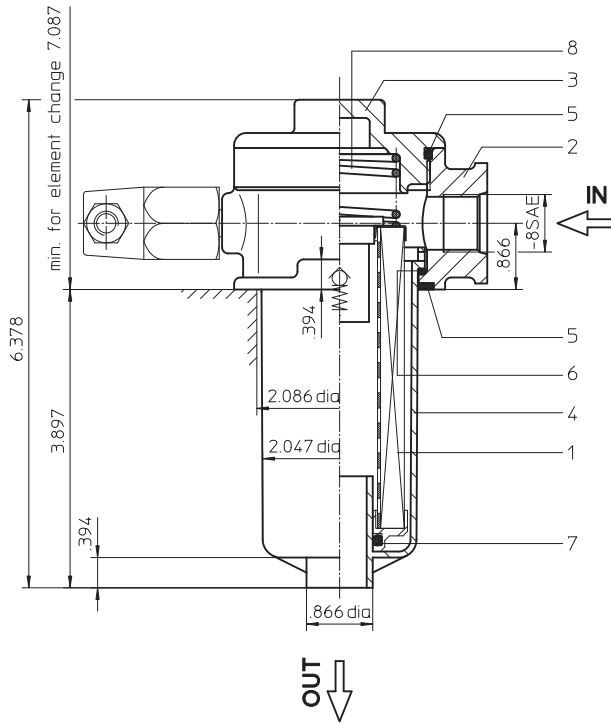
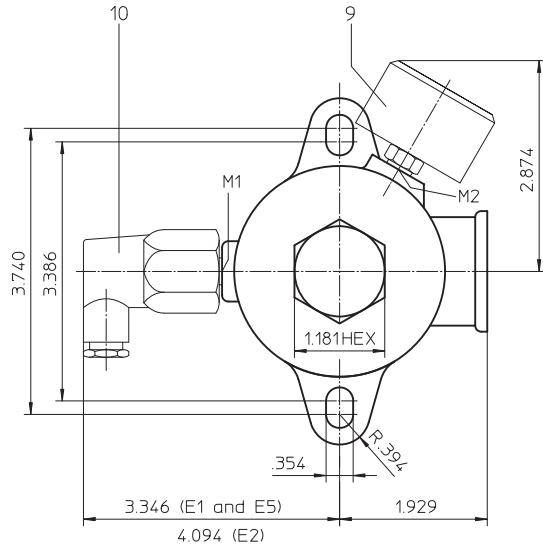


Series TEF 41 145 PSI



Use connection M1 if only one indicator is required.

Weight: approx. 1.76 lbs.

Dimensions: inches

Designs and performance values are subject to change.



Powering Business Worldwide

Return Line Filter

Series TEF 41

145 PSI

Description:

Return-line TEF series filters 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 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 direction is from outside to inside. Filter elements are available down to 4 $\mu\text{m}_{(c)}$.

Eaton filter elements are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.

Eaton filter elements are known for high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life. Due to its practical design, the return-line filter is easy to service.

When changing the filter element, a detachable connection between the filter head and the filter bowl prevents a flow back of dirty oil into the tank.

1. Type index:

1.1. Complete filter: (ordering example)

TEF. 41. 10VG. 16. S. P. - UG. 3. - E1. O

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

- 1 series:**
TEF = tank-mounted return-line-filter
- 2 nominal size:** 41
- 3 filter-material and filter-fineness:**
80G, 40G, 25G stainless steel wire mesh
25VG, 16VG, 10VG, 6VG, 3VG microglass
10P paper (only with 01E.41)
- 4 filter element collapse rating:**
16 = 01E.41 for Δp 232 PSI (standard with by-pass valve)
30 = 01E.60 for Δp 435 PSI (standard without by-pass valve)
- 5 filter element design:**
S = with by-pass valve (01E.41) Δp 29 PSI
E = without by-pass valve (01E.60)
- 6 sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)
- 7 filter element specification: (see catalog)**
- = standard
VA = stainless steel
IS06 = for HFC applications, see sheet-no. 31601
- 8 process connection:**
UG = thread connection
- 9 process connection size:**
3 = - 8 SAE
- 10 filter housing specification: (see catalog)**
- = standard
IS06 = for HFC applications, see sheet-no. 31605
- 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
- 12 clogging indicator at M2:**
see position 11 of the type index for indicator options

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. 41. 10VG. 16. S. P. -

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

- 1 series:**
01E. = filter element according to company standard
- 2 nominal size:** 41, 60
- 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
process connection:	thread connection
housing material:	Al-cast, glass fiber reinforced polyamide
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
volume tank:	.05 Gal

