Water Oil Coolers

HPC/HGPC Series - Plate Coolers

HSC Series - Shell &Tube Coolers

HLDA Series - Chiller

What is a water-cooled cooler?

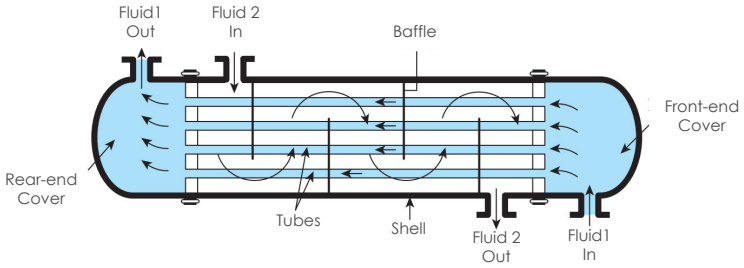
Just as the purpose of air-cooled coolers, the purpose of a water-cooled cooler is to optimize the heat management of oil and maintain the performance and lifespan of hydraulic systems. However, unlike air-cooled coolers, water-cooled coolers use water as a cooling medium, and in places where water resources are abundant, water-cooled coolers are widely used.

Water-cooled coolers can be classified according to their structure, and are generally divided into 1) tubular coolers, 2) plate coolers, and 3) chillers.

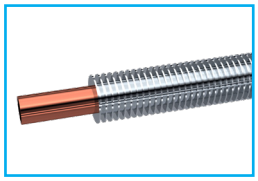
Tubular cooler

Tubular coolers are divided into double pipe, shell and tube, and coiled tube types, and Hydrolync supplies shell and tube products.

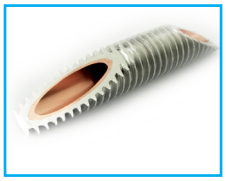
In the process industry, shell and tube heat exchangers are used much more frequently than other types. More than 90% of tubular coolers used in the industry are of the shell and tube type. Shell and tube heat exchangers used in various industries have the most well-established standards for design and manufacturing using various materials, and are therefore produced in the widest range of sizes and types. Our products include the **HSC Series**.



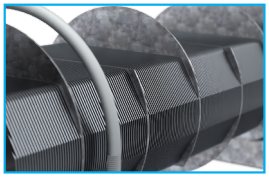
General structure of shell and tube



Copper-Aluminum Finned Tube



Cross section



Copper-Aluminum Plate Tube

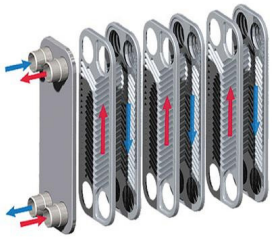
Our **HSC Series** shell and tube product uses an extrusion fin-tube type and Aluminum pate tube ype, which minimizes the thermal resistance coefficient between the copper tube and aluminum fin to maximize heat performance. The finned and plate tube generates turbulence in the fluid flow, allowing efficient transfer of heat from the fluid to the tube, thus maximizing heat exchange performance.

Plate coolers

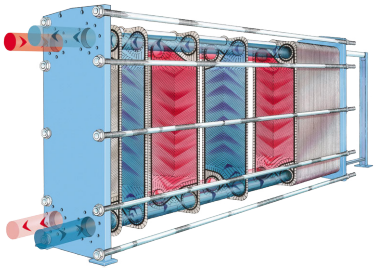
Plate-type coolers offer several important advantages but are less commonly used than shell-and-tube heat exchangers. Plate-type coolers can be classified into three types:

1. Brazed plate coolers, gasketed plate coolers: used in liquid-liquid heat exchange applications at low and medium pressures and are an alternative to shell-and-tube coolers.
2. Spiral plate coolers: used for fluids containing sludge or viscous impurities and are an alternative to shell-and-tube coolers in locations where little maintenance is required.
3. Panel coil coolers: made by forming a double pipe or coil of liquid combined with fins using angled plates.

Our Brazed Plate Cooler and Gasketed Plate Cooler are the main types of plate heat exchangers. The biggest advantage of a plate heat exchanger is its high heat transfer performance compared to its compact size. This is because the fluid flowing along the angled shape of the plate generates high turbulence, leading to high heat transfer performance. Depending on the method of joining plates with different angled shapes, plate heat exchangers can be divided into two types: brazed plate heat exchangers, where welding material is melted in a high-temperature chamber to join the plates, and gasketed plate heat exchangers, where a gasket is inserted between the plates and compressed by front and back covers. Our company's Brazed Plate Cooler is the **HPC Series**, and the Gasketed Plate Cooler is the **HGPC Series**.



Brazed Plate Cooler

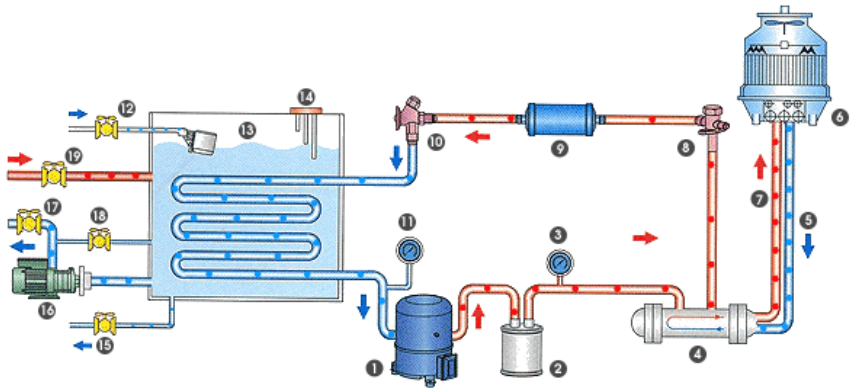


Gasketed Plate Cooler

Chiller

A chiller is a mechanical refrigeration device that cools water, air, or other liquids, using a compressor, evaporator, condenser, refrigerant, and other components. The core technology of a chiller typically lies in its control system, which manages and optimizes the performance of the chiller, including temperature control, flow control, and pressure control.

