

Give the classification of air conditioning systems.

Air conditioning systems are classified as

1) Classification as to major function- i) Comfort air-conditioning - air conditioning in hotels, homes, offices etc. ii) Commercial air-conditioning- air conditioning for malls, super market etc iii) Industrial air-conditioning – air conditioning for processing, laboratories etc

Define : i) DBT

i) DBT – Dry bulb temperature - t_{DB} - It is the temperature of air recorded by an ordinary thermometer and it is not affected by the moisture present in air.

ii) WBT -It is the temperature recorded by thermometer when its bulb is covered with wet cloth known as wick and is exposed to air.

iii) DPT – Dew point temperature t_{DP} *D.P.T. of mixture is defined as the temperature at which water vapours starts to condense.*

iv) Relative humidity:- It is defined as the ratio of partial pressure of water vapour in a given volume of mixture to the partial pressure of water vapour when same volume of mixture is saturated at the same temperature.

$$\therefore RH = \frac{P_v}{P_{v\ sat}} \times 100$$

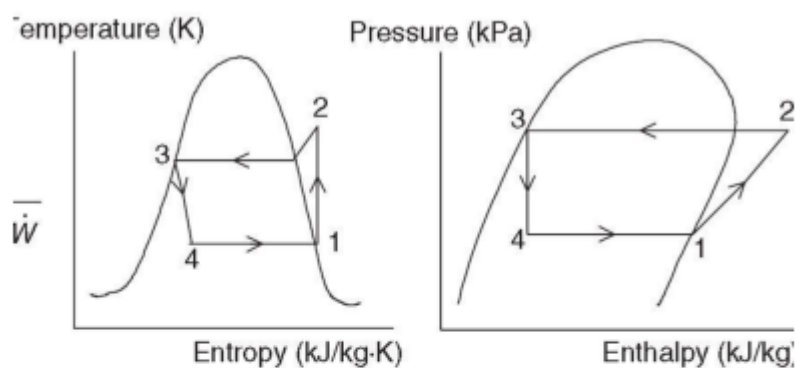
Explain with neat sketch working principle of Ice plant.

Working of Ice plant: The main cycle used for ice plant is vapor

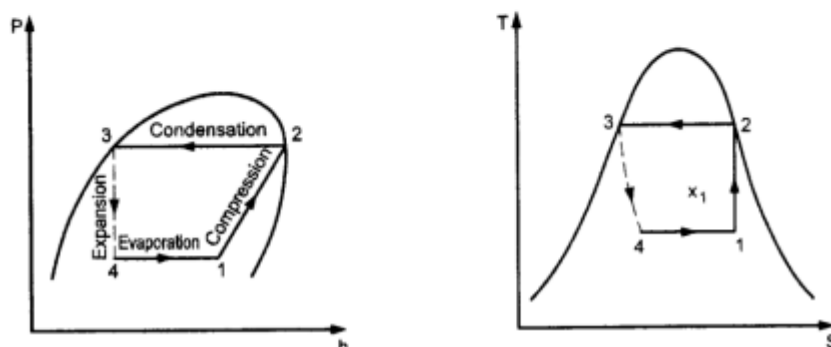
compression cycle with ammonia as the refrigerant in primary circuit and brine solution in secondary circuit. Brine solution takes heat from water in secondary circuit and delivers the heat to ammonia in primary circuit. Thus, the indirect method of cooling is used in ice plant. In secondary circuit brine is cooled in evaporator and then it is circulated around the can which contains water. The heat is extracted from the water in the can and is given to the brine.

