

A Review on Design, Fabrication and Experimentation of Bed mounted Air Conditioning Unit

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Abstract - Air conditioning which is use to fulfill requirement of the person in summer and winter session. The component of cooling load are numerous often these not easy to define interrelated. Many cooling load component vary in wide different rang of duration 24 hour period. Since these cooling load component changes cyclically are often not in a phase with each other, each to meet be determine to establish maximum cooling load for the zone. Cooling load estimation for the two person bed undertake different variable were considered to give optimum air conditioning to deliver conditioned air to the bed to deliver the person comfort expectation at the indoor condition. Due to limitation of space for the duct system, it is proposed that split type air conditioner is better because of there is no sufficient space to pass between roof and inner insulator.

Keywords- Air-conditioning system, Cooling Load, Temperature and pressure

I. INTRODUCTION

These days, air conditioner is commonly promoted in homes and in public enclosed spaces to create a comfortable environment. Air conditioning is a name of the product, but by using the ideas and methods of air conditioning to create comfort and natural environment. At the same time reduce the protect dangerous zone of the nature [1]. Air conditioning system made up of various components and equipment in proper manner to heat and cold. Clean and purify indoor and outdoor condition of a bed to optimum energy use in it [2]. There are several types of air conditioner which are

- Window-mounted types are available for installation in single- and double-hung windows, and for horizontal sliding windows and even casement windows.
- Wall-mounted units use a sleeve to allow for through the-wall mounting instead of window mounting.
- The arrangement of bed mounted air conditioning unit is freely movement of in standing position.

II. Components and Principle of air conditioning system

Air conditioners function in much the same way as refrigerators do – heat is extracted from the space that is being cooled and is conveyed outside of that space. A fan circulates room air flow through evaporator which contains low pressure refrigeration. When the refrigerant entering into evaporator its condition is low pressure low temperature refrigerant. When the refrigerant living forms the evaporator its condition is low pressure low temperature vapor refrigerant. Condensation process is carried out in a condenser it's the heat transfer device. Condenser transfers the latent heat from the refrigerant to the surrounding. When the refrigerant entering into the condenser its condition is high temperature high pressure vapor refrigerant and when the refrigerant leaving from the condenser high pressure high temperature liquid.

