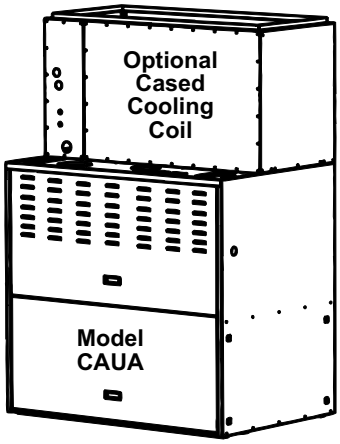
Installation

Applies to: **Cased Cooling Coil for Model CAUA (either Model ACU or Option C)**

Table of Contents

1. Description/ Application



Model CAUA Upflow Heater with Optional Cased Cooling Coil

These instructions apply to an optional cased cooling coil when installed on a Model CAUA heater. See **TABLE 1** below for matching the cabinet size of the Model CAUA heater with the cooling coil. The coil may have been ordered as either a Model ACU or an Option C to be used with R-410A refrigerant. Thermostatic expansion valves selected to match the coil are shipped loose for field installation.

Installation should be done by a qualified agency in accordance with these instructions and in compliance with all codes and requirements of authorities having jurisdiction. Follow the instructions in installation Form I-CAUA to install the heater. The heater should be in its final installation location (without discharge ductwork) before installing the cooling coil.

Shipped with the heater is a package of parts required to install a heat section condensate drain. When the application includes a cooling coil, installation of the heat section condensate drain is required.

TABLE 1 - Heater/Coil Cross-Reference Table

Heater/Coil Cross-Reference Table by Model CAUA and Cased Coil Option C or Model ACUA, ACUB, or ACUC Cased Cooling Coil		
CAUA 150 and 200	**CAUA 250 and 300**	**CAUA 350* and 400***
ACUA 060 / Opt C060	**ACUB 090 / Opt C090**	**ACUC 120 / Opt C120**
ACUA 072 / Opt C072	**ACUB 120 / Opt C120**	**ACUC 150 / Opt C150**
ACUA 090 / Opt C090	**ACUB150 / Opt C150**	**ACUC 180 / Opt C180**
*The cased cooling coil for a CAUA 350 or 400 may include a factory-attached discharge plenum (Option CD62). To install a cased cooling coil with a discharge plenum, follow the instructions in this sheet plus the instructions in Form I-CAUA-DP. Dimensions are shown in that instruction form.		

Coil Description and Size - All coils are for use with R-410A refrigerant.

Coil Description and Size
ACUA 060 or Option C060 - a cased 5-ton, single circuit or 1/3-2/3 dual circuit "A" coil.
ACUA 072 or Option C072 - a cased 6-ton, single circuit "A" coil.
ACUA, ACUB 090 or Option C090 - a cased 7.5-ton, dual (50/50 or 1/3-2/3) circuit "A" coil.
ACUB, ACUC 120 or Option C120 - a cased 10-ton, dual (50/50 or 1/3-2/3) circuit "A" coil.
ACUB, ACUC 150 or Option C150 - a cased 12-ton, dual (50/50 or 1/3-2/3) circuit "A" coil.
ACUC 180 or Option C180 - a cased 15-ton, dual (50/50 or 1/3-2/3) circuit "A" coil.

2. Uncrating and Preparation

Uncrate and inspect the cooling coil. If damage has been incurred during shipment, document the damage with the transporting agency and contact an authorized manufacturer Distributor. If you are an authorized Distributor, follow the freight policy procedures.

Check the rating plate for the specifications and electrical characteristics to be sure that they are compatible with the installation. Locate the thermostatic expansion valve(s) that are shipped loose. Size 060 will have either one or two valves. Size 072 will have one valve. Sizes 090-180 will have two valves. If a reducer is required to connect the thermostatic expansion valve to the distributor, the required reducers are shipped with the valves. Refer to the appropriate chart on page 4 and verify that the valves are correct for the installation.

