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THIS HEATER IS A VARIATION OF A STANDARD
PRODUCT. THE ATTACHED INSTRUCTION SHEET IS
FOR THAT PRODUCT. USE THIS INSTRUCTION SHEET
FOR GENERAL GUIDANCE ONLY; FOR APPLICATION,
REPLACEMENT PARTS, ETC., CONSULT FACTORY.

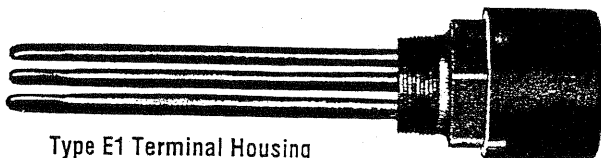
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Installation, Operation and MAINTENANCE INSTRUCTIONS

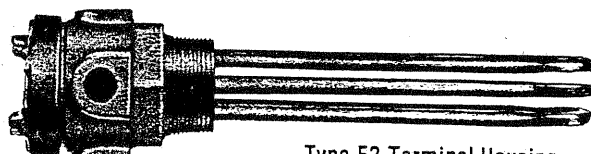
SERVICE REFERENCE

DIVISION 4	SECTION MT
SALES REFERENCE	(Supersedes PD407-10) PD407-11
	161-048381-001
DATE	MARCH, 1997

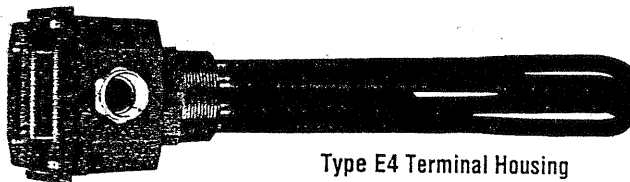
Chromalox® Screwplug Immersion Heaters (MT, MTI, MTO, MTS, EMT, EMTI, EMTO and EMTS)



Type E1 Terminal Housing
General Purpose (Rotatable)



Type E2 Terminal Housing
Moisture Resistant/Explosion Proof



Type E4 Terminal Housing
Moisture Resistant

GENERAL

Chromalox type MT, MTI, MTO, MTS, EMT, EMTI, EMTO and EMTS screwplug immersion heaters are designed for a wide variety of heating applications.

WARNING: It is the responsibility of the purchaser of the heater to make the ultimate choice of sheath material based upon his knowledge of the chemical composition of the solution, character of the material entering the solution, and controls which he maintains on the process. *Chromalox cannot warrant any electric immersion heater against failure by sheath corrosion if such failure is the result of operating conditions beyond our control.*

Heater Construction Characteristics:

- High quality resistance wire held in place by compacted Magnesium Oxide Refractory enclosed in a wide variety of sheath materials.

- High to low watt densities.
- Broad selection of sheath materials to operate successfully in many corrosive solutions. Note: Proper selection of sheath material is the sole responsibility of the customer.
- E1 (General Purpose), E2 (Moisture Resistant/Explosion Proof) and E4 (Moisture Resistant) terminal housings are standard.

WARNING: Users should install adequate controls and safety devices with their electric heating equipment. Where the consequences of failure may be severe, back-up controls are essential, including GFCI (Ground Fault Circuit Interrupters). Although the safety of the installation is the responsibility of the user, Chromalox will assist in identifying equipment options.

INSTALLATION

WARNING: Hazard of electric shock. Disconnect all power before installing heater. Install in accordance with the National Electrical Code, NFPA 70.

- Before installing, check your type MT or EMT immersion heater for any damage that may have occurred during shipment.
- Check to insure that the line voltage is the same as that stamped on the nameplate.
- Do not bend the heating elements. If bending is necessary, consult factory.
- IMPORTANT:** Mount heater in the tank so the liquid level will always be above the effective heated portion of the heater (see Figure 1). *If the heater is not properly submerged, it may overheat and damage the heating elements and create a possible fire hazard due to excessive sheath temperatures.*
- Where work will pass over or near equipment, additional protection such as a metal guard may be needed.

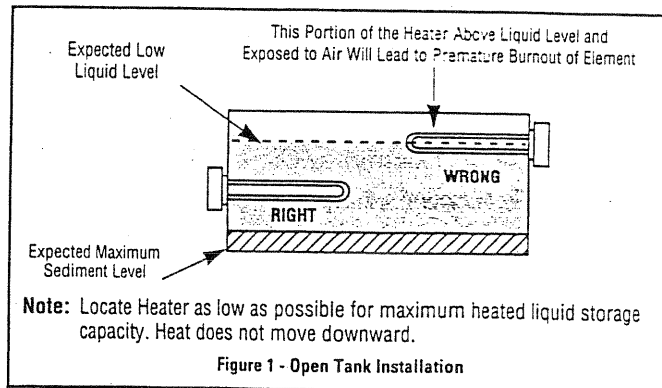
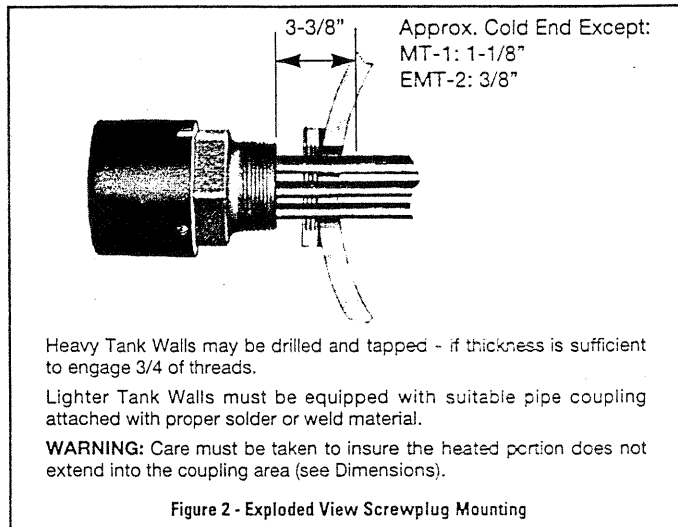


