Oil Filter & Heat Exchanger

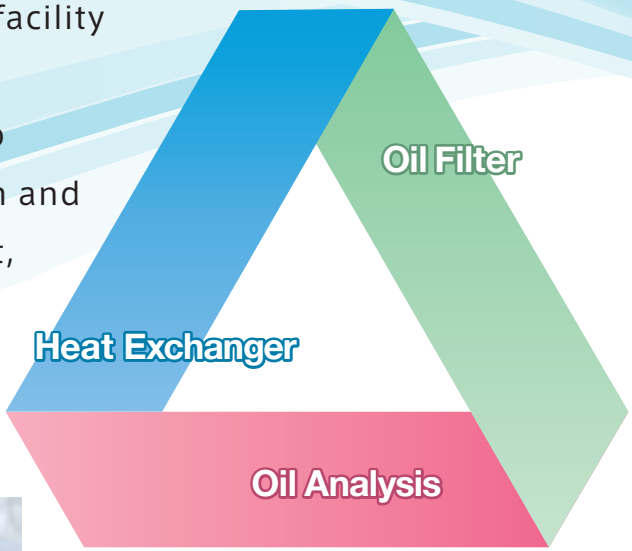
Catalog

TAISEI KOGYO Co.,Ltd.

CONTENTS

Reliable Technology and Passion to keep supporting “Motive Power”.

We, TAISEI KOGYO, are the only one manufacturer in Japan that provides total solution for oil facility management: Oil Filter, Heat Exchanger, and Oil Analysis. These are indispensable to control three key factors of oil deterioration and functional depression: Contamination, Heat, and Water Content.








Proven value and adoption records in various field.

TAISEI KOGYO is earnestly working on high-quality manufacture and severe delivery management. We always respond to customer’s various requirements by our cultivated know-how through over half a century.

Facility Introduction

Manufacturing Facilities


Kita-Ibaraki Factory

【Utsunomiya Factory】
High-quality products are being manufactured at this highly skilled factory to respond to customer’s various requirements.

【Kita-Ibaraki Factory】
Excellent products are being manufactured at the special assembly line designed and constructed based on our experienced manufacturing know-how.

Design and R&D Facilities


R&D Center

【Engineering Dept. in Head Office】
Experienced engineers are working on customization of standard product, design for special model, and so on to respond to customer’s various requirements.

【R&D Center】
Skilled specialists are working on development of new products and providing oil analysis service.

INDEX ～ FILTER ～

TYPE		STRUCTURE	INNER DIAMETER	MODEL		MAX WORKING PRESSURE(MPa) 0 5 10 20 30 40
Line		T-type Downward extraction	Rc1/4,Rc3/8	LND	02,03	0～0.5
			Rc1/2		04	0～0.5
			Rc3/4		06	0～0.5
			Rc1		08	0～0.5
		T-type Downward extraction	Rc1 1/4,Rc1 1/2	LN	10,12	0～0.5
			Rc2		16	0～0.5
			Rc2 1/2,Rc3		20,24	0～0.5
		T-type Downward extraction With scraper	Rc1/2,Rc3/4	AK	04,06	0～1.0
			Rc1,Rc1 1/4		08,10	0～1.0
			Rc1 1/2,Rc2		12,16	0～1.0
		T-type Downward extraction	Rc3/8,Rc1/2	351	A-03,A-04	0～3.5
			Rc3/4,Rc1		B-06,B-08	0～3.5
			Rc1 1/4,Rc1 1/2		A-10,A-12	0～3.5
		T-type Upward extraction	Rc3/8,Rc1/2	UL	03A,04A	0～3.5
			Rc3/4,Rc1		06A,08A	0～3.5
			Rc1 1/4,Rc1 1/2		10A,12A	0～3.5
			Rc2		16A	0～3.5
			Rc2 1/2,Rc3		20B,24B	0～3.5
		T-type Upward extraction	Rc3/8,Rc1/2	UM	03,04	0～7.0
			Rc3/4,Rc1		06,08	0～7.0
			Rc1 1/4,Rc1 1/2		10,12	0～7.0
			Rc2		16A	0～7.0
			Rc2 1/2,Rc3		20B,24B	0～7.0
		T-type Upward extraction	Rc3/8,Rc1/2	UH	03A,04A	0～21
			Rc3/4,Rc1		06A,08A	0～21
			Rc1 1/4,Rc1 1/2		10A,12A	0～21
			Rc2		16A	0～21
		T-type Downward extraction	Rc1/2,Rc3/4	TM	04,06	0～21
		T-type Downward extraction	G3/8,G1/2	3501	03A,04A	0～35
			G3/4		06A	0～35
		T-type Downward extraction	G1	SH	08Z	0～35
			G1 1/2		12Z	0～35

C-Fiber High performance element. Filtration rating is guaranteed by the multi-pass test method	Paper The most common paper element	Notch wire Cleanable & reusable notch wire element (Dimple wire element)
Relief valve Safety valve for element protection when clogged	Magnet For magnetic dust collection	High press. element High pressure element (21MPa)

SUS Wire gauze Cleanable & reusable wire gauze element	Companion flange Flange for welding pipe (standard/option)	Indicator Differential pressure type indicator (Visual type/Electric contact type)
Scraper Cleaning function by scraper		

INDEX ～ FILTER ～

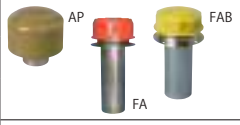
	TYPE	STRUCTURE	INNER DIAMETER	MODEL		MAX WORKING PRESSURE(MPa) 0 5 10 20 30 40
Line		Manifold type Upward extraction	15A Equivalent	GM	04Z	0～21
		Manifold type Upward extraction	20A Equivalent	GF	06	0～25
			25A Equivalent		08	0～25
		Manifold type Upward extraction	40A Equivalent	GC	12Z	0～35
		Manifold type Upward extraction	40A Equivalent	4201	12Z	0～42
		Modular type	φ7	MVF	01	0～25
			φ9		03	0～25
		Self-standing type Upward extraction	40A～200A	TL	40～200	0～1.0
		L-type Upward extraction	40A,50A	LCN	12,16	0～3.0
		L-type Upward extraction	Rc3/4, Rc1 → Rc1	TLA	0.6,0.8	0～1.6
			Rc1 1/4, Rc1 1/2 → Rc1 1/2		10,12	0～1.6
		Tank-top type	Rc3/4, Rc1 → Rc1	TRA	06(A),08(A)	0～1.0
			Rc1 1/4, Rc1 1/2 → Rc1 1/2	TRF	10(A),12(A)	0～1.0
Return		Tank-top type	Rc2	TRF	16	0～1.0
			Rc2 1/2, Rc3 → Rc3		20,24	0～1.0
		Tank-top type	Rc3/8,Rc1/2	TR	03,04	0～1.0
Suction		Case type Suction filter Upward extraction	10A,15A	VN	03A,04A	-0.1～0.5
			20A,25A		06A,08A	-0.1～0.5
			32A,40A		10A,12A	-0.1～0.5
			50A		16A	-0.1～0.5
			65A,80A		20B,24B	-0.1～0.5
			90A,100A		28A,32A	-0.1～0.5
		Case type Suction filter Horizontal extraction	10A,15A	ISH	03A,04A	-0.1～0.5
			20A,25A		06A,08A	-0.1～0.5
			32A,40A		10A,12A	-0.1～0.5
			50A		16A	-0.1～0.5
			65A,80A		20A,24A	-0.1～0.5
		Case type Suction filter Horizontal extraction	10A,15A	STU	03B,04B	-0.1～0.5
			20A,25A		06B,08B	-0.1～0.5
			32A,40A		10B,12B	-0.1～0.5
			50A		16B	-0.1～0.5
			65A,80A		20B,24B	-0.1～0.5
			90A,100A		28B,32B	-0.1～0.5
		Tank-top type	Rc3/4, Rc1 → Rc1	TSF	06A,08A	-0.1～0.5
			Rc1 1/4, Rc1 1/2 → Rc1 1/2		10A,12A	-0.1～0.5
			Rc2		16	-0.1～0.5

C-Fiber	High performance element. Filtration rating is guaranteed by the multi-pass test method	Paper	The most common paper element	SUS Wire gauze	Cleanable & reusable wire gauze element
Rc threaded flange	Flange for Rc threaded pipe (option)	Indicator	Differential pressure type indicator (Visual type/Electric contact type)	Press. gauge	Pressure gauge for clogging indication (standard/option)
Reverse flow valve	Safety valve for element protection from reverse flow	Adjustment bracket	Mounting bracket for position adjustment	High press. element	High pressure element (21MPa)

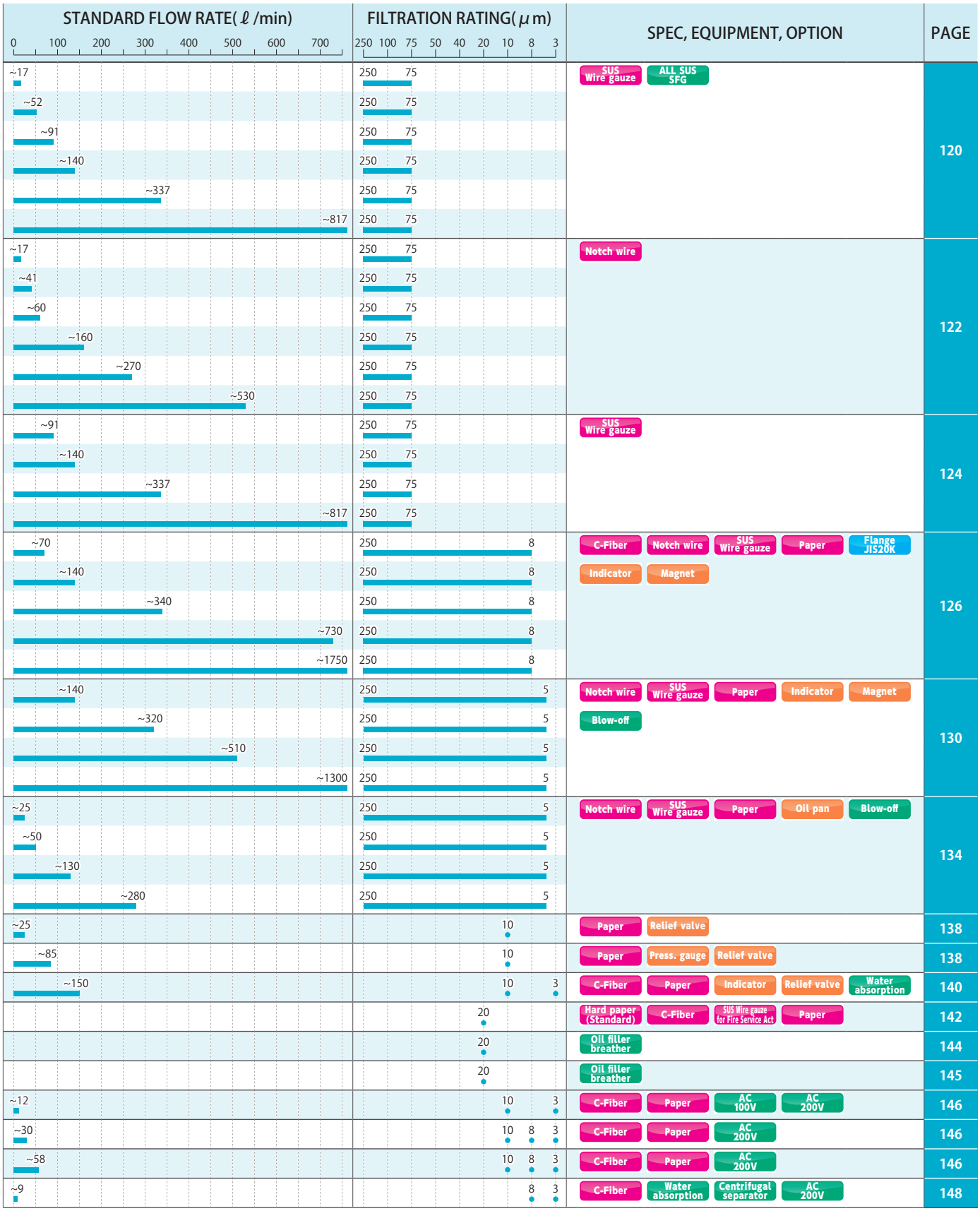
STANDARD FLOW RATE(ℓ /min) (0 100 200 300 400 500 600 700)	FILTRATION RATING(μ m) (250 100 75 50 40 20 10 8 3)	SPEC, EQUIPMENT, OPTION	PAGE
~30	250 – 3	C-Fiber · SUS Wire gauze · Paper · Reverse flow valve · Indicator · Relief valve · High press. element	60
~110	250 – 3	C-Fiber · SUS Wire gauze · Paper · Indicator · Relief valve · High press. element	64
~230	250 – 3		
~350	250 – 3	C-Fiber · SUS Wire gauze · Paper · Indicator · Relief valve · High press. element	68
~350	40 – 3	C-Fiber · Paper · Indicator · Relief valve · High press. element	72
~10	105 – 3	C-Fiber · SUS Wire gauze · Paper · Modular ISO4401	76
~20	105 – 3		
~3000	250 – 8	C-Fiber · SUS Wire gauze · Paper · Flange JIS10K · Indicator · Relief valve	80
~600	40 – 3	C-Fiber · Paper · Companion flange · Indicator · Relief valve	84
~200	250 – 3	C-Fiber · SUS Wire gauze · Paper · Companion flange · Indicator · Relief valve	88
~400	250 – 3		
~200	250 – 3	C-Fiber · SUS Wire gauze · Paper · Companion flange · Indicator · Press. gauge/switch · Relief valve	92
~400	250 – 3		
~440	250 – 3	C-Fiber · SUS Wire gauze · Paper · Companion flange · Press. gauge/switch · Relief valve	96
~860	250 – 3		
~40	250 – 3	C-Fiber · SUS Wire gauze · Paper · Press. gauge · Air breather	100
~36	250 – 75	SUS Wire gauze · Rc threaded flange · Indicator · Relief valve · Magnet	104
~120	250 – 75		
~330	250 – 75		
~490	250 – 75		
~830	250 – 75		
~1350	250 – 75		
~27	250 – 75	SUS Wire gauze · Rc threaded flange · Indicator · Relief valve · Magnet	108
~92	250 – 75		
~150	250 – 75		
~210	250 – 75		
~475	250 – 75		
~25	250 – 75	SUS Wire gauze · Rc threaded flange · Indicator · Relief valve	112
~70	250 – 75		
~160	250 – 75		
~260	250 – 75		
~550	250 – 75		
~900	250 – 75		
~50	250 – 75	SUS Wire gauze · Companion flange · Press. gauge/switch · Relief valve	116
~130	250 – 75		
~180	250 – 75		

Modular ISO4401 Mount face standard ISO4401 AB-03-4-A/AC-05-4-A	Flange JIS10K JIS 10K flange connection	Companion flange Flange for welding pipe (standard/option)
Press. gauge/switch Pressure gauge/switch for clogging indication (standard/option)	Relief valve Safety valve for element protection when clogged	Magnet For magnetic dust collection
Air breather Air breather installed in filter case		

INDEX ～ FILTER ～

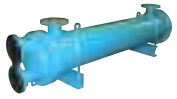
TYPE		STRUCTURE	INNER DIAMETER	MODEL		MAX WORKING PRESSURE(MPa) 0 5 10 20 30 40
Suction		Suction strainer	Rc1/4,Rc3/8	SFT SFG	02,03	-0.1～0
			Rc1/2,Rc3/4		04,06	-0.1～0
			Rc1		08	-0.1～0
			Rc11/4		10	-0.1～0
			Rc1 1/2,Rc2		12,16	-0.1～0
			Rc2 1/2,Rc3		20,24	-0.1～0
		Suction strainer	Rc1/4,Rc3/8	SFN	02,03	-0.1～0
			Rc1/2,Rc3/4		04,06	-0.1～0
			Rc1		08	-0.1～0
			Rc11/4		10	-0.1～0
			Rc1 1/2,Rc2		12,16	-0.1～0
			Rc2 1/2,Rc3		20,24	-0.1～0
		Suction strainer With extension rod	25A	SFR	08	-0.1～0
			32A		10	-0.1～0
			40A,50A		12,16	-0.1～0
			65A,80A		20,24	-0.1～0
Duplex		Steel body Double cases	15A,20A	COS	04,06	0～2.0
			25A,32A		08,10	0～2.0
			40A,50A		12,16	0～2.0
			65A,80A		20,24	0～2.0
			90A,100A		28,32	0～2.0
		Blow-off	25A,32A	BOS BCS	08,10	0～0.5
			40A,50A		12,16	0～0.5
			65A,80A		20,24	0～0.5
			125A,150A		40,48	0～0.5
		Blow-off	10A,15A	BDV BCV	03,04	0～0.6
			20A		06	0～0.6
			25A,32A		08,10	0～0.6
			40A,50A		12,16	0～0.6
Cartridge		Spin-on	Rc1/2	CS	04	0～0.5
		Spin-on	Rc3/4,Rc1	CF	06,08	0～0.5
		Spin-on	Rc1 1/4	107	10	0～1.0
Breather		Air inlet	R1/4～R3,100A,150A	AP	02～24,32,48	
		Oil filler	-	FAB	35,50	
		Oil filler	-	FA	35,50	
Off-line		With pump/Handy	-	FP	400Y	
		With pump/Single type	-		750S	
		With pump/Duplex type	-		1500S-5060A	
		With centrifugal separator	-		1500S-1010	

C-Fiber High performance element. Filtration rating is guaranteed by the multi-pass test method	Paper The most common paper element	Hard paper (Standard) High collection efficiency and high porosity
Indicator Differential pressure type indicator (Visual type/Electric contact type)	Press. gauge Pressure gauge for clogging indication (standard/option)	Relief valve Safety valve for element protection when clogged
Blow-off Cleaning function by blow-off	Oil filler breather Oil filler filter with air breather	AC 100V/200V Power: AC 100V/200V (50/60Hz) *Special spec 200V for FP-400Y



Notch wire	Cleanable & reusable notch wire element (Dimple wire element)	SUS Wire gauze	Cleanable & reusable wire gauze element	Flange JIS20K	JIS 20K flange connection
Magnet	For magnetic dust collection	Oil pan	Oil pan adjustment to horizontal flow direction (option)	ALL SUS SFG	All stainless-steel model: SFG
Water absorption	Filter element for water absorption in oil	Centrifugal separator	Centrifugal separator for sludge collection		

INDEX ～ HEAT EXCHANGER ～

TYPE		STRUCTURE	COOLING TUBE	MAX WORKING PRESSURE (MPa)	MODEL		HEAT TRANSFER AREA(m^2) 0 5 10 30 50 70
Water-Cooled Shell and Tube type		Fixed tube sheet type 2 pass	Ø9 Low fin tube Phosphorous-deoxidized copper	1.0	FCF	00□	0.15～0.3
						1□□	0.4～1.1
						2□□	1.3～3.5
						3□□	2.5～8
						4□□	5.5～10
		Floating tube sheet type 2 pass	Ø9 Low fin tube Phosphorous-deoxidized copper (Fresh water) / Aluminum brass (Sea water)	1.0	FCD (Fresh water) FCDB (Sea water)	1□□A	0.4～1.1
						2□□A	1.3～3.5
						3□□A	2.5～5.5
		Floating tube sheet type 2 pass	Ø12.7 Low fin tube Phosphorous-deoxidized copper	1.0	FPD	5□□	9～27
						6□□	17～33
		Floating tube sheet type 2 pass	Ø12.7 Low fin tube Phosphorous-deoxidized copper (Fresh water) / Aluminum brass (Sea water)	1.0	FTC (Fresh water) FTCB (Sea water)	150A	6～11
						200A	7～22
						250A	18～44
						300A	31～71
		Floating tube sheet type 4 pass	Ø12.7 Low fin tube Phosphorous-deoxidized copper (Fresh water) / Aluminum brass (Sea water)	1.0	FTS (Fresh water) FTSB (Sea water)	150A	6～11
						200A	7～22
						250A	18～44
						300A	31～71
		TEMA standard type 2 pass	Ø12.7 Low fin tube	1.0	TFMC	125A	1.6～64.9
			Ø15.88 Low fin tube		TFLC	150A 200A	1.0～51.3
			Ø12.7 Bare tube		TBMC	250A	0.6～26.7
			Ø15.88 Bare tube		TBLC	300A	0.4～20.8
	 FCX  FCW	With thermostat 2 pass Fixed tube sheet type	Ø9 Low fin tube Phosphorous-deoxidized copper	1.0	FCX	1□□	0.4～1.1
						2□□	1.3～3.5
		With thermostat 2 pass Floating tube sheet type	Ø9 Low fin tube Phosphorous-deoxidized copper	1.0	FCW	3□□	2.5～5.5
		Tank insert type 2 pass	Ø9 Low fin tube Phosphorous-deoxidized copper	1.0	FCU	1□□A	0.4～1.1
						2□□A	1.3～2.8
		Fixed tube sheet type 2 pass	Ø9 Bare tube Stainless-steel	1.0	TCW	1□□	0.15～0.3
						2□□	0.5～1.3
						3□□	1.5～3.3

ϕ9 TAISEI Low Fin Tube ϕ12.7 TAISEI Low Fin Tube ϕ15.88 TAISEI Low Fin Tube TAISEI original low fin tube (Refer to the introduction page of "TAISEI Low Fin Tube")

ϕ9 Bare Tube ϕ12.7 Bare Tube ϕ15.88 Bare Tube Common and raw cooling tube without fin

Sea water Cooling tube is available for sea water

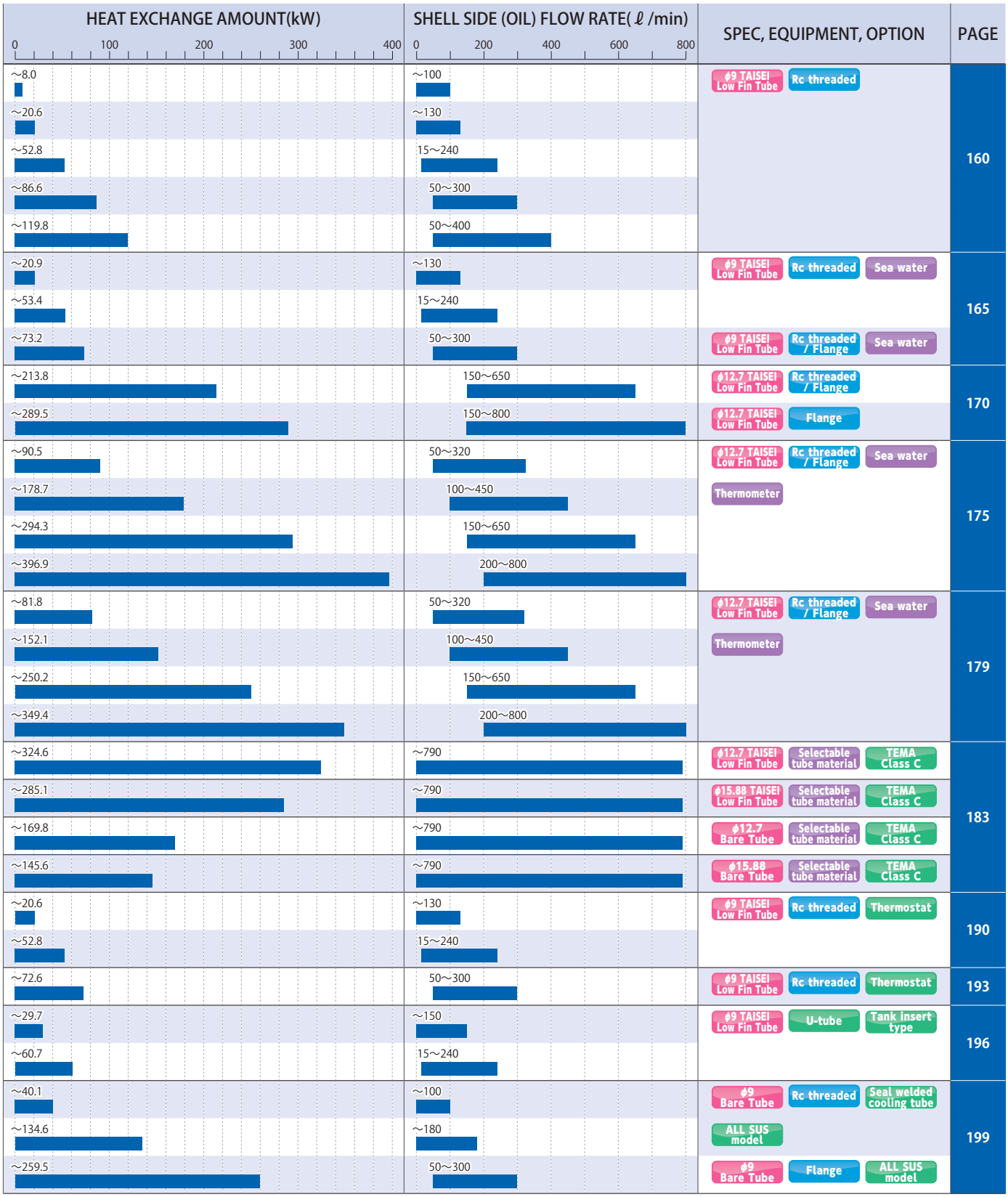
Thermometer Thermometer on shell side is available (option)

Selectable tube material Material of cooling tube and tube sheet is selectable

U-tube U-tube for heat shrink adaption

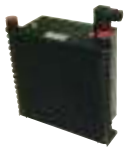
Tank insert type Installable to reserve tank for space saving

ALL SUS model All the parts exposed to fluid are stainless-steel (SUS304)

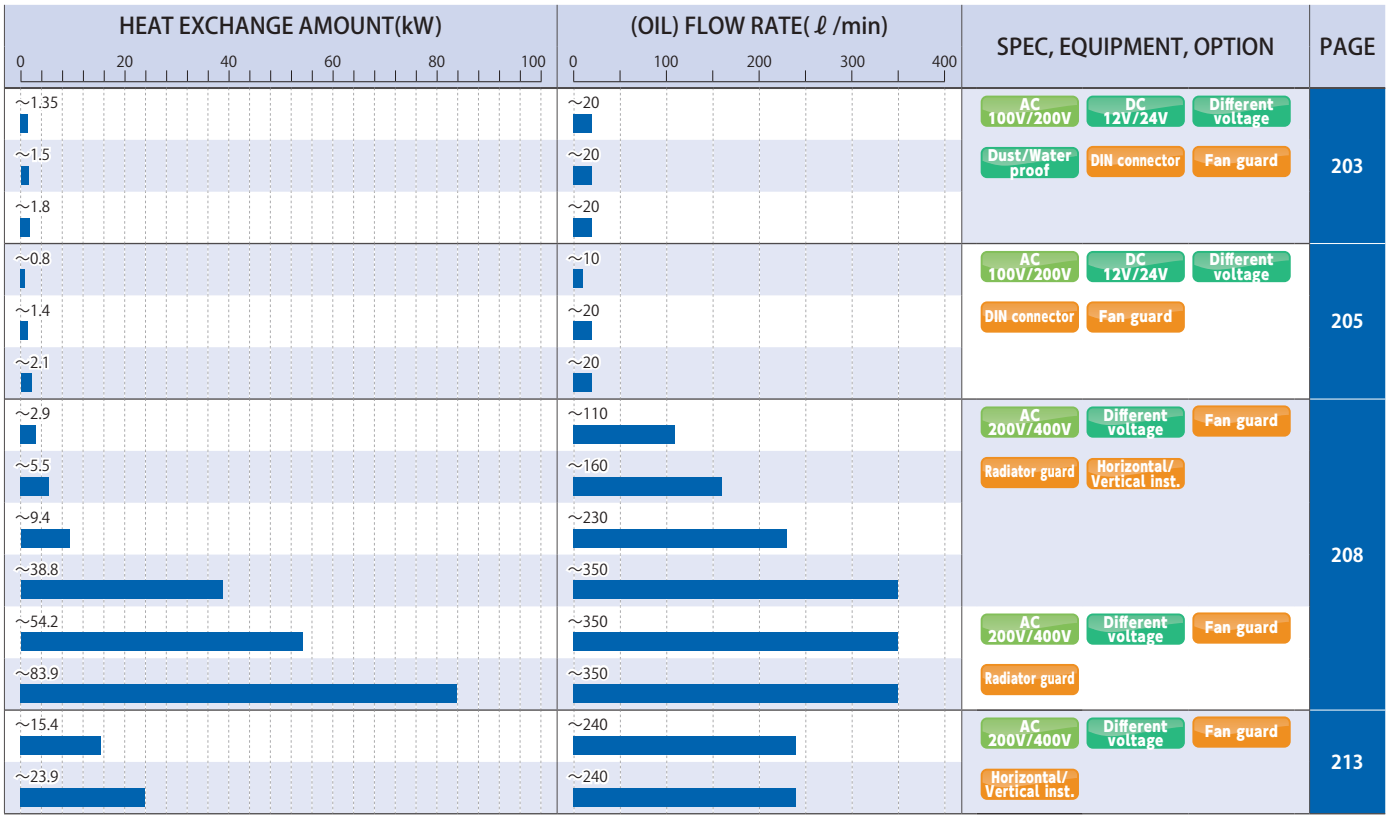


Rc threaded — Rc threaded connection at shell side/tube side	Rc threaded / Flange — Rc threaded and flange connection are selectable	Flange — Flange connection at shell side/tube side
TEMA Class C — TEMA Class C Comformable ASME SecVII Div.1 (NO STAMP)	Thermostat — Built-in thermostat in channel	Seal welded cooling tube — High adhesion by seal welding between cooling tube and tube sheet

INDEX ～ HEAT EXCHANGER ～

TYPE		STRUCTURE	RADIATOR	MAX WORKING PRESSURE (MPa)	MODEL		HEAT TRANSFER AREA(m^2) 0 5 10 30 50 70
Air-Cooled type		Drawn cup type 1 pass	Aluminum core	1.0	**ATL**	13A	Radiator size：13 stages
						14A	Radiator size：14 stages
						16A	Radiator size：16 stages
		Plate fin type 2 pass	Aluminum core	1.0	**ATK**	1552FA	～1.18
						2032FA	～1.21
						2432FA	～2.36
		Plate fin type 1 pass / 2 pass	Aluminum core	1.0	**ATS**	3061,3062	～2.9
						3561,3562	～4.5
						4061,4062	～6.8
		Plate fin type 1 pass				70101A	～32.8
						80101A	～44.5
						100101A	～66.5
		Plate fin type 1 pass	Aluminum core	1.0	**ATF**	5061A	～9.8
						6061A	～13.9

AC 100V/200V Fan motor power: AC 100V/200V (50/60Hz)	AC 200V/400V Fan motor power: AC 200V/400V (50/60Hz)	DC 12V/24V DC fan motor is available ＊Shape and spec are different with standard.
Fan guard Safety guard (standard/option) ＊Not available for ATF-5061A,6061A-H1,V1	Radiator guard For radiator protection from collision (standard/option)	Horizontal/Vertical inst. Horizontal/Vertical installation is available



Different voltage — Different voltage other than standard lineup is available (special model)

Dust/Water proof — Fan motor equivalent to IP54 is selectable (special model)

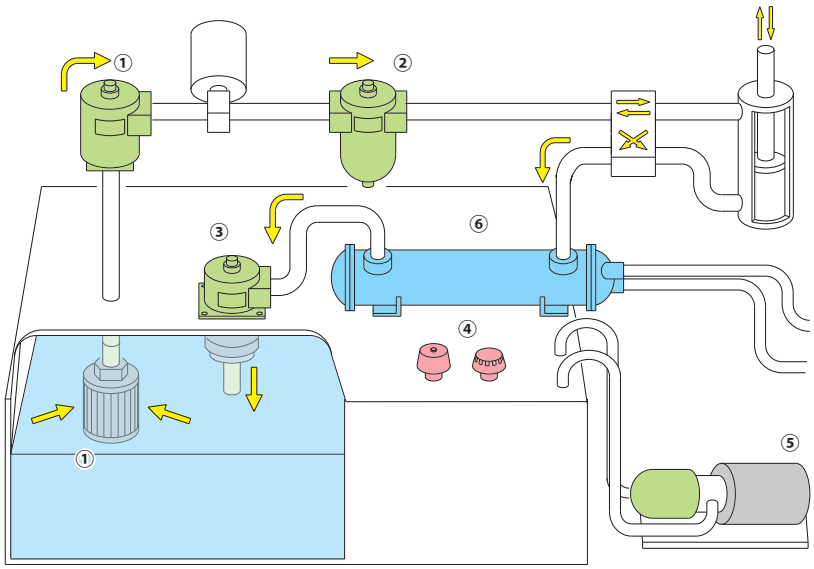
DIN connector — DIN connector (option)

For Long and Safe Use of hydraulic system

Hydraulic systems are usually contaminated with dust and foreign substances, and this contamination causes frictional wear and unexpected breakdown of hydraulic components. Moreover, contamination enhances pollution of hydraulic oil and causes a chain reaction of frictional wear that particles newly generate other particles.
The oil filter is an indispensable component to remove particles, build reliability, and provide long service life of hydraulic systems. In addition, hydraulic oil is normally heated in a system, and this may induce oil deterioration and problems with stable operation. Heat exchangers are an indispensable component to control oil temperature and provide stable operation of hydraulic systems.

Usage example of TAISEI product in hydraulic circuit

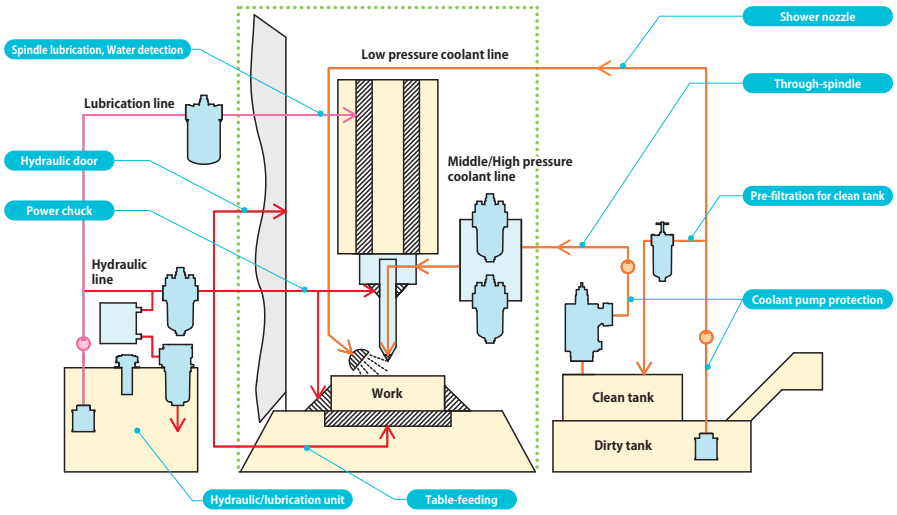
Oil filter should be installed at each point where contamination occurs.



Product	Purpose	Page
① Suction filter	Installed in front of a pump inlet to protect an oil pump. Suction strainer: Installed directly inside of a tank Case type suction filter: Easy element replacement Suction resistance load at start-up should be considered.	P104～125
② Line filter	Installed in a pressure line to protect control/actuating part such as valve, cylinder, and motor. Adaptive to low/high pressure and various shape. Filtration rating should be considered by clearance of downstream component.	P20～91
③ Return filter	To remove particles generated in a whole circuit and avoid oil tank pollution. Surge flow should be considered.	P92～103
④ Air breather	Installed on a tank to avoid contamination from air inlet.	P142～145
⑤ Off-line filter	To improve cleanliness of tank oil. Effective when supplying new oil as well. Directly installed to an oil tank and operated by an attached oil pump.	P146～149
⑥ Heat exchanger	To control oil temperature, prevent efficiency reduction of component, and protect a hydraulic system. Types: Water-cooled Shell and Tube type / Air-cooled type (Radiator)	P160～215
Duplex filter	To protect continuously operated system that cannot be shut-down. Since switching valve is installed between two filters, filter can be switched to the other when it is clogged and therefore continuous operation is available.	P126～137

Usage example of TAISEI product in machine tool

Oil filter is used in not only hydraulic system but also coolant line of machine tool.



Contamination removal and component protection from system pollution.

Oil Filter

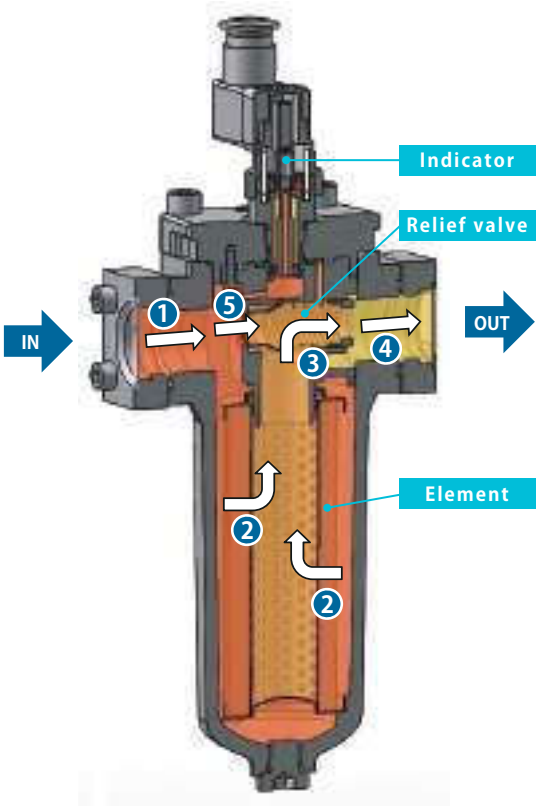
Structure of Oil Filter and Element

What is an Oil Filter?

The most common way to remove particles in oil is to install an oil filter.
There are various types of oil filters depending on fluid type, installation location, max working pressure, filtration rating, and application.
It is important to select the correct filter for the individual purpose.
Structure and function of filter are as below (Example: our signature line filter "UL" model).

As shown in the right figure, oil flowing into Inlet of a filter housing (①) passes through filtration media of an element and particles can be removed (②). Oil flows upward in the center of the element and clean oil comes out from Outlet (③,④). When clogging of the element starts, differential pressure between IN-side and OUT-side increases and this can be checked by an indicator. After indicator detection, a relief valve opens and oil bypasses the element, directly flows out from Outlet, to prevent the element from damage or breakdown (⑤). As an optional function, magnet can be installed in a filter housing in order to collect magnetic particles in oil (Not for all models).

Filtration rating of our standard element is from 3μm to 250μm. Although oil cleanliness normally increases at higher filtration rating, duration until clogging becomes shorter. On the other hand, though oil cleanliness decreases at lower filtration rating, duration until clogging becomes longer. Various type of filter element is selectable: different material and different filtration rating.

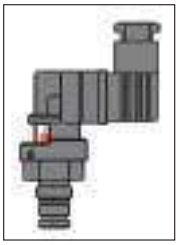


Indicator

Visual type

Red colored signal starts to come up when differential pressure of a filter element increases to setting value. Signal reset function is either automatic type or manual type.

Electric contact type



Additional function on visual observation type. When differential pressure increases to setting value※1, microswitch is activated to output electric signal.

Signal	Element condition	Measures
Red:0%	Normal	Available to use
Red:50%	Careful	Replace element early
Red:100%※2	Clogged	Replace element immediately

※1 Differential pressure of a filter element is set at 0.3MPa (0.7MPa for high pressure element). Please ask us if supply pressure is lower than 0.3MPa.

※2 Please replace a filter element as soon as the signal indicates Red: 100% since serious accident may occur otherwise.

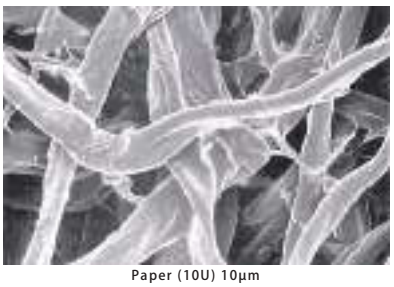
What is TAISEI "C-fiber" element?

TAISEI original filtration media "C-fiber (Control)" is a high performance element that satisfies three conditions of ideal filter.

3 conditions of ideal filter
①High filtration ratio (High β-ratio)
②High flow rate
③Long service life (Large amount of particle collection)

Difference between C-fiber and common paper media

C-fiber (3C) 3μm



Paper (10U) 10μm

Common paper media is made of cellulose and C-fiber is made of fine glass fiber, and they both are reinforced by resin. Since diameter of glass fiber is much smaller than cellulose, C-fiber can form a lot of tiny collection pockets and so it can collect more and smaller particles.
Moreover, C-fiber element can perform stably because fiber diameter is uniform.

Filter Element

Many types of filter element are available: utilizing TAISEI's original media, common paper, wire gauze, various filtration rating, and so on.
We produce highly reliable filter element by strict quality control.

C-fiber element | Model code: C, CH

TAISEI original high performance element that filtration rating is guaranteed by the multi-pass test method.
Fine glass fiber is used for filtration media, and it enables high porosity, high filtration rating, and long service life.
High pressure model is available: 21MPa of allowable differential pressure (0.7MPa for standard model).

Filtration rating: 3C, 8C, 25C (3µm – 25µm)

Structure A

Paper element | Model code: U

The most common paper element.
Although it is an inexpensive model, it is same structure and manufactured under the same quality control as other high specification element.

Filtration rating: 10U, 20U, 40U (10µm – 40µm)

Structure A

Wire gauze element | Model code: W, UW

An element made with woven stainless-steel wire. It is reusable by washing.
There are brass wire gauze elements from other manufacturers, however we select stainless-steel that has high durability in order to maximize the reusable characteristic.
Filtration rating is lined up from rough wire gauze representing "Mesh" to fine wire gauze representing "Micron".

Filtration rating: 5UW – 50UW (5µm – 50µm), 200W – 60W (75µm – 250µm)

Structure A

Notch wire element | Model code: K, UK

An element constructed with fine stainless-steel dimple wire and particles are trapped by dimple gaps.
Dimple wire is processed in our factory and it enables higher filtration performance than wire gauze element.
The element is washable and reusable, and flat surface makes cleaning easier.

Filtration rating: 40UK, 50UK (40µm – 50µm), 200K – 60K (75µm – 250µm)

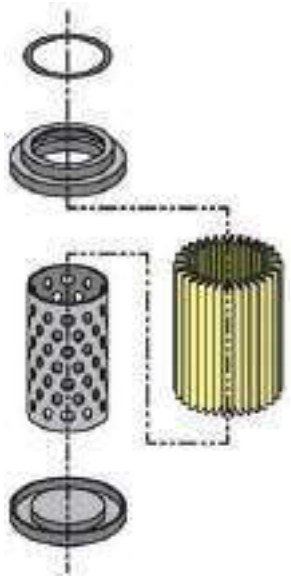
Structure B

Wedge wire element | Model code: UT

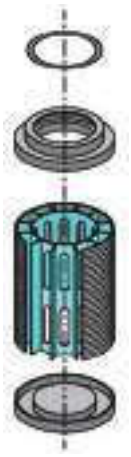
An element constructed with fine stainless-steel wire that has triangular shaped face and particles are trapped by between wire gaps.
Wedge wire is processed in our factory and it enables higher filtration performance than notch wire element.
The element is washable and reusable, and flat surface makes cleaning easier.

Filtration rating: 10UT - 50UT (10µm – 50µm)

Structure B



Structure A



Structure B

Mesh/Micron Conversion Table

Filtration rating of wire gauze element is represented by "Mesh" that is the number of mesh per an inch.
Filtration gap is different depending on wire diameter even though "Mesh" is same number.

Filtration rating code	60W	100W	150W	200W	50UW	20UW	10UW	5UW
Mesh	60	100	150	200	325	1000	1500	2400
Micron µm	250	150	105	75	50	20	10	5

Performance Evaluation of Filter

TAISEI "C-fiber" element and β-ratio

β-ratio is a filtration ratio and an important number to represent filter performance.
β-ratio is estimated according to ISO evaluation standard, ISO16889.

Filtration rating code of TAISEI C-fiber element is set by the minimum particle diameter at $\beta X \geqq 200$ of the old standard ISO4572.
β-ratio Conversion Table of C-fiber by the old ISO4572 and the new ISO16889 is as below.

Filtration rating code	$\beta_x \geqq 200$ ISO4572	$\beta_{x(C)} \geqq 1000$ ISO16889-1999
3C	3	5
8C	8	8
25C	25	24

x(μm)

Evaluation Outline of Filtration Performance

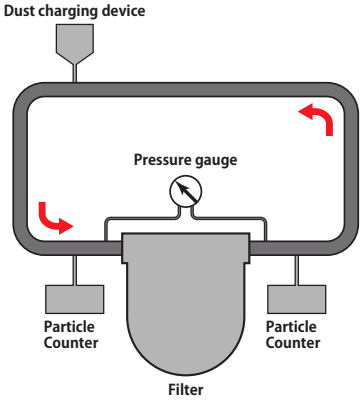
Filtration ratio is estimated by the multi-pass test method.
Install particle counters at upstream and downstream of a filter, feed certain amount of test dust* from upstream of a filter, circulate in a test circuit until differential pressure increases to a certain value, and count the number of particle at each diameter at upstream/downstream.
Filtration ratio is estimated by the following equation.

$$\beta_{x(C)} = \frac{\text{The number of particle over X [μm] at upstream of a filter}}{\text{The number of particle over X [μm] at downstream of a filter}}$$

Example:
$\beta_{x(C)} \geqq 1000$ ・・・ (1000-1)/1000=**99.9%**

Higher β-ratio, Higher filtration rating

＊ISO16889：ISO MTD(Medium Test Dust)



Test Facilities

Latest test facilities are installed in our R&D center and utilized for product development.

Latest multi-pass test stand (ISO16889)
Evaluation test of filtration rating is available according to the standard.
The test stand is so valuable that only a few stands are installed in Japan.

Impulse test machine
Repetition durability test of filter and heat exchanger is available.

Flow characteristic test machine
Test of filter and heat exchanger at large flow rate is available.
It is used for research of flow characteristic.

Cleanliness Control

Cleanliness Code for Hydraulic Oil

Contamination (Cleanliness) of hydraulic oil is measured by a automatic particle counter such as HIAC.
Measurement of diameter and the number of particles enables to show contamination of hydraulic oil that is invisible to the naked eyes.
NAS1638 and ISO4406 are common evaluation method.

NAS1638 Cleanliness code

(The number of particles in 100mL of test fluid)

Particle diamenter μm \ Code	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	8000	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

ISO4406 Cleanliness code comparison with NAS1638

Pariticle number/mL	ISO code	Particles/mL	
2,500,000			
1,300,000	28		
640,000	27		
320,000	26		
160,000	25		
80,000	24		
40,000	23		
20,000	22		
10,000	21		
5,000	20		
2,500	19		
1,300	18	1,850	>4μm
640	17		
320	16	620.8	>6μm
160	15		
80	14		
40	13	50.5	>14μm
20	12		
10	11		
5	10		
2.5	9		
1.3	8		
0.64	7		
0.32	6		
0.16	5		
0.08	4		
0.04	3		
0.02	2		
0.01	1		
	0		

Description Ex.: ISO Coad =18 / 16 / 13

Ideal Cleanliness Code and Recommended Filtration Rating

Comparison outline table between ideal cleanliness for each hydraulic component and filtration rating of our filter element is as below.

Component	Ideal cleanliness of hydraulic oil		Recommended filtration rating
	NAS1638	ISO4406	
Servo valve	7	16/14/11	3C
Piston pump, motor	9	18/16/13	8C
Proportional solenoid control valve	9	18/16/13	
"Hydraulic system Over 21MPa"	9	18/16/13	
"Hydraulic system 14 – 21 MPa"	10	19/17/14	25C
Common hydraulic system	11	20/18/15	

※Since the values in the table are general cleanliness requirements, please ask each component manufacturer for appropriate cleanliness requirement.

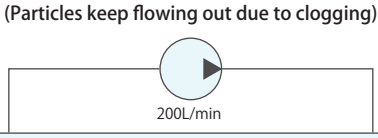
Reference: Japan Fluid Power Association

Correlation between Cleanliness Control and Maintenance Cost

Oil filter is effective to remove particles in oil. Constant replacement/cleaning of filter element and cleanliness control enable longer service life of components and reduction of total maintenance cost as a result.

Case 1

No replacement over a year
(Particles keep flowing out due to clogging)

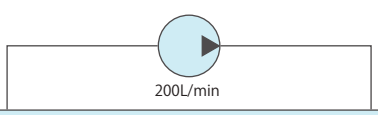


Out of NAS Cleanliness Code
Highly contaminated oil

3200kg of particles pass
through oil pump every year
↓
Expected service life of pump: 2 years

Case 2

Constant replacement every 6 months



NAS Cleanliness Code : 5
Highly cleaned oil

20kg of particles pass
through oil pump every year
↓
**Expected service life of pump:
over 14 years**

Reference: Japanese Society of Tribologists

How to select Oil Filter

You can select oil filter simply by the catalog. Please refer to the following instructions.

STEP.1 Working condition check

Check item	Remarks
Installation location	Suction / In-line / Return-line / Off-line / Air breather (Depends on a component to be protected / where to be cleaned)※1
Max working pressure	In case of a hydraulic circuit that undergoes repeated pressure fluctuation, please select a circuit peak pressure
Flow rate (normal/max)	Normal flow rate, max flow rate
Fluid	Fluid type, density, and kinematic viscosity
Working temperature	Confirm if it is within working temperature

Filter selection is NOT possible if check item in large character is not specified.

Check item	Remarks
Initial pressure drop	TAISEI standard setting value if not specified※2
Filtration rating	Depends on clearance of a component (Please refer to the comparison outline on P.17)
Filtration media	Reusable element / Disposable element
Filter type	Simplex / Duplex, connection type, element replacement type
Option	Indicator, relief valve, companion flange, and so on

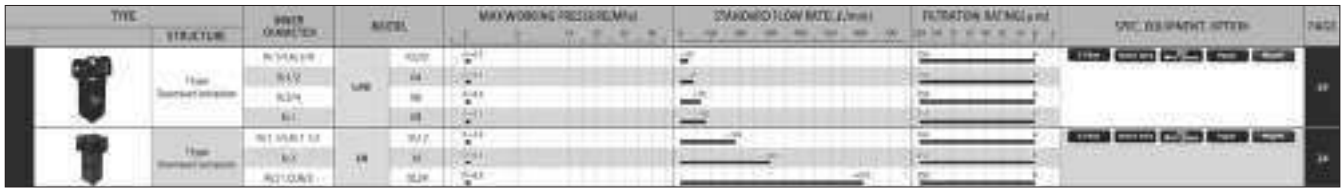
※1 Please ask us if flow rate variation or pressure variation are remarkable.
※2 Suction: 0.005MPa, Low-Middle pressure line: 0.05MPa, High pressure line: 0.07MPa

STEP.2 Base model selection

① Select a base model from P.2 - 7 "INDEX" that meets the requirements in **STEP 1.**

By: Installation location, Max working pressure, Flow rate, Filter type (Simplex / Duplex, connection type, element replacement type)

② Refer to the production line-up page of the selected base model.



STEP.3 Filtration rating selection

○ Refer to "MODEL CODE" on page of the selected base model and select a required filtration rating from a table.

STEP.4 Size selection

A) Select by "Inner diameter".

① Select a required inner diameter from "MODEL CODE" table.

② Confirm an initial pressure drop at a working flow rate from "FLOW RATE GRAPH".

I) If lower than TAISEI standard setting value: OK => to STEP 5

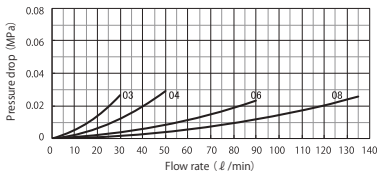
II) If higher than TAISEI standard setting value: Select larger size or reconsider allowable pressure drop.

B) Select by "Flow rate".

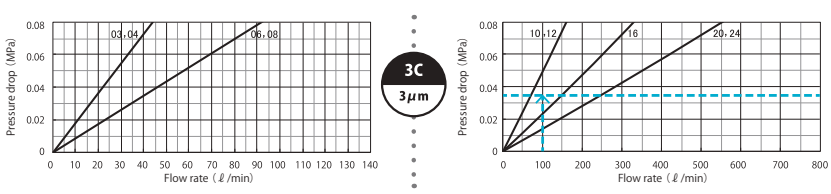
Confirm an initial pressure drop at the required filtration rating from "FLOW RATE GRAPH".

Select the smallest size that is lower than TAISEI standard value of initial pressure drop.※3

① Pressure drop of filter housing



② Pressure drop of filter element



※3 Please ask us if operation is repeated at lower temperature than the selecting condition.

STEP.5 Optional equipment selection

① Refer to "MODEL CODE" table and select optional equipment if required (Flg.1).

② Refer to "MODEL CODE" table and select fluid type.

STEP.6 Complete model selection

○ Confirm model code selected by STEP 5 and model selection is completed.

MODEL CODE

(Model code example)

F – 351 – A-12 – 10U – I V M

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

Code	Inner diameter	
A-03	Rc 3/8	(10A)
A-04	Rc 1/2	(15A)
B-06	Rc 3/4	(20A)
B-08	Rc1	(25A)
A-10	Rc1 1/4	(32A)
A-12	Rc1 1/2	(40A)

Code	Filtration rating	Code	Filtration rating
C-Fiber		Wire gauze	
3C	3 μm	5UW	5 μm
8C	8 μm	10UW	10 μm
25C	25 μm	20UW	20 μm
Paper		40UW	40 μm
10U	10 μm	50UW	50 μm
20U※2	20 μm	200W	200Mesh
40U※2	40 μm	150W	150Mesh
		100W	100Mesh
		60W	60Mesh

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

Code	Option
❶ Indicator	
Blank	Closing plug
I	Visual type
E	Electric contact type
D	Electric contact type (Micro capacity)
❷ Relief valve	
K	Non
V	Relief valve
❸ Magnet	
Blank	Non
M	Magnet

(fig.1)

◎ If standard working condition on the catalog does not meet your requirement or if you request air-cooled type heat exchanger, please fill out necessary items from "Request (Filter/Heat Exchanger)" on our WEB site.
Download of drawing, CAD data (outline drawing), and operation manual is available on our WEB site*.
＊ User account registration is required (for free). http://www.taiseikogyo.co.jp/en/support/

Common Specification of Oil Filter

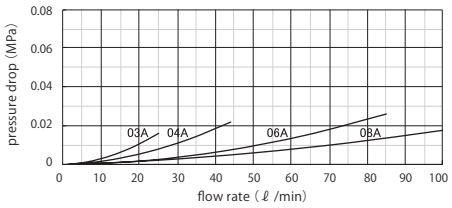
Standard Flow Rate

"Standard flow rate" in the catalog is determined by the following condition as an example value for model selection.
(Since it is adjusted by characteristics of each product, value can be different in some cases.)

Filter type	Suction	Low-Middle pressure line	High pressure line
Filtration rating (code)	150W, 150K	10U	10U
Pressure drop	0.005MPa	0.05MPa	0.07MPa
Physical properties	Density: 0.86, Kinematic viscosity: 32mm^2/s		

Correlation between Pressure Drop of Filter and Physical Property of Fluid

Pressure drop of filter housing and filter element on each flow rate graph is a value when using hydraulic oil of ISO VG32 at oil temperature of 40℃ (Density: 0.86, Kinematic viscosity: 32mm^2/s).
Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.
If required condition is different from the above, pressure drop can be estimated by following equation.
Please use our product within appropriate condition satisfying both viscosity and oil temperature.



$$\text{Pressure drop of filter housing} = \frac{\text{fluid density}}{0.86} \times \text{pressure drop of filter housing at density of 0.86}$$

$$\text{Pressure drop of filter element} = \frac{\text{fluid density}}{0.86} \times \frac{\text{kinematic visconsity}}{32} \times \text{pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

Max Working Pressure / Ambient Temperature

Max working pressure:
It represents maximum allowable pressure of filter housing. Please do not use at over max working pressure since a product may break down.
In case of a hydraulic circuit that undergoes repeated pressure fluctuation, please select a circuit peak pressure as a max working pressure.

Ambient temperature:
Ambient temperature of installation location should be from 0 to 80℃.

Fluid Suitability Table

The table below shows available fluid type for our oil filter.
It represents suitability to typical specification of each fluid type and fluid suitability depends on each filter model.
Refer to the page of the selected filter model for how to add "Fluid code" to model code.

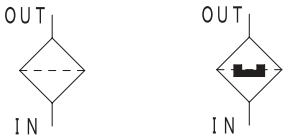
Fluid type	Fluid code	Sealing part material
Mineral oil Gear oil	-	NBR
Water-glycol fluid	G	NBR
Phosphate ester fluid	F	FKM
Fatty ester fluid	C	NBR
High water based fluid	W	FKM
Fuel oil※1 (Kerosene, Gas oil, Diesel oil)	S	High Nitrile Rubber
Brake fluid	B	EPDM
Refrigerant oil	R	※2

※1 Fluid code is "F" for Marine Fuel Oil, Heavy Fuel Oil, and Residual Fuel Oil.
※2 Please ask us since the sealing part material depends on refrigerant.

Simple Line Filter with filtration function only

Characteristics

- **Suitable for various fluid: hydraulic oil, fuel oil, and so on**
- **Less components, Simple, Light**
- **Magnet is installable for magnetic particle removal (option)**
- **Pipe connection type is "Rc threaded" only**



Oil filter　　Magnet

SPECIFICATION

Max working pressure		MPa	0.5
Working temperature	Standard	℃	–10 ～ 90
	High temperature *1	℃	–10 ～ 150
Indicator working pressure		MPa	Not available
Cracking pressure		MPa	Not available
Allowable differential pressure of filter element		MPa	0.7
Flow direction/Extract direction of filter element			OUT → IN / Downward

Inner diameter			02	03	04	06	08
Standard flow rate ☆		ℓ /min	15	30	45	70	85
Main material	Upper cover		ADC				
	Lower cover		SPCE				
Coating	Upper cover		Non-coating				
	Lower cover		Plating				
Weight		kg	0.85		0.85	0.95	1.0

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

F – LND – 08 – 10U – M

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

Code	Inner diameter
02	Rc 1/4
03	Rc 3/8
04	Rc 1/2
06	Rc 3/4
08	Rc1

Code	Filtration rating
C-Fiber	
8C	8 μm
25C	25 μm
Paper	
10U	10 μm
20U *2	20 μm
40U *2	40 μm

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

Code	Filtration rating
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh
Notch wire (Dimple wire)	
50UK	50 μm
200K	200Mesh
150K	150Mesh
100K	100Mesh
60K	60Mesh

Code	Option
Magnet	
Blank	Non
M	Magnet

＊1 Sealing parts: FKM, only for wire gauze element　＊2 Not available for water-glycol based oil and high water based fluid

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

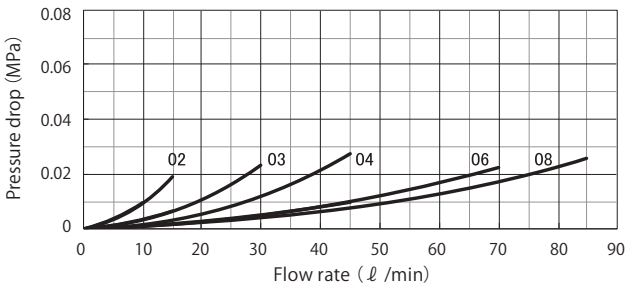
・Estimate pressure drop of filter assembly by following equation if required condition is different:

$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

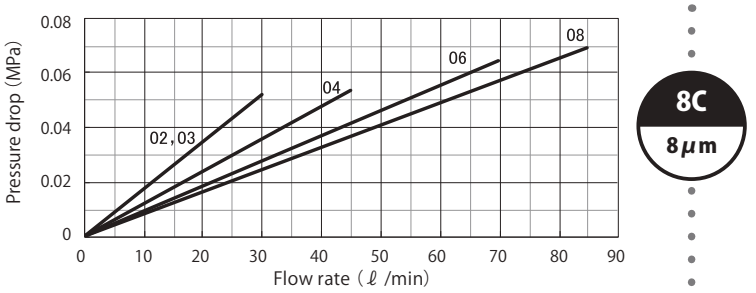
$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

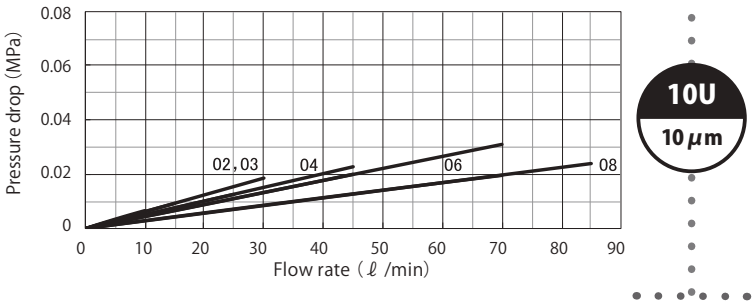
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

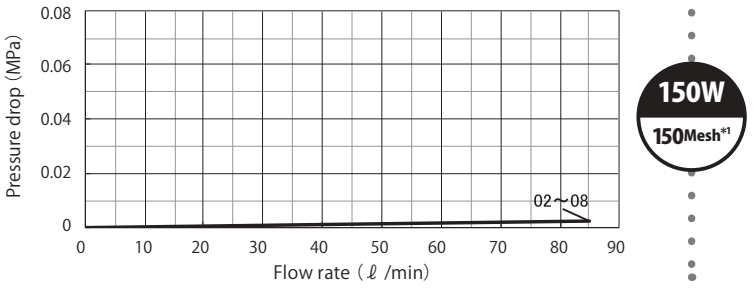
① Pressure drop of filter housing



② Pressure drop of filter element



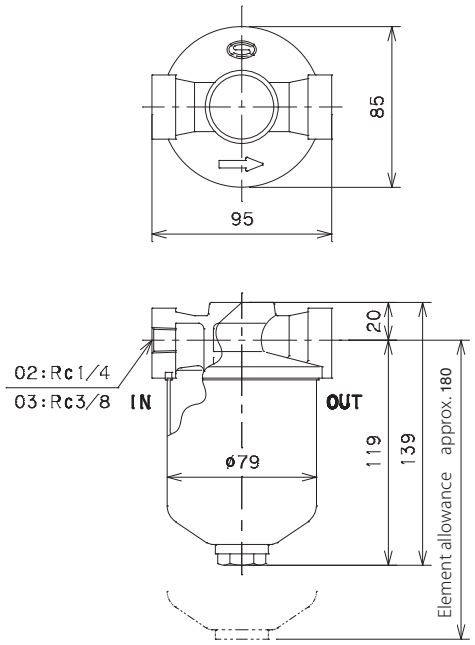




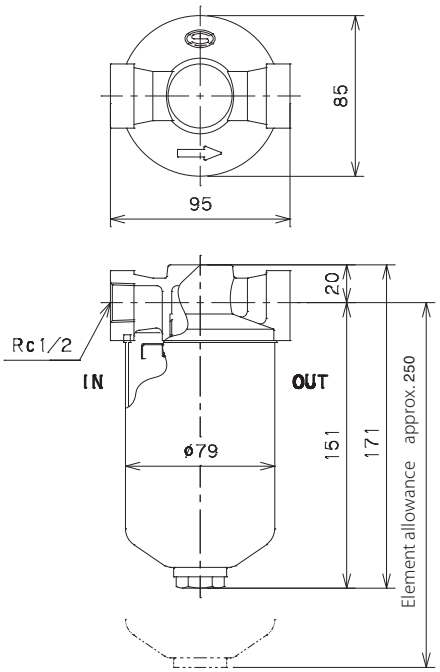
LND

＊1 Pressure drop of wire gauze element is described with one line since the value is low and there is no difference at each filter size.

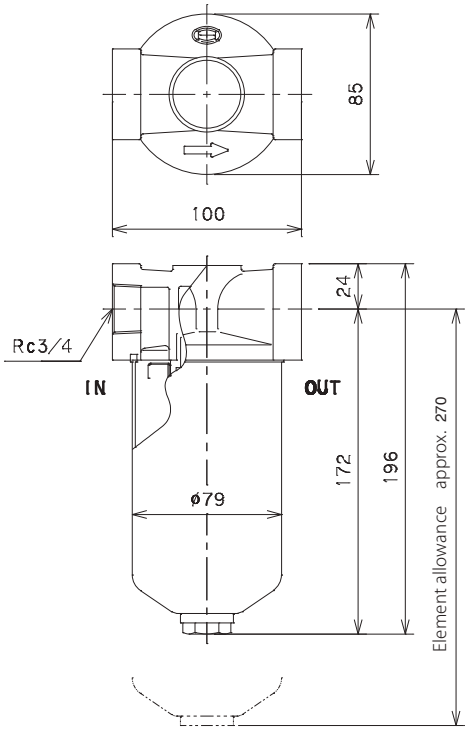
LND-02,03 -□□-□



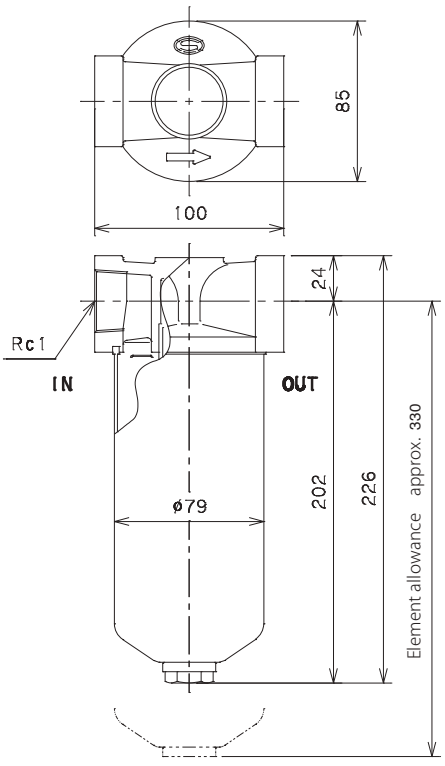
LND-04 -□□-□



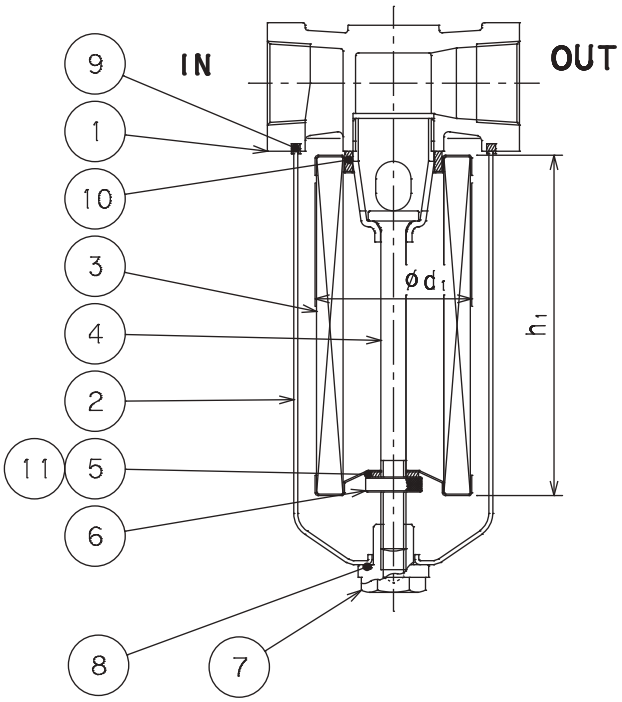
LND-06 -□□-□



LND-08 -□□-□



CROSS SECTION



PARTS LIST

No.	Item	Qty
1	Upper cover	1
2	Lower cover	1
3	Element	1
4	Center rod	1
5	Washer	1
6	Round nut	1
7	Nut	1
8	O-ring	1
9	Packing	1
10	Packing	1
11	Packing	1

ELEMENT SIZE

Element Model code	Size(mm)		Weight*1 (kg)
	φd1	h1	
P-LND-02,03	62.2	66	0.13
P-LND-04		95	0.18
P-LND-06		105	0.19
P-LND-08		135	0.22

SEALING PARTS LIST

No.	8	9	10	11	Item code of sealing parts set *3	
Standard *2 / Model code	JIS B2401 1A	Special packing			Material	SA No.:8～11
LND-02	P20	t4xφ80.7/φ74.3	t8xφ38.5/φ32.5	t2xφ20/φ10	NBR	SSF000041
LND-03						
LND-04						
LND-06					FKM	SSF000408
LND-08						

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P	–	F	–	LND	–	08	–	10U
("P" represents filter element)		Fluid type				Inner diameter		Filtration rating

Sealing parts set 〈Model code example〉

SA	–	F	–	LND	–	08
		Fluid type				Inner diameter

Code	Sealing parts set
SA	For both overhaul and element replacement

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

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

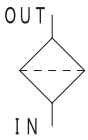
★ Sealing parts set is available for both overhaul and element replacement. Model code is represented as "SA".

＊1 Weight of "Paper" element ＊2 Standard for NBR. For other material, conform to the standard.
＊3 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.

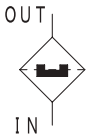
Simple Line Filter with filtration function only

Characteristics

- **Suitable for various fluid: hydraulic oil, fuel oil, and so on**
- **Less components, Simple, Light**
- **Magnet is installable for magnetic particle removal (option)**
- **Pipe connection type is "Rc threaded" only**



Oil filter



Magnet

SPECIFICATION

Max working pressure		MPa	0.5
Working temperature	Standard	℃	–10 ～ 90
	High temperature *1	℃	–10 ～ 150
Indicator working pressure		MPa	Not available
Cracking pressure		MPa	Not available
Allowable differential pressure of filter element		MPa	0.7
Flow direction/Extract direction of filter element			OUT → IN / Downward

Inner diameter		10	12	16	20	24
Standard flow rate ☆ ℓ /min		170	185	300	570	610
Main material	Upper cover	AC				
	Lower cover	SPCE				
Coating	Upper cover	Non-coating				
	Lower cover	Plating				
Weight kg		2.6		4.0		7.8

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa .
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

F – LN – 24 – 10U – M

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

Code	Inner diameter
10	Rc1 1/4
12	Rc1 1/2
16	Rc2
20	Rc2 1/2
24	Rc3

Code	Filtration rating
C-Fiber	
8C	8 μm
25C	25 μm
Paper	
10U	10 μm
20U *2	20 μm
40U *2	40 μm

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

Code	Filtration rating
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh
Notch wire (Dimple wire)	
50UK	50 μm
200K	200Mesh
150K	150Mesh
100K	100Mesh
60K	60Mesh

Code	Option
Magnet	
Blank	Non
M	Magnet

＊1 Sealing parts: FKM, only for wire gauze element ＊2 Not available for water-glycol based oil and high water based fluid

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

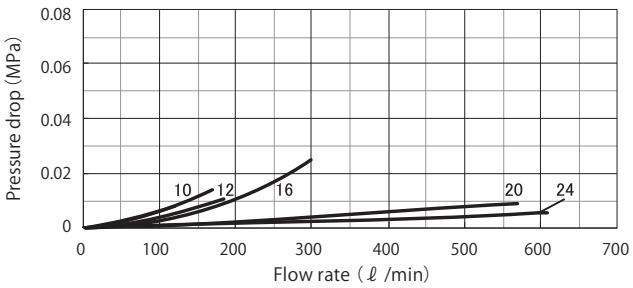
・Estimate pressure drop of filter assembly by following equation if required condition is different:

$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

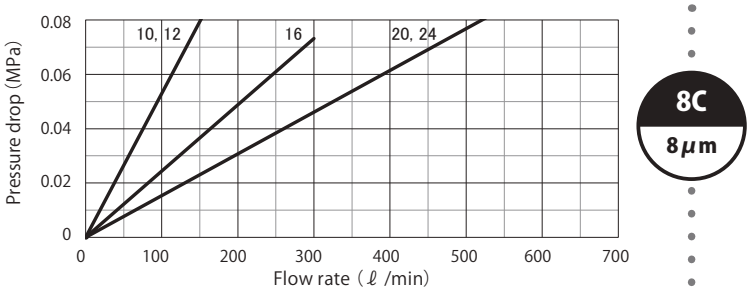
$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

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

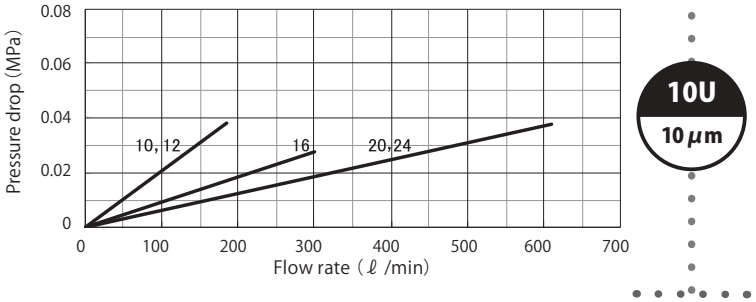
① Pressure drop of filter housing



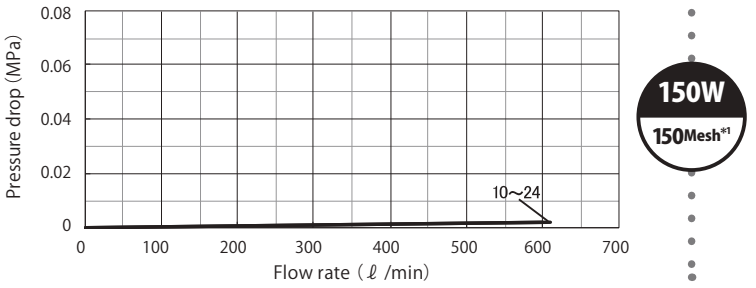
② Pressure drop of filter element



8C
8μm



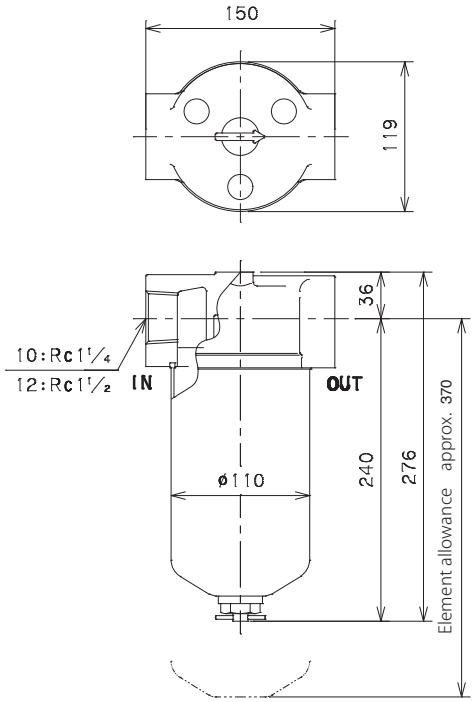
10U
10μm



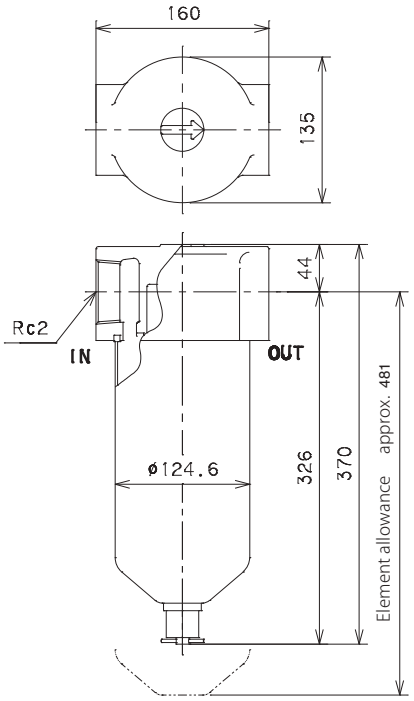
150W
150Mesh*1

＊1 Pressure drop of wire gauze element is described with one line since the value is low and there is no difference at each filter size.

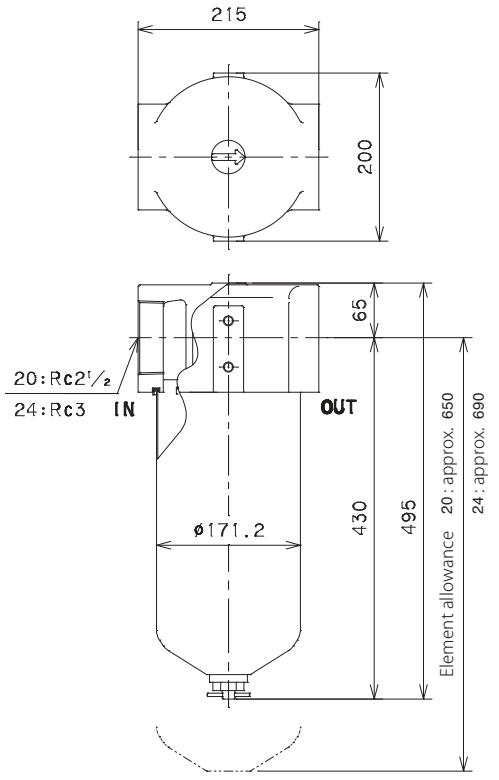
LN-10,12 -□□-□



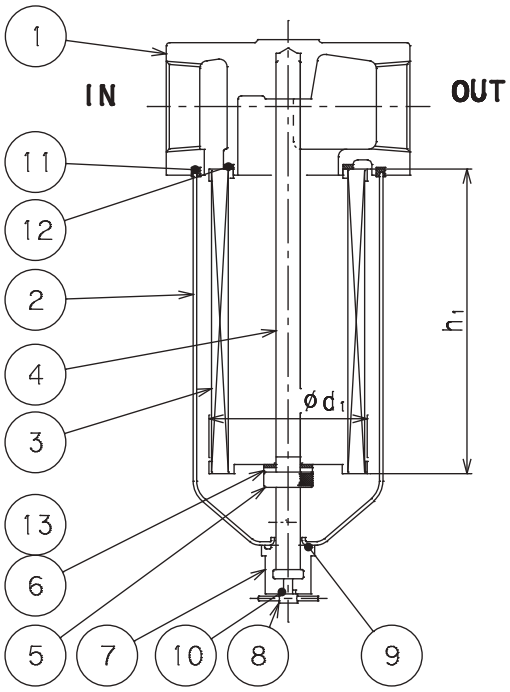
LN-16 -□□-□



LN-20,24 -□□-□



CROSS SECTION



PARTS LIST

No.	Item	Qty
1	Upper cover	1
2	Lower cover	1
3	Element	1
4	Center rod	1
5	Round nut	1
6	Washer	1
7	Nut	1
8	Drain plug	1
9	O-ring	1
10	O-ring	1
11	Packing	1
12	Packing	1
13	Packing	1

ELEMENT SIZE

Element Model code	Size(mm)		Weight*1 (kg)
	φd1	h1	
P-LN-10,12	83	150 (152)	0.37
P-LN-16	104	200	0.72
P-LN-20	124	260	1.00
P-LN-24		300	1.13

＊In case of Notch wire element, size is in ( ) .

SEALING PARTS LIST

No.	9	10	11	12	13	Item code of sealing parts set *3	
Standard *2 / Model code	JIS B2401 1A		Special packing			Material	SA No. : 9 ～ 13
LN-10	P25	P7	t4xφ111.7/φ104.3	t3xφ58/φ48	t2xφ26/φ12	NBR	SSF000043
LN-12						FKM	SSF000410
LN-16			t6xφ126.6/φ116	t3xφ85/φ72	t2xφ32/φ16	NBR	SSF000044
						FKM	SSF000411
LN-20	P34	P9	t3xφ181/φ165	t3xφ110/φ92	t2xφ40/φ20	NBR	SSF000609
LN-24						FKM	SSF000923

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P	–	F	–	LN	–	24	–	8C
("P" represents filter element)		Fluid type				Inner diameter		Filtration rating

Sealing parts set 〈Model code example〉

SA	–	F	–	LN	–	24
		Fluid type				Inner diameter

Code	Sealing parts set
SA	For both overhaul and element replacement

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

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

★ Sealing parts set is available for both overhaul and element replacement. Model code is represented as "SA".

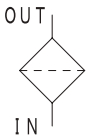
＊1 Weight of "Paper" element ＊2 Standard for NBR. For other material, conform to the standard.
＊3 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.

Easy Maintenance Filter by cleaning handle

Characteristics

- **Element cleaning by handle rotation on the top**
- **Best for a system that filter is often clogged with large amount of particle**
- **Wedge wire element (10 – 50 µm) is available (MODEL: CFK *)**
- **Pipe connection type is "Rc threaded" and "flange"**

＊ CFK is a special model. Please ask us since price and delivery are different with AK type.



Oil filter

SPECIFICATION

Max working pressure		MPa	1.0
Working temperature	Standard	℃	–10 ～ 90
	High temperature ＊1	℃	–10 ～ 150
Indicator working pressure		MPa	Not available
Cracking pressure		MPa	Not available
Allowable differential pressure of filter element		MPa	0.7
Flow direction/Extract direction of filter element			OUT → IN / Downward

Inner diameter		04	06	08	10	12	16
Standard flow rate ☆ ℓ /min		45	60	135	170	330	350
Main material	Body	ADC				AC	
	Lower cover	ADC		Steel plate			
Coating	Body	Non-coating					
	Lower cover	Non-coating		Protective film treatment			
Weight ＊2 kg		0.8		2.0		4.7	

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

F – AK – 08 – 150K – N

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

Code	Inner diameter
04	Rc 1/2 (15A)
06	Rc 3/4 (20A)
08	Rc1 (25A)
10	Rc1 1/4 (32A)
12	Rc1 1/2 (40A)
16	Rc2 (50A)

Code	Filtration rating
Notch wire (Dimple wire)	
40UK	40 µm
50UK	50 µm
200K	200Mesh
150K	150Mesh
100K	100Mesh
60K	60Mesh

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

Code	Option
Companion flange	
Blank	Non
N	Companion flange ＊3

＊1 Sealing parts: FKM ＊2 Weight without companion flange ＊3 Companion flange is not available for Inner diameter of 04 and 06

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

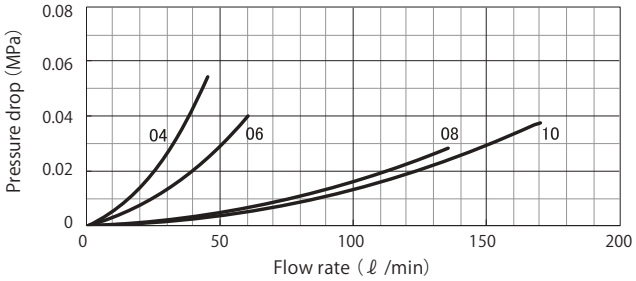
・Estimate pressure drop of filter assembly by following equation if required condition is different:

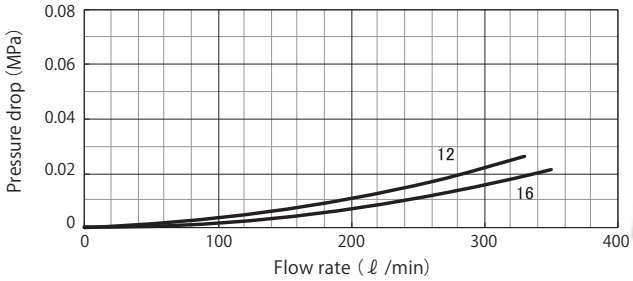
$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

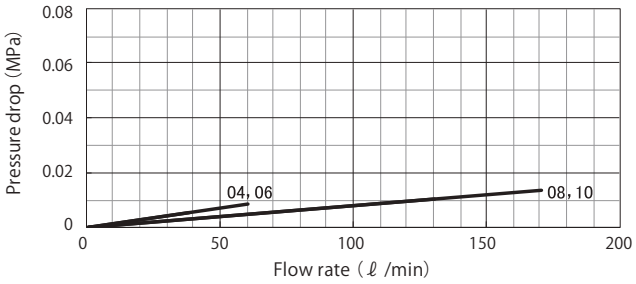
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

① Pressure drop of filter housing

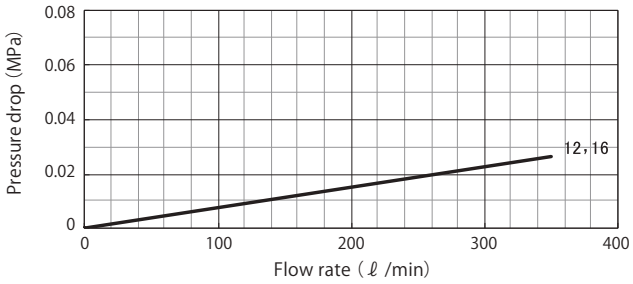




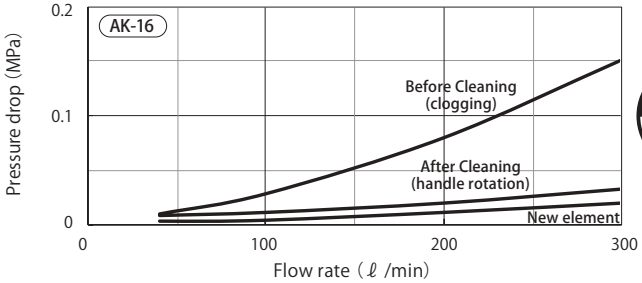
② Pressure drop of filter element



150K
150Mesh



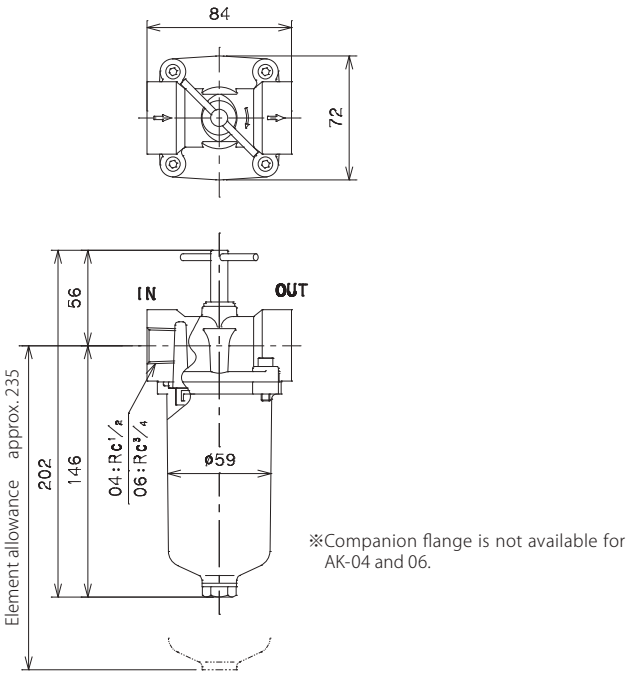
③ Pressure drop of filter element "Cleaning Effect"



150K
150Mesh

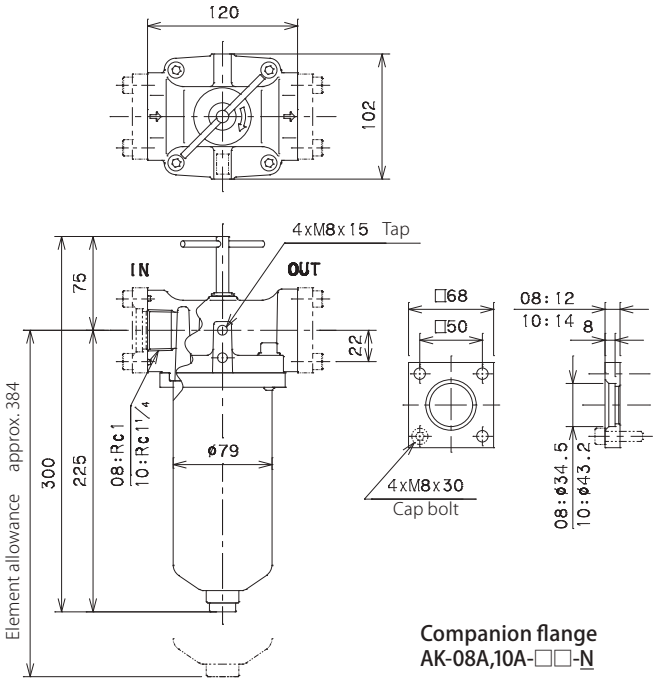
AK

AK-04,06 -□□*1



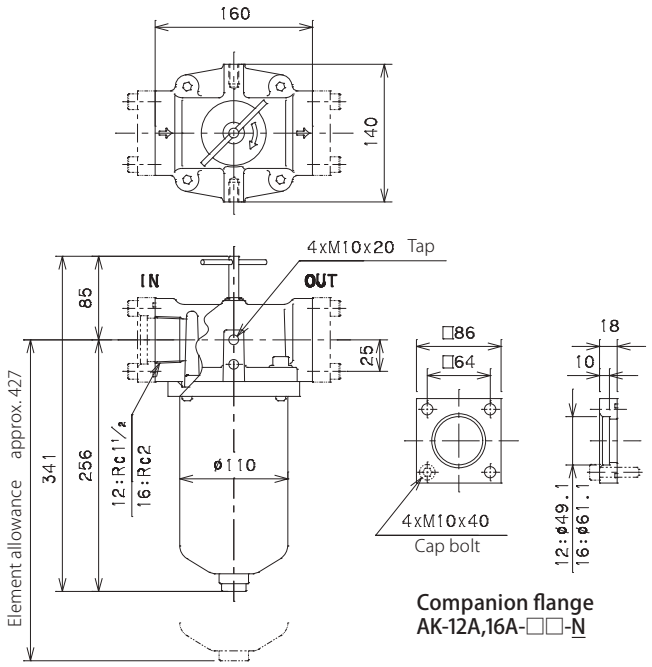
※Companion flange is not available for AK-04 and 06.

AK-08,10 -□□



Companion flange
AK-08A,10A-□□-N

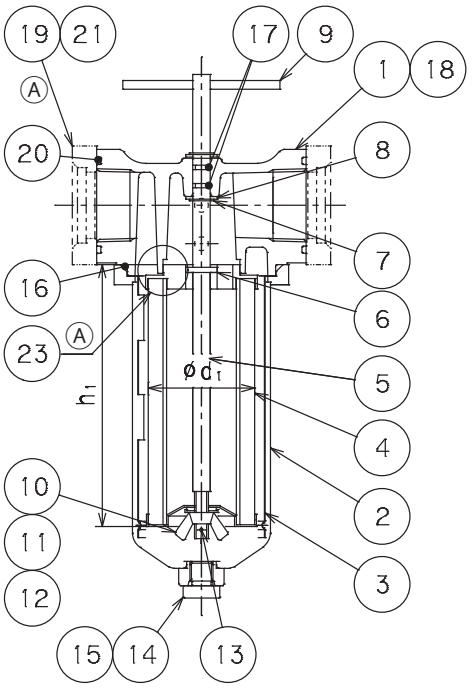
AK-12,16 -□□



Companion flange
AK-12A,16A-□□-N

＊1 Companion flange is not available for connection diameter of 04 and 06

CROSS SECTION



Ⓐ O-ring groove on companion flange for AK-12 and 16.

PARTS LIST

No.	Item	Qty
1	Body	1
2	Lower cover	1
3	Scraper	1
4	Element	1
5	Center rod	1
6	Spring pin	1
7	Stop ring	2
8	Washer	2
9	Handle	1
10	Wing nut	1
11	Washer	1
12	Packing	1
13	Snap pin	1
14	Drain plug	1
15	O-ring	1
16	O-ring	1
17	O-ring	2
18	Cap bolt	4
19	Companion flange	2
20	O-ring	2
21	Cap bolt	8

ELEMENT SIZE

Element Model code	Size(mm)		Weight (kg)
	φd1	h1	
P-AK-04,06	44	90	0.1
P-AK-08,10	64	150	0.25
P-AK-12,16	84	166	0.52

SEALING PARTS LIST

No.	12	15	16	17	20	Item code of sealing parts set ＊2			
Standard ＊1 / Model code	Special packing	JIS B2401 1A			JIS B2401 1A	Material	SP No.: 12,15,16	SA No.: 12,15 ～ 17	SA-N No.: 12,15 ～ 17,20
AK-04,06	t2xφ14 /φ6.5	Seal washer	G60	P7		NBR	SSF000163	SSF000158	
						FKM	SSF000518	SSF000513	
AK-08,10	t2xφ17 /φ8.5	P11	G85		G50	NBR	SSF000164	SSF000159	SSF000161
						FKM	SSF000519	SSF000514	SSF000516
AK-12,16		P14	G105		G70	NBR	SSF000165	SSF000160	SSF000162
						FKM	SSF000520	SSF000515	SSF000517

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P	–	F	–	AK	–	08	–	150K
("P" represents filter element)		Fluid type				Inner diameter		Filtration rating

Sealing parts set 〈Model code example〉

SA	–	F	–	AK	–	08	–	N
		Fluid type				Inner diameter		

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

Code	Companion flange
Blank	Non
N	Companion flange (Only for SA)

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

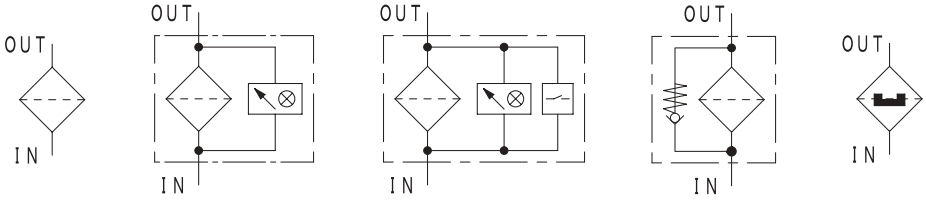
★ Refer to the MODEL CODE table on the previous page for code selection.

＊1 Standard for NBR. For other material, conform to the standard.
＊2 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.

Downward Extraction Model for construction machines

Characteristics

- **Simple structure and easy element replacement by screwing a lower case**
  Especially best for a system that hardly secures space above
- **Light filter housing of aluminum alloy for small models**
- **Clogging indicator, magnet, and relief valve are selectable as an option**
- **Pipe connection type is 351: "Rc threaded"**



Oil filter | Visual type indicator | Electric contact type indicator | Relief valve | Magnet

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

SPECIFICATION

Max working pressure		MPa	3.5
Repetition durability test			0〜3.5MPa x10^7 times
Working temperature	Standard	℃	–10 〜 90
	High temperature ＊1	℃	–10 〜 150
Indicator working pressure		MPa	0.3
Cracking pressure		MPa	0.35
Allowable differential pressure of filter element		MPa	0.7
Flow direction/Extract direction of filter element			OUT → IN / Downward

Inner diameter		A-03	A-04	B-06	B-08	A-10	A-12
Standard flow rate ☆ ℓ /min		30	50	90	135	240	290
Main material	Body	ADC				FC	
	Lower case	Aluminum		STKM, Steel plate			
Coating	Body	Non-coating				Aqua blue	
	Lower case	Non-coating		Protective film treatmen		Aqua blue	
Weight kg		1.0		2.9		6.9	

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

F – **351** – **A-12** – **10U** – **I V M**
❶ ❷ ❸

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

Code	Inner diameter	
A-03	Rc 3/8	(10A)
A-04	Rc 1/2	(15A)
B-06	Rc 3/4	(20A)
B-08	Rc1	(25A)
A-10	Rc1 1/4	(32A)
A-12	Rc1 1/2	(40A)

Code	Filtration rating
C-Fiber	
3C	3 μm
8C	8 μm
25C	25 μm
Paper	
10U	10 μm
20U ＊2	20 μm
40U ＊2	40 μm

Code	Filtration rating
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh

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

Code	Option
❶ Indicator	
Blank	Closing plug
I	Visual type
E	Electric contact type
D	Electric contact type (Micro capacity)
❷ Relief valve	
K	Non
V	Relief valve
❸ Magnet	
Blank	Non
M	Magnet

＊1 Sealing parts: FKM, only for wire gauze element, indicator and relief valve are not available (Max oil temperature is visual type: 130℃ , electric contact type: 90℃)
＊2 Not available for water-glycol based oil and high water based fluid

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

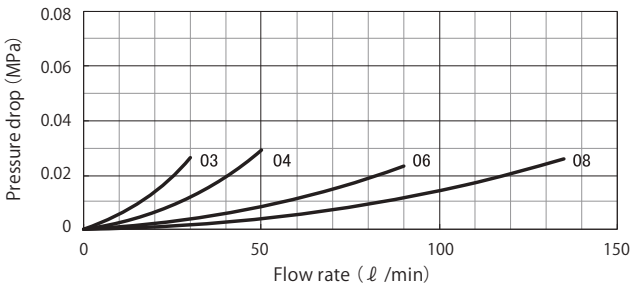
・Estimate pressure drop of filter assembly by following equation if required condition is different:

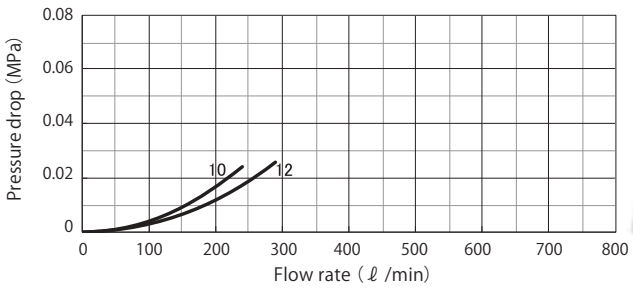
$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86,kinematic viscosity of 32}$$

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

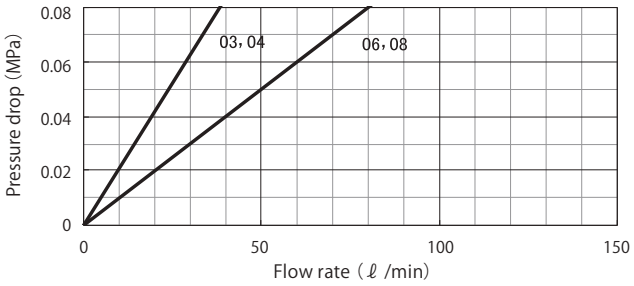
① Pressure drop of filter housing

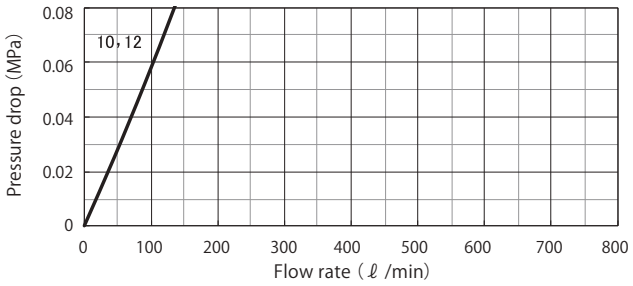




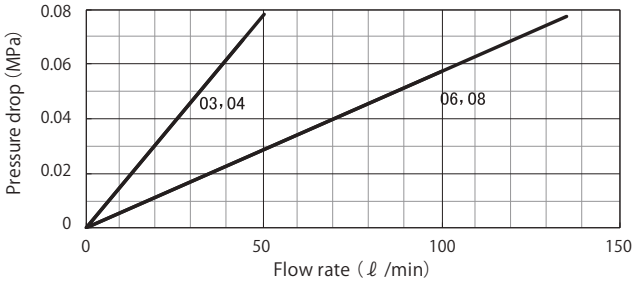
② Pressure drop of filter element

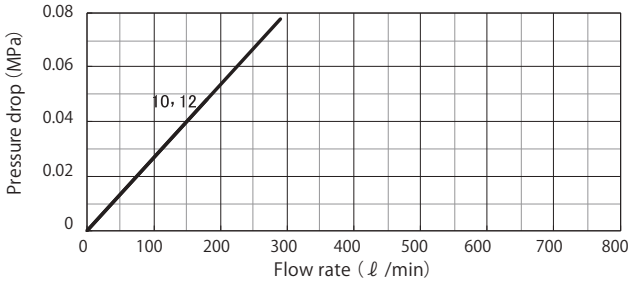
3C 3μm



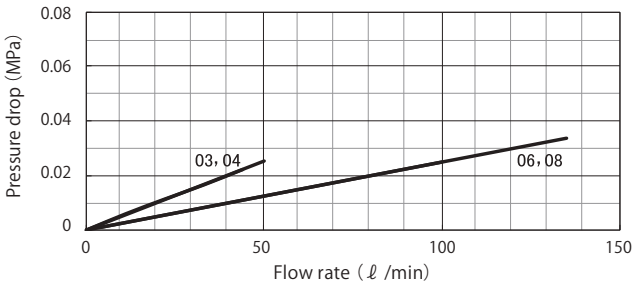


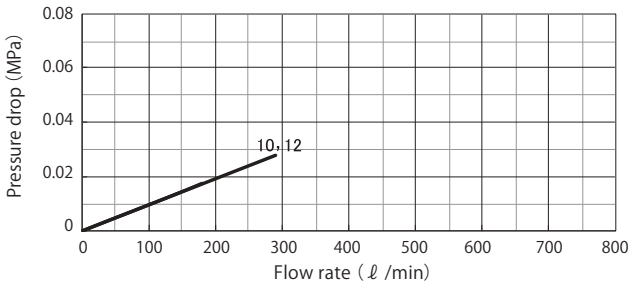
8C 8μm



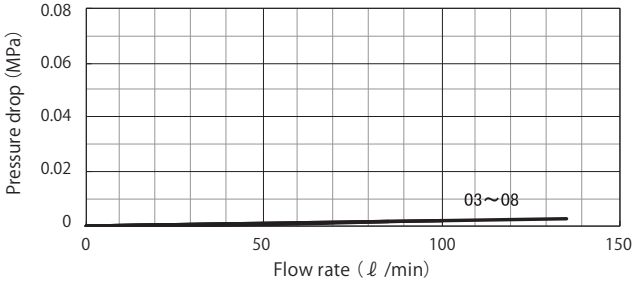


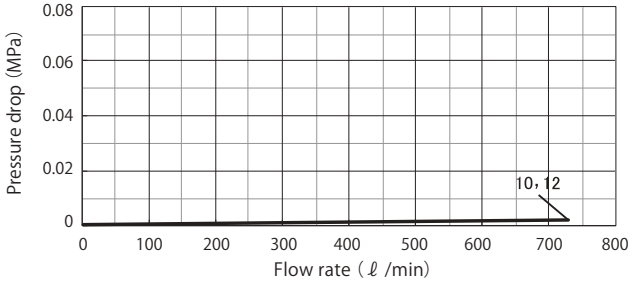
10U 10μm





150W 150Mesh*1

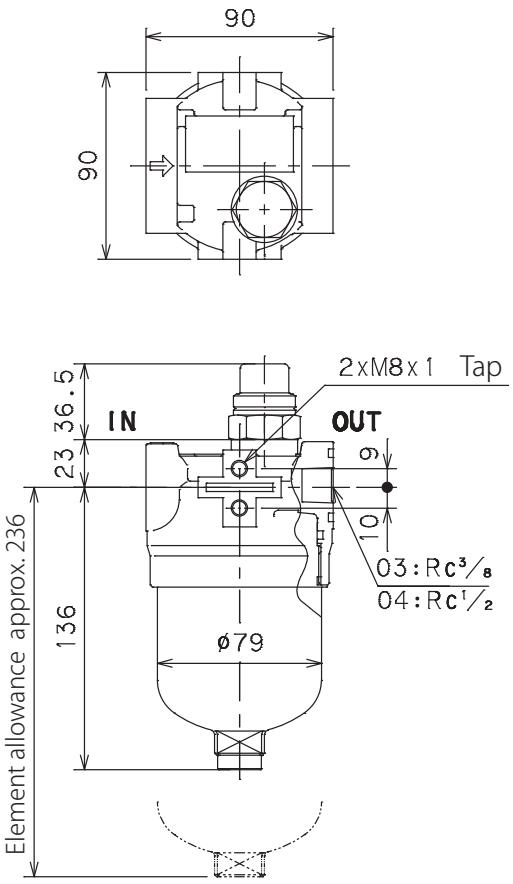




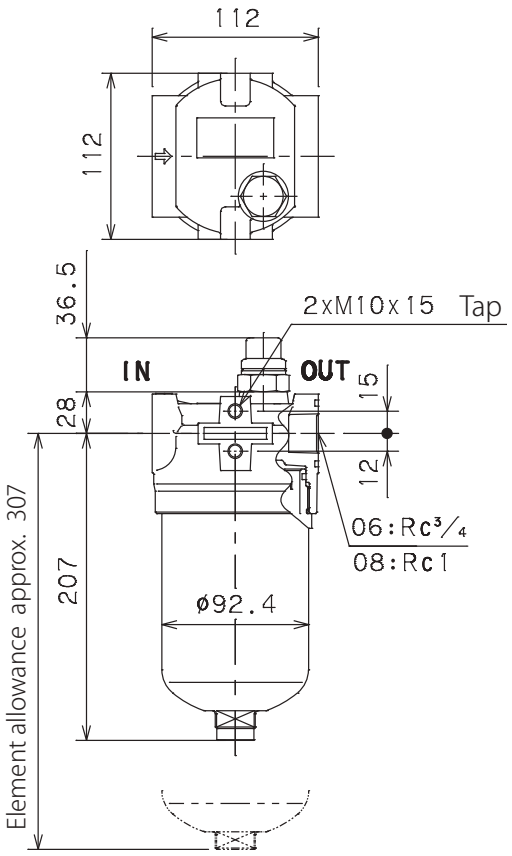
＊1 Pressure drop of wire gauze element is described with one line since the value is low and there is no difference at each filter size.

351-A-03,04-I□□

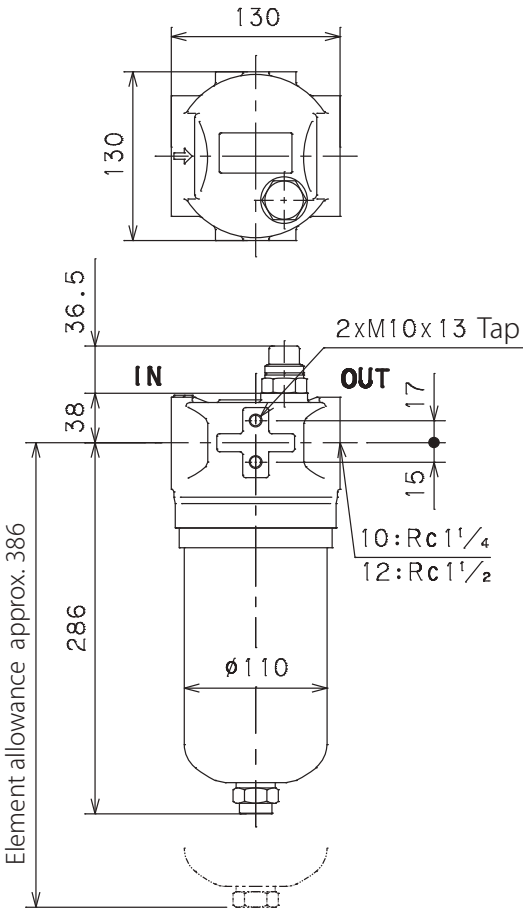
I : Visual type indicator



351-B-06,08-I□□

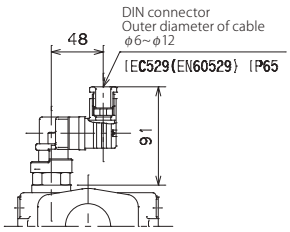


351-A-10,12-I□□

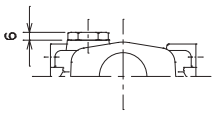


Differential pressure type indicator part

＊Common at all size



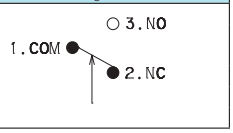
E,D : Electric contact type indicator
351-□-□□-E,D□□



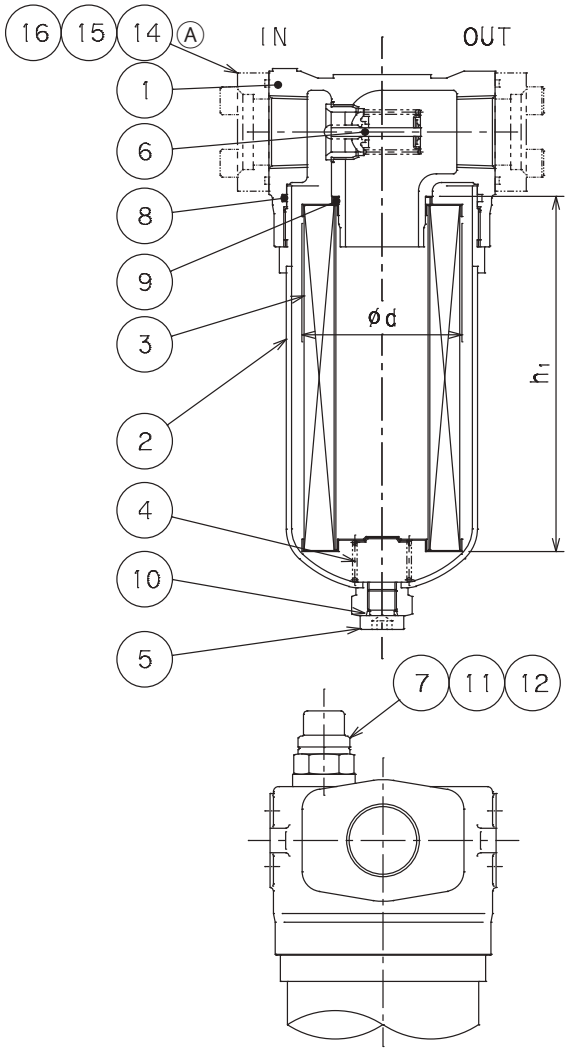
Closing plug
351-□-□□- _□□

Model code	Working pressure (MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
IA-3	0.2	0.3	
EA-3	0.2	0.3	0.3
EA-3D			

〈Micro switch specification〉

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

CROSS SECTION



Ⓐ O-ring groove on Body for 03□08.

PARTS LIST

No.	Item	Qty
1	Body	1
2	Lower case	1
3	Element	1
4	Spring	1
5	Drain plug	1
6	Relief valve	1
7	Indicator	1
8	O-ring	1
9	O-ring	1
10	O-ring	1
11	O-ring	1
12	O-ring	1
—	—	—
14	Companion flange (Only for 352)	2
15	Cap bolt (Only for 352)	8
16	O-ring (Only for 352)	2

★ 352 filter assembly is discontinued model.

ELEMENT SIZE

Element Model code	Size(mm)		Weight*1 (kg)
	φd1	h1	
P-351-A-03,04	64	84.2	0.16
P-352-A-03,04			
P-351-B-06,08	76	140.0	0.33
P-352-B-06,08			
P-351-A-10,12	92	204.2	0.72
P-352-A-10,12			
P-351-A-16	105	254.2	0.93
P-352-A-16			
P-351-A-20,24	133	304.5	1.64
P-352-A-20,24			

SEALING PARTS LIST

No.	8	9	10	11	12	16	Item code of sealing parts set *3			
Standard *2 / Model code	AS568	JIS B2401 1A		JIS B2401 1B	JIS B2401 1A		Material	SP No.: 8～10	SA (351MODEL) No.: 8～12	SA (352MODEL) No.: 8～12, 16
351 352 - A-03,04	234	G25	P11	P18	P14	G30	NBR	SSF000055	SSF000045	SSF000050
							FKM	SSF000422	SSF000412	SSF000417
351 352 - B-06,08	G90*4	P36	P14			G40	NBR	SSF000056	SSF000046	SSF000051
							FKM	SSF000423	SSF000413	SSF000418
351 352 - A-10,12	245	G50				G55	NBR	SSF000057	SSF000047	SSF000052
							FKM	SSF000424	SSF000414	SSF000419
351 352 - A-16	250	G60				G70	NBR	SSF000058	SSF000048	SSF000053
							FKM	SSF000425	SSF000415	SSF000420
351 352 - A-20,24	259	G90	P18			G100	NBR	SSF000059	SSF000049	SSF000054
							FKM	SSF000426	SSF000416	SSF000421

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P	–	F	–	351 352	–	A-12	–	10U
("P" represents filter element)		Fluid type				Inner diameter		Filtration rating

Sealing parts set 〈Model code example〉

SA	–	F	–	351 352	–	A-12
		Fluid type				Inner diameter

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

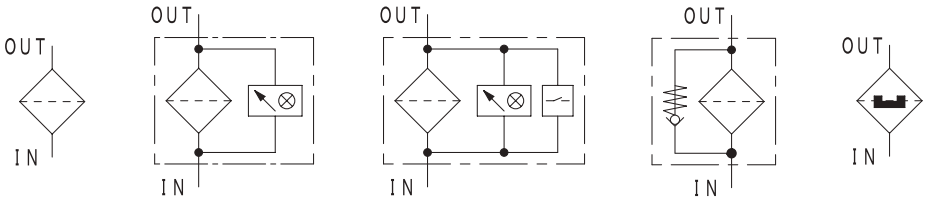
★ Refer to the MODEL CODE table on the previous page for code selection.

＊1 Weight of "Paper" element ＊2 Standard for NBR. For other material, conform to the standard.
＊3 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually. ＊4 O-ring standard is JIS B2401 1A.

Best-selling Line Filter

Characteristics

- **Light filter housing of aluminum alloy (FCD for large models)**
- **Exchange of In/Outlet is available by changing of cover direction**
- **Easy element replacement by only removing 4 bolts**
- **Clogging indicator, magnet, relief valve, and companion flange are selectable as an option**
- **Element of "U" series (UL, UM, UH) can be used in common**



Oil filter | Visual type indicator | Electric contact type indicator | Relief valve | Magnet

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

SPECIFICATION

Max working pressure		MPa	3.5
Repetition durability test			0~3.5MPa x10^7 times
Working temperature	Standard	℃	–10 ~ 90
	High temperature *1	℃	–10 ~ 150
Indicator working pressure		MPa	0.3
Cracking pressure		MPa	0.35
Allowable differential pressure of filter element		MPa	0.7
Flow direction/Extract direction of filter element			OUT → IN / Upward

Inner diameter		03A	04A	06A	08A	10A	12A	16A	20B	24B
Standard flow rate ☆	ℓ /min	30	50	90	105	240	290	440	680	730
Main material	Body	ADC						FCD		
	Cover	ADC						FCD		
	Inlet	ADC								
Coating		Non-coating						Aqua blue		
Weight *2	kg	2.5		3.0		5.5		21.5	37.0	

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

F – UL – 08A – 10U – I V N M – L
(❶ ❷ ❸ ❹)

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

Code	Inner diameter
03A	Rc 3/8 (10A)
04A	Rc 1/2 (15A)
06A	Rc 3/4 (20A)
08A	Rc1 (25A)
10A	Rc1 1/4 (32A)
12A	Rc1 1/2 (40A)
16A	Rc2 (50A)
20B	Rc2 1/2 (65A)
24B	Rc3 (80A)

Code	Filtration rating
C-Fiber	
3C	3 μm
8C	8 μm
25C	25 μm
Paper	
10U	10 μm
20U *3	20 μm
40U *3	40 μm

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

Code	Filtration rating
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh
Notch wire (Dimple wire)	
50UK	50 μm
200K	200Mesh
150K	150Mesh
100K	100Mesh
60K	60Mesh

Code	Option
❶ Indicator	
Blank	Closing plug
I	Visual type
E	Electric contact type
D	Electric contact type (Micro capacity)
❷ Relief valve	
K	Non
V	Relief valve
❸ Companion flange	
Blank	Non
N	Companion flange
❹ Magnet	
Blank	Non
M	Magnet

Code	Flow direction of fluid
Blank	Left → Right
L	Right → Left

＊1 Sealing parts: FKM, only for wire gauze element, indicator and relief valve are not available (Max oil temperature is visual type: 130℃ , electric contact type: 90℃)
＊2 Weight without companion flange ＊3 Not available for water-glycol based oil and high water based fluid

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

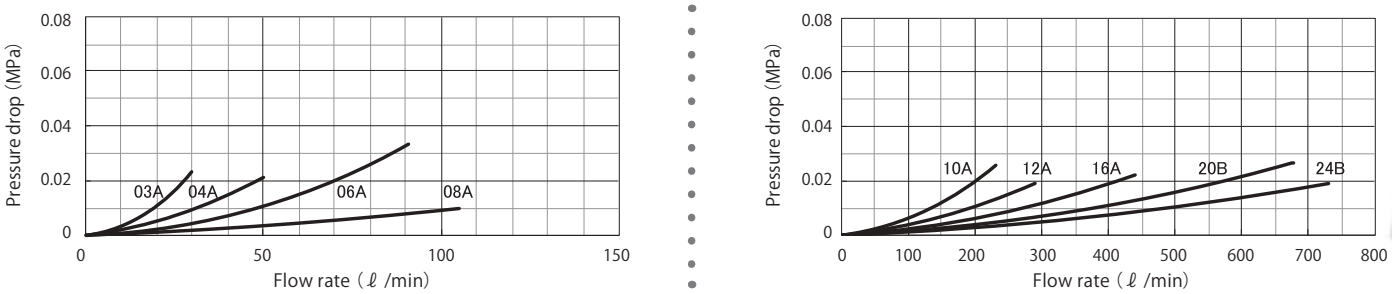
・Estimate pressure drop of filter assembly by following equation if required condition is different:

$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

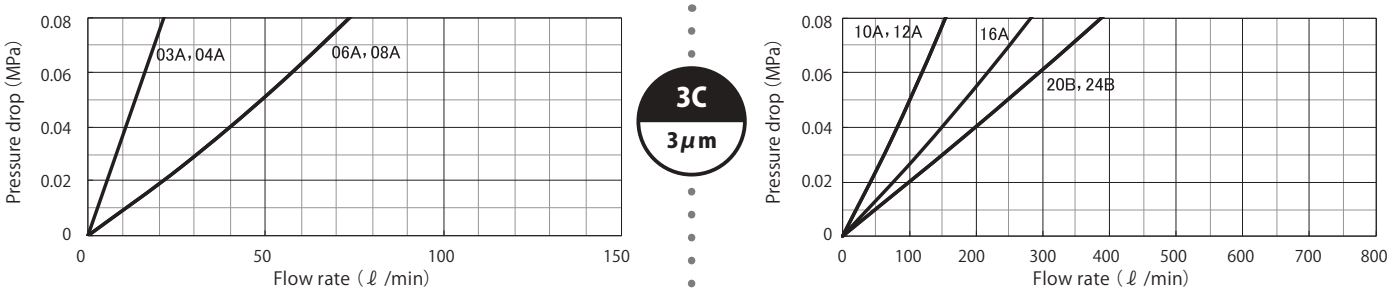
$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86,kinematic viscosity of 32}$$

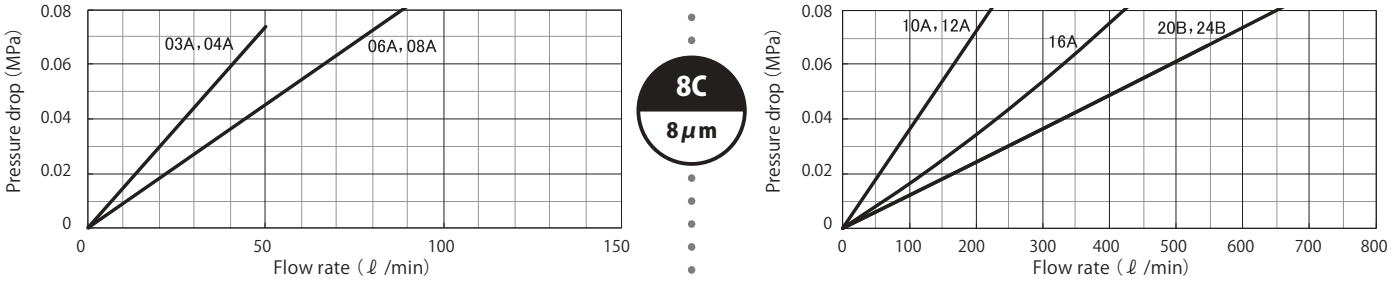
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

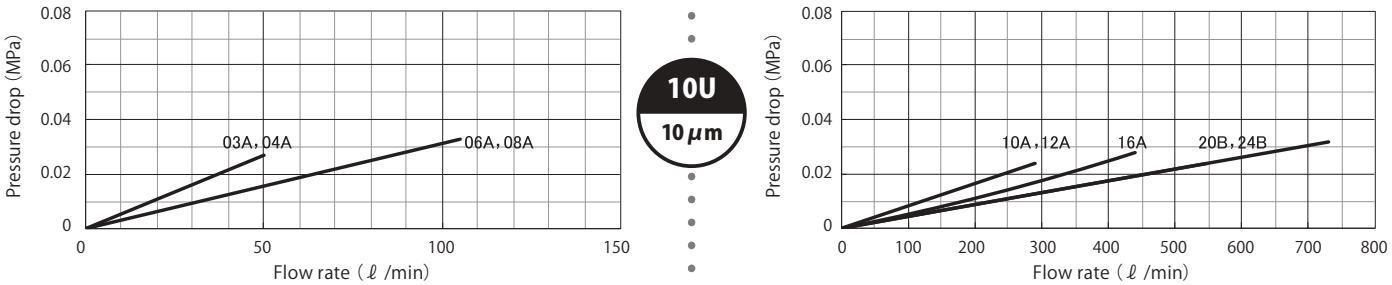
① Pressure drop of filter housing

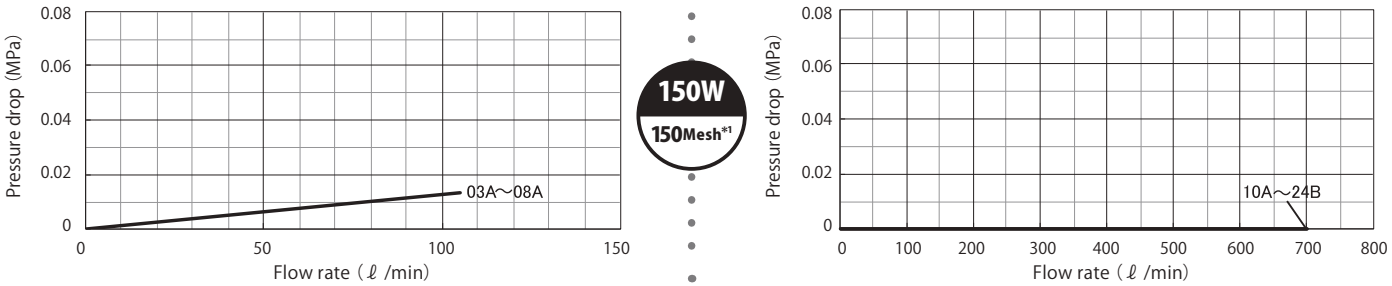


② Pressure drop of filter element



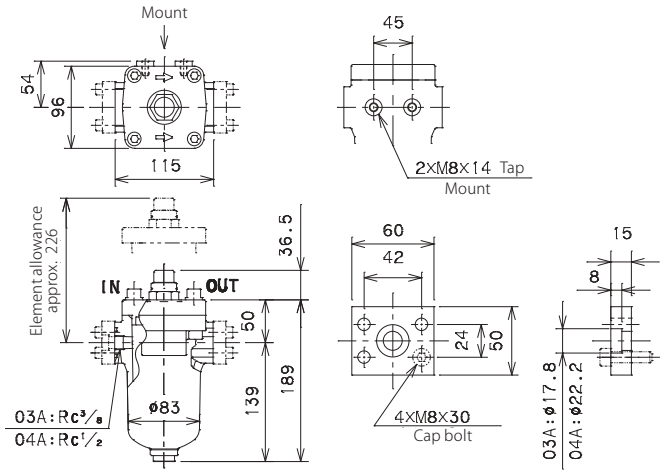






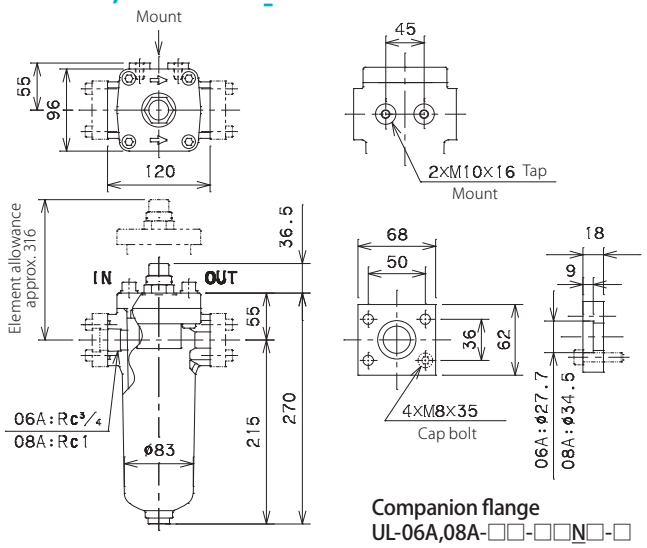
＊1 Pressure drop of wire gauze element is described with one line since the value is low and there is no difference at each filter size.

