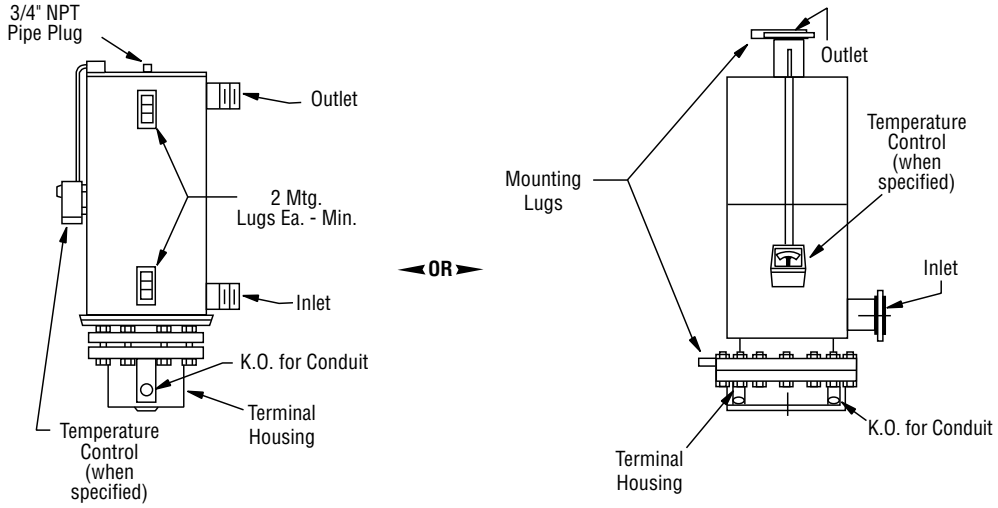
Chromalox®

Installation, Operation
and
RENEWAL PARTS IDENTIFICATION

SERVICE REFERENCE	
DIVISION 4	SECTION GCH
SALES REFERENCE (Supersedes PE417-2)	PE417-3
	161-025752-001
DATE FEBRUARY, 1999	

Type GCH/GCHIS Circulation Heater (for Steam, Gas and Air Heating)



Specifications – Design is dependent upon size of heater and customer's specifications.

GENERAL

WARNING: ***Safe operating conditions depend on operating pressure, mass velocity of gas and discharge temperature of the gas. At a given discharge gas temperature, heater element sheath temperature and pipe body temperature will increase as gas flow (mass velocity) decreases. The standard GCH has a 750˚F limitation on the carbon steel body and 1500˚F limit on the INCOLOY® sheath elements. Pressure limits vary as the temperature of the vessel increases. If the vessel temperatures exceed 250˚F or operating pressure is greater than 100psi, the vessel limits must be evaluated at the specific pressures and temperatures expected during operation. Contact Chromalox if any doubt exists as to temperatures that will be encountered in your specific application. At pipe body temperatures above 750˚F, a stainless steel body is required (Model GCHIS).***

WARNING: ***Do not exceed the Pressure-Temperature rating of the flange as listed in ANSI B16.5. Before installing, local codes must be reviewed to verify ASME Certification of the pressure vessel is not a requirement. If required, contact Chromalox.***

WARNING: ***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 explosion or fire.***

The GCH/GCHIS series is a general purpose gas or steam circulation heater intended for indoor use. This heater can be used in an outdoor environment, if ordered with an E4 moisture-resistant terminal enclosure and a weatherproof insulation jacket. Also available is an E3 explosion-resistant terminal enclosure. Consult with Chromalox for operating restrictions in hazardous locations. **Note:** The GCHIS is intended for use in corrosive or high temperature applications.

The INCOLOY® sheathed tubular elements are centered in a steel/stainless steel heating chamber and welded to a removable steel/stainless steel flange. The number of elements will vary, depending upon the flange size used. Some units are fitted with baffles to increase the flow. They are designated as GCHB. The assembly is surrounded by insulation and a sheet metal jacket.

Depending upon the order specifications, the GCH/GCHIS 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 are not fail-safe.

