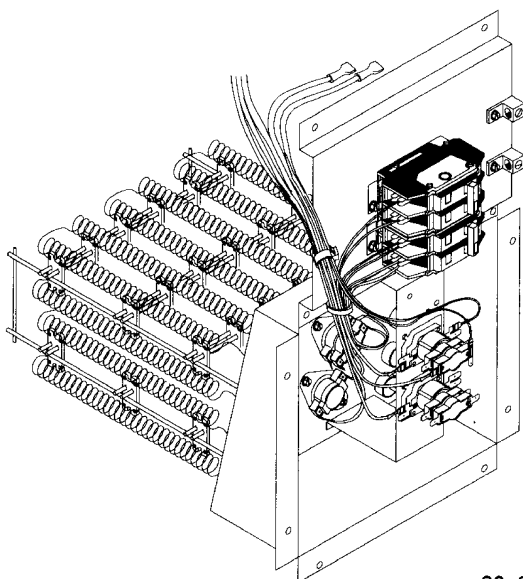


Installation Instructions

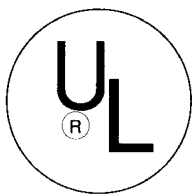


80-30-42a

- Safety Labeling
- Installation Procedures
- Wiring
- Start-Up Procedures
- Technical Data
- Parts

Model Series
208/240V
1 Phase – 60 Cycles

AEB005BKA1
AEB010CKA1
AEB015BKA1
AEB015CKA1
AEB020CKA1
AEB025CKA1
AEB030CKA1



ELECTRIC HEAT ACCESSORY
FOR 2 – 5 TON PACKAGE UNITS

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1. Safety Labeling and Signal Words

Danger, Warning and Caution

The signal words **DANGER**, **WARNING** and **CAUTION** are used to identify levels of hazard seriousness. The signal word **DANGER** is only used on product labels to signify an immediate hazard. The signal words **WARNING** and **CAUTION** will be used on product labels and throughout this manual and other manuals that may apply to the product.

Signal Words

DANGER – Immediate hazards which **WILL** result in severe personal injury or death.

WARNING – Hazards or unsafe practices which **COULD** result in severe personal injury or death.

CAUTION – Hazards or unsafe practices which **COULD** result in minor personal injury or product or property damage.

Signal Words in Manuals

The signal word **WARNING** is used throughout this manual in the following manner:

WARNING

The signal word **CAUTION** is used throughout this manual in the following manner:

CAUTION

Product Labeling

Signal words are used in combination with colors and/or pictures on product labels. Following are examples of product labels with explanations of the colors used.

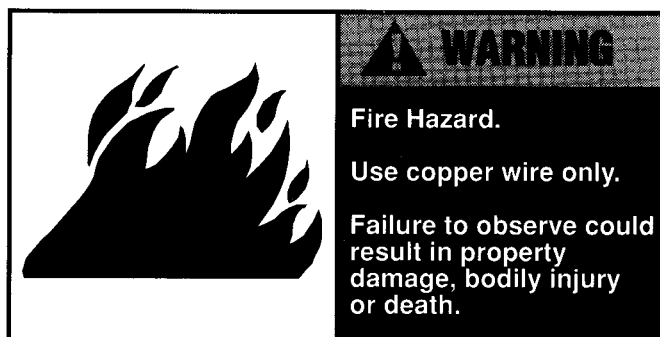
Danger Label

White lettering on a black background except the word **DANGER** which is white with a red background.



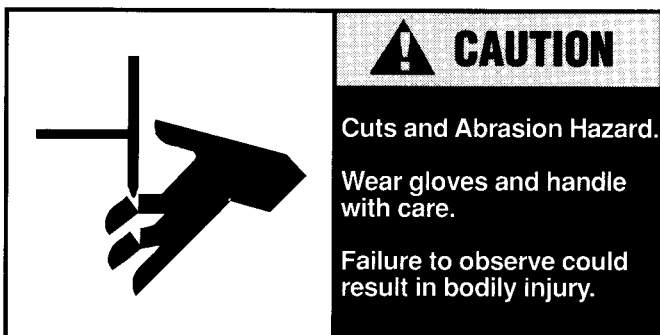
Warning Label

White lettering on a black background except the word **WARNING** which is black with an orange background.



Caution Label

White lettering on a black background except the word **CAUTION** which is black with a yellow background.



2. General Information

General Information

WARNING

Installation or repairs made by unqualified persons can result in hazards to you and others. Installation must conform with local building codes or, in the absence of local codes, with National Electrical Code ANSI/NFPA 70–1990 or current edition or in Canada with CSA C.22.1 – Canadian Electrical Code Part 1 or current edition.

The information contained in this manual is intended for use by a qualified service technician familiar with safety procedures, equipped with the proper tools and test instruments.

Failure to carefully read and follow all instructions in this manual can result in malfunction, property damage, personal injury, and/or death.

When an electric heat accessory is installed, two separate field power supplies **MUST** be provided – one or more for the electric heat accessory and one for the unit. This process is detailed in later sections of this manual.

Model Series

The following electric heater accessory models are designed for installation into the following units:

Unit Size	Heater Model Number
2 tons	AEB005BKA1
2 1/2 tons	AEB010CKA1
	AEB015BKA1
3 tons	AEB005BKA1
3 1/2 tons	AEB010CKA1
	AEB015CKA1
	AEB020CKA1
4 tons	AEB005BKA1
5 tons	AEB010CKA1
	AEB015CKA1
	AEB020CKA1
	AEB025CKA1
	AEB030CKA1

3. Installing Electric Heat Accessory

WARNING

Electrical shock hazard.

Shut OFF electric power at unit disconnect and/or service panel before beginning the following procedures.

Failure to follow this warning can result in property damage, personal injury, and/or death.

1. Shut OFF electric power at unit disconnect switch or service panel.
2. Remove the heater access panel from unit.
3. From inside the heater compartment, remove the two screws above the insulated cover plate and save the screws (see **Figure 1**).

Remove the eight screws that attach the insulated cover plate to the bottom center of the heater division panel. Remove the insulated cover plate and save the screws.

The screws will be used later to mount the electric heat accessory and its cover.

4. Place the electric heat accessory in its proper mounting position as shown in **Figure 2**.

Secure the electric heat accessory with six of the screws removed in **Step 3**. The other four screws will be used to attach the electric heat accessory cover after electrical wiring is complete.

Figure 1 Removing Insulated Cover Plate

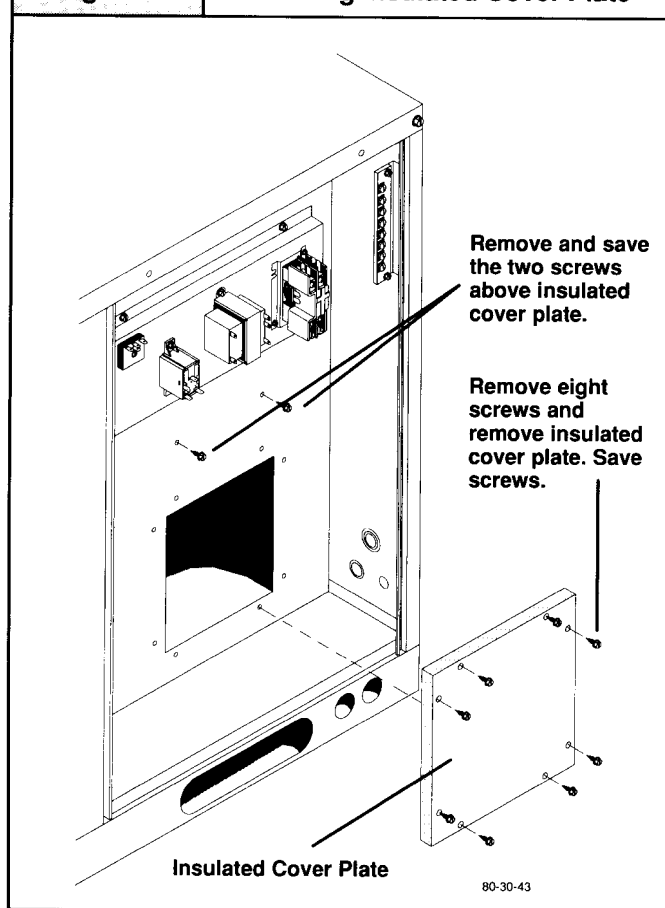
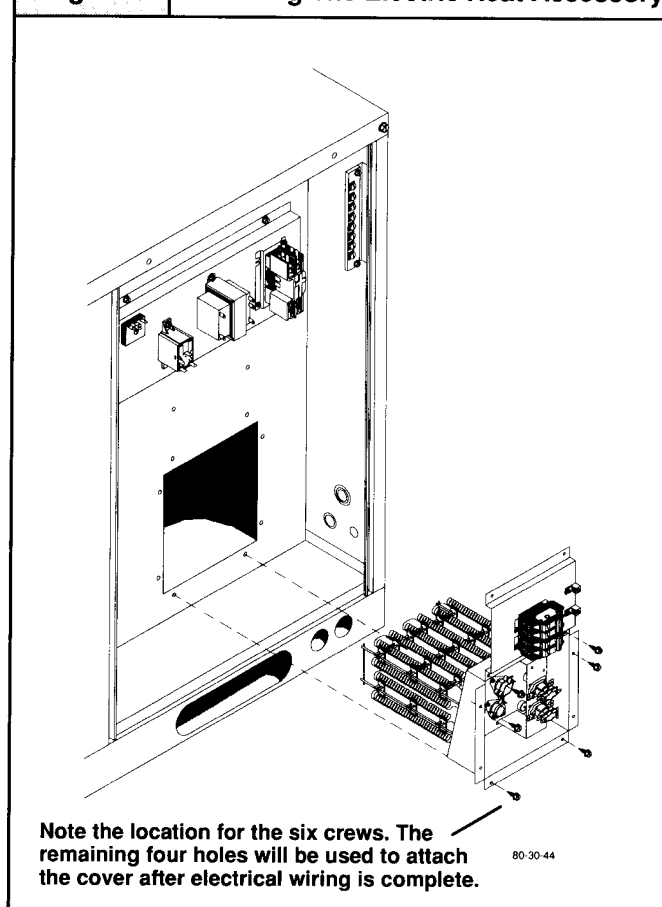


