

# MPS/MST

## SERIES

**S** PIN - ON FILTER SUCTION - RETURN



Maximum working pressure 12 bar

Flow rates to 300 l/min

**MPFILTRI**  
filtri per oleodinamica



# Description

## MPS / MST

The **MPS** spin-on filter series is a complete product range suitable, for both suction and return applications. Utilising spin-on canisters, the MPS series are quick and easy to service and provide a 'clean' solution when changing elements.

The filter elements are either resin-impregnated paper ( $\beta_{x>2}$ ), glass fibre ( $\beta_{x\geq 200}$ ) or square wire mesh.

The unique filter head is designed for both European CS and American CG standard canister series. One head design series accommodates both styles of elements.

**Also available is a new design utilizing a pressure differential visual and electrical indicators - ideal for lubrication applications.**

MPS filters are specifically designed for contamination control in hydraulic and lubrication circuits for mobile applications, agricultural and machine tool systems.

The **CW** series of canister removes water from oil while filtering the oil at the same time.

Water absorbent polymers up to 800 times their own weight, provide this major feature.

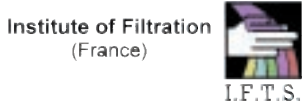
Water holding capacities: - CW 050 - 240 ml.  
CW 150 - 788 ml.

### DIFFERENTIAL INDICATORS For Use with series "1" filter heads.

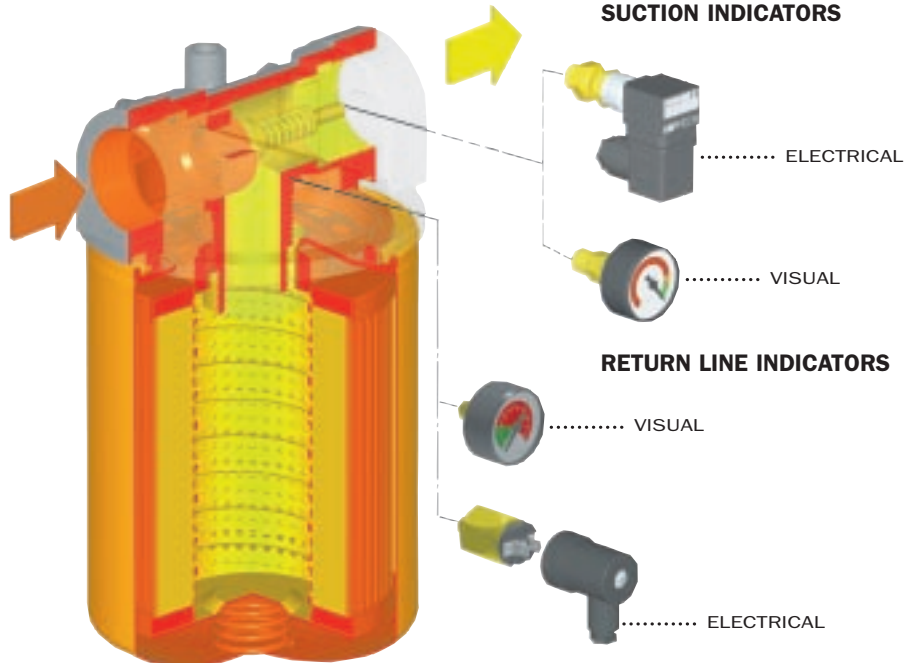


**New**

absolute filter elements  
independently tested  
in the following Institutes:



### For Use with series "0" filter head.



## Filter element:

### Materials

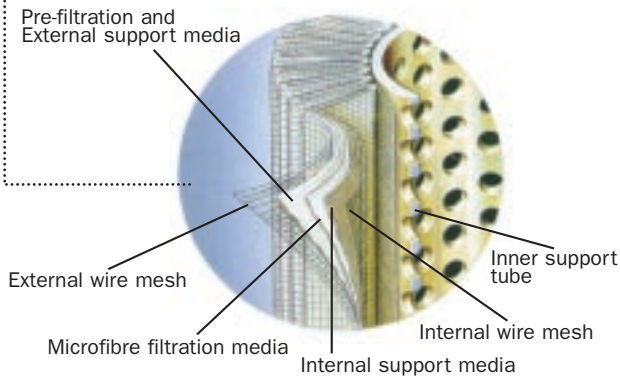
**End caps:**  
Galvanized steel

**Support tube:**  
Galvanized steel

**Support frames:**  
Galvanized steel with an epoxy coating

### A Series

Inorganic microfibre



### MP Filter elements - Conform to the following ISO standards

- ISO 2941 - Verification of collapse/burst resistance.
- ISO 2942 - Verification of fabrication integrity and determination of the first bubble point.
- ISO 2943 - Verification of material compatibility with fluids.
- ISO 3723 - Method for end load test.
- ISO 3724 - Verification of flow fatigue characteristics.
- ISO 3968 - Evaluation of pressure drop versus flow characteristics.
- ISO 16889 - Multi-pass method for evaluating filtration performance.

### Element material Absolute filtration

## A Series

Inorganic microfibre with acrylic support

### Contamination retention

as per ISO 16889: Multi-pass test.

**New improved  $\beta \geq 200$  filter elements with greater efficiency and increased dirt holding capacity**

Filter elements	Dimensions for $\beta$ ( $\mu\text{m}$ ) values				Filtration ratios			$\Delta P$ (bar)
	$\beta \geq 2$ (50%)	$\beta \geq 20$ (95%)	$\beta \geq 75$ (98,7%)	$\beta \geq 200$ (99,5%)	$\beta_2$	$\beta_{10}$	$\beta_{20}$	
A03	-	2	2,4	3	20	> 10.000	> 10.000	7
A06	-	3	4,6	6	8	> 2.000	> 10.000	7
A10	3	6	7,8	10	1,5	$\geq 200$	> 10.000	7
A25	13	19	22	25	-	> 1,5	> 35	7

N.B. Other materials giving different degrees of filtration are available on request.

Type	050	070	100	150
CS-CG-CT				
A03/A06	1900	3160	3950	5390
A10/A25	1900	3160	3950	5390

Values in  $\text{cm}^2$

### Filtering area Filter elements

### Element material Nominal filtration

## P Series

Resin - impregnated paper

## M Series

Square wire mesh (filtration degree is defined in microns by the maximum diameter of a sphere corresponding to the mesh size)

### Filtering area Filter elements

Type	050	070	100	150
CS-CG-CT				
P10/P25	2440	4140	4300	5760
M25	1000	1270	1990	2400
M60	1000	1270	1990	2400
M90	1000	1270	1990	2400

Values in  $\text{cm}^2$

## CW Series

Resin - impregnated paper

Type CW	050	150
P10/P25	2000	3050

## Materials

### Head

Aluminium

### Bypass valve

Nylon

### Seals

A Series: Nitrile (Buna-N)  
V Series: Viton

### Indicator

Brass

## Working

### temperature

From -25 to +110°C

For temperatures outside this range, please consult our Sales Network Organization

## Pressure filter

### body

Maximum working pressure up to

12 bar

## Collapse pressure

### filter elements

4 bar

## Bypass valve

### Calibration pressure

Bypass valve, differential opening pressure:

S series: 0,3 bar ± 10% (MPS series only)  
R series: 1,75 bar ± 10%

## Types of indicators for MPS series "0" (MPS 050-070-100...) and MST series

Description:

**MPS** series filters are fitted with indicators switching:

Suction filters at a pressure of:

Line filters at a pressure of:

Return filter at a pressure of:

**1 Kpa = 0.01 bar**

20 kPa ± 10%

1,3 bar ± 10% (MPS series only)

1,3 bar ± 10% (MPS-MST series only)

### Visual indicator

**Suction filter:** (MPS series only)

**VS** vacuum switch

scale 0 - 76 cm Hg

**Return and line filter**

**VA** Pressure gauge

**VR** colour coded pressure gauge

scale 0 - 12 bar

scale 0 - 6 bar

### Electrical indicator

**Suction filter** (MPS series only)

**E0** Vacuum switch with change over contact

**Return filter**

**ER** Pressure switch with N.O. contacts

**EC** Pressure switch with N.C. contacts

### Operational information:

Switching at 20kPa ± 10%

Max voltage: 250V 50÷60 Hz

Max current: 5 A resistive, 2 A inductive

Protection degree IP65

Switching at 1,3 bar ± 10%

Max voltage: 48V 50÷60 Hz

Max current: 0,5A resistive

0,2A inductive

## Types of indicators for MPS series "1" (MPS 051-071-101-151-301-351)

**MPS** filter series 1 (051-071-101... and so on) are fitted with, differential style indicators.

### Visual indicator

**1V - Z1 Series** for Filter with bypass set to 1,75 bar

switching at 1,2 bar ± 10%

### Electrical indicator

**V6 - Z6 Series** for Filter without bypass

switching at 2 bar ± 10%

### Visual-electrical indicator

**N1 Series** for Filter with bypass set to 1,75 bar

switching at 1,2 bar ± 10%

**N6 Series** for Filter without bypass

switching at 2 bar ± 10%

**1E - K1\* Series** for Filter with bypass set to 1,75 bar

switching at 1,2 bar ± 10%

**E6 - K6\* Series** for Filter without bypass

switching at 2 bar ± 10%

\*For K visual-electrical indicator, specify the voltage (il. K61 = LED: 24 volt)

\* { 1 - 24 Volt  
2 - 115 Volt  
3 - 230 Volt

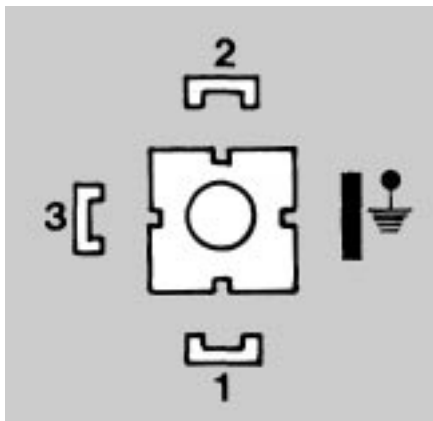
# MP Filtri - Specification

## Pressure differential indicator option

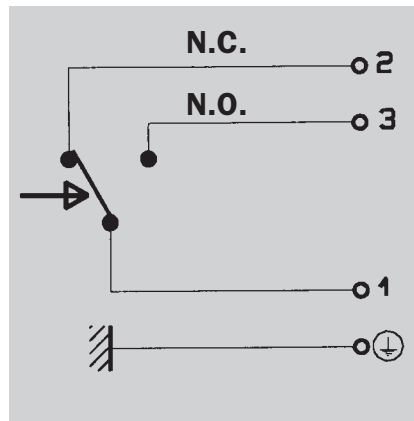
### K - E - N Series

Supply voltage (50/60 Hz) (V)	Resistive load (A)	Inductive load (A)
Vca 125	5	2
Vca 250	5	2
Vcc 30	5	3
Vcc 125	0,5	0,03
Vcc 250	0,25	0,03

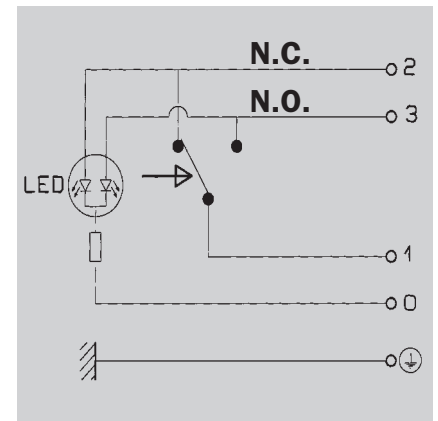
### CONNECTOR DIN 43650



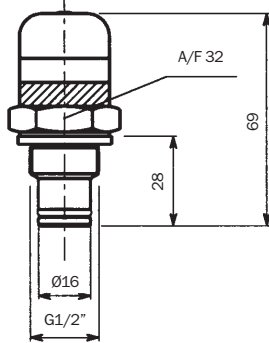
### ELECTRICAL CONNECTION E - N SERIES



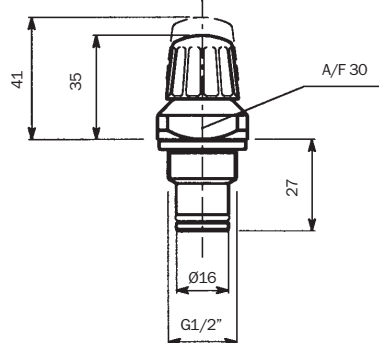
### ELECTRICAL CONNECTION K SERIES



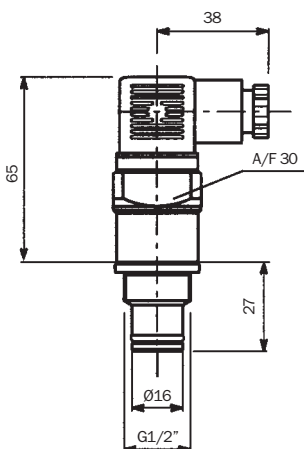
Visual V series



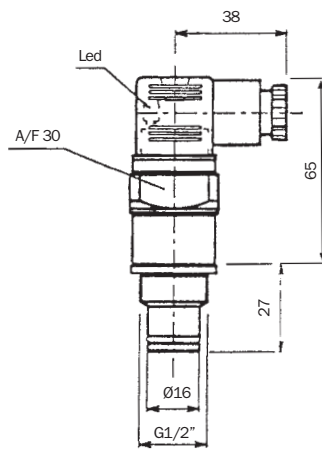
Visual Z series



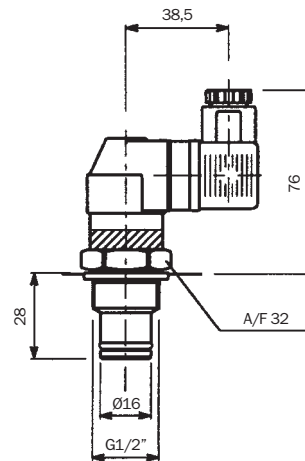
Electrical N series



Visual led - Electrical K series



Visual - Electrical E series



## Fluid

### Compatibility

#### Filter head and bowls

compatible for use with:

- mineral oils  
(types HH-HL-HM-HR-HV-HG as per ISO 6743/4)
- water-based emulsions  
(types HFAE-HFAS as per ISO 6743/4)
- synthetic fluids  
(types HS-HFDR-HFDS-HFDU as per ISO 6743/4)
- water-glycol (types HFC as per ISO 6743/4)

#### Seals

##### A Series

**Nitrile (Buna-N)** compatible with mineral oils  
(types HH-HL-HM-HR-HV-HG as per ISO 6743/4)

water-based emulsions

(types HFAE-HFAS as per ISO 6743/4)

water - glycol (types HFC as per ISO 6743/4)

##### V Series

**Viton** compatible with synthetic fluids

(types HS-HFDR-HFDS-HFDU as per ISO 6743/4)

#### Filter elements

As per ISO 2943; suitable for mineral oils  
(types HH-HL-HM-HR-HV-HG as per ISO 6743/4)

and synthetic fluids (A and M series only)  
(types HS-HFDR-HFDS-HFDU as per ISO 6743/4)

For water-based emulsions (types HFAE-HFAS  
as per ISO 6743/4) and fluids other than  
those mentioned, please consult our Sales  
Network Organization.

## International standards for contamination fluid control

A general (no direct) comparison between ISO 4406 and NAS 1638 is given in table below.

Contamination codes ISO 4406			Correspondent codes NAS 1638	Recommended filtration degree	Typical applications
<i>4µm(c)</i>	<i>6µm(c)</i>	<i>14µm(c)</i>		<i>B x ≥ 200</i>	
14	12	9	3	3	High precision and laboratory servo-systems
17	15	12	6	3-6	Robotic and servo-systems
18	16	13	7	10-12	Very sensitive - high reliability systems
20	18	15	9	12-15	Sensitive - reliable systems
21	19	16	10	15-25	General equipment of limited reliability
23	21	18	12	25-40	Low - pressure equipment not in continuous service

# Selection & installation information

## Filter elements types

### A Series

Absolute inorganic microfibre filtration media, available in 3, 6, 10 and 25 micron  
Example - **A03, A06, A10** or **A25**

### P Series

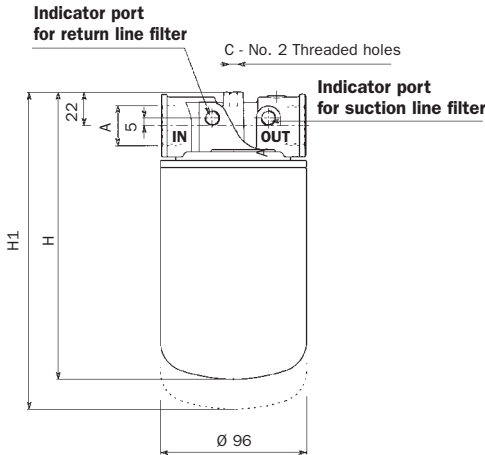
Nominal cellulose impregnated paper media, available in 10 and 25 micron.  
Example - **P10** or **P25**

### M Series

Metal mesh media, available in 25, 60, and 90 micron.  
Example - **M25, M60** or **M90**.

**Please refer to individual pressure drop curves to obtain filter assembly pressure drop information**

The following filter sizing recommendations are based using a mineral oil fluid at 30 mm<sup>2</sup>/s (cSt) with a maximum total filter assembly (housing and filter element) pressure drop of 30% of the filter condition indicator (0.4 bar) for line and return filter and 8 kPa for suction filter.



## MPS 050-071

### Lengths

Type	H	H1
050-051	180	200
070-071	248	268

## MPS SERIES 050-051 SIZES

Filter assembly	Line Flow rate l/min *	Suction Flow rate l/min *	Port size BSP/NPT/SAE	Weight kg **
A03	40	9	SEE TABLE BELOW	1,0
A06	44	11		
A10	48	14		
A25	58	18		
P10	55	16		
M60-M90	-	24		

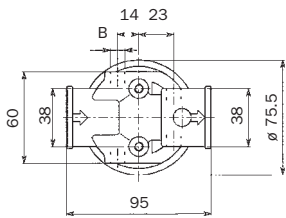
## MPS SERIES 070-071 SIZES

Filter assembly	Line Flow rate l/min *	Suction Flow rate l/min *	Port size BSP/NPT/SAE	Weight kg **
A03	45	11	SEE TABLE BELOW	1,3
A06	49	13		
A10	53	15		
A25	63	20		
P10	58	18		
M60-M90	-	26		

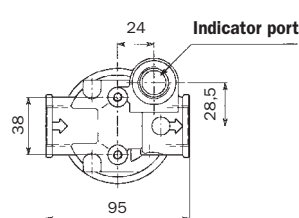
\* Flow rates with 30 mm<sup>2</sup>/s fluid viscosity

\*\* Weight including filter element

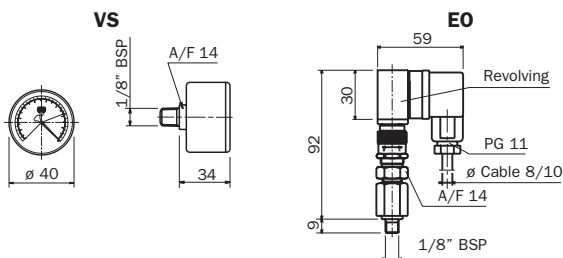
### MPS 050-070 Series



### MPS 051-071 Series



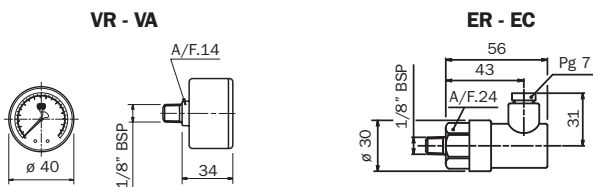
### Indicator for suction filter MPS 050-070 (only for option G1-G5)



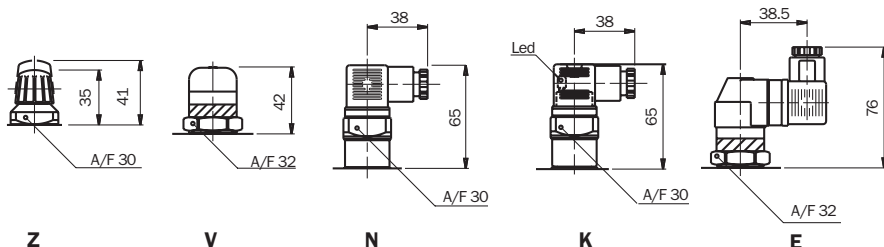
### Thread connections

Type	A	B	C
G1	3/4" BSP	1/8" BSP	M6
G2	3/4" NPT	1/8" NPT	1/4" UNC
G3	SAE 12 - 1 1/16" - 12 UN	1/8" NPT	1/4" UNC
G4	SAE 8 - 3/4" - 16 UNF	1/8" NPT	1/4" UNC
G5	1" BSP	1/8" BSP	M6
G6	1" NPT	1/8" NPT	1/4" UNC

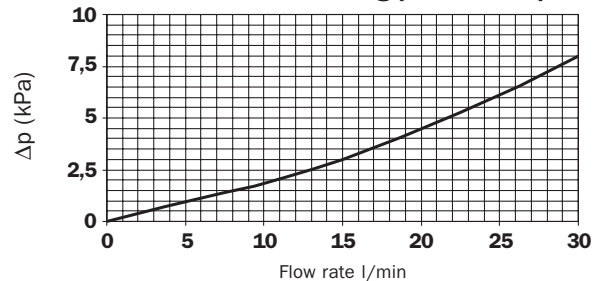
### Indicator for return filter MPS 050-070 (only for option G1-G5)



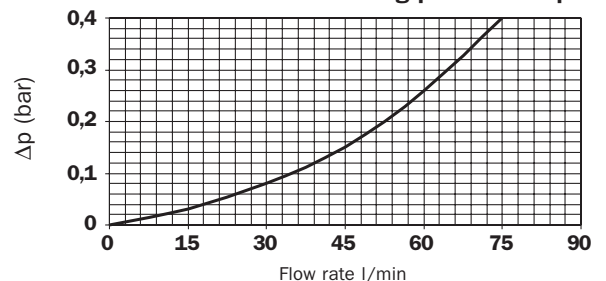
### Indicator for line filter MPS 051-071



### Suction filter - Housing pressure drop



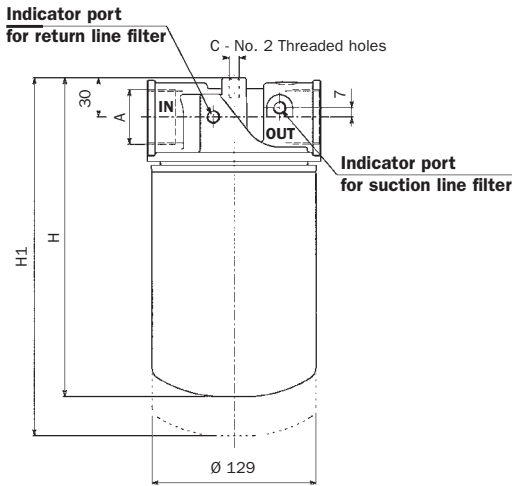
### Return line filter - Housing pressure drop



# Selection & installation information

Please refer to individual pressure drop curves to obtain filter assembly pressure drop information

The following filter sizing recommendations are based using a mineral oil fluid at 30 mm<sup>2</sup>/s (cSt) with a maximum total filter assembly (housing and filter element) pressure drop of 30% of the filter condition indicator (0.4 bar) for line and return filter and 8 kPa for suction filter.

