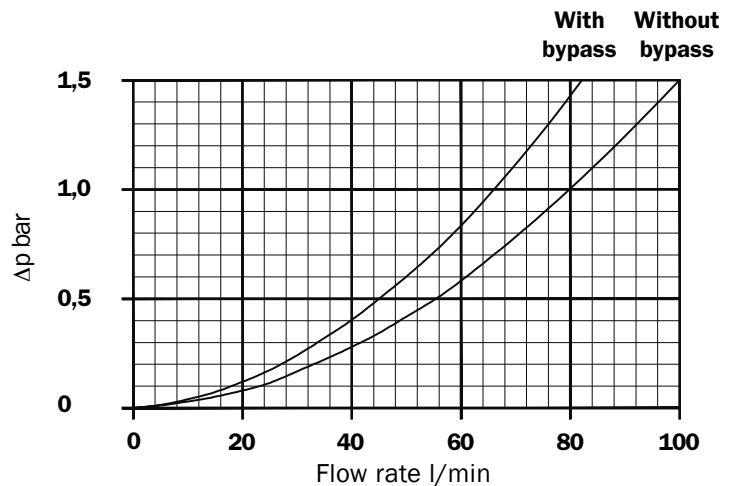
Filter element in stainless steel mesh  
Length

Type	2	3	4
HP039	350	570	700
Values expressed in cm <sup>2</sup>			

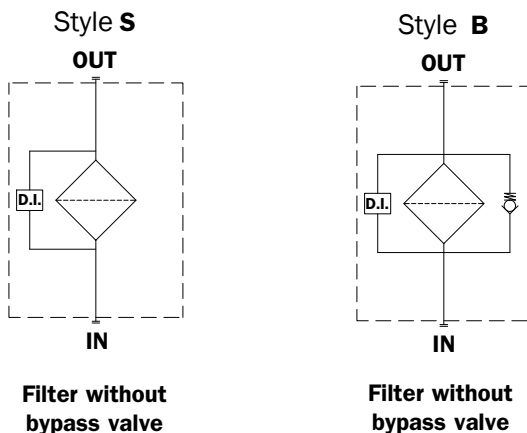
## Filter housings $\Delta p$ pressure drop

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

$\Delta p$  varies proportionally with density.

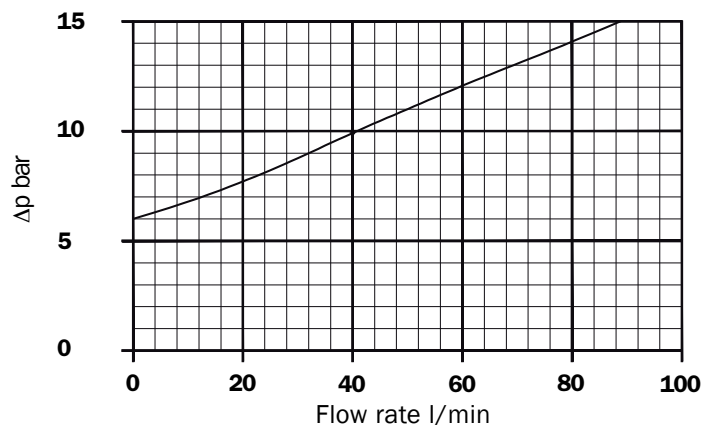


# Symbols



## Valves

### Bypass valve pressure drop



# Recommended maximum flow rate

- Pressure drop of filter assembly equal to  $\Delta p$  1,5 bar.
- Oil kinematic viscosity 30 mm<sup>2</sup>/s (cSt).
- Density 0,86 kg/dm<sup>3</sup>.
- Connections of filter under test G 1/2".

## Filtration

	Length	A01	A03	A06	A10	A16	A25	M25
<b>FMP 039</b>	2	10	20	25	45	46	54	80
	3	16	32	35	50	58	66	90
	4	22	40	43	58	62	71	95

Flow rate l/min

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## Filter Sizing

Correct sizing of the filter must be based on a variable pressure drop depending on the application:

- pressure filter  $\Delta p$  from 0.8 to 1.5 bar

The pressure drop calculation is performed by adding together the value for the housing and the value for the filter element.

