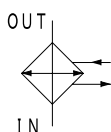
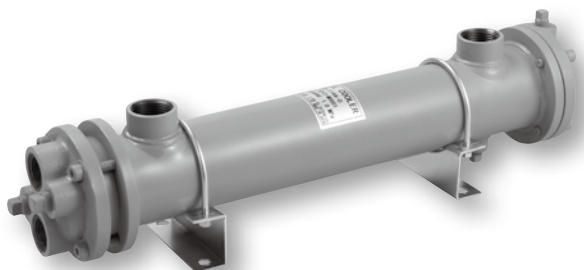


FCD FCDB model

Water-Cooled Shell and Tube type Compact Oil Cooler
Floating Tube Sheet type
Heat exchange amount: ~ 73.2kW

Best-selling Compact Oil Cooler: Floating tube sheet type of FCF



Water-cooled type cooler

Characteristics

- $\phi 9$ 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 °C	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 $\phi 12.7$ low fin tube.

Shell size code			1□□A	2□□A	3□□A
Cooling tube type			$\phi 9$ 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	0.4m ²	$\phi 76.3$ (65A)
114A	0.7m ²	
122A	1.1m ²	
226A	1.3m ²	$\phi 114.3$ (100A)
234A	1.7m ²	
242A	2.1m ²	
256A	2.8m ²	
270A	3.5m ²	
350A	2.5m ²	
370A	3.5m ²	$\phi 139.8$ (125A)
390A	4.5m ²	
311A	5.5m ²	

