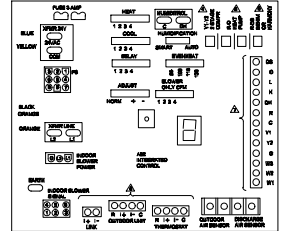


GUIDELINES FOR AIR HANDLER CONTROL FIELD REPLACEMENT (13Y22)

AIR HANDLER CONTROL (AHC) REPLACEMENT PROCEDURE

Indoor Unit NEW MAIN CONTROL Catalog Number
CBX32MV and CBX40UHV – Kit # 13Y22



AIR HANDLER CONTROL (AHC)

STEP 1.

Verify **OLD CONTROL** jumper settings, links and wiring connections. Use the same settings and wiring connections for the **NEW CONTROL**. See Figure 10 for location of jumpers and loop location.

STEP 2.

- Transfer **OLD CONTROL** wire connections to **NEW CONTROL**.
- Remove **OLD MAIN CONTROL**.
- Install **NEW MAIN CONTROL**.

Unit Size Code

See Figure 6 for details on this procedure.
Set **Unit Size Code** by following configuration procedure provided in this instruction or unit installation instructions

Non-Communicating System

The unit will operate based on jumper and link settings on the control. All setting changes must be done at the control board. The Lennox ComfortSense® 7000 thermostat may be used, as well as other non-communicating thermostats.

Communicating System

The jumper and link settings are **default settings** and **ONLY** control system operation if configuration settings in the iComfort® thermostat are not available. The Lennox iComfort® thermostat must be used in communicating applications.

MAIN CONTROL Set-up

Use the procedures provided in this instruction or that of the unit installation instruction.
Set jumpers and clip links to match parameters of equipment
(See figure 2 in this instruction for location of single character display, push button, jumpers and links.)

Configure Electric Heat

See Figure 7 for details on this procedure.
Configuring / Detecting Electric Heat Section.

Configure Electric Heat

See Figure 7 for details on this procedure.
Configuring / Detecting Electric Heat Section .

System Operation Configuration

Confirm or configure system operation using iComfort® Thermostat Installer System Setup Guide.

NOTE – Error code troubleshooting is included in all kit and unit installation instructions

⚠ WARNING

The State of California has determined that this product may contain or produce a chemical or chemicals, in very low doses, which may cause serious illness or death. It may also cause cancer, birth defects, or reproductive harm.

⚠ 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.

⚠ 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.

⚠ CAUTION

Electrostatic discharge can affect electronic components. Take precautions during unit installation and service to protect the unit's electronic controls. Precautions will help to avoid control exposure to electrostatic discharge by putting the unit, the control and the technician at the same electrostatic potential. Neutralize electrostatic charge by touching hand and all tools on an unpainted unit surface before performing any service procedure.

Shipping and Packing List

Check package content for shipping damage. Consult last carrier immediately if damage is found.

- 1 — Control
- 1 — Wiring diagram (537202-01)
- 1 — Jumper, Link Guide and Diagnostic Code Sheet

General

This document provides general guidelines on field replacement of air handler control and unit configuration.

This kit replaces Kit # 65W70 and is backwards compatible.

Air Handler Control Removal and Installation

1. Disconnect power to the unit.
2. Remove unit access panel. See unit installation instruction for access panel removal procedure.
3. Recommend removing each wire connected to the control individually and connecting to the new control. Alternate method recommended is to mark each wire as it is removed from control.
4. Once all connections have been transferred to the new Control. Remove the old Control by removing the two screws securing the control mounting bracket to the control box (see figure 1). Also see *Field Control Wiring* on page 4.
5. Remove the four plastic standoffs that secure the Control to mounting bracket
6. Secure the new indoor control to the mounting bracket using existing four plastic standoffs.
7. Secure control mounting bracket to control box using existing two screws.

For Non-Communicating Applications Only

8. Note position of all jumpers on the existing air handler control and relocate same jumpers to those positions on the new air handler control. Also see *Air Handler Button, Display and Jumpers* section on page 3.
9. Configure new Control for non-communicating systems using the procedures outline in *Configuring Unit* on page 16. For communicating systems, refer to the iComfort® thermostat installation instructions for system configuration.

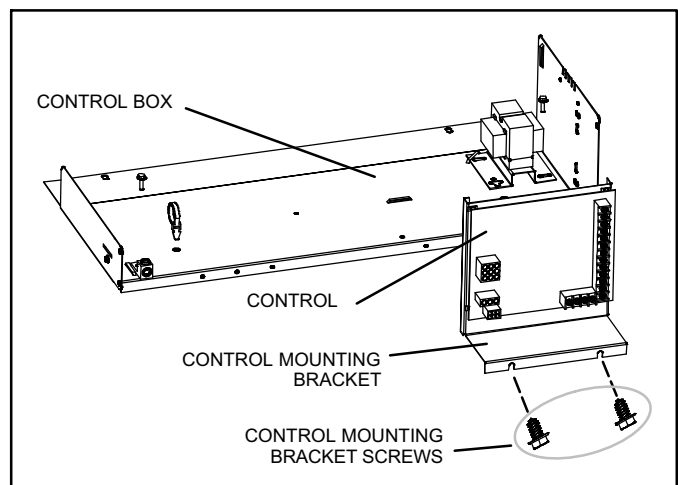
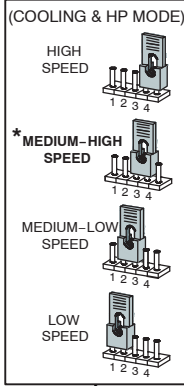


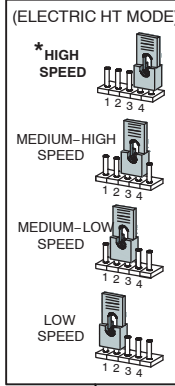
Figure 1. Air Handler Control Removal and Installation

