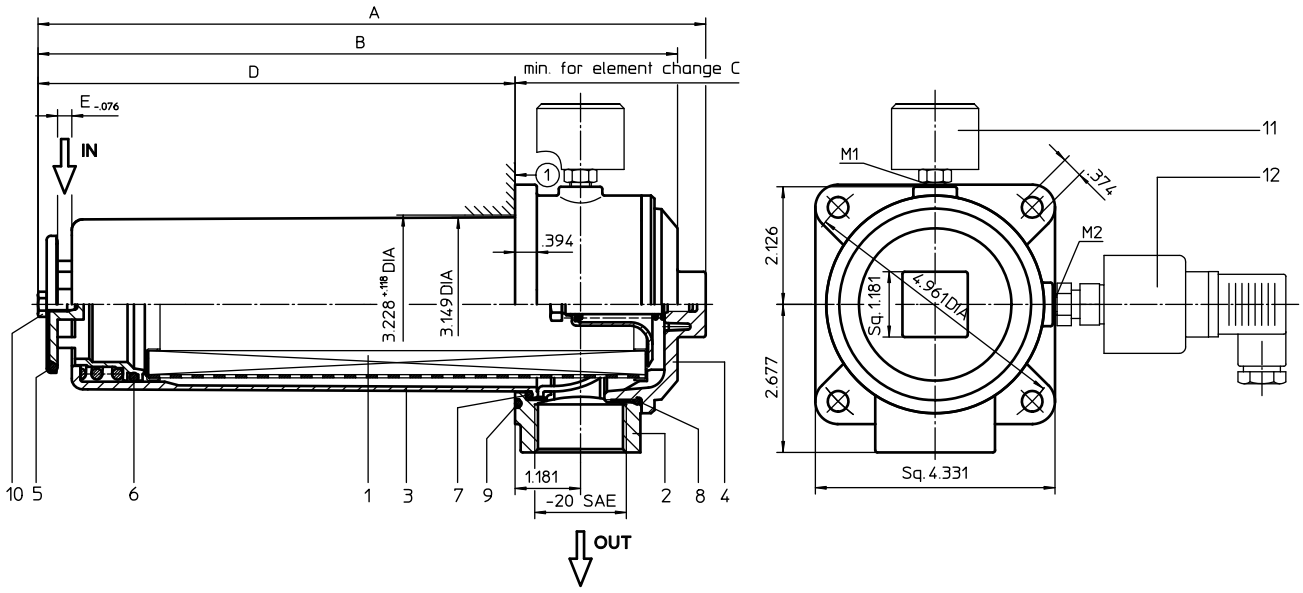
Series TSW 210-310



Dimensions:

type	TSW 210	TSW 310
connection	- 20 SAE	-20 SAE
A	12.09	15.47
B	11.57	14.96
C	11.42	14.76
D	8.62	12.00
E	.26	.30
weight	5.10 lbs.	6.60 lbs.
volume tank	.30 Gal.	.40 Gal.

mounting surface ①

surface quality .12 µin

flatness tolerance ⏥ .01"

Dimensions: inches

Designs and performance values are subject to change.

Powering Business Worldwide

Suction Filter
Series TSW 210-310

Description:

The TSW filters are directly mounted to the reservoir and connected to the suction-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.

Eaton filter elements are known for a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.

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

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

When removing the filter cover, a plate-shaped valve closes the suction-inlet of the filter bowl and prevents dirty oil from flowing into the tank. For cleaning, the filter bowl and the filter element can be taken out of the filter head.

1. Type index:

1.1. Complete filter: (ordering example)

TSW.	210.	10VG.	-.	B.	P.	-.	UG.	6.	-.	-.	O1.	E4
1	2	3	4	5	6	7	8	9	10	11	12	13

1 **series:**
TSW = suction filter for horizontal tank-mounting

2 **nominal size**: 210, 310

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:**
- = not specified

5 **filter element design:**
B = both sides open

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

7 **filter element specification:**
- = standard
VA = stainless steel

8 **process connection:**
UG = thread connection

9 **process connection size:**
6 = -20 SAE

10 **filter housing specification:**
- = standard

11 **internal valve:**
- = without
S = with by-pass valve Δp 4.1 PSI

12 **clogging indicator at M1:**
- = without
O1 = visual, see sheet-no. 1616
E4 = pressure switch, see sheet-no. 1616