3. Dimensions

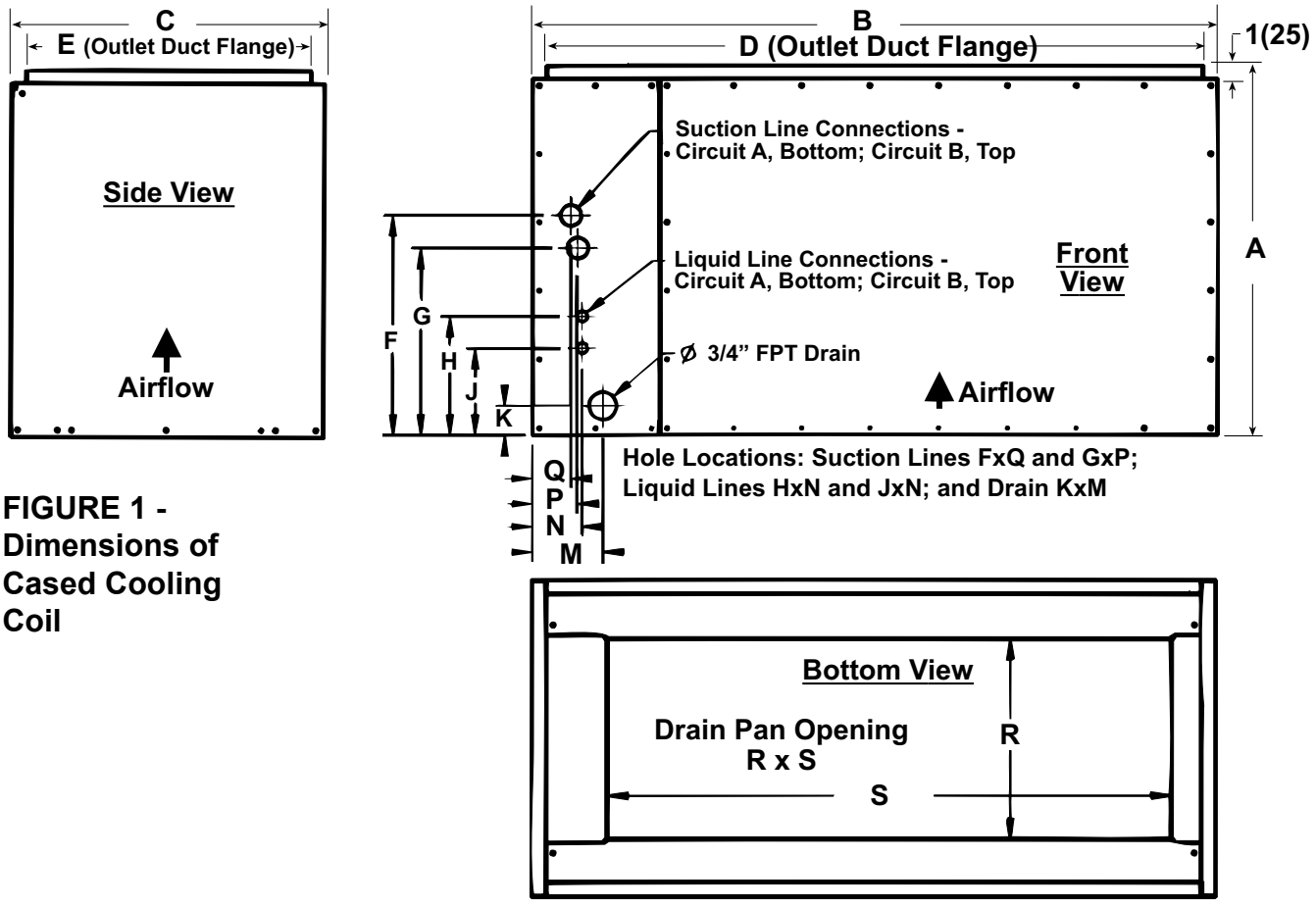


FIGURE 1 - Dimensions of Cased Cooling Coil

TABLE 2 - Dimensions of Cased Cooling Coil

Option C for Model CAUA	Model		A	B	C	D	E	F	G	H	J	K
Option C060, C072, C090 for CAUA 150 or 200	All ACUA	inches	27	38	23	36	21	16-1/2	--	8-1/2	--	2-1/8
		mm	686	965	584	914	533	419	--	217	--	54
Option C090, C120, C150 for CAUA 250 or 300	All ACUB	inches	27	50	23	48	21	16	13-5/8	8-5/8	6-1/4	2-1/8
		mm	686	1270	584	1219	533	406	346	219	159	54
Option C120, C150, C180 for CAUA 350 or 400	All ACUC	inches	32-5/8	50	36	48	34	20-1/2	17-1/4	9-1/4	7-3/4	2-1/8
		mm	829	1270	914	1219	864	521	438	235	197	54

Option C for Model CAUA	Model		M	N	P	Q	U	V
Option C060, C072, C090 for CAUA 150 or 200	All ACUA	inches	6	4	--	3-1/2	14-1/2	27
		mm	152	102	--	89	368	686
Option C090, C120, C150 for CAUA 250 or 300	All ACUB	inches	5-1/8	3-5/8	3-1/4	2-3/4	14-1/2	41-1/4
		mm	130	92	83	70	368	1048
Option C120, C150, C180 for CAUA 350 or 400	All ACUC	inches	4-1/4	5-3/4	4-1/4	3	27-1/2	39-7/8
		mm	108	146	108	76	699	1013

Hole Locations:
Suction Lines, Circuit B - FxQ and Circuit A - GxP
Liquid Lines, Circuit B - HxN and Circuit A, JxN
Drain, KxM
NOTE: See tubing sizes in chart on page 4.