Figure 2 Installing The Electric Heat Accessory



4. Electrical Wiring

WARNING

Electrical shock hazard.

Shut OFF electric power at unit disconnect or service panel before making any electrical connections.

Unit MUST be grounded before making line voltage connections. Do NOT fuse ground or neutral conductors.

Failure to follow this warning can result in property damage, personal injury, and/or death.

NOTE: All electrical work **MUST** conform with the requirements of local codes and ordinances and in the United States with National Electrical Code ANSI/NFPA70–1990 or current edition and in Canada CSA C.22.1 – Canadian Electrical Code Part 1 or current edition. Provide line voltage power supply from a separate protected circuit with a disconnect switch (when required) located within sight of the unit. Supply voltage, amperage, fuse and disconnect switch sizes **MUST** conform with all technical specifications in this manual and on the unit rating plate.

Wiring **MUST** be protected from possible mechanical damage and **MUST NOT** interfere with removal of access panels, filters, etc.

All exposed wiring or connections **MUST** be made with weatherproof cable or wire unless installed in conduit.

All line voltage connections and the ground connection **MUST** be made with copper wire.

The power supply wiring **MUST** have overcurrent protection. This can be either fuses or circuit breakers. The maximum size for the overcurrent protection is shown in the column labeled "Max. Fuse or NEC HACR Breaker (Amps)" in the Electrical Data Table in **Figure 5** or on the unit rating plate.

Grounding

Permanently ground the electric heat accessory in accordance with local codes and ordinances and in the United States with National Electrical Code ANSI/NFPA70–1990 or current edition and in Canada with CSA C.22.1 – Canadian Electrical Code Part 1 or current edition. Use a copper conductor of the appropriate size from the electric heat accessory to the ground lug on the circuit breaker panel as shown in **Figure 3**.

Adjusting Thermostat Anticipator

Set the heat anticipator of the thermostat to the proper value. See instructions provided with the thermostat before making this adjustment.

Model Number	Anticipator Setting
AEB005BKA1	.18
AEB010CKA1	.36
AEB015BKA1	.36
AEB015CKA1	.36
AEB020CKA1	.54
AEB025CKA1	.72
AEB030CKA1	.72

Limit Controls

The limit controls are mounted on the face of the heater and are wired into the supply wires to each element. If there is not enough air flow through the heater, the limit will open and break the power circuit. The limit will reset when the electric heat accessory cools down.

Time Delay Operation

The heater elements are switched **ON** and **OFF** through one or more controls which operate through the low voltage thermostat circuit.

These controls consist of a number of time delays depending on the specific heater model. An electric heat accessory has anywhere from 1–4 of these controls. The first time delay is activated when the thermostat contacts close. Approximately 20 seconds later the indoor blower and the first heater bank are energized. Approximately 70 seconds after the first heater bank is energized the remaining time delays and heater banks are energized.

Staging

Some electric utilities require staging on electric heaters larger than 6 kilowatts. Therefore, the heater elements are turned on in 5 or 10 kW increments under control of the sequencers.

The wiring diagram identifies the proper wire to control each of the electric heat stages. Some electronic indoor thermostats may provide the necessary staging for multiple stages of electric heat. When this type of thermostat is used, refer to its instructions and the appropriate wiring

diagram for the heater to select wires to connect for proper staging sequence.

NOTE: If an indoor thermostat is used for staging, it must do so by breaking the 24V "common" leg and not the "hot" leg. Consult the electric heat accessory wiring diagram.

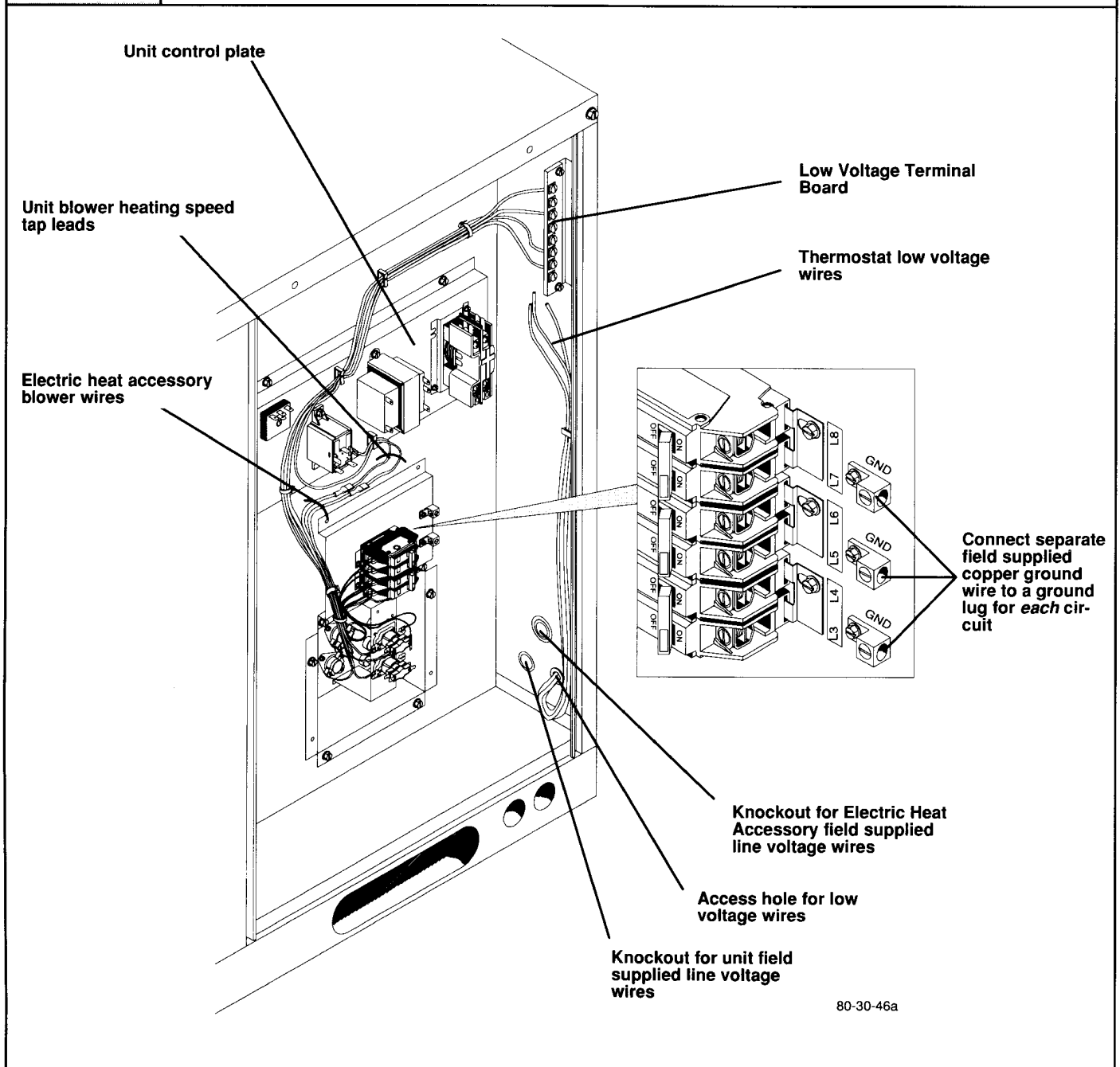
If the thermostat does not have staging capabilities, accessory electronic outdoor thermostats are available that will control two or four stages of electric heat.