(Non-Communicating) CBX32MV / CBX40UHV JUMPER & LINK GUIDE

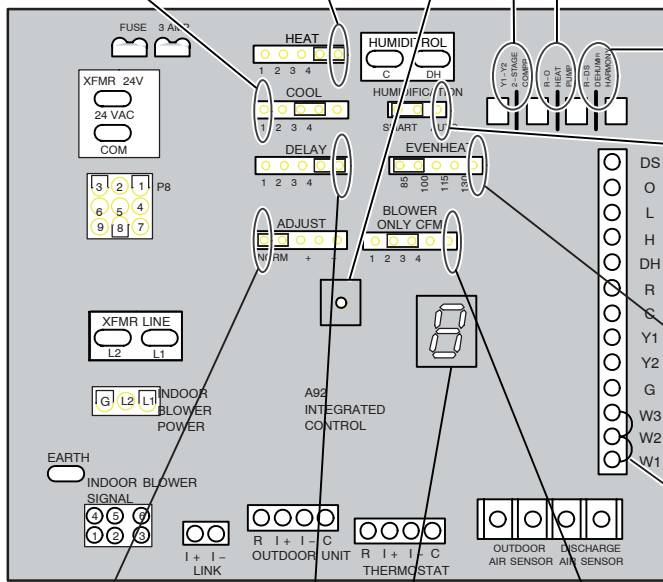
COOLING MODE BLOWER SPEED



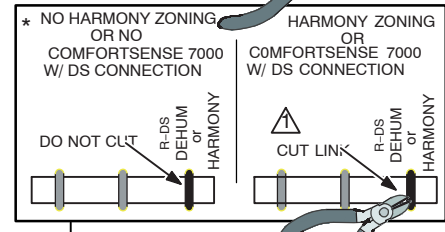
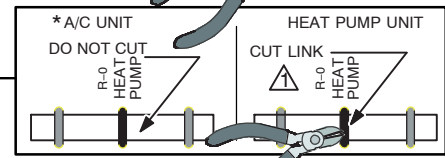
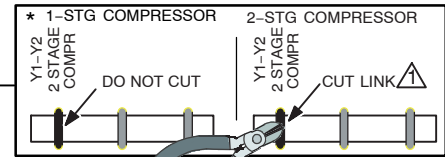
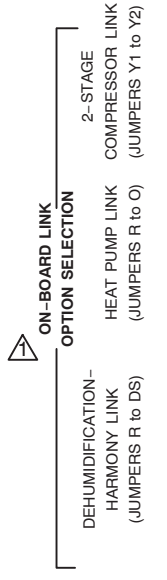
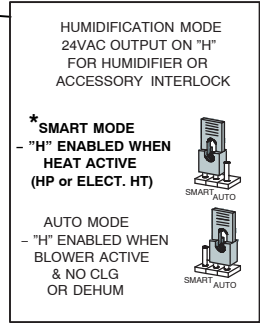
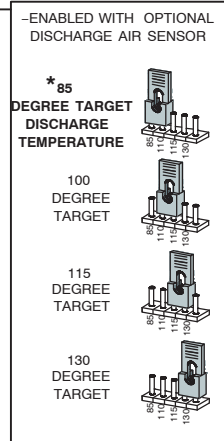
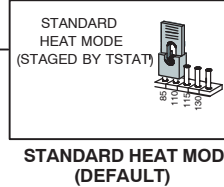
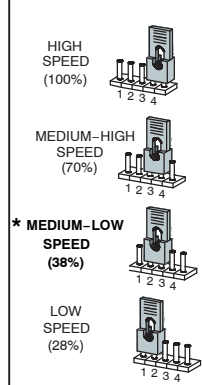
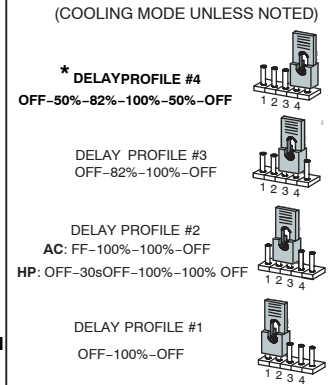
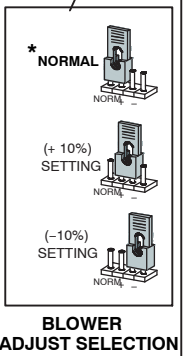
HEATING MODE BLOWER SPEED



PUSH BUTTON



SINGLE CHARACTER DISPLAY



-CUT ON-BOARD LINK (SOLDER TRACE) COMPLETELY THROUGH BOTH LAYERS ON THE CONTROL BOARD
IMPORTANT: USE CARE WHEN CUTTING LINKS TO PREVENT DAMAGE TO CONTROL.

* FACTORY DEFAULT SETTING

Figure 2. Air Handler Configuration (Non-Communicating)

Field Control Wiring

⚠️ 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.

WIRING CONNECTIONS

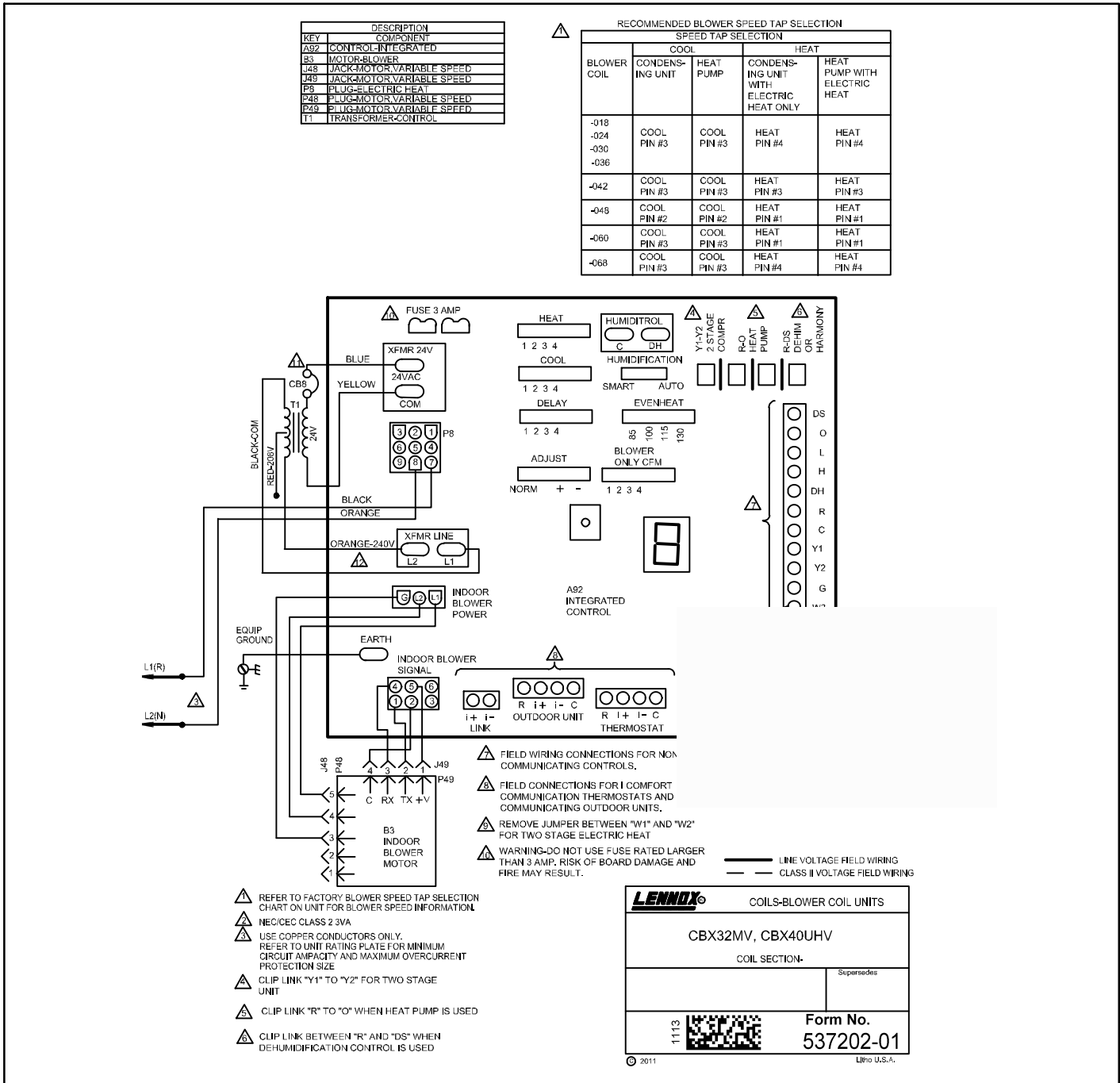


Figure 3. Typical CBX32MV / CBX40UHV Air Handler Unit Typical Wiring Diagram

DETAIL A

NOTE - Due to varying duct designs and airflow conditions, relocation of the discharge sensor may be required to insure accurate sensing.

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 (CATALOG # 88K38).

DISCHARGE SENSOR (DAT)

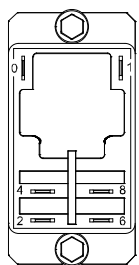
TEMPERATURE RESISTANCE CHART

TEMP °F	RESISTANCE (OHMS)
30	34,566
40	26,106
50	19,904
60	15,313
70	11,884
80	9,298
90	7,332
100	5,826

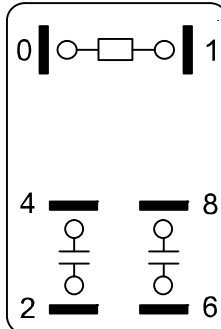
FASTEN THE PROBE BRACKET TO THE PLENUM WITH TWO SELF-TAPPING SHEET METAL SCREWS.

