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Absorption Chiller

Air conditioning is very important in our daily life, among all the system equipment, chiller is the heart of the cooling system. In the early years of the 20th century, the vapor absorption cycle using water-ammonia systems was popular and widely used, but after the development of the electrical compression cycle, absorption cycle became less important due to its low COP issues. But the absorption chiller still plays an important role where electricity is unreliable, costly or unavailable, where noise from the compressor is a problem and where there is a free heat source (from industrial process heat, exhaust heat or solar heating). Nowadays, when environment protection becomes a hot topic and energy saving are on everyone's lips. Absorption chiller is very popular in a CCHP system (Combine Cooling, Heating and Power system) that lift the entire system efficiency and turning the waste into usable energy.



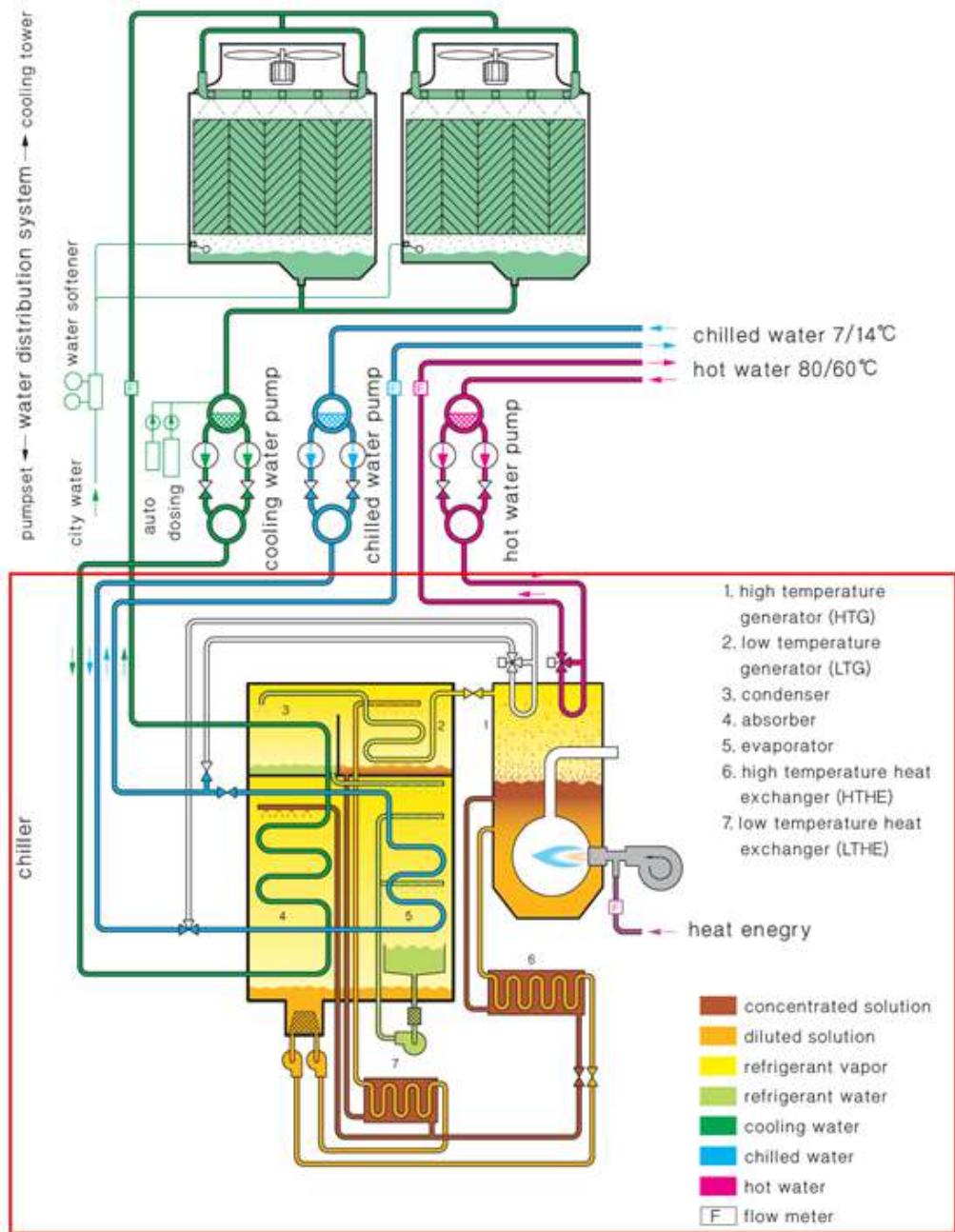
The input heat energy heats LiBr solution to 140°C and generate vapor, which is then condensed into water by cooling water. When the refrigerant water enters evaporator (in high vacuum condition), its temperature goes down immediately to 5°C and is sprayed over the evaporator tubes, to make chilled water drop down from 14°C to 7°C to make cooling. The refrigerant water absorbs heat from air conditioning system and evaporates, then is absorbed by concentrated LiBr solution from the

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generators. The cooling water takes away the heat and rejects it into the air. Diluted solution is pumped into HTG and LTG (as below diagram) separately to be heated to begin the process all over again.

Notes: lithium bromide is a salt of strong hygroscopicity, nontoxic and harmless, with no greenhouse effect and no damage to the ozone layer.



The absorption chiller consumes very less electrical power, the power consumption is mainly for the solution circulation pumps and control which is an extremely low portion compare to its energy output. The main energy input of the absorption chiller is heat energy. There are normally two type of absorption chiller – Direct Fire or Indirect Fire. Direct fire

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absorption chiller equip with a gas fired burner to power the high temperature generator while indirect fire absorption chiller has no standby burner. Indirect fire absorption chiller is rely on external heat source which can be exhaust flue gas, waste hot water or even solar hot water. The hot water heat source can be as low as 70°C. Wherever there is waste heat energy and cooling requirements, absorption chiller can find its position.



What's Next

"Smart Metering" by Kamstrup