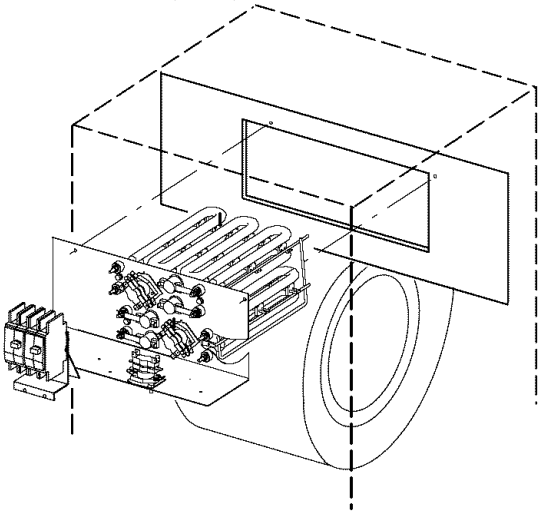
INSTALLATION INSTRUCTIONS

ECB29 Series Units
ECB31 Series Units

ELECTRIC HEAT SECTIONS
505,251M
01/08
Supersedes 08/06

Technical Publications
Litho U.S.A.



⚠ CAUTION

Physical contact with metal edges and corners while applying excessive force or rapid motion can result in personal injury. Be aware of, and use caution when working near these areas during installation or while servicing this equipment.

Table of Contents

RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCE

Electric Heat Sections

The ECB29 series electric heat sections provide field installed electric heat for CB27UH, CBX27UH, CB30M, CB30U, CBX32M and some CB31MV and CBX32MV series blower coil units. ECB29 sections are available in single-phase and three-phase. Single-phase ECB29s are equipped with either terminal blocks, fuse blocks or circuit breakers.

ECB31 series electric heat sections provide field installed electric heat for CB31MV and CBX32MV blower coil sections. ECB31 sections are equipped with circuit breakers and are available in single-phase 10kW and 20kW sizes.

Refer to the engineering handbook for specific heat section applications.

Shipping & Packing List

Package 1 of 1 contains

1 - Assembled electric heat section
1 - Bag assembly containing the following:
6-Screws
1-Wiring diagram
1 - Transformer (575V only)
1 - Fuse block extension plate (460V & 575V only)
2 - Adhesive-backed foam seals

Check equipment for shipping damage. If you find any damage, immediately contact the last carrier.

General Information

These instructions are a general guide and do not supersede local codes. Local authorities having jurisdiction should be consulted before installation. Read these instructions thoroughly before starting installation.

Only qualified installers or technicians should install the electric heat section and all other equipment used in HVAC systems. You ***must*** follow federal, state, and local codes while you install this or any other HVAC equipment.

⚠ WARNING

If these instructions and/or codes are not followed or if the equipment is not properly installed, possible injury or death could occur during installation or operation.

Be sure to disconnect all power to the unit while you install and service this equipment. Use proper tools and protective equipment during installation and service.

Installation of Lennox blower sections with or without optional electric heat must conform with standards in the National Fire Protection Association (NFPA) "Standard for Installation of Air Conditioning and Ventilation Systems NFPA No. 90A," and "Standard for Installation of Resident Type Warm Air Heating and Air Conditioning System, No. 90B," the manufacturer's installation instructions, and local municipal building codes.

Heat Section Installation

Before installing the unit, check information on the unit rating plate to ensure that the unit meets the job specification, proper electrical power is available, and that proper duct clearances are maintained.

⚠ WARNING

Before installing or servicing unit, be sure ALL power to the unit is OFF. More than one disconnect switch may be present. *Electrical shock can cause personal injury or death!*

NOTE - It is easier to install the ECB29EH heat section inside the blower coil unit before the unit is set and the plenum is attached.

1. Shut off all power to the blower coil unit. More than one disconnect may be required.
2. Remove blower section access panel.
3. Remove the electric heat knockout section in the blower coil vestibule panel for the appropriate size of heater used. Remove the extended width knockout to allow for installation of 20kW heater (see figure 1).
4. Slide the electric heat section into the blower section. Be careful that the heating elements do not rub against the sheet metal opening when they slide into the blower section. The hole(s) on each side of the heater line up with holes in the blower coil control box. Secure the electric heater into place with the screws that are provided in the bag assembly.

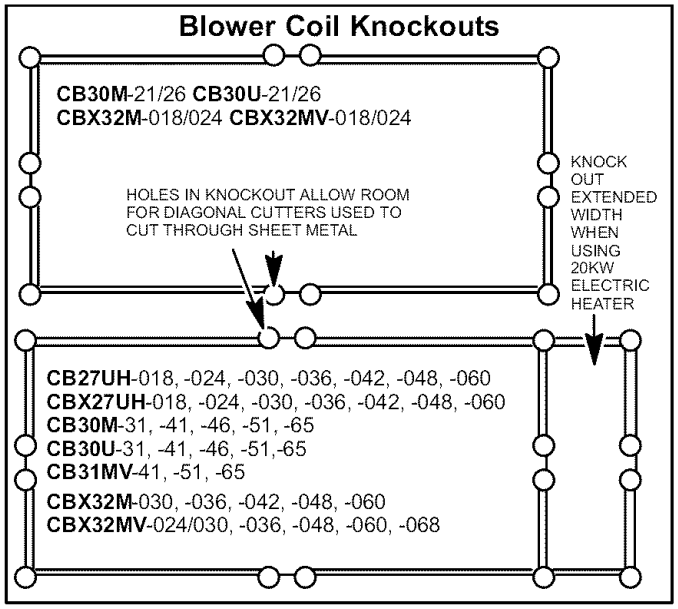


Figure 1

Circuit Breaker Installation

1. Install the circuit breaker on the blower deck flange. Use the provided screws (6) to secure (see figure 2).

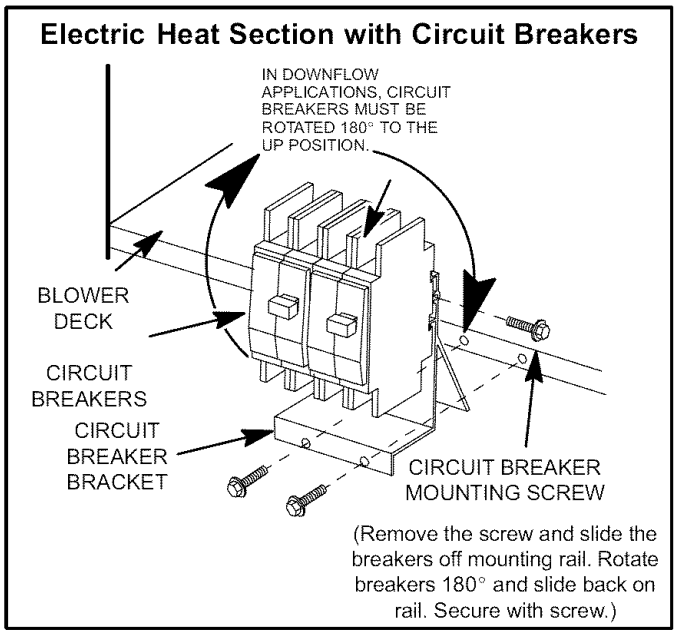


Figure 2

NOTE - When applied in the downflow position, ***the circuit breakers must be rotated to the UP position.*** *See figure 2 and follow the procedure below:*

- **A** Disconnect power to the unit if present.
- **B** Remove the screw and slide the breakers off the mounting rail.

NOTE - You may need to remove the wire tie that's closest to the circuit breaker to allow for rotation.

- **C** Rotate the circuit breaker 180°.
- **D** Slide the circuit breaker back on the rail and secure in place with previously removed screw.

