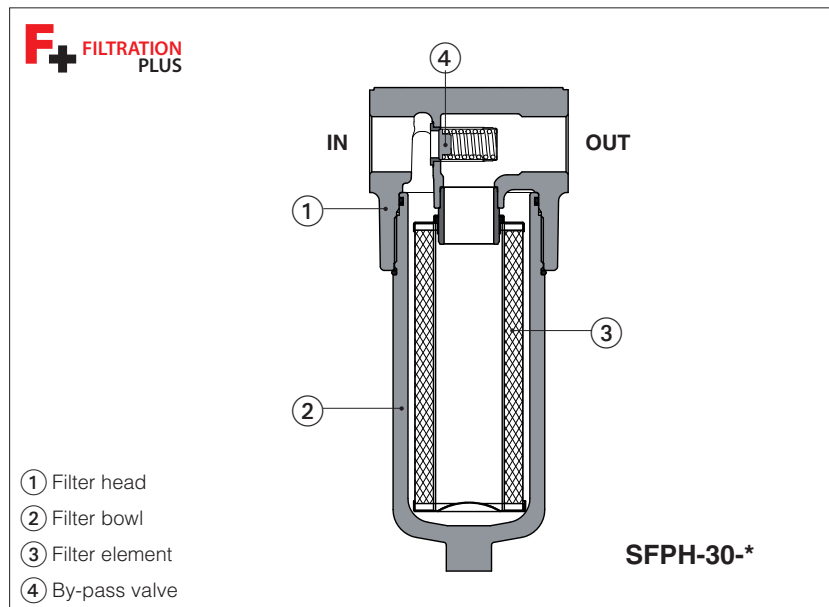


# In line filters, high pressure type SFPH

SAE flanged ports



## SFPH

In line filters are designed for installation on the pressure line downstream the pump, to ensure a high cleanliness of the fluid circulating into the hydraulic system. They protect sensible components from contamination present in the working fluid and they are particularly recommended for systems with proportional valves.

- two head sizes
- SAE 6000 flanged ports, from 3/4" to 1 1/2"
- **Filtration Plus** microfiber filter elements ensure high efficiency, low pressure drop, high DHC and long lasting performance. Collapse pressure 21 bar for filters equipped with by-pass valve or 210 bar for filters without by-pass
- filtration rating 5 - 7 - 12 - 22 µm(c) (βx(c) >1000, ISO 16889).
- versions without or with by-pass valve with cracking pressure 6 bar.
- without or with differential clogging indicator

