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Dallas, Texas, USA

INSTALLATION INSTRUCTIONS

ECB40 Series Units

**THIS MANUAL MUST BE LEFT WITH THE
HOMEOWNER FOR FUTURE REFERENCE**

ELECTRIC HEAT SECTIONS
507414-01
10/2014
Supersedes 506415-01

Technical
Publications
Litho U.S.A.

⚠ WARNING

Electric Shock Hazard.

Can cause injury or death.

Foil-faced insulation has conductive characteristics similar to metal. Be sure there are no electrical connections within a 1/2" of the insulation. If the foil-faced insulation comes in contact with electrical voltage, the foil could provide a path for current to pass through to the outer metal cabinet. While the current produced may not be enough to trip existing electrical safety devices (e.g. fuses or circuit breakers), the current can be enough to cause an electric shock hazard that could cause personal injury or death.

Shipping and Packing List

Package 1 of 1 contains

- 1 - Assembled electric heat section
- 1 - Bag assembly containing the following:
 - Screws - 6 each
 - Wiring diagram - 1 each
 - Circuit breaker cover - 1 each
- 2 - Adhesive-backed foam seals

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

⚠ 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!*

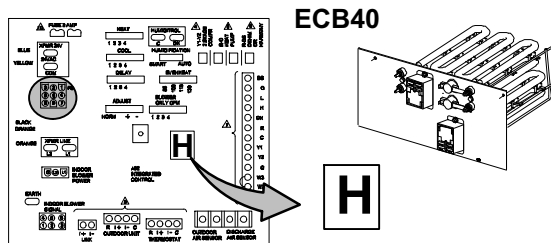
⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause personal injury, loss of life, or damage to property.

Installation and service must be performed by a licensed professional installer (or equivalent) or a service agency.

IMPORTANT INFORMATION FOR INSTALLER

CONFIGURE ELECTRIC HEAT



**ELECTRIC HEAT WILL NOT OPERATE
IF IT IS NOT CONFIGURED (SET UP)
THROUGH THE AIR HANDLER
CONTROL (AHC).
SEE CONFIGURATION PROCEDURE,
FIGURE 12 ON PAGE 9.**



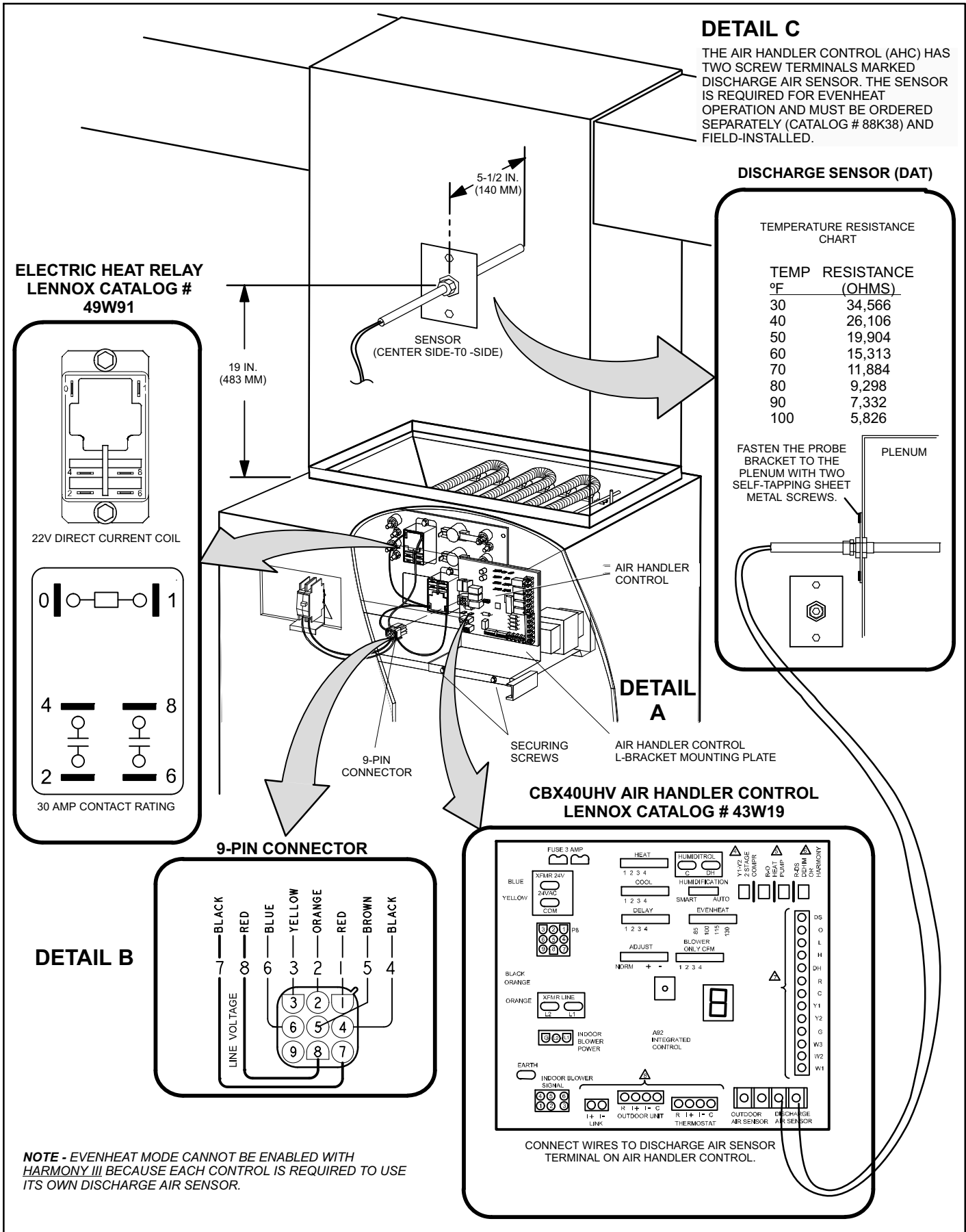


Figure 1. Component Connections

Electric Heat Sections

⚠ CAUTION

As with any mechanical equipment, contact with sharp sheet metal edges can result in personal injury. Take care while handling this equipment and use protective clothing.

