

furnace. The air passes through a lint filter, then through the fans and finally through an air washer or spray system. Surplus spray is eliminated and the air delivered to the hot air system. In other cases, similar spray type apparatus is used to deliver humidified air through ducts to openings beneath existing radiators in a steam heated house.

For other steam heated homes, there is a humidifying unit as illustrated in Fig. 21. This unit is normally placed at some central location on the first floor, and receives the air from the floor into fans, delivering it through a heating coil and up through a target spray atomizer. Surplus

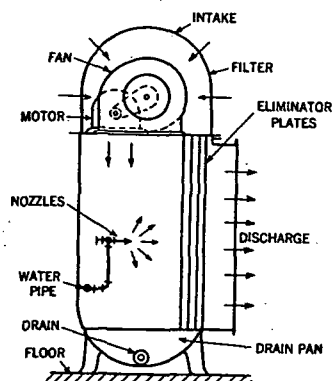


FIG. 20. HUMIDIFYING UNIT FOR WARM AIR FURNACE

moisture is removed by means of an eliminator filter and the humidified air is delivered upward through the other half of the floor grille. Since a large percentage of the heater capacity is transformed into the latent heat of humidification, this unit does not eliminate any existing steam radiation. It may also be used with hot water systems but its capacity is considerably reduced.

CONTROLS

The controls of all unitary equipment represent a vital part of their successful operation. This is particularly true in the case of conditioning equipment where a very close inter-relationship exists between the thermostatic room controls and the refrigerating unit controls.

The proper selection of controls and the proper adjustment is extremely important to prevent short cycling of compressors. Furthermore, the proper adjustment of direct expansion valve controls is likewise extremely important.

A detailed discussion of control problems is contained in Chapter 14.

PROBLEMS IN PRACTICE

1 ● Distinguish between a unit and a central type of air conditioning system.

In a unit system, the air treating apparatus consists of factory assembled equipment which is shipped substantially complete or in sections and is installed without field fabrication except for the duct connections between the equipment and the point of delivery of the air. Usually the air treating equipment is located closely adjacent to the conditioned space and serves a limited area. A central type of air conditioning system localizes the air treating equipment for the entire area at one point and involves the field assembly of a large number of individual elements. Manufacturer of the unit is responsible for the out-put and performance of the unit under rated conditions, whereas, the contractor installing the completely unitary or central type equipment is held responsible for the complete performance of the system.

2 ● Is it satisfactory to use superheated steam in unit heaters?

Superheated steam can be satisfactorily used in unit heaters provided the capacity is based on the saturated steam temperature and not on the total temperature. If unusually high superheat is used, trouble may be experienced from the excessive expansion and contraction of the heating elements.

3 ● Is it satisfactory to install one unit heater as the total load on a coal fired boiler?

Such an arrangement is impractical if the unit heater is started and stopped in keeping with the room temperature. However, if the room temperature controls the steam pressure and the unit heater is arranged to start when there is steam in the mains and to stop when there is no steam in the mains, such an installation will be satisfactory.

4 ● Will a unit heater with a slow speed fan be more quiet than one with a high speed fan?

The speed of the fan is no indication of quietness. Quietness is a function of the type, diameter, blade form, speed, and location of the fan.

5 ● Is it satisfactory to use steam at pressures less than atmospheric for unit heaters or unit ventilators?

If the air inlet temperature is above freezing, steam at any pressure may be used in the heating element of the unit heater or unit ventilator. If the inlet temperature is below freezing the heating element should be filled with steam of at least 5 lb pressure (or with a positive 5 lb pressure differential between supply and return) and the steam supply should never be throttled or the heating element may be frozen.

6 ● In general, what is the primary function of a unit ventilator?

To maintain the desired room air conditions as to temperature, air change, and air cleanliness, without drafts regardless of variations in outdoor temperature, occupancy, sun heat, and wind.

7 ● What are the usual working parts of a unit ventilator?

The fan and motor assembly, a set of heating elements, outdoor and indoor air dampers, filters (optional), outlet grille, some method of varying the outlet temperature in keeping with the room requirements, and, in the case of some unit ventilators, a method of limiting the outlet temperature to a minimum of 60 F.

8 ● Do all unit ventilators introduce a constant amount of outdoor air?

Certain types employ full recirculation except when outdoor air is obtained by throttling the steam valve on the heating element so the proportion of outdoor air to room air is varied. This is a very economical type of unit ventilator but in some communities it cannot be used because of existing laws which require that some fixed amount of outdoor air be introduced whenever the room is occupied. Certain types of units are designed to always take in a minimum quantity of air from the outside and to automatically vary this with the weather.