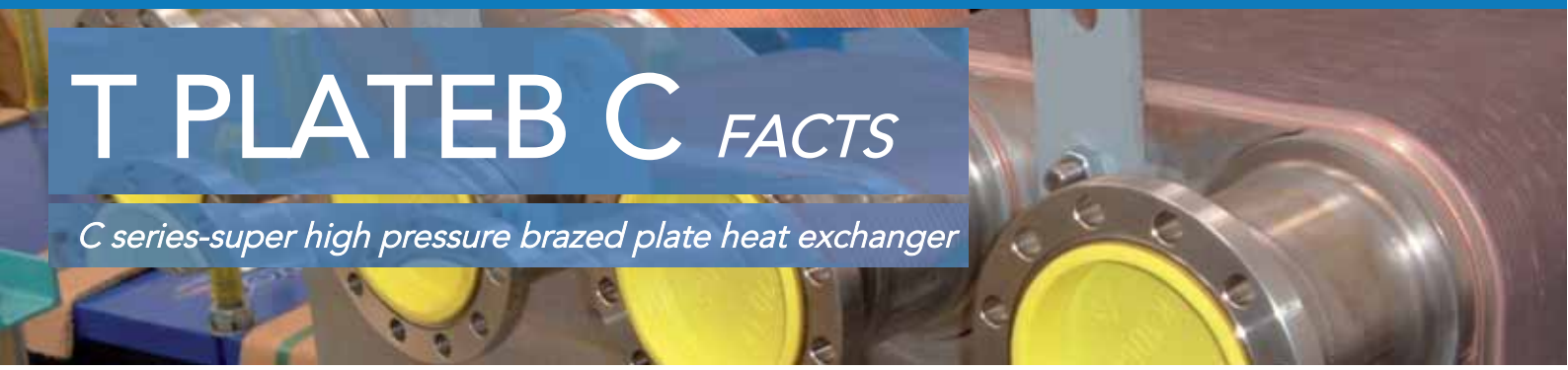
tempco

SOLUZIONI PER L'ENERGIA TERMICA

SCHEDA TECNICA/TECHNICAL SHEET

Scambiatori di calore a piastre



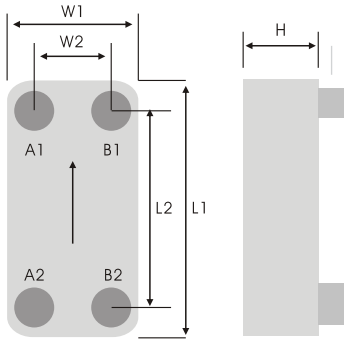
T PLATEB C *FACTS*

C series-super high pressure brazed plate heat exchanger

C series is specially designed for Gas cooler,condenser, evaporator and economizer in R744 (CO_2) heat pump and refrigeration system. Different designs with max. working pressure 140 bar, 100 bar and 70 bar are available for Supercritical, Transcritical and Subcritical CO_2 heating and cooling systems. Compact size, outstanding heat transfer performance and low pressure drop are the three key features. The quality and the durability of C series is proven by thorough inspection, achieving the burst test pressure up to 650 bar and cycle test over 100,000 cycles.

Brazing Material	Copper		
Model	TCBC020 TCBC500 TCBC1500 TCBC2100	TCBC021 TCBC501 TCBC1501 TCBC2101	TCBC022 TCBC502 TCBC1502 TCBC2102
	(A1,A2/B1,B2)		
Max. Working Pressure (bar)	70/30*	100/30*	140/30*
Min. Test Pressure (bar)	100/43*	143/43*	200/43*
Max. Working Temperature (°C)	150 °C		

※For higher working pressure request on B1/B2, please contact TEMPCO representative.



