

FILTRATION

Contributing to various industries

Taisei Kogyo Co.,Ltd.




TAISEI KOGYO Co., Ltd.


Thank you for your interest in TAISEI oil filters.

For safe use of filters, please make sure the following precautions and out-of-warranty provisions before adoption of our products.

Also prior to use, please read instruction manual thoroughly to ensure safe operation.

1. Warning

 Caution: Do not use filters with fluids other than mineral oil (unless specified for other fluids by fluid symbols). For use of fluids other than mineral oil, please follow instructions provided by TAISEI.

 Caution: Never use filters at a pressure exceeding its maximum operating pressure.

2. Out of Warranty

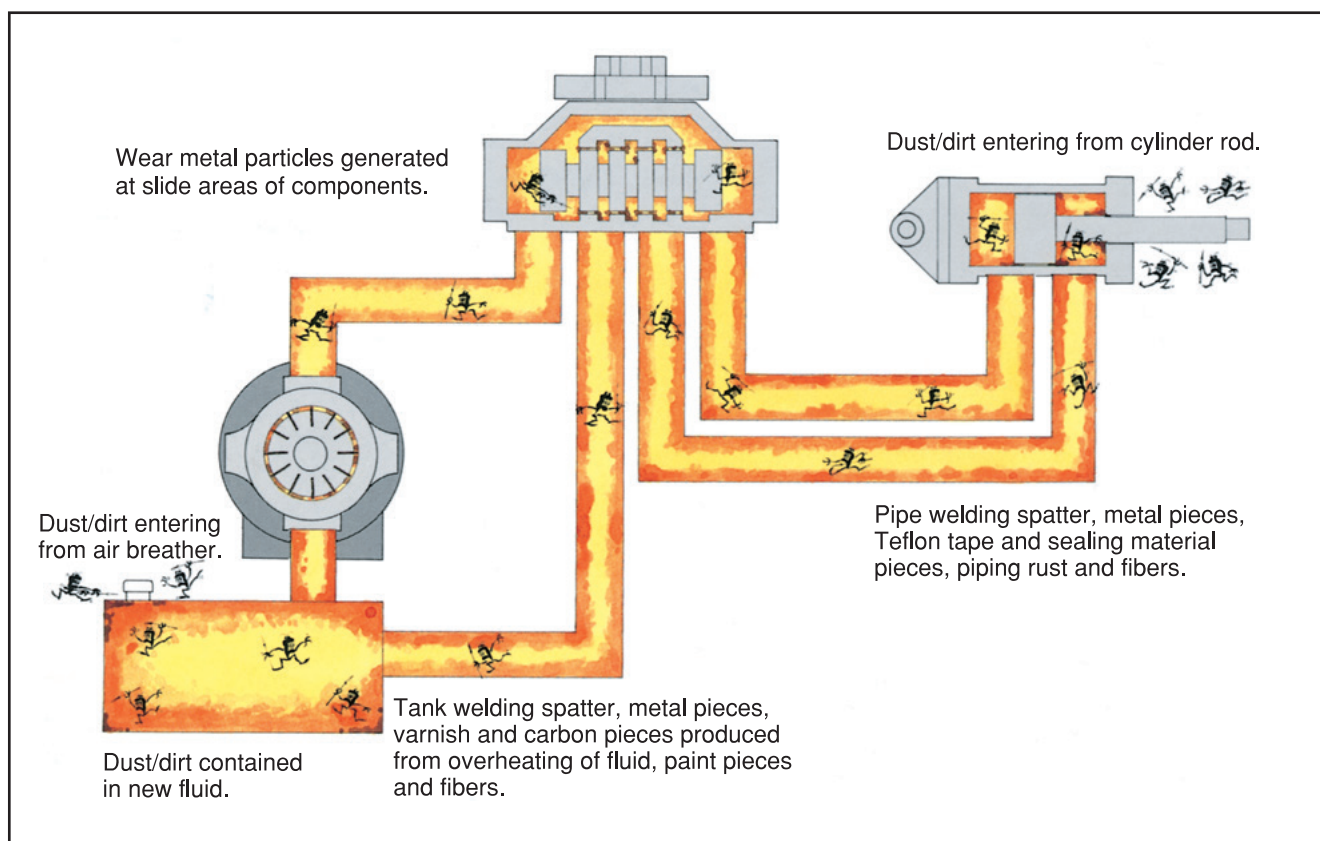
In case filters are used in different manner from the precautions described below, warranty is not applicable to such filters regardless of a length of use.

Symptom	Precautions
Filter damage	<ul style="list-style-type: none">(1) Fluids Do not use filters with fluids other than mineral oil (unless specified for other fluids by fluid symbols). For use of fluids other than mineral oil, please contact us.(2) Maximum Operating Pressure "Maximum operating pressure" in this catalogue indicates highest pressure which each filter case can withstand in use. Filters may be damaged for the use of exceeding the specified maximum pressure. For hydraulic circuits that are subjected to cyclic pressure fluctuations, maximum operating pressure is not the set pressure of the system, but its peak pressure.(3) Operating Temperature Range Fluid temperature: 0 to 90°C, Ambient temperature: 0 to 80°C(4) For Filter Elements, guaranteed values of maximum differential pressure are as follows. Suction Filter: 0.15 MPa Line Filter: Standard 0.7 MPa High pressure type: 21 MPa Please do not exceed above values.(5) Protective Device for Filter Element Use an indicator if a selected filter does not have relief valve. If neither one is used, monitor clogging status on filter element with a pressure gauge or pressure (differential pressure) switch to protect element from damage.(6) Reverse Flow Prevent reverse flow in system since it causes problems such as damages to filter elements. Install filters correct way in regards to "IN" and "OUT".(7) Air Bleed Prior to using filters with air bleed such as manifold type, release air completely ensuring safety.
Leakage	<ul style="list-style-type: none">(8) Indicators are shipped in separate packages to avoid damages in transit. When installing an indicator, remove the cap from indicator mount and tighten the indicator to a specified torque. Insufficient tightening causes leakage.
Degradation of performance Adverse influence to system others	<ul style="list-style-type: none">(9) Replacement of Filter Element Continuing use of clogged filters with exceeding specified value ("red" color of indicator) affects adverse influences onto hydraulic system for not maintaining their functions. Replace clogged elements immediately.(10) Reuse of Filter Elements Paper elements are not reusable. Wire and Notch Wire elements are cleanable and reusable. Ultrasonic cleaning are required for 5, 10, 20UW.

► Hydraulic Systems Are Contaminated.

Hydraulic systems are contaminated by dirt and foreign matter. Contaminants circulate in the system causing unexpected failure or wear of components. Furthermore, they accelerate contamination resulting in "chain reaction of wear" where contaminants generate more contaminants.

Hydraulic filters are essential equipment in hydraulic systems as they eliminate "contaminants," a formidable enemy to the system, and improve the reliabilities and prolong the service life of the systems.

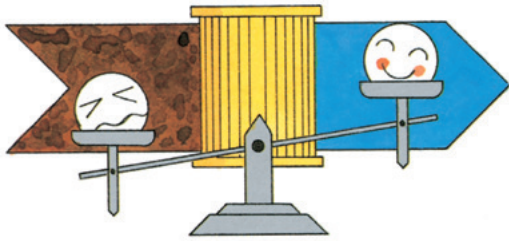


► Hydraulic Filters Protect Systems from Contamination

High performance filters capable of removing fine particles of $1\mu\text{m}$ to $5\mu\text{m}$ called silt are required to prevent wear of hydraulic components.

TAISEI uses its original technologies to develop and manufacture various hydraulic filter media. The use of these filters helps prolong the service life of hydraulic components by preventing the chain reaction of wear, not to mention maintaining the cleanliness of hydraulic fluid.





Evaluation of Filter Performance

Good filters eliminate a large number of particles. Contaminating particles in hydraulic fluid are captured by the filter, decreasing the number of particles that go to the downstream and increasing the filtration ratio (β ratio).

For example, $\beta_3 = 100$ means that if the total number of particles larger than $3\mu\text{m}$ in the upstream of the filter is 100,000 particles, it is reduced to 1,000 particles in the downstream.

This means that taking one pass filtration as an example, when NAS Class 12 oil is transferred from a drum to a tank, its cleanliness after it has passed the filter is NAS Class 3 to 4. For accurate evaluation of the β ratio, the ISO-4572 Multipass Method is used, which requires the use of a test stand.

ISO = Multipass Filter Test Stand (ISO-4572 Multipass Filter Test Method)



$$\text{Filtration ratio } (\beta_\mu) = \frac{\text{Total number of particles larger than } xx \mu\text{m in upstream of filter}}{\text{Total number of particles larger than } xx \mu\text{m in downstream of filter}}$$

TAISEI Filter Media and β Ratios

- The β ratio is based on ISO-4572 Multipass Filter Test Method.
- Filtration efficiency:
 $\beta_\mu = 10 \dots 90\%$
 $\beta_\mu = 75 \dots 98.7\%$
 $\beta_\mu = 200 \dots 99.5\%$
- TAISEI expresses $\beta_\mu \geq 200$ media as Contole 3(C), 8(C) and 25(C).
- General filter paper (nominal) is based on JIS-B-8356 Hydraulic Filters. (See "Filtration Size Test")

Filter Media \ β ratio	β_μ			
	β_3	β_6	β_8	β_{20}
3 microns(3C)	>200	>600	>3000	>3000
8 microns(8C)	—	> 75	>200	>1000
※Nominal 10 microns(10U)	—	—	6	10
※Nominal 20 microns(20U)	—	—	1.5	3

※Nomial β ratios are for reference only.

Cleanliness of Hydraulic Fluids

Cleanliness of hydraulic fluids is evaluated with HIAC automatic particle counter by measuring particle diameter and the number of particles. Generally it is expressed in NAS or ISO.

NAS 1638 Cleanliness Code (Number of ACFTD particles in 100 ml sample)

Class \ Particle dia. μm	00	0	1	2	3	4	5	6	7	8	9	10	11	12
5~15	125	250	500	1,000	2,000	4,000	8,000	16,000	32,000	64,000	128,000	256,000	512,000	1,024,000
15~25	22	44	89	178	356	712	1,425	2,850	5,700	11,400	22,800	45,600	91,200	182,400
25~50	4	8	16	32	63	126	253	506	1,012	2,025	4,050	8,100	16,200	32,400
50~100	1	2	3	6	11	22	45	90	180	360	720	1,440	2,880	5,760
>100	0	0	1	1	2	4	8	16	32	64	128	256	512	1,024

ISO 4406-99 Cleanliness Code (Number of ISO-MTD particles in 1 ml sample)

ISO No.	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Number of particles	50,000,000	2,500,000	1,300,000	640,000	320,000	160,000	80,000	40,000	20,000	10,000	5,000	2,500	1,300	640	320
ISO No.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Number of particles	160	80	40	20	10	5	2.5	1.3	0.6	0.3	0.15	0.08	0.04	0.02	>0.02

Example)

NAS		
	Number of particles in 100ml	NAS Class
Particles of 5~15 μm	8,000	→ Class 5
Particles of 15~25 μm	3,000	→ Class 7
Particles of 25~50 μm	240	→ Class 5
NAS class of sample		Class 7

4 μm / 6 μm / 14 μm (c)

↓
ISO code derived from the number of particles of the above diameters

ISO		
	Number of particles in 1ml	ISO code
Particles of 1~4 μm	19	→ 12
Particles of 1~6 μm	48	→ 14
Particles of 1~14 μm	128	→ 15
ISO code of sample		12/14/15

Filter Selection

- Select a filter based on appropriate location in system and operating pressure.
- All of the operating pressures shown in this catalog are maximum operating pressures.
- Filter connection:
Piping T type: Directly connects piping by use of thread or flange.
Manifold type: Directly connects to a manifold block.
- Materials of filter components vary according to hydraulic fluids to use. Symbols of fluids are as follows:
Mineral oil: Standard (No symbol)
Phosphate ester-based fire resistant oil: F
Water glycol-based fire resistant oil: G
These symbols are affixed to model code. For details, see following pages on each model. For fluids other than the above oils, please contact us.
- Select a filter that is capable of eliminating particles of sizes near the clearance of hydraulic components.

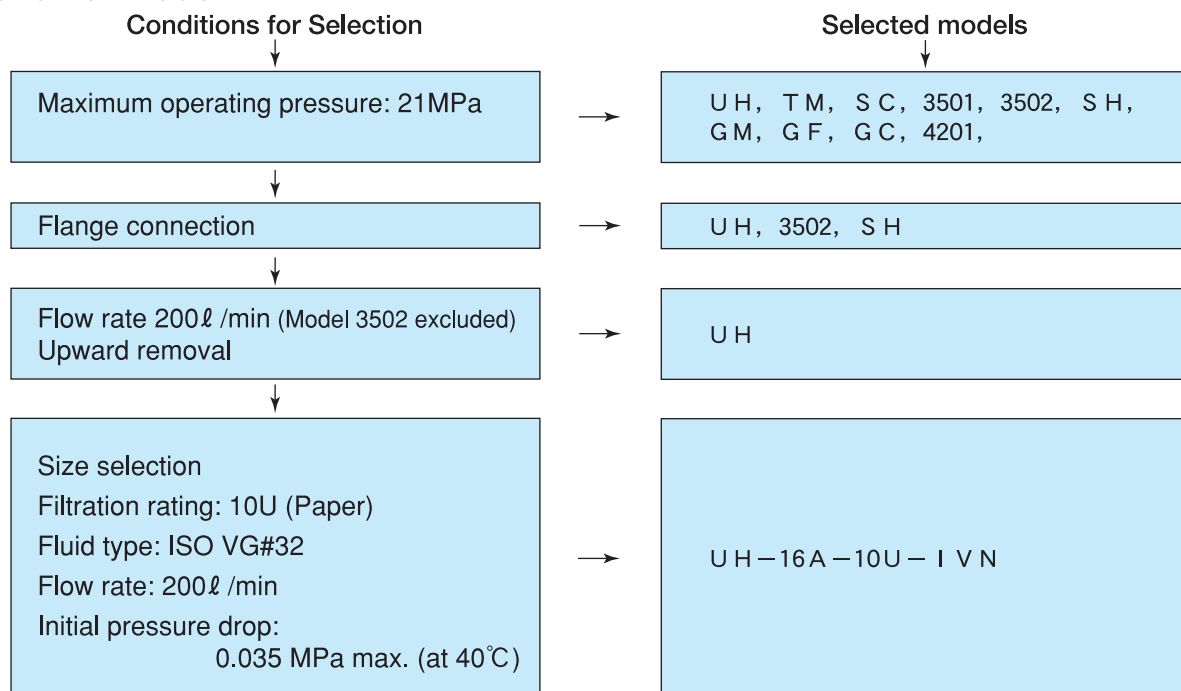
Conditions of use to be checked

Location of installation (suction, inline, etc.)	Initial pressure drop
Maximum operating pressure	Filtration rating, filter media
Flow rate (normal, max)	Options
Fluid type	Type of filter (single, duplex, piping method, etc.)
Operating (selected) temperature and temperature range	

Example of Selection

Location of installation: Discharge side of pump	Initial pressure drop: 0.035 MPa max. (at 40°C)
Maximum operating pressure: 21MPa	Filtration rating, filter media: 10U (paper)
Flow rate: 200ℓ /min	Options: Indicator (visual observation type), relief valve
Fluid type: ISO VG#32	Type of filter: Single type, upward removal, flange connection
Fluid temperature: 40°C (10 to 50°C)	

Selection of Model



From the above conditions, the model to select is UH-16A-10U and considering the options, the model that is finally selected is "UH-16A-10U-IVN."

- To request for filter selection, please fill out "Request for Filter Selection" on the last page of this catalog and send it to TAISEI. We will inform you results of selection in due course.

Glossary

Nominal filtration rating

Filtration rating that is indicated by filter manufacturers.

TAISEI indicates the rating based on "Filtration Size Test" in JIS-B-8356.

Absolute filtration rating

Diameter of the largest hard spherical particle found in downstream of a filter when hard spherical particles are forced to pass through the filter once under specified test conditions. (Maximum pore size of filter element)

Maximum operating pressure

Maximum operating pressure at which filter can be used. (This is not set pressure of system, but pressure that actually rises, including surge peak pressure.)

Standard flow rate

This is indicated as follows as a guide for selection:

At viscosity 32 cSt

	Suction Filter	Low/Mid Pressure Line	High Pressure Line
Filtration rating	150W,K	10U	
Pressure drop	0.005MPa	0.05MPa	0.07MPa

Flow rate indicated on each model is based on the above. If filtration rating and viscosity are different, standard flow rate becomes different.

※Some models don't meet the above conditions.

Contole 3, 8, 25 (3C, 8C, 25C)

Filter media having a β ratio greater than 200 when tested in accordance with the Multipass Filter Test (ISO 4572).

Indication of filtration rating

C: **Contole** 3, 8, 25

CH: **Contole** 3, 8, 25 and maximum differential pressure 21 MPa

U: Paper of nominal filtration rating

W: Wire gauge of nominal filtration rating, indicated by mesh

UW: Wire gauge of nominal filtration rating, indicated by microns

K: Notch wire of nominal filtration rating, indicated by mesh

UK: Notch wire of nominal filtration rating, indicated by microns

High pressure filter element

Filter elements that can withstand a differential pressure up to 21 MPa among line filters of 14 MPa or over.

Indicator

A device to indicate the degree of clogging.

Indicators are largely classified to I type (visual observation) and E type (electric contact).

E type indicator will output signals activating built-in micro switch when differential pressure reaches set value.









Relief valve

Pressure relief valve that protects a filter element from damage when the element is becoming clogged causing differential pressure rise.

◆Notes

- Photographs in this catalog may differ from actual products in detail.
- Figures in this catalog are representative figures and may slightly be different depending on inner diameters.
- Some photographs and figures show filters equipped with additional options such as indicator, relief valve and companion flange.
- Part lists, except for SFG, in this catalog apply to mineral oil.
Materials and others may vary for use of fluids other than mineral oil.

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Type		Model	Size	Design Pressure (MPa)						
				0	10	20	30	40		
Suction Filter	Without case		SFN	02,03	Rc1/4,Rc3/8	-0.1~0				
				04,06	Rc1/2,Rc3/4	-0.1~0				
				08	Rc1	-0.1~0				
				10	Rc1 1/4	-0.1~0				
				12,16	Rc1 1/2 ,Rc2	-0.1~0				
				20,24	Rc2 1/2 ,Rc3	-0.1~0				
			SFT	02,03	Rc1/4,Rc3/8	-0.1~0				
				04,06	Rc1/2,Rc3/4	-0.1~0				
				08	Rc1	-0.1~0				
				10	Rc1 1/4	-0.1~0				
				12,16	Rc1 1/2 ,Rc2	-0.1~0				
				20,24	Rc2 1/2 ,Rc3	-0.1~0				
			SFG	02,03	Rc1/4,Rc3/8	-0.1~0				
				04,06	Rc1/2,Rc3/4	-0.1~0				
				08	Rc1	-0.1~0				
				10	Rc1 1/4	-0.1~0				
				12,16	Rc1 1/2 ,Rc2	-0.1~0				
				20,24	Rc2 1/2 ,Rc3	-0.1~0				
		SFR	08	25A	-0.1~0					
			10	32A	-0.1~0					
			12,16	40A,50A	-0.1~0					
			20,24	65A,80A	-0.1~0					
	With case		VN	03,04	10A,15A	-0.1~0.5				
				06,08	20A,25A	-0.1~0.5				
				10,12	32A,40A	-0.1~0.5				
				16	50A	-0.1~0.5				
				20,24	65A,80A	-0.1~0.5				
				28,32	90A,100A	-0.1~0.5				
		VM	03,04	10A,15A	-0.1~0.5					
			06,08	20A,25A	-0.1~0.5					
			10,12	32A,40A	-0.1~0.5					
		ISH	03,04	10A,15A	-0.1~0.5					
			06,08	20A,25A	-0.1~0.5					
			10,12	32A,40A	-0.1~0.5					
			16	50A	-0.1~0.5					
			20,24	65A,80A	-0.1~0.5					
	TSF	06,08	20A,25A	-0.1~0.5						
		10,12	32A,40A	-0.1~0.5						
		16	50A	-0.1~0.5						

Explanation of symbols

Notch Wire

Cleanable and reusable notch wire element used (or usable).

SUS Wire

Cleanable and reusable wire element used (or usable).

G Thread **Flange** Rc thread, G thread, flange connection.

Mount Flange
[Movable]

Movable mount flange mountable.

3C

8C

25C

3C, 8C and 25C elements ($\beta\mu\geq 200$) usable.

High Press.
Element

21 MPa high pressure element usable.

Standard Flow Rate (l/min)							Filtration Rating (μm)							Features, Options			Page
0	100	200	300	400	500	600	700	250	100	75	50	40	20	10	8	3	
~16.7								250	75								1
~41								250	75								
~60								250	75								
~160								250	75								
~270								250	75								
~530								250	75								3
~17								250	75								
~51.5								250	75								
~91								250	75								
~206								250	75								
~337								250	75								5
~817								250	75								
~17								250	75								
~52								250	75								
~91								250	75								
~210								250	75								7
~340								250	75								
~817								250	75								
~91								250	75								
~206								250	75								
~337								250	75								9
~817								250	75								
~35.5								250	75								
~107								250	75								
~250								250	75								11
~395								250	75								
~795								250	75								
~1310								250	75								
~30								250	75								
~90								250	75								13
~205								250	75								
~27								250	75								
~92								250	75								
~150								250	75								
~210								250	75								15
~475								250	75								
~48								250	75								
~124								250	75								
~145								250	75								

Indicator
IDiff. PI

Differential pressure type clog detecting indicator mountable (or mounted as standard).

Indicator
IP.Gaugel

Clog detecting pressure gauge mountable (or mounted as standard).

Relief Valve

Element protective relief valve mountable (or mounted as standard).

Magnet

Magnet mountable (or mounted as standard).




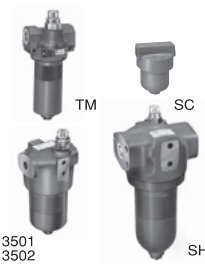





Scraper

Cleaning feature by scraper provided.

Blow-off


















Cleaning feature by blow off provided.

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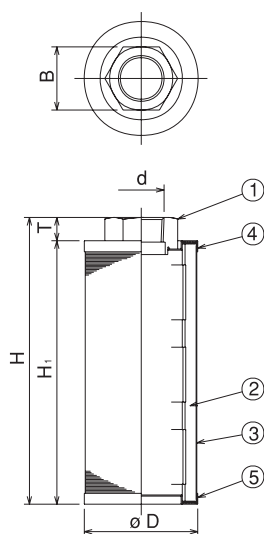
Type		Model		Size		Design Pressure (MPa)				
						0	10	20	30	40
Line Filter	T type Downward removal	 LND LN	LND	02~08	Rc1/4~Rc1	0~0.5				
				LN	10,12	Rc1 1/4 ,Rc1 1/2	0~0.5			
		16	Rc2		0~0.5					
		20,24	Rc2 1/2 ,Rc3		0~0.5					
			351 352	03,04	10A,15A	0~3.5				
				06,08	20A,25A	0~3.5				
				10,12	32A,40A	0~3.5				
	16			50A	0~3.5					
	20,24			65A,80A	0~3.5					
	T type Upward removal		UL	03,04	10A,15A	0~3.5				
				06,08	20A,25A	0~3.5				
				10,12	32A,40A	0~3.5				
				16	50A	0~3.5				
				20,24	65A,80A	0~3.5				
			UM	03,04	10A,15A	0 7				
				06,08	20A,25A	0 7				
				10,12	32A,40A	0 7				
				16	50A	0 7				
				20,24	65A,80A	0 7				
		UH	03,04	10A,15A	0 21					
			06,08	20A,25A	0 21					
	10,12		32A,40A	0 21						
	16		50A	0 21						
	T type Downward removal	 TM SC 3501 3502 SH	TM	04,06	Rc1/2,Rc3/4	0 21				
			SC	01,02	Rc1/8,Rc1/4	0 21				
			3501 3502	03,04	10A,15A	0 35				
				06	20A	0 35				
			SH	08	25A	0 35				
				10	32A	0 35				
				12	40A	0 35				
Gasket type Upward removal		GM	04	15A equivalent	0 21					
		GF	03	10A equivalent	0 25					
			06	20A equivalent	0 25					
			08	25A equivalent	0 25					
		GC	12	40A equivalent	0 35					
Modular type		MVF	01,03	φ 7, φ 9	0 25					
Steel-made		TL	40~200	40A~200A	0~1					
Bypass		LCN	12,16	40A,50A	0~3					
Scraper		AK CFK	04,06	15A,20A	0~1					
			08,10	25A,32A	0~1					
			12,16	40A,50A	0~1					

Standard Flow Rate (l/min)							Filtration Rating (μm)							Features, Options					Page				
0	100	200	300	400	500	600	700	250	100	75	50	40	20	10	8	3							
~70							250							8		8C	25C	Notch Wire	SUS Wire	RcThread	17		
~160							250							8		Magnet							
~260							250							8		8C	25C	Notch Wire	SUS Wire	RcThread	19		
~600							250							8		Magnet							
~44							250							3		3C	8C	25C	SUS Wire	RcThread	21		
~100							250							3		Flange	Indicator IDiff. PI	Relief Valve	Magnet				
~180							250							3									
~360							250							3									
~660							250							3									
~44							250							3		3C	8C	25C	Notch Wire	SUS Wire			
~100							250							3		RcThread	Flange	Indicator IDiff. PI	Relief Valve	Magnet	23		
~180							250							3									
~360							250							3									
~660							250							3									
~44							250							3		3C	8C	25C	Notch Wire	SUS Wire			
~100							250							3		RcThread	Flange	Indicator IDiff. PI	Relief Valve	Magnet			
~180							250							3							25		
~360							250							3									
~660							250							3									
~44							250							3		3C	8C	25C	Notch Wire	SUS Wire			
~100							250							3		RcThread	Flange	Indicator IDiff. PI	Relief Valve	Magnet			
~180							250							3									
~360							250							3							27		
~660							250							3									
~55							250							3		3C	8C	25C	Notch Wire	SUS Wire			
~125							250							3		High Press. Element	RcThread	Flange	Indicator IDiff. PI	Relief Valve			
~238							250							3		Magnet							
~433							250							3		3C	8C	25C	SUS Wire	High Press. Element	29		
~30							250							3		RcThread	Indicator IDiff. PI	Relief Valve					
~15							250							3		3C	8C	SUS Wire	RcThread	25C	31		
~55							250							3		3C	8C	SUS Wire	High Press. Element	G Thread	33		
~100							250							3		Flange	Indicator IDiff. PI	Relief Valve	25C				
~250							250							3		3C	8C	25C	SUS Wire	High Press. Element	35		
~340							250							3		G Thread	Flange	Indicator IDiff. PI	Relief Valve				
~400							250							3									
~35							250							3		3C	8C	SUS Wire	High Press. Element	Indicator IDiff. PI	37		
~27							250							3		Relief Valve	25C						39
~110							250							3		3C	8C	25C	SUS Wire	High Press. Element			
~230							250							3		Indicator IDiff. PI	Relief Valve						
~350							250							3		3C	8C	25C	SUS Wire	High Press. Element			
~350							250							3		Indicator IDiff. PI	Relief Valve						41
~350							250							3		3C	8C	SUS Wire	High Press. Element	Indicator IDiff. PI	43		
~30							105							3		3C	8C	25C	SUS Wire	Indicator IDiff. PI	45		
~3000							75							10		8C	25C	SUS Wire	Flange	Indicator IDiff. PI	47		
~600							20							3		Relief Valve						49	
~38							250							10		3C	8C	25C	SUS Wire	Flange			
~130							250							10		Indicator IDiff. PI	Relief Valve	Notch Wire	RcThread	Flange	Scraper	51	
~300							250							10									

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Type			Model		Size	Design Pressure (MPa)						
						0	10	20	30	40		
Return	Tank top		TRF	06,08	20A,25A	0~1						
				10,12	32A,40A	0~1						
				16	50A	0~1						
				20,24	65A,80A	0~1						
			TR	03,04	Rc3/8,Rc1/2	0~1						
					UR	06,08	20A,25A	0~1				
10,12	32A,40A	0~1										
Duplex	Steel-made		COS-H	04,06	15A,20A	0~2						
				08,10	25A,32A	0~2						
				12,16	40A,50A	0~2						
				20,24	65A,80A	0~2						
				28,32	90A,100A	0~2						
	Blow-off		BDV BCV	03,04	10A,15A	0~0.6						
				06	20A	0~0.6						
				08,10	25A,32A	0~0.6						
				12,16	40A,50A	0~0.6						
	Blow-off		BOS BCS	08,10	25A,32A	0~0.5						
				12,16	40A,50A	0~0.5						
				20,24	65A,80A	0~0.5						
				28,32	90A,100A	0~0.5						
				40,48	125A,150A	0~0.5						
Cartridge	 CS	 CF	 107	CS	04	Rc1/2	0~0.5					
				CF	06,08	Rc3/4,Rc1	0~0.5					
				107	10	Rc1 1/4	0~1					
Breather	Air	 AP	 FAB	 FA	 FU	AP	02~24,32,48	8A,100A,150A				
	FAB					35,50						
	FA					35,50						
	FU					50,75						
Indicator	Visual observation		ID,IA,IF									
	Electric contact		ED,EA,EF									
Filtration Unit	With pump	 750S	 400Z	 1500S-5060A	FP	400Z						
					750S							
					1500S-5060A							
Oil Refresher	With pump centrifugal separator	 1500S-1010	FP	1500S-1010								

Standard Flow Rate (l/min)		Filtration Rating (μm)		Features, Options		Page
0 100 200 300 400 500 600 700		250 100 75 50 40 20 10 8 3				
<div><div></div><div>~100</div><div></div></div> <div><div></div><div>~180</div><div></div></div> <div><div></div><div>~360</div><div></div></div> <div><div></div><div>~660</div><div></div></div>		<div><div></div><div>250</div><div>3</div></div> <div><div></div><div>250</div><div>3</div></div> <div><div></div><div>250</div><div>3</div></div> <div><div></div><div>250</div><div>3</div></div>		<div><div>3C</div><div>8C</div><div>25C</div><div>SUS Wire</div><div>Rc Thread</div></div> <div><div>Flange</div><div>Indicator IP Gauge</div><div>Relief Valve</div></div>		53
<div><div></div><div>~30</div><div></div></div>		<div><div></div><div>150</div><div>3</div></div>		<div><div>3C</div><div>8C</div><div>25C</div><div>SUS Wire</div><div>Rc Thread</div></div> <div><div>Indicator IP Gauge</div><div>Relief Valve</div></div>		55
<div><div></div><div>~90</div><div></div></div> <div><div></div><div>~220</div><div></div></div>		<div><div></div><div>250</div><div>3</div></div> <div><div></div><div>250</div><div>3</div></div>		<div><div>3C</div><div>8C</div><div>25C</div><div>SUS Wire</div><div>Rc Thread</div></div> <div><div>Indicator IDiff. PI</div><div>Relief Valve</div><div>Flange</div><div>Mount Flange (Movable)</div></div>		57
<div><div></div><div>~60</div><div></div></div> <div><div></div><div>~120</div><div></div></div> <div><div></div><div>~340</div><div></div></div> <div><div></div><div>~700</div><div></div></div> <div><div></div><div>~1400</div><div></div></div>		<div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div>		<div><div>8C</div><div>25C</div><div>Notch Wire</div><div>SUS Wire</div><div>Flange</div></div> <div><div>Indicator IDiff. PI</div><div>Magnet</div></div>		59
<div><div></div><div>~25</div><div></div></div> <div><div></div><div>~45</div><div></div></div> <div><div></div><div>~120</div><div></div></div> <div><div></div><div>~260</div><div></div></div> <div><div></div><div>~140</div><div></div></div> <div><div></div><div>~320</div><div></div></div> <div><div></div><div>~510</div><div></div></div> <div><div></div><div>~950</div><div></div></div> <div><div></div><div>~1300</div><div></div></div>		<div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div>		<div><div>Notch Wire</div><div>SUS Wire</div><div>Flange</div><div>Blow-off</div></div>		61
<div><div></div><div>~25</div><div></div></div> <div><div></div><div>~85</div><div></div></div> <div><div></div><div>~150</div><div></div></div>		<div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> <div><div></div><div>250</div><div>10</div></div> 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1. Installed inside a tank of mineral oil.
2. Stainless steel notch wire type.
3. Filtration rating of 60, 100, 150 and 200 mesh as standard.

Caution When mounting/dismounting the filter to and from a pipe, set a wrench on the hex part of the coupling.

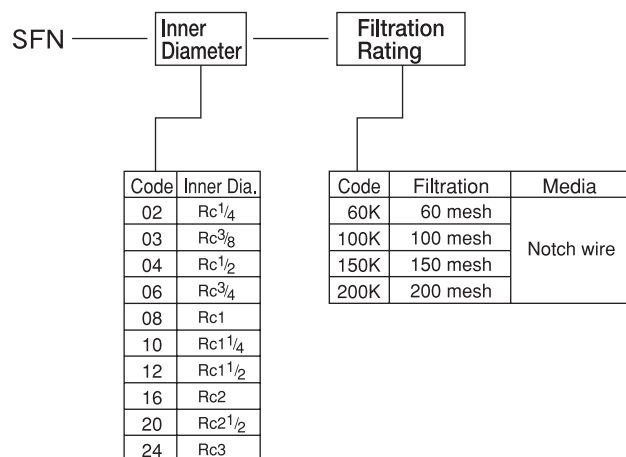
Part List

5	End plate	SECC	1	
4	End plate	SECC	1	
3	Notch wire	SUS304	1 unit	
2	Fin tube	A6063	1	
1	Coupling	A6063	1	
Part No.	Part Name	Material	Qty	Remarks

Dimensions and Standard Flow Rates

Symbol Model	Inner Dia. (d)	D	B	H	H ₁	T	Mass (kg)	Standard Flow Rate (ℓ /min)
SFN-02	Rc1/4	63	26	103	92	11	0.21	6.8
SFN-03	Rc3/8							16.7
SFN-04	Rc1/2		30	164	151	13	0.28	30
SFN-06	Rc3/4		36					41
SFN-08	Rc1	83	46	209	192	17	0.49	60
SFN-10	Rc1 1/4	104	55	230	212	18	1.02	160
SFN-12	Rc1 1/2	124	65	250.5	232.5		1.42	200
SFN-16	Rc2		75	332.5	312.5	20	1.77	270
SFN-20	Rc2 1/2	147	90	450	423	27	2.77	425
SFN-24	Rc3		Octagon 110				2.87	530

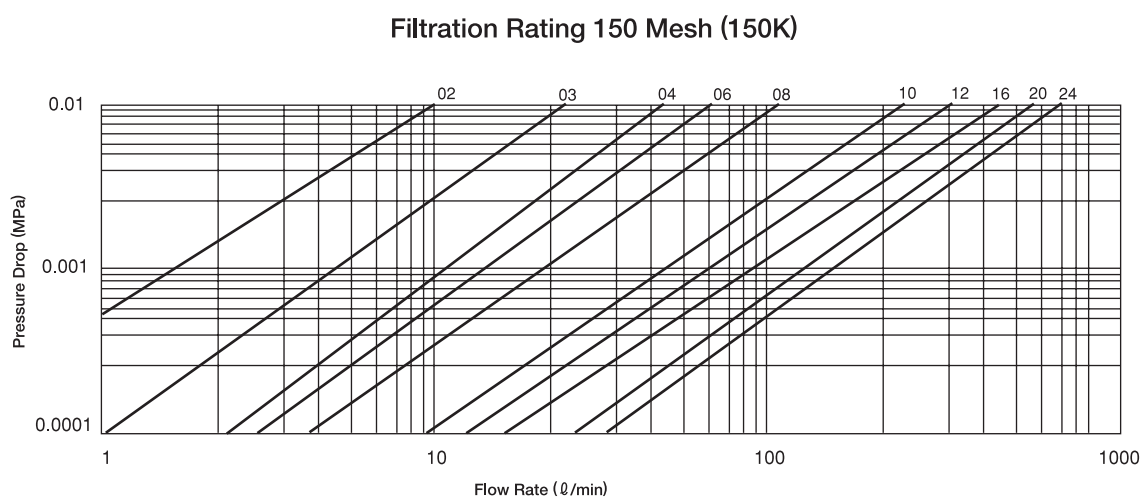
► Model Code

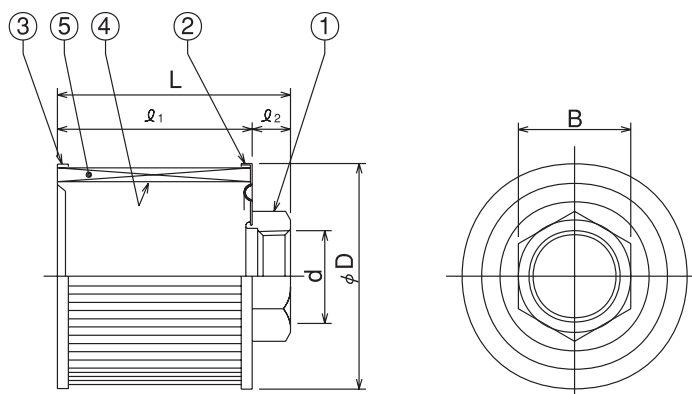


Coding Example
SFN-08-150K

► Flow Rate Chart

- ISO VG32
- Viscosity: 32 cSt (40°C)





1. Installed inside a tank of mineral oil.
2. A stainless steel wire type.
3. Filtration rating of 60, 100, 150 and 200 mesh as standard.

Caution When mounting/dismounting the filter to and from a pipe, set a wrench on the hex part of the coupling.

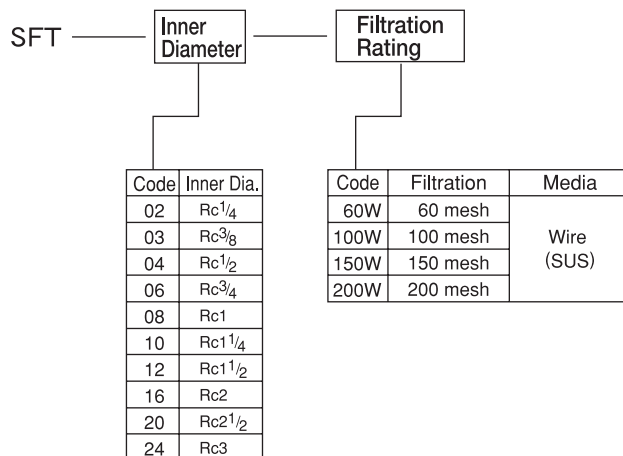
Part List

5	Wire gauge	SUS	1	
4	Inner tube	SECC	1	
3	End plate (Lower)	SECC	1	
2	End plate (Upper)	SECC	1	
1	Coupling	SS400	1	
Part No.	Part Name	Material	Qty	Remarks

Dimensions and Standard Flow Rates

Symbol Model	Inner Dia. (d)	φD	B	L	l ₁	l ₂	Mass (kg)	Standard Flow Rate (l /min)
SFT-02	Rc1/4	62.2	19	45	36	9	0.085	7
SFT-03	Rc3/8		22	46		10	0.085	17
SFT-04	Rc1/2		27	71	59	12	0.115	24.5
SFT-06	Rc3/4		32	72		13	0.115	51.5
SFT-08	Rc1	82	41	85	71	14	0.2	91
SFT-10	Rc1 1/4	104	50	87	71	16	0.325	140
SFT-12	Rc1 1/2	124	55	97.5	81.5		0.405	206
SFT-16	Rc2		70	130	110	20	0.59	337
SFT-20	Rc2 1/2	147	85	150	128	22	0.75	605
SFT-24	Rc3		100	152		24	0.95	817

► Model Code

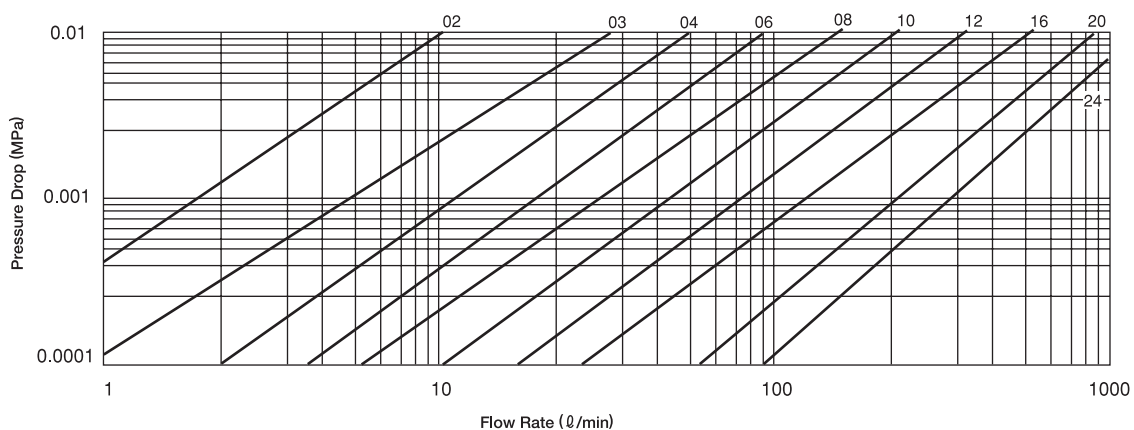


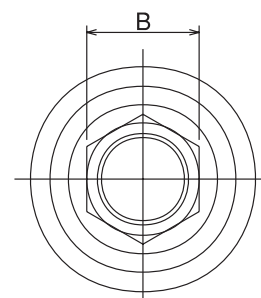
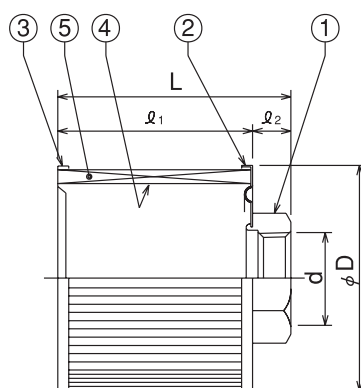
Coding Example
SFT-03-150W

► Flow Rate Chart

- ISO VG32
- Viscosity: 32 cSt (40°C)

Filtration Rating 150 Mesh (150W)





1. Installed inside a tank of fire resistant fluid.
2. All stainless steel construction.
3. Filtration rating of 60, 100, 150 and 200 mesh as standard.
4. Applicable fluids
 - Phosphate ester-based oil
 - Water glycol-based oil
 - Water

Caution When mounting/dismounting the filter to and from a pipe, set a wrench on the hex part of the coupling.

