



## AC250

### The revolutionary heat exchanger with single and double circuit solution

**Brazed plate DX-evaporator from Alfa Laval**  
Alfa Laval introduces a new size of plate, the AlfaChill 250. It is a brazed plate evaporator and condenser optimized for air conditioning and refrigeration duties. The new plate has been designed and tested with both HCFC and HFC. Performance range is from 150 to 450 kW (40-120 RT) with R22 in both single and double compressor circuits.

**Patented technology for double circuit solution**  
Water channels are interlaced between the dual alternating refrigerant channels. This means that the whole water flow is always in contact with the active circuit when working at partload. The system thus ensures very efficient and safe working conditions. The benefits versus using two units in parallel are the simplified and more accurate water temperature control and lower cost for piping.

#### Distribution system

The AlfaChill 250 incorporates the Equalancer System. The principle of the Equalancer is the remixing of the two phase flow that equalizes and balances the refrigerant flow in the channels. The distribution system is integrated in the plate. The main advantage of Equalancer is that a closer temperature approach can be achieved and in addition the superheating can be decreased. Both the Dualaced Plate System™ and the Equalancer System™ are completely integrated in the pressed plate. This means no loose parts are added which is an important quality factor.

#### Other advantages of AlfaChill 250

Water and Refrigerant connections are positioned on opposite side of the unit for easy joint internally to compressor and externally to water/brine supply. The water connections are in the centre on the opposite side from the refrigerant connections which are diagonally placed. Diagonal flow is used to better exploit the plate surface by improving the channel distribution. The freezing risk is also reduced as result.



