

# Module 5 Heat Pump drying

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# Heat Pump

The heat pump is basically a refrigeration unit which is capable of extracting heat from low grade heat sources like atmosphere, sea, ground and upgrading the same to a useful temperature. This absorbed heat is upgraded with the help of a compressor and the fluid carrying the heat is discharged to the required space through the condenser. The heating system is same as refrigeration unit.

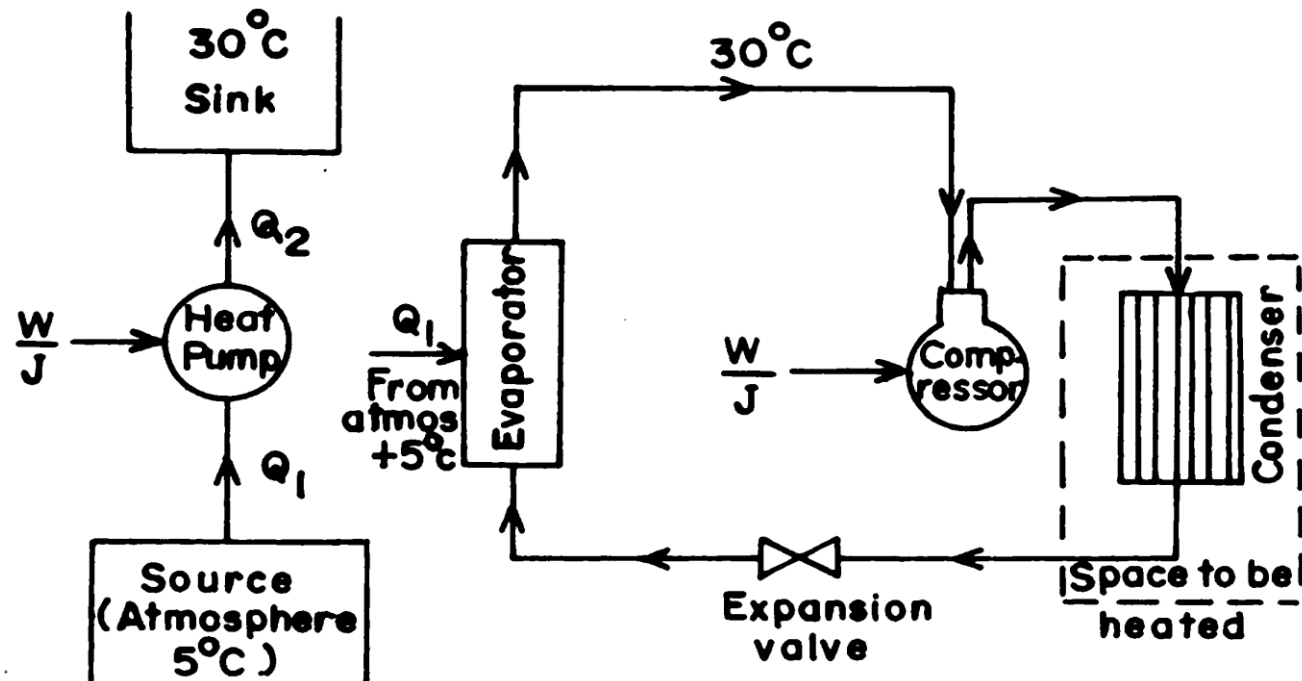


Diagram of a heat pump and space heating system

- The refrigerant which passes out of the expansion valve extracts heat  $Q_1$  from atmosphere as its temperature ( $-5\text{ }^{\circ}\text{C}$ ) is lower than the atmospheric temperature ( $+5\text{ }^{\circ}\text{C}$ ).
- This absorbed heat by refrigerant is upgraded by addition of the work through the compressor and the total heat  $Q_2(Q_2 = Q_1 + W/J)$  is discharged in the room through condenser. Thus the device that lifts or “pumps” heat energy from a low temperature source for use at higher temperature is known as “Heat-pump”.
- The refrigeration cycle is used for heating purposes when the atmospheric temperature is below the required temperature for comfort is called heat pump.
- The heat pump performs a number of operations, some of them are listed below
  - Heating and cooling of buildings for comfort conditions
  - Evaporating and concentrating the juices
  - Drying
  - Cooling of water and heating of space
  - Heating of water and cooling of space etc.

Thank you