4. Cooling Coil Installation Instructions

Read these instructions and become familiar with the installation requirements. If you do not have knowledge of local requirements, check with the local gas company or any other local agencies who might have requirements concerning this installation.

Before beginning, make preparations for necessary supplies, tools, and manpower. Installation should be done by an HVAC technician qualified in refrigerant system installation.

Verify that the package of parts required to install the heat section condensate drain is either already installed or at the job site.

4.1 Place Coil on top of the Model CAUA Heater

The coil fits over the discharge opening on the top of Model CAUA heater. The heater should be in its final installed location before adding the cased cooling coil. The heater must be level.

FIGURE 2 - Model CAUA Heater with Cooling Coil

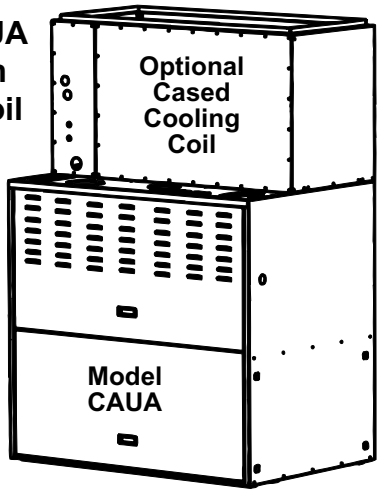


TABLE 3 - Approximate Weights of the Cooling Coils

For CAUA 150 or 200	lbs	kg
ACUA 060 / Opt C060	83	38
ACUA 072 / Opt C072	86	39
ACUA 090 / Opt C090	105	48
For CAUA 250 or 300	**lbs**	**kg**
ACUB 090 / Opt C090	110	50
ACUB 120 / Opt C120	122	55
ACUB 150 / Opt C150	140	64
For CAUA 350 or 400	**lbs**	**kg**
ACUC 120 / Opt C120	176	80
ACUC 150 / Opt C150	180	82
ACUC 180 / Opt C180	188	85

If specified, place field-supplied gasket material on the top of the heater where the cabinet surfaces will have contact. The coil will "fit" with the line connection holes in front or rear of the cabinet. Locate the openings and determine the most efficient orientation. Lift the coil and place it on top of the heater.

Because of the cabinet design, there is no mechanical attachment required between the heater and the cased cooling coil.

Verify that the heater and coil cabinet are level.

4.2 Thermostatic Expansion Valves

Locate the shipped-loose TEV Kit components and verify them by Size with the list in **TABLE 4** and with the unit rating plate.

Identify the components that are required for each circuit and prepare to assemble. Refer to the valve manufacturer's instructions for installation information. When brazing the valve, wet wrap the valve body, but do not allow moisture to enter the tubing. Braze with the flame pointed away from the valve.

Position the **outlet** of the **Circuit A thermostatic expansion valve** toward the distributor connection on the bottom liquid line. If a reducer is required, position it between the distributor and the outlet of the valve.

☐ If there is a reducer, attach the reducer to the distributor connection and the outlet of the valve to the reducer.

☐ If there is no reducer, attach the outlet of the valve to the distributor connection.

Repeat the same procedure to install the thermostatic expansion valve in Circuit B (the top liquid line).

