

# FMM series

Maximum working pressure up to 42 MPa (420 bar) - Flow rate up to 300 l/min



## INSTALLATION, SERVICE AND MAINTENANCE MANUAL AND SAFETY INSTRUCTIONS



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FMM050

FMM150

*For all the QR codes: Scan or click me!*

## Description

## Technical data

### High Pressure filters

#### In-line

**Maximum working pressure up to 42 MPa (420 bar)**

**Flow rate up to 300 l/min**

FMM is a range of versatile high pressure filter for protection of sensitive components in high pressure hydraulic systems in the mobile machines.

They are directly connected to the lines of the system through the hydraulic fittings.

#### Available features:

- Female threaded connections up to 1 1/4", for a maximum flow rate of 250 l/min
- Fine filtration rating, to get a good cleanliness level into the system
- Bypass valve, to relieve excessive pressure drop across the filter media
- Low collapse filter element "N", for use with filters provided with bypass valve
- Low collapse filter element with external support "R", for filter element protection against the back pressure caused by the check valve in filters provided with the bypass valve
- High collapse filter element with external support "S", for filter element protection against the back pressure caused by the check valve in filters not provided with the bypass valve
- Visual, electrical and electronic differential clogging indicators

#### Common applications:

- Agricultural machines
- Mobile machines

#### Filter housing materials

- Head: Painted cast iron, black RAL 9005
- Housing: Phosphatized steel
- Bypass valve: Steel

#### Pressure

- Test pressure: 63 MPa (630 bar)
- Burst pressure: 126 MPa (1260 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 42 MPa (420 bar)

#### Bypass valve

- Opening pressure 600 kPa (6 bar) ±10%
- Other opening pressures on request.

#### Δp element type

- Microfiber filter elements - series N-R: 20 bar
- Microfiber filter elements - series S: 210 bar
- Wire mesh filter elements - series N: 20 bar
- Fluid flow through the filter element from OUT to IN

#### Seals

- Standard NBR series A
- Optional FPM series V

#### Temperature

From -25 °C to +110 °C

#### Connections

In-line Inlet/Outlet

#### Note

FMM filters are provided for vertical mounting

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

Filter series	Weights [kg]					Volumes [dm <sup>3</sup> ]						
	Length	1	2	3	4	5	Length	1	2	3	4	5
<b>FMM 050</b>		3.11	3.48	3.90	4.36	5.54		0.34	0.48	0.63	0.81	1.23
<b>FMM 150</b>		7.50	9.50	10.90	-	-		0.60	1.00	1.25	-	-

Flow rates [l/min]

Filter series	Length	Filter element design - N Series						Filter element design - S Series				
		A03	A06	A10	A16	A25	M25	A03	A06	A10	A16	A25
<b>FMM 050</b>	<b>1</b>	42	43	79	82	106	147	29	39	57	59	74
	<b>2</b>	52	57	85	96	121	149	45	49	76	88	114
	<b>3</b>	66	69	97	106	130	150	58	61	89	99	125
	<b>4</b>	83	89	113	115	134	152	74	80	106	108	129
	<b>5</b>	107	110	130	134	141	154	93	95	111	121	139
<b>FMM 150</b>	<b>1</b>	81	88	156	163	179	295					
	<b>2</b>	142	145	227	230	236	312					
	<b>3</b>	170	180	242	245	263	315					

### Maximum flow rate for a complete pressure filter with a pressure drop $\Delta p = 1.5$ bar.

The reference fluid has a kinematic viscosity of 30 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

