

## Electric Baseboard Heaters K and CB Series



### Installation, Operation & Maintenance Instructions

## IMPORTANT INSTRUCTIONS

### GENERAL

This heater is designed to provide years of efficient, trouble free operation as a primary or supplementary heat source for comfort heating in residential and commercial applications. Baseboard heaters must be thermostatically controlled for efficient, safe operation. A thermostat is not provided with this heater. However, a single or double pole thermostat accessory is available for installation into this heater at your place of purchase, or the heater may be connected to any suitable wall mounted thermostat that will meet the electrical load requirements. Installation or use of this product in any manner not described herein will void the warranty and could result in injury, damage to property, or permanent damage to heater.



### WARNING



**WHEN USING ELECTRICAL APPLIANCES, BASIC PRECAUTIONS SHOULD ALWAYS BE FOLLOWED TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, AND INJURY TO PERSONS, INCLUDING THE FOLLOWING:**

- 1) Read all instructions before installing or using the heater.
- 2) A heater has hot and arcing or sparking parts inside. Do not use in areas where gasoline or flammable liquids are used or stored.
- 3) This heater is hot when in use. To avoid burns, do not let bare skin touch hot surfaces. Keep combustible materials, such as furniture, pillows, bedding, papers, clothes, and curtains away from heater.
- 4) To prevent a possible fire, do not block air intakes or exhaust in any manner.
- 5) Do not insert or allow foreign objects to enter any ventilation or exhaust opening as this may cause an electric shock or fire, or damage the heater.
- 6) Serious injury or death could result from electric shock. Make sure electrical power supply circuit coming to heater is disconnected at main disconnect or service panel before installing or servicing this heater.



### NAMEPLATE

King Electrical Mfg. Co.  
Seattle, WA

Model 2B2405 K SERIES 4  
VOLTS 208/220/240  
WATTS 375/420/500

CAUTION: ALL WIREWAY WIRING MUST BE APPROVED FOR 75 C WIRE AND DERATED 58% NO MORE THAN 3 #10 AWG CONDUCTORS IN WIREWAY WITH NO MORE THAN 2 ENERGIZED. FIELD WIRING COMPARTMENT APPROVED FOR 60 DEGREE C WIRE. THE INSTALL BOTTOM OF HEATER NO LESS THAN 3/4" ABOVE THE FINISHED FLOOR.

**When installing in a bathroom, the heater must be connected to a GFCI protected branch circuit. Do not install in bathtub or shower areas.**

Table 1

| Total Amps   | Minimum AWG.<br>Wire Size<br>(Copper) | Circuit Breaker or<br>Fuse Size |
|--------------|---------------------------------------|---------------------------------|
| 0 thru 12    | #14                                   | 15 amp                          |
| 12.1 thru 16 | #12                                   | 20 amp                          |
| 16.1 thru 24 | #10                                   | 30 amp                          |

Table 2: Net Volumes of Wiring Compartment

| Description                              | Cubic Inches | Cubic CM |
|------------------------------------------|--------------|----------|
| Heater Only<br>(Each Wiring Compartment) | 49.69        | 8.14     |
| Heater with SP Thermostat                | 44.24        | 7.25     |
| Heater with DP Thermostat                | 44.24        | 7.25     |

Figure 1: NameplateE Location

## UNPACKING HEATER

Check heater to make sure it has not been damaged in shipping. Do not install or attempt to operate the heater if damaged. Return to place of purchase or file claim with freight carrier.

## INSTALLATION INSTRUCTIONS



### WARNING

#### TO REDUCE THE RISK OF FIRE AND ELECTRIC SHOCK OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

1. Serious injury or death could result from electric shock. Make sure electrical power supply circuit coming to heater is disconnected at main disconnect or service panel before installing this heater.
2. Wiring procedures and connections must be in accordance with the National Electrical Code (NEC) and local codes. Refer to Wiring Diagrams Figure 5. Make sure all electrical connections are tight to prevent possible overheating. Use Copper Supply Wire Only.
3. Verify the electrical power supply voltage matches the voltage rating as printed on the heater nameplate - see Figure 1.

