

23ME702

:REFRIGERATION AND AIR CONDITIONING

UNIT -3

Vapour Absorption Refrigeration System

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- **Introduction**
- **What is Vapour Absorption System?**
- A refrigeration system that uses **heat energy instead of mechanical work**.
- Uses **ammonia-water** or **lithium bromide-water** as working pairs.
- Alternative to Vapour Compression System.

- **Principle of VARS**
- **Working Principle**
- Based on **absorption and desorption of refrigerant**
- Refrigerant is absorbed in a solution and later separated using heat
- Uses **thermal energy (steam, gas, solar heat)**

- **Generator**
- **Function**
 - Heat is supplied to separate refrigerant from solution.
 - Converts weak solution back to strong solution.
 - Releases refrigerant vapor.
- **Condenser & Expansion Valve**
- **Condenser**
 - High-pressure vapor turns into liquid.
 - Heat is rejected to surroundings.
- **Expansion Valve**

- **Evaporator**
- **Function**
- Low-pressure refrigerant absorbs heat.
- Produces cooling effect.
- Refrigerant evaporates into vapor.
- **Absorber**
- **Function**
- Absorbs refrigerant vapor into absorbent solution.
- Maintains low pressure in evaporator.
- Example: Ammonia absorbed in water.

- **Condenser & Expansion Valve**
- **Condenser**
 - High-pressure vapor turns into liquid.
 - Heat is rejected to surroundings.
- **Expansion Valve**
 - Reduces pressure of liquid refrigerant.
 - Prepares it for evaporation.
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- **Advantages & Disadvantages**
- **Advantages**
- Low running cost
- Uses waste heat or solar energy
- Less electricity consumption
- Quiet operation
- **Disadvantages**
- Low COP
- Bulky system
- Slow response



Thank You..