

- in Fluid Energy Management

# Global perspective

and local entrepreneurial flair



optimisation.

We work at a local level with the whole world as our workplace-local entrepreneurial flair and a global perspective go hand in hand.

Our local presence, long experience and a wealth of knowledge combined with our cutting-edge expertise to give you the best possible conditions for making a professional choice.

The Olaer Group is a global player specialising in innovative, efficient system solutions for temperature optimisation and energy storage.

The Group develops, manufactures and markets products and systems for a number of different sectors, e.g. the aircraft, engineering, steel and mining industries, as well as for sectors such as oil and gas, contracting and transport, farming and forestry, renewable energy, etc. All over the world, our products operate in the most diverse environments and applications. One constantly repeated demand in the market is for optimal energy storage and temperature



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Olaer Group Network



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# HST-Series

Shell & Tube Cooler

Cooling system - optimized for industrial use





*The Professional Choice  
...in Fluid Management*



## Table of Content

### Common content

General information and Quality assurance .....	4
Features / Comparison .....	5
Cooler sizing / Sizing program .....	6

### HST-S Type

#### Removable tube bundle & All-in-one type

General information and features .....	7
Ordering Shell & Tube Cooler .....	8
Specification & cooling capacity graph(2pass).....	9
Specification & cooling capacity graph(4pass).....	13

### HST-C, M, N Type

#### Fixed tube bundle type / Standard cooler

General information and features .....	18
Ordering Shell & Tube Cooler .....	19
Specification & cooling capacity graph(C-Type) .....	20
Specification & cooling capacity graph(M-Type) .....	24
Specification & cooling capacity graph(N-Type) .....	28

### Common content

Maintenance .....	32
How to size cooler .....	34
HST cooler sizing application form .....	35

# HST-Series



## Next generation high-end cooler with special & unique design!

Brand new cooler of Hyundai Olaer designed for high cooling capacity with differentiated compact design compared with Traditional cooler. Hyundai Olaer can meet all requirement by launching HST-S type(2pass, 4pass) cooler for high cooling capacity and ultra water saving with compact design and light weight as well as existing traditional HST standard type(2,4,6pass) for wide range of application. Hyundai Olaer cooler will make your system safe and efficient under any hard working condition such as

- High pressure
- High temperature for stationary, brackish, or special application.



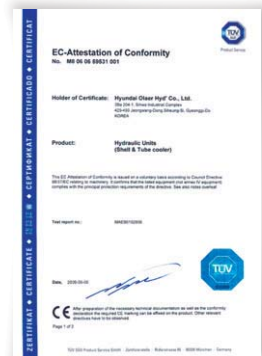
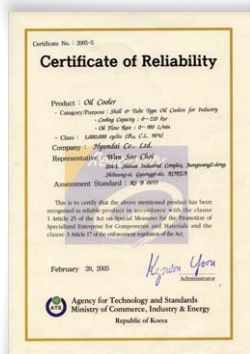
**HST-S-Series**



**HST-C,M,N Series**

## Quality Assurance

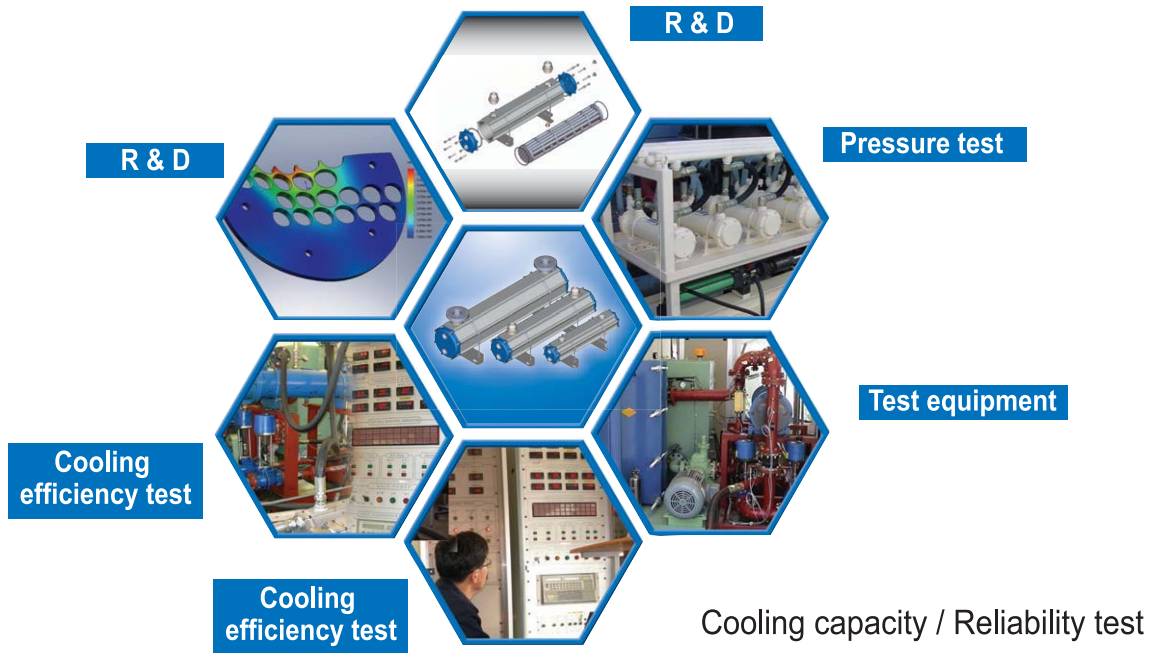
CE approval for all models – Pressure Equipment Directive 97/23EC



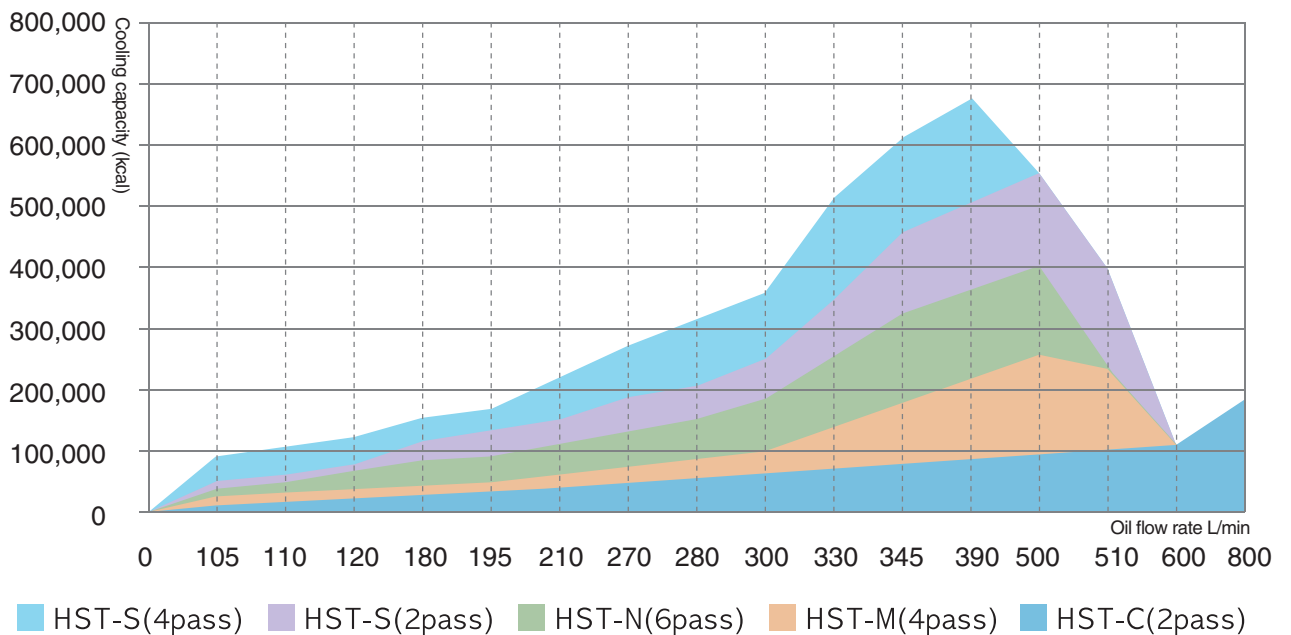


## High cooling capacity & Ultra water-saving

- ▶ Keep environment
- ▶ Cost-saving

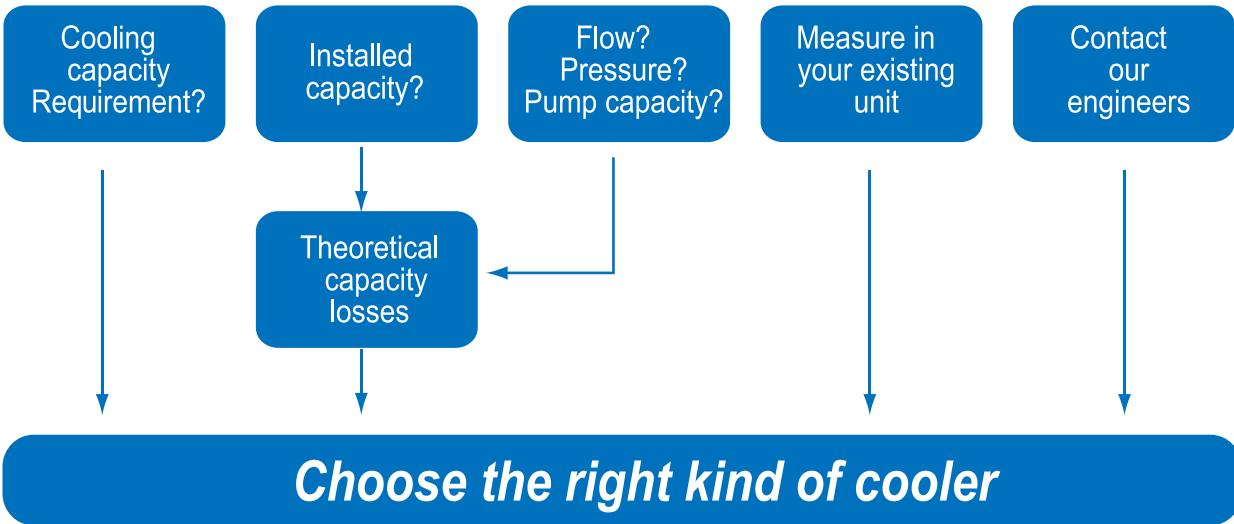


### ▶ Cooling capacity comparison graph





## Optimum solution for complicated sizing condition



Enter your values.....

**Data Input**

Type of oil: ISO VG 32  
 Type of Water: Fresh water  
 Model Type: S2Type (2pass)

Customer Data  
 Customer: olaer  
 Country: Korea  
 Project Name: project1  
 Phone: \_\_\_\_\_  
 e-mail: \_\_\_\_\_

**Cooler Selection**

C-Type (2Pass)  
 H-Type (4Pass)  
 N-Type (6Pass)  
 S2-Type (2Pass)  
 S4-Type (4Pass)

Model No: HST-S4-6-1088

PDF File  
3D Modeling

**Sizing Calculation Sheet**

**HST-S2-8-750**

	Side 1(Oil)	Side 2(Water)
Fluid name	ISO VG 32	Fresh water
Flow rate	l/min 390.000	150.000
Inlet temperature	°C 60.00	25.00
Calculated Outlet temperature	°C 55.00	30.69
Velocity	m/s 1.547	1.207
Calculated Pressure drop	kg/cm <sup>2</sup> 1.047	0.394
Total heat Transfer	Kcal/hr 97983.171	
Reynolds number	695.903	3038.888
Inlet port area	2 1/2"	1 1/2"
Outlet port area	2 1/2"	1 1/2"

Information:  
 This calculation is based upon more parameters than in catalogue.  
 Subject to technical alterations.

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...suggested solution



## EN13445-3~5:2002

- Ultra light weight with high-end design(2/5 improved)
- High cooling capacity and ultra water saving (30% improved than traditional cooler)
- High quality and reliable cooler(Any cool)
- Easy maintenance (Complete removable type & all-in-one)
- Minimum installation space(over 1/3 improved) compared with heat transfer area

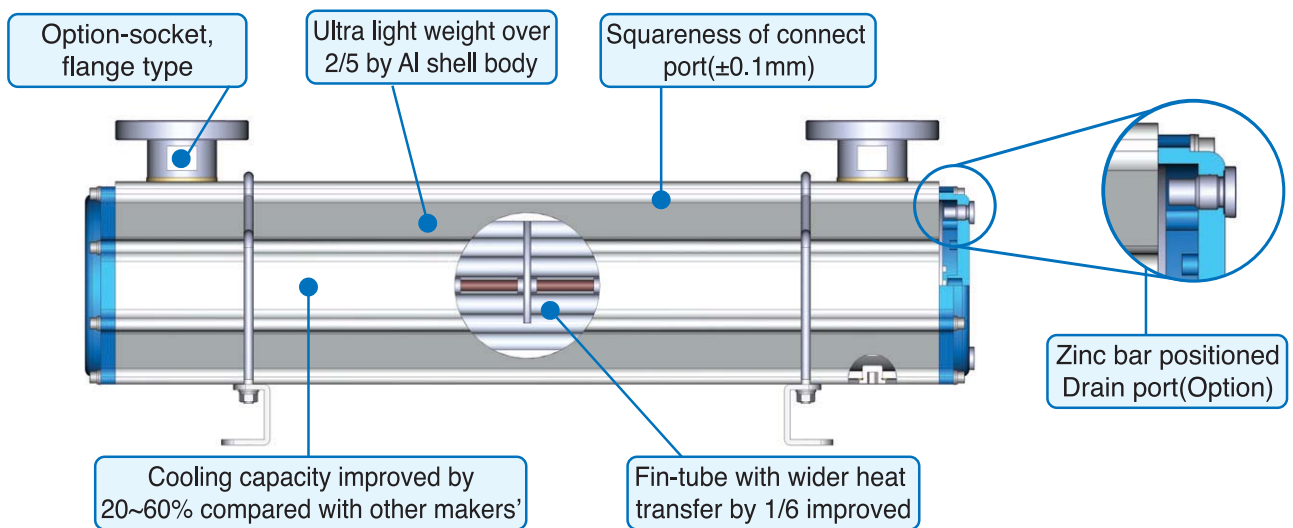
### Removable tube bundle & all-in-one type



Designed by EN13445-3~5:2002  
Compare with other equivalent model in terms of cooling capacity, weight and specification

### Specification

Type	Oil side	Water side	Material			Connection type
			Flange	Fin-tube	Bonnet cover	
Max pressure	15bar	10bar	Special Aluminum	Fresh water (AL+Cooper)	Special Aluminum	Flange or Socket
Test pressure	22bar	15bar		Brackish water (AL+Ni alloy)		
Working Temp.	100°C	100°C				



Model	Comparison	Remark
S2-3-670	124%	K(Oversea)
S2-4-450	141%	D(Local)
S2-5-680	160%	S(Local)

