



CONVERSION KIT INSTRUCTION MANUAL COMMERCIAL ELECTRIC WATER HEATER

Models: CE050, CE080, CE119

WARNING

This conversion kit shall be installed by a qualified service agency in accordance with the manufacturer's instructions and all applicable codes and requirements of the authority having jurisdiction. The information in these instructions must be followed to minimize the risk of fire or explosion or to prevent property damage, personal injury or death. The qualified service agency is responsible for the proper installation of this kit. The installation is not proper and complete until the operation of the converted appliance is checked as specified in the manufacturer's instructions supplied with this kit.

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1.0 General Information

Installation of this conversion kit must be performed by a qualified service agency. A qualified service agency is any individual, firm, corporation or company which either in person or through a representative is engaged in and is responsible for the connection, utilization, repair or servicing of electric equipment or accessories; who is experienced in such work, familiar with all precautions required, and has complied with all the requirements of the authority having jurisdiction.

This kit is for the conversion of voltage and/or wattage on your Bock water heater. Before beginning, verify that the water heater model to be converted is compatible with the conversion kit. If the kit number is not compatible with the model to be converted, contact your local sales representative or Bock Water Heaters to obtain the correct kit.

WARNING

The total number of heating elements in the water heater must be the same before and after the conversion. Any other configuration could result in unsafe conditions at the water heater.

Failure to maintain the total number of elements is not approved by Bock Water Heaters, Inc. or Underwriters Laboratories, Inc.

Proper conversion of the Bock water heater must include the following, 1) replacement of original elements with conversion elements, 2) replacement of original transformer fuses (if applicable), 3) replacement of original transformer (if applicable), 4) application of conversion ratings label, and 5) closing the crate.

2.0 Required Materials

- Conversion Kit – matches specifications for heater required and is compatible with model to be converted
- 1-1/2" deep well socket and ratchet
- 7/16" nut driver or socket wrench
- Phillips (#2) screwdriver
- 5/16" nut driver or flat head screwdriver

3.0 Approved Conversion Kits

3.1 Three Element Models

The conversion kits in this section only apply to models CE050, CE080, and CE119 that were manufactured with three heating elements. In the table below, use the voltage and wattage for the required water heater to select the proper conversion kit number.

Original Heater Models CE050/CE080/CE119, Three Element, 208/240/277/480 Volt			
Required Heater Models CE050/CE080/CE119, Three Element, see below for Voltage and Wattage			
Voltage	Element Input (kW)	Total Input (kW)	Kit Part Number
208	4.5	13.5	2631A
208	5.0	15.0	2632A
208	6.0	18.0	2633A
240	4.5	13.5	2631B
240	5.0	15.0	2632B
240	6.0	18.0	2633B
277	4.5	13.5	2631C
277	5.0	15.0	2632C
277	6.0	18.0	2633C
480	4.5	13.5	2631D
480	5.0	15.0	2632D
480	6.0	18.0	2633D

All voltage and input configurations shown above are compatible with a three phase or single phase supply.

If converting to or from 277 V, the transformer will need to be converted for compatibility with the new voltage. Contact Bock Water Heaters to purchase the correct transformer. Please reference the table below for part numbers.

Description	Part Number
277 V Transformer	20502
208/240/480 V Transformer	20500

3.2 Six Element Models

The conversion kits in this section only apply to models CE050, CE080, and CE119 that were manufactured with six heating elements. In the table below, use the voltage and wattage for the required water heater to select the proper conversion kit number.

Original Heater Models CE050/CE080/CE119, Six Element, 208/240/277/480 Volt			
Required Heater Models CE050/CE080/CE119, Six Element, see below for Voltage and Wattage			
Voltage	Element Input (kW)	Total Input (kW)	Kit Part Number
208	4.0	24.0	2634A
208	4.5	27.0	2635A
208	5.0	30.0	2636A
240	4.0	24.0	2634B
240	4.5	27.0	2635B
240	5.0	30.0	2636B
277	4.0	24.0	2634C
277	4.5	27.0	2635C
277	5.0	30.0	2636C
480	4.0	24.0	2634D
480	4.5	27.0	2635D
480	5.0	30.0	2636D

All voltage and input configurations shown above are compatible with a three phase or single phase supply.

