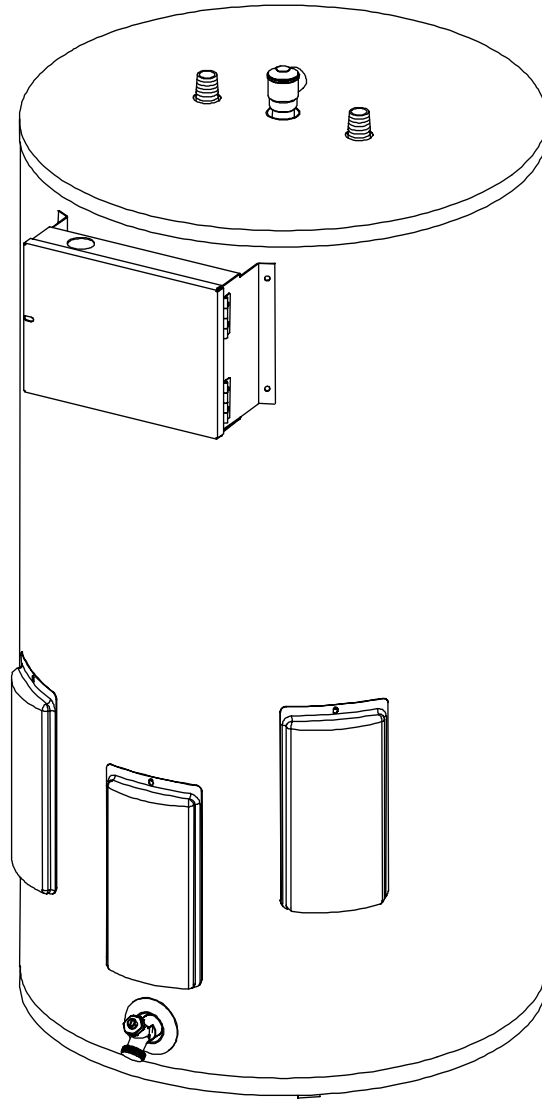


Conversions To Be Performed By A Qualified Service Person “Only”

Conversion Kit Instructions



For Models: E32-50S3, E32-80R3, & E32-120R3

Bradford White Corporation

Instructions for Conversion of Commercial Electric Models

The conversion procedure outlined in this manual is to be executed only by Qualified Service Personnel. Before attempting conversions it is recommended that you read the detailed instructions described on pages 3 thru 8.

The purpose of this instruction manual is to instruct about the changing of wattage, voltage, and electrical phase for the commercial electric water heaters manufactured by Bradford White Corporation. Underwriters Laboratories Inc. recognizes this procedure as herein presented and no deviation from these instructions are allowed.

Special factory prepared "Conversion Kits" must be used for these conversions. There are separate conversion kits that have individual instructions and must be followed. Page 4 of these instructions lists the kits that have been prepared for the various wattages and voltages.

These instructions do not allow for a modification that adds or deletes the number of heating elements originally supplied with the heater; therefore such a modification must not be attempted.

These conversion kits are only applicable to Models E32-50S-3 / 80R-3 / 120R-3.

The following information relating to the efficient and safe conversion is contained in these instructions:

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Instructions for Conversion of Commercial Electric Models

Safety Precautions

This conversion procedure is to be executed only by Qualified Service Personnel

Be sure to disconnect the water heater from the electrical supply before performing any servicing of the electrical system or before attempting any of the conversion procedures. Never perform servicing of the electrical system or any of the conversion procedures with wet hands or when you are in contact with water that is on the floor or in the vicinity of the water heater.

Introduction

These conversions have been brought into being in order to expedite the heater replacement activity. Water heaters suitable for conversion have been wired at the factory to the maximum electrical duty for which they have been designed. Therefore, internal electrical components are provided that satisfy the maximum voltage and maximum electrical current conditions

18 KW heaters suitable for operation with 208vac cannot be created by conversion since there are no “kits” established for this electrical system. These heaters can be obtained by ordering directly from the factory.

