Tanpera®

BRAZED
PLATE HEAT EXCHANGER

MAXIMUM ENERGY EFFICIENCY AT HIGH PRESSURE

What is a Brazed Plate Heat Exchanger?

It is a type of heat exchanger that is usually compact and provides high thermal efficiency.

It is produced by joining a series of metal plates together at high temperature using a special brazing material. The brazing process creates a sealed bond between the plates and thus ensures that the heat exchanger has an integrated and robust structure.

Brazed heat exchangers consist of plates, usually made of corrosion-resistant materials such as stainless steel. Narrow channels between these plates create pathways for hot and cold fluids. As the fluids move along these channels, they transfer heat to each other through the plates. This structure provides high heat transfer efficiency and generally shows strong performance even under high pressure and temperature.

Main Features

Plate: Brazed plate heat exchangers have a structure in which thin metal plates are clamped together. These plates are usually made of materials with high thermal conductivity, such as stainless steel.

Brazing: The plates are brought together by a special brazing process at their edges. This brazing creates a seal between the plates, which is necessary to ensure highly efficient heat transfer.

Fluid Channels: The small channels formed between the plates allow two different fluids to pass through. These fluids are positioned close to each other via the plates but do not mix. This way, the temperature of one fluid affects the temperature of the other.

Efficiency: Brazed plate heat exchangers provide compact and high efficient heat transfer. This efficiency is achieved thanks to the large surface area of the plates and the brazing process.

Usage Areas: These types of heat exchangers are commonly used in heating, cooling, hot water systems and HVAC systems. They are also commonly found in the food processing, chemical and energy sectors.

Brazed plate heat exchangers save energy with their compact design and high efficiency and offer an effective heat transfer solution in various industrial applications.

Advantages

- **High Heat Transfer Efficiency**
  Brazed plate heat exchangers provide high efficiency due to the large surface area of the plates and effective heat transfer. This maximizes the heat transfer between the two fluids.
- **Compact Design**
  These heat exchangers have a small and compact structure, which saves space. They offer an ideal solution in cramped spaces or limited locations.
- **Energy Saving**
  Thanks to their high efficiency, they can reduce energy consumption. This reduces both costs and environmental impact.
- **Easy Installation and Assembly**
  Thanks to their compact structure and modular design, brazed plate heat exchangers can usually be installed quickly, reducing installation time.
- **High Pressure Resistance**
  Because they are made of durable materials such as stainless steel, they can withstand high pressures. This ensures safe use in various industrial applications.
- **Flexibility**
  Brazed plate heat exchangers can be manufactured in a variety of sizes and capacities, which means they are customizable to different application needs.
- **Low Water Loss and Tightness**
  The brazing process minimizes sealing issues, which reduces fluid loss and loss of efficiency.
- **Suitable for High Temperature Differences**
  These heat exchangers provide effective heat transfer despite high temperature differences, which makes temperature control and regulation more effective.

Areas of Application

Brazed plate heat exchangers have a wide range of applications and are used in a variety of industries, especially those requiring heat transfer and temperature control. Here are some common uses:

HVAC Systems
Hot Water Systems: Used for heating and regulating hot water in central heating systems.

Construction and Building Management
Used in hot water systems inside the building to ensure energy efficiency. Supports cooling and heating functions in air conditioning systems.

Energy and Power Generation
It is used in power plants, especially in hot water and steam heating processes and in the transfer of the heat generated.

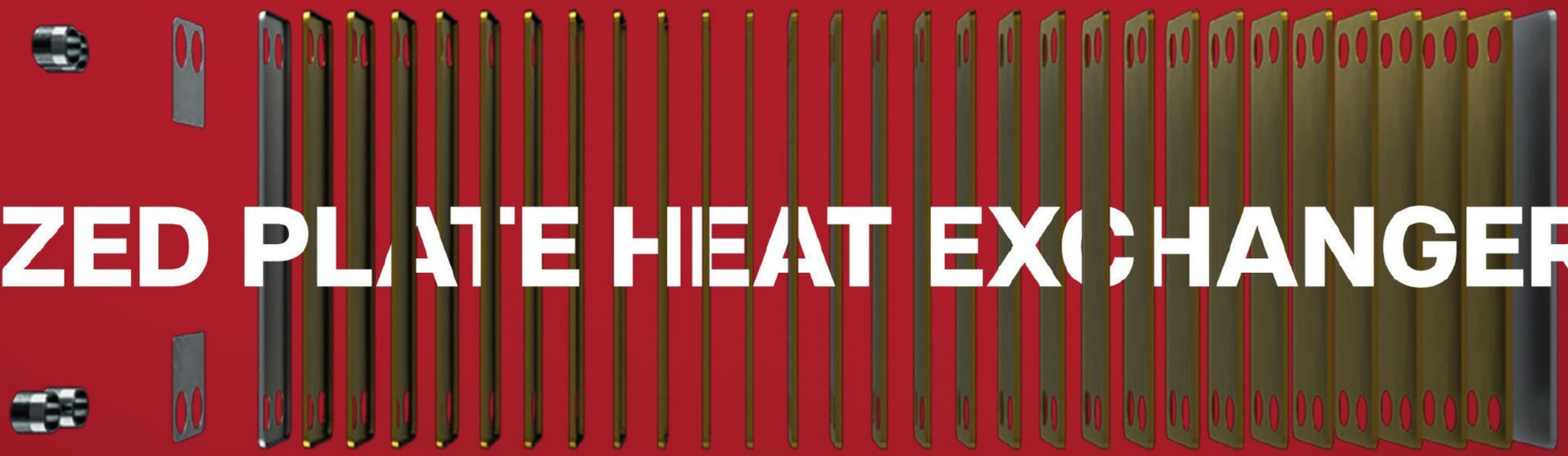
Technology and Electronics
Used for cooling servers and other equipment in data centers. Used for cooling electronic devices and systems.