The pressure drop in the housing is proportional to the fluid density kg/dm<sup>3</sup>; all the graphs in the catalogue are referred to mineral oil with density of 0.86 kg/dm<sup>3</sup>.

The filter element pressure drop value is proportional to viscosity mm<sup>2</sup>/s, the Y values in the catalogue are referred to viscosity of 30 mm<sup>2</sup>/s.

### Sizing data for single cartridge, head at top

$\Delta p$  Tot.

$\Delta p_c$  Filter housing

$\Delta p_e$  Filter element

Y Multiplication factor (see below)

Q l/min = flow rate

V1 = reference viscosity 30 mm<sup>2</sup>/s (cSt)

V2 = operating viscosity in mm<sup>2</sup>/s (cSt)

$\Delta p$  Tot. =  $\Delta p_c + \Delta p_e$

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

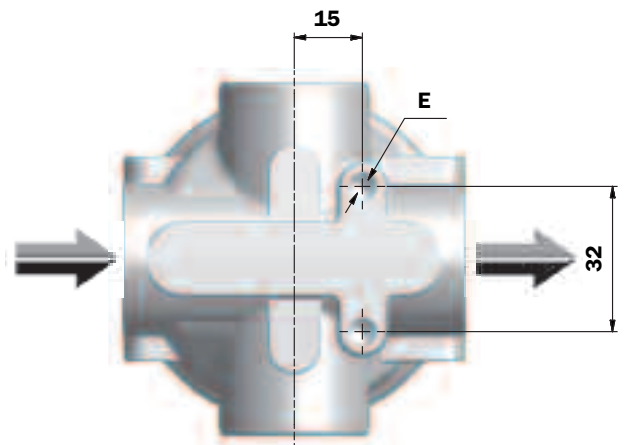
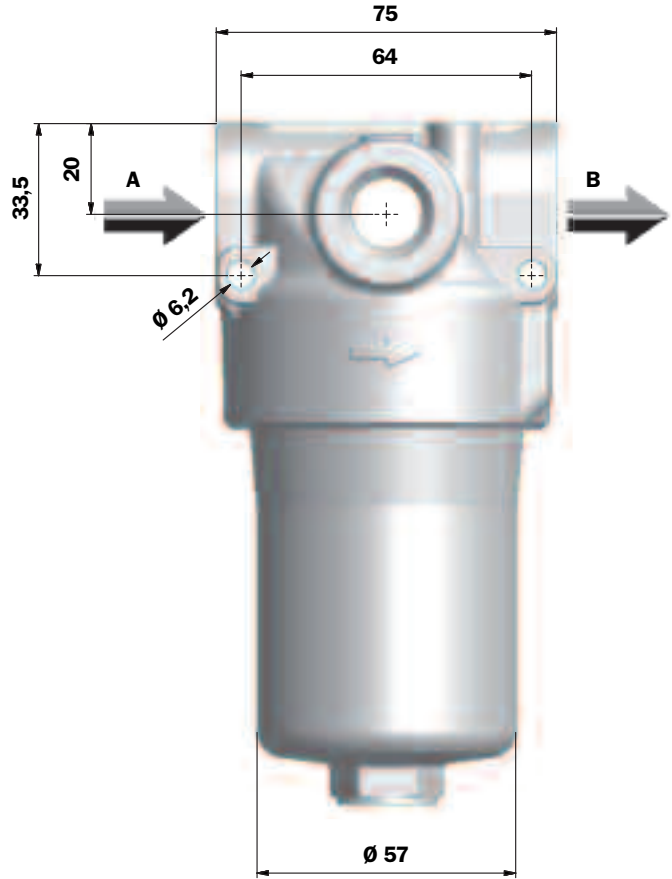
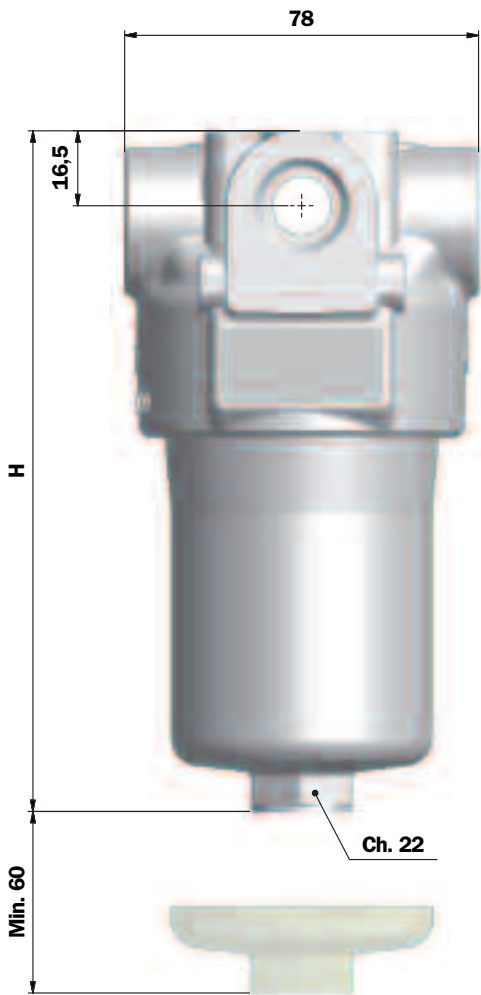
### Multiplication factor "Y" for definition of the pressure drop of filter elements.