Represent wet compression and dry compression on

Dry Compression



Wet Compression -



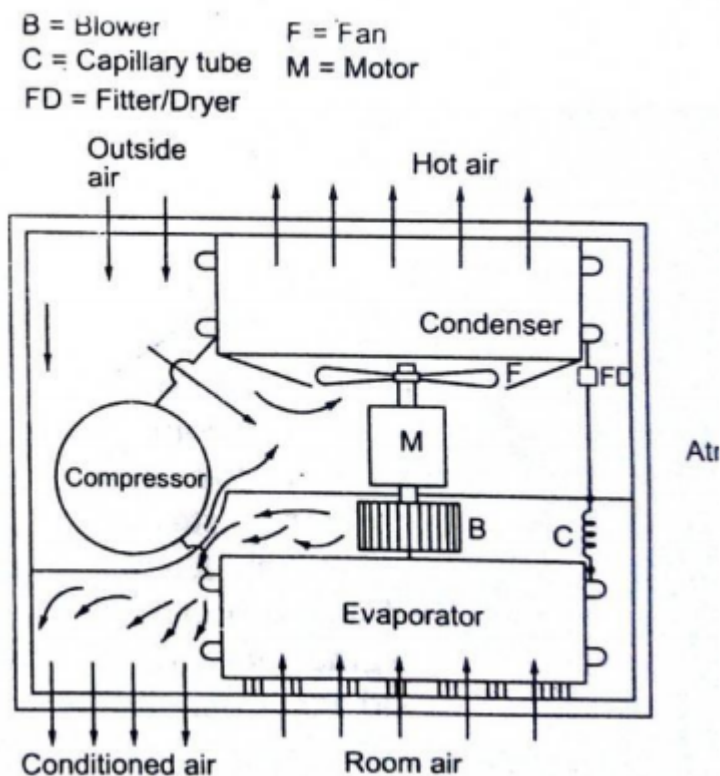
Explain working principle of simple vapour

Working of Simple Vapor absorption system: A Simple Vapor

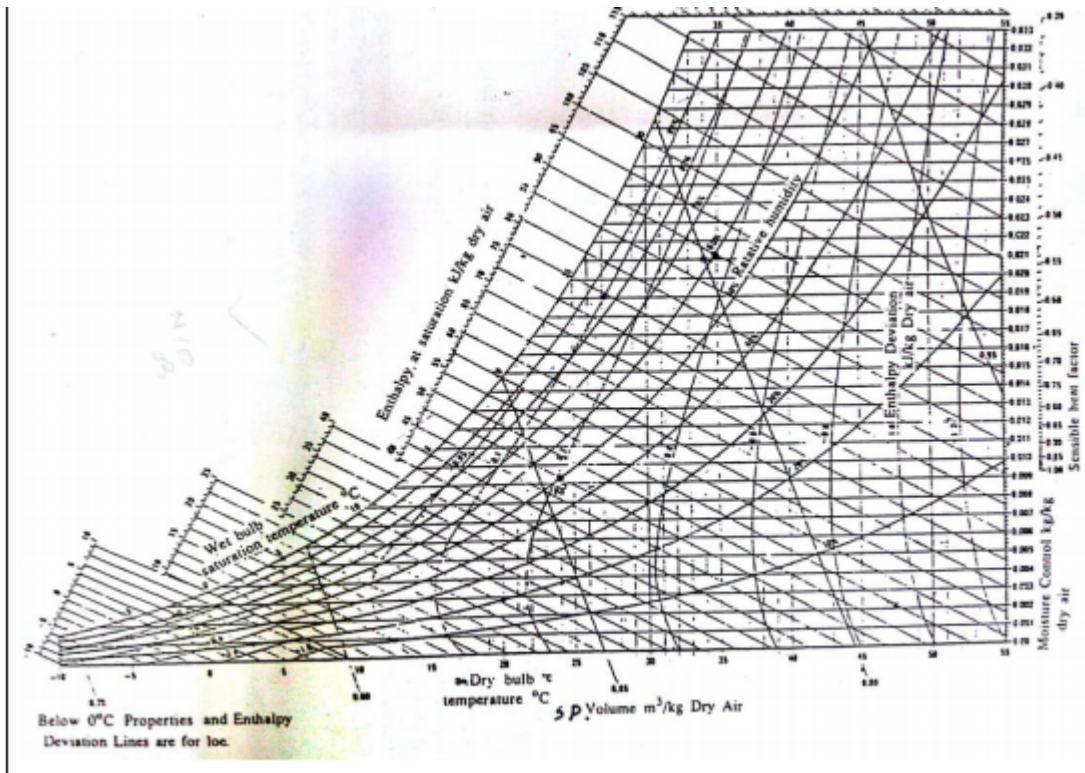
absorption system consists of evaporator, absorber, generator, condenser, expansion valve, pump & reducing valve. In this system ammonia is used as refrigerant and solution is used is aqua ammonia. Strong solution of aqua ammonia contains as much as ammonia as it can and weak solution contains less ammonia. The compressor of vapor compressor system is replaced by an absorber, generator, reducing valve and pump. The heat flow in the system at generator, and work is supplied to pump.

