



CONVERSION KIT INSTRUCTION MANUAL COMMERCIAL ELECTRIC WATER HEATER

Models: LCE6-1, LCE12-1, LCE20-1, LCE20-2, LCE30-2, LCE40-2, LCE50-2

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 wattage, voltage, phase, and element operating mode (from non-simultaneous to simultaneous) on your Bock water heater. Wattage and voltage conversion is achieved by changing the elements. Wiring jumpers are supplied to convert the phase or element operating mode.

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 Waters Heaters to obtain the correct kit.



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 and/or addition of wiring jumpers, 2) application of new labels and identification of new ratings, and 3) resealing the box.

2.0 Required Materials

- Conversion Kit – matches specifications for heater required and is compatible with model to be converted
- Socket (1-1/2" deep well) and ratchet
- Phillips (#2) screwdriver
- Filament packaging tape

3.0 Approved Conversion Kits

3.1 Single Element Models

The conversion kits in this section only apply to models LCE6-1, LCE12-1, and LCE20-1. In the table below, use the voltage and wattage for the required water heater to select the proper conversion kit number.

Original Heater Models 6-20, Single Element, 1-Phase, 120/208/240/277/480 Volt

Required Heater Models 6-20, Single Element, 1-Phase, see below for Voltage and Wattage
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Voltage	Element Input (kW)	Total Input (kW)	Kit Part Number
120	1.5	1.5	26100
120	2.0	2.0	26102
120	2.5	2.5	26104
120	3.0	3.0	26106
208	1.5	1.5	26108
208	2.0	2.0	26110
208	2.5	2.5	26112
208	3.0	3.0	26114
208	4.0	4.0	26118
208	4.5	4.5	26120
208	5.0	5.0	26122
208	5.5	5.5	26124
208	6.0	6.0	26126
240	1.5	1.5	26128
240	2.0	2.0	26130
240	2.5	2.5	26132
240	3.0	3.0	26134
240	3.5	3.5	26136
240	4.0	4.0	26138
240	4.5	4.5	26140
240	5.0	5.0	26142
240	5.5	5.5	26144
240	6.0	6.0	26146
277	1.5	1.5	26148
277	2.0	2.0	26150
277	2.5	2.5	26152
277	3.0	3.0	26154
277	4.0	4.0	26156
277	4.5	4.5	26158
277	6.0	6.0	26160
480	2.5	2.5	26162
480	3.0	3.0	26164
480	4.0	4.0	26166
480	4.5	4.5	26168
480	5.5	5.5	26170
480	6.0	6.0	26172

3.2 Dual Element Models – 120/277 V

The conversion kits in this section apply to models LCE20-2, LCE30-2, LCE40-2, and LCE50-2 that were built for 120 V or 277 V supply voltage. In the table below, use the voltage and wattage for the required water heater to select the proper conversion kit number.

Original Heater				
Models 20-50, Dual Element, 1-Phase, 120/277 Volt, Non-Simultaneous				
Required Heater				
Models 20-50, Dual Element, 1-Phase or 3-Phase, Non-Simultaneous or Simultaneous				
>>> See below for Voltage and Wattage <<<				
Voltage	Element Input (kW)	Total Input (kW)		Kit Part Number
		Non-Simultaneous	Simultaneous	
120	1.5	1.5	3.0	26174
120	2.0	2.0	4.0	26176
120	2.5	2.5	*	26178
120	3.0	3.0	*	26180
208	1.5	1.5	3.0	26182
208	2.0	2.0	4.0	26184
208	2.5	2.5	5.0	26186
208	3.0	3.0	6.0	26188
208	4.0	4.0	8.0	26192
208	4.5	4.5	9.0 #	26194
208	5.0	5.0	*	26196
208	5.5	5.5	*	26198
208	6.0	6.0	*	26200
240	1.5	1.5	3.0	26202
240	2.0	2.0	4.0	26204
240	2.5	2.5	5.0	26206
240	3.0	3.0	6.0	26208
240	3.5	3.5	7.0	26210
240	4.0	4.0	8.0	26212
240	4.5	4.5	9.0	26214
240	5.0	5.0	10.0 #	26216
240	5.5	5.5	11.0 #	26218
240	6.0	6.0	*	26220
277	1.5	1.5	3.0	26222
277	2.0	2.0	4.0	26224
277	2.5	2.5	5.0	26226
277	3.0	3.0	6.0	26228
277	4.0	4.0	8.0	26230
277	4.5	4.5	7.0	26232
277	6.0	6.0	*	26234
480	2.5	2.5	5.0	26236
480	3.0	3.0	6.0	26238
480	4.0	4.0	8.0	26240
480	4.5	4.5	9.0	26242
480	5.5	5.5	11.0	26244
480	6.0	6.0	12.0	26246