Reference viscosity 30 mm<sup>2</sup>/s

Filter Element	Absolute Filtration					
	Series N					
Type	A 0 3	A 0 6	A 1 0	A 1 6	A 2 5	M 2 5
<b>HP 039</b> 2	70,66	53,20	25,77	20,57	14,67	0,490
3	36,57	32,28	18,00	13,38	08,00	02,90
4	26,57	23,27	12,46	09,88	05,58	02,20

# Dimension

## FMP 039



### Threaded Connections

St.	A - B	E
A	G 1/2"	M6
B	1/2" NPT	1/4" UNC
C	SAE 8 3/4" 16 UNF	1/4" UNC

### FMP 039

Length Filter	H mm
2	150
3	193
4	237

3D drawings available on website [www.mpfiltri.com](http://www.mpfiltri.com), under TOOLS/2D/3D CAD COMPONENTS

## Execution 1: Without indicator connection



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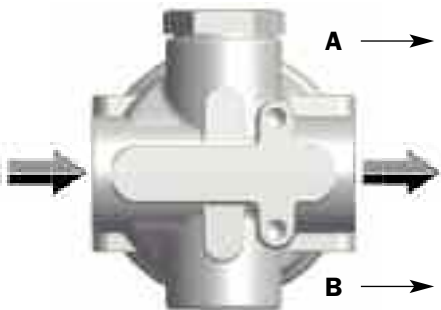
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## Execution 6: Double indicator connection (A - B)



A → Closure cap with standard T2 steel.  
The position of the cap is reversible.

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B → Standard closure cap with plastic thread protection.  
If necessary, the second plug T2 see page 7, the order code