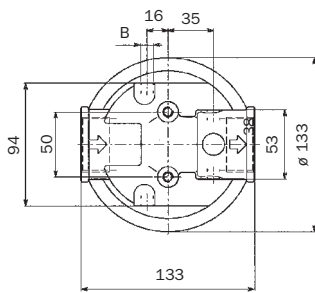


## MPS 100-151

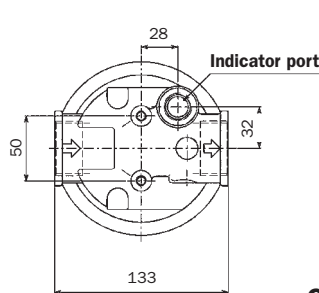
### Lengths

Type	H	H1
100-101	241	266
150-151	286	311

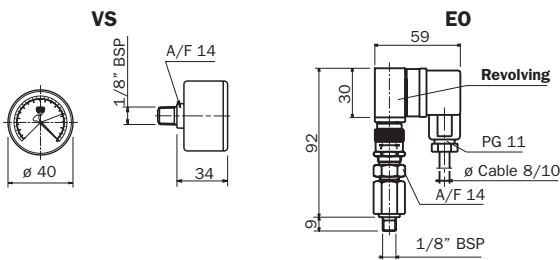
### MPS 100-150 Series



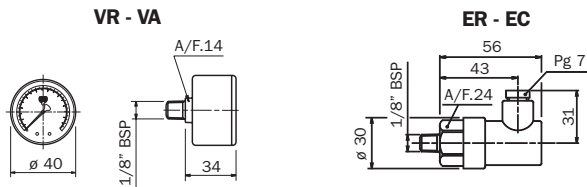
### MPS 101-151 Series



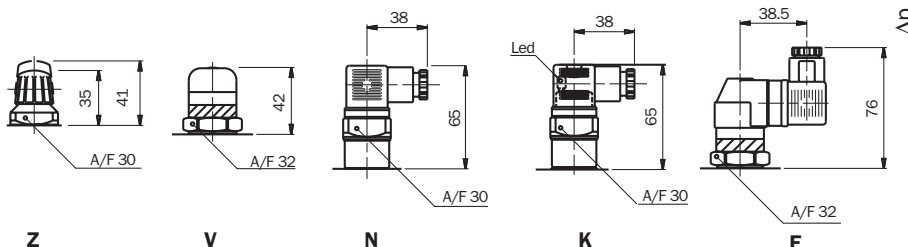
### Indicator for suction filter MPS 100-150 (only for option G1)



### Indicator for return filter MPS 100-150 (only for option G1)



### Indicator for line filter MPS 101-151



## MPS SERIES 100-101 SIZES

Filter assembly	Line Flow rate l/min *	Suction Flow rate l/min *	Port size BSP/NPT/SAE	Weight kg **
A03	75	16	1 1/4"	2,2
A06	85	19		
A10	110	25		
A25	140	40		
P10	130	35		
M60-M90	-	65		

## MPS SERIES 150-151 SIZES

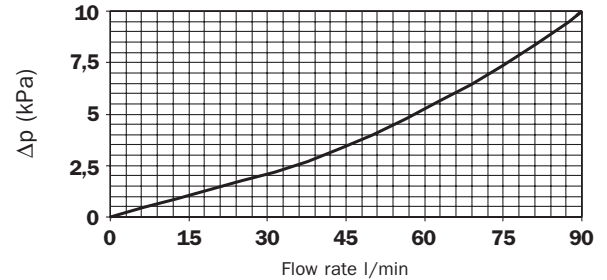
Filter assembly	Line Flow rate l/min *	Suction Flow rate l/min *	Port size BSP/NPT/SAE	Weight kg **
A03	85	18	1 1/4"	2,3
A06	100	22		
A10	115	30		
A25	160	45		
P10	150	40		
M60-M90	-	68		

\* Flow rates with 30 mm<sup>2</sup>/s fluid viscosity  
\*\* Weight including filter element

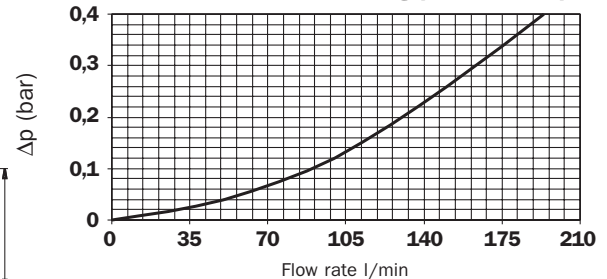
### Thread connections

Type	A	B	C
G1	1 1/4" BSP	1/8" BSP	M8
G2	1 1/4" NPT	1/8" NPT	5/16" UNC
G3	SAE 20 - 1 5/8" - 12 UN	1/8" NPT	5/16" UNC

### Suction filter - Housing pressure drop



### Return line filter - Housing pressure drop



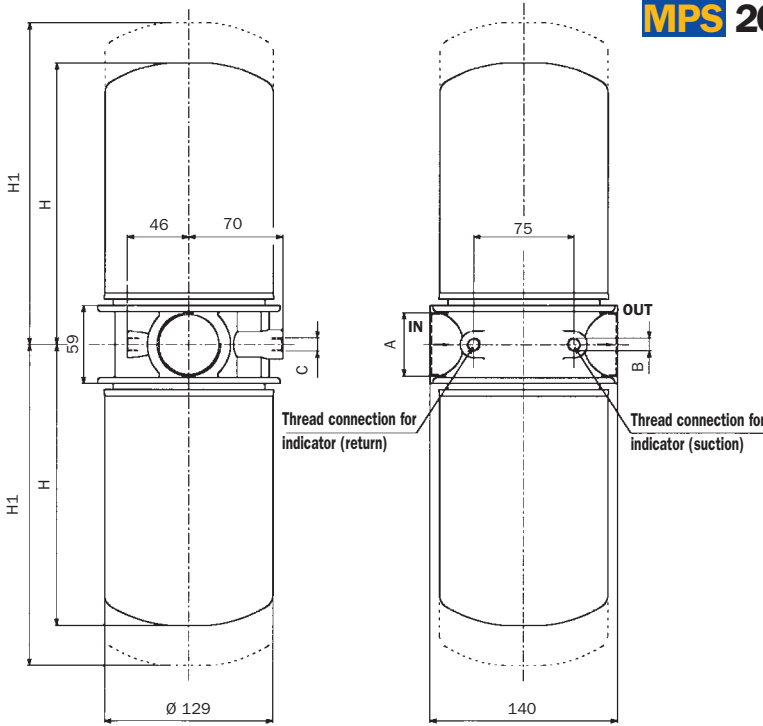


# Selection & installation information

Please refer to individual pressure drop curves to obtain filter assembly pressure drop information

The following filter sizing recommendations are based using a mineral oil fluid at 30 mm<sup>2</sup>/s (cSt) with a maximum total filter assembly (housing and filter element) pressure drop of 30% of the filter condition indicator (0.4 bar) for line and return filter and 8 kPa for suction filter.

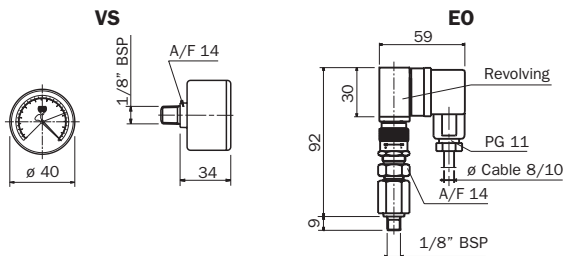
## MPS 200-250



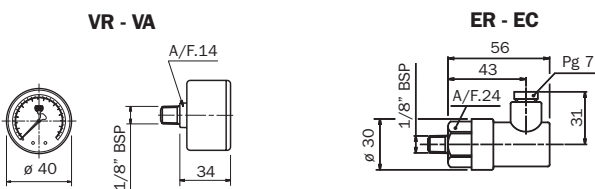
### Lengths

Type	H	H1
200	216	241
250	261	286

### Indicator for suction filter (only for option G1)



### Indicator for return filter (only for option G1)



## MPS SERIES 200 SIZES

Filter assembly	Line Flow rate l/min *	Suction Flow rate l/min *	Port size BSP/NPT/SAE	Weight kg **
A03	130	30	1 1/2"	4,0
A06	170	45		
A10	220	65		
A25	290	110		
P10	270	100		
M60-M90	-	120		

## MPS SERIES 250 SIZES

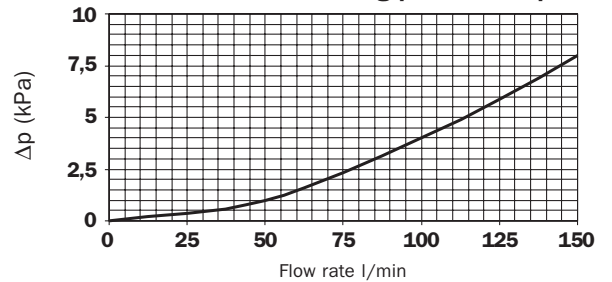
Filter assembly	Line Flow rate l/min *	Suction Flow rate l/min *	Port size BSP/NPT/SAE	Weight kg **
A03	180	50	1 1/2"	4,2
A06	210	60		
A10	250	80		
A25	310	125		
P10	280	118		
M60-M90	-	130		

\* Flow rates with 30 mm<sup>2</sup>/s fluid viscosity  
\*\* Weight including filter element

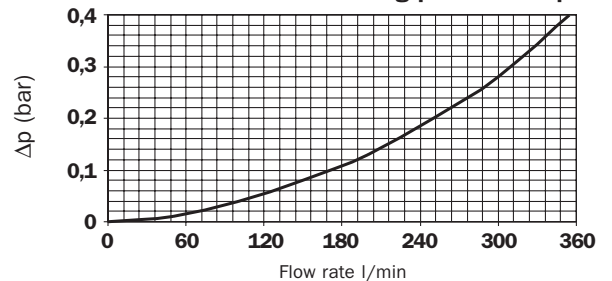
### Thread connections

Type	A	B	C
G1	1 1/2" BSP	1/8" BSP	M10
G2	1 1/2" NPT	1/8" NPT	3/8" UNC
G3	SAE 24 - 1 7/8" - 12 UN	1/8" NPT	3/8" UNC

### Suction filter - Housing pressure drop



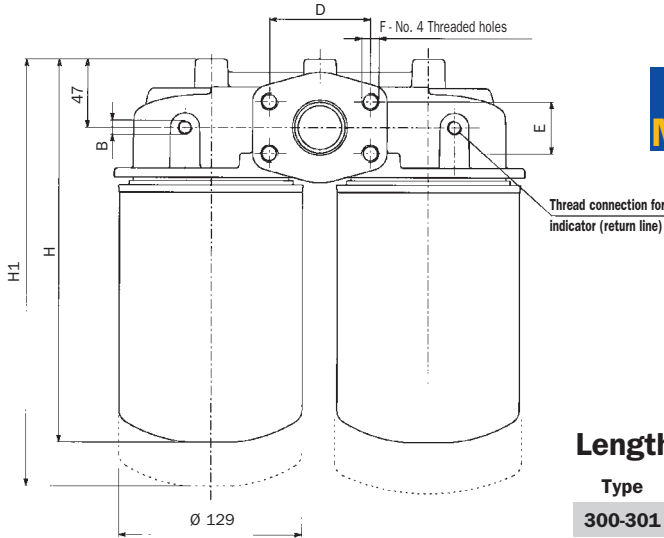
### Return line filter - Housing pressure drop



# Selection & installation information

Please refer to individual pressure drop curves to obtain filter assembly pressure drop information

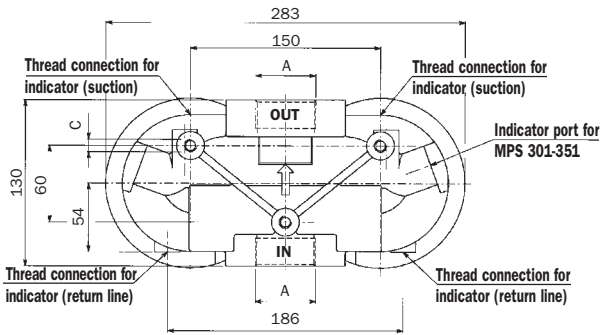
The following filter sizing recommendations are based using a mineral oil fluid at 30 mm<sup>2</sup>/s (cSt) with a maximum total filter assembly (housing and filter element) pressure drop of 30% of the filter condition indicator (0.4 bar) for line and return filter and 8 kPa for suction filter.



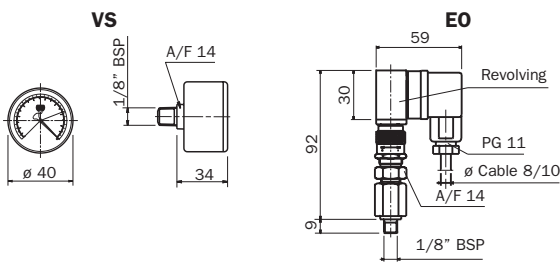
## MPS 300-351

### Lengths

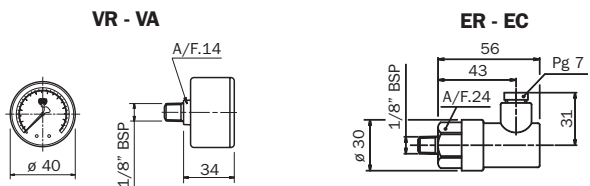
Type	H	H1
300-301	265	290
350-351	310	335



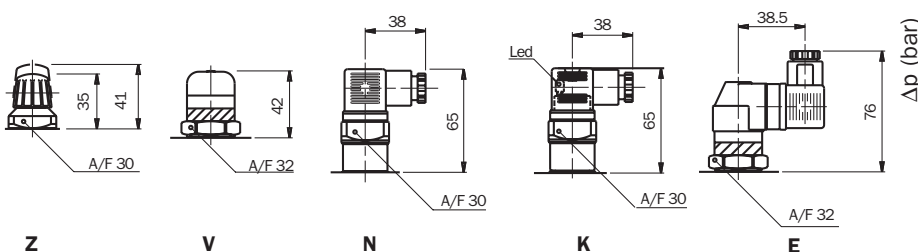
### Indicator for suction filter MPS 300-350 (only for option G1-G5-F1)



### Indicator for return filter MPS 300-350 (only for option G1-G5-F1)



### Indicator for line filter MPS 301-351



## MPS SERIES 300-301 SIZES

Filter assembly	Line Flow rate l/min	Suction Flow rate l/min	Port size BSP/NPT/SAE	Weight kg **
A03	130	30	1 1/2"	5,4
A06	170	45		
A10	220	65		
A25	290	110		
P10	270	100		
M60-M90	-	120		

## MPS SERIES 350-351 SIZES

Filter assembly	Line Flow rate l/min	Suction Flow rate l/min	Port size BSP/NPT/SAE	Weight kg **
A03	180	50	1 1/2"	5,6
A06	210	60		
A10	250	80		
A25	310	125		
P10	280	118		
M60-M90	-	130		

\* Flow rates with 30 mm<sup>2</sup>/s fluid viscosity  
\*\* Weight including filter element

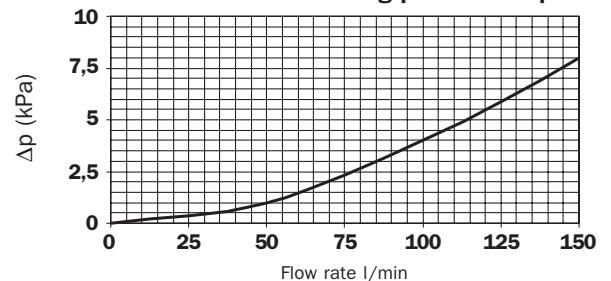
### Thread connections

Type	A	B	C
G1	1 1/2" BSP	1/8" BSP	M10
G2	1 1/2" NPT	1/8" NPT	3/8" UNC
G3	SAE 24 - 1 7/8" - 12 UN	1/8" NPT	3/8" UNC

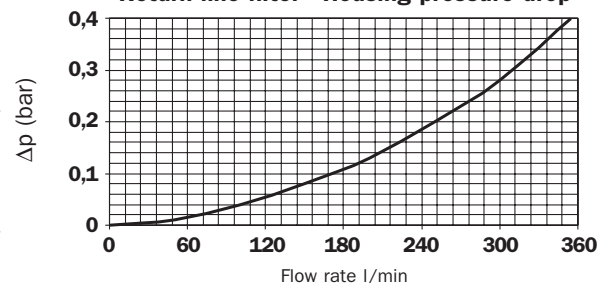
### Flange connections

Type	A	B	C	D	E	F
F1	1 1/2" SAE 3000 PSI/M	1/8" BSP	M12	69,85	35,71	M12
F2	1 1/2" SAE 3000 PSI/UNC	1/8" NPT	1/2" UNC	69,85	35,71	1/2" UNC

### Suction filter - Housing pressure drop

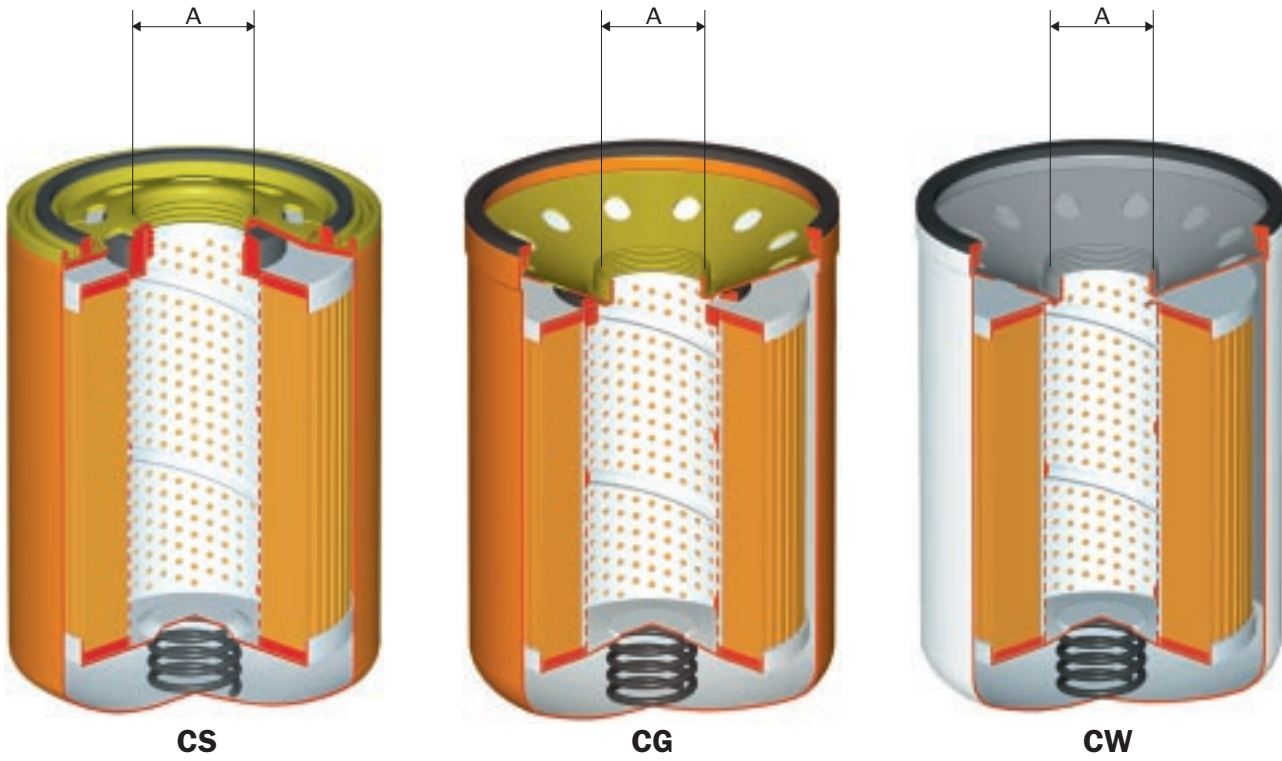


### Return line filter - Housing pressure drop



# Description

## FILTER ELEMENT SERIES -



**New**

absolute filter elements  
independently tested  
in the following Institutes:

### Thread connections

Type	A
CS 050-070	3/4" BSP
CS 100-150	1 1/4" BSP

Type	A
CG 050-070	1" - 12 UN
CG 100-150	1 1/2" - 16 UN

Type	A
CW 050	1" - 12 UN
CW 150	1 1/2" - 16 UN

Institute of Filtration  
(France)



I.F.T.S.



Royal Institute of Technology

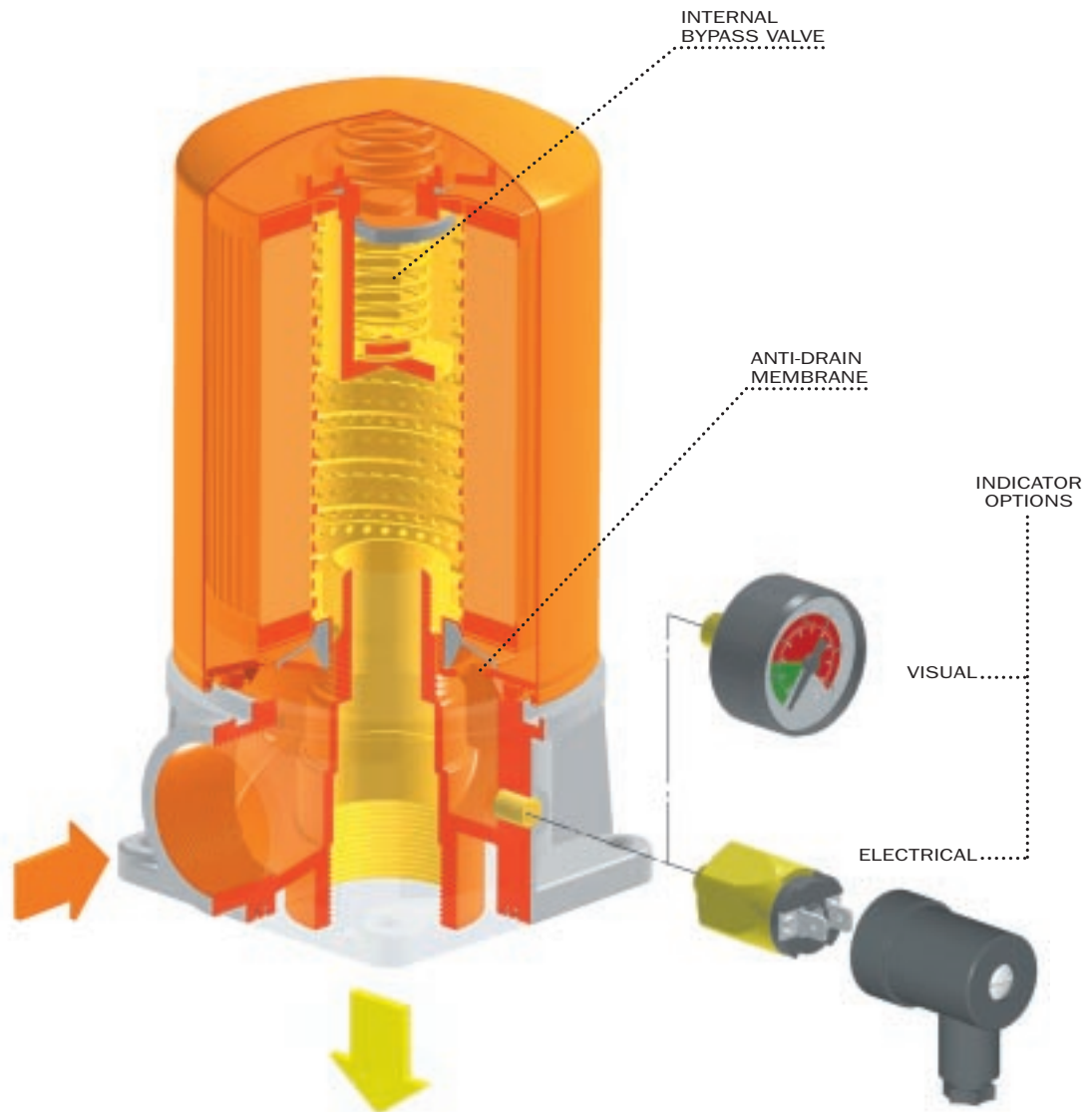
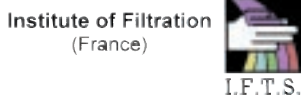


# Description

**MST** - Suitable for installation on return lines, mounted tank top where the flow does not exceed 350 l/min. MST use spin-on canisters incorporating a bypass valve. To avoid oil leaks during maintenance, the canisters have a special anti-drain membrane. **MST** - filter is ideal for machine tool and agricultural applications.

