

Newsletter: Our partner helps Apple achieve renewable energy goals on campus

When it comes to technological advancement, Apple is one of the world's leaders. When a global technology leader like them commits to sustainability, it does so with precision and action. The specifications called for an energy efficient design and cooling solutions to provide a comfortable and attractive working environment.



Apple Park, the company's spaceship styled building, is a circular design with some 2.8 million square feet, excluding the large hollow space in the middle planted with trees, plants and pond spanning approximately 175 acres. Apple planned on having the entire complex powered by 100% renewable energy.

To reach its goal, Its engineers installed 2 units of our manufacturer's heat pumps. These heat pumps provide carbon friendly hot water needed for all the cafes on the campus.

The campus has a total of seven including one that has three levels and doors that are 92 feet tall. Considered to be one of the most energy efficient buildings in the world, Apple's campus features one of the largest solar roofs in the world, generating some 17 megawatts of power. It is one of the largest green rated LEED (Leadership in Energy and Environmental Design) Platinum-certified office buildings in North America.

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Features of the heat pump model installed in Apple

The heat pumps are refrigerant based with a buffer tank and redundant pumps built inside the unit. The advantage of having the pumps inside the unit is that mechanical room space is not required inside the building.

These machines are compact units with high efficiency, axial fans, external copper coils with aluminium fins and plate heat exchangers. They offer high efficiencies even at partial loads.