2. The blower coil access panels are factory supplied, and they have a patch plate over the circuit breaker opening. Remove the circuit breaker patch plate from the blower access panel. See figure 3.
3. Replace the unit blower access door.
4. Choose the appropriately sized adhesive-backed circuit breaker seal and remove any perforated sections (if needed). Apply the seal to the outside of the blower access panel so that the seal is snug around the circuit breakers.
5. Break the patch plate for the specific size of electric heat unit / blower coil unit that you are installing. Discard the unused piece of patch plate. Figure 4 shows CB30M-21/26, CB30U-21/26, CBX32M-018/024 and CBX32MV-018/024 units; refer to figure 5 for all other blower coil units.
6. Secure the patch plate on the blower access door.

505251M 01/08

Circuit Breaker Seal and Patch Plate Installation

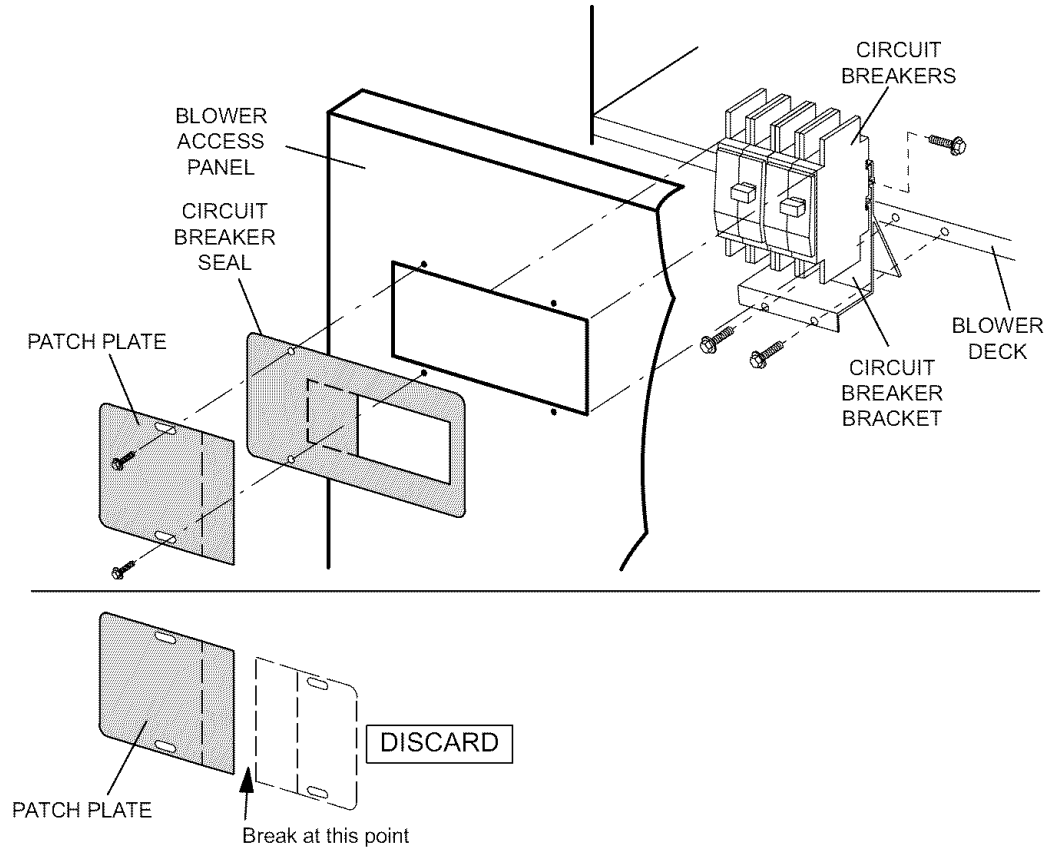


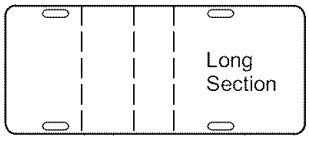
Figure 3

Circuit Breaker Heater And Patch Plate Configuration

CB30M-21/26, **CB30U**-21/26, **CBX32M**-018/024 & **CBX32MV**-018/024

PATCH PLATE

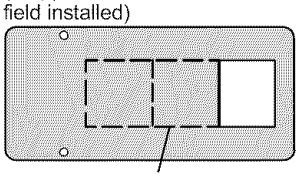
(Shipped installed on CB unit)



Patch plate shown with longest section on the right side. Patch plate may be factory installed with long section on the left side.

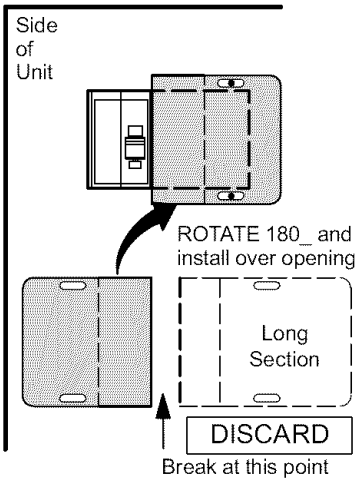
CIRCUIT BREAKER SEAL

(Shipped with electrical heat and field installed)



Dotted lines are perforations

ECB29-5CB, ECB29-6CB, ECB29-8CB, ECB29-10CB



ECB29-12.5CB ECB29-15CB

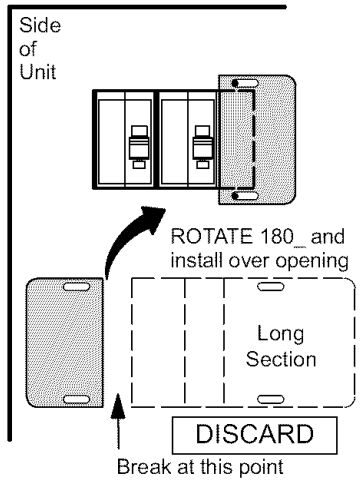


Figure 4

Circuit Breaker Heater and Patch Plate Configuration

CB27UH/CBX27UH-018, -024, -030, -036, -042, -048, -060;
CB30M-31, -41, -46, -51 -65; **CB30U**-31, -41, -46, -51, -65; **CB31M**-41, -51, -65,
CBX32M-030; -036, -042, -048, -060; **CBX32MV**-024/030, -036, -048, -060, -068