**Consult HOH for seawater application**





## Model Code

### HST-S-SERIES

HST

Hyundai Olaer  
Shell & Tube  
Cooler

- S2 -

3 -

370 -

S -

CE

#### Certificate

Blank - No CERT  
CE - CE APPROVAL  
Other

#### Oil Connection



S(Bushing)



F(Flange)



H(Hose fitting)



N(Nipple)

#### Tube Length

370 - 370mm  
450 - 450mm  
530 - 530mm  
550 - 550mm  
.  
.  
.  
1300 - 1300mm

#### Shell Norminal Size

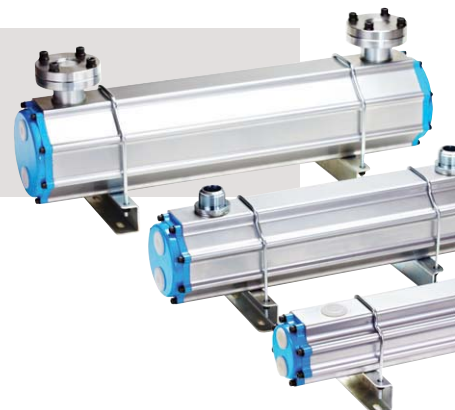
3 - 3"  
4 - 4"  
5 - 5"  
6 - 6"  
8 - 8" Norminal size might be different from ISO standard inch size

#### Water Configuration

S2 - 2PASS(Octagon type)  
S4 - 4PASS(Octagon type)

#### Shell & Tube Cooler - series

Blank - Oil / Water cooler  
2 - Oil / Salt-Water (Fin:Cu70%+Ni30%) or SUS316  
3 - Alloy Oil / Water Cooler, (Fin:Cu90%+Ni10%)  
Epoxy resin Coating inside the Coolant Chamber)





## HST-S2-Series

The Table is based on :

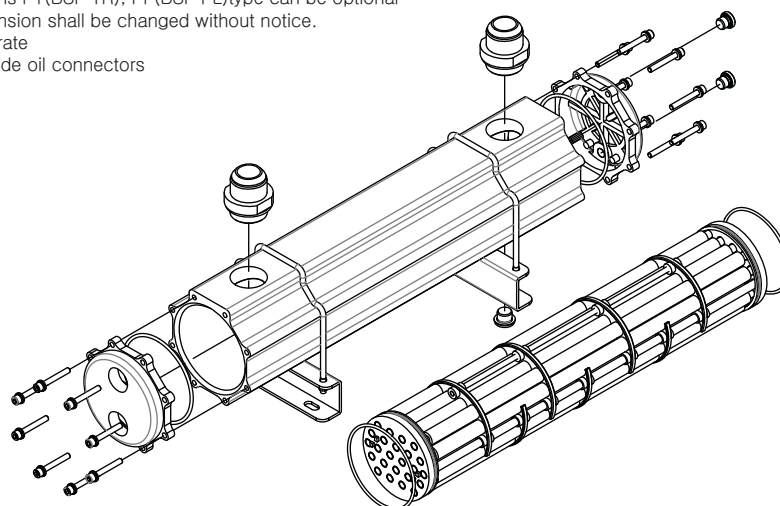
Oil	ISO VG32
Oil inlet temperature	60°C
Water inlet temperature	25°C
Oil / Water inlet ratio	2:1
Configuration	2Pass



### Technical Data

MODEL	Connection		Max. oil flow (l/min)		Max. pressure drop ΔP(bar)		Cooling capacity		Heat transfer (m <sup>2</sup> )	Weight (kg)
	OIL	WATER	OIL	WATER	OIL	WATER	Kcal/hr	KW		
HST-S2-3-370	1" (25A)	PT3/4"	120	60	1.28	0.8	13,870	16	0.72	5.4
HST-S2-3-460					1.47	0.82	16,540	19	0.91	6.6
HST-S2-3-550					1.69	0.83	19,064	22	1.11	7.3
HST-S2-4-340	1 1/4" (32A)	PT1"	210	120	1.21	0.79	26,633	31	1.57	9.41
HST-S2-4-450					1.48	0.82	32,450	38	2.1	11.6
HST-S2-4-530					1.68	0.84	38,091	44	2.52	13.6
HST-S2-4-680					1.9	0.89	45,997	53	3.3	16.3
HST-S2-4-870					2.1	0.95	54,662	64	4.3	20.3
HST-S2-5-450	1 1/2" (40A)	PT1"	300	140	1.24	0.83	52,912	62	3.04	15.5
HST-S2-5-550					1.35	0.84	56,884	66	3.79	19
HST-S2-5-680					1.5	0.85	62,048	72	4.66	23.4
HST-S2-5-870					1.8	0.89	69,595	81	6.07	29.5
HST-S2-5-1088					1.91	0.97	83,849	97	7.69	36
HST-S2-6-680	2" (50A)	PT1 1/4"	330	170	1.78	0.55	79,417	92	6.93	31.6
HST-S2-6-850					1.98	0.57	95,707	111	8.82	38.1
HST-S2-6-970					2.1	0.6	105,998	123	10.16	42.5
HST-S2-6-108					2.18	0.63	111,998	130	11.47	47.6
HST-S2-6-1288					2.26	0.65	124,216	144	13.7	55.9
HST-S2-6-1483					2.37	0.66	134,398	156	15.87	62.6
HST-S2-8-690	2 1/2" (65A)	PT1 1/2"	510	180	1.79	0.27	109,941	128	12.25	48.2
HST-S2-8-750					1.81	0.33	111,382	130	11.73	51.8
HST-S2-8-850					1.84	0.38	113,784	132	13.98	57.7
HST-S2-8-950					1.88	0.41	116,186	135	15.18	63.6
HST-S2-8-1050					1.92	0.43	128,228	149	17.25	69.5
HST-S2-8-1300					2.03	0.44	158,334	184	21.22	84

- \* Standard connection size is PT(BSP TR), PF(BSP PL) type can be optional
- \* The specification or dimension shall be changed without notice.
- \* Ask factory for High flow rate
- \* The weight does not include oil connectors



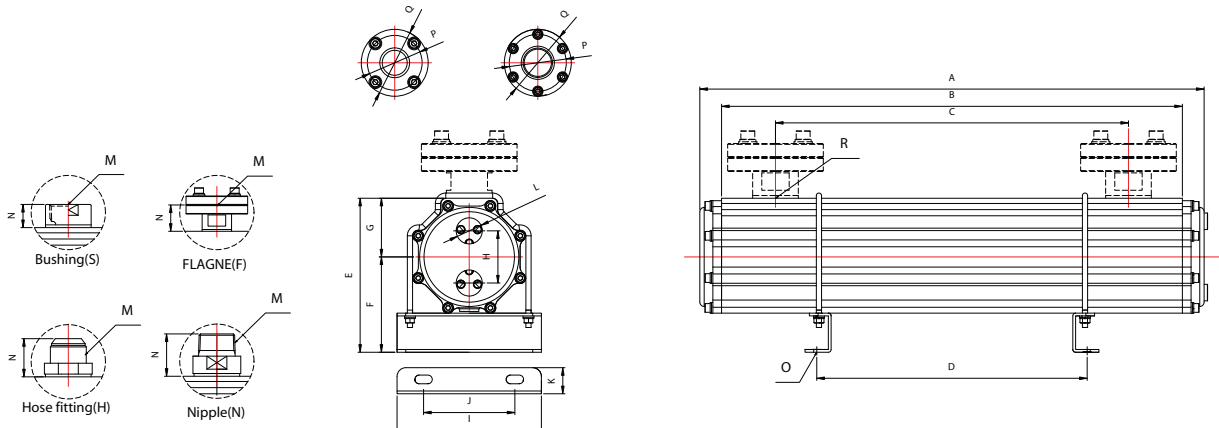
# HST-Series



	Oil Side	Water Side
Max pressure	15bar	10bar
Test pressure	22bar	15bar
Max temperature	100°C	100°C



HST-S2-4~6 FLANGE      HST-S2-8 FLANGE



## Dimension

MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M				N				O	P	Q	R										
													S(BUSING)	FLANGE	H(OSEFITING)	N(NIPPLE)	S(BUSING)	FLANGE	H(OSEFITING)	N(NIPPLE)														
HST-S2-3-370	416	370	258	195																														
HST-S2-3-460	506	460	348	285	141	93	48	44	133	103	30	3/4"	26.7		40.9	44.2	PT 1"		15/16" UNF	PT 1"	SLOT 10X20											G1"		
HST-S2-3-550	594	550	483	375																														
HST-S2-4-340	390	340	135	216																														
HST-S2-4-450	500	450	326	245																														
HST-S2-4-530	580	530	406	325	177	109.7	67.5	60	166	105	30	1"	29.7	46.8	43.9	48.7	PT 1 1/4"	1 1/4" (32A)	15/8" UNF	PT 1 1/4"	SLOT 10X20	90	110								G1 1/4"			
HST-S2-4-680	730	680	570	475																														
HST-S2-4-870	952	870	740	665																														
HST-S2-5-450	500	450	340	240																														
HST-S2-5-550	600	550	440	340																														
HST-S2-5-680	730	680	570	470	217	131.3	85.5	85	200	127	40	1"	29.7	50.2	45.5	48.8	PT 1 1/2"	1 1/2" (40A)	1 3/4" UNF	PT 1 1/2"	SLOT 10X20	90	110									G1 1/2"		
HST-S2-5-1088	1138	1088	978	878																														
HST-S2-6-680	746	680	520	410																														
HST-S2-6-850	916	850	690	580																														
HST-S2-6-970	1036	970	810	700																														
HST-S2-6-1088	1154	1088	928	818	246	151.1	94.5	100	223	167	40	1 1/4"	35.8	46.4	55.6	53.2	PT 2"	2" (50A)	2 1/2" UNF	PT 2"	SLOT 12X24	90	110											
HST-S2-6-1288	1354	1288	1018	1128																														
HST-S2-6-1483	1549	1483	1303	1213																														
HST-S2-8-690	772	690	530	400																														
HST-S2-8-750	832	750	59	460																														
HST-S2-8-850	932	850	690	560																														
HST-S2-8-950	1032	950	790	660	287	169.6	117.5	130	260	204	40	1 1/2"	37	104.2	63	60.1	PT 2 1/2"	2 1/2" (65A)	3" UNF	PT 2 1/2"	SLOT 2X24	130	155										G2 1/2"	
HST-S2-8-1050	1132	1050	890	700																														
HST-S2-8-1300	1382	1300	1105	950																														

\* Standard connection size is PT(BSP TR), PF(BSP PL)type can be optional  
 \* The specification or dimension shall be changed without notice.  
 \* Ask factory for high flow rate.  
 \* The weight does not include oil connectors



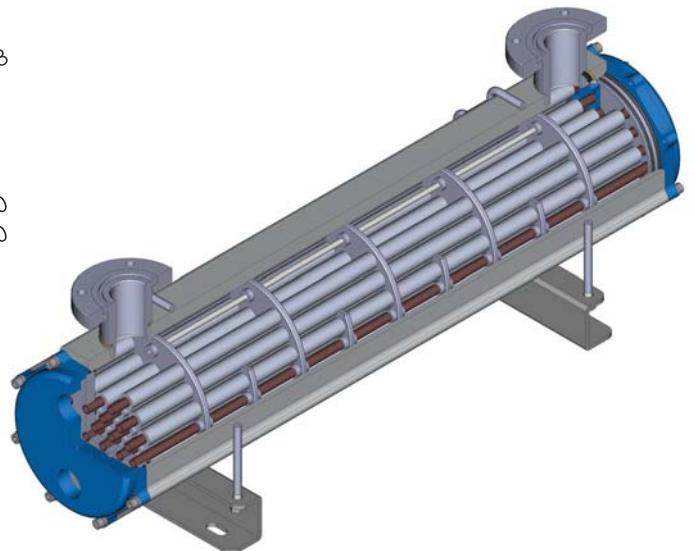
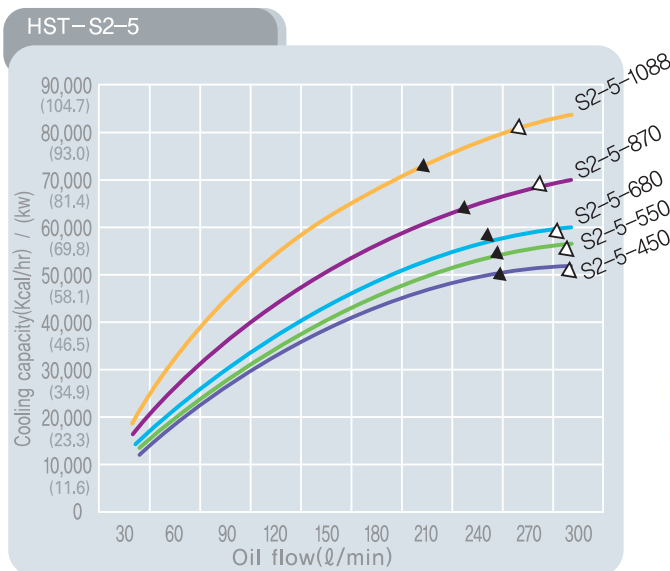
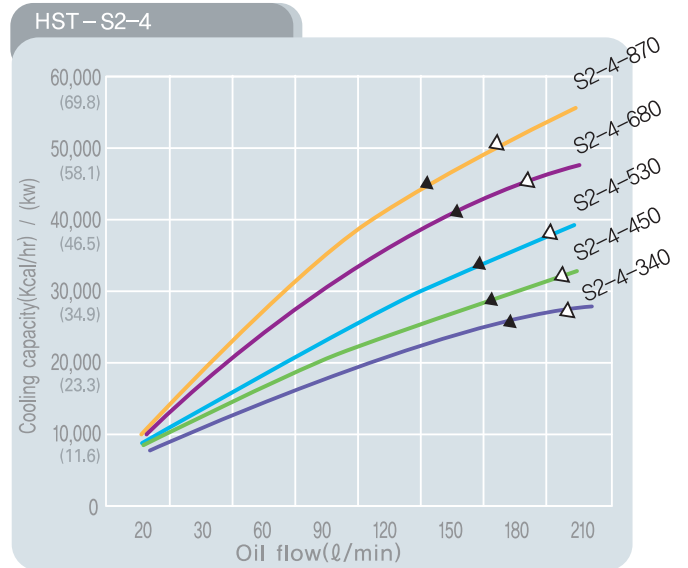
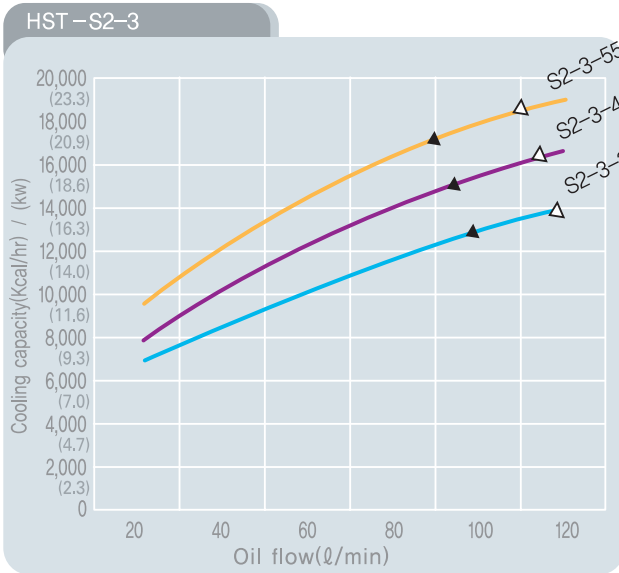
## HST-S2-Series