PLENUM

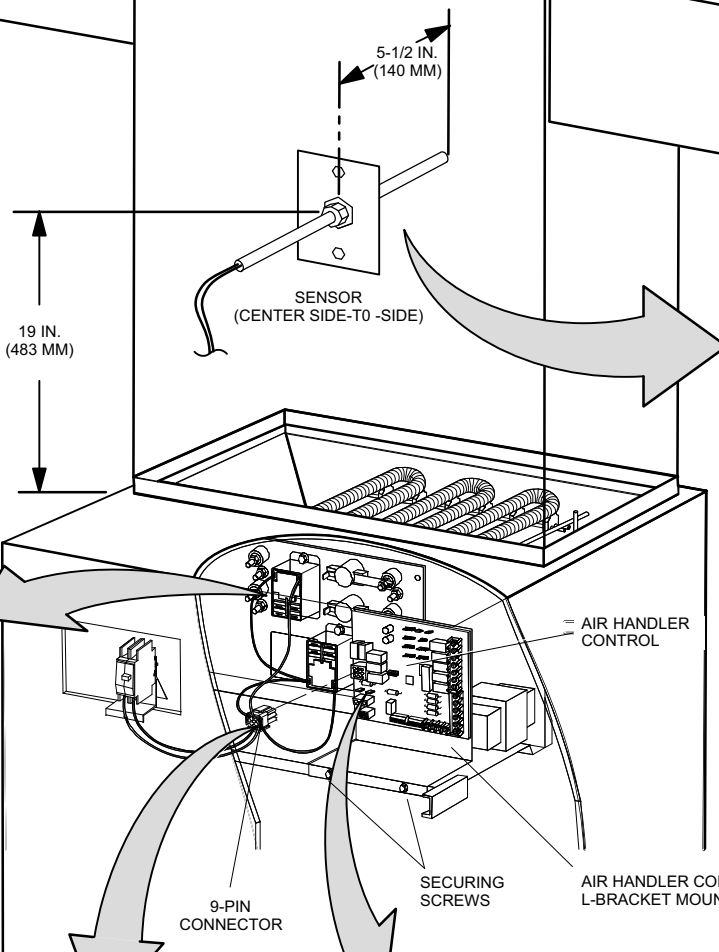
ELECTRIC HEAT RELAY PART NO. 49W91



22V DIRECT CURRENT COIL

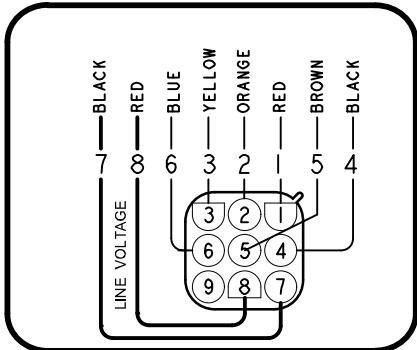


30 AMP CONTACT RATING



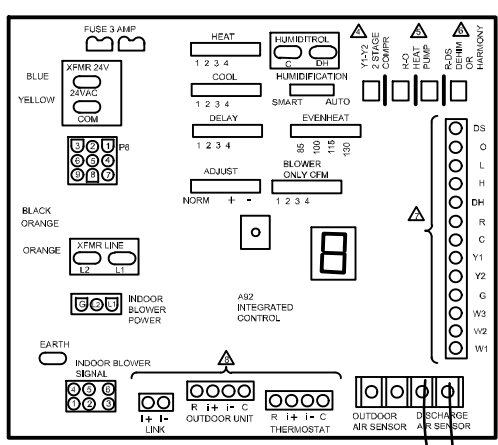
AIR HANDLER CONTROL

9-PIN CONNECTOR



DETAIL B

NOTE — EVENHEAT MODE CANNOT BE ENABLED WITH HARMONY III DUE TO EACH CONTROL REQUIRING ITS OWN DISCHARGE AIR SENSOR.



CONNECT WIRES TO DISCHARGE AIR SENSOR TERMINAL ON AIR HANDLER CONTROL.

NOTE — REFER TO TABLE 1 FOR 6-PIN CONNECTOR DESIGNATIONS.

Figure 4. Component Connections

CONTROL AND SENSOR CONNECTIONS REQUIREMENTS

The following are sensor connections and wiring requirements for the discharge air and outdoor air sensors.

DISCHARGE SENSOR (DAT)

The air handler control has two screw terminals marked **Discharge Air Sensor**. The sensor is REQUIRED for EVENHEAT operation and is field mounted and ordered separately using Lennox Catalog # 88K38.

OUTDOOR AIR SENSOR (OAS)

This is a two screw terminal for connection to a Lennox X2658 outdoor temperature sensor.

INDOOR BLOWER SIGNAL 6-PIN CONNECTOR (P7)

This is the connection between the air handler control and the B3 Indoor Blower Motor.

Table 1. Indoor Blower Signal (P7)

Position	Function / Description
1	TX
2	C
3	Not used
4	RX
5	+V
6	Not used

AIR HANDLER CONTROL 9-PIN CONNECTOR (P8)

1. Air Handler (no electric heat) — Two wire factory harness (wired to pins 7 and 8) which provides 230 VAC power to air handler control.
2. Air Handler (with electric heat) — Eight wire factory harness (all pin position are wired as noted in table 2).

NOTE — See figure 4, Detail B for wire colors.

Table 2. Electric Heat Connection (P8)

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

This section provides information on communicating and non-communicating control connections and wire run lengths.

Table 3. Air Handler Control Connections — Communicating

Label	Label	Function
Thermostat	R	24VAC
	i+	RSbus data high connection
	i-	RSbus data low connection
	C	24VAC command (ground)
Outdoor Unit	R	24VAC
	i+	RSbus data high connection
	i-	RSbus data low connection
	C	24VAC command (ground)

Table 4. Air Handler Control Connections — Non-Communicating

Label	Function
W1	First-stage heating demand.
W2	Second stage heating demand. W1 input must be active to recognize second stage heat demand. .
W3	Third stage heating demand. W1 and W2 inputs must be active to recognize third stage heat demand.
G	Indoor blower demand
Y1 and Y2	First and second stage cooling demands.
C	24VAC common.
R	24VAC power.
DH	Use in communicating system only
H	24VAC output for humidification.
L	Use in communicating system only
O	Reversing Valve demand. (Energized by thermostat in cooling mode.)
DS	Blower speed control input for Harmony Zoning or thermostat de-humidification control.

WARNING



Electric Shock Hazard. Can cause injury or death. Unit must be grounded in accordance with national and local codes.

Line voltage is present at all components when unit is not in operation on units with single-pole contactors. Disconnect all remote electric power supplies before opening access panel. Unit may have multiple power supplies.

Air Handler Control Button and Display

IMPORTANT

Before changing any clippable links or jumper settings, make sure the motor has completely stopped. Any changes will not take place while the motor is running.

PUSH BUTTON

An on-board push button is provided for the purpose of placing the air handler control in different operation modes and can be used to recall stored error codes. When button is pushed and held, air handler control will cycle through a menu of options depending on current operating mode. Every three seconds a new menu item will be displayed. If the button is released while that item is shown on the display, air handler control will enter displayed operating mode, or execute defined operation sequence for that menu option. Once all items on menu have been displayed the menu resumes from the beginning (if button is still held).

Table 5. AHC Single Character Display

AHC Single Character Display	Action
Letter or Number	Unit Size Code (number or letter) displayed represents air handler model size and capacity. See <i>Configuring Unit Size Codes</i> in figure 6.
≡	If three horizontal bars are displayed, board does not recognize air handler model size and capacity. See <i>Configuring Unit Size Codes</i> in figure 6.
.	Idle mode (decimal point / no unit operation)
R	Requested CFM. Example: R 1200
[Stage Cooling (Shows active cooling stages) [1 or [2
d	Dehumidification mode (Unit in dehumidification mode only)
d F	Shown only while in active defrost (Y, W and O call)
H	Stage heating (Shows number of active electric heat pilot relays) H1 or H2 or H3
h	Stage heat pump (shows active heat pump stages) h1 or h2
U	Discharge air sensor temperature (indoor blower must be operating) U 105

Table 6. AHC Configuration, Test and Error Recall (Fault and Lockout) Function

NOTE — AHC MUST BE IN IDLE MODE)		
Single Character LED Display		Action
Solid	-	Push and hold button until solid appears, release button. Display will blink.
Blinking	-	Push and hold button until required symbol displays. H A or P
CONFIGURING ELECTRIC HEAT SECTIONS		
Solid	H	Release push button - control will cycle the indoor blower motor on to the selected heat speed and stage the electric heat relays on and off to automatically detect number of electric heat sections. Control will store the number of electric heat sections. Control will automatically exit current active mode .
INDOOR BLOWER TEST		
Solid	R	Release push button - control cycles indoor blower on for ten seconds at 70% of maximum air for selected capacity size unit. Control will automatically exit current active mode .
CONFIGURING UNIT SIZE CODES		
Single Character LED Display		Action
Solid	P	RELEASE push button - This mode allows the field to select a unit size code (number or letter) that matches the air handler model size and capacity. IMPORTANT — All field replacement controls MUST be manually configured to confirm air handler model size and capacity.
Blinking	P	<ol style="list-style-type: none"> When the correct Unit Sized Code is displayed, RELEASE push button. Selected code will flash for 10 second period. During ten second period, HOLD push button until code stops blinking (three seconds minimum). Air handler control will store code in memory and exit current active mode. LED display will go blank and then the Unit Size Code will display for 2 to 5 seconds. <p>NOTE - If ten second period expires, or push button is held less than 3 seconds, control will automatically exit current active mode and go into IDLE Mode without storing unit size code. If this occurs, then Unit Size Code configuring procedure must be repeated.</p>