## Options: Possibility of special connections



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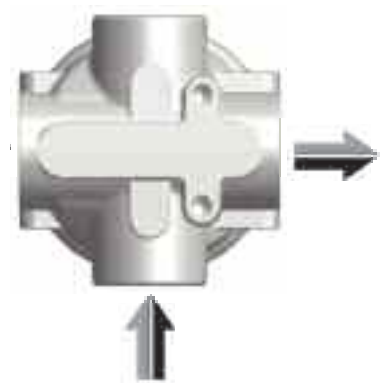
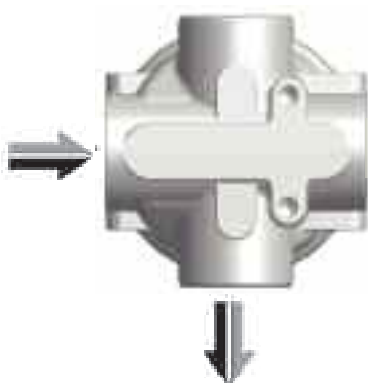
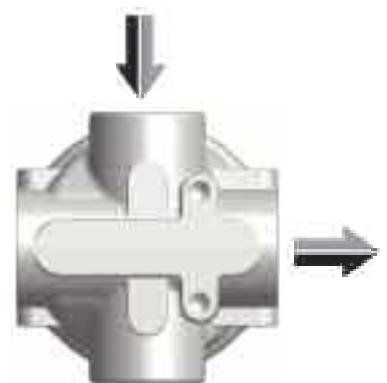
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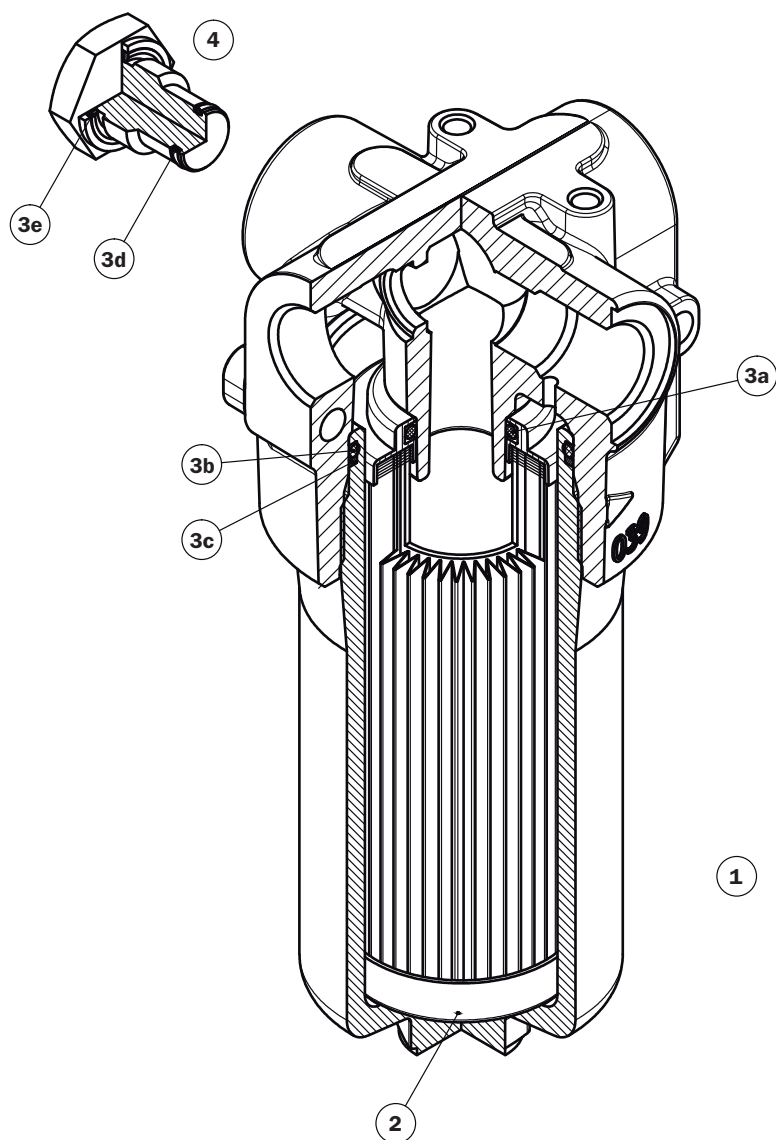
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Contact  
MP Filtri

# Spare parts



Pos.	Description	Qty	FILTER Series FMP 039	
<b>1</b>	Filter assembly	1	See order table	
<b>2</b>	Filter element	1	See order table	
<b>3</b>	Seals kit	1	NBR 02050310	FPM 02050311
<b>3a</b>	O-Ring for filter element	1	OR 4087 Ø 21,82 x 3,53	
<b>3b</b>	O-Ring for housing	1	OR 3200 Ø 50,47 x 2,62	
<b>3c</b>	Anti-extrusion ring	1	Parbak 136 Ø 51,26 x 2,18	
<b>3d</b>	O-Ring	2	OR 2050 Ø 12,42 x 1,78	
<b>3e</b>	Seal	1	01030058 (HNBR)	01030046 (FPM)
<b>4</b>	Indicator Plug	1	T2H	T2V
-	Indicator	1	See order table	