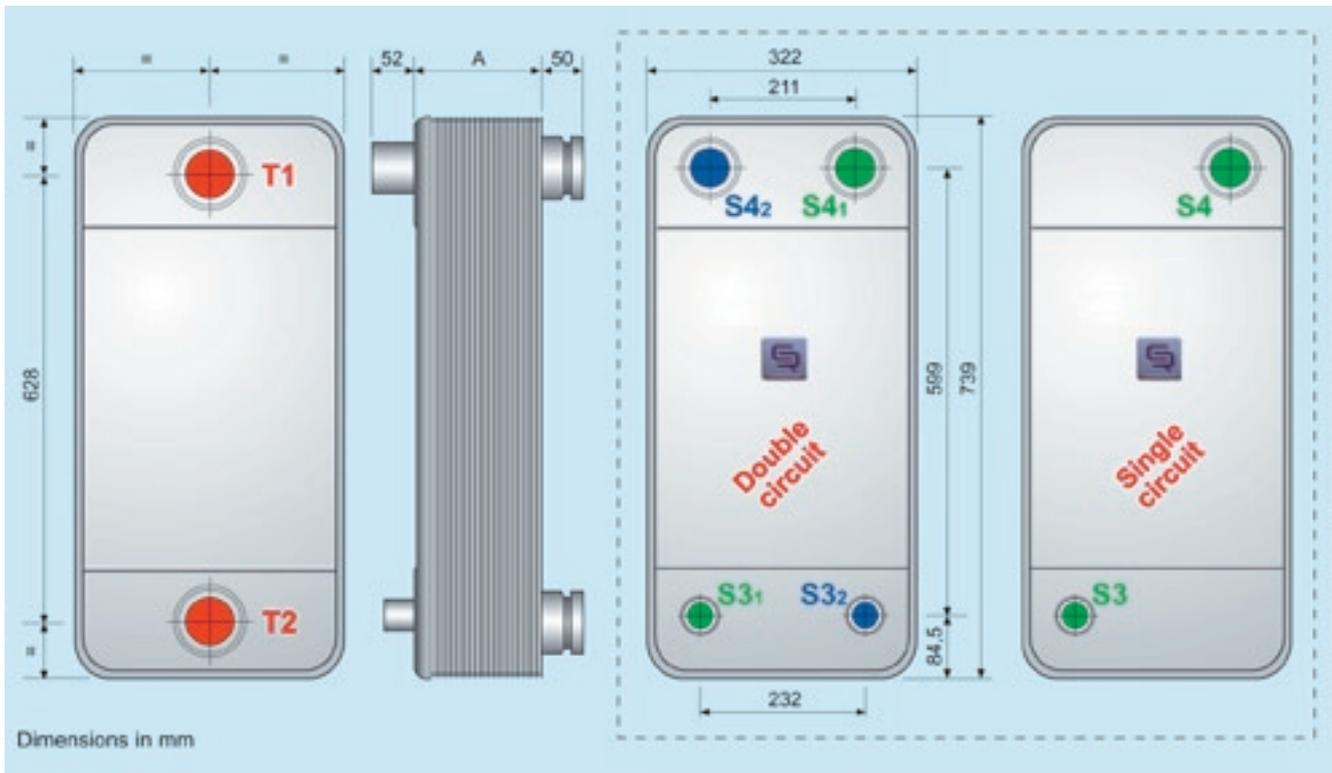
Special  
innovations  
of Alfa Laval



**Dualaced System** An advanced dual circuitry integrated in the plate

**Equalancer System** The integrated refrigerant distribution system that increases performance

**Diagonal Refrigerant flow** Improves performance in the plate



#### General data

Working Temperature min.	-50°C (-58°F)
Working Temperature max.	+150°C (+302°F)
Working Pressure min.	Vacuum
Working Pressure max. (Ref.)	3.2 MPa (465 psig)
Working Pressure max. (Water)	2.5 MPa (365 psig)
Volume per Channel	0.4 dm <sup>3</sup> (0.100 usg)
Max Flow Rate Water Side	105 m <sup>3</sup> /h (27700 usgph)
Distribution System	Available EQ
Dual Circuit System	Dualaced

#### Standard connections

Water/Brine side 3" Victaulic in T1 and T2

Refrigerant side 1"3/8 in S3  
(single circuit) 3"1/8, 2"5/8 in S4

Refrigerant side 1"1/8 in S3  
(double circuit) 2"5/8, 2"1/8 in S4

#### Dimensions

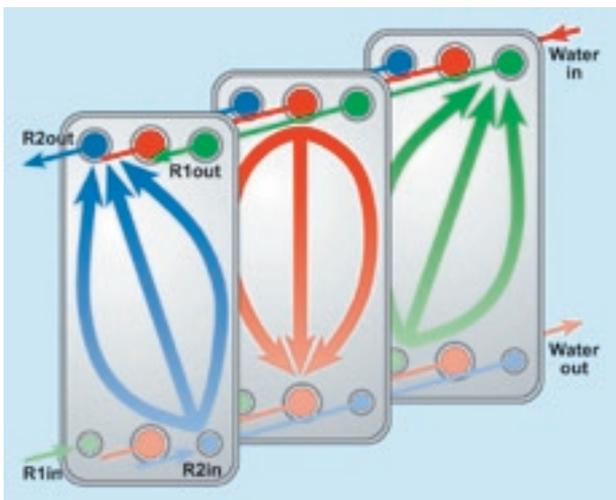
$$A = 13 + n \times 2.82 \text{ (mm)}$$

$$\text{Weight} = 13 + 0.82 \times n \text{ (kg)}$$

n = number of plates

$$A = 0.51 + n \times 0.11 \text{ (in)}$$

$$\text{Weight} = 28.66 + 1.81 \times n \text{ (lb)}$$



#### Application of the diagonal flow in Alfa Laval AC250 with real double circuit

The diagonal flow is intuitively more efficient as it produces an effective cross-flow and exploits in the best way the heat exchange surface, even if only one refrigerant circuit is in operation. Its application in a unit size like the AC250 was found, by testing, to improve distribution and plate efficiency. The AC250 can also be built in single refrigerant circuit configuration.

## Real double circuit for brazed plate heat exchanger now patented by Alfa Laval

The Real Double Circuit is now a reality in the BHE! Alfa Laval presents a new BHE evaporator and condenser with real double circuit; this means a permanent contact between the liquid circuit and the two independent refrigerant circuits.

The development of a partialising double refrigerant circuit, already available in Shell and Tube Heat Exchangers is in fact the patented innovation that Alfa Laval offers in the AlfaChill 250, the latest product among our wide range of BHE in Refrigeration and Air Conditioning.