13 **clogging indicator at M2:**
possible indicators see position 12 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)

01TS.	210.	10VG.	-.	B.	-.	-
1	2	3	4	5	6	7

1 **series:**
01TS. = suction filter element according to company standard

2 **nominal size:** 210, 310

3 - 5 / 7 see type index-complete filter

6 **seling material:**
- = without

Technical data:

design temperature:	14 °F to +212 °F
operating temperature:	14 °F to +176 °F
operating medium	mineral oil, other media on request
process connection:	thread connection
housing material:	Al-casting, glass 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/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:

$\Delta p_{assembly} = \Delta p_{housing} + \Delta p_{element}$
$\Delta p_{housing}$ = *(see Δp = f (Q) - characteristics)*

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

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

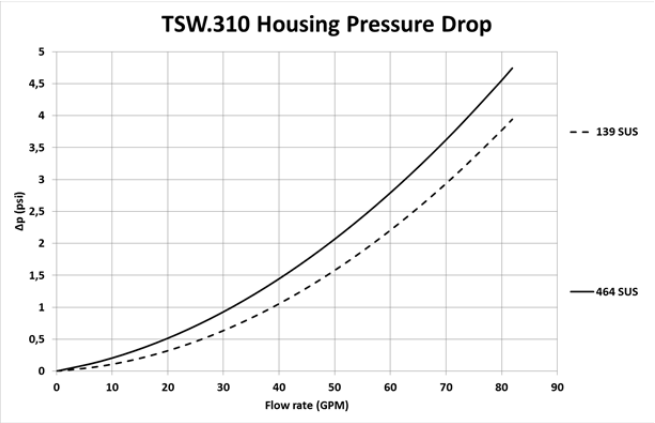
Material gradient coefficients (MSK) for filter elements

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.

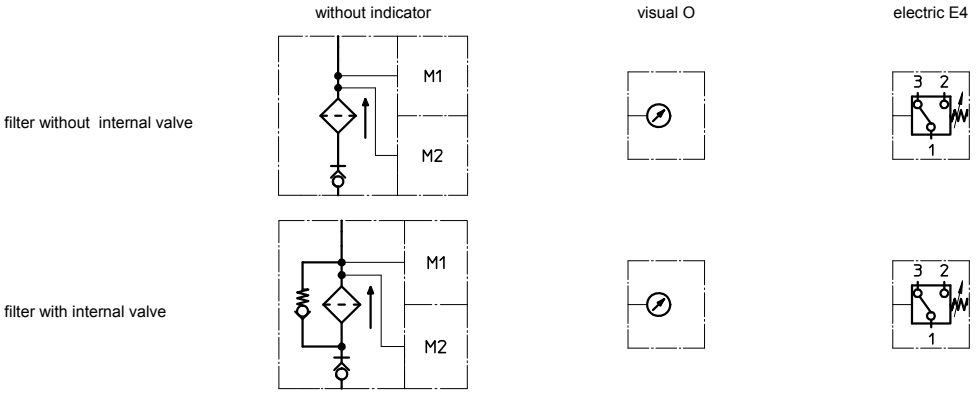
TSW	VG					G			P
	3VG	6VG	10VG	16VG	25VG	25G	40G	80G	10P
210	2.250	1.562	1.000	0.871	0.595	0.0826	0.0612	0.0571	0.443
310	1.628	1.130	0.724	0.630	0.430	0.0598	0.0443	0.0413	0.321

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.



Symbols:



Spare parts:

item	qty.	designation	dimension		article-no.	
			TSW 210	TSW 310		
1	1	filter element	01TS.210…	01TS.310…		
2	1	filter head			304423	
3	1	filter bowl			304518.1	
4	1	filter cover	M 90 x 2			
5	1	O-ring	53 x 4		309143 (NBR)	332434 (FPM)
6	1	O-ring	62 x 4		308045 (NBR)	311472 (FPM)
7	1	O-ring	75 x 3		302215 (NBR)	304729 (FPM)
8	1	O-ring	82 x 3		305191 (NBR)	305298 (FPM)
9	1	O-ring	88 x 3		304417 (NBR)	310266 (FPM)
10	1	sheet metal screw	B 6,3 x 13		316641	
11	1	clogging indicator, visual	O1		301722	
12	1	pressure switch, electric	E4		311016	

