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CENTRAL SYSTEMS FOR AIR CONDITIONING

Features of Systems, Zoning, Apparatus Dew-Point, Cooling Load, Heating Load, Air Quantity and Effective Temperature Difference, Low and High Pressure Induction Convector, Evaporative Cooling, Precooling, Sensible Cooling with Unwetted Coils, Run-Around System; Selection of Type of System, Location of Apparatus

THE term central applied to an air conditioning system implies that the equipment such as fans, coils, filters and their encasement are designed for assembly in the field rather than in a factory as a unit. As a central system usually serves several different rooms, individual controls are required for each room.

FEATURES OF CENTRAL SYSTEMS

One advantage of a central air supply system is that one apparatus serving many rooms may involve a lower investment cost than that for a number of self-contained plants, each serving a single room. A central system may occupy basement or attic space that is relatively unimportant, whereas individual factory-assembled apparatus placed in each room may occupy otherwise valuable space. Another advantage of a central system is accessibility for servicing, since it is possible to provide doors in the encasement for cleaning and inspecting all of the component parts in a manner usually superior to that practicable with compact factory-assembled equipment.

Central air conditioning systems usually are connected by ducts with the various rooms served, and preferably have exhaust fans that may effect complete removal and disposal of any desired proportion of the air. The exhaust fan may return air to the supply system for recirculation, as a measure of economy of fuel or refrigeration.

Central air conditioning systems are served by heating and refrigerating equipment which may be located at some distance from the air supply apparatus and which may serve one or more central air supply systems.

Year-Round Air Supply System

Fig. 1 is a plan of a year-round air supply system. Outside air may enter from the left at A, desirably from an intake on the side of the building least exposed to solar heat and not close to the ground or to a sun-heated or dust-gathering roof. A damper B for proportioning the volume of outside air, is interlocked with the return air damper C in such manner that as the outside air volume increases the return air volume decreases. The return air duct D, shown diagrammatically, comes from the exhaust fan. All the air, it will be observed, must pass through the filters E and there is ample room on both the inlet and outlet sides of the filters for servicing them. The filters may be of mechanically cleaned type, of replaceable cell type, or may be electronic, as described in more detail in Chapter 33.

The cleaned air passes to the equipment that changes its temperature and humidity. Except in very warm climates, a heating or tempering