# Differential indicators

## Order code

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

**Example: NM 7 H A 11 P01**

### 1 - Styles

<b>NR</b>	Electrical
<b>KR</b>	Electrical-Visual
<b>NM</b>	Electrical IP 67
<b>U</b>	Visual

### 2 - Differential trip pressure

<b>6</b>	2 bar ± 10% (filter without by-pass)
<b>7</b>	5 bar ± 10% (filter with by-pass)
<b>8</b>	7 bar ± 10% (filter without by-pass)

### 3 - Power supply voltage

(only for style KR - only voltage DC DC)

<b>1</b>	24 Volt
<b>2</b>	110 Volt

### 4 - Seals

<b>H</b>	HNBR Standard
<b>V</b>	FPM
<b>x</b>	Other on request

### 5 - Thermostat (only for style NM)

<b>A</b>	Without
<b>C</b>	50 °C

### 6 - Electrical connector (only for style NM)

<b>11</b>	Connector AMP superseal series 1.5
<b>21</b>	Connector AMP timer
<b>31</b>	Connector DEUTSCH DT 04-2-P
<b>32</b>	Connector DEUTSCH DT 04-3-P
<b>41</b>	Length electrical cable 0,5 m

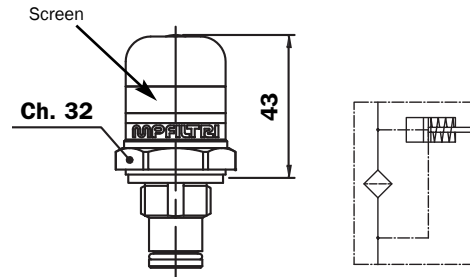
### 7 - Option

<b>P01</b>	MP standard
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## Pressure:

Working pressure 420 bar  
 Pulse pressure fatigue test: 1.000.000 cycles with pressure from 0 to 420 bar (42 MPa)

## SERIES V VISUAL



Cover and lens in nylon.

Visual indicator green = Cartridge clean.  
 Visual indicator red = Cartridge clogged.

Tightening torque: 60 Nm.  
 Weight: 137 gr.

## Order code

<b>1</b>	<b>2</b>	<b>3</b>

**Example: E 7**

### 1 - Style

<b>V</b>	Visual
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### 2 - Differential trip pressure

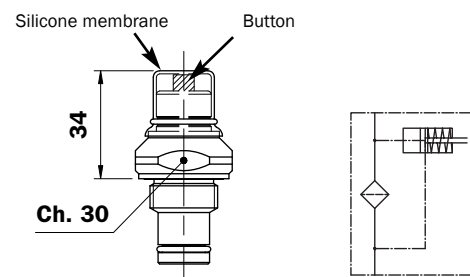
<b>6</b>	2 bar ± 10%
<b>7</b>	5 bar ± 10%
<b>8</b>	7 bar ± 10%

### 3 - Seals

	FPM Standard
<b>x</b>	Other on request

Seal for indicator/filter head, Bonded Seal.

## SERIES U VISUAL



"U" indicator provide to accurate view indication of filter element condition.

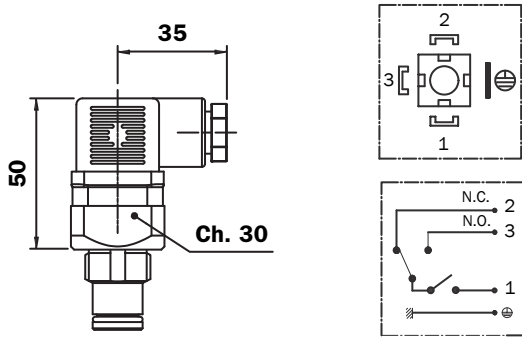
Visual signal Red button down: clean cartridge  
 Red button up: clogging cartridge