**CAUTION - Never connect a heater to a voltage greater than the nameplate voltage as this will damage the heater and could cause a fire.**

4. Do not install the heater against combustible low-density cellulose fiberboard surfaces, against or below vinyl wall coverings, or below any materials that may be damaged by heat such as vinyl or plastic blinds, curtains, etc.
5. Do not install heater below an electrical convenience receptacle (outlet).
6. **CAUTION - Heater Operates at High Temperatures.** Keep Electrical Cords (including telephone and computer cables), Drapes, and Other Furnishings Away From Heater. For efficient and safe operation, we recommend maintaining a minimum of 6 inches (152 mm) clearance above and in front of the heater at all times. See Figure 2 for minimum clearance requirements for drapery.
7. To reduce the risk of fire, do not store or use gasoline or other flammable vapors or liquids in the vicinity of the heater.
8. Do not install heater upside down or in any position other than as shown in this manual. Caution label with word "TOP" must be at the top when heater is installed.
9. Do not recess heater in wall or install heater inside any type enclosure as this will cause heater to overheat and could create a hazard.
10. When mounting heater, (see Figure 4), make sure screws do not damage crossover wiring or the safety limit in the heater.
11. Do not remove or bypass the safety limit control as this could allow heater to become a fire hazard - see Figure 4.
12. When using Transformer Relay Accessory, supply wiring provided in compartment where this accessory is installed, must be rated 90 °C minimum.

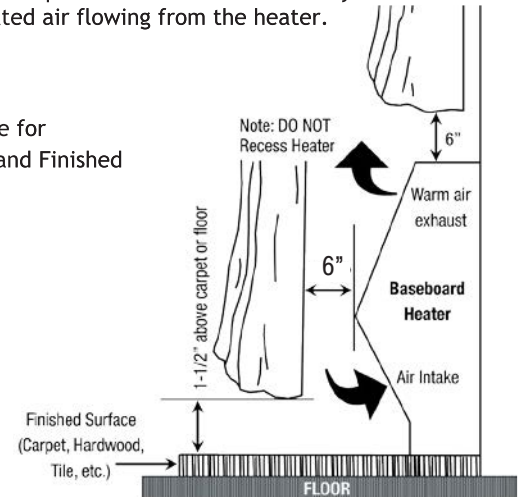
## Minimum Clearances

**Heater to Floor:** heater may be mounted directly on finished floor or, if desired, above floor (such as above the baseboard). Up to 3/4 inch (19 mm) of carpeting may be installed up to and around heater as long as it does not obstruct the air flow.

**Heater to Drapery:** do not install heater where curtains or drapery will contact the heater. See Figure 2 for required minimum clearances.

**Important Note:** Certain fabrics and materials discolor or may become damaged by heat. Therefore, avoid installing heater against vinyl wall coverings or below plastic or vinyl items such as blinds or vinyl drapes since these items may become damaged by the heated air flowing from the heater.

Figure 2:  
Clearance for  
Drapery and Finished  
Floor



**Furniture:** maintain at least 6 inches (152 mm) space between furniture and heater to allow for proper air flow.

1. Remove wiring compartment cover at end of heater where power supply cable is to enter (Figure 3). Determine desired mounting location, position heater to wall and mark wall (or floor) at location where power supply is to enter heater.
2. The air inlet of the heater cannot be obstructed by the finished floor materials such as carpet, tile or hardwood. The installer, must make allowance for the finished floor materials when installing the heater during rough-in construction on a subfloor. For example if thickness of the padding and carpet to be installed is 3/4", then the heater must be mounted 3/4" above the subfloor.

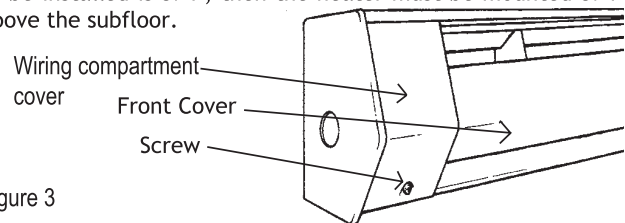


Figure 3

**NOTE:** For most efficient operation locate heaters along outside wall under windows. Position heater so it can be secured to wall stud. Power cable must enter heater through built in cable clamp or one of the knockouts provided in wiring compartment.