WARNING: ***Users should install adequate back-up controls and safety devices with their electric heating equipment. When heating in closed vessels where the consequences of failure may be severe, controls and back-up controls must be used to prevent buildup of temperature and/or pressure. Although the safety of the installation is the responsibility of the user, Chromalox will be glad to make equipment recommendations.***

INSTALLATION

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

1. Before installing, check your GCH/GCHIS circulation heater for any damage that may have occured during shipment.
2. Check to insure that the line voltage is the same as that stamped on the nameplate.
3. Vertical mounting (axis of chamber vertical as in Figures on previous page) is preferred.
4. 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.
5. The GCH/GCHIS series of circulation heaters is provided with mounting lugs to support the heater chamber. Refer to figures on previous page for location of these mounting lugs.
6. 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.
7. Provide adequate space at terminal end to permit withdrawal of the heater from chamber should servicing be required.
8. **DANGER:** ***Hazard of Fire.*** Provide a minimum of 6" spacing from chamber and related piping to nearest combustible material. Avoid operation of heater near combustible fluids or in combustible vapor or gas laden atmosphere.
9. If two or more heaters are required to provide the needed heating capacity, arrange them for series gas or vapor flow.
10. **DANGER:** ***Possible Explosion.*** A pressure relief valve should be provided by customer at outlet of vessel. There should be no valving between vessel and relief valve.
11. In a forced circulation system, use pump on the inlet side.

WIRING

WARNING: ***Hazard of Electric Shock. Any installation involving electric heaters 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. All wiring should be done in accordance with local codes and the National Electrical Code by a qualified person as defined in the NEC.
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 Diagrams for the typical wiring used for connecting the GCH series heater.
6. Other circuit arrangements are often supplied depending upon customer specifications or amperage rating.

OPERATION

WARNING: ***Do not heat materials that are corrosive to the heating element sheath or chamber.***

It is the responsibility of the user to know the chemical composition of the corrosive solution and the character of the materials entering the solution as well as the corrosive effect of the solution upon entering the heating elements and chamber. Chromalox cannot warrant any electric circulation heater against failure by sheath corrosion if such failure is the result of operating beyond our control.

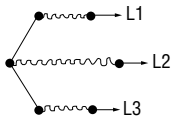
1. Terminal ends of heater must be protected from drippings, condensation, spray or direct spill-over of material whose presence at the terminals may damage heater electrical insulation. Liquid-tight terminal enclosures are available to protect heater. Consult your Local Chromalox Sales office.
2. If foreign material is carried by the gaseous flow, install suitable filters in the inlet pipe line to the heater.
3. Do not allow heater to operate when steam, air or gas flow is interrupted as dry operation of the heater can cause failure.

MAINTENANCE

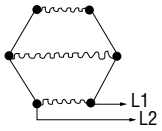
1. **WARNING:** ***Hazard of Electric Shock. Disconnect all power before wiring or servicing heater.***
2. Remove heating element assembly periodically to check heater sheath for corrosion or excessive oxidation. Correct operating conditions to minimize sheath deterioration.
3. Periodically check temperature control and pressure-temperature safety limit control operation to insure accurate and safe process operation.
4. Check all electrical connections periodically and retighten connections which may have loosened in service. Replace wire and wire terminals which show signs of oxidation which would interfere with establishment of reliable electrical connections.
5. Clean any filters in the inlet pipeline to avoid reduced flow, which can cause element overheating and premature failure.

TYPICAL WIRING DIAGRAMS

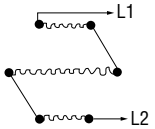
3 Series



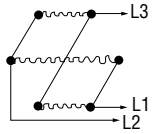
208-600V, 3Ø Y



208-600V, 1Ø

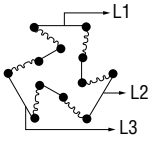


380-600V, 1Ø, SERIES

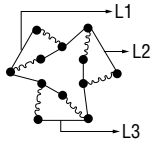


208-600V, 3ØΔ

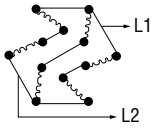
6 SERIES



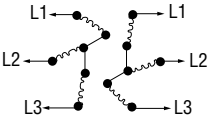
380-600V, 3Ø, SERIES Δ



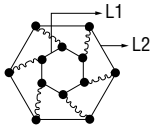
208-240V, 3Ø, PARALLEL Δ



380-600V, 1Ø, SERIES

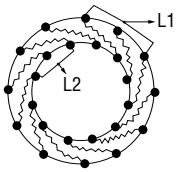


208-600V, 3Ø Y
2 CIRCUITS

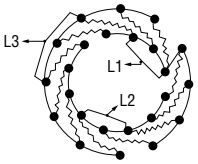


240V, 1Ø (15 kW Max)
208-230V, 1Ø (12 kW Max)