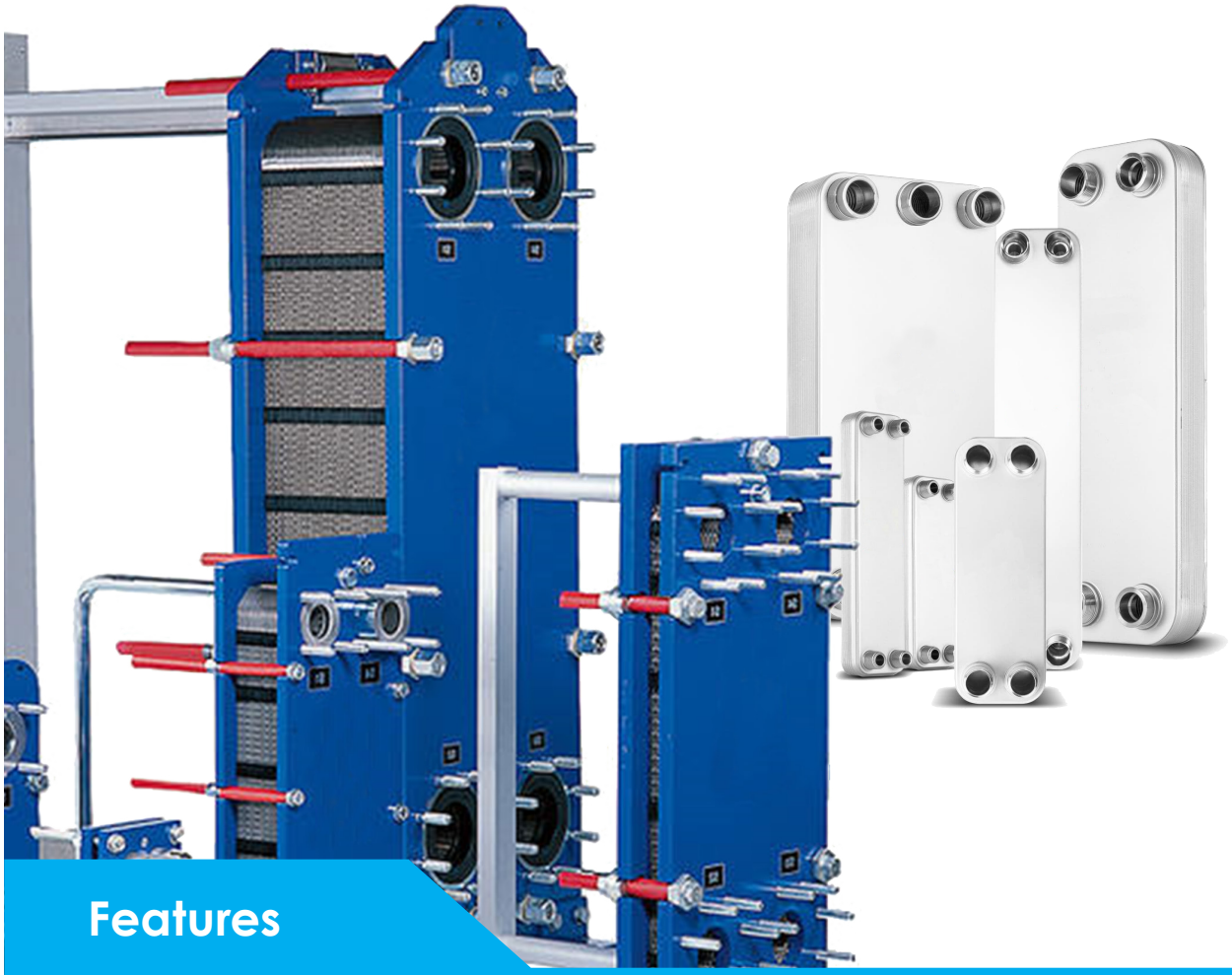
Many modern chillers are equipped with advanced energy-saving technologies, such as variable speed drives and high-efficiency compressors, to reduce energy consumption and operating costs. They are also designed to withstand harsh industrial environments with durable structures, corrosion-resistant materials, and stable performance and lifespan. Therefore, despite being more expensive than other heat exchangers, there is an increasing demand for chillers that guarantee robust structure, corrosion-resistant materials, and stable performance and lifespan. Our chiller products include the **HLDA series**.



❶ Compressor
❷ Oil Separator
❸ High-Pressure Gauge
❹ Condenser (Shell & Tube)
❺ Cooling Water Supply
❻ Cooling Tower
❼ Cooling Water Return
❽ Shut Off Valve
❾ Filter Dryer
❿ Expansion Valve
⓫ Low-Pressure Gauge
⓬ City Water Supply
⓭ Evaporator & Tank
⓮ Level Sensor
⓯ Drain Valve
⓰ Circulation Pump
⓱ Cooled Water Supply
⓲ Cooled Water Return
⓳ By-Pass Valve

HPC/HGPC Series

Plate Coolers



Features

- Compact, easy installation and cost-effective
- High thermal transfer efficiency
- Proven and reliable quality
- Reduce life cycle cost

Quick Overview

HydroLync provides two types of plate heat exchangers. HPC uses a brazing method, while HGPC is a gasket type.

