

INSTALLATION INSTRUCTIONS

Low Ambient Head Pressure Control Kits for Models:

CAE091, CAE120, CAE150-240, CHE091, CHE120,

Part Numbers:

AXB175LAA (32LT900301) (208/230 Volt)

AXB275LAA (32LT900611) (460/575 Volt)

These instructions must be read and understood completely before attempting installation.

WARNING

Electrical shock hazard.

Installation or repairs made by unqualified persons can result in hazards to you and others. Installation must conform with local building codes or, in the absence of local codes, with National Electrical Code ANSI/NFPA 70-1996 or current edition.

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

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

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

BEFORE STARTING INSTALLATION, DISCONNECT ALL POWER TO THE UNIT.

Package Contents	
ITEM	Quantity
Controller	1
No. 10 Sheet Metal Screws	4
Star Lockwashers	4
3/4 in. 4-40 Screws	2
Plate Washers	2
4-40 Nuts	2
Wirenuts	2
Sensor Assembly	1

General

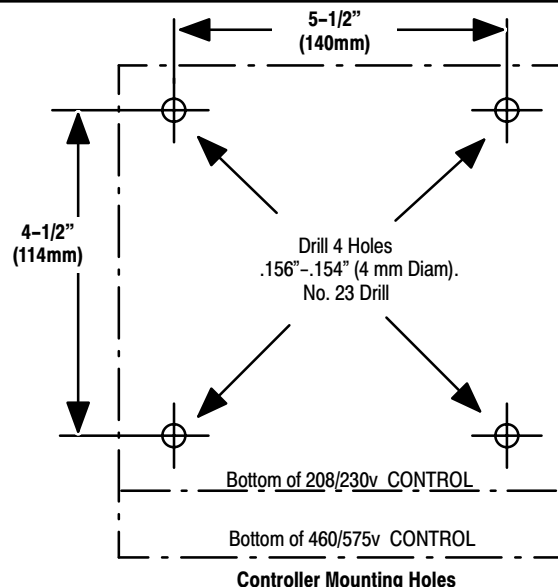
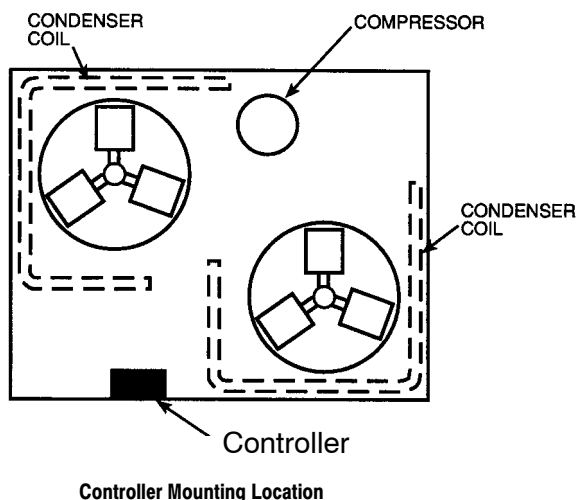
This solid-state head pressure control regulates fan speed. A temperature sensor, mounted on a return bend of the condenser (outdoor) coil, activates the device. The controller controls the speed of approved condenser (outdoor) fan motors in order to maintain a constant head pressure in the condenser (outdoor) coil. When properly installed, the control will maintain the appropriate head pressure at low ambient temperatures down to -20° F (-29° C).

INSTALLATION for CAE091, CHE091, CAE120, CHE120: (See page 8 for CAE150-240 installation.)

1. Disconnect power to the unit.
2. Disconnect condenser (outdoor) fan motor (OFM) wires at the contactor and capacitor. Note position of fan blades in relation to fan orifice.
3. Remove OFM(s) from the unit.
4. Remove fan blade(s) from motor(s).
5. Mount controller on the unit. See Fig. 1. The controller must be mounted vertically with leads at the bottom. Using the dimensions in Fig. 1, drill 4 mounting holes. To ensure electrical ground, insert star lockwashers (supplied with the controller) under the heads of the sheet metal screws.

Two field-fabricated mounting brackets are required. See Fig. 2. The bracket is mounted under the unit control box. Mounting holes are provided in the unit basepan.

Figure 1



6. Route sensor wire from bottom of control to sensor location as specified in Fig. 3. Fasten sensor with 3 / 4 -in. 4-40 screws, plate washers, and 4-40 nuts provided.

CAUTION:

Sensor assembly is delicate. Handle with care.

7. If required, replace the OFM(s) with the motor(s) shown in Table 1. Rewire the motor connections as shown in Fig. 5 – 8. Two wirenuts are included in package, if needed.

NOTE: A field installed single pole, double throw 24V control coil relay must be installed on heat

pump units only to bypass low ambient control in heating operation. Relay uses normally closed contacts. Relay wiring is shown in Figures 7 and 8.

8. Coil up all excess wire and secure it next to the controller.
9. Wind baffles are required to prevent wind cross currents from causing abnormally low condensing temperatures. Fabricate sheet metal baffles as shown in Fig. 4. Use 20-gage sheet metal.
10. Re-install fan blade. Ensure that fan blade is properly located in the orifice. Refer to the base unit installation instructions for further details.
11. Reconnect power to the unit.

