



## FA1 SERIES

In line spin-on type filters

Inline filters with spin-on cartridge, suitable for use on suction, return or low pressure line.

Available with or without bypass, indicator port is a standard option to fit a visual or electrical indicator.



### HOUSING

tested according to NFPA T3.10.17, ISO12829, ISO3968

**PRESSURE:** Max operating: 12 bar  
Burst: 20 bar

**CONNECTIONS:** G 3/4" ÷ G 1 1/2"

**MATERIALS:** Head: aluminium alloy  
Bowl: painted steel  
Seal: NBR

**BYPASS VALVE:** No by-pass (max work pressure 5 bar)  
0,25 bar setting (SUCTION)  
1,7 bar setting (RETURN/IN LINE)

### ELEMENT

tested according to ISO 11170, 2941, 2942, 2943, 3724, 3968, 16889, 16908, 23181

**FILTER MEDIA:** Paper:  
C10 - C25 - CW25  
Inorganic microfiber:  
G10 - G25  
Wire mesh:  
T60 - T125

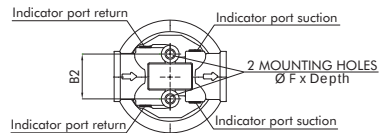
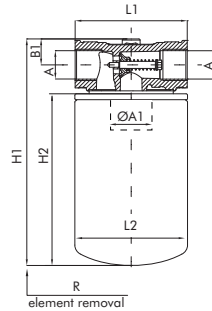
**COLLAPSE PRESSURE:** 5 bar

**TEMPERATURE RANGE:** from -30 °C to +100 °C

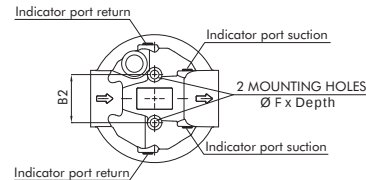
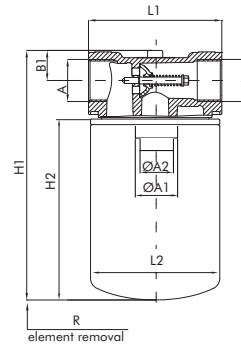
**FLUID COMPATIBILITY:** Full with HH-HL-HM-HV  
HETG-HEES (acc. to ISO 6743/4).  
For use with other fluid please  
contact Filtrec Customer Service  
(info@filtrec.it).

## OVERALL DIMENSIONS

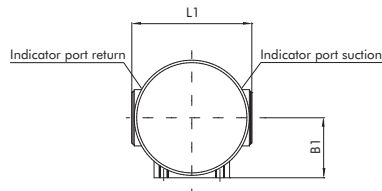
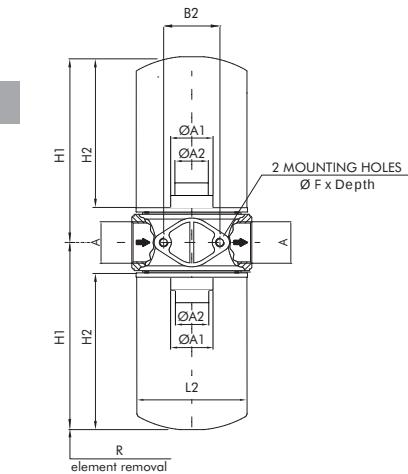
FA1-10/11



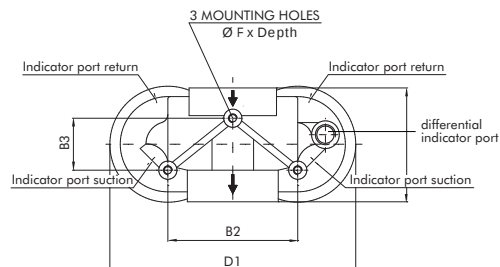
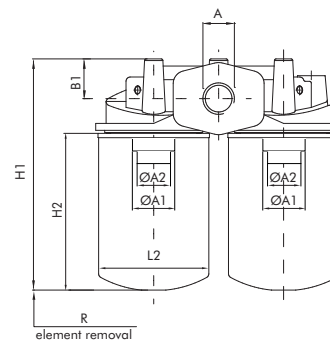
FA1-20/21/22



FA1 30/31/32



FA1 40/41/42



## NOMINAL SIZE

| CODE   | A                        | A1       | A2              | B1  | B2  | B3 | D1 | F      | H1     | L1        | R      | WEIGHT | ELEMENT   | H2     | L2  |
|--------|--------------------------|----------|-----------------|-----|-----|----|----|--------|--------|-----------|--------|--------|-----------|--------|-----|
| FA1-10 | G 3/4"                   | G 3/4"   | ---             | 22  | 38  |    |    | M8x15  | 192    | 95        | 20     | 1,3 Kg | A-1-10    | 148    | 96  |
| FA1-11 |                          |          |                 |     |     |    |    |        | 257    |           |        | 1,5 Kg | A-1-11    | 213    |     |
| FA1-20 |                          |          |                 |     | 249 |    |    |        | 133    |           | 1,9 Kg | A-1-20 | 182       |        |     |
| FA1-21 | G 1 1/4"                 | G 1 1/4" | 1 1/2"<br>16-UN | 30  | 50  |    |    |        |        |           | 295    | 2,2 Kg | A-1-21    | 228    |     |
| FA1-22 |                          |          |                 |     |     |    |    |        |        |           | 380    | 2,6 Kg | A-1-22    | 313    |     |
| FA1-30 |                          |          |                 |     |     |    |    |        |        |           |        | 218    |           | 3,5 Kg |     |
| FA1-31 | G 1 1/2"                 | G 1 1/4" | 1 1/2"<br>16-UN | 70  | 65  |    |    | M10x15 | 264    | 140       | 40     | 3,8 Kg | 2x A-1-21 | 228    | 128 |
| FA1-32 |                          |          |                 |     |     |    |    |        | 349    |           |        | 4,2 Kg | 2x A-1-22 | 313    |     |
| FA1-40 | G 1 1/2"                 |          |                 | 267 |     |    |    |        | 5,0 Kg | 2x A-1-20 |        | 182    |           |        |     |
| FA1-41 | G 1 1/4" +<br>1 1/2" SAE |          |                 | 313 | 132 |    |    |        | 5,2 Kg | 2x A-1-21 |        | 228    |           |        |     |
| FA1-42 | J518-3000                |          |                 | 398 |     |    |    |        | 5,6 Kg | 2x A-1-22 |        | 313    |           |        |     |

## ORDERING INFORMATION

|               | 1.       | 2.        | 3.        | 4.         | 5.       | 6.        | 7.       | 8.         |
|---------------|----------|-----------|-----------|------------|----------|-----------|----------|------------|
|               | <b>F</b> | <b>A1</b> | <b>21</b> | <b>G10</b> | <b>B</b> | <b>B6</b> | <b>R</b> | <b>000</b> |
| SPARE ELEMENT |          | <b>A1</b> | <b>21</b> | <b>G10</b> |          |           |          |            |

|                          |          |                                                  |                             |
|--------------------------|----------|--------------------------------------------------|-----------------------------|
| 1. FILTER SERIES         | F        |                                                  |                             |
| 2. FILTER ELEMENT SERIES | A1       |                                                  |                             |
| 3. FILTER SIZE           | 10-11    |                                                  |                             |
|                          | 20-21-22 |                                                  |                             |
|                          | 30-31-32 | fit 2 elements A120-A121-A122                    |                             |
|                          | 40-41-42 | fit 2 elements A120-A121-A122                    |                             |
| 4. FILTER MEDIA          | 000      | no element                                       |                             |
|                          | C10      | paper $\beta_{10\mu m(c)} > 2$                   |                             |
|                          | C25      | paper $\beta_{25\mu m(c)} > 2$                   |                             |
|                          | CW25     | paper $\beta_{25\mu m(c)} > 2$ + water absorbent |                             |
|                          | G10      | glassfiber $\beta_{12\mu m(c)} > 1.000$          |                             |
|                          | G25      | glassfiber $\beta_{22\mu m(c)} > 1.000$          |                             |
|                          | T60      | wire mesh 60 $\mu m$                             |                             |
|                          | T125     | wire mesh 125 $\mu m$                            |                             |
| 5. SEALS                 | B        | NBR                                              |                             |
| 6. CONNECTIONS           | B4       | G 3/4"                                           | for sizes 10-11             |
|                          | B6       | G 1 1/4"                                         | for sizes 20-21-22          |
|                          | B7       | G 1 1/2"                                         | for sizes 30-31-32-40-41-42 |
|                          | B6F7M    | G 1 1/4" + 1 1/2" SAE J518-3000 psi - M12        | for sizes 40-41-42          |
| 7. BYPASS VALVE          | 0        | no by-pass                                       |                             |
|                          | R        | 1,7 bar (return application)                     |                             |
|                          | S        | 0,25 bar (suction application)                   |                             |
| 8. COMPULSORY FIELD      | 000      | Filtrec standard                                 |                             |

## ACCESSORIES

The accessories must be ordered separately

|           |       |                                      |                                    |
|-----------|-------|--------------------------------------|------------------------------------|
| INDICATOR | MPB   | pressure gauge 0 ÷ 10 bar            |                                    |
|           | * PDB | pressure switch 1,3 bar SPDT         | for return application             |
|           | MP0   | pressure gauge 0 ÷ 16 bar            | for inline application             |
|           | MPA   | pressure/vacuum gauge -1 ÷ 5 bar     | for return and suction application |
|           | MPS   | vacuum gauge 0 ÷ -1 bar              |                                    |
|           | * PDS | vacuum switch -0,2 bar               | for suction application            |
|           | LC24  | LED connector pressure/vacuum switch |                                    |

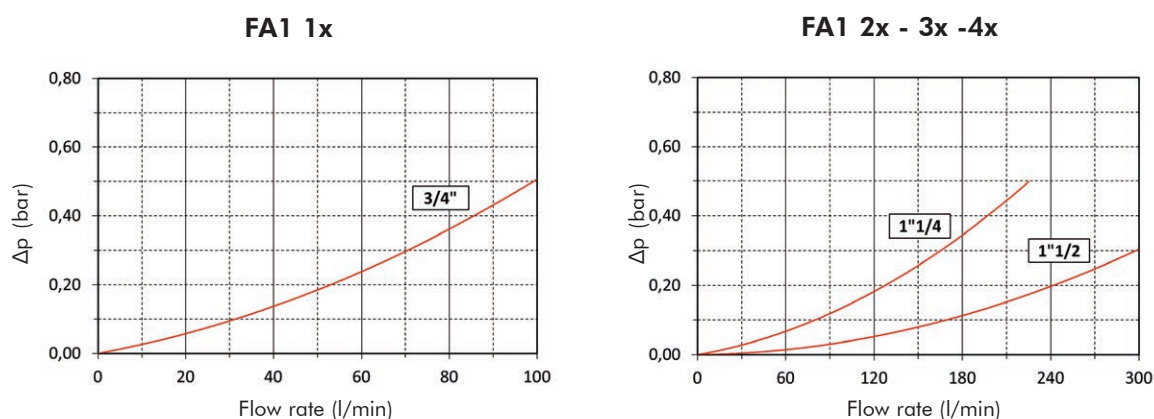
\* Available also with LC24=Led connector (see clogging indicators catalogue)

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

The total Delta P through a filter assembly is given from Housing  $\Delta p$  + Element  $\Delta p$ . This ideally should not exceed 0,2 bar for suction application and 0,5 bar for return (it should never exceed 1/3 of the set value of the by-pass valve). N.B. All the reported data have been obtained at our laboratory, according to specification ISO3968 with mineral oil having 32 cSt viscosity 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.



### 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  $V_x$  different than 32 cSt a corrective factor  $V_x/32$  must be applied.

Example: 80 l/min with A120G10 and oil viscosity 46 cSt:  $(80 \times 2,33)/1000 \times (46/32) = 0,27$  bar

Example: 80 l/min with (\*1) 2x A120G10 and oil viscosity 46 cSt:  $(80 \times 1,17)/1000 \times (46/32) = 0,13$  bar

|                      | C10  | C25  | CW25 | G10  | G25  | T60  | T125 |
|----------------------|------|------|------|------|------|------|------|
| <b>A110</b>          | 1,90 | 1,70 | 6,17 | 3,60 | 2,80 | 0,90 | 0,60 |
| <b>A111</b>          | 1,60 | 0,90 | 3,67 | 3,40 | 1,60 | 0,50 | 0,25 |
| <b>A120</b>          | 0,67 | 0,57 | 2,27 | 2,33 | 1,23 | 0,27 | 0,23 |
| <b>A121</b>          | 0,60 | 0,47 | 1,4  | 2,00 | 1,00 | 0,23 | 0,20 |
| <b>A122</b>          | 0,33 | 0,26 | 0,94 | 1,13 | 0,57 | 0,13 | 0,11 |
| <b>(*1) 2 x A120</b> | 0,34 | 0,29 | 1,13 | 1,17 | 0,62 | 0,14 | 0,12 |
| <b>(*2) 2 x A121</b> | 0,30 | 0,24 | 0,70 | 1,00 | 0,50 | 0,12 | 0,10 |
| <b>(*3) 2 x A122</b> | 0,16 | 0,13 | 0,47 | 0,56 | 0,28 | 0,06 | 0,05 |

(\*1) values for FA130 & FA140 - (\*2) values for FA131 & FA141 - (\*3) values for FA132 & FA142  
These sizes are fitting 2 cartridges each

### EXAMPLE OF TOTAL $\Delta p$ CALCULATION

FA120G10BB6R000 with 80 l/min and oil 46 cSt:

Housing  $\Delta p$  0,1 bar + element  $\Delta p$  0,27 bar  $(80 \times 2,33)/1000 \times (46/32) =$  total assembly  $\Delta p$  0,37 bar.

