



# Installation Instructions

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## SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury or property damage. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product.

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit. Consult local building codes and the current editions of the National Electrical Code (NEC) NFPA 70. In Canada, refer to the current editions of the Canadian Electrical Code CSA C22.1.

Understand the signal words — DANGER, WARNING, and CAUTION. DANGER identifies the most serious hazards which will result in severe personal injury or death. WARNING signifies hazards that could result in personal injury or death. CAUTION is used to identify unsafe practices, which would result in minor personal injury or product and property damage.

Recognize safety information. This is the safety-alert symbol (⚠). When this symbol is displayed on the unit and in instructions or manuals, be alert to the potential for personal injury.

### ⚠ WARNING

Electrical shock can cause personal injury and death. Shut off all power to this equipment during installation. There may be more than one disconnect switch. Tag all disconnect locations to alert others not to restore power until work is completed.

### ⚠ CAUTION

Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing and gloves when handling parts. Failure to follow this caution may result in personal injury.

### ⚠ CAUTION

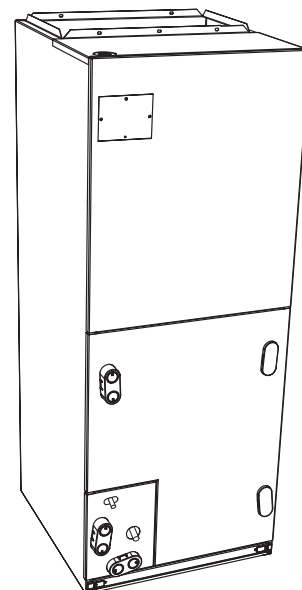
R-410A refrigerant systems operate at higher pressures than standard R-22 systems. Do not use R-22 service equipment or components on R-410A refrigerant equipment. If service equipment is not rated for R-410A refrigerant, equipment damage or personal injury may result.

## INTRODUCTION

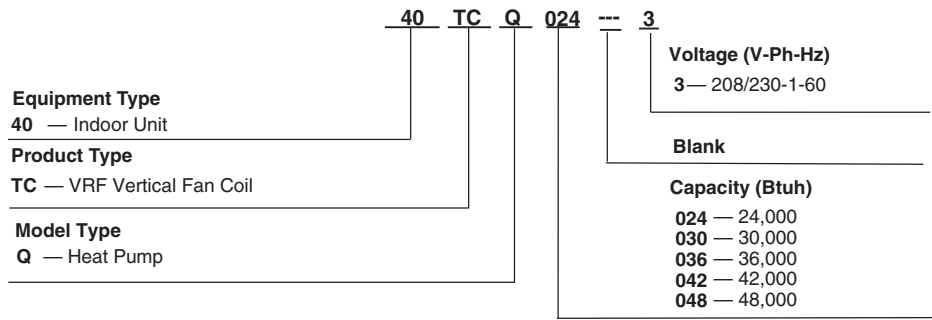
Model 40TCQ fan coil units (see Fig. 1) are designed for flexibility and can be used for up flow or horizontal applications. They require R-410A refrigerant and must be used only with VRF (variable refrigerant flow) heat pumps and heat recovery units as shipped.

These units are available for application in VRF systems of 72,000 to 240,000 Btuh nominal cooling and heating capacities. See Fig. 2 for model number nomenclature. Tables 1 and 2 summarize physical and electrical data.

Model 40TCQ fan coil units are designed to meet current low air leak requirements. Because of this, the units need special attention in the condensate pan and drain connection area and when brazing tubing.



**Fig. 1 — Model 40TCQ Fan Coil Unit**



LEGEND  
VRF — Variable Refrigerant Flow



Fig. 2 — Model Number Nomenclature

Table 1 — 40TCQ Physical Data

UNIT 40TCQ	024	030	036	042	048
<b>CAPACITY (Btuh)</b>	24,000	30,000	36,000	42,000	48,000
<b>COIL</b>					
Refrigerant Type	R-410A				
Refrigerant Modulating Device	Pulse Modulating Valve (PMV)				
Fin Spacing (fins/in.)	14.5				
Configuration	A		Slab		
<b>BLOWER AND MOTOR</b>					
Air Discharge	Vertical, Horizontal Left				
<b>Airflow (CFM)</b>					
Low	350	390	470	550	
Medium	505	630	755	880	
High	630	785	945	1100	
Motor (ECM) (hp)	0.5				
Filter Size (L x W x H, in.)	21 x 16 x 1			21 x 20 x 1	

ECM — Electronically Commutated Motor

Table 2 — 40TCQ Electrical Data

UNIT	VOLTAGE (V-Ph-Hz)	MOTOR HP	FLA	MCA	MOCP
40TCQ	208/230-1-60	0.5	4.3	5.4	7.5

LEGEND

FLA — Full Load Amps  
MCA — Minimum Circuit Amps (1.25 x FLA)  
MOCP — Maximum Overcurrent Protection

## INSTALLATION

### Step 1 — Unpack and Check Equipment —

Unpack unit and move to final location. Remove carton, taking care not to damage unit.