Max flow **410 l/min**

Max working pressure **420 bar**

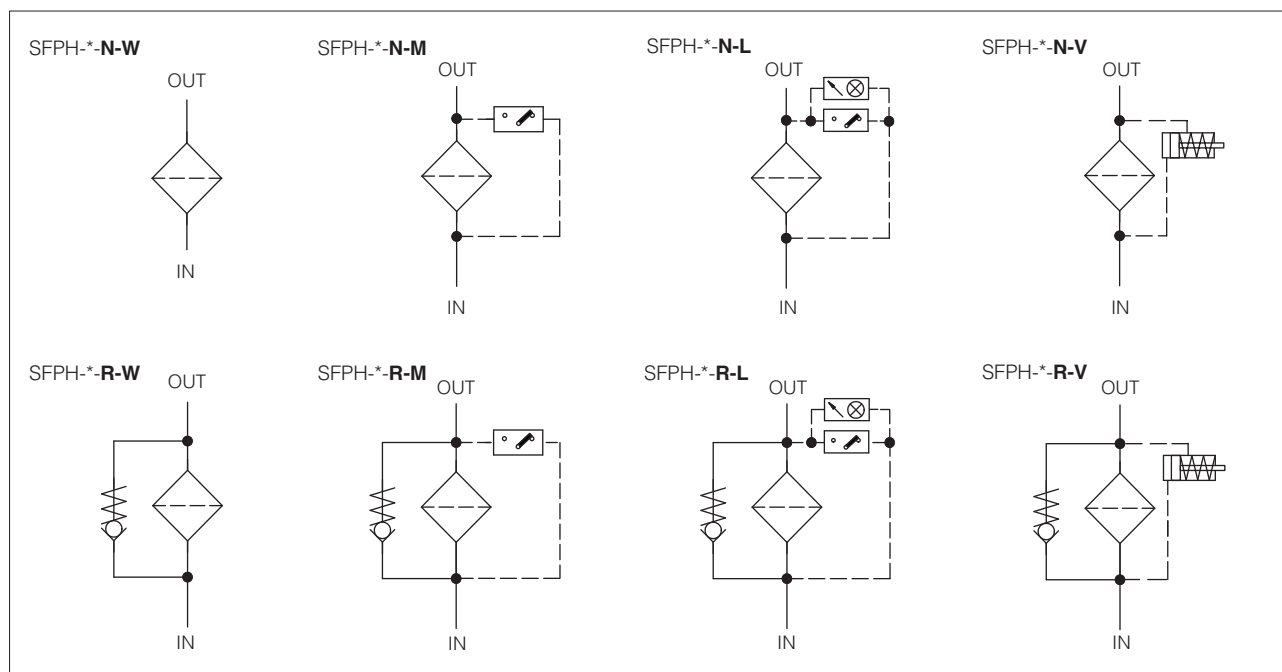
## 1 MODEL CODE OF COMPLETE FILTERS

| SFPH                                                                                                                                                                                                                                                                                                                                                                 | -                           | 10      | - | A | - | F10 | - | 21 | - | R | - | W | **               | / | *                                             |                       |                             |  |  |         |         |            |     |     |            |     |     |            |   |     |            |   |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------|---|---|---|-----|---|----|---|---|---|---|------------------|---|-----------------------------------------------|-----------------------|-----------------------------|--|--|---------|---------|------------|-----|-----|------------|-----|-----|------------|---|-----|------------|---|-----|
| In line filter,<br>high pressure                                                                                                                                                                                                                                                                                                                                     |                             |         |   |   |   |     |   |    |   |   |   |   | Series<br>number |   | Seals material:<br>- = NBR<br><b>PE</b> = FKM |                       |                             |  |  |         |         |            |     |     |            |     |     |            |   |     |            |   |     |
| <b>Filter size:</b><br><b>10</b> = ports size 3/4" ÷ 1"<br>SAE6000 flange<br><b>30</b> = ports size 1 1/4" ÷ 1 1/2<br>SAE6000 flange                                                                                                                                                                                                                                 |                             |         |   |   |   |     |   |    |   |   |   |   |                  |   |                                               |                       |                             |  |  |         |         |            |     |     |            |     |     |            |   |     |            |   |     |
| <table><tr><td><b>Filter length:</b></td><td colspan="2"><b>Max flow [l/min] (1)</b></td></tr><tr><td></td><td>SFPH-10</td><td>SFPH-30</td></tr><tr><td><b>A</b> =</td><td>100</td><td>242</td></tr><tr><td><b>B</b> =</td><td>120</td><td>334</td></tr><tr><td><b>C</b> =</td><td>-</td><td>371</td></tr><tr><td><b>D</b> =</td><td>-</td><td>410</td></tr></table> |                             |         |   |   |   |     |   |    |   |   |   |   |                  |   |                                               | <b>Filter length:</b> | <b>Max flow [l/min] (1)</b> |  |  | SFPH-10 | SFPH-30 | <b>A</b> = | 100 | 242 | <b>B</b> = | 120 | 334 | <b>C</b> = | - | 371 | <b>D</b> = | - | 410 |
| <b>Filter length:</b>                                                                                                                                                                                                                                                                                                                                                | <b>Max flow [l/min] (1)</b> |         |   |   |   |     |   |    |   |   |   |   |                  |   |                                               |                       |                             |  |  |         |         |            |     |     |            |     |     |            |   |     |            |   |     |
|                                                                                                                                                                                                                                                                                                                                                                      | SFPH-10                     | SFPH-30 |   |   |   |     |   |    |   |   |   |   |                  |   |                                               |                       |                             |  |  |         |         |            |     |     |            |     |     |            |   |     |            |   |     |
| <b>A</b> =                                                                                                                                                                                                                                                                                                                                                           | 100                         | 242     |   |   |   |     |   |    |   |   |   |   |                  |   |                                               |                       |                             |  |  |         |         |            |     |     |            |     |     |            |   |     |            |   |     |
| <b>B</b> =                                                                                                                                                                                                                                                                                                                                                           | 120                         | 334     |   |   |   |     |   |    |   |   |   |   |                  |   |                                               |                       |                             |  |  |         |         |            |     |     |            |     |     |            |   |     |            |   |     |
| <b>C</b> =                                                                                                                                                                                                                                                                                                                                                           | -                           | 371     |   |   |   |     |   |    |   |   |   |   |                  |   |                                               |                       |                             |  |  |         |         |            |     |     |            |     |     |            |   |     |            |   |     |
| <b>D</b> =                                                                                                                                                                                                                                                                                                                                                           | -                           | 410     |   |   |   |     |   |    |   |   |   |   |                  |   |                                               |                       |                             |  |  |         |         |            |     |     |            |     |     |            |   |     |            |   |     |
| <b>Filter element:</b><br><b>SN</b> = only body, without filter element<br><b>F+</b> microfibre filter element β <sub>x</sub> (c) >1000 - ISO 16889:<br><b>F03</b> = 5 μm (c) <b>F10</b> = 12 μm (c)<br><b>F06</b> = 7 μm (c) <b>F20</b> = 22 μm (c)<br>Filter element <b>F01</b> = 4 μm (c) available on request                                                    |                             |         |   |   |   |     |   |    |   |   |   |   |                  |   |                                               |                       |                             |  |  |         |         |            |     |     |            |     |     |            |   |     |            |   |     |
| <b>Ports size:</b><br>SAE 6000 flange with metric bolts:<br>SFPH-10      SFPH-30<br><b>21</b> = 3/4" <b>23</b> = 1 1/4"<br><b>22</b> = 1" <b>24</b> = 1 1/2"                                                                                                                                                                                                         |                             |         |   |   |   |     |   |    |   |   |   |   |                  |   |                                               |                       |                             |  |  |         |         |            |     |     |            |     |     |            |   |     |            |   |     |
| <b>Differential clogging indicator</b> see sect. 9 :<br><b>W</b> = without, indicator port with plastic plug (2)<br><b>P</b> = without, indicator port with steel plug<br><b>L</b> = electrical indicator with LED (3)<br><b>M</b> = electrical indicator without LED (3)<br><b>V</b> = visual indicator (3)<br>See also note (4)                                    |                             |         |   |   |   |     |   |    |   |   |   |   |                  |   |                                               |                       |                             |  |  |         |         |            |     |     |            |     |     |            |   |     |            |   |     |
| <b>By-pass:</b><br><b>R</b> = by-pass valve with cracking pressure 6 bar<br>(filter element with collapse pressure 21 bar)<br><b>N</b> = without by-pass<br>(filter element with collapse pressure 210 bar)                                                                                                                                                          |                             |         |   |   |   |     |   |    |   |   |   |   |                  |   |                                               |                       |                             |  |  |         |         |            |     |     |            |     |     |            |   |     |            |   |     |

**Note:** filters for use in potentially explosive atmosphere are available on request, contact Atos Technical Office

- (1) Max flow rates are measured with: Δp 1 bar, filter element F20, largest port size, option -R, oil viscosity 32 mm²/s - see also section 6  
In case of different conditions see section 11 for filter sizing
- (2) The plastic plug (option W) is factory assembled to prevent impurities from entering the filter through the clogging indicator port. A clogging indicator must be fitted on the filter before commissioning. Do not install the filter with the plastic cap on the hydraulic system
- (3) The clogging indicator is supplied disassembled from the filter. The indicator port on filter head is plugged with plastic plug
- (4) Differential thermostated indicator CID-T and differential electronic transmitter with output signal 4÷20 mA CID-Z are available on request, see section 4

