

Installation Instructions

RADH **Electric Radiant Heaters**



PG427-1
161-058031-001
October 2020

RADH Electric Radiant Heaters

NOTE: Please familiarize yourself with these instructions before attempting to install or connect this Radiant Heater.

⚠ WARNING

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

- A. Mount heater with the proper clearance from adjacent surfaces.**
- B. Do not mount heater over combustible surfaces.**

C. Do not stack or store combustible materials directly below the heater or in the space a distance of 5 feet from any projected edge of the heater.

D. Do not operate the heater without Ground Fault Equipment Protection.

Failure to follow these instructions can result in personal injury and fire.

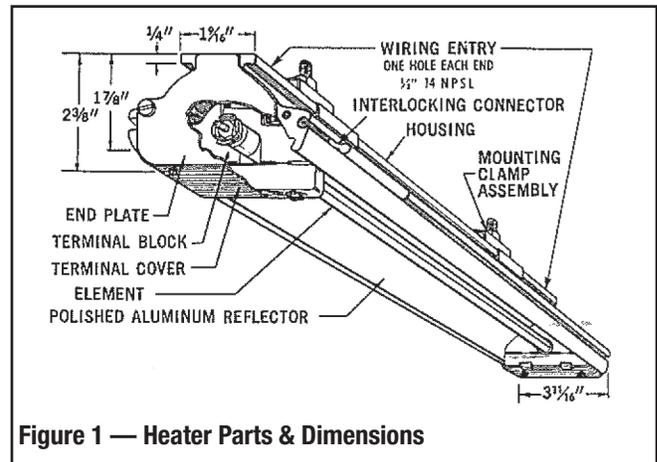
Installation

⚠ 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.

Before Installing

1. Open carton and remove heater at the place of installation. Mounting clamps are in parts bag in carton.
2. Check nameplate volt and watt rating against your power supply voltage and heating requirements of your installation. This nameplate of the complete assembly is located on the back of the heater housing.

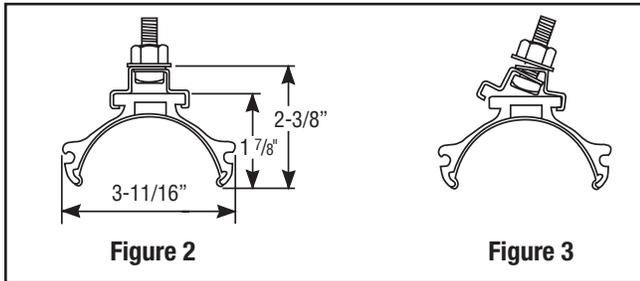


Mounting

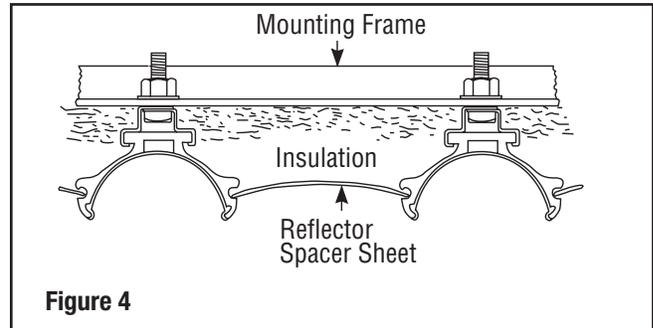
⚠ WARNING

FIRE HAZARD. Since heaters are capable of developing high temperatures, extreme care should be taken to maintain adequate spacing between heater and combustible materials. Failure to comply can result in personal injury or property damage.

1. **Clamps** — Heaters are mounted by means of the mounting clamp and 3/4" bolt assembly which is used as shown in Figure 2. Clamp assembly may be attached to heater by sliding over end or by snapping over top of extruded frame section at any point along its length. (See Figure 3) For proper heater support, the maximum distance between clamps must not exceed 48". On extra-long heaters, more than two clamps are furnished.