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

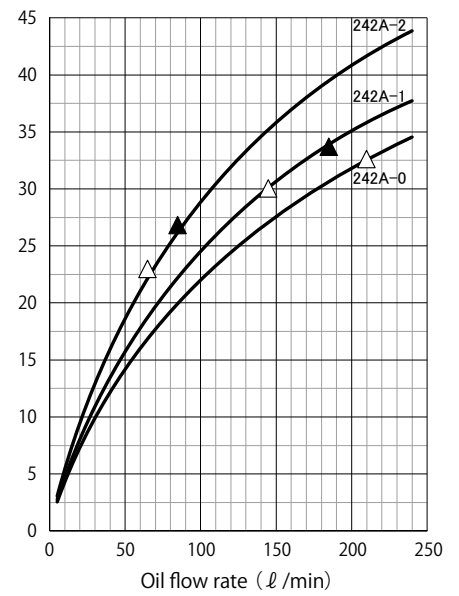
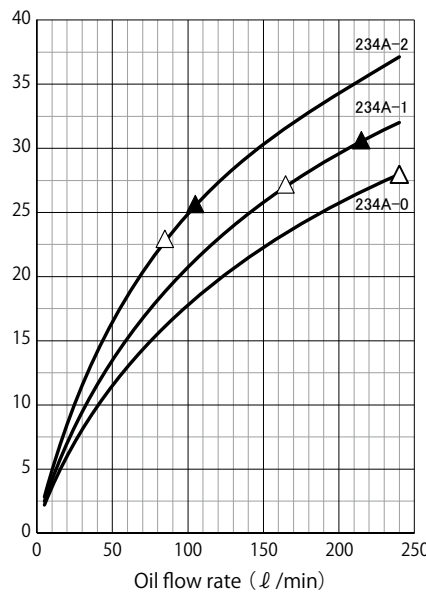
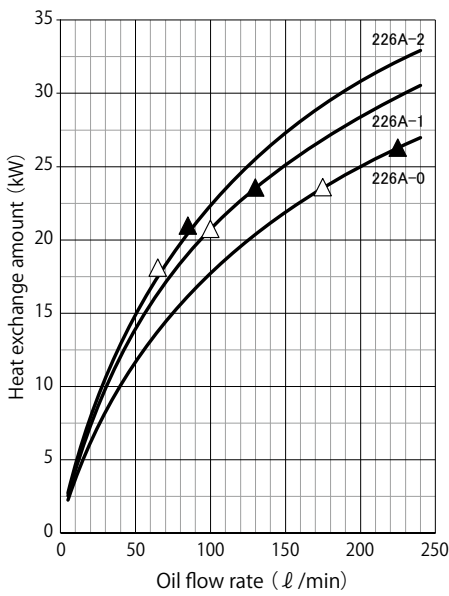
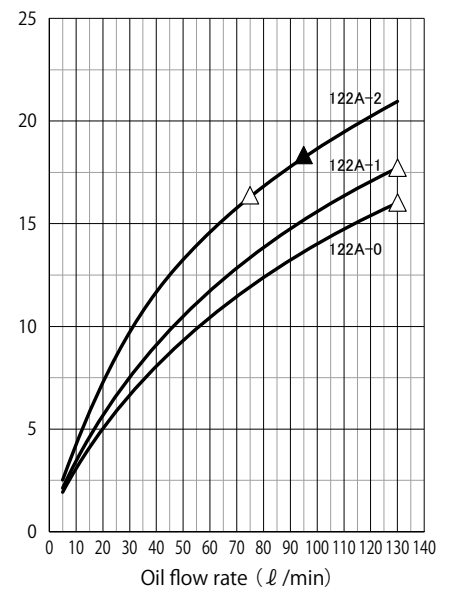
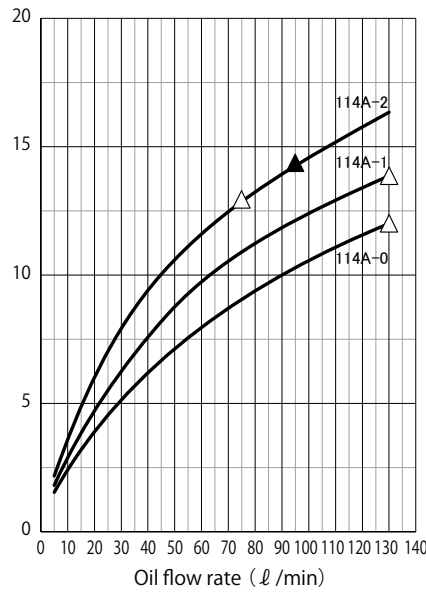
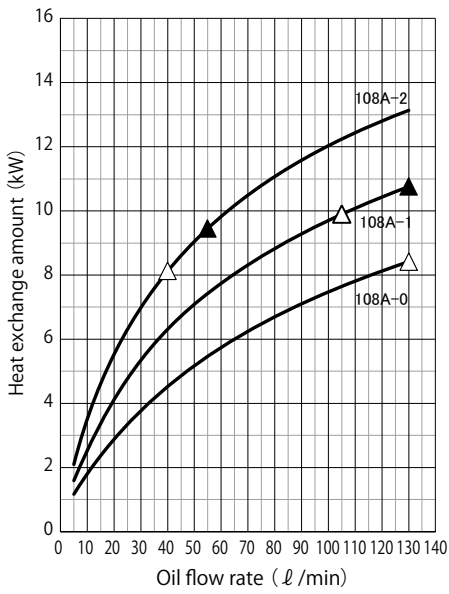
Condition

Fluid type		Corresponding to ISO VG46	Pressure drop	Shell side MPa	\triangle : ≤ 0.1
Inlet temperature	Shell side $^{\circ}\text{C}$	55		Tube side MPa	\blacktriangle : 0.15
	Tube side $^{\circ}\text{C}$	30			0.01 - 0.03
Flow rate at tube side		Max allowable flow rate	Scale coefficient at tube side $\text{m}^3\text{C/W}$	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