## 2 HYDRAULIC SYMBOLS (representation according to ISO 1219-1)



## 3 MODEL CODE OF FILTER ELEMENTS - only for spare (1)

|                                                                                                                                                                                                                                                                                                                                                                                      |   |           |   |          |   |            |   |          |  |   |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-----------|---|----------|---|------------|---|----------|--|---|----------|
| <b>SPSH</b>                                                                                                                                                                                                                                                                                                                                                                          | - | <b>10</b> | - | <b>A</b> | - | <b>F10</b> | - | <b>R</b> |  | / | <b>*</b> |
| <p>Spare filter element for in line filter type SFPH</p>                                                                                                                                                                                                                                                                                                                             |   |           |   |          |   |            |   |          |  |   |          |
| <p><b>Filter element size:</b><br/> <b>10</b> = for SFPH-10<br/> <b>30</b> = for SFPH-30</p>                                                                                                                                                                                                                                                                                         |   |           |   |          |   |            |   |          |  |   |          |
| <p><b>Filter element length:</b><br/> for SFPH-10                      for SFPH-30<br/> <b>A</b>                                      <b>A</b><br/> <b>B</b>                                      <b>B</b><br/>                                              <b>C</b><br/>                                              <b>D</b></p>                                                 |   |           |   |          |   |            |   |          |  |   |          |
| <p><b>Microfibre filter element, <math>\beta_{x(c)} &gt; 1000</math> - ISO 16889:</b><br/> <b>F03</b> = 5 <math>\mu\text{m}</math> (c)<br/> <b>F06</b> = 7 <math>\mu\text{m}</math> (c)<br/> <b>F10</b> = 12 <math>\mu\text{m}</math> (c)<br/> <b>F20</b> = 22 <math>\mu\text{m}</math> (c)<br/> Filter element <b>F01</b> = 4 <math>\mu\text{m}</math> (c) available on request</p> |   |           |   |          |   |            |   |          |  |   |          |
| <p><b>R</b> = filter element with collapse pressure 21 bar, for filter SFPH-*-R with by-pass valve<br/> <b>N</b> = filter element with collapse pressure 210 bar, for filter SFPH-*-N without by-pass valve</p>                                                                                                                                                                      |   |           |   |          |   |            |   |          |  |   |          |
| <p>Series number</p>                                                                                                                                                                                                                                                                                                                                                                 |   |           |   |          |   |            |   |          |  |   |          |
| <p>Seals material:<br/> - = NBR<br/> <b>PE</b> = FKM</p>                                                                                                                                                                                                                                                                                                                             |   |           |   |          |   |            |   |          |  |   |          |

(1) Select the filter element according to the model code reported on the filter nameplate, see section 17

## 4 MODEL CODE OF DIFFERENTIAL CLOGGING INDICATORS - only for spare - see section 13 and 14

|                                                                                                                                                                                                      |   |          |   |           |   |          |  |   |          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----------|---|-----------|---|----------|--|---|----------|
| <b>CID</b>                                                                                                                                                                                           | - | <b>E</b> | - | <b>05</b> | - | <b>M</b> |  | / | <b>*</b> |
| <p>Spare differential clogging indicator for in line filter</p>                                                                                                                                      |   |          |   |           |   |          |  |   |          |
| <p><b>Type of indicator:</b><br/> <b>E</b> = electrical<br/> <b>V</b> = visual<br/> <b>T</b> = thermostated (available on request)<br/> <b>Z</b> = electronic transmitter (available on request)</p> |   |          |   |           |   |          |  |   |          |
| <p><b>Differential switching pressure</b> (only for CID-E and CID-V):<br/> <b>05</b> = 5 bar for filters with by-pass valve<br/> <b>08</b> = 8 bar for filters without by-pass valve</p>             |   |          |   |           |   |          |  |   |          |
| <p><b>Optional LED</b> - only for CID-E<br/> <b>L</b> = with LED<br/> <b>M</b> = without LED</p>                                                                                                     |   |          |   |           |   |          |  |   |          |
| <p>Series number</p>                                                                                                                                                                                 |   |          |   |           |   |          |  |   |          |
| <p>Seals material:<br/> - = NBR<br/> <b>PE</b> = FKM</p>                                                                                                                                             |   |          |   |           |   |          |  |   |          |

## 5 GENERAL CHARACTERISTICS

|                              |                                                                                              |
|------------------------------|----------------------------------------------------------------------------------------------|
| Assembly position / location | Vertical position with the bowl downward                                                     |
| Ambient temperature range    | <b>Standard</b> = -20°C ÷ +70°C <b>/PE</b> option = -20°C ÷ +70°C                            |
| Storage temperature range    | <b>Standard</b> = -20°C ÷ +80°C <b>/PE</b> option = -20°C ÷ +80°C                            |
| Materials                    | Filter head<br>Filter bowl                                                                   |
|                              | Cast iron<br>Carbon steel                                                                    |
| Surface protection           | Zinc coating with black passivation                                                          |
| Fatigue strength             | min. 1 x 10 <sup>6</sup> cycles at 420 bar                                                   |
| Compliance                   | RoHS Directive 2011/65/EU as last update by 2015/863/EU<br>REACH Regulation (EC) n°1907/2006 |

## 6 HYDRAULICS CHARACTERISTICS - based on mineral oil ISO VG 46 at 50 °C (viscosity 32mm<sup>2</sup>/s)

| Filter size                                                                     |            | SFPH-10 |    |     |     | SFPH-30 |     |     |     |        |     |     |     |
|---------------------------------------------------------------------------------|------------|---------|----|-----|-----|---------|-----|-----|-----|--------|-----|-----|-----|
| Ports size code                                                                 |            | 21      |    | 22  |     | 23      |     |     |     | 24     |     |     |     |
| Ports dimension SAE 6000 flange                                                 |            | 3/4"    |    | 1"  |     | 1 1/4"  |     |     |     | 1 1/2" |     |     |     |
| Filter length                                                                   |            | A       | B  | A   | B   | A       | B   | C   | D   | A      | B   | C   | D   |
| Max flow (l/min) at Δp= 1 bar<br>Filter with by-pass <b>-R</b><br>(see note)    | <b>F03</b> | 36      | 58 | 39  | 66  | 84      | 158 | 204 | 246 | 86     | 164 | 214 | 260 |
|                                                                                 | <b>F06</b> | 50      | 73 | 55  | 87  | 122     | 216 | 263 | 309 | 126    | 227 | 279 | 329 |
|                                                                                 | <b>F10</b> | 66      | 84 | 77  | 104 | 176     | 262 | 302 | 352 | 184    | 277 | 322 | 377 |
|                                                                                 | <b>F20</b> | 82      | 93 | 100 | 120 | 230     | 312 | 346 | 378 | 242    | 334 | 371 | 410 |
| Max flow (l/min) at Δp= 1 bar<br>Filter without by-pass <b>-N</b><br>(see note) | <b>F03</b> | 31      | 44 | 33  | 48  | 68      | 116 | 184 | 207 | 69     | 119 | 192 | 217 |
|                                                                                 | <b>F06</b> | 48      | 57 | 53  | 64  | 90      | 180 | 218 | 274 | 92     | 188 | 230 | 291 |
|                                                                                 | <b>F10</b> | 56      | 80 | 63  | 98  | 153     | 234 | 282 | 320 | 158    | 246 | 300 | 342 |
|                                                                                 | <b>F20</b> | 75      | 90 | 91  | 114 | 202     | 297 | 341 | 352 | 212    | 316 | 365 | 380 |
| Max operating pressure                                                          | [bar]      | 420     |    |     |     |         |     |     |     |        |     |     |     |
| Burst pressure                                                                  | [bar]      | > 1260  |    |     |     |         |     |     |     |        |     |     |     |

**Note:** Max flow rates are measured with Δp= 1 bar and viscosity 32mm<sup>2</sup>/s. In case of different conditions see section 11 for filter sizing