Table 6. Seven-Segment Status Display

Idle Mode: Decimal point blinks at 1 Hz	Idle Mode: Decimal point blinks at 1 Hz (0.5 second on, 0.5 second off). Display OFF.
Soft Disabled Top & Bottom horizontal line and decimal point blink at 1 Hz	Soft Disabled: Top & Bottom horizontal line and decimal point blink at 1 Hz (0.5 second on, 0.5 second off). See additional information below this table.
O.E.M. Test Mode	All segments flashing at 2 Hz (unless error is detected)
Electrical Heating stage Shows number of currently active electric heat pilot relays.	Following string is repeated if one stage Heat is active with 850 CFM: H 1 pause A 8 5 0 pause
Cooling Stage Shows what stage of cooling is currently operating.	Following string is repeated if second stage cooling is active with 1235 CFM: C 2 pause A 1 2 3 5 pause
Heat Pump Stage Shows what stage of heat pump is currently operating.	Following string is repeated if first stage heat pump is active with 925 CFM and no Electrical Heat: h 1 pause H 0 pause A 9 2 5 pause
Heat pump & electrical heating stage Shows current heat pump operating stage and number of active electric heat pilot relays.	Following string is repeated if one stage electrical heat and second stage heat pump is active with 1600 CFM: h 1 pause H 1 pause A 1 6 5 0 pause
Defrost Mode Shown only while in an active defrost. (Simultaneous Y, W, and O)	Following string is repeated if defrost is active with two electrical heat stages active and 975 CFM: d f pause H 2 pause A 9 7 5 pause
Dehumidification mode Shows that the unit is providing dehumidification instead of straight cooling.	Following string is repeated if dehumidification is active with 685 CFM: d pause A 6 8 5 pause
Indoor Blower only (G demand) Shows the current CFM delivery of the main blower in actual CFM.	If indoor blower is providing 1600 CFM: following string is repeated: A 1 6 0 0 pause
Diagnostic recall Shows the last 10 stored diagnostic error codes. Initiated by a 2-second button press. Button press interrupts the current display pattern. After all codes are displayed, current display status will resume operation.	If first error is 250, second 231: E pause 2 5 0 pause E pause 2 3 1 Next codes (up to 10) are show using same method. If there is no error codes stored: E pause 0 0 0
Fault Memory clear	After the fault memory is cleared following string is displayed with 0.5 seconds character on/off time: 0 0 0 0 pause
Active Error in AHC Idle mode Shown all active error(s) codes	Following string is repeated if Error E125 and E201 are present: E 1 2 5 pause E 2 0 1
Active Error in Run Mode Shown current status and all active error(s) codes	Following string is repeated if Error E311 is present while blower aped at 880CFM: A 8 8 0 pause E 3 1 1
DATS Any time DAT is sensed in operating range value is displayed if indoor blower is running.	Following string is repeated if three stage el. heat is active with 850 CFM & DAT is 104° F: H 3 pause A 8 5 0 pause U 1 0 4 pause

SOFT DISABLE

Steps to follow if the damper control module is displaying the soft disable code

1. Confirm proper wiring between all devices (Thermostat, damper control module, indoor and outdoor)
2. Cycle power to the control that is displaying the soft disable code.

3. Put the room thermostat through Set up.
4. Go to **setup / system devices/ thermostat / edit/ push reset.**
5. Go to **setup / system devices / thermostat / edit / push resetAll.**

Table 6. AHC Configuration, Test and Error Recall (Fault and Lockout) Function (continued)

ERROR CODE RECALL MODE (NOTE — CONTROL MUST BE IN IDLE MODE)		
Solid	E	To enter Error Code Recall function — PUSH and HOLD button until solid E appears, then RELEASE button. Control will display up to ten error codes stored in memory. If E000 is displayed, there are no stored error codes.
Solid	— — —	To exit Error Code Recall function — PUSH and HOLD button until solid three horizontal bars appear, then RELEASE button. <i>NOTE - Error codes are not cleared</i>
Solid	c	To clear error codes stored in memory, continue to HOLD push button while the three horizontal bars are displayed. Release push button when solid c is displayed. Display will blink.
Blinking	c	Push button to confirm command to delete codes. Error codes are cleared.

Table 7. AHC Single Character Display — Error Codes (Communicating and Non-Communicating)

Error Codes	Status of Air Handler
E 105	Device communication problem - No other devices on BUS (Communication system).
E 114	No 60 hertz power (Check voltage and frequency)
E 115	Low 24 volts (18 or less volts) - Control will restart if the error recovers.
E 120	Unresponsive Device2 - Indicates a device on the RSbus is not responding to a message sent to it by another device. Error code is applicable to all communicating devices on the RSbus (thermostat, indoor and outdoor units). Normally indicates a malfunctioning device.
E 124	Active Subnet Controller Missing for > 180 seconds. This indicates a data connection has been lost between a communicating device and the communicating thermostat. Device (indoor or outdoor unit) sends the alarm if no communication is established between device and thermostat within three minutes.
E 130	Configuration jumper(s) is missing on board.
E 131	Non-volatile data corruption.
E 132	Internal hardware failure.
E 180	Outdoor air temperature sensor (OAS) out of range.
E 201	Indoor Blower communication failure - (includes indoor blower power outage)
E 202	Incorrect air handler model size and capacity selected or wrong motor. Check for proper configuring under <i>Configuring Unit Size Codes</i> .
E 203	No air handler model size and capacity selected. Check for proper configuring under <i>Configuring Unit Size Codes</i> .
E 292	Indoor blower motor unable to start (seized bearing, stuck wheel, etc.).
E 295	Indoor blower motor over temperature (motor trip on internal protector)
E 310	Discharge air temperature sensor (DATS) out of range.
E 312	Restricted airflow — Indoor blower motor is running at a reduced CFM (cutback mode **)
E 313	Indoor and outdoor unit capacity mismatch.
E 331	Global network connection error. This usually indicates there is a short or overladed resistance is too low condition between thermostat and indoor or outdoor units.
E 345	Jumper for second-stage cooling not removed.
E 346	Jumper for heat pump operation not removed.
E 347	Relay Y1 failure.
E 348	Relay Y2 failure.
E 350	Heat call with non-configured or mis-configured electric heat. Check for proper configuring under <i>Configuring Electric Heat Stages</i> .
E 351	Heat section / Stage 1 failed (Pilot relay contacts did not close or the relay coil in electric heat did not energize)
E 352	Heat section / Stage 2 failed.
E 353	Heat section / Stage 3 failed.
E 354	Heat section / Stage 4 failed.
E 355	Heat section / Stage 5 failed.
Error codes 401 through 409 are only displayed when the Control's L terminal is connected to a non-communicating outdoor unit's LSOM device.	
E 401	Compressor ran more than 18 hours in air conditioning mode.

Table 7. AHC Single Character Display — Error Codes (Communicating and Non-Communicating) (continued)

Error Codes	Status of Air Handler
E 402	Compressor system pressure trip.
E 403	Compressor short-cycling - running less than four minutes.
E 404	Compressor rotor locked.
E 405	Compressor open circuit.
E 406	Compressor open start circuit.
E 407	Compressor open run circuit.
E 408	Compressor contactor is welded.
E 409	Compressor low voltage.
E 420	Defrost cycle lasts longer than 20 minutes. Check heat pump operation. Cleared when W1 signal is removed. Applicable only in communicating mode with non-communicating heat pump.

** Cutback Mode — The variable speed motor has pre-set speed and torque limiters to protect the motor from damage caused by operating out of its designed parameters (0 through 0.80 in. w.g. total external static pressure).

Air Handler Jumpers

Jumpers are used for non-communicating mode only. Use figure 2 as reference for jumper settings. If any of the reference jumpers are missing, the air handler control will display Error code 130 as per table 10, and the air handler control will automatically use the **factory default** setting show in figure 2)

- Humidification** — Controls the status of **H** terminal on the thermostat block. Configurations are as follows:
 - If jumper is installed in **SMART** Humidification position (Default), **H** terminal is active if heat demand is present and indoor blower is running.
 - If jumper is installed in **AUTO** Humidification position, **H** terminal is energized whenever indoor blower is running.
- EvenHeat** — Target Discharge Air Temperature selection is used to set discharge air temperatures for EvenHeat operation.

NOTE - Optional Discharge Air Temperature Sensor, Lennox Catalog # 88K38 is REQUIRED for EVENHEAT operation and must be ordered separately.

