

Vapour Absorption Refirgration System

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Abstract- Simple vapour absorption system. The function of the compressor in the vapour compression system is to continuously withdraw the refrigerant vapour from the evaporator and to raise its pressure and hence temperature, so that the heat absorbed in the evaporator, along with the work of compression, may be rejected in the condenser to the surroundings.

In the vapour-absorption system, the function of the compressor is accomplished in a three step process by the use of the absorber, pump and generator or reboiler.

Index Terms- Absorber, Pump And Generator or Desorber

I. INTRODUCTION

A simple vapour absorption system, therefore, consists of a condenser, and expansion device and evaporator in the vapour compression system, and in addition, an absorber, a pump, generator or desorber and the pressure reducing valve to replace the compressor. The vapour absorption system is a heat operated refrigerating machine. It may be considered as a combination of heat engine and refrigerating machine. The energy supplied to the system is in the form of heat Q_h at temperature T_h . The thermodynamic cycle is considered to comprise of a heat engine E cycle, operating between the heat source temperature T_h and the temperature of heat rejection T_k , and a refrigerator R cycle operating between the refrigeration temperature T_0 and temperature of heat rejection T_k . The work done in the heat engine part of the cycle is equal to the work requirement of the refrigeration part of the cycle which implies that the COP of a heat operated refrigerating machine is equal to the product of the thermal efficiency of the heat engine part of the cycle and the coefficient of performance for cooling of the refrigeration part of cycle

II. STUDY OF COMPONENTS

A. Main Switch

The mechanism of a switch removes or restores the conducting path in a circuit when it is operated. A switch will have one or more sets of contacts, which may operate simultaneously, sequentially, or alternately. Switches in high-powered circuits must operate rapidly to prevent destructive arcing, and may include special features to assist in rapidly interrupting a heavy current.

B. Volt Meter

A voltmeter is an instrument used for measuring electrical potential difference between two points in an electric circuit. Analog voltmeters move a pointer across a scale in proportion to the voltage of the circuit; digital voltmeters give a numerical display of voltage by use of an analog to digital converter. Voltmeters are made in a wide range of styles. Instruments permanently mounted in a panel are used to monitor generators or other fixed apparatus.

C. AMPERE METER

An ammeter (also known as Ampere Meter) is a measuring instrument used to measure the current in a circuit. Electric currents are measured in amperes (A). Instruments used to measure smaller currents, in the mill ampere or microampere range. Improved instruments were designed which could be mounted in any position and allowed accurate measurements in electric power systems. It is generally represented by letter 'A' in a circle. Ammeters have very low resistance and are always connected in series in any circuit.

D. CONDENSER

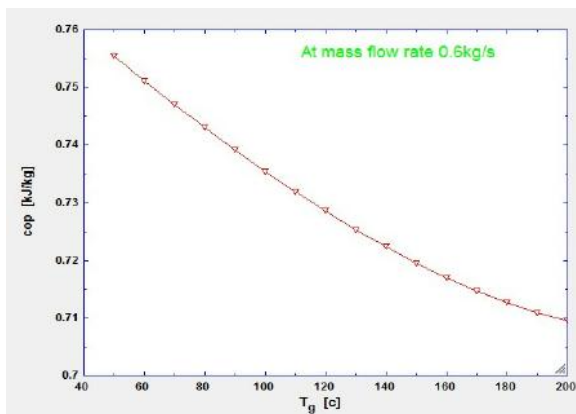
In systems involving heat transfer, a condenser is a device or unit used to condense a substance from its gaseous to its liquid state, by cooling it. In so doing, the latent heat is given up by the substance and transferred to the surrounding environment. Condensers can be made according to numerous

designs, and come in many sizes ranging from rather small (hand-held) to very large (industrial-scale units used in plant processes).

E. REFRIGERATOR

A refrigerator is a popular household appliance that consists of a thermally insulated compartment and a heat pump (mechanical, electronic or chemical) that transfers heat from the inside of the fridge to its external environment so that the inside of the fridge is cooled to a temperature below the ambient temperature of the room. Refrigeration is an essential food storage technique in developed countries. The lower temperature lowers the reproduction rate of bacteria, so the refrigerator reduces the rate of spoilage. A refrigerator maintains a temperature a few degrees above the freezing point of water. Optimum temperature range for perishable food storage is 3 to 5 °C (37 to 41 °F). A similar device that maintains a temperature below the freezing point of water is called a freezer.

III. GRAPHICAL REPRESENTATION



Plot between generator temperature (T_g) and COP (at constant mass flow rate)

IV. CONCLUSION

Vapour Absorption Refrigeration Systems (VARS) belong to the class of vapour cycles similar to vapour compression refrigeration systems. However, unlike vapour compression refrigeration systems, the required input to absorption systems is in the form of heat. Hence these systems are also called as heat operated or thermal energy driven systems. Similar to vapour compression refrigeration systems, vapour

absorption refrigeration systems have also been commercialized and are widely used in various refrigeration and air conditioning applications. Since these systems run on low-grade thermal energy, they are preferred when low-grade energy such as waste heat or solar energy is available. Since conventional absorption systems use natural refrigerants such as water or ammonia they are environment friendly

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