Technical Information

**Pressure:**
- Max working: 12 bar (175 psi) (acc. to NFPA T 3.10.17)
- Burst: 20 bar (290 psi) (acc. to NFPA T 3.10.17)

**Connection Ports:**
- 3/4”÷1 1/2” BSP (other thread options on request)

**Materials:**
- Head: aluminium alloy
- Bowl: steel
- Seal: Buna-N

**By-pass:**
- Suction line 0,25 bar (3.6 psi) setting
- Return line 1,7 bar (24.6 psi) setting

**Filter Media:**
- Microglass fiber: 4,5 - 7 - 12 - 27 μm (acc. to ISO 16889)
- Cellulose: 10 - 25 μm (acc. to ISO 16889)
- Wire mesh: 60 - 125 μm

**Differential collapse pressure:**
- 4 bar (58 psi) (acc. to ISO 2941)

Filtrec elements are tested also according to ISO 2942, ISO 23181 and ISO 3968

**Working temperature:**
- -25°C +120°C (-13°F +248°F)

**Fluid compatibility** (acc. to ISO 2943):
- Full with HH-HL-HM-HV (acc. to ISO 6743/4).
- For use with other fluid applications please contact Filtrec Customer Service (info@filtrec.it).
### Ordering information
(n.b. for return & inline see page 6)

**SUCTION LINE**

<table>
<thead>
<tr>
<th>NOMINAL SIZE</th>
<th>MEDIA</th>
<th>SEALS</th>
<th>CONNECTION</th>
<th>BY-PASS</th>
<th>INDICATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>FA-1</td>
<td>31</td>
<td>C10</td>
<td>B</td>
<td>B7</td>
<td>S S1</td>
</tr>
</tbody>
</table>

**Filter element**

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>MEDIA</th>
<th>SEALS</th>
<th>CONNECTION</th>
<th>BY-PASS</th>
<th>INDICATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1-1x</td>
<td>C10</td>
<td>B</td>
<td>B7</td>
<td>S</td>
<td>S1</td>
</tr>
<tr>
<td>A1-2x</td>
<td>C10</td>
<td>B</td>
<td>B7</td>
<td>S</td>
<td>S1</td>
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<tr>
<td>A1-3x</td>
<td>C10</td>
<td>B</td>
<td>B7</td>
<td>S</td>
<td>S1</td>
</tr>
<tr>
<td>A1-4x</td>
<td>C10</td>
<td>B</td>
<td>B7</td>
<td>S</td>
<td>S1</td>
</tr>
</tbody>
</table>

**MEDIA**

- 000: no element
- C10: cellulose $\beta_{10 \mu m} \geq 2$
- C25: cellulose $\beta_{25 \mu m} \geq 2$
- G10: microglass fiber $\beta_{12 \mu m} \geq 1000$
- G25: microglass fiber $\beta_{27 \mu m} \geq 1000$
- T60: wire mesh 60 $\mu$m
- T125: wire mesh 125 $\mu$m

**SEALS**

- B: NBR

**CONNECTION**

- B4: 3/4" BSP (size 10-11)
- B6: 1 1/4" BSP (size 20-21)
- B7: 1 1/2" BSP (size 30-41)

**BY-PASS**

- 0: no by-pass
- S: 0,25 bar / 3,6 psi

**Preferential option**

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>no indicator</td>
</tr>
<tr>
<td>R7</td>
<td>pressure/vacuum gauge -1÷5 bar / -14,5÷72,5 psi</td>
</tr>
<tr>
<td>S1</td>
<td>vacuum gauge indicator scale 0÷-1 bar / 0÷-14,5 psi</td>
</tr>
<tr>
<td>S2</td>
<td>electric vacuum switch -0,2 bar / -2,9 psi N.O.</td>
</tr>
<tr>
<td>S3</td>
<td>electric vacuum switch -0,2 bar / -2,9 psi N.C.</td>
</tr>
<tr>
<td>S4</td>
<td>visual vacuum switch -0,2 bar / -2,9 psi</td>
</tr>
</tbody>
</table>

For different thread options please check availability with Filtrec Customer Service.
Overall dimensions

**FA-1-10/11**

- L1
- H1
- R
- Element removal
- 2 MOUNTING HOLES Ø F x Depth
- Indicator port 1/8"