4. Cooling Coil Installation Instructions (cont'd)

4.2 Thermostatic Expansion Valves (cont'd)

TABLE 4 - Thermostatic Expansion Valves (TEV) and Tubing Sizes

Thermostatic Expansion Valve Kit (shipped with the Cased Cooling Coil) and Tubing Sizes by Model, Size, and Circuit																							
TEV Kit P/N for R-410A	Model	Size	Circuit		Evaporator Coil					Circuit A (Bottom Liquid Line Connection; see FIGURE 1) - *TEV inlet is liquid line tubing size.						Circuit A - Suction Line Tubing	Circuit B (Top Liquid Line Connection; see FIGURE 1) - *TEV inlet is liquid line tubing size.						Circuit B - Suction Line Tubing
												Field-Installed TEV							Field-Installed TEV				
			Desc.	Code	P/N	Row	FH	FL	FPI	Distributor (on coil) Connection	Field-Installed Reducer	P/N	Mfr	Outlet	*Inlet		Distributor (on coil) Connection	Field-Installed Reducer	P/N	Mfr.	Outlet	*Inlet	
258856	ACUA	060	Single	AUD1	**257328**	2	20	28	10	5/8	**216428**	**234052**	BBIZE-5	7/8	5/8	7/8							
258858		060	1/3-2/3	AUD3	**258846**	2	20	28	10	5/8	**None**	**220552**	BBIZE-2	5/8	1/2	7/8	5/8	**None**	**220553**	BBIZE-3	5/8	5/8	7/8
258857		072	Single	AUD1	**257329**	2	20	28	12	7/8	**None**	**220555**	BBIZE-6	7/8	5/8	7/8							
258860		090	50/50	AUD2	**257538**	3	24	28	10	5/8	**216428**	**220554**	BBIZE-4	7/8	5/8	7/8	5/8	**216428**	**220554**	BBIZE-4	7/8	5/8	7/8
258861		090	1/3-2/3	AUD3	**257330**	3	24	28	10	5/8	**None**	**220553**	BBIZE-3	5/8	5/8	7/8	5/8	**216428**	**234052**	BBIZE-5	7/8	5/8	7/8
258860	ACUB	090	50/50	AUD2	**257539**	2	24	42	12	5/8	**216428**	**220554**	BBIZE-4	7/8	5/8	7/8	5/8	**216428**	**220554**	BBIZE-4	7/8	5/8	7/8
258861		090	1/3-2/3	AUD3	**257331**	2	24	42	12	5/8	**None**	**220553**	BBIZE-3	5/8	5/8	7/8	5/8	**216428**	**234052**	BBIZE-5	7/8	5/8	7/8
258862		120	50/50	AUD2	**257540**	3	20	42	10	5/8	**216428**	**234052**	BBIZE-5	7/8	5/8	7/8	5/8	**216428**	**234052**	BBIZE-5	7/8	5/8	7/8
258863		120	1/3-2/3	AUD3	**257332**	3	20	42	10	5/8	**None**	**220553**	BBIZE-3	5/8	5/8	7/8	7/8	**None**	**220555**	BBIZE-6	7/8	5/8	7/8
258864		150	50/50	AUD2	**257541**	3	24	42	12	7/8	**None**	**220555**	BBIZE-6	7/8	5/8	7/8	7/8	**None**	**220555**	BBIZE-6	7/8	5/8	7/8
258865		150	1/3-2/3	AUD3	**257333**	3	24	42	12	5/8	**216428**	**220554**	BBIZE-4	7/8	5/8	1-3/8	7/8	**None**	**220557**	BBIZE-8	7/8	5/8	7/8
258862	ACUC	120	50/50	AUD2	**257542**	2	30	41	12	5/8	**216428**	**234052**	BBIZE-5	7/8	5/8	1-3/8	5/8	**216428**	**234052**	BBIZE-5	7/8	5/8	1-3/8
258863		120	1/3-2/3	AUD3	**257334**	2	30	41	12	5/8	**None**	**220553**	BBIZE-3	5/8	5/8	1-3/8	7/8	**None**	**220555**	BBIZE-6	7/8	5/8	7/8
258864		150	50/50	AUD2	**257543**	3	27	41	10	7/8	**None**	**220555**	BBIZE-6	7/8	5/8	1-3/8	7/8	**None**	**220555**	BBIZE-6	7/8	5/8	1-3/8
258866		150	1/3-2/3	AUD3	**257335**	3	27	41	10	5/8	**216428**	**220554**	BBIZE-4	7/8	5/8	1-3/8	1-1/8	**216432**	**220557**	BBIZE-8	7/8	5/8	7/8
258867		180	50/50	AUD2	**257544**	3	30	41	10	1-1/8	**216432**	**220557**	BBIZE-8	7/8	5/8	1-3/8	1-1/8	**216432**	**220557**	BBIZE-8	7/8	5/8	1-3/8
258868		180	1/3-2/3	AUD3	**257336**	3	30	41	10	5/8	**216428**	**234052**	BBIZE-5	7/8	5/8	1-3/8	1-1/8	**216432**	**220557**	BBIZE-8	7/8	5/8	7/8

NOTE: For replacement information, including TEV's for R22 refrigerant, see Form P-CAUA at www.RezSpec.com..

CAUTION: The thermostatic expansion valve must be for R-410A refrigerant and must be sized to match the circuit. Failure to correctly select and install thermostatic expansion valve(s) will prevent the system from operating properly and will void the manufacturer's warranty.

After the refrigerant lines are installed and before charging, extend the thermostatic expansion valve bulb from the valve to the suction line. If there are two circuits, be sure to match the liquid line with the corresponding suction line. Comply with the illustration in **FIGURE 3A** and the valve manufacturer's instructions on bulb placement. General recommendations are listed below.

- Place bulb on suction line as close to the evaporator coil outlet as possible.
- Place the bulb on a straight horizontal section of suction line (if bulb must be vertical, line must be descending).
- Never place bulb in a trap or downstream of a trap.
- Position bulb on the tubing as shown in **FIGURE 3A**.
- Bulb must have 100% contact with tubing.
- Secure the bulb tightly.
- Cover bulb with waterproof insulation.

In addition, an external equalizer line must be installed from the stem on the valve to a location on the suction line that is downstream of the bulb. Follow the instructions in **FIGURE 3B** to install the field-provided tubing.

FIGURE 3A - Suction Line showing Orientation and Location of the Thermostatic Expansion Valve Bulb and the Equalizer Tubing (applies to each circuit)

Position bulb flat against the surface of the suction line tubing. Secure bulb tightly and insulate.