UL-03A,04A-□□-I□□□-□ I : Visual type indicator



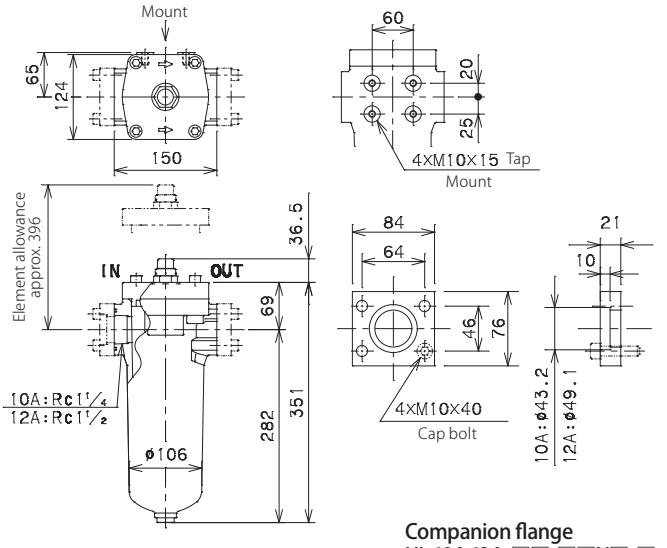
Companion flange
UL-03A,04A-□□-□□N□-□

UL-06A,08A-□□-I□□□-□



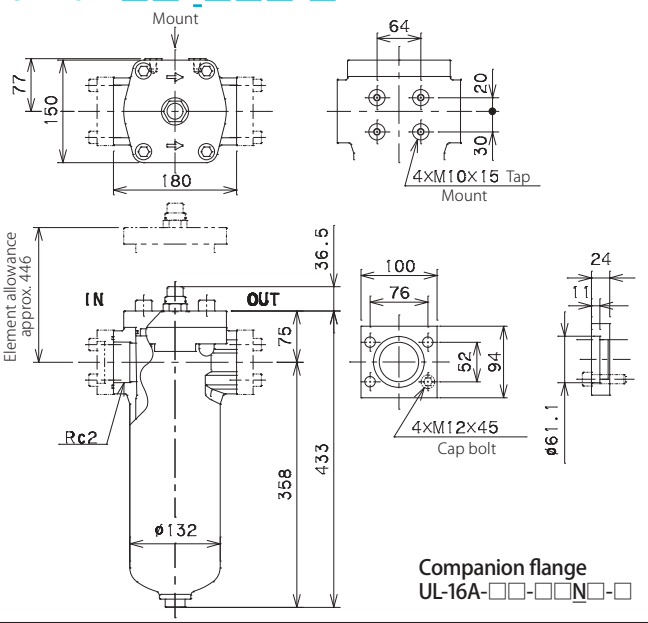
Companion flange
UL-06A,08A-□□-□□N□-□

UL-10A,12A-□□-I□□□-□



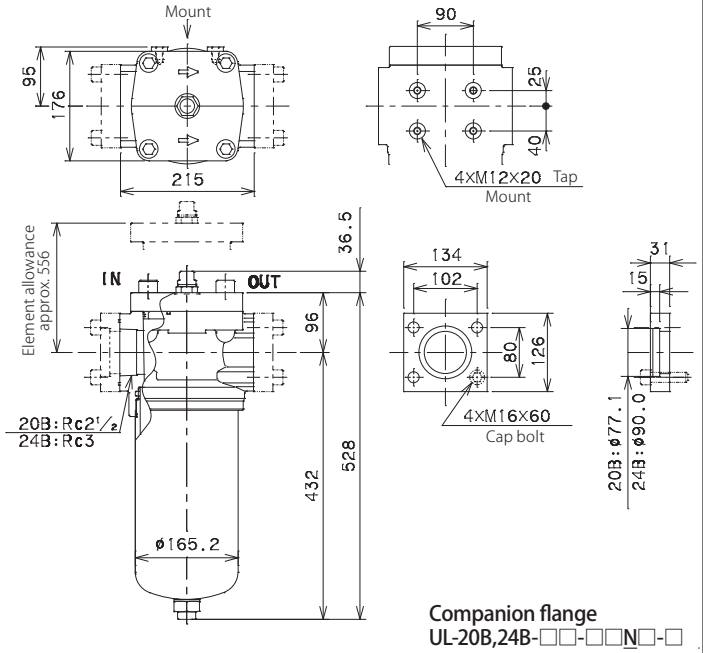
Companion flange
UL-10A,12A-□□-□□N□-□

UL-16A-□□-I□□□-□



Companion flange
UL-16A-□□-□□N□-□

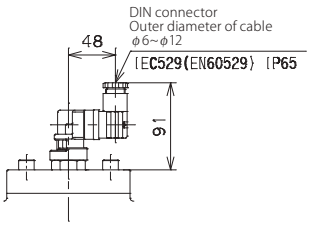
UL-20B,24B-□□-I□□□-□



Companion flange
UL-20B,24B-□□-□□N□-□

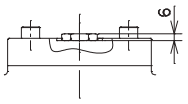
Differential pressure type indicator part

＊Common at all size



＊Element allowance should be +60mm.

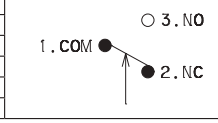
E,D : Electric contact type indicator
UL-□□-□□-E,D□□□-□



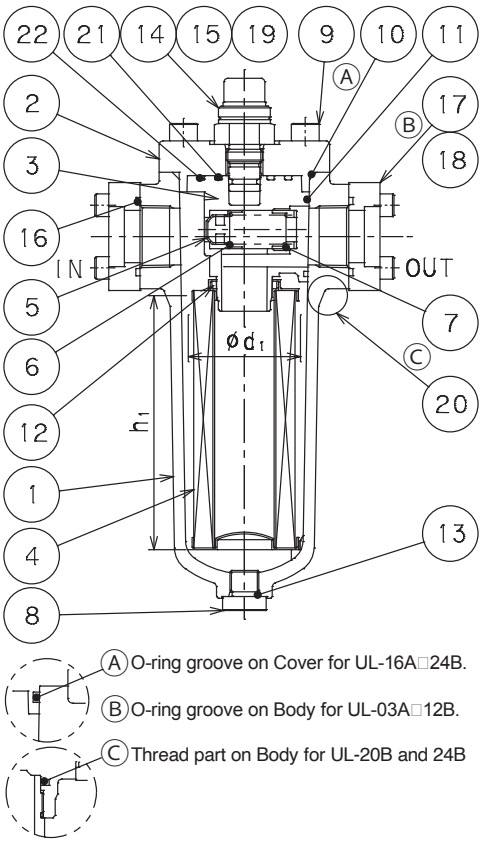
Closing plug
UL-□□-□□-_□□□-□

Model code	Working pressure (MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
IA-3	0.2	0.3	
EA-3	0.2	0.3	0.3
EA-3D			

〈Micro switch specification〉

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

CROSS SECTION



A O-ring groove on Cover for UL-16A□24B.
B O-ring groove on Body for UL-03A□12B.
C Thread part on Body for UL-20B and 24B

PARTS LIST

No.	Item	Qty
1	Body	1
2	Cover	1
3	Inlet	1
4	Element	1
5	Relief valve	1
6	Spring	1
7	Spring holder	1
8	Drain plug	1
9	Cap bolt	4
10	O-ring	1
11	O-ring	1
12	O-ring	1
13	O-ring	1
14	O-ring	1
15	O-ring	1
16	O-ring	2
17	Companion flange	2
18	Cap bolt	8
19	Indicator	1
20	O-ring	1
21	O-ring	1
22	O-ring	1

ELEMENT SIZE

Element Model code	Size(mm)		Weight*1 (kg)
	φd1	h1	
P-UL-03A,04A	62.2	85.3	0.15
P-UL-06A,08A		155.3	0.22
P-UL-10A,12A	82.2	204.5	0.46
P-UL-16A	102.2	254.5	0.81
P-UL-20B,24B	124.0	304.5	1.43

＊ Common to UL,UM,UH

SEALING PARTS LIST

No.	10	11	12	13	14	15	16	20	21	22
Standard*2 / Model code	JIS B2401 1A				JIS B2401 1B	JIS B2401 1A				
UL-03A,04A	G75	G30	P32	P14	P18	P14	G30			G40
UL-06A,08A		G40					G40			
UL-10A,12A	G100	G55	G45				G55		G25	G45
UL-16A	G110	G65	G60	P18			G70			
UL-20B,24B	G135	G95	G80				G100	G155	G30	G55

Item code of sealing parts set*3			
Material	SP No.: 10～13	SA No.: 10～15, 20～22	SA-N No.: 10～16, 20～22
NBR	SSF000070	SSF000060	SSF000065
FKM	SSF000437	SSF000427	SSF000432
NBR	SSF000071	SSF000061	SSF000066
FKM	SSF000438	SSF000428	SSF000433
NBR	SSF000072	SSF000062	SSF000067
FKM	SSF000439	SSF000429	SSF000434
NBR	SSF000073	SSF000063	SSF000068
FKM	SSF000440	SSF000430	SSF000435
NBR	SSF000074	SSF000064	SSF000069
FKM	SSF000441	SSF000431	SSF000436

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P	–	F	–	UL	–	08A	–	10U
("P" represents filter element)		Fluid type				Inner diameter		Filtration rating

Sealing parts set 〈Model code example〉

SA	–	F	–	UL	–	08A	–	N
		Fluid type				Inner diameter		

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

Code	Companion flange
Blank	Non
N	Companion flange (Only for SA)

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

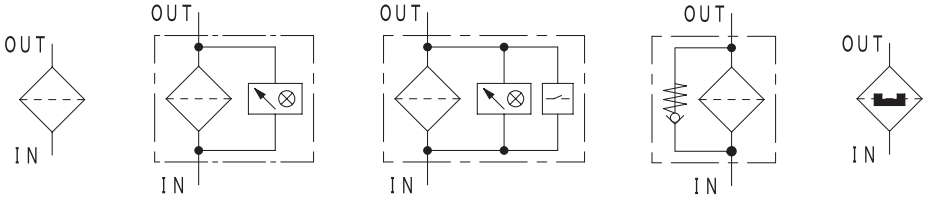
★ Refer to the MODEL CODE table on the previous page for code selection.

＊1 Weight of "Paper" element. Refer to the pages of UM and UH model for element weight with other material. element. ＊2 Standard for NBR. For other material, conform to the standard. ＊3 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.

Middle Pressure Model of Best-selling "U" series

Characteristics

- **Strong filter housing by FCD material.**
- **Exchange of In/Outlet is available by changing of cover direction**
- **Easy element replacement by only removing 4 bolts**
- **Clogging indicator, magnet, relief valve, and companion flange are selectable as an option**
- **Element of "U" series (UL, UM, UH) can be used in common**



Oil filter | Visual type indicator | Electric contact type indicator | Relief valve | Magnet

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

SPECIFICATION

Max working pressure		MPa	7.0
Repetition durability test			0~7.0MPa x10^7 times
Working temperature	Standard	℃	–10 ~ 90
	High temperature *1	℃	–10 ~ 150
Indicator working pressure		MPa	0.3
Cracking pressure		MPa	0.35
Allowable differential pressure of filter element		MPa	0.7
Flow direction/Extract direction of filter element			OUT → IN / Upward

Inner diameter		03	04	06	08	10	12	16A	20B	24B
Standard flow rate ☆	ℓ /min	30	50	90	105	240	290	440	680	730
Main material	Body	FCD								
	Cover	FCD								
	Inlet	ADC								
Coating		Aqua blue								
Weight *2	kg	8.9		11.1		22.7		21.5	37.0	

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

F – UM – 08 – 10U – I V N M – L

(I V N M: ❶ ❷ ❸ ❹)

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

Code	Inner diameter	
03	Rc 3/8	(10A)
04	Rc 1/2	(15A)
06	Rc 3/4	(20A)
08	Rc1	(25A)
10	Rc1 1/4	(32A)
12	Rc1 1/2	(40A)
16A	Rc2	(50A)
20B	Rc2 1/2	(65A)
24B	Rc3	(80A)

Code	Filtration rating
C-Fiber	
3C	3 μm
8C	8 μm
25C	25 μm
Paper	
10U	10 μm
20U *3	20 μm
40U *3	40 μm

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

Code	Filtration rating
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh
Notch wire (Dimple wire)	
50UK	50 μm
200K	200Mesh
150K	150Mesh
100K	100Mesh
60K	60Mesh

Code	Option
❶ Indicator	
Blank	Closing plug
I	Visual type
E	Electric contact type
D	Electric contact type (Micro capacity)
❷ Relief valve	
K	Non
V	Relief valve
❸ Companion flange	
Blank	Non
N	Companion flange
❹ Magnet	
Blank	Non
M	Magnet

Code	Flow direction of fluid
Blank	Left→Right
L	Right→Left

＊1 Sealing parts: FKM, only for wire gauze element, indicator and relief valve are not available (Max oil temperature is visual type: 130℃ , electric contact type: 90℃)
＊2 Weight without companion flange ＊3 Not available for water-glycol based oil and high water based fluid

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

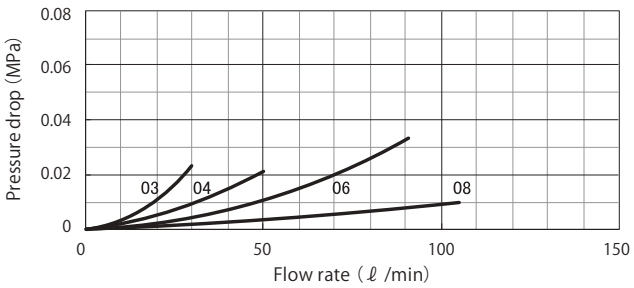
・Estimate pressure drop of filter assembly by following equation if required condition is different:

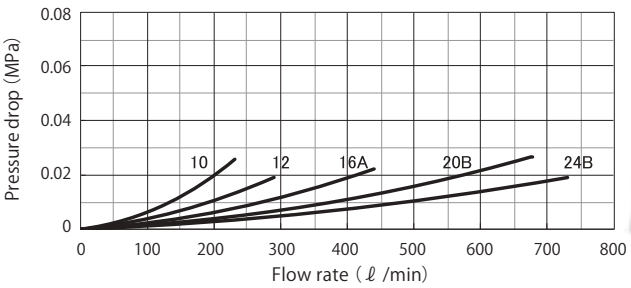
$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86,kinematic viscosity of 32}$$

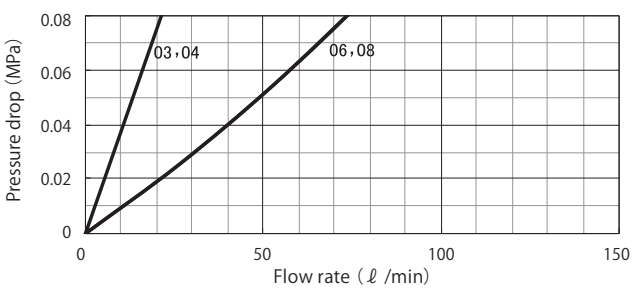
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

① Pressure drop of filter housing

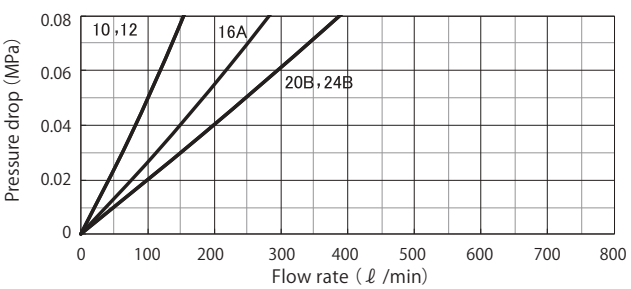


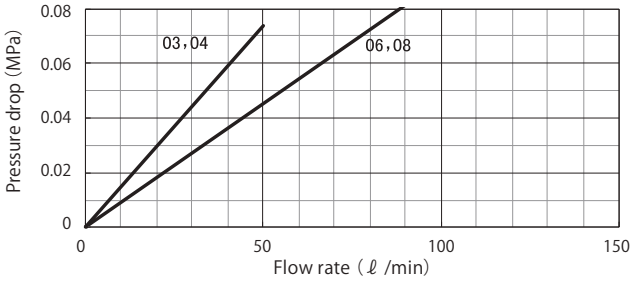


② Pressure drop of filter element

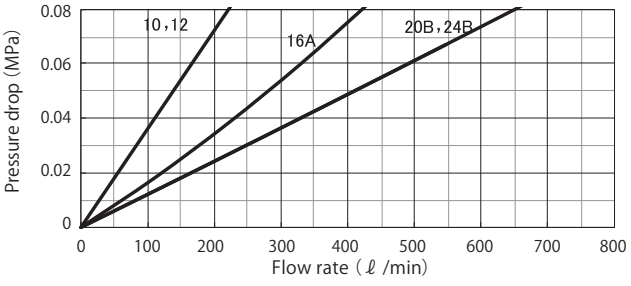


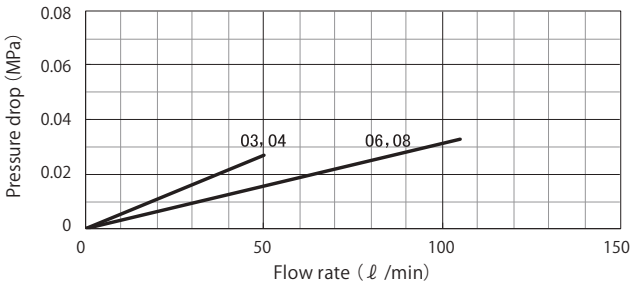
3C
3μm



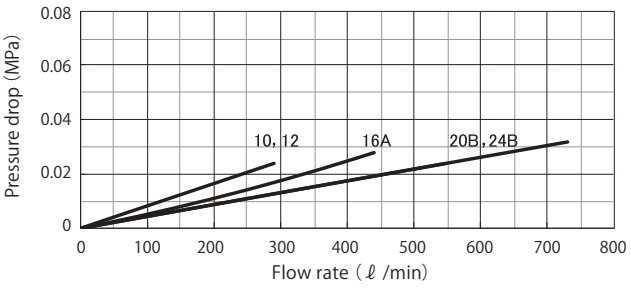


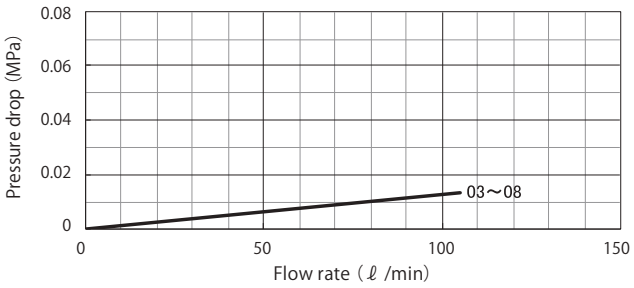
8C
8μm



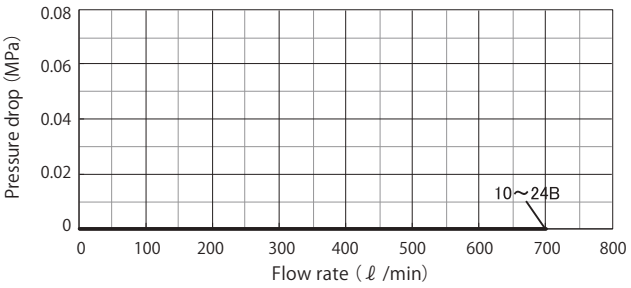


10U
10μm





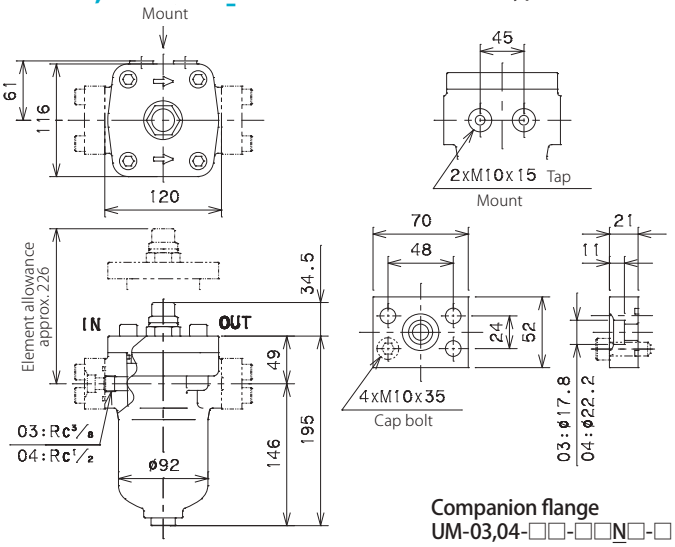
150W
150Mesh*1



＊1 Pressure drop of wire gauze element is described with one line since the value is low and there is no difference at each filter size.

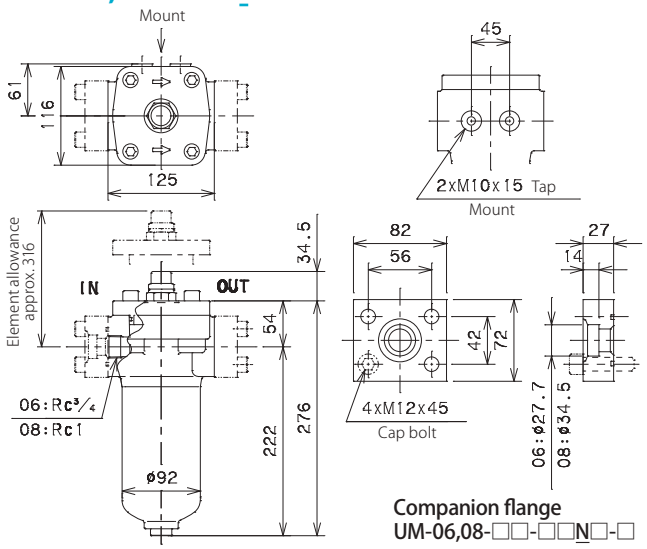
UM-03,04-□□-I□□□-□

I : Visual type indicator



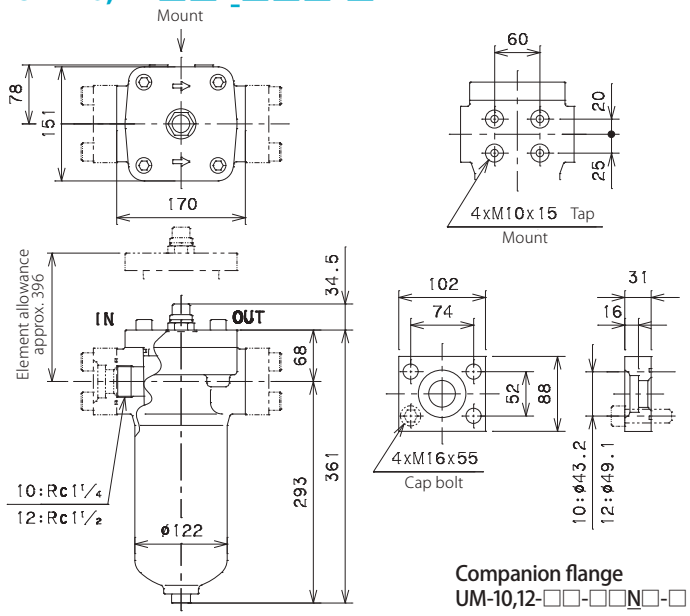
Companion flange
UM-03,04-□□-□□N□-□

UM-06,08-□□-I□□□-□



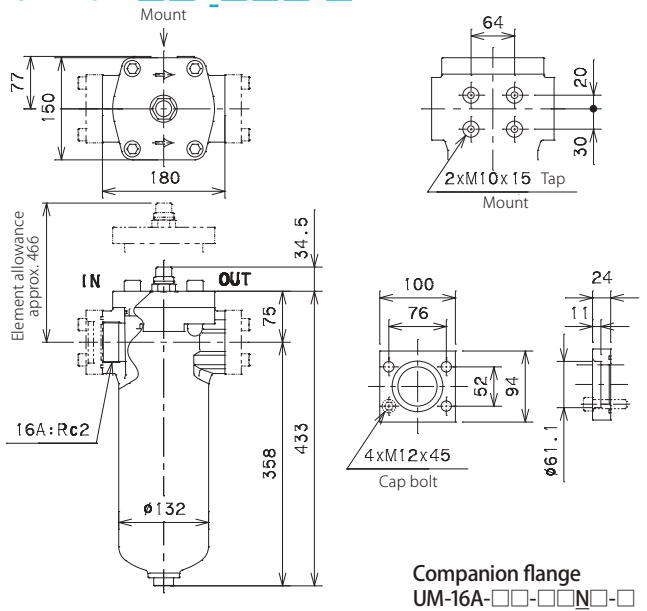
Companion flange
UM-06,08-□□-□□N□-□

UM-10,12-□□-I□□□-□



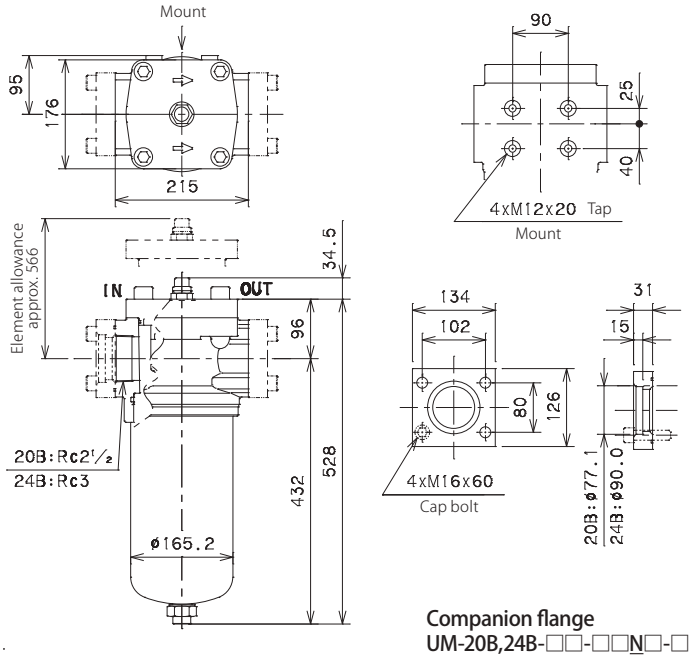
Companion flange
UM-10,12-□□-□□N□-□

UM-16A-□□-I□□□-□



Companion flange
UM-16A-□□-□□N□-□

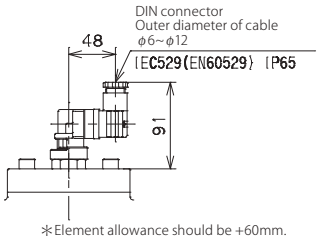
UM-20B,24B-□□-I□□□-□



Companion flange
UM-20B,24B-□□-□□N□-□

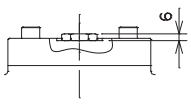
Differential pressure type indicator part

＊Common at all size



＊Element allowance should be +60mm.

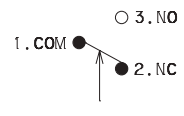
E,D : Electric contact type indicator
UM-□□-□□-E,D□□□-□



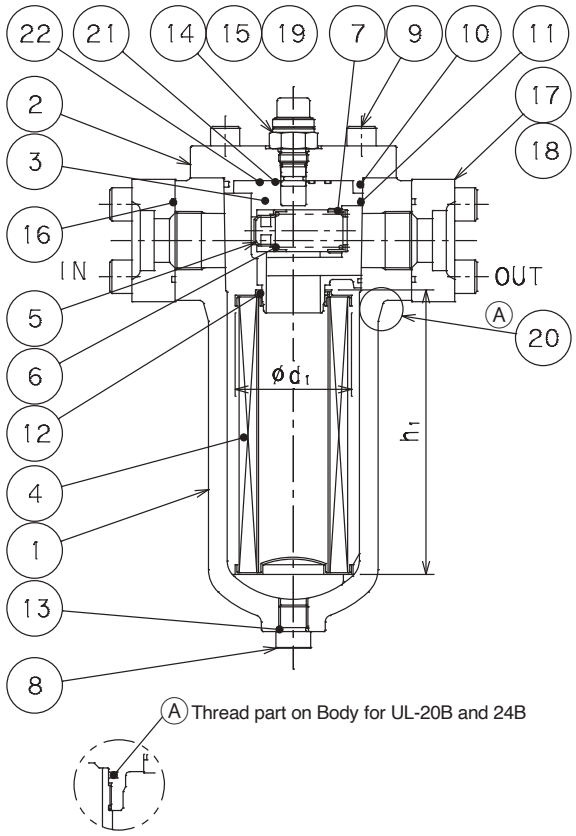
Closing plug
UM-□□-□□-_□□□-□

Model code	Working pressure(MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
IA-3	0.2	0.3	
EA-3	0.2	0.3	0.3
EA-3D			

〈Micro switch specification〉

Model code	Rated capacity		Contact diagram : 1C
EA-3	Resistance load	3A/250V AC	
		3A/30V DC	
	Inductive load	2A/250V AC	
		2A/30V DC	
EA-3D	Micro capacity	100mA/125V AC	
		100mA/30V DC	

CROSS SECTION



PARTS LIST

No.	Item	Qty
1	Body	1
2	Cover	1
3	Inlet	1
4	Element	1
5	Relief valve	1
6	Spring	1
7	Spring holder	1
8	Drain plug	1
9	Cap bolt	4
10	O-ring	1
11	O-ring	1
12	O-ring	1
13	O-ring	1
14	O-ring	1
15	O-ring	1
16	O-ring	2
17	Companion flange	2
18	Cap bolt	8
19	Indicator	1
20	O-ring	1
21	O-ring	1
22	O-ring	1

ELEMENT SIZE

Element Model code	Size(mm)		Weight*1 (kg)
	φd1	h1	
P-UM-03,04	62.2	85.3	0.19
P-UM-06,08		155.3	0.29
P-UM-10,12	82.2	204.5	0.63
P-UM-16A	102.2	254.5	1.13
P-UM-20B,24B	124.0	304.5	1.85

＊ Common to UL,UM,UH

SEALING PARTS LIST

No.	10	11	12	13	14	15	16	20	21	22	Item code of sealing parts set *3			
Standard*2 / Model code	JIS B2401 1A				JIS B2401 1B	JIS B2401 1A					Material	SP No.: 10～13	SA No.: 10～15, 20～22	SA-N No.: 10～16, 20～22
UM-03,04	G70	G30	P32	P14	P18	P14	G30			G40	NBR	SSF000083	SSF000075	SSF000079
											FKM	SSF000450	SSF000442	SSF000446
UM-06,08		G40					G40				NBR	SSF000084	SSF000076	SSF000080
											FKM	SSF000451	SSF000443	SSF000447
UM-10,12	G95	G55	G45	P18			G55		G25	G45	NBR	SSF000085	SSF000077	SSF000081
											FKM	SSF000452	SSF000444	SSF000448
UM-16A	G110	G65	G60				G70				NBR	SSF000073	SSF000063	SSF000068
											FKM	SSF000440	SSF000430	SSF000435
UM-20B,24B	G135	G95	G80				G100	G155	G30	G55	NBR	SSF000074	SSF000064	SSF000069
											FKM	SSF000441	SSF000431	SSF000436

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P	–	F	–	UM	–	08	–	10U
("P" represents filter element)		Fluid type				Inner diameter		Filtration rating

Sealing parts set 〈Model code example〉

SA	–	F	–	UM	–	08	–	N
		Fluid type				Inner diameter		

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

Code	Companion flange
Blank	Non
N	Companion flange (Only for SA)

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

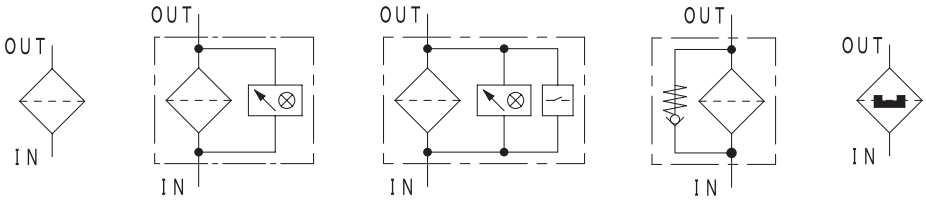
★ Refer to the MODEL CODE table on the previous page for code selection.

＊1 Weight of "Paper" element. Refer to the pages of UM and UH model for element weight with other material. element. ＊2 Standard for NBR. For other material, conform to the standard. ＊3 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.

High Pressure Model of Best-selling "U" series

Characteristics

- **High pressure element of allowable differential pressure 21MPa is available (standard: 0.7MPa)**
- **Exchange of In/Outlet is available by changing of cover direction**
- **Easy element replacement by only removing 4 bolts**
- **Clogging indicator, magnet, relief valve, and companion flange are selectable as an option**
- **Element of "U" series (UL, UM, UH) can be used in common**



Oil filter | Visual type indicator | Electric contact type indicator | Relief valve | Magnet

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

SPECIFICATION

Max working pressure		MPa	21.0
Repetition durability test			0~21.0MPa x10^{7}times
Working temperature	Standard	℃	–10 ~ 90
	High temperature *1	℃	–10 ~ 150
Indicator working pressure	Standard	MPa	0.3
	High pressure	MPa	0.7
Cracking pressure	Standard	MPa	0.35
	High pressure	MPa	Non bypass
Allowable differential pressure of filter element	Standard	MPa	0.7
	High pressure	MPa	21.0
Flow direction/Extract direction of filter element			OUT → IN / Upward

Inner diameter		03A	04A	06A	08A	10A	12A	16A
Standard flow rate ☆ ℓ /min		35	60	110	125	280	380	480
Main material	Body	FCD						
	Cover	FCD						
	Inlet	ADC						
Coating		Aqua blue						
Weight *2 kg		10.0		12.2		25.4		36.6

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

G – UH – 08A – 10U – I V N M – L

❶ ❷ ❸ ❹

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

Code	Inner diameter
03A	Rc 3/8 (10A)
04A	Rc 1/2 (15A)
06A	Rc 3/4 (20A)
08A	Rc1 (25A)
10A	Rc1 1/4 (32A)
12A	Rc1 1/2 (40A)
16A	Rc2 (50A)

Code	Filtration rating
C-Fiber	
3C	3 μm
8C	8 μm
25C	25 μm
High pressure C-Fiber	
3CH	3 μm
8CH	8 μm
25CH	25 μm
Paper	
10U	10 μm
20U *3	20 μm
40U *3	40 μm

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

Code	Filtration rating
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh
Notch wire (Dimple wire)	
50UK	50 μm
200K	200Mesh
150K	150Mesh
100K	100Mesh
60K	60Mesh

Code	Option
❶ Indicator	
Blank	Closing plug
I	Visual type
E	Electric contact type
D	Electric contact type (Micro capacity)
❷ Relief valve *4	
K	Non
V	Relief valve
❸ Companion flange	
Blank	Non
N	Companion flange
❹ Magnet	
Blank	Non
M	Magnet

Code	Flow direction of fluid
Blank	Left → Right
L	Right → Left

＊1 Sealing parts: FKM, only for wire gauze element, indicator and relief valve are not available (Max oil temperature is visual type: 130℃ , electric contact type: 90℃)
＊2 Weight without companion flange ＊3 Not available for water-glycol based oil and high water based fluid ＊4 Relief valve is not available if selecting high pressure element

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

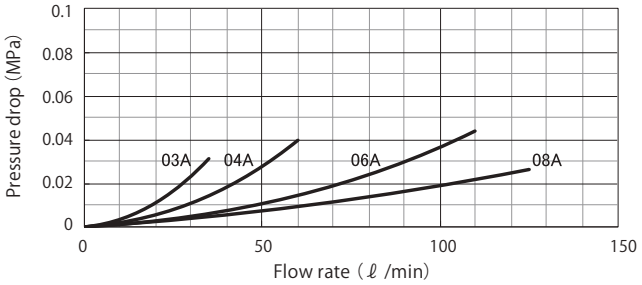
・Estimate pressure drop of filter assembly by following equation if required condition is different:

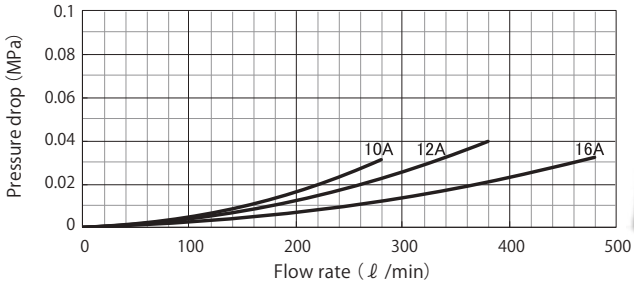
$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86,kinematic viscosity of 32}$$

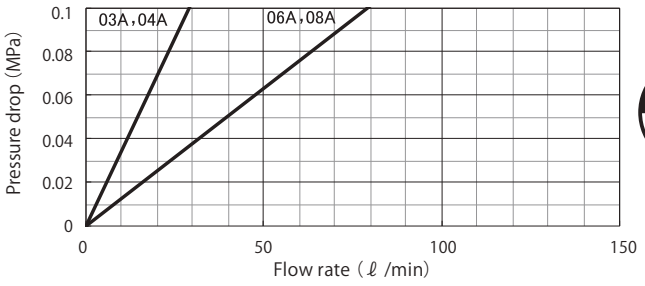
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

① Pressure drop of filter housing

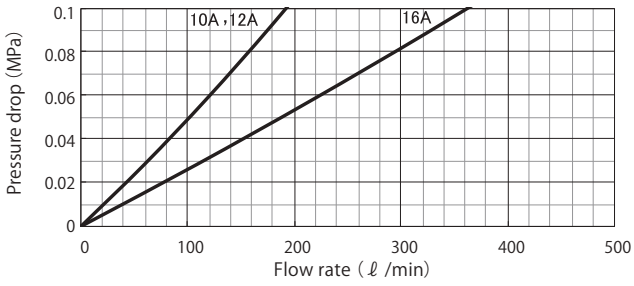


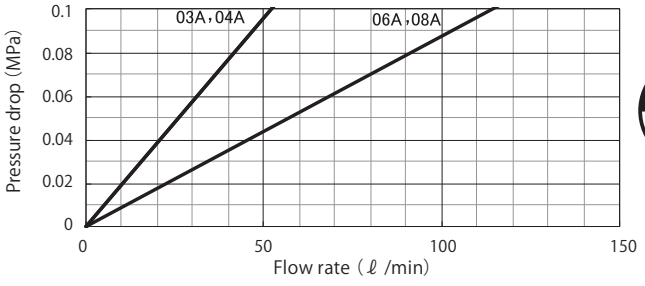


② Pressure drop of filter element

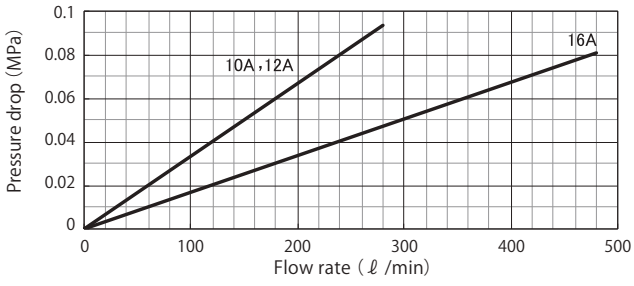


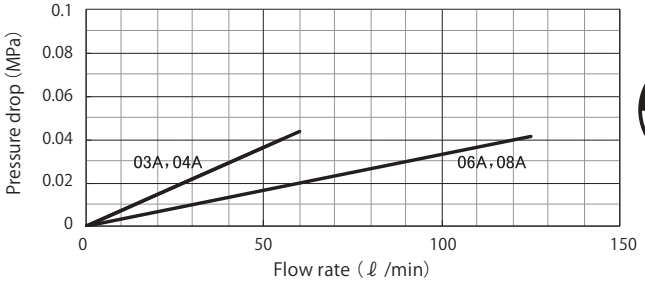
3C
3μm



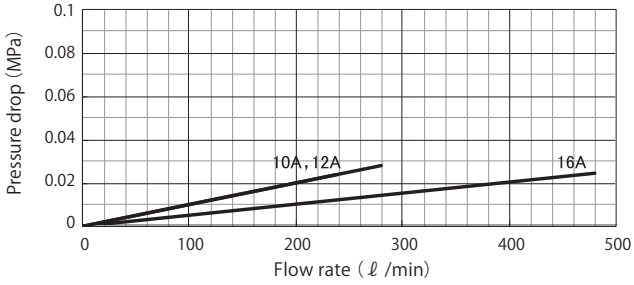


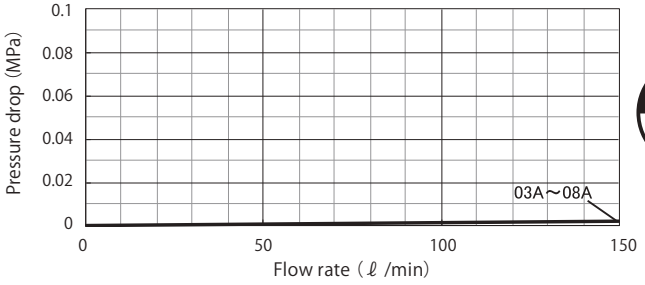
8C
8μm



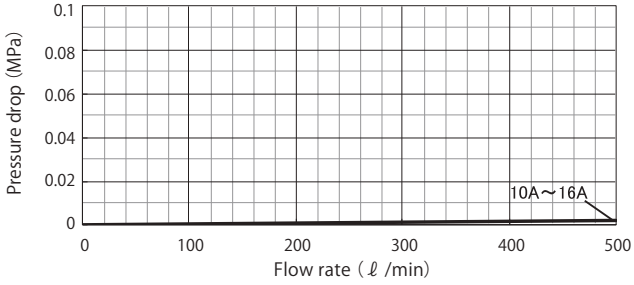


10U
10μm



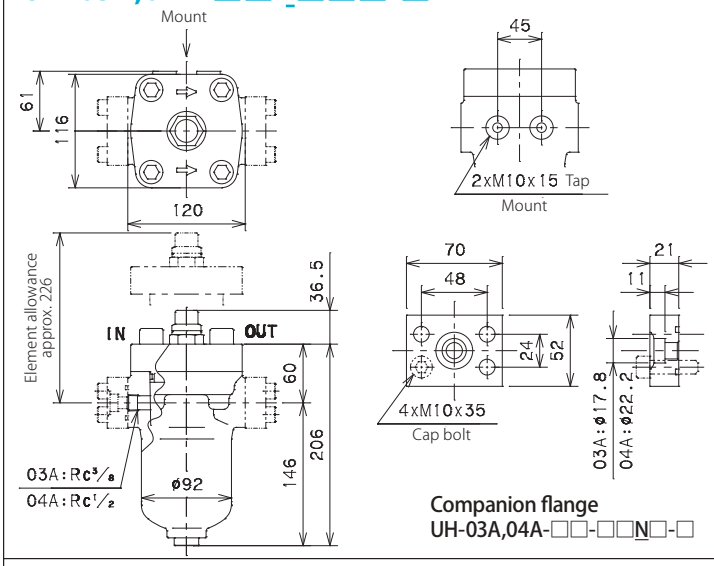


150W
150Mesh*1



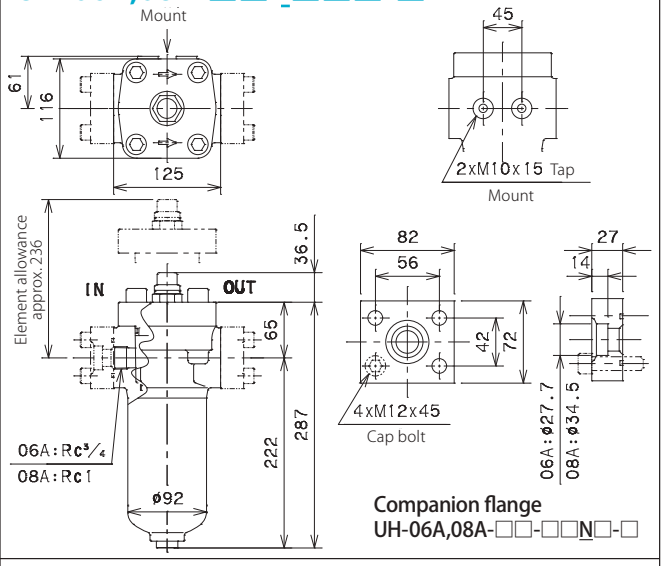
＊1 Pressure drop of wire gauze element is described with one line since the value is low and there is no difference at each filter size.

UH-03A,04A-□□-I□□□-□ I : Visual type indicator



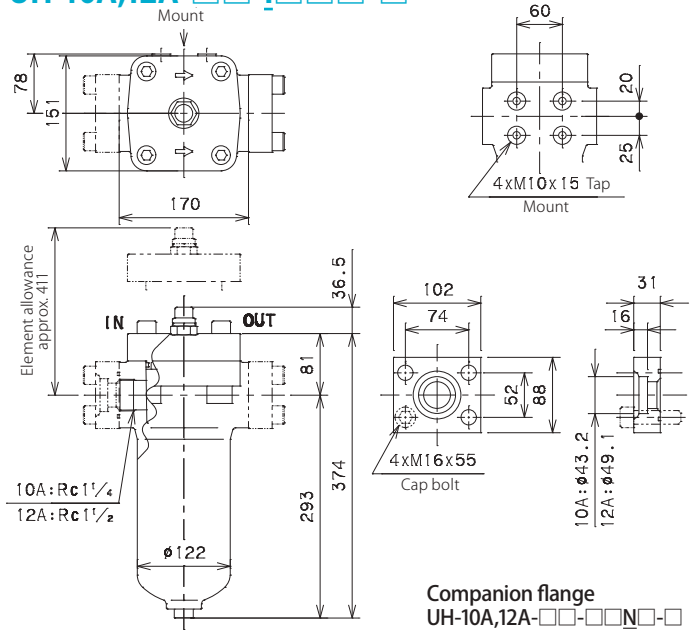
Companion flange
UH-03A,04A-□□-□□N□-□

UH-06A,08A-□□-I□□□-□



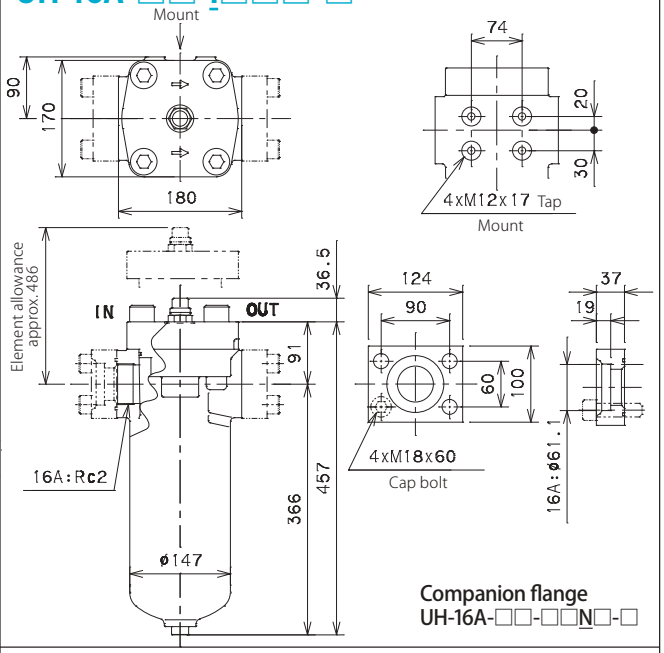
Companion flange
UH-06A,08A-□□-□□N□-□

UH-10A,12A-□□-I□□□-□



Companion flange
UH-10A,12A-□□-□□N□-□

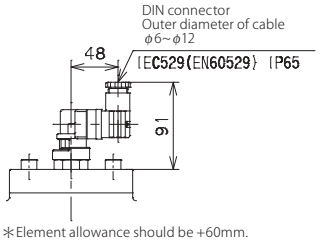
UH-16A-□□-I□□□-□



Companion flange
UH-16A-□□-□□N□-□

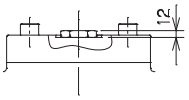
Differential pressure type indicator part

＊Common at all size



＊Element allowance should be +60mm.

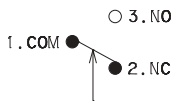
E,D : Electric contact type indicator
UH-□□-□□-E,D□□□-□



Closing plug
UH-□□-□□- _□□□-□

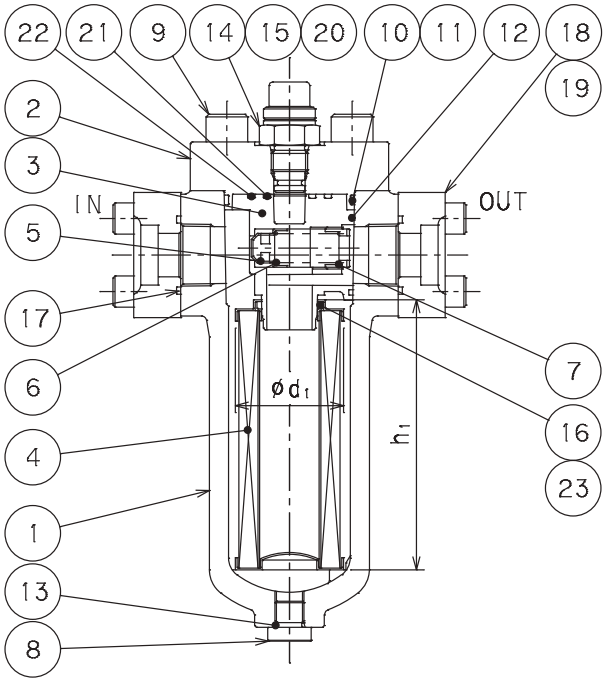
Model code	Working pressure(MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
IF-3	0.2	0.3	
IF-7		0.7	
EF-3		0.3	0.3
EF-3D			
EF-7		0.7	0.7
EF-7D			

〈Micro switch specification〉

Model code	Rated capacity		Contact diagram : 1C
EF-3 EF-7	Resistance load	3A,250V AC	
		3A,30V DC	
	Inductive load	2A,250V AC	
		2A,30V DC	
EF-3D EF-7D	Micro capacity	100mA,125V AC	
		100mA,30V DC	

★ IF-7 and EF-7(D) are for High pressure element.

CROSS SECTION



PARTS LIST

No.	Item	Qty
1	Body	1
2	Cover	1
3	Inlet	1
4	Element	1
5	Relief valve	1
6	Spring	1
7	Spring holder	1
8	Drain plug	1
9	Cap bolt	4
10	O-ring	1
11	Backup ring	1
12	O-ring	1
13	O-ring	1
14	O-ring	1
15	O-ring	1
16	O-ring	1
17	O-ring	2
18	Companion flange	2
19	Cap bolt	8
20	Indicator	1
21	O-ring	1
22	O-ring	1
23	Backup ring	1

ELEMENT SIZE

Element Model code	Size(mm) φd1		h1	Weight*1 (kg)
		High pressure		
P-UH-03A,04A	62.2	64.0	85.3	0.66
P-UH-06A,08A			155.3	0.89
P-UH-10A,12A	82.2	81.0	204.5	1.62
P-UH-16A	102.2	102.0	254.5	2.70

＊ Common to UL,UM,UH

SEALING PARTS LIST

No.	10	11	12		13	14	15	16	17	21	22	23
Standard*2 / Model code	JIS B2401 1B	JIS B2407 T3	JIS B2401 1A	High pressure element AS568	JIS B2401 1B		JIS B2401 1A		JIS B2401 1B	JIS B2401 1A		High pressure element JIS B2407 T3
UH-03A,04A	G70	For G70	G30	123	P14	P18	P14	P32	G30	G25	G40	For P32
UH-06A,08A			G40	130					G40			
UH-10A,12A	G95	For G95	G55	139	P18			G45	G55		G45	For G45
UH-16A	G110	For G110	G65	145				G60	G70			For G60

Item code of sealing parts set *3							
Model code	Material	SP No.: 10～13, 16	SP-H No.: 10～13, 16,23	SA No.: 10～16, 21～22	SA-N No.: 10～17, 21～22	SA-H No.: 10～16, 21～22	SA-HN No.: 10～17, 21～23
UH-03A,04A	NBR	SSF000538	SSF000095	SSF000531	SSF000535	SSF000087	SSF000091
	FKM	SSF000560	SSF000462	SSF000553	SSF000557	SSF000454	SSF000458
UH-06A,08A	NBR	SSF000539	SSF000096	SSF000532	SSF000536	SSF000088	SSF000092
	FKM	SSF000561	SSF000463	SSF000554	SSF000558	SSF000455	SSF000459
UH-10A,12A	NBR	SSF000540	SSF000097	SSF000533	SSF000537	SSF000089	SSF000093
	FKM	SSF000562	SSF000464	SSF000555	SSF000559	SSF000456	SSF000460
UH-16A	NBR	SSF000541	SSF000098	SSF000534	SSF000082	SSF000090	SSF000094
	FKM	SSF000563	SSF000465	SSF000556	SSF000449	SSF000457	SSF000461

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P	–	F	–	UH	–	08A	–	3CH
("P" represents filter element)		Fluid type				Inner diameter		Filtration rating

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

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

Sealing parts set 〈Model code example〉

SA	–	F	–	UH	–	08A	–	H	N
		Fluid type				Inner diameter			

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

Code	Filtration rating
Blank	All models except below
H	3CH, 8CH, 25CH

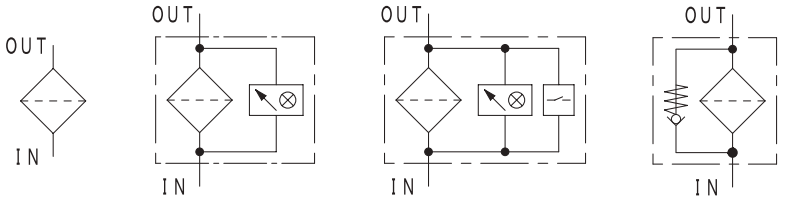
Code	Companion flange
Blank	Non
N	Companion flange (Only for SA)

＊1 Weight of "Paper" element. Refer to the pages of UM and UH model for element weight with other material. element. ＊2 Standard for NBR. For other material, conform to the standard. ＊3 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.

Sharp-formed T-type High Pressure Filter

Characteristics

- **Element size is selectable depending on flow rate and contaminant amount**
- **Clogging indicator and relief valve are selectable as an option**
- **High pressure element of allowable differential pressure 21MPa is available (standard: 0.7MPa)**
- **Element of TM can be used in common with GM model**
- **Pipe connection type is "Rc threaded"**



Oil filter | Visual type indicator | Electric contact type indicator | Relief valve

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

SPECIFICATION

Max working pressure		MPa	21.0
Repetition durability test			0 ~ 21MPa x10^7times
Working temperature	Standard	℃	–10 ~ 90
	High temperature ＊1	℃	–10 ~ 150
Indicator working pressure	Standard	MPa	0.3
	High pressure	MPa	0.7
Cracking pressure	Standard	MPa	0.35
	High pressure	MPa	Non bypass
Allowable differential pressure of filter element	Standard	MPa	0.7
	High pressure	MPa	21.0
Flow direction/Extract direction of filter element			OUT → IN / Downward

		04-2	04-3
Inner diameter			
Standard flow rate ☆	ℓ /min	20	30
Main material	Body	FCD	
	Lower cover	S25C	
Coating		Protective film treatment	
Weight	kg	3.3	4.4

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

F – TM – C – 04 – 2 – 3C – I V
(❶ ❷)

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

Code	Inner diameter
04	Rc 1/2

Case length	
Code	2
	3

Code	Filtration rating
C-Fiber	
3C	3 μm
8C	8 μm
25C	25 μm
High pressure C-Fiber	
3CH	3 μm
8CH	8 μm
25CH	25 μm
Paper	
10U	10 μm
20U ＊2	20 μm
40U ＊2	40 μm

Code	Filtration rating
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh

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

Code	Option
❶ Indicator	
Blank	Closing plug
I	Visual type
E	Electric contact type
D	Electric contact type (Micro capacity)

❷ Relief valve ＊3	
K	Non
V	Relief valve

＊1 Sealing parts: FKM, only for wire gauze element, indicator and relief valve are not available (Max oil temperature is visual type: 130℃ , electric contact type: 90℃)
＊2 Not available for water-glycol based oil and high water based fluid ＊3 Relief valve is not available if selecting high pressure element

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

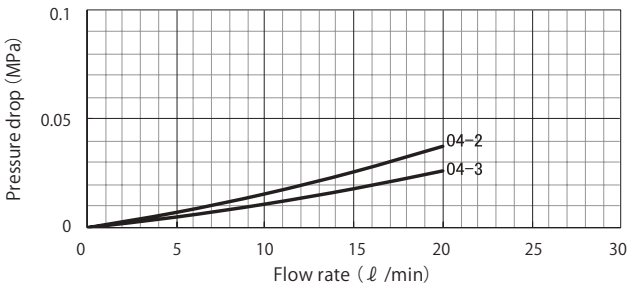
・Estimate pressure drop of filter assembly by following equation if required condition is different:

$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

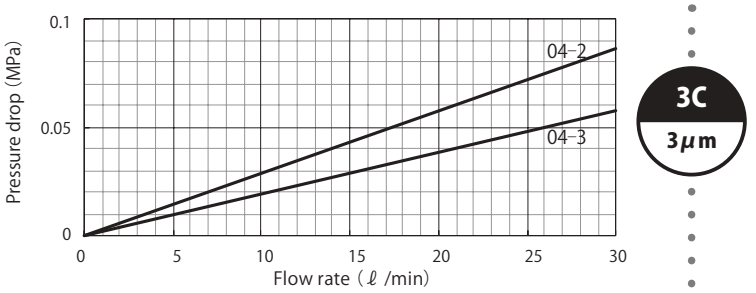
$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

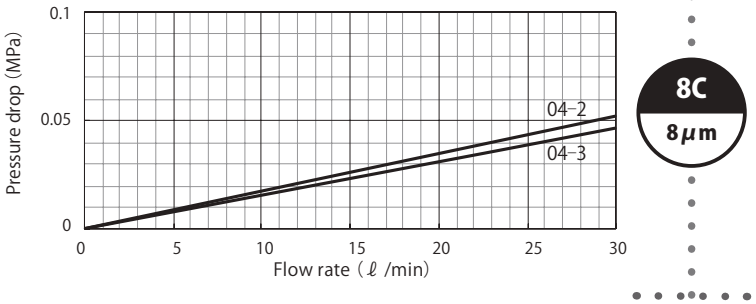
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

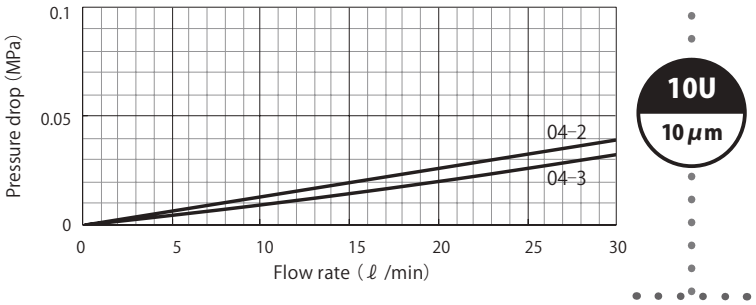
① Pressure drop of filter housing

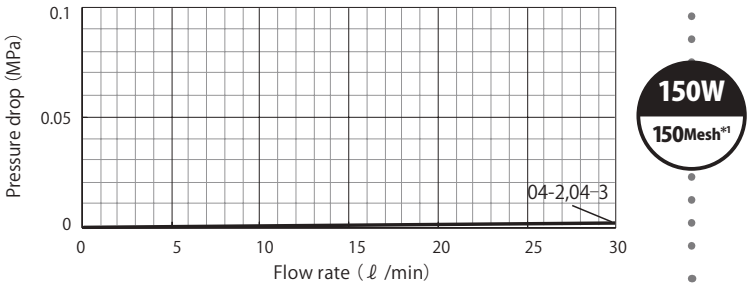


② Pressure drop of filter element





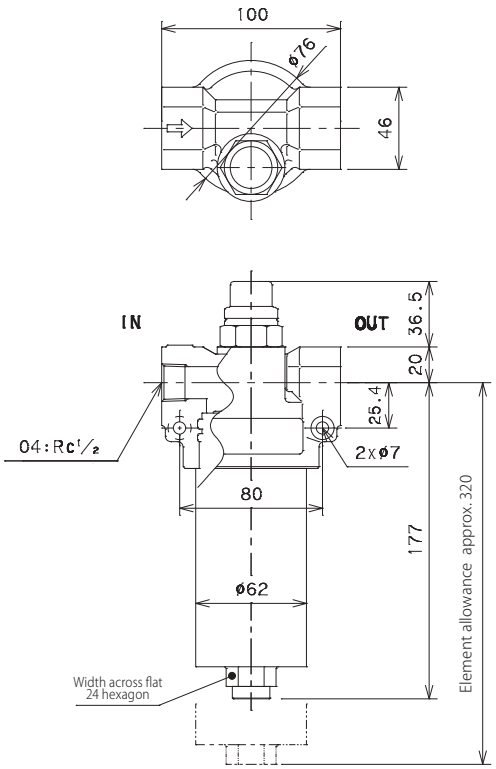




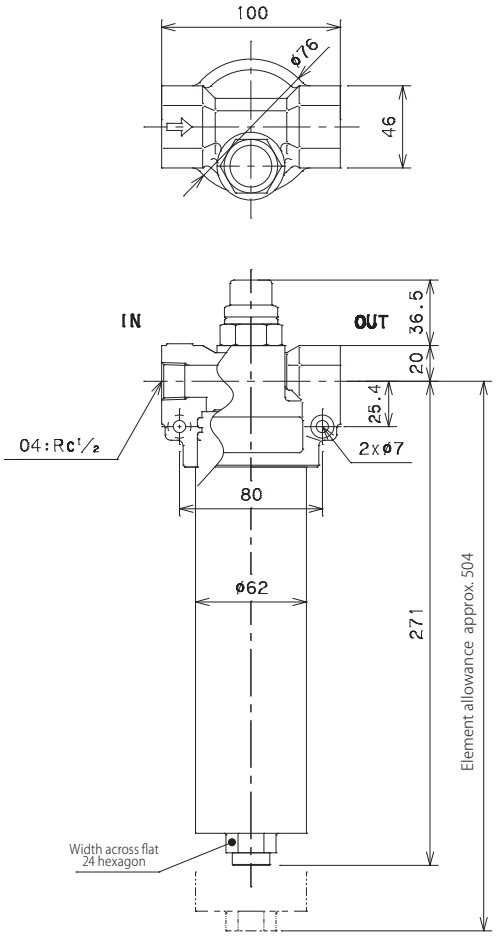
＊1 Pressure drop of wire gauze element is described with one line since the value is low and there is no difference at each filter size.

TM-C-04-2 -□□-I□

I : Visual type indicator

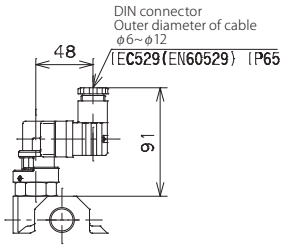


TM-C-04-3 -□□-I□

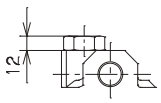


Differential pressure type indicator part

∗ Common at all size



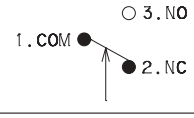
E,D : Electric contact type indicator
TM-C-□□-□-□□-E,D□



Closing plug
TM-C-□□-□-□□- _□

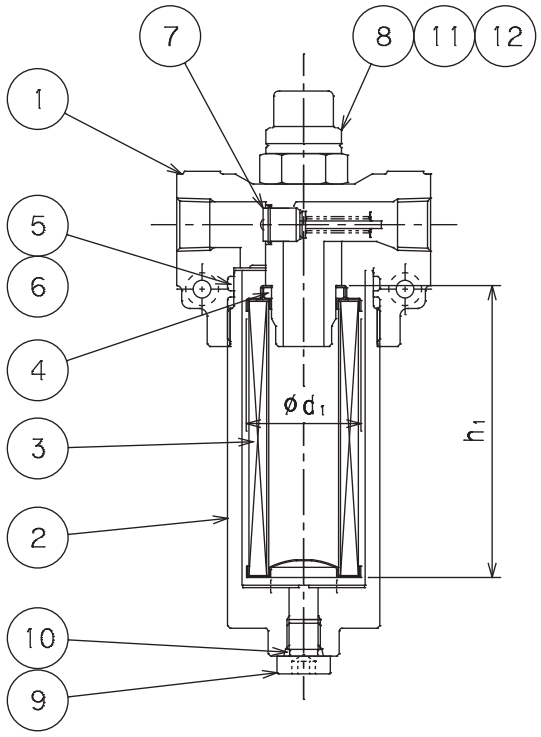
Model code	Working pressure(MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
IF-3	0.2	0.3	
IF-7		0.7	
EF-3		0.3	0.3
EF-3D			
EF-7		0.7	0.7
EF-7D			

〈Micro switch specification〉

Model code	Rated capacity		Contact diagram : 1C
EF-3 EF-7	Resistance load	3A,250V AC	
		3A,30V DC	
	Inductive load	2A,250V AC	
		2A,30V DC	
EF-3D EF-7D	Micro capacity	100mA,125V AC	
		100mA,30V DC	

★ IF-7 and EF-7(D) are for High pressure element.

CROSS SECTION



PARTS LIST

No.	Item	Qty
1	Body	1
2	Lower cover	1
3	Element	1
4	O-ring	1
5	O-ring	1
6	Backup ring	1
7	Relief valve	1
8	Indicator	1
9	Drain plug	1
10	O-ring	1
11	O-ring	1
12	O-ring	1

ELEMENT SIZE

Element Model code	Size(mm)				Weight*1 (Kg)
	φd1			h1	
		High mesh *	High pressure		
P-TM-2	45.2	46.0	45.3	115	0.11
P-TM-3				209	0.18

＊Filtration rating：5UW、10UW、20UW　＊Common to TM、GM

SEALING PARTS LIST

No.	4	5	6	10	11	12	Item code of sealing parts set *3		
Standard *2 / Model code	AS568	JIS B2401 1A	JIS B2407 T3	JIS B2401 1B	JIS B2401 1A	JIS B2401 1B	Material	SP No.：4～6, 10	SA No.：4～6, 10～12
TM-C-04	214	G55	For G55	P11	P14	P18	NBR	SSF000100	SSF000099
TM-C-06							FKM	SSF000467	SSF000466

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P – **F** – **TM** – **2** – **3C**

(“P” represents filter element)

Fluid type

Case length	
Code	2
	3

Filtration rating

Sealing parts set 〈Model code example〉

SA – **F** – **TM** – **C** – **04**

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

Fluid type

Inner diameter

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

“Individual code”: Used in drawings and nameplate as shown in <Model code example>.
“Common code”: Used in vouchers and tag
Refer to【Spare Element List】on P.152 for “Common code”.

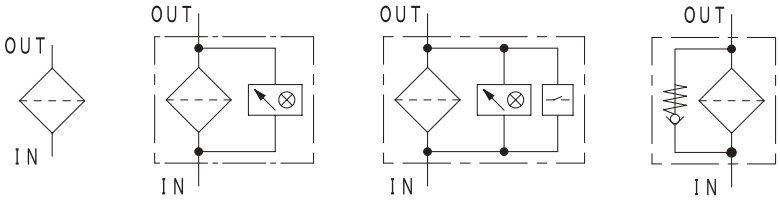
★ Refer to the MODEL CODE table on the previous page for code selection.

＊1 Weight of “Paper” element ＊2 Standard for NBR. For other material, conform to the standard.
＊3 Sealing parts are available as “Sealing parts set” only. We do not provide single part individually.

Best-selling High Pressure Filter for construction machines

Characteristics

- **Compact and downward extraction model for high pressure line**
  Especially best for a system that hardly secures installation space
- **Element size is selectable depending on flow rate and contaminant amount**
- **Clogging indicator and relief valve are selectable as an option**
- **High pressure element of allowable differential pressure 21MPa is available (standard: 0.7MPa)**
- **Pipe connection type is "G Thread"**



Oil filter | Visual type indicator | Electric contact type indicator | Relief valve

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

SPECIFICATION

Max working pressure		MPa	35.0
Repetition durability test			0〜35.0MPa x10^{7}times
Working temperature	Standard	℃	–10 〜 90
	High temperature ＊1	℃	–10 〜 150
Indicator working pressure	Standard	MPa	0.3
	High pressure	MPa	0.7
Cracking pressure	Standard	MPa	0.35
	High pressure	MPa	Non bypass
Allowable differential pressure of filter element	Standard	MPa	0.7
	High pressure	MPa	21.0
Flow direction/Extract direction of filter element			OUT→IN / Downward

Inner diameter			03A-2	03A-3	04A-2	04A-3	06A-2	06A-3
Standard flow rate ☆		ℓ /min	50	55	55	60	100	110
Main material	Body		FCD					
	Lower cover		Carbon steel					
Coating			Protective film treatment					
Weight		kg	6.3	7.4	6.3	7.4	6.4	7.5

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

★ Please prepare and use bonded seals when piping.

MODEL CODE

〈Model code example〉

F – 3501 – 06A – 3 – 3C – I V
(❶ ❷)

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

Code	Inner diameter
03A	G 3/8 (10A)
04A	G 1/2 (15A)
06A	G 3/4 (20A)

Case length	
Code	2
	3

Code	Filtration rating
C-Fiber	
3C	3 μm
8C	8 μm
25C	25 μm
High pressure C-Fiber	
3CH	3 μm
8CH	8 μm
25CH	25 μm
Paper	
10U	10 μm
20U＊2	20 μm
40U＊2	40 μm

Code	Filtration rating
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh

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

Code	Option
❶ Indicator	
Blank	Closing plug
I	Visual type
E	Electric contact type
D	Electric contact type (Micro capacity)

❷ Relief valve ＊3	
K	Non
V	Relief valve

＊1 Sealing parts: FKM, only for wire gauze element, indicator and relief valve are not available (Max oil temperature is visual type: 130℃ , electric contact type: 90℃)
＊2 Not available for water-glycol based oil and high water based fluid ＊3 Relief valve is not available if selecting high pressure element

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

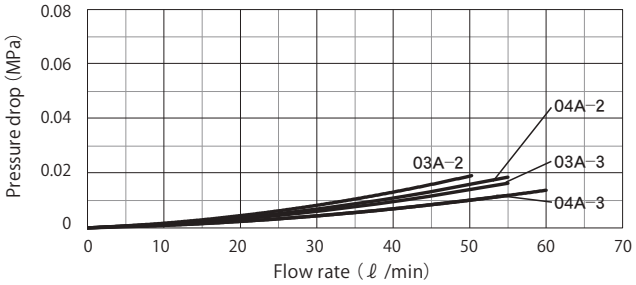
・Estimate pressure drop of filter assembly by following equation if required condition is different:

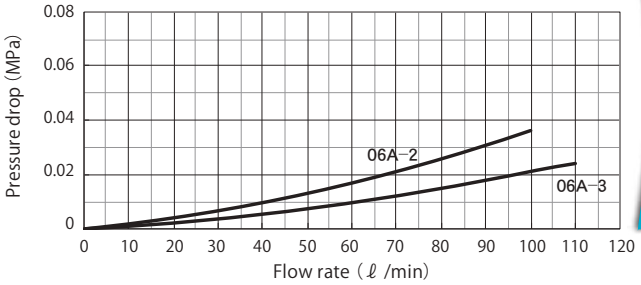
$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

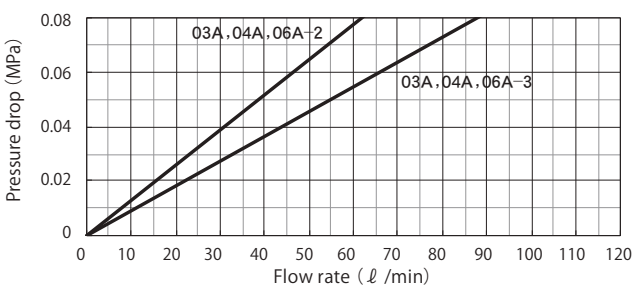
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

① Pressure drop of filter housing

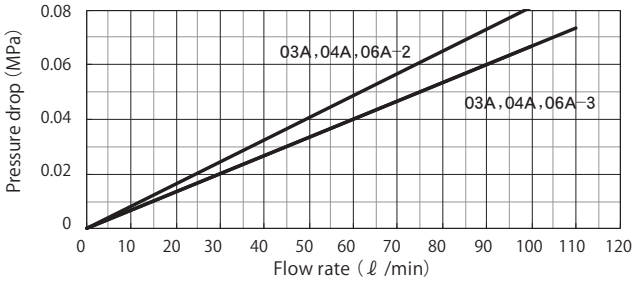




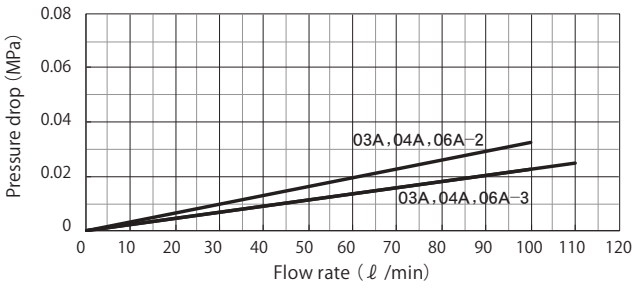
② Pressure drop of filter element



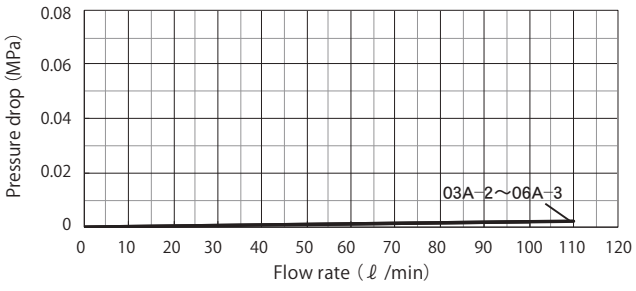
3C
3μm



8C
8μm



10U
10μm

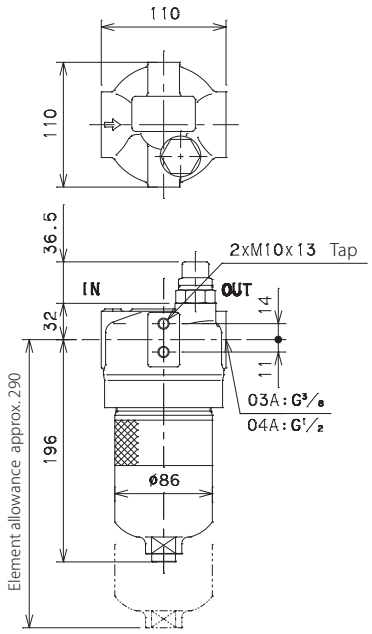


150W
150Mesh*1

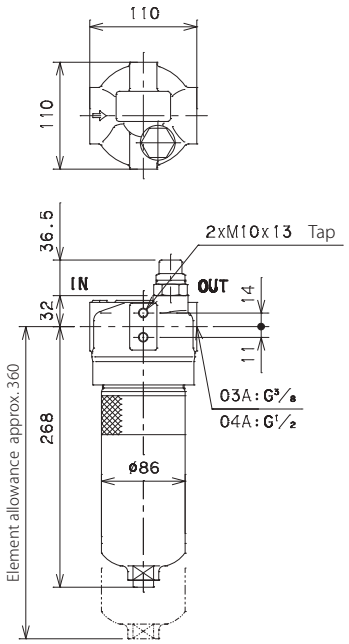
＊1 Pressure drop of wire gauze element is described with one line since the value is low and there is no difference at each filter size.

3501-03A,04A-2-I□

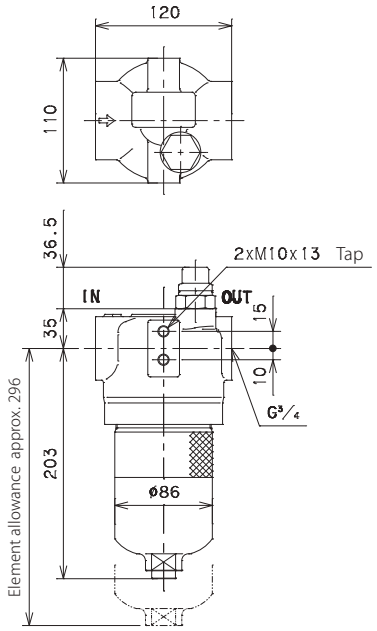
I : Visual type indicator



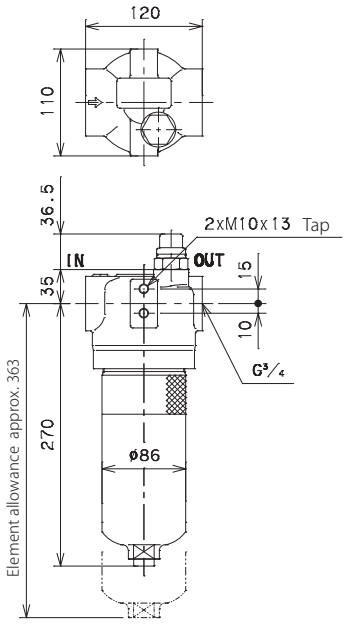
3501-03A,04A-3-I□



3501-06A-2-I□

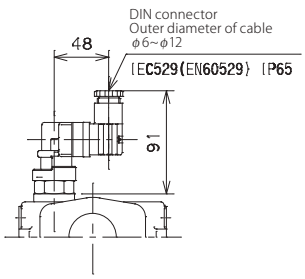


3501-06A-3-I□

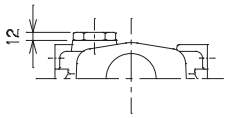


Differential pressure type indicator part

＊Common at all size



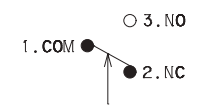
E,D : Electric contact type indicator
3501-□□-□-□□-E,D□



Closing plug
3501-□□-□-□□- _□

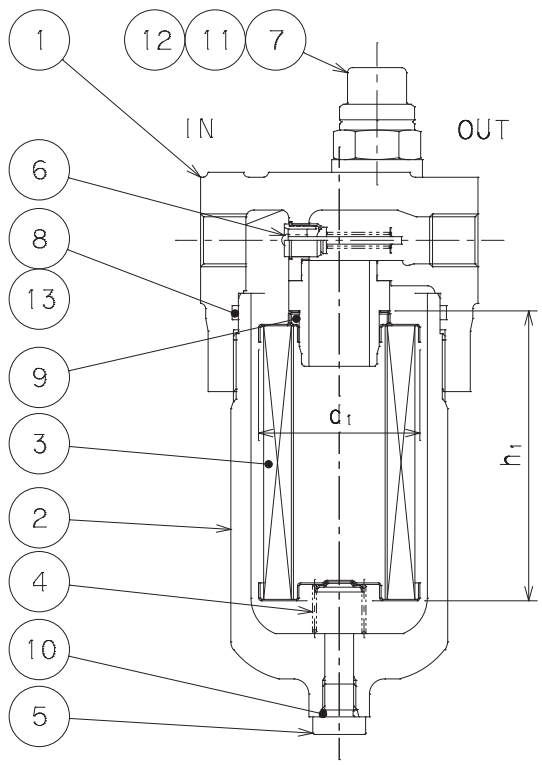
Model code	Working pressure(MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
IF-3	0.2	0.3	
IF-7		0.7	
EF-3		0.3	0.3
EF-3D			
EF-7		0.7	0.7
EF-7D			

〈Micro switch specification〉

Model code	Rated capacity		Contact diagram : 1C
EF-3 EF-7	Resistance load	3A,250V AC	
		3A,30V DC	
	Inductive load	2A,250V AC	
		2A,30V DC	
EF-3D EF-7D	Micro capacity	100mA,125V AC	
		100mA,30V DC	

★ IF-7 and EF-7(D) are for High pressure element.

CROSS SECTION



PARTS LIST

No.	Item	Qty
1	Body	1
2	Lower cover	1
3	Element	1
4	Spring	1
5	Drain plug	1
6	Relief valve	1
7	Indicator	1
8	O-ring	1
9	O-ring	1
10	O-ring	1
11	O-ring	1
12	O-ring	1
13	Backup ring	1

ELEMENT SIZE

Element Model code	Size(mm)			Weight*1 (kg)
	φd1	h1		
			High pressure	
P-3501-2	64	115.0	115.3	0.22
P-3501-3		182.0	182.3	0.32

SEALING PARTS LIST

No.	8	9	10	11	12	13	Item code of sealing parts set *3				
Standard*2 / Model code	JIS B2401 1B	JIS B2401 1A	JIS B2401 1B		JIS B2401 1A	JIS B2407 T3	Material	SP No.:8～10, 13	SP-H No.:8～10, 13	SA No.:8～13	SA-H No.:8～13
3501-03A,04A,06A	G80	P32*4	P11	P18	P14	For G80	NBR	SSF000105	SSF000109	SSF000102	SSF000106
							FKM	SSF000472	SSF000479	SSF000469	SSF000473

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P – **F** – **3501** – **3** – **3C**

("P" represents filter element)

Fluid type

Case length	
Code	2
	3

Filtration rating

Sealing parts set 〈Model code example〉

SA – **F** – **3501** – **06A** – **H**

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

Fluid type

Inner diameter

Code	Filtration rating
Blank	All models except below
H	3CH, 8CH, 25CH

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

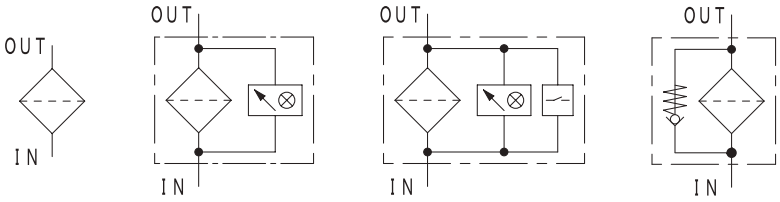
★ Refer to the MODEL CODE table on the previous page for code selection.

＊1 Weight of "Paper" element ＊2 Standard for NBR. For other material, conform to the standard.
＊3 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.
＊4 Backup ring (P32) is attached for high pressure element (JIS B2407.T3)

T-type Base Filter for high pressure line

Characteristics

- **Element size is selectable depending on flow rate and contaminant amount**
- **Clogging indicator and relief valve are selectable as an option**
- **High pressure element of allowable differential pressure 21MPa is available (standard: 0.7MPa)**
- **Element of SH can be used in common with GC model.**
- **Pipe connection type is "G Thread" and "Flange" (option: companion flange)**



Oil filter | Visual type indicator | Electric contact type indicator | Relief valve

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

SPECIFICATION

Max working pressure		MPa	35.0
Repetition durability test			0~35.0MPa x10^7 times
Working temperature	Standard	℃	–10 ~ 90
	High temperature *1	℃	–10 ~ 150
Indicator working pressure	Standard	MPa	0.3
	High pressure	MPa	0.7
Cracking pressure	Standard	MPa	0.35
	High pressure	MPa	Non bypass
Allowable differential pressure of filter element	Standard	MPa	0.7
	High pressure	MPa	21.0
Flow direction/Extract direction of filter element			OUT→IN / Downward

Inner diameter			08Z-3	08Z-4	08Z-6	12Z-3	12Z-4	12Z-6
Standard flow rate ☆		ℓ /min	193	225	250	260	335	400
Main material	Body		FCD					
	Lower case		Steel pipe					
Coating			Protective film treatment					
Weight *2		kg	13	15	20	13	15	20

☆Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

F – SH – 08Z – 6 – 3C – E V N
(❶ ❷ ❸)

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

Code	Inner diameter	
08Z	G1	(25A)
12Z	G1 1/2	(40A)

Case length	
Code	3
	4
	6

Code	Filtration rating
C-Fiber	
3C	3 μm
8C	8 μm
25C	25 μm
High pressure C-Fiber	
3CH	3 μm
8CH	8 μm
25CH	25 μm
Paper	
10U	10 μm
20U *3	20 μm
40U *3	40 μm

Code	Filtration rating
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh

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

Code	Option
❶ Indicator	
Blank	Closing plug
I	Visual type
E	Electric contact type
D	Electric contact type (Micro capacity)
❷ Relief valve *4	
K	Non
V	Relief valve
❸ Companion flange	
Blank	Non
N	Companion flange

＊1 Sealing parts: FKM, only for wire gauze element, indicator and relief valve are not available (Max oil temperature is visual type: 130℃ , electric contact type: 90℃)
＊2 Weight without companion flange ＊3 Not available for water-glycol based oil and high water based fluid ＊4 Relief valve is not available if selecting high pressure element

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

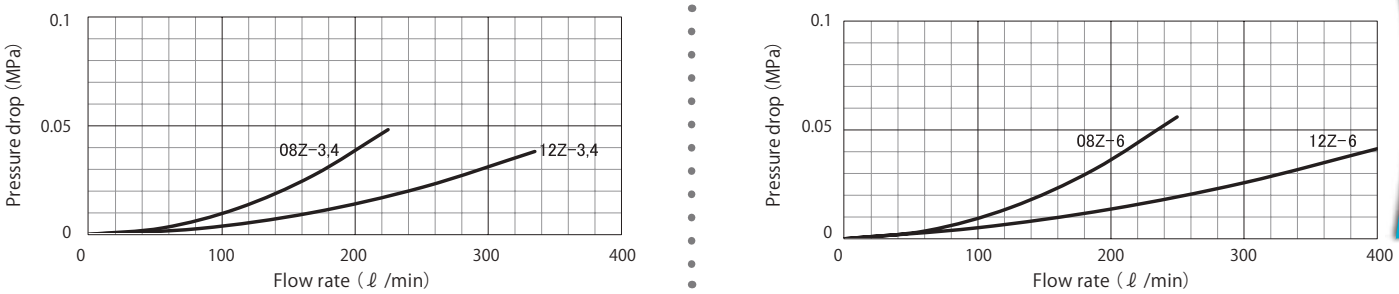
・Estimate pressure drop of filter assembly by following equation if required condition is different:

$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

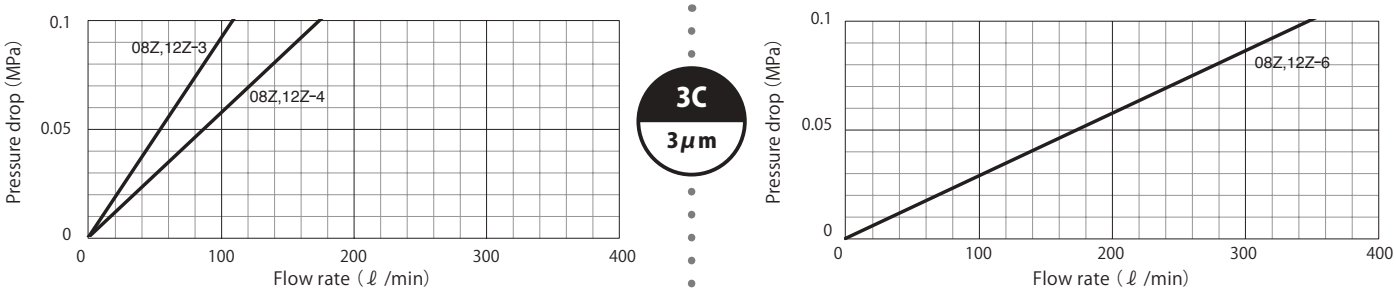
$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86,kinematic viscosity of 32}$$

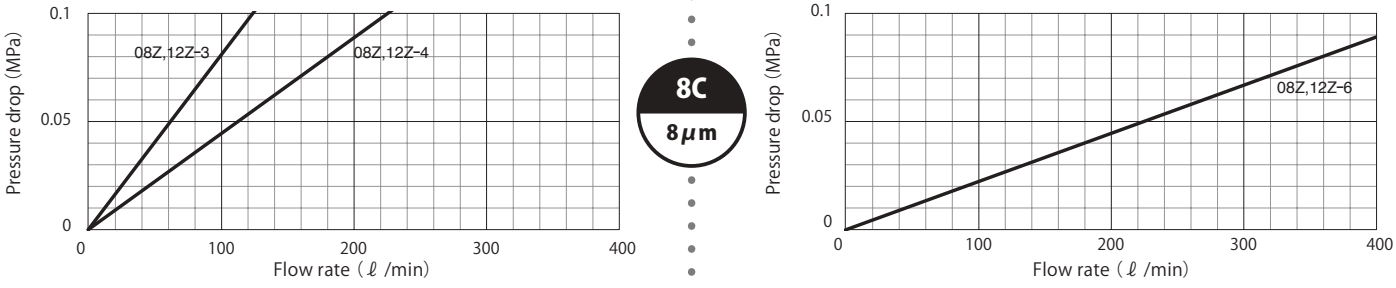
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

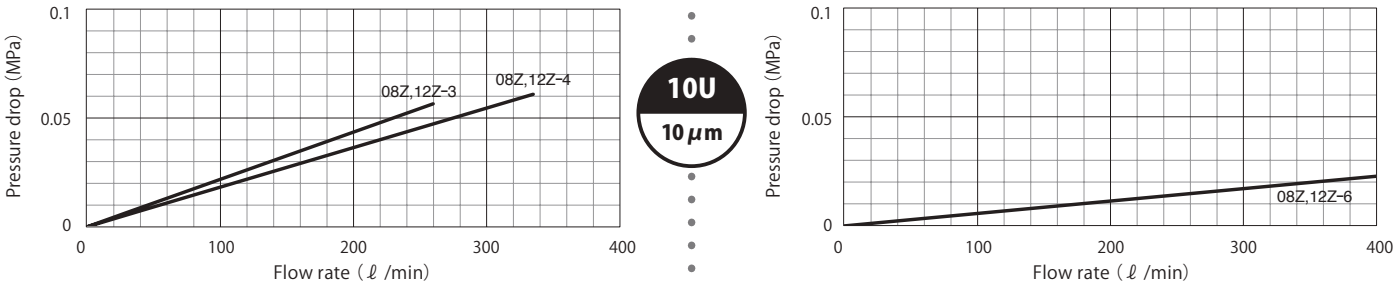
① Pressure drop of filter housing

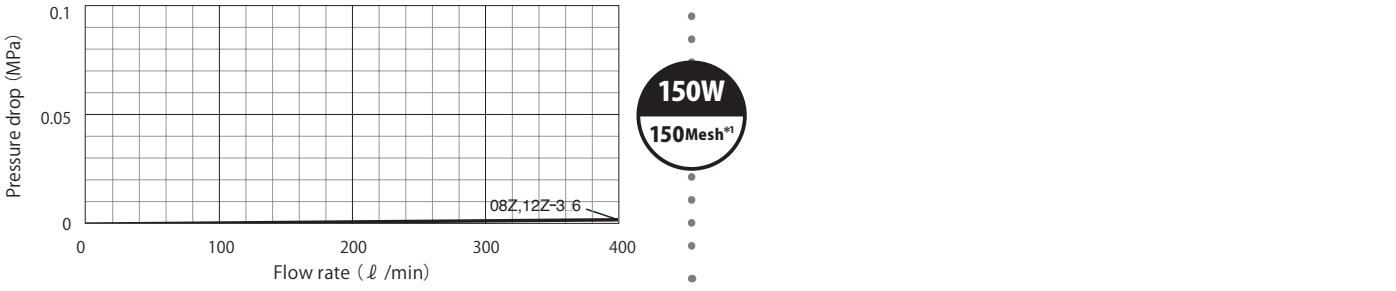


② Pressure drop of filter element





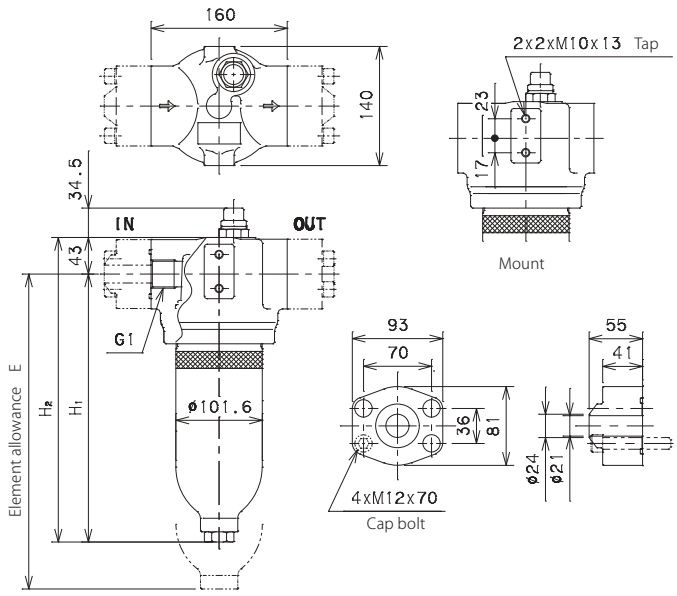




＊1 Pressure drop of wire gauze element is described with one line since the value is low and there is no difference at each filter size.

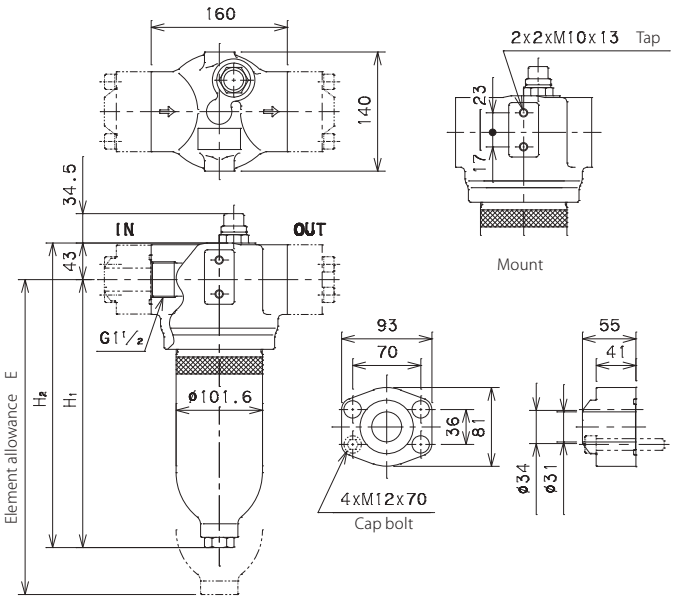
SH-08Z-□-□□-I□□

I : Visual type indicator



Companion flange
SH-08Z-□-□□-□□N

SH-12Z-□-□□-I□□



Companion flange
SH-12Z-□-□□-□□N

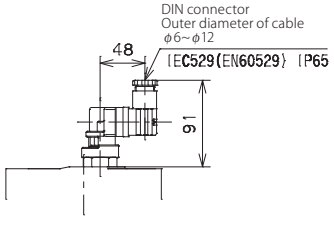
SH-08Z,12Z-□-□□-□□□

〈Dimension〉

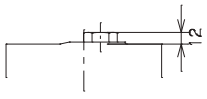
Model code	H_1	H_2	E
SH-08Z,12Z-3	224	267	360
SH-08Z,12Z-4	315	358	540
SH-08Z,12Z-6	535	578	980

Differential pressure type indicator part

＊Common at all size



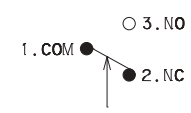
E,D : Electric contact type indicator
SH-□□Z-□-□□-E,D□□



Closing plug
SH-□□Z-□-□□-_□□

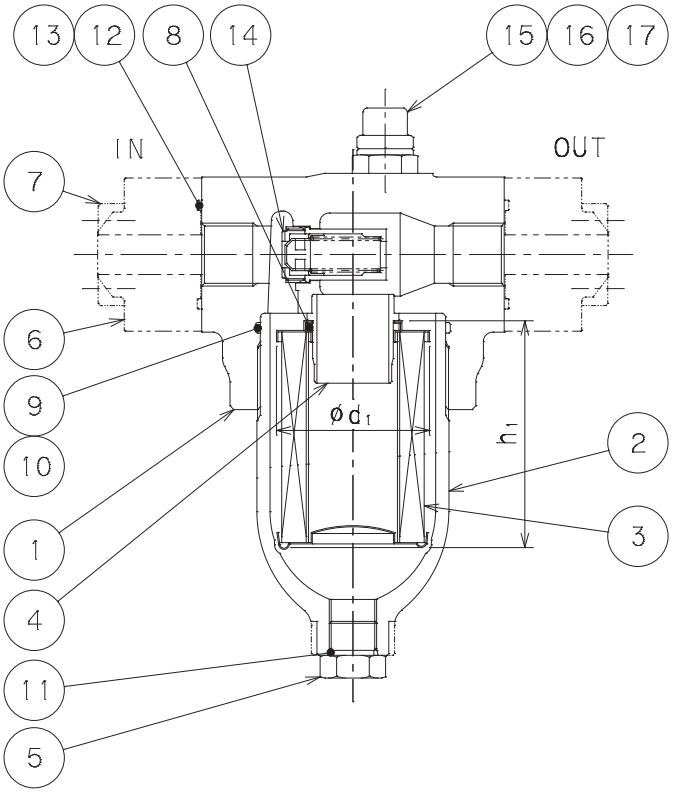
Model code	Working pressure(MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
IF-3	0.2	0.3	
IF-7		0.7	
EF-3		0.3	0.3
EF-3D			
EF-7		0.7	0.7
EF-7D			

〈Micro switch specification〉

Model code	Rated capacity		Contact diagram : 1C
EF-3 EF-7	Resistance load	3A,250V AC	
		3A,30V DC	
	Inductive load	2A,250V AC	
		2A,30V DC	
EF-3D EF-7D	Micro capacity	100mA,125V AC	
		100mA,30V DC	

★ IF-7 and EF-7(D) are for High pressure element.

CROSS SECTION



PARTS LIST

No.	Item	Qty
1	Body	1
2	Lower case	1
3	Element	1
4	Inlet	1
5	Drain plug	1
6	Companion flange	2
7	Cap bolt	8
8	O-ring	1
9	O-ring	1
10	Backup ring	1
11	O-ring	1
12	O-ring	2
13	Backup ring	2
14	Relief valve	1
15	Indicator	1
16	O-ring	1
17	O-ring	1

ELEMENT SIZE

Element Model code	Size(mm)				Weight*1 (kg)
	φd1	h1			
			High mesh *	High pressure	
P-SH-3	81	120	115	119	0.33
P-SH-4		211	206	208	0.52
P-SH-5		330	325	329	0.76
P-SH-6		431	426	428	1.16

＊Filtration rating：5UW、10UW、20UW　＊Common to SH、GC、4201

SEALING PARTS LIST

Model code／Standard*2 \ No.		8		9	10	11	12	13	16	17
		AS568	JIS B2401 1A	JIS B2401 1B		JIS B2401 1B		SUN-4B	JIS B2401 1B	JIS B2401 1A
SH-08Z,10Z,12Z	O-ring	131	P42*3	G100		P22	G50		P18	P14
	Backup ring	t1.25xφ47.2xφ42.9*4			t1.5xφ103xφ98			G50 用		

Model code	Item code of sealing parts set*5									
	Material	SP No.：8～11	SP-H No.：8～11	SP-UW No.：8～11	SA No.：8～11, 16,17	SA-N No.：8～13, 16,17	SA-H No.：8～11, 16,17	SA-HN No.：8～13, 16,17	SA-UW No.：8～11, 16,17	SA-UWN No.：8～13, 16,17
SH-08Z,10Z,12Z	NBR	SSF000112	SSF000115	SSF000118	SSF000110	SSF000111	SSF000113	SSF000114	SSF000116	SSF000117
	FKM	SSF000479	SSF000482	SSF000485	SSF000477	SSF000478	SSF000480	SSF000481	SSF000483	SSF000484

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P – **F** – **SH** – **6** – **3C**

("P" represents filter element)

Fluid type

Case length	
Code	3
	4
	5
	6

Filtration rating

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

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

Sealing parts set 〈Model code example〉

SA – **F** – **SH** – **08Z** – **H** – **N**

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

Fluid type

Inner diameter

Code	Filtration rating
Blank	All models except below
H	3CH, 8CH, 25CH
UW	5UW,10UW,20UW

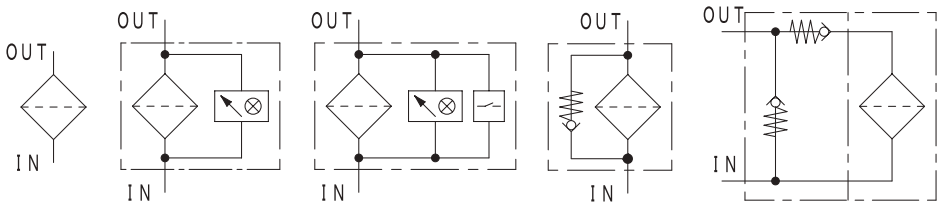
Code	Companion flange
Blank	Non
N	Companion flange (Only for SA)

＊1　Weight of "Paper" element　＊2　Standard for NBR. For other material, conform to the standard.
＊3　O-ring is different if selecting an element: 5UW, 10UW, 20UW　＊4　Backup ring is attached for high pressure element
＊5　Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.

Manifold type Filter with built-in check valve* *option

Characteristics

- **Directly installable on manifold block *1**
- **Manifold type reverse flow valve is available for reciprocating motion circuit**
- **Element size is selectable depending on flow rate and contaminant amount**
- **Clogging indicator and relief valve are selectable as an option**
- **Element of GM can be used in common with TM model.**



Oil filter | Visual type indicator | Electric contact type indicator | Relief valve | Reverse flow valve

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

SPECIFICATION

Max working pressure		MPa	21.0
Repetition durability test			0 ~ 21.0MPa x10^{7}times
Working temperature	Standard	℃	–10 ~ 90
	High temperature *2	℃	–10 ~ 150
Indicator working pressure	Standard	MPa	0.3
	High pressure	MPa	0.7
Cracking pressure	Standard	MPa	0.35
	High pressure	MPa	Non bypass
Allowable differential pressure of filter element	Standard	MPa	0.7
	High pressure	MPa	21.0
Flow direction/Extract direction of filter element			OUT → IN / Upward

Inner diameter		04Z-2	04Z-3	Reverse flow valve
Standard flow rate ☆ ℓ /min		25	30	—
Main material	Body	FCD		—
	Shell	STPT		
	Cover	FCD		
	Block	—		Carbon steel
Coating		Protective film treatment		
Weight kg		4.2	5.0	2.1

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

F – GM – 04Z – 2 – 3C – I V D P

❶ ❷ ❸ ❹

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

Code	Inner diameter
04Z	15A Equivalent

Case length	
Code	2
	3

Code	Filtration rating	Code	Filtration rating
C-Fiber		Wire gauze	
3C	3 μm	5UW	5 μm
8C	8 μm	10UW	10 μm
25C	25 μm	20UW	20 μm
High pressure C-Fiber		40UW	40 μm
3CH	3 μm	50UW	50 μm
8CH	8 μm	200W	200Mesh
25CH	25 μm	150W	150Mesh
Paper		100W	100Mesh
10U	10 μm	60W	60Mesh
20U *3	20 μm		
40U *3	40 μm		

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

Code	Option
❶ Indicator	
Blank	Closing plug
I	Visual type
E	Electric contact type
D	Electric contact type (Micro capacity)
❷ Relief valve *4	
K	Non
V	Relief valve
❸ Reverse flow valve	
Blank	Non
D	Reverse flow valve
❹ Knock pin	
Blank	Non
P	Knock pin

＊1 Surface roughness of manifold should be lower than Ra1.6 ＊2 Sealing parts: FKM, only for wire gauze element, indicator and relief valve are not available (Max oil temperature is visual type: 130℃ , electric contact type: 90℃) ＊3 Not available for water-glycol based oil and high water based fluid ＊4 Relief valve is not available if selecting high pressure element

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

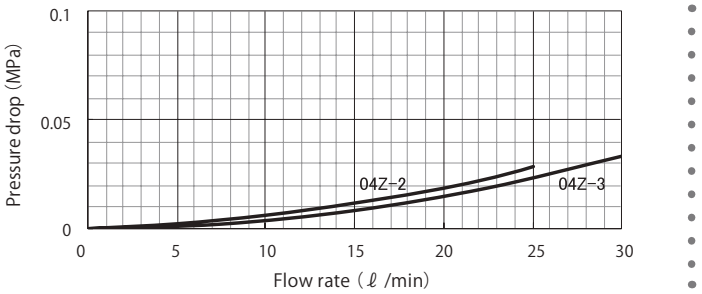
・Estimate pressure drop of filter assembly by following equation if required condition is different:

$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

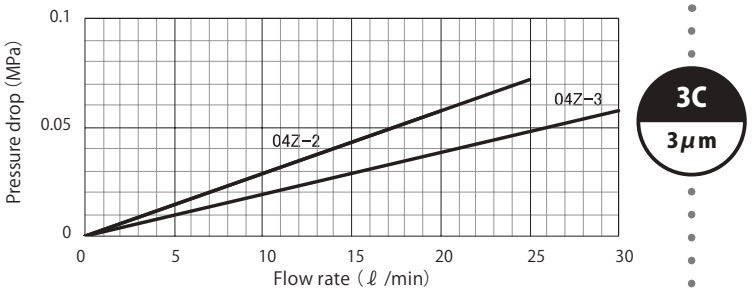
$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

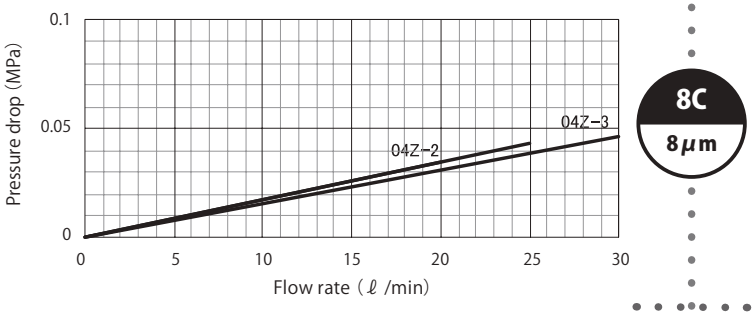
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

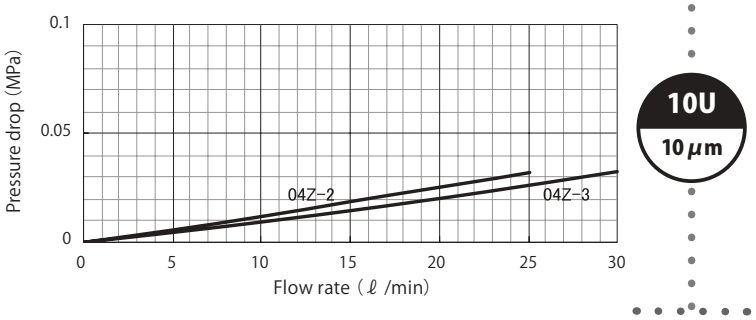
① Pressure drop of filter housing

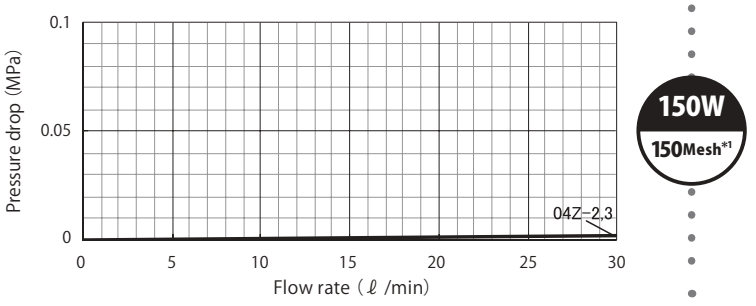


② Pressure drop of filter element





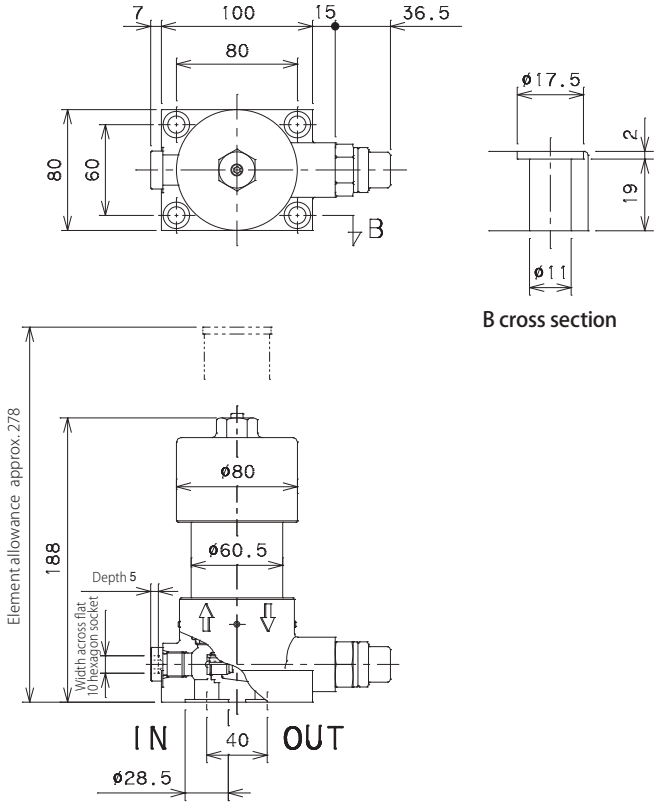




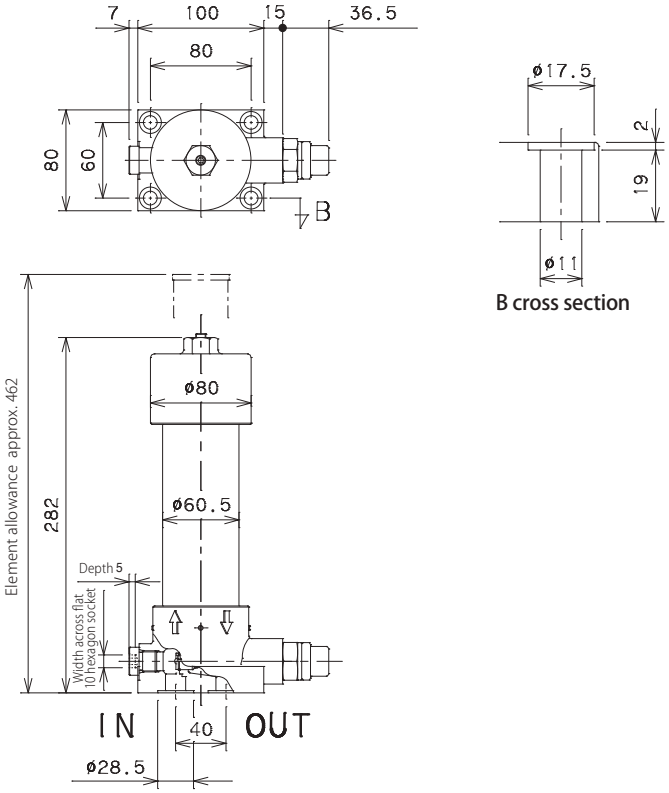
＊1 Pressure drop of wire gauze element is described with one line since the value is low and there is no difference at each filter size.

GM-04Z-2-□□-I□□□

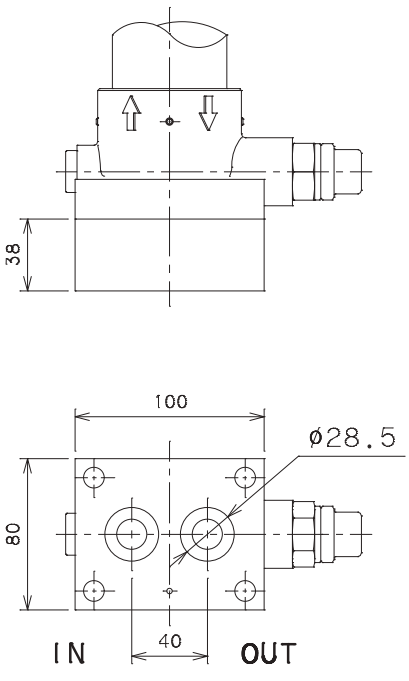
I : Visual type indicator



GM-04Z-3-□□-I□□□



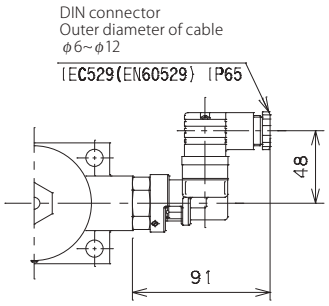
GM-04Z-□-□□-□□D□



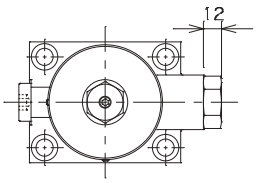
D : Reverse flow valve
GM-04Z-□-□□-□□D□

Differential pressure type indicator part

∗ Common at all size



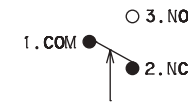
E,D : Electric contact type indicator
GM-04Z-□-□□-E,D□□□



Closing plug
GM-04Z-□-□□-_□□□

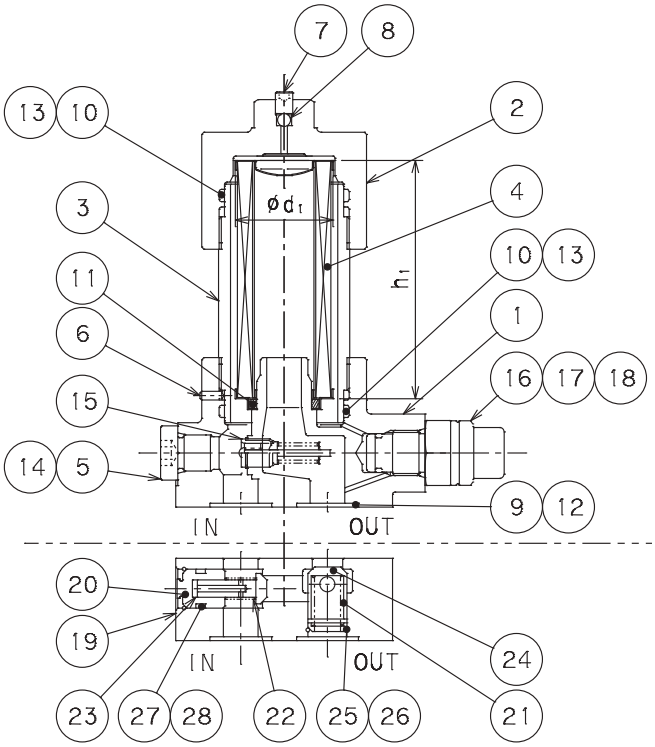
Model code	Working pressure(MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
IF-3	0.2	0.3	
IF-7		0.7	
EF-3		0.3	0.3
EF-3D			
EF-7		0.7	0.7
EF-7D			

〈Micro switch specification〉

Model code	Rated capacity		Contact diagram : 1C
EF-3 EF-7	Resistance load	3A,250V AC	
		3A,30V DC	
	Inductive load	2A,250V AC	
		2A,30V DC	
EF-3D EF-7D	Micro capacity	100mA,125V AC	
		100mA,30V DC	

★ IF-7 and EF-7(D) are for High pressure element.

CROSS SECTION



PARTS LIST

No.	Item	Qty
1	Body	1
2	Cover	1
3	Shell	1
4	Element	1
5	Drain plug	1
6	Cap bolt (set screw)	2
7	Cap bolt (air vent)	1
8	Steel ball	1
9	O-ring	2*1
10	O-ring	2
11	O-ring	1
12	Backup ring	2*1
13	Backup ring	2
14	O-ring	1
15	Relief valve	1
16	Indicator	1
17	O-ring	1
18	O-ring	1

No.	Item	Qty
19	Reverse flow block	1
20	Plug	1
21	Spring	1
22	Spring	1
23	Spool	1
24	Spool	1
25	Spring holder	1
26	Stop ring	2
27	O-ring	1
28	Backup ring	1

ELEMENT SIZE

Element Model code	Size(mm)				Weight*2 (Kg)
	φd1			h1	
		High mesh*	High pressure		
P-GM-2	45.2	46.0	45.3	115	0.32
P-GM-3				209	0.52

*Filtration rating : 5UW、10UW、20UW　　*Common to TM、GM

SEALING PARTS LIST

No.	9	10	11	12	13	14	17	18	27	28	Item code of sealing parts set*4			
Standard*3 / Model code	JIS B2401 1B	JIS B2401 1A	AS568	SUN-4B	JIS B2407 T3	JIS B2401 1B	JIS B2401 1B	JIS B2401 1A	JIS B2401 1A	JIS B2407 T2	Material	SP*5 No. : 10,11,13, 14	SA No. : 9 ～ 14, 17,18	SA-D No. : 9 ～ 14, 17,18,27,28
GM-04Z	P22	G55	214	For P22	For G55	P14	P18	P14	P14	For P14	NBR	SSF000121	SSF000119	SSF000120
											FKM	SSF000488	SSF000486	SSF000487

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P	–	F	–	GM	–	2	–	3C

("P" represents filter element)

Fluid type

Case length	
Code	2
	3

Filtration rating

Sealing parts set 〈Model code example〉

SA	–	F	–	GM	–	04Z	–	D

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

Fluid type

Code	Reverse flow valve
Blank	Non
D	Reverse flow valve

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

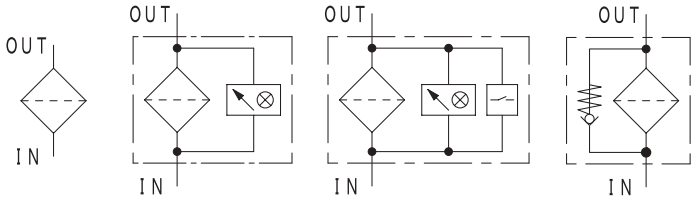
★ Refer to the MODEL CODE table on the previous page for code selection.

＊1　O-rings are attached 4 pcs each for the model with the (optional) reverse flow valve.　＊2　Weight of "Paper" element
＊3　Standard for NBR. For other material, conform to the standard.
＊4　Sealing parts are available as "Sealing parts set" only. We do not provide single part individually. ＊5　Part #10 and #13 are only for the cover side.

