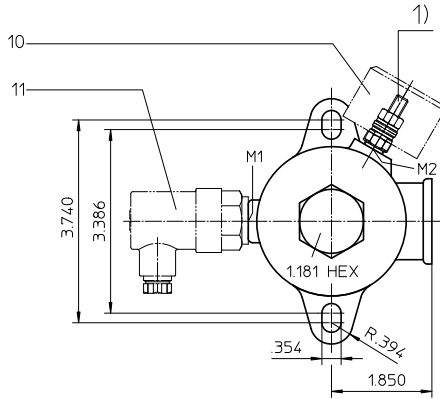


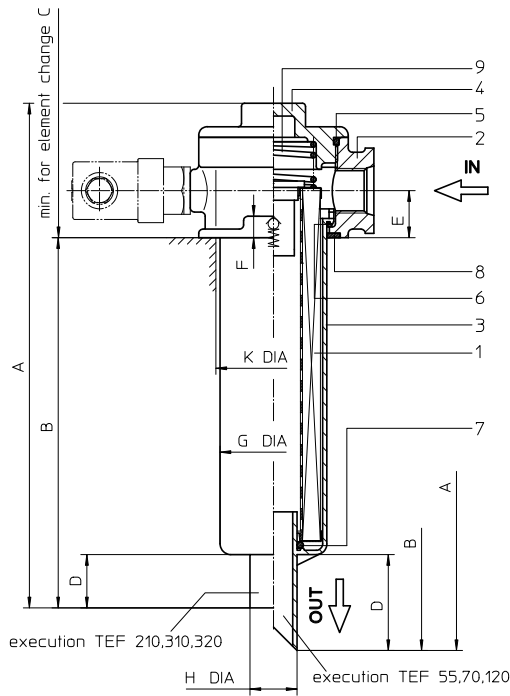
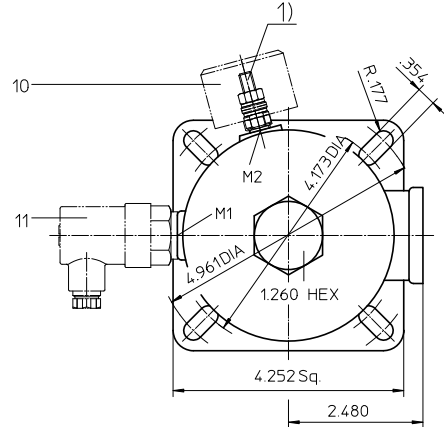
# Series TEF 55-320

## 145 PSI

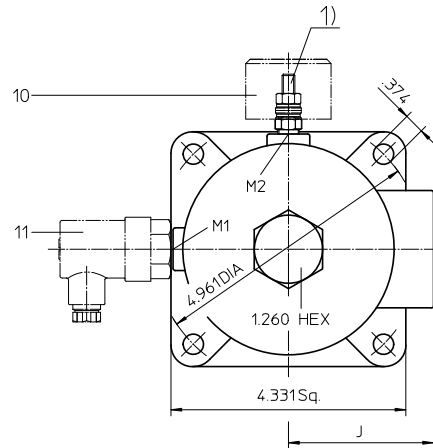
view TEF 55,70



view TEF 120



view TEF 210,310,320



1) Connect the stand grounding tab to a suitable earth ground point.

**Dimensions:**

type	connection	A	B	C	D	E	F	G	H	J	K	weight	volume tank
TEF 55	-8 SAE	10.11	7.64	10.63	1.77	.87	.39	2.05	.87	-	2.08	1.98 lbs.	.08 Gal.
TEF 70	-12 SAE	10.11	7.64	10.63	1.77	.87	.39	2.05	.87	-	2.08	1.98 lbs.	.08 Gal.
TEF 120	-16 SAE	11.30	8.39	11.80	2.56	1.06	.39	2.76	.97	-	2.83 <sup>+39</sup>	3.30 lbs.	.15 Gal.
TEF 210	-20 SAE	12.00	9.06	13.78	.98	1.18	.39	3.15	1.50	2.64	3.22 <sup>+11</sup>	4.60 lbs.	.29 Gal.
TEF 310	-20 SAE	15.25	12.26	15.94	.98	1.18	.39	3.15	1.50	2.64	3.22 <sup>+11</sup>	5.50 lbs.	.36 Gal.
TEF 320	-24 SAE	16.54	13.00	18.31	1.57	1.42	.39	3.35	1.73	2.79	3.38 <sup>+23</sup>	6.20 lbs.	.45 Gal.

Dimensions: inches

Designs and performance values are subject to change.

# Return Line Filter

## Series TEF 55-320

### 145 PSI

#### Description:

Return-line filters series TEF 55-320 have a working pressure up to 145 PSI. Pressure peaks can be absorbed with a sufficient safety margin.

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 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.