Installing Wiring

1. Shut **OFF** electric power at unit disconnect or service panel.
2. Install the appropriate field supplied conduit fitting into the *upper* knockout located in the corner post of the unit (see **Figure 3**). The knockout is sized for 1", 1½" and 2" conduit.

NOTE: The *bottom* knockouts **MUST** be used for the unit's field supplied line voltage wires **ONLY**.

Figure 3 Typical Wiring Installation



3. Route the electric heat accessory's field supplied line voltage wires through the conduit fitting to the line side of the electric heat accessory's circuit breaker(s). Make line voltage connections to L3–L8 as appropriate.
4. Connect field installed copper ground wire(s) to the ground lug(s) on the circuit breaker panel. On models with more than one circuit, a separate copper ground wire **MUST** be connected to a separate ground lug for *each* circuit.
5. The electric heat accessory blower wires are the two red wires with insulated female quick connects. Route and connect these two wires to the two red blower heating speed tap leads located on the unit control plate.
6. Check the electric heat accessory's wiring diagram to see how to wire the unit's low voltage terminal board. Route and connect the electric heat accessory's low voltage wires to the unit's low voltage terminal board.
7. Secure the electric heat accessory's cover with the remaining four screws.

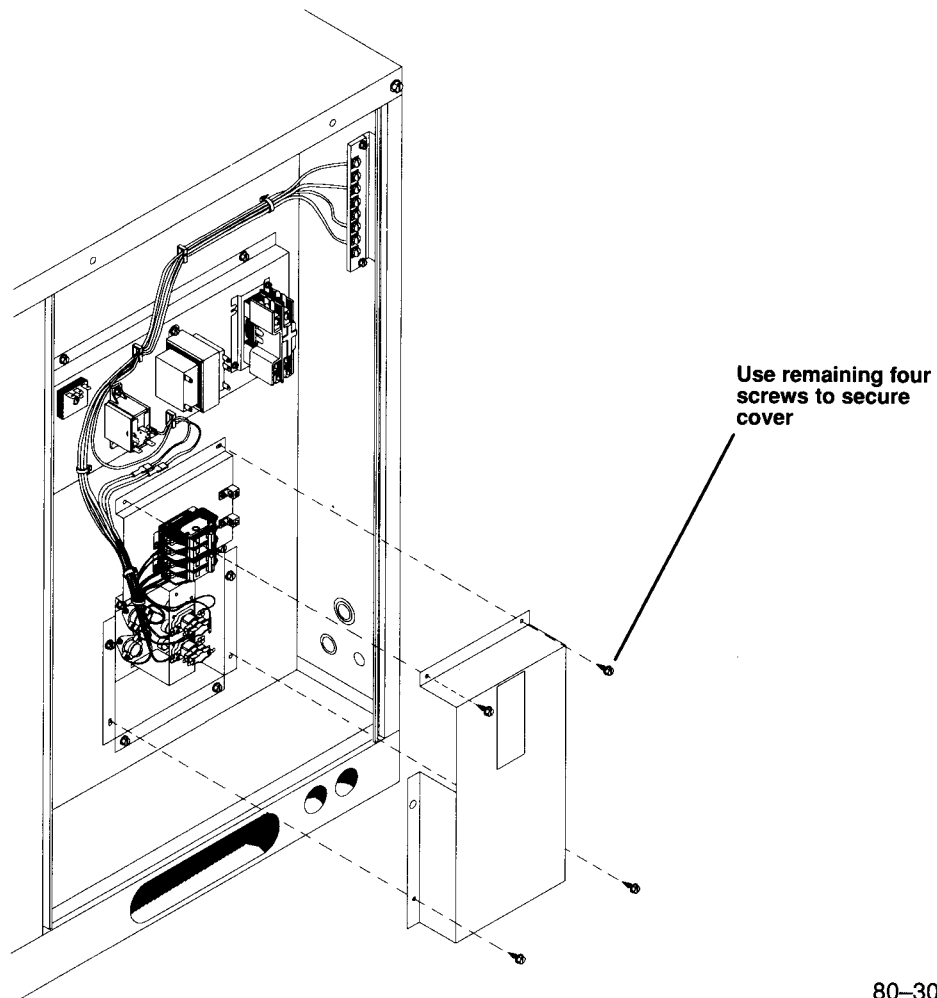
WARNING

Electrical shock hazard.

Replace cover after making wire connections.

Failure to follow this warning can result in personal injury and/or death.

Figure 4 Installing Electric Heat Accessory Cover



80-30-45

5. Start-up Procedure

WARNING

Electrical shock hazard.

Use extreme care during all of the following checks and procedures.

Make sure electric power is turned OFF as instructed in appropriate steps.

Failure to follow this warning can result in property damage, personal injury, and/or death.

Check the unit's operation as outlined in the following instructions.

NOTE: The electric heat accessory Start-up Procedures are performed *after* the unit has been set to the proper airflow for cooling and the cooling Start-up Procedures have been completed. If these have not been done, first perform the Airflow and Start-up Procedures in the unit's *Installation Instructions* before continuing with this section.

Blower Check

NOTE: Do not repeat Blower Check if it has just been done during the unit Start-up Procedures.

1. Shut electric power **OFF**.
2. Set thermostat Heat-Cool selector to **OFF**.
3. Set thermostat fan switch to **AUTO**.
4. Turn electric power **ON**. Nothing should start running. If any unusual arcing, odors or noises are encountered, shut electric power **OFF** immediately and check for wiring errors or obstructions in or near blower.
5. Set thermostat fan switch to **ON**. The circulating air blower should come on.
6. Reset thermostat fan switch to **AUTO**. The circulating air blower should go **OFF**. Nothing should be running.
7. Shut electric power **OFF**.

Temperature Rise Check

Temperature rise is the difference between the supply and return air temperatures. See **Figure 6** to determine the correct temperature rise for the unit's airflow. The temperature rise should be $\pm 2^{\circ}\text{F}$ (1.1°C) of the temperature rise specified in **Figure 6**.

NOTE: The temperature rise can be adjusted by changing the heating speed tap at the unit's blower terminal block. All units are shipped with this speed tap set to "high". Refer to the unit's *Installation Instructions* for airflow information.

A temperature rise greater than 60°F (33.3°C) is not recommended.

The heating speed tap for the AEB015CKA1, AEB020CKA1, AEB025CKA1 and AEB030CKA1 electric heat accessory models **MUST NOT** be operated on low speed.

1. To check the temperature rise through the unit, place thermometers in the supply and return air ducts as close to the unit as possible.

Keep the economizer dampers (if equipped) completely closed while checking the temperature rise.

2. Open **ALL** registers and duct dampers.
3. Set thermostat Heat-Cool selector to **HEAT**.
4. Set the thermostat temperature setting as high as it will go.
5. Turn electric power **ON**.
6. Operate unit **AT LEAST** 5 minutes, then check temperature rise.

NOTE: The maximum outlet air temperature for all models is 200°F (93.3°C).

7. Set thermostat to normal temperature setting.
8. Turn electric power **OFF**.
9. Be sure to seal all holes in ducts if any were created during this process.

6. Operation and Maintenance Instructions

WARNING

Electrical shock hazard.

Turn OFF electric power supply at disconnect switch or service panel before removing any access or service panel from unit.

Failure to follow this warning can result in property damage, personal injury, and/or death.

WARNING

Electrical shock hazard.

Turn OFF electric power supply at disconnect switch or service panel before removing any access or service panel from unit.

Failure to follow this warning can result in property damage, personal injury, and/or death.