- Blower Only CFM** — Used to select Indoor blower CFM for continuous operation.
- Heat** — Used to select Indoor blower CFM for electric heat by placing the jumper in proper position. Actual CFM values for different air handler sizes are shown in *Targeted CFM Tables* starting on page 12.
- Cool** — Used to select cooling indoor blower CFM by placing the jumper in proper position. Actual CFM values for different air handler sizes are shown in *Targeted CFM Tables* starting on page 12.
- Adjust** - Used to select the indoor blower CFM adjustment value by placing the jumper in appropriate position.

- If **NORM** is selected, indoor blower runs at normal speeds.
- If **+** is selected, indoor blower runs at approximately 10% higher speed than NORM setting.
- If **-** is selected, indoor blower runs at approximately 10% lower speed than NORM setting.

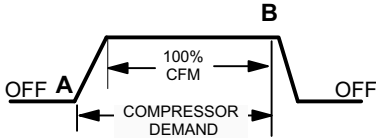
If the jumper is missing, the air handler control will activate the *Configuration Jumper is Missing* alarm in and will automatically use the default factory setting in table 10. See figure 2 for jumper configurations. Actual CFM values for different air handler sizes are shown in *Targeted CFM Tables* starting on page 12.

- Delay** — Indoor blower cooling profile, delay for cooling and heat pump operations.
 - When operating a heat pump, delay profiles 1 and 2 are only applicable.
 - When operating a heat pump, and profiles 3 and 4 are selected, the air handler control will default to profile 1.

If the jumper is missing, the air handler control will activate the *Configuration Jumper is Missing* alarm and will automatically use the default factory setting in table 10. See figure 2 for jumper configurations.

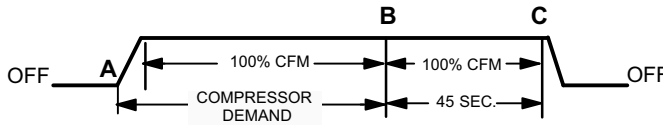
Delay Profile 1

- When cool or heat demand is initiated, motor ramps up to 100% and runs at 100% until demand is satisfied.
- Once demand is met, motor ramps down to stop.



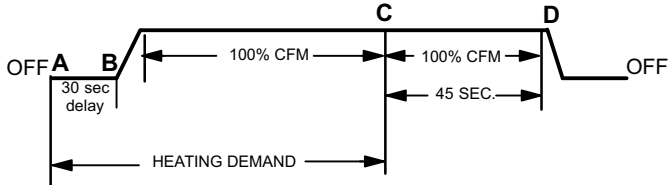
Delay Profile 2

Cooling — Air Conditioner and Heat Pump:



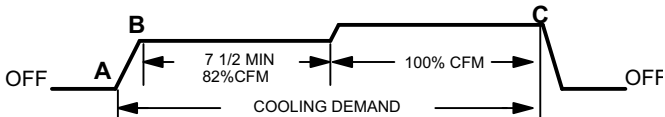
- A** When cool demand is initiated, motor ramps up to 100% and runs at 100% until demand is satisfied.
- B** Once demand is met, motor runs at 100% for 45 seconds.
- C** Motor ramps down to stop.

Heating — Heat Pump only:



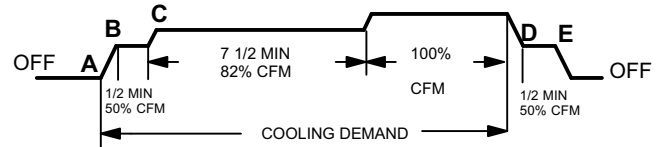
- A** When heat demand is initiated, 30 seconds motor on delay starts
- B** After the motor on delay expires, motor ramps up to 100% and runs at 100% until demand is satisfied.
- C** Once demand is met, motor runs at 100% for 45 seconds.
- D** Motor ramps down to stop.

Delay Profile 3



- A** When cool demand is initiated, motor ramps up to 82%
- B** Motor runs at 82% for approximately 7.5 minutes and then ramps up to 100% (unless the demand has been satisfied) and motor runs at 100% until demand is satisfied.
- C** Once demand is met, motor ramps down to stop

Delay Profile 4



- A** When cool demand is initiated, motor ramps up to 50%
- B** Motor runs at 50% for 30 seconds and ramps up to 82%
- C** Motor runs at 82% for approximately 7.5 minutes and then ramps up to 100% (unless the demand has been satisfied) and motor runs at 100% until demand is satisfied.
- D** Once demand is met, motor runs at 50% for 30 seconds.
- E** Motor ramps down to stop

DISPLAY

An on-board single character display (see figure 2 for display location) indicates general system status information such as mode of operation, indoor blower CFM and error codes. Multi-character strings are displayed with character ON for one second, OFF for 0.5 seconds and one second pause between the character groups.

Target CFM Tables

CBX32MV-018/024 BLOWER PERFORMANCE — 0 through 0.80 in. w.g. (0 through 200 Pa) External Static Pressure Range																
ADJUST Jumper Setting	Jumper Speed Positions															
	HEAT Speed								COOL Speed							
	1		2		3		4		1		2		3		4	
	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s		
+	715	337	855	405	1000	470	1130	535	465	220	690	325	900	425	1050	495
NORM	670	315	770	365	900	425	1035	490	425	200	620	290	825	390	950	450
-	580	275	700	330	800	375	930	440	385	180	560	265	735	345	850	400

CBX32MV-024/030 BLOWER PERFORMANCE — 0 through 0.80 in. w.g. (0 through 200 Pa) External Static Pressure Range																
ADJUST Jumper Setting	Jumper Speed Positions															
	HEAT Speed								COOL Speed							
	1		2		3		4		1		2		3		4	
	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s		
+	800	380	935	440	1070	505	1210	570	660	310	880	415	1100	520	1320	625
NORM	725	340	850	400	975	460	1100	520	600	285	800	380	1000	470	1200	565
-	655	310	765	360	880	415	990	470	540	255	720	340	900	425	1080	510

CBX32MV-036 BLOWER PERFORMANCE — 0 through 0.80 in. w.g. (0 through 200 Pa) External Static Pressure Range																
ADJUST Jumper Setting	Jumper Speed Positions															
	HEAT Speed								COOL Speed							
	1		2		3		4		1		2		3		4	
	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s		
+	1230	580	1335	630	1445	680	1545	730	1090	515	1225	580	1380	650	1545	730
NORM	1120	530	1215	575	1315	620	1400	660	975	460	1125	530	1275	600	1400	660
-	1010	475	1185	560	1200	565	1265	595	900	425	1000	470	1135	535	1265	595

CBX32MV-048 AND CBX32MV-060 BLOWER PERFORMANCE — 0 through 0.80 in. w.g. (0 Through 200 Pa) External Static Pressure Range																
ADJUST Jumper Setting	Jumper Speed Positions															
	HEAT Speed								COOL Speed							
	1		2		3		4		1		2		3		4	
	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s		
+	1850	875	1960	925	2090	985	2150	1015	1625	765	1820	860	2055	970	2145	1010
NORM	1705	805	1800	850	1900	895	2005	945	1425	670	1625	765	1805	850	2005	945
-	1560	735	1625	765	1720	810	1770	835	1205	570	1375	650	1555	735	1725	815

CBX32MV-068 BLOWER PERFORMANCE — 0 through 0.80 in. w.g. (0 Through 200 Pa) External Static Pressure Range																
ADJUST Jumper Setting	Jumper Speed Positions															
	HEAT Speed								COOL Speed							
	1		2		3		4		1		2		3		4	
	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s		
+	1875	885	1975	930	2090	985	2150	1015	1640	775	1840	870	2075	980	2150	1015
NORM	1760	830	1825	860	1920	905	2030	960	1465	690	1625	765	1800	850	2000	945
-	1550	730	1650	780	1725	815	1800	850	1250	590	1390	655	1560	735	1720	810

NOTES - The effect of static pressure, filter and electric heater resistance is included in the air volumes listed.
 First stage cooling air volume is 70% of COOL speed setting. Continuous blower speed is approximately 50% of COOL speed setting.
 Lennox Harmony III™ Zone Control applications - minimum blower speed is 300 cfm (145 L/s)

CBX40UHV-024 BLOWER PERFORMANCE — 0 through 0.80 in. w.g. (0 Through 200 Pa) External Static Pressure Range								
ADJUST Jumper Setting	Jumper Speed Positions							
	HEAT Speed				COOL Speed			
	1	2	3	4	1	2	3	4
	cfm	cfm	cfm	cfm	cfm	cfm	cfm	cfm
+	715	855	1000	1130	465	690	900	1050
NORM	670	770	900	1035	425	620	825	950
-	580	700	800	930	385	560	735	850

NOTES -The effect of static pressure, filter and electric heater resistance is included in the air volumes listed.
 First stage cooling air volume is 70% of COOL speed setting. Continuous blower speed is approximately 50% of COOL speed setting.
 Lennox Harmony III™ Zone Control applications - minimum blower speed is 300 cfm.