Figure 1 - Open Tank Installation

INSTALLATION

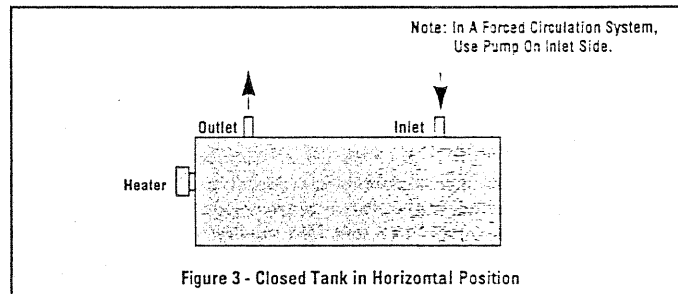
6. Heater must not be operated in sludge.
7. Install the heater using a high quality pipe sealing compound on the threads. Screw the heater into the opening (Figure 2). Tighten sufficiently with wrench applied on the hex portion of the screwplug.



8. Closed Tank Installation

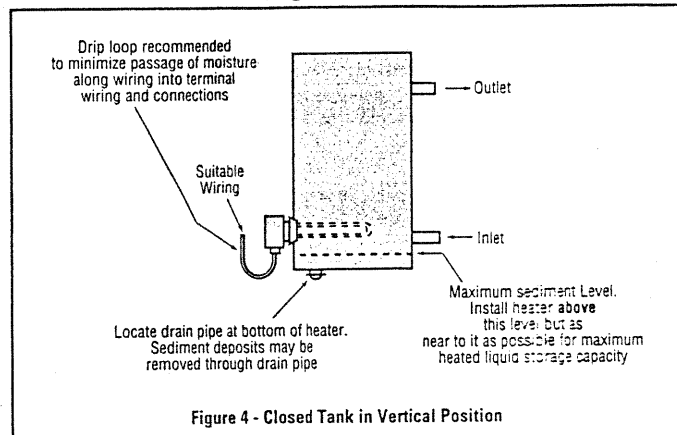
WARNING: When heating in closed vessels, controls and back-up controls must be used to regulate buildup of temperature and/or pressure.

a. Horizontal Position (Figure 3)



- a1. Place heater at an elevation so that natural circulation can take place.
- a2. Position outlet and inlet in a vertical plane, facing upward to prevent air pockets. Be sure all trapped air is removed from the closed tank. Bleed the air out of the liquid piping system and heater housing prior to operation.
- a3. **IMPORTANT:** Heater should never be located at the highest point of the liquid system. Provide expansion tank, if necessary.

b. Vertical Position (Figure 4)

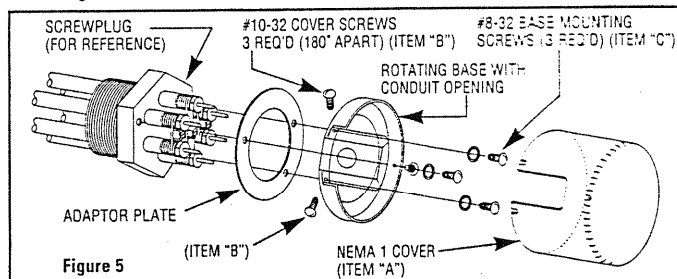


9. **DANGER: Hazard of Fire — Since the heaters are capable of developing high temperatures, extreme care should be taken to:**

- a. Use explosion-proof terminal housing in hazardous locations. See Chromalox catalog for selection of explosion-proof terminal enclosure for hazardous locations.
- b. Avoid contact between heaters and combustible material.
- c. Keep combustible materials far enough away to be free of the effects of high temperatures.

WARNING: Provisions should be made to prevent damage from any eventual leaking of tank or components.

10. Adjustment Instructions for Rotating Housing (E1) Only —



- a. After tightening the heater into the tank opening. The terminal housing can be rotated to a more convenient position to install the power feed.
- b. Remove the terminal box cover (Item A) by loosening the three cover screws (Item B) (Do not completely remove the screws since the cover holes are open slotted).
- c. To rotate the terminal housing base, loosen the three mounting screws (Item C) until the base rotates freely (do not completely remove).
- d. Turn the base until the conduit opening is on the desired position.
- e. Tighten the base mounting screws securely (Item C).
- f. Follow the rest of the screwplug installation instructions complete installation.