**FA-1-20/21**

- L1
- H1
- R
- Element removal
- 2 MOUNTING HOLES Ø F x Depth
- Indicator port 1/8"

**FA-1-30/31**

- L1
- H1
- R
- Element removal
- 2 MOUNTING HOLES Ø F x Depth
- Indicator port 1/8"

**FA-1-40/41**

- L1
- H1
- R
- Element removal
- 3 MOUNTING HOLES Ø F x Depth
- Indicator port 1/8"

---

**Nominal size**

<table>
<thead>
<tr>
<th>CODE</th>
<th>A</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>D1</th>
<th>F</th>
<th>H1</th>
<th>L1</th>
<th>R</th>
<th>WEIGHT</th>
<th>ELEMENT</th>
<th>H2</th>
<th>A1</th>
<th>L2</th>
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</thead>
<tbody>
<tr>
<td>FA-1-10</td>
<td>3/4&quot; BSP</td>
<td>22</td>
<td>38</td>
<td></td>
<td></td>
<td></td>
<td>192</td>
<td>95</td>
<td>20</td>
<td>1,3 Kg</td>
<td>A-1-10</td>
<td>148</td>
<td>3/4&quot; BSP</td>
<td>96</td>
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<tr>
<td>FA-1-11</td>
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<td></td>
<td></td>
<td></td>
<td>M8x15</td>
<td>257</td>
<td></td>
<td></td>
<td>1,5 Kg</td>
<td>A-1-11</td>
<td>213</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FA-1-20</td>
<td>1 1/4&quot; BSP</td>
<td>30</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td>249</td>
<td>133</td>
<td></td>
<td>1,9 Kg</td>
<td>A-1-20</td>
<td>182</td>
<td>1 1/4&quot; BSP</td>
<td>128</td>
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<tr>
<td>FA-1-21</td>
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<td></td>
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<td></td>
<td></td>
<td>295</td>
<td></td>
<td></td>
<td>2,2 Kg</td>
<td>A-1-21</td>
<td>228</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FA-1-30</td>
<td>1 1/2&quot; BSP</td>
<td>70</td>
<td>65</td>
<td></td>
<td></td>
<td></td>
<td>218</td>
<td>140</td>
<td>40</td>
<td>3,6 Kg</td>
<td>2x A-1-20</td>
<td>20</td>
<td>1,3 Kg</td>
<td></td>
</tr>
<tr>
<td>FA-1-31</td>
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<td></td>
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<td></td>
<td>M10x15</td>
<td>262</td>
<td></td>
<td></td>
<td>3,8 Kg</td>
<td>2x A-1-21</td>
<td>21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FA-1-40</td>
<td>1 1/2&quot; BSP</td>
<td>46</td>
<td>150</td>
<td>60</td>
<td></td>
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<td>267</td>
<td>132</td>
<td></td>
<td>5,0 Kg</td>
<td>2x A-1-20</td>
<td>22</td>
<td>1,9 Kg</td>
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</tr>
<tr>
<td>FA-1-41</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>313</td>
<td></td>
<td></td>
<td>5,2 Kg</td>
<td>2x A-1-21</td>
<td>21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For different thread options please contact Filtrec Customer Service.

FA-1 series
Pressure drop diagrams

The total Pressure Drop ($\Delta p$) value is obtained by adding the $\Delta p$ values of filter housing and filter element at the given flow rate. This ideally should not exceed 0.2 bar (2.9psi).

### PRESSURE DROP THROUGH THE FILTER HOUSING

The Pressure Drop through the filter housing is governed by the port, not the bowl length and the oil viscosity.

### PRESSURE DROP THROUGH THE CLEAN FILTER ELEMENT

The Pressure Drop through the filter element is related both to the internal diameter of the filter element and to the filter media; this value is affected by the oil viscosity in a roughly proportional way: e.g. when the $Dp$ value from the curve is 0.1 bar and a 46 cSt oil is used, the corresponding value is 0.15 ($=0.1 \times 46/30$) bar.

The above diagrams have been obtained at the FILTREC laboratory, according to the ISO 3968 specification, with mineral oil having 30 cSt viscosity and 0.86 Kg/dm³ density.

In case of discrepancy, please check contamination level, viscosity and features of the oil in use and the sampling points of the differential pressure.