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

North America
44 Apple Street
Tinton Falls, NJ 07724
Toll Free: 800 656-3344
(North America only)
Tel: +1 732 212-4700

Europe/Africa/Middle East
Auf der Heide 2
53947 Nettersheim, Germany
Tel: +49 2486 809-0

Friedensstraße 41
68804 Altlußheim, Germany
Tel: +49 6205 2094-0

An den Nahewiesen 24
55450 Langenlonsheim, Germany
Tel: +49 6704 204-0

China
No. 3, Lane 280,
Linhong Road
Changning District, 200335
Shanghai, P.R. China
Tel: +86 21 5200-0099

Singapore
4 Loyang Lane #04-01/02
Singapore 508914
Tel: +65 6825-1668

Brazil
Av. Julia Gaioli, 474 – Bonsucesso
07251-500 – Guarulhos, Brazil
Tel: +55 11 2465-8822

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

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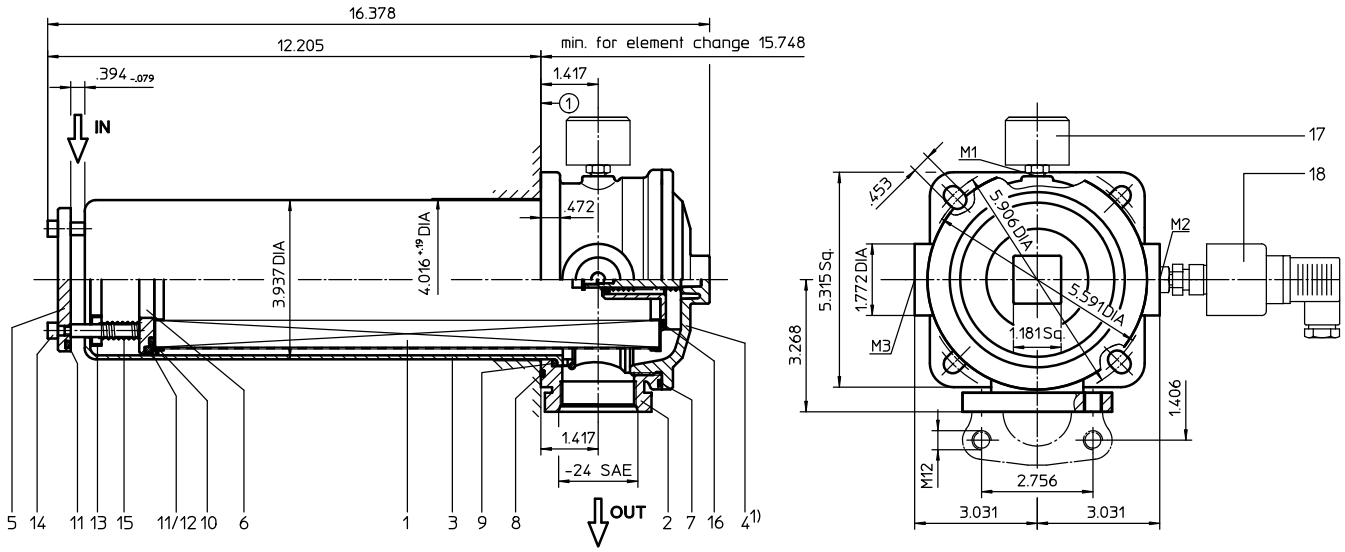
Series TSW 426



[1] The bypass valve is contained in the screw plug. For filters without a by-pass valve, the opening pressure is Δp 14.5 PSI.

mounting surface ①

surface quality .12 µin

flatness tolerance ▱ .01"

Weight: approx. 12.5 lbs.
Dimensions: inches

Designs and performance values are subject to change.

Powering Business Worldwide

Suction Filter
Series TSW 426

Description:

The TSW-filters are directly mounted to the reservoir and connected to the suction-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.

Eaton filter elements are known for a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.

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

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

When removing the filter cover, a plate-shaped valve closes the suction-inlet of the filter bowl and prevents dirty oil from flowing into the tank. For cleaning, the filter bowl and the filter element can be taken out of the filter head.