CBX40UHV-030 BLOWER PERFORMANCE — 0 through 0.80 in. w.g. (0 Through 200 Pa) External Static Pressure Range								
ADJUST Jumper Setting	Jumper Speed Positions							
	HEAT Speed				COOL Speed			
	1	2	3	4	1	2	3	4
	cfm	cfm	cfm	cfm	cfm	cfm	cfm	cfm
+	800	935	1070	1210	660	880	1100	1320
NORM	725	850	975	1100	600	800	1000	1200
-	655	765	880	990	540	720	900	1080

NOTES -The effect of static pressure, filter and electric heater resistance is included in the air volumes listed.
 First stage cooling air volume is 70% of COOL speed setting. Continuous blower speed is approximately 50% of COOL speed setting.
 Lennox Harmony III™ Zone Control applications - minimum blower speed is 300 cfm.

CBX40UHV-036 BLOWER PERFORMANCE — 0 through 0.80 in. w.g. (0 Through 200 Pa) External Static Pressure Range								
ADJUST Jumper Setting	Jumper Speed Positions							
	HEAT Speed				COOL Speed			
	1	2	3	4	1	2	3	4
	cfm	cfm	cfm	cfm	cfm	cfm	cfm	cfm
+	1230	1335	1445	1545	1090	1225	1380	1545
NORM	1120	1215	1315	1400	975	1125	1275	1400
-	1010	1185	1200	1265	900	1000	1135	1265

NOTES -The effect of static pressure, filter and electric heater resistance is included in the air volumes listed.
 First stage cooling air volume is 70% of COOL speed setting. Continuous blower speed is approximately 50% of COOL speed setting.
 Lennox Harmony III™ Zone Control applications - minimum blower speed is 300 cfm.

CBX40UHV-042 BLOWER PERFORMANCE — 0 through 0.80 in. w.g. (0 Through 200 Pa) External Static Pressure Range								
ADJUST Jumper Setting	Jumper Speed Positions							
	HEAT Speed				COOL Speed			
	1	2	3	4	1	2	3	4
	cfm	cfm	cfm	cfm	cfm	cfm	cfm	cfm
+	1100	1320	1540	1760	1100	1320	1540	1760
NORM	1000	1200	1400	1600	1000	1200	1400	1600
-	900	1080	1260	1440	900	1080	1260	1440

NOTES -The effect of static pressure, filter and electric heater resistance is included in the air volumes listed.
 First stage cooling air volume is 70% of COOL speed setting. Continuous blower speed is approximately 50% of COOL speed setting.
 Lennox Harmony III™ Zone Control applications - minimum blower speed is 300 cfm.

CBX40UHV-48 AND CBX40UHV-060 BLOWER PERFORMANCE — 0 through 0.80 in. w.g. (0 Through 200 Pa) External Static Pressure Range								
ADJUST Jumper Setting	Jumper Speed Positions							
	HEAT Speed				COOL Speed			
	1	2	3	4	1	2	3	4
	cfm	cfm	cfm	cfm	cfm	cfm	cfm	cfm
+	1850	1960	2090	2150	1625	1820	2055	2145
NORM	1705	1800	1900	2005	1425	1625	1805	2005
-	1560	1625	1720	1770	1205	1375	1555	1725

NOTES -The effect of static pressure, filter and electric heater resistance is included in the air volumes listed.
 First stage cooling air volume is 70% of COOL speed setting. Continuous blower speed is approximately 50% of COOL speed setting.
 Lennox Harmony III™ Zone Control applications - minimum blower speed is 300 cfm.

Unit Operating Sequences

This section details unit operating sequence for non-communicating systems. For communicating systems, see the iComfort® thermostat installation instruction.

Table 8. Air Handler with ComfortSense™ 7000 Thermostat and Single-Stage Outdoor Unit Operating Sequence

Operating Sequence		System Demand								System Response		
System Condition	Step	Thermostat Demand						Relative Humidity		Comp	Air Handler CFM (COOL)	Comments
		Y1	Y2	O	G	W1	W2	Status	D			
NO CALL FOR DEHUMIDIFICATION												
Normal Operation	1	On		On	On			Acceptable	24 VAC	High	100%	Compressor and indoor air handler follow thermostat demand
BASIC MODE (Only active on a Y1 thermostat demand)												
Normal Operation	1	On		On	On			Acceptable	24 VAC	High	100%	ComfortSense™ 7000 thermostat energizes Y1 and de-energizes D on a call for dehumidification. <i>NOTE — No over cooling.</i>
Dehumidification Call	2	On		On	On			Demand	0 VAC	High	70%	
PRECISION MODE (Operates independent of a Y1 thermostat demand)												
Normal Operation	1	On		On	On			Acceptable	24 VAC	High	100%	Dehumidification mode begins when humidity is greater than set point
Dehumidification call	2	On		On	On			Demand	0 VAC	High	70%	
Dehumidification call ONLY	1	On		On	On			Demand	0 VAC	High	70%	ComfortSense™ 7000 will keep outdoor unit energized after cooling temperature setpoint has been reach in order to maintain room humidity setpoint. <i>NOTE — Allow to over cool 2°F from cooling set point.</i>

Table 9. Air Handler with ComfortSense™ 7000 Thermostat and Two-Stage Outdoor Unit Operating Sequence

Operating Sequence		System Demand								System Response			Comments
System Condition	Step	Thermostat Demand					Relative Humidity			Compressor	Air Handler CFM (COOL)		
		Y1	Y2	O	G	W1	W2	Status	D				
No Call for Dehumidification													
Normal Operation - Y1	1	On		On	On			Acceptable	24 VAC	Low	70%	Compressor and indoor air handler follow thermostat demand	
Normal Operation - Y2	2	On	On	On	On			Acceptable	24 VAC	High	100%		
Room Thermostat Calls for First-Stage Cooling													
BASIC MODE (Only active on a Y1 thermostat demand)													
Normal Operation	1	On		On	On			Acceptable	24 VAC	Low	70%	ComfortSense™ 7000 thermostat energizes Y2 and de-energizes D on a call for dehumidification <i>NOTE — No over cooling.</i>	
Dehumidification Call	2	On	On	On	On			Demand	0 VAC	High	70%		
PRECISION MODE (Operates independent of a Y1 thermostat demand)													
Normal Operation	1	On		On	On			Acceptable	24 VAC	Low	70%	Dehumidification mode begins when humidity is greater than set point	
Dehumidification call	2	On	On	On	On			Demand	0 VAC	High	70%		
Dehumidification call ONLY	1	On	On	On	On			Demand	0 VAC	High	70%	ComfortSense™ 7000 thermostat will keep outdoor unit energized after cooling temperature setpoint has been reached in order to maintain room humidity setpoint. <i>NOTE — Allow to over cool 2°F from cooling set point.</i>	
Room Thermostat Calls for First- and Second-Stage Cooling													
BASIC MODE (Only active on a Y1 thermostat demand)													
Normal Operation	1	On	On	On	On			Acceptable	24 VAC	High	100%	ComfortSense™ 7000 thermostat energizes Y2 and de-energizes D on a call for dehumidification <i>NOTE — No over cooling.</i>	
Dehumidification Call	2	On	On	On	On			Demand	0 VAC	High	70%		
PRECISION MODE (Operates independent of a Y1 thermostat demand)													
Normal Operation	1	On	On	On	On			Acceptable	24 VAC	High	100%	Dehumidification mode begins when humidity is greater than set point	
Dehumidification call	2	On	On	On	On			Demand	0 VAC	High	70%		
Dehumidification call ONLY	1	On	On	On	On			Demand	0 VAC	High	70%	ComfortSense™ 7000 thermostat will keep outdoor unit energized after cooling temperature setpoint has been reached in order to maintain room humidity setpoint. <i>NOTE —: Allow to over cool 2°F from cooling set point.</i>	

Configuring Unit

This section identifies the requirements for configuring the air handler in non-communicating mode for unit size, heat mode selection and EvenHeat. For communicating configuration see the iComfort® installation instruction.