If converting to or from 277 V, the transformer will need to be converted for compatibility with the new voltage. Contact Bock Water Heaters to purchase the correct transformer. Please reference the table below for part numbers.

Description	Part Number
277 V Transformer	20502
208/240/480 V Transformer	20500

3.3 Nine Element Models

The conversion kits in this section only apply to models CE050, CE080, and CE119 that were manufactured with nine heating elements. In the table below, use the voltage and wattage for the required water heater to select the proper conversion kit number.

Original Heater			
Models CE050/CE080/CE119, Nine Element, 208/240/277/480 Volt			
Required Heater			
Models CE050/CE080/CE119, Nine Element, see below for Voltage and Wattage			
Voltage	Element Input (kW)	Total Input (kW)	Kit Part Number
208	4.0	36.0	2637A
208	5.0	45.0	2638A
208	6.0	54.0	2639A
240	4.0	36.0	2637B
240	5.0	45.0	2638B
240	6.0	54.0	2639B
277	4.0	36.0	2637C
277	5.0	45.0	2638C
277	6.0	54.0	2639C
480	4.0	36.0	2637D
480	5.0	45.0	2638D
480	6.0	54.0	2639D

The voltage and input configurations shown above are compatible with a three phase or single phase supply except for 208V/54kW. **208V/54kW shall only be operated with a three phase supply.**

If converting to or from 277 V, the transformer will need to be converted for compatibility with the new voltage. Contact Bock Water Heaters to purchase the correct transformer. Please reference the table below for part numbers.

Description	Part Number
277 V Transformer	20502
208/240/480 V Transformer	20500

4.0 Conversion Instructions

Prior to starting the conversion, confirm that the conversion kit number matches the number shown in this manual for the original heater and the required heater. If converting to or from 277 V, a new transformer needs to be purchased separately from the conversion kit.

Figure 1 shows how to access the water heater without disassembling the entire crate. Use a box cutter to cut along the dotted access line to create a door. Cutting inside of the lines or cutting with a blade longer than 0.75" may cause damage to the product.