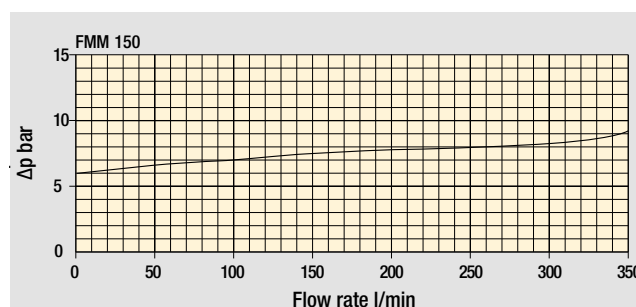
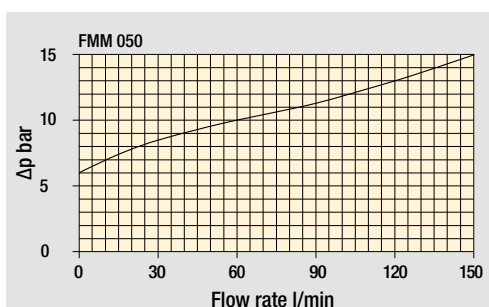
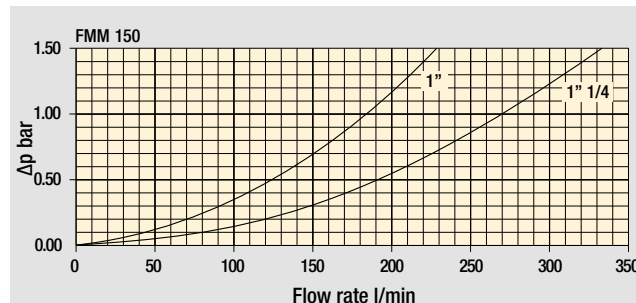
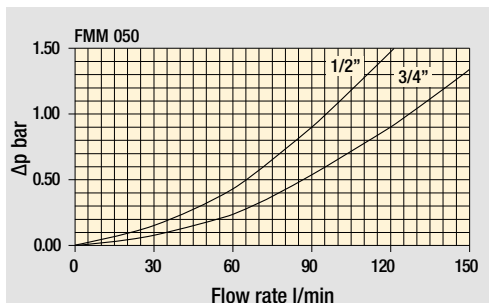
Filter series	Style S	Style B	Style T	Style D
<b>FMM 050</b>	•	•	•	•
<b>FMM 150</b>	•	•	-	-

### Pressure drop

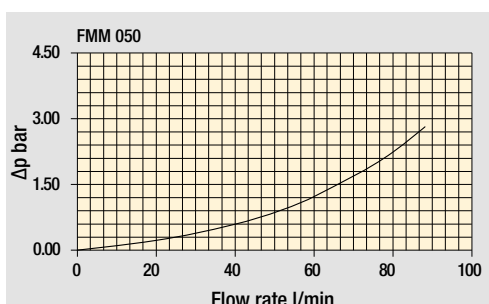
Filter housings

$\Delta p$  pressure drop



Bypass valve

pressure drop



Filter housing  
with check valve

Valves

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

## Designation & Ordering code

### COMPLETE FILTER

Series and size **FMM050** Configuration example: **FMM050** **3** **B** **A** **G** **A10** **N** **P01**

Length  
**1** | **2** | **3** | **4** | **5**

Valves  
**S** Without bypass  
**B** With bypass 6 bar  
**T** With check valve, without bypass  
**D** With check valve, with bypass 6 bar

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

Connections  
**A** M18x1.5 - ISO 6149      **E** 1/2" NPT  
**B** M22x1.5 - ISO 6149      **F** 3/4" NPT  
**C** G 1/2"                      **G** SAE 8 - 3/4" - 16 UNF  
**D** G 3/4"                      **H** SAE 12 - 1 1/16" - 12 UN

Filtration rating (filter media)	
<b>A03</b>	Inorganic microfiber 3 µm
<b>A06</b>	Inorganic microfiber 6 µm
<b>A10</b>	Inorganic microfiber 10 µm
<b>A16</b>	Inorganic microfiber 16 µm
<b>A25</b>	Inorganic microfiber 25 µm
<b>M25</b>	Wire mesh 25 µm

Element Δp	Valves			
	S	B	T	D
<b>N</b> 20 bar	-	•	-	-
<b>R</b> 20 bar	-	-	-	•
<b>S</b> 210 bar	•	-	•	-