Turning the Unit Off

Heating

NOTE: If the unit overheats or fails to shut off during operation, shut the electric power **OFF** at disconnect switch or service panel.

1. Set thermostat selector switch to **OFF** and fan switch to **AUTO**.
2. To shut the unit down completely, shut electric power supply **OFF** at disconnect switch or service panel.

Starting the Unit After Shutdown

Heating

1. Set the thermostat selector switch to **OFF**.
2. Turn electric power **ON**.
3. Set thermostat to desired temperature and set thermostat selector switch to **HEAT**. Unit will start and operate automatically under control of the thermostat.

7. Technical Data

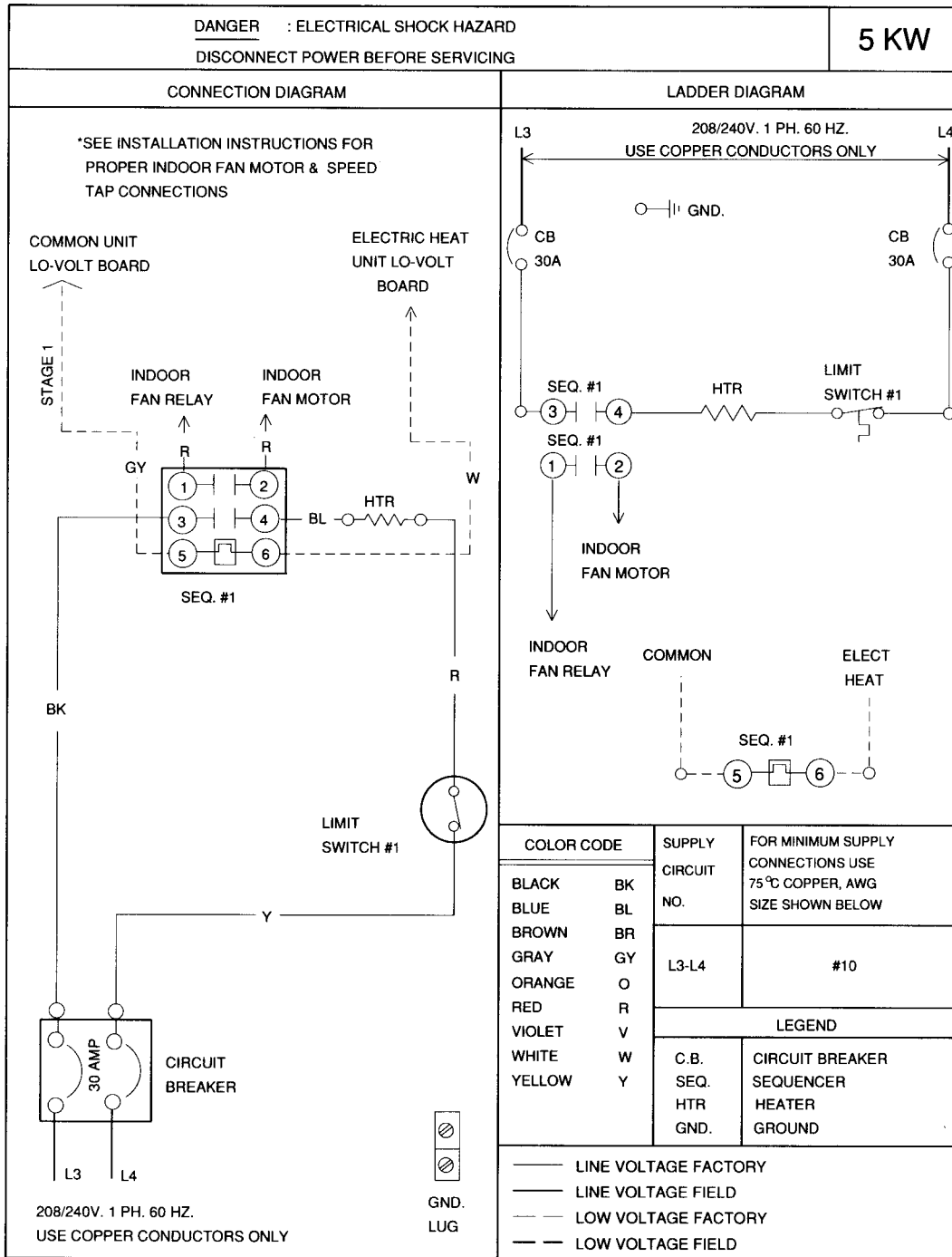
Figure 5		Electrical Data – Electric Heat Accessory					
Heater Model #	Supply Voltage (Volts–Phase–Cycles)	Nominal Btu/h	kW Rating	Supply Circuit Number	Heater Amps	Minimum Circuit Ampacity	Max. Fuse or NEC HACR Breaker (Amps)
AEB005BKA1	240–1–60	17,065	5.0	L3–L4	20.8	26.0	30
	208–1–60	12,969	3.8	L3–L4	18.2	22.8	25
AEB010CKA1	240–1–60	34,130	10.0	L3–L4	41.7	52.5	60
	208–1–60	25,598	7.5	L3–L4	36.1	45.1	50
AEB015BKA1	240–1–60	51,195	15.0	L3–L4	41.7	52.5	60
				L5–L6	20.8	26.0	30
	208–1–60	38,567	11.3	L3–L4	36.1	45.1	50
				L5–L6	18.2	22.8	25
AEB015CKA1	240–1–60	51,195	15.0	L3–L4	41.7	52.5	60
				L5–L6	20.8	26.0	30
	208–1–60	38,567	11.3	L3–L4	36.1	45.1	50
				L5–L6	18.2	22.8	25
AEB020CKA1	240–1–60	68,260	20.0	L3–L4	41.7	52.5	60
				L5–L6	41.7	52.5	60
	208–1–60	51,195	15.0	L3–L4	36.1	45.1	50
				L5–L6	36.1	45.1	50
AEB025CKA1	240–1–60	85,325	25.0	L3–L4	41.7	52.5	60
				L5–L6	41.7	52.5	60
				L7–L8	20.8	26.0	30
	208–1–60	64,164	18.8	L3–L4	36.1	45.1	50
				L5–L6	36.1	45.1	50
				L7–L8	18.2	22.8	25
AEB030CKA1	240–1–60	102,390	30.0	L3–L4	41.7	52.5	60
				L5–L6	41.7	52.5	60
				L7–L8	41.7	52.5	60
	208–1–60	76,793	22.5	L3–L4	36.1	45.1	50
				L5–L6	36.1	45.1	50
				L7–L8	36.1	45.1	50

Figure 6		Performance Data – Electric Heat Accessory Temperature Rise*										
Heater Model #	Supply Voltage	kW	Total Heating Btu/h	Temperature Rise in °F @ CFM								
				600	800	1000	1200	1400	1600	1800	2000	2200
AEB005BKA1	240–1–60	5.0	17,065	26.3	19.8	15.8	13.2	11.3	—	—	—	—
	208–1–60	3.8	12,969	20.0	15.0	12.0	10.0	8.6	—	—	—	—
AEB010CKA1	240–1–60	10.0	34,130	52.7	39.5	31.6	26.3	22.6	19.8	17.8	15.8	14.4
	208–1–60	7.5	25,598	39.5	29.6	23.7	19.8	16.9	14.8	13.2	11.9	10.8
AEB015BKA1	240–1–60	15.0	51,195	—	59.3	47.4	39.5	33.9	—	—	—	—
	208–1–60	11.3	38,567	—	44.6	35.7	29.8	25.5	—	—	—	—
AEB015CKA1	240–1–60	15.0	51,195	—	—	—	39.5	33.9	29.6	26.3	23.7	21.5
	208–1–60	11.3	38,567	—	—	—	29.8	25.5	22.3	19.8	17.9	16.2
AEB020CKA1	240–1–60	20.0	68,260	—	—	—	52.6	45.1	39.5	35.1	31.6	28.7
	208–1–60	15.0	51,195	—	—	—	39.5	33.9	29.6	26.3	23.7	21.5
AEB025CKA1	240–1–60	25	85,325	—	—	—	—	—	49.4	43.9	39.5	35.9
	208–1–60	18.8	64,164	—	—	—	—	—	37.3	33.0	29.7	27.0
AEB030CKA1	240–1–60	30	102,390	—	—	—	—	—	59.3	52.7	47.4	43.1
	208–1–60	22.5	76,793	—	—	—	—	—	44.4	39.5	35.6	32.3

*NOTE: Temperature rise above 60°F (33.3°C) not recommended.