**New**

absolute filter elements  
independently tested  
in the following Institutes:



# Selection & installation information

## Filter elements types

### A Series

Absolute inorganic microfibre filtration media, available in 3, 6, 10 and 25 micron  
Example - **A03, A06, A10** or **A25**

### P Series

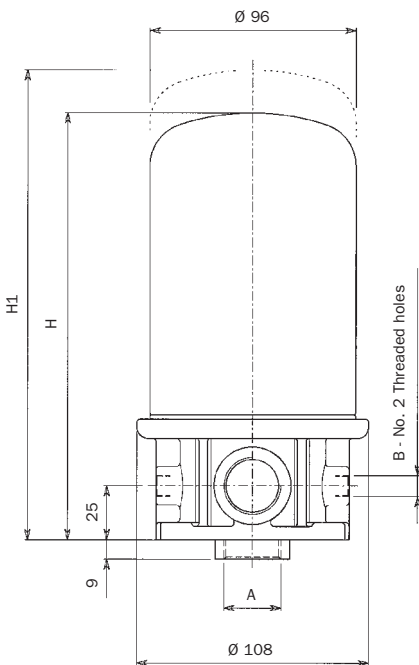
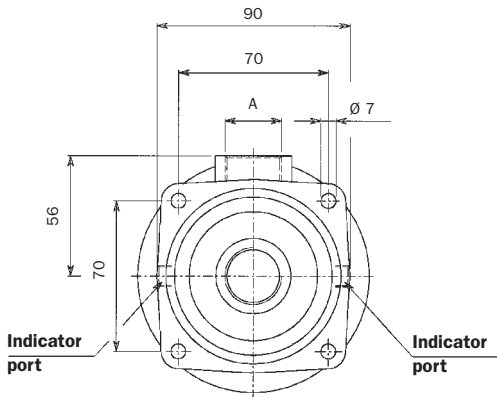
Nominal cellulose impregnated paper media, available in 10 and 25 micron.  
Example - **P10** or **P25**

### M Series

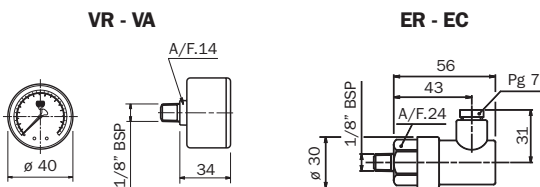
Metal mesh media, available in 25, 60, and 90 micron.  
Example - **M25, M60** or **M90**.

**Please refer to individual pressure drop curves to obtain filter assembly pressure drop information**

The following filter sizing recommendations are based using a mineral oil fluid at 30 mm<sup>2</sup>/s (cSt) with a maximum total filter assembly (housing and filter element) pressure drop of 30% of the filter condition indicator (0.4 bar) for line and return filter.



## Indicator (only for option G1)



## MST SERIES 050 SIZES

### MST 050-070

Filter assembly	Flow rate l/min *	Port size BSP/NPT/SAE	Weight kg **
A03	42	3/4"	1,2
A06	50		
A10	65		
A25	75		
P10	68		

## MST SERIES 070 SIZES

Filter assembly	Flow rate l/min *	Port size BSP/NPT/SAE	Weight kg **
A03	55	3/4"	1,5
A06	60		
A10	68		
A25	80		
P10	76		

\* Flow rates with 30 mm<sup>2</sup>/s fluid viscosity  
\*\* Weight including filter element

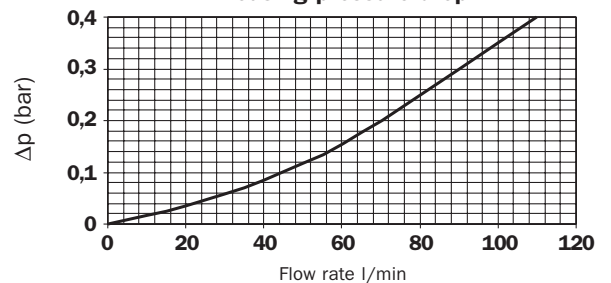
## Thread connections

Type	A	B
G1	3/4" BSP	1/8" BSP
G2	3/4" NPT	1/8" NPT
G3	SAE 8 - 3/4" - 16 UN	1/8" NPT

## Lengths

Type	H	H1
050	190	208
070	265	283

## Housing pressure drop

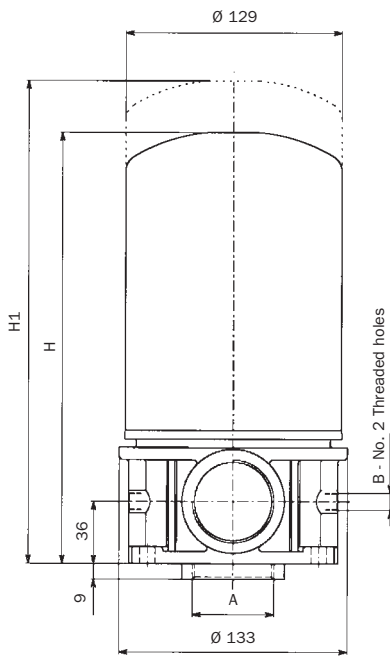
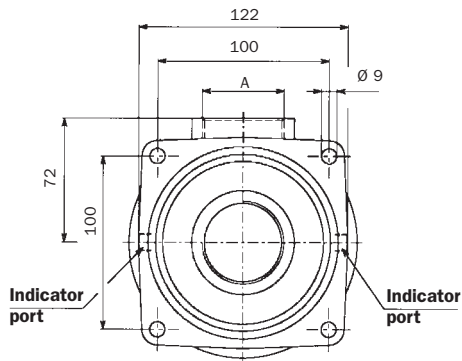


# Selection & installation information

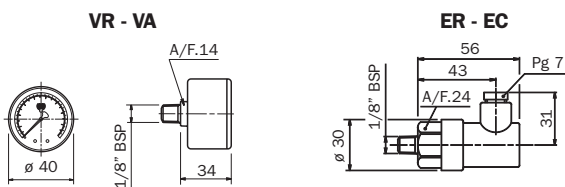
**Please refer to individual pressure drop curves to obtain filter assembly pressure drop information**

The following filter sizing recommendations are based using a mineral oil fluid at 30 mm<sup>2</sup>/s (cSt) with a maximum total filter assembly (housing and filter element) pressure drop of 30% of the filter condition indicator (0.4 bar) for line and return filter.

## MST 100-150



**Indicator (only for option G1)**



## MST SERIES 100 SIZES

Filter assembly	Flow rate l/min *	Port size BSP/NPT/SAE	Weight kg **
A03	80	1 1/2"	2,3
A06	90		
A10	125		
A25	185		
P10	175		

## MST SERIES 150 SIZES

Filter assembly	Flow rate l/min *	Port size BSP/NPT/SAE	Weight kg **
A03	90	1 1/2"	2,4
A06	110		
A10	140		
A25	210		
P10	190		

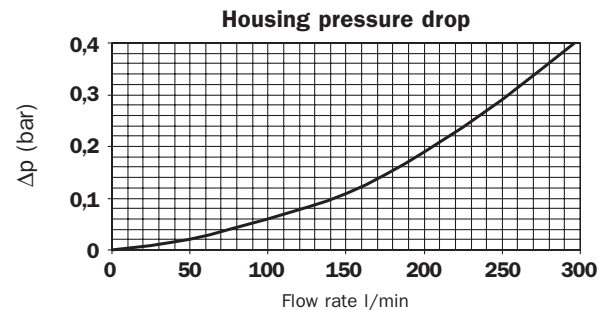
\* Flow rates with 30 mm<sup>2</sup>/s fluid viscosity  
\*\* Weight including filter element

## Thread connections

Type	A	B
G1	1 1/2" BSP	1/8" BSP
G2	1 1/2" NPT	1/8" NPT
G3	SAE 20 - 1 5/8" - 12 UN	1/8" NPT

## Lengths

Type	H	H1
100	250	275
150	280	305



# Pressure drop information

## General

Pressure drop versus flow rate curve information for both housing and filter elements is in accordance with ISO 3968

**Filter assembly pressure drop** -  $\Delta p_{\text{Total}} = \Delta p_{\text{Housing}} + \Delta p_{\text{Filter element}}$

**Housing pressure drop** - The housing pressure drop is proportional to the fluid density

**Filter element pressure drop** - Filter element pressure drop is proportional to kinematic viscosity therefore always check the fluid operating temperature and fluid type to obtain the working viscosity according to the following formula:

$$\Delta p_1 \text{ Filter element} = (\text{working viscosity} / \text{brochure viscosity}) \times \Delta p \text{ filter element}$$

Brochure viscosity 30 mm<sup>2</sup>/s (cSt)

$$1 \text{ kPa} = 0,01 \text{ bar}$$

## Filter assembly sizing example

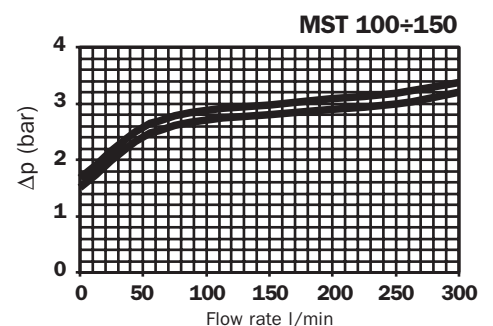
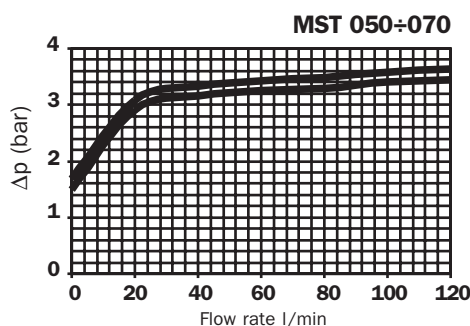
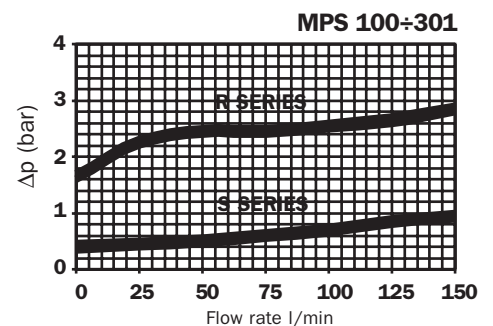
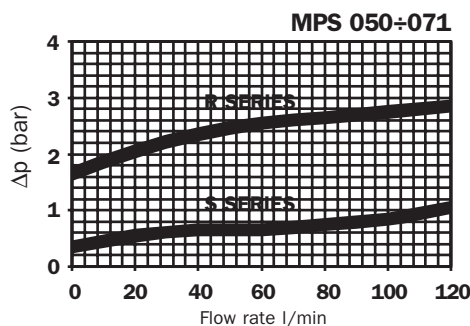
- Customer requires a 100 l/min filter assembly
- Mineral oil fluid: ISO VG46 (46 mm<sup>2</sup>/s (cSt) at 40°C)
- 25 micron absolute filtration
- return line application

### Selection :

- **Housing pressure drop** - MPS 100/101 with 100 l/min  $\Delta p = 0,13 \text{ bar}$  (see curve on page 8)
- **Filter element pressure drop** brochure viscosity - CS 100A25 with 100 l/min  $\Delta p = 0,09 \text{ bar}$  (see curve on page 17)
- **Filter element pressure drop** working viscosity - With 46 mm<sup>2</sup>/s (cSt)  $\Delta p_1 = 0,09 \times (46/30) = 0,138 \text{ bar}$
- **Filter assembly pressure drop**  $\Delta p_{\text{Total}} = \Delta p_{\text{Housing}} + \Delta p_1 \text{ Filter element} = 0,13 + 0,138 = \mathbf{0,268 \text{ bar}^*}$  { Acceptable pressure drop value, as per our recommendations

## Bypass valves pressure drop

The curves were obtained using a mineral oil with a density of 0,86 kg/dm<sup>3</sup>.  
The  $\Delta p$  varies proportionally to the density.

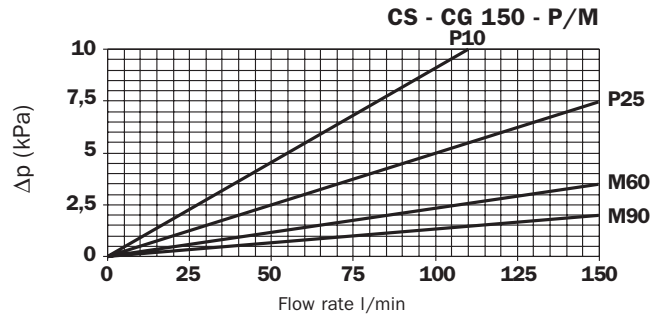
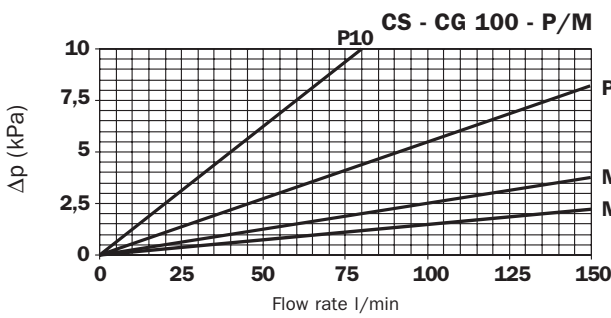
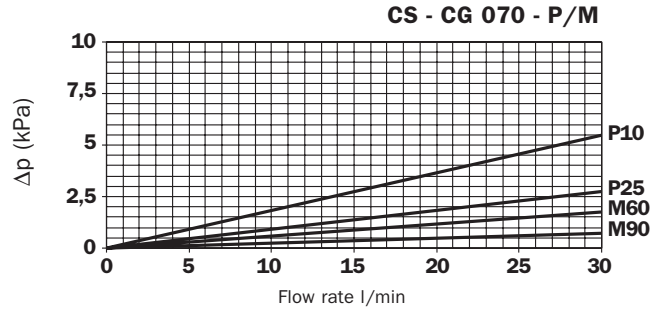
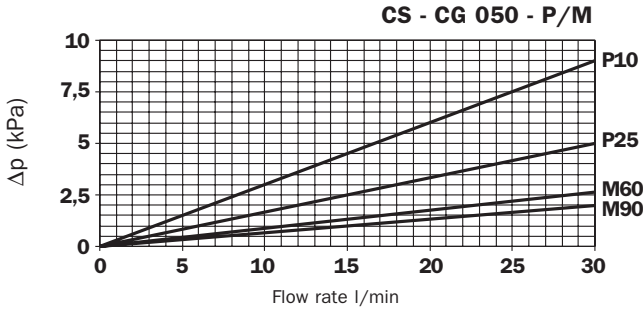


**R series:** Return filter  
**S series:** Suction filter

# SUCTION FILTER

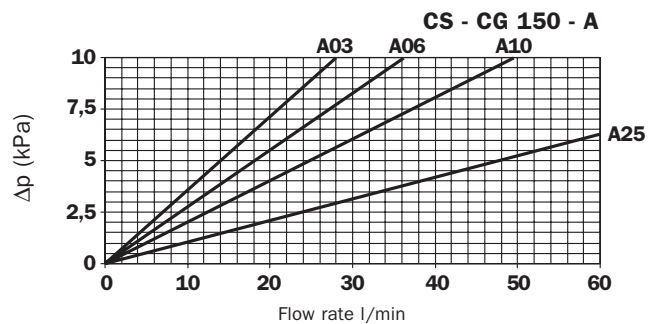
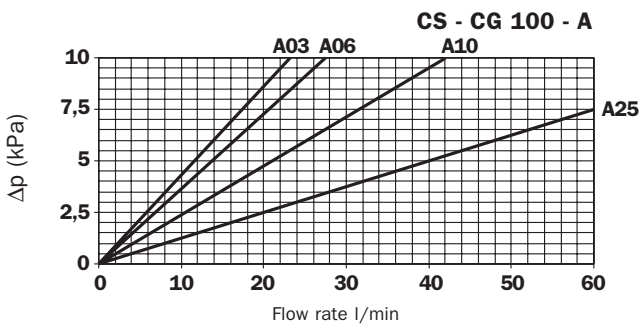
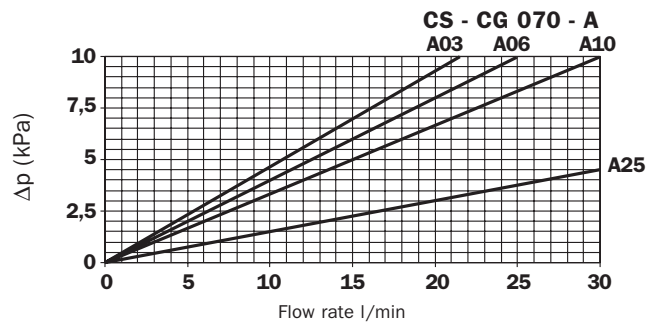
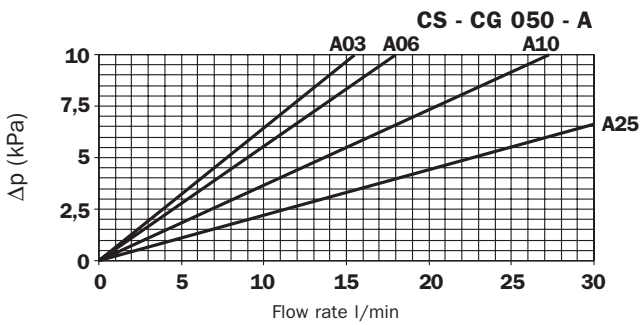
## Filter elements - P/M Series

The curves were obtained using a mineral oil with a kinematic viscosity of 30 mm<sup>2</sup>/s (cSt).  
The  $\Delta p$  varies proportionally to the fluid kinematic viscosity.



## Filter elements - A Series

The curves were obtained using a mineral oil with a kinematic viscosity of 30 mm<sup>2</sup>/s (cSt).  
The  $\Delta p$  varies proportionally to the fluid kinematic viscosity.

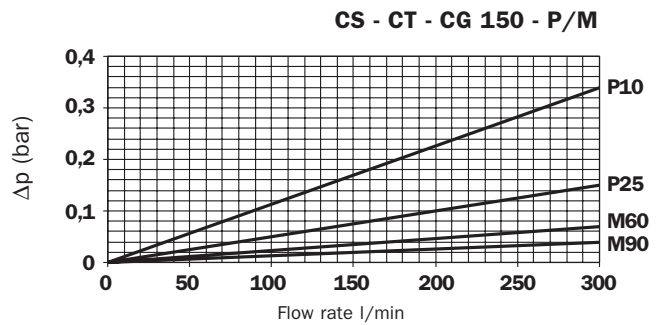
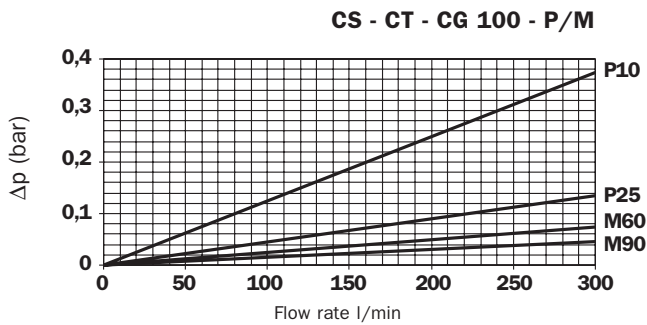
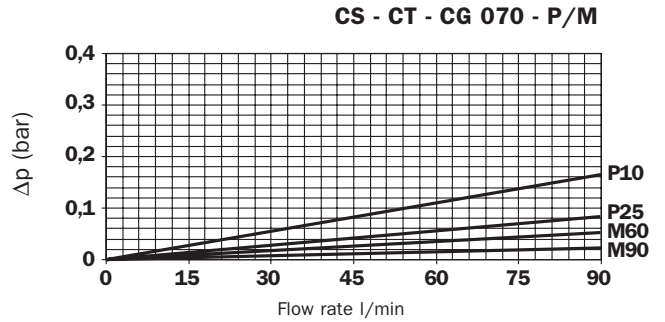
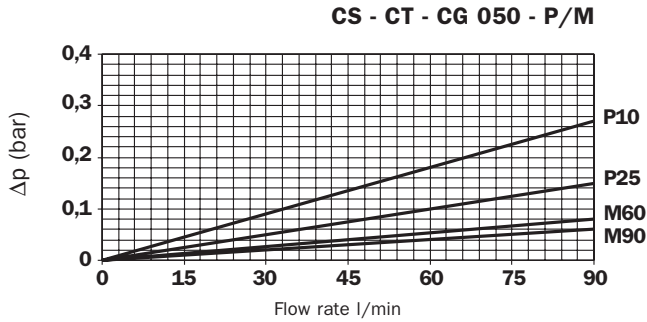




# RETURN FILTER

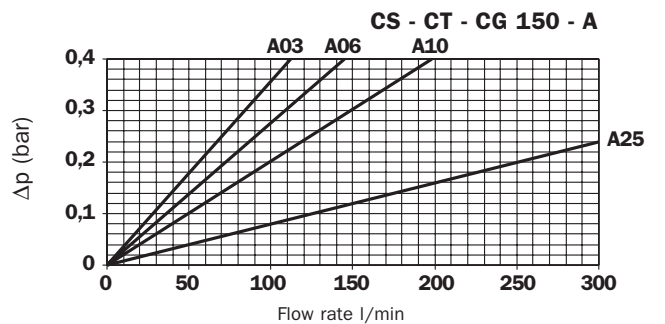
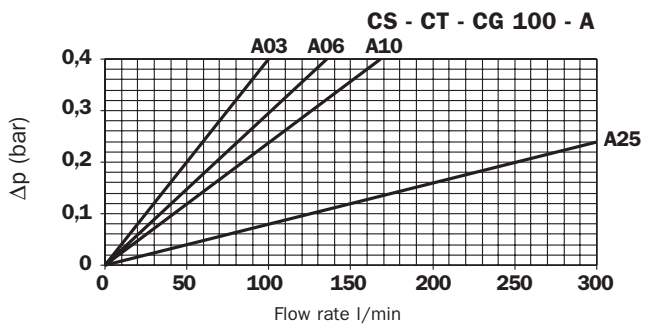
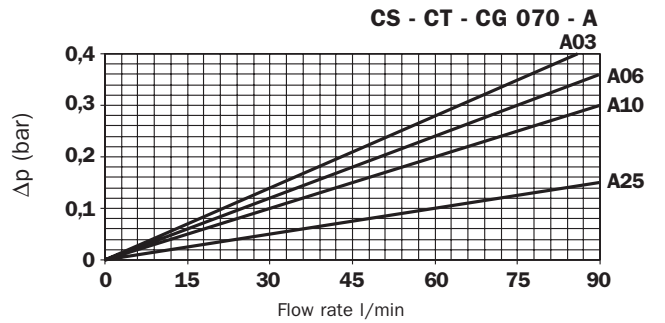
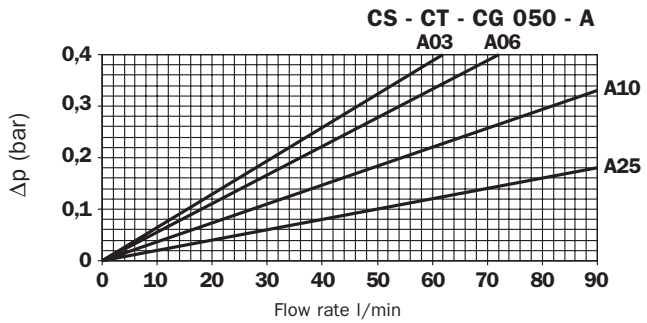
## Filter elements - P/M Series

The curves were obtained using a mineral oil with a kinematic viscosity of  $30 \text{ mm}^2/\text{s}$  (cSt).  
The  $\Delta p$  varies proportionally to the fluid kinematic viscosity.