* NOT AVAILABLE

THREE PHASE ONLY

3.3 Dual Element Models – 208/240/480 V

The conversion kits in this section apply to models LCE20-2, LCE30-2, LCE40-2, and LCE50-2 that were built for 208 V, 240 V, or 480 V supply voltage. In the table below, use the voltage and wattage for the required water heater to select the proper conversion kit number.

Original Heater				
Models 20-50, Dual Element, 3-Phase, 208/240/480 Volt, Non-Simultaneous				

Required Heater				
Models 20-50, Dual Element, 1-Phase or 3-Phase, Non-Simultaneous or Simultaneous				
>>> See below for Voltage and Wattage <<<				

Voltage	Element Input (kW)	Total Input (kW)		Kit Part Number
		Non-Simultaneous	Simultaneous	
120	1.5	1.5	3.0	26174
120	2.0	2.0	4.0	26176
120	2.5	2.5	*	26178
120	3.0	3.0	*	26180
208	1.5	1.5	3.0	26182
208	2.0	2.0	4.0	26184
208	2.5	2.5	5.0	26186
208	3.0	3.0	6.0	26188
208	4.0	4.0	8.0	26192
208	4.5	4.5	9.0 #	26194
208	5.0	5.0	*	26196
208	5.5	5.5	*	26198
208	6.0	6.0	*	26200
240	1.5	1.5	3.0	26202
240	2.0	2.0	4.0	26204
240	2.5	2.5	5.0	26206
240	3.0	3.0	6.0	26208
240	3.5	3.5	7.0	26210
240	4.0	4.0	8.0	26212
240	4.5	4.5	9.0	26214
240	5.0	5.0	10.0 #	26216
240	5.5	5.5	11.0 #	26218
240	6.0	6.0	*	26220
277	1.5	1.5	3.0	26222
277	2.0	2.0	4.0	26224
277	2.5	2.5	5.0	26226
277	3.0	3.0	6.0	26228
277	4.0	4.0	8.0	26230
277	4.5	4.5	7.0	26232
277	6.0	6.0	*	26234
480	2.5	2.5	5.0	26236
480	3.0	3.0	6.0	26238
480	4.0	4.0	8.0	26240
480	4.5	4.5	9.0	26242
480	5.5	5.5	11.0	26244
480	6.0	6.0	12.0	26246

* NOT AVAILABLE

THREE PHASE ONLY

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. The kit contains the necessary parts to change the voltage, wattage, phase, and element operating mode (simultaneous or non-simultaneous).

To access the water heater without disassembling the packaging, a 2-sided flap must be cut from the front and right side of the cardboard box. Refer to Figure 1 for locating the cut. The opening on the right side of the box shall only extend to the metal strap. Use the vertical edge along the front-left corner as a hinge for the flap.

