



## FR1 SERIES

### Tank top return filters

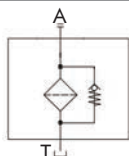
Return filter for mounting on the tank lid. Filter element with inbuilt bypass valve. Flow rates up to 600 l/min.

## TECHNICAL INFORMATION

### HOUSING

tested according to NFPA T3.10.5.1\* , ISO3968

HYDRAULIC SYMBOL:



PRESSURE:

Max working 8 bar  
Burst 16 bar

CONNECTION PORTS:

G 3/8" ÷ G 2"

MATERIALS:

Cover: aluminium alloy  
Head: aluminium alloy  
Bowl: PA6 reinforced (size 10 to 43) - zinc plated steel (size 50 to 64)  
Seal: NBR (FKM on request)

BYPASS:

Inbuilt in the filter element  
B version 1,7 bar  
C version 3 bar

### ELEMENT

tested according to ISO 2941, 2942, 2943, 3968, 16889, 23181

FILTER MEDIA:

Microglass fiber G06-G10-G15-G25-G40  
Cellulose C10-C25  
Wire mesh T60  
Synthetic M05-M10-M15

DIFFERENTIAL COLLAPSE PRESSURE:

10 bar

OPERATING TEMPERATURE RANGE:

-25°C +100°C

FLUID COMPATIBILITY:

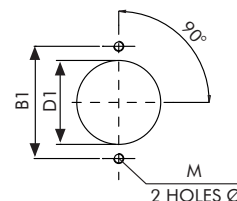
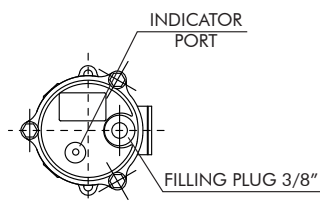
Full with HH-HL-HM-HV (acc. To ISO 2943).  
For use with other fluid please contact Filtrec Customer Service (info@filtrec.it).

\* as reference method only for verifying the pressure fatigue resistance and establishing the burst pressure ratings.

## OVERALL DIMENSIONS

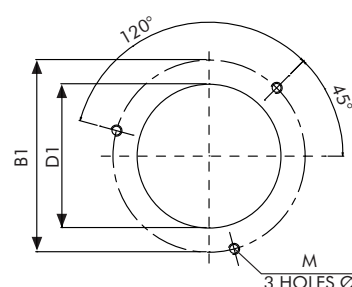
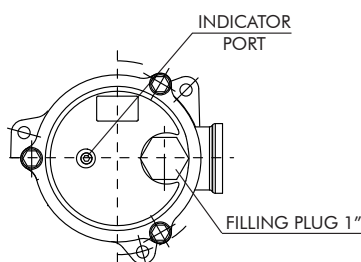
FR - 1 - 10 / 11 / 20 / 22 / 30 / 31

TANK MOUNTING PATTERN



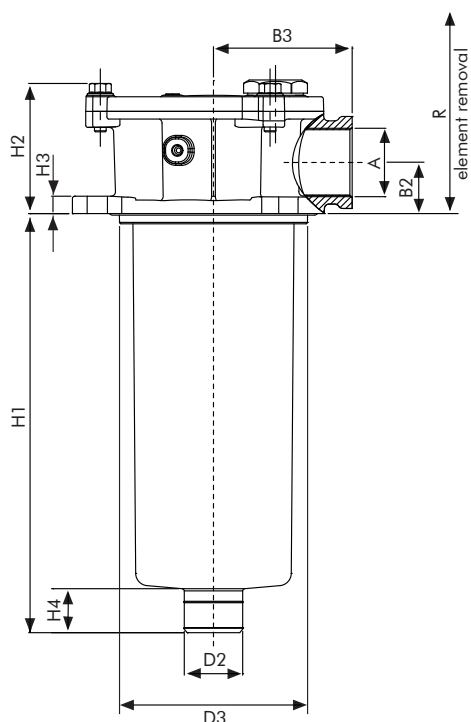
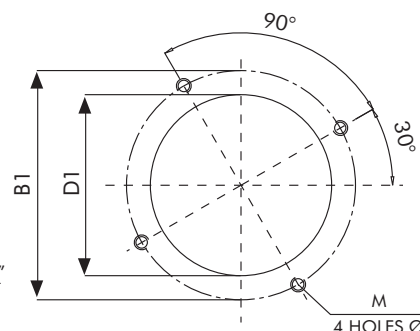
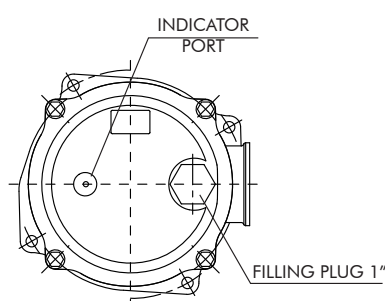
FR - 1 - 40 / 43