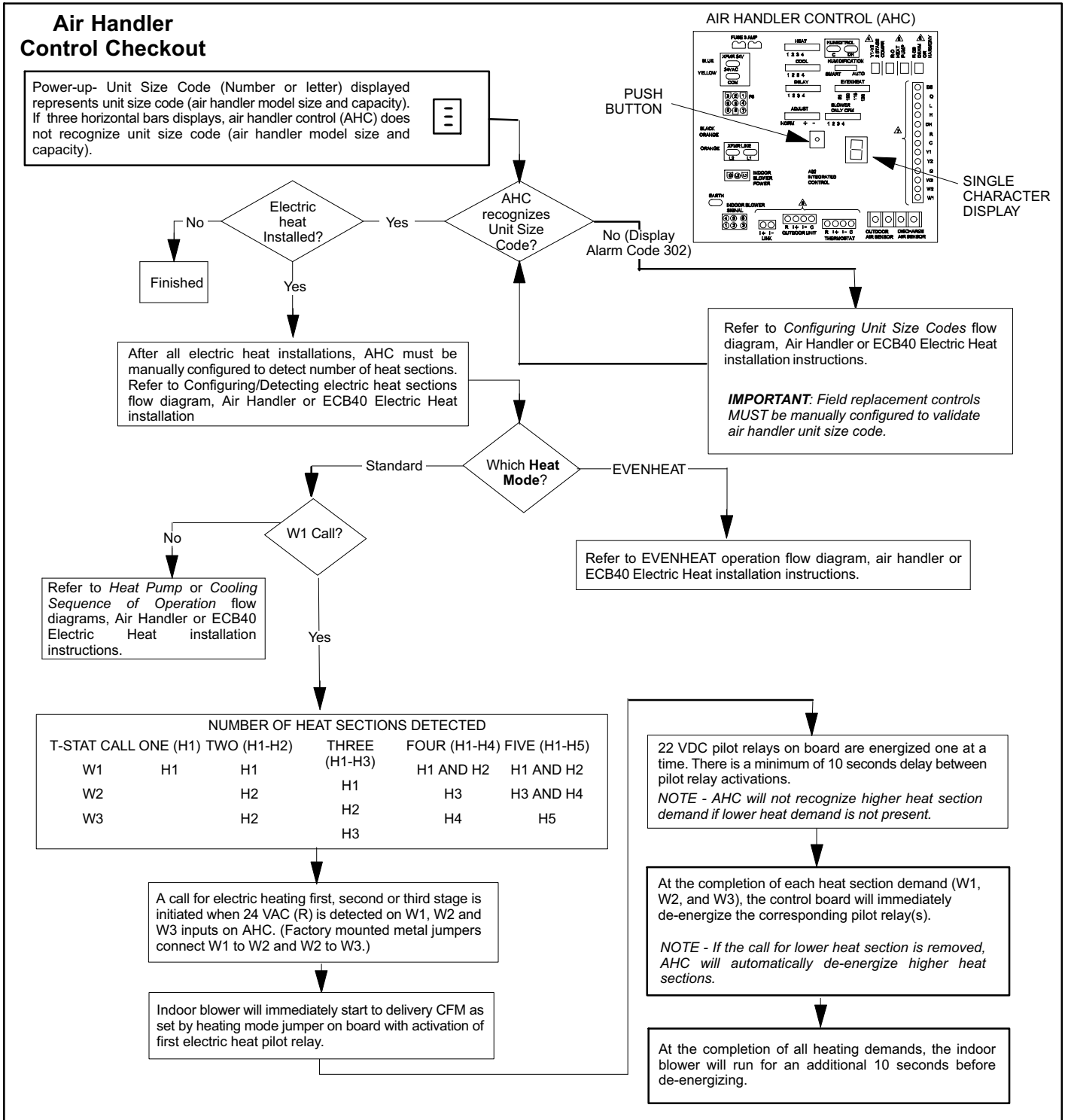
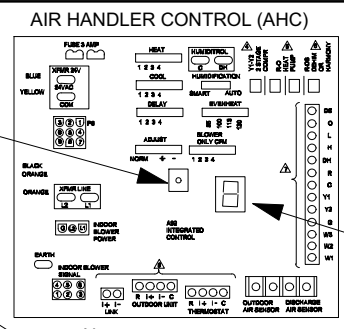


Figure 5. Air Handler Control Checkout

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)

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

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.

Turn room thermostat to OFF

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 sized 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.

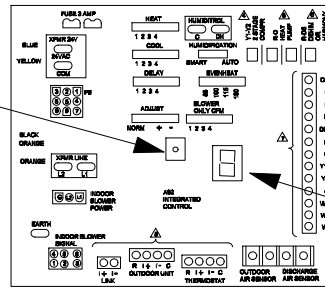
Verify that the selected unit size code is correct and stored by cycling the 24 volt power to the AHC. (During power-up of the AHC, the single character display will show the stored unit size code. If three horizontal bars display, AHC did not store the unit size code. If this happens, configuration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

Figure 6. 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)



SINGLE CHARACTER DISPLAY

PUSH BUTTON

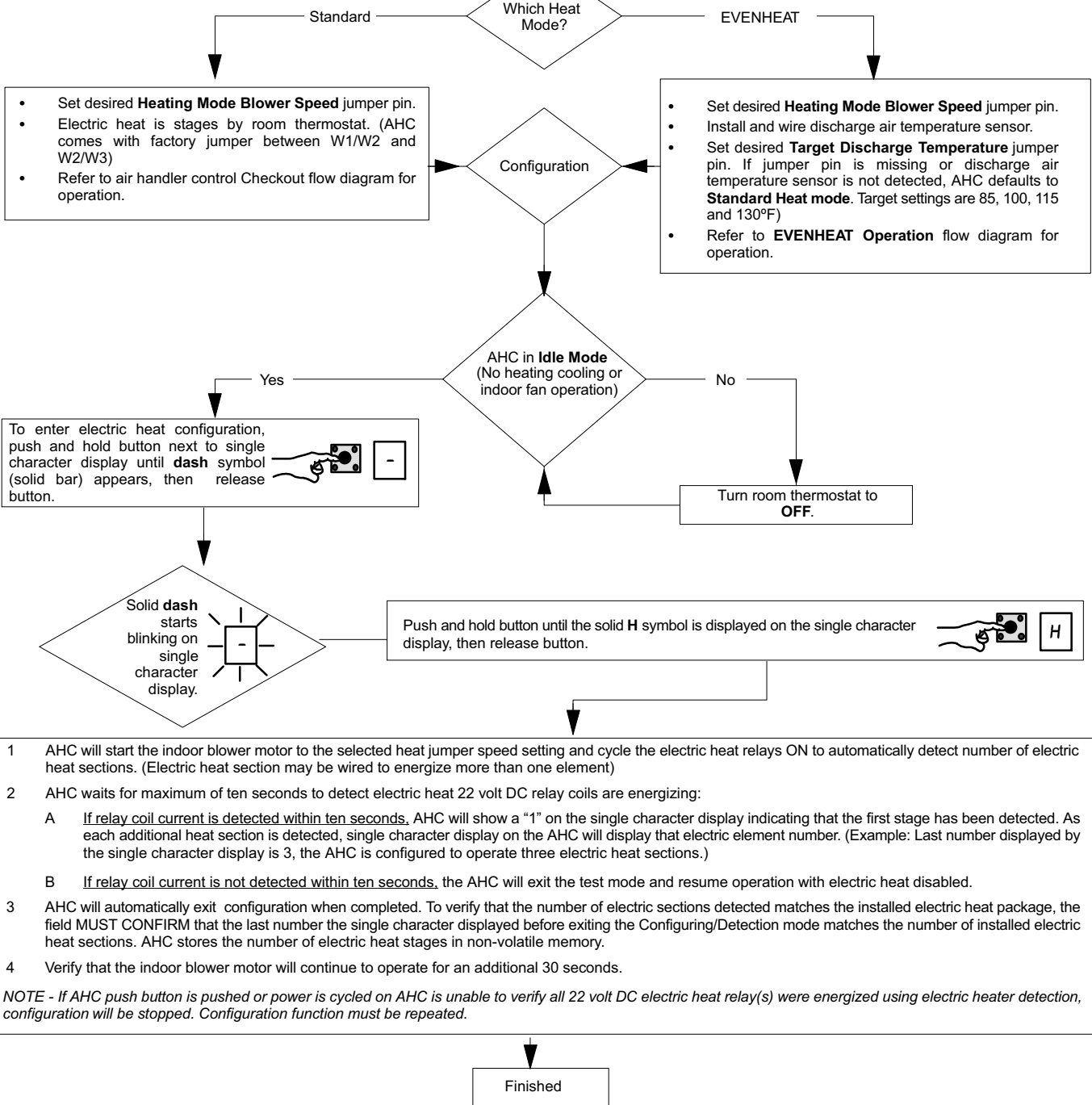


Figure 7. Heat Mode Selection

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.

