

HORIZONTAL UNIT HEATERS FOR STEAM AND HOT WATER HEATING SYSTEMS

CONTENTS

INSPECTION	1
INSTALLATION	2
Unit Mounting	1
Piping	2
Wiring	2, 3
START-UP	3
MAINTENANCE	3
Coil: Cleaning	3
Coil: Internal Corrosion Safeguards	3
General	3
Motor: 1) Cleaning	3
2) Lubrication	3
SERVICE	4
Horizontal Unit Heaters — Face Mounted Motors	4
Horizontal Unit Heaters — Shelf Mounted Motors	4

INSPECTION

When the equipment is received all items must be carefully checked against the bill of lading to be sure all cartons have been received. Visible or concealed damage should be

reported immediately to the carrier and a claim filed with him for damage. The electrical nameplate should be checked to be sure it agrees with the power supply available.

INSTALLATION

Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations, and experienced with this type of equipment. **CAUTION:** Sharp edges and coil surfaces are a potential injury hazard. Avoid contact.

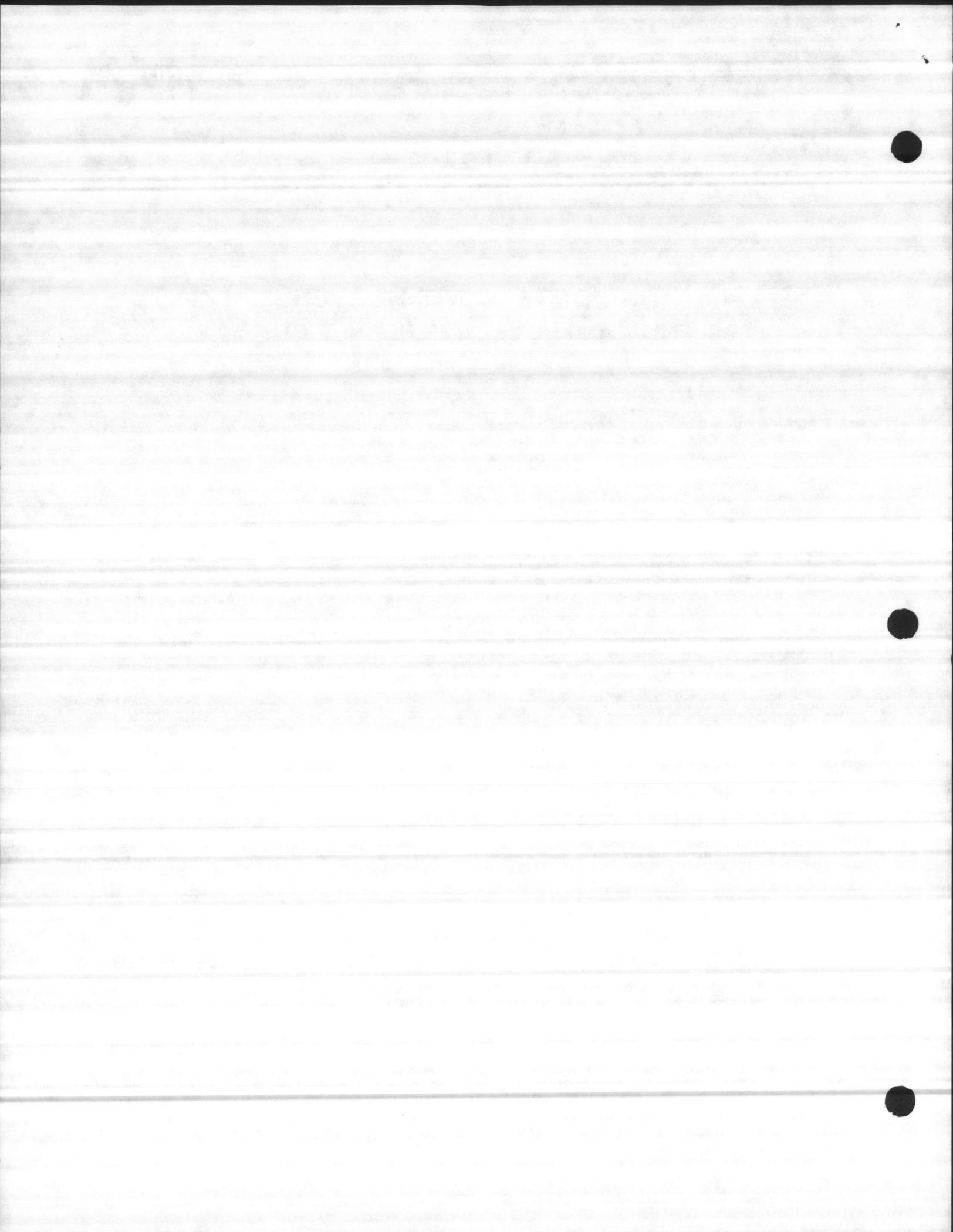
UNIT MOUNTING

Use care in handling the units to avoid damage to the coil fins. Hang units with supporting rods; do not hang units from piping.

The horizontal unit heaters have two ½-13 weld nuts on top of the unit for threaded hanger rods.

OSHA regulations, as recorded in Federal Register Vol. 37, No. 202 in October 1972, require the use of a fan guard

