

# PB



## MATERIALS

Head:  
Cast iron

Bowl:  
Steel

Bypass valve:  
Steel

Seals:  
NBR Nitrile  
(FKM - on request fluoroelastomer)

Indicator housing:  
Brass

## PRESSURE (ISO 10771-1:2002)

Max. working: 42 MPa (420 bar)

Test: 62 MPa (620 bar)

Bursting: 126 MPa (1.260 bar)

Collapse, differential  
for the filter element (ISO 2941):  
series standard 2 MPa (20 bar)  
serie H+ 21 MPa (210 bar)

## APPLICATION EXAMPLE



## BYPASS VALVE

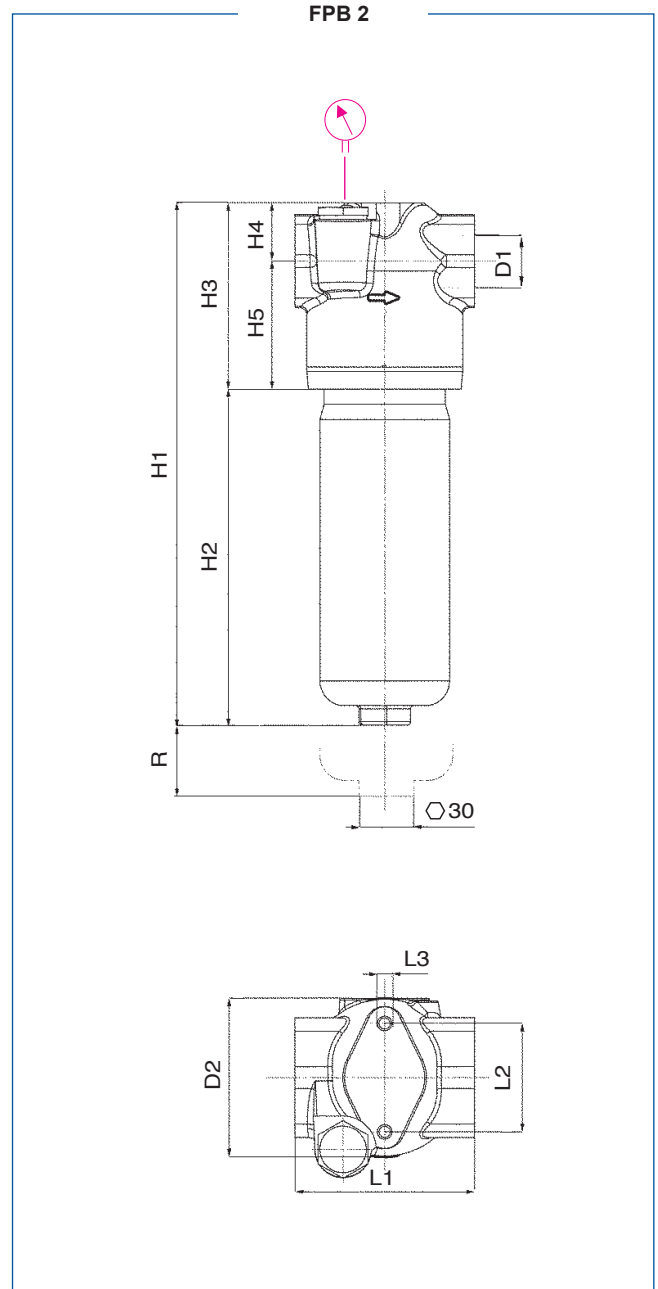
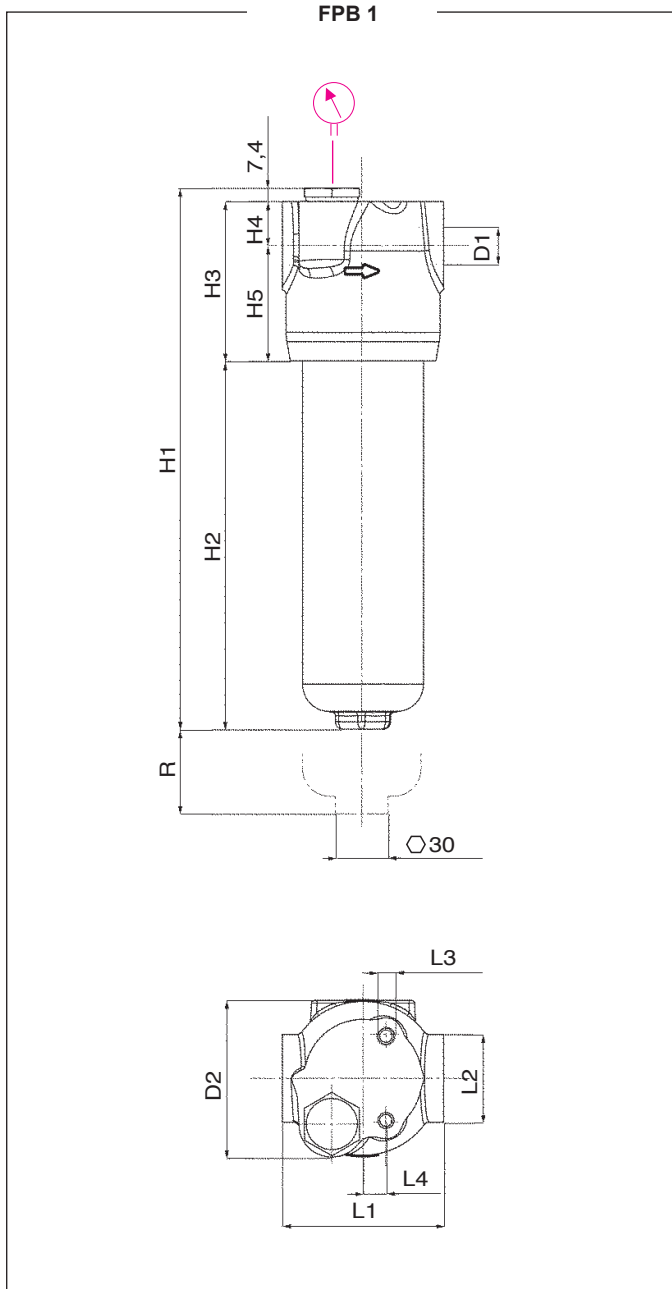
Setting:  
600 kPa (6 bar)  $\pm$  10%

## WORKING TEMPERATURE

From -25° to +110° C

## COMPATIBILITY (ISO 2943:1999)

Full with fluids: HH-HL-HM-HV-HTG  
(according to ISO 6743/4)  
For fluids different than the above  
mentioned, please contact our Sales  
Department.