Inspect equipment for damage prior to installation. File claim with shipping company if shipment is damaged or incomplete. Locate unit rating plate which contains proper installation information. Check rating plate to be sure unit matches job specifications. See Fig. 3 for unit dimensions.

**Step 2 — Mount Fan Coil —** Unit can stand or lie on floor, or hang from ceiling or wall. Allow space for wiring, piping, and servicing unit.

**IMPORTANT:** When unit is installed over a finished ceiling and/or living area, building codes may require a field-supplied secondary condensate pan to be installed under the entire unit. Some localities may allow the alternative of running a separate, secondary condensate line. Consult local codes for additional restrictions or precautions.

When installing any fan coil over a finished ceiling and/or living area, installation of a secondary drain pan under entire unit to avoid damage to ceiling is recommended.

The 40TCQ fan coils can be installed for up-flow and horizontal-left applications as factory shipped. Unit sizes 024 and 030 are A-coils. Unit sizes 036-048 are slab coils. See Fig. 4.

**UP-FLOW INSTALLATION —** If return air is to be ducted, install duct flush with floor. Set unit on floor over opening. Only use return-air opening provided. All return air must pass through the coil. See Fig. 5.

**HORIZONTAL INSTALLATION —** Be sure installation complies with all applicable building codes, which may require installation of a secondary condensate pan.

**NOTE:** To ensure proper drainage for horizontal installations, unit must be installed so it is within  $\frac{1}{8}$  in. level of the length and width of unit.

1. Arrange support for unit by setting it in or above secondary condensate pan.
2. When suspending unit from ceiling, dimples in casing indicate proper location of screws for mounting metal support straps.

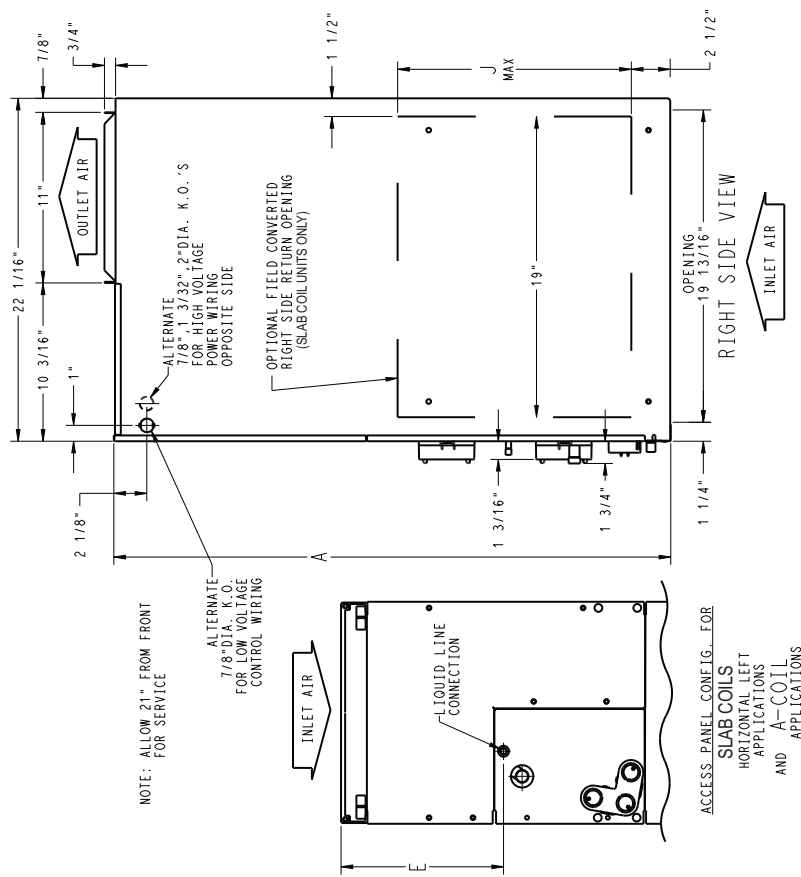
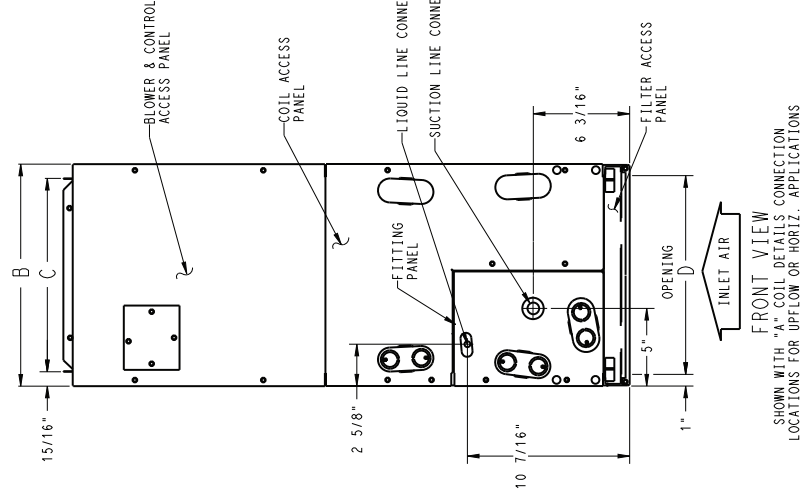
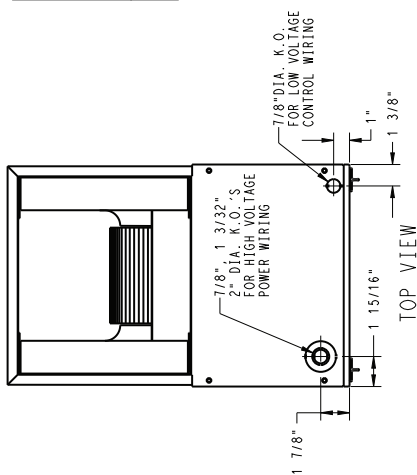
See Fig. 6 and 7 for horizontal-left applications.