TANK MOUNTING PATTERN



FR - 1 - 50 / 51 / 60 / 64

TANK MOUNTING PATTERN



## NOMINAL SIZE

| MODEL  | A               | Ø B1 | B2   | B3  | Ø D1 | Ø D2 | Ø D3 | H1  | H2  | H3 | H4 | M   | R   | WEIGHT<br>Kg |
|--------|-----------------|------|------|-----|------|------|------|-----|-----|----|----|-----|-----|--------------|
| FR1 10 | G 3/8"          | 89   | 25   | 51  | 67,5 | 24   | 67   | 82  | 60  | 8  | 22 | M6  | 150 | 0,45         |
| FR1 11 | G 3/4" - G 1/2" |      |      |     |      |      |      | 155 |     |    |    |     |     | 0,60         |
| FR1 20 | G 1/2"          | 115  | 28,5 | 67  | 88,5 | 40   | 87   | 106 | 73  |    | 24 | M8  | 190 | 0,80         |
| FR1 22 | G 3/4"          |      |      |     |      |      |      | 151 |     |    |    |     | 230 | 0,90         |
| FR1 30 | G 1"            |      |      |     |      |      |      | 232 |     |    |    |     | 310 | 1,10         |
| FR1 31 | G 1 1/4"        |      |      |     |      |      |      | 336 |     |    |    |     | 420 | 1,30         |
| FR1 40 | G 1" - G 1 1/4" | 175  | 35   | 95  | 130  | 40   | 129  | 241 | 90  | 11 | 30 | M10 | 320 | 2,10         |
| FR1 43 | G 1 1/2"        |      |      |     |      |      |      | 287 |     |    |    |     | 360 | 2,40         |
| FR1 50 | G 1 1/4"        | 220  | 42   | 115 | 175  | 50   | 174  | 181 | 105 |    | 50 | M10 | 270 | 3,20         |
| FR1 51 | G 1 1/2"        |      |      |     |      |      |      | 240 |     |    |    |     | 340 | 3,60         |
| FR1 60 | G 2"            |      |      |     |      |      |      | 289 |     |    |    |     | 380 | 4,20         |
| FR1 64 |                 |      |      |     |      |      |      |     |     |    |    |     |     |              |

## ORDERING INFORMATION

| 1.         | 2.        | 3.         | 4.       | 5.            | 6.        | 7.       | 8.       | 9.         |
|------------|-----------|------------|----------|---------------|-----------|----------|----------|------------|
| <b>FR1</b> | <b>30</b> | <b>G15</b> | <b>B</b> | <b>B</b>      | <b>B6</b> | <b>0</b> | <b>C</b> | <b>000</b> |
| <b>R1</b>  | <b>30</b> | <b>G15</b> | <b>B</b> | SPARE ELEMENT |           |          |          |            |