## 7 FILTER ELEMENTS

|                                   |                                                                                         |                               |
|-----------------------------------|-----------------------------------------------------------------------------------------|-------------------------------|
| Material                          |                                                                                         | Inorganic microfibre          |
| Filtration rating as per ISO16889 | <b>F03</b>                                                                              | β <sub>4,5μm (c)</sub> ≥ 1000 |
|                                   | <b>F06</b>                                                                              | β <sub>7μm (c)</sub> ≥ 1000   |
|                                   | <b>F10</b>                                                                              | β <sub>12μm (c)</sub> ≥ 1000  |
|                                   | <b>F20</b>                                                                              | β <sub>22μm (c)</sub> ≥ 1000  |
| Filter element collapse pressure  | <b>R</b> = for filter with by-pass valve<br><b>N</b> = for filter without by-pass valve | 21 bar<br>210 bar             |

## 8 SEALS AND HYDRAULIC FLUIDS - for other fluids not included in below table, consult our technical office

|                                      |                                                                                  |                            |                      |
|--------------------------------------|----------------------------------------------------------------------------------|----------------------------|----------------------|
| Seals, recommended fluid temperature | NBR seals (standard) = -25°C ÷ +100°C<br>FKM seals (/PE option) = -25°C ÷ +100°C |                            |                      |
| Recommended viscosity                | 15 ÷ 100 mm <sup>2</sup> /s - max allowed range 2.8 ÷ 500 mm <sup>2</sup> /s     |                            |                      |
| <b>Hydraulic fluid</b>               | <b>Suitable seals type</b>                                                       | <b>Classification</b>      | <b>Ref. Standard</b> |
| Mineral oils                         | NBR, FKM                                                                         | HL, HLP, HLPD, HVLP, HVLDP | DIN 51524            |
| Flame resistant without water        | FKM                                                                              | HFDU, HFDR                 | ISO 12922            |

## 9 BY-PASS VALVE

### Filter with by-pass valve - version -R

The filter with by-pass valve ① is used in combination with filter elements SPSH\*-R with collapse pressure 21 bar.

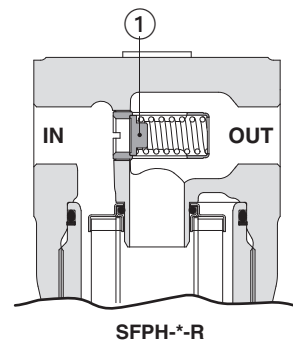
The by-pass valve allows the oil flow to by-pass the filter element in particular conditions:

- it protects the filter element from pressure peaks that could be generated, especially at the cold system start-up. In these cases the valve opens only for the instant necessary to discharge the pressure peak, limiting the quantity of oil that bypasses the filter.

- it allows the free passage of the oil flow in case of completely clogged filter element ( $\Delta p > 6$  bar).

This situation should be carefully avoided, by means of a scheduled maintenance, otherwise the contaminated oil will pass to the clean side of the filter and then it will circulate in the hydraulic system.

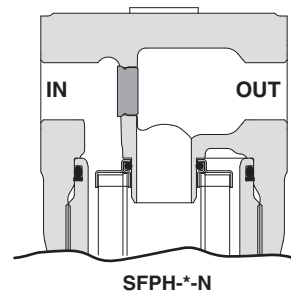
The filter element must be replaced before the clogging condition, at this purpose the use of a differential clogging indicator CID-V (visual, option V) or CID-E (electrical, options L or M) is highly recommended.



### Filter without by-pass valve - version -N

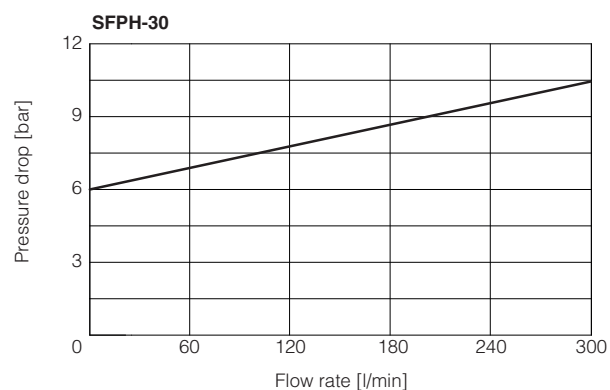
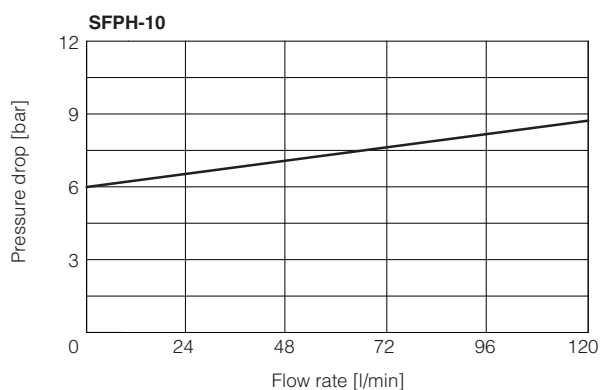
The filter version without by-pass is recommended when the hydraulic system must be absolutely protected by contamination, then avoiding the risk that the contaminant passes through the by-pass valve.

The filter without by pass must be used in combination with filter elements SPSH-N with high collapse pressure 210 bar.



## 10 BY-PASS VALVE - based on mineral oil ISO VG46 at 50°C (viscosity = 32 mm²/s)

Q/Δp diagrams of flow through the by-pass valve



## 11 FILTERS SIZING

For the filter sizing it is necessary to consider the Total  $\Delta p$  at the maximum flow at which the filter must work.

The Total  $\Delta p$  is given by the sum of filter head  $\Delta p$  plus the filter element  $\Delta p$ :

$$\text{Total } \Delta p = \text{filter head } \Delta p + \text{filter element } \Delta p$$

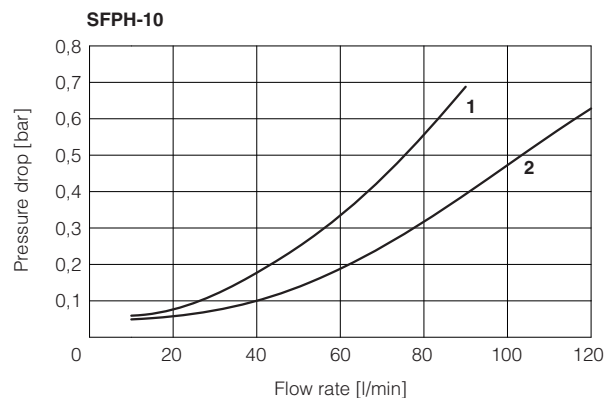
In the best conditions the total  $\Delta p$  should not exceed 1,0 bar