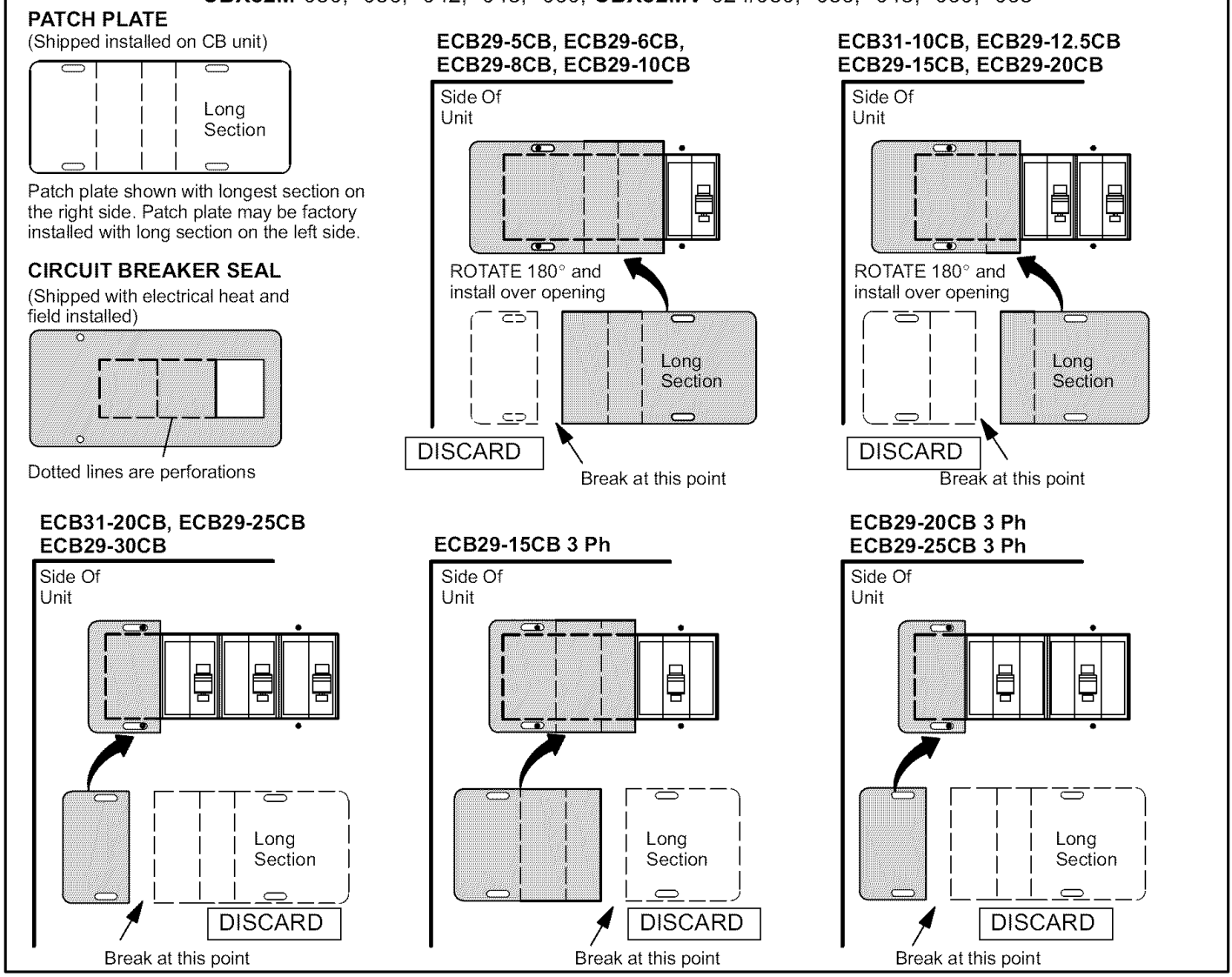


Figure 5

Blower Speed Connections

When using ECB29 or ECB31 heat section with the CB30M, CB30U, CB31MV, CBX32M and CBX32MV series blower coil units, adjust the blower speed according to the size of electric heat and blower coil unit. The **minimum blower setting** for each blower size with any heat sections in any application is **HIGH**. See specific blower coil installation instructions for blower speed adjustment procedure and location.

Electrical Connections

⚠ WARNING

USE COPPER CONDUCTORS ONLY.

NOTE - Refer to the nameplate on the blower coil unit for minimum circuit ampacity and maximum overcurrent protection size.

The blower coil units are provided with openings to be used with 1-1/2 inch trade size (1-31/32 inch diameter) conduit. A conduit reducer washer has been provided if you are installing a smaller conduit.

For single-point power supply, refer to the nameplate on the single-point power supply accessory for minimum circuit ampacity and maximum overcurrent protection size. Select the proper supply circuit conductors in accordance with tables 310-16 and 310-17 in the National Electric Code, ANSI/NFPA No. 70 or tables 1 through 4 in the Canadian Electric Code, Part I, CSA Standard C22.1.

505251M 01/08

Refer to figure 7 for typical condensing unit application and figure 8 for typical heat pump application with a blower coil unit and electric heat section. Figure 10 shows wiring for a 20KW unit.

Refer to figures 11 through 15 for typical system diagrams for all units with installed electric heat sections.

Make wiring connections

1. Make wiring connections as follows

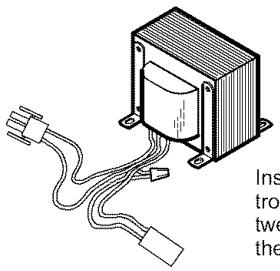
   Heaters equipped with circuit breakers—Connect field power supply wiring to circuit breaker(s)

   Heaters equipped with terminal blocks—Connect field power supply wiring to terminal block(s).

   Heaters equipped with fuses (G and J voltage)—Connect field power supply wiring to fuse block. (An extension plate is provided for J voltage units.)
2. Remove the interface harness from the blower coil unit and connect the plug from the heater to the matching plug inside blower coil unit.

   NOTE - J voltage (575V) heaters are shipped with a line voltage to 460V transformer. This transformer provides 460V power to the blower motor only. See figure 6.
3. **If using a two-stage thermostat**—Remove the jumper between terminals "W2" and "R" of TB1 terminal block and connect the second stage heat bulb lead to "W2".
4. **If using an outdoor thermostat**—Remove the jumper between terminals "W2" and "R" of TB1 terminal block and connect leads to "W2" and "R".

Installing Transformer (575V only)



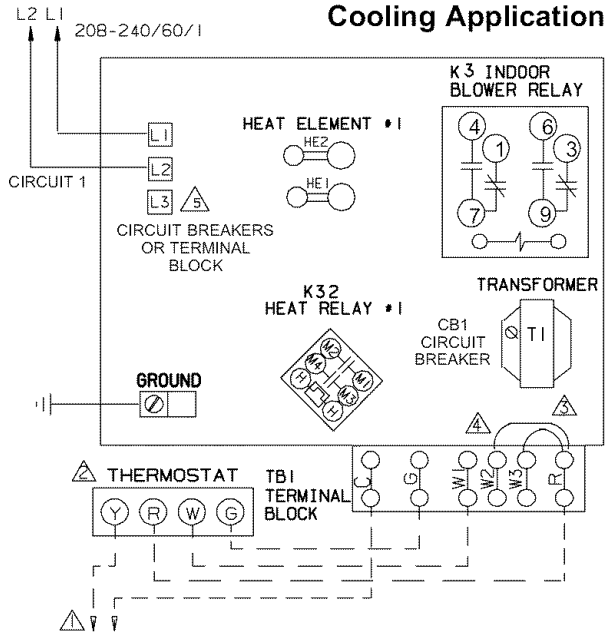
Install transformer in the control box and connect it between the provided plug in the blower coil unit.

Figure 6

Unit Start-Up

1. Replace the blower compartment access cover.
2. Restore power to the unit.
3. Set the thermostat heat anticipator to 0.4 amps.
4. Set the thermostat above room temperature.
5. Check the heat pump and the heat section for normal operation.
6. Set the thermostat to desired setting.
7. Affix the wiring diagram sticker to blower scroll aligned with CB unit wiring diagram sticker.

Cooling Application With Electric Heat



NOTE - USE COPPER CONDUCTORS ONLY

REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE

NOTE - ALL REMAINING WIRES FACTORY-INSTALLED

———— LINE VOLTAGE FIELD-INSTALLED

– – – – CLASS 2 VOLTAGE FIELD-INSTALLED NEC/CEC

⚠1 TO EXTERNAL LOAD 24VAC AT .50 AMP MAXIMUM

⚠2 THERMOSTAT HEAT ANTICIPATION SETTING 0.4 AMP (ELECTRIC HEAT)

⚠3 WHEN TWO-STAGE THERMOSTAT IS USED, CONNECT SECOND STAGE HEAT BULB TO TERMINAL "W2" AND REMOVE JUMPER BETWEEN TERMINALS "R" AND "W2"