Classified under the Pressure Equipment Directive 2014/68/EC for mineral oil (fluid group 2), Article 4, Para. 3.
 Classified under ATEX Directive 2014/34/EC 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:

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

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

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

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

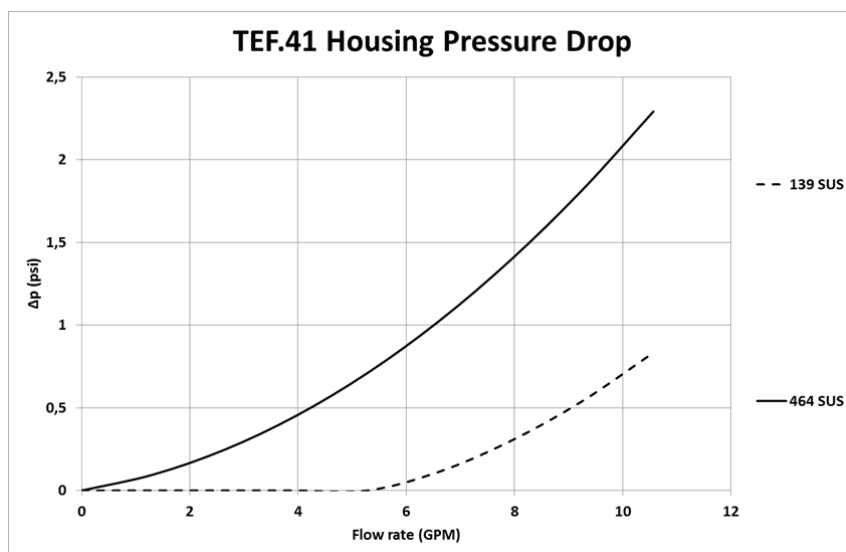
Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in psi/gpm apply to mineral oil (HLP) with a density of 0.876 kg/dm³ and a kinematic viscosity of 139 SUS (30 mm²/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	10P
41 (without bypass)	6.748	4.685	2.999	2.577	1.760	0.2002	0.1868	0.1280	1.469
41 (with bypass)	6.748	4.685	2.999	2.577	1.760	0.2002	0.1868	0.1280	-

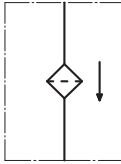
$\Delta p = f(Q)$ – characteristics according to ISO 3968

The pressure drop characteristics apply to mineral oil (HLP) with a density of 0.876 kg/dm³. The pressure drop changes proportionally to the density.

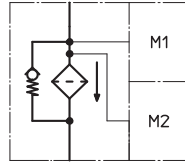


Symbols:

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	article-no.	
1	1	filter element with by-pass	01.E41...		
	1	filter element without by-pass	01.E60...		
2	1	filter head	TEF 41 - 55	308646	
3	1	filter cover	M 60 x 2	303621	
4	1	filter bowl	TEF 41	306673	
5	2	O-ring	56 x 3	305072 (NBR)	305322 (FPM)
6	1	O-ring	50 x 2,5	305239 (NBR)	305321 (FPM)
7	1	O-ring	22 x 3,5	304341 (NBR)	304392 (FPM)
8	1	spring	DA = 40	304982	
9	1	clogging indicator visual	O	301721	
10	1	clogging indicator electrical	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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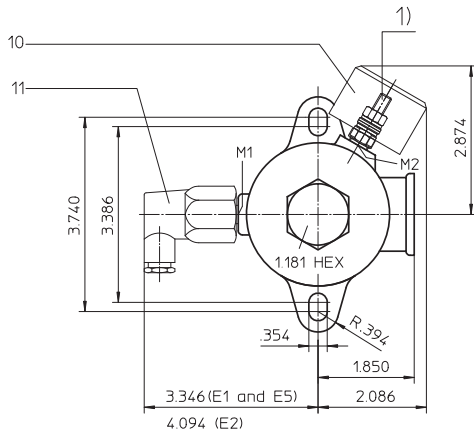
or visit www.eaton.com/filtration