UNIT	ELECTRICAL CHARACTERISTICS	A	B	C	D	E	J	COIL CONFIGURATION		SHIPPING WT (LBS)
								SLAB	"A"	
40TC0024	3	42 11/16"	17 5/8"	15 3/4"	15 5/8"	10 3/4"	-	-	X	135
40TC0030	3	42 11/16"	17 5/8"	15 3/4"	15 5/8"	10 3/4"	-	-	X	135
40TC0036	3	53 7/16"	21 1/8"	19 1/4"	19 1/8"	19 3/16"	19"	-	X	150
40TC0042	3	53 7/16"	21 1/8"	19 1/4"	19 1/8"	19 3/16"	19"	-	X	150
40TC0048	3	53 7/16"	21 1/8"	19 1/4"	19 1/8"	19 3/16"	19"	-	X	150

X=YES  
- =NO

**NOTE:**

1. ALL DIMENSIONS ARE IN "INCHES" UNLESS NOTED.



**UNIT CONNECTION SIZES**

SUCTION: 3/4" I.D. SWEAT  
LIQUID: 3/8" I.D. SWEAT  
CONDENSATE: 3/4" FPT

**NOTE: ALLOW 21" FROM FRONT FOR SERVICE**

7/8" DIA. K.O. FOR LOW VOLTAGE CONTROL WIRING

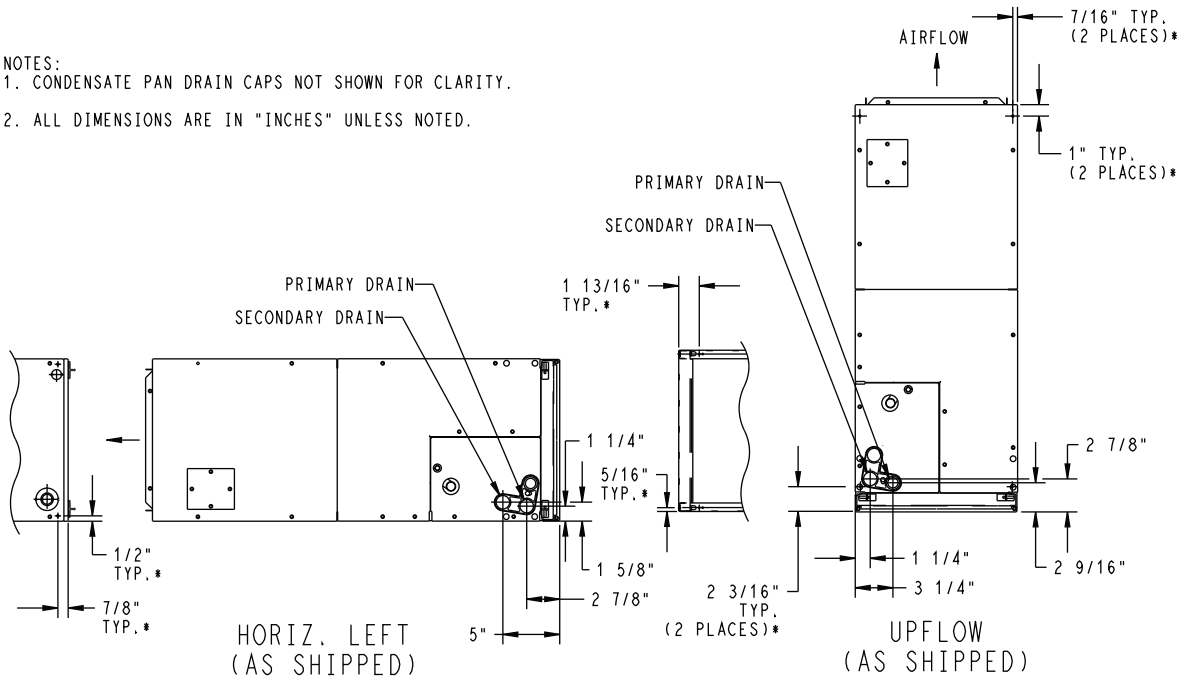
ACCESS PANEL CONEIG. FOR SLAB COILS HORIZONTAL LEFT APPLICATIONS AND A-COIL APPLICATIONS

SLAB COIL DETAILS CONNECTION LOCATIONS SHOWN FOR UPFLOW OR HORIZ. LEFT APPLICATIONS

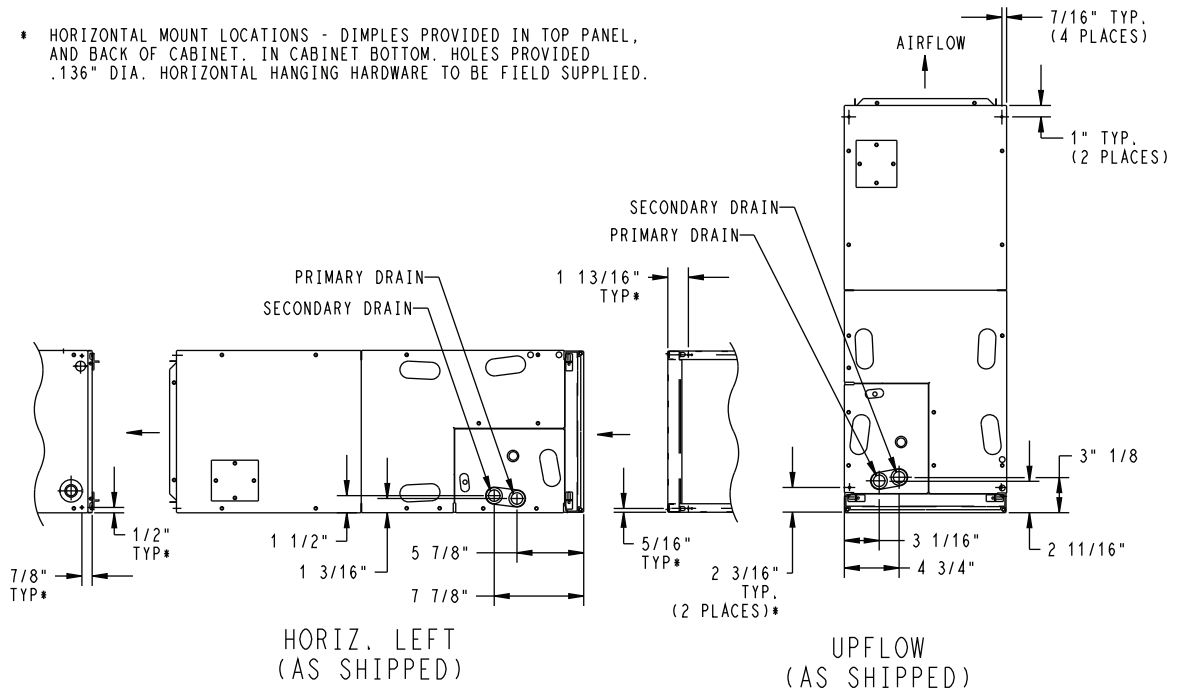
**Fig. 3 — 40TCQ Unit Dimensions**

# SLAB COIL

- NOTES:  
 1. CONDENSATE PAN DRAIN CAPS NOT SHOWN FOR CLARITY.  
 2. ALL DIMENSIONS ARE IN "INCHES" UNLESS NOTED.