Figure 2

Field Fabricated Mounting Bracket

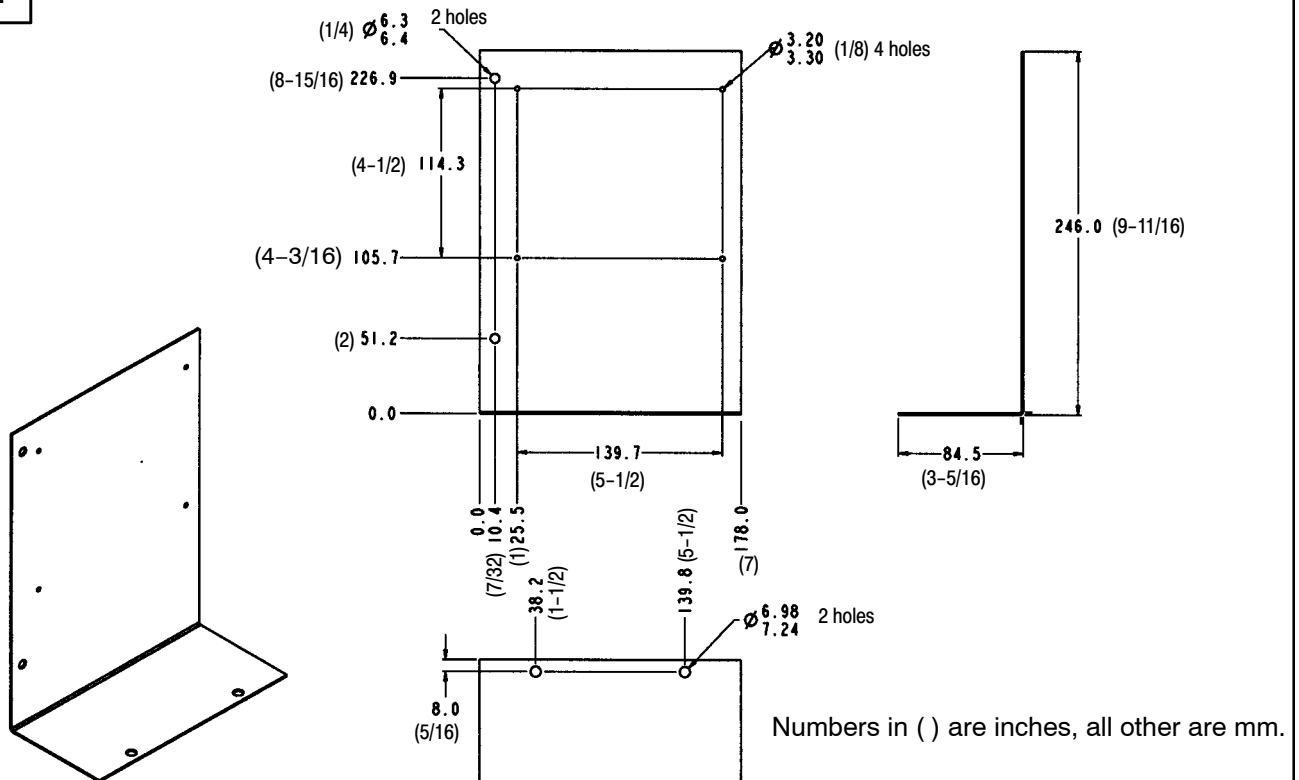


Figure 3

Sensor Location

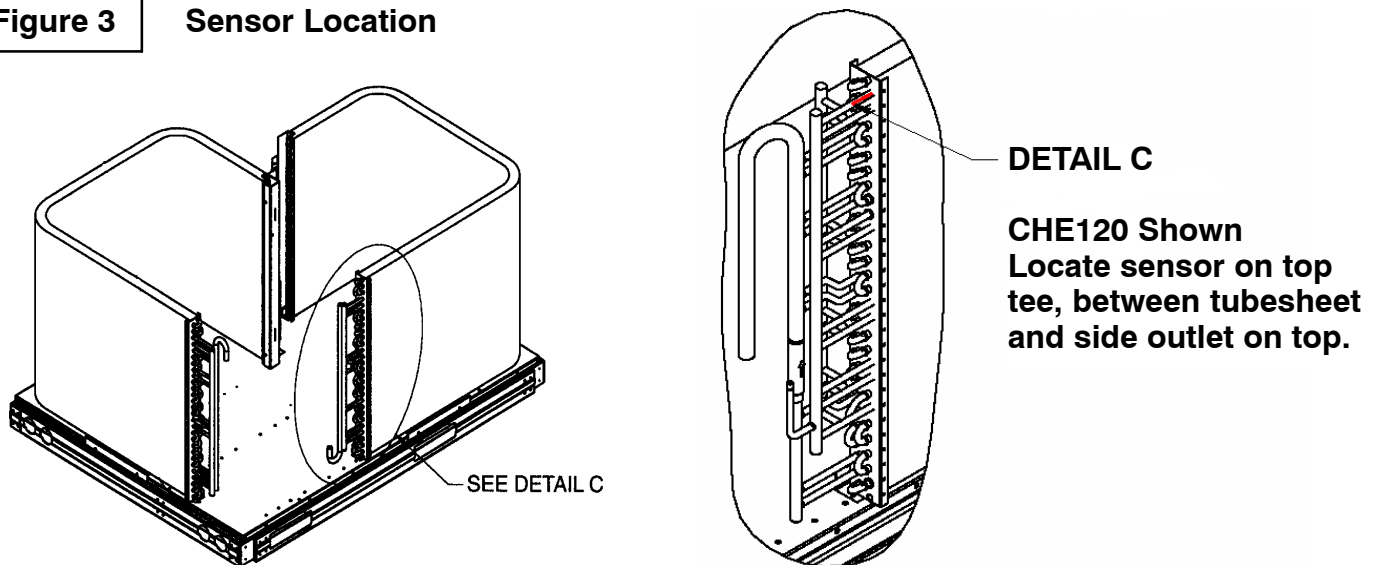


Table 1 – Controller Usage for CAE

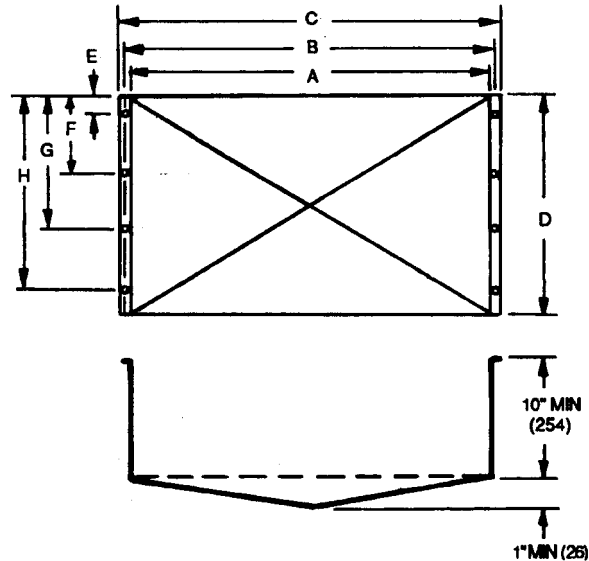
Unit CAE	Voltage-Ph-Hz	Fast Motor Part No.	Low Ambient Kit Model No.
091H, 120H	208/230-3-60	1171974 (2 each) *	AXB175LAA (32LT900301)
091L, 120L	460-3-60	1171975 (2 each) *	AXB275LAA (32LT900611)
091S, 120S	575-3-60	1171975 (2 each) *	AXB275LAA (32LT900611)

Controller Usage for CHE

Unit CHE	Voltage-Ph-Hz	Fast Motor Part No.	Low Ambient Kit Model No.
091H	208/230-3-60	1171974 (2 each) *	AXB175LAA (32LT900301)
091L	460-3-60	1171975 (2 each) *	AXB275LAA (32LT900611)