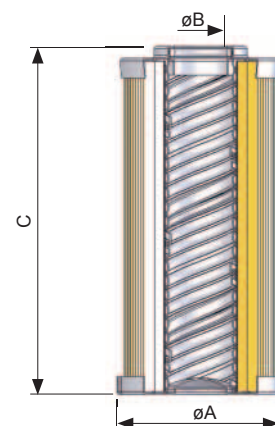
### FILTER HOUSING

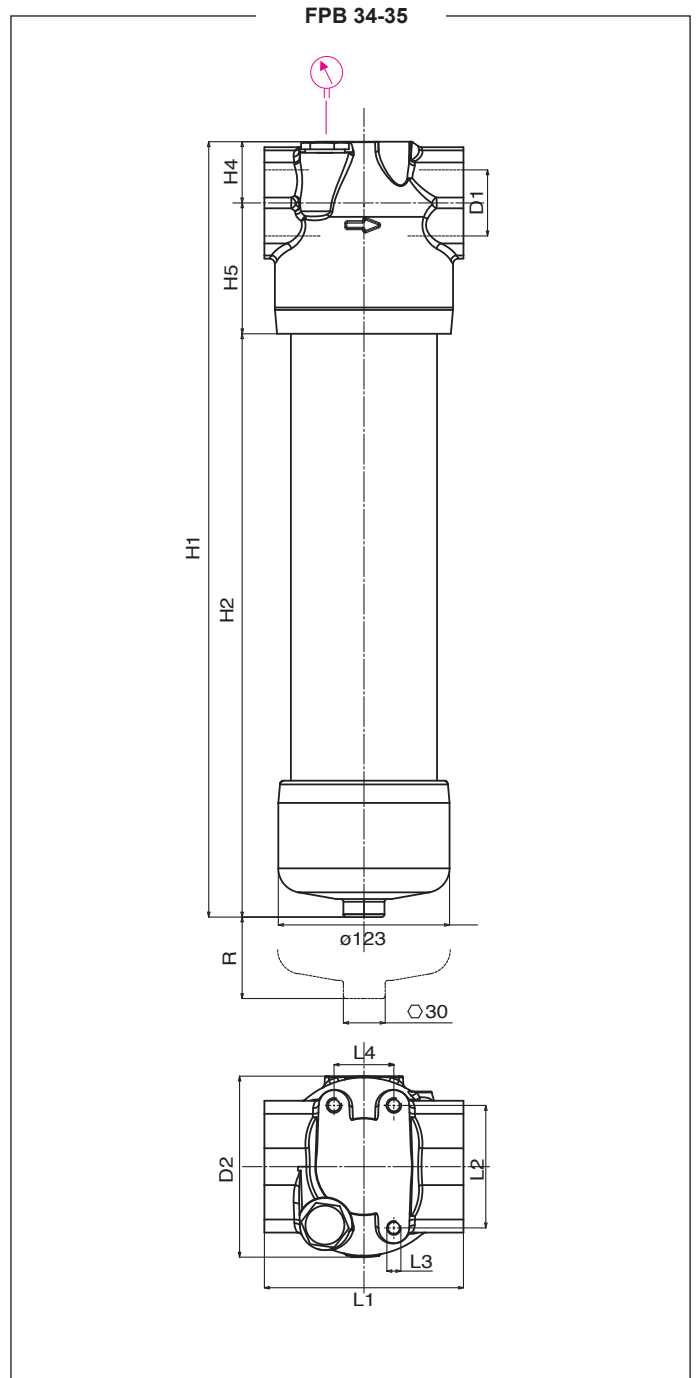
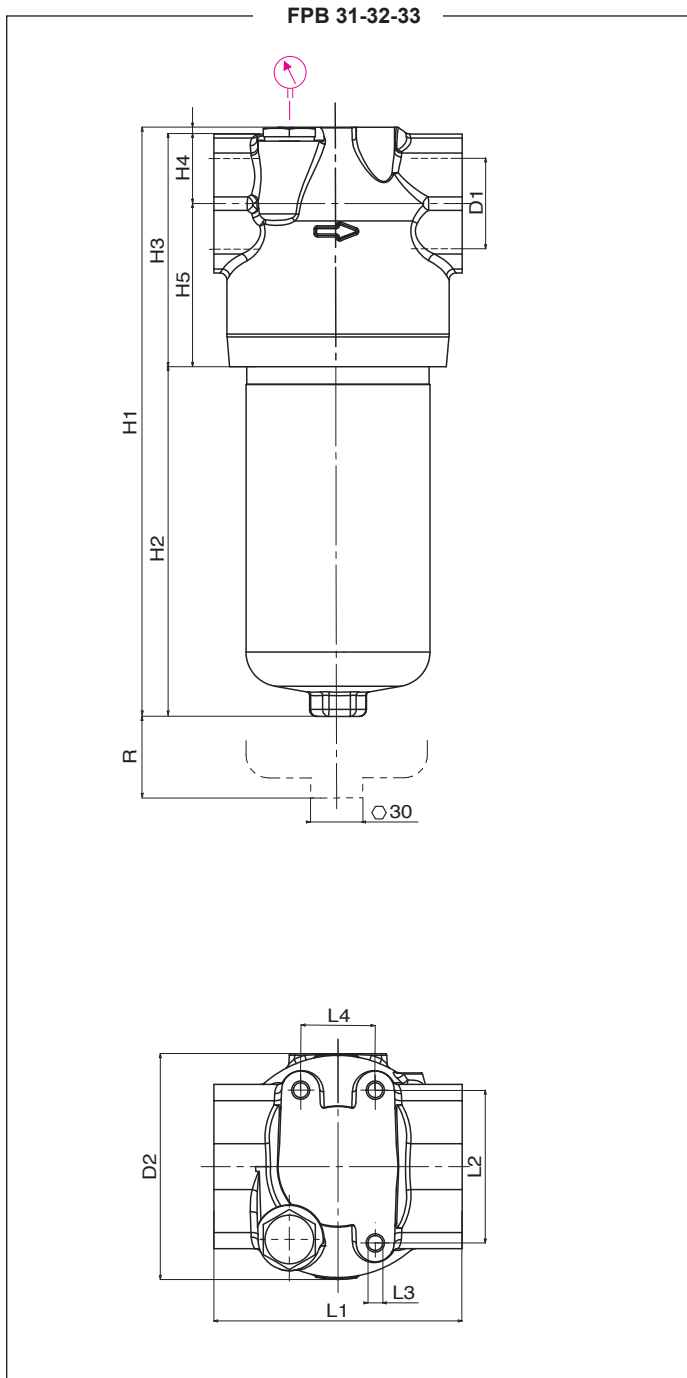
|       | D1          | D2 | H1  | H2  | H3  | H4 | H5 | L1  | L2 | L3 | L4   | R   | kg  |
|-------|-------------|----|-----|-----|-----|----|----|-----|----|----|------|-----|-----|
| FPB11 | 1/2" - 3/4" | 86 | 166 | 79  | 87  | 24 | 63 | 88  | 46 | M8 | 12,5 | 100 | 4,4 |
| FPB12 | 1/2" - 3/4" | 86 | 196 | 109 | 87  | 24 | 63 | 88  | 46 | M8 | 12,5 | 100 | 4,6 |
| FPB13 | 1/2" - 3/4" | 86 | 296 | 209 | 87  | 24 | 63 | 88  | 46 | M8 | 12,5 | 100 | 5,2 |
| FPB21 | 3/4" - 1"   | 94 | 226 | 116 | 112 | 35 | 77 | 108 | 65 | M8 | -    | 100 | 6,6 |
| FPB22 | 3/4" - 1"   | 94 | 317 | 207 | 112 | 35 | 77 | 108 | 65 | M8 | -    | 100 | 8,2 |

