

50TCQD
Single Package Rooftop
Heat Pump
with Puron® (R-410A) Refrigerant
15 and 20 Nominal Tons – (Sizes 17 and 24)



Installation Instructions

NOTE: Read the entire instruction manual before starting the installation

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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 personal injury or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloths for brazing operations and have a fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local building codes and appropriate national electrical codes (in USA, ANSI/NFPA70, National Electrical Code (NEC); in Canada, CSA C22.1) for special requirements.

It is important to recognize safety information. This is the safety-alert symbol . When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, CAUTION, and NOTE. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices, which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could cause personal injury or death.

Before performing service or maintenance operations on unit, always turn off main power switch to unit and install lockout tag. Unit may have more than one power switch.

WARNING

UNIT OPERATION AND SAFETY HAZARD

Failure to follow this warning could cause personal injury, death and/or equipment damage.

Puron® (R-410A) refrigerant systems operate at higher pressures than standard R-22 systems. Do not use R-22 service equipment or components on Puron refrigerant equipment.

WARNING

PERSONAL INJURY AND ENVIRONMENTAL HAZARD

Failure to follow this warning could cause personal injury or death.

Relieve pressure and recover all refrigerant before system repair or final unit disposal.

Wear safety glasses and gloves when handling refrigerants. Keep torches and other ignition sources away from refrigerants and oils.

CAUTION

CUT HAZARD

Failure to follow this caution may result in personal injury.

Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing, safety glasses and gloves when handling parts and servicing air conditioning equipment.

Rated Indoor Airflow (cfm)

The table to the right lists the rated indoor airflow used for the AHRI efficiency rating for the units covered in this document.

Model Number	Full Load Airflow (cfm)	
	Vertical Airflow Units	Horizontal Airflow Units
50TCQD17	5250	5250
50TCQD24	6500	6000

Position:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Example:	5	0	T	C	Q	D	2	4	A	1	A	6	-	0	A	0	A	0

Unit Heat Type

50 - Electric Heat
Packaged Rooftop

Model Series - WeatherMaker™

TC - Standard Efficiency

Heat Options

Q = Heat Pump

Refrig. Systems Options

D = Two stage cooling models

Cooling Tons

17 - 15 ton
24 - 20 ton

Sensor Options

A = None
B = RA Smoke Detector
C = SA Smoke Detector
D = RA + SA Smoke Detector
E = CO₂
F = RA Smoke Detector and CO₂
G = SA Smoke Detector and CO₂
H = RA + SA Smoke Detector and CO₂

Indoor Fan Options

1 = Standard Static Option, Vertical
2 = Medium Static Option, Vertical
3 = High Static Option, Vertical
B = Medium Static, High Efficiency Motor, Vertical
C = High Static, High Efficiency Motor, Vertical

5 = Standard Static Option, Horizontal*
6 = Medium Static Option, Horizontal
7 = High Static Option, Horizontal
F = Medium Static, High Efficiency Motor, Horizontal
G = High Static, High Efficiency Motor, Horizontal

Coil Options (Outdoor - Indoor - Hail Guard)

A = Al/Cu - Al/Cu
B = Precoat Al/Cu - Al/Cu
C = E-coat Al/Cu - Al/Cu
D = E-coat Al/Cu - E-coat Al/Cu
E = Cu/Cu - Al/Cu
F = Cu/Cu - Cu/Cu
M = Al/Cu - Al/Cu — Louvered Hail Guard
N = Precoat Al/Cu - Al/Cu — Louvered Hail Guard
P = E-coat Al/Cu - Al/Cu — Louvered Hail Guard
Q = E-coat Al/Cu - E-coat Al/Cu — Louvered Hail Guard
R = Cu/Cu - Al/Cu — Louvered Hail Guard
S = Cu/Cu - Cu/Cu — Louvered Hail Guard

Packing & Seismic Compliance

0 = Standard
3 = California seismic compliant

Electrical Options

A = None
C = Non-Fused Disconnect
G = 2-Speed Indoor Fan (VFD) Controller
J = 2-Speed Fan Controller (VFD) and Non-Fused Disconnect

Service Options

0 = None
1 = Unpowered Convenience Outlet
2 = Powered Convenience Outlet
3 = Hinged Panels
4 = Hinged Panels and Unpowered Convenience Outlet
5 = Hinged Panels and Powered Convenience Outlet

Intake / Exhaust Options

A = None
B = Temperature Economizer w/ Barometric Relief
F = Enthalpy Economizer w/ Barometric Relief
K = 2-Position Damper
U = Temperature Ultra Low Leak Economizer w/ Barometric Relief
V = Temperature Ultra Low Leak Economizer w/ PE (cent) - Vertical Air Only
W = Enthalpy Ultra Low Leak Economizer w/ Barometric Relief
X = Enthalpy Ultra Low Leak Economizer w/ PE (cent) - Vertical Air Only

Base Unit Controls

0 = Base Electromechanical Controls
1 = PremierLink Controller
2 = RTU Open Multi-Protocol Controller
6 = Electromechanical with 2-Speed Fan and W7220 Economizer Controller

Design Revision

- = Factory Assigned

Voltage

1 = 575/3/60
5 = 208-230/3/60
6 = 460/3/60

* Not available on horizontal 50TCQ 24 units.

50TCQD

Fig. 1 - 50TCQD 17-24 Model Number Nomenclature (Example)