Chemical and Petrochemical Industry
Provides heat transfer in reactors for controlling chemical reactions. Used as heat exchangers resistant to high temperature and pressure in chemical processes.

Automotive Industry
Used for cooling vehicle engines, keeps engine temperatures under control. In air conditioning systems inside the vehicle, it regulates the interior air temperature.

Food and Beverage Industry
In the pasteurization processes of food and beverages, it ensures that the products are brought to a certain temperature and that the temperature is controlled and regulated in production.

BRAZED PLATE HEAT EXCHANGER



Product Notation and Explanations

TBR Series Heat Exchangers can be designed and manufactured with different channel types.

H Type Channel

Channel angles are wide in H type plates. This channel structure, which is preferred to make the flow turbulent, maximizes heat transfer. Pressure loss in H type plate heat exchangers is higher than L and M type plate geometries.

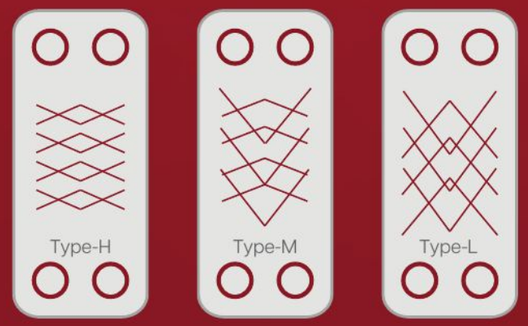
L Type Channel

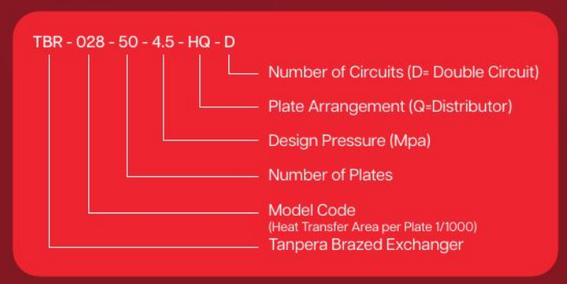
L type plate channels have a narrower channel angle unlike H type channel angles. These plate channels are preferred in applications where pressure loss is taken into consideration. Since narrow channel angles reduce pressure losses and turbulence in the flow, the heat transfer on the heat exchanger surface is lower than the H-type plate geometry.

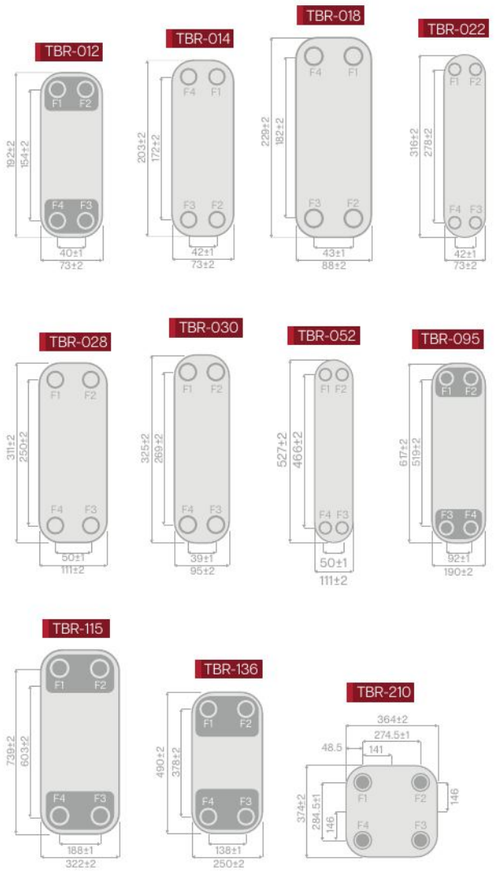
M Type Channel

It is a combination of H and L type wide and narrow angle channels. This type of channel is generally preferred when the heat transfer between the heat and the fluid is much higher on one side than the other. The ratio between heat transfer and pressure loss is optimum.

Representative images of channel structures;







