Chromalox®

Installation, Operation

and

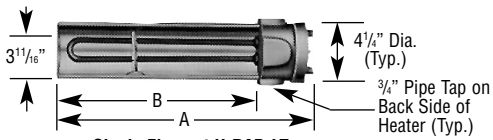
RENEWAL PARTSIDENTIFICATION

SERVICE REFERENCE	
DIVISION 4	SECTION U-RAD
SALES REFERENCE (Supersedes PG421)	PG421-1
	161-058006-001
DATE APRIL, 2005	

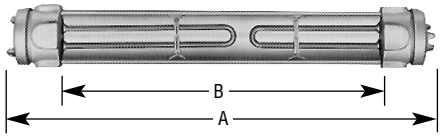
Type U-RAD-LT Electric Radiant Heaters

The Safety Alert Symbol ⚠ is used to indicate a risk of personal injury.

Please familiarize yourself with these instructions before attempting to install or operate this Radiant Heater.



Single Element U-RAD-LT



Double Element U-RAD-LT

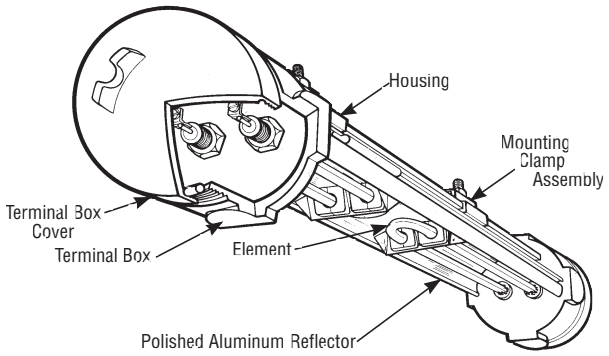


Figure 1 — Heater Parts and Dimensions

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 is located on one end of the heater.

⚠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.

Specifications Table —

Model	Volts	Watts	A Overall Length (In.)	B Heated Length (In.)
Single U-Shaped Element				
U-RAD-2LT U-RAD-2VLT	120 or 240 208 or 275	800	13 5/16	8 7/16
U-RAD-3LT U-RAD-3VLT	120 or 240 208 or 275	1100	16 7/16	11 5/16
U-RAD-4VLT U-RAD-4LT	208 or 275 240 or 480	1800	24 3/8	19 3/8
U-RAD-5VLT U-RAD-5LT	208 or 275 240 or 480	2500	31 13/16	26 13/16
U-RAD-6VLT U-RAD-6LT	208 or 275 240 or 480	3000	37 13/16	32 13/16
U-RAD-7VLT U-RAD-7LT	208 or 275 240 or 480	3600	43 15/16	38 15/16
Two U-Shaped Elements				
U-RAD-22LT U-RAD-22VLT	120 or 240 208 or 275	1600	26 1/8	16 5/8
U-RAD-32LT U-RAD-32VLT	120 or 240 208 or 275	1900	29 1/4	19 3/4
U-RAD-33LT U-RAD-33VLT	120 or 240 208 or 275	2200	32 3/8	22 7/8
U-RAD-42VLT U-RAD-42LT	208 or 275 240	2600	37 1/8	27 11/16
U-RAD-43VLT U-RAD-43LT	208 or 275 480	2900	40 1/4	30 13/16
U-RAD-44VLT U-RAD-44LT	208 or 275 240 or 480	3600	48 1/8	38 3/4
U-RAD-52VLT U-RAD-52LT	208 or 275 240	3300	44 5/8	35 1/8
U-RAD-53VLT U-RAD-53LT	208 or 275 240	3600	47 3/4	38 1/4
U-RAD-54VLT U-RAD-54LT	208 or 275 240 or 480	4300	55 5/8	46 9/16
U-RAD-55VLT U-RAD-55LT	208 or 275 240 or 480	5000	63 1/8	53 5/8
U-RAD-62VLT U-RAD-62LT	208 or 275 240	3800	50 9/16	41 1/8
U-RAD-63VLT U-RAD-63LT	208 or 275 240	4100	53 11/16	44 1/4
U-RAD-64VLT U-RAD-64LT	208 or 275 240 or 480	4800	61 9/16	52 3/16
U-RAD-65VLT U-RAD-65LT	208 or 275 240 or 480	5500	69 1/16	59 5/8
U-RAD-66VLT U-RAD-66LT	208 or 275 240 or 480	6000	75	65 5/8
U-RAD-72VLT U-RAD-72LT	208 or 275 240	4400	56 11/16	47 1/4
U-RAD-73VLT U-RAD-73LT	208 or 275 240	4700	59 13/16	50 3/8
U-RAD-74VLT U-RAD-74LT	208 or 275 240 or 480	5400	67 11/16	58 5/16
U-RAD-75VLT U-RAD-75LT	208 or 275 240 or 480	6100	75 3/16	65 11/16
U-RAD-76VLT U-RAD-76LT	208 or 275 240 or 480	6600	81 7/16	72 1/16
U-RAD-77VLT U-RAD-77LT	208 or 275 240 or 480	7200	87 1/4	77 7/8