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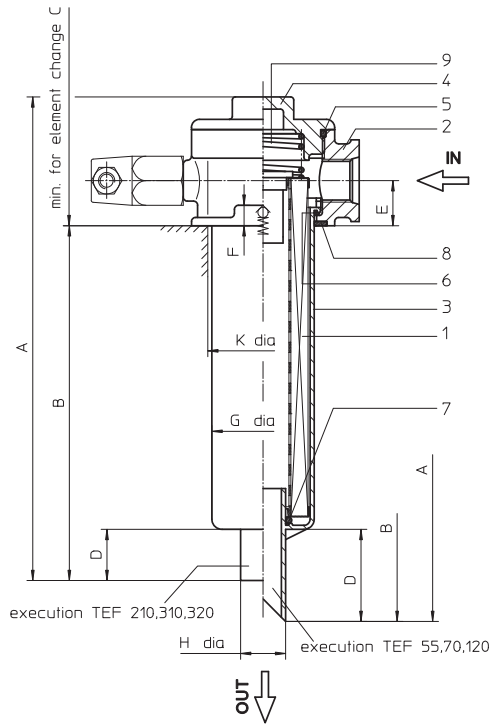
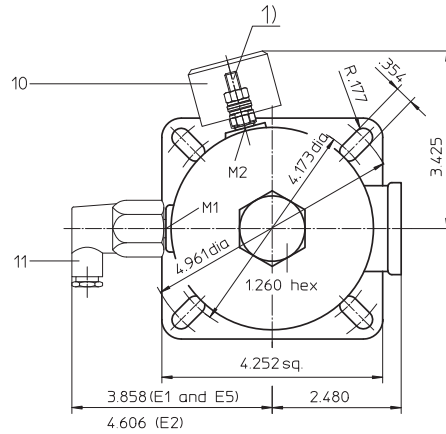
Series TEF 55-320

145 PSI

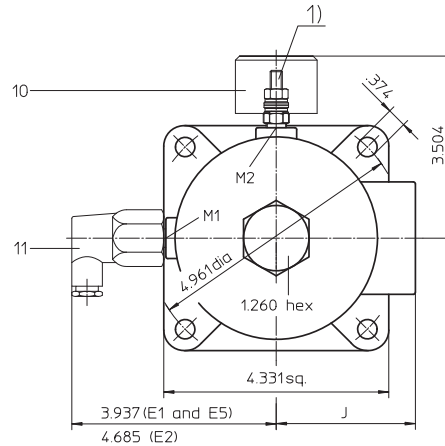
view TEF 55,70



view TEF 120



view TEF 210,310,320



Use connection M1 if only one indicator is required.

- 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 ⁺³⁹	3.30 lbs.	.15 Gal.
TEF 210	-20 SAE	12.00	9.06	13.78	.98	1.18	.39	3.15	1.50	2.86	3.22 ⁺¹¹	4.60 lbs.	.29 Gal.
TEF 310	-20 SAE	15.25	12.26	15.94	.98	1.18	.39	3.15	1.50	2.86	3.22 ⁺¹¹	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 ⁺²³	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 TEF series filters 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 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 direction is from outside to inside. Filter elements are available down to 4 $\mu\text{m}_{(G)}$.

Eaton filter elements are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.

Eaton filter elements are known for high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life. Due to its practical design, the return-line filter is easy to service.

When changing the filter element, a detachable connection between the filter head and the filter bowl prevents a flow back of dirty oil 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 series:**
TEF = tank-mounted return-line-filter
- 2 nominal size:** 55, 70, 120, 210, 310, 320
- 3 filter-material and filter-fineness:**
80G, 40G, 25G stainless steel wire mesh
25VG, 16VG, 10VG, 6VG, 3VG microglass
10P paper
- 4 filter element collapse rating:**
16 = Δp 232 PSI
- 5 filter element design:**
E = without by-pass valve
S = with by-pass valve Δp 29 PSI
S1 = with by-pass valve Δp 51 PSI
- 6 sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)
- 7 filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = For HFC applications, see sheet-no. 31601
- 8 process connection:**
UG = thread connection
- 9 process connection size:**
3 = - 8 SAE TEF 55
4 = - 12 SAE TEF 70
5 = - 16 SAE TEF 120
6 = - 20 SAE TEF 210/310
7 = - 24 SAE TEF 320
- 10 filter housing specification:** (see catalog)
- = standard
IS06 = for HFC applications, see sheet-no. 31605
IS11 = for mining applications, see sheet-no. 40530
- 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 = electrical grounding connection
- 12 clogging indicator at M2:**
possible indicators see position 11 of the type index
- 13 permanent magnet:**
- = without
M = with permanent 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 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:

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
housing material standard:	filter head AL, filter cover / filter bowl microglass reinforced polyamide
housing material IS11, category M2:	filter head GG, filter cover steel, filter bowl carbon fibre reinforced polyamide
housing material IS11, category 2:	filter head AL, filter cover / filter bowl carbon fibre reinforced polyamide
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical

Classified under the Pressure Equipment Directive 2014/68/EC for mineral oil (fluid group 2), Article 4, Para. 3.
 Classified under ATEX Directive 2014/34/EC 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:

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

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

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

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

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/dm³ and a kinematic viscosity of 139 SUS (30 mm²/s). The pressure drop changes proportionally to the change in kinematic viscosity and density.