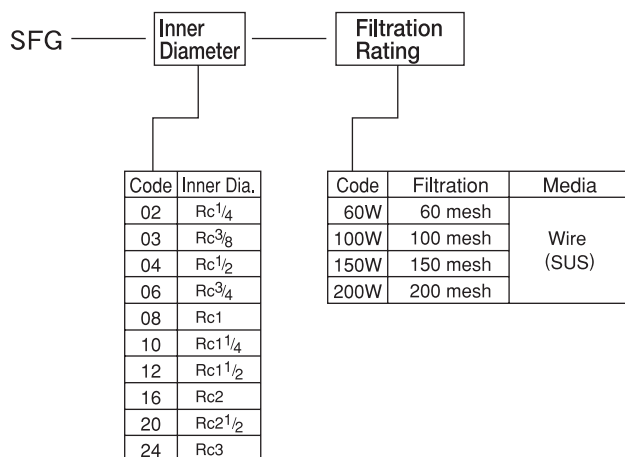
Part List

5	Wire gauge	SUS	1	
4	Inner tube	SUS304	1	
3	End plate (Lower)	SUS304	1	
2	End plate (Upper)	SUS304	1	
1	Coupling	SUS304	1	
Part No.	Part Name	Material	Qty	Remarks

Dimensions and Standard Flow Rates

Symbol Model	Inner Dia. (d)	$\varnothing D$	B	L	\varnothing_1	\varnothing_2	Mass (kg)	Standard Flow Rate (\varnothing /min)
SFG-02	Rc1/4	62.2	19	45	36	9	0.075	7
SFG-03	Rc3/8		22	46		10	0.075	17
SFG-04	Rc1/2		27	71	59	12	0.105	31
SFG-06	Rc3/4		32	72		13	0.105	52
SFG-08	Rc1	82	41	85	71	14	0.19	91
SFG-10	Rc1 1/4	104	50	87	71	16	0.325	145
SFG-12	Rc1 1/2	124	55	97.5	81.5		0.405	210
SFG-16	Rc2		70	130	110	20	0.59	340
SFG-20	Rc2 1/2	147	85	150	128	22	0.75	580
SFG-24	Rc3		100	152		24	0.95	830

► Model Code

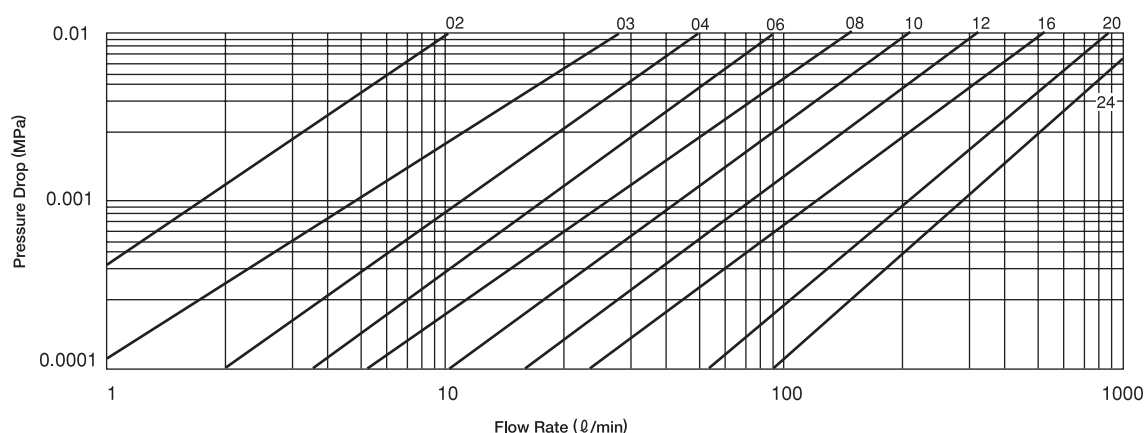


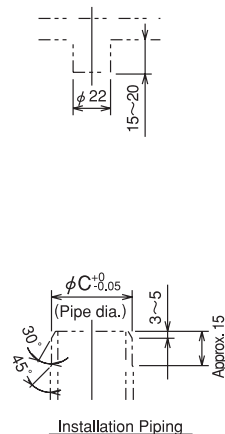
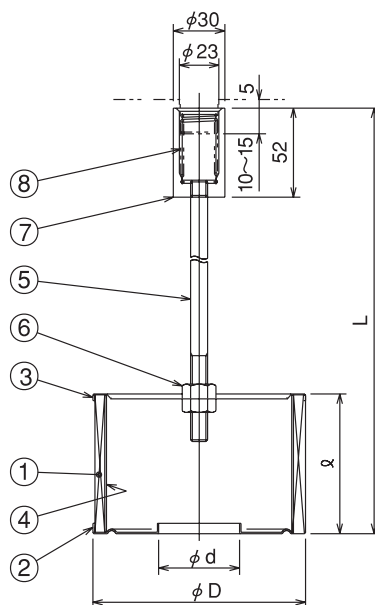
Coding Example
SFG-03-150W

► Flow Rate Chart

- Water glycol-based oil
- Viscosity: 32 cSt (approx. 51°C)

Filtration Rating 150 Mesh (150W)





1. Installed inside a tank of mineral oil.
2. A stainless steel wire type.
3. Filtration rating of 60, 100, 150 and 200 mesh as standard.

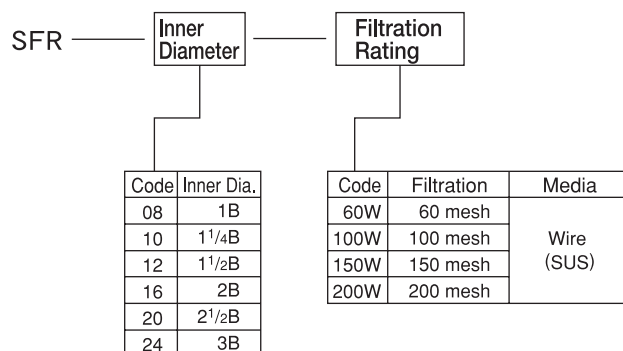
Part List

8	Spring	SWPA	1	
7	Holder	A5056	1	
6	Nut	SS	2	M10
5	Rod	SS400	1	
4	Inner tube	SECC	1	
3	End plate (B)	SECC	1	
2	End plate (A)	SECC	1	
1	Media	SUS	1	
Part No.	Part Name	Material	Qty	Remarks

Dimensions and Standard Flow Rates

Symbol Model	Inner Dia. (d)	D	C	L	φ	Standard Flow Rate (ℓ /min)
SFR-08	33.1	82.2	33.0	260	71	91
SFR-10	41.6	103.6	41.5	350	71	140
SFR-12	47.1	123.6	47.0	440	81.5	206
SFR-16	59.6		59.5	560	110	337
SFR-20	75.1	146.6	75.0	680	128	605
SFR-24	88.1		88.0	800		817

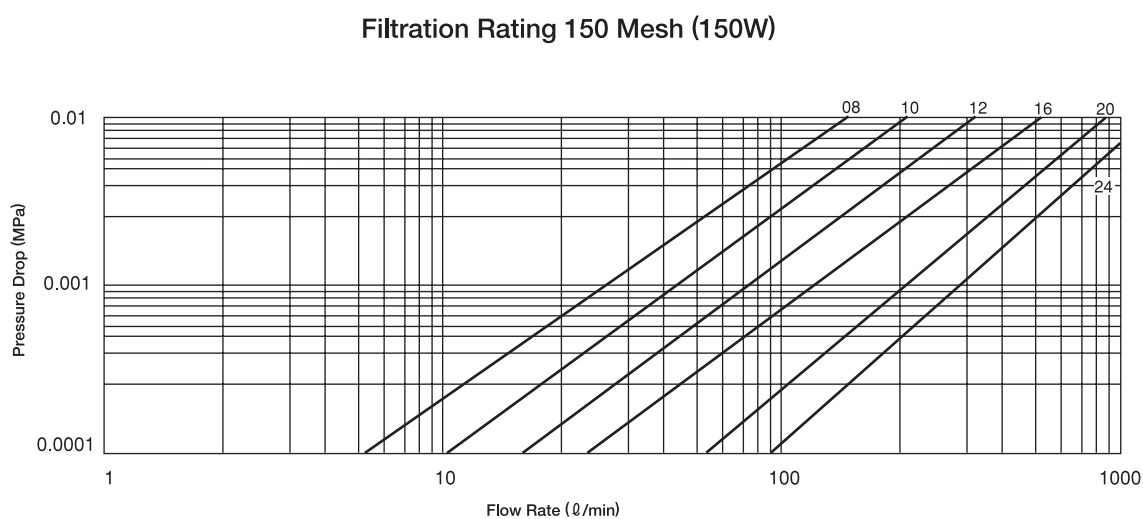
► Model Code

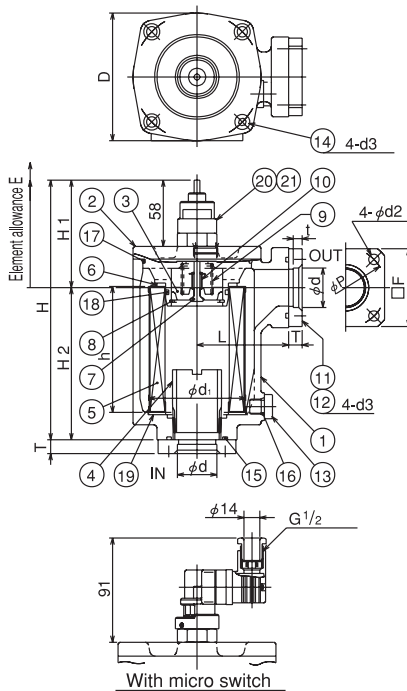


Coding Example
SFR-08-150W

► Flow Rate Chart

- ISO VG32
- Viscosity: 32 cSt (40°C)





1. Designed to prevent air bubble accumulation inside the suction filter with case.
2. Stainless steel wire elements of 60, 100, 150 and 200 mesh are provided as standard.
3. Clogging of filter element can be checked by an indicator.
4. Built-in relief valve prevents risk due to clogging.
5. I type (visual observation) indicator is installed as standard. E type (electric contact together with visual observation) indicator and magnet can be installed as additional option.
Note: Magnet cannot be installed on site after purchase of filter.
6. Dust cover of I type and E type indicators are made of plastic. Exercise caution when handling solvents (e.g. thinner).
7. Indicator is horizontal and can be viewed from any direction.
8. Indicating differential pressures:
Green (Start of red): 0.012 MPa
Red (All red): 0.02 MPa
9. I type indicator is reset manually. E type indicator is reset automatically.
10. Please contact us for use of fluid other than mineral oil on packing, O-rings and other parts.
11. Thread type companion flange is available in additional option.

Part List

21	O-ring	NBR	1	JISB 2401. 1A
20	Indicator		1	
19	Packing	NBR	1	
18	O-ring	NBR	1	JISB 2401. 1A
17	O-ring	NBR	1	JISB 2401. 1A
16	O-ring	NBR	1	JISB 2401. 1A
15	O-ring	NBR	2	JISB 2401. 1A
14	Cap bolt	SCM	4	
13	Drain plug	SCM	1	
12	Bolt	SS	8	
11	Companion flange	SS400	2	
10	Spring	SWPA	1	
9	Spring	SWPA	1	
8	Stop ring	SK	1	
7	Guide rod	C3604	1	
6	Wave washer	SK	1	
5	Element		1	
4	Inner tube	SGP	1	
3	Valve	CAC406	1	
2	Upper cover	ADC12	1	
1	Body	AC2B	1	
Part No.	Part Name	Material	Qty	Remarks

Dimensions and Standard Flow Rates

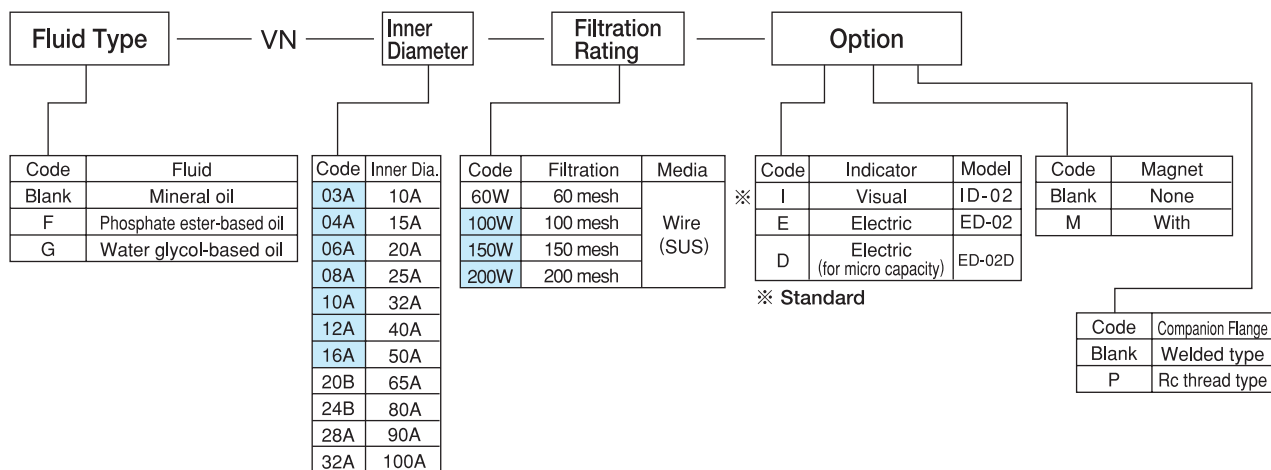
Symbol Model	Inner Dia.	H	H1	H2	L	D	Companion Flange						Bolt d3	E	Element		Mass (kg)	Standard Flow Rate (l / min)
							d	F	P	T	t	d2			h	φd1		
VN-03A	10A	203	87	116	72	90	18	60	56	12	8	9	M8	240	90	65	3	18.5
VN-04A	15A						22											35.5
VN-06A	20A	227	94	133	80	112	27.5	68	70	12	8	9	M8	266	110	85	5	67.5
VN-08A	25A						34.5											107
VN-10A	32A	285	100	185	95	138	43	82	86	14	9	11	M10	331	160	100	6	200
VN-12A	40A						49											250
VN-16A	50A	321	107	214	110	156	61.1	96	102	14	9	14	M12	368	180	120	8.5	395
VN-20B	65A	348	133	215	105	180	77	122	130	20	14	14	M12	419	200	140	11	640
VN-24B	80A						90.5											795
VN-28A	90A	442	202	240	135	230	102.5	156	166	22	15	18	M16	562	260	180	20	1070
VN-32A	100A						115.5											1310

O-ring and Packing

Part No.	15	16	17	18	19	21
Model						
VN-03A	G30	P11	G65	G35	t2× φ 65/40	P18
VN-04A						
VN-06A	G45		G90	G50	t2× φ 85/55	
VN-08A		P14				
VN-10A	G55		G100	G65	t2× φ 100/70	
VN-12A						
VN-16A	G70		G125	G80	t2× φ 120/85	
VN-20B	G95		G145	G100	t2× φ 140/105	
VN-24B						
VN-28A	G125		G180	G140	t2× φ 180/145	
VN-32A						

Quick delivery of filters in with mineral oil use.
Please contact us on delivery time for others.

Model Code



Coding Example F-VN-08A-100W-E

Spares

Element

P — Fluid Type — VN — Inner Diameter — Filtration Rating

Coding example: P-F-VN-08A-100W

Sealing parts set

● For element replacement (Part No. with ◎ in “O-ring and packing”.)

SP — Fluid Type — VN — Inner Diameter

Coding example: SP-F-VN-08A

● For overhaul

SA — Fluid Type — VN — Inner Diameter

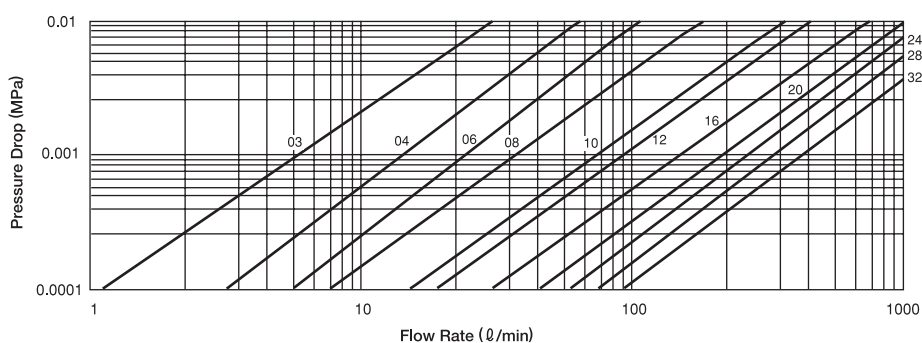
Coding example: SA-F-VN-08A

Flow Rate Chart

● ISO VG32V

● Viscosity: 32 cSt (40°C)

Filtration Rating 150 Mesh (150W)





1. Designed to prevent air bubble accumulation ensuring smooth flow inside suction filter with case.
2. Perfectly suited for variable displacement pumps as a suction filter.
3. Detachable magnet attracts metal particles resulting in extending life of pump and spool valve.
4. Detachable magnet enables quick and easy cleaning. (See Fig. A)
5. Indicator (Additional Option) detects negative pressure at the outlet of filter (inlet of pump), visual or electric indicator is available.
6. Relief valve (Additional Option) installed at the bottom of element is actuated by differential pressure.
7. Stainless steel wire elements of 60,100,150 and 200 mesh are provided as standard.
8. Please contact us for use of fluids other than mineral oil on O-rings and other parts.

4-1. Detachable magnet must be pulled out from element after taking out the element with upper cover.

4-2. When the magnet is pulled out, metal particles fall down.

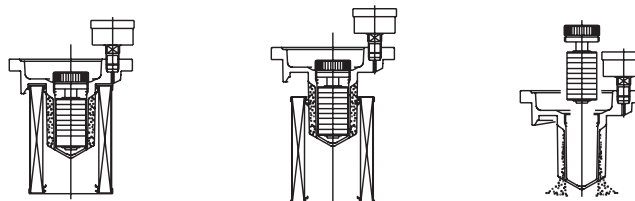
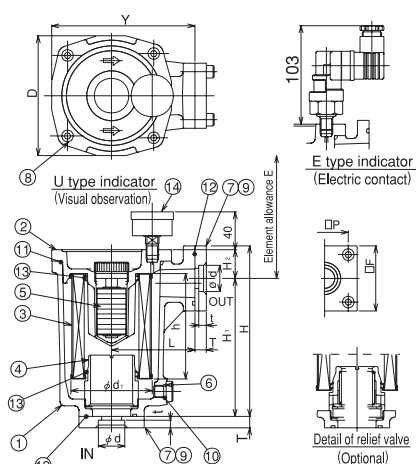


Fig. A



Part List

14	Indicator		1	Option
13	O-ring	NBR	2	JISB 2401. 1A
12	O-ring	NBR	2	JISB 2401. 1A
11	O-ring	NBR	1	JISB 2401. 1A
10	O-ring	NBR	1	JISB 2401. 1A
9	Cap bolt	SCM435	8	
8	Cap bolt	SCM435	4	
7	Companion flange	SS400	2	
6	Drain plug	SCM435	1	G1/4
5	Magnet		1	
4	Element holder	A5056	1	
3	Element	SUS SECC	1	
2	Upper cover	ADC12	1	
1	Body	AC2B	1	
Part No.	Part Name	Material	Qty	Remarks

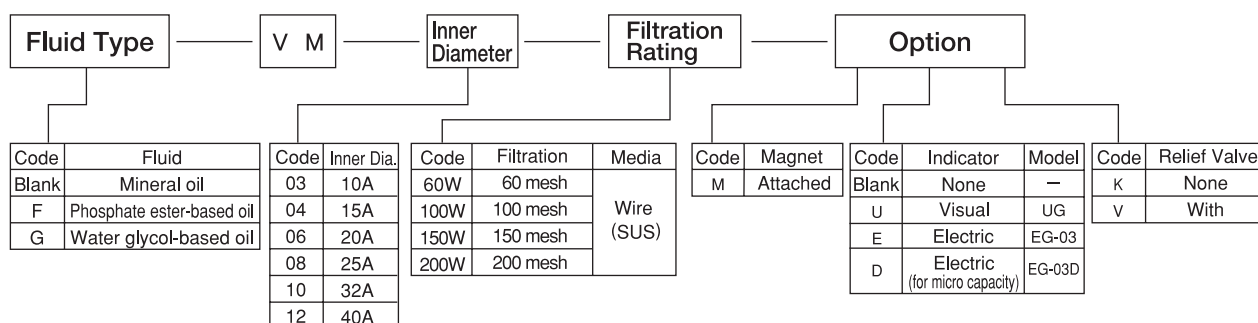
Dimensions and Standard Flow Rates

Symbol Model	Inner Dia.	H	H ₁	H ₂	L	D	Y	Companion Flange					Bolt 8,9	Element Allowance E	Element h	d ₁	Mass (kg)	Standard Flow Rate (ℓ/min)
VM-03	10A	155	125	28	77	104	129	18	60	39.6	12	8	M8×25	150	90	65	2.3	18
VM-04	15A							22										30
VM-06	20A							27.5										45
VM-08	25A	177	143	31.5	87	125	149.5	34.5	68	50	12	8	M8×25	170	110	85	3.3	90
VM-10	32A							43										150
VM-12	40A	234	192	41	105	150	180	49	82	60.8	14	9	M10×30	230	160	100	5.8	205

O-ring

Part No.	10	11	12	13
Model				
VM-03				
VM-04		G80	G30	G35
VM-06				
VM-08		G100	G45	G50
VM-10				
VM-12		G125	G55	G65

► Model Code



Coding Example F-VM-08-150W-MUK

► Spares

■ Element

P — **Fluid Type** — VM — **Inner Diameter** — **Filtration Rating**

Coding example: P-F-VM-08-150W

■ Sealing parts set

● For element replacement (Part No. with ◎ in “O-ring”).

SP — **Fluid Type** — VM — **Inner Diameter**

Coding example: SP-F-VM-08

● For overhaul

SA — **Fluid Type** — VM — **Inner Diameter**

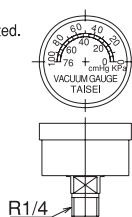
Coding example: SA-F-VM-08

► Indicator

■ U type indicator (Visual)

Code	U
Model	UG

- Unit of pressure “kPa” and “cmHg” both indicated.
- U type indicator is auto reset type.
- Relief valve opens at a differential pressure of 40 kPa.



■ E type indicator (Electric)

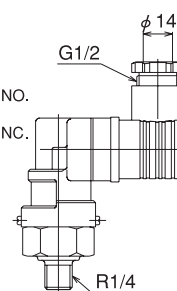
Code	E/D
Model	EG-03/EG-03D

- Operating pressure Switch pressure: 30 kPa
- Wire outlet uses DIN connector and price-tube of G(PF) 1/2 can also be installed.
- DIN connector allows wire outlet to be set in any direction at intervals of 90 degrees.
- Terminal block is provided in DIN connector.
- E type indicator is auto reset.

DIN Connector Standard IEC529 (EN60529) IP65 compatible.

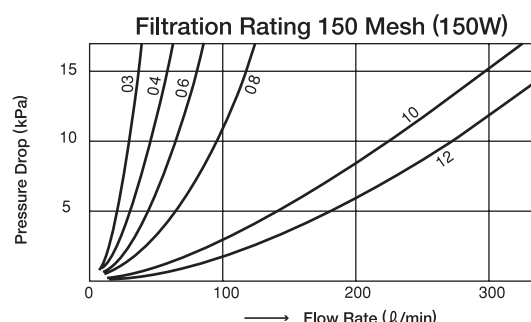
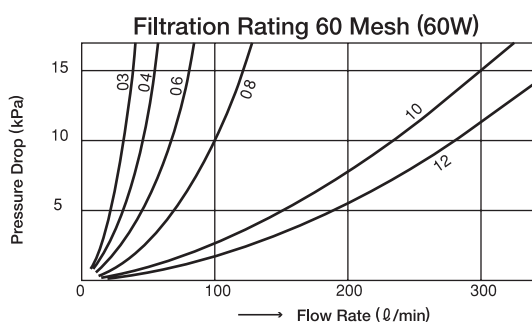
- Indicator wiring and terminal No.
 - 2, NO.
 - 3, NC.

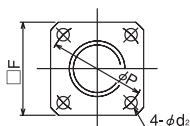
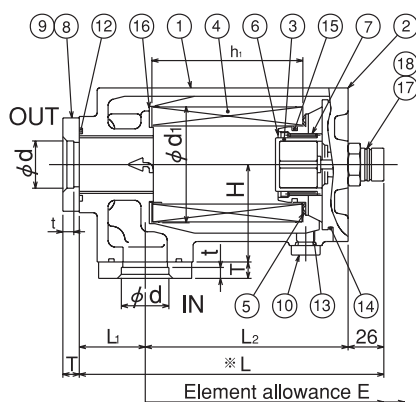
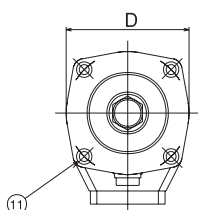
Micro switch electric rating		
Type of Load	Resistance Load	Inductive Load
Rated Voltage		
250V AC	3A	2A
30V DC	3A	2A



► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)





1. Aluminum alloy body with stainless steel wire element, indicator and relief valve.
2. Horizontal installation type, no need for space above filter body to take out element.
3. Element is taken out horizontally, no need for space above filter body.
4. Clogging of filter element can be checked by indicator.
5. Built-in relief valve ensures oil flow to pump.
6. U type indicator is provided as standard.
Micro switch and magnet are available under additional options.
7. Indicating pressure difference
Green (start of red): 0.02 MPa
8. Please contact us for use of fluids other than mineral oil on packing, O-rings and other parts.

Caution

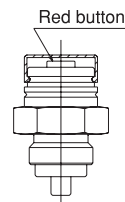
No features for air-bleeding due to filter's design.
Use this filter only in suction line where no air bubble accumulation occurs.

Indicator

U type indicator (Visual)

Code	U
Model	U4-02

- Indicating differential pressure
Red button pops out: 0.02 MPa
- U type indicator remains indication even a pump shut down.
- Push in the red button with a finger to reset the indicator.
- When the red indication appears, clean the element soon.



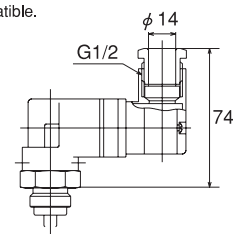
E type indicator (Electric contact)

Code	E
Model	E4-02

DIN Connector Standard
IEC529 (EN60529) IP65 compatible.

- Indicating differential pressure
Switch actuating pressure: 0.02 MPa
- Wire outlet uses DIN connector and price-tube of G(PF)1/2 can also be installed.
- DIN connector allows wire outlet to be set in any direction at intervals of 90 degrees.
- Terminal block is provided in DIN connector.
- E type indicator is auto reset.

- When warning signal is issued, clean the element.
- Indicator wiring and terminal No.



O-ring and Packing

Part No.	12	13	14	15	16	18
Model						
ISH-03A	G30	P11	G65	G35	t2X φ 65/φ 40	P18
ISH-04A						
ISH-06A	G45		G90	G50	t2X φ 85/φ 55	
ISH-08A		P14				
ISH-10A	G55		G100	G65	t2X φ 100/φ 70	
ISH-12A						
ISH-16A	G70		G125	G80	t2X φ 120/φ 85	
ISH-20A						
ISH-24A	G95		G145	G100	t2X φ 140/φ 105	

Dimensions and Standard Flow Rates

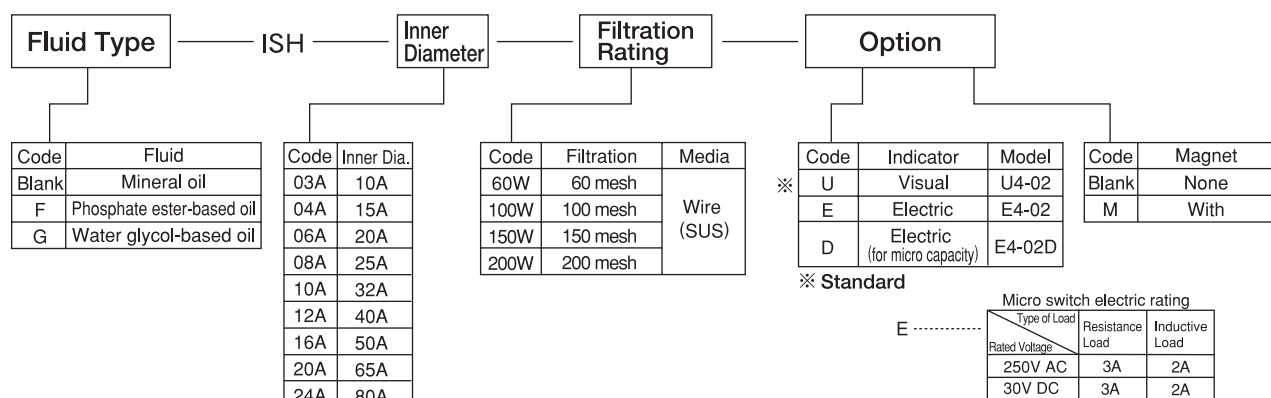
Dimensions and Standard Flow Rates																		
Symbol Model	※ Inner Dia.	L	L ₁	L ₂	H	D	Flange					Bolt d ₃	Element Allowance E	Element		Mass (kg)	Standard Flow Rate (ℓ/min)	
							d	F	P	T	t	d ₂			h ₁	d ₁		
ISH-03A	10A	192	43	123	58	90	18	60	56	12	8	9	M8	300	90	65	2.9	15.4
ISH-04A	15A						22											27
ISH-06A	20A	222	48	148	71	112	27.5	68	70	12	8	9	M8	340	110	85	4.0	44
ISH-08A	25A						34.5											92
ISH-10A	32A	283	57	200	85	138	43	82	86	14	9	11	M10	450	160	100	6.4	130
ISH-12A	40A						49											150
ISH-16A	50A	319	64	229	100	156	61.1	96	102	14	9	14	M12	510	180	120	8.6	210
ISH-20A	65A						77											420
ISH-24A	80A	370	79	265	113	180	90	122	130	20	14	14	M12	580	200	140	13.3	475

※ Add 48 mm to the dimension "L" when E(D) type indicator is installed.

Part List

Part No.	Part Name	Material	Qty	Remarks
18	O-ring	NBR	1	JISB 2401.1A
17	Indicator		1	
16	Packing	NBR	1	
15	O-ring	NBR	1	JISB 2401.1A
14	O-ring	NBR	1	φ
13	O-ring	NBR	1	φ
12	O-ring	NBR	2	JISB 2401.1A
11	Cap bolt	SCM	4	
10	Drain plug	SCM	1	
9	Bolt	SS	8	
8	Companion flange	SS400	2	
7	Spring	SWPA	1	
6	Stop ring	SS	1	
5	Wave washer	SK	1	
4	Element		1	
3	Relief valve	CAC406	1	
2	Cover	ADC12	1	
1	Body	AC2B	1	

Model Code



Coding Example F-ISH-08A-100W-E

Spares

■ Element

P — Fluid Type — ISH — Inner Diameter — Filtration Rating

Coding example: P-F-ISH-08A-100W

■ Sealing parts set

● For element replacement (Part No. with ◎ in “O-ring and packing”.)

SP — Fluid Type — ISH — Inner Diameter

Coding example: SP-F-ISH-08A

● For overhaul

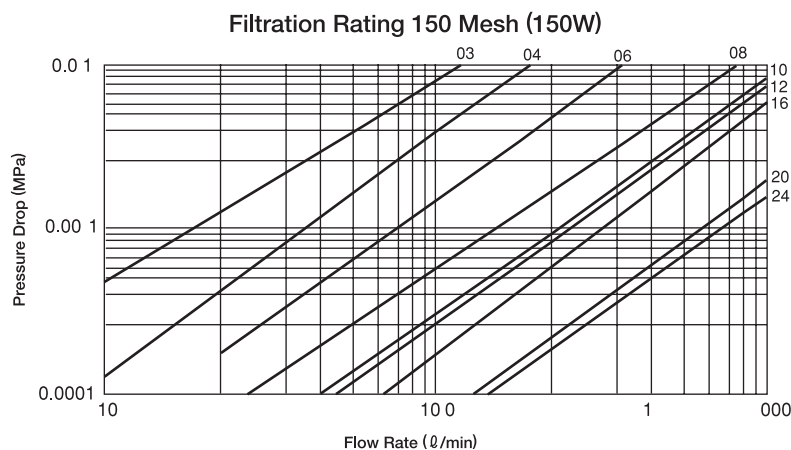
SA — Fluid Type — ISH — Inner Diameter

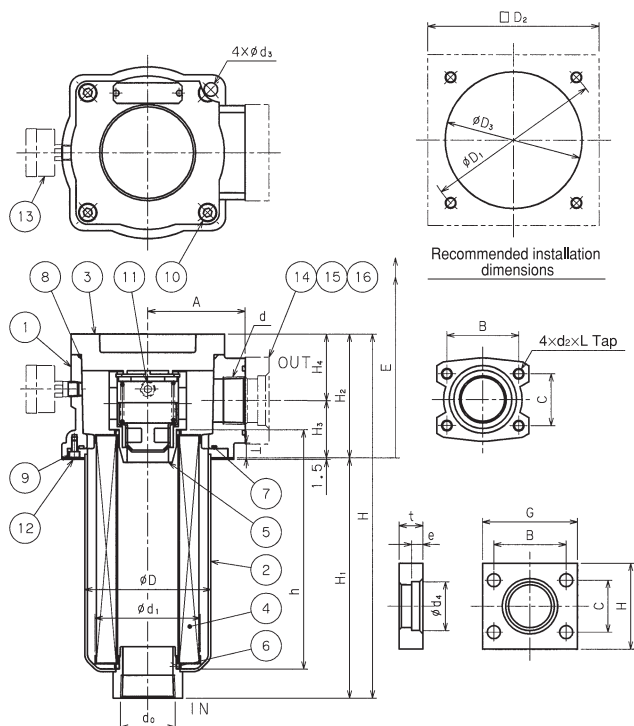
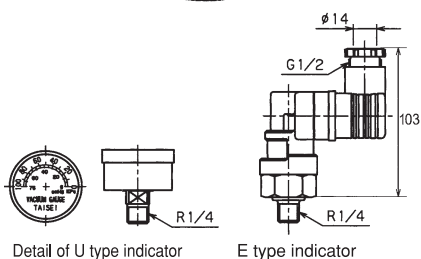
Coding example: SA-F-ISH-08A

Flow Rate Chart

● ISO VG32

● Viscosity: 32 cSt (40°C)





Note: ID "16" has an O-ring groove on the companion flange.

1. Install TSF filter directly on top of tank.
Secure the filter to companion flange seat with bolts firmly using d3 holes.
2. No oil outflow from case during checking or replacing of filter elements when extracting element upward from vertical housing.
3. Stainless steel wire elements of 60,100,150 and 200 mesh are provided as standard.
4. Either thread or flange (Additional Option) can be used for piping connection.
5. Relief valve (Additional option) opens at 40kPa.
6. Indicator (additional option) of either visual observation type to detect negative pressure or electric contact type (activation pressure 30kPa) can be installed.
7. Please contact us for use of fluids other than mineral oil on O-rings and other parts.

Part List

16	O-ring	NBR	1	JIS B2401, 1A
15	Cap bolt	SCM435	4	
14	Companion flange	SS400	1	Option
13	Indicator		1	
12	Packing	Non asbestos	1	
11	Blind plug	SCM435	2	R ¹ / ₄
10	Cap bolt	SCM435	4	
9	Cap bolt	SCM435	4	TSF-10, 12, 16 only
8	O-ring	NBR	1	JIS B2401,1A
7	O-ring	NBR	1	JIS B2401,1A
6	O-ring	NBR	2	JIS B2401,1A
5	Relief valve	STKM13A	1	TSF-16 : AC2B
4	Element		1	
3	Cover	ADC12	1	
2	Lower case	SS400 SPCC	1	TSF-06,08 : ADC12
1	Body	ADC12	1	
Part No.	Part Name	Material	Qty	Remarks

Companion Flange and O-ring

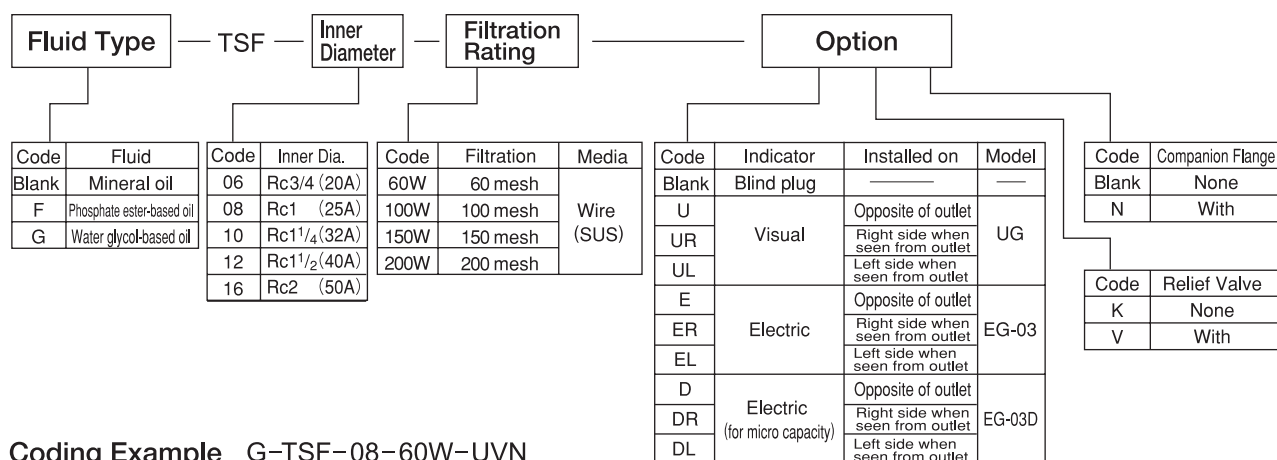
Part No.	Companion Flange (Option)					6	7	8	12
	G	H	t	e	d ₄				
Model									
TSF-06	68	62	18	9	φ 27.7	G-40	P-36	G-90	t1.5X□113/φ105
TSF-08					φ 34.5				
TSF-10	84	76	21	10	φ 43.2	G-55	G-50	G-115	t1.5X□136/φ120
TSF-12					φ 49.1				
TSF-16	100	94	24	11	φ 61.1	G-70	G-60	G-130	t1.5X□170/φ134

Dimensions

Symbol Model	Inner Dia. (d)	d ₀	H	H ₁	H ₂	H ₃	H ₄	A	D	B	C	d ₂ ×L	Mount				T	Element Allowance E	Element		Mass (kg)※
													D ₁	D ₂	D ₃	d ₃			h	D ₃	
TSF-06	Rc 3/4	Rc 1	234	147	87	40	47	70	102	50	36	M8×19	135	125	105	9.6	10	255	145	76	3
TSF-08	Rc 1																				
TSF-10	Rc 1 1/4	Rc 1 1/2	318	210	108	50	58	85	110	64	46	M10×21	156	150	120	12	13	330	209	92	6
TSF-12	Rc 1 1/2																				
TSF-16	Rc 2		388	260	128	60	68	95	124.6	76	52	M12×23	190	170	134	15	17	440	259	105	8

※Mass(kg) does not include companion flange.

► Model Code



Coding Example G-TSF-08-60W-UVN

► Spares

■ Element

P — **Fluid Type** — TSF — **Inner Diameter** — **Filtration Rating**

Coding example : P-G-TSF-08-60W

■ Sealing parts set

● For element replacement (Part No. with ◎ in “Companion flange and O-ring” .)

SP — **Fluid Type** — TSF — **Inner Diameter**

Coding example : SP-G-TSF-08

● For overhaul

SA — **Fluid Type** — TSF — **Inner Diameter** — **Option**

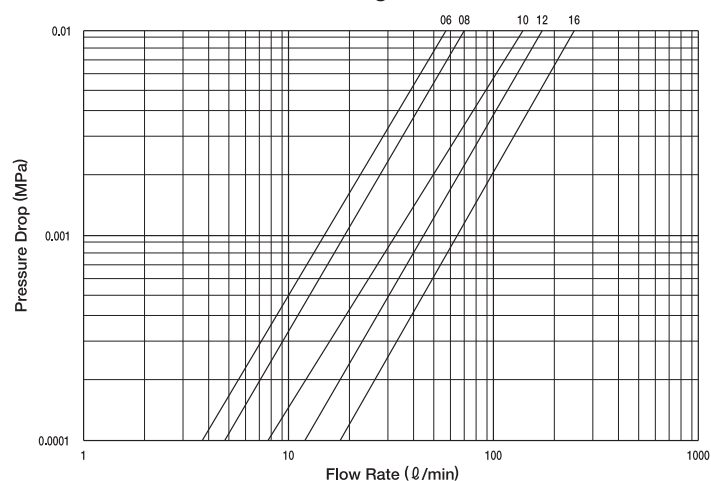
Coding example : SA-G-TSF-08-N

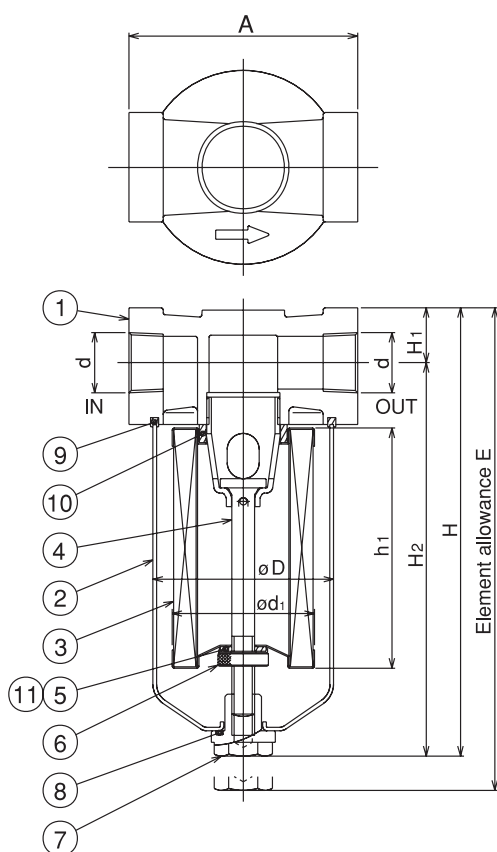
Code	Companion Flange
Blank	None
N	With

► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)

Filtration Rating 150 Mesh (150W)





1. Thread type line filter of maximum operating pressure of 0.5 MPa.
2. Please contact us for use of fluids other than mineral oil on packing, O-rings and other parts.
3. Magnet is available in Additional Option.
4. Indicator and relief valve cannot be installed.

