

# FRI

**Maximum pressure 20 bar**  
**Flow rates to 1500 l/min**



## Technical data

### Filter housing (Materials)

- Filter body: Aluminium: FRI 255  
 Anodized Aluminium: FRI 025-040-100-250-630  
 Phosphated Steel: FRI 850
- Cover: Nylon (only for: FRI 255)  
 Anodized Aluminium (all the other)
- Valve: Nylon - Steel

### Pressure

- Working pressure: 20 bar (2 MPa)

### Temperature

- From -25 °C to +110 °C

### Bypass valve

- Opening pressure 2,4 bar  $\pm$ 10%

### $\Delta p$ Elements type

- Microfibre filter elements series N: 10 bar
- Fluid flow through the filter element from OUT to IN.

### Seals

- Standard NBR series A
- Optional FPM series V

### FRI FILTERS ARE PROVIDED FOR VERTICAL MOUNTING

### Weights (kg)

| Length    | 1    |
|-----------|------|
| • FRI 025 | 1,0  |
| • FRI 040 | 2,0  |
| • FRI 100 | 3,8  |
| • FRI 250 | 6,3  |
| • FRI 255 | 4,2  |
| • FRI 630 | 13,8 |
| • FRI 850 | 48,0 |

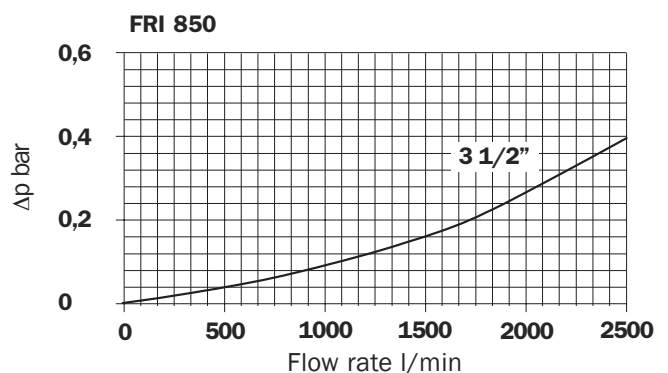
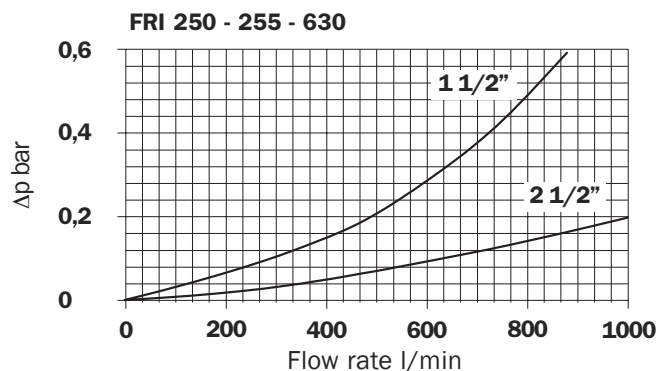
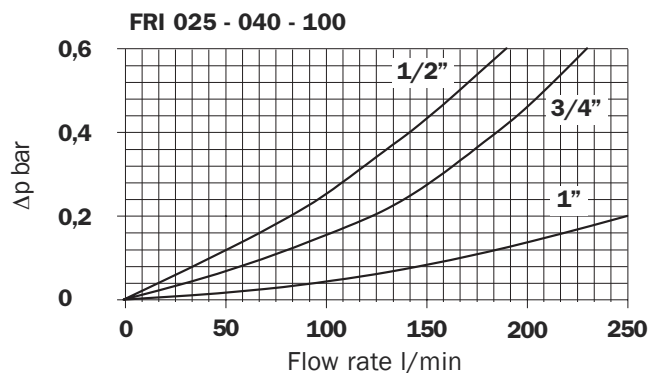
### Volumes (dm<sup>3</sup>)

| Length    | 1    |
|-----------|------|
| • FRI 025 | 0,28 |
| • FRI 040 | 0,70 |
| • FRI 100 | 1,09 |
| • FRI 250 | 2,60 |
| • FRI 255 | 3,2  |
| • FRI 630 | 7,05 |
| • FRI 850 | 21,5 |