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

1. **Clamps** — Heaters are mounted by means of the mounting clamp and 3/8" bolt assembly which is used as shown in Fig. 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 Fig. 3). For proper heater support, the maximum distance between clamps must not exceed 48". On extra-long heaters, more than two clamps are furnished.

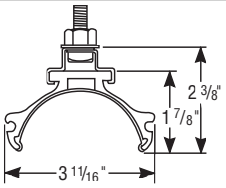

Figure 2

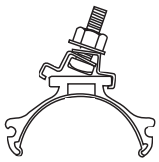
Figure 3

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 4 1/4" 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 4 1/4".
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 Fig. 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.

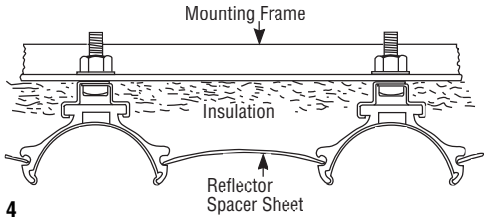

Figure 4

5. **Insulation** — Where unusually high work temperatures are encountered, it may be desirable to insulate behind heaters with high-temperature fibrous insulation. A suggested method of accomplishing this is indicated in Fig. 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.

⚠WARNING

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

A. Keep combustible materials at least 6" away form sides and back of heater housing and its supporting brackets and spaced far enough in front of heater (heating element side) so thermal radiation from the elements will not ignite combustible materials.

B. If combustible materials are being processed, stoppage of process should initiate immediate heater shutdown and interception of residual heat from radiant heaters (use radiation baffles or move heaters away from work).

C. 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, refer to NFPA 86, Standard for Ovens and Furnaces.

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 or serviced 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 the 3/4" diameter conduit opening in the terminal box.
2. Access to Radiant Heater terminals is obtained by removing the terminal box cover.
3. 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.
4. Wires supplying power to heating element terminals shall have insulation rated for 150°C minimum.

CAUTION

High Temperatures will oxidize copper. Use only nickel-plated copper wire for supplying power to heater. Do not use aluminum conductors.

5. 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.
6. Assemble terminal, screw and wire as shown in Fig. 5.

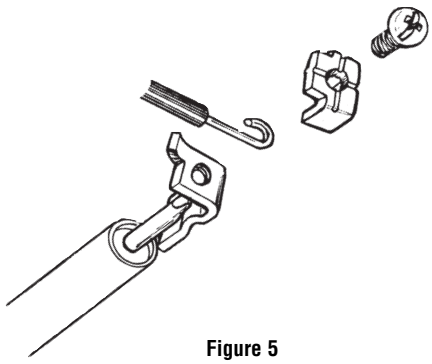
Figure 5

7. Hold terminal with pliers and tighten the terminal screw securely with a screwdriver.
   Note: Where circuit wiring is installed in locations of high ambient temperature, conductors should be insulated in accordance with requirements for temperature and voltage.

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8. **SERIES CONNECTION** of Radiant Heaters of equal volt and watt rating is permitted in all line voltages up to 600 volts. In making such series connections it is necessary to observe the "right" (series-parallel) connection rather than the "wrong" (parallel-series) connection both shown in Figure 6. If heaters are connected according to the "wrong" illustration, failure of any heater will cause progressive failure of other heaters still operating.

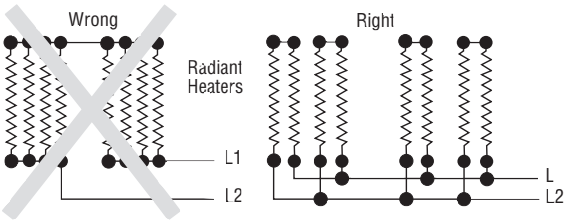

Figure 6

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 7.

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.

