Heat pumps

Customized heat transfer solutions

Heat transfer solutions that will help you break barriers

Condenser

Evaporator

Economizer

Heat pumps are classified according to their source of energy:

- *Water-to-water* heat pumps use wells, lakes or rivers as energy source.
- *Brine-to-water* heat pumps use the ground (bedrock).
- *Air-to-water* and air-to-air heat pumps use the outside air.

Basics about heat pumps

Heat pumps are highly efficient, electrically driven systems used primarily to heat residential or commercial areas. In reversible operation, they are also used for cooling. Heat is produced during a condensation process in the refrigeration cycle and is transferred to either air or water. (The opposite applies to cooling.)

In the European heat pump design the heat exchanger in contact with the energy source is the evaporator, while the heat exchanger producing the hot water is the condenser.

As with all modern heating and cooling systems, the aim is maximum efficiency. In a heat pump, this is achieved by ensuring the closest possible temperature approach between the evaporator and the condenser. Optimizing the heat exchangers for the customer's specific systems is therefore critical.

The heat generated by a heat pump is used for space heating but also for producing hot tap water. To enhance the production of hot water and increase efficiency of the heat pump, an economizer is often used. It helps the compressor to achieve higher condensing temperatures, thereby raising the water temperature.

In applications where very high temperatures are required, heat pumps can be designed as cascade systems or use CO_2 as refrigerant.

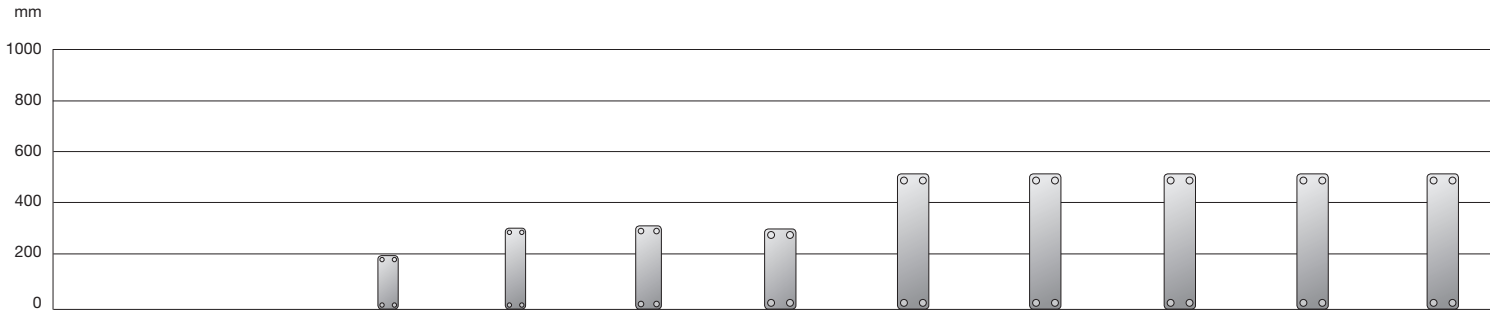
Brazed heat exchangers (BHE) are commonly used in European heat pumps. They act as condensers, as evaporators in water-to-water and water-to-brine systems and, optionally, as economizers.

The Alfa Laval adv

Alfa Laval offers a complete range of heat exchangers – brazed heat exchangers (BHE) and shell-and-tube heat exchangers (S&T). BHEs are very compact compared to any other heat exchanger for similar applications. This means less refrigerant is needed.

AlfaNova is a range of fusion-bonded, all stainless-steel heat exchangers. They are ideal in situations where one of the media is corrosive.

Water Kit is a series of rapid connections that minimize the time of



Heat Pump	AC16	AC18	AC30	CB30	AC70	CB60	CB62	CB65	AC75
Evaporator		x	x		x	x	x		x
Condenser		x	x	x	x	x	x	x	
Economizer	x	x	x		x				
Dimensions	see product leaflet								
Desing Pressure	32/45	32/45	32/45	32/45	32/45	32/45	32/48	32/45	32/45
Distribution System**			x	(x)	x	(x)	(x)	(x)	
DynaStatic Distribution									x
Assymetric plates available	x	x					x	x	x
High Theta plates available	x	x	x	x	x	x	x	x	x
Low Theta plates available				x	x	x			
Combination High & Low				x	x	x			
Water Kit**			(x)	(x)	(x)	(x)	(x)	(x)	(x)
High Efficiency							x	x	x
CO_2 transcritical									

** *(x) = optional*

vantage

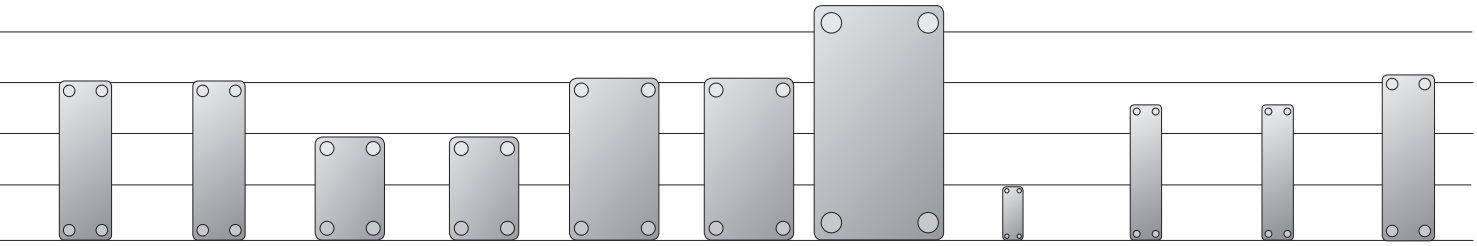
assembly. They have integrated temperature sensors and safety valves.