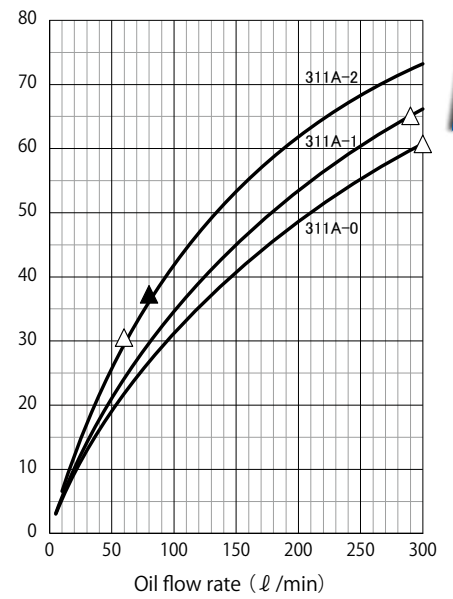
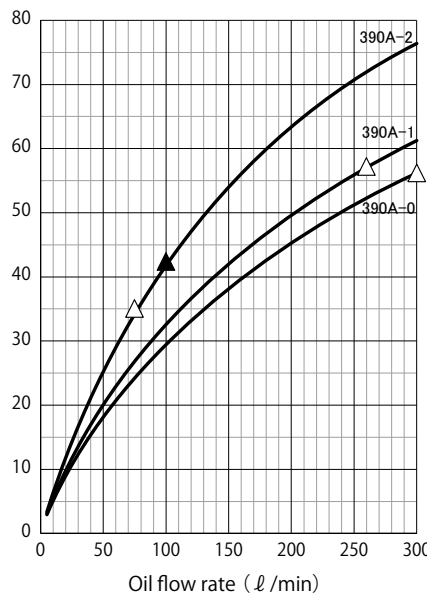
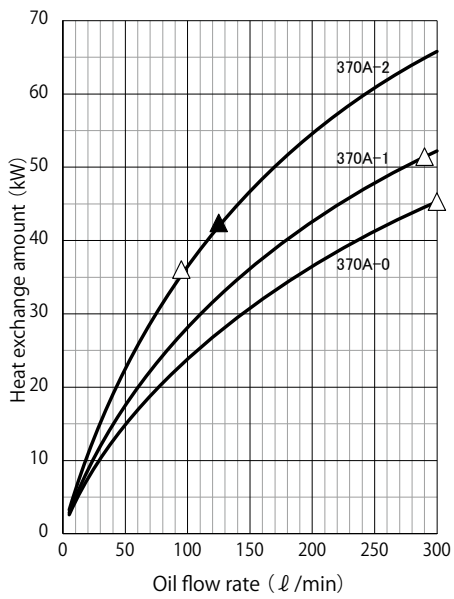
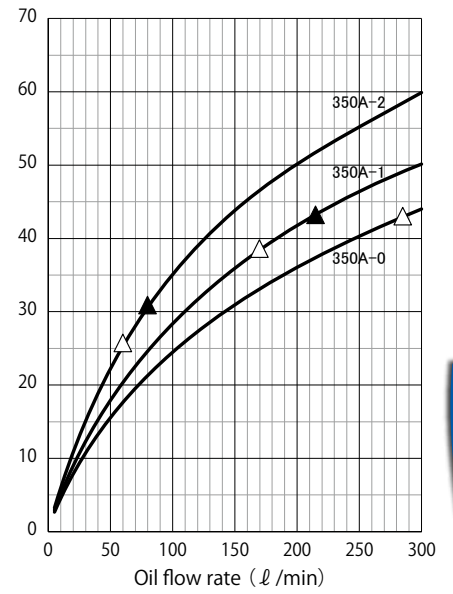
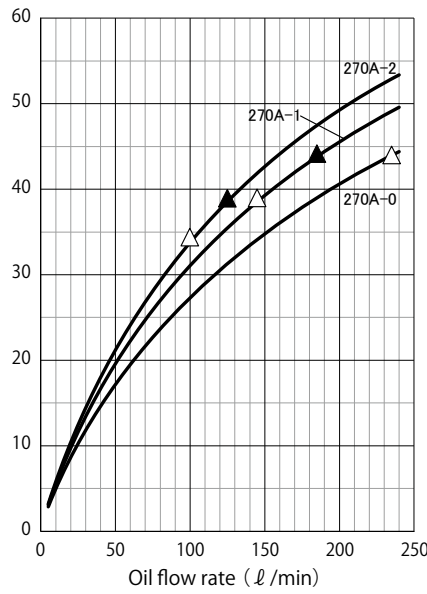
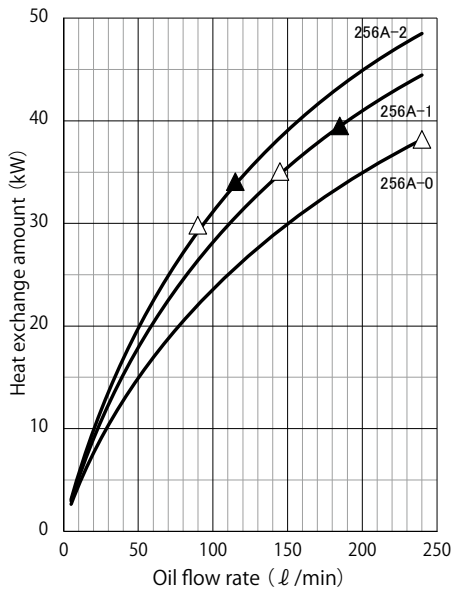
Condition