Manifold type Compact Filter

Characteristics

- **Directly installable on manifold block** *1
- **Regulation of installation surface (JOHS121)**
  GF-A-06: P-AH-08-2-A
- **Slimed to the utmost limit by eliminating drain plug port** *2
- **Clogging indicator (option) on the top enables to improve visibility**
- **Relief valve is available as an option**



Oil filter | Visual type indicator | Electric contact type indicator | Relief valve

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

SPECIFICATION

Max working pressure		MPa	25.0
Repetition durability test			0 ~ 25.0MPa x10^7times
Working temperature	Standard	℃	–10 ~ 90
	High temperature *3	℃	–10 ~ 150
Indicator working pressure	Standard	MPa	0.3
	High pressure	MPa	0.7
Cracking pressure	Standard	MPa	0.35
	High pressure	MPa	Non bypass
Allowable differential pressure of filter element	Standard	MPa	0.7
	High pressure	MPa	21.0
Flow direction/Extract direction of filter element			OUT → IN / Upward

Inner diameter			06-2	06-3	08-2	08-3
Standard flow rate ☆		ℓ /min	90	110	200	230
Main material	Body		FCD			
	Shell		Carbon steel			
	Cover		Carbon steel			
Coating			Protective film treatment			
Weight		kg	7.1	8.4	12.1	14.8

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

F – GF – A – 08 – 2 – 3C – I V
❶ ❷

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

Code	Inner diameter
06	20A Equivalent
08	25A Equivalent

Case length	
Code	2
	3

Code	Filtration rating
C-Fiber	
3C	3 μm
8C	8 μm
25C	25 μm
High pressure C-Fiber	
3CH	3 μm
8CH	8 μm
25CH	25 μm
Paper	
10U	10 μm
20U *4	20 μm
40U *4	40 μm

Code	Filtration rating
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh

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

Code	Option
❶ Indicator	
Blank	Closing plug
I	Visual type
E	Electric contact type
D	Electric contact type (Micro capacity)
❷ Relief valve *5	
K	Non
V	Relief valve

＊1 Surface roughness of manifold should be lower than Ra1.6 ＊2 Drainlet should be prepared on manifold block ＊3 Sealing parts: FKM, only for wire gauze element, indicator and relief valve are not available (Max oil temperature is visual type: 130℃ , electric contact type: 90℃) ＊4 Not available for water-glycol based oil and high water based fluid ＊5 Relief valve is not available if selecting high pressure element

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

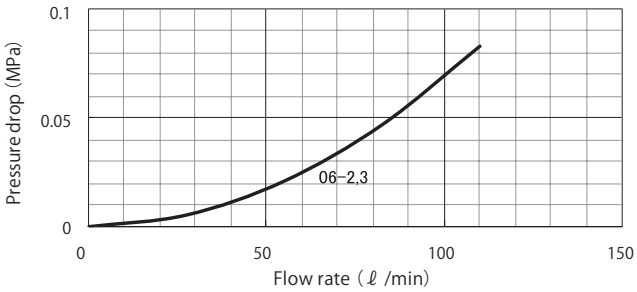
・Estimate pressure drop of filter assembly by following equation if required condition is different:

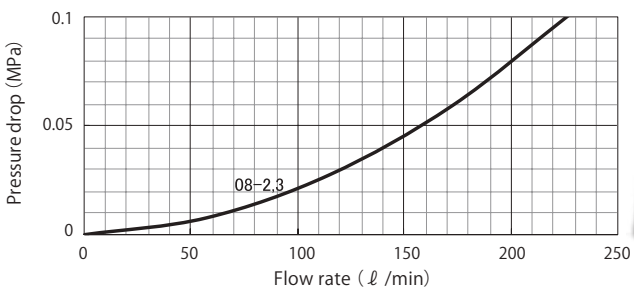
$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

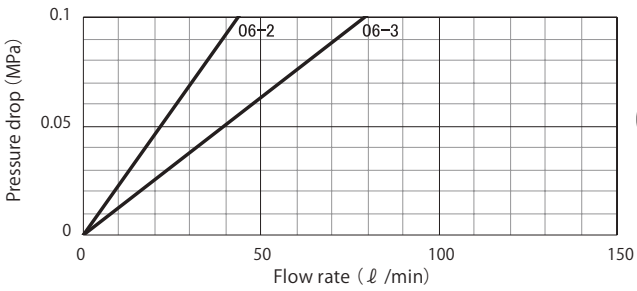
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

① Pressure drop of filter housing

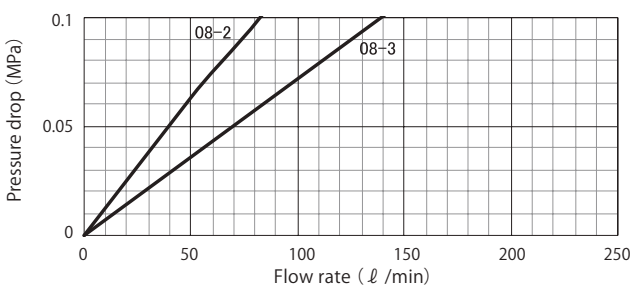


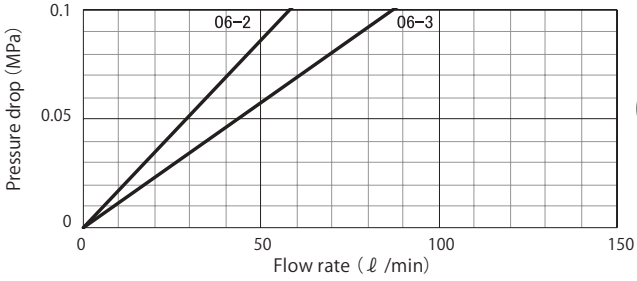


② Pressure drop of filter element

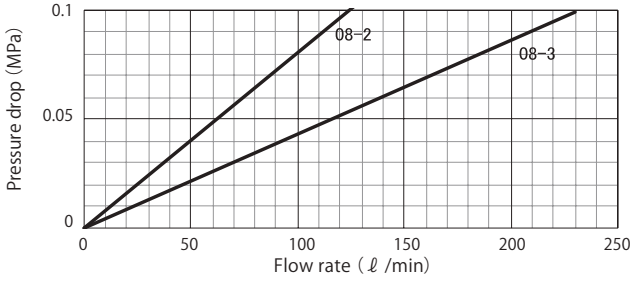


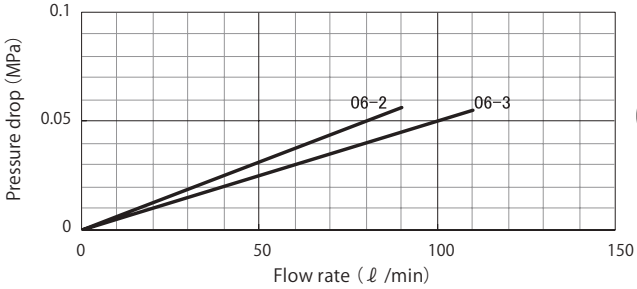
3C
3μm



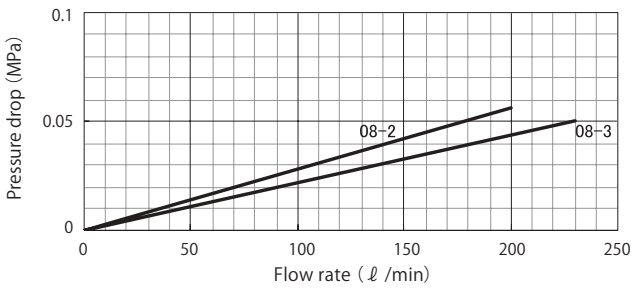


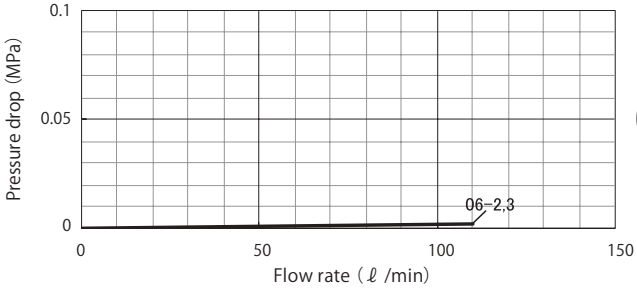
8C
8μm



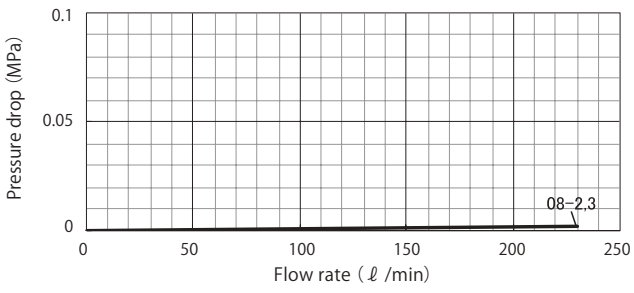


10U
10μm





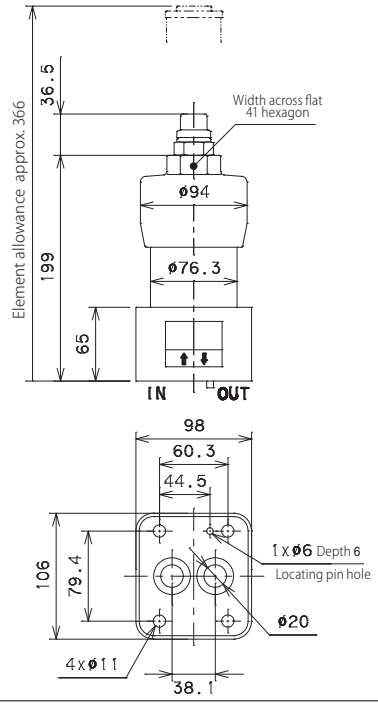
150W
150Mesh*1



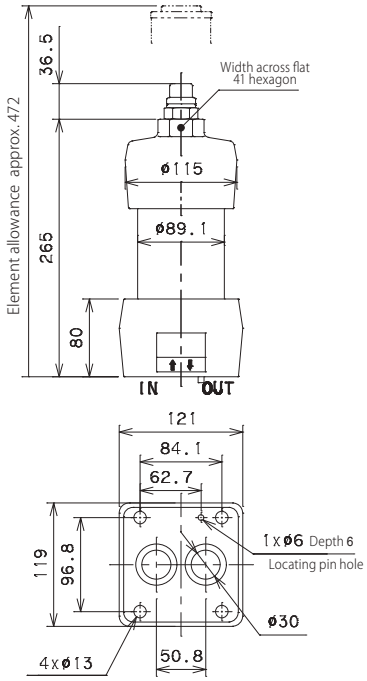
＊1 Pressure drop of wire gauze element is described with one line since the value is low and there is no difference at each filter size.

GF-A-06-2-□□-I□

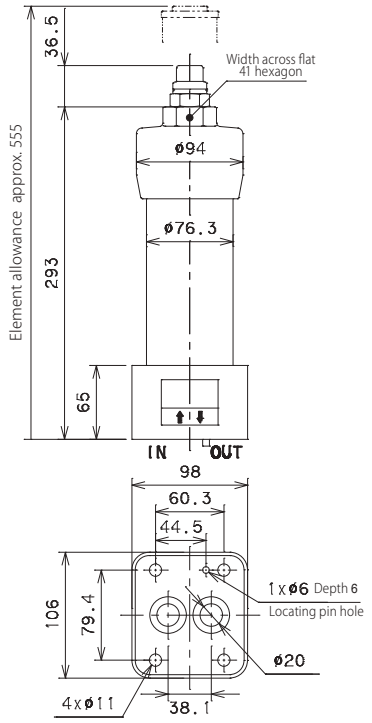
I : Visual type indicator



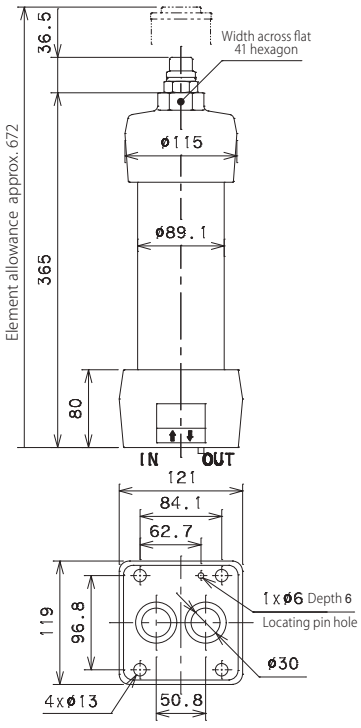
GF-A-08-2-□□-I□



GF-A-06-3-□□-I□

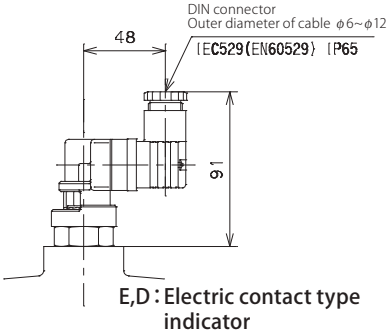


GF-A-08-3-□□-I□

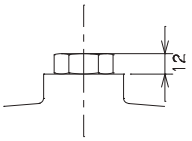


Differential pressure type indicator part

＊Common at all size



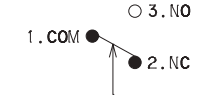
E,D : Electric contact type indicator
GF-A-□□-□-□□-E,D□



Closing plug
GF-A-□□-□-□□-_□

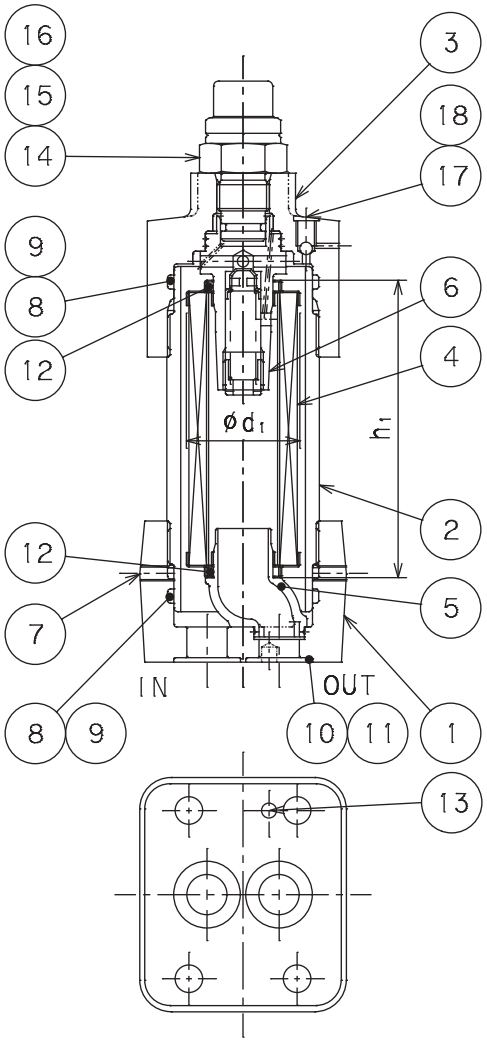
Model code	Working pressure(MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
IF-3	0.2	0.3	
IF-7		0.7	
EF-3		0.3	0.3
EF-3D			
EF-7		0.7	0.7
EF-7D			

〈Micro switch specification〉

Model code	Rated capacity		Contact diagram : 1C
EF-3 EF-7	Resistance load	3A,250V AC	
		3A,30V DC	
	Inductive load	2A,250V AC	
		2A,30V DC	
EF-3D EF-7D	Micro capacity	100mA,125V AC	
		100mA,30V DC	

★ IF-7 and EF-7(D) are for High pressure element.

CROSS SECTION



PARTS LIST

No.	Item	Qty
1	Body	1
2	Shell	1
3	Cover	1
4	Element	1
5	Inlet	1
6	Relief valve	1
7	Set Screw	2
8	O-ring	2
9	Backup ring	2
10	O-ring	2
11	Backup ring	2
12	O-ring	2
13	Spring Pin	1
14	Indicator	1
15	O-ring	1
16	O-ring	1
17	Set Screw	1
18	Steel ball	1

ELEMENT SIZE

Element Model code	Size(mm) φd1	Size(mm) φd1 High pressure	Size(mm) h1	Weight*1 (kg)
P-GF-A-03-2	45	45.3	118	0.12
P-GF-A-03-3			212	0.19
P-GF-A-06-2	50.2	51	118	0.16
P-GF-A-06-3			212	0.26
P-GF-A-08-2	62.2	64	160.6	0.25
P-GF-A-08-3			260.6	0.36

SEALING PARTS LIST

No.	8	9	10	11	12	15	16	Item code of sealing parts set *3				
Standard*2 / Model code	JIS B2401 1A	JIS B2407 T3	JIS B2401 1B	SUN-4B	AS568 / JIS B2401 1A	JIS B2401 1B	JIS B2401 1A	Material	SP No.: 8,9,12 *4	SP-H No.: 8,9,12 *4	SA No.: 8～12, 15,16	SA-H No.: 8～12, 15,16
GF-A-03	G55	For G55	P20	For P20	119	P18	P14	NBR	SSF000696		SSF000122	
								FKM	SSF000880		SSF000489	
GF-A-06	G70	For G70	G25	For G25	119			NBR	SSF000566		SSF000123	
								FKM	SSF000594		SSF000490	
GF-A-08	G80	For G80	G35	For G35	P32*5			NBR	SSF000740	SSF000849	SSF000124	SSF000127
								FKM	SSF000922	SSF001152	SSF000491	SSF000494

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P	–	F	–	GF – A –	08	–	2	–	3C
("P" represents filter element)		Fluid type			Inner diameter		Case length: Code 2 / 3		Filtration rating

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

Sealing parts set 〈Model code example〉

SA	–	F	–	GF – A –	08	–	H
		Fluid type			Inner diameter		

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

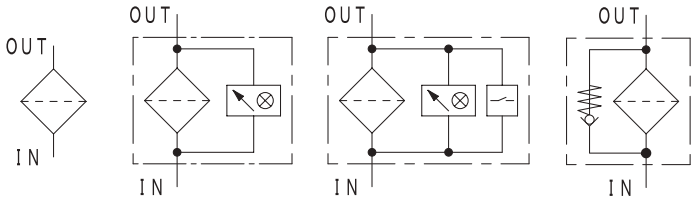
Code	Filtration rating
Blank	All models except below
H	3CH, 8CH, 25CH

＊1 Weight of "Paper" element ＊2 Standard for NBR. For other material, conform to the standard.
＊3 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.
＊4 Part #8 O-ring and #9 Backup ring are only for the cover side (1 pc each). ＊5 Backup ring (P32) is attached for high pressure element (JIS B2407.T3)

Signature Model of Manifold type Filter

Characteristics

- **Applicable to 35MPa that is major for high pressure hydraulic system**
- **Directly installable on manifold block** *1
- **Element size is selectable depending on flow rate and contaminant amount**
- **Install position of clogging indicator (option) is selectable on left/right side**
- **Element of GC can be used in common with SH and 4201 model**



Oil filter | Visual type indicator | Electric contact type indicator | Relief valve

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

SPECIFICATION

Max working pressure		MPa	35.0
Repetition durability test			0 ~ 35.0MPa x10^7 times
Working temperature	Standard	℃	–10 ~ 90
	High temperature *2	℃	–10 ~ 150
Indicator working pressure	Standard	MPa	0.3
	High pressure	MPa	0.7
Cracking pressure	Standard	MPa	0.35
	High pressure	MPa	Non bypass
Allowable differential pressure of filter element	Standard	MPa	0.7
	High pressure	MPa	21.0
Flow direction/Extract direction of filter element			OUT → IN / Upward

Inner diameter		12Z-3	12Z-4	12Z-5	12Z-6
Standard flow rate ☆	ℓ /min	240	300	330	350
Main material	Body	FCD			
	Case	Steel pipe			
	Upper cover	Carbon steel			
Coating		Protective film treatment			
Weight	kg	20	22	24	26

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

F – GC – 12Z – 5 – 3C – RE V P
❶ ❷ ❸

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

Code	Inner diameter
12Z	40A Equivalent

Case length	
Code	3
	4
	5
	6

Code	Filtration rating	Code	Filtration rating
C-Fiber		Wire gauze	
3C	3 μm	5UW	5 μm
8C	8 μm	10UW	10 μm
25C	25 μm	20UW	20 μm
High pressure C-Fiber		40UW	40 μm
3CH	3 μm	50UW	50 μm
8CH	8 μm	200W	200Mesh
25CH	25 μm	150W	150Mesh
Paper		100W	100Mesh
10U	10 μm	60W	60Mesh
20U *4	20 μm		
40U *4	40 μm		

Code	Option
❶ Indicator *5	
Blank	Closing plug
RI	Visual type
LI	
RE	Electric contact type
LE	
RD	Electric contact type (Micro capacity)
LD	
❷ Relief valve *6	
K	Non
V	Relief valve
❸ Knock pin	
Blank	Non
P	Knock pin

＊1 Surface roughness of manifold should be lower than Ra1.6 ＊2 Sealing parts: FKM, only for wire gauze element, indicator and relief valve are not available (Max oil temperature is visual type: 130℃ , electric contact type: 90℃) ＊3 Refrigerant should be specified ＊4 Not available for water-glycol based oil and high water based fluid ＊5 Indicator position: Right/Left is as seen from Inlet side ＊6 Relief valve is not available if selecting high pressure element

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

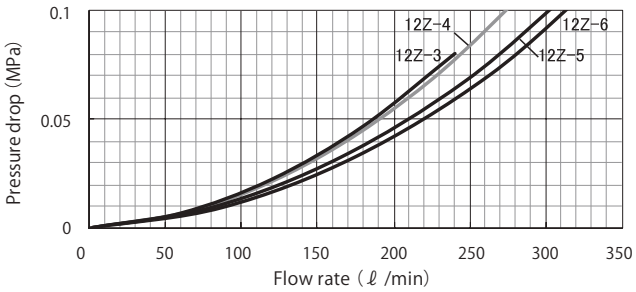
・Estimate pressure drop of filter assembly by following equation if required condition is different:

$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

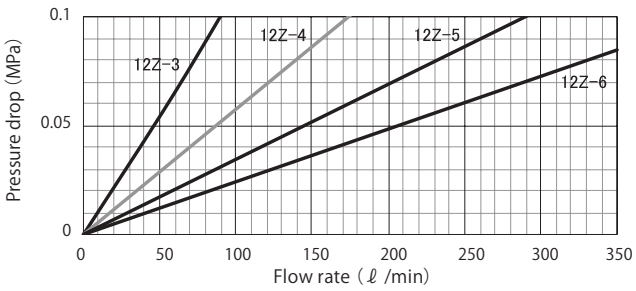
$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

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

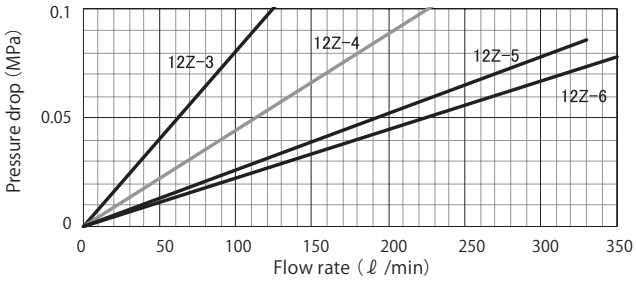
① Pressure drop of filter housing



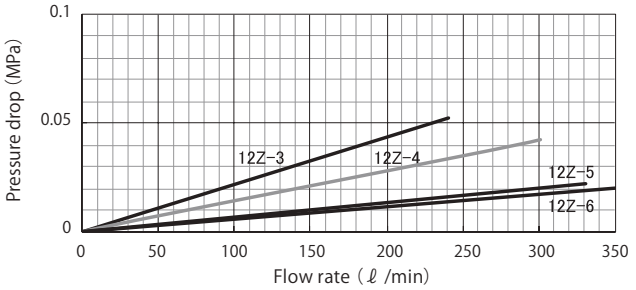
② Pressure drop of filter element



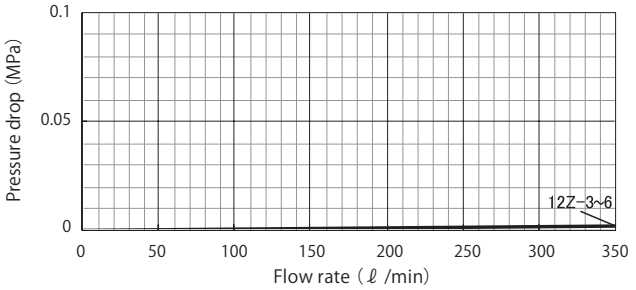
3C
3μm



8C
8μm



10U
10μm

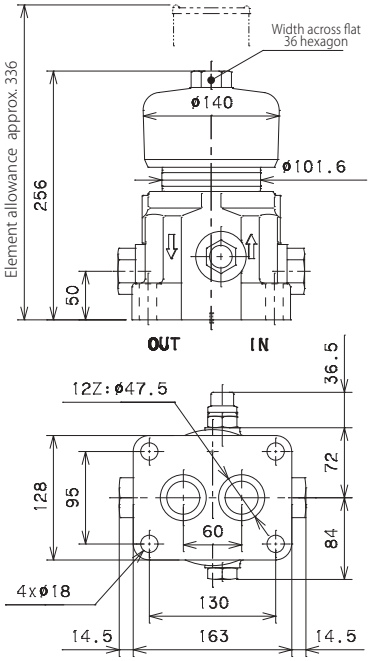


150W
150Mesh*1

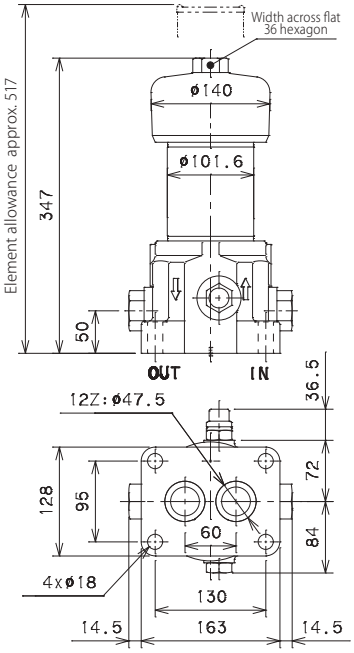
＊1 Pressure drop of wire gauze element is described with one line since the value is low and there is no difference at each filter size.

GC-12Z-3-□□-LI□□

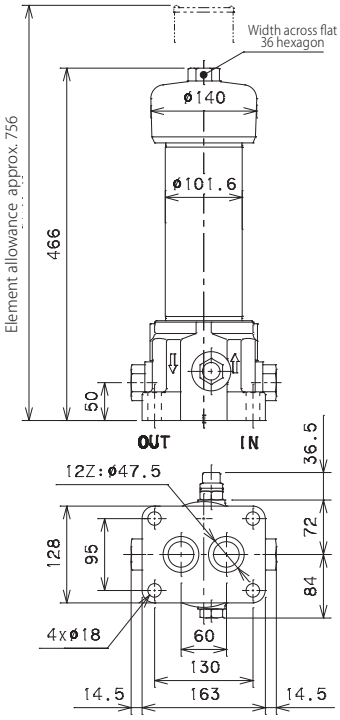
I : Visual type indicator



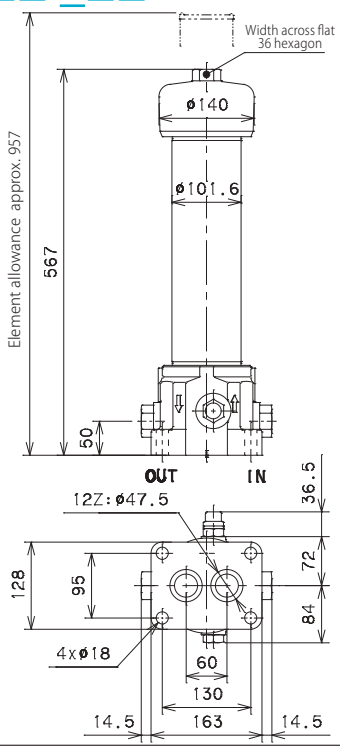
GC-12Z-4-□□-LI□□



GC-12Z-5-□□-LI□□

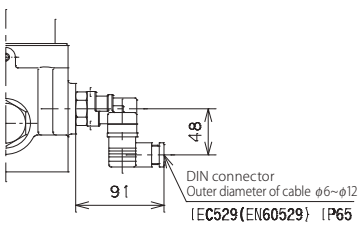


GC-12Z-6-□□-LI□□

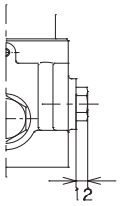


Differential pressure type indicator part

＊Common at all size



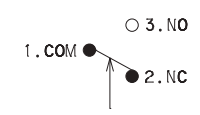
E,D : Electric contact type indicator
GC-12Z-□-□□-□E,D□□



Closing plug
GC-12Z-□-□□-_□□

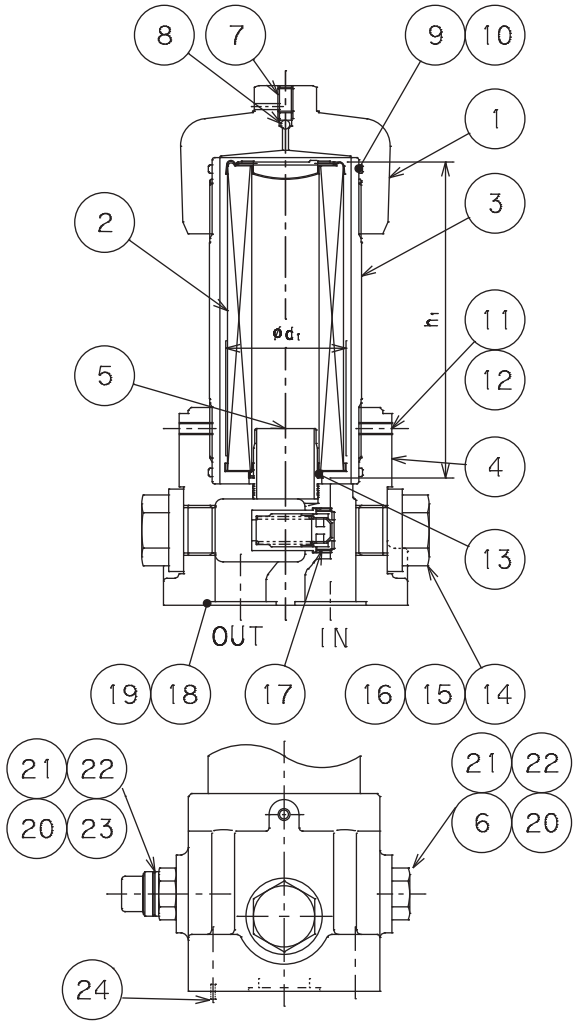
Model code	Working pressure(MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
IH-3	0.2	0.3	
IH-7		0.7	
EH-3		0.3	0.3
EH-3D			
EH-7		0.7	0.7
EH-7D			

〈Micro switch specification〉

Model code	Rated capacity		Contact diagram : 1C
EH-3 EH-7	Resistance load	3A,250V AC	
		3A,30V DC	
	Inductive load	2A,250V AC	
		2A,30V DC	
EH-3D EH-7D	Micro capacity	100mA,125V AC	
		100mA,30V DC	

★ IH-7 and EH-7(D) are for High pressure element.

CROSS SECTION



PARTS LIST

No.	Item	Qty
1	Upper cover	1
2	Element	1
3	Case	1
4	Body	1
5	Guide	1
6	Plug (Indicator/Non)	1/2
7	Air vent plug	1
8	Steel ball	1
9	O-ring	2
10	Backup ring	2
11	Set screw	2
12	Piece	2

No.	Item	Qty
13	O-ring	1
14	Plug	2
15	O-ring	2
16	Backup ring	2
17	Relief valve	1
18	O-ring	2
19	Backup ring	2
20	O-ring	2
21	Backup ring	2
22	O-ring	2
23	Indicator	1
24	Spring pin	1

ELEMENT SIZE

Element Model code	Size(mm) φd1	Size(mm) h1		Weight*1 (kg)
			High mesh *	High pressure
P-GC-3	81	120	115	119	0.41
P-GC-4		211	206	208	0.74
P-GC-5		330	325	329	1.14
P-GC-6		431	426	428	1.47

*Filtration rating : 5UW、10UW、20UW　*Common to SH、GC、4201

SEALING PARTS LIST

No.		9	10	13		15,18	16,19	20	21	22
Model code \ Standard*2		JIS B2401 1B		AS568	JIS B2401 1A	JIS B2401 1B	SUN-4B	JIS B2401 1B	JIS B2407 T2	JIS B2401 1A
GC-12Z	O-ring	G100		131	P42*3	G40		P22		P16
	Backup ring		t1.5xφ103φ98	t1.25xφ47.2φ42.9*4			For G40		For P22	

Model code	Item code of sealing parts set*5						
	Material	SP*6 No. : 9, 10, 13, 15, 16	SP-H*6 No. : 9, 10, 13, 15, 16	SP-UW*6 No. : 9, 10,13, 15,16	SA No. : 9, 10, 13, 15, 16, 18~22	SA-H No. : 9, 10, 13, 15, 16, 18~22	SA-UW No : 9, 10, 13, 15, 16, 18~22
GC-12Z	NBR	SSF000131	SSF000132	SSF000133	SSF000128	SSF000129	SSF000130
	FKM	SSF000498	SSF000499	SSF000500	SSF000495	SSF000496	SSF000497

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P – **F** – **GC** – **5** – **3C**

("P" represents filter element)

Fluid type

Case length	
Code	3
	4
	5
	6

Filtration rating

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

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

Sealing parts set 〈Model code example〉

SA – **F** – **GC** – **12Z** – **H**

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

Fluid type

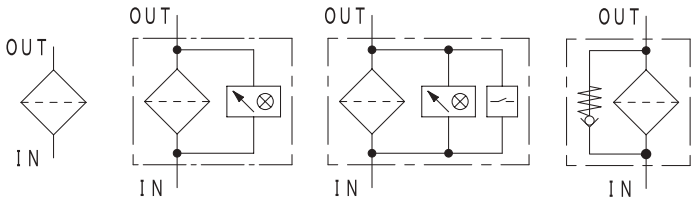
Code	Filtration rating
Blank	All models except below
H	3CH, 8CH, 25CH
UW	5UW, 10UW, 20UW

＊1 Weight of "C-Fiber" element ＊2 Standard for NBR. For other material, conform to the standard. ＊3 Spec of O-ring is different for High mesh element (Filtration rating: 5UW, 10UW, 20UW). ＊4 Backup ring is attached for high pressure element Filtration rating : 3CH, 8CH, 25CH ＊5 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually. ＊6 Part #9 and #10 are only for the cover side.

The Highest Pressure Model of TAISEI Filter

Characteristics

- **Applicable to 42MPa that is suitable to hydraulic testing machines**
- **Directly installable on manifold block** *1
- **Element size is selectable depending on flow rate and contaminant amount**
- **Install position of clogging indicator (option) is selectable on left/right side**
- **Element of 4201 can be used in common with GC and SH model.**
- **Drain port is selectable: with/without.**



Oil filter | Visual type indicator | Electric contact type indicator | Relief valve

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

SPECIFICATION

Max working pressure		MPa	42.0
Repetition durability test			0 ～ 42.0MPa x10⁷times
Working temperature	Standard	℃	–10 ～ 90
	High temperature *2	℃	–10 ～ 150
Indicator working pressure	Standard	MPa	0.3
	High pressure	MPa	0.7
Cracking pressure	Standard	MPa	0.35
	High pressure	MPa	Non bypass
Allowable differential pressure of filter element	Standard	MPa	0.7
	High pressure	MPa	21.0
Flow direction/Extract direction of filter element			OUT → IN / Upward

		12Z-4	12Z-5	12Z-6
Inner diameter				
Standard flow rate ☆	ℓ /min	300	330	350
Main material	Body	FCD		
	Case	Steel pipe		
	Upper cover	SF		
Coating		Protective film treatment		
Weight	kg	30	33	36

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm²/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

F – 4201 – 12Z – 4 – 3C – RE V Y
❶ ❷ ❸

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

Code	Inner diameter
12Z	40A Equivalent

Case length Code	
	4
	5
	6

Code	Filtration rating
C-Fiber	
3C	3 μm
8C	8 μm
25C	25 μm
High pressure C-Fiber	
3CH	3 μm
8CH	8 μm
25CH	25 μm
Paper	
10U	10 μm
20U *4	20 μm
40U *4	40 μm

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

Code	Option
❶ Indicator *5	
Blank	Closing plug
RI	Visual type
LI	
RE	Electric contact type
LE	
RD	Electric contact type (Micro capacity)
LD	
❷ Relief valve *6	
K	Non
V	Relief valve
❸ Drain	
Blank	Attached
Y	Non

＊1 Surface roughness of manifold should be lower than Ra1.6 ＊2 Sealing parts: FKM, only for wire gauze element, indicator and relief valve are not available (Max oil temperature is visual type: 130℃ , electric contact type: 90℃) ＊3 Refrigerant should be specified ＊4 Not available for water-glycol based oil and high water based fluid ＊5 Indicator position: Right/Left is as seen from Inlet side ＊6 Relief valve is not available if selecting high pressure element

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

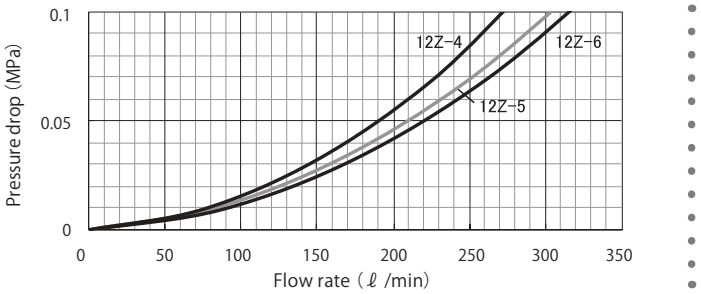
・Estimate pressure drop of filter assembly by following equation if required condition is different:

$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

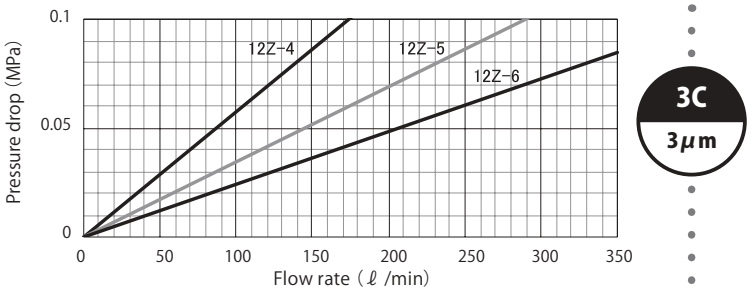
$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

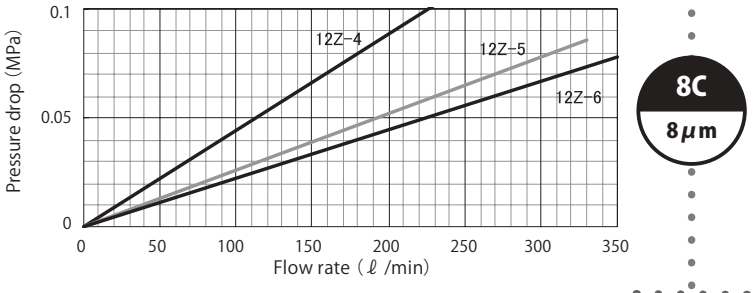
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

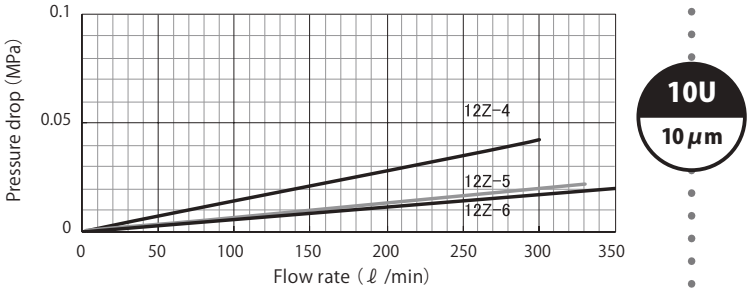
① Pressure drop of filter housing



② Pressure drop of filter element

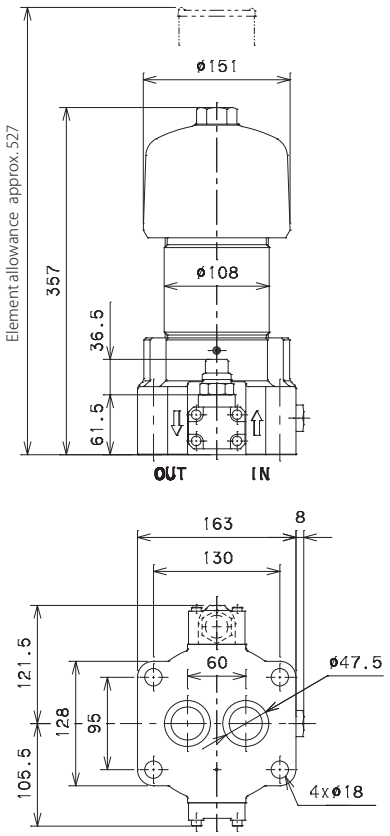




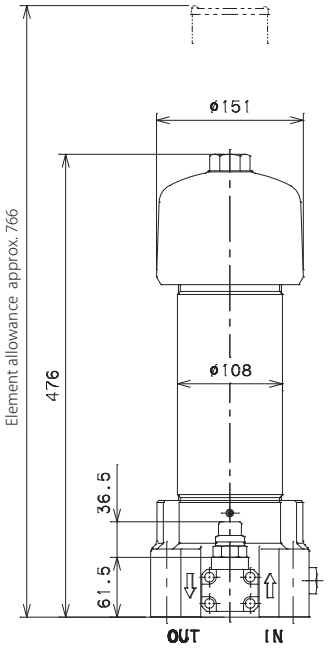


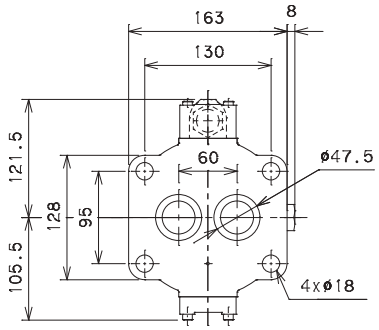
4201-12Z-4-□□-LI□

I : Visual type indicator
Drain Attached

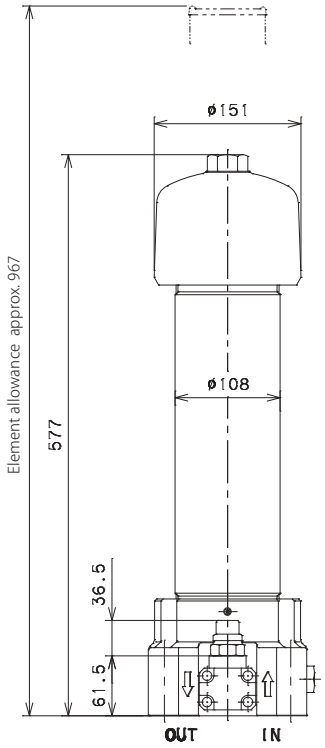


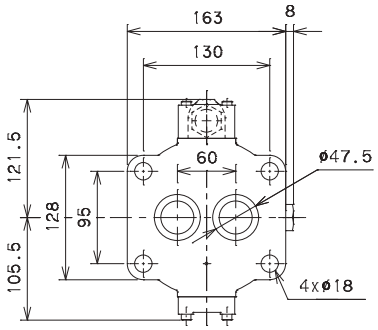
4201-12Z-5-□□-LI□





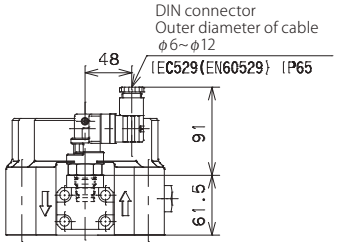
4201-12Z-6-□□-LI□



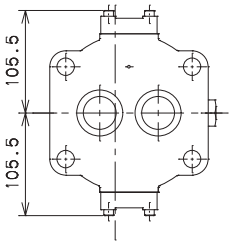


Differential pressure type indicator part

＊ Common at all size



E,D : Electric contact type indicator
4201-12Z-□-□□-□E,D□



Closing plate
4201-12Z-□-□□-□__□

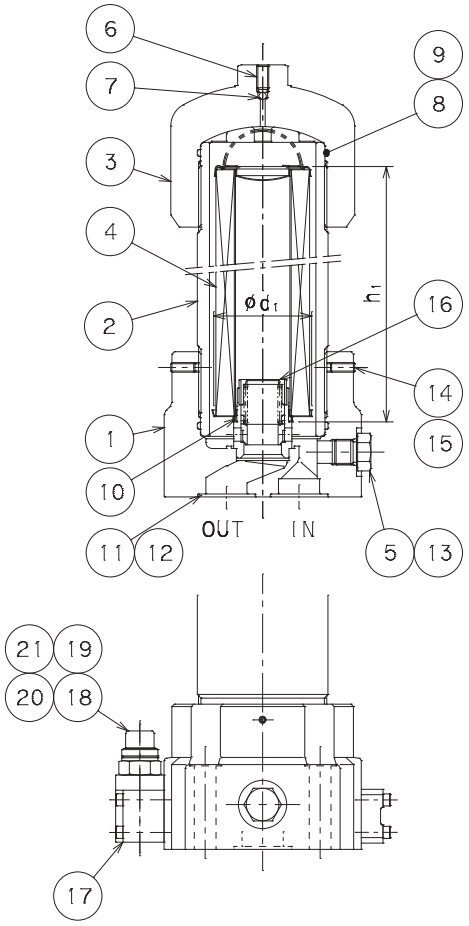
Model code	Working pressure(MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
IH-3	0.2	0.3	
IH-7		0.7	
EH-3		0.3	0.3
EH-3D			
EH-7		0.7	0.7
EH-7D			

〈Micro switch specification〉

Model code	Rated capacity		Contact diagram : 1C
EH-3 EH-7	Resistance load	3A,250V AC	
		3A,30V DC	
	Inductive load	2A,250V AC	
		2A,30V DC	
EH-3D EH-7D	Micro capacity	100mA,125V AC	
		100mA,30V DC	

★ IH-7 and EH-7(D) are for High pressure element.

CROSS SECTION



PARTS LIST

No.	Item	Qty
1	Body	1
2	Case	1
3	Upper cover	1
4	Element	1
5	Drain plug	1
6	Air vent plug	1
7	Steel ball	1
8	O-ring	2
9	Backup ring	2
10	O-ring	1
11	O-ring	2

No.	Item	Qty
12	Backup ring	2
13	O-ring	1
14	Set screw	2
15	Piece	2
16	Relief valve	1
17	Indicator block	1
18	Indicator	1
19	O-ring	1
20	O-ring	1
21	Backup ring	1

ELEMENT SIZE

Element Model code	Size(mm)				Weight*1 (kg)
	φd1	h1			
			High mesh	High pressure	
P-4201-4	81	211	206	208	1.58
P-4201-5		330	325	329	2.22
P-4201-6		431	426	428	2.85

*Common to SH、GC、4201

SEALING PARTS LIST

No.		8	9	10		11	12	13	(16)	(17)*2	19	20	21
Model code \ Standard*3		JIS B2401 1B		AS568	JIS B2401 1A	JIS B2401 1B	SUN-4B	JIS B2401 1B	JIS B2401 1B	JIS B2401 1B /SUB-4B	JIS B2401 1B	JIS B2401 1A	JIS B2407 T2
4201-12Z	O-ring	G105		131	P42*4	G40		P18	S32	P6	P22	P16	
	Backup ring		t1.5xφ108/φ103	t1.25xφ47.2/φ42.9*5			For G40			For P6			For P22

Model code	Material	Item code of sealing parts set*6												
		NO.8~10,13*7			NO.8~10*7			NO.8~13,16,17*4*5		NO.8~13,17*4*5			NO.8~13,16,17,19~21*4*5	
		SP	SP-H	SP-UW	SP-Y	SP-H-Y	SP-UW-Y	SA-V	SA-UW-V	SA-K	SA-H-K	SA-UW-K	SA-I,E,DV	SA-UW-I,E,DV
4201-12Z	NBR	SSF000137	SSF000138	SSF000139	SSF001986	SSF001987	SSF001988	SSF00958	SSF001607	SSF000134	SSF000135	SSF000136	SSF001000	SSF001609
	FKM	SSF000504	SSF000505	SSF000506	SSF001989	SSF001990	SSF001991	SSF001610	SSF001616	SSF000501	SSF000502	SSF000503	SSF001612	SSF001618

Model code	Material	NO.8~13,17,19~21*4*5			NO.8~12,16,17*4*5		NO.8~12,17*4*5			NO.8~12,16,17,19~21*4*5		NO.8~12,17,19~21*4*5		
		SA-I,E,DK	SA-H-I,E,DK	SA-UW-I,E,DK	SA-VY	SA-UW-VY	SA-KY	SA-H-KY	SA-UW-KY	SA-I,E,DVY	S-UW-I,E,DVY	SA-I,E,DKY	SA-H-I,E,DKY	SA-UW-I,E,DKY
4201-12Z	NBR	SSF000999	SSF001605	SSF001608	SSF001967	SSF001973	SSF001966	SSF001970	SSF001972	SSF001969	SSF001975	SSF001968	SSF001971	SSF001974
	FKM	SSF001611	SSF001614	SSF001617	SSF001977	SSF001983	SSF001976	SSF001980	SSF001982	SSF001979	SSF001985	SSF001978	SSF001981	SSF001984

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P – **F** – **4201** – **4** – **3C**

("P" represents filter element)

Fluid type

Case length Code	
	4
	5
	6

Filtration rating

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

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

Sealing parts set 〈Model code example〉

SA – **F** – **4201** – **12Z** – **H** – **E V Y**

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

Fluid type

Code	Filtration rating
Blank	All models except below
H	3CH, 8CH, 25CH
UW	5UW, 10UW, 20UW

❶ ❷ ❸

Code	❶ Indicator
Blank	Closing plug
I	Visual type
E	Electric contact type
D	Electric contact type (Micro capacity)

Code	❷ Relief valve
K	Non
V	Relief valve

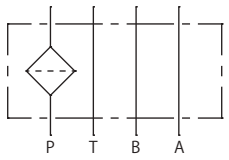
Code	❸ Drain
Blank	Attached
Y	Non

＊1 Weight of "C-Fiberhigh pressure" element ＊2 O-ring and backup ring for indicator block are included 4 pcs each. ＊3 Standard for NBR. For other material, conform to the standard. ＊4 Spec of O-ring is different for High mesh element (Filtration rating: 5UW, 10UW, 20UW). ＊5 Backup ring is attached for high pressure element Filtration rating：3CH, 8CH, 25CH ＊6 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually. ＊7 Part #8 and #9 are only for the cover side.

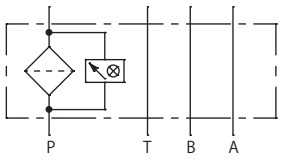
High Performance Compact Filter for modular valve

Characteristics

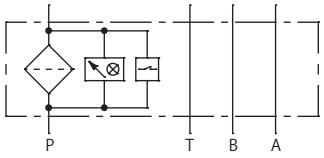
- **Modular type filter enables downsizing of hydraulic system**
- **Filter is installed in P-port**
- **Regulation of installation surface**
  - **MVF-01 : ISO 4401-AB-03-4-A • MVF-03 : ISO 4401-AC-05-4-A**
- **Clogging indicator (visual type / electric contact type) is selectable as an option**



Oil filter



Visual type indicator



Electric contact type indicator

諸元表

Max working pressure		MPa	25.0
Repetition durability test			0〜25.0MPa x10^7times
Working temperature	Standard	℃	–10 〜 90
	High temperature *1	℃	–10 〜 150
Indicator working pressure		MPa	0.3
Cracking pressure		MPa	Not available
Allowable differential pressure of filter element		MPa	0.7
Flow direction/Extract direction of filter element			OUT → IN / Horizontal extraction

Inner diameter		01	03
Standard flow rate ☆	ℓ /min	10	20
Main material	Base	FCD	
	Body	SCC	
	Cover	SS	
	Case		SS
Coating		Protective film treatment	
Weight *1	kg	1.5	3.8

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

G – MVF – 01 – 10U – I

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

Code	Inner diameter
01	ISO4401 AB-03-4-A
03	ISO4401 AC-05-4-A

Code	Filtration rating
C-Fiber	
3C	3 μm
8C	8 μm
25C	25 μm
Paper	
10U	10 μm
20U *2	20 μm
Wire gauze	
150W	150Mesh

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

Code	Option
Blank	Closing plug
I	Visual type indicator
E	Electric contact type indicator
D	Electric contact type indicator (Micro capacity)

＊1 Sealing parts: FKM, only for wire gauze element, indicator and relief valve are not available (Max oil temperature is Visual type: 130℃ , electric contact type: 90℃)
＊2 Not available for water-glycol based oil and high water based fluid

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

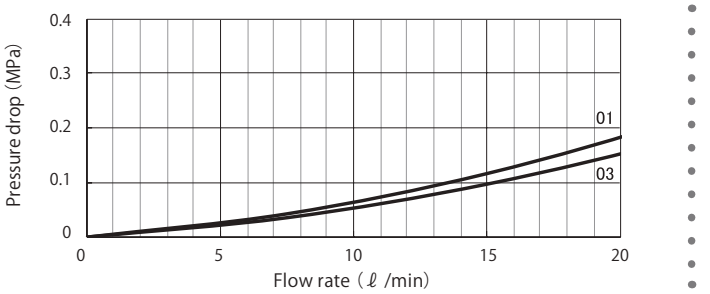
・Estimate pressure drop of filter assembly by following equation if required condition is different:

$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

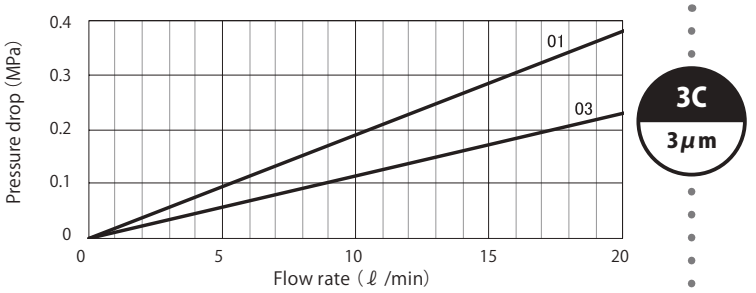
$$\text{Pressure drop of filter element} = \frac{\text{Fluid Density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86,kinematic viscosity of 32}$$

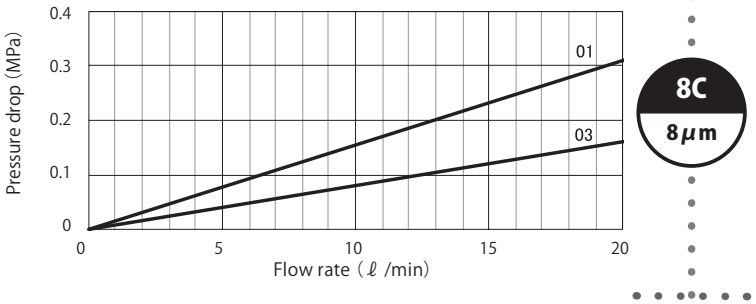
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

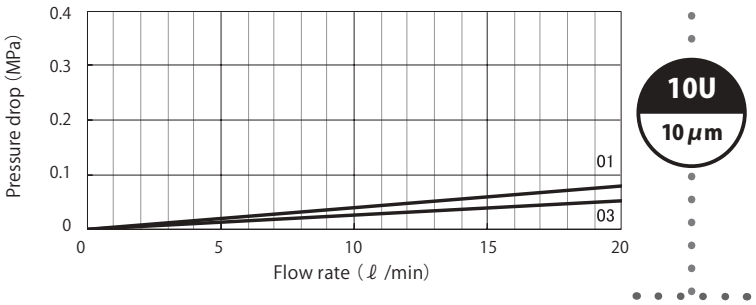
① Pressure drop of filter housing

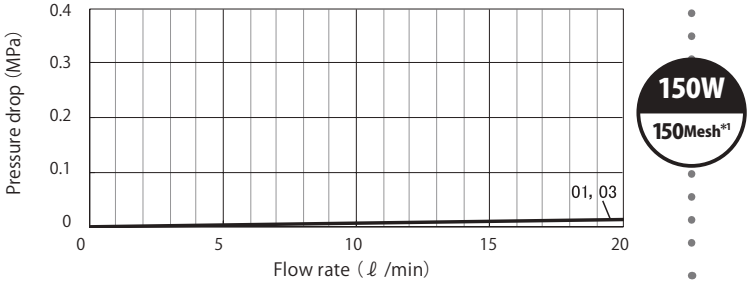


② Pressure drop of filter element





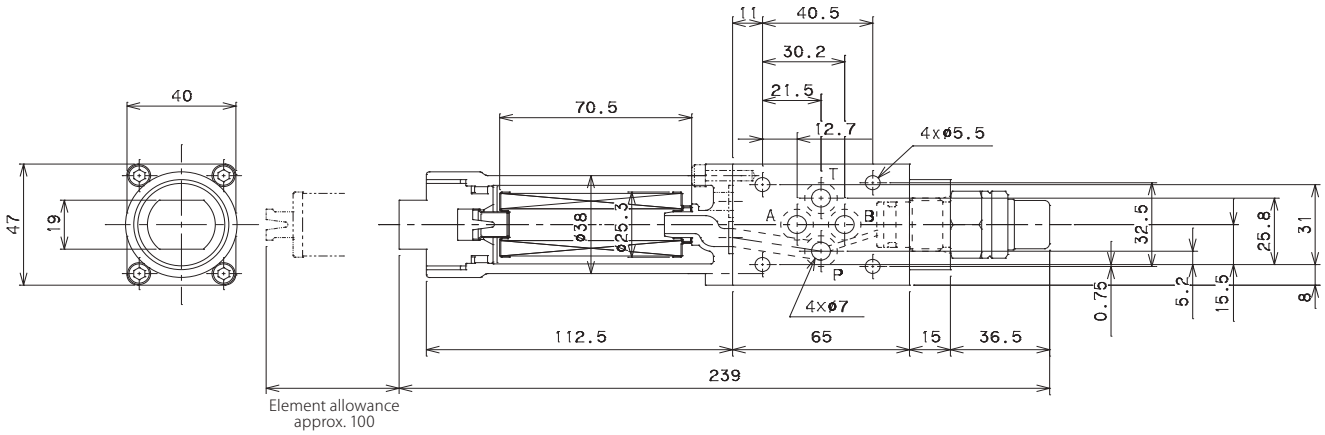




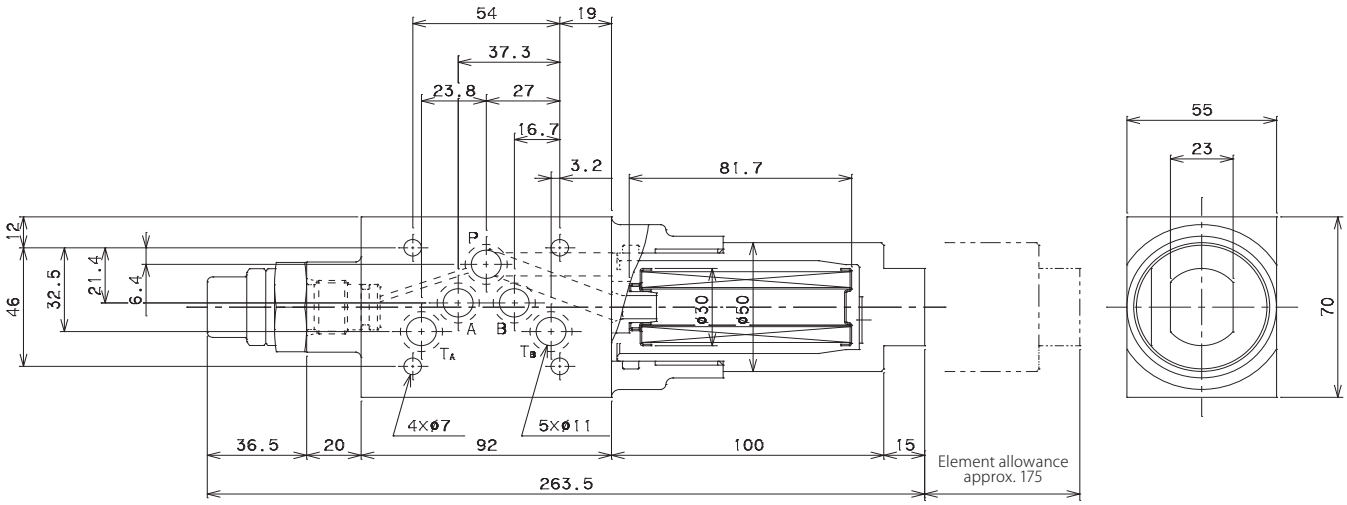
＊1 Pressure drop of wire gauze element is described with one line since the value is low and there is no difference at each filter size.

MVF-01-□□-I

I : Visual type indicator

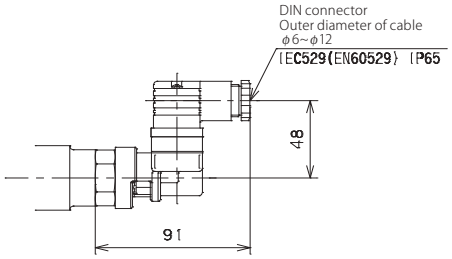


MVF-03-□□-I

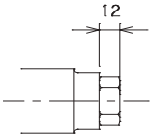


Differential pressure type indicator part

＊Common at MVF-01,03



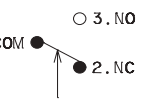
E,D : Electric contact type indicator
MVF-□□-□□-E,D



Closing plug
MVF-□□-□□-__

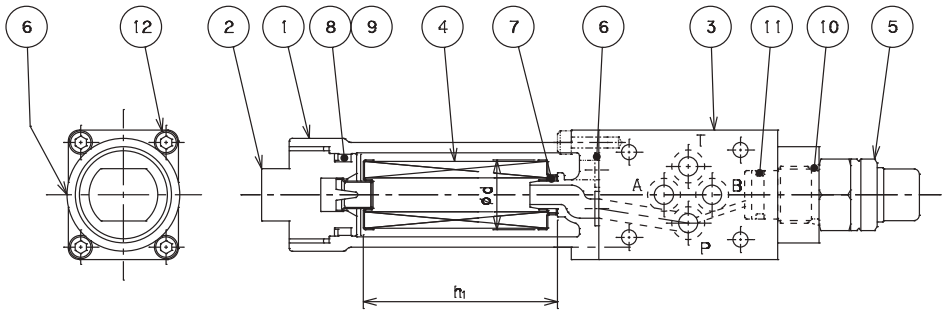
Model code	Working pressure(MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
IF-3	0.2	0.3	
EF-3	0.2	0.3	0.3
EF-3D			

〈Micro switch specification〉

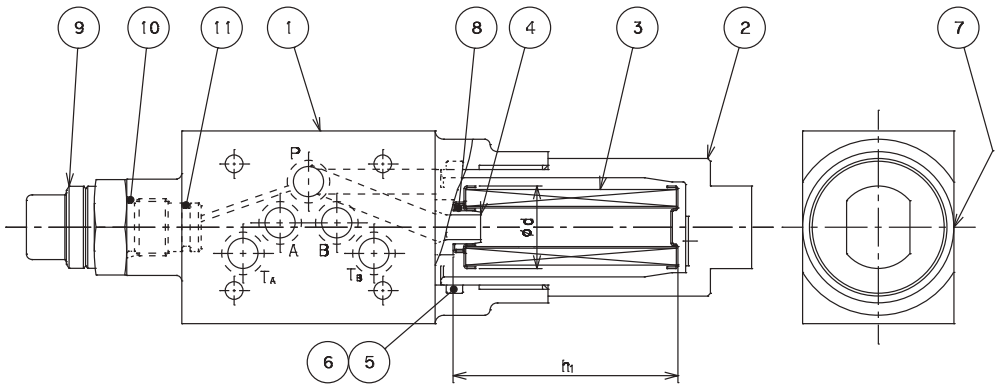
Model code	Rated capacity		Contact diagram : 1C
EF-3	Resistance load	3A,250V AC	
		3A,30V DC	
	Inductive load	2A,250V AC	
		2A,30V DC	
EF-3D	Micro capacity	100mA,125V AC	
		100mA,30V DC	

CROSS SECTION

MVF-01-□□-I



MVF-03-□□-I



PARTS LIST

No.	Item	Qty
1	Body	1
2	Cover	1
3	Base	1
4	Element	1
5	Indicator	1
6	O-ring	6
7	O-ring	1
8	O-ring	1
9	Backup ring	1
10	O-ring	1
11	O-ring	1
12	Cap bolt	4

No.	Item	Qty
1	Base	1
2	Case	1
3	Element	1
4	Coulpling	1
5	Backup ring	1
6	O-ring	1
7	O-ring	5
8	O-ring	1
9	Indicator	1
10	O-ring	1
11	O-ring	1

ELEMENT SIZE

Element Model code	Size(mm)		Weight*1 (kg)
	φd1	h1	
P-MVF-01	25.3	70.5	0.03
P-MVF-03	30.0	81.7	

SEALING PARTS LIST

No.	5	6	7	8	9	10	11	Item code of sealing parts set *3		
Standard *2 / Model code	JIS B2407 T2	JIS B2401 01 : 1B 03 : 1A	JIS B2401 1A		JIS B2407 T2	JIS B2401 1B	JIS B2401 1A	Material	SP 01 : 7 ~ 9 03 : 5,6,8	SA 01 : 6 ~ 11 03 : 5~8,10,11
MVF-01		P9	P10	P25	For P25	P18	P14	NBR	SSF000142	SSF000140
								FKM	SSF000509	SSF000507
MVF-03	For P42	P42	AS568(Hs90) 014	P12				NBR	SSF000143	SSF000141
								FKM	SSF000510	SSF000508

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P – **F** – **MVF** – **03** – **3C**

("P" represents filter element)

F: Fluid type
03: Inner diameter
3C: Filtration rating

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

Sealing parts set 〈Model code example〉

SA – **F** – **MVF** – **03**

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

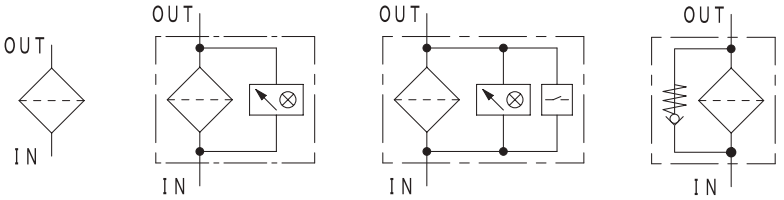
F: Fluid type
03: Inner diameter

＊1 Weight of "Paper" element ＊2 Standard for NBR. For other material, conform to the standard.
＊3 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.

Self-standing type High Flow Filter

Characteristics

- **Lubricant oil filter with inner diameter 40A ～ 200A**
- **Easy pipe connection since height of In/Outlet nozzle is same**
- **Pipe connection flange is JIS 10K SOP FF**
- **Clogging indicator (with connecting tube) and relief valve are selectable as an option**



Oil filter | Visual type indicator | Electric contact type indicator | Relief valve

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

SPECIFICATION

Max working pressure		MPa	1.0
Working temperature	Standard	℃	–10 ～ 90
	High temperature *1	℃	–10 ～ 150
Indicator working pressure		MPa	0.3
Cracking pressure		MPa	0.35
Allowable differential pressure of filter element		MPa	0.7
Flow direction/Extract direction of filter element			OUT → IN / Upward

Inner diameter		40	50	80	100	150	200
Standard flow rate ☆	ℓ /min	300	450	800	1500	2500	3000
Main material	Body	STKM, SGP, SS					
	Cover	SS					
Coating		Aqua blue					
Weight	kg	approx. 70	approx. 80	approx. 106	approx. 139	approx. 225	approx. 330

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

F – TL – 40 – 10U – I V
(❶ ❷)

Code	Fluid type
Blank	Mineral oil
F	Phosphate ester fluid
G	Water glycol fluid
C	Fatty ester fluid
W	High water base fluid
R	Refrigerant oil *2
S	Fuel (Kerosene, Gas oil, Diesel oil)
B	Brake fluid

Code	Inner diameter
40	JIS10K-40A. SOP. FF
50	JIS10K-50A. SOP. FF
80	JIS10K-80A. SOP. FF
100	JIS10K-100A. SOP. FF
150	JIS10K-150A. SOP. FF
200	JIS10K-200A. SOP. FF

Code	Filtration rating
C-Fiber	
8C	8 μm
25C	25 μm
Paper	
10U	10 μm
20U *3	20 μm
40U *3	40 μm

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

Code	Filtration rating
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh

Code	Option
❶ Indicator	
Blank	Non
I	Visual type
E	Electric contact type
D	Electric contact type (Micro capacity)
❷ Relief valve	
K	Non
V	Relief valve

＊1 Sealing parts: FKM, only for wire gauze element, indicator and relief valve are not available (Max oil temperature is Visual type: 130℃ , electric contact type: 90℃) ＊2 Refrigerant should be specified
＊3 Not available for water-glycol based oil and high water based fluid

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

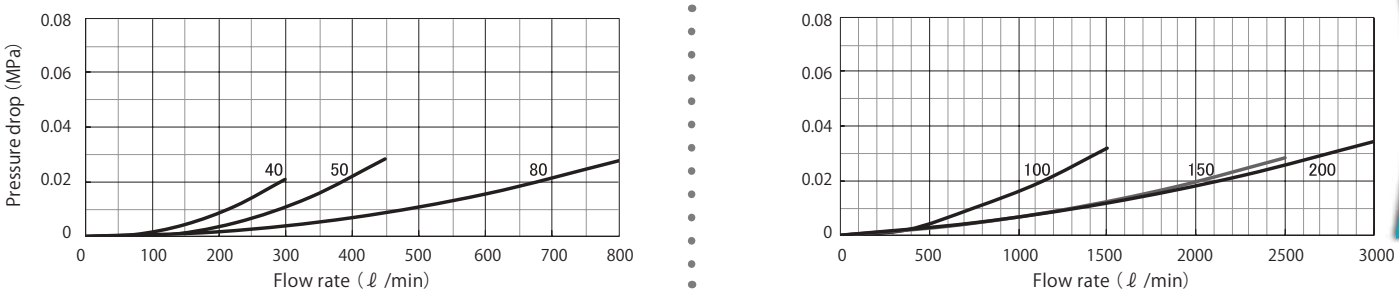
・Estimate pressure drop of filter assembly by following equation if required condition is different:

$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

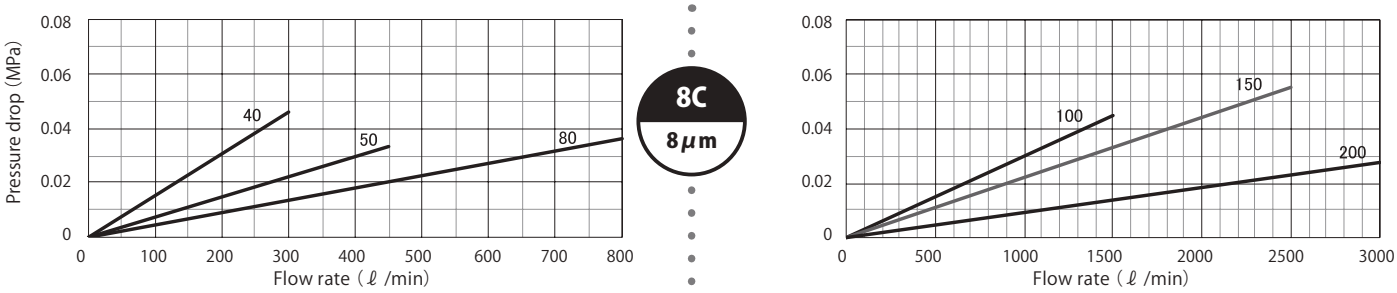
$$\text{Pressure drop of filter element} = \frac{\text{Fluid Density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86,kinematic viscosity of 32}$$

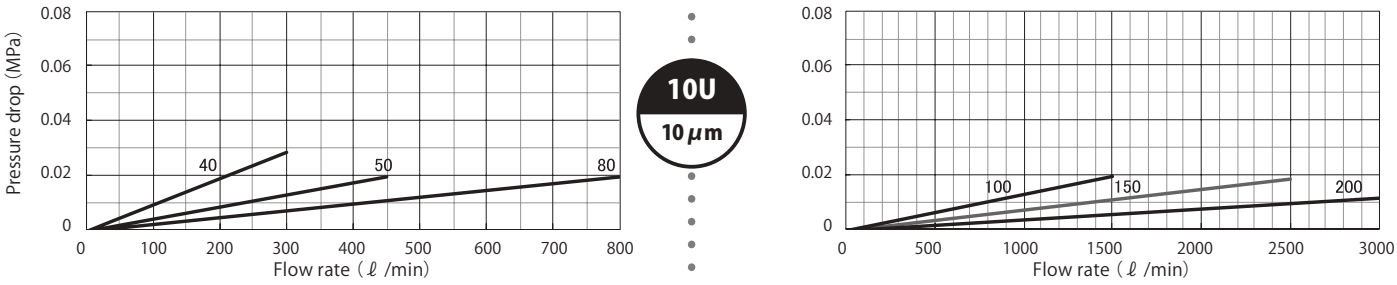
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

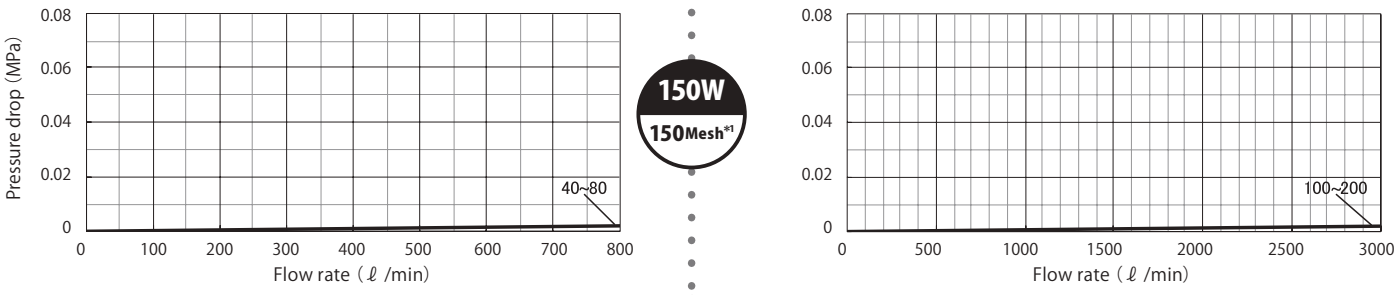
① Pressure drop of filter housing



② Pressure drop of filter element

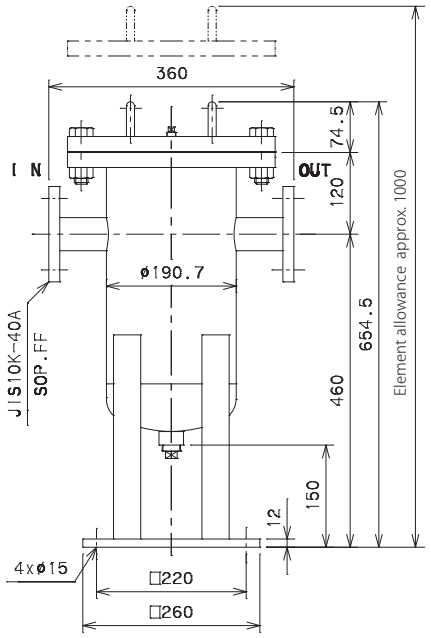




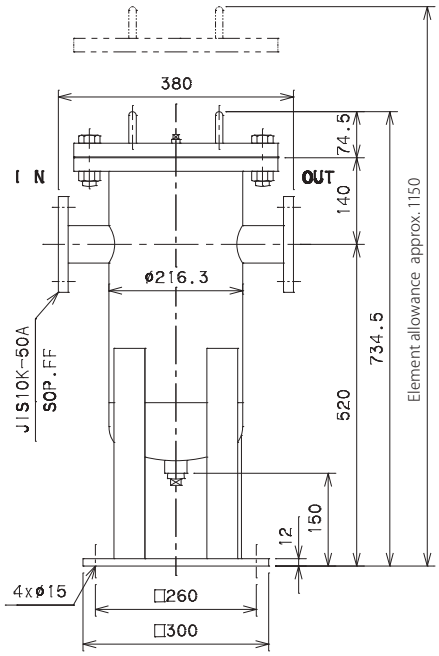


＊1 Pressure drop of wire gauze element is described with one line since the value is low and there is no difference at each filter size.

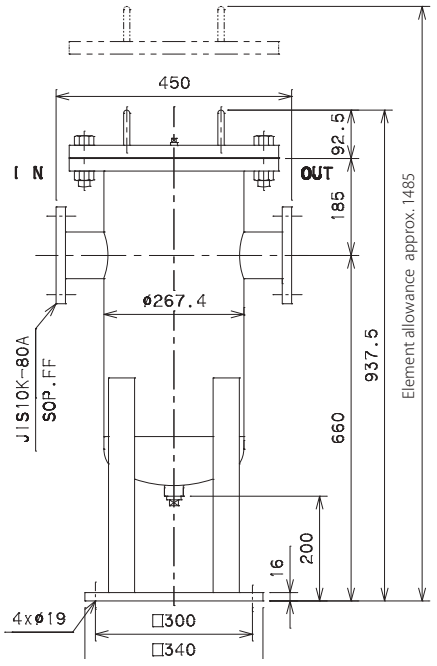
TL-40-□□-□□



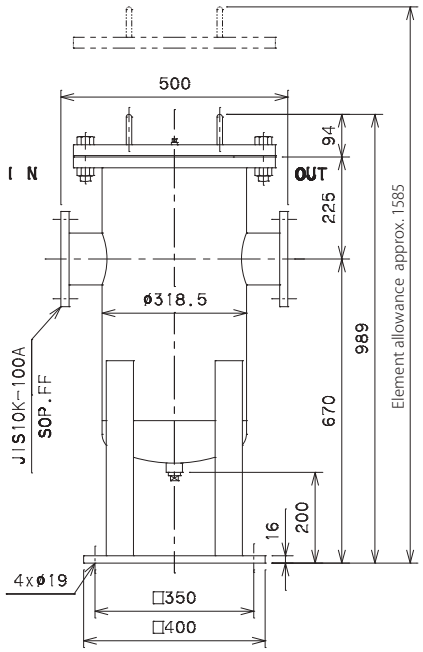
TL-50-□□-□□



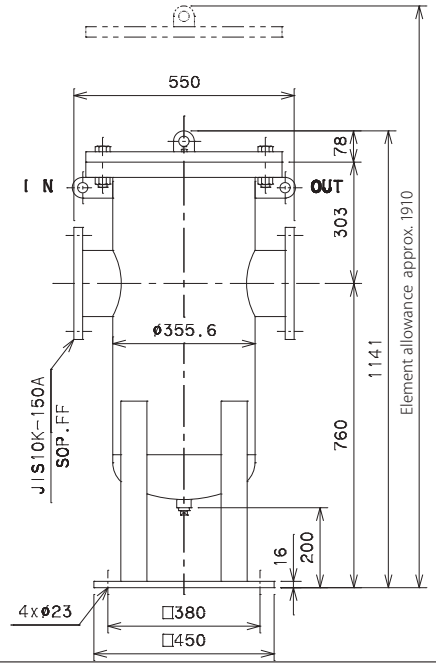
TL-80-□□-□□



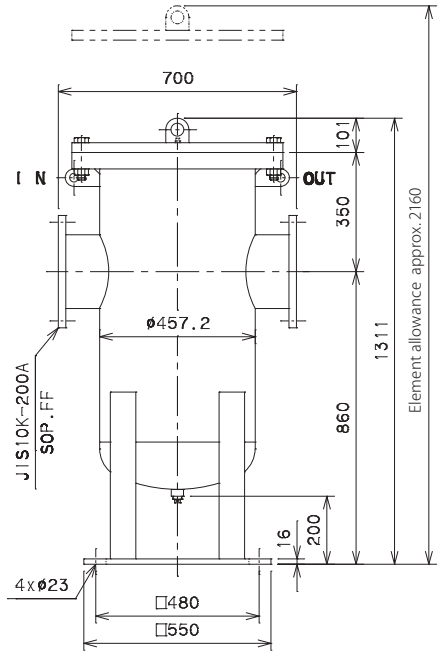
TL-100-□□-□□



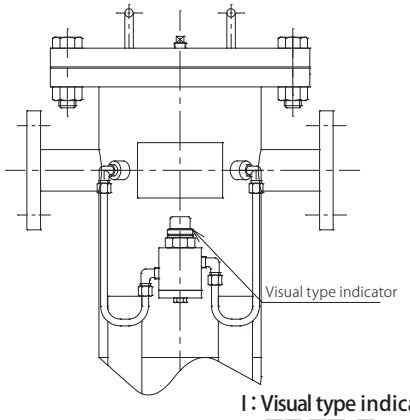
TL-150-□□-□□



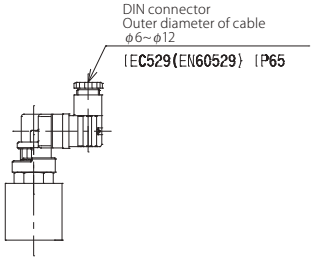
TL-200-□□-□□



Differential pressure type indicator part ＊ Common at all size



I : Visual type indicator
TL-□□-□□-I□



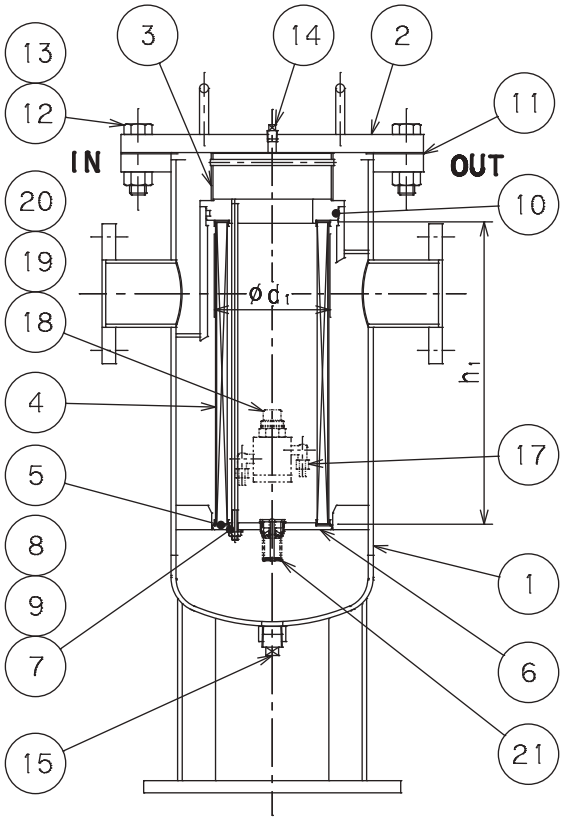
E,D : Electric contact type indicator
TL-□□-□□-E,D□

Model code	Working pressure(MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
IA-3	0.2	0.3	
EA-3	0.2	0.3	0.3
EA-3D			

〈Micro switch specification〉

Model code	Rated capacity		Contact diagram : 1C
EA-3	Resistance load	3A,250V AC 3A,30V DC	○ 3.NO 1.COM ● ● 2.NC
	Inductive load	2A,250V AC 2A,30V DC	
EA-3D	Micro capacity	100mA,125V AC 100mA,30V DC	

CROSS SECTION



PARTS LIST

No.	Item	Qty	
1	Body	1	
2	Cover	1	
3	Cartridge	1	
4	Element	1	
5	Packing	2	
6	Element holder	1	
7	Packing	1	TL-40,50
		4	TL-80,100
	Seal washer	4	TL-150,200
8	Washer	1 set	
9	Nut	1set	
10	O-ring	1	
11	Packing	1	
12	Bolt	1set	
13	Nut	1set	
14	Air vent plug	1	
15	Drain plug	1	
17	Guidance pipe	1	
18	Indicator	1	
19	O-ring	1	
20	O-ring	1	
21	Relief valve	1set	

ELEMENT SIZE

Element Model code	Size(mm) φd_1	Size(mm) h_1	Weight*1 (kg)
P-TL-40	102.2	250	0.93
P-TL-50	124	300	1.40
P-TL-80	153	400	2.44
P-TL-100	165		4.00
P-TL-150	210	500	5.20
P-TL-200	260	600	6.00

SEALING PARTS LIST

No.	5	7	10	11	19	20	Item code of sealing parts set *3		
Standard*2 / Model code	Special packing	TL-40 ~ 100 : Special packing TL-150,200 : Seal washer	JIS B2401 1A	TL-40 ~ 100 : Non asbestos TL-150,200 : JIS B2401 1A	JIS B2401 1B	JIS B2401 1A	Material	SA No. : 5, 7, 10, 11	SA-I,E,D No. : 5, 7, 10, 11, 19, 20
TL-40	t8xφ73.5／φ61	t2xφ20／φ10	G115	JIS10K-175A, For FF	P18	P14	NBR	SSF000144	SFL001648
							FKM	SSF001550	SFL001654
TL-50	t8xφ93／φ80		G140	JIS10K-200A, For FF			NBR	SSF000145	SFL001649
							FKM	SSF001551	SFL001655
TL-80	t2xφ153／φ116	t2xφ17／φ8.5	G165	JIS10K-250A, For FF			NBR	SSF000146	SFL001650
							FKM	SSF001552	SFL001656
TL-100	t2φ165／φ124		G190	JIS10K-300A, For FF			NBR	SSF000147	SFL001651
							FKM	SSF001553	SFL001657
TL-150	t2xφ210／φ165	For M12	G240	P375			NBR	SSF000148	SFL001652
							FKM	SSF001554	SFL001658
TL-200	t2xφ260／φ208	For M16	G290	P505			NBR	SSF000148	SFL001653
							FKM	SSF001555	SFL001659

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P	–	F	–	TL	–	40	–	10U
("P" represents filter element)		Fluid type				Inner diameter		Filtration rating

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

★ Sealing parts set is available for both overhaul and element replacement. Model code is represented as "SA".

Sealing parts set 〈Model code example〉

SA	–	F	–	TL	–	40	–	I
		Fluid type				Inner diameter		

Code	Sealing parts set
SA	For both overhaul and element replacement

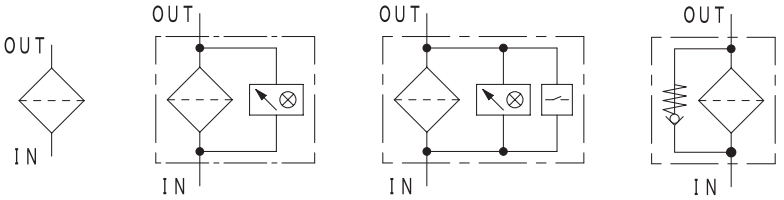
Code	❶ Indicator
Blank	Non
I	Visual type
E	Electric contact type
D	Electric contact type (Micro capacity)

＊1 Weight of "Paper" element ＊2 Standard for NBR. For other material, conform to the standard.
＊3 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.

L-type Bypass Filter

Characteristics

- **Best for bypass filter because of element with large filtration area**
- **Element size is selectable depending on flow rate and contaminant amount**
- **Pipe connection type is "flange" (companion flange is included)**
- **Clogging indicator and relief valve are selectable as an option**



Oil filter | Visual type indicator | Electric contact type indicator | Relief valve

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

SPECIFICATION

Max working pressure		MPa	3.0
Working temperature	Standard	℃	–10 ～ 90
	High temperature *1	℃	–10 ～ 150
Indicator working pressure		MPa	0.3
Cracking pressure		MPa	0.35
Allowable differential pressure of filter element		MPa	0.7
Flow direction/Extract direction of filter element			OUT → IN / Upward

Inner diameter		12-4	12-6	12-10	16-4	16-6	16-10
Standard flow rate ☆ ℓ /min		450	500	600	450	500	600
Main material	Upper cover	FCD					
	Lower cover	FCD					
	Shell	STKM, SS					
Coating		Protective film treatment					
Weight kg		30	38	57	30	38	57

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

F – LCN – 12 – 4 – 3C – E V
(❶ ❷)

Code	Fluid type
Blank	Mineral oil
F	Phosphate ester fluid
G	Water glycol fluid
C	Fatty ester fluid
W	High water base fluid
R	Refrigerant oil *2
S	Fuel (Kerosene, Gas oil, Diesel oil)
B	Brake fluid

Code	Inner diameter
12	40A
16	50A

Case length	
Code	4
	6
	10

Code	Filtration rating
C-Fiber	
3C	3 μm
8C	8 μm
25C	25 μm
Paper	
10U	10 μm
20U *3	20 μm
40U *3	40 μm

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

Code	Option
❶ Indicator	
Blank	Closing plug
I	Visual type
E	Electric contact type
D	Electric contact type (Micro capacity)
❷ Relief valve	
K	Non
V	Relief valve

＊1 Sealing parts: FKM, only for wire gauze element, indicator and relief valve are not available (Max oil temperature is Visual type: 130℃ , electric contact type: 90℃) ＊2 Refrigerant should be specified
＊3 Not available for water-glycol based oil and high water based fluid

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

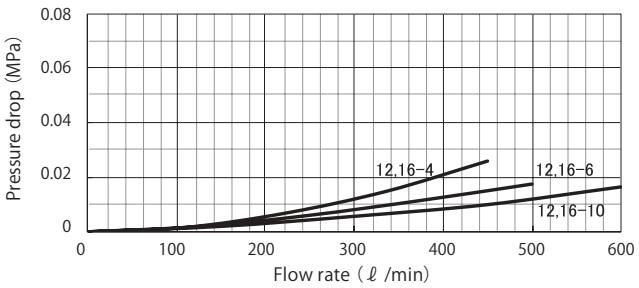
・Estimate pressure drop of filter assembly by following equation if required condition is different:

$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

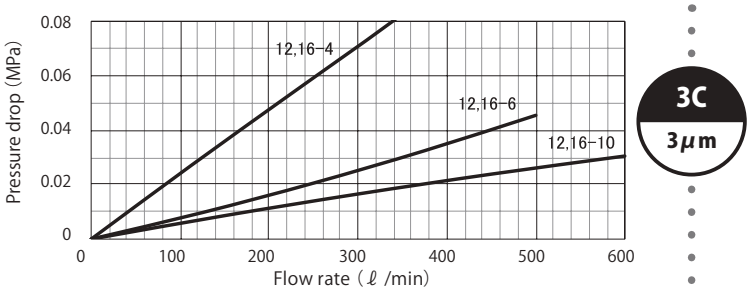
$$\text{Pressure drop of filter element} = \frac{\text{Fluid Density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86,kinematic viscosity of 32}$$

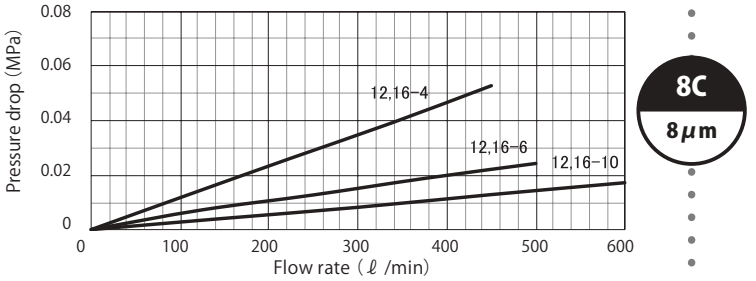
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

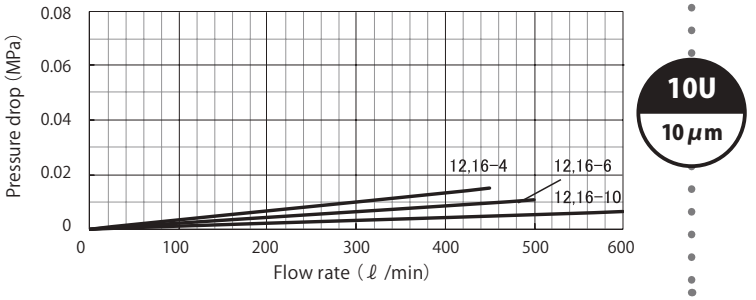
① Pressure drop of filter housing



② Pressure drop of filter element

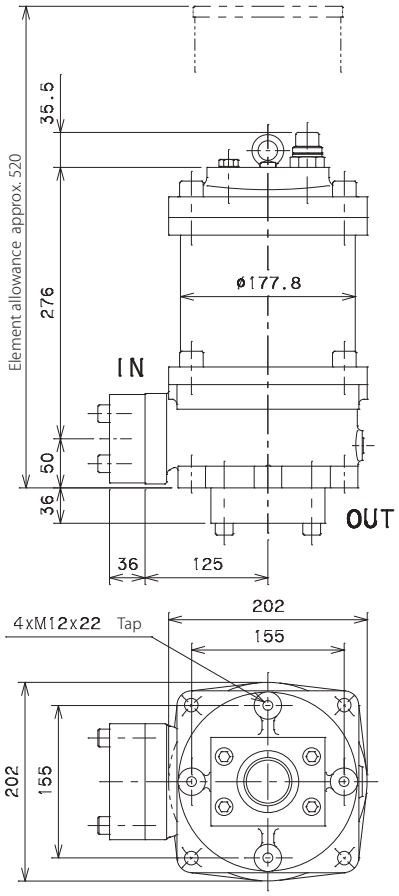




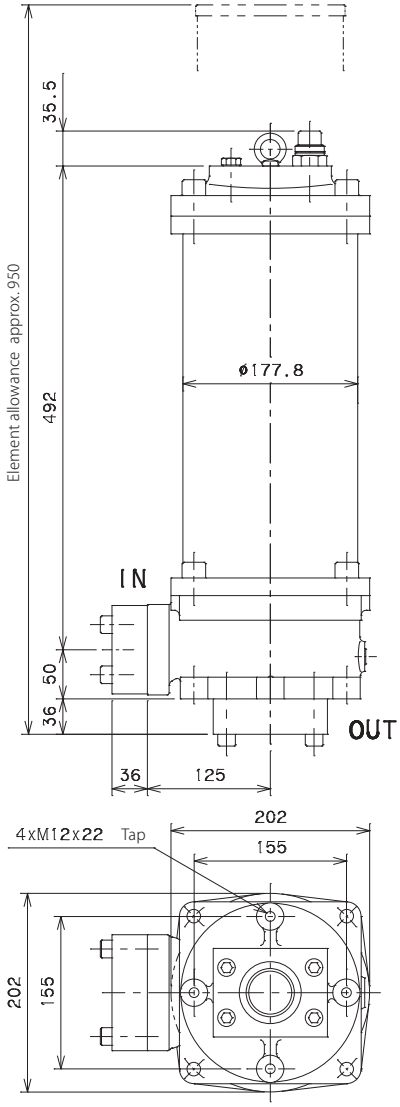


LCN-12,16-4-□□-I□

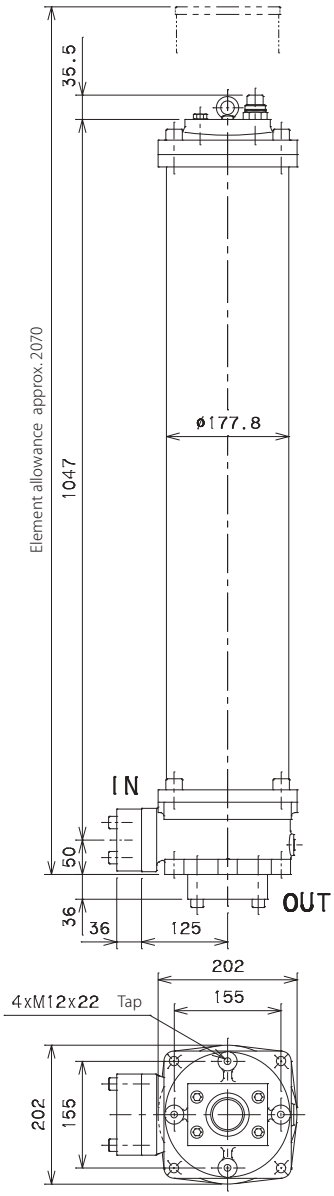
I : Visual type indicator

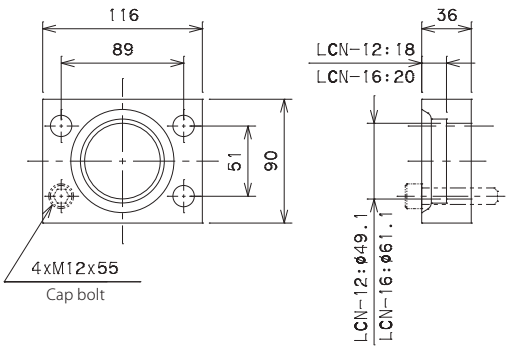


LCN-12,16-6-□□-I□



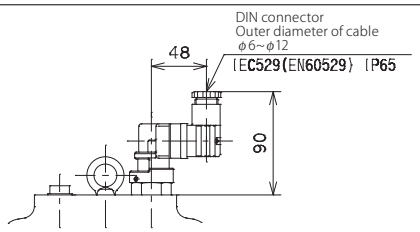
LCN-12,16-10-□□-I□





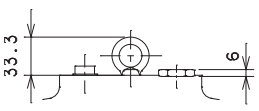
Companion flange

Differential pressure type indicator part ＊Common at all size



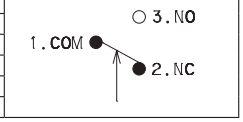
E,D : Electric contact type indicator
LCN-□□-□-□□-E,D□

Closing plug
LCN-□□-□-□□-_□

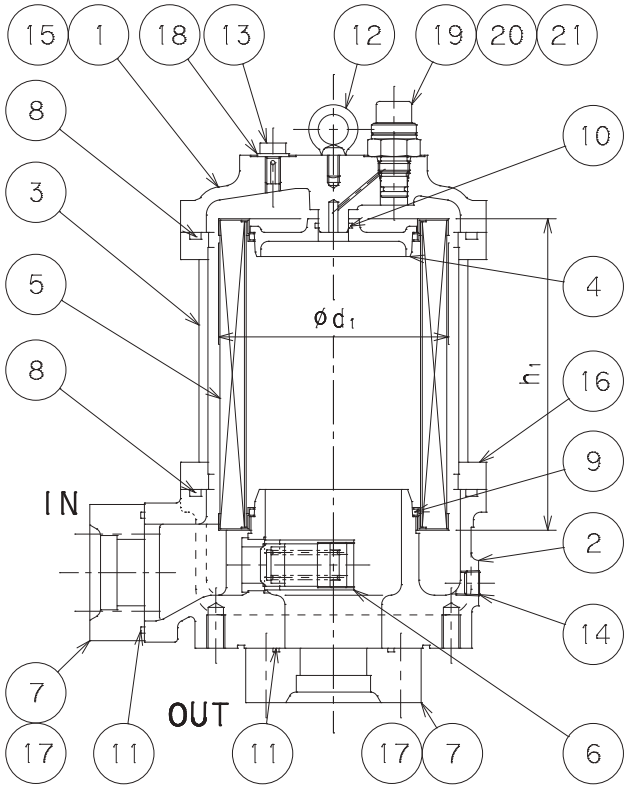


Model code	Working pressure(MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
IA-3	0.2	0.3	
EA-3	0.2	0.3	0.3
EA-3D			

〈Micro switch specification〉

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

CROSS SECTION



PARTS LIST

No.	Item	Qty
1	Upper cover	1
2	Lower cover	1
3	Case	1
4	Element holder	1
5	Element	1
6	Relief valve	1
7	Companion flange	2
8	O-ring	2
9	O-ring	2
10	O-ring	1
11	O-ring	2
12	Eye bolt	1
13	Air vent bolt	1
14	Drain plug	1
15	Cap bolt	4
16	Cap bolt	4
17	Cap bolt	8
18	Seal washer	1
19	Indicator	1
20	O-ring	1
21	O-ring	1

ELEMENT SIZE

Element Model code	Size(mm)		Weight *1 (kg)
	φd1	h1	
P-LCN-4	152	206	1.53
P-LCN-6		426	2.49
P-LCN-10		981	5.60

SEALING PARTS LIST

No.	8	9	10	11	18	20	21	Item code of sealing parts set *3		
Standard *2 / Model code	JIS B2401 1A	AS568	JIS B2401 1A		Seal washer	JIS B2401 1B	JIS B2401 1A	Material	SP No.: 8*4～10,18	SA No.: 8～11, 18, 20, 21
LCN-12,16	G180	243	P20	G75	t3xφ17/φ10.5	P18	P14	NBR	SSF000157	SSF000156
								FKM	SSF000512	SSF000511

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P – **F** – **LCN** – **4** – **3C**

("P" represents filter element)

Fluid type

Case length	
Code	4
	6
	10

Filtration rating

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

Sealing parts set 〈Model code example〉

SA – **F** – **LCN** – **12**

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

Fluid type

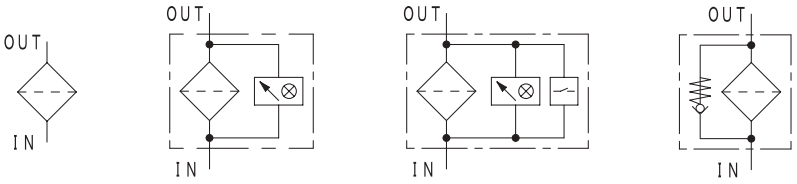
Inner diameter

＊1 Weight of "Paper" element ＊2 Standard for NBR. For other material, conform to the standard. ＊3 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually. ＊4 Part #8 O-ring is included only 1 pc for the upper cover side.

The Newest Low Pressure Line Filter

Characteristics

- **Lower pressure drop and higher flow rate model by CFD (computational fluid dynamics)**
- **The new "High flow" element is available**
- **Clogging indicator, relief valve, and companion flange are selectable as an option**
- **Light filter housing of aluminum alloy**



Oil filter | Visual type indicator | Electric contact type indicator | Relief valve

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

SPECIFICATION

Max working pressure		MPa	1.6
Repetition durability test			0~1.6MPa x10^7 times
Working temperature	Standard	℃	–10 ~ 90
	High temperature *1	℃	–10 ~ 150
Indicator working pressure		MPa	0.3
Cracking pressure		MPa	0.35
Allowable differential pressure of filter element		MPa	0.7
Flow direction/Extract direction of filter element			OUT → IN / Upward

Inner diameter		06	08	10	12
Standard flow rate ☆	Standard ℓ /min	130	170	320	340
	High flow ℓ /min	145	185	360	400
Main material	Body	ADC			
	Cover	ADC			
Coating	Body	Non-coating			
	Cover	Non-coating			
Weight *2 kg		2.4		3.8	

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U/10UF, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

F – TLA – 06 – 10UF – I V N
❶ ❷ ❸

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

Code	Inner diameter IN	OUT
06	Rc3/4 (20A)	Rc1
08	Rc1 (25A)	
10	Rc1 1/4 (32A)	Rc1 1/2
12	Rc1 1/2 (40A)	

Code	Filtration rating
C-Fiber	
3C	3 μm
8C	8 μm
25C	25 μm
Paper	
10U	10 μm
20U *3	20 μm
40U *3	40 μm
High flow Paper	
10UF *3	10 μm
20UF *3	20 μm

Code	Filtration rating
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh

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

Code	Option
❶ Indicator	
Blank	Closing plug
I	Visual type
E	Electric contact type
D	Electric contact type (Micro capacity)
❷ Relief valve	
K	Non
V	Relief valve
❸ Companion flange	
-	Non
N	Companion flange

＊1 Sealing parts: FKM, only for wire gauze element, indicator and relief valve are not available (Max oil temperature is visual type: 130℃ , electric contact type : 90℃)
＊2 Weight without companion flange ＊3 Not available for water-glycol based oil and high water based fluid

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

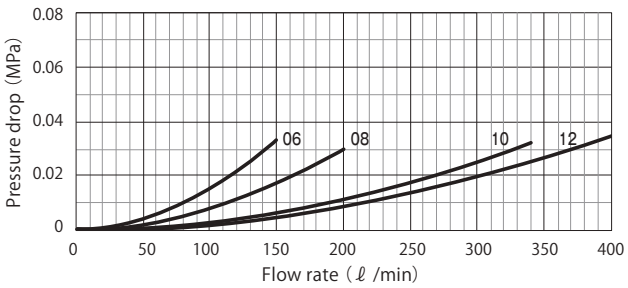
・Estimate pressure drop of filter assembly by following equation if required condition is different:

$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

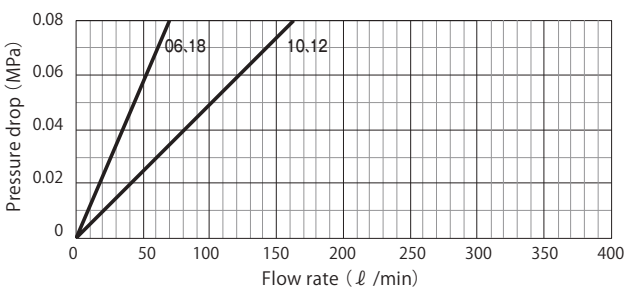
$$\text{Pressure drop of filter element} = \frac{\text{Fluid Density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86,kinematic viscosity of 32}$$

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

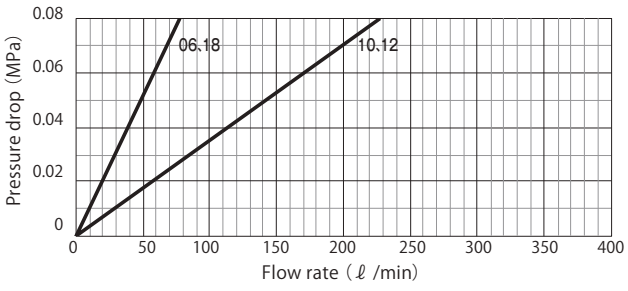
① Pressure drop of filter housing



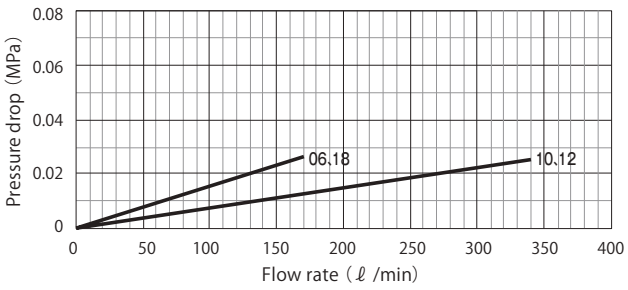
② Pressure drop of filter element



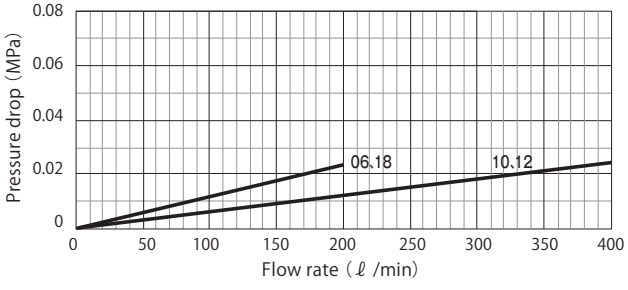
3C
3μm



8C
8μm



10U
10μm

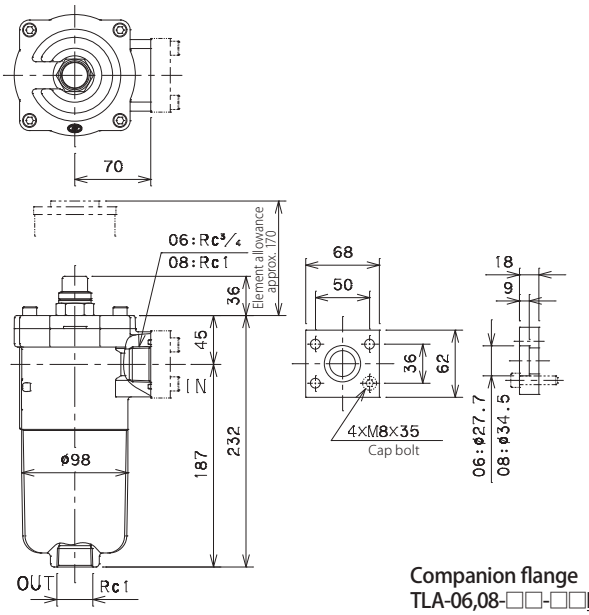


10UF
10μm Hi

＊1 Pressure drop of wire gauze element is described with one line since the value is low and there is no difference at each filter size.

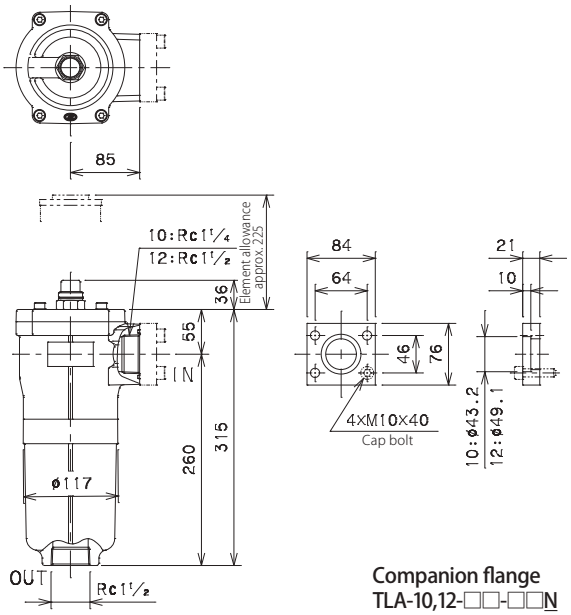
TLA-06,08-□□-I□□

I : Visual type indicator



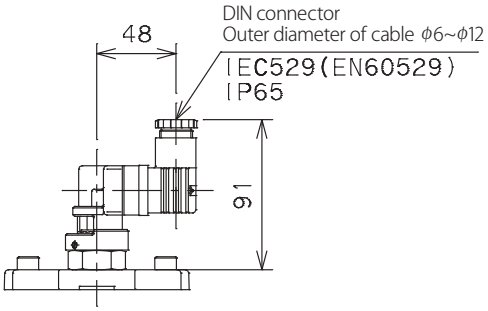
Companion flange
TLA-06,08-□□-□□N

TLA-10,12-□□-I□□

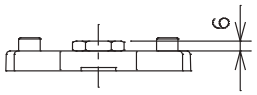


Companion flange
TLA-10,12-□□-□□N

Differential pressure type indicator part ＊Common at all size



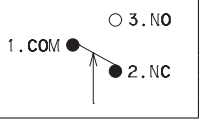
E,D:Electric contact type
TLA-□□-□□-E,D□□



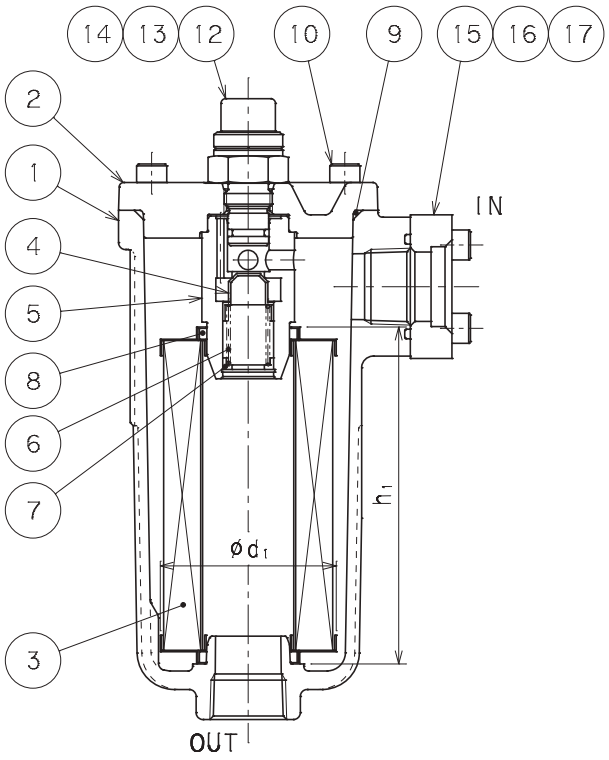
Closing plug
TLA-□□-□□-_□□

Model code	Working pressure(MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
IA-3	0.2	0.3	
EA-3	0.2	0.3	0.3
EA-3D			

〈Micro switch specification〉

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

CROSS SECTION



PARTS LIST

No.	Item	Qty
1	Body	1
2	Cover	1
3	Element	1
4	Relief valve	1
5	Valve seat	1
6	Spring	1
7	Spring holder	1
8	O-ring	2
9	O-ring	1
10	Cap bolt	4
11	———	—
12	O-ring	1
13	O-ring	1
14	Indicator	1
15	Companion flange	1
16	Cap bolt	4
17	O-ring	1

ELEMENT SIZE

Element Model code	Size(mm)		Weight*1 (kg)
	φd1	h1	
P-TLA-06,08	76	145.6	0.32
P-TLA-10,12	92	209	0.59

＊ Common to TRF,TRA,TLA

SEALING PARTS LIST

No.	8	9	12	13	17	Item code of sealing parts set *3			
Standard*2 / Model code	JIS B2401 1A					Material	SP No.: 8, 9	SA No. : 8, 9, 12, 13	SA-N No. : 8, 9, 12, 13, 17
TLA-06,08	P36	G90	P18	P14	G40	NBR	SSF001922	SSF001920	SSF001921
						FKM	SSF001931	SSF001929	SSF001930
TLA-10,12	G50	G115			G55	NBR	SSF002025	SSF002019	SSF002020
						FKM	SSF002026	SSF002021	SSF002022

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P	–	F	–	TLA	–	06	–	10U
("P" represents filter element)		Fluid type				Inner diameter		Filtration rating

Sealing parts set 〈Model code example〉

SA	–	F	–	TLA	–	06	–	N
		Fluid type				Inner diameter		

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

Code	Companion flange
Blank	Non
N	Companion flange

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

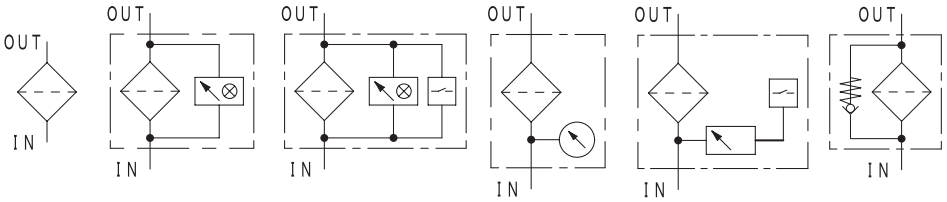
★ Refer to the MODEL CODE table on the previous page for code selection.

＊1 Weight of "Paper" element ＊2 Standard for NBR. For other material, conform to the standard.
＊3 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.

The Newest Return Filter (Model change of TRF)

Characteristics

- **Lower pressure drop and higher flow rate model by CFD (computational fluid dynamics)**
- **The new "High flow" element is available**
- **Differential pressure type indicator (TRA) and Primary pressure gauge (TRF) are selectable as an option**
- **Direct installation on tank-top is available (pipe connection is at inlet only)**



Oil filter | Visual type indicator | Electric contact type indicator | Primary pressure gauge | Primary pressure switch | Relief valve

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

SPECIFICATION

Max working pressure		MPa	1.0
Repetition durability test			0〜1.0MPa x10^7 times
Working temperature	Standard	℃	–10 〜 90
	High temperature *1	℃	–10 〜 150
Indicator working pressure		MPa	0.3
Cracking pressure		MPa	0.35
Allowable differential pressure of filter element		MPa	0.7
Flow direction/Extract direction of filter element			OUT → IN / Upward

Model code		TRA				TRF			
Inner diameter		06	08	10	12	06A	08A	10A	12A
Standard flow rate ☆	Standard ℓ /min	130	170	320	340	130	170	320	340
	High flow ℓ /min	145	185	360	400	145	185	360	400
Main material	Body	ADC							
	Cover	ADC							
Coating	Body	Non-coating							
	Cover	Non-coating							
Weight *2 kg		2.7		4.1		2.5		3.7	

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U/10UF, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

F – TRA – 06 – 10UF – I V N
❶ ❷ ❸

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

TRA / TRF

Code	Inner diameter IN	OUT
06	Rc3/4 (20A)	Rc1
08	Rc1 (25A)	
10	Rc1 1/4 (32A)	Rc1 1/2
12	Rc1 1/2 (40A)	
06A	Rc3/4 (20A)	Rc1
08A	Rc1 (25A)	
10A	Rc1 1/4 (32A)	Rc1 1/2
12A	Rc1 1/2 (40A)	

Code	Filtration rating
C-Fiber	
3C	3 μm
8C	8 μm
25C	25 μm
Paper	
10U	10 μm
20U *3	20 μm
40U *3	40 μm
High flow Paper	
10UF *3	10 μm
20UF *3	20 μm

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

Code	Filtration rating
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh

TRA Code	❶ Indicator
Blank	Closing plug
I	Visual type
E	Electric contact type
D	Electric contact type (Micro capacity)

TRF Code	❶ Pressure gauge
Blank	Closing plug
I	Pressure gauge
E	Pressure switch

Common to all models Code	❷ Relief valve
K	Non
V	Relief valve

Code	❸ Companion flange
Blank	Non
N	Companion flange

＊1 Sealing parts: FKM, only for wire gauze element, indicator and relief valve are not available (Max oil temperature is visual type: 130℃ , electric contact type/pressure gauge/pressure switch : 90℃)
＊2 Weight without companion flange ＊3 Not available for water-glycol based oil and high water based fluid

FLOW RATE GRAPH

■ Condition

Fluid type : ISO VG32
Oil temperature : 40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

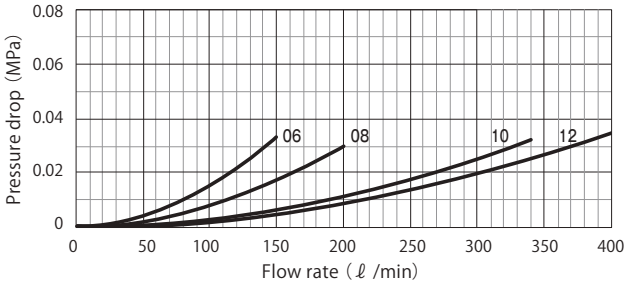
・Estimate pressure drop of filter assembly by following equation if required condition is different:

$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

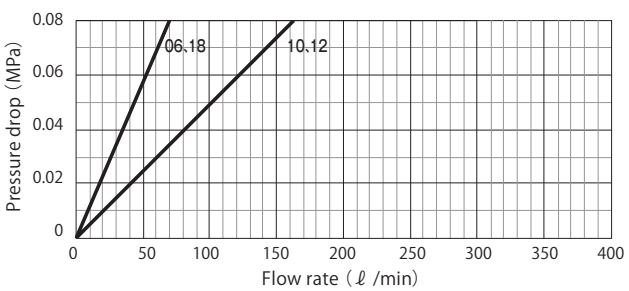
$$\text{Pressure drop of filter element} = \frac{\text{Fluid Density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

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

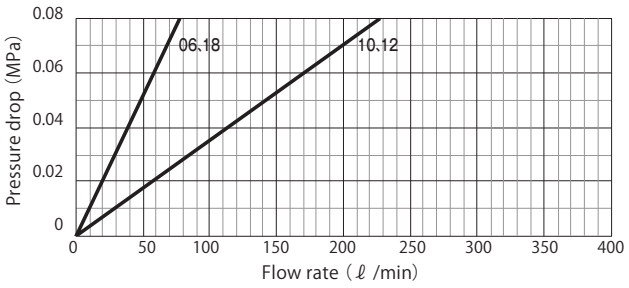
① Pressure drop of filter housing



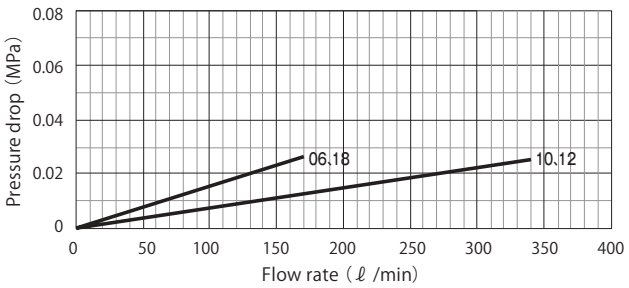
② Pressure drop of filter element



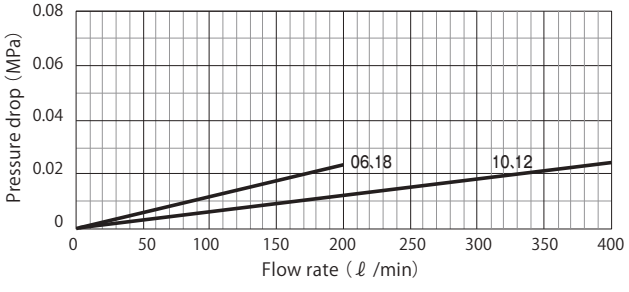
3C
3μm



8C
8μm



10U
10μm

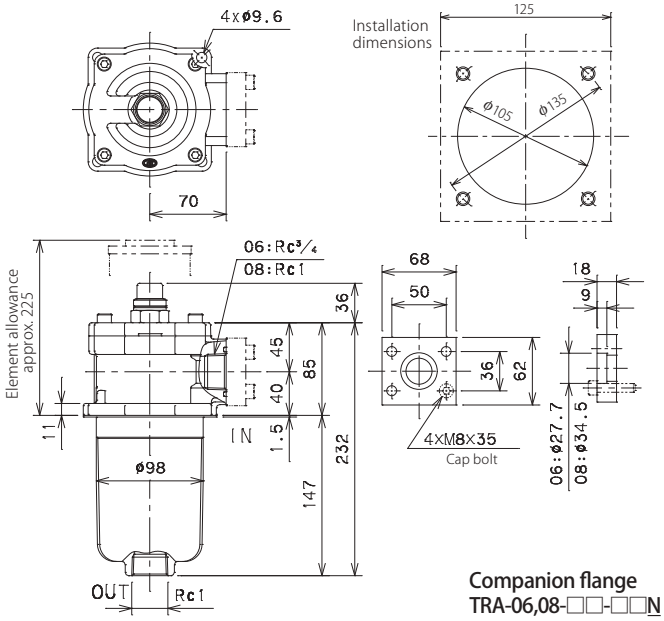


10UF
10μm Hi

＊1 Pressure drop of wire gauze element is described with one line since the value is low and there is no difference at each filter size.

