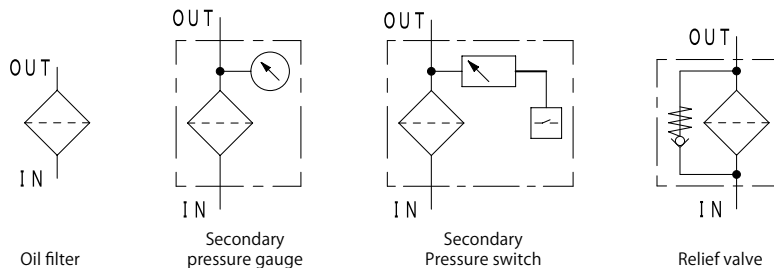


### Tank-top Suction Filter for saving space and cost



#### Characteristics

- Directly installable on tank-top (piping at Outlet side only)
- Light filter housing of aluminum alloy (steel housing for large models)
- Pressure gauge/switch for secondary pressure is available as an option
- Relief valve is available as an option
- Pipe connection type is "Rc threaded" and "flange" for standard model (option: companion flange)



★ Refer to P.222 for hydraulic graphic symbol of other combination of optional equipment.

#### SPECIFICATION

Max working pressure	MPa	0.5	Inner diameter					
Working temperature	Standard	°C	-10 ~ 90	06A	08A	10A	12A	16
	High temperature *1	°C	-10 ~ 150	Standard flow rate ☆ ℓ /min				
Measurable pressure range	MPa	-0.1 ~ 0	40	50	95	130	180	
Cracking pressure	MPa	0.04	Main material		ADC			
Allowable differential pressure of filter element	MPa	0.15	Body	Steel plate				
			Case	ADC				
Flow direction/Extract direction of filter element	IN → OUT / Upward		Coating	Non-coating				
			Case	Protective film treatment				
Weight *2			kg	2.5	3.7	8.0		

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm<sup>2</sup>/s, filtration rating: 150W, pressure drop: lower than 0.05MPa.

(Since it is adjusted by characteristic of each product, value can be different in some cases.)

#### MODEL CODE

(Model code example)

**G** - **TSF** - **16** - **60W** - **U V N**  
① ② ③

Code	Fluid type
Blank	Mineral oil
F	Phosphate ester fluid
G	Water glycol fluid
C	Fatty ester fluid
W	High water base fluid
S	Fuel (Kerosene, Gas oil, Diesel oil)
B	Brake fluid *3

Code	Inner diameter	
	IN	OUT
06A	Rc 3/4 (20A)	Rc1
08A	Rc1 (25A)	
10A	Rc1 1/4 (32A)	Rc1 1/2
12A	Rc1 1/2 (40A)	
16	Rc2 (50A)	Rc2

Code	Filtration rating
Wire gauze	
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh

Refer to P.15-16 for detail information of filter element.

Code	Option	Indicator position	
① Indicator			
Blank	Closing plug	06A~12A	16
U	Pressure gauge	On the upper cover	Opposite side of outlet
UR	(Secondary pressure)	Non	Right side as seen from outlet
UL		Non	Left side as seen from outlet
E	Electric contact type	On the upper cover	Opposite side of outlet
ER	(Secondary pressure)	Non	Right side as seen from outlet
EL		Non	Left side as seen from outlet
D	Electric contact type	On the upper cover	Opposite side of outlet
DR	(Micro capacity)	Non	Right side as seen from outlet
DL		Non	Left side as seen from outlet

② Relief valve	
K	Non
V	Relief valve

③ Companion flange	
Blank	Non
N	Companion flange

\* 1 Sealing parts: FKM, indicator is not available (Max oil temperature is pressure gauge or electric contact type : 90°C) \* 2 Weight without companion flange

\* 3 Electric contact type indicator is not available.