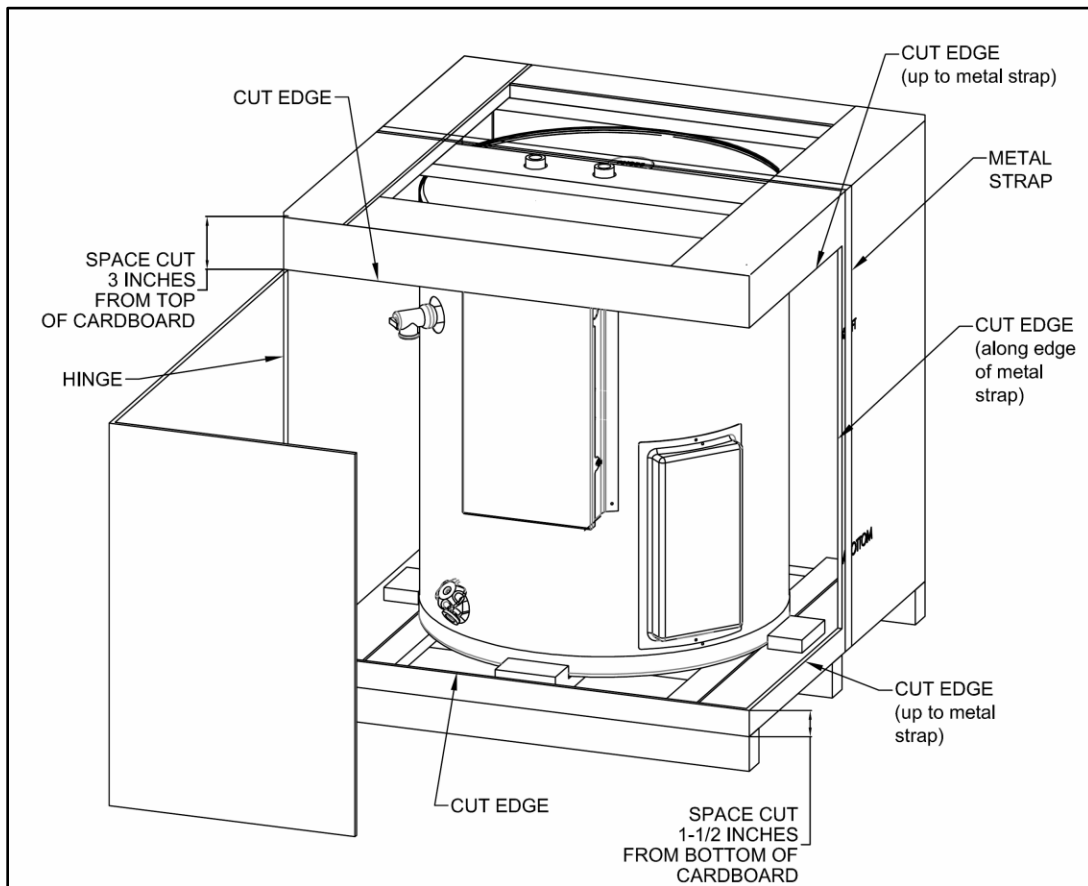


Figure 1: Cutting the Box

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

4.1.1 Remove the screws (2x) from the top and bottom of the access panel with a Phillips (#2) screwdriver.



4.1.2 Pull the cover out of the foam barrier to expose the thermostat and element. If applicable, remove the insulation.



4.1.3 Remove the plastic protector from the thermostat by lifting the protector forward and up.



Set the foam barrier cover, insulation (if applicable) and plastic protector 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 1-1/2" deep well socket wrench to remove the original element 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. Use the 1-1/2" socket wrench to tighten another 1/2 to 3/4 of a turn.



4.1.7 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.** Overtightening may push the wire out from under the screw - damaging the control, breaking continuity, or both.



NOTE: Dual element models have an additional element located behind the junction cabinet. Loosen the set screw on the lower right side of the cabinet and pull the door open to access the element. Repeat steps 4.1.1 through 4.1.7 to replace the element.

4.2 Phase Conversion

Dual element models are factory wired for connection to a three-phase delta branch circuit. The phase may be converted to single-phase by adding a jumper to the terminal block.

