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.

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.
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.

**Electric Heat Section with Circuit Breakers**

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

**Blower Coil Knockouts**

- CB30M-21/26
- CB30U-21/26
- CBX32M-018/024
- CBX32MV-018/024

Holes in knockout allow room for diagonal cutters used to cut through sheet metal

- CB27UH-018,-024,-030,-036,-042,-048,-060
- CBX27UH-018,-024,-030,-036,-042,-048,-060
- CB30M-31,-41,-46,-51,-65
- CB30U-31,-41,-46,-51,-65
- CB31MV-41,-51,-65
- CBX32M-030,-036,-042,-048,-060
- CBX32MV-024/030,-036,-048,-060,-068

**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.
- 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.

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

**Figure 3**

**Figure 4**

**Figure 5**
**Figure 3**

**Circuit Breaker Seal and Patch Plate Installation**

- BLOWER ACCESS PANEL
- CIRCUIT BREAKER SEAL
- PATCH PLATE

- 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

**Figure 4**

**Circuit Breaker Heater And Patch Plate Configuration**

**PATCH PLATE**
(Shipped installed on CB unit)

- Long Section

**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

- Rotate 180 degrees and install over opening
- Long Section

**Side of Unit**

- Break at this point

**Side of Unit**

- Break at this point
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

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
Side Of Unit

ROTATE 180° and install over opening

DISCARD
Break at this point

ECB31-10CB, ECB29-12.5CB, ECB29-15CB, ECB29-20CB
Side Of Unit

ROTATE 180° and install over opening

DISCARD
Break at this point

ECB31-20CB, ECB29-25CB, ECB29-30CB
Side Of Unit

Break at this point

Long Section

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.

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.
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.

---

**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**

![Diagram of cooling application with electric heat](image)

**NOTE - USE COPPER CONDUCTORS ONLY**

REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AM-PACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE

**NOTE** - ALL REMAINING WIRES FACTORY-INSTALLED

**LINE VOLTAGE FIELD-INSTALLED**

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

△ TO EXTERNAL LOAD 24VAC AT .50 AMP MAXIMUM

△ THERMOSTAT HEAT ANTICIPATION SETTING 0.4 AMP (ELECTRIC HEAT)

△ WHEN TWO-STAGE THERMOSTAT IS USED, CONNECT SECOND STAGE HEAT BULB TO TERMINAL “W2” AND REMOVE JUMPER BETWEEN TERMINALS “R” AND “W2”

△ FACTORY-INSTALLED JUMPER

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

---

**Figure 7**
Figure 8

- THERMOSTAT HEAT ANTICIPATION SETTING 0.4 AMP ELECTRIC HEAT
- FACTORY INSTALLED JUMPERS
- WHEN OUTDOOR THERMOSTAT IS USED, CONNECT LEADS TO TERMINALS “R” AND “W2” AND REMOVE JUMPER BETWEEN TERMINALS “R” AND “W2.”
- EMERGENCY HEAT RELAY (USED ONLY IF OUTDOOR T-STAT IS USED) FIELD PROVIDED AND INSTALLED NEAR INDOOR UNIT. 24VAC 5VA MAX NEC/CEC CLASS 2
- USING SERVICE LIGHT OPTION (S54) WITH SOME ELECTRONIC THERMOSTATS MAY REQUIRE MOVING S54 COMMON WIRE TO Y1 IN HEAT PUMP UNIT.
- COMMON USED ONLY ON SOME THERMOSTATS.
- Y2 USED ONLY WHEN TWO SPEED COMPRESSOR IS USED (HP21).
- AMBIENT COMPENSATING THERMISTOR CONNECTION USED ONLY ON SOME THERMOSTATS.
- L3 CONNECTION USED ON Y VOLTAGE 3 PHASE ELECTRIC HEATERS ONLY.
Wiring for Models -10, -15, -20 and -25 KW Electric Heat (G Voltage)

COMPONENT ARRANGEMENT

KEY
- FUSE-ELECTRIC HEAT
- HEI- ELEMENT-ELECTRIC HEAT
- K15-1 - CONTACOR-ELECTRIC HEAT
- K36-1,2,3 - RELAY-HEAT BLOWER
- P3 - PLUG-ELECTRIC HEAT
- S15 - SWITCH-LIMIT-PRIMARY, AUTO RESET
- S20 - SWITCH-LIMIT-SECONDARY, ELECT. HT
- TB3 - TERMINAL BLOCK-ELECTRIC HEAT

