



## Heater Replacement





## RADAK HEATING ELEMENT REPLACEMENT INSTRUCTIONS

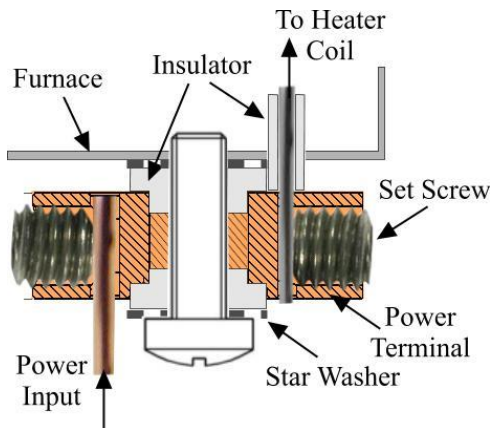
### *Removing the old Heating Element*

1. Mount the furnace base securely. It will be helpful if the furnace is bolted to a bracket held in a bench-top vise.
2. Remove wire or foil termination at upper and lower ends of heater element where they are attached to the power-leads.
3. Note location and orientation of the shorter power-lead conductor. This is where the new lower power lead will be installed.
4. Loosen the 4-40 set screws retaining both upper and lower power-leads at the copper power terminals.



5. Remove lower power lead by pulling it out of the top of its insulator.
6. Remove the upper power lead-
  - Remove the copper power terminal from the furnace base.
  - Slide the ceramic insulator down almost flush with the top of heater element support plate.
  - Pull the power conductor out of the top of insulator.

***Note: If it is necessary to remove the ceramic insulators from the furnace, they must be replaced immediately with 1/8-inch diameter rods to prevent misalignment of internal radiation baffles. Baffle misalignment will prevent re-assembly of the furnace.***



7. Note that the heater element is wound in the furnace clockwise from the bottom (as viewed from the top).
8. Beginning at the top, remove the heating element by remove the element from the notch in each successive ceramic post. Be careful to avoid damage to the ceramic heater supports.

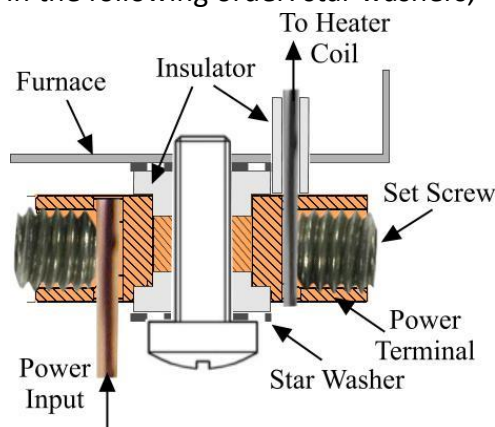


### *Install the New Heating Element*

1. If necessary, replace the existing upper (longer) power lead insulator.
 

**Note: Never remove both power lead insulators at the same time. This will leave the lower pedestal radiation baffles free to rotate possibly resulting in internal misalignment. Alignment cannot be corrected without rebuilding the furnace.**

  - Insert the upper power lead insulator into the base of the furnace until just visible inside the furnace.
2. Insert the upper (longer) power lead into the upper power lead insulator.
3. Slide the upper power lead and insulator until the insulator is just showing out of the bottom of the furnace.
4. Re-assemble the copper power terminal in the following order: star washers,



ceramic insulators, copper terminal (counter-bored side out), second set of insulators, second set of star washers, then 4-40 mounting screws.

**Note: If the screw lengths differ, the shorter screw is to be used in the outside hole.**

5. Push ceramic power-lead insulator down to seat against top of the installed copper power terminal.
6. Position the upper power lead so that the bend in the lead is two or three wire widths below the top of the furnace. The upper end should point in the same direction as the heater element winding.
7. Secure the power-lead with the set screw in the copper terminal.
8. Insert lower power-lead (attached to end of pre-wound element) into its insulator, pushing down until upper end is aligned with bottom slot in ceramic heater support post.
9. Tighten set screw in copper terminal to secure.
10. Wind in heater element, beginning at the bottom, seating element in each slot successively. At each post check to insure that all preceding turns are snugly seated. Wind to top. At the last turn, pull free end out under the upper ring alongside the upper power conductor.

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11. The end of the upper power lead should point toward free end of element. Bend heater element inward slightly where it meets the power conductor. This prevents the end of the power conductor and termination from contacting the inside of the radiation baffle assembly.

12. Wrap the supplied .015-inch diameter tantalum wire over the end of the element and the power conductor similar to that observed on the bottom conductor.

- It will be helpful in making this binding tightly if one wrap is made around the power conductor alone first.



- Make subsequent wraps tight and close together but not overlapping.



- Bring the final wrap between the power lead and the heating element and twist to ensure a tight bond.

13. Carefully trim excess wrap wire and heater element. Wrap wire should cover as much as possible of the power conductor end.



14. Loosen setscrews as necessary to rotate power feed conductors to insure the power leads do not short to adjacent element turns or to surrounding furnace structure. Tighten setscrews.

15. Check with an ohmmeter to insure heater element terminals are not shorted to furnace body.



## Heater replacement kit parts