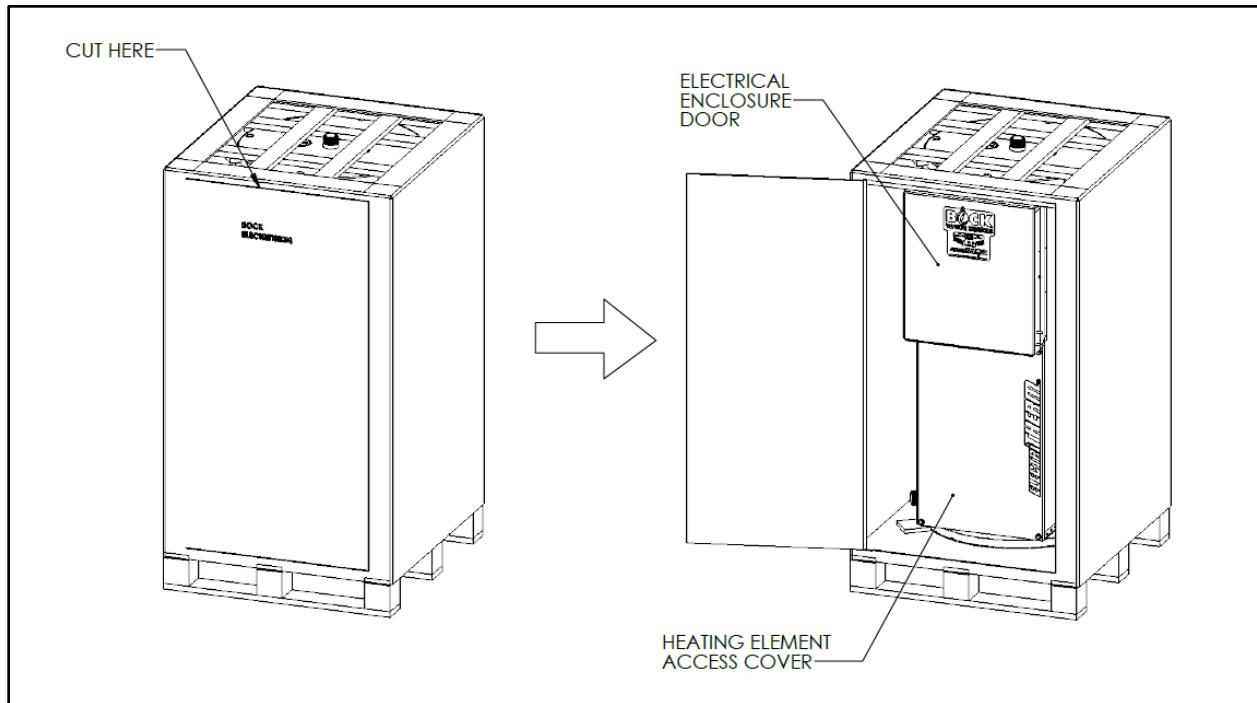


Figure 1: Opening the Crate

4.1 Voltage and/or Wattage Conversion (i.e. Element Replacement)

4.1.1 Remove the bolts (4x) from the top and bottom corners of the access panel with a $\frac{7}{16}$ " nut driver or socket wrench.



4.1.2 Remove the insulation to expose the elements.



4.1.3 Remove the insulation from the plastic flanges.

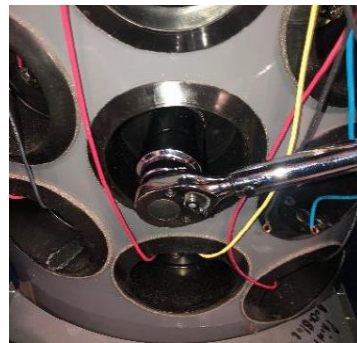


Set the insulation to the side in a safe area. All parts must be returned to their original position.

4.1.4 Use a Phillips (#2) screwdriver to loosen the two screws on the element and remove the wires.



4.1.5 Use a $1\frac{1}{2}$ " deep well socket wrench to remove the original element and O-ring from the tank.

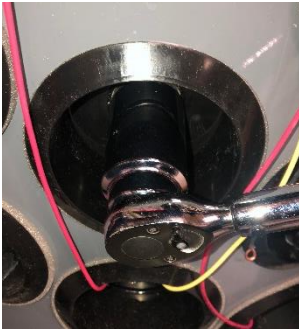


4.1.6 Obtain the required element and new O-ring gasket. Turn the element into the threaded tank fitting by hand until the gasket contacts the fitting.



NOTE: Repeat steps 4.1.4 through 4.1.8 to replace the remaining elements.

4.1.7 Use the 1½” socket torque wrench and tighten the element to approximately 50 ft/lbs.



4.1.8 Insert the bare wire ends under each screw terminal. If necessary, use a pair of rounded pliers to redirect the wires to the screw terminals. **DO NOT DAMAGE THE WIRE INSULATION.**



Tighten the screws with the Phillips screwdriver until snug. **DO NOT OVERTIGHTEN THE SCREW.**



4.2 Fuse Conversion (if applicable)

Note: This step is required only if the conversion changes the operating voltage.

4.2.1 Use a 5/16” nut driver or flat head screwdriver to loosen the screw on the right side of the electrical enclosure door. Pull the door open.

4.2.2 Find the fuse block that is located to the right of the transformer (with the three small fuses). Remove the two fuses that are connected to the primary side of the transformer (the middle and right fuses).



4.2.3 Insert the two fuses that were supplied with the conversion kit into the two empty fuse holders.

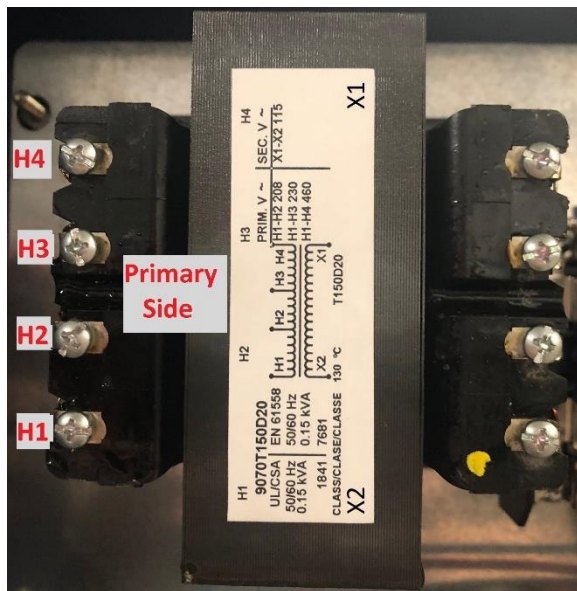
4.3 Transformer Conversion (if applicable)

Note: This step is required if converting voltages to/from any voltage other than 277V.