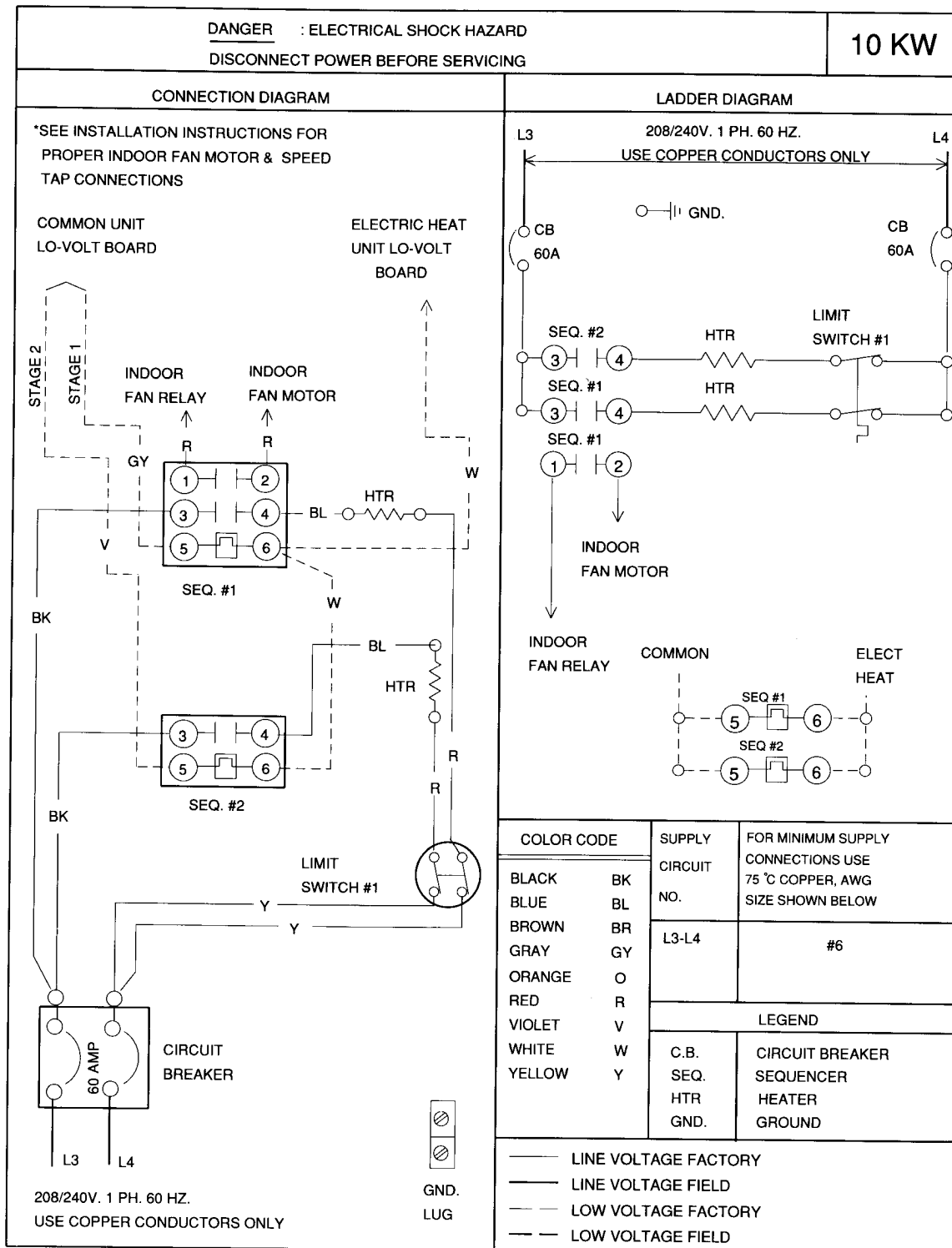
8. Wiring Diagrams

Figure 7 Connection and Ladder Wiring Diagrams For AEB005BKA*



*SEE UNIT INSTALLATION INSTRUCTIONS FOR PROPER HEATING AND COOLING CONNECTIONS.

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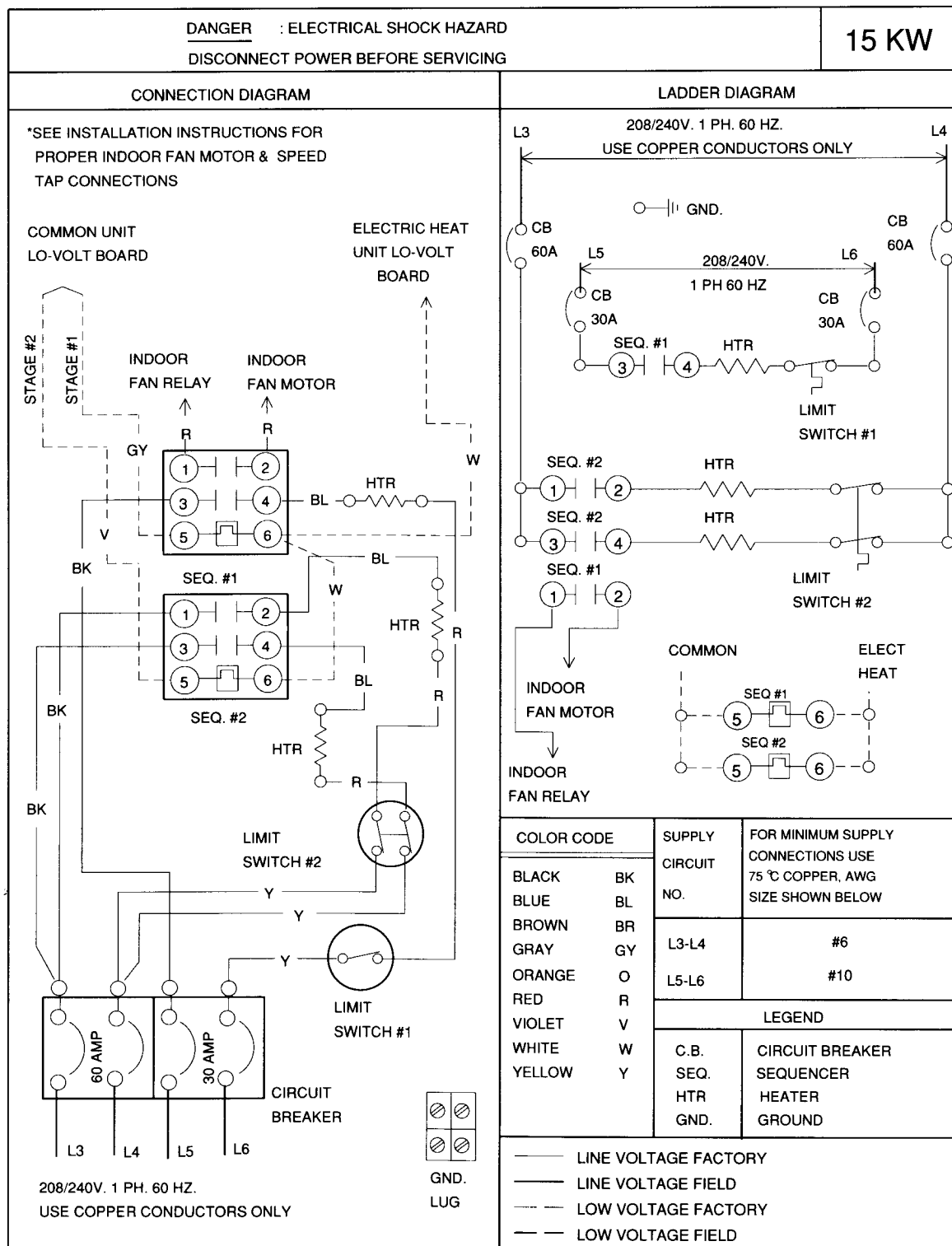
Figure 8 Connection and Ladder Wiring Diagrams For AEB010CKA*


*SEE UNIT INSTALLATION INSTRUCTIONS FOR PROPER HEATING AND COOLING CONNECTIONS.

1066217

Figure 9

Connection and Ladder Wiring Diagrams For AEB015BKA* and AEB015CKA*



*SEE UNIT INSTALLATION INSTRUCTIONS FOR PROPER HEATING AND COOLING CONNECTIONS.