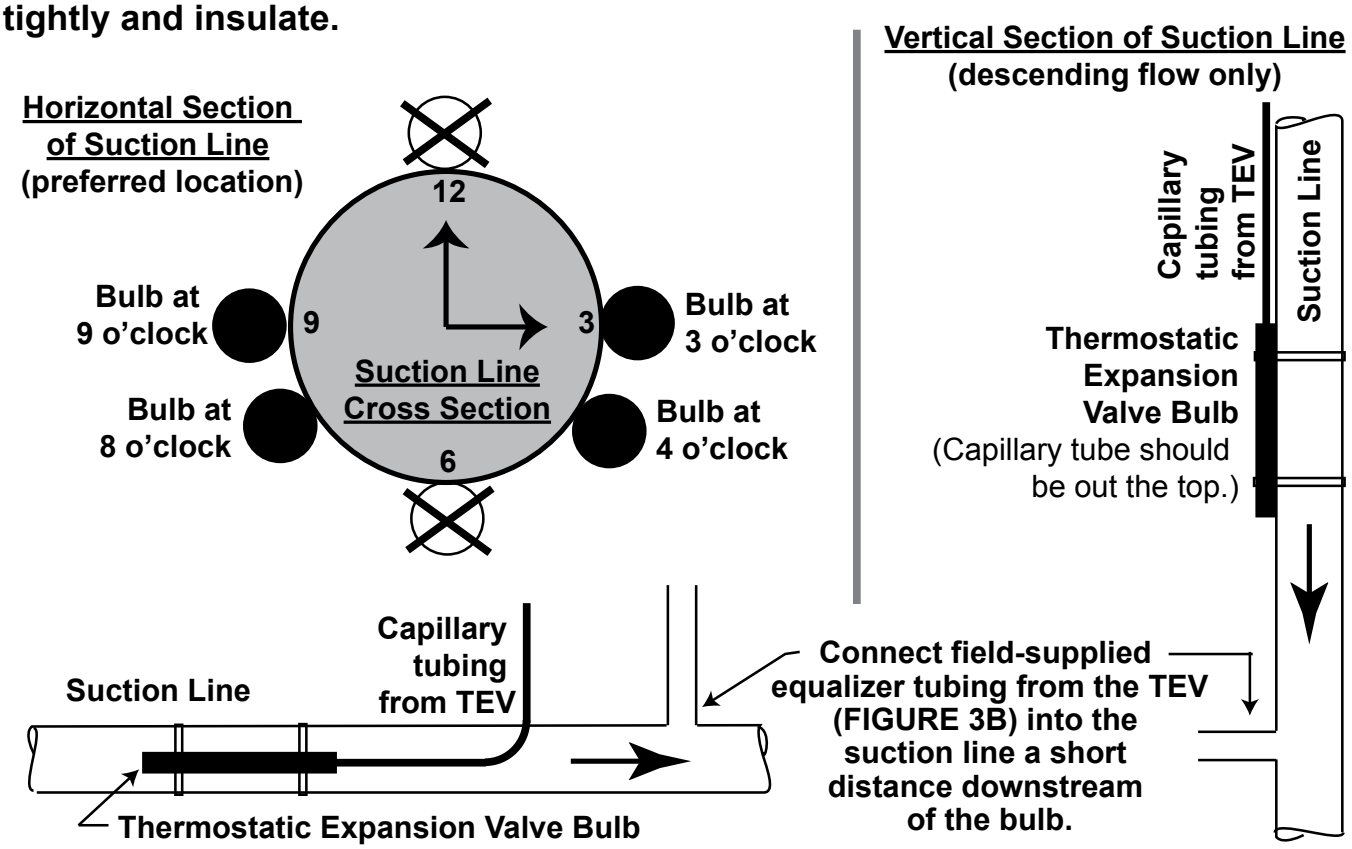
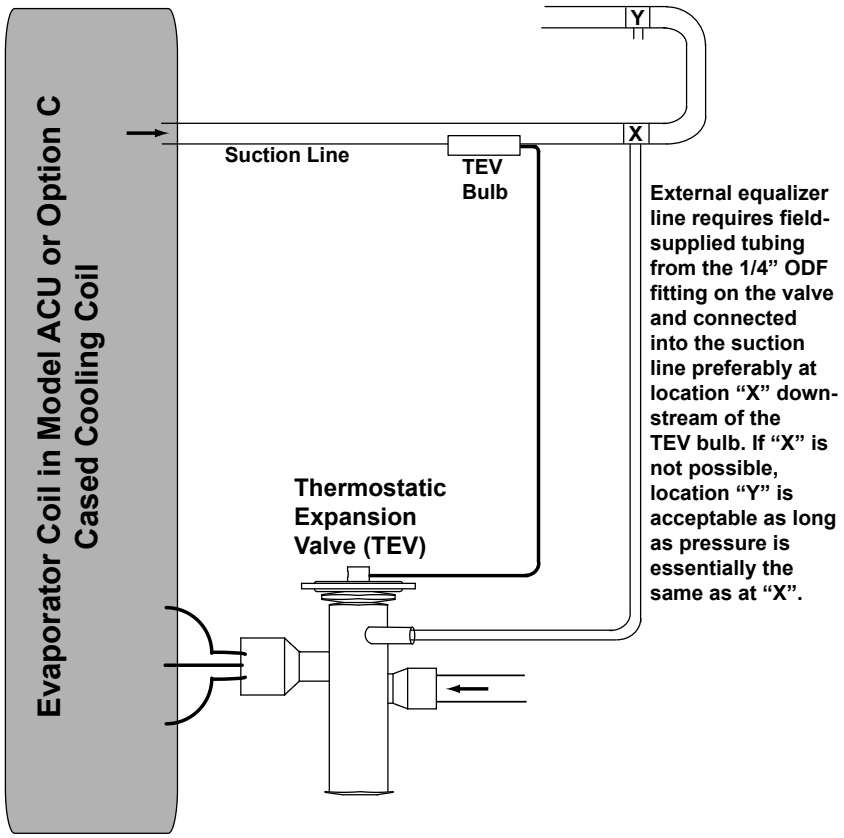