Skip to step 4.3.3 if converting to/from 277V

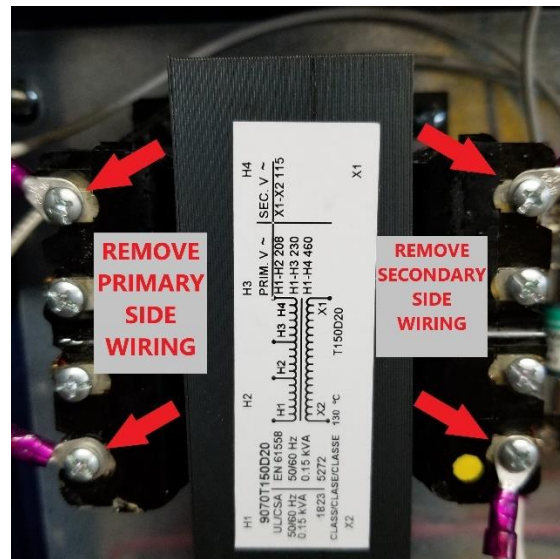
4.3.1 Disconnect the black wire from the primary side of the transformer.

4.3.2 Reconnect the black wire to the correct terminal on the primary side as shown in the table below.



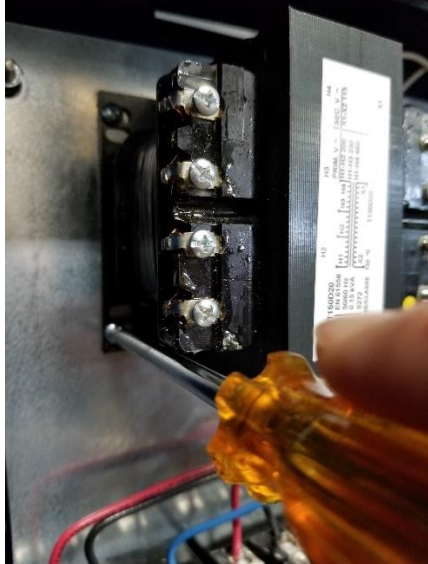
Note: The following steps are required only if converting to 277 V from 208/240/480 V OR to 208/240/480 V from 277 V.

4.3.3 Disconnect the four wires from the transformer. Note which wires are removed from the primary and secondary sides. Keep the wires separate and label them if necessary.



4.3.4 Remove the transformer from the panel by removing the four sheet metal screws.

Primary Voltage	Primary Side				Secondary Side	
	H1	H2	H3	H4	X1	X2
208 V	RD	BK	-	-	RD	WH
240 V	RD	-	BK	-	RD	WH
480 V	RD	-	-	BK	RD	WH



For the 277 V transformer:
(See Image Above)

Primary Voltage	Primary Side		Secondary Side	
	H1	H2	X1	X2
277 V	RD	BK	RD	WH

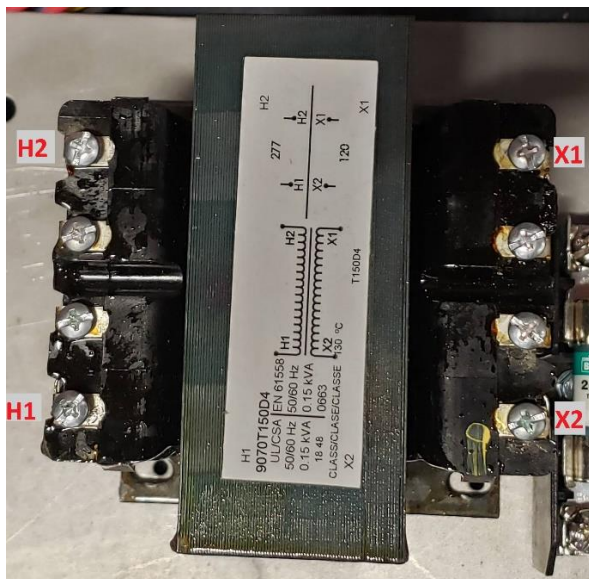
For the 208/240/480 V transformer:
(See transformer image in Step 4.3.2)

