

tion equipment; and suitable controls. Generally, however, a central station air conditioning system is designed for year-round service. This means that properly sized heaters and humidifiers, with their respective controls, must be added. With few exceptions, systems designed to meet summer capacity requirements will have ample capacity for winter and intermediate season conditioning.

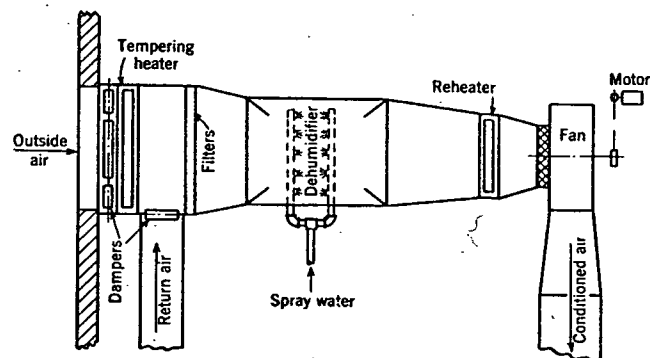


FIG. 1. SPRAY TYPE AIR CONDITIONING APPARATUS

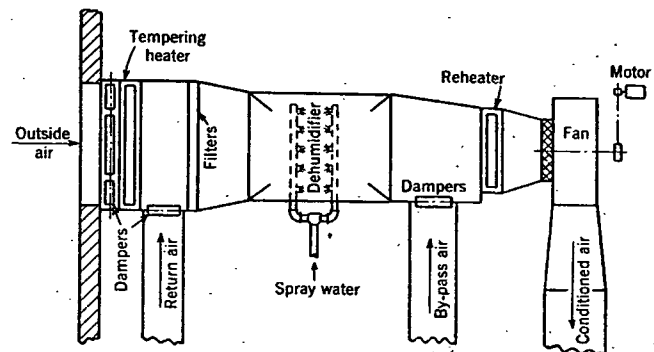


FIG. 2. SPRAY TYPE AIR CONDITIONING APPARATUS WITH BY-PASS

A common arrangement of a central station spray type system for cooling and dehumidifying is illustrated in Fig. 1. The plant may be designed to condition 100 per cent outside air, 100 per cent return air, or a mixture of outside and return air. Further, part of the air returned from the conditioned space may be by-passed¹ around the conditioner as illustrated in Fig. 2. The reheater may be installed in the fan inlet chamber as shown, in the by-pass air duct, or in the fan discharge duct,

¹Patents exist covering the use of the by-pass for cooling and dehumidifying systems.

depending upon apparatus space and other design conditions. Still another arrangement of equipment will result if the dehumidified air fan delivers the conditioned air to several other fans rather than to the conditioned space directly. These booster fan equipments may use part by-pass air as illustrated in Fig. 3 or 100 per cent dehumidified air and reheaters. The main apparatus, in either case, may or may not have a by-pass connection, depending on load conditions and other design factors.

The systems illustrated in Figs. 1 and 2 may be converted into the surface cooling type by merely replacing the dehumidifiers with surface cooling coils which use cold water or direct expansion of refrigerant to accomplish the required cooling and dehumidifying. The coils may also be installed within the spray chamber, either in series with the sprays or below them.

DEHUMIDIFIERS

Information on spray type dehumidifiers is given in Chapter 12.

Surface cooling type dehumidifiers generally consist of extended-surface

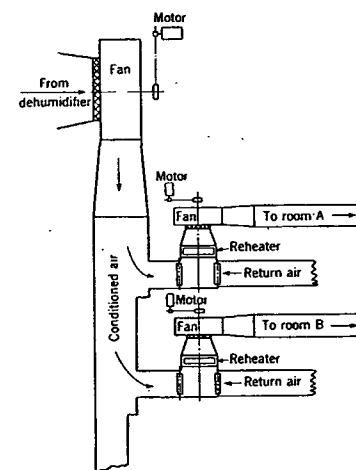


FIG. 3. CENTRAL DEHUMIDIFYING PLANT AND LOCAL RECIRCULATING FANS

coils within which the water or refrigerant is circulated or the refrigerant is expanded. The air to be cooled and dehumidified is drawn or blown over the coils. This system is generally comparatively low in initial cost and has low operating costs. Some localities have refrigeration codes which restrict the use, in comfort conditioning applications, of refrigerants acting by direct expansion in coils exposed to the air stream. Therefore, local codes should be consulted by the designer before he plans a system employing direct-expansion methods. Close humidity control cannot be maintained during the cooling season by the surface cooling type of equipment. Winter humidification may be accomplished by use of