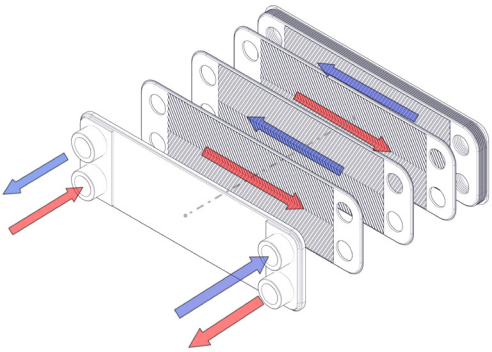
HPC is one of the products with excellent heat transfer performance. It consists of a corrugated channel plate package between the front and back cover plate packages. The cover plate package is composed of a sealing plate, a blind ring, and a cover plate. The connection is mounted on the cover plate and can be custom-made according to user requests for specific markets and applications designed for high-pressure hydraulic systems.

HGPC is a multi-purpose gasket plate heat exchanger. The heat transfer area of the gasket plate heat exchanger is composed of a series of corrugated plates assembled between the frame and pressure plate to maintain pressure. The gasket plays a sealing role between the plates. Fluid typically flows through the heat exchanger in a counter-current manner. This provides the most efficient heat transfer performance and allows for a very close temperature approach, i.e., the temperature difference between the outlet cooled fluid and the inlet cooling fluid.

HPC Materials

Parts	Standard Materials
Cover Plates	Stainless steel - 304
Connections	Stainless steel - 304
Plates	Stainless steel - 304 / 306L
Brazing filler	Copper

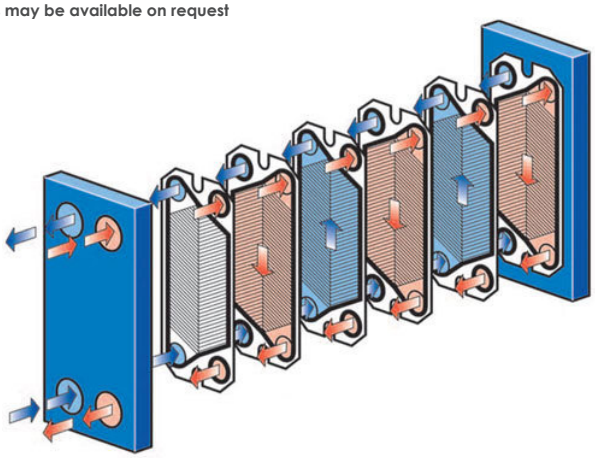
***Other materials may be available on request**



HGPC Materials

Parts	Standard Materials
Field gaskets	NBR, EPDM. FKM, etc.
Heat transfer plates	Stainless steel - 304 / 316L
Flange connections	Stainless steel - 304 / 316, Alloy 254, Titanium
Frame and pressure plate	Carbon steel, epoxy painted

***Other materials may be available on request**



HPC Ordering code

Example: HPC [K] - [205] - [60] - [M]
1 2 3 4

1	Series
K	K Series
BL	BL Series

2	Plate size		
Series	**Model**	**Size**	**L**
K	**030**	80 x 194 x L	9 + 2.20xN
	070	124 x 304 x L	10 + 2.38xN
	105	124 x 504 x L	11 + 2.38xN
	205	246 x 528 x L	14 + 2.40xN
BL	**30**	111 x 310 x L	13 + 2.30xN
	120	246 x 528 x L	13 + 2.38xN

***Note:** The actual thickness and weight may differ from the theoretical calculation result by up to ±3%.

3	Number of plates					
Number	**K Series**				**BL Series**	
	030	**070**	**105**	**205**	**30**	**120**
10	●					
20	●	●	●	●	●	●
30	●	●	●	●	●	●
40	●	●	●	●	●	●
50	●	●	●	●	●	●
60		●	●	●	●	●
70		●	●	●	●	●
80				●		●
100				●		●

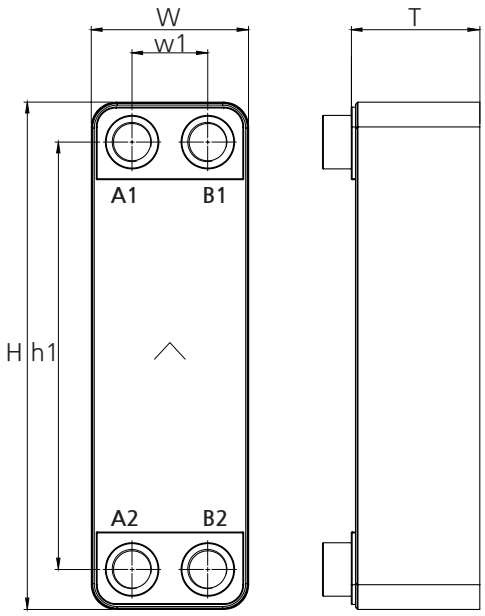
4	Port
Type	
M	PT Male only (Standard)
F	PF Female only

*** Please consult with the sales department for other types of port.**

Port sizes by model

Series	Model	Port size	
		Oil	Water
K	**030**	3/4"	3/4"
	070	1"	1"
	105	1"	1"
	205	1 1/2"	1 1/2"
BL	**30**	1"	1"
	120	1 1/2"	1 1/2"

HPC Specifications



Brazing materials	Copper	Copper *Extra Strength	Nickel
		A1, A2 / B1, B2	
Max. Working pressure (bar)	30/30	45/30	10/10
Reinforced max. Pressure (bar)	43/43	65/43	15/15
Max. Working temperature (˚C)		200 ˚C	