|                        |              |                                               |
|------------------------|--------------|-----------------------------------------------|
| 1. FILTER SERIES       | FR1          |                                               |
| 2. FILTER SIZE         | 10-11        |                                               |
|                        | 20-22-30-31  |                                               |
|                        | 40-43        |                                               |
|                        | 50-51-60-64  |                                               |
| 3. FILTER MEDIA        | G06          | glassfiber $\beta_{7\mu m(c)} > 1.000$        |
|                        | G10          | glassfiber $\beta_{12\mu m(c)} > 1.000$       |
|                        | G15          | glassfiber $\beta_{17\mu m(c)} > 1.000$       |
|                        | G25          | glassfiber $\beta_{22\mu m(c)} > 1.000$       |
|                        | G40          | glassfiber $\beta_{35\mu m(c)} > 1.000$       |
|                        | C10          | paper $\beta_{10\mu m(c)} > 2$                |
|                        | C25          | paper $\beta_{25\mu m(c)} > 2$                |
|                        | T60          | wire mesh 60 $\mu m$                          |
|                        | M05          | synthetic $\beta_{10\mu m(c)} > 1.000$        |
|                        | M10          | synthetic $\beta_{15\mu m(c)} > 1.000$        |
|                        | M15          | synthetic $\beta_{20\mu m(c)} > 1.000$        |
| 4. BYPASS VALVE        | B            | 1,7 bar                                       |
|                        | C            | 3 bar (for glassfiber elements only)          |
| 5. SEALS               | B            | NBR                                           |
| 6. CONNECTION PORT     | B2           | G 3/8" size 10 to 11                          |
|                        | B3           | G 1/2" size 10 to 31                          |
|                        | B4           | G 3/4" size 10 to 31                          |
|                        | B5           | G 1" size 20 to 43                            |
|                        | B6           | G 1 1/4" size 20 to 64                        |
|                        | B7           | G 1 1/2" size 40 to 64                        |
|                        | B8           | G 2" size 50 to 64                            |
| 7. FILLING PLUG        | 0            | no filling plug                               |
|                        | T            | with filling plug                             |
| 8. INDICATOR PORT      | C            | 1/8" plugged                                  |
| 9. CLOGGING INDICATORS | 000          | no indicator                                  |
|                        | MPB (ex R9)  | press. gauge rear connection                  |
|                        | MRB (ex R10) | press. gauge radial connection for "B" bypass |
|                        | PDB (ex R13) | pressure switch                               |
|                        | MPC          | press. gauge rear connection                  |
|                        | MRC          | press. gauge radial connection for "C" bypass |
|                        | PDC (ex R14) | pressure switch                               |