## Filter elements - A Series

The curves were obtained using a mineral oil with a kinematic viscosity of  $30 \text{ mm}^2/\text{s}$  (cSt).  
The  $\Delta p$  varies proportionally to the fluid kinematic viscosity.



# Ordering information

## MPS

### Nominal sizes .....

Series 0	Series 1
050	051
070	071
100	101
150	151
200	-
250	-
300	301
350	351

### Bypass valve .....

Filter series "0"	
C	With bypass 1,75 bar - 4 indicator ports
O	Without bypass with indicator ports on suction
P	Without bypass with indicator ports on return
R	with bypass 1,75 bar and indicator ports on return
S	With bypass 30 kPa and indicator ports on suction
U	Without bypass without indicator ports
Filter series "1"	
R	With bypass 1.75 bar
P	Without bypass

### Port options .....

Type	MPS 050-071	MPS 100-151	MPS 200-250	MPS 300-351
G1	3/4" BSP	1 1/4" BSP	1 1/2" BSP	1 1/2" BSP
G2	3/4" NPT	1 1/4" NPT	1 1/2" NPT	1 1/2" NPT
G3	SAE 12	SAE 20	SAE 24	SAE 24
G4	SAE 8	-	-	-
G5	1" BSP	-	-	-
G6	1" NPT	-	-	-
F1	-	-	-	1 1/2" SAE 3000 Psi/M
F2	-	-	-	1 1/2" SAE 3000 Psi/UNC

G4 Option without bypass only

### Series

CS	European std. filter element
CG	USA standard filter element
CW	USA standard filter element (water removal type)

### Filter condition indicator

S	With threaded hole only
T	With plug

### Indicators for suction filters (MPS series only)

VS	Visual vacuum gauge
EO	Electrical vacuum switch exchange contact

### Indicators for return filters (for MPS/MST series)

VA	Visual pressure gauge
VR	Colour coded pressure gauge
ER	Pressure switch with N.O. contacts
EC	Pressure switch with N.C. contacts

### Differential indicators for line filters (only for series "1")

S	With threaded hole only
T2	Plug for indicator port
1V	Visual 1,2 bar
V6	Visual 2 bar
Z1	Visual 1,2 bar
Z6	Visual 2 bar
N1	Electrical 1,2 bar
N6	Electrical 2 bar
1E	Visual-electrical 1,2 bar
E6	Visual-electrical 2 bar
K1*	Visual-Electrical 1,2 bar
K6*	Visual-Electrical 2 bar

\*For K visual-electrical indicator, specify the voltage (f.i. K61)

### Seals .....

A	Nitrile (Buna - N)
V	Viton

### Filter elements M/P series .....

P10	Resin-impregnated paper $\beta_x \geq 2$
P25	
M25	Square wire mesh
M60	
M90	

### Filter elements A series

A03	Inorganic microfibre $\beta_x \geq 200$
A06	
A10	
A25	

### Nominal sizes

050	no. 1 element for MPS 050-051
070	no. 1 element for MPS 070-071
100	no. 1 element for MPS 100-101
100	no. 2 elements for MPS 200
100	no. 2 elements for MPS 300-301
150	no. 1 element for MPS 150-151
150	nr. 2 elements for MPS 250
150	nr. 2 elements for MPS 300-301

## CS

# Replacement element

MP Filtri - Filtration products will only be guaranteed if original MP Filtri replacement elements and spares are used

Data held in this publication is given only for indicative purposes. MP Filtri reserves to introduce modifications to described items for technical or commercial reasons. Copyright reserved.

## MST

### Nominal sizes

050  
070  
100  
150

### Seals

A Nitrile (Buna - N)  
V Viton

### Port options

Type	MST 050-070	MST 100-150
G1	3/4" BSP	1 1/2" BSP
G2	3/4" NPT	1 1/2" NPT
G3	SAE 8	SAE 20

### Filter elements indicator

S With threaded hole only  
T With plug  
VR Colour coded pressure gauge  
ER Pressure switch with N.O. contacts  
EC Pressure switch with N.C. contacts

### Bypass valve

B Calibration: 1,75 bar

### Seals

A Nitrile (Buna - N)  
V Viton

### Filter elements M/P series

P10  
P25 Resin-impregnated paper  $\beta_x \geq 2$   
M25  
M60  
M90 Square wire mesh

### Filter elements A series

A03  
A06  
A10  
A25 Inorganic microfibre  $\beta_x \geq 200$

## CT

# Replacement element

**MP Filtri** - Filtration products will only be guaranteed if original MP Filtri replacement elements and spares are used

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**New Headquarters :**

**MP FILTRI S.p.A. Italy**

Via 1° Magglo, n. 3  
20060 Pessano con Bornago  
(Milano) Italy  
Tel. +39.02/95703.1  
Fax +39.02/95741497-95740188  
email: sales@mpfiltri.com  
<http://www.mpfiltri.com>

**GREAT BRITAIN**

**MP FILTRI U.K. Ltd.**

Bourton Industrial Park  
Bourton on the Water  
Gloucestershire GL54 2HQ UK  
Phone: +44.01451-822522  
Fax: +44.01451-822282  
email: sales@mpfiltri.co.uk  
<http://www.mpfiltri.com>

**GERMANY**

**MP FILTRI D GmbH**

Am Wasserturm 5  
D-66265 Heusweiler/Holz  
Phone: +49.(0)6806-85022.0  
Fax: +49.(0)6806-85022.18  
email: service@mpfiltri.de  
<http://www.mpfiltri.com>

**FRANCE**

**MP FILTRI FRANCE Sas**

198 Avenue des Gresillons  
92600 Asnieres Sur Seine  
France  
Tel: +33.(0)1-40-86-47-00  
Fax: +33.(0)1-40-86-47-09  
email: contact@mpfiltrifrance.com  
<http://www.mpfiltri.com>

**USA**

**MP FILTRI USA Inc.**

2055 Quaker Pointe Drive  
Quakertown, PA 18951  
Phone: +1.215-529-1300  
Fax: +1.215-529-1902  
email: sales@mpfiltriusa.com  
<http://www.mpfiltriusa.com>

**CANADA**

**MP FILTRI CANADA Inc.**

380 Four Valley Drive Concorde  
Ontario Canada L4K 5Z1  
Phone: +1.905-303-1369  
Fax: +1.905-303-7256  
email: mail@mpfiltricanada.com  
<http://www.mpfiltricanada.com>

**RUSSIAN FEDERATION**

**MP FILTRI RUSSIA**

Phone/Fax: +7(495)220-94-60  
P.O. Box 44 127562 Moscow, Russia  
email: mpfiltrirusia@yahoo.com  
<http://www.mpfiltri.ru>

**CHINA**

**MP FILTRI (Shanghai) Co. Ltd.**

1280 Lianxi Rd, 8 Bld - 2 Floor  
Shanghai, Pudong  
201204 P.R. China  
Phone: + 86.21-58919916  
Fax: + 86.21-58919667  
email: sales@mpfiltrishanghai.com  
<http://www.mpfiltri.com>

# SERIES MSH

**SPIN-ON FILTER - LOW PRESSURE LINE**



**MPFILTRI**<sup>®</sup>  
filtri per oleodinamica



Maximum working pressure 500 psi

Flow rate to 80 GPM

# D e s c r i p t i o n

## MSH

This filter **MSH** series utilises spin-on canisters, with flow capabilities of 80 gpm and has a maximum working pressure of 500 psi, with a peak pressure rating of 700 psi.

Technically, the **MSH** filters is a new concept, as the filter canister is seamless. Our unique sealing system ensures that the product will withstand medium pressure up to 700 psi.

The **MSH** filters feature a bypass valve and utilise a pressure differential indicator. A patented (no.22083A/86) head/bowl sealing system ensures leak free filters every time.

The **MSH** series is particularly suitable for use on supercharging or auxiliary, low-pressure lines. Ideally suited for use in a servo-assisted hydrostatic transmission where the servo line requires high-performance filtration at medium working pressures.

### INDICATORS

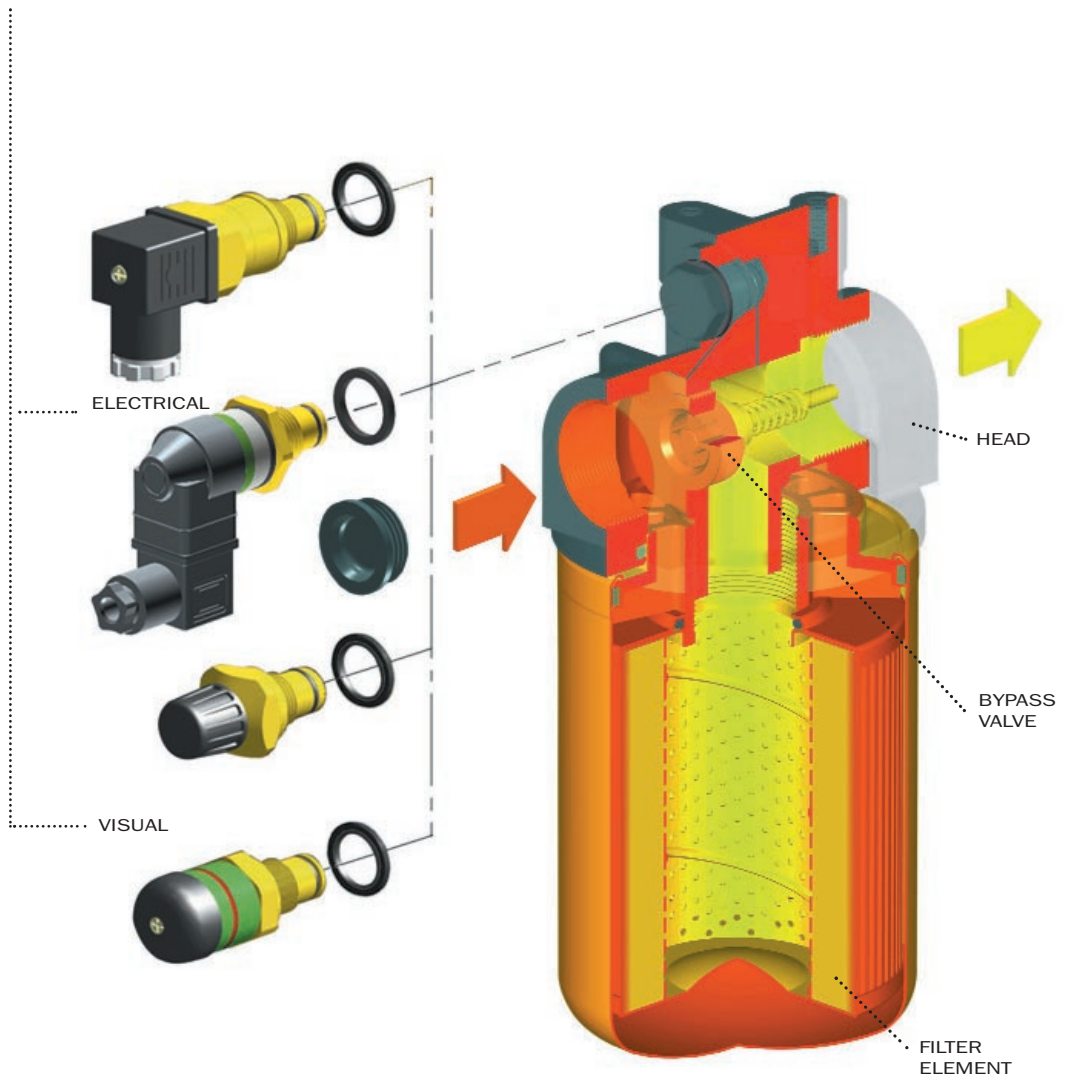
#### New

absolute filter elements  
independently tested  
in the following Institutes:

Institute of Filtration  
(France)



Royal Institute of Technology



## Filter element:

### Materials

### End caps:

Galvanized steel  
Nylon (MSH 050/070)

### Support tube:

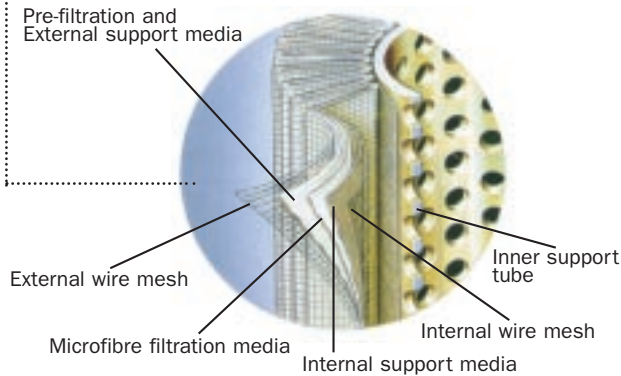
Galvanized steel

### Support frames:

Galvanized steel with an epoxy coating

### A Series

#### Inorganic microfibre



### MP Filter elements - Conform to the following ISO standards

- ISO 2941 - Verification of collapse/burst resistance.
- ISO 2942 - Verification of fabrication integrity and determination of the first bubble point.
- ISO 2943 - Verification of material compatibility with fluids.
- ISO 3723 - Method for end load test.
- ISO 3724 - Verification of flow fatigue characteristics.
- ISO 3968 - Evaluation of pressure drop versus flow characteristics.
- ISO 16889 - Multi-pass method for evaluating filtration performance.

### Element material Absolute filtration

## A Series

Inorganic microfibre with acrylic support

### Contamination retention

as per ISO 16889: Multi-pass test.

**New improved  $\beta \geq 200$  filter elements with greater efficiency and increased dirt holding capacity**

Filter elements	Dimensions for $\beta$ ( $\mu\text{m}$ ) values				Filtration ratios			$\Delta P$ (bar)
	$\beta \geq 2$ (50%)	$\beta \geq 20$ (95%)	$\beta \geq 75$ (98,7%)	$\beta \geq 200$ (99,5%)	$\beta_2$	$\beta_{10}$	$\beta_{20}$	
A03	-	2	2,4	3	20	> 10.000	> 10.000	7
A06	-	3	4,6	6	8	> 2.000	> 10.000	7
A10	3	6	7,8	10	1,5	$\geq 200$	> 10.000	7
A25	13	19	22	25	-	> 1,5	> 35	7

N.B. Other materials giving different degrees of filtration are available on request.

Type CH	050	070	100	150
A03/A06	217	450	620	800
A10/A25	217	450	620	800

Values in in<sup>2</sup>

### Filtering area Filter elements

### Element material Nominal filtration

## P Series

Resin - impregnated paper

## M Series

Square wire mesh (filtration degree is defined in microns by the maximum diameter of a sphere corresponding to the mesh size)

### Filtering area Filter elements

Type CH	050	070	100	150
P10/P25	280	560	800	100
M25	190	250	320	450
M60	190	250	320	450
M90	190	250	320	450

Values in in<sup>2</sup>

## Filter body:

### Materials

#### Head

Aluminium

#### Bypass valve

Nylon

#### Selas

A Series: Nitrile (Buna-N)

V Series: Viton

#### Indicator

Brass

### Working

#### temperature

From -13 to +230°F

For temperatures outside this range, please consult our Sales Network Organization

### Pressure filter

#### body

Maximum working pressure up to 35 bar

Fatigue test: A filter subjected to pressure impulses from 0 to 500 psi will withstand 1.000.000 cycles.

### Collapse pressure

#### filter elements

75 psi

### Bypass valve

#### Calibration pressure

Bypass valve, differential opening pressure:

35 psi ± 10%

### Types of indicators

Description:

**MSH** series filters are fitted with , differential style indicators

switching at : 30 psi ± 10%

#### Visual indicator

**V6 - Z6 Series**

switching at : 30 psi ± 10%

#### Electrical indicator

**N6 Series**

switching at : 30 psi ± 10%

#### Visual-electrical indicator

**K6\* Series**

switching at 30 psi ± 10%

\*For K visual-electrical indicator, specify the voltage (il. K61 = LED: 24 volt)

{ 1 - 24 Volt  
2 - 115 Volt  
3 - 230 Volt



# MP Filtri - Specification

## Pressure differential indicator option

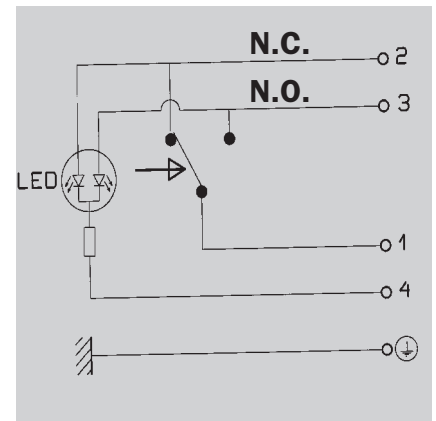
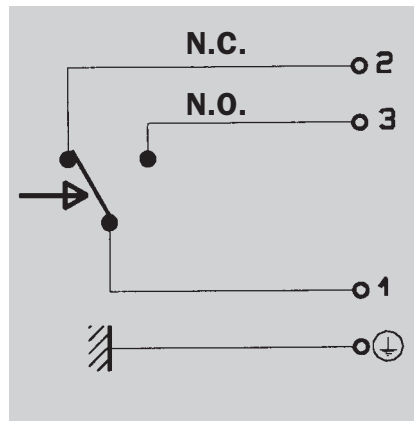
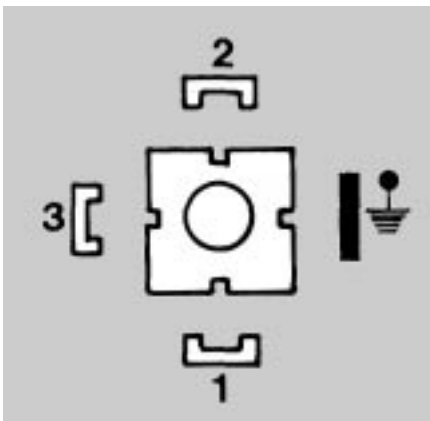
### K - E - N Series

Supply voltage (50/60 Hz) (V)	Resistive load (A)	Inductive load (A)
Vca 125	5	2
Vca 250	5	2
Vcc 30	5	3
Vcc 125	0,5	0,03
Vcc 250	0,25	0,03

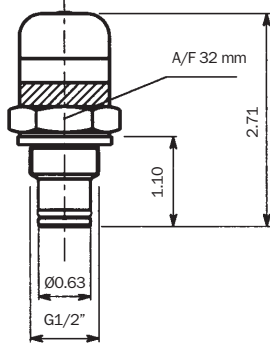
### CONNECTOR DIN 43650

### ELECTRICAL CONNECTION E - N SERIES

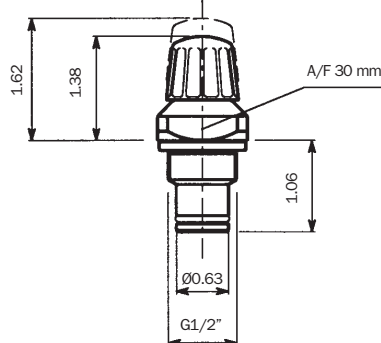
### ELECTRICAL CONNECTION K SERIES



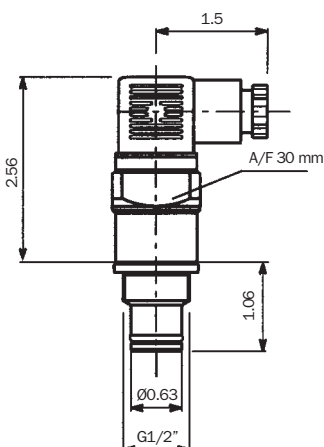
Visual V series



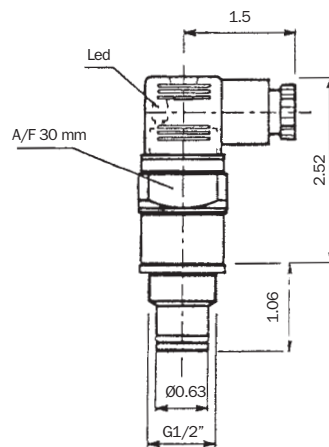
Visual Z series



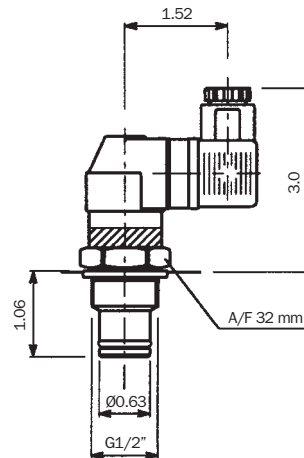
Electrical N series



Led visual - Electrical K series



Visual - Electrical E series



## Fluid Compatibility

### Filter head and bowls

compatible for use with:

- mineral oils  
(types HH-HL-HM-HR-HV-HG as per ISO 6743/4)
- water-based emulsions  
(types HFAE-HFAS as per ISO 6743/4)
- synthetic fluids  
(types HS-HFDR-HFDS-HFDU as per ISO 6743/4)
- water-glycol (types HFC as per ISO 6743/4)

### Seals

#### A Series

**Nitrile (Buna-N)** compatible with mineral oils  
(types HH-HL-HM-HR-HV-HG as per ISO 6743/4)

water-based emulsions  
(types HFAE-HFAS as per ISO 6743/4)  
water - glycol (types HFC as per ISO 6743/4)

#### V Series

**Viton** compatible with synthetic fluids  
(types HS-HFDR-HFDS-HFDU as per ISO 6743/4)

### Filter elements

As per ISO 2943; suitable for mineral oils  
(types HH-HL-HM-HR-HV-HG as per ISO 6743/4)  
and synthetic fluids (A and M series only)  
(types HS-HFDR-HFDS-HFDU as per ISO 6743/4)  
For water-based emulsions (types HFAE-HFAS  
as per ISO 6743/4) and fluids other than  
those mentioned, please consult our Sales  
Network Organization.

## International standards for contamination fluid control

A general (no direct) comparison between ISO 4406 and NAS 1638 is given in table below.

Contamination codes ISO 4406			Correspondent codes NAS 1638	Recommended filtration degree	Typical applications
4µm(c)	6µm(c)	14µm(c)		<i>B x ≥ 200</i>	
14	12	9	3	3	High precision and laboratory servo-systems
17	15	12	6	3-6	Robotic and servo-systems
18	16	13	7	10-12	Very sensitive - high reliability systems
20	18	15	9	12-15	Sensitive - reliable systems
21	19	16	10	15-25	General equipment of limited reliability
23	21	18	12	25-40	Low - pressure equipment not in continuous service

# Selection & installation information

## Filter elements types

### A Series

Absolute inorganic microfibre filtration media, available in 3, 6, 10 and 25 micron  
Example - **A03, A06, A10** or **A25**

### P Series

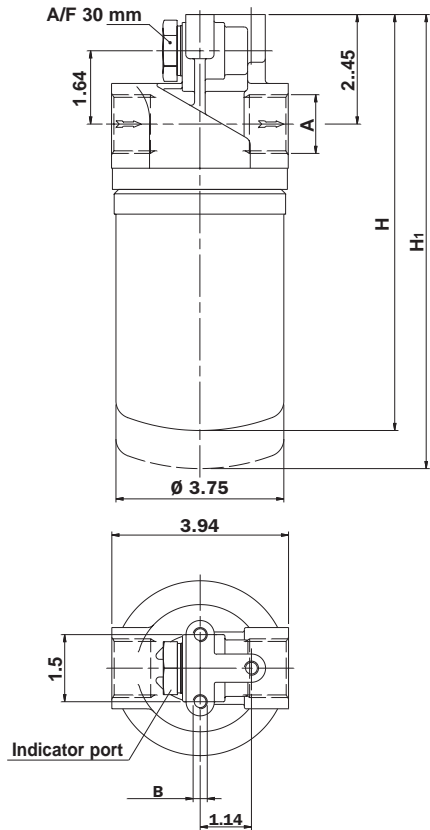
Nominal cellulose impregnated paper media, available in 10 and 25 micron.  
Example - **P10** or **P25**

### M Series

Metal mesh media, available in 25, 60, and 90 micron.  
Example - **M25, M60** or **M90**.