1066218

Figure 10

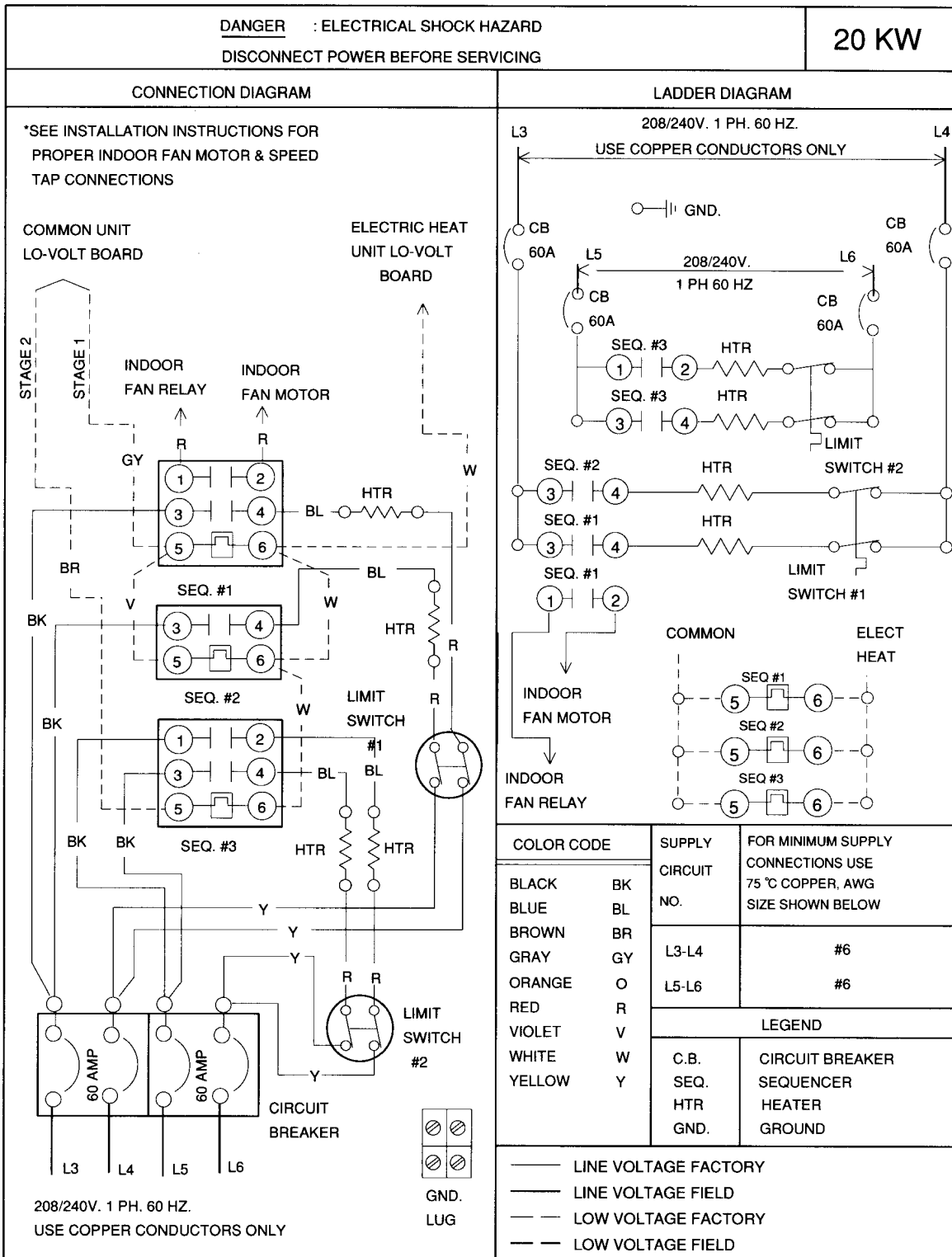
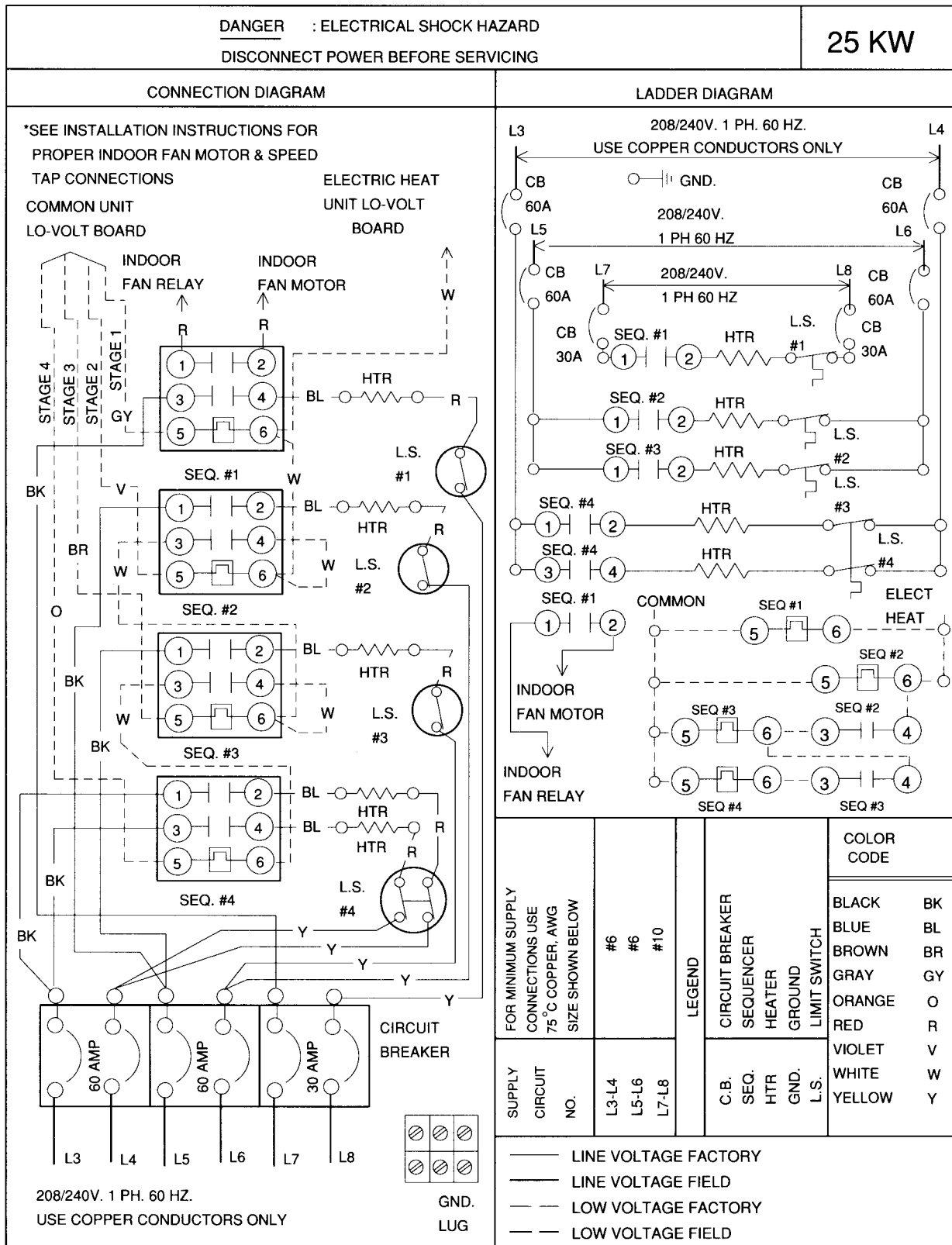