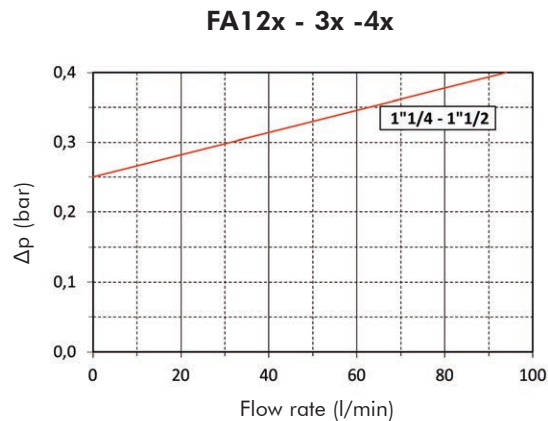
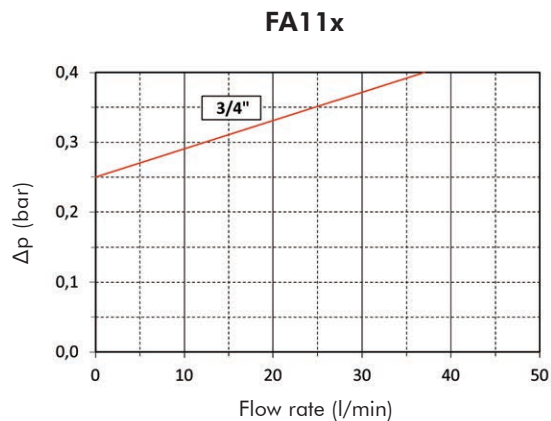
FA140G10BB6R000 with 80 l/min and oil 46 cSt:

Housing  $\Delta p$  0,03 bar + element  $\Delta p$  0,13 bar  $(80 \times 1,17)/1000 \times (46/32) =$  total assembly  $\Delta p$  0,16 bar.

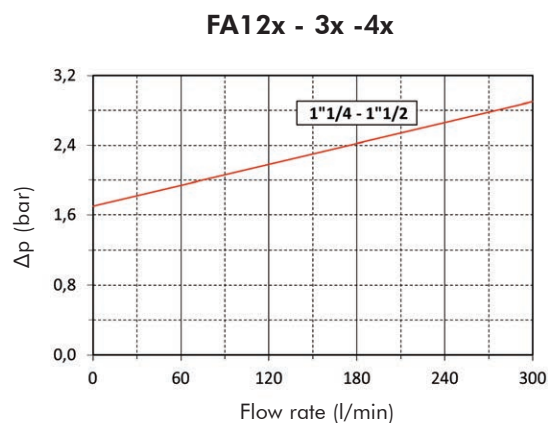
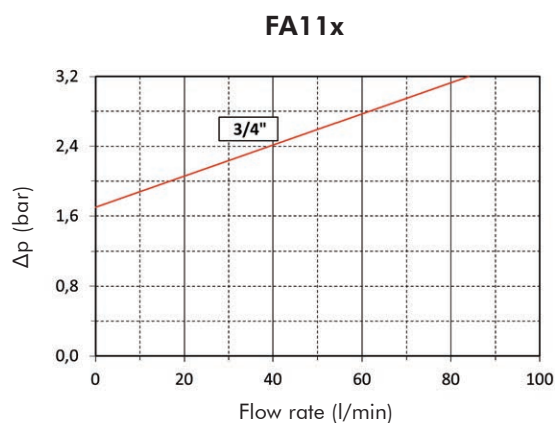
## BYPASS VALVE PRESSURE DROP

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

### SUCTION BYPASS

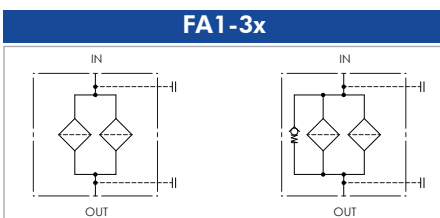
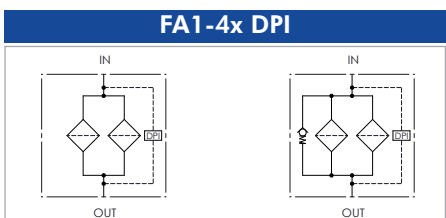
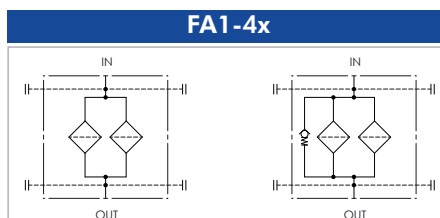
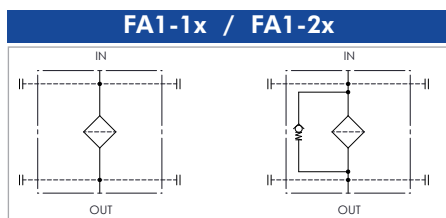


### RETURN/INLINE BYPASS



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

## HYDRAULIC SYMBOLS



## USER TIPS



- 1 FILTER HEAD
- 2 INDICATOR PORT
- 3 FIXING HOLES
- 4 FILTER CARTRIDGE
- 5 IDENTIFICATION LABEL

### CARTRIDGE TIGHTENING TORQUE

|            |          |
|------------|----------|
| All models | 3/4 turn |
|------------|----------|

### INDICATOR TIGHTENING TORQUE

|              |       |
|--------------|-------|
| Absolute     | 10 Nm |
| Differential | 50 Nm |

## 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

-  1. The IN and OUT ports must be connected to the hoses in the correct flow direction (an arrow shows on the filter head (1)).
- 2. The filter housing should be preferably mounted with the cartridge (5) downward.
- 3. Secure to the frame the filter head (1) using the threaded fixing holes (3).
- 4. Verify that no tension is present on the filter after mounting.
- 5. Enough space must be available for filter element cartridge replacement.
- 6. The visual clogging indicator must be in a easily viewable position.
- 7. When a electrical indicator is used, make sure that it is properly wired.
-  8. Never run the system with no filter element fitted.
- 9. Keep in stock a spare FILTREC filter element for timely replacement when required.

## OPERATION

-  1. The filter must work within the operating conditions of pressure, temperature and compatibility given in the first page of this data sheet.
- 2. The filter element must be replaced as soon as the clogging indicator signals at working temperature (in cold start conditions, oil temperature lower than 30°C, a false alarm can be given due to oil viscosity).
- 3. If no clogging indicator is mounted, replace the element according to the system manufacturer's recommendations.

## MAINTENANCE

-  1. Make sure that the system is switched off and there is no residual pressure in the filter.
- 2. Unscrew the filter cartridge (5) by turning it anti-clockwise and remove it.
- 3. Fit a new FILTREC cartridge element (5), verifying the part number, particularly concerning the micron rating.
- 4. Ensure that the head mounting face is clean.
-  5. Lubricate the gasket of the replacement cartridge and the thread prior to assembly.
- 7. Spin on the new cartridge until it reaches the mounting face and tighten for 3/4 turn.





## FAH SERIES

In line spin-on type filters

Inline filters with spin-on cartridge, suitable for use on return or low pressure line.

Available with or without bypass, indicator port is a standard option to fit a visual or electrical indicator.



### HOUSING

tested according to NFPA T3.10.17, ISO12829, ISO3968

#### PRESSURE:

Max operating 14 bar for FAH-A15x - FAHD-A15x  
Max operating 17 bar for FAH-A14x  
Burst: 20 bar for FAH-A15x - FAHD-A15x  
Burst: 28 bar for FAH-A14x

#### CONNECTIONS:

G 3/4" ÷ G 1 1/2"  
SAE Flange 1 1/2" 3000 psi

#### MATERIALS:

Head: aluminium alloy  
Bowl: painted steel  
Seal: NBR

#### BYPASS VALVE:

3,5 bar

### ELEMENT

tested according to ISO 11170, 2941, 2942, 2943, 3724, 3968, 16889, 16908, 23181

#### FILTER MEDIA:

Inorganic microfiber:  
G03 - G06 - G10 - G25 - G40 - GW03 -  
GW06 - GW10 - GW25  
Paper:  
C10 - C25 - CW25  
Wire mesh:  
T60 - T125

#### COLLAPSE PRESSURE:

5 bar

#### TEMPERATURE RANGE:

from -30 °C to +100 °C

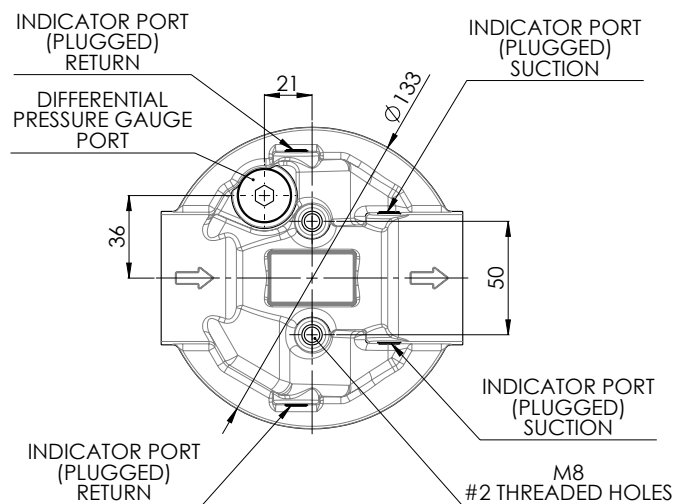
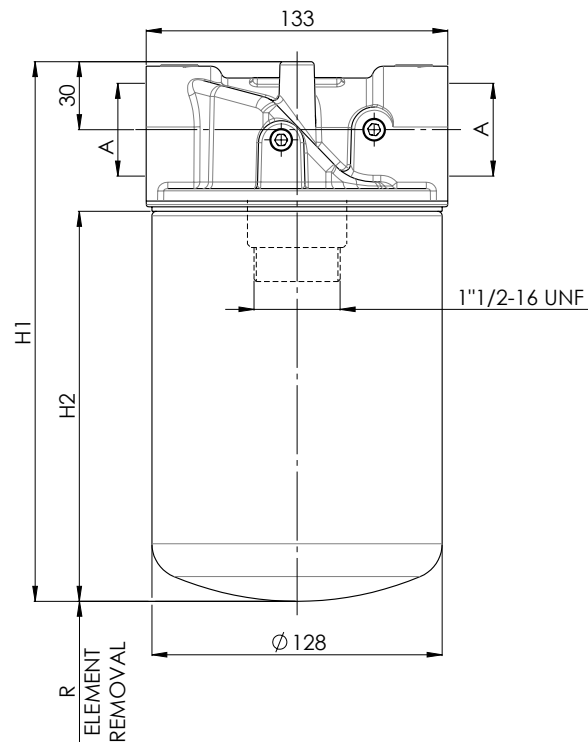
#### FLUID COMPATIBILITY:

Full with HH-HL-HM-HV  
HETG-HEES (acc. to ISO 6743/4).  
For use with other fluid please  
contact Filtrec Customer Service  
(info@filtrec.it).