**Please refer to individual pressure drop curves to obtain filter assembly pressure drop information**

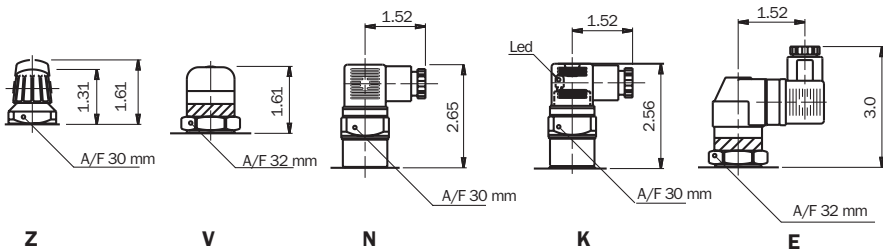
The following filter sizing recommendations are based using a mineral oil fluid at 150 SUS with a maximum total filter assembly (housing and filter element) pressure drop of 30% of the filter condition indicator (9 psi).



## Lengths

Type	H	H1
050	9.15	10.3
070	12.8	14.0

## Indicator



## MSH SERIES 050 - SIZES

### MSH050 - 070

Filter assembly	Flow rate gpm *	Port size BSP/NPT/SAE	Weight lbs **
A03	12	SEE TABLE BELOW	3.75
A06	13		
A10	19		
A25	27		
P10	24		
M60	32		

## MSH SERIES 070 SIZES

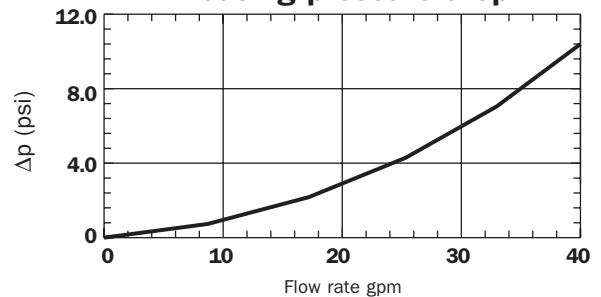
Filter assembly	Flow rate gpm *	Port size BSP/NPT/SAE	Weight lbs **
A03	23	SEE TABLE BELOW	4.8
A06	24		
A10	25		
A25	34		
P10	30		
M60	34		

\* Flow rates with 150 SUS fluid viscosity  
\*\* Weight including filter element

## Thread connections

Type	A	B
G1	1" BSP	M8
G2	3/4" BSP	M8
G3	1" NPT	5/16" UNC
G4	3/4" NPT	5/16" UNC
G5	SAE 16 - 1 5/16" - 12 UN	5/16" UNC
G6	SAE 12 - 1 1/16" - 12 UN	5/16" UNC

## Housing pressure drop

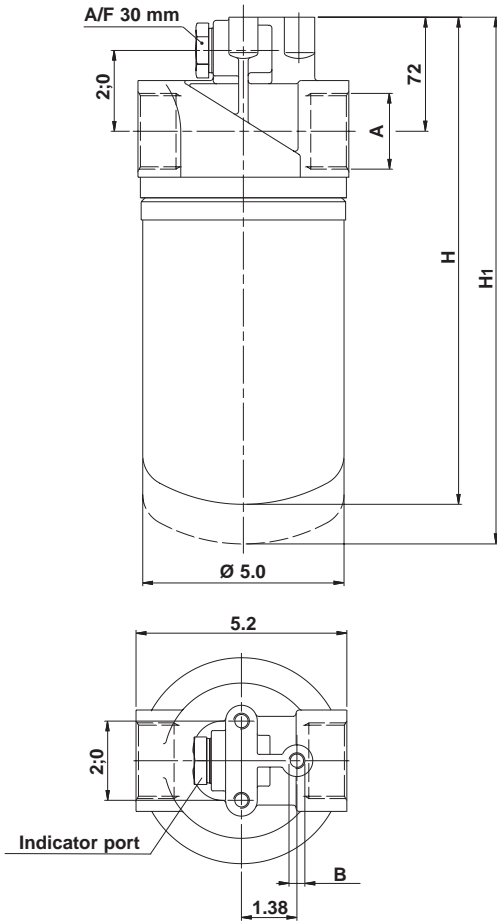


# Selection & installation information

## Filter elements types

Please refer to individual pressure drop curves to obtain filter assembly pressure drop information

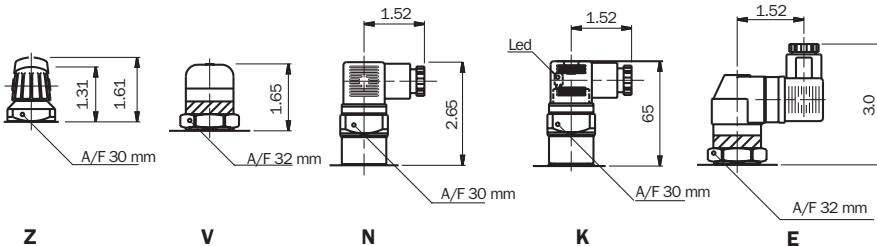
The following filter sizing recommendations are based using a mineral oil fluid at 150 SUS with a maximum total filter assembly (housing and filter element) pressure drop of 30% of the filter condition indicator (9 psi).



### Lengths

Type	H	H1
100	12.1	13.3
150	14.0	15.2

### Indicator



## MSH100 - 150

### MSH SERIES 100 - SIZES

Filter assembly	Flow rate gpm *	Port size BSP/NPT/SAE	Weight lbs **
A03	29	SEE TABLE BELOW	6.0
A06	32		
A10	42		
A25	56		
P10	53		
M60	66		

### MSH SERIES 150 SIZES

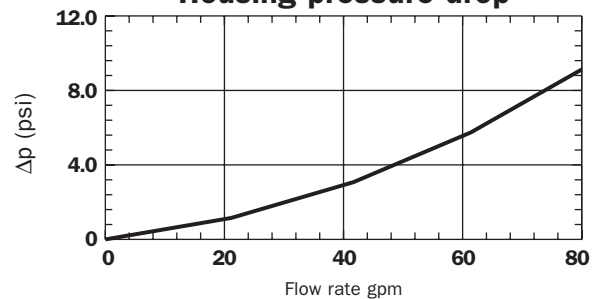
Filter assembly	Flow rate gpm *	Port size BSP/NPT/SAE	Weight kg **
A03	40	SEE TABLE BELOW	8.4
A06	43		
A10	47		
A25	60		
P10	70		
M60	73		

\* Flow rates with 150 SUS fluid viscosity  
\*\* Weight including filter element

### Thread connections

Type	A	B
G1	1 1/2" BSP	M10
G2	1 1/4" BSP	M10
G3	1 1/2" NPT	3/8" UNC
G4	1 1/4" NPT	3/8" UNC
G5	SAE 24 - 1 7/8" - 12 UN	3/8" UNC
G6	SAE 20 - 1 5/8" - 12 UN	3/8" UNC

### Housing pressure drop



# Pressure drop information

## General

Pressure drop versus flow rate curve information for both housing and filter elements is in accordance with ISO 3968

**Filter assembly pressure drop** -  $\Delta p_{\text{Total}} = \Delta p_{\text{Housing}} + \Delta p_{\text{Filter element}}$

**Housing pressure drop** - The housing pressure drop is proportional to the fluid density

**Filter element pressure drop** - Filter element pressure drop is proportional to kinematic viscosity therefore always check the fluid operating temperature and fluid type to obtain the working viscosity according to the following formula:

$$\Delta p_1 \text{ Filter element} = (\text{working viscosity} / \text{brochure viscosity}) \times \Delta p \text{ filter element}$$

Brochure viscosity 150 SUS

## Filter assembly sizing example

- Customer requires a 48 gpm filter assembly
- Mineral oil fluid: 212 SUS
- 25 micron absolute filtration
- line application

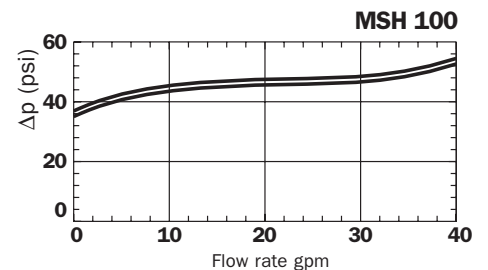
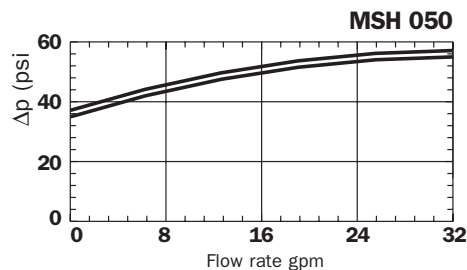
### Selection :

- **Housing pressure drop** - MSH 100 with 48 gpm  $\Delta p = 3.9$  psi (see curve on page 8)
- **Filter element pressure drop** brochure viscosity - CH 100A25 with 48 gpm  $\Delta p = 2.9$  psi (see curve on page 10)
- **Filter element pressure drop** working viscosity - With 212 SUS  $\Delta p_1 = 2.9 \times (212/150) = 4$  psi
- **Filter assembly pressure drop**  $\Delta p_{\text{Total}} = \Delta p_{\text{Housing}} + \Delta p_1 \text{ Filter element} = 3.9 + 4.0 = 7.9 \text{ psi}^*$  { Acceptable pressure drop value, as per our recommendations

## Bypass valves pressure drop

The curves were obtained using a mineral oil with a density of 0,86.

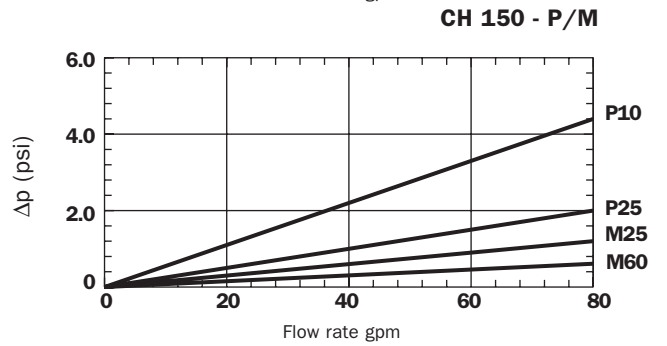
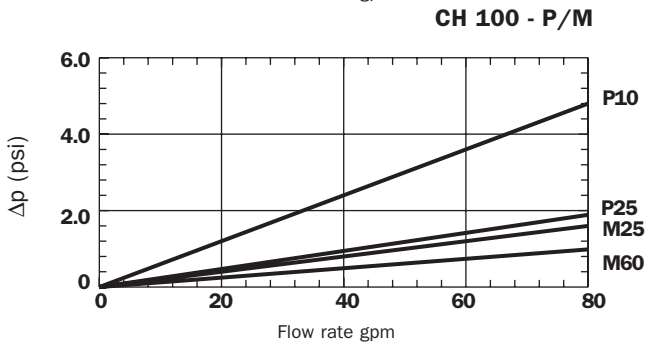
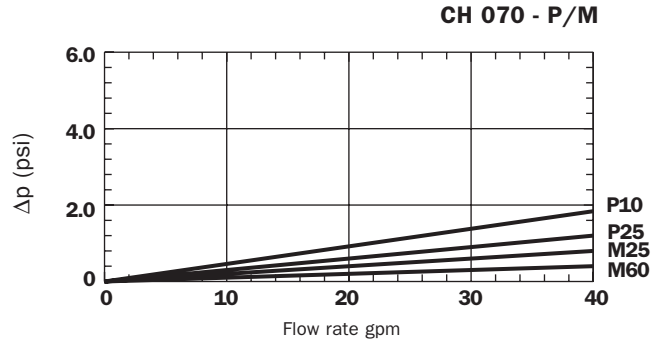
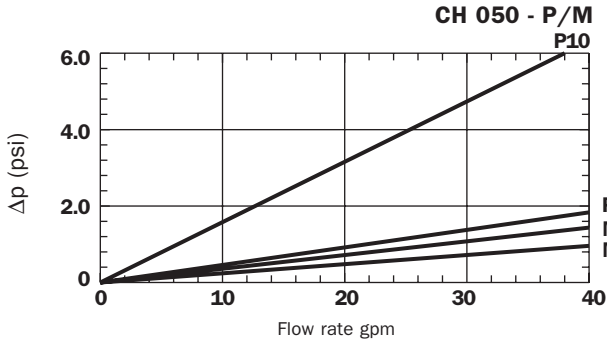
The  $\Delta p$  varies proportionally to the density.



# FILTER ELEMENT

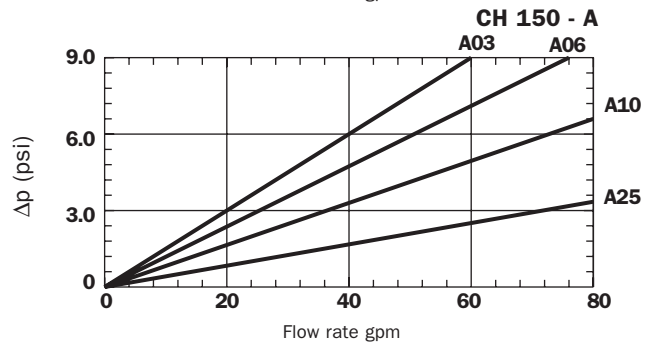
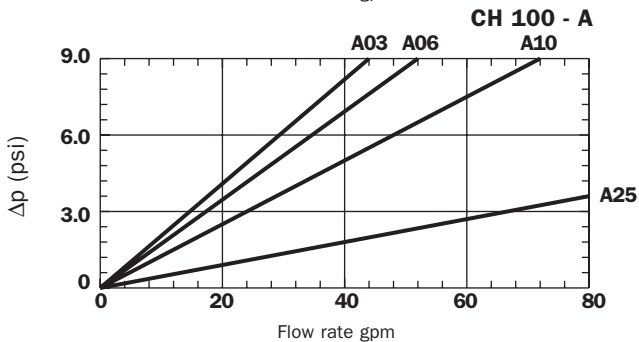
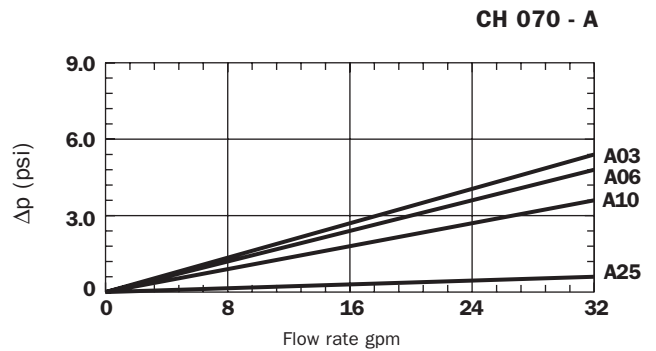
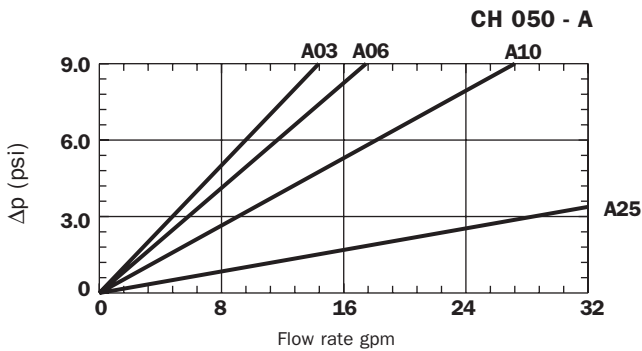
## Filter elements - P/M Series

The curves were obtained using a mineral oil with a kinematic viscosity of 150 SUS.  
The  $\Delta p$  varies proportionally to the fluid kinematic viscosity.



## Filter elements - A Series

The curves were obtained using a mineral oil with a kinematic viscosity of 150 SUS.  
The  $\Delta p$  varies proportionally to the fluid kinematic viscosity.



# Ordering information

## MSH

### Nominal sizes

050
070
100
150

### Filter condition indicator

S	With threaded hole only
T2	Plug for indicator port
V6	Visual 30 psi
Z6	Visual 30 psi
N6	Electrical 30 psi
E6	Visual-electrical 30 psi
K6*	Visual-Electrical 30 psi

\* { 1 - 24 Volt  
2 - 115 Volt  
3 - 230 Volt

\*For K visual-electrical indicator, specify the voltage (f.i.; K61 = LED: 24 volt)

### Bypass valve

B	With bypass 35 psi
S	Without bypass

### Filter elements M/P series

P10	Resin-impregnated paper $\beta_x \geq 2$
P25	
M25	Square wire mesh
M60	
M90	

### Filter elements A series

A03	Inorganic microfibre $\beta_x \geq 200$
A06	
A10	
A25	

### Seals

A	Nitrile (Buna - N)
V	Viton

### Port options

Type	MSH 050-070	MSH 100-150
G1	1" BSP	1 1/2" BSP
G2	3/4" BSP	1 1/4" BSP
G3	1" NPT	1 1/2" NPT
G4	3/4" NPT	1 1/4" NPT
G5	SAE 16-1 5/16"- 12 UN	SAE 24-1 7/8"- 12 UN
G6	SAE 12-1 1/16"- 12 UN	SAE 20-1 5/8"- 12 UN

## CH

# Replacement element

**MP Filtri** - Filtration products will only be guaranteed if original MP Filtri replacement elements and spares are used

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**New Headquarters :**

**MP FILTRI S.p.A. Italy**

Via 1° Maggio, n. 3  
20060 Pessano con Bornago  
(Milano) Italy  
Tel. +39.02/95703.1  
Fax +39.02/95741497-95740188  
email: sales@mpfiltri.com  
<http://www.mpfiltri.com>

**GREAT BRITAIN**

**MP FILTRI U.K. Ltd.**

Bourton Industrial Park  
Bourton on the Water  
Gloucestershire GL54 2HQ UK  
Phone: +44.01451-822522  
Fax: +44.01451-822282  
email: sales@mpfiltri.co.uk  
<http://www.mpfiltri.com>

**GERMANY**

**MP FILTRI D GmbH**

Am Wasserturm 5  
D-66265 Heusweiler/Holz  
Phone: +49.(0)6806-85022.0  
Fax: +49.(0)6806-85022.18  
email: service@mpfiltri.de  
<http://www.mpfiltri.com>

**FRANCE**

**MP FILTRI FRANCE Sas**

198 Avenue des Gresillons  
92600 Asnieres Sur Seine  
France  
Tel: +33.(0)1-40-86-47-00  
Fax: +33.(0)1-40-86-47-09  
email: contact@mpfiltrifrance.com  
<http://www.mpfiltri.com>

**USA**

**MP FILTRI USA Inc.**

2055 Quaker Pointe Drive  
Quakertown, PA 18951  
Phone: +1.215-529-1300  
Fax: +1.215-529-1902  
email: sales@mpfiltriusa.com  
<http://www.mpfiltriusa.com>

**CANADA**

**MP FILTRI CANADA Inc.**

380 Four Valley Drive Concorde  
Ontario Canada L4K 5Z1  
Phone: +1.905-303-1369  
Fax: +1.905-303-7256  
email: mail@mpfiltricanada.com  
<http://www.mpfiltricanada.com>

**RUSSIAN FEDERATION**

**MP FILTRI RUSSIA**

Phone/Fax: +7(495)220-94-60  
P.O. Box 44 127562 Moscow, Russia  
email: mpfiltrirusia@yahoo.com  
<http://www.mpfiltri.ru>

**CHINA**

**MP FILTRI (Shanghai) Co. Ltd.**

1280 Lianxi Rd, 8 Bld - 2 Floor  
Shanghai, Pudong  
201204 P.R. China  
Phone: + 86.21-58919916  
Fax: + 86.21-58919667  
email: sales@mpfiltrishanghai.com  
<http://www.mpfiltri.com>



**S**ERIES

# **CLOGGING INDICATORS**



# Production summary



## Contamination monitoring products

- Calibrated on test rigs manufactured and certified to ISO 11943 based on methods from ISO 11171
- On-line and In-line counting to 400 bar
- Bottle sampler options
- Mobile designs RS 232 - RS 485 digital bus interface



## Suction filters

- Flow rates to 620 l/min

Mounting:

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



## Return filters

- Flow rates to 3000 l/min

- Pressure to 20 bar

Mounting:

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



## Pressure filters

- Flow rates to 700 l/min

- Pressure from 110 bar to 560 bar

Mounting:

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



## Spin-On filters

- Flow rates to 300 l/min

- Pressure to 35 bar

Mounting:

- In-Line
- Tank top

# Production summary



## Stainless Steel Pressure filters

- Flow rates to 100 l/min
- Pressure from 350 bar to 700 bar

Mounting:

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



## In-Line filters

- Flow rates to 3000 l/min
- Pressure to 80 bar

Mounting:

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



## Filtration units

- Flow rates from 15 l/min to 200 l/min
- In static and mobile style



## Accessories

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



## Mechanical Products

- Aluminium bell housings for motors from 0.12 kW to 400 kW
- Couplings in Aluminium - Cast Iron - Steel
- Damping rings
- Support feet
- Aluminium tanks
- Inspection doors

# Introduction

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

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

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

MP Filtri can supply indicators of the following designs:

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

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

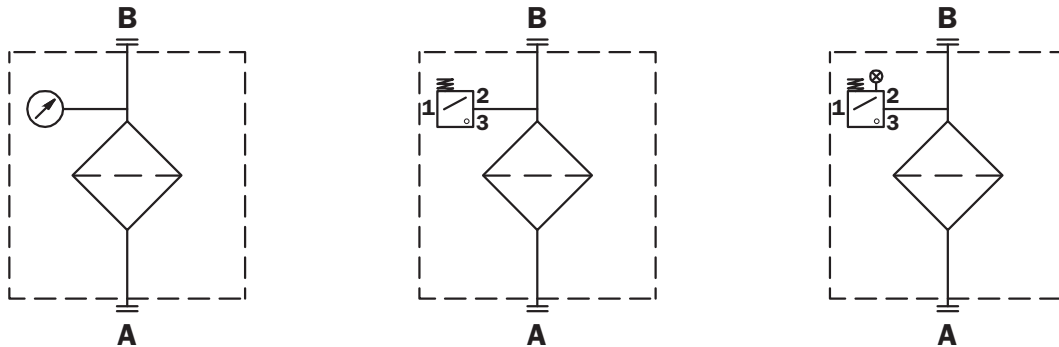
The electronic model (only available for differential type indicators) with warning signals (75% of clogging) and alarm (clogging).

# Index

	<b>PAGE</b>
Suitable indicator types	5
Quick reference guide	6 - 7
Vacuum indicators	8
Barometric indicators	12
Differential indicators	16
Stainless Steel differential indicators	22
Comparative table Old - New code	26

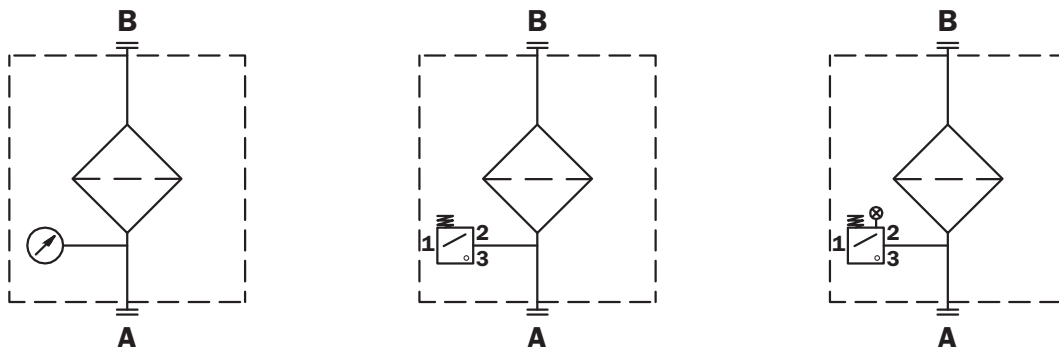
## VACUUM INDICATORS

Vacuum indicators are used on the Suction line to check the efficiency of the filter element. They measure the pressure downstream of the filter element. Standard items are produced with R 1/4" EN 10226 connection. Available products with R 1/8" EN 10226 to be fitted on MPS series.