Dimensions

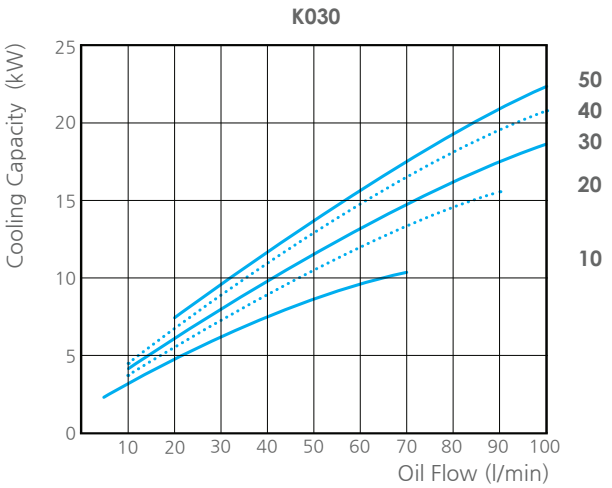
Model	W	w1	H	h1	T	Weight
	mm	mm	mm	mm	mm	Kg
K030	80	40	194	154	9+2.20n	0.50+0.047n
K070	124	70	304	250	10+2.38n	1.38+0.134n
K105	124	64	504	444	11+2.38n	3.23+0.230n
K205	246	174	528	456	14+2.40n	7.30+0.480n
BL30	124	70	304	250	13+2.3n	1.30+0.130n
BL120	246	174	528	456	13+2.36n	7.70+0.414n

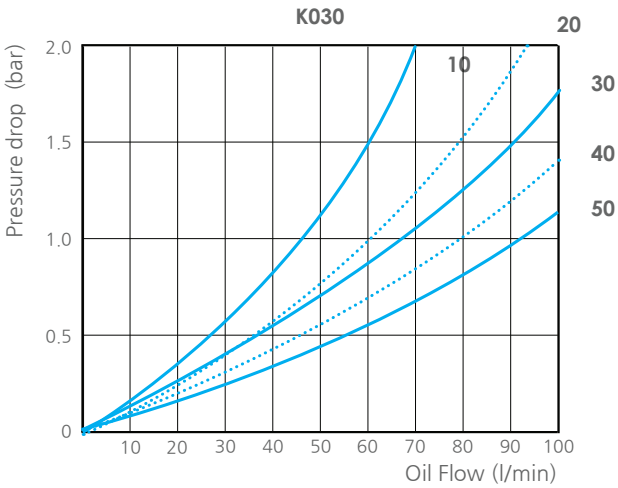
***Note:** The actual thickness and weight may differ from the theoretical calculation result by up to ±3%.

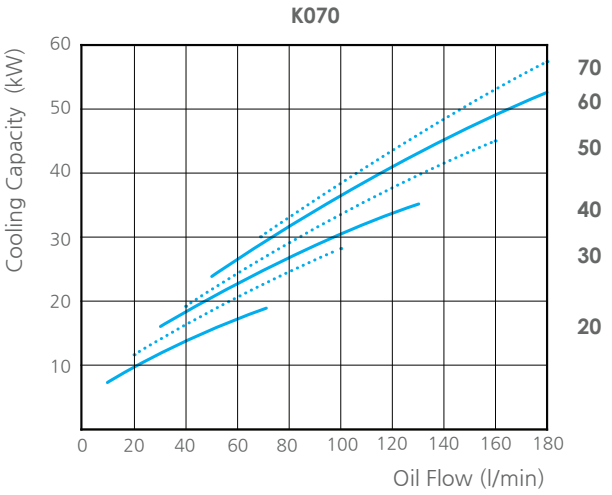
Connections

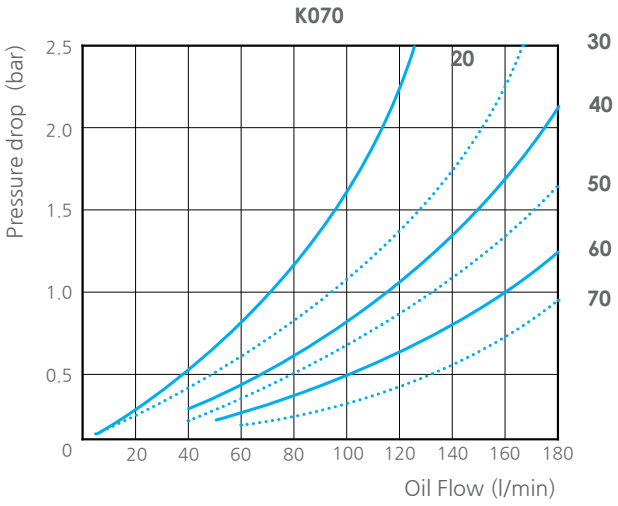
Model	Inlet/Outlet Ports				Remark
	A1	A2	B1	B2	
K030	PT 3/4"	PT 3/4"	PT 3/4"	PT 3/4"	PT - Male only PF - Female only
K070	PT 1"	PT 1"	PT 1"	PT 1"	
K105	PT 1"	PT 1"	PT 1"	PT 1"	
K205	PT 1 1/2"	PT 1 1/2"	PT 1 1/2"	PT 1 1/2"	
BL30	PT 1"	PT 1"	PT 1"	PT 1"	
BL120	PT 1 1/2"	PT 1 1/2"	PT 1 1/2"	PT 1 1/2"	