1. Type index:

1.1. Complete filter: (ordering example)

TSW.	426.	10VG.	-.	B.	P.	-.	UG.	7.	-.	-.	O1.	E4.	-
1	2	3	4	5	6	7	8	9	10	11	12	13	14

1 **series:**
TSW = suction filter for horizontal tank-mounting

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:**
- = not specified

5 **filter element design:**
B = both sides open

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

7 **filter element specification:**
- = standard
VA = stainless steel

8 **process connection:**
UG = thread connection
FS = SAE-flange 3000 PSI

9 **process connection size:**
7 = -24 SAE or 1 ½“ SAE

10 **filter housing specification:**
- = standard

11 **internal valve:**
- = without
S = with by-pass valve ∆p 4.1 PSI

12 **clogging indicator at M1:**
- = without
O1 = visual, see sheet-no. 1616
E4 = pressure switch, see sheet-no. 1616

13 **clogging indicator at M2:**
possible indicators see position 12 of the type index

14 **clogging indicator at M3:**
possible indicators see position 12 of the type index

1.2. Filter element: (ordering example)

01TS.	425.	10VG.	-.	B.	-.	-
1	2	3	4	5	6	7

1 **series:**
01TS. = suction filter element according to company standard

2 **nominal size:** 425

3 - 5 / 7 see type index-complete filter

6 **seling material:**
- = without

Technical data:

design temperature:	14 °F to +212 °F
operating temperature:	14 °F to +176 °F
operating medium	mineral oil, other media on request
process connection:	thread connection or 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:	.70 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 ∆p and the element ∆p and is calculated as follows:

$\Delta p_{assembly} = \Delta p_{housing} + \Delta p_{element}$
$\Delta p_{housing}$ = *(see ∆p = f (Q) - characteristics)*

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

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

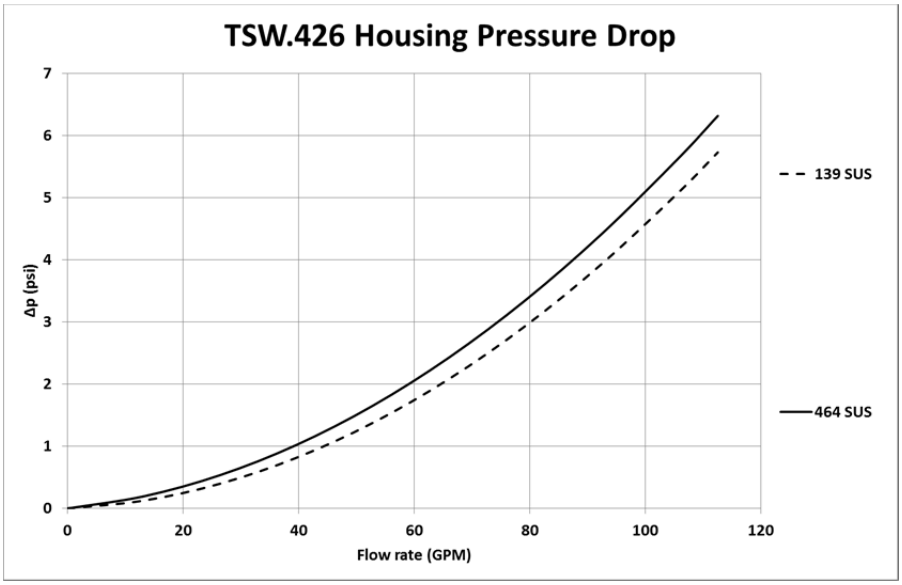
Material gradient coefficients (MSK) for filter elements

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.

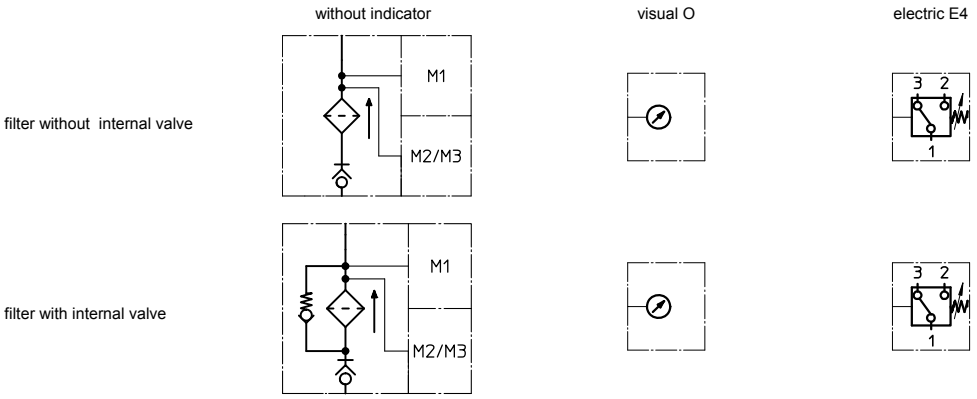
TSW	VG					G			P
	3VG	6VG	10VG	16VG	25VG	25G	40G	80G	10P
426	0.887	0.616	0.394	0.343	0.235	0.0226	0.0211	0.0144	0.188