Model	L1 (mm)	L2 (mm)	W1 (mm)	W2 (mm)	H Thickness (mm)	Weight*(kg) (Without Connection)	Heat Transfer Area/ plate (m^2)	Total Heat Transfer Area (m^2)	Volume/ Channel (liter)	Total Volume (liter)
TCBC020	191	154	77	40	9.5+1.10*N	1.12+0.042*N	0.01109	(N-2)*0.01109	0.009	(N-1)*0.009
TCBC500	314	275	76	40	13.0+2.00*N	1.74+0.145*N	0.0193	(N-2)*0.0193	0.030	(N-1)*0.030
TCBC1500	524	466	108	50	13.2+2.16*N	5.52+0.320*N	0.0475	(N-2)*0.0475	0.071	(N-1)*0.071
TCBC2100	616	519	189	92	14.0+2.15*N	12.39+0.603*N	0.0950	(N-2)*0.0950	0.156	(N-1)*0.156

Model	L1 (mm)	L2 (mm)	W1 (mm)	W2 (mm)	H Thickness (mm)	Weight*(kg) (Without Connection)	Heat Transfer Area/ plate (m^2)	Total Heat Transfer Area (m^2)	Volume/ Channel (liter)	Total Volume (liter)
TCBC021	191	154	77	40	9.5+1.10*N	1.14+0.042*N	0.01109	(N-2)*0.01109	0.009	(N-1)*0.009
TCBC501	314	275	76	40	13.0+2.00*N	1.83+0.145*N	0.0193	(N-2)*0.0193	0.030	(N-1)*0.030
TCBC1501	524	466	108	50	13.2+2.16*N	5.68+0.320*N	0.0475	(N-2)*0.0475	0.071	(N-1)*0.071
TCBC2101	616	519	189	92	14.0+2.15*N	12.56+0.631*N	0.0950	(N-2)*0.0950	0.156	(N-1)*0.156

Model	L1 (mm)	L2 (mm)	W1 (mm)	W2 (mm)	H Thickness (mm)	Weight*(kg) (Without Connection)	Heat Transfer Area/ plate (m^2)	Total Heat Transfer Area (m^2)	Volume/ Channel (liter)	Total Volume (liter)
TCBC022	191	154	77	40	9.5+1.10*N	1.126+0.042*N	0.01109	(N-6)*0.01109	0.009	(N-5)*0.009
TCBC502	314	275	76	40	13.0+2.00*N	1.75+0.152*N	0.0193	(N-2)*0.0193	0.030	(N-1)*0.030
TCBC1502	524	466	108	50	13.2+2.16*N	5.90+0.346*N	0.0475	(N-2)*0.0475	0.071	(N-1)*0.071
TCBC2102	616	519	189	92	14.0+2.15*N	12.41+0.755*N	0.0950	(N-2)*0.0950	0.156	(N-1)*0.156

N: number of plates

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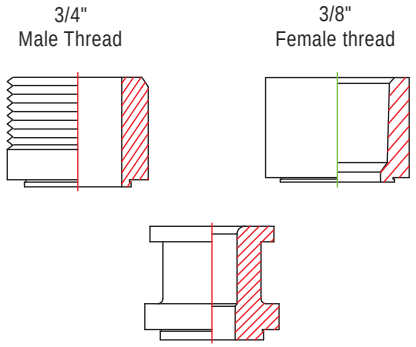
Model Selection Chart

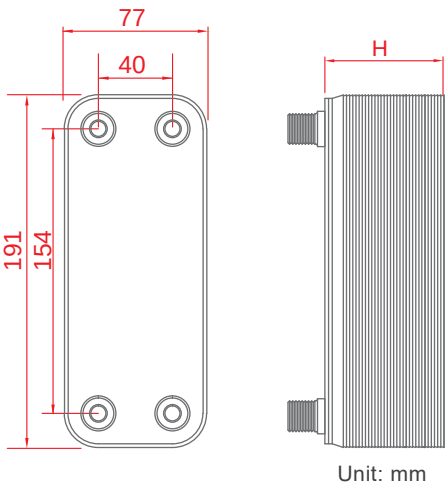
R744 vs. Water Gas Cooler (Max. Working Pressure: 140bar)