## OVERALL DIMENSIONS

### FAH - A15x

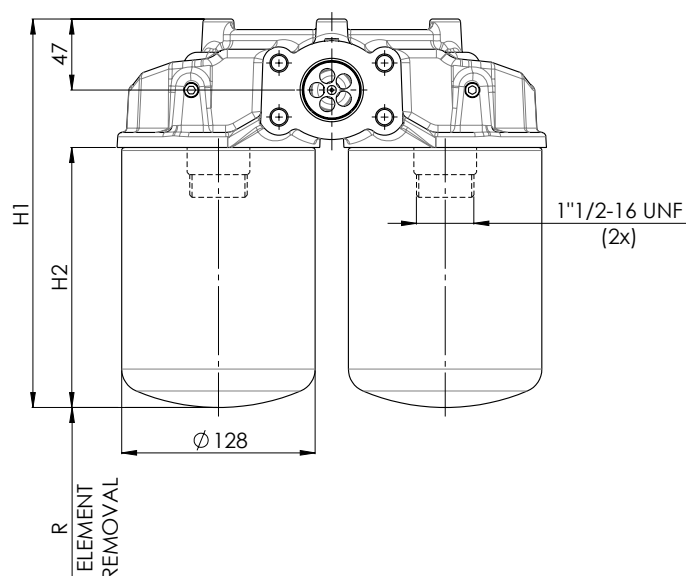


## NOMINAL SIZE

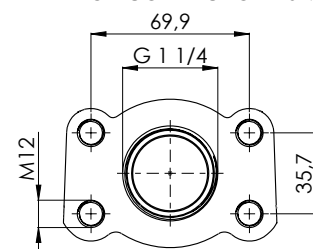
| CODE       | A        | H1  | H2  | R  | WEIGHT |
|------------|----------|-----|-----|----|--------|
| FAH - A150 | G 1 1/4" | 238 | 172 | 40 | 2 Kg   |
| FAH - A152 |          | 398 | 266 |    | 2,3 Kg |

## OVERALL DIMENSIONS

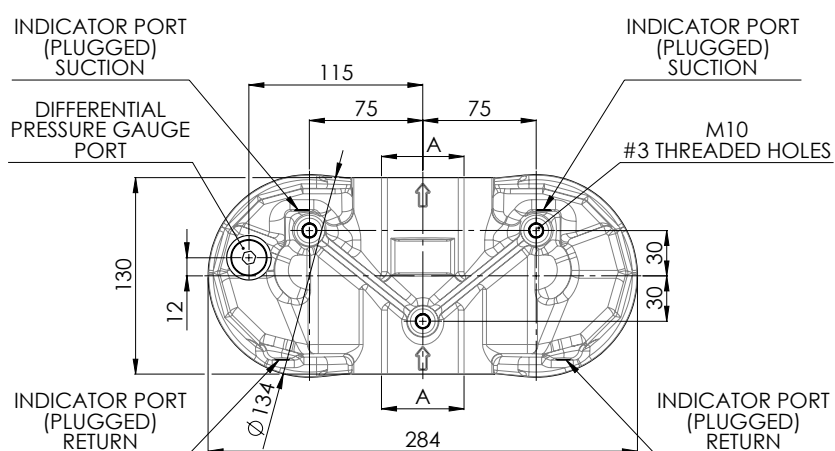
### FAHD - A15x



DETAIL FOR CONNECTION B6F7M



G1 1/4 + 1 1/2" SAE J518-3000 - M12



## NOMINAL SIZE

| CODE        | A                                    | H1  | H2  | R  | WEIGHT |
|-------------|--------------------------------------|-----|-----|----|--------|
| FAHD - A150 | G 1 1/2                              | 257 | 172 | 40 | 6,4 Kg |
| FAHD - A152 | G1 1/4" + 1 1/2" SAE J518-3000 - M12 | 351 | 266 |    | 7 Kg   |

## ORDERING INFORMATION

|               | 1.  | 2. | 3. | 4.  | 5. | 6. | 7. | 8. | 9.  | 10. | 11. |
|---------------|-----|----|----|-----|----|----|----|----|-----|-----|-----|
|               | FAH | A1 | 50 | G25 | B  | B6 | D  | S  | 000 | S   | 0   |
| SPARE ELEMENT |     | A1 | 50 | G25 |    |    |    |    |     |     |     |

|                          |       |                                                           |
|--------------------------|-------|-----------------------------------------------------------|
| 1. FILTER SERIES         | FAH   |                                                           |
|                          | FAHD  |                                                           |
| 2. FILTER ELEMENT SERIES | A1    |                                                           |
| 3. FILTER SIZE           | 40-42 | only for FAH                                              |
|                          | 50-52 |                                                           |
| 4. FILTER MEDIA          | 000   | no element                                                |
|                          | G03   | glassfiber $\beta_{5\mu m(c)} > 1.000$                    |
|                          | G06   | glassfiber $\beta_{7\mu m(c)} > 1.000$                    |
|                          | G10   | glassfiber $\beta_{12\mu m(c)} > 1.000$                   |
|                          | G25   | glassfiber $\beta_{22\mu m(c)} > 1.000$                   |
|                          | G40   | glassfiber $\beta_{35\mu m(c)} > 1.000$                   |
|                          | GW03  | glassfiber $\beta_{5\mu m(c)} > 1.000$ + water absorbent  |
|                          | GW06  | glassfiber $\beta_{7\mu m(c)} > 1.000$ + water absorbent  |
|                          | GW10  | glassfiber $\beta_{12\mu m(c)} > 1.000$ + water absorbent |
|                          | GW25  | glassfiber $\beta_{22\mu m(c)} > 1.000$ + water absorbent |
|                          | C10   | paper $\beta_{10\mu m(c)} > 2$                            |
|                          | C25   | paper $\beta_{25\mu m(c)} > 2$                            |
|                          | CW25  | paper $\beta_{25\mu m(c)} > 2$ + water absorbent          |
|                          | T60   | wire mesh 60 $\mu m$                                      |
|                          | T125  | wire mesh 125 $\mu m$                                     |
| 5. SEALS                 | B     | NBR                                                       |
|                          |       | omitted for spare elements                                |
| 6. CONNECTIONS           | B4    | G 3/4"                                                    |
|                          | B5    | G 1"                                                      |
|                          | B6    | G 1 1/4"                                                  |
|                          | B7    | G 1 1/2"                                                  |
|                          | B6F7M | G 1 1/4" or 1 1/2" SAE J518-3000 psi - M12                |
|                          |       | for FAHD-50-52 only                                       |
| 7. BYPASS VALVE          | 0     | no bypass                                                 |
|                          | D     | 3,5 bar                                                   |
|                          |       | on request only for size 40-42                            |
| 8. INDICATOR PORT        | S     | differential with metal plug                              |
|                          | W     | differential with plastic plug                            |
| 9. COMPULSORY FIELD      | 000   | filtrec standard                                          |
| 10. CORROSION PROTECTION | S     | standard                                                  |
| 11. OPTIONS              | 0     | standard                                                  |

## ACCESSORIES

The accessories must be ordered separately

### INDICATOR

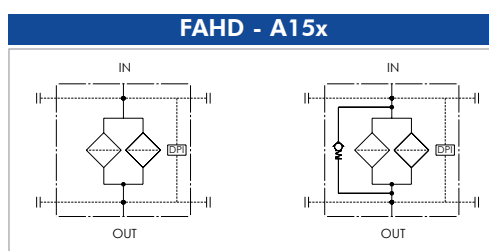
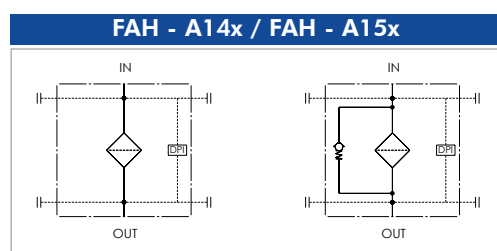
For other options see clogging indicators catalogue

|      |                                       |                     |
|------|---------------------------------------|---------------------|
| MPC  | pressure gauge 0÷10 bar setting 3 bar |                     |
| MRC  | pressure gauge 0÷10 bar setting 3 bar |                     |
| PDC  | pressure switch 2 bar SPDT            |                     |
| VE02 | differential visual-electric 2,7 bar  |                     |
| V02  | differential visual 2,7bar            | for size 40-42 only |
| E02  | differential electric 2,7bar          |                     |
| E02L | differential electric 2,7bar + LC24*  |                     |
| Z34  | differential visual 2,7 bar           | for size 50-52 only |
| Z35  | differential electric 2,7 bar SPST    |                     |
| LC24 | LED connector for pressure switch     |                     |

### PLUG

|     |                                     |                     |
|-----|-------------------------------------|---------------------|
| P01 | metal plug for indicator port - NBR | for size 40-42 only |
| P02 | metal plug for indicator port - NBR | for size 50-52 only |

## HYDRAULIC SYMBOLS



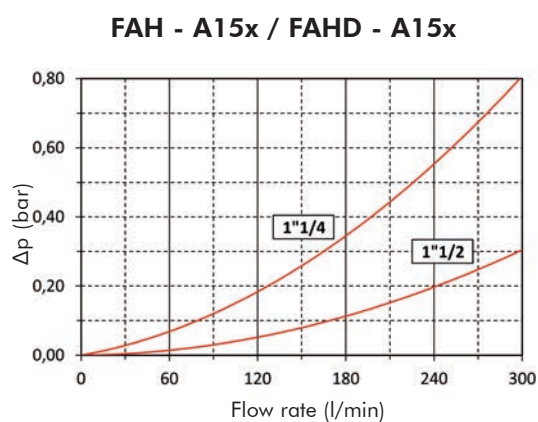
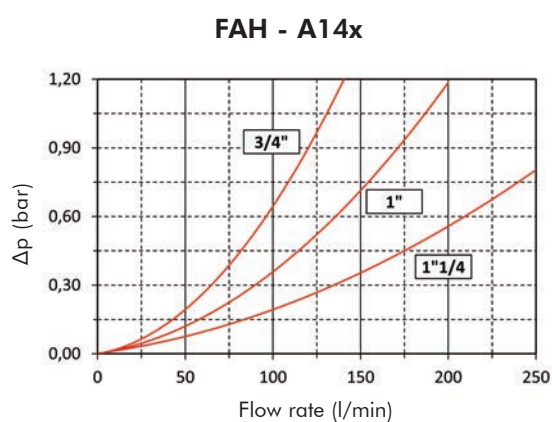
## PRESSURE DROP ( $\Delta p$ ) INFORMATION FOR FILTER SIZING

The total Delta P through a filter assembly is given from Housing  $\Delta p$  + Element  $\Delta p$ . This ideally should not exceed 0,5 bar for return application (it should never exceed 1/3 of the set value of the by-pass valve).

N.B. All the reported data have been obtained at our laboratory, according to specification ISO3968 with mineral oil having 32 cSt viscosity 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.



## 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  $V_x$  different than 32 cSt a corrective factor  $V_x/32$  must be applied.

Example: 120 l/min with A150G25 and oil viscosity 46 cSt:  $(120 \times 1,41)/1000 \times (46/32) = 0,24$  bar

Example: 120 l/min with (\*1) 2x A150G25 and oil viscosity 46 cSt:  $(120 \times 0,71)/1000 \times (46/32) = 0,12$  bar

|                      | G03  | G06  | G10  | G25  | G40  | GW03  | GW06  | GW10  | GW25 | C10  | C25  | CW25 | T60  | T125 |
|----------------------|------|------|------|------|------|-------|-------|-------|------|------|------|------|------|------|
| <b>A140</b>          | 6,92 | 6,39 | 3,83 | 2,98 | 1,99 | 19,52 | 18,02 | 10,81 | 8,41 | 2,02 | 1,81 | 5,11 | 0,96 | 0,64 |
| <b>A142</b>          | 4,47 | 4,16 | 3,54 | 1,66 | 1,03 | 12,61 | 11,73 | 9,97  | 4,69 | 1,66 | 0,94 | 2,64 | 0,52 | 0,26 |
| <b>A150</b>          | 4,98 | 4,22 | 2,68 | 1,41 | 0,72 | 14,03 | 11,89 | 7,55  | 3,99 | 0,77 | 0,65 | 1,85 | 0,31 | 0,26 |
| <b>A152</b>          | 3,16 | 2,30 | 1,72 | 0,86 | 0,45 | 8,91  | 6,48  | 4,86  | 2,43 | 0,52 | 0,40 | 1,14 | 0,20 | 0,17 |
| <b>(*1) 2 x A150</b> | 2,49 | 2,11 | 1,34 | 0,71 | 0,36 | 7,02  | 5,95  | 3,77  | 1,99 | 0,38 | 0,33 | 0,92 | 0,15 | 0,13 |
| <b>(*2) 2 x A152</b> | 1,58 | 1,15 | 0,86 | 0,43 | 0,22 | 4,45  | 3,24  | 2,43  | 1,21 | 0,26 | 0,20 | 0,57 | 0,10 | 0,08 |

(\*1) values for FAHD-A150 (\*2) values for FAHD-A152. These sizes are fitting 2 cartridges each

## EXAMPLE OF TOTAL $\Delta p$ CALCULATION

FAHA150G25BB6DS000S0 with 120 l/min and oil 46 cSt:

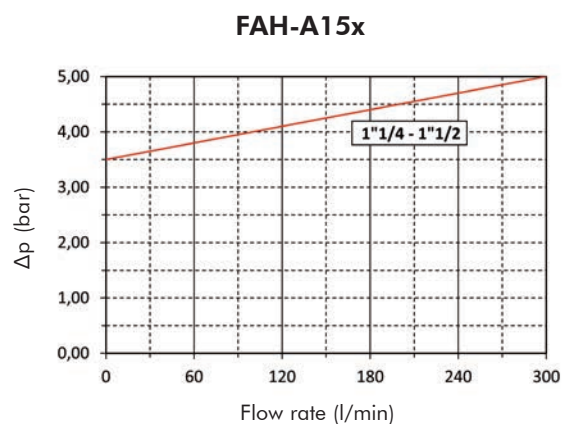
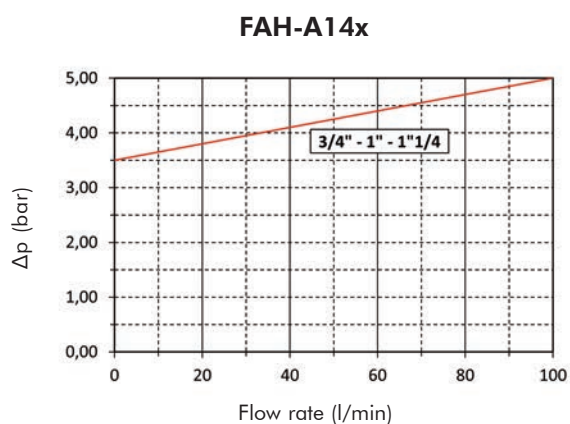
Housing  $\Delta p$  0,19 bar + element  $\Delta p$  0,24 bar  $(120 \times 1,41)/1000 \times (46/32) =$  Total assembly  $\Delta p$  0,43 bar.