See below sections to calculate the  $\Delta p$  of filter head and  $\Delta p$  of the filter element

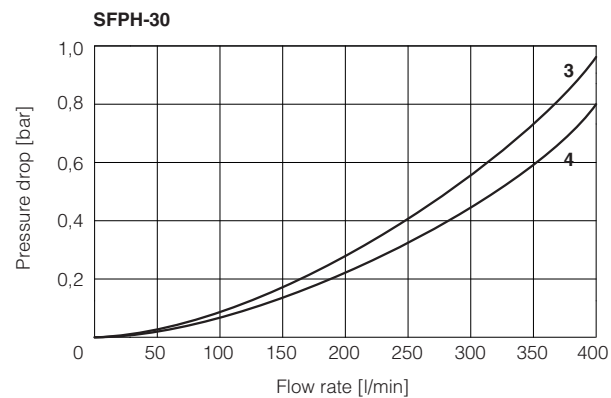
### 11.1 Q/ $\Delta p$ DIAGRAMS OF FILTER HEAD

The pressure drop of filter head mainly depends on the ports size and fluid density

In the following diagrams are reported the  $\Delta p$  characteristics of filter head based on mineral oil with density 0,86 kg/dm<sup>3</sup> and viscosity 30 mm<sup>2</sup>/s



1 = SFPH-10\*\*\* 21 (3/4" SAE 6000)    2 = SFPH-10\*\*\* 22 (1" SAE 6000)



3 = SFPH-30\*\*\* 23 (1 1/4" SAE 6000)    4 = SFPH-30\*\*\* 24 (G 1 1/2" SAE 6000)

### 11.2 FILTER ELEMENT $\Delta p$

The pressure drop through the filter depends to:

- size of filter element
- filtration rating
- fluid viscosity

The  $\Delta p$  of filter element is given by the formula:

$$\Delta p \text{ of filter element} = Q \times \frac{G_c}{1000} \times \frac{\text{Viscosity}}{32}$$

**Q** = working flow (l/min)

**Gc** = Gradient coefficient (mbar/(l/min)).

The Gc values are reported in the following table

**Viscosity** = effective fluid viscosity in the working conditions (mm<sup>2</sup>/s)

#### Gradient coefficient Gc of SPSH filter elements

| Filter element size                            |                   | 10                      |       | 20    |       |      | 30    |      |      |      |
|------------------------------------------------|-------------------|-------------------------|-------|-------|-------|------|-------|------|------|------|
| Filter element length                          |                   | A                       | B     | A     | B     | C    | A     | B    | C    | D    |
| Filter element type                            | Filtration rating | Gc Gradient coefficient |       |       |       |      |       |      |      |      |
| <b>R</b><br>for filter with<br>bypass valve    | <b>F03</b>        | 21.30                   | 10.84 | 11.07 | 9.23  | 6.74 | 10.26 | 4.82 | 3.27 | 2.30 |
|                                                | <b>F06</b>        | 13.97                   | 6.79  | 7.27  | 6.06  | 4.43 | 6.73  | 2.98 | 1.99 | 1.26 |
|                                                | <b>F10</b>        | 8.39                    | 4.42  | 4.45  | 3.71  | 2.71 | 4.12  | 2.02 | 1.36 | 0.70 |
|                                                | <b>F20</b>        | 4.78                    | 2.93  | 2.87  | 2.39  | 1.75 | 2.66  | 1.21 | 0.77 | 0.40 |
| <b>N</b><br>for filter without<br>bypass valve | <b>F03</b>        | 26.03                   | 16.72 | 14.19 | 11.83 | 8.64 | 13.00 | 7.15 | 3.87 | 3.21 |
|                                                | <b>F06</b>        | 14.77                   | 11.25 | 9.50  | 7.92  | 5.79 | 9.63  | 4.00 | 2.93 | 1.80 |
|                                                | <b>F10</b>        | 11.57                   | 5.25  | 5.66  | 4.72  | 3.45 | 5.05  | 2.57 | 1.67 | 1.10 |
|                                                | <b>F20</b>        | 6.13                    | 3.34  | 3.41  | 2.84  | 2.07 | 3.33  | 1.44 | 0.83 | 0.70 |

#### Example:

Calculation of Total  $\Delta p$  for filter type SFPH-10-B-F10-22-R at Q = 80 l/min and viscosity 46 mm<sup>2</sup>/s (filter element SPSH-10-B-F10-R)

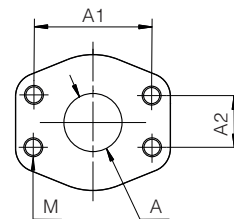
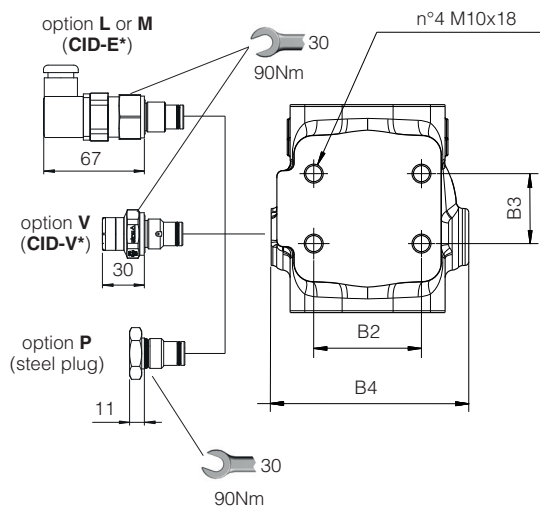
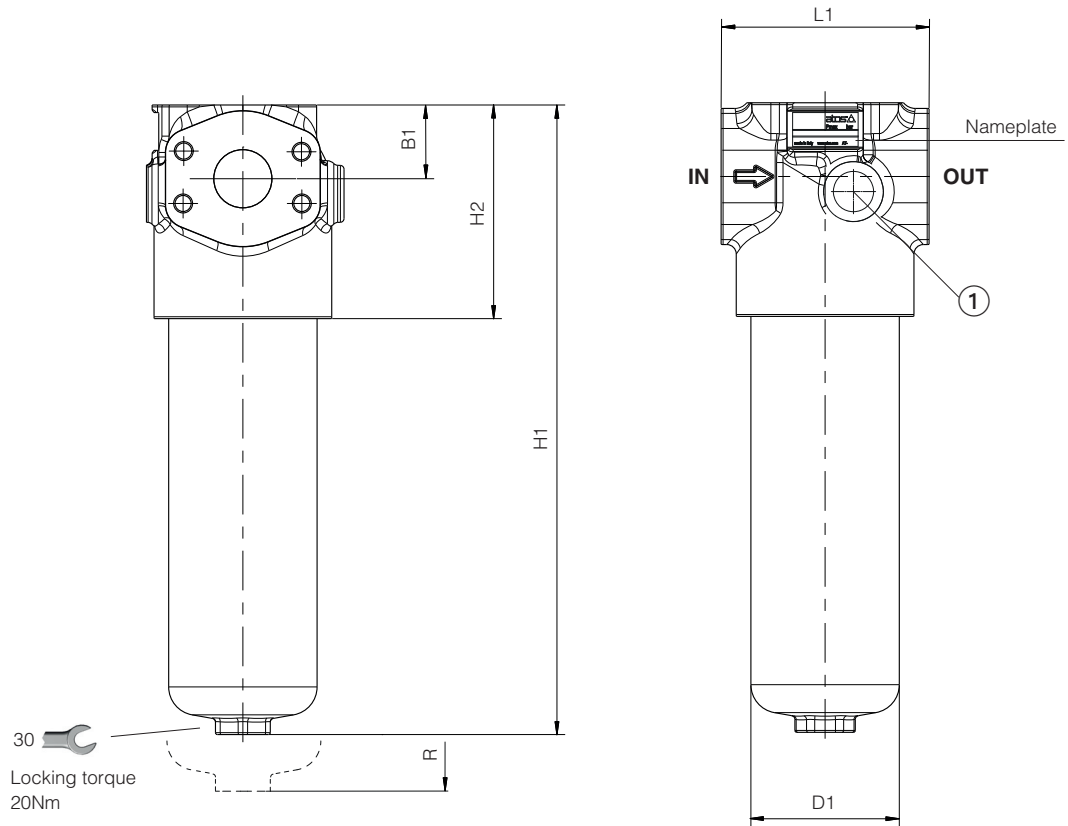
$\Delta p$  of filter head = 0,32 bar