Tanpera Product Code	TBR-012	TBR-014	TBR-018	TBR-022	TBR-028	TBR-030	TBR-052	TBR-095	TBR-115	TBR-136	TBR-210
Cooling Capacity / Heat Load (kW)	0,5-4	0,5-5	2-10	2-10	5-15	3-30	10-60	30-200	60-200	60-200	150-450
Heat Transfer Area	(n-2) x 0,012	(n-2) x 0,014	(n-2) x 0,018	(n-2) x 0,022	(n-2) x 0,026	(n-2) x 0,023	(n-2) x 0,050	(n-2) x 0,095	(n-2) x 0,097	(n-2) x 0,092	(n-2) x 0,021
Design Temperature	-196/+200	-196/+200	-196/+200	-196/+200	-196/+200	-196/+200	-196/+200	-196/+200	-196/+200	-196/+200	-196/+200
Standard Design / Test Pressure	10/15	30/45	30/45	30/45	30/45	30/45	30/45	30/45	30/45	30/45	30/45
High Design / Test Pressure	30/45	45/65	45/65	45/65	45/65	45/65	45/65	45/65	45/65	45/65	45/65
Distributor	-	-	-	-	-	Q	Q	Q	Q	-	Q
Double Circuit	-	-	-	-	-	-	-	-	D	-	D
Plate Channel Pattern	H	H,L,M	H	H,L,M	H,L,M	H	H,L,M	H,L,M	H	H	H
Max. Number of Plates	50	60	60	60	150	150	150	250	200	200	250
Height x Width (Outside)	192x73	205x42	230x89	318x75	311x111	325x95	527x111	617x190	490x250	490x250	739x322
Height x Width (Connection Centers)	154x40	172x42	182x43	278x42	250x50	269x39	466x50	515x92	515x92	391,4x	250
Empty Weight (n=Number of Plates)	0,6+0,044n	0,365+0,05n	1,1+0,055n	0,44+0,76n	1,2+0,13n	1+0,09n	1+8,023n	5,64+0,4n	6,5+0,38n	6,5+0,38n	13+0,8n
Max. Weld Connection Dimension	7/8"	7/8"	7/8"	7/8"	1 3/8"	1 1/8"	1 3/8"	2 1/8"	2 1/8"	2 5/8"	3 1/8"
Max. Threaded Connection Size	3/4"	3/4"	3/4"	3/4"	1 1/4"	1"	1 1/4"	2"	2"	3"	3 1/8" Klemp
Standard Plate Material	AISI316L	AISI316L	AISI316L	AISI316L	AISI316L	AISI316L	AISI316L	AISI316L	AISI316L	AISI316L	AISI316L

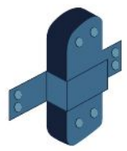
Figure 1:

Setting / Product Flow Direction	Vertical	Horizontal	Horizontal Ground	Curved	Curved
Reverse Flow	Vaporizer ✓ Condenser ✓ Cooler ✓	Vaporizer ✗ Condenser ✗ Cooler ✓	Vaporizer ✗ Condenser ✗ Cooler ✓	Vaporizer ✗ Condenser ✗ Cooler ✓	Vaporizer ✗ Condenser ✗ Cooler ✓
Diagonal Flow	Vaporizer ✓ Condenser ✓ Cooler ✓	Vaporizer ✓ Condenser ✓ Cooler ✓	Vaporizer ✗ Condenser ✗ Cooler ✓	Vaporizer ✗ Condenser ✗ Cooler ✓	Vaporizer ✗ Condenser ✗ Cooler ✓

*The use of vibration dampers or other absorbing devices is also recommended.

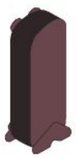
Figure 1:

a. Stud Nuts



b. Sheet Metal Bracket

c. Transverse Connection and Bolts



d. Ground Pillar

Installation

Installation of the plate heat exchanger must be done carefully to ensure efficient and safe operation of the device. The installation process can vary depending on the design of the device, the application area and the system requirements. Here are the steps for plate heat exchanger installation in general:

1.Preparation

Preparation of the Installation Area: Make sure that the area where the heat exchanger will be installed is clean, flat and has adequate ventilation. Select an installation place suitable for the size of the heat exchanger.

2. Inspection of the Heat Exchanger

Checking the Heat Exchanger: Before installation, check the physical condition of the heat exchanger. Check for any damage or missing parts.

Examination of Technical Documents: Review the installation manual and technical documentation provided by the manufacturer. These documents ensure that the installation is done correctly.

3. Preparation of Connection Points

Flanges and Connectors: Prepare flanges and fittings suitable for the connection points of the heat exchanger. Check flanges, screws and fittings.

Sealing Materials: Prepare the necessary sealing materials (e.g. gasket or rubber) and place them properly.

4. Assembly Process

Placing the Heat Exchanger: Carefully place the heat exchanger in the mounting area. Make sure that the heat exchanger is in the correct position and fully seated on the mounting surface.

Making Connections: Make the inlet and outlet connections of the heat exchanger. Carefully place and tighten the connection points, flanges and screws. Make sure that the connections are correct and leak tight.

Tightness Check: When tightening the connections, make sure that the sealing materials are properly placed and that there is no risk of leakage.

5.Making System Connections

Connecting Heat Fluids Make the appropriate fluid connections to the inlet and outlet of the heat exchanger. Make sure that the fluids flow in the right direction.

Connecting Pumps and Valves: Connect the pumps and valves in the system in accordance with the heat exchanger. This ensures smooth and efficient passage of fluids.

6. System Tests and Checks

Tightness Test: Test the system with low pressure and check for leaks. If any leakage is detected, recheck the connections and tighten if necessary.

Pressure Test: Test the system in accordance with the working pressure. Be careful during pressure tests and take immediate action if any abnormalities or leaks are detected.

7. Final Checks and Start-up

Final Checks: Recheck all connections, seals and assembly of the heat exchanger. Make sure that all connections are secure and correct.