Fluid type		Corresponding to ISO VG46		Pressure drop	Shell side MPa	\triangle : ≤ 0.1
Inlet temperature	Shell side $^{\circ}\text{C}$	55			Tube side MPa	\blacktriangle : 0.15
	Tube side $^{\circ}\text{C}$	30		0.01 - 0.03		
Flow rate at tube side		Max allowable flow rate		Scale coefficient at tube side $\text{m}^2\text{C/W}$		0

Allowable flow rate

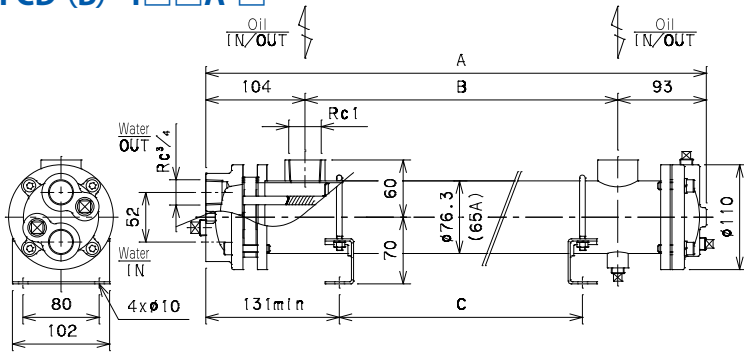
Model code	FCD(B)-1□□A	FCD(B)-2□□A	FCD(B)-3□□A
Shell side ℓ/min	~ 130	15~240	50~300
Tube side ℓ/min	10~35	20~80	30~110

★ It is max value and it depends on each working condition.



FCD/FCDB

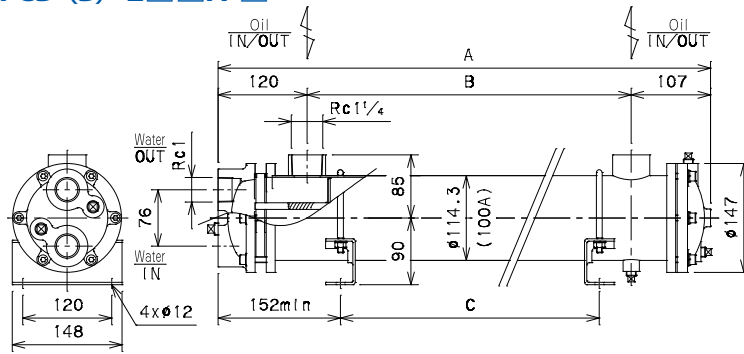
FCD (B) -1□□A-□



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.