⚠ 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.

The ECB40 series electric heat sections provide field-installed electric heat for both CBX32MV and CBX40UHV series air handler units. ECB40 electric heat sections are available in single-phase and three-phase voltages. Single-phase ECB40 heat sections are equipped with either terminal blocks or circuit breakers.

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.

This electric heat section and all other equipment used in the HVAC system must be installed by a licensed professional installer, or equivalent. You **must** follow federal, state, and local codes while you install this or any other HVAC equipment.

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

Installation of Lennox air handlers 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 electric heat section, check the unit rating plate to ensure that the unit meets the job requirements, that proper electrical power is available, and that proper duct clearances are maintained.

NOTE - It is easier to install the ECB40 heat section inside the air handler unit before the unit is set and the plenum is attached.

1. Shut off all power to the air handler. More than one disconnect may be required.

2. Remove air handler access panel.
3. Disconnect and discard the 9-pin connector currently attached to the air handler control.
4. Loosen the two screws (see figure 1, detail A) securing the air handler control L-bracket mounting plate, and lift the plate off the screws. Pull the plate forward and let it suspend in front of the unit to allow access to the electric heat knockout.

Measure the length and width of the backing plate of the electric heat section to be installed in the air handler. Remove the appropriate electric heat knockout in the air handler vestibule panel to match the electric heat section being installed.

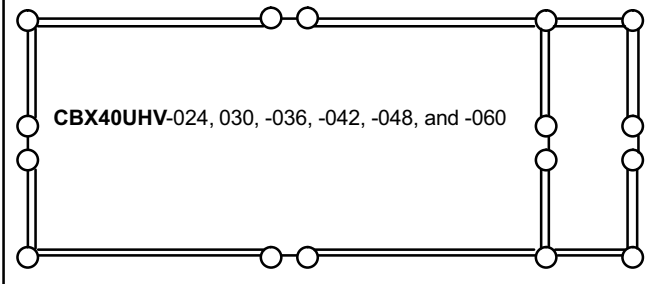


Figure 2. Air Handler Electric Heat Knockouts

5. Remove the electric heat knockout from the air handler vestibule panel to accommodate the heater being used.
6. Slide the electric heat section into the air handler as illustrated in figure 3. Be careful that the heating elements do not rub against the sheet metal opening when they slide into the air handler. The hole(s) on each side of the heater line up with holes in the air handler control box. Secure the electric heater into place with the screws that are provided in the bag assembly.

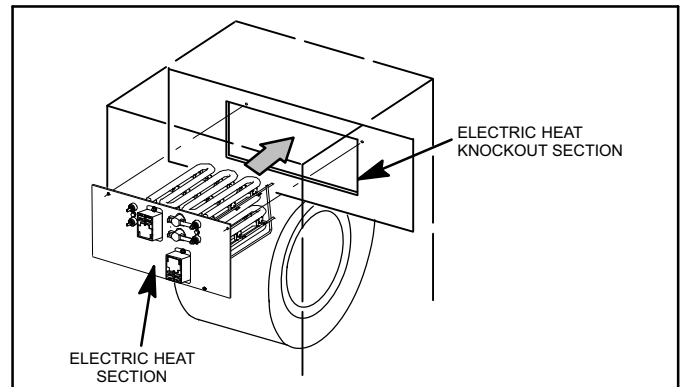


Figure 3. Electric Heat Section Installation

7. Reinstall the air handler control L-bracket mounting plate by lifting it back in place. Tighten the two screws to secure in place.
8. Plug the 9-pin connector from the electric heat section onto the air handler control 9-pin receptacle as illustrated in figure 1, detail B.