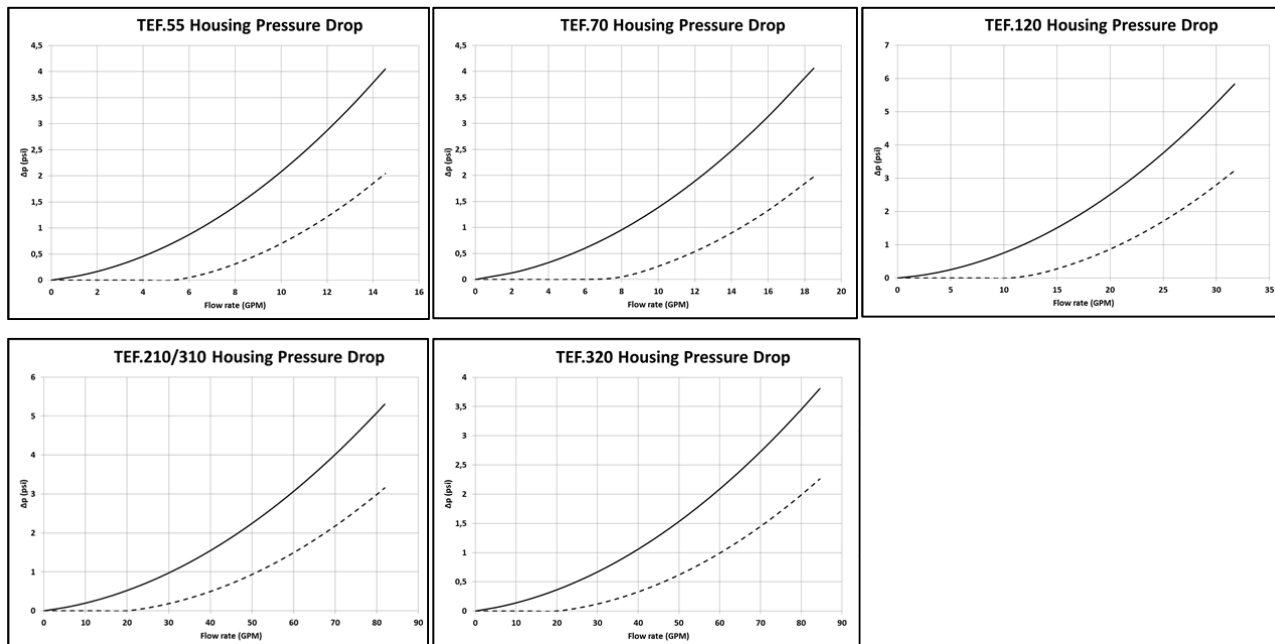
TEF	VG					G			P
	3VG	6VG	10VG	16VG	25VG	25G	40G	80G	10P
55	3.535	2.454	1.571	1.368	0.935	0.1196	0.1117	0.0765	0.797
70	3.535	2.454	1.571	1.368	0.935	0.1196	0.1117	0.0765	0.797
120	3.162	2.195	1.405	1.224	0.836	0.1144	0.1068	0.0731	0.690
210	1.600	1.111	0.711	0.619	0.423	0.0588	0.0549	0.0376	0.353
310	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/dm³. The pressure drop changes proportionally to the density.

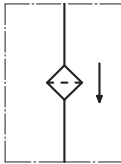
Viscosity key:

--- 139 SUS ——— 464 SUS

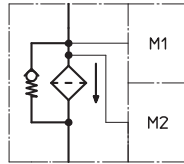


Symbols:

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	filter cover	M 60 x 2		M 82 x 2		M 90 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 = 53 305053
10	1	clogging indicator	O 301721					
11	1	clogging indicator electric	alternatively E1, E2 or E5see 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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Return Line Filter

Series TEF 426

145 PSI

Description:

Return-line TEF series filters 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 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 direction is from outside to inside. Filter elements are available down to 4 $\mu\text{m}_{(c)}$.

Eaton filter elements are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.

Eaton filter elements are known for high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life. Due to its practical design, the return-line filter is easy to service.