∆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:



Spare parts:

item	qty.	designation	dimension	article-no.	
1	1	filter element	01TS.425…		
2	1	filter head	NG 426		
3	1	filter bowl	NG 426		
4	1	screw plug with by-pass	M 120 x 3		
	1	screw plug without by-pass	M 120 x 3		
5	1	valve disc		311892	
6	1	valve bushing		307548	
7	1	O-ring	128 x 3	304602 (NBR)	308140 (FPM)
8	1	O-ring	115 x 3	303963 (NBR)	307762 (FPM)
9	1	O-ring	98 x 4	301914 (NBR)	304765 (FPM)
10	1	O-ring	70 x 4	306253 (NBR)	310280 (FPM)
11	2	O-ring	76 x 4	305599 (NBR)	310291 (FPM)
12	1	sliding ring		307547	
13	1	pressure ring		307549	
14	1	fillister head cap screw	M 6 x 60	307534	
15	1	spring	1,6 x 10 x 53 x 12.5	311847	
16	1	O-ring	50 x 3	307398 (NBR)	314682 (FPM)
17	1	clogging indicator, visual	O1	301722	
18	1	clogging indicator, electric	E4	311016	

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

North America
44 Apple Street
Tinton Falls, NJ 07724
Toll Free: 800 656-3344
(North America only)
Tel: +1 732 212-4700

Europe/Africa/Middle East
Auf der Heide 2
53947 Nettersheim, Germany
Tel: +49 2486 809-0

Friedensstraße 41
68804 Altlußheim, Germany
Tel: +49 6205 2094-0

An den Nahewiesen 24
55450 Langenlonsheim, Germany
Tel: +49 6704 204-0

China
No. 3, Lane 280,
Linhong Road
Changning District, 200335
Shanghai, P.R. China
Tel: +86 21 5200-0099

Singapore
4 Loyang Lane #04-01/02
Singapore 508914
Tel: +65 6825-1668

Brazil
Av. Julia Gaioli, 474 – Bonsucesso
07251-500 – Guarulhos, Brazil
Tel: +55 11 2465-8822

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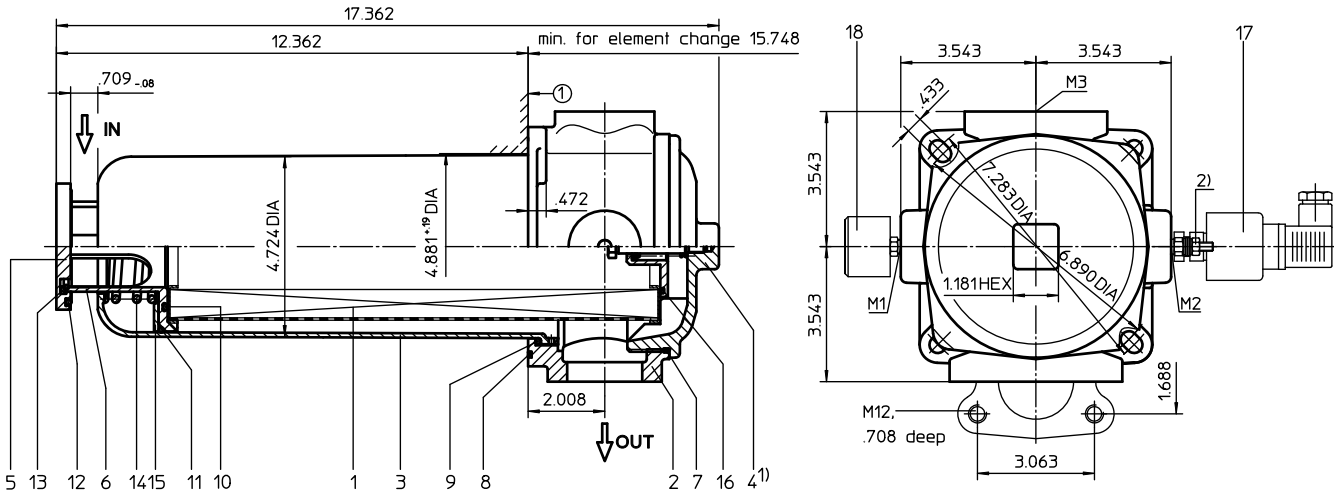
Series TSW 625