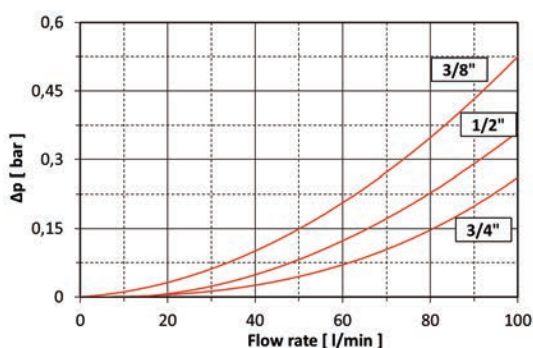
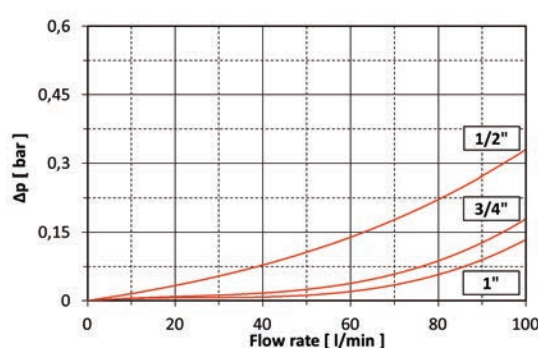
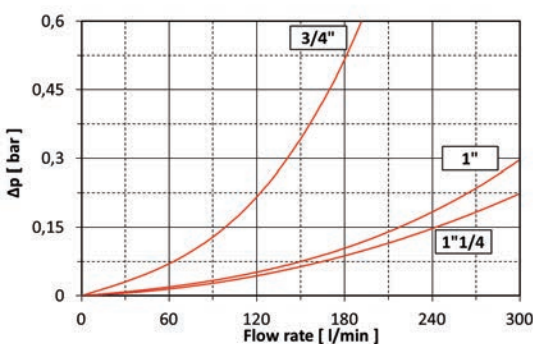
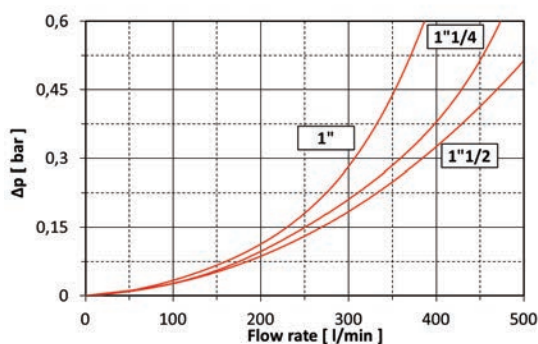
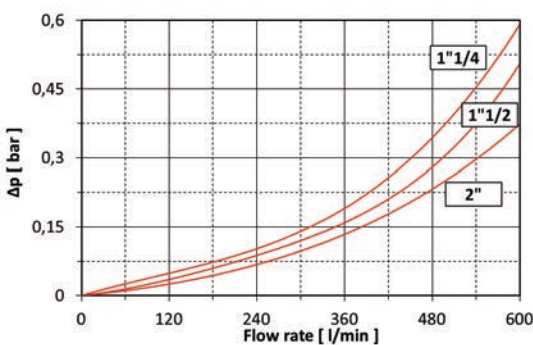
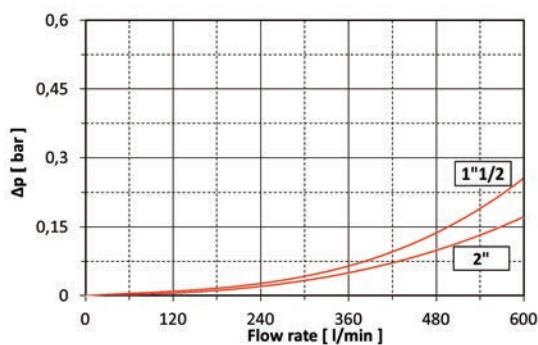
## PRESSURE DROP ( $\Delta p$ ) INFORMATION FOR FILTER SIZING

The total Delta P through a filter assembly is given from Housing  $\Delta p$  + Element  $\Delta p$ .  
The max recommended total  $\Delta p$  for return filters is 0,4 – 0,6 bar with clean element.

N.B. All the reported data have been obtained at our laboratory, according to specification ISO3968 with mineral oil having 32 cSt viscosity at 40°C and density 0,875 kg/dm<sup>3</sup>.

### HOUSING PRESSURE DROP

The housing  $\Delta p$  is given by the curve of the considered model and port, in correspondence of the flow rate value.

**FR110-11**

**FR120-22**

**FR130-31**

**FR140-43**

**FR150-51**

**FR160-64**


## ELEMENT PRESSURE DROP

The element  $\Delta p$  (bar) is given by the flow rate (l/min) multiplied by the factor in the table here below corresponding to the selected media and divided by 1000.

If the oil has a viscosity  $V_1$  different than 32 cSt a corrective factor  $V_1/32$  must be applied.