Figure 11

Connection and Ladder Wiring Diagrams For AEB025CKA*

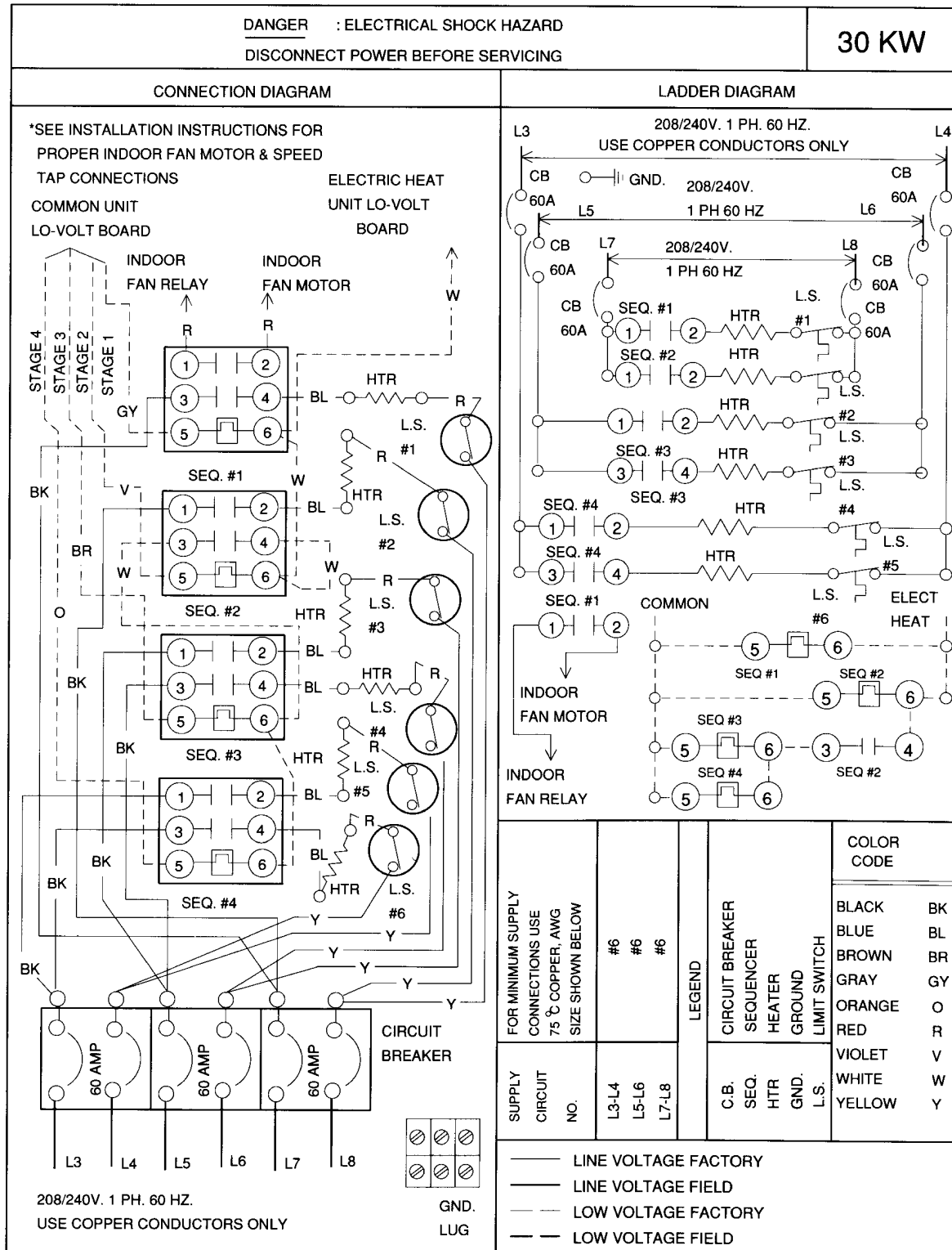


*SEE UNIT INSTALLATION INSTRUCTIONS FOR PROPER HEATING AND COOLING CONNECTIONS.

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Figure 12

Connection and Ladder Wiring Diagrams For AEB030CKA*

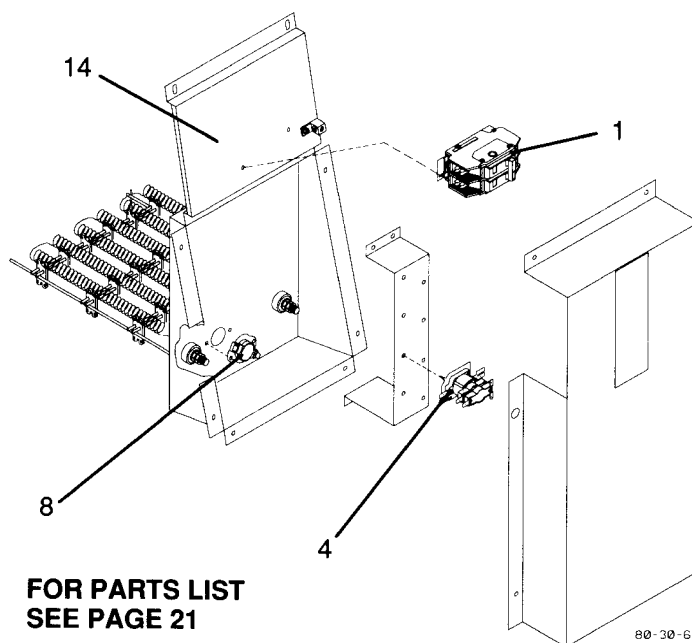


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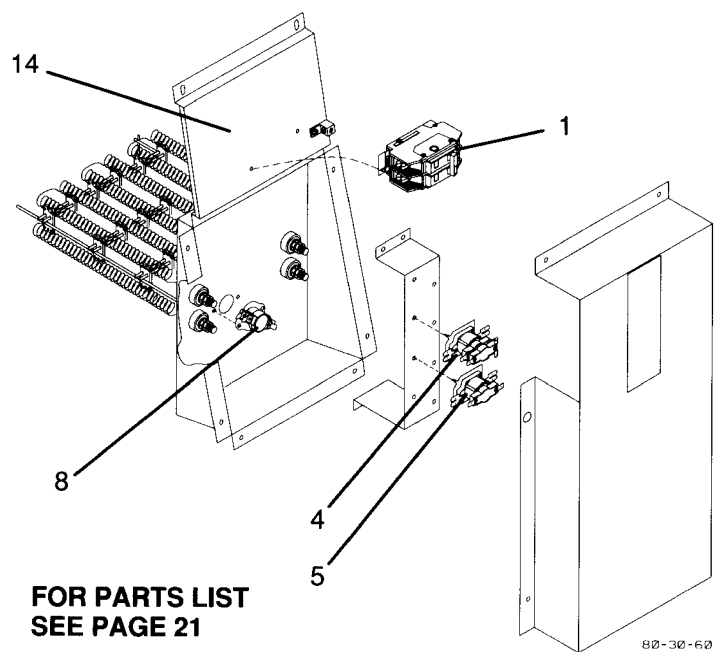
*SEE UNIT INSTALLATION INSTRUCTIONS FOR PROPER HEATING AND COOLING CONNECTIONS.