when the periphery of the fan blades is less than 7 feet above the floor or working surface. The customer must evaluate the location of the unit to determine if the guidelines set up by OSHA provide adequate protection against personal injury and provide protection if required. A fan guard designed to comply with OSHA requirements is available from the unit manufacturer.



PIPING

Typical piping diagrams are illustrated in Figures 1 through 4. All piping should be in conformance with good standard practice and local codes. Pipe size is based on the type of heating system, pressure and flow rate. Consult the ASHRAE guide for complete data. The selection of proper steam traps and air vents is very important. Steam traps must be properly sized and orificed for the pressure involved and should be sized for a minimum of two times the maximum condensing rate of the unit heater. In case of doubt, consult the steam

trap manufacturer. Branch piping must allow for expansion and contraction without placing a strain on the unit heater. Piping should be independently supported, not supported by the unit.

Do not exceed 150 psig or 375°F temperature on standard coils, 350 psig or 450°F temperature on high pressure coils, or 300°F temperature on optional low flow water coils. The unit nameplate designates coil pressure.

PIPING DIAGRAMS

Figure 1. HOT WATER SYSTEM

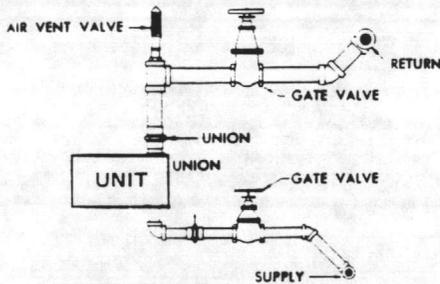


Figure 2. VAPOR & VACUUM STEAM SYSTEM

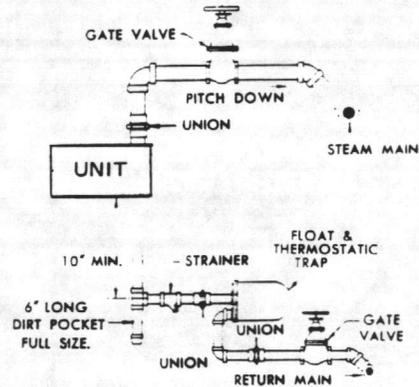


Figure 3. HIGH PRESSURE STEAM SYSTEM

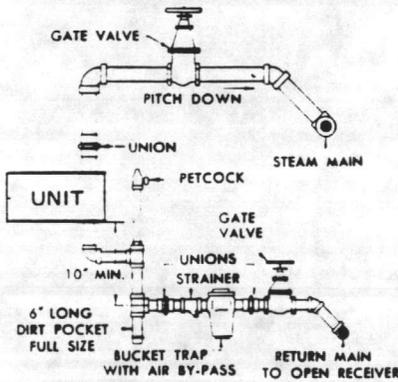
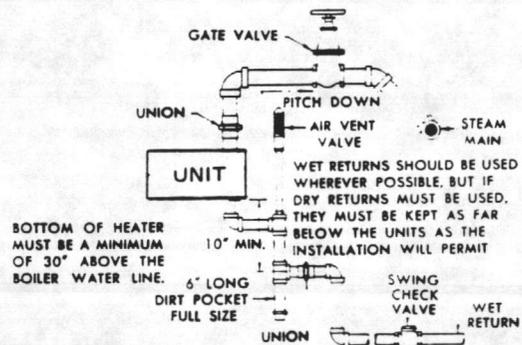


