

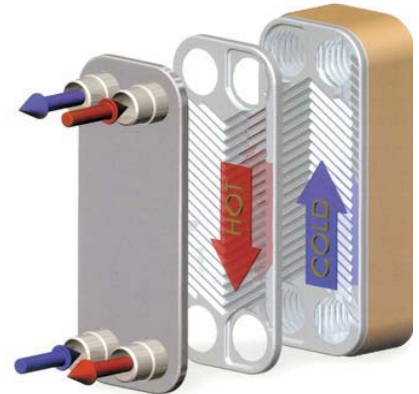
## INSTALLATION AND OPERATING INSTRUCTIONS

# ABX - Brazed Plate Heat Exchangers

**WARNING: BEFORE PROCEEDING WITH INSTALLATION AND OPERATION, READ ENTIRE MANUAL CAREFULLY. FAILURE TO DO SO CAN CAUSE INJURY OR PROPERTY DAMAGE**

Armstrong's ABX brazed plate heat exchangers are designed to facilitate heat transfer between two media of different temperatures without allowing them to mix. The high heat transfer rates allow for a compact design, and the stainless steel construction combined with copper brazing creates a robust and corrosion resistant unit. The design and construction conform to ASME code.

**WARNING: THE HEAT EXCHANGER MAY HAVE SHARP EDGES. EXERCISE CAUTION WHEN HANDLING**



Exploded view of Armstrong Brazed Plate Heat Exchanger

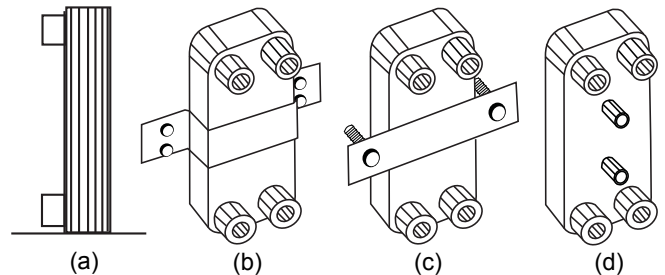
### INSTALLATION GUIDE

In order to achieve high thermal efficiency and high heat transfer rates, ABX has to be installed in a counter flow direction. Always install your ABX vertically especially for a refrigerant system. This is done to secure the ABX and keep minimum amount of water below the connector.

### MOUNTING POSITIONS

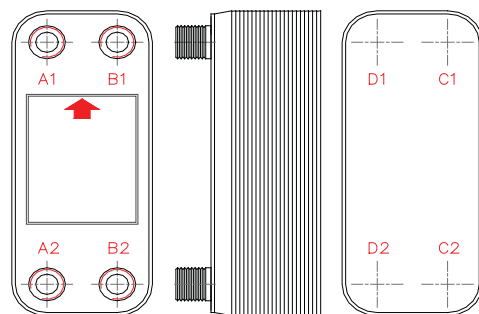
There are four different ways to mount the ABX:

- Bottom support
  - Sheet metal bracket
  - Crossbar & bolts
  - Stud bolts
- All items should be supported independently.
  - Do not apply excessive forces to the fittings.
  - Except for small sized ABX030 model, our ABX cannot be fastened directly to the fittings/piping.
  - Use flexible hoses or vibration dampers to reduce pulsation, shock or vibrations that are caused by the operating system.



### CONNECTION LOCATION

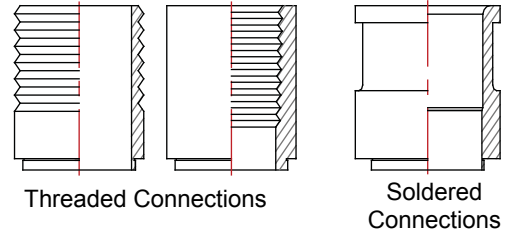
Application	Fluid 1	Fluid 2
Heating, Cooling	Cold water A2→A1	Hot water B1→B2
Evaporator single refrigerant	Refrigerant A2→A1	Chiller water B1→B2
Condenser	Refrigerant A1→A2	Cooling water B2→B1



## CONNECTION TYPES

The temperature of the brazing or welding process must not exceed the melting point of the internal brazing material. Use a wet towel around the connection and the plate pack to reduce the amount of heat transmitted to the pack during installation.

1. Clean the soldering assembly surface at the copper pipe and heat exchanger connections.  
Remove oil or other buildup with a degreasing agent. Polish the surfaces to remove oxide.
2. Apply the flux to the surface with a brush to remove and prevent oxidation.
3. For refrigerant applications, use dry nitrogen gas on the refrigerant side.
4. Heat the soldering area to the soldering temperature, about 649°C (1,200°F).  
Temperatures above this can melt the brazing materials and result in damage.
5. Keep the pipe in a fixed position and apply the filler material.



**WARNING: DURING OPERATION DO NOT EXCEED MAXIMUM PRESSURE AND TEMPERATURE LIMITS SHOWN ON THE NAMEPLATE. FAILURE TO DO SO CAN CAUSE INJURY OR PROPERTY DAMAGE.**

## OPERATING INSTRUCTIONS

**Start-Up Venting:** During the filling process the unit must be vented to eliminate any trapped air. This will assure proper performance and longevity of the unit.

**Shut Down:** The two sides should be shut down simultaneously and slowly. If this is not possible the hot side

should be shut down first. If the unit is shut down for an extended period of time, it must be drained and cleaned. This is especially true if there is a risk of frost or in the presence of any aggressive medium inside the heat exchanger.

## FOULING AND CLEANING

Different factors may effect fouling such as fluid velocity, turbulence, flow distribution, surface finish and water quality. Proper maintenance and adequate water treatment can help reduce fouling. Properly sized strainers should be installed when particles are known to exist (strainers with a mesh size of 16-20 will retain particles over 0.04"). In installations where high calcium hardness or fluid contamination is expected, the heat exchanger should be cleaned periodically by flushing, back-flushing and cleaning of the strainers.

Two types of fouling are described below:

**Scaling** Deposits of calcium on the heat transfer surface. Deposits increase with temperatures higher than 60°C (140°F),

Calcium content and pH. Maintaining a turbulent flow and lower temperatures can help reduce this type of scaling.

**Particles** Solids in suspension in the heat transfer media. Fouling is influenced by flow rate and velocity, as well as by the physical size of the particles.

**Cleaning** of fouled plate heat exchanger by back flushing will remove most of the soft debris that is blocked inside. The solution used for back flushing shall be weak acids with concentration less than 5%; one example is citric acid. If the acidity is too high, the copper and stainless steel inside the PHE may 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.

## WARNING

1. Highly chlorinated water and seawater can corrode standard stainless steel plates and copper braze. The maximum CL content is 1,000 ppm for 80°F (27°C) and 100 ppm for 170°F (77°C) for stainless steel plates and copper braze.
2. Any formation of freezing or icing will damage the ABX and possibly the system. Use brine (e.g. glycol) when operating temperature is close to the freezing point and proper control package to prevent this.
3. When an unknown quality of water is applied to the ABX, a strainer with a minimum 20 mesh size shall be placed at the inlet to the ABX.
4. Solution in the ABX shall have a PH range between 6 and 8.
5. Ground water with high sulfuric compound and low PH value may cause gradual damage to the copper braze.
6. Explosive, flammable, corrosive, toxic and/or hazardous Fluids shall not be used in an ABX,

## WARRANTY

Standard Armstrong warranty applies.

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