9. Replacement Parts

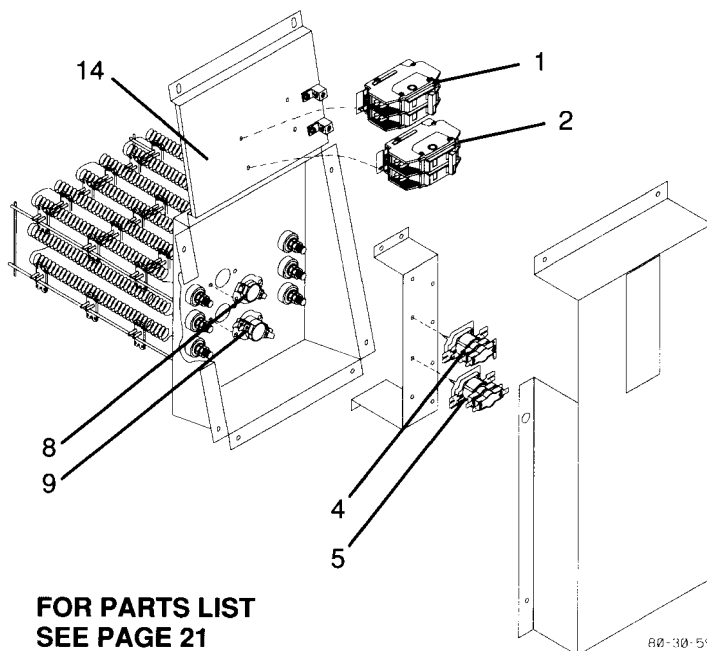
AEB005BKA



AEB010CKA

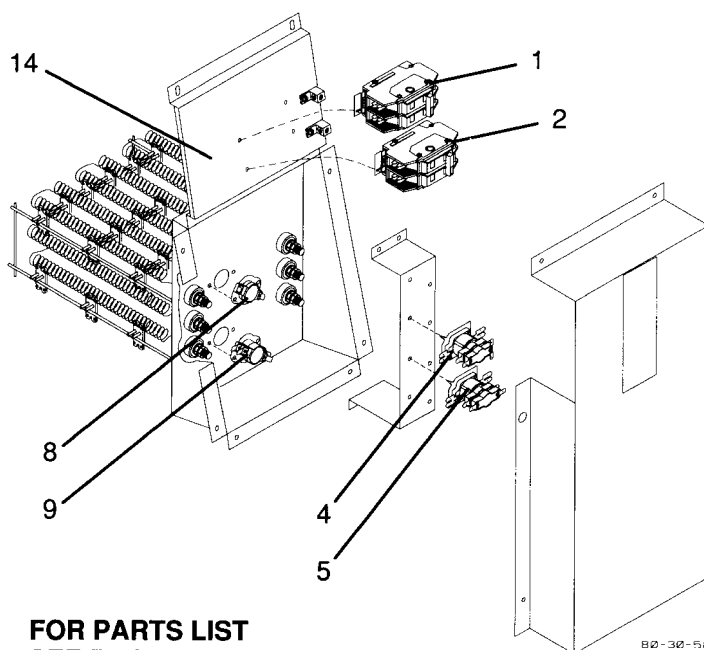


AEB015BKA

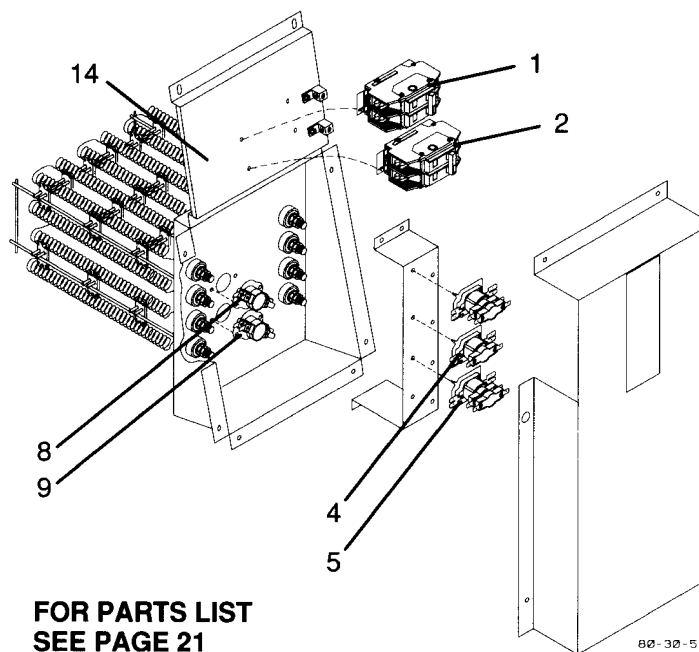
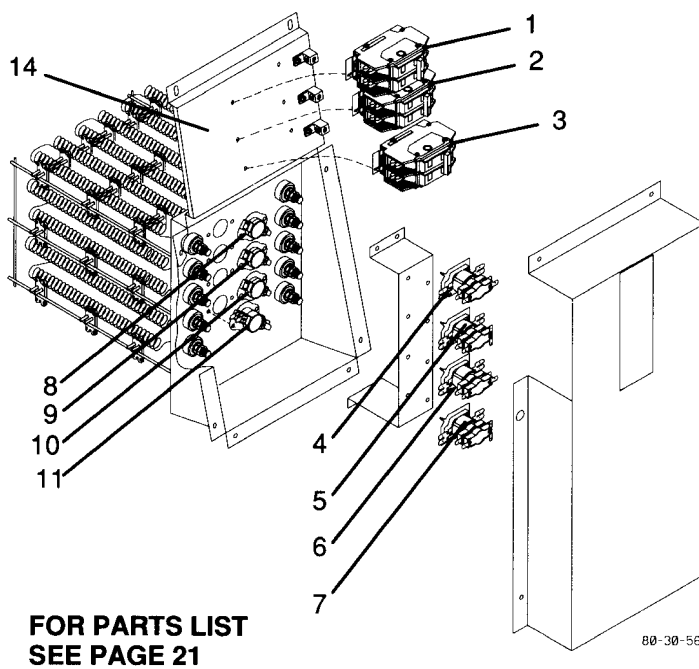


FOR PARTS LIST
SEE PAGE 21

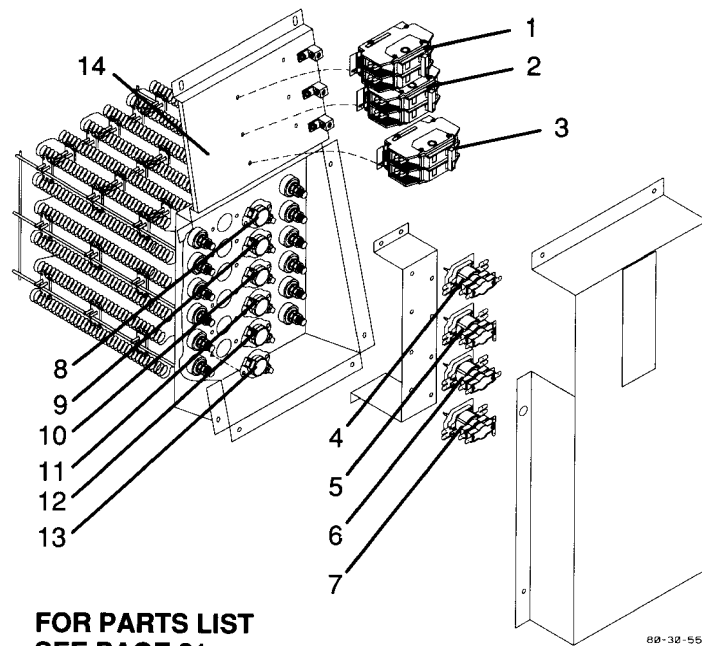
AEB015CKA



FOR PARTS LIST
SEE PAGE 21

AEB020CKA**AEB025CKA**

АЕВ030СКА



Replacement Parts

Replacement part supplied will be current active part.
For parts not listed, consult place of purchase.

Key No.	Description	Replacement Part Number	Model Number/Quantity Required						
			AEB005BKA1	AEB010CKA1	AEB015BKA1	AEB015CKA1	AEB020CKA1	AEB025CKA1	AEB030CKA1
1	Circuit breaker #1	711353	1	—	1	1	—	1	—
		711357	—	1	—	—	1	—	1
2	Circuit breaker #2	711357	—	—	1	1	1	1	1
3	Circuit breaker #3	711357	—	—	—	—	—	1	1
4	Sequencer #1	1056789	1	1	1	1	1	1	1
5	Sequencer #2	1057251	—	1	—	—	1	—	—
		1056788	—	—	1	1	—	1	1
6	Sequencer #3	1056788	—	—	—	—	1	1	1
7	Sequencer #4	1056788	—	—	—	—	—	1	1
8	Switch, Limit #1	1066294	1	—	—	1	—	—	—
		1066290	—	1	—	—	—	—	—
		1066295	—	—	1	—	—	—	—
		1066293	—	—	—	—	1	—	—
		1066427	—	—	—	—	—	1	—
		1066428	—	—	—	—	—	—	1
9	Switch, Limit #2	1066292	—	—	1	—	—	—	—
		1066291	—	—	—	1	—	—	—
		1066293	—	—	—	—	1	—	—
		1066427	—	—	—	—	—	1	—
		1066428	—	—	—	—	—	—	1
10	Switch, Limit #3	1066427	—	—	—	—	—	1	—
		1066428	—	—	—	—	—	—	1
11	Switch, Limit #4	1066429	—	—	—	—	—	1	—
		1066428	—	—	—	—	—	—	1
12	Switch, Limit #5	1066429	—	—	—	—	—	—	—
		1066428	—	—	—	—	—	—	1
13	Switch, Limit #6	1066428	—	—	—	—	—	—	1
14	Electric Heat Accessory*	1066266	1	—	—	—	—	—	—
	(includes cover)	1066267	—	1	—	—	—	—	—
		1066288	—	—	1	—	—	—	—
		1066271	—	—	—	1	—	—	—
		1066275	—	—	—	—	1	—	—
		1066279	—	—	—	—	—	1	—
		1066283	—	—	—	—	—	—	1
) (	Manual, Installation Instructions	1066305	1	1	1	1	1	1	1
) (	PART NOT ILLUSTRATED								
FOR PARTS ILLUSTRATION, SEE PAGE 17									
*If heating element malfunctions, entire electric heat accessory must be replaced.									