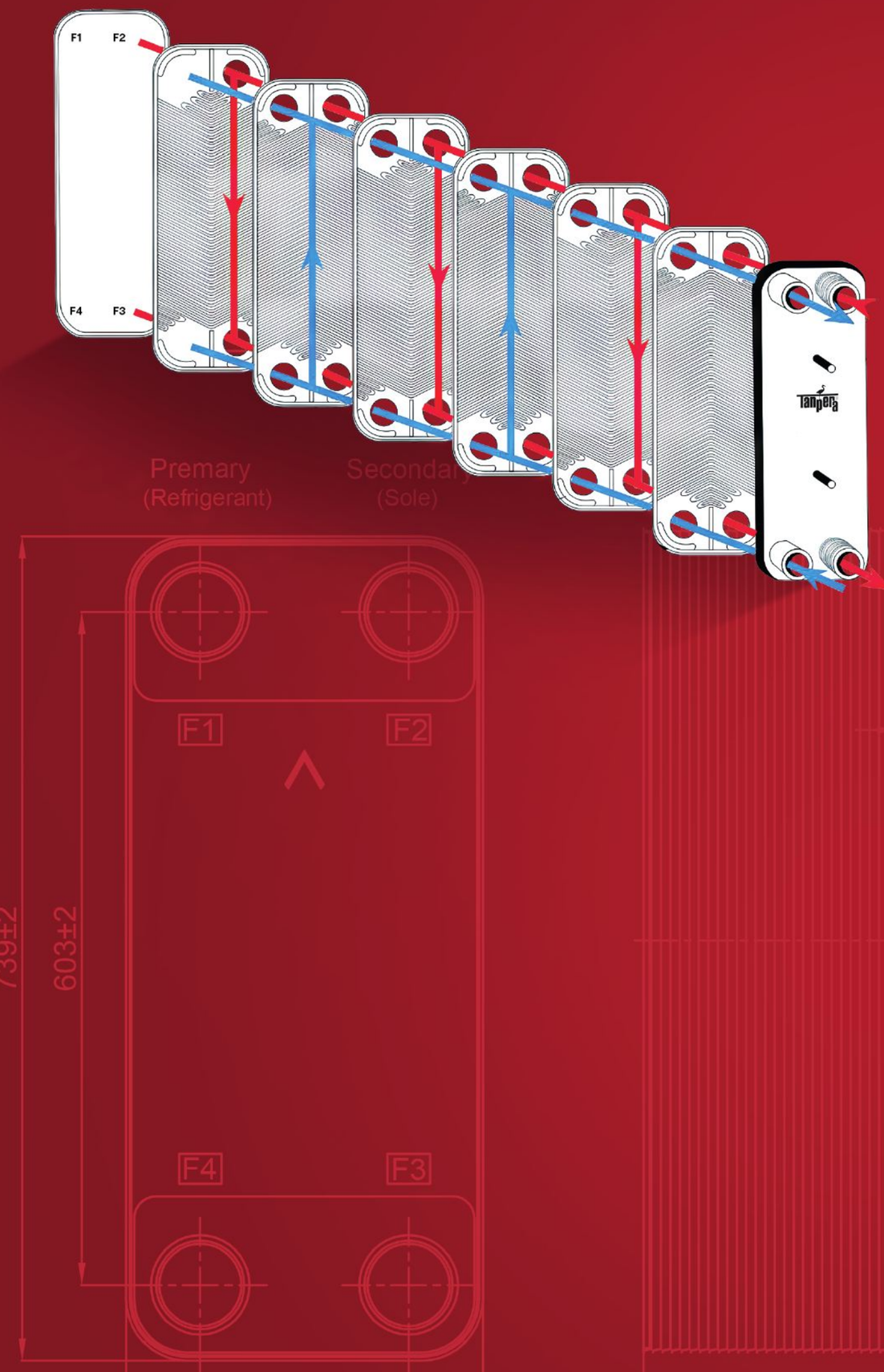
System Start-up: Operate the system carefully and monitor the performance of the heat exchanger. If any problems occur, take immediate action.

8. Maintenance and Monitoring

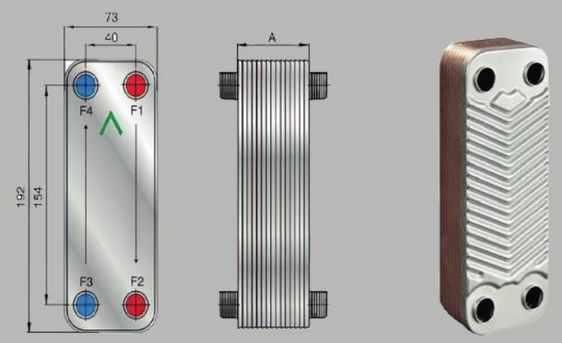
Regular Maintenance: Monitor the performance of the heat exchanger and perform regular maintenance. Check the cleanliness of the plates and the general condition of the system.

Troubleshooting: If you detect any performance problems or leaks, make the necessary corrections.

The installation process may vary according to the technical specifications and field of use of each plate heat exchanger, so it is important to follow the specific installation instructions provided by the manufacturer.



TBR 012



General Information: TBR-012 model brazed heat exchangers are generally used in chiller units for evaporator/condenser, economizer purposes, heat pump applications and many industrial applications.