TRA-06,08-□□-I□□

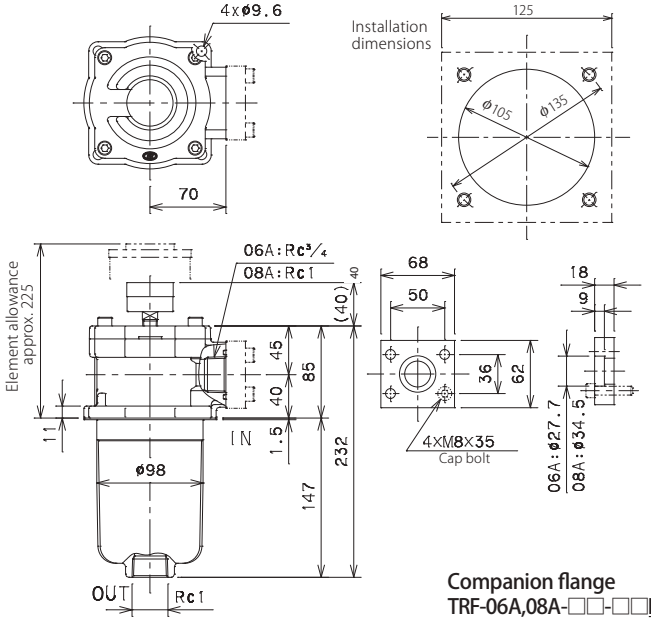
I : Visual type indicator



Companion flange
TRA-06,08-□□-□□N

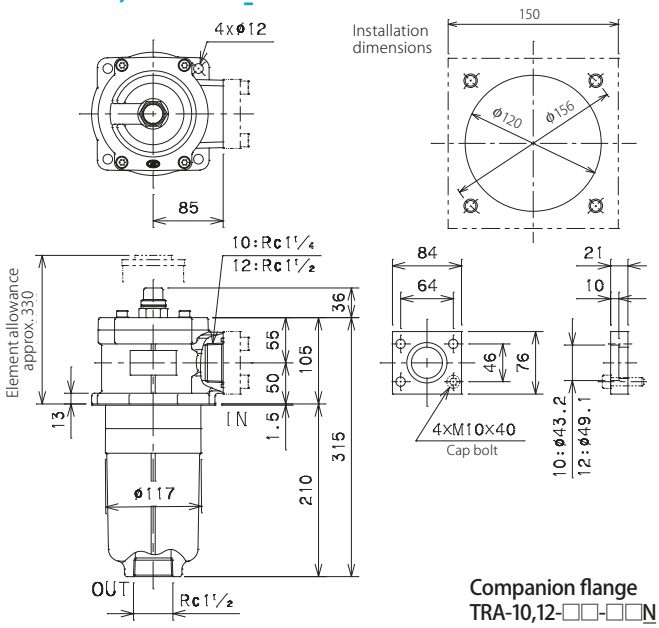
TRF-06A,08A-□□-I□□

I : Pressure gauge



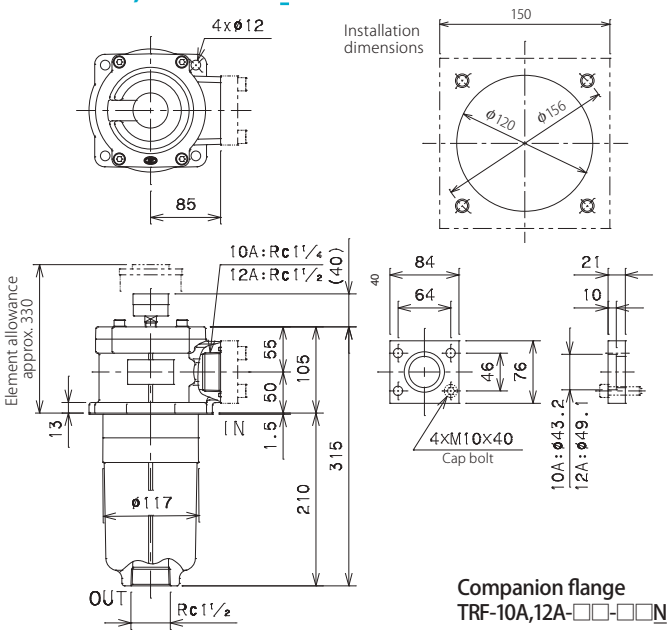
Companion flange
TRF-06A,08A-□□-□□N

TRA-10,12-□□-I□□



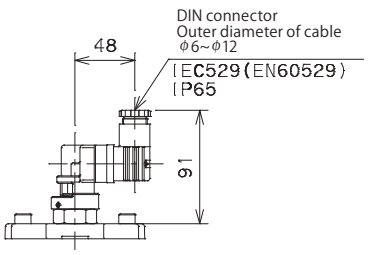
Companion flange
TRA-10,12-□□-□□N

TRF-10A,12A-□□-I□□



Companion flange
TRF-10A,12A-□□-□□N

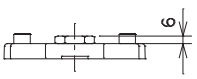
Differential pressure type indicator part ＊ Common at all size



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

〈Micro switch specification〉

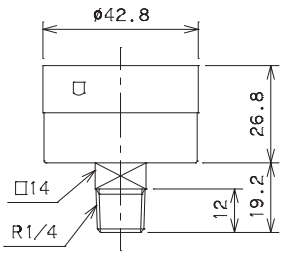
Model code	Rated capacity		Contact diagram : 1C
EA-3	Resistance load	3A,250V AC 3A,30V DC	1.COM ○ 3.NO ● 2.NC
	Inductive load	2A,250V AC 2A,30V DC	
EA-3D	Micro capacity	100mA,125V AC 100mA,30V DC	



Closing plug
TRA-□□-□□-_□□

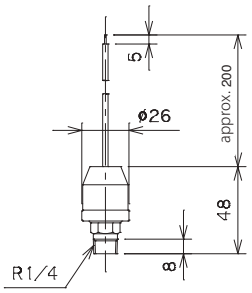
Model code	Working pressure(MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
IA-3	0.2	0.3	
EA-3	0.2	0.3	0.3
EA-3D			

Primary pressure type indicator part ＊ Common at all size



U:Pressure gauge
TRF-□□-□□-I□□

Model code	Working pressure(MPa)		
	Visual observation signal		Electric signal
	Pressure range	Clogging	
UT-4	0 ~ 1.0	0.3 ~	
PS-20			0.3



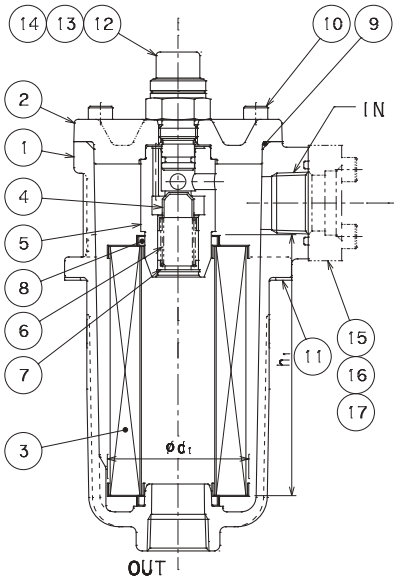
E:Pressure switch
TRF-□□-□□-E□□

〈Pressure switch specification〉

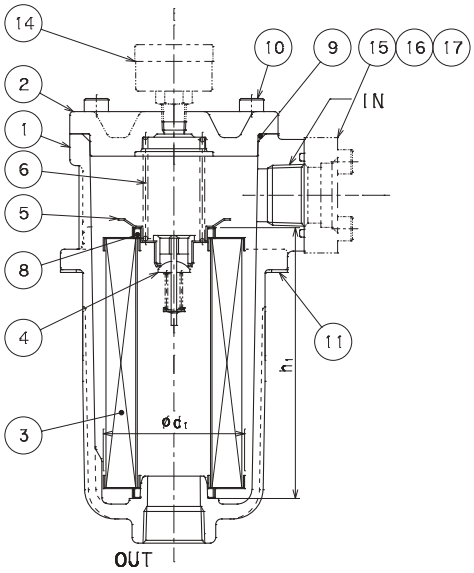
Model code	Electric standard	Contact diagram
PS-20	DC5 ~ 30V 5mA ~ 2A	1A (NO)
	AC120/240V 135VA	

CROSS SECTION

TRA



TRF



PARTS LIST

No.	Item	Qty
1	Body	1
2	Cover	1
3	Element	1
4	Relief valve	1
5	Valve seat	1
6	Spring	1
7	Spring holder	1
8	O-ring	2
9	O-ring	1
10	Cap bolt	4
11	Packing	1
12	O-ring	1
13	O-ring	1
14	Indicator	1
15	Companion flange	1
16	Cap bolt	4
17	O-ring	1

No.	Item	Qty
1	Body	1
2	Cover	1
3	Element	1
4	Relief valve	1
5	Cap	1
6	Spring	1
7	—	—
8	O-ring	2
9	O-ring	1
10	Cap bolt	4
11	Packing	1
12	—	—
13	—	—
14	Pressure gauge	1
15	Companion flange	1
16	Cap bolt	4
17	O-ring	1

ELEMENT SIZE

Element Model code	Size(mm) φd1	Size(mm) h1	Weight*1 (kg)
P-TRA-06,08	76	145.6	0.39
P-TRF-06A,08A			
P-TRA-10,12	92	209	0.7
P-TRF-10A,12A			

＊Common to TRF,TRA,TLA

SEALING PARTS LIST

No.	8	9	11	12	13	17
Standard*2 / Model code	JIS B2401 1A		Special packing non asbestos	JIS B2401 1A		
TRA-06,08	P36	G90	t1.5x□113/φ105	P18	P14	G40
TRA-10,12	G50	G115	t1.5x□136/φ120			G55
TRF-06A,08A	P36	G90	t1.5x□113/φ105			G40
TRF-10A,12A	G50	G115	t1.5x□136/φ120			G55

Item code of sealing parts set *3				
Material	SP No.: 8, 9	SA No. : 8, 9,11, (12,13)	SA-N No.: 8, 9,11, (12,13),17	( ) : For TRA
NBR	SSF001922	SSF001916	SSF001917	
FKM	SSF001931	SSF001925	SSF001926	
NBR	SSF002025	SSF002013	SSF002014	
FKM	SSF002026	SSF002015	SSF002016	
NBR	SSF001922	SFL001920	SFL001921	
FKM	SSF001931	SFL001929	SFL001930	
NBR	SSF002025	SFL002019	SFL002020	
FKM	SSF002026	SFL002021	SFL002022	

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P	–	F	–	TRA	–	06	–	10U
("P" represents filter element)		Fluid type				Inner diameter		Filtration rating

Sealing parts set 〈Model code example〉

SA	–	F	–	TRA	–	06	–	N
		Fluid type				Inner diameter		

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

Code	Companion flange
Blank	Non
N	Companion flange

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

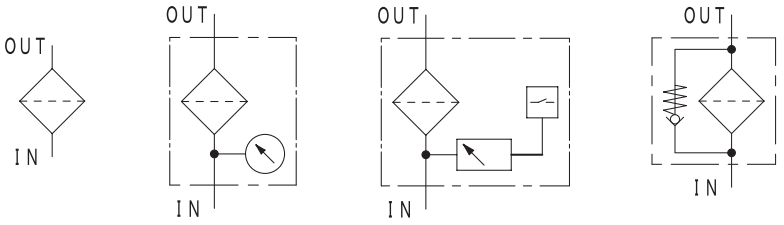
★ Refer to the MODEL CODE table on the previous page for code selection.

＊1 Weight of "C-Fiber" element ＊2 Standard for NBR. For other material, conform to the standard.
＊3 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.

Signature Model of Tank-top type Return Filter

Characteristics

- **Directly installable on tank-top (pipe connection at Inlet side only)**
- **Simple structure and Low pressure drop**
- **Light filter housing of aluminum alloy (steel lower case for large models)**
- **Primary pressure gauge/switch is selectable as an option (Installation position is changeable)**
- **Pipe connection type is "Rc threaded" and "flange" (companion flange is an option)**



Oil filter | Primary pressure gauge | Primary pressure switch | Relief valve

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

SPECIFICATION

Max working pressure		MPa	1.0
Repetition durability test			0〜1.0MPa x10^7 times
Working temperature	Standard	℃	–10 〜 90
	High temperature *1	℃	–10 〜 150
Indicator working pressure		MPa	0.3
Cracking pressure		MPa	0.35
Allowable differential pressure of filter element		MPa	0.7
Flow direction/Extract direction of filter element			OUT → IN / Upward

Inner diameter		16	20	24
Standard flow rate ☆	ℓ /min	440	770	860
Main material	Body	ADC	AC	
	Lower case	Steel plate		
	Cover	ADC	AC	
Painting Coating	Body、Cover	Non-coating		
	Lower case	Protective film treatment		
Weight *2	kg	8.0	20.0	

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

G — TRF — 16 — 10U — I V N
❶ ❷ ❸

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

Code	Inner diameter IN	OUT
16	Rc2 (20A)	Rc2
20	Rc2 1/2 (25A)	Rc3
24	Rc3 (32A)	

Code	Filtration rating
C-Fiber	
3C	3 μm
8C	8 μm
25C	25 μm
Paper	
10U	10 μm
20U *3	20 μm
40U *3	40 μm

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

Code	Filtration rating
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh

Code	Option	Switch position
❶ Indicator		
Blank	Closing plug	
I	Pressure gauge (Primary pressure)	Opposite side of Inlet
IR		Right side as seen from Inlet side
IL		Left side as seen from Inlet side
E	Pressure switch (Primary pressure)	Opposite side of Inlet
ER		Right side as seen from Inlet side
EL		Left side as seen from Inlet side

❷ Relief valve	
K	Non
V	Relief valve

❸ Companion flange	
Blank	Non
N	Companion flange

＊1 Sealing parts: FKM, only for wire gauze element, indicator and relief valve are not available (Max oil temperature are pressure gauge or pressure switch : 90℃)
＊2 Weight without companion flange ＊3 Not available for water-glycol based oil and high water based fluid

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

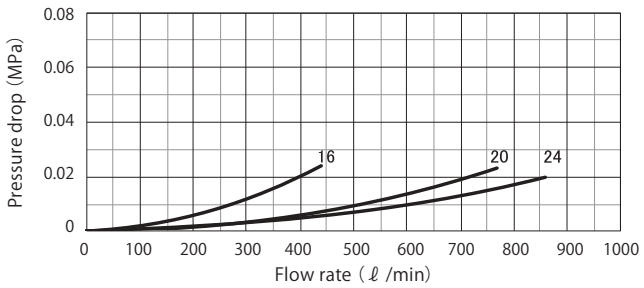
・Estimate pressure drop of filter assembly by following equation if required condition is different:

$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

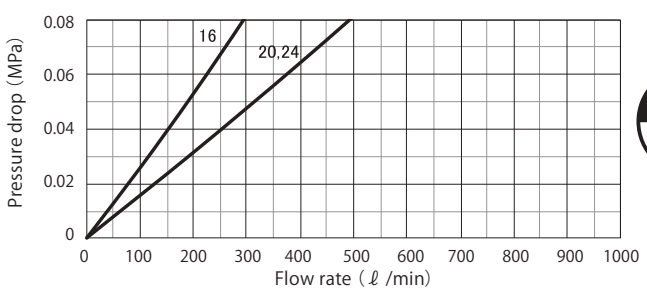
$$\text{Pressure drop of filter element} = \frac{\text{Fluid Density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86,kinematic viscosity of 32}$$

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

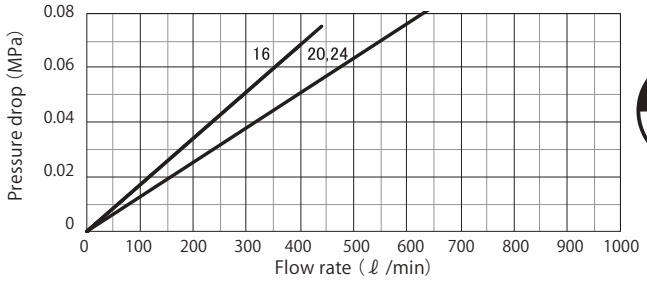
① Pressure drop of filter housing



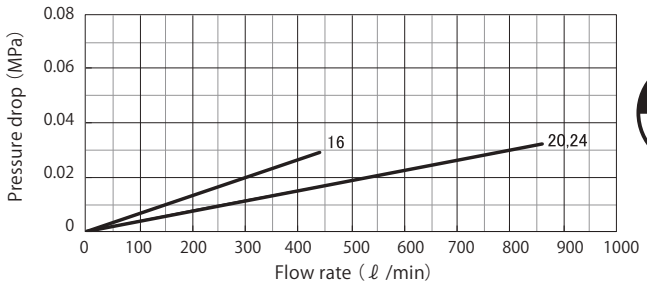
② Pressure drop of filter element



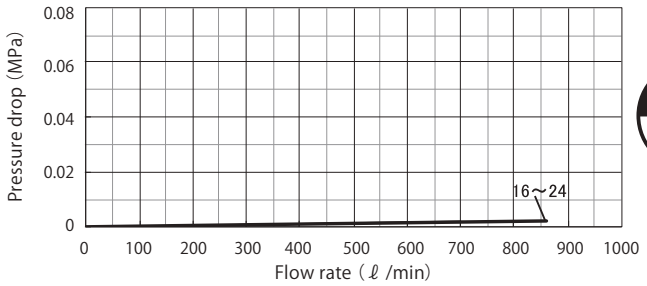
3C
3μm



8C
8μm



10U
10μm

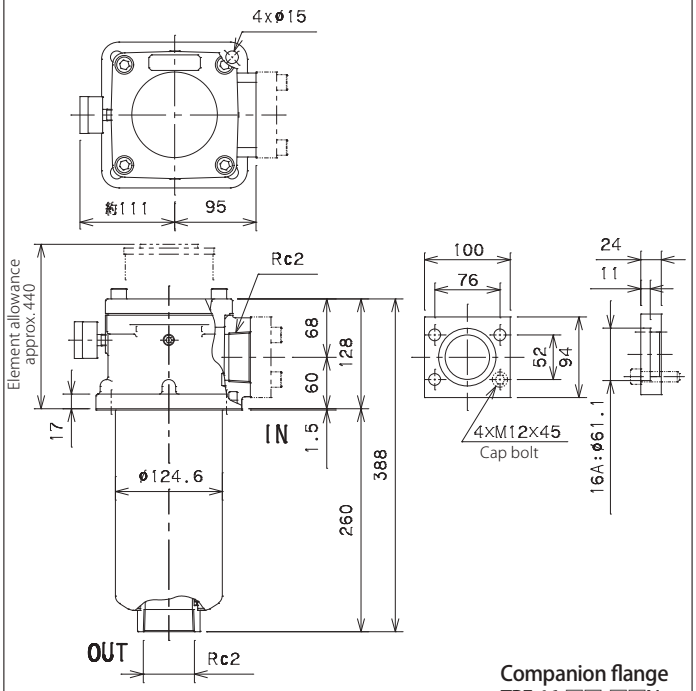


150W
150Mesh*1

＊1 Pressure drop of wire gauze element is described with one line since the value is low and there is no difference at each filter size.

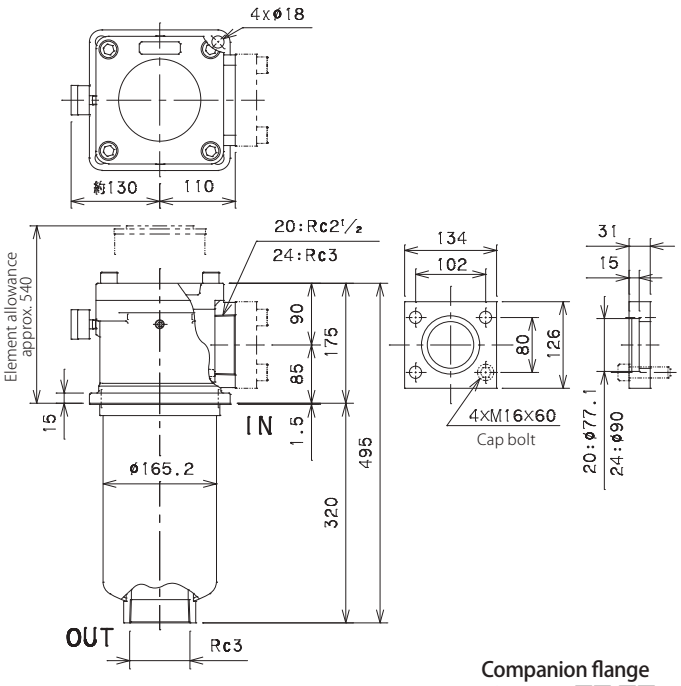
TRF-16-□□-I□□

I : Pressure gauge



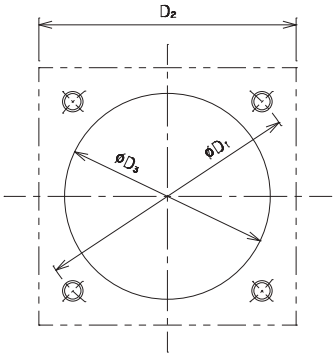
Companion flange
TRF-16-□□-□□N

TRF-20,24-□□-I□□



Companion flange
TRF-20,24-□□-□□N

Recommended installation dimensions

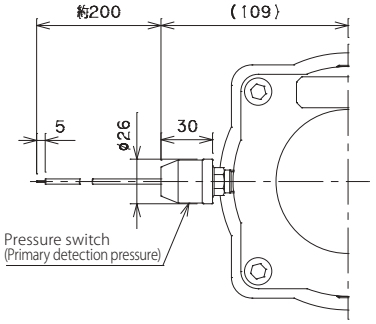


(mm)

Model code \ Mark	D1	D2	D3
TRF-16	190	170	134
TRF-20,24	240	205	176

Primary pressure type indicator part

＊Common at all size



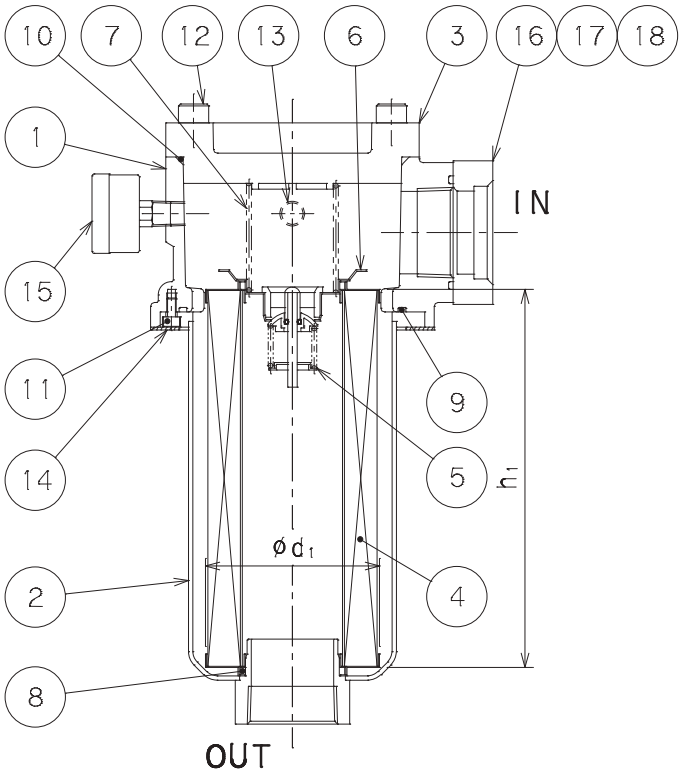
E : Pressure switch
TRF-□□-□□-E□□

Model code	Working pressure(MPa)		
	Visual observation signal		Electric signal
	Pressure range	Clogging	
UT-4	0 ～ 1.0	0.3 ～	
PS-20			0.3

〈Pressure switch specification〉

Model code	Electric standard	Contact diagram
PS-20	DC5 ～ 30V 5mA ～ 2A	1A (NO)
	AC120/240V 135VA	

CROSS SECTION



PARTS LIST

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

ELEMENT SIZE

Element Model code	Size(mm)		Weight*1 (kg)
	φd1	h1	
P-TRF-16	105	258	0.94
P-TRF-20,24	133	309	1.60

SEALING PARTS LIST

No.	8	9	10	14	18	Item code of sealing parts set *3			
Standard*2 / Model code	JIS B2401 1A			Special packing non asbestos	JIS B2401 1A	Material	SP No.:8, 10	SA No.: 8～10, 14	SA-N No.: 8～10, 14, 18
TRF-16	G60	G130	G130	t1.5x□170/φ134	G70	NBR	SSF000039	SSF000031	SSF000035
						FKM	SSF000406	SSF000398	SSF000402
TRF-20,24	G90	AS568 259	G160	t1.5x□205/φ176	G100	NBR	SSF000040	SSF000032	SSF000036
						FKM	SSF000407	SSF000399	SSF000403

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P	–	G	–	TRF	–	16	–	10U
("P" represents filter element)		Fluid type				Inner diameter		Filtration rating

Sealing parts set 〈Model code example〉

SA	–	G	–	TRF	–	16	–	N
		Fluid type				Inner diameter		

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

Code	Companion flange
Blank	Non
N	Companion flange

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

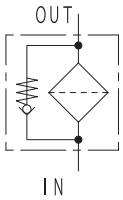
★ Refer to the MODEL CODE table on the previous page for code selection.

＊1 Weight of "Paper" element ＊2 Standard for NBR. For other material, conform to the standard.
＊3 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.

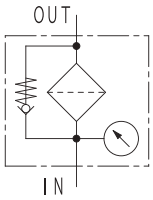
Tank-top Return Filter with Air Breather

Characteristics

- **Double role with built-in air breather (60 mesh)**
- **Light filter housing of aluminum alloy, ADC**
- **Relief valve is included in standard model**
- **Pressure gauge for clogging check is selectable as an option**
- **Pipe connection type is “Rc threaded”**



Relief valve



Primary pressure gauge
Relief valve

SPECIFICATION

Max working pressure		MPa	1.0
Working temperature	Standard	℃	–10 ～ 90
	High temperature *1	℃	–10 ～ 150
Measurable pressure range		MPa	0 ～ 1.0
Cracking pressure		MPa	0.25
Allowable differential pressure of filter element		MPa	0.7
Flow direction/Extract direction of filter element			OUT → IN / Upward

		03	04
Inner diameter			
Standard flow rate ☆ ℓ /min		30	40
Main material	Body	ADC	
	Cover	ADC	
Coating		Non-coating	
Weight kg		0.75	

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

G – TR – 04 – 10U – P

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

Code	Inner diameter
03	Rc 3/8
04	Rc 1/2

Code	Filtration rating
C-Fiber	
3C	3 μm
8C	8 μm
25C	25 μm
Paper	
10U	10 μm
20U *2	20 μm
40U *2	40 μm

Code	Filtration rating
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh
40W	40Mesh

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

Code	Option
Blank	Non
P	Pressure gauge

＊1 Sealing parts: FKM, only for wire gauze element, pressure gauge and relief valve are not available (Max oil temperature is pressure gauge : 90℃) ＊2 Not available for water-glycol based oil and high water based fluid

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

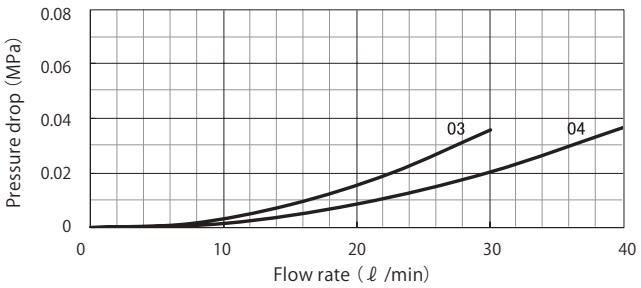
・Estimate pressure drop of filter assembly by following equation if required condition is different:

$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

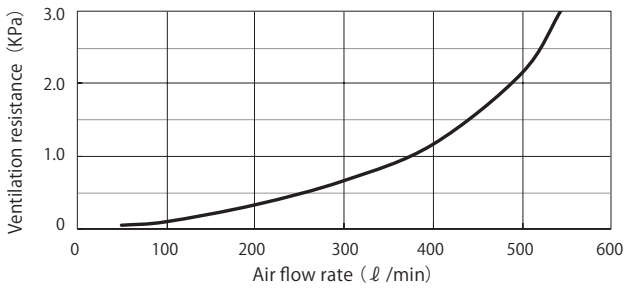
$$\text{Pressure drop of filter element} = \frac{\text{Fluid Density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86,kinematic viscosity of 32}$$

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

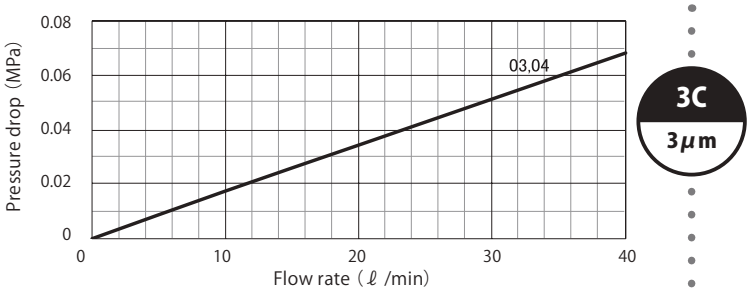
① Pressure drop of filter housing

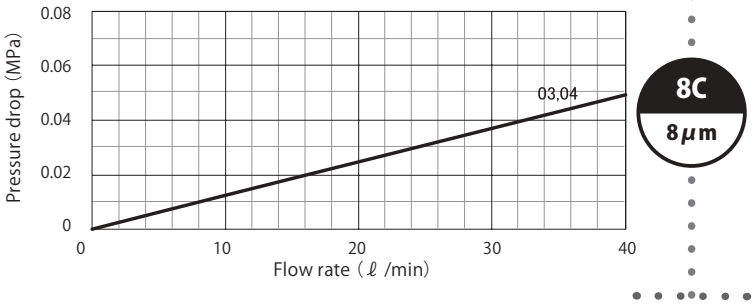


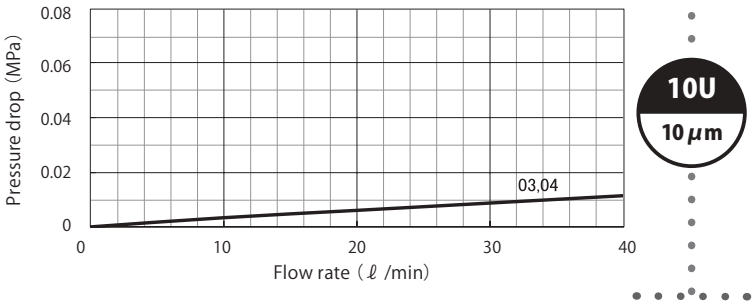
③ Air breather Ventilation resistance：60Mesh

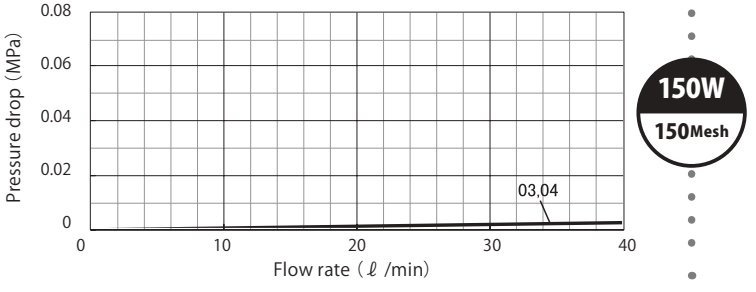


② Pressure drop of filter element



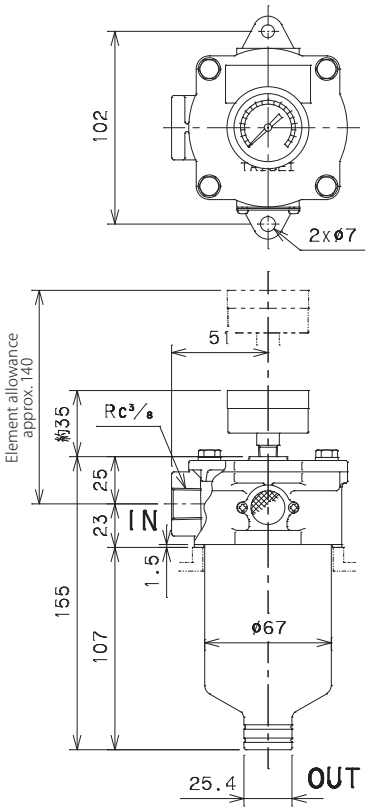




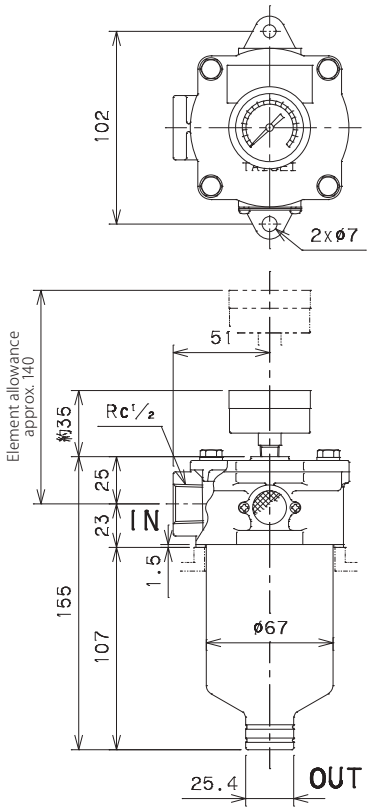


TR-03-□□-P

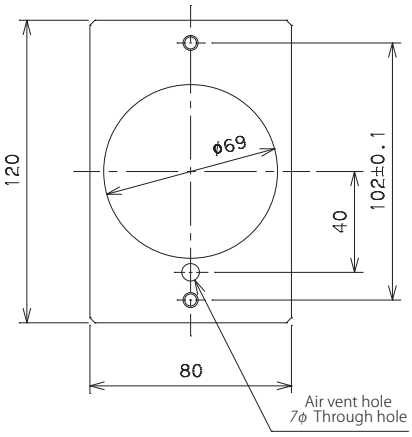
P : Pressure gauge



TR-04-□□-P

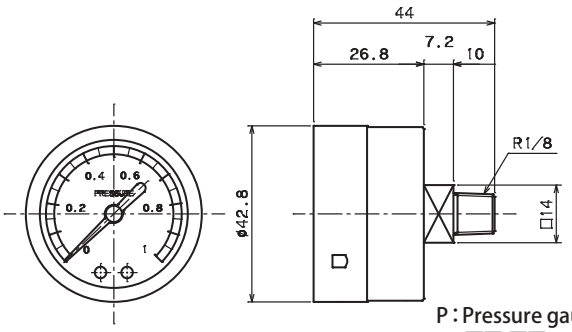


Recommended installation dimensions



Primary pressure type indicator part

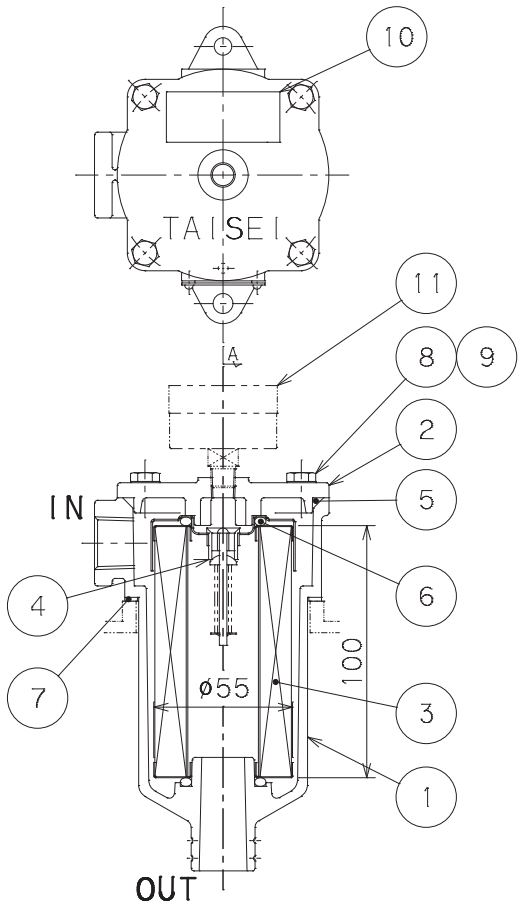
＊ Common at all size

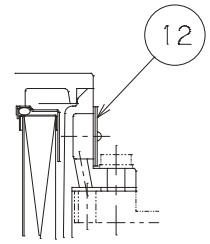


P : Pressure gauge
TR-□□-□□-P

Model code	Pressure range (MPa)
	Visual observation signal
UT-1	0～1 (Min. scale : 0.05)

CROSS SECTION





A Cross section

PARTS LIST

部番	名称	数量
1	Body	1
2	Cover	1
3	Element	1
4	Relief valve	1
5	O-ring	1
6	O-ring	2
7	Packing	1
8	Hex bolt	4
9	Washer	4
10	Nameplate	1
11	Pressure gauge	1
12	Air breather	1

ELEMENT SIZE

Element Model code	Size(mm)		Weight*1 (kg)
	φd1	h1	
P-TR-03,04	55	100	0.14

SEALING PARTS LIST

No.	5	6	7	Item code of sealing parts set *3		
Standard *2 / Model code	JIS B2401 1A	JIS B2401 1A	Special packing	Materia	SP No.:5,6	SA No.:5～7
TR-03,04	G70	P25	t1.5x(118x78)/φ68	NBR	SSF000175	SSF000174
				FKM	SSF000530	SSF000529

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P	–	G	–	TR	–	03,04	–	10U
("P" represents filter element)		Fluid type				Inner diameter		Filtration rating

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

Sealing parts set 〈Model code example〉

SA	–	G	–	TR	–	03,04
		Fluid type				Inner diameter

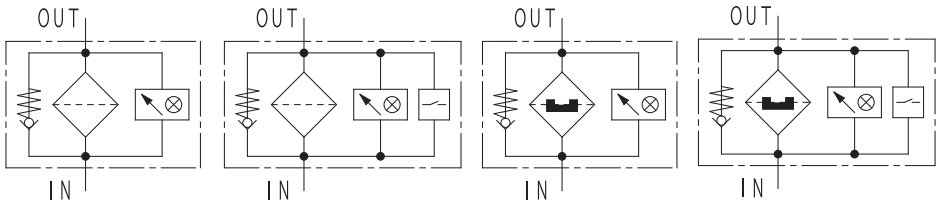
Code	Sealing parts set
SP	For element replacement
SA	For overhaul

＊1 Weight of "Paper" element ＊2 Standard for NBR. For other material, conform to the standard.
＊3 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.

Signature Model of Case type Suction Filter

Characteristics

- **Special structure to prevent air pocket inside filer**
- **Special structure to prevent flow-out of collected particles when replacing element**
- **Light filter housing of aluminum alloy**
- **Clogging indicator[*1] and relief valve are included in standard model**
- **Magnet is installable for magnetic particle removal (option)**
- **Pipe connection type is "flange" for standard model (option: Rc threaded type companion flange)**



Visual type indicator Relief valve | Electric contact type indicator Relief valve | Visual type indicator Relief valve,Magnet | Electric contact type indicator Relief valve,Magnet

SPECIFICATION

Max working pressure		MPa	0.5
Working temperature	Standard	℃	–10 ～ 90
	High temperature *2	℃	–10 ～ 130
Indicator working pressure		MPa	0.02
Cracking pressure		MPa	0.023
Allowable differential pressure of filter element		MPa	0.15
Flow direction/Extract direction of filter element			IN → OUT / Upward

Inner diameter		03A	04A	06A	08A	10A	12A	16A	20B	24B	28A	32A
Standard flow rate ☆ ℓ /min		20	36	70	120	240	330	490	670	830	1070	1350
Main material	Body	AC										
	Upper cover	ADC									AC	
Coating		Non-coating										
Weight kg		3.0		5.0		6.0		8.5		11.0		20.0

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm²/s, filtration rating: 150W, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)
★ Size : inner diameter 125A and 150A are available(built-to-order)

MODEL CODE

〈Model code example〉

F – VN – 08A – 100W – E M P
❶ ❷ ❸

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

Code	Inner diameter
03A	10A
04A	15A
06A	20A
08A	25A
10A	32A
12A	40A
16A	50A
20B	65A
24B	80A
28A	90A
32A	100A

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

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

Code	Option
❶ Indicator	
Blank	Closing plug
I	Visual type (Standard)
E	Electric contact type
D	Electric contact type (Micro capacity)
❷ Magnet	
Blank	Non
M	Magnet
❸ Companion flange	
Blank	Weld type (Standard)
P	Rc threaded type

＊1 Visual type indicator is installed for standard model. Electric contact type indicator is selectable as an option.
＊2 Sealing parts: FKM, visual type indicator is available (Max oil temperature is electric contact type : 90℃)

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

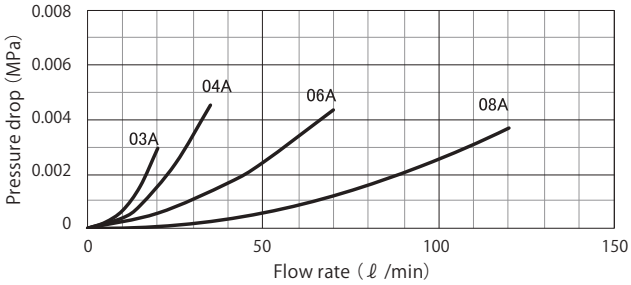
・Estimate pressure drop of filter assembly by following equation if required condition is different:

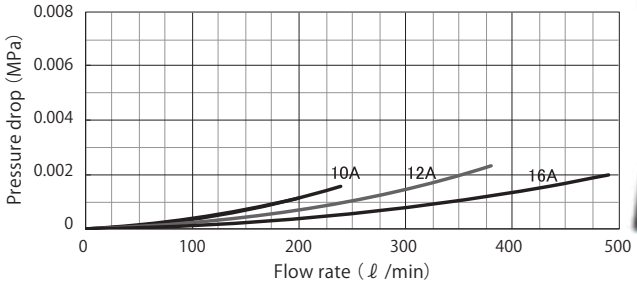
$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

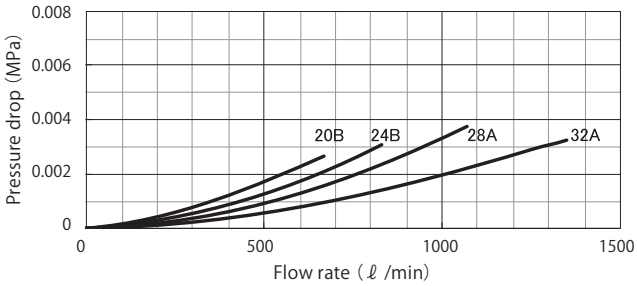
$$\text{Pressure drop of filter element} = \frac{\text{Fluid Density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

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

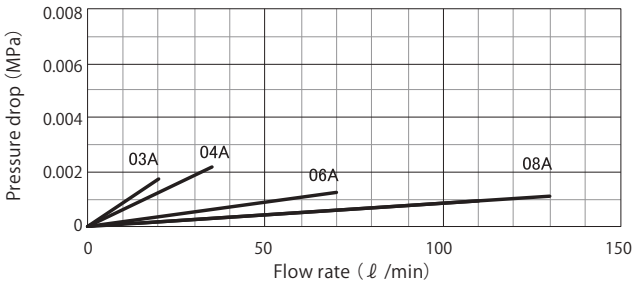
① Pressure drop of filter housing

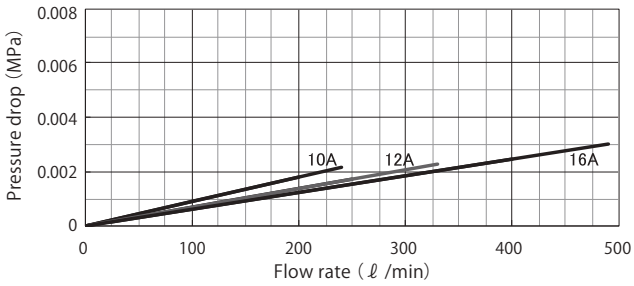




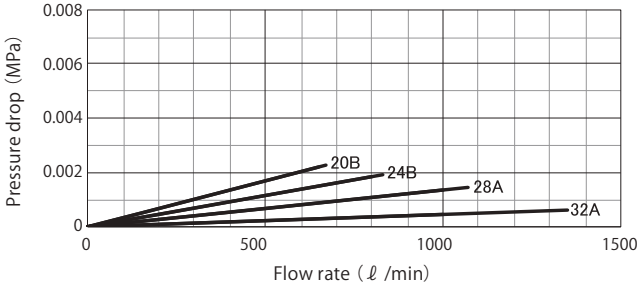


② Pressure drop of filter element





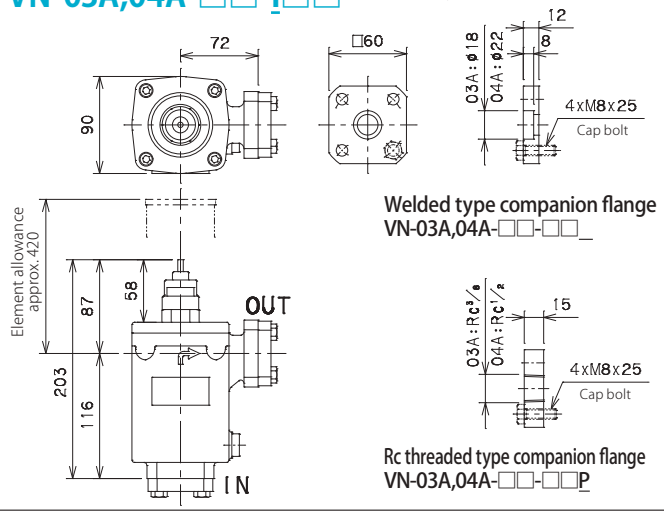
150W
150Mesh



VN

VN-03A,04A-□□-I□□

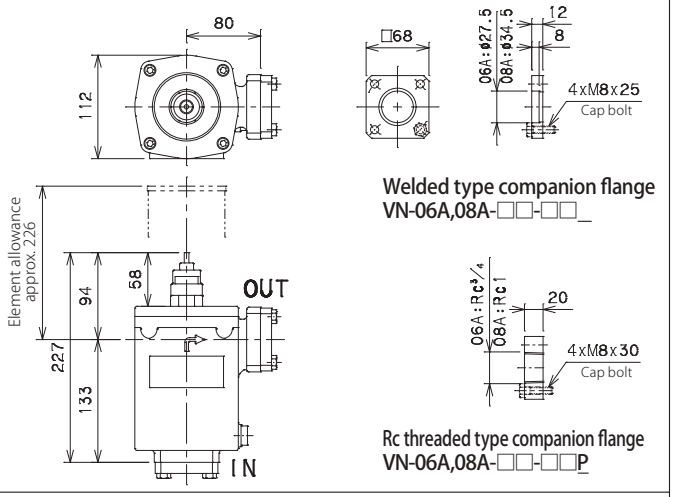
I : Visual type indicator



Welded type companion flange
VN-03A,04A-□□-□□_

Rc threaded type companion flange
VN-03A,04A-□□-□□P

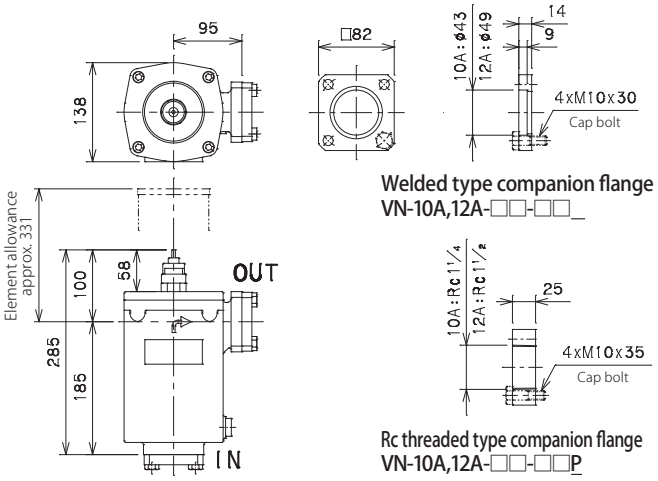
VN-06A,08A-□□-I□□



Welded type companion flange
VN-06A,08A-□□-□□_

Rc threaded type companion flange
VN-06A,08A-□□-□□P

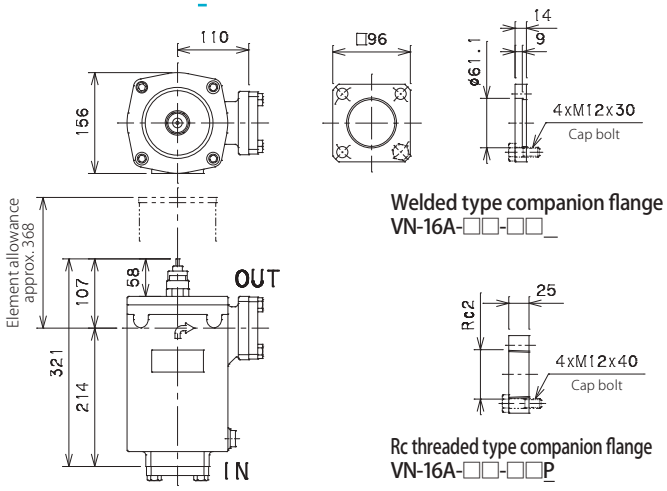
VN-10A,12A-□□-I□□



Welded type companion flange
VN-10A,12A-□□-□□_

Rc threaded type companion flange
VN-10A,12A-□□-□□P

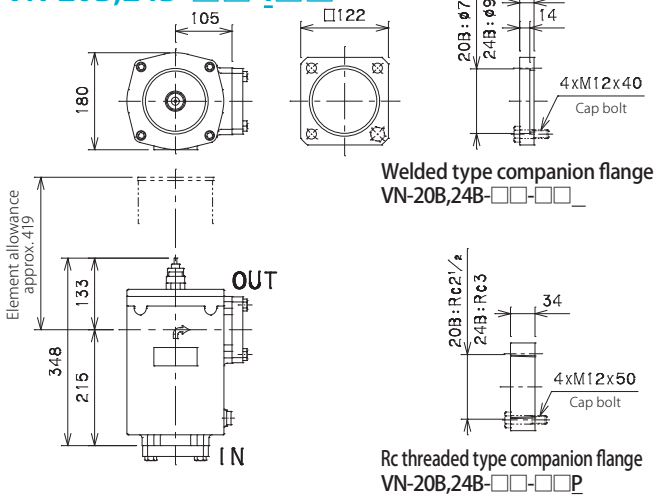
VN-16A-□□-I□□



Welded type companion flange
VN-16A-□□-□□_

Rc threaded type companion flange
VN-16A-□□-□□P

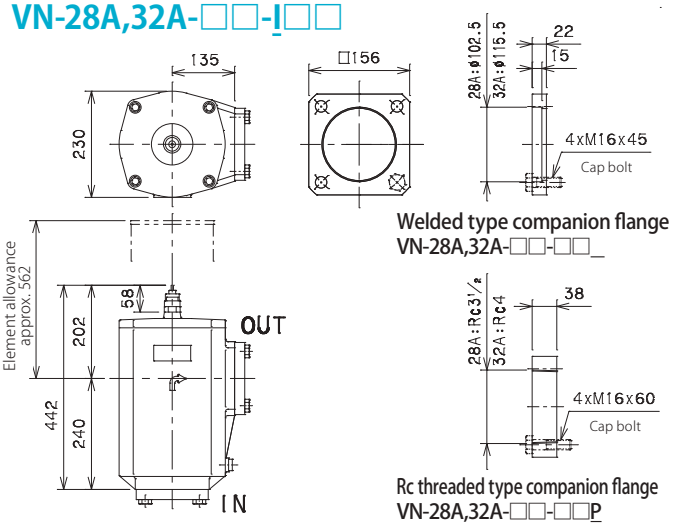
VN-20B,24B-□□-I□□



Welded type companion flange
VN-20B,24B-□□-□□_

Rc threaded type companion flange
VN-20B,24B-□□-□□P

VN-28A,32A-□□-I□□

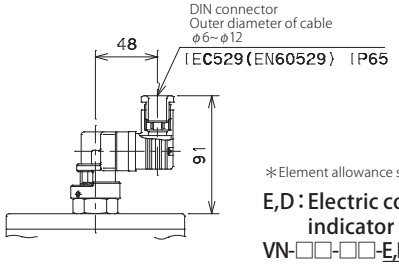


Welded type companion flange
VN-28A,32A-□□-□□_

Rc threaded type companion flange
VN-28A,32A-□□-□□P

Differential pressure type indicator part

＊Common at all size

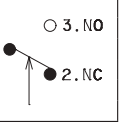


＊Element allowance should be +35mm.

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

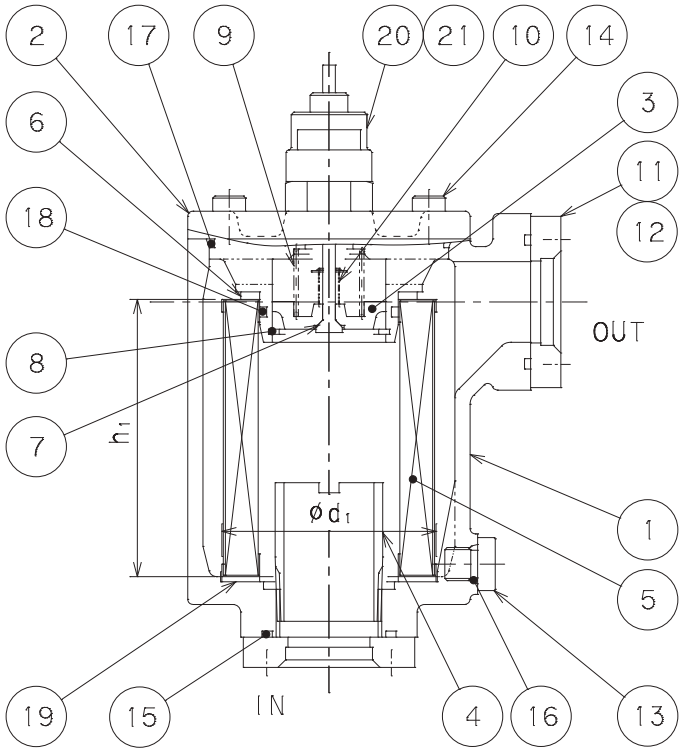
Model code	Working pressure (MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
ID-02*1	0.012	0.02	
ED-02	0.012	0.02	0.02
ED-02D			

〈Micro switch specification〉

Model code	Rated capacity		Contact diagram : 1C
ED-02	Resistance load	3A,250V AC	
		3A,30V DC	
	Inductive load	2A,250V AC	
		2A,30V DC	
ED-02D	Micro capacity	100mA,125V AC	
		100mA,30V DC	

＊1 Visual type indicator (ID-02) is manual reset type. Please reset clogging signal after indicator activation.

CROSS SECTION



PARTS LIST

No.	Item	Qty
1	Body	1
2	Upper cover	1
3	Valve	1
4	Inner tube	1
5	Element	1
6	Wave washer	1
7	Guide rod	1
8	Stop ring	1
9	Spring	1
10	Spring	1
11	Companion flange	2
12	Bolt	8
13	Drain plug	1
14	Cap bolt	4
15	O-ring	2
16	O-ring	1
17	O-ring	1
18	O-ring	1
19	Packing	1
20	Indicator	1
21	O-ring	1

ELEMENT SIZE

Element Model code	Size(mm)		Weight (kg)
	φd1	h1	
P-VN-03A,04A	65	90	0.20
P-VN-06A,08A	85	110	0.28
P-VN-10A,12A	100	160	0.50
P-VN-16A	120	180	0.70
P-VN-20B,24B	140	200	0.88
P-VN-28A,32A	180	260	1.37

SEALING PARTS LIST

No.	15	16	17	18	19	21	Item code of sealing parts set *2		
Standard *1 / Model code	JIS B2401 1A				Special packing	JIS B2401 1A	Material	SP No.: 16 ~ 19	SA No.: 15 ~ 19, 21
VN-03A,04A	G30	P11	G65	G35	t2xφ65/φ40	P18	NBR	SSF000007	SSF000001
							FKM	SSF000374	SSF000368
VN-06A,08A	G45		G90	G50	t2xφ85/φ55		NBR	SSF000008	SSF000002
							FKM	SSF000375	SSF000369
VN-10A,12A	G55	P14	G100	G65	t2xφ100/φ70		NBR	SSF000009	SSF000003
							FKM	SSF000376	SSF000370
VN-16A	G70		G125	G80	t2xφ120/φ85		NBR	SSF000010	SSF000004
							FKM	SSF000377	SSF000371
VN-20B,24B	G95		G145	G100	t2xφ140/φ105		NBR	SSF000011	SSF000005
							FKM	SSF000378	SSF000372
VN-28A,32A	G125		G180	G140	t2xφ180/φ145		NBR	SSF000012	SSF000006
							FKM	SSF000379	SSF000373

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P	–	F	–	VN	–	08A	–	100W
("P" represents filter element)		Fluid type				Inner diameter		Filtration rating

Sealing parts set 〈Model code example〉

SA	–	F	–	VN	–	08A
		Fluid type				Inner diameter

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

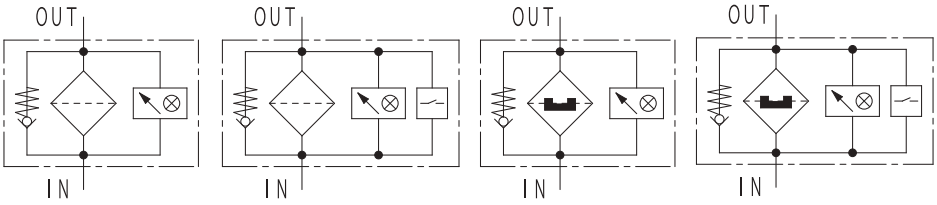
★ Refer to the MODEL CODE table on the previous page for code selection.

＊1 Standard for NBR. For other material, conform to the standard.
＊2 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.

Horizontal installation L-type Suction Filter

Characteristics

- Special structure for horizontal installation enables to save space above
- Light filter housing of aluminum alloy
- Clogging indicator*1 and relief valve are included in standard model
- Magnet is installable for magnetic particle removal (option)
- Pipe connection type is "flange" for standard model
  (option: Rc threaded type companion flange)



Visual type indicator Relief valve | Electric contact type indicator Relief valve | Visual type indicator Relief valve,Magnet | Electric contact type indicator Relief valve,Magnet

SPECIFICATION

Max working pressure		MPa	0.5
Working temperature	Standard	℃	–10 ～ 90
	High temperature*2	℃	–10 ～ 130
Indicator working pressure		MPa	0.02
Cracking pressure		MPa	0.023
Allowable differential pressure of filter element		MPa	0.15
Flow direction/Extract direction of filter element			OUT → IN ／ Horizontal extraction

Inner diameter		03A	04A	06A	08A	10A	12A	16A	20A	24A
Standard flow rate ☆ ℓ /min		16	27	44	92	130	150	210	420	475
Main material	Body	AC								
	Cover	ADC								
Coating		Non-coating								
Weight kg		2.9		4.0		6.4		8.6		13.3

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 150W, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

F – ISH – 08A – 100W – E M P
❶ ❷ ❸

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

Code	Inner diameter
03A	10A
04A	15A
06A	20A
08A	25A
10A	32A
12A	40A
16A	50A
20A	65A
24A	80A

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

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

Code	Option
❶ Indicator	
Blank	Closing plug
U	Visual type (Standard)
E	Electric contact type
D	Electric contact type (Micro capacity)
❷ Magnet	
Blank	Non
M	Magnet
❸ Companion flange	
Blank	Weld type (Standard)
P	Rc threaded type

＊1 Visual type indicator is installed for standard model. Electric contact type indicator is selectable as an option.
＊2 Sealing parts: FKM, visual type indicator is available (Max oil temperature is electric contact type : 90℃)

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

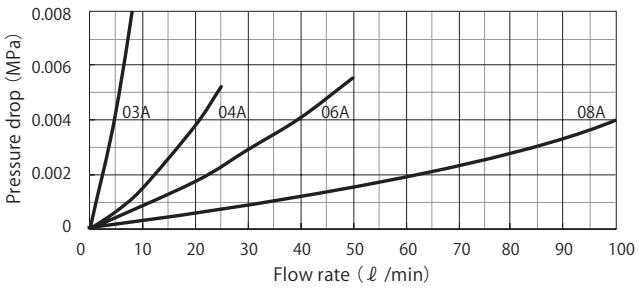
・Estimate pressure drop of filter assembly by following equation if required condition is different:

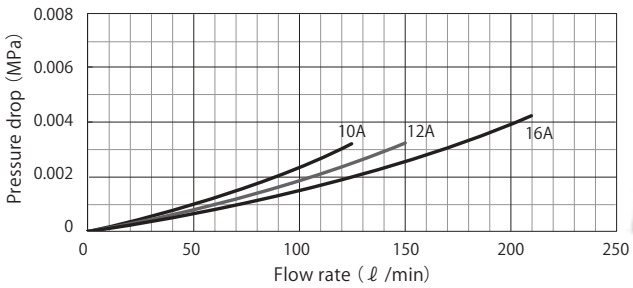
$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

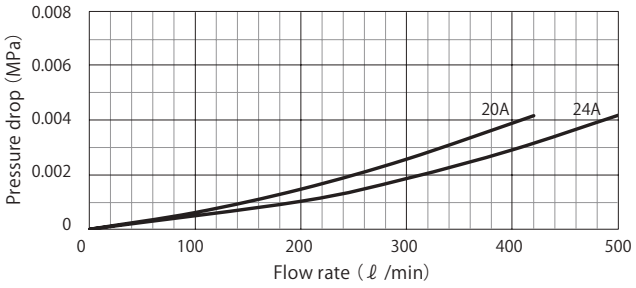
$$\text{Pressure drop of filter element} = \frac{\text{Fluid Density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86,kinematic viscosity of 32}$$

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

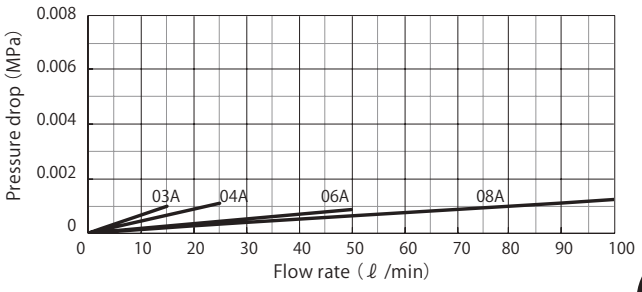
① Pressure drop of filter housing

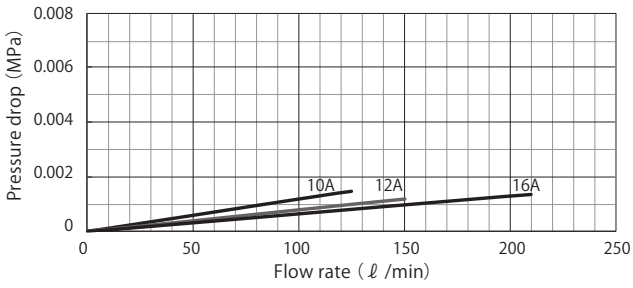




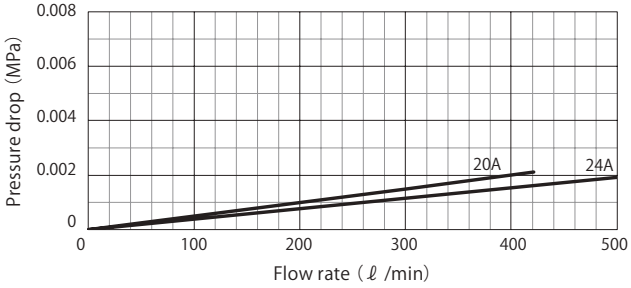


② Pressure drop of filter element

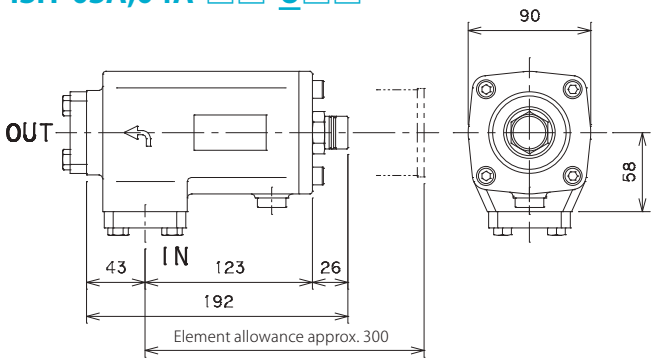


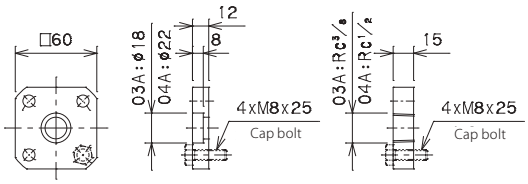


150W
150Mesh



ISH-03A,04A-□□-U□□ U : Visual type indicator

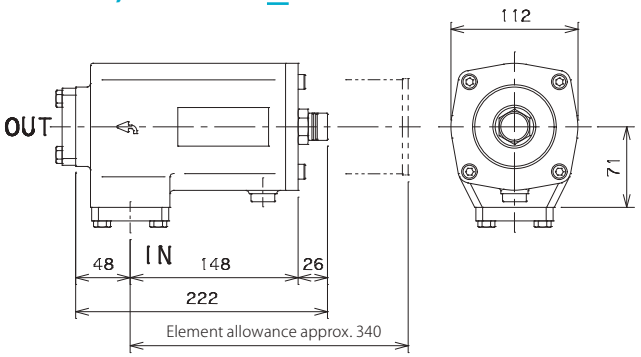


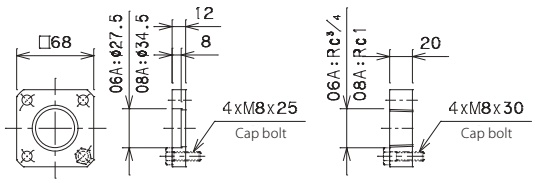


Welded type companion flange ISH-03A,04A-□□-□□_

Rc threaded type companion flange ISH-03A,04A-□□-□□P

ISH-06A,08A-□□-U□□

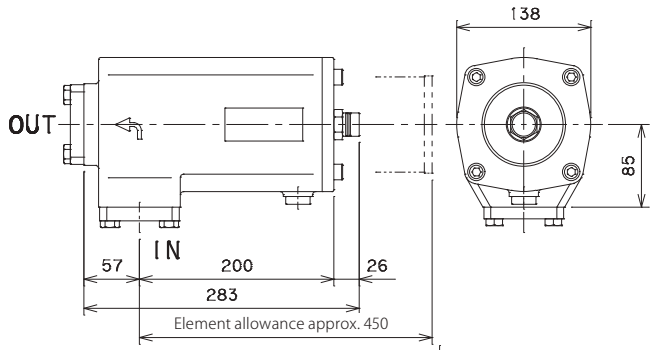


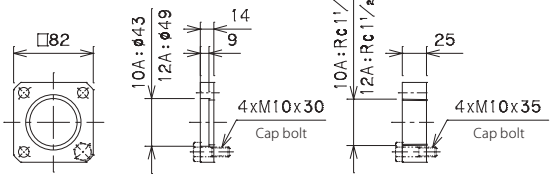


Welded type companion flange ISH-06A,08A-□□-□□_

Rc threaded type companion flange ISH-06A,08A-□□-□□P

ISH-10A,12A-□□-U□□

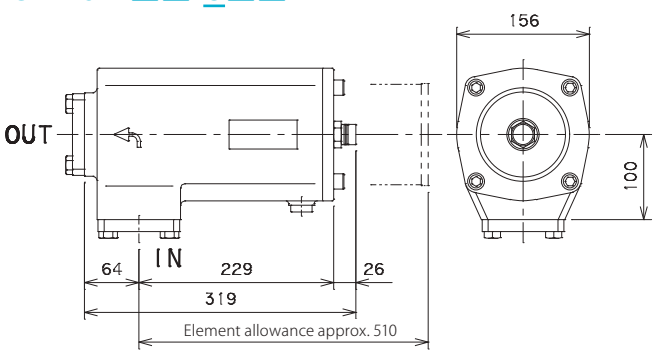


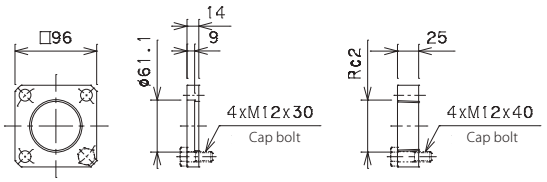


Welded type companion flange ISH-10A,12A-□□-□□_

Rc threaded type companion flange ISH-10A,12A-□□-□□P

ISH-16A-□□-U□□

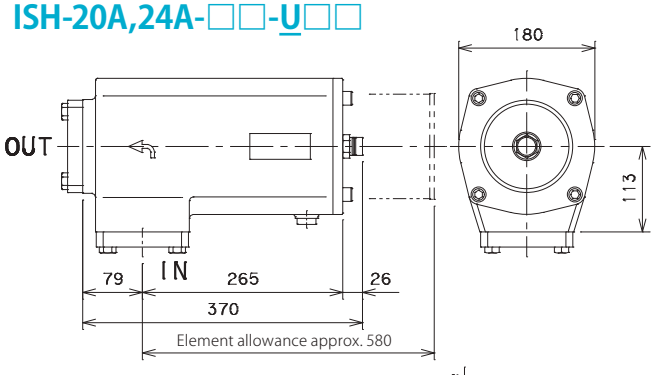


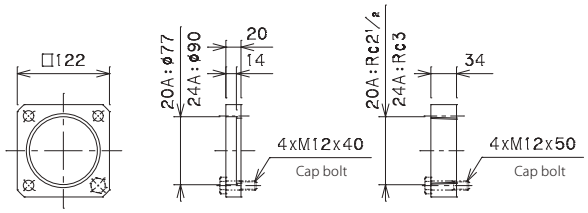


Welded type companion flange ISH-16A-□□-□□_

Rc threaded type companion flange ISH-16A-□□-□□P

ISH-20A,24A-□□-U□□



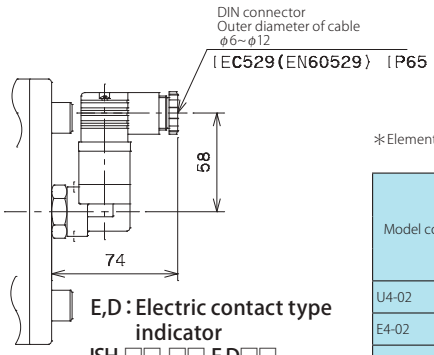


Welded type companion flange ISH-20A,24A-□□-□□_

Rc threaded type companion flange ISH-20A,24A-□□-□□P

Differential pressure type indicator part

＊Common at all size



E,D : Electric contact type indicator

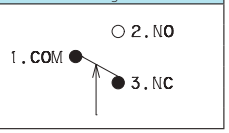
ISH-□□-□□-E,D□□

＊Element allowance should be +50mm.

Model code	Working pressure (MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
U4-02	—	0.02	
E4-02	—	0.02	0.02
E4-02D			

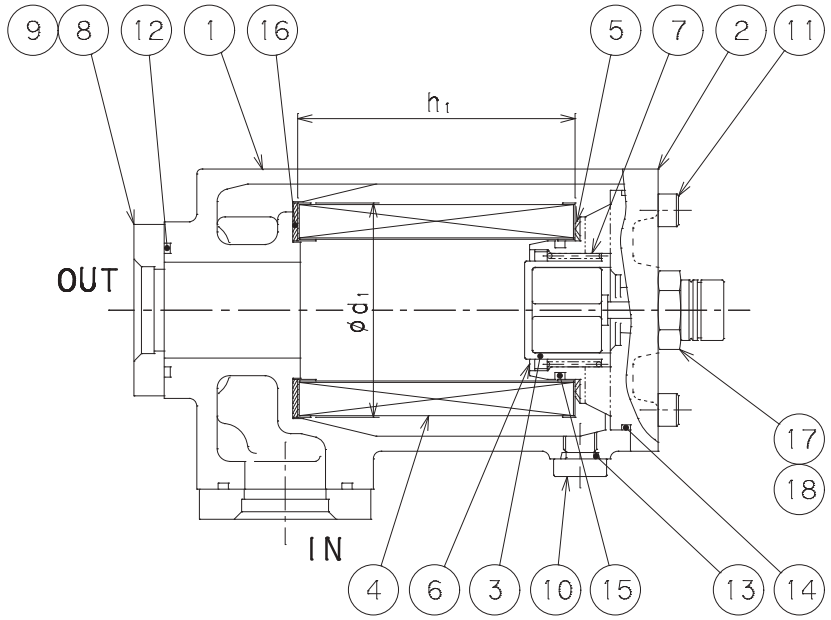
〈Micro switch specification〉

Model code	Rated capacity	
E4-02＊1	Resistance load	3A,250V AC
		3A,30V DC
	inductive load	2A,250V AC
		2A,30V DC
E4-02D	Micro capacity	100mA,125V AC
		100mA,30V DC



＊1 Visual type indicator (U4-02) is manual reset type. Please reset clogging signal after indicator activation.

CROSS SECTION



PARTS LIST

No.	Item	Qty
1	Body	1
2	Cover	1
3	Relief valve	1
4	Element	1
5	Wave washer	1
6	Stop ring	1
7	Spring	1
8	Companion flange	2
9	Bolt	8
10	Drain plug	1
11	Cap bolt	4
12	O-ring	2
13	O-ring	1
14	O-ring	1
15	O-ring	1
16	Packing	1
17	Indicator	1
18	O-ring	1

ELEMENT SIZE

Element Model code	Size(mm)		Weight (kg)
	φd1	h1	
P-ISH-03A,04A	65	90	0.15
P-ISH-06A,08A	85	110	0.31
P-ISH-10A,12A	100	160	0.39
P-ISH-16A	120	180	0.65
P-ISH-20A,24A	140	200	0.74

SEALING PARTS LIST

No.	12	13	14	15	16	18	Item code of sealing parts set *2		
Standard *1 / Model code	JIS B2401 1A				Special packing	JIS B2401 1A	Material	SP No.: 13 ~ 16	SA No.: 12 ~ 16, 18
ISH-03A,04A	G30	P11	G65	G35	t2xφ65/φ40	P18	NBR	SSF000024	SSF000019
							FKM	SSF000391	SSF000386
ISH-06A,08A	G45		G90	G50	t2xφ85/φ55		NBR	SSF000025	SSF000020
							FKM	SSF000392	SSF000387
ISH-10A,12A	G55	P14	G100	G65	t2xφ100/φ70		NBR	SSF000026	SSF000021
							FKM	SSF000393	SSF000388
ISH-16A	G70		G125	G80	t2xφ120/φ85		NBR	SSF000027	SSF000022
							FKM	SSF000394	SSF000389
ISH-20A,24A	G95		G145	G100	t2xφ140/φ105		NBR	SSF000028	SSF000023
							FKM	SSF000395	SSF000390

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P	–	F	–	ISH	–	08A	–	100W
("P" represents filter element)		Fluid type				Inner diameter		Filtration rating

Sealing parts set 〈Model code example〉

SA	–	F	–	ISH	–	08A
		Fluid type				Inner diameter

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

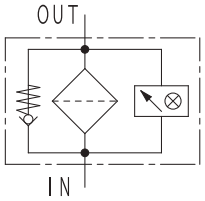
★ Refer to the MODEL CODE table on the previous page for code selection.

＊1 Standard for NBR. For other material, conform to the standard.
＊2 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.

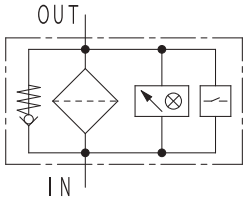
In/Outlet reversed type of ISH model

Characteristics

- **Horizontal Inlet and downward Outlet enables efficient piping from tank side***
  ＊Filter element of STU is NOT same as ISH model.
- **Horizontal extraction of element replacement**
- **Light filter housing of aluminum alloy**
- **Clogging indicator[*1] and relief valve are included in standard model**
- **Pipe connection type is "flange" for standard model**
  (option: Rc threaded type companion flange)



Visual type indicator
Relief valve



Electric contact type indicator
Relief valve

SPECIFICATION

Max working pressure		MPa	0.5
Working temperature	Standard	℃	–10 ～ 90
	High temperature ＊2	℃	–10 ～ 130
Indicator working pressure		MPa	0.02
Cracking pressure		MPa	0.023
Allowable differential pressure of filter element		MPa	0.15
Flow direction/Extract direction of filter element			OUT → IN ／ Horizontal extraction

Inner diameter		03B	04B	06B	08B	10B	12B	16B	20B	24B	28B	32B
Standard flow rate ☆ ℓ /min		15	25	45	70	120	160	260	400	550	700	900
Main material	Body	AC										
	Cover	ADC										
Coating		Non-coating										
Weight kg		3.3		4.5		7.0		9.2	13.5		24.6	

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 150W, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

F – STU – 08B – 100W – E P
❶ ❷

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

Code	Inner diameter
03B	10A
04B	15A
06B	20A
08B	25A
10B	32A
12B	40A
16B	50A
20B	65A
24B	80A
28B	90A
32B	100A

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

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

Code	Option
❶ Indicator	
Blank	Closing plug
U	Visual type (Standard)
E	Electric contact type
D	Electric contact type (Micro capacity)

❷ Companion flange	
Blank	Weld type (Standard)
P	Rc threaded type

＊1 Visual type indicator is installed for standard model. Electric contact type indicator is selectable as an option.
＊2 Sealing parts: FKM, visual type indicator is available (Max oil temperature is electric contact type : 90℃)

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

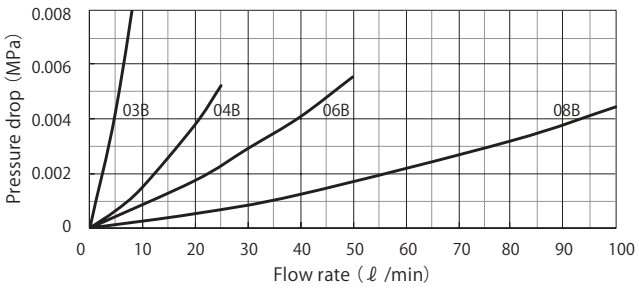
・Estimate pressure drop of filter assembly by following equation if required condition is different:

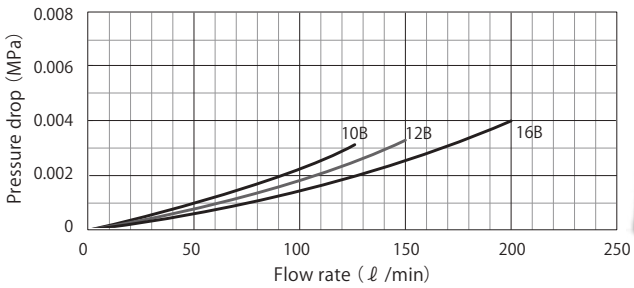
$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

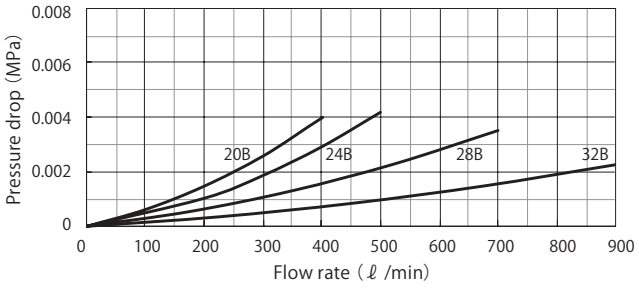
$$\text{Pressure drop of filter element} = \frac{\text{Fluid Density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86,kinematic viscosity of 32}$$

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

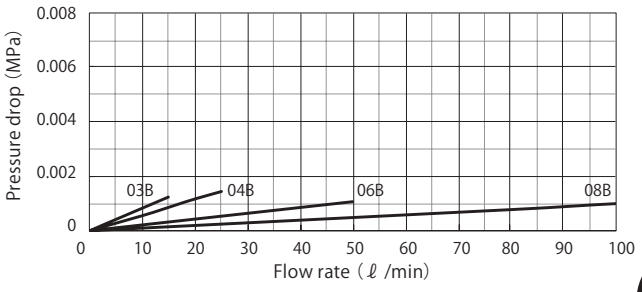
① Pressure drop of filter housing

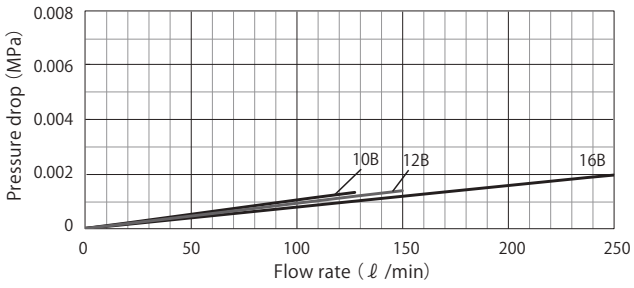




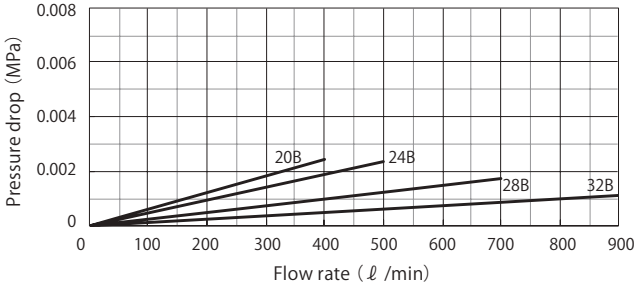


② Pressure drop of filter element



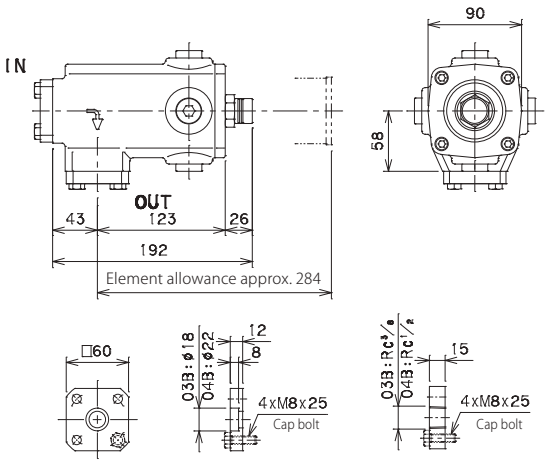


150W
150Mesh



STU-03B,04B-□□-U□□

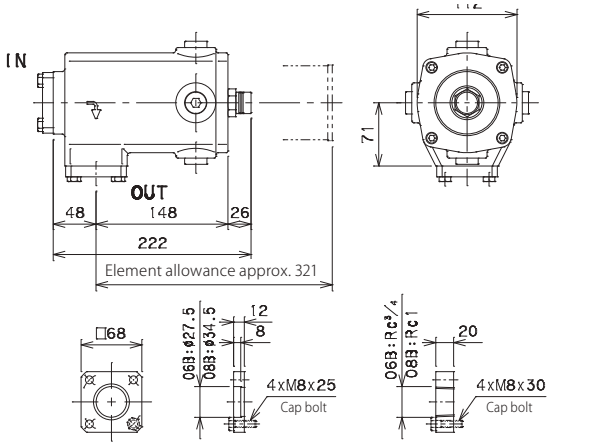
U : Visual type indicator



Welded type companion flange
STU-03B,04B-□□-□□_

Rc threaded type companion flange
STU-03B,04B-□□-□□P

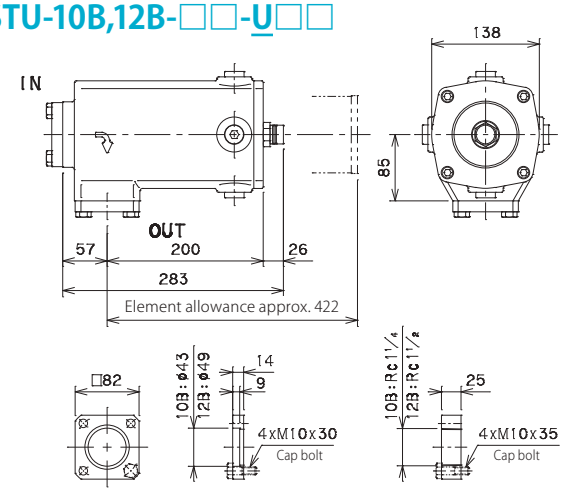
STU-06B,08B-□□-U□□



Welded type companion flange
STU-06B,08B-□□-□□_

Rc threaded type companion flange
STU-06B,08B-□□-□□P

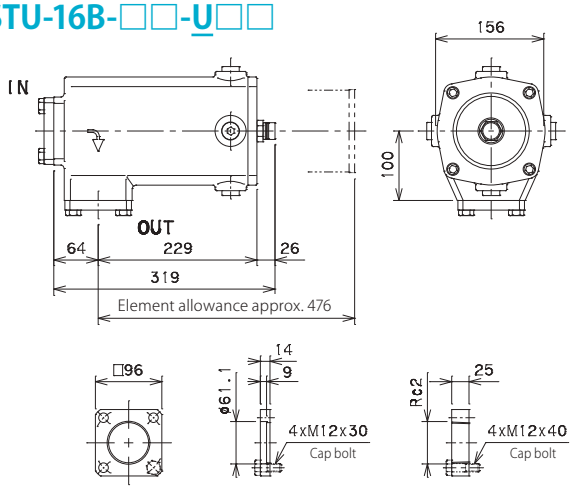
STU-10B,12B-□□-U□□



Welded type companion flange
STU-10B,12B-□□-□□_

Rc threaded type companion flange
STU-10B,12B-□□-□□P

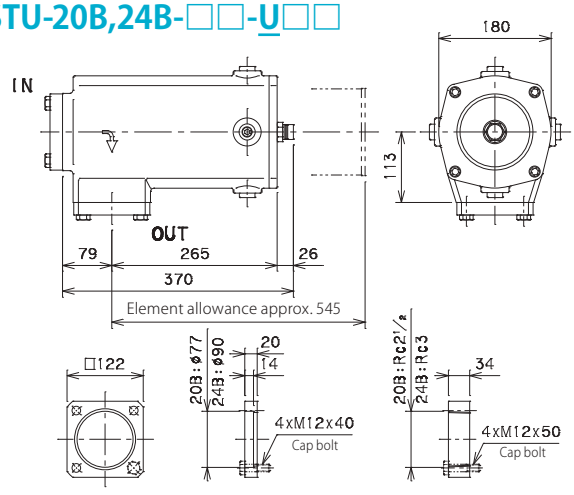
STU-16B-□□-U□□



Welded type companion flange
STU-16B-□□-□□_

Rc threaded type companion flange
STU-16B-□□-□□P

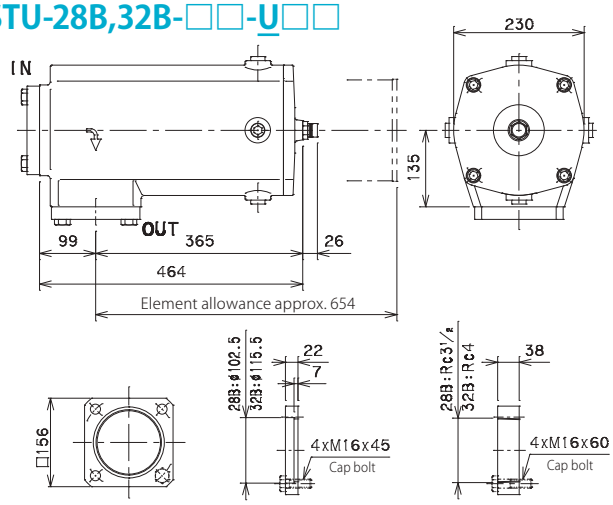
STU-20B,24B-□□-U□□



Welded type companion flange
STU-20B,24B-□□-□□_

Rc threaded type companion flange
STU-20B,24B-□□-□□P

STU-28B,32B-□□-U□□

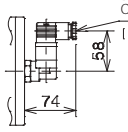


Welded type companion flange
STU-28B,32B-□□-□□_

Rc threaded type companion flange
STU-28B,32B-□□-□□P

Differential pressure type indicator part

＊Common at all size



＊Element allowance should be +50mm.

E,D : Electric contact type indicator

STU-□□-□□-E,D□□

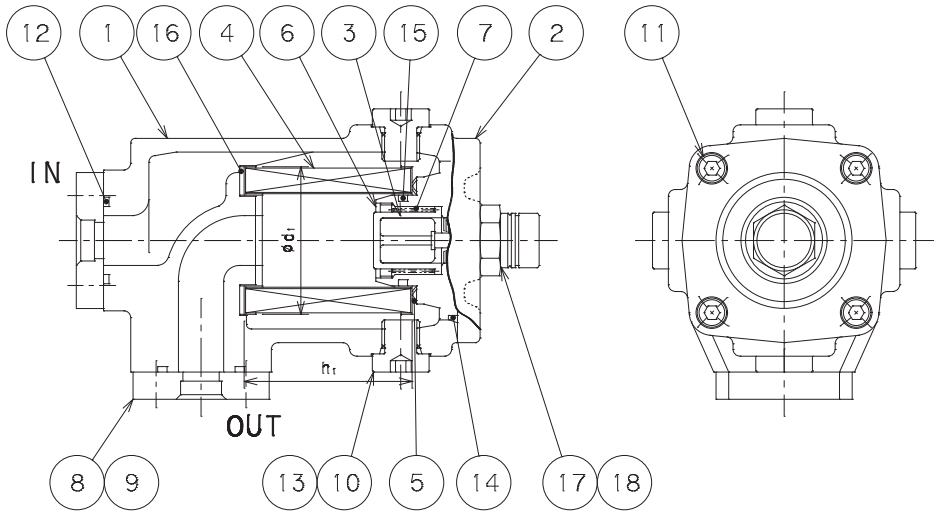
〈Micro switch specification〉

Model code	Rated capacity		Contact diagram : 1C
E4-02	Resistance load	3A,250V AC 3A,30V DC	1. COM 2. NO 3. NC
	inductive load	2A,250V AC 2A,30V DC	
E4-02D	Micro capacit	100mA,125V AC 100mA,30V DC	

Model code	Working pressure (MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
U4-02*1	—	0.02	
E4-02	—	0.02	0.02
E4-02D			

＊1 Visual type indicator (U4-02) is manual reset type. Please reset clogging signal after indicator activation.

CROSS SECTION



PARTS LIST

No.	Item	Qty
1	Body	1
2	Cover	1
3	Relief valve	1
4	Element	1
5	Wave washer	1
6	Stop ring	1
7	Spring	1
8	Companion flange	2
9	Bolt	8
10	Drain plug	4
11	Cap bolt	4
12	O-ring	2
13	O-ring	4
14	O-ring	1
15	O-ring	1
16	Packing	1
17	Indicator	1
18	O-ring	1

ELEMENT SIZE

Element Model code	Size(mm)		Weight (kg)
	φd_1	h_1	
P-STU-03B,04B	65	74	0.14
P-STU-06B,08B	85	91	0.23
P-STU-10B,12B	100	132	0.33
P-STU-16B	120	146	0.54
P-STU-20B,24B	140	165	0.74
P-STU-28B,32B	180	220	1.16

SEALING PARTS LIST

No.	12	13	14	15	16	18	Item code of sealing parts set *2		
Standard *1 / Model code	JIS B2401 1A				Special packing NBR	JIS B2401 1A	Material	SP No. : 13 ~ 16	SA No. : 12 ~ 16, 18
STU-03B,04B	G30	P14	G65	G35	t2xφ65/φ40	P18	NBR	SSF000790	SSF000789
							FKM	SSF001600	SSF001594
STU-06B,08B	G45		G90	G50	t2xφ85/φ55		NBR	SSF001057	SSF001055
							FKM	SSF001342	SSF001595
STU-10B,12B	G55		G100	G65	t2xφ100/φ70		NBR	SSF000674	SSF000673
							FKM	SSF001601	SSF001596
STU-16B	G70		G125	G80	t2xφ120/φ85		NBR	SSF000701	SSF000604
							FKM	SSF001430	SSF001597
STU-20B,24B	G95		G145	G100	t2xφ140/φ105		NBR	SSF000660	SSF000675
							FKM	SSF001602	SSF001598
STU-28B,32B	G125		G180	G140	t2xφ180/φ145		NBR	SSF000806	SSF001593
							FKM	SSF001603	SSF001599

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P	–	F	–	STU	–	08B	–	100W
("P" represents filter element)		Fluid type				Inner diameter		Filtration rating

Sealing parts set 〈Model code example〉

SA	–	F	–	STU	–	08B
		Fluid type				Inner diameter

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

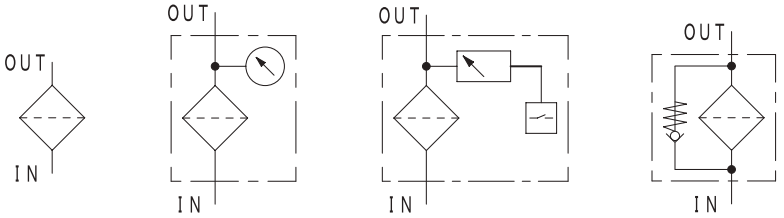
★ Refer to the MODEL CODE table on the previous page for code selection.

＊1 Standard for NBR. For other material, conform to the standard.
＊2 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.

Tank-top Suction Filter for saving space and cost

Characteristics

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



Oil filter | Secondary pressure gauge | Secondary Pressure switch | Relief valve

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

SPECIFICATION

Max working pressure		MPa	0.5
Working temperature	Standard	℃	–10 ～ 90
	High temperature *1	℃	–10 ～ 150
Measurable pressure range		MPa	-0.1 ～ 0
Cracking pressure		MPa	0.04
Allowable differential pressure of filter element		MPa	0.15
Flow direction/Extract direction of filter element			IN → OUT ／ Upward

Inner diameter		06A	08A	10A	12A	16
Standard flow rate ☆	ℓ /min	40	50	95	130	180
Main material	Body	ADC				
	Case					Steel plate
	Cover	ADC				
Coating	Body、Cover	Non-coating				
	Case					Protective film treatment
Weight *2	kg	2.5		3.7		8.0

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 150W, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

G — TSF — 16 — 60W — U V N
❶ ❷ ❸

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

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

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

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

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

❷ Relief valve	
K	Non
V	Relief valve

❸ Companion flange	
Blank	Non
N	Companion flange

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

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

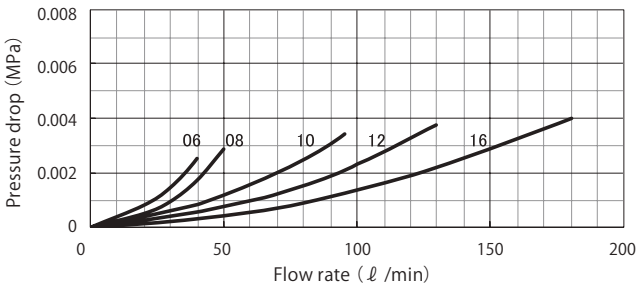
・Estimate pressure drop of filter assembly by following equation if required condition is different:

$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

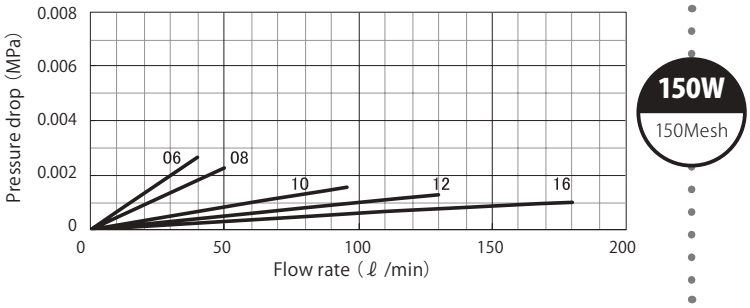
$$\text{Pressure drop of filter element} = \frac{\text{Fluid Density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86,kinematic viscosity of 32}$$

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

① Pressure drop of filter housing



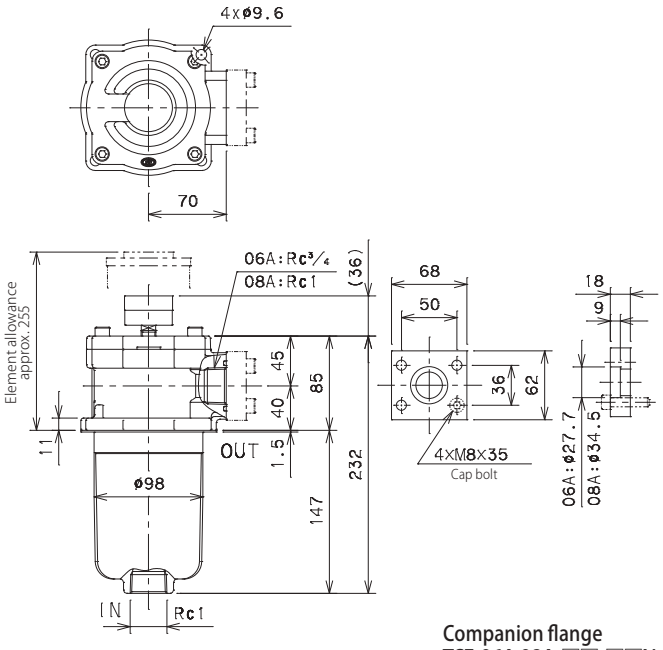
② Pressure drop of filter element



TSF

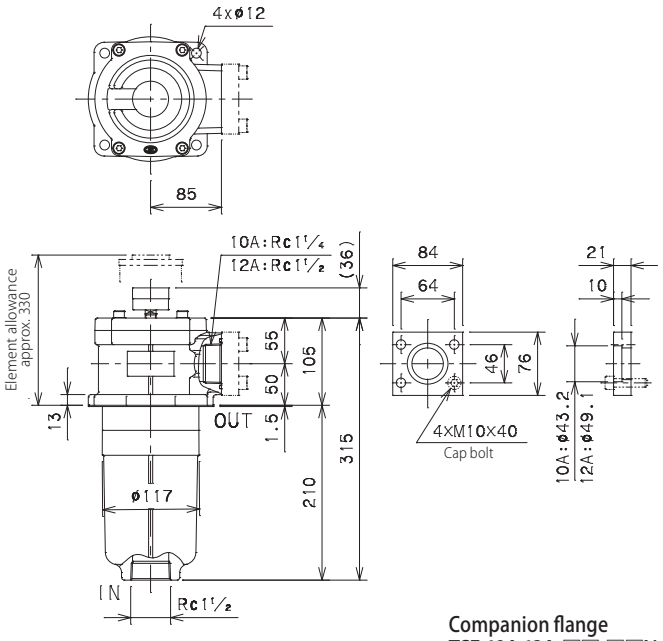
TSF-06A,08A-□□-U□□

P : Pressure gauge



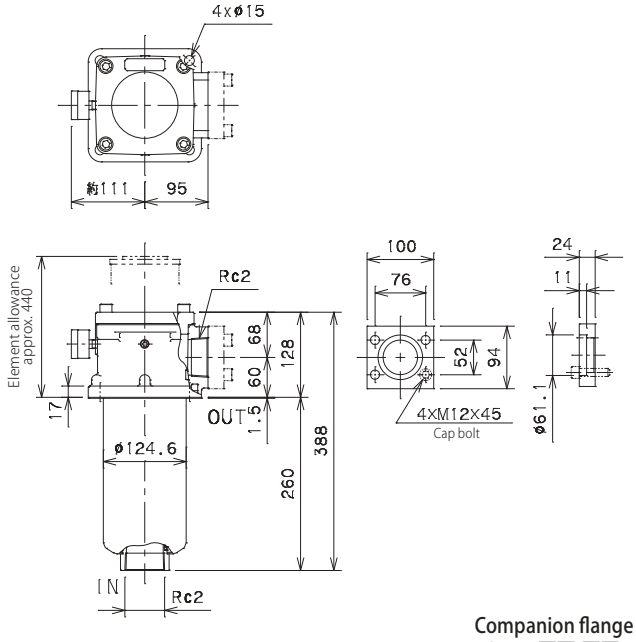
Companion flange
TSF-06A,08A-□□-□□N

TSF-10A,12A-□□-U□□



Companion flange
TSF-10A,12A-□□-□□N

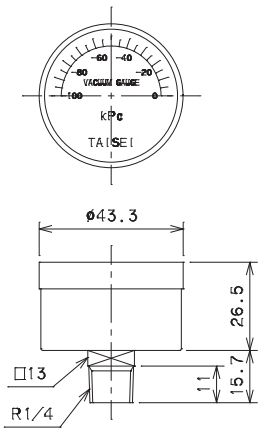
TSF-16-□□-U□□



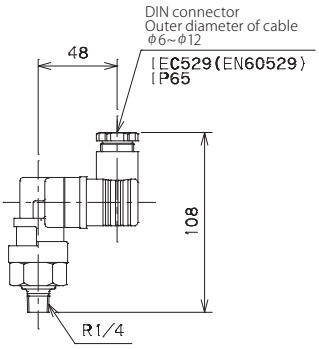
Companion flange
TSF-16-□□-□□N

Secondary pressure type indicator part

＊Common at all size

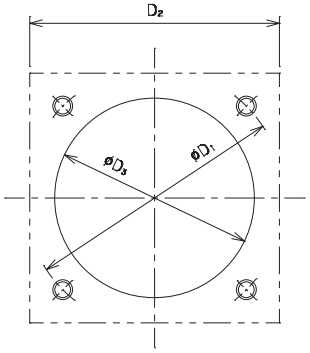


U : Pressure gauge
TSF-□□-□□-U□□□



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

Recommended installation dimensions



(mm)

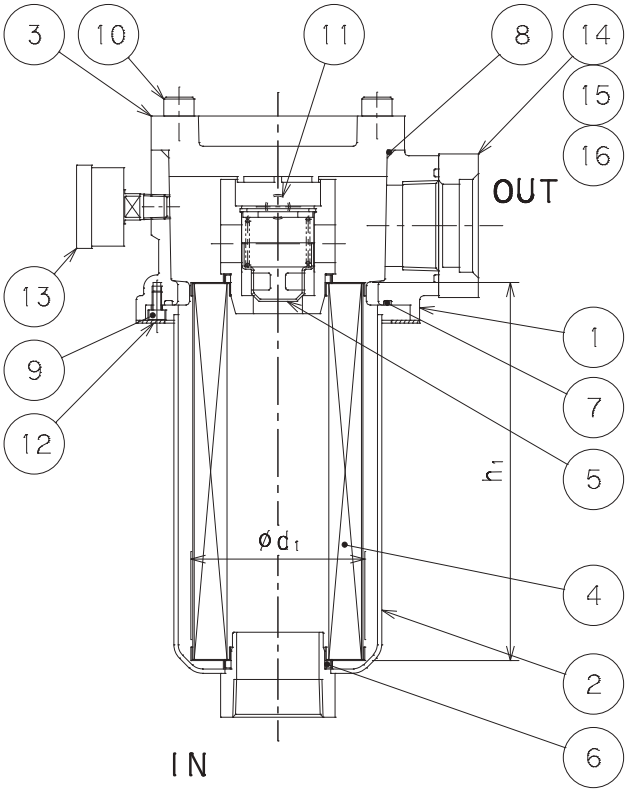
Model code \ Mark	D1	D2	D3
TSF-06A,08A	135	125	105
TSF-10A,12A	156	150	120
TSF-16	190	170	134

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

〈Micro switch specification〉

Model code	Rated capacity		Contact diagram : 1C
EG-03	Resistance load	3A,250V AC	○ 2.NO 1.COM ● ● 3.NC
		3A,30V DC	
	inductive load	2A,250V AC	
		2A,30V DC	
EG-03D	Micro capacity	100mA,125V AC	
		100mA,30V DC	

CROSS SECTION



Cross section : TSF-16

PARTS LIST

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

ELEMENT SIZE

Element Model code	Size(mm)		Weight (kg)
	φd1	h1	
P-TSF-06A,08A	76	145	0.30
P-TSF-10A,12A	92	209	0.52
P-TSF-16	105	258	0.86

TSF

SEALING PARTS LIST

No.	6	7	8	12	16	Item code of sealing parts set *2			
Standard *1 / Model code	JIS B2401 1A			Special packing non asbestos	JIS B2401 1A	Material	SP No.: 6, 8	SA No.: 6, (7), 8, 12,	SA-N No.: 6, (7), 8, ( ) : For TSF-16 12, 16
TSF-06A,08A	P36		G90	t1.5x□113/φ105	G40	NBR	SSF001922	SSF001914	SSF001915
						FKM	SSF001931	SSF001923	SSF001924
TSF-10A,12A	G50		G115	t1.5x□136/φ120	G55	NBR	SSF002025	SSF002007	SSF002008
						FKM	SSF002026	SSF002009	SSF002010
TSF-16	G60	G130	G130	t1.5x□170/φ134	G70	NBR	SSF000039	SSF000031	SSF000035
						FKM	SSF000406	SSF000398	SSF000402

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P	–	G	–	TSF	–	16	–	60W
("P" represents filter element)		Fluid type				Inner diameter		Filtration rating

Sealing parts set 〈Model code example〉

SA	–	G	–	TSF	–	16	–	N
		Fluid type				Inner diameter		

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

Code	❶Companion flange
Blank	Non
N	Companion flange (Only for SA)

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

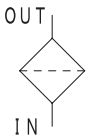
★ Refer to the MODEL CODE table on the previous page for code selection.

＊1 Standard for NBR. For other material, conform to the standard.
＊2 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.

Standard Tank-in type Suction Strainer

Characteristics

- **SFT: General hydraulic fluid, SFG: Fire-resistant hydraulic fluid**
- **All stainless-steel SFG is available for water-based fluid**
- **Pleated wire gauze enables large filtration area and space saving**
- **Cleanable and reusable because of stainless-steel wire gauze**
- **Pipe connection type is "Rc threaded"**



oil filter

SPECIFICATION

Inner diameter			02	03	04	06	08	10	12	16	20	24
Standard flow rate ☆ ℓ /min			7	17	25	52	91	140	206	337	605	817
Max working pressure MPa			-0.1 ～ 0									
Working temperature ℃			-10 ～ 150									
Main material	Inlet,Inner tube End plate	SFT	Plated steel plate, SS									
		SFG	Stainless-steel									
	Filtration media (Wire gauze)											
Coating			Non-coating									
Weight kg		SFT	0.085		0.115		0.2	0.325	0.405	0.59	0.75	0.95
		SFG	0.075		0.105		0.19					

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 150W, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

SFT / SFG – 08 – 150W

Code	Fluid type
SFT	Mineral oil
SFG	Fire resistant fluid
	Water

Code	Inner diameter
02	Rc 1/4
03	Rc 3/8
04	Rc 1/2
06	Rc 3/4
08	Rc1
10	Rc1 1/4
12	Rc1 1/2
16	Rc2
20	Rc2 1/2
24	Rc3

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

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

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32, Oil temperature：40℃
(Density: 0.86,
Kinematic viscosity: 32mm²/s)
Filtration rating：150W (150Mesh)

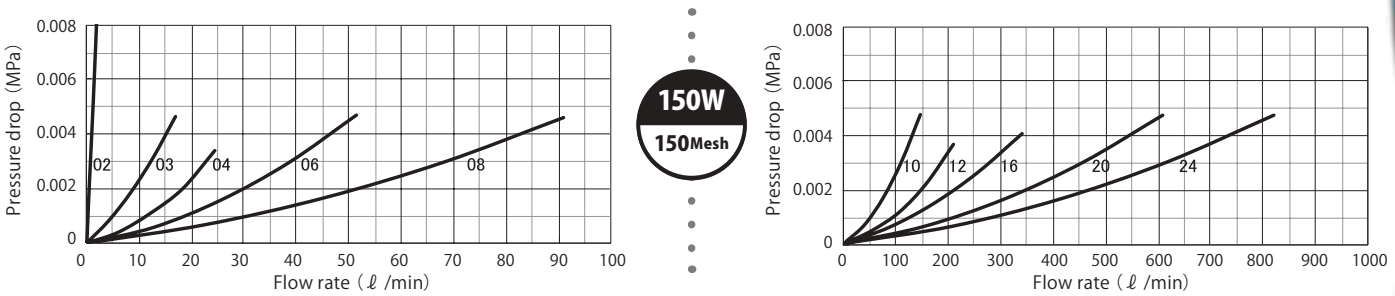
■ How to calculate of pressure drop

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

$$\text{Pressure drop of filter (Non case suction)} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

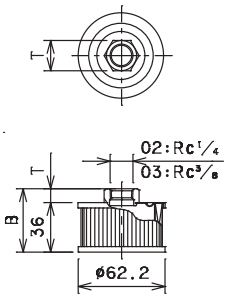
★ Pressure drop of filter (non case suction) is proportional to fluid density and kinematic viscosity.

① SFT・SFG model Pressure drop



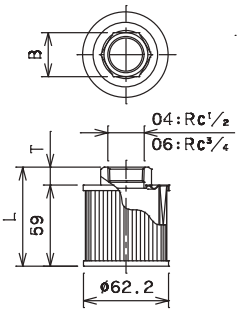
DIMENSION・PARTS LIST

SFT,SFG-02,03-□□



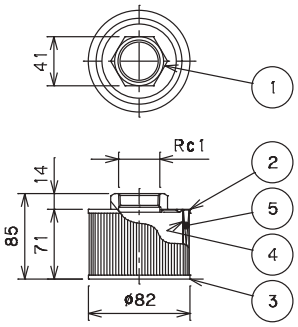
Model code \ Symbol	B	L	T
SFT,SFG-02	19	45	9
SFT,SFG-03	22	45	10

SFT,SFG-04,06-□□



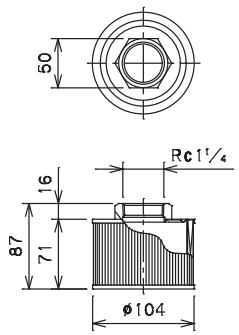
Model code \ Symbol	B	L	T
SFT,SFG-04	27	71	12
SFT,SFG-06	32	72	13

SFT,SFG-08-□□

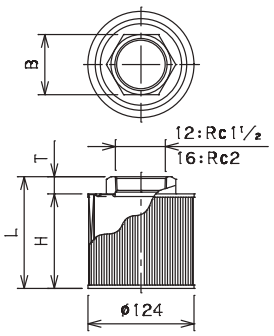


No.	Item	Qty
1	Coupling	1
2	End plate	1
3	End plate	1
4	Inner tube	1
5	Wire gauze	1

SFT,SFG-10-□□

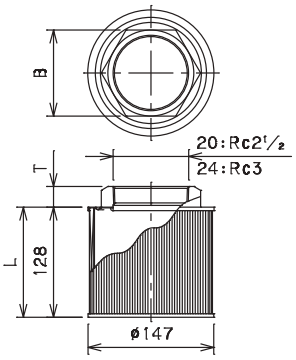


SFT,SFG-12,16-□□



Model code \ Symbol	B	H	L	T
SFT,SFG-12	55	81.5	97.5	16
SFT,SFG-16	70	110	130	20

SFT,SFG-20,24-□□

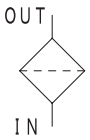


Model code \ Symbol	B	L	T
SFT,SFG-20	85	150	22
SFT,SFG-24	100	152	24

Long-seller Tank-in type Suction Strainer

Characteristics

- **For General hydraulic fluid**
- **Less widening of filtration gap and stable performance comparing with wire gauze**
- **Flat surface of notch wire (dimple wire) enables easy cleaning**
- **Pipe connection type is "Rc threaded"**



oil filter

SPECIFICATION

Inner diameter		02	03	04	06	08	10	12	16	20	24
Standard flow rate ☆ ℓ /min		7	17	30	41	60	160	200	270	425	530
Max working pressure MPa		-0.1 ～ 0									
Working temperature ℃		-10 ～ 150									
Main material	Inlet,Fin tube,End plate	Aluminum, SS									
	Filtration media (Notch wire)	Stainless-steel									
Coating		Non-coating									
Weight kg		0.21		0.28		0.49	1.02	1.42	1.77	2.77	2.87

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 150K, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

SFN – 08 – 150K

Code	Inner diameter
02	Rc 1/4
03	Rc 3/8
04	Rc 1/2
06	Rc 3/4
08	Rc1
10	Rc1 1/4
12	Rc1 1/2
16	Rc2
20	Rc2 1/2
24	Rc3

Code	Filtration rating
Notch wire (Dimple wire)	
200K	200Mesh
150K	150Mesh
100K	100Mesh
60K	60Mesh

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

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32, Oil temperature：40℃
(Density: 0.86,
Kinematic viscosity: 32mm²/s)
Filtration rating：150W（150Mesh）

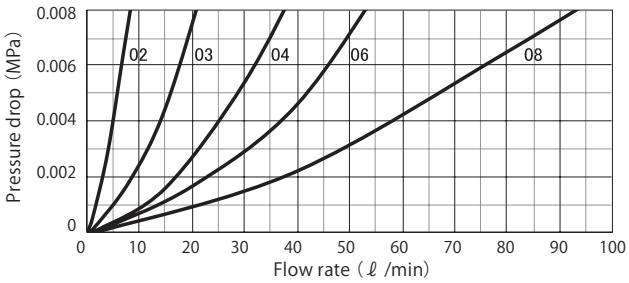
■ How to calculate of pressure drop

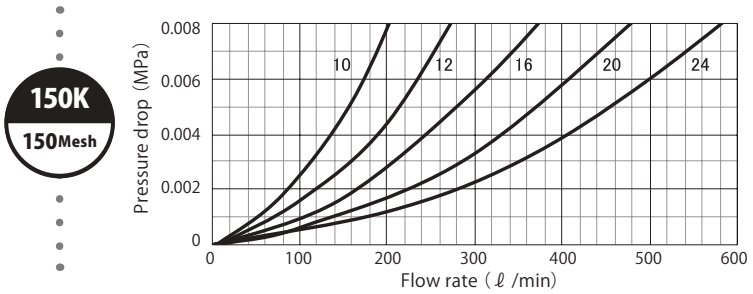
・Estimate pressure drop of filter assembly by following equation if required condition is different:

$$\text{Pressure drop of filter (Non case suction)} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

★ Pressure drop of filter（non case suction）is proportional to fluid density and kinematic viscosity.

① SFN model Pressure drop

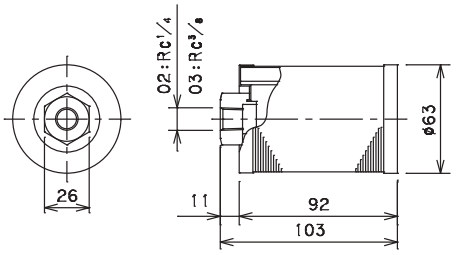




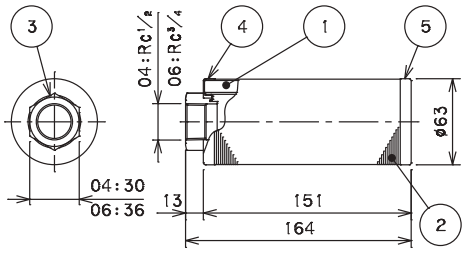
SFN

DIMENSION・PARTS LIST

SFN-02,03-□□

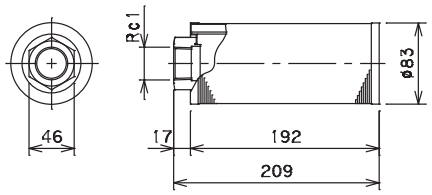


SFN-04,06-□□

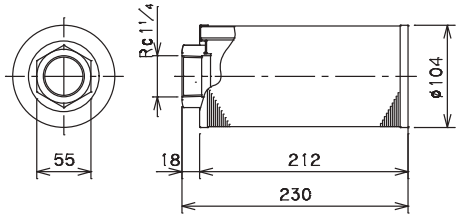


No.	Item	Qty
1	Fin tube	1
2	Notch wire	1
3	Coupling	1
4	End plate	1
5	End plate	1

SFN-08-□□

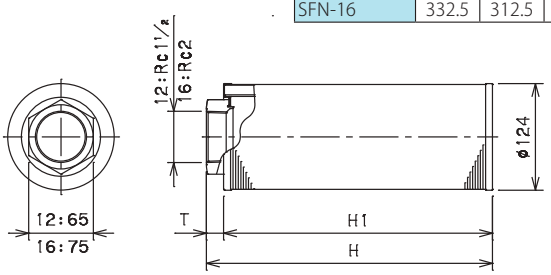


SFN-10-□□

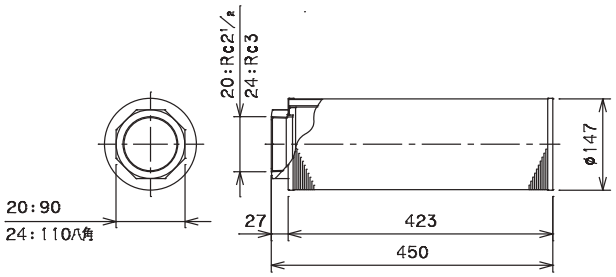


SFN-12,16-□□

Model code \ Symbol	H	H_1	T
SFN-12	250.5	232.5	18
SFN-16	332.5	312.5	20



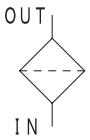
SFN-20,24-□□



Tank-in type Suction Strainer with extension rod

Characteristics

- For General hydraulic fluid
- Easy filter replacement by extension rod
- Pleated wire gauze enables large filtration area and space saving
- Cleanable and reusable because of stainless-steel wire gauze
- Pipe connection type is “insert”



oil filter

SPECIFICATION

Inner diameter		08	10	12	16	20	24
Standard flow rate ☆	ℓ /min	91	140	206	337	605	817
Max working pressure	MPa	-0.1 ～ 0					
Working temperature	℃	-10 ～ 150					
Main material	Inner tube,End plate	Plated steel plate					
	Filtration media（Wire gauze）	Stainless-steel					
	Rod part	SS, Aluminum					
Coating		Non-coating					
Weight	kg	0.30	0.46	0.62	0.69	0.91	0.96

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s,filtration rating: 150W, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

SFR – 08 – 150W

Code	Inner diameter
08	1B
10	1 1/4B
12	1 1/2B
16	2B
20	2 1/2B
24	3B

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

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

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32, Oil temperature：40℃
(Density: 0.86,
Kinematic viscosity: 32mm²/s)
Filtration rating：150W（150Mesh）

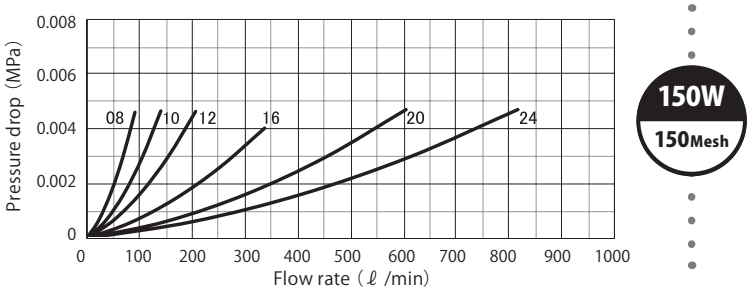
■ How to calculate of pressure drop

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

$$\text{Pressure drop of filter (Non case suction)} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

★ Pressure drop of filter（non case suction）is proportional to fluid density and kinematic viscosity.

① SFR model Pressure drop

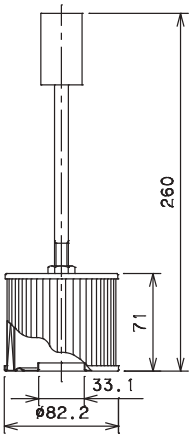


150W
150Mesh

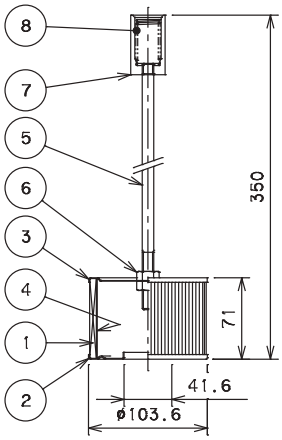
SFR

DIMENSION・PARTS LIST

SFR-08-□□

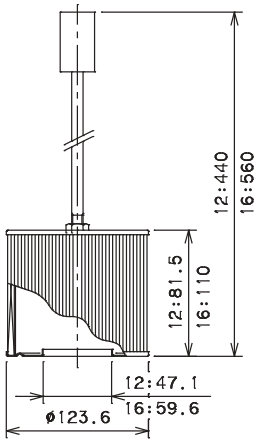


SFR-10-□□

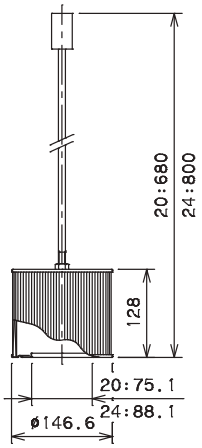


No.	Item	Qty
1	Wire gauze	1
2	End plate	1
3	End plate	1
4	Inner tube	1
5	Rod	1
6	Nut（M10）	2
7	Holder	1
8	Spring	1

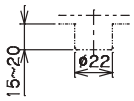
SFR-12,16-□□



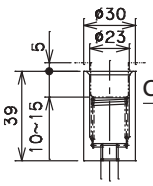
SFR-20,24-□□



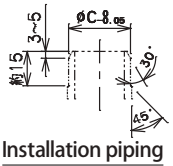
Detail of connecting part



Filter mount



Connecting part of holder



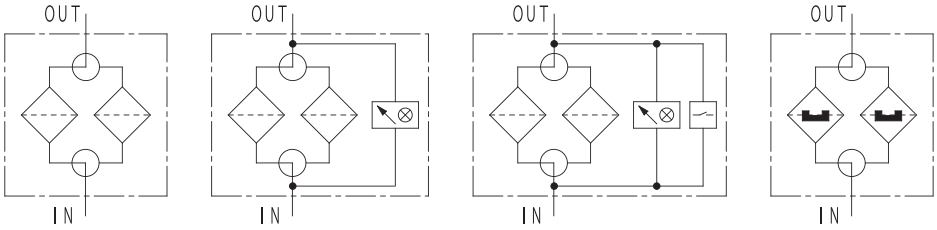
Installation piping

Model code \ Symbol	φC (mm)
SFR-08	33.0
SFR-10	41.5
SFR-12	47.0
SFR-16	59.5
SFR-20	75.0
SFR-24	88.0

Duplex Filter proven in heavy industry field

Characteristics

- **Element replacement without system shut-down is available by handle switching of two filters**
- **Welded structure filter case**
- **Clogging indicator and magnet for magnetic particle removal are available (option)**
- **Pipe connection type is JIS 20K SOP, FF Flange in standard model**
- **Several types of flange rating are selectable: ANSI, JPI, JIS (option)**



Duplex filter | Visual type indicator | Electric contact type indicator | Duplex filter / Magnet

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

SPECIFICATION

Max working pressure	MPa	2.0
Working temperature	Standard ℃	–10 ～ 90
	High temperature *1 ℃	–10 ～ 150
Indicator working pressure	MPa	0.3
Cracking pressure	MPa	Non bypass
Allowable differential pressure of filter element	MPa	0.7
Flow direction of filter element	C-Fiber,Paper,Wire gauze	IN → OUT
	Notch wire	OUT → IN
Extract direction of filter element		Upward

Inner diameter		04	06	08	10	12	16	20	24	28	32
Standard flow rate ☆ ℓ /min		70		140		340		730		1750	
Main material	Body	STPG, STKM, SS									
	Cover	STKM, SS									
	Cock	FCD									
Coating		Aqua blue									
Weight kg		24		35		63		170		250	

☆ Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

★ Please ask us for compatibility of fluid other than mineral oil.