2. Drill hole in wall (or floor) at desired location for power supply entry. Install power supply wiring to heater and thermostat location as determined by thermostat option selected. Allow approximately 10 to 12 in (254mm to 305mm) of wire at heater for connections.
3. If any accessories are to be used with this heater, refer to installation instructions provided with the accessory for proper installation and wiring. Visit [www.king-electric.com](http://www.king-electric.com) for instructions on some common accessories.
4. Position heater at desired location and attach to wall using good screws or appropriate hardware. Locate studs and drive screws into studs where possible. For heaters up to 6 feet (1.8 m) in length, one screw at each end is adequate. For longer units, an additional screw in center is required. Tighten screws and then loosen screws at least 1/4 turn to allow heater to expand and contract during use. If unit is mounted above floor, two additional mounting holes are provided at each end below the heating element (see Figure 4). Install an additional screw at each end for stability making sure to loosen each screw at least 1/4 turn.
5. Connect the supply cable grounding wire to the green wire pigtail in wiring compartment.

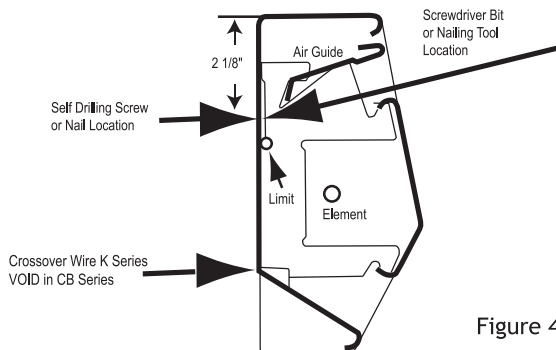


Figure 4

6. Follow the desired wiring diagram, as shown in Figure 5, to connect the power supply to the heater using approved wire nuts.

**NOTE:** When accessories are installed, use wiring diagram supplied with the accessory.

7. If front cover was removed, reinstall by hooking the top edge on the support bracket(s). Then push down to latch onto the support bracket(s).

8. Replace wiring compartment cover(s).

9. Follow instructions accompanying thermostat for installation and wiring thermostat. Visit [www.king-electric.com](http://www.king-electric.com) for typical thermostat wiring diagrams.

## For CB Ceramic Element Baseboard Heater Models

The CB Series baseboard heater has the return wire within the element and the wireway is empty. If your power supply is on the right side you will need to cut the loop to apply your power. If the power supply is on the left, cut one connector to apply power supply similar to diagram in Figure 5.

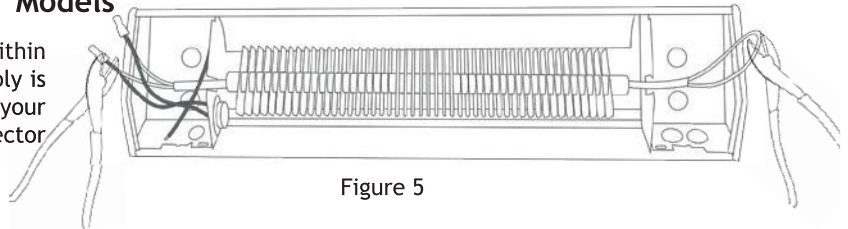
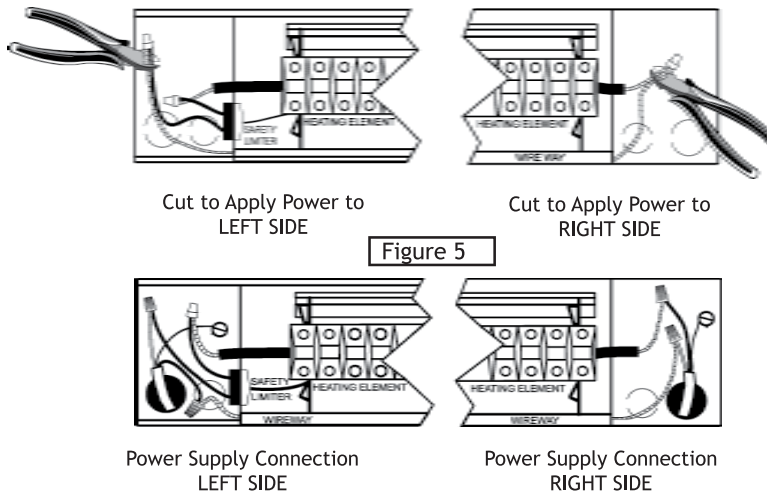