⚠4 FACTORY-INSTALLED JUMPER

⚠5 L3 CONNECTION USED ON (Y VOLTAGE) 3-PHASE ELECTRIC HEATERS ONLY

Figure 7

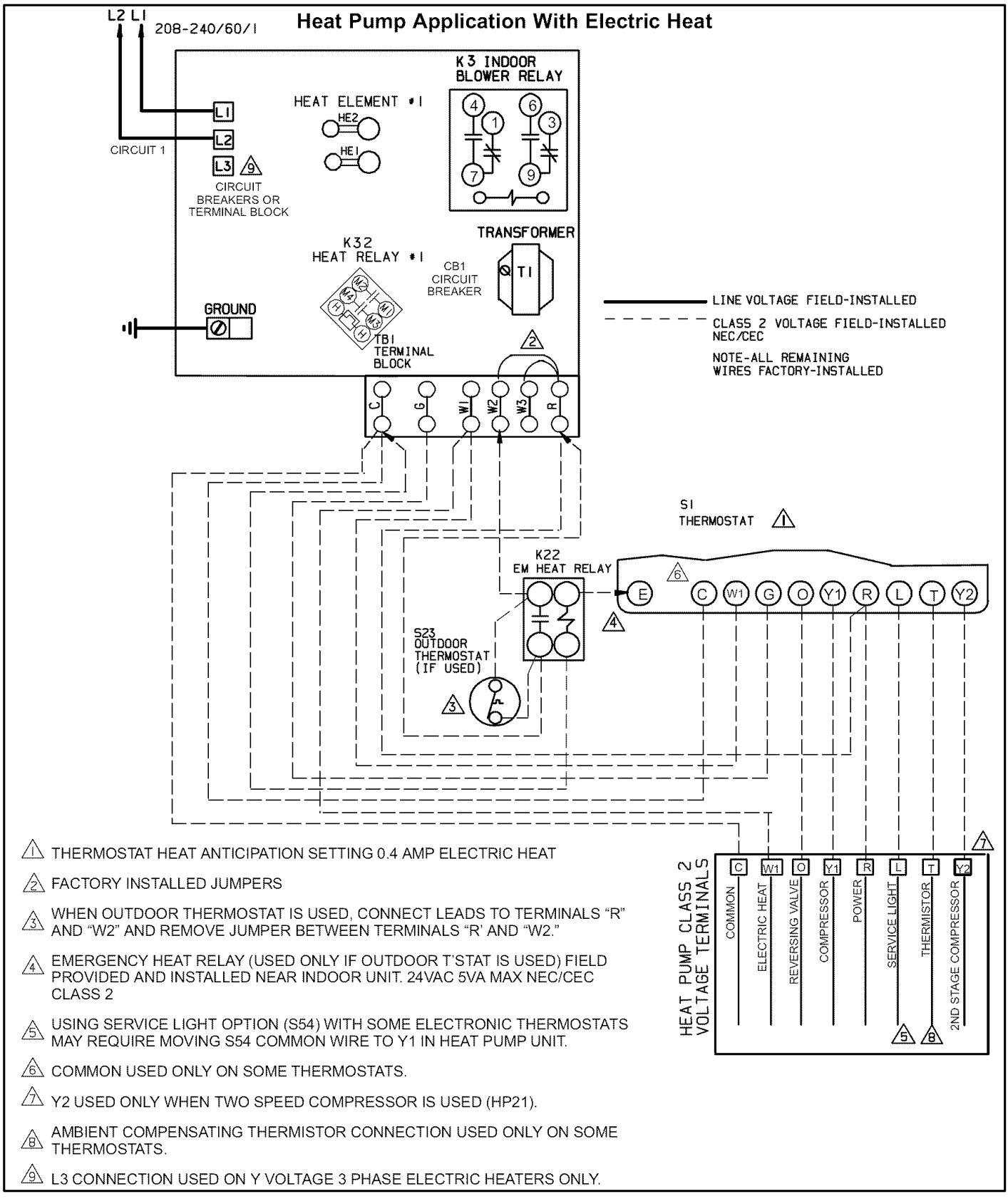
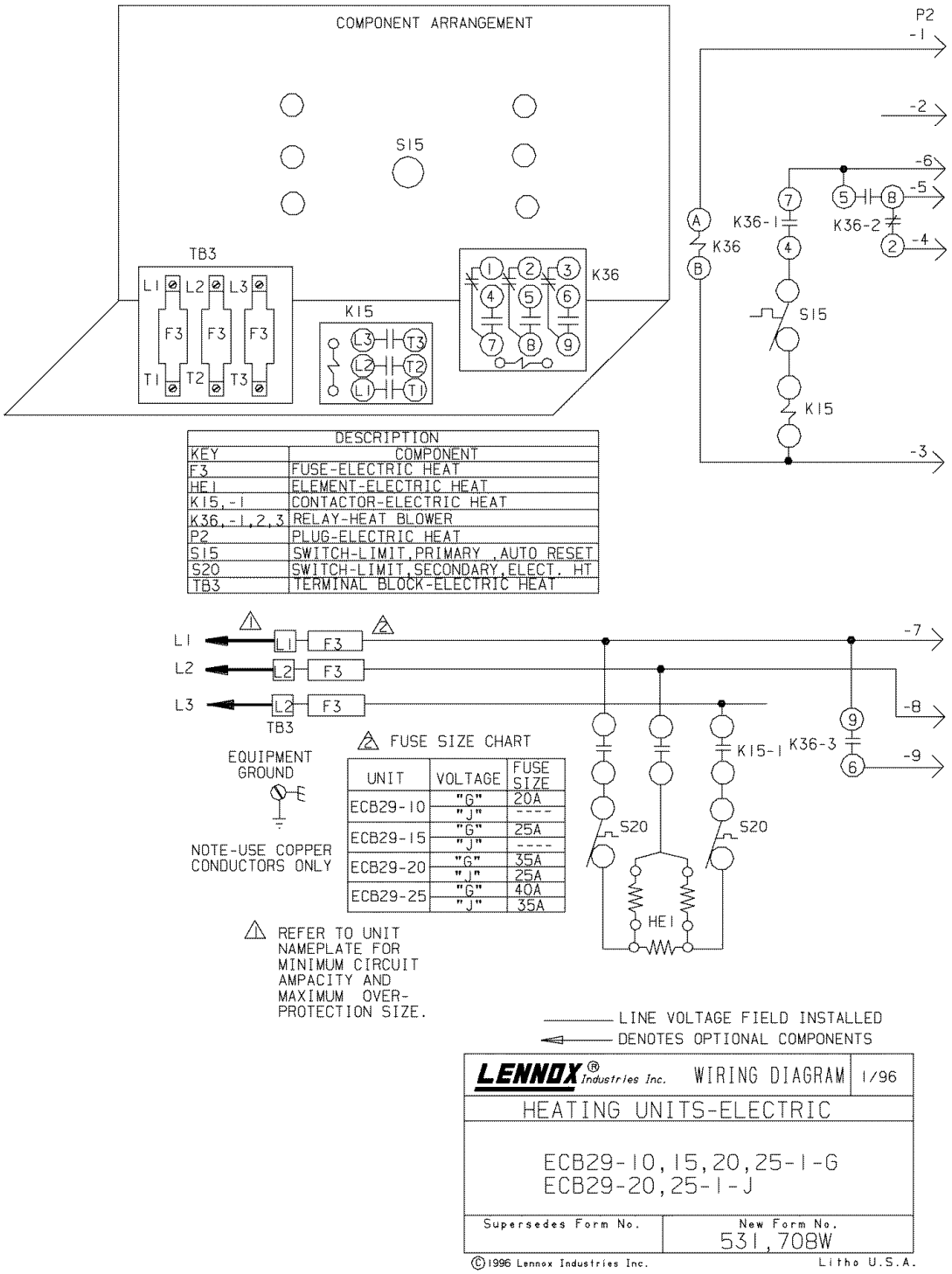


Figure 8

505251M 01/08

Wiring for Models -10, -15, -20 and -25 KW Electric Heat (G Voltage)



KEY	DESCRIPTION COMPONENT
F3	FUSE-ELECTRIC HEAT
HE1	ELEMENT-ELECTRIC HEAT
K15, -1	CONTACTOR-ELECTRIC HEAT
K36, -1, 2, 3	RELAY-HEAT BLOWER
P2	PLUG-ELECTRIC HEAT
S15	SWITCH-LIMIT, PRIMARY, AUTO RESET
S20	SWITCH-LIMIT, SECONDARY, ELECT. HT
TB3	TERMINAL BLOCK-ELECTRIC HEAT

UNIT	VOLTAGE	FUSE SIZE
ECB29-10	"G"	20A
	"J"	----
ECB29-15	"G"	25A
	"J"	----
ECB29-20	"G"	35A
	"J"	25A
ECB29-25	"G"	40A
	"J"	35A

