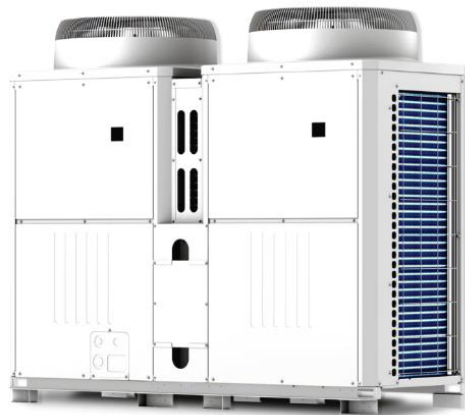


Using heat pumps to produce hot water in factories, hotel buildings

Many industries need hot water (40-90 °C) in production. Traditional hot water production methods such as Water Heater, Infrared, Boiler, and Thermistor.

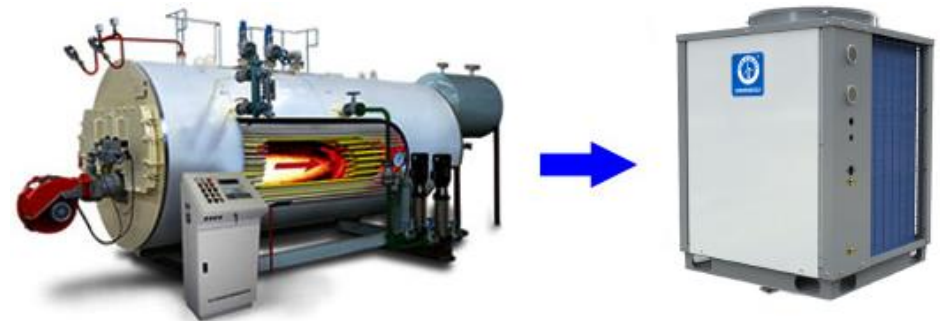
Heat pumps has been introduced into the industry sector but not widely applied. In response to increasingly stringent environmental protection regulations, industrial heat pumps water heaters could become an important technology application in reducing the emission of waste gas into the environment and saving energy.



1. What is a heat pump?

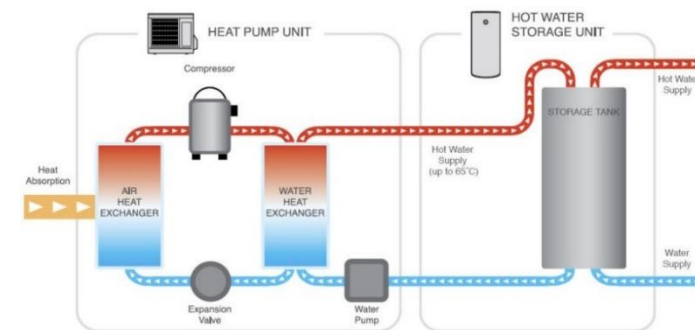
A **heat pump** is a device operating according to the principle of Thermodynamics in order to transfer a quantity of heat from one medium to another. A conventional heat pump only allows the heat to travel in a fixed direction (from "hot" to "cold" or vice versa), for example, fireplaces, refrigerators, etc. Heat pumps that allow adjustment and selection of the direction of heat movement are called Reversible heat pumps.

The heat pump water heater is mainly responsible for creating a hot water source that replaces the conventional heating methods, enabling the investor to save maximum electricity bills.



2. Heat pump water heater working principle

A heat pump water heater works on the same principle as a refrigerator. It absorbs heat from the ambient air and transfers it to the refrigerant. This heat is then raised using a circulating refrigerant cycle and this energy is used to create hot water.



3. Heat pump water heater efficiency

For a heat pump, the COP - Coefficient of Performance is calculated by:

$$\text{COP} = \frac{\text{Heat from pump}}{\text{Input Energy for pump operation}}$$

When the COP of a heat pump water heater is equal to 4, it means: 1 kW of electricity can generate more than 4 kW of heat.

Using a heat pump water heater can save 50% of costs compared to operation of a boiler using DO oil.

4. Application of heat pump water heater in factories, hotel buildings

Industrial heat pumps certainly bring high economic efficiency and absolute safety, especially for projects using a large amount of hot water. The more heat pumps they use, the more beneficial they get. Therefore, industrial heat pumps can meet the hot water demand for large projects.

For hotels: The demand for hot water is extremely great, not only for guests per room but also for warm water swimming pools, or other services. Therefore, using a heat pump is a safe and economical solution because **heat pump water heaters** have a high energy-saving potential.



For production activities: **Heat pump water heater** can operate effectively in plants which require both heating and cooling water such as alcohol distillation, industrial cleaning, drying of agricultural products, processing of aquatic products.



5. Comparison between heat pump water heaters, solar water heaters, and boilers

Criteria	Solar water heater			Heat pump water heater			Boiler	
Investment cost	★	★	★	★	★		★	
Efficiency		★		★	★	★	★	★
Ease of installation	★		★	★	★	★		★
Ease of maintenance	★		★	★	★	★		★