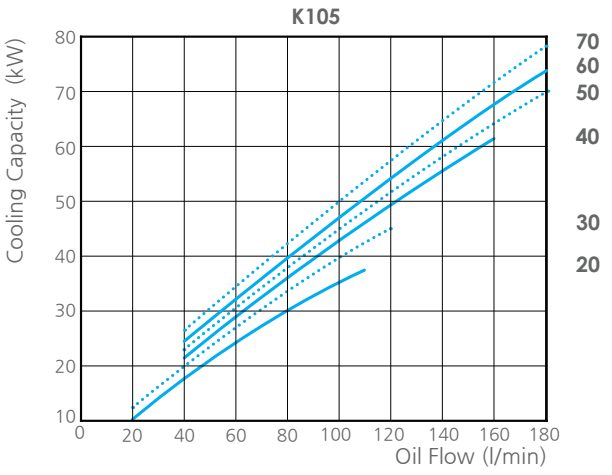
Performance curve

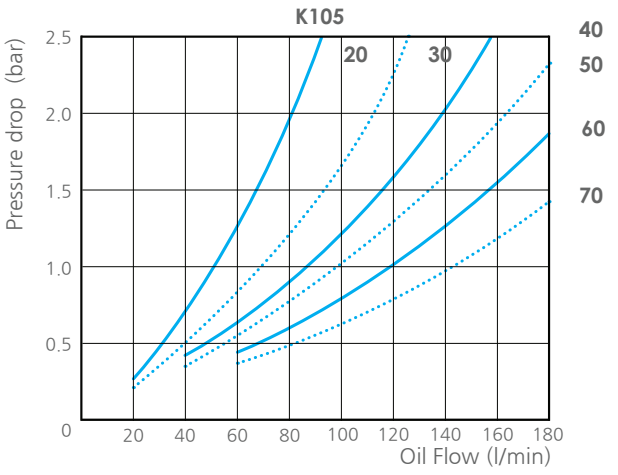






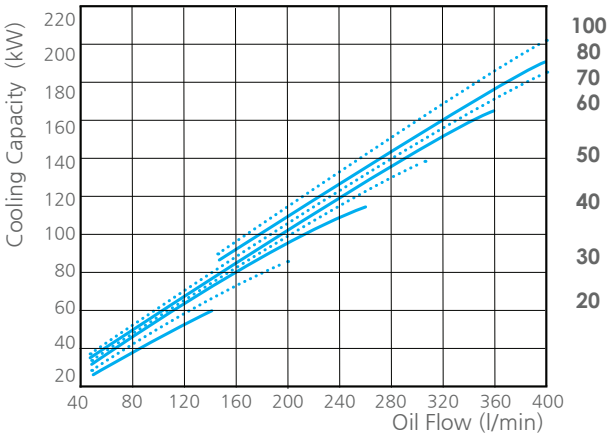




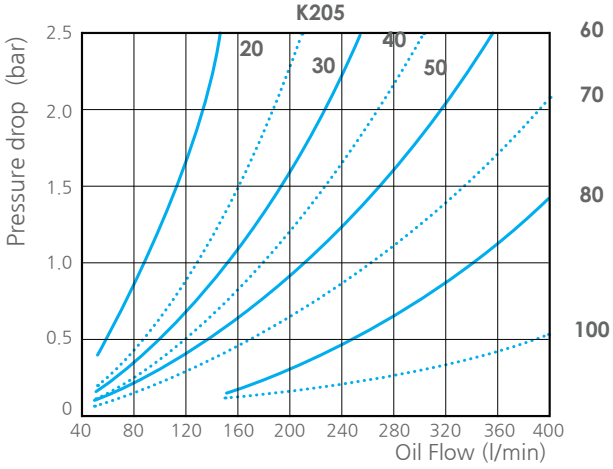


***Performance curve conditions: Fluid: VG68 / Fluid temperature: 60℃, Cooling water temperature: 20℃ / Flow rate ratio: Fluid: Cooling water = 2:1**