120H	208/230-3-60	No change required	AXB175LAA (32LT900301)
120L	460-3-60	No change required	AXB275LAA (32LT900611)

* Two motors required and must be ball bearing motors.

Figure 4 Wind Baffle Dimensions



See Tables below for
Dimensions

CAE091, CAE120, CHE091, CHE120 BAFFLE DIMENSIONS (INCHES)

	A	B	C	D	E	F	G	H
Rear Baffle	30	31	32	27	2-1/4	9-1/4	16-1/4	23-1/4
Front Baffle	25	26	27	27	2-1/4	9-1/4	16-1/4	23-1/4
Right Baffle	30-1/2	31-1/2	32-1/2	27	2-1/4	9-1/4	16-1/4	23-1/4

CAE091, CAE120, CHE091, CHE120 BAFFLE DIMENSIONS (mm)

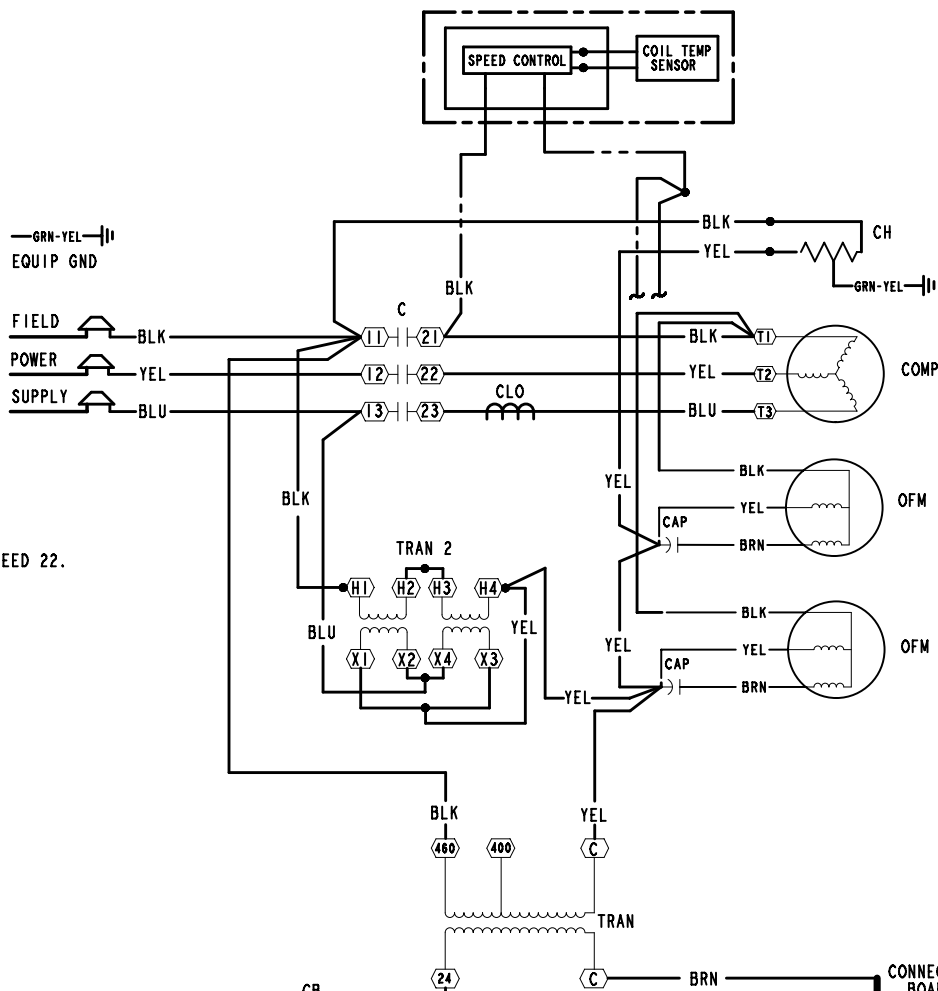
	A	B	C	D	E	F	G	H
Rear Baffle	762	787	813	686	57	235	413	591
Front Baffle	635	660	686	686	57	235	413	591
Right Baffle	775	800	826	686	57	235	413	591