Figure 5

## For K Series Element Baseboard Heater Models

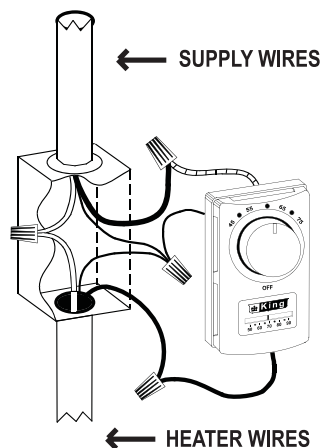


### Instructions for Left or Right Side Wiring

1. Heater can be wired from either side - wire one side only.
2. Cut one factory splice cap as shown.
3. This leaves two wires for power connection.
4. **Caution:** Do not cut both factory splice caps on left side - you need only two wires for power connection.

### Connection Diagram for Wall Thermostat

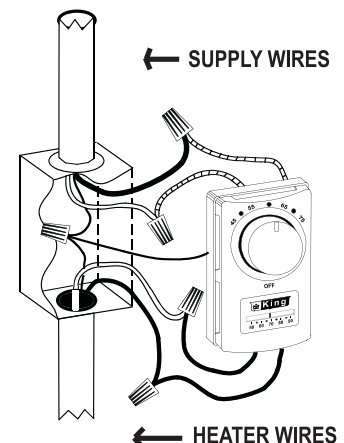
1. Connect power supply wires from wall thermostat as shown.
2. Black and white supply wires can be connected to the heater in reverse order. For simplicity the
3. most common method is shown.
4. Connect bare groundwire to green groundwire.



### Connection Diagram for Wall Mounted Single Pole Thermostat

1. Red thermostat wire to black power supply wire.
2. Black thermostat wire to black heater wire.
3. White power supply wire to white heater wire.
4. Connect all bare groundwires together.

| WIRE COLOR CHART |                 |
|------------------|-----------------|
|                  | BLACK WIRE      |
|                  | RED WIRE        |
|                  | BARE GROUNDWIRE |
|                  | WHITE WIRE      |



### Connection Diagram for Wall Mounted Double Pole Thermostat

1. Connect the two red thermostat wires to the black and white power supply wires.
2. Connect the two black thermostat wires to the black and White heater wires.
3. Connect all the bare groundwires together.

## OPERATING INSTRUCTIONS

1. This heater must be properly installed in accordance with the National Electrical Codes (NEC) & local electrical codes before it is used.
2. After the baseboard system has been completely installed, all thermostats should be turned to LOW or NO HEAT. Turn on breakers, wait 3 to 5 minutes and check to see that none of the heaters are operating. If operating, disconnect power and check wiring. If none are operating then turn thermostats to highest position and wait 3 to 5 minutes. Check to see that all heater(s) are operating. Should any not be operating, disconnect power and check wiring.
3. Allow entire system to operate steadily for 1/2 hour. This

should remove oily residue from manufacturing. (Some smoking may occur).

4. Select the setting for comfort on all thermostats.

5. A safety limit control is provided to turn off the heater automatically if it is blocked or otherwise overheats due to an abnormal condition-see Figures 4 and 5. DO NOT bypass or remove this safety device from the electrical circuit-see Warning 11 on page 2. During normal use, this safety control should not operate. If you find that this control is operating, make sure the heater is not being blocked. If it continues to cycle the heater off, disconnect power to heater and have it checked and repaired by a qualified electrician.