### Filter housings $\Delta p$ pressure drop

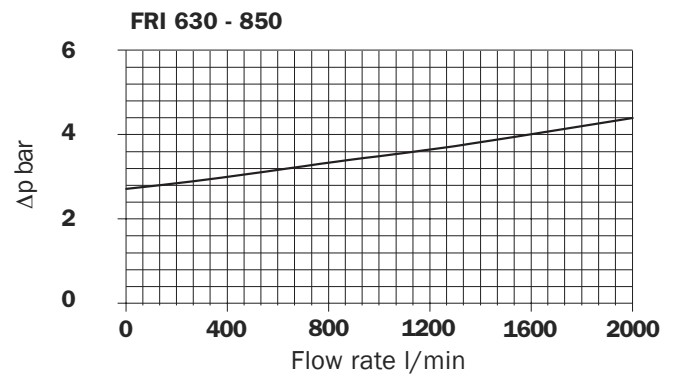
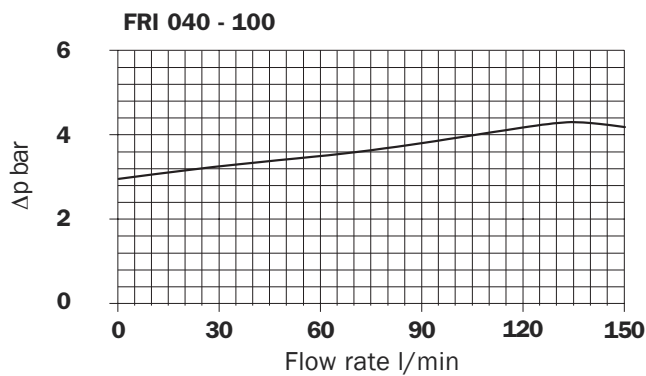
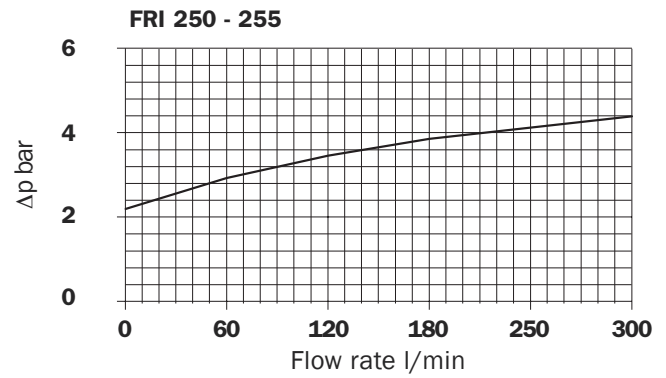
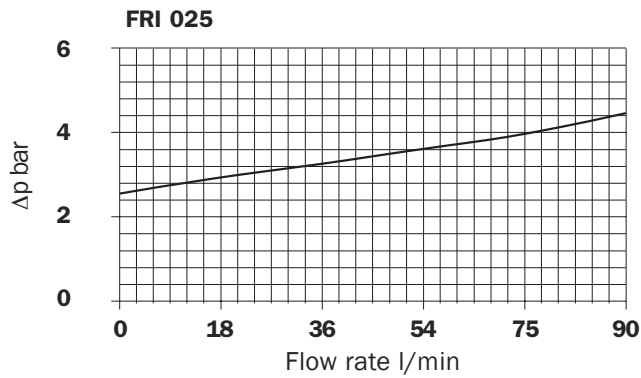
The curves are plotted utilising mineral oil with density of 0,86 kg/dm<sup>3</sup> to ISO 3968.

$\Delta p$  varies proportionally with density.



## Valves

### Bypass valve pressure drop



### Recommended maximum flow rate

- Pressure drop of filter assembly equal to  $\Delta p$  0,5 bar.
- Oil kinematic viscosity 30 mm<sup>2</sup>/s (cSt).
- Density 0,86 kg/dm<sup>3</sup>.

|                | Filtration |     |     |     |     |     |     |     |             |
|----------------|------------|-----|-----|-----|-----|-----|-----|-----|-------------|
|                | Length     | A03 | A06 | A10 | A16 | A25 | P10 | P25 | M25-M60-M90 |
| <b>FRI 025</b> | 1          | 6   | 10  | 16  | 19  | 43  | 43  | 47  | 50*         |

Flow rate l/min

|                | Filtration |     |     |     |     |     |     |     |             |
|----------------|------------|-----|-----|-----|-----|-----|-----|-----|-------------|
|                | Length     | A03 | A06 | A10 | A16 | A25 | P10 | P25 | M25-M60-M90 |
| <b>FRI 040</b> | 1          | 18  | 22  | 42  | 44  | 80  | 80  | 80  | 80*         |

Flow rate l/min

|                | Filtration |     |     |     |     |     |     |     |             |
|----------------|------------|-----|-----|-----|-----|-----|-----|-----|-------------|
|                | Length     | A03 | A06 | A10 | A16 | A25 | P10 | P25 | M25-M60-M90 |
| <b>FRI 100</b> | 1          | 32  | 33  | 88  | 91  | 140 | 140 | 140 | 140*        |

Flow rate l/min

|                      | Filtration |     |     |     |     |     |     |     |             |
|----------------------|------------|-----|-----|-----|-----|-----|-----|-----|-------------|
|                      | Length     | A03 | A06 | A10 | A16 | A25 | P10 | P25 | M25-M60-M90 |
| <b>FRI 250 - 255</b> | 1          | 143 | 178 | 270 | 300 | 350 | 350 | 350 | 350*        |

Flow rate l/min

|                | Filtration |     |     |     |     |     |     |     |             |
|----------------|------------|-----|-----|-----|-----|-----|-----|-----|-------------|
|                | Length     | A03 | A06 | A10 | A16 | A25 | P10 | P25 | M25-M60-M90 |
| <b>FRI 630</b> | 1          | 240 | 278 | 507 | 575 | 700 | 700 | 700 | 700*        |

Flow rate l/min

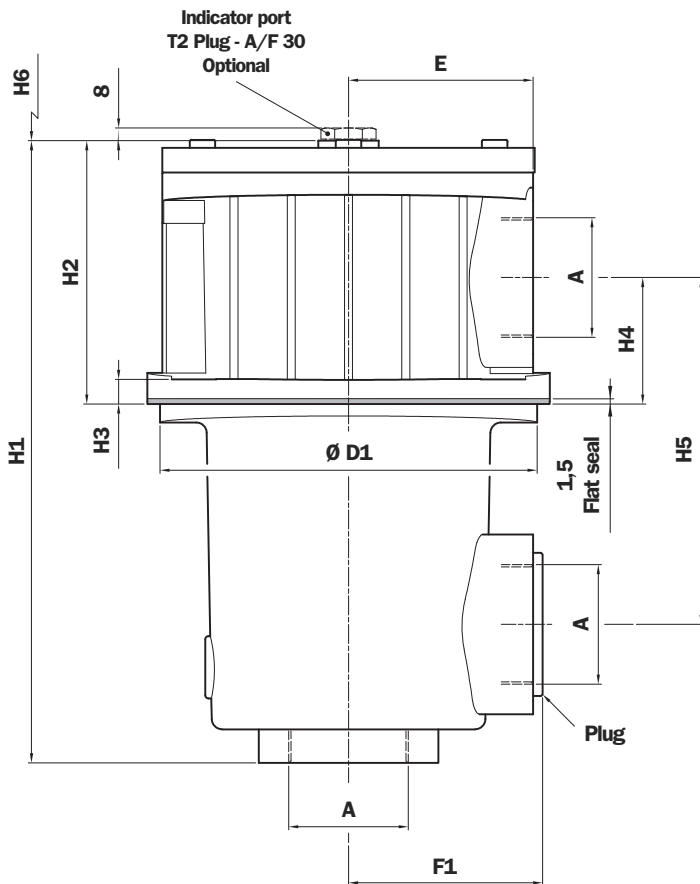
|                | Filtration |     |     |     |      |      |      |      |             |
|----------------|------------|-----|-----|-----|------|------|------|------|-------------|
|                | Length     | A03 | A06 | A10 | A16  | A25  | P10  | P25  | M25-M60-M90 |
| <b>FRI 850</b> | 1          | 440 | 540 | 970 | 1140 | 1600 | 1600 | 1600 | 1600*       |