Example: 80 l/min with R130G10B and oil viscosity 46 cSt  $> 80 \times 3,19/1000 \times 46/32 = 0,36$  bar

|             | G06   | G10   | G15   | G25  | G40  | C10  | C25  | T60  | M05   | M10  | M15  |
|-------------|-------|-------|-------|------|------|------|------|------|-------|------|------|
| <b>R110</b> | 33,84 | 15,68 | 12,50 | 8,81 | 4,54 | 4,83 | 4,13 | 2,56 | 10,46 | 8,94 | 5,58 |
| <b>R111</b> | 12,28 | 7,32  | 4,48  | 4,28 | 2,27 | 2,74 | 2,06 | 0,81 | 4,79  | 4,09 | 2,00 |
| <b>R120</b> | 13,85 | 8,65  | 6,44  | 6,32 | 2,77 | 4,09 | 2,52 | 0,86 | 5,65  | 4,83 | 3,19 |
| <b>R122</b> | 7,80  | 5,27  | 3,92  | 3,60 | 1,55 | 2,70 | 1,41 | 0,76 | 3,83  | 3,27 | 1,79 |
| <b>R130</b> | 5,09  | 3,19  | 2,25  | 2,06 | 0,90 | 1,64 | 0,82 | 0,49 | 2,31  | 1,98 | 1,02 |
| <b>R131</b> | 3,34  | 1,94  | 1,37  | 1,26 | 0,46 | 1,06 | 0,42 | 0,24 | 1,41  | 1,20 | 0,63 |
| <b>R140</b> | 2,43  | 1,31  | 1,25  | 1,10 | 0,43 | 0,85 | 0,39 | 0,22 | 0,95  | 0,82 | 0,62 |
| <b>R143</b> | 2,25  | 1,21  | 1,15  | 1,00 | 0,39 | 0,83 | 0,35 | 0,20 | 0,88  | 0,75 | 0,57 |
| <b>R150</b> | 2,16  | 1,12  | 1,08  | 0,96 | 0,37 | 0,82 | 0,34 | 0,19 | 0,81  | 0,69 | 0,54 |
| <b>R151</b> | 1,80  | 0,88  | 0,77  | 0,71 | 0,29 | 0,64 | 0,26 | 0,15 | 0,64  | 0,55 | 0,38 |
| <b>R160</b> | 1,49  | 0,74  | 0,71  | 0,51 | 0,25 | 0,45 | 0,23 | 0,10 | 0,54  | 0,46 | 0,35 |
| <b>R164</b> | 1,32  | 0,52  | 0,45  | 0,42 | 0,13 | 0,36 | 0,12 | 0,10 | 0,38  | 0,32 | 0,21 |

## EXAMPLE OF TOTAL $\Delta p$ CALCULATION

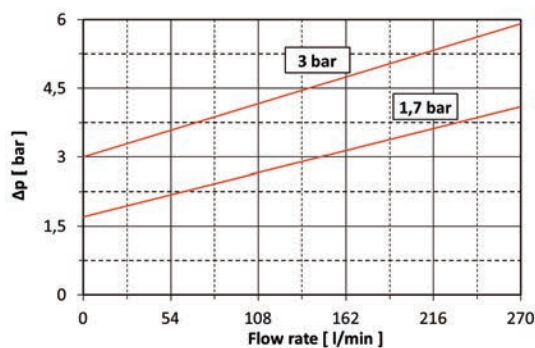
FR130G10BBB60C000 with **80 l/min** and oil **46 cSt**:

Housing  $\Delta p$  0,01 bar + element  $\Delta p$  0,36 bar ( $80 \times 3,19/1000 \times 46/32$ ) = total assembly  $\Delta p$  0,37 bar

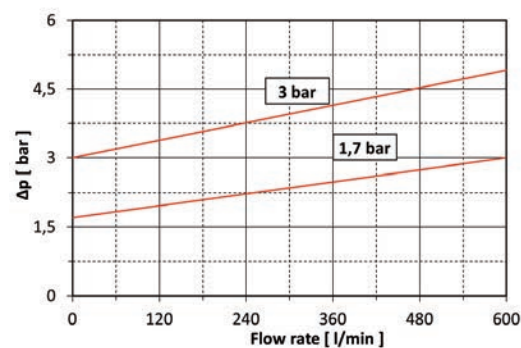
## BYPASS VALVE PRESSURE DROP

The bypass valve  $\Delta p$  is given by the curve of the considered model and setting, in correspondence of the flow rate value.