Connection G 1/2"  
 Tightening torque: 65 Nm  
 Weight: 128 gr



## SERIES NR ELECTRICAL

Connector EN 175301-803 A/ISO 4400

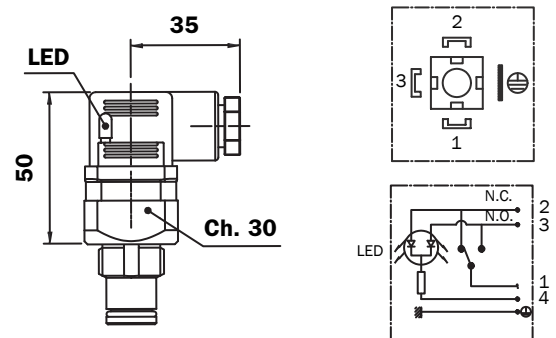


Switching type N/O or N/C contacts (change over Contact)  
 Max. contact rating 0,8 A / 24 Vdc  
 0,17 A / 115 Vdc  
 Max power supply voltage 230 Vac  
 Electrical connection EN 175301-803  
 Cable gland PG 9  
 Protection rating IP 65  
 Connection G 1/2"

Tightening torque: 65 Nm  
 Weight: 123 gr

## SERIES KR ELECTRICAL/VISUAL

Connector EN 175301-803 A/ISO 4400

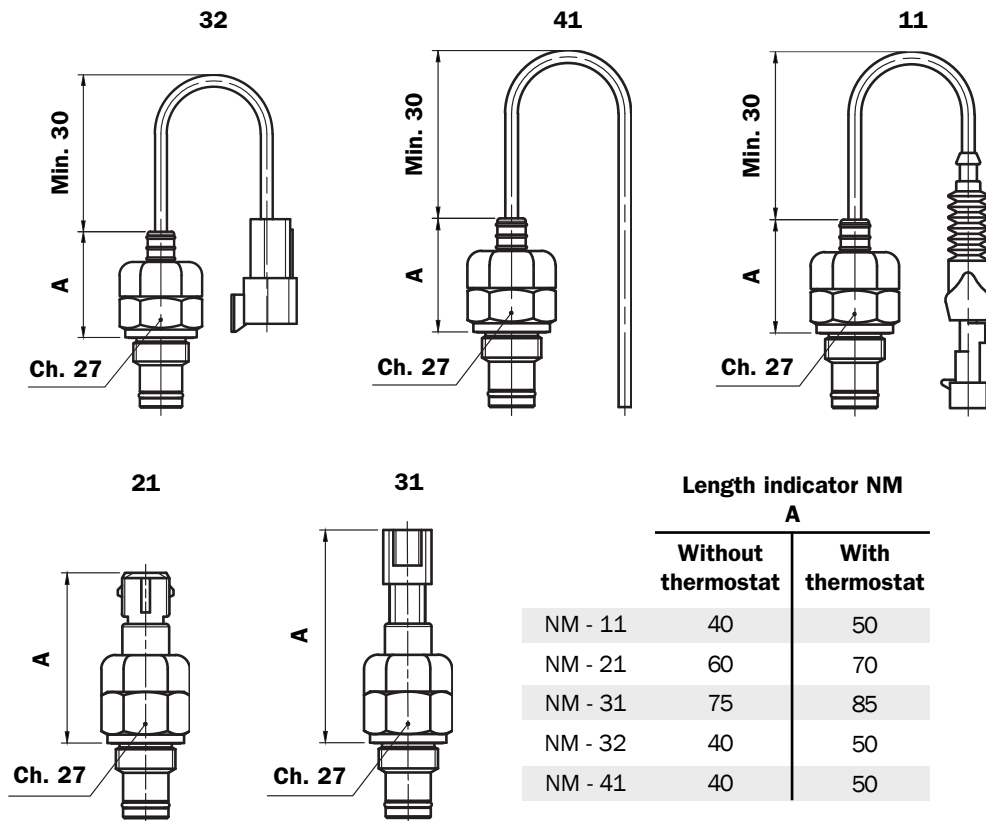


Switching type N/O or N/C contacts (change over Contact)  
 Max. contact rating 0,8 A / 24 Vdc  
 0,17 A / 115 Vdc  
 Max power supply voltage 24 Vdc - 115 Vdc/ac - 230 Vac  
 Electrical connection EN 175301-803  
 visual indicator by LED  
 GREEN LED = Clean element.  
 RED LED = Blocked element.