FAHDA150G25BB7DS000S0 with 120 l/min and oil 46 cSt:

Housing  $\Delta p$  0,05 bar + element  $\Delta p$  0,12 bar  $(120 \times 0,71)/1000 \times (46/32) =$  Total assembly  $\Delta p$  0,17 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.



## USER TIPS



### CARTRIDGE TIGHTENING TORQUE

|            |          |
|------------|----------|
| All models | 3/4 turn |
|------------|----------|

### INDICATOR TIGHTENING TORQUE

|                             |       |
|-----------------------------|-------|
| Differential pressure gauge | 50 Nm |
|-----------------------------|-------|

## 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

-  1. the IN and OUT ports must be connected to the hoses in the correct flow direction (an arrow shows on the filter head (1))
2. the filter housing should be preferably mounted with the cartridge (3) downward
3. secure to the frame the filter head (1) using the threaded fixing holes (2)
4. verify that no tension is present on the filter after mounting
5. enough space must be available for filter element cartridge replacement
6. the visual clogging indicator must be in a easily viewable position
7. when a electrical indicator is used, make sure that it is properly wired
-  8. never run the system with no filter element fitted
9. keep in stock a spare FILTREC filter element for timely replacement when required

## OPERATION

-  1. the filter must work within the operating conditions of pressure, temperature and compatibility given in the first page of this data sheet
2. the filter element must be replaced as soon as the clogging indicator signals at working temperature (in cold start conditions, oil temperature lower than 30°C, a false alarm can be given due to oil viscosity)
3. If no clogging indicator is mounted, replace the element according to the system manufacturer's recommendations

## MAINTENANCE

-  1. make sure that the system is switched off and there is no residual pressure in the filter
2. unscrew the filter cartridge (3) by turning it anti-clockwise and remove it
3. fit a new FILTREC cartridge element (3), verifying the part number, particularly concerning the micron rating
4. ensure that the head mounting face is clean
-  5. lubricate the gasket of the replacement cartridge and the thread prior to assembly
7. spin on the new cartridge until it reaches the mounting face and tighten for 3/4 turn.





FH100 SERIES

In line pressure filters

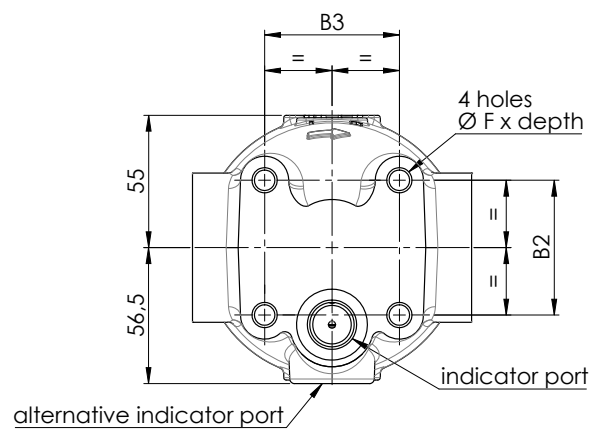
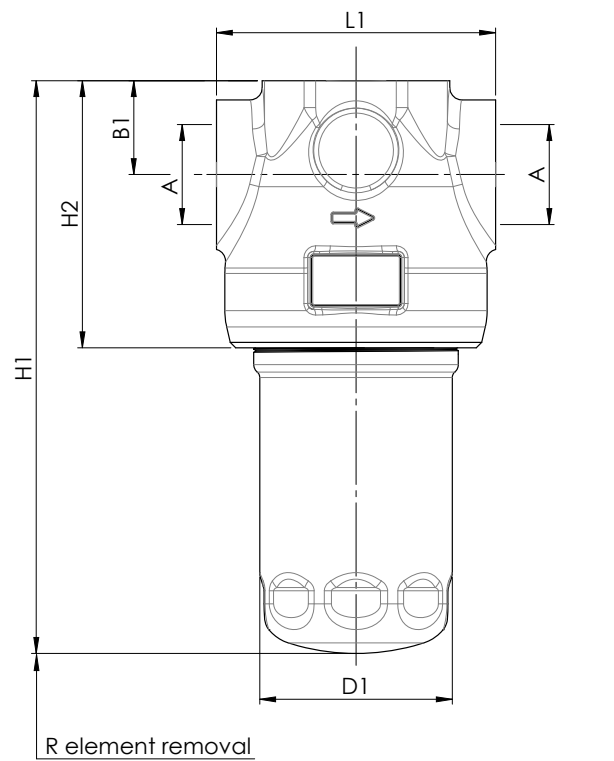
Inline filters for operating pressure up to 100 bar.  
Flow rate up to 300 l/min



| HOUSING              | tested according to NFPA T3.10.5.1, ISO 10771, ISO 3968                                                                                               |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| PRESSURE:            | Max operating: 100 bar<br>Fatigue rating: 10 <sup>6</sup> cycles 0÷100 bar<br>Burst: 300 bar                                                          |
| CONNECTIONS:         | G 1" ÷ G 1 1/4"                                                                                                                                       |
| MATERIALS:           | Head: cast iron<br>Bowl: carbon steel<br>Seal: NBR (FKM on request)                                                                                   |
| BYPASS VALVE:        | 6 bar<br>3,5 bar (on request)<br>ABF valve<br>ABF valve+ RF valve                                                                                     |
| ELEMENT              | tested according to ISO 11170, 2941, 2942, 2943, 3724, 3968,16889, 16908, 23181                                                                       |
| FILTER MEDIA:        | Inorganic microfiber:<br>G01 - G03 - G06 - G10<br>G15 - G25<br>Synthetic:<br>M05 - M10 - M15                                                          |
| COLLAPSE PRESSURE:   | 21 bar<br>210 bar                                                                                                                                     |
| TEMPERATURE RANGE:   | with NBR seal<br>from -30 °C to +100 °C<br><br>with FKM seal (OPTION)<br>from -25 °C to +120 °C                                                       |
| FLUID COMPATIBILITY: | Full with HH-HL-HM-HV<br>HETG-HEES (acc. to ISO 6743/4).<br>For use with other fluid please<br>contact Filtrec Customer Service<br>(info@filtrec.it). |

## OVERALL DIMENSIONS

FH100-D1-3x



## NOMINAL SIZE

| MODEL      | A                | B1 | B2 | B3 | D1 | F      | H1  | H2  | L1  | R   | WEIGHT  |
|------------|------------------|----|----|----|----|--------|-----|-----|-----|-----|---------|
| FH100-D135 | G 1"<br>G 1 1/4" | 39 | 56 | 56 | 80 | M10X15 | 238 | 111 | 116 | 120 | 5,15 Kg |
| FH100-D136 |                  |    |    |    |    |        | 298 |     |     |     | 5,5 Kg  |
| FH100-D137 |                  |    |    |    |    |        | 368 |     |     |     | 5,9 Kg  |

## ORDERING INFORMATION

|               | 1.           | 2.        | 3.         | 4.         | 5.       | 6.       | 7.        | 8.       | 9.       | 10.      | 11.        | 12.      | 13.      |
|---------------|--------------|-----------|------------|------------|----------|----------|-----------|----------|----------|----------|------------|----------|----------|
|               | <b>FH100</b> | <b>D1</b> | <b>36</b>  | <b>G10</b> | <b>A</b> | <b>B</b> | <b>B5</b> | <b>D</b> | <b>0</b> | <b>S</b> | <b>000</b> | <b>S</b> | <b>0</b> |
| SPARE ELEMENT | <b>D1</b>    | <b>36</b> | <b>G10</b> | <b>A</b>   |          |          |           |          |          |          |            |          |          |

|                                                                                       |          |                                                     |
|---------------------------------------------------------------------------------------|----------|-----------------------------------------------------|
| 1. FILTER SERIES                                                                      | FH100    |                                                     |
| 2. FILTER ELEMENT SERIES                                                              | D1       |                                                     |
| 3. FILTER SIZE                                                                        | 35-36-37 |                                                     |
| 4. FILTER MEDIA                                                                       | 000      | no element                                          |
| For different media options please check availability with Filtrec Customer Service.  | G01      | glassfiber $\beta_{4\mu m(c)} \geq 1.000$           |
|                                                                                       | G03      | glassfiber $\beta_{5\mu m(c)} \geq 1.000$           |
|                                                                                       | G06      | glassfiber $\beta_{7\mu m(c)} \geq 1.000$           |
|                                                                                       | G10      | glassfiber $\beta_{12\mu m(c)} \geq 1.000$          |
|                                                                                       | G15      | glassfiber $\beta_{17\mu m(c)} \geq 1.000$          |
|                                                                                       | G25      | glassfiber $\beta_{22\mu m(c)} \geq 1.000$          |
|                                                                                       | M05      | synthetic $\beta_{10\mu m(c)} \geq 1.000$           |
|                                                                                       | M10      | synthetic $\beta_{15\mu m(c)} \geq 1.000$           |
|                                                                                       | M15      | synthetic $\beta_{20\mu m(c)} \geq 1.000$           |
| 5. ELEMENT COLLAPSE                                                                   | A        | 21 bar                                              |
|                                                                                       | Y        | 21 bar - with ABF / RF valve                        |
|                                                                                       | B        | 210 bar                                             |
|                                                                                       | X        | 210 bar - with ABF / RF valve                       |
|                                                                                       |          | not available for "M" media                         |
| 6. SEALS                                                                              | *B       | NBR                                                 |
| *omitted for spare element                                                            | V        | FKM (option)                                        |
| 7. CONNECTIONS                                                                        | B5       | G 1"                                                |
| For different thread options please check availability with Filtrec Customer Service. | B6       | G 1 1/4"                                            |
| 8. BYPASS VALVE                                                                       | 0        | no by-pass                                          |
|                                                                                       | D        | 6 bar                                               |
|                                                                                       | L        | 3,5 bar (on request)                                |
| 9. ABF VALVE / RF VALVE                                                               | 0        | no valve                                            |
| ABF=anti back flow valve                                                              | C        | ABF valve                                           |
| RF= reverse flow valve                                                                | R        | ABF valve+RF valve                                  |
| 10. INDICATOR PORT OPTION                                                             | S        | upper differential indicator seat with metallic cap |
|                                                                                       | W        | upper differential indicator seat with plastic cap  |

Continued on the next page

|                          |     |           |
|--------------------------|-----|-----------|
| 11. COMPULSORY FIELD     | 000 | standard  |
| 12. CORROSION PROTECTION | S   | standard  |
| 13. OPTION               | 0   | no option |

## ACCESSORIES

The accessories must be ordered separately

## INDICATOR

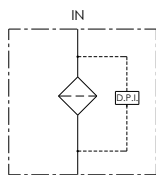
(F) digit for FKM seal option

\*LC24=Led connector

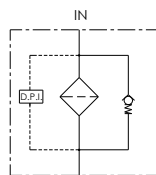
For other options see clogging indicators catalogue

|             |                                          |                                   |
|-------------|------------------------------------------|-----------------------------------|
| V02 (VF2)   | differential visual 2,7 bar              |                                   |
| E02 (EF2)   | differential electrical 2,7 bar          |                                   |
| E02L (EF2L) | differential electric 2,7 bar + *LC24    |                                   |
| VEF2        | differential visual and electric 2,7 bar |                                   |
| V05 (VF5)   | differential visual 5 bar                |                                   |
| E05 (EF5)   | differential electrical 5 bar            |                                   |
| E05L (EF5L) | differential electric 5 bar + *LC24      |                                   |
| VEF5        | differential visual and electric 5 bar   |                                   |
| V08 (VF8)   | differential visual 8 bar                | recommended for no by-pass option |
| E08 (EF8)   | differential electrical 8 bar            |                                   |
| E08L (EF8L) | differential electric 8 bar + *LC24      |                                   |
| VEF8        | differential visual and electric 8 bar   |                                   |

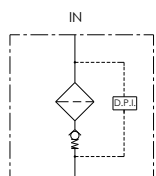
## HYDRAULIC SYMBOLS



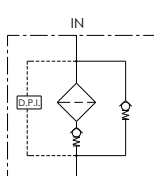
NO VALVE



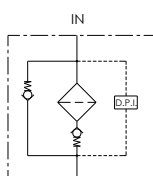
WITH BY-PASS VALVE



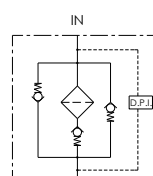
WITH ABF VALVE



WITH BY-PASS VALVE  
WITH ABF VALVE



WITH RF VALVE  
WITH ABF VALVE



WITH BY-PASS VALVE  
WITH RF VALVE  
WITH ABF VALVE

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

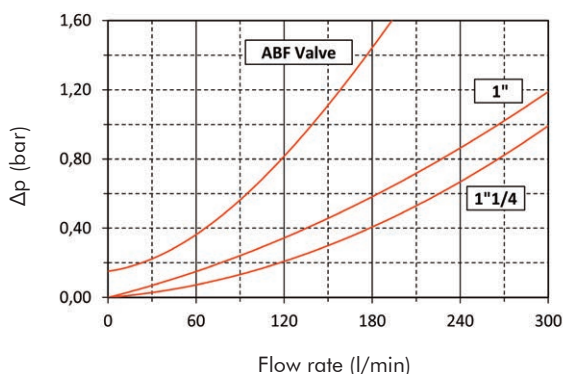
The total Delta P through a filter assembly is given from Housing  $\Delta p$  + Element  $\Delta p$ .