Part List

11	Packing	NBR	1	
10	Packing	NBR	1	
9	Packing	NBR	1	
8	O-ring	NBR	1	JISB 2401. 1A
7	Nut	SS	1	
6	Round nut	SS400	1	
5	Washer	SECC	1	
4	Center rod	SPCC + SS400	1	
3	Element		1	
2	Lower cover	SPCE	1	
1	Upper cover	ADC12	1	
Part No.	Part Name	Material	Qty	Remarks

O-ring and Packing

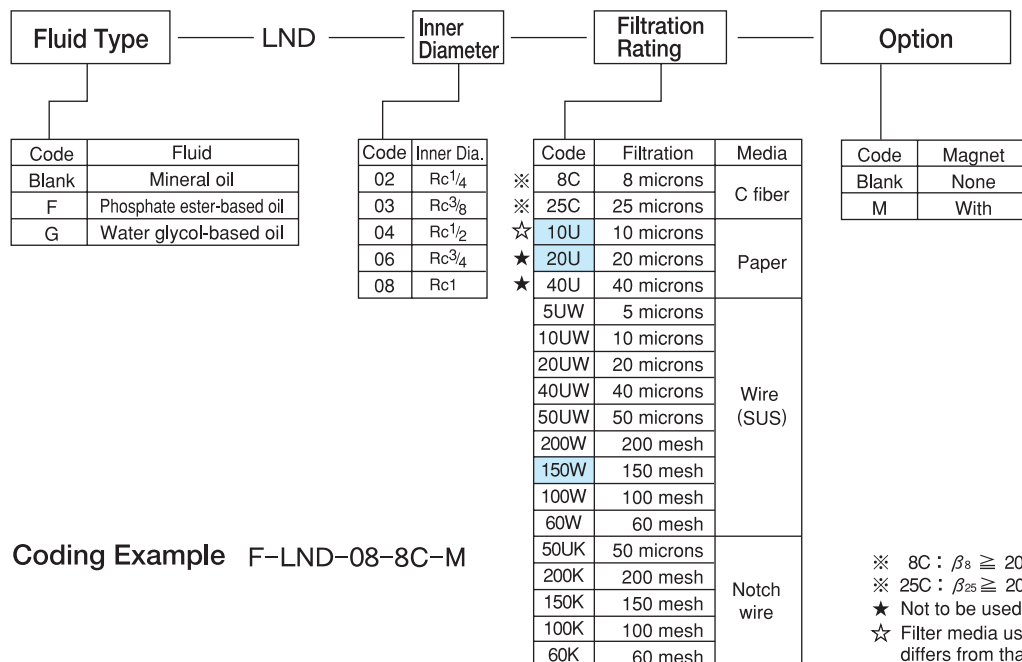
Part No.	8	9	10	11
Model				
LND-02	P-20	t4× φ 80.7/74.3	t8× φ 38.5/32.5	t2× φ 20/10
LND-03				
LND-04				
LND-06				
LND-08				

Dimensions and Standard Flow Rates

Symbol Model	d	H	H ₁	H ₂	A	D	Element Allowance E	Element		Mass (kg)	Standard Flow Rate (ℓ/min)
								h ₁	d ₁		
LND-02	Rc1/4	139	20	119	95	79	180	66	62.2	0.85	10
LND-03	Rc3/8										15
LND-04	Rc1/2	171	20	151	95	79	250	95	62.2	0.85	25
LND-06	Rc3/4	196	24	172	100	79	270	105	62.2	0.95	45
LND-08	Rc1	226	24	202	100	79	330	135	62.2	1.0	70

Quick delivery of filters in with mineral oil use.
Please contact us on delivery time for others.

► Model Code



► Spares

■ Element

P — Fluid Type — LND — Inner Diameter — Filtration Rating

Coding example: P-F-LND-08-8C

■ Sealing parts set

● For element replacement (Part No. with ◎ in “O-ring and packing”.)

SP — Fluid Type — LND — Inner Diameter

Coding example: SP-F-LND-08

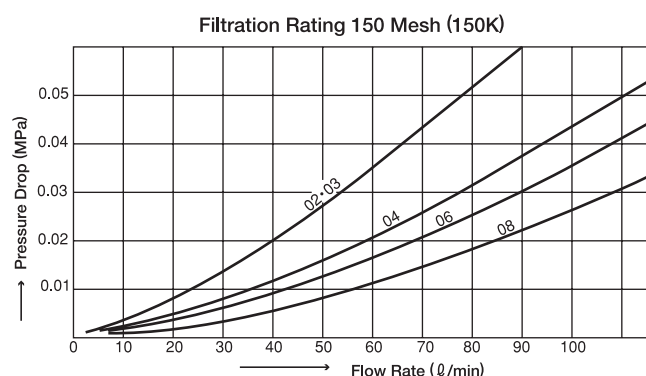
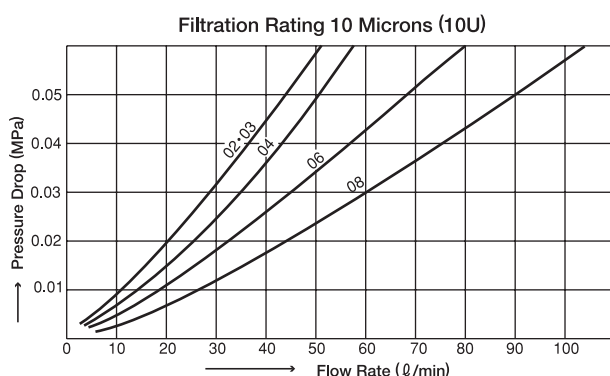
● For overhaul

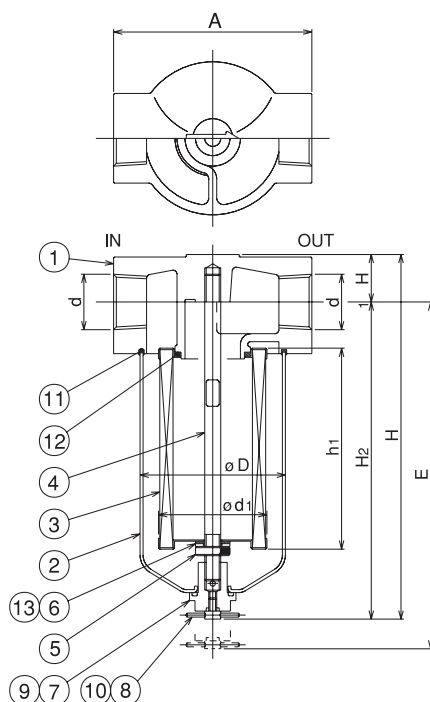
SA — Fluid Type — LND — Inner Diameter

Coding example: SA-F-LND-08

► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)





1. Thread type low pressure line filter of maximum operating pressure of 0.5 MPa.
2. Please contact us for use of fluids other than mineral oil on packing, O-rings and other parts.
3. Magnet is available in Additional Option.
4. Indicator and relief valve cannot be installed.

Part List

13	Packing	NBR	1	
12	Packing	NBR	1	
11	Packing	NBR	1	
10	O-ring	NBR	1	JISB 2401. 1A
9	O-ring	NBR	1	JISB 2401. 1A
8	Drain plug	SS400	1	
7	Nut	SS	1	
6	Washer	SS	1	
5	Round nut	SS400	1	
4	Center rod	SS400	1	
3	Element		1	
2	Lower cover	SPCE	1	
1	Upper cover	AC2B	1	
Part No.	Part Name	Material	Qty	Remarks

O-ring and Packing

Part No.	9	10	11	12	13
Model					
LN-10	P25	P7	t4×φ 111.7/104.3	t3×φ 58/48	t2×φ 26/12
LN-12	P25	P7	t6×φ 126.6/116	t3×φ 85/72	t2×φ 32/16
LN-20	P34	P9	t3×φ 181/165	t3×φ 110/92	t2×φ 40/20
LN-24					

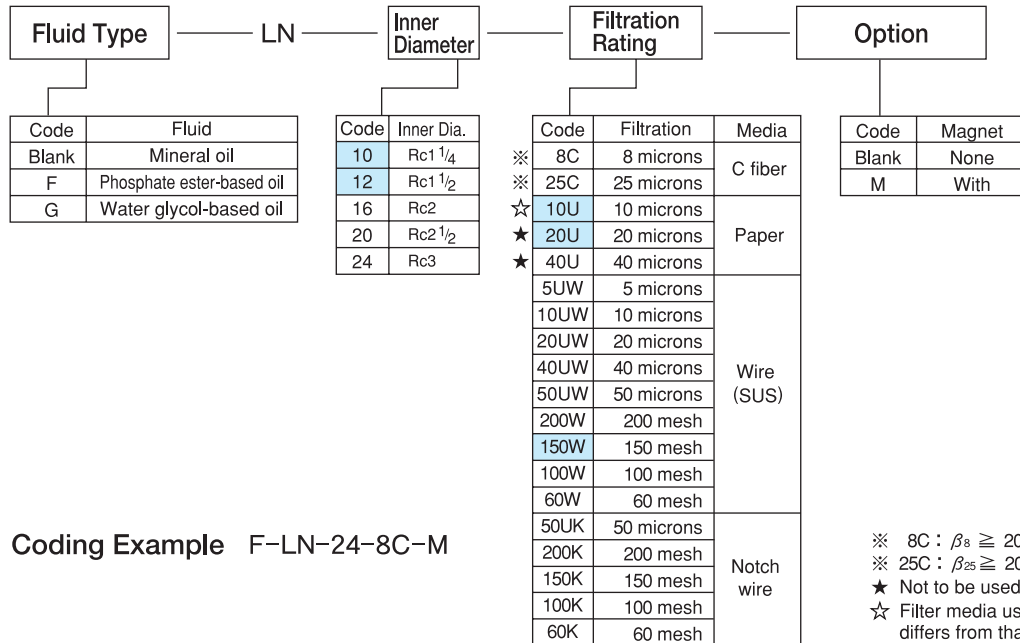
Dimensions and Standard Flow Rates

Symbol Model	d	H	H ₁	H ₂	A	D	Element Allowance E	Element		Mass (kg)	Standard Flow Rate (ℓ/min)
								h ₁	d ₁		
LN-10	Rc1 1/4	276	36	240	150	110	370	※1		2.6	120
LN-12	Rc1 1/2							150	83		160
LN-16	Rc2	370	44	326	160	124.6	481	200	104	4.0	260
LN-20	Rc2 1/2	495	65	430	215	172	650	260	124	7.8	430
LN-24	Rc3						690	300	124	7.8	600

※1 Dimension for Notch Wire Element : 152

Quick delivery of filters in with mineral oil use.
Please contact us on delivery time for others.

► Model Code



► Spares

■ Element

P — Fluid Type — LN — Inner Diameter — Filtration Rating

Coding example: P-F-LN-24-8C

■ Sealing parts set

● For element replacement (Part No. with ◎ in “O-ring and packing”).

SP — Fluid Type — LN — Inner Diameter

Coding example: SP-F-LN-24

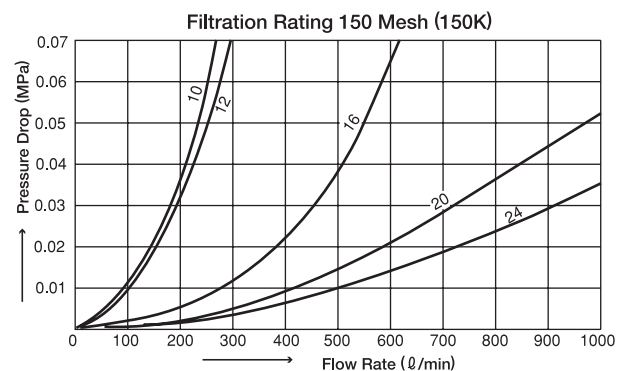
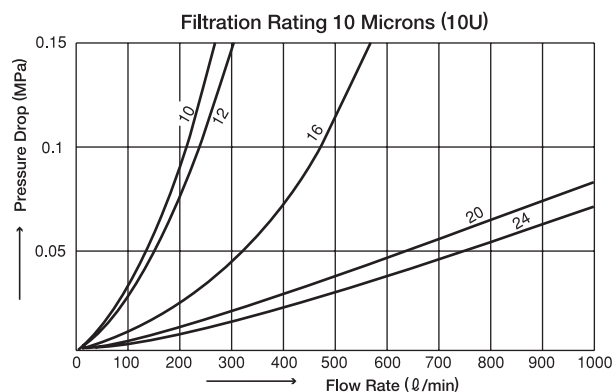
● For overhaul

SA — Fluid Type — LN — Inner Diameter

Coding example: SA-F-LN-24

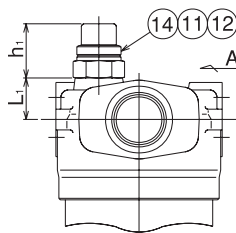
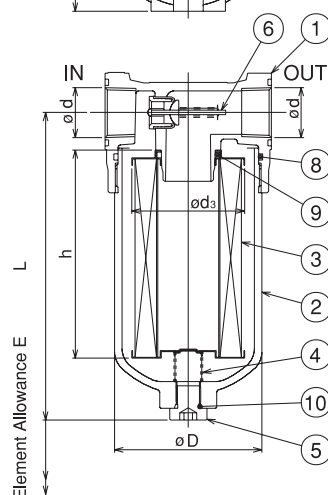
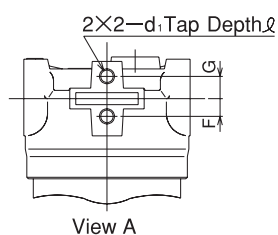
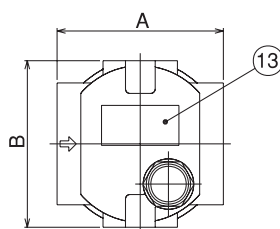
► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)



h₁ (Indicator height)

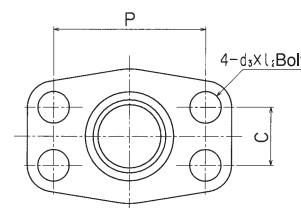
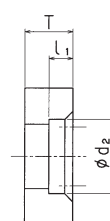
Blank	6
I	36.5
E/D	91



1. Maximum operating pressure: 3.5 MPa
Impulse test: 0 to 3.5 MPa x 10⁷ times
2. Model 351: Thread connection
Model 352: Companion flange connection
3. T connection and element removal is downward.
4. Please contact us for use of fluids other than mineral oil on packing, O-rings and other parts.

Max. differential pressure of element	Option	
	Indicator pressure (All red)	Relief valve opening pressure
0.7MPa	0.3MPa	0.35MPa

Companion Flange and Piping Connection



Companion flange

Companion flange seat for Model 352

P	C	d ₃ ×L ₂
46	18	M8×30
58	22	M10×35
70	36	M10×35
84	44	M12×50
112	65	M16×60

(Note: Model 352 only.
ID "03" to "08" have
O-ring groove on the body.)

Part List

Part No.	Part Name	Material	Qty	Remarks
15	Companion flange	SS400	2	For Model 352
14	Indicator		1	Option
13	Nameplate		1	
12	O-ring	NBR	1	JISB 2401. 1A
11	O-ring	NBR	1	JISB 2401. 1B
10	O-ring	NBR	1	JISB 2401. 1A
9	O-ring	NBR	1	JISB 2401. 1A
8	O-ring	NBR	1	JISB 2401. 1A
6	Relief valve		1	Option
5	Drain plug	SCM435	1	
4	Spring	SWPA	1	
3	Element		1	
2	Lower cover	STKM13A・SS400	1	03~04 A6061
1	Body	FC250	1	03~08 ADC12

O-ring

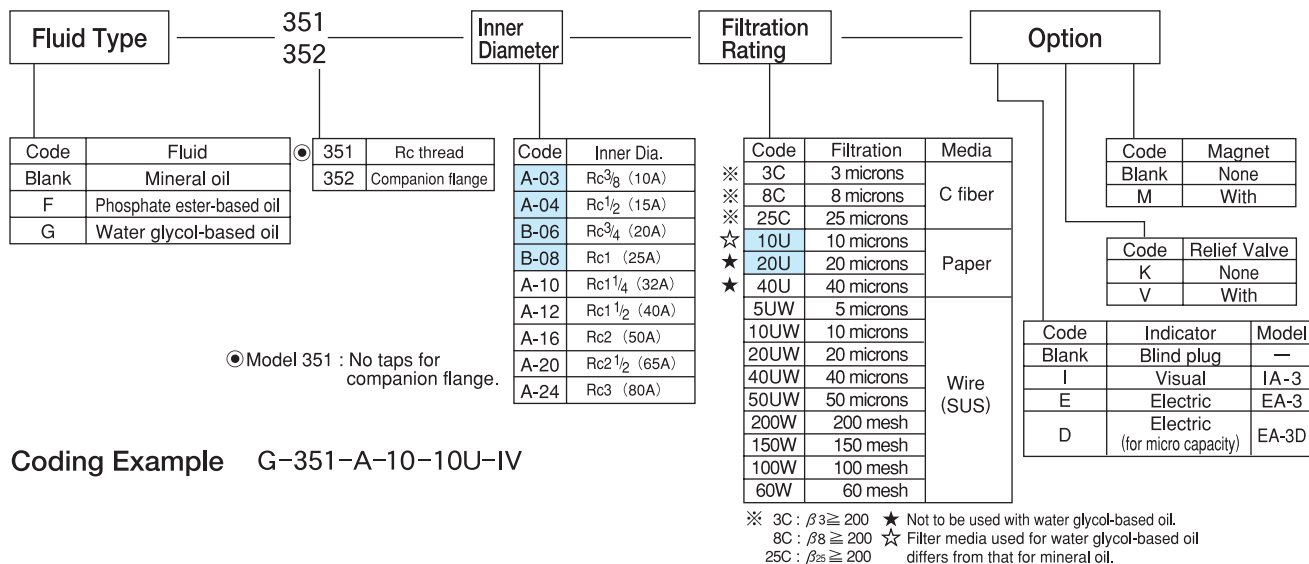
Part No.	8	9	10	11	12	Companion Flange (Model 352)
03,04	AS568 234	G-25	P-11	P-18	P-14	G-30
06,08	G-90	P-36	P-14	P-18	P-14	G-40
10,12	AS568 245	G-50	P-14	P-18	P-14	G-55
16	AS568 250	G-60	P-14	P-18	P-14	G-70
20,24	AS568 259	G-90	P-18	P-18	P-14	G-100

Dimensions and Standard Flow Rates

Symbol	d	A	B	D	F	G	4-d ₁ ×ℓ	L	L ₁	Element Allowance E	d ₂	ℓ ₁	T	Element		Mass (kg)		Standard Flow Rate (ℓ / min)
Model														d ₃	h	351 ASS'Y	352 ASS'Y	
35 ₂ ¹ -A-03	Rc3/8	90	90	79	10	9	M8×12	136	23	100	17.8	7	15	64	84.2	1	1.5	25
35 ₂ ¹ -A-04	Rc1/2										22.2							44
35 ₂ ¹ -B-06	Rc3/4	112	112	92.4	12	15	M10×15	207	28	100	27.7	9	18	76	140	2.9	3.8	85
35 ₂ ¹ -B-08	Rc1										34.5							100
35 ₂ ¹ -A-10	Rc1 1/4	130	130	110	15	17	M10×13	286	38	100	43.2	9	18	92	204.2	6.9	8.3	155
35 ₂ ¹ -A-12	Rc1 1/2										49.1							180
35 ₂ ¹ -A-16	Rc2	150	150	124.6	20	22	M12×16	349	45	150	61.1	11	24	105	254.2	11	13	360
35 ₂ ¹ -A-20	Rc2 1/2	200	200	165.2	35	35	M16×21	427	63	150	77.1	15	35	133	304.5	27	33	600
35 ₂ ¹ -A-24	Rc3										90.0							660

Quick delivery of filters in with mineral oil use.
Please contact us on delivery time for others.

► Model Code



Coding Example G-351-A-10-10U-IV

► Spares

■ Element

P — Fluid Type — 351 — Inner Diameter — Filtration Rating
352

Coding example: P-G-351-A-10-10U

■ Sealing parts set

● For element replacement (Part No. with ◎ in “O-ring”).

SP — Fluid Type — 351 — Inner Diameter
352

Coding example: SP-G-351-A-10

● For overhaul

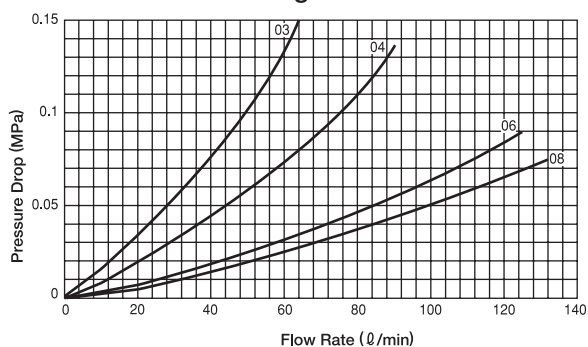
SA — Fluid Type — 351 — Inner Diameter
352

Coding example: SA-G-351-A-10

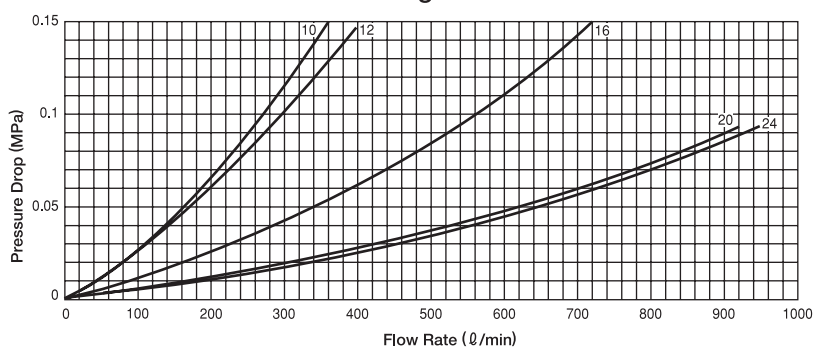
► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)

Filtration Rating 10 Microns (10U)



Filtration Rating 10 Microns (10U)





1. Maximum operating pressure: 3.5 MPa
Impulse test: 0 to 3.5 MPa x 10⁷ times
2. Easy to replace elements for upward removal.
3. Elements are common to all "U" Series (UL,UM,UH).
4. Piping method is common to the thread type and flange type.
Companion flange is available in additional option.
5. Flow direction can be changed by turning Cover-ASSY 180 degrees.
6. Please contact us for use of fluids other than mineral oil on packing, O-rings and other parts.

Max. differential pressure of element	Option	
	Indicator pressure (All red)	Relief valve opening pressure
0.7MPa	0.3MPa	0.35MPa

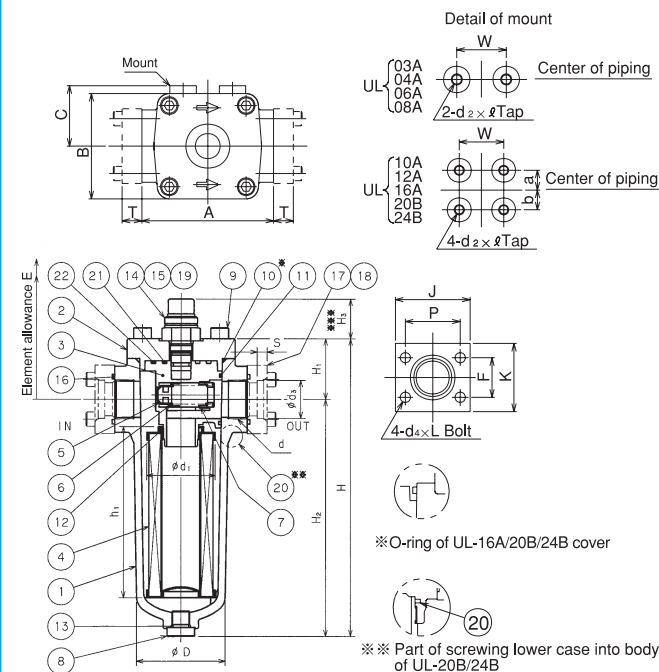
Part List

Part No.	Part Name	Material	Qty	Remarks
22	O-ring	NBR	1	JISB 2401. 1A
21	O-ring	NBR	1	JISB 2401. 1A
20	O-ring	NBR	1	JISB 2401. 1A G-155
19	Indicator		1	Option
18	Cap bolt	SCM435	8	
17	Companion flange	SS400	2	JISB 2401. 1A
16	O-ring	NBR	2	
15	O-ring	∅	1	1A
14	O-ring	∅	1	1B
13	O-ring	∅	1	1A
12	O-ring	∅	1	1A
11	O-ring	∅	1	1A
10	O-ring	NBR	1	JISB 2401. 1A
9	Cap bolt	SCM435	4	UL-03A~12A with washer
8	G3/8 drain plug	SCM435	1	UL-16A~24B: G ¹ / ₂
7	Spring holder	SS400	1	Option
6	Spring	SWPA	1	
5	Relief valve	SECC	1	
4	Element		1	
3	Inlet	ADC12	1	
2	Cover	ADC12	1	UL-16A~24B: FCD500
1	Body	ADC12	1	UL-16A~24B: FCD500

Element and O-ring

Part No.	10	11	12	13	14	15	16	21	22	Element	
Model										h ₁	d ₁
UL-03A	G-75	G-30	P-32	P-14	P-18	P-14	G-30	G-40	G-45	85.3	62.2
UL-04A		G-40					G-40			155.3	62.2
UL-06A		G-40					G-40			204.5	82.2
UL-08A	G-100	G-55	G-45	P-18	P-14	P-14	G-55	G-25	G-45	254.5	102.2
UL-10A	G-110	G-65	G-60				G-70			304.5	124
UL-12A	G-135	G-95	G-80				G-100				

※※※H₃ height of indicator: Model I ...36, Model E ... 91
Add this height to the element allowance E.



Notes: • ID "03" to "12" have O-ring groove on the body.
• ID "16" to "24" have O-ring groove on the companion flange.

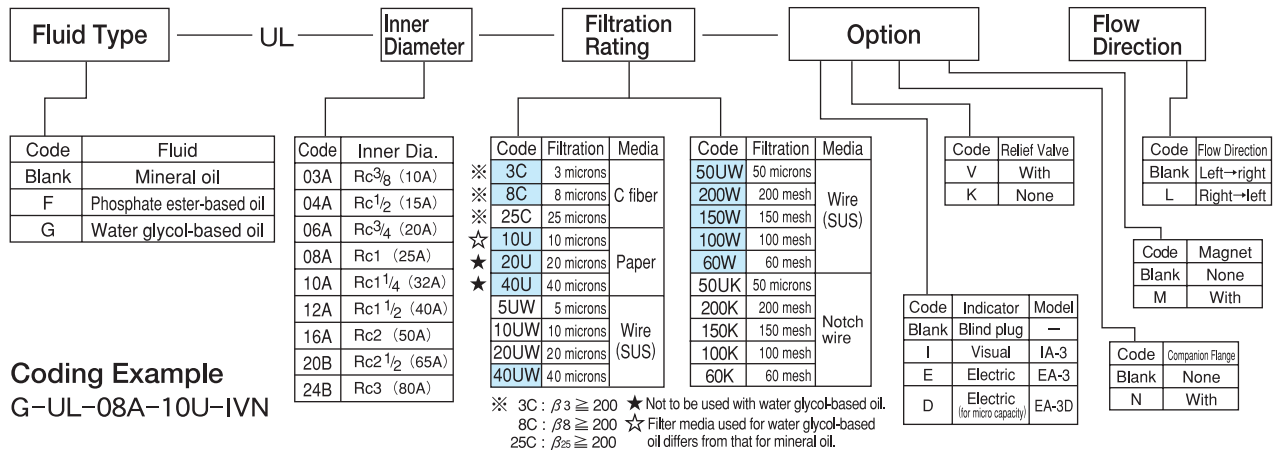
Dimensions and Standard Flow Rates

Symbol	d	H	H ₁	H ₂	A	B	C	D	W	a	b	d ₂ × Q	Element Allowance E	Companion Flange (Option)								Mass (kg) [※]	Standard Flow Rate (ℓ /min)
Model														d ₃	S	T	P	F	J	K	d ₄ × L		
UL-03A	Rc ³ / ₈	189	50	139	115	96	54	83	45			M8×14	190	17.8	8	15	42	24	60	50	M8×30	2.5	25
UL-04A	Rc ¹ / ₂													22.2									44
UL-06A	Rc ³ / ₄	270	55	215	120	96	55	83	45			M10×16	280	27.7	9	18	50	36	68	62	M8×35	3.0	85
UL-08A	Rc1													34.5									100
UL-10A	Rc1 1/4	351	69	282	150	124	65	106	60	20	25	M10×15	360	43.2	10	21	64	46	84	76	M10×40	5.5	155
UL-12A	Rc1 1/2													49.1									180
UL-16A	Rc2	433	75	358	180	150	77	132	64	20	30	M10×15	430	61.1	11	24	76	52	100	94	M12×45	21.5	360
UL-20B	Rc2 1/2	528	96	432	215	176	95	165.2	90	25	40	M12×20	530	77.1	15	31	102	80	134	126	M16×60	37.0	600
UL-24B	Rc3													90.0									660

※Mass(kg) does not include companion flange.

Quick delivery of filters in with mineral oil use.
Please contact us on delivery time for others.

► Model Code



► Spares

■ Element

P — **Fluid Type** — **UL** — **Inner Diameter** — **Filtration Rating**

Coding example : P-G-UL-08A-10U

■ Sealing parts set

● For element replacement (Part No. with ◎ in “Element and O-ring”.)

SP — **Fluid Type** — **UL** — **Inner Diameter**

Coding example : SP-G-UL-08A

● For overhaul

SA — **Fluid Type** — **UL** — **Inner Diameter** — **Option**

Coding example : SA-G-UL-08A-N

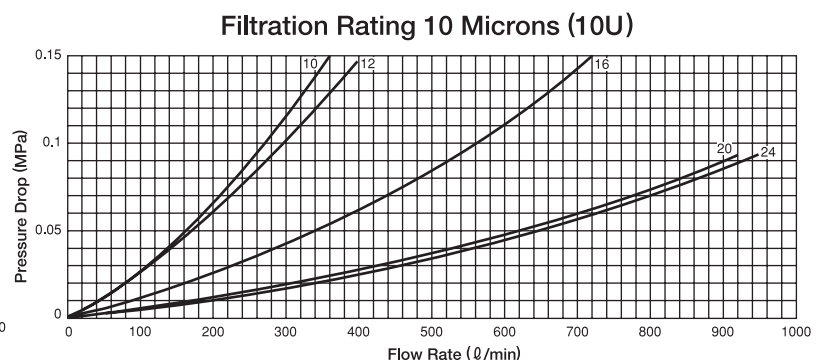
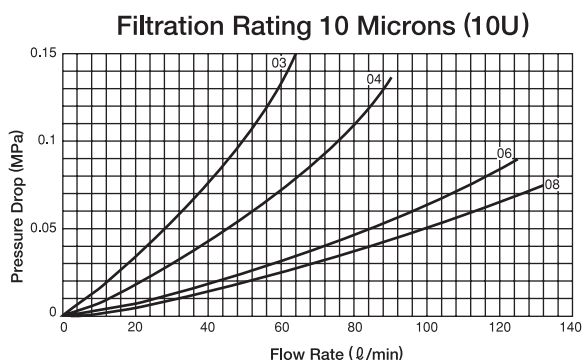
Code	Companion Flange
Blank	None
N	With

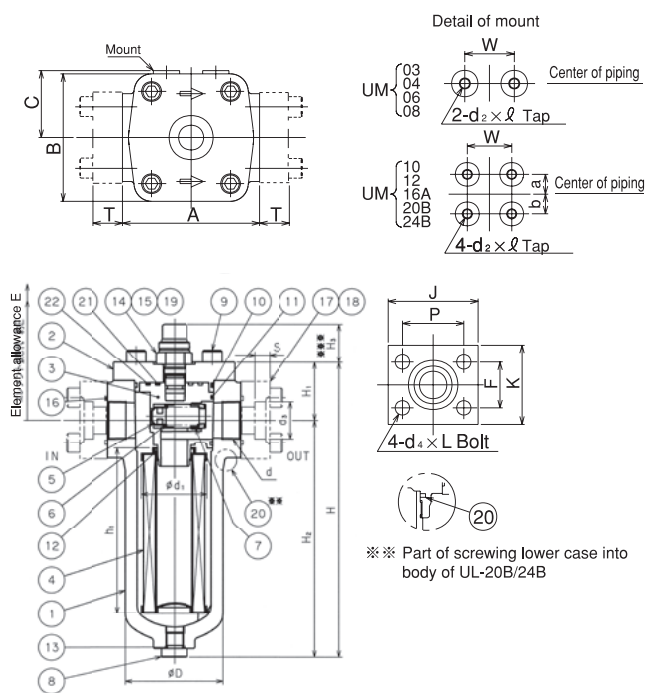
► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)

Common to Models UL, UM and UH

(Except for UH-20 and UH-24)





- Maximum operating pressure: 7 MPa
Impulse test: 7 MPa x 10⁷ times
- Easy to replace elements for upward removal.
- Elements are common to all "U" Series (UL, UM, UH).
- Piping method is common to thread type and flange type.
Companion flange is available in additional option.
- Flow direction can be changed by turning Cover-ASSY 180 degrees.
- Please contact us for use of fluids other than mineral oil on packing, O-rings and other parts.

Max. differential pressure of element	Option	
	Indicator pressure (All red)	Relief valve opening pressure
0.7MPa	0.3MPa	0.35MPa

Part List

22	O-ring	NBR	1	JIS B2401. 1A
21	O-ring	NBR	1	JIS B2401. 1A
20	O-ring	NBR	1	JIS B2401. 1A G-155
19	Indicator		1	Option
18	Cap bolt	SCM435	8	
17	Companion flange	SS400	2	JISB 2401. 1A
16	O-ring	NBR	2	
15	O-ring	∅	1	1A
14	O-ring	∅	1	1B
13	O-ring	∅	1	1A
12	O-ring	∅	1	1A
11	O-ring	∅	1	1A
10	O-ring	NBR	1	JISB 2401. 1A
9	Cap bolt	SCM435	4	Option
8	G3/8 drain plug	SCM435	1	
7	Spring holder	SS400	1	Option
6	Spring	SWPA	1	
5	Relief valve	SECC	1	Option
4	Element		1	
3	Inlet	ADC12	1	
2	Cover	FCD500	1	
1	Body	FCD500	1	
Part No.	Part Name	Material	Qty	Remarks

Element and O-ring

Part No. Model	10	11	12	13	14	15	16	21	22	Element		
										h ₁	d ₁	
UM-03	G-70	G-30	P-32	P-14	P-18	P-14	G-30	G-40	G-40	85.3	62.2	
UM-04												
UM-06		G-40										
UM-08												
UM-10	G-95	G-55	G-45					G-55	G-25	G-45	204.5	82.2
UM-12												
UM-16A	G-110	G-65	G-60	P-18				G-70			254.5	102.2
UM-20B	G-135	G-95	G-80					G-100	G-30	G-55	304.5	124
UM-24B												

※※※H₃ height of indicator: Model I...36, Model E...91
Add this height to the element allowance E.

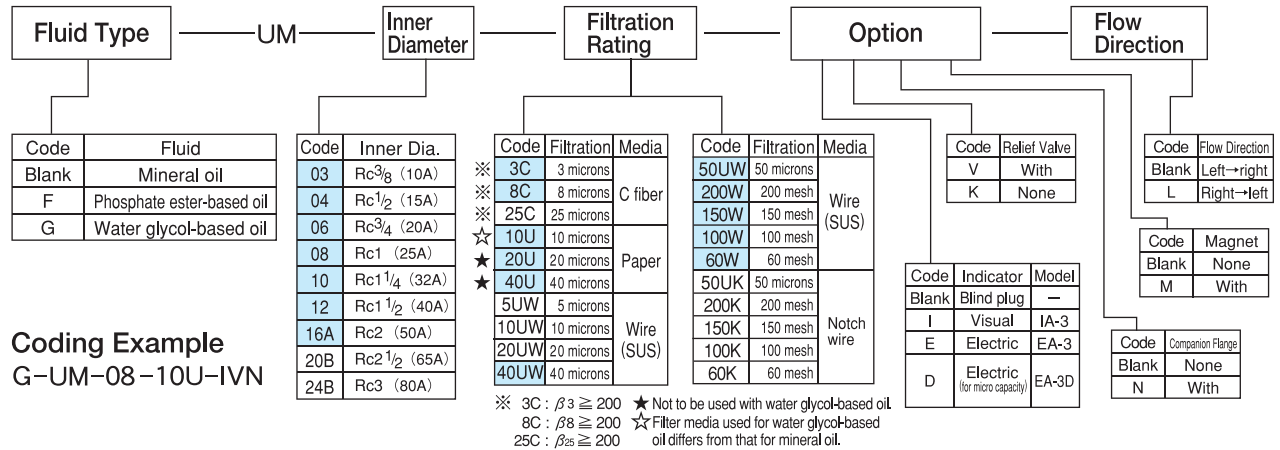
Dimensions and Standard Flow Rates

Symbol Model	d	H	H ₁	H ₂	A	B	C	D	W	a	b	d ₂ × Q	Element Allowance E	Companion Flange (Option)								Mass kg [※]	Standard Flow Rate (ℓ/min)
														d ₃	S	T	P	F	J	K	d ₄ × Q		
UM-03	Rc3/8	195	49	146	120	116	61	92	45			M10×15	190	17.8	11	21	48	24	70	52	M10×35	8.9	25
UM-04	Rc1/2													22.2									44
UM-06	Rc3/4	276	54	222	125	116	61	92	45			M10×15	280	27.7	14	27	56	42	82	72	M12×45	11.1	85
UM-08	Rc1													34.5									100
UM-10	Rc1 1/4	361	68	293	170	151	78	122	60	20	25	M10×15	360	43.2	16	31	74	52	102	88	M16×55	22.7	155
UM-12	Rc1 1/2													49.1									180
UM-16A	Rc2	433	75	358	180	150	77	132	64	20	30	M10×15	430	61.1	11	24	76	52	100	94	M12×45	21.5	360
UM-20B	Rc2 1/2													77.1									600
UM-24B	Rc3													90.0									660

※Mass(kg) does not include companion flange.

Quick delivery of filters in with mineral oil use.
Please contact us on delivery time for others.

► Model Code



► Spares

■ Element

P — Fluid Type — UM — Inner Diameter — Filtration Rating

Coding example : P-G-UM-08-10U

■ Sealing parts set

● For element replacement (Part No. with ◎ in “Element and O-ring”.)

SP — Fluid Type — UM — Inner Diameter

Coding example : SP-G-UM-08

● For overhaul

SA — Fluid Type — UM — Inner Diameter — Option

Coding example : SA-G-UM-08-N

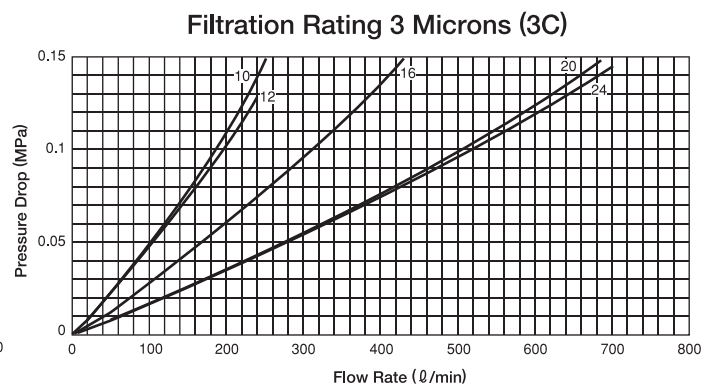
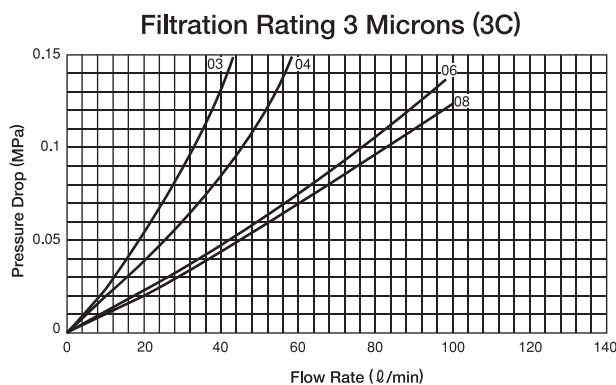
Code	Companion Flange
Blank	None
N	With

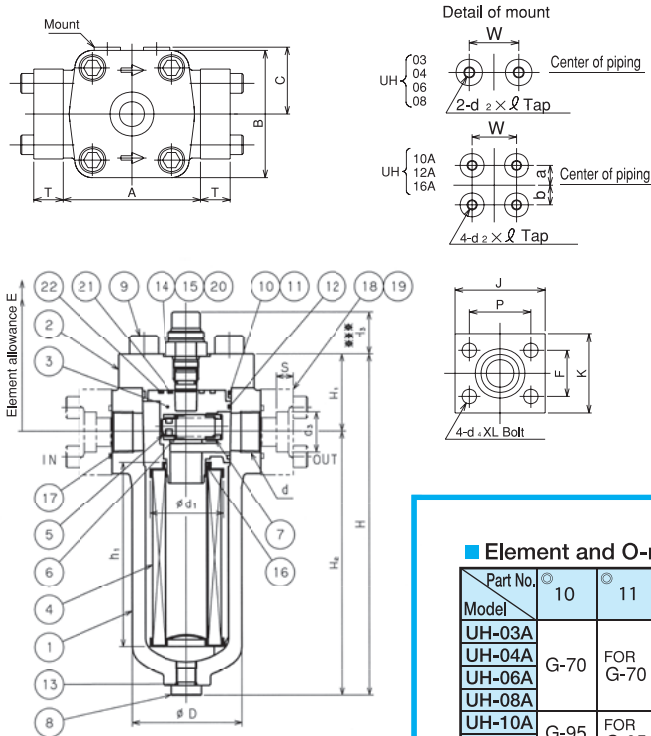
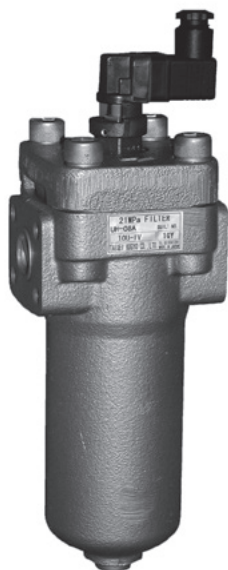
► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)

Common to Models UL, UM and UH

(Except for UH-20 and UH-24)





1. Maximum operating pressure: 21 MPa
Impulse test: 21 MPa x 10⁷ times
2. Easy to replace elements for upward removal.
3. Elements are common to all "U" Series (UL, UM, UH).
4. Piping method is common to thread type and flange type.
Companion flange is available in additional option.
5. Flow direction can be changed by turning Cover-ASSY 180 degrees.
6. Please contact us for use of fluids other than mineral oil on packing, O-rings and other parts.