Flow rate l/min

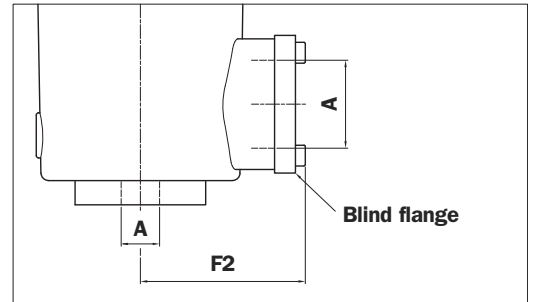
\* Maximum flow recommended



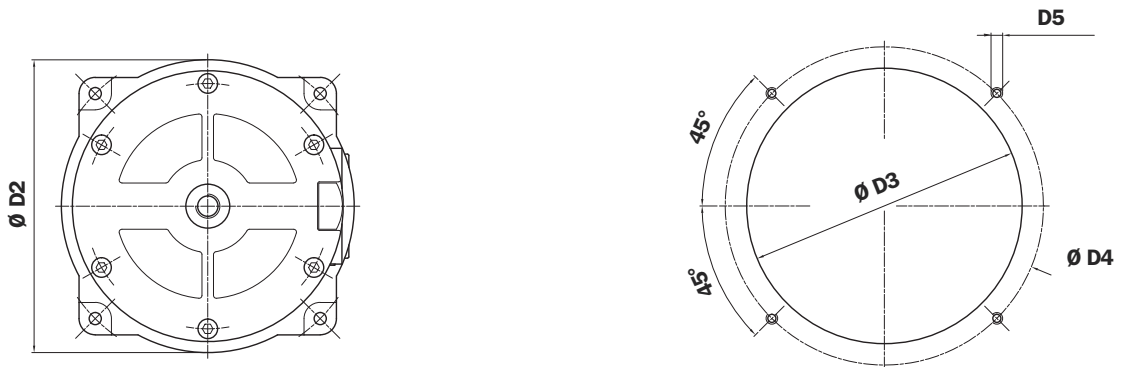
# FRI 100 - 250 - 630



Flange connections



Holes on the tank



Thread connections

| Type | A                        |                         |                         |
|------|--------------------------|-------------------------|-------------------------|
|      | FRI 100                  | FRI 250                 | FRI 630                 |
| G1   | G 1"                     | G 1 1/2"                | G 2 1/2"                |
| G2   | 1" NPT                   | 1 1/2" NPT              | 2 1/2" NPT              |
| G3   | SAE 16 - 1.5/16" - 12 UN | SAE 24 - 1.7/8" - 12 UN | SAE 32 - 2 1/2" - 12 UN |

Flange connections\*

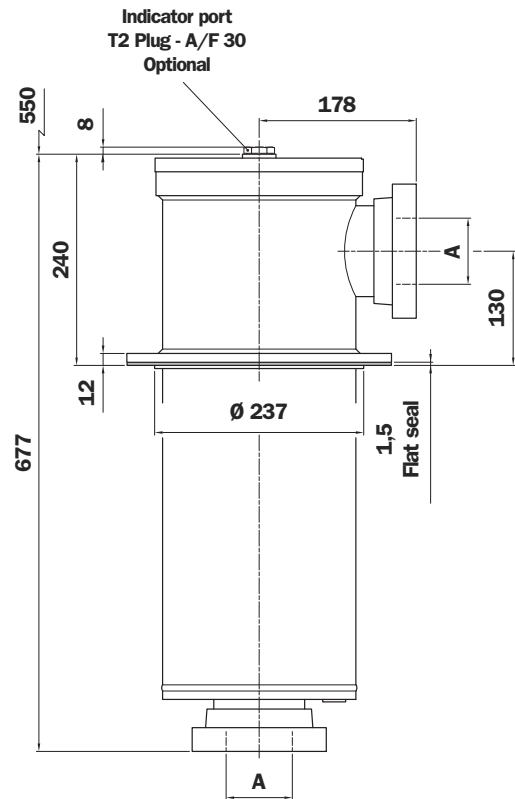
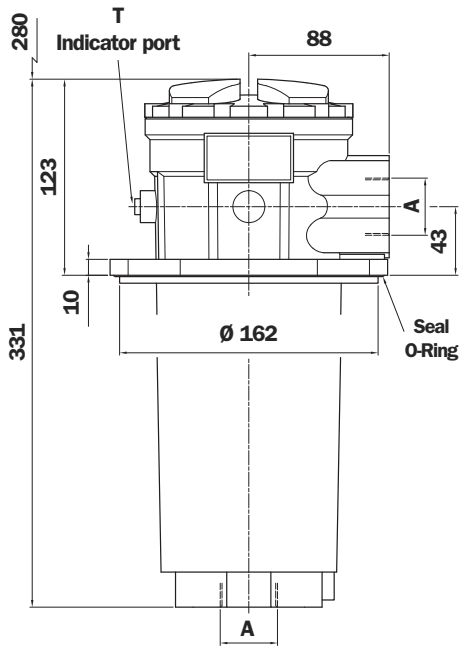
| Type | A                   |                         |                         |
|------|---------------------|-------------------------|-------------------------|
|      | FRI 100             | FRI 250                 | FRI 630                 |
| F1   | 1" SAE 3000 psi/M   | 1 1/2" SAE 3000 psi/M   | 2 1/2" SAE 3000 psi/M   |
| F2   | 1" SAE 3000 psi/UNC | 1 1/2" SAE 3000 psi/UNC | 2 1/2" SAE 3000 psi/UNC |