Industry	Application
HVAC, Heat Pump, Chiller, Oil Cooler, Process Cooling, Heating	Evaporator/Condenser, Desuperheater, Subcooler, Economiser, Precooler/Preheater

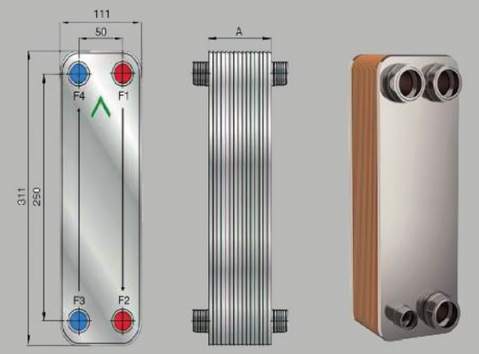
TBR-012 Formulation

Plates Number	A (mm)	Weight	Volume F2,F3 Side / F1,F4 Side	Exchanger Surface (m2)
n	9+2,3n	0,4+0,04n	0,018x1/2n / 0,018x1/2 (n-2)	(n-2) 0,012

Design Parameters

Design Pressure	10/30 Bar
Test Pressure	15/45 Bar
Design Temperature	-196/200
Max Connection Diameter	3/4”
Connection Type	Threaded, Flanged, Welded
Plate Type	H
Heat Load	0,5-4 kW
Maximum Number of Plate	50

TBR 014



General Information: TBR-014 model brazed heat exchangers are generally used in chiller units for evaporator/condenser, economizer purposes, heat pump applications and many industrial applications.

Industry	Application
HVAC, Heat Pump, Chiller, Oil Cooler, Process Cooling, Heating	Evaporator/Condenser, Desuperheater, Subcooler, Economiser, Precooler/Preheater

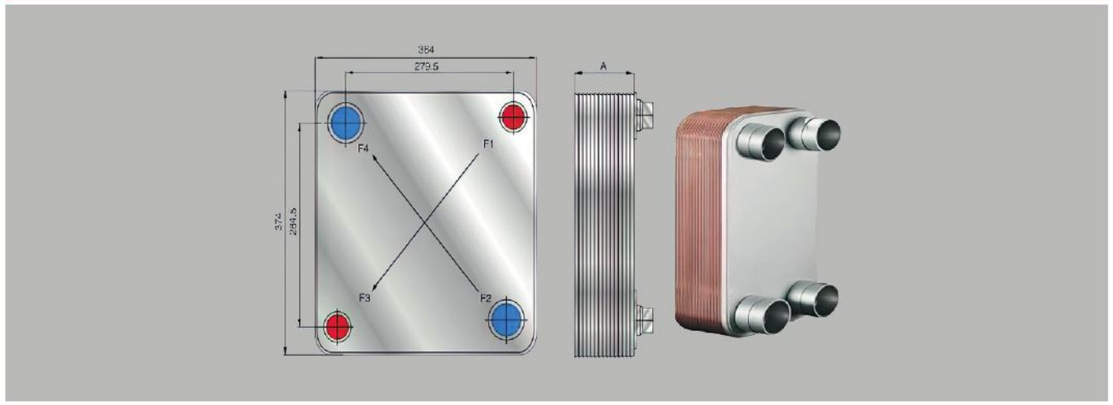
TBR-014 Formulation

Plates Number	A (mm)	Weight	Volume F2,F3 Side / F1,F4 Side	Exchanger Surface (m2)
n	9+2,3n	0,5+0,05n	0,020x1/2n / 0,020x1/2 (n-2)	(n-2) 0,014

Design Parameters

Design Pressure	30/45 Bar
Test Pressure	45/67,5 Bar
Design Temperature	-196/200
Max Connection Diameter	3/4”
Connection Type	Threaded, Flanged, Welded
Plate Type	H, M, L
Heat Load	0,5 - 4 Kw
Maximum Number of Plate	60

TBR-018



General Information: TBR-018 model brazed heat exchangers are generally used in chiller units for evaporator/condenser, economizer purposes, heat pump applications and many industrial applications.

Industry	Application
HVAC, Heat Pump, Chiller, Oil Cooler, Process Cooling, Heating	Evaporator/Condenser, Desuperheater, Subcooler, Economiser, Precooler/Preheater

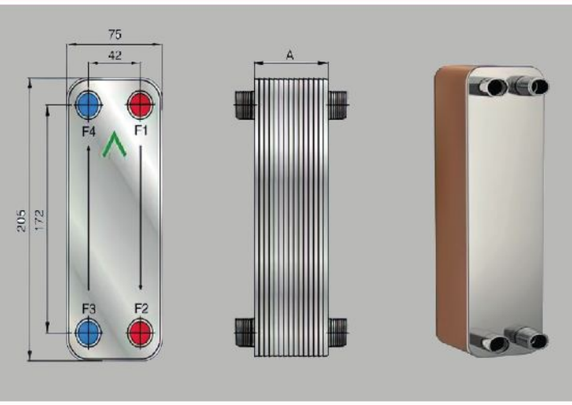
TBR-018 Formulation

Plates Number	A (mm)	Weight	Volume F2,F3 Side / F1,F4 Side	Exchanger Surface (m2)
n	11+2,3n	1,1+0,055n	0,036x1/2n / 0,036x1/2 (n-2)	(n-2) 0,018

Design Parameters

Design Pressure	30/45 Bar
Test Pressure	45/67,5 Bar
Design Temperature	-196/200
Max Connection Diameter	3/4”
Connection Type	Threaded, Flanged, Welded
Plate Type	H
Heat Load	2-10 kW
Maximum Number of Plate	60

TBR-022



General Information: TBR-022 model brazed heat exchangers are generally used in chiller units for evaporator/condenser, economizer purposes, heat pump applications and many industrial applications.