**Gr** = 4,42 mbar/(l/min)

$$\text{Filter element } \Delta p = 80 \times \frac{4,42}{1000} \times \frac{46}{32} = 0,51 \text{ bar}$$

**Total  $\Delta p$**  = 0,32 + 0,51 = **0,83 bar**

## SFPH -10

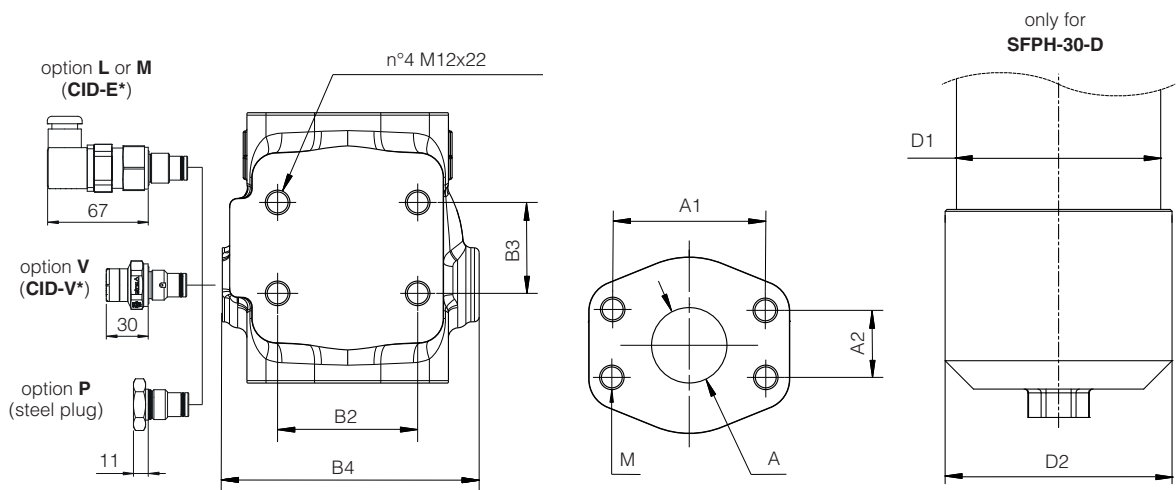
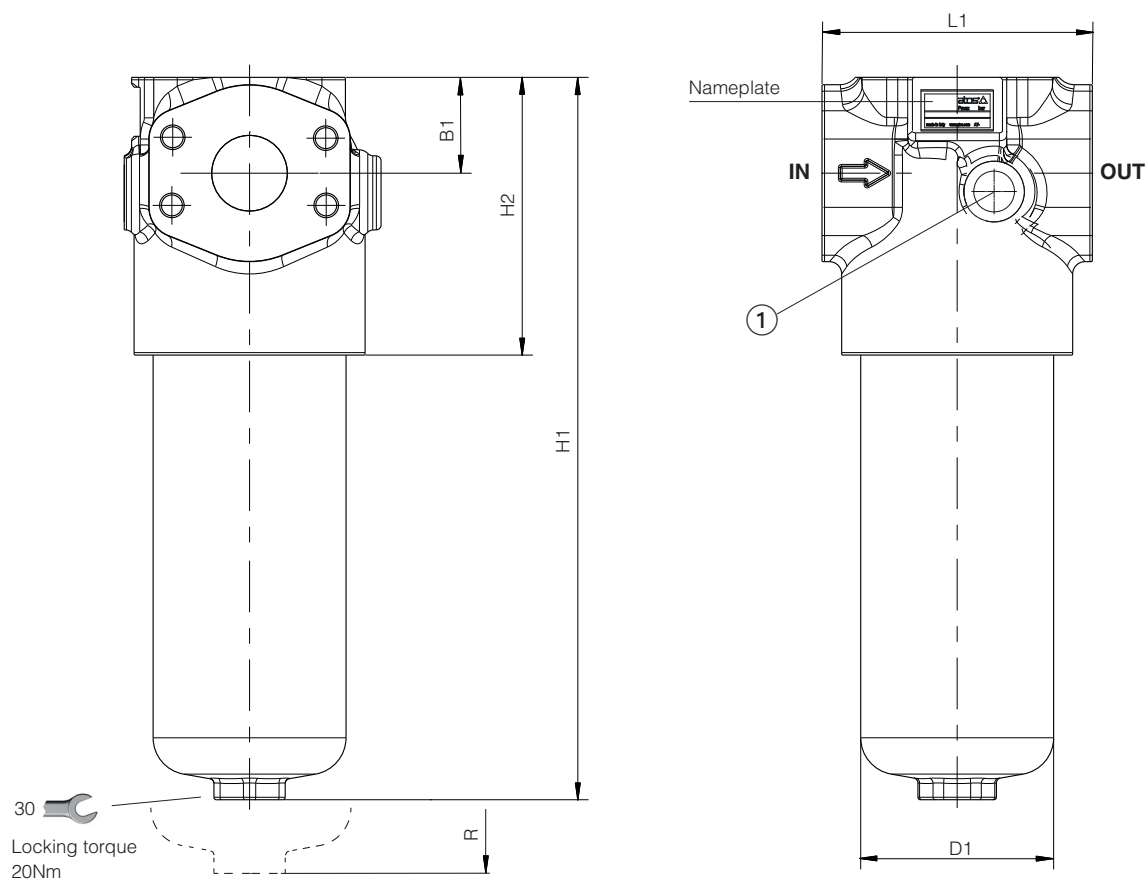


| SAE J518-6000 FLANGE | A  | A1   | A2   | M   |
|----------------------|----|------|------|-----|
| 3/4"                 | 19 | 50.8 | 23.8 | M10 |
| 1"                   | 22 | 57.2 | 27.8 | M12 |