2. **Mounting Holes** — When heaters are mounted adjacent to each other in the same plane, note that distance between mounting holes on framing to support heaters will be 3-11/16" minimum. When heaters are not in the same plane, i.e., set at an angle to one another, distance between mounting holes in framing will be either greater or less than 3-11/16".
3. **Framing** — Where an extensive installation is being made, the use of continuous slot metal framing manufactured by several concerns will be of assistance in saving time and money. The framing is reusable.
4. **Reflector Spacer Sheets** — Where heaters are not mounted side by side (See Figure 4), reflector spacer sheets can be used between heaters. These reflector spacer sheets and companion reflectors consisting of an extruded aluminum housing with reflector sheet and mounting clamps are available. Check factory.



5. **Insulation** — Where unusually high work temperatures are encountered, it may be desirable to insulate with high temperature insulation. NOTE: An air space should be left between backs of heaters and insulation. (see Figure 4).
6. **Ventilation** — Where solvents, water, etc. are being evaporated from work in process, it is necessary to provide substantial quantities of ventilation air to carry away the resulting vapors.

IMPORTANT - In the case of solvents of an explosive nature, ventilation air must be in sufficient volume to dilute the solvent vapor so that explosive mixtures cannot occur. In order to comply with the standards of safety required by the insurance companies, ventilation protection and other facilities must be in accordance with NFPA Bulletin No. 86, entitled "Standard for Ovens and Furnaces". This Bulletin may be obtained from the Association at 470 Atlantic Avenue, Boston Mass., 02110

⚠ 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.

Wiring

⚠ 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

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 connection to the Radiant Heater is made through two openings tapped for 1/2" connector. Openings are in the top of the extruded heater housing, one near each end.
2. Wiring should be run in flexible or rigid metal conduit and must be installed in accordance with the requirements of the National Electrical Code and such other local requirements as may be applicable. **NOTE:** High temperatures will oxidize copper. Do not use copper wire in connecting this heater. Stranded, insulated, nickel-plated copper wire is recommended.
3. Access to Radiant Heater terminals is obtained by removing the two screws in each of the terminal box covers.
4. A sufficient length of this wire (not less than 12") should be used to extend from each heater terminal into a connection box location where the temperature does not exceed 300°F.
5. Leave generous loop in wire when connecting to allow for expansion of heating element.
6. Assemble terminal, nut and wire as shown in Fig. 5.
7. Tighten the terminal nut securely with a wrench.
NOTE: Where circuit wiring is installed in locations of high ambient temperature, conductors should be insulated in accordance with requirements for temperature and voltage.
8. **SINGLE END WIRING** may be made through one of the wiring entries by bringing a lead through it from the opposite end of the heating element using the wire-way provided behind integral reflector in the housing extrusion. Wire used in making such connections must be able to operate in high ambient and have a sufficiently high voltage rating for the specific application. The maximum wire diameter is limited by the wire-way and must not exceed .224" over the insulation.
9. **DELTA CONNECTIONS** - When heaters occur in multiples of three, they may be connected to, and balanced across, three-phase lines. The most commonly used connection is the delta connection illustrated in Figure 6.

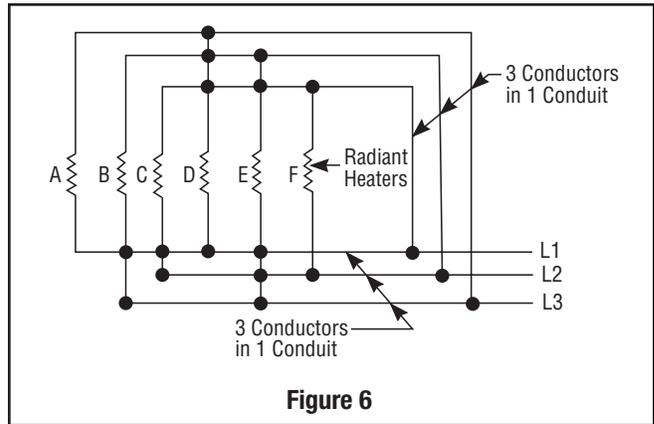


Figure 6

Three phase Delta connections to minimize inductive effect in conduits are made per this diagram. The rule: run all 3 three-phase conductors in the same conduit as far as possible. For single-phase, run only two conductors and follow the same rule.