FA-1 series
Clogging indicator

The Pressure Drop (Δp) through the filter increases during the system operation due to the contaminant retained by the filter element.
The filter element must be replaced when the indicator shows an alarm and before the Δp reaches the by-pass value setting.
N.B. in cold start conditions a false alarm can be caused by higher oil viscosity due to low temperature; the indicator alarm must be considered at normal working temperature only.

### PRESSURE/ VACUUM GAUGE

**Housing in black ABS material**

Multipurpose product: this gauge can also be used as pressure gauge on return filters.

### VACUUM GAUGE

**Housing in black ABS material**

### ELECTRIC VACUUM SWITCH

- Current: 0,5 A resistive/ 0,2 A inductive
- Max voltage: 30-48 V DC
- Protection: IP54 as per DIN 40050

### VISUAL VACUUM SWITCH

**Preferential option**
Ordering information

(n.b. for suction see page 2)

FA-1 series

Filter assembly
FA-1
31
C10
B
B7
R
R2

Filter element
A1
21
C10

ELEMENT
FA-1-1x
A1-1x (1 pc.)
FA-1-2x
A1-2x (1 pc.)
FA-1-3x
A1-2x (2 pc.)
FA-1-4x
A1-2x (2 pc.)

SEALS
B
NBR

CONNECTION
B4
3/4" BSP (size 10-11)
B6
1 1/4" BSP (size 20-21)
B7
1 1/2" BSP (size 30-41)

BY-PASS
0
no by-pass
R
1,7 bar/ 24,6 psi

MEDIA
no element
microglass fiber β_{10 µm} ≥ 1000
microglass fiber β_{17 µm} ≥ 1000
microglass fiber β_{27 µm} ≥ 1000
cellulose β_{10 µm} ≥ 2
microglass fiber β_{27 µm} ≥ 2

CONNECTION
BY-PASS
R2
pressure switch 1,3 bar N.O. / 18,9 psi
R3
pressure switch 1,3 bar N.C. / 18,9 psi
R6
visual pressure switch 1,3 bar / 18,9 psi
R7
pressure/vacuum gauge -1÷5 bar /-14,5÷72,5 psi
R9
pressure gauge 0÷4 bar / 0÷58 psi
R12
pressure gauge indicator scale 0÷16 bar / 0÷232 psi
Z1
differential visual indicator 1,3 bar / 18,9 psi
Z2
differential electric visual indicator 1,3 bar / 18,9 psi
Z41
differential visual indicator 1,3 bar / 18,9 psi
Z39
differential electric visual indicator 1,3 bar / 18,9 psi

For different thread options, please check availability with Filtrec Customer Service.
## Overall dimensions

### FA-1-10/11

- **L1**  
- **H1**  
- **B2**  
- **MOUNTING HOLES**  
- **Ø F x Depth**  

### FA-1-20/21

- **L1**  
- **H1**  
- **B2**  
- **MOUNTING HOLES**  
- **Ø F x Depth**  

### FA-1-30/31

- **L1**  
- **H1**  
- **B2**  
- **MOUNTING HOLES**  
- **Ø F x Depth**  

### FA-1-40/41

- **L1**  
- **H1**  
- **B2**  
- **MOUNTING HOLES**  
- **Ø F x Depth**  

## Nominal size

<table>
<thead>
<tr>
<th>CODE</th>
<th>A</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>D1</th>
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<th>ELEMENT</th>
<th>H2</th>
<th>A1</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>FA-1-10</td>
<td>3/4&quot; BSP</td>
<td>22</td>
<td>38</td>
<td>---</td>
<td>M8x15</td>
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<td>A-1-10</td>
<td>148</td>
<td>3/4&quot; BSP</td>
<td>96</td>
<td></td>
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<tr>
<td>FA-1-11</td>
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<td>4</td>
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<td></td>
<td>1,5 Kg</td>
<td>A-1-11</td>
<td>213</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FA-1-20</td>
<td>1 1/4&quot; BSP</td>
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<td>50</td>
<td>---</td>
<td>M10x15</td>
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<td>133</td>
<td>40</td>
<td>1,9 Kg</td>
<td>A-1-20</td>
<td>182</td>
<td>1 1/4&quot; BSP</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>FA-1-21</td>
<td>295</td>
<td>26</td>
<td></td>
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<td>2,2 Kg</td>
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<td>228</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>FA-1-30</td>
<td>1 1/2&quot; BSP</td>
<td>70</td>
<td>65</td>
<td>---</td>
<td></td>
<td>218</td>
<td>140</td>
<td>60</td>
<td>3,6 Kg</td>
<td>2x A-1-20</td>
<td>284</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FA-1-31</td>
<td>262</td>
<td>38</td>
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<td></td>
<td>3,8 Kg</td>
<td>2x A-1-21</td>
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</tr>
<tr>
<td>FA-1-40</td>
<td>1 1/2&quot; BSP</td>
<td>46</td>
<td>150</td>
<td>60</td>
<td>M10x15</td>
<td>267</td>
<td>132</td>
<td>60</td>
<td>5,0 Kg</td>
<td>2x A-1-20</td>
<td>313</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FA-1-41</td>
<td>313</td>
<td>5,2 Kg</td>
<td>2x A-1-21</td>
<td>313</td>
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<td></td>
<td></td>
<td></td>
<td>5,2 Kg</td>
<td>2x A-1-21</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*For different thread options please contact Filtrec Customer Service.*