|   |   |  |    |    |    |    |                                     |   |
|---|---|--|----|----|----|----|-------------------------------------|---|
|   |   | <b>TYPE</b>  |    |    |    |    |                                     |   |
|   |   | F = FILTER COMPLETE  | F  | F  | F  | F  | F                                   |   |
|   |   | B = FILTER HOUSING   | B  | B  | B  | B  | B                                   | <b>ELEMENT</b> E  |
| P | B | <b>FAMILY, SIZE &amp; LENGTH</b>                           |    |    |    |    | <b>FAMILY SIZE &amp; LENGTH</b> P B |   |
|   |   |  | 11 | 12 | 13 | 21 | 22                                  |   |
|   |   | <b>PORT TYPE</b>   |    |    |    |    |                                     |   |
|   |   | B = BSP - thread   | B  | B  | B  | B  | B                                   |   |
|   |   | N = NPT - thread   | N  | N  | N  | N  | N                                   |   |
|   |   | S = SAE - thread   | S  | S  | S  | S  | S                                   |   |
|   |   | F = SAE Flange 3000 psi                                    | -  | -  | -  | F  | F                                   |   |
|   |   | G = SAE Flange 6000 psi                                    | -  | -  | -  | G  | G                                   |   |
|   |   | <b>PORT SIZE</b>   |    |    |    |    |                                     |   |
|   |   | 04 = 1/2" (N04 not available)                              | 04 | 04 | 04 | -  | -                                   |   |
|   |   | 06 = 3/4"  | 06 | 06 | 06 | 06 | 06                                  |   |
|   |   | 08 = 1" (G08 not available; F08 for PB2+ only)             | -  | -  | -  | 08 | 08                                  |   |
|   |   | <b>BYPASS VALVE</b>  |    |    |    |    |                                     |   |
|   |   | W = without  | W  | W  | W  | W  | W                                   |   |
|   |   | C = 600 kPa (6 bar)  | C  | C  | C  | C  | C                                   |   |
|   |   | R = reverse flow valve                                     | -  | -  | -  | R  | R                                   | } on request only   |
|   |   | P = reverse flow + bypass valve                            | -  | -  | -  | P  | P                                   |   |
|   |   | <b>SEALS</b>   |    |    |    |    | <b>SEALS</b>                        |   |
|   |   | N = NBR Nitrile  | N  | N  | N  | N  | N                                   | N = NBR   |
|   |   | F = FKM Fluoroelastomer                                    | F  | F  | F  | F  | F                                   | F = FKM   |
|   |   | <b>FILTER MEDIA</b>  |    |    |    |    | <b>FILTER MEDIA</b>                 |   |
|   |   | FA = fiber 5 μm <sub>(e)</sub> β>1.000 Δp 2MPa (20 bar)    | FA | FA | FA | FA | FA                                  | FA = fib. 5 μm <sub>(e)</sub> 20 bar  |
|   |   | FB = fiber 7 μm <sub>(e)</sub> β>1.000 Δp 2MPa (20 bar)    | FB | FB | FB | FB | FB                                  | FB = fib. 7 μm <sub>(e)</sub> 20 bar  |
|   |   | FC = fiber 12 μm <sub>(e)</sub> β>1.000 Δp 2MPa (20 bar)   | FC | FC | FC | FC | FC                                  | FC = fib. 12 μm <sub>(e)</sub> 20 bar   |
|   |   | FD = fiber 21 μm <sub>(e)</sub> β>1.000 Δp 2MPa (20 bar)   | FD | FD | FD | FD | FD                                  | FD = fib. 21 μm <sub>(e)</sub> 20 bar   |
|   |   | HA = fiber 5 μm <sub>(e)</sub> β>1.000 Δp 21MPa (210 bar)  | HA | HA | HA | HA | HA                                  | HA = fib. 5 μm <sub>(e)</sub> 210 bar   |
|   |   | HB = fiber 7 μm <sub>(e)</sub> β>1.000 Δp 21MPa (210 bar)  | HB | HB | HB | HB | HB                                  | HB = fib. 7 μm <sub>(e)</sub> 210 bar   |
|   |   | HC = fiber 12 μm <sub>(e)</sub> β>1.000 Δp 21MPa (210 bar) | HC | HC | HC | HC | HC                                  | HC = fib. 12 μm <sub>(e)</sub> 210 bar  |
|   |   | HD = fiber 21 μm <sub>(e)</sub> β>1.000 Δp 21MPa (210 bar) | HD | HD | HD | HD | HD                                  | HD = fib. 21 μm <sub>(e)</sub> 210 bar  |
|   |   | CC = cellulose 10 μm β>2 Δp 2MPa (20 bar)                  | CC | CC | CC | CC | CC                                  | CC = cel. 10 μm 20 bar  |
|   |   | <b>CLOGGING INDICATORS</b>                                 |    |    |    |    |                                     |   |
|   |   | 03 = port, plugged   | 03 | 03 | 03 | 03 | 03                                  | When the filter is ordered with FKM seals, the first digit of the indicator code is a letter (please see page 182 - 183). |
|   |   | 5E = visual differential 500 kPa (5 bar)                   | 5E | 5E | 5E | 5E | 5E                                  |   |
|   |   | 5F = visual differential 800 kPa (8 bar)                   | 5F | 5F | 5F | 5F | 5F                                  |   |
|   |   | 6E = electrical differential 500 kPa (5 bar)               | 6E | 6E | 6E | 6E | 6E                                  |   |
|   |   | 6F = electrical differential 800 kPa (8 bar)               | 6F | 6F | 6F | 6F | 6F                                  |   |
|   |   | 7E = indicator 6E with LED                                 | 7E | 7E | 7E | 7E | 7E                                  |   |
|   |   | 7F = indicator 6F with LED                                 | 7F | 7F | 7F | 7F | 7F                                  |   |
|   |   | T2 = elect. diff. 500 kPa (5 bar) with thermostat 30°C     | T2 | T2 | T2 | T2 | T2                                  |   |
|   |   | T3 = elect. diff. 800 kPa (8 bar) with thermostat 30°C     | T3 | T3 | T3 | T3 | T3                                  |   |
|   |   | <b>ACCESSORIES</b>   |    |    |    |    |                                     |   |
| X | X | XX = no accessory available                                | XX | XX | XX | XX | XX                                  | N.B. Indicator series 72 & 73 only on request   |