When changing the filter element, a detachable connection between the filter head and the filter bowl prevents a flow back of dirty oil into the tank.

Type index:

Complete filter: (ordering example)

TEF. 426. 10VG. 16. S. P. -. FS. 7. -. E1. O. -

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

- 1 series:**
TEF = tank-mounted return-line-filter
- 2 nominal size:** 426
- 3 filter-material and filter-fineness:**
80G, 40G, 25G stainless steel wire mesh
25VG, 16VG, 10VG, 6VG, 3VG microglass
10P paper
- 4 filter element collapse rating:**
16 = Δp 232 PSI
- 5 filter element design:**
E = without by-pass valve
S = with by-pass valve Δp 29 PSI
- 6 sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)
- 7 filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = for HFC applications, see sheet-no. 31601
- 8 process connection:**
FS = SAE-flange 3000 PSI
- 9 process connection size:**
7 = 1 1/2"
- 10 filter housing specification:** (see catalog)
- = standard
IS06 = for HFC applications, see sheet-no. 31605
- 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
- 12 clogging indicator at M2:**
see position 11 of the type index for indicator options
- 13 clogging indicator at M3:**
see position 11 of the type index for indicator options

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. 425. 10VG. 16. S. P. -

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

- 1 series:**
01E. = filter element according to company standard
- 2 nominal size:** 425
- 3 - 7** see type index-complete filter

Accessories:

- SAE-counter flange, see sheet-no. 1652

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
process connection:	SAE-flange 3000 PSI
housing material:	AL-casting; glass fiber reinforced polyamide
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
volume tank:	.65 Gal

Classified under the Pressure Equipment Directive 2014/68/EC for mineral oil (fluid group 2), Article 4, Para. 3.
 Classified under ATEX Directive 2014/34/EC 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:

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

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

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

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

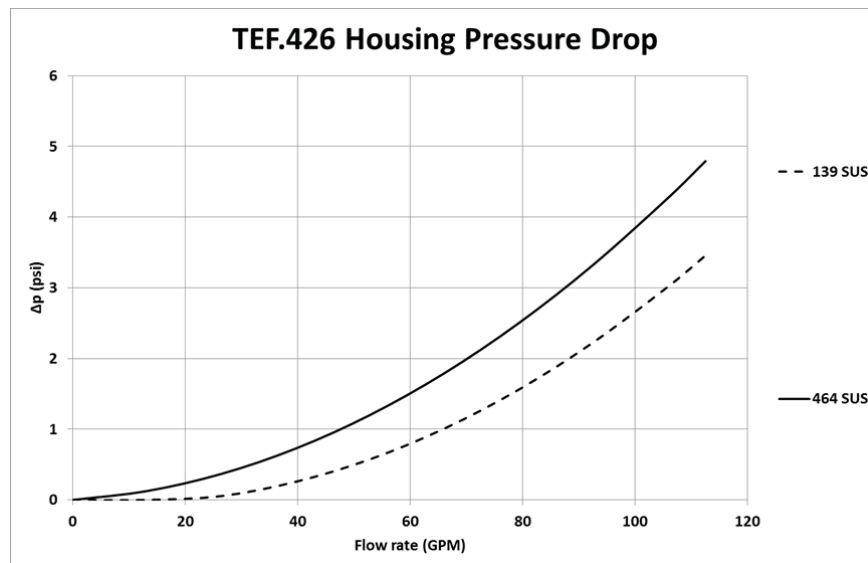
Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in psi/gpm apply to mineral oil (HLP) with a density of 0.876 kg/dm³ and a kinematic viscosity of 139 SUS (30 mm²/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	10P
426	0.849	0.589	0.377	0.328	0.224	0.0270	0.0252	0.0172	0.182

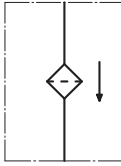
$\Delta p = f(Q)$ – characteristics according to ISO 3968

The pressure drop characteristics apply to mineral oil (HLP) with a density of 0.876 kg/dm³. The pressure drop changes proportionally to the density.