Circuit Breaker Installation

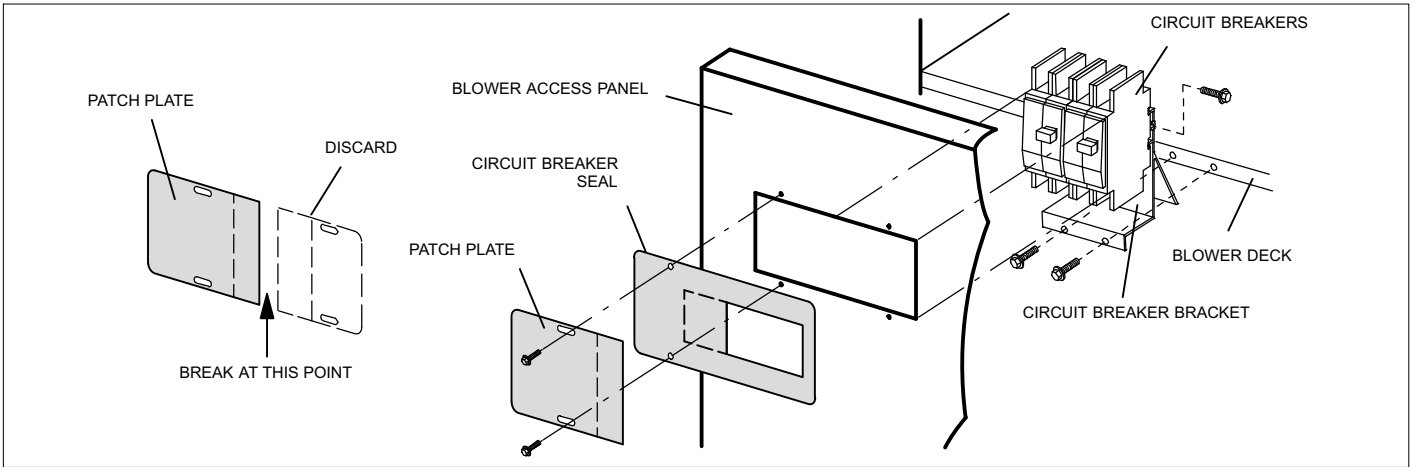


Figure 4. Circuit Breaker Seal and Patch Plate Installation

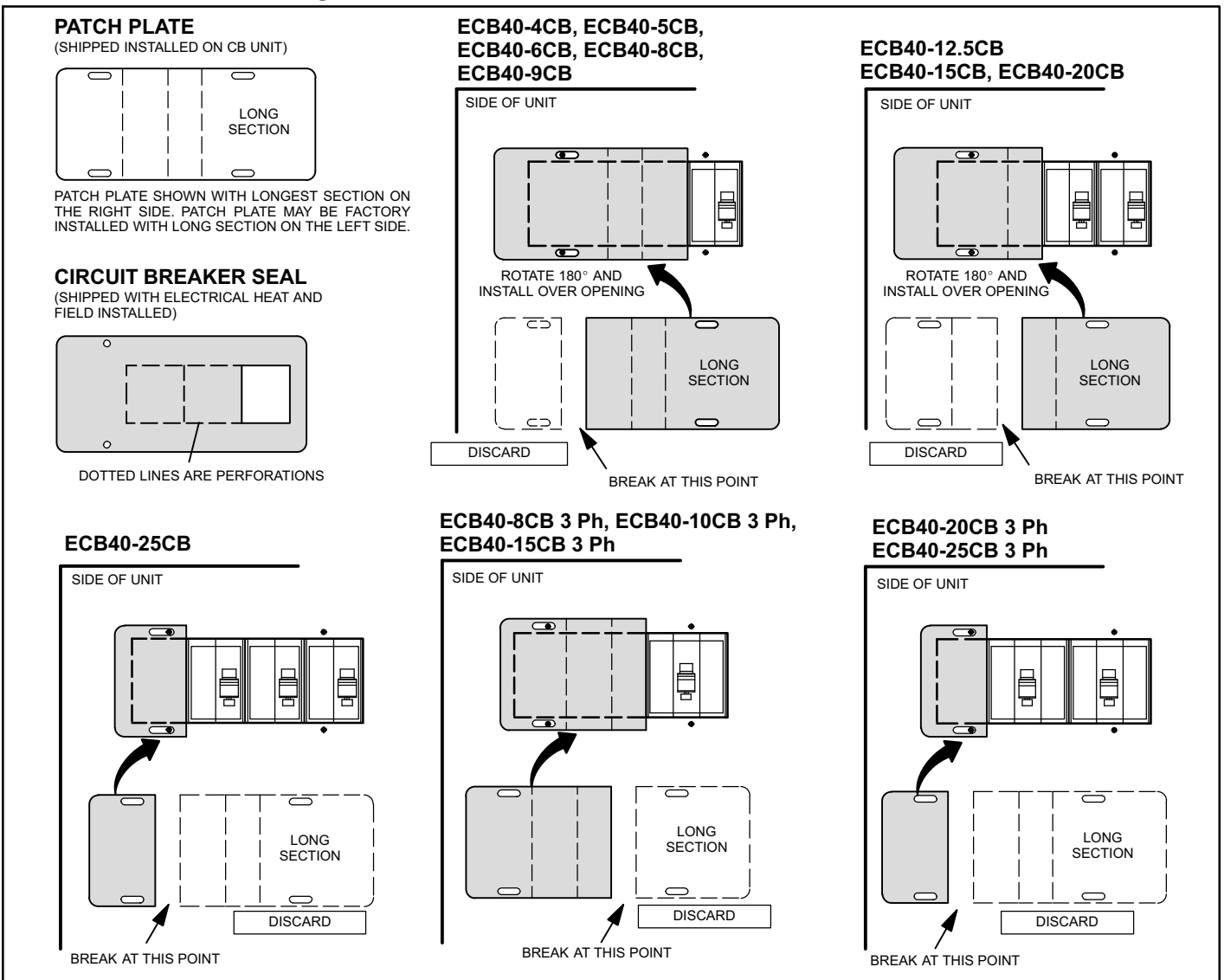


Figure 5. Circuit Breaker Heater and Patch Plate Configuration (CBX40UHV)

1. Install the circuit breaker on the air handler deck flange as illustrated in figure 4. Use the provided six screws to secure the circuit breaker.

NOTE - When applied in the downflow position, **the circuit breakers must be rotated to the UP position.** See figure 6 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 closest to the circuit breaker to allow rotation.

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

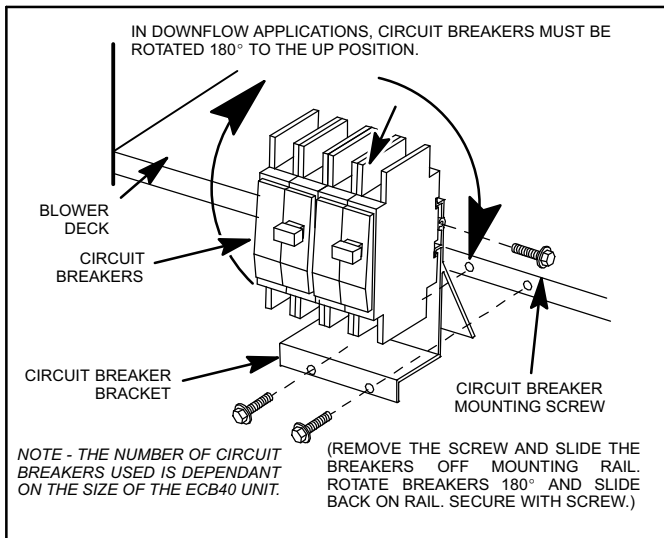


Figure 6. Typical Electric Heat Section with Circuit Breakers

Circuit Breaker Cover Installation

If the air handler is installed in an unconditioned space, the provided circuit breaker cover must be installed.