The Curve is based on :

Oil ISO VG32  
 Oil Inlet Temperature 60°C  
 Water Inlet Temperature 25°C  
 Oil / Water Inlet Ratio 2:1  
 Configuration 2Pass  
 Oil side pressure drop ▲=0.1Mpa(1bar)  
 Δ=0.15Mpa(1.5bar)  
 Water side pressure drop 0.01Mpa~1Mpa(0.1~1bar)

### Water Flow

	Min. (ℓ/min)	Max. (ℓ/min)
HST-S2-3	20	60
HST-S2-4	25	120
HST-S2-5	30	140



# HST-Series

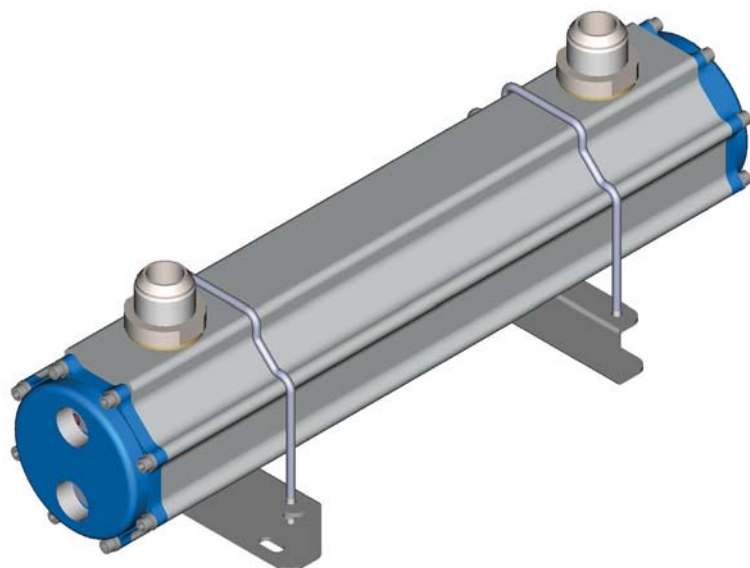
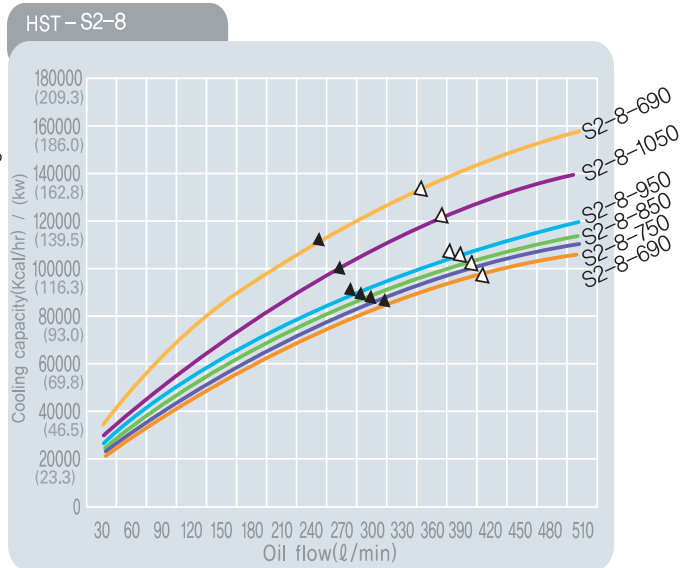
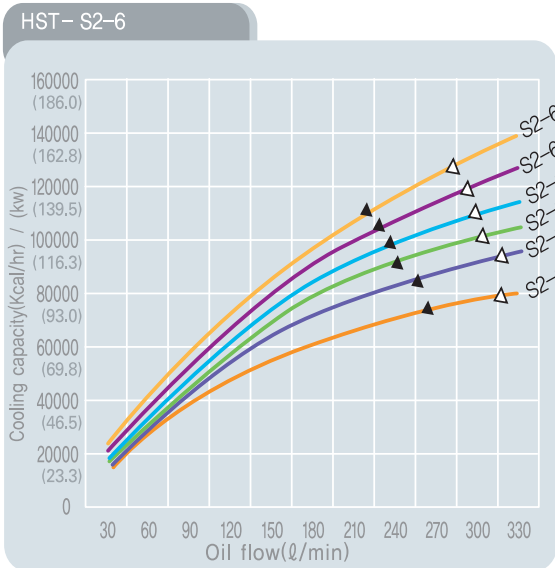


The Curve is based on :

Oil ISO VG32  
 Oil Inlet Temperature 60°C  
 Water Inlet Temperature 25°C  
 Oil / Water Inlet Ratio 2:1  
 Configuration 2Pass  
 Oil side pressure drop ▲=0.1Mpa(1bar)  
 Δ=0.15Mpa(1.5bar)  
 Water side pressure drop 0.01Mpa~1Mpa(0.1~1bar)

## ► Water Flow

	Min. (ℓ/min)	Max. (ℓ/min)
HST-S2-6	30	170
HST-S2-8	40	180



# HST-Series



## HST-S4-Series

The Table is based on :

Oil	ISO VG32
Oil inlet temperature	60°C
Water inlet temperature	25°C
Oil / Water inlet ratio	3:1
Configuration	4Pass



### Technical Data

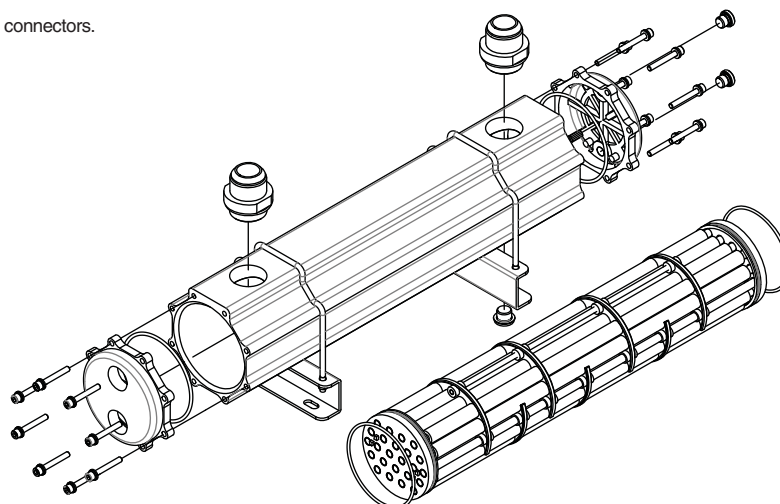
MODEL	Connection		Max. oil flow (ℓ/min)		Max. pressure drop ΔP(bar)		Cooling capacity		Heat transfer (m <sup>2</sup> )	Weight (kg)
	OIL	WATER	OIL	WATER	OIL	WATER	Kcal/hr	KW		
HST-S4-4-450	1 1/4" (32A)	PT 1"	180	65	1.07	0.90	30,440	35	2,14	11,6
HST-S4-4-530					1.28	0.92	35,700	42	2,41	13,6
HST-S4-4-680					1.39	1.00	42,000	49	3,22	16,3
HST-S4-4-870					1.65	1.12	50,429	59	4,18	20,3
HST-S4-5-680	1 1/2" (40A)	PT 1"	270	90	1.3	0.63	58,754	68	4,83	23,4
HST-S4-5-870					1.43	1.15	61,988	72	6,05	29,5
HST-S4-5-1088					1.46	1.31	77,620	90	7,88	36
HST-S4-6-680	2" (50A)	PT 1 1/4"	300	140	1.42	1.02	82,172	96	7,05	31,6
HST-S4-6-850					1.54	1.20	101,457	118	8,4	38,1
HST-S4-6-970					1.74	1.38	107,326	125	10,14	42,5
HST-S4-6-1088					1.87	1.45	117,388	136	11,54	47,6
HST-S4-6-1288					1.95	1.50	131,643	153	13,44	55,9
HST-S4-6-1483					2.13	1.52	147,574	172	14,63	62,6
HST-S4-8-750	2 1/2" (65A)	PT1 1/2"	390	150	2.2	0.52	129,166	150	10,18	51,8
HST-S4-8-950					2.36	0.73	150,286	175	13,02	63,6
HST-S4-8-1300					2.4	1.07	169,615	197	18,81	84

\* Standard connection size is PT(BSP TR), PF(BSP PL)type can be optional.

\* The specification or dimension shall be changed without notice.

\* Ask factory for High flow rate.

\* The weight does not include oil connectors.



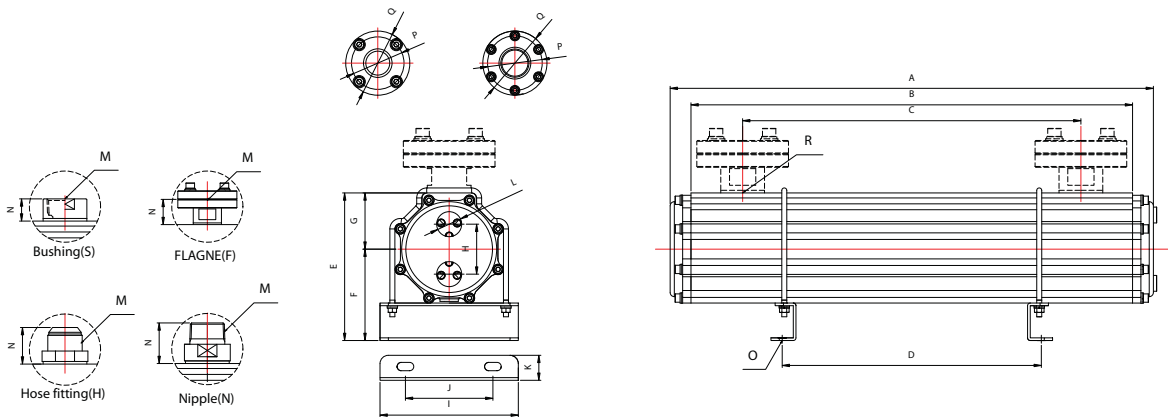
# HST-Series



	Oil Side	Water Side
Max pressure	15bar	10bar
Test pressure	22bar	15bar
Max temperature	100°C	100°C



HST-S2-4~6 FLANGE      HST-S2-8 FLANGE



## Dimension

MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M				N				O	P	Q	R
													S(BUSING)	FLANGE	H(HOSEFITTING)	N(NIPPLE)	S(BUSING)	FLANGE	H(HOSEFITTING)	N(NIPPLE)				
HST-S2-4-450	500	450	326	245	224	109.7	67.5	60	166	105	30	1"	29.7	46.8	43.9	48.7	PT1 1/4"	1 1/4" (32A)	1 5/8UNF	PT1 1/4"	SLOT 10X20	90	110	G1 1/4"
HST-S2-4-530	580	530	406	325																				
HST-S2-4-680	730	680	570	475																				
HST-S2-4-870	952	870	740	665																				
HST-S2-5-680	730	680	570	470	267	131.3	58.5	85	200	127	40	1"	29.7	50.2	45.5	48.8	PT1 1/2"	1 1/2" (40A)	1 3/4UNF	PT1 1/2"	SLOT 12X24	90	110	G1 1/2"
HST-S2-5-870	920	870	740	660																				
HST-S2-5-1088	1,138	1,088	978	878																				
HST-S2-6-680	746	680	520	410	292	151.1	94.5	100	223	167	40	1 1/4"	35.8	46.4	55.6	53.2	PT2"	2" (50A)	2 1/2UNF	PT1 1/4"	SLOT 12X24	90	110	G2"
HST-S2-6-850	916	850	690	580																				
HST-S2-6-970	1,036	970	810	700																				
HST-S2-6-1088	1,154	1,088	928	818																				
HST-S2-6-1288	1,354	1,288	1,018	1,128																				
HST-S2-6-1483	1,549	1,483	1,303	1,213																				
HST-S2-8-750	832	750	59	460	391.3	169.6	117.5	130	260	204	40	1 1/2"	37	104.2	63	60.1	PT2 1/2"	2 1/2" (32A)	3UNF	PT1 1/4"	SLOT 12X24	130	155	G2 1/2"
HST-S2-8-950	1032	950	790	660																				
HST-S2-8-1300	1,382	1,300	1,105	950																				

\* Standard connection size is PT(BSP TR), PF(BSP PL) type can be optional  
 \* The specification or dimension shall be changed without notice.