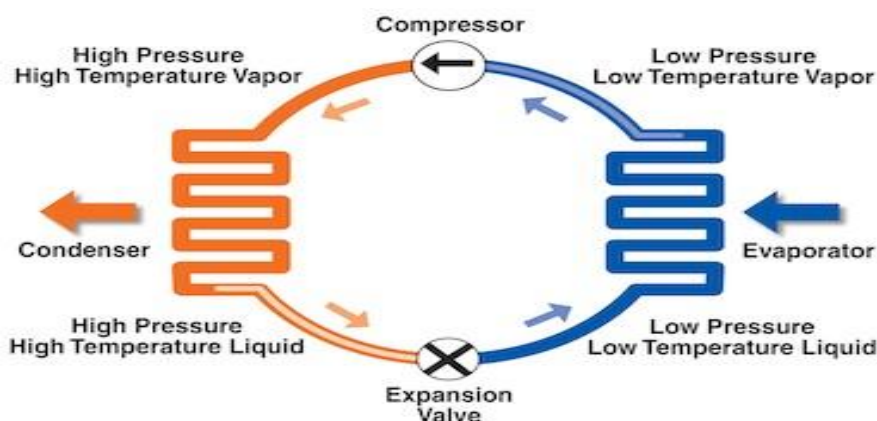


Fig.1 Refrigeration Cycle

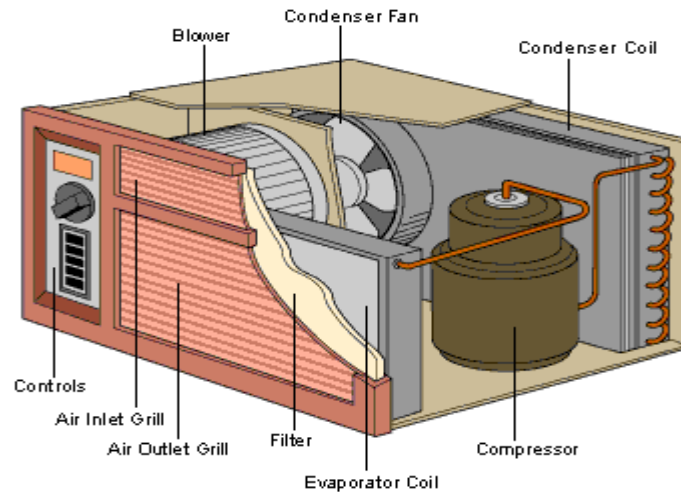


Fig. 2 Components of room air conditioner

III. Literature Review

A building is a structure that has a roof and walls and primarily designed to provide shelter and ensure comfort for its occupants. Heerwagen[3] to proper controlling of a building environment its mention the cooling effect. Satisfaction of user physical and physiological needs, supporting the social activities of each person, opposes the natural forces against it (e.g. weather and climate, gravity and seismic loads etc.). Above mention requirements should be provided at a some cost and proper use of resources. The building sensible and latent cooling load which gives the exact estimation. For the minimum consumption of energy is to use suitable way compensate to give desired indoor environment. The selection procedure will entail a consideration of various competing air-conditioning systems. All such systems must be able to maintain the indoor environmental condition required in each area. The ability to provide sufficient thermal zoning is also mandatory [4]. For each system considered, the following items should be evaluated: (i) the relative space requirements for equipment, ducts and piping, (ii) the fuel and /or electrical use and thermal storage requirements, (iii) the initial and operating costs, (iv) the acoustical requirements, (v) the compatibility with the building plan and structural system, and (vi) the effect of indoor air quality, illumination, noise and vibration. The results of this rigorous study will lead to the selection of an appropriate air conditioning system [5].

IV. Heat Flow Rates

The design of heat flow rate there are several types and varying with time :

- Space heat gain: - how much heat (energy) is entering the space
- Space cooling load: - how many energy removed from the space to maintain temperature and relative humidity.
- Space heat extraction: - Which amount of energy is removed by the AC removing from the space.
- Coil: - The energy is removed by the cooling coil serving various space and any load outdoor zone such as duct heat gain, duct leakage, fan heat and outdoor makeup air.

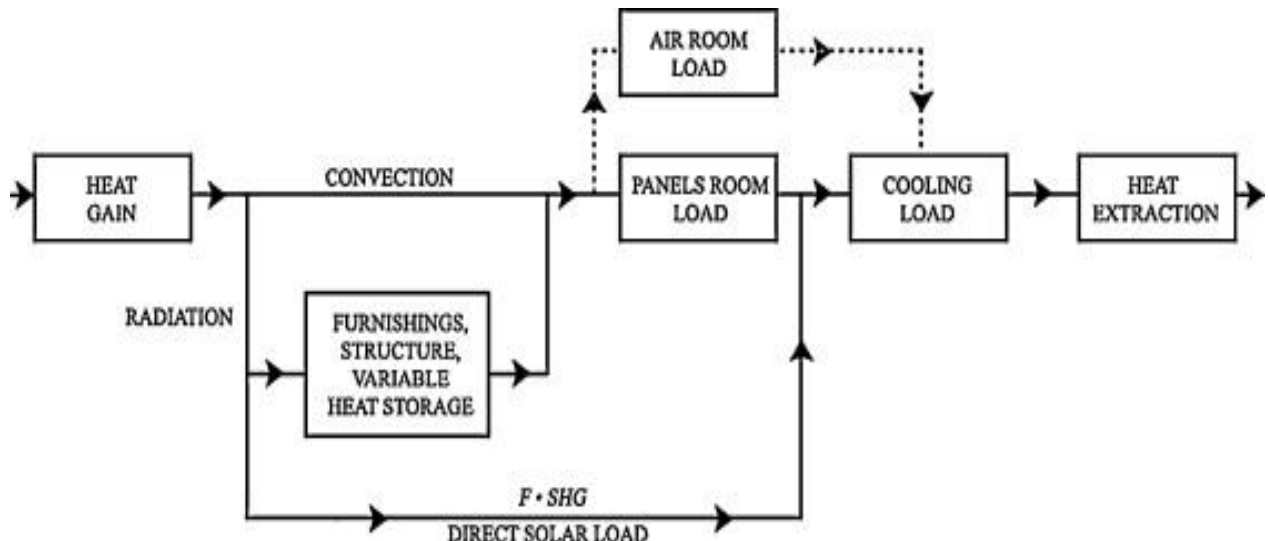


Fig. 3 Conversion of Heat gain into cooling load

4.1.1 Cooling Load for Hall

The total cooling load on a building consists of external as well as internal loads.

Space Load Component	Sensible Heat Load [BTU/Hr]	Latent Heat Load [BTU/Hr]
Conduction through roof	20323	-
Conduction through windows	5618	-
Conduction through exterior walls	15879	-
Solar radiation through windows	74515	-
Occupants	21510	12330
Lights	4092	-
Electrical equipments	15271	-
Infiltration	1194	490
Total	158402	12920

The consideration of all load factors which affect the indoor condition. Internal heat extract from occupants, equipment's and the external heat gain from radiation, conduction and convection are considered during the analysis [6].

V. CONCLUSION

Since the purpose of this paper is to study the air conditioning system and its components. The recirculating air conditioning unit may use to bed zone and evaluate most of the process found in a practical air conditioning plant.

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