LENNOX® Industries Inc. WIRING DIAGRAM 1/96

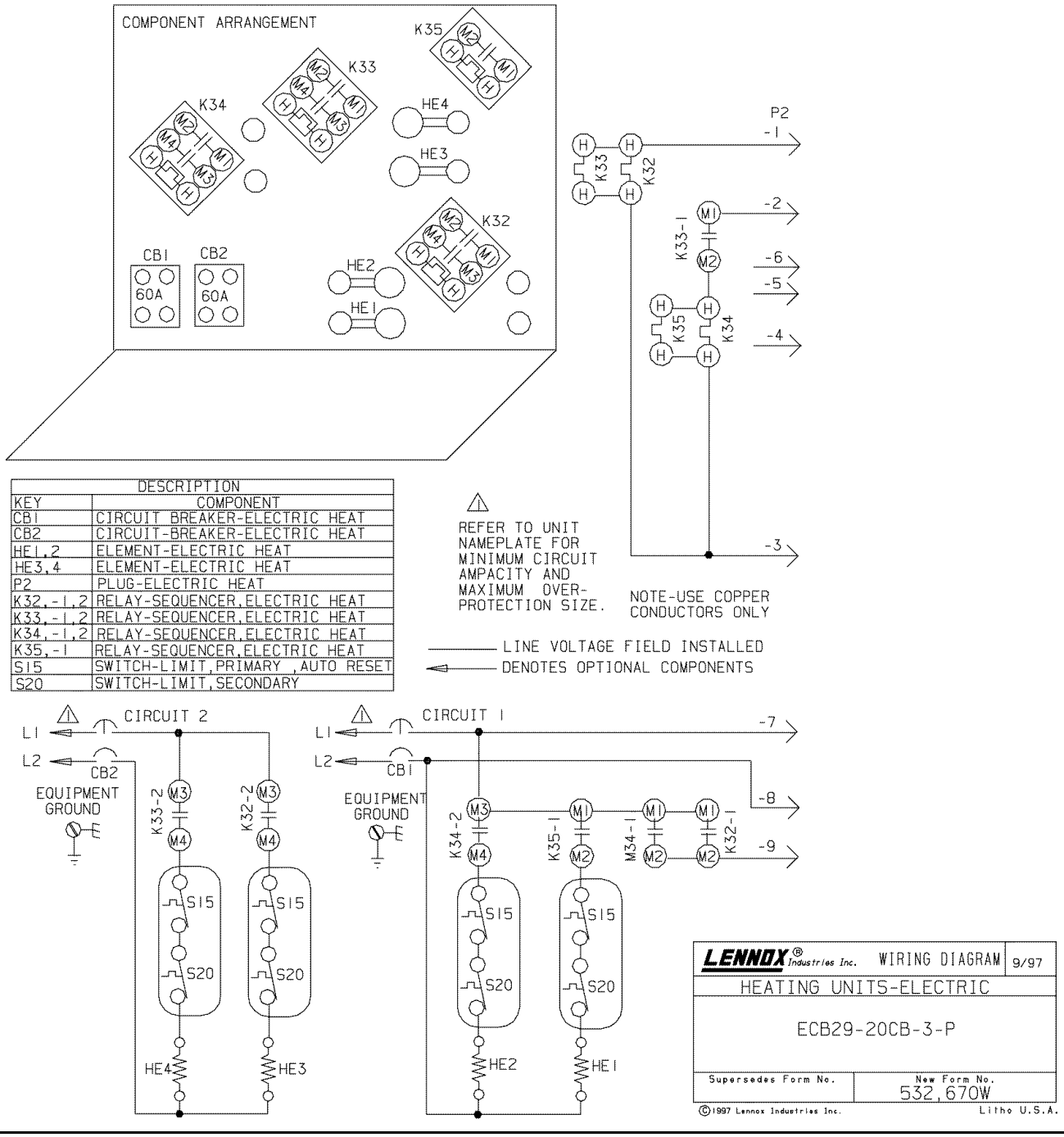
HEATING UNITS-ELECTRIC

ECB29-10, 15, 20, 25-1-G
ECB29-20, 25-1-J

Supersedes Form No.	New Form No.
	531, 708W

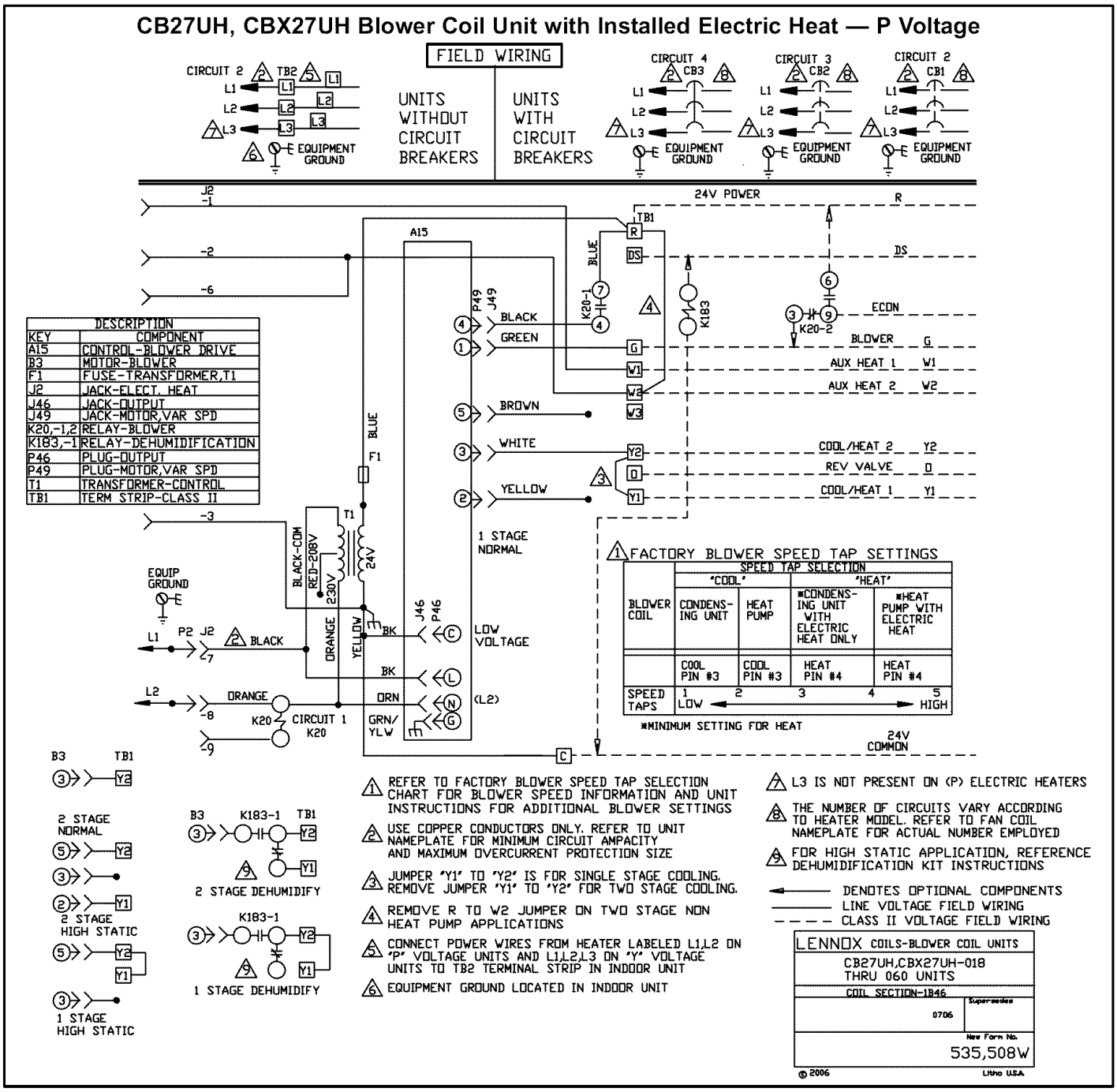
Figure 9

Wiring for 20CB-3 KW Electric Heat (P Voltage)