C14048

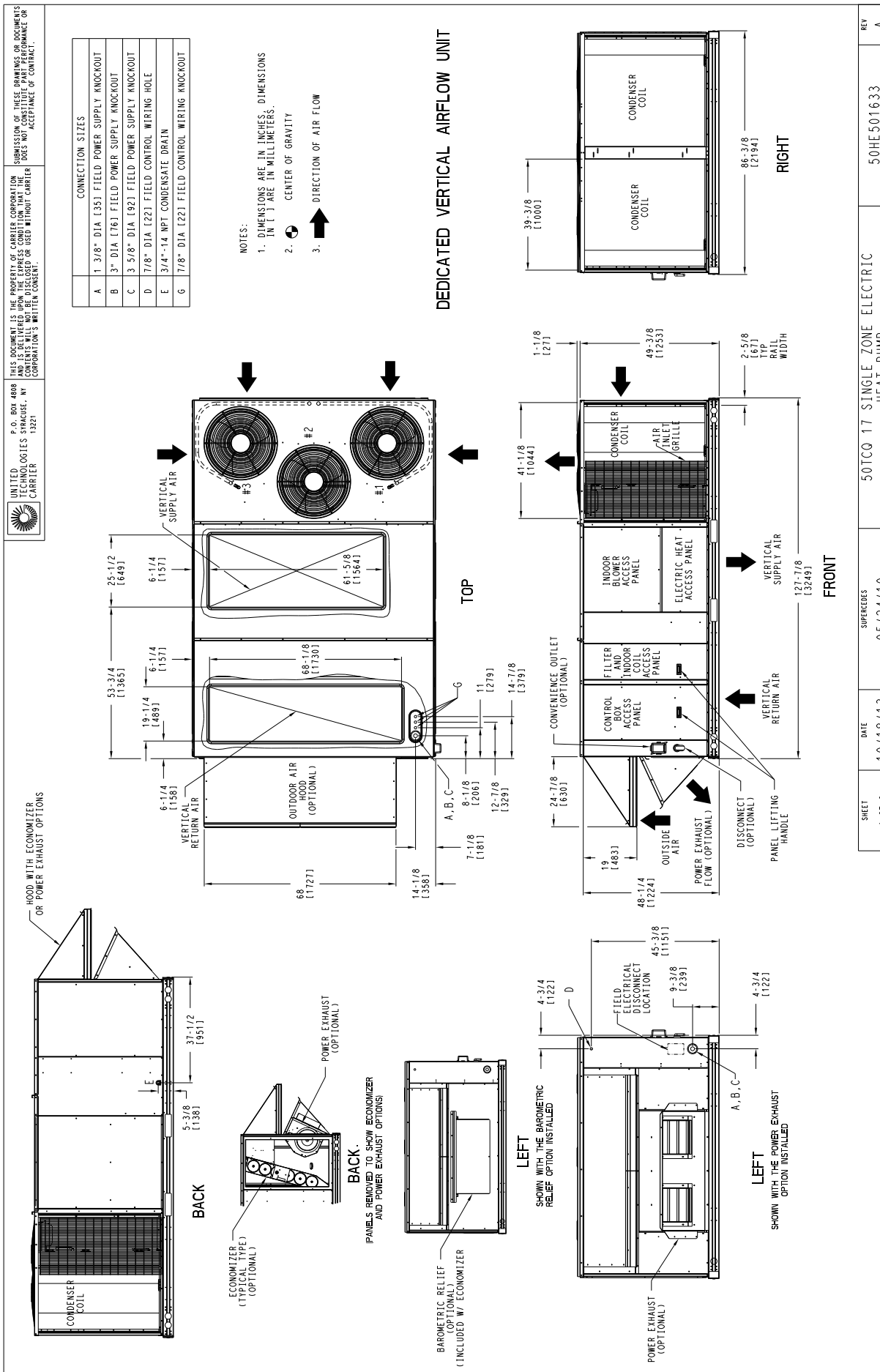


Fig. 2 - Unit Dimensional Drawing – Size 17 Units, Sheet 1 of 3

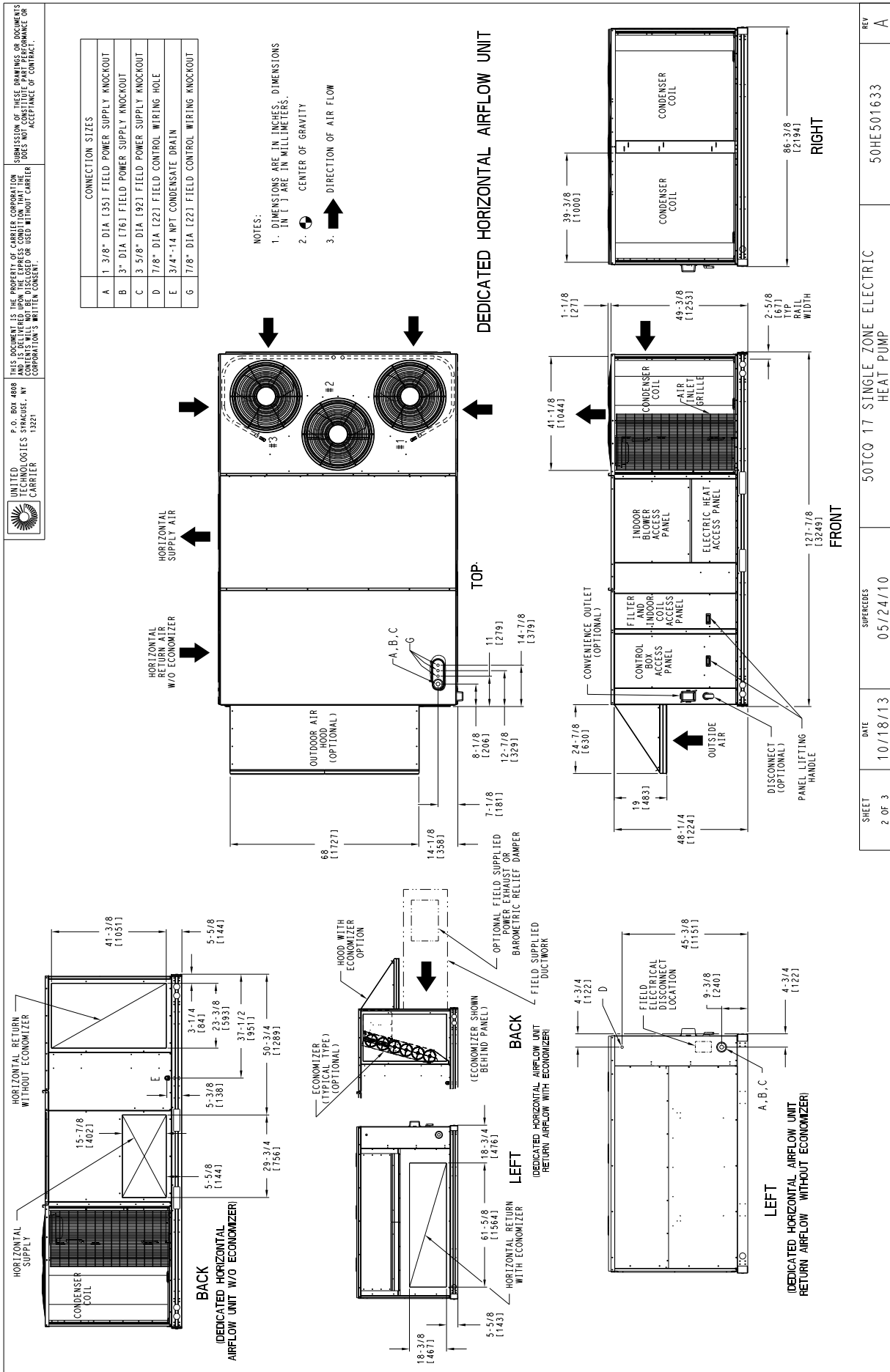


Fig. 2 - Unit Dimensional Drawing – Size 17 Units, Sheet 2 of 3

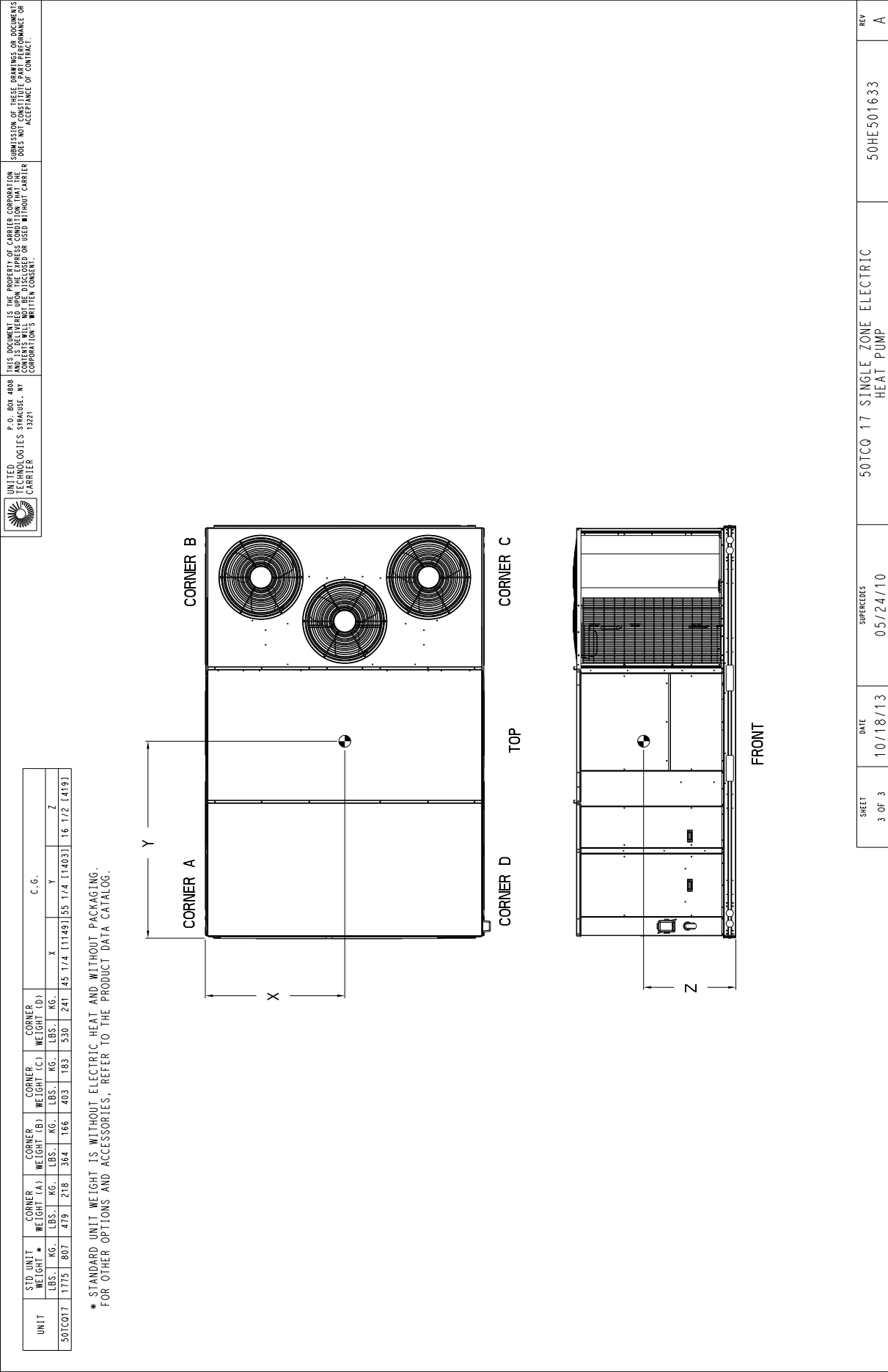
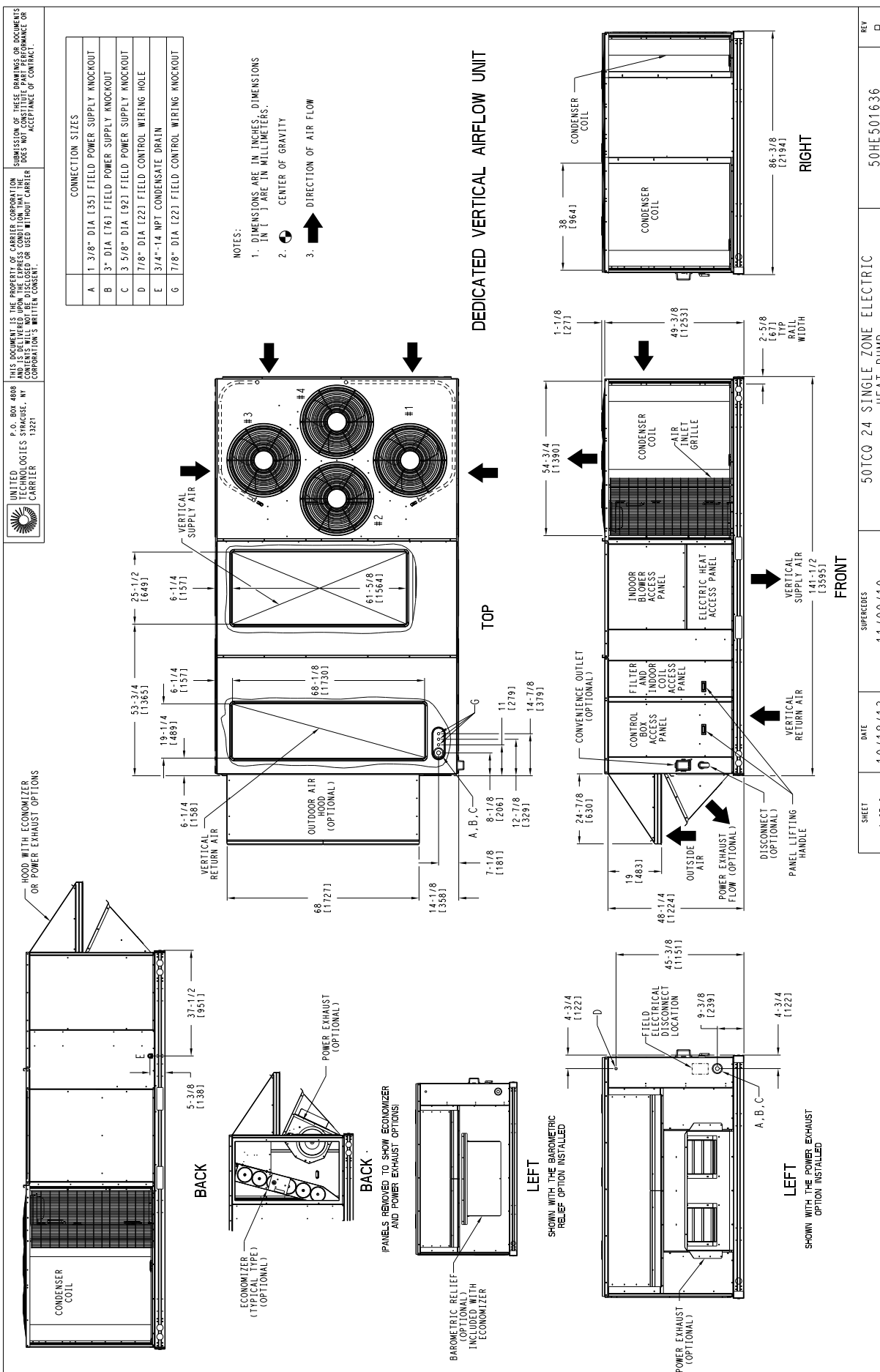


Fig. 2 - Unit Dimensional Drawing – Size 17 Units, Sheet 3 of 3



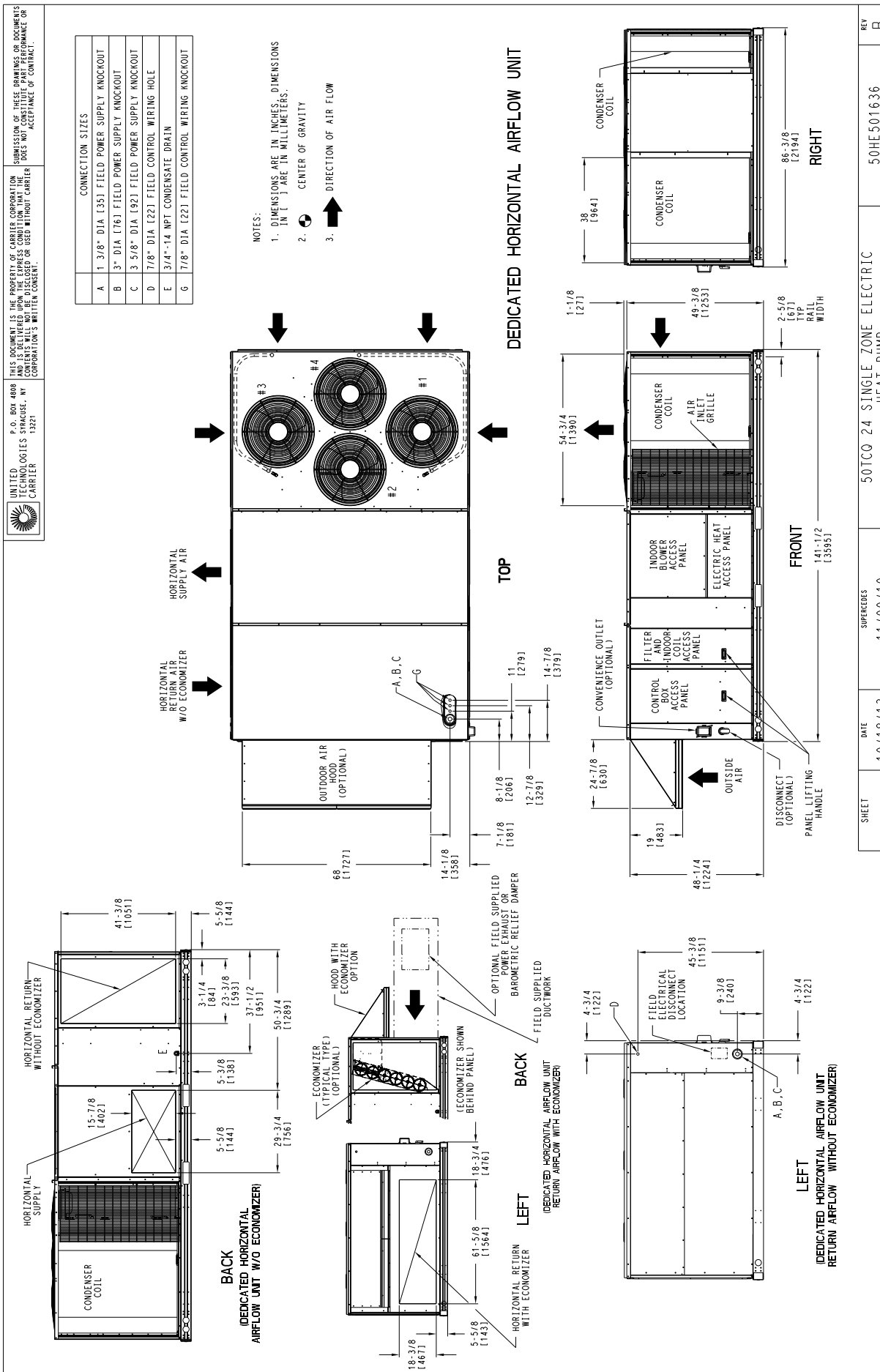


Fig. 3 - Unit Dimensional Drawing – Size 24 Units, Sheet 2 of 3

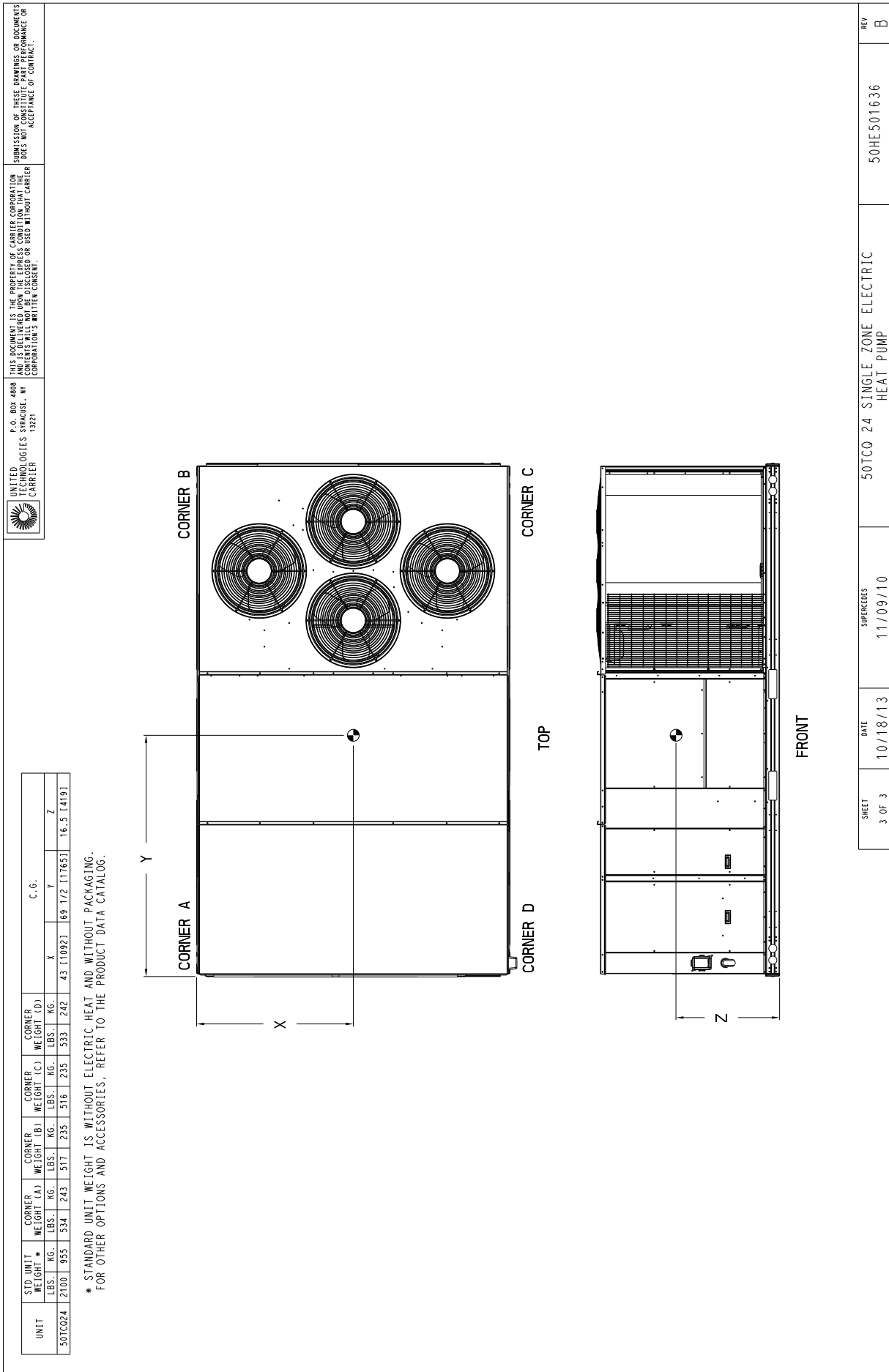


Fig. 3 - Unit Dimensional Drawing – Size 24 Units, Sheet 3 of 3

INSTALLATION

Jobsite Survey

Complete the following checks before installation.