\*Connections table "DN/SAE flange" see page 39

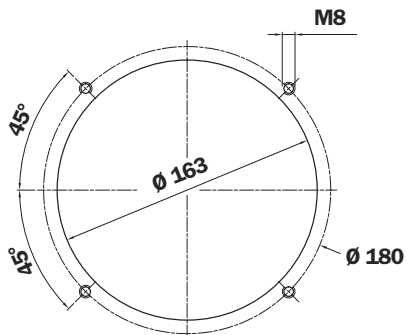
| Filter Length | H1 mm | H2 mm | H3 mm | H4 mm | H5 mm | H6 mm | D1 mm | D2 mm | D3 mm | D4 mm | D5 mm | E mm | F1 mm | F2 mm |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| FRI 100       | 245   | 106   | 12    | 51    | 140   | 175   | 135   | 146   | 136   | 154   | M6    | 67   | 73    | 90    |
| FRI 250       | 335   | 129   | 14    | 59    | 177   | 265   | 162   | 174   | 163   | 180   | M8    | 82   | 86    | 108   |
| FRI 630       | 391   | 166   | 16    | 80    | 218   | 300   | 237   | 253   | 238   | 275   | M10   | 116  | 122   | 143   |

# FRI 255

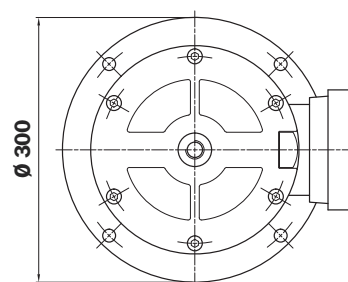
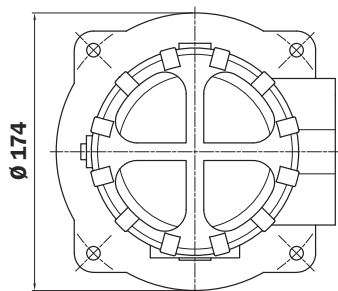
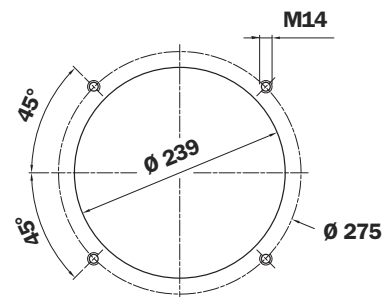
# FRI 850



Holes on the tank



Holes on the tank



## FRI 255 - Thread connections

| Type | A                       | T      |
|------|-------------------------|--------|
| G1   | G 1 1/2"                | G 1/8" |
| G2   | 1 1/2" NPT              | G 1/8" |
| G3   | SAE 24 - 17/8" - 12 UN  | G 1/8" |
| G4   | G 1 1/4"                | G 1/8" |
| G5   | 1 1/4" NPT              | G 1/8" |
| G6   | SAE 20 - 1.5/8" - 12 UN | G 1/8" |

## FRI 255 - Flange connections\*

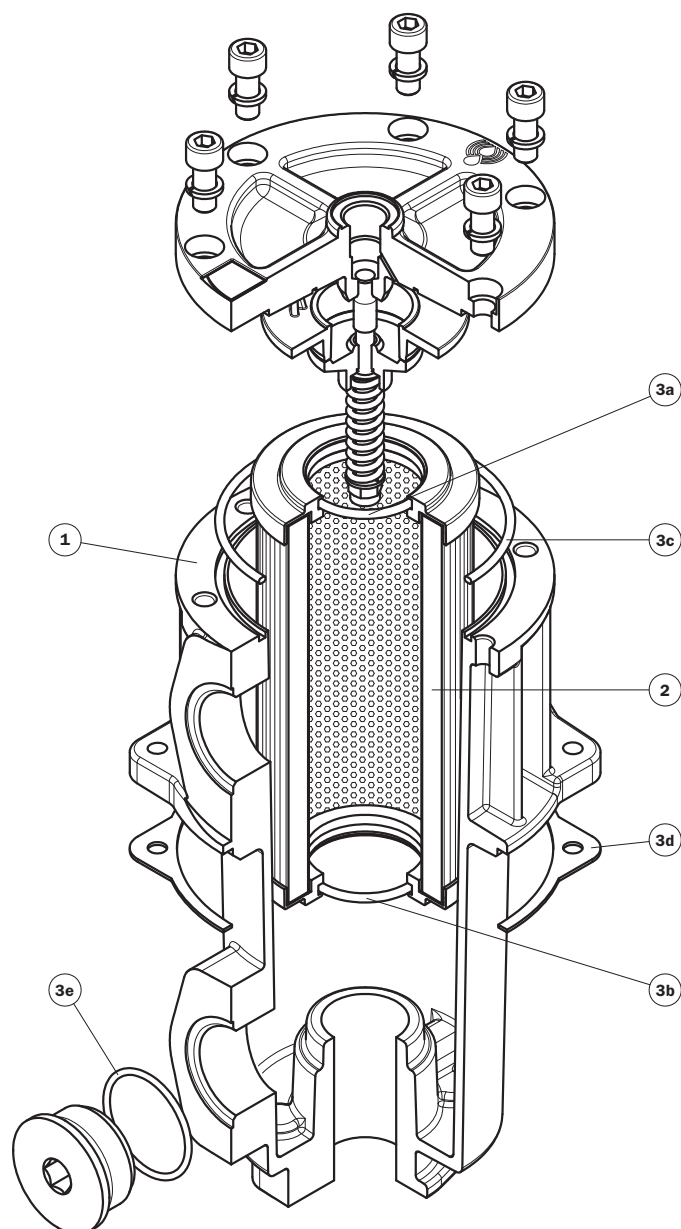
| Type | A                       | T      |
|------|-------------------------|--------|
| F1   | 1 1/2" SAE 3000 psi/M   | G 1/8" |
| F2   | 1 1/2" SAE 3000 psi/UNC | G 1/8" |