CAUTION: Do not over tighten.

WIRING

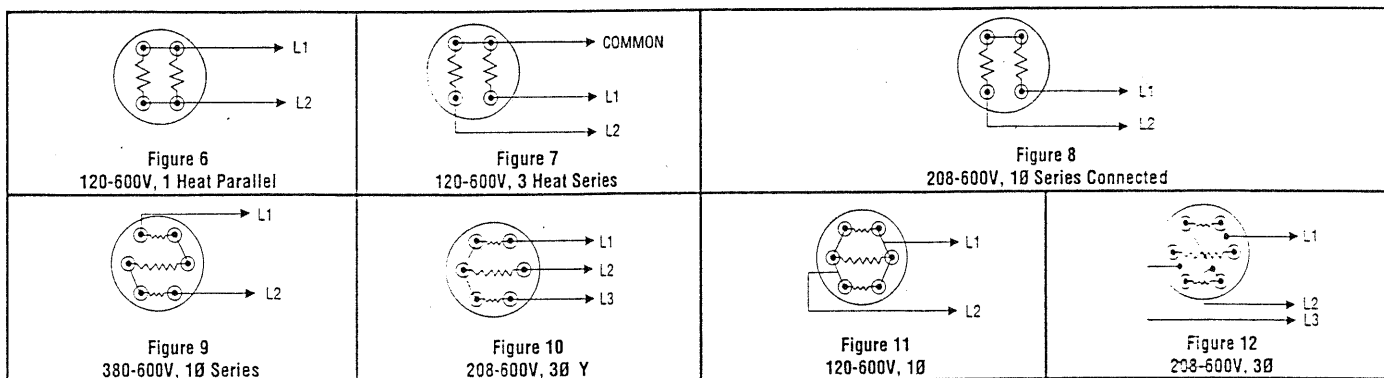
WARNING: Hazard of electric shock. Any installation involving electric heaters must be grounded to earth to eliminate shock hazard.

1. Electric wiring to heater must be installed in accordance with the National Electrical Code and with local codes by a qualified person. **WARNING: Use copper conductors only.**
2. When element wattages are not equal, heaters must not be connected in series.
3. Electrical wiring to heater should be contained in rigid con-

duit or in sealed flexible hose to keep corrosive vapors and liquids out of the terminal housing. If high humidity is encountered, the conduit should slope down away from the heater.

4. If flexible cord is employed, a watertight connector should be used for entry of the cord into the terminal housing. Outdoor applications require liquid-tight conduit and connectors.
5. Bring the power line wires through the opening in the terminal housing. Connect line wires as shown in the wiring diagrams. (See Figures 6 thru 12.)

WIRING



OPERATION

1. Do not operate heaters at voltages in excess of that stamped on the heater since excess voltage will shorten heater life.
2. Always maintain a minimum of 2" of liquid above the heated portion of the element to prevent exposure of the effective heated length. If the heater is not properly submerged, it may overheat and damage heating elements, tank or contents. **DO NOT OPERATE HEATER IF DRY.**
3. Be sure all trapped air is removed from a closed tank. Bleed the air out of the liquid piping system and heater housing prior to energizing.
Note: The tank or heating chamber in closed tank systems must be kept filled with liquid at all times.
4. Keep heating elements above sediment deposits.
5. **Low Megohm Condition** — The refractory materials used in electric heaters may absorb moisture during transit or when

subject to a humid environment. This moisture absorption results in a cold insulation resistance of less than twenty megohms. Normally, this megohm value corrects itself after heatup and does not affect heater efficiency or life.

A low megohm condition can easily be corrected by removing the terminal hardware and terminal housing and baking the heater in an oven at 350°F for several hours, preferably overnight. **Note:** Before baking the lid must be removed from an E2 housing. The housing and screwplug gasket must be removed from E4 models.

An alternate procedure is to energize the heater(s) at low voltage until the megohm reading returns to normal. When energizing heater(s) in air, the sheath temperatures should not exceed 400°F for copper and 750°F for steel and alloy elements.

MAINTENANCE

WARNING: Hazard of severe shock. Disconnect all power to heater before servicing or replacing heaters.

1. Heaters should be checked periodically for coatings and corrosion and cleaned if necessary.
2. The tank should be checked regularly for sediment around the heater as sediment can act as an insulator and shorten heater life.
3. Remove any accumulated sludge deposits from heater and from tank.

4. Check for loose terminal connections and tighten if necessary.
5. If corrosion is indicated in the E2 or E4 terminal housing, check terminal box gasket and replace if necessary. Check screwplug gasket on E4 models and replace if necessary. Check conduit layout to correct conditions that allow corrosion to enter the terminal housing.
6. Clean terminal ends of all contamination.
7. Check thermostat for proper identification.