RT	kW	BTU/H	TCBC020/021/022	TCBC500/501/502	TCBC1500/1501/1502	TCBC2100/2101/2102
1	3.52	12000	022x36 (4 Pass)	502x24 (4 Pass)		
1.5	5.27	18000	022x44 (4 Pass)	502x32 (4 Pass)		
2	7.03	24000	022x52 (4 Pass)	502x40 (4 Pass)	1502x24 (4 Pass)	
3	10.55	36000			1502x24 (4 Pass)	
4	14.06	48000			1502x32 (4 Pass)	
5	17.58	60000			1502x40 (4 Pass)	2102x24 (3 Pass)
7.5	26.37	90000			1502x48 (4 Pass)	2102x30 (3 Pass)
10	35.16	120000			1502x64 (4 Pass)	2102x36 (3 Pass)
12.5	43.95	150000			1502x72 (4 Pass)	2102x48 (3 Pass)
15	52.74	180000			1502x88 (4 Pass)	2102x54 (3 Pass)
20	70.32	240000				2102x66 (3 Pass)
25	87.90	300000				2102x84 (3 Pass)
30	105.48	360000				2102x102 (3 Pass)
35	123.06	420000				2102x114 (3 Pass)
40	140.64	480000				2102x132 (3 Pass)

The above information is for reference only; the data will be different under various working conditions and specifications.

Connectors





Unit: mm

Industries
CO_2(R744) Heat Pump, Refrigeration Showcase, Transport Refrigeration Systems

Applications
Gas cooler, Condenser, Evaporator, Economizer, Pre-cooler/ Pre-heater

Specifications
Quality Materials

Connections	Stainless Steel
Plates	Stainless Steel
Brazing Material	99.9% Pure Copper