**FILTER ELEMENT**

|       | A  | B    | C   | kg media F+ & C+ | kg media H+ | Area (cm <sup>2</sup> ) |          |          |
|-------|----|------|-----|------------------|-------------|-------------------------|----------|----------|
|       |    |      |     |                  |             | Media F+                | Media H+ | Media C+ |
| EPB11 | 45 | 25   | 85  | 0,15             | 0,25        | 355                     | 340      | 310      |
| EPB12 | 45 | 25   | 116 | 0,20             | 0,55        | 500                     | 475      | 435      |
| EPB13 | 45 | 25   | 211 | 0,30             | 0,45        | 935                     | 915      | 815      |
| EPB21 | 52 | 23,5 | 115 | 0,25             | 0,40        | 975                     | 975      | 780      |
| EPB22 | 52 | 23,5 | 210 | 0,35             | 0,55        | 1.830                   | 1.785    | 1.465    |





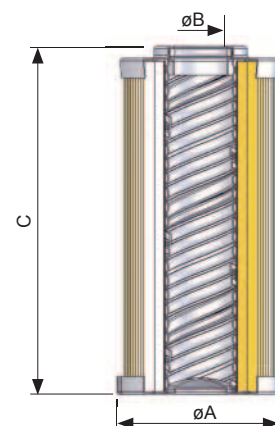
### FILTER HOUSING

|       | D1                   | D2  | H1  | H2  | H3  | H4 | H5 | L1  | L2 | L3  | L4 | R   | kg   |
|-------|----------------------|-----|-----|-----|-----|----|----|-----|----|-----|----|-----|------|
| FPB31 | 1" - 1" 1/4 - 1" 1/2 | 128 | 245 | 107 | 138 | 44 | 94 | 143 | 88 | M10 | 43 | 100 | 11,0 |
| FPB32 | 1" - 1" 1/4 - 1" 1/2 | 128 | 337 | 199 | 138 | 44 | 94 | 143 | 88 | M10 | 43 | 100 | 13,9 |
| FPB33 | 1" - 1" 1/4 - 1" 1/2 | 128 | 457 | 319 | 138 | 44 | 94 | 143 | 88 | M10 | 43 | 100 | 17,2 |
| FPB34 | 1" - 1" 1/4 - 1" 1/2 | 128 | 558 | 420 | 138 | 44 | 94 | 143 | 88 | M10 | 43 | 100 | 22,0 |
| FPB35 | 1" - 1" 1/4 - 1" 1/2 | 128 | 658 | 520 | 138 | 44 | 94 | 143 | 88 | M10 | 43 | 100 | 25,0 |

