

# Chromalox®

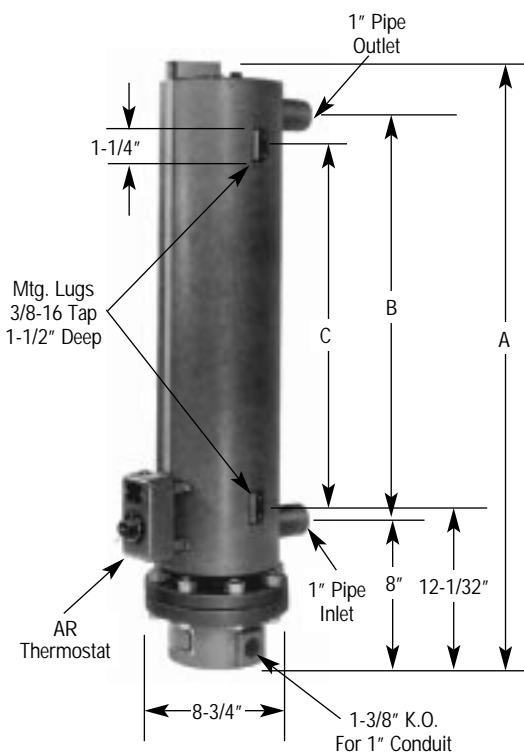
## Installation, Operation and

### RENEWAL PARTS IDENTIFICATION

#### SERVICE REFERENCE

DIVISION 4	SECTION GCH-GCHIS
SALES REFERENCE (Supersedes PE419-3)	PE419-4
161-027331-001	
DATE	MARCH, 2001

## GCH and GCHIS-6 Circulation Heaters For Steam, Gas and Air Heating



Specifications — Table A

Model	Volts	Phase	kW	W/In <sup>2</sup>	Dimensions (In.)			
					A	B	C	D
GCH-60905	240 or 480	1 or 3 Δ	9	23.8	41-3/4	30	25	11-3/8
GCH-61205	240 or 480	1 or 3 Δ	12	23.1	48-3/4	37	25	14-7/8
GCH-62005	240 or 480	1 or 3 Δ	20	23.3	60-1/4	48-1/2	25	20-5/8
GCH-62505	240 or 480	3Y	25	22.9	73-5/8	61-7/8	25	27-5/16
GCH-63005	240 or 480	3Y	30	22.7	86-5/8	74-7/8	25	33-7/8
GCHIS-6045	240 or 480	3Y	4	15	41-3/4	30	25	11-3/8
GCHIS-6085	240 or 480	3Y	8	15	48-3/4	37	25	14-7/8
GCHIS-6125	240 or 480	3Y	12	15	60-1/4	48-1/2	25	20-5/8
GCHIS-6155	240 or 480	3Y	15	15	73-5/8	61-7/8	25	27-5/16
GCHIS-6205	240 or 480	3Y	30	15	86-5/8	74-7/8	25	33-7/8

### GENERAL

#### ⚠ WARNING

Read and understand all instructions before installing, servicing or operating product. Failure to do so could result in personal injury or property damage.

The GCH and GCHIS-6 series is a general-purpose gas or steam circulation heater intended for use indoors.

The 6 INCOLOY® sheathed tubular elements are centered in a 5" diameter heating chamber and welded to a removable flange. The assembly is surrounded by 1-1/2" insulation and sheet metal jacket. The GCH series has a steel flange and chamber. The GCHIS series has stainless steel flange and chamber.

Depending upon the order specifications, the GCH-GCHIS-6 may or may not be factory equipped with an AR, or other Chromalox thermostat. Such thermostats function to control outlet temperatures and to limit internal temperatures under abnormal flow conditions. These controls do not fail safe.

#### ⚠ 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.

### ⚠ WARNING

**FREEZE HAZARD.** This unit is equipped with a thermowell for process control or over-temperature control. Do not allow moisture to accumulate in thermowell. Freezing temperatures can cause damage that may result in the heated medium leaking into terminal enclosure.