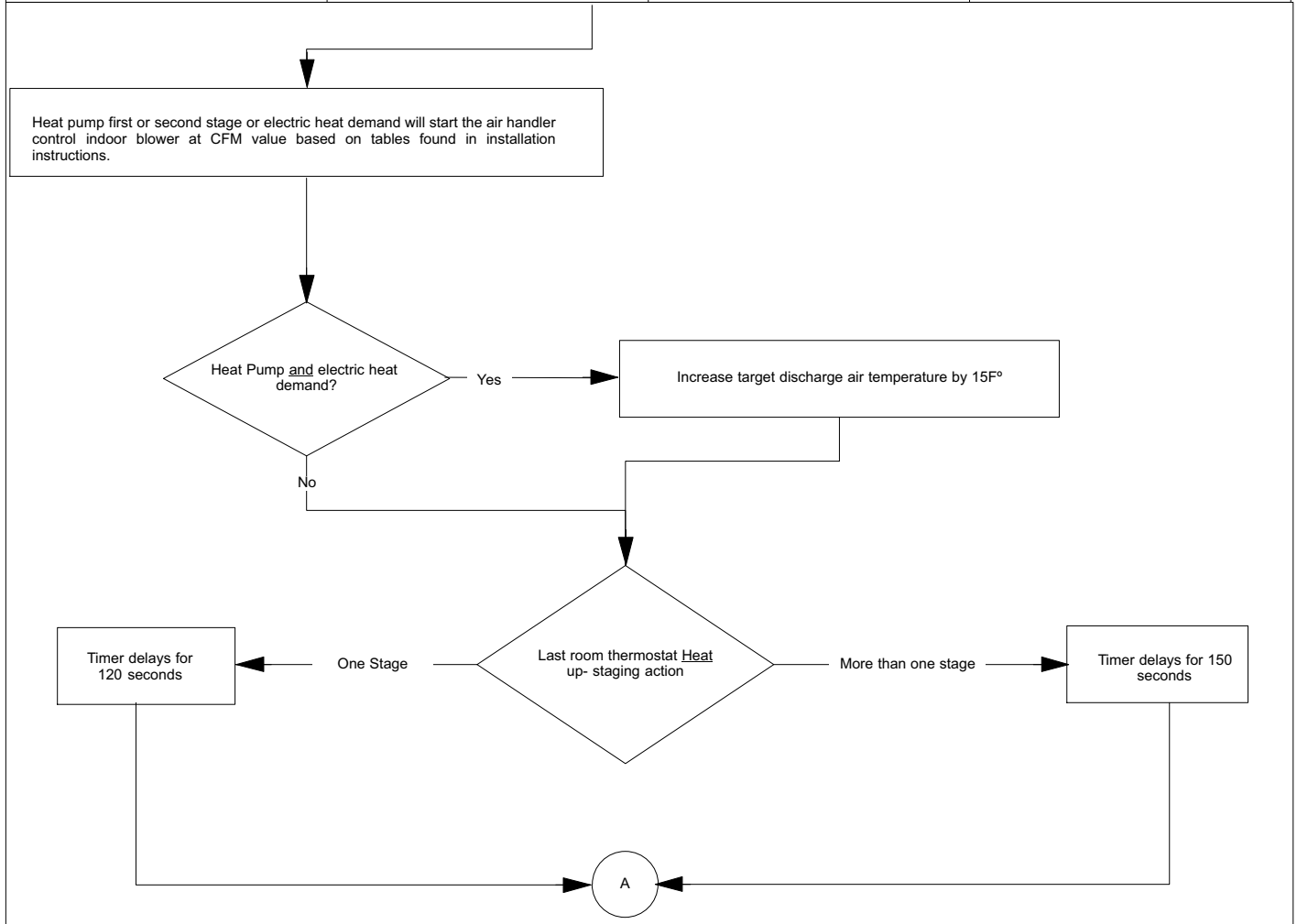


Figure 8. EVENHEAT Operation (1 of 2)

EVENHEAT Operation

Note 1 Activation delay

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

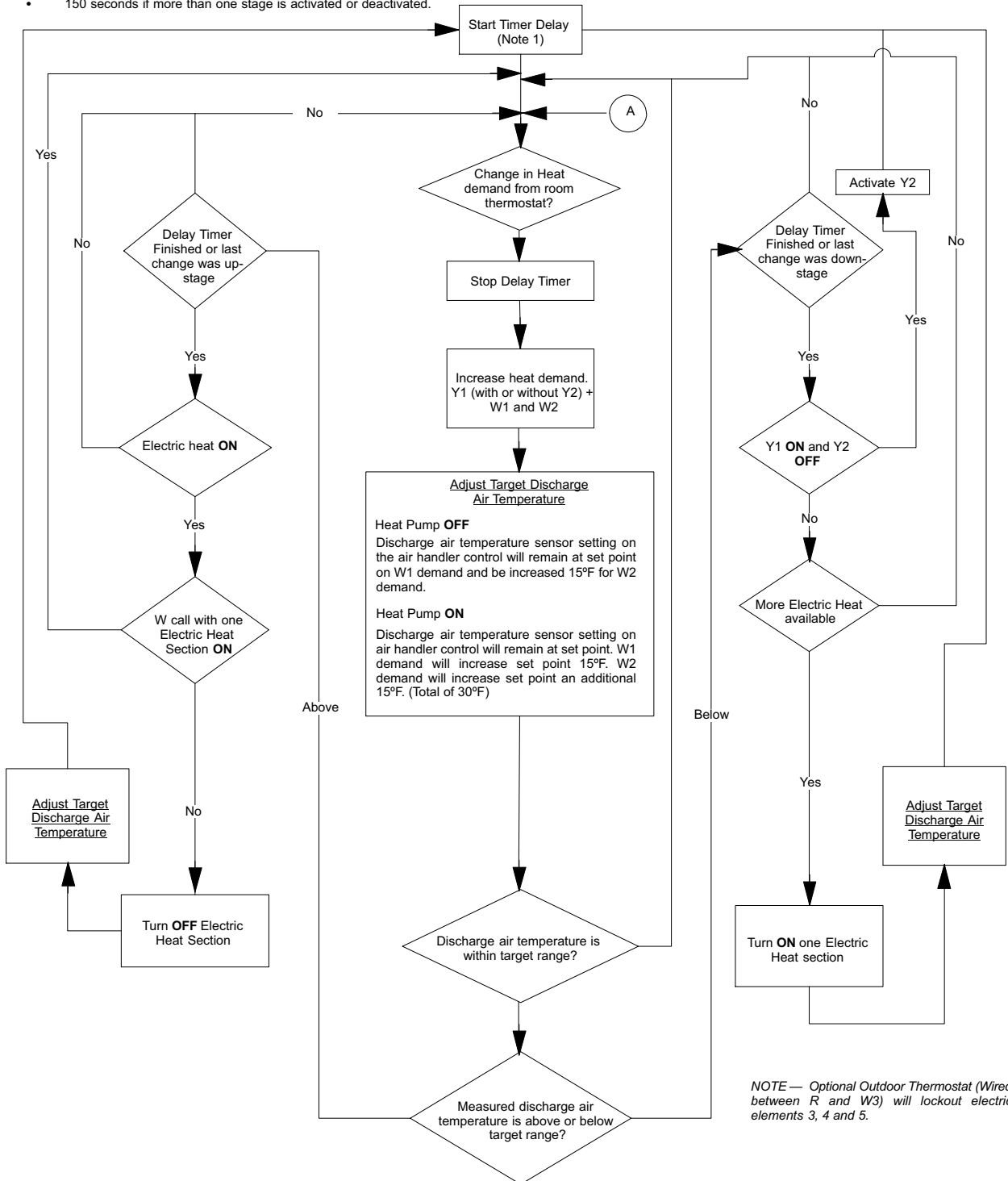


Figure 9. EVENHEAT Operation (2 of 2)