1) The bypass valve is contained in the screw plug. For filters without a by-pass valve, the opening pressure is Δp 14.5 PSI.

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

mounting surface ①

surface quality .12 µin

flatness tolerance ▱ .01"

Weight: approx. 12.0 lbs.
Dimensions: inches

Designs and performance values are subject to change.

Suction Filter
Series TSW 625

Description:

The TSW-filters are directly mounted to the reservoir and connected to the suction-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.

Eaton filter elements are known for a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.

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

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

When removing the filter cover, a plate-shaped valve closes the suction-inlet of the filter bowl and prevents dirty oil from flowing into the tank. For cleaning, the filter bowl and the filter element can be taken out of the filter head.

1. Type index:

1.1. Complete filter: (ordering example)

TSW.	625.	10VG.	-.	B.	P.	-.	FS.	8.	-.	-.	O1.	E4.	-
1	2	3	4	5	6	7	8	9	10	11	12	13	14

1 **series:**
TSW = suction filter for horizontal tank-mounting

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:**
- = not specified

5 **filter element design:**
B = both sides open

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

7 **filter element specification:**
- = standard
VA = stainless steel

8 **process connection:**
FS = SAE-flange 3000 PSI

9 **process connection size:**
8 = 2“

10 **filter housing specification:**
- = standard
IS11 = for filter head and filter cover, see sheet-no. 40530

11 **internal valve:**
- = without
S = with by-pass valve ∆p 4.1 PSI

12 **clogging indicator at M1:**
- = without
O1 = visual, see sheet-no. 1616
E4 = pressure switch, see sheet-no. 1616
PA = potential equalisation

13 **clogging indicator at M2:**
possible indicators see position 12 of the type index

14 **clogging indicator at M3:**
possible indicators see position 12 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)

01TS.	625.	10VG.	-.	B.	-.	-
1	2	3	4	5	6	7

1 **series:**
01TS. = suction filter element according to company standard

2 **nominal size:** 625

3 - 5 / 7 see type index-complete filter

6 **seling material:**
- = without

Technical data:

design temperature:	14 °F to +212 °F
operating temperature:	14 °F to +176 °F
operating medium	mineral oil, other media on request
process connection:	SAE-flange 3000 PSI
housing material standard:	filter head, filter cover AL / filter bowl glass fibre reinforced polyamide
housing material IS11:	filter head, filter cover GG / filter bowl carbon fibre reinforced polyamide
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	horizontal
volume tank:	1.0 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:

$\Delta p_{assembly} = \Delta p_{housing} + \Delta p_{element}$
$\Delta p_{housing}$ = *(see Δp = f (Q) - characteristics)*

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

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

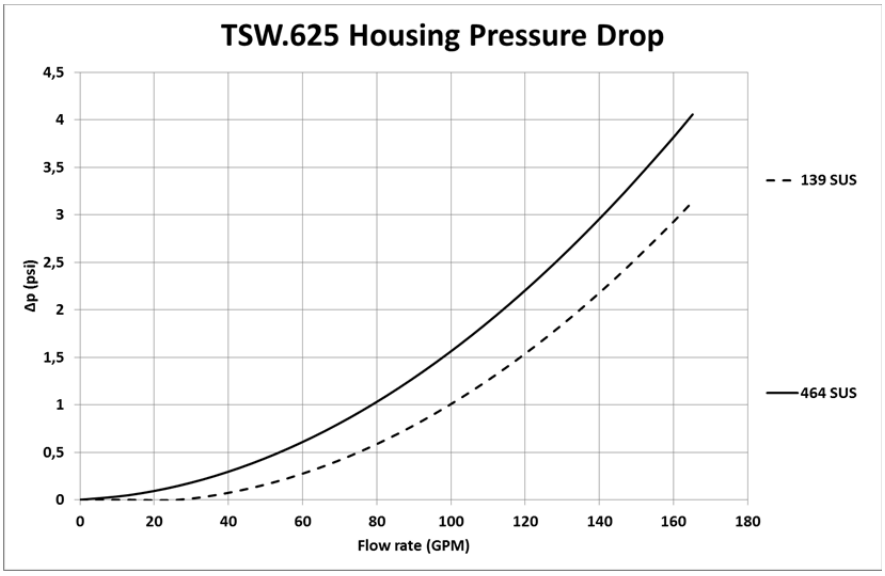
Material gradient coefficients (MSK) for filter elements

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.