Other wattage, voltage, and phase requirements can be readily fitted to the heater. Conversions may involve altering any one or all of these electrical characteristics.

Needed Conversion Materials

Screw-in element removal wrench --- or --- 1 ½” deep throat socket wrench.

One Phillips head and one standard screwdriver.

Conversion Kit that includes: conversion instructions, electrical elements, product label overlay (related to the newly created electrical parameters), and element gaskets. Refer to page 4 of these instructions in order to determine the correct Conversion Kit numbers.

Heater Preparation

Locate the areas of the carton to be opened opposite the three electrical elements. A dotted line locates the position on the carton that needs to be scored and cut. Make these three-sided cuts and fold the carton flap outward to make an opening in the carton. The carton flap will be closed to seal the carton after conversion is completed. Remove the three element cover screws and the element covers from the heater in order to provide access to the elements.

Locate the area of the carton to be opened opposite the electrical enclosure box. A dotted line locates the position on the carton that needs to be scored and cut. Make this three-sided cut and fold the carton flap outward to make an opening in the carton. The carton flap will be closed to seal the carton after conversion is completed.

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Conversion Kits for Models E32-50S-3/80R-3/120R-3

Proceed as follows:

1. Refer to the table below that contains Heater KW, Element Wattage, Voltage, and kit part numbers.
2. Locate the KW of the required heater.
3. Move across the table (to the right) until you reach the required voltage.
4. Select the required kit number.
5. Use that kit for this conversion.
6. Refer to the remaining pages 5 thru 8 for the detailed conversion procedure.

Conversion Kit Table

Required Total Heater KW	Element Wattage	----- Kit Part Numbers -----		
		208 volts	240 volts	480 volts
6	2000	243-43942-13	243-43942-07	243-43942-01
9	3000	243-43942-14	243-43942-08	243-43942-02
12	4000	243-43942-15	243-43942-09	243-43942-03
13.5	4500	243-43942-16	243-43942-10	243-43942-04
15	5000	243-43942-17	243-43942-11	243-43942-05
18	6000	-----	243-43942-12	243-43942-06

These three element heaters with surface mount thermostats have been factory wired with the following common components; terminal block for max service wire size of 2 awg, 3 elements each having a surface mount thermostat with hi-limit control, two fuse blocks rated at 480 volts ac max, and 6 type G 30 amp fuses (rated at 480 volts max).

Instructions for Conversion of Commercial Electric Models

KW Conversion --- Element Changes

1. Remove and replace one element at a time.
2. Disconnect the electrical wires from the element terminals.
3. Remove the electrical elements using the Screw-in element removal wrench --- or ---- a 1 ½” deep throat socket wrench.
4. Remove the replacement elements from the conversion kit. Check the element markings to ensure correct wattage and voltage before installing.
5. Apply the new gasket (provided in the kit) to the element. Make sure the gasket is aligned correctly and it is not rolled- over.
6. Thread the replacement element into the element fitting until it is seated. Tighten ½ to ¾ turns with the element wrench.
7. Re-connect the wiring to the element terminals. The screw should be snugly tighten but caution should be exercised not to over tighten. To do so could fracture the element ceramic terminal block, which would have to be replaced.
8. Repeat this procedure (steps 1 thru 7 above) for all other elements needing replacement.

Voltage Conversion

1. Voltage conversion is accomplished by replacing the existing elements with elements that are rated at the required voltage.
2. To accomplish this conversion refer to the above procedure for KW Conversion ---- Element Changes.
3. Execute steps 1 thru 8 of that procedure.

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Electrical Phase Conversion

Electrical phase conversion will require a change from single-phase to three-phase or an opposite conversion change from three-phase to single-phase. Each of these conversions will be explained separately as follows:

Three-Phase to Single-Phase

1. Disconnect blue wires and yellow wires from terminal L-3 of the terminal block
2. Connect all yellow wires to terminal L-1 of the terminal block. The black wires should remain connected to L-1 of the terminal block as it was originally manufactured.
3. Connect all blue wires to terminal L-2 of the terminal block. The red wires should remain connected to L-2 of the terminal block as it was originally manufactured.
4. Field wiring for the heater power supply will eventually be connected to terminals L-1 and L-2 of the terminal block when the product is installed.