Executions	
<b>P01</b>	Upper connection for clogging indicator
<b>P02</b>	Without connection for clogging indicator
<b>P03</b>	Frontal connection for clogging indicator
<b>Pxx</b>	Customized

### FILTER ELEMENT

Element series and size **HP050** Configuration example: **HP050** **3** **A10** **A** **N** **P01**

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

Filtration rating (filter media)	
<b>A03</b>	Inorganic microfiber 3 µm
<b>A06</b>	Inorganic microfiber 6 µm
<b>A10</b>	Inorganic microfiber 10 µm
<b>A16</b>	Inorganic microfiber 16 µm
<b>A25</b>	Inorganic microfiber 25 µm
<b>M25</b>	Wire mesh 25 µm

Seals	
<b>A</b>	NBR
<b>V</b>	FPM

Element Δp	
<b>N</b>	20 bar
<b>R</b>	20 bar
<b>S</b>	210 bar

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

### CLOGGING INDICATORS

See page 727

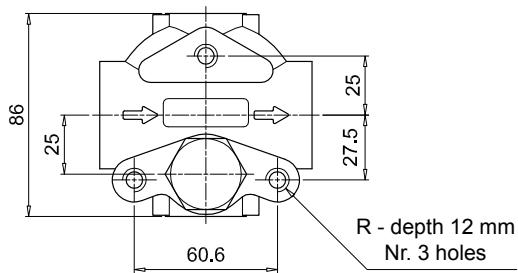
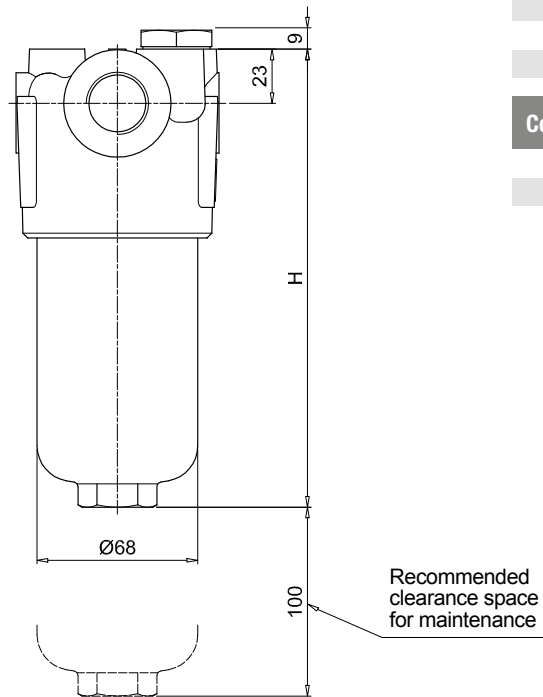
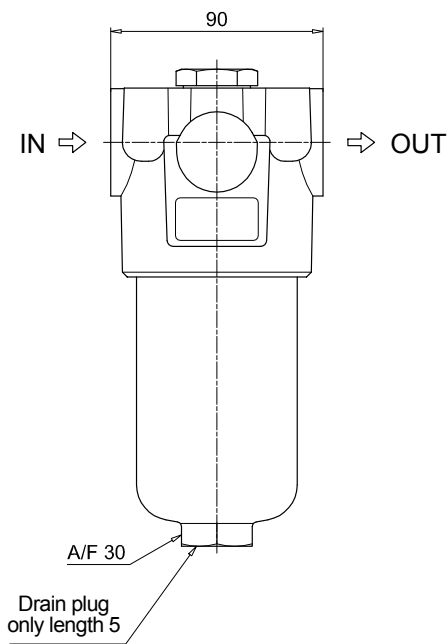
**DEA** Electrical differential pressure indicator  
**DEM** Electrical differential pressure indicator  
**DEU** Electrical differential pressure indicator  
**DLA** Electrical / visual differential pressure indicator