\*Connections table  
"DN - SAE flange" see page 39

## FRI 850 - Flange connections\*

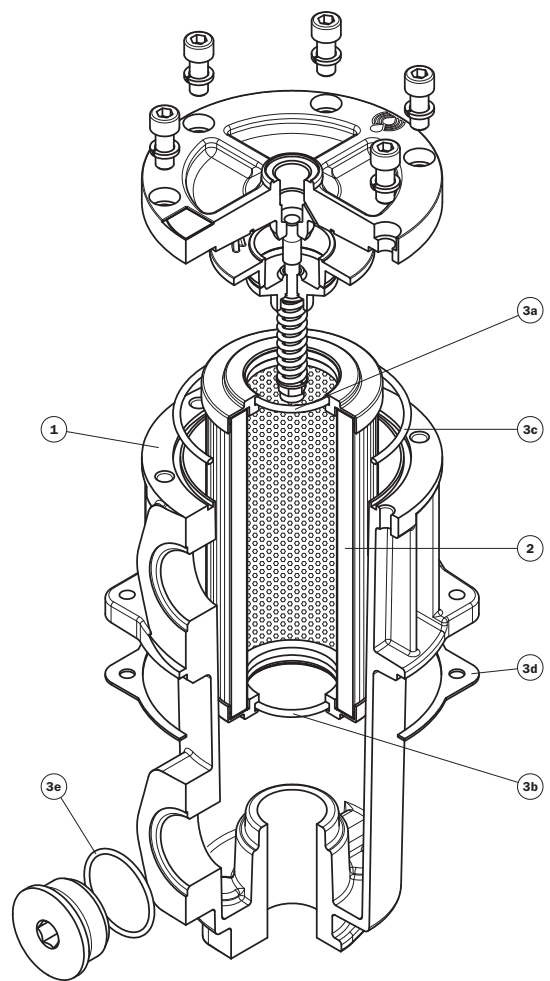
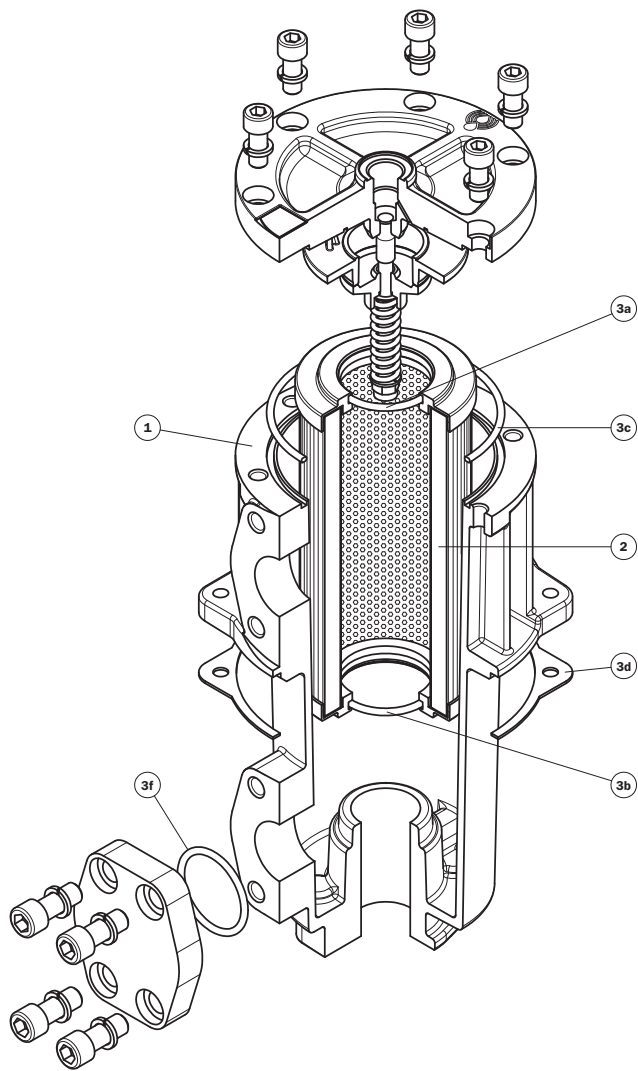
| Type | A                       |
|------|-------------------------|
| F1   | 3 1/2" SAE 3000 psi/M   |
| F2   | 3 1/2" SAE 3000 psi/UNC |