SCHEMATIC
230/460-3-60

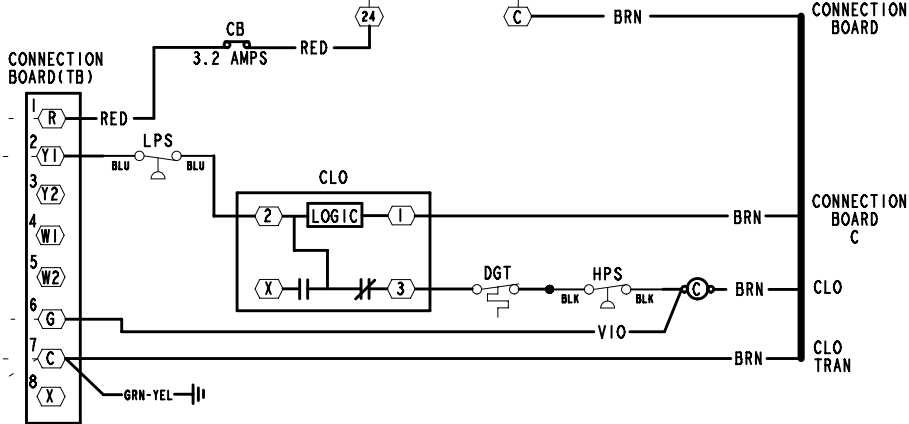
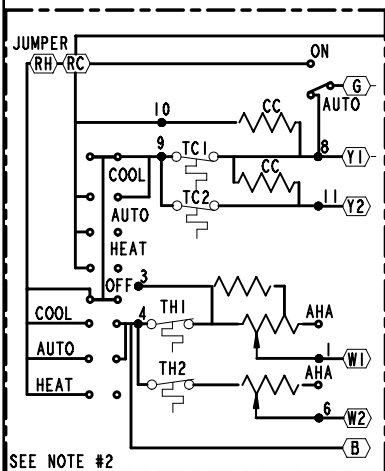


CAE091/120S

SCHEMATIC
575-3-60



1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE 90°C WIRE OR ITS EQUIVALENT
2. SEALED VA FOR 1FC & LLSV IS NOT TO EXCEED 22.
3. USE COPPER CONDUCTORS ONLY.
4. THREE PHASE MOTORS ARE PROTECTED UNDER PRIMARY SINGLE PHASING CONDITIONS.

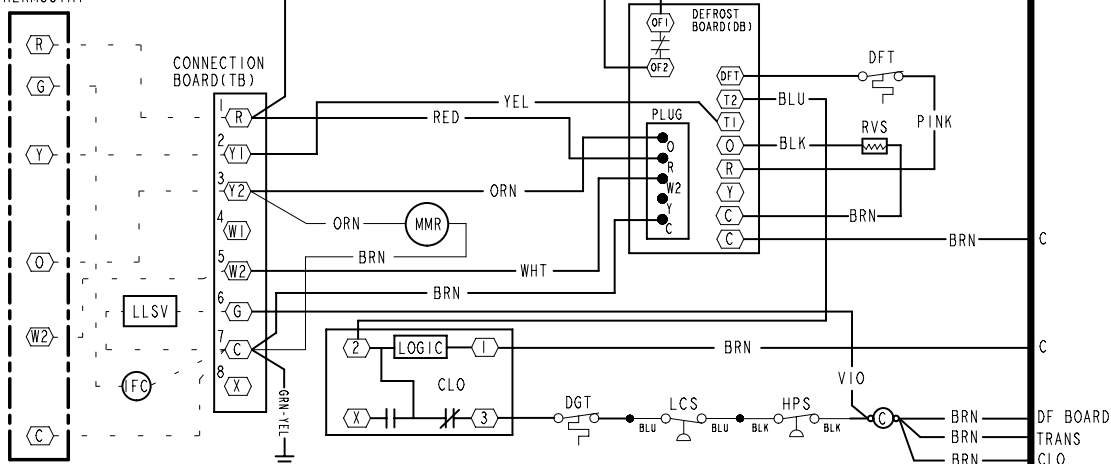
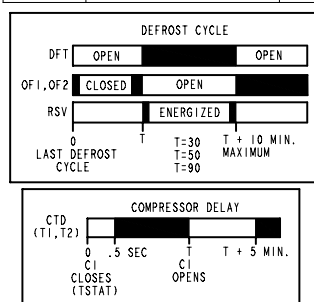


SCHEMATIC
230-3-60

1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE 90°C WIRE OR ITS EQUIVALENT
2. SET HEAT ANTICIPATOR AT .6.
3. USE COPPER CONDUCTORS ONLY.
4. THREE PHASE MOTORS ARE PROTECTED UNDER PRIMARY SINGLE PHASING CONDITIONS.
5. 39VA AVAILABLE FOR FIELD INSTALLED ACCESSORIES

CONTROL POWER REQUIREMENT FOR HEATPUMP CONDENSING UNIT IS 36VA (SEALED). SUPPLIED CONTROL TRANSFORMER IS 75 VA.