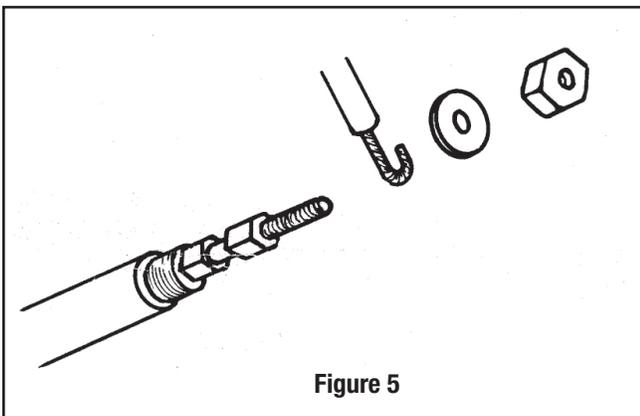


Figure 5

Operation

CAUTION: For your own safety

Before energizing this heater:

1. Be sure all electrical connections are tightly made.
2. Be sure that all conductors are properly insulated, and that they will not chafe at the heater wire entrance due to expansion and contraction of the heating element.
3. Be sure that terminal box covers have been properly replaced, and that secondary insulation bushings have not been omitted.

Controlling Radiant Intensity

Standard Radiant Heaters are built to operate at 40 watts per sq. inch on the element sheath. When it is desired to reduce radiant intensity, one or more of the following methods may be used.

1. **INPUT CONTROLLERS.** These motor-driven cycling devices can be used to vary heater output capacity from 4 to 100%. They are usually connected in holding coil circuit of magnetic contactors. See Chromalox Radiant Heater Manual for further information regarding Input Controllers and Contactors.
2. **SOLID STATE THYRISTOR POWER CONTROLLERS.** For best non-contact control of radiant heat, a Series #6 Chromalox Thyristor Power Controller with manual potentiometer setting is recommend-

ed. Truly proportional output of from 0-100% can be easily dialed-in to suit the particular product or process requirements. The Series #6 panels are pre-engineered, pre-packaged assemblies in an enclosure with circuit disconnect provided and ready for installation.

Maximum Ambient Temperatures

CHROMALOX Radiant Heaters are not recommended for applications in ambient temperatures exceeding 300°F. Higher ambient temperatures mean shorter heater life.

Maximum work temperature in a given time depends on several factors: Reflectivity of work, specific heat of work, mass of work, kw. input and losses from oven, and time of exposure. As work temperature increases, the work loses heat by radiation and by convection to the surrounding ambient.

Although it is a general principle of Radiant Heater application that work temperature conventionally exceeds ambient temperature, in cases where high work temperatures are desired, it is necessary to enclose the heaters in order to increase the ambient. If evaporation of a liquid is desired as a result of increasing work temperature, it is necessary to provide ventilation air in order to carry away the evaporated liquid.

Maintenance

⚠ WARNING

HAZARD OF ELECTRIC SHOCK. Disconnect power before servicing heater.

To Remove Heating Element

1. Remove conduit box cover screws, gasket and cover.
2. Disconnect heating element from electrical leads at both ends.
3. Remove screws @ from porcelain terminal blocks.
4. Remove element support clips and secondary insulating bushings.
5. Lift element out of heater.