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

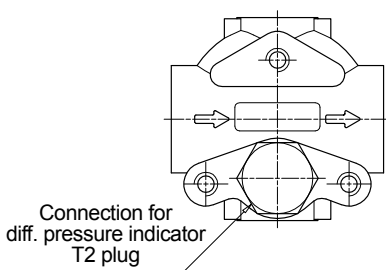
### PLUGS

See page 747

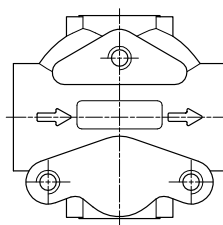
**T2** Plug



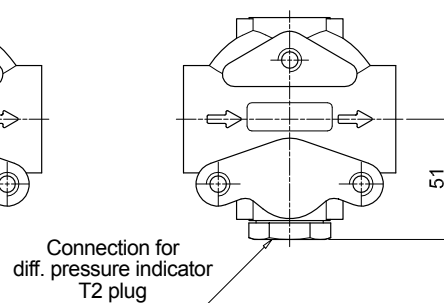
Execution P01



Execution P02



Execution P03



FMM050	
Filter length	H [mm]
1	158
2	195
3	237
4	285
5	407
Connections	R
A-B-C-D	M10
E-F-G-H	3/8" UNC

## Designation & Ordering code

### COMPLETE FILTER

Configuration example: **FMM150** | **2** | **B** | **A** | **D** | **2** | **M25** | **N** | **P01**

**Series and size**  
**FMM150**

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

**Valves**  
**S** Without bypass  
**B** With bypass 6 bar

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

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

**Connection for differential pressure indicator**  
**1** Without connection  
**2** Upper connection  
**3** Frontal connection

**Filtration rating (filter media)**

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

Element Δp	S	B
<b>N</b>	20 bar	- •
<b>S</b>	210 bar	• •

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

### FILTER ELEMENT

Configuration example: **HP150** | **2** | **M25** | **A** | **N** | **P01**

**Element series and size**  
**HP150**

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

**Filtration rating (filter media)**

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

Seals	
<b>A</b>	NBR
<b>V</b>	FPM

Element Δp	
<b>N</b>	20 bar
<b>S</b>	210 bar

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

### CLOGGING INDICATORS

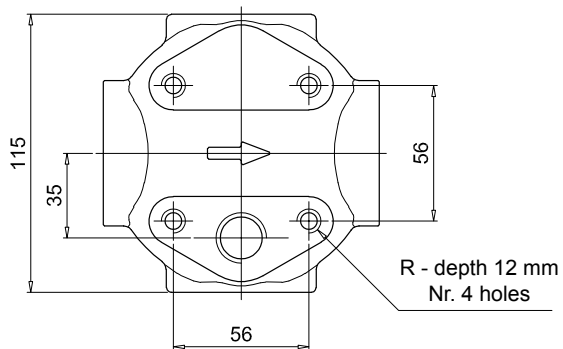
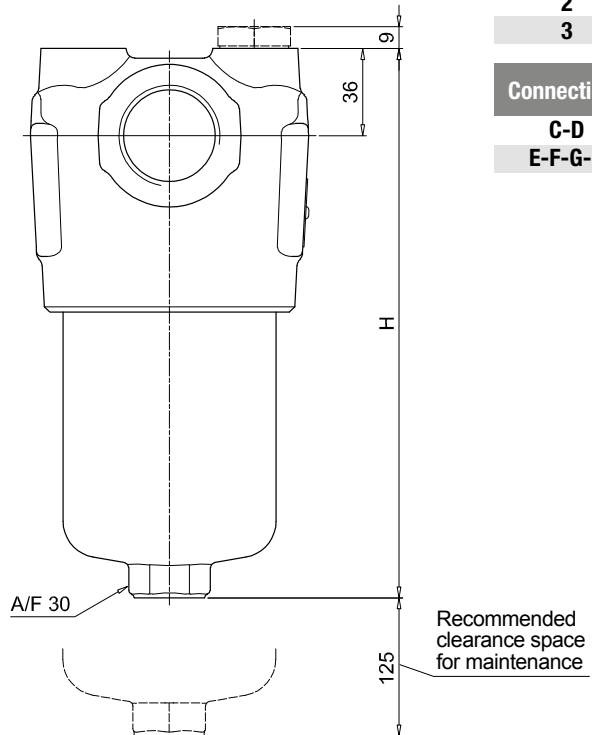
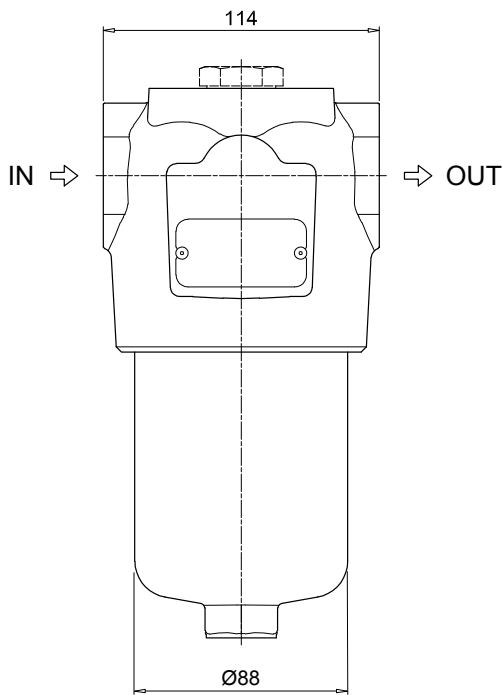
See page 727