Industry	Application
HVAC, Heat Pump, Chiller, Oil Cooler, Process Cooling, Heating	Evaporator/Condenser, Desuperheater, Subcooler, Economiser, Precooler/Preheater

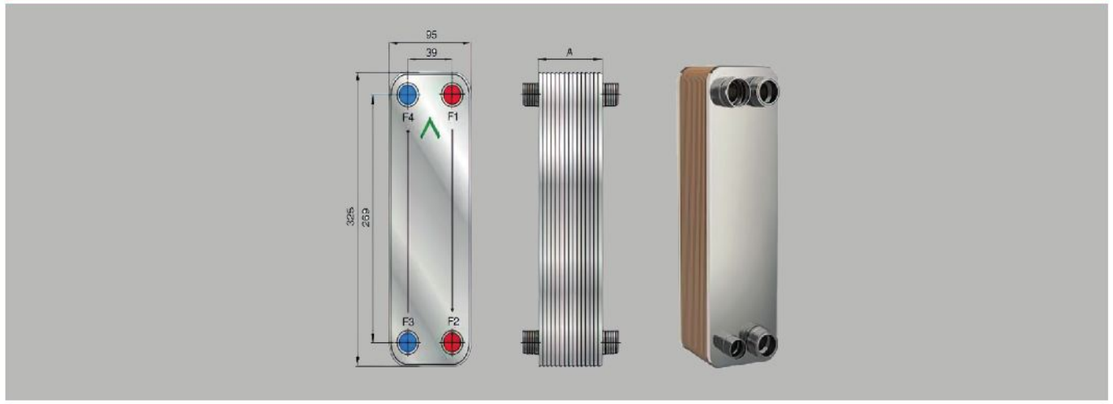
TBR-022 Formulation

Plates Number	A (mm)	Weight	Volume F2,F3 Side / F1,F4 Side	Exchanger Surface (m2)
n	11+2,3n	0,7+0,07n	0,040x1/2n / 0,040x1/2 (n-2)	(n-2) 0,022

Design Parameters

Design Pressure	30/45 Bar
Test Pressure	45/67,5 Bar
Design Temperature	-196/200
Max Connection Diameter	3/4”
Connection Type	Threaded, Flanged, Welded
Plate Type	H,M,L
Heat Load	2-10 kW
Maximum Number of Plate	60

TBR-028



General Information: TBR-028 model brazed heat exchangers are generally used in chiller units for evaporator/condenser, economizer purposes, heat pump applications and many industrial applications.

Industry	Application
HVAC, Heat Pump, Chiller, Oil Cooler, Process Cooling, Heating	Evaporator/Condenser, Desuperheater, Subcooler, Economiser, Precooler/Preheater

TBR-028 Formulation

Plates Number	A (mm)	Weight	Volume F2,F3 Side / F1,F4 Side	Exchanger Surface (m2)
n	10 +2,3n	1,2+0,10n	0,050x1/2n / 0,050x1/2 (n-2)	(n-2) 0,028

Design Parameters

Design Pressure	30/45 Bar
Test Pressure	45/67,5 Bar
Design Temperature	-196/200
Max Connection Diameter	1 1/4"
Connection Type	Threaded, Flanged, Welded
Plate Type	H,M,L
Heat Load	5-15 kW
Maximum Number of Plate	150

TBR-030

General Information: TBR-030 model brazed heat exchangers are generally used in chiller units for evaporator/condenser, economizer purposes, heat pump applications and many industrial applications.

Industry	Application
HVAC, Heat Pump, Chiller, Oil Cooler, Process Cooling, Heating	Evaporator/Condenser, Desuperheater, Subcooler, Economiser, Precooler/Preheater

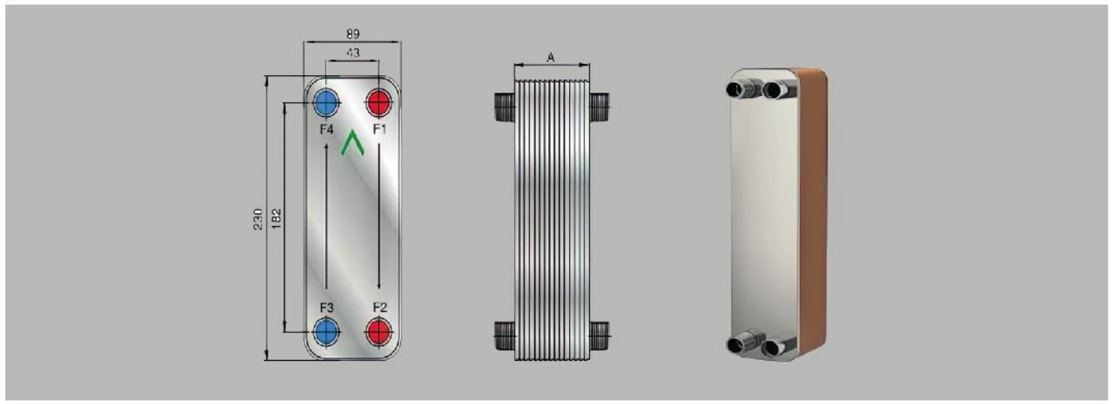
TBR-030 Formulation

Plates Number	A (mm)	Weight	Volume F2,F3 Side / F1,F4 Side	Exchanger Surface (m2)
n	11+1,55n	1,0+0,09n	0,028x1/2n / 0,028x1/2 (n-2)	(n-2) 0,030

Design Parameters

Design Pressure	30/45 Bar
Test Pressure	45/67,5 Bar
Design Temperature	-196/200
Max Connection Diameter	1”
Connection Type	Threaded, Flanged, Welded
Plate Type	H
Heat Load	3-10 kW
Maximum Number of Plate	150

TBR-052



General Information: TBR-052 model brazed heat exchangers are generally used in chiller units for evaporator/condenser, economizer purposes, heat pump applications and many industrial applications.