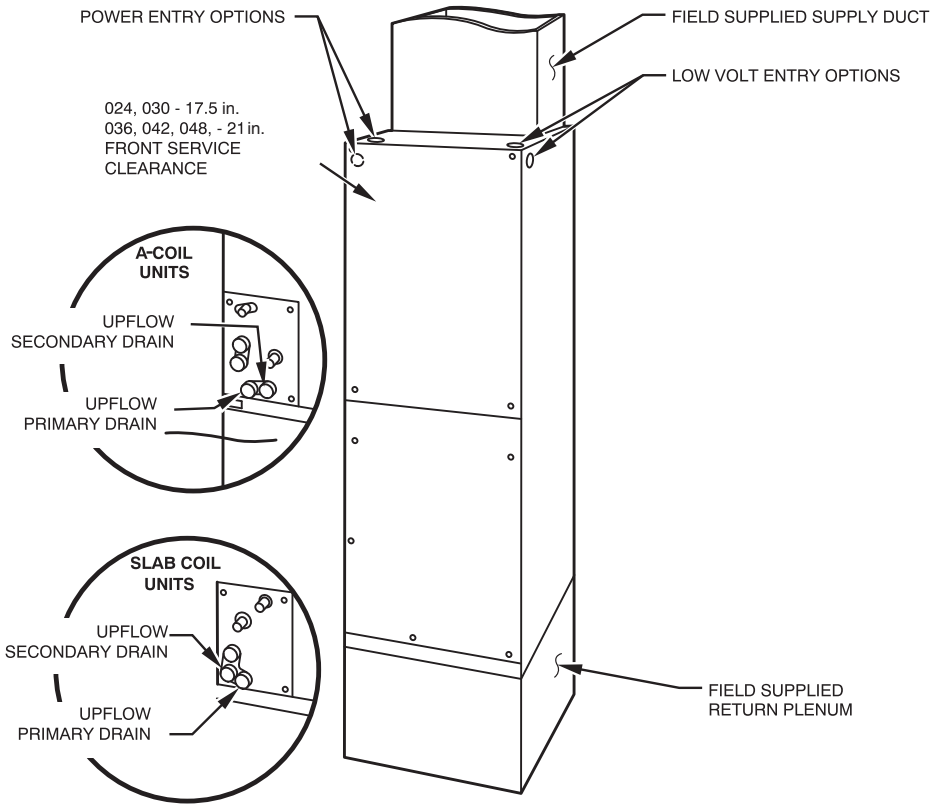


\* HORIZONTAL MOUNT LOCATIONS - DIMPLES PROVIDED IN TOP PANEL, AND BACK OF CABINET. IN CABINET BOTTOM. HOLES PROVIDED .136" DIA. HORIZONTAL HANGING HARDWARE TO BE FIELD SUPPLIED.