\*Connections table  
"DN - SAE flange" see page 39

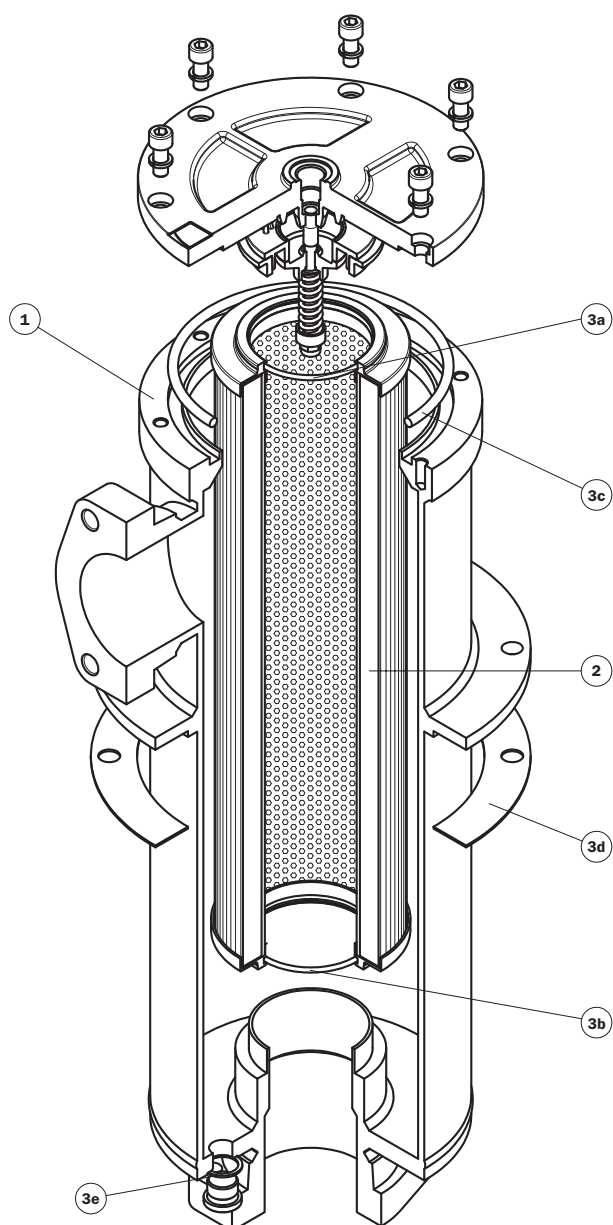


| Item      | Description                | Q.ty | FILTER Series              |                 |                            |                 |
|-----------|----------------------------|------|----------------------------|-----------------|----------------------------|-----------------|
|           |                            |      | FRI 025                    |                 | FRI 040                    |                 |
| <b>1</b>  | Filter assembly            | 1    | See order table            |                 |                            |                 |
| <b>2</b>  | Filter element             | 1    | See order table            |                 |                            |                 |
| <b>3</b>  | Seal Kit                   | 1    | NBR<br>02050213            | FPM<br>02050220 | NBR<br>02050214            | FPM<br>02050221 |
| <b>3a</b> | Filter element top seal    | 1    | O-R 3106<br>Ø 25,65 x 2,62 |                 | O-R 4137<br>Ø 34,52 x 3,53 |                 |
| <b>3b</b> | Filter element bottom seal | 1    | O-R 3093<br>Ø 23,47 x 2,62 |                 | O-R 4137<br>Ø 34,52 x 3,54 |                 |
| <b>3c</b> | Cover seal                 | 1    | O-R 3243<br>Ø 61,60 x 2,62 |                 | O-R 4350<br>Ø 88,50 x 3,53 |                 |
| <b>3d</b> | Head seal                  | 1    | 01026404                   |                 | 01026400                   |                 |
| <b>3e</b> | Plug seal GAS thread       | 1    | 01017055                   |                 | 01017030                   |                 |
|           | Plug seal SAE thread       | 1    | O-R 1064<br>Ø 16,36 x 2,20 |                 | O-R 1092<br>Ø 23,47 x 2,95 |                 |