Draw only a neat labelled sketch of window air-conditioner.

Sketch of window air conditioner



Sketch a psychrometric chart and show the following properties of air on it.....



Explain the following terms :- i) Daltons law of partial pressures

i) Daltons Law of partial pressure – It states that the total pressure of mixture of gases is equal to the sum of the partial pressures exerted by each gas when it occupies the mixture volume at the temperature of mixture.

Consider mixture of gas having constituents as gas a, gas b, gas c

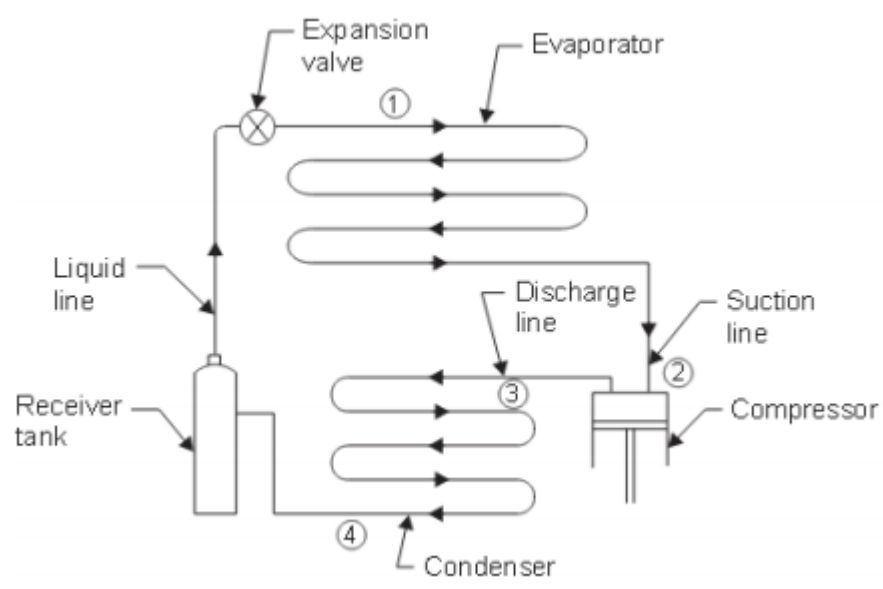
Then, Total pressure $P_t = P_a + P_b + P_c$

ii) Relative humidity:- It is defined as the ratio of partial pressure of water vapour in a given volume of mixture to the partial pressure of water vapour when same volume of mixture is saturated at the same temperature.

$$\therefore \phi = \frac{P_v}{P_{v\text{sat}}} \times 100$$

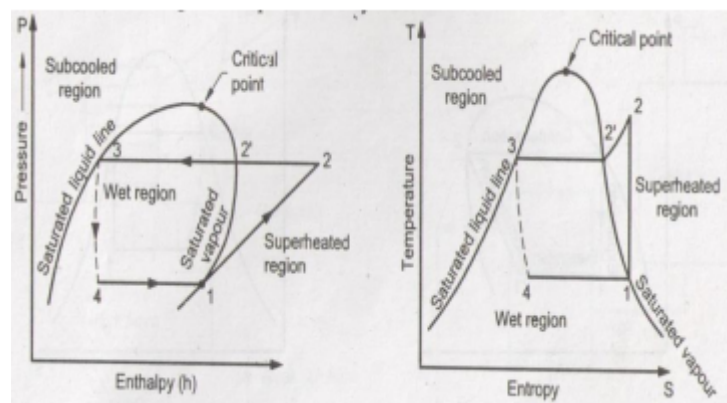
Draw a neat block diagram of vapour compression cycle.

Block diagram of Vapour Compression cycle :-



Explain vapour compression refrigeration cycle on T-S and p-h charts..

Vapour Compression Refrigeration Cycle



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