This ideally should not exceed 1,0 bar and should never exceed 1/3 of the set value of the by-pass valve.  
N.B. All the reported data have been obtained at our laboratory, according to specification ISO3968 with mineral oil having 32 cSt viscosity and density 0,875 Kg/dm<sup>3</sup>.

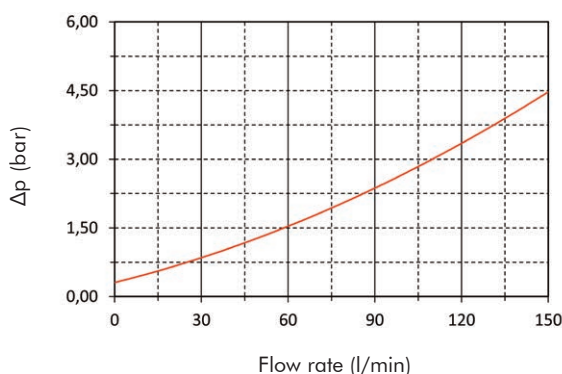
## HOUSING PRESSURE DROP

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

FH100 D1-3x



RF VALVE



## ELEMENT PRESSURE DROP (filter elements 21 bar collapse)

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  $V_x$  different than 32 cSt a corrective factor  $V_x/32$  must be applied.

Example: 90 l/min with D136G10A and oil viscosity 46 cSt:  $(90 \times 3,71)/1000 \times (46/32) = 0,48$  bar

|             | G01   | G03   | G06  | G10  | G15  | G25  | M05  | M10  | M15  |
|-------------|-------|-------|------|------|------|------|------|------|------|
| <b>D135</b> | 15,82 | 11,07 | 7,27 | 4,45 | 3,03 | 2,87 | 3,11 | 2,36 | 1,58 |
| <b>D136</b> | 13,19 | 9,23  | 6,06 | 3,71 | 2,53 | 2,39 | 2,59 | 1,97 | 1,32 |
| <b>D137</b> | 9,63  | 6,74  | 4,43 | 2,71 | 1,85 | 1,75 | 1,89 | 1,44 | 0,96 |

### EXAMPLE OF TOTAL $\Delta p$ CALCULATION

FH100D136G10ABB5D0S000S0 with **90** l/min and oil **46** cSt:

Housing  $\Delta p$  0,25 bar + element  $\Delta p$  0,48 bar:  $(90 \times 3,71)/1000 \times (46/32) =$  total assembly  $\Delta p$  0,73 bar

## ELEMENT PRESSURE DROP (filter elements 210 bar collapse)

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  $V_x$  different than 32 cSt a corrective factor  $V_x/32$  must be applied.

Example: 90 l/min with D136G10B and oil viscosity 46 cSt:  $(90 \times 4,72)/1000 \times (46/32) = 0,61$  bar

|             | G01   | G03   | G06  | G10  | G15  | G25  |
|-------------|-------|-------|------|------|------|------|
| <b>D135</b> | 20,27 | 14,19 | 9,50 | 5,66 | 4,01 | 3,41 |
| <b>D136</b> | 16,90 | 11,83 | 7,92 | 4,72 | 3,34 | 2,84 |
| <b>D137</b> | 12,35 | 8,64  | 5,79 | 3,45 | 2,44 | 2,07 |

### EXAMPLE OF TOTAL $\Delta p$ CALCULATION

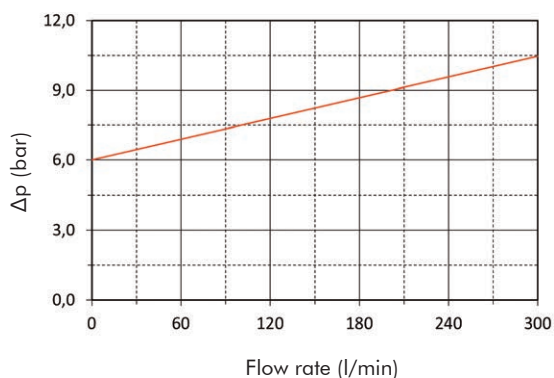
FH100D136G10ABB5D0S000S0 with **90** l/min and oil **46** cSt :

Housing  $\Delta p$  0,25 bar + element  $\Delta p$  0,61 bar:  $(90 \times 4,72)/1000 \times (46/32) =$  total assembly  $\Delta p$  0,86 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.

**FH100 D13x**



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

## USER TIPS



- 1 FILTER HEAD
- 2 INDICATOR PORT
- 3 FIXING HOLES
- 4 FILTER ELEMENT
- 5 SEAL KIT
- 6 FILTER BOWL
- 7 IDENTIFICATION LABEL

### INDICATOR TIGHTENING TORQUE

90 Nm

### SPARE SEAL KIT PART NUMBER (5)

|             | NBR          | FKM          |
|-------------|--------------|--------------|
| FH100 D1-3x | 06.021.00270 | 06.021.00271 |

### BOWL TIGHTENING TORQUE

screw up filter bowl till end

## 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

-  1. The IN and OUT ports must be connected to the hoses in the correct flow direction, an arrow shows on the filter head (1).
- 2. The filter housing should be preferably mounted with the bowl (6) downward.
- 3. Secure to the frame the filter head (1) using the threaded fixing holes (3).
- 4. Verify that no tension is present on the filter after mounting.
- 5. Enough space must be available for filter element replacement.
- 6. The visual clogging indicator must be in an easily viewable position.
- 7. When an electrical indicator is used, make sure that it is properly wired.
-  8. Never run the system with no filter element fitted.
- 9. Keep in stock a spare FILTREC filter element for timely replacement when required.
- 10. Filter housing should be earthed.

## OPERATION

-  1. The filter must work within the operating conditions of pressure, temperature and compatibility given in the first page of this data sheet.
- 2. The filter element must be replaced as soon as the clogging indicator signals at working temperature (in cold start conditions, oil temperature lower than 30°C, a false alarm can be given due to oil viscosity).
- 3. If no clogging indicator is mounted, replace the element according to the system manufacturer's recommendations.

## MAINTENANCE

-  1. Make sure that the system is switched off and there is no residual pressure in the filter.
- 2. Unscrew the bowl (6) by turning it anti-clockwise and remove it.
- 3. Remove the dirty element (4).
- 4. Fit a new FILTREC element (4), verifying the part number, particularly concerning the micron rating; open its plastic protection on the open-end side and insert it onto the spigot in the filter head, then remove completely the plastic protection.
- 5. Clean the bowl carefully; check condition of O-rings (5) and replace them if necessary.
- 6. Lubricate the bowl's thread (6) and screw it by hand into the filter head (1) by turning it clockwise.
- 7. Screw in the bowl to stop.
-  8. The used filter elements cannot be cleaned and re-used.





## FH320 SERIES

In line pressure filters

Inline filters for operating pressure up to 320 bar, flow rate up to 150 l/min.

Available with or without bypass, indicator port is a standard option to fit a visual or electrical differential indicator.



### HOUSING

tested according to NFPA T3.10.5.1, ISO 10771, ISO 3968

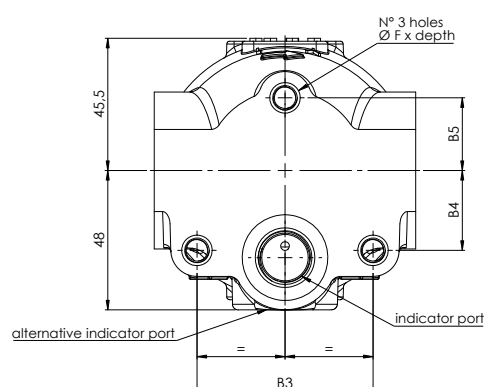
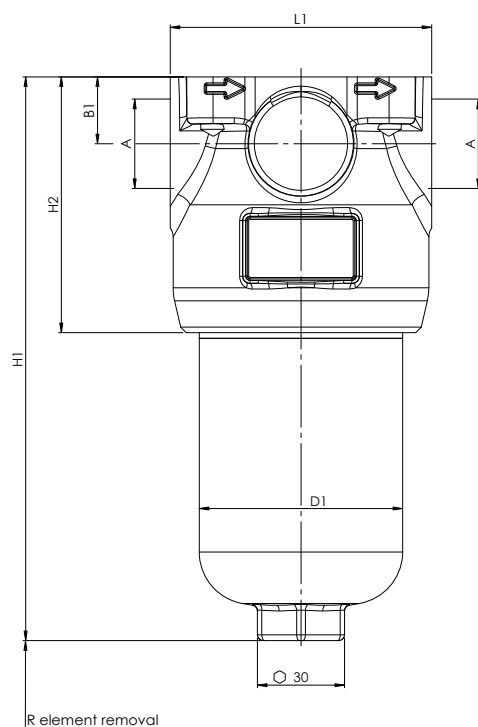
|               |                                                                                  |
|---------------|----------------------------------------------------------------------------------|
| PRESSURE:     | Max operating:<br>320 bar<br>Fatigue rating:<br>10 <sup>6</sup> cycles 0÷320 bar |
| CONNECTIONS:  | G 1/2"÷1" - M22x1,5 on request                                                   |
| MATERIALS:    | Head: cast iron<br>Bowl: extruded steel<br>Seal: NBR (FKM on request)            |
| BYPASS VALVE: | No by-pass or 6 bar setting                                                      |

### ELEMENT

tested according to ISO 11170, 2941, 2942, 2943, 3724, 3968, 16889, 16908, 23181

|                      |                                                                                                                                                       |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| FILTER MEDIA:        | Inorganic microfiber:<br>G01 - G03 - G06 - G10<br>G15 - G25                                                                                           |
| COLLAPSE PRESSURE:   | 21 bar<br>210 bar                                                                                                                                     |
| TEMPERATURE RANGE:   | with NBR seal<br>from -30 °C to +100 °C<br><br>with FKM seal (OPTION)<br>from -25 °C to +120 °C                                                       |
| FLUID COMPATIBILITY: | Full with HH-HL-HM-HV<br>HETG-HEES (acc. to ISO 6743/4).<br>For use with other fluid please<br>contact Filtrec Customer Service<br>(info@filtrec.it). |

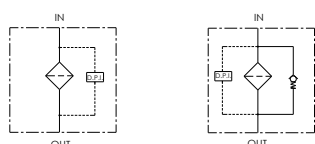
## OVERALL DIMENSIONS



## NOMINAL SIZE

| MODEL      | A                                   | B1 | B3   | B4   | B5 | D1 | F      | H1  | H2 | L1 | R   | WEIGHT |
|------------|-------------------------------------|----|------|------|----|----|--------|-----|----|----|-----|--------|
| FH320-D125 | G 1/2"<br>G 3/4"<br>G 1"<br>M22x1,5 | 23 | 60,6 | 27,5 | 25 | 70 | M10x15 | 157 | 88 | 90 | 110 | 3,3 Kg |
| FH320-D120 |                                     |    |      |      |    |    |        | 198 |    |    |     | 3,9 Kg |
| FH320-D124 |                                     |    |      |      |    |    |        | 241 |    |    |     | 4,4 Kg |
| FH320-D121 |                                     |    |      |      |    |    |        | 291 |    |    |     | 4,9 Kg |
| FH320-D126 |                                     |    |      |      |    |    |        | 335 |    |    |     | 5,3 Kg |

HYDRAULIC SYMBOL



## ORDERING INFORMATION

|               | 1.           | 2.        | 3.        | 4.         | 5.       | 6.       | 7.        | 8.       | 9.       | 10.        | 11.      | 12.      |
|---------------|--------------|-----------|-----------|------------|----------|----------|-----------|----------|----------|------------|----------|----------|
|               | <b>FH320</b> | <b>D1</b> | <b>20</b> | <b>G10</b> | <b>A</b> | <b>B</b> | <b>B3</b> | <b>D</b> | <b>W</b> | <b>E05</b> | <b>S</b> | <b>0</b> |
| SPARE ELEMENT |              | <b>D1</b> | <b>20</b> | <b>G10</b> | <b>A</b> |          |           |          |          |            |          |          |

|                                                                                       |                |                                           |
|---------------------------------------------------------------------------------------|----------------|-------------------------------------------|
| 1. FILTER SERIES                                                                      | FH320          |                                           |
| 2. FILTER ELEMENT SERIES                                                              | D1             |                                           |
| 3. FILTER SIZE                                                                        | 25-20-24-21-26 |                                           |
| 4. FILTER MEDIA                                                                       | 000            | no element                                |
|                                                                                       | G01            | glassfiber $\beta_{4\mu m(c)} \geq 1.000$ |
|                                                                                       | G03            | glassfiber $\beta_{5\mu m(c)} > 1.000$    |
|                                                                                       | G06            | glassfiber $\beta_{7\mu m(c)} > 1.000$    |
|                                                                                       | G10            | glassfiber $\beta_{12\mu m(c)} > 1.000$   |
|                                                                                       | G15            | glassfiber $\beta_{18\mu m(c)} > 1.000$   |
|                                                                                       | G25            | glassfiber $\beta_{22\mu m(c)} > 1.000$   |
| 5. ELEMENT COLLAPSE                                                                   | A              | 21 bar                                    |
|                                                                                       | B              | 210 bar                                   |
|                                                                                       |                | recommended with no by-pass option        |
| 6. SEALS                                                                              | B              | *NBR                                      |
| *omitted for spare element                                                            | V              | FKM                                       |
| 7. CONNECTIONS                                                                        | B3             | G 1/2"                                    |
| For different thread options please check availability with Filtrec Customer Service. | B4             | G 3/4"                                    |
|                                                                                       | B5             | G 1"                                      |
|                                                                                       | M22            | M22 x 1,5 (on request)                    |
| 8. BYPASS VALVE                                                                       | 0              | no by-pass                                |
|                                                                                       | D              | 6 bar                                     |
| 9. INDICATOR PORT OPTION                                                              | S              | with metal plug                           |
|                                                                                       | W              | with plastic plug                         |
|                                                                                       |                | when using an indicator                   |
| 10. INDICATOR                                                                         | 000            | no indicator                              |
| (F) digit for FKM seal option                                                         | V05 (VF5)      | differential visual 5 bar                 |
| *LC24=Led connector (see clogging indicators catalogue)                               | E05 (EF5)      | differential electrical 5 bar             |
|                                                                                       | E05L (EF5L)    | differential electric 5 bar + *LC24       |
|                                                                                       | V08 (VF8)      | differential visual 8 bar                 |
|                                                                                       | E08 (EF8)      | differential electrical 8 bar             |
|                                                                                       | E08L (EF8L)    | differential electric 8 bar + *LC24       |
|                                                                                       |                | recommended for no by-pass option         |
| 11. CORROSION PROTECTION                                                              | S              | phosphated - standard                     |
| 12. OPTIONS                                                                           | 0              | standard                                  |