# FLOW RATE GRAPH

## Condition

Fluid type : ISO VG32  
Oil temperature : 40°C

(Density: 0.86,  
Kinematic  
viscosity: 32mm<sup>2</sup>/s)

## How to calculate of pressure drop

• Estimate pressure drop of filter assembly by following equation:

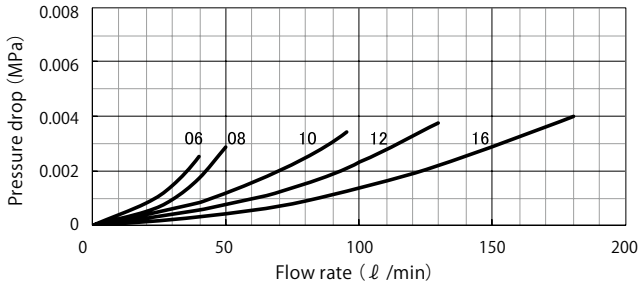
$$\text{Pressure drop of filter assembly} = \text{① Pressure drop of filter housing} + \text{② Pressure drop of filter element}$$

• Estimate pressure drop of filter assembly by following equation if required condition is different:

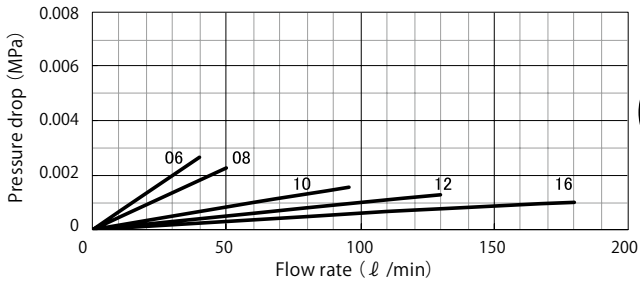
$$\begin{aligned} \text{Pressure drop of filter housing} &= \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86} \\ \text{Pressure drop of filter element} &= \frac{\text{Fluid Density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32} \end{aligned}$$