Element Type	Max. differential pressure of element	Option	
		Indicator pressure (All red)	Relief valve opening pressure
Standard	0.7MPa	0.3MPa	0.35MPa
High differential pressure	21MPa	0.7MPa	—

Part List

22	O-ring	NBR	1	JISB 2401. 1A
21	O-ring	NBR	1	JISB 2401. 1A
20	Indicator	SUS303	1	Option
19	Cap bolt	SCM435	8	
18	Companion flange	SS400	2	JISB 2401. 1B
17	O-ring	NBR	2	
16	O-ring	—	1	JISB 2401. 1A
15	O-ring	—	1	1A
14	O-ring	—	1	1B
13	O-ring	—	1	1B
12	O-ring	NBR	1	1A
11	Backup ring	PTFE	1	JISB 2407. T3
10	O-ring	NBR	1	JISB 2401. 1B
9	Cap bolt	SCM435	4	UH-10A~16A: G ¹ / ₂
8	G3/8 drain plug	SCM435	1	
7	Spring holder	SS	1	Option
6	Spring	SWPA	1	
5	Relief valve	SECC	1	
4	Element	—	1	
3	Inlet	ADC12	1	
2	Cover	FCD500	1	
1	Body	FCD500	1	
Part No.	Part Name	Material	Qty	Remarks

Element and O-ring

Part No.	10	11	12	13	14	15	16	17	21	22	Element	
Model			High Pressure Element Used								h1	d1
UH-03A	G-70	FOR G-70	G-30	P-14	P-18	P-14	※1 P-32	G-30	G-25	G-40	85.3	62.2
UH-04A			G-40					G-40			155.3	62.2
UH-06A			G-55					G-55			204.5	82.2
UH-08A	G-95	FOR G-95	G-65	P-18	P-18	P-14	※1 G-45	G-70	G-25	G-45	254.5	102.2
UH-10A			G-65					G-70			254.5	102.2
UH-12A	G-110	FOR G-110	G-65	P-18	P-18	P-14	※1 G-60	G-70	G-25	G-45	254.5	102.2
UH-16A			G-65					G-70			254.5	102.2

※※※ H₃ height of indicator: Model I...36, Model E...91
Add this height to the element allowance E.

※1 Only when the high pressure element is used, the backup ring is attached.

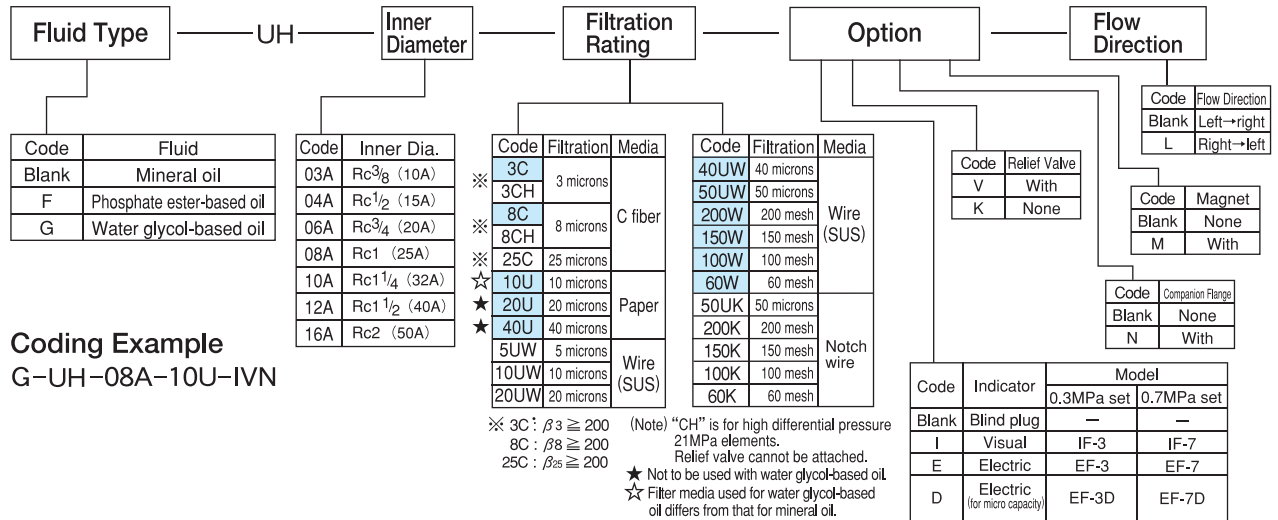
Dimensions and Standard Flow Rates

Symbol	d	H	H ₁	H ₂	A	B	C	D	W	a	b	d ₂ × L	Element Allowance E	Companion Flange (Option)								Mass kg※	Standard Flow Rate (L/min)
Model														d ₃	S	T	P	F	J	K	d ₄ × L		
UH-03A	Rc ³ / ₈	206	60	146	120	116	61	92	45	—	—	M10×15	200	17.8	11	21	48	24	70	52	M10×35	10.0	33
UH-04A	Rc ¹ / ₂	287	65	222	125	116	61	92	45	—	—	M10×15	290	22.2	14	27	56	42	82	72	M12×45	12.2	55
UH-06A	Rc ³ / ₄	374	81	293	170	151	78	122	60	20	25	M10×15	375	27.7	16	31	74	52	102	88	M16×55	25.4	106
UH-08A	Rc1	457	91	366	180	170	90	147	74	20	30	M12×17	450	34.5	19	37	90	60	124	100	M18×60	36.6	125
UH-10A	Rc ¹ / ₄	—	—	—	—	—	—	—	—	—	—	—	—	43.2	—	—	—	—	—	—	—	—	213
UH-12A	Rc ¹ / ₂	—	—	—	—	—	—	—	—	—	—	—	—	49.1	—	—	—	—	—	—	—	—	238
UH-16A	Rc2	—	—	—	—	—	—	—	—	—	—	—	—	61.1	—	—	—	—	—	—	—	—	433

※Mass(kg) does not include companion flange.

Quick delivery of filters in with mineral oil use.
Please contact us on delivery time for others.

► Model Code



► Spares

■ Element

P — **Fluid Type** — UH — **Inner Diameter** — **Filtration Rating**

Coding example: P-G-UH-08A-10U

■ Sealing parts set

● For element replacement (Part No. with © in "Element and O-ring".)

SP — **Fluid Type** — UH — **Inner Diameter** — (H)

Coding example: SP-G-UH-08A

When the high differential pressure element is used.

● For overhaul

SA — **Fluid Type** — UH — **Inner Diameter** — (H)

Coding example: SA-G-UH-08A-HN

Code	Companion Flange
Blank	None
N	With

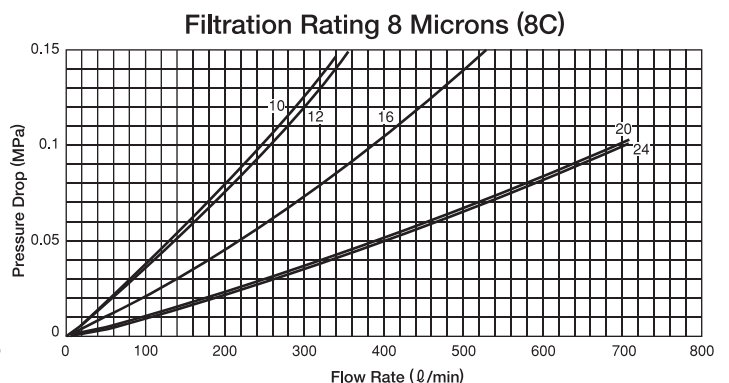
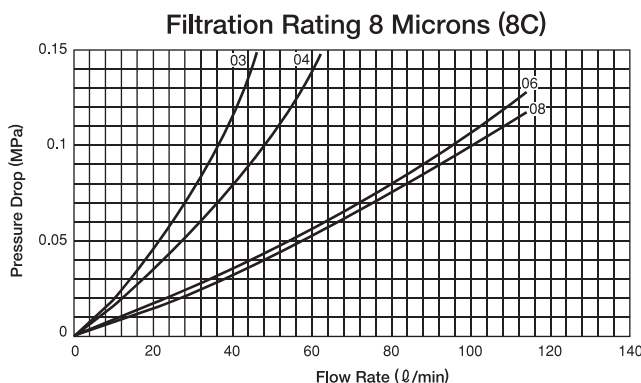
When the high differential pressure element is used.

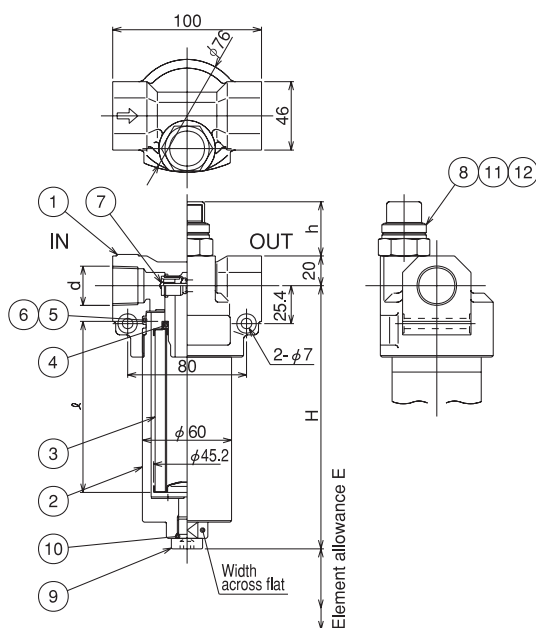
► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)

Common to Models UL, UM and UH

(Except for UH-20 and UH-24)





1. Maximum operating pressure: 21 MPa
Impulse test: 21 MPa x 10⁷ times
2. T connection and element removal is downward.
3. Option spec. table of standard & high differential pressure elements.

Element Type	Max. differential pressure of element	Option	
		Indicator pressure (All red)	Relief valve opening pressure
Standard	0.7MPa	0.3MPa	0.35MPa
High differential pressure	21MPa	0.7MPa	—

4. Elements are common to TM, GM and TMA.
5. Please contact us on packing, O-ring and parts for fluids other than mineral oil.

Part List

12	O-ring	NBR	1	JISB 2401. 1B
11	O-ring	NBR	1	JISB 2401. 1A
10	O-ring	NBR	1	JISB 2401. 1B
9	Drain plug	SCM435	1	PF(G) ¹ / ₄
8	Indicator		1	Option
7	Relief valve	Nylon SS	1	
6	Backup ring	PTFE	1	
5	O-ring	NBR	1	JISB 2401. 1A
4	O-ring	NBR	1	
3	Element		1	
2	Lower cover	SGD	1	
1	Body	FCD500	1	
Part No.	Part Name	Material	Qty	Remarks

O-ring and Backup Ring

Part No.	4	5	6	10	11	12
Model						
TM-B-04	AS	G-55	G-55 (Endless)	P-11	P-14	P-18
TM-B-06	568-214					

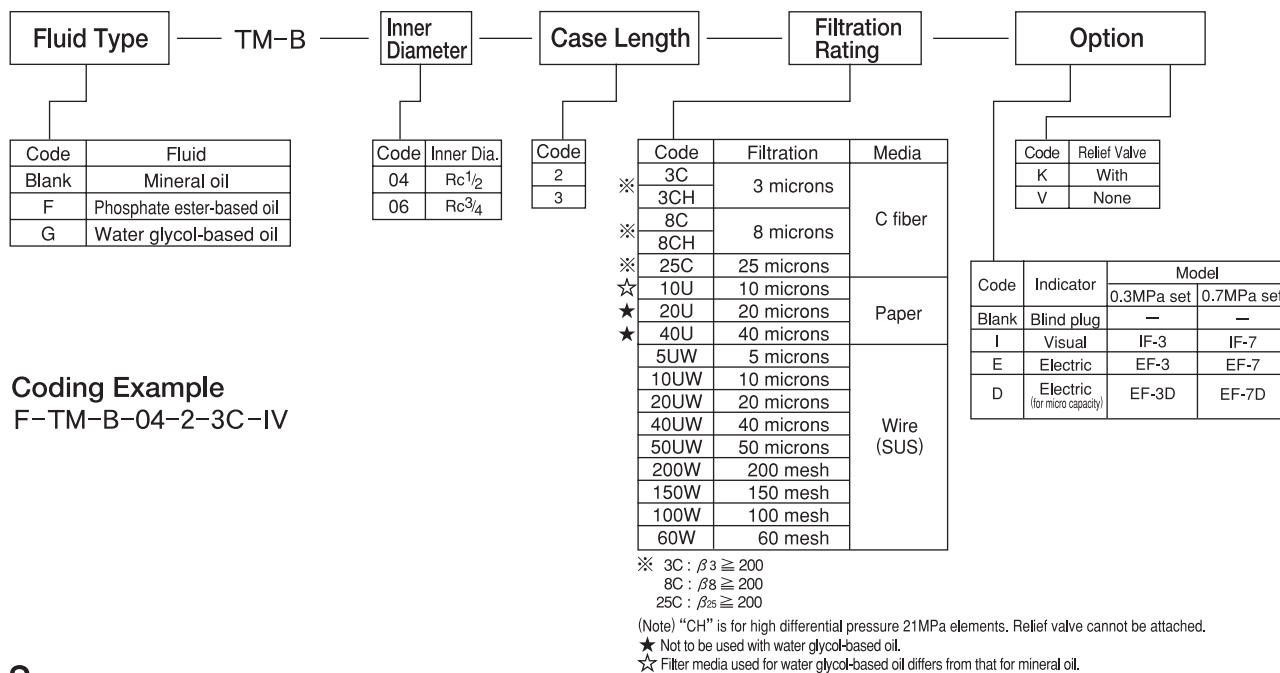
Dimensions and Standard Flow Rates

Model	Symbol	Inner Dia. (d)	H	ℓ	Element Allowance E	Mass (kg)	Standard Flow Rate (ℓ / min)
TM-B-04-2		Rc1/2	177	115	150	3.2	20
TM-B-06-2		Rc3/4					20
TM-B-04-3		Rc1/2	271	209	240	4.1	30
TM-B-06-3		Rc3/4					30

Indicator Height

Indicator Code	h
Blank	12
I	36.5
E/D	91

► Model Code



► Spares

■ Element

P — Fluid Type — TM — Case Length — Filtration Rating

Coding example: P-F-TM-2-3C

■ Sealing parts set

● For element replacement (Part No. with ◎ in "O-ring and Backup ring".)

SP — Fluid Type — TM — B — Inner Diameter

Coding example: SP-F-TM-B-04

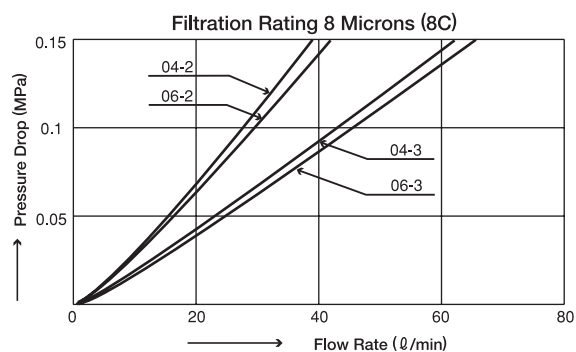
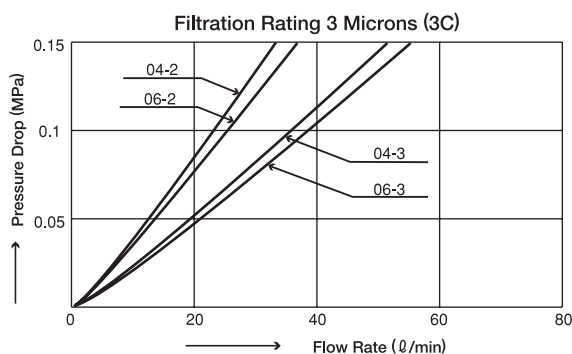
● For overhaul

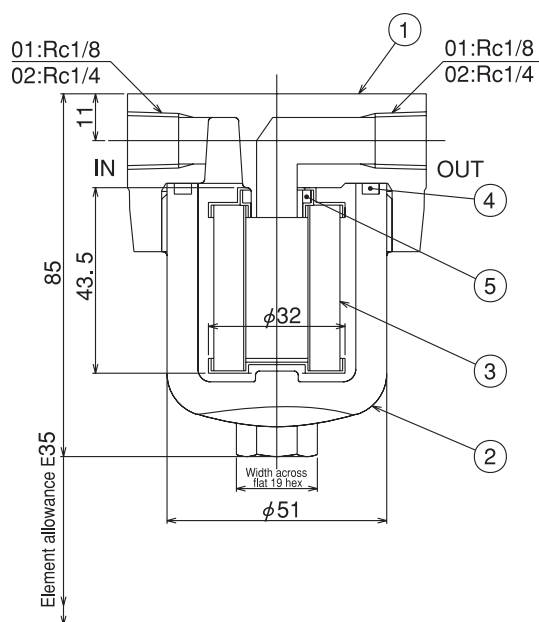
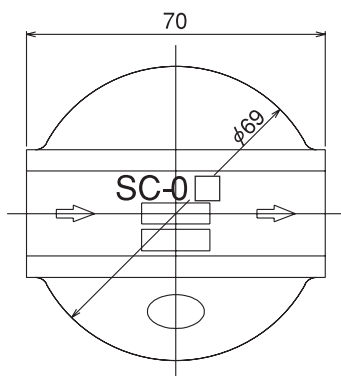
SA — Fluid Type — TM — B — Inner Diameter

Coding example: SA-F-TM-B-04

► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)





1. Maximum operating pressure: 21 MPa
Impulse test: 21 MPa x 10⁷ times
2. T connection. Element removal is downward.
3. Compact filter for small installation space.
4. Relief valve or indicator cannot be added.
5. Mass: 1 kg
6. Please contact us for use of fluid other than mineral oil on packing, O-rings and other parts.

Element Max. Differential Pressure
0.7MPa

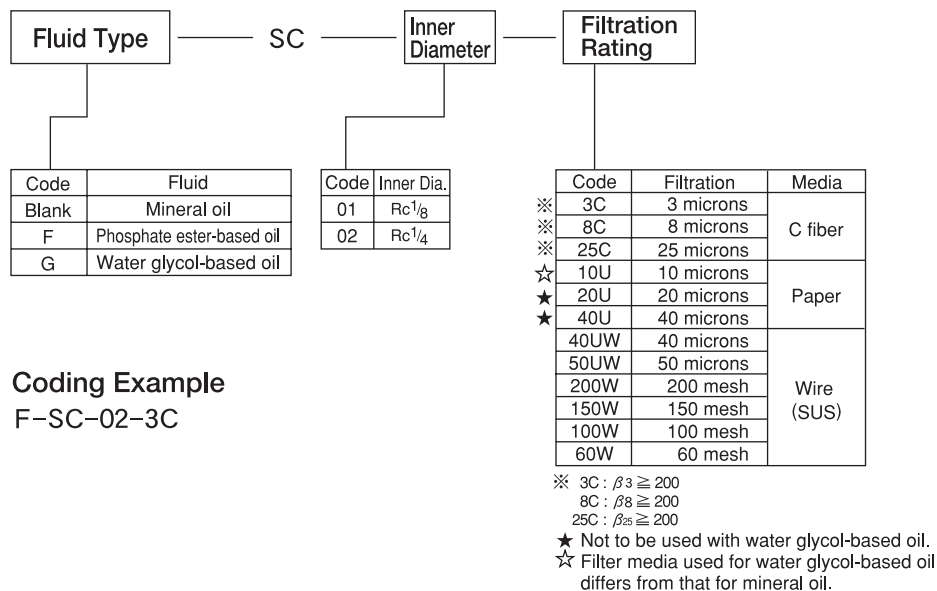
■ O-ring

Part No.	4	5
Model		
SC-01	AS568-131	P-12
SC-02		

■ Part List

Part No.	Part Name	Material	Qty	Remarks
5	O-ring	NBR	1	JIS B2401-1A
4	O-ring	NBR	1	AS568-131
3	Element		1	
2	Case	C3771	1	
1	Body	C3771	1	

► Model Code



Coding Example

F-SC-02-3C

► Spares

■ Element

P — Fluid Type — SC-01,02 — Filtration Rating

Coding example: P-F-SC-01,02-3C

■ Sealing parts set

● For element replacement / For overhaul

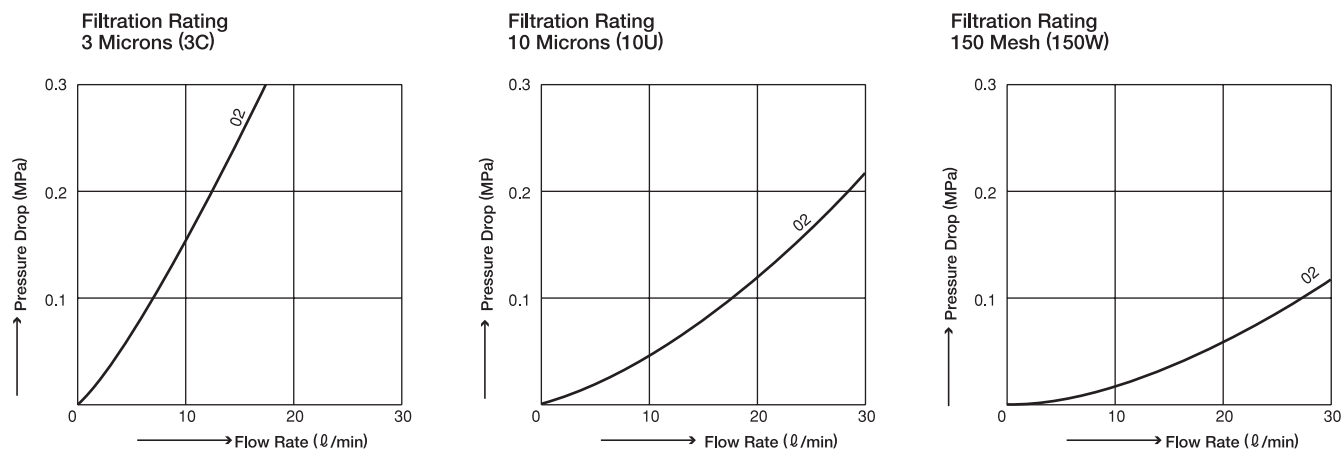
SA — Fluid Type — SC — 01,02

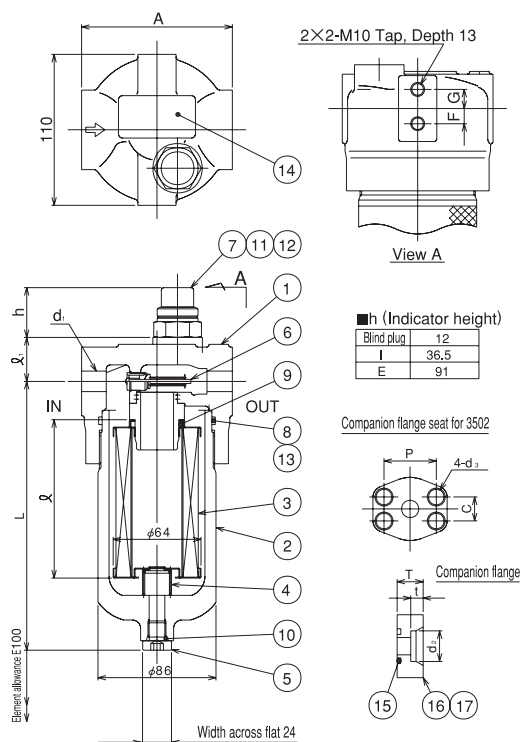
Coding example: SA-F-SC-01,02

*Spares are common to ID 01 and 02.

► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)





1. Maximum operating pressure: 35 MPa
Impulse test: 35 MPa x 10⁷ times
2. T connection. Element removal is downward.
3. Model 3501: G female thread
Model 3502: SAE J518C, Code 61 equivalent flange
4. Please contact us for use of fluid other than mineral oil on packing, O-rings and other parts.

Element Type	Element Max. Differential Pressure	Option	
		Indicator pressure (All red)	Relief valve opening pressure
Standard	0.7MPa	0.3MPa	0.35MPa
High differential pressure	21MPa	0.7MPa	—

Part List

Part No.	Part Name	Material	Qty	Remarks
17	Cap bolt	SCM435	8	3502 only
16	Companion flange	S25C	2	
15	O-ring	NBR	2	AS568
14	Nameplate		1	
13	Backup ring	Teflon	1	JISB 2407. T3
12	O-ring	NBR	1	JISB 2401. 1A
11	O-ring	NBR	1	JISB 2401. 1B
10	O-ring	NBR	1	JISB 2401. 1B
9	O-ring	NBR	1	JISB 2401. 1A
8	O-ring	NBR	1	JISB 2401. 1B
7	Indicator		1 set	Option
6	Relief valve		1 set	
5	Drain plug	SCM435	1	
4	Spring	SWPA	1	
3	Element		1	
2	Lower case	S45C	1	
1	Body	FCD500	1	

O-ring and Backup Ring

Part No.	8	9	10	11	12	13
Model	G-80	※1 P-32 With backup ring	P-11	P-18	P-14	For G-80 (Endless)

※1 Backup ring is included for use of high differential pressure element only.

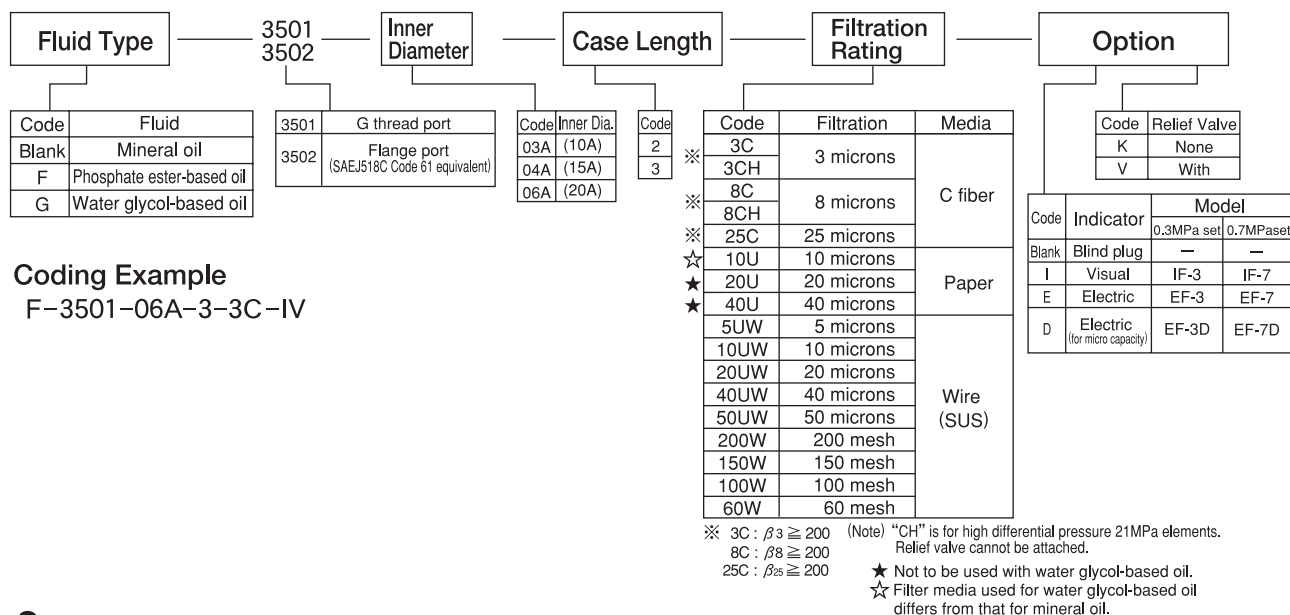
O-ring for Companion Flange

Part No.	15
Model	3502-03A 04A
3502-06A	AS568-210
3502-06A	AS568-214

Dimensions and Standard Flow Rates

Symbol	Inner Dia.		L	Q ₁	A	Q	F	G	T	t	P	C	d ₃	Mass (kg)		Standard Flow Rate (Q / min)
	d ₁	d ₂												Assy	Lower case	
3501-03A-2	G ³ / ₈	—	196	32	110	115	11	14	—	—	—	—	—	6.3	2.6	35
3501-04A-2	G ¹ / ₂	—							—	—	—	—	—	6.3		55
3502-03A-2	—	10A							19	9	38.1	17.4	M8×23	6.9		35
3502-04A-2	—	15A							19	9	38.1	17.4	M8×23	8.0		55
3501-03A-3	G ³ / ₈	—	268	32	110	182	11	14	—	—	—	—	—	7.4	3.7	35
3501-04A-3	G ¹ / ₂	—							—	—	—	—	—	7.4		55
3502-03A-3	—	10A							19	9	38.1	17.4	M8×23	8.0		35
3502-04A-3	—	15A							19	9	38.1	17.4	M8×23	8.0		55
3501-06A-2	G ³ / ₄	—	203	35	120	115	10	15	—	—	—	—	—	6.4	2.6	100
3502-06A-2	—	20A							24	12	47.6	22.2	M10×24	7.5		100
3501-06A-3	G ³ / ₄	—							24	12	47.6	22.2	M10×24	7.5		100
3502-06A-3	—	20A							24	12	47.6	22.2	M10×24	8.6		100

► Model Code



► Spares

■ Element

P — Fluid Type — 3501 — Case Length — Filtration Rating
3502

Coding example : P-F-3501-3-3C

■ Sealing parts set

● For element replacement (Part No. with ◎ in "O-ring and Backup ring".)

SP — Fluid Type — 3501 — Inner Diameter — (H)
3502

Coding example : SP-F-3501-06A — When the high differential pressure element is used.

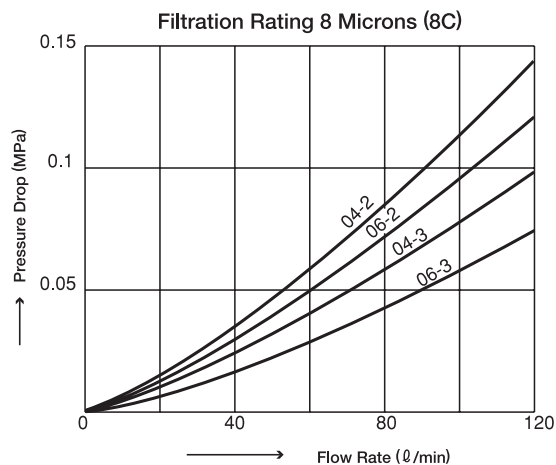
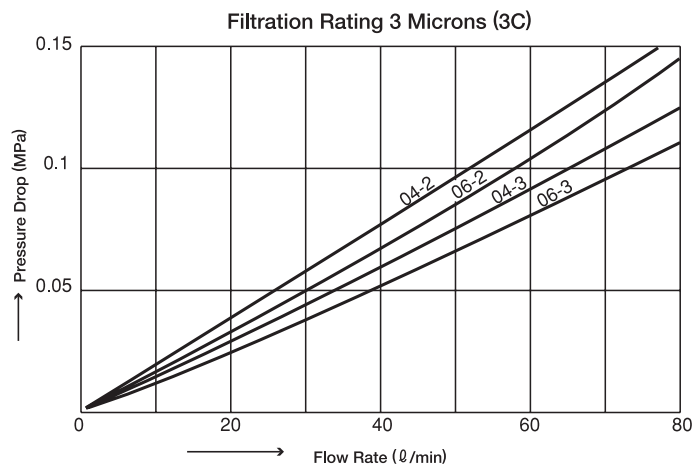
● For overhaul

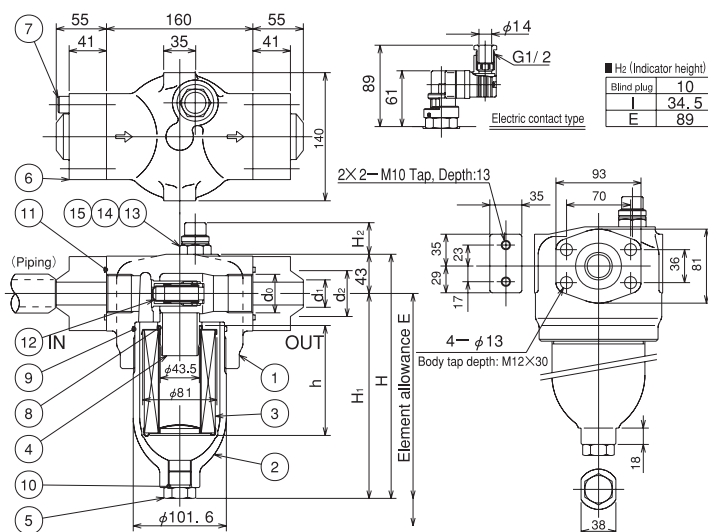
SA — Fluid Type — 3501 — Inner Diameter — (H)
3502

Coding example : SA-F-3501-06A-H — When the high differential pressure element is used.

► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)





- Maximum operating pressure: 35 MPa
Impulse test: 35 MPa x 10⁷ times
- Spec. for option

Element Type	Element Max. Differential Pressure	Option	
		Indicator pressure (All red)	Relief valve opening pressure
Standard	0.7MPa	0.3MPa	0.35MPa
High differential pressure	21MPa	0.7MPa	—

- T connection. Element removal is downward.
- Companion flange is available in additional option.
- Please contact us for use of fluid other than mineral oil on packing, O-rings and other parts.

Part List

15	O-ring	NBR	1	JISB 2401. 1A
14	O-ring	NBR	1	JISB 2401. 1B
13	Indicator		1 set	Option
12	Relief Valve		1 set	
11	O-ring	NBR	2	Option
10	O-ring	NBR	1	JISB 2401. 1B
9	O-ring	NBR	1	JISB 2401
8	O-ring	NBR	1	
7	Cap bolt	SCM435	8	Option
6	Companion flange	S25C	2	
5	Drain plug	S45C	1	
4	Inlet	SS400	1	
3	Element		1	
2	Lower case	SA372Gr.D	1	
1	Body	FCD500	1	
Part No.	Part Name	Material	Qty	Remarks

O-ring and backup ring (All SH models)

Part No.	8	9	10	11	14	15
Part Name	AS568-131 ※1 P-42(Hs70)	G-100	P-22	G-50	P-18	P-14
Backup ring	※2 t1.25× φ 47.2/42.9	t1.5× φ 103/98		SUN-4B G-50		

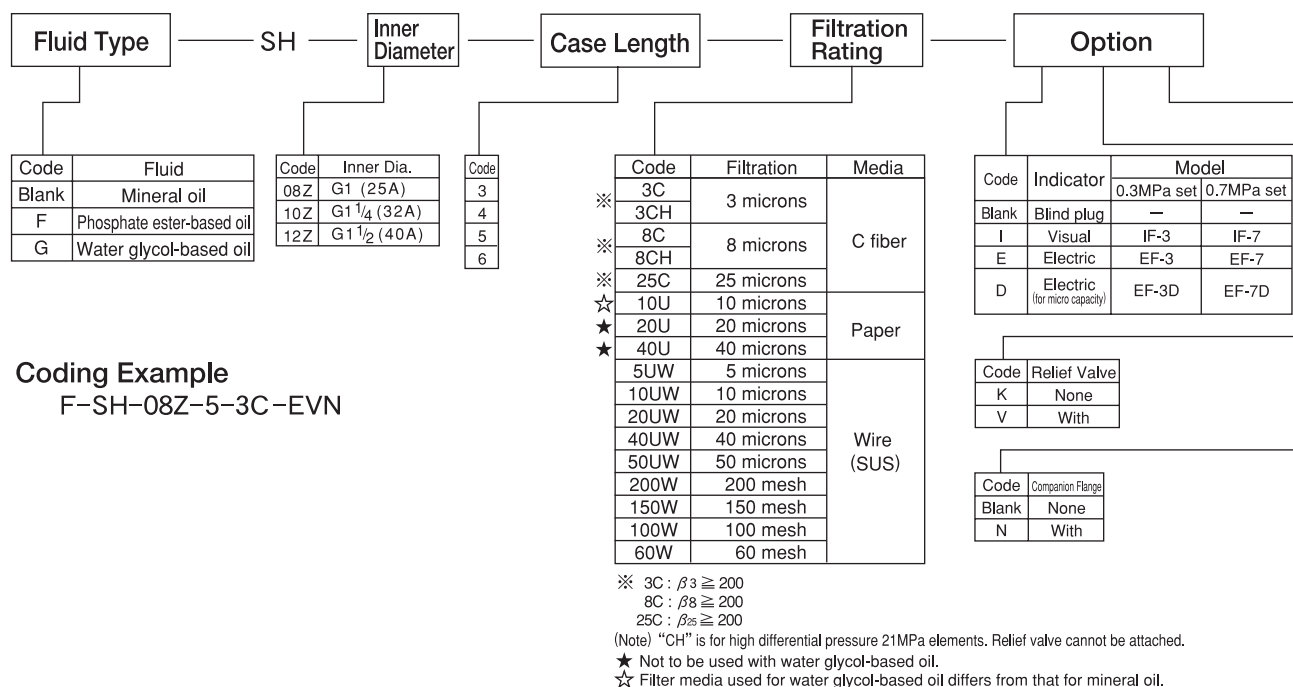
※1 For use of 5UW, 10UW and 20UW

※2 Backup ring is included for use of high differential pressure element only.

Dimensions and Standard Flow Rates

Symbol Model	Inner Dia.	H	H ₁	Element Height h	Element Allowance E	d ₀	d ₁	d ₂	Mass (kg)	Standard Flow Rate (ℓ/min)
SH-08Z-3	25A	267	224	120	360	G1	φ 24	φ 45	13	193
SH-08Z-4		358	315	211	540				15	225
SH-08Z-5		477	434	330	780				17	240
SH-08Z-6		578	535	431	980				20	250
SH-10Z-3	32A	267	224	120	360	G1 1/4	φ 30	φ 50	13	240
SH-10Z-4		358	315	211	540				15	295
SH-10Z-5		477	434	330	780				17	325
SH-10Z-6		578	535	431	980				20	340
SH-12Z-3	40A	267	224	120	360	G1 1/2	φ 34	φ 55	13	260
SH-12Z-4		358	315	211	540				15	335
SH-12Z-5		477	434	330	780				17	375
SH-12Z-6		578	535	431	980				20	400

Model Code



Coding Example

F-SH-08Z-5-3C-EVN

Spares

Element

P — Fluid Type — SH — Case Length — Filtration Rating

Coding example: P-F-SH-5-3C

Sealing parts set

● For element replacement (Part No. with ◎ in "O-ring and Backup ring".)

SP — Fluid Type — SH — Inner Diameter

Coding example: SP-F-SH-08Z-H

● For overhaul

SA — Fluid Type — SH — Inner Diameter

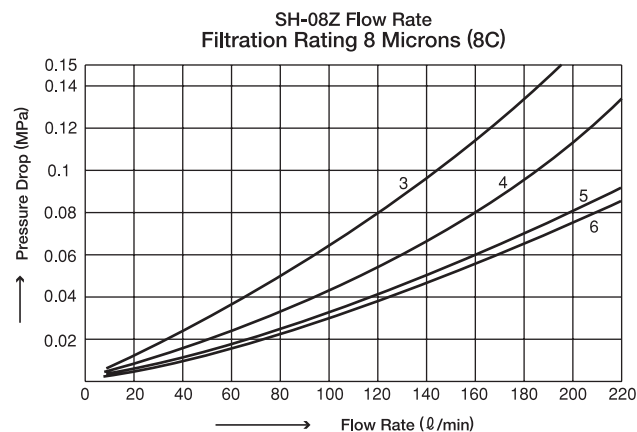
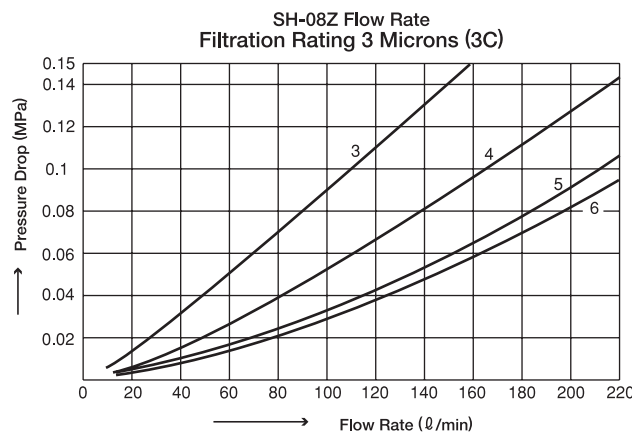
Coding example: SA-F-SH-08Z-UWN

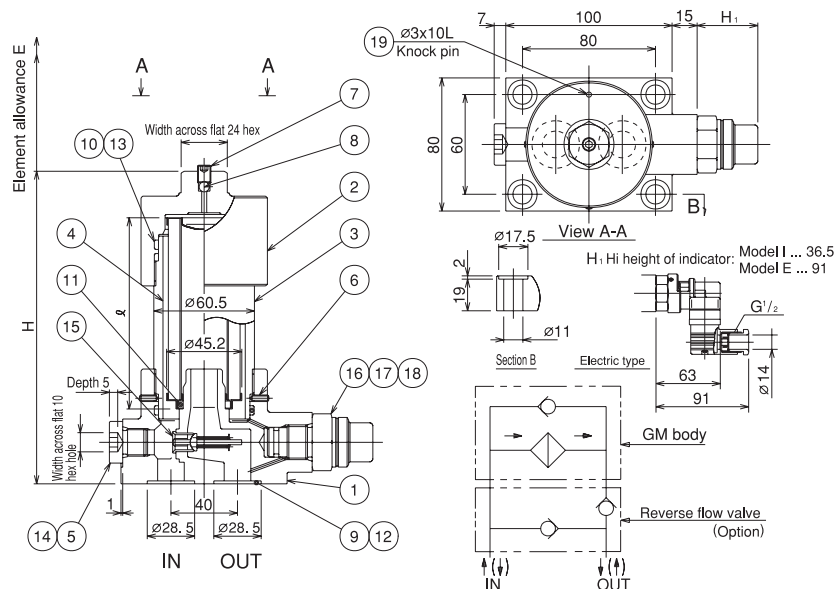
Code	Filtration Rating
H	3CH, 8CH
UW	5UW, 10UW, 20UW
Blank	Others

Code	Filtration Rating	Code	Companion Flange
H	3CH, 8CH	Blank	None
UW	5UW, 10UW, 20UW	N	With
Blank	Others		

Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)





1. Maximum operating pressure: 21 MPa
Impulse test: 21 MPa x 10⁷ times
2. Manifold type: Easy to replace elements for upward removal.
3. Spec. for option

Element Type	Element Max. Differential Pressure	Indicator Operating Pressure	Relief Valve Opening Pressure
Standard	0.7MPa	0.3MPa	0.35MPa
High differential pressure	21MPa	0.7MPa	—

4. Filter element is common to Models TM, GM and TMA.
5. Reverse flow valve for manifold type is available in additional option.
6. Please contact us for use of fluids other than mineral oil on O-rings and other parts.
7. Manifold surface finish should be Ra 1.6S (▽▽▽) or better.
8. For mounting, please prepare and use hexagon socket cap bolt (strength 12.9).
Size M10x35 (without reverse flow valve)
Size M10x70 (with reverse flow valve) bolt too much.