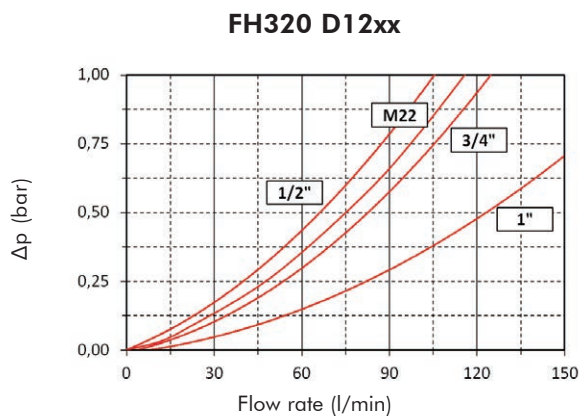
## PRESSURE DROP ( $\Delta p$ ) INFORMATION FOR FILTER SIZING

The total Delta P through a filter assembly is given from Housing  $\Delta p$  + Element  $\Delta p$ .

This ideally should not exceed 1,0 bar and should never exceed 1/3 of the set value of the by-pass valve.  
N.B. All the reported data have been obtained at our laboratory, according to specification ISO3968 with mineral oil having 32 cSt viscosity 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.



### ELEMENT PRESSURE DROP (filter elements 21 bar collapse)

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  $V_x$  different than 32 cSt a corrective factor  $V_x/32$  must be applied.

Example: 80 l/min with D121G10A and oil viscosity 46 cSt  $> (80 \times 4,42)/1000 \times (46/32) = 0,51$  bar

|             | G01A  | G03A  | G06A  | G10A  | G15A | G25A |
|-------------|-------|-------|-------|-------|------|------|
| <b>D125</b> | 50,24 | 35,56 | 25,75 | 15,51 | 8,27 | 7,57 |
| <b>D120</b> | 30,43 | 21,30 | 13,97 | 8,39  | 5,18 | 4,78 |
| <b>D124</b> | 19,90 | 13,93 | 8,42  | 5,17  | 4,16 | 3,60 |
| <b>D121</b> | 15,48 | 10,84 | 6,79  | 4,42  | 3,38 | 2,93 |
| <b>D126</b> | 13,24 | 8,61  | 5,75  | 4,03  | 2,91 | 2,43 |

### EXAMPLE OF TOTAL $\Delta p$ CALCULATION

FH320D121G10ABB5DWV05 with **80** l/min and oil **46** cSt:

Housing  $\Delta p$  0,25 bar + element  $\Delta p$  0,51 bar  $(80 \times 4,42)/1000 \times (46/32) =$  total assembly  $\Delta p$  0,76 bar

## ELEMENT PRESSURE DROP (filter elements 210 bar collapse)

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  $V_x$  different than 32 cSt a corrective factor  $V_x/32$  must be applied.

Example: 80 l/min with D121G10B and oil viscosity 46 cSt  $> (80 \times 5,25)/1000 \times (46/32) = 0,60$  bar

|             | G01B  | G03B  | G06B  | G10B  | G15B  | G25B |
|-------------|-------|-------|-------|-------|-------|------|
| <b>D125</b> | 57,38 | 39,23 | 27,50 | 16,53 | 10,15 | 8,03 |
| <b>D120</b> | 37,18 | 26,03 | 14,77 | 11,57 | 6,89  | 6,13 |
| <b>D124</b> | 24,56 | 17,19 | 11,37 | 6,63  | 4,93  | 3,92 |
| <b>D121</b> | 23,89 | 16,72 | 11,25 | 5,25  | 3,85  | 3,34 |
| <b>D126</b> | 17,65 | 11,48 | 7,79  | 5,17  | 3,55  | 2,85 |

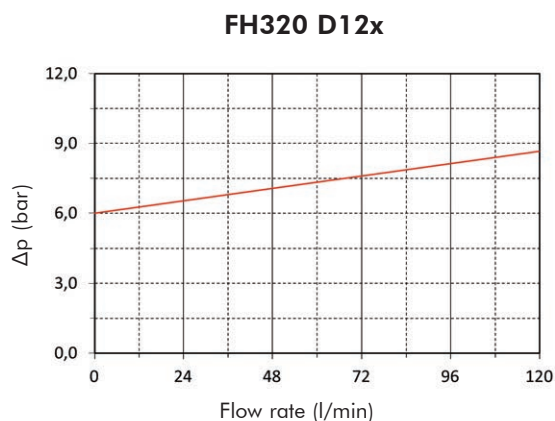
## EXAMPLE OF TOTAL $\Delta p$ CALCULATION

FH320D121G10BBB5DWV08 with **80** l/min and oil **46** cSt :

Housing  $\Delta p$  0,25 bar + element  $\Delta p$  0,60 bar  $(80 \times 5,25)/1000 \times (46/32) =$  total assembly  $\Delta p$  0,85 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.



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

## USER TIPS



### INDICATOR TIGHTENING TORQUE

90 Nm

### SPARE SEAL KIT PART NUMBER (6)

|             | NBR          | FKM          |
|-------------|--------------|--------------|
| FH320 D1-2x | 06.021.00268 | 06.021.00269 |

### BOWL TIGHTENING TORQUE

screw up filter bowl till end

## 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

-  1. The IN and OUT ports must be connected to the hoses in the correct flow direction an arrow shows on the filter head (1).
2. The filter housing should be preferably mounted with the bowl (5) downward.
3. Secure to the frame the filter head (1) using the threaded fixing holes (3).
4. Verify that no tension is present on the filter after mounting.
5. Enough space must be available for filter element replacement.
6. The visual clogging indicator must be in a easily viewable position.
7. When a electrical indicator is used, make sure that it is properly wired.
-  8. Never run the system with no filter element fitted.
9. Keep in stock a spare FILTREC filter element for timely replacement when required.
10. Filter housing should be earthed.

## OPERATION

-  1. The filter must work within the operating conditions of pressure, temperature and compatibility given in the first page of this data sheet.
2. The filter element must be replaced as soon as the clogging indicator signals at working temperature (in cold start conditions, oil temperature lower than 30°C, a false alarm can be given due to oil viscosity).
3. If no clogging indicator is mounted, replace the element according to the system manufacturer's recommendations.

## MAINTENANCE

-  1. Make sure that the system is switched off and there is no residual pressure in the filter.
2. Unscrew the bowl (5) by turning it anti-clockwise and remove it.
3. Remove the dirty element (4).
4. Fit a new FILTREC element (4), verifying the part number, particularly concerning the micron rating; open its plastic protection on the open end side and insert it onto the spigot in the filter head, then remove completely the plastic protection.
5. Clean carefully the bowl; check the O-rings (6) conditions and replace if necessary.
6. Lubricate the bowl's thread (5) and screw it by hand in the filter head (1) by turning it clockwise.
7. Screw in the bowl to stop.
-  8. The used filter elements cannot be cleaned and re-used.





## FH420 SERISI DISLI

Hat tip Yüksek Basınç Filtresi

420 bar çalışma basıncı ve 500 lt/dk debiye göre hat tipi filtreler.



### GÖVDE

NFPA T3.10.5.1, ISO 10771, ISO 3968 göre test edilir

#### BASINÇ:

Maksimum Çalışma: 420 bar  
Yorulma basınç testi :106 cycles 0÷420 bar-  
Patlama: 1260 bar

#### BAĞLANTILAR:

G 1/2" ÷ G 1 1/2"

#### MALZEME:

Kafa: Demir Döküm  
Kap: Karbon çelik  
Conta: NBR (FKM talebe istinaden)

#### BYPASS VALFİ :

6 bar  
ABF valfi  
ABF valfi + RF valfi

### ELEMAN

ISO 11170, 2941, 2942, 2943, 3724,  
3968,16889, 16908, 23181 göre test edilir

#### FILTRE MEDYASI:

Fibreglass: G01 - G03 - G06 - G10  
G15 - G25

#### ÇÖKME DAYANIMI BASINCI:

21 bar  
210 bar

#### ÇALIŞMA SICAKLIK ARALIĞI:

NBR conta ile  
-30 °C +100 °C

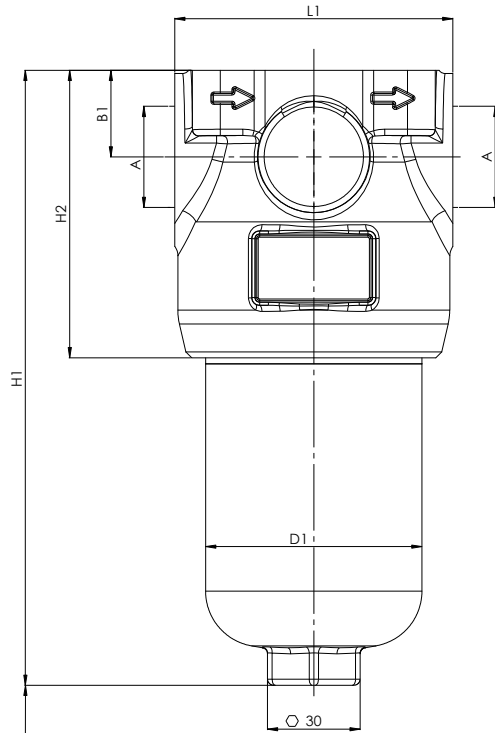
FKM conta (opsiyon)  
-25 °C to +120 °C

#### AKIŞKAN UYUMLULUĞU:

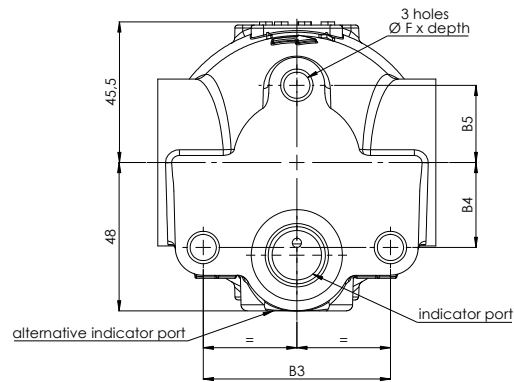
HH-HL-HM-HV  
HETG-HEES (ISO 6743/4).  
Diğer akışkanlar için satış temsil  
cinizle görüşünüz (info@filtrec.it).

