Series TEF 55-320
DN15-40 PN10

Dimensions:

<table>
<thead>
<tr>
<th>Type</th>
<th>Connection</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>Weight kg</th>
<th>Volume Tank</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEF 55</td>
<td>G ½</td>
<td>257</td>
<td>194</td>
<td>270</td>
<td>45</td>
<td>22</td>
<td>10</td>
<td>52</td>
<td>21</td>
<td>-</td>
<td>53</td>
<td>0.9</td>
<td>0.31</td>
</tr>
<tr>
<td>TEF 70</td>
<td>G ¼</td>
<td>257</td>
<td>194</td>
<td>270</td>
<td>45</td>
<td>22</td>
<td>10</td>
<td>52</td>
<td>21</td>
<td>-</td>
<td>53</td>
<td>0.9</td>
<td>0.31</td>
</tr>
<tr>
<td>TEF 120</td>
<td>G 1</td>
<td>285</td>
<td>211</td>
<td>300</td>
<td>65</td>
<td>27</td>
<td>10</td>
<td>70</td>
<td>24</td>
<td>-</td>
<td>72</td>
<td>1.5</td>
<td>0.61</td>
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<tr>
<td>TEF 210</td>
<td>G 1 ¼</td>
<td>302</td>
<td>227</td>
<td>350</td>
<td>25</td>
<td>30</td>
<td>10</td>
<td>80</td>
<td>36</td>
<td>67</td>
<td>82</td>
<td>2.1</td>
<td>1.11</td>
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<tr>
<td>TEF 310</td>
<td>G 1 ½</td>
<td>387</td>
<td>312</td>
<td>405</td>
<td>25</td>
<td>30</td>
<td>10</td>
<td>80</td>
<td>36</td>
<td>67</td>
<td>82</td>
<td>2.5</td>
<td>1.41</td>
</tr>
<tr>
<td>TEF 320</td>
<td>G 1 ¾</td>
<td>418</td>
<td>327</td>
<td>465</td>
<td>40</td>
<td>36</td>
<td>10</td>
<td>85</td>
<td>40</td>
<td>71</td>
<td>86</td>
<td>2.8</td>
<td>1.71</td>
</tr>
</tbody>
</table>

1) Connection for the potential equalization, only for application in the explosive area.

Dimensions: mm

Designs and performance values are subject to change.
Return Line Filter
Series TEF 55-320
DN15-40 PN10

Description:

Return-line filter series TEF 55-320 have a working pressure up to 10 bar. Pressure peaks will be absorbed by a sufficient margin of safety.

The TEF-filters are directly mounted to the reservoir and connected to the return-line.

The filter element consists of a star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow is from outside to inside.

For cleaning the stainless steel mesh element (see special leaflets 21070-4 and 39448-4) or changing the filter element, remove the cover and take out the element. The mesh elements are not guaranteed to maintain 100% performance after cleaning.

Filters finer than 40 µm use the disposable elements made of paper or microglass. Filter elements as fine as 5 µm(c) are available; finer filter elements on request.

Eaton filter elements are known as stable elements which have excellent filtration capabilities and a high dirt retaining capacity, therefore having a long service life. Due to its practical design, the return-line filter is easy to service.

Eaton filter can be used for petroleum-based fluids, HW emulsions, water glycols, most synthetic fluids and lubrication fluids. Consult factory for specific fluid applications.

When changing the filter element, a detachable connection between the filter head and the filter bowl prevents dirty oil from flowing into the tank.

<table>
<thead>
<tr>
<th>1. Type index:</th>
</tr>
</thead>
</table>

1.1. Complete filter: (ordering example)

<table>
<thead>
<tr>
<th>TEF. 70. 10VG. 16. S. P. -</th>
<th>G. 4. -</th>
<th>E1. O. -</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

1. series:  
   TEF = tank-mounted return-line-filter

2. nominal size: 55, 70, 120, 210, 310, 320

3. filter-material:  
   80G, 40G, 25G stainless steel wire mesh  
   25VG, 16VG, 10VG, 6VG, 3VG microglass  
   10P paper

4. filter element collapse rating:  
   16 = ρ 16 bar

5. filter element design:  
   E = without by-pass valve  
   S = with by-pass valve Δp 2.0 bar  
   S1 = with by-pass valve Δp 3.5 bar

6. sealing material:  
   P = Nitrile (NBR)  
   V = Viton (FPM)

7. filter element specification:  
   - = standard  
   IS06 = for HFC application, see sheet-no. 31601

8. process connection:  
   G = thread connection according to DIN 3852, T2

9. process connection size:
   3 = G ½  
   4 = G ¾  
   5 = G 1
   6 = G 1 ¼  
   7 = G 1 ½  
   8 = G 1 ½

10. filter housing specification:  
    - = standard  
    IS06 = for HFC application, see sheet-no. 31605  
    IS10 = for ATEX, see sheet-no. 68267  
    IS11 = for mining applications, see sheet-no. 40530 (TEF320)

11. clogging indicator at M1:  
    - = without  
    O = visual, see sheet-no. 1616  
    E1 = pressure switch, see sheet-no. 1616  
    E2 = pressure switch, see sheet-no. 1616  
    E5 = pressure switch, see sheet-no. 1616  
    PA = ground connection

12. clogging indicator at M2:  
    - possible indicators see position 11 of the type index

13. permanent magnet:  
    - = without  
    M = with magnet

To add an indicator to your filter, use the corresponding indicator data sheet to find the indicator details and add them to the filter assembly model code.

