BRAZED HEAT EXCHANGER

TAIBONG INDUSTRIES INC.

BRAZED PLATE HEAT EXCHANGER

Brazed Plate Heat Exchanger(BPHE) consists of chevron plates of acid-resistant stainless steel. Every other plate is reversed so the ridges of the herringbone pattern intersect one another on adjacent plates forming a lattice on contact points. When these points are vacuum brazed together, two separate systems of channels for two media flow in counter-current are formed. The lattice structure causes vigorous turbulence, ensuring maximum heat transfer.

■ ADVANTAGE

COMPACT

Compared with shall-and-tube of the same capacity, BPHE is as much as 80% smaller by weight and volume. Moreover, the BPHE which is assembled from the thin plates & 2~4mm's cover frames is very compact size.

HIGH HEAT TRANSFER PERFORMANCE

The plate of the herringbone pattern causes vigorous turbulence, thus, ensuring maximum heat transfer.

HIGH WORKING TEMPERATURE & PRESSURE

Standard BPHE is designed to meet 30 kg/cm^2 and 225℃.

ECONOMICAL IN COST

When BPHE is applied to refrigeration application, space savings & Simple pipe connections can make the effects of improving the utilization of the machinery room and of increasing the value of the building. By using the BPHE, the overall size of the system, I.e. compressor, boiler using midnight electric power and injection machine, can be minimized, the Installation cost is reduced and the value added of the product is increased.

■ APPLICATION-MEDIA

MEDIA

BPHE can be used for various medias, i.e. organic solvents, water, oil, steam and various brine solutions(glycol mixtures, CaCl2, alcohols and etc.) except for all type of refrigerants; ammonia will be used for nickel brazed.

RANGE

Heat pumps

Heat recovery including heat recycling from hot steam

District heating and hot water supply system

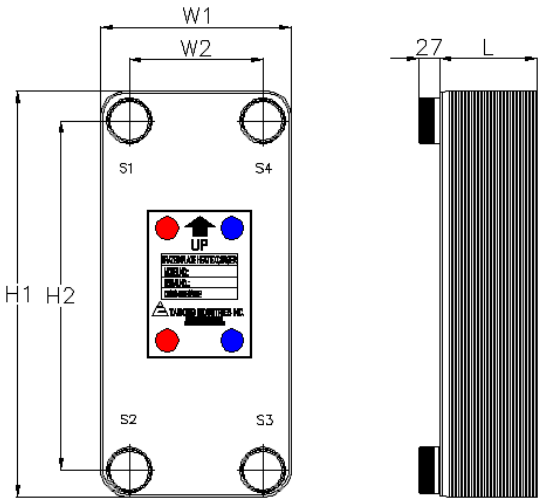
Refrigeration: Evaporators and condensers

Industries chiller: Plastic machine, welding machines, hydraulic presses(oil) and compressor oil cooling.

Sterilization Process of food

BRAZED PLATE HEAT EXCHANGER

SPECIFICATION & DIMENSION



T	H1 mm	H2 mm	W1 mm	W2 mm	Weight kg	Thickness (L)mm	Area /plate	Volume ℓ /channel	Max No. of plate
K030	194	154	80	40	0.8+0.05N	10.0+2.25N	0.0123	0.025	30
K070	304	250	124	70	1.6+0.15N	10.0+2.40N	0.0315	0.067	100
K105	504	444	124	64	3.5+0.24N	10.0+2.40N	0.0580	0.112	120
K205	528	456	246	174	7.2+0.52N	11.5+2.40N	0.1135	0.234	160
K210	527	430	245	148	8.5+0.49N	11.0+2.85N	0.1036	0.280	140

※ 'N' is the Number of Plates.

DESIGN CONDITION

TYPE	Max. Allowable Pressure (PS)	Test Pressure (PT)	Working Temperature Range
K030, K070, K105, K205	30 kg/cm^2	43 kg/cm^2	−160 ~ 225℃
K210	16 kg/cm^2	23 kg/cm^2	−160 ~ 225℃