## BOYUTLAR

FH420-D1-2x



R element removal

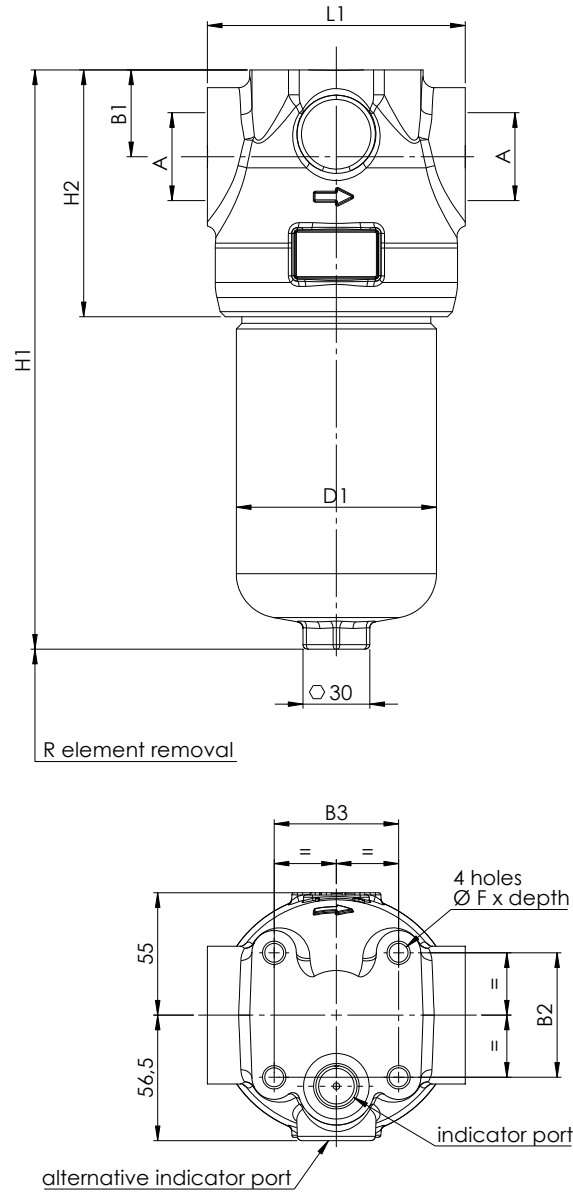


## BOYUTLAR

| MODEL      | A                        | B1 | B3   | B4   | B5 | D1 | F      | H1  | H2 | L1 | R   | AĞIRLIK |
|------------|--------------------------|----|------|------|----|----|--------|-----|----|----|-----|---------|
| FH420-D125 | G 1/2"<br>G 3/4"<br>G 1" | 28 | 60,6 | 27,5 | 25 | 70 | M10x15 | 162 | 93 | 90 | 110 | 3,5 Kg  |
| FH420-D120 |                          |    |      |      |    |    |        | 203 |    |    |     | 4 Kg    |
| FH420-D124 |                          |    |      |      |    |    |        | 246 |    |    |     | 4,5 Kg  |
| FH420-D121 |                          |    |      |      |    |    |        | 296 |    |    |     | 5 Kg    |
| FH420-D126 |                          |    |      |      |    |    |        | 340 |    |    |     | 5,4 Kg  |

## BOYUTLAR

FH420-D1-3x

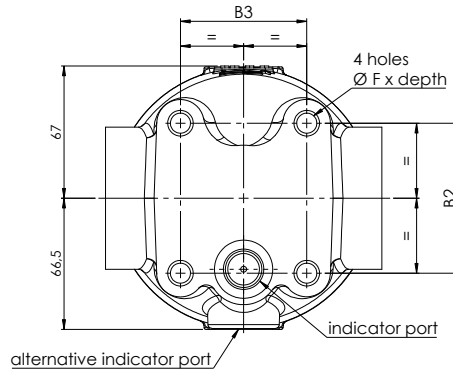
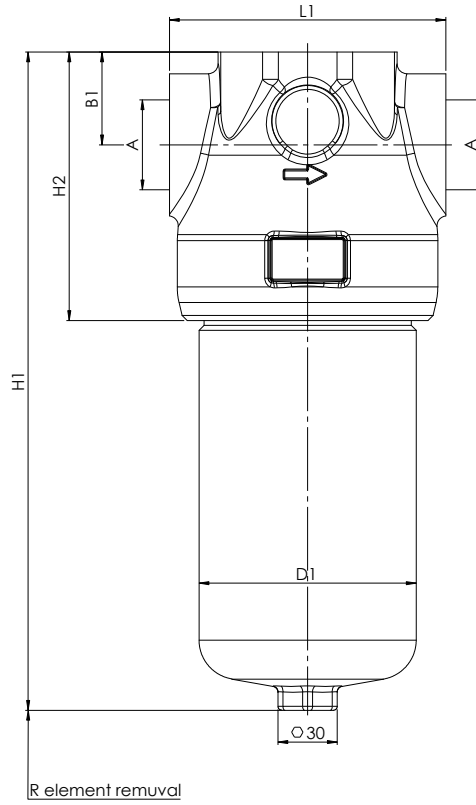


## BOYUTLAR

| MODEL      | A                | B1 | B2 | B3 | D1 | F      | H1  | H2  | L1  | R   | AĞIRLIK |
|------------|------------------|----|----|----|----|--------|-----|-----|-----|-----|---------|
| FH420-D135 | G 1"<br>G 1 1/4" | 39 | 56 | 56 | 90 | M10x15 | 261 | 111 | 116 | 120 | 7,4 Kg  |
| FH420-D136 |                  |    |    |    |    |        | 320 |     |     |     | 8,5 Kg  |
| FH420-D137 |                  |    |    |    |    |        | 390 |     |     |     | 9,9 Kg  |

## BOYUTLAR

FH420-D1-4x



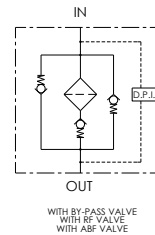
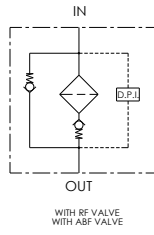
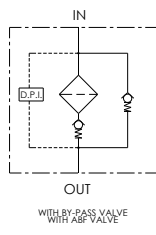
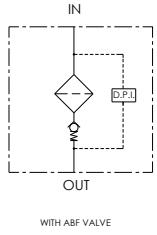
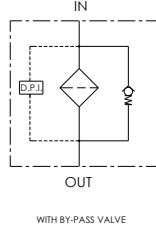
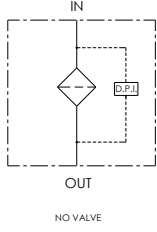
## BOYUTLAR

| MODEL      | A                    | B1 | B2 | B3 | D1  | F      | H1    | H2  | L1  | R   | AĞIRLIK |
|------------|----------------------|----|----|----|-----|--------|-------|-----|-----|-----|---------|
| FH420-D140 | G 1 1/4"<br>G 1 1/2" | 47 | 76 | 64 | 110 | M12x18 | 240,5 | 136 | 140 | 130 | 10,5 Kg |
| FH420-D141 |                      |    |    |    |     |        | 333,5 |     |     |     | 13 Kg   |
| FH420-D142 |                      |    |    |    |     |        | 453,5 |     |     |     | 16,4 Kg |
| FH420-D143 |                      |    |    |    |     |        | 552,5 |     |     |     | 19 Kg   |

## SİPARİŞ BİLGİSİ

| 1.                                                                                              | 2.                                                 | 3.        | 4.         | 5.       | 6.       | 7.        | 8.       | 9.       | 10.      | 11.        | 12.      | 13.                              |
|-------------------------------------------------------------------------------------------------|----------------------------------------------------|-----------|------------|----------|----------|-----------|----------|----------|----------|------------|----------|----------------------------------|
| <b>FH420</b>                                                                                    | <b>D1</b>                                          | <b>20</b> | <b>G10</b> | <b>A</b> | <b>B</b> | <b>B4</b> | <b>D</b> | <b>C</b> | <b>W</b> | <b>E05</b> | <b>S</b> | <b>0</b>                         |
| YEDEK                                                                                           | <b>D1</b>                                          | <b>20</b> | <b>G10</b> | <b>A</b> |          |           |          |          |          |            |          |                                  |
| 1. FİLTRE SERİSİ                                                                                | FH420                                              |           |            |          |          |           |          |          |          |            |          |                                  |
| 2. FİLTRE ELEMAN SERİSİ                                                                         | D1                                                 |           |            |          |          |           |          |          |          |            |          |                                  |
| 3. FİLTRE BOYUT                                                                                 | 25-20-24-21-26                                     |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | 35-36-37                                           |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | 40-41-42-43                                        |           |            |          |          |           |          |          |          |            |          |                                  |
| 4. FİLTRE MEDYASI                                                                               | 000 elemansız                                      |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | G01 glassfiber $\beta_{4\mu m(c)} \geq 1.000$      |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | G03 glassfiber $\beta_{5\mu m(c)} \geq 1.000$      |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | G06 glassfiber $\beta_{7\mu m(c)} \geq 1.000$      |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | G10 glassfiber $\beta_{12\mu m(c)} \geq 1.000$     |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | G15 glassfiber $\beta_{17\mu m(c)} \geq 1.000$     |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | G25 glassfiber $\beta_{22\mu m(c)} \geq 1.000$     |           |            |          |          |           |          |          |          |            |          |                                  |
| 5. ELEMAN ÇÖKME BASINCI                                                                         | A 21 bar                                           |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | Y 21 bar ABF / RF valfi ile                        |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | B 210 bar                                          |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | X 210 bar ABF / RF valfi ile                       |           |            |          |          |           |          |          |          |            |          |                                  |
| 6. CONTA                                                                                        | *B NBR                                             |           |            |          |          |           |          |          |          |            |          |                                  |
| *Yedek eleman için ihmail edilmiştir.                                                           | V FKM (talebe istinaden)                           |           |            |          |          |           |          |          |          |            |          |                                  |
| 7. BAĞLANTILAR                                                                                  | B3 G 1/2"                                          |           |            |          |          |           |          |          |          |            |          |                                  |
| Farklı bağlantı seçenekleri için Filtrec Müşteri hizmetleri ile uygunluğunu kontrol edin.       | B4 G 3/4"                                          |           |            |          |          |           |          |          |          |            |          | 2x boyutlar için                 |
|                                                                                                 | B5 G 1"                                            |           |            |          |          |           |          |          |          |            |          | 2x - 3x boyutlar için            |
|                                                                                                 | B6 G 1 1/4"                                        |           |            |          |          |           |          |          |          |            |          | 3x - 4x boyutlar için            |
|                                                                                                 | B7 G 1 1/2"                                        |           |            |          |          |           |          |          |          |            |          | 4x boyutlar için                 |
| 8. BYPASS VALFİ                                                                                 | 0 by-passız.                                       |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | D 6 bar                                            |           |            |          |          |           |          |          |          |            |          |                                  |
| 9. ABF VALFİ / RF VALFİ                                                                         | 0 Valfsiz                                          |           |            |          |          |           |          |          |          |            |          |                                  |
| ABF=ters akış engelleyici<br>valf RF= ters akış valfi                                           | C ABF valfi                                        |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | R ABF valfi+RF valfi                               |           |            |          |          |           |          |          |          |            |          |                                  |
| 10. GÖSTERGE PORTU                                                                              | S Metal tıpa                                       |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | W Plastik tıpa                                     |           |            |          |          |           |          |          |          |            |          |                                  |
| 11. GÖSTERGE                                                                                    | 000 göstergesiz                                    |           |            |          |          |           |          |          |          |            |          |                                  |
| (F) conta seçeneği için rakam *LC24= Led konektörü (kirlilik göstergesi için kataloğa bakınız.) | V05 (VF5) diferansiyel görsel 5 bar                |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | E05 (EF5) diferansiyel elektriksel 5 bar           |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | E05L (EF5L) diferansiyel elektriksel 5 bar + *LC24 |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | V08 (VF8) diferansiyel görsel 8 bar                |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | E08 (EF8) diferansiyel elektriksel 8 bar           |           |            |          |          |           |          |          |          |            |          | By-passız seçeneği için önerilir |
|                                                                                                 | E08L (EF8L) diferansiyel elektriksel 8 bar + *LC24 |           |            |          |          |           |          |          |          |            |          |                                  |
| 12. KOREZYON KORUMA                                                                             | S fosfatlı - standart                              |           |            |          |          |           |          |          |          |            |          |                                  |
| 13. OPTION                                                                                      | 0 standart                                         |           |            |          |          |           |          |          |          |            |          |                                  |
|                                                                                                 | D Tahliye tıpası (talebe istinaden)                |           |            |          |          |           |          |          |          |            |          | Standart boyut 43                |

## HİDROLİK SEMBOLLER



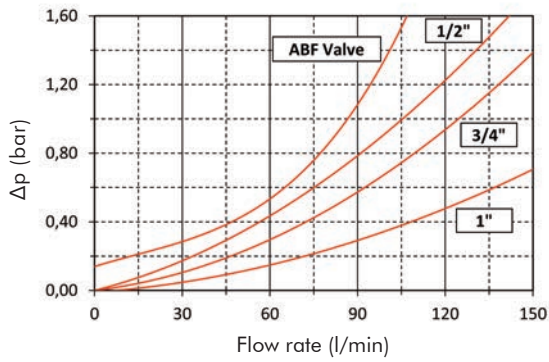
## SEÇİM İÇİN BASINÇ DÜŞÜMÜ ( $\Delta p$ ) BİLGİSİ

Toplam fark basınç düşümü Filtre Gövdesi  $\Delta p$  + Eleman  $\Delta p$  değeridir. Bu değer ideal olarak 1,0 bar değerini aşmamalı ve asla bypass valf 1/3 değerini aşmamalıdır. NOT: Raporlanan tüm veriler laboratuvarlarımızda, ISO3968 spesifikasyonlarına göre 32 cSt viskozite ve 0,875 Kg/dm<sup>3</sup> yoğunluklu yağ ile elde edilmiştir.

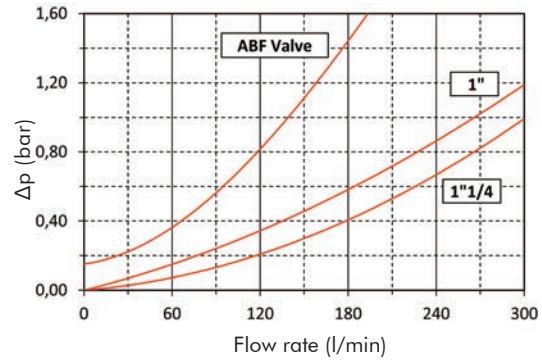
## GÖVDE BASINÇ DÜŞÜMÜ

Gövde fark basıncı  $\Delta p$ , debiye göre model ve bağlantı portuna göre şu şekildedir;

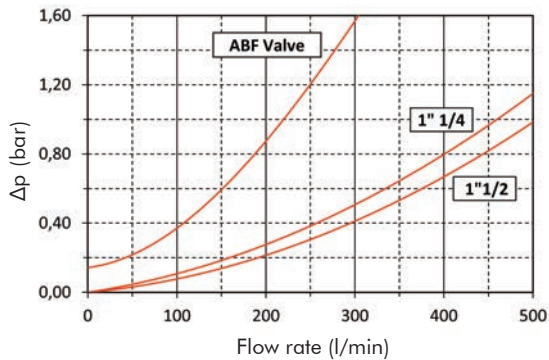
**FH420 D1-2x**



**FH420 D1-3x**



**FH420 D1-4x**



## ELEMAN BASINÇ DÜŞÜMÜ (21 bar çökme basıncına sahip elemanlar)

Eleman fark basıncı  $\Delta p$  (bar) tespit etmek için tablodaki değer ile debi (l/min) çarpılık, 1000 ile bölünmelidir. Eğer yağ viskozitesi 32 cst den farklı ise ( $V_x$ ) düzeltici faktör olarak  $V_x/32$  ile çarpılır, sonuç elde edilir.