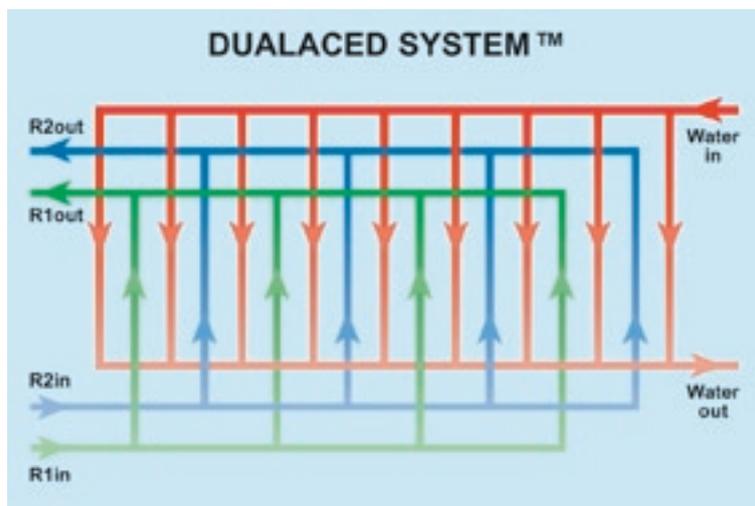
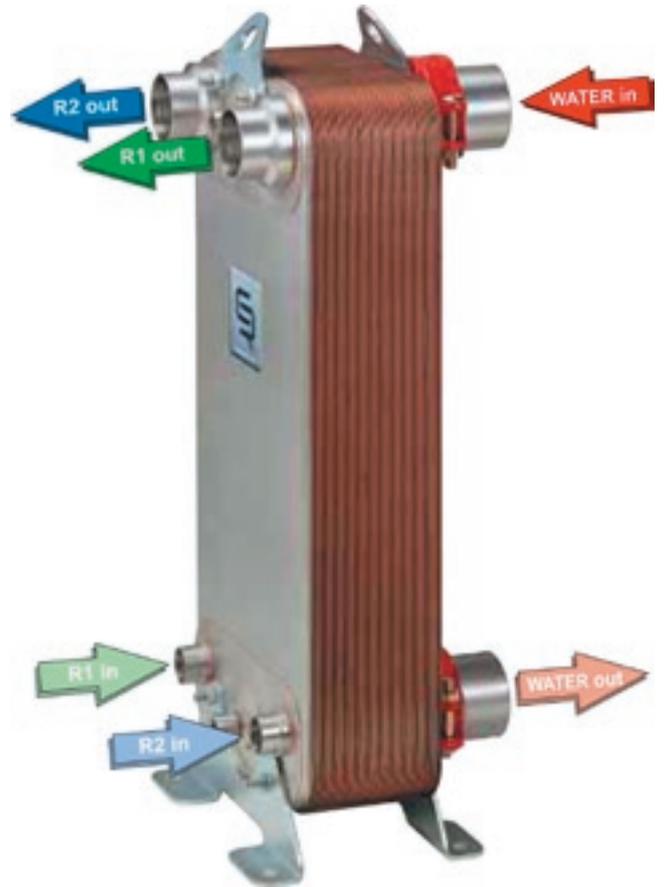
The real double circuit, as shown in the diagram is obtained with alternate liquid and refrigerant channels. All liquid channels, with the exception of the first and the last are always in contact with both of the refrigerants. The unit is therefore able to work in partial load conditions when one of the two refrigerant circuits is switched off.

This design ensures a balanced thermal load between the circuits and above all a more precise liquid outlet temperature control. There is no mixing of refrigerated and non-refrigerated flow as in previous double circuit solutions (see detailed explanation overleaf); potential freezing risks due to non correct settings of the temperature controllers are therefore prevented.

The two refrigerant circuits are completely independent.

The plate pressing technology, where Alfa Laval is world leader since the birth of the Plate Heat Exchanger, allows, without any added disk or washer, the build-up of the real double circuit by a simple combination of plates.

The solution that integrates into the plate both the Dualaced System and the Equalancer System is an outstanding example of the high quality level of plate design in Alfa Laval.



