

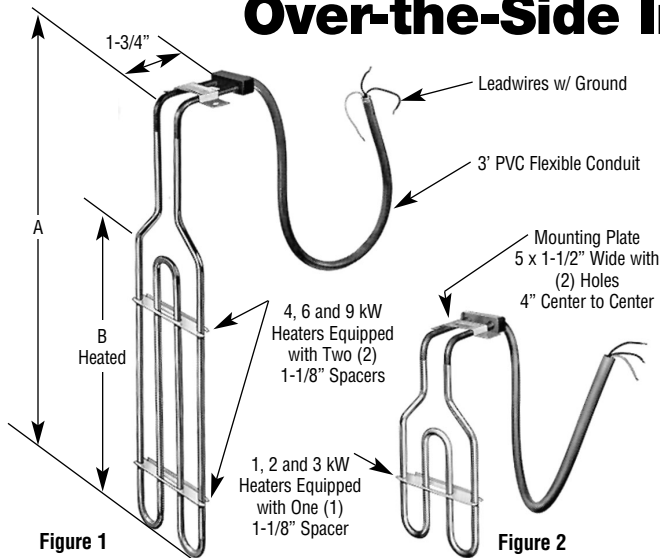
# Chromalox®

## Installation and Operating Instructions

### Type PTH Over-the-Side Immersion Heaters

#### SERVICE REFERENCE

DIVISION 4	SECTION PTH
SALES REFERENCE	(Supersedes PD422-3) PD422-4
161-056676-001	
DATE	NOVEMBER, 2004



#### Specifications

Model Number	Volts (1 Ph)	kW	W/ln <sup>2</sup>	Dimensions (In.)		Approx. Wt. (Lbs.)
				A	B	
PTH-101	120	1	21	14	8	4
PTH-102	240	1	21	14	8	4
PTH-202	240	2	31	21	11	4
PTH-204	480	2	31	21	11	4
PTH-302	240	3	32	26	16	5
PTH-304	480	3	32	26	16	5
PTH-402	240	4	34	20	20	5
PTH-404	480	4	34	30	20	5
PTH-602	240	6	34	40	30	6
PTH-604	480	6	34	40	30	6
PTH-902	240	9	34	54	44	8
PTH-904	480	9	34	54	44	8

#### GENERAL

#### ⚠ WARNING

**FIRE/EXPLOSION 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 PTH over-the-side immersion heaters are especially suited for use in plating tanks, rinse tanks and other aqueous solutions.

**IMPORTANT: 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 corrosive solution, character of the materials entering the solution, and controls which he maintains on the process.**

#### ⚠ WARNING

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

#### Heater Construction Characteristics.

- A. High quality resistance wire held in place by compacted magnesium oxide in type 316 passivated stainless steel sheath.
- B. Medium watt densities.
- C. Vapor resistant junction box with 3' PVC flexible conduit with ground wire.
- D. Spacer bar prevents elements from touching tank wall.
- E. Flat profile consumes little tank work area.

#### ⚠ 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 by a qualified person in accordance with the National Electrical Code, NFPA 70.**

1. Before installing the PTH 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 heater nameplate.
2. Where work will pass over or near equipment, additional protection such as a metal guard may be needed.
3. To resist buoyancy and to keep the heater in close profile with tank wall, a metal bracket with two mounting holes has been provided.

4. **IMPORTANT:** Heated section (See Figure 1, "B" Dimension) must be totally immersed at all times. *If the heater is not properly submerged, it will overheat and damage the heating elements and create a possible fire hazard due to excessive sheath temperatures.*
5. Heater must not be operated in sludge.

### ⚠ WARNING

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

- A. Avoid installing heaters in an atmosphere containing combustible gases and vapors.
- B. Avoid contact between heater and combustible materials.
- C. Keep combustible materials far enough away to be free of the effects of high temperatures.

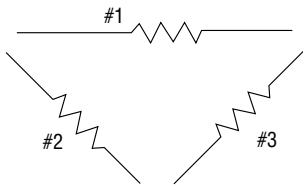
## WIRING

### ⚠ WARNING

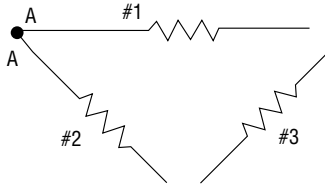
**ELECTRIC SHOCK HAZARD. Any installation involving electric heaters must be performed by a qualified person and must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.**

1. Electrical wiring to heater must be installed in accordance with the National Electrical Code or local codes by a qualified person.

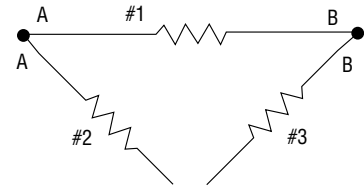
2. When element wattages are not equal, heaters must not be connected in series.
3. For single phase, apply power across two (2) black leads. Green wire (ground) must be properly grounded.
4. For balanced 3 phase loads, three (3) heaters of the same voltage and wattage ratings are required. A six-step guide to wiring connections for 3 phase delta:



**Step 2:** Assign designations 1, 2, 3 to heaters.

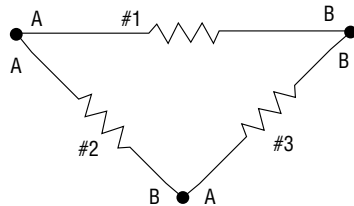


**Step 3:** Connect leadwire "A" of Heater #1 to leadwire "A" of Heater #2.

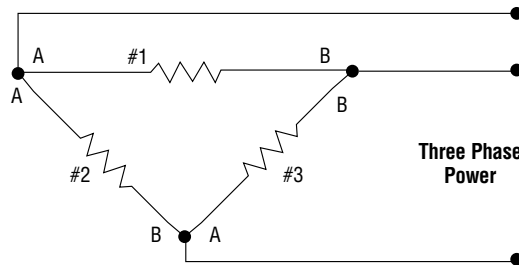


**Step 4:** Connect leadwire "B" of Heater #1 to leadwire "B" of Heater #3.

**Step 1:** Designate one black leadwire as "A" and one black leadwire as "B".



**Step 5:** Connect leadwire "B" of Heater #2 to leadwire "A" of Heater #3.



**Step 6:** Connect one 3 phase power line to each of the three connections.

**Three Phase Power**

**Note:** Green wire (ground) of each heater must be properly grounded.

## 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 2" of solution above the heated portion of the element (See Figure 1, "B" Dimension) to prevent exposure of the effective heated length. If the heater is not properly submerged, it may overheat and shorten heater life.

### **⚠ WARNING**

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

3. 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 by a qualified person in accordance with the National Electrical Code, NFPA 70.***

1. Heaters should be checked periodically for coatings and corrosion, and cleaned if necessary.
2. Tank should be checked regularly for sediment around the end of heater as this sediment can act as an insulator and shorten heater life.

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