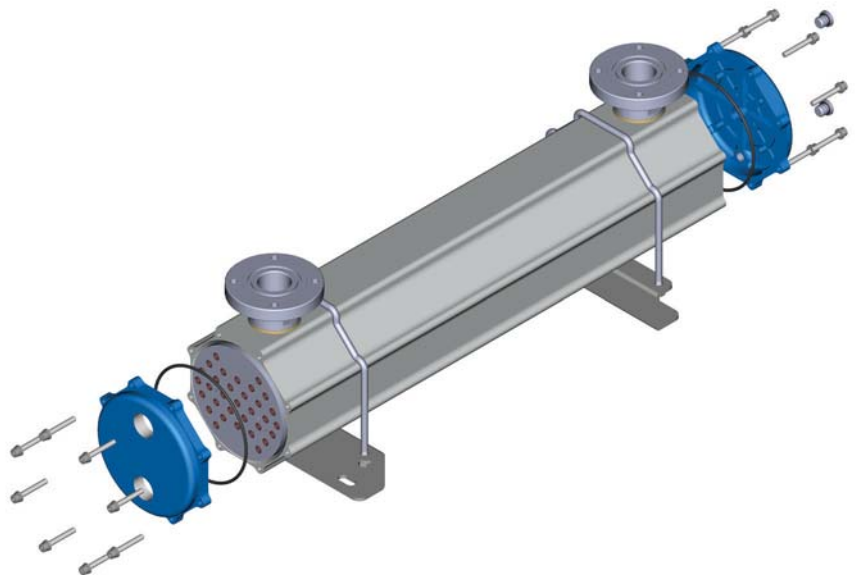
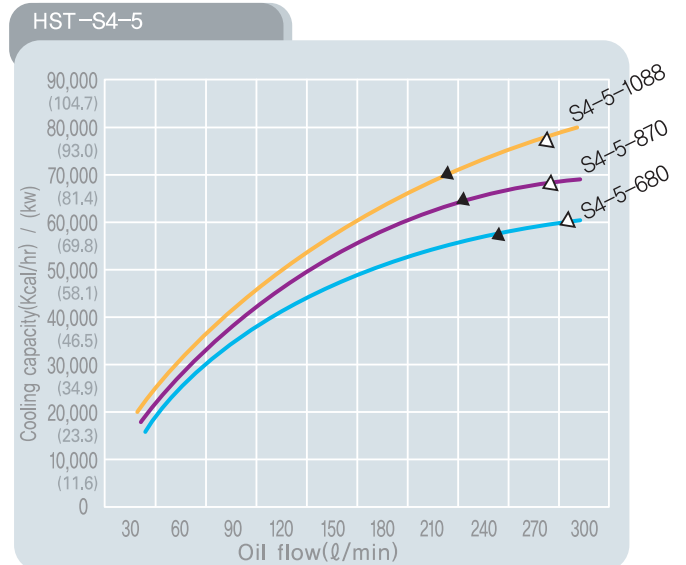
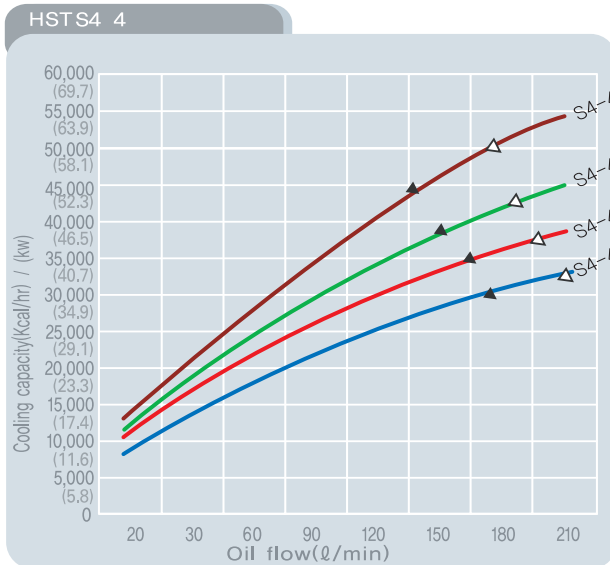
## HST S4-Series

The Curve is based on :

Oil	ISO VG32
Oil Inlet Temperature	60°C
Water Inlet Temperature	25°C
Oil / Water Inlet Ratio	3:1
Configuration	4Pass
Oil side pressure drop	▲=0.1Mpa(1bar) △=0.15Mpa(1.5bar)
Water side pressure drop	0.01Mpa~1Mpa(0.1~1bar)

### Water Flow

	Min. (ℓ/min)	Max. (ℓ/min)
HST-S4-4	25	65
HST-S4-5	30	90





# HST-Series



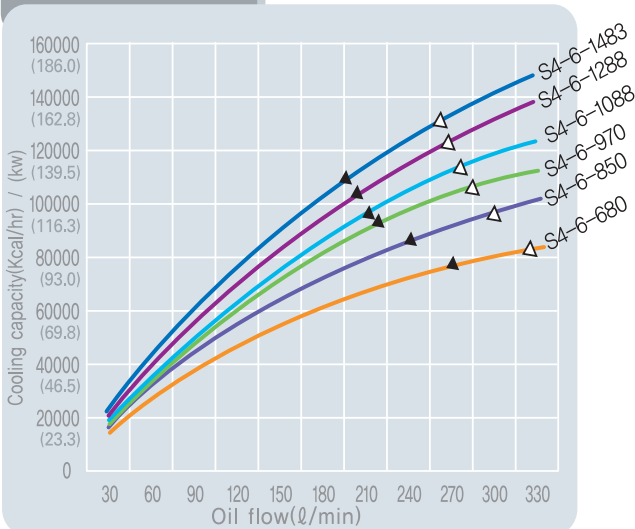
The Curve is based on :

Oil ISO VG32  
 Oil Inlet Temperature 60°C  
 Water Inlet Temperature 25°C  
 Oil / Water Inlet Ratio 3:1  
 Configuration 4Pass  
 Oil side pressure drop  $\Delta=0.1\text{Mpa}(1\text{bar})$   
 $\Delta=0.15\text{Mpa}(1.5\text{bar})$   
 Water side pressure drop 0.01Mpa~1Mpa(0.1~1bar)

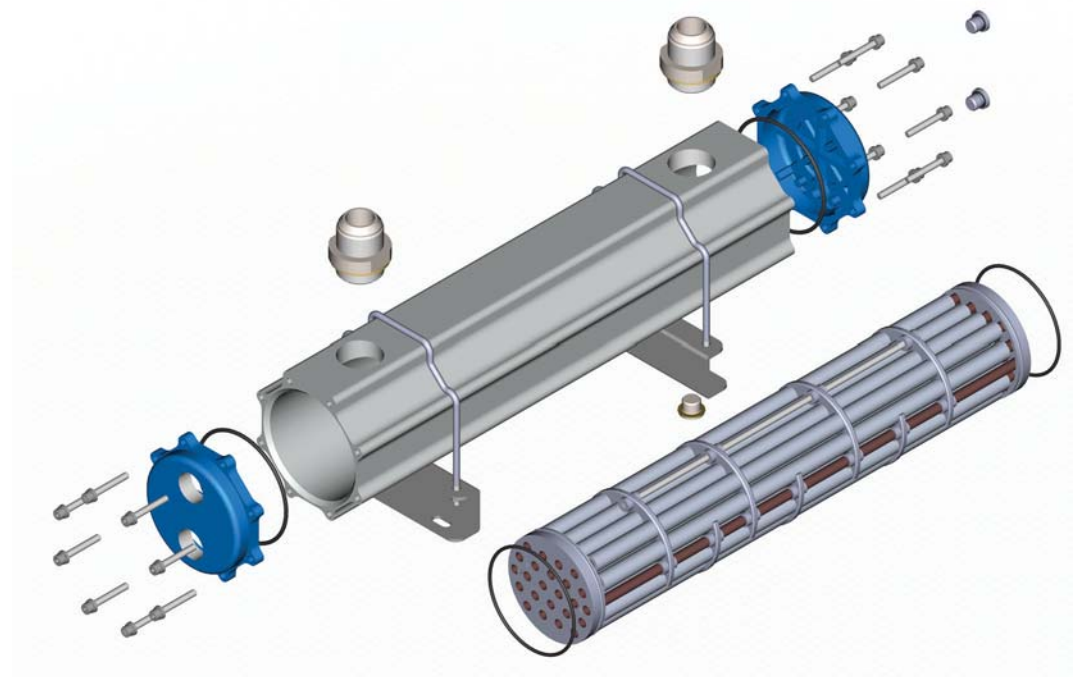
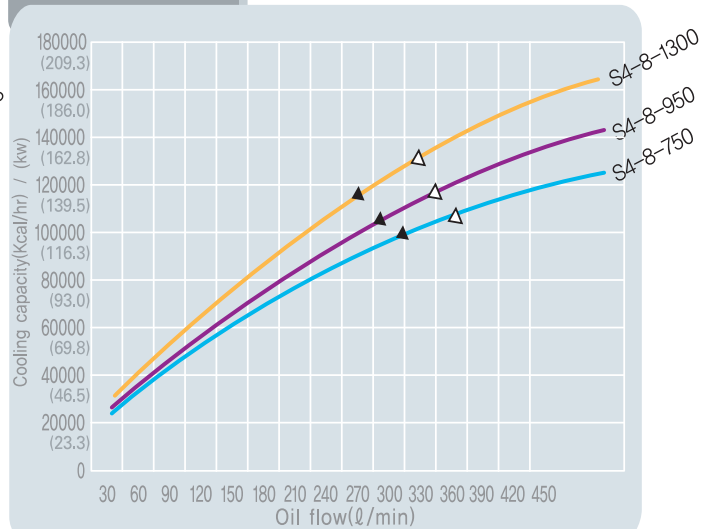
## Water Flow

	Min. (ℓ/min)	Max. (ℓ/min)
HST-S4-6	30	140
HST-S4-8	40	150

HST S4-6



HST S4-8

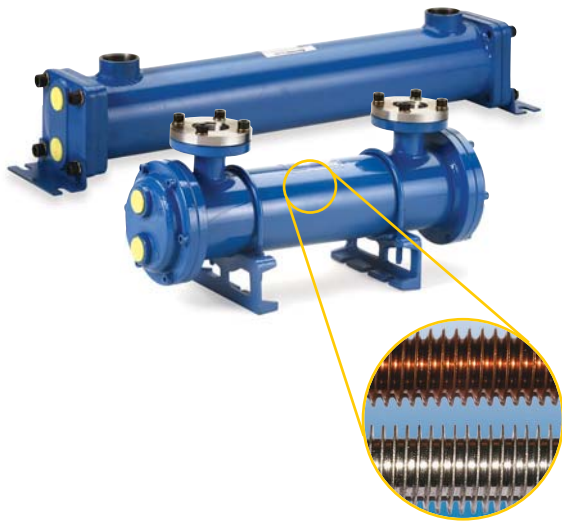




# HST-Series

Shell & Tube Cooler

# HST-Series



A pioneer in the Whole World Market **Hyundai-Olaer** has been consistently producing highly efficient low-fin tube oil coolers, based on our own original technology, over a long period of time.

The currently used low-fin tube(extruded type), and fin tube(aluminum fins & copper bare tube), have our own original specifications and are suitable for oil coolers. With our excellent technology in producing small size, light weight and fourfold-increased surface area tubes, our products have been well received in the market for hydraulic unit of injection molding machines, industrial machines, etc.

In order to meet customer needs, we have standardized a number of types (2/4/6 pass), for our fixed-tube-sheet types HST(**H**yundai**O**laer **S**hell & **T**ube) Series.

## Basic Product Specification

Model / Type		Shell & Tube Oil Cooler (fixed-tube-sheet type)	
Max. Working Pressure	Shell	20 bar(2.0Mpa)	20 bar(2.0Mpa)
			20 bar(2.0Mpa)
Fluid Type	Shell : General petroleum, mineral oil		
	Tube : Freshwater, Seawater(separate model code table option)		
Cooling Tube Specifications	φ9.52 Low Fin → 2, 4, 6 Pass(basic types)		
	φ7.94 Low Fin →6 Pass(order-based optional type)		
	φ12.7 Internal U-type and special order-based type(for large capacity)		
Cooling / Heat Transfer Area		0.58~20.0 m <sup>2</sup> (Company's standard specification)	
Characteristics	Space	The low-fin tube with large surface area makes the product small in size and light in weight	
	Function	With the U-bolt type mounting clamp the product can be moved to a different location. The tar epoxy resin coating inside the coolant chamber provides excellent corrosion resistance.	

Low-Fin Tube Material		
JIS/KS Number	Name	Classification
C1020T	Oxygen-free copper pipe	A
C7060T-0	Copper-nikel(10%)	B
C7150T-0	Copper-nikel(30%)	B
STB 304	Carbon steel pipe for boiler heat exchangers	B
SUS 304TP	Stainless steel pipe(φ12.7)	B
SUS 316TP	Stainless steel pipe(φ12.7)	C
C1220T	Carbon copper pipe	C



## HST-Standard Series

### Model Code

HST - C - 4 - 450 - F - 2 - CE

Hyundai Olaer  
Shell & Tube  
Cooler

#### Certificate

Blank - No CERT (Standard)  
CE - CE Approval  
GL - German Lloyd  
Others

#### N' Passes (Water Side)

2 - 2 pass (C-type : Standard, A-type : option)  
4 - 4 pass (M-type : Standard)  
6 - 6 pass (N-type : Standard)

#### Oil Connection

F - Flange  
S - Socket(G)

#### Tube Length (Oil Center Length)

C(M) - Series(Tube Length)

340 - 340mm  
680 - 680mm  
850 - 850mm  
968 - 968mm  
1198 - 1198mm

N - Series(Oil Center Length)

257 - 257mm  
546 - 546mm  
636 - 636mm  
770 - 770mm  
1130 - 1130mm

#### Cooler Diameter(Shell) Codes

C(M) - Series

3 -  $\phi$  89.1mm  
4 -  $\phi$  114.3mm  
5 -  $\phi$  139.8mm  
6 -  $\phi$  165.2mm  
8 -  $\phi$  216.3mm

N - Series

C -  $\phi$  114.3mm  
D -  $\phi$  139.8mm  
E -  $\phi$  165.2mm  
F -  $\phi$  216.3mm

#### Coolant Bonnet Types

C- Circular type M- Square type

N- Square type A- Circular type(For technical Specification & demension, Please Contact Hyundai Olaer)

See Page 4 for futher information

#### Shell & Tube Cooler Series

Blank - Oil / Water cooler

2 - Oil / Salt-Water

3 - Alloy Oil / Water Cooler (Fin:Copper 90% + Nikel 10%)

Epoxy resin Coating inside the Coolant Chamber.)

\*ex: HST-N-C-546-S-6 (6 pass Type)





## HST-C-Series(Standard)

The Table is based on:

Oil	ISO VG32
Oil inlet temperature	60°C
Water inlet temperature	32°C
Oil / Water ratio	3 : 1
Configuration	2 Pass

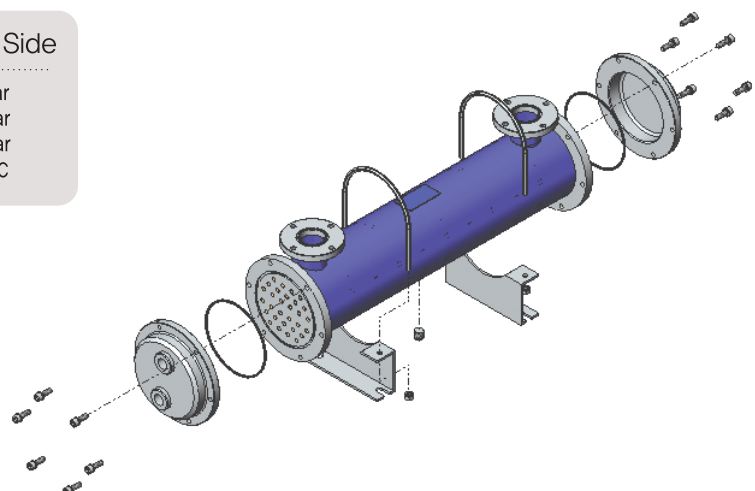


### Technical Data

MODEL	Connection		Max. oil flow (l/min)		Max. pressure drop ΔP(bar)		Cooling capacity		Heat transfer (m <sup>2</sup> )	Weight (kg)
	Oil	Water	Oil	Water	Oil	Water	Kcal/hr	kW		
HST-C-3-370-S-2	PT1"	PT1/2"	120	40	1.26	0.42	13,000	15	0.6	11
HST-C-3-460-S-2					1.36	0.43	16,600	19	0.7	12
HST-C-3-550-S-2					1.80	0.44	18,300	21	1.2	13
HST-C-4-340-F-2	1 1/4" (32A)	PT3/4"	240	80	0.86	1.08	19,100	22	0.7	20
HST-C-4-450-F-2					0.99	1.1	23,600	27	1.0	21
HST-C-4-530-F-2					1.20	1.2	28,100	33	1.2	22
HST-C-5-450-F-2	1 1/2" (40A)	PT1"	270	90	1.07	0.77	27,900	32	1.3	27
HST-C-5-680-F-2					1.21	0.79	36,800	43	2.0	30
HST-C-5-870-F-2					1.31	0.81	45,700	53	2.5	33
HST-C-6-680-F-2	2" (50A)	PT1"	350	120	1.61	0.95	50,200	58	2.6	39
HST-C-6-850-F-2					1.84	0.96	57,100	66	3.3	43
HST-C-6-970-F-2					2.08	1.03	64,000	74	3.8	46
HST-C-8-848-F-2	2 1/2" (65A)	PT 1/4"	600	150	1.92	0.81	89,700	104	5.4	91
HST-C-8-968-F-2					2.16	0.91	99,300	115	6.2	96
HST-C-8-1198-F-2					2.36	1	108,800	127	8.1	105
HST-C-10-848-F-2	2 1/2" (65A)	PT 1/2"	800	210	1.97	0.79	120,795	140	8.9	129
HST-C-10-1198-F-2					2.24	0.81	138,147	161	12.8	164
HST-C-10-1798-F-2					2.44	0.87	184,331	214	19.5	225

\* Standard connection size is PT(BSP TR) , PF(BSP PL)type can be optional  
 \* The specification or dimension shall be changed without notice.

