

VAPOUR ABSORPTION TYPE REFRIGERATION SYSTEM TRAINER

Make: EEI, Model: RAC-VAR040, Origin: India



SYSTEM MAIN COMPONENTS AND WORKING:

1. Evaporator

The low-pressure liquid refrigerant enters the evaporator through the expansion valve. It evaporates by absorbing heat from the space or fluid being cooled. This produces the refrigeration effect.

2. Absorber

The refrigerant vapour leaving the evaporator enters the absorber. Here, it is absorbed by an absorbent solution. This maintains the low pressure in the evaporator.



For a conventional $\text{NH}_3\text{--H}_2\text{O}$: **Ammonia = refrigerant; water = absorbent**, suitable for applications requiring lower refrigeration temperatures.

3. Solution Pump

The refrigerant-rich solution is pumped from the absorber to the generator. The pump increases the pressure of the solution. Since a pump handles liquid rather than vapour, the mechanical work requirement is relatively small compared with a conventional vapour-compression compressor.

4. Generator

Heat is supplied to the generator. The absorbed refrigerant separates from the absorbent solution and becomes high-pressure refrigerant vapour. The weak absorbent solution returns toward the absorber.

5. Condenser

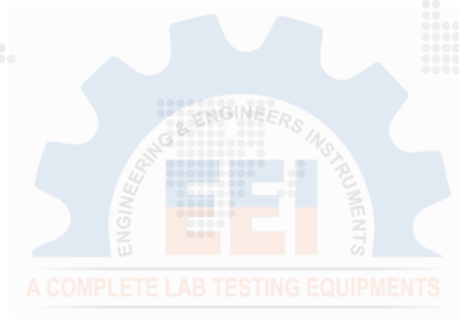
The high-pressure refrigerant vapour enters the condenser and rejects heat to the cooling medium. It condenses into high-pressure liquid refrigerant.

6. Expansion Valve

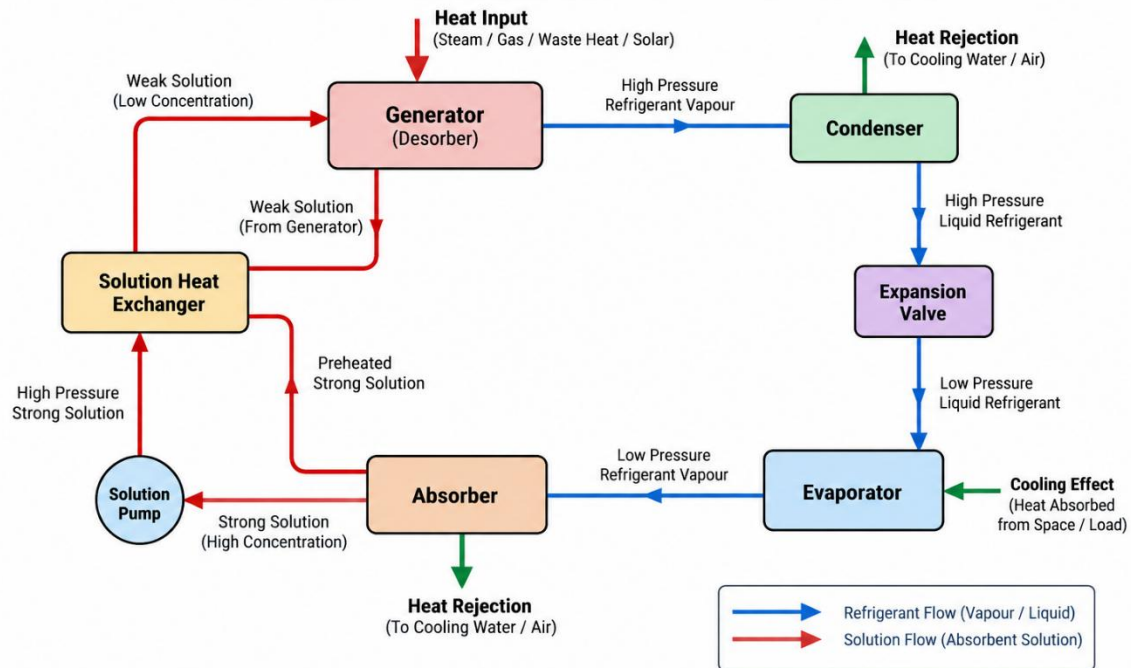
The liquid refrigerant passes through the expansion valve, where its pressure and temperature decrease.

7. Return to Evaporator

The low-pressure refrigerant enters the evaporator again and absorbs heat. The cycle then repeats.



Vapour Absorption Refrigeration System (Block Diagram)



TECHNICAL SPECIFICATIONS:

- The System has no moving parts at all, which makes it Silent and very durable.
- Refrigerant: Mixture of three fluid system Ammonia (NH₃) + Water (H₂O) + Hydrogen (H₂)
- Gases: Non – CEC, Non – HCFC, Non – FCKW, Non – Freon
- Mode of heating System: Externally heated by electric resistance heater
- Evaporator: Coil Type evaporator with facility to determine performance efficiency ratio with the help of supply water facility.
- Volume of Cabinet: 40 Ltrs.
- Voltage Input – 65 Watts, Electrical Consumption/24 Hrs. – 0.8 kWh, Auto Defrost.
- Experimental Capability Actual, theoretical COP
- Manual Self-explanatory Instruction manual, sample calculation
- Digital volts meter, ammeter and energy meter for power input measurements Thermocouples Teflon coated (PT-100 type)-6 nos.
- The whole system is mounted on a Metallic powder coated frame and panel with Caster Wheels
- Floor area required: 0.8mtr x0.8 mtr floor space
- Power supply required: single phase, 230volts, 5 amps, and 50Hz.