Caution: When releasing air, do not over-loosen No.7 Cap bolt. Avoid No.8 Steel ball pop-out which may cause injury.

Part List

19	φ3 × 10L knock pin	SK	1	Option
18	O-ring	NBR	1	JISB 2401. 1A
17	O-ring	NBR	1	JISB 2401. 1B
16	Indicator		1 set	Option
15	Relief valve	Nylon SWPA	1	Option
14	O-ring	NBR	1	JISB 2401. 1B
13	Backup ring	PTFE	2	JISB 2407.
12	Backup ring	PTFE	2	SUN-4B
11	O-ring	NBR	1	AS568-214
10	O-ring	NBR	2	JISB 2401. 1A
9	O-ring	NBR	2	JISB 2401. 1B
8	Steel ball	SUJ	1	
7	Cap bolt	SCM435	1	
6	Cap bolt	SCM435	2	
5	G ³ / ₈ drain plug	SCM435	1	Under head 15
4	Element		1	
3	Shell	STPT410S	1	
2	Cover	FCD450	1	
1	Body	FCD500	1	
Part No.	Part Name	Material	Qty	Remarks

O-ring and Backup Ring

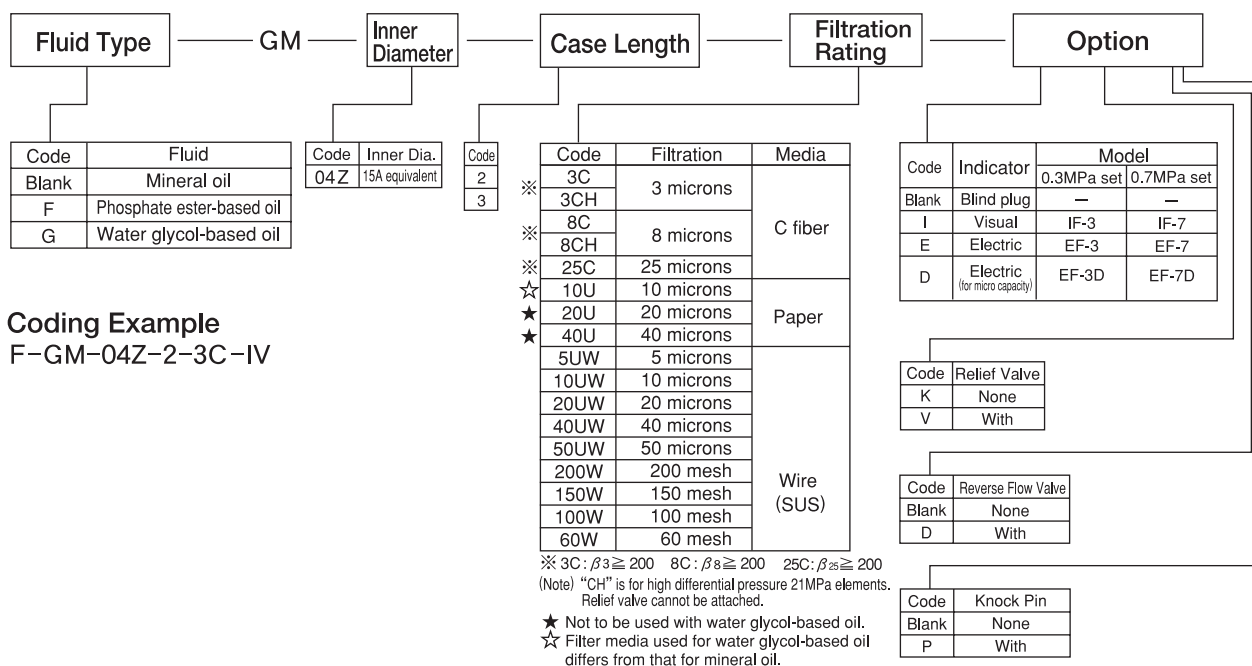
Part No.	9	10	11	12	13	14	17	18
Model	P-22	G-55	AS 568-214	P-22 (for flange)	G-55 (Endless)	P-14	P-18	P-14
All GM models	P-22	G-55	AS 568-214	P-22 (for flange)	G-55 (Endless)	P-14	P-18	P-14

Reverse flow valve (additional option) comes with P-14 O-ring (JIS B2401.1A) and Backup ring (JIS B2407 T2).

Dimensions and Standard Flow Rates

Symbol	Inner Dia.	H	ø	Element Allowance E	Mass (kg)	Standard Flow Rate (l/min)
Model						
GM-04Z-2	15A	188	115	90	4.2	20
GM-04Z-3		282	209	180	5.0	30
Reverse flow valve		—	—	—	2.1	—

► Model Code



► Spares

■ Element

P — Fluid Type — GM — Case Length — Filtration Rating

Coding example : P-F-GM-2-3C

■ Sealing parts set

● For element replacement (Part No. with ◎ in "O-ring and Backup ring".)

SP — Fluid Type — GM — 04Z

Coding example : SP-F-GM-04Z

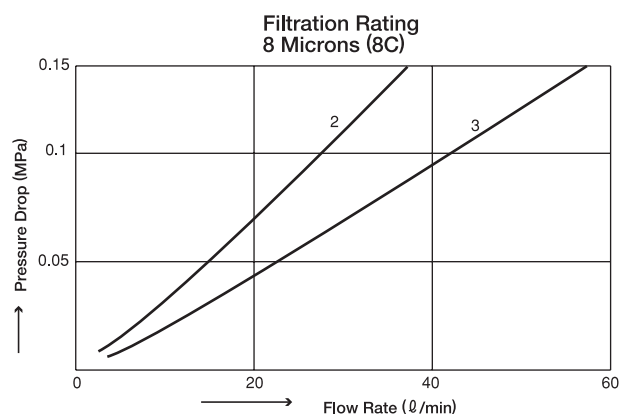
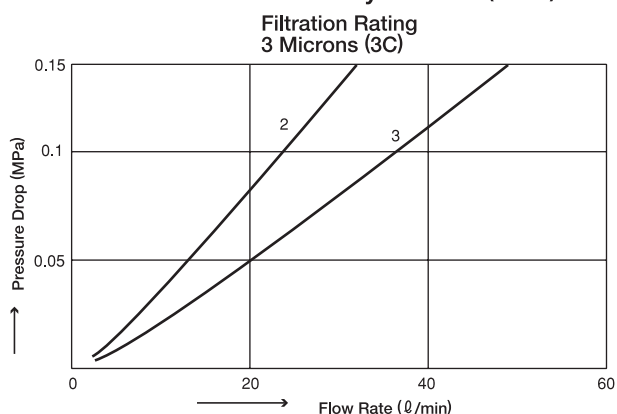
● For overhaul

SA — Fluid Type — GM — 04Z — Option

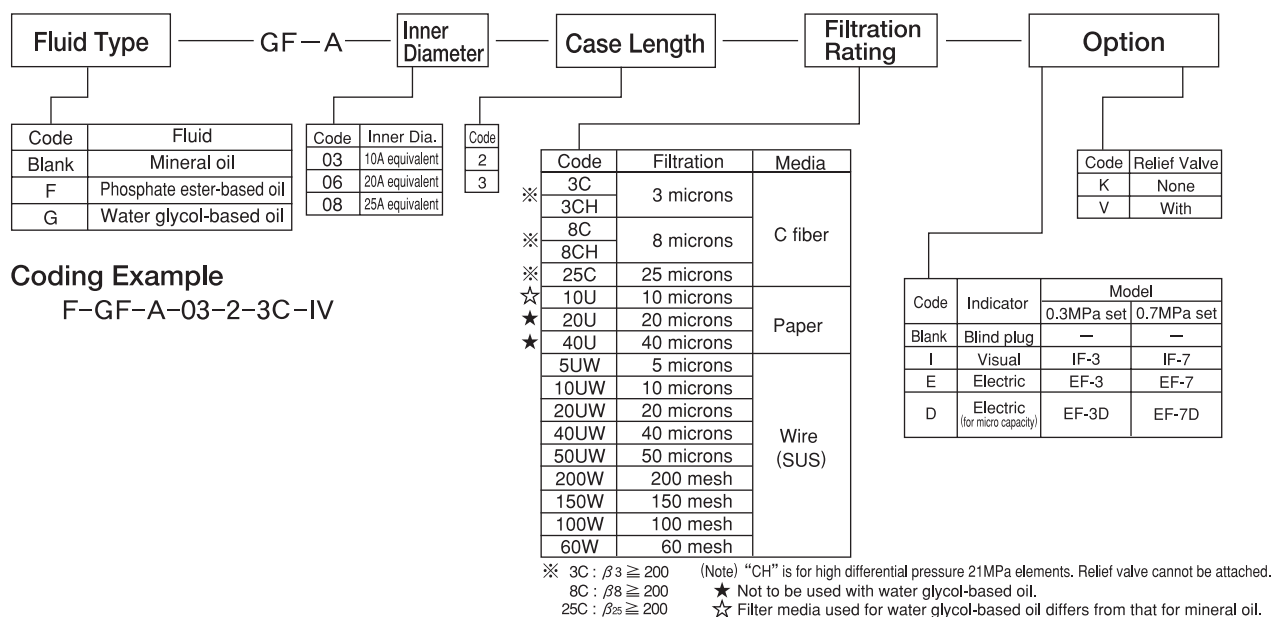
Code	Reverse Flow Valve
Blank	None
D	With

► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)



► Model Code



► Spares

■ Element

P — **Fluid Type** — GF — **A** — **Inner Diameter** — **Case Length** — **Filtration Rating**

Coding example : P-F-GF-A-03-2-3C

■ Sealing parts set

● For element replacement (Part No. with ◎ in "O-ring and Backup ring" .)

SP — **Fluid Type** — GF — **A** — **Inner Diameter** — (H)

Coding example : SP-F-GF-A-03

When the high differential pressure element is used

● For overhaul

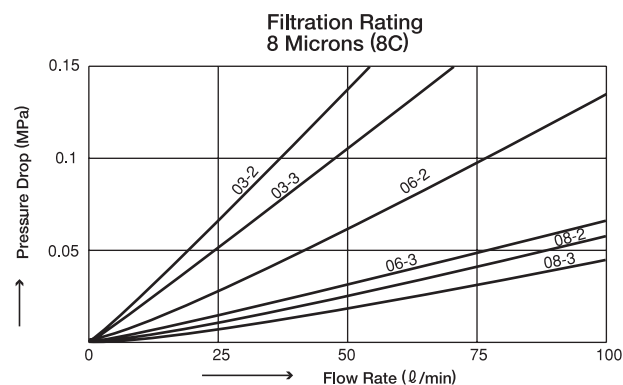
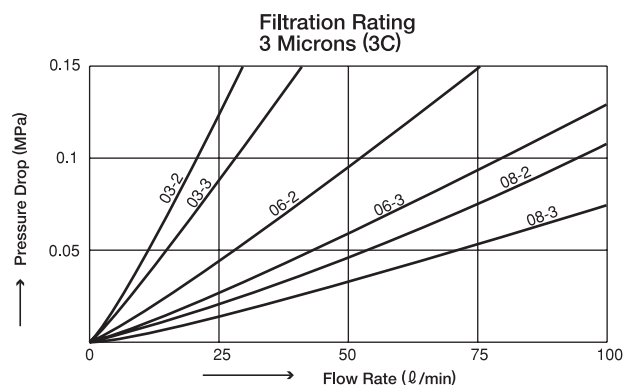
SA — **Fluid Type** — GF — **A** — **Inner Diameter** — (H)

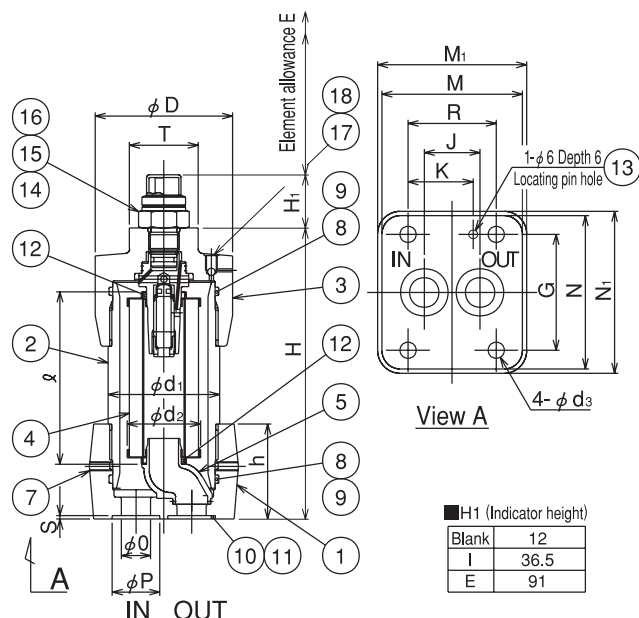
Coding example : SA-F-GF-A-03-H

When the high differential pressure element is used

► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)





- Maximum operating pressure: 25 MPa
Impulse test: 25 MPa x 10⁷ times

- Spec. for option

Element Type	Element Max. Differential Pressure	Indicator Operating Pressure	Relief Valve Opening Pressure
Standard	0.7MPa	0.3MPa	0.35MPa
High differential pressure	21MPa	0.7MPa	—

- Manifold-mount type.
Mounting face standard ... JOHS121 (Mounting face of hydraulic 2-port control valve in Japan Oil Hydraulic Standard)

● GF-03 : P-AG-06-2-A

● GF-06 : P-AH-08-2-A

- Please contact us for use of fluids other than mineral oil on O-rings and other parts.

- Manifold surface finish should be Ra 1.6S(▽▽▽) or better.

- For mounting, please prepare and use hexagon socket cap bolt (strength 12.9).

Size GF-03: M10 x 70

GF-06: M10 x 80

GF-08: M12 x 100

- Drain plug is not provided with filter assembly.
Please provide drain plug at manifold block for installation.

- Manganese phosphate coating on filter body.

⚠ **Caution** When releasing air, do not over-loosen No.17 Cap bolt. Avoid No.18 Steel ball pop-out which may cause injury.

Part List

Part No.	Part Name	Material	Qty	Remarks
18	φ 5 Steel ball	SUJ	1	
17	M8 Cap bolt	SCM435	1	Cup point
16	O-ring	NBR	1	JISB 2401. 1A
15	O-ring	NBR	1	JISB 2401. 1B
14	Indicator	SUS303	1	
13	φ 6 × 12 spring pin	SK	1	
12	O-ring	NBR	2	JISB 2401.1A※1
11	Backup ring	PTFE	2	SUN-4B (for flange)
10	O-ring	NBR	2	JISB 2401.1B
9	Backup ring	PTFE	2	JISB 2407. T3
8	O-ring	NBR	2	JISB 2401. 1A
7	Cap bolt	SCM435	2	Cup point
6	Relief valve		1	
5	Inlet	AC2B	1	
4	Element		1	
3	Cover	S25C	1	
2	Shell	S45C	1	GF-A-03: STPT410S
1	Body	S25C	1	

O-ring and Backup Ring

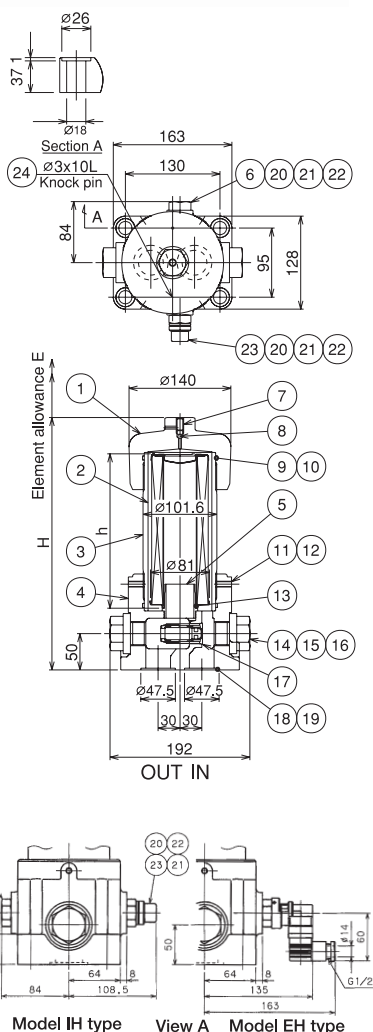
Part No.	8	9	10	11	12	15	16
Model							
GF-A-03-2	G-55	For G-55	P-20	For P-20	AS568-119 HS70	P-18	P-14
GF-A-03-3							
GF-A-06-2	G-70	For G-70	G-25	For G-25	AS568-119 HS70		
GF-A-06-3							
GF-A-08-2	G-80	For G-80	G-35	For G-35	※1 P-32 With backup ring		
GF-A-08-3							

※1 Backup ring is included for use of high differential pressure element only.

Dimensions and Standard Flow Rates

Symbol Model	H	h	D	d ₁	Element		M	M ₁	R	N	N ₁	G	J	O	P	S	K	d ₃	T	Element Allowance E	Mass (kg)	Standard Flow Rate (ℓ/min)
					ℓ	※2 d ₂																
GF-A-03-2	194	56	76	60.5	118	45 (45.3)	78	82	42.9	88	93	66.7	28.6	16	26.5	1.8	31.8	11	With across flat 36 hex	130	4.6	25
GF-A-03-3	288				212															225	5.3	27
GF-A-06-2	199	65	94	76.3	118	50.2 (51)	96	102	60.3	105	111	79.4	38.1	20	32.5	2.4	44.5	11	With across flat 41 hex	130	7.1	90
GF-A-06-3	293				212															225	8.4	110
GF-A-08-2	265	80	115	89.1	160.6	62.2 (64)	118	127	84.1	118	127	96.8	50.8	30	42.5	2.4	62.7	13	With across flat 41 hex	170	12.1	200
GF-A-08-3	365				260.6															270	14.8	230

※2 High differential pressure element dimensions in ().



■ Dimensions and Standard Flow Rates

Symbol Model	H	Element Height h	Element Allowance E	Mass kg	Standard Flow Rate (l/min)
GC-12Z-3	256	120	80	20	240
GC-12Z-4	347	211	170	22	300
GC-12Z-5	466	330	290	24	330
GC-12Z-6	567	431	390	26	350

- Maximum operating pressure: 35 MPa
Impulse test: 35 MPa x 10⁷ times

- Spec. for option

Element Type	Element Max. Differential Pressure	Indicator Operating Pressure	Relief Valve Opening Pressure
Standard	0.7MPa	0.3MPa	0.35MPa
High differential pressure	21MPa	0.7MPa	—

- Manifold-mount type.
- Please contact us for use of fluids other than mineral oil on O-rings and other parts.
- Manifold surface finish should be Ra 1.6S(▽▽▽) or better.
- For mounting, please prepare and use hexagon socket cap bolt (strength 12.9).
Size M16 x 60

■ Replacement of filter element for Model GC

- Loosen the plug on the side of body to drain oil.
- Remove head cover and pull upward element holding the grip on end plate of the element.
- Check a new element, O-rings and backup rings and if they are damaged, replace with new ones.
Set a new element, the plug and head cover.
- Prior to operation start-up, loosen the cap bolt in the center of head cover to release air.



Caution

When releasing air, do not over-loosen No.7 Air vent plug.
Avoid No.8 Steel ball pop-out which may cause injury.
When removing No.1 Cover, make sure No.11 Set screw is tighten.
(Loose screw may damage No.3 Sell.)

■ Part List

Part No.	Part Name	Material	Qty	Remarks
24	φ 3 x 10L knock pin	SK	1	Option
23	Indicator	SUS303	1	Option
22	O-ring	NBR	2	JISB 2401.1A
21	Backup ring	PTEF	2	JISB 2407. T2
20	O-ring	NBR	2	JISB 2401.1B
19	Backup ring	PTEF	2	
18	O-ring	NBR	2	JISB 2401.1B
17	Relief valve assy	SUM,SECC,SWPA	1s	Option
16	Backup ring	PTEF	2	
15	O-ring	NBR	2	JISB 2401.1B
14	Plug	SS400	2	G1
13	O-ring	NBR	1	
12	Piece	C3604	2	
11	Set screw	SCM435	2	
10	Backup ring	PTEF	2	
9	O-ring	NBR	2	JISB 2401.1B
8	Steel ball	SUJ	1	
7	Air vent plug	SCM435	1	
6	Plug	S45CH	1	
5	Guide	STPG370	1	
4	Body	FCD500	1	
3	Shell	SA372Gr.D	1	
2	Element		1	
1	Cover	S48C	1	

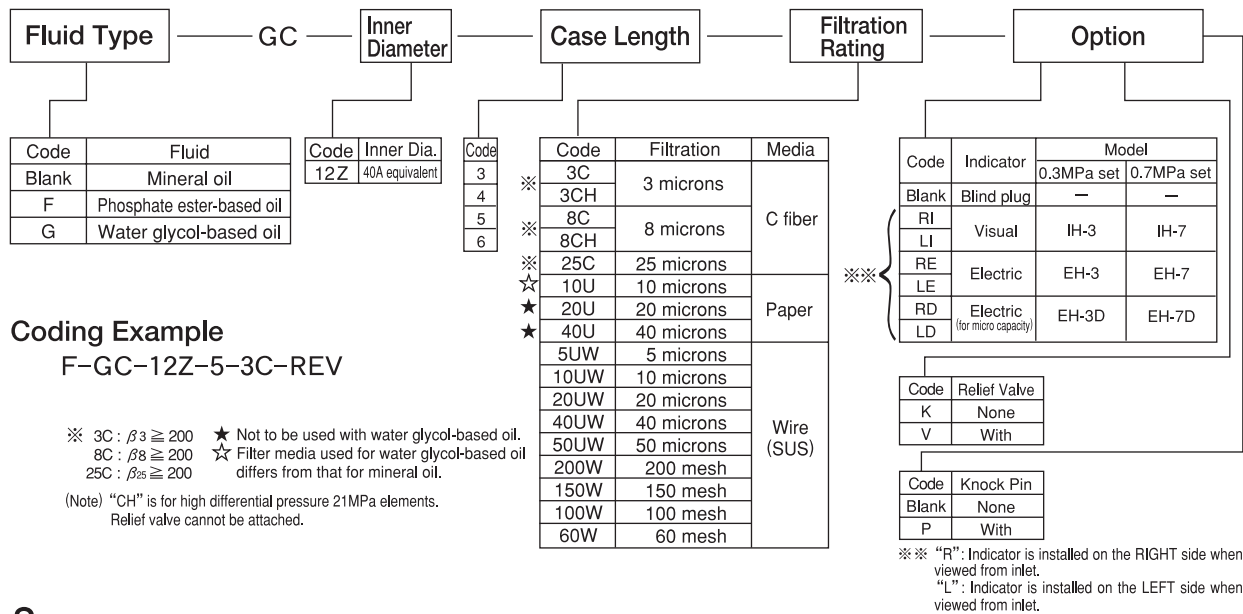
■ O-ring and backup ring (All GC models)

Part No.	9 · 10	13	15 · 16	18 · 19	20 · 21	22
Part Name						
O-ring	G-100	AS568-131 ※1 P-42(Hs70)	G-40	G-40	P-22	P-16
Backup ring	t1.5×φ 103/98	※2 t1.25×φ 47.2×42.9	SUN-4B,G-40 (for fange)	SUN-4B,G-40 (Endless)	JIS B2407,T2 ,P22	

※1 For use of 5UW, 10UW and 20UW

※2 Backup ring is included for use of high differential pressure element only.

► Model Code



► Spares

■ Element

P — Fluid Type — GC — Case Length — Filtration Rating

Coding example: P-F-GC-5-3C

■ Sealing parts set

● For element replacement (Part No. with ◎ in "O-ring and Backup ring".)

SP — Fluid Type — GC — 12 Z —

Coding example: SP-F-GC-12Z-H

Code	Filtration Rating
H	3CH, 8CH
UW	5UW, 10UW, 20UW
Blank	Others

● For overhaul

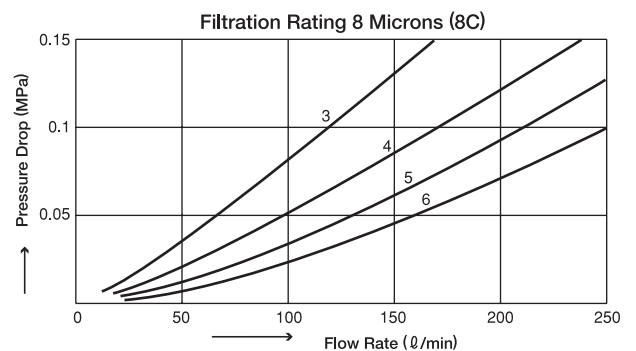
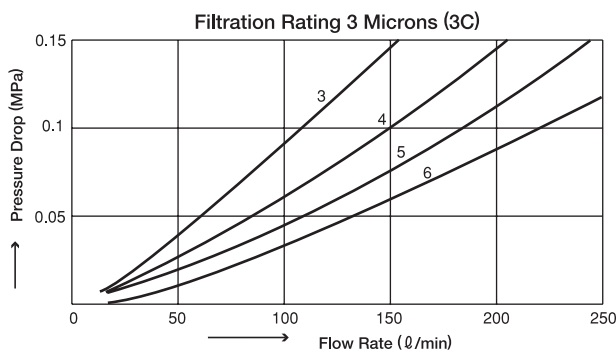
SA — Fluid Type — GC — 12 Z —

Coding example: SA-F-GC-12Z-UW

Code	Filtration Rating
H	3CH, 8CH
UW	5UW, 10UW, 20UW
Blank	Others

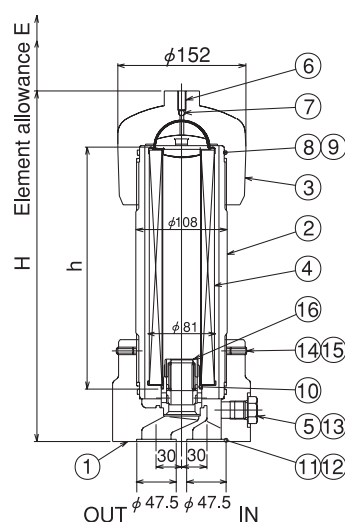
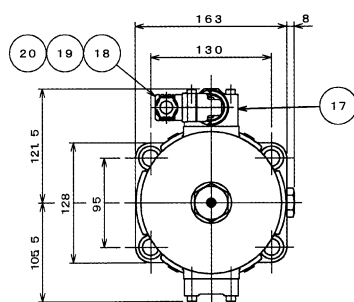
► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)



MODEL 4201

MANIFOLD TYPE FILTER 42 MPa



1. Maximum operating pressure: 42 MPa
Impulse test: 42 MPa x 10⁷ times
2. Installation dimensions are the same for Model 4201 and GC.
3. Elements used for Model 4201 and GC are the same.
4. For mounting, please prepare and use hexagon socket cap bolt (strength 12.9).
Size M16 x 90



Caution

When releasing air, do not over-loosen No.6 Air vent plug. Avoid No.7 Steel ball pop-out which may cause injury.

Part List

20	O-ring	NBR	1	JISB 2401. 1A
19	O-ring	NBR	1	JISB 2401. 1B
18	Indicator	SUS	1SET	Option
17	Indicator block	FCD500	1SET	With bolt & P-6 (backup ring)
16	Relief valve	SS, C3604 SWPA	1SET	Option With S-32
15	Piece	C3604	2	
14	Set screw	SCM435	2	
13	O-ring	NBR	1	JISB 2401.1B
12	Backup ring	Teflon	2	
11	O-ring	NBR	2	JISB 2401.1B
10	O-ring	NBR	1	
9	Backup ring	Teflon	2	
8	O-ring	NBR	2	JISB 2401.1B
7	Steel ball	SUJ	1	
6	Air vent plug	SCM435	1	
5	Drain plug	SCM435	1	
4	Element		1	
3	Cover	SF440	1	
2	Shell	SA372Gr.D	1	
1	Body	FCD500	1	
Part No.	Part Name	Material	Qty	Remarks

O-ring and backup ring (All 4201 models)

Part No.	8 · 9	10	11 · 12	13	19	20
Part Name	G-105	AS568-131 ※1 P-42(Hs70)	G-40	P-18	P-22	P-16
Backup ring	11.5X φ 108/103 (Endless)	※2 11.25X φ 47.2/42.9	SUN-4B,G-40 (for fange)	JIS B2407,T2 ,P-22		

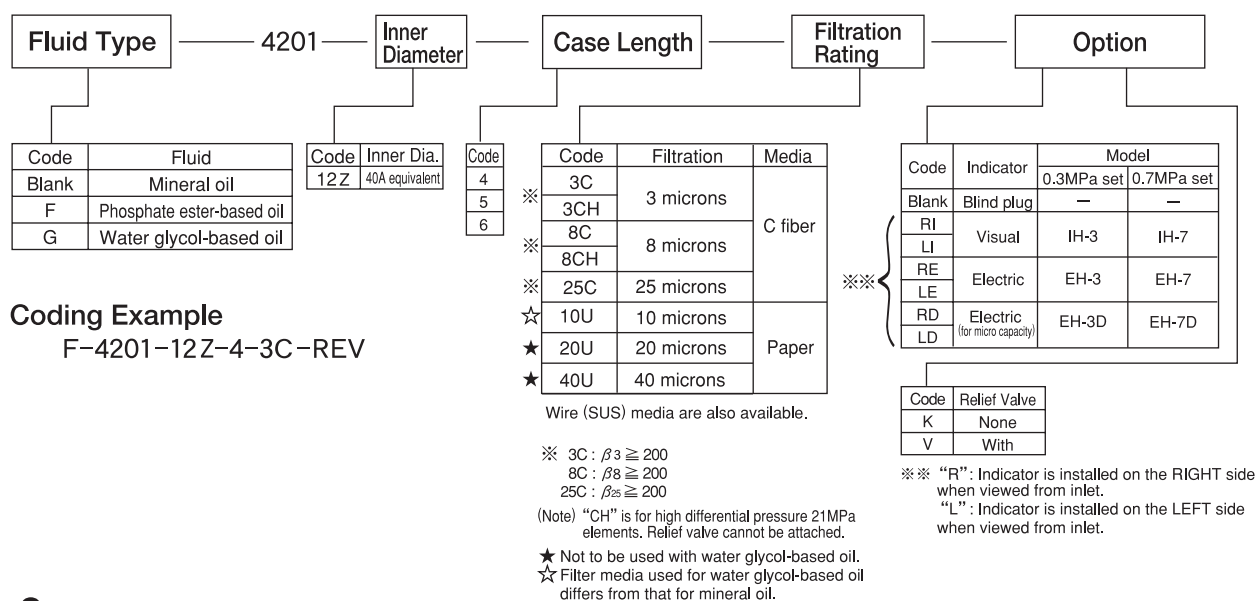
※1 For use of 5UW, 10UW and 20UW

※2 Backup ring is included for use of high differential pressure element only.

Dimensions and Standard Flow Rates

Symbol Model	h	H	Element Allowance E	Mass (kg)	Standard Flow Rate (ℓ /min)
4201-12Z-4	211	357	170	30	300
4201-12Z-5	330	476	290	33	330
4201-12Z-6	431	577	390	36	350

► Model Code



Coding Example

F-4201-12Z-4-3C-REV

► Spares

■ Element

P — Fluid Type — 4201 — Case Length — Filtration Rating

Coding example: P-F-4201-4-3C

■ Sealing parts set

● For element replacement (Part No. with ◎ in "O-ring and Backup ring".)

SP — Fluid Type — 4201 — Inner Diameter — Filtration Rating

Code	Filtration Rating
H	3CH, 8CH
UW	5UW, 10UW, 20UW
Blank	Others

Coding example: SP-F-4201-12Z-UW

● For overhaul

SA — Fluid Type — 4201 — Inner Diameter — Filtration Rating — Indicator — Relief Valve

Code	Filtration Rating
H	3CH, 8CH
UW	5UW, 10UW, 20UW
Blank	Others

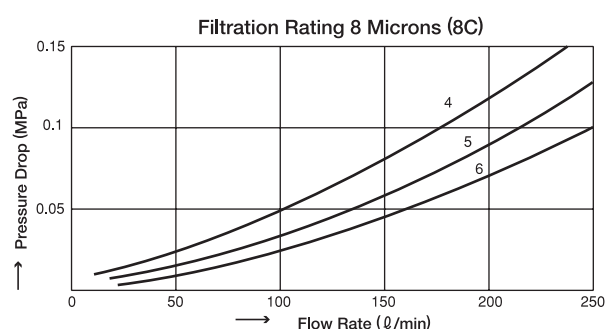
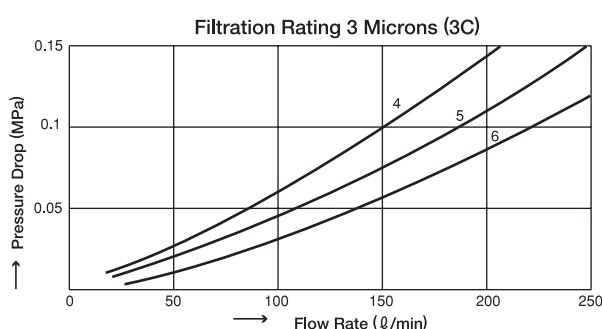
Code	Indicator
Blank	Blind plug
I	Visual
E	Electric
D	Electric (for micro capacity)

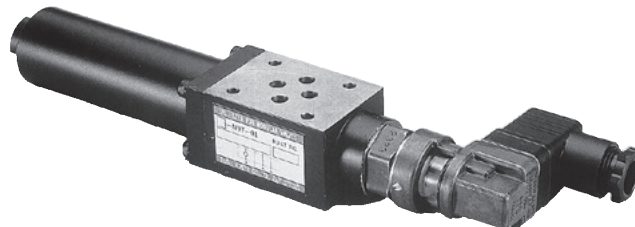
Code	Relief Valve
K	None
V	With

Coding example: SA-F-4201-12Z-UW-EV

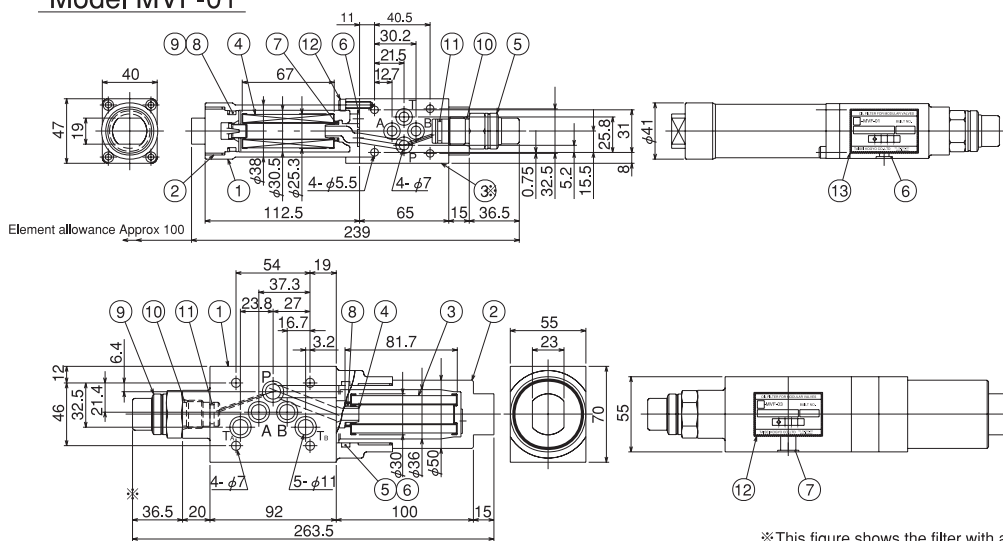
► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)





Model MVF-01



Model MVF-03

※ This figure shows the filter with a visual type indicator installed.
Model EF indicator: 91
Without indicator (Blind plug): 12

1. Maximum operating pressure: 25 MPa
2. Dimensions of installation face comply with ISO standards as follows.
MVF-01: ISO4401-AB-03-4-A, MVF-03: ISO4401-AC-05-4-A.

Part List MVF-01

13	Nameplate		1	
12	Cap bolt	SCM435	4	
11	O-ring	NBR	1	JISB 2401. 1A
10	O-ring	NBR	1	JISB 2401. 1B
9	Backup ring	PTFE	1	
8	O-ring	NBR	1	JISB 2401. 1A
7	O-ring	NBR	1	JISB 2401. 1A
6	O-ring	NBR	6	JISB 2401. 1B
5	Indicator		1	Option
4	Element		1	
3	Base	SS400	1	
2	Cover	SS400	1	
1	Body	SCC5	1	
Part No.	Part Name	Material	Qty	Remarks

O-ring and Backup Ring MVF-01

Part No.	6	7	8	9	10	11
Model						
MVF-01	P-9	P-10	P-25	JIS B2407,T2 ,P-25(Bias)	P-18	P-14

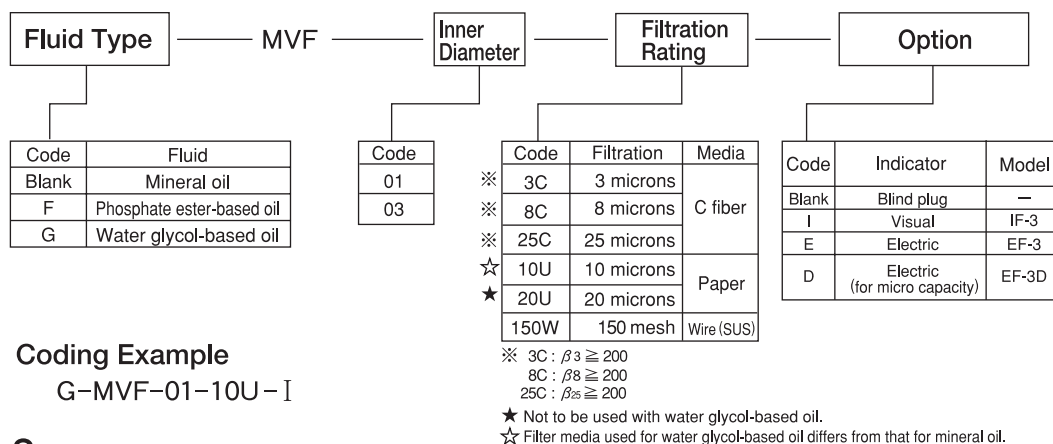
Part List MVF-03

12	Nameplate		1	
11	O-ring	NBR	1	JISB 2401. 1A
10	O-ring	NBR	1	JISB 2401. 1B
9	Indicator	SUS,Nylon	1	Option
8	O-ring	NBR	1	JISB 2401. 1A
7	O-ring	NBR	5	Hs90
6	O-ring	NBR	1	JISB 2401. 1A
5	Backup ring	PTFE	1	
4	Coupling	SS400	1	
3	Element		1	
2	Case	SS400	1	
1	Base	FCD450	1	
Part No.	Part Name	Material	Qty	Remarks

O-ring and Backup Ring MVF-03

Part No.	5	6	7	8	10	11
Model						
MVF-03	JIS B2407,T2 ,P-42(Bias)	P-42	AS568-014	P-12	P-18	P-14

Model Code



Spares

Element



Coding example : P-G-MVF-01-10U

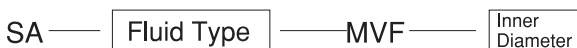
Sealing parts set

● For element replacement (Part No. with ◎ in “O-ring and Backup ring”.)



Coding example : SP-G-MVF-01

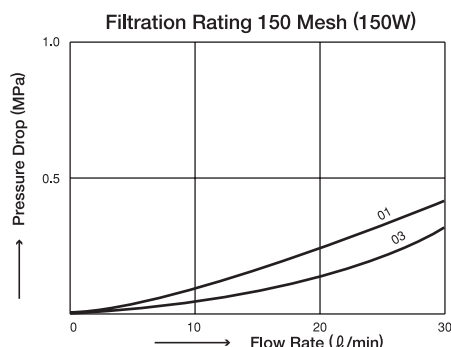
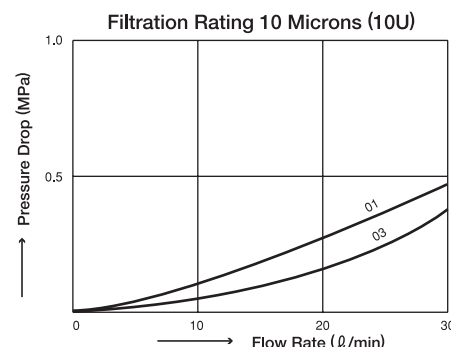
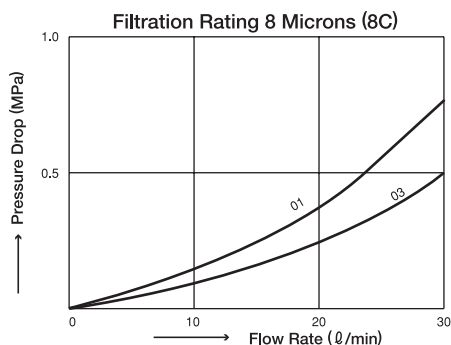
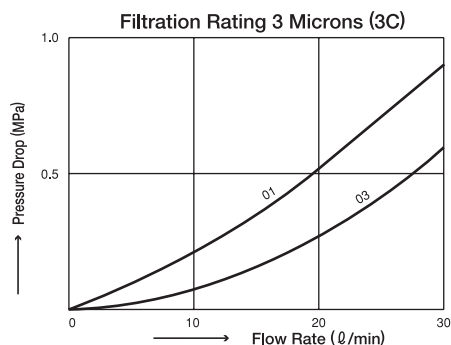
● For overhaul

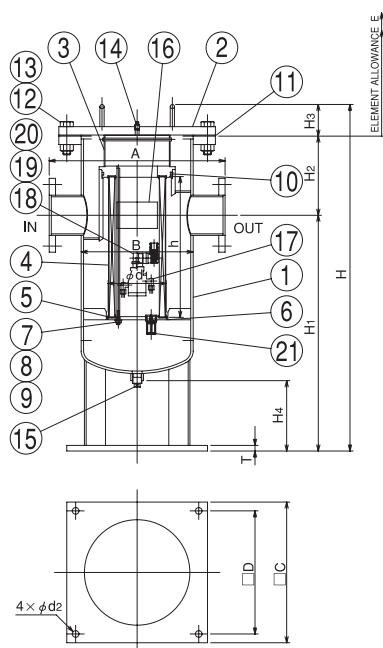


Coding example : SA-G-MVF-01

Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)





1. Maximum operating pressure: 1 MPa
2. Line filter with inner diameter 04A to 200A for high flow.
3. Self-standing type with legs.
4. Indicators are available in additional options.
5. Please contact us for use of fluids other than mineral oil on O-rings and other parts.