	Oil Side	Water Side
Max. Working pressure	15 Bar	15 Bar
Design pressure	22 Bar	22 Bar
Hydrostatic test pressure	33 Bar	33 Bar
Max. Working temperature	100 °C	100 °C





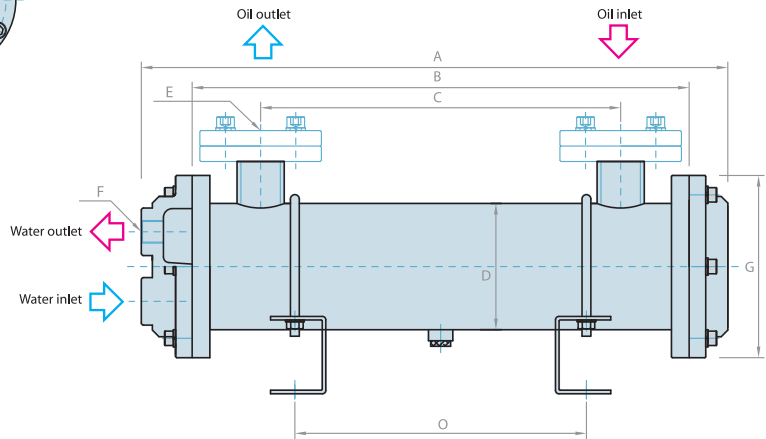
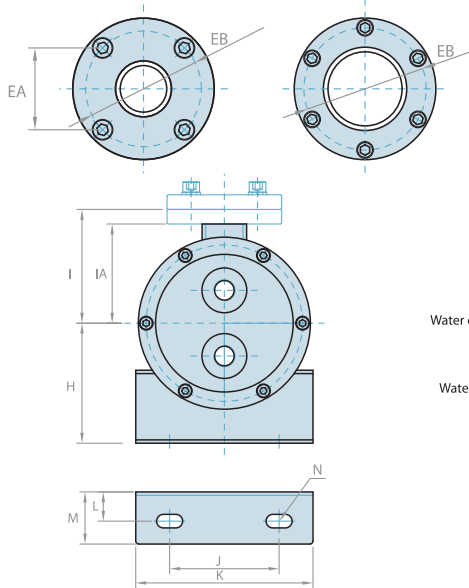
## HST-C-Series(Standard)

	Oil Side	Water Side
Max. Working pressure	15 Bar	15 Bar
Design pressure	22 Bar	22 Bar
Hydrostatic test pressure	33 Bar	33 Bar
Max. Working temperature	100 °C	100 °C
Configuration		2 Pass



▶HST-C-4~6 FLANGE

▶HST-C-8~10 FLANGE



### Dimension

Unit : mm

MODEL	A	B	C	D	E	EA	EB	F	G	H	I	IA	J	K	L	M	N	O	Weight (kg)
HST-C-3-370-S-2	436	370	258	φ 89.1	PT1"	-	-	PT1/2"	φ 135	90	-	82	103	154	19	32	11×24	200	11
HST-C-3-460-S-2	526	460	348															290	12
HST-C-3-550-S-2	616	550	438															380	13
HST-C-4-340-F-2	421	340	216	φ 114.3	1 1/4" (32A)	63.6	PCD φ 90	PT3/4"	φ 165	115	109	100	105	180	28	50	13×25	153	20
HST-C-4-450-F-2	531	450	326															264	21
HST-C-4-530-F-2	611	530	406															344	22
HST-C-5-450-F-2	538	450	340	φ 139.8	1 1/2" (40A)	63.6	PCD φ 90	PT1"	φ 195	141	126	113	127	209	27	50	14×25	243	27
HST-C-5-680-F-2	768	680	570															473	30
HST-C-5-870-F-2	958	870	760															643	33
HST-C-6-680-F-2	778	680	520	φ 165.2	2" (50A)	63.6	PCD φ 90	PT1"	φ 225	156	136	132	167	210	27	50	15×38	412	39
HST-C-6-850-F-2	948	850	690															582	43
HST-C-6-970-F-2	1068	970	810															702	46
HST-C-8-848-F-2	965	848	678	φ 216.3	2 1/2" (65A)	-	PCD φ 132	PT1 1/4"	φ 295	208	183	165	200	280	30	70	18×38	552	91
HST-C-8-968-F-2	1085	968	798															672	96
HST-C-8-1198-F-2	1315	1198	1028															902	105
HST-C-10-848-F-2	972	848	640	φ 267.4	2 1/2" (65A)	-	PCD φ 132	PT1 1/2"	φ 360	233.7	208	190	300	360	31	70	18×38	514	129
HST-C-10-1198-F-2	1322	1198	990															864	164
HST-C-10-1798-F-2	1922	1798	1590															1464	225

Note:\* Product HST-C-4 through HST-C-10 are standard flange type products. HST-C-3 products are standard socket types products. Socket type are order-based products only.

\* This data was prepared considering a number of conditions and is subject to change according to technical conditions. In addition to the Models previously mentioned, order-based manufacturing is also possible.



## HST-C-Series(Standard)

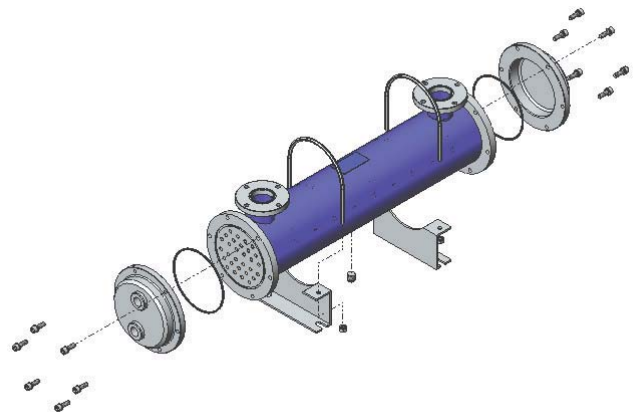
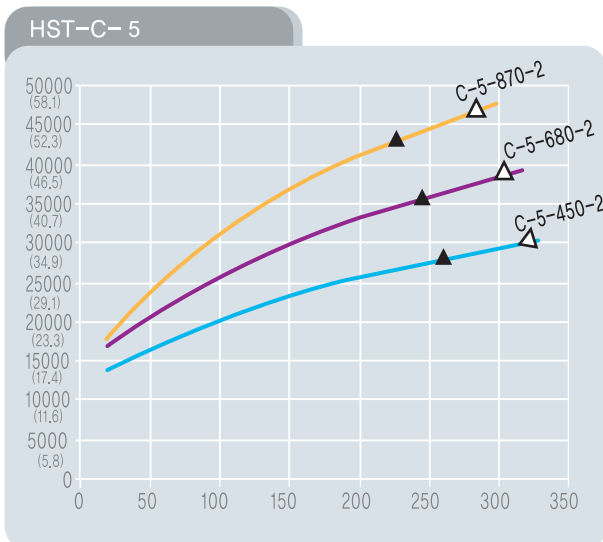
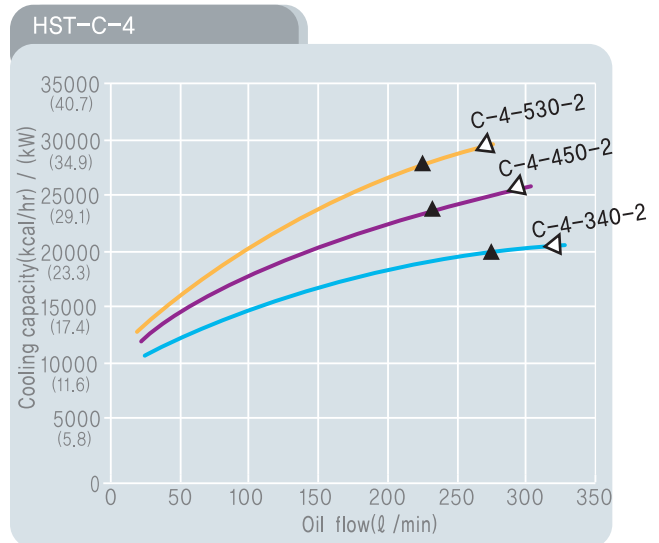
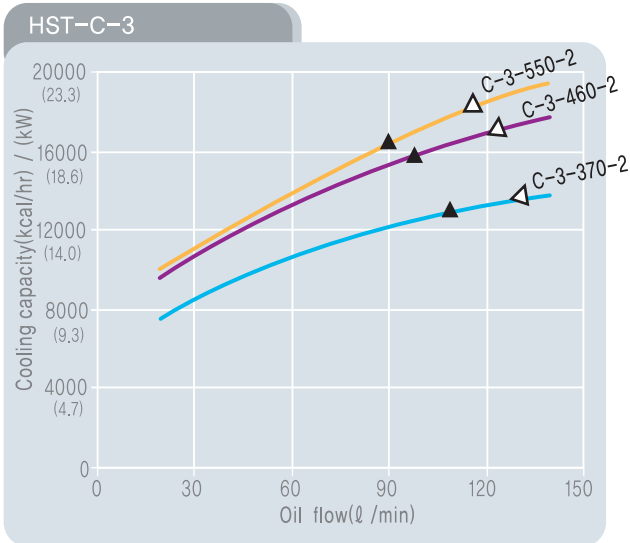
The Curve is based on :

Oil ISO VG32  
 Oil Inlet Temperature 60°C  
 Water Inlet Temperature 32°C  
 Oil / Water Inlet Ratio 3 : 1  
 Configuration 2 pass  
 Oil side pressure drop ▲=0.1Mpa(1bar)  
 △=0.15Mpa(1.5bar)  
 Water side pressure drop 0.01Mpa~0.1Mpa(0.1~1.0bar)

### Water Flow

	Min. (ℓ/min)	Max. (ℓ/min)
HST-C-3	5	40
HST-C-4	20	70
HST-C-5	20	90

### Heat Dissipation





## HST-C-Series(Standard)

The Curve is based on :

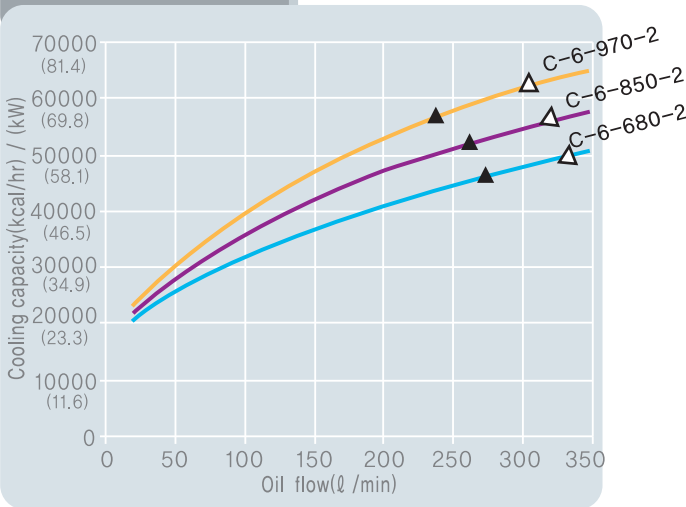
Oil ISO VG32  
 Oil Inlet Temperature 60°C  
 Water Inlet Temperature 32°C  
 Oil / Water Inlet Ratio 3 : 1  
 Configuration 2 pass  
 Oil side pressure drop  $\Delta=0.1\text{Mpa}(1\text{bar})$   
 $\Delta=0.15\text{Mpa}(1.5\text{bar})$   
 Water side pressure drop 0.01Mpa~0.1Mpa(0.1~1.0bar)

### Water Flow

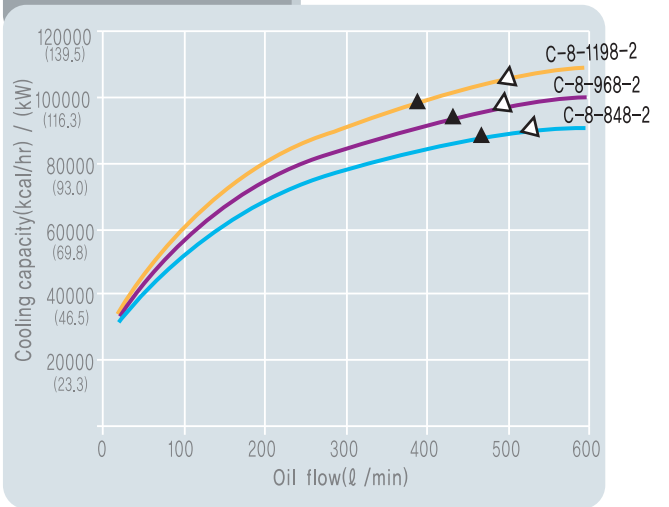
	Min. (ℓ/min)	Max. (ℓ/min)
HST-C-6	25	120
HST-C-8	30	150
HST-C-10	40	210