1. Vertical mounting (axis of chamber vertical as in photo on previous page) is preferred.
2. To avoid excess temperatures at electrical wiring, mount heater with terminal enclosure at bottom and use lower nozzle as inlet to the circulating steam, air or gas.
3. The GCH-GCHIS-6 series of circulation heaters are provided with mounting lugs to support the heater chamber. Refer to photo on previous page for location of these mounting lugs.
4. Mount heaters to permit unrestrained expansion of chamber due to

temperature. This can be accomplished by using a slotted mounting assembly on either of the lugs.

### ⚠ WARNING

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

- A. Provide minimum of 6" spacing from a chamber and related piping to nearest combustible material.
- B. Avoid operation of heater near combustible fluids or in combustible vapor or gas laden atmosphere.
5. Provide adequate space at terminal end to permit withdrawal of the heater from chamber should servicing be required.
6. If two or more heaters are needed to provide the needed heating capacity, arrange them for series gas or vapor flow.

### ⚠ WARNING

**EXPLOSION HAZARD.** When heating in closed vessels, controls and back-up controls must be used to regulate build-up of temperature and/or pressure.

7. A pressure relief valve should be provided by customer at outlet of vessel. There should be no other valving between vessel and relief valve.

## WIRING

### ⚠ WARNING

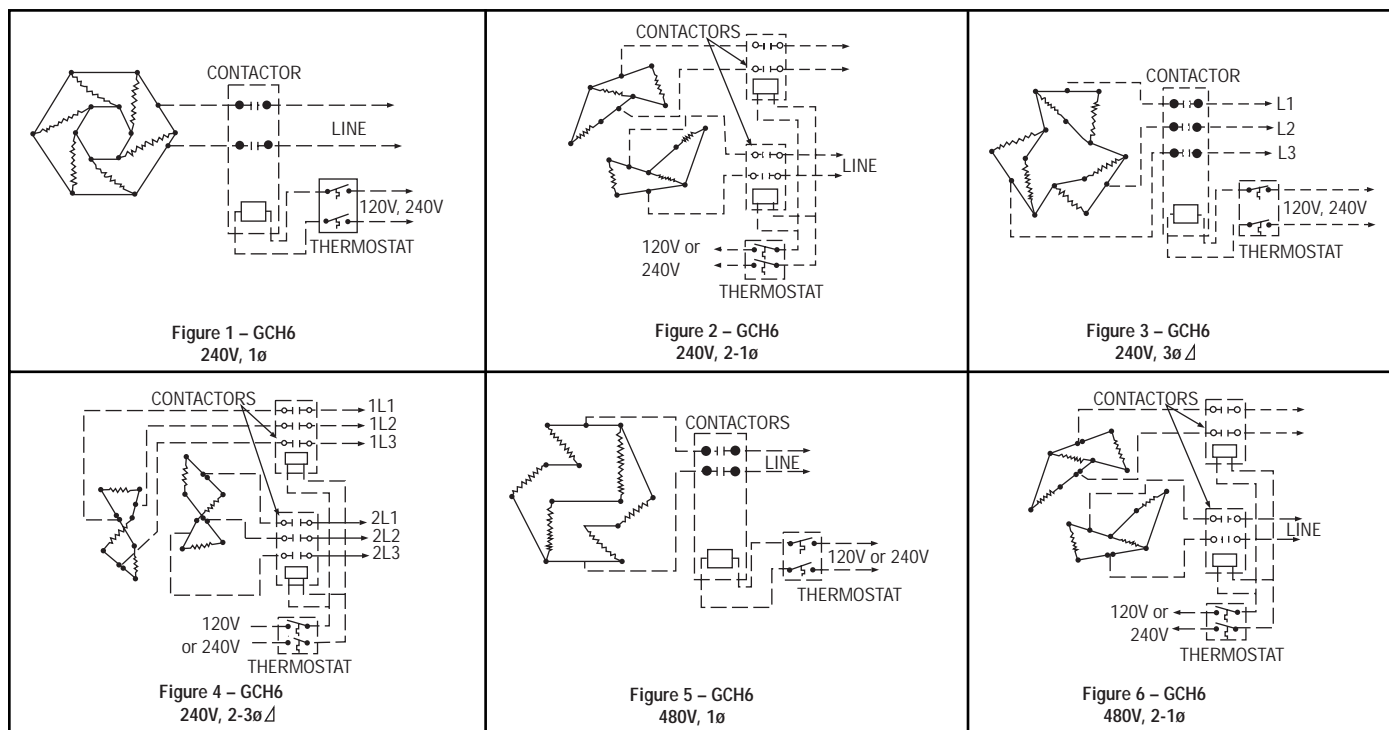
**ELECTRIC SHOCK HAZARD.** Any installation involving electric heaters must be performed by a qualified person and must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.