Industry	Application
HVAC, Heat Pump, Chiller, Oil Cooler, Process Cooling, Heating	Evaporator/Condenser, Desuperheater, Subcooler, Economiser, Precooler/Preheater

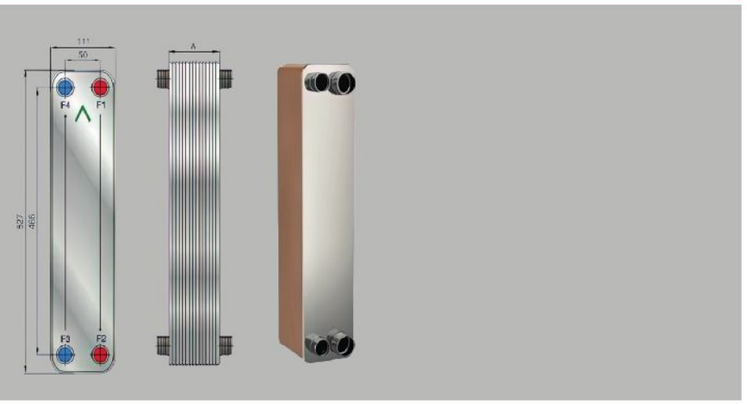
TBR-052 Formulation

Plates Number	A (mm)	Weight	Volume F2,F3 Side / F1,F4 Side	Exchanger Surface (m2)
n	11 +2,4n	1,8+0,23n	0,094x1/2n / 0,094x1/2 (n-2)	(n-2) 0,052

Design Parameters

Design Pressure	30/45 Bar
Test Pressure	45/67,5 Bar
Design Temperature	-196/200
Max Connection Diameter	1”
Connection Type	Threaded, Flanged, Welded
Plate Type	H
Heat Load	10-60 kW
Maximum Number of Plate	150

TBR-095



General Information: TBR-095 model brazed heat exchangers are generally used in chiller units for evaporator/condenser, economizer purposes, heat pump applications and many industrial applications.

Industry	Application
HVAC, Heat Pump, Chiller, Oil Cooler, Process Cooling, Heating	Evaporator/Condenser, Desuperheater, Subcooler, Economiser, Precooler/Preheater

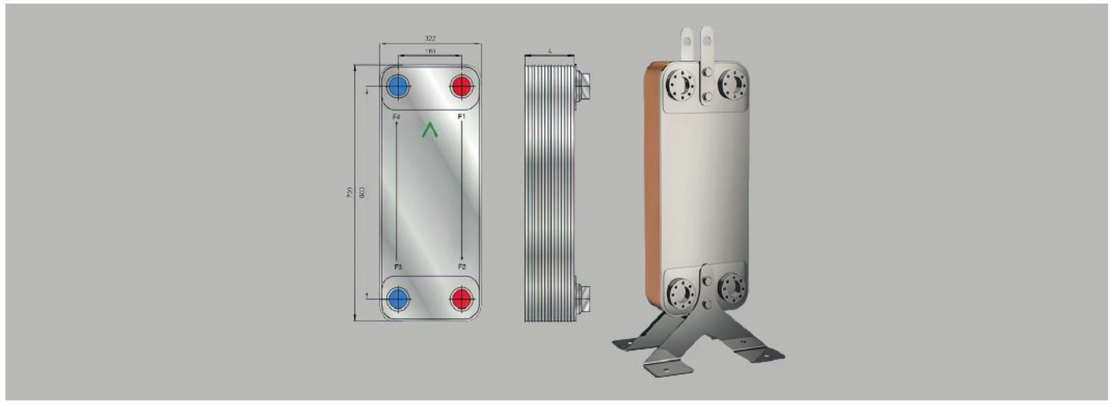
TBR-095 Formulation

Plates Number	A (mm)	Weight	Volume F2,F3 Side / F1,F4 Side	Exchanger Surface (m2)
n	15+2,4n	4,6+0,44n	0,210x1/2n / 0,210x1/2 (n-2)	(n-2) 0,095

Design Parameters

Design Pressure	30/45 Bar
Test Pressure	45/67,5 Bar
Design Temperature	-196/200
Max Connection Diameter	2”
Connection Type	Threaded, Flanged, Welded
Plate Type	H,M,L
Heat Load	30-200 kW
Maximum Number of Plate	250

TBR-115



General Information: TBR-115 model brazed heat exchangers are generally used in chiller units for evaporator/condenser, economizer purposes, heat pump applications and many industrial applications.