DESCRIPTION	
KEY	COMPONENT
CB1	CIRCUIT BREAKER-ELECTRIC HEAT
CB2	CIRCUIT-BREAKER-ELECTRIC HEAT
HE1,2	ELEMENT-ELECTRIC HEAT
HE3,4	ELEMENT-ELECTRIC HEAT
P2	PLUG-ELECTRIC HEAT
K32,-1,2	RELAY-SEQUENCER,ELECTRIC HEAT
K33,-1,2	RELAY-SEQUENCER,ELECTRIC HEAT
K34,-1,2	RELAY-SEQUENCER,ELECTRIC HEAT
K35,-1	RELAY-SEQUENCER,ELECTRIC HEAT
S15	SWITCH-LIMIT,PRIMARY ,AUTO RESET
S20	SWITCH-LIMIT,SECONDARY

Figure 10


CB27UH, CBX27UH Blower Coil Unit with Installed Electric Heat — P Voltage
FIELD WIRING
UNITS WITHOUT CIRCUIT BREAKERS
UNITS WITH CIRCUIT BREAKERS
CIRCUIT 2
CIRCUIT 3
CIRCUIT 4
EQUIPMENT GROUND
24V POWER
DESCRIPTION
KEY COMPONENT
A15 CONTROL-BLOWER DRIVE
B3 MOTOR-BLOWER
F1 FUSE-TRANSFORMER,T1
J2 JACK-ELECT. HEAT
J46 JACK-OUTPUT
J49 JACK-MOTOR,VAR SPD
K20,-1,2 RELAY-BLOWER
K183,-1 RELAY-DEHUMIDIFICATION
P46 PLUG-OUTPUT
P49 PLUG-MOTOR,VAR SPD
T1 TRANSFORMER-CONTROL
TB1 TERM STRIP-CLASS II
BLACK
GREEN
BROWN
WHITE
YELLOW
BLUE
ORANGE
RED-208V
230V
24V
BLACK-COM
1 STAGE NORMAL
LOW VOLTAGE
ECON
BLOWER
AUX HEAT 1
AUX HEAT 2
COOL/HEAT 2
REV VALVE
COOL/HEAT 1
24V COMMON
FACTORY BLOWER SPEED TAP SETTINGS
SPEED TAP SELECTION
'COOL'
'HEAT'
BLOWER COIL
CONDENSING UNIT
HEAT PUMP
*CONDENSING UNIT WITH ELECTRIC HEAT ONLY
*HEAT PUMP WITH ELECTRIC HEAT
COOL PIN #3
HEAT PIN #4
SPEED TAPS
LOW
HIGH
*MINIMUM SETTING FOR HEAT
2 STAGE NORMAL
2 STAGE HIGH STATIC
1 STAGE HIGH STATIC
2 STAGE DEHUMIDIFY
1 STAGE DEHUMIDIFY
1 REFER TO FACTORY BLOWER SPEED TAP SELECTION CHART FOR BLOWER SPEED INFORMATION AND UNIT INSTRUCTIONS FOR ADDITIONAL BLOWER SETTINGS
2 USE COPPER CONDUCTORS ONLY. REFER TO UNIT NAMEPLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE
3 JUMPER 'Y1' TO 'Y2' IS FOR SINGLE STAGE COOLING. REMOVE JUMPER 'Y1' TO 'Y2' FOR TWO STAGE COOLING.
4 REMOVE R TO W2 JUMPER ON TWO STAGE NON HEAT PUMP APPLICATIONS
5 CONNECT POWER WIRES FROM HEATER LABELED L1,L2 ON 'P' VOLTAGE UNITS AND L1,L2,L3 ON 'Y' VOLTAGE UNITS TO TB2 TERMINAL STRIP IN INDOOR UNIT
6 EQUIPMENT GROUND LOCATED IN INDOOR UNIT
7 L3 IS NOT PRESENT ON (P) ELECTRIC HEATERS
8 THE NUMBER OF CIRCUITS VARY ACCORDING TO HEATER MODEL. REFER TO FAN COIL NAMEPLATE FOR ACTUAL NUMBER EMPLOYED
9 FOR HIGH STATIC APPLICATION, REFERENCE DEHUMIDIFICATION KIT INSTRUCTIONS
DENOTES OPTIONAL COMPONENTS
LINE VOLTAGE FIELD WIRING
CLASS II VOLTAGE FIELD WIRING
LENNOX COILS-BLOWER COIL UNITS
CB27UH,CBX27UH-018 THRU 060 UNITS
COIL SECTION-1B46
0706
Supersedes
New Form No.
535,508W
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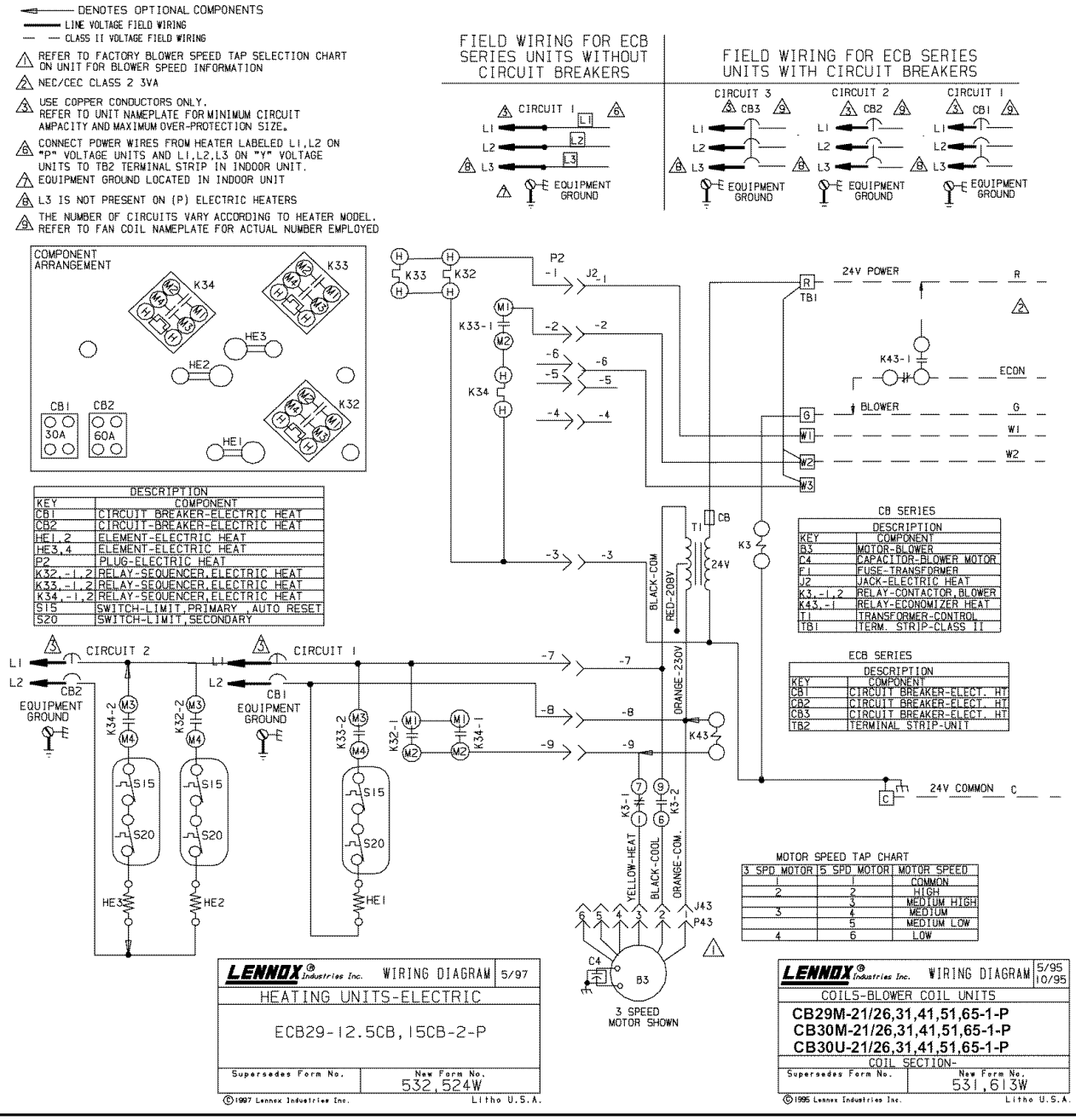
Litho U.S.A.