1. Consult local building codes and the NEC (National Electrical Code) ANSI/NFPA 70 for special installation requirements.
2. Determine unit location (from project plans) or select unit location.
3. Check for possible overhead obstructions which may interfere with unit lifting or rigging.

Step 1 — Plan for Unit Location

Select a location for the unit and its support system (curb or other) that provides for the minimum clearances required for safety. This includes the clearance to combustible surfaces, unit performance and service access below, around and above unit as specified in unit drawings. See Fig. 4.

NOTE: Consider also the effect of adjacent units.

Unit may be installed directly on wood flooring or on Class A, B, or C roof-covering material when roof curb is used.

Do not install unit in an indoor location. Do not locate air inlets near exhaust vents or other sources of contaminated air.

Although unit is weatherproof, avoid locations that permit water from higher level runoff and overhangs to fall onto the unit.

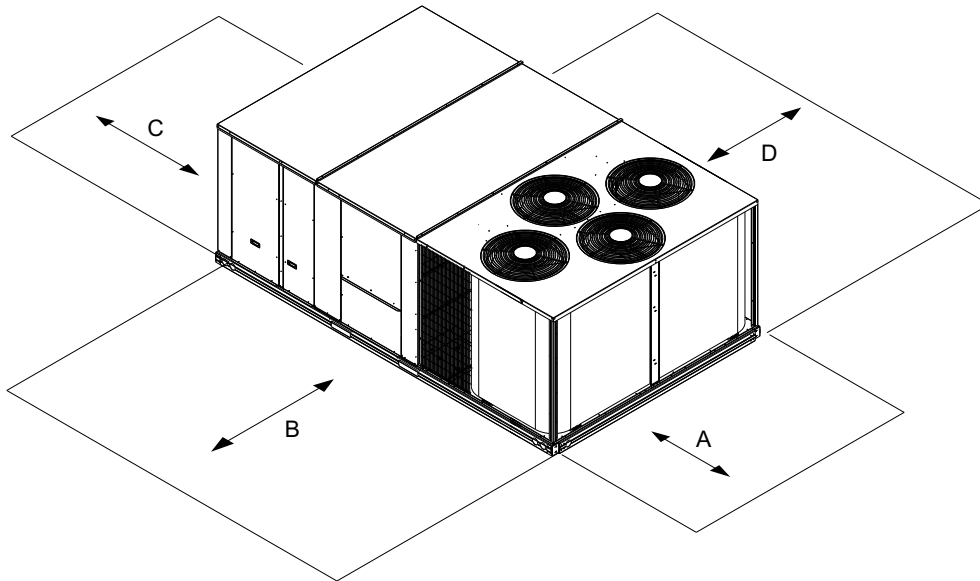
Select a unit mounting system that provides adequate height to allow installation of condensate trap per requirements. Refer to Step 9 — Install External Condensate Trap and Line – for required trap dimensions.

Roof mount —

Check building codes for weight distribution requirements. Unit operating weight is shown in Table 1.

Table 1 – Operating Weights

50TCQD	UNITS LB (KG)	
	17	24
Base Unit	1775 (807)	2100 (955)
Economizer	246 (112)	246 (112)
Powered Outlet	35 (16)	35 (16)
Curb		
14-in/356 mm	240 (109)	255 (116)
24-in/610 mm	340 (154)	355 (161)



LOCATION	DIMENSION	CONDITION
A	36-in (914 mm)	• Recommended clearance for air flow and service
B	42-in (1067 mm)	• Recommended clearance for air flow and service
C	18-in (457 mm)	• No Convenience Outlet • No Economizer • No field installed disconnect on economizer hood side (Factory-installed disconnect installed).
	36-in (914 mm)	• Convenience Outlet installed. • Vertical surface behind servicer is electrically non-conductive (e.g.: wood, fiberglass).
	42-in (1067 mm)	• Convenience Outlet installed. • Vertical surface behind servicer is electrically conductive (e.g.: metal, masonry).
	96-in (2438 mm)	• Economizer and/or Power Exhaust installed. • Check for sources of flue products with 10 feet (3 meters) of economizer fresh air intake.
D	42-in (1067 mm)	• Recommended clearance for service.

C12392

NOTE: Unit not designed to have overhead obstruction. Contact Application Engineering for guidance on any application planning overhead obstruction or for vertical clearances.

Fig. 4 - Service Clearance Dimensional Drawing

Step 2 — Plan for Sequence of Unit Installation

The support method used for this unit will dictate different sequences for the steps of unit installation. For example, on curb-mounted units, some accessories must be installed on the unit before the unit is placed on the curb. Review the following for recommended sequences for installation steps.

Curb-mounted installation —

- Install curb
- Install field-fabricated ductwork inside curb
- Install thru-base service connection fittings (affects curb and unit)
- Rig and place unit
- Remove top skid
- Install condensate line trap and piping
- Make electrical connections
- Install other accessories

Pad-mounted installation —

- Prepare pad and unit supports
- Rig and place unit
- Remove duct covers and top skid
- Install field-fabricated ductwork at unit duct openings
- Install condensate line trap and piping
- Make electrical connections
- Install other accessories

Frame-mounted installation —

Frame-mounted applications generally follow the sequence for a curb installation. Adapt as required to suit specific installation plan.

Step 3 — Inspect unit

Inspect unit for transportation damage. File any claim with transportation agency.

Confirm before installation of unit that voltage, amperage and circuit protection requirements listed on unit data plate agree with power supply provided.

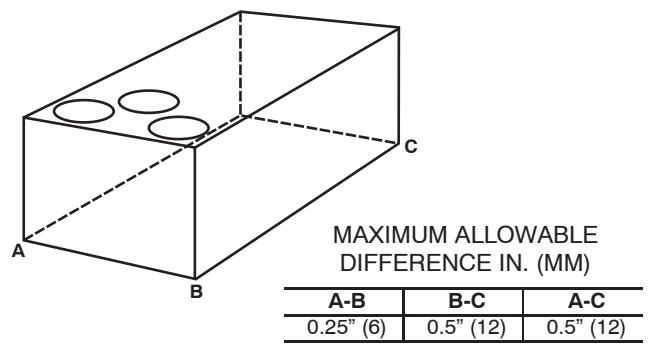
Step 4 — Provide Unit Support

Roof Curb Mount —

Accessory roof curb details and dimensions are shown in Fig. 7 (size 17) and Fig. 8 (size 24). Assemble and install accessory roof curb in accordance with instructions shipped with the curb.

NOTE: The gasketing of the unit to the roof curb is critical for a watertight seal. Install gasket supplied with the roof curb as shown in Fig. 7 and Fig. 8. Improperly applied gasket can also result in air leaks and poor unit performance.

Curb should be level. This is necessary for unit drain to function properly. Unit leveling tolerances are shown in Fig. 5. Refer to Accessory Roof Curb Installation Instructions for additional information as required.

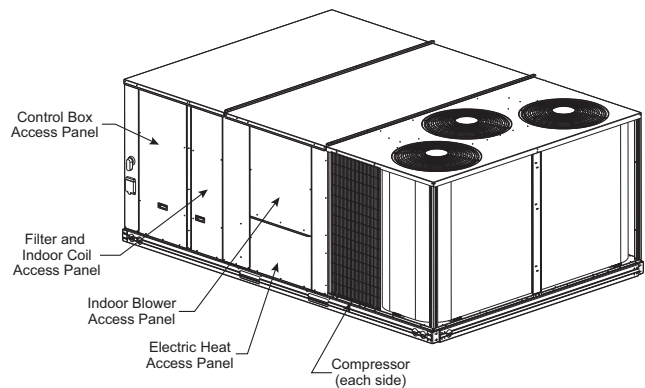


C09132

Fig. 5 - Unit Leveling Tolerances

Install insulation, cant strips, roofing felt, and counter flashing as shown. *Ductwork must be attached to curb and not to the unit. Thru-the-base power connection must be installed before the unit is set on the roof curb.*

If electric and control wiring is to be routed through the basepan remove knockouts in basepan located in control box area, see Fig. 6 for location. Attach the service connections to the basepans.



C09118

Fig. 6 - Typical Access Panel and Compressor Locations

Slab Mount (Horizontal Units Only) —

Provide a level concrete slab that extends a minimum of 6-in. (150 mm) beyond unit cabinet. Install a gravel apron in front of condenser coil air inlet to prevent grass and foliage from obstructing airflow.

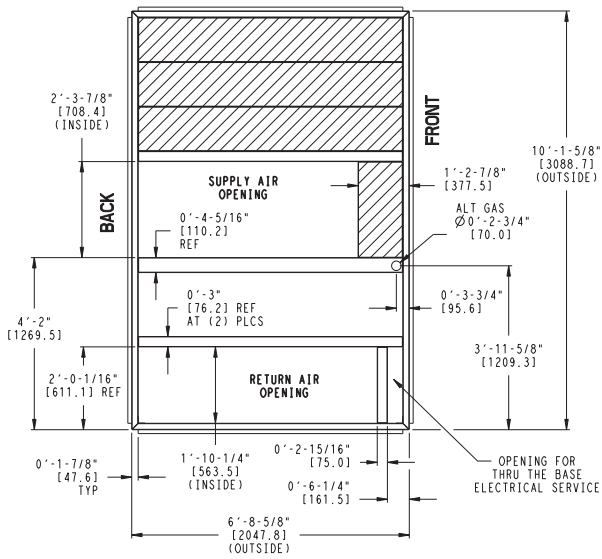
NOTE: Horizontal units may be installed on a roof curb if required.

Alternate Unit Support (In Lieu of Curb or Slab Mount) —

A non-combustible sleeper rail can be used in the unit curb support area. If sleeper rails cannot be used, support the long sides of the unit with a minimum of 4 equally spaced 4-in. x 4-in. (102 mm x 102 mm) pads on each side. Locate pads so that they support the rails. Make sure to avoid the fork openings.