Industry	Application
HVAC, Heat Pump, Chiller, Oil Cooler, Process Cooling, Heating	Evaporator/Condenser, Desuperheater, Subcooler, Economiser, Precooler/Preheater

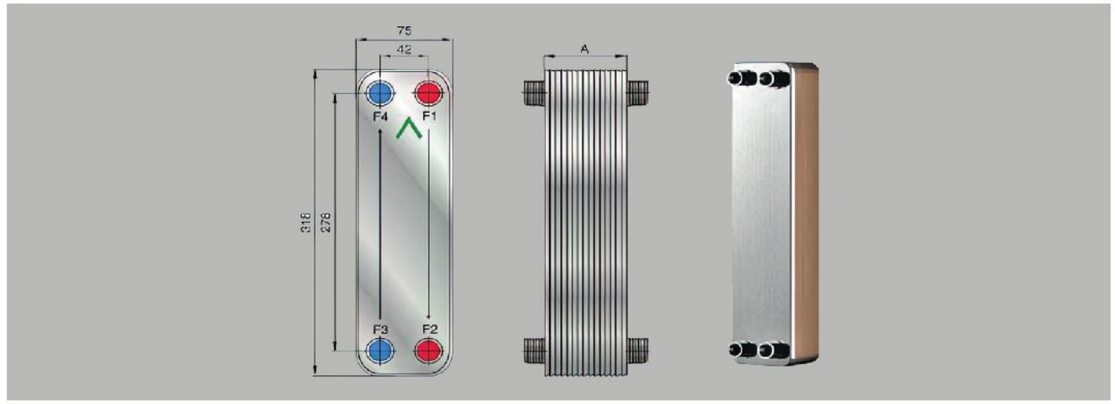
TBR-115 Formulation

Plates Number	A (mm)	Weight	Volume F2,F3 Side / F1,F4 Side	Exchanger Surface (m2)
n	16+2,32n	0,45n+15,5	0,018x1/2n / 0,018x1/2 (n-2)	(n-2) 0,012

Design Parameters

Design Pressure	30/45 Bar
Test Pressure	45/67,5 Bar
Design Temperature	-196/200
Max Connection Diameter	2 1/2"
Connection Type	Threaded, Flanged, Welded
Plate Type	H
Heat Load	30-200 kW
Maximum Number of Plate	200

TBR-136



General Information: TBR-136 model brazed heat exchangers are generally used in chiller units for evaporator/condenser, economizer purposes, heat pump applications and many industrial applications.

Industry	Application
HVAC, Heat Pump, Chiller, Oil Cooler, Process Cooling, Heating	Evaporator/Condenser, Desuperheater, Subcooler, Economiser, Precooler/Preheater

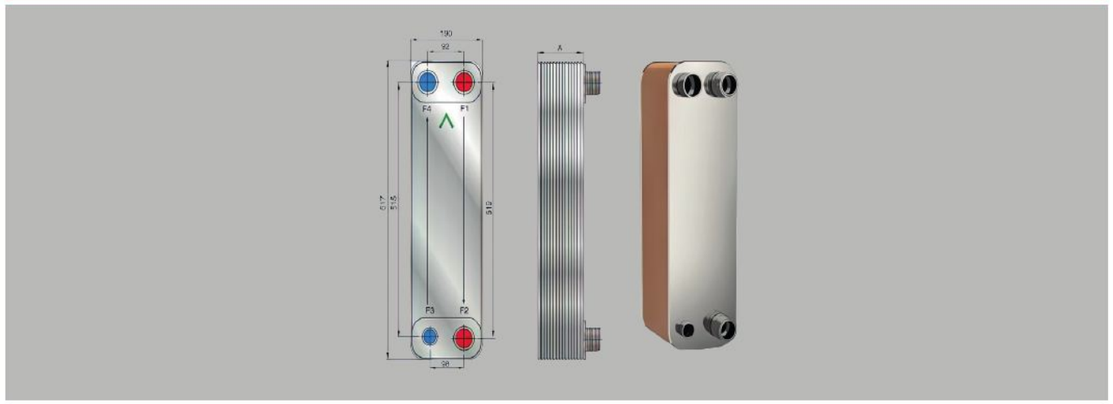
TBR-136 Formulation

Plates Number	A (mm)	Weight	Volume F2,F3 Side / F1,F4 Side	Exchanger Surface (m2)
n	15+2,85n	6,5+0,42n	0,250x1/2n / 0,250x1/2 (n-2)	(n-2) 0,136

Design Parameters

Design Pressure	30/45 Bar
Test Pressure	45/67,5 Bar
Design Temperature	-196/200
Max Connection Diameter	3”
Connection Type	Threaded, Flanged, Welded
Plate Type	H
Heat Load	60-200 kW
Maximum Number of Plate	200

TBR-210



General Information: TBR-210 model brazed heat exchangers are generally used in chiller units for evaporator/condenser, economizer purposes, heat pump applications and many industrial applications.

Industry	Application
HVAC, Heat Pump, Chiller, Oil Cooler, Process Cooling, Heating	Evaporator/Condenser, Desuperheater, Subcooler, Economiser, Precooler/Preheater

TBR-210 Formulation

Plates Number	A (mm)	Weight	Volume F2,F3 Side / F1,F4 Side	Exchanger Surface (m2)
n	10 +2,3n	0,6+0,044n	0,018x1/2n / 0,018x1/2 (n-2)	(n-2) 0,012

Design Parameters

Design Pressure	30 Bar
Test Pressure	45 Bar
Design Temperature	-196/200
Max Connection Diameter	4”
Connection Type	Threaded, Flanged, Welded
Plate Type	H
Heat Load	150-450 kW
Maximum Number of Plate	250

By effective heat transfer between the blood coming from its heart at 40°C and the blood returning from its feet at 1°C, it can stay in cold water for a long time without freezing. Using these natural principles, we design our engineering marvel heat exchangers.

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