Figure 4. LOW PRESSURE STEAM GRAVITY SYSTEM



WIRING

Wire in accordance with local codes or the National Electrical Code, whichever is applicable. The installer shall provide wiring to the motor, branch circuit overcurrent protection, and disconnect means. All standard units except the UHH-094 are provided with motors which have internal thermal overloads. The installer must provide overload protection for the UHH-094 unit. Typical wiring diagrams are shown in Diagrams 1 through 6. Wiring instructions for the optional speed controller are included with the speed controller.

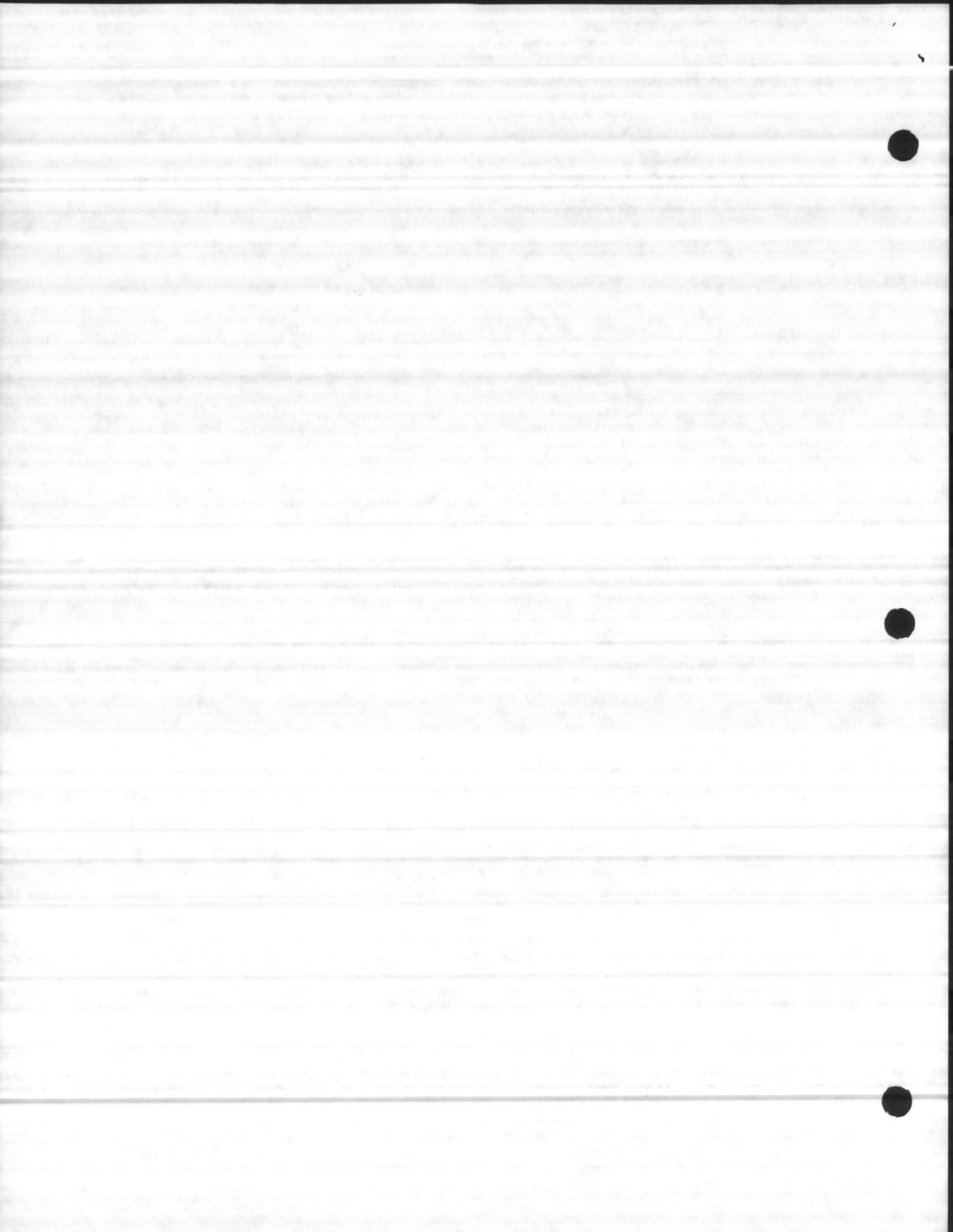
Diagrams 1 & 4. Although unit heaters are usually thermostatically controlled, there are some installations where manual "on-off" control is sufficient. These diagrams show this type of control. The single phase manual starter shown in Diagram 1 may be of the single pole or double pole type.