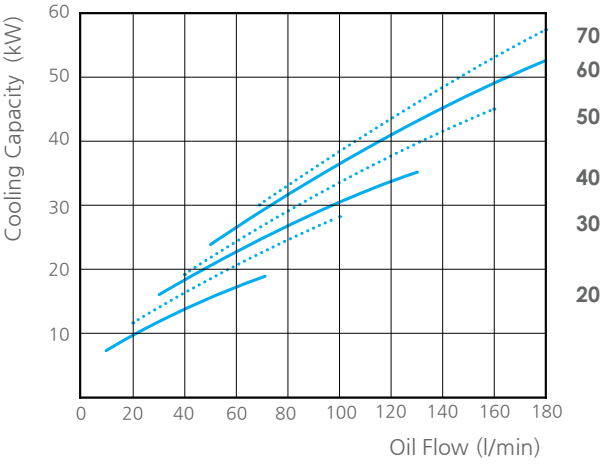
K205



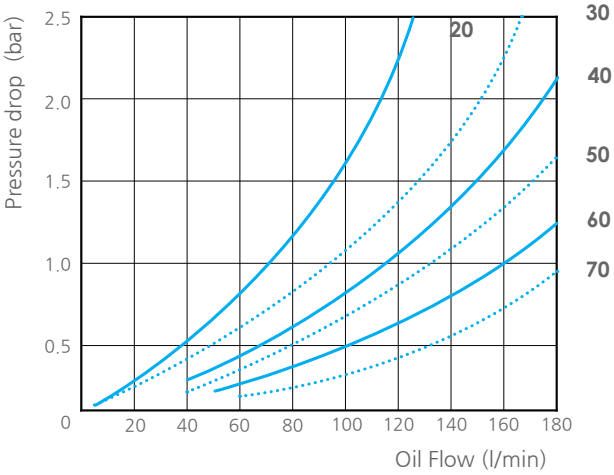
K205



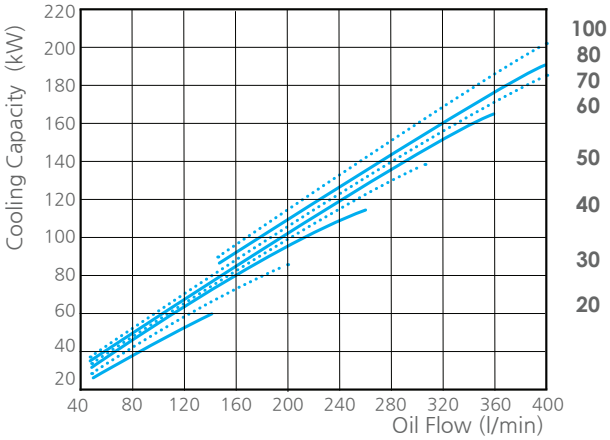
BL30



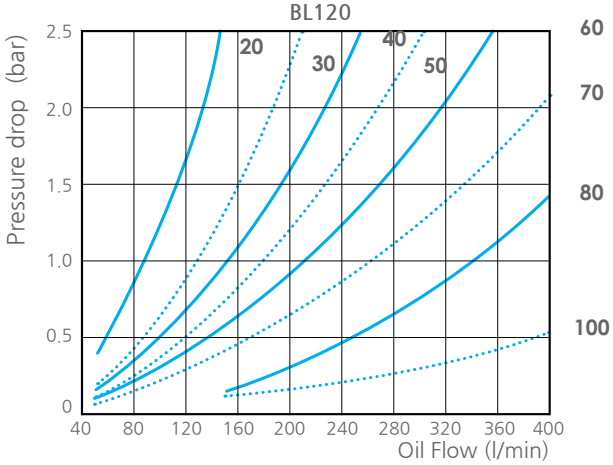
BL30



BL120



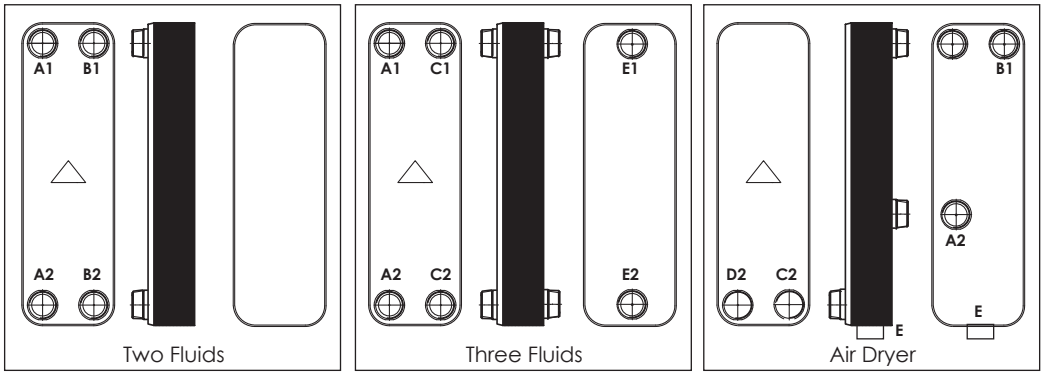
BL120



Performance curve conditions: Fluid: VG68 / Fluid temperature: 60℃, Cooling water temperature: 20℃ / Flow rate ratio: Fluid: Cooling water = 2:1

Installation

1. Fluid connecting directions

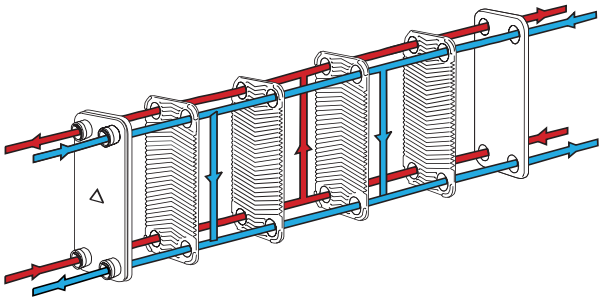


Applications	Type	Fluid 1 (Side1)	Fluid 2 (Side 2)	Fluid 3 (Side 3)
Evaporator (Single Refrigerant)	K, K-S, R ,C	Refrigerant A2->A1	Chiller water B1->B2	
	Z400, Z401, Z600	Refrigerant 1 A2->B1	Chiller water A1->B2	
Evaporator (Dual refrigerant)	K215, K215S	Refrigerant 1 A2->A1	Refrigerant 2 C2->C1	Chiller water E1->E2
	Z415, Z416	Refrigerant 1 A2->C1	Refrigerant 2 C2->A1	Water E1->E2
Condenser	K, K-S	Refrigerant A1->A2	Cooling water B2->B1	
	Z400, Z401, Z600	Refrigerant B1->A2	Cooling water B2->A1	

Applications	Type	Fluid 1 (Side1)	Fluid 2 (Side 2)	Fluid 3 (Side 3)
Heating, Cooling	K, K-S, R ,C, E, F	Cold water (or hot oil) A2->A1	Hot oil (or cold water) B1->B2	
	Z400, Z401, Z600	Cold water (or hot oil) A2->B1	Hot oil (or cold water) A1->B2	
Oil cooler	**K, BL, H, JX**	**Cold water (or hot oil) B1->B2**	**Hot oil (or cold water) A2->A1**	
	Z400, Z401, Z600	Refrigerant 1 A2->B1	Hot oil (or cold water) A1->B2	
Air Dryer (Refrigerant)	A030, A070	Refrigerant A2->B1	Air C2-> Separator ->D2	
	A210	Refrigerant B1->A2	Air D2-> Separator ->C2	

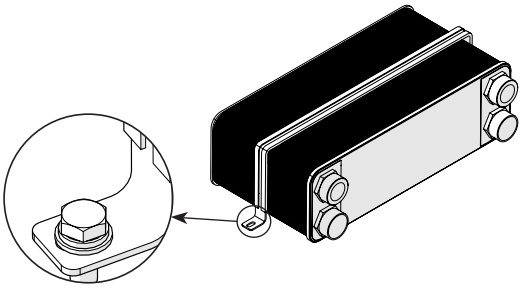
*** The fluid connection direction above is a standard recommendation that achieves the best performance. Please contact the HydroLync sales representative if you want to connect the fluid in a different direction.**

- Always install HPC vertically (especially in refrigerant systems). This is done to maintain the minimum amount of water under the connector.
- To achieve high heat efficiency and high heat transfer rate, HPC must be installed in reverse as shown in the right picture.