<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

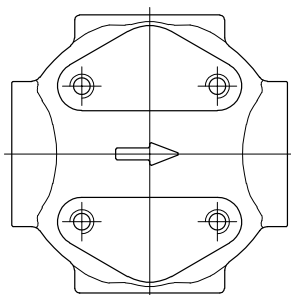
### PLUGS

See page 747

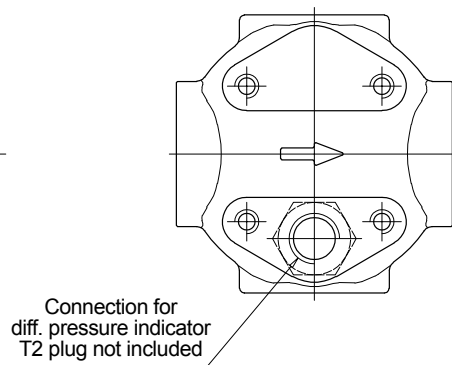
<b>T2</b>	Plug (not included)
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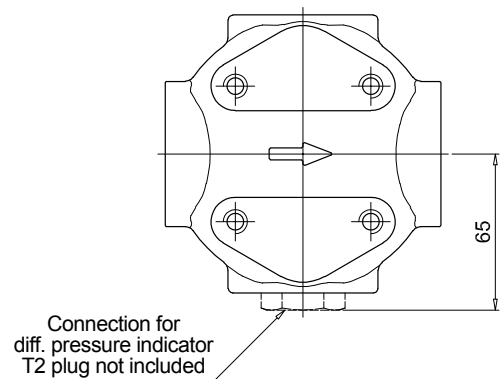
Version 1