## 1. Type index:

### 1.1. Complete filter: (ordering example)

**TEF. 70. 10VG. 16. S. P. -. UG. 4. -. E1. O. -**

1	2	3	4	5	6	7	8	9	10	11	12	13
---	---	---	---	---	---	---	---	---	----	----	----	----

- |    |   |
|----|---|
| 1  | <b>series:</b><br>TEF = tank-mounted return-line-filter   |
| 2  | <b>nominal size:</b> 55, 70, 120, 210, 310, 320   |
| 3  | <b>filter-material:</b><br>80G, 40G, 25G stainless steel wire mesh<br>25VG, 16VG, 10VG, 6VG, 3VG microglass<br>10P paper  |
| 4  | <b>filter element collapse rating:</b><br>16 = Δp 232 PSI   |
| 5  | <b>filter element design:</b><br>E = without by-pass valve<br>S = with by-pass valve Δp 29 PSI<br>S1 = with by-pass valve Δp 51 PSI   |
| 6  | <b>sealing material:</b><br>P = Nitrile (NBR)<br>V = Viton (FPM)  |
| 7  | <b>filter element specification:</b> (see catalog)<br>- = standard<br>IS06 = for HFC applications, see sheet-no. 31601  |
| 8  | <b>process connection:</b><br>UG = thread connection  |
| 9  | <b>process connection size:</b><br>3 = - 8 SAE TEF 55<br>4 = - 12 SAE TEF 70<br>5 = - 16 SAE TEF 120<br>6 = - 20 SAE TEF 210/310<br>7 = - 24 SAE TEF 320  |
| 10 | <b>filter housing specification:</b> (see catalog)<br>- = standard<br>IS06 = for HFC application, see sheet-no. 31605 (TEF55-320)<br>IS10 = for ATEX, see sheet-no. 68267 (TEF55-310)<br>IS11 = for mining applications, see sheet-no. 40530 (TEF320) |
| 11 | <b>clogging indicator at M1:</b><br>- = without<br>O = visual, see sheet-no. 1616<br>E1 = pressure switch, see sheet-no. 1616<br>E2 = pressure switch, see sheet-no. 1616<br>E5 = pressure switch, see sheet-no. 1616<br>PA = ground connection       |
| 12 | <b>clogging indicator at M2:</b><br>possible indicators see position 11 of the type index   |
| 13 | <b>permanent magnet:</b><br>- = without<br>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)

**01E. 70. 10VG. 16. S. P. -**

1	2	3	4	5	6	7
---	---	---	---	---	---	---

- |   |   |
|---|---|
| 1 | <b>series:</b><br>01E. = filter element according to company standard               |
| 2 | <b>nominal size:</b> 70 (TEF55/70), 120 (TEF120),<br>210 (TEF210), 320 (TEF310/320) |
| 3 | - 7   see type index-complete filter  |

## Technical data:

design temperature:	14 °F to +212 °F
operating temperature:	14 °F to +176 °F
operating medium	mineral oil, other media on request
max. operating pressure:	145 PSI
opening pressure by-pass valve:	29 PSI, 51 PSI
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  $\Delta p$  and the element  $\Delta p$  and is calculated as follows:

$$\Delta p_{assembly} = \Delta p_{housing} + \Delta p_{element}$$

$$\Delta p_{housing} = (\text{see } \Delta p = f(Q) \text{ - characteristics})$$

$$\Delta p_{element} (PSI) = Q (GPM) \times \frac{MSK}{1000} \left( \frac{PSI}{GPM} \right) \times v (SUS) \times \frac{\rho}{0.876} \left( \frac{kg}{dm^3} \right)$$

For ease of calculation our Filter Selection tool is available online at [www.eatonpowersource.com/calculators/filtration/](http://www.eatonpowersource.com/calculators/filtration/)

### Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in psi/gpm apply to mineral oil (HLP) with a density of 0.876 kg/dm<sup>3</sup> and a kinematic viscosity of 139 SUS (30 mm<sup>2</sup>/s). The pressure drop changes proportionally to the change in kinematic viscosity and density.