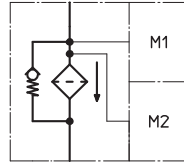


Symbols:

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	article-no.	
1	1	filter element	01.E425...	-	
2	1	filter head	nominal size 426	313571	
3	1	filter bowl	nominal size 425	303732	
4	1	screw plug	M 120 x 3	313649	
5	1	O-ring	128 x 3	304602 (NBR)	308140 (FPM)
6	1	O-ring	98 x 4	301914 (NBR)	304765 (FPM)
7	1	O-ring	44 x 6	302222 (NBR)	304384 (FPM)
8	1	O-ring	115 x 3	303963 (NBR)	307762 (FPM)
9	1	spring	DA = 63,5	304983	
10	1	clogging indicator visual	O	see sheet-no. 1616	
11	1	clogging indicator electrical	alternatively 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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Return Line Filter

Series TEF 625

145 PSI

Description:

Return-line TEF series filters 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 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 direction is from outside to inside. Filter elements are available down to 4 $\mu\text{m}_{(c)}$.

Eaton filter elements are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.

Eaton filter elements are known for high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life. Due to its practical design, the return-line filter is easy to service.

When changing the filter element, a detachable connection between the filter head and the filter bowl prevents a flow back of dirty oil into the tank.

Type index:

Complete filter: (ordering example)

TEF. 625. 10VG. 16. S. P. -. FS. 8. -. E1. O. -

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

- 1 series:**
TEF = tank-mounted return-line-filter
- 2 nominal size:** 625
- 3 filter-material and filter-fineness:**
80G, 40G, 25G stainless steel wire mesh
25VG, 16VG, 10VG, 6VG, 3VG microglass
10P paper
- 4 filter element collapse rating:**
16 = Δp 232 PSI
- 5 filter element design:**
E = without by-pass valve
S = with by-pass valve Δp 29 PSI
- 6 sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)
- 7 filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = for HFC applications, see sheet-no. 31601
- 8 process connection:**
FS = SAE-flange 3000 PSI
- 9 process connection size:**
8 = 2"
- 10 filter housing specification:** (see catalog)
- = standard
IS06 = for HFC applications, see sheet-no. 31605
IS11 = for mining applications, see sheet-no. 40530
- 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 = electrical grounding connection
- 12 clogging indicator at M2:**
possible indicators see position 11 of the type index
- 13 clogging indicator at M3:**
possible indicators see position 11 of the type index

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. 631. 10VG. 16. S. P. -

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

- 1 series:**
01E. = filter element according to company standard
- 2 nominal size:** 631
- 3 - 7** see type index-complete filter

Accessories:

- SAF-counter flange see sheet-no. 1652

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
process connection:	SAE-flange 3000 PSI
housing material:	filter head / filter cover AL; filter bowl glass fiber reinforced polyamide (standard) filter head / filter cover GG; filter bowl carbon fiber reinforced polyamide (according to IS11)
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
volume tank:	.95 Gal

Classified under the Pressure Equipment Directive 2014/68/EC for mineral oil (fluid group 2), Article 4, Para. 3.
Classified under ATEX Directive 2014/34/EC 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:

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

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

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

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

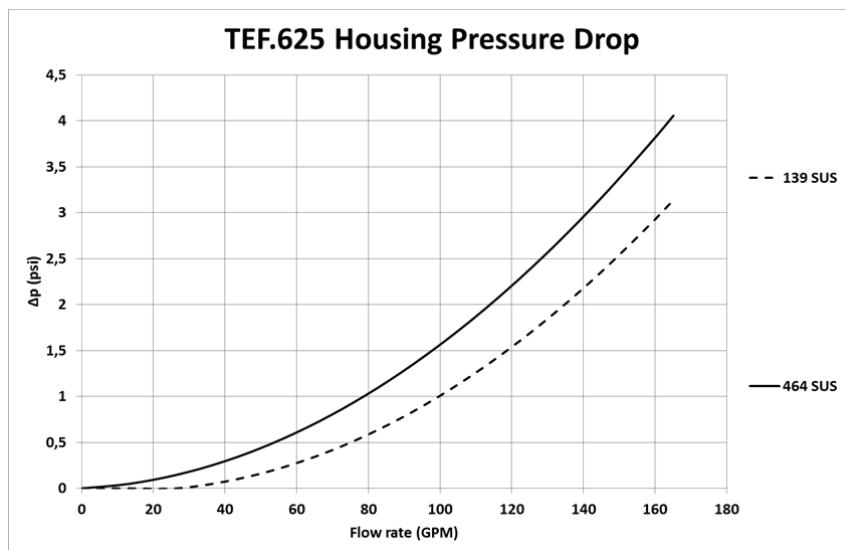
Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in psi/gpm apply to mineral oil (HLP) with a density of 0.876 kg/dm³ and a kinematic viscosity of 139 SUS (30 mm²/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	10P
625	0.643	0.446	0.286	0.249	0.170	0.0236	0.0220	0.0151	0.142

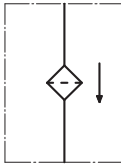
$\Delta p = f(Q)$ – characteristics according to ISO 3968

The pressure drop characteristics apply to mineral oil (HLP) with a density of 0.876 kg/dm³. The pressure drop changes proportionally to the density.