1. Be sure line voltage matches heater voltage (on nameplate).
2. Electric wiring to heater must be installed in accordance with local codes and the National Electrical Codes.
3. Because of the high operating temperatures expected, 250°C wire should be used.
4. Power controls must be used when heaters are rated 3 phase and when the heater amperage exceeds the rating of the thermostat.

5. Refer to Wiring Diagram Table B, to properly connect the heater.

**Table B — Wiring Diagrams**

Model	240V				480V		
	1Ø Fig. No.	2-1Ø Fig. No.	3Ø Fig. No.	2-3Ø Fig. No.	1Ø Fig. No.	2-1Ø Fig. No.	3Ø Fig. No.
GCH-60905	1	—	3	—	5	—	7
GCH-61205	—	2	3	—	5	—	7
GCH-62005	—	2	—	4	5	—	7
GCH-62505	—	—	—	4	—	6	7
GCH-63005	—	—	—	4	—	—	7
GCHIS 4, 8 12, 15, 20 kW	—	—	8	—	—	—	9



## WIRING

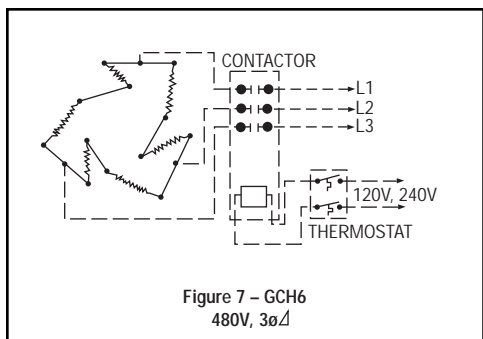


Figure 7 – GCH6  
480V, 3Ø

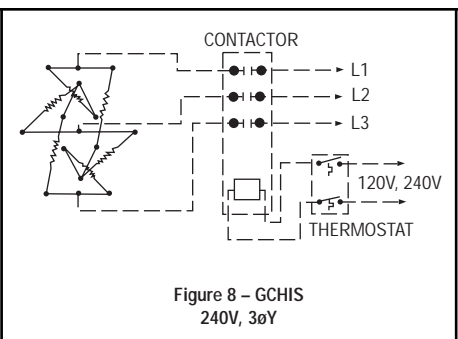


Figure 8 – GCHIS  
240V, 3ØY

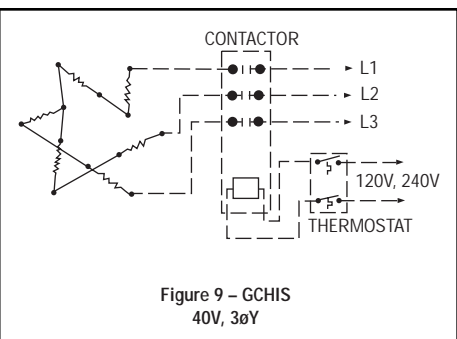


Figure 9 – GCHIS  
40V, 3ØY

### Instructions for converting GCH6, 240V, 3Ø to GCH6, 480V, 3Ø

1. Remove all jumper straps and separate according to different lengths.
2. Discard jumper straps 166-075229-018 (1-1/4" long).
3. Reassemble jumper straps 166-014828-024 (2-1/2" long) and 166-075229-014 (1-1/2" long) as in Figure B.
4. Replace washers and nuts.
5. Check circuits.