Max. operating pressure	Max. differential pressure of element	Option	
		Indicator pressure (All red)	Relief valve opening pressure
1.0MPa	0.7MPa	0.3MPa	0.35MPa

Part List

21	Relief valve	SECC,SS400,NYLON	1 set	Option
20	O-ring	NBR	1	JIS B 2401.1A
19	O-ring	NBR	1	
18	Indicator		1	Option
17	Guidance pipe	C1220T,C3771	1 set	
16	Name plate		1	
15	Drain plug	FcMB	1	R ³ / ₄
14	Air vent plug	FcMB	1	R ¹ / ₄
13	Nut	SS400	1 set	
12	Bolt	SS400	1 set	
11	O-ring	NBR	1	TL-150,200 JIS B2401,1A
	Packing	Non asbestos	1	TL-40~100
10	O-ring	NBR	1	JIS B2401.1A
9	Nut	SS400	4 ※1	
8	Washer	SECC	4 ※1	TL-40~100
7	Seal washer	NBR,SPCC	4	TL-150,200
	Packing	NBR	4 ※1	TL-40~100
6	Element holder	SS400	1	
5	Packing	NBR	2	
4	Element		1	
3	Cartridge	SS400.SGP	1	
2	Cover	SS400	1	
1	Body	SS400.SGP,STKM 13A	1	
Part No.	Part Name	Material	Qty	Remarks

※ TL-40,50:1pc

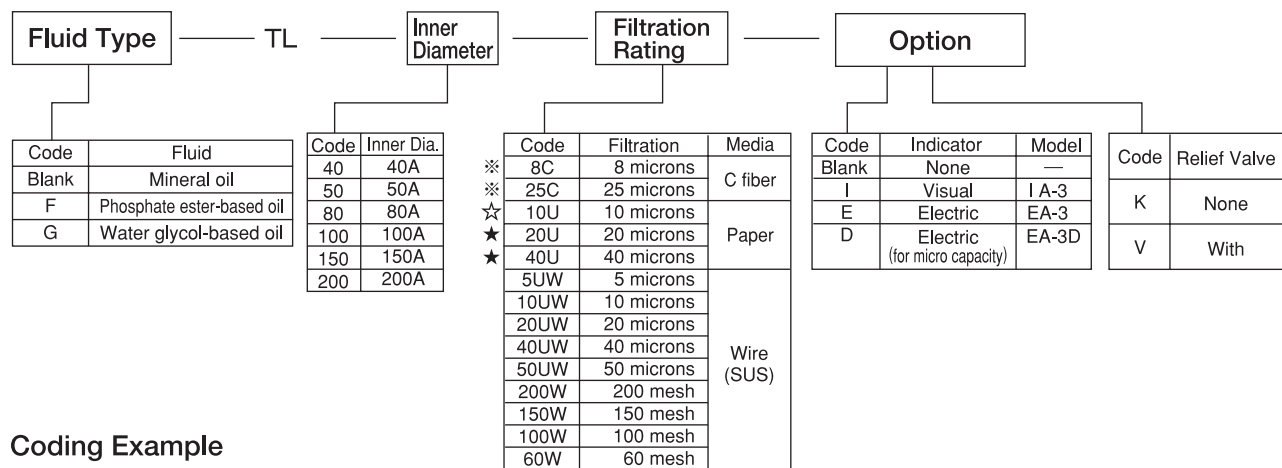
O-ring and Packing

Model	Part No.	5	7	10	11	19	20
TL-40	t8×φ 73.5/61	t2×φ 20/φ 10	G-115	For JIS 10K-175A,SOP,FF	P-18	P-14	
TL-50	t8×φ 93/80	t2×φ 20/φ 10	G-140	For JIS 10K-200A,SOP,FF			
TL-80	t2×φ 153/116	t2×φ 17/8.5	G-165	For JIS 10K-250A,SOP,FF			
TL-100	t2×φ 165/124	t2×φ 17/8.5	G-190	For JIS 10K-300A,SOP,FF			
TL-150	t2×φ 210/165	For M12 Seal washer	G-240	P-375			
TL-200	t2×φ 260/208	For M16 Seal washer	G-290	P-505			

Dimensions and Standard Flow Rates

Symbol Model	Inner Dia.	H	H1	H2	H3	H4	A	B	T	C	D	d2	Element		Element Allowance E	Standard Flow Rate (l/min)	Mass (kg)
													h	d1			
TL-40	JIS10K-40AFF	650	460	120	70	150	360	190.7	12	260	220	15	250	102.2	350	300	Approx. 70
TL-50	JIS10K-50AFF	730	520	140	70	150	380	216.3	12	300	260	15	300	124	420	450	Approx. 80
TL-80	JIS10K-80AFF	935	660	185	90	200	450	267.4	16	340	300	19	400	153	550	800	Approx.106
TL-100	JIS10K-100AFF	985	670	225	90	200	500	318.5	16	400	350	19	400	165	600	1500	Approx.139
TL-150	JIS10K-150AFF	1160	760	300	100	200	550	355.6	16	450	380	23	500	210	750	2500	Approx.225
TL-200	JIS10K-200AFF	1310	860	350	100	200	700	457.2	16	550	480	23	600	260	850	3000	Approx.330

► Model Code



Coding Example

F-TL-40-10U-EV

※ 8C: $\beta_8 \geq 200$
25C: $\beta_{25} \geq 200$

★ Not to be used with water glycol-based oil.
☆ Filter media used for water glycol-based oil differs from that for mineral oil.

► Spares

■ Element

P — Fluid Type — TL — Inner Diameter — Filtration Rating

Coding example : P-F-TL-40-10U

■ Sealing parts set

● For element replacement (Part No. with ◎ in “O-ring and packing”.)

SP — Fluid Type — TL — Inner Diameter

Coding example : SP-F-TL-40

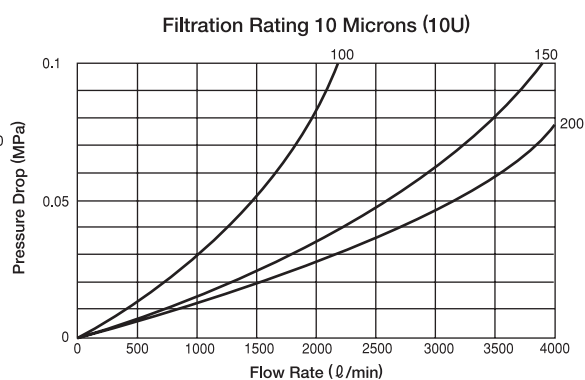
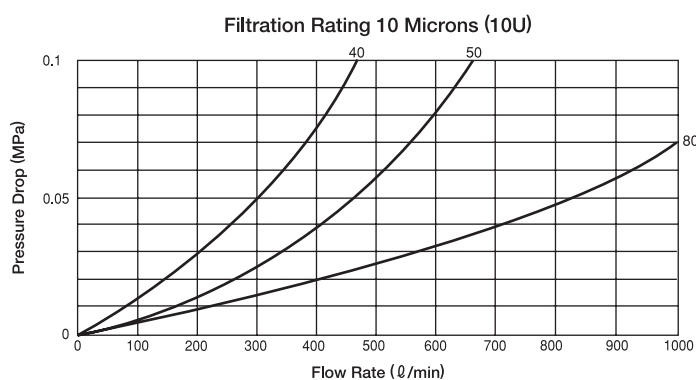
● For overhaul

SA — Fluid Type — TL — Inner Diameter — Indicator

Coding example : SA-TL-40-E

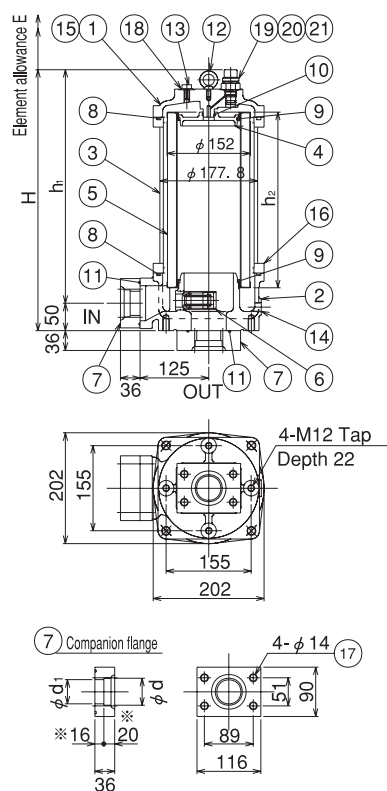
► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)





1. Maximum operating pressure: 3 MPa
2. L-port connection and element removal is upward.
3. Perfectly suited as bypass filter.
4. Please contact us for use of fire resistant fluids on O-rings and other parts.



※ LCN-12: 18

■ Part List

21	O-ring	NBR	1	JISB 2401.1A
20	O-ring	NBR	1	JISB 2401.1B
19	Indicator	A5056	1 set	Option
18	Seal washer	SPPC NBR	1	
17	Cap bolt	SCM435	8	
16	Cap bolt	SCM435	4	
15	Cap bolt	SCM435	4	
14	Drain plug	SCM435	1	R ³ / ₈
13	Air vent bolt	SS400	1	
12	Eyebolt	SS400	1	M8
11	O-ring	NBR	2	JISB 2401.1A
10	O-ring	NBR	1	JISB 2401.1A
9	O-ring	NBR	2	
8	O-ring	NBR	2	JISB 2401.1A
7	Companion flange	SS400	2	
6	Relief valve		1 set	
5	Element		1	
4	Element holder	AC2B	1	
3	Shell	STKM13A SS400	1	
2	Lower cover	FCD450	1	
1	Upper cover	FCD450	1	
Part No.	Part Name	Material	Qty	Remarks

- O-ring

Model \ Part No.	8	9	10	11	18	20	21
All LCN models	G-180	AS 568-243	P-20	G-75	Seal washer 13X ϕ 17/ ϕ 10.5	P-18	P-14

Note: Ⓢ O-ring: Only upper cover side is included in Sealing Parts Set.

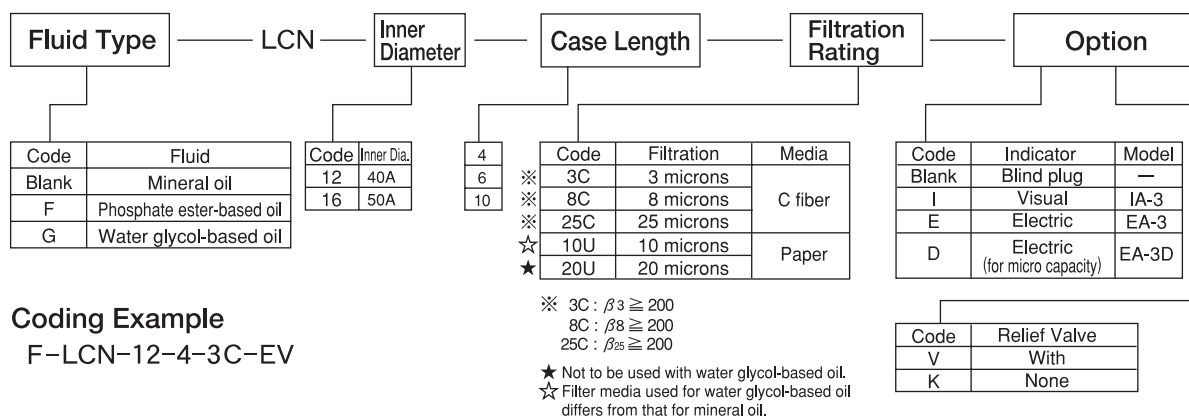
■ Dimensions and Standard Flow Rates

Dimensions and Standard Flow Rates									
Symbol	With I Type Indicator			With E Type Indicator			h ₂	Mass (kg)	Standard Flow Rate (g/min)
Model	H	E	h ₁	H	E	h ₁			
LCN- $\frac{12}{16}$ -4	362	155	312	416	100	366	206	30	450
LCN- $\frac{12}{16}$ -6	578	375	528	632	320	582	426	38	500
LCN- $\frac{12}{16}$ -10	1133	935	1083	1187	880	1137	981	57	600

■ Dimensions of Companion Flange

Model \ Symbol	Inner Dia.	d	d ₁
LCN-12	40A	49.1	44
LCN-16	50A	61.1	55

► Model Code



Coding Example

F-LCN-12-4-3C-EV

► Spares

■ Element

P — Fluid Type — LCN — Case Length — Filtration Rating

Coding example : P-F-LCN-4-3C

■ Sealing parts set

● For element replacement (Part No. with ◎ in “O-ring”.)

SP — Fluid Type — LCN — Inner Diameter

Coding example : SP-F-LCN-12

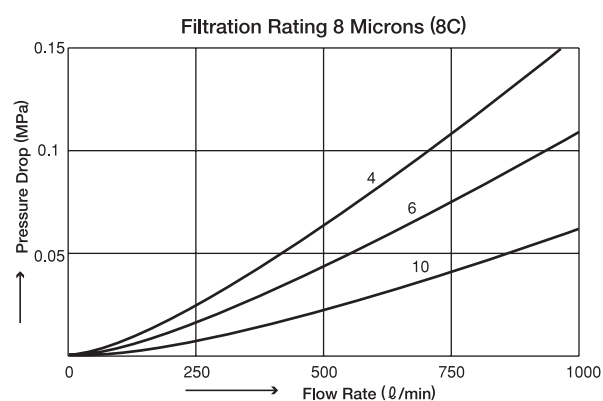
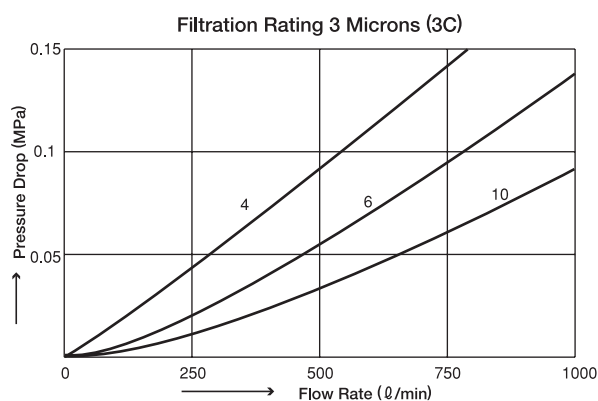
● For overhaul

SA — Fluid Type — LCN — Inner Diameter

Coding example : SA-F-LCN-12

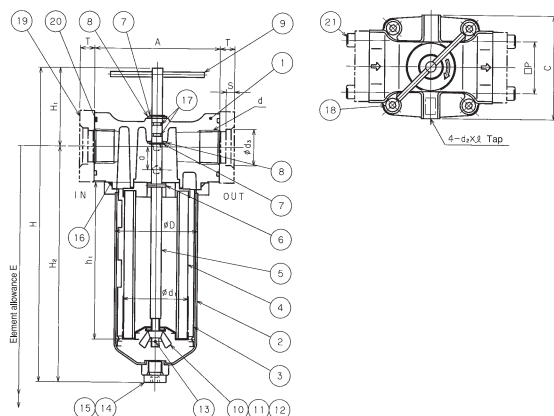
► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)

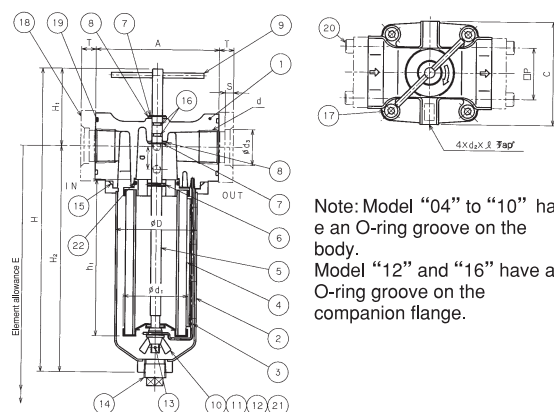




[Model AK]



[Model CFK]



Note: Model “04” to “10” have an O-ring groove on the body.
Model “12” and “16” have an O-ring groove on the companion flange.

1. Maximum operating pressure: 1 MPa
2. Element can be cleaned with scraper by rotating a handle.
Model AK: Notch wire element
Model CFK: Wedge wire element
3. Thread type connection is provided as standard.
Companion flange for flange connection is available in additional option.
4. Please contact us for use of fluid other than mineral oil on packing, O-rings and other parts.

- O-ring and Packing (Model AK)

Part No. Model	12	15	16	17	20
AK-04	t2×φ14／φ6.5 t2×φ17／φ8.5	Seal washer	G-60	P-7	
AK-06					
AK-08			P-11		
AK-10					
AK-12		P-14	G-105		
AK-16					

- O-ring and X-ring (Model CFK)

Part No.	12	15	16	19	22
Model					
CFK-04	t2× ϕ 14 / ϕ 6.5	G-60	P-7		X-121
CFK-06					
CFK-08	t2× ϕ 17 / ϕ 8.5	G-85		G-50	X-128
CFK-10					
CFK-12		G-105		G-70	X-140
CFK-16					

■ Part List

Part List					
CFK	22	X-ring	NBR	1	
	21	Bushing	SS400	1	
AK	21	Cap bolt	SCM	8	} Option JISB 2401. 1A
	20	O-ring	NBR	2	
	19	Companion flange	SS400	2	
	18	Cap bolt	SCM435	4	
CFK	17	O-ring	NBR	2	JISB 2401. 1A
	16	O-ring	NBR	1	JISB 2401. 1A
	15	O-ring (Seal washer)	NBR	1	JISB 2401. 1A (AK-04,06)
	14	Drain plug	SCM435	1	AK-04, 06: SS400
AK CFK	13	Snap pin	SWRH	1	
	12	Packing	NBR	1	
	11	Special washer	SECC	1	
	10	Wing nut	SS	1	
	9	Handle	SK	1	
	8	Washer	SS	2	
	7	Stop ring	SK	2	
	6	Spring pin	SK	1	
	5	Center rod	SGD	1	
	4	Element	SUS A6063	1	
	3	Scraper	SK	1	Model CFK: C5210P-H
	2	Lower cover	SPCE SS400	1	AK-04, 06: ADC12
1	Body	ADC12	1	AK-12, 16: AC2B	
	Part No.	Part Name	Material	Qty	Remarks

■ Companion Flange Dimensions

Companion Flange Dimensions							
Symbol	Companion Flange (Option)						
Model	d ₃	S	T	P	20	21	Mass kg
AK CFK-04.06	Companion flange is not attached						
AK CFK-08	34.5	8	12	50	G-50	M8×30	0.4
AK CFK-10	43.2		14				
AK CFK-12	49.1	10	18	64	G-70	M10×40	0.8
AK CFK-16	61.1						

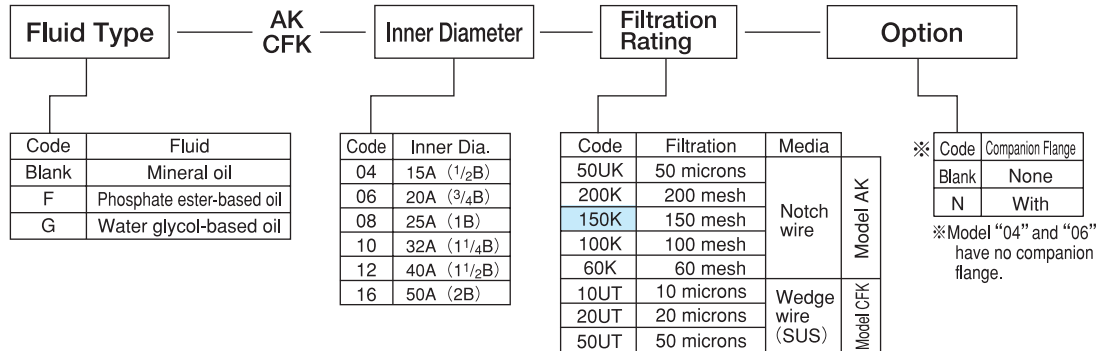
■ Dimensions and Standard Flow Rates

★Upper: Model AK, lower: Model CFK

Symbol	d	H	H ₁	H ₂	A	C	D	a	Tap d ₂ × ℓ	Element Allowance E	Element h ₁ d ₁	Mass (kg)	Standard Flow Rate (ℓ / min)
AK-04 CFK-04	Rc1/2	202		146						235	90		20 40
AK-06 CFK-06	Rc3/4	194	56	138	84	72	59			240	92.5	44	0.8 38 45
AK-08 CFK-08	Rc1	300		225							150		65 150
AK-10 CFK-10	Rc1 ¹ / ₄	293.5	75	218.5	120	102	79	22	M8×15	384	152	64	2.0 130 160
AK-12 CFK-12	Rc1 ¹ / ₂	341		256						427	166		200 200
AK-16 CFK-16	Rc2	333.5	85	248.5	160	140	110	25	M10×20	420	168	84	4.7 300 210

Quick delivery of filters in with mineral oil use.

► Model Code



Coding Example

F-AK-08-150K-N

► Spares

■ Element

P — **Fluid Type** — **AK CFK** — **Inner Diameter** — **Filtration Rating**

Coding example : P-G-CFK-08-10UT

■ Sealing parts set

● For element replacement (Part No. with © in "O-ring and packing/X-ring" .)

SP — **Fluid Type** — **AK CFK** — **Inner Diameter**

Coding example : SP-F-AK-08

● For overhaul

SA — **Fluid Type** — **AK CFK** — **Inner Diameter** — **Option**

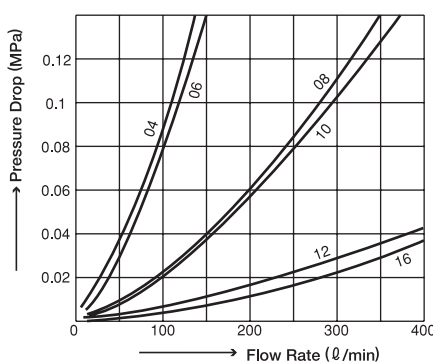
Coding example : SA-F-AK-08-N

Code	Companion Flange
Blank	None
N	With

► Flow Rate Chart

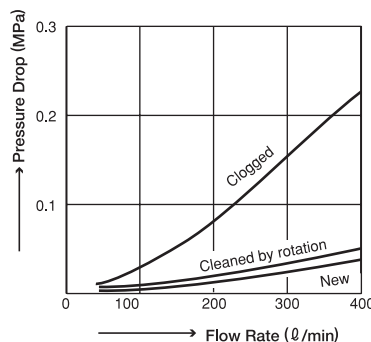
● AK-04 to16

Filtration rating 150 mesh (150K)
ISO VG32, Viscosity: 32 cSt (40°C)



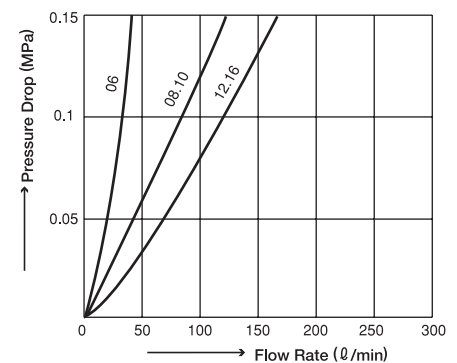
● AK-16

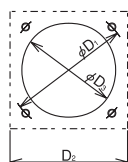
Filtration rating 150 mesh (150K)
ISO VG32, Viscosity: 32 cSt (40°C)



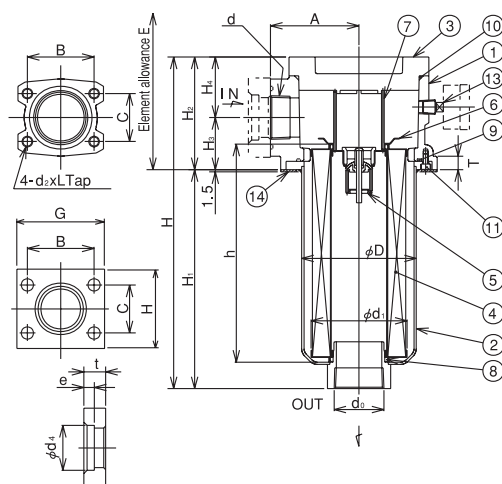
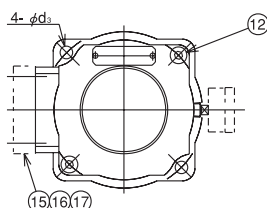
● CFK-04 to16

Filtration rating 10 microns (10UT)
ISO VG32, Viscosity: 32 cSt (40°C)





Recommended installation



The figure shows Model TRF-12.

1. Maximum operating pressure: 1 MPa
Impulse test: 1 MPa x 10⁷ times
2. TRF return filter is installed directly on top of a tank.
3. Thread type connection is provided as standard.
Companion flange for flange connection is available in additional option.
4. Structure of relief valve for TRF-16, 20 and 24 is different from the drawing shown on this page.
5. Secure the filter to the companion flange seat with bolts using $\phi 3$ holes firmly.
6. Please contact us for use of fluid other than mineral oil on packing, O-rings and other parts.

Spec. for option

Element Max. Differential Pressure	Option	
	Indicator pressure (All red)	Relief valve opening pressure
0.7MPa	0.3MPa	0.35MPa

Part List

Part No.	Part Name	Material	Qty	Remarks
17	O-ring	NBR	1	JISB 2401. 1A
16	Bolt	SCM435	4	Option
15	Companion flange	SS400	1	
14	Packing	Non asbestos	1	
13	Indicator		1	Option
12	Bolt	SCM435	4	
11	Bolt	SCM435	4or6	10, 12, 16 only
10	O-ring	NBR	1	JISB 2401. 1A
9	O-ring	NBR	1	JISB 2401. 1A
8	O-ring	NBR	2	JISB 2401. 1A
7	Spring	SWPA	1	
6	Cap	SECC	1	16, 20, 24: AC2B
5	Relief valve		1	Option
4	Element		1	
3	Cover	ADC12	1	20, 24: AC2B
2	Case	SPCC	1	06, 08: ADC12
1	Body	ADC12	1	20, 24: AC2B

O-ring

Model	Part No.	8	9	10
TRF-06	P-36			G-90
TRF-08				
TRF-10	G-50	G-115	G-115	
TRF-12				
TRF-16	G-60	G-130	G-130	
TRF-20	G-90	AS568 259	G-160	
TRF-24				

Companion Flange (Option)

Model	Symbol	G	H	t	e	d4	17
TRF-06		68	62	18	9	$\phi 27.7$	G-40
TRF-08						$\phi 34.5$	
TRF-10		84	76	21	10	$\phi 43.2$	G-55
TRF-12						$\phi 49.1$	
TRF-16		100	94	24	11	$\phi 61.1$	G-70
TRF-20		134	126	31	15	$\phi 77.1$	G-100
TRF-24						$\phi 90$	

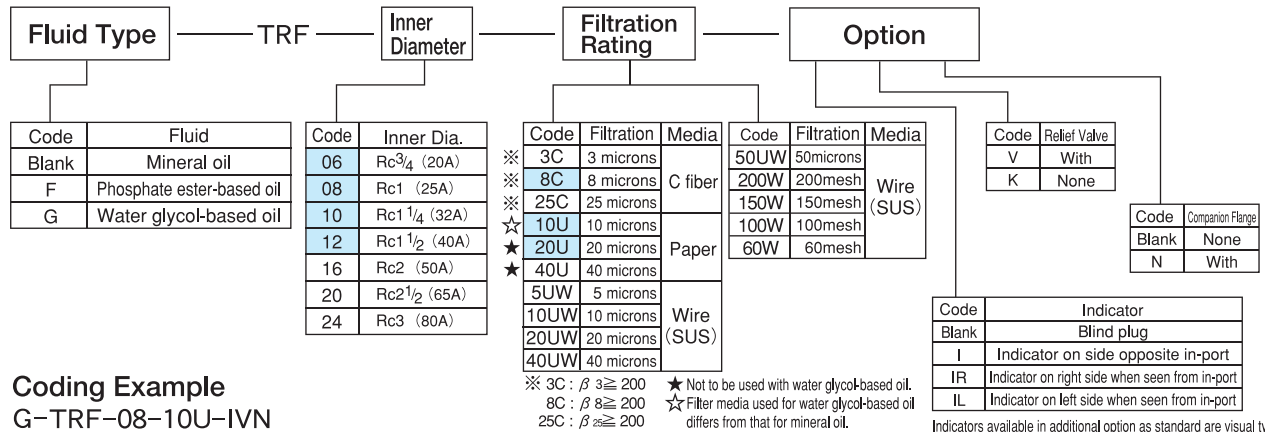
Note: Companion flange for Model TRF-16 and TRF-24 has O-ring groove.

Dimensions

Model	Symbol	d	d0	H	H1	H2	H3	H4	A	D	B	C	d2xL	Mount				T	Element Allowance E	Element		Mass (kg)
														D1	D2	D3	d3			h	d1	
TRF-06	Rc3/4		Rc1	234	147	87	40	47	70	102	50	36	M8x19	135	125	105	9.6	10	255	145	76	3
TRF-08	Rc1																					
TRF-10	Rc1 1/4		Rc1 1/2	318	210	108	50	58	85	110	64	46	M10x21	156	150	120	12	13	330	209	92	6
TRF-12	Rc1 1/2																					
TRF-16	Rc2		Rc2	388	260	128	60	68	95	124.6	76	52	M12x23	190	170	134	15	17	440	259	105	8
TRF-20	Rc2 1/2		Rc3	495	320	175	85	90	110	165.2	102	80	M16x30	240	205	176	18	15	540	309	133	20
TRF-24	Rc3																					

Quick delivery of filters in with mineral oil use.

► Model Code



Coding Example

G-TRF-08-10U-IVN

► Spares

■ Element

P — **Fluid Type** — TRF — **Inner Diameter** — **Filtration Rating**

Coding example : P-G-TRF-08-10U

■ Sealing parts set

● For element replacement (Part No. with © in “O-ring and packing”.)

SP — **Fluid Type** — TRF — **Inner Diameter**

Coding example : SP-G-TRF-08

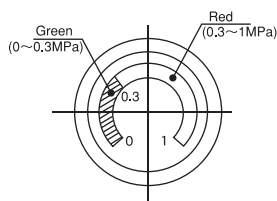
● For overhaul

SA — **Fluid Type** — TRF — **Inner Diameter** — **Option**

Coding example : SA-G-TRF-08

Code	Companion Flange
Blank	None
N	With

► Indicator

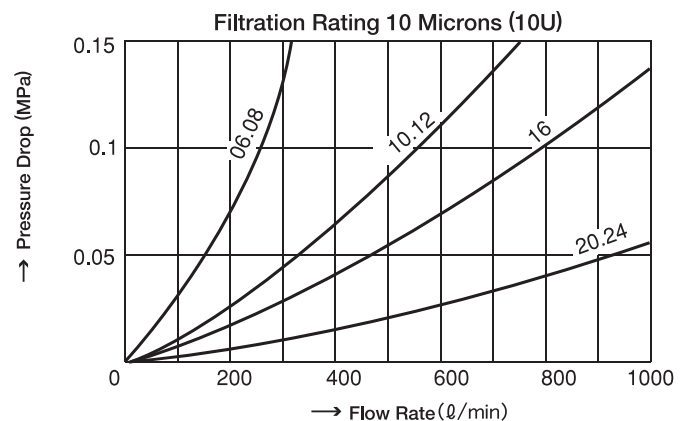
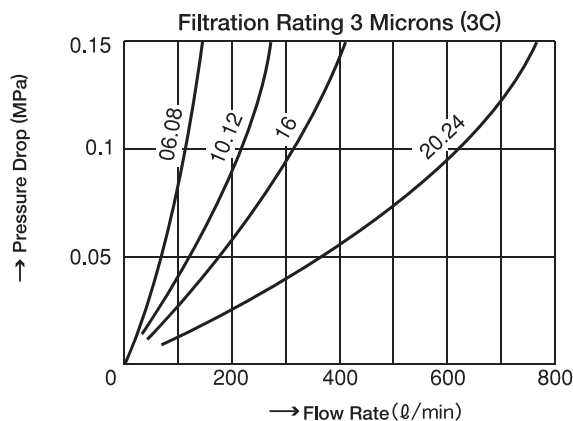


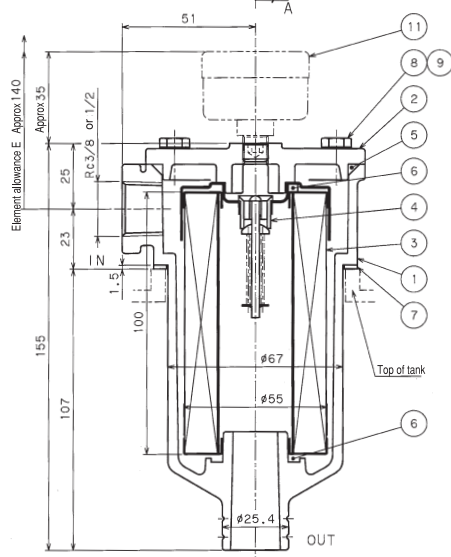
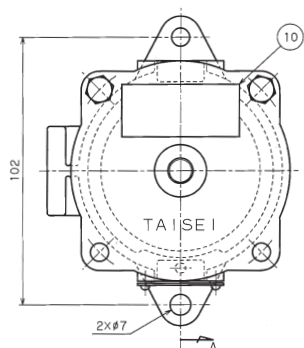
Green (0~0.3 MPa): Element is clean.
 Red (over 0.3 MPa): Replace element.

Replace element when indicator shows “red” zone due to clogging.
 Note: Indicators might show “red” zone caused by rising pressure during operation with high viscosity fluid.

► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)



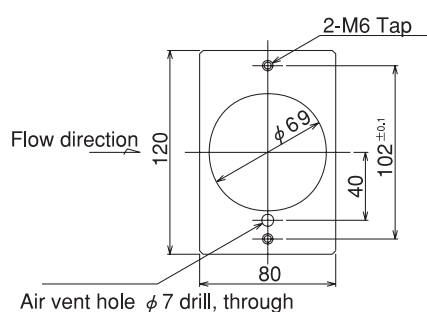


1. Maximum operating pressure: 1 MPa
2. Model TR return filter with a built-in air breather is installed directly on top of a tank.
3. Inner Diameter RC3/8" or RC1/2" thread connection.
4. Relief valve, its opening pressure 0.25 MPa, is installed as standard.
Pressure gage is available in additional option.
5. Please contact us for use of fluid other than mineral oil on packing, O-rings and other parts.

Part List

11	Pressure gauge		1	Option
10	Nameplate	AL	1	
9	Washer	SS400	4	For M6
8	Bolt	SS400	4	M6×20
7	Packing	Non asbestos	1	
6	O-ring	NBR	2	JIS B2401,1A
5	O-ring	NBR	1	JIS B2401,1A
4	Relief valve	Nylon SECC	1	
3	Element		1 set	
2	Cover	ADC12	1	
1	Body	ADC12	1	
Part No.	Part Name	Material	Qty	Remarks

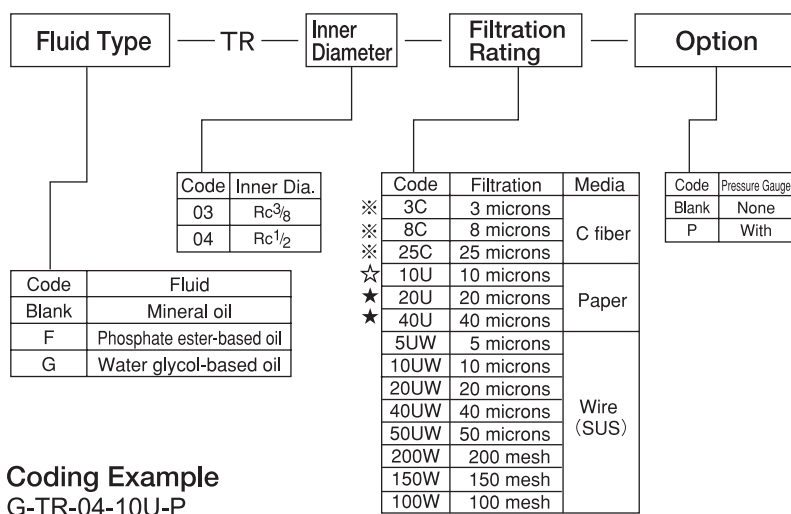
Details of Filter Mount



O-ring and Packing

Part No.	5	6	7
Size	JISB 2401.1A G-70	JISB 2401.1A P-25	t1.5×(118×78)/φ68

► Model Code



Coding Example
G-TR-04-10U-P

※ 3C : $\beta_3 \geq 200$ ★ Not to be used with water glycol-based oil.
8C : $\beta_8 \geq 200$ ☆ Filter media used for water glycol-based oil differs from that for mineral oil.
25C : $\beta_{25} \geq 200$

► Spares

■ Element

P — Fluid Type — TR — Inner Diameter — Filtration Rating

Coding example: P-G-TR-04-10U

■ Sealing parts set

● For element replacement (Part No. with ◎ in “O-ring and packing”.)

SP — Fluid Type — TR — Inner Diameter

Coding example: SP-G-TR-04

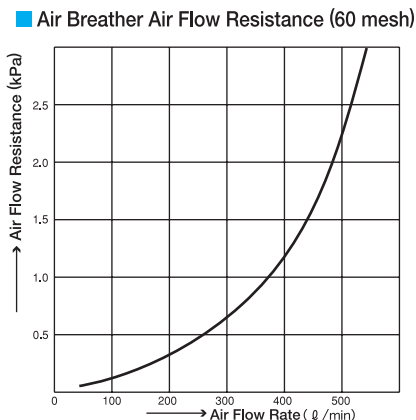
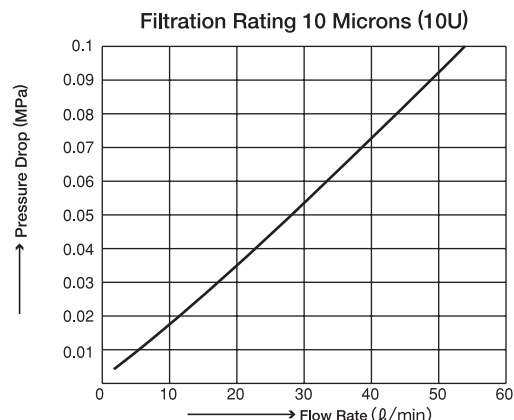
● For overhaul

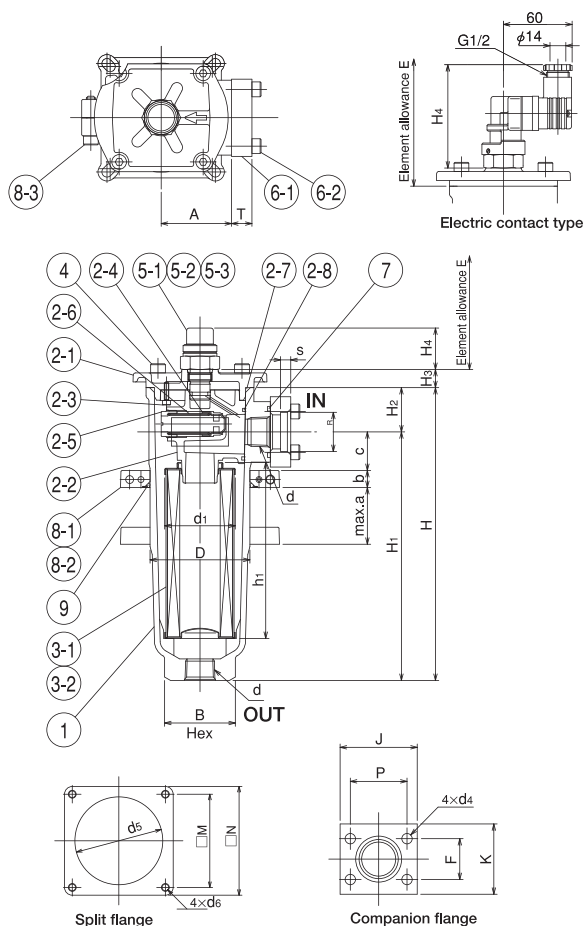
SA — Fluid Type — TR — Inner Diameter

Coding example: SA-G-TR-04

► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)





1. Model UR is installed directly on top of a tank.
2. Movable flange for installation to a tank. Nozzle can be set in any direction and height.
3. New design for improving work efficiency to replace elements.
4. Indicators of visual or electric type to detect differential pressure are available in additional option.
5. Model UR can also be used as a low pressure in-line filter.
6. Model UR is available to use for low pressure in-line filter.
7. Please contact us for use of fluid other than mineral oil on packing, O-rings and other parts.