DESCRIPTION

COMPONENT
- FUSE-ELECTRIC HEAT
- ELEMENT-ELECTRIC HEAT
- CONTACTOR-ELECTRIC HEAT
- RELAY-HEAT BLOWER
- PLUG-ELECTRIC HEAT
- SWITCH-LIMIT-PRIMARY, AUTO RESET
- SWITCH-LIMIT-SECONDARY, ELECT. HT
- TERMINAL BLOCK-ELECTRIC HEAT

FUSE SIZE CHART

<table>
<thead>
<tr>
<th>UNIT</th>
<th>VOLTAGE</th>
<th>FUSE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECB29-10</td>
<td>&quot;G&quot; 20A</td>
<td>20A</td>
</tr>
<tr>
<td>ECB29-15</td>
<td>&quot;G&quot; 25A</td>
<td>25A</td>
</tr>
<tr>
<td>ECB29-20</td>
<td>&quot;G&quot; 35A</td>
<td>35A</td>
</tr>
<tr>
<td>ECB29-25</td>
<td>&quot;G&quot; 40A</td>
<td>40A</td>
</tr>
</tbody>
</table>

NOTE-USE COPPER CONDUCTORS ONLY

REFER TO UNIT NAMEPLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERPROTECTION SIZE.

LINE VOLTAGE FIELD INSTALLED

DENOTES OPTIONAL COMPONENTS

LENNOX Industries Inc. WIRING DIAGRAM 1/96

HEATING UNITS-ELECTRIC

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

Figure 9
Wiring for 20CB-3 KW Electric Heat (P Voltage)

COMPONENT ARRANGEMENT

DESCRIPTION

<table>
<thead>
<tr>
<th>KEY</th>
<th>COMPONENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBI</td>
<td>CIRCUIT BREAKER-ELECTRIC HEAT</td>
</tr>
<tr>
<td>CB2</td>
<td>CIRCUIT BREAKER=ELECTRIC HEAT</td>
</tr>
<tr>
<td>HFI.2</td>
<td>ELEMENT-ELECTRIC HEAT</td>
</tr>
<tr>
<td>HE3,4</td>
<td>ELEMENT-ELECTRIC HEAT</td>
</tr>
<tr>
<td>P2</td>
<td>PLUG-ELECTRIC HEAT</td>
</tr>
<tr>
<td>K32,-1.2</td>
<td>RELAY-SEQUENCER=ELECTRIC HEAT</td>
</tr>
<tr>
<td>K33,-1.2</td>
<td>RELAY-SEQUENCER=ELECTRIC HEAT</td>
</tr>
<tr>
<td>K34,-1.2</td>
<td>RELAY-SEQUENCER=ELECTRIC HEAT</td>
</tr>
<tr>
<td>S15</td>
<td>SWITCH-LIMIT PRIMARY AUTO RESET</td>
</tr>
<tr>
<td>S20</td>
<td>SWITCH-LIMIT SECONDARY</td>
</tr>
</tbody>
</table>

Refer to unit nameplate for minimum circuit ampacity and maximum over-protection size. Note-use copper conductors only.

Line voltage field installed.

Denotes optional components.

Figure 10
CB3OM, CB30U Blower Coil Unit with Installed Electric Heat — P Voltage

**FIELD WIRING FOR ECB SERIES UNITS WITHOUT CIRCUIT BREAKERS**

**FIELD WIRING FOR ECB SERIES UNITS WITH CIRCUIT BREAKERS**

---

**COMPONENT ARRANGEMENT**

- **K34**: Circuit Breaker - Electric Heat
- **K35**: Circuit Breaker - Electric Heat
- **H31**: Element - Electric Heat
- **H41**: Element - Electric Heat
- **P2**: Plug - Electric Heat
- **K32, K33**: Relays - Sequencer, Electric Heat
- **G22**: Switch - Limit, Primary
- **O30**: Switch - Limit, Secondary
- **H1**: Equipment Ground
- **K34**: Element - Electric Heat