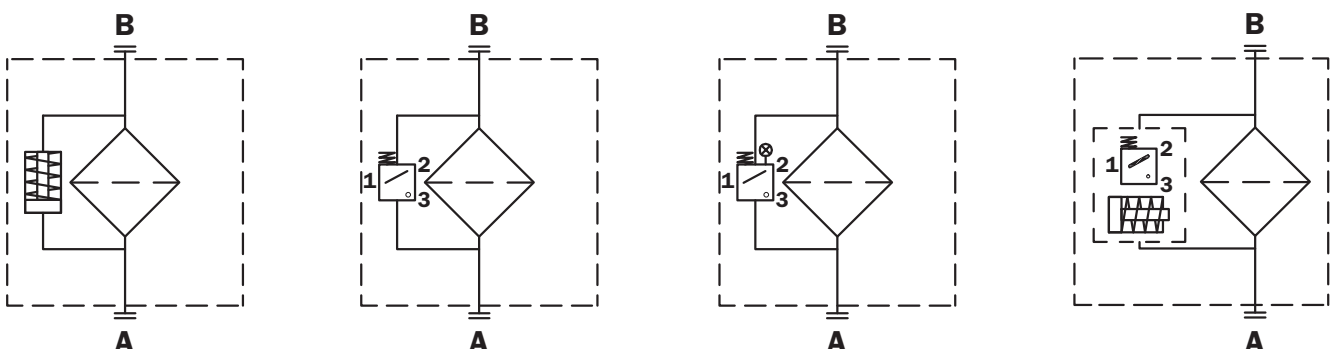
## BAROMETRIC INDICATORS

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



## DIFFERENTIAL INDICATORS

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



# Quick reference guide

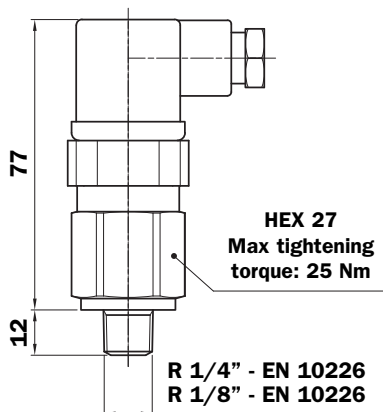
Filter series	VISUAL INDICATOR	ELECTRICAL INDICATOR	ELECTRICAL/VISUAL INDICATOR	ELECTRONIC INDICATOR
<b>Suction filters</b>				
SF2 250 - 251 - 350 SF2 500 - 501 - 502 - 503 - 504 - 505 SF2 510 - 535 - 540 FAS	VVA16P01 VVR16P01	VEA21AA50P01	VLA21AA51P01 VLA21AA52P01 VLA21AA53P01 VLA21AA71P01	
<b>Return filters</b>				
MPF - MPT with bypass 1,75 bar MPH with bypass 1,75 bar	BVA14P01 BVR14P01 BVP15HAP01 BVP15HMP01	BEA15HA50P01 BEM15HA41P01	BLA15HA51P01 BLA15HA52P01 BLA15HA53P01 BLA15HA71P01	
MPF - MPT with bypass 3 bar MPH with bypass 2,5 bar FRI 255 RF2 250	BVA25P01 BVR25P01 BVP20HAP01 BVP20HMP01	BEA20HA50P01 BEM20HA41P01	BLA20HA51P01 BLA20HA52P01 BLA20HA53P01 BLA20HA71P01	
FRI 025 - 040 - 100 - 250 - 630 - 850	DVA20xP01 DVM20xP01	DEA20xA50P01 DEM20xAxxP01	DLA20xA51P01 DLA20xA52P01 DLA20xA71P01 DLE20xA50P01 DLE20xF50P01	DTA20xF70P01
<b>Suction/Return filters</b>				
MRS 116 - 165 - 166 Suction line	VVB16P01 VVS16P01	VEB21AA50P01	VLB21AA51P01 VLB21AA52P01 VLB21AA53P01 VLB21AA71P01	
MRS 116 - 165 - 166 Return line	BVA14P01 BVR14P01 BVP15HAP01 BVP15HMP01	BEA15HA50P01 BEM15HA41P01	BLA15HA51P01 BLA15HA52P01 BLA15HA53P01 BLA15HA71P01	
<b>Spin-On filters</b>				
MPS 050 - 070 - 100 - 150 MPS 200 - 250 - 300 - 350 Suction line	VVB16P01 VVS16P01	VEB21AA50P01	VLB21AA51P01 VLB21AA52P01 VLB21AA53P01 VLB21AA71P01	
MPS 050 - 070 - 100 - 150 MPS 200 - 250 - 300 - 350 MST 050 - 070 - 100 - 150 Return line	BVA14P01 BVR14P01 BVP15HAP01 BVP15HMP01	BEA15HA50P01 BEM15HA41P01	BLA15HA51P01 BLA15HA52P01 BLA15HA53P01 BLA15HA71P01	
MPS 051 - 071 - 101 - 151 MPS 301 - 351 MSH 050 - 070 - 100 - 150 In-line	DVA12xP01 DVM12xP01	DEA12xA50P01 DEM12xAxxP01	DLA12xA51P01 DLA12xA52P01 DLA12xA71P01 DLE12xA50P01 DLE12xF50P01	

# Quick reference guide

Filter series	VISUAL INDICATOR	ELECTRICAL INDICATOR	ELECTRICAL/VISUAL INDICATOR	ELECTRONIC INDICATOR
<b>Low Pressure In-Line filters</b>				
LMP 110 - 112 - 116 - 118 - 119 LMP 120 - 122 - 123 LMP 210 - 211 LMP 400 - 401 - 430 - 431 LMP 900 - 901 - 950 - 951 LMD 400 - 401 - 431 - 951 With bypass valve	DVA20xP01 DVM20xP01	DEA20xA50P01 DEM20xAxxP01	DLA20xA51P01 DLA20xA52P01 DLA20xA71P01 DLE20xA50P01 DLE20xF50P01	DTA20xF70P01
LMP 110 - 112 - 116 - 118 - 119 LMP 120 - 122 - 123 LMP 210 - 211 LMP 400 - 401 - 430 - 431 LMP 900 - 901 - 950 - 951 LMD 400 - 401 - 431 - 951 MPD 250 - 251 Without bypass valve	DVA50xP01 DVM50xP01	DEA50xA50P01 DEM50xAxxP01	DLA50xA51P01 DLA50xA52P01 DLA50xA71P01 DLE50xA50P01 DLE50xF50P01	DTA50xF70P01
<b>High Pressure In-Line filters</b>				
FMP 039 - 065 - 135 - 320 FMM 050 FHP 010 - 011 - 065 - 135 - 320 - 500 FHB 050 - 135 - 320 FHM 006 - 007 - 010 - 050 - 135 - 320 - 500 FHF 325 FHD 021 - 051 - 326 - 333 With bypass valve	DVA50xP01 DVM50xP01	DEA50xA50P01 DEM50xAxxP01	DLA50xA51P01 DLA50xA52P01 DLA50xA71P01 DLE50xA50P01 DLE50xF50P01	DTA50xF70P01
FMP 039 - 065 - 135 - 320 FMM 050 FHP 010 - 011 - 065 - 135 - 320 - 500 FHB 050 - 135 - 320 FHM 006 - 007 - 010 - 050 - 135 - 320 - 500 FHF 325 FHD 021 - 051 - 326 - 333 Without bypass valve	DVA70xP01 DVM70xP01	DEA70xA50P01 DEM70xAxxP01	DLA70xA51P01 DLA70xA52P01 DLA70xA71P01 DLE70xA50P01 DLE70xF50P01	DTA70xF70P01
<b>Stainless Steel High Pressure In-Line filters</b>				
FZB 039 FZP 039 - 136 FZH 010 - 011 - 039 With bypass valve	DVX50xP01 DVY50xP01	DEX50xA50P01	DLX50xA51P01 DLX50xA52P01 DLY50xA50P01	
FZB 039 FZP 039 - 136 FZH 010 - 011 - 039 Without bypass valve	DVX70xP01 DVY70xP01	DEX70xA50P01	DLX70xA51P01 DLX70xA52P01 DLY70xA50P01	

# VACUUM INDICATORS

## VEA - VEB



Available connections:  
R 1/4" EN 10226 (VEA21AA50P01)  
R 1/8" EN 10226 (VEB21AA50P01)

### Electrical Vacuum Indicator

#### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: NBR

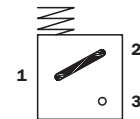
#### Technical data:

- Indicator type: Electrical vacuum indicator
- Setting pressure: -0,21 bar  $\pm$ 10%
- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

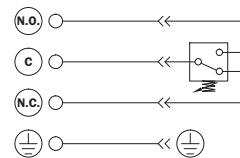
#### Electrical data:

- Resistive load: 5 A / 14 Vdc  
4 A / 30 Vdc  
5 A / 125 VAC  
5 A / 250 VAC
- Electrical connections: 50 - EN 175301-803
- Protection degree: IP 65 in according to EN 60529
- Available ATEX product: II 1GD Ex ia IIC Tx Ex ia IIC Tx °C X

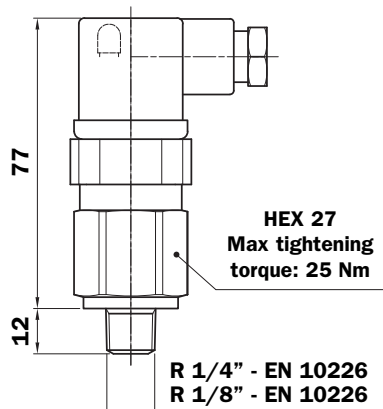
### HYDRAULIC SYMBOL



### ELECTRICAL SYMBOL



## VLA - VLB



Available connections:  
R 1/4" EN 10226 (VLA21AAxxP01)  
R 1/8" EN 10226 (VLB21AAxxP01)

### Electrical/Visual Vacuum Indicator

#### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: NBR

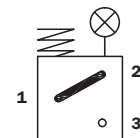
#### Technical data:

- Indicator type: Electrical/Visual vacuum indicator
- Setting pressure: -0,21 bar  $\pm$ 10%
- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

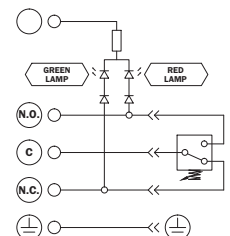
#### Electrical data:

- Resistive load: 51: 0,8 A / 24 Vdc  
52: 0,2 A / 115 Vdc  
53: 4 A / 230 Vdc
- Electrical connections: 51 - EN 175301-803 (24 Vdc lamps)  
52 - EN 175301-803 (110 Vdc lamps)  
53 - EN 175301-803 (230 VAC lamps)
- Protection degree: IP 65 in according to EN 60529

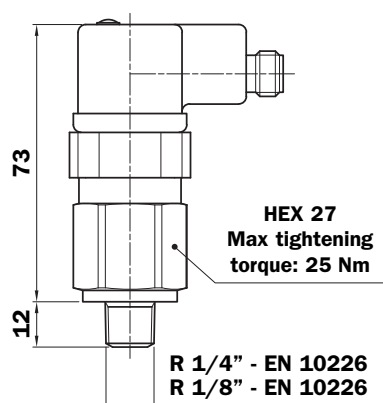
### HYDRAULIC SYMBOL



### ELECTRICAL SYMBOL



## VLA - VLB



Available connections:  
R 1/4" EN 10226 (VLA21AA71P01)  
R 1/8" EN 10226 (VLB21AA71P01)

### Electrical/Visual Vacuum Indicator

#### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: NBR

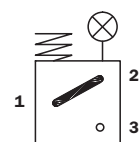
#### Technical data:

- Indicator type: Electrical/Visual vacuum indicator
- Setting pressure: -0,21 bar  $\pm$ 10%
- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

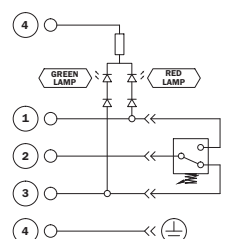
#### Electrical data:

- Resistive load: 0,4 A / 24 Vdc
- Electrical connections: 71 - M12 IEC 61076-2-101 (24 Vdc lamps)
- Protection degree: IP 65 in according to EN 60529

### HYDRAULIC SYMBOL



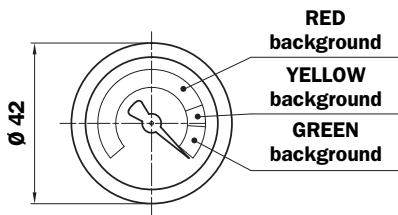
### ELECTRICAL SYMBOL



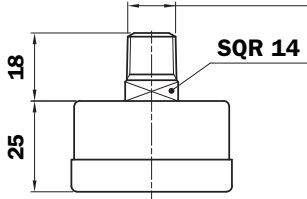


# VACUUM INDICATORS

## VVA - VVB



R 1/4" - EN 10226  
R 1/8" - EN 10226



Available connections:  
R 1/4" EN 10226 (VVA16P01)  
R 1/8" EN 10226 (VVB16P01)

### Axial Vacuum Gauge

#### Materials:

- Case: Painted Steel
- Window: Clear plastic
- Dial: Painted Steel
- Pointer: Painted Aluminium
- Pressure connection: Brass
- Pressure element: Bourdon tub Cu-alloy soft soldered

#### Technical data:

- Indicator type: Axial vacuum gauge
- Max working pressure: Static: 7 bar  
Fluctuating: 6 bar  
Short time: 10 bar
- Working temperature: From -40 °C to +60 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943
- Accuracy class: cl. 2.5
- Protection degree: IP 31 in according to EN 60529

### HYDRAULIC SYMBOL



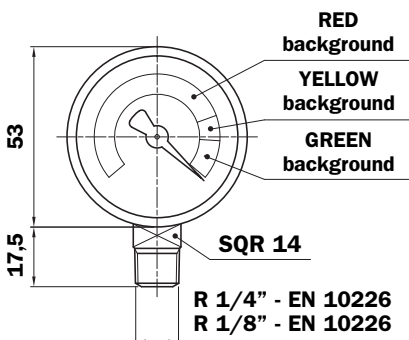
### GRADUATED DISPLAY

GREEN BACKGROUND  
(from 0 to -12 cmHg)  
Clean filter element

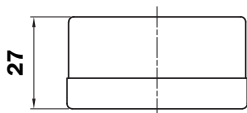
YELLOW BACKGROUND  
(from -12 to -18 cmHg)  
Warning

GREEN BACKGROUND  
(from -18 to -76 cmHg)  
Bypass

## VVR - VVS



R 1/4" - EN 10226  
R 1/8" - EN 10226



Available connections:  
R 1/4" EN 10226 (VVR16P01)  
R 1/8" EN 10226 (VVS16P01)

### Radial Vacuum Gauge

#### Materials:

- Case: Painted Steel
- Window: Clear plastic
- Dial: Painted Steel
- Pointer: Painted Aluminium
- Pressure connection: Brass
- Pressure element: Bourdon tub Cu-alloy soft soldered

#### Technical data:

- Indicator type: Radial vacuum gauge
- Max working pressure: Static: 7 bar  
Fluctuating: 6 bar  
Short time: 10 bar
- Working temperature: From -40 °C to +60 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943
- Accuracy class: cl. 2.5
- Protection degree: IP 31 in according to EN 60529

### HYDRAULIC SYMBOL



### GRADUATED DISPLAY

GREEN BACKGROUND  
(from 0 to -12 cmHg)  
Clean filter element

YELLOW BACKGROUND  
(from -12 to -18 cmHg)  
Warning

GREEN BACKGROUND  
(from -18 to -76 cmHg)  
Bypass



# Ordering information VE - VL - VV

<b>Series</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>VE</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Example:</b>	<b>VE</b>	<b>A</b>	<b>21</b>	<b>A</b>	<b>A</b>	<b>50</b>	<b>P01</b>

<b>Series</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>VL</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Example:</b>	<b>VL</b>	<b>A</b>	<b>21</b>	<b>A</b>	<b>A</b>	<b>52</b>	<b>P01</b>

<b>Series</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>7</b>
<b>VV</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Example:</b>	<b>VV</b>	<b>A</b>	<b>16</b>	<b>P01</b>

## 1 - Series

<input type="checkbox"/> <b>VE</b>	Electrical indicator
<input type="checkbox"/> <b>VL</b>	Electrical/Visual indicator
<input type="checkbox"/> <b>VV</b>	Visual indicator

## 2 - Type

### VE - VL series

<input type="checkbox"/> <b>A</b>	R 1/4" EN 10226 connection
<input type="checkbox"/> <b>B</b>	R 1/8" EN 10226 connection

### VV series

<input type="checkbox"/> <b>A</b>	Axial vacuumeter R 1/4" EN 10226 connection
<input type="checkbox"/> <b>B</b>	Axial vacuumeter R 1/8" EN 10226 connection
<input type="checkbox"/> <b>R</b>	Radial vacuumeter R 1/4" EN 10226 connection
<input type="checkbox"/> <b>S</b>	Radial vacuumeter R 1/8" EN 10226 connection

## 3 - Setting pressure

### VEA - VLA series

<input type="checkbox"/> <b>21</b>	-0,21 bar
------------------------------------	-----------

### VVA - VVR series

<input type="checkbox"/> <b>16</b>	-0,16 bar
------------------------------------	-----------

## 4 - Seals (excluded for VV)

<input type="checkbox"/> <b>A</b>	NBR
<input type="checkbox"/>	On request

## 5 - Thermostat (excluded for VV)

<input type="checkbox"/> <b>A</b>	Without thermostat
-----------------------------------	--------------------

## 6 - Electrical connection (excluded for VV)

### VEA series

<input type="checkbox"/> <b>50</b>	EN 175301-803 connector
------------------------------------	-------------------------

### VLA series

<input type="checkbox"/> <b>51</b>	EN 175301-803 clear connector with 24 V lamps
<input type="checkbox"/> <b>52</b>	EN 175301-803 clear connector with 110 V lamps
<input type="checkbox"/> <b>53</b>	EN 175301-803 clear connector with 230 V lamps
<input type="checkbox"/> <b>71</b>	M12 IEC 61076-2-101 clear connector with 24 V lamps

## 7 - Option

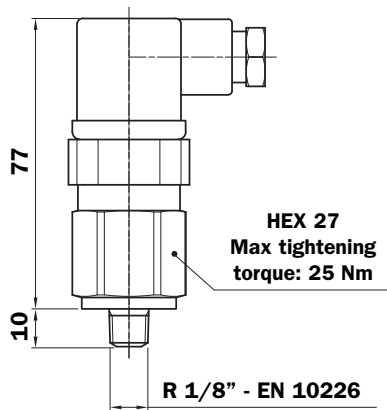
<input type="checkbox"/> <b>P01</b>	MP Filtri standard
<input type="checkbox"/> <b>Pxx</b>	Customer request

**MP Filtri** - The filter functions as described in this bulletin are valid exclusively for original MP Filtri filter elements and replacement parts. All rights reserved

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# BAROMETRIC INDICATORS

## BEA



Available setting:  
1,5 bar  $\pm 10\%$  (BEA15HA50P01)  
2 bar  $\pm 10\%$  (BEA20HA50P01)

### Electrical Pressure Indicator

#### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: NBR

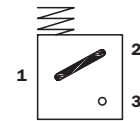
#### Technical data:

- Indicator type: Electrical pressure indicator
- Max working pressure: 40 bar
- Proof pressure: 60 bar
- Working temperature: From  $-25^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

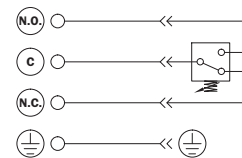
#### Electrical data:

- Resistive load: 5 A / 14 VDC  
4 A / 30 VDC  
5 A / 125 VAC  
5 A / 250 VAC
- Electrical connections: 50 - EN 175301-803
- Protection degree: IP 65 in according to EN 60529
- Available Atex product II 1GD Ex ia IIC Tx Ex ia IIC Tx °C X

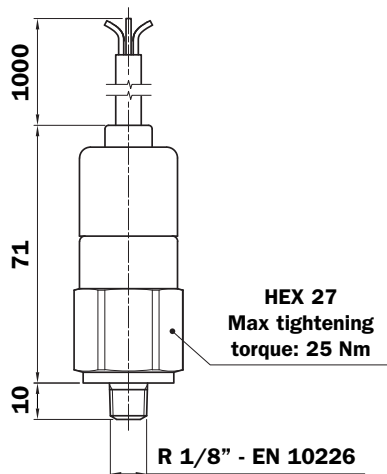
### HYDRAULIC SYMBOL



### ELECTRICAL SYMBOL



## BEM



Available setting:  
1,5 bar  $\pm 10\%$  (BEM15HA50P01)  
2 bar  $\pm 10\%$  (BEM20HA50P01)

### Electrical Pressure Indicator

#### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR

#### Technical data:

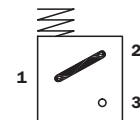
- Indicator type: Electrical pressure indicator
- Max working pressure: 40 bar
- Proof pressure: 60 bar
- Working temperature: From  $-25^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

#### Electrical data:

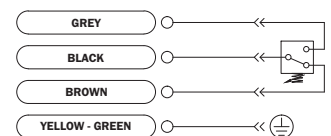
- Resistive load: 5 A / 14 VDC  
4 A / 30 VDC  
5 A / 125 VAC  
5 A / 250 VAC
- Electrical connections: 50 - EN 175301-803
- Protection degree: IP 67 in according to EN 60529

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

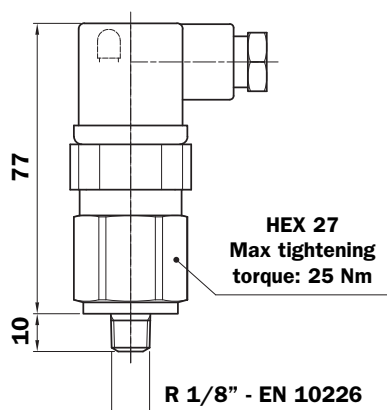
### HYDRAULIC SYMBOL



### ELECTRICAL SYMBOL



## BLA



Available setting:  
1,5 bar  $\pm 10\%$  (BLA15HAxxP01)  
2 bar  $\pm 10\%$  (BLA20HAxxP01)

### Electrical/Visual Pressure Indicator

#### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: NBR

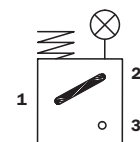
#### Technical data:

- Indicator type: Electrical/Visual pressure indicator
- Max working pressure: 40 bar
- Proof pressure: 60 bar
- Working temperature: From  $-25^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

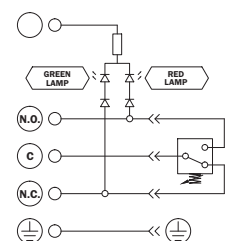
#### Electrical data:

- Resistive load: 51: 0,8 A / 24 VDC  
52: 0,2 A / 115 VDC  
53: 4 A / 230 VDC
- Electrical connections: 51 - EN 175301-803 (24 VDC lamps)  
52 - EN 175301-803 (110 VDC lamps)  
53 - EN 175301-803 (230 VAC lamps)
- Protection degree: IP 65 in according to EN 60529

### HYDRAULIC SYMBOL

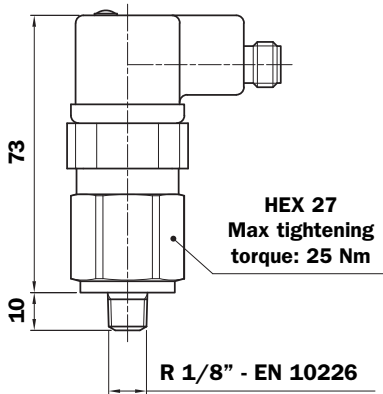


### ELECTRICAL SYMBOL



# BAROMETRIC INDICATORS

## BLA



Available setting:  
1,5 bar  $\pm 10\%$  (BLA15HA71P01)  
2 bar  $\pm 10\%$  (BLA20HA71P01)