1. Use isopropyl alcohol to clean the surface that the circuit breaker cover will be attached to.

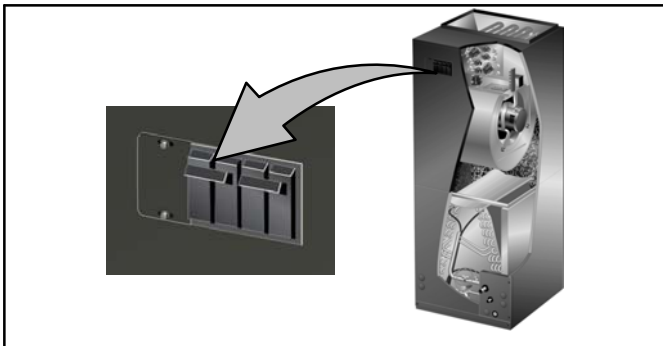


Figure 7. Circuit Breaker Location

2. Remove paper backing from seal around perimeter of circuit breaker cover (figure 8).

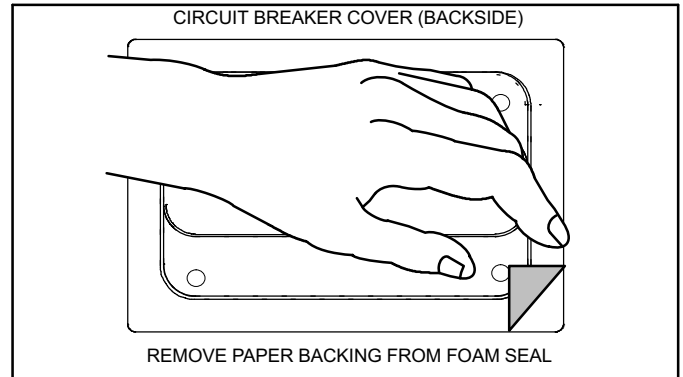


Figure 8. Remove Paper Backing

3. Run a bead of clear silicone around the perimeter of the circuit breaker cover to seal any gaps between the cabinet access door and the circuit breaker cover.
4. Position the breaker cover over the air handler circuit breaker opening (figure 9).

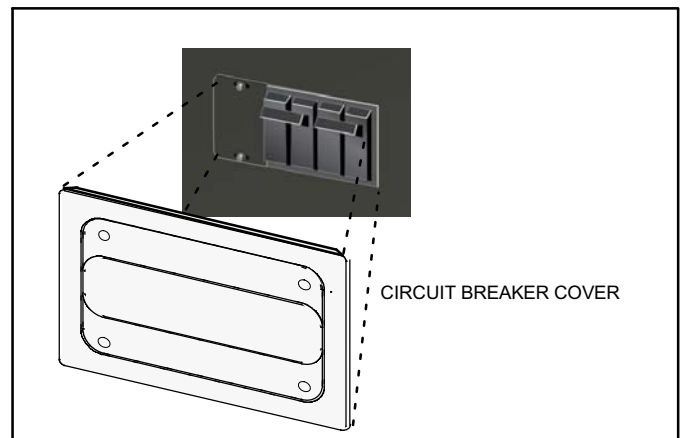


Figure 9. Circuit Breaker Cover Installation

⚠ IMPORTANT

Confirm air tight seal between breaker cover and air handler access panel. Apply a thin silicone bead to the adhesive back seat to ensure air tight seal.

Failure to seal circuit breaker cover will allow warm moist air to be pulled into control panel which can create condensation to form on the circuit breaker and other electrical components within the control panel.

Discharge Air Temperature Sensor

The Air Handler Control (AHC) has two screw terminals marked *Discharge Air Sensor*. The sensor is REQUIRED for EVENHEAT operation, is field-mounted and must be ordered separately (Lennox Catalog # 88K38).

The air handler control reads the discharge air temperature sensor and initiates the following actions:

- In EVENHEAT mode the control turns ON or OFF the electric heating elements during the heat demand to maintain a specified temperature range at the discharge air sensor.
- Sends discharge temperature status message when operating in EVENHEAT mode.
- Sends discharge air sensor temperatures to be displayed on the Air Handler Control when operating in EVENHEAT mode

The discharge air sensor should be mounted downstream of the electric heat elements and indoor air handler as illustrated in figure 1, detail C. It must be placed in a location with unobstructed airflow, where other accessories (such as humidifiers, UV lights, etc.) will not interfere with its accuracy.

Electrical Connections

WARNING

USE COPPER CONDUCTORS ONLY.

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

The air handler units are provided with openings to be used with 1-1/2 inch trade size (1-31/32 inch diameter) conduit. 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.

AIR HANDLER CONTROL 9-PIN CONNECTOR

Wiring connections between the air handler and the ECB40 electric heat section are made with an eight wire harness. See table 1 for wire designations.