1.2. Filter element: (ordering example)

<table>
<thead>
<tr>
<th>01E. 70. 10VG. 16. S. P. -</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

1. series:  
   01E. = filter element according to company standard

2. nominal size:  
   70 (TEF55/70), 120 (TEF120),  
   210 (TEF210), 320 (TEF310/320)

3. - 7 see type index-complete filter
Technical data:
operating temperature: -10°C to +100°C
operating medium: mineral oil, other media on request
max. operating pressure: 10 bar
opening pressure by-pass valve: 2.0 bar, 3.5 bar
process connection: thread connection according to DIN 3852, T2
housing material standard: filter head AL, screw plug / filter bowl glass fiber reinforced polyamide
housing material IS10, category 2 and 3: filter head AL, screw plug / filter bowl carbon fiber reinforced polyamide
housing material IS11, category M2: filter head GG, screw plug steel / filter bowl carbon fiber reinforced polyamide
sealing material: Nitrile (NBR) or Viton (FPM), other materials on request
installation position: vertical

Classified under the Pressure Equipment Directive 2014/68/EU for mineral oil (fluid group 2), Article 4, Para. 3.
Classified under ATEX Directive 2014/34/EU according to specific application (see questionnaire sheet no. 34279-4).

Pressure drop flow curves:
Filter calculation/sizing
The pressure drop of the assembly at a given flow rate Q is the sum of the housing Δp and the element Δp and is calculated as follows:

Δp = Δp_housing + Δp_element

Δp_housing = (see Δp = f(Q) - characteristics)

Δp_element (mbar) = \( Q \left( \frac{L}{\text{min}} \right) \times \frac{\text{MSK}}{10} \times \frac{\text{mbar}}{\text{l/min}} \times V \left( \frac{\text{mm}^2}{s} \right) \times \frac{p}{0.876} \left( \frac{\text{kg}}{\text{dm}^3} \right) \)

For ease of calculation our Filter Selection tool is available online at www.eatonpowersource.com/calculatorsfiltration/

Material gradient coefficients (MSK) for filter elements
The material gradient coefficients in mbar/(l/min) apply to mineral oil (HLP) with a density of 0.876 kg/dm³ and a kinematic viscosity of 30 mm²/s (139 SUS). The pressure drop changes proportionally to the change in kinematic viscosity and density.

<table>
<thead>
<tr>
<th>TEF</th>
<th>VG</th>
<th>G</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>3VG</td>
<td>6VG</td>
<td>10VG</td>
</tr>
<tr>
<td>2.933</td>
<td>2.036</td>
<td>1.304</td>
<td>1.135</td>
</tr>
<tr>
<td>2.933</td>
<td>2.036</td>
<td>1.304</td>
<td>1.135</td>
</tr>
<tr>
<td>2.624</td>
<td>1.821</td>
<td>1.166</td>
<td>1.015</td>
</tr>
<tr>
<td>1.327</td>
<td>0.922</td>
<td>0.590</td>
<td>0.514</td>
</tr>
<tr>
<td>0.953</td>
<td>0.661</td>
<td>0.423</td>
<td>0.369</td>
</tr>
</tbody>
</table>

Δp = f(Q) – characteristics according to ISO 3968
The pressure drop characteristics apply to mineral oil (HLP) with a density of 0.876 kg/dm³. The pressure drop changes proportionally to the density.

Viscosity key:
_ _ _ 30mm²/s  ____ 100 mm²/s

| TEF,55 Housing Pressure Drop | TEF,70 Housing Pressure Drop | TEF,120 Housing Pressure Drop |
| TEF,210 Housing Pressure Drop | TEF,320 Housing Pressure Drop |
Symbols:

- without indicator
- with by-pass valve
- visual O
- electric contact maker E1
- electric contact breaker E5
- electric contact maker/breaker E2

Spare parts:

<table>
<thead>
<tr>
<th>item</th>
<th>qty.</th>
<th>designation</th>
<th>dimension and article-no.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>filter element</td>
<td>01E.70... 01E.120... 01E.210... 01E.320... 01E.320...</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>filter head</td>
<td>M60 x 2 M82 x 2 M90 x 2</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>filter bowl</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>screw plug</td>
<td>O-ring 56 x 3 305072 (NBR) 304729 (FPM)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>O-ring 50 x 2.5 305239 (NBR) 303037 (NBR)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>O-ring 22 x 3 304387 (NBR) 304397 (FPM)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>O-ring 56 x 3 305072 (NBR) 304397 (FPM)</td>
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</tr>
<tr>
<td></td>
<td>1</td>
<td>spring DA = 40 344920 DA = 52 302144</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>clogging indicator, visual</td>
<td>O 301721</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>clogging indicator, electric</td>
<td>E1, E2 or E5 see sheet-no. 1616</td>
</tr>
</tbody>
</table>

Test methods:

Filter elements are tested according to the following ISO standards:

- ISO 2941 Verification of collapse/burst resistance
- ISO 2942 Verification of fabrication integrity
- ISO 2943 Verification of material compatibility with fluids
- ISO 3723 Method for end load test
- ISO 3724 Verification of flow fatigue characteristics
- ISO 3968 Evaluation of pressure drop versus flow characteristics
- ISO 16889 Multi-pass method for evaluating filtration performance

For more information, please email us at filtration@eaton.com or visit www.eaton.com/filtration

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