# Spare parts



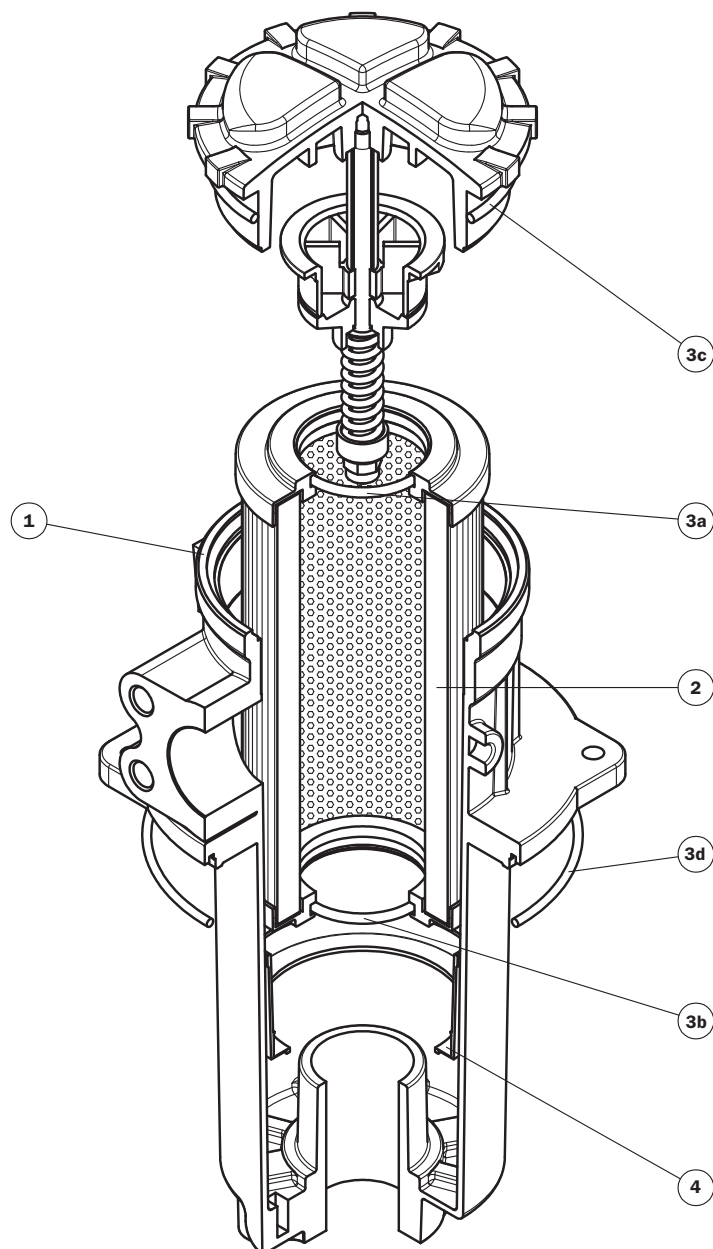
| Item | Description                | Q.ty | FILTER Series              |                 |                             |                 |                            |                 |
|------|----------------------------|------|----------------------------|-----------------|-----------------------------|-----------------|----------------------------|-----------------|
|      |                            |      | FRI 100                    |                 | FRI 250                     |                 | FRI 630                    |                 |
| 1    | Filter assembly            | 1    | See order table            |                 |                             |                 |                            |                 |
| 2    | Filter element             | 1    | See order table            |                 |                             |                 |                            |                 |
| 3    | Seal Kit                   | 1    | NBR<br>02050215            | FPM<br>02050222 | NBR<br>02050216             | FPM<br>02050223 | NBR<br>02050217            | FPM<br>02050224 |
| 3a   | Filter element top seal    | 1    | O-R 4137<br>Ø 34,52 x 3,53 |                 | O-R Metric<br>Ø 50 x 4      |                 | O-R 177<br>Ø 74,61 x 3,53  |                 |
| 3b   | Filter element bottom seal | 1    | O-R 4137<br>Ø 34,52 x 3,53 |                 | O-R Metric<br>Ø 50 x 4      |                 | O-R 177<br>Ø 74,61 x 3,53  |                 |
| 3c   | Cover seal                 | 1    | O-R 4387<br>Ø 98,02 x 3,53 |                 | O-R 4475<br>Ø 120,20 x 3,53 |                 | O-R 233<br>Ø 181,00 x 6,99 |                 |
| 3d   | Head seal                  | 1    | 01026401                   |                 | 01026402                    |                 | 01026403                   |                 |
| 3e   | Plug seal GAS thread       | 1    | O-R 2131<br>Ø 33,05 x 1,78 |                 | O-R 3193<br>Ø 48,89 x 2,62  |                 | O-R 3325<br>Ø 82,22 x 2,62 |                 |
|      | Plug seal SAE thread       | 1    | O-R 1117<br>Ø 29,74 x 2,95 |                 | O-R 1172<br>Ø 43,69 x 3     |                 | O-R 1234<br>Ø 59,36 x 3    |                 |
| 3f   | Blind flange seal          | 1    | O-R 4131<br>Ø 32,93 x 3,53 |                 | O-R 150<br>Ø 46,04 x 3,53   |                 | O-R 171<br>Ø 68,26 x 3,53  |                 |



| Item      | Description                | Q.ty | FILTER Series<br>FRI 850   |                 |
|-----------|----------------------------|------|----------------------------|-----------------|
| <b>1</b>  | Filter assembly            | 1    | See order table            |                 |
| <b>2</b>  | Filter element             | 1    | See order table            |                 |
| <b>3</b>  | Seal Kit                   | 1    | NBR<br>02050218            | FPM<br>02050225 |
| <b>3a</b> | Filter element top seal    | 1    | O-R 4337<br>Ø 85,32 x 3,53 |                 |
| <b>3b</b> | Filter element bottom seal | 1    | O-R 4337<br>Ø 85,32 x 3,53 |                 |
| <b>3c</b> | Cover seal                 | 1    | O-R 233<br>Ø 181,00 x 6,99 |                 |
| <b>3d</b> | Head seal                  | 1    | 01026320                   | 01026326        |
| <b>3e</b> | Plug seal                  | 1    | 01017055                   |                 |



# Spare parts



|             |                               | <b>FILTER Series<br/>FRI 255</b> |   |     |     |          |          |
|-------------|-------------------------------|----------------------------------|---|-----|-----|----------|----------|
| <b>Item</b> | <b>Description</b>            | <b>Q.ty</b>                      |   |     |     |          |          |
| <b>1</b>    | Filter assembly               | 1                                | See order table   |     |     |          |          |
| <b>2</b>    | Filter element                | 1                                | See order table   |     |     |          |          |
| <b>3</b>    | Seal Kit                      | 1                                | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">NBR</td> <td style="text-align: center;">FPM</td> </tr> <tr> <td style="text-align: center;">02050013</td> <td style="text-align: center;">02050014</td> </tr> </table> | NBR | FPM | 02050013 | 02050014 |
| NBR         | FPM                           |                                  |   |     |     |          |          |
| 02050013    | 02050014                      |                                  |   |     |     |          |          |
| <b>3a</b>   | Filter element top seal       | 1                                | O-R Metric<br>Ø 50 x 4  |     |     |          |          |
| <b>3b</b>   | Filter element bottom seal    | 1                                | O-R Metric<br>Ø 50 x 4  |     |     |          |          |
| <b>3c</b>   | Cover seal                    | 1                                | O-R Metric<br>Ø 113 x 4   |     |     |          |          |
| <b>3d</b>   | Head seal                     | 1                                | O-R 4650<br>Ø 164,70 x 3,53   |     |     |          |          |
| <b>4</b>    | Contamination retainer binder | 1                                | 01060301  |     |     |          |          |

# Ordering information FRI

## Filter assembly FRI

|                     |                          |                          |                          |                          |                          |                          |                          |
|---------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|                     | <b>1</b>                 | <b>2</b>                 | <b>3</b>                 | <b>4</b>                 | <b>5</b>                 | <b>6</b>                 | <b>8</b>                 |
|                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>Example: FRI</b> | <b>040</b>               | <b>B</b>                 | <b>A</b>                 | <b>G1</b>                | <b>A10</b>               | <b>N</b>                 | <b>P01</b>               |