Cable gland PG 9  
 Protection rating IP 65  
 Connection G 1/2"

Tightening torque: 65 Nm  
 Weight: 123 gr

## SERIES NM ELECTRICAL



Switching type N/O contacts  
 N/O thermostat  
 Max. contact rating 0,8 A / 24 Vdc  
 0,17 A / 115 Vdc  
 Max power supply voltage Max. 120 Vdc  
 Electrical connection 11 Connector AMP superseal series 1.5  
 21 Connector AMP timer  
 31 Connector DEUTSCH DT 04-2-P  
 32 Connector DEUTSCH DT 04-3-P  
 41 Length electrical cable 0,5 m

Length indicator NM

	A	
	Without thermostat	With thermostat
NM - 11	40	50
NM - 21	60	70
NM - 31	75	85
NM - 32	40	50
NM - 41	40	50

Protection rating IP 67  
 Connection G 1/2"  
 Tightening torque: 65 Nm  
 Weight: 125 gr



# Ordering information FMP 039

## Filter assembly FMP039

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2</b>	<b>B</b>	<b>A</b>	<b>A</b>	<b>1</b>	<b>A10</b>	<b>N</b>	<b>P01</b>

Example: FMP039

## Filter element HP 039

<b>1</b>	<b>6</b>	<b>3</b>	<b>7</b>	<b>8</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2</b>	<b>A10</b>	<b>A</b>	<b>N</b>	<b>P01</b>

Example: HP039

### 1 - Filter length

- 2**
- 3**
- 4**

### 2 - By-pass valve

- S** Without bypass
- B** With bypass  
Opening pressure: 6 bar

### 3 - Seals

- A** NBR
- V** FPM
- On request

### 4 - Connections

- A** G 1/2"
- B** 1/2" NPT
- C** SAE 8

### 5 - Indicator port

- 1** Without indicator port
- 6** With 2 indicators port\*

### 6 - Filter element

- |                                     |          |  |
|-------------------------------------|----------|--|
| <input type="checkbox"/> <b>A01</b> | 1 $\mu$  | } Absolute filtration<br>Inorganic<br>microfibre<br><br>$\beta_x(c) \geq 1000$ |
| <input type="checkbox"/> <b>A03</b> | 3 $\mu$  |  |
| <input type="checkbox"/> <b>A06</b> | 6 $\mu$  |  |
| <input type="checkbox"/> <b>A10</b> | 10 $\mu$ |  |
| <input type="checkbox"/> <b>A16</b> | 16 $\mu$ |  |
| <input type="checkbox"/> <b>A25</b> | 25 $\mu$ | } Nominal Filtration<br>Metal mesh   |
| <input type="checkbox"/> <b>M25</b> | 25 $\mu$ |  |

### 7 - Collapse pressure

- N**  $\Delta p = 20$  bar

### 8 - Options

- P01** MP Filtri standard
- Pxx** Customer request

### \*Options

Steel plug T2 has to be ordered separately

#### Code

- **T2H** Seal NBR
- **T2V** Seal FPM

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# Operating & Maintenance



Pressurized filters are utilized to remove contaminant from hydraulic systems. Long working life of the hydraulic components and correct use of the hydraulic systems can be assured only when maintenance is performed correctly and at regular intervals.

Pressurized filters can be equipped with bypass valves, reverse flow valves, and check valves.

If the filters are not equipped with a bypass valve, only high strength filter cartridges should be used ( $\Delta p$  210 bar) to avoid the risk of collapse due to the presence of contaminants retained during the filtration process.

- “H” series cartridges when by-pass valves are not installed.
- “S” series cartridges when reverse flow valves and duplex filters are installed.

When bypass valves are present and during flushing operations, we recommend the use of cartridges with low mechanical strength ( $\Delta p$  20 bar).

- “N” series cartridges when reverse flow valves are not installed.
- “R” series cartridges when reverse flow valves and duplex filters are installed.

In order to prevent the filter elements from collapsing due to excessive hydraulic pressure it is essential to use differential indicators that serve to inform the user of the need to change the cartridge.

Effective contamination control can be assured only by the correct use of clogging indicators.

**Differential Indicators**

Wrenches Ch. 27/30/32

**Filter housing**

Wrenches Ch. 22

- A** The date on which the filter elements are changed should be recorded in the machine datasheet.
- B** Spare parts installed must be in compliance with the specifications given in the machine operating and maintenance manual.
- C** Filter bodies should be handled carefully since they are cleaner than most work station.
- D** After having opened the filter to change the filter element, check the condition of the seals and change them if necessary.