**FR110-31**



**FR140-64**



## USER TIPS



- 1 FILTER HEAD
- 2 FILTER BOWL
- 3 FILTER ELEMENT
- 4 SPRING
- 5 INDICATOR PORT
- 6 FILLING PLUG

### SPARE SEALS KIT

|                  | NBR          | FKM          |
|------------------|--------------|--------------|
| FR-1-10/11       | 06.021.00170 | 06.021.00174 |
| FR-1-20/22/30/31 | 06.021.00171 | 06.021.00175 |
| FR-1-40/43       | 06.021.00172 | 06.021.00176 |
| FR-1-50/51/60/64 | 06.021.00173 | 06.021.00177 |

### FIXING BOLTS TIGHTENING TORQUE

|     |       |
|-----|-------|
| M6  | 10 Nm |
| M8  | 25 Nm |
| M10 | 50 Nm |

### INDICATOR TIGHTENING TORQUE

|       |
|-------|
| 10 Nm |
|-------|

### SPARE SPRING

When a spare spring (4) is needed please ask for, specifying model and production batch (data given in the identification label on the top cover)

## WARNING

- ⚠ Make sure that Personal Protective Equipment (PPE) is worn during installation and maintenance operation.

## DISPOSAL OF FILTER ELEMENT

- ⚠ The used filter elements and the filter parts dirty of oil are classified as "Dangerous waste material": they must be disposed according to the local laws by authorized Companies.

## INSTALLATION

- the filter head (1) must be properly positioned and well secured on the tank lid through the fixing holes
- the hose must be properly connected to the IN port
- ⚠ the OUT port must be clear (an extension tube could be fitted, if needed for having the outlet below the oil level)
- verify that no tension is present on the filter after mounting
- enough space must be available for filter element replacement
- the visual clogging indicator must be in a easily viewable position
- when a electrical indicator is used, make sure that it is properly wired
- keep in stock a spare FILTREC filter element for timely replacement when required

## OPERATION

- ⚠ the filter must work within the operating conditions of pressure, temperature and compatibility given in the first page of this data sheet
- the filter element must be replaced as soon as the clogging indicator signals at working temperature
- If no clogging indicator is mounted, replace the element according to the system manufacturer's recommendations

## MAINTENANCE

- ⚠ before removing the top cover from the head, ensure that the system is switched off and there is no residual pressure in the filter
- unscrew the fixing bolts of the top cover and remove it
- remove the spring (4) first, then the dirty element (3) and the bowl (2)
- clean the bowl (2) and fit a new FILTREC element (3), verifying the part number, particularly concerning the micron rating
- when fitting the new element (3), open its plastic protection on the open end side and insert it onto the spigot in the filter bowl, then remove completely the plastic protection
- check the top cover O-ring conditions and replace if necessary
- put the spring (4) in its position on the filter element (3)
- mount the top cover onto the head and fix it screwing the fixing bolts
- ⚠ the used filter elements cannot be cleaned and re-used

**Distribuidor Autorizado:**



**megafilter**  
Filtros e sistemas de Filtragem

**Fone: +55 41 3081 3050**

**E-mail: [vendas@megafilter.com.br](mailto:vendas@megafilter.com.br)**

**Site: <https://www.megafilter.com.br/>**

**Rua Silvio Pinto Ribeiro, 1625 – Quississana, São José dos Pinhais – PR  
CEP 83085-400**