### Heat Dissipation

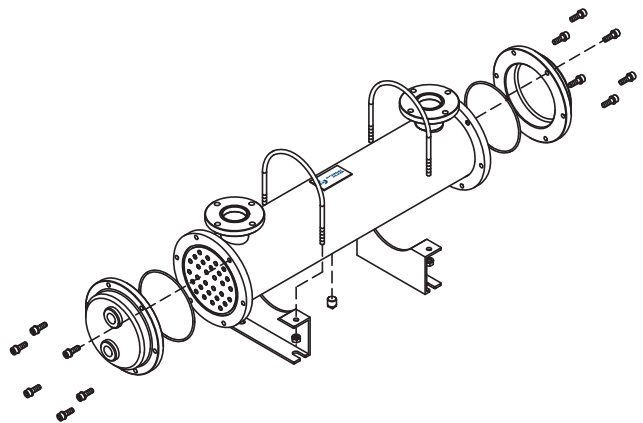
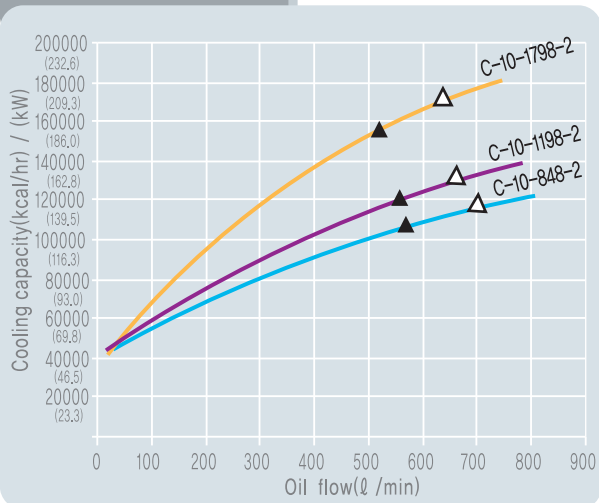
HST-C-6



HST-C-8



HST-C-10







## HST-M-Series(Standard)

The Table is based on:

Oil	ISO VG32
Oil inlet temperature	60°C
Water inlet temperature	32°C
Oil / Water ratio	3 : 1
Configuration	4 Pass



### Technical Data

MODEL	Connection		Max. oil flow (l/min)		Max. pressure drop ΔP(bar)		Cooling capacity		Heat transfer (m <sup>2</sup> )	Weight (kg)
	Oil	Water	Oil	Water	Oil	Water	Kcal/hr	kW		
HST-M-3-370-S-2	PT1"	PT1/2"	105	35	0.86	0.6	16,300	19	0.8	9
HST-M-3-460-S-2					0.87	0.7	17,500	20	1.0	10
HST-M-3-550-S-2					1.21	0.8	20,280	24	1.2	11
HST-M-4-340-F-2	1 1/4" (32A)	PT3/4"	195	65	0.95	1.25	25,700	30	1.2	18
HST-M-4-450-F-2					0.97	1.33	31,300	36	1.6	19
HST-M-4-530-F-2					1.19	1.4	36,300	42	1.9	20
HST-M-5-450-F-2	1 1/2" (40A)	PT1"	280	80	1.12	1.16	40,900	48	2.1	26
HST-M-5-680-F-2					1.25	1.18	53,800	63	3.3	28
HST-M-5-870-F-2					1.41	1.48	62,500	73	4.1	30
HST-M-6-680-F-2	2" (50A)	PT1"	300	100	1.29	0.95	65,800	77	5.2	41
HST-M-6-850-F-2					1.45	1.01	76,300	89	6.6	46
HST-M-6-970-F-2					1.61	1.03	91,500	106	7.5	50
HST-M-8-848-F-2	2 1/2" (65A)	PT1 1/4"	510	150	1.65	0.73	104,920	122	11.4	91
HST-M-8-968-F-2					1.98	1.00	118,630	138	13.1	96
HST-M-8-1198-F-2					2.25	1.27	132,300	154	16.9	102

\* Standard connection size is PT(BSP TR), PF(BSP PL)type can be optional

\* The specification or dimension shall be changed without notice.

	Oil Side	Water Side
Max. Working pressure	15 Bar	15 Bar
Design pressure	22 Bar	22 Bar
Hydrostatic test pressure	33 Bar	33 Bar
Max. Working temperature	100 °C	100 °C

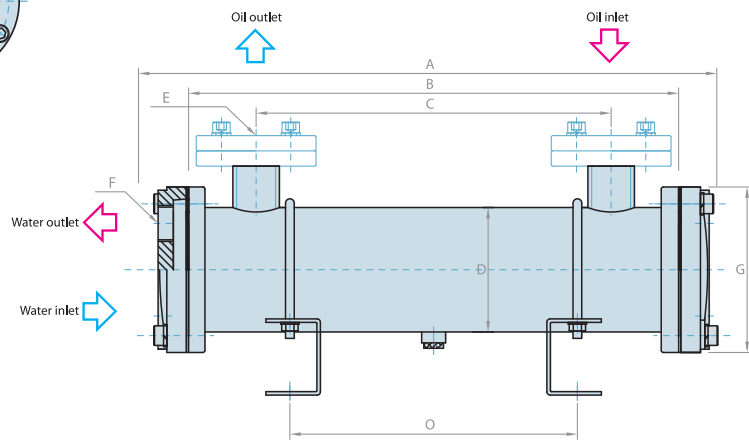
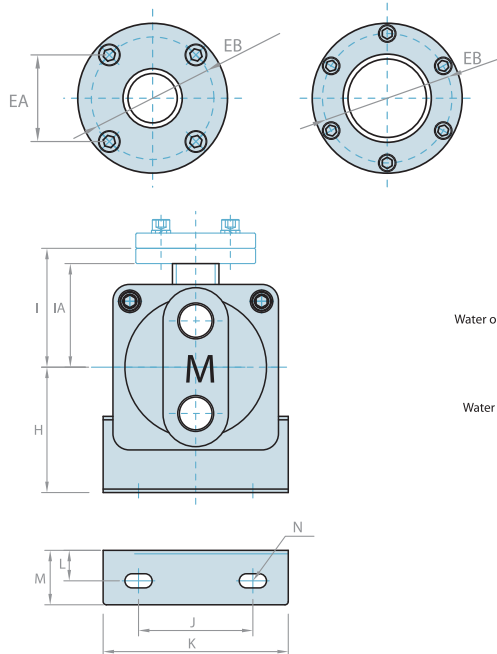


## HST-M-Series(Standard)

	Oil Side	Water Side
Max. Working pressure	15 Bar	15 Bar
Design pressure	22 Bar	22 Bar
Hydrostatic test pressure	33 Bar	33 Bar
Max. Working temperature	100 °C	100 °C
Configuration		4 pass

▶HST-M-4~6 FLANGE

▶HST-M~8 FLANGE



### Dimension

MODEL	A	B	C	D	E	EA	EB	F	G	H	I	IA	J	K	L	M	N	O	Unit : mm	
																			Weight (kg)	
HST-M-3-370-S-4	429	370	258	ø 89.1	PT1"	-	-	PT1/2"	100	90	-	83	103	154	19	32	11×24	200	9	
HST-M-3-460-S-4	519	460	348															290	10	
HST-M-3-550-S-4	609	550	438															380	11	
HST-M-4-340-F-4	409	340	216	ø 114.3	1 1/4" (32A)	63.6	PCD ø 90	PT3/4"	125	115	109	100	105	170	28	50	13×25	153	18	
HST-M-4-450-F-4	519	450	326															264	19	
HST-M-4-530-F-4	599	530	406															344	20	
HST-M-5-450-F-4	514	450	340	ø 139.8	1 1/2" (40A)	63.6	PCD ø 90	PT1"	152	141	126	113	127	209	27	50	14×25	243	26	
HST-M-5-680-F-4	744	680	570															473	28	
HST-M-5-870-F-4	934	870	760															643	30	
HST-M-6-680-F-4	752	680	520	ø 165.2	2" (50A)	63.6	PCD ø 90	PT1"	182	156	136	132	167	210	27	50	15×38	412	41	
HST-M-6-850-F-4	922	850	690															582	46	
HST-M-6-970-F-4	1042	970	810															702	50	
HST-M-8-848-F-4	932	848	678	ø 216.3	2 1/2" (65A)	-	PCD ø 132	PT1 1/4"	233	208	183	165	200	280	30	70	18×38	552	91	
HST-M-8-968-F-4	1052	968	798															672	96	
HST-M-8-1198-F-4	1282	1198	1028															902	102	

Note:\* Product HST-M-3 through HST-M-8 are standard flange type products. HST-M-3 products are standard socket types products. Socket type are order-based products only.

\*This data was prepared considering a number of conditions and is subject to change according to technical conditions. In addition to the models previously mentioned, order-based manufacturing is also possible.



## HST-M-Series(Standard)

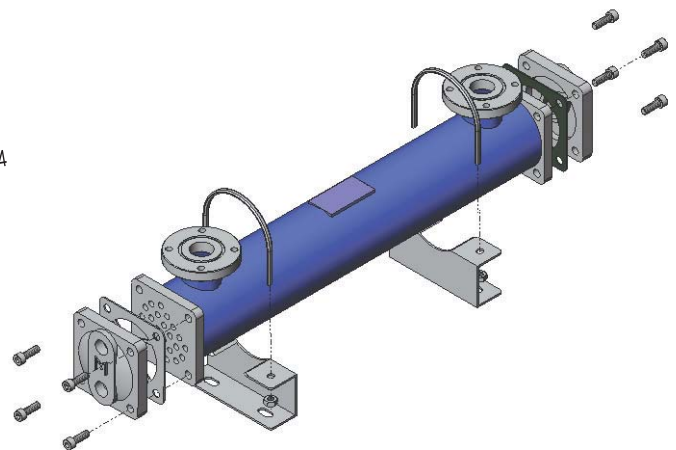
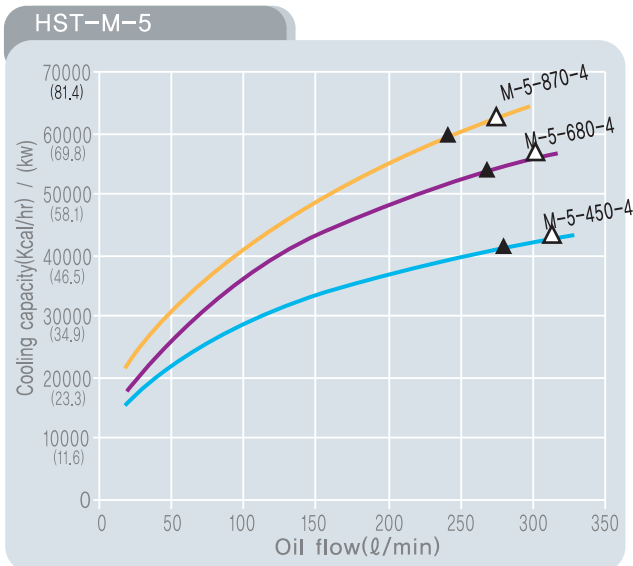
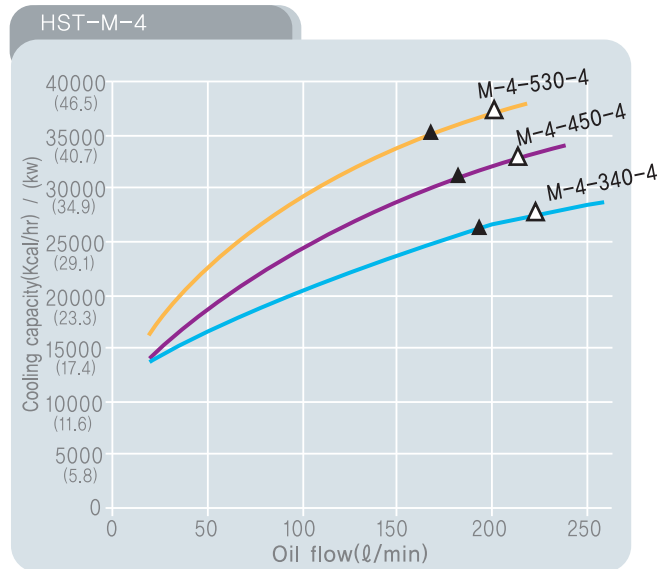
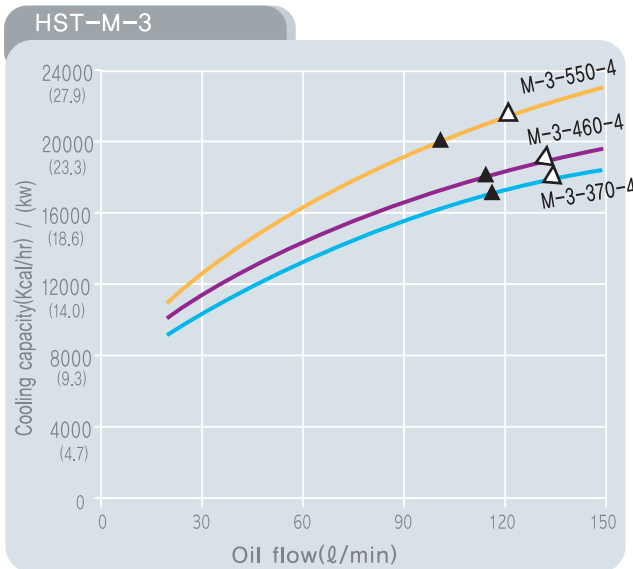
The Curve is based on :

Oil	ISO VG32
Oil Inlet Temperature	60°C
Water Inlet Temperature	32°C
Oil / Water Inlet Ratio	3 : 1
Configuration	4 pass
Oil side pressure drop	▲=0.1Mpa(1bar) △=0.15Mpa(1.5bar)
Water side pressure drop	0.01Mpa~0.1Mpa(0.1~1.0bar)