MODEL CODE

〈Model code example〉

COS – H – 06 – A – 10U – R A E M

❶ ❷ ❸ ❹

Code	Inner diameter
04	15A
06	20A
08	25A
10	32A
12	40A
16	50A
20	65A
24	80A
28	90A
32	100A

Code	Flow direction
A	IN → OUT (Paper or Wire gauze)
B	OUT → IN (Notch wire (Dimple wire))

Code	Filtration rating
C-Fiber	
8C	8 μm
25C	25 μm
Paper	
10U	10 μm
20U *2	20 μm
40U *2	40 μm

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

Code	Filtration rating
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh
Notch wire (Dimple wire)	
50UK	50 μm
200K	200Mesh
150K	150Mesh
100K	100Mesh
60K	60Mesh

Code	Option
❶ Handle	
Blank	Standard position
R	Opposite position
❷ Flange rating *3	
Blank	JIS 20K SOP,FF (SS400)
A	ANSI 150LB SO,RF (A105) *4
B	ANSI 300LB SO,RF (SFVC2A) *4
C	JPI 150LB SO,RF (A105)
F	JPI 300LB SO,RF (SFVC2A)
H	JIS 20K SOH,RF (S25C)
❸ Indicator	
Blank	Non
I	Visual type
E	Electric contact type
D	Electric contact type (Micro capacity)
❹ Magnet	
Blank	Non
M	Magnet

＊1 Sealing parts: FKM, only for wire gauze element, indicator is not available (Max oil temperature is visual type: 130℃ , electric contact type: 90℃) ＊2 Not available for water-glycol based oil and high water based fluid
＊3 In case of JIS 20K SOP, FF: Different diameter companion flange is attached for inner diameter of 04, 08, 12, 20, 28. Moreover, only inner diameter of 06, 10, 16, 24, 32 are available for other flange rating (companion flange is not included).
＊4 Spiral serrated finish

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

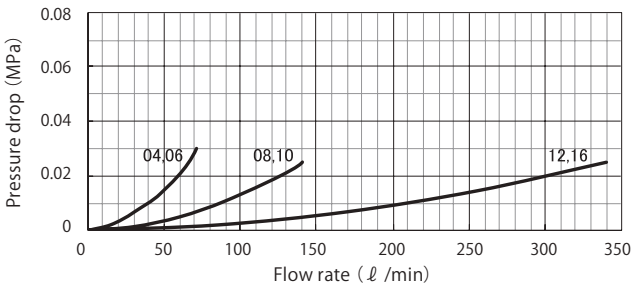
・Estimate pressure drop of filter assembly by following equation if required condition is different:

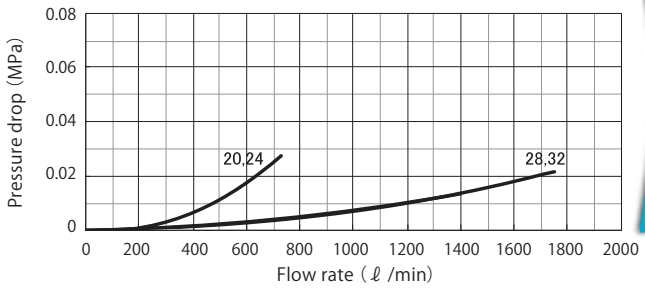
$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

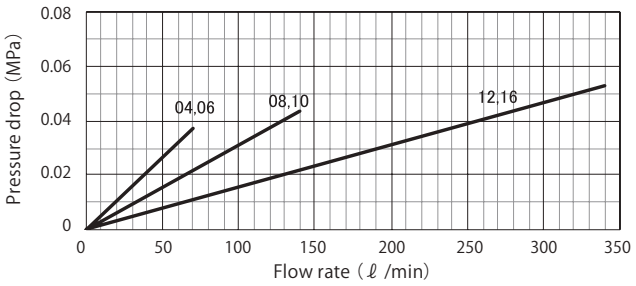
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

① Pressure drop of filter housing

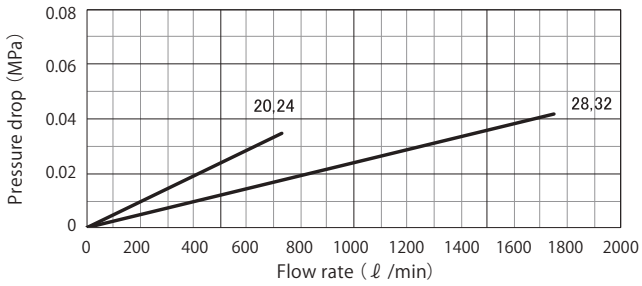


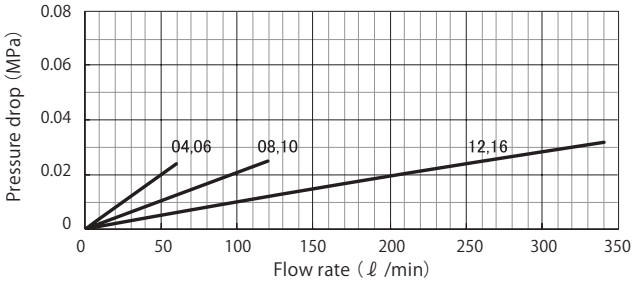


② Pressure drop of filter element

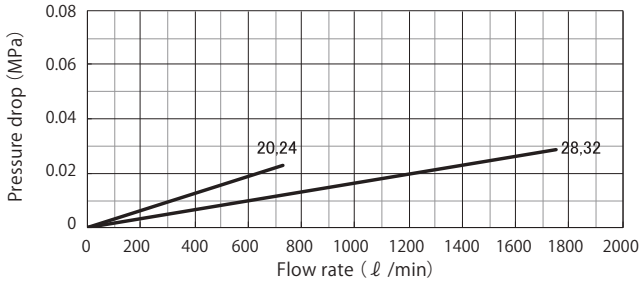


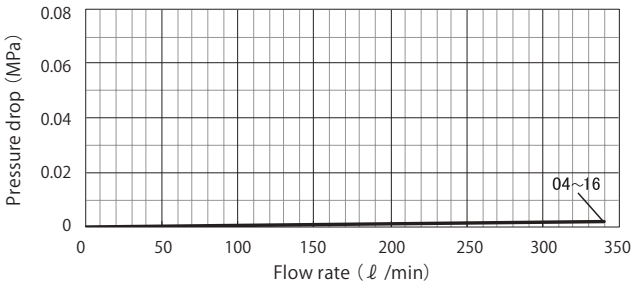
8C
8μm



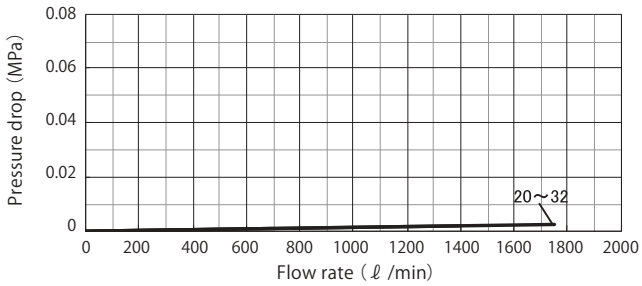


10U
10μm





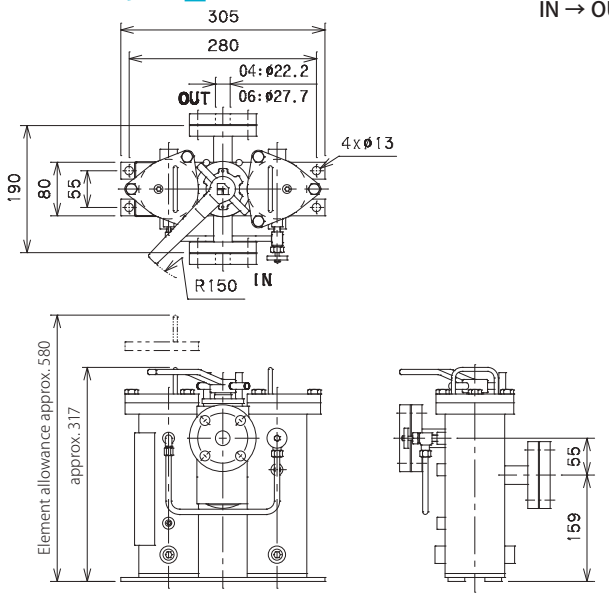
150W
150Mesh*1



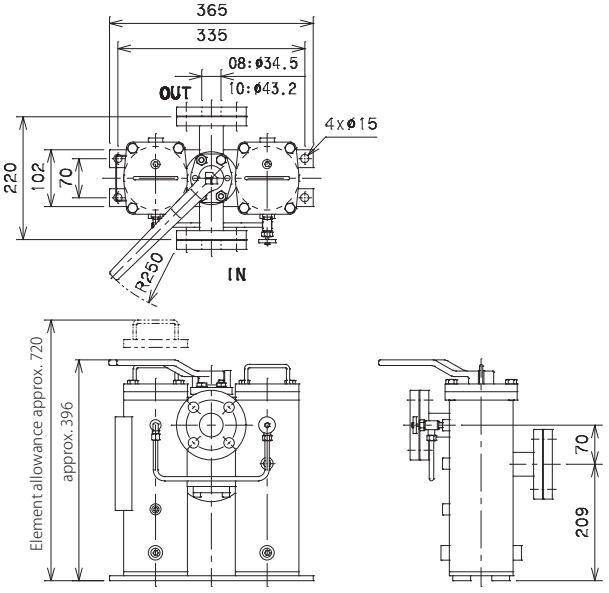
＊1 Pressure drop of wire gauze element is described with one line since the value is low and there is no difference at each filter size.

COS-H-04,06-A-□□

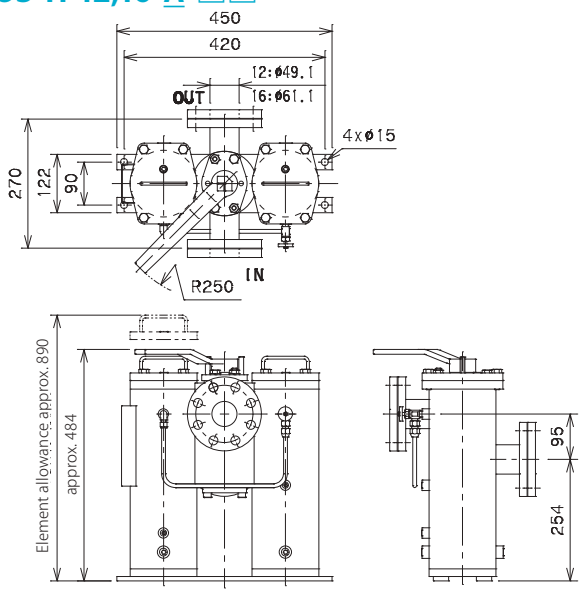
A : Flow direction
IN → OUT



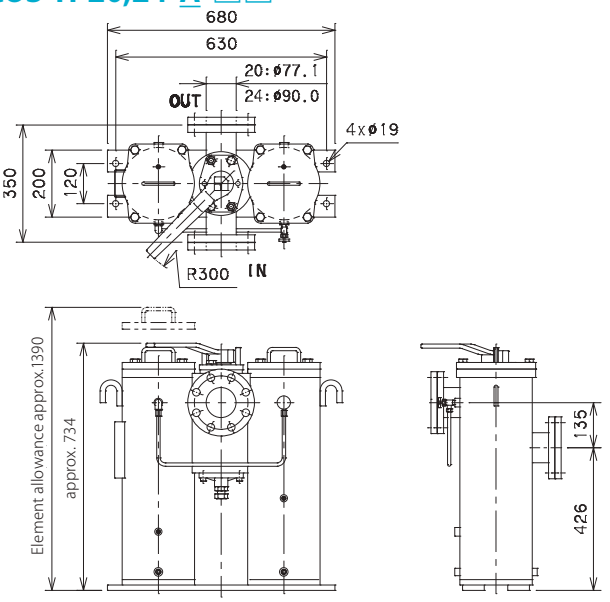
COS-H-08,10-A-□□



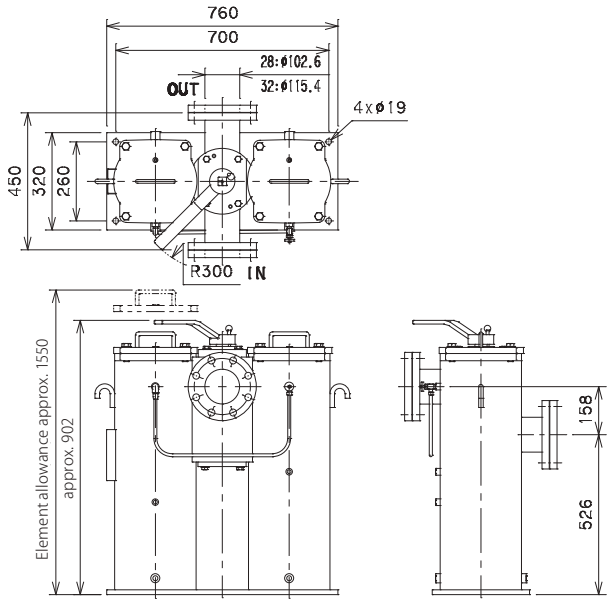
COS-H-12,16-A-□□



COS-H-20,24-A-□□



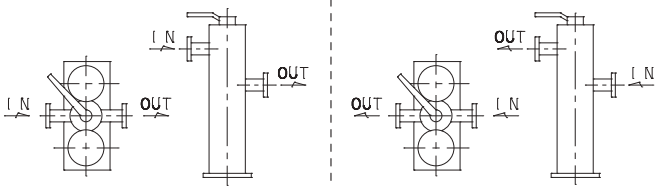
COS-H-28,32-A-□□



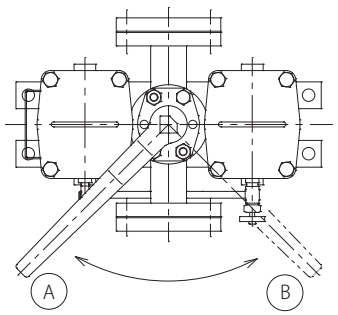
Flow direction and In/Outlet position

A : Flow direction IN → OUT
(Paper,Wire gauze)

B : Flow direction OUT → IN
(Notch wire (Dimple wire))



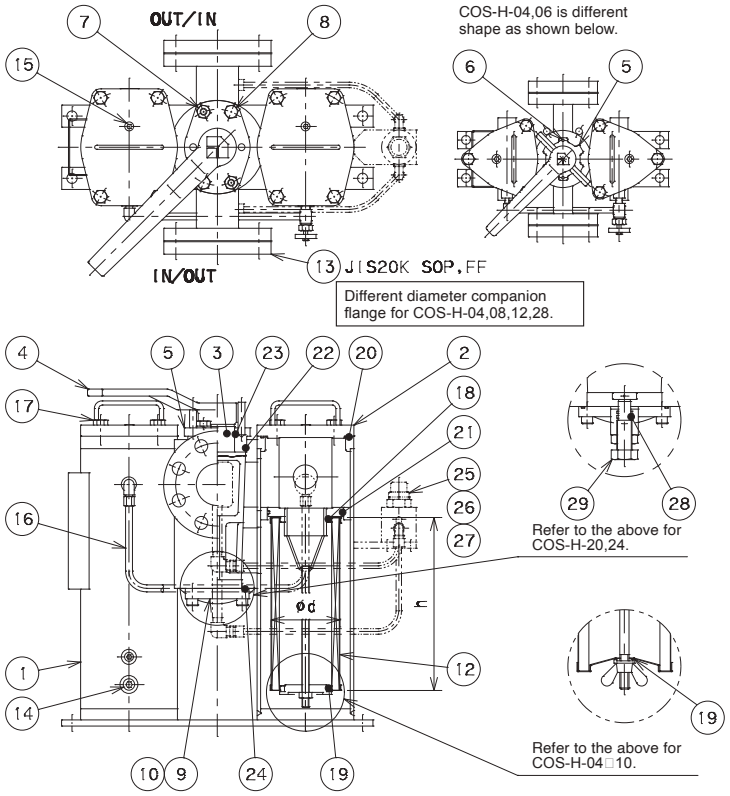
Handle position and operating condition



☆ At position shown in left figure
(for standard handle position)

Mark	Left filter	Right filter
Ⓐ	Filtration	Closed
Ⓑ	Closed	Filtration

CROSS SECTION



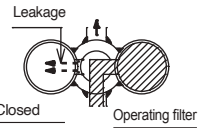
PARTS LIST

No.	Item	Qty
1	Body	1
2	Cover	2
3	Cock	1
4	Change handle	1
5	Cock flange	1
6	Cap bolt	2
7	Stud bolt, Nut *1	2
8	Bolt	2
9	Closing plug (Inner diameter : 04,06) Closing flange (Inner diameter : 08 ~ 32)	1
10 *1	Cap bolt (Inner diameter : 08 ~ 32)	4
12	Element	2
13	Companion flange (JIS 20K SOP,FF only)	2
14	Drain plug	4
15	Air vent plug	2
16	Equalizer pipe	1
17	Bolt	1 set
18	Packing	2
19	Packing	2
20	O-ring	2
21	O-ring	2
22	O-ring	1
23	O-ring	1
24	O-ring	1
25	Indicator	1
26	O-ring	1
27	O-ring	1
28	O-ring	1
29	Push rod	1

ELEMENT SIZE

Element Model code	Size(mm) φd_1	Size(mm) h_1	Weight*2 (kg)
P-COS-H-04,06-A,B	62.2	150	0.33
P-COS-H-08,10-A,B	82.2	200	0.56
P-COS-H-12,16-A,B	102.2	250	0.93
P-COS-H-20,24-A	153	400	2.44
P-COS-H-20,24-B	147	423	3.20
P-COS-H-28,32-A,B	202	550	3.84

■ Cock leakage



Model code	Leakage (cc/min)	Conditions
COS-H-04,06	MAX.30	2MPa Kinematic viscosity 35mm²/s
COS-H-08,10	MAX.50	
COS-H-12,16	MAX.100	
COS-H-20,24	MAX.125	
COS-H-28,32	MAX.200	

☆Leakage from the operating filter to the standby filter through cock clearance is estimated in the table.

SEALING PARTS LIST

No.	18	19	20	21	22	23	24	26	27	28	13	Item code of sealing parts set *4		
Standard *3 / Model code	Special packing NBR		JIS B2401 1A								Special packing non asbestos	Material	SP No. : 18 ~ 21	SA *5 No. : 13, 18 ~ 24, 28
COS-H-04,06	t8xφ38.5/φ32.5	t2xφ14/φ6.5	G70	G60	P38	P25	—	P18	P14	—	JIS20K-20A	NBR	SSF000614	SSF000788
												FKM	SSF000689	SSF000607
COS-H-08,10	t8xφ58.5/φ43	t2xφ14/φ8.5	G100	G80	P50	P30	P55			—	JIS20K-32A	NBR	SSF000693	SSF000579
												FKM	SSF001587	SSF001589
COS-H-12,16	t8xφ73.5/φ61	A t8xφ73.5/φ61	G125	G105	G80	P50	G80			—	JIS20K-50A	NBR	SSF000599	SSF000791
												FKM	SSF000930	SSF001590
		B t2xφ17/φ8.5										NBR	SSF000600	SSF000920
												FKM	SSF001296	SSF001591
COS-H-20,24	t2xφ140/φ116	t2xφ140/φ116	G180	G155	G120	P55	G120			P18	JIS20K-80A	NBR	SSF000645	SSF000878
												FKM	SSF001013	SSF001213
COS-H-28,32	t2xφ202/φ162	t2xφ202/φ162	G250	G210	G135	G55	G140			—	JIS20K-100A	NBR	SSF000592	SSF000620
												FKM	SSF001588	SSF001592

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P — COS — H — 06 — A — 10U

("P" represents filter element)

06: Inner diameter; A: Flow direction; 10U: Filtration rating

Sealing parts set 〈Model code example〉

SA — COS — H — 06 — A — A — E

06: Inner diameter; A: Flow direction; A: Flange rating; E: Indicator

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

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

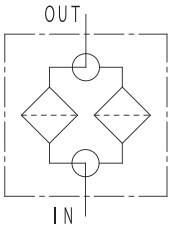
★ Sealing parts set for element replacement (CODE:SP) is for 1 filter case.
2 sets are required for 1 duplex filter assembly.

＊1 Hex bolt for COS-H-28, 32 ＊2 Weight of "Paper" element ＊3 Standard for NBR. For other material, conform to the standard.
＊4 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.
＊5 Packing is not included for flange rating of JIS 20K SOP, FF.

Blow-off Duplex Filter for continuously operated lubrication system

Characteristics

- Element cleaning during operation is available by oil backflow
- Easy switching of filtration, cleaning, and shut by handle operation
- Flow direction is selectable
- Clogging indicator, magnet, and other special specification are available
- BOS: with blow-off function, BCS: without



Duplex Filter

SPECIFICATION

Max working pressure		MPa	0.5
Working temperature	Standard	℃	–10 ～ 90
	High temperature *1	℃	–10 ～ 150
Indicator working pressure		MPa	0.3
Cracking pressure		MPa	Non bypass
Allowable differential pressure of filter element		MPa	0.7
Flow direction/Extract direction of filter element			OUT → IN ／ Upward

★ Please ask us for compatibility of fluid other than mineral oil.

Inner diameter			08	10	12	16	20	24	40	48
Standard flow rate ☆		ℓ/min	140		320		510		1300	
Main material	Body		FC							
	Housing		SGP		STKM, SS		SGP, SS			
	Cover		FCD						SS	
	Cock		FCD							
Coating			Aqua blue							
Weight		kg	24.5	27.5	57	64	96.5	105.5	350	

☆Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: 10U, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

BOS / BCS – 10 – R – 100K

Code	Blow-off
BOS	Blow-off
BCS	Non

Code	Inner diameter
08	25A
10	32A
12	40A
16	50A
20	65A
24	80A
40	125A
48	150A

Code	Flow direction
R	Right → Left
L	Left → Right

(As seen from the handle side)

Code	Filtration rating
BOS *2/ BCS	
Notch wire (Dimple wire)	
50UK	50 μm
200K	200Mesh
150K	150Mesh
100K	100Mesh
60K	60Mesh

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

Code	Filtration rating
Only for BCS	
Paper	
10U	10 μm
20U *3	20 μm
40U *3	40 μm
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh

＊1 Sealing parts: FKM, only for wire gauze element ＊2 Notch wire element should be selected for BOS model. ＊3 Not available for water-glycol based oil and high water based fluid

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

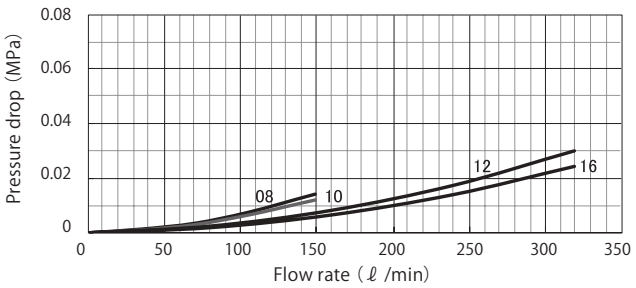
・Estimate pressure drop of filter assembly by following equation if required condition is different:

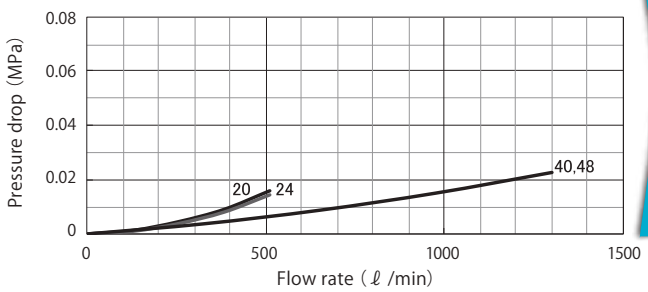
$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

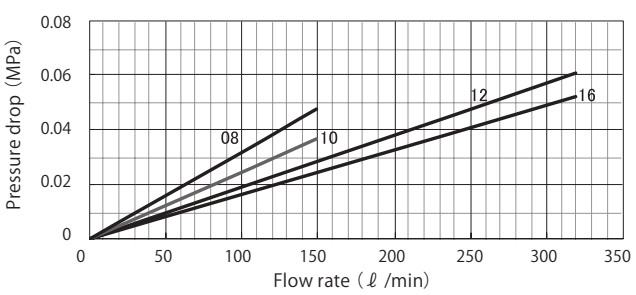
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

① Pressure drop of filter housing

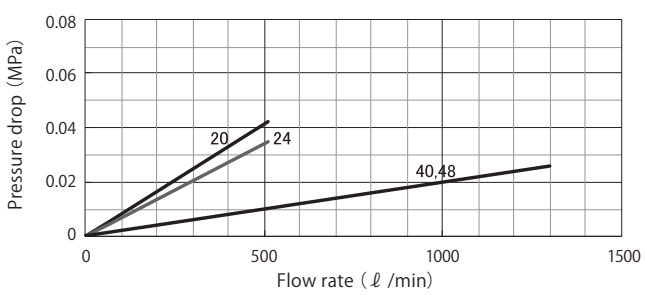


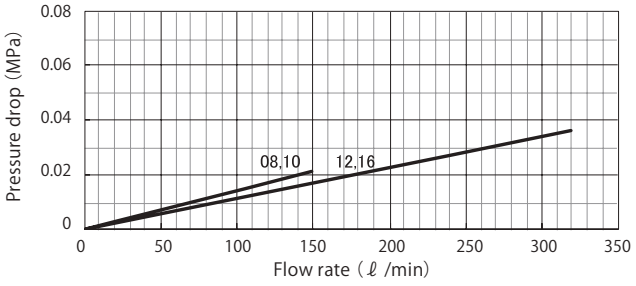


② Pressure drop of filter element

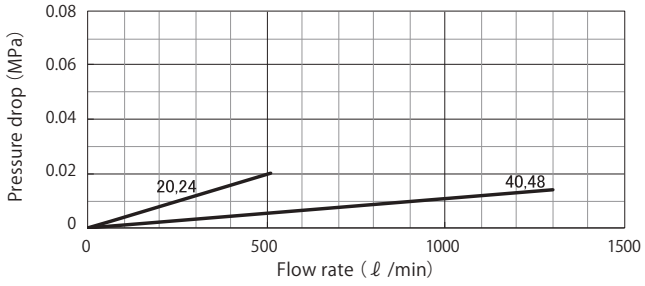


10U
10 μm



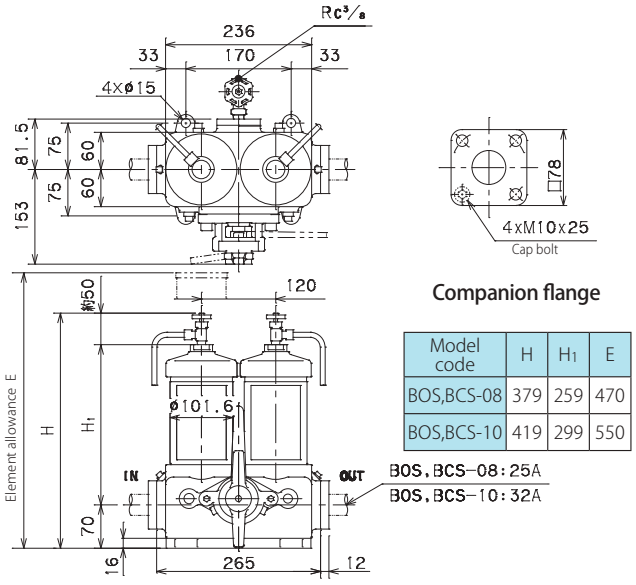


150K
150Mesh



BOS,BCS-08,10-L-□□

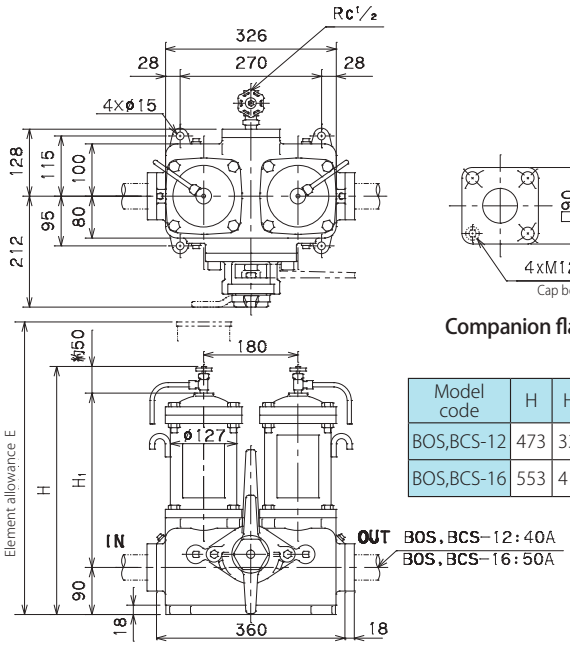
L : Flow direction
Left → Right *1



Companion flange

Model code	H	H1	E
BOS,BCS-08	379	259	470
BOS,BCS-10	419	299	550

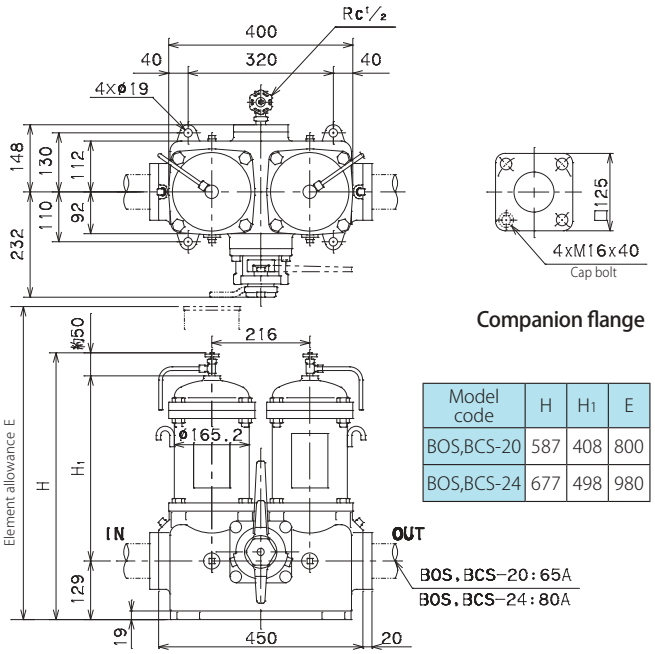
BOS,BCS-12,16-L-□□



Companion flange

Model code	H	H1	E
BOS,BCS-12	473	333	620
BOS,BCS-16	553	413	780

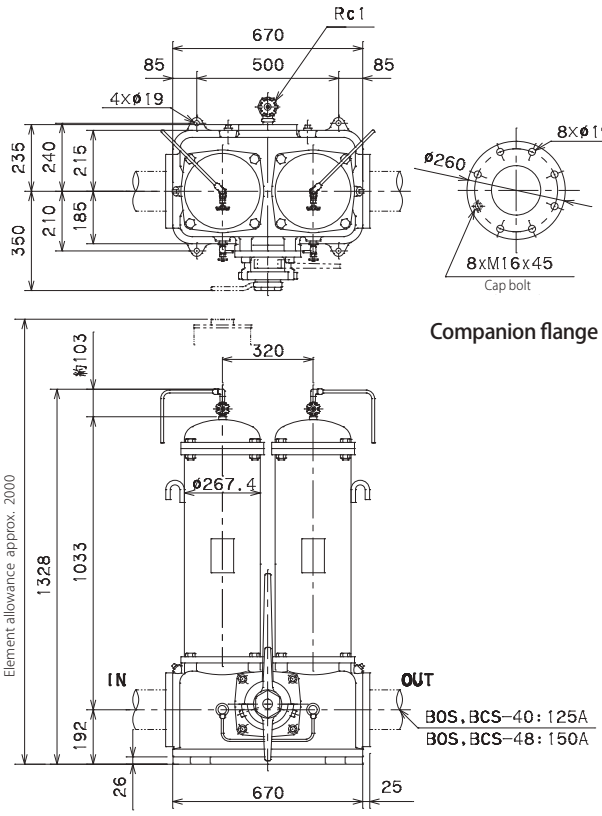
BOS,BCS-20,24-L-□□



Companion flange

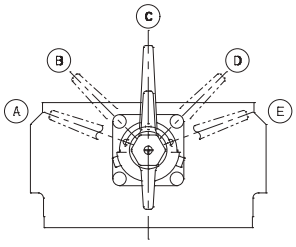
Model code	H	H1	E
BOS,BCS-20	587	408	800
BOS,BCS-24	677	498	980

BOS,BCS-40,48-L-□□



Companion flange

Handle position and operating condition



※ Position of Ⓑ and Ⓓ is only for BOS model.

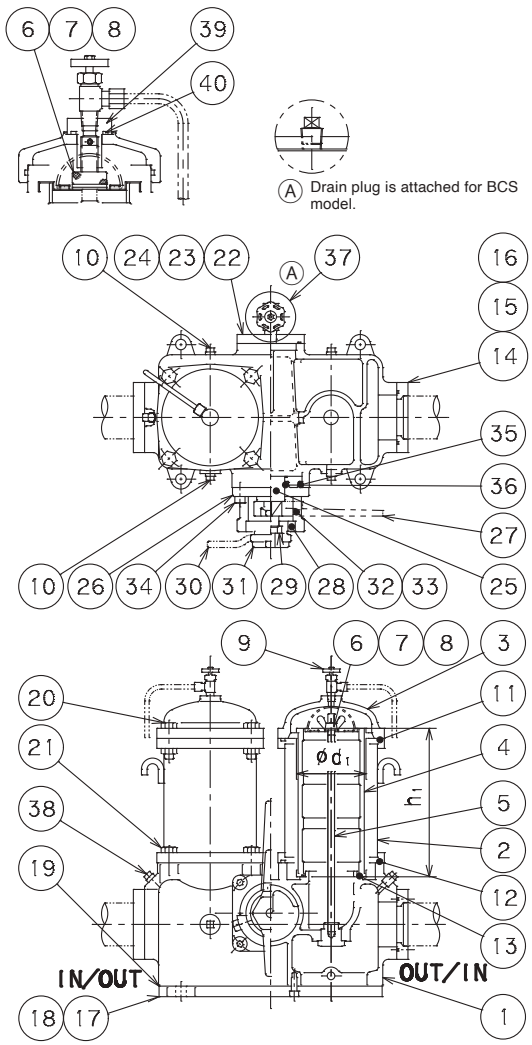
☆ At position shown in the left

Mark	Left filter	Right filter
Ⓐ	Closed	Filtration
Ⓑ	Cleaning	Filtration
Ⓒ	Filtration	
Ⓓ	Filtration	Cleaning
Ⓔ	Filtration	Closed

＊1 In case of flow direction of Right → Left (CODE:R), In/Outlet is opposite from the above figure.

CROSS SECTION

Inner diameter : 08,10

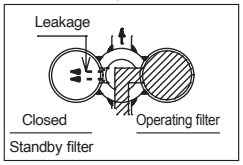


PARTS LIST

No.	Item	Qty
1	Body	1
2	Housing	2
3	Cover	2
4	Element	2
5	Spindle	2
6	Nut	2
7	Washer	2
8	Packing	2
9	Air vent plug	2
10	Plug (Inner diameter08～24)	4
	Equalizer valve (Inner diameter28～48)	1 set
11	O-ring	2
12	O-ring	2
13	O-ring	2
	Packing	2
14	Companion flange	2
15	Hex bolt	2
16	O-ring	2
	Packing	2
17	Blank flange	1
18	Cap bolt	1 set
19	Packing	1

No.	Item	Qty
20	Bolt	8
21	Bolt	8
22	Cover	1
23	Bolt	4
24	O-ring	1
	Packing	1
25	Cock	1
26	Gland flange	1
27	Handle	1
28	Round nut (Large)	1
29	Round nut (Small)	1
30	Cock clamping handle	1
31	Round nut holder	1 set
32	Stopper	1
33	Spring	1
34	Cap bolt	1
35	O-ring	1
36	O-ring	1
37	Drain valve (BOS)	1
	Drain plug (BCS)	1
38	Plug	2
39	Cap nut	2
40	O-ring	2

Cock leakage



Model code	Leakage (cc/min)	Conditions
BOS,BCS-08,10	MAX . 30	0.5MPa Kinematic viscosity 35mm²/s
BOS,BCS-12,16	MAX . 60	
BOS,BCS-20,24	MAX . 80	
BOS,BCS-40,48	MAX . 150	

☆Leakage from the operating filter to the standby filter through cock clearance is estimated in the table.

ELEMENT SIZE

Element Model code	Size(mm) φd1	Size(mm) h1
P-BOS,BCS-08	83	152
P-BOS,BCS-10		192
P-BOS,BCS-12	104	200
P-BOS,BCS-16		280
P-BOS,BCS-20	124	260 (265)
P-BOS,BCS-24		350 (355)
P-BOS,BCS-28	148	550 (551)
P-BOS,BCS-32		800 (801)
P-BOS,BCS-40	203	800 (802)
P-BOS,BCS-48		

＊In case of Notch wire element, size is in ( ).

SEALING PARTS LIST

No.	8	11	12	13＊2		16＊3	19	24	35	36	40
Standard＊1 / Model code	Special packing non asbestos	JIS B2401 1A		Special packing non asbestos	Notch wire element	JIS B2401 1A	Special packing non asbestos	JIS B2401 1A			
BOS BCS-08	t1.5xφ28/φ14	G100	G100	t1.5xφ55/φ48		t1.5x□78/φ35	t2x118x234	t1.5x□70/φ46 Non asbestos	G50	G35	G25
BOS BCS-10						t1.5x□78/φ43					
BOS BCS-12,16	t1.5xφ21/φ10	G130	G130	t1.5xφ71/φ63		G65	t2x178x324	G85	G85	G50	
BOS BCS-20,24	t1.5xφ24/φ12	G170	G170	t1.5xφ122/φ94	AS568-241	G90	t2x202x398	G100	G105	G50	
BOS BCS-40,48	t2xφ73φ16	G270	G270	t2xφ200/φ172	JIS B2401 1A P180	G175	t2x398x668	G180	G190	G85	

Item code of sealing parts set＊4				
Material	SP No.：8,11, 13,40	SP-K No.：8,11, 13,40	SA No.：8,11～13,16, 19,24,35,36,40	SA-K No.：8,11～13,16, 19,24,35,36,40
NBR	SSF000564		SSF000870	
FKM	SSF001556		SSF001562	
NBR	SSF000564		SSF000188	
FKM	SSF001556		SSF001563	
NBR	SSF000201		SSF000193	
FKM	SSF001557		SSF001564	
NBR	SSF000202	SSF000198	SSF000194	SSF000190
FKM	SSF001558	SSF000801	SSF001515	SSF000797
NBR	SSF000204	SSF000200	SSF000196	SSF000192
FKM	SSF000816	SSF001561	SSF001566	SSF001568

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P – BOS BCS – 16 – 100K

("P" represents filter element)

16: Inner diameter

100K: Filtration rating

Sealing parts set 〈Model code example〉

SA – BOS BCS – 16 – K

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

16: Inner diameter

Code＊5	Filtration media
Blank	Wire gauze,Paper
K	Notch wire (Dimple wire)

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

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

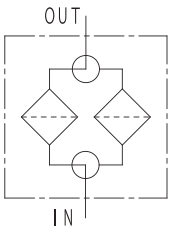
★ Sealing parts set for element replacement (CODE:SP) is for 1 filter case. 2 sets are required for 1 duplex filter assembly.

＊1 Standard for NBR. For other material, conform to the standard. ＊2 Material of #13 Packing is nitrile cork for BCS-40, 48. ＊3 Material of #16 Packing is non asbestos for BOS, BCS-08,10. ＊4 Sealing parts are available as "Sealing parts set" only. We do not provide single part individually. ＊5 Specify the CODE since sealing parts set for BOS,BCS-20～48 is different depending on filtration rating (element material). No need to specify the CODE when selecting BOS,BCS-08～16 since sealing parts set is common.

Light and Compact Blow-off Duplex Filter

Characteristics

- **Element cleaning during operation is available by oil backflow**
- **Easy switching of filtration, cleaning, and shut by handle operation**
- **In/Outlet is on the downward side for standard model (Oil pan for adjusting from vertical flow direction to horizontal is available as an option)**
- **Filtration area is larger than BOS model and enables longer service life of element**
- **BDV: with blow-off cleaning function, BCV: without**



Duplex Filter

SPECIFICATION

Max working pressure		MPa	0.6
Working temperature	Standard	℃	–10 ～ 90
	High temperature*1	℃	–10 ～ 150
Indicator working pressure		MPa	Non bypass
Cracking pressure		MPa	Non bypass
Allowable differential pressure of filter element		MPa	0.7
Flow direction/Extract direction of filter element			OUT → IN ／ Upward

★ Please ask us for compatibility of fluid other than mineral oil.

Inner diameter		03	04	06	08	10	12	16	Oil pan 06	08	10	12	16
Standard flow rate ☆ ℓ /min		25		50	130		280						
Main material	Body	FC											
	Cock	FCD											
	Case	SS											
Coating		Aqua blue											
Weight kg		8	11		21		40		16		26		58

☆Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: U10, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

BDV / BCV – 08 – SO-R – 200K

Code	Blow-off
BDV	Blow-off
BCV	Non

Code	Inner diameter
03	10A
04	15A
06	20A
08	25A
10	32A
12	40A
16	50A

Code	Oil pan*2 (Flow direction*)
Blank	Non
SO-R	Oil pan (Right → Left)
SO-L	Oil pan (Left → Right)

* Flow direction of oil pan as seen from the handle side.

Code	Filtration rating
BDV*3/ BCV	
Notch wire (Dimple wire)	
50UK	50 μm
200K	200Mesh
150K	150Mesh
100K	100Mesh
60K	60Mesh

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

Code	Filtration rating
Only for BCV	
Paper	
10U	10 μm
20U*4	20 μm
40U*4	40 μm
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh

＊1 Sealing parts: FKM, only for wire gauze element ＊2 Oil pan for inner diameter of 03 and 04 is no longer manufactured.
＊3 Notch wire element should be selected for BDV model. ＊4 Not available for water-glycol based oil and high water based fluid

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

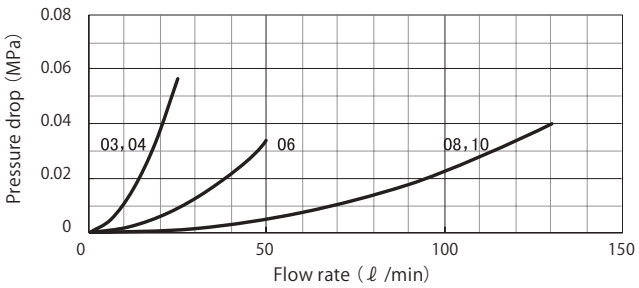
・Estimate pressure drop of filter assembly by following equation if required condition is different:

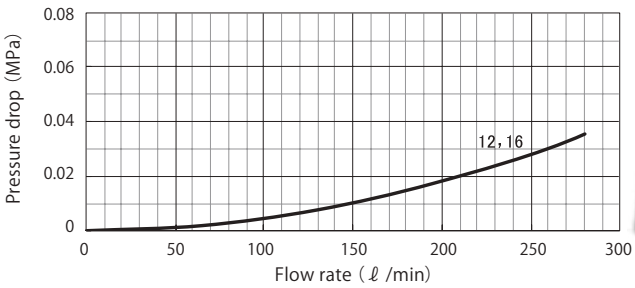
$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86,kinematic viscosity of 32}$$

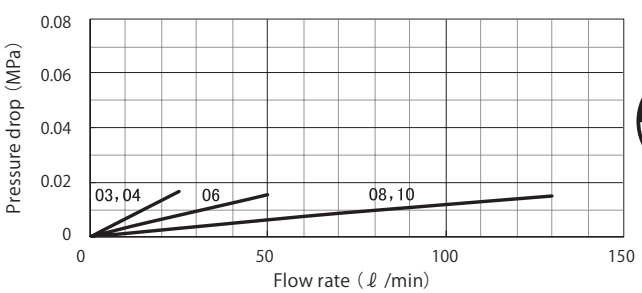
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

① Pressure drop of filter housing

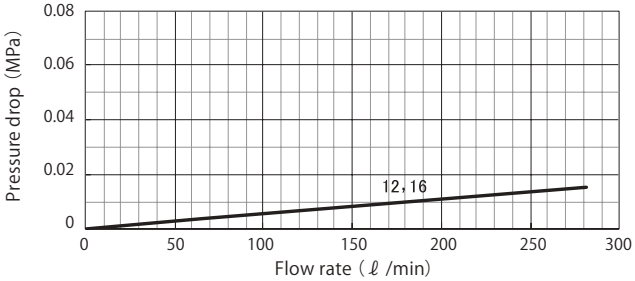




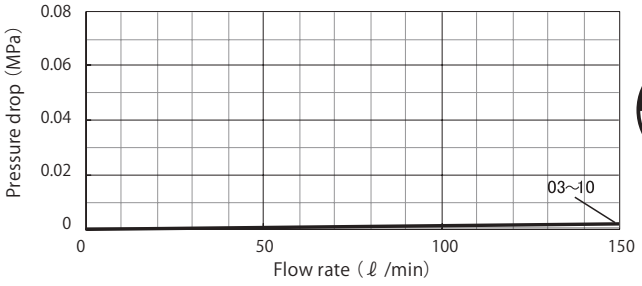
② Pressure drop of filter element

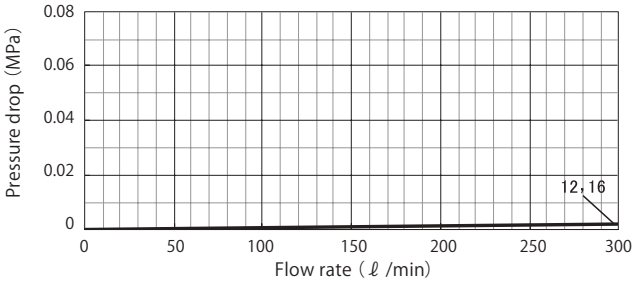


10U
10μm

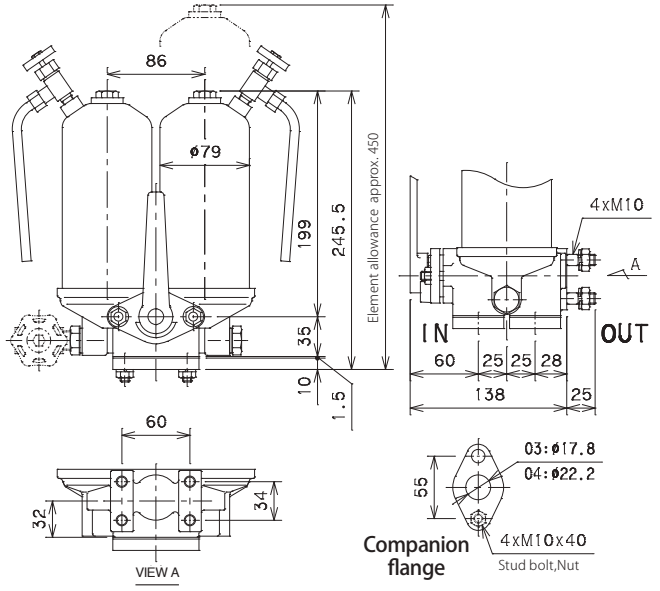


150K
150Mesh

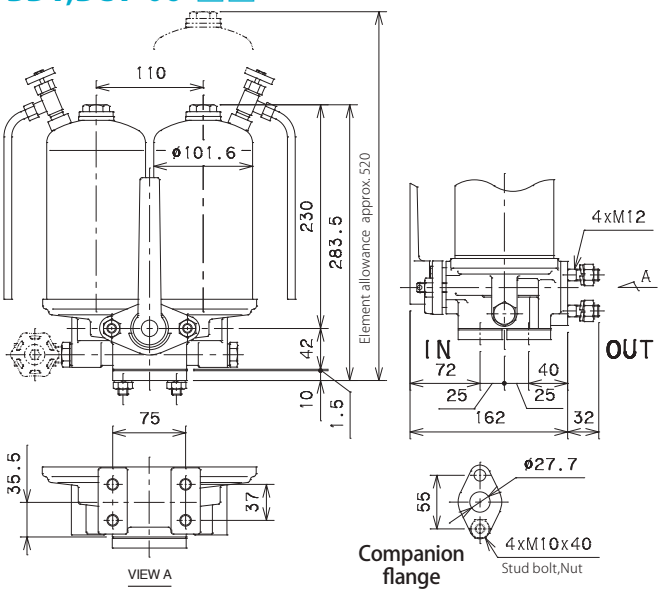




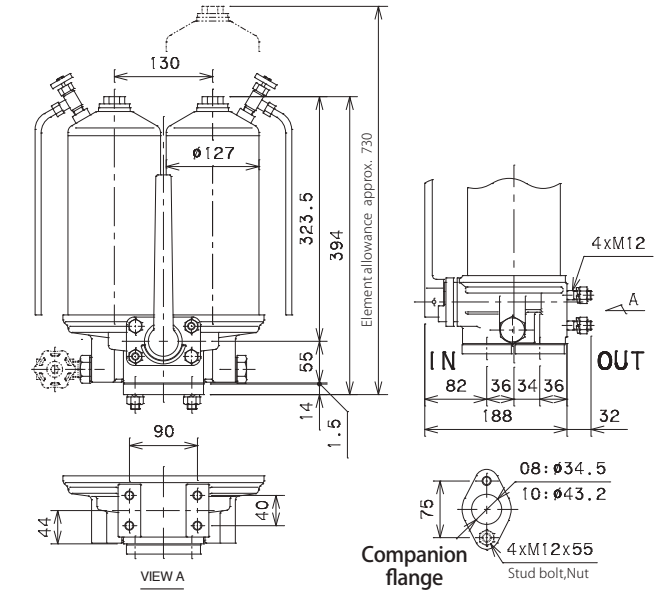
BDV,BCV-03,04-□□



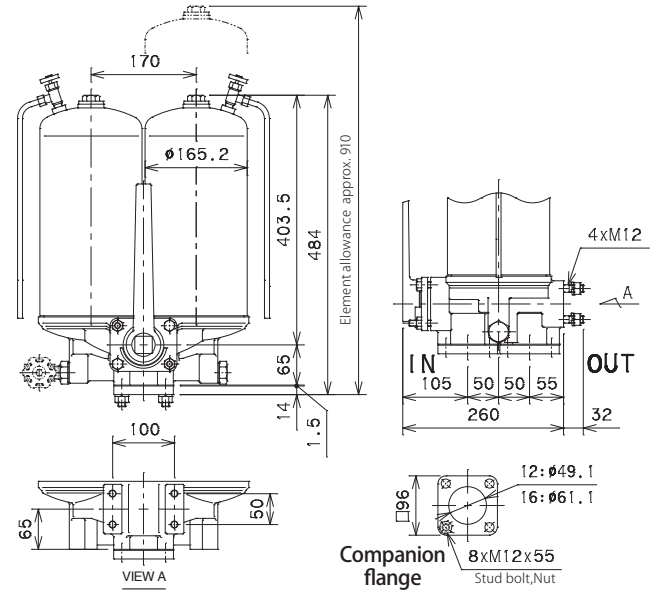
BDV,BCV-06-□□



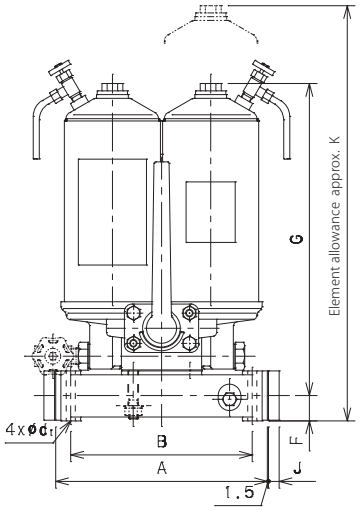
BDV,BCV-08,10-□□



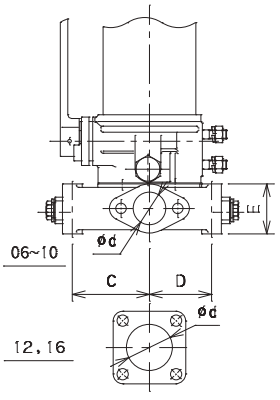
BDV,BCV-12,16-□□



BDV,BCV-06~16-SO-R,L-□□



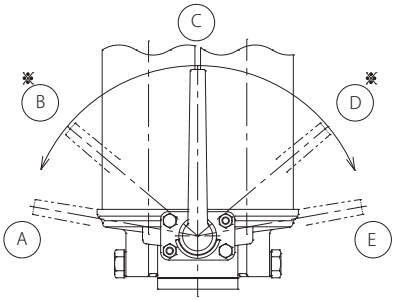
Flow direction
R : Right → Left
L : Left → Right



※ No oil pan option for BDV,BCV-03,04.

Model code \ Mark	d	A	B	C	D	E	F	G	J	K	nxd1
BDV,BCV-06	27.7	240	200	80	65	50	25	297	10	570	4×φ12
BDV,BCV-08	34.5	280	240	102	82	66	33.5	414	14	795	4×φ12
BDV,BCV-10	43.2										
BDV,BCV-12	49.1	360	320	140	120	100	60	520	14	1010	4×φ14
BDV,BCV-16	61.1										

Handle position and operating condition

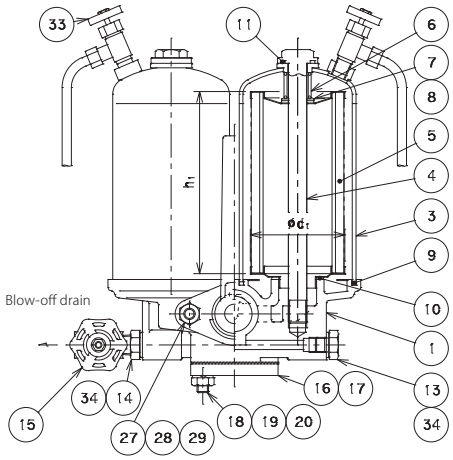


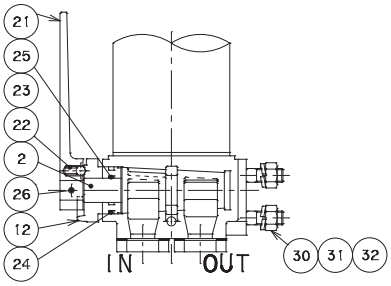
※ Position of Ⓑ and Ⓓ is only for BDV model.

☆ At position shown in the left

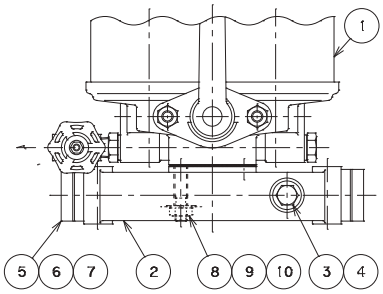
Mark	Left filter	Right filter
Ⓐ	Closed	Filtration
Ⓑ	Cleaning	Filtration
Ⓒ	Filtration	
Ⓓ	Filtration	Cleaning
Ⓔ	Filtration	Closed

CROSS SECTION





BDV,BCV-SO （with Oil pan）



PARTS LIST

No.	Item	Qty
1	Body	1
2	Cock	1
3	Case	2
4	Center rod	2
5	Element	2
6	Spring	2
7	Washer	2
8	Packing	2
9	Packing	2
10	Packing	2
11	O-ring	2
12	Gland flange	1
13	Plug	1 set
14	Nipple (Only for BDV)	1
15	Drain valve(Only for BDV)	1
16	Companion flange	2
17	Packing	2
18	Stud bolt	1 set
19	Nut	1 set
20	Spring washer	1 set
21	Handle	1
22	Spring	1
23	Steel ball	1
24	O-ring	1

No.	Item	Qty
25	O-ring	1
26	Spring Pin	1
27	Stud bolt	2
28	Nut	2
29	Bolt (Inner diameter 08 ～ 16)	2
30	Stud bolt	4
31	Nut	4
32	Spring washer	4
33	Air vent plug	2
34	Packing	2

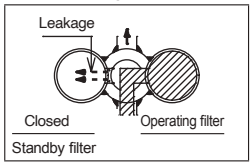
BDV,BCV-SO （with Oil pan ）

No.	Item	Qty
1	Filter	1
2	Oil pan	1
3	Drain plug	2
4	Packing	2
5	Companion flange	2
6	Packing	2
7	Hex bolt	1 set
8	Stud bol	1 set
9	Hex nut	1 set
10	Spring washer	1 set

ELEMENT SIZE

Element Model code	Size(mm) φd1	Size(mm) h1	Weight*1 (kg)
P-BDV,BCV-03,04	62	135	0.23
P-BDV,BCV-06	82	158	0.38
P-BDV,BCV-08,10	102	230	0.95
P-BDV,BCV-12,16	125	300	1.69

■ Cock leakage



Model code	Leakage (cc/min)	Conditions
BDV,BCV-03,04,06	MAX .30	0.6MPa Kinematic viscosity 35mm²/s
BDV,BCV-08,10	MAX .50	
BDV,BCV-12,16	MAX .100	

☆Leakage from the operating filter to the standby filter through cock clearance is estimated in the table.

SEALING PARTS LIST

No.	8	9	10	11	17	24	25	34	Oil pan 4	Oil pan 6	Item code of sealing parts set *3 Material	SP No.：8 ～ 11	SA No.：8~11,17, 24,25,34	SA-SO No.：8,11,17, 24,25,34 For Oil pan：4,6
Standard *2 / Model code	Special packing NBR			JIS B2401 1A	Special packing non asbestos	JIS B2401 1A		Special packing non asbestos						
BDV BCV -03,04	t2xφ20/ φ10	t4xφ80.7/ φ74.3	t2xφ46/ φ38	P20	t1.5xφ76/ φ28.5	P30	P18	t2xφ22/ φ13.5			NBR	SSF000184	SSF000176	–
											FKM	SSF001062	SSF001619	–
BDV BCV -06	t2xφ28/ φ16	t3xφ101.6/ φ94.3	t2xφ45/ φ32.5	G25		P35	P21		t2xφ25/ φ17	t1.5xφ76/ φ28.5	NBR	SSF000185	SSF000177	SSF000181
											FKM	SSF000937	SSF001620	SSF001623
BDV BCV -08,10	t2xφ38/ φ16	t3xφ123/ φ115.5	t2xφ50/ φ37.5	G30	t1.5xφ105/ φ44	P46	P28	t2xφ32/ φ24		t1.5xφ105/ φ44	NBR	SSF000186	SSF000178	SSF000182
											FKM	SSF001382	SSF001621	SSF001624
BDV BCV -12,16	t2xφ42φ19.5	t3xφ162.5/ φ153.5	t2xφ70/ φ60	G30	t1.5xφ□96/ φ63	G65	G40			t1.5xφ□96/ φ63	NBR	SSF000187	SSF000179	SSF000183
											FKM	SSF001365	SSF001622	SSF001625

MODEL CODE OF SPARE PARTS

Replacement element 〈Model code example〉

P – BDV / BCV – 08 – 200K

("P" represents filter element)

08: Inner diameter　200K: Filtration rating

Sealing parts set 〈Model code example〉

SA – BDV / BCV – 08 – SO

Code	Sealing parts set
SP	For element replacement
SA	For overhaul

08: Inner diameter

Code	Oil pan
Blank	Non
SO	Oil pan

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

"Individual code": Used in drawings and nameplate as shown in <Model code example>.
"Common code": Used in vouchers and tag
Refer to【Spare Element List】on P.152 for "Common code".

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

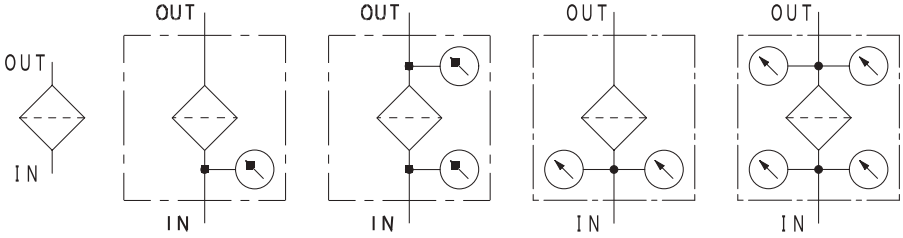
★ Sealing parts set for element replacement (CODE:SP) is for 1 filter case. 2 sets are required for 1 duplex filter assembly.

＊1　Weight of "Notch wire" element.　＊2　Standard for NBR. For other material, conform to the standard.
＊3　Sealing parts are available as "Sealing parts set" only. We do not provide single part individually.

Spin-on type Oil Filter

Characteristics

- **Easy maintenance by cartridge replacement**
- **Applicable to both total amount filtration and partial filtration depending on flow rate**
- **Built-in relief valve prevents cartridge from breakdown by clogging**
- **Pressure gauge is installable at 4 positions: In/Outlet, left/right side (option)**
- **Pipe connection type is "Rc threaded"**



Oil filter CS,CF | 1 press. gauge at inlet only for CF | 2 press. gauges at in/outlet only for CF | 2 press. gauges at inlet only for CF | 4 press. gauges at in/outlet only for CF

SPECIFICATION

Max working pressure	MPa	0.5
Working temperature	℃	–10 ～ 90
Working fluid		Mineral oil
Measurable pressure range	MPa	0 ～ 1.0
Cracking pressure	MPa	0.1
Flow direction/ Extract direction of filter element		OUT → IN ／ Downward

Model code		CS-04	CF-06	CF-08
Standard flow rate ☆ ℓ /min		25	70	85
Main material	Body	Aluminum		
Coating	Body	Non-coating		
	Cartridge	Blue gray	Gray	
Weight kg		0.49	0.92	

☆Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: U10, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

CS / CF – 04 – 10U – P 1
❶

Code		Inner diameter
CS	04	Rc 1/2
CF	06	Rc 3/4
	08	Rc1

Code	Filtration rating
Paper	
10U	10 μm

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

Code	Option
Only for CF	
❶ Pressure gauge*1*2	
Blank	Non
P1	1 pc
P2	2 pcs
P3	3 pcs
P4	4 pcs

＊1 Only for CF model. If selecting the model without pressure gauge, additional installation is NOT available due to no mounting port.
＊2 Since pressure gauge is not installed, please remove the appropriate closing plug and install pressure gauge by yourself.

FLOW RATE GRAPH

■ Condition

Fluid type：ISO VG32
Oil temperature：40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

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

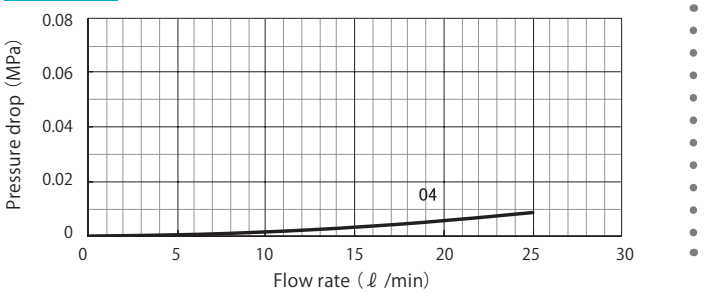
$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

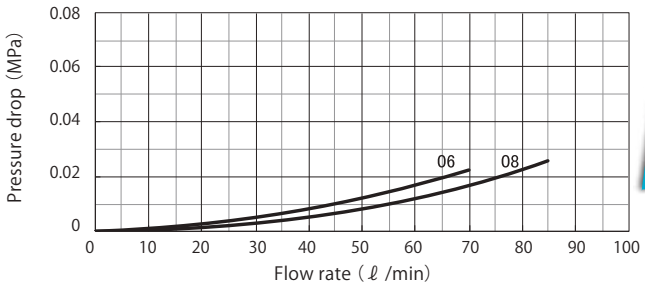
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

① Pressure drop of filter housing

CS

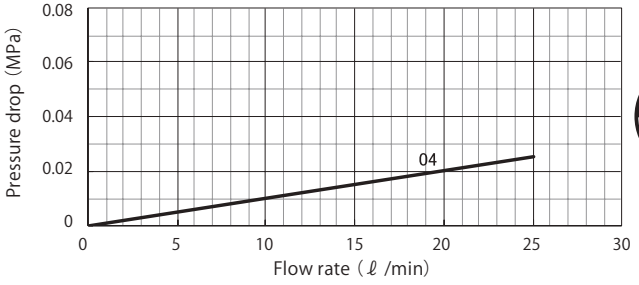


CF



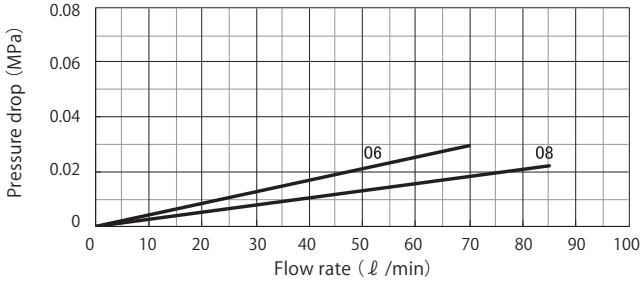
② Pressure drop of filter element

CS



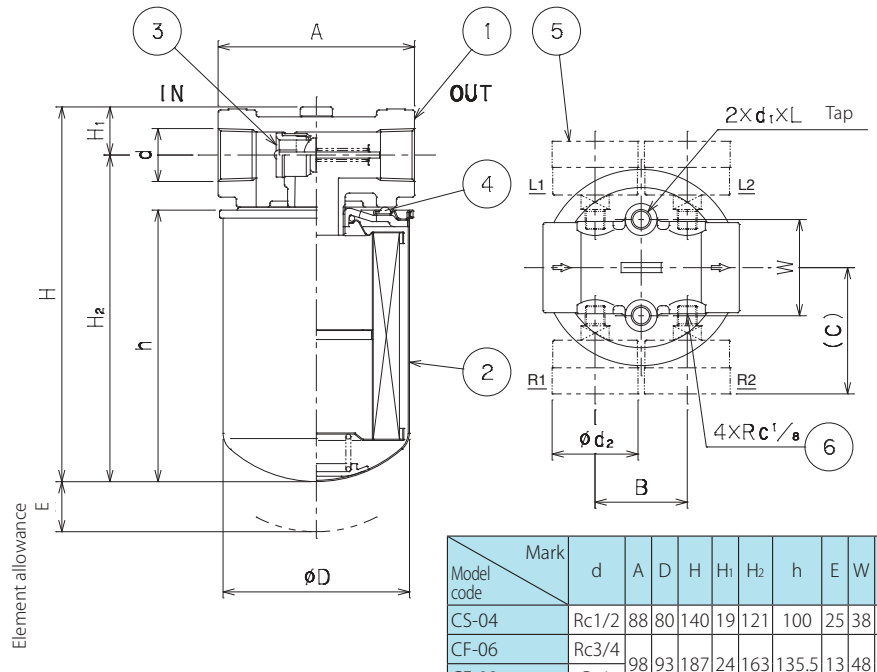
10U
10μm

CF



DIMENSION・PARTS LIST

CS-04-10U
CF-□□-10U-P□

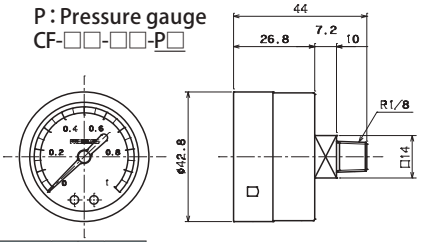


No.	Item	Qty
1	Body	1
2	Cartridge	1
3	Relief valve	1
4	Packing	1
5	Pressure gauge (Only for CF with option)	1 ～ 4
6	Plug (Only for CF with option)	1 ～ 4

Spare Cartridge

Model code	Cartridge model code	Weight(kg)
CS-04	S-810-1	0.33
CF-06,08	F-913-1	0.63

P：Pressure gauge
CF-□□-□□-P□



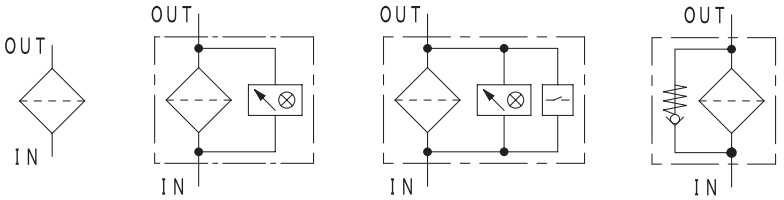
Model code \ Mark	d	A	D	H	H₁	H₂	h	E	W	d₁×L	B	C	d₂
CS-04	Rc1/2	88	80	140	19	121	100	25	38	M8×14			
CF-06	Rc3/4	98	93	187	24	163	135.5	13	48	M10×19	46	63	42.8
CF-08	Rc1												

Indicator model code	Pressure range(MPa)	Mount position	
	Visual observation signal	L1,R1	L2,R2
UT-1	0 ～ 1 (Minimum scale:0.05)	Primary pressure	Secondary pressure

Spin-on type Multi-functional Oil Filter

Characteristics

- **Easy maintenance by cartridge replacement**
- **High performance C-fiber (3μm) and paper (10μm) are selectable for cartridge**
- **Water absorption element is available**
- **Clogging indicator and relief valve are selectable as an option**
- **Pipe connection type is "Rc threaded"**



Oil filter | Visual type indicator | Electric contact type indicator | Relief valve

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

SPECIFICATION

Max working pressure		MPa	1.0
Repetition durability test			0〜1.0MPa x10^7times
Working temperature	Standard	℃	–10 〜 90
	Working fluid		Mineral oil
Indicator working pressure		MPa	0.3
Cracking pressure		MPa	0.35
Flow direction/Extract direction of filter element			OUT → IN ／ Downward

Model code			107-10-2	107-10-3	107-10-W
Standard flow rate ☆		ℓ /min	150		20 (Max)
Main material	Body		Aluminum		
Coating	Body		Non-coating		
	Cartridge	3C	Yellow		Blue
		10U	Black		
Weight		kg	2.4	2.7	2.8

☆Standard flow rate is estimated by the condition of density: 0.86, kinematic viscosity: 32mm^2/s, filtration rating: U10, pressure drop: lower than 0.05MPa.
(Since it is adjusted by characteristic of each product, value can be different in some cases.)

MODEL CODE

〈Model code example〉

107 – 10 – 2 – 3C – I V
❶ ❷

W

Code	Inner diameter
10	Rc1 1/4

Code	Cartridge size
2	Approx. 220mm
3	Approx. 300mm

Code	Filtration rating
C-Fiber	
3C *1	3 μm
Paper	
10U	10 μm
Water absorption cartridge	
W	W-1321

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

Code	Option
❶ Indicator	
Blank	Closing plug
I	Visual type
E	Electric contact type
D	Electric contact type (Micro capacity)

❷ Relief valve	
K	Non
V	Relief valve

＊1 3C element (3μm) is available only for the model with cartridge size code: 2 (approx. 220mm)

FLOW RATE GRAPH

■ Condition

Fluid type : ISO VG32
Oil temperature : 40℃
(Density: 0.86, Kinematic viscosity: 32mm²/s)

■ How to calculate of pressure drop

・Estimate pressure drop of filter assembly by following equation:

Pressure drop of filter assembly = ① Pressure drop of filter housing + ② Pressure drop of filter element

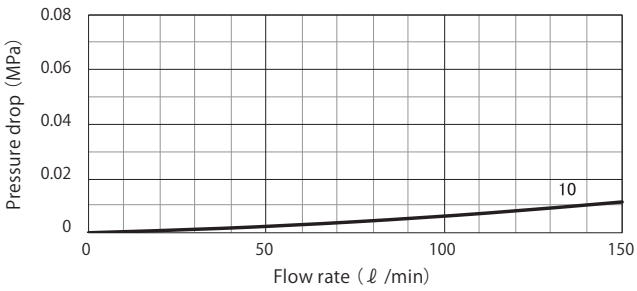
・Estimate pressure drop of filter assembly by following equation if required condition is different:

$$\text{Pressure drop of filter housing} = \frac{\text{Fluid density}}{0.86} \times \text{Pressure drop of filter housing at density of 0.86}$$

$$\text{Pressure drop of filter element} = \frac{\text{Fluid density}}{0.86} \times \frac{\text{Kinematic viscosity}}{32} \times \text{Pressure drop of filter element at density of 0.86, kinematic viscosity of 32}$$

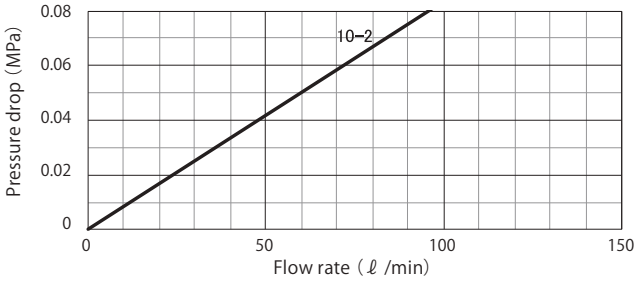
★ Pressure drop of filter housing is proportional to fluid density, and pressure drop of filter element is proportional to fluid density and kinematic viscosity.

① Pressure drop of filter housing

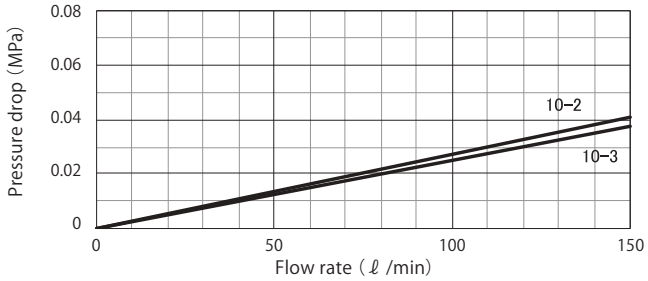


② Pressure drop of filter element

3C
3μm



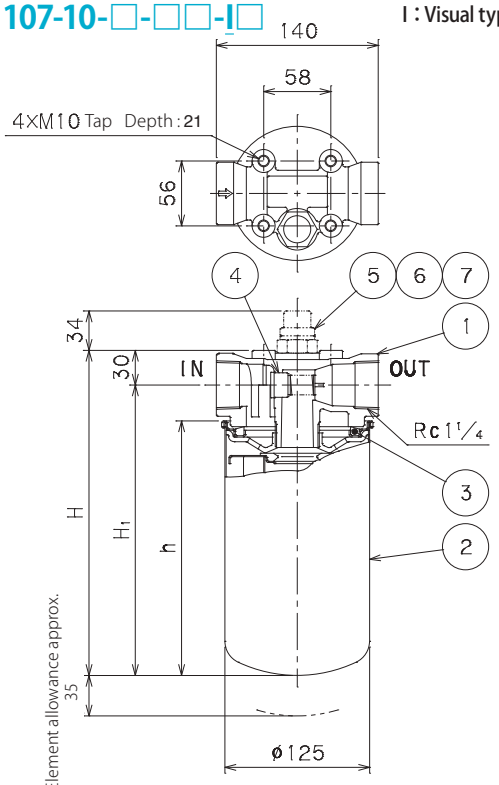
10U
10μm



DIMENSION・PARTS LIST

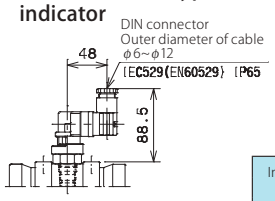
107-10-□-□□-I□

I : Visual type indicator



No.	Item	Qty
1	Body	1
2	Cartridge	1
3	Relief valve	1
4	Packing	1
5	Indicator	1
6	O-ring	1
7	O-ring	1

E,D : Electric contact type indicator



107-10-□-□□-E,D□

Mark / Model code	H	H₁	h
107-10-2	281	251	220
107-10-3	339	309	278
107-10-W	281	251	220

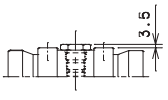
Spare Cartridge

Model code \ Filtration rating	10U	3C	W
	Cartridge model code		
107-10-2	J-1321-10	J-1321-03	W-1321
107-10-3	J-1330-10		

Sealing parts

No.	6	7
Standard	JIS B2401 1B	JIS B2401 1A
Size	P18	P14

Closing plug

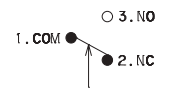


107-10-□-□□-_□

Cartridge model	Weight (kg)
J-1321-10	1.63
J-1330-10	1.78
J-1321-03	1.84
W-1321	1.92

Indicator model code	Working pressure (MPa)		
	Visual observation signal		Electric signal
	Caution	Clogging	
IA-3	0.2	0.3	
EA-3	0.2	0.3	0.3
EA-3D			

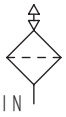
〈Micro switch specification〉

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

Air Breather for reserve tank with wide variation

Characteristics

- **Appropriate to avoid contamination from air inlet of a tank**
- **Standard filter element is hard paper (equivalent to 20μm)**
- **Each filtration rating of C-fiber, paper, and wire gauze is selectable for filter element (Not available for AP-02)**
- **Pipe connection type: AP-02～24 "R Thread", AP-32, 48 "flange (JIS 5K SOP, FF)"**



Air breather

SPECIFICATION

Inner diameter		02	03	04	06	08	12	16	24	32	48
Air flow rate ☆	m³/min	0.06	0.10	0.15	0.20	0.40	0.90	2.00	4.00	7.00	15.0
Working temperature	℃	-10 ～ 90									
Main material	Cover	Steel plate							Plated steel plate	Steel plate	
	Nipple	ADC									
	Body									SGP, Steel plate, SS	
Coating		Dark yellow (Upper cover)								Aqua blue	
Weight	kg	0.04	0.09	0.14	0.15	0.20	0.35	0.65	1.30	7.50	14.5

★ Please ask us for compatibility of fluid other than mineral oil.
☆Standard flow rate is estimated by the condition of air temperature: 20℃ , filtration rating (AP-02 ～ 24: hard paper (equivalent to 20 μm), AP-32,48: paper (20 μm)), and ventilation resistance: lower than 0.5kPa.

MODEL CODE

〈Model code example〉

AP – 16 (W – 10UW)

Code	Inner diameter
02	R 1/4
03	R 3/8
04	R 1/2
06	R 3/4
08	R1
12	R1 1/2
16	R2
24	R3
32	JIS5K-100A
48	JIS5K-150A

Code	Option
Blank	Non (standard)
W*2	Outdoor spec.*3

Code	Filtration rating
Hard paper	
Blank	20μm Equivalent
C-Fiber	
3C	3 μm
8C	8 μm
25C	25 μm
Paper	
10U	10 μm
20U	20 μm
40U	40 μm

Code	Filtration rating
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh

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

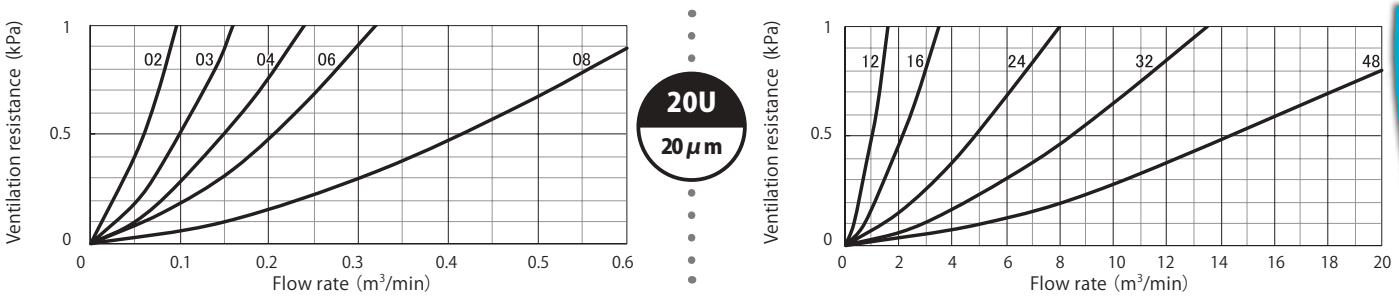
＊1 20μm paper (20U) is a standard element for AP-32 and AP-48. ＊2 Not available for AP-32 and AP-48.
＊3 Since it is a simple drip-proof structure to avoid water inlet such as rain drops from above, it cannot shut water inlet from below. Please note that upper cover should be at top when installation.

FLOW RATE GRAPH

■ Condition

Air temperature：20℃　Standard = Hard element　20μm Equivalent (AP-02 ～ 24) , Paper 20 μm（AP-32,48）

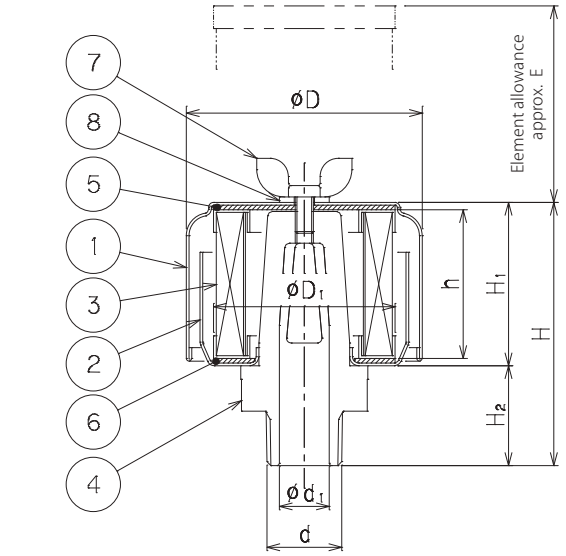
AP model　Ventilation resistance



AP

DIMENSION・PARTS LIST

AP-02~24



Mark / Model code	d	H	H1	H2	Φ	φl1	Φ1	h	E
AP-02	R 1/4	50	30	20	40	9	31	25	50
AP-03	R 3/8	58	36	22	52	11	40	35 (33)	56
AP-04	R 1/2	66	41	25	66	14	50	40 (38)	61
AP-06	R 3/4	69		28		19			
AP-08	R1	80	51	29	78	25	60	50 (48)	71
AP-12	R1 1/2	101	71	30	96	38	70	71 (69)	91
AP-16	R2	115 (116)	83 (84)	32	122	50	88	81 (78)	101
AP-24	R3	157 (159)	112 (114)	45	170	75	125	110 (108)	133

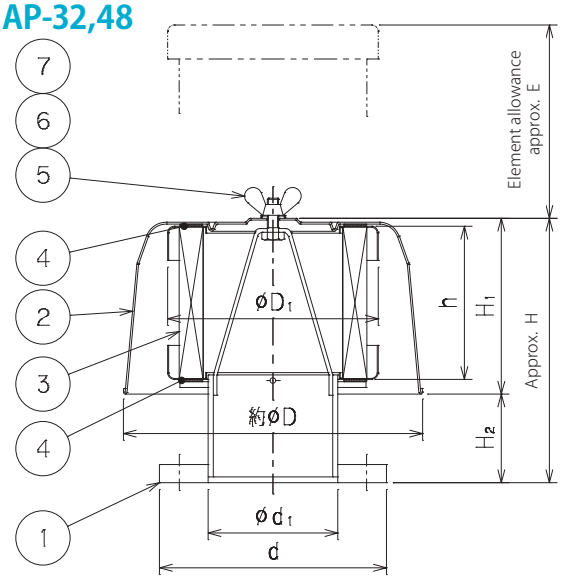
( ) is dimension for C-fiber, paper, and wire gauze element.

No.	Item	Qty
1	Upper cover	1
2	Lower cover	1
3	Element	1
4	Nipple	1
5	Packing	(1)
6	Packing	(1)
7	Wing nut	1
8	Seal washer	1

( ) is included for C-fiber, paper, and wire gauze element.
Part ⑧ Seal washer is attached for outdoor spec (W).

No.	5*1	6*1
Standard*2 / Model code	Special packing NBR	
AP-02		
AP-03	t1xφ40/φ4	t1xφ40/φ22
AP-04	t1xφ50/φ5	t1xφ50/φ30
AP-06		
AP-08	t1xφ60/φ5	t1xφ60/φ36
AP-12	t1xφ70/φ6	t1xφ70/φ48
AP-16	t2xφ88/φ6	t2xφ88/φ64
AP-24	t2xφ125/φ9	t2xφ125/φ92

AP-32,48



Mark / Model code	d	H	H1	H2	Φ	φl1	Φ1	h	E
AP-32	JIS5K-100A	233	155	78	264	100A	185.6	135	180
AP-48	JIS5K-150A	308	215	93	324	150A	244.6	200	240

No.	Item	Qty
1	Body	1
2	Upper cover	1
3	Element	1
4	Packing	2
5	Wing nut	1
6	Washer	1
7	Packing	1

No.	4	7
Standard*2 / Model code	Special packing NBR	
AP-32	t2xφ164/φ125	t2xφ20/φ10
AP-48	t2xφ223/φ176	

MODEL CODE OF SPARE PARTS

Replacement element〈**Model code example**〉

P – **AP** – **08** – **10U**

(“P” represents filter element)

Inner diameter

Filtration rating

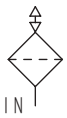
★ Refer to the MODEL CODE table on the previous page for code selection.

＊1　Necessary for C-fiber, paper, and wire gauze element.　＊2　Specify the fluid type if it is other than mineral oil. Packing material is different.

Oil Filler Filter with Air Breather

Characteristics

- **Built-in air breather in inlet cap enables space saving of tank-top**
- **Low-priced edition of FA model with basic performance**
- **Oil resistant filter with high collection efficiency and high porosity**
- **Long mounting hole of inlet flange enables flexible installation**



Air breather

SPECIFICATION

Working temperature	Standard	℃	0 ～ 90
Filtration rating	Air breather		20μm Equivalent
	Oil filler	mm	φ1.2

★Please ask us for compatibility of fluid other than mineral oil.

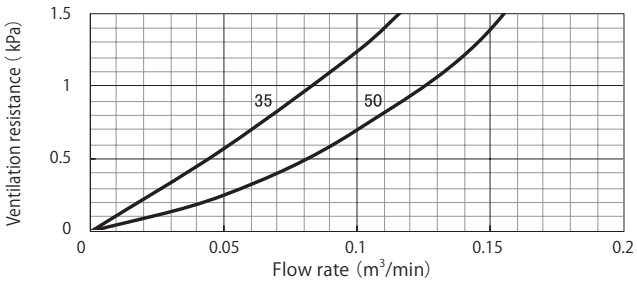
Model code		FAB-35	FAB-50
Main material	Cover	Plated steel plate	
	Oil filler filter	Steel plate	
	Element	Urethane	
Coating	Cover	Yellow	
Weight kg		0.11	0.23

FLOW RATE GRAPH

■ Condition

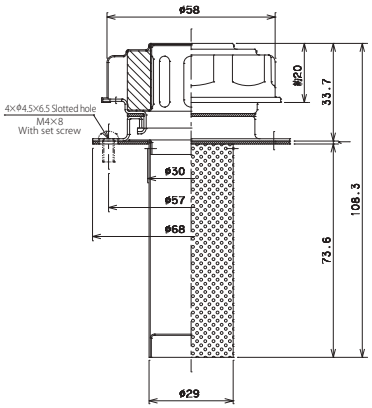
Air temperature：20℃　Filtration：20μm Equivalent

FAB model　Ventilation resistance

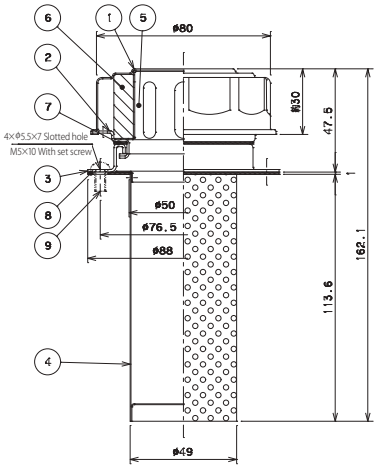


DIMENSION・PARTS LIST

FAB-35



FAB-50



No.	Item	Qty
1	Cover	1
2	Inlet	1
3	Flange for fixing	1
4	Oil filler filter	1
5	Inner cover	1
6	Element	1
7	Packing	1
8	Packing	1
9	Set screw	4

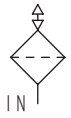
SEALING PARTS LIST

No.	7	8
Standard / Model code	Special packing NBR	Special packing non asbestos
FAB-35	t1.5xφ44/φ33	t1xφ68/φ30
FAB-50	t1.5xφ64/φ52.5	t1xφ88/φ50

Oil Filler Filter with Air Breather

Characteristics

- Built-in air breather in inlet cap enables space saving of tank-top
- Hard paper equivalent to 20μm is used for air breather
- Oil filler filter is replaceable without separating body from tank
- Ball chain is attached to inlet cap for fall prevention



Air breather

SPECIFICATION

Working temperature	Standard	℃	0 ～ 90
Filtration rating	Air breather		20μm Equivalent
	Oil filler	mm	φ1.0

★Please ask us for compatibility of fluid other than mineral oil.

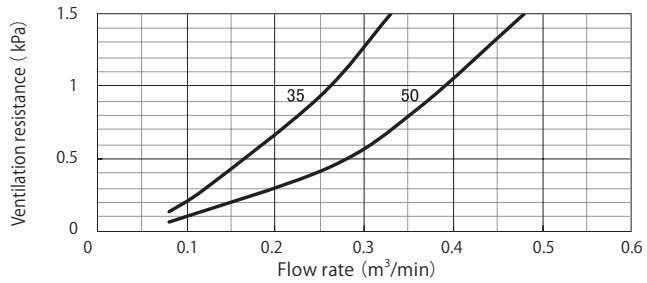
Model code		FA-35	FA-50
Main material	Cover	Steel plate	
	Oil filler filter		
	Element	Hard paper	
Coating	Cover	Dark red	
Weight kg		0.15	0.3

FLOW RATE GRAPH

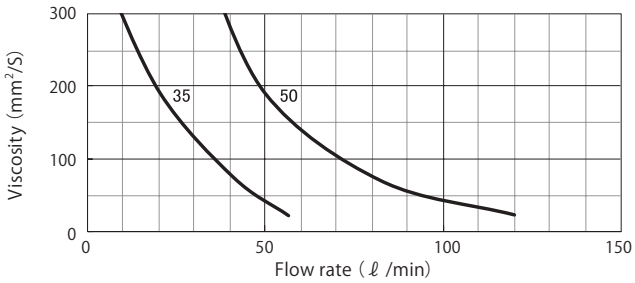
■ Condition

Air temperature：20℃　Filtration：20μm Equivalent

FA model　Ventilation resistance

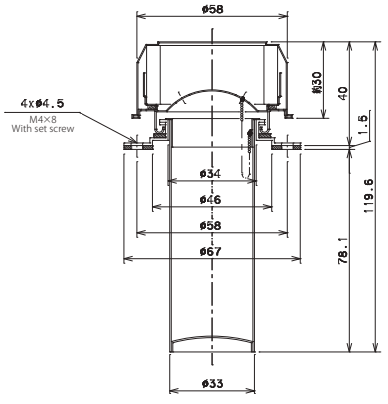


FA model　Oil flow rate

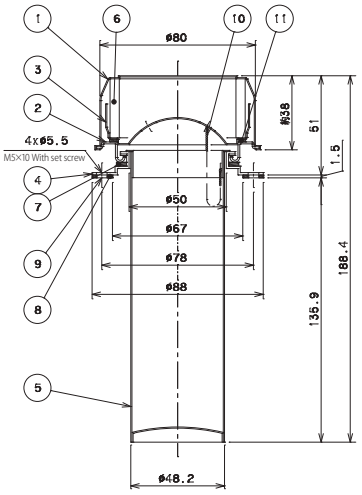


DIMENSION・PARTS LIST

FA-35



FA-50



No.	Item	Qty
1	Cover	1
2	Inlet	1
3	Element holder	1
4	Flange for fixing	1
5	Oil filler filter	1
6	Element	1
7	Packing	1
8	Packing	1
9	Set screw	4
10	Ball chain	1
11	Packing	1

Basic Model Off-line Filter for oil cleanliness improvement

Characteristics

【FP-400 series】

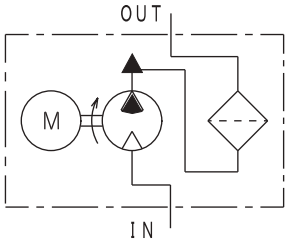
- Handy type filtration unit is appropriate to new oil filtration
- Easy maintenance by spin-on cartridge replacement

【FP-750/1500 series】

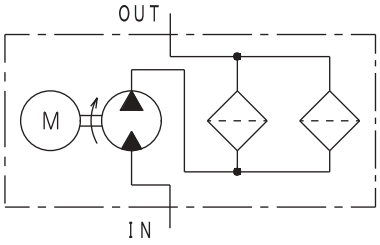
- Cart type filtration unit enables movable filtration at several locations
- High performance C-fiber element and other filtration rating are selectable

Effects

- Prevention of sudden machine breakdown
- Stable machine operation
- Long service life of oil



FP-400,750



FP-1500S-5060

SPECIFICATION

Corresponding fluid	Oil type	Mineral oil
	Kinematic viscosity mm²/s	Under300 (standard)
Max working pressure ℃		80
Cracking pressure MPa		0.3

Specification ／ Model code			400Y-2512	400Y-1318	750S-4030	1500S-5060A
Pump	Flow rate ℓ/min	50Hz	12.0		30.0	58.5
		60Hz	14.4		36.0	70.2
	Discharge pressure MPa	50Hz	0.4		0.55	0.8
		60Hz			0.35	0.6
	IN・OUT inner diameter		Rc1/2		Rc3/4	Rc1 1/4
Motor	Voltage V		Single phase 100/200		3 phase 200	
	Output kW		0.4		0.75	1.5
Accessory	Suction strainer		Model : SFW-04S (Option)		Y-type suction strainer	
	Braid hose		IN:φ22x2.0m/OUT:φ18x2.0m		IN/OUT:φ19x2.0m	IN/OUT:φ32x2.0m
Weight Kg			15	18	60	122

MODEL CODE

〈Model code example〉

FP – 400Y – 1318 – 3C – 1

Code	Type
400Y	Handy
750S	Cart
1500S	Cart

Code	Element size
2512	φ 95xL135
1318	φ130xL180
4030	φ152xL426 (Single type)
5060A	φ152xL426 (Duplex type)

Code	Filtration rating
C-Fiber	
3C	3 μm
8C*1	8 μm
Paper	
10U	10 μm

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

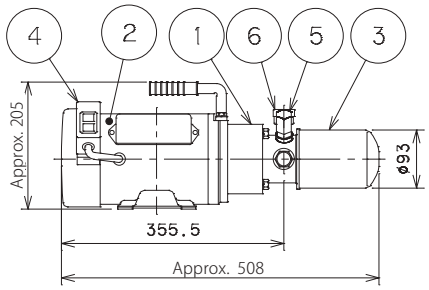
Code	Voltage	
Only for FP-400Y		
1	100V	Standard
2	200V	Special*
FP-750S/1500S		
Blank	200V	Standard**

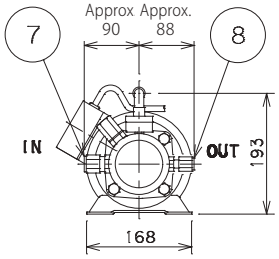
＊ Please ask us for 200V since price and delivery are different with standard.

＊＊ Please ask us for special specification : overseas spec (different AC voltage).

＊1 8C (8 μm) is only for FP-750S and FP-1500S.

FP-400Y-2512-□□

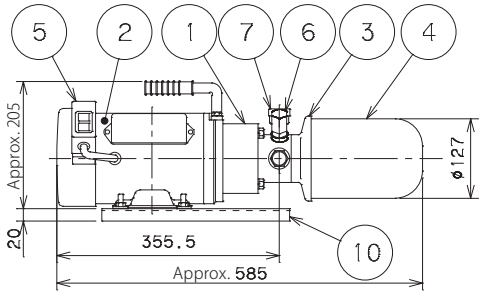


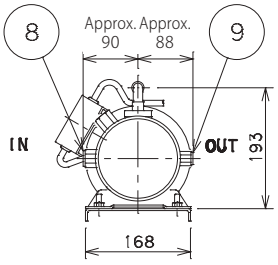


Spare cartridge model
L-913-□□

No.	Item	Qty
1	Pump	1
2	Motor	1
3	Cartridge filter	1
4	Push switch	1
5	Relief valve	1
6	Pressure gauge Model：ut-3	1
7	In-side hose nipple	1
8	Out-side hose nipple	1

FP-400Y-1318-□□

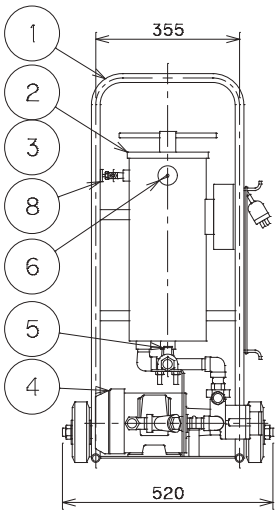


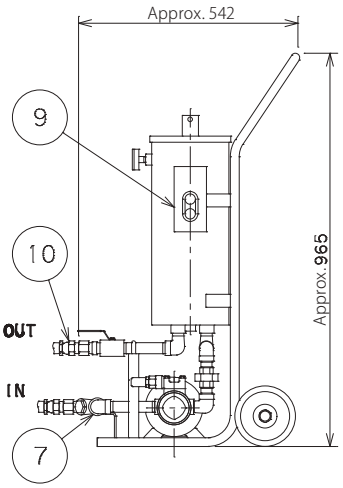


Spare cartridge model
N-1318-□□

No.	Item	Qty
1	Pump	1
2	Motor	1
3	Cartridge adapter	1
4	Cartridge filter	1
5	Push switch	1
6	Relief valve	1
7	Pressure gauge Model：ut-3	1
8	In-side hose nipple	1
9	Out-side hose nipple	1
10	Base	1

FP-750S-4030-□□





Spare element model
P-LCN-6-□□

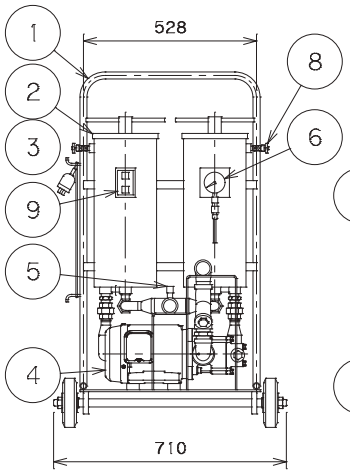
No.	Item	Qty
1	Carrier	1
2	Filter ASS'Y	1
3	Filter element	1
4	Pump motor	1
5	Ball valve	1
6	Pressure gauge	1
7	Y-type strainer	1
8	Air vent valve	1
9	Push switch	1
10	Screw adapter	2

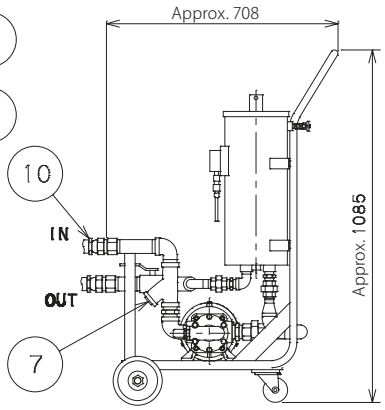
Sealing part

★ Parts quantity is for 1 filter case.

	Filter case Cover part packing	Filter element Upper O-ring	Filter element Lower O-ring
Size	t3xφ194/φ178	JIS B2401,1A P20	AS568-243
Qty	1	1	2

FP-1500S-5060-□□





Spare element model
P-LCN-6-□□

No.	Item	Qty
1	Carrier	1
2	Filter ASS'Y	2
3	Filter element	2
4	Pump motor	1
5	Ball valve	1
6	Pressure gauge	1
7	Y-type strainer	1
8	Air vent valve	2
9	Push switch	1
10	Screw adapter	2

Sealing part

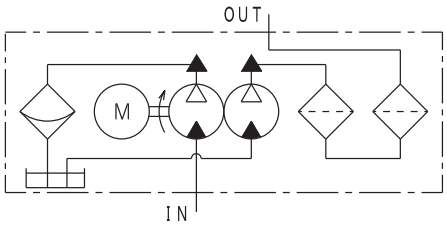
★ Parts quantity is for 1 filter case.

	Filter case Cover part packing	Filter element Upper O-ring	Filter element Lower O-ring
Size	t3xφ194/φ178	JIS B2401,1A P20	AS568-243
Qty	1	1	2

High performance Off-line Filter for oil cleanliness improvement

Characteristics

- "Oil Refresher" enables TAISEI's original triple filtration method:
  ① Sludge removal by Centrifugal separator
  ② Water elimination by Water absorption element
  ③ Fine particle removal by High performance C-fiber element
- Lower running cost comparing with a general off-line filter
- Clogging indicator (electric contact type) is included in standard model
- Integration time meter, outside lamp, and sight glass are selectable for special accessary
- Cart-type filtration unit enables movable filtration at several locations



FP-1500S-1010

SPECIFICATION

Corresponding fluid	Oil type		Mineral oil
	Kinematic viscosity mm²/s		20 ～200
	(Standard temperature) ℃		(ISO VG32： 7 ～ 52 VG46：13 ～ 60 VG68：21 ～ 61)
Max working pressure ℃			0 ～ 60
Cracking pressure MPa			0.3

Pump	Flow rate ℓ /min	50Hz	9.0
		60Hz	10.8
	Discharge pressure MPa		1.0
	Cracking pressure MPa	IN → Centrifugal separator	0.7
		Tank → Filter	0.7
	IN・OUT inner diameter		Rc1/2
Motor	Voltage V		3 phase 200*
	Output kW		1.5
Accessory	Suction strainer		Y-type suction strainer（Standard equipment）
	Braid hose		IN/OUT：1/2B x 2.0m
Weight Kg			About 95

＊Please ask us for special specification: overseas spec (different AC voltage).

MODEL CODE

〈Model code example〉

FP – 1500S – 1010 – 3C – S H T
❶ ❷ ❸

Code	Filtration rating
C-Fiber	
3C	3 μm
8C	8 μm

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

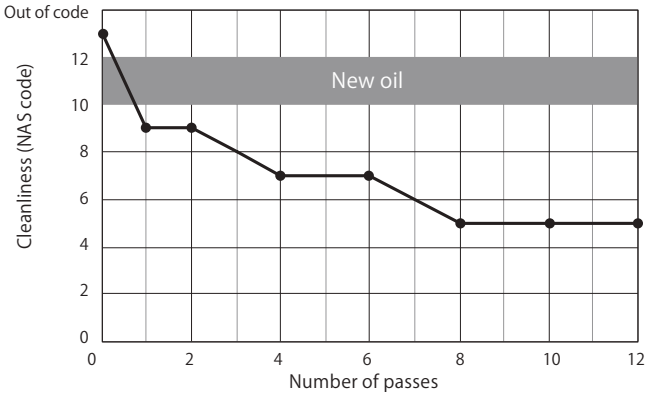
Code	Option
❶ Sight glass	
Blank	Non
S	Sight glass
❷ IN, OUT, hose tip shape	
Blank	Joint（R1/2）
H	Non（Notch）
❸ Control box	
Blank	Non
T	Integration time meter
R	Outside lamp
TR	Integration time meter, Outside lamp

FLOW RATE GRAPH

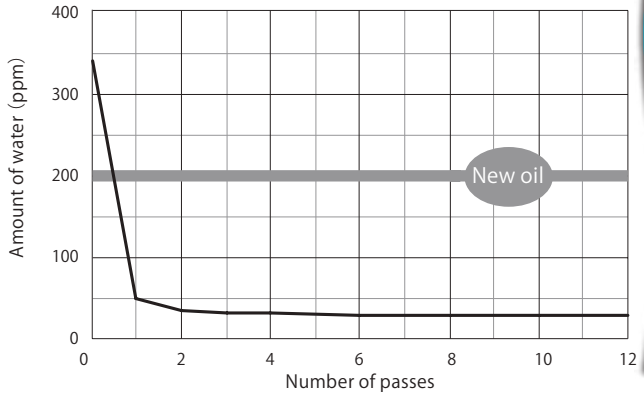
■ Condition

Fluid type：ISO VG46　Tank capacity：40ℓ　Dust type：ACFTD　Amount of water：100cc

FP model　Cleanliness



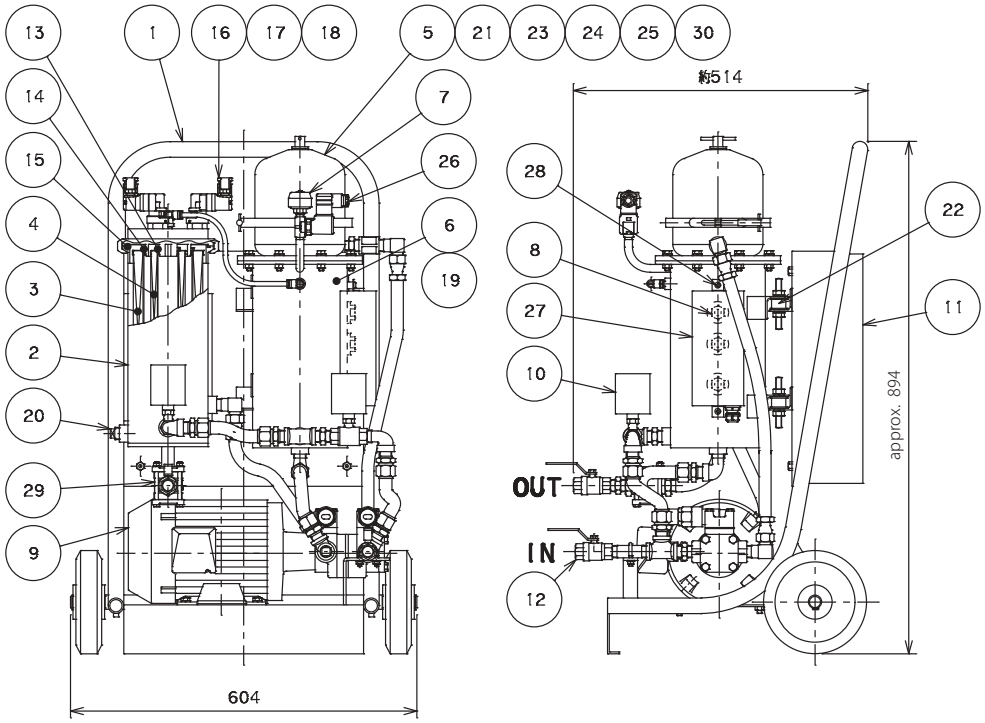
FP model　Amount of water removal



FP

DIMENSION・PARTS LIST

FP-1500S-1010-□□-S□□



No.	Item	Qty
1	Carrier	1
2	Filter	1
3	Water absorption element	1
4	Filter element	1
5	Centrifuge	1
6	Tank	1
7	Air breather　Model : AP-02	1
8	Level sensor	3
9	Pump motor	1
10	Ball valve	2
11	Control box	1
12	Ball valve	2
13	O-ring	2
14	O-ring	2
15	O-ring	1
16	Indicator　Mode：EA-3	2
17	O-ring	2
18	O-ring	2
19	Packing	1
20	Drain plug	2
21	Packing	1
22	Rubber vibration isolator	4
23	Paper insert	1
24	O-ring	1
25	O-ring	1
26	Solenoid valve	1
27	Sensor Cover	1
28	Screw	2
29	Sight glass	1
30	O-ring	1

SEALING PARTS LIST

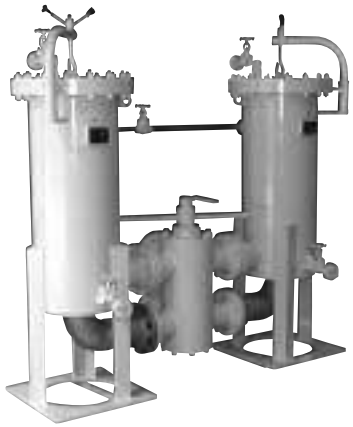
No.	13	14	15	17	18	19	21	24	25	30
Standard / Model code	JIS B2401 1A			JIS B2401 1B	JIS B2401 1A	Special packing NBR	Special packing non asbestos	O-ring for centrifuge		
FP-1500S-1010	P32	G80	G140	P18	P14	t3xφ213/φ167	t1.5xφ106/φ96	For rotor	For cover	For cover nut

MODEL CODE OF SPARE PARTS

Replacement element

No.	Item	Element model	Filtration rating	Remarks
3	Water absorption element	P-AN-03100-W	For water absorption	With O-ring
4	Filter element	P-GF-A-08-3-3C	3 μm	
		P-GF-A-08-3-8C	8 μm	
23	Paper insert	FM060	For centrifuge	25 sheets /sets

Specialty Products



TAISEI oil filters are applicable to not only general industrial machines but also severe requirements for public utilities, power plants, shipbuilding, and so on.
We are proud of our reliable delivery records in various fields.

We are able to manufacture custom-made product of various dimensions, materials, and regulations other than standard products on the catalog.
Please confirm the following "Manufacturable Specification" and contact us at any time.

Filter

Item	Manufacturable Specification
Type	Simplex, Duplex
Use	Suction filter, Line filter, Return filter, Off-line filter
Inner diameter	1/8B～12B (6A～300A)
Flow rate	~10000 ℓ/min
Weight	~5 ton
Max working pressure	Simplex: ～42MPa, Duplex: ～3.0MPa
Working temperature	0~150℃
Material	JIS standard (except titan canning) and catalog standard material
Fluid type	Mineral oil, Ammonia-containing oil*1, Brake fluid, Fatty ester fluid, Phosphate ester fluid, Water glycol fluid, Water-soluble coolant, Refrigerant oil, Fuel oil (Kerosene, Gas oil, Diesel oil), High water based fluid (HWBF), Aviation oil, Water
Regulation	ASME Section VIII Division I (U-1 STAMP), TEMA Class-R/C/B (Conform), API614 (Conform), JIS B8265/JIS B8249 (Conform)
Ship class	NK (Authorization), JG (Authorization), CCS, ABS, LR, KR, BV, BKI, RINA, CR, DNV-GL
Inspection	DOSH (for Malaysia) / MOM (for Singapore) Shipping inspection
Other	Automatic cleaning, Water absorbing filter

Element

Item	Manufacturable Specification
Type	C-fiber, Paper, Wire gauze, Notch wire, Wedge wire, General wire
Filtration rating	1~1700 μm
Allowable differential pressure	~21MPa
Working temperature	0~150℃
Material	JIS standard (except titan canning) and Catalog standard material
Fluid type	Mineral oil, Ammonia-containing oil*1, Brake fluid, Fatty ester fluid, Phosphate ester fluid, Water glycol fluid, Water-soluble coolant, Refrigerant oil, Fuel oil (Kerosene, Gas oil, Diesel oil), High water based fluid (HWBF), Aviation oil, Water
Other	Gas element, Element for other manufacturer's filter case

* Some cases may not be available depending on operating condition or combination of each item.

＊1 Ammonia content should be less than 10%.

Spare Element List

【CAUTION!】Please use only TAISEI genuine elements to avoid reduction of filter performance and possible breakdown of your machine or component.

Please select "Model code of spare element" corresponding to "Model code of filter" on the table below.

☆ Please select fluid type if other than mineral oil (Refer to <Fluid type>).

☆ "##" on the table represents filtration rating code (Refer to <Filtration rating>).

(Ex.) In case of phosphate ester fluid: P-F-UL,UM,UH-16-8C (Insert "Fluid type code" between element code "P" and "Model code of filter".)

● Line Filter（For mineral oil）

Model code of filter	Model code of spare element	Remarks
LND-02-##/LND-03-##	P-LND-02,03-##	
LND-04-##	P-LND-04-##	
LND-06-##	P-LND-06-##	
LND-08-##	P-LND-08-##	
LN-10-##/LN-12-##	P-LN-10,12-##	
LN-16-##	P-LN-16-##	
LN-20-##	P-LN-20-##	
LN-24-##	P-LN-24-##	
AK-04-##/AK-06-## AC-04-##/AC-06-##/AC-08S-##	P-AK-04,06-##	Common with AK, AC
AK-08-##/AK-10-## AC-08-##/AC-10-##/ACF-08-##/ACF-10-##	P-AK-08,10-##	Common with AK, AC, ACF
AK-12-##/AK-16-## AC-12-##/AC-16-##/ACF-12-##/ACF-16-##	P-AK-12,16-##	
ACF-24-##	P-ACF-24-##	
CFK-04-##/CFK-06-##	P-CFK-04,06-##	
CFK-08-##/CFK-10-##	P-CFK-08,10-##	
CFK-12-##/CFK-16-##	P-CFK-12,16-##	
351(352)-03-##/351(352)-A-03-## 351(352)-04-##/351(352)-A-04-##	P-351,352-03,04-##	Common with 351, 352
351(352)-06-##/351(352)-A-06-##/351(352)-B-06-## 351(352)-08-##/351(352)-A-08-##/351(352)-B-08-##	P-351,352-06,08-##	
351(352)-10-##/351(352)-A-10-## 351(352)-12-##/351(352)-A-12-##	P-351,352-10,12-##	
351(352)-16-##/351(352)-A-16-##	P-351,352-16-##	
351(352)-20-##/351(352)-A-20-## 351(352)-24-##/351(352)-A-24-##	P-351,352-20,24-##	
UL-03-##/UL-03A-##/UL-04-##/UL-04A-## UM-03-##/UM-04-## UH-03-##/UH-03A-##/UH-04-##/UH-04A-##	P-UL,UM,UH-03,04-##	Common with UL, UM, UH
UL-06-##/UL-06A-##/UL-08-##/UL-08A-## UM-06-##/UM-08-## UH-06-##/UH-06A-##/UH-08-##/UH-08A-##	P-UL,UM,UH-06,08-##	
UL-10-##/UL-10A-##/UL-12-##/UL-012A-## UM-10-##/UM-12-## UH-10-##/UH-10A-##/UH-12-##/UH-12A-##	P-UL,UM,UH-10,12-##	
UL-16-##/UL-16A-## UM-16-##/UM-16A-## UH-16-##/UH-16A-##	P-UL,UM,UH-16-##	
UL-20-##/UL-20A-##/UL-20B-## UL-24-##/UL-24A-##/UL-24B-##	P-UL,UM-20,24-##	
UM-20-##/UM-20A-##/UM-20B-## UM-24-##/UM-24A-##/UM-24B-##		
UH-03-##H/UH-03A-##H/UH-04-##H/UH-04A-##H	P-UH-03,04-##H	For high pressure UH（21MPa）
UH-06-##H/UH-06A-##H/UH-08-##H/UH-08A-##H	P-UH-06,08-##H	
UH-10-##H/UH-10A-##H/UH-12-##H/UH-12A-##H	P-UH-10,12-##H	
UH-16-##H/UH-16A-##H	P-UH-16-##H	
SC-01-##/SC-02-##	P-SC-01,02-##	
3501(3502)-03-2-##/3501(3502)-03A-2-## 3501(3502)-04-2-##/3501(3502)-04A-2-## 3501(3502)-06-2-##/3501(3502)-06A-2-##	P-3501,3502-2-##	Common with 3501, 3502
3501(3502)-03-3-##/3501(3502)-03A-3-## 3501(3502)-04-3-##/3501(3502)-04A-3-## 3501(3502)-06-3-##/3501(3502)-06A-3-##	P-3501,3502-3-##	
TM-C-04-2-##/TM-C-06-2-## TM-B-04-2-##/TM-B-06-2-##/TM-04-2-##/TM-06-2-## TMA-04-2-##/TMA-04Z-2-##/TMA-06-2-##/TMA-06Z-2-## GM-04-2-##/GM-04Z-2-##	P-GM,TM-2-##	Common with TM, TMA, GM
TM-C-04-3-##/TM-C-06-3-## TM-B-04-3-##/TM-B-06-3-##/TM-04-3-##/TM-06-3-## TMA-04-3-##/TMA-04Z-3-##/TMA-06-3-##/TMA-06Z-3-## GM-04-3-##/GM-04Z-3-##	P-GM,TM-3-##	
SH-08-3-##/SH-08Z-3-##/SH-10-3-##/SH-10Z-3-## SH-12-3-##/SH-12Z-3-## GC-12-3-##/GC-12Z-3-##/GV-12-3-##	P-GC,SH-3-##	Common with SH, GC, GV
SH-08-4-##/SH-08Z-4-##/SH-10-4-##/SH-10Z-4-## SH-12-4-##/SH-12Z-4-## GC-12-4-##/GC-12Z-4-##/GV-12-4-## 4201-12-4-##/4201-12Z-4-##	P-GC,SH,4201-4-##	Common with SH, GC, GV, 4201
SH-08-5-##/SH-08Z-5-##/SH-10-5-##/SH-10Z-5-## SH-12-5-##/SH-12Z-5-## GC-12-5-##/GC-12Z-5-##/GV-12-5-## 4201-12-5-##/4201-12Z-5-##	P-GC,SH,4201-5-##	
SH-08-6-##/SH-08Z-6-##/SH-10-6-##/SH-10Z-6-## SH-12-6-##/SH-12Z-6-## GC-12-6-##/GC-12Z-6-##/GV-12-6-## 4201-12-6-##/4201-12Z-6-##	P-GC,SH,4201-6-##	
GF-03-2-##/GF-A-03-2-##	P-GF-A-03-2-##	
GF-03-3-##/GF-A-03-3-##	P-GF-A-03-3-##	
GF-06-2-##/GF-A-06-2-##	P-GF-A-06-2-##	
GF-06-3-##/GF-A-06-3-##	P-GF-A-06-3-##	
GF-08-2-##/GF-A-08-2-##	P-GF-A-08-2-##	
GF-08-3-##/GF-A-08-3-##	P-GF-A-08-3-##	
MVF-01-##	P-MVF-01-##	
MVF-03-##	P-MVF-03-##	
TL-40-##	P-TL-40-##	
TL-50-##	P-TL-50-##	
TL-80-##	P-TL-80-##	
TL-100-##	P-TL-100-##	
TL-150-##	P-TL-150-##	
TL-200-##	P-TL-200-##	
LCN-12-4-##/LCN-16-4-##/LC-12-4-##/LC-16-4-##	P-LCN-4-##	Common with LCN, LC
LCN-12-6-##/LCN-16-6-##/LC-12-6-##/LC-16-6-##	P-LCN-6-##	
LCN-12-10-##/LCN-16-10-##/LC-12-10-##/LC-16-10-##	P-LCN-10-##	

<Fluid type>

Code	Fluid type
-	Mineral oil
F	Phosphate ester fluid
G	Water-glycol based oil
C	Fatty acid ester oil
W	High water based fluid
S	Fuel oil
B	Brake oil
R	Refrigerant oil※1

<Filtration rating>

Code	Filtration rating
C-fiber	
3C	3 μm
8C	8 μm
25C	25 μm
High pressure C-fiber	
3CH	3 μm
8CH	8 μm
25CH	25 μm
Paper	
10U	10 μm
20U※2	20 μm
40U※2	40 μm
High flow Paper	
10UF※2	10 μm
20UF※2	20 μm
Wire gauze	
5UW	5 μm
10UW	10 μm
20UW	20 μm
40UW	40 μm
50UW	50 μm
200W	200Mesh
150W	150Mesh
100W	100Mesh
60W	60Mesh
Notch wire	
40UK	40 μm
50UK	50 μm
200K	200Mesh
150K	150Mesh
100K	100Mesh
60K	60Mesh
Wedge wire	
10UT	10 μm
20UT	20 μm
50UT	50 μm

＊1 Please specify refrigerant oil type since spec is different. ＊2 Not available for water glycol fluid and high water base fluid.