|  |   |                       |    |    |    |    |   |   |
|--|---|-----------------------|----|----|----|----|---|---|
| TYPE   |   |                       |    |    |    |    |   |   |
| F = FILTER COMPLETE  |   | F                     | F  | F  | F  | F  |   |   |
| B = FILTER HOUSING   |   | B                     | B  | B  | B  | B  | ELEMENT   | E |
| P  | B | FAMILY, SIZE & LENGTH |    |    |    |    | FAMILY SIZE & LENGTH  |   |
|  |   | 31                    | 32 | 33 | 34 | 35 |   |   |
| PORT TYPE  |   |                       |    |    |    |    |   |   |
| B = BSP - thread   |   | B                     | B  | B  | B  | B  |   |   |
| N = NPT - thread   |   | N                     | N  | N  | N  | N  |   |   |
| S = SAE - thread   |   | S                     | S  | S  | S  | S  |   |   |
| F = SAE Flange 3000 psi                                    |   | F                     | F  | F  | F  | F  |   |   |
| G = SAE Flange 6000 psi                                    |   | G                     | G  | G  | G  | G  |   |   |
| PORT SIZE  |   |                       |    |    |    |    |   |   |
| 08 = 1" (G08 not available; F08 for PB2+ only)             |   | 08                    | 08 | 08 | 08 | 08 |   |   |
| 10 = 1" 1/4  |   | 10                    | 10 | 10 | 10 | 10 |   |   |
| 12 = 1" 1/2 (G12 option not available)                     |   | 12                    | 12 | 12 | 12 | 12 |   |   |
| BYPASS VALVE   |   |                       |    |    |    |    |   |   |
| W = without  |   | W                     | W  | W  | W  | W  |   |   |
| C = 600 kPa (6 bar)  |   | C                     | C  | C  | C  | C  |   |   |
| R = reverse flow valve                                     |   | R                     | R  | R  | R  | R  |   |   |
| P = reverse flow + bypass valve                            |   | P                     | P  | P  | P  | P  | } on request only   |   |
| SEALS  |   |                       |    |    |    |    | SEALS   |   |
| N = NBR Nitrile  |   | N                     | N  | N  | N  | N  | N = NBR   |   |
| F = FKM Fluoroelastomer                                    |   | F                     | F  | F  | F  | F  | F = FKM   |   |
| FILTER MEDIA   |   |                       |    |    |    |    | FILTER MEDIA  |   |
| FA = fiber 5 μm <sub>(c)</sub> β>1.000 Δp 2MPa (20 bar)    |   | FA                    | FA | FA | FA | FA | FA = fib. 5 μm <sub>(c)</sub> 20 bar  |   |
| FB = fiber 7 μm <sub>(c)</sub> β>1.000 Δp 2MPa (20 bar)    |   | FB                    | FB | FB | FB | FB | FB = fib. 7 μm <sub>(c)</sub> 20 bar  |   |
| FC = fiber 12 μm <sub>(c)</sub> β>1.000 Δp 2MPa (20 bar)   |   | FC                    | FC | FC | FC | FC | FC = fib. 12 μm <sub>(c)</sub> 20 bar   |   |
| FD = fiber 21 μm <sub>(c)</sub> β>1.000 Δp 2MPa (20 bar)   |   | FD                    | FD | FD | FD | FD | FD = fib. 21 μm <sub>(c)</sub> 20 bar   |   |
| HA = fiber 5 μm <sub>(c)</sub> β>1.000 Δp 21MPa (210 bar)  |   | HA                    | HA | HA | HA | HA | HA = fib. 5 μm <sub>(c)</sub> 210 bar   |   |
| HB = fiber 7 μm <sub>(c)</sub> β>1.000 Δp 21MPa (210 bar)  |   | HB                    | HB | HB | HB | HB | HB = fib. 7 μm <sub>(c)</sub> 210 bar   |   |
| HC = fiber 12 μm <sub>(c)</sub> β>1.000 Δp 21MPa (210 bar) |   | HC                    | HC | HC | HC | HC | HC = fib. 12 μm <sub>(c)</sub> 210 bar  |   |
| HD = fiber 21 μm <sub>(c)</sub> β>1.000 Δp 21MPa (210 bar) |   | HD                    | HD | HD | HD | HD | HD = fib. 21 μm <sub>(c)</sub> 210 bar  |   |
| CC = cellulose 10 μm β>2 Δp 2MPa (20 bar)                  |   | CC                    | CC | CC | CC | CC | CC = cel. 10 μm 20 bar  |   |
| CLOGGING INDICATORS  |   |                       |    |    |    |    |   |   |
| 03 = port, plugged   |   | 03                    | 03 | 03 | 03 | 03 | When the filter is ordered with FKM seals, the first digit of the indicator code is a letter (please see page 182 - 183). |   |
| 5E = visual differential 500 kPa (5 bar)                   |   | 5E                    | 5E | 5E | 5E | 5E |   |   |
| 5F = visual differential 800 kPa (8 bar)                   |   | 5F                    | 5F | 5F | 5F | 5F |   |   |
| 6E = electrical differential 500 kPa (5 bar)               |   | 6E                    | 6E | 6E | 6E | 6E |   |   |
| 6F = electrical differential 800 kPa (8 bar)               |   | 6F                    | 6F | 6F | 6F | 6F |   |   |
| 7E = indicator 6E with LED                                 |   | 7E                    | 7E | 7E | 7E | 7E |   |   |
| 7F = indicator 6F with LED                                 |   | 7F                    | 7F | 7F | 7F | 7F |   |   |
| T2 = elect. diff. 500 kPa (5 bar) with thermostat 30°C     |   | T2                    | T2 | T2 | T2 | T2 | N.B. Indicator series 72 & 73 only on request   |   |
| T3 = elect. diff. 800 kPa (8 bar) with thermostat 30°C     |   | T3                    | T3 | T3 | T3 | T3 |   |   |
| X  | X | ACCESSORIES           |    |    |    |    |   |   |
| XX = no accessory available                                |   | XX                    | XX | XX | XX | XX |   |   |

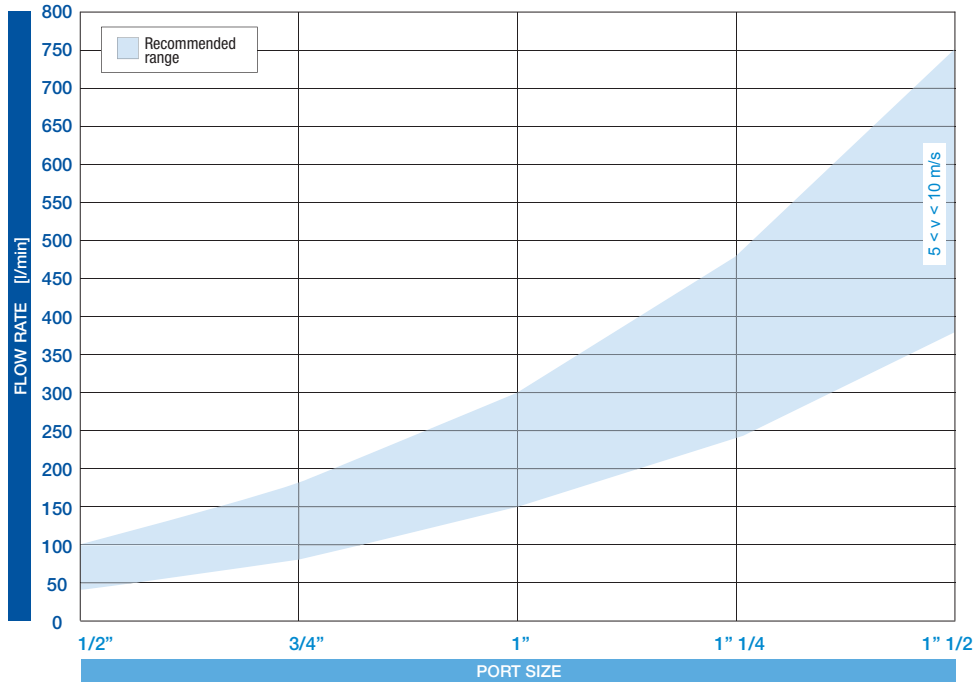
FILTER ELEMENT

|       | A  | B    | C   | kg media F+ & C+ | kg media H+ | Area (cm <sup>2</sup> ) |          |          |
|-------|----|------|-----|------------------|-------------|-------------------------|----------|----------|
|       |    |      |     |                  |             | Media F+                | Media H+ | Media C+ |
| EPB31 | 78 | 42,5 | 118 | 0,40             | 0,70        | 2.000                   | 1.470    | 1.720    |
| EPB32 | 78 | 42,5 | 210 | 0,80             | 1,30        | 3.695                   | 2.695    | 3.170    |
| EPB33 | 78 | 42,5 | 330 | 1,00             | 1,60        | 5.025                   | 4.325    | 4.025    |
| EPB34 | 78 | 42,5 | 430 | 1,20             | 1,80        | 6.585                   | 5.685    | 6.585    |
| EPB35 | 78 | 42,5 | 530 | 1,40             | 2,00        | 8.145                   | 7.045    | 8.645    |