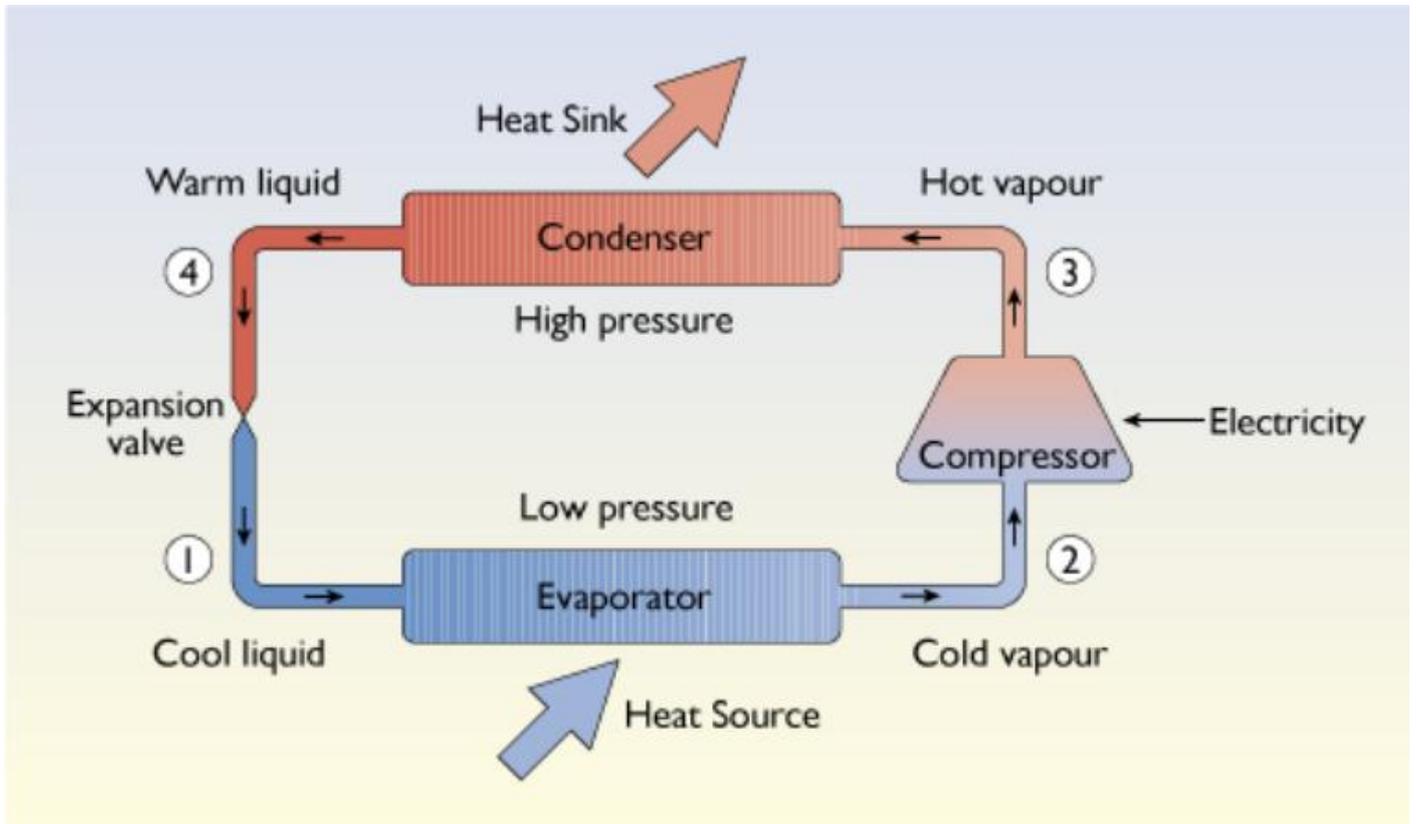


They have compact dimensions. Installation is quick and easy.

Accessories are available for remote monitoring of the system through mobile applications.

Optional controller is available to control multiple chillers installed in parallel as one system.

Difference between a Chiller and a Heat Pump



Chillers and heat pumps work on the same principle and contain very similar components. In the above schematic with a chiller, the heat source is where the chilled water will flow and cooled down by the chiller to the required temperature and in the heat sink, this absorbed heat from the chilled water will be ejected to the atmosphere either directly by the condenser or via a cooling tower. This heat that is ejected to the atmosphere is wasted. This can be utilized with a heat pump. With a heat pump, this waste heat can be used to heat various mediums by flowing water through the condenser and absorbing the waste heat from the condenser. So naturally, the utility of the machine is almost doubled and results in energy and cost savings.

The desired temperature for the hot water can be attained by varying the compressor working pressures, refrigerant and rearranging other working parameters of the chiller. Currently there are heat pumps which can generate hot water above 100C. Common temperatures through standard heat pumps without special components are between 65C to 80C. But this temperature is also dependent on the chilled water temperature required on the evaporator side. For low temperature and precision temperature control applications, heat pumps are not suitable. In these cases, Specialised chiller would be the right solution.

Advantages of Heat pumps

Heat pumps have dual functionality as they can be used for both heating and cooling at the same time.

Heat pumps are 3 to 4 times more efficient than gas/oil boilers.

Heat pumps are almost 2 times more efficient than chillers.

Heat pumps have decarbonisation potential when powered by renewable electricity whereas a boiler needs fossil fuels to function and leaves a large carbon footprint.

Fewer moving parts and no combustion process make heat pumps relatively low maintenance compared to traditional boilers.

Heat pumps have longer lifespans than boilers.



Conclusion

Although heat pumps have been used in Europe and other countries with cold weather for a long time, the shift is happening to utilize heat pumps in all possible applications throughout the world currently. The major driving factor for this shift is to improve energy efficiency and to reduce the carbon footprint.

Heat pumps were mainly used for domestic space heating in the past, now it has become popular in a lot of other applications and industries. Some of the industries that are utilizing heat pumps are hotels, data centres, semiconductor manufacturers, District heating plants, chemicals, F&B and paper industries.

As more organizations harness the usage of heat pumps to save cost by saving energy and at the same time protect the environment, it is good for businesses to explore the feasibility of utilizing heat pumps for their refrigeration needs. They offer clear long-term advantages.

Our Products and Services

Industrial process chillers,

Low temperature refrigeration for cold storage,

Heat pumps,

Customised and standard chillers,

Natural refrigerant chillers, HFO chillers,

Crane cabin Air conditioners,

Dehumidifiers,

Compressed Air Dryers (Refrigerant and Desiccant type),

Compressed air filtration, Aftercoolers/Moisture Separators/Pressure vessels,

OEM Spare parts,

Service and maintenance of refrigeration products.