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**FA-1 series**

7
Pressure drop diagrams

The total Pressure Drop ($\Delta p$) value is obtained by adding the $\Delta p$ values of filter housing and filter element at the given flow rate. This ideally should not exceed 0,5 bar (7,2psi).

**PRESSURE DROP THROUGH THE FILTER HOUSING**

The Pressure Drop through the filter housing is governed by the port, not the bowl length and the oil viscosity.

**PRESSURE DROP THROUGH THE CLEAN FILTER ELEMENT**

The Pressure Drop through the filter element is related both to the internal diameter of the filter element and to the filter media; this value is affected by the oil viscosity in a roughly proportional way: e.g. when the $\Delta p$ value from the curve is 0,2 bar and a 46 cSt oil is used, the corresponding value is $0,31 (=0,2 \times 46/30)$ bar.

**Element A-1-10-..**

**Element A-1-11-..**

**Element A-1-20-..**

**Element A-1-21-..**

**PRESSURE DROP THROUGH THE BY-PASS VALVE**

The by-pass valve is a safety device to prevent element collapse in case of differential pressure peaks due to flow peaks, cold start conditions or when the clogged element is not replaced in a timely manner.

The above diagrams have been obtained at the FILTREC laboratory, according to the ISO 3968 specification, with mineral oil having 30 cSt viscosity and 0,86 Kg/dm³ density.

In case of discrepancy, please check contamination level, viscosity and features of the oil in use and the sampling points of the differential pressure.

FA-1 series
Clogging indicator

The Pressure Drop ($\Delta p$) through the filter increases during the system operation due to the contaminant retained by the filter element. The filter element must be replaced when the indicator shows an alarm and before the $\Delta p$ reaches the by-pass value setting.

N.B. in cold start conditions a false alarm can be caused by higher oil viscosity due to low temperature; the indicator alarm must be considered at normal working temperature only. The clogging indicator registers the pressure upstream the filter element:
• with the VISUAL indicator a value higher than 1.3 bar indicates the need of element replacement.
• with the ELECTRIC indicator an electrical switch is activated when the set value 1.3 bar is reached.

**PRESSURE SWITCH**

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>CODE</th>
<th>SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>R2</td>
<td>1,3 bar (18.9 psi) N.O.</td>
<td></td>
</tr>
<tr>
<td>R3</td>
<td>1,3 bar (18.9 psi) N.C.</td>
<td></td>
</tr>
</tbody>
</table>

- Current: 0.5 A resistive/ 0.2 A inductive
- Max voltage: 30-48 V DC
- Protection: IP54 as per DIN 40050

**VISUAL PRESSURE GAUGE**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>R6</td>
<td>1.3 bar (18.9 psi)</td>
</tr>
</tbody>
</table>

**PRESSURE/ VACUUM GAUGE**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SCALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>R7</td>
<td>0 ÷ 1.4 bar (0 ÷ 20 psi) green sector, 1.4 ÷ 5 bar (20 ÷ 72.5 psi) red sector</td>
</tr>
</tbody>
</table>

Housing in black ABS material

N.B. Multipurpose product: this gauge can also be used as vacuum gauge on suction filters.