Figure 11

CB30M, CB30U Blower Coil Unit with Installed Electric Heat — P Voltage



DESCRIPTION	
KEY	COMPONENT
CB1	CIRCUIT BREAKER-ELECTRIC HEAT
CB2	CIRCUIT-BREAKER-ELECTRIC HEAT
HE1,2	ELEMENT-ELECTRIC HEAT
HE3,4	ELEMENT-ELECTRIC HEAT
P2	PLUG-ELECTRIC HEAT
K32,-1,2	RELAY-SEQUENCER,ELECTRIC HEAT
K33,-1,2	RELAY-SEQUENCER,ELECTRIC HEAT
K34,-1,2	RELAY-SEQUENCER,ELECTRIC HEAT
S15	SWITCH-LIMIT,PRIMARY ,AUTO RESET
S20	SWITCH-LIMIT,SECONDARY

CB SERIES

DESCRIPTION	
KEY	COMPONENT
B3	MOTOR-BLOWER
C4	CAPACITOR-BLOWER MOTOR
F1	FUSE-TRANSFORMER
J2	JACK-ELECTRIC HEAT
K3,-1,2	RELAY-CONTACTOR,BLOWER
K43,-1	RELAY-ECONOMIZER HEAT
T1	TRANSFORMER-CONTROL
TB1	TERM. STRIP-CLASS II

ECB SERIES

DESCRIPTION	
KEY	COMPONENT
CB1	CIRCUIT BREAKER-ELECT. HT
CB2	CIRCUIT BREAKER-ELECT. HT
CB3	CIRCUIT BREAKER-ELECT. HT
TB2	TERMINAL STRIP-UNIT

MOTOR SPEED TAP CHART

3 SPD MOTOR	5 SPD MOTOR	MOTOR SPEED
	1	COMMON
2	2	HIGH
	3	MEDIUM HIGH
3	4	MEDIUM
	5	MEDIUM LOW
4	6	LOW

LENNOX Industries Inc. WIRING DIAGRAM 5/97

HEATING UNITS-ELECTRIC

ECB29-12.5CB,15CB-2-P

Supersedes Form No.	New Form No.
	532,524W

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LENNOX Industries Inc. WIRING DIAGRAM 5/95 10/95

COILS-BLOWER COIL UNITS

CB29M-21/26,31,41,51,65-1-P
CB30M-21/26,31,41,51,65-1-P
CB30U-21/26,31,41,51,65-1-P

COIL SECTION-

Supersedes Form No.	New Form No.
	531,613W

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Figure 12

CB31MV Blower Coil Unit with installed Electric Heat — P Voltage

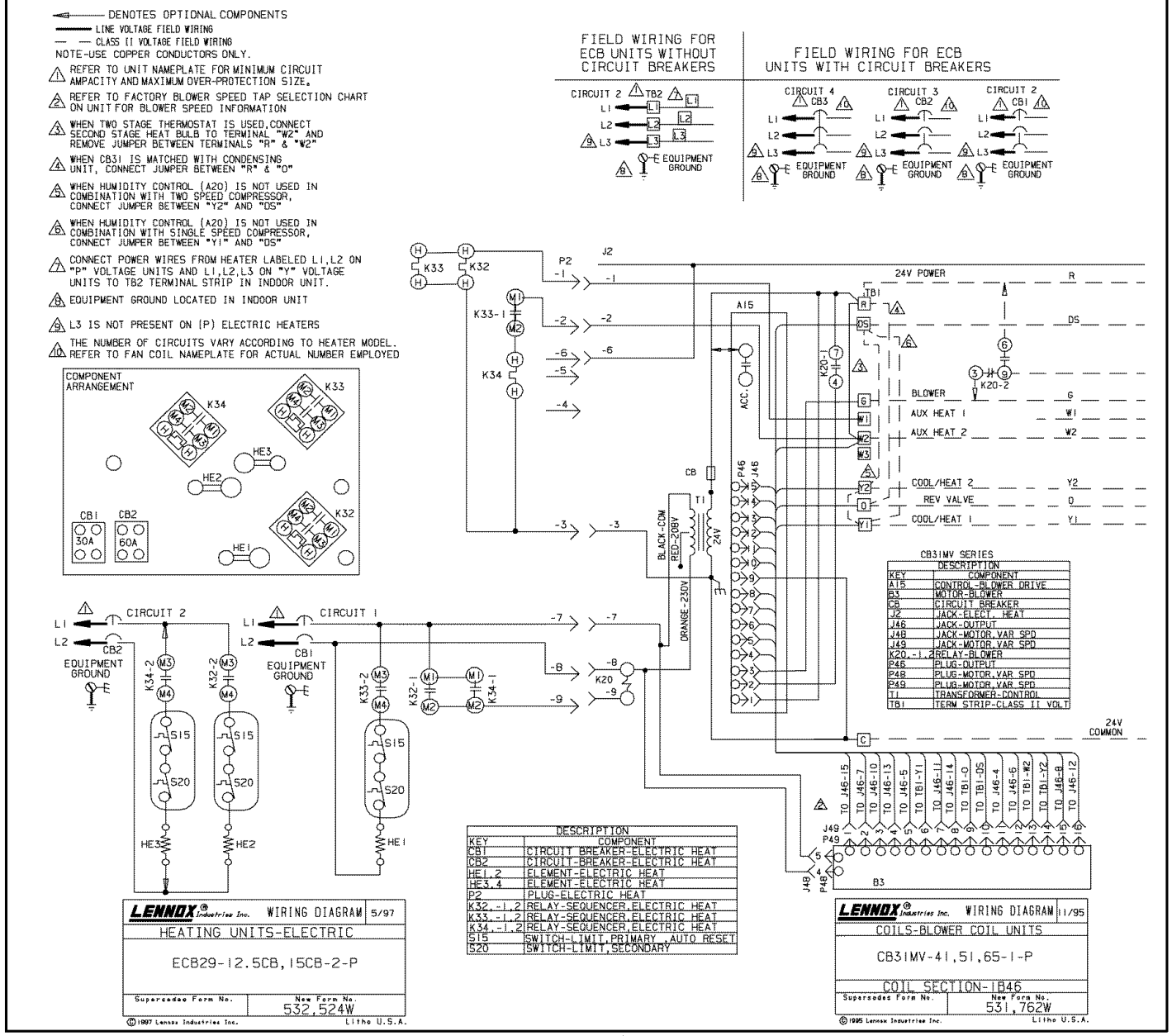
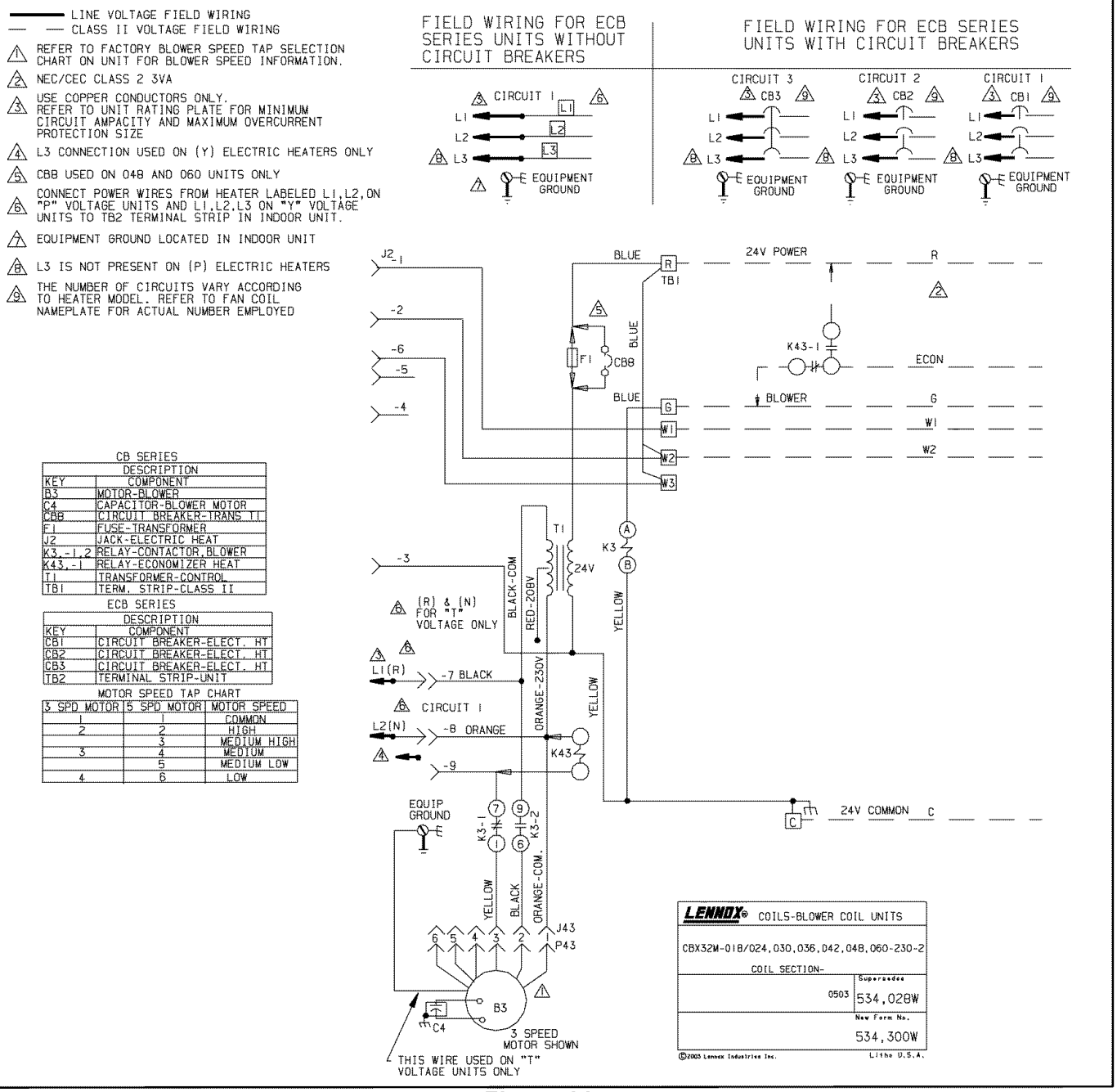


