

# Chromalox®

## Installation and OPERATION INSTRUCTIONS

### SERVICE REFERENCE

DIVISION 4	SECTION C
SALES REFERENCE (Supersedes PC400-2)	PC400-3
	161-027925-001
DATE	JANUARY, 1994

## Type C, CDE and CIR Cartridge Heaters



Type C (Bolt Terminals)



Type CDE



Type CTRH



Type CIR/CSIR

NOTICE: Carefully remove heater(s) from shipping containers and check for shipping damage. Any damage claims should be entered immediately with the carrier.

### GENERAL

The Chromalox electric cartridge heaters are ruggedly constructed and if properly installed, operated and maintained, will provide long life and dependable, trouble-free service.

Since excess temperatures may permanently damage the heaters, temperature regulating and limiting controls are recommended.

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

### INSTALLATION

**WARNING:** Hazard of Shock. Disconnect all power before installing heater.

**WARNING:** The suitability of these heaters for any particular application is solely the responsibility of the user. Please check Chromalox factory or representative for guidance if needed.

1. If cartridge heater is to be used in platen, dies, mold, etc. the hole should be drilled and reamed to allow as close a fit as is possible. This is especially important when installing high watt density heaters. Good surface contact between the heater surface and the heated metal is essential to good heat transfer and for longer heater life. A loose fit, resulting in poor contact will cause the heater to "run hot" and could cause premature heater failure. Table A gives the difference between nominal and actual diameters. If further information regarding fit or watt density is required, contact your Chromalox representative or

ask for a copy of Curve G-235 from Chromalox Cartridge Heater manuals.

**WARNING:** Never hammer the heater ends when installing.

2. Graphite and other lubricants to help insert the cartridge heater into the hole are not recommended. They are electrically conductive and can contaminate the heater and shorten heater life. Chromalox HTRC (Heat Transfer and Release Coating) is recommended.
3. Do not twist or braid wire leads. Where leads are subject to flexing, support the leadwires to prevent them from twisting or breaking off at the terminal end.
4. Avoid the use of tape on leads where they emerge from the cartridge heater. The adhesive on some tapes can contaminate the heater and shorten heater life.

## INSTALLATION

- Leadwires must not enter the hole containing the heater. The lead end of the heater should be flush with the surface of the part being heated. Make sure that the leads are in an ambient temperature which does not exceed the maximum temperature rating of the lead insulation and end seal material.
- DANGER: Hazard of Fire.** Since cartridge heaters are capable of developing high temperatures, extreme care should be taken to:
  - Avoid mounting heaters in an atmosphere containing combustible gases and vapors.
  - Avoid contact between heaters and combustible materials.
  - Keep combustible materials far enough away to be free of the effects of high temperatures.

Table A

Nominal Dia.	Actual Dia. +.000 -.005	Nominal Dia.	Actual Dia. +.000 -.005
1/4"	.248"	15/16"	.933
3/8"	.373"	1"	.996
1/2"	.498"	1 1/4"	1.250
5/8"	.622"	1 19/64"	1.291
3/4"	.747"		

## WIRING

**WARNING: Hazard of Shock.** Any installation involving electric heaters must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.

- Electric wiring to heating elements must be installed in accordance with National Electrical Codes and Local Electrical Codes by a qualified person as defined in the NEC.
- Use high-temperature manganese nickel leadwire or alloy busbar for electrical connections at the heater itself. Insulated cop-

per leadwire may be used up to 350°F.

- Cartridge heaters of 5/8" diameter and larger and of equal wattage and voltage can be series-connected across 480 volts maximum power supply. Smaller diameter units of equal rating can be series-connected across 250 volts maximum. An extra layer of high temperature Fiberglass sleeving is recommended for the leadwire to increase electrical insulation.
- Protection with properly sized fuses/breakers is required to minimize hazards.

## OPERATION

- Do not operate heaters at voltages in excess of that stamped on the heater since excess voltage will shorten heater life.
- Do not operate heaters under conditions that result in temperatures higher than the recommended maximum since excess temperatures can cause premature heater failure.