## MAINTENANCE INSTRUCTIONS

Your heater will give you years of service and comfort with only minimum care. To assure efficient operation follow the simple instructions below.



### WARNING

1. Serious injury or death could result from electric shock. Make sure electrical power supply circuit coming to heater is disconnected at main disconnect or service panel before servicing this heater. Allow heater to cool before cleaning to prevent a possible burn
2. Use care when cleaning element fins to avoid damaging fins. Note also that fins are sharp and may cause cuts so avoid contact.

1. The user can perform some basic cleaning of the heater. All other servicing is to be done by qualified service personnel.
2. Because of the convection heating principle which depends upon a circulation of air through the finned element, dust will collect between the fins. The heater should be cleaned regularly for maximum efficiency.

3. To clean heating element fins, first remove both wiring compartment covers and the front cover. Using a vacuum cleaner or compressed air, remove the dust and lint from the aluminum heating element fins while being careful not to damage the fins.

4. The painted heater cabinet may be cleaned using a slightly damp cloth. Do not use abrasive cleaners or waxes as these may damage the finish or leave a residue that will discolor.

5. Replace front cover (making sure it is latched in place at each element support bracket and at each end) and two wiring compartment covers (using the two screws provided), restore power and check heater for proper operation.

## Painting

If it becomes necessary to repaint heater, use only a quality enamel paint suitable for metal surfaces following the instructions provided with the paint. DO NOT paint the heating element or safety limit capillary tube. Repaint only the exterior of the cabinet.

## TROUBLESHOOTING CHART FOR BASEBOARD HEATERS

| SYMPTOM                                            | PROBLEM                                       | SOLUTION                                                                                                                                                                                                       |
|----------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Breaker trips                                      | 1. Short circuit                              | 1. Find source of short. Trace heater circuit and verify the heater is wired properly.                                                                                                                         |
|                                                    | 2. Overloaded circuit                         | 2. Reduce wattage in circuit. Refer to circuit sizing table for maximum wattage                                                                                                                                |
|                                                    | 3. Improper voltage                           | 3. Verify the heater voltage matches the supply voltage.                                                                                                                                                       |
| Heater not working                                 | 1. No power                                   | 1. Turn breaker on. Turn thermostat on. Check that the breaker is positioned properly on panel bus-bar. A 2-Pole breaker must be connected to both bus-bars (A&B phase) to produce 240V power.                 |
|                                                    | 2. Loose connections                          | 2. Tighten wire connections.                                                                                                                                                                                   |
|                                                    | 3. Defective limit                            | 3. By-pass the limit to test. If heater works, replace the limit.                                                                                                                                              |
| Heater Smokes                                      | 1. Oil on element                             | 1. It is normal for the element to burn off some light finishing oil used in the manufacturing process when first energized. Open windows and allow room to vent until it stops, usually within a few minutes. |
|                                                    | 2. Needs cleaning                             | 2. Remove any dust or dirt accumulation.                                                                                                                                                                       |
| Room Temperature does not match thermostat setting | 1. Thermostat affected by another heat source | 1. Sunlight or other heat sources can affect the thermostat. Move the thermostat to another location or remove the heat source.                                                                                |
|                                                    | 2. Improper calibration                       | 2. Remove cover and adjust calibration screw.                                                                                                                                                                  |
| Room Temperature swings from too hot to too cold   | 1. Defective or low quality thermostat        | 1. Replace with a better quality thermostat. Anticipated thermostats are fairly accurate; an electronic thermostat is the best.                                                                                |

## WARRANTY

King Electrical Mfg Company will repair or replace, without charge to the original owner, any baseboard heater found to be defective or malfunctioning within 7 years (K Series) or 12 years (CB Series) of installation. If the product becomes defective, contact King at 206-762-0400 for instructions on how to replace heater. Do not return the heater to the store. All returned goods require a Returned Goods Authorization. This warranty requires the owner or his agent install the heater in accordance with these instructions, the National Electrical Code and any other applicable heating or electrical codes. It further requires that reasonable and necessary maintenance be performed on the unit. The company is not liable for abuse or misuse of product.