Diagrams 2 & 5. These diagrams show the most common

method of controlling unit heaters. Each unit is controlled by a space thermostat and, in addition, a limit control (temperature or pressure type) is connected in the circuit so that the unit cannot operate when the temperature of the steam or water is too low.

Diagrams 3 & 6. These diagrams show the flexible method of control providing both automatic and manual operation. The automatic operation will be the same as in Diagrams 2 and 5. However, an additional provision is made for operating the unit manually. This permits the unit being used as an air circulator during the non-heating season.

Although Diagram 6 shows a multiple application, this same type of control may be applied to individual units by substituting a magnetic starter for the magnetic relay and omitting the manual starter.



TYPICAL WIRING DIAGRAMS

Diagram 1. Single Phase Power
MANUAL CONTROL

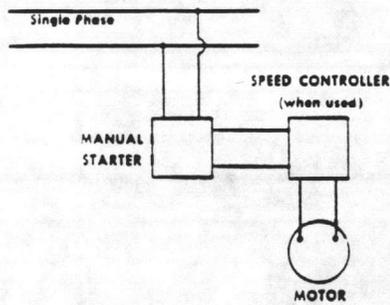


Diagram 2. Single Phase Power
AUTOMATIC CONTROL

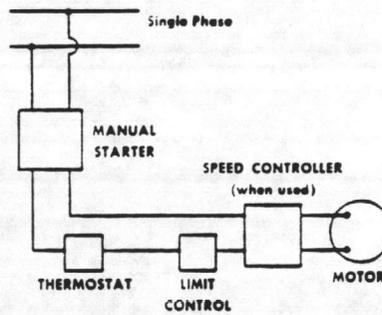


Diagram 3. Single Phase Power
MANUAL OR AUTOMATIC CONTROL

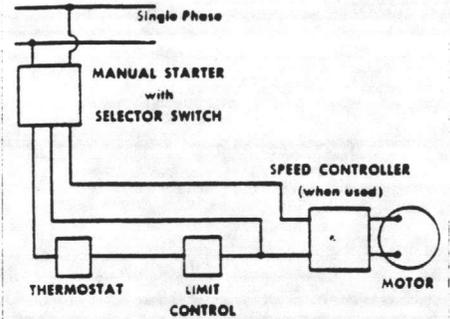


Diagram 4. 3-Phase Power
MANUAL CONTROL

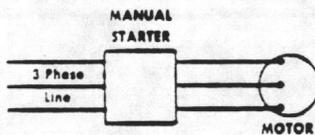


Diagram 5. 3-Phase Power
AUTOMATIC CONTROL

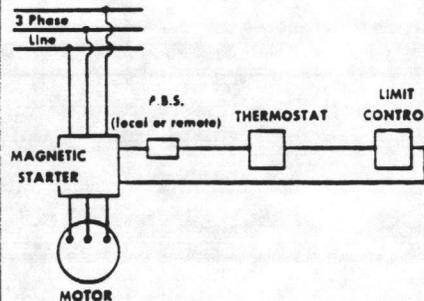
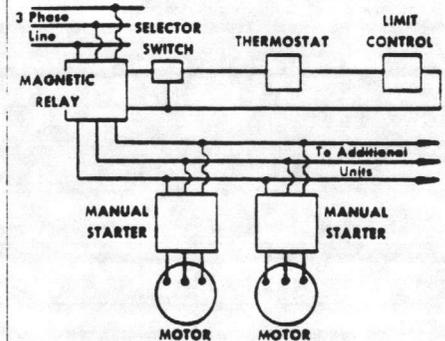