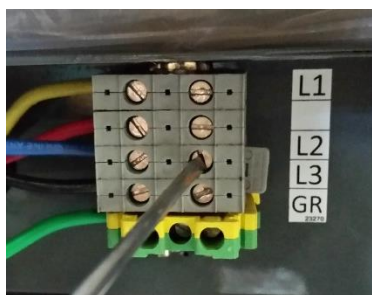
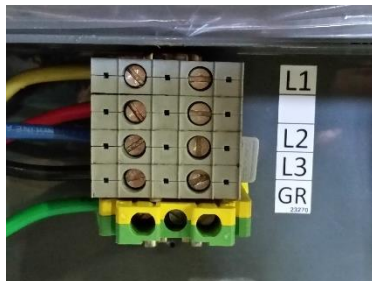
**WARNING**

NOT ALL VOLTAGE, WATTAGE, AND OPERATING MODE CONFIGURATIONS CAN BE CONVERTED FROM THREE-PHASE TO SINGLE-PHASE. REFER TO APPENDIX A FOR SPECIFIC LIMITATIONS.

4.2.1 Obtain a factory supplied jumper from the conversion kit.




4.2.2 Insert the jumper into the L2 and L3 positions on the terminal block. Tighten the L2 and L3 screws to secure the jumper in place.



4.2.3 At the jobsite, the power supply will be connected to L1 and L2.

4.3 Element Operating Mode Conversion

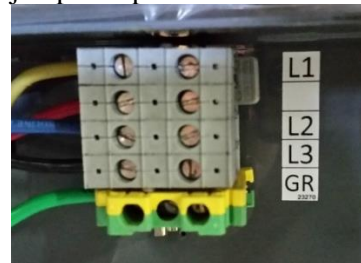
Dual element models are factory wired for non-simultaneous element operation (i.e. only one element may operate at a time). The operating mode may be converted to simultaneous operation (i.e. both elements can operate at the same time) by adding a jumper to the terminal block.

**WARNING**

NOT ALL VOLTAGE, WATTAGE, AND PHASE CONFIGURATIONS CAN BE CONVERTED FROM NON-SIMULTANEOUS TO SIMULTANEOUS OPERATION. REFER TO APPENDIX A FOR SPECIFIC LIMITATIONS.


4.3.1 Obtain a factory supplied jumper from the conversion kit. *See image in Step 4.2.1.*

4.3.2 Insert the jumper into the L1 and “OPEN” positions on the terminal block. Tighten the L1 and “OPEN” position screws to secure the jumper in place.




Refer to Appendix B for all wiring diagrams.

4.4 Replace Components


WARNING

PRIOR TO INSTALLING ALL COMPONENTS TO THEIR ORIGINAL LOCATIONS, CHECK ALL WATER AND 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.** Overtightening may push the wire out from under the screw - damaging the control, breaking continuity, or both.


CAUTION

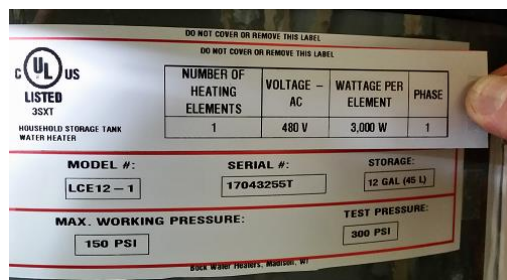
RECHECK ALL TERMINALS FOR TIGHTNESS, PROPER WIRING PER SCHEMATIC, AND NEATNESS OF WIRING.