UNIT SIZE	"A"	ROOF CURB ACCESSORY
17	1'-2" [356.0] 2'-0" [610.0]	CRRFCURB045A00 CRRFCURB046A00

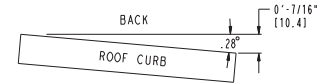
50TCQD



NOTES:

- 1 ROOF CURB ACCESSORY IS SHIPPED UNASSEMBLED.
- 2 DIMENSIONS IN [] ARE IN MILLIMETERS.
- 3 ROOF CURB GALVANIZED STEEL.
- 4 ATTACH DUCTWORK TO CURB (FLANGES ON DUCT REST ON CURB)
- 5 SERVICE CLEARANCE 4 ft ON EACH SIDE

➔ DIRECTION OF AIR FLOW



MAX CURB LEVELING TOLERANCES

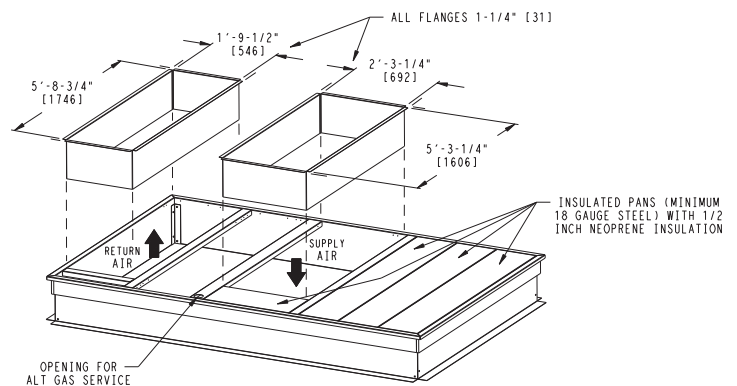
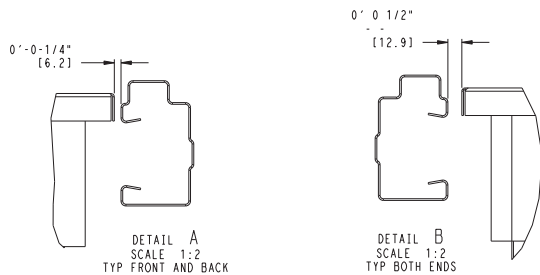
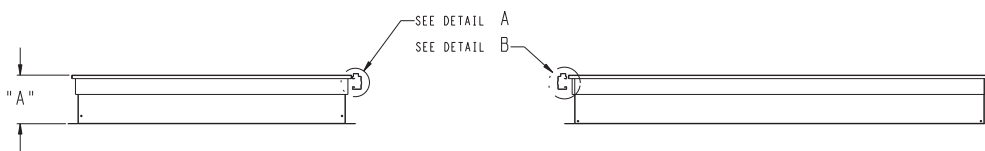
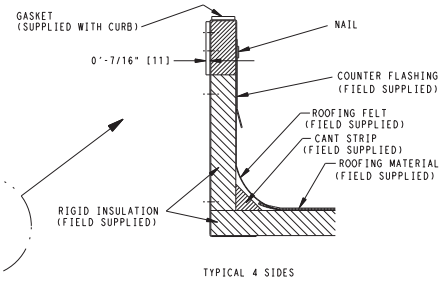
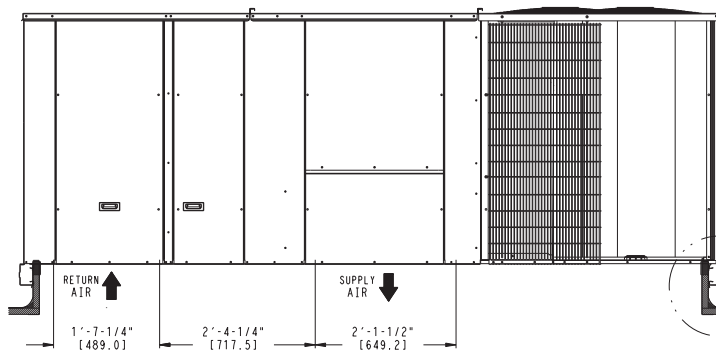
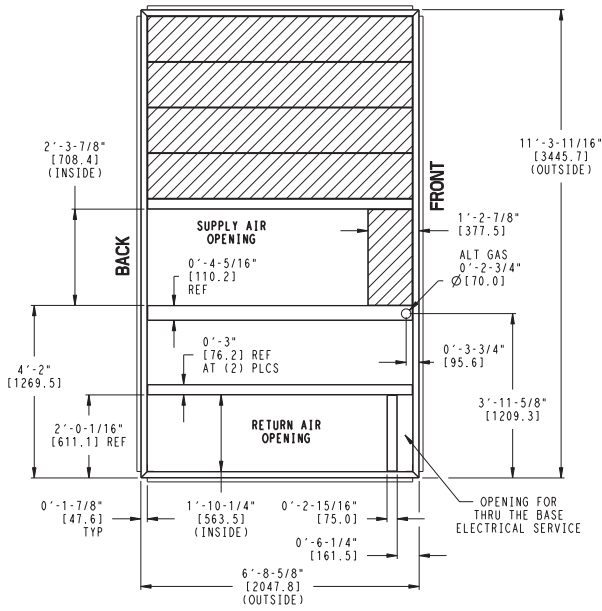


Fig. 7 - Roof Curb Details - Size 17 Units

C10139

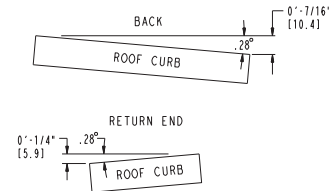
UNIT SIZE	"A"	ROOF CURB ACCESSORY
24	1'-2" [356.0] 2'-0" [610.0]	CRRFCURB047A00 CRRFCURB048A00



NOTES:

- 1 ROOF CURB ACCESSORY IS SHIPPED UNASSEMBLED.
- 2 DIMENSIONS IN [] ARE IN MILLIMETERS.
- 3 ROOF CURB GALVANIZED STEEL.
- 4 ATTACH DUCTWORK TO CURB (FLANGES ON DUCT REST ON CURB)
- 5 SERVICE CLEARANCE 4 ft ON EACH SIDE

➔ DIRECTION OF AIR FLOW



MAX CURB LEVELING TOLERANCES

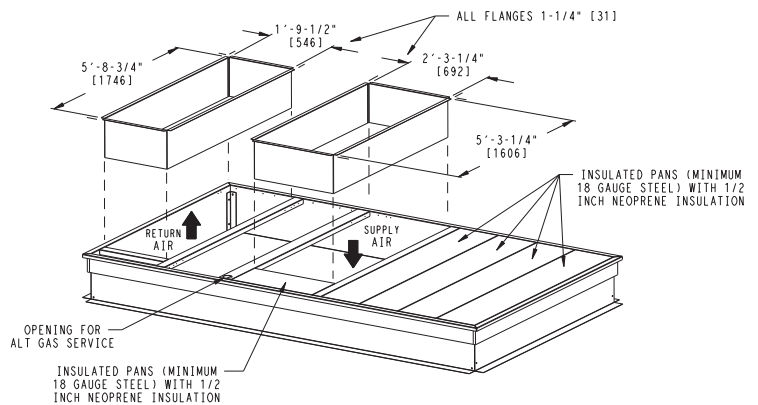
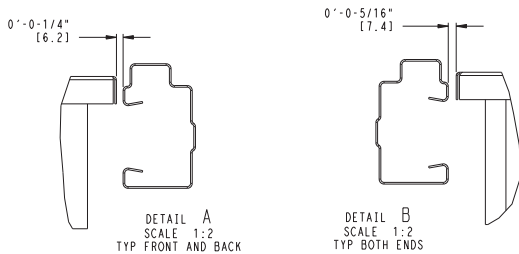
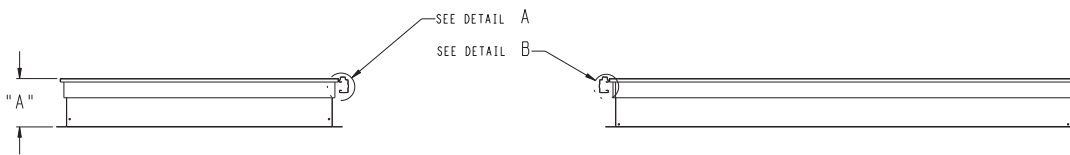
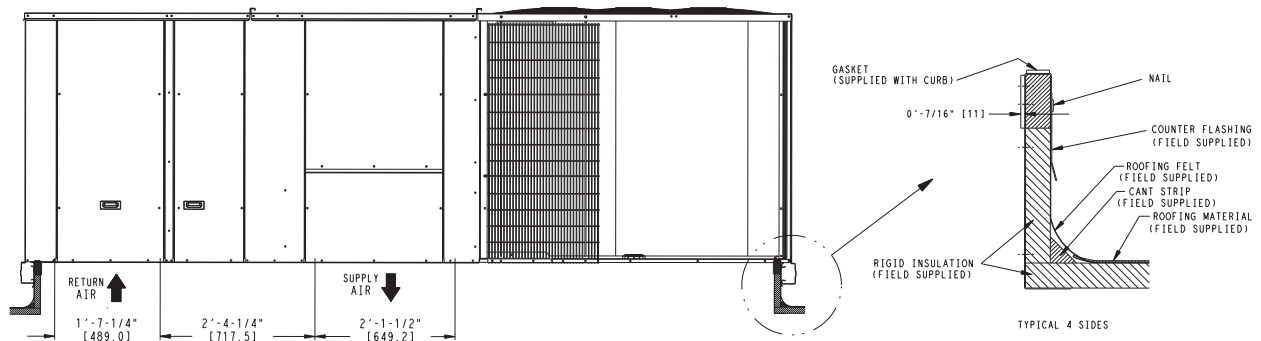


Fig. 8 - Roof Curb Details – Size 24 Units

C10140

Step 5 — Field Fabricate Ductwork

Cabinet return-air static pressure (a negative condition) shall not exceed 0.5 in. wg (87 Pa) with economizer or without economizer.

For vertical ducted applications, secure all ducts to roof curb and building structure. *Do not connect ductwork to unit.*

Insulate and weatherproof all external ductwork, joints, and roof openings with counter flashing and mastic in accordance with applicable codes.

Ducts passing through unconditioned spaces must be insulated and covered with a vapor barrier.

If a plenum return is used on a vertical unit, the return should be ducted through the roof deck to comply with applicable fire codes.

For units with accessory electric heaters, minimum clearance is not required around ductwork. One inch (25 mm) clearance to combustible materials must be maintained for the first 48 inches (1220 mm) of ductwork exiting the unit. This applies to horizontal and vertical applications.

Outlet grilles must not lie directly below unit discharge.

NOTE: A 90-degree elbow must be provided in the ductwork to comply with UL (Underwriters Laboratories) code for use with electric heat.

⚠ WARNING

PERSONAL INJURY HAZARD

Failure to follow this warning could cause personal injury.

For vertical supply and return units, tools or parts could drop into ductwork and cause an injury. Install a 90-degree turn in the return ductwork between the unit and the conditioned space. If a 90-degree elbow cannot be installed, then a grille of sufficient strength and density should be installed to prevent objects from falling into the conditioned space. Due to electric heater, supply duct will require 90-degree elbow.

Step 6 — Rig and Place Unit

Keep unit upright and do not drop. Spreader bars are not required if top crating is left on unit. Rollers may be used to move unit across a roof. Level by using unit frame as a reference. See Table 1 (on page 10) and Fig. 9 for additional information.

Lifting holes are provided in base rails as shown in Fig. 9. Refer to rigging instructions on unit.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

All panels must be in place when rigging. Unit is not designed for handling by fork truck.

Before setting the unit onto the curb, recheck gasketing on curb.

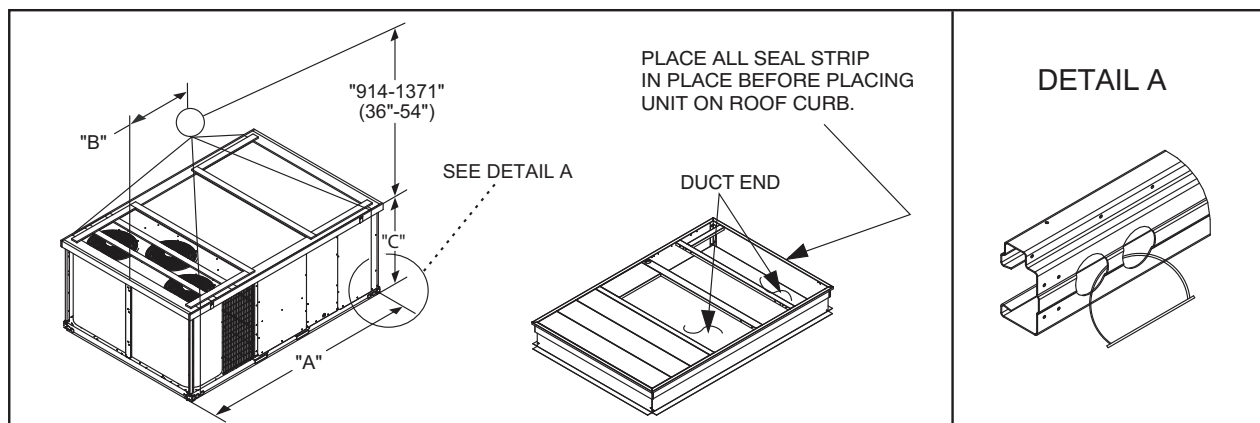
Positioning on Curb —

Position unit on roof curb so that the following clearances are maintained: $\frac{1}{4}$ in. (6 mm) clearance between the roof curb and the base rail inside the right and left, $\frac{1}{2}$ in. (12 mm) clearance between the roof curb and the base rail inside the front and back. This will result in the distance between the roof curb and the base rail inside on the condenser end of the unit being approximately equal to Detail A in Figs. 4 and 5.

Do not attempt to slide unit on curb after unit is set. Doing so will result in damage to the roof curb seal.

Although unit is weatherproof, guard against water from higher level runoff and overhangs.

After unit is in position, remove rigging skids and shipping materials.



C09107

UNIT	MAX WEIGHT		DIMENSIONS					
			A		B		C	
	LB	KG	IN	MM	IN	MM	IN	MM
50TCQD17	2070	940	127.8	3249	58.7	1491	52.3	1328
50TCQD24	2358	1071	141.5	3595	58.7	1491	52.3	1328

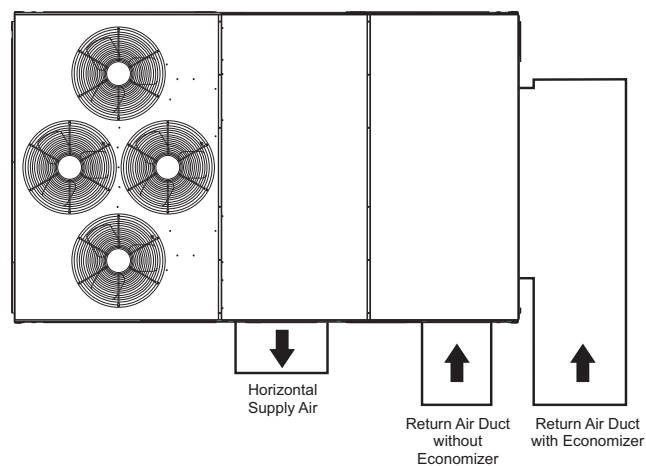
NOTES:

1. Dimensions in () are in millimeters.
2. Hook rigging shackles through holes in base rail, as shown in detail "A." Holes in base rails are centered around the unit center of gravity. Use wooden top to prevent rigging straps from damaging unit.