Primary Voltage	Primary Side				Secondary Side	
	H1	H2	H3	H4	X1	X2
208 V	RD	BK	-	-	RD	WH
240 V	RD	-	BK	-	RD	WH
480 V	RD	-	-	BK	RD	WH

4.3.5 Install the new transformer in the same location with the four sheet metal screws.

4.3.6 Reconnect the wiring to the transformer. There shall be a red and a black wire connected to the primary side. A red and a white wire shall be connected to the secondary side. Refer to the table below and the wiring diagrams in Appendix B for more details.

Note: H2 location on 277V transformer is different than on the 208/240/480V transformer, see image.



4.4 Replace Components

⚠ WARNING

PRIOR TO INSTALLING ALL COMPONENTS TO THEIR ORIGINAL LOCATIONS, CHECK ALL ELECTRICAL CONNECTIONS FOR TIGHTNESS. LOOSE CONNECTIONS ARE A FIRE HAZARD.

4.4.1 Make sure that the screw at every wiring terminal is tight. DO NOT OVERTIGHTEN THE SCREW.

⚠ CAUTION

RECHECK ALL TERMINALS FOR TIGHTNESS, PROPER WIRING PER SCHEMATIC, AND NEATNESS OF WIRING.

HEATER SHALL BE NO LESS THAN FACTORY CONSTRUCTED QUALITY AND APPEARANCE.

4.4.2 Double check all wiring to the elements.
Refer to Appendix B for all wiring diagrams.

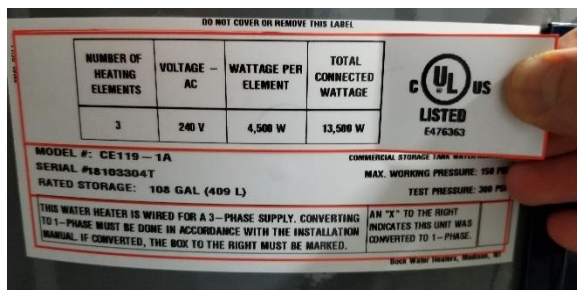
4.4.3 Return the small pieces of insulation to the plastic flanges.

4.4.4 Place the large sheet of insulation in front of the elements and secure the access panel to its original position with the four bolts.

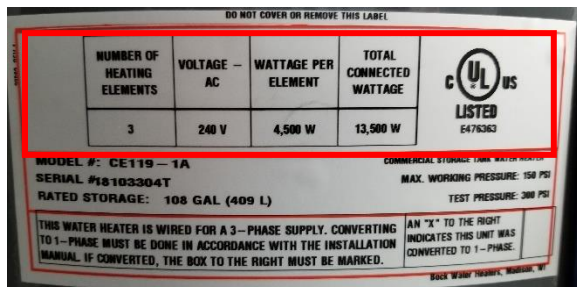
4.4.5 If applicable, close the electrical enclosure door and tighten the screw to lock the door.

4.5 Labeling

4.5.1 Peel off the ratings section on the conversion label and place over the top section on the original ratings label.



4.5.2 The converted ratings label will appear as shown below. The red box shows the converted ratings.



4.6 Close the Crate

Close the cardboard door and securely tape the box closed with packaging tape.