## FLUID SPEED

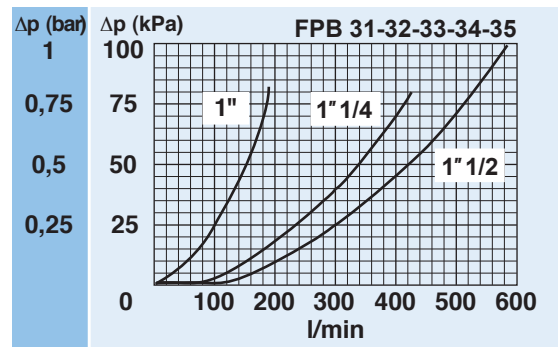
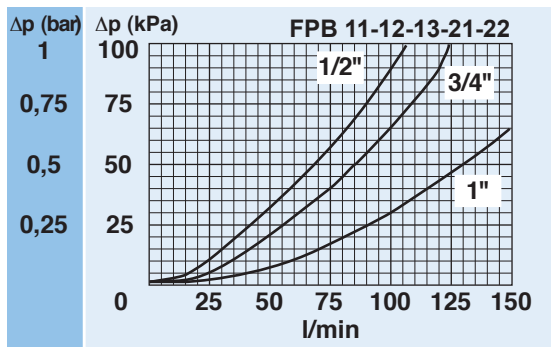
when selecting the filter size, we suggest to consider also the max recommended fluid speed (in pressure lines normally  $5 < v < 10$  m/s).



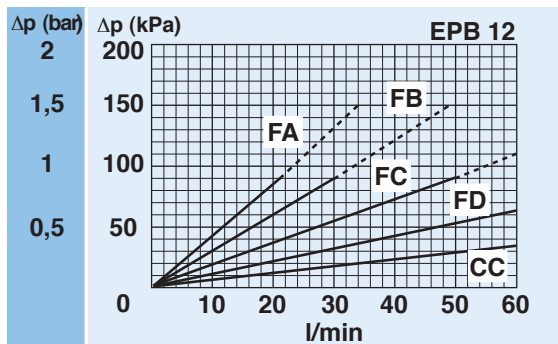
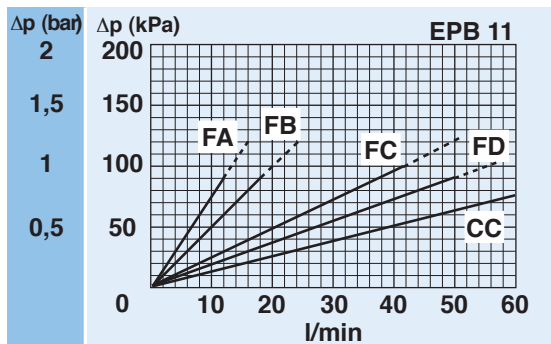
## PRESSURE DROP CURVES ( $\Delta p$ )

The "Assembly Pressure Drop ( $\Delta p$ )" is obtained by adding the pressure drop values of the Filter Housing and of the Clean Filter Element corresponding to the considered Flow Rate and it must be lower than 120 kPa (1,2 bar).

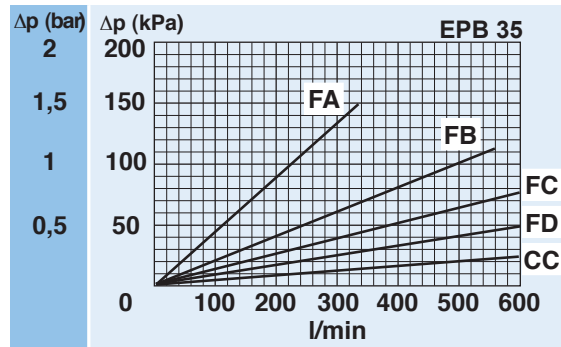
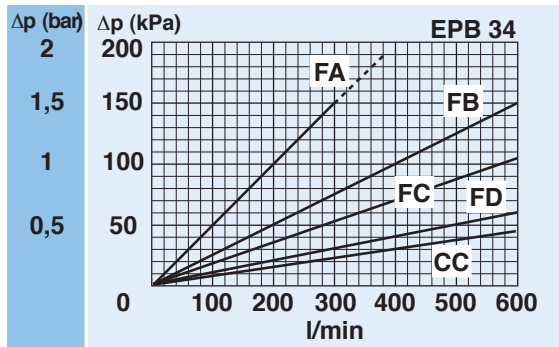
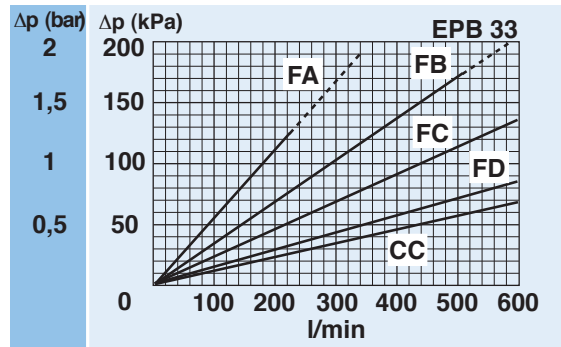
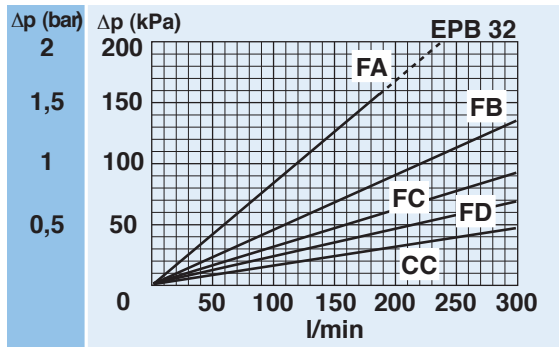
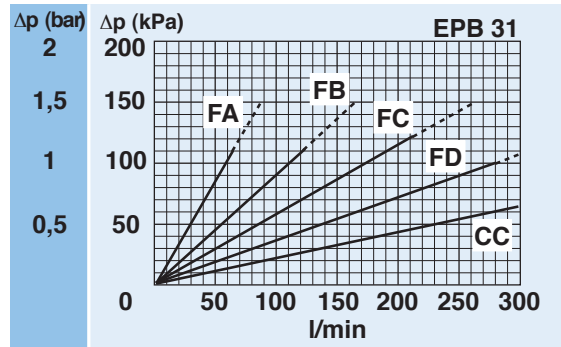
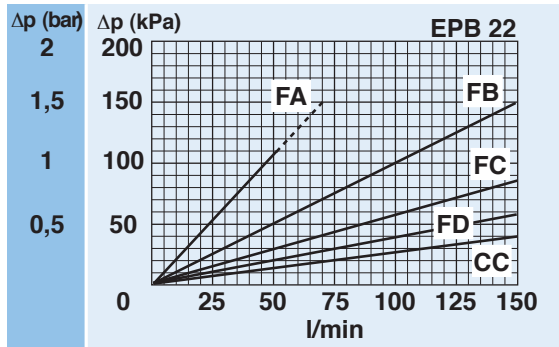
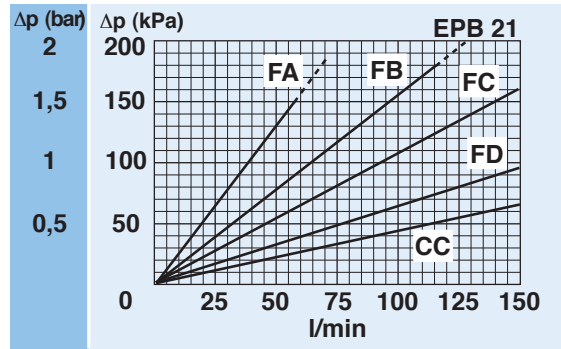
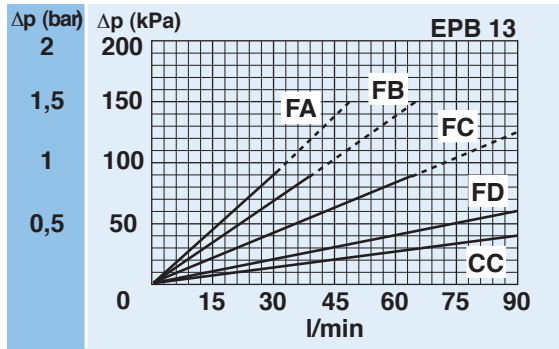
### FILTER HOUSING PRESSURE DROP (mainly depending on the port size)