Fig. 9 - Rigging Details

Step 7 — Horizontal Duct Connection

Refer to Figs. 2 and 3 for locations and sizes of the horizontal duct connections. Note that there are two different return air duct connection locations – one for unit without an economizer (on back side of unit) and a different one for unit equipped with an economizer (on left end, under the economizer hood). The supply air duct connection is on the back side. See Fig. 10 for top view depicting typical horizontal duct arrangements.



C10740

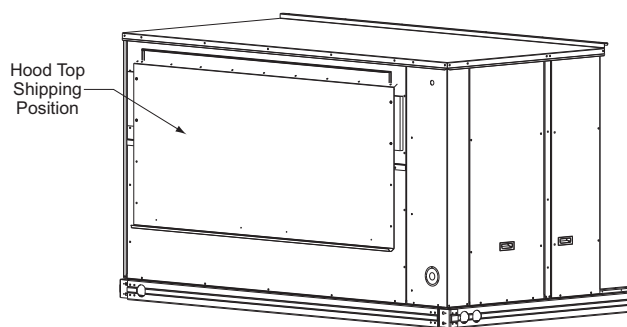
UNIT		Supply	Return without Economizer	Return with Economizer
	Location	Back	Back	Left end
50TCQ*17	Height – in. (mm)	15 ⁷ / ₈ (402)	41 ³ / ₈ (1051)	18 ³ / ₈ (467)
	Width – in. (mm)	29 ³ / ₄ (756)	23 ³ / ₈ (593)	61 ⁵ / ₈ (1564)
50TCQ*24	Height – in. (mm)	15 ⁷ / ₈ (402)	49 ³ / ₈ (1253)	18 ³ / ₈ (467)
	Width – in. (mm)	29 ³ / ₄ (756)	23 ³ / ₈ (593)	61 ⁵ / ₈ (1564)

Fig. 10 - Horizontal Duct Opening Dimensions

Field-supplied (³/₄-inch) flanges should be attached to horizontal duct openings (see Fig. 10) and all ductwork should be secured to the flanges. Insulate and weatherproof all external ductwork, joints, and roof or building openings with counter flashing and mastic in accordance with applicable codes.

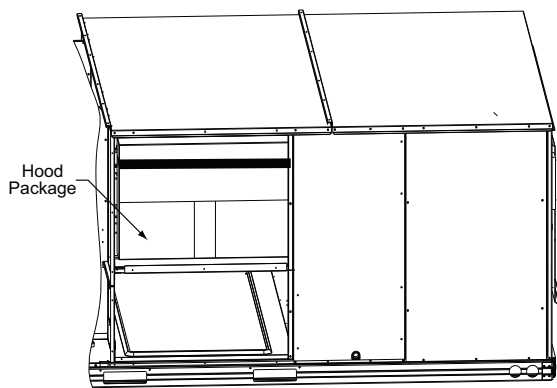
Step 8 — Install Outside Air Hood — Factory Option

The outside air hood for factory-option economizer and two-position damper is shipped in knock-down form and requires field assembly. The panel for the hood top is shipped on the end of the unit (see Fig. 11). The remaining parts for the hood assembly (including side panels, filters and tracks) are shipped in a carton that is secured to the rear of the blower assembly. Access the carton location through rear panel (see Fig. 12).



C09134

Fig. 11 - Hood Top – Shipping Position



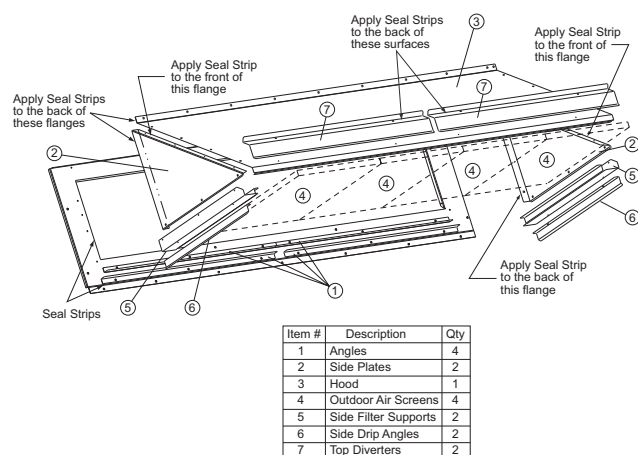
C13785

Fig. 12 - Hood Package – Shipping Location

To remove the hood parts package:

1. Remove the back blower access panel.
2. Locate and cut the strap, being careful to not damage any wiring.
3. Carefully lift the hood package carton through the back blower access opening.

See Fig. 13 for identification of the various parts of the hood assembly.



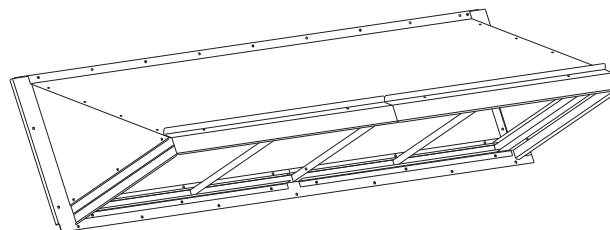
C09079

Fig. 13 - Hood Part Identification and Seal Strip Application Areas

To assemble the outside air hood:

1. Remove hood top panel from shipping position on unit end.
2. Install four angles to the upper end panel using the screws provided
3. Apply seal strip to mating flanges on the side plates of the hood (see Fig. 13).
4. Secure side plates to panel using the screws provided.
5. Apply seal strip to mating flange of the hood (see Fig. 13).
6. Secure top flange using screws provided in kit.
7. Install outdoor air screens by sliding them into the channel formed by the four angles installed in step 2. Make sure that the screens extend across the entire length of the hood.
8. Install side filter supports using the screws provided

9. Install side drip angles using the screws provided.
10. Run a continuous length of seal strip across the hood covering the engagement holes in the lower hood.
11. Install top diverter using the screws provided.
12. On units with barometric relief, remove screws at bottom of relief damper. **Do not discard damper door.**

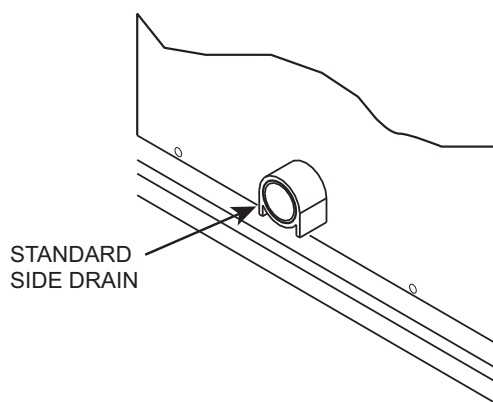


C09090

Fig. 14 - Hood Assembly – Completed

Step 9 — Install External Condensate Trap & Line

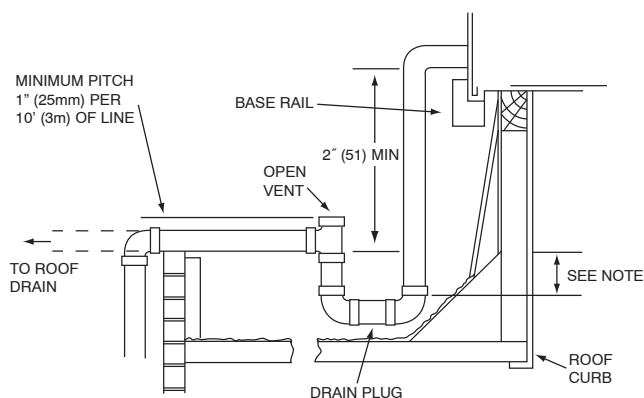
The unit has one $\frac{3}{4}$ -in. condensate drain connection on the end of the condensate pan (see Fig. 15) See Fig. 2 (or Fig. 3), item “E”, in the view labeled “BACK” for the location of the condensate drain connection.



C09056

Fig. 15 - Condensate Drain Pan Connection

The piping for the condensate drain and external trap can be completed after the unit is in place. Hand tighten fittings to the drain pan fitting. Provide adequate support for the drain line. Failure to do so can result in damage to the drain pan. See Fig. 16.



NOTE: Trap should be deep enough to offset maximum unit static difference. A 4" (102) trap is recommended

C08022

Fig. 16 - Condensate Drain Piping Details

All units must have an external trap for condensate drainage. Install a trap at least 4-in. (102 mm) deep and protect against freeze-up. If drain line is installed downstream from the external trap, pitch the line away from the unit at 1-in. per 10 ft (25 mm in 3 m) of run. Do not use a pipe size smaller than the unit connection ($3/4$ -in.).

Step 10 — Make Electrical Connections

⚠ WARNING

ELECTRICAL SHOCK HAZARD

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

Do not use gas piping as an electrical ground. Unit cabinet must have an uninterrupted, unbroken electrical ground to minimize the possibility of personal injury if an electrical fault should occur. This ground may consist of electrical wire connected to unit ground lug in control compartment, or conduit approved for electrical ground when installed in accordance with NEC (National Electrical Code); ANSI/NFPA 70, latest edition (in Canada, Canadian Electrical Code CSA [Canadian Standards Association] C22.1), and local electrical codes.

NOTE: Check all factory and field electrical connections for tightness. Field-supplied wiring shall conform with the limitations of 63°F (33°C) rise.

Field Power Supply —

If equipped with optional Powered Convenience Outlet: The power source leads to the convenience outlet's transformer primary are not factory connected. Installer must connect these leads according to required operation of the convenience outlet. If an always-energized convenience outlet operation is desired, connect the source leads to the line side of the unit-mounted disconnect. (Check with local codes to ensure this method is acceptable in your area.) If a de-energize via unit disconnect switch operation of the convenience outlet is desired, connect the source leads to the load side of the unit disconnect. On a unit without a unit-mounted disconnect, connect the source leads to the terminal block with unit field power leads.

Field power wires are connected to the unit at line-side pressure lugs on the terminal block (see wiring diagram label for control box component arrangement) or at factory-installed option non-fused disconnect switch. Use copper conductors only.

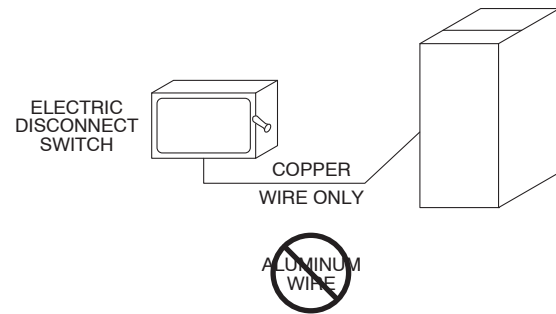
NOTE: Make field power connections directly to line connection pressure lugs only.

⚠ WARNING

FIRE HAZARD

Failure to follow this warning could result in intermittent operation or performance satisfaction.

Do not connect aluminum wire between disconnect switch and air conditioning unit. Use only copper wire. (See Fig. 17.)



A93033

Fig. 17 - Disconnect Switch and Unit

Units Without Factory-Installed Non-Fused Disconnect —

When installing units, provide a disconnect switch per NEC (National Electrical Code) of adequate size. Disconnect sizing data is provided on the unit informative plate. Locate on unit cabinet or within sight of the unit per national or local codes. Do not cover unit informative plate if mounting the disconnect on the unit cabinet.

Units With Factory-Installed Non-Fused Disconnect —

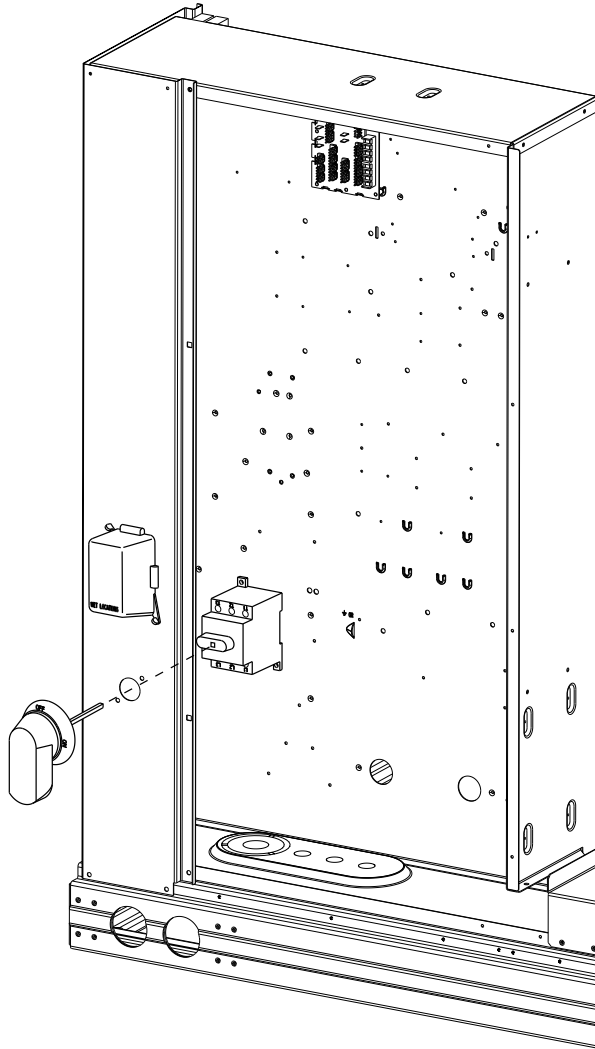
The factory-installed option non-fused disconnect switch (NFD) is located in the main control box. The manual switch handle and shaft are shipped in the control box and must be mounted on the corner post adjacent to the control box (see Fig. 18). Note that the tape covering the hole for the shaft in the corner post must be removed prior to handle and shaft installation.