Spec. for option

Max. operating pressure	Option	
	Indicator pressure (All red)	Relief valve opening pressure
1.0Mpa	0.3Mpa	0.35Mpa

Part List

8	9	Packing		NBR	1	
	3	Cap bolt		SCM435	2	M8×35
	2	Spring pin		S60CM	2	
	1	Split flange		ADC12	2	
7	Split flange set				1set	Option For attached to tank
	O-ring		NBR	1	JIS B2401.1A	
	2	Cap bolt	SCM435	4		
	1	Flange	SS400	1		
6	Flange set				1set	Option
	3	O-ring	NBR	1	JIS B2401.1B	
	2	O-ring	NBR	1	JIS B2401.1A	
	1	Indicator	—	1		
5	Indicator				1set	Option
	Cap bolt		SCM435	4	M8×35	
	2	O-ring	NBR	1	JIS B2401.1A	
	1	Element	—	1		
4	Element				1set	
	8	O-ring	NBR	1	JIS B2401.1A	
	7	O-ring	NBR	1	JIS B2401.1A	
	6	Spring	SWPA	1		
3	5	Spring holder	S20C	1		
	4	Relief valve	SECC	1		
	3	Cap bolt	SUS304	4		
	2	Inlet	ADC12	1		
2	1	Upper cover	ADC12	1		
	Upper cover assy				1set	
	Body		ADC12	1		
	Part No.	Part Name		Material	Qty	Remarks

O-ring and Packing

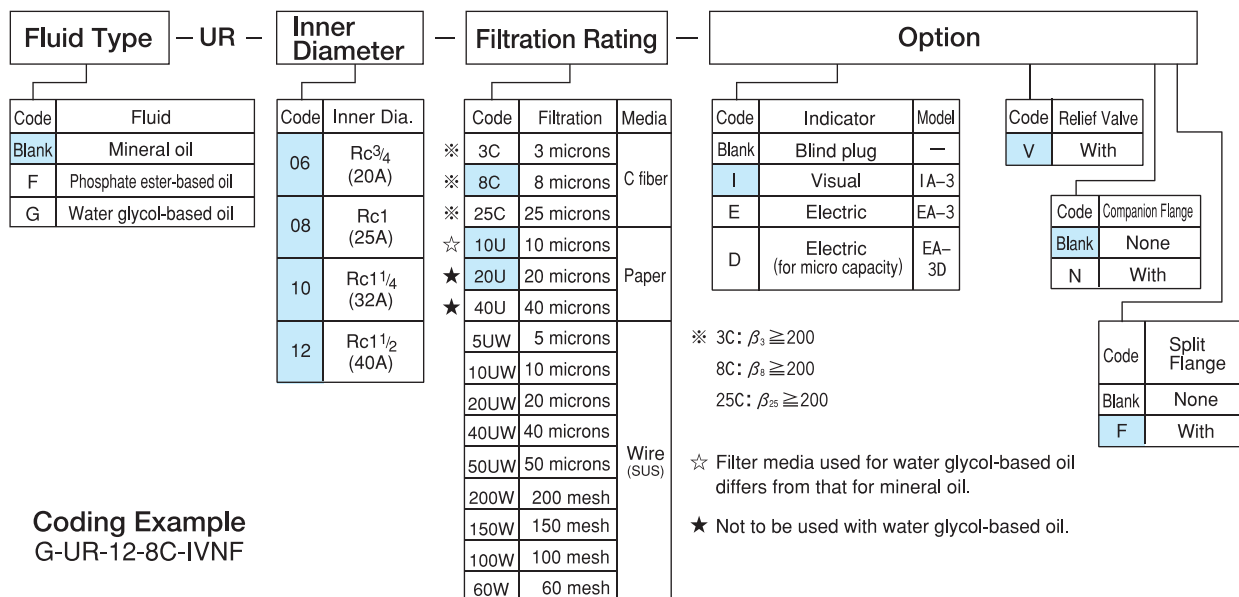
Part No.	2-7	2-8	3-2	5-2	5-3	7	9
Model	G-80	G-40	P-32	P-14	P-18	G-40	t4.35×100.5/89
UR-06,08	G-80	G-40	P-32	P-14	P-18	G-40	t4.35×100.5/89
UR-10,12	G-105	G-55	G-45	P-14	P-18	G-55	t4.35×127.5/116

Dimensions

Symbol	d	H	H ₁	H ₂	H ₃	A	B	D	a	b	C	E	h ₁	d ₁	Mass (kg)	Companion Flange (Option)								Split Flange (Option)				Indicator (Option)	
Model	Inner Dia.															d ₃	S	T	P	F	J	K	d ₄	d ₅	M	N	d ₆	Common to all	H ₄
UR-06	Rc ³ / ₄	258	219	39		62	54	88	50		34	260	155.1	62.2	2.3	27.7	9	18	50	36	68	62	9.2	90	90~95.5	111.5	M8	Blind plug	6
UR-08	Rc1				16					15						34.5												IA-3	36.5
UR-10	Rc1 ¹ / ₄	335	290	45		77.5	63	115	60		52	390	204.5	82.2	4.8	43.2	10	21	64	46	84	76	11.6	120	110.3~113.2	150	M10	EA-3 (D)	91
UR-12	Rc1 ¹ / ₂															49.1													

► Model Code

Quick delivery of filters in with mineral oil use.



► Spares

■ Element

P — Fluid Type — UR — Inner Diameter — Filtration Rating

Coding example : P-G-UR-12-8C

■ Sealing parts set

● For element replacement (Part No. with ◎ in “O-ring and packing”.)

SP — Fluid Type — UR — Inner Diameter

Coding example : SP-G-UR-12

● For overhaul

SA — Fluid Type — UR — Inner Diameter —

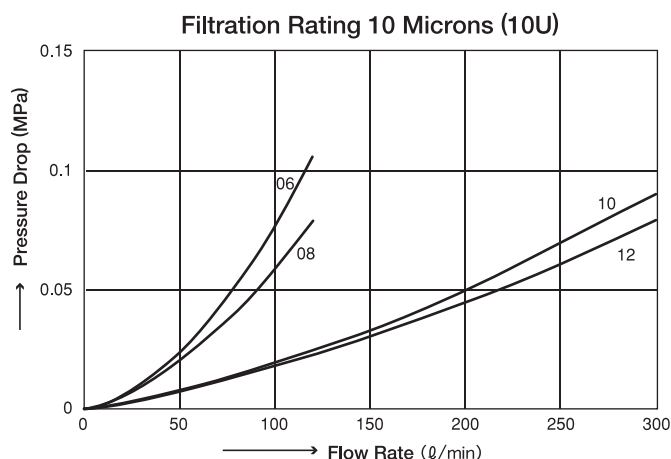
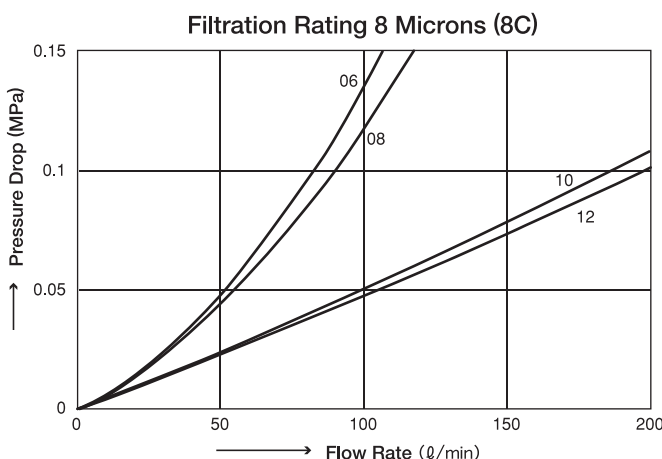
Code	Companion Flange
Blank	None
N	With

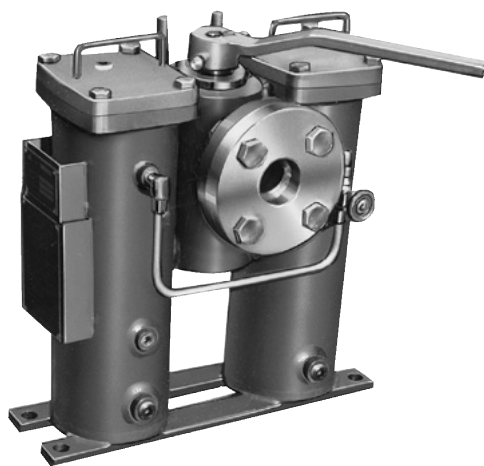
Code	Split Flange
Blank	None
F	With

Coding example : SA-G-UR-12-NF

► Flow Rate Chart

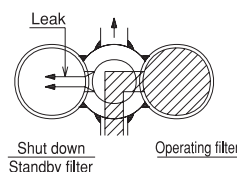
● ISO VG32 ● Viscosity: 32 cSt (40°C)



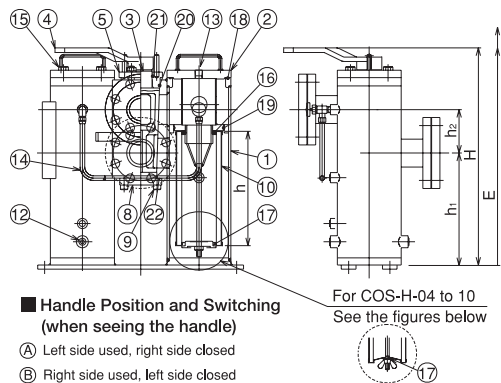
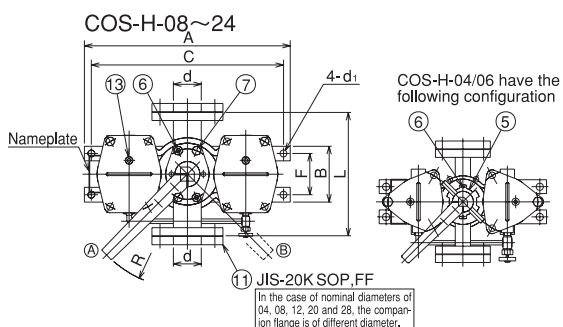


- Model COS-H is a steel duplex filter having a maximum operating pressure of 2 MPa.
- Easy handle operation enables cleaning and replacing elements without stopping system operation.
- Paper, Notch Wire and Wire (SUS) are available as filter media.
Flow direction is the opposite between Code A and B.
Paper, Wire (SUS): Code A
Notch Wire: Code B
- Standard flange is JIS20K-FF.
- Internal leak from operating filter to standby filter occurs due to cock structure.
(The leakage is controlled within the criteria values in table below.)

Criteria of cock leakage: Specified amount of fluid leakage from operation filter to standby filter through cock clearance.



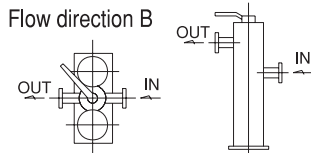
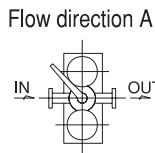
	Leakage cc/min	Condition
COS-H-04 06	MAX.30	2 MPa Viscosity 35 cSt
COS-H-08 10	MAX.50	
COS-H-12 16	MAX.100	
COS-H-20 24	MAX.125	
COS-H-28 32	MAX.200	



■ Handle Position and Switching (when seeing the handle)

- (A) Left side used, right side closed
(B) Right side used, left side closed

Flow direction A or B



■ Part List

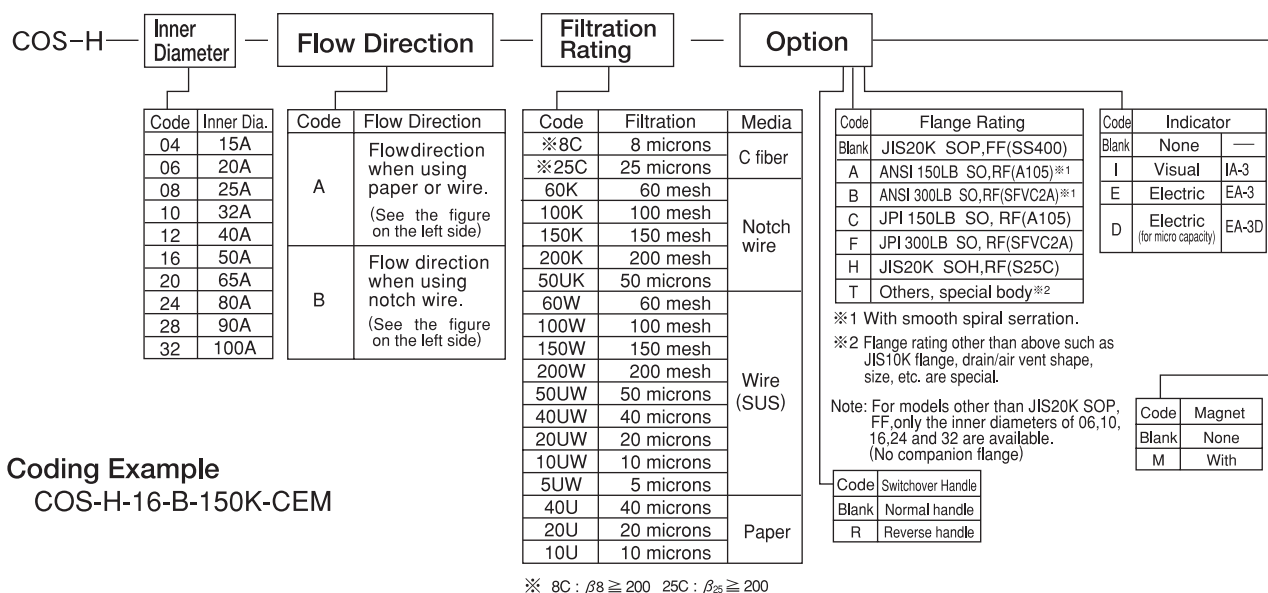
Part No.	Part Name	Material	Qty	Remarks
22	O-ring	NBR	1	
21	O-ring	NBR	1	
20	O-ring	NBR	1	
19	O-ring	NBR	2	
18	O-ring	NBR	2	
17	Packing	NBR	2	
16	Packing	NBR	2	
15	Hex bolt	SS400	8 6	COS-H-08~32 COS-H-04~06
14	Equalizer valve assy	C1220T-1 1/2H C3771	1 set	
13	Air vent plug	SCM435	2	
12	Drain plug	SCM435	4	
11	Companion flange (JIS20K SOP, FF only)	SS400	2	With bolt, nut and packing
10	Element		2	
9	Cap bolt	SCM435	4	
8	Blind cover	SS400	1	COS-H-08~32
7	Blind plug	SCM435	1	COS-H-04 · 06
6	Hex bolt	SS400	2	
5	Stud bolt	SS400	2	With nut
4	Cap bolt	SCM435	2	
3	Cock flange	FCD450	1	
2	Handle	FCD450	1	
1	Cock	FCD450	1	
1	Cover	SS400	2	
1	Body	SS400 STPG370	1	

■ Dimensions

Symbol Model	Inner Dia.	A	B	C	F	φd ₁	d	L	R	H	h ₁	h ₂	Element Allowance E	Element		Mass (kg)	O-ring and Packing									
														h	d ₂		16	17	18	19	20	21	22	11 included		
COS-H-04	15A	305	80	280	55	13	15A	190	150	317	159	55	580	150	62.2	26	18× φ 38.5/ φ 32.5	12× φ 14/ φ 6.5	G-70	G-60	P-38	P-25	—	For JIS 20K-20A		
COS-H-06	20A	305	80	280	55	13	20A	190	150	317	159	55	580	150	62.2	26	18× φ 38.5/ φ 32.5	12× φ 14/ φ 6.5	G-70	G-60	P-38	P-25	—	For JIS 20K-20A		
COS-H-08	25A	365	102	335	70	15	25A	220	250	396	209	70	720	200	82.2	33	18× φ 58.5/ φ 43	12× φ 14/ φ 8.5	G-100	G-80	P-50	P-30	G-55	For JIS 20K-32A		
COS-H-10	32A	365	102	335	70	15	32A	220	250	396	209	70	720	200	82.2	33	18× φ 58.5/ φ 43	12× φ 14/ φ 8.5	G-100	G-80	P-50	P-30	G-55	For JIS 20K-32A		
COS-H-12	40A	450	122	420	90	15	40A	270	250	484	254	95	890	250	102.2	63	18× φ 73.5/ φ 61	A 18× φ 73.5/ φ 61 B 12× φ 17/ φ 8.5	G-125	G-105	G-80	P-50	G-80	For JIS 20K-50A		
COS-H-16	50A	450	122	420	90	15	50A	270	250	484	254	95	890	250	102.2	63	18× φ 73.5/ φ 61	A 18× φ 73.5/ φ 61 B 12× φ 17/ φ 8.5	G-125	G-105	G-80	P-50	G-80	For JIS 20K-50A		
COS-H-20	65A	680	200	630	120	19	65A	350	300	734	426	135	1390	400 (423)	153.0 (147.0)	144	12× φ 140/ φ 116	12× φ 140/ φ 116	G-180	G-155	G-120	P-55	G-120	For JIS 20K-80A		
COS-H-24	80A	680	200	630	120	19	80A	350	300	734	426	135	1390	400 (423)	153.0 (147.0)	144	12× φ 140/ φ 116	12× φ 140/ φ 116	G-180	G-155	G-120	P-55	G-120	For JIS 20K-80A		
COS-H-28	90A	760	320	700	260	19	90A	450	300	902	526	158	1550	550	202	250	12× φ 202/ φ 162	12× φ 202/ φ 162	G-250	G-210	G-135	G-55	G-140	For JIS 20K-100A		
COS-H-32	100A	760	320	700	260	19	100A	450	300	902	526	158	1550	550	202	250	12× φ 202/ φ 162	12× φ 202/ φ 162	G-250	G-210	G-135	G-55	G-140	For JIS 20K-100A		

B type in ()

► Model Code



Coding Example
COS-H-16-B-150K-CEM

► Spares

■ Element

P — COS — H — Inner Diameter — Flow Direction — Filtration Rating

Coding example: P-COS-H-06-A-10U

■ Sealing parts set

● For element replacement (Part No. with ◎ in “O-ring and packing”). Note: The contents of this set are for one side only.

SP — COS — H — Inner Diameter — Flow Direction

Coding example: SP-COS-H-16-B

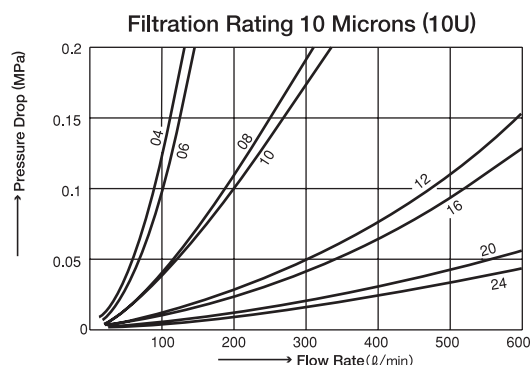
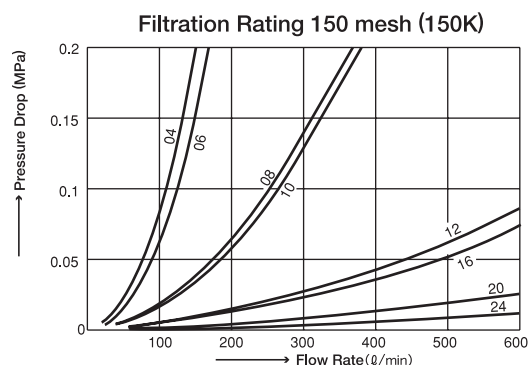
● For overhaul

SA — COS — H — Inner Diameter — Flow Direction — ※3 Flange Rating — Indicator

Coding example: SA-COS-H-16-B-CE ※3 Packings other than JIS20K SOP, FF for Flange Rating are not included.

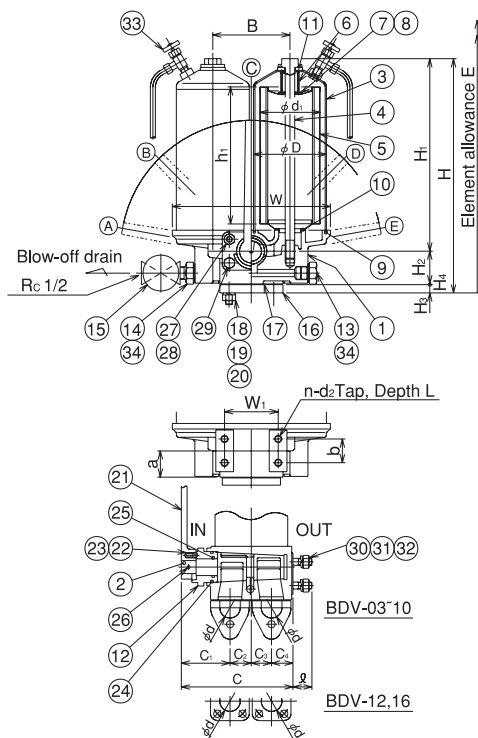
► Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)



MODEL BDV/BCV

BLOW-OFF DUPLEX FILTER 0.6 MPa



Handle Position and Switchover (A) to (E) in figure)

- (A): Left side closed, right side in use
- (B): Right side blow off, right side in use
- (C): Both sides in use
- (D): Left side in use, right side blow off
- (E): Left side in use, right side closed

1. Maximum operating pressure: 0.6 MPa
2. Model BDV is blow-off duplex filter. Switching handle with five levels enables cleaning one of the elements or closing one side of filters during operation. Model BCV has switching function only.
3. Larger elements for BDV/BCV have longer life-span compared to elements for BOS.
4. Wire (SUS) and Paper are provided as well as Notch Wire for model BCV only.
5. Standard Model BDV/BCV: IN and OUT flow vertical. BDV/BCV-SO (with oil pan): IN and OUT flow horizontal.

Part List

Part No.	Part Name	Material	Qty	Remarks
34	Packing	Non asbestos	2	
33	Air vent plug	C3771	2	
32	Spring washer	SWRH	4	
31	Hex nut	SS400	4	
30	Stud bolt	SS400	4	
29	Hex bolt	SS400	2	Not attached to BDV-03-06
28	Hex nut	SS400	2	
27	Stud bolt	SS400	2	
26	Spring pin	SK5	1	
25	O-ring	NBR	1	JISB 2401. 1A
24	O-ring	NBR	1	JISB 2401. 1A
23	Steel ball	SUJ	1	
22	Spring	SWPA	1	
21	Handle	FC200	1	
20	Spring washer	SWRH	4	
19	Hex nut	SS400	4	BDV-12,16: 8 pcs
18	Stud bolt	SS400	4	
17	Packing	Non asbestos	2	
16	Companion flange	SS400	2	
15	Drain plug	BC	1	BDV only
14	Nipple	SS400	1 set	
13	Plug	SS400	1	
12	Gland flange	FCD450	1	
11	O-ring	NBR	2	JISB 2401. 1A
10	Packing	NBR	2	
9	Packing	NBR	2	
8	Packing	NBR	2	
7	Washer	SECC	2	
6	Spring	SWPA	2	
5	Element		2	
4	Center rod	SS400	2	
3	Case	SS400	2	
2	Cock	FCD450	1	
1	Body	FC200	1	

O-ring and Packing

Model	8	9	10	11	17	24	25	34
BDV-03	t2X φ20/φ9.9	t4X φ80.7/φ74.3	t2X φ46/φ38	P-20		P-30	P-18	t2X φ22/φ13.5
BDV-04	t2X φ28/φ16	t3X φ101.6/φ94.3	t2X φ45/φ32.5	G-25	11.5X 76/φ28.5	P-35	P-21	t2X φ22/φ13.5
BDV-06	t2X φ38/φ16	t3X φ123/φ115.5	t2X φ50/φ37.5	G-30	11.5X 105/φ44	P-46	P-28	t2X φ32/φ24
BDV-08	t2X φ42/φ19.5	t3X φ162.5/φ153.5	t2X φ70/φ60	G-30	11.5X □96/φ63	G-65	G-40	t2X φ32/φ24

Dimensions and Standard Flow Rates

Symbol Model	Inner Dia.	φd	W	H	H ₁	H ₂	H ₃	H ₄	C	C ₁	C ₂	C ₃	C ₄	L	B	W ₁	a	b	D	E	n-d ₂	ℓ	Element		Mass (kg)	Standard Flow Rate (ℓ / min)
																							h ₁	d ₁		
BDV-03	10A	17.8	174	245.5	199	35	10	1.5	138	60	25	25	28	17	86	60	32	34	79	450	4 - M10	25	135	62	8	15
BDV-04	15A	22.2																								25
BDV-06	20A	27.7	220	283.5	230	42	10	1.5	162	72	25	25	40	20	110	75	35.5	37	101.6	520	4 - M12	32	158	82.2	11	45
BDV-08	25A	34.5	266	394	323.5	55	14	1.5	188	82	36	34	36	20	130	90	44	40	127	730	4 - M12	32	230	102	21	70
BDV-10	32A	43.2																								120
BDV-12	40A	49.1	340	484	403.5	65	14	1.5	260	105	50	50	55	20	170	100	65	50	165.2	910	4 - M12	32	300	125	40	160
BDV-16	50A	61.1																								260

► Model Code

Model	Inner Diameter	※1 Oil Pan	Filtration Rating																																																																												
<table><tr><th>Code</th><th>Model Type</th></tr><tr><td>BDV</td><td>Blow off</td></tr><tr><td>BCV</td><td>Switchover only</td></tr></table>	Code	Model Type	BDV	Blow off	BCV	Switchover only	<table><tr><th>Code</th><th>Inner Dia.</th></tr><tr><td>03</td><td>10A(³/₈B)</td></tr><tr><td>04</td><td>15A(¹/₂B)</td></tr><tr><td>06</td><td>20A(³/₄B)</td></tr><tr><td>08</td><td>25A(1B)</td></tr><tr><td>10</td><td>32A(1¹/₄B)</td></tr><tr><td>12</td><td>40A(1¹/₂B)</td></tr><tr><td>16</td><td>50A(2B)</td></tr></table>	Code	Inner Dia.	03	10A(³ / ₈ B)	04	15A(¹ / ₂ B)	06	20A(³ / ₄ B)	08	25A(1B)	10	32A(1 ¹ / ₄ B)	12	40A(1 ¹ / ₂ B)	16	50A(2B)	<table><tr><th>Code</th><th>Oil Pan</th></tr><tr><td>Blank</td><td>None</td></tr><tr><td>SO-R</td><td>With (Right→left)</td></tr><tr><td>SO-L</td><td>With (Left→right)</td></tr></table>	Code	Oil Pan	Blank	None	SO-R	With (Right→left)	SO-L	With (Left→right)	<table><tr><th>Code</th><th>Filtration</th><th>Media</th></tr><tr><td>60K</td><td>60 mesh</td><td rowspan="6">Notch wire</td></tr><tr><td>100K</td><td>100 mesh</td></tr><tr><td>150K</td><td>150 mesh</td></tr><tr><td>200K</td><td>200 mesh</td></tr><tr><td>50UK</td><td>50 microns</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td><td rowspan="10">Wire (SUS)</td></tr><tr><td>60W</td><td>60 mesh</td></tr><tr><td>100W</td><td>100 mesh</td></tr><tr><td>150W</td><td>150 mesh</td></tr><tr><td>200W</td><td>200 mesh</td></tr><tr><td>50UW</td><td>50 microns</td></tr><tr><td>40UW</td><td>40 microns</td></tr><tr><td>20UW</td><td>20 microns</td></tr><tr><td>10UW</td><td>10 microns</td></tr><tr><td>5UW</td><td>5 microns</td></tr><tr><td></td><td></td><td rowspan="4">Paper</td></tr><tr><td>40U</td><td>40 microns</td></tr><tr><td>20U</td><td>20 microns</td></tr><tr><td>10U</td><td>10 microns</td></tr></table>	Code	Filtration	Media	60K	60 mesh	Notch wire	100K	100 mesh	150K	150 mesh	200K	200 mesh	50UK	50 microns					Wire (SUS)	60W	60 mesh	100W	100 mesh	150W	150 mesh	200W	200 mesh	50UW	50 microns	40UW	40 microns	20UW	20 microns	10UW	10 microns	5UW	5 microns			Paper	40U	40 microns	20U	20 microns	10U	10 microns
Code	Model Type																																																																														
BDV	Blow off																																																																														
BCV	Switchover only																																																																														
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200K	200 mesh																																																																														
50UK	50 microns																																																																														
		Wire (SUS)																																																																													
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		Paper																																																																													
40U	40 microns																																																																														
20U	20 microns																																																																														
10U	10 microns																																																																														

※1 Oil pans (BDV/BCV-03,04) have been discontinued.

Model BCV only

Coding Example

Coding Example

BDV-06-SO-R-100K

► Spares

■ Element

P — Fluid Type — BDV (BCV) — Inner Diameter — Filtration Rating

Coding example : P-BDV-06-100K

■ Sealing parts set

● For element replacement (Part No. with ◎ in “O-ring and packing” .) Note: The contents of this set are for one side only.

SP — Fluid Type — BDV (BCV) — Inner Diameter

Coding example : SP-BCV-16

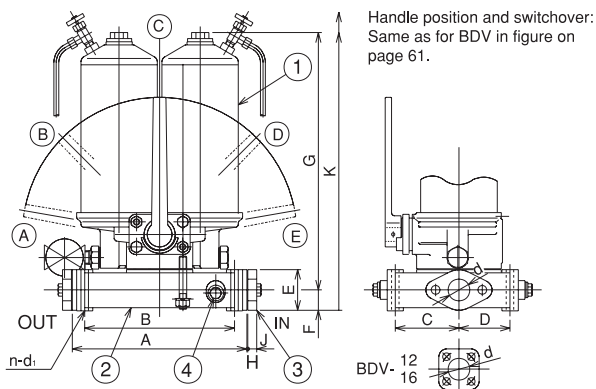
● For overhaul

SA — Fluid Type — BDV (BCV) — Inner Diameter —

Code	Oil Pan
Blank	None
SO	With

Coding example : SA-BCV-16

► Model BDV-SO (with oil pan)



■ Part List

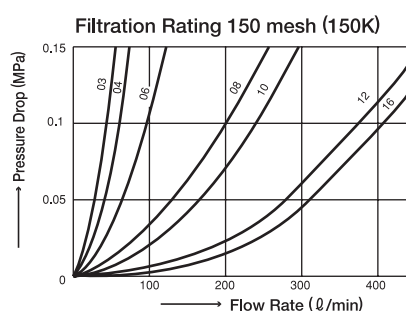
Part No.	Part Name	Material	Qty	Remarks
1	BDV filter		1	
2	Oil pan	FC	1	
3	Companion flange	SS	2	With packing and bolt
4	Drain plug	SS	1	With packing

■ Dimensions

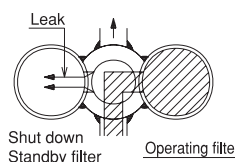
Symbol Model	Inner Dia.	d	A	B	C	D	E	F	G	H	J	Element Allowance K	n-d ₁	Mass (kg)
BDV-06	20A	27.7	240	200	80	65	50	25	297	1.5	10	570	4-φ 12	16
BDV-08	25A	34.5	280	240	102	82	65	32.5	414	1.5	14	795	4-φ 12	26
BDV-10	32A	43.2												
BDV-12	40A	49.1	360	320	140	120	100	60	520	1.5	14	1010	4-φ 14	58
BDV-16	50A	61.1												

► Flow Rate Chart

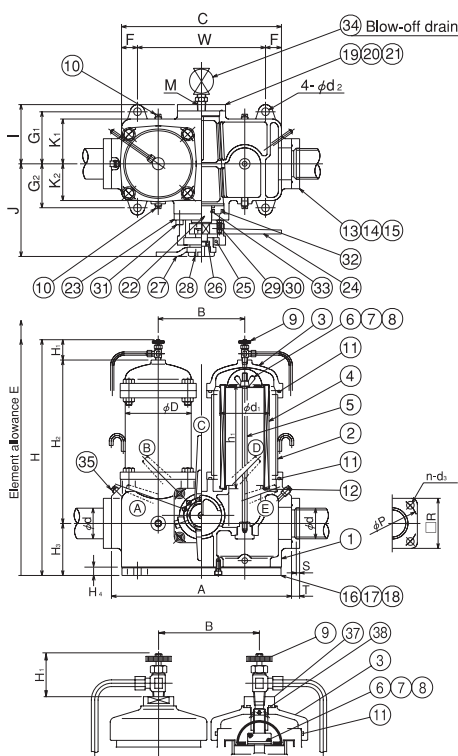
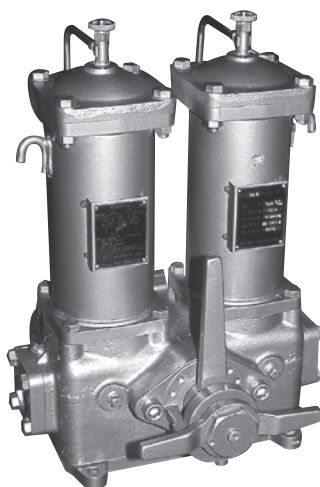
● ISO. VG32 ● Viscosity: 32 cSt (40°C)



Criteria of cock leakage: Specified amount of fluid leakage from operation filter to standby filter through cock clearance.



	Leakage cc/min	Condition
BDV - 03 04 06	MAX.30	0.6MPa
BDV - 08 10	MAX.50	Viscosity
BDV - 12 16	MAX.100	35 cSt



BOS/BCS-08,10

〈Handle Position and Switchover〉 (A) to (E) in figure
 (A) : Left side closed, right side in use
 (B) : Right side blow off, right side in use
 (C) : Both sides in use
 (D) : Left side in use, right side blow off
 (E) : Left side in use, right side closed

1. Maximum operating pressure: 0.5 MPa
2. Model BOS is blow-off duplex filter and uses notch wire elements. Switching handle at five levels enables cleaning one of the elements or closing one side of filters during operation.
3. Model BCS and BOS are the same design. Switching handle at three levels enables taking out clogged element by closing one of the filters while let the other filter keep running. Wire (SUS) and Paper are provided as well as Notch Wire for model BCS only.

Part List

Part No.	Part Name	Material	Qty	Remarks
38	O-ring	NBR	2	For BOS/BCS-08,10 JIS B2401. 1A
37	Cap nut	SS400	2	For BOS/BCS-08,10
36	Ring	C3604	1	
35	Plug	SS400	2	
34	Blow-off drain valve	CAC406	1	For BCS : Plug stopper (SS400)
33	O-ring	NBR	1	JIS B2401. 1A
32	O-ring	NBR	1	JIS B2401. 1A
31	Cap bolt	SCM435	1set	
30	Spring	SWPA	1	
29	Stopper	SS400	1	
28	Round nut holder	SS400	1	
27	Cock clamping handle	FCD450	1	For BOS/BCS-40,48 : FC200
26	Round nut (small)	SS400	1	
25	Round nut (large)	SS400	1	For BOS/BCS-12~24 : STKM13A
24	Handle	FCD450	1	} For BOS/BCS-40,48 : FC200
23	Gland flange	FCD450	1	
22	Cock	FCD450	1	
21	O-ring	NBR	1	For BOS/BCS-12~24 JIS B2401. 1A
20	Packing	Non asbestos	1	For BOS/BCS-08,10
19	Bolt	SS	4	
18	Cover	SS	1	
17	Packing	Non asbestos	1	
16	Cap bolt	SCM435	1set	
15	Blind flange	SS400	2	
14	O-ring	NBR	2	For BOS/BCS-12~24 JIS B2401. 1A
13	Packing	Non asbestos	2	For BOS/BCS-08,10
12	Cap bolt	SS400	1set	
11	Companion flange	SS400	2	
10	O-ring	NBR	2	For notch wire elements of BOS/BCS-20~48
9	Packing	Non asbestos	2	For paper and wire (SUS) elements of BOS/BCS-08~16/40,48
8	O-ring	NBR	4	JIS B2401. 1A
7	Suppression valve/Plug	C3771/SS400	2/2	For BOS/BCS-28~48
6	Plug	SS400	4	For BOS/BCS-08~24
5	Air vent valve	C3771	2	For BOS/BCS-40,48 : CAC406
4	Packing	Non asbestos	2	For BOS/BCS-40,48 : NBR
3	Washer	SS400	2	
2	Wing nut	SS400	2	
1	Spindle	SS400	2	
38	Element	SUS A6063	2	
37	Cover	FCD450	2	For BOS/BCS-28~48 : SS400
36	Shell	SGP,SS400	2	For BOS/BCS-12,16 : STKM13A,SS400
35	Body	FC200	1	

O-ring and Packing ※For notch wire element, O-rings in ().

Model	Part No.	8	11	12	Notch wire element	15	18	21	32	33	38
BOS/BCS-08	t1.5Xφ28/14	G-100	t1.5Xφ55/48	t1.5X□78/φ35	t1.5X□78/φ43	t2X118X234	t1.5X□70/46	G-50	G-35	G-25	
BOS/BCS-10	t1.5Xφ28/14	G-100	t1.5Xφ55/48	t1.5X□78/φ35	t1.5X□78/φ43	t2X118X234	t1.5X□70/46	G-50	G-35	G-25	
BOS/BCS-12,16	t1.5Xφ21/10	G-130	t1.5Xφ71/63	G-65	t2X178X324	G-85	G-85	G-50			
BOS/BCS-20,24	t1.5Xφ24/12	G-170	t1.5Xφ122/94	AS568-241	G-90	t2X202X398	G-100	G-105	G-50		
BOS/BCS-28,32	t1.5Xφ28/14	G-220	t1.5Xφ145/119	AS568-250	G-130	t2X283X500	G-125	G-135	G-75		
BOS/BCS-40,48	t2Xφ73/16	G-270	t2Xφ200/172	P-180 ※1	G-175	t2X398X668	G-180	G-190	G-85		

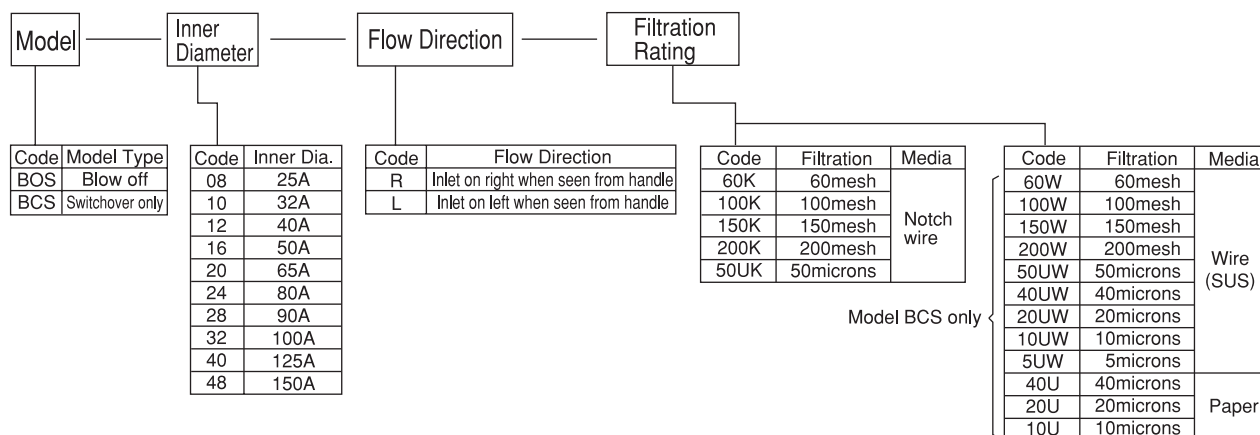
※1 JIS B2401, 1A

Dimensions

Model	Symbol	Inner Dia.	H	H ₁	H ₂	H ₃	H ₄	A	B	D	C	W	F	d ₂	G ₁	G ₂	I	J	K ₁	K ₂	M	Mass (kg)	Companion Flange						Element Allowance	Element	
																							d	R	P	T	S	n-d ₃		h ₁ ※2	d ₁
BOS/BCS-08	25A	379	50	259	70	16	265	120	101.6	236	170	33	15	75	75	81.5	153	60	60	Rc 3/8	24.5	35	□78	78	12	4-φ12	470	152	83		
BOS/BCS-10	32A	419		299																		43					550	192			
BOS/BCS-12	40A	473	50	333	90	18	360	180	127	326	270	28	15	115	95	128	212	100	80	Rc 1/2	57	49.2	□90	92	18	8	4-φ15	620	200	104	
BOS/BCS-16	50A	553		413																		61						780	280		
BOS/BCS-20	65A	587	50	408	129	19	450	216	165.2	400	320	40	19	130	110	148	232	112	92	Rc 1/2	96.5	78	□125	128	20	8	4-φ19	800	260 (265)	124	
BOS/BCS-24	80A	677		498																		90						980	350 (355)		
BOS/BCS-28	90A	998	103	730	165	22	550	260	216.3	502	410	46	19	175	150	197	277	155	130	Rc 3/4	212	103	φ210	175	22	10	8-φ19	1440	550 (551)	148	
BOS/BCS-32	100A	1248		980																		116						1940	800 (801)		
BOS/BCS-40	125A	1328	103	1033	192	26	670	320	267.4	670	500	85	19	240	210	235	350	215	185	Rc 1	350	141	φ260	220	25	10	8-φ19	2000	800 (802)	203	
BOS/BCS-48	150A			166																											

※2 Notch wire element dimensions in ().

Model Code



Coding Example
BOS-12-R-100K

Spares

Element

P — Fluid Type — BOS (BCS) — Inner Diameter — Filtration Rating

Coding example : P-BOS-12-100K

Sealing parts set

● For element replacement (Part No. with ◎ in “O-ring and packing”.) Note: The contents of this set are for one side only.

SP — BOS (BCS) — Inner Diameter — Symbol*3 Filtration Rating

K	Notch wire
Blank	Others

Coding example : SP-BOS-12

● For overhaul

SA — BOS (BCS) — Inner Diameter — Symbol*3 Filtration Rating

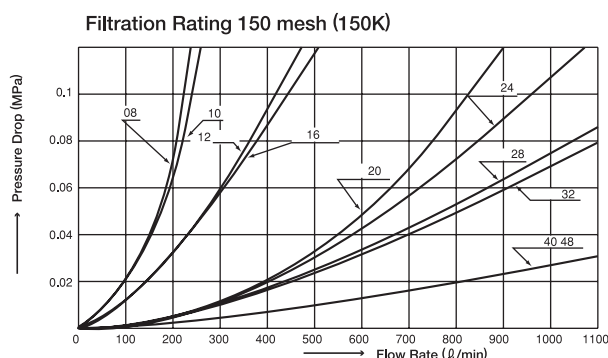
K	Notch wire
Blank	Others

Coding example : SP-BCS-20-K

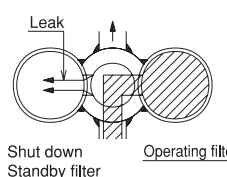
*3 Please input “K” when the notch wire elements (Dia. 20~48) are used.

Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)



Criteria of cock leakage: Specified amount of fluid leakage from operation filter to standby filter through cock clearance.