Table 1 - Electric Heat Connectors

Position	Function / Description
1	Heat stage 1 relay coil
2	Heat stage 2 relay coil
3	Relay coil return
4	Heat stage 3 relay coil
5	Heat stage 4 relay coil
6	Heat stage 5 relay coil
7	L1 230VAC supply from heater kit
8	L2 230 VAC supply from heater kit
9	Not Used

Unit Start-Up

1. Use speed tap selection chart in table 2 to set air handler blower speed.

Table 2 - Recommend Blower Speed Tap Selection

BLOWER COIL	SPEED TAP SELECTION			
	COOL		HEAT	
	AC	HP	AC WITH ELECTRIC HEAT	HP WITH ELECTRIC HEAT
-024	COOL PIN #3	COOL PIN #3	HEAT PIN #4	HEAT PIN #4
-030				
-036				
-042	COOL PIN #3	COOL PIN #3	HEAT PIN #3	HEAT PIN #3
-048	COOL PIN #2	COOL PIN #2	HEAT PIN #1	HEAT PIN #1
-060	COOL PIN #3	COOL PIN #3	HEAT PIN #1	HEAT PIN #1

2. Restore power to the unit with room thermostat set to OFF.
3. Unit can be configured in either Standard Heat or EVENHEAT Mode. See **Configuring/Detecting Heat Section** flow diagram on page 12 for set up.
4. Affix the wiring diagram sticker to blower scroll aligned with CB unit wiring diagram sticker.
5. The air handler access panels are factory supplied, and they have a patch plate over the circuit breaker opening. Remove the circuit breaker patch plate from the air handler access panel.
6. Replace the air handler compartment access cover.
7. Choose the appropriately sized adhesive-backed circuit breaker seal and remove any perforated sections (if needed). Apply the seal to the outside of the air handler access panel so that the seal is snug around the circuit breakers (see figure 4).
8. Break the patch plate for the specific size of electric heat unit / air handler unit that you are installing as illustrated in figure 5. Discard the unused piece of patch plate.
9. Secure the patch plate on the air handler access door.
10. Set the thermostat to desired setting.

Configuring Unit

This section identifies the requirements for configuring the air handler unit for unit size, heat mode selection, EVENHEAT operation and Heat Pump/Cooling Operations.

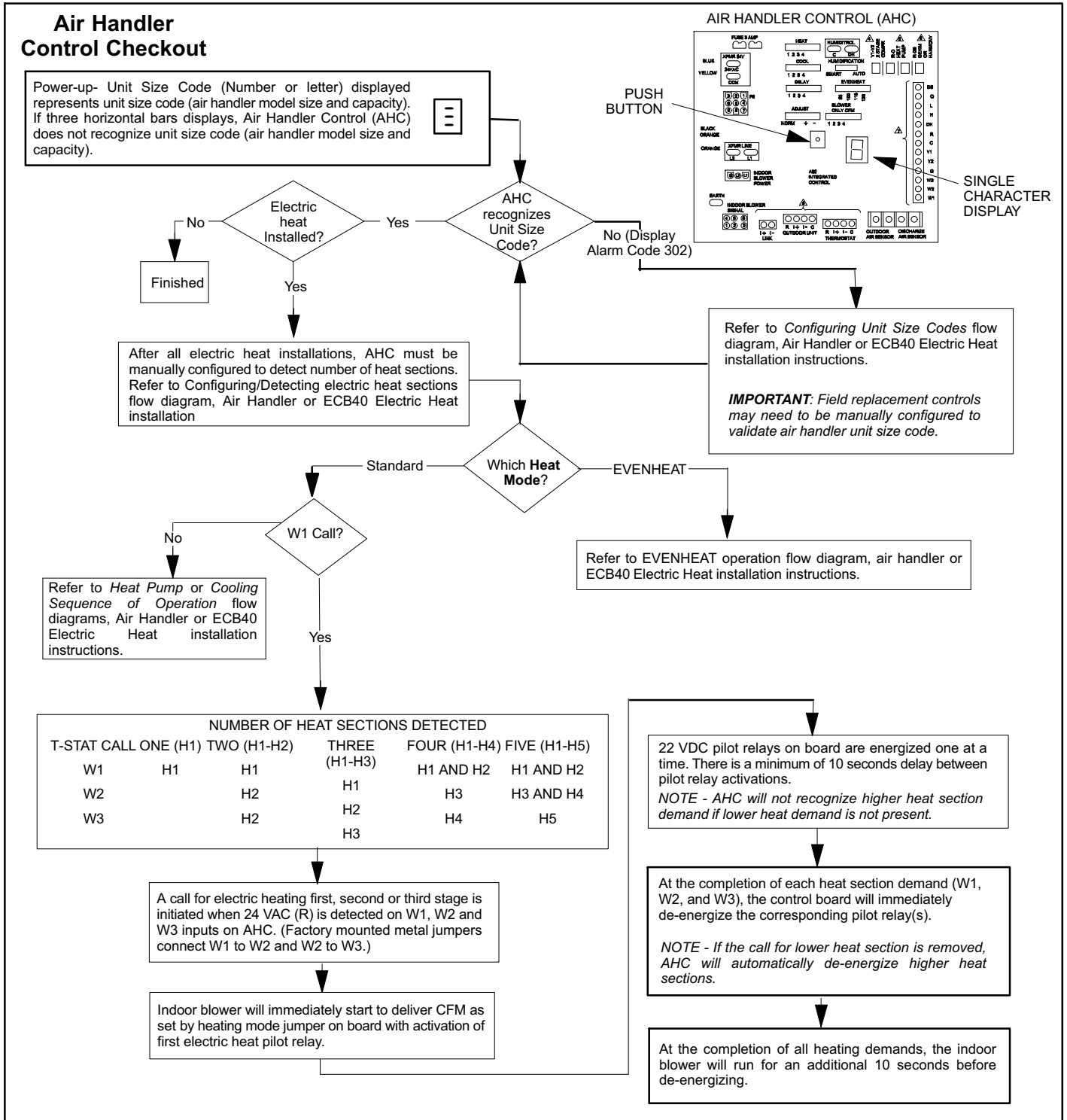
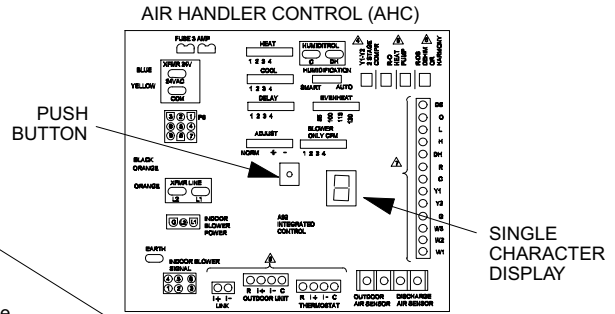


Figure 10. Air Handler Control Checkout

Configuring Unit Size Codes (Model Number)

Power-up - Unit Size Code (number or letter) displayed represents unit size code (air handler model size and capacity). If three horizontal bars display, Air Handler Control (AHC) does not recognize **unit size code** (air handler model size and capacity).