### CLEAN FILTER ELEMENT PRESSURE DROP WITH F+ AND C+ MEDIA (depending both on the internal diameter of the element and on the filter media)



**CLEAN FILTER ELEMENT PRESSURE DROP WITH F+ AND C+ MEDIA**  
 (depending both on the internal diameter of the element and on the filter media)



N.B. All the curves have been obtained with mineral oil having a kinematic viscosity 30 cSt and specific gravity 0,9 kg/dm<sup>3</sup>; for fluids with different features, please consider the factors described in the first part of this catalogue. All the curves are obtained from test done at the UFI HYDRAULIC DIVISION Laboratory, according to the specification ISO 3968:2005. In case of discrepancy, please check the contamination level, viscosity and features of the fluid in use.

## PRESSURE DROP CURVES ( $\Delta p$ )

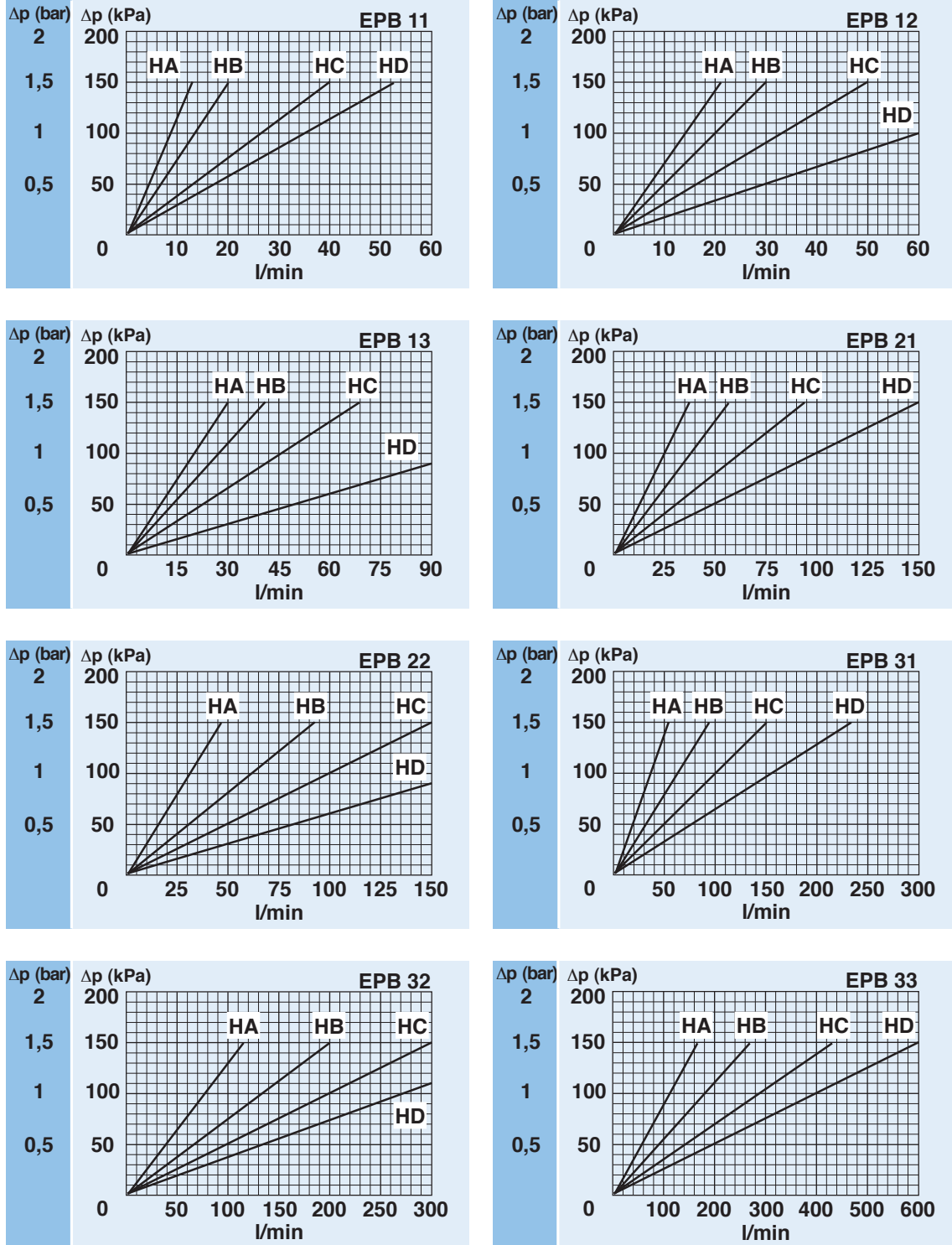
The “Assembly Pressure Drop ( $\Delta p$ )” is obtained by adding the pressure drop values of the Filter Housing and of the Clean Filter Element corresponding to the considered Flow Rate and it must be lower than 120 kPa (1,2 bar).