All BHE units are pressure-tested and labelled to comply with all major industry approvals (PED, UL, Chinese PV, KHK, KRA, and CRN). They are also leak-tested with helium to ensure that every unit is gas tight. All relevant approvals are also available for shell-and-tube heat exchangers.

For OEM customers, Alfa Laval can optimize the BHE according to specific applications and system requirements. Each optimized heat exchanger is unique to the customer, with a unique article number. Customers can be safe in the knowledge that Alfa Laval uses all its know-how to optimize their products.

Continuous innovation and product development are ensured by Alfa Laval's in-house laboratory. All developments and solutions are validated before being offered to customers.

Water Kit



	AC112	CB112	AC230	AC232	AC500	AC502	AC1000	AXP10	AXP52	AN52	AN76
	x		x	x	x	x	x			x	x
		x	x	x	x	x	x	x	x	x	x
	see product leaflet										
	32/48	32/48	32/45	32/45	32/45	32/45	48	140	140	32	32
	x	(x)	x	x	x	x	x			(x)	(x)
	x	x				x	x				
	x	x	x	x	x	x	x	x	x	x	x
	x	x								x	x
	x	x								x	x
										x	
	x	x					x				
								x	x		

Three innovations that break barriers

Product scope

EVAPORATORS

In evaporator duties, BHEs can be optimized by varying the channel plate characteristics and also by adding a distribution system. The distribution system ensures a uniform distribution of the refrigerant throughout the heat exchanger. This assures high performance and stable superheating under variable conditions. Though designed to operate with typical heat fluxes, Alfa Laval's distribution systems can be adapted to higher and lower heat-flux conditions as well. For very large heat pumps, Alfa Laval offers shell-and-tube heat exchangers.

CONDENSERS

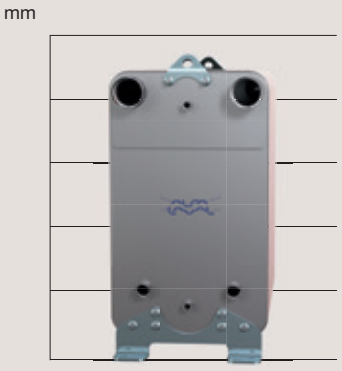
Alfa Laval offers a range of BHEs optimized as condensers. They feature specially designed channel plates combining different corrugation angles, pressing depths and asymmetric channels. This makes them suitable for a wide variety of heat-pump duties – from water heaters and micro heat pumps to residential and commercial systems.

ECONOMIZERS

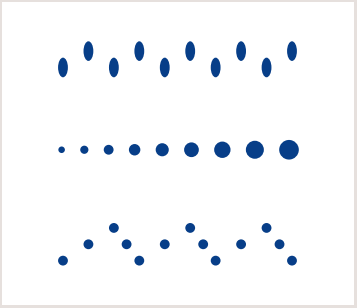
The small footprint and versatile configurations of Alfa Laval's brazed heat exchangers make them easy to optimize for economizer duties.

AC1000 XTRM / **CAPACITY**

The largest borehole heat exchanger on the market features a flexible design and delivers major energy savings. With these highly efficient plates, you can either expand capacity or reduce the total number of plates in your system.



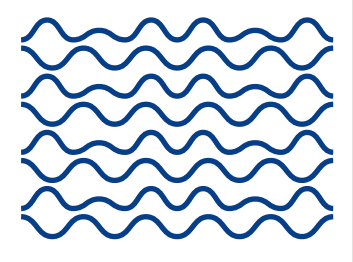
DYNASTATIC DESIGN / **FLEXIBILITY**



This breakthrough production method gives you complete freedom to design the perfect refrigerant distribution system for your products. Whatever placement, size and number of distributors you want, we can produce it.

FLEXFLOW DESIGN / **EFFICIENCY**

Our range of asymmetrical flow patterns unlock new levels of efficiency. We don't believe in a one size fits all approach – we develop new asymmetrical patterns tailored by application.



Partner with Alfa Laval to become best in class

With our unique wealth of experience, our dedication to finding innovative new heat transfer OEM solutions with greater efficiency and lower energy consumption and our global manufacturing and distribution network, Alfa Laval is your ideal partner.

Don't get left behind in a competitive market, affected by a constant flow of new regulations and ever-changing trends. We support your need to drive performance to new levels as well as the need of cost-efficient solutions.

Join forces with Alfa Laval and be the best that you possibly can.

OEM applications

- Air Conditioning (Chillers, Absorption Chillers and VRF's)
- Heat Pumps
- Boilers
- Solar Heating
- Domestic Water Heating
- Process Cooling
- Fuel Cells
- (Micro) Combined Heating and Power
- Air Dryers
- Air Compressors
- Oil Cooling
- Transport Refrigeration
- Wind Power
- Vending Machines

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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