Figure 13

CBX32M Blower Coil Unit with installed Electric Heat — P Voltage



CB SERIES

DESCRIPTION	
KEY	COMPONENT
B3	MOTOR-BLOWER
C4	CAPACITOR-BLOWER MOTOR
CB8	CIRCUIT BREAKER-TRANS II
F1	FUSE-TRANSFORMER
J2	JACK-ELECTRIC HEAT
K3,-1,2	RELAY-CONTACTOR,BLOWER
K43,-1	RELAY-ECONOMIZER HEAT
T1	TRANSFORMER-CONTROL
TB1	TERM. STRIP-CLASS II

ECB SERIES

DESCRIPTION	
KEY	COMPONENT
CB1	CIRCUIT BREAKER-ELECT. HT
CB2	CIRCUIT BREAKER-ELECT. HT
CB3	CIRCUIT BREAKER-ELECT. HT
TB2	TERMINAL STRIP-UNIT

MOTOR SPEED TAP CHART

3 SPD MOTOR	5 SPD MOTOR	MOTOR SPEED
1	1	COMMON
2	2	HIGH
	3	MEDIUM HIGH
3	4	MEDIUM
	5	MEDIUM LOW
4	6	LOW

Figure 14

CBX32MV Blower Coil Unit with Installed Electric Heat — P Voltage

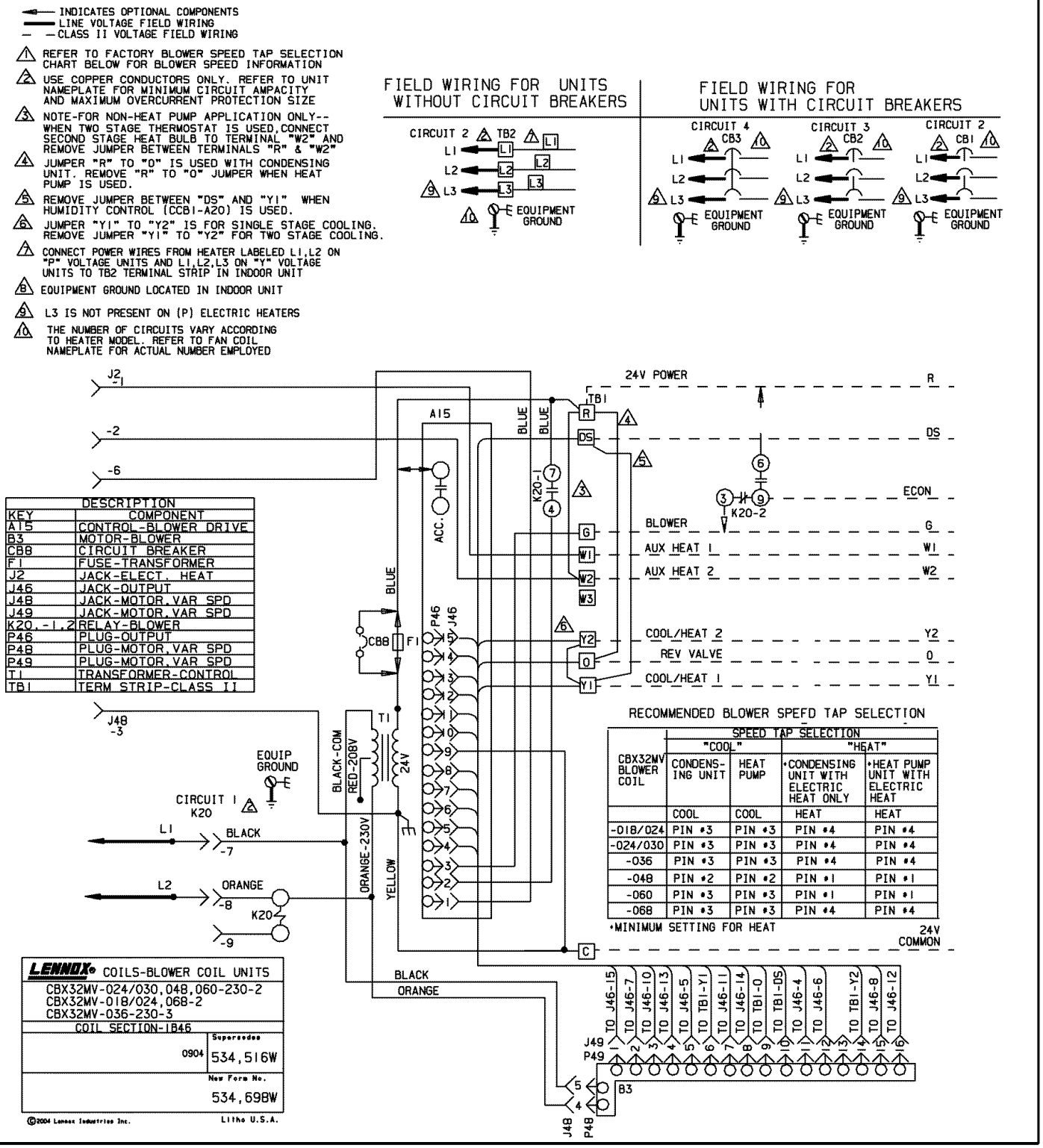


Figure 15