**PRESSURE GAUGE**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>R9</td>
<td>0 ÷ 4 bar (0 ÷ 58 psi)</td>
</tr>
</tbody>
</table>

Housing in black ABS material

<table>
<thead>
<tr>
<th>CODE</th>
<th>SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>R12</td>
<td>0 ÷ 16 bar (0 ÷ 232 psi)</td>
</tr>
</tbody>
</table>

Housing in black ABS material
Clogging indicator

The Pressure Drop (Δp) through the filter increases during the system operation due to the contaminant retained by the filter element. The filter element must be replaced when the indicator shows an alarm and before the Δp reaches the by-pass value setting.

N.B. in cold start conditions a false alarm can be caused by higher oil viscosity due to low temperature; the indicator alarm must be considered at normal working temperature only. The differential clogging indicator registers the pressure upstream and downstream the filter element and activates a signal when the differential pressure reaches the set value:

- in the VISUAL indicator the signal is given by a green sector switching into red.
- in the ELECTRIC VISUAL indicator, further to the green to red visual indication, an electrical switch is activated. N.B. the set value of the clogging indicator must always be lower than the set value of the by-pass valve.

DIFFERENTIAL VISUAL INDICATOR (for FA-1-3x only)

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>CODE</th>
<th>SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Symbol Image]</td>
<td>Z1</td>
<td>1.3 bar (18.9 psi)</td>
</tr>
</tbody>
</table>

Visual indicator:
- GREEN: clean element
- RED: dirty element

DIFFERENTIAL ELECTRIC VISUAL INDICATOR (for FA-1-3x only)

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>CODE</th>
<th>SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Symbol Image]</td>
<td>Z2</td>
<td>1.3 bar (18.9 psi)</td>
</tr>
</tbody>
</table>

Visual indicator:
- GREEN: clean element
- RED: dirty element

- Electric plug connection as per DIN 43650
- Protection: IP65 secondo DIN 40050
- Max current: 5A resistive 5A inductive
- Max voltage: 250V AC - 30V DC

DIFFERENTIAL VISUAL SWITCH (for FA-1-4x only)

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>CODE</th>
<th>SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Symbol Image]</td>
<td>Z41</td>
<td>1.3 bar (18.9 psi)</td>
</tr>
</tbody>
</table>

Visual indicator:
- GREEN: clean element
- RED: dirty element

DIFFERENTIAL ELECTRIC VISUAL SWITCH (for FA-1-4x only)

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>CODE</th>
<th>SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Symbol Image]</td>
<td>Z39</td>
<td>1.3 bar (18.9 psi)</td>
</tr>
</tbody>
</table>

Visual indicator:
- GREEN: clean element
- RED: dirty element

- Electric plug connection as per DIN 43650
- Protection: IP65 secondo DIN 40050
- Max current: 5A resistive 5A inductive
- Max voltage: 250V AC - 30V DC

FA-1 series
User Tips

Installation
Make sure that the filter is connected in the correct IN-OUT flow direction (shown by an arrow on the filter head). The filter housing should be preferably mounted with the bowl downward; the filter head should be properly secured using the threaded fixing holes on the filter head; verify that no tension is present on the filter after mounting.

Make sure that enough space is available for element replacement and that the clogging indicator is in an easily viewable position. If an electrical indicator is used, make sure that it is properly wired.

Never run the system without a filter element fitted. We recommend the stocking of a spare FILTREC filter element for timely replacement when needed.

Maintenance
Before unscrewing the cartridge, ensure that the system is switched off and there is no residual pressure in the filter.

Unscrew the cartridge by turning it anticlockwise. Verify the correct part number of the FILTREC replacement cartridge, particularly concerning the micron rating. Ensure that the mounting face is clean, lubricate the gasket of the replacement cartridge prior to assembly. Spin on new cartridge until it reaches the mounting face and tighten for 3/4 turn.

Operation
Make sure that the filter works within the conditions of pressure, temperature and fluid compatibility given in the first page of this data sheet.

The filter element must be replaced as soon as the clogging indicator signals at working temperature (in cold start conditions, oil temperature lower than 30°C, a false alarm can be given due to oil viscosity). If no clogging indicator is mounted, make sure that the filter element is replaced according to the system manufacturer’s recommendations.

PED Compliance
FA-1 filters conform to PED 97/23/CE norm, article 3 section 3, and so they can be used with fluids of group 2 (liquids with steam pressure < 0,5 bar at the maximum allowable temperature, article 3, section 1.1(b) – sub-section II).

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

Disposal of filter elements
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.