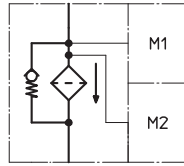


Symbols:

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	article-no.	
1	1	filter element	01E.631...		
2	1	filter head	NG 625		
3	1	filter cover			
4	1	filter bowl	NG 625		
5	1	O-ring	140 x 3	304604 (NBR)	307514 (FPM)
6	1	O-ring	120 x 4	305300 (NBR)	307991 (FPM)
7	1	O-ring	63 x 3,5	311189 (NBR)	311592 (FPM)
8	1	O-ring	135 x 3,5	318386 (NBR)	318387 (FPM)
9	1	clogging indicator, visual	O	301721	
10	1	clogging indicator, electric	alternatively 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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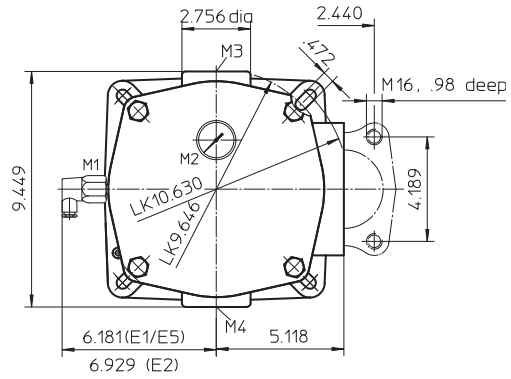
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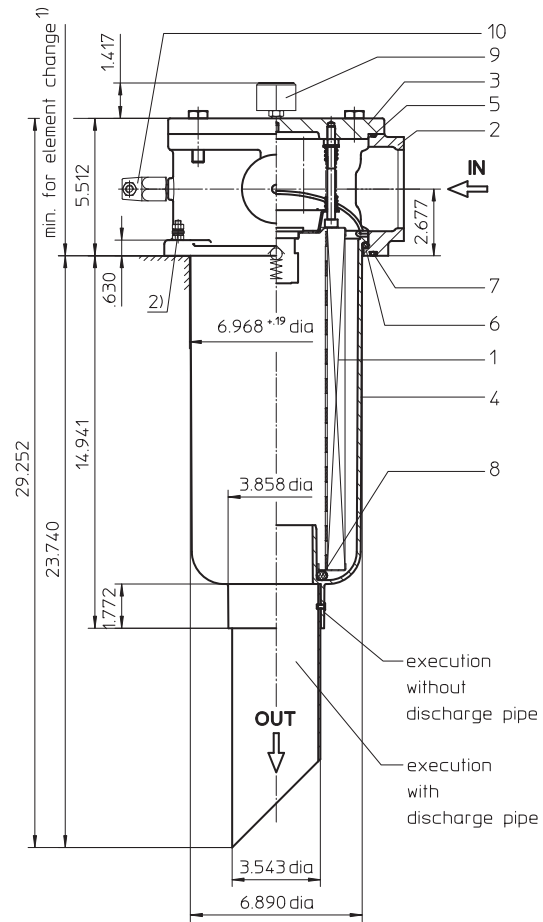
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Series TEF 952 145 PSI



- 1) min. for element change without discharge pipe 21.88
- min. for element change with discharge pipe 30.70



Use connection M1 if only one indicator is required.

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

Weight: approx. 24 lbs.

Dimensions: inches

Designs and performance values are subject to change.



Powering Business Worldwide

Return Line Filter

Series TEF 952

145 PSI

Description:

Return-line TEF series filters 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 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. Filters finer than 40 µm should use 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 suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.

Eaton filter elements are known for high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life. Due to its practical design, the return-line filter is easy to service.

When changing the filter element, a detachable connection between the filter head and the filter bowl prevents a flow back of dirty oil into the tank.