Version 2



Version 3

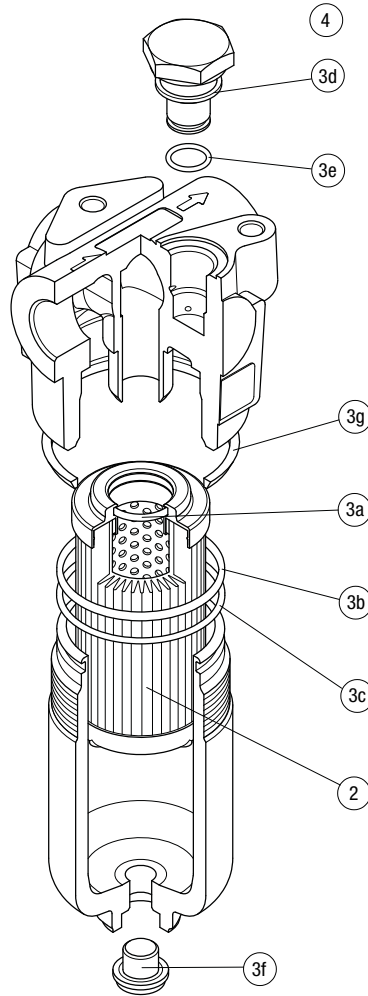


FMM150	
Filter length	H [mm]
1	230
2	340
3	415
Connections	R
C-D	M10
E-F-G-H	3/8" UNC

# FMM SPARE PARTS

Order number for spare parts

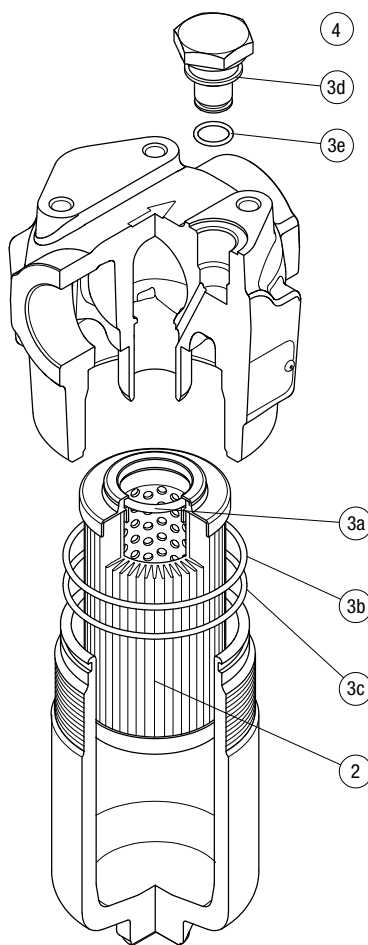
## FMM 050



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug	
FMM 050	See order table	NBR	FPM	NBR	FPM
	<b>2</b>	<b>3</b> (3a ÷ 3g)		<b>4</b>	
		02050314	02050315	T2H	T2V



## FMM 150



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>FMM 150</b>	See order table	02050731	02050732	T2H	T2V

## DIFFERENTIAL PRESSURE INDICATORS

Series	Configuration example 1:							Configuration example 2:		Configuration example 3:		Configuration example 4:		Configuration example 5:	
<b>DE</b> Electrical differential pressure indicator	DE	M	12	H	F	50	P01	DE	U	50	V	A	50	P01	UL
<b>DL</b> Electrical/Visual differential pressure indicator	DL	E	20	V	A	71	P01	DL	E	20	V	A	71	P01	
<b>DT</b> Electronic differential pressure indicator	DT	A	50	H	F	70	P01	DT	A	50	H	F	70	P01	
<b>DV</b> Visual differential pressure indicator	DV	M	70	V			P01	DV	M	70	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>E</b> For high power supply	-	•	-	

Pressure setting	DEA	DEM	DEU	DLA	DLE	DTA	DVA	DVM
<b>50</b> 5.0 bar	•	•	•	•	•	•	•	•
<b>70</b> 7.0 bar	•	•	•	•	•	•	•	•
<b>95</b> 9.5 bar	•	•	-	•	•	•	•	•

Seals	DEA	DEM	DEU	DLA	DLE	DTA	DVA	DVM
<b>H</b> HNBR	•	•	-	•	•	•	•	•
<b>V</b> FPM	•	•	•	•	•	•	•	•

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

Electrical connections	DEA	DEM	DEU	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	-	-	-	•	-	-

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

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

## PLUGS

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

Seals
<b>H</b> HNBR
<b>V</b> FPM