REPORT ON THIRD YEAR MECHANICAL ENGINEERING STUDENTS INDUSTRIAL VISIT TO ZECO AIRCON LIMITED, THANSIT CONDUCTED BY ISHRAE THANE STUDENT CHAPTER AT DBIT

Date: - 24th February, 2018

ISHRAE THANE CHAPTER conducted an Industrial Visit at ZECO AIRCON LIMITED, THANSIT for Third Year Mechanical Engineering students of Don Bosco Institute of Technology. There were total 18 students along with ISHRAE DBIT Student Council Members Mitesh S. Joshi and Kaustubh S. Morye who attended this Industrial Visit. This industry is well-known for their production of Air Handling Units and manufacturing of Ducts of Centralised Air-conditioning system. This company is related Air conditioning which very useful for mechanical students. The design of AHU is done by company personnel according to customer requirements. This company produces Air-handling units of tonnage capacity of 5 ton to 60 ton as well as Ducts.

TE IV at Zeco Aircon Limited, Thansit

Students reached at site on 11 A.M. on 24th February, 2018. HR Head Mr. Vikrant first gave introduction about their company, their products, about centralised air-conditioning systems. Then Mr. Hemant showed various processes going on the factory in manufacturing air handling units.

The Centralized AC system consists of three main parts:-

1. Chiller for refrigerant
2. Air Handling Units
3. Ducts

The air handler is normally constructed around a framing system with metal infill panels as required to suit the configuration of the components. In its simplest form the frame may be made from metal channels or sections, with single skin metal infill panels. The metalwork is normally galvanized for long term protection. For outdoor units some form of weatherproof lid and additional sealing around joints is provided.

1. Air Handling Unit (AHU)

A typical AHU has following components:-

- Supply duct
- Fan compartment
- Vibration isolator
- Heating and/or cooling coil
- Filter compartment
- Mixed (recirculated + outside) air duct

- Air filter

Air filtration is almost always present in order to provide clean dust-free air to the building occupants.

- Heating and/or cooling elements

Air handlers may need to provide heating, cooling, or both to change the supply air temperature, and humidity level depending on the location and the application. Such conditioning is provided by heat exchanger coil(s) within the air handling unit air stream, such coils may be direct or indirect in relation to the medium providing the heating or cooling effect.

- Air mixing Chamber

In order to maintain indoor air quality, air handlers commonly have provisions to allow the introduction of outside air into, and the exhausting of air from the building. A mixing chamber is used which has dampers for controlling the ratio between the return, outside, and exhaust air.

- Blower/fan

Air handlers typically employ a large squirrel cage blower driven by an AC induction electric motor to move the air. The blower may operate at a single speed, offer a variety of set speeds, or be driven by a variable-frequency drive to allow a wide range of air flow rates. Flow rate may also be controlled by inlet vanes or outlet dampers on the fan.

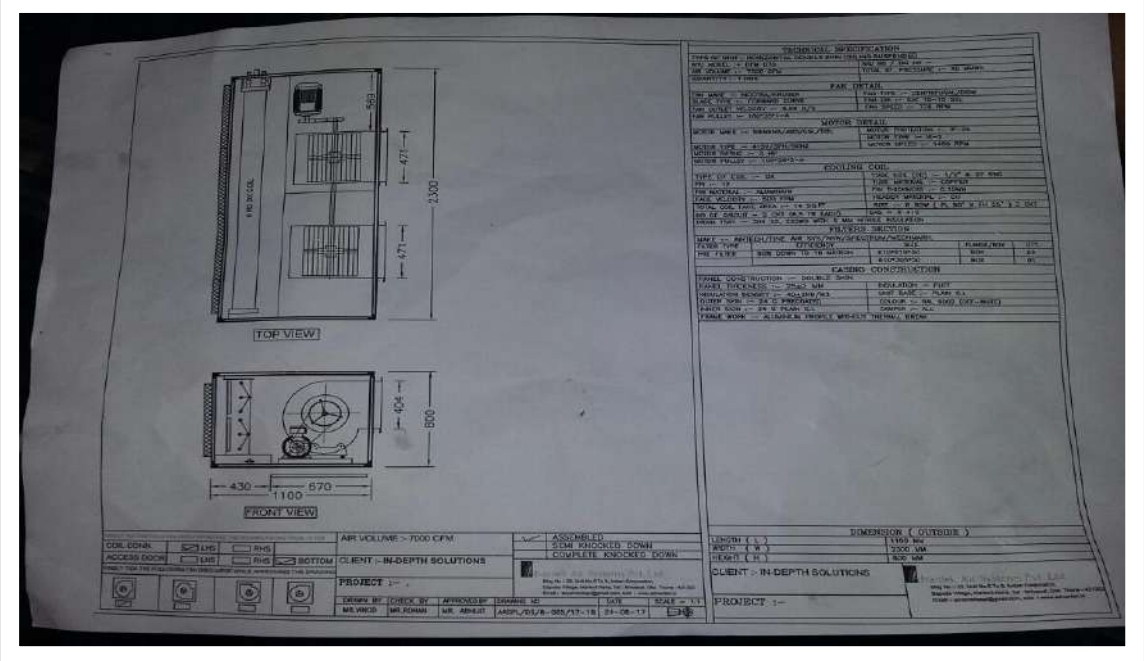
- Vibration isolators

The blowers in an air handler can create substantial vibration and the large area of the duct system would transmit this noise and vibration to the occupants of the building. To avoid this, vibration isolators (flexible sections) are normally inserted into the duct immediately before and after the air handler and often also between the fan compartment and the rest of the AHU. The rubberized canvas-like material of these sections allows the air handler components to vibrate without transmitting this motion to the attached ducts.

Design of Air-handling unit is done according to Customer's requirement. Usually following two criteria are used in design of air handling unit.

1) Cooling area (on m^3 basis)

2) Static flow



AHU Design

2. Ducts

Ducts are conduits or passages used in heating, ventilation, and air conditioning (HVAC) to deliver and remove air. The needed airflows include, for example, supply air, return air, and exhaust air. Ducts commonly also deliver ventilation air as part of the supply air. As such, air ducts are one method of ensuring acceptable indoor air quality as well as thermal comfort.

Factory produced 2 types of ducts –

- Galvanised Iron Ducts (GI Ducts)
- Pre Insulated Ducts (PID)

Galvanized Iron Ducts

A duct system is also called ductwork. Planning (laying out), sizing, optimizing, detailing, and finding the pressure losses through a duct system is called duct design. Various C-clits and S-clits were used in the design. For Cutting of GI, Plasma Arc Cutting Machine is used. In manufacturing of GI ducts, GI used is from 18 Gauge thickness to 26 Gauge thickness(depends on design of duct required)

Insulation Coating Machine in PID formation

An Italian design machine element which mixes chemicals in right proportions for forming insulation material of PID and it is designed in such a way to produce the Material at the right time without affecting its function.

Factory also manufactures Evaporator coils. This was done by first making hairpin shape copper tubing. Then these tubes were assembled along with fins and then rigidly fixed by increasing tube diameter. Then open ends of coils properly joined to form complete tube network. These coils were checked for leakages by submerging them in water.

Industrial Visit was concluded at 2:00 PM.

Made By,

Vikrant Jaiswar.