**DESCRIPTION**

- **CIRCUIT 1**: L1, L2, L3
- **CIRCUIT 2**: L1, L2, L3
- **CIRCUIT 3**: L1, L2, L3

**Figure 12**

---

**CB SERIES DESCRIPTION**

- **T1**: Transformer - Electric Heat
- **T2**: Transformer - Electric Heat
- **T3**: Transformer - Electric Heat
- **T4**: Transformer - Electric Heat

**ECB SERIES DESCRIPTION**

- **T1**: Transformer - Electric Heat
- **T2**: Transformer - Electric Heat
- **T3**: Transformer - Electric Heat
- **T4**: Transformer - Electric Heat

**HEATING UNITS - ELECTRIC**

- **ECB29-12.5CB, 15CB-2-P**: 3-Speed Motor Shown

**Motor Speed Tap Chart**

- **1**: Common Motor Speed
- **2**: High Motor Speed
- **3**: Medium Motor Speed
- **4**: Low Motor Speed

---

LENNOX®

**WIRING DIAGRAM 5/97**

**HEATING UNITS - ELECTRIC**

**CB3OM-21/26,31,41,51,65-1-P**

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

---

Page 10
CB31MV Blower Coil Unit with installed Electric Heat — P Voltage

- **DENOTES OPTIONAL COMPONENTS**
- **LINE VOLTAGE FIELD WIRING**
- **CLASS II WIRING**
- **NOTE: USE COPPER CONDUCTORS ONLY.**

Refer to unit nameplate for minimum circuit ampacity and maximum over-protection size.

Refer to factory blower speed tap selection chart on unit for blower speed information.

When two-stage thermostat is used, connect MAX stage heat bulb to terminals "R" & "S" and remove jumper between terminals "R" & "T".

When coil is matched with condensing unit, connect jumper between "R" & "T".

When humidity control (X20) is not used in combination with single-speed compressor, connect jumper between terminals "R" & "T".

Connect power wires from heater labeled L1, L2 on "24V" voltage units and L1, L2, L3 on "415V" voltage units to TB2 terminal strip in indoor unit.

Equipment ground located in indoor unit.

L3 is not present on (P) electric heaters.

The number of circuits vary according to heater model. Refer to fan coil nameplate for actual number employed.

---

**FIELD WIRING FOR ECB UNITS WITHOUT CIRCUIT BREAKERS**

**CIRCUIT 1**

- L1
- L2
- Equipment Ground

**CIRCUIT 2**

- L1
- L2
- Equipment Ground

---

**FIELD WIRING FOR ECB UNITS WITH CIRCUIT BREAKERS**

- **CIRCUIT 1**
- **CIRCUIT 2**
- **CIRCUIT 3**
- **CIRCUIT 4**

---

**DESCRIPTION**

- **C1** Circuit Breaker Electric Heat
- **C2** Circuit Breaker Electric Heat
- **C3** Circuit Breaker Electric Heat
- **C4** Circuit Breaker Electric Heat
- **C5** Circuit Breaker Electric Heat

---

**ECB29-12.5CB, 15CB-2-P**

---

**Figure 13**
CBX32M Blower Coil Unit with installed Electric Heat — P Voltage

**Line Voltage Field Wiring**
- Class II Voltage Field Wiring
- Refer to Factory Blower Speed Tap Selection Chart on unit for Blower Speed Information.
- NEC/CEC Class II SVA
- Use Copper Conductors Only
- Refer to Unit Rating Plate for Minimum Circuit Ampacity and Maximum Overcurrent Protection Size
- L3 connection used on (Y) Electric Heaters Only
- CB used on O48 and O60 Units Only
- 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.
- Equipment Ground Located in Indoor Unit
- L3 is Not Present on (P) Electric Heaters
- The Number of Circuits Vary According to Heater Model. Refer to Fan Coil Nameplate for Actual Number Employed

**EVB Series**
- Description
- CBX32M Blower Coil Units OIB, O24, O30, O36, O42, O48, O54, O60-230/240V

**EVB Series**
- Description
- CBX32M Blower Coil Units OIB, O24, O30, O36, O42, O48, O54, O60-230/240V

**Motor Speed Tap Chart**

**Field Wiring for ECB Series Units Without Circuit Breakers**

**Field Wiring for ECB Series Units With Circuit Breakers**

**Figure 14**