Diagram 6. 3-Phase Power
MANUAL OR AUTOMATIC CONTROL



START-UP

Inspect the unit heater carefully before starting. Tighten any loose nuts, bolts or screws. Examine the propeller fan to see that it has not been damaged during installation, that it is tight on the shaft, and that it rotates freely and in the correct direction. The fan should be centered in the orifice (equal gap between fan and orifice on each side of fan), and the fan should

protrude through the orifice (in direction of airflow) approximately $\frac{1}{3}$ of the blade depth. Make sure that the line voltage at the unit is within 10% of the motor nameplate voltage. Vent the lines on hot water systems. Discharge louvers should not be closed more than 75% or motor overheating may occur.

MAINTENANCE

WARNING: Before performing any maintenance, disconnect the electrical power to avoid electrical shock or injury from rotating parts.

COIL CLEANING

All unit heater coils should be cleaned at least once a year and more often under unfavorable conditions. Build-up of dirt, grease, and lint will reduce original heating capacity and may overload motor. The following are suggested cleaning methods.

1. Disconnect the electrical power before servicing to avoid electrical shock or injury from rotating parts.
2. Use a brush to loosen dirt on side where air enters the coil and then turn fan on to blow the dirt from the unit.
3. Use compressed air to loosen dirt by blowing from leaving airside of unit.
4. For a more thorough cleaning of coil, remove the fan and motor and spray a mild alkaline solution over the coil. This must be followed by a very thorough hot water rinse.

INTERNAL CORROSION SAFEGUARDS

1. Provide controlled water treatment, but do not use an excess of boiler compounds.

2. De-aerate boiler feed water.

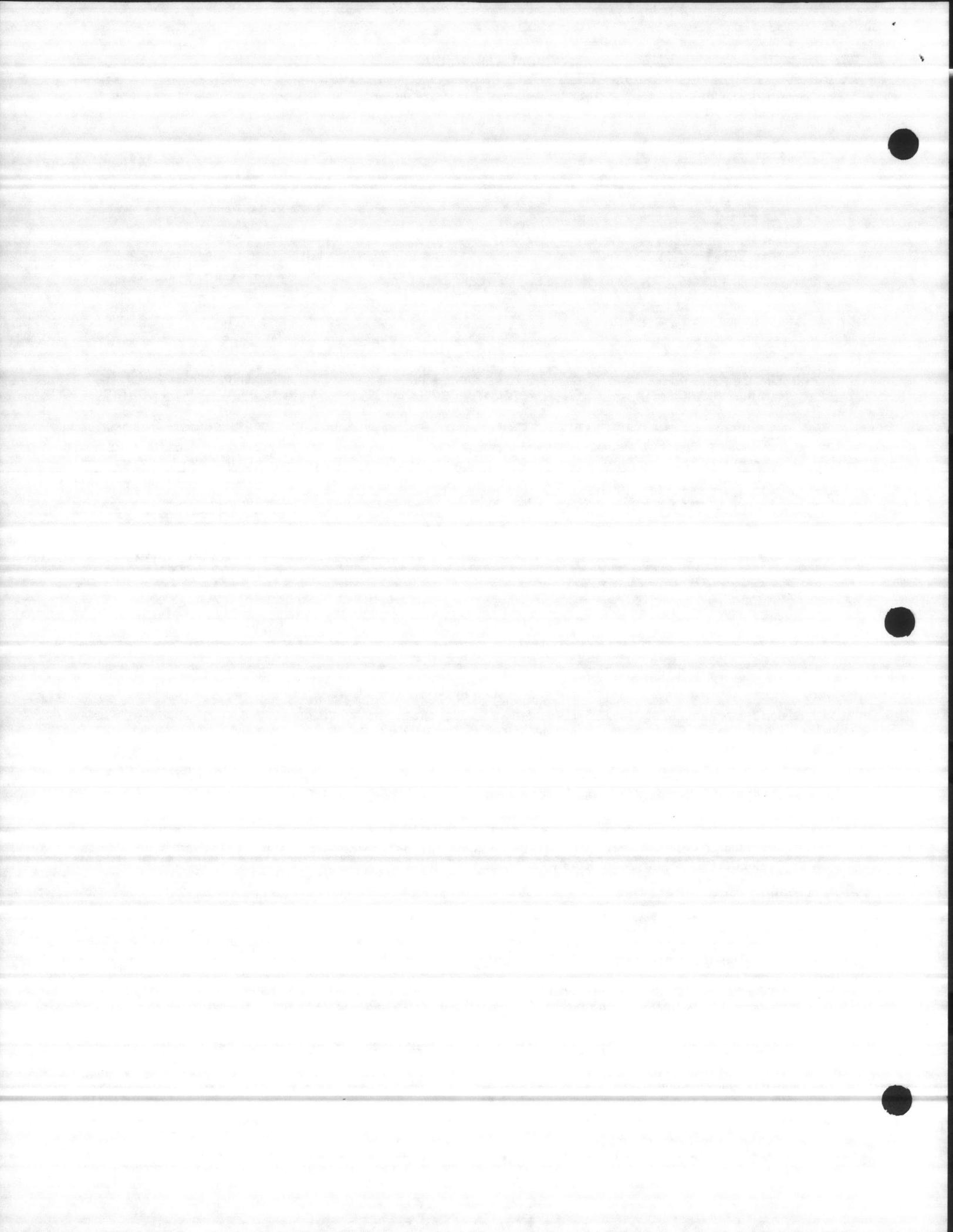
3. Insure rapid and continuous condensate drainage by proper sizing and installation of steam traps and piping.
4. Clean strainers and check steam traps for proper operation.
5. Provide proper vents for each unit. Verify annually that automatic vents are operating properly.
6. Use low pressure steam whenever possible.