AHC in **IDLE** mode (No heating, cooling or indoor fan operation)

Yes

No

To enter **unit size code configuration**, push and hold button next to single character display until **dash** symbol appears, then release button.



Turn room thermostat to **OFF**

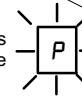
Solid **dash** starts blinking on single character display.



Push and hold button until the solid **P** symbol is displayed on the single character display, then release button. This mode allows the user to select a unit size code (number or letter) that matches the air handler model size and capacity.
IMPORTANT: Field replacement controls may need to be manually configured to validate air handler unit size code.



Solid **P** starts blinking on single character display.



Push and hold button to allow AHC to display unit size code (letter or number) for each different air handler model for three seconds.

UNIT SIZE CODE	AIR HANDLER MODEL
0	CBX32MV-018/024
1	CBX32MV-024/030
2	CBX32MV-036
3	CBX32MV-048
4	CBX32MV-060
5	CBX32MV-068
6	CBX40UHV-024
7	CBX40UHV-030
8	CBX40UHV-036
9	CBX40UHV-042
L	CBX40UHV-048
U	CBX40UHV-060

When the correct unit size code is displayed, release button. Selected code will flash for 10 second period. During that period, hold down push button until code stops blinking. AHC will store code in memory and will automatically exit the configuration and reset.
If ten second period expires or push button is held less than three seconds, AHC will automatically exit **configuration** and go into **IDLE** mode without storing unit size code. If this happens, configuration sequence must be repeated.

Verify that the selected **unit size code** is correct and stored by cycling the 24 volt power to the AHC. (During power-up of the AHC, the single character display will show the stored **unit size code**. If three horizontal bars display, AHC did not store the unit size code. If this happens, configuration sequence must be repeated.



Figure 11. Configure Unit Size Codes

Heat Mode Selection - Configuring / Detecting Electric Heat Sections

IMPORTANT: All electric heat installations require the Air Handler Control (AHC) to be manually configured to detect number of heat sections.
NOTE - All field replacement AHC will require configuring/detecting electric heat sections.

AIR HANDLER CONTROL (AHC)

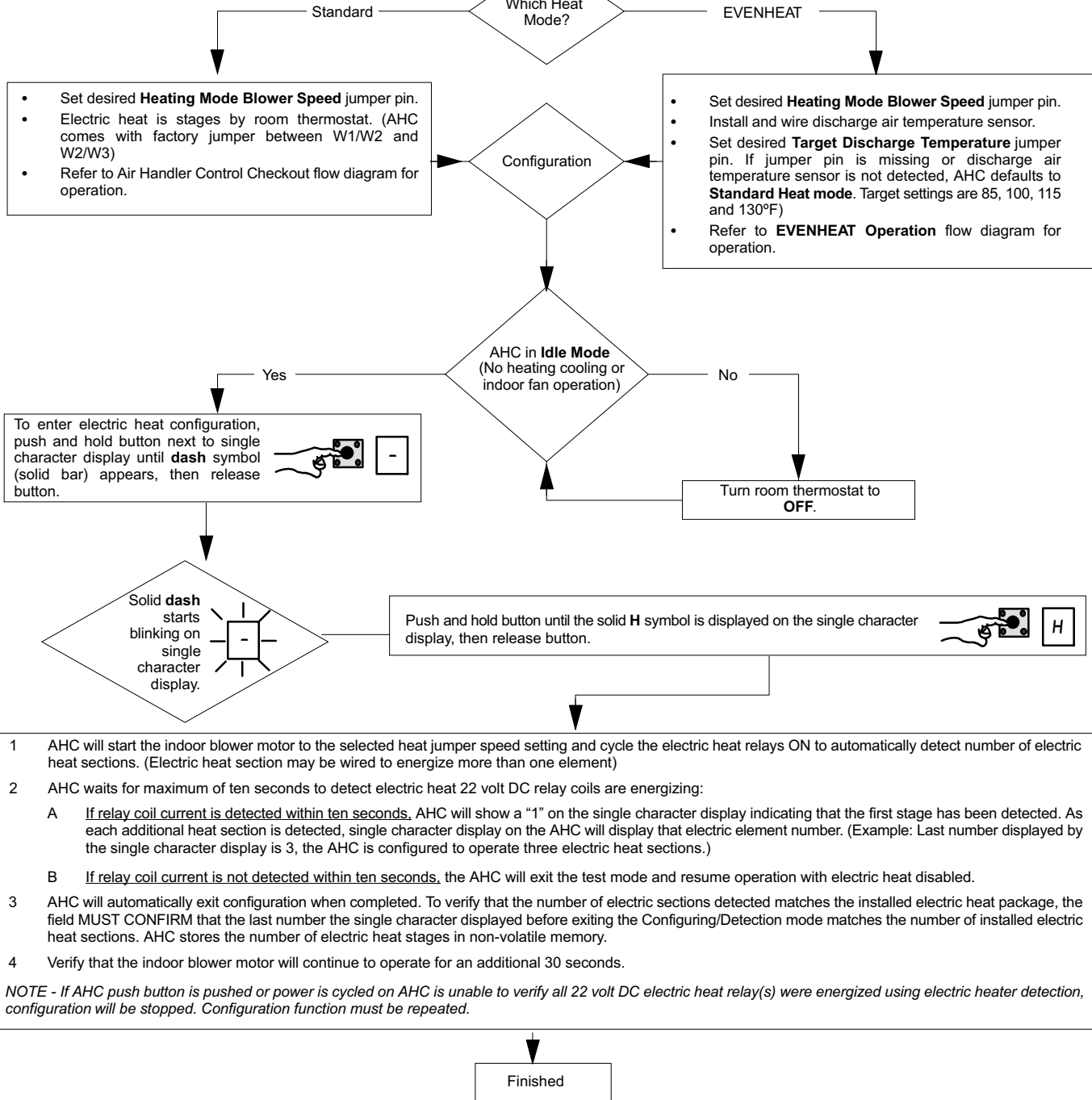
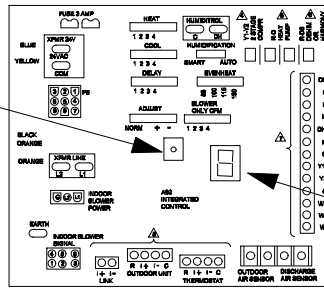