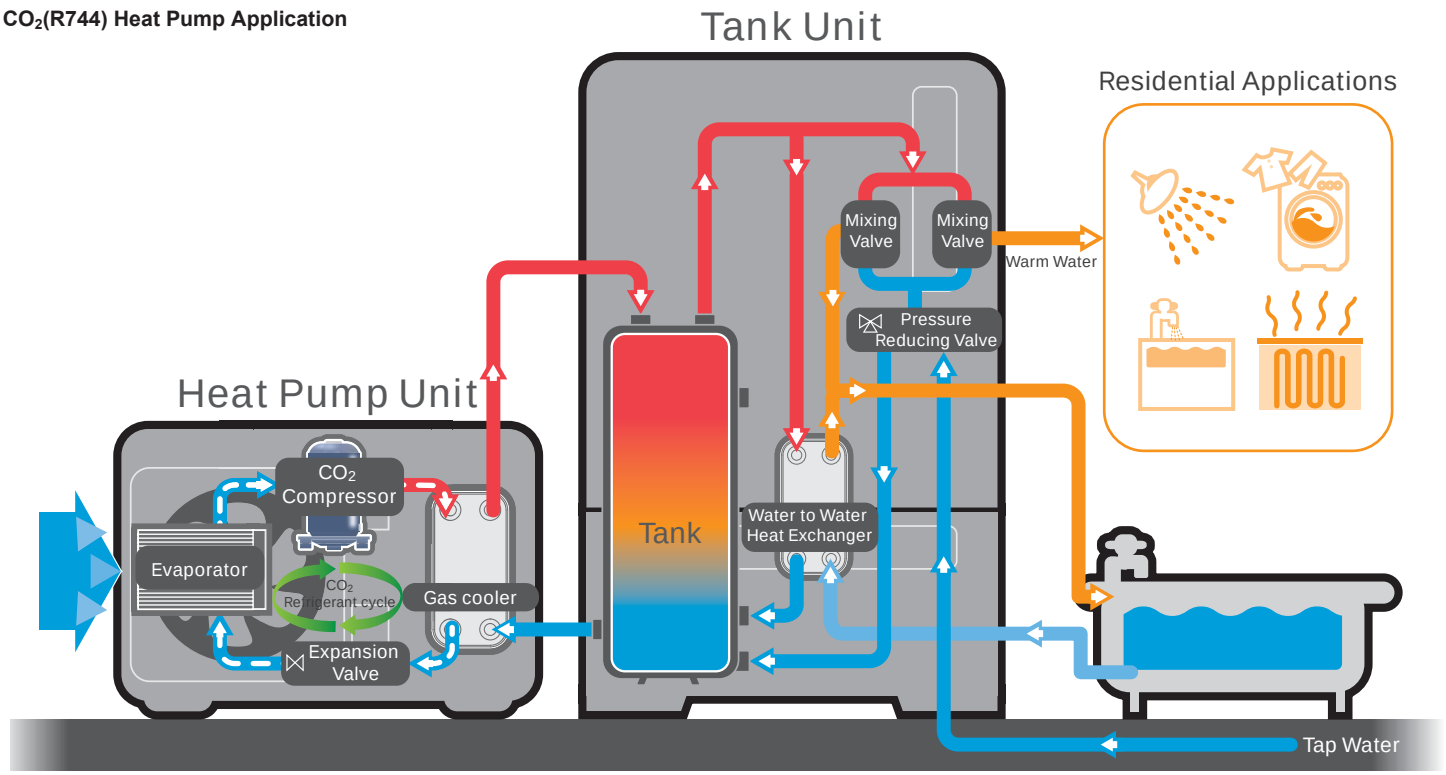
Technical Data

Model	TCBC020	TCBC021	TCBC022
Max. working temperature	200 °C	200 °C	200 °C
Max. working pressure (bar)	70	100	140
Test pressure (bar)	100	143	200
Plate Heat Transfer Area (m^2)	0.01109*(N-2)	0.01109*(N-2)	0.01109*(N-2)
Thickness - H (mm)	9.5+1.1*N	9.5+1.1*N	9.5+1.1*N
Weight(kg)(without connector)	1.12+0.042*N	1.14+0.042*N	1.126+0.042*N

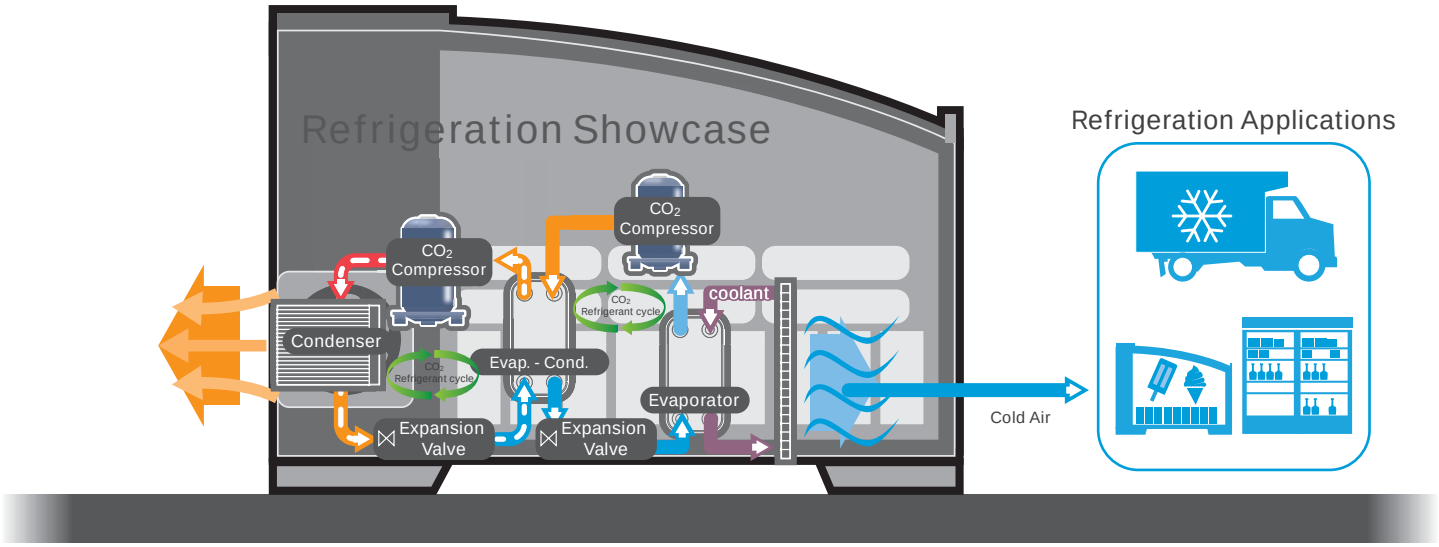
N: Number of Plates

Benefits Add Up
- Environmental Friendly, Efficiency Optimized, Cost Saved
- Variety of Choices with max. working pressure 70, 100, 140 bar
- Design for Supercritical, Transcritical and Subcritical CO_2 systems
- Compact Size and Easy Installation
- Patented Plate Design, Quality Guaranteed