FIGURE 3B - Thermostatic Expansion Valve with External Equalizer Line Fitting (required for each circuit)

Thermostatic Expansion Valve Equalizer Line - To ensure that the correct pressure is signaled to the valve, an external equalizer line must be connected into the **suction line downstream of the thermostatic expansion valve bulb.** (See location indicated in **FIGURES 3A** and **3B**.) Connect the other end of the equalizer tubing to the 1/4" ODF stem on the thermostatic expansion valve as shown in **FIGURE 3B**.



4. Cooling Coil Installation Instructions (cont'd)

4.3 Drain Line

The cased coil has a 3/4" FPT drain connection; see location in **FIGURE 1**. page 2. Install a trap (see below) and pitch the drain line downward at least 1/2" (13mm) for every 10 feet (3M) of horizontal run. Drain lines must not interfere with access panels. An obstruction in the drain or a poorly designed drain can cause an over flow. Overflow could result in unit or building damage.

Connect the heat section condensate tubing (see Paragraph 4.4) into the cooling coil drain line and continue into a sanitary drain system.

Condensate Drain Trap

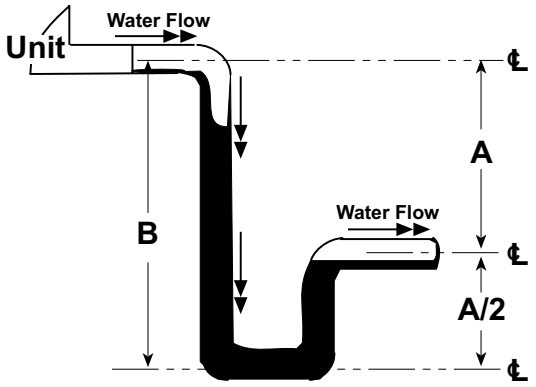
Condensate Drain Trap

The design of the drain trap is important. If dimension "B" in **FIGURE 4A** is not tall enough, the water seal will not hold, and air will be drawn through the drain pipe into the system. If the outlet leg of the trap is too tall, water will back up into the drain pan. As condensate forms during normal operation, the water level in the trap rises until there is a constant outflow. **FIGURE 4A** illustrates the appropriate dimensions.

FIGURE 4A - Condensate Drain Trap Dimensions

A = 3" (76mm) minimum

B = A + A/2



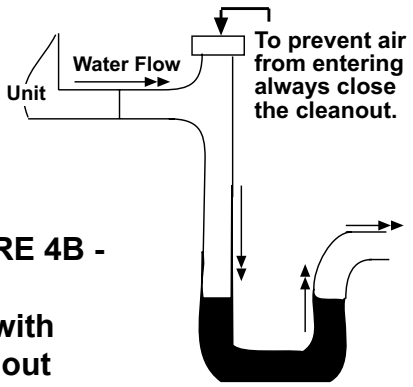


FIGURE 4B - Drain Trap with Cleanout

Condensate Drain Use

Improper trap design accounts for some condensate drainage system failures, but incorrect use and maintenance of condensate drain traps can also cause problems. The combination of airborne particles and moisture in the air handler can result in algae formation in the drain pan and traps. The traps must be cleaned regularly to avoid blockage that can slow or stop water flow, resulting in backup into the system.

If drains have a cleanout opening (**FIGURE 4B**), be sure to close the opening after cleaning.

Seasonal Usage - At the beginning of the cooling season, inspect and clean the entire cooling coil cabinet including the condensate drain pan. Thoroughly clean dirt, algae, grease, and other contaminates. Inspect condensate drain pans, traps, and piping; fill traps with water to ensure proper operation. During a wintertime shutdown of the cooling system it may be desirable to disconnect and remove all water from the traps and drains to prevent freeze damage. If local building codes permit, traps may be filled with an antifreeze solution. Or, piping may be designed with freeze plugs or other freeze protection methods (such as a heat tape).