● Return Filter（For mineral oil）

Model code of filter	Model code of spare element	Remarks
UR-06-##/UR-08-##	P-UR-06,08-##	
UR-10-##/UR-12-##	P-UR-10,12-##	
TRF-06A-##/TRF-08A-##/TRF-06-##/TRF-08-##	P-TRF,TRA,TLA-06,08-##	
TRA-06-##/TRA-08-##/TLA-06-##/TLA-08-##		
TRF-10A-##/TRF-12A-##/TRF-10-##/TRF-12-##	P-TRF,TRA,TLA-10,12-##	
TRA-10-##/TRA-12-##/TLA-10-##/TLA-12-##		
TRF-16-##	P-TRF-16-##	
TRF-20-##/TRF-24-##	P-TRF-20,24-##	
TR-03-##/TR-04-##	P-TR-03,04-##	

● Suction Filter（For mineral oil）

Model code of filter	Model code of spare element	Remarks
VN-03-##/VN-03A-##/VN-04-##/VN-04A-## ISV-03-##/ISV-03A-##/ISV-04-##/ISV-04A-##	P-VN-03,04-##	Common with ISV, VN
VN-06-##/VN-06A-##/VN-08-##/VN-08A-## ISV-06-##/ISV-06A-##/ISV-08-##/ISV-08A-##	P-VN-06,08-##	
VN-10-##/VN-10A-##/VN-12-##/VN-12A-## ISV-10-##/ISV-10A-##/ISV-12-##/ISV-12A-##	P-VN-10,12-##	
VN-16-##/VN-16A-## ISV-16-##/ISV-16A-##	P-VN-16-##	
VN-20-##/VN-20A-##/VN-20B-## VN-24-##/VN-24A-##/VN-24B-## ISV-20-##/ISV-20A-##/ISV-24-##/ISV-24A-##	P-VN-20,24-##	
VN-28-##/VN-28A-##/VN-32-##/VN-32A-## ISV-28-##/ISV-28A-##/ISV-32-##/ISV-32A-##	P-VN-28,32-##	
ISH-03-##/ISH-03A-##/ISH-04-##/ISH-04A-##	P-ISH-03,04-##	
ISH-06-##/ISH-06A-##/ISH-08-##/ISH-08A-##	P-ISH-06,08-##	
ISH-10-##/ISH-10A-##/ISH-12-##/ISH-12A-##	P-ISH-10,12-##	
ISH-16-##/ISH-16A-##	P-ISH-16-##	
ISH-20-##/ISH-20A-##/ISH-24-##/ISH-24A-##	P-ISH-20,24-##	
STU-03-##/STU-03A-##/STU-03B-## STU-04-##/STU-04A-##/STU-04B-##	P-STU-03,04-##	
STU-06-##/STU-06A-##/STU-06B-## STU-08-##/STU-08A-##/STU-08B-##	P-STU-06,08-##	
STU-10-##/STU-10A-##/STU-10B-## STU-12-##/STU-12A-##/STU-12B-##	P-STU-10,12-##	
STU-20-##/STU-20A-##/STU-20B-## STU-24-##/STU-24A-##/STU-24B-##	P-STU-20,24-##	
STU-16-##/STU-16A-##/STU-16B-##	P-STU-16-##	
STU-28-##/STU-28A-##/STU-28B-## STU-32-##/STU-32A-##/STU-32B-##	P-STU-28,32-##	
TSF-06A-##/TSF-08A-##/TSF-06-##/TSF-08-##	P-TSF-06,08-##	
TSF-10-##/TSF-12-##	P-TSF-10,12-##	
TSF-16-##	P-TSF-16-##	

● Duplex Filter *3 （For mineral oil）

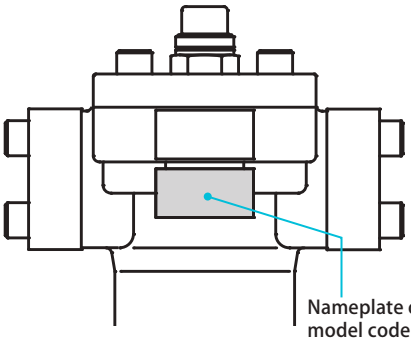
Model code of filter	Model code of spare element	Remarks
COS-H-04-A-##/COS-H-06-A-##	P-COS-H-04,06-A-##	Only for COS-H
COS-H-04-B-##/COS-H-06-B-##	P-COS-H-04,06-B-##	
COS-H-08-A-##/COS-H-10-A-##	P-COS-H-08,10-A-##	
COS-H-08-B-##/COS-H-10-B-##	P-COS-H-08,10-B-##	
COS-H-12-A-##/COS-H-16-A-## COS-L-12-A-##/COS-L-16-A-##	P-COS-L,H-12,16-A-##	Common with COS-H, COS-L
COS-H-12-B-##/COS-H-16-B-##	P-COS-H-12,16-B-##	
COS-H-20-A-##/COS-H-24-A-## COS-L-20-A-##/COS-L-24-A-##	P-COS-L,H-20,24-A-##	
COS-H-20-B-##/COS-H-24-B-## COS-L-20-B-##/COS-L-24-B-##	P-COS-L,H-20,24-B-##	
COS-H-28-A-##/COS-H-32-A-## COS-L-28-A-##/COS-L-32-A-##	P-COS-L,H-28,32-A-##	
COS-H-28-B-##/COS-H-32-B-## COS-L-28-B-##/COS-L-32-B-##	P-COS-L,H-28,32-B-##	
COS-L-04-A-##/COS-L-06-A-##	P-COS-L-04,06-A-##	Only for COS-L
COS-L-04-B-##/COS-L-06-B-##	P-COS-L-04,06-B-##	
COS-L-08-A-##/COS-L-10-A-##	P-COS-L-08,10-A-##	
COS-L-08-B-##/COS-L-10-B-##	P-COS-L-08,10-B-##	
COS-L-12-B-##/COS-L-16-B-##	P-COS-L-12,16-B-##	
BOS(BCS)-08-R-##/BOS(BCS)-08-L-##	P-BOS,BCS-08-##/P-BCS-08-##	Common with BOS, BCS Blow-off is only available with BOS and element should be notch wire (code: ##K)
BOS(BCS)-10-R-##/BOS(BCS)-10-L-##	P-BOS,BCS-10-##/P-BCS-10-##	
BOS(BCS)-12-R-##/BOS(BCS)-12-L-##	P-BOS,BCS-12-##/P-BCS-12-##	
BOS(BCS)-16-R-##/BOS(BCS)-16-L-##	P-BOS,BCS-16-##/P-BCS-16-##	
BOS(BCS)-20-R-##/BOS(BCS)-20-L-##	P-BOS,BCS-20-##/P-BCS-20-##	
BOS(BCS)-24-R-##/BOS(BCS)-24-L-##	P-BOS,BCS-24-##/P-BCS-24-##	
BOS(BCS)-28-R-##/BOS(BCS)-28-L-##	P-BOS,BCS-28-##/P-BCS-28-##	
BOS(BCS)-32-R-##/BOS(BCS)-32-L-##	P-BOS,BCS-32-##/P-BCS-32-##	
BOS(BCS)-40-R-##/BOS(BCS)-40-L-## BOS(BCS)-48-R-##/BOS(BCS)-48-L-##	P-BOS,BCS-40,48-## /P-BCS-40,48-##	
BDV(BCV)-03-##/BDV(BCV)-04-##	P-BCV,BDV-03,04-##/P-BCV-03,04-##	Common with BDV, BCV Blow-off is only available with BDV and element should be notch wire (code: ##K)
BDV(BCV)-06-##	P-BCV,BDV-06-##/P-BCV-06-##	
BDV(BCV)-08-##/BDV(BCV)-10-##	P-BCV,BDV-08,10-##/P-BCV-08,10-##	
BDV(BCV)-12-##/BDV(BCV)-16-##	P-BCV,BDV-12,16-##/P-BCV-12,16-##	

● Other Filter（For mineral oil）

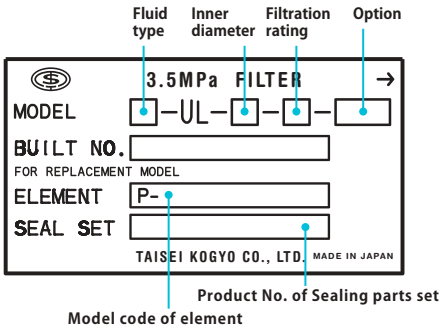
Model code of filter	Model code of spare element	Remarks
CS-04-10U	S-810-1	
CF-06-10U/CF-08-10U	F-913-1	F-913-2（20 μm）: Discontinued
① 107-10-2-10U ② 107-10-2-3C ③ 107-10-3-10U ① 108-02-2-10U ② 108-02-2-3C ③ 108-02-3-10U	① J-1321-10 ② J-1321-03 ③ J-1330-10	Common with 107, 108
① 105-08Z-2-10U ② 105-08Z-2-3C	① N-1318-10 ② N-1318-3	
CL-02-3-3C	L-913-3	
FP-400Y-2512-3C/FP-400Z-2512-3C	L-913-3	
FP-400Y-2512-10U/FP-400Z-2512-10U	L-913-1	Available for FP-400S
FP-400Y-1318-10U/FP-400Z-1318-10U	N-1318-10	
FP-400Y-1318-3C/FP-400Z-1318-3C	N-1318-3	FP-750S：element 1 PC/Assy FP-1500S：element 2 PCs/Assy
FP-750S-4030-##	P-LCN-6-##	
FP-1500S-5060A-##		
FP-1500S-1010-##	P-GF-A-08-3-##　(Filtration element) P-AN03100-W　(Water absorption element) FM060　(Paper insert)	

How to check MODEL CODE

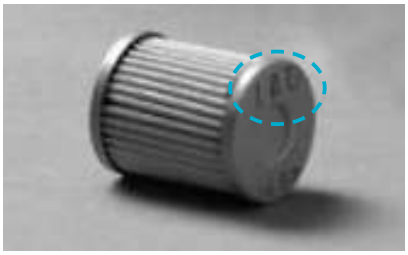
［Example］UL model
Nameplate



Enlarged view of nameplate*4



Identification stamp of filtration rating

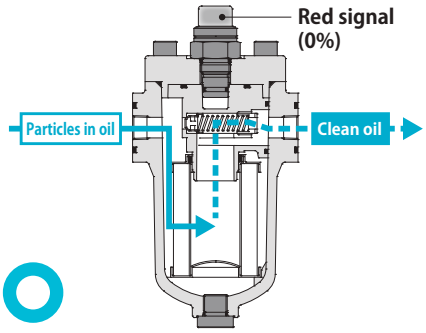


＊3　Two replacement elements are needed for one duplex filter.　＊4　Position and description items are different with each model.

Maintenance

Mechanism of Filter

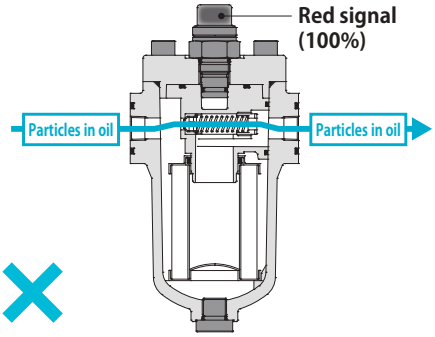
At normal operation



○

Particles in oil are trapped in the filter. Since particles can be an oxidation catalyst, particle removal prevents oil deterioration.

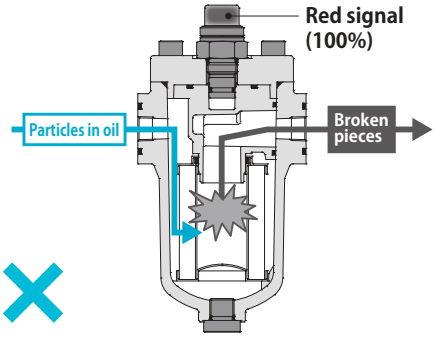
At clogging (with relief valve)



×

Particles in oil bypass the element and directly flow out from the filter. These particles will cause frictional wear and as a result, machine efficiency will decrease and electricity expense will increase.

At clogging (without relief valve)



×

If you keep using the filter in this situation, element will break down. Broken pieces of element will flow out from the filter and will cause serious damage to the machine and great loss.

Please replace a filter element as soon as indicator signal turns red color.

※Even if relief valve is included in the filter, continually use after clogging may cause breakdown of element and broken pieces will flow out.

Recommendation of periodic replacement of element

Although our element is strong enough for regular use, we recommend element replacement every 6 months, with or without clogging, for safe use in various operating condition.

- Continuous operation under high temperature
- System with high flow rate fluctuation
- Long operation with heavy load

→ **Widening of filtration gap → Flow out of particles**
Breakdown of element → Flow out of broken pieces

◀Broken element that was used continually

Please confirm and eliminate a cause before your element becomes like the left photo.

How to Maintenance Filter

Please refer to the below example of element replacement of our signature line filter "UL" type.
Work procedure is different depending on product model.

①Preparation

Shut down hydraulic system and confirm the pressure in filter decreases to zero. Then, remove drain plug and drain oil completely from filter.

②Disassembly

Remove four mounting bolts on upper cover and pull up the cover. Upper cover, inlet, and element can be taken out together.

③Check

(A) **Paper and C-fiber element**
Replace to a new element. Check stamp on the element top and be sure that filtration rating code and fluid type code are correct.

(B) **Wire gauze, notch wire, and wedge wire element**
Element is reusable after cleaning. ※1

④Element replacement

Remove the used element from inlet and replace to a new/ cleaned element.
In addition, remove O-rings attached in upper cover, inlet, and drain plug and replace with new ones (Sealing parts set for element replacement is available).

⑤Re-assembly and Check

Re-assembly is a reverse procedure of disassembly. When re-assembling, please be sure that arrow mark of flow direction on the upper cover is correct.
Please tighten mounting bolts and drain plug at prescribed torque value.
Turn on hydraulic system and confirm oil leakage.

DO NOT USE IMITATION ELEMENT!!!

Using imitation element may cause reduction of filtration performance, service life shortening, and breakdown of your machine. Please replace with **TAISEI genuine elements**.

※1 About element cleaning:
● Filtration rating of 40mesh – 40μm : Use light oils such as Kerosene or Gas oil.
● Filtration rating less than 40μm : After cleaning by light oils, use ultrasonic cleaning machine. (Please ask us for purchase of ultrasonic cleaning machine)

Prevention of oil deterioration and performance reduction
by controlling oil temperature.

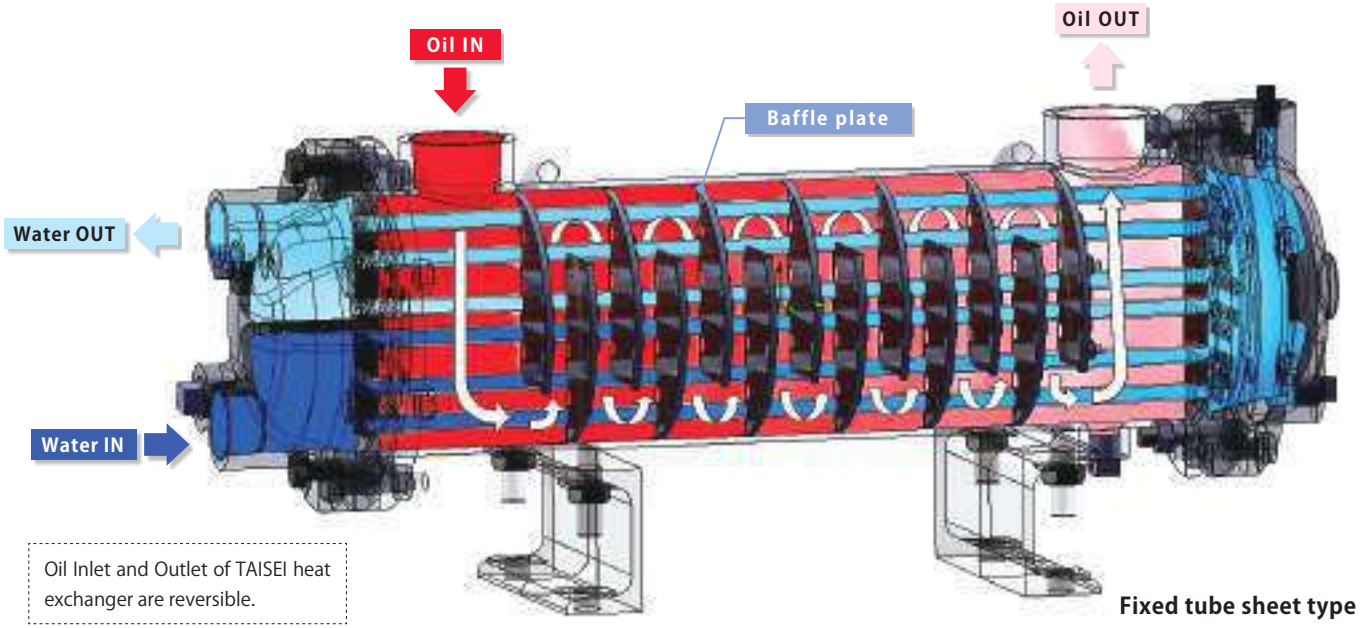
Heat Exchanger

Structure and Type of Heat Exchanger

What is Heat Exchanger?

Since heat exchanger suppresses temperature rise of oil heated in hydraulic system, it can prevent performance reduction and breakdown of components.

Water-Cooled Shell and Tube type



Oil Inlet and Outlet of TAISEI heat exchanger are reversible.

Fixed tube sheet type

As shown above, many small tubes are installed in a shell. Low-temperature water flows inside of the small tubes (blue colored area) and high-temperature oil flows outside of the small tubes along baffle plates (red colored area), and this passing process enables heat exchanging.
TAISEI shell and tube type heat exchanger utilizes Low Fin Tube and Inner Fin Tube manufactured by our own experiences and know-how. This enables compact and reasonable products.
Moreover, shell and tube type heat exchanger has characteristics that is applicable to large flow rate, great strength, and easy maintenance. Since we can carry out flow characteristic test at large flow rate and repetition durability test by our special test machines, critical design of heat exchanger based on the test results is possible.

Fixed tube sheet type	Floating tube sheet type
Tube sheets and shell are integrated by welding, and therefore it is simple structure and less components. Temperature difference between shell side and tube side is limited under 80℃.	Tube sheets are installed in shell without welding or fixing, and therefore this can accept thermal expansion gap between shell and tube. In addition, since tube bundle can be pulled out from shell, cleaning of tube outer and replacement of tube bundle are available.

Air-Cooled type

Air movement from fan motor cools oil. Various type of structures are available: simple Drawn cup type, general Plate fin type, and special Tube fin type. Air-Cooled type heat exchanger is used where cooling water cannot be supplied and is appropriate to cool pump drain, inverter-controlled pump, and system with low heating value.

(Front) Drawn cup type (Left and Right) Plate fin type

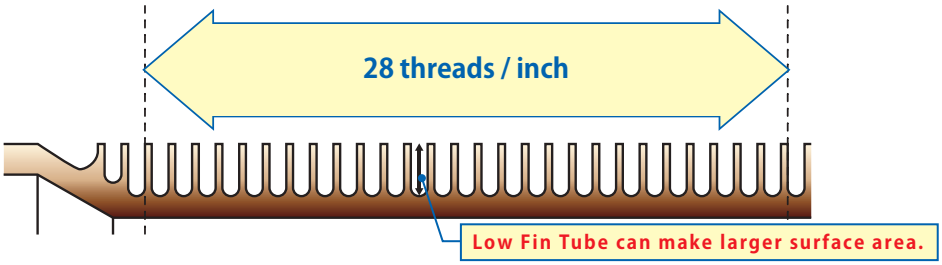
Why TAISEI Heat Exchanger shows High Performance?

TAISEI shell and tube type heat exchanger utilizing "Low Fin Tube" shows high performance.
This is derived from the most proper surface area ratio between inner and outer tube for heat exchanging of water and oil.
Our endless pursuit and rich experiences enable to manufacture Low Fin Tube that has "the smallest tube diameter and the largest number of fin threads per inch in the industry".
Therefore, by comparing with other manufacturers' heat exchanger,

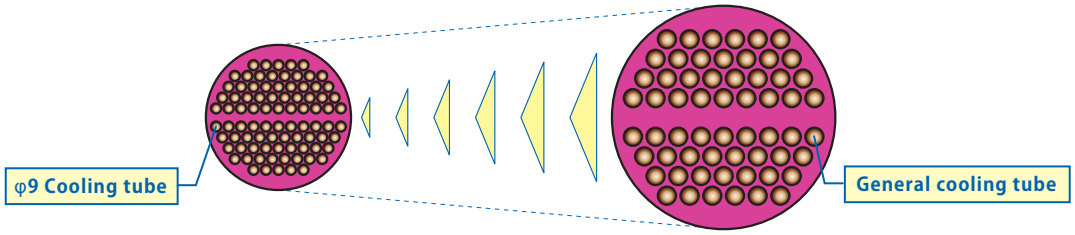
"If outer dimension is same, we can provide larger heat transfer area and larger heat exchange amount."
"If heat transfer area is same, we can provide smaller heat exchanger."

TAISEI Low Fin Tube — Developed and Manufactured by our special technique

Characteristic 1 — Larger number of fin threads (28 threads per inch) makes heat transfer area larger.



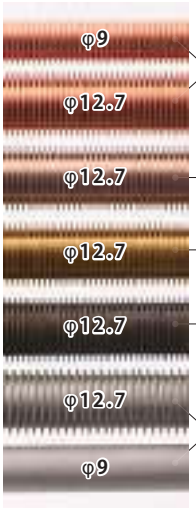
Characteristic 2 — Tube minimization enables increase of heat transfer coefficient, high performance, and downsizing.



TAISEI Φ9mm Low Fin Tube
(The smallest size in the industry※1)

General sized cooling tube

Characteristic 3 — Applicable to various material and diameter of tube due to internal manufacturing.



Phosphorous-deoxidized copper
For fresh water, industrial water, river water. General and popular cooling tube with high heat transfer ratio.

Cupronickel
For brackish water (mixture of seawater and river water) and chloride-containing water that requires higher corrosion resistant than copper.

Aluminum brass
Mainly for clean seawater. Be careful when using with fresh water since it is sensitive to stress corrosion cracking.

Carbon steel for boiler/heat exchanger
For severe inspection standard and dimensional accuracy of pressure vessels utilized in high temperature and high pressure condition.

Stainless-steel
For low-pH water and highly contaminated fresh water.

＊1 In standard mass-produced product (according to TAISEI survey)

How to select Heat Exchanger

You can select heat exchanger simply by the catalog. Please refer to the following instruction.

STEP.1 Working condition check

Check item	Remarks
Type	Water-Cooled Shell and Tube type, Air-Cooled type
Heat exchange amount	If not specified, temperature of inlet and outlet at shell side should be set.
Working temperature	Shell side: inlet and outlet temperature Tube side: inlet temperature
Max working pressure	1 MPa for both Shell and Tube type and Air-Cooled type
Flow rate (normal/max)	Shell side: Should be specified Tube side: If not specified, set the same value as a shell side.

Heat exchanger selection is NOT possible if check item in **large character** is not specified.

Check item	Remarks
Fluid type	Shell side: Fluid type, density, and kinematic viscosity Tube side: Type of cooling water
Allowable pressure drop	If not specified, Shell side: ≦ 0.1MPa Tube side: ≦ 0.05MPa
Scale coefficient	If not specified, set 0 m^2℃/W for both shell side and tube side.
Pipe connection	Size and connection type (flange/thread) should be specified.

〈Standard working condition in the catalog〉 **Fluid: Corresponding to ISO VG46／Inlet temperature at shell side: 55℃／Inlet temperature at tube side: 30℃**

STEP.2 Calculation of required condition

A)	If working condition checked at **STEP 1** is almost same with standard condition in the catalog ·····	Go to **STEP.2-①**
B)	If working condition checked at **STEP 1** is NOT same with standard condition in the catalog ·····	Go to **STEP.6**

①Calculation of heat transfer area

i) Calculation of heat exchange amount [kW]
(ρ: specific gravity, C: specific heat)
Calculate working temperature by the following equation if heat exchange amount and oil flow rate is determined.

$$Q = W_o \times 60 \times \rho_o \times C_o \times (T_1 - T_2)$$
$$= W_w \times 60 \times \rho_w \times C_w \times (t_2 - t_1)$$

ii) Calculation of logarithmic mean temperature difference θ [℃]

$$\theta = \frac{(T_1 - t_2) - (T_2 - t_1)}{2.3 \log \frac{(T_1 - t_2)}{(T_2 - t_1)}}$$

iii) Calculation of required heat transfer area A [m^2]
(K-value: Overall heat transfer coefficient[W/m^2℃])

$$A = \frac{Q \times 1000}{\theta \cdot K}$$

Fig.1 Although K-value depends on working condition, structure of heat exchanger, and so on, please select mean value of catalog products.

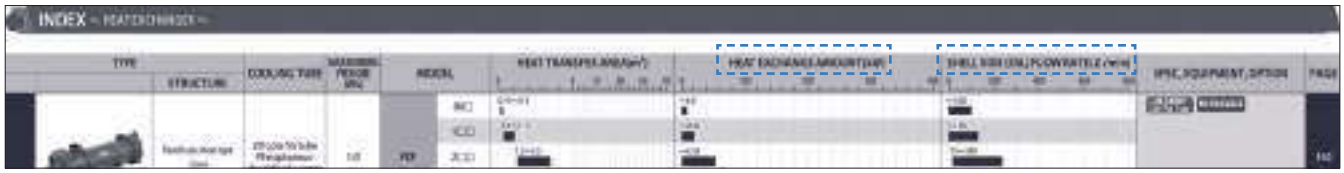
Type of cooling tube	K - Value
Products of φ9 low fin tube	350～450
Products of φ12.7 low fin tube	200～250

[W：Flow rate(ℓ/min), T1/T2：Inlet and outlet temperature at shell side(℃), t1/t2：Inlet and outlet temperature at tube side(℃)]

STEP.3 Base model selection

①Select a base model from P.8 – 9 "INDEX" that meets the requirements in **STEP 2**.

②Refer to the production line-up page of the selected base model.



STEP.4 Size selection

Refer to "PERFORMANCE GRAPH" of the selected model in **STEP 3**, and select the minimum size within the determined condition of heat exchange amount and allowable pressure drop.

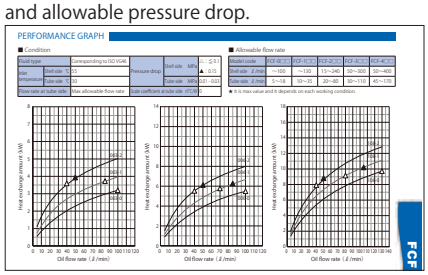


Fig.2 Oil quantity variation

Oil flow rate	Large		Small
CODE	0	1	2

Fig.3 How to check heat transfer area of heat exchanger

Type	How to check
FCF*1、FCD(B)、FCX、FCW、FCU	Divide the last two numbers of MODEL CODE by 20
FCF*2、FPD	Divide the last two numbers of MODEL CODE by 2
FTC(B)、FTS(B)、TEMA	The number right after MODEL CODE (It is directly heat transfer area.)

(Ex.) In case of FCF-1<u>14</u>-2 ==> <u>14</u> ÷ 20 = 0.7m^2

＊1 FCF-003～FCF-390　＊2 FCF-311～FCF-420

STEP.5 Spec confirmation

○Estimate K-value by back calculating in **STEP 2 -** ①, and confirm if the heat transfer area of selected model in **STEP 4** satisfies required specification.

a)	Estimated K-value equals to the one in **fig.1**	⇒ ○ Selected model is OK.
b)	Estimated K-value does not equal to the one in **fig.1**	⇒ × Back to **STEP 4** and select again.

STEP.6 Model selection for other conditions

◎If standard working condition on the catalog does not meet your requirement or if you request air-cooled type heat exchanger, please fill out necessary items from "Request (Filter/Heat Exchanger)" on our WEB site.
Download of drawing, CAD data (outline drawing), and operation manual is available on our WEB site*.
＊ User account registration is required (for free). http://www.taiseikogyo.co.jp/en/support/

Common Specification of Heat Exchanger

Heat Exchange Amount

"Heat exchange amount" in the catalog is estimated by following condition.
(Since it is standard value, please select by actual working condition.)

Heat exchanger type		Water-Cooled Shell and Tube type※1	Air-Cooled type
Inlet temperature	Shell side	55℃	Room temperature + 35℃
	Tube side	30℃	Room temperature
Flow rate	Shell side	Max value of allowable flow rate	Max value of allowable flow rate
	Tube side	Max value of allowable flow rate	—
Fluid type		Corresponding to ISO VG46	Corresponding to ISO VG32

＊1 Except TCW model and TEMA series

Applicable Fluid type

Applicable fluid type and sealing parts material are shown in the table below.
Please ask us for other fluid type.

Cooled fluid type	Fluid code	Sealing parts material
Mineral oil	Blank	NBR
Gear oil		
Water-glycol fluid	G	
Fatty ester fluid		
Ammonia-containing oil		
Water-soluble coolant		
Phosphate ester fluid	F	FKM
G + F	W	

Water Quality Standard for Heat Exchanger

Refer to the following water quality standard table for cooling water of heat exchanger.

By Standard of the Japan Refrigeration and Air Conditioning Industry Association (JRA-GL-02-1994):

	Item		Quality standard of cooling water	Tendency	
				Corrosion	Scale adhesion
Basic item	pH	[25℃]	6.5 – 8.2	○	○
	Electric conductivity	[25℃] (mS/m)	≦ 800	○	○
	Chloride ion	($mgCl^-$/ℓ)	≦ 200	○	
	Sulfate ion	($mgSO_4^{2-}$/ℓ)	≦ 200	○	
	Acid consumption	[pH4.8] ($mgCaCO_3$/ℓ)	≦ 100		○
	Total hardness	($mgCaCO_3$/ℓ)	≦ 200		○
Reference	Total iron	($mgCaCO_3$/ℓ)	≦ 1.0	○	○
	Total copper	($mgSiO_2$/ℓ)	≦ 0.3	○	
	Sulfide ion	(mgFe/ℓ)	Not detected	○	
	Ammonium ion	(mgCu/ℓ)	≦ 1.0	○	
	Residual chlorine	(mgS^{2-}/ℓ)	≦ 0.3	○	
	Free carbon dioxide	($mgNH_4^+$/ℓ)	≦ 4.0	○	
	RSI(Ryznar Stability Index)	($mgCl^-$/ℓ)	6.0 – 7.0	○	○

※1 Tap water, underground water, and industrial water are generally used as cooling water. In case of using untreated water from river, lake, and pond, please be careful of pollution and contamination.
※2 Since the standard value in the table is reference values determined for longer service life and efficiency retention of heat exchangers, corrosion and scale adhesion may cause even if each value is within the standard value.

Unit Conversion Table

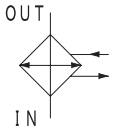
The table below shows conversion of representative values in heat exchanger specification.

	Gravimetric unit	Conversion	SI unit
Heat exchange amount	kcal/h	×4.186	kJ/h
		÷860	kW
Pressure	kg/cm^2	÷9.8	MPa
	bar	÷10	
	psi	÷145	

FCF model

Water-Cooled Shell and Tube type Compact Oil Cooler
Fixed Tube Sheet type
Heat exchange amount: ~ 119.8kW

Definitive Model of General-use Compact Oil Cooler



Water-cooled type cooler

Characteristics

- φ9 Low Fin Tube enables high cooling performance and downsizing
- Wide size variation allows to appropriate model selection
- High flexibility of installation by selectable flow direction and adjustable U-bolt stand
- Fixed tube sheet type is the simplest structure and low price

SPECIFICATION

	Shell side		Tube side
Max working pressure MPa	1.0		1.0
Max working temperature ℃	100*1		60
Pass structure	1 pass		2 passes
Fluid type	Standard	Mineral oil	Fresh water
	G	Water glycol fluid	
		Fatty ester fluid	

Shell size code		00 □	1 □□	2 □□	3 □□	4 □□
Cooling tube type		φ9 Low Fin Tube ☆				
Main material	Cooling tube	Phosphorous-deoxidized copper				
	Body	STKM, SS			STK, SS	SGP
	Channel	FC				
Coating	Outside coating	Aqua blue				
	Inside of channel	Tar-free epoxy coating				

☆ TAISEI original high performance cooling tube enables 20% size reduction compared with general φ12.7 low fin tube.

MODEL CODE

〈Model code example〉

G – FCF – 226 – 2

Code	Fluid type (Shell side)
Blank	Mineral oil
G	Water-glycol fluid
	Fatty ester fluid

Code	Heat transfer area	Shell size
003	0.15㎡	φ63.5
006	0.3㎡	
108	0.4㎡	φ76.3 (65A)
114	0.7㎡	
122	1.1㎡	
226	1.3㎡	φ114.3 (100A)
234	1.7㎡	
242	2.1㎡	
256	2.8㎡	
270	3.5㎡	

Code	Heat transfer area	Shell size
350	2.5㎡	φ139.8 (125A)
370	3.5㎡	
390	4.5㎡	
311	5.5㎡	
313	6.5㎡	
314	7.0㎡	
316	8.0㎡	
411	5.5㎡	φ165.2 (150A)
414	7.0㎡	
416	8.0㎡	
418	9.0㎡	
420	10.0㎡	

Code	Flow rate*2
0	Large
1	Medium
2	Small

＊1 Temperature difference between shell side fluid and tube side fluid should be within 80℃. If it is larger than 80℃, please select FCD model.
＊2 "Flow rate" is for optimization of flow velocity by adjusting the number of baffle plate depend on flow amount variation.

PERFORMANCE GRAPH

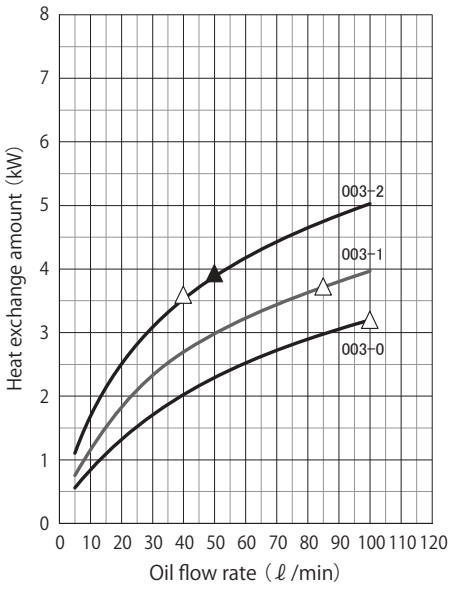
■ Condition

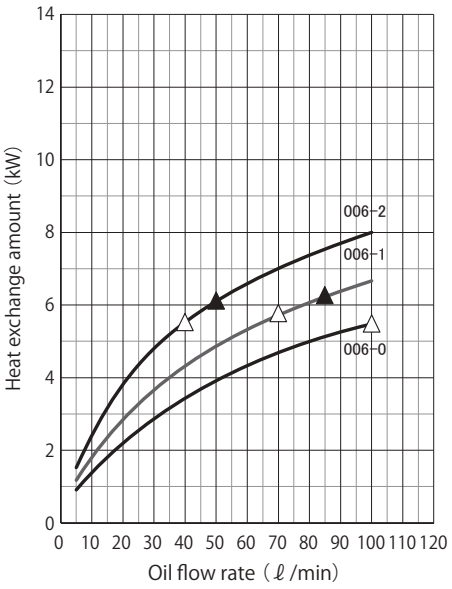
Fluid type		Corresponding to ISO VG46	Pressure drop	Shell side MPa	△ : ≦ 0.1 ▲ : 0.15
Inlet temperature	Shell side ℃	55			
	Tube side ℃	30		Tube side MPa	0.01 - 0.03
Flow rate at tube side		Max allowable flow rate	Scale coefficient at tube side	㎡℃/W	0

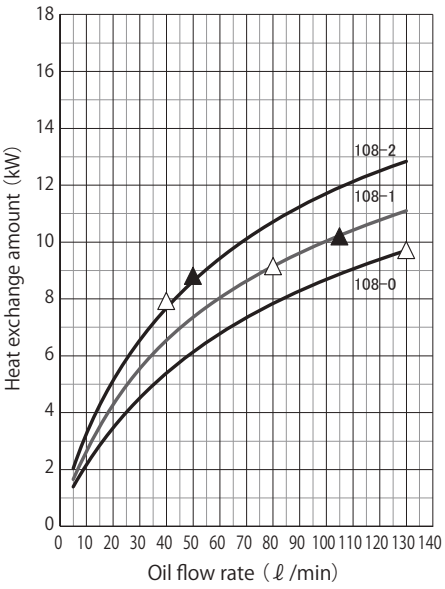
■ Allowable flow rate

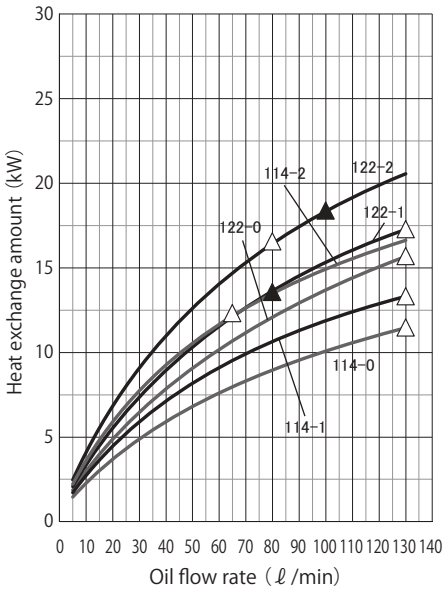
Model code	FCF-0□□	FCF-1□□	FCF-2□□	FCF-3□□	FCF-4□□
Shell side ℓ/min	～100	～130	15～240	50～300	50～400
Tube side ℓ/min	5～18	10～35	20～80	30～110	45～170

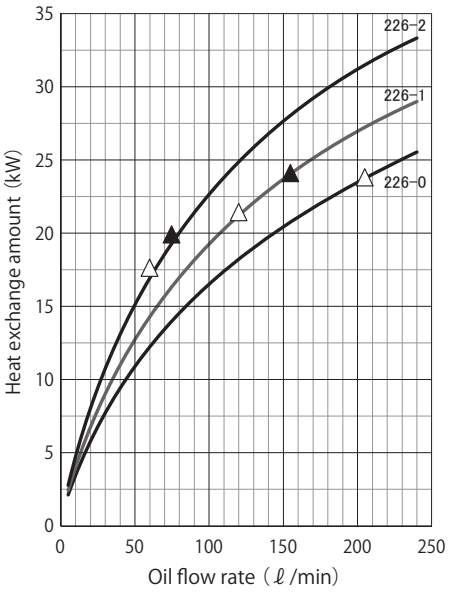
★ It is max value and It depends on each working condition.

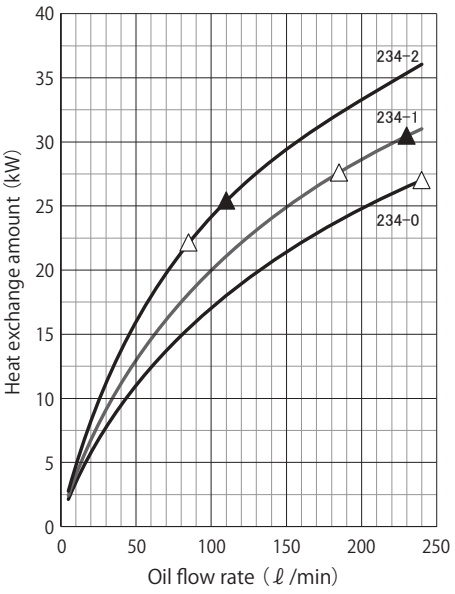


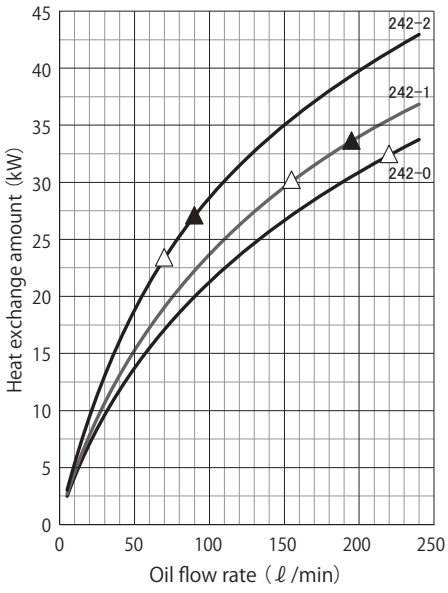


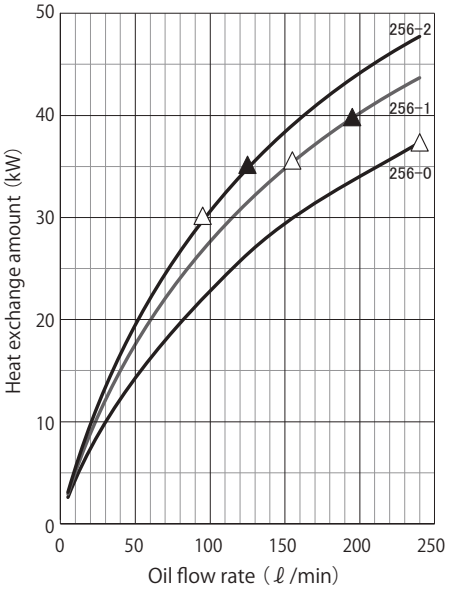


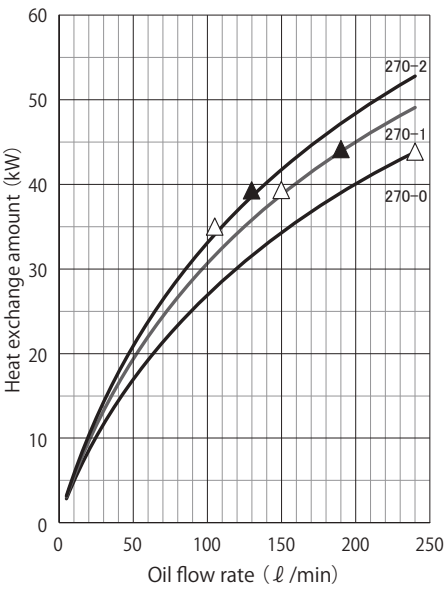












FCF

PERFORMANCE GRAPH

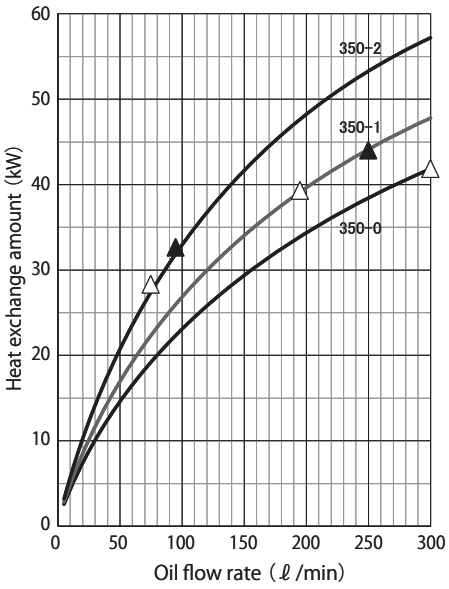
■ Condition

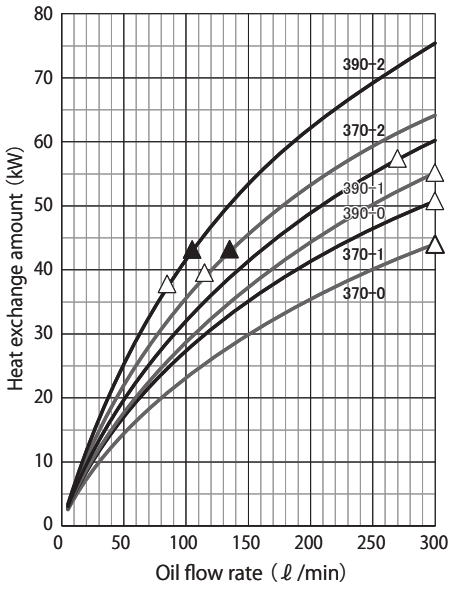
Fluid type		Corresponding to ISO VG46	Pressure drop	Shell side MPa	△ : ≦ 0.1 ▲ : 0.15
Inlet temperature	Shell side ℃	55			
	Tube side ℃	30		Tube side MPa	0.01 - 0.03
Flow rate at tube side		Max allowable flow rate	Scale coefficient at tube side	㎡℃/W	0

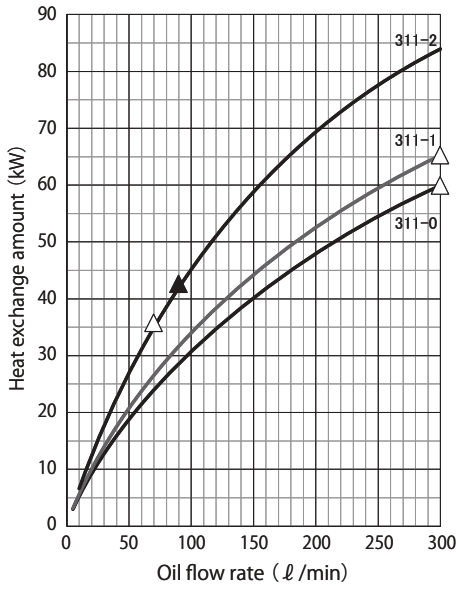
■ Allowable flow rate

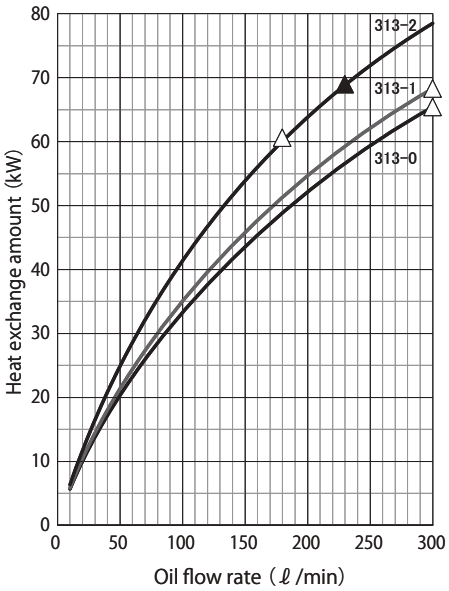
Model code	FCF-0 □□	FCF-1 □□	FCF-2 □□	FCF-3 □□	FCF-4 □□
Shell side ℓ/min	～100	～130	15～240	50～300	50～400
Tube side ℓ/min	5～18	10～35	20～80	30～110	45～170

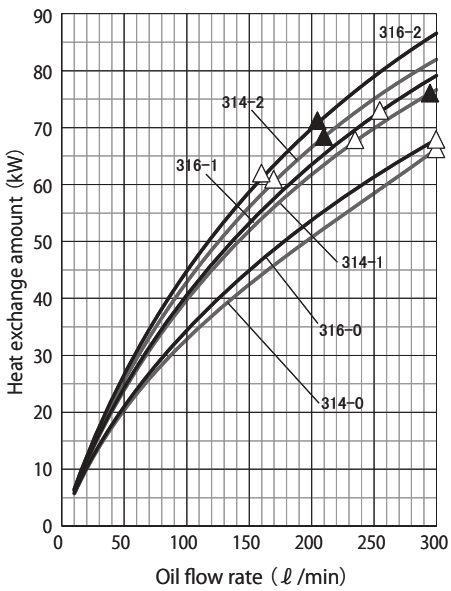
★ It is max value and It depends on each working condition.

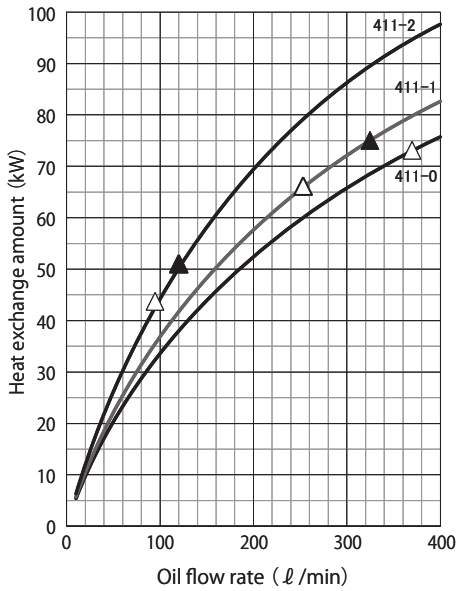


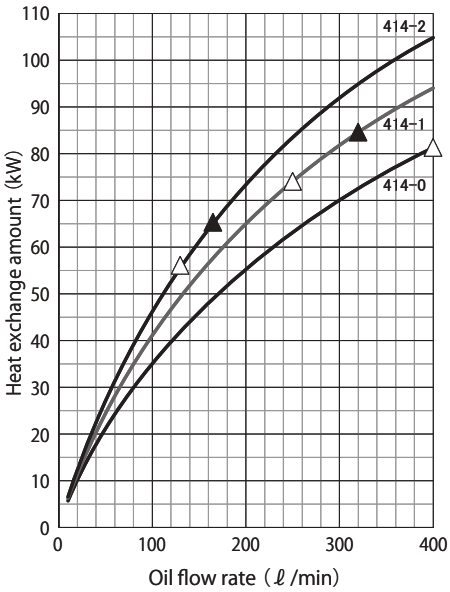


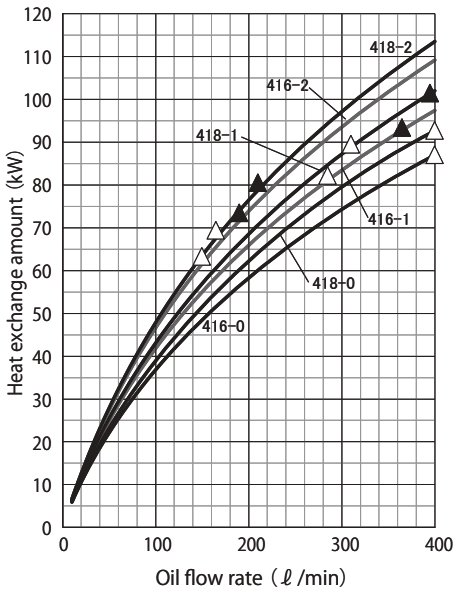


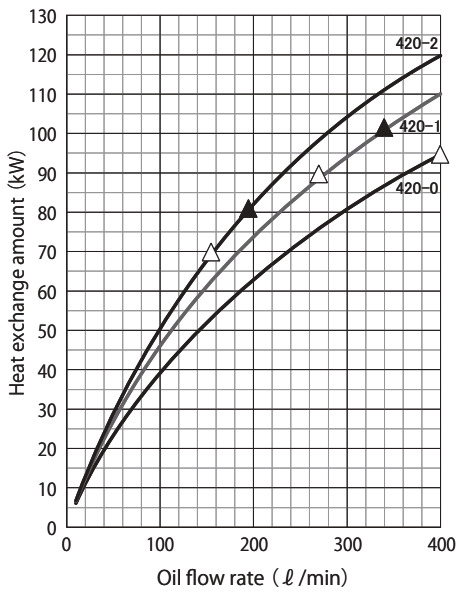






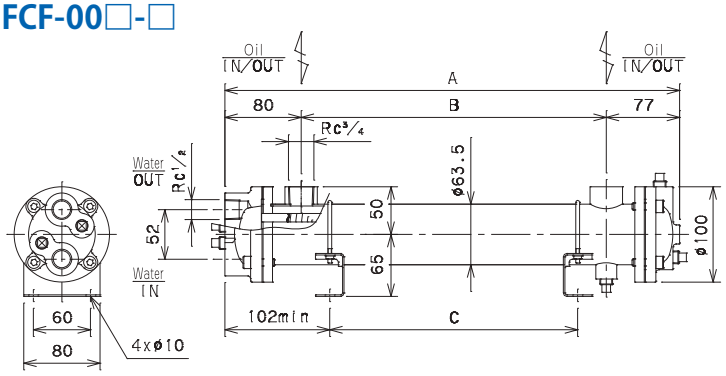






Unit : mm

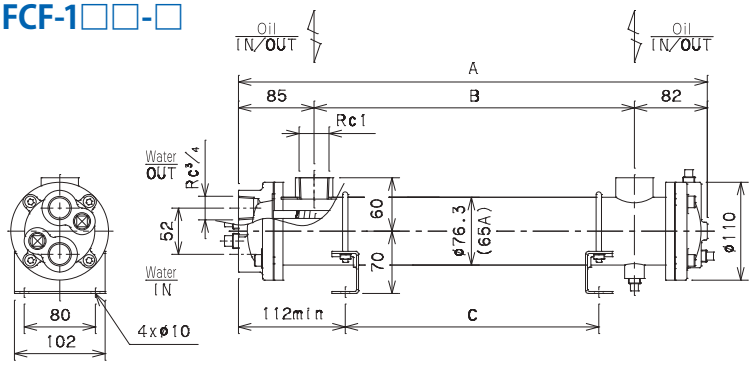
FCF-00□-□



Model code	Length			Weight (kg)
	A	B	C	
FCF-003-□	297	140	30～95	5.5
FCF-006-□	477	320	30～275	6.3

★Stand position is adjustable.

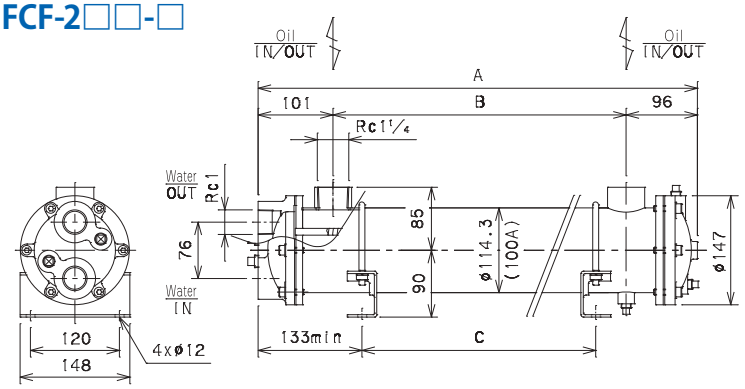
FCF-1□□-□



Model code	Length			Weight (kg)
	A	B	C	
FCF-108-□	347	180	30～125	6.5
FCF-114-□	527	360	30～305	8.5
FCF-122-□	757	590	30～535	11

★Stand position is adjustable.

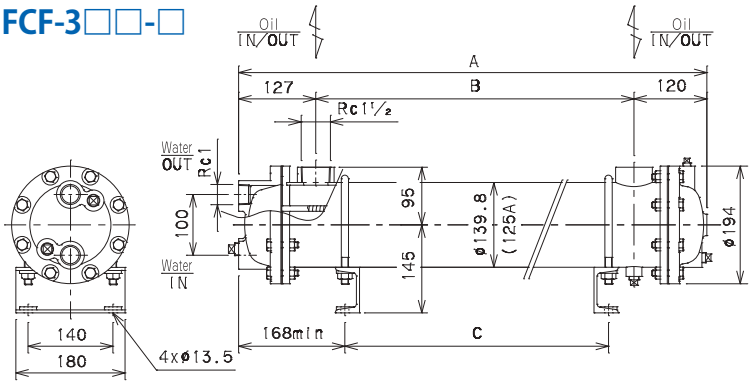
FCF-2□□-□



Model code	Length			Weight (kg)
	A	B	C	
FCF-226-□	437	240	40～175	14
FCF-234-□	547	350	40～285	16
FCF-242-□	627	430	40～365	17.5
FCF-256-□	777	580	40～515	22
FCF-270-□	947	750	40～685	25

★Stand position is adjustable.

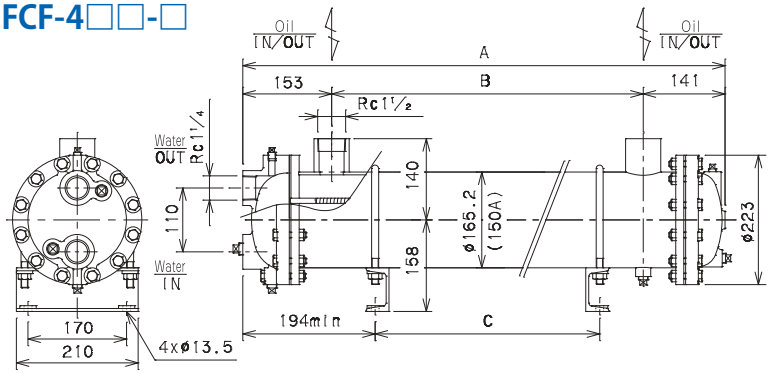
FCF-3□□-□



Model code	Length			Weight (kg)
	A	B	C	
FCF-350-□	587	340	50～255	34
FCF-370-□	817	570	50～485	42
FCF-390-□	987	740	50～655	47
FCF-311-□	1107	860	50～775	52
FCF-313-□	1287	1040	50～955	58
FCF-314-□	1407	1160	50～1075	63
FCF-316-□	1587	1340	50～1255	69

★Stand position is adjustable.

FCF-4□□-□

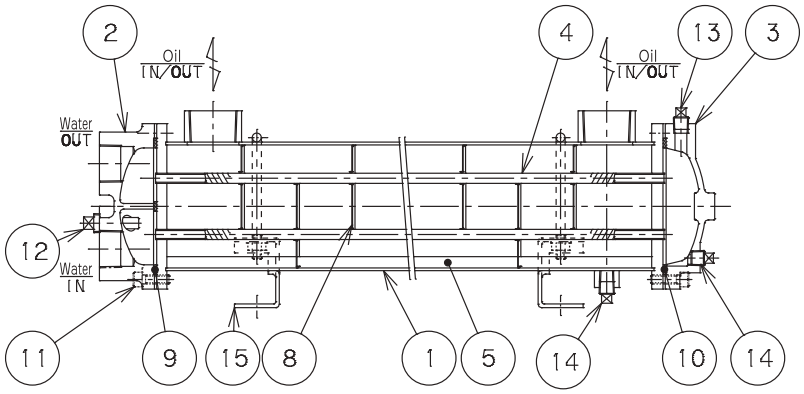


Model code	Length			Weight (kg)
	A	B	C	
FCF-411-□	834	540	50～455	60
FCF-414-□	1004	710	50～625	68
FCF-416-□	1124	830	50～745	74
FCF-418-□	1204	910	50～825	78
FCF-420-□	1304	1010	50～925	83

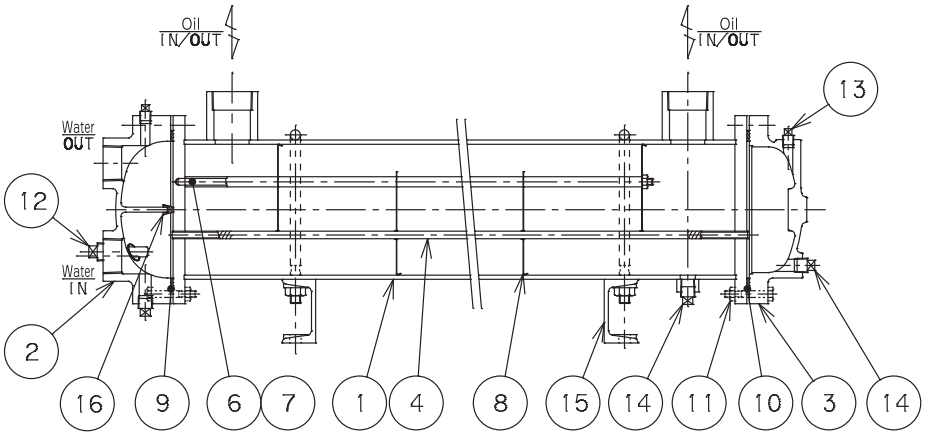
★Stand position is adjustable.

CROSS SECTION

FCF-00□～FCF-2□□



FCF-3□□, FCF-4□□



PARTS LIST

No.	Item	Qty
1	Body	1
2	Channel "A"	1
3	Channel "B"	1
4	Fin tube	n*
5	Set plate (Only for 00□～2□□)	n*
6	Distance pipe	n*
7	Rod	4
8	Baffle plate	n*
9	Packing	1
10	Packing	1
11	Bolt (00□～2□□)	n*
	Bolt・Nut (3□□、4□□)	
12	Zinc plug	2
13	Air vent plug	1
14	Drain plug	2
15	Stand	2
16	U-shaped packing (Only for 4□□)	1

n*：The number of part depends on model.

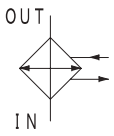
SEALING PARTS & ANTICORROSIVE PARTS LIST

No.	9	10	16	Sealing parts set		12
Item / Model code	Special packing non asbestos		U-shaped packing NBR		No.：9,10,16	Zinc plug
				Material	Code of sealing parts set (Item code)	Size (Item code)
FCF-00□	t2xφ74/φ60, W6 (with partition)	t2xφ74/φ60		—	SA-FCF-000 (SSC000001)	R 1/4 (7Z3010000)
FCF-1□□	t2xφ83/φ72, W6 (with partition)	t2xφ83/φ72		—	SA-FCF-100 (SSC000002)	R 3/8 (7Z3020000)
FCF-2□□	t2xφ120/φ109, W6 (with partition)	t2xφ120/φ109		—	SA-FCF-200 (SSC000003)	
FCF-3□□	t2xφ160/φ134, W6 (with partition)	t2xφ160/φ134		—	SA-FCF-300 (SSC000004)	R 1/2 (7Z3040000)
FCF-4□□	t3xφ188/φ162		12x12x162	NBR	SA-FCF-400 (SSC000005)	

MAINTENANCE TOOL LIST

Item	Size (mm)	Item code	Remarks
Tube brush	D6x1000	KZZ000001	For periodic cleaning of tube to prevent scale.
Tube plug	D5.5x7.5x25	BZZ000021	For closing a tube when leakage occurs due to tube corrosion. 2 plugs are required for a tube.

Best-selling Compact Oil Cooler: Floating tube sheet type of FCF



Water-cooled type cooler

Characteristics

- φ9 Low Fin Tube enables high cooling performance and compact design
- FCD model: For fresh water (general industrial machine and other uses)
- FCDB model: For seawater (marine machine and component)
- High flexibility of installation by selectable flow direction and adjustable U-bolt stand
- Cleaning and replacement of tube bundle are available with floating tube sheet type

SPECIFICATION

	Shell side		Tube side	
Max working pressure MPa	1.0		1.0	
Max working temperature ℃	90*1		60	
Pass structure	1 pass		2 pass	
Fluid type	Standard	Mineral oil	FCD	Fresh water
	G	Water glycol fluid		
		Fatty ester fluid		
	F	Phosphate ester fluid	FCDB	Sea water
	W	G+F		

☆ TAISEI original high performance cooling tube enables 20% size reduction compared with general φ12.7 low fin tube.

Shell size code			1□□A	2□□A	3□□A
Cooling tube type			φ9 Low Fin Tube ☆		
Main material	Cooling tube	FCD	Phosphorous-deoxidized copper		
		FCDB	Aluminum brass		
	Tube plate	FCD	SS		
		FCDB	Naval brass		
	Body		STKM、SS		SGP
	Channel		FC		
Coating	Outside coating	FCD	Aqua blue		
		FCDB	Light bluish green (10B7/6)		
	Inside of channel		Tar-free epoxy coating		

MODEL CODE

〈Model code example〉

F – **FCDB** – **350A** – **0** – **C**

Code	Fluid type (Shell side)
Blank	Mineral oil
G	Water-glycol fluid
	Fatty ester fluid
F	Phosphate ester fluid
W	G+F

Code	Cooling water type
FCD	Fresh water
FCDB	Sea water

Code	Heat transfer area	Shell size
108A	0.4㎡	φ76.3 (65A)
114A	0.7㎡	
122A	1.1㎡	
226A	1.3㎡	φ114.3 (100A)
234A	1.7㎡	
242A	2.1㎡	
256A	2.8㎡	
270A	3.5㎡	
350A	2.5㎡	φ139.8 (125A)
370A	3.5㎡	
390A	4.5㎡	
311A	5.5㎡	

Code	Flow rate*2
0	Large
1	Medium
2	Small

Code	Connection type	
Blank	Shell side	Rc threaded
	Tube side	Rc threaded
A*3	Shell side	Rc threaded
	Tube side	Flange
B*3	Shell side	Flange
	Tube side	Rc threaded
C*3	Shell side	Flange
	Tube side	Flange

＊1 High temperature specification is available as well. Please ask us for details. ＊2 "Flow rate" is for optimization of flow velocity by adjusting the number of baffle plate depend on flow amount variation. ＊3 Only for FCD/FCDB-3 □□. Thread pipe connection only for FCD/FCDB-1 □□~2 □□.

PERFORMANCE GRAPH

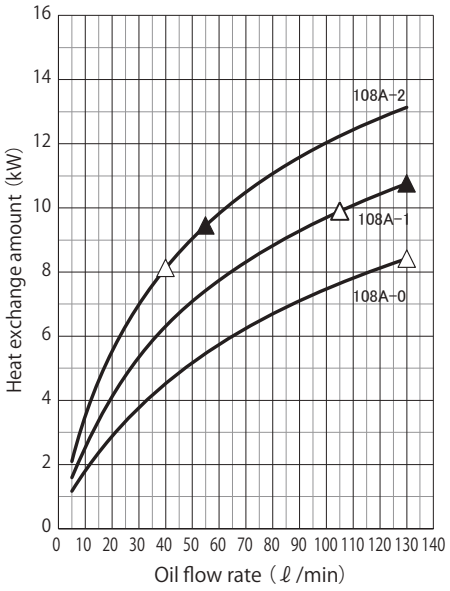
■ Condition

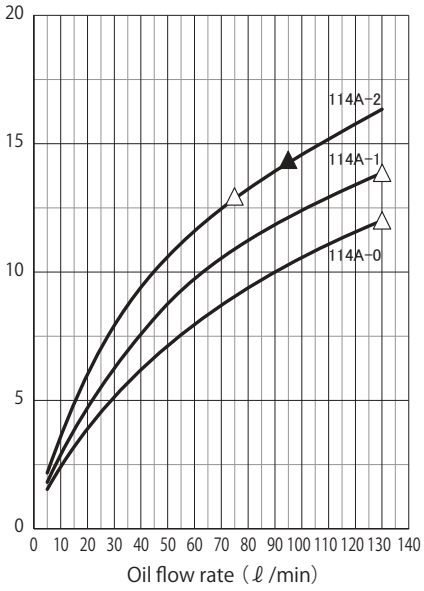
Fluid type		Corresponding to ISO VG46	Pressure drop	Shell side MPa	△ : ≦ 0.1 ▲ : 0.15
Inlet temperature	Shell side ℃	55			
	Tube side ℃	30		Tube side MPa	0.01 - 0.03
Flow rate at tube side		Max allowable flow rate	Scale coefficient at tube side	㎡℃/W	0

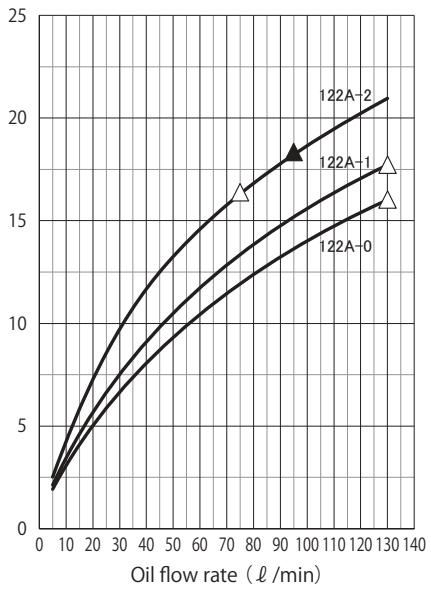
■ Allowable flow rate

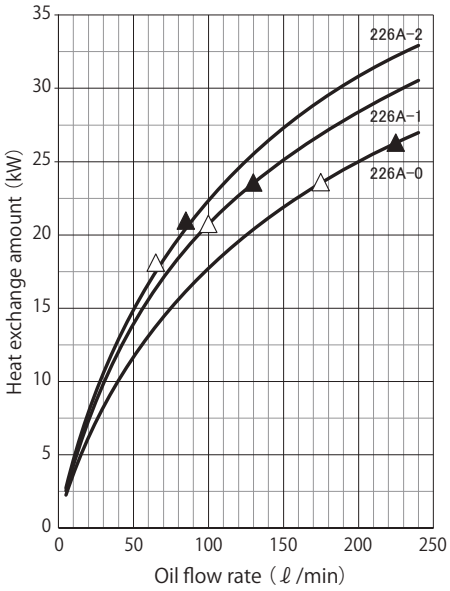
Model code	FCD(B)-1□□A	FCD(B)-2□□A	FCD(B)-3□□A
Shell side ℓ/min	～130	15～240	50～300
Tube side ℓ/min	10～35	20～80	30～110

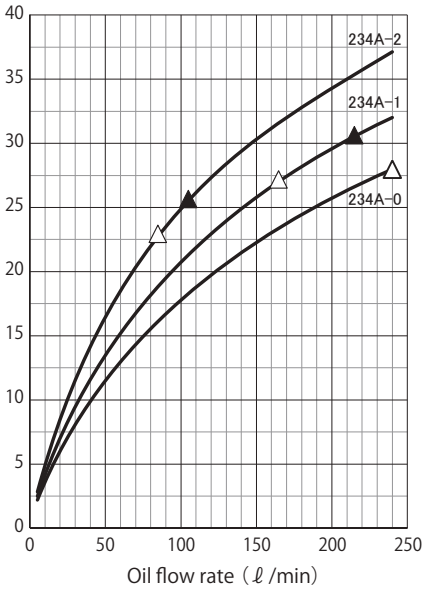
★ It is max value and It depends on each working condition.

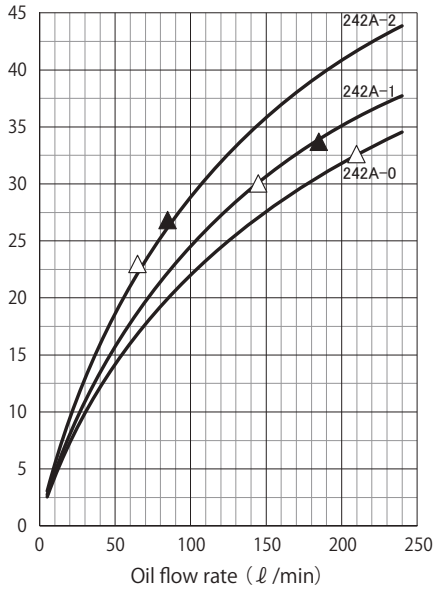












PERFORMANCE GRAPH

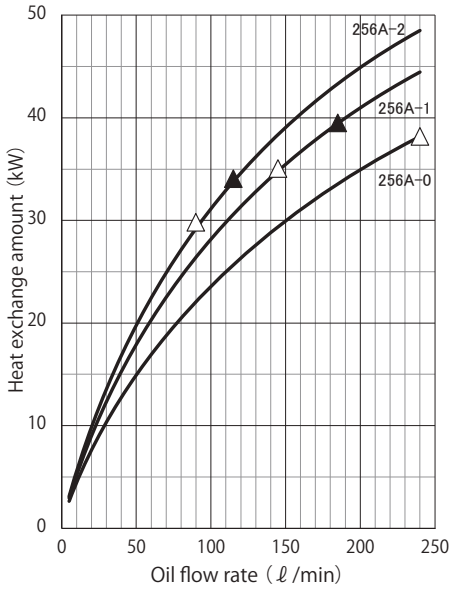
■ Condition

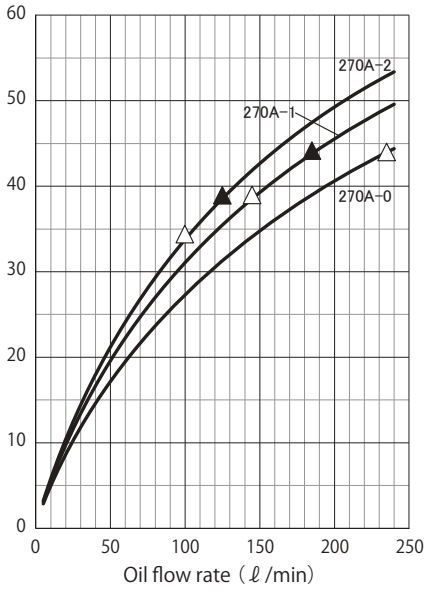
Fluid type		Corresponding to ISO VG46	Pressure drop	Shell side MPa	△ : ≦ 0.1 ▲ : 0.15
Inlet temperature	Shell side ℃	55			
	Tube side ℃	30		Tube side MPa	0.01 - 0.03
Flow rate at tube side		Max allowable flow rate	Scale coefficient at tube side	㎡℃/W	0

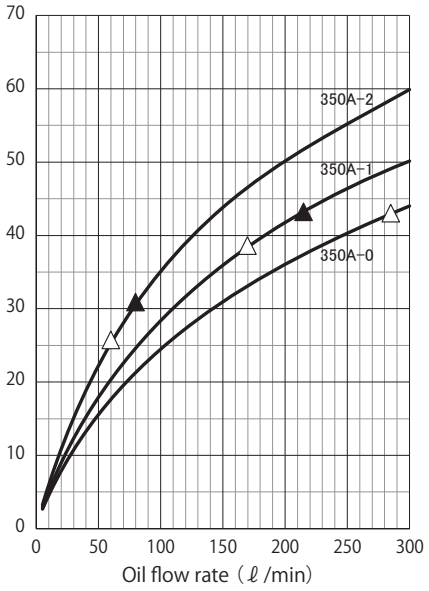
■ Allowable flow rate

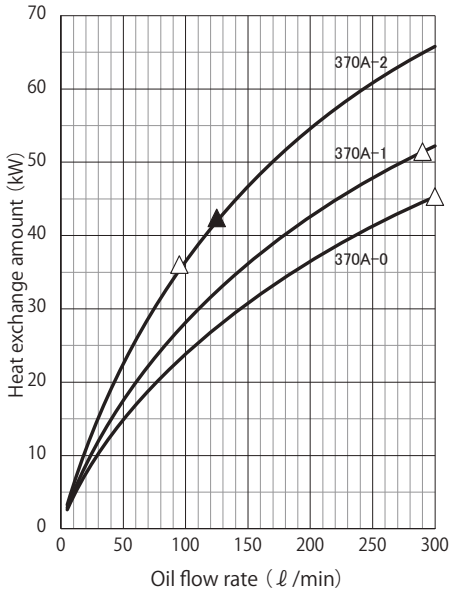
Model code	FCD(B)-1□□A	FCD(B)-2□□A	FCD(B)-3□□A
Shell side ℓ/min	～130	15～240	50～300
Tube side ℓ/min	10～35	20～80	30～110

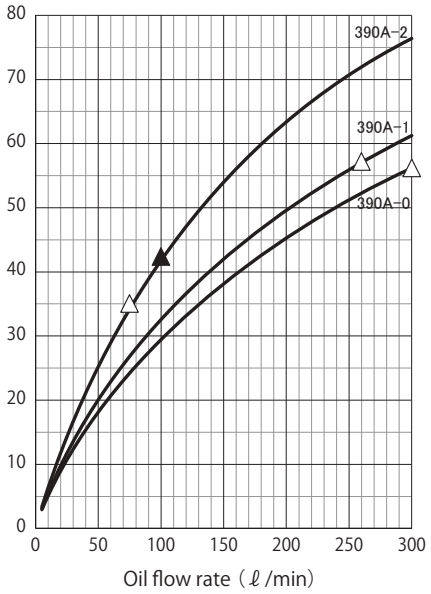
★ It is max value and It depends on each working condition.

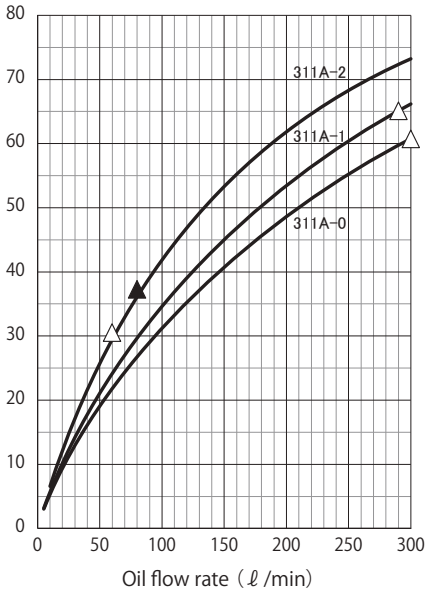








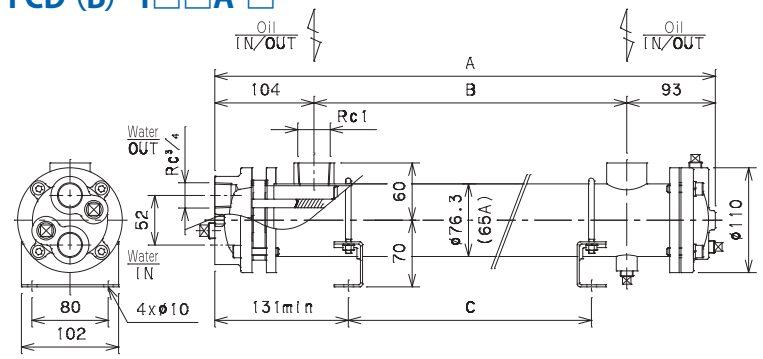




FCD/FCDB

FCD (B) -1□□A-□

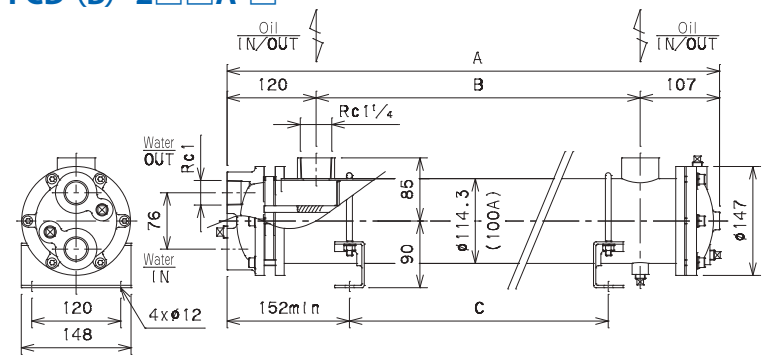
Unit : mm



Model code	Length			Weight (kg)	
	A	B	C		FCDB
FCD(B)-108A-□	345	148	30～95	7.5	8.5
FCD(B)-114A-□	525	328	30～275	10	11
FCD(B)-122A-□	755	558	30～505	13	14

★Stand position is adjustable.

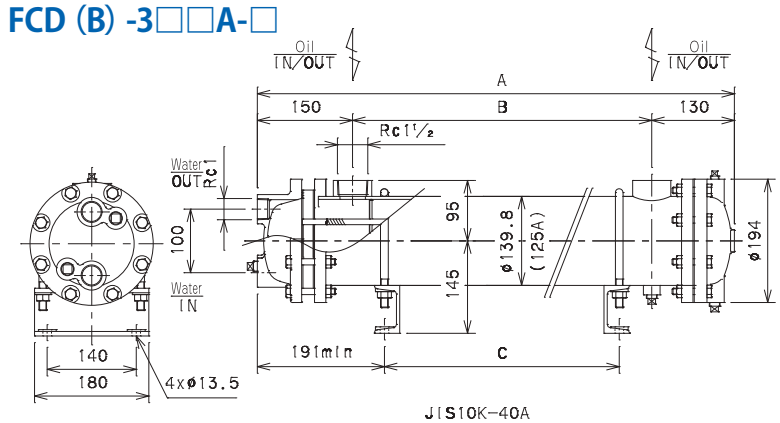
FCD (B) -2□□A-□



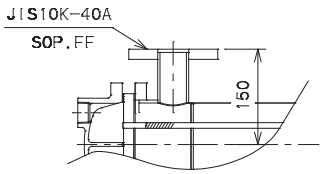
Model code	Length			Weight (kg)	
	A	B	C		FCDB
FCD(B)-226A-□	435	208	40～145	15	16
FCD(B)-234A-□	545	318	40～255	19	20
FCD(B)-242A-□	625	398	40～335	22	23
FCD(B)-256A-□	775	548	40～485	25	26
FCD(B)-270A-□	945	718	40～655	31	32

★Stand position is adjustable.

FCD (B) -3□□A-□



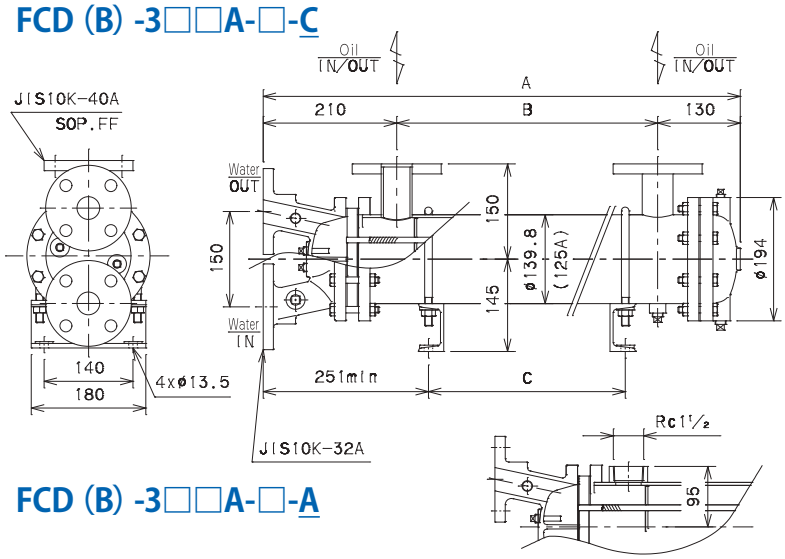
FCD (B) -3□□A-□-B



Model code	Length			Weight (kg)	
	A	B	C		FCDB
FCD(B)-350A-□	581	301	50～220	40	42
FCD(B)-350A-□-B				43	45
FCD(B)-370A-□	881	531	50～450	47	49
FCD(B)-370A-□-B				50	52
FCD(B)-390A-□	981	701	50～620	52	54
FCD(B)-390A-□-B				55	57
FCD(B)-311A-□	1101	821	50～740	56	58
FCD(B)-311A-□-B				59	64

★Stand position is adjustable.

FCD (B) -3□□A-□-C



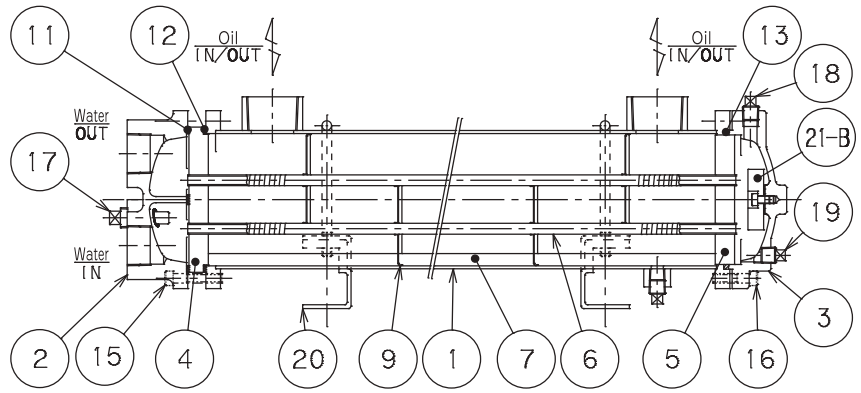
FCD (B) -3□□A-□-A

Model code	Length			Weight (kg)	
	A	B	C		FCDB
FCD(B)-350A-□-A	641	301	50～220	44	46
FCD(B)-350A-□-C				47	49
FCD(B)-370A-□-A	871	531	50～450	51	53
FCD(B)-370A-□-C				54	56
FCD(B)-390A-□-A	1041	701	50～620	56	58
FCD(B)-390A-□-C				59	61
FCD(B)-311A-□-A	1161	821	50～740	60	62
FCD(B)-311A-□-C				63	65

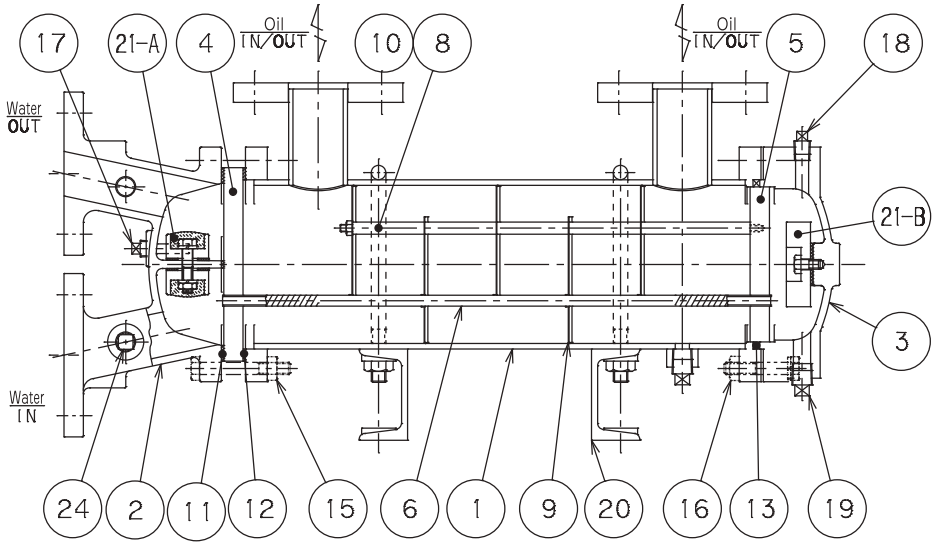
★Stand position is adjustable.

CROSS SECTION

FCD (B) -1□□A-□, FCD (B) -2□□A-□



FCD (B) -3□□A-□-C



PARTS LIST

No.	Item	Qty
1	Body	1
2	Channel "A"	1
3	Channel "B"	1
4	Tube plate "A"	1
5	Tube plate "B"	1
6	Fin tube	n*
7	Set plate (Only for 1□□A～2□□A)	n*
8	Distance pipe (Only for 3□□A)	n*
9	Baffle plate	n*
10	Rod (Only for 3□□A)	4
11	Packing	1
12	Packing	1
13	Packing	1
—	———	—
15	Bolt (1□□A、2□□A)	n*
	Bolt・Nut (3□□A)	
16	Bolt *1 (1□□A、2□□A)	n*
	Bolt・Nut *1 (3□□A)	
17	Zinc plug	2
18	Air vent plug	1
19	Drain plug	2
20	Stand	2
21	Zinc plate (Only for FCDB)	n*
—	———	—
—	———	—
24	Plug (Only for 3□□A－A/C)	2

n*：The number of part depends on model.

FCD/FCDB

SEALING PARTS & ANTICORROSIVE PARTS LIST

No.	11	12	13	Sealing parts set		17	21-A [Only for FCDB]		21-B [Only for FCDB]	
Item / Model code	Special packing non asbestos		Special packing NBR		No.：11～13	Zinc plug	Zinc plate set (with packing)		Zinc plate set (with packing)	
				Material	Code of sealing parts set (Item code)	Size (Item code)	Size (Item code)	Qty	Size (Item code)	Qty
FCD(B)-1□□A	t2xφ83/φ72, W6 (with partition)	t2xφ83/ φ72	t3xφ79.2/ φ71	NBR	SA-FCD-100A (SSC000009)	R 3/8 (7Z3020000)			t8x30x30 (B61000132)	1set/pc
				FKM	SA-F/W-FCD-100A (SSC000012)					
FCD(B)-2□□A	t2xφ120/φ109, W6 (with partition)	t2xφ120/ φ109	t3xφ115.2/ φ107	NBR	SA-FCD-200A (SSC000010)				t13x50x50 (B61000133)	1set/pc
				FKM	SA-F/W-FCD-200A (SSC000013)					
FCD(B)-3□□A -3□□A-B	t2xφ160/φ134, W6 (with partition)	t2xφ160/ φ134	t4.5xφ140.2/ φ128	NBR	SA-FCD-300A (SSC000011)	R 1/2 (7Z3040000)	t20x35x75 (B61000134)	1set/pc*2	t20x70x70 (B61000135)	1set/pc
				FKM	SA-F/W-FCD-300A (SSC000014)					
FCD(B)-3□□A-A -3□□A-C				NBR	SA-FCD-300A (SSC000011)	R 1/4 (7Z3010000)				
				FKM	SA-F/W-FCD-300A (SSC000014)					

＊Zinc plug and zinc plate are not included in sealing parts set.

MAINTENANCE TOOL LIST

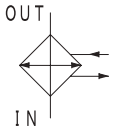
Item	Size (mm)	Item code	Remarks
Tube brush	D6x1000	KZZ000001	For periodic cleaning of tube to prevent scale.
Tube plug	D5.5x7.5x25	BZZ000021	For closing a tube when leakage occurs due to tube corrosion. 2 plugs are required for a tube.

＊1 Spring washer is attached. ＊2 A set of zinc plate (2 pcs) is required for channel "A".

FPD model

Water-Cooled Shell and Tube type Middle-sized Oil Cooler
Floating Tube Sheet type
Heat exchange amount: ~ 289.5kW

Middle-sized Basic Oil Cooler



Water-cooled type cooler

Characteristics

- φ12.7 Low Fin Tube enables high cooling performance and compact design
- Low-priced model with high cooling performance
- High flexibility of installation by selectable flow direction and adjustable U-bolt stand
- Cleaning and replacement of tube bundle are available with floating tube sheet type

SPECIFICATION

		Shell side		Tube side
Max working pressure MPa		1.0		1.0
Max working temperature ℃		90		60
Pass structure		1 pass		2 passes
Fluid type	Standard	Mineral oil		Fresh water
	G	Water glycol fluid		
		Fatty ester fluid		
	F	Phosphate ester fluid		
	W	G+F		

Shell size code		5□□-B	5□□-C	6□□-C
Cooling tube type		φ12.7 Low Fin Tube ☆		
Main material	Cooling tube	Phosphorous-deoxidized copper		
	Tube plate	SS		
	Body	SGP、SS		
	Channel	FC		
Coating	Outside coating	Aqua blue		
	Inside of channel	Tar-free epoxy coating		

☆ TAISEI original high performance cooling tube has larger number of fin thread per inch than general φ12.7 low fin tube.

MODEL CODE

〈Model code example〉

G – FPD – 518 – 2 – B

Code	Fluid type (Shell side)
Blank	Mineral oil
G	Water-glycol fluid
	Fatty ester fluid
F	Phosphate ester fluid
W	G+F

Code	Heat transfer area	Shell size
518	9㎡	φ216.3 (200A)
522	11㎡	
526	13㎡	
531	15.5㎡	
535	17.5㎡	
540	20㎡	
544	22㎡	
549	24.5㎡	
554	27㎡	
634	17㎡	φ267.4 (250A)
644	22㎡	
652	26㎡	
658	29㎡	
666	33㎡	

Code	Flow rate*1
0	Large
1	Medium
2	Small

Code	Connection type*2	
B	Shell side	Flange
	Tube side	Rc threaded
C	Shell side	Flange
	Tube side	Flange

＊1 "Flow rate" is for optimization of flow velocity by adjusting the number of baffle plate depend on flow amount variation. ＊2 Only for FPD-5 □□ . Flange pipe connection only for FPD-6 □□ .

PERFORMANCE GRAPH

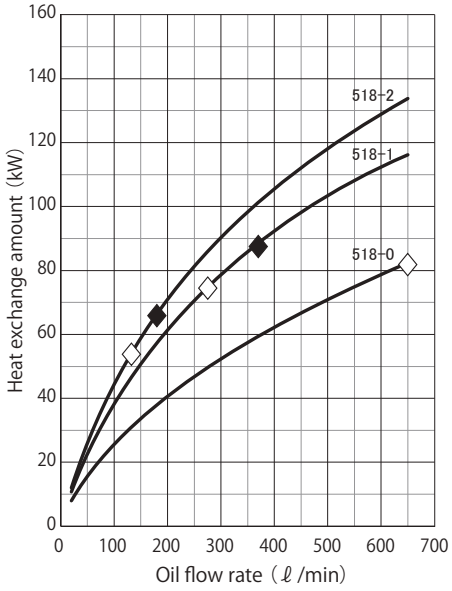
■ Condition

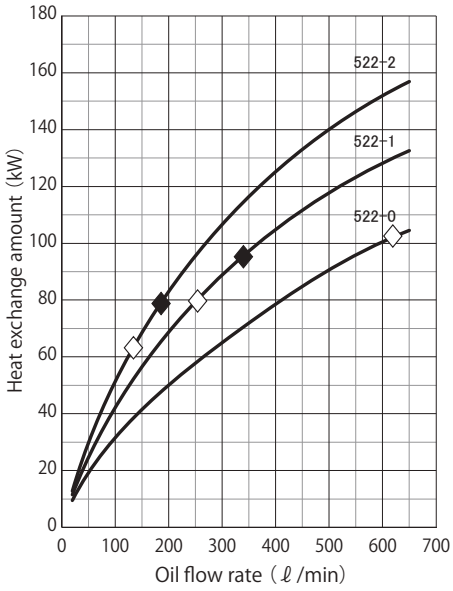
Fluid type		Corresponding to ISO VG46	Pressure drop	Shell side MPa	◇: ≦ 0.03 ◆ : 0.05
Inlet temperature	Shell side ℃	55			
	Tube side ℃	30		Tube side MPa	0.01 - 0.03
Flow rate at tube side		Max allowable flow rate	Scale coefficient at tube side	m²℃/W	0

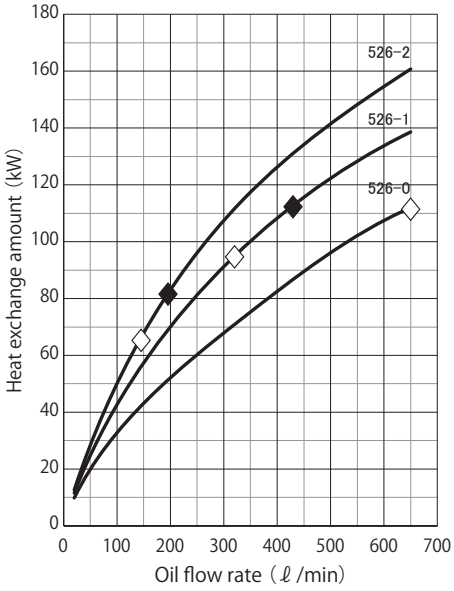
■ Allowable flow rate

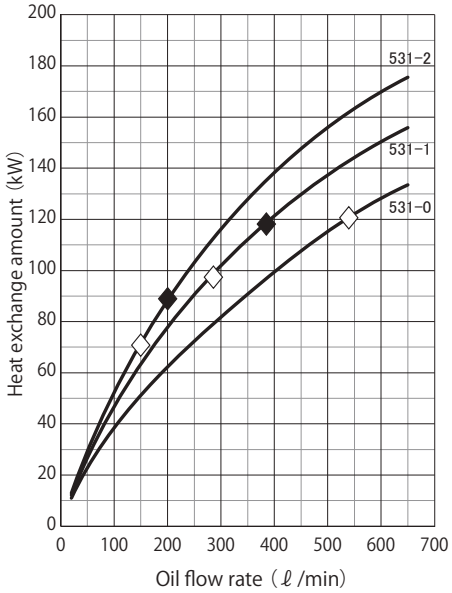
Model code	FPD-5□□	FPD-6□□
Shell side ℓ/min	150～650	150～800
Tube side ℓ/min	85～360	120～590

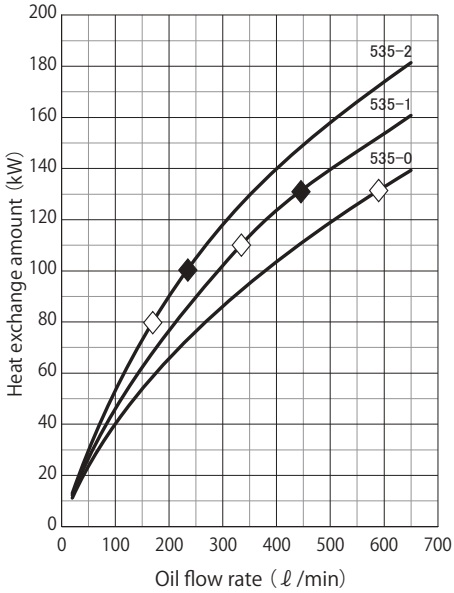
★ It is max value and It depends on each working condition.

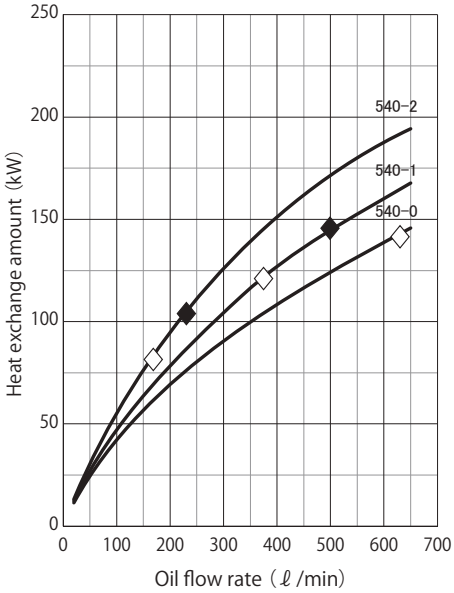


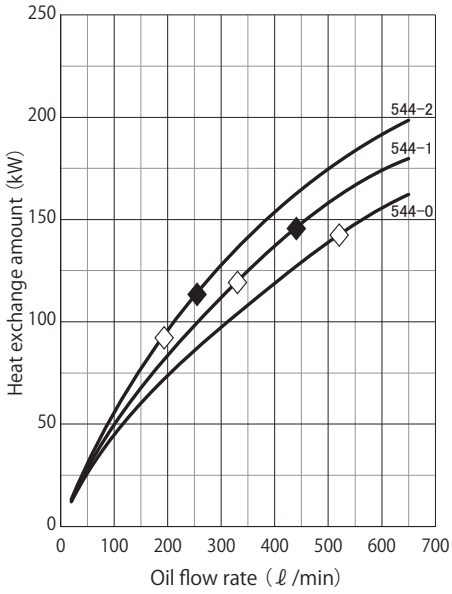


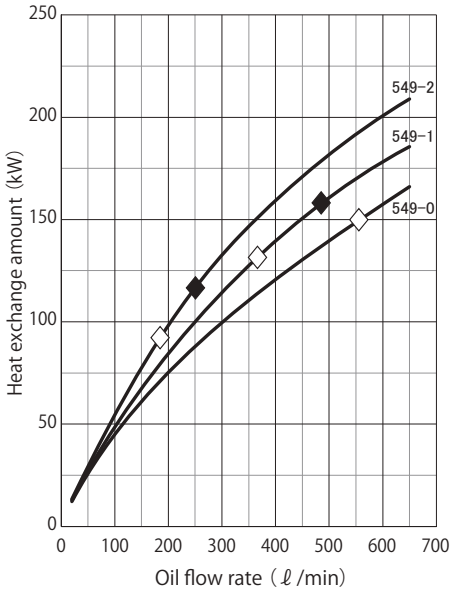


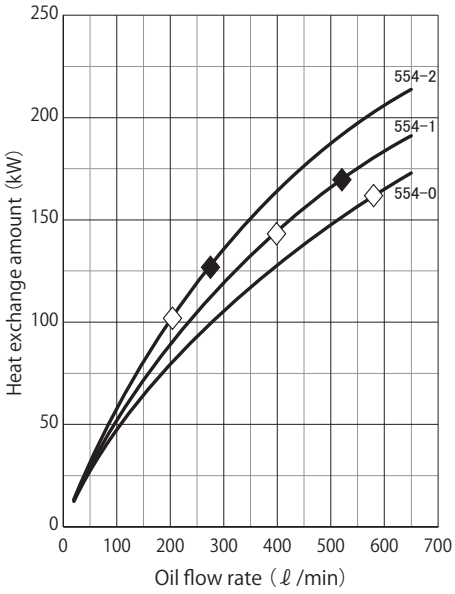












FPD

PERFORMANCE GRAPH

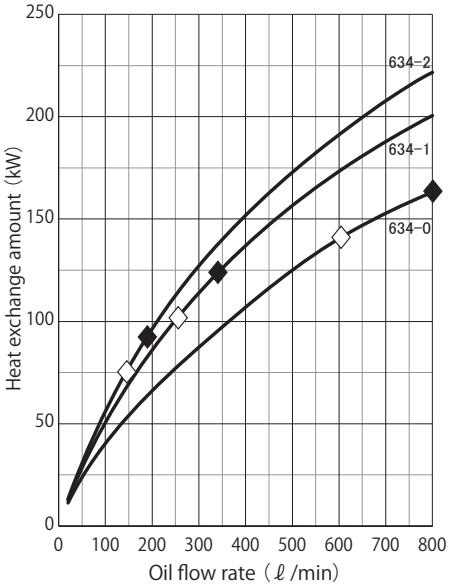
■ Condition

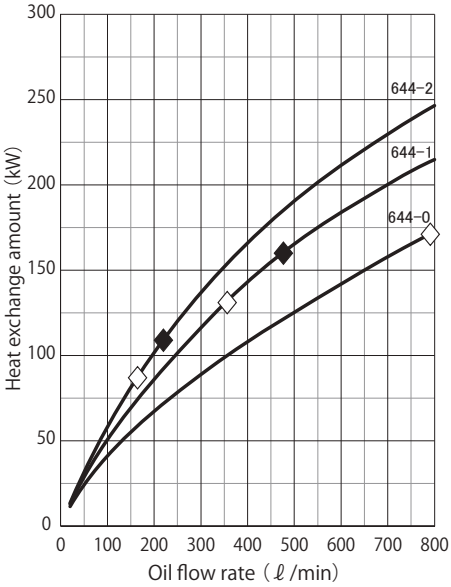
Fluid type		Corresponding to ISO VG46	Pressure drop	Shell side MPa	◇: ≦ 0.03 ◆ : 0.05
Inlet temperature	Shell side ℃	55			
	Tube side ℃	30		Tube side MPa	0.01 - 0.03
Flow rate at tube side		Max allowable flow rate	Scale coefficient at tube side		㎡℃/W 0

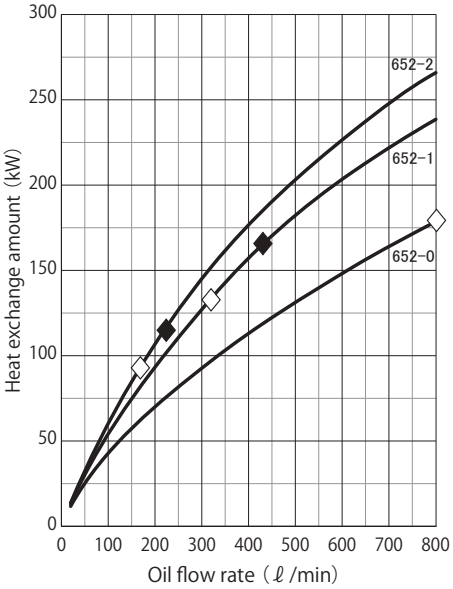
■ Allowable flow rate

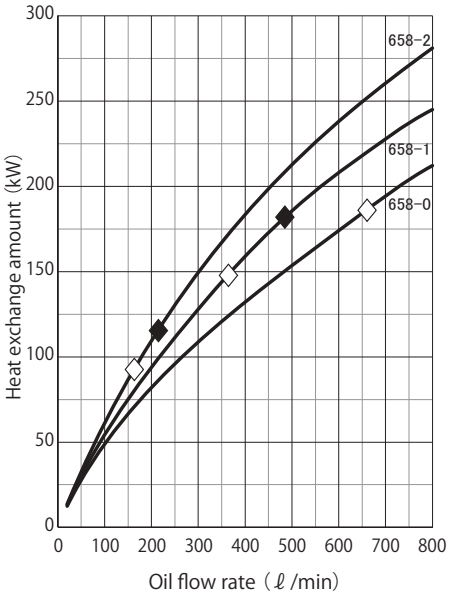
Model code	FPD-5□□	FPD-6□□
Shell side ℓ/min	150～650	150～800
Tube side ℓ/min	85～360	120～590

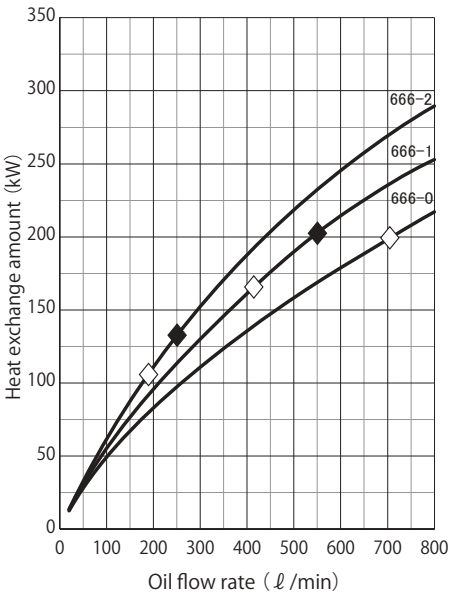
★ It is max value and It depends on each working condition.





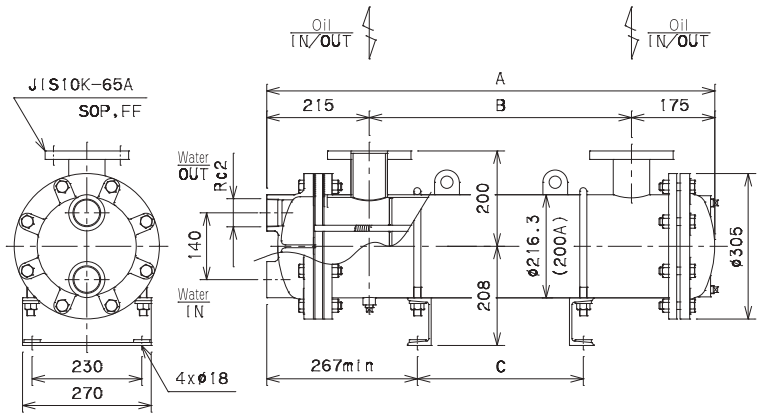






FPD-5□□-□-B

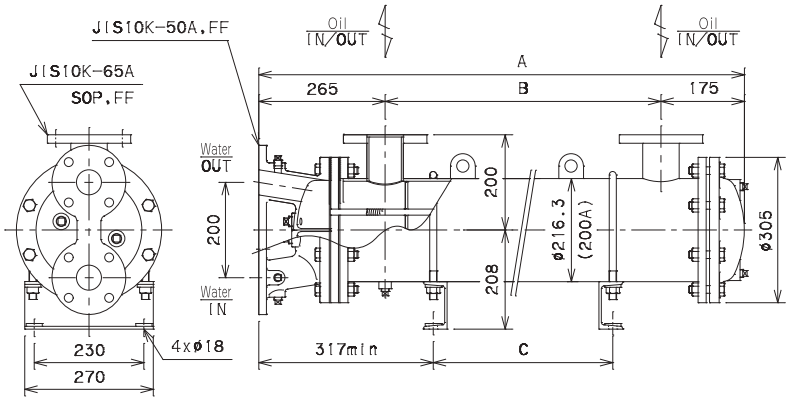
Unit : mm



Model code	Length			Weight (kg)
	A	B	C	
FPD-518-□-B	867	477	60～370	111
FPD-522-□-B	1017	627	60～520	121
FPD-526-□-B	1167	777	60～670	132
FPD-531-□-B	1337	947	60～840	144
FPD-535-□-B	1497	1107	60～1000	156
FPD-540-□-B	1657	1267	60～1160	173
FPD-544-□-B	1827	1437	60～1330	185
FPD-549-□-B	2007	1617	60～1510	198
FPD-554-□-B	2117	1787	60～1680	209

★Stand position is adjustable.

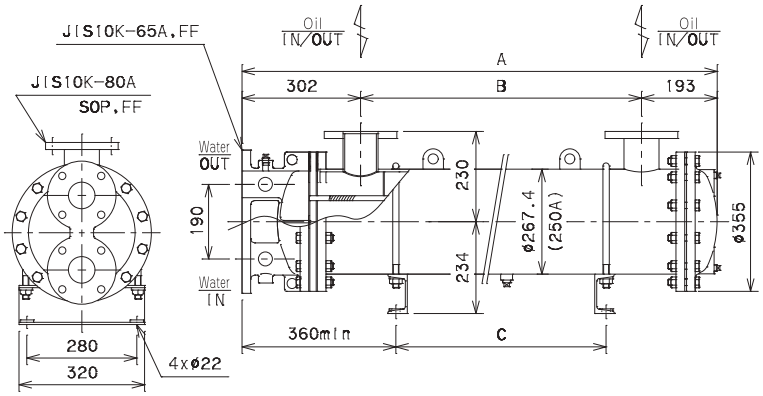
FPD-5□□-□-C



Model code	Length			Weight (kg)
	A	B	C	
FPD-518-□-C	917	477	60～370	116
FPD-522-□-C	1067	627	60～520	126
FPD-526-□-C	1217	777	60～670	137
FPD-531-□-C	1387	947	60～840	149
FPD-535-□-C	1547	1107	60～1000	161
FPD-540-□-C	1707	1267	60～1160	178
FPD-544-□-C	1877	1437	60～1330	190
FPD-549-□-C	2057	1617	60～1510	203
FPD-554-□-C	2227	1787	60～1680	214

★Stand position is adjustable.

FPD-6□□-□-C

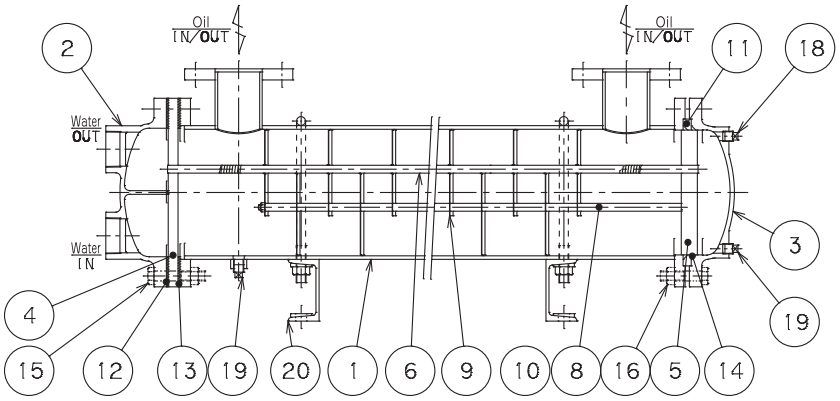


Model code	Length			Weight (kg)
	A	B	C	
FPD-634-□-C	1091	596	60～480	194
FPD-644-□-C	1327	832	60～715	221
FPD-652-□-C	1497	1002	60～885	241
FPD-658-□-C	1657	1162	60～1045	260
FPD-666-□-C	1827	1332	60～1215	280

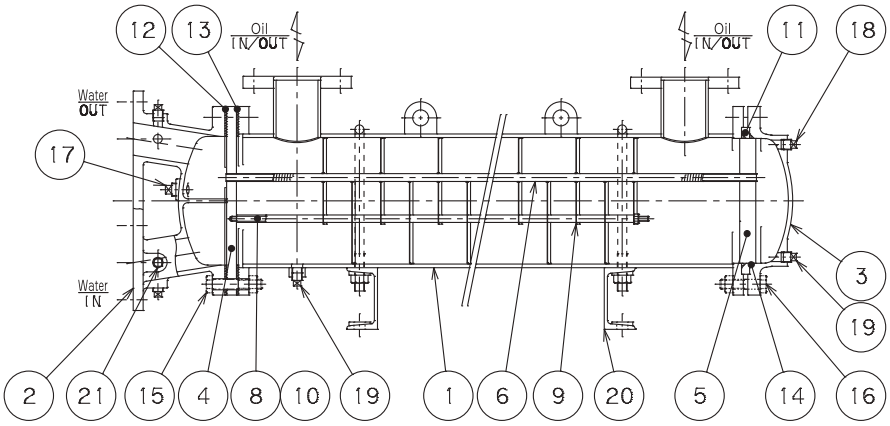
★Stand position is adjustable.

CROSS SECTION

FPD-5□□-□-B



FPD-5□□-□-C、FPD-6□□-□-C



PARTS LIST

No.	Item	Qty
1	Body	1
2	Channel "A"	1
3	Channel "B"	1
4	Tube plate "A"	1
5	Tube plate "B"	1
6	Fin tube	n*
—	———	—
8	Distance pipe	n*
9	Baffle plate	n*
10	Rod	4
11	Ring	1
12	Packing	1
13	Packing	1
14	O-ring	2
15	Bolt・Nut	n*
16	Bolt・Nut	n*
17	Plug (Only for 5□□−C)	2
18	Air vent plug	1
19	Drain plug	2
20	Stand	2
21	Plug (Only for 5□□−C)	6

n*：The number of part depends on model.

SEALING PARTS LIST

No.	12	13	14	Sealing parts set	
Item・Standard*1 / Model code	Special packing non asbestos		JIS B2401 1A		No.：12～14
				Material	Code of sealing parts set (Item code)
FPD-5□□	t3xφ305/φ208, W6 (with partition)	t3xφ305/φ208	G200	NBR	SA-FPD-500 (SSC000022)
				FKM	SA-F/W-FPD-500 (SSC000025)
FPD-6□□	t3xφ355/φ258, W6 (with partition)	t3xφ355/φ258	G250	NBR	SA-FPD-600 (SSC000023)
				FKM	SA-F/W-FPD-600 (SSC000026)

Upper side：Code or Size　Under side：(Item code)

MAINTENANCE TOOL LIST

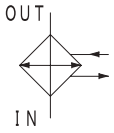
Item	Size (mm)	Item code	Remarks
Tube brush	D9x1820	KZZ000002	For periodic cleaning of tube to prevent scale.
Tube plug	D9.5x11.5x25	BZZ000023	For closing a tube when leakage occurs due to tube corrosion. 2 plugs are required for a tube.

＊1　Standard material of sealing part is NBR, but other material is selectable depending on fluid type.

FTC FTCB model

Water-Cooled Shell and Tube type Middle-sized Oil Cooler Floating Tube Sheet type Heat exchange amount: ~ 396.9kW

Middle-sized Advanced Oil Cooler



Water-cooled type cooler

Characteristics

- φ12.7 Low Fin Tube enables high cooling performance and compact design
- FTC model: For fresh water (general industrial machine and other uses)
- FTCB model: For seawater (marine machine and component)
- Air vent valve and mounting port for thermometer are included in standard model
- High flexibility of installation by selectable flow direction and adjustable U-bolt stand

FTC/FTCB

SPECIFICATION

	Shell side		Tube side	
Max working pressure MPa	1.0		1.0	
Max working temperature ℃	90		60	
Pass structure	1 pass		2 pass	
Fluid type	Standard	Mineral oil	FTC	Fresh water
	G	Water glycol fluid		
		Fatty ester fluid		
	F	Phosphate ester fluid	FTCB	Sea water
	W	G+F		

☆ TAISEI original high performance cooling tube has larger number of fin thread per inch than general φ12.7 low fin tube.

Shell size code			FTC、FTCB to all sizes
Cooling tube type			φ12.7 Low Fin Tube ☆
Main material	Cooling tube	FTC	Phosphorous-deoxidized copper
		FTCB	Aluminum brass
	Tube plate	FTC	SS
		FTCB	Naval brass
	Body		SGP、SS
	Channel		FC
Coating	Outside coating	FTC	Aqua blue
		FTCB	Light bluish green (10B7/6)
	Inside of channel		Tar-free epoxy coating
Other	Bar thermometer (Option)		0～100℃ I type、L type

MODEL CODE

〈Model code example〉

F – **FTCB** – **7** – **20** **07** **F**

Code	Fluid type (Shell side)
Blank	Mineral oil
G	Water-glycol fluid
	Fatty ester fluid
F	Phosphate ester fluid
W	G+F

Code	Cooling water type
FTC	Fresh water
FTCB	Sea water

Code	Heat transfer area	Shell size
6-15	6㎡	φ165.2 (150A)
7-15	7㎡	
8-15	8㎡	
9-15	9㎡	
10-15	10㎡	
11-15	11㎡	
7-20	7㎡	φ216.3 (200A)
9-20	9㎡	
10-20	10㎡	
12-20	12㎡	
14-20	14㎡	
16-20	16㎡	
18-20	18㎡	
20-20	20㎡	
22-20	22㎡	

Code	Heat transfer area	Shell size
18-25	18㎡	φ267.4 (250A)
21-25	21㎡	
24-25	24㎡	
27-25	27㎡	
30-25	30㎡	
34-25	34㎡	
37-25	37㎡	
41-25	41㎡	
44-25	44㎡	
31-30	31㎡	φ318.5 (300A)
35-30	35㎡	
40-30	40㎡	
44-30	44㎡	
49-30	49㎡	
54-30	54㎡	
61-30	61㎡	
66-30	66㎡	
71-30	71㎡	

Code	Baffle plate*1
03	3 sheets
05	5 sheets
07	7 sheets
09	9 sheets
11	11 sheets
**	** sheets

Code	Connection type	
P	Shell side	Rc threaded
	Tube side	Rc threaded
F	Shell side	Flange
	Tube side	Rc threaded

＊1 "Baffle plate" : We select appropriate number of baffle plate according to customer's working condition.

PERFORMANCE GRAPH

■ Condition

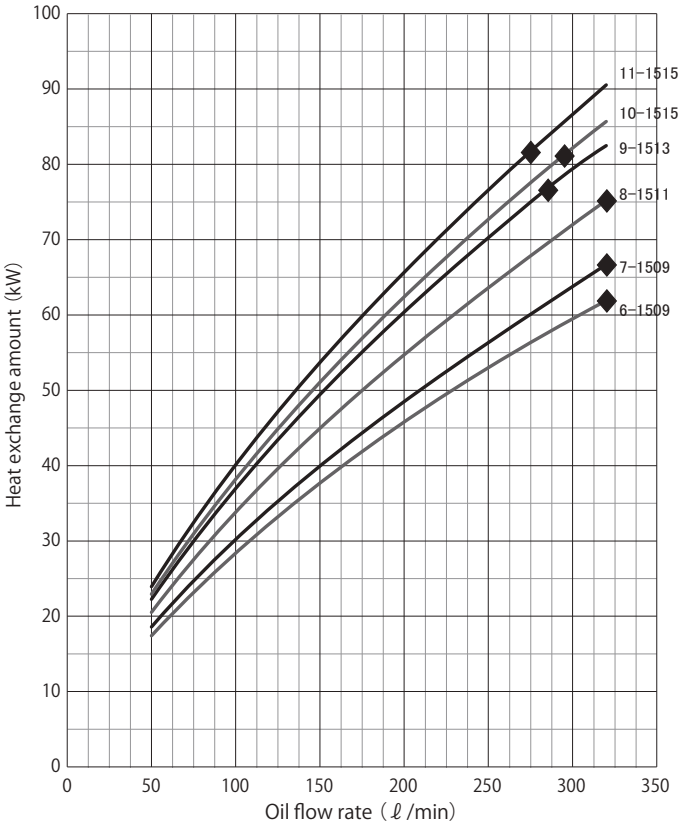
Fluid type		Corresponding to ISO VG46	Pressure drop	Shell side MPa	◆: ≦ 0.05 △ : 0.1
Inlet temperature	Shell side ℃	55			
	Tube side ℃	30		Tube side MPa	0.01 - 0.03
Flow rate at cold side		Max allowable flow rate	Scale coefficient at tube side	㎡℃/W	0

■ Allowable flow rate

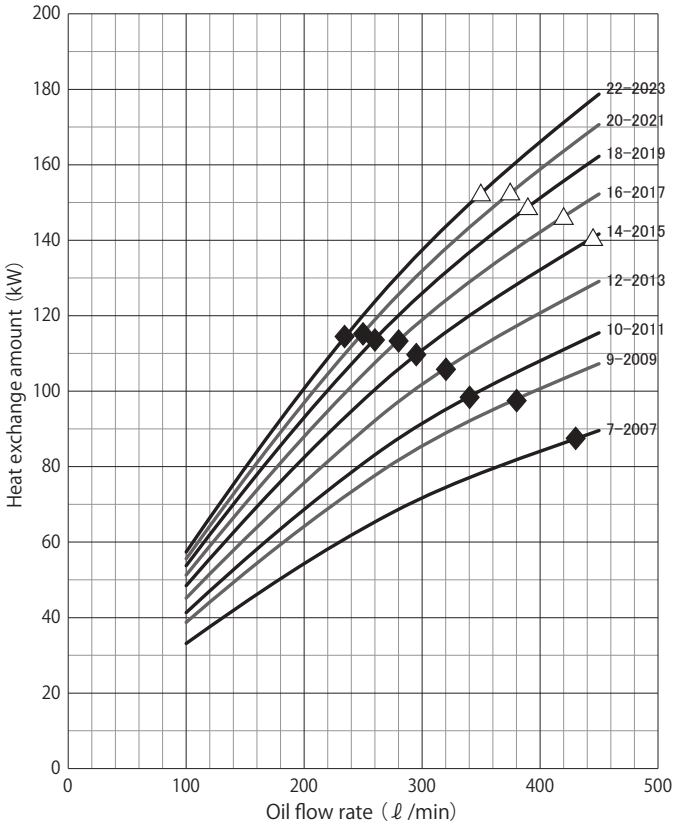
Model code	FTC(B)-15□□	FTC(B)-20□□	FTC(B)-25□□	FTC(B)-30□□
Shell side ℓ/min	50～320	100～450	150～650	200～800
Tube side ℓ/min	50～200	80～360	120～600	160～900

★ It is max value and It depends on each working condition.