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

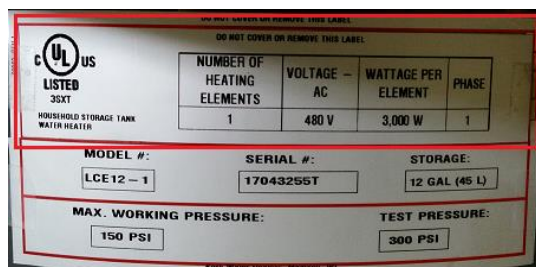
4.4.2 Install the plastic thermostat protector, insulation (if applicable), foam barrier cover, and access panel to their original locations.

4.5 Labeling

4.5.1 For single element models, peel off the ratings section on the conversion label and place over the top section on the original ratings label.



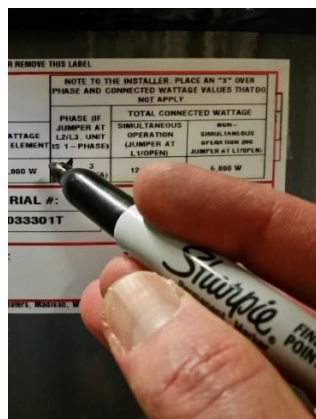
4.5.2 The converted ratings label (on single element models) will appear as shown below. The red box shows the converted ratings.



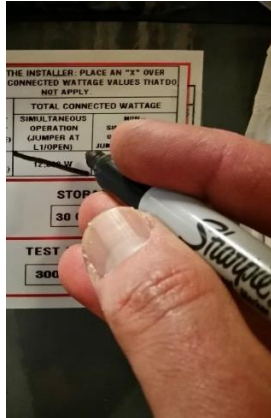
4.5.3 For dual element models, peel-off the ratings section on the conversion label and place over the top section on the original ratings label.



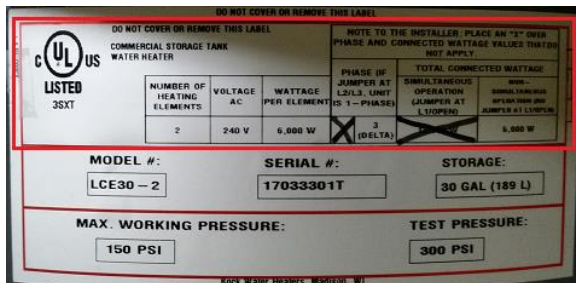
4.5.2 **Dual element models only** - With a black permanent marker, place an "x" over the phase rating that **DOES NOT** match the rating of the converted water heater.



4.5.3 Dual element models only - With a black permanent marker, place an “x” over the “total connected wattage” rating that DOES NOT match the rating of the converted water heater.



4.5.4 The converted ratings label (on dual element models) will appear as shown below. The red box shows the converted ratings.

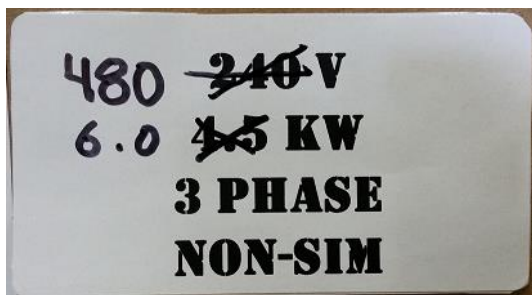
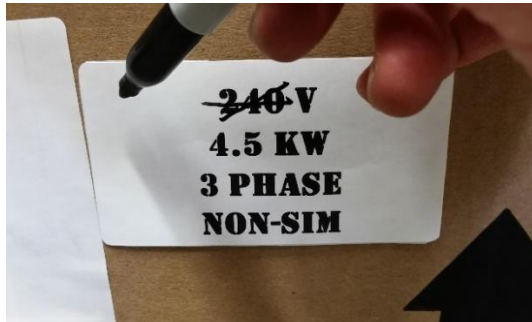


4.5.5 Dual element models only - If a jumper was added, cover the original wiring diagram (located on inside of junction cabinet door) with a new diagram for the specific converted water heater configuration. The table below specifies the correct wiring diagram sticker based on jumper location(s). The part number is located at the lower right corner of the sticker.

