

FIG. 7. UNIT HEATER CONNECTION TO HIGH PRESSURE STEAM SYSTEM

pitch toward the main, and be connected to its top to prevent condensation in the main from draining through the heater where it might reduce capacity and cause noise.

The return piping from steam heaters should provide a minimum drop of 10 in. below the heater so that the head of water required to overcome resistances of check valves, traps, and strainers will not cause condensation to remain in the heater.

Dirt pockets shown in Figs. 5 to 7 are essential, and strainers are recommended as an additional means of retaining dirt and scale which might affect operation of check valves and traps. Return piping between the heater and strainer should be of the same size as the heater outlet. Strainers should always be installed in the steam supply line if the heater is equipped with the steam distributing type of coils.

An adequate air vent is required for closed low pressure gravity systems. The vertical pipe connection to the air vent should be at least $\frac{3}{4}$ in. I.P.S. to permit separation of the water from the air passing to the vent.

In vacuum systems, if thermostatic instead of float and thermostatic traps are used, a cooling leg must be provided ahead of the trap.

In high pressure systems it is customary to vent the air through a pet cock which is left slightly open at all times. Where possible it is advisable to install pressure reducing valves to permit operation of the heaters at lower pressure. Traps used must be suitable for the operating pressure encountered.

In connecting piping to hot water unit heaters, the piping should be

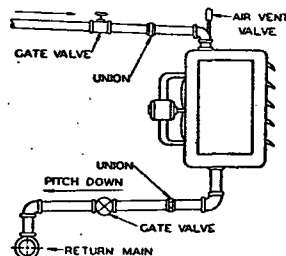


FIG. 8. CONNECTION OF HORIZONTAL UNIT HEATER TO HOT WATER SYSTEM

pitched to permit escape of air to the high point in the piping where it can be vented to the atmosphere. An air vent at the heater is used to facilitate air removal or to vent the top of the heater. Provision should be made for complete drainage of the system if shutdown in freezing weather is possible.

Maintenance

Regular inspection based upon a schedule determined by the amount of dirt in the atmosphere will insure maximum economy in operation and maintenance of heating capacity.

Heating elements should be cleaned when necessary by brushing or blowing with high-pressure air, or by using a steam spray. Removal of the heating element and washing with a mild alkali solution, followed by thorough rinsing with water, may be necessary in certain installations.

Dirty fan blades may cause unbalance and vibration with consequent noise and damage to bearings. Hence, fan blades should be cleaned when necessary. Vibration may also be caused by improper fan position or loose set screws.

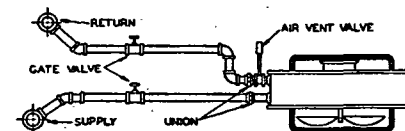


FIG. 9. CONNECTION OF VERTICAL UNIT HEATER TO HOT WATER SYSTEM

There is considerable difference in the attention required by the various types of motors used with unit heaters. This is particularly true of lubrication, the instructions for which must be carefully followed for trouble-free operation. Excessive lubrication may cause lubricant to reach and damage the rotor. An improper lubricant may cause failure of bearings. Instructions for care of the motor on any unit heater should therefore be obtained from the manufacturer and should be kept at the unit.

Fan bearings and drives must be given the lubrication and other attention specified by the manufacturer. If the unit is direct-connected, the couplings should be inspected periodically for wear and alignment. V-belt drives should have all belts replaced with a matched set if one belt shows wear.

Periodical inspection of traps, check valves, and air valves, and the replacement of worn parts are important maintenance items. Strainers should be cleaned regularly.

When filters are incorporated in the unit, they must be cleaned or replaced when dirty.

For prevention of corrosion in unit heaters, see Chapter 43, Corrosion and Water Formed Deposits, Causes and Prevention, in this edition, and also Bulletin 12, The Care and Maintenance of Steam and Hot Water Unit Heaters, published by the *Industrial Unit Heater Association*.