CO_2(R744) Heat Pump Application



CO_2(R744) Refrigeration Showcase



Standard connections

Tempco Model	Threaded Connections															Solder Connections											Height
	PT/NPT/GB Male								PT/NPT/GB Female							Ø 6.6 mm	Ø 9.73 mm	Ø 12.9 mm	Ø 16.15 mm	Ø 19.25 mm	Ø 22.36 mm	Ø 25.6 mm	Ø 28.8 mm	Ø 35.25 mm	Ø 41.5 mm	Ø 54.3 mm	
	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	1/4"	3/8"	1/2"	5/8"	6/8"	7/8"	1"	1 1/8"	1 3/8"	1 5/8"	2 1/8"	(mm)
100	•								•							•	•	•	•	•							20
300	•	•							•	•						•	•	•	•	•	•						20
500	•	•							•	•						•	•	•	•	•							20
800	•	•	•						•	•	•					•	•	•	•	•	•	•	•				27
900	•	•	•	•	•				•	•	•					•	•	•	•	•	•	•	•	•			27
1500	•	•	•						•	•	•					•	•	•	•	•	•	•	•	•			27
1700	•	•	•	•	•				•	•	•	•				•	•	•	•	•	•	•	•	•			27
2100			•	•	•	•	•		•		•	•	•					•	•	•	•		•	•	•	•	27/42/54
2500			•	•	•	•			•		•	•	•					•	•	•	•		•	•	•	•	27/42/54
2700					•	•	•	•	•				•	•	•						•		•	•	•		27/42
2600					•	•	•		•									•	•	•	•		•	•	•	•	27/42/54

• Flange, SAE Connections are available

1 Installation and Mounting Advice

1.The brazed plate heat exchanger should be installed vertically as the instruction mark shown on the label (↑) demonstration as below:

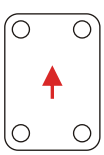
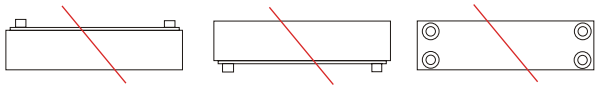


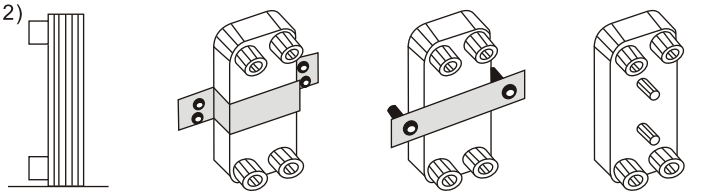
Fig. 1 Installation of the brazed plate heat exchanger



Improper Installation Position

2.Recommended installation position(Fig.2)
a. Bottom Support
b. Sheet Metal Bracket
c. Crossbar& Bolts
d. Stud Bolts

∗Vibration dampener or other absorbing devices are also recommended.



a. Bottom Support b. Sheet Metal Bracket c. Crossbar& Bolts d. Stud Bolts

Fig. 2 Recommended Installation Position

2 Softening Treatment of Cooling Tower Water

Softening treatment and regular maintenance for cooling tower can reduce the scale clogging problem. While using chemical additives to do the cleaning, the concentration of the additive should be carefully controlled. Avoid using corrosive additives. If stainless steel and copper react to the corrosive content, it will reduce the pressure resistance on the brazing joints and possibly lead to internal or external leakages. To avoid the problem mentioned above, please refer to the below data for proper chemical additives:

pH:6~8 SO_4^{-2}<30mg/L
Cl^-< 50ppm (<100°C) NH_4^+<0.1mg/L

3 Prevention of Water Hammer

Water hammer occurs when the pipes carry incompressible fluids and the flow suddenly changes its velocity. The most common case occurs when one rapidly closes the solenoid valve and thus, causes instant pressure in the pipes. This will damage the valve, heat exchanger and other equipment. In order to avoid the problem mentioned above, installation of pressure suction pipe,water hammer arrestor, air chamber…etc is highly recommended.

4 Cleaning

To clean the brazed plate heat exchanger, it is recommended to use weak acid (5% phosphoric acid, nitric or oxalic acid…etc.) back flushing to remove soft debris inside. (as Fig. 3). The flow rate of the cleaning solution should be at least 1.5-2 times of the normal flow rate and the duration should be 30 minutes.After cleaning, the heat exchanger should be rinsed carefully with large amounts of clean water to purge any remaining acid solution before re-starting the system.