## Electrical/Visual Pressure Indicator

### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: NBR

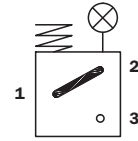
### Technical data:

- Indicator type: Electrical/Visual pressure indicator
- Max working pressure: 40 bar
- Proof pressure: 60 bar
- Working temperature: From  $-25^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

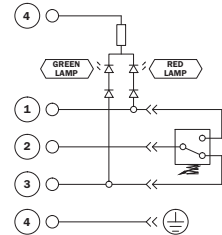
### Electrical data:

- Resistive load: 0,4 A / 24 VDC
- Electrical connections: 71 - M12 IEC 61076-2-101 (24 VDC lamps)
- Protection degree: IP 65 in according to EN 60529

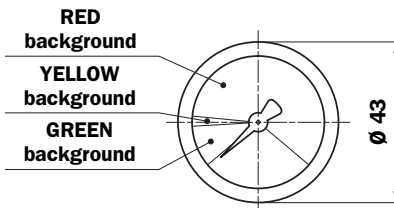
## HYDRAULIC SYMBOL



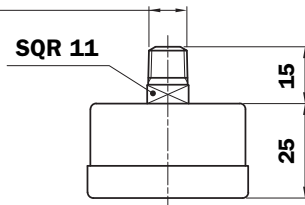
## ELECTRICAL SYMBOL



## BVA



R 1/8" - EN 10226



Available setting:  
1,4 bar  $\pm 10\%$  (BVA14P01)  
2,5 bar  $\pm 10\%$  (BVA25P01)

## Axial Pressure Gauge

### Materials:

- Case: Painted Steel
- Window: Clear plastic
- Dial: Painted Steel
- Pointer: Painted Aluminium
- Pressure connection: Brass
- Pressure element: Bourdon tub cu-alloy soft soldered

### Technical data:

- Indicator type: Axial pressure gauge
- Max working pressure: Static: 7 bar  
Fluctuating: 6 bar  
Short time: 10 bar
- Working temperature: From  $-40^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943
- Accuracy class: cl. 2.5
- Protection degree: IP 31 in according to EN 60529

## HYDRAULIC SYMBOL

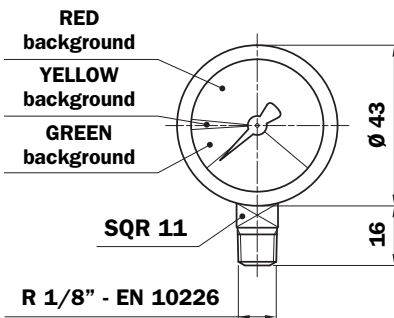


## DYED RANGE

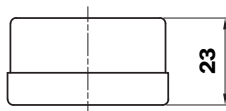
BVA14P01  
GREEN BACKGROUND (from 0 to 1,4 bar)  
Clean filter element  
YELLOW BACKGROUND (from 1,4 to 1,7 bar)  
Warning  
RED BACKGROUND (from 1,7 to 10 bar)  
Bypass

-----  
BVA25P01  
GREEN BACKGROUND (from 0 to 2,5 bar)  
Clean filter element  
YELLOW BACKGROUND (from 2,5 to 3 bar)  
Warning  
RED BACKGROUND (from 3 to 10 bar)  
Bypass

## BVR



R 1/8" - EN 10226



Available setting:  
1,4 bar  $\pm 10\%$  (BVR14P01)  
2,5 bar  $\pm 10\%$  (BVR25P01)

## Radial Pressure Gauge

### Materials:

- Case: Painted Steel
- Window: Clear plastic
- Dial: Painted Steel
- Pointer: Painted Aluminium
- Pressure connection: Brass
- Pressure element: Bourdon tub cu-alloy soft soldered

### Technical data:

- Indicator type: Radial pressure gauge
- Max working pressure: Static: 7 bar  
Fluctuating: 6 bar  
Short time: 10 bar
- Working temperature: From  $-40^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943
- Accuracy class: cl. 2.5
- Protection degree: IP 31 in according to EN 60529

## HYDRAULIC SYMBOL



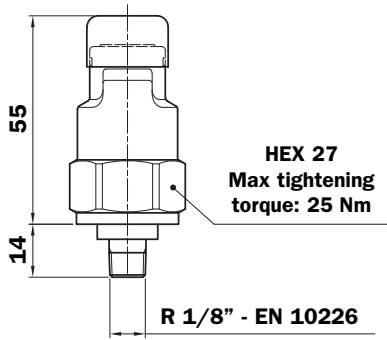
## DYED RANGE

BVR14P01  
GREEN BACKGROUND (from 0 to 1,4 bar)  
Clean filter element  
YELLOW BACKGROUND (from 1,4 to 1,7 bar)  
Warning  
RED BACKGROUND (from 1,7 to 10 bar)  
Bypass

-----  
BVR25P01  
GREEN BACKGROUND (from 0 to 2,5 bar)  
Clean filter element  
YELLOW BACKGROUND (from 2,5 to 3 bar)  
Warning  
RED BACKGROUND (from 3 to 10 bar)  
Bypass

# BAROMETRIC INDICATORS

## BVP - BVQ



Available setting:  
 1,5 bar  $\pm 10\%$  (BVP15AP01 - BVQ15AP01)  
 2 bar  $\pm 10\%$  (BVP20AP01 - BVQ20AP01)

### Visual Pressure Indicator

#### Materials:

- Body: Brass
- Internal parts: Nylon
- Seals: NBR

#### Technical data:

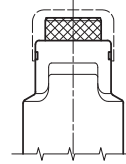
- Indicator type: Visual pressure indicator
- Reset: BVP - Automatic reset  
BVQ - Manual reset
- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From  $-25^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943
- Protection degree: IP 45 in according to EN 60529

### HYDRAULIC SYMBOL

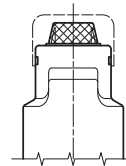


#### SIGNALS

GREEN BUTTON: INLET PRESSURE



RED BUTTON: CLOGGED FILTER ELEMENT



# Ordering information BE - BL - BV

<b>Series</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>BE</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Example:</b>	<b>BE</b>	<b>A</b>	<b>20</b>	<b>H</b>	<b>A</b>	<b>50</b>	<b>P01</b>

<b>Series</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>BL</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Example:</b>	<b>BL</b>	<b>A</b>	<b>20</b>	<b>H</b>	<b>A</b>	<b>52</b>	<b>P01</b>

<b>Series</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>7</b>
<b>BV</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Example:</b>	<b>BV</b>	<b>P</b>	<b>20</b>	<b>H</b>	<b>P01</b>

<b>Series</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>7</b>
<b>BV</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Example:</b>	<b>BV</b>	<b>A</b>	<b>14</b>	<b>P01</b>

## 1 - Series

<input type="checkbox"/> <b>BE</b>	Electrical indicator
<input type="checkbox"/> <b>BL</b>	Electrical/Visual indicator
<input type="checkbox"/> <b>BV</b>	Visual indicator

## 2 - Type

### BE series

<input type="checkbox"/> <b>A</b>	Standard type
<input type="checkbox"/> <b>M</b>	With wired connector

### BL series

<input type="checkbox"/> <b>A</b>	Standard type
-----------------------------------	---------------

### BV series

<input type="checkbox"/> <b>A</b>	Axial manometer
<input type="checkbox"/> <b>R</b>	Radial manometer
<input type="checkbox"/> <b>P</b>	Visual pressure indicator - Automatic reset
<input type="checkbox"/> <b>Q</b>	Visual pressure indicator - Manual reset

## 3 - Setting pressure

### BEA - BEM - BLA - BVP series

<input type="checkbox"/> <b>15</b>	1,5 bar
<input type="checkbox"/> <b>20</b>	2 bar

### BVA - BVR series

<input type="checkbox"/> <b>14</b>	1,4 bar
<input type="checkbox"/> <b>25</b>	2,5 bar

## 4 - Seals (excluded for BVA - BVR)

<input type="checkbox"/> <b>H</b>	HNBR
<input type="checkbox"/>	On request

## 5 - Thermostat (excluded for BV)

<input type="checkbox"/> <b>A</b>	Without thermostat
-----------------------------------	--------------------

## 6 - Electrical connection (excluded for BV)

### BEA series

<input type="checkbox"/> <b>50</b>	EN 175301-803 connector
------------------------------------	-------------------------

### BEM series

<input type="checkbox"/> <b>41</b>	Four core cable
<input type="checkbox"/>	On request

### BLA series

<input type="checkbox"/> <b>51</b>	EN 175301-803 clear connector with 24 V lamps
<input type="checkbox"/> <b>52</b>	EN 175301-803 clear connector with 110 V lamps
<input type="checkbox"/> <b>53</b>	EN 175301-803 clear connector with 230 V lamps
<input type="checkbox"/> <b>71</b>	M12 IEC 61076-2-101 clear connector with 24 V lamps

## 7 - Option

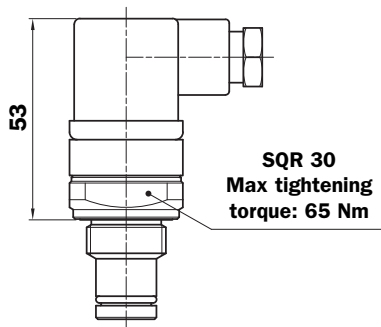
<input type="checkbox"/> <b>P01</b>	MP Filtri standard
<input type="checkbox"/> <b>Pxx</b>	Customer request

**MP Filtri** - The filter functions as described in this bulletin are valid exclusively for original MP Filtri filter elements and replacement parts. All rights reserved

The data in this publication are purely guideline. MP Filtri reserves the right to make changes to the models described herein at any time it deems fit in relation to technical or commercial requirements. The colours of the products shown on the cover are purely guideline. Copyright. All rights reserved.

# DIFFERENTIAL INDICATORS

## DEA



Available setting:

- 1,2 bar ±10% (DEA12xA50P01)
- 2 bar ±10% (DEA20xA50P01)
- 5 bar ±10% (DEA50xA50P01)
- 7 bar ±10% (DEA70xA50P01)
- 9,5 bar ±10% (DEA95xA50P01)

## Electrical Differential Indicator

### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR - FPM

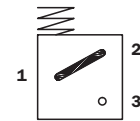
### Technical data:

- Indicator type: Electrical differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

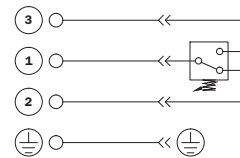
### Electrical data:

- Resistive load: 0,2 A / 115 VDC
- Electrical connections: 50 - EN 175301-803
- Protection degree: IP 66 in according to EN 60529  
IP 69K in according to ISO 20653

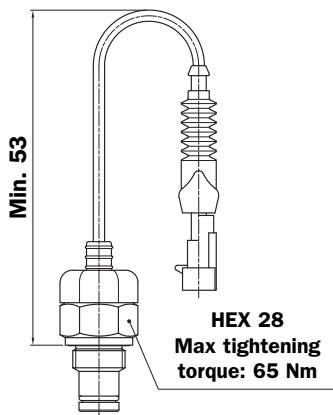
## HYDRAULIC SYMBOL



## ELECTRICAL SYMBOL



## DEM



Available setting:

- 1,2 bar ±10% (DEM12xx10P01)
- 2 bar ±10% (DEM20xx10P01)
- 5 bar ±10% (DEM50xx10P01)
- 7 bar ±10% (DEM70xx10P01)
- 9,5 bar ±10% (DEM95xx10P01)

## Electrical Differential Indicator

### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR - FPM

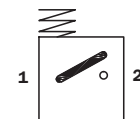
### Technical data:

- Indicator type: Electrical differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

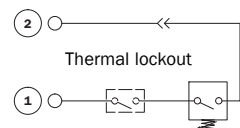
### Electrical data:

- Resistive load: 0,2 A / 115 VDC
- Electrical connections: 10 - AMP Superseal series 1,5
- Switching type: Normally open contacts (N.C. on request)
- Thermal lockout: Normally open up to 30 °C (F option)
- Protection degree: IP 66 in according to EN 60529

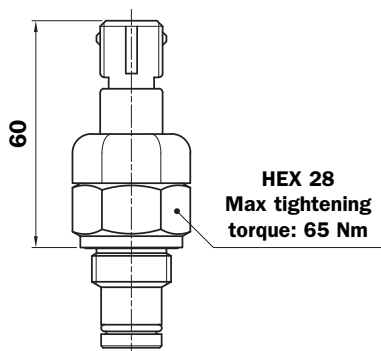
## HYDRAULIC SYMBOL



## ELECTRICAL SYMBOL



## DEM



Available setting:

- 1,2 bar ±10% (DEM12xx20P01)
- 2 bar ±10% (DEM20xx20P01)
- 5 bar ±10% (DEM50xx20P01)
- 7 bar ±10% (DEM70xx20P01)
- 9,5 bar ±10% (DEM95xx20P01)

## Electrical Differential Indicator

### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR - FPM

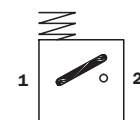
### Technical data:

- Indicator type: Electrical differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

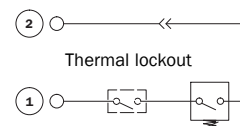
### Electrical data:

- Resistive load: 0,2 A / 115 VDC
- Electrical connections: 20 - AMP Time junior
- Switching type: Normally open contacts (N.C. on request)
- Thermal lockout: Normally open up to 30 °C (F option)
- Protection degree: IP 66 in according to EN 60529

## HYDRAULIC SYMBOL



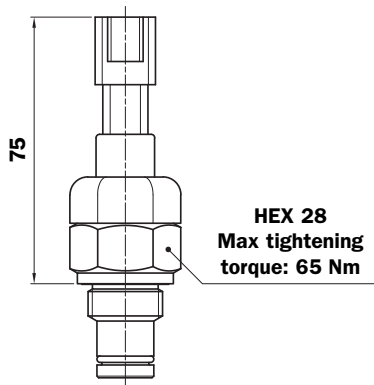
## ELECTRICAL SYMBOL





# DIFFERENTIAL INDICATORS

## DEM



Available setting:  
 1,2 bar ±10% (DEM12xx30P01)  
 2 bar ±10% (DEM20xx30P01)  
 5 bar ±10% (DEM50xx30P01)  
 7 bar ±10% (DEM70xx30P01)  
 9,5 bar ±10% (DEM95xx30P01)

## Electrical Differential Indicator

### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR - FPM

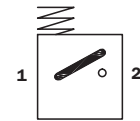
### Technical data:

- Indicator type: Electrical differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

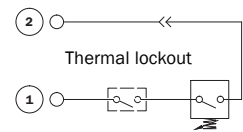
### Electrical data:

- Resistive load: 0,2 A / 115 Vdc
- Electrical connections: 30 - Deutsch DT-04-2-P
- Switching type: Normally open contacts (N.C. on request)
- Thermal lockout: Normally open up to 30 °C (F option)
- Protection degree: IP 66 in according to EN 60529

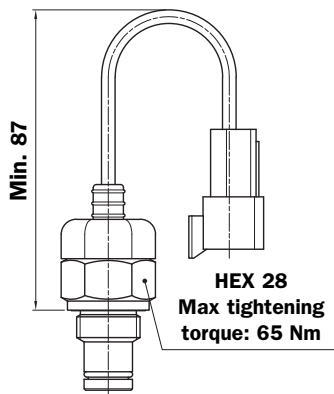
## HYDRAULIC SYMBOL



## ELECTRICAL SYMBOL



## DEM



Available setting:  
 1,2 bar ±10% (DEM12xx35P01)  
 2 bar ±10% (DEM20xx35P01)  
 5 bar ±10% (DEM50xx35P01)  
 7 bar ±10% (DEM70xx35P01)  
 9,5 bar ±10% (DEM95xx35P01)

## Electrical Differential Indicator

### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR - FPM

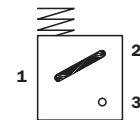
### Technical data:

- Indicator type: Electrical differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

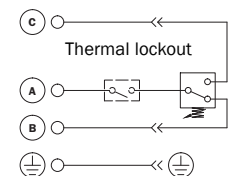
### Electrical data:

- Resistive load: 0,2 A / 115 Vdc
- Electrical connections: 35 - Deutsch DT-04-3-P
- Switching type: SPDT contact
- Thermal lockout: Normally open up to 30 °C (F option)
- Protection degree: IP 66 in according to EN 60529

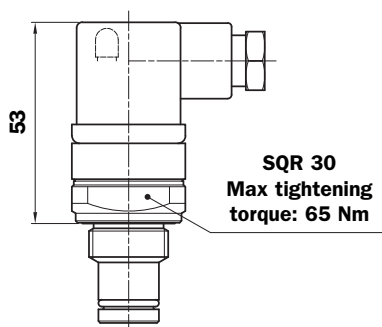
## HYDRAULIC SYMBOL



## ELECTRICAL SYMBOL



## DLA



Available setting:  
 1,2 bar ±10% (DLA12xAxxP01)  
 2 bar ±10% (DLA20xAxxP01)  
 5 bar ±10% (DLA50xAxxP01)  
 7 bar ±10% (DLA70xAxxP01)  
 9,5 bar ±10% (DLA95xAxxP01)

## Electrical/Visual Differential Indicator

### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR - FPM

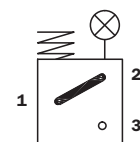
### Technical data:

- Indicator type: Electrical/Visual differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

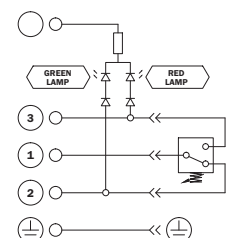
### Electrical data:

- Resistive load: 51: 0,8 A / 24 Vdc  
52: 0,2 A / 115 Vdc
- Electrical connections: 51 - EN 175301-803 (24 Vdc lamps)  
52 - EN 175301-803 (110 Vdc lamps)
- Protection degree: IP 66 in according to EN 60529  
IP 69K in according to ISO 20653

## HYDRAULIC SYMBOL

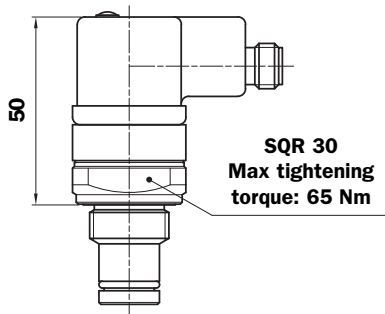


## ELECTRICAL SYMBOL



# DIFFERENTIAL INDICATORS

## DLA



Available setting:

- 1,2 bar ±10% (DLA12xA71P01)
- 2 bar ±10% (DLA20xA71P01)
- 5 bar ±10% (DLA50xA71P01)
- 7 bar ±10% (DLA70xA71P01)
- 9,5 bar ±10% (DLA95xA71P01)

## Electrical/Visual Differential Indicator

### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR - FPM

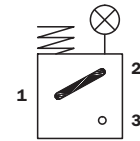
### Technical data:

- Indicator type: Electrical/Visual differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

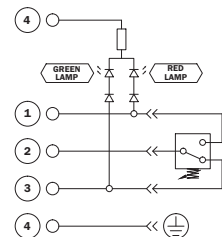
### Electrical data:

- Resistive load: 0,4 A / 24 Vdc
- Electrical connections: 71 - M12 IEC 61076-2-101 (24 Vdc lamps)  
IP 65 in according to EN 60529
- Protection degree: IP 69K in according to ISO 20653

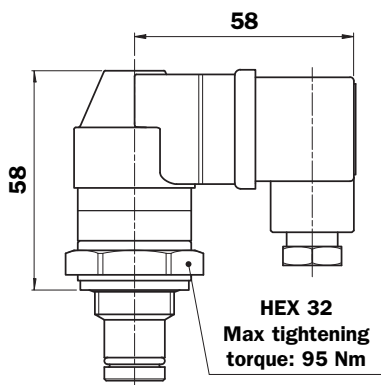
## HYDRAULIC SYMBOL



## ELECTRICAL SYMBOL



## DLE



Available setting:

- 1,2 bar ±10% (DLE12VA50P01)
- 2 bar ±10% (DLE20VA50P01)
- 5 bar ±10% (DLE50VA50P01)
- 7 bar ±10% (DLE70VA50P01)
- 9,5 bar ±10% (DLE95VA50P01)

## Electrical/Visual Differential Indicator

### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: FPM

### Technical data:

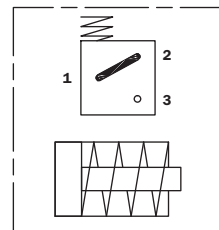
- Indicator type: Electrical/Visual differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

### Electrical data:

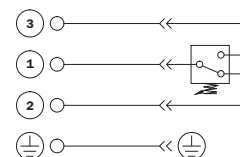
- Resistive load: 5 A / 250 VAC
- Electrical connections: 50 - EN 175301-803
- Protection degree: IP 65 in according to EN 60529

Available the connector with lamps

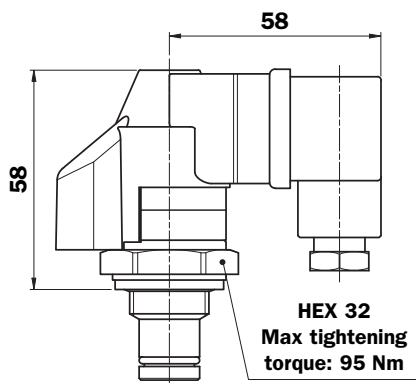
## HYDRAULIC SYMBOL



## ELECTRICAL SYMBOL



## DLE



Available setting:

- 1,2 bar ±10% (DLE12VF50P01)
- 2 bar ±10% (DLE20VF50P01)
- 5 bar ±10% (DLE50VF50P01)
- 7 bar ±10% (DLE70VF50P01)
- 9,5 bar ±10% (DLE95VF50P01)

## Electrical/Visual Differential Indicator

### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: FPM

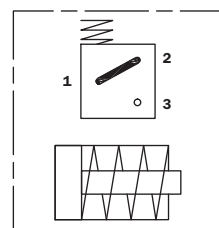
### Technical data:

- Indicator type: Electrical/Visual differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

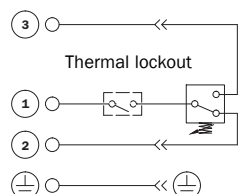
### Electrical data:

- Resistive load: 5 A / 250 VAC
- Thermal lockout setting: +30 °C
- Electrical connections: 50 - EN 175301-803
- Protection degree: IP 65 in according to EN 60529

## HYDRAULIC SYMBOL

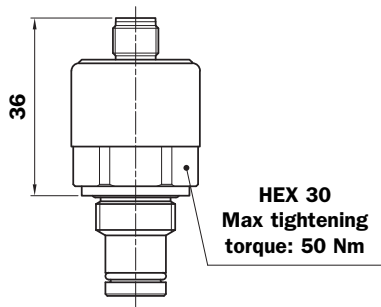


## ELECTRICAL SYMBOL



# DIFFERENTIAL INDICATORS

## DTA



Available setting:  
 1,2 bar ±10% (DTA12xF70P01)  
 2 bar ±10% (DTA20xF70P01)  
 5 bar ±10% (DTA50xF70P01)  
 7 bar ±10% (DTA70xF70P01)  
 9,5 bar ±10% (DTA95xF70P01)

### Electronic Differential Indicator

#### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: NBR

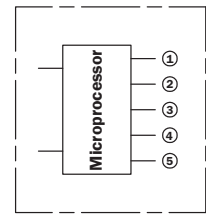
#### Technical data:

- Indicator type: Electronic differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

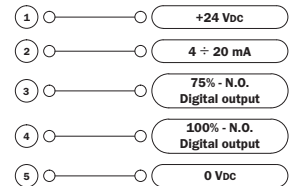
#### Electrical data:

- Power supply: 24 VDC
- Analogue output: From 4 to 20 mA
- Thermal lockout: 30 °C (all output signals stalled up to 30 °C)
- Protection degree: IP 67 in according to EN 60529

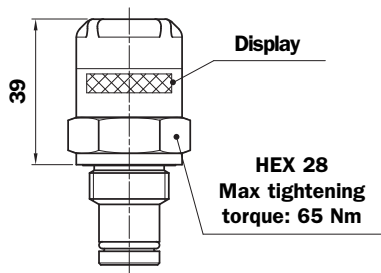
### HYDRAULIC SYMBOL



### ELECTRICAL SYMBOL



## DVA



Available setting:  
 1,2 bar ±10% (DVA12xP01)  
 2 bar ±10% (DVA20xP01)  
 5 bar ±10% (DVA50xP01)  
 7 bar ±10% (DVA70xP01)  
 9,5 bar ±10% (DVA95xP01)

### Visual Differential Indicator

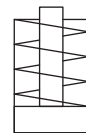
#### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR - FPM

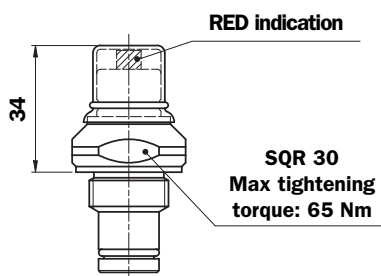
#### Technical data:

- Indicator type: Visual differential indicator
- Reset: Automatic reset
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

### HYDRAULIC SYMBOL



## DVM



Available setting:  
 1,2 bar ±10% (DVM12xP01)  
 2 bar ±10% (DVM20xP01)  
 5 bar ±10% (DVM50xP01)  
 7 bar ±10% (DVM70xP01)  
 9,5 bar ±10% (DVM95xP01)

### Visual Differential Indicator

#### Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR - FPM

#### Technical data:

- Indicator type: Visual differential indicator
- Reset: Manual reset
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

### HYDRAULIC SYMBOL



# Notes

Handwriting practice lines consisting of horizontal dotted lines.