Year Round Usage - Climates or applications with cooling requirements year round require more frequent inspections of the cooling coil cabinet and condensate drains. Depending on climate, freeze protection of traps may be required during non-cooling hours.

4.4 Heat Section Condensate Drain

When a cooling coil is installed on a Model CAUA heater, a heat section condensate drain line must be installed.

The parts to install the drain line are packaged and shipped with all Model CAUA heaters.

TABLE 6 - Burner Condensate Drain Components	Qty	P/N	Description
	1	**165955**	6-ft length of 3/8" I.D. Tubing
	1	**165952**	90° Nylon Fitting, 1/4" NPT x 3/8" tubing
	1	**110628**	1/4" NPT Brass Nut
	1	**171527**	1/4" Locknut, Hex, T& B 139
	1	**165953**	Sealing Washer
	2	**20913**	Nylon Wire Ties, T&B #TY-24M
	1	**87556**	Snap Bushing, Heyco SB 625-8

Instructions for Installing Burner Condensate Drain

1. Remove the burner compartment door.

2. Depending on date of manufacture, the burner box cover is in either two sections (top left and top right extending over the front) or three sections (top left, top right, and a separate front cover).

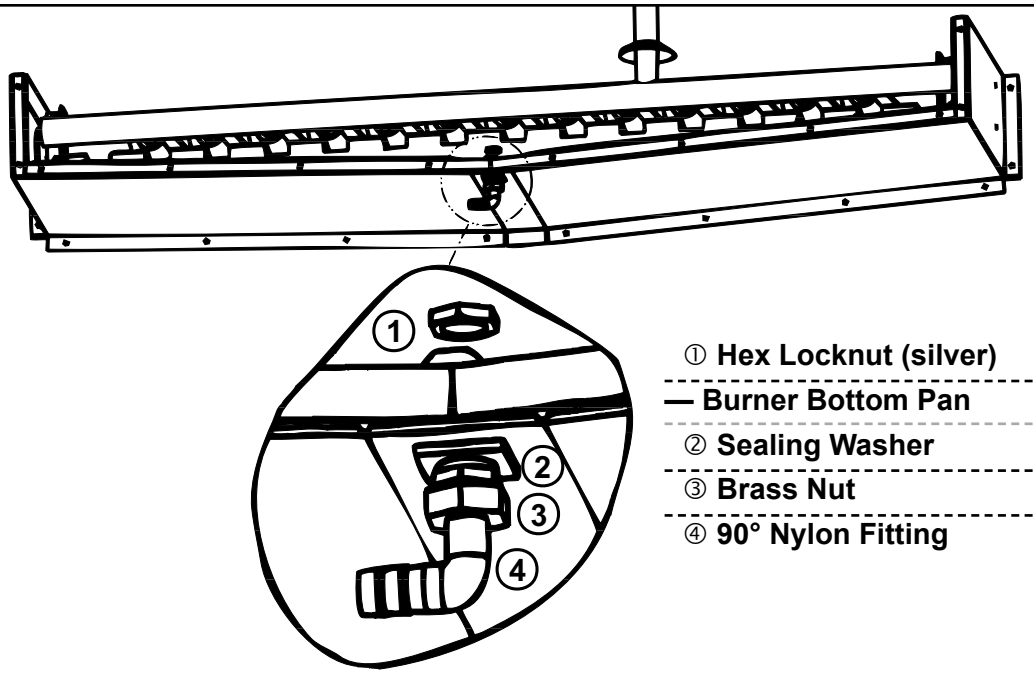
***-- If the front of the burner cover is separate*,** remove the front section only.

***-- If the front burner cover is not a separate piece*,** on the left side of the burner box cover, disconnect the flame sensor wire and the flame rollout switch wires. Disconnect the silicone tubing from the static tap. Remove the top left cover.

3. Determine which side of the cabinet will be most convenient for the drain line. Remove the hole plug on that side and replace with the snap bushing from the package.

4. Locate the hole in the bottom center of the burner pan and remove the plug. Follow the instructions in **FIGURE 5** to install the drain. Complete all steps and re-assemble the heater.

FIGURE 5 - Burner Condensate Drain Connection



Instructions:

1) Assemble the brass nut, the sealing washer, and the 90° fitting.

2) Position the threaded fitting up through the hole so that the hose barb is toward the bushing that you installed in the side of the cabinet. Attach using the silver-colored locknut.

3) Under the burner, push the tubing onto the hose barb, being sure that it is secure. Maintaining a downward slope, extend the hose out through the bushing installed in the hole in the cabinet side.

4) Just **after exiting** the cabinet, **create a trap in the line by making a loop in the hose.** Secure the loop with the wire ties.