## Filter element CU

|                    |                          |                          |                          |                          |
|--------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|                    | <b>1</b>                 | <b>5</b>                 | <b>7</b>                 | <b>8</b>                 |
|                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>Example: CU</b> | <b>040</b>               | <b>A10</b>               | <b>N</b>                 | <b>P01</b>               |

### 1 - Style

| Filter     | Filter element |
|------------|----------------|
| <b>025</b> | <b>025</b>     |
| <b>040</b> | <b>040</b>     |
| <b>100</b> | <b>100</b>     |
| <b>250</b> | <b>250</b>     |
| <b>255</b> | <b>250</b>     |
| <b>630</b> | <b>630</b>     |
| <b>850</b> | <b>850</b>     |

### 5 - Filter element

|            |                            |   |
|------------|----------------------------|---|
| <b>A03</b> | Inorganic microfibre 3 µm  | Absolute filtration<br>Inorganic<br>Microfibre<br><br>βx (c) ≥ 1000 |
| <b>A06</b> | Inorganic microfibre 6 µm  |   |
| <b>A10</b> | Inorganic microfibre 10 µm |   |
| <b>A16</b> | Inorganic microfibre 16 µm |   |
| <b>A25</b> | Inorganic microfibre 25 µm |   |
| <b>M25</b> | Wire mesh 25 µm            | Nominal<br>Filtration   |
| <b>M60</b> | Wire mesh 60 µm            |   |
| <b>M90</b> | Wire mesh 90 µm            |   |
| <b>P10</b> | Resin - Impregnated paper  | Nominal<br>Filtration   |
| <b>P25</b> | Resin - Impregnated paper  |   |

### 2 - By-pass valve

|          |                |
|----------|----------------|
| <b>B</b> | With bypass    |
| <b>S</b> | Without bypass |

### 3 - Filter seals & Treatment

|          |  |
|----------|--|
| <b>A</b> | NBR  |
| <b>V</b> | FPM  |
| <b>W</b> | NBR, Filter body anodized. Filter element compatible with fluid HFA, HFB, HFC (only for filter element type Axx and Mxx) |
| <b>Z</b> | FPM, Filter body anodized. Filter element compatible with fluid HFA, HFB, HFC (only for filter element type Axx and Mxx) |

### 6 - Δp Filter element

|          |           |
|----------|-----------|
| <b>N</b> | Δp 10 bar |
|----------|-----------|

### 7 - Filter element seals

|           |  |
|-----------|--|
| <b>N</b>  | NBR  |
| <b>V</b>  | FPM  |
| <b>W*</b> | NBR (only for filter element type Axx and Mxx) |
| <b>Z*</b> | FPM (only for filter element type Axx and Mxx) |

### 8 - Option

|            |                    |
|------------|--------------------|
| <b>P01</b> | MP Filtri standard |
|------------|--------------------|

\* Compatible with fluid HFA, HFB, HFC

### 4 - Connections

#### FRI 025

| Type      | A                     |
|-----------|-----------------------|
| <b>G1</b> | G 1/2"                |
| <b>G2</b> | 1/2" NPT              |
| <b>G3</b> | SAE 8 - 3/4" - 16 UNF |

#### FRI 040

| Type      | A                        |
|-----------|--------------------------|
| <b>G1</b> | G 3/4"                   |
| <b>G2</b> | 3/4" NPT                 |
| <b>G3</b> | SAE 12 - 1 1/16" - 12 UN |

#### FRI 100

| Type      | A                        |
|-----------|--------------------------|
| <b>G1</b> | G 1"                     |
| <b>G2</b> | 1" NPT                   |
| <b>G3</b> | SAE 16 - 1 5/16" - 12 UN |
| <b>F1</b> | 1" SAE 3000 psi/M        |
| <b>F2</b> | 1" SAE 3000 psi/UNC      |

#### FRI 255

| Type      | A                       |
|-----------|-------------------------|
| <b>G1</b> | G 1 1/2"                |
| <b>G2</b> | 1 1/2" NPT              |
| <b>G3</b> | SAE 24 - 1 7/8" - 12 UN |
| <b>G4</b> | G 1 1/4"                |
| <b>G5</b> | 1 1/4" NPT              |
| <b>G6</b> | SAE 20 - 1 5/8" - 12 UN |
| <b>F1</b> | 1 1/2" SAE 3000 psi/M   |
| <b>F2</b> | 1 1/2" SAE 3000 psi/UNC |

#### FRI 630

| Type      | A                       |
|-----------|-------------------------|
| <b>G1</b> | G 2 1/2"                |
| <b>G2</b> | 2 1/2" NPT              |
| <b>G3</b> | SAE 32 - 2 1/2" - 12 UN |
| <b>F1</b> | 2 1/2" SAE 3000 psi/M   |
| <b>F2</b> | 2 1/2" SAE 3000 psi/UNC |

#### FRI 850

| Type      | A                       |
|-----------|-------------------------|
| <b>F1</b> | 3 1/2" SAE 3000 psi/M   |
| <b>F2</b> | 3 1/2" SAE 3000 psi/UNC |

#### FRI 250

| Type      | A                       |
|-----------|-------------------------|
| <b>G1</b> | G 1 1/2"                |
| <b>G2</b> | 1 1/2" NPT              |
| <b>G3</b> | SAE 24 - 1 7/8" - 12 UN |
| <b>F1</b> | 1 1/2" SAE 3000 psi/M   |
| <b>F2</b> | 1 1/2" SAE 3000 psi/UNC |

**For Clogging Indicator:**  
See page 324

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