2. Mounting

- It is dangerous to expose the device to vibrations, excessive pulsating pressure, or temperature changes. Therefore, it is important to mount the heat exchanger to prevent the transfer of vibrations. If there is such a risk, a vibration absorber should be installed, and for large diameter pipelines, it is recommended to use appropriate converters. In addition, rubber mounting strips should be used as a buffer, that is, a vibration-absorbing material, between the HPC and the mounting clamp..
- The mounting method of HPC is as shown on the right. For small HPCs, it is also possible to mount a flat cooler directly onto the pipe/connectors.
- To prevent damage to the stud bolt due to excessive force, refer to the chart when installing the stud bolt.



Torque Guide for Stud Bolt Fastening

Item	"First time bolting torque(MAX) (kgf-cm)"	"First time loosing torque(MIN) (kgf-cm)"	"Fifth time loosing torque(MIN) (kgf-cm)"
M6	30.6	4.6	3.06
M8	61.2	8.67	6.12
M10	107.1	15.3	10.2
M12	158.1	23.4	16.3

This table is based on ISO 2320:1997(E) Table 8. Excessive torque on the connection of the heat exchanger can cause damage to the stud bolts.

3. Preventing Freezing of HPC

Freezing or icing can damage the HPC and the system. Therefore, the following methods are recommended to minimize freezing of the HPC:

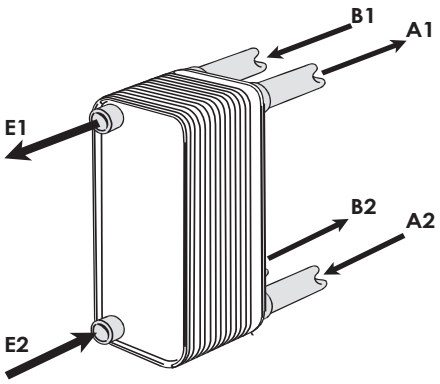
- Use a strainer or filter with <1mm, 16 mesh before the inlet water.
- Use a brine (e.g. glycol) when the evaporation temperature is close to the freezing point.

(1) Water Temperature Sensor
Installing a floating temperature sensor near the water outlet is also a way to prevent the water from freezing. The recommended set temperature for buffering is 4°C.
(2) Flow Switch
Installing a water flow switch in the water circuit can prevent HPC freezing by stopping the flow of

cooling water. Typically, low flow rates can occur due to malfunctioning of the water pump, pipe leakage, pipe blockage due to pipe contamination, or filter contamination.

4. Cleaning

If contamination occurs in a plate heat exchanger, most of the soft foreign substances that block the inside can be removed by backflushing. For example, glycolic acid oxalic acid, which is a weak acid with a concentration of less than 5%, is added to the cleaning tank. For optimal cleaning, the flow rate of the cleaning solution should be at least 1.5 times the normal flow rate, and it should be used in backflush mode as much as possible. After use, the heat exchanger should be carefully rinsed with clean water. Before the final rinse, a 1-2% solution of sodium hydroxide (NaOH) or sodium bicarbonate (NaHCO3) must be used to neutralize all acids. If the acidity is too high, the copper and stainless steel inside the HPC can be etched or corroded.