	Leakage cc/min	Condition
BOS - 08 10	MAX.30	0.5MPa
BOS - 12 16	MAX.60	
BOS - 20 24	MAX.80	Viscosity 35 cSt
BOS - 28 32	MAX.105	
BOS - 40 48	MAX.150	



Model CS



Model CF

1. Maximum operating pressure: 0.5 MPa
2. Standard filtration rating: 10U (10 microns)
3. Cartridge type for easy replacement.
4. Built-in relief valve (Opening pressure 0.1 MPa)
5. Pressure gauge is available in additional option for Model CF only and installed on four positions; in-port, outlet, right and left on filter.
Note: To install pressure gauge, please remove plug at installation position.
6. Applicable fluid : Mineral oil as standard

Part List

Part No.	Part Name	Material	Qty	Remarks
5	Pressure gauge			R1/8 Option(For CF)
4	Packing	NBR	1	
3	Relief valve		1	
2	Cartridge		1	
1	Body	ADC12	1	

Model Code

CF (CS)	Inner Diameter	10U	Pressure Gauge	※Model CF only
	Code	Inner Dia.	Code	Qty
	06	Rc 3/4	Blank	None
	08	Rc1	P1	1
	(04)	(Rc 1/2)	P2	2
			P3	3
			P4	4

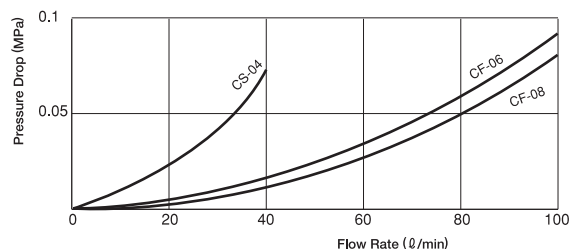
Coding example CF-08-10U-P2

Spare Cartridge

CS-04	S-810-1
CF-06/08	F-913-1

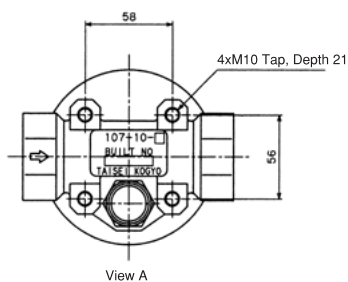
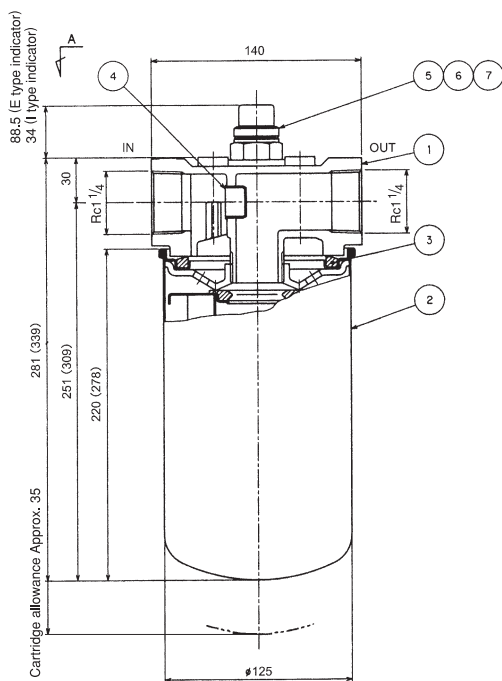
Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)



Dimensions and Standard Flow Rates

Symbol Model	d	A	D	H	H ₁	H ₂	h	E	W	d ₁ ×L	Mass (kg)	Standard Flow Rate (l/min)
CS-04	Rc 1/2	88	80	140	19	121	100	25	38	M8×14	0.49	25
CF-06	Rc 3/4	98	93	187	24	163	135.5	13	48	M10×19	0.92	45
CF-08	Rc 1											70



Dimensions in () are for cartridge length "3".
Dimensions of water absorbing cartridge and of cartridge length "2" are the same.

1. Maximum operating pressure: 1 MPa
2. Impulse test: 1 MPa x 10⁵ times
3. Applicable fluid: Mineral oil as standard
4. Cartridge type for easy replacement.
5. Water-absorbing cartridge (P/N: W-1321, Max. flow rate: 20 l/min) is available in additional option.

Part List

Part No.	Part Name	Material	Qty	Remarks
7	O-ring	NBR	1	JISB 2401.1A P-14
6	O-ring	NBR	1	JISB 2401.1B P-18
5	Indicator		1	Option
4	Relief valve		1	Option
3	Packing	NBR	1	
2	Cartridge		1	
1	Body	ADC12	1	

Weight: 107-10-2 . . . 2.4kg
107-10-3 . . . 2.7kg

Model Code

107	Inner Diameter	Cartridge Length	Filtration Rating	Option
	Code Inner Dia.	Code Length	Code Filtration	Code Indicator Model
	10 Rc1 1/4	2 Approx. 220	10U 10 microns	Blank Blind plug —
		3 Approx. 300	3C 3 microns	I Visual IA-3
				E Electric EA-3
				Code Relief Valve
				K None
				V With

Coding Example
107-10-2-3C-IV

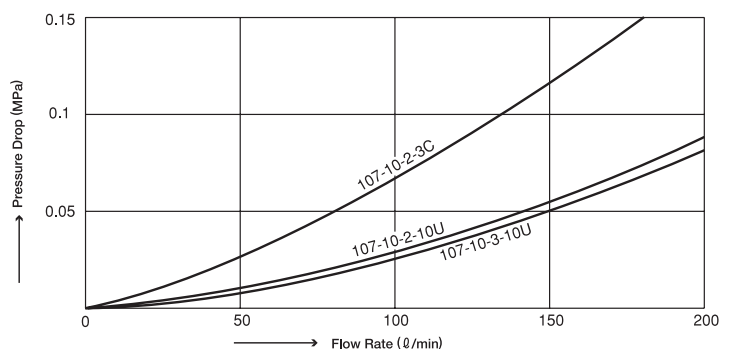
※ 3C : β_s ≥ 200
Note: "3C" limited to cartridge length "2".

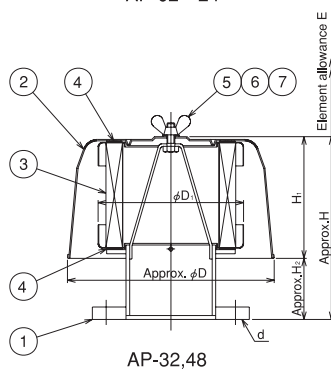
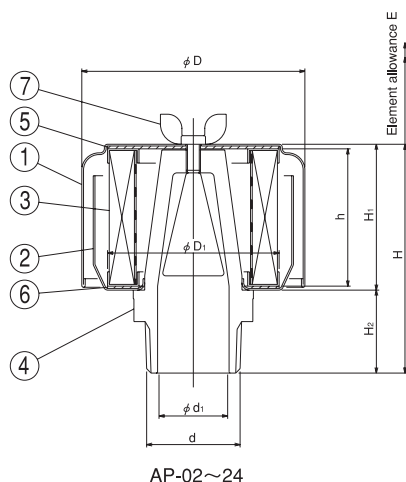
Spare Cartridge

107-10	Filtration rating	10Microns	3Microns	Water absorbing cartridge
	Cartridge length			
	2	J-1321-10	J-1321-03	W-1321
	3	J-1330-10		

Flow Rate Chart

● ISO VG32 ● Viscosity: 32 cSt (40°C)





1. Model AP is installed on top of a reservoir tank and prevent the contaminants from entering in the tank.
2. "02" to "24" are easy to be installed by only placing Rc female thread seat on tank side.
3. For model AP-32 and -48, JIS5K.FF flange is provided as standard.
4. Hard paper element is standard for "02" to "24". And paper element is standard for "32" and "48".
5. Wire element (SUS) is available as a conformity inspection of Japanese fire laws.
6. Steel wool element is available for moisture filtration.
7. Please contact us for use of fluids other than the mineral oil.

Part List AP-02~24

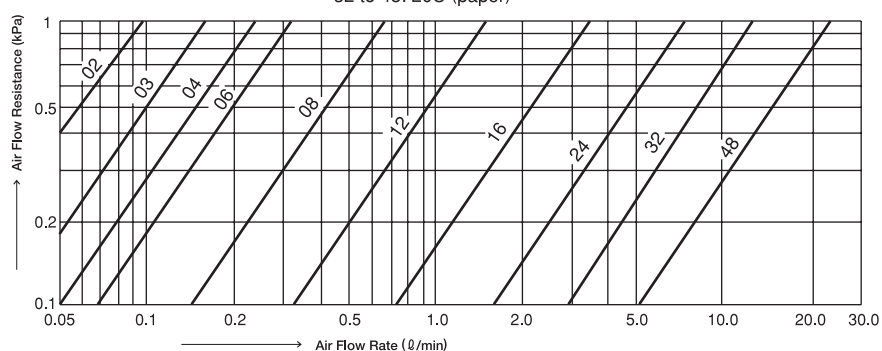
Part No.	Part Name	Material	Qty	Remarks
7	Wing bolt	SS400	1	
6	Packing	NBR	1	Except for hard paper element
5	Packing	NBR	1	Except for hard paper element
4	Nipple	ADC12	1	
3	Element		1	Hard paper element(20μm equivalent)
2	Lower cover	SPCD	1	Except for AP-02
1	Upper cover	SPCD	1	

Part List AP-32,48

Part No.	Part Name	Material	Qty	Remarks
7	Packing	NBR	1	
6	Washer	SECC	1	
5	Wing nut	SS400	1	
4	Packing	NBR	2	
3	Element		1	Paper element: 20U (20μm)
2	Upper cover	SPCC	1	
1	Body	SS400, SGP SPCC	1	

Model AP Flow Rate Chart

02 to 24: 20U equivalent (hard paper)
32 to 48: 20U (paper)



Dimensions

Symbol Model	d	H	H ₁	H ₂	D	d ₁	Element Allowance E	Element D ₁ h	Packing (Except for hard paper) 4 5 6 7	Air Flow Rate※ (m ³ /min)	Mass ※ (kg)
AP-02	R 1/4	50	30	20	40	9	50	31	t1×φ40/φ4 t1×φ50/φ5 t1×φ60/φ5 t1×φ70/φ6 t2×φ88/φ6 t2×φ125/φ9	0.06	0.035
AP-03	R 3/8	58	36	22	52	11	56	40 33		0.10	0.09
AP-04	R 1/2	66	41	25	66	14	61	50 38		0.15	0.14
AP-06	R 3/4	69	41	28	66	19	61	50 38		0.20	0.15
AP-08	R 1	80	51	29	78	25	71	60 48		0.40	0.20
AP-12	R 1 1/2	101	71	30	96	38	91	70 69		0.90	0.35
AP-16	R 2	113	81	32	122	50	101	88 78	t2×φ164/φ125 t2×φ223/φ176	2.00	0.65
AP-24	R 3	158	113	45	170	75	133	125 108		4.00	1.30
AP-32	JIS5K-100A	233	155	78	264	100A	180	185.6 135	t2×φ20/φ10	7.00	7.5
AP-48	JIS5K-150A	308	215	93	324	150A	240	244.6 200		15.0	14.5

※ AP-02~24: The datas installed hard paper element are.
AP-32,48: The datas installed paper element are.



1. Model FAB filter is installed on top of a reservoir tank to serve as inlet and air breather.
2. As air breather element, oil resistant air filter material is used because of its high trapped efficiency and porosity.
3. Slotted hole for tank installation gives flexibility for installation dimensions.
(Note: Installation methods of FAB and FA are different.)
4. Yellow paint is used on cover.
5. Model FAB is cheap edition but keeps the function and performance of FA model.

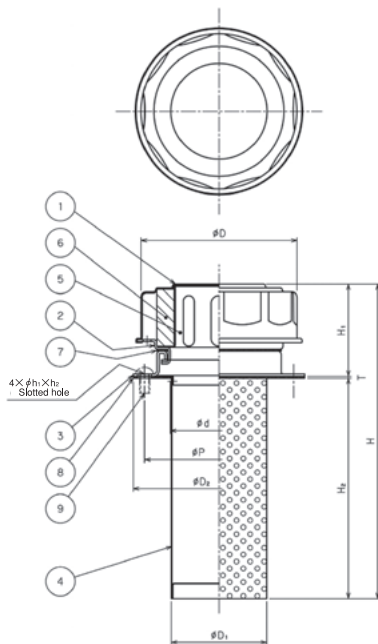
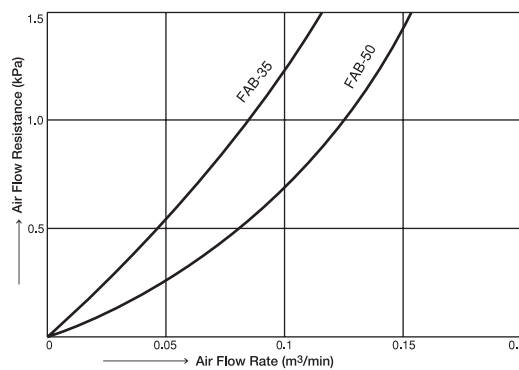
Part List

9	Screw	SS400	4	
8	Packing	Non asbestos	1	
7	Packing	NBR	1	
6	Element	Polyurethane	1	20 μ m
5	Inner cover	SPCC	1	
4	Oiling filter	SPCC	1	
3	Flange for fixing	SPCC	1	
2	Inlet	SPCC	1	
1	Cover	SECC	1	
Part No.	Part Name	Material	Qty	Remarks

Packing and screw

Part No. Model	7	8	9
FAB-35	t1.5 \times ϕ 44/ ϕ 33.0	t1 \times ϕ 68/ ϕ 30	M4 \times 8
FAB-50	t1.5 \times ϕ 64/ ϕ 52.5	t1 \times ϕ 88/ ϕ 50	M5 \times 10

Model FAB Air Flow Resistance



Dimensions

Symbol Model	D	D1	D2	d	P	H	H1	H2	T	h1	h2	Mass (kg)
FAB-35	58	29	68	30	57	108.3	33.7	73.6	1	4.5	6.5	0.11
FAB-50	80	49	88	50	76.5	162.1	47.5	113.6	1	5.5	7	0.23

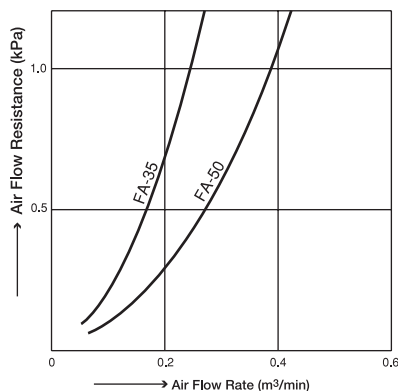


1. Model FA filter breather is installed on top of a reservoir tank to serve as inlet and air breather.
2. Hard paper used in element removes mist effectively.
3. Oiling filter can be removed remaining in "Flange for fixing" secured to tank.

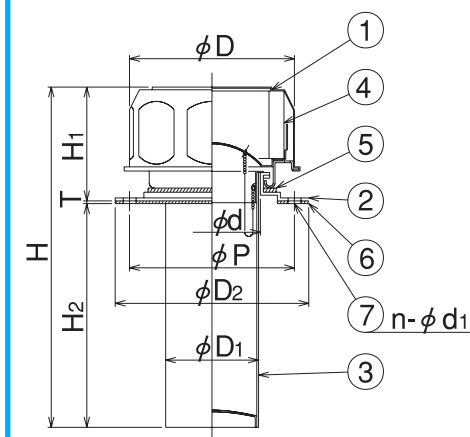
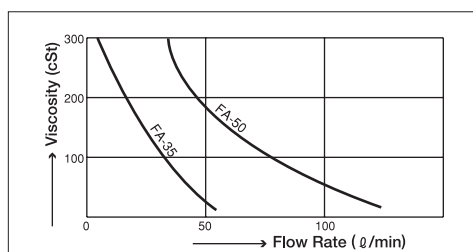
Part List

7	Set screw	SS	4	
6	Packing	Non asbestos	1	
5	Packing	Nitrile rubber	1	
4	Element	Hard paper	1	20U equivalent
3	Oiling filter	SPCC	1	φ 1
2	Flange for fixing	SPCC	1	
1	Cover assy	SPCC	1	Baking finish (Dark red)
Part No.	Part Name	Material	Qty	Remarks

Model FA Air Flow Resistance

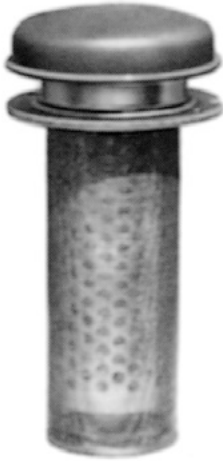


Model FA Oil Flow



Dimensions

Symbol Model	d	D	D ₁	D ₂	P	H	H ₁	H ₂	T	n-φd ₁	Set Screw	Mass (kg)
FA-35	34	58	33	68	58	119.6	40	78.1	1.5	4-φ 4.5	M4×8	0.15
FA-50	50	80	48.2	88	78	188.4	51	135.9	1.5	4-φ 5.5	M5×10	0.3

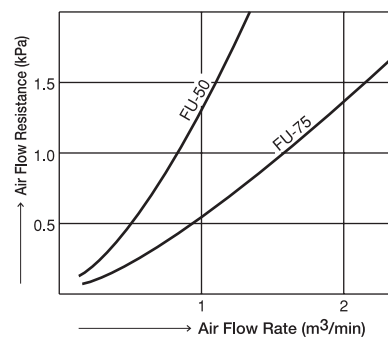


1. Model FU filter breather is installed on top of a reservoir tank to serve as inlet and air breather.

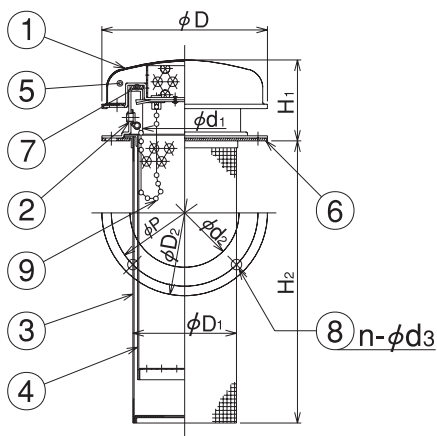
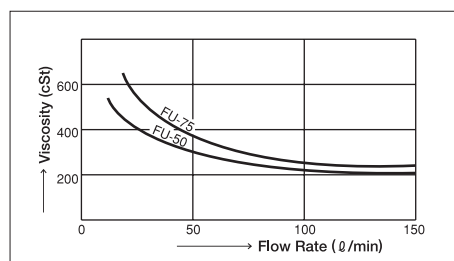
Part List

9	Ball chain	Brass	1 set	
8	Set screw	SS	1 set	
7	Packing	Cork	1	
6	Packing	Non asbestos	1	
5	Element	SS	1 set	Steel wool
4	Inner tube	SPCC	1	
3	Oiling filter	SPCC SUS net	1	40 mesh
2	Flange for fixing	SPCC	1	
1	Cover assy	SPCC	1	Baking finish (Dark red)
Part No.	Part Name	Material	Qty	Remarks

Model FU Air Flow Resistance



Model FU Oil Flow





Dimensions

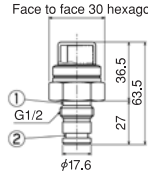
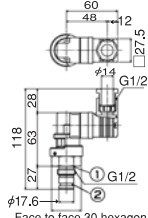
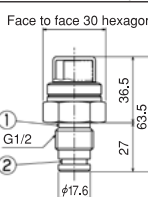
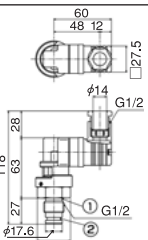
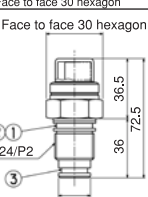
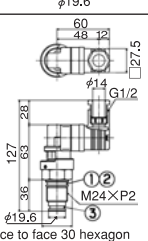
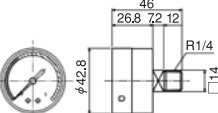
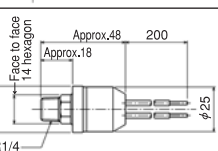
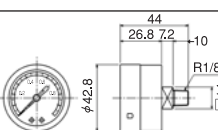
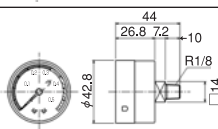
Symbol Model	d ₁	D ₁	d ₂	D	D ₂	P	H ₁	H ₂	n-φd ₃	Set Screw	Mass (kg)	Air Flow Rate m³/min (Pressure drop 0.5 kPa)
FU-50	45	55	58	88	88	78	43	150	4- φ 5.5	M5×10	0.4	0.5
FU-75	66	79	83	115	115	105	60	200	6- φ 5.5	M5×10	0.8	1

1. Indicators alert us to status on clogging of filter element visually or by electric signals detecting differential pressure in inlet and outlet ports of oil.
(Some models detect one port only, inlet or outlet port.)
2. Indicators for micro capacity in electric contact (under 100mA/AC100V,160mA/DC5V) are available in additional option.
3. O-rings and others are different depending on fluid type. Please contact us for detail.
4. G(PF) 1/2 price-tube is connectable to DIN connector, wire outlet.
Indicators can be set in different direction at every 90 degrees.
5. Material of dust cover is plastic.
6. Micro switch and DIN connector used for Electric Contact Type conform with following specifications.※1
UL spec., CSA spec., CE mark for DIN connector only (Except pressure switch for TRF models.)

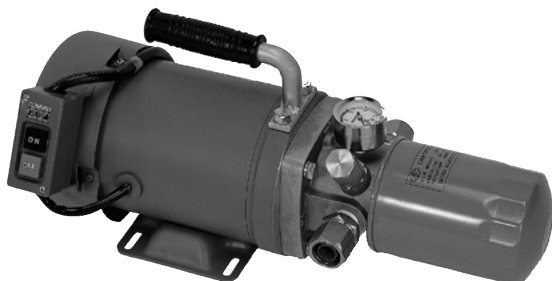
Specification

Applicable To	Model No.	Type	Pressure Indication		Dimensions	O-rings	Remarks
			Start of red	All red			
VN	ID-02	Visual 【Manual reset】	0.012MPa	0.02MPa		① JIS B2401.1A P-18	Standard options
	ED-02 (ED-02D)	Electric 【Automatic reset】 (micro capacity under 100mA)	0.02MPa				With visual signal DIN connector Code : IEC529(EN60529) IP65 Conform with UL and CSA spec. ※1
VM TSF	UG	Visual	-100kPa to 0kPa			—	Pressure gauge type (Secondary pressure detection)
	EG-03 (EG-03D)	Electric 【Automatic reset】 (micro capacity under 100mA)	0.03MPa				Pressure switch type (Secondary pressure detection) DIN connector Code : IEC529(EN60529) IP65 Conform with UL and CSA spec. ※1
ISH	U4-02	Visual 【Manual reset】	—	0.02MPa		① JIS B2401.1A P-18	Standard options
	E4-02 (E4-02D)	Electric 【Automatic reset】 (micro capacity under 100mA)	0.02MPa				With visual signal DIN connector Code : IEC529(EN60529) IP65 Conform with UL and CSA spec. ※1

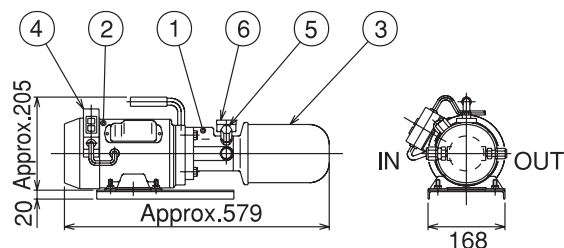
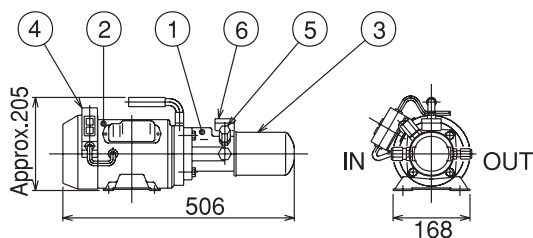
	Contact Capacity ☆Excluded Micro capacity		Configuration of contacts : 1C	
Specifications of Electric Contacts	Resistance	3A, 250V AC	ED-02(D)、EA-3(D)、EF-3/7(D)、EH-3/7(D)	EG-03(D)、E4-02(D)
		3A, 30V DC		
	Inductive	2A, 250V AC		
		2A, 250V DC		

Applicable To	Model No.	Type	Pressure Indication		Dimensions	O-rings	Remarks
			Start of red	Fully red			
351/352 UL、UM TL LCN COS-H UR 107 FP-1500S -1010 ※2	IA-3	Visual 【Automatic reset】	0.2MPa	0.3MPa		① JIS B2401.1B P-18	With visual signal DIN connector Code : IEC529(EN60529) IP65 Conform with UL and CSA spec. ※1 EA-3 : Standard options ※2
	EA-3 (EA-3D)	Electric 【Automatic reset】 (micro capacity under 100mA)	0.3MPa			② JIS B2401.1A P-14	
UH TM 3501/3502 SH GM GF MVF	IF-3	Visual 【Automatic reset】	0.2MPa	0.3MPa		① JIS B2401.1B P-18	
	IF-7		For high differential pressure elements				
	EF-3 (EF-3D)	Electric 【Automatic reset】 (micro capacity under 100mA)	0.3MPa			② JIS B2401.1A P-14	With visual signal DIN connector Code : IEC529(EN60529) IP65 Conform with UL and CSA spec. ※1
	EF-7 (EF-7D)		For high differential pressure elements				
GC 4201	IH-3	Visual 【Automatic reset】	0.2MPa	0.3MPa		① JIS B2401.1B P-22	
	IH-7		For high differential pressure elements				
	EH-3 (EH-3D)	Electric 【Automatic reset】 (micro capacity under 100mA)	0.3MPa			② JIS B2407,T2 P-22 BUR	With visual signal DIN connector Code : IEC529(EN60529) IP65 Conform with UL and CSA spec. ※1
	EH-7 (EH-7D)		For high differential pressure elements				
TRF	UT-4	Visual	0MPa to 1MPa (Start of red: above 0.3MPa)			—	Pressure gauge type (Primary pressure detection)
	Exclusive used type TRF	Electric 【Automatic reset】	0.3MPa			—	Pressure switch type (Primary pressure detection)
TR CF	UT-1	Visual	0MPa to 1MPa			—	Pressure gauge type TR : Primary pressure detection CF : Primary and secondary pressures can be detected depending on installation
FP-400Z	UT-3	Visual	0MPa to 1MPa (Start of red: above 0.3MPa)			—	Pressure gauge type (Primary pressure detection) Standard options

FP-400Z-2512



FP-400Z-1318

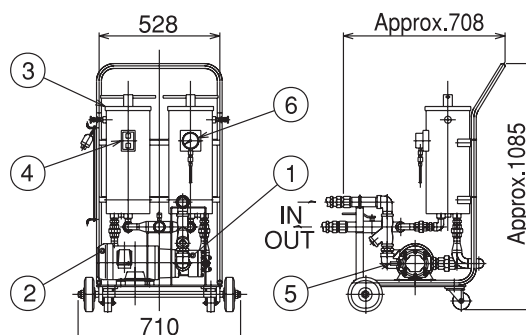
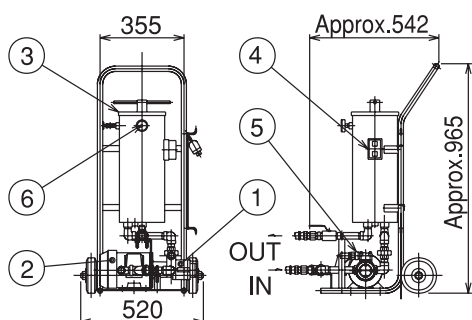


- ① Handy and light-weight unit. ② Spin-on cartridge type for easy replacement.

FP-750S-4030



FP-1500S-5060A

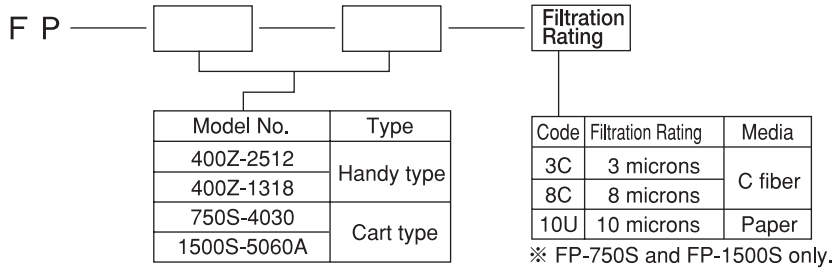


- ① Handy and easy-to-move unit. ② No tools are required for replacing element.

► Applications

1. Removing contaminants in hydraulic tanks ...
2. Changing and adding fluid to construction machinery, industrial vehicles ...
3. Charging and draining fluid ...
4. Other applications such as cleaning fluid ...

► Model Code



► Spare Elements

Model	Spare Element
FP-400Z-2512	L-913- [Filtration rating]
FP-400Z-1318	N-1318- [Filtration rating]
FP-750S-4030	P-LCN-6- [Filtration rating]
FP-1500S-5060A	P-LCN-6- [Filtration rating]

► Specifications

Model			FP-400Z-2512	FP-400Z-1318	FP-750S-4030	FP-1500S-5060A
Pump	Discharge	50Hz	12 ℓ /min		30 ℓ /min	58.5 ℓ /min
		60Hz	14.4 ℓ /min		36 ℓ /min	70.2 ℓ /min
	Pressure	50Hz	0.4MPa		0.55MPa	0.8MPa
		60Hz			0.35MPa	0.6MPa
	IN/OUT		Rc1/2		Rc3/4	Rc1 1/4
Motor			Single-phase 100V×50/60Hz×400		3-phase 200V×50/60Hz×0.75KW	3-phase 200V×50/60Hz×1.5KW
Cartridge filter and filter element	Operating temperature		MAX80℃			
	Operating pressure		MAX0.5MPa			
	Model No.		L-913	N-1318	P-LCN-6×1pc	P-LCN-6×2pcs
Power switch/Power cord			Pushbutton type/Power cord : 2m		Pushbutton type/Power cord : 5m	
Relief valve (Installed on the pump)		Opening pressure	0.3MPa		0.35MPa	
Pressure gauge			Primary pressure : 0 to 0.3MPa…Operating range			
			Above 0.3MPa…Replace element			
Accessories			In/out wire nylon hose (with hose fitting) 2m × 2pcs			
Options			Suction strainer (SFW-04S)		Y-strainer (built in as standard)	
Weight			16kg	19kg	60kg	122kg

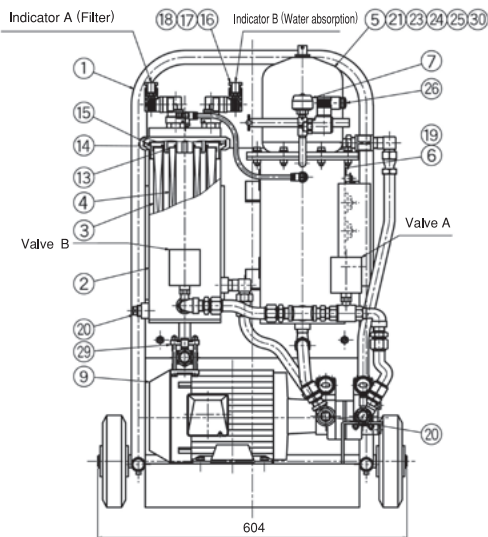
► Precautions for Handling

- ① Rotating direction Check rotation direction of motor indicated by arrow.
Reverse flow due to inverse rotation of motor causes damages to pump and filter element.
- ② Fluid to use Use mineral oil only. Do not use other fluids.
When using low temperature or high viscosity fluid, pressure gauge may show over 0.3 MPa. Recommended viscosity is 300 cSt or below.
- ③ Inlet condition Use accessory hoses only. Should other hoses be used, avoid smaller ones.
- ④ Relief valve Unless necessary, do not change set value of built-in relief valve (opening pressure: 0.35 MPa) in pump as it protects filter and pump.
- ⑤ Replacement of filter element ... Replace filter element once pressure gauge indicates 0.3 Mpa for clogging of element. Continuous use of clogged filter causes troubles on element or pump motor.
- ⑥ Others Install ground wire to prevent electric shock.

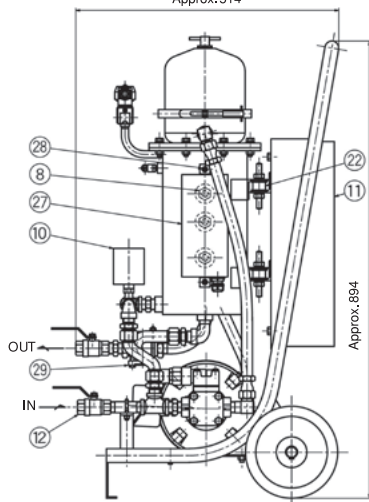
FP-1500S-1010



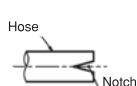
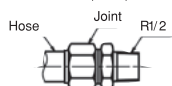
Actual products may slightly differ from photo.



Approx. 514



◆ IN, OUT hose tip shape

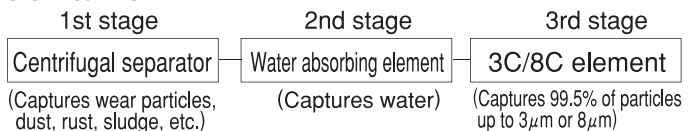


Mass: Approx. 95Kg

- 3-stage filtration unit. First, fluid fed by pump motor from oil inlet is filtered by centrifugal separator. Then, water is captured by absorbing element. Lastly particles are filtered through C fiber element.
- Two indicators, one for filter element and the other for water absorbing element, are provided as standard to indicate clogging. Each indicator shows time for replacement on each element.
- Transportable type for operation at any desired place.
- Do not use fire resistant fluid.
- Pressure resistance braid hoses (with joints on both sides) are included.
- Outside lamp, addition timer and site glass are also available in additional option.
- Use in the range of oil viscosity from 20 to 200 cSt.

Viscosity	Operating temperature
ISO VG32	7°C to 52°C
ISO VG46	13°C to 60°C
ISO VG68	21°C to 60°C

Mechanism



O-ring ※1

Part No.	13	14	15	17
Sealing material	P-32	1A G-80	1A G140	18 P-18
Quantity	2	2	1	2
Part No.	18	19	21	
Sealing material	1A P-14	t3X φ 213 / φ 167	t1.5X φ 141 / φ 52	
Quantity	2	1	1	

Spares of Centrifugal Separator ※1

Part No.	23	24	25	30
Part name	Paper insert	O-ring for rotor	O-ring for cover	O-ring for cover nut
Quantity	1	1	1	1

Part List

30	O-ring	NBR	1	For cover nut
29	Site glass	FC	1	Option
28	Screw	SS400	2	M6
27	Sensor cover	SECC	1	
26	Solenoid valve	C37	1	Rc1/4
25	O-ring	NBR	1	For cover
24	O-ring	FKM	1	For rotor
23	Paper insert		1	
22	Rubber vibration isolator		4	With M10 nut & spring washer
21	Packing	Non asbestos	1	t1.5X106X96
20	Drain plug	SS400	2	R1/2
19	Packing	NBR	1	t3X φ 213 / φ 167
18	O-ring	NBR	2	JIS B2401, 1A
17	O-ring	NBR	2	JIS B2401, 1B
16	Indicator	A5056	2	Model : EA-3
15	O-ring	NBR	1	JIS B2401, 1A
14	O-ring	NBR	2	JIS B2401, 1A
13	O-ring	NBR	2	JIS B2401, 1A
12	Ball valve	C3771	2	Rc1/2
11	Control box	ASS'Y	1	
10	Ball valve	CAC406	2	Rc1/2
9	Pump motor	ASS'Y	1	
8	Level sensor	POLYPROPYLENE POLYACETAL	3	
7	Air breather	ASS'Y	1	AP-02
6	Tank	SGP SS400	1	
5	Centrifuge	ASS'Y	1	
4	Filter element	FIBER SECC	1	3C : P-GF-A-08-3-3C 8C : P-GF-A-08-3-8C
3	Water absorption element	BELLOASIS SECC	1	P-AN03100-W
2	Filter	STK400E SS400	1	
1	Carrier	SGP SS400	1	
Part No.	Part Name	Material	Qty	Remarks

► Model Code

F P — 1500S — 1010 —			Filtration Rating	Option				
Code	Filtration	Media				Code	Control box	
3C	3 microns	C fiber	Code	Site glass	Code	IN,OUT hose tip shape	Blank	Standard
8C	8 microns		Blank	None	Blank	With joint	T	With addition timer
			S	With	H	With notch	R	With outside lamp
							TR	With addition timer & outside lamp

► Spares

■ Element

Water absorbing element	P-AN03100-W	Paper insert	FM060
Filter element	P-GF-A-08-3- ^{3C} _{8C}		

■ Sealing Parts

See the parts lists of “O-ring” and “Spares of Centrifugal Separator” on the left page.

※1 When replacing element, replace sealing parts with ◎ as well.

When cleaning centrifugal separator, replace sealing parts with ○ as well.

► Main Specifications

Fluid to use: Mineral oil (hydraulic fluid, lubricating oil)		
Operating temperature: 0 to 60°C		
Indicator red indication: 0.3MPa		
Filtration rating	1st stage	Centrifugal separator (10 μm equivalent)
	2nd stage	Water absorption
	3rd stage	8 μm (β ₈ ≥200) 3 μm (β ₃ ≥200)

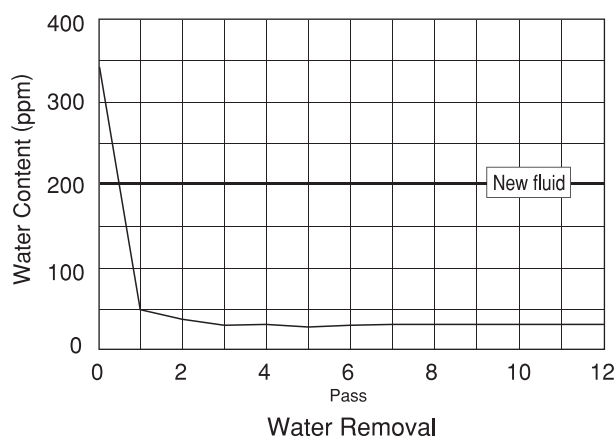
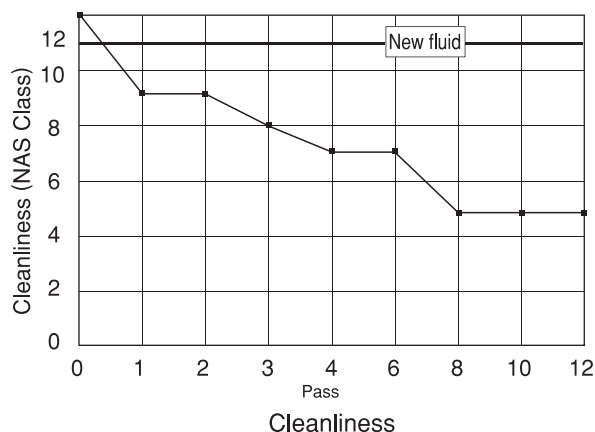
Pump	Model		TOP-2MY1500-206HBMVB×206HBVB	
	Flow rate	50Hz	9.0 ℓ /min	
		60Hz	10.8 ℓ /min	
	Discharge pressure		1.0MPa	
	Opening pressure of relief valve	IN → centrifugal separator		0.7MPa
Tank → filter		0.7MPa		
Motor	Model		FELQ-8T	
	Voltage		3 ϕ 200V-1.5kW	
	Frequency		50Hz/60Hz	
	Poles		4P	
Accessories	Cord		Control box power cord 5 m	
	Hose		1/2 B Braid hose (with joints on both sides) 2 m × 2 hoses	

► Performance Graphs

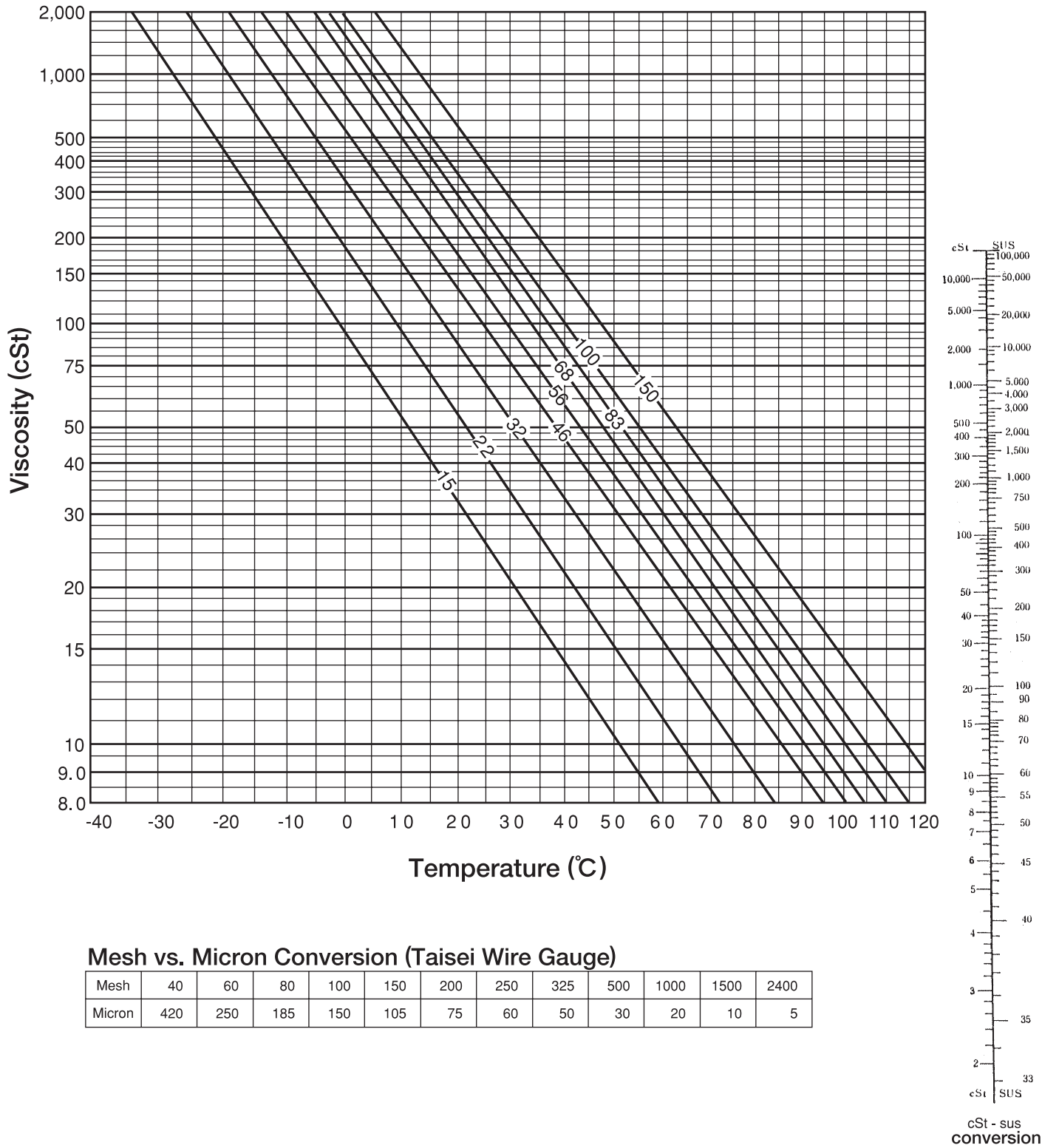
● Test Conditions

- Tank capacity: 40L
- Oil type: ISO VG46

- Dust: ACFTD
- Water content: 100 cc



Viscosity - Temperature Chart (ISO)



Request for Filter Selection

To: Sales Dept. Taisei Kogyo Co., Ltd. Fax: +81-3-6912-5921		Company name			
		Section		Contact person	
		Tel		Fax	
Item	Unit	Specification			
Fluid name					
Flow rate	Liters/min				
Operating pressure	MPa				
Operating temperature	°C				
Viscosity	mm ² /S				
Filtration rating					
Allowable pressure drop	MPa				
Indicator	Required / Not required [Visual observation / Electric contact]				
Required model	[Thread type / Flange type] [Single / Duplex] (Single) ... [Upward removal / Downward removal] (Duplex) Blow off ... (Required / Not required)				
Comments					



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