

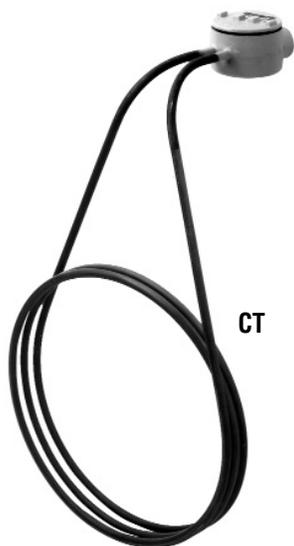
# Chromalox®

## Installation and Operating Instructions

### SERVICE REFERENCE

DIVISION 4	SECTION CT
SALES REFERENCE (Supersedes PD409-8)	PD409-9
161-048640-001	
DATE	MARCH, 2006

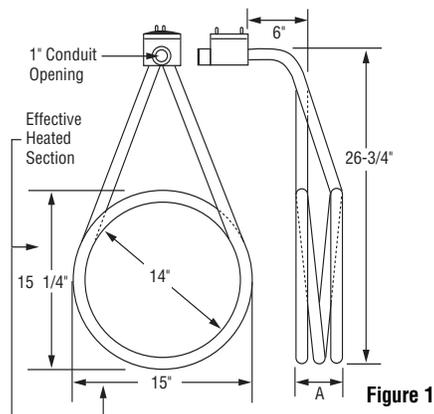
## CT & CTT Vertical Loop Over-The-Side Immersion Heaters



CT



CTT



### Specifications —

Model	Volts	kW	W/In <sup>2</sup>	Sheath Material	Dim. A (In.)
CTC-50	240	5	25	Copper	2
CTC-75	240	7.5	40	Copper	2
CTS-50	240	5	25	Steel	2
CTS-75	240	7.5	40	Steel	2
CTSS-50	240	5	25	304 Stainless Steel	2-3/4
CTSS-75	240	7.5	40	304 Stainless Steel	2-3/4
CTAC-50	240	5	25	*20 Stainless Steel	2-3/4
CTAC-75	240	7.5	40	20 Stainless Steel	2-3/4
CTT-50	240	5	44	Titanium	1-1/2
CTT-75	240	7.5	44	Titanium	2-1/2

\*Carpenter Stainless No. 20-CB-3

### GENERAL

#### ⚠ WARNING

**FIRE/EXPOSION HAZARD. This heater is not intended for use in hazardous atmospheres where flammable vapors, gases, liquids or other combustible atmospheres are present as defined in the National Electrical Code. Failure to comply can result in personal injury or property damage.**

Chromalox type CT Over-the-side Immersion Heaters are especially suited for use in plating tanks, rinse tanks and other aqueous solutions.

#### 1. Heater Construction Characteristics

- High quality resistance wire held in place by compact magnesium oxide in various sheath materials.
- Medium watt densities.
- Broad selection of sheath materials to operate successfully in many corrosive solutions.

#### ⚠ WARNING

**Sheath corrosion can result in a ground fault which, depending upon the solution being heated can cause an explosion or fire.**

**NOTE:** Chromalox cannot warrant any electric immersion heater against failure by sheath corrosion if such failure is the result of operating conditions beyond our control.

- Cast iron terminal enclosure is used to keep out moisture, vapors and splashing. Type CTT Titanium sheath heaters utilize a special non-metallic seal.
- Relatively flat profile consumes little tank work area allowing unrestricted flow.

#### ⚠ WARNING

**The system designer is responsible for the safety of this equipment and should install adequate back-up controls and safety devices with their electric heating equipment. Where the consequences of failure could result in personal injury or property damage, back-up controls are essential.**

## INSTALLATION

### ⚠ WARNING

**ELECTRIC SHOCK HAZARD. Disconnect all power before installing or servicing heater. Failure to do so could result in personal injury or property damage. Heater must be installed or serviced by a qualified person in accordance with the National Electrical Code, NFPA 70.**

1. Before installing a CT heater, inspect it thoroughly for possible damage which may have occurred during shipment. Also check to insure that the line voltage is the same as that stamped on the nameplate.
2. Mount heater in the tank so the liquid level will always be 6 to 8" above the coiled portion of the heater (See Figure 1).

### ⚠ WARNING

**FIRE HAZARD. If the heater is not properly submerged, the heating elements will overheat and could result in fire or damaged equipment.**

3. Heater must not be operated in sludge. Mount heater 1" above expected sludge level. Clean tank as necessary.

4. Where work will pass over or near equipment, additional protection, such as a metal guard, may be needed.
5. In an electroplating operation the heaters are not, under any circumstance, to be placed between the electrodes and the work.
6. A drip loop is recommended to minimize passage of moisture along wiring into terminal enclosure and connections.

