

secured with either the propeller or centrifugal type of fans, and in either the draw-through or blow-through type.

Unit heaters also vary in other minor respects. For example, steam and return inlets and outlets may be located on the top and bottom, respectively, or on the same side of the unit. Some units are supported by the piping and some have independent supports. The heating surface of steam or water type units is generally made up of a non-ferrous tube-and-fin assembly; or it may be fabricated of steel, or cast in steel.

Application of Unit Heaters

Unit heaters are used principally for heating commercial and industrial structures such as garages, factories, laboratories, and stores. They may also be used for heating finished rooms, if properly applied and concealed, and if some consideration is given to the problem of noise.

Unit heaters may also be adapted to a number of industrial processes, such as drying and curing, in which the use of heated air in rapid circulation with uniform distribution is of particular advantage. They may be used for moisture absorption, such as fog removal in dye houses, or for the prevention of condensation on ceilings or other cold surfaces of buildings, in which process moisture is released. When such conditions are severe, it is necessary that the unit heaters draw air from outside in enough volume to provide a rapid air change, and that they operate in conjunction with ventilators or fans for exhausting the moisture-laden air. See discussion of condensation in Chapter 9.

There are three major factors to consider in the application of unit heaters, namely: (1) location of unit, (2) air distribution, and (3) heating medium.

There are a variety of applications which are favorable to the use of *electric unit heaters*. For supplemental heat in residence bathrooms, for the heating of ticket booths, watchmen's offices, factory offices, locker rooms and other isolated rooms scattered over large areas, their use is peculiarly adaptable. They are particularly useful in isolated and untended pumping stations or pits where they may be thermostatically controlled to prevent freezing temperatures.

Gas-fired unit heaters find application in industrial plants, offices, stores, garages; in fact, in almost every location where steam type units are used. The installation cost of gas-fired units is usually less than that of a type requiring that a new boiler be installed.

Oil-fired unit heaters are used in industrial plants, garages and commercial buildings.

Coal-fired unit heaters are of finned, welded steel, or cast-iron construction, and equipped with centrifugal blowers. They are usually stoker-fired to insure proper firing of fuel. They are used principally in large industrial plants such as foundries or assembly plants, and provide a convenient source of heat, are readily installed and economical in operation, since all heat given off by the surface of the heater remains in the heated space.

Outlet Velocities

Outlet velocities of unit heaters vary from about 400 to 2500 fpm, depending upon the type of unit and the distance to which the air is to be projected. Noise and drafts must be considered in the choice of air velocities, since both increase with increase of air velocity. Velocities and decibel ratings for the various types of unit heaters illustrated in Figs. 1, 2, 3 and 4 are given in Table 1. (See Chapter 40 for a discussion of decibel ratings.)

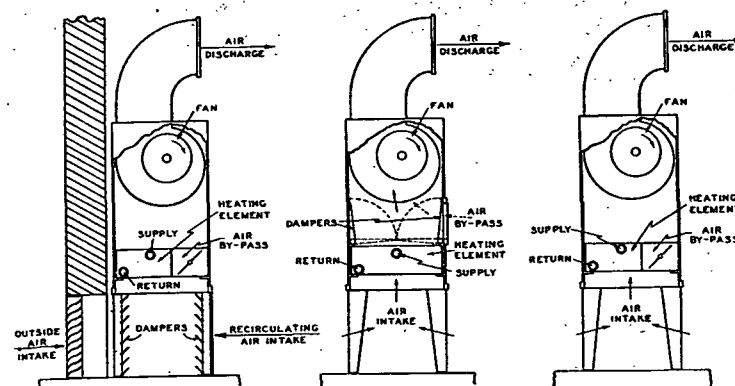


FIG. 1. CENTRIFUGAL FAN TYPE UNIT HEATER—FLOOR MOUNTED

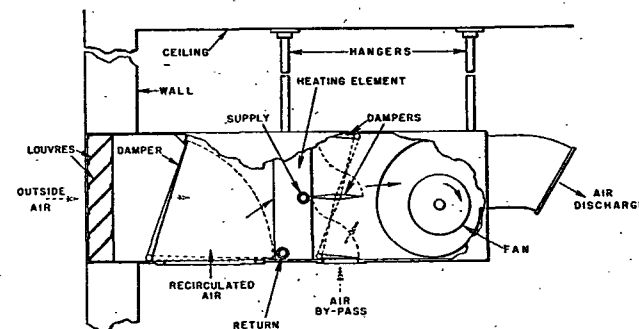


FIG. 2. CENTRIFUGAL FAN TYPE UNIT HEATER—SUSPENDED

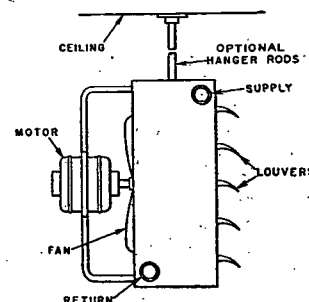


FIG. 3. PROPELLER FAN TYPE UNIT HEATER—HORIZONTAL BLOW

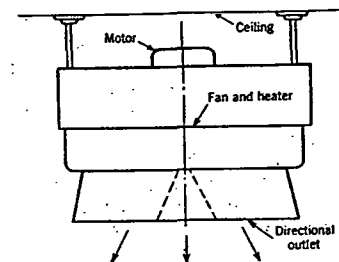


FIG. 4. PROPELLER FAN TYPE UNIT HEATER—VERTICAL BLOW