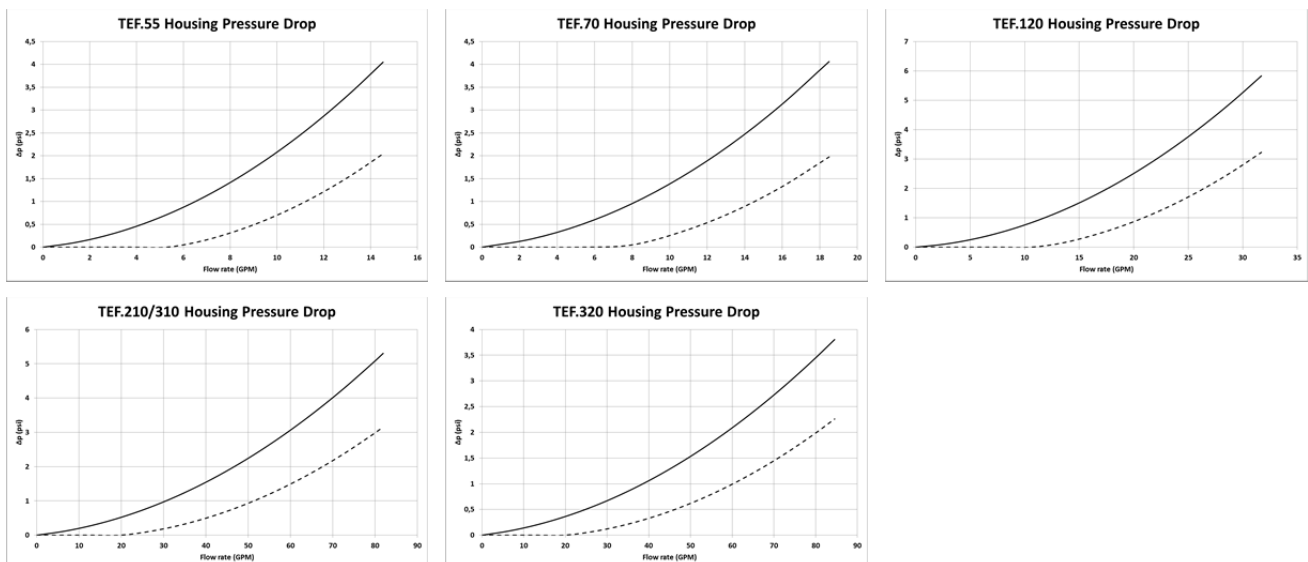
TEF	VG					G			P
	3VG	6VG	10VG	16VG	25VG	25G	40G	80G	
55	3.535	2.454	1.571	1.368	0.935	0.1196	0.1117	0.0765	0.797
70	3.535	2.454	1.571	1.368	0.935	0.1196	0.1117	0.0765	0.797
120	3.162	2.195	1.405	1.224	0.836	0.1144	0.1068	0.0731	0.690
210	1.600	1.111	0.711	0.619	0.423	0.0588	0.0549	0.0376	0.353
310	1.148	0.797	0.510	0.444	0.304	0.0337	0.0314	0.0215	0.253
320	1.148	0.797	0.510	0.444	0.304	0.0337	0.0314	0.0215	0.253

### $\Delta p = f(Q)$ – characteristics according to ISO 3968

The pressure drop characteristics apply to mineral oil (HLP) with a density of 0.876 kg/dm<sup>3</sup>. The pressure drop changes proportionally to the density.

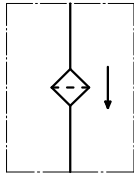
Viscosity key:

--- 139 SUS      ——— 464 SUS

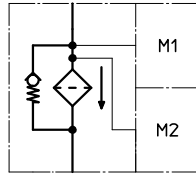


## Symbols:

without indicator



with by-pass valve



visual O



electric contact maker E1



electric contact breaker E5



electric contact maker/breaker E2



## Spare parts:

item	qty.	designation	dimension and article-no.					
			TEF 55	TEF 70	TEF 120	TEF 210	TEF 310	TEF 320
1	1	filter element	01E.70...		01E.120...	01E.210...	01E.320...	01E.320...
2	1	filter head						
3	1	filter bowl						
4	1	screw plug	M60 x 2		M82 x 2		M90 x 2	M100 x 2
5	1	O-ring	56 x 3 305072 (NBR) 305322 (FPM)		75 x 3 302215 (NBR) 304729 (FPM)		82 x 3 305191 (NBR) 305298 (FPM)	96 x 3 305292 (NBR) 305297 (FPM)
6	1	O-ring	50 x 2,5 305239 (NBR) 305321 (FPM)		68 x 4 303037 (NBR) 313046 (FPM)		75 x 3 302215 (NBR) 304729 (FPM)	82 x 3 305191 (NBR) 305298 (FPM)
7	1	O-ring	22 x 3 304387 (NBR) 304931 (FPM)		24 x 3 303038 (NBR) 304397 (FPM)		40 x 3 304389 (NBR) 304391 (FPM)	40 x 3 304389 (NBR) 304391 (FPM)
8	1	O-ring	56 x 3 305072 (NBR) 305322 (FPM)		86 x 3 305470 (NBR) 313047 (FPM)		88 x 3 304417 (NBR) 310266 (FPM)	96 x 3 305292 (NBR) 305297 (FPM)
9	1	spring	DA = 40 304982		DA = 52 302144		DA = 52 302144	DA = 52 305053
10	1	clogging indicator	O 301721					
11	1	clogging indicator electric	E1, E2 or E5 see sheet-no. 1616					

## 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

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