★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

### ① Pressure drop of filter housing



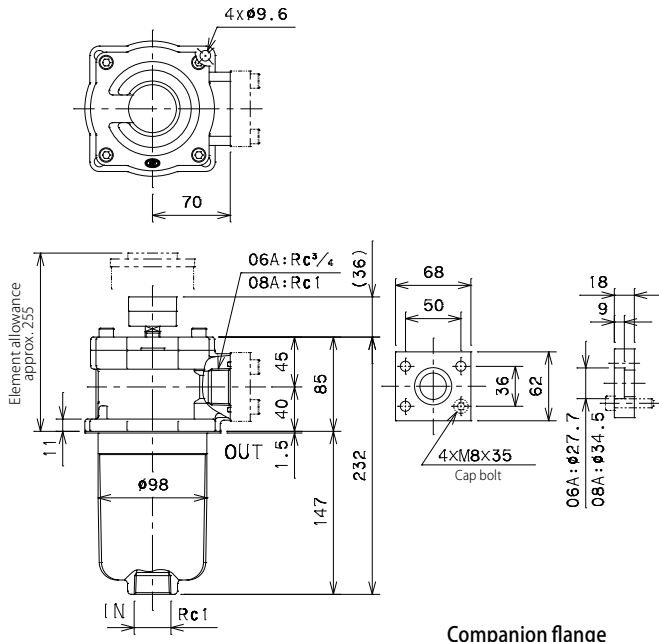
### ② Pressure drop of filter element



TSE

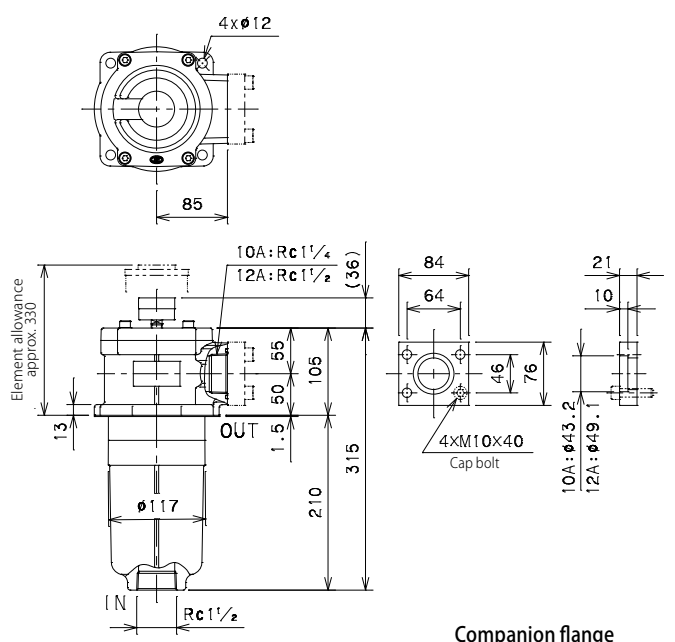
**TSF-06A,08A-□□-U□□**

P : Pressure gauge



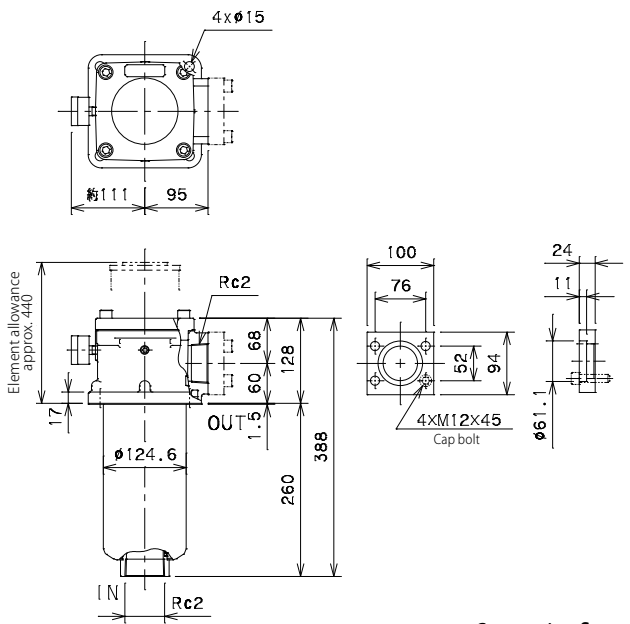
Companion flange  
TSF-06A,08A-□□-□□N

**TSF-10A,12A-□□-U□□**



Companion flange  
TSF-10A,12A-□□-□□N

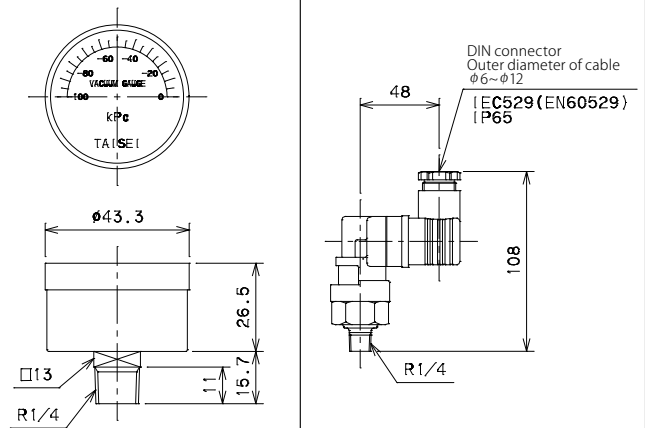
**TSF-16-□□-U□□**



Companion flange  
TSF-16-□□-□□N

**Secondary pressure type indicator part**

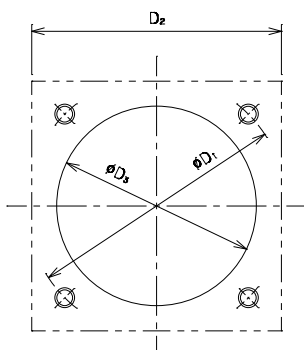
\* Common at all size



U : Pressure gauge  
TSF-□□-□□-U□□□

E,D : Electric contact type  
indicator  
TSF-□□-□□-E□,D□□□

**Recommended installation dimensions**

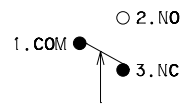


Mark	D1	D2	D3
TSF-06A,08A	135	125	105
TSF-10A,12A	156	150	120
TSF-16	190	170	134

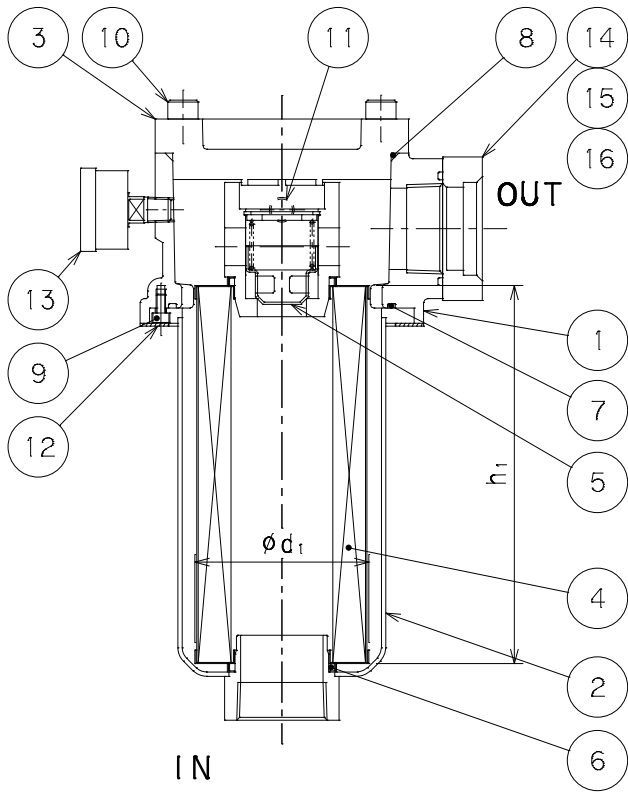
Model code	Working pressure		
	Visual observation signal (kPa)		Electric signal (MPa)
	Pressure range	Clogging	
UG	-100~0		
EG-03 EG-03D		0.03	0.03

<Micro switch specification>

Model code	Rated capacity	Contact diagram : 1C
EG-03	Resistance load	3A,250V AC
		3A,30V DC
	inductive load	2A,250V AC
		2A,30V DC
Micro capacity	100mA,125V AC	
	100mA,30V DC	



## CROSS SECTION



Cross section : TSF-16

## PARTS LIST

No.	Item	Qty
1	Body	1
2	Case	TSF-16 1
3	Cover	1
4	Element	1
5	Relief valve	1
6	O-ring	2
7	O-ring	TSF-16 1
8	O-ring	1
9	Cap bolt	TSF-16 4
10	Cap bolt	4