ÖRNEK : 80 lt/dk D121G10A ve yağ viskozitesi 46 cSt ise  $>(80 \times 4,42)/1000 \times (46/32) = 0,51$  bar

|      | G01   | G03   | G06   | G10   | G15  | G25  |
|------|-------|-------|-------|-------|------|------|
| D125 | 50,24 | 35,56 | 25,75 | 15,51 | 8,27 | 7,57 |
| D120 | 30,43 | 21,30 | 13,97 | 8,39  | 5,18 | 4,78 |
| D124 | 19,90 | 13,93 | 8,42  | 5,17  | 4,16 | 3,60 |
| D121 | 15,48 | 10,84 | 6,79  | 4,42  | 3,38 | 2,93 |
| D126 | 13,24 | 8,61  | 5,75  | 4,03  | 2,91 | 2,43 |
| D135 | 15,82 | 11,07 | 7,27  | 4,45  | 3,03 | 2,87 |
| D136 | 13,19 | 9,23  | 6,06  | 3,71  | 2,53 | 2,39 |
| D137 | 9,63  | 6,74  | 4,43  | 2,71  | 1,85 | 1,75 |
| D140 | 14,65 | 10,26 | 6,73  | 4,12  | 2,81 | 2,66 |
| D141 | 6,88  | 4,82  | 2,98  | 2,02  | 1,42 | 1,21 |
| D142 | 4,67  | 3,27  | 1,99  | 1,36  | 1,04 | 0,77 |
| D143 | 3,28  | 2,30  | 1,26  | 0,70  | 0,56 | 0,40 |

### ÖRNEK TOPLAM FARK BASINÇ ( $\Delta p$ ) HESAPLAMA

FH420D121G10ABB5DCWE05S0 80 lt/dk ve yağ 46 cSt:

Gövde  $\Delta p$  0,25 bar + eleman  $\Delta p$  0,51 bar  $(80 \times 4,42)/1000 \times (46/32) = \text{toplam } \Delta p$  0,76 bar

## ELEMAN BASINÇ DÜŞÜMÜ (210 bar çökme basıncına sahip elemanlar)

Eleman fark basıncı  $\Delta p$  (bar) tespit etmek için tablodaki değer ile debi (l/min) çarpılık, 1000 ile bölünmelidir. Eğer yağ viskozitesi 32 cst den farklı ise ( $V_x$ ) düzeltici faktör olarak  $V_x/32$  ile çarpılır, sonuç elde edilir.

ÖRNEK: 80 lt/dk D121G10B ve yağ viskozitesi 46 cSt  $> (80 \times 5,25)/1000 \times (46/32) = 0,60$  bar

|      | G01   | G03   | G06   | G10   | G15   | G25  |
|------|-------|-------|-------|-------|-------|------|
| D125 | 57,38 | 89,23 | 27,5  | 16,53 | 10,15 | 8,03 |
| D120 | 37,18 | 26,03 | 14,77 | 11,57 | 6,89  | 6,13 |
| D124 | 24,56 | 17,19 | 11,37 | 6,63  | 4,93  | 3,92 |
| D121 | 23,89 | 16,72 | 11,25 | 5,25  | 3,85  | 3,34 |
| D126 | 17,65 | 11,48 | 7,79  | 5,17  | 3,55  | 2,85 |
| D135 | 20,27 | 14,19 | 9,50  | 5,66  | 4,01  | 3,41 |
| D136 | 16,90 | 11,83 | 7,92  | 4,72  | 3,34  | 2,84 |
| D137 | 12,35 | 8,64  | 5,79  | 3,45  | 2,44  | 2,07 |
| D140 | 18,57 | 13,00 | 9,63  | 5,05  | 3,74  | 3,33 |
| D141 | 10,22 | 7,15  | 4,00  | 2,57  | 1,76  | 1,44 |
| D142 | 5,53  | 3,87  | 2,93  | 1,67  | 1,12  | 0,83 |
| D143 | 4,59  | 3,21  | 1,80  | 1,10  | 0,93  | 0,70 |

### ÖRNEK TOPLAM FARK BASINÇ ( $\Delta p$ ) HESAPLAMA

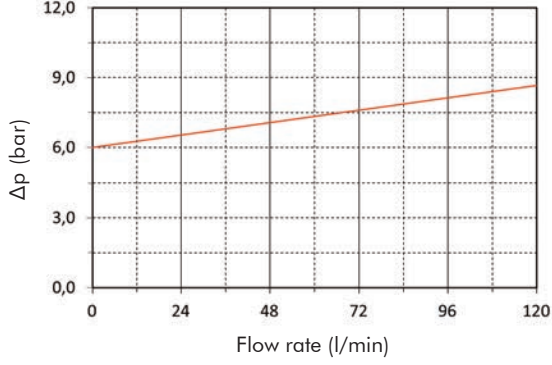
FH420D121G10BBB5DCWE05S0 80 lt/dk ve yağ viskozitesi 46 cSt :

Gövde  $\Delta p$  0,25 bar + eleman  $\Delta p$  0,60 bar  $(80 \times 5,25)/1000 \times (46/32) = \text{toplam } \Delta p$  0,85 bar

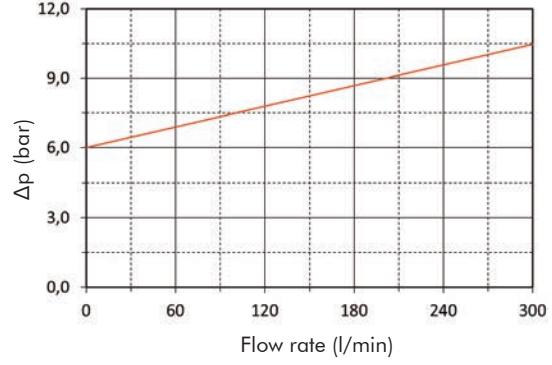
## BYPASS VALF BASINÇ DÜŞÜMÜ

Bypass valf basınç düşümü  $\Delta p$ , belirtilen model, porta ve debiye göre değişimi şu şekildedir;

**FH420 D12x**

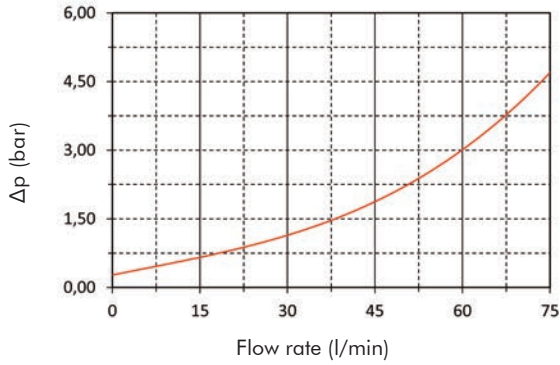


**FH420 D13x - D14x**

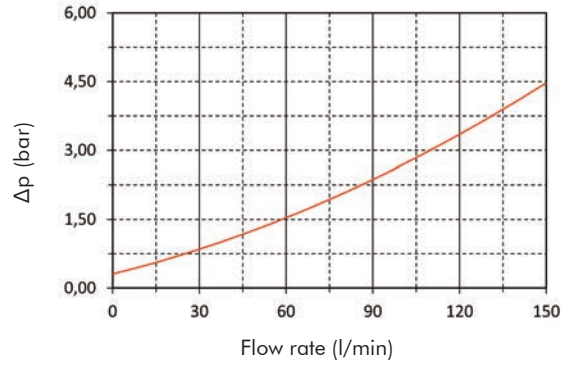


## RF VALFİ BASINÇ DÜŞÜMÜ

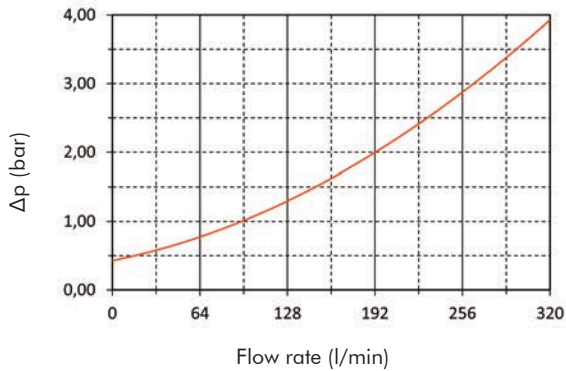
**FH420 D12x**



**FH420 D13x**



**FH420 D14x**



NOT: Raporlanan tüm veriler laboratuvarlarımızda, ISO 3968 spesifikasyonlarına göre 32 cSt viskozite ve 0,875 Kg/dm<sup>3</sup> yoğunluklu yağ ile elde edilmiştir.

## KULLANICI İPUÇLARI



- 1 FİLTRE KAFASI
- 2 GÖSTERGE PORTU
- 3 SABİTLEME DELİĞİ
- 4 FİLTRE ELEMANI
- 5 CONTA KİTİ
- 6 FİLTRE KABI
- 7 AÇIKLAYICI ETİKET
- 8 TAHLİYE TİPASI
- 9 GÖSTERGE TİPASI

### GÖSTERGE SIKMA TORKU

90 Nm

### YEDEK CONTA SETİ PARÇA NUMARASI

|             | NBR          | FKM          |
|-------------|--------------|--------------|
| FH420 D1-2x | 06.021.00268 | 06.021.00269 |
| FH420 D1-3x | 06.021.00270 | 06.021.00271 |
| FH420 D1-4x | 06.021.00272 | 06.021.00273 |

### FİLTRE KABI SIKMA TORKU

Kabı sonuna kadar döndürün.

### UYARI

- ⚠ Çalıştırma ve bakım esnasında kişisel koruyucu ekipmanlarınızın takılı olduğundan emin olunuz.

### FİLTRE ELEMANININ BERTARAF EDİLMESİ

- ⚠ Kullanılmış filtre elemanları ve filtre parçaları kirli yağları "tehlikeli atık malzeme" sınıfındadır; yerel yönetimlerce belirlenen kanunen uygun şekilde bertarafı sağlanmalıdır.

## MONTAJ

- ⚠ 1. GİRİŞ ve ÇIKIŞ portları hortumlara doğru akış yönünde bağlanmalıdır (filtre kafasında (1) bir ok gösterilir)
- 2. Filtre muhafazası tercihen hazne (6) aşağı bakacak şekilde takılmalıdır
- 3. Dişli sabitleme deliklerini (3) kullanarak filtre kafasını (1) çerçeveye sabitleyin
- 4. Monte ettikten sonra filtrede gerginlik olmadığını doğrulayın
- 5. Filtre elemanı değişimi için yeterli alan olmalıdır
- 6. Görsel tıkanıklık göstergesi kolayca görülebilen bir konumda olmalıdır
- 7. Bir elektrik göstergesi kullanıldığında, kablo bağlantısının düzgün yapıldığından emin olun
- 8. Filtre elemanı takılı olmadan sistemi kesinlikle çalıştırmayın
- 9. Gerektiğinde zamanında değiştirmek için yedek bir FILTREC filtre elemanı bulundurunuz
- 10. Filtre muhafazası topraklanmalıdır

## OPERASYON

- ⚠ 1. Filtre, Teknik dokümanın ilk sayfasında belirtilen basınç, sıcaklık ve sıvı uygunluğuna göre kullanılmalıdır
- 2. Gösterge uyarısı alınır alınmaz en kısa sürede filtre elemanı değiştirilmelidir.(30°C derece altı soğuk başlangıç koşullarında yağ viskozitesi yüksek olacağından yanlış alarm alınabilir)
- 3. Eğer gösterge kullanılmıyor ise, üreticinin tavsiye ettiği periyotta filtre elemanı değişimi yapınız

## BAKIM

- ⚠ 1. Sistemin kapalı olduğundan ve filtrede artık basınç olmadığından emin olun
- 2. Hazneyi (6) saat yönünün tersine çevirerek sökün ve çıkarın
- 3. Kirli elemanı (4) çıkarın
- 4. Yeni bir FILTREC elemanı (4) takın, parça numarasını, özellikle mikron derecesini doğrulayın; açık taraftaki plastik korumasını açın ve filtre kafasındaki deliğe takın, ardından plastik korumayı tamamen çıkarın
- 5. Hazneyi dikkatlice temizleyin; O-halkaların (5) durumunu kontrol edin ve gerekirse değiştirin
- 6. Haznenin dişlerini yağlayın (6) ve saat yönünde çevirerek filtre kafasına (1) elle vidalayın
- 7. Durana kadar hazneyi çevirin
- 8. Kullanılmış filtre elemanları temizlenemez ve tekrar kullanılamaz