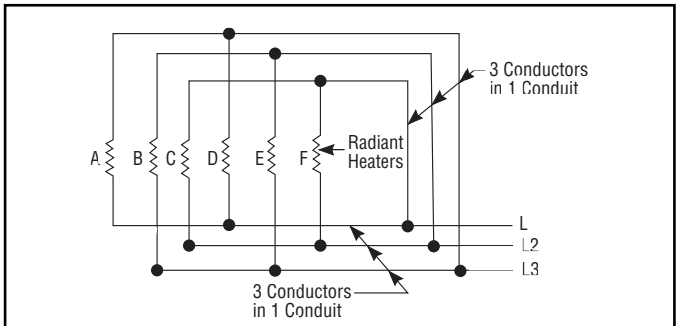

Figure 7

OPERATION

⚠WARNING

FIRE/EXPOSION 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.

Before energizing this heater:

1. **Be sure** all electrical connections are tightly made. Hold terminal with pliers when tightening screw.
2. **Be sure** that all conductors are properly insulated.
3. **Be sure** that terminal box cover has been properly replaced, and that secondary insulation bushings have not been omitted.

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 recommended. 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 450°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 extremely 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. Under carefully engineered circumstances, a maximum work temperature of 600°F may be attained.

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

To Remove Heating Element —

1. Remove terminal box cover ⑥.
2. Disconnect heating element from electrical leads.
3. Remove threaded fitting nuts ⑨ and washers ⑧.
4. Remove element support clips and secondary insulating bushings.
5. Lift out element.

To Install Element —

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

Care of Reflectors —

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

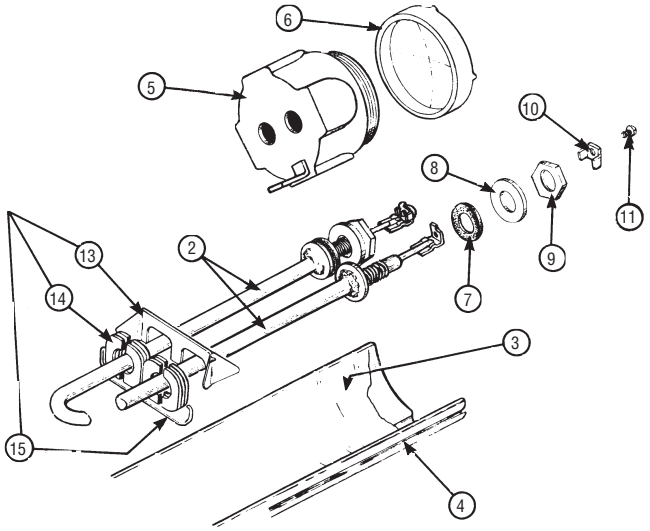

Figure 8

① Element assembly includes all parts shown except items ③ and ④ For element assembly part number, and prefix "R" to Element part number ② Ex: R UTU-6VLT, 208V, 3000W

Model	Volts	Watts	② Element*	③ Reflector	④ Aluminum Housing
U-RAD-2LT	120	800	UTU-2LT	234-013411-032	152-016961-001
U-RAD-2VLT	208		UTU-2VLT		
U-RAD-2LT	240		UTU-2LT		
U-RAD-2VLT	275		UTU-2VLT		
U-RAD-3LT	120	1100	UTU-3LT	234-013411-033	152-016961-002
U-RAD-3VLT	208		UTU-3VLT		
U-RAD-3LT	240		UTU-3LT		
U-RAD-3VLT	275		UTU-3VLT		
U-RAD-4VLT	208	1800	UTU-4VLT	234-013411-034	152-016961-003
U-RAD-4LT	240		UTU-4LT		
U-RAD-4VLT	275		UTU-4VLT		
U-RAD-4LT	480		UTU-4LT		
U-RAD-5VLT	208	2500	UTU-5VLT	234-013411-035	152-016961-004
U-RAD-5LT	240		UTU-5LT		
U-RAD-5VLT	275		UTU-5VLT		
U-RAD-5LT	480		UTU-5LT		
U-RAD-6VLT	208	3000	UTU-6VLT	234-013411-036	152-016961-005
U-RAD-6LT	240		UTU-6LT		
U-RAD-6VLT	275		UTU-6VLT		
U-RAD-6LT	480		UTU-6LT		
U-RAD-7VLT	208	3600	UTU-7VLT	234-013411-037	152-016961-006
U-RAD-7LT	240		UTU-7LT		
U-RAD-7VLT	275		UTU-7VLT		
U-RAD-7LT	480		UTU-7LT		
U-RAD-22LT	120	1600	UTU-2LT (2)	234-013411-032 (2)	152-016963-001
U-RAD-22VLT	208		UTU-2VLT (2)		
U-RAD-22LT	240		UTU-2LT (2)		
U-RAD-22VLT	275		UTU-2VLT (2)		
U-RAD-32LT	120	1900	UTU-3LT	234-013411-033	152-016963-002
			UTU-2LT	234-013411-032	
U-RAD-32VLT	208		UTU-3VLT	234-013411-033	
			UTU-2VLT	234-013411-032	
U-RAD-32LT	240		UTU-3LT	234-013411-033	
			UTU-2LT	234-013411-032	
U-RAD-32VLT	275		UTU-3VLT	234-013411-033	
			UTU-2VLT	234-013411-032	