HGPC Ordering code

Example: HGPC M80 S FP 10 - 50 - 1 - 1 - ☐

1 2 3 4 5 6 7 8

1	Models
M Series	M25
	M65
	M80
	M100

2	Types of heat transfer plate
T	Tiny
S	Small
M	Medium
L	Large

3	Frame types
FP	
B	
CDL	

4	Max working pressure
10	10 bar
16	16 bar
20	20 bar

5	Number of plates
	Number of plates

6	Materials of plate
1	316L
2	304
3	Titanium
4	Others

7	Materials of gasket
1	NBR (STANDARD)
2	EPDM
3	VITON
4	Others

8	Customization label
	Customization label

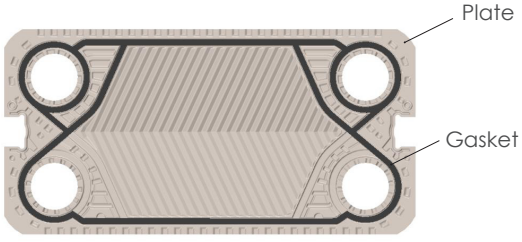
HGPC Part ordering code

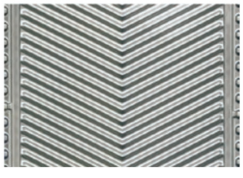
Example: PH M80S FP10-50-1-1-

1 2

1	Part code
PH	Plate H type
PV	Plate V type
GK	Gasket

2	Product Code
	The product code on the name plate

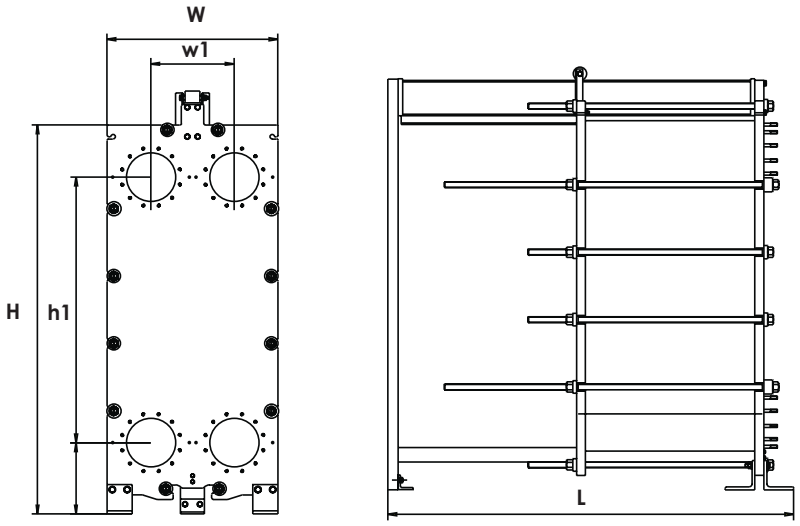




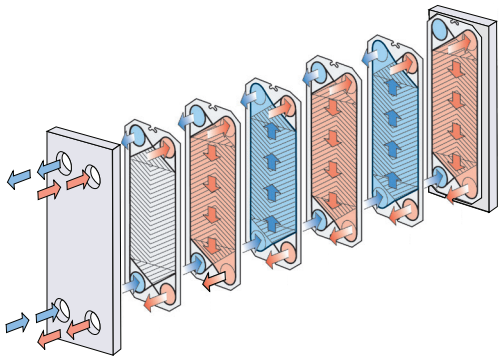
H: High theta

L: Low theta

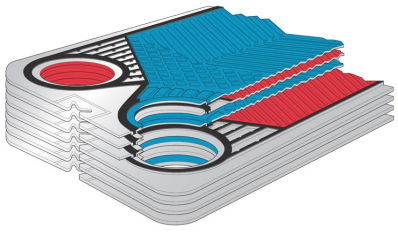
HGPC Specifications



Model	W	w1	H	h1	L	Flange	Max. Pressure	Max. Flowrate
	mm	mm	mm	mm	mm	inch	bar	L/min
M25	198	150	595	381	415-520	JIS 10/16K 25A	10/16	175
M65M	340	150	1052	800	617-922	JIS 10/16K 65A	10/16	1550
M80S	435	238	1117	794	640-960	JIS 10/16/20K 80A	10/16/20	2033
M80M	435	238	1393	1070	640-960	JIS 10/16/20K 80A	10/16/20	2033
M100T	540	262	1130	727	500-810	JIS 10/16/20K 100A	10/16/20	3417
M100M	540	262	1536	1133	500-810	JIS 10/16/20K 100A	10/16/20	3417
M100L	540	262	1942	1539	500-810	JIS 10/16/20K 100A	10/16/20	3417



Flow direction of hot fluid and cold fluid



Efficient Heat Exchange Structure

A gasketed plate heat exchanger (HGPC) is an efficient heat exchange device consisting of a series of thin metal plates with corrugated shapes and gaskets. The high-temperature fluid and low-temperature fluid between the plates are separated by sealing gaskets and flow independently in each channel. The heat transfer coefficient of HGPC is 3-5 times higher than that of shell-and-tube heat exchangers, as the high and low-temperature fluids reach a high level of turbulence when flowing through the plate channels, maximizing the heat exchange performance.

Installation

Attention

Always wear protective and preventive gears before starting any work

Hand protection gear: Use protective gloves when necessary to avoid the risk of cutting and abrasion.

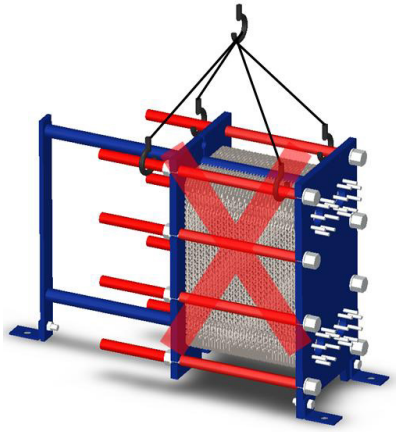
Eye protection gear: Wear safety goggles before performing product installation and maintenance.

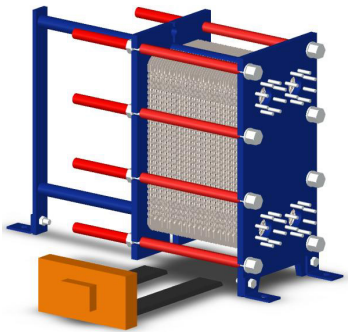
Head protection gear: Wear a safety helmet when working in areas where there is a risk of objects falling from above, hitting fixed objects, or electric hazards above the head.

Foot protection gear: Wear safety shoes to avoid injury from falling objects on your feet when working around heavy equipment or falling objects.

1. Handling

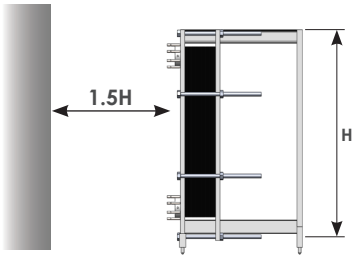
HGPCs are shipped fixed on wooden pallets. If you move the product using some parts of the structure other than the pallet, it may cause damage to the product and affect its heat exchange performance. Please refrain from moving any part of the product using flange pipes, plate fixing bolts, or directly with forklifts. We will not be responsible for any product damage or performance issues caused by inappropriate transportation methods by the user. Before handling, always wear protective and preventive gear.

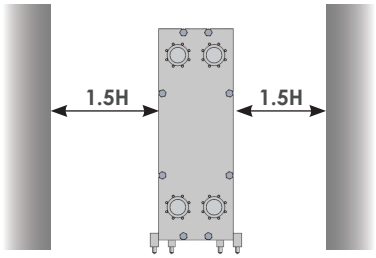




2. Installation

Adequate workspace should be secured for maintenance when installing HGPC. As shown in the diagram below, in order to replace the plate properly, a space 1.5 times the height of the plate must be secured in the front and on both sides.





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