To field install the NFD shaft and handle:

1. Open the control box panel.
2. Make sure the NFD shipped from the factory is at OFF position (the arrow on the black handle knob or on the silver metal collar is at OFF).
3. Insert the shaft with the cross pin on the top of the shaft in the horizontal position.
4. Measure the tip of the shaft to the outside surface of the corner post to be 0.88".
5. Tighten the locking screw to secure the shaft to the NFD.
6. Turn the handle to OFF position with red arrow pointing at OFF.

50TCQD

7. Install the handle on to the corner post vertically with the red arrow pointing up.
8. Secure the handle to the corner post with (2) screws and lock washers supplied.



C12385

Fig. 18 - Handle and Shaft Assembly for NFD

All Units -

All field wiring must comply with NEC and all local code requirements.

Size wire based on MCA (Minimum Circuit Amps) on the unit informative plate. See Fig. 19 for power wiring connections to the unit power terminal block and equipment ground.

Provide a ground-fault and short-circuit over-current protection device (fuse or breaker) per NEC Article 440 (or local codes). Refer to unit informative data plate for MOCP (Maximum Over-current Protection) device size.

Voltage to compressor terminals during operation must be within voltage range indicated on unit nameplate. On 3-phase units, voltages between phases must be balanced within 2% and the current within 10%. Use the formula shown in the legend for Tables 9 - 12 (see Note 2 on page 41) to determine the percent of voltage imbalance.

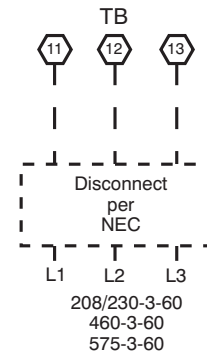
⚠ CAUTION

UNIT DAMAGE HAZARD

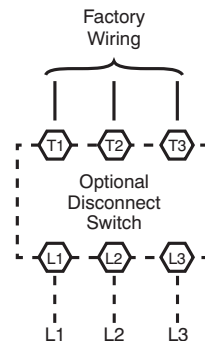
Failure to follow this caution may result in equipment damage.

Operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components. Such operation would invalidate any applicable Carrier warranty.

Units Without Disconnect Option



Units With Disconnect Option



C09057

Fig. 19 - Power Wiring Connections

Convenience Outlets —

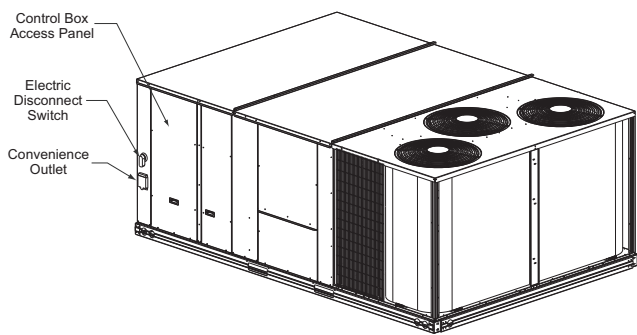
⚠ WARNING

ELECTRICAL OPERATION HAZARD

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

Units with convenience outlet circuits may use multiple disconnects. Check convenience outlet for power status before opening unit for service. Locate its disconnect switch, if appropriate, and open it. Tag-out this switch, if necessary.

Two types of convenience outlets are offered on 48TC*D models: Non-powered and unit-powered. Both types provide a 125-volt GFCI (ground-fault circuit-interrupter) duplex receptacle rated at 15-A behind a hinged access cover, located on the corner panel of the unit. See Fig. 20.



C09119

Fig. 20 - Convenience Outlet Location

Installing Weatherproof Cover –

A weatherproof while-in-use cover for the factory-installed convenience outlets is now required by UL standards. This cover cannot be factory-mounted due its depth; it must be installed at unit installation. For shipment, the convenience outlet is covered with a blank cover plate.

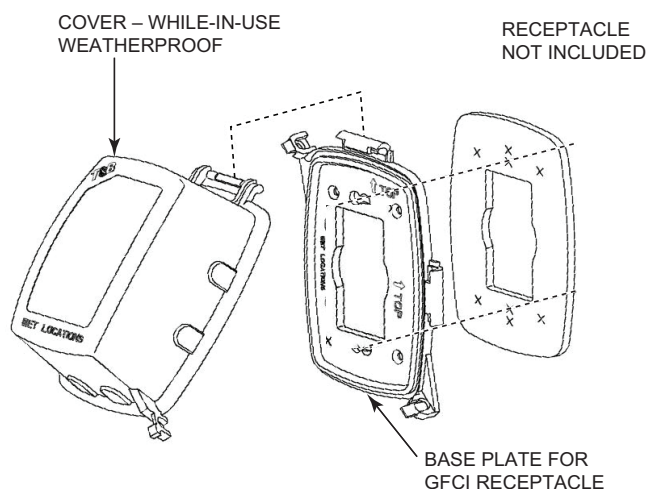
The weatherproof cover kit is shipped in the unit's control box. The kit includes the hinged cover, a backing plate and gasket.

DISCONNECT ALL POWER TO UNIT AND CONVENIENCE OUTLET.

Remove the blank cover plate at the convenience outlet; discard the blank cover.

Loosen the two screws at the GFCI duplex outlet, until approximately 1/2-in (13 mm) under screw heads are exposed. Press the gasket over the screw heads. Slip the backing plate over the screw heads at the keyhole slots and align with the gasket; tighten the two screws until snug (do not over-tighten).

Mount the weatherproof cover to the backing plate as shown in Fig. 21. Remove two slot fillers in the bottom of the cover to permit service tool cords to exit the cover. Check for full closing and latching.



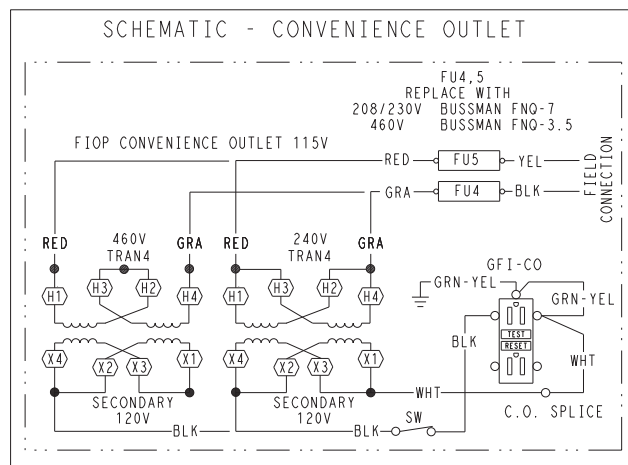
C09022

Fig. 21 - Weatherproof Cover Installation

Non-powered type: This type requires the field installation of a general-purpose 125-volt 15-A circuit powered from a source elsewhere in the building. Observe national and local codes when selecting wire size, fuse or breaker requirements and disconnect switch size and location. Route 125-v power supply conductors into the bottom of the utility box containing the duplex receptacle.

Unit-powered type: A unit-mounted transformer is factory-installed to stepdown the main power supply voltage to the unit to 115-v at the duplex receptacle. This option also includes a manual switch with fuse, located in a utility box and mounted on a bracket behind the convenience outlet; access is through the unit's control box access panel. See Fig. 20.

The primary leads to the convenience outlet transformer are not factory-connected. If local codes permit, the transformer primary leads can be connected at the line-side terminals on the unit-mounted non-fused disconnect switch; this will provide service power to the unit when the unit disconnect switch is open. See Fig. 22.



C09250

UNIT VOLTAGE	CONNECT AS	PRIMARY CONNECTIONS	TRANSFORMER TERMINALS
208, 230	240	L1: RED + YEL L2: BLU + GRA	H1 + H3 H2 + H4
460	480	L1: RED Splice BLU + YEL L2: GRA	H1 H2 + H3 H4
575	600	L1: RED L2: GRA	H1 H2

Fig. 22 - Powered Convenience Outlet Wiring

Duty Cycle: the unit-powered convenience outlet has a duty cycle limitation. The transformer is intended to provide power on an intermittent basis for service tools, lamps, etc; it is not intended to provide 15-amper loading for continuous duty loads (such as electric heaters for overnight use). Observe a 50% limit on circuit loading above 8-amper (i.e., limit loads exceeding 8-amper to 30 minutes of operation every hour).

Test the GFCI receptacle by pressing the TEST button on the face of the receptacle to trip and open the receptacle. Check for proper grounding wires and power line phasing

if the GFCI receptacle does not trip as required. Press the RESET button to clear the tripped condition.

Fuse on power type: The factory fuse is a Bussman FNQ-7 dual element time delay fuse.

Using unit-mounted convenience outlets: Units with unit-mounted convenience outlet circuits will often require that two disconnects be opened to de-energize all power to the unit. Treat all units as electrically energized until the convenience outlet power is also checked and de-energization is confirmed. Observe National Electrical Code Article 210, Branch Circuits, for use of convenience outlets.

Factory-Option Thru-Base Connections —

All units are equipped with the ability to bring utilities through the base.

The electrical entrance is located in the control box area and can be accessed through the control box access panel. An embossed area is provided with three knock outs. High voltage is brought through the multi knock out by removing the appropriate size for the size of the fitting required. A $\frac{7}{8}$ -in. knock out is provided for low voltage. An additional $\frac{7}{8}$ -in. knock out is provided for a 115 volt line which is used when the unit is equipped with the non-powered convenience outlet option.

All required fittings are field supplied. Install fittings when access to both top and bottom of the base pan is available.

Units Without Thru-Base Connections —

1. Install conduit, liquid tight, between disconnect and control box.
2. Pull correctly rated high voltage wires through the conduit.
3. Install power lines to terminal connections as shown in Fig. 19.

Field Control Wiring —

The 50TCQD unit requires an external temperature control device. This device can be a thermostat (field-supplied) or a PremierLink controller (available as factory-installed option or as field-installed accessory, for use on a Carrier Comfort Network or as a stand alone control) or the RTU Open for Building Management Systems using non-CCN protocols (RTU Open is available as a factory-installed option only).

Thermostat —

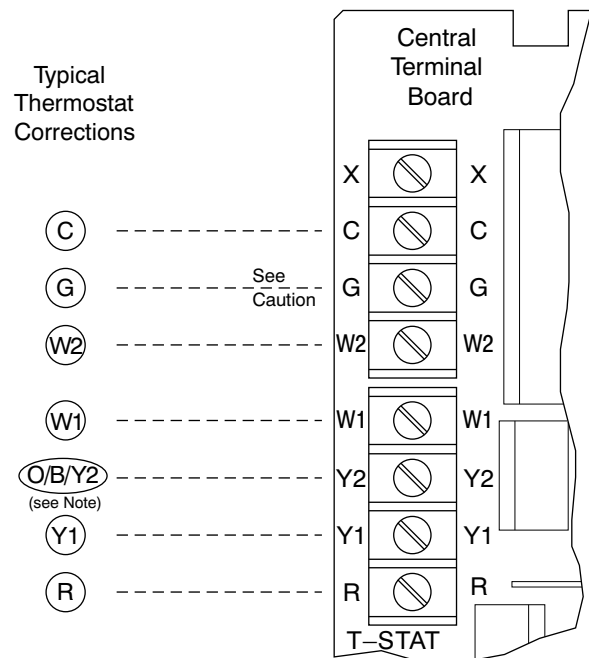
Select a Carrier-approved accessory thermostat. The 50TCQ models do not require a thermostat with an O function to control the reversing valve operation. When electric heat is installed in the 50TCQ unit, the thermostat must be capable of energizing the G terminal (to energize the Indoor Fan Contactor) whenever there is a space call for heat (energizing the W1 terminal). The accessory thermostats listed on the unit price pages can provide this signal but they are not configured to enable this signal as shipped.

Install the accessory thermostat according to installation instructions included with the accessory.

Locate the thermostat accessory on a solid wall in the conditioned space to sense average temperature in accordance with the thermostat installation instructions.

If the thermostat contains a logic circuit requiring 24-v power, use a thermostat cable or equivalent single leads of different colors with minimum of seven leads. If the thermostat does not require a 24-v source (no "C" connection required), use a thermostat cable or equivalent with minimum of six leads. Check the thermostat installation instructions for additional features which might require additional conductors in the cable.

For wire runs up to 50 ft. (15 m), use no. 18 AWG (American Wire Gage) insulated wire (35°C minimum). For 50 to 75 ft. (15 to 23 m), use no. 16 AWG insulated wire (35°C minimum). For over 75 ft. (23 m), use no. 14 AWG insulated wire (35°C minimum). All wire sizes larger than no. 18 AWG cannot be directly connected to the thermostat and will require a junction box and splice at the thermostat.



Note: Typical multi-function marking. Follow manufacturer's configuration instructions to select Y2. Do not configure for O output.

--- Field Wiring

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may cause a short circuit. Carefully check the connection of control conductor for indoor fan control at terminal G. Connecting the indoor fan lead to terminal C will cause a short circuit condition which can cause component damage inside the unit or at thermostat.