INSTALLATION

- A** Check that the pressure rating of the selected filter is higher than the system's maximum operating pressure (the maximum pressure value is shown on the nameplate).
- B** Check that the filter body contains the filter cartridge.
- C** Check that the operating fluid is compatible with the material of the body, cartridge, and seals.
- D** Secure the filter using the relevant threaded holes, to rigid brackets. Rigid installation makes it possible to unscrew the housing without introducing flexing of the hydraulic fittings, limiting any points of stress transfer.
- E** Install the filter in an accessible position for correct and trouble-free maintenance.
- F** Start the machine and check any of oil leaks from the filter and relative fittings.
- G** Repeat the visual inspection when the system arrives at the operating temperature of the oil.

MAINTENANCE

- A** All maintenance operations must be performed only by suitably trained personnel.
- B** The hydraulic system must be depressurized before performing maintenance operations (except in the case of FHD double filters).
- C** Maintenance must be carried out using suitable tools and containers to collect the fluid contained in the filter body. Spent fluids must be disposed of in compliance with statutory legislation.
- D** Do not use naked flames during maintenance operations.
- E** Use the utmost caution in relation to the temperature of the fluid. High temperatures can lead to residual pressure with resulting undesirable movements of mechanical parts.

## CHANGING THE FILTER ELEMENT FILTERS WITH IN-LINE AND MANIFOLD TYPE CONNECTIONS

- 1 Depressurize system and filter.
- 2 Unscrew (the oil drain plug, first if present) the housing using the appropriate tools and extract the filter element (see fig. 2).
- 3 Collect the spent oil and cartridge in a suitable container and dispose of them in compliance with statutory legislation.

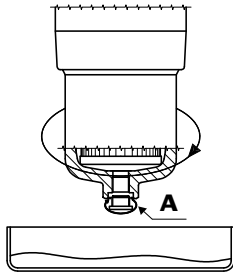


Fig. 1

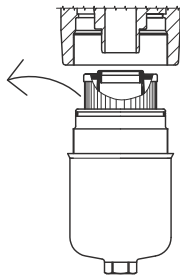


Fig. 2

### !!! WARNING !!!

- 4 To avoid damaging the components check and clean the following parts is necessary:
  - the thread of the housing and the seals and the thread of the head.
 Check the condition of the seals - when chasing the seals lubricate the new seals with operating fluid prior to installation (see fig. 3).

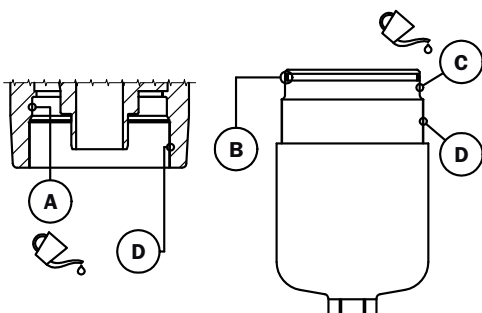


Fig. 3

- 5 Lubricate the filter element seal with the operating fluid before installing the new filter element (see fig. 4).

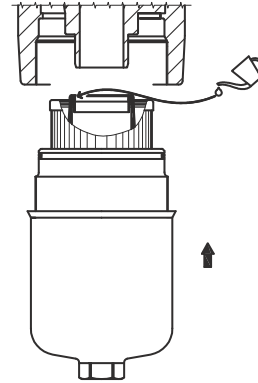


Fig. 4

- 6 Screw the housing onto the head using the correct tool. **WARNING:** Screw the housing fully home onto the head “**DO NOT APPLY EXCESSIVE TIGHTENING TORQUE**”.

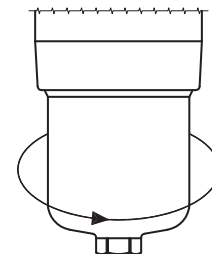


Fig. 5

- 7 Start the machine and check for the absence of leaks. Repeat the operation when the machine has reached its operating temperature.





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