Figure 12. Heat Mode Selection

EVENHEAT Operation

INPUTS	OUTPUTS		
Room Thermostat Demand	Target Discharge Air Temperature Set at 85°F	Target Discharge Air Temperature Set at 100°F	Target Discharge Air Temperature Set at 115°F/130°F
Y1	Heat Pump First Stage	Heat Pump First Stage	Heat Pump First + First Electric Heat Section (H1)
Y1 + Y2	Heat Pump First and Second Stage	Heat Pump First and Second Stage + First Electric Heat Section (H1)	Heat Pump First and Second Stage + First Electric Heat Section (H1) + Second Electric Heat Section (H2) if number of electric heater sections detected is more than two.
Y1 + W1 and/or W2	Heat Pump First Stage + First Electric Heat Section (H1)	Heat Pump First Stage + First Electric Heat Section + Second Electric Heat Section (H2) if number of electric heater sections detected is more than two.	Heat Pump First Stage + First Electric Heat Section (H1) Second Electric Heat Section (H2) if number of electric heater sections detected is more than two.
Y1 and Y2 + W1 and/or W2	Heat Pump First and Second Stage+ First Electric Heat Section (H1)	Heat Pump First and Second Stage + First Electric Heat Section + Second Electric Heat Section (H2) if number of electric heater sections detected is more than two.	Heat Pump First and Second Stage + First Electric Heat Section (H1) Second Electric Heat Section (H2) if number of electric heater sections detected is more than two.
W1 and/or W2	First Electric Heat Section (H1)	First Electric Heat Section (H1) + Second Electric Heat Section (H2) if number of electric heater sections detected is more than two.	First Electric Heat Section (H1) + Second Electric Heat Section (H2) if number of electric heater sections detected is more than two.

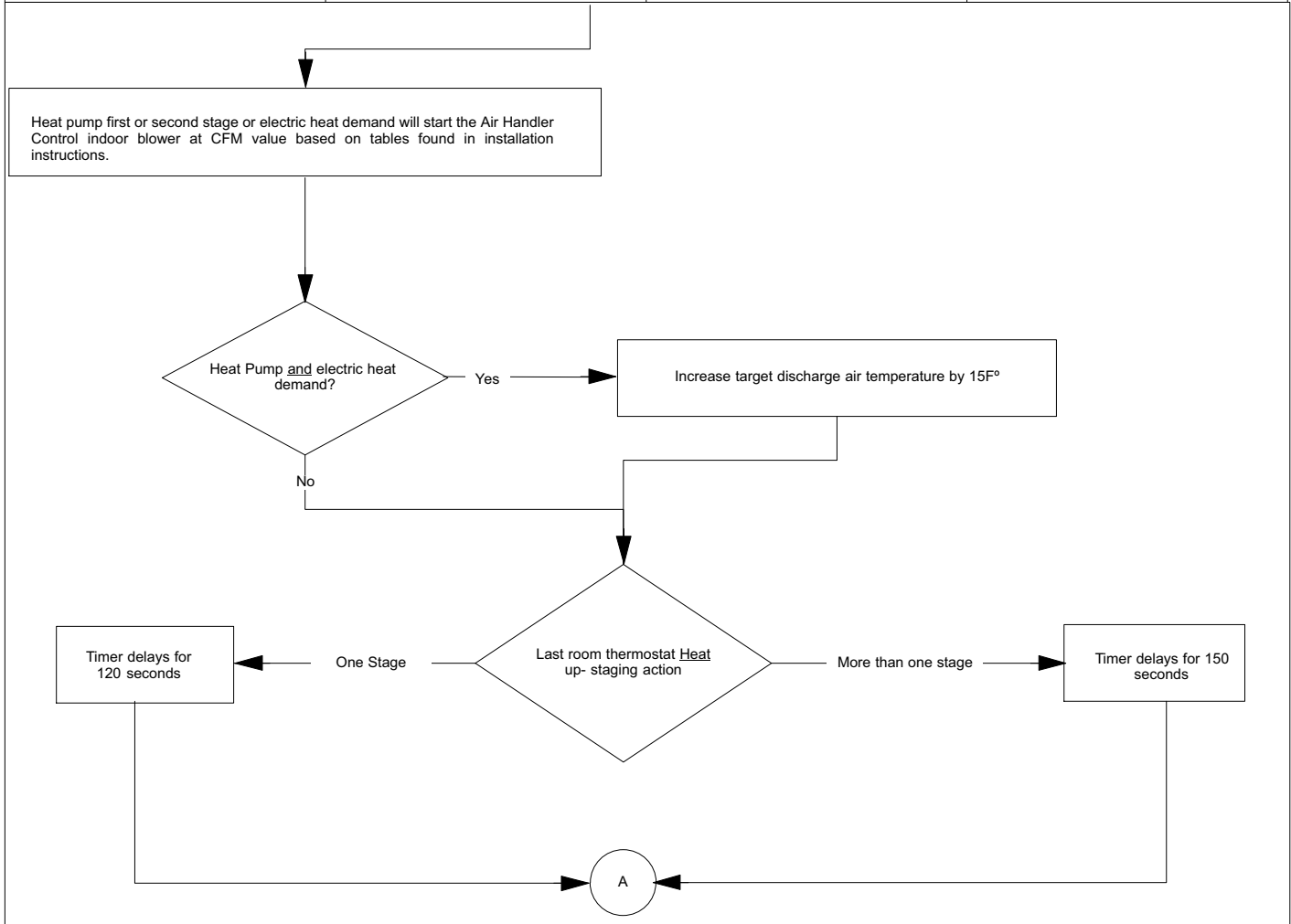


Figure 13. EVENHEAT Operation (1 of 2)