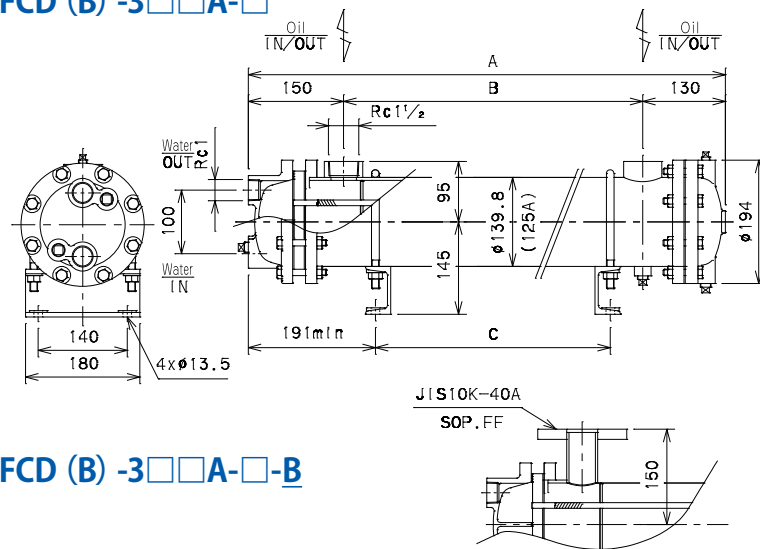
FCD (B) -2□□A-□



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.

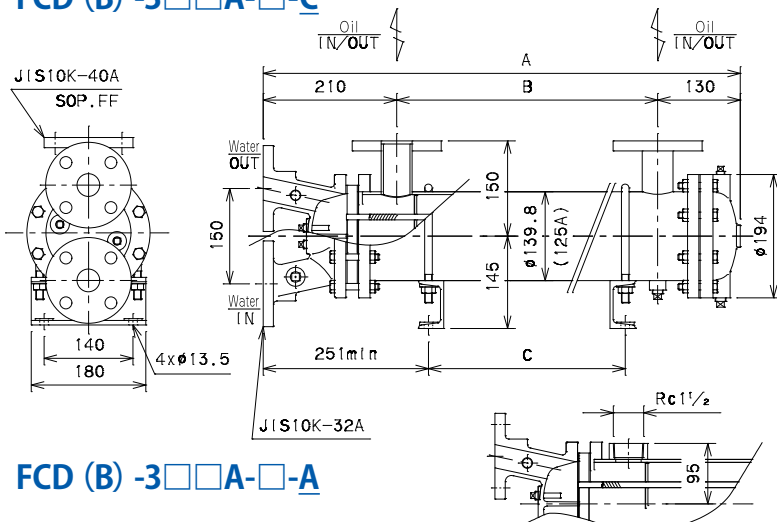
FCD (B) -3□□A-□



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



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

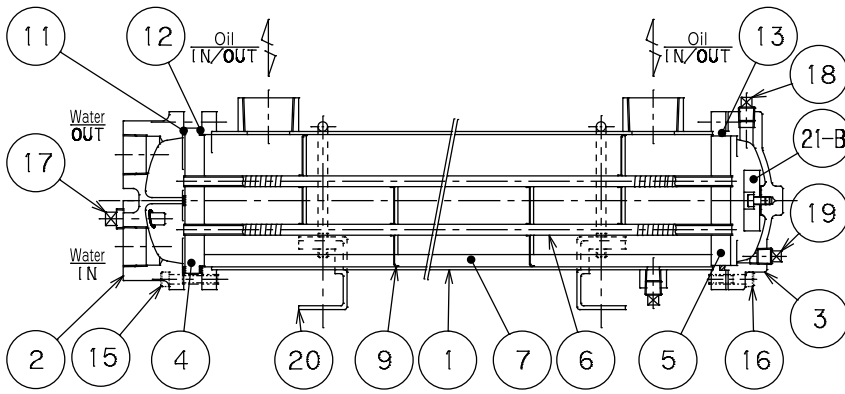
★Stand position is adjustable.