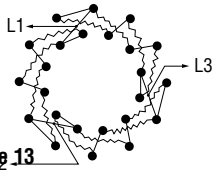
12 Series



380-600V, 1Ø PARALLEL



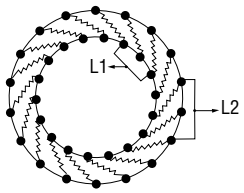
208-600V, 3Ø, PARALLEL Δ



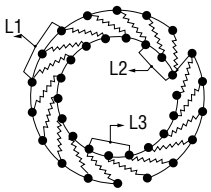
380-600V, 3Ø, SERIES Δ

Figure 13

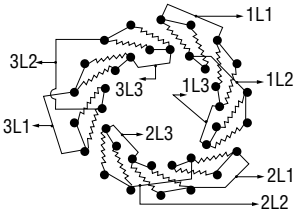
18 Series



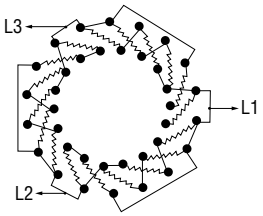
380-600V, 1Ø, PARALLEL



208-600V, 3Ø, PARALLEL Δ

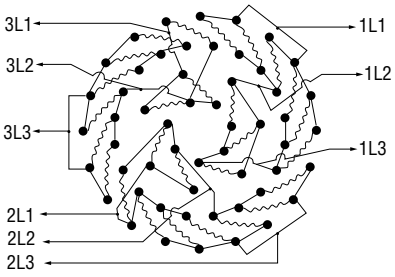


208-600V, 3Ø, PARALLEL Δ, 3 CIRCUITS



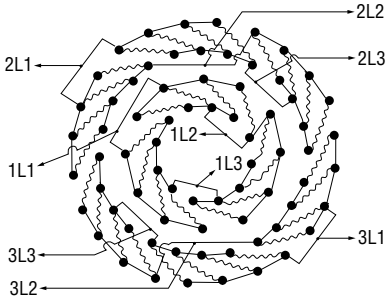
380-600V, 3Ø, SERIES Δ

27 Series



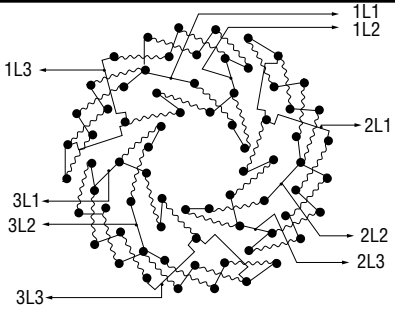
208-600V, 3ØΔ, 3 CIRCUITS

36 Series



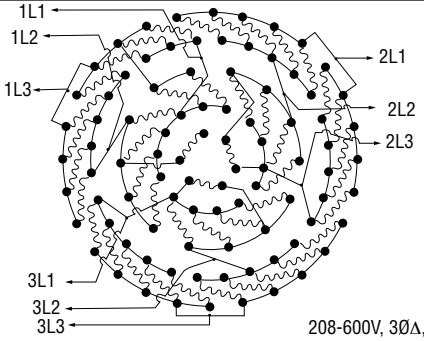
208-600V, 3ØΔ, 3 CIRCUITS

36 Series



380-600V, 3Ø, 3 CIRCUITS, SERIES Δ

45 Series



208-600V, 3ØΔ, 3 CIRCUITS

RENEWAL PARTS IDENTIFICATION

Contact Chromalox Product Service for a list of the necessary replacement parts of your specific heater.

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

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