APPENDIX A

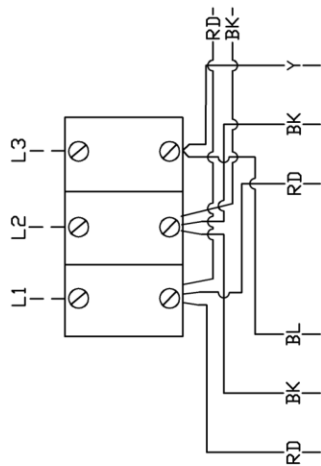
Full Load Current and Overcurrent Protection

			kW	13.5	15.0	18.0	24.0	27.0	30.0	36.0	45.0	54.0
			# of elements	3	3	3	6	6	6	9	9	9
			Element Wattage	4.5	5.0	6.0	4.0	4.5	5.0	4.0	5.0	6.0
208 V	1 ϕ	Full Load Current (Amps)		64.9	72.1	86.5	115.4	129.8	144.2	173.0	216.3	n/a
		Recommended Overcurrent Protection Rating (Amps)		90	100	110	150	175	200	225	300	n/a
	3 ϕ	Full Load Current (Amps)		37.5	41.6	50.0	66.7	75.0	83.3	100.0	125.0	150.0
		Recommended Overcurrent Protection Rating (Amps)		50	60	70	90	100	110	125	175	200
240 V	1 ϕ	Full Load Current (Amps)		56.2	62.5	75.0	100.0	112.5	125.0	150.0	187.5	225.0
		Recommended Overcurrent Protection Rating (Amps)		80	80	100	125	150	175	200	250	300
	3 ϕ	Full Load Current (Amps)		32.5	36.1	43.4	57.8	65.0	72.2	86.7	108.3	130.0
		Recommended Overcurrent Protection Rating (Amps)		45	50	60	80	90	100	110	150	175
277 V	1 ϕ	Full Load Current (Amps)		48.7	54.1	64.0	86.6	97.4	108.3	129.9	162.4	194.9
		Recommended Overcurrent Protection Rating (Amps)		70	70	80	110	125	150	175	225	250
480 V	1 ϕ	Full Load Current (Amps)		28.1	31.2	37.5	50.0	56.2	62.5	75.0	93.7	112.5
		Recommended Overcurrent Protection Rating (Amps)		40	40	50	70	80	80	100	125	150
	3 ϕ	Full Load Current (Amps)		16.2	18.0	21.6	28.9	32.5	36.1	43.3	54.1	65.0
		Recommended Overcurrent Protection Rating (Amps)		25	25	30	40	45	50	60	70	90

⚠ CAUTION



THREE PHASE CONFIGURATION (FACTORY STANDARD)