Jumper Location(s)	Wiring Diagram Sticker Part No.
L2-L3	23266
L1-OPEN	23267
L2-L3 & L1-OPEN	23268



4.5.6 With a black permanent marker, cross-out the original heater ratings on the box and write the converted ratings as applicable.



4.6 Close the Box

Close the flap on the box and seal the cut with filament tape.



APPENDIX A

Approved Element Ratings					
Input Rating (kW)	Voltage Rating (V)				
	120	208	240	277	480
1.5	Yes	Yes	Yes	Yes	Yes
2.0	Yes	Yes	Yes	Yes	Yes
2.5	Yes ¹	Yes	Yes	Yes	Yes
3.0	Yes ²	Yes	Yes	Yes	Yes
3.5	-	-	Yes	-	-
4.0	-	Yes	Yes	Yes	Yes
4.5	-	Yes ³	Yes	Yes	Yes
5.0	-	Yes ⁴	Yes ⁷	Yes	Yes
5.5	-	Yes ⁵	Yes ⁸	-	Yes
6.0	-	Yes ⁶	Yes ⁹	Yes ¹⁰	Yes

Notes:

120/277V available in single phase only.

¹120V/2500W available as non-simultaneous only.

²120V/3000W available as non-simultaneous only.

³208V/4500W simultaneous available in three phase only.

⁴208V/5000W available as non-simultaneous only.

⁵208V/5500W available as non-simultaneous only.

⁶208V/6000W available as non-simultaneous only.

⁷240V/5000W simultaneous available in three phase only.

⁸240V/5500W simultaneous available in three phase only.

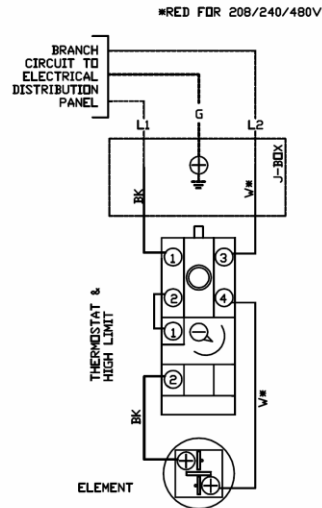
⁹240V/6000W available as non-simultaneous only.

¹⁰277V/6000W available as non-simultaneous only.

APPENDIX B

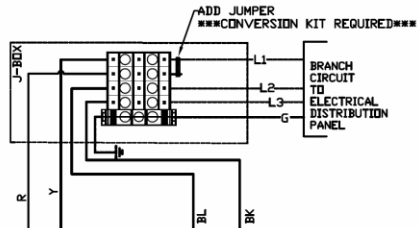
FACTORY WIRING

SINGLE ELEMENT MODELS SINGLE PHASE

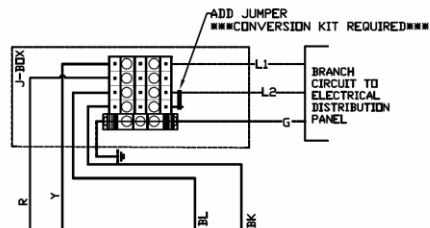


ALTERNATIVE WIRING (CONVERSION KIT REQUIRED)

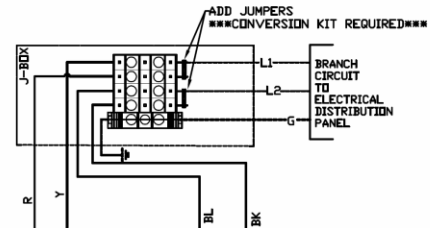
DUAL ELEMENT MODELS THREE PHASE, SIMULTANEOUS



DUAL ELEMENT MODELS SINGLE PHASE, NON-SIMULTANEOUS



DUAL ELEMENT MODELS SINGLE PHASE, SIMULTANEOUS



DUAL ELEMENT MODELS THREE PHASE, NON-SIMULTANEOUS