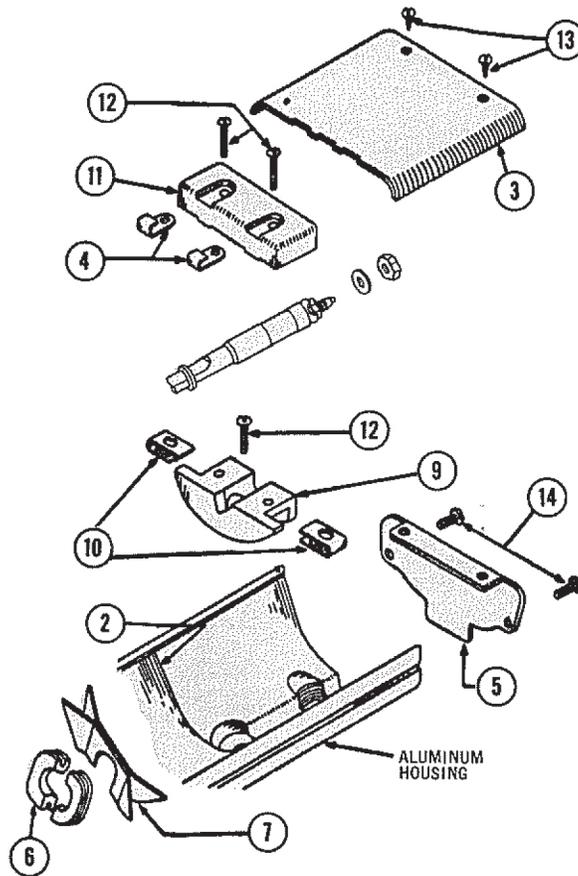
To Install Element

Observe instructions for removing element and proceed in reverse order. Be sure to replace secondary insulating bushings,

Care of Reflector

Reflectors should be cleaned periodically. A mild soap and water solution or fine cleaning powder is best although more drastic means may be required if reflectors are badly soiled by chemical or other deposits. The reflector is aluminum. DO NOT use alkali cleaners since alkalies will dull reflector. Mild non-alkaline cleaners, such as used for scouring kitchen sinks, may be used. Reflectors are replaceable and may be purchased from Chromalox.

Renewal Parts Identification



Miscellaneous Hardware

Screws		
Ref. #	Description	Part Number
12	#8 X 1" Lg.	248-075519-095(6)
13	#8 X 3/8" Lg.	248-075519-080(4)
14	#8-32 X 3/8" Lg	248-075512-053(4)

Miscellaneous Parts

Ref. #	Description	Part Number
9	Terminal Lock	303-016367-001(2)
10	Speed Nuts	272-048153-005(4)
11	Terminal Block	303-014326-001(2)

Terminal Block Set

168-016585-002 consists of the following:

Ref. #	Description	Part Number
9	Terminal Lock	303-016367-001(2)
10	Speed Nuts	272-048153-005(4)
11	Terminal Block	303-014326-001(2)
12	Screws- #8 x 1" Lg.	248-075519-095(6)

Heater Mounting Clamp Assembly

See Figures 1, 2, 3, and 4, page 1.

For mounting heater with catalog numbers up thru Cat No. RADH-630, use mounting clamp assembly part no. 168-013071-001. For mounting Cat. No. RADH-736 Use mounting clamp assembly part no. 168-013071-002

Model	Volts	Watts	Catalog Element Number	Reflector Sheet	Insulation Bushing	Element Support Clip
RADH-207	120 240	700	RTUH-207-120V RTUH-207-240V	234-013411-024	—	—
RADH-310	240	1000	RTUH-310-240V	234-013411-025	—	—
RADH-418	240	1800	RTUH-418-240V	234-013411-027	032-013454-001 (2)	059-013424-001
RADH-525	240	2500	RTUH-525-240V	234-013411-029	032-013454-001 (6)	059-013424-001 (3)
RADH-630	240	3000	RTUH-630-240V	234-013411-003* 234-013411-019*	032-013454-001 (8)	059-013424-001 (4)
RADH-736	240	3600	RTUH-735-240V	234-013411-019* 234-013411-029*	032-013454-001 (10)	059-013424-001 (5)

**For ease of installation, these reflectors shipped in two pieces (one each of part numbers listed).

Parts Common to All Heaters

Ref. #	Description	Part Number
3	Terminal Cover	306-014405-002 (2)
4	Terminal Cover	056-014401-002 (4)
5	End Plates	220-014462-001 ** 220-014462-002
8	Terminal Nut # 10-32	200-07552-016 (2)
15	Terminal Cup Washer #	328-075560-004 (2)
16	Terminal Flat Washer #	328-075528-012 (2)

**Indicates stamped end plate with voltage, wattage, etc.

NOTE: Part Numbers suffixed by a number in () indicates the quantity of the same part number used.

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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