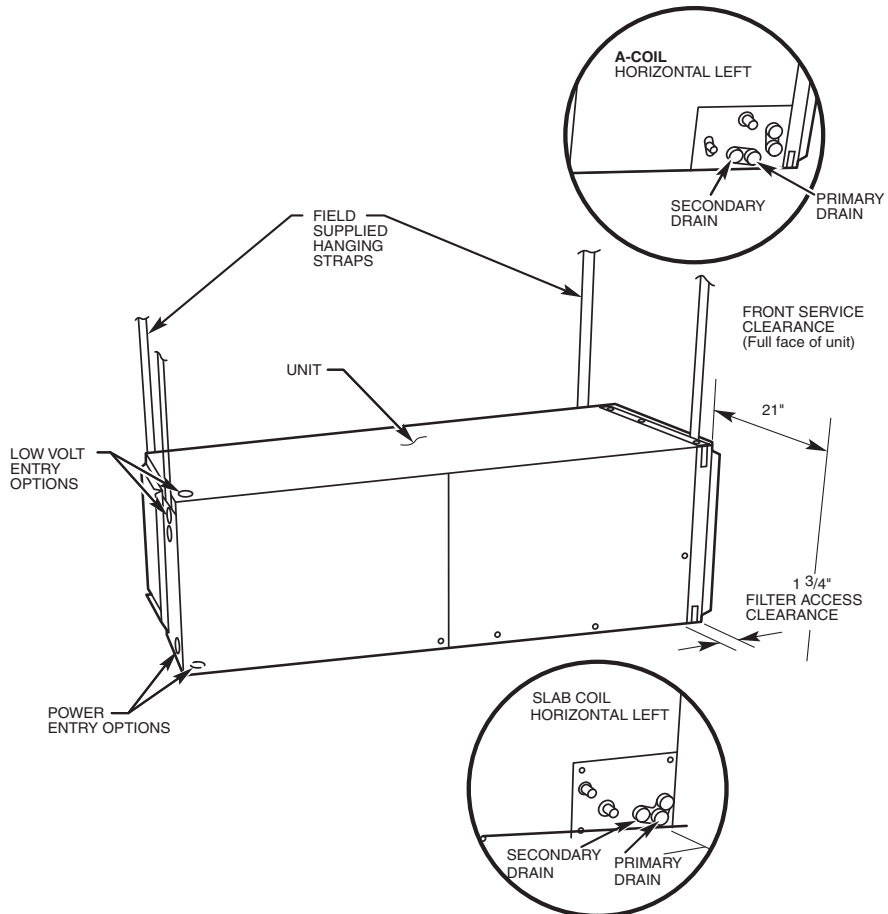


# A-COIL

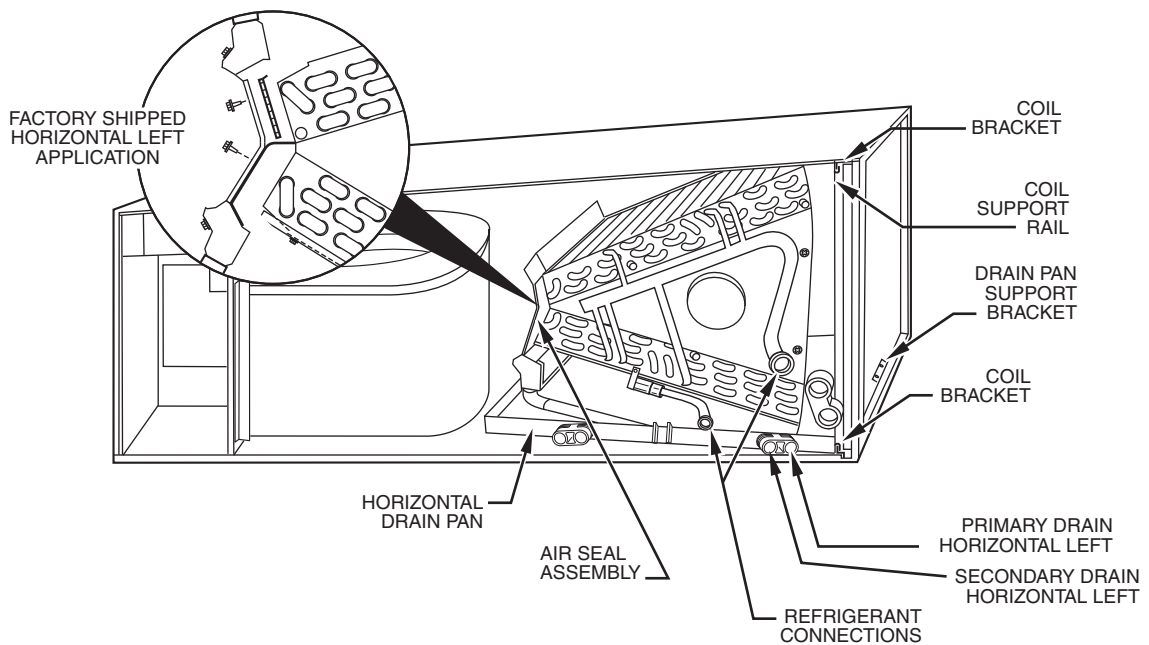
**Fig. 4 — Coil Configuration and Layout**



**Fig. 5 — Up-Flow Application**



**Fig. 6 — Horizontal-Left Application (Factory Ready)**



**Fig. 7 — A-Coil in Horizontal-Left Application (Factory Ready)**

**Step 3 — Install Air Ducts** — Connect supply-air duct over outside of  $\frac{3}{4}$ -in. flange provided on supply-air opening. Secure duct to flange with proper fasteners for type of duct used, and seal duct-to-unit joint.

Duct connection flanges are provided on unit air discharge connection.

Use flexible connectors between ductwork and unit to prevent transmission of vibration. Ductwork passing through unconditioned space must be insulated and covered with vapor barrier.

**DUCTWORK ACOUSTICAL TREATMENT** — Metal duct systems that do not have a 90 degree elbow and 10 ft of main duct to first branch takeoff may require internal acoustical insulation lining.

As an alternative, fibrous ductwork may be used if constructed and installed in accordance with the latest edition of SMACNA (Sheet Metal and Air Conditioning Contractors' National Association) construction standard on fibrous ducts. Both acoustical lining and fibrous ductwork shall comply with National Fire Protection Association Standards 90A or B as tested by UL (Underwriters Laboratories) Standard 181 for Class 1 air ducts.