① Clogging indicator port M20x1.5

| Code      | B1 | B2 | B3 | B4  | D1   | D2 | F  | H1  | H2  | L1  | R<br>(element removal) | Mass (Kg) |
|-----------|----|----|----|-----|------|----|----|-----|-----|-----|------------------------|-----------|
| SFPH-10-A | 39 | 57 | 37 | 105 | 78,5 | -  | 68 | 222 | 113 | 110 | 130                    | 6,7       |
| SFPH-10-B |    |    |    |     |      |    |    | 333 |     |     |                        | 8,4       |

SFPH -30

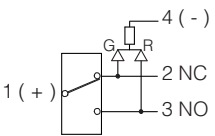
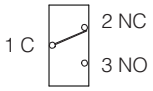
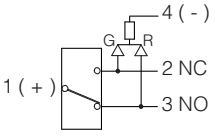
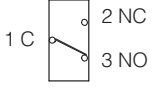


| SAE J518-6000 FLANGE | A  | A1   | A2   | M   |
|----------------------|----|------|------|-----|
| 1 1/4"               | 32 | 66.7 | 31.8 | M14 |
| 1 1/2"               | 38 | 79.4 | 36.5 | M16 |

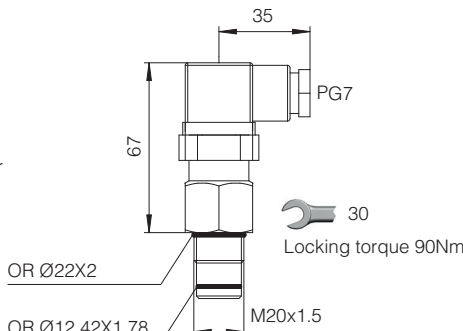
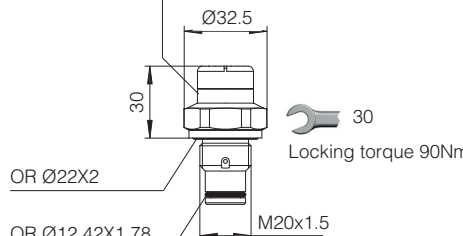
① Clogging indicator port M20x1.5

| Code      | B1 | B2 | B3 | B4  | D1  | D2  | F  | H1  | H2  | L1  | R<br>(element removal) | Mass (Kg) |
|-----------|----|----|----|-----|-----|-----|----|-----|-----|-----|------------------------|-----------|
| SFPH-30-A | 47 | 76 | 64 | 140 | 107 | -   | 68 | 262 | 145 | 140 | 140                    | 13,2      |
| SFPH-30-B |    |    |    |     |     |     |    | 355 |     |     |                        | 15,5      |
| SFPH-30-C |    |    |    |     |     |     |    | 475 |     |     |                        | 18,4      |
| SFPH-30-D |    |    |    |     |     | 120 |    | 568 |     |     |                        | 22,8      |

### 13 CHARACTERISTICS OF DIFFERENTIAL CLOGGING INDICATORS

| Model code                          |                      | CID-E* ELECTRICAL                                                                                  |                                                                                                      | CID-V* VISUAL   |
|-------------------------------------|----------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-----------------|
| Differential switching pressure     | CID-E05, CID-V05     | 5 bar $\pm$ 10%                                                                                    |                                                                                                      | 5 bar $\pm$ 15% |
|                                     | CID-E08, CID-V08     | 8 bar $\pm$ 10%                                                                                    |                                                                                                      | 8 bar $\pm$ 10% |
| Max pressure                        |                      | 450 bar                                                                                            |                                                                                                      | 420 bar         |
| Max differential pressure           |                      | 200 bar                                                                                            |                                                                                                      |                 |
| Ambient temperature                 |                      | -25°C ÷ +100°C                                                                                     |                                                                                                      | -25°C ÷ +80°C   |
| Hydraulic connection                |                      | M20x1,5                                                                                            |                                                                                                      |                 |
| Duty factor                         |                      | 100%                                                                                               |                                                                                                      |                 |
| Mechanical life                     |                      | 1 x 10 <sup>6</sup> operations                                                                     |                                                                                                      |                 |
| Mass (Kg)                           |                      | 0,16                                                                                               |                                                                                                      | 0,11            |
| Electric connection                 |                      | Electric plug connection as per DIN 43650 with cable gland type PG7                                |                                                                                                      | -               |
| Power supply                        | CID-E05-L, CID-E08-L | 24 V <sub>DC</sub> $\pm$ 10%                                                                       |                                                                                                      | -               |
|                                     | CID-E05-M, CID-E08-M | 14 V <sub>DC</sub> ÷ 30 V <sub>DC</sub>                                                            | 125 V <sub>AC</sub> ÷ 250 V <sub>AC</sub>                                                            | -               |
| Max current - resistive (inductive) |                      | 5 A (4 A) ÷ 4 A (3 A)                                                                              | 5 A (3 A) ÷ 3 A (2 A)                                                                                | -               |
| Protection degree to DIN EN 60529   |                      | IP65 with mating connector                                                                         |                                                                                                      | -               |
| Switching scheme                    |                      | <b>CID*-L</b><br> | <b>CID*-M</b><br> | GREEN           |
|                                     |                      |                  |                  | RED             |

### 14 DIMENSIONS OF DIFFERENTIAL CLOGGING INDICATORS

| ELECTRICAL INDICATOR                                                                                               |                                                                                                                                      | VISUAL INDICATOR                                                                                                                                                            |  |
|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>CID-E05-L</b><br><b>CID-E08-L</b><br>Electric connector<br>DIN 43650<br>Transparent<br><b>with internal Led</b> | <b>Led signal:</b><br><b>Green</b> = clean filter element<br><b>Red</b> = clogged filter element<br>(filter elements to be replaced) | <b>CID-V05</b><br><b>CID-V08</b><br><b>Visual signal:</b><br><b>Green</b> = clean filter element<br><b>Red</b> = clogged filter element<br>(filter elements to be replaced) |  |
| <b>CID-E05-M</b><br><b>CID-E08-M</b><br>Electric connector<br>DIN 43650<br>Black colour                            |                                                   |                                                                                         |  |
| Note: the electrical connector can be oriented at steps of 90°                                                     |                                                                                                                                      |                                                                                                                                                                             |  |

**NOTE:** Differential thermostated indicator CID-T and differential electronic transmitter with output signal 4÷20 mA CID-Z are available on request



## 15 INSTALLATION AND COMMISSIONING

The max operating pressure of the system must not exceed the max working pressure of the filter (420 bar).