GENERAL

Casings should be periodically cleaned to remove dirt, grease and corrosive substances which might injure the finish. Any rusted or corroded spots should be cleaned and repainted. Check accessories and motor mount. Also, check fan for tight connection to shaft, free rotation, and proper clearance.

MOTOR

Cleaning — Disconnect the electrical power before cleaning to avoid electrical shock or injury from rotating parts. Dur-



ing each inspection, remove all grease and dirt from the outside of the motor. This is important as grease and dirt act as insulation and thereby prevent heat dissipation, causing overheating of the motor.

Lubrication — Sleeve bearing motors with oilers should be relubricated at the end of the first year and after each 2000

hours of operation thereafter. Use one teaspoon or 5cc of SAE #20 non-detergent oil per bearing. Where motors are operated in high ambient temperatures and/or under severe conditions, they must be serviced more frequently. DO NOT OVERLUBRICATE.

SERVICE

This equipment should be serviced only by qualified, experienced technicians. Always disconnect the electrical power before servicing to avoid electrical shock or injury from rotating parts. If motor service is required, the motor can be removed as follows.

FACE MOUNTED MOTOR REMOVAL

1. Shut off electrical power to the unit.
2. Disconnect wires from motor.
3. Remove the fan guard/motor mount from the back panel of the unit by removing the four attaching screws.
4. Loosen the setscrew(s) on the fan and slide the fan off the motor shaft.
5. Remove four nuts holding the motor to the fan guard/motor mount.

6. Reverse process to reassemble. Fan should be centered in the orifice and $\frac{1}{3}$ of the fan should protrude through the orifice in direction of airflow.

SHELF MOUNTED MOTOR REMOVAL

1. Shut off electrical power to unit.
2. Disconnect wires from motor.
3. Loosen the setscrew(s) on the fan and slide the fan off the motor shaft.
4. Remove the four nuts and bolts holding the motor to the motor shelf and lift the motor off the unit.
5. Reverse process to reassemble. Fan should be centered in the orifice and $\frac{1}{3}$ of the fan should protrude through the orifice in direction of airflow.

REPLACEMENT PARTS

When writing for service or replacement parts always provide a complete description of the service part, part number (if known), plus complete serial and model number of unit involved.

