

cooling section may be placed in the air inlet, with cold water, or refrigerant being circulated through the cooling element.

BASIS OF RATING

In the past, the unit air conditioning industry has been handicapped by the lack of any standard method of rating. A proposed code giving a Standard Method of Rating and Testing Air Conditioning Equipment⁸ has recently been prepared.

On the basis of this new code, air conditioners are to be classified primarily as *free delivery type* and *pressure type*, where delivery will be measured in cfm standard air at specified fan speed. Pressure type units will specify the delivery against various total fan static pressures. Cooling

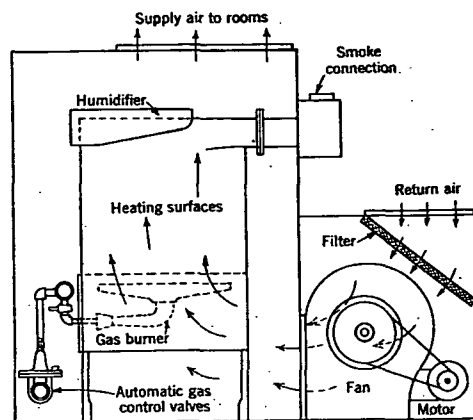


FIG. 18. GAS-FIRED FURNACE CONDITIONING UNIT

capacity will be expressed in total Btu per hour and this total will be subdivided into sensible heat cooling effect and dehumidification or latent heat effect. Cooling capacities will be given on entering air temperatures of 85 F, 50 per cent relative humidity with 40 F refrigerant temperature for comfort conditions and 45 F, 85 per cent relative humidity with 30 F refrigerant temperature for commercial applications.

The duty for heating surfaces will be specified in Btu per hour for 70 F entering air temperature based on 2 lb gage steam pressure or 180 F entering water temperature with 20 F drop. Humidification will be specified in pounds of water evaporated per hour at 70 F and 30 per cent relative humidity entering air conditions. The *Catalog Data Section* gives ratings of current models offered by leading manufacturers.

⁸Loc. Cit. Note 1.

METHODS OF CALCULATING CAPACITIES

The methods of calculating heating and cooling loads for conditioning units are similar to those described under Chapters 7 and 8. Certain manufacturers have adopted simplified and approximate methods which through experience they have found applicable to unitary equipment. Such methods involve certain averaging approximations which are suitable for estimating purposes but many of which require rechecking on a more accurate basis before actual installations are made.

The greatest error in calculating cooling loads is apt to be introduced in the failure to appreciate the magnitude of the latent heat loads and the

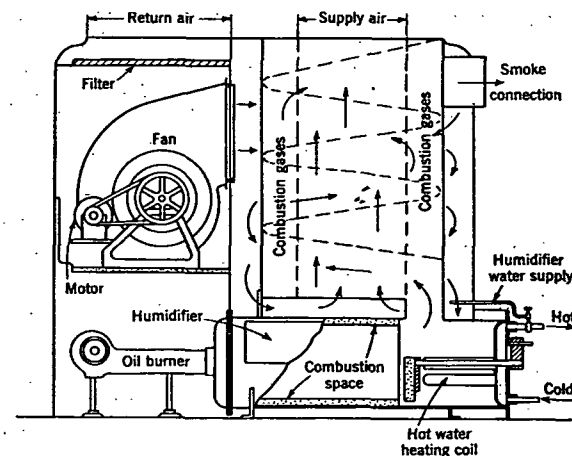


FIG. 19. OIL-FIRED CONDITIONING UNIT

relationship between the latent heat removal and the refrigerant temperature. It is extremely important that the proper balance be obtained between the refrigerant temperature, the conditioning unit surface and the conditions to be maintained within the occupied space. Unsatisfactory conditions often result through the attempt to apply units with a source of refrigeration which gives too high a surface temperature. Such conditions may be obtained when well water of too high a temperature is used or when a direct expansion evaporator is connected to a refrigeration compressor of inadequate size. The high refrigerant temperature even though it may give adequate dry-bulb temperatures, due to over-size conditioning units, will not give proper humidity control due to its inability to furnish sufficient dehumidification.

The use of surface coolers with widely extended fins may lead to similar results since the large ratio of extended surfaces gives an average surface temperature considerably above the refrigerant temperature within the tubes. All these factors must be kept in mind when making the selection