Type index:

Complete filter: (ordering example)

TEF. 952. 10VG. 10. S. P. -. FS. A. -.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

E1. O. -. -. -

11	12	13	14	15
----	----	----	----	----

- 1 series:**
TEF = tank-mounted return-line-filter
- 2 nominal size:** 952
- 3 filter-material and filter-fineness:**
80G, 40G, 25G stainless steel wire mesh
25VG, 16VG, 10VG, 6VG, 3VG microglass
10P paper
- 4 resistance of pressure difference for filter element:**
10 = Δp 145 PSI
- 5 filter element design:**
E = without by-pass valve
S = with by-pass valve Δp 29 PSI
S1 = with by-pass valve Δp 51 PSI
- 6 sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)
- 7 filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = For HFC applications, see sheet-no. 31601
- 8 process connection:**
FS = SAE-flange 3000 PSI
- 9 process connection size:**
A = 3"
- 10 filter housing specification:** (see catalog)
- = standard
IS06 = for HFC applications, see sheet-no. 31605
IS11 = for mining applications, see sheet-no. 40530
- 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
- 12 clogging indicator at M2:**
possible indicators see position 11 of the type index
- 13 clogging indicator at M3:**
possible indicators see position 11 of the type index
- 14 clogging indicator at M4:**
possible indicators see position 11 of the type index
- 15 discharge pipe:**
- = without
1 = with discharge pipe

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. 950. 10VG. 10. S. P. -

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

- 1 series:**
01E. = filter element according to company standard
- 2 nominal size:** 950
- 3 - 7** see type index-complete filter

Accessories:

- SAE-counter flange, see sheet-no. 1652

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:	SAE-flange 3000 PSI
housing material:	filter head / filter cover AL; filter bowl glass fiber reinforced polyamide (standard) filter head / filter cover GG; filter bowl carbon fiber reinforced polyamide (according to IS11)
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
volume tank:	2.60 Gal

Classified under the Pressure Equipment Directive 2014/68/EC for mineral oil (fluid group 2), Article 4, Para. 3.
Classified under ATEX Directive 2014/34/EC 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:

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

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

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

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

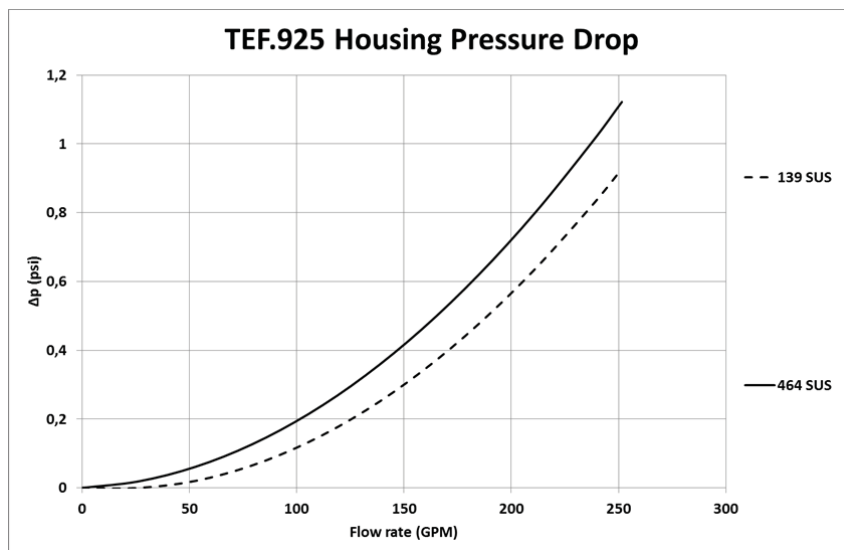
Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in psi/gpm apply to mineral oil (HLP) with a density of 0.876 kg/dm³ and a kinematic viscosity of 139 SUS (30 mm²/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	10P
952	0.364	0.253	0.162	0.141	0.096	0.0179	0.0167	0.0115	0.076

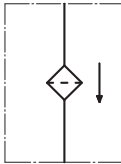
$\Delta p = f(Q)$ – characteristics according to ISO 3968

The pressure drop characteristics apply to mineral oil (HLP) with a density of 0.876 kg/dm³. The pressure drop changes proportionally to the density.

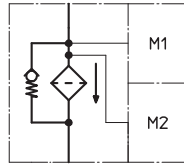


Symbols:

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	article-no.	
1	1	filter element	01.E 950...		
2	1	filter head			
3	1	filter cover			
4	1	filter bowl without discharge pipe			
	1	filter bowl with discharge pipe			
5	1	O-ring	195 x 3,5	301831 (NBR)	306528 (FPM)
6	1	O-ring	170 x 6	304799 (NBR)	306529 (FPM)
7	1	O-ring	190 x 5	305432 (NBR)	310283 (FPM)
8	1	O-ring	78 x 10	305017 (NBR)	305552 (FPM)
9	1	clogging indicator visual	O	301721	
10	1	clogging indicator electric	alternatively 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
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