### Water Flow

	Min. (ℓ/min)	Max. (ℓ/min)
HST-M-3	5	35
HST-M-4	20	65
HST-M-5	25	80

### Heat Dissipation





## HST-M-Series(Standard)

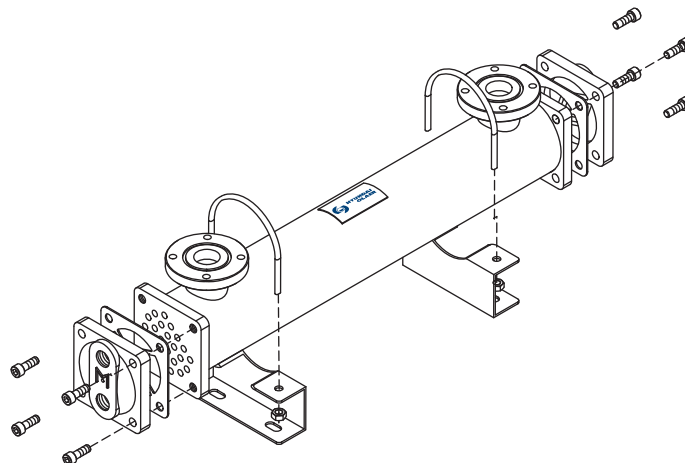
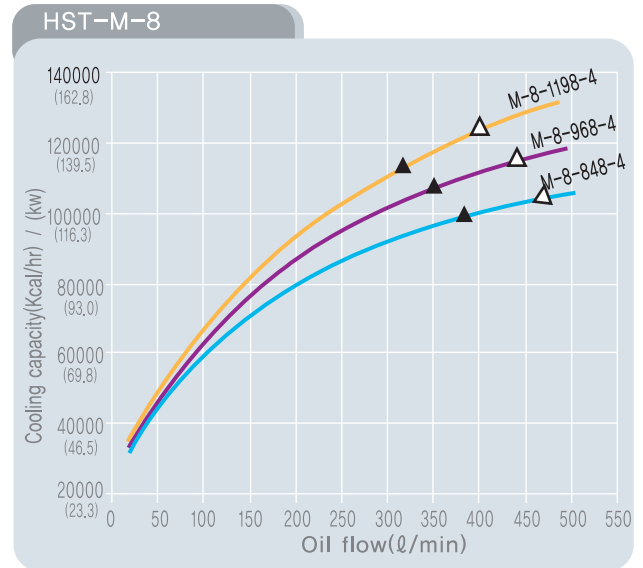
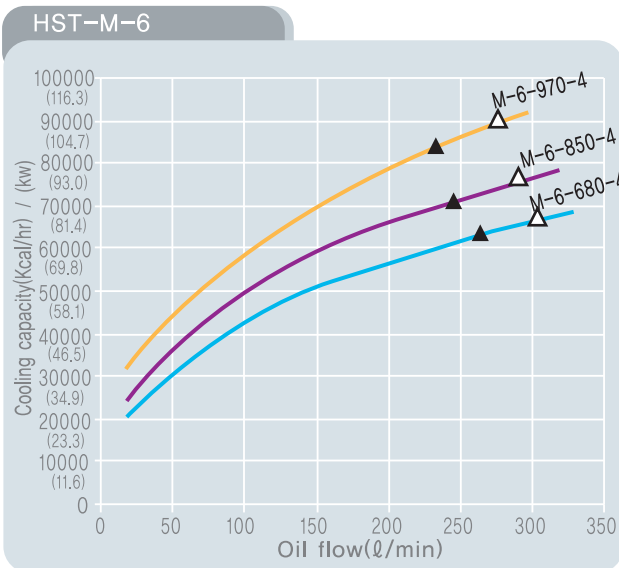
The Curve is based on :

Oil	ISO VG32
Oil Inlet Temperature	60°C
Water Inlet Temperature	32°C
Oil / Water Inlet Ratio	3 : 1
Configuration	4 pass
Oil side pressure drop	△=0.1Mpa(1bar) △=0.15Mpa(1.5bar)
Water side pressure drop	0.01Mpa~0.1Mpa(0.1~1.0bar)

### Water Flow

	Min. (ℓ/min)	Max. (ℓ/min)
HST-M-6	25	100
HST-M-8	30	150

### Heat Dissipation



# HST-Series



## HST-N-Series(Standard)

Fluid type ISO VG32  
 Oil inlet temperature 60°C  
 Water inlet temperature 32°C  
 Oil / Water ratio 6 : 1  
 Configuration 6Pass

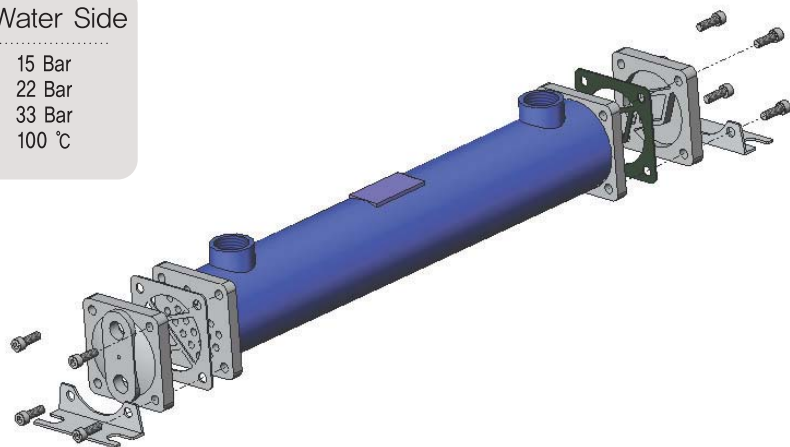


### Technical Data

MODEL	Connection		Max. oil flow (l/min)		Max. pressure drop ΔP(bar)		Cooling capacity		Heat transfer (m <sup>2</sup> )	Weight (kg)
	Oil	Water	Oil	Water	Oil	Water	Kcal/hr	kW		
HST-N-C-257-S-6	PT1 1/4"	PT3/4"	180	30	1.20	0.78	21,200	25	1.4	14
HST-N-C-546-S-6	PT1 1/2"				1.40	1.10	29,900	35	2.6	22
HST-N-C-636-S-6					1.60	1.20	33,900	39	2.9	25
HST-N-D-546-S-6	PT1"	280	40	1.40	0.84	42,000	49	3.5	42	
HST-N-D-636-S-6				1.70	0.96	45,100	52	4.0	47	
HST-N-D-726-S-6				1.80	1.00	50,600	59	4.5	49	
HST-N-E-616-S-6	PT2"	330	60	1.70	0.84	68,000	79	6.3	60	
HST-N-E-706-S-6				2.00	0.92	70,100	82	7.1	68	
HST-N-E-796-S-6				2.40	0.95	73,200	85	7.9	80	
HST-N-F-680-S-6	PT2 1/2"	PT1 1/4"	500	110	2.10	1.20	139,800	163	12.4	95
HST-N-F-770-S-6					2.40	1.25	141,200	164	13.7	120
HST-N-F-1130-S-6					2.70	1.32	147,100	171	19.2	135

\* Standard connection size is PT(BSP TR) , PF(BSP PL)type can be optional  
 \* The specification or dimension shall be changed without notice.

	Oil Side	Water Side
Max. Working pressure	15 Bar	15 Bar
Design pressure	22 Bar	22 Bar
Hydrostatic test pressure	33 Bar	33 Bar
Max. Working temperature	100 °C	100 °C

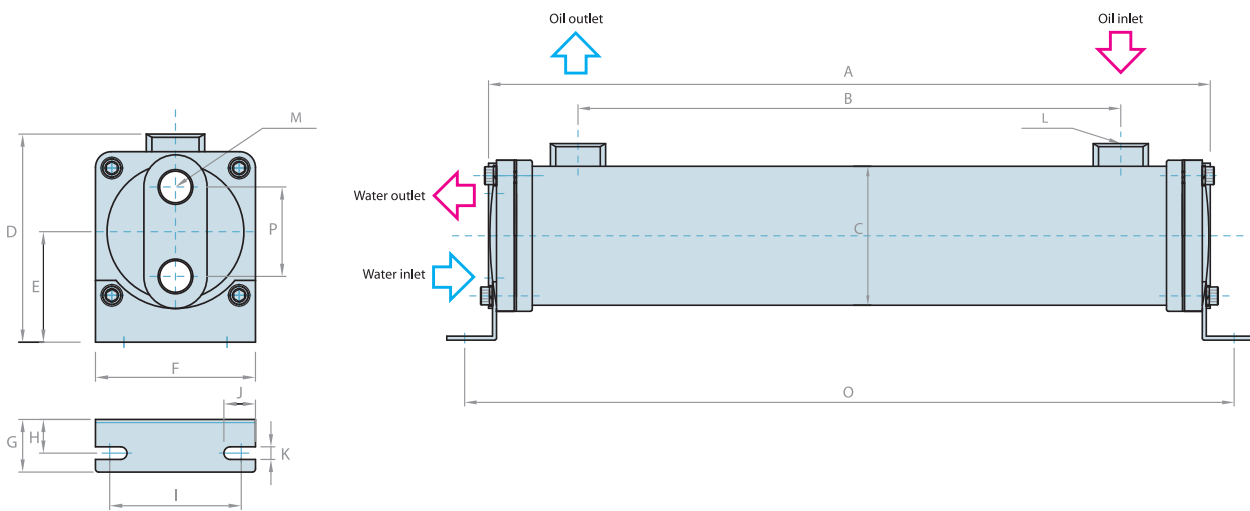


# HST-Series



## HST-N-Series(Standard)

	Oil Side	Water Side
Max. Working pressure	15 Bar	15 Bar
Design pressure	22 Bar	22 Bar
Hydrostatic test pressure	33 Bar	33 Bar
Max. Working temperature	100 °C	100 °C
Configuration		6 pass



### Dimension

Unit : mm

MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Weight (kg)
HST-N-C-257-S-6	437	257	φ 114.3	153	73	138	50	30	98	30	12	PT1 1/4"	PT3/4"	M10	480	70	14
HST-N-C-546-S-6	726	546		769	22												
HST-N-C-636-S-6	816	636		859	25												
HST-N-D-546-S-6	726	546	φ 139.8	198	105	152	50	32	125	30	12	PT1 1/2"	PT1"	M10	774	85	42
HST-N-D-636-S-6	816	636		864	47												
HST-N-D-726-S-6	906	726		954	49												
HST-N-E-616-S-6	820	616	φ 165.2	250	137	200	50	32	164	25	14	PT2"	PT1"	M12	866	112	60
HST-N-E-706-S-6	910	706		956	68												
HST-N-E-796-S-6	1000	796		1046	80												
HST-N-F-680-S-6	914	680	φ 216.3	305	162	270	65	42	208	31	18	PT2 1/2"	PT1 1/4"	M16	978	147	95
HST-N-F-770-S-6	1004	770		1068	120												
HST-N-F-1130-S-6	1364	1130		1428	135												

Note: \* Product HST-N-C through HST-N-F are standard flange type products. Flange type are order-based products only.

\* This data was prepared considering a number of conditions and is subject to change according to technical conditions. In addition to the models previously mentioned, order-based manufacturing is also possible.



## HST-N-Series(Standard)

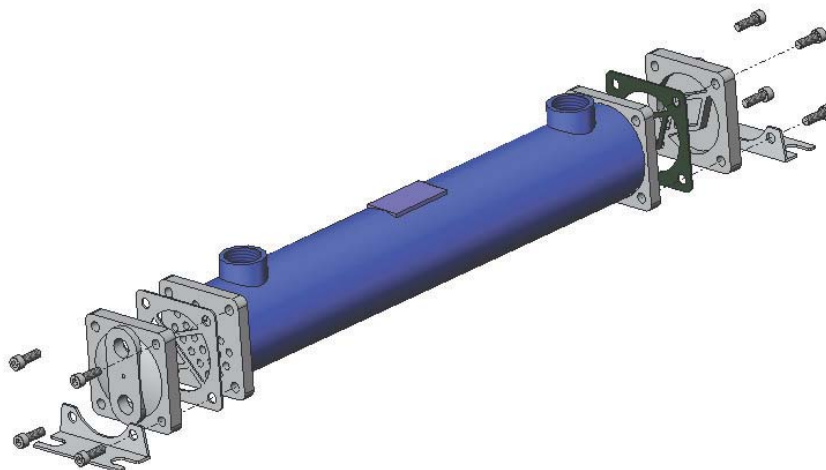
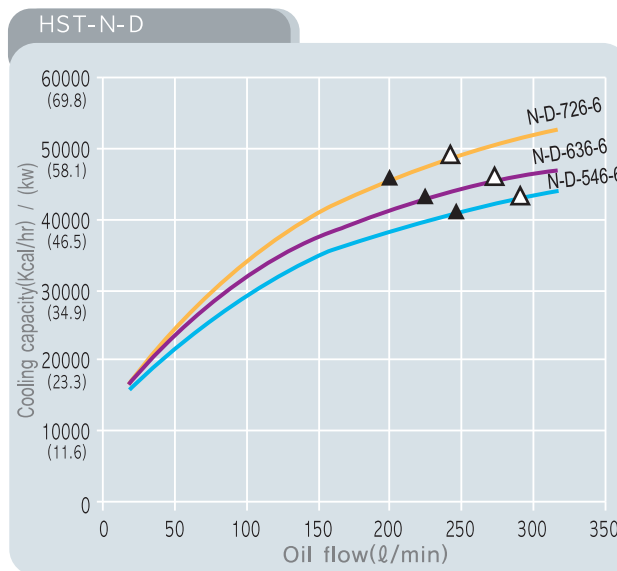
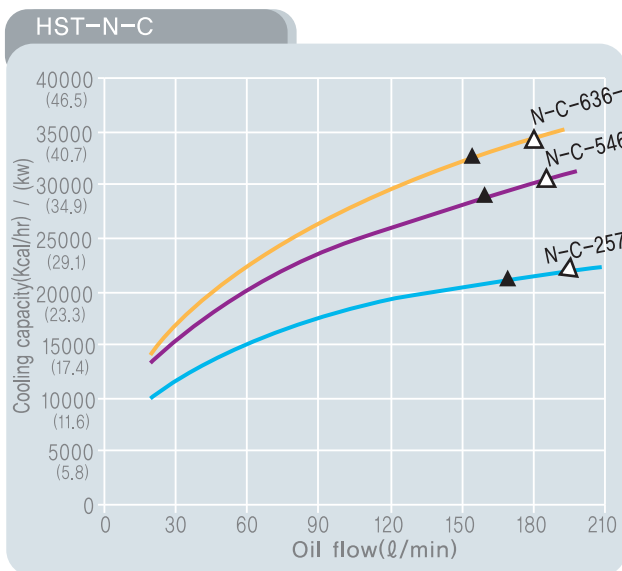
The Curve is based on :

Oil	ISO VG32
Oil Inlet Temperature	60°C
Water Inlet Temperature	32°C
Oil / Water Inlet Ratio	6 : 1
Configuration	6 pass
Oil side pressure drop	▲=0.1Mpa(1bar) △=0.15Mpa(1.5bar)
Water side pressure drop	0.01Mpa~0.1Mpa(0.1~1.0bar)

### ► Water Flow

	Min. (ℓ/min)	Max. (ℓ/min)
HST-N-C	8	30
HST-N-D	10	40

### Heat Dissipation





## HST-N-Series(Standard)

The Curve is based on :

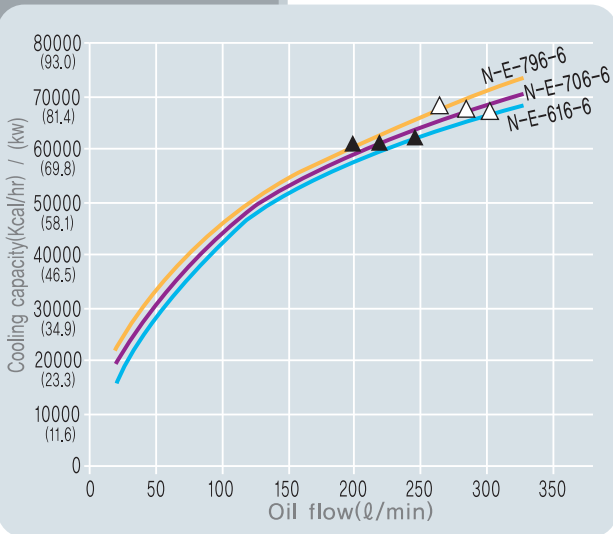
Oil	ISO VG32
Oil Inlet Temperature	60°C
Water Inlet Temperature	32°C
Oil / Water Inlet Ratio	6 : 1
Configuration	6 pass
Oil side pressure drop	▲=0.1Mpa(1bar) △=0.15Mpa(1.5bar)
Water side pressure drop	0.01Mpa~0.1Mpa(0.1~1.0bar)