C14067

Fig. 23 - Typical Low-Voltage Control Connections

Unit Without Thru-Base Connection Kit —

Correctly rated low voltage wire can be routed through the rubber grommet located on the corner post adjacent to the

control box access panel. Route wire through the grommet and then route the wire behind the corner post utilizing the factory provided wire ties secured to the control box. This will insure separation of the field low voltage wire and the high voltage circuit. Route the low voltage wire to the central terminal board. See Fig. 24.

NOTE: If utilizing the through the base connections, route the low voltage wire through the wire ties to the central terminal board.

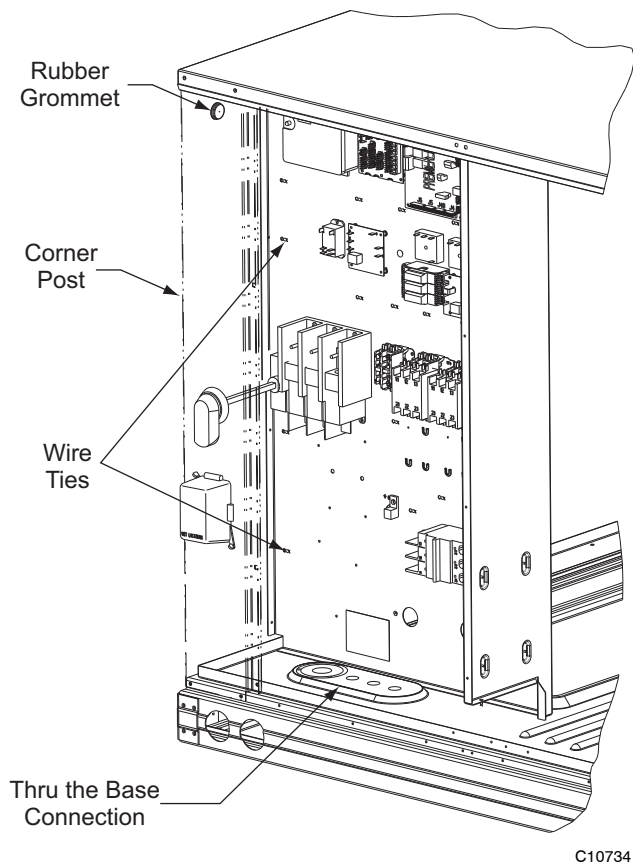


Fig. 24 - Field Control Wiring Raceway

Heat Anticipator Settings —

Set heat anticipator settings at 0.14 amp for the first stage and 0.14 amp for second-stage heating, when available.

Transformer Connection for 208-v Power Supply —

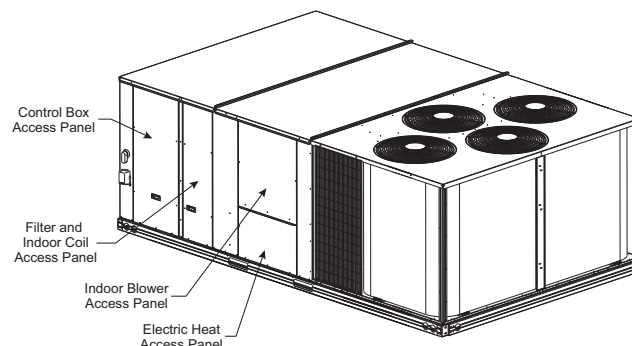
All units except 208/230-v units are factory wired for the voltage shown on the nameplate. *If the 208/230-v unit is to be connected to a 208-v power supply, the control transformer must be rewired by moving the black wire with the 1/4-in. female spade connector from the 230-v connection and moving it to the 208-v 1/4-in. male terminal on the primary side of the transformer. Refer to unit label diagram for additional information.*

Electric Heaters

50TCQD units may be equipped with field-installed accessory electric heaters. The heaters are modular in design.

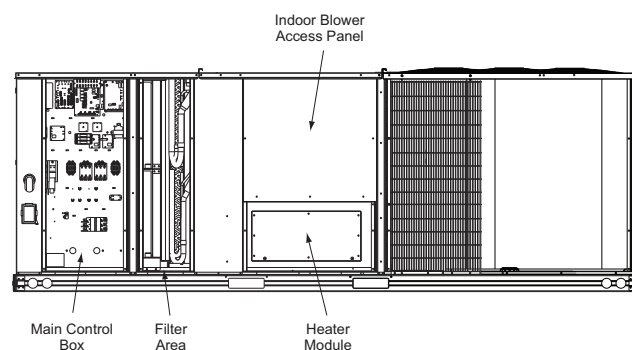
Heater modules are installed in the compartment below the indoor blower access panel. Access is through the electric heat access panel. Heater modules slide into the compartment on tracks along the bottom of the heater opening. See Fig. 25, Fig. 26 and Fig. 27. Refer to the Electric Heater Kit Installation Instructions for complete details.

Not all available heater modules may be used in every unit. Use only those heater modules that are ETL listed for use in a specific size unit. Refer to the label on the unit cabinet for the list of approved heaters.



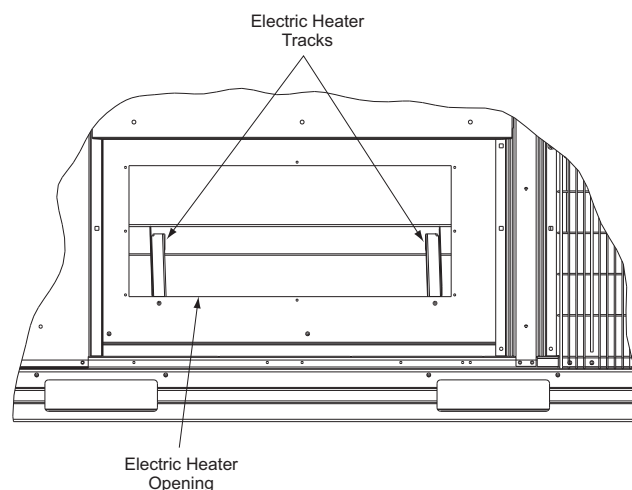
C10631

Fig. 25 - Typical Access Panel Location



C10632

Fig. 26 - Typical Component Location



C09142

Fig. 27 - Electric Heater Compartment (Cover Removed)

50TCQD

Low-Voltage Control Connections —

Locate the plug assembly in the electric heater section of the main unit. Connect the plug with the mating low voltage plug located on the heater.

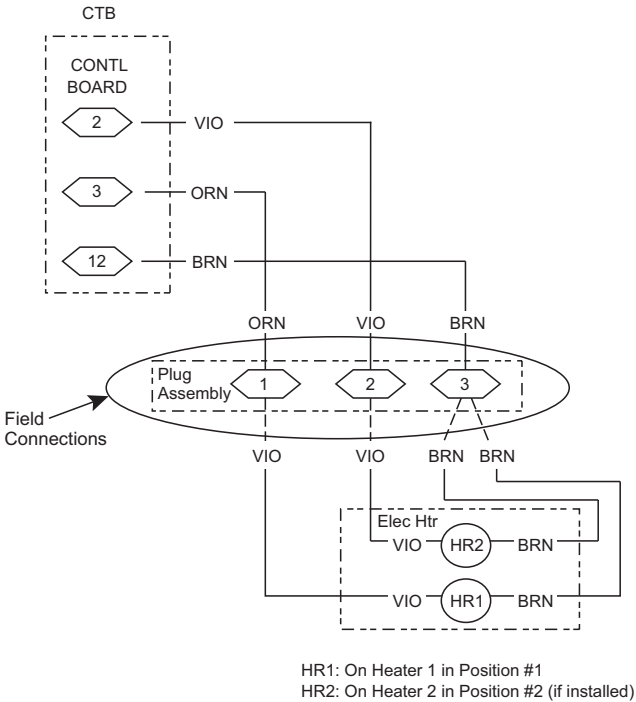


Fig. 28 - Accessory Electric Heater Control Connections

C09149

Staged Air Volume (SAV™) with Variable Frequency Drive (Factory Option)

For details on operating 50TCQ 2 stage cooling units equipped with the factory installed Staged Air Volume option, refer to the *Variable Frequency Drive (VFD) Installation, Setup & Troubleshooting Supplement* (Catalog No. VFD-03SI, or later).

EconoMi\$er X - Ultra Low Leak Economizer (Factory Option)

For details on operating 50TCQ 2 stage cooling units equipped with a factory installed EconoMi\$er X, refer to the *EconoMi\$er X Installation, Setup & Troubleshooting Supplement* (Catalog No. LLECON-02SI, or later).

PremierLink™ (Factory-Option) —

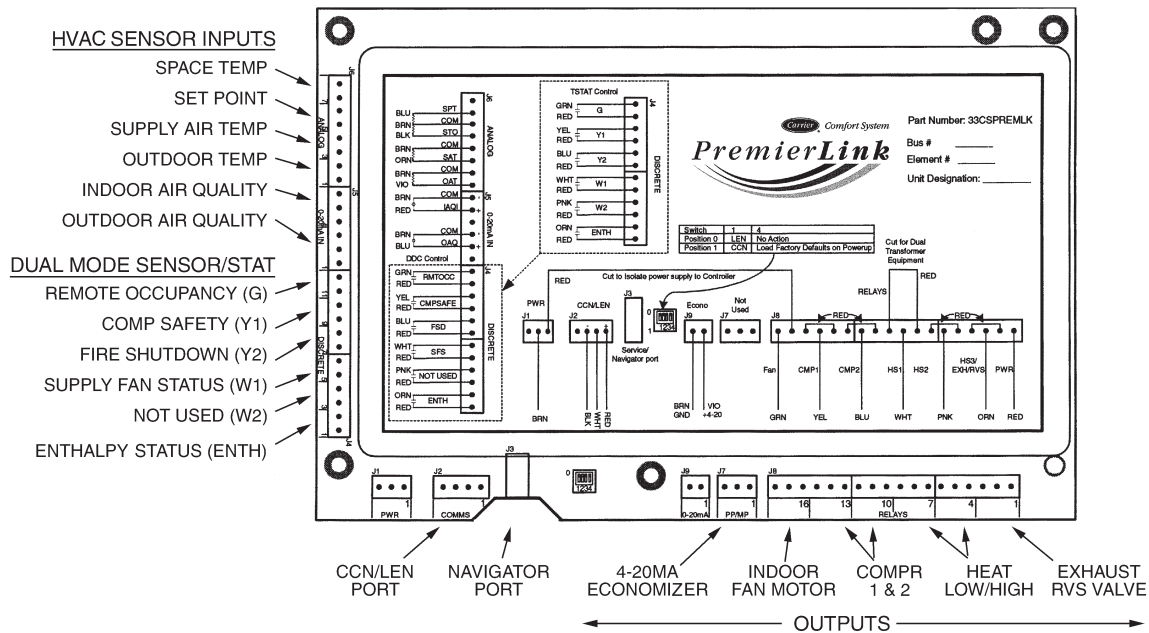


Fig. 29 - PremierLink Controller

C08199

The PremierLink controller (see Fig. 29) is compatible with Carrier Comfort Network® (CCN) devices. This control is designed to allow users the access and ability to change factory-defined settings, thus expanding the function of the standard unit control board. CCN service access tools include System Pilot™, Touch Pilot™ and Service Tool. (Standard tier display tools Navigator™ and Scrolling Marquee are not suitable for use with latest PremierLink controller (Version 2.x).)

The PremierLink control is factory-mounted in the 50TCQD unit's main control box to the right of the Control Terminal Board (CTB). Factory wiring is completed through harnesses connected to the CTB thermostat. Field connections are made at a 16-pole terminal block (TB3) located at the top of the unit control box in front of the PremierLink controller. The factory-installed PremierLink control includes the supply-air temperature (SAT) sensor. The outdoor air temperature (OAT) sensor is included in the FIOP/accessory EconoMi\$er™ 2 package. (See page 39 for accessory enthalpy controls.)

The PremierLink controller requires the use of a Carrier electronic thermostat or a CCN connection for time broadcast to initiate its internal timeclock. This is necessary for broadcast of time of day functions (occupied/unoccupied).

NOTE: PremierLink controller is shipped in Sensor mode. To be used with a thermostat, the PremierLink controller must be configured to Thermostat mode. Refer to PremierLink Configuration instructions for Operating Mode.

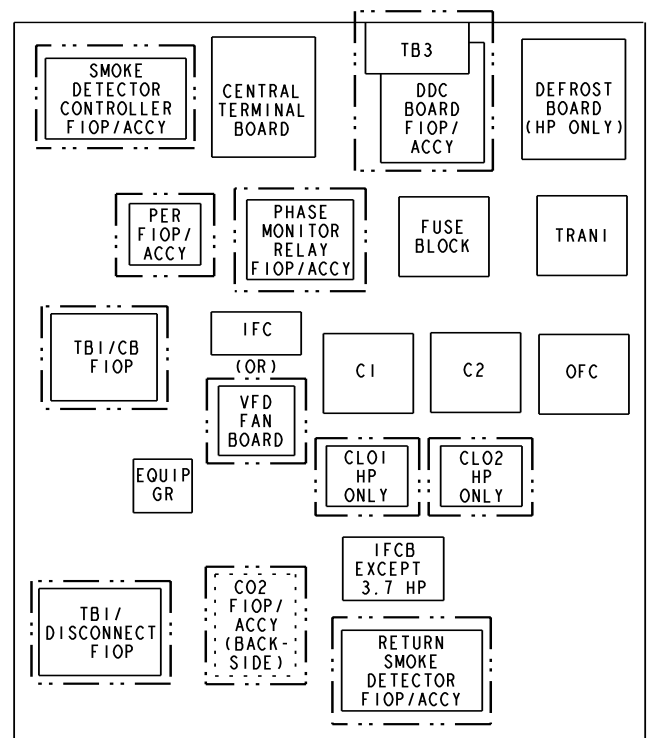


Fig. 30 - 50TCQ Control Box Component Locations

C14049

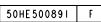


Fig. 31 - PremierLink Wiring Schematic

Supply Air Temperature (SAT) Sensor —

On FIOP-equipped 50TCQD unit, the unit is supplied with a supply-air temperature (SAT) sensor (33ZCSENSAT). This sensor is a tubular probe type, approx 6-inches (12.7 mm) in length. It is a nominal 10-k ohm thermistor.