5) Continue downward with the tubing, connecting it into the cooling coil drain pipe.

4. Cooling Coil Installation Instructions (cont'd)

4.5 Ductwork

This system requires both return air and discharge ductwork (unless ordered with an Option AVA2 inlet base and/or an Option CD discharge plenum). Discharge ductwork attaches to the top of the coil cabinet. Dimensions D x E in **FIGURE 1** (page 2) are the duct flange dimensions.

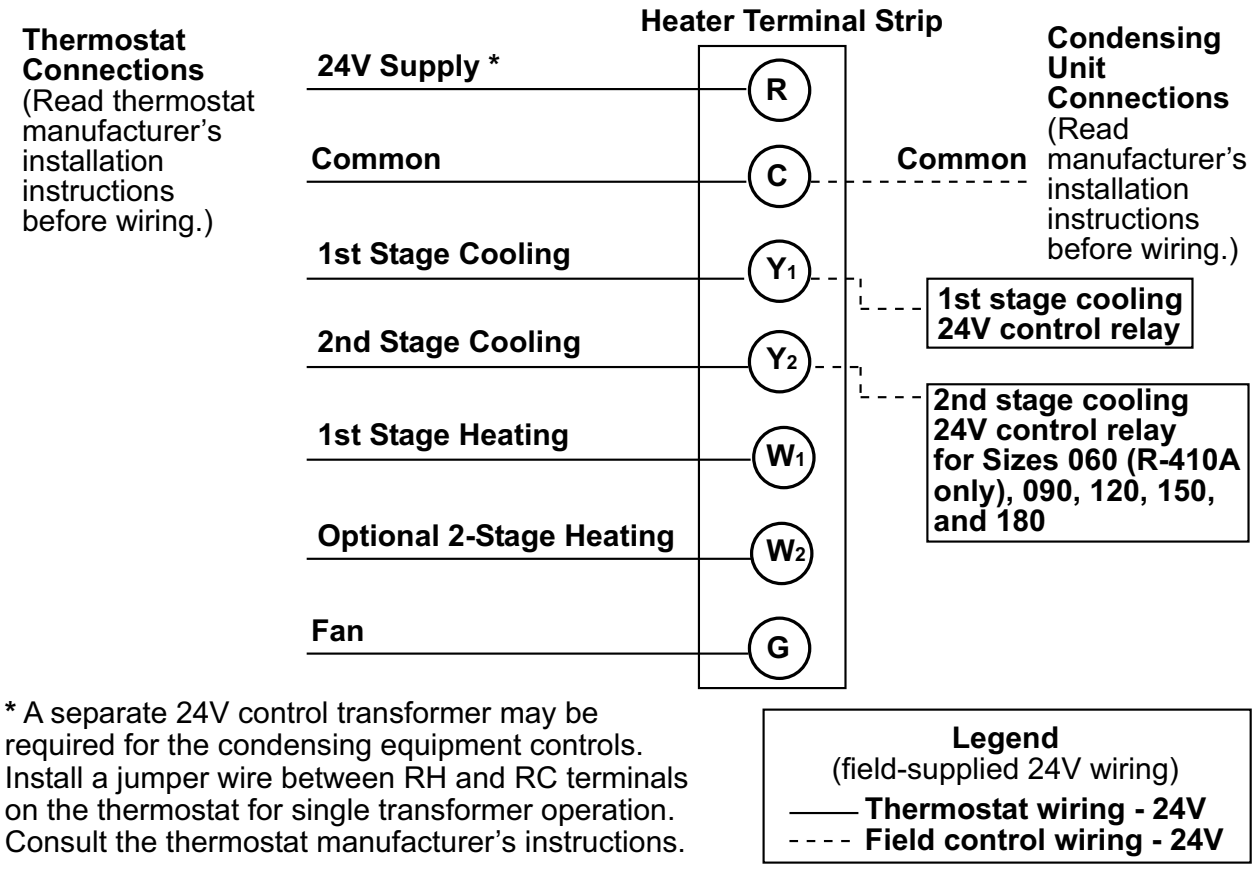
It is recommended that an optional mixing box with filters, an optional filter cabinet, or field-supplied filters be installed in the inlet air duct.

Refer to the heater installation manual, Form I-CAUA, Paragraph 6.4, for additional details on installing ductwork.

4.6 Electrical Connections

The system is operated by 24-volt controls. A separate 24V control transformer is required for the condensing equipment controls. Refer to the 24V electrical requirements of the condenser manufacturer.

FIGURE 6 - Typical Low Voltage Wiring (field supplied)



Follow the installation instructions and startup procedure in heater installation manual Form I-CAUA to complete installation of the heating/cooling unit.

Follow the instructions and requirements of the Model MASA or field-provided condensing unit to complete the cooling system.

Printed in the U.S.A. (04/15)
Form I-CAUA-CC (04-15)