MATERIAL

PLATE : SUS316

COVER PLATE & CONNECTIONS : SUS304

SEALING(Brazing) : 99.9% COPPER

BRAZED PLATE HEAT EXCHANGER

MODEL SELECTION CHART FOR HVAC

RT	APPLICATION		CONNECTION	
	CONDENSER	EVAPORATOR	R-22	WATER
0.5 & 1	K070*14C		Φ28.8	1 "
2	K070*20C		Φ28.8	1 "
3	K070*34C		Φ28.8	1 "
6	K105*34B		Φ28.8	1 "
7.5	K105*40B		Φ28.8	1 "
10	K105*60C	K105*60V	Φ35.15	1¼ "
12.5	K205*30C		Φ41.50	1½ "
15	K205*40C	K205*40V	Φ22.36 / Φ41.50	1½ "
20	K205*60C	K205*60V	Φ22.36 / Φ41.50	1½ "
25	K205*80C	K205*80V	Φ22.36 / Φ41.50	1½ "
30	K205*100C	K205*100V	Φ22.36 / Φ41.50	1½ "
35	K205*120C	K205*120V	Φ22.36 / Φ41.50	1½ "

☞ Design conditions
- Condenser : Water Inlet=29.4℃, Outlet=33.9℃, Condensing Temp.=37.8℃, Subcooling=4℃
- Evaporator : Water Inlet=12.2℃, Outlet=6.7℃, Evaporator Temp.=1.7℃, Superheat=4℃

MODEL SELECTION CHART FOR OIL COOLER (i.e ISO VG68)

Kcal/hr	TYPE	FLOW RATE(LPM)		INLET TEMP.(℃)		CONNECTION
		OIL	WATER	OIL	WATER	
3,000	K070*20	11	6	60	28	¾ "
5,000	K070*34	20	10	60	28	¾ "
8,000	K205*10	30	15	60	28	1 "
12,000	K205*10	45	23	60	28	1 "
20,000	K205*16	75	38	60	28	1 "

CORRECTION FACTOR

OIL	HEAT FLUX CORRECTION FACTOR	PRESSURE DROP CORRECTION FACTOR	OIL	HEAT FLUX CORRECTION FACTOR	PRESSURE DROP CORRECTION FACTOR
ISO VG15	0.074	0.495	ISO VG68	1.000	1.000
ISO VG22	0.780	0.521	ISO VG100	1.119	1.302
ISO VG32	0.835	0.590	ISO VG150	1.320	1.802
ISO VG46	0.875	0.763	ISO VG220	1.412	2.008

MODEL SELECTION CHART FOR HOT WATER BOILER

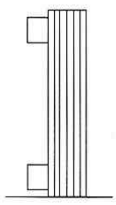
Kcal/hr	TYPE	DESIGN CONDITION
10,000 kcal/hr	K030*10	■ Temperature – Primary : 80℃ → 70℃ – Secondary : 50℃ → 60℃ ■ Pressure Drop : 0.5 kg/cm^2 ~ 1.0kg/cm^2
30,000 kcal/hr	K030*20	
50,000 kcal/hr	K070*20	
70,000 kcal/hr	K070*34	
100,000 kcal/hr	K205*16	
150,000 kcal/hr	K210*20	
200,000 kcal/hr	K210*30	
300,000 kcal/hr	K210*40	

INSTALLATION

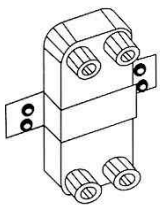
Always install your BPHE vertically.

In order to achieve high thermal efficiency and high heat transfer rates, BPHE is better to be installed in counter flow direction.

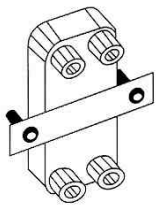
When BPHE works as an Evaporator, the two-phased(liquid an gas) refrigerant enters the evaporator at the bottom left connector and the single-phased(gas) refrigerant leaves the evaporator from the top left connector after heat transferring. The water enters at the top right connector and leaves from the bottom right. In the case of evaporator, heat is transferred from water to refrigerant and both fluids are in counter flow direction.



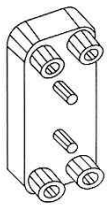
(1) Bottom support



(2) Sheet metal bracket



(3) Crossbar & bolts



(4) Stud bolts

CLEANING

Cleaning of Fouled plate heat exchangers is important back flushing will remove most of the soft debris that is blocked the inside. The solution used by back flushing shall be weak acid with concentration less than 5%, for example citric acid. If acidity is too high, the copper and stainless steel, which is inside the PHE, might be etched or corroded. Before restarting the system, flush the plate heat exchanger with large amounts of fresh water to purge any remaining acid solution.

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