

conditioned area. A feature of the design shown in Fig. 1 is that the condensate from the cooling coil is sprayed over the condenser surface and vaporized, thus eliminating the need for drain connections. A simple dampering arrangement is generally provided for exhausting some air from the room, in addition to introducing outside air and recirculating required amounts of air. It is possible to remove the equipment for winter storage or utilize the ventilating features for winter operation.

Water or evaporative-cooled units start at 1 hp in size and may be as large as 30 hp. Condensers requiring water use either city water, well water or recirculating water from a cooling tower. Evaporative condensers are seldom used on units under 5 hp.

The heat generated by the compression of refrigerant gases and that given off by the electric motor is removed from the compressor compartment in four ways: by the use of a water coil in the compressor compartment; by means of utilizing the cold suction gases; by drawing part of the return air through the compressor compartment and finally by

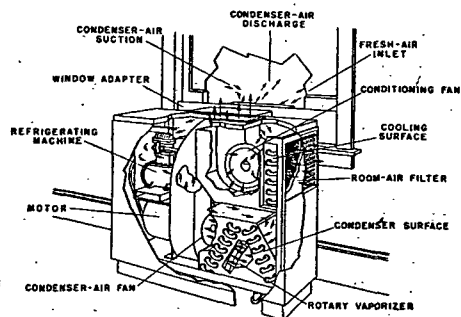


FIG. 1. SELF-CONTAINED AIR-COOLED UNIT AIR CONDITIONER

circulating room air through the compressor compartment by means of a fan attached to the motor shaft.

The smaller water-cooled units have somewhat the same application as the air-cooled units. Water and drain facilities must be available and, although window connections are not required for heat disposal, it is desirable to have an outside air connection for ventilation purposes. Electrical wiring is generally permanently connected.

Up to $7\frac{1}{2}$ or 10 hp in size the units are usually styled for locating directly in the conditioned area. Above this size the tendency is to locate the equipment adjacent to the conditioned area, with supply and return duct connections. Compressor compartment heat is removed by the same methods described previously.

On water units of the vertical type of 5 hp and under, use is made of air distributor headers, equipped with directional louvers, on one or more sides, for discharging the air directly into the conditioned space in which the unit is located. Above 5 hp this method usually becomes impractical and a system of ducts is employed. Arrangements for outside air supply are similar to those in central plant design, although simpler, hand operated dampers are usually employed.

Accessory equipment for the self-contained unit conditioners includes heating coils, humidifiers, and controls for utilizing the unit for winter

heating and ventilating. Refinements of dust and odor control and constant temperature and humidity regulation are considered to be special application problems with this type of equipment.

A typical unit with water-cooled condenser is illustrated in Fig. 2. The header arrangement permits air distribution in several directions, and in such a way as not to fall on the room occupants. All side panels are removable for complete access to equipment. It is only necessary to bring water, drain and electrical service to the unit, and a source of heat if desired.

Remote type units cover a much broader range of size and application and generally are used in connection with or in lieu of a central plant

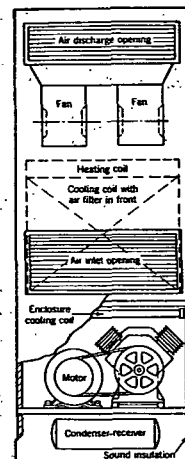


FIG. 2. SELF-CONTAINED WATER-COOLED AIR CONDITIONER

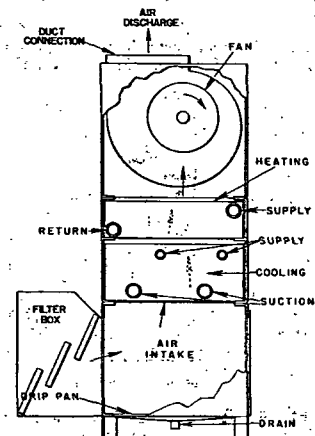


FIG. 3. VERTICAL REMOTE TYPE UNIT AIR CONDITIONER

system. They may be used individually or in groups in the place of self-contained equipment.

Without the weight of the refrigerating equipment, these units may be suspended from roofs or ceilings, or located wherever space permits on roofs and in basements, or in the conditioned area itself. All combinations of filtering, humidification, cooling and heating may be employed, with control as elaborate or as simple as is required. The remote unit is particularly adaptable where a variety of application conditions is to be met from a single source of refrigeration, such as the modern industrial plant which may have a laboratory, executive offices, a cafeteria, together with various processing departments.

The cooling and heating mediums, consisting of a refrigerant, chilled water or brine, and steam or hot water, are piped to the units, and transfer takes place by means of coils, or in the case of air washers, by means of water or brine sprays in the air stream, or a combination of the two.

The floor mounted or vertical type and the suspended or horizontal type of remote units are respectively shown in Figs. 3 and 4. The cabinets are generally of sheet steel, insulated to prevent heat transfer, finished to prevent corrosion and suitable for applying decoration if desired.