**Step 4 — Complete Electrical Connections**

<b>⚠ WARNING</b>
Do not perform service and maintenance to incoming wiring until the main disconnect switch (remote to the unit) is turned off. Failure to following this warning could result in personal injury or death.

**LINE-VOLTAGE CONNECTIONS**

1. Connect 208/230-v power leads from field disconnect to L1 and L2 connections on high voltage terminal block.
2. Connect ground wire to unit ground lug.

Check all factory wiring per unit wiring diagram and inspect factory wiring connections to be sure none were loosened in transit or installation.

<b>⚠ WARNING</b>
Electrical shock can cause personal injury and death. Shut off all power to this equipment during installation. There may be more than one disconnect switch. Tag all disconnect locations to alert others not to restore power until work is completed.

<b>⚠ CAUTION</b>
If a disconnect switch is to be mounted on unit, select a location where drill or fastener will not contact electrical or refrigerant components. Failure to follow this caution may result in product or property damage.

**NOTE:** Before proceeding with electrical connections, make certain that supply voltage, frequency, and phase are as specified on unit rating plate.

Be sure that electrical service provided by the utility is sufficient to handle the additional load imposed by this equipment. See unit wiring label for proper field high-voltage and low-voltage wiring. Make all electrical connections in accordance with NEC (National Electrical Code) and any local codes or ordinances that may apply. Use copper wire only. The unit must have a separate branch electric circuit with a field-supplied disconnect switch located within sight from, and readily accessible from the unit.

**LOW-VOLTAGE CONNECTIONS** — Refer to unit wiring instructions for recommended wiring procedures. Use minimum 18 AWG (American Wire Gage) 2-conductor, shielded cable for low-voltage connections between remote control and indoor unit, between indoor units, and between indoor unit and outdoor unit.

Connect remote control leads to terminals A and B on low voltage terminal block. Connect outdoor unit and additional indoor units to terminals U1 and U2 on the low voltage terminal block. Neither of these connections is polarity sensitive. The shield of all control wiring should be connected to the mounting screw for the low voltage terminal block.

#### GROUND CONNECTIONS

#### ⚠ WARNING

Failure to follow this warning could result in personal injury or death.

According to NEC, NFPA (National Fire Protection Association) 70, and local codes, the cabinet must have an uninterrupted or unbroken ground to minimize personal injury if an electrical fault should occur. The ground may consist of electrical wire or metal conduit when installed in accordance with existing electrical codes. If conduit connection uses reducing washers, a separate ground wire must be used.

Use UL listed conduit and conduit connector to connect supply wire(s) to unit and obtain proper grounding. Grounding may also be accomplished by using grounding lug provided in control box.

#### Step 5 — Connect and Evacuate Refrigerant Tubing

Use field-supplied tubing of refrigerant grade. Insulate both suction and liquid line for correct installation. Do not use damaged, dirty, or contaminated tubing because it may plug refrigerant flow control device.

Always evacuate coil and field-supplied tubing to 500 microns before opening outdoor unit service valves.

#### ⚠ CAUTION

A brazing shield **MUST** be used when tubing sets are being brazed to the unit connections to prevent damage to the unit surface and condensate pan fitting caps. Failure to follow this caution may result in product or property damage.

#### ⚠ CAUTION

Wrap a wet cloth around rear of fitting to prevent damage to EXV (electronic expansion valve) and factory-made joints. Failure to follow this caution may result in product or property damage.

Units have sweat suction and liquid tube connections. Make suction tube connection first.

1. Cut tubing to correct length.
2. Insert tube into sweat connection on unit until it bottoms.
3. Braze connection using silver bearing or non-silver bearing brazing materials. Do not use solder (materials which melt below 800 F).
4. Evacuate coil and tubing system to 500 microns using deep vacuum method. Consult local code requirements.

#### Step 6 — Install Condensate Drain

To connect drains, the cap openings must be removed

1. Use a knife to start the opening near the tab and using pliers, pull the tab to remove the disk.
2. Clean the edge of the opening if necessary and install the condensate line.
3. Caulk around the lines where they exit the fitting to retain the low leak rating of the unit.