## Dual circuit comparisons

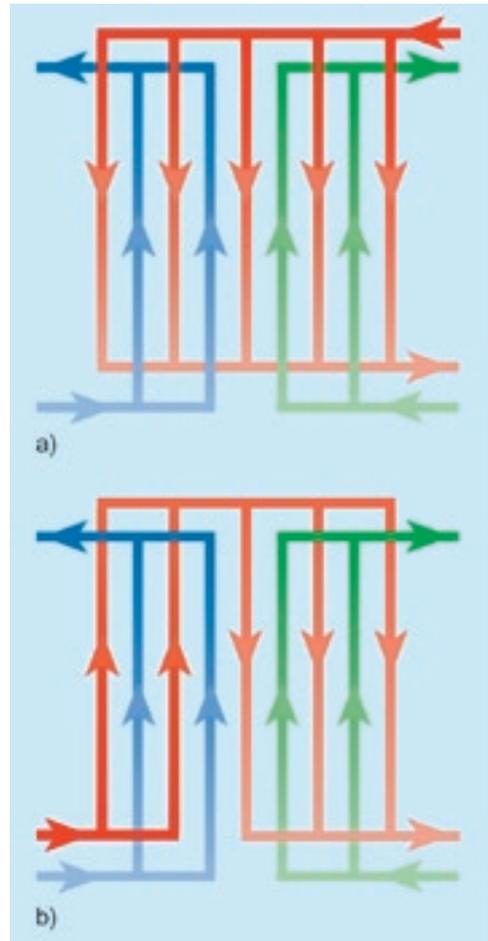
The new exchanger, with a real dual circuit layout, solves many of the drawbacks of the original BHE dual circuit design.

### a) Two refrigerant circuits, one single-pass liquid circuit.

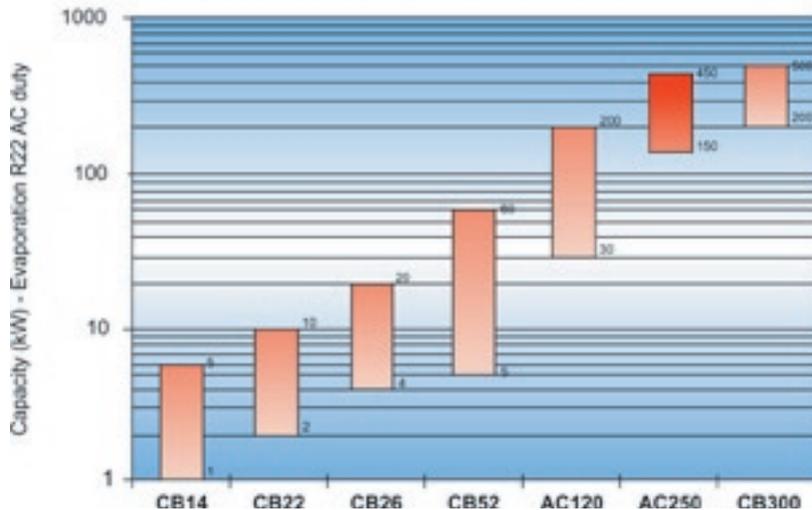
In the most frequently used dual circuit BHE, a plate with blind refrigerant ports is used to divide the unit into two, distinct refrigerant circuits as shown in the first illustration. Both refrigerant circuits are used to cool a single stream of liquid. What the diagram also makes clear is that, under partial load conditions, some of the liquid flow is not cooled. When this stream mixes with the chilled liquid it can result in inaccurate temperature control, since the temperature controller is often set-up on the whole liquid flow. This could lead to a drop in evaporation temperature in the active refrigerant circuit and a consequent risk of freezing in the low velocity areas on the liquid side, even when the mixed temperature of the whole liquid flow is greater than freezing. To counter this risk, greater care is needed in installation and in the placement and monitoring of temperature sensors.

### b) Two refrigerant circuits, one two-passes liquid circuit.

As in case a), above, the unit is divided in two by a blind plate. With this case the liquid circuit is in two passes. The main difference is that the total liquid flow passes through each circuit and there is no mixing of cooled and uncooled liquid when one circuit is closed, thus misleading temperature readings are eliminated. However, this arrangement often leads to high values of pressure drop.



## Alfa Laval Braze Plate Heat Exchangers Range



### How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at [www.alfalaval.com](http://www.alfalaval.com)