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RENEWAL PARTS IDENTIFICATION

Model	Volts	Watts	② Element*	③ Reflector	④ Aluminum Housing
U-RAD-33LT	120	2200	UTU-3LT (2)	234-013411-033 (2)	152-016963-003
U-RAD-33VLT	208		UTU-3VLT (2)		
U-RAD-33LT	240		UTU-3LT (2)		
U-RAD-33VLT	275		UTU-3VLT (2)		
U-RAD-42VLT	208	2600	UTU-4VLT UTU-2VLT	234-013411-034 234-013411-032	152-016963-004
U-RAD-42LT	240		UTU-4LT UTU-2LT	234-013411-034 234-013411-032	
U-RAD-42VLT	275		UTU-4VLT UTU-2VLT	234-013411-034 234-013411-032	
U-RAD-43VLT	208	2900	UTU-4VLT UTU-3VLT	234-013411-034 234-013411-033	152-016963-005
U-RAD-43LT	240		UTU-4LT UTU-3LT	234-013411-034 234-013411-033	
U-RAD-43VLT	275		UTU-4VLT UTU-3VLT	234-013411-034 234-013411-033	
U-RAD-44VLT	208	3600	UTU-4VLT (2)	234-013411-034 (2)	152-016963-006
U-RAD-44LT	240		UTU-4LT (2)		
U-RAD-44VLT	275		UTU-4VLT (2)		
U-RAD-44LT	480		UTU-4LT (2)		
U-RAD-52VLT	208	3300	UTU-5VLT UTU-2VLT	234-013411-035 234-013411-032	152-016963-007
U-RAD-52LT	240		UTU-5LT UTU-2LT	234-013411-035 234-013411-032	
U-RAD-52VLT	275		UTU-5VLT UTU-2VLT	234-013411-035 234-013411-032	
U-RAD-53VLT	208	3600	UTU-5VLT UTU-3LT	234-013411-035 234-013411-033	152-016963-008
U-RAD-53LT	240		UTU-5VLT UTU-3LT	234-013411-035 234-013411-033	
U-RAD-53VLT	275		UTU-5VLT UTU-3LT	234-013411-035 234-013411-033	
U-RAD-54VLT	208	4300	UTU-5VLT UTU-4VLT	234-013411-035 234-013411-034	152-016963-009
U-RAD-54LT	240		UTU-5LT UTU-4LT	234-013411-035 234-013411-034	
U-RAD-54VLT	275		UTU-5VLT UTU-4VLT	234-013411-035 234-013411-034	
U-RAD-54LT	480		UTU-5LT UTU-4LT	234-013411-035 234-013411-034	
U-RAD-55VLT	208	5000	UTU-5VLT (2)	234-013411-035 (2)	152-016963-010
U-RAD-55LT	240		UTU-5LT (2)		
U-RAD-55VLT	275		UTU-5VLT (2)		
U-RAD-55LT	480		UTU-5LT (2)		
U-RAD-62VLT	208	3800	UTU-6VLT UTU-2VLT	234-013411-036 234-013411-032	152-016963-011
U-RAD-62LT	240		UTU-6LT UTU-2LT	234-013411-036 234-013411-032	
U-RAD-62VLT	275		UTU-6VLT UTU-2VLT	234-013411-036 234-013411-032	
U-RAD-63VLT	208	4100	UTU-6VLT UTU-3VLT	234-013411-036 234-013411-033	152-016963-012
U-RAD-63LT	240		UTU-6LT UTU-3LT	234-013411-036 234-013411-033	
U-RAD-63VLT	275		UTU-6VLT UTU-3VLT	234-013411-036 234-013411-033	
U-RAD-64VLT	208	4800	UTU-6VLT UTU-4VLT	234-013411-036 234-013411-034	152-016963-013
U-RAD-64LT	240		UTU-6LT UTU-4LT	234-013411-036 234-013411-034	
U-RAD-64VLT	275		UTU-6VLT UTU-4VLT	234-013411-036 234-013411-034	
U-RAD-64LT	480		UTU-6LT UTU-4LT	234-013411-036 234-013411-034	
U-RAD-65VLT	208	5500	UTU-6VLT UTU-5VLT	234-013411-036 234-013411-035	152-016963-014
U-RAD-65LT	240		UTU-6LT UTU-5LT	234-013411-036 234-013411-035	
U-RAD-65VLT	275		UTU-6VLT UTU-5VLT	234-013411-036 234-013411-035	
U-RAD-65LT	480		UTU-6LT UTU-5LT	234-013411-036 234-013411-035	