### ⚠ WARNING

**FIRE HAZARD. Since heaters are capable of developing high temperatures, extreme care should be taken to:**

- A. Avoid mounting heaters in an environment containing combustible liquids, gases and vapors.**
- B. Avoid contact between heater and combustible material.**
- C. Keep combustible materials far enough away to be free of the effects of high temperatures.**

## WIRING

### ⚠ WARNING

**ELECTRIC SHOCK HAZARD. Any installation involving electric heaters must be performed by a qualified person and must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.**

1. Electrical wiring to heater must be installed in accordance with the National Electrical Code and with local electric codes by a qualified person. Refer to appropriate wiring diagram 2, 3 or 4.  
**CAUTION: 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 conduit or in sealed flexible hose to keep corrosive vapors and liquids out of the terminal enclosure. Conduit should terminate at some remote area free of corrosive vapors. If high humidity is encountered, the conduit should slope away from the heater terminals to keep condensation away from the heater.
4. If flexible cord is employed with heater, a moisture resistant connection should be used for entry of the cord into the terminal enclosure.
5. Make sure heater is grounded by attaching ground conductor, traceable back to service entrance, to the ground terminal located inside the terminal enclosure. If heater is used in an electroplating tank, the heater should be grounded externally to the tank wall to minimize stray plating currents in heater sheath that may cause sheath corrosion.

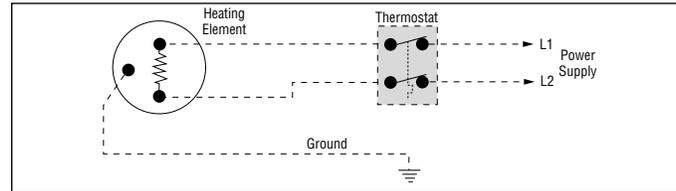


Figure 2 - Single Phase Heater with Thermostat

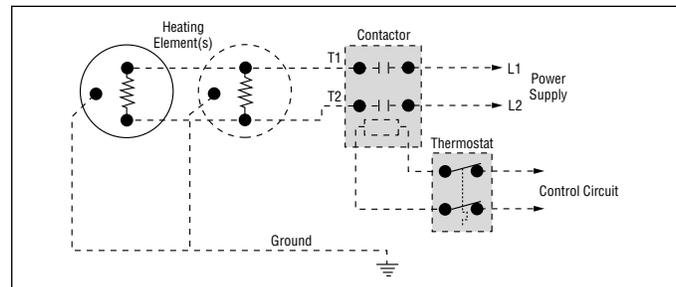


Figure 3 - Single Phase Heater with Contactor and Thermostat

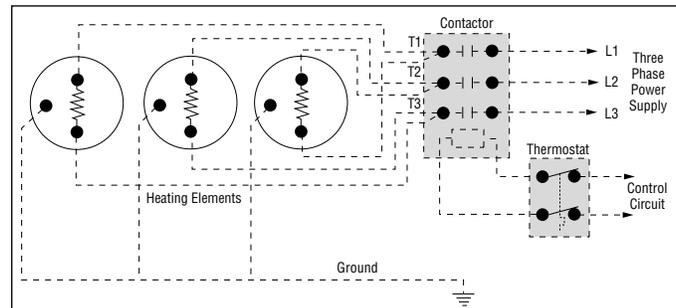


Figure 4 - Three Phase Heater with Contactor and Thermostat

## OPERATION

1. Do not operate heater at voltages in excess of that stamped on the heater since excess voltage will shorten heater life.
2. Always maintain a minimum of 6 to 8" of solution above the heated portion of the element to prevent exposure of the effective heated length. If the heater is not properly submerged, it may over-heat and shorten heater life. *Do not operate heater if dry.*
3. Sludge should not be allowed to build-up to the point where it contacts heater as this can lead to premature heater failure. *Heater must not be operated in sludge.*
4. In an electroplating operation the heaters are **not**, under any circumstances, to be placed between the electrodes and the work.

## MAINTENANCE

### **⚠ WARNING**

***ELECTRIC SHOCK HAZARD. Disconnect all power before installing or servicing heater. Failure to do so could result in personal injury or property damage. Heater must be installed or serviced by a qualified person in accordance with the National Electrical Code, NFPA 70.***

1. Heaters should be checked periodically for coating and corrosion build-up, and cleaned if necessary.
2. Tank should be checked regularly for sediment around the end of heater as this sediment can act as an insulation and shorten heater life. Remove sediment and sludge as necessary.

3. Check for loose terminal connections.
4. If corrosion is indicated in the terminal enclosure, check terminal box gasket and replace if necessary and check conduit layout to correct conditions that allow corrosion to enter the terminal enclosure.

### **⚠ WARNING**

***Provisions should be made to prevent damage from any eventual leaking of tank or components. Failure to comply could result in personal injury or property damage.***

**Limited Warranty:**  
Please refer to the Chromalox limited warranty applicable to this product at  
<http://www.chromalox.com/customer-service/policies/termsofsale.aspx>.

**Chromalox<sup>®</sup>**  
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