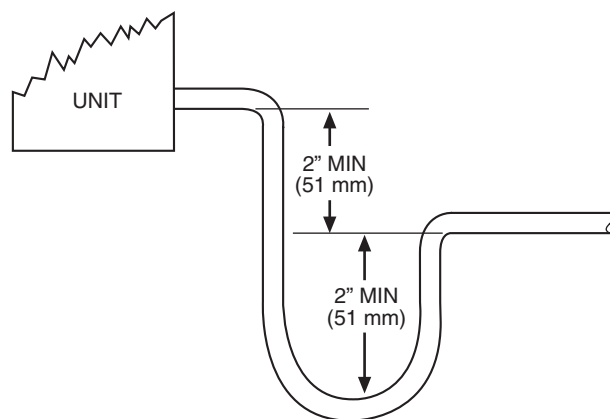
Units are equipped with primary and secondary  $\frac{3}{4}$ -in. FPT drain connections. For proper condensate line installation see Fig. 8 and 9.

To prevent property damage and achieve optimum drainage performance, BOTH primary and secondary drain lines should be installed and include properly sized condensate traps. (See Fig. 8 and 9.) Factory-approved condensate traps are available. Be sure to install plastic push-in plugs in unused condensate drain fittings. It is recommended that PVC fittings be used on the plastic condensate pan. Do not over-tighten. Finger-tighten plus  $1\frac{1}{2}$  turns. Use pipe dope.

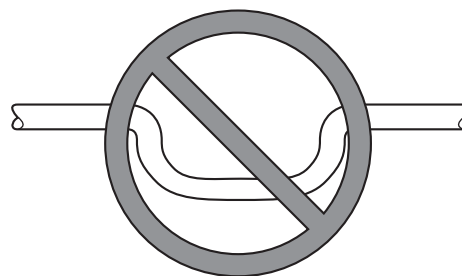
#### ⚠ CAUTION

Shallow running traps are inadequate and **DO NOT** allow proper condensate drainage. Use the recommended depths shown in Fig. 8. Failure to follow this caution may result in product or property damage.

NOTE: When connecting condensate drain lines avoid blocking filter access panel. Prime both primary and secondary condensate traps after connecting to drain pan.



RECOMMENDED CONDENSATE TRAP



DO NOT USE SHALLOW RUNNING TRAPS!

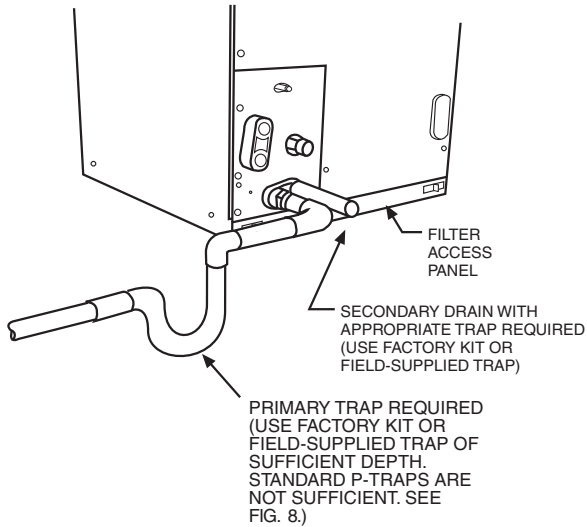
Fig. 8 — Recommended Condensate Trap

NOTE: If unit is located in or above a living space where damage may result from condensate overflow, a field-supplied external condensate pan should be installed underneath the entire unit, and a secondary condensate line (with appropriate trap) should be run from the unit into the pan. Any condensate in this external condensate pan should be drained to a noticeable place. As an alternative to using an external condensate pan, some localities may allow the use of a separate  $\frac{3}{4}$ -in. condensate line (with appropriate trap) to a place where the condensate will be noticeable. The owner of the structure must be informed that when condensate flows from the secondary drain or external condensate pan, the unit requires servicing, or water damage will occur.



Install traps in the condensate line as close as possible to the coil. (See Fig. 9.) Make sure that the outlet of each trap is below its connection to the condensate pan to prevent condensate from overflowing the drain pan. Prime all traps, test for leaks, and insulate traps if located above a living area.

Condensate drain lines should be pitched downward at a minimum of 1 in. for every 10 ft of length. Consult local codes for additional restrictions or precautions.



**Fig. 9 — Condensate Trap Installation**

## START-UP

### ⚠ CAUTION

Never operate unit without a filter. Damage to blower motor or coil may result. A field-supplied filter must be installed in the return duct system.

Refer to outdoor unit Installation Instructions for system start-up instructions and refrigerant charging method details. Table 3 lists the cfm range for 40TCQ units.

**Table 3 — CFM Range for 40TCQ Units**

40TCQ UNIT SIZE	FAN ONLY (CFM)		
	LOW	MEDIUM	HIGH
024	350	505	630
030	390	630	785
036	470	755	945
042,048	550	880	1100