Model	Volts	Watts	② Element*	③ Reflector	④ Aluminum Housing
U-RAD-66VLT	208	6000	UTU-6VLT (2)	234-013411-036 (2)	152-016963-015
U-RAD-66LT	240		UTU-6LT (2)		
U-RAD-66VLT	275		UTU-6VLT (2)		
U-RAD-66LT	480		UTU-6LT (2)		
U-RAD-72VLT	208	4400	UTU-7VLT UTU-2VLT	234-013411-037 234-013411-032	152-016963-016
U-RAD-72LT	240		UTU-7LT UTU-2LT	234-013411-037 234-013411-032	
U-RAD-72VLT	275		UTU-7VLT UTU-2VLT	234-013411-037 234-013411-032	
U-RAD-73VLT	208	4700	UTU-7VLT UTU-3VLT	234-013411-037 234-013411-033	152-016963-017
U-RAD-73LT	240		UTU-7LT UTU-3LT	234-013411-037 234-013411-033	
U-RAD-73VLT	275		UTU-7VLT UTU-3VLT	234-013411-037 234-013411-033	
U-RAD-74VLT	208	5400	UTU-7VLT UTU-4VLT	234-013411-037 234-013411-034	152-016963-018
U-RAD-74LT	240		UTU-7LT UTU-4LT	234-013411-037 234-013411-034	
U-RAD-74VLT	275		UTU-7VLT UTU-4VLT	234-013411-037 234-013411-034	
U-RAD-74LT	480		UTU-7LT UTU-4LT	234-013411-037 234-013411-034	
U-RAD-75VLT	208	6100	UTU-7VLT UTU-5VLT	234-013411-037 234-013411-035	152-016963-021
U-RAD-75LT	240		UTU-7LT UTU-5LT	234-013411-037 234-013411-035	
U-RAD-75VLT	275		UTU-7VLT UTU-5VLT	234-013411-037 234-013411-035	
U-RAD-75LT	480		UTU-7LT UTU-5LT	234-013411-037 234-013411-035	
U-RAD-76VLT	208	6600	UTU-7VLT UTU-6VLT	234-013411-037 234-013411-036	152-016963-019
U-RAD-76LT	240		UTU-7LT UTU-6LT	234-013411-037 234-013411-036	
U-RAD-76VLT	275		UTU-7VLT UTU-6VLT	234-013411-037 234-013411-036	
U-RAD-76LT	480		UTU-7LT UTU-6LT	234-013411-037 234-013411-036	
U-RAD-77VLT	208	7200	UTU-7VLT (2)	234-013411-037 (2)	152-016963-020
U-RAD-77LT	240		UTU-7LT (2)		
U-RAD-77VLT	275		UTU-7VLT (2)		
U-RAD-77LT	480		UTU-7LT (2)		

*When ordering, specify Model Number and Volts. Ex: UTU-3VLT 275V

PARTS COMMON TO ALL HEATERS (PER ELEMENT)		
⑤	Terminal Box	304-037344-001
⑥	Terminal Box Cover	080-048621-001
⑦	Threaded Fitting Gasket	132-010712-007 (2)
⑧	Threaded Fitting Washer	328-046907-003 (2)
⑨	Threaded Fitting Nut	200-046906-003 (2)
⑩	Saddle Clamp	238-026539-001 (2)
⑪	Terminal Screw	248-046044-002 (2)
⑬	Element Support Clip	059-014304-002
⑭	Insulating Bushing	032-013454-001
⑮	Bushing Retaining Clip	059-017175-001

HEATER MOUNTING CLAMP ASSEMBLY	
For heaters less than 74½" overall length (Includes two complete assemblies)	168-013071-001
For heaters 74½" and greater overall length (Includes three complete assemblies)	168-013071-002

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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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