FCD (B) -3□□A-□-A

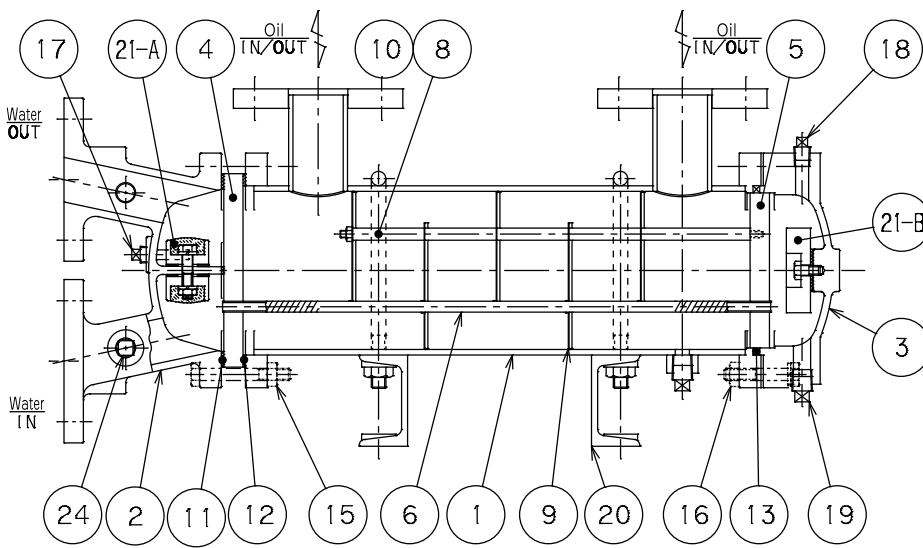
CROSS SECTION

PARTS LIST

FCD (B) -1□□A-□, FCD (B) -2□□A-□



FCD (B) -3□□A-□-C



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) Bolt · Nut (3□□A)	n*
16	Bolt *1 (1□□A, 2□□A) Bolt · Nut *1 (3□□A)	n*
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-△/□)	2

n* : The number of part depends on model.

FCD/FCDB

SEALING PARTS & ANTICORROSIVE PARTS LIST

No.	Item	11	12	13	Sealing parts set		17		21-A [Only for FCDB]		21-B [Only for FCDB]	
					Material	No. : 11~13 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)	Zinc plug	Zinc plate set (with packing)	Zinc plate set (with packing)	t8x30x30 (B61000132)	1set/pc	
FCD(B)-2□□A	t2xφ120/φ109, W6 (with partition)	t2xφ120/φ109	t3xφ115.2/φ107	FKM	SA-F/W-FCD-100A (SSC000012)							
FCD(B)-3□□A	t2xφ160/φ134, W6 (with partition)	t2xφ160/φ134	t4.5xφ140.2/φ128	NBR	SA-FCD-200A (SSC000010)	R 1/2 (7Z3040000)	Zinc plug	Zinc plate set (with packing)	Zinc plate set (with packing)	t13x50x50 (B61000133)	1set/pc	
FCD(B)-3□□A-B				FKM	SA-F/W-FCD-200A (SSC000013)							
FCD(B)-3□□A-A	t2xφ160/φ134, W6 (with partition)	t2xφ160/φ134	t4.5xφ140.2/φ128	NBR	SA-FCD-300A (SSC000011)	R 1/4 (7Z3010000)	Zinc plug	Zinc plate set (with packing)	Zinc plate set (with packing)	t20x35x75 (B61000134)	1set/pc*2	
FCD(B)-3□□A-C				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".