Single-Phase to Three-Phase

1. Disconnect all yellow wires from terminal L-1 of the terminal block
2. Disconnect all blue wires from terminal L-2 of the terminal block
3. Connect all blue and all yellow wires to L-3 of the terminal block
4. Field wiring for the heater power supply will eventually be connected to terminals L-1, L-2, and L-3 of the terminal block when the product is installed.

Warning --- Recheck and Make Inspection of Your Conversion

Recheck all of the electrical wiring changes made against the wiring diagram requirements for accuracy. Check to insure all of the electrical connections are tightly secured and the electrical wire routings are orderly.

Special attention should be given to the electrical heating elements. The wattage and voltage rating of the element is marked on the element itself. Confirm the marking agrees with the intended conversion. Additionally, the element wattage can be verified by checking the electrical resistance (ohms of resistance) with an Ohm Meter. This should be done initially before connecting the element to the circuit. The element resistance should be plus or minus 5 percent of the following values:

Instructions for Conversion of Commercial Electric Models

Ohms of Electrical Resistance

<u>Element Wattage</u>	<u>Voltage Rating of the Element</u>		
	<u>208</u>	<u>240</u>	<u>480</u>
2000	21.6	28.8	115.2
3000	14.4	19.2	76.8
4000	10.8	14.4	57.6
4500	9.6	12.8	51.2
5000	8.7	11.5	46.1
6000	7.2	9.6	38.4

Concluding Steps

The heater rating plate will need to be modified because the conversion altered the electrical characteristics of the heater. Refer to the illustration below that displays a typical commercial electric rating plate that is to be altered. This rating plate is placed on every Commercial Electric water heater produced by Bradford White Corporation. Locate this rating plate on the heater you have just converted.

BRADFORD WHITE CORPORATION		
200 LAFAYETTE ST. MIDDLEVILLE MI 49333		
Model No:E32-50S3		
Serial No:ZB2564812 Dash No:		
Cap. 50(gal.)/ 189.3(Liters)		
Press: Test 300(psi), Working 150(psi)		
Volts 240	Max Temp 180°	
Phase Three	Amps 43.3	3 Elements
KW Each 6	Total KW 18	
Wattage rating based upon 60 HZ		

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Also locate the adhesive backed label (marked as part # 238-43990-00) (see illustration below) that was provided inside the kit. It is marked with the new electrical data that is accurate for the conversion just executed. The kit will contain two labels for this voltage and KW. One for three phase and one for single phase. Select the correct label for the electrical phase in this conversion.

Volts 480	Max Temp 180°	
Phase Three	Amps 7.2	3 Elements
KW Each 2	Total KW 6	
Wattage rating based upon 60 HZ		238-43990-00

Remove the adhesive peel strip and place this label onto the rating plate in such a manner that the new electrical data will appear in place of the data originally marked. Refer to the illustration below that displays the rating plate revision.

BRADFORD WHITE CORPORATION 200 LAFAYETTE ST. MIDDLEVILLE MI 49333 Model No:E32-50S3 Serial No:ZB2564812 Dash No: Cap. 50(gal.)/ 189.3(Liters) Press: Test 300(psi), Working 150(psi)		
Volts 480	Max Temp 180°	
Phase Three	Amps 7.2	3 Elements
KW Each 2	Total KW 6	
Wattage rating based upon 60 HZ		238-43990-00

Replace all insulation pieces and element covers that were removed. Replace the electrical enclosure door. Heater identification information that was placed on the heater carton must also be altered. This can be done by making a bold face inscription on the carton with a large size black ink marker. Write the new electrical data in place of the original data.

The conversion is now complete.