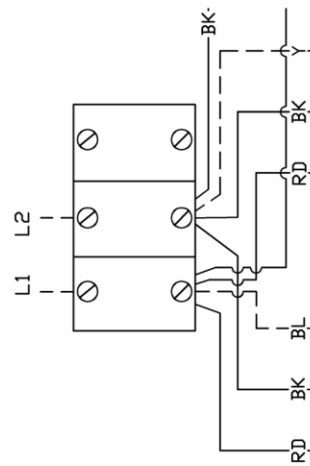


CAUTION

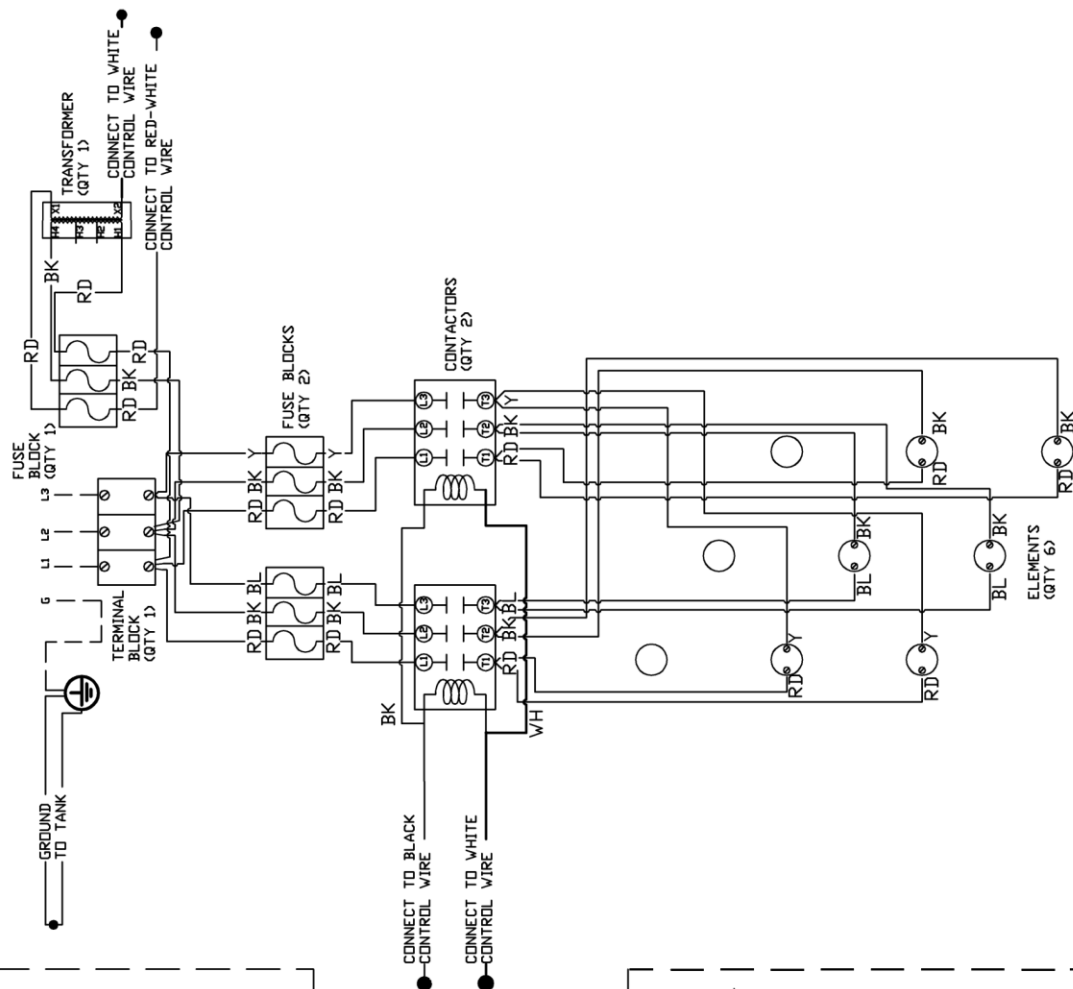
THIS WATER HEATER IS
FACTORY WIRED FOR THREE
PHASE OPERATION. TO CONVERT
FROM THREE PHASE TO SINGLE
PHASE, REFER TO THE WATER
HEATER INSTRUCTION MANUAL
OR TO THIS DIAGRAM.

SINGLE PHASE CONFIGURATION

INSTRUCTIONS:
MOVE YELLOW
WIRES TO L2,
BLUE WIRES TO L1

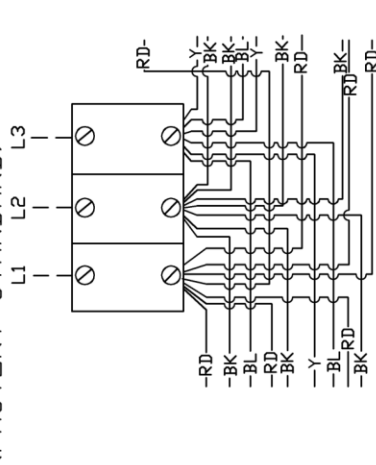


WIRING DIAGRAM 6 ELEMENT THREE PHASE



Note: If any of the original wire as supplied with the appliance must be replaced, it must be replaced with wire of its equivalent.

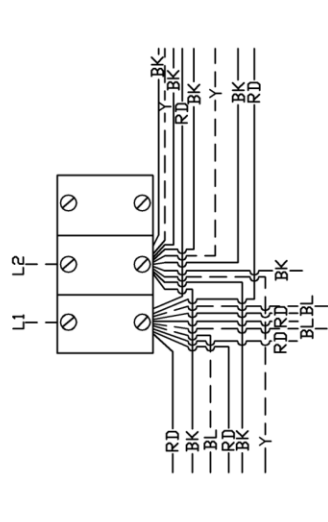
THREE PHASE CONFIGURATION (FACTORY STANDARD)