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# Ordering information DE - DL - DV

<b>Series</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>DE</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Example:</b>	<b>DE</b>	<b>A</b>	<b>20</b>	<b>H</b>	<b>A</b>	<b>50</b>	<b>P01</b>

<b>Series</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>DL</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Example:</b>	<b>DL</b>	<b>A</b>	<b>20</b>	<b>H</b>	<b>A</b>	<b>52</b>	<b>P01</b>

<b>Series</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>DT</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Example:</b>	<b>DT</b>	<b>A</b>	<b>20</b>	<b>H</b>	<b>F</b>	<b>70</b>	<b>P01</b>

<b>Series</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>7</b>
<b>DV</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Example:</b>	<b>DV</b>	<b>A</b>	<b>20</b>	<b>H</b>	<b>P01</b>

## 1 - Series

<input type="checkbox"/> <b>DE</b>	Electrical indicator
<input type="checkbox"/> <b>DL</b>	Electrical/Visual indicator
<input type="checkbox"/> <b>DT</b>	Electronic indicator
<input type="checkbox"/> <b>DV</b>	Visual indicator

## 2 - Type

### DE series

<input type="checkbox"/> <b>A</b>	Standard type
<input type="checkbox"/> <b>M</b>	With wired connector

### DL series

<input type="checkbox"/> <b>A</b>	Standard type
<input type="checkbox"/> <b>E</b>	Standard type for High power supply

### DT series

<input type="checkbox"/> <b>A</b>	Standard type
-----------------------------------	---------------

### DV series

<input type="checkbox"/> <b>A</b>	Automatic reset
<input type="checkbox"/> <b>M</b>	Manual reset

## 3 - Setting pressure

<input type="checkbox"/> <b>12</b>	1,5 bar
<input type="checkbox"/> <b>20</b>	2 bar
<input type="checkbox"/> <b>50</b>	5 bar
<input type="checkbox"/> <b>70</b>	7 bar
<input type="checkbox"/> <b>95</b>	9,5 bar

## 4 - Seals

<input type="checkbox"/> <b>H</b>	HNBR
<input type="checkbox"/>	On request

## 5 - Thermostat (excluded for DV)

<input type="checkbox"/> <b>A</b>	Without thermostat
<input type="checkbox"/> <b>F</b>	With thermostat (Normally open up to 30°C) Option available only for DEM-DTA series

## 6 - Electrical connection (excluded for BV)

### DEA - DLE series

<input type="checkbox"/> <b>50</b>	EN 175301-803 connector
------------------------------------	-------------------------

### DEM series

<input type="checkbox"/> <b>10</b>	AMP Superseal series 1,5 (Normally open contacts)
<input type="checkbox"/> <b>20</b>	AMP Timer Junior (Normally open contacts)
<input type="checkbox"/> <b>30</b>	Deutsch DT-04-2-P (Normally open contacts)
<input type="checkbox"/> <b>35</b>	Deutsch DT-04-3-P (Change over contacts)
<input type="checkbox"/>	On request

### DLA series

<input type="checkbox"/> <b>51</b>	EN 175301-803 clear connector with 24 V lamps
<input type="checkbox"/> <b>52</b>	EN 175301-803 clear connector with 110 V lamps
<input type="checkbox"/> <b>71</b>	M12 IEC 61076-2-101 clear connector with 24 V lamps

### DTA series

<input type="checkbox"/> <b>70</b>	M12 IEC 61076-2-101 connector
------------------------------------	-------------------------------

## 7 - Option

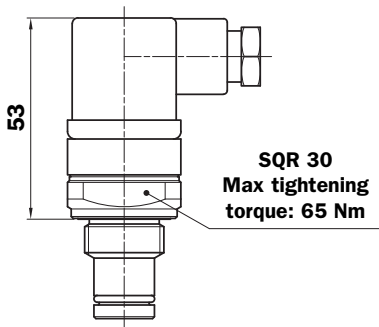
<input type="checkbox"/> <b>P01</b>	MP Filtri standard
<input type="checkbox"/> <b>Pxx</b>	Customer request

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# STAINLESS STEEL DIFFERENTIAL INDICATORS

## DEX



Available setting:  
 1,2 bar ±10% (DEX12xA50P01)  
 2 bar ±10% (DEX20xA50P01)  
 5 bar ±10% (DEX50xA50P01)  
 7 bar ±10% (DEX70xA50P01)  
 9,5 bar ±10% (DEX95xA50P01)

## Electrical Differential Indicator

### Materials:

- Body: AISI 316L
- Internal parts: AISI 316L - Nylon
- Seals: HNBR - MFQ

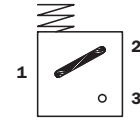
### Technical data:

- Indicator type: Electrical differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

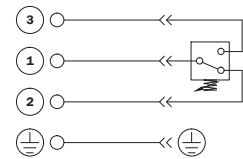
### Electrical data:

- Resistive load: 0,2 A / 115 VDC
- Electrical connections: 50 - EN 175301-803
- Protection degree: IP 66 in according to EN 60529  
IP 69K in according to ISO 20653

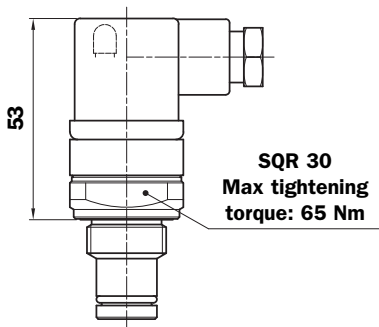
## HYDRAULIC SYMBOL



## ELECTRICAL SYMBOL



## DLX



Available setting:  
 1,2 bar ±10% (DLX12xAxxP01)  
 2 bar ±10% (DLX20xAxxP01)  
 5 bar ±10% (DLX50xAxxP01)  
 7 bar ±10% (DLX70xAxxP01)  
 9,5 bar ±10% (DLX95xAxxP01)

## Electrical/Visual Differential Indicator

### Materials:

- Body: AISI 316L
- Internal parts: AISI 316L - Nylon
- Seals: HNBR - MFQ

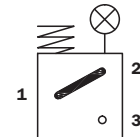
### Technical data:

- Indicator type: Electrical differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

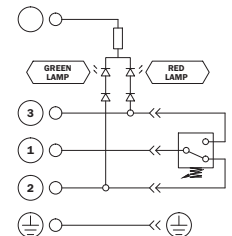
### Electrical data:

- Resistive load: 51: 0,8 A / 24 VDC  
52: 0,2 A / 115 VDC
- Electrical connections: 51 - EN 175301-803 (24 VDC lamps)  
52 - EN 175301-803 (110 VDC lamps)
- Protection degree: IP 66 in according to EN 60529  
IP 69K in according to ISO 20653

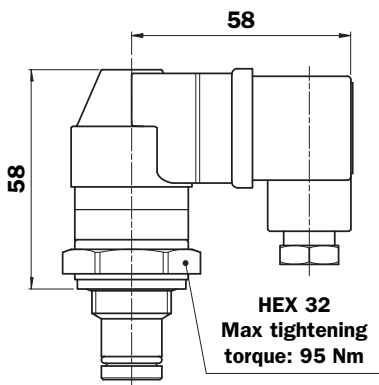
## HYDRAULIC SYMBOL



## ELECTRICAL SYMBOL



## DLY



Available setting:  
 1,2 bar ±10% (DLY12VA50P01)  
 2 bar ±10% (DLY20VA50P01)  
 5 bar ±10% (DLY50VA50P01)  
 7 bar ±10% (DLY70VA50P01)  
 9,5 bar ±10% (DLY95VA50P01)

## Electrical/Visual Differential Indicator

### Materials:

- Body: AISI 316L
- Internal parts: AISI 316L - Nylon
- Seals: FPM

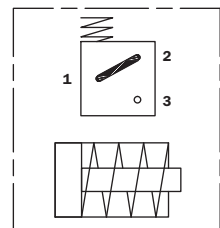
### Technical data:

- Indicator type: Electrical/Visual differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

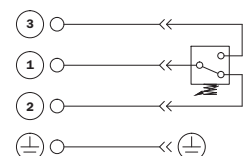
### Electrical data:

- Resistive load: 5 A / 250 VAC
- Electrical connections: 50 - EN 175301-803
- Protection degree: IP 65 in according to EN 60529

## HYDRAULIC SYMBOL

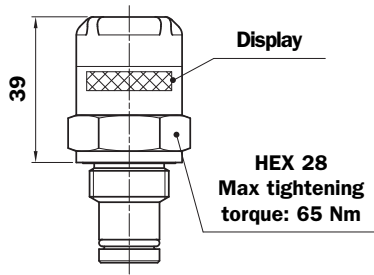


## ELECTRICAL SYMBOL



# STAINLESS STEEL DIFFERENTIAL INDICATORS

## DVX



Available setting:  
 1,2 bar ±10% (DVX12xP01)  
 2 bar ±10% (DVX20xP01)  
 5 bar ±10% (DVX50xP01)  
 7 bar ±10% (DVX70xP01)  
 9,5 bar ±10% (DVX95xP01)

### Visual Differential Indicator

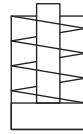
#### Materials:

- Body: AISI 316L
- Internal parts: AISI 316L - Nylon
- Seals: HNBR - MFQ

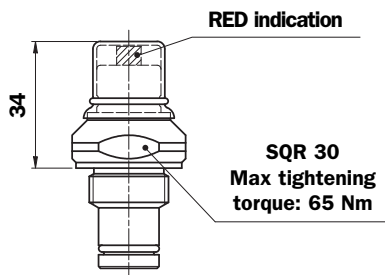
#### Technical data:

- Indicator type: Visual differential indicator with automatic reset
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

### HYDRAULIC SYMBOL



## DVY



Available setting:  
 1,2 bar ±10% (DVY12xP01)  
 2 bar ±10% (DVY20xP01)  
 5 bar ±10% (DVY50xP01)  
 7 bar ±10% (DVY70xP01)  
 9,5 bar ±10% (DVY95xP01)

### Visual Differential Indicator

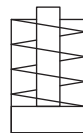
#### Materials:

- Body: AISI 316L
- Internal parts: AISI 316L - Aluminium
- Seals: HNBR - MFQ

#### Technical data:

- Indicator type: Visual differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids  
HFA, HFB, HFC fluids in according to ISO 2943

### HYDRAULIC SYMBOL



# Notes

Ruled area for notes with horizontal dashed lines.



# Ordering information DE - DL - DV

<b>Series</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>DE</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Example:</b>	<b>DE</b>	<b>X</b>	<b>20</b>	<b>H</b>	<b>A</b>	<b>50</b>	<b>P01</b>

<b>Series</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>DL</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Example:</b>	<b>DL</b>	<b>X</b>	<b>20</b>	<b>H</b>	<b>A</b>	<b>52</b>	<b>P01</b>

<b>Series</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>7</b>
<b>DV</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Example:</b>	<b>DV</b>	<b>X</b>	<b>20</b>	<b>H</b>	<b>P01</b>

## 1 - Series

- DE** Electrical indicator
- DL** Electrical/Visual indicator
- DV** Visual indicator

## 2 - Type

- X** Standard type
- Y** Optional type

## 3 - Setting pressure

- 12** 1,5 bar
- 20** 2 bar
- 50** 5 bar
- 70** 7 bar
- 95** 9,5 bar

## 4 - Seals

- H** HNBR
- F** MFQ
- On request

## 5 - Thermostat (excluded for DV)

- A** Without thermostat

## 6 - Electrical connection (excluded for DV)

### DEX series

- 50** EN 175301-803 connector

### DLA series

- 51** EN 175301-803 clear connector with 24 V lamps
- 52** EN 175301-803 clear connector with 110 V lamps
- 71** M12 IEC 61076-2-101 clear connector with 24 V lamps

## 7 - Option

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

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# Comparative table OLD - NEW code

## VACUUM INDICATORS

Old code	New code
E0	VED20AA50P01
E0P01	VEB21AA50P01
E1	VEC20AA50P01
E1P01	VEA21AA50P01
E1P02	VEA21AA05P01
-	-
-	VVS16P01
VP01	VVR16P01
VOP01	VVA16P01
VSP01	WVB16P01

## BAROMETRIC INDICATORS

Old code	New code	Old code	New code
FE08H1AP01	BEA08HA50P01	VP15AMP01	BVQ15HP01
FE08H1BP01	BLA08HA51P01	VP20AAP01	BVP20HP01
FE15H1AP01	BEA15HA50P01	VP20AMP01	BVQ20HP01
FE15H1BP01	BLA15HA51P01	-	-
FE15H1DP01	BLA15HA53P01	VRP01	BVA14P01
FE15H1EP01	BEM15HA41P01	VR25P01	BVA25P01
FE20H1AP01	BEA20HA50P01	V1P01	BVR14P01
FE20H1BP01	BLA20HA51P01	-	BVR25P01
FE20H1CP01	BLA20HA52P01		
FE20H1DP01	BLA20HA53P01		
FE20H1EP01	BEM20HA41P01		
FE25H1AP01	BEA25HA50P01		
FE25H1BP01	BLA25HA51P01		
VP15AAP01	BVP15HP01		

## STAINLESS STEEL DIFFERENTIAL INDICATORS

Old code	New code	Old code	New code
1EX	DLY12HA50P01 - DLY12VA50P01	VB6FP01	DVY20FP01
E6X	DLY20HA50P01 - DLY20VA50P01	VB6HP01	DVY20HP01
E6XE	DLY20EA50P01	VB7FP01	DVY50FP01
E7X	DLY50HA50P01 - DLY50VA50P01	VB7HP01	DVY50HP01
E8X	DLY70HA50P01 - DLY70VA50P01	VB7VP01	DVY50VP01
-	-	VB8EP01	DVY70EP01
K7X1HP01	DLX50HA51P01	VB8FP01	DVY70FP01
K8X1HP01	DLX70HA51P01	VB8HP01	DVY70HP01
-	-	-	-
N7X	DEX50HA50P01	1VX	DVX12HP01 - DVX12VP01
N7XEP01	DEX50EA50P01	V6X	DVX20HP01 - DVX20VP01
N8X	DEX70HA50P01	V7X	DVX50HP01 - DVX50VP01
N8XEP01	DEX70EA50P01	V7XE	DVX50EP01
		V8X	DVX70HP01 - DVX70VP01
		V8XE	DVX70EP01

# Comparative table OLD - NEW code

## DIFFERENTIAL INDICATORS

Old code	New code	Old code	New code
1E	DLE12HA50P01 - DLE12VA50P01	NM6HA11P01	DEM20HA10P01
E6	DLE20HA50P01 - DLE20VA50P01	NM6HA31P01	DEM20HA30P01
E6E	DLE20EA50P01	NM6HA36P01	DEM20HA31P01
E6H	DLE20HA50P01	NM7HA11P01	DEM50HA10P01
E7	DLE50HA50P01 - DLE50VA50P01	NM7HA21P01	DEM50HA20P01
E7E	DLE50EA50P01	NM7HA31P01	DEM50HA30P01
E7H	DLE50HA50P01	NM7HA32P01	DEM50HA35P01
E8	DLE70HA50P01 - DLE70VA50P01	NM7HC32P01	DEM50HF35P01
E8E	DLE70EA50P01	NM7VA11P01	DEM50VA10P01
E8H	DLE70HA50P01	NM7VC11P01	DEM50VF10P01
E9	DLE95HA50P01 - DLE95VA50P01	NM8HA11P01	DEM70HA10P01
E9E	DLE95EA50P01	NM8HA31P01	DEM70HA30P01
E9H	DLE95HA50P01	NM8HA36P01	DEM70HA32P01
-	-	-	-
J1	DLE12HF50P01 - DLE12VF50P01	NR2HP01	DEA12HA50P01
J6	DLE20HF50P01 - DLE20VF50P01	NR2VP01	DEA12VA50P01
J7	DLE50HF50P01 - DLE50VF50P01	NR6EP01	DEA20EA50P01
J8	DLE70HF50P01 - DLE70VF50P01	NR6HP01	DEA20HA50P01
J9	DLE95HF50P01 - DLE95VF50P01	NR6VP01	DEA20VA50P01
-	-	NR7HP01	DEA50HA50P01
KR21HP01	DLA12HA51P01	NR7VP01	DEA50VA50P01
KR21VP01	DLA12VA51P01	NR8EP01	DEA70EA50P01
KR31HP01	DLA30HA51P01	NR8HP01	DEA70HA50P01
KR61HP01	DLA20HA51P01	NR8VP01	DEA70VA50P01
KR61VP01	DLA20VA51P01	NR9HP01	DEA95HA50P01
KR62HP01	DLA20HA52P01	NR9VP01	DEA95VA50P01
KR62VP01	DLA20VA52P01	-	-
KR71HP01	DLA50HA51P01	U3HP01	DVM30HP01
KR71VP01	DLA50VA51P01	U6HP01	DVM20HP01
KR72HP01	DLA50HA52P01	U6VP01	DVM20VP01
KR72VP01	DLA50VA52P01	U7HP01	DVM50HP01
KR81HP01	DLA70HA51P01	U7VP01	DVM50VP01
KR81VP01	DLA70VA51P01	U8VP01	DVM70VP01
KR82HP01	DLA70HA52P01	-	-
KR91HP01	DLA95HA51P01	1V	DVA12HP01 - DVA12VP01
-	-	V6	DVA20HP01 - DVA20VP01
NE2HTP01	DTA12HF70P01	V6E	DVA20EP01
NE2VSP01	DTA12VF70P01	V6H	DVA20HP01
NE6HSP01	DTA20HF70P01	V7	DVA50HP01 - DVA50VP01
NE6HTP01	DTA20HF70P01	V7E	DVA50EP01
NE6VSP01	DTA20VF70P01	V7H	DVA50HP01
NE6VTP01	DTA20VF70P01	V8	DVA70HP01 - DVA70VP01
NE7HSP01	DTA50HF70P01	V8E	DVA70EP01
NE7HTP01	DTA50HF70P01	V9	DVA95HP01 - DVA95VP01
NE7VSP01	DTA50VF70P01	V9E	DVA95EP01
NE7VTP01	DTA50VF70P01	-	-
NE8HSP01	DTA70HF70P01	Z2HP01	DVM12HP01
NE8HTP01	DTA70HF70P01	Z2VP01	DVM12VP01
NE8VSP01	DTA70VF70P01	Z6EP01	DVM20EP01
NE8VTP01	DTA70VF70P01	Z6HP01	DVM20HP01
NE9VSP01	DTA70VF70P01	Z6VP01	DVM20VP01
NE9VTP01	DTA70VF70P01	Z7HP01	DVM50HP01
NE9VTP01	DTA95VF70P01	Z7VP01	DVM50VP01
NE9VTP01	DTA95VF70P01	Z7XHP01	DVY70HP01
NE9VTP01	DTA95VF70P01	Z8EP01	DVM70EP01
NE9VTP01	DTA95VF70P01	Z8HP01	DVM70HP01
NE9VTP01	DTA95VF70P01	Z8VP01	DVM70VP01
NE9VTP01	DTA95VF70P01	Z9HP01	DVM95HP01











**New Headquarters:**

**MP FILTRI S.p.A. Italy**

Via 1° Maggio, n. 3  
20060 Pessano con Bornago  
(Milan) Italy  
Tel. +39.02/95703.1  
Fax +39.02/95741497-95740188  
email: sales@mpfiltri.com  
www.mpfiltri.com

**GREAT BRITAIN  
MP FILTRI U.K. Ltd.**

Bourton Industrial Park  
Bourton on the Water  
Gloucestershire GL54 2HQ UK  
Phone: +44.01451-822522  
Fax: +44.01451-822282  
email: sales@mpfiltri.co.uk  
www.hydraulicparticlecounter.com  
www.mpfiltri.com

**GERMANY  
MP FILTRI Germany GmbH**

Hans - Wilhelmi - Straße 2  
DE-66386 St. Ingbert  
Phone: +49.(0)6894-95652-0  
Fax: +49.(0)6894-95652-20  
email: sales@mpfiltri.de  
www.mpfiltri.com

**FRANCE  
MP FILTRI FRANCE Sas**

Parc d'activités des Chanteraines  
8 rue du Commandant d'Estienne  
d'Orves, Immeuble D3  
92396 Villeneuve la Garenne - France  
Phone: +33(0)1.40.86.47.00  
Fax: +33(0)1.40.86.47.09  
email: sales@mpfiltrifrance.com  
www.mpfiltri.com

**USA**

**MP FILTRI USA Inc.**

2055 Quaker Pointe Drive  
Quakertown, PA 18951  
Phone: +1.215-529-1300  
Fax: +1.215-529-1902  
email: sales@mpfiltriusa.com  
www.mpfiltriusa.com

**CANADA**

**MP FILTRI CANADA Inc.**

8831 Keele Street, Concord,  
Ontario L4K 2N1, Canada  
Phone: +1.905-303-1369  
Fax: +1.905-303-7256  
email: mail@mpfiltricanada.com  
www.mpfiltricanada.com

**RUSSIAN FEDERATION  
ITALFILTRI**

Yuryevskiy Pereulok 13 a, Building 1  
111020 Moscow, Russia  
Phone/Fax: +7(495)220-94-60  
email: mpfiltrirusia@yahoo.com  
www.mpfiltri.ru

**CHINA**

**MP FILTRI (Shanghai) Co. Ltd.**

1280 Lianxi Road, 8 Bld - 2 Floor  
Shanghai, Pudong  
201204 P.R. China  
Phone: + 86.21-58919916  
Fax: + 86.21-58919667  
email: sales@mpfiltrishanghai.com  
www.mpfiltri.com

**INDIA**

**MP FILTRI INDIA Pvt. Ltd.**

Plot-7F, Raj Pinnacle  
Beside RMZ Centennial,  
Brookefield Road, Whitefield,  
Bangalore 560048 - India  
Phone: +91-80-4147 7444/4146 1444  
Fax: +91-80-41461888  
email: sales@mpfiltri.co.in  
www.mpfiltri.com