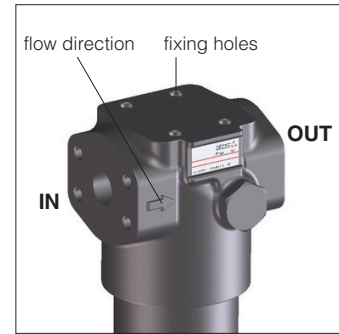
During the filter installation, pay attention to respect the flow direction, shown by the arrow on the filter head.

The filter should be preferably mounted with the housing downward.

The filter should be properly secured using the threaded fixing holes on the filter head.

Make sure that there is enough space for the replacement of the filter element, see dimension "R" at section 13.

Never run the system without the filter element.



For filters ordered with clogging indicator:

- remove the plastic plug from the indicator port on the filter head
- install the clogging indicator and lock it at the specified torque

During the cold start up (fluid temperature lower than 30°C), a false clogging indicator signal can be given due to the high fluid viscosity.

To avoid false signal, a differential threaded clogging indicator CID-T can be used.



## 16 MAINTENANCE

The filter element must be replaced as soon as the clogging indicator switches to highlight the filter clogged condition

For filters without clogging indicator, the filter element must be replaced according to the system manufacturer's recommendations.

Select the new filter element according to the model code reported on the filter nameplate, see section 17.

For the replacement of the filter element, proceed as follow:

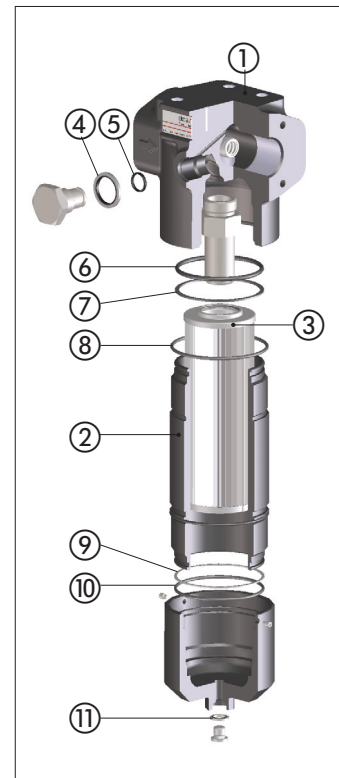
- releases the system pressure; the filter has no pressure bleeding device
- pay attention to the fluid and filter surface temperature. Always use suitable gloves and protection glasses
- unscrew the bowl (2) from the filter head (1) by turning counterclockwise (view from bottom side)
- remove the dirty filter element (3) pulling it carefully
- lubricate the seal of new filter element and insert it over the spigot in the filter head
- clean the bowl internally, check the o-ring (6) (8) and replace them if damaged
- lubricate the o-ring and threads and screw by hand the bowl to the filter head by turning clockwise (view from bottom side). Tighten at the recommended torque.



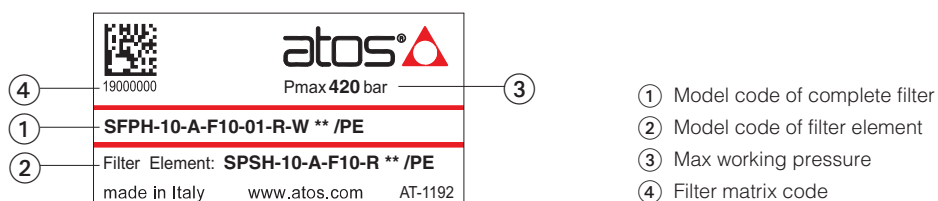
**WARNING:** The dirty filter elements cannot be cleaned and re-used. They are classified as "dangerous waste material", then they must be disposed of by authorized Companies, according to the local laws.

### 16.1 SEALS KIT

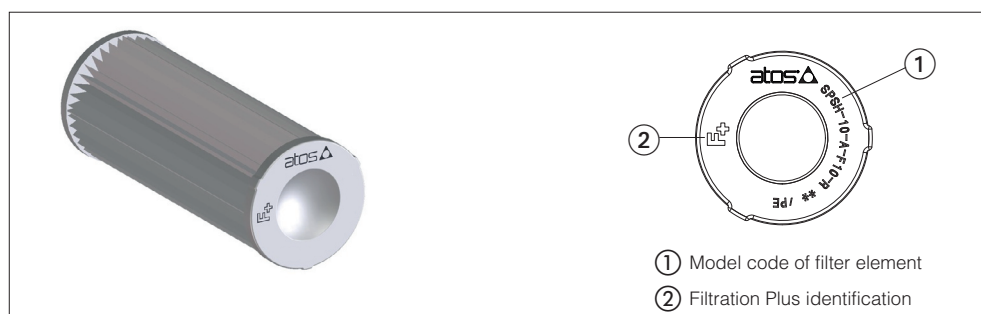
| Filter type | Seal kit code (NBR) | Seal kit code (FKM) | Seal kit composition |
|-------------|---------------------|---------------------|----------------------|
| SFPH-10     | GUARN SFPH-10       | GUARN SFPH-10 /PE   | ④+⑤+⑥+⑦+⑧            |
| SFPH-30     | GUARN SFPH-30       | GUARN SFPH-30 /PE   | ④+⑤+⑥+⑦+⑧            |
| SFPH-30-D   | GUARN SFPH-30-D     | GUARN SFPH-30-D /PE | ④+⑤+⑥+⑦+⑧+⑨+⑩+⑪      |



## 17 FILTER IDENTIFICATION NAMEPLATE



### 17.1 IDENTIFICATION OF FILTER ELEMENT



## 18 RELATED DOCUMENTATION

|              |                       |
|--------------|-----------------------|
| <b>LF010</b> | Fluid contamination   |
| <b>LF020</b> | Filtration guidelines |