CAUTION

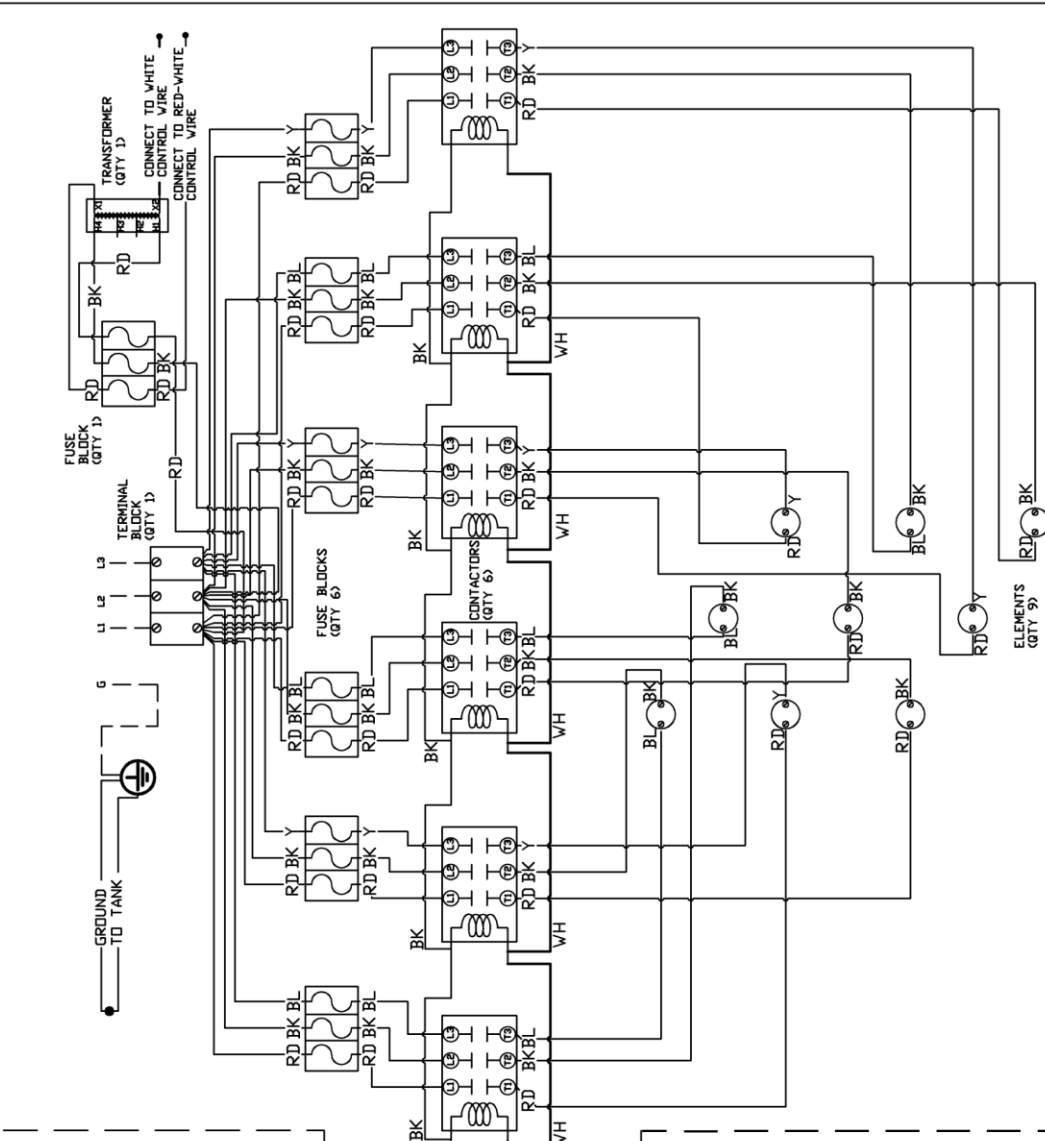
THIS WATER HEATER IS
FACTORY WIRED FOR THREE
PHASE OPERATION. TO CONVERT
FROM THREE PHASE TO SINGLE
PHASE, REFER TO THE WATER
HEATER INSTRUCTION MANUAL
OR TO THIS DIAGRAM.

SINGLE PHASE CONFIGURATION



INSTRUCTIONS:
MOVE YELLOW
WIRES TO L2,
BLUE WIRES TO L1

WIRING DIAGRAM 9 ELEMENT THREE PHASE



Note: If any of the original wire as supplied with the appliance must be replaced, it must be replaced with wire of its equivalent.