### Water Flow

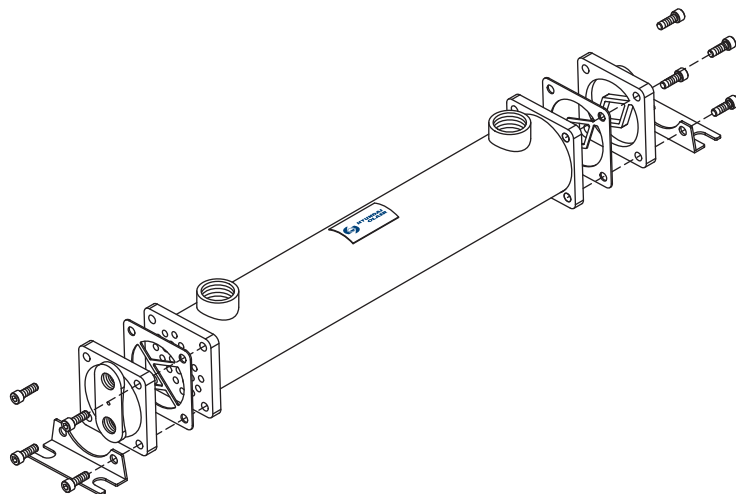
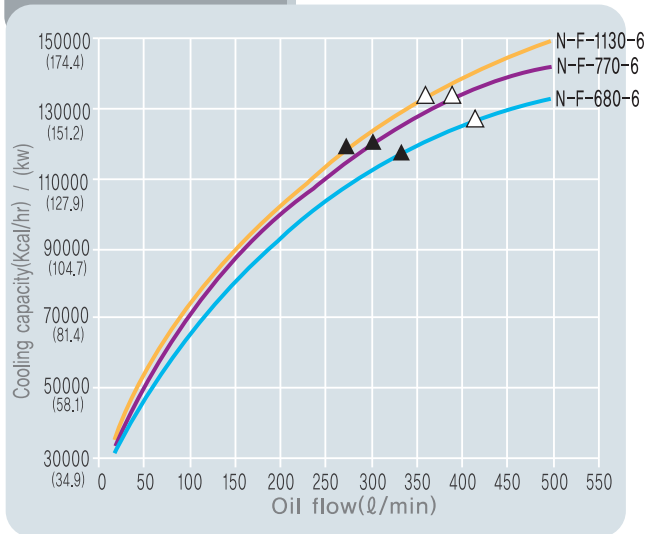
	Min. (ℓ/min)	Max. (ℓ/min)
HST-N-E	17	60
HST-N-F	20	110

### Heat Dissipation

HST-N-E



HST-N-F





## Handling / Installation manual

Thank you for choosing the HST-series, Hyundai Olaer's representative oil coolers. In order to apply the product more safely, please carefully read the handling/installation manual and observe the precautions and disclaimers listed prior to use.

## Warning

**[Caution]** When using fluids other than mineral oil, (Water-glycogel, phosphoric esters, etc, any fluids featuring a 'fluid spray' warning symbol), a separate option should be used when selecting models. Other fluid types should not be used for the model selected in this way.

**[Caution]** Under no circumstances should you use this product above maximum operating pressure and Design temperature levels.

## Disclaimers / Caution

Where the products are used contrary to the manner outlined in the product manual, the products shall be excluded from warranty, regardless of the duration of said product use.

### (1) Usage

Do not use the product for any purposes other than as an oil cooler.

[Examples of usages not permitted]

- Heater
- Where the fluid used is other than oil, (air, gas, or water discharged into the shell side).

### (2) Fluid types

Do not use any fluid types other than general mineral oil. (Where there is a fluid spray symbol indicated for fluid handling, follow the instructions carefully).

If the product is intended to be used for fluids other than those designated, ensure to contact our Technical Sales Department prior to use.

### (3) Operating pressure

Under no circumstances should you use the product above the maximum operating pressure or Design temperature levels.

## Disclaimers / Caution

### Maximum Working pressure

Outside the tube (oil side) : 20bar(2.0MPa)

Inside the tube (water side) : 20bar(2.0MPa)

### Design temperature

100°C (The oil and water inlet temperatures should be 80°C or lower).

### (4) Operating cooling water

Tap water, underground water, or industrial water should be used as cooling water for Hyundai Olaer standard oil coolers, adhering to the water quality standards below. Do not use contaminated water.

(※ For coolers that use seawater as cooling water, an appropriate symbol option should be chosen when selecting the product model).

## Standard Values for Cooling Water Quality

	Item	Standard	Tendency	
			Corrosion	Scale Formation
Standard Items	Ph(25°C)	6.5 ~ 8.2	○	○
	Electric conductivity(25°C) $\mu\text{S}/\text{cm}$	800 or lower	○	○
	Chlorine ions( $\text{Cl}^-$ ) $\text{mgCl}^-/\ell$	200 or lower	○	
	Sulfur ions ( $\text{SO}_4^{2-}$ ) $\text{mgSO}_4^{2-}/\ell$	200 or lower		○
	Ph4-8 $\text{mgCaCO}_3/\ell$	100 or lower		○
	Total hardness $\text{mgCaCO}_3/\ell$	200 or lower	○	○
Reference Items	Iron (Fe) $\text{mgFe}/\ell$	1.0 or lower	○	
	Sulfurized ions( $\text{S}^{2-}$ ) $\text{mgS}^{2-}/\ell$	Not to be detected	○	
	Ammonium ions( $\text{NH}_4^+$ ) $\text{mgNH}_4^+/\ell$	1.0 or lower	○	
	Ionized silica ( $\text{SiO}_2$ ) $\text{mgSiO}_2/\ell$	50 or lower	○	○

※ Note1) In the case of use of untreated water from a river, lake, or pond, ensure the water is not contaminated.

※ Note2) This standard has been adopted to extend the cooler's maximum life, maintain efficiency, and/or prevent any decrease in efficiency. Corrosion may occur even within the standard range.

## Operating precautions

When not in operation for a long period of time, drain the water from the cooler. Water left for a long period of time in the cooler not in operation may result in corrosion.

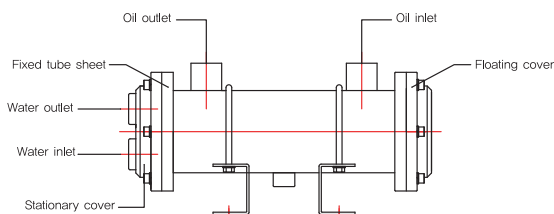
During the winter, drain water from the cooler when turning the cooler off in order to prevent freezing, ensuring that foreign matter does not enter.

## Regular maintenance and cleaning

**[Common]** The oil cooler's fin tube should be cleaned and checked once every six months, (at a minimum of once annually). When the cooler is disassembled for cleaning, replace all packing materials with new material. Check whether the cooling water contains hydraulic oil.

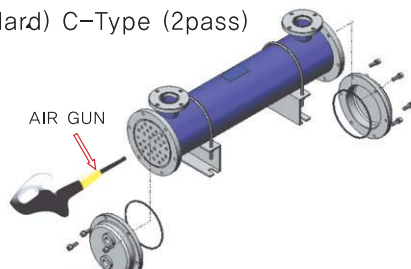
### [Cleaning / Disassembly]

(1) HST-Series (standard) A-Type (2pass)

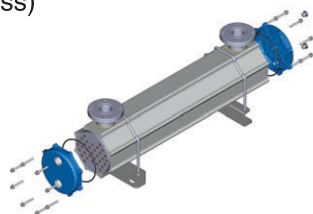


- 1). Separate Stationary cover and Floating cover, and check the internal status of tube. When it is polluted with leaves, fur or remnants, etc., clean simply using Air.
- 2). Clean by inserting into the tube using a brush bar for cleaning, appropriate for the size.
- 3). Where there are limestone in the tube, as it is difficult to clean, connect a separate circulation pump to cooling water pipe, and then clean using an anti-limestone chemicals.

(2) HST-Series (standard) C-Type (2pass)



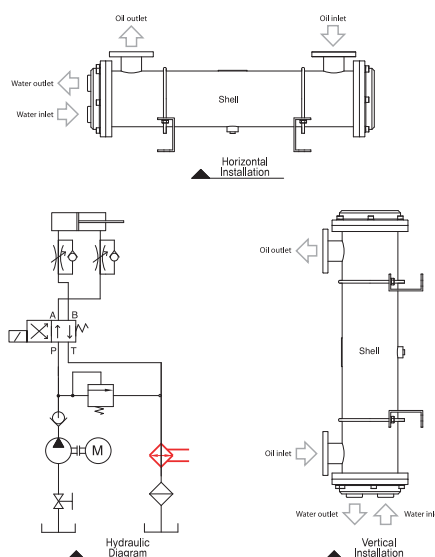
(3) HST-Series S-Type (2&4 Pass)



(3) Product information Operation & Maintenance manual

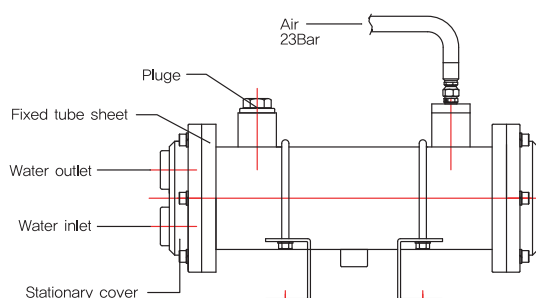


## Installation



## Product inspection method

After reassembling the cooler, close the oil outlet with a plug. Inject approximately 23bar of air into the oil inlet. Submerge the cooler in a diesel fuel tank, and carefully check whether any bubbles are generated.





## How to select a water cooling oil cooler

- Choose a model referring to the oil flow (l/min) and cooling capacity (kcal/hr) on the cooling performance graph per product model (HST series) in the catalogue.
- Where your specific operating conditions fall outside the coordinate range on the cooling performance graphs, or where you need more detailed technical data to select a model, please fill out the Product Selection Request on the following page, and send it to us by fax or email. We will advise you of the results as soon as possible.
- Simplified Product Selection (Applicable when your oil flow and cooling capacity are similar to those outlined on the graph).
- For a detailed product selection method, please adhere to the following steps:

### [Step 1]

Calculate the required cooling capacity by using the basic cooling capacity formula.

$$Q = Q_o \times 60 \times C_o \times P_o \times (T_1 - T_2)$$

$$= Q_w \times 60 \times C_w \times P_w \times (t_2 - t_1)$$

※ Note) For the unit of each symbol of the formula, please refer to the Product Selection Request table.

### [Step 2]

Calculate the LMTD (Log Mean Temperature Difference).

$$LMTD = \frac{(T_1 - t_2) - (T_2 - t_1)}{2.3 \log \frac{(T_1 - t_2)}{(T_2 - t_1)}}$$

(You may use an  $LMTD = \frac{(T_1 - t_2) + (T_2 - t_1)}{2}$  but apply some degree of error)

● LMTD : Log Mean Temperature Difference (°C)

- Q<sub>o</sub> = Flow rate of oil (l/min)
- C<sub>o</sub> = Specific heat of oil (kcal/kg°C)
- P<sub>o</sub> = Specific gravity of oil (kg/l)
- T<sub>1</sub> = Temperature of oil at inlet (°C)
- T<sub>2</sub> = Temperature of oil at outlet (°C)
- Q<sub>w</sub> = Flow rate of cooling water (l/min)
- C<sub>w</sub> = Specific heat of cooling water (kcal/kg°C)
- P<sub>w</sub> = Specific gravity of cooling water (kg/l)
- t<sub>1</sub> = Temperature of cooling water at inlet (°C)
- t<sub>2</sub> = Temperature of cooling water at outlet (°C)

### [Step 3]

Obtain an approximate cooling area.

$$A = \frac{Q}{K \times a \times LMTD}$$

- A = Heat transfer area (m<sup>2</sup>)
- K = Overall heat transfer coefficient (kcal/m<sup>2</sup>hr)
- a = Correction factor

#### ※ Caution

The K value changes depending on operating conditions and cooler's structure.

Please use the K values as per the following table:

MODEL	TYPE	K value	Liquid viscosity
C-TYPE	2PASS	600~800	ISO VG32
M-TYPE	4PASS	500~700	ISO VG32
N-TYPE	6PASS	400~600	ISO VG32
S2-TYPE	2PASS	400~600	ISO VG32
S4-TYPE	4PASS	450~550	ISO VG32

※ Note) The values represent the mean values of the cooling performance graph in the catalogue.

### [Step 4]

Select a model for the heat transfer area.

Select a model that fits heat transfer area 'A' in the standard specifications table (HST series).

- ※ Ex)  $A = 1.6 \text{ m}^2$
- HST C-Type - (1.8m<sup>2</sup>)
  - HST M-Type - (1.7m<sup>2</sup>)
  - HST N-Type - (1.65m<sup>2</sup>)
  - HST S2-Type - (1.5m<sup>2</sup>)
  - HST S4-Type - (1.7m<sup>2</sup>)


※ Note) For heat transfer areas of the HST series C, M, N, S-Type pass products, refer to the detailed specifications and technical data on pages 9, 13, 20, 24 and 28.

# HST-Series



## HST Cooler Calculation Sheet

Date. . . . .

Company		 <p>3Ba, 204-1, Shiwhan Industrial Complex, Jeongwang-dong, shiheung-si, Gyeonggi, Korea Tel. 031-499-0797 Fax. 031-499-2249 http://www.hyundaiolaer.co.kr E-mail : master@hyundaiolaer.co.kr</p>
Project Name		
Dept./Name		
TEL		
FAX		
E-mail		

- For other cooler sizing, please fill out this form and send to HOH.
- If the unit per each item is different from this, please specify.

	Cooled Fluid(High temperature)		Cooled Fluid(Low temperature)	
Fluid Name				
Heat Transfer	P = (1kw=860kcal)		KW(kcal/h)	
Flow Rate	Q =	ℓ /min		ℓ /mn
Inlet Temperature	T <sub>1</sub> =	°C		°C
Outlet Temperature	t <sub>1</sub> =	°C		°C
Pressure Drop	p <sub>1</sub>	bar		bar
Working Pressure		bar		bar
Design Pressure		bar		
Design Temperature		°C		
Type / Model				
Insulation Site	< <input type="checkbox"/> In door, <input type="checkbox"/> Out door >		<Sea wind <input type="checkbox"/> O, <input type="checkbox"/> X >	
Application				
Cert	CE <input type="checkbox"/> , Other( )			
Density	ρ =	kg/m <sup>3</sup>	ρ =	kg/m <sup>3</sup>
Specific Heat	C =	kJ/kg°C	C =	kJ/kg°C
Conductivity	K =	w/m°C	K =	w/m°C
Viscosity	μ =	mm <sup>2</sup> /s(at °C)	μ =	mm <sup>2</sup> /s(at °C)

[Remark] Specify if any comment