The maximum recommended temperature on sheath materials normally supplied is:

Stainless Steel — 1200°F

Alloy — 1600°F

- Electrical terminals should be protected from spillage of plastics, water, oil, and their vapors which can create electrical hazards and/or heater failure.

## MAINTENANCE

**WARNING: Hazard of Shock.** Disconnect all power to heaters before servicing or replacing heaters.

- Make certain that the terminals or leads and heater sheath are free from contact with oil, liquids or other foreign matter.

**Note:** Chromalox cannot be responsible for failures or damage caused by organic contamination in cartridge heaters. Make certain that the heaters are not exposed to organic contaminants.

- Check electrical connections and tighten if necessary. This will help avoid hot terminals that may destroy wire insulation or heater terminals.
- Check overheat operation to insure heater protection.
- REPAIR** — For In-Warranty repair please follow instructions in warranty below.

### WARRANTY AND LIMITATION OF REMEDY AND LIABILITY

Chromalox warrants only that the Products and parts manufactured by Chromalox, when shipped, and the work performed by Chromalox when performed, will meet all applicable specification and other specific product and work requirements (including those of performance), if any, and will be free from defects in material and workmanship under normal conditions of use. All claims for defective or nonconforming (both hereinafter called defective) Products, parts or work under this warranty must be made in writing immediately upon discovery, and in any event, within one (1) year from delivery, provided, however all claims for defective Products and parts must be made in writing no later than eighteen (18) months after shipment by Chromalox. Defective and nonconforming items must be held for Chromalox's inspections and returned to the original f.o.b. point upon request. THE FOREGOING IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES WHATSOEVER, EXPRESS, IMPLIED AND STATUTORY, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Notwithstanding the provisions of this WARRANTY AND LIMITATION Clause, it is specifically understood that Products and parts not manufactured and work not performed by Chromalox are warranted only to the extent and in the manner that the same are warranted to Chromalox by Chromalox's vendors, and then only to the extent that Chromalox is reasonably able to enforce such warranty, it being understood Chromalox shall have no obligation to initiate litigation unless Buyer undertakes to pay all cost and expenses therefor, including but not limited to attorney's fees, and indemnifies Chromalox against any liability to Chromalox's

vendors arising out of such litigation.

Upon Buyer's submission of a claim as provided above and its substantiation, Chromalox shall at its option either (i) repair or replace its Products, parts or work at the original f.o.b. point of delivery or (ii) refund an equitable portion of the purchase price.

THE FOREGOING IS CHROMALOX'S ONLY OBLIGATION AND BUYER'S EXCLUSIVE REMEDY FOR BREACH OF WARRANTY, AND IS BUYER'S EXCLUSIVE REMEDY AGAINST CHROMALOX FOR ALL CLAIMS ARISING HEREUNDER OR RELATING HERETO WHETHER SUCH CLAIMS ARE BASED ON BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORIES, BUYER'S FAILURE TO SUBMIT A CLAIM AS PROVIDED ABOVE SHALL SPECIFICALLY WAIVE ALL CLAIMS FOR DAMAGES OR OTHER RELIEF, INCLUDING BUT NOT LIMITED TO CLAIMS BASED ON LATENT DEFECTS. IN NO EVENT SHALL BUYER BE ENTITLED TO INCIDENTAL OR CONSEQUENTIAL DAMAGES AND BUYER SHALL HOLD CHROMALOX HARMLESS THEREFROM. ANY ACTION BY BUYER ARISING HEREUNDER OR RELATING HERETO, WHETHER BASED ON BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORIES, MUST BE COMMENCED WITHIN ONE (1) YEAR AFTER THE DATE OF SHIPMENT OR IT SHALL BE BARRED.

W2008M

**Chromalox®**  
PRODUCT SERVICE  
2150 N. RULON WHITE BLVD., OGDEN, UT 84404  
Phone: 1-800-368-2493

WIEGAND INDUSTRIAL DIVISION  
EMERSON ELECTRIC CO.