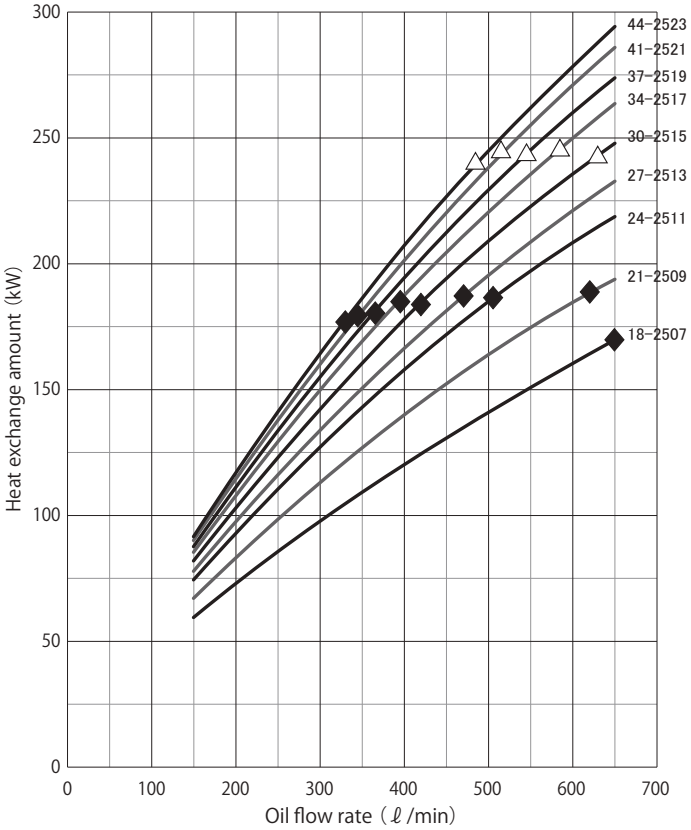
FTC(B)-15 □□



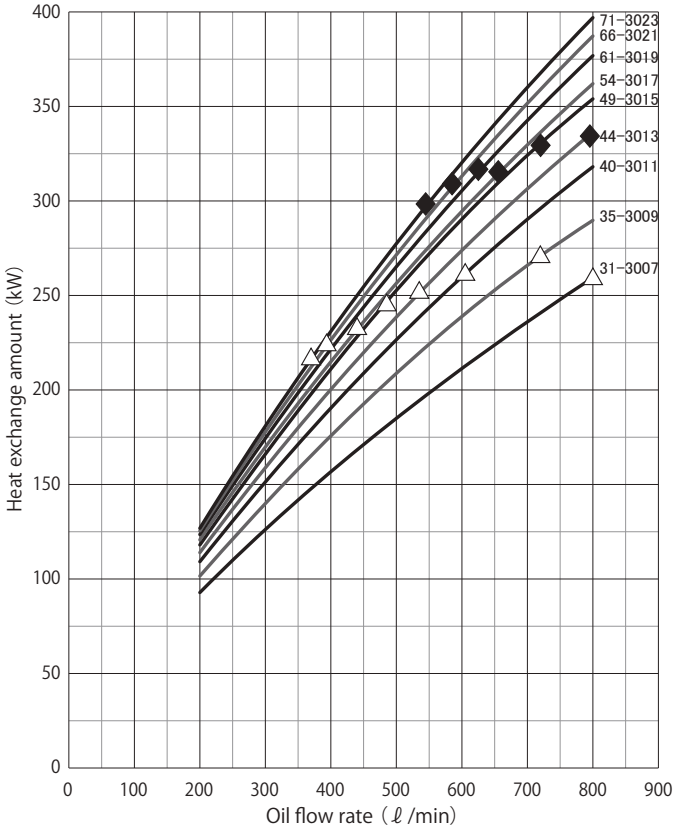
FTC(B)-20 □□



FTC(B)-25 □□

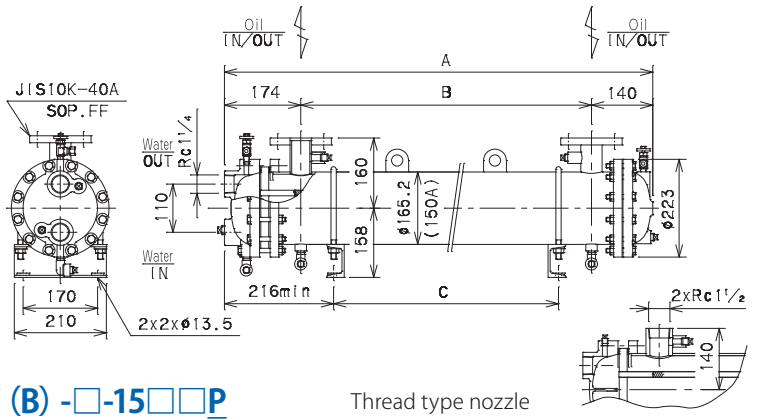


FTC(B)-30 □□



FTC (B) -□-15□□F

Unit : mm

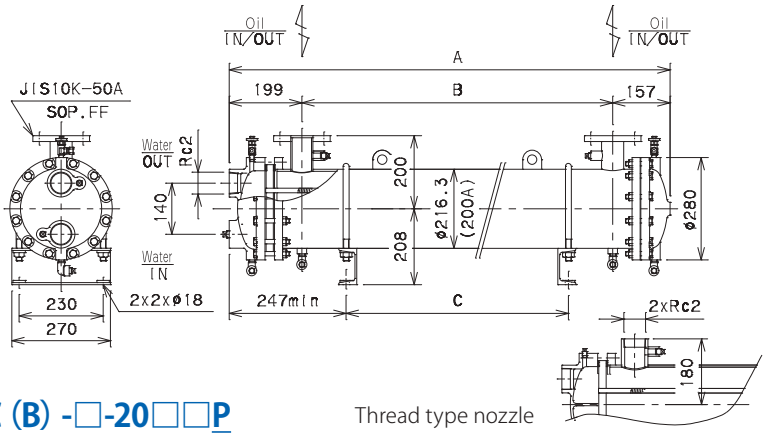


Model code	Length			Weight (kg)	
	A	B	C		FTCB
FTC(B)-6-15□□	1229	915	50～830	85	88
FTC(B)-7-15□□	1313	999	50～915	90	93
FTC(B)-8-15□□	1473	1159	50～1075	96	99
FTC(B)-9-15□□	1633	1319	50～1235	105	108
FTC(B)-10-15□□	1803	1489	50～1405	110	113
FTC(B)-11-15□□	1983	1669	50～1585	118	121

FTC (B) -□-15□□P

Thread type nozzle

FTC (B) -□-20□□F

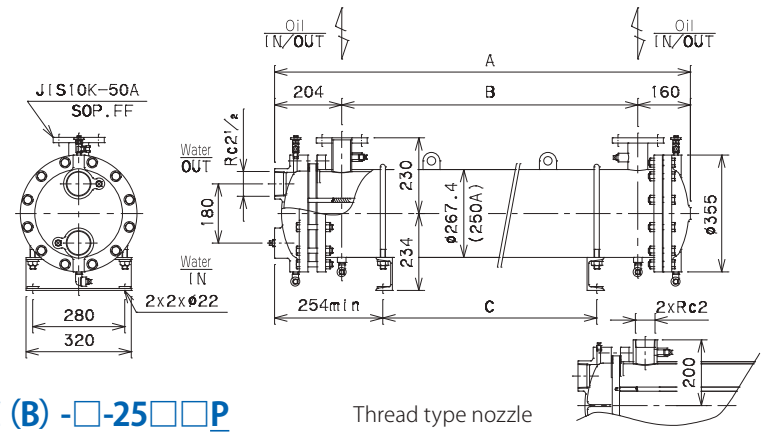


Model code	Length			Weight (kg)	
	A	B	C		FTCB
FTC(B)-7-20□□	873	517	60～420	118	123
FTC(B)-9-20□□	1023	667	60～570	129	134
FTC(B)-10-20□□	1173	817	60～720	140	145
FTC(B)-12-20□□	1343	987	60～890	152	157
FTC(B)-14-20□□	1503	1147	60～1050	164	169
FTC(B)-16-20□□	1663	1307	60～1210	175	180
FTC(B)-18-20□□	1833	1477	60～1380	188	193
FTC(B)-20-20□□	2013	1657	60～1560	200	205
FTC(B)-22-20□□	2183	1827	60～1730	213	218

FTC (B) -□-20□□P

Thread type nozzle

FTC (B) -□-25□□F

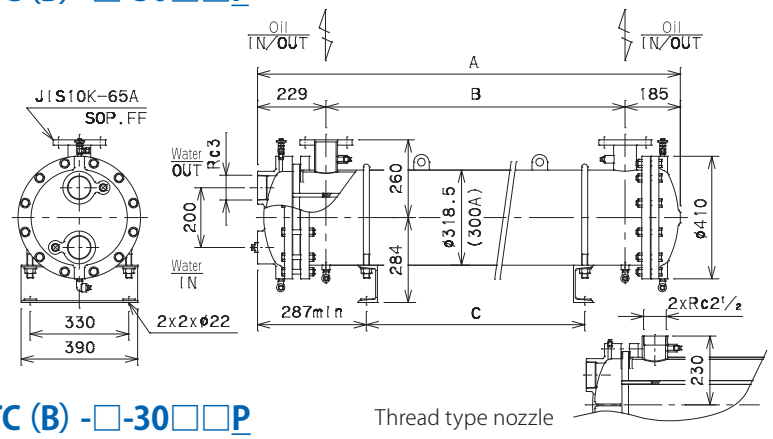


Model code	Length			Weight (kg)	
	A	B	C		FTCB
FTC(B)-18-25□□	1264	900	60～800	223	229
FTC(B)-21-25□□	1434	1070	60～970	242	248
FTC(B)-24-25□□	1594	1230	60～1130	260	266
FTC(B)-27-25□□	1764	1400	60～1300	279	285
FTC(B)-30-25□□	1934	1570	60～1470	297	303
FTC(B)-34-25□□	2154	1790	60～1690	322	328
FTC(B)-37-25□□	2324	1960	60～1860	340	346
FTC(B)-41-25□□	2544	2180	60～2080	366	372
FTC(B)-44-25□□	2714	2350	60～2250	384	390

FTC (B) -□-25□□P

Thread type nozzle

FTC (B) -□-30□□F



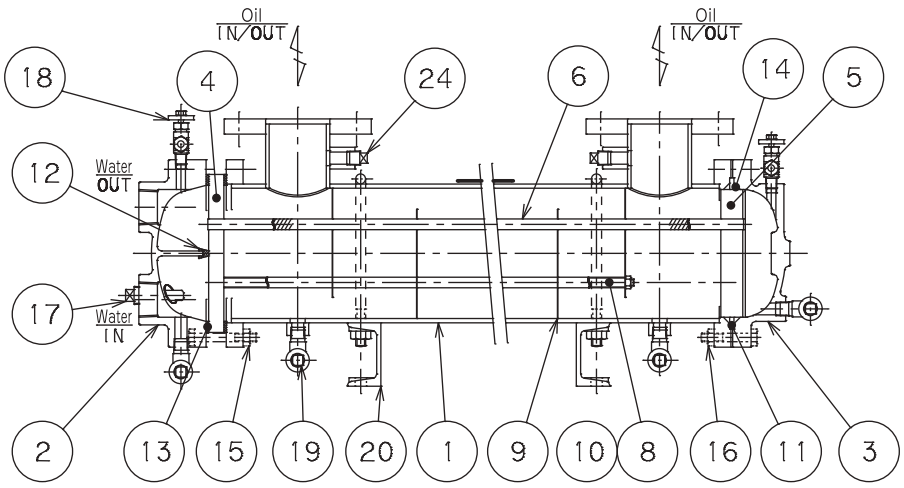
Model code	Length			Weight (kg)	
	A	B	C		FTCB
FTC(B)-31-30□□	1378	964	75～845	340	349
FTC(B)-35-30□□	1538	1124	75～1005	380	389
FTC(B)-40-30□□	1698	1284	75～1165	390	399
FTC(B)-44-30□□	1868	1454	75～1335	426	435
FTC(B)-49-30□□	2048	1634	75～1515	450	459
FTC(B)-54-30□□	2218	1804	75～1685	470	479
FTC(B)-61-30□□	2454	2040	75～1920	505	514
FTC(B)-66-30□□	2634	2220	75～2100	535	544
FTC(B)-71-30□□	2814	2400	75～2280	565	574

FTC (B) -□-30□□P

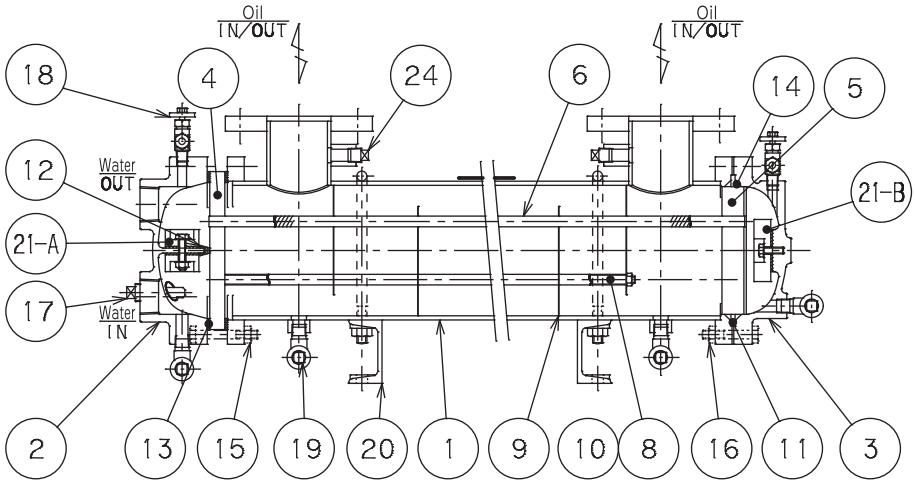
Thread type nozzle

CROSS SECTION

FTC-□-15□□F～FTC-□-30□□F



FTCB-□-15□□F～FTCB-□-30□□F



PARTS LIST

No.	Item	Qty
1	Body	1
2	Channel "A"	1
3	Channel "B"	1
4	Tube plate "A"	1
5	Tube plate "B"	1
6	Fin tube	n*
—	— — —	—
8	Distance pipe	n*
9	Baffle plate	n*
10	Rod	4
11	Ring	1
12	Packing	1
13	Packing	2
14	O-ring	2
15	Bolt・Nut	12
16	Bolt・Nut	12
17	Zinc plug	2
18	Air vent valve	2
19	Drain plug	n*
20	Stand	2
21	Zinc plate (Only for FTCB)	n*
—	— — —	—
—	— — —	—
24	Plug	2

n*：The number of part depends on model.

SEALING PARTS & ANTICORROSIVE PARTS LIST

No.	12	13	14	Sealing parts set		17	21-A [Only FTCB]		21-B [Only FTCB]	
				No.：12～14		Zinc plug	Zinc plate set (with packing)		Zinc plate set (with packing)	
Item・Standard*1 / Model code	U-shaped packing NBR	Special packing non asbestos	JIS B2401 1A	Material	Code of sealing parts set (Item code)	Size (Item code)	Size (Item code)	Qty	Size (Item code)	Qty
FTC(B)-□-15□□	12x12x162	t3xφ188/φ162	G150	NBR	SA-FTC-150A (SSC000028)	R 1/2 (7Z3040000)	t20x40x100 (B61000118)	1set/pc*2	t20x74x74 (B61000119)	1set/pc
				FKM	SA-F/W-FTC-150A (SSC000038)					
FTC(B)-□-20□□	12x12x208	t3xφ241/φ208	G200	NBR	SA-FTC-200A (SSC000030)		t30x50x150 (B61000120)	1set/pc*2	t30x100x100 (B61000122)	1set/pc
				FKM	SA-F/W-FTC-200A (SSC000040)					
FTC(B)-□-25□□	12x12x258	t3xφ302/φ258	G250	NBR	SA-FTC-250A (SSC000031)		t30x50x200 (B61000121)	1set/pc*2	t30x120x120 (B61000123)	1set/pc
				FKM	SA-F/W-FTC-250A (SSC000041)					
FTC(B)-□-30□□	12x12x308	t3xφ357/φ308	G300	NBR	SA-FTC-300A (SSC000032)	R1 (7Z3060000)	t30x60x200 (B61000125)	1set/pc*2	t30x150x150 (B61000124)	1set/pc
				FKM	SA-F/W-FTC-300A (SSC000042)					

＊Zinc plug and zinc plate are not included in sealing parts set.

MAINTENANCE TOOL LIST

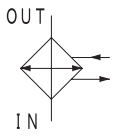
Item	Size (mm)	Item code	Remarks
Tube brush	D9x1820	KZZ000002	For periodic cleaning of tube to prevent scale.
Tube plug	D9.5x11.5x25	BZZ000023	For closing a tube when leakage occurs due to tube corrosion. 2 plugs are required for a tube.

＊1 Standard material of sealing part is NBR, but other material is selectable depending on fluid type. ＊2 A set of zinc plate (2 pcs) is required for channel "A".

FTS FTSB model

Water-Cooled Shell and Tube type Middle-sized Oil Cooler Floating Tube Sheet type Heat exchange amount: ~ 349.4kW

Oil Cooler for small cooling water quantity (4-pass type of FTC)



Water-cooled type cooler

Characteristics

- φ12.7 Low Fin Tube enables high cooling performance and compact design
- FTS model: For fresh water (general industrial machine and other uses)
- FTSB model: For seawater (marine machine and component)
- Air vent valve and mounting port for thermometer are included in standard model
- High flexibility of installation by selectable flow direction and adjustable U-bolt stand

FTS/FTSB

SPECIFICATION

	Shell side		Tube side	
Max working pressure MPa	1.0		1.0	
Max working temperature ℃	90		60	
Pass structure	1 pass		4 pass	
Fluid type	Standard	Mineral oil	FTS	Fresh water
	G	Water glycol fluid		
		Fatty ester fluid		
	F	Phosphate ester fluid	FTSB	Sea water
	W	G+F		

☆ TAISEI original high performance cooling tube has larger number of fin thread per inch than general φ12.7 low fin tube.

Shell size code			FTS、FTSB to all sizes
Cooling tube type			φ12.7 Low Fin Tube ☆
Main material	Cooling tube	FTS	Phosphorous-deoxidized copper
		FTSB	Aluminum brass
	Tube plate	FTS	SS
		FTSB	Naval brass
	Body		SGP、SS
	Channel		FC
Coating	Outside coating	FTS	Aqua blue
		FTSB	Light bluish green (10B7/6)
	Inside of channel		Tar-free epoxy coating
Other	Bar thermometer (Option)		0～100℃ I type、L type

MODEL CODE

〈Model code example〉

F – **FTS** – **7** – **20** **07** **F**

Code	Fluid type (Shell side)
Blank	Mineral oil
G	Water-glycol fluid
	Fatty ester fluid
F	Phosphate ester fluid
W	G+F

Code	Cooling water type
FTS	Fresh water
FTSB	Sea water

Code	Heat transfer area	Shell size
6-15	6㎡	φ165.2 (150A)
7-15	7㎡	
8-15	8㎡	
9-15	9㎡	
10-15	10㎡	
11-15	11㎡	
7-20	7㎡	φ216.3 (200A)
9-20	9㎡	
10-20	10㎡	
12-20	12㎡	
14-20	14㎡	
16-20	16㎡	
18-20	18㎡	
20-20	20㎡	
22-20	22㎡	

Code	Heat transfer area	Shell size
18-25	18㎡	φ267.4 (250A)
21-25	21㎡	
24-25	24㎡	
27-25	27㎡	
30-25	30㎡	
34-25	34㎡	
37-25	37㎡	
41-25	41㎡	
44-25	44㎡	
31-30	31㎡	φ318.5 (300A)
35-30	35㎡	
40-30	40㎡	
44-30	44㎡	
49-30	49㎡	
54-30	54㎡	
61-30	61㎡	
66-30	66㎡	
71-30	71㎡	

Code	Baffle plate*1
03	3 sheets
05	5 sheets
07	7 sheets
09	9 sheets
11	11 sheets
**	** sheets

Code	Connection type	
P	Shell side	Rc threaded
	Tube side	Rc threaded
F	Shell side	Flange
	Tube side	Rc threaded

＊1 "Baffle plate" : We select appropriate number of baffle plate according to customer's working condition.

PERFORMANCE GRAPH

■ Condition

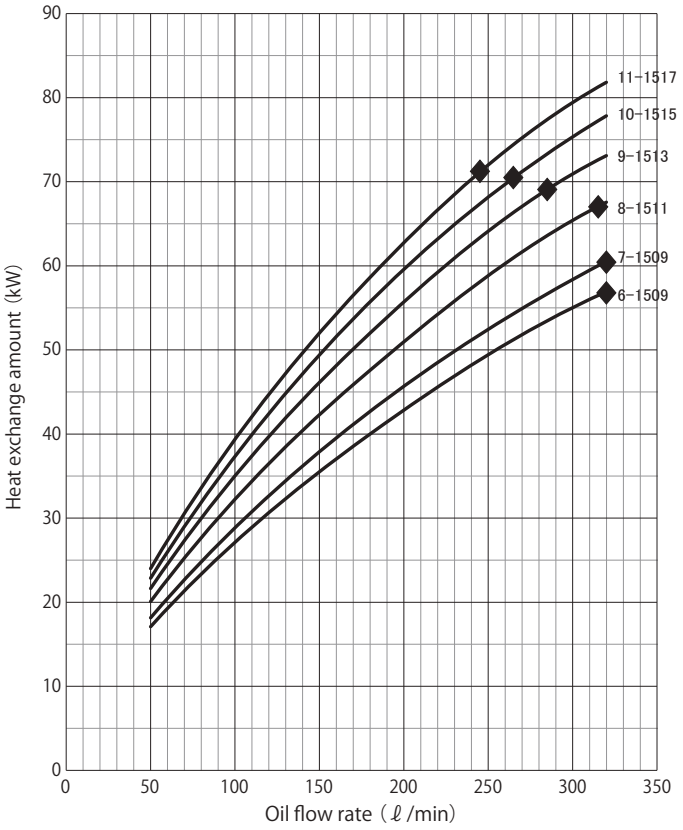
Fluid type		Corresponding to ISO VG46	Pressure drop	Shell side MPa	◆ : ≦ 0.05 △ : 0.1
Inlet temperature	Shell side ℃	55			
	Tube side ℃	30		Tube side MPa	0.01 - 0.03
Flow rate at cold side		Max allowable flow rate	Scale coefficient at tube side	㎡℃/W	0

■ Allowable flow rate

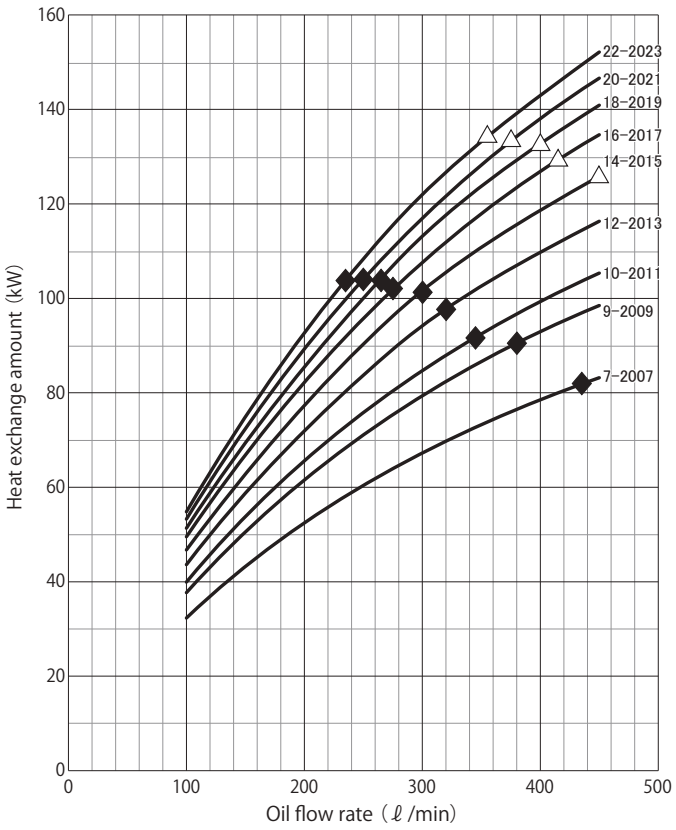
Model code	FTS(B)-15□□	FTS(B)-20□□	FTS(B)-25□□	FTS(B)-30□□
Shell side ℓ/min	50～320	100～450	150～650	200～800
Tube side ℓ/min	30～100	60～180	80～300	100～450

★ It is max value and It depends on each working condition.

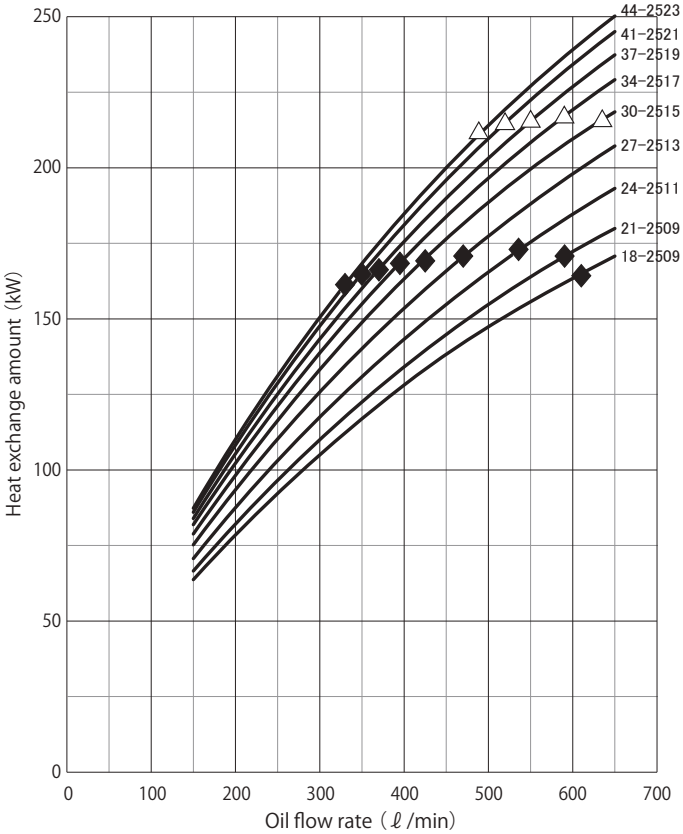
FTS(B)-15 □□



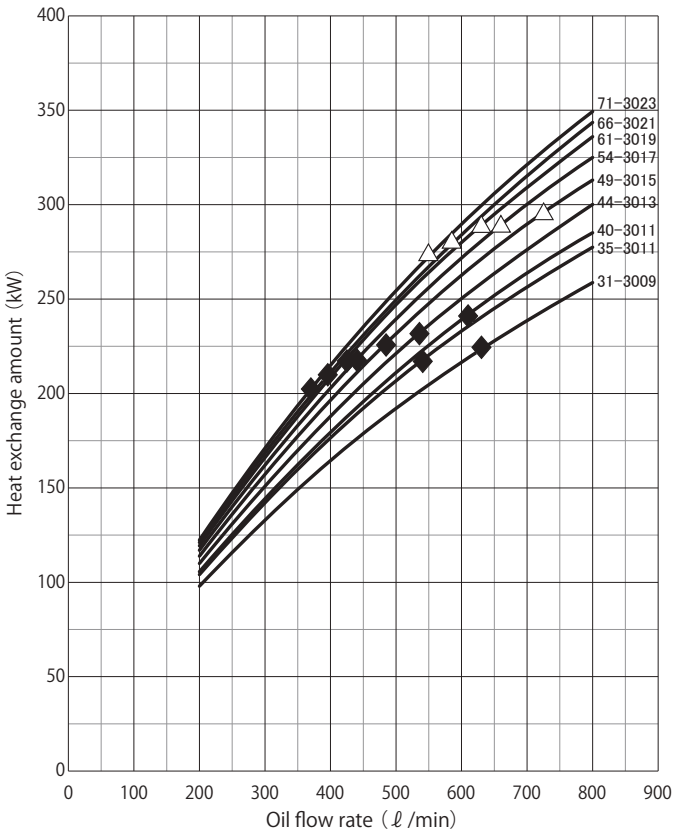
FTS(B)-20 □□



FTS(B)-25 □□

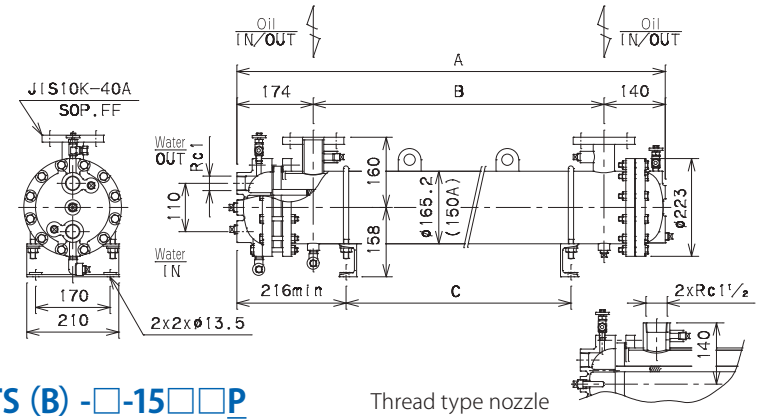


FTS(B)-30 □□



FTS (B) -□-15□□F

Unit : mm

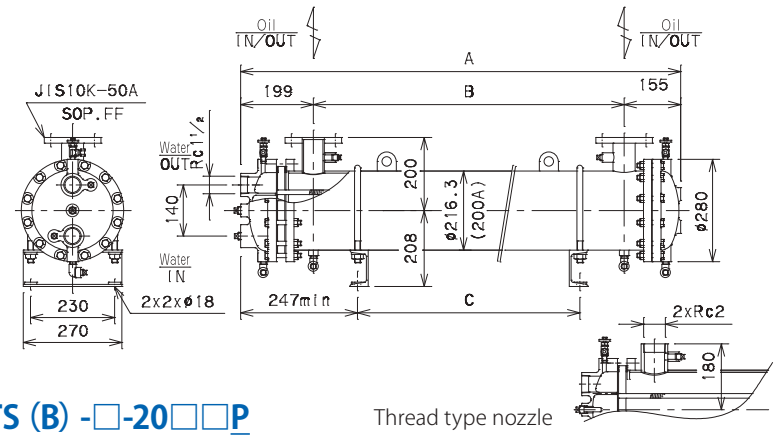


Model code	Length			Weight (kg)	
	A	B	C		FTSB
FTS(B)-6-15□□	1229	915	50～830	85	89
FTS(B)-7-15□□	1313	999	50～915	90	94
FTS(B)-8-15□□	1473	1159	50～1075	96	100
FTS(B)-9-15□□	1633	1319	50～1235	105	109
FTS(B)-10-15□□	1803	1489	50～1405	110	114
FTS(B)-11-15□□	1983	1669	50～1585	118	122

FTS (B) -□-15□□P

Thread type nozzle

FTS (B) -□-20□□F

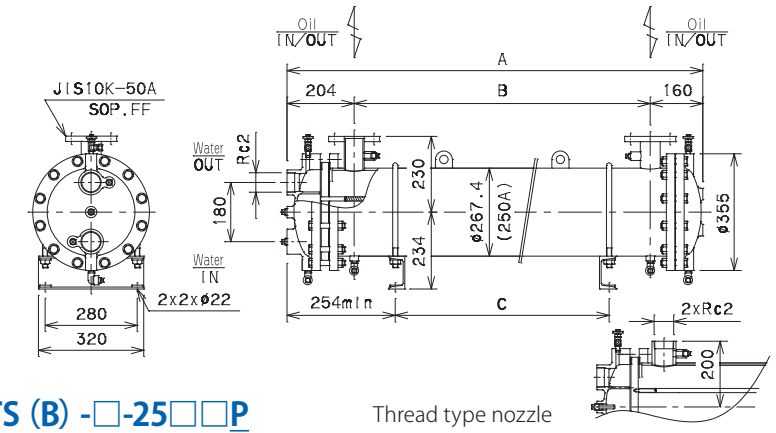


Model code	Length			Weight (kg)	
	A	B	C		FTSB
FTS(B)-7-20□□	871	517	60～420	118	124
FTS(B)-9-20□□	1021	667	60～570	129	135
FTS(B)-10-20□□	1171	817	60～720	140	146
FTS(B)-12-20□□	1341	987	60～890	152	158
FTS(B)-14-20□□	1501	1147	60～1050	164	170
FTS(B)-16-20□□	1661	1307	60～1210	175	181
FTS(B)-18-20□□	1831	1477	60～1380	188	194
FTS(B)-20-20□□	2011	1657	60～1560	200	206
FTS(B)-22-20□□	2181	1827	60～1730	213	219

FTS (B) -□-20□□P

Thread type nozzle

FTS (B) -□-25□□F

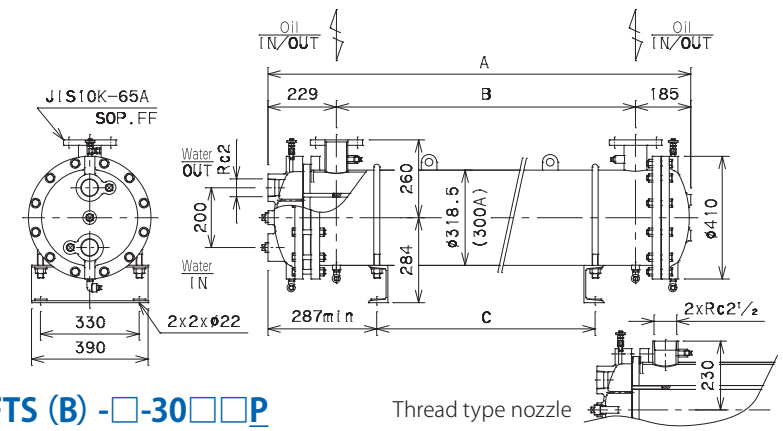


Model code	Length			Weight (kg)	
	A	B	C		FTSB
FTS(B)-18-25□□	1264	900	60～800	223	234
FTS(B)-21-25□□	1434	1070	60～970	242	253
FTS(B)-24-25□□	1594	1230	60～1130	260	271
FTS(B)-27-25□□	1764	1400	60～1300	279	290
FTS(B)-30-25□□	1934	1570	60～1470	297	308
FTS(B)-34-25□□	2154	1790	60～1690	322	333
FTS(B)-37-25□□	2324	1960	60～1860	340	351
FTS(B)-41-25□□	2544	2180	60～2080	366	377
FTS(B)-44-25□□	2714	2350	60～2250	384	395

FTS (B) -□-25□□P

Thread type nozzle

FTS (B) -□-30□□F



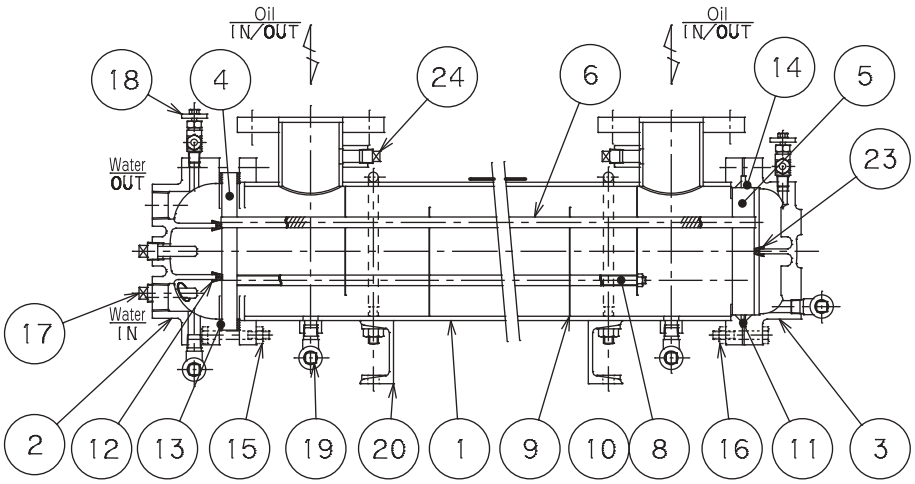
Model code	Length			Weight (kg)	
	A	B	C		FTSB
FTS(B)-31-30□□	1378	964	75～845	340	357
FTS(B)-35-30□□	1538	1124	75～1005	380	397
FTS(B)-40-30□□	1698	1284	75～1165	390	407
FTS(B)-44-30□□	1868	1454	75～1335	426	443
FTS(B)-49-30□□	2048	1634	75～1515	450	467
FTS(B)-54-30□□	2218	1804	75～1685	470	487
FTS(B)-61-30□□	2454	2040	75～1920	505	522
FTS(B)-66-30□□	2634	2220	75～2100	535	552
FTS(B)-71-30□□	2814	2400	75～2280	565	582

FTS (B) -□-30□□P

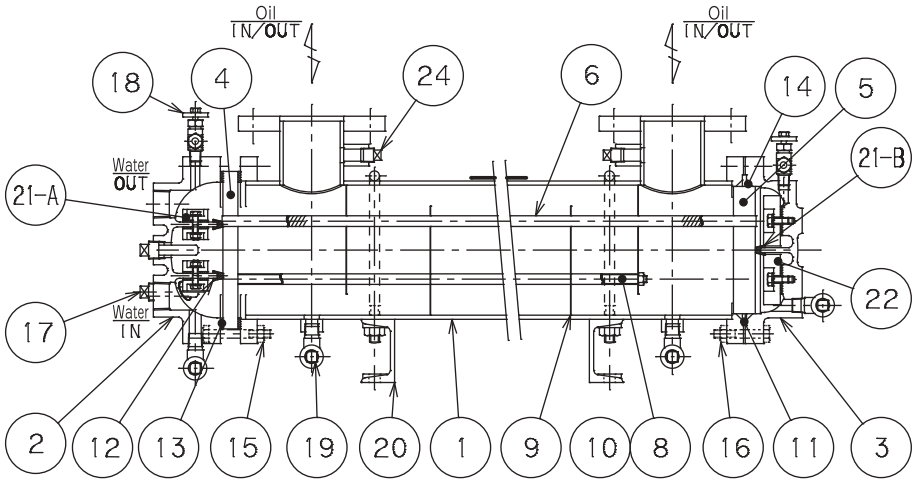
Thread type nozzle

CROSS SECTION

FTS-□-15□□F～FTS-□-30□□F



FTSB-□-15□□F～FTSB-□-30□□F



PARTS LIST

No.	Item	Qty
1	Body	1
2	Channel "A"	1
3	Channel "B"	1
4	Tube plate "A"	1
5	Tube plate "B"	1
6	Fin tube	n*
—	— — —	—
8	Distance pipe	n*
9	Baffle plate	n*
10	Rod	4
11	Ring	1
12	Packing	2
13	Packing	2
14	O-ring	2
15	Bolt・Nut	12
16	Bolt・Nut	12
17	Zinc plug	3
18	Air vent valve	2
19	Drain plug	n*
20	Stand	2
21	Zinc plate (Only for FTSB)	n*
—	— — —	—
23	Packing	1
24	Plug	2

n*：The number of part depends on model.

SEALING PARTS & ANTICORROSIVE PARTS LIST

No.	12	13	14	23	Sealing parts set		17	21-A [Only FTSB]		21-B [Only FTSB]	
					No.：12～14,23		Zinc plug	Zinc plate set (with packing)		Zinc plate set (with packing)	
Item・Standard*1 / Model code	U-shaped packing NBR	Special packing non asbestos	JIS B2401 1A	Special packing NBR	Material	Code of sealing parts set (Item code)	Size (Item code)	Size (Item code)	Qty	Size (Item code)	Qty
FTS(B)-□□-15□□	12x12x152	t3xφ188/φ162	G150	12x12x152	NBR	SA-FTS-150A (SSC000033)	R 1/2 (7Z3040000)	t13x30x65 (B61000130)	1set/pc*2	t20x60x60 (B61000131)	1set/pc*3
					FKM	SA-F/W-FTS-150A (SSC000043)					
FTS(B)-□□-20□□	12x12x194	t3xφ241/φ208	G200	12x12x202	NBR	SA-FTS-200A (SSC000034)		t20x35x80 (B61000128)	1set/pc*2	t20x70x70 (B61000138)	1set/pc*3
					FKM	SA-F/W-FTS-200A (SSC000044)					
FTS(B)-□□-25□□	12x12x233	t3xφ302/ φ258	G250	12x12x251	NBR	SA-FTS-250A (SSC000035)		t20x35x120 (B61000126)	1set/pc*2	t20x80x80 (B61000129)	1set/pc*3
					FKM	SA-F/W-FTS-250A (SSC000045)					
FTS(B)-□□-30□□	12x12x287	t3xφ357/ φ308	G300	12x12x302	NBR	SA-FTS-300A (SSC000036)	R1 (7Z3060000)	t20x50x150 (B61000127)	1set/pc*2	t30x100x100 (B61000224)	1set/pc*3
					FKM	SA-F/W-FTS-300A (SSC000046)					

＊Zinc plug and zinc plate are not included in sealing parts set.

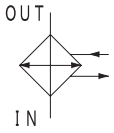
MAINTENANCE TOOL LIST

Item	Size (mm)	Item code	Remarks
Tube brush	D9x1820	KZZ000002	For periodic cleaning of tube to prevent scale.
Tube plug	D9.5x11.5x25	BZZ000023	For closing a tube when leakage occurs due to tube corrosion. 2 plugs are required for a tube.

＊1 Standard material of sealing part is NBR, but other material is selectable depending on fluid type. ＊2 A set of zinc plate (4 pcs) is required for channel "A".
＊3 A set of zinc plate (2 pcs) is required for channel "B". ＊4 2 sets of zinc plate(2pcs) are required for channel "B".

Water-Cooled Shell and Tube type TEMA compatible Oil Cooler Floating Tube Sheet type

TEMA Class C conformable Standard Heat Exchanger



Water-cooled type cooler

Characteristics

- Low-priced model based on our records of TEMA conformable special products
- Since each connecting dimension is standardized, smooth system design is assured
- Line-up: TFMC, TFLC, TBMC, TBLC for each cooling tube (φ12.7/15.88, Fin/Bare)
- Wide range of size variation (125A – 300A, 33 sizes in total)
- Material of cooling tube and tube sheet is selectable for various requests

SPECIFICATION

Applicable standard (Conformity)	TEMA Class C [JIS B8249*1]		
	ASME Sec.Ⅷ Div.1 (NO STAMP) [JIS B8265*1]		
Structure	BEW*2		
		Shell side	Tube side
Max working pressure MPa		1.0	1.0
Max working temperature ℃		90	60
Fluid type		Mineral oil	Fresh water

★ Other spec is available in addition to the above. Please ask us.

Model code		TFMC	TFLC	TBMC	TBMC
Cooling tube type		φ12.7	φ15.88	φ12.7	φ15.88
		Low Fin Tube		Bare tube	
Main material	Cooling tube	Select from (Cooling tube) table in "MODEL CODE".			
	Body	STPG、SS			
	Channel	STPG、SS			
Coating	Outside coating	Aqua blue			
	Inside of channel	Tar-free epoxy coating			
Flange rating		ANSI 150Lb SO.RF			

MODEL CODE

〈Model code example〉

TFMC – 9.1 – 20 11 – S C 50 50 – S S S – N

(Tube sheet) (Cooling tube) (Shell side) (Tube side) (Shell side) (Tube side) (Drain/Vent)

Code	Cooling tube type
TFMC	φ12.7 Low fin tube
TFLC	φ15.88 Low fin tube
TBMC	φ12.7 Bare tube
TBLC	φ15.88 Bare tube

Heat transfer area
See below.

Code	Shell size
12	125A
15	150A
20	200A
25	250A
30	300A

Baffle plate	
03	Depends on required spec
05	
07	
09	
11	
13	
**	

Code	Material
S	SS400
M	SM400B
V	SFVC2A
C	C4621P
4	SUS304
6	SUS316

Code	Material
C	C1220T
2	C1020T
A	C4430T
B	C6872T
1	C7060T
3	C7150T
H	STB340SC
4	SUS304
6	SUS316

Code	Nozzle size*3
20	3/4B
25	1B
40	1 1/2B
50	2B
65	2 1/2B
80	3B
10	4B

Code	Nozzle direction
S	Straight
L	Left
R	Right

※ Direction from tube connection side

Code	Option
V	Shell side vent
G	Grooving
W	V+G
N	Non

Model code	Shell size	Heat transfer area*4 (㎡)								
TFMC	125A	1.6	2.1	2.6	3.1	3.7				
	150A	2.6	3.4	4.2	5.0	5.8				
	200A	7.4	9.1	10.8	12.5	15.1	17.8			
	250A	12.1	14.9	17.7	20.5	24.7	28.9	33.3	37.7	
	300A	18.7	23.0	27.5	31.8	38.3	44.9	51.4	58.1	64.9
TFLC	125A	1.0	1.3	1.6	2.0	2.3				
	150A	1.9	2.5	3.1	3.7	4.3				
	200A	5.5	6.9	8.1	9.4	11.4	13.5			
	250A	9.4	11.7	13.8	15.9	19.2	22.7	26.1	29.6	
	300A	14.8	18.2	21.7	25.1	30.3	35.5	40.6	45.9	51.3

Model code	Shell size	Heat transfer area*4 (㎡)								
TBMC	125A	0.6	0.8	1.0	1.3	1.5				
	150A	1.0	1.4	1.7	2.0	2.4				
	200A	3.0	3.7	4.4	5.1	6.2	7.3			
	250A	4.9	6.1	7.2	8.4	10.1	11.9	13.7	15.5	
	300A	7.7	9.4	11.3	13.0	15.7	18.4	21.1	23.9	26.7
TBLC	125A	0.4	0.5	0.6	0.8	0.9				
	150A	0.8	1.0	1.2	1.5	1.7				
	200A	2.2	2.7	3.3	3.8	4.6	5.4			
	250A	3.8	4.7	5.6	6.4	7.8	9.2	10.5	11.9	
	300A	6.0	7.3	8.8	10.2	12.2	14.3	16.4	18.6	20.8

＊1 It is designed and manufactured by using JIS standard material. ＊2 Please ask us for other structure type. Other standards such as API is available as well.
＊3 Nozzle size is selectable but limited by shell diameter. ＊4 If using stainless-steel tube (SUS304, SUS316), described heat transfer area is different.

PERFORMANCE GRAPH

■ Condition

Fluid type		Corresponding to ISO VG46	Pressure drop	Shell side MPa	≦ 0.1
Inlet temperature	Shell side ℃	55		Tube side MPa	0.01 - 0.03
	Tube side ℃	30	Scale coefficient at tube side ㎡℃/W		0
Flow rate at tube side		Flow rate at when flow velocity in tube or nozzle at tube side is 2.0 m/s.			

■ Relationship between scale coefficient at tube side and heat exchange amount

Scale coefficient (㎡℃/W)	Rate of heat exchange amount
0	As shown in the graph
0.0002	30% less than in the graph
0.0004	40% less than in the graph

■ Allowable flow rate

TFMC-125A

Nozzle size	3/4B	1B	1 1/2B
Shell side ℓ/min	～34	～57	～130
Nozzle size	1B	1 1/2B	
Tube side ℓ/min	21～69	21～82	

TFMC-150A

Nozzle size	1B	1 1/2B	2B
Shell side ℓ/min	～55	～128	～210
Nozzle size	1 1/2B, 2B		
Tube side ℓ/min	33～129		

TFMC-200A

Nozzle size	1 1/2B	2B	2 1/2B	3B
Shell side ℓ/min	～128	～210	～320	～460
Nozzle size	2B		2 1/2B, 3B	
Tube side ℓ/min	70～261		70～277	

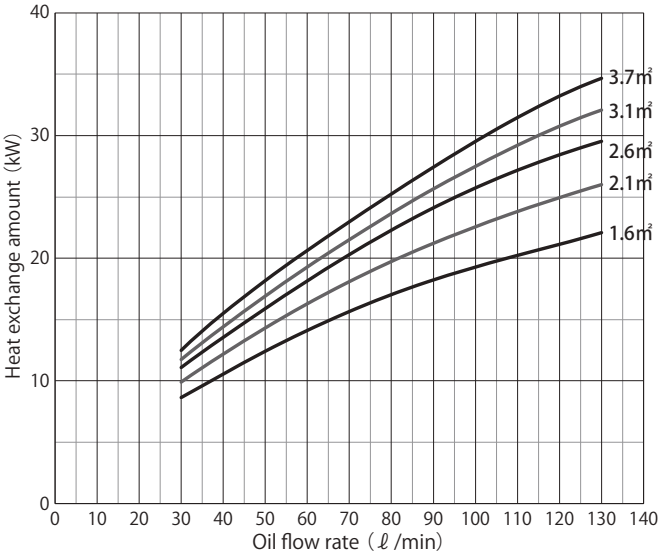
TFMC-250A

Nozzle size	1 1/2B	2B	2 1/2B	3B
Shell side ℓ/min	～128	～210	～320	～460
Nozzle size	2B	2 1/2B	3B	
Tube side ℓ/min	113～261	113～409	113～448	

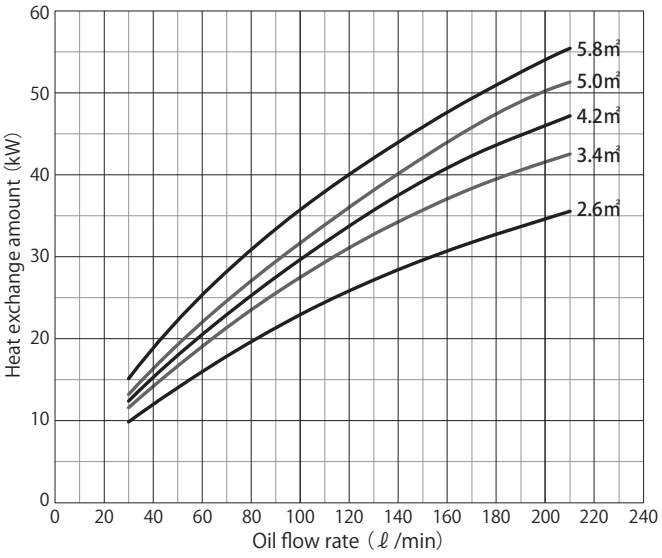
TFMC-300A

Nozzle size	2B	2 1/2B	3B	4B
Shell side ℓ/min	～210	～320	～460	～790
Nozzle size	2 1/2B	3B	4B	
Tube side ℓ/min	173～409	173～574	173～689	

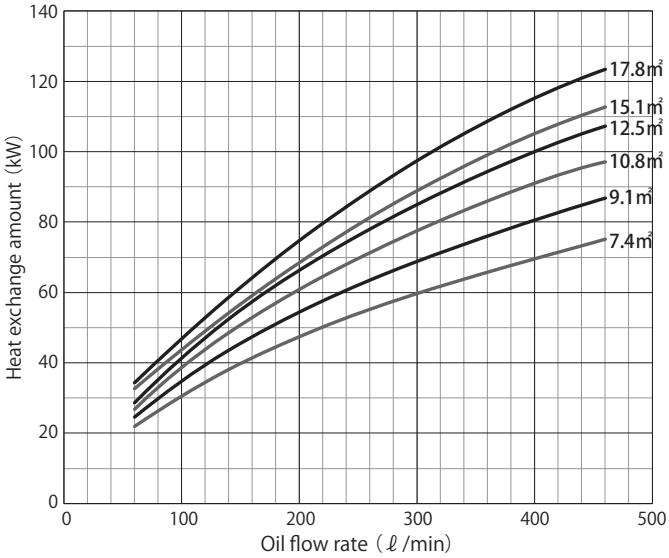
TFMC-125A



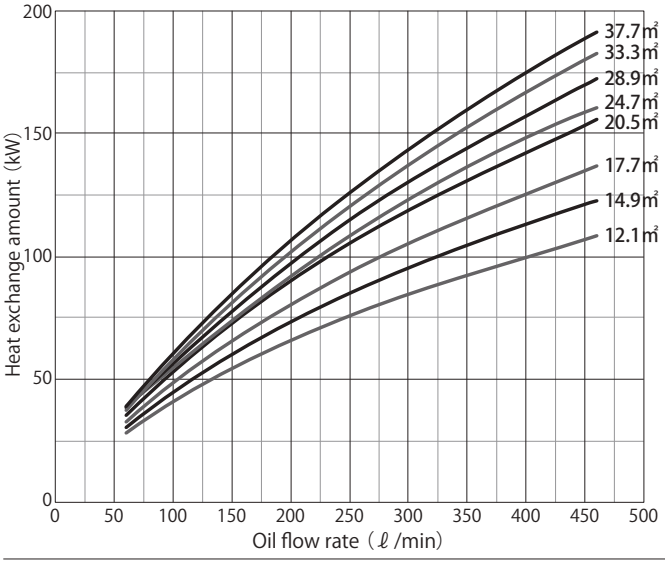
TFMC-150A



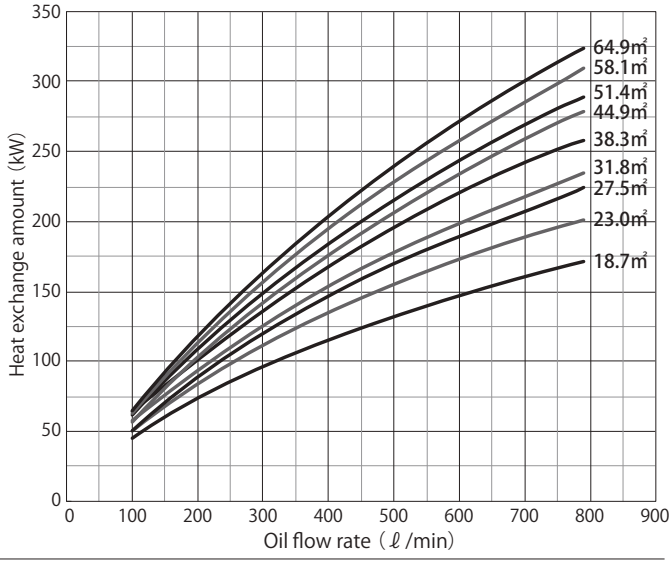
TFMC-200A



TFMC-250A



TFMC-300A



＊ If using stainless-steel tube (SUS304, SUS316), performance graph is different. Please ask us.

PERFORMANCE GRAPH

■ Condition

Fluid type		Corresponding to ISO VG46	Pressure drop	Shell side MPa	≦ 0.1
Inlet temperature	Shell side ℃	55		Tube side MPa	0.01 - 0.03
	Tube side ℃	30	Scale coefficient at tube side ㎡℃/W		0
Flow rate at tube side		Flow rate at when flow velocity in tube or nozzle at tube side is 2.0 m/s.			

■ Relationship between scale coefficient at tube side and heat exchange amount

Scale coefficient (㎡℃/W)	Rate of heat exchange amount
0	As shown in the graph
0.0002	30% less than in the graph
0.0004	40% less than in the graph

■ Allowable flow rate

TFLC-125A

Nozzle size	3/4B	1B	1 1/2B
Shell side ℓ/min	～34	～57	～130
Nozzle size		1B, 1 1/2B	
Tube side ℓ/min		18～68	

TFLC-150A

Nozzle size	1B	1 1/2B	2B
Shell side ℓ/min	～55	～128	～210
Nozzle size		1 1/2B, 2B	
Tube side ℓ/min		32～127	

TFLC-200A

Nozzle size	1 1/2B	2B	2 1/2B	3B
Shell side ℓ/min	～128	～210	～320	～460
Nozzle size	2B		2 1/2B, 3B	
Tube side ℓ/min	69～261		69～275	

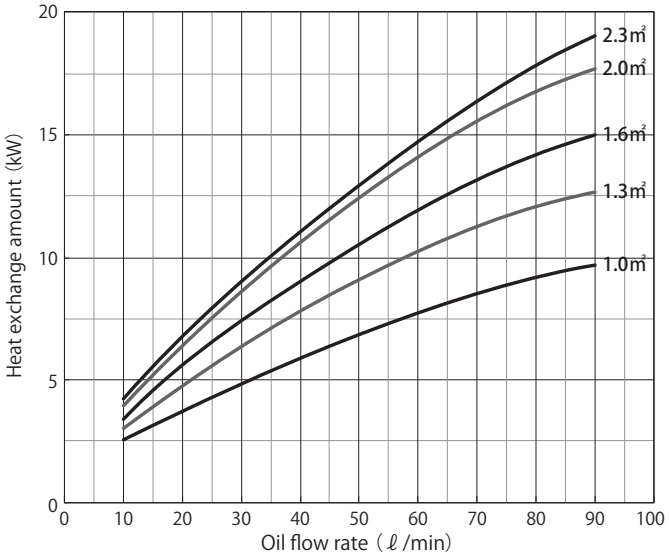
TFLC-250A

Nozzle size	1 1/2B	2B	2 1/2B	3B
Shell side ℓ/min	～128	～210	～320	～460
Nozzle size	2B	2 1/2B		3B
Tube side ℓ/min	116～261	116～409		116～462

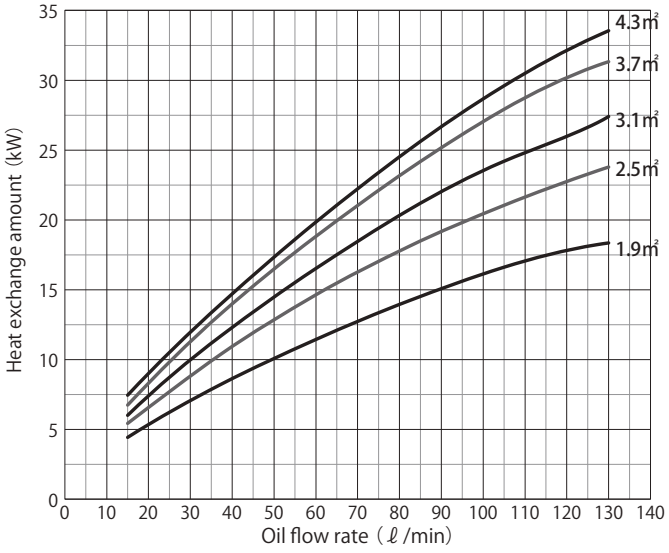
TFLC-300A

Nozzle size	2B	2 1/2B	3B	4B
Shell side ℓ/min	～210	～320	～460	～790
Nozzle size	2 1/2B	3B		4B
Tube side ℓ/min	180～409	180～574		180～718

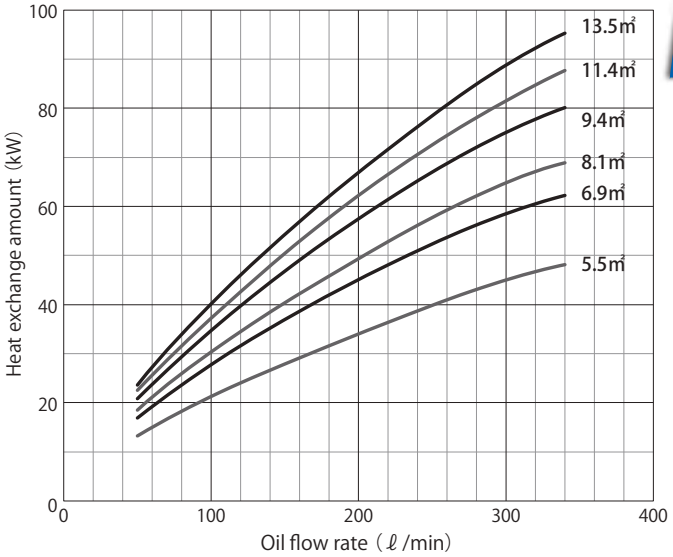
TFLC-125A



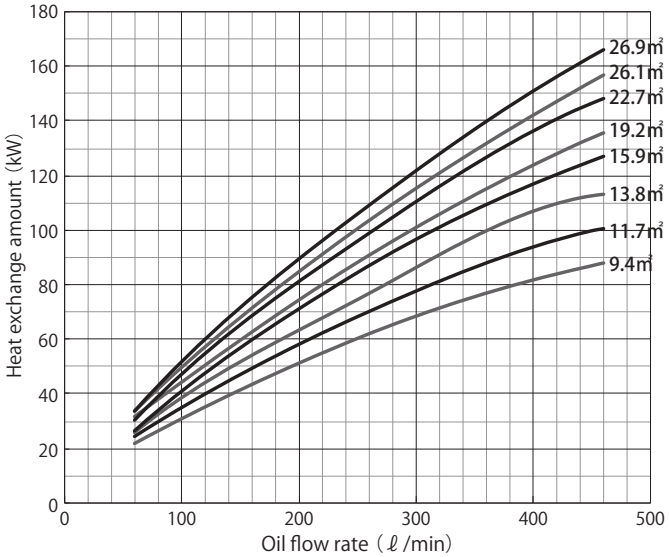
TFLC-150A



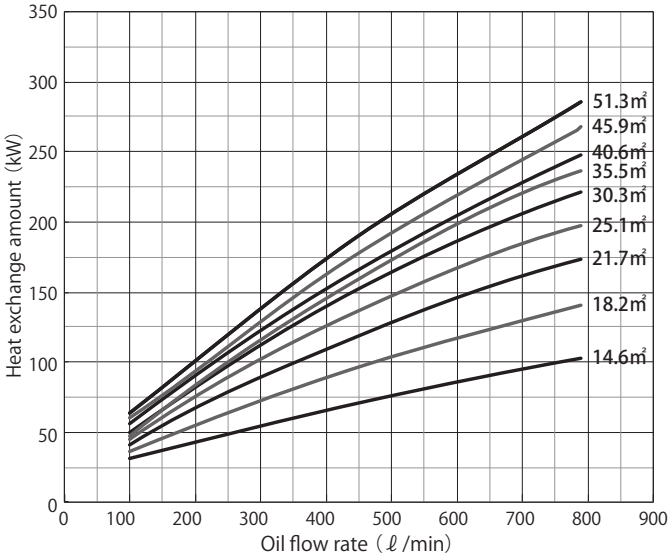
TFLC-200A



TFLC-250A



TFLC-300A



TEMA

＊ If using stainless-steel tube (SUS304, SUS316), performance graph is different. Please ask us.

PERFORMANCE GRAPH

■ Condition

Fluid type		Corresponding to ISO VG46	Pressure drop	Shell side MPa	≦ 0.1
Inlet temperature	Shell side ℃	55		Tube side MPa	0.01 - 0.03
	Tube side ℃	30	Scale coefficient at tube side ㎡℃/W		0
Flow rate at tube side		Flow rate at when flow velocity in tube or nozzle at tube side is 2.0 m/s.			

■ Relationship between scale coefficient at tube side and heat exchange amount

Scale coefficient (㎡℃/W)	Rate of heat exchange amount
0	As shown in the graph
0.0002	30% less than in the graph
0.0004	40% less than in the graph

■ Allowable flow rate

TBMC-125A

Nozzle size	3/4B	1B	1 1/2B
Shell side ℓ/min	～34	～57	～130
Nozzle size	1B	1 1/2B	
Tube side ℓ/min	32～69	32～121	

TBMC-150A

Nozzle size	1B	1 1/2B	2B
Shell side ℓ/min	～55	～128	～210
Nozzle size	1 1/2B	2B	
Tube side ℓ/min	50～159	50～197	

TBMC-200A

Nozzle size	1 1/2B	2B	2 1/2B	3B
Shell side ℓ/min	～128	～210	～320	～460
Nozzle size	2B	2 1/2B	3B	
Tube side ℓ/min	106～261	106～409	106～421	

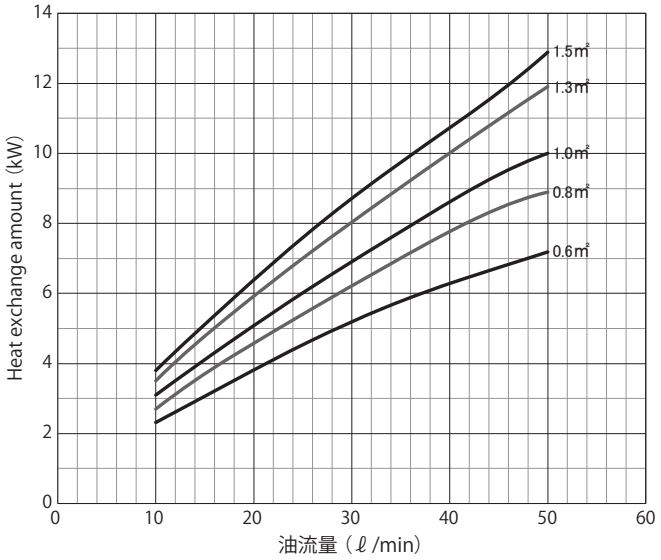
TBMC-250A

Nozzle size	1 1/2B	2B	2 1/2B	3B
Shell side ℓ/min	～128	～210	～320	～460
Nozzle size	2B	2 1/2B	3B	
Tube side ℓ/min	171～261	171～409	171～574	

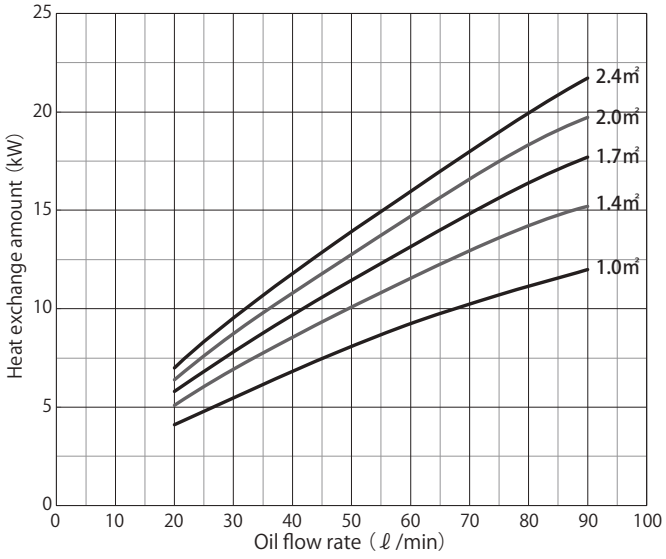
TBMC-300A

Nozzle size	2B	2 1/2B	3B	4B
Shell side ℓ/min	～210	～320	～460	～790
Nozzle size	2 1/2B	3B	4B	
Tube side ℓ/min	265～409	265～574	265～986	

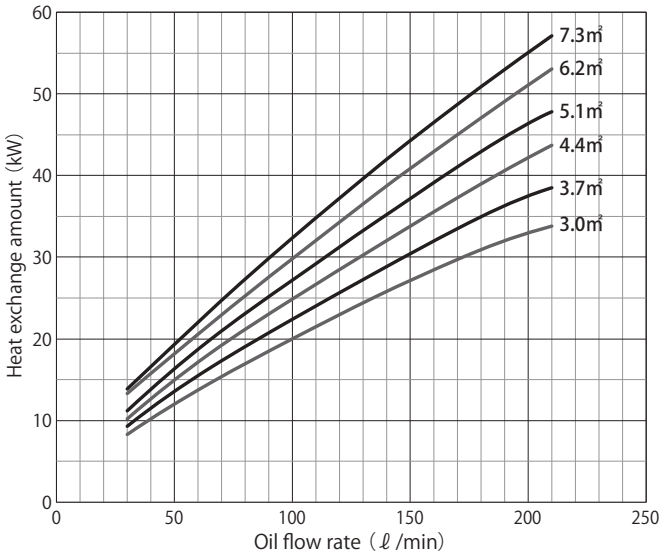
TBMC-125A



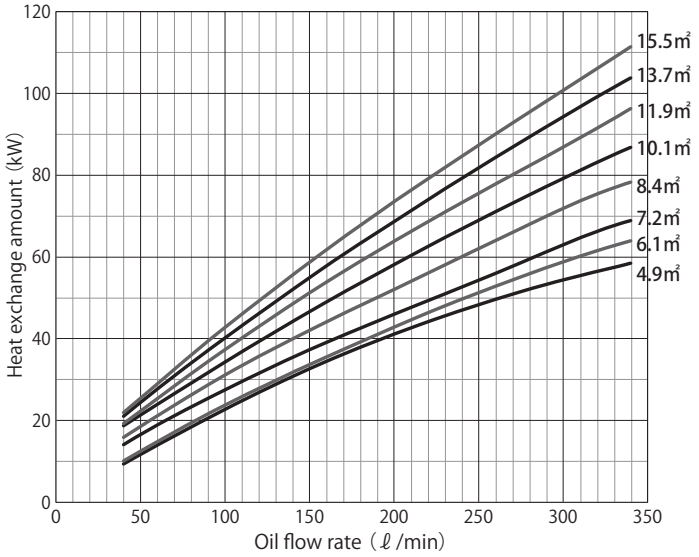
TBMC-150A



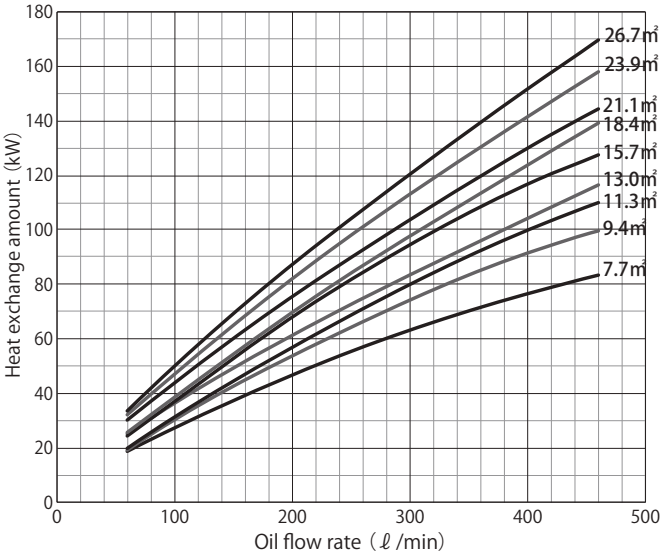
TBMC-200A



TBMC-250A



TBMC-300A



＊ If using stainless-steel tube (SUS304, SUS316), performance graph is different. Please ask us.

PERFORMANCE GRAPH

■ Condition

Fluid type		Corresponding to ISO VG46	Pressure drop	Shell side MPa	≦ 0.1
Inlet temperature	Shell side ℃	55		Tube side MPa	0.01 - 0.03
	Tube side ℃	30	Scale coefficient at tube side ㎡℃/W		0
Flow rate at tube side		Flow rate at when flow velocity in tube or nozzle at tube side is 2.0 m/s.			

■ Relationship between scale coefficient at tube side and heat exchange amount

Scale coefficient (㎡℃/W)	Rate of heat exchange amount
0	As shown in the graph
0.0002	30% less than in the graph
0.0004	40% less than in the graph

■ Allowable flow rate

TBLC-125A

Nozzle size	3/4B	1B	1 1/2B
Shell side ℓ/min	～34	～57	～130
Nozzle size	1B	1 1/2B	
Tube side ℓ/min	26～69	26～104	

TBLC-150A

Nozzle size	1B	1 1/2B	2B
Shell side ℓ/min	～55	～128	～210
Nozzle size	1 1/2B	2B	
Tube side ℓ/min	45～159	49～193	

TBLC-200A

Nozzle size	1 1/2B	2B	2 1/2B	3B
Shell side ℓ/min	～128	～210	～320	～460
Nozzle size	2B	2 1/2B	3B	
Tube side ℓ/min	105～261	105～409	105～415	

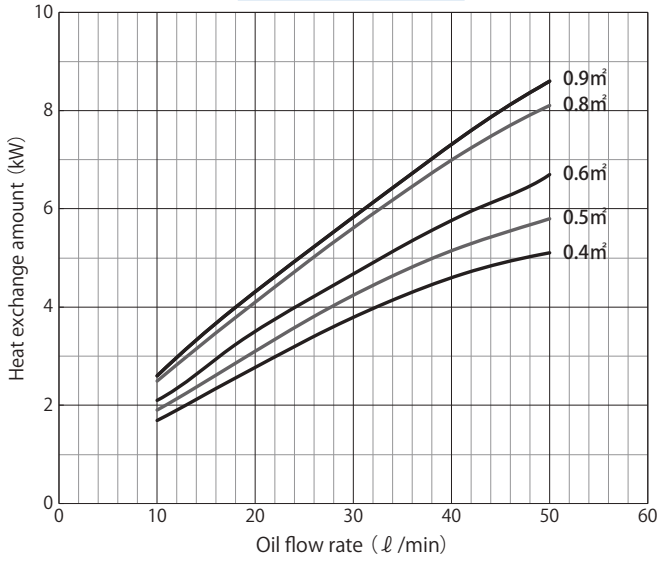
TBLC-250A

Nozzle size	1 1/2B	2B	2 1/2B	3B
Shell side ℓ/min	～128	～210	～320	～460
Nozzle size	2B	2 1/2B	3B	
Tube side ℓ/min	176～261	176～409	176～574	

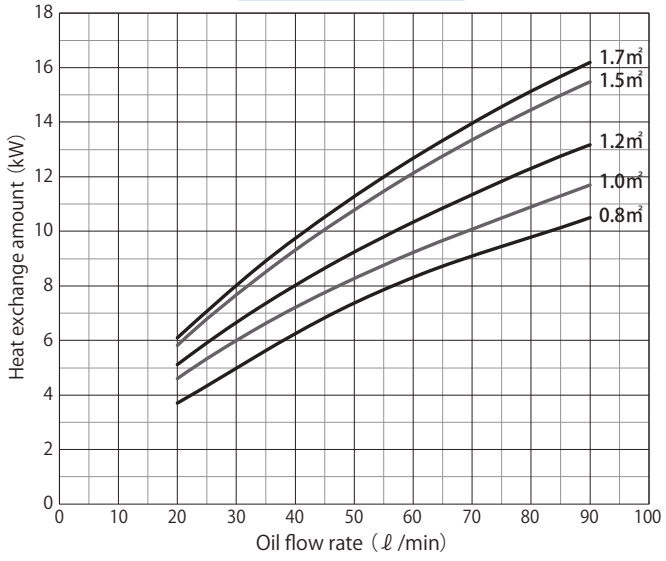
TBLC-300A

Nozzle size	2B	2 1/2B	3B	4B
Shell side ℓ/min	～210	～320	～460	～790
Nozzle size	2 1/2B	3B	4B	
Tube side ℓ/min	275～409	275～574	275～986	

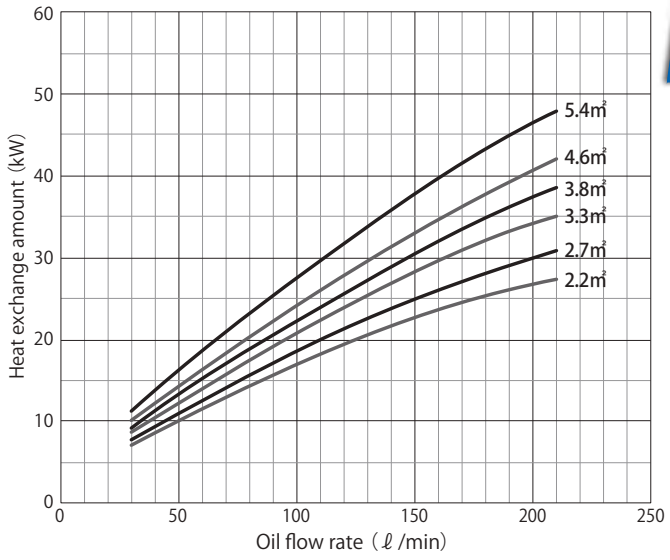
TBLC-125A



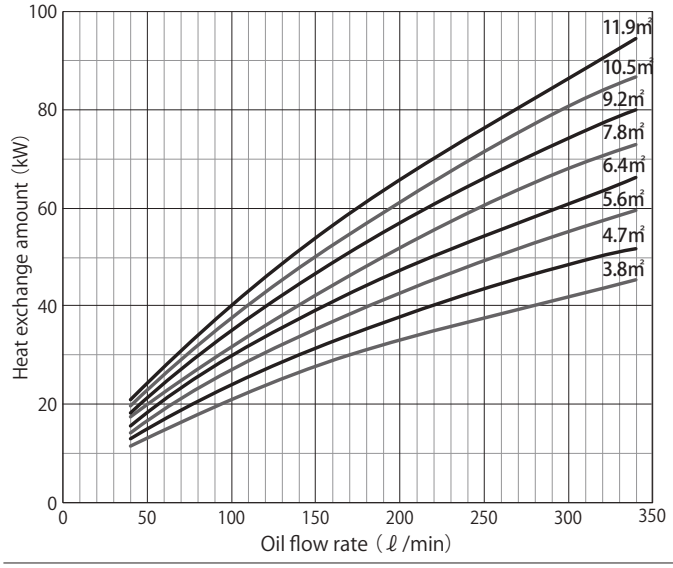
TBLC-150A



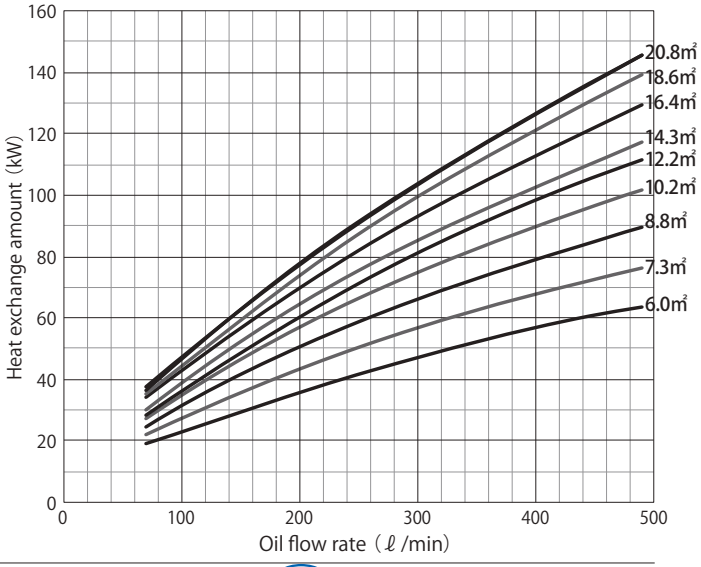
TBLC-200A



TBLC-250A



TBLC-300A

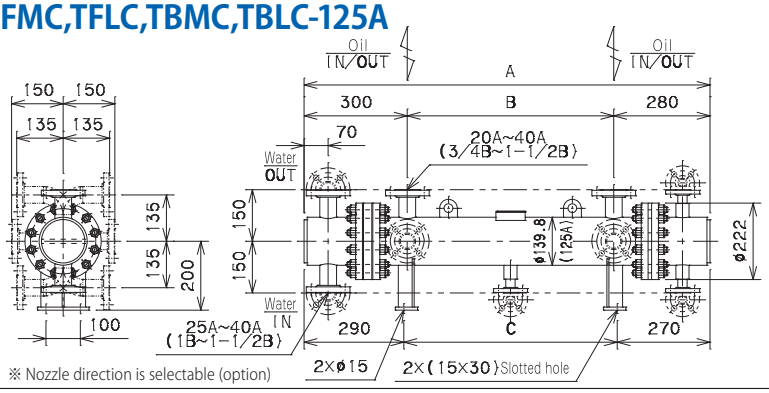


TEMA

＊ If using stainless-steel tube (SUS304, SUS316), performance graph is different. Please ask us.

Unit : mm

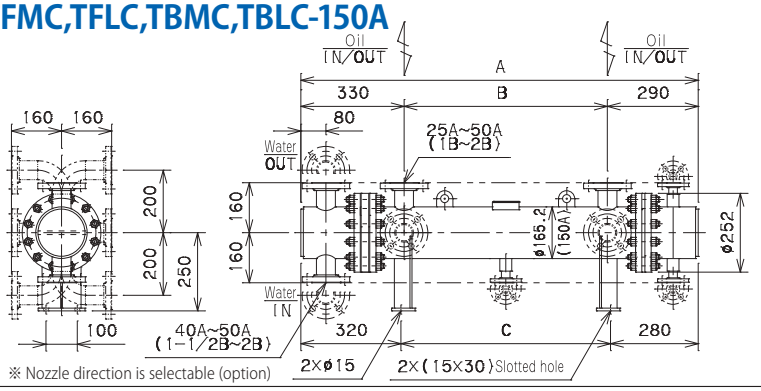
TFMC,TFLC,TBMC,TBLC-125A



※ Nozzle direction is selectable (option)

Length			Weight *1 (kg)			
A	B	C	TFMC	TFLC	TBMC	TBLC
1034	454	474	89	89	89	89
1234	654	674	97	97	97	97
1434	854	874	103	103	103	103
1634	1054	1074	110	110	110	110
1834	1254	1274	118	118	118	118

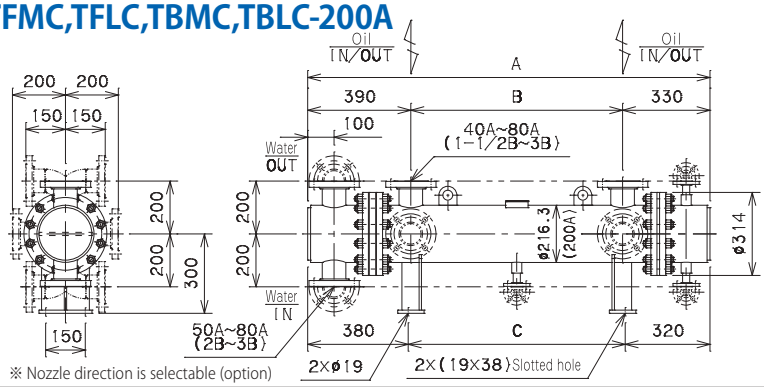
TFMC,TFLC,TBMC,TBLC-150A



※ Nozzle direction is selectable (option)

Length			Weight *2 (kg)			
A	B	C	TFMC	TFLC	TBMC	TBLC
1054	434	454	105	101	107	105
1254	634	654	114	109	117	114
1454	834	854	124	117	127	123
1654	1034	1054	133	134	136	133
1854	1234	1254	142	143	146	142

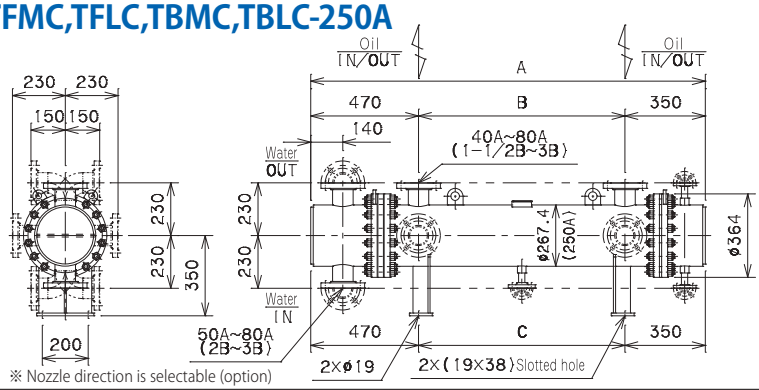
TFMC,TFLC,TBMC,TBLC-200A



※ Nozzle direction is selectable (option)

Length			Weight *3 (kg)			
A	B	C	TFMC	TFLC	TBMC	TBLC
1310	590	610	212	212	217	217
1510	790	810	228	228	235	235
1710	990	1010	245	245	252	252
1910	1190	1210	261	261	270	270
2210	1490	1510	286	286	297	297
2510	1790	1810	310	310	323	323

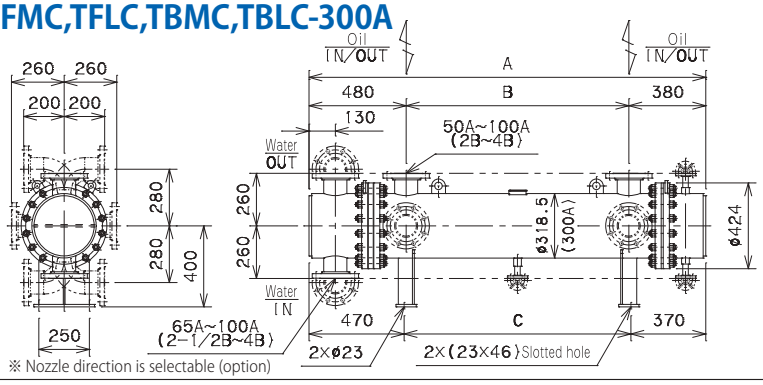
TFMC,TFLC,TBMC,TBLC-250A



※ Nozzle direction is selectable (option)

Length			Weight *4 (kg)			
A	B	C	TFMC	TFLC	TBMC	TBLC
1370	550	550	274	269	283	275
1570	750	750	298	291	309	300
1770	950	950	322	314	335	324
1970	1150	1150	346	337	361	348
2270	1450	1450	382	371	400	385
2570	1750	1750	418	405	439	421
2870	2050	2050	454	439	478	458
3170	2350	2350	490	474	517	494

TFMC,TFLC,TBMC,TBLC-300A



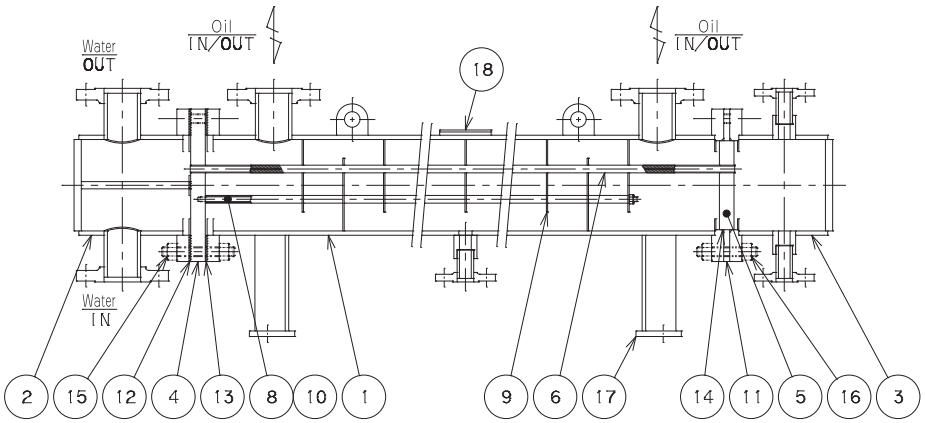
※ Nozzle direction is selectable (option)

Length			Weight *5 (kg)			
A	B	C	TFMC	TFLC	TBMC	TBLC
1390	530	550	420	420	433	433
1590	730	750	455	455	471	471
1790	930	950	490	490	509	509
1990	1130	1150	525	525	547	547
2290	1430	1450	577	577	604	604
2590	1730	1750	630	630	661	661
2890	2030	2050	682	682	718	718
3190	2330	2350	735	735	775	775
3490	2630	2650	787	787	832	832

＊ Nozzle direction is adjustable (option). ＊1 Reference weight when using tube sheet: C4621P, cooling tube: C4430T, nozzle at shell/tube side: 1I/2B. ＊2 Reference weight when using tube sheet: C4621P, cooling tube: C4430T, nozzle at shell/tube side: 2B. ＊3 Reference weight when using tube sheet: C4621P, cooling tube: C4430T, nozzle at shell/tube side: 3B. ＊4 Reference weight when using tube sheet: C4621P, cooling tube: C4430T, nozzle at shell/tube side: 2B. ＊5 Reference weight when using tube sheet: C4621P, cooling tube: C4430T, nozzle at shell/tube side: 4B.

CROSS SECTION

TFMC,TFLC,TBMC,TBLC-125A,150A,200A,250A,300A



PARTS LIST

No.	Item	Qty
1	Body	1
2	Channel "A"	1
3	Channel "B"	1
4	Tube plate "A"	1
5	Tube plate "B"	1
6	Fin tube / Bare tube	n*
—		
8	Distance pipe	n*
9	Baffle plate	n*
10	Rod	4
11	Ring	1
12	Packing	1
13	Packing	1
14	O-ring	2
15	Stud bolt / Heavy nut	n*
16	Stud bolt / Heavy nut	n*
17	Stand	1set
18	Nameplate	1

n* : The number of part depends on model.

SEALING PARTS LIST

No.	12	13	14	Sealing parts set	
Item・Standard*1 / Model code	Special packing non asbestos		JIS B2401 1A		No. : 12～14
				Material	Code of sealing parts set (Item code)
TFMC,TFLC-125A TBMC,TBLC-125A	t3×φ222/φ134, with partition	t3×φ222/φ134	G120	NBR	SA-TEMA-125A (SSC000064)
TFMC,TFLC-150A TBMC,TBLC-150A	t3×φ252/φ162, with partition	t3×φ252/φ162	G145	NBR	SA-TEMA-150A (SSC000065)
TFMC,TFLC-200A TBMC,TBLC-200A	t3×φ314/φ208, with partition	t3×φ314/φ208	G195	NBR	SA-TEMA-200A (SSC000066)
TFMC,TFLC-250A TBMC,TBLC-250A	t3×φ364/φ258, with partition	t3×φ364/φ258	G240	NBR	SA-TEMA-250A (SSC000067)
TFMC,TFLC-300A TBMC,TBLC-300A	t3×φ424/φ308, with partition	t3×φ424/φ308	G290	NBR	SA-TEMA-300A (SSC000068)

Upper side : Code or Size Under side : (Item code)

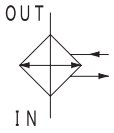
MAINTENANCE TOOL LIST

Item	Model code	Size (mm)	Item code	Remarks
Tube brush	TFMC	D8.5x1820	KZZ000005	For periodic cleaning of tube to prevent scale.
	TFLC	D10.5x1820	KZZ000004	
	TBMC			
	TBLC	D14x1820	KZZ000083	
Tube plug	TFMC	D9.5x11.5x25	BZZ000023	For closing a tube when leakage occurs due to tube corrosion. 2 plugs are required for a tube.
	TFLC	D12x14x25	BZZ000202	
	TBMC	D9.5x11.5x25	BZZ000023	
	TBLC	D12x14x25	BZZ000202	

TEMA

＊1 Standard material of sealing part is NBR, but other material is selectable depending on fluid type.

Fixed Tube Sheet type Oil Cooler with built-in Thermostat



Water-cooled type cooler

Characteristics

- Built-in thermostat automatically controls cooling water quantity and keeps temperature setting
- Valve opening temperature of thermostat is adjustable between 35 – 55℃.
- φ9 Low Fin Tube enables high cooling performance and compact design
- High flexibility of installation by adjustable U-bolt stand
- Fixed tube sheet type is appropriate to a system with small temperature difference and small amount of oil contamination

SPECIFICATION

		Shell side	Tube side
Max working pressure MPa		1.0	0.5
Max working temperature ℃		100	60
Pass structure		1 pass	2 passes
Fluid type	Standard	Mineral oil	Fresh water
	G	Water glycol fluid	
		Fatty ester fluid	

☆ TAISEI original high performance cooling tube enables 20% size reduction compared with general φ12.7 low fin tube.

Shell size code		1□□	2□□
Cooling tube type		φ9 Low Fin Tube ☆	
Main material	Cooling tube	Phosphorous-deoxidized copper	
	Body	STKM、SS	
	Channel	FC	
Coating	Outside coating	Aqua blue	
	Inside of channel	Tar-free epoxy coating	
Other	Valve opening temp. ℃	35 ~ 55 (Inlet of oil)	

MODEL CODE

〈Model code example〉

G – FCX – 226 – 0

Code	Fluid type (Shell side)
Blank	Mineral oil
G	Water-glycol fluid
	Fatty ester fluid

Code	Heat transfer area	Shell size
108	0.4㎡	φ76.3 (65A)
114	0.7㎡	
122	1.1㎡	
226	1.3㎡	φ114.3 (100A)
234	1.7㎡	
242	2.1㎡	
256	2.8㎡	
270	3.5㎡	

Code	Flow rate*2
0	Large
1	Medium
2	Small

＊1 Temperature difference between shell side fluid and tube side fluid should be within 80℃.
＊2 "Flow rate" is for optimization of flow velocity by adjusting the number of baffle plate depend on flow amount variation.

PERFORMANCE GRAPH

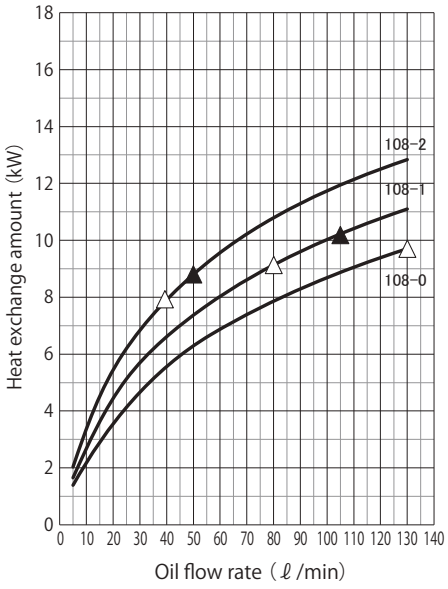
■ Condition

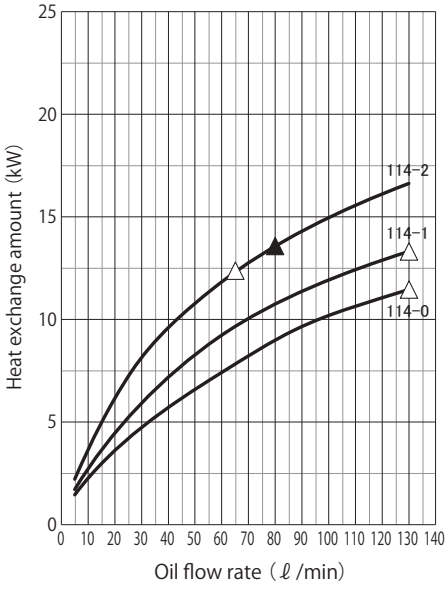
Fluid type		Corresponding to ISO VG46	Pressure drop	Shell side MPa	△ : 0.1 ▲ : 0.15
Inlet temperature	Shell side ℃	55			
	Tube side ℃	30		Tube side MPa	0.01 - 0.03
Flow rate at tube side		Max allowable flow rate	Scale coefficient at tube side	㎡℃/W	0

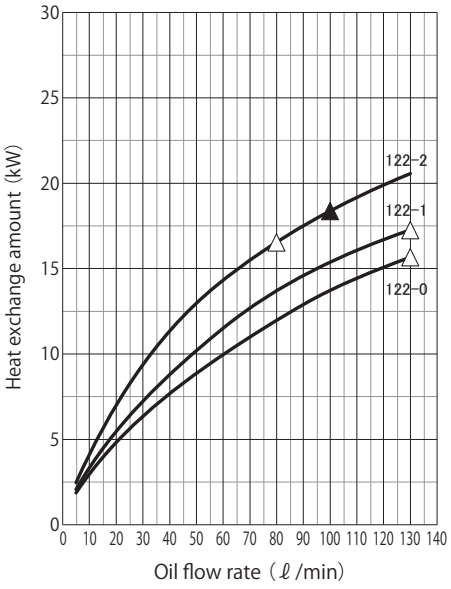
■ Allowable flow rate

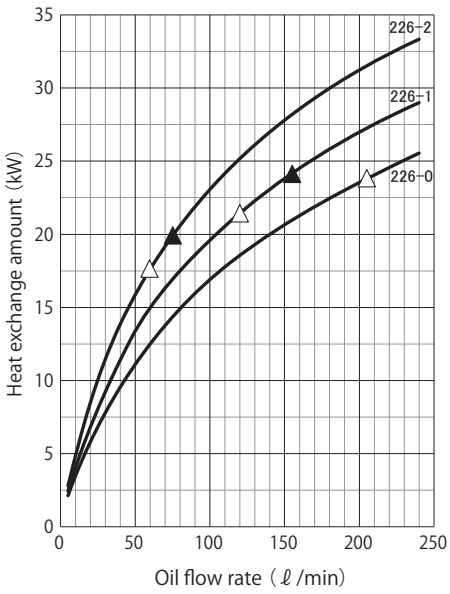
Model code	FCX-1□□	FCX-2□□
Shell side ℓ/min	～130	15～240
Tube side ℓ/min	10～35	20～80

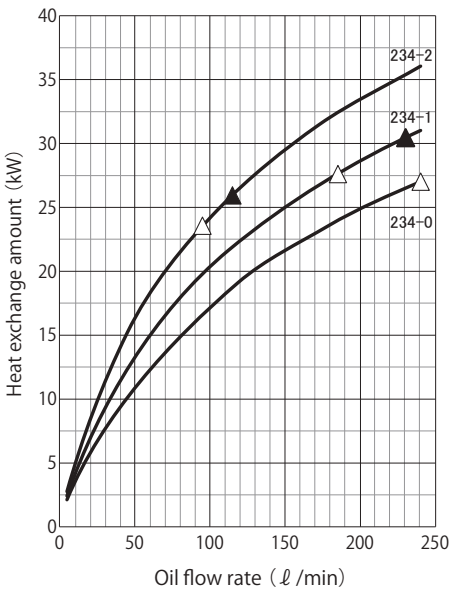
★ It is max value and It depends on each working condition.

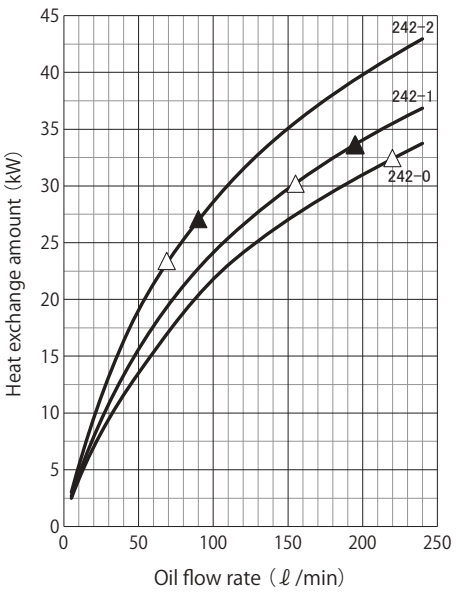


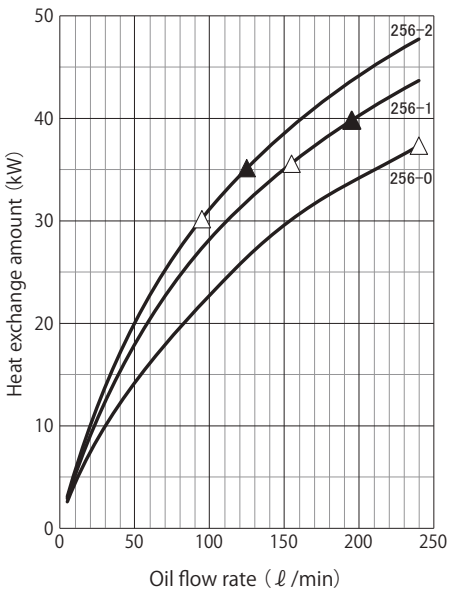


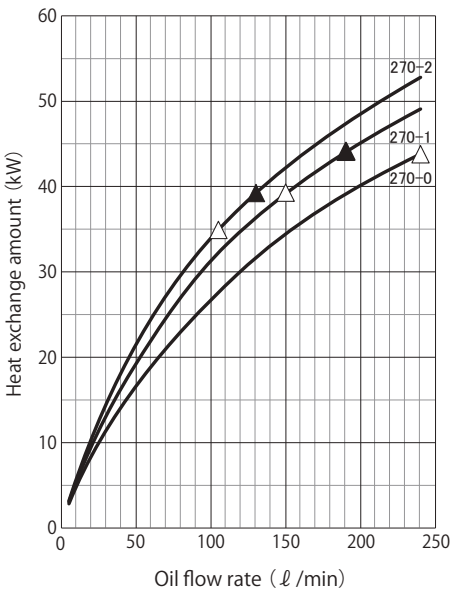










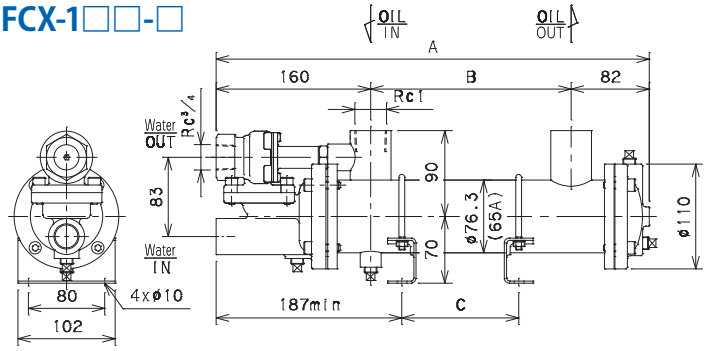


FCX

DIMENSION

FCX-1□□-□

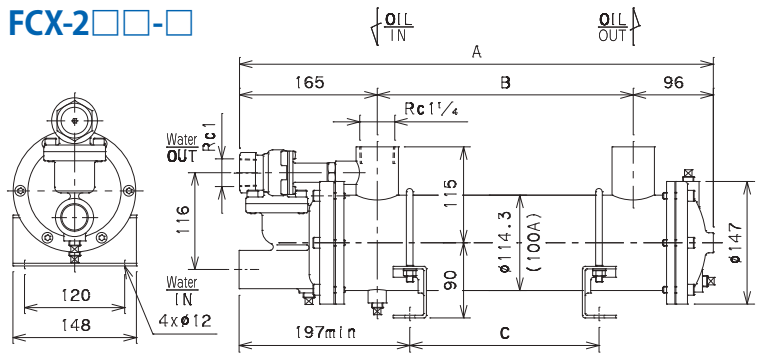
Unit：mm



Model code	Length			Weight (kg)
	A	B	C	
FCX-108-□	422	180	30～125	9
FCX-114-□	602	360	30～305	10.5
FCX-122-□	832	590	30～535	13

★Stand position is adjustable.

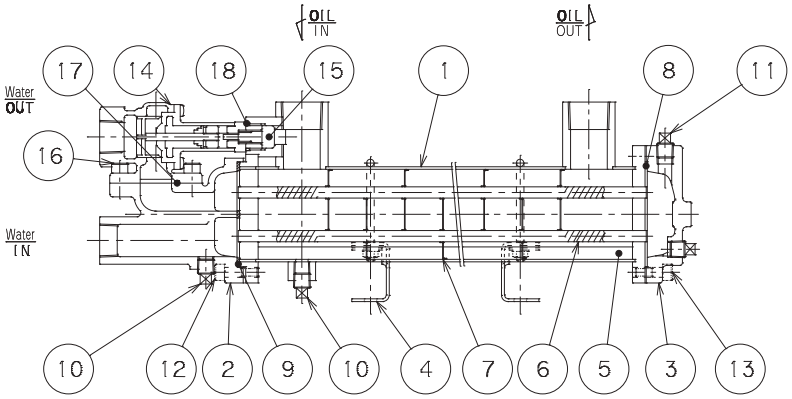
FCX-2□□-□

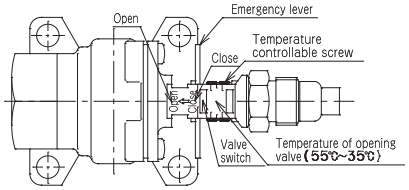


Model code	Length			Weight (kg)
	A	B	C	
FCX-226-□	501	240	40～175	17
FCX-234-□	611	350	40～285	19
FCX-242-□	691	430	40～365	20.5
FCX-256-□	841	580	40～515	25
FCX-270-□	1011	750	40～685	28

★Stand position is adjustable.

CROSS SECTION





- Valve opening temp.: Adjustable between 35 - 55℃
- Valve seat leakage: Less than 30 cc/min (at water supply pressure 0.15MPa)
- Manual valve operation is available by emergency lever

PARTS LIST

No.	Item	Qty
1	Body	1
2	Channel "A"	1
3	Channel "B"	1
4	Stand	2
5	Set plate	n*
6	Fin tube	n*
7	Baffle plate	n*
8	Packing	1
9	Packing	1
10	Drain plug	3
11	Air vent plug	1
12	Bolt	n*
13	Bolt	n*
14	Thermostat	1
15	Thermo sensor	1
16	Bolt	4
17	O-ring	1
18	O-ring	1

n*：The number of part depends on model.

SEALING PARTS LIST

No.	8	9	17	18	Sealing parts set	
Item・Standard*1 / Model code	Special packing non asbestos		JIS B2401 1A		No.：8,9,17,18	
					Material	Code of sealing parts set (Item code)
FCX-1□□	t2×φ83/φ72	t2×φ83/φ72,W6 (with partition)	P34	P18	NBR	SA-FCX-100 (SSC000047)
FCX-2□□	t2x120x109	t2×φ120/φ109,W6 (with partition)			NBR	SA-FCX-200 (SSC000048)

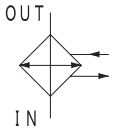
Upper side：Code or Size　Under side：(Item code)

MAINTENANCE TOOL LIST

Item	Size (mm)	Item code	Remarks
Tube brush	D6x1000	KZZ000001	For periodic cleaning of tube to prevent scale.
Tube plug	D5.5x7.5x25	BZZ000021	For closing a tube when leakage occurs due to tube corrosion. 2 plugs are required for a tube.

＊1　Standard material of sealing part is NBR, but other material is selectable depending on fluid type.

Floating Tube Sheet type Oil Cooler with built-in Thermostat



Water-cooled type cooler

Characteristics

- Built-in thermostat automatically controls cooling water quantity and keeps temperature setting
- φ9 Low Fin Tube enables high cooling performance and compact design
- High flexibility of installation by adjustable U-bolt stand
- Cleaning and replacement of tube bundle are available with floating tube sheet type

SPECIFICATION

		Shell side	Tube side
Max working pressure MPa		1.0	0.7
Max working temperature ℃		80	80
Pass structure		1 pass	2 passes
Fluid type	Standard	Mineral oil	Fresh water
	G	Water glycol fluid	
		Fatty ester fluid	
	F	Phosphate ester fluid	
	W	G+F	

Shell size code		3□□
Cooling tube type		φ9 Low Fin Tube ☆
Main material	Cooling tube	Phosphorous-deoxidized copper
	Tube plate	SS
	Body	SGP、SS
	Channel	FC
Coating	Outside coating	Aqua blue
	Inside of channel	Tar-free epoxy coating

☆ TAISEI original high performance cooling tube enables 20% size reduction compared with general φ12.7 low fin tube.

MODEL CODE

〈Model code example〉

F – FCW – 350A – 2 – 40

Code	Fluid type (Shell side)
Blank	Mineral oil
G	Water-glycol fluid
	Fatty ester fluid
F	Phosphate ester fluid
W	G+F

Code	Heat transfer area	Shell size
350A	2.5㎡	φ139.8 (125A)
370A	3.5㎡	
390A	4.5㎡	
311A	5.5㎡	

Code	Flow rate*1
0	Large
1	Medium
2	Small

Code	Temperature of opening valve (inlet temperature)	
Blank	51$^{+3}_{-1}$ ℃	Standard
40	40$^{+3}_{-1}$ ℃	Special specification☆
45	45$^{+3}_{-1}$ ℃	

☆ Since standard spec, price, and delivery are different for 40 and 45℃, please ask us.

＊1 "Flow rate" is for optimization of flow velocity by adjusting the number of baffle plate depend on flow amount variation.

PERFORMANCE GRAPH

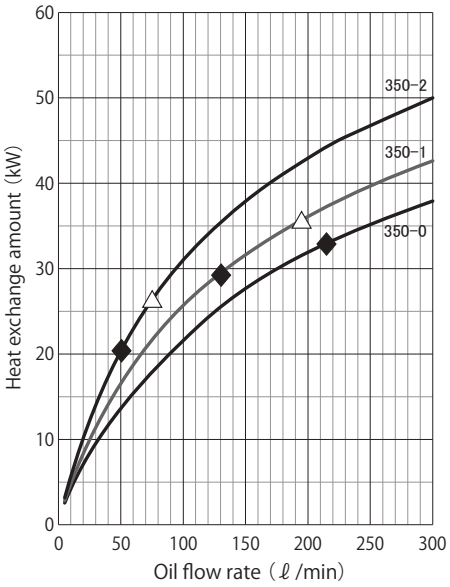
■ Condition

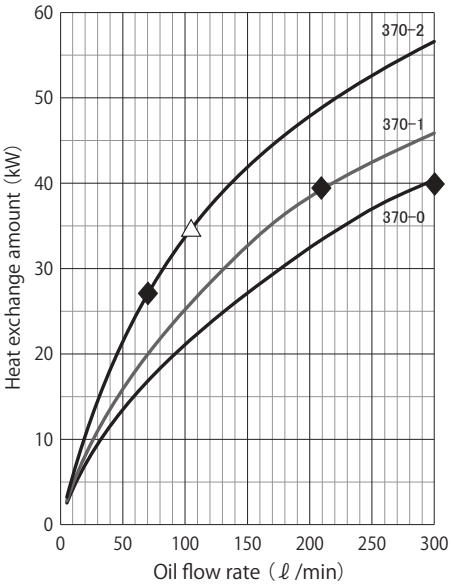
Fluid type		Corresponding to ISO VG46	Pressure drop	Shell side MPa	◆ : 0.05 △ : 0.1
Inlet temperature	Shell side ℃	55			
	Tube side ℃	30		Tube side MPa	0.01 - 0.03
Flow rate at tube side		Max allowable flow rate	Scale coefficient at tube side		㎡℃/W 0

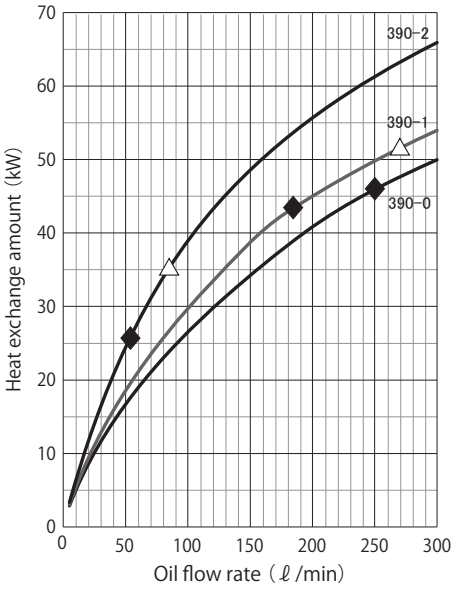
■ Allowable flow rate

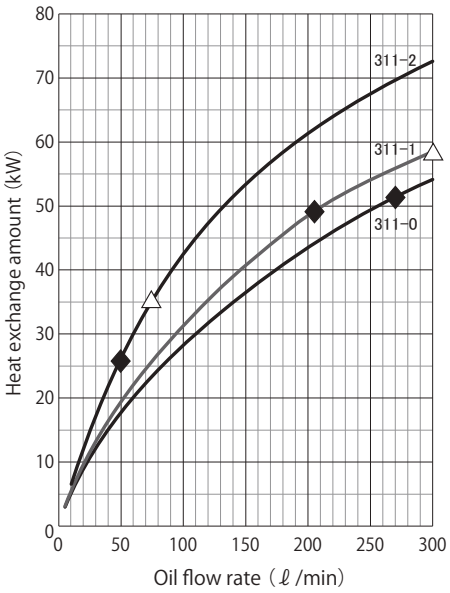
Model code	FCW-3□□A
Shell side ℓ/min	50～300
Tube side ℓ/min	30～100

★ It is max value and It depends on each working condition.





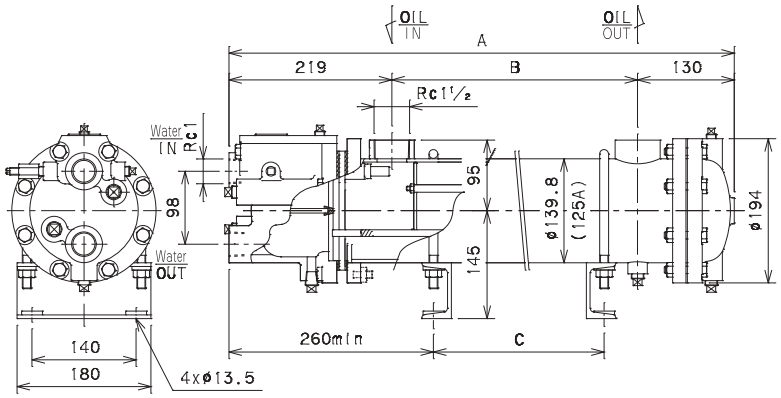




DIMENSION

FCW-3□□A-□

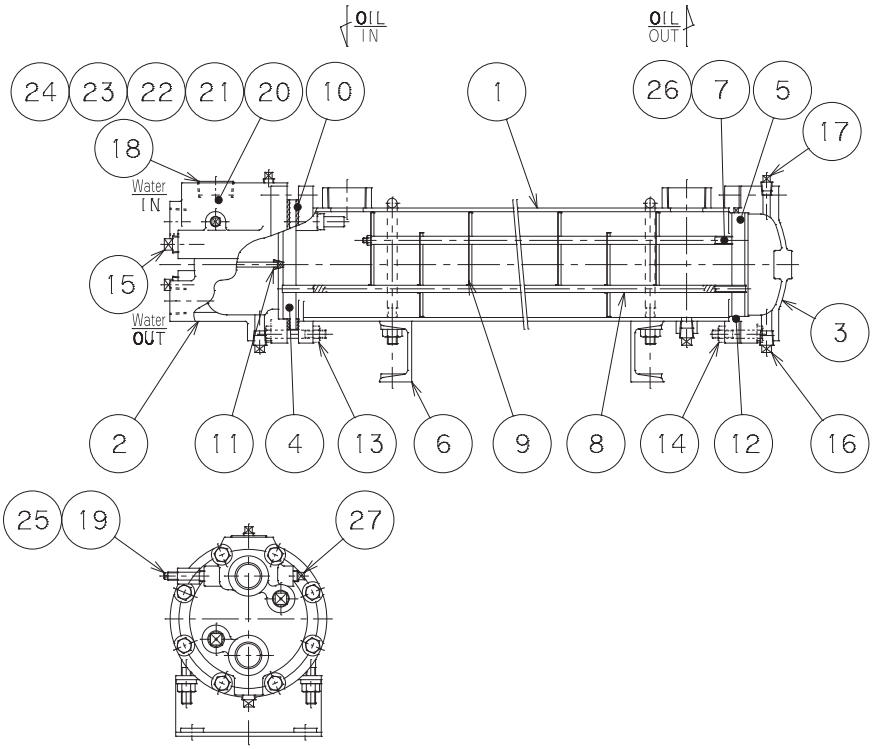
Unit : mm



Model code	Length			Weight (kg)
	A	B	C	
FCW-350A-□	650	310	50~220	43
FCW-370A-□	880	531	50~450	58
FCW-390A-□	1050	701	50~620	71
FCW-311A-□	1170	821	50~740	88

★Stand position is adjustable.

CROSS SECTION



PARTS LIST

No	Item	Qty
1	Body	1
2	Channel "A"	1
3	Channel "B"	1
4	Tube plate	1
5	Tube plate	1
6	Stand	2
7	Rod	4
8	Fin tube	n*
9	Baffle plate	n*
10	Packing	2
11	Packing	1
12	Packing	1
13	Bolt・Nut	8
14	Bolt・Nut	8
15	Zinc plug	2
16	Drain plug	3
17	Air vent plug	2
18	Plug	1
19	Manual valve	1
20	Thermo sensor	1
21	Ball	1
22	"O"ring	2
23	Packing	1
24	Packing with spring washer	1
25	"O"ring	1
26	Distance pipe	n*
27	Plug	1

n* : The number of part depends on model.

SEALING PARTS & ANTICORROSIVE PARTS LIST

No.	10	11	12	Sealing parts set*2		22	23	25	15
Item・Standard*1 / Model code	Special packing non asbestos	U-shaped packing NBR	Special packing NBR		No. : 10~12	JIS B2401 1A	Special packing	JIS B2401 1A	Zinc plug
				Material	Code of sealing parts set (Item code)	Size (Item code)	Size (Item code)	Size (Item code)	Size (Item code)
FCW-3□□A	t3×φ160/φ134	12×12×134	t4.5×φ140.2/φ128 Oval	NBR	SA-FCW-300 (SSC000049)	P12 (712P01210)	t3×φ32/φ22 (K24000043)	P3 (712P00310)	R 3/8 (7Z3020000)
				FKM	SA-F/W-FCW-300 (SSC000050)				

MAINTENANCE TOOL LIST

Item	Size (mm)	Item code	Remarks
Tube brush	D6x1000	KZZ000001	For periodic cleaning of tube to prevent scale.
Tube plug	D5.5x7.5x25	BZZ000021	For closing a tube when leakage occurs due to tube corrosion. 2 plugs are required for a tube.

＊1 Standard material of sealing part is NBR, but other material is selectable depending on fluid type.
＊2 Sealing parts attached around thermostat (part No.22, 23, 25) and zinc plug (part No.15) is not included in sealing part set.

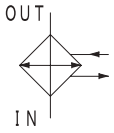
FCU model

Water-Cooled Shell and Tube type Oil Cooler with U-tube Tank Insert type
Heat exchange amount: ~ 60.7kW

Tank-insert type Oil Cooler for space-saving

Characteristics

- **Space-saving and less piping by tank-insert type**
- **Appropriate for high temperature use by U-tube**
- **φ9 Low Fin Tube enables high cooling performance and compact design**



Water-cooled type cooler

SPECIFICATION

		Shell side		Tube side
Max working pressure MPa		1.0		1.0
Max working temperature ℃		100		60
Pass structure		1 pass		2 passes
Fluid type	Standard	Mineral oil		Fresh water
	G	Water glycol fluid		
		Fatty ester fluid		

☆ TAISEI original high performance cooling tube enables 20% size reduction compared with general φ12.7 low fin tube.

Shell size code		1□□A	2□□A
Cooling tube type		φ9 Low Fin Tube ☆	
Main material	Cooling tube	Phosphorous-deoxidized copper	
	Body	FCD	
	Channel	FC	
	Shell	STKM	
Coating	Outside coating	Aqua blue	
	Inside of channel	Tar-free epoxy coating	
	Shell	Non-coating	

MODEL CODE

〈Model code example〉

G – FCU – 108A – 0

Code	Fluid type (Shell side)
Blank	Mineral oil
G	Water-glycol fluid
	Fatty ester fluid

Code	Heat transfer area	Shell size
108A	0.4㎡	φ76.3 (65A)
114A	0.7㎡	
122A	1.1㎡	
226A	1.3㎡	φ114.3 (100A)
234A	1.7㎡	
242A	2.1㎡	
256A	2.8㎡	

Code	Flow rate *1
0	Large
1	Medium
2	Small

＊1 "Flow rate" is for optimization of flow velocity by adjusting the number of baffle plate depend on flow amount variation.

PERFORMANCE GRAPH

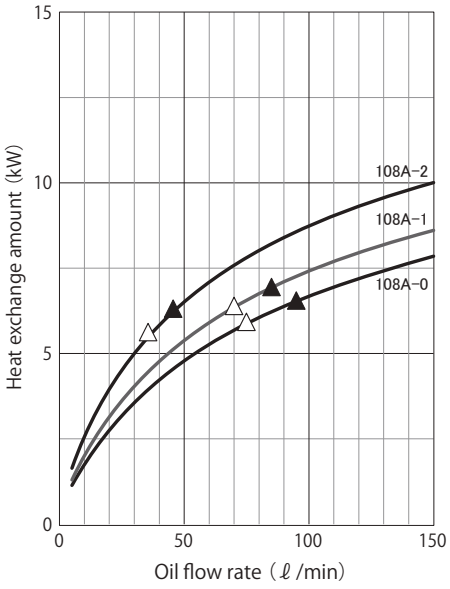
■ Condition

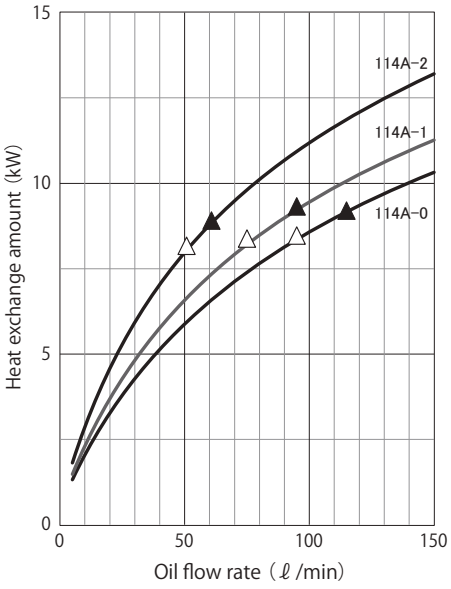
Fluid type		Corresponding to ISO VG46	Pressure drop	Shell side MPa	△ : 0.1 ▲ : 0.15
Inlet temperature	Shell side ℃	55			
	Tube side ℃	30		Tube side MPa	0.01 - 0.03
Flow rate at tube side		Max allowable flow rate	Scale coefficient at tube side	㎡℃/W	0

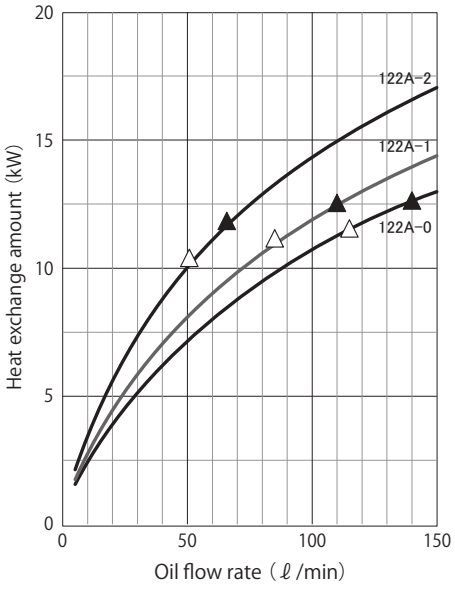
■ Allowable flow rate

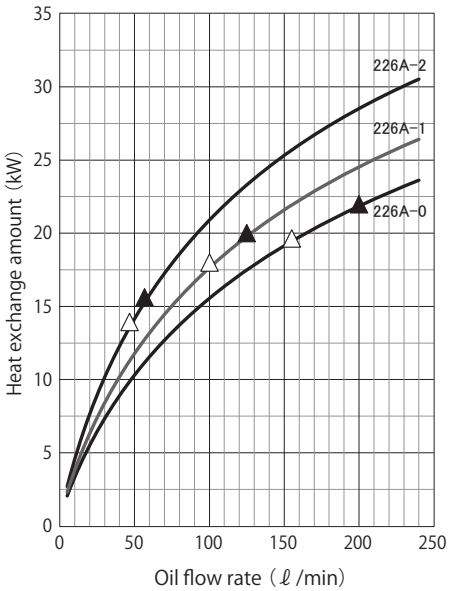
Model code	FCU-1□□A	FCU-2□□A
Shell side ℓ/min	～150	15～240
Tube side ℓ/min	10～30	15～55

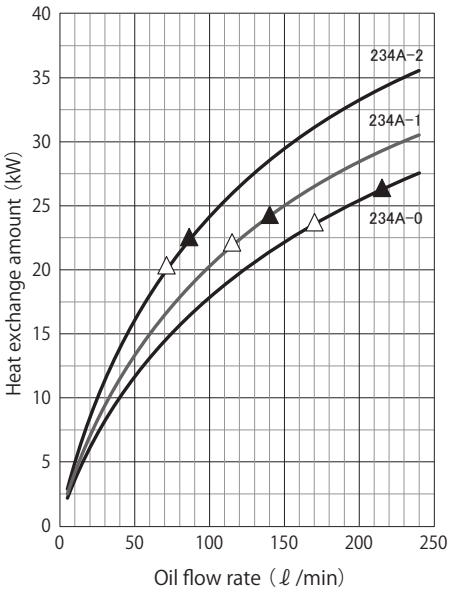
★ It is max value and It depends on each working condition.

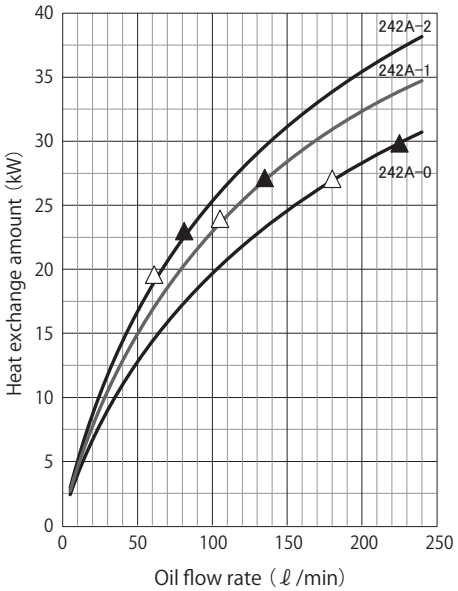


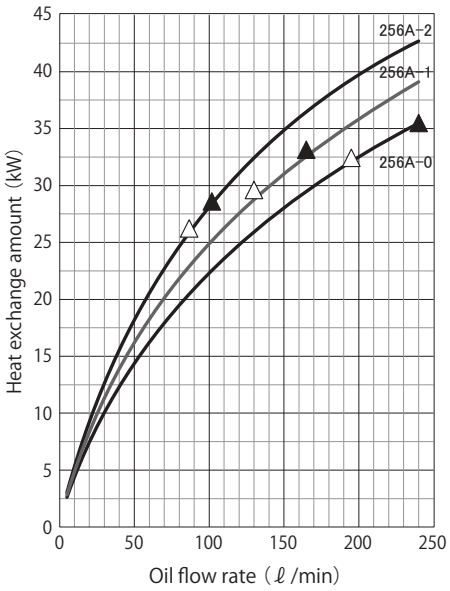










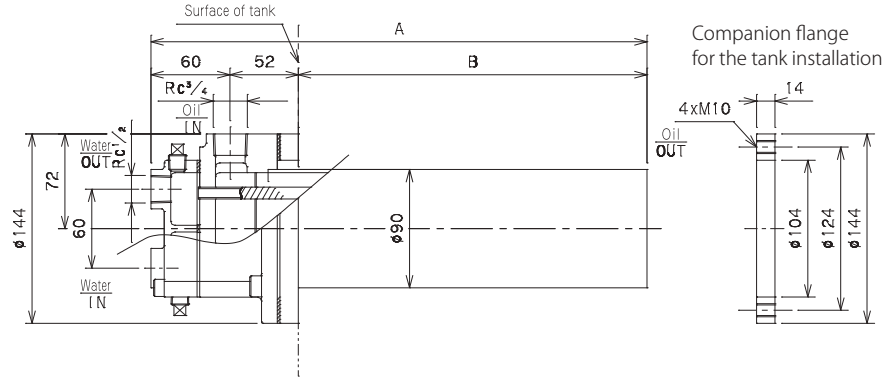


FCU

DIMENSION

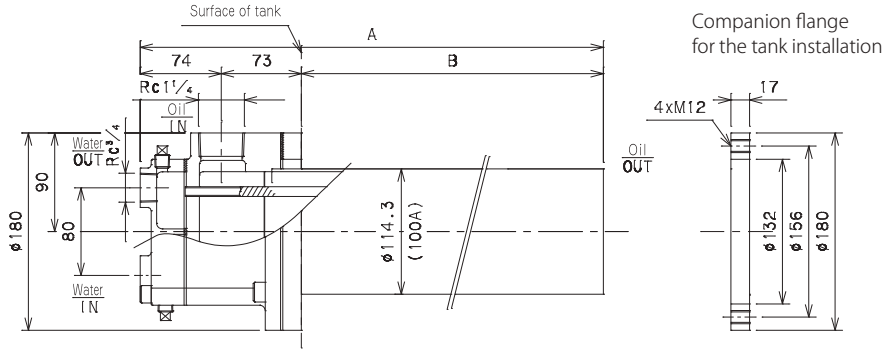
FCU-1□□A-□

Unit：mm



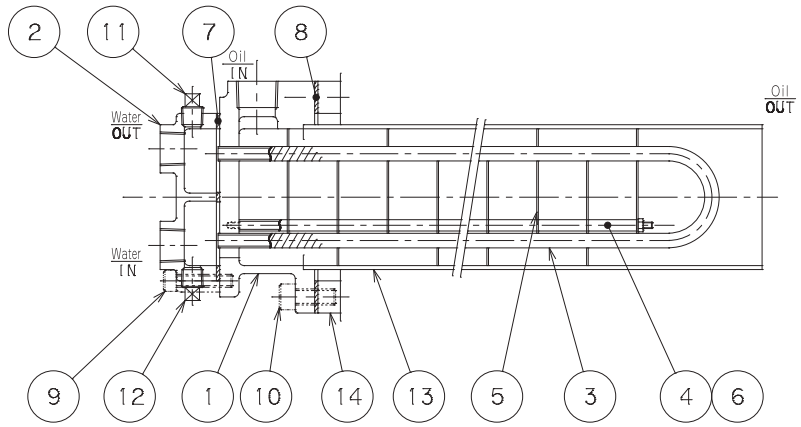
Model code	Length		Weight (kg)
	A	B	
FCU-108A-□	377	265	9
FCU-114A-□	577	465	10
FCU-122A-□	777	665	12

FCU-2□□A-□



Model code	Length		Weight (kg)
	A	B	
FCU-226A-□	547	400	18
FCU-234A-□	687	540	20
FCU-242A-□	827	680	23
FCU-256A-□	1057	910	27

CROSS SECTION



PARTS LIST

No.	Item	Qty
1	Body	1
2	Channel "A"	1
3	Fin tube	n*
4	Distance pipe	n*
5	Baffle plate	n*
6	Rod	4
7	Packing	1
8	Packing	1
9	Bolt	4
10	Bolt	4
11	Air vent plug	1
12	Drain plug	1
13	Shell	1
14	Companion flange	1

n*：The number of part depends on model.