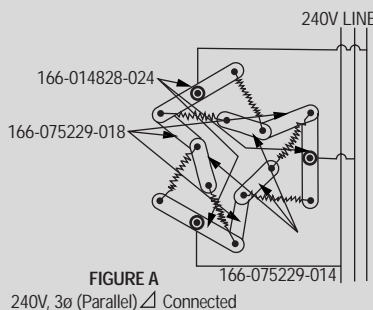


FIGURE A  
240V, 3Ø (Parallel) Connected

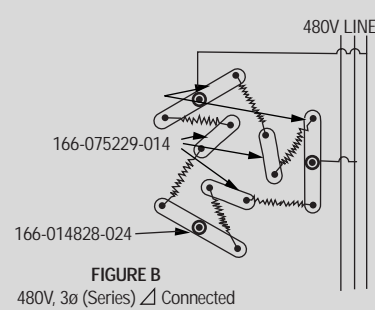


FIGURE B  
480V, 3Ø (Series) Connected

NOTE: Broken Lines Indicate "Customer-furnished". However, thermostat could have been furnished by chromalox if so specified on order.

## OPERATION

1. Do not heat materials that are corrosive to the heating element sheath or chamber.
2. Terminal ends of heater must be protected from drippings, condensation, spray or direct spill-over of material whose presence at the terminals may damage heater electrical insulation. Liquid-tight terminal enclosures are available to protect heater. Consult your local Chromalox Sales office.
3. If foreign material is carried by the gaseous flow, install suitable filters in the inlet pipe line to the heater.
4. Do not allow heater to operate when steam, air or gas flow is interrupted.

*given discharge gas temperature, heater element sheath temperature and pipe body temperature tend to increase as gas flow (mass velocity) decreases. The standard GCH-6 has a 750°F limitation on the carbon steel body and a 1500°F limit on the INCOLOY sheath elements. Check factory if any doubt exists as to temperatures that will be encountered in your specific application. At pipe body temperatures above 750°F, stainless steel pipe body is required (model GCHIS).*

### ⚠ WARNING

**FIRE/EXPLOSION HAZARD.** Safe operating conditions depend on operating pressure, mass velocity of gas and discharge temperature of the gas. At a

### ⚠ WARNING

**FIRE/EXPLOSION HAZARD.** Do not exceed the Pressure-Temperature rating of the flange as listed in ANSI B16.5.

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

1. Remove heating element assembly periodically to check heater sheath for corrosion or excessive oxidation. Correct operating conditions to minimize sheath deterioration.

2. Periodically check temperature control and limit control operation to insure accurate and safe process operation.
3. Check all electrical connections periodically and retighten connections which may have loosened in service. Replace wire and wire terminals that show signs of oxidation which would interfere with establishment of reliable electrical connections.

NOTE: Maintenance intervals to be determined by the user based on their knowledge of the heated medium and operating conditions.

## RENEWAL PARTS

Catalog Number	Volts	Phase	kW	Heating Element
GCH-60905	240	1	9	155-115143-001
	240	3 Δ	9	155-115143-002
	480	1	9	155-115143-003
	482	3 Δ	9	155-115143-004
GCH-61205	240	2-1	12	155-115143-006
	240	3 Δ	12	155-115143-007
	480	1	12	155-115143-008
	480	3 Δ	12	155-115143-009
GCH-62005	240	2-1	20	155-115143-011
	240	3 Δ	20	155-115143-012
	480	1	20	155-115143-013
	480	3 Δ	20	155-115143-014
GCH-62505	240	2-3 Δ	25	155-115143-016
	480	2-1	25	155-115143-017
	480	3 Δ	25	155-115143-018
GCH-63005	240	2-3 Δ	30	155-115143-020
	480	3 Δ	30	155-115143-021

**Note:** When ordering parts for Model Numbers suffixed by "XX" or any other letter or any other letters not specifically identified on this instruction sheet, order Renewal Parts on special order basis, giving name of part, part number, model number and description. **Note:** Number in ( ) indicates quantity of same part number used. Model GCHIS - contact local Chromalox Representative.

PARTS COMMON TO ALL HEATERS	
AR5524 Thermostat	300-013863-015
Standard Gasket	132-017222-016

### 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.

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