11	Closing plug	TSF-16 2
12	Packing	1
13	Indicator	1
14	Companion flange	1
15	Cap bolt	4
16	O-ring	1

## ELEMENT SIZE

Element Model code	Size(mm)		Weight (kg)
	$\phi d_1$	$h_1$	
P-TSF-06A,08A	76	145	0.30
P-TSF-10A,12A	92	209	0.52
P-TSF-16	105	258	0.86

## SEALING PARTS LIST

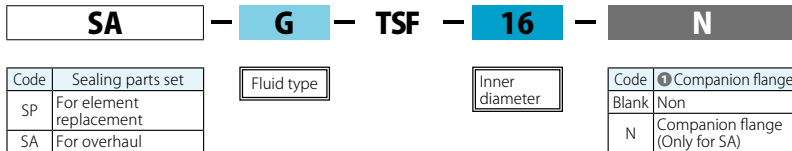
No.	6	7	8	12	16	Item code of sealing parts set*2				
						Material	SP No.: 6, 8	SA No.: 6, (7), 8, 12,	SA-N No.: 6, (7), 8, 12, 16	
Standard*1	JIS B2401 1A			Special packing non asbestos	JIS B2401 1A					( ) : For TSF-16
Model code										
TSF-06A,08A	P36		G90	t1.5x□113/φ105	G40	NBR	SSF001922	SSF001914	SSF001915	
			G115	t1.5x□136/φ120	G55	NBR	SSF002025	SSF002007	SSF002008	
TSF-10A,12A	G50					FKM	SSF002026	SSF002009	SSF002010	
TSF-16	G60	G130	G130	t1.5x□170/φ134	G70	NBR	SSF000039	SSF000031	SSF000035	
						FKM	SSF000406	SSF000398	SSF000402	

## MODEL CODE OF SPARE PARTS

### Replacement element (Model code example)



### Sealing parts set (Model code example)



★ Model code of replacement element exists two types: "Individual code" and "Common code", however it represents same product.

"Individual code": Used in drawings and nameplate as shown in <Model code example>.

"Common code": Used in vouchers and tag Refer to [Spare Element List] on P.152 for "Common code".

★ Refer to the [MODEL CODE] table on the previous page for code selection.

\* 1 Standard for NBR. For other material, conform to the standard.

\* 2 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.