SEALING PARTS LIST

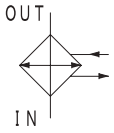
No.	7	8	Sealing parts set	
Item / Model code	Special packing non asbestos			No.：7,8
			Material	Code of sealing parts set (Item code)
FCU-1□□A	t2×φ104/φ85,W6 (with partition)	t2×φ144/φ104	—	SA-FCU-100 (SSC000051)
FCU-2□□A	t2×φ132/φ109,W6 (with partition)	t2×φ180/φ132	—	SA-FCU-200 (SSC000052)

Upper side：Code or Size　Under side：(Item code)

MAINTENANCE TOOL LIST

Item	Size (mm)	Item code	Remarks
Tube plug	D5.5x7.5x25	BZZ000021	For closing a tube when leakage occurs due to tube corrosion. 2 plugs are required for a tube.

Standard Model of All Stainless-steel Heat Exchanger



Water-cooled type cooler

Characteristics

- All stainless-steel model enables use in various fluids (especially for water/water cooler)
- Low-priced model with cast iron channels (FC) is available
- Tube ends sealing
  TCW-1□□/2□□: Tube expansion with seal welding
  TCW-3□□: Tube expansion only
- High flexibility of installation by selectable flow direction and adjustable U-bolt stand
- Bare cooling tube appropriate to fluid contamination at shell side is used

SPECIFICATION

	Shell side	Tube side
Max working pressure MPa	1.0	1.0
Max working temperature ℃	100*1	100
Pass structure	1 pass	2 passes
Fluid type	Fresh water Fluid without corrosiveness to stainless-steel	Fresh water

Shell size code		1□□-SCS	2□□-SCS	3□□-SCS	1□□	2□□	3□□
Cooling tube type		φ9 Bare tube					
Main material	Cooling tube	Stainless-steel					
	Body	Stainless-steel					
	Channel	SCS			FC		
Coating	Outside coating	Non-coating			Aqua blue		
	Inside of channel	Non-coating			Tar-free epoxy coating		

MODEL CODE

〈Model code example〉

TCW – 103 – 1 – SCS

Code	Heat transfer area	Shell size
103	0.15㎡	φ76.3 (65A)
106	0.3㎡	
210	0.5㎡	φ114.3 (100A)
214	0.7㎡	
220	1.0㎡	
226	1.3㎡	
330	1.5㎡	φ139.8 (125A)
338	1.9㎡	
352	2.6㎡	
366	3.3㎡	

Code	Flow rate*2
1	Large
2	Small

Code	Material of channel
Blank	FC
SCS	Stainless-steel

＊1 Temperature difference between shell side fluid and tube side fluid should be within 80℃.
＊2 "Flow rate" is for optimization of flow velocity by adjusting the number of baffle plate depend on flow amount variation.

PERFORMANCE GRAPH

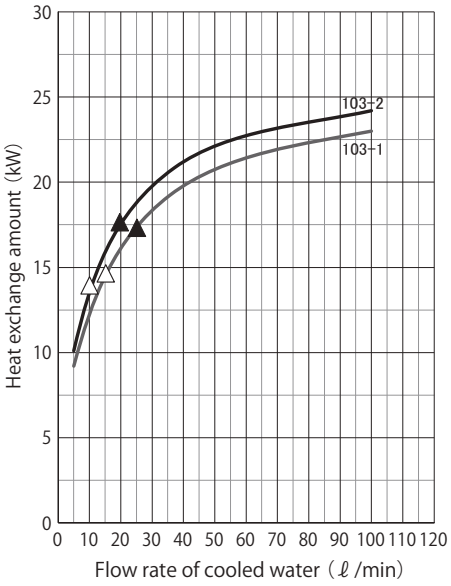
■ Condition

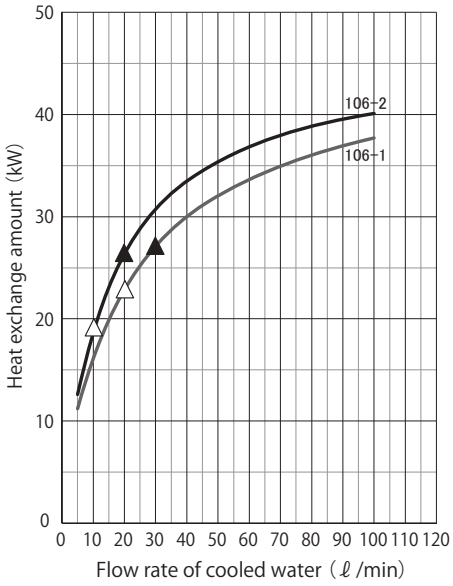
Fluid type		Fresh water	Pressure drop	Shell side MPa	△ : ≦0.002 ▲ : 0.005
Inlet temperature	Shell side ℃	80			
	Tube side ℃	30		Tube side MPa	0.01 - 0.03
Flow rate at tube side		Max allowable flow rate	Scale coefficient at tube side	㎡℃/W	0

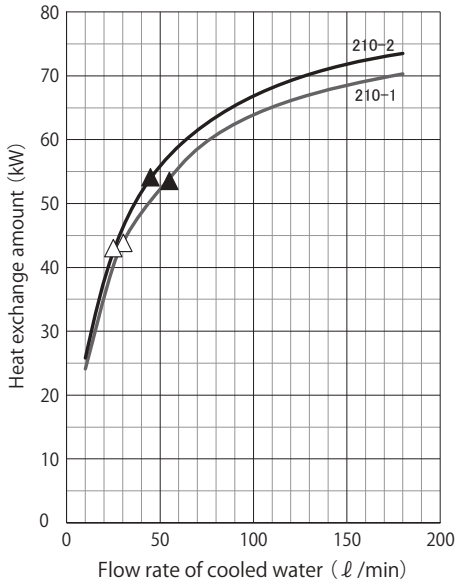
■ Allowable flow rate

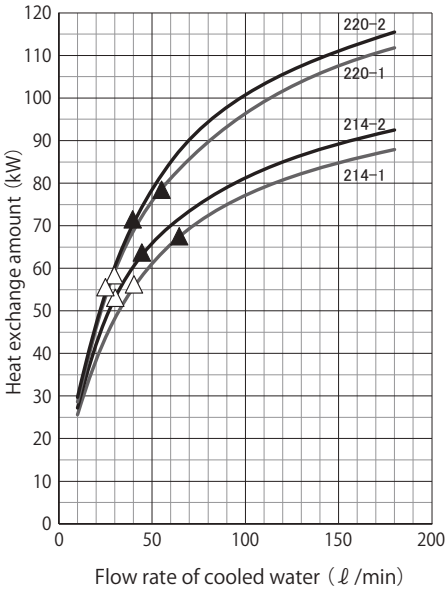
Model code	TCW-1□□	TCW-2□□	TCW-3□□
Shell side ℓ/min	～100	～180	50～300
Tube side ℓ/min	20～35	30～80	30～110

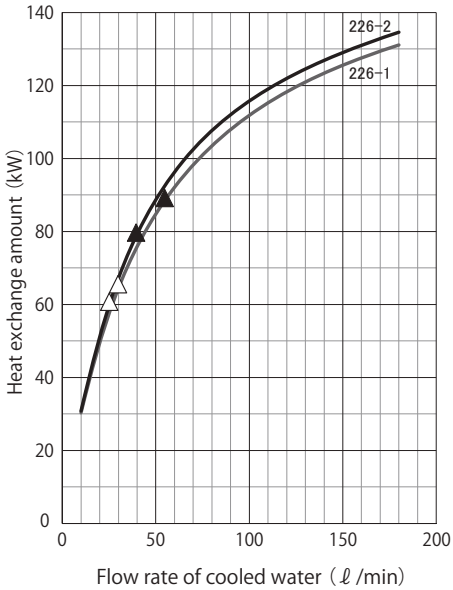
★ It is max value and It depends on each working condition.

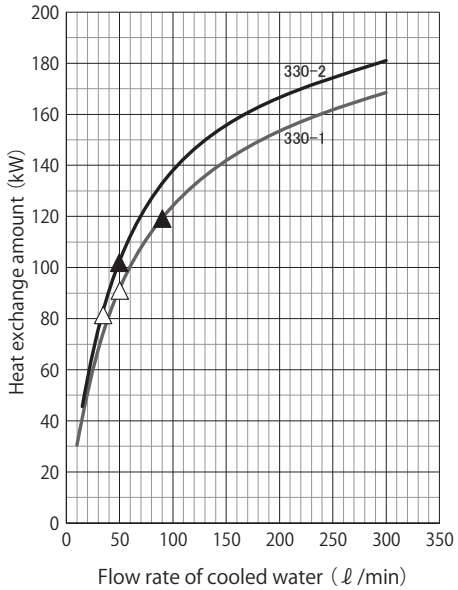


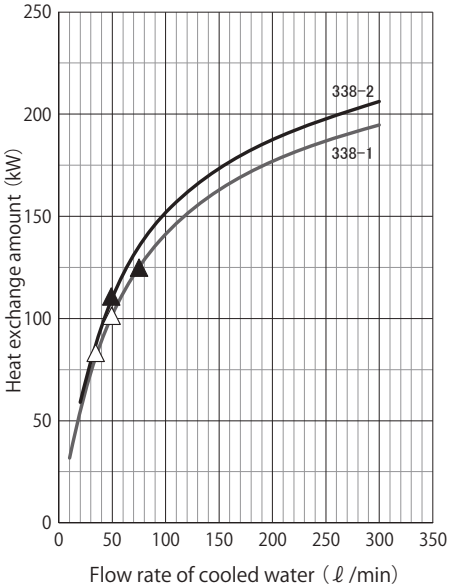


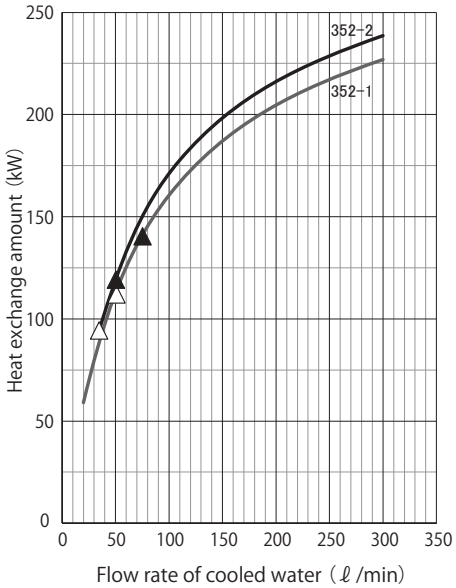


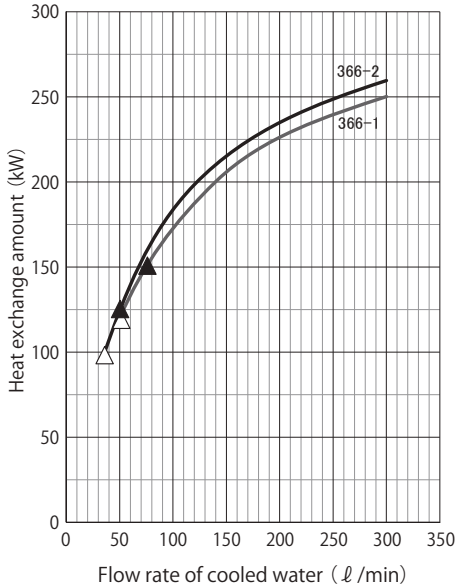






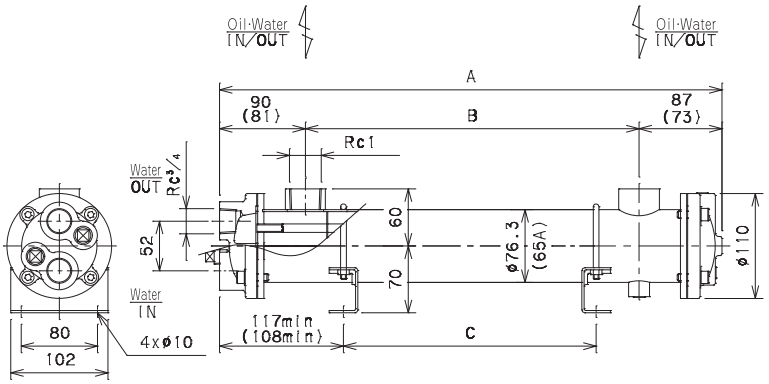






TCW-1□□-□

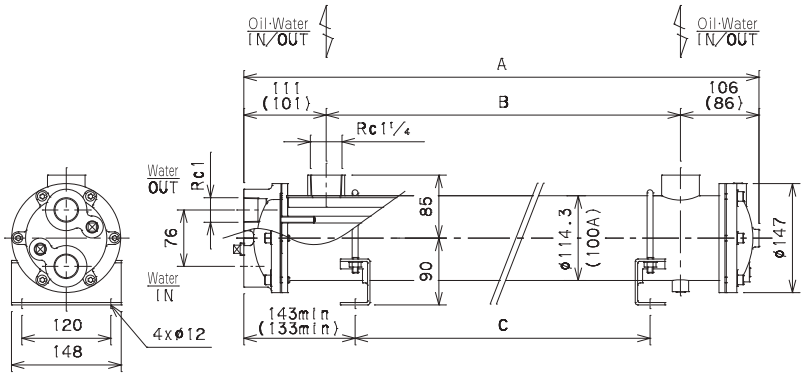
Unit : mm



Model code	Length			Weight (kg)
	A	B	C	
TCW-103-□	347 (324)	170	30～115	5.5 (4.7)
TCW-106-□	527 (504)	350	30～295	7.5 (6.7)

★Value in ( ) is for SCS material.
★Stand position is adjustable.

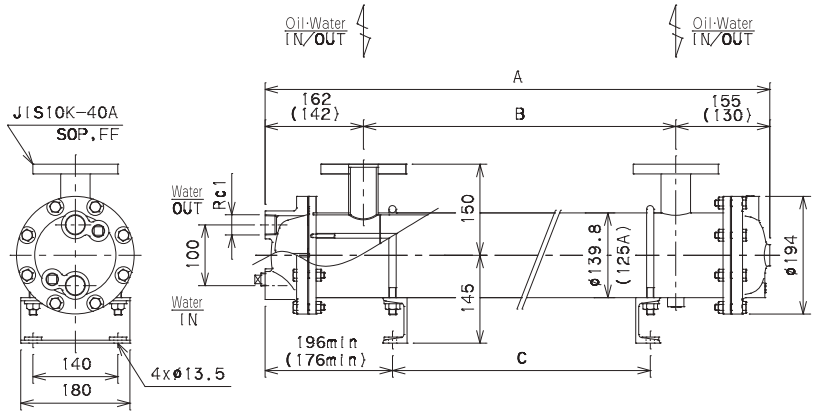
TCW-2□□-□



Model code	Length			Weight (kg)
	A	B	C	
TCW-210-□	437 (407)	220	40～155	11.5 (10)
TCW-214-□	547 (517)	330	40～265	12.5 (11)
TCW-220-□	777 (747)	560	40～495	16.5 (15)
TCW-226-□	947 (917)	730	40～665	18 (16.5)

★Value in ( ) is for SCS material.
★Stand position is adjustable.

TCW-3□□-□

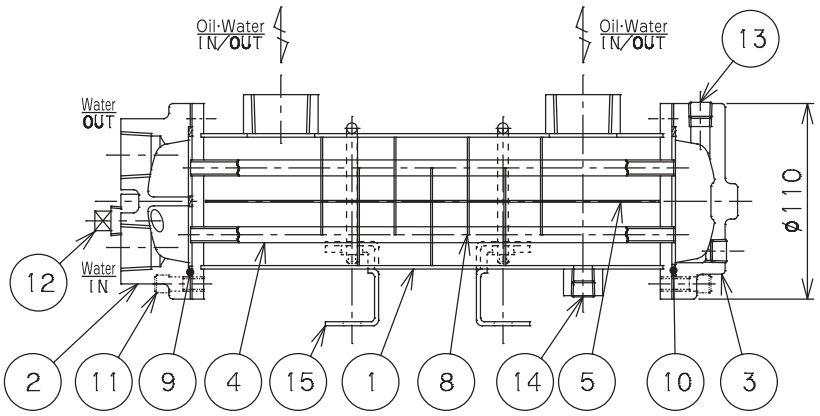


Model code	Length			Weight (kg)
	A	B	C	
TCW-330-□	817 (772)	500	50～430	33 (25)
TCW-338-□	987 (942)	670	50～600	37.5 (30.5)
TCW-352-□	1287 (1242)	970	50～900	45 (38)
TCW-366-□	1587 (1542)	1270	50～1200	58 (51)

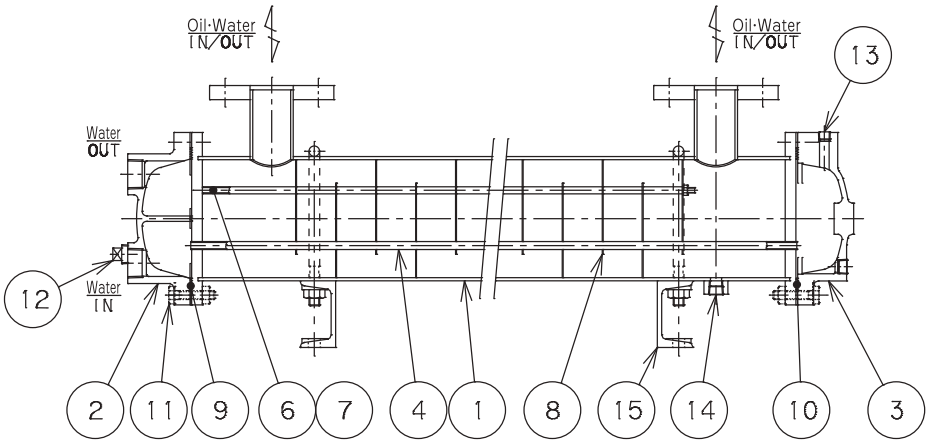
★ Value in ( ) is for SCS material.
★ Stand position is adjustable.

CROSS SECTION

TCW-1□□,TCW-2□□



TCW-3□□



PARTS LIST

No.	Item	Qty
1	Body	1
2	Channel "A"	1
3	Channel "B"	1
4	Bare tube	n*
5	Set plate (Only for TCW-1□□,2□□)	n*
6	Distance pipe (Only for TCW-3□□)	n*
7	Rod (Only for TCW-3□□)	4
8	Baffle plate	n*
9	Packing	1
10	Packing	1
11	Bolt (TCW-1□□,2□□) Bolt・Nut (TCW-3□□)	n*
12	Plug	2
13	Air vent plug	1
14	Drain plug	2
15	Stand	2

n*：The number of part depends on model.

SEALING PARTS LIST

No.	9	10	Sealing parts set	
Item / Model code	Special packing non asbestos			No.：9,10
			Material	Code of sealing parts set (Item code)
TCW-1□□	t2×φ83/φ72,W6 (with partition)	t2×φ83/φ72	—	SA-TCW-1□□ (SSC000002)
TCW-2□□	t2×φ120/φ109,W6 (with partition)	t2×φ120/φ109	—	SA-TCW-2□□ (SSC000003)
TCW-3□□	t2×φ160/φ134,W6 (with partition)	t2×φ160φ134	—	SA-TCW-3□□ (SSC000004)

Upper side：Code or Size　Under side：(Item code)

MAINTENANCE TOOL LIST

Item	Size (mm)	Item code	Remarks
Tube brush	φ8.5x1820	KZZ000005	For periodic cleaning of tube to prevent scale.
Tube plug	D5.5×7.5×25	BZZ000021*1	For closing a tube when leakage occurs due to tube corrosion. 2 plugs are required for a tube.

＊1　Material of tube plug is brass. Please confirm fluid type.

ATL model

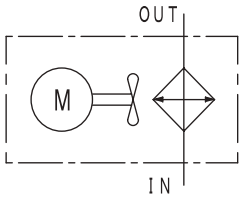
Air-Cooled type Compact Oil Cooler
Drawn cup type
Heat exchange amount: ~ 1.8kW

Advanced Model of conventional "ATL"

Characteristics

- Larger flow rate, Less pressure loss, and Great improvement of heat transfer performance (Max 200% of the conventional model)
- Light weight aluminum radiator is selectable from 3 sizes
- Waterproof and dustproof specification are selectable (option)
- Electric connection is selectable from DIN connector and lead wire
- Fan motor is selectable from single phase AC 100V and 200V
- Other special specification is available: Different AC voltage or DC motor

※ Shape and each specification are different with standard model.



Air-cooled type cooler

ATL

SPECIFICATION

Max working pressure *1		MPa	1.0	
Max working temperature	Inside of tube	℃	100	
	Outside of tube	℃	60	
Ambient conditions *2	Temperature	℃	-10~60	
	Relative humidity	%	Unguarded	RH35~85
			Corresponding to IP54	≦RH95
	Place of installation		Indoor	
Fluid type			Mineral oil、Water glycol fluid *3	

Model code		13A	14A	16A
Material	Radiator	Aluminum		
	Support	Steel plate		
Coating	Radiator	Black		
	Fan motor・Support	Black		
	Fan guard	Plating		
Waterproof・Dustproof		Corresponding to IP54 (Option)		
Weight	kg	2.4	2.5	3.0

Model code	Frequency (Hz)	Rated voltage (V)	Rated current (A)	Maximum load current (A)	Sound level *4 (dB)	Standard
ATL-□□A-03-□M1	50 / 60	100	0.52 / 0.44	0.61 / 0.51	56 / 58	UL・TUV
ATL-□□A-03-□M2		200	0.26 / 0.22	0.3 / 0.27		
ATL-□□A-03-□P1		100	0.55 / 0.46	0.61 / 0.6		TUV
ATL-□□A-03-□P2		200	0.26 / 0.22	0.29 / 0.29		
Common to all models	Single phase, 2P, Built-in thermal protection					

MODEL CODE

〈Model code example〉 With Fan motor ASSY

ATL – 13A – 03 – B M 2
❶ ❷ ❸

Code	Radiator size
13A	13stages
14A	14stages
16A	16stages

Code	Connection diameter
03	Rc 3/8

Code	Fan motor
❶ Wiring type	
A	DIN connector
B	Lead wire

❷ Protection type☆	
M	Unguarded
P	Dustproof・Waterproof

❸ Voltage☆	
1	100V
2	200V

☆ Since price and delivery are different for Dustproof・Waterproof spec, please ask us.
☆ Different voltage is available (special specification). Please ask us for details.

〈Model code example〉 Single radiator

R – 13A – 03

Code	Radiator size
13A	13stages
14A	14stages
16A	16stages

Code	Connection diameter
03	Rc 3/8

＊1 Please do not use in a hydraulic circuit with repeated pressure fluctuation. ＊2 Please ask us in advance if you use in an environment with oil mists
＊3 Please be sure that using fluid is not aluminum corrosive
＊4 Noise value of fan motor only (from manufacturer's catalog). It is not from cooler assembly.

PERFORMANCE GRAPH

■ Condition

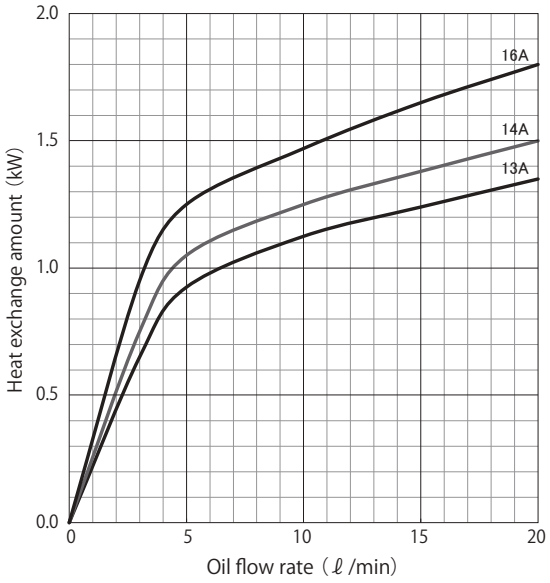
Fluid type		Corresponding to ISO VG32
Oil inlet temperature	℃	Room temperature +30℃
Temp. of Pressure drop measurement	℃	55
Power frequency	Hz	50

■ Allowable flow rate

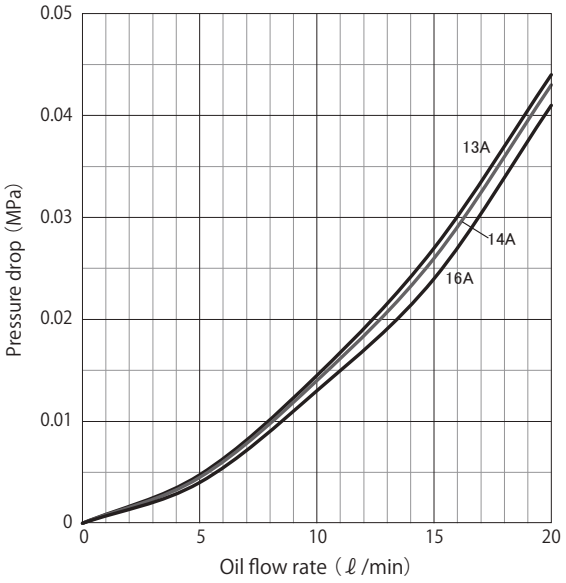
Model code	ATL-13A-03	ATL-14A-03	ATL-16A-03
Frow rate ℓ/min	～20	～20	～20

★ It is max value and It depends on each working condition.

ATL-13A,14A,16A heat exchange amount



ATL-13A,14A,16A pressure drop

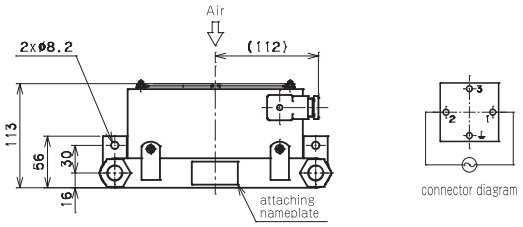


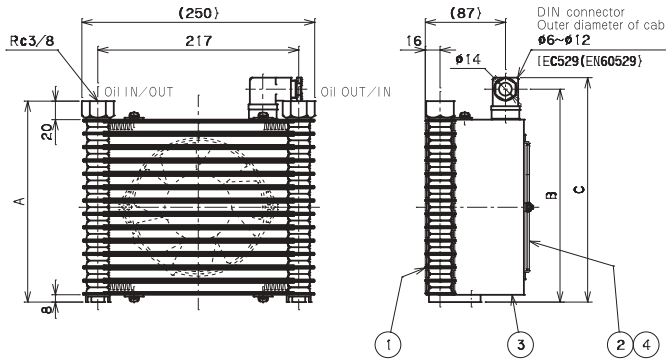
CROSS SECTION • PARTS LIST

ATL-13A,14A,16A-03-A□□

A : DIN connector

Unit : mm



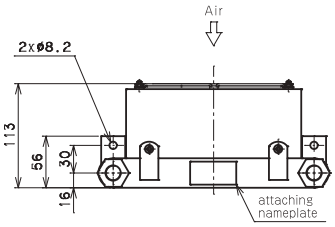


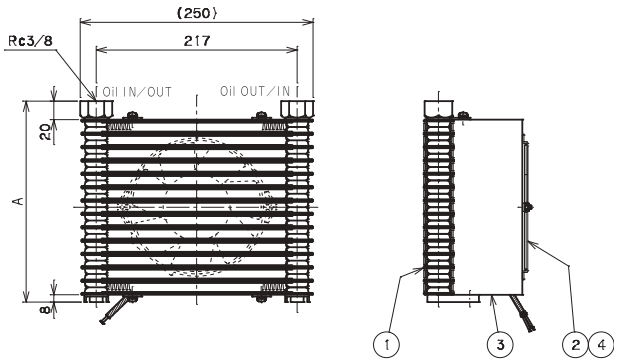
Model code	Length		
	A	B	C
ATL-13A-03-A□□	204	216	228
ATL-13A-03-B□□			
ATL-14A-03-A□□	218	231	243
ATL-14A-03-B□□			
ATL-16A-03-A□□	248	262	274
ATL-16A-03-B□□			

No.	Item	Qty
1	Radiator	1
2	Fan motor	1
3	Support	1
4	Fan guard	1
5	Connector	1

ATL-13A,14A,16A-03-B□□

B : Lead wire

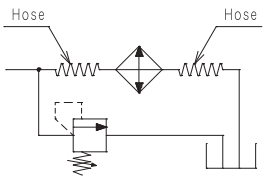




〈About pressure surge〉

Allowable pressure fluctuation range is within 0.3MPa when using in a hydraulic circuit with repeated pressure fluctuation. Please do not install a component (filter or relief valve) after oil cooler in hydraulic circuit. Since our air-cooled type oil cooler (ATL, ATK, ATS, ATF) is aluminum radiator and it expands greatly, fluctuating pressure and vibration may cause breakdown of product. Moreover, please be sure that there is no rapid change of oil level in tank.

■ Recommended piping ex.



ATK model

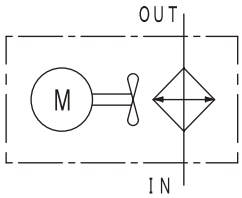
Air-Cooled type Compact Oil Cooler
Plate fin type
Heat exchange amount: ~2.1kW

Standard Model of Air-Cooled type Oil Cooler

Characteristics

- Light weight aluminum radiator
- Electric connection is selectable from DIN connector and lead wire
- Power connection is selectable from DIN connector and cable
- Fan motor is selectable from single phase AC 100V and 200V
- Other special specification is available: Different AC voltage or DC motor

※ Shape and each specification are different with standard model.



Air-cooled type cooler

SPECIFICATION

Max working pressure *1		MPa	1.0
Max working temperature	Inside of tube	℃	100
	Outside of tube	℃	60
Ambient conditions	Temperature	℃	-10~60
	Relative humidity	%	RH35~85
	Place of installation		Indoor *2
Fluid type			Mineral oil、Water glycol fluid *3

Model code			1552FA	2032FA	2432FA
Material	Radiator		Aluminum		
	Support		Steel plate		
Coating	Radiator		Black		
	Fan motor・Support		Black		
	Fan guard		Plating		
Weight (With connector)		kg	3.3(3.4)	3.2(3.3)	5.7(5.9)

Model code	Frequency (Hz)	Rated voltage (V)	Rated current (A)	Maximum load current (A)	Sound level *4 (dB)	Standard
ATK-□□□□FA-□□-1	50 / 60	100	0.52 / 0.44	0.61 / 0.51	56 / 58	UL・TUV
ATK-□□□□FA-□□-2		200	0.26 / 0.22	0.3 / 0.27		
ATK-□□□□FA-□□-15		115	0.36 / 0.3	0.42 / 0.41		
ATK-□□□□FA-□□-12		120	0.45 / 0.37	0.52 / 0.5		
ATK-□□□□FA-□□-22		220	0.23 / 0.19	0.27 / 0.23		
ATK-□□□□FA-□□-23		230	0.21 / 0.17	0.25 / 0.22		
Common to all models	Single phase, 2P, Built-in thermal protection					

MODEL CODE

〈Model code example〉

ATK — 2032FA — 03 — A — 2

Code	Heat transfer area
1552FA	1.18㎡
2032FA	1.21㎡
2432FA	2.36㎡

Code	Connection diameter
02	Rc 1/4
04	Rc 1/2
03	Rc 3/8
04	Rc 1/2
03	Rc 3/8

Code	Connector
Blank	Non
A	Connector

Code	Fan motor voltage	
1	100V	Standard
2	200V	
15	115V	Special specification ☆
12	120V	
22	220V	
23	230V	

☆ Since price and lead time of different voltage type (special specification) are different with standard type, please ask us.

＊1 Allowable pressure fluctuation range is within 0.3MPa when using in a hydraulic circuit with repeated pressure fluctuation.
＊2 Please ask us in advance if you use in an environment with oil mists ＊3 Please be sure that using fluid is not aluminum corrosive
＊4 Noise value of fan motor only (from manufacturer's catalog). It is not from cooler assembly.

PERFORMANCE GRAPH

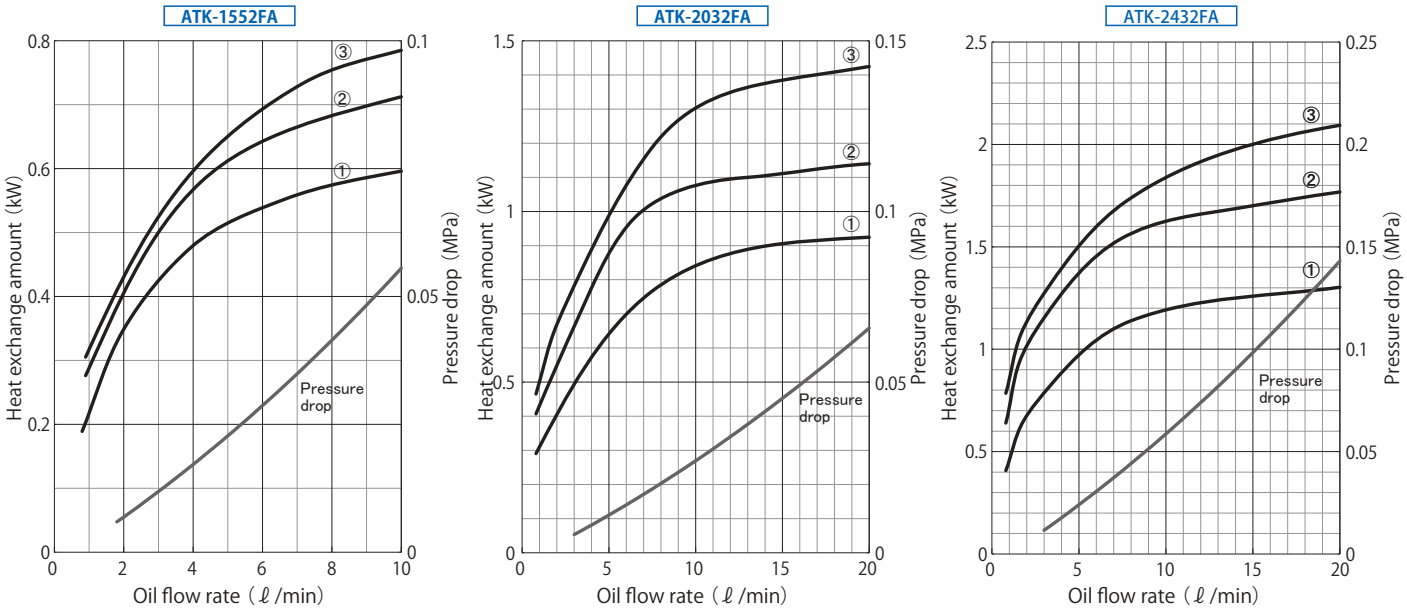
■ Condition

Fluid type		Corresponding to ISO VG32
Oil inlet temperature	℃	①Room temperature +20℃ ②Room temperature +30℃ ③Room temperature +35℃
Temp. of Pressure drop measurement	℃	55
Power frequency	Hz	50

■ Allowable flow rate

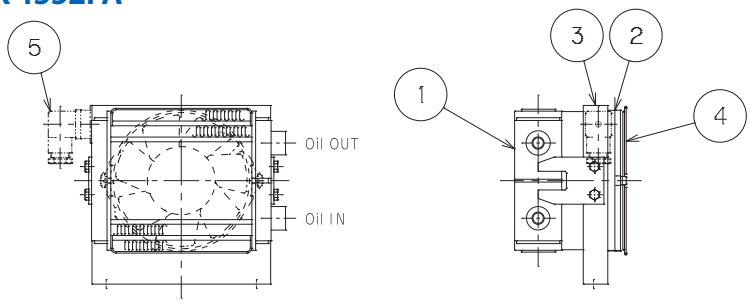
Model code	ATK-1552FA	ATK-2032FA	ATK-2432FA
Frow rate ℓ/min	～10	～20	～20

★ It is max value and It depends on each working condition.

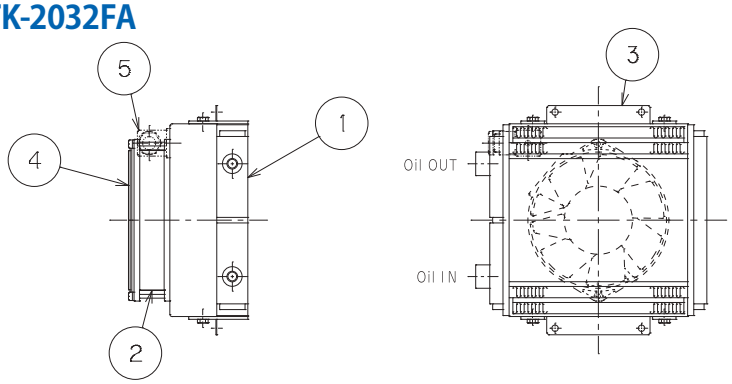


CROSS SECTION

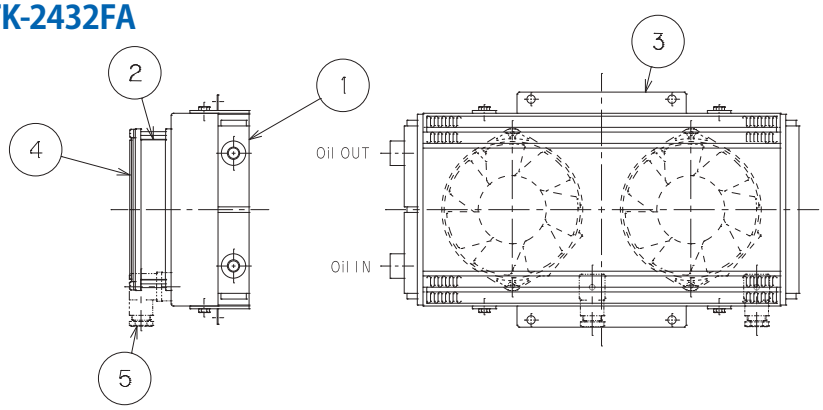
ATK-1552FA



ATK-2032FA



ATK-2432FA



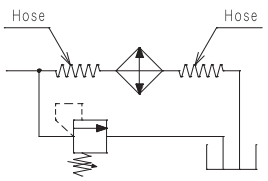
PARTS LIST

No.	Item		Qty
1	Radiator		1
2	Fan motor	1552FA,2032FA	1
		2432FA	2
3	Support		1
4	Fan guard	1552FA,2032FA	1
		2432FA	2
5	Connector	1552FA,2032FA	1
		2432FA	2

〈About pressure surge〉

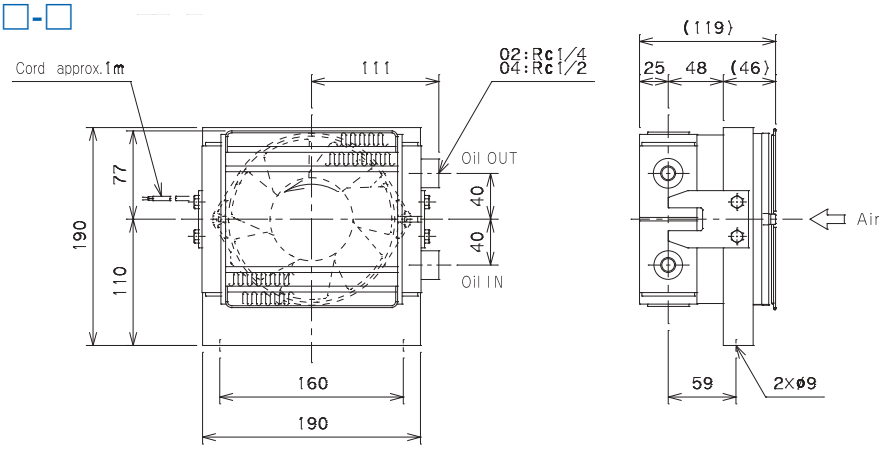
Allowable pressure fluctuation range is within 0.3MPa when using in a hydraulic circuit with repeated pressure fluctuation. Please do not install a component (filter or relief valve) after oil cooler in hydraulic circuit. Since our air-cooled type oil cooler (ATL, ATK, ATS, ATF) is aluminum radiator and it expands greatly, fluctuating pressure and vibration may cause breakdown of product. Moreover, please be sure that there is no rapid change of oil level in tank.

■ Recommended piping ex.

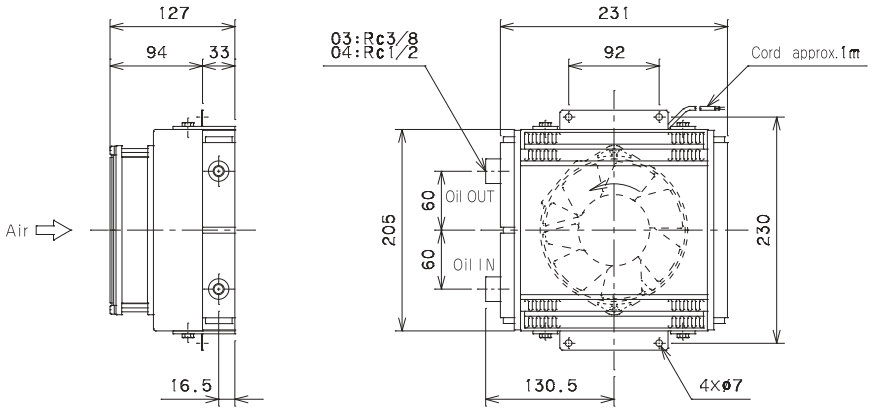


Unit : mm

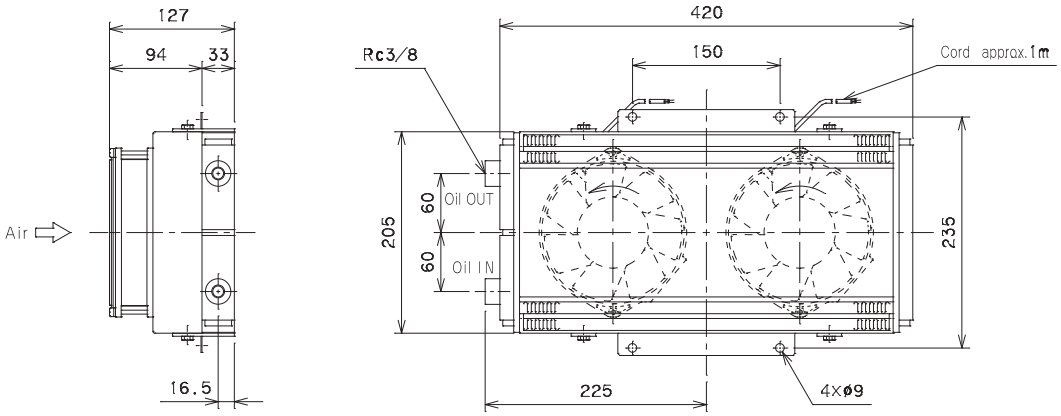
ATK-1552FA-□□-□



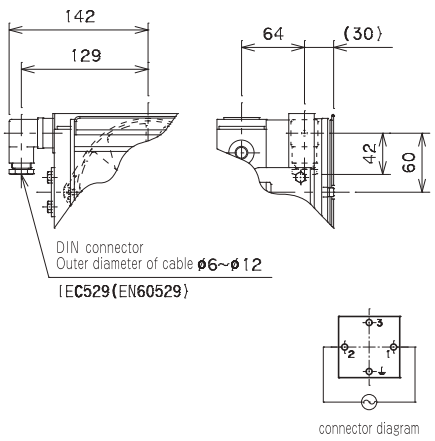
ATK-2032FA-□□-□



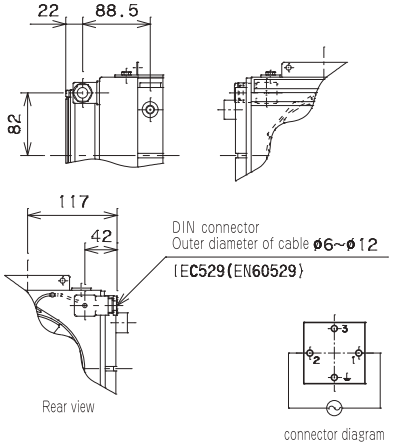
ATK-2432FA-□□-□



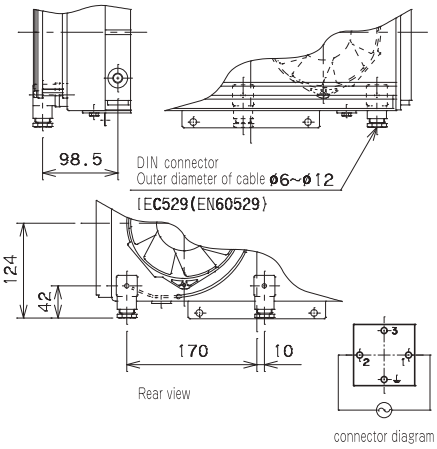
ATK-1552FA-□□-A□ A : With connector



ATK-2032FA-□□-A□ A : With connector



ATK-2432FA-□□-A□ A : With connector



ATK

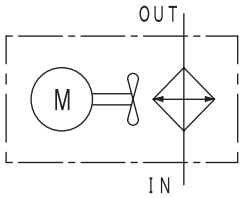
ATS model

Air-Cooled type Middle/Large-sized Oil Cooler
Plate fin type
Heat exchange amount: ~ 83.9kW

Air-Cooled type Oil Cooler with various line-up

Characteristics

- Various sizes suitable for application from hydraulic power units to large lubrication machines
- Various installation types are available: Horizontal, Vertical, and Built-in
- Fan motor is selectable from 3 phase AC 300V class and 400V class
- 2 pass model is available for small oil flow rate (ATS-30, 35, 40 only)



Air-cooled type cooler

SPECIFICATION

Max working pressure *2		MPa	1.0
Max working temperature	Inside of tube	℃	150
	Outside of tube	℃	50
Ambient conditions	Temperature	℃	ATS-30~40: -10~50
			ATS-70~100: -30~50
	Relative humidity	%	≦RH90
	Place of installation		Indoor *3
Fluid type			Mineral oil、Water glycol fluid *4
Material	Radiator		Aluminum
	Case・Guard		Steel plate

Model code		306□-H	356□-H	406□-H	306□-V	356□-V	406□-V
Coating	Radiator	Black					
	Fan motor	Ivory					
	Case、Guard	Ivory					
Weight	kg	16	21	28	17	22	30

Model code		70101A-H	70101A-V	80101A-H	100101A-H
Coating	Radiator	Black			
	Fan motor	Ivory			
	Case、Guard	Ivory			
Weight	kg	113	113	140	240

Model code		Frequency (Hz)	Rated voltage (V)	Rated current (A)	Rated power (W)	Sound level *5 (dB)
ATS-306□	200V class	50 / 60	200~220	0.21~0.23 / 0.20~0.21	25	38.5 / 41.5
ATS-306□	400V class		380-400-415 / 380-400-440	0.10-0.10-0.104 / 0.094-0.10-0.10		
ATS-356□	200V class		200~220	0.33~0.37 / 0.29~0.31	50	43.0 / 46.0
ATS-356□	400V class		380-400-415 / 380-400-440	0.16-0.17-0.18 / 0.14-0.15-0.15		
ATS-406□	200V class		200~220	0.63~0.75 / 0.52~0.56	100	47.0 / 51.0
ATS-406□	400V class		380-400-415 / 380-400-440	0.29-0.32-0.33 / 0.25-0.26-0.28		
ATS-70101A	200V class		200~220	1.55~1.65 / 1.90~1.88	750	49.5 / 53.5
ATS-70101A	400V class		380-400-415 / 400~440	0.78-0.80-0.82 / 0.91~0.91		
ATS-80101A	200V class		200 / 200~220	5.60 / 5.30~5.50	1500	64.5 / 68.0
ATS-80101A	400V class		380-400-415 / 400~440	2.60-2.80-2.90 / 2.70~2.80		
ATS-100101A	200V class		200 / 200~220	5.80 / 6.30~6.30	2200	69.0 / 73.0
ATS-100101A	400V class		380-400-415 / 400~440	2.80-2.90-3.00 / 3.15~3.00		
Common to all models		Three phase, 4P, Built-in thermal protection (except 400V class and ATS-80101A/100101A), UL・TUV standard and other special spec are available				

MODEL CODE

〈Model code example〉

ATS – 3062 –

Code	Heat transfer area	Pass number
3061	2.9㎡	1
3062		2
3561	4.5㎡	1
3562		2
4061	6.8㎡	1
4062		2

Code	Heat transfer area	Pass number
70101A	32.8㎡	1
80101A	41.5㎡	1
100101A	66.5㎡	1

〈ATS-30,35,40〉

M – ① ② ③ ④

〈ATS-70〉

– ① R G ④

〈ATS-80,100〉

– H – G ④

①Code	Installation type
H	Horizontal stand
V	Vertical stand
N*6	No stand

②Code	Radiator guard
R	Radiator guard
N	Non

③Code	Fan guard
G	Fan guard
N	Non

④Code	Motor voltage
2	200V class
4	400V class

★ ATS-70, 80, 100 : Radiator and fan guard are included in standard equipment.

＊1 Only horizontal installation type for ATS-80, 100. ＊2 Allowable pressure fluctuation range is within 0.3MPa when using in a hydraulic circuit with repeated pressure fluctuation. ＊3 Please ask us in advance if you use in an environment with oil mists ＊4 Please be sure that using fluid is not aluminum corrosive ＊5 Noise value of fan motor only (from manufacturer's catalog). It is not from cooler assembly. ＊6 Only for ATS-30, 35, 40.

PERFORMANCE GRAPH

■ Condition

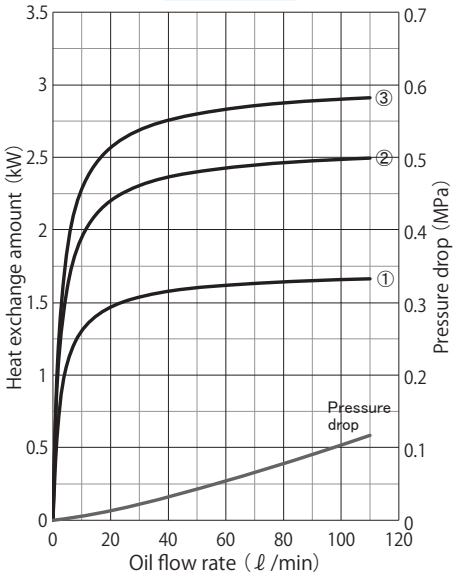
Fluid type		Corresponding to ISO VG32
Oil inlet temperature	℃	①Room temperature +20℃ ②Room temperature +30℃ ③Room temperature +35℃
Temp. of Pressure drop measurement	℃	55
Power frequency	Hz	50

■ Allowable flow rate

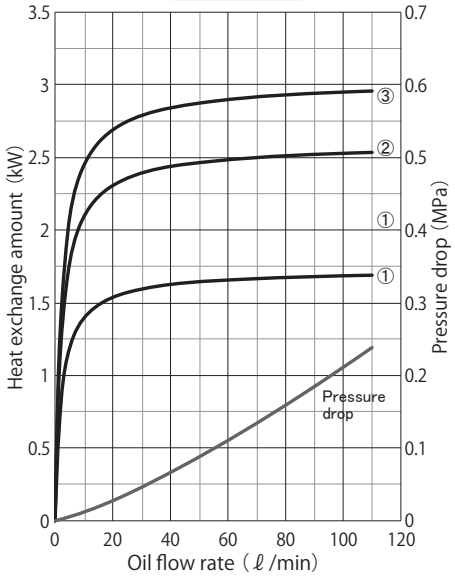
Model code	ATS-306□	ATS-356□	ATS-406□	ATS-70101A	ATS-80101A	ATS-100101A
Frow rate ℓ/min	～110	～160	～230	～350	～350	～350

★ It is max value and It depends on each working condition.

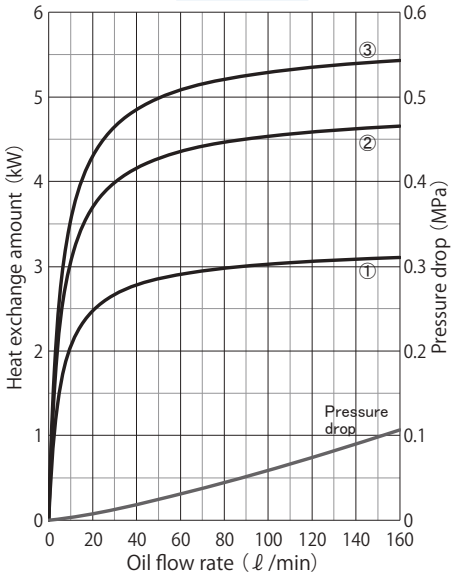
ATS-3061



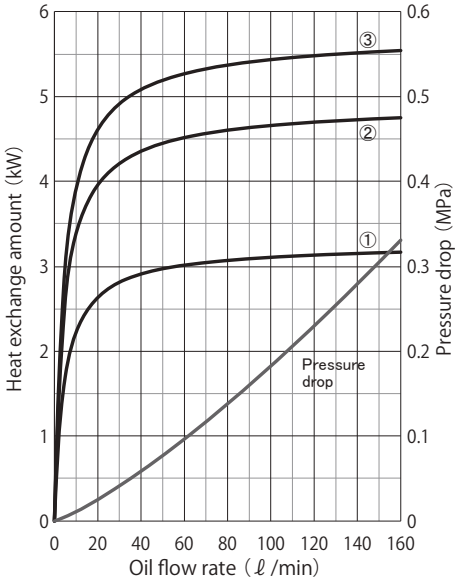
ATS-3062



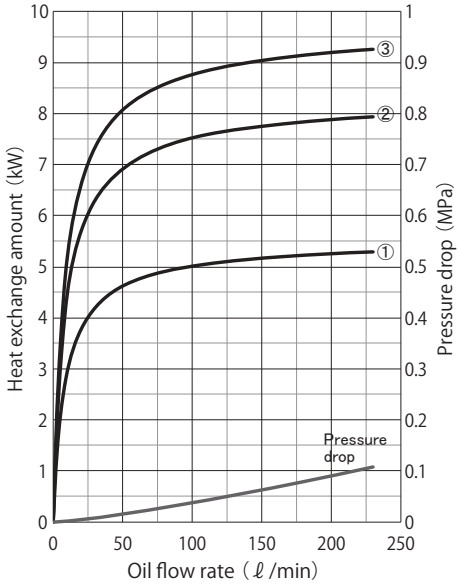
ATS-3561



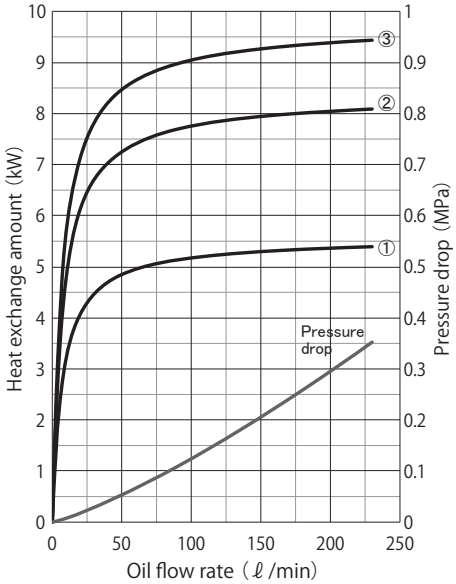
ATS-3562



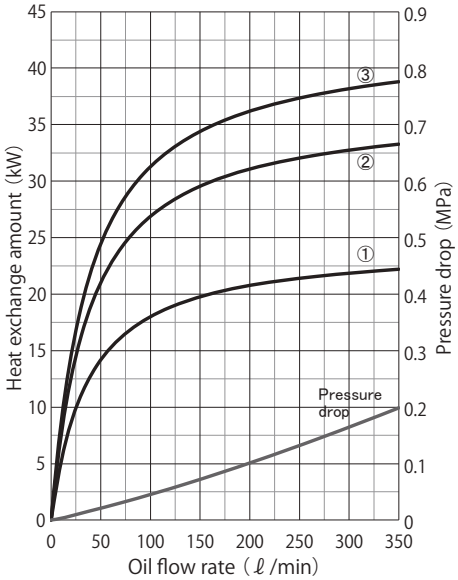
ATS-4061



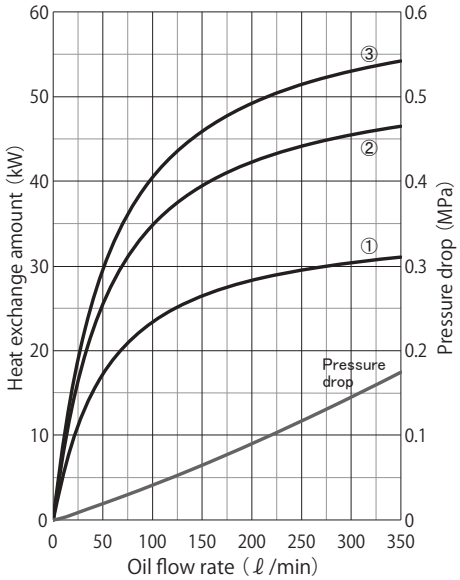
ATS-4062



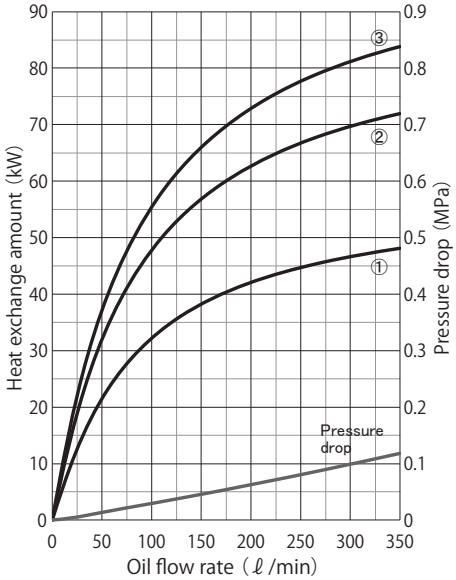
ATS-70101A



ATS-80101A

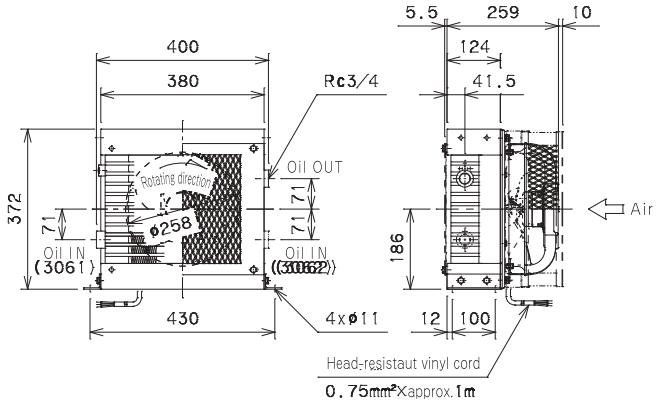


ATS-100101A



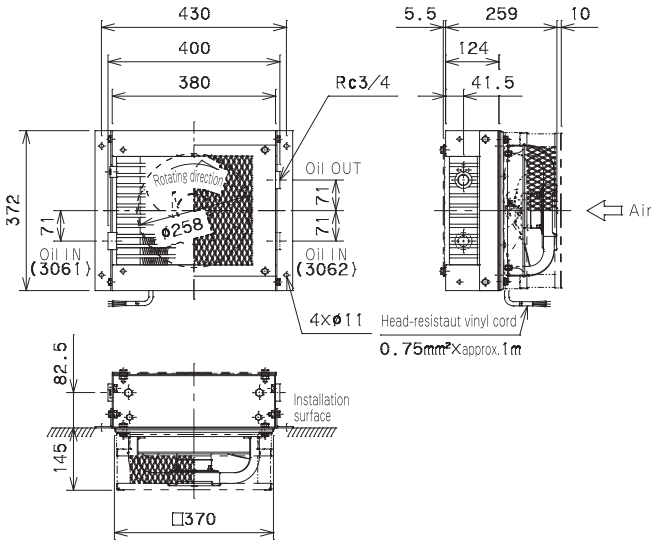
ATS

ATS-306□-MH□□□



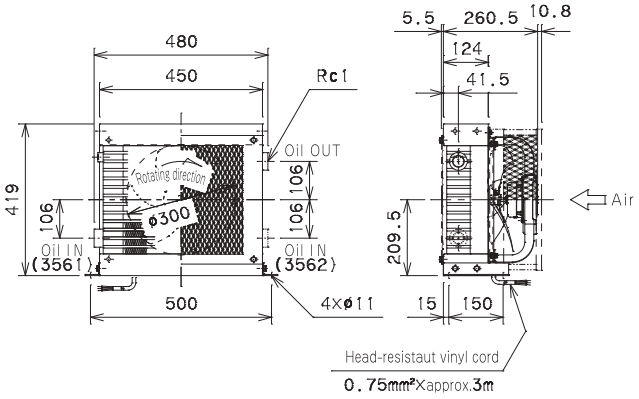
ATS-306□-MV□□□

Unit：mm

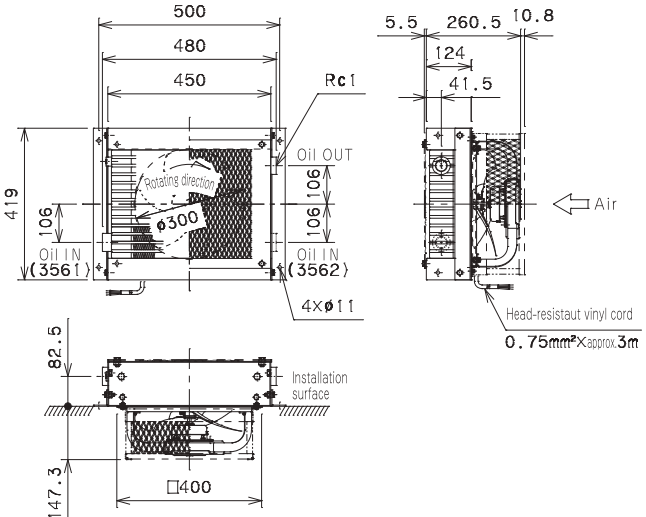


※ Opening size of installation surface should be larger than □370mm.

ATS-356□-MH□□□

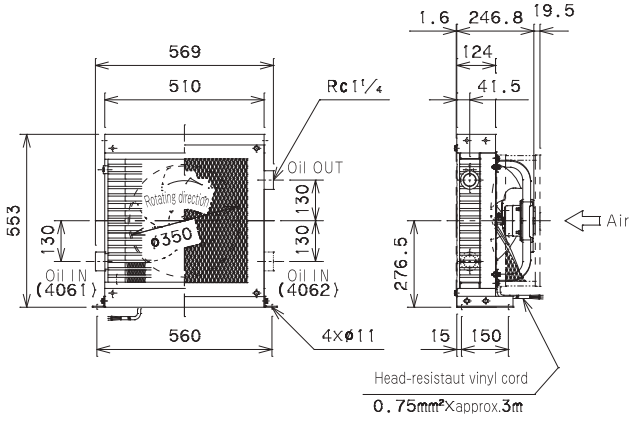


ATS-356□-MV□□□

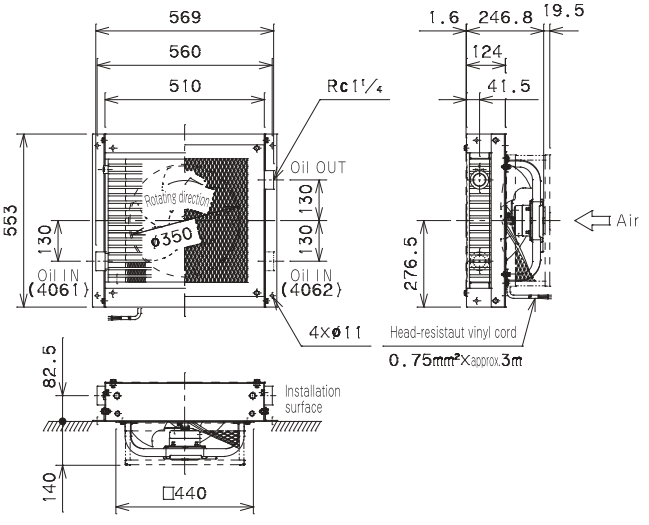


※ Opening size of installation surface should be larger than □400mm.

ATS-406□-MH□□□

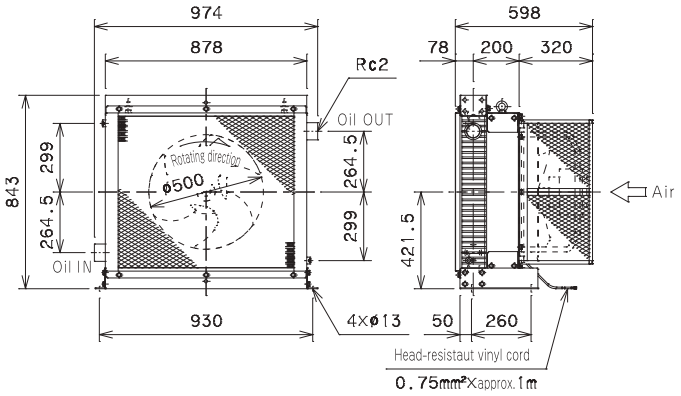


ATS-406□-MV□□□



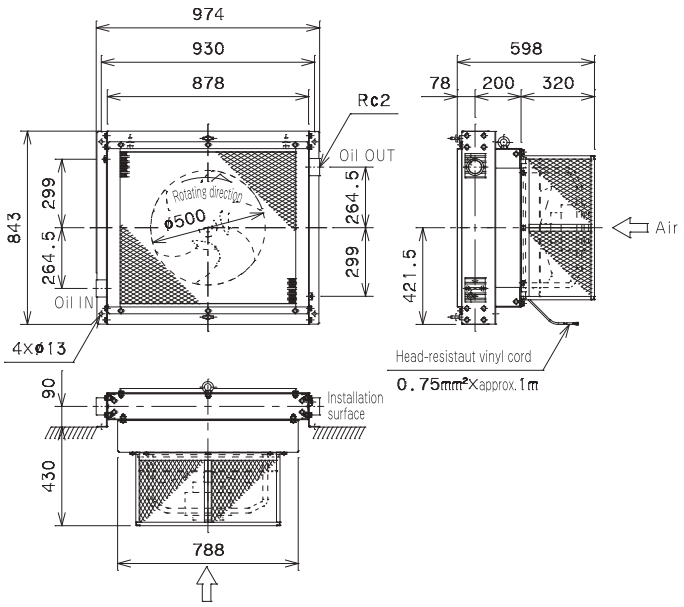
※ Opening size of installation surface should be larger than □440mm.

ATS-70101A-HRG□

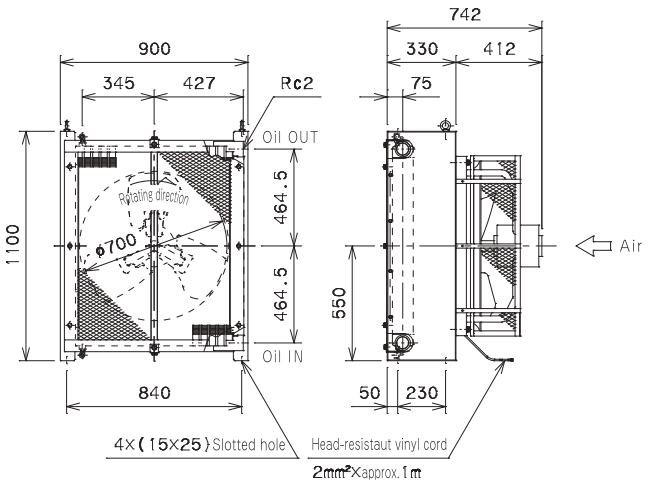


ATS-70101A-VRG□

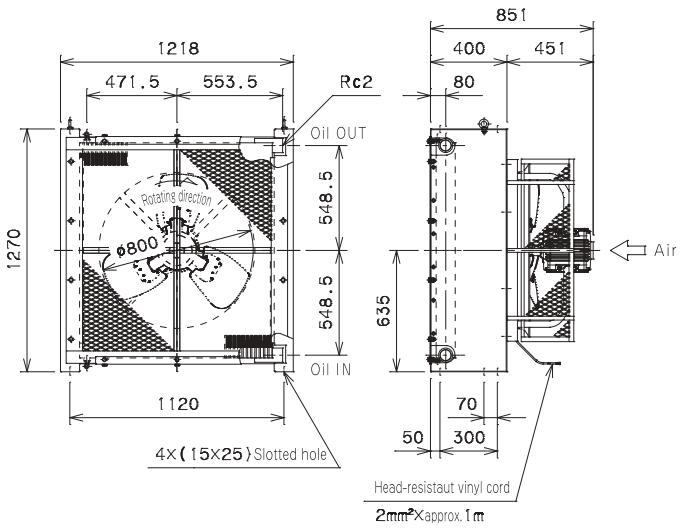
Unit : mm



ATS-80101A-H-G□



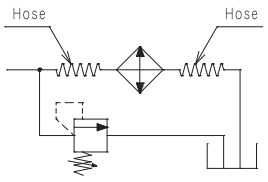
ATS-100101A-H-G□



〈About pressure surge〉

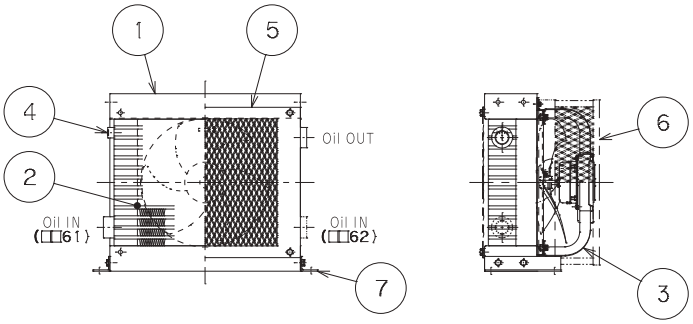
Allowable pressure fluctuation range is within 0.3MPa when using in a hydraulic circuit with repeated pressure fluctuation. Please do not install a component (filter or relief valve) after oil cooler in hydraulic circuit. Since our air-cooled type oil cooler (ATL, ATK, ATS, ATF) is aluminum radiator and it expands greatly, fluctuating pressure and vibration may cause breakdown of product. Moreover, please be sure that there is no rapid change of oil level in tank.

■ Recommended piping ex.



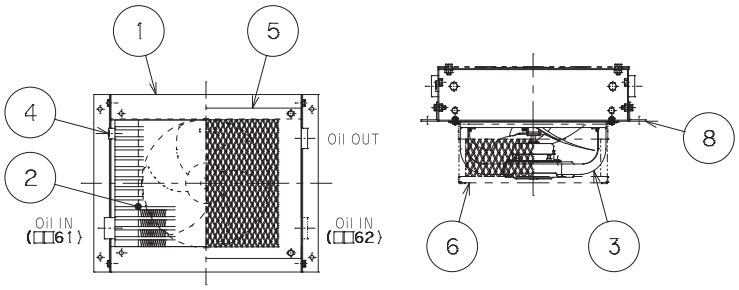
ATS-306□,356□,406□-M□□□□

H model



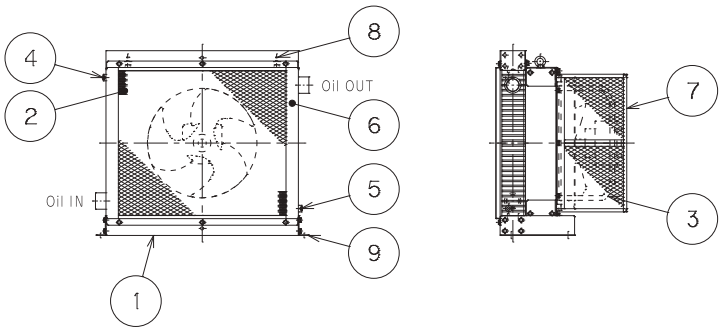
No.	Item		Qty
1	Case		1
2	Radiator		1
3	Fan motor		1
4	Air vent valve		1
5	Radiator guard		1
6	Fan guard		1
7	Horizontal stand	H model	2
8	Vertical stand	V model	2

V model



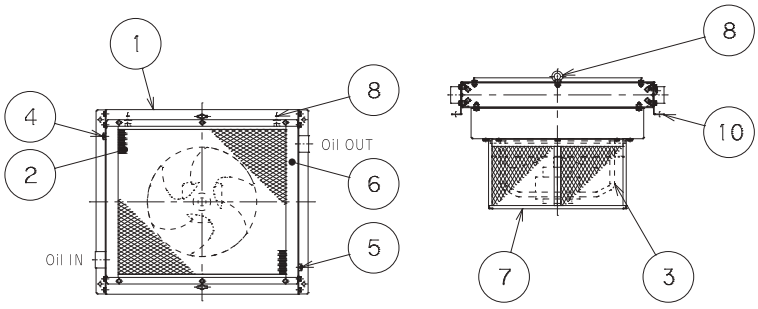
ATS-70101A-□□□□

H model

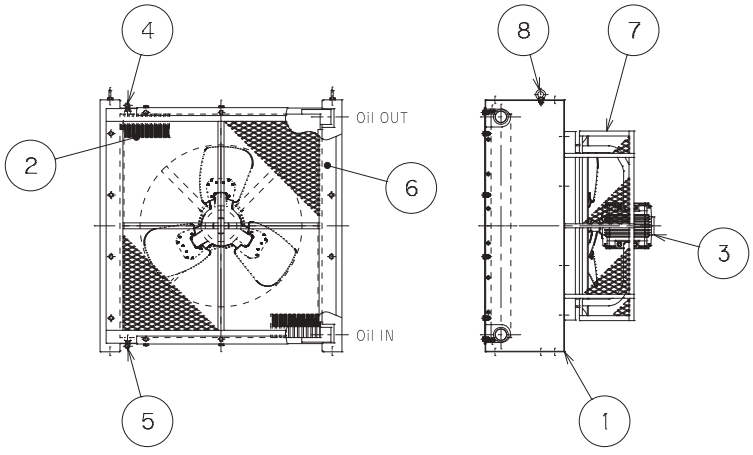


No.	Item		Qty
1	Case		1
2	Radiator		1
3	Fan motor		1
4	Air vent valve		1
5	Drain plug		1
6	Radiator guard		1
7	Fan guard		1
8	Eye bolt	H model	2
8		V model	4
9	Horizontal stand	H model	2
10	Vertical stand	V model	2

V model



ATS-80101A,100101A-H-G□

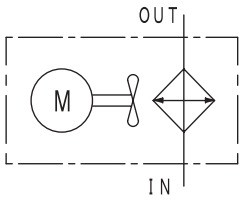


No.	Item	Qty
1	Case	1
2	Radiator	1
3	Fan motor	1
4	Air vent valve	1
5	Drain plug	1
6	Radiator guard	1
7	Fan guard	1
8	Eye bolt	2

Box shaped Air-Cooled type Oil Cooler

Characteristics

- Radiator and fan motor are fully covered by case (H1, V1 model)
- Fan guard is selectable instead of case as an option (HS1, VS1 model)
- Fan motor is selectable from 3 phase AC 300V class and 400V class
- Various installation types are available: Horizontal, Vertical, and Built-in



Air-cooled type cooler

SPECIFICATION

Max working pressure *1		MPa	1.0
Max working temperature	Inside of tube	℃	150
	Outside of tube	℃	50
Ambient conditions	Temperature	℃	-10~50
	Relative humidity	%	≦RH90
	Place of installation		Indoor *2
Fluid type			Mineral oil、Water glycol fluid *3

Model code		5061A		6061A		5061A		6061A	
		H1	HS1	H1	HS1	V1	VS1	V1	VS1
Material	Radiator	Aluminum							
	Case・Guard	Steel plate							
Coating	Radiator	Black							
	Case	Ivory							
	Fan motor	Ivory							
Weight (With Fan guard) kg		44	42(44)	62	53(56)	49	31(33)	77	47(50)

Model code		Frequency (Hz)	Rated voltage (V)	Rated current (A)	Rated power (W)	Sound level *4 (dB)
ATF-5061A	200V class	50 / 60	200~220	1.1~1.3 / 0.91~0.99	200	53.5 / 57.3
ATF-5061A	400V class		380-400-415 / 400~440	0.52-0.55-0.58 / 0.46~0.50		
ATF-6061A	200V class		200~220	1.8~2.1 / 1.7~1.8	400	58.0 / 61.5
ATF-6061A	400V class		380-400-415 / 400~440	0.85-0.90-0.98 / 0.85~0.88		
Common to all models		Three phase, 4P, Built-in thermal protection(except 400V class), UL・TUV standard and other special spec are available				

MODEL CODE

〈Model code example〉

ATF – 5061A – HS1 – G – 2

Code	Heat transfer area
5061A	10.2㎡
6061A	14.2㎡

Code	Installation type
H1	Horizontal with case
HS1	Horizontal without case
V1	Vertical with case
VS1	Vertical without case

Code	Fan guard	
G	Fan guard	For HS1 VS1
Blank	Non	

Code	Motor voltage
2	200V class
4	400V class

★ Fan guard is available only when selecting HS1, VS1 model (without case)
★ Fan guard is for blade protection simply. To prevent injury and accident, please select "with case (H1, V1)" for installation type.
★ AC 200V class fan motor is standard specification. Since price and lead time of AC400V class (special specification) are different with standard type, please ask us.

＊1 Allowable pressure fluctuation range is within 0.3MPa when using in a hydraulic circuit with repeated pressure fluctuation.
＊2 Please ask us in advance if you use in an environment with oil mists ＊3 Please be sure that using fluid is not aluminum corrosive
＊4 Noise value of fan motor only (from manufacturer's catalog). It is not from cooler assembly.

PERFORMANCE GRAPH

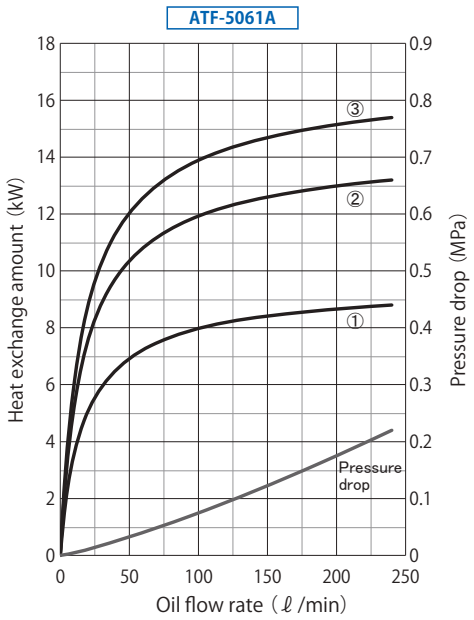
■ Condition

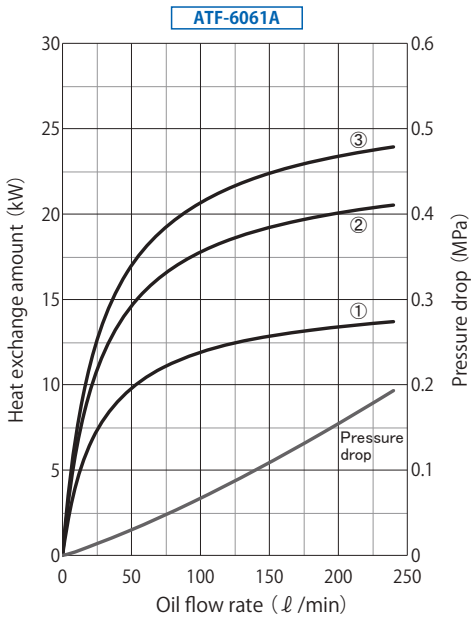
Fluid type		Corresponding to ISO VG32
Oil inlet temperature	℃	①Room temperature +20℃ ②Room temperature +30℃ ③Room temperature +35℃
Temp. of Pressure drop measurement	℃	55
Power frequency	Hz	50

■ Allowable flow rate

Model code		ATF-5061A	ATF-6061A
Frow rate	ℓ/min	～240	～240

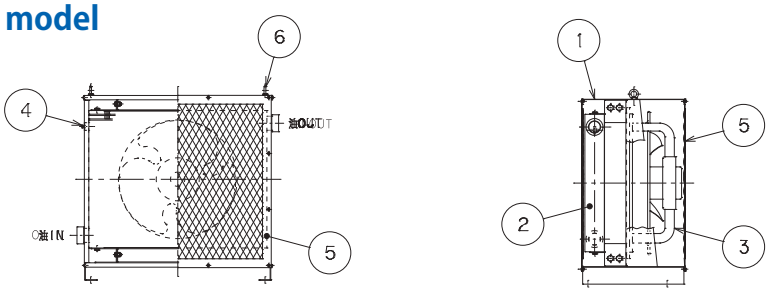
★ It is max value and It depends on each working condition.



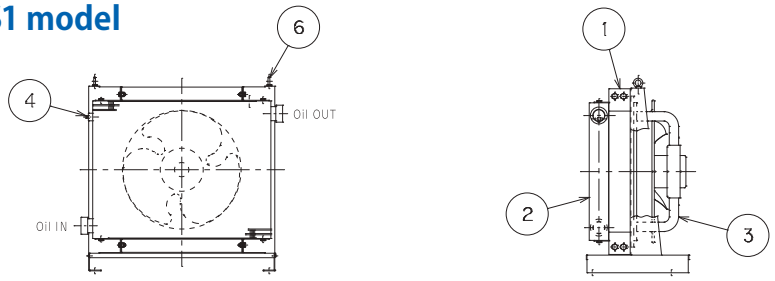


CROSS SECTION

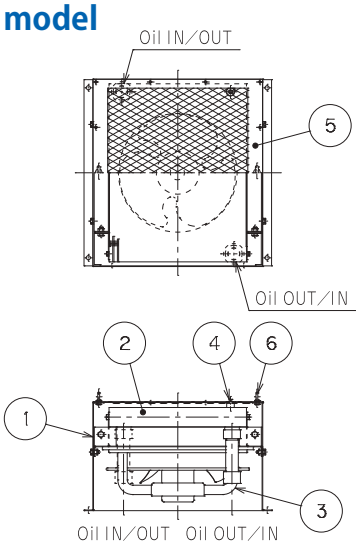
H1 model



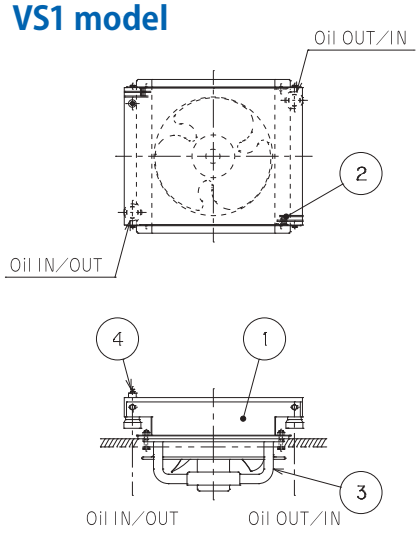
HS1 model



V1 model



VS1 model



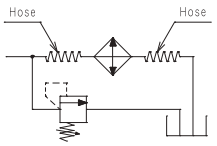
PARTS LIST

No.	Item		Qty
1	Case		1
2	Radiator		1
3	Fan motor		1
4	Air vent valve		1
5	Guard net	H1	2
		V1	1
6	Eye bolt		2

〈About pressure surge〉

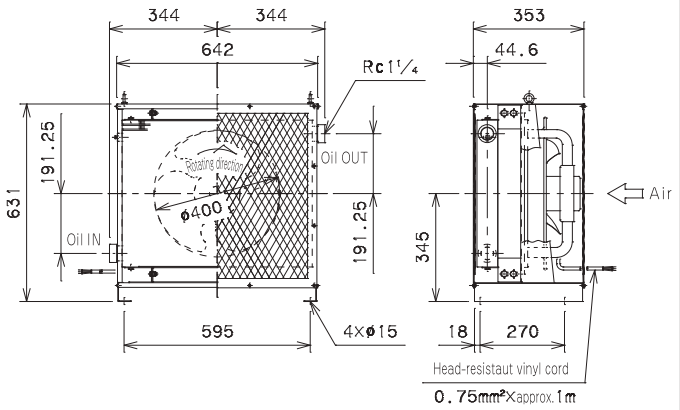
Allowable pressure fluctuation range is within 0.3MPa when using in a hydraulic circuit with repeated pressure fluctuation. Please do not install a component (filter or relief valve) after oil cooler in hydraulic circuit. Since our air-cooled type oil cooler (ATL, ATK, ATS, ATF) is aluminum radiator and it expands greatly, fluctuating pressure and vibration may cause breakdown of product. Moreover, please be sure that there is no rapid change of oil level in tank.

■ Recommended piping ex.

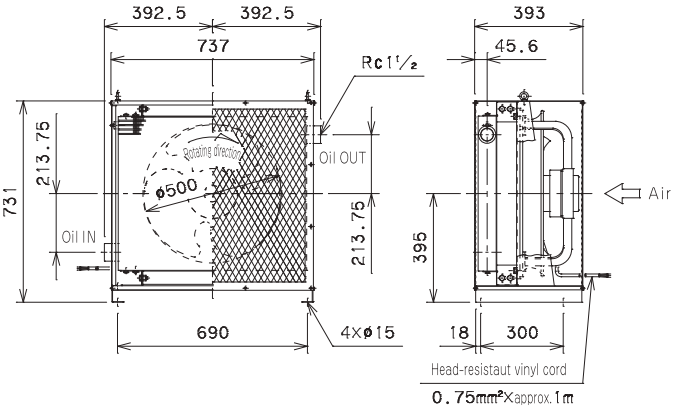


Unit : mm

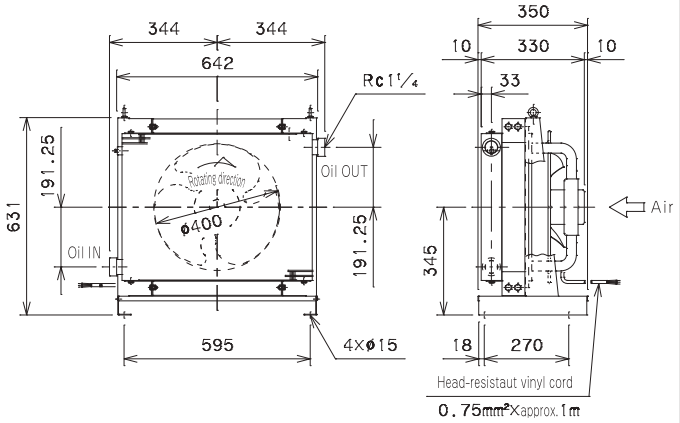
ATF-5061A-H1-□



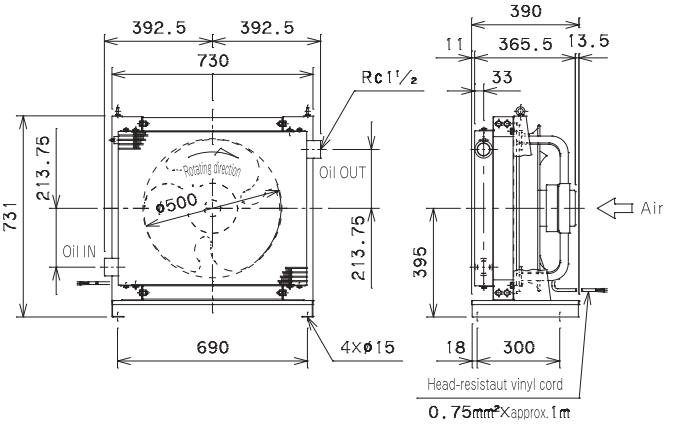
ATF-6061A-H1-□



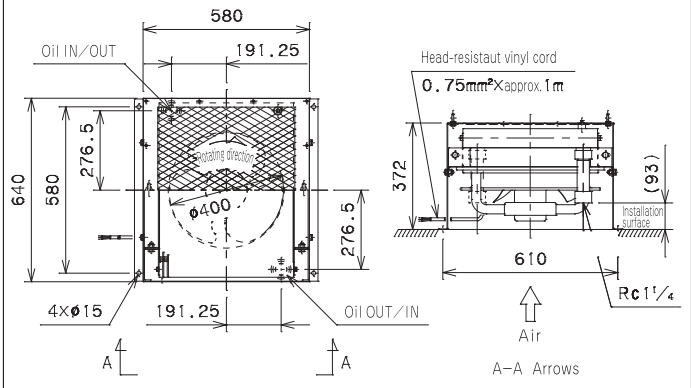
ATF-5061A-HS1-□



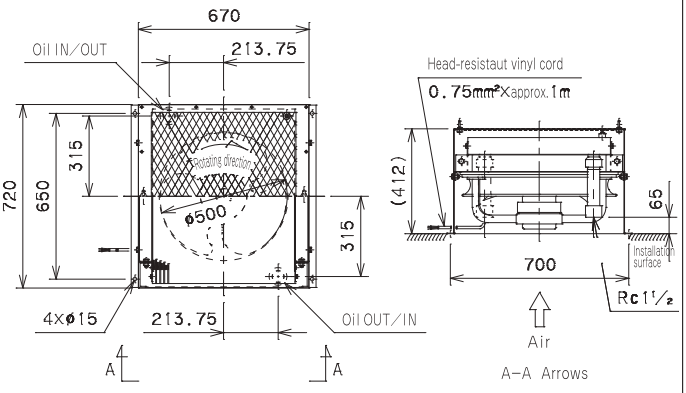
ATF-6061A-HS1-□



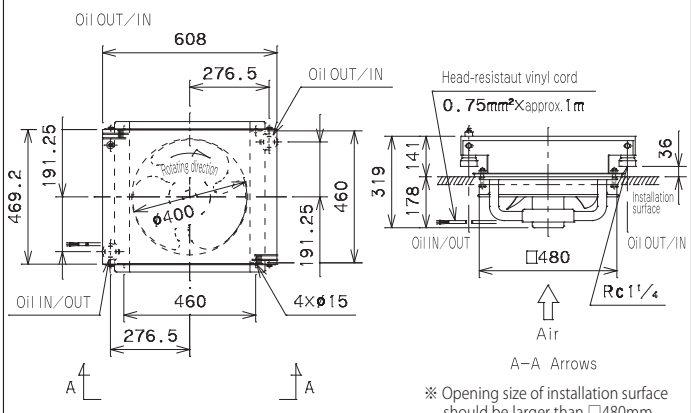
ATF-5061A-V1-□



ATF-6061A-V1-□

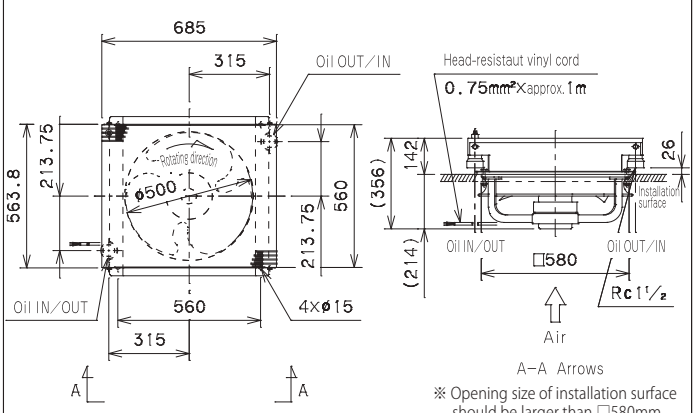


ATF-5061A-VS1-□



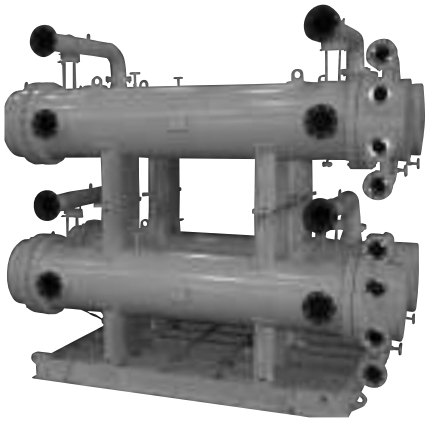
※ Opening size of installation surface should be larger than □480mm.

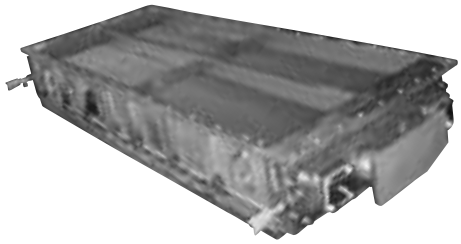
ATF-6061A-VS1-□



※ Opening size of installation surface should be larger than □580mm.

Specialty Products





TAISEI heat exchangers are applicable to not only general machinery industry but also severe requirements for public utilities, power plants, shipbuilding, and so on.
We are proud of our reliable delivery records in various fields.

We are able to manufacture custom-made product of various dimensions, materials, and regulations other than standard products on the catalog.
Please confirm the following "Manufacturable Specification" and contact us at any time.

Water-Cooled Shell and Tube type Heat Exchanger

Item		Manufacturable Specification
Type		Fixed tube sheet, Floating tube sheet, Floating head, U-tube
Use		Cooler, Heater
Shell diameter		2B – 34B (φ60.5 – φ863.6)
Weight		~5 ton
Length of cooling tube		~4,500mm
Type of cooling tube		Bare, Low Fin, Inner Fin
Max working pressure		~5.0MPa
Max working temperature		~350℃
Material	Shell	JIS standard (except titan canning) and Catalog standard material
	Tube	C4430T, C7060T, C7150T, STB340SC, SUS316(L), SUS329J4L, 2 kinds of titan, and catalog standard material
Fluid type	Shell side	Mineral oil, Synthetic oil, Fire resistant fluid, Fuel oil, Sealing fluid, Air, Standard gas, Mixed gas, and other
	Tube side	Fresh water, Seawater, Sealing fluid, Air, Standard gas, Mixed gas, and other
Regulation		ASME Section VIII Division I (U-1 STAMP), TEMA Class-R/C/B (Conform), API614 (Conform), JIS B8265/JIS B8249 (Conform)
Structure standards		Class-2 pressure vessel, Small-sized pressure vessel (Standards by Industrial Safety and Health Act)
Ship class		NK (Authorization), JG (Authorization), CCS, ABS, LR, KR, BV, BKI, RINA, CR, DNV-GL
Inspection		DOSH (for Malaysia) / MOM (for Singapore) Shipping inspection
Other		Horizontal two-stage type, Vertical two-cylinder type, With sequential three-way switching valve

Air-Cooled type Heat Exchanger

Item		Manufacturable Specification
Type		Plate fin type (standard radiator), Tube type (special)
Use		Cooler, Heater
Weight		~5 ton
Max working pressure	Plate fin type	~1.0 MPa
	Tube type	~2.0 MPa
Max working temperature	Plate fin type	~150℃
	Tube type	~180 ℃
Material	Plate fin type	Aluminum
	Tube type	Copper tube, Copper alloy tube, Copper fin, Aluminum fin
Fluid type	Plate fin type	Mineral oil, Synthetic oil, Fuel oil
	Tube type	Mineral oil, Synthetic oil, Fire resistant fluid, Fuel oil, Fresh water, Seawater
Motor		AC/DC motor, Explosion-proof motor, Standardized motor, Hydraulic motor
Other		Outdoor/Drip-proof type, Different voltage type

＊ Some cases may not be available depending on operating condition or combination of each item.

Web site Introduction

We provide various information and services on our web site other than described in the catalog.
Please access our web site below at first when you consider about oil filter or heat exchanger.

TAISEI Web Site

taiseikogyo 検索

What you can do on our web site:

- Browsing information about products, support, company profile, and so on
- Download of drawings, instruction manuals, and CAD data
- Check latest notification
- Request of product selection (through the internet)
- Other inquiries (e-mail)
- Find distributor in your country*2

Product Information Page

Not only confirmation of product characteristics and specification, but also download of drawings, spare parts list, instruction manuals, CAD data, and catalog is available*1.

*1 Free user registration is necessary to download CAD data/manual instruction and to request product selection (through the internet).

*2 For security trade control reason, please clarify (1) END USER, (2) FINAL DESTINATION (COUNTRY), (3) APPLICATION when requesting our distributors or us. Unless it is clarified, we are unable to answer. In addition, please contact a distributor in your country ONLY.

Discontinued Product List

Discontinued product and recommended replacement are shown in the table below.
Some of the filter elements are commonly compatible with old model and therefore current model can be used after model changing as well.
Please refer to “Spare Element List” on P.152 – 153 for details.

Oil Filter

Discontinued product	Recommended replacement	Difference with old model		Element supply for old model	Discontinuance period
Model	Model	Connection diameter	Dimension		
Suction Strainer					
OSW	SFG		Different	Use the recommended replacement	July 1987
SFW	SFT		Different	Use the recommended replacement	July 1987
SFN-KW	SFN	Same	Different	Use the recommended replacement	-
SFN-*N	SFN	Same	Different	Use the recommended replacement	October 1989
Suction Filter					
ISF	ISH	Different	Different	Possible	1970
ISV-03～24	VN-03～24	Different	Different	Possible (Common with VN)	November 2004
ISV-28～32	VN-28～32	Same	Same		
VM	VN (With magnet)	Different	Different	Possible	December 2017
VNS	VN	Different	Different	Possible (P-VN-10,12-150W)	September 2020
Line Filter					
351-A-16, 20, 24	-	-	-	Possible	September 2020
352	-	-	-	Possible	September 2020
AC-04~16	AK	Different	Different	Possible (Common with AK)	April 1992
AC-08S	-	-	-	Possible (P-AK-04,06-150K)	1992
ACF-04～16	AK(With companion flange)	Different	Different	Possible (Common with AK)	April 1992
ACF-24	-	-	-	-	February 1992
AK-03	-	-	-	Possible	
GF-A-03	-	-	-	Possible	September 2020
GV	GC	Same	Different	Possible (Common with GC)	August 1990
HN	UH	Different	Different	Possible	
HU	UH	Different	Different	Possible	May 1984
HUD	UH(With companion flange)	Different	Different	Possible (Common with LU(D), MU(D)) MODEL CODE EX：P-LU,MU-06,08-10U	May 1984
LC	LCN	Same	Same	Possible (Common with LCN) MODEL CODE EX：P-LCN-6-3C	June 1986
LFHN	UH	Different	Different	Possible (Common with HU) MODEL CODE EX：P-HU,HN-08,10-3C	-
LFLN	LN	Same	Different	Possible(Common with LN-02～08)	-
LFHU	UH	Different	Different	Possible	-
LFM	UL(Except inner dia. 02)	Different	Different	Possible	-
LN-02～08	LND	Same	Different	Possible	August 1973
LU	UL	Different	Different	Possible	December 1987
LUD	UL(With companion flange)	Different	Different	Possible (Common with LU) MODEL CODE EX：P-LU,MU-06,08-10U	December 1987
MU	UM	Different	Different	Possible	December 1987
MUD	UM(With companion flange)	Different	Different	Possible (Common with LU)	December 1987
NT	UH	Different	Different	Possible (Common with LU)	May 1984
SC	-	-	-	Possible	February 2020
SH-08Z-5, 12Z-5	-	-	-	Possible	September 2020
SH-10Z-3, 4, 5, 6	-	-	-	Possible	September 2020
TM-06	-	-	-	Possible	September 2020
TMA	TM	Same	Different	Possible (Common with TM)	April 2003
UR	TRA	Different	Different	Possible	December 2020
UVH	UH(With relief valve)	Different	Different	Possible (Common with UL,UH except UL,UH-24)	September 1989
UVL	UL(With relief valve)	Different	Different	Possible (Common with UL,UH except UL,UH-24)	February 1989
Duplex Filter					
BCV/BDV-02	-	-	-	Possible	December 1989
COS-L	COS-H	Different	Different	Possible	January 2008
Cartridge Filter					
105	107-10-3	Different	Different	Possible (Different with 107 cartridge)	March 2006
106	Use 2 pcs of 107	Different	Different	Possible (Different with 107 cartridge)	March 1994
108	-	-	-	Possible	May 2005
CF-06/08-20U	CF-06/08-10U	Same	Same	Possible only for F-913-1 (10μm)	September 2007
CL	-	-	-	Possible	March 2008
Air Breather					
AB-P	AP	Same	Different	Not possible	-
DC-2	-	-	-	-	December 2013
FU-50	FAB-50 or FA-50	Same	Different	Not possible	December 2019
FU-75	FAB-50 or FA-50	Different	Different	Not possible	December 2019
Off-line Filter					
FP-400S-3012	FP-400Y-1318	-	Different	Possible (N-1318-10 or N-1318-3)	September 1994
OLF-30-3	FP-400Y-2512	-	Different	Possible (L-913-3)	1986
OLF-75-3	FP-400Y-1318	-	Different	Possible (J-1321-03)	1986
Water Absorption Filter					
WP	-	-	-	-	August 1997

● Filter Element

Discontinued product Filtration rating (Former code)	Recommended replacement Filtration rating (Current code)	Difference with old model	Compatibility with filter	Discontinuance period
5U	8C		Replaceable	August 1996
3M	3C	Longer service life	Replaceable	February 2002
6M	8C	Longer service life	Replaceable	June 2004
10M	8C	Longer service life	Replaceable	November 1999
3MH	3CH	Longer service life	Replaceable	February 2002
6MH	8CH	Longer service life	Replaceable	June 2004
10MH	8CH	Longer service life	Replaceable	November 1999

● Heat Exchanger

Discontinued product Model	Recommended replacement Model	Difference with old model Connection diameter	 Dimension	Remarks	Discontinuance period
Water-Cooled Shell and Tube type					
NTC	FCD、FCF	Different	Different		1985
FCN	FCD、FCF	Different	Different		1985
FTC-0.4～3.5	FCD	Different	Different		1985
FCW-106A～270A	FCX-108～270	Different	Different		May 2001
TC-4-B～TC-6-B	-	-	-		May 2019
TSC	-	-	-		December 2005
FPD-412～423	FTS	Different	Different		March 2008
Air-Cooled type					
ATC	ATS・ATF	Different	Different		1988
ATL-1252	ATL-13A	Different	Different		May 2002
ATL-1231,1531	ATL-13A	Different	Different		November 2018
ATF-3051,3052, 3551,3552, 4061,4062	ATS-3061,3062, 3561,3562, 4061,4062	Different	Different		November 2004
Plate type					
TX、GC	-	-	-		July 2007
TB5T,TB8T,TB10T,TB25T	-	-	-		March 2020

Code Difference of Filter by Model Changing and Element Compatibility

Model changed filter for its improvement can be identified by alphabet before/after the number of connection diameter in model code.
Replacement element is usable as a common product no matter if filter is changed or not.

Ex.1)	Model code of Filter		Model code of Element (Individual)	Model code of Element (Common)
	UL-20-10U-IV	The first model	P-UL-20-10U	P-UL, UM, UH-20, 24, -10U (Before/After model change and common with UL, UM, UH)
	↓		↓	
	UL-20**A**-10U-IV	1st model change	P-UL-20A-10U	
	↓		↓	
	UL-20**B**-10U-IV	2nd model change	P-UL-20B-10U	

Ex.2)	Model code of Filter		Model code of Element (Individual)	Model code of Element (Common)
	GC-12-4-3C-RIV	The first model	P-GC-4-3C	P-GC, SH, 4201-4-3C (Before/After model change and common with GC, SH, 4201)
	↓			
	GC-12**Z**-4-3C-RIV	1st model change		

Ex.3)	Model code of Filter		Model code of Element (Individual)	Model code of Element (Common)
	351-08-8C-IV	The first model	P-351-08-8C	P-351, 352-06, 08-8C (Before/After model change and common with 351, 352)
	↓			
	351-**A**-08-8C-IV	1st model change	P-351-A-08-8C	
	↓			
	351-**B**-08-8C-IV	2nd model change	P-351-B-08-8C	

Glossary

A	air pocket	A situation whereby air is trapped in a component or a pipe. It may affect pump suction and so on.
	allowable differential pressure of element	Max differential pressure that does not break a filter element when applied instantly. Filter type / Standard / High pressure Line filter / Return filter / 0 .7MPa / 21MPa Suction filter / 0.15MPa / —
	ambient temperature	Ambient temperature of an object component.
B	baffle plate	Guide plates to allow fluid at high temperature side (shell side) to flow through whole body of heat exchanger.
	bare tube	A raw tube without fin thread processing. Generally, it is used when fluids at shell side and tube side are same.
	blow-off (backwashing type filter)	A function to eliminate collected particles in a filter by reverse flow of fluid.
	β-ratio	Refer to "Outline of filtration performance evaluation" on P16.
C	C-fiber element 3, 8, 25 (filtration rating code: 3C, 8C, 25C)	Refer to "TAISEI "C-fiber" element and β-ratio" on P16.
	cleanliness classification	International standards that measure diameter and the number of contaminants in oil and classify. ISO/NAS cleanliness code is generally used.
	clogging	Unusable condition of filter element due to accumulated particles on an element surface. It can be detected by differential pressure between inside and outside of element. We define a condition when differential pressure is over 0.3MPa as a clogging.
	companion flange	Flange that is a companion to In/Outlet of filter or heat exchanger for pipe connection. There are welding type and partial thread type.
	contaminant	Foreign substances contained in oil that affect a system. Such as solid fine particle, absorbed water, contained air, and so on.
	cooling area	= heat transfer area
	cracking pressure	The pressure at which a relief valve opens to protect filter element from breakdown.
D	differential pressure for indication	Differential pressure for clogging indication of element.
E	element (filter element)	A filtration part installed inside a filter. It is generally constructed of filtration media and metal parts such as end plate.
	equipment	Selectable and installable functional parts for oil filter or heat exchanger. It depends on model either standard or option.
F	fan guard	A cover to protect fan of air-cooled type heat exchanger. Basically, it is not for a protection of human body such as finger insertion.
	filtration gap	A gap between fibers or wires of filtration media. Filtration media with small variation of gap is better in filtration performance.
	filtration media	A filtration part of a filter element. Various type is available: paper, C-fiber, wire gauze, notch wire, and wedge wire.
	filtration rating	An index to describe filtration level of element. It is described with a particle diameter that can be trapped at a specific efficient.
	filtration ratio	= β-ratio
	fin tube (heat exchanger)	A cooling tube with thread shaped fin on its outer surface that enables increase of cooling area. There are several height types of fin: high, middle, low, and we use low fin tube for our standard heat exchanger.
	flange pipe connection	It describes that pipe connection to a component is flange type. There is another connection: "thread" type.
	flow direction (filter)	Direction of In/Outlet is specified for oil filter. Flow direction is selectable for some models (UL, UM, UH).
	fluid type	A code to be put at the begging of model code of a filter or a heat exchanger, and it describes available fluid type. Sealing material and surface treatment are different depending on fluid type (ex: Code "F" = phosphate ester fluid, sealing material is FKM).
	form rolling process	A processing method of cooling tubes for heat exchanger. Fin is formed on a surface of a tube by rolling and pressing a tube strongly. Since it is a compression forming process, strength of tube material increases.
G	G thread	It describes parallel pipe thread (JIS B0202).
H	heat exchange amount	Heat amount that a heat exchanger can exchange. Normally, it is estimated by deducting exhaust heat value from total heat generation value of all working component.

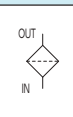
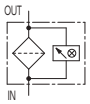
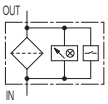
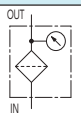
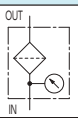
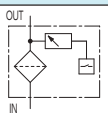
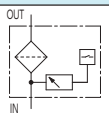
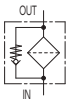
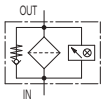
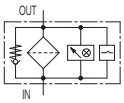
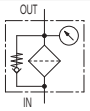
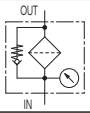
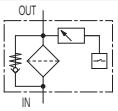
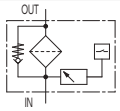
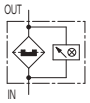
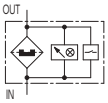
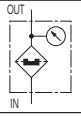
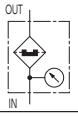
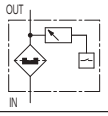
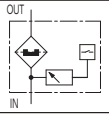
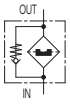
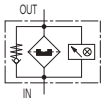
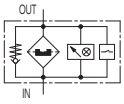
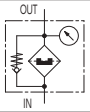
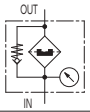
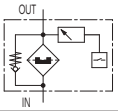
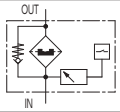
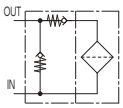
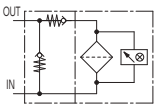
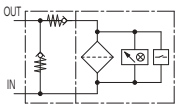
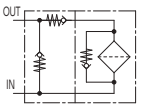
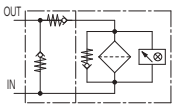
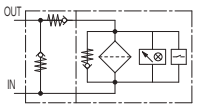
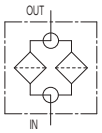
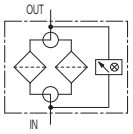
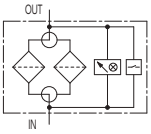
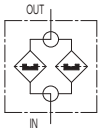
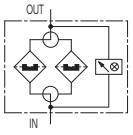
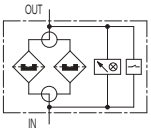
H	heat transfer area	Outside surface area of cooling tube for heat exchanging (contact surface with high temperature fluid). The larger heat transfer area, the larger heat amount it can exchange.
	heat transfer coefficient	Heat amount that can be transferred per unit area, unit time, and unit temperature. Heat transfer ratio.
	high pressure element	An element with allowable differential pressure of 21MPa. It is appropriate when using line filter with max working pressure of over 14MPa and relief valve is not available.
I	impulse test	A test to confirm fatigue strength of product by applying repetition pressure. Since it is regarded that strength reduction is generally saturated after ten million times, products that stand the durability test running ten million times are put on the market.
	indicator	An equipment to detect differential pressure between upstream and downstream and indicate signals. Visual observation type: Color of signal changes from green to red at setting value. Electric contact type: microswitch is activated to output electric signal at setting value.
	initial pressure drop	A pressure drop value of a filter with an unused element. Pressure loss value is measured based on the standard method of JIS B8356.
L	low fin tube	A fin tube that height of fin does not exceed a diameter of raw tube.
M	magnet	An equipment of a filter to collect magnetic particles in oil.
	manifold block	A metal block with oil passages enables to simplify piping of hydraulic component. Manifold type filter is directly installable to a manifold block.
	max working pressure	Max allowable pressure that oil filter or heat exchanger can be used. In case of a hydraulic circuit that undergoes repeated pressure fluctuation, max working pressure should be not a design value but a peak value.
	max working temperature	Max allowable temperature that oil filter or heat exchanger can be used. High temperature use is also available by selecting appropriate sealing parts material.
	Mesh (filtration rating notation)	The number of meshes in an inch and it describes a filtration gap of wire gauze (ex: 5 Mesh = 5 meshes in an inch). Since there are several types of wire diameter, filtration gap can be different even if Mesh number is same. Refer to "Mesh/Micron Conversion Table" on P15.
	Micron (filtration rating notation)	Filtration rating notation described with a diameter of a target particle to collect. In case of our C-fiber element, it describes a particle size (μ) that β-ratio is over 200. In case of wire gauze, it describes a filtration gap.
	modular type filter	A filter installable to a manifold block or a subplate conforming to an integrated valve standard.
	multi-pass test method	A test method to measure filtration performance of filter element. Refer to the "Performance evaluation of Filter" on P16 for details.
N	number of fin threads	The number of threads per unit length of fin tube. The more the number of fin threads, the larger its cooling surface area gets. Normally, it is described the number of fin threads per inch.
P	pass number	The number of turns of cooling water at low temperature side (tube side) in heat exchanger. Generally, the more pass number, the less cooling water quantity, however, efficiency of heat exchanger increases.
	peak pressure	Max pressure generated in a circuit including serge pressure.
	pressure drop	Decrease of fluid pressure when fluid flows channel of filter or heat exchanger. Large pressure drop may cause decrease of flow rate and damage on working component.
R	Rc threaded	It describes taper pipe thread (JIS B0203).
	relief valve	A safety valve to prevent a filter element from breakdown when an element is clogged and differential pressure increases. Cracking pressure of relief valve is normally set at 0.35MPa.
	reverse flow valve	A part to protect a filter element from reverse flow in a filter. It enables fluid flowing from Outlet to bypass an element and directly flow to Inlet.
S	scale coefficient	Heat exchanging performance can decrease gradually in long term use due to dirt accumulation in a heat exchanger. Scale coefficient is a value multiplied to provide a margin to a heat transfer coefficient when selecting a heat exchanger.
	serge pressure	Pressure that is rapidly elevated by operation delay of relief valve or operation of switching valve in a hydraulic circuit.
	spare parts	Parts/tools for maintenance and repair of a filter or a heat exchanger. Primarily: spare element, spare sealing parts, spare zinc plug/plate, cooler maintenance set, and so on.
	spiral serrated finish	Fine spiral unevenness is formed on sealing surface of a flange. This machining process is based on the standard method of ANSI B16.5.
	standard flow rate	"Standard flow rate" is determined by the specified condition as an example value for product selection. Refer to the "Common specification of oil filter – Standard flow rate" on P19 for details.
T	temperature controllable oil cooler	A heat exchanger with a water control valve that enables to shut water supply when oil temperature decreases under a setting value.
W	water absorbing element	A filtration media to eliminate absorbed water in oil. It is available for cartridge filter and a part of filtration unit.
Z	zinc plug (zinc plate)	Plug/plate of zinc material to protect water chamber cover (channel) by sacrificial anticorrosive effect. Large zinc plate is available for seawater use.

Hydraulic Graphic Symbol List

Hydraulic graphic symbol list for our oil filer and heat exchanger is shown in the following table.

- Though hydraulic graphic symbol of filter includes optional equipment, combination of equipment depends on a model.
- Each hydraulic graphic symbol is drawn base on JIS B 0125-1.
- These hydraulic graphic symbols do not describe actual structure of product.

Filter

	Filter	Visual type indicator	Electric contact type indicator	Secondary pressure gauge	Primary pressure gauge	Secondary pressure switch	Primary pressure switch
Filter							
Relief valve							
Magnet							
Relief valve \ Magnet							
Reverse flow							
Reverse flow \ Relief valve							
Duplex							
Duplex \ Magnet							
MVF							

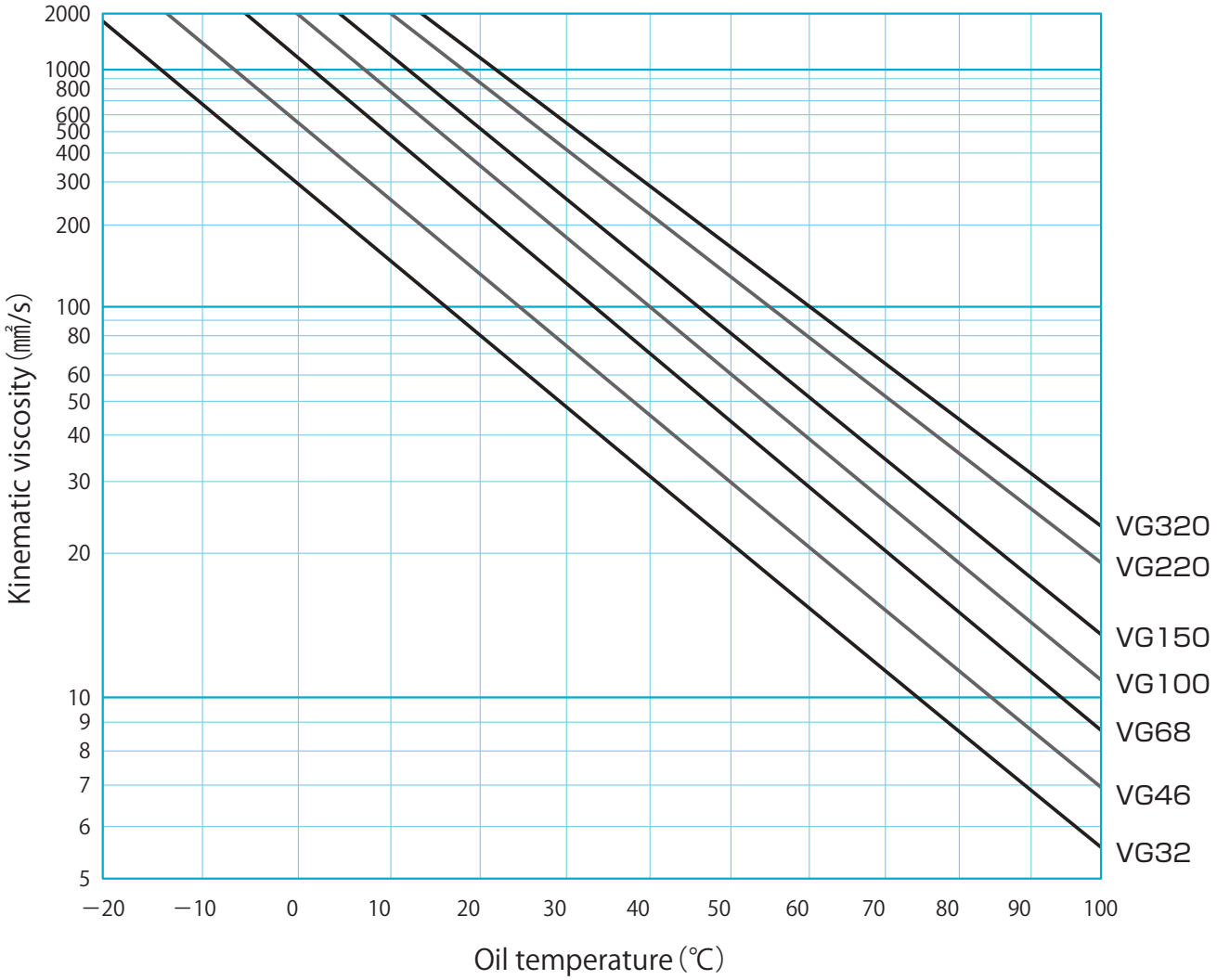
CF				Air breather

FP-1500S-5060	FP-1500S-1010	FP-400, 750

Heat Exchanger

Water-Cooled Shell and Tube type	Air-Cooled type

ISO Viscosity Grade Graph



Use Guidance

This catalog is planned and compiled to be used as product introduction and technical information of our products.
As for our major products, product information is released on the web site as well, and detailed technical information is provided and available for the customer registered web membership.

☐ Published Product / Published Contents

Our standard oil filter and heat exchanger are published in this catalog.
Published contents of each model is as follows:

- Product characteristic
- Hydraulic graphic symbol (JIS B 0125-1)
- Model code example
- Performance graph
- Main dimensional drawing
- Information of spare parts

Even if our standard models are unable to satisfy a requested specification, we can offer special product as well. Please feel free to send us your inquiry.

⚠CAUTION

① Product model should be selected by a designer or a specialist of hydraulic system/circuit. Wrong model selection may cause not only difficulty to obtain expected performance but also breakdown of components and injury.

② Please contact us in advance if you use our product with the following component or environment.
A) Use in non-specified condition on the catalog, outdoor, and salt damage environment.
B) Use for transportation system (ships, vehicles, automobiles), food machinery, medical apparatus, and military apparatus.

③ Product should be used by a specialist of hydraulic system/circuit.
Installation, assembly, and maintenance should be carried out by a specialist who has sufficient knowledge and experience.

☐ Contents (model code, specification, dimension) in the catalog are as of December 2020.

The contents in the catalog or product appearance may be changed for its improvement without prior notice. Your understanding is appreciated.

☐ Inquiries

For security trade control reason, please clarify (1) END USER, (2) FINAL DESTINATION (COUNTRY), (3) APPLICATION when requesting our distributors or us. Unless it is clarified, we are unable to answer. In addition, please contact a distributor in your country ONLY.

For any other inquiries including document request:
Sales Dept. at the Head Office of TAISEI KOGYO Co., Ltd. **TEL : +81-3-6912-9922**
Open: 8:30 – 17:15 (Except Saturdays, Sundays, and Holidays)
E-mail: isales@taiseikogyo.co.jp

NANDEE

บริษัท นานดีอินเตอร์เทรด จำกัด
NANDEE INTER-TRADE CO., LTD.
314,316,318,320,322 ซอยจันทน์32 ถนนจันทน์ แขวงทุ่งวัดดอน เขตสาทร กทม. 10120

: @nandeeintertrade
: nandeeintertrade
: www.nandee.co.th
: 02-675-8230 ต่อ 410 -416