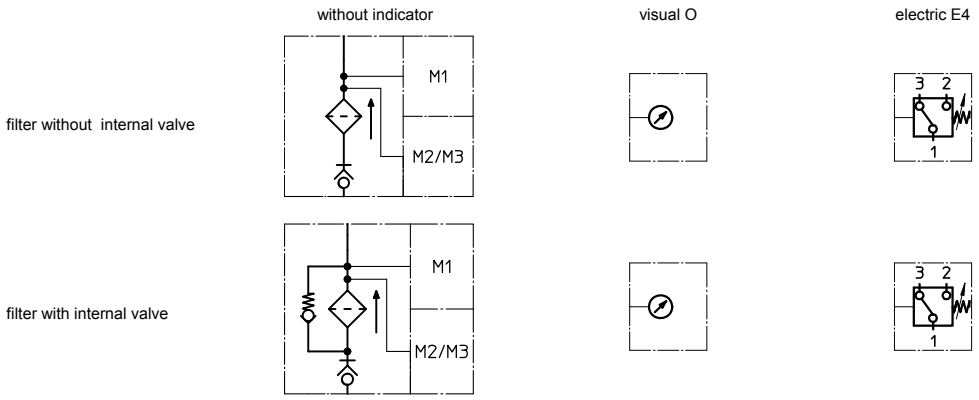
TSW	VG					G			P
	3VG	6VG	10VG	16VG	25VG	25G	40G	80G	10P
625	0.733	0.509	0.326	0.284	0.194	0.0170	0.0159	0.0109	0.160

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.



Symbols:



Spare parts:

item	qty.	designation	dimension	article-no.	
1	1	filter element	01TS.625...		
2	1	filter head	NG 625		
3	1	filter bowl	NG 625		
4	1	screw plug with by-pass valve	M 140 x 3		
	1	screw plug without by-pass valve	M 140 x 3		
5	1	valve disc		318740	
6	1	valve bushing		318739	
7	1	O-ring	135 x 3,5	318386 (NBR)	318387 (FPM)
8	1	O-ring	140 x 3	304604 (NBR)	307514 (FPM)
9	1	O-ring	120 x 4	305300 (NBR)	307991 (FPM)
10	1	O-ring	76 x 4	305599 (NBR)	310291 (FPM)
11	1	O-ring	104,37 x 3,53	304339 (NBR)	304390 (FPM)
12	1	O-ring	70 x 4	306253 (NBR)	310280 (FPM)
13	1	snap ring	B 55	311976	
14	1	spring	5,0 x 70 x 117 x 3,5	318742	
15	1	disc		318741	
16	1	O-ring	56 x 3	307398 (NBR)	314682 (FPM)
17	1	clogging indicator, visual	E4	311016	
18	1	clogging indicator, electric	O1	301722	

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
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North America
44 Apple Street
Tinton Falls, NJ 07724
Toll Free: 800 656-3344
(North America only)
Tel: +1 732 212-4700

Europe/Africa/Middle East
Auf der Heide 2
53947 Nettersheim, Germany
Tel: +49 2486 809-0

Friedensstraße 41
68804 Altlußheim, Germany
Tel: +49 6205 2094-0

An den Nahewiesen 24
55450 Langenlonsheim, Germany
Tel: +49 6704 204-0

China
No. 3, Lane 280,
Linhong Road
Changning District, 200335
Shanghai, P.R. China
Tel: +86 21 5200-0099

Singapore
4 Loyang Lane #04-01/02
Singapore 508914
Tel: +65 6825-1668

Brazil
Av. Julia Gaioli, 474 – Bonsucesso
07251-500 – Guarulhos, Brazil
Tel: +55 11 2465-8822

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