EVENHEAT Operation

Note 1 Activation delay

- 120 seconds if one heat stage is activated or deactivated
- 150 seconds if more than one stage is activated or deactivated.

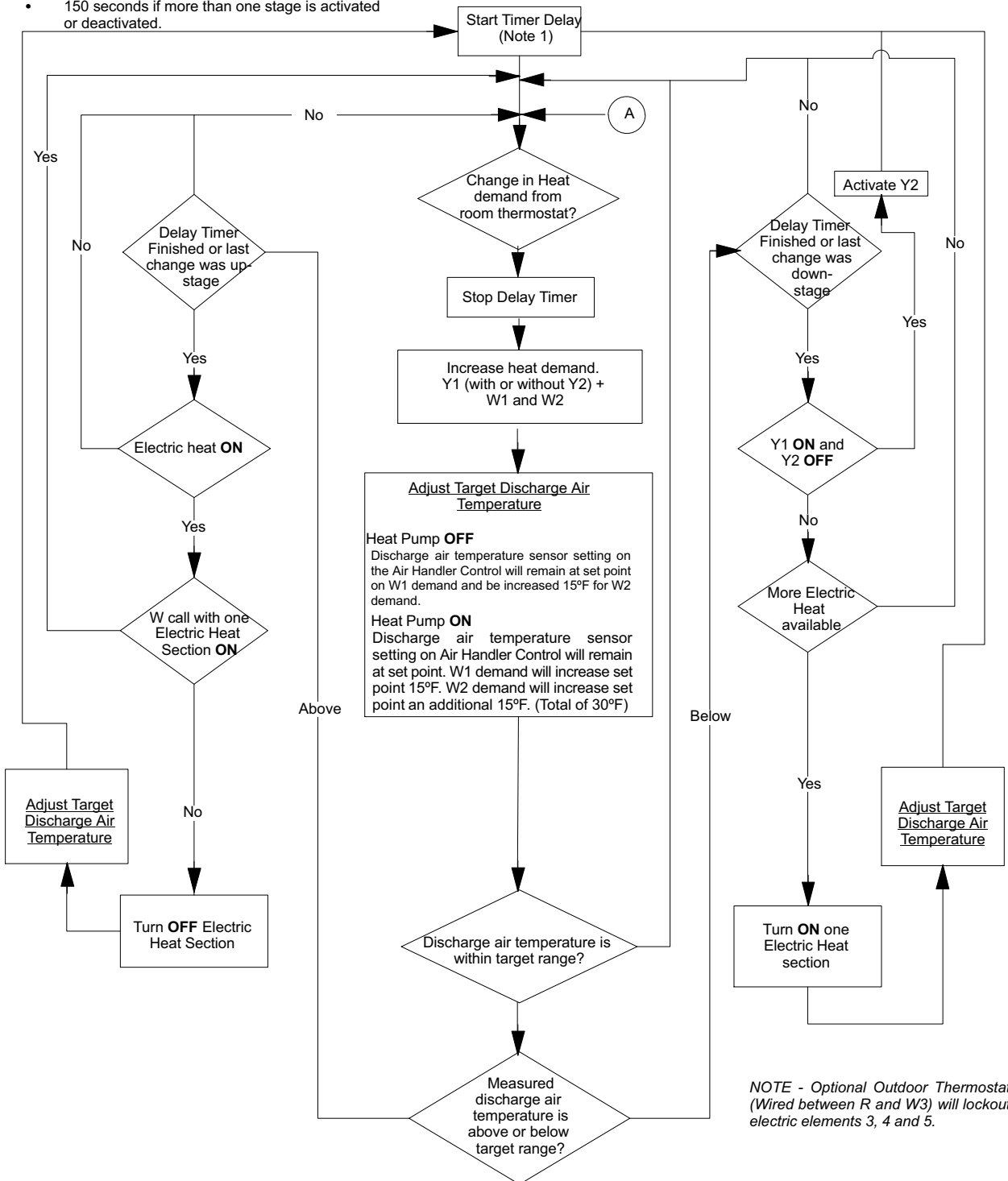


Figure 14. EVENHEAT Operation (2 of 2)

Electric Heat Wiring Diagram Cross Reference

The following table provides a cross-reference for diagrams for specific electric heat models.

Table 3.

Electric Heat Section Model	Wiring Diagram #
ECB40-2.5-2P	537761-01
ECB40-4-2P	537761-01
ECB40-4CB-2P	537761-01
ECB40-5-2P	537761-01
ECB40-6-2P	537762-01
ECB40-8-2P	537763-01
ECB40-5CB-2P	537761-01
ECB40-6CB-2P	537762-01
ECB40-8CB-2P	537763-01
ECB40-9CB-2P	537763-01
ECB40-12.5CB-2P	537765-01
ECB40-15CB-2P	537765-01
ECB40-20CB-2P	537766-01
ECB40-25CB-2P	537767-01
ECB40-8-2Y	537768-01
ECB40-10-2Y	537768-01
ECB40-15CB-2Y	537768-01
ECB40-20CB-2Y	537769-01
ECB40-25CB-2Y	537769-01