VOLTAGE	CB	MUST
RATING	MFG. PART NO.	TRIP
24V	POTTER & BRUMFIELD	AMPS
	W28X-1024-3 2	3 2



SCHEMATIC
460-3-60

The diagram illustrates the timing sequence for a defrost cycle. It consists of two main horizontal bars representing the states of different components over time.

DEFROST CYCLE:

- DFT:** A bar that is **OPEN** from time 0 to T, **CLOSED** from T to T+30, and **OPEN** again after T+30.
- OF1, OF2:** A bar that is **CLOSED** from time 0 to T, **OPEN** from T to T+50, and **CLOSED** again after T+50.
- RSV:** A bar that is **ENERGIZED** from time T to T+90, and **DE-ENERGIZED** after T+90.

Time markers on the left of the first bar are 0, T, T+30, T+50, and T+90 MIN. The label **LAST DEFROST CYCLE** is positioned below the 0 and T markers.

COMPRESSOR DELAY:

- CTD (T1, T2):** A bar representing the compressor delay. It is **CLOSES (TSTAT)** at time 0, remains closed until 0.5 SEC, then **OPENS** at T, and remains open until T+5 MIN.

Time markers on the left of the second bar are 0, 0.5 SEC, T, and T+5 MIN.

-
- The diagram illustrates the electrical wiring for a thermostat control system. It includes the following components and connections:
- THERMOSTAT:** Contains terminals R, G, Y, O, W2, and C.
 - CONNECTION BOARD (TB):** Features terminals 1 through 8, labeled R, Y1, Y2, W1, W2, G, C, and X.
 - DEFROST BOARD (DB):** Includes terminals OF1, OF2, DFT, T2, T1, O, R, Y, C, and C.
 - LOGIC BOARD:** Contains terminals 1, 2, and 3, labeled LOGIC, CLO, and X.
 - Control Board (C):** Features terminals C, OFR, and CLO.
 - Other Components:** MMR (Motor Relay), LLSV (Line Voltage Switch), FFC (Frost Free Control), DFT (Defrost Timer), RVS (Reversing Valve Solenoid), DGT (Defrost Generator), LCS (Line Control Switch), HPS (High Pressure Switch), and CLO (Control Limiting Output).
- The wiring connections are as follows:
- Terminal 1 (R):** Connected to RED and YEL.
 - Terminal 2 (Y1):** Connected to ORN.
 - Terminal 3 (Y2):** Connected to ORN.
 - Terminal 4 (W1):** Connected to ORN.
 - Terminal 5 (W2):** Connected to BRN.
 - Terminal 6 (G):** Connected to BRN.
 - Terminal 7 (C):** Connected to VIO.
 - Terminal 8 (X):** Connected to GRN-YEL.
 - DEFROST BOARD (DB):**
 - OF1 and OF2 are connected to the MMR.
 - DFT is connected to T2 and T1.
 - O is connected to BLU.
 - R is connected to BLK.
 - Y is connected to BRN.
 - C is connected to BRN.
 - LOGIC BOARD:**
 - Terminal 1 (LOGIC) is connected to BRN.
 - Terminal 2 (CLO) is connected to X.
 - Terminal 3 (X) is connected to CLO.
 - Control Board (C):**
 - Terminal C is connected to BRN.
 - Terminal OFR is connected to BRN.
 - Terminal CLO is connected to CLO.

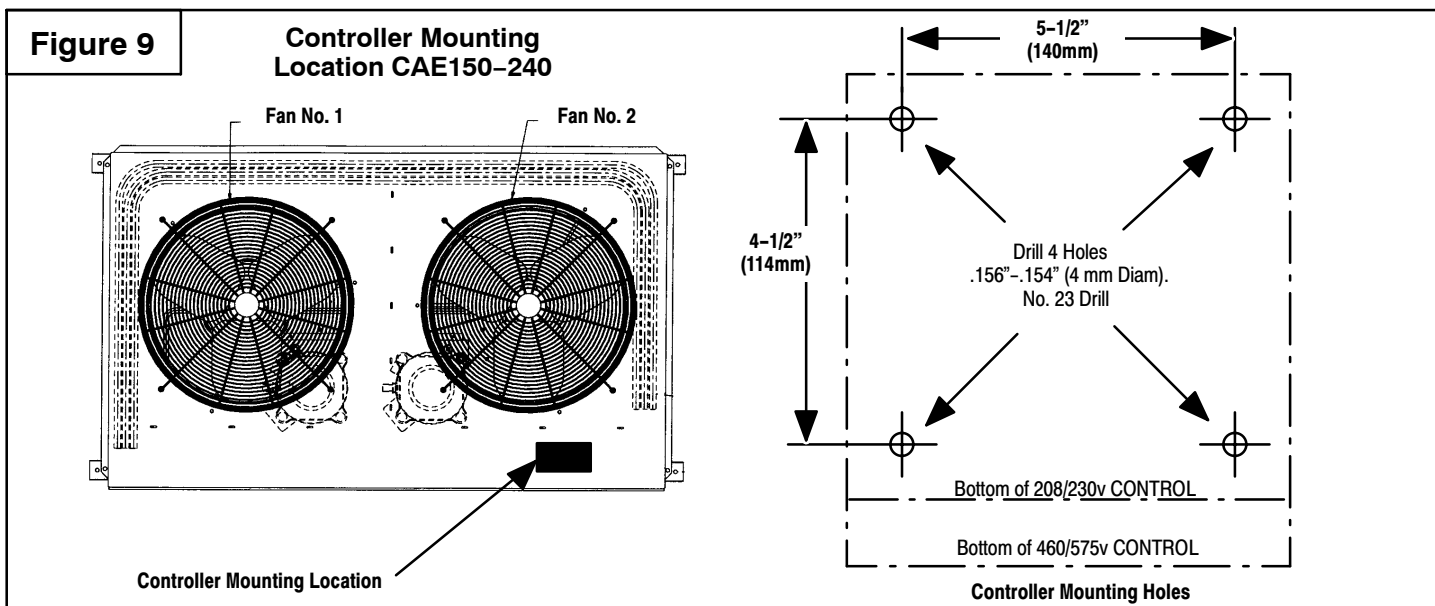
INSTALLATION CAE150-240:

1. Disconnect power to the unit.
2. Disconnect condenser (outdoor) fan motor (OFM) wires at the contactor and capacitor.
3. Mount controller on the unit. See Fig. 9. The controller must be mounted vertically with leads at the bottom. Using the dimensions in Fig. 9, drill 4 mounting holes. To ensure electrical ground, insert

star lockwashers (supplied with the controller) under the heads of the sheet metal screws.

4. Route sensor wire from bottom of controller to sensor location as specified in Fig. 10. Fasten sensor with 3 / 4 -in. 4-40 screws, plate washers, and 4-40 nuts provided.

NOTE: Sensor assembly is delicate. Handle with care.



5. Rewire the motor connections as shown in Fig. 11 for CAE150-240 units. Two wirenuts are included in package, if needed.
6. Coil up all excess wire and secure it next to the controller.
7. Winter start control is required on all CAE150-240, see Fig. 12. (Kit Part # DNWINSTR001A00)
8. Wind baffles are required to prevent wind cross currents from causing abnormally low condensing temperatures. Fabricate sheet metal baffles as shown in Fig. 13. Use 20-gage sheet metal.
9. Reconnect power to the unit.

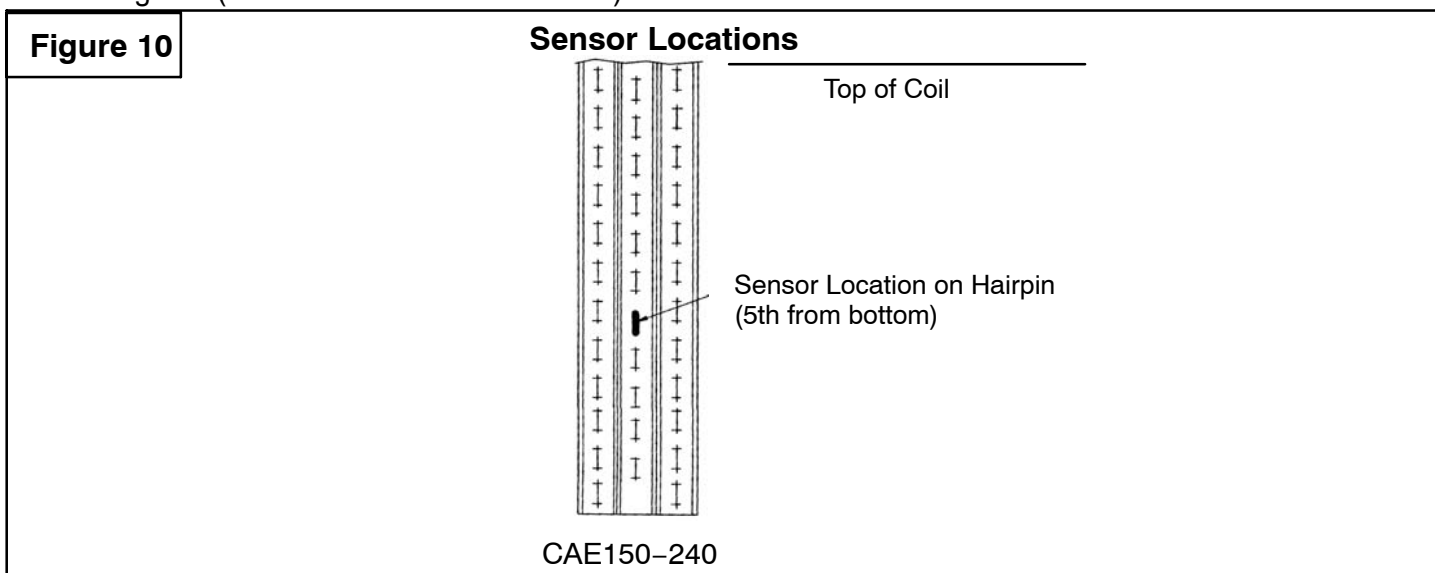


Figure 11

Wiring Diagram – CAE150–240

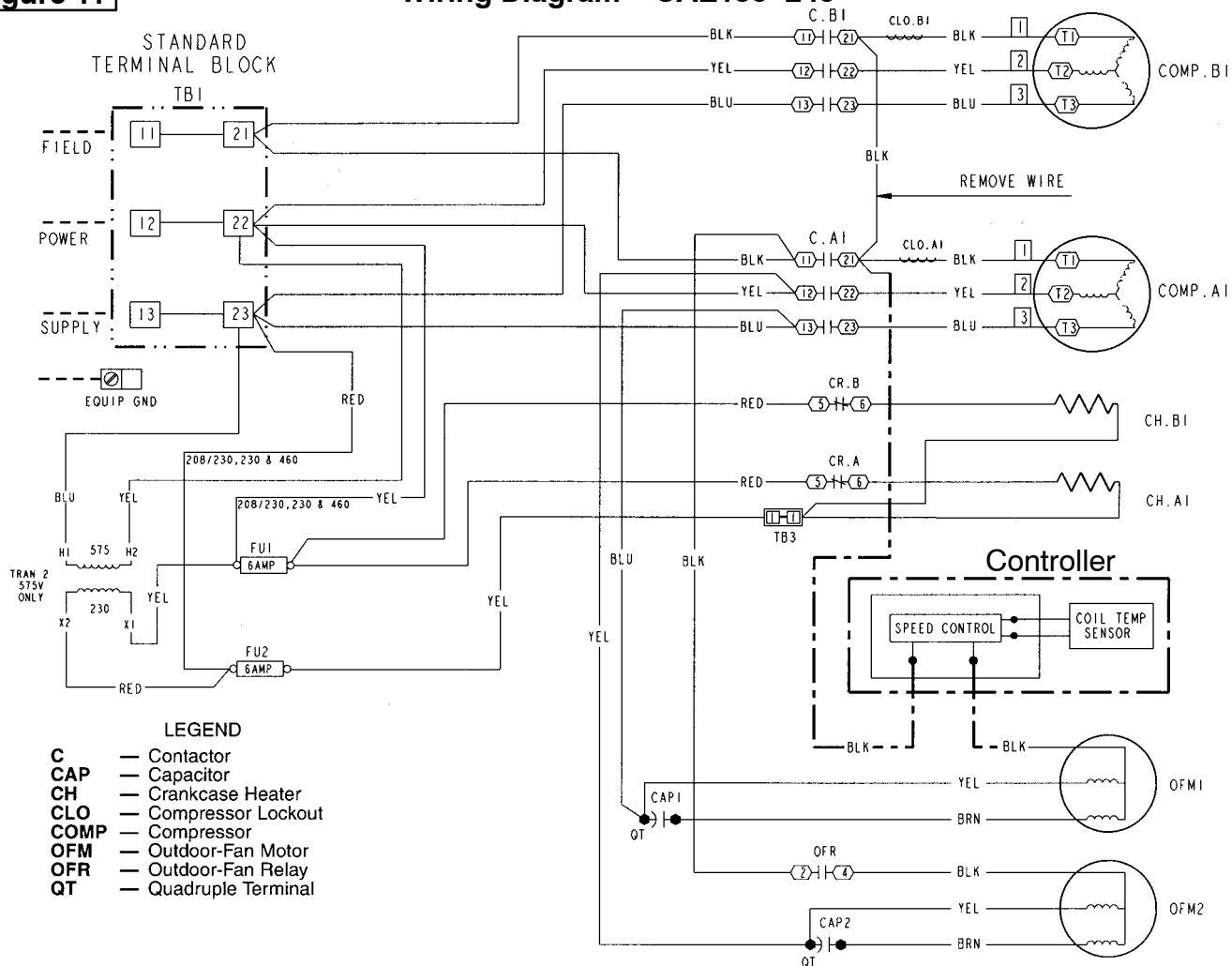


Figure 12

**Connection Points, Time-Delay Relay, Winter Start Accessory
DNWINSTR001A00**

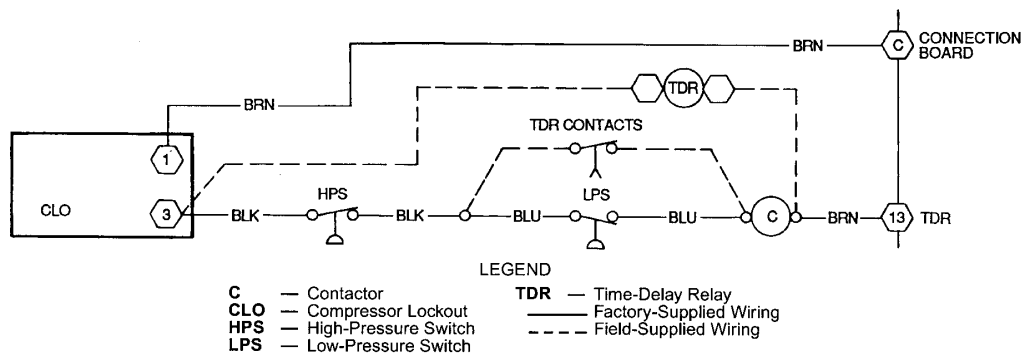
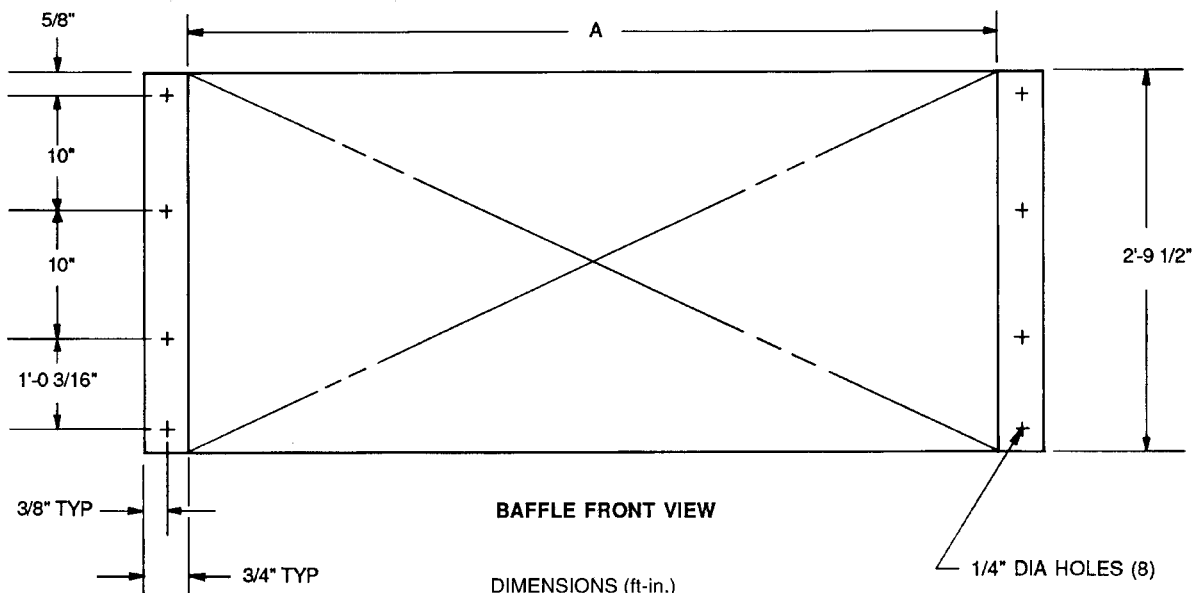
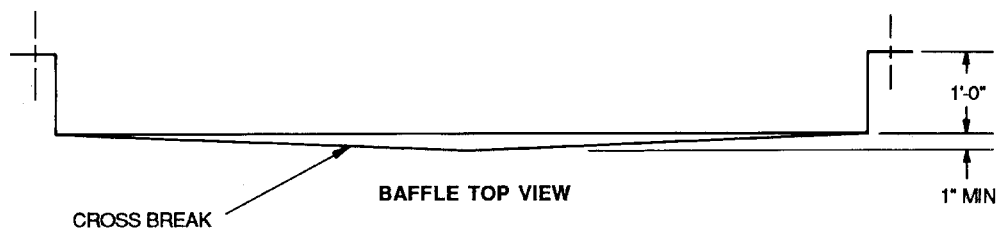
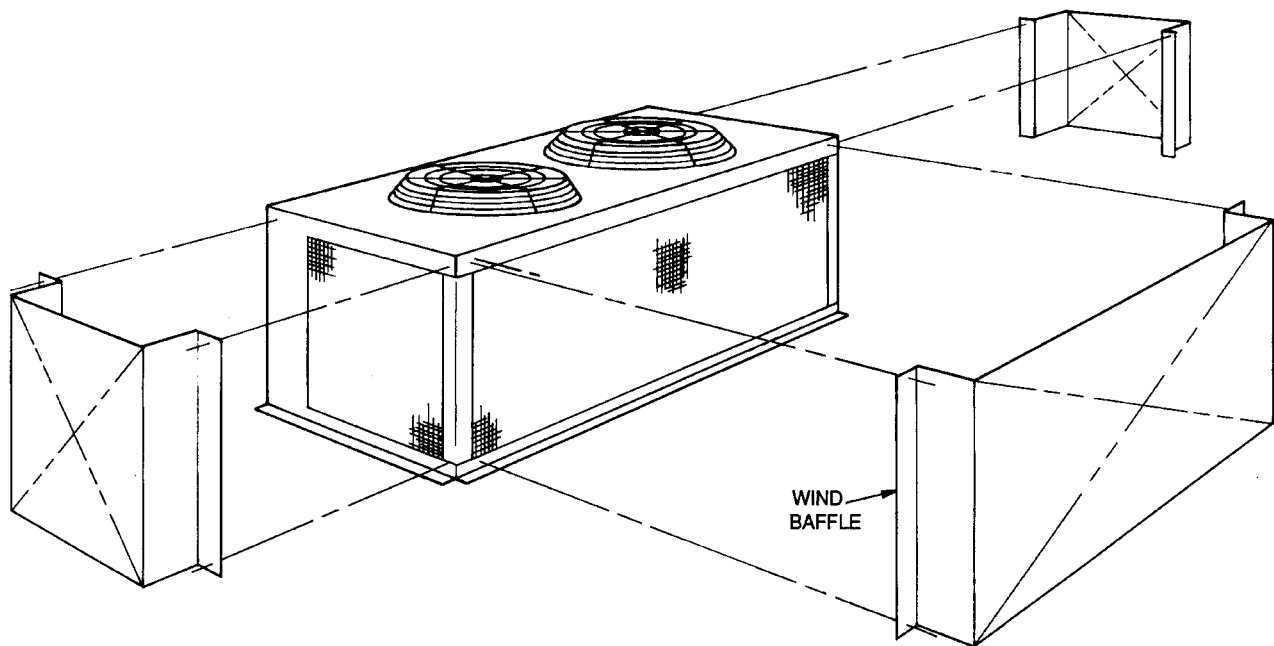


Figure 13 Wind Baffle Mounting Details



DIMENSIONS (ft-in.)

BAFFLE LOCATIONS	A
Right-Hand Side*	2-5 ¹¹ / ₁₆
Back	5-8 ¹ / ₂
Left-Hand Side*	3-0 ⁷ / ₁₆

*As viewed from access panel side.