### CLEAN FILTER ELEMENT PRESSURE DROP

(depending both on the internal diameter of the element and on the filter media)

#### WITH H+ MEDIA

(recommended with no bypass option)



N.B. All the curves have been obtained with mineral oil having a kinematic viscosity 30 cSt and specific gravity 0,9 kg/dm<sup>3</sup>; for fluids with different features, please consider the factors described in the first part of this catalogue. All the curves are obtained from test done at the UFI HYDRAULIC DIVISION Laboratory, according to the specification ISO 3968:2005. In case of discrepancy, please check the contamination level, viscosity and features of the fluid in use.

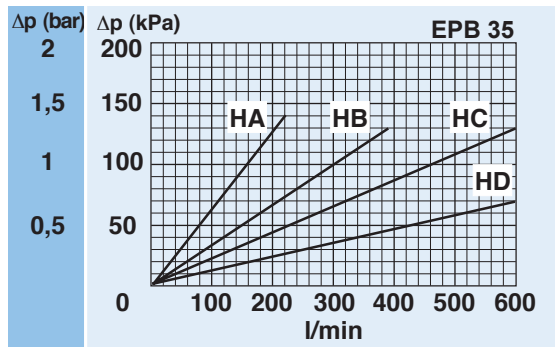
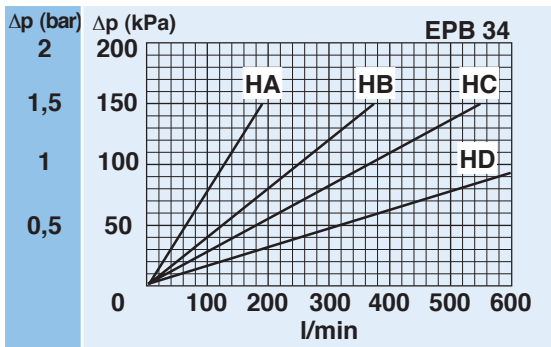


**CLEAN FILTER ELEMENT PRESSURE DROP**

(depending both on the internal diameter of the element and on the filter media)

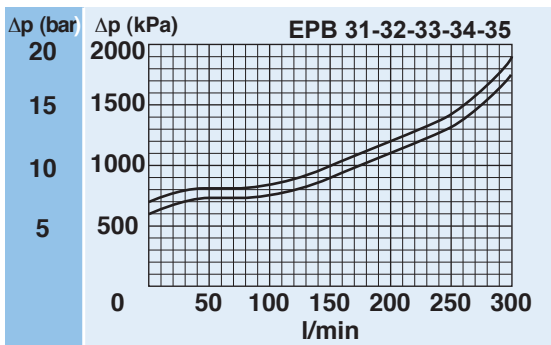
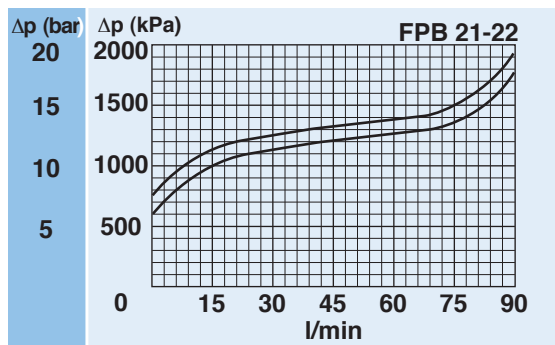
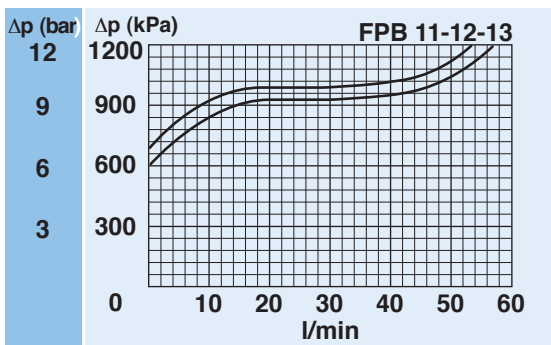
**WITH H+ MEDIA**

(recommended with no bypass option)



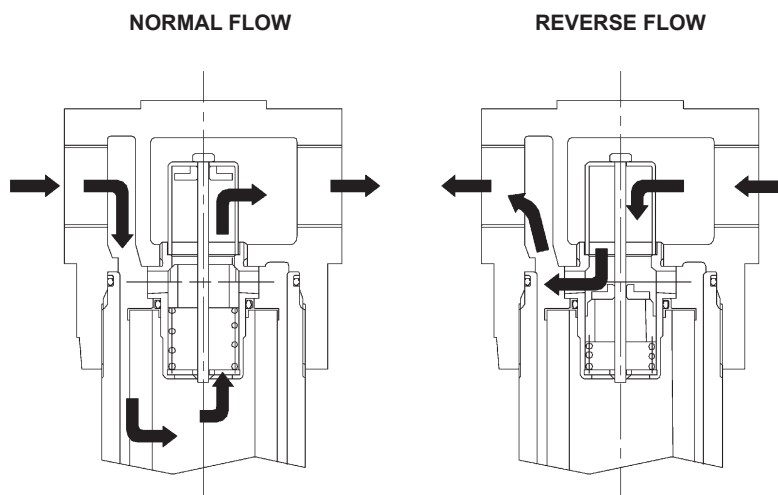
**BYPASS VALVE PRESSURE DROP**

When selecting the filter size, these curves must be taken into account if it is foreseen that any flow peak is to be absorbed by the bypass valve, it also must be of proper configuration to avoid pressure peaks. The valve pressure drop is directly proportional to fluid specific gravity.



N.B. All the curves have been obtained with mineral oil having a kinematic viscosity 30 cSt and specific gravity 0,9 kg/dm<sup>3</sup>; for fluids with different features, please consider the factors described in the first part of this catalogue. All the curves are obtained from test done at the UFI HYDRAULIC DIVISION Laboratory, according to the specification ISO 3968:2005. In case of discrepancy, please check the contamination level, viscosity and features of the fluid in use.

**REVERSE FLOW VALVE**



For hydraulic systems where reverse flow can occur, the pressure filters series FPB2+ and FPB3+ are available with a free reverse flow valve allowing the fluid to pass through the filter element in the normal direction and to bypass the filter element in the reverse direction (option "R"). The reverse flow valve is available also with incorporated bypass valve for the normal flow direction, set at 6 bar (option "P").

In normal flow conditions the whole flow pass through the filter element. In the option "P", if the differential pressure across the element exceeds 6 bar the bypass is activated.

In reverse flow conditions the flow bypasses the filter element.

**Pressure drop through the valve in the reverse direction:**

- 0,4 bar at 100 L/min
- 0,6 bar at 200 L/min
- 0,8 bar at 300 L/min