The SAT is factory-wired. The SAT probe is mounted in the fan deck. It can be removed or remounted per local codes. Drill or punch a 1/2-in. hole in the flange or duct. Use two field-supplied, self-drilling screws to secure the sensor probe in a horizontal orientation (see Fig. 32). Insure that the sensor wires do not contact the hot surface of the electric heaters.

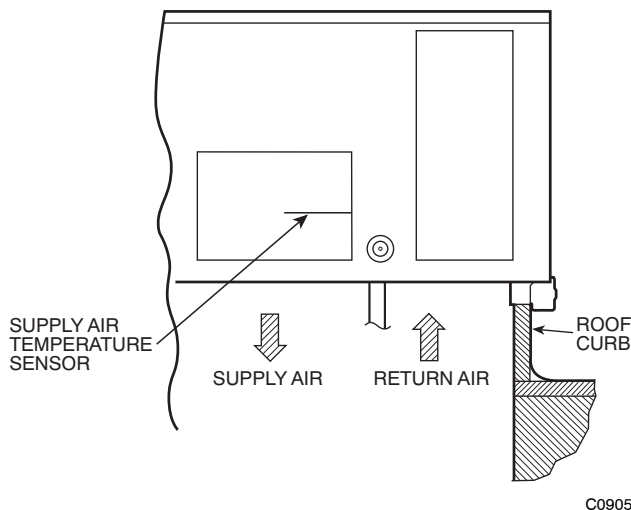


Fig. 32 - Mounting Location for Supply Air Temperature (SAT) Sensor on 50TCQD Units

NOTE: Refer to Form 33CS-68SI for complete PremierLink configuration, operating sequences and troubleshooting information. Have a copy of this manual available at unit start-up.

NOTE: The sensor must be mounted in the discharge airstream downstream of the cooling coil and any heating devices. Be sure the probe tip does not come in contact with any of the unit's heater surfaces.

Outdoor Air Temperature (OAT) Sensor —

The OAT is factory-mounted in the EconoMi\$er2 (FIOP or accessory). It is a nominal 10k ohm thermistor attached to an eyelet mounting ring.

EconoMi\$er2 —

The PremierLink control is used with EconoMi\$er2 (option or accessory) for outdoor air management. The damper position is controlled directly by the PremierLink control; EconoMi\$er2 has no internal logic device.

Outdoor air management functions can be enhanced with field-installation of these accessory control devices:

- Enthalpy control (outdoor air or differential sensors)
- Space CO₂ sensor
- Outdoor air CO₂ sensor

Refer to Table 2 for accessory part numbers.

Field Connections

Field connections for accessory sensor and input devices are made at the 16-pole terminal block (TB1) located on the control box top in front of the PremierLink control (See Fig. 31). Some input devices also require a 24-vac signal source; connect at CTB terminal R at "THERMOSTAT" connection strip for this signal source. See connections figures on following pages for field connection locations (and for continued connections at the PremierLink board inputs).

Table 3 provides a summary of field connections for units equipped with Space Sensor. Table 4 provides a summary of field connections for units equipped with Space Thermostat.

Space Sensors -

The PremierLink controller is factory-shipped configured for Space Sensor Mode. A Carrier T-55 or T-56 space sensor must be used. T-55 space temperature sensor provides a signal of space temperature to the PremierLink control. T-56 provides same space temperature signal plus it allows for adjustment of space temperature setpoints from the face of the sensor by the occupants.

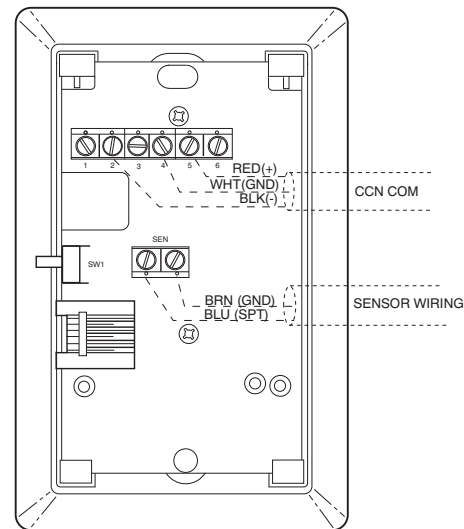


Fig. 33 - T-55 Space Temperature Sensor Wiring

Connect T-55: See Fig. 33 for typical T-55 internal connections. Connect the T-55 SEN terminals to TB1 terminals 1 and 3 (see Fig. 34).

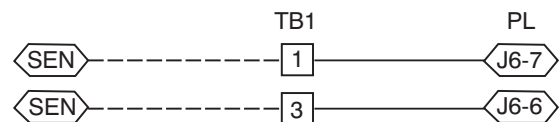


Fig. 34 - PremierLink T-55 Sensor

Table 2 – PremierLink Sensor Usage

APPLICATION	OUTDOOR AIR TEMPERATURE SENSOR	RETURN AIR TEMPERATURE SENSOR	OUTDOOR AIR ENTHALPY SENSOR	RETURN AIR ENTHALPY SENSOR
Differential Dry Bulb Temperature with PremierLink (PremierLink requires 4–20 mA Actuator)	Included – CRTEMPSN001A00	Required – 33ZCT55SPT or equivalent	–	–
Single Enthalpy with PremierLink (PremierLink requires 4–20mA Actuator)	Included – Not Used	–	Requires – 33CSENTHSW	–
Differential Enthalpy with PremierLink (PremierLink requires 4–20mA Actuator)	Included – Not Used	–	Requires – 33CSENTHSW or equivalent	Requires – 33CSENTSEN or equivalent

NOTES:

CO₂ Sensors (Optional):

33ZCSENCO2 – Room sensor (adjustable). Aspirator box is required for duct mounting of the sensor.

33ZCASPCO2 – Aspirator box used for duct-mounted CO₂ room sensor.

33ZCT55CO2 – Space temperature and CO₂ room sensor with override.

33ZCT56CO2 – Space temperature and CO₂ room sensor with override and setpoint.

Table 3 – Space Sensor Mode

TB1 TERMINAL	FIELD CONNECTION	INPUT SIGNAL
1	T55 – SEN/T56 – SEN	Analog (10k thermistor)
2	RMT OCC	Discrete, 24VAC
3	T55 – SEN/T56 – SEN	Analog (10k thermistor)
4	CMPSAFE	Discrete, 24VAC
5	T56 – SET	Analog (10k thermistor)
6	FSD	Discrete, 24VAC
7	LOOP – PWR	Analog, 24VDC
8	SPS	Discrete, 24VAC
9	IAQ – SEN	Analog, 4–20mA
10	FILTER	Discrete, 24VAC
11	IAQ – COM/OAQ – COM/RH – COM	Analog, 4–20mA
12	CCN + (RED)	Digital, , 5VDC
13	OAQ – SEN/RH – SEN	Analog, 4–20mA
14	CCN Gnd (WHT)	Digital, 5VDC
15	AUX OUT(Power Exhaust)	(Output)Discrete 24VAC
16	CCN – (BLK)	Digital, 5VDC

LEGEND:

T55 – Space Temperature Sensor

T56 – Space Temperature Sensor

CCN – Carrier Comfort Network (communication bus)

CMPSAFE – Compressor Safety

FILTER – Dirty Filter Switch

FSD – Fire Shutdown

IAQ – Indoor Air Quality (CO₂)

OAQ – Outdoor Air Quality (CO₂)

RH – Relative Humidity

SFS – Supply Fan Status

Table 4 – Thermostat Mode

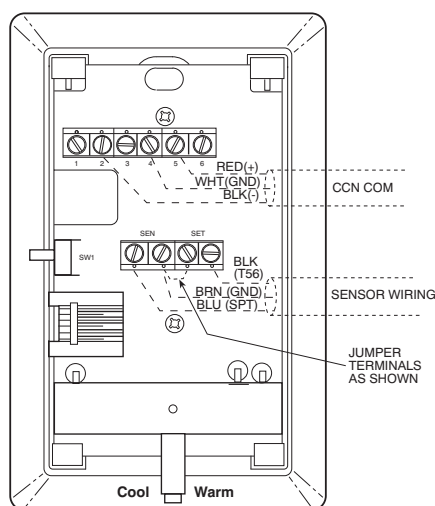
TB1 TERMINAL	FIELD CONNECTION	INPUT SIGNAL
1	RAT SEN	Analog (10k thermistor)
2	G	Discrete, 24VAC
3	RAT SEN	Analog (10k thermistor)
4	Y1	Discrete, 24VAC
5		
6	Y2	Discrete, 24VAC
7	LOOP – PWR	Analog, 24VDC
8	W1	Discrete, 24VAC
9	IAQ – SEN	Analog, 4 – 20mA
10	W2	Discrete, 24VAC
11	IAQ – COM/OAQ – COM/RH – COM	Analog, 4 – 20mA
12	CCN + (RED)	Digital, 5VDC
13	OAQ – SEN/RH – SEN	Analog, 4 – 20mA
14	CCN Gnd (WHT)	Digital, 5VDC
15	AUX OUT (Power Exhaust)	(Output) Discrete 24VAC
16	CCN – (BLK)	Digital, 5VDC

LEGEND:

CCN – Carrier Comfort Network (communication bus)
 G – Thermostat Fan
 IAQ – Indoor Air Quality (CO₂)
 OAQ – Outdoor Air Quality (CO₂)
 RAT – Return Air Temperature

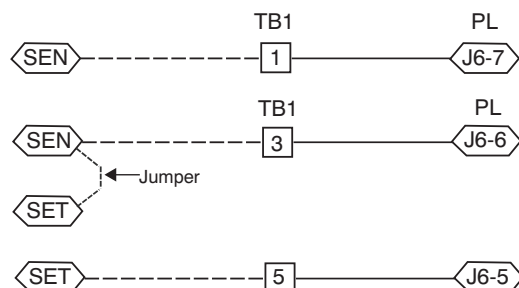
RH – Relative Humidity
 W1 – Thermostat Heat Stage 1
 W2 – Thermostat Heat Stage 2
 Y1 – Thermostat Cool Stage 1
 Y2 – Thermostat Cool Stage 2

Connect T-56: See Fig. 35 for T-56 internal connections. Install a jumper between SEN and SET terminals as illustrated. Connect T-56 terminals to TB1 terminals 1, 3 and 5 (see Fig. 36).



C08202

Fig. 35 - T-56 Internal Connections

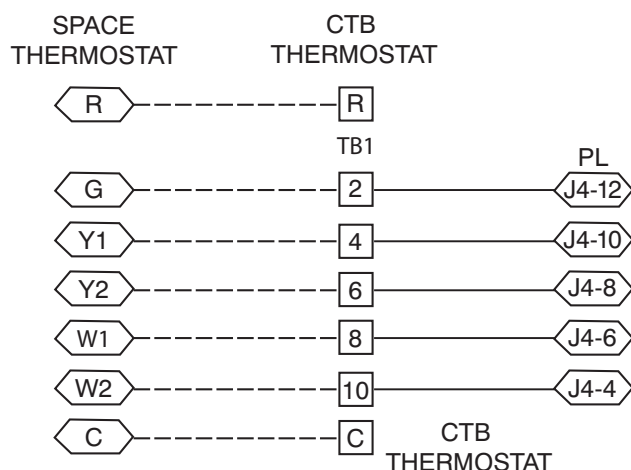


C08213

Fig. 36 - PremierLink T-56 Sensor

Connect Thermostat —

A 7-wire thermostat connection requires a 24-v power source and a common connection. Use the R and C terminals on the CTB's THERMOSTAT connection strip for these. Connect the thermostat's Y1, Y2, W1, W2 and G terminals to PremierLink TB1 as shown in Fig. 37.



C08119

Fig. 37 - Space Thermostat Connections

If the 50TCQD unit is equipped with factory-installed smoke detector(s), disconnect the factory BLU lead at TB1-6 (Y2) before connecting the thermostat. Identify the BLU lead originating at CTB-DDC-1; disconnect at TB1-6 and tape off. Confirm that the second BLU lead at TB1-6 remains connected to PremierLink J4-8.

If the 50TCQD unit has an economizer system and free-cooling operation is required, a sensor representing Return Air Temperature must also be connected

(field-supplied and installed). This sensor may be a T-55 Space Sensor (see Fig. 31) installed in the space or in the return duct, or it may be sensor PNO 33ZCSENSAT, installed in the return duct. Connect this sensor to TB1-1 and TB1-3 per Fig. 34.

Configure the Unit for Thermostat Mode —

Connect to the CCN bus using a CCN service tool and navigate to PremierLink Configuration screen for Operating Mode. Default setting is Sensor Mode (value 1). Change the value to 0 to reconfigure the controller for Thermostat Mode.

When the PremierLink is configured for Thermostat Mode, these functions are not available: Fire Shutdown (FSD), Remote Occupied (RMTOCC), Compressor Safety (CMPSAFE), Supply Fan Status (SFS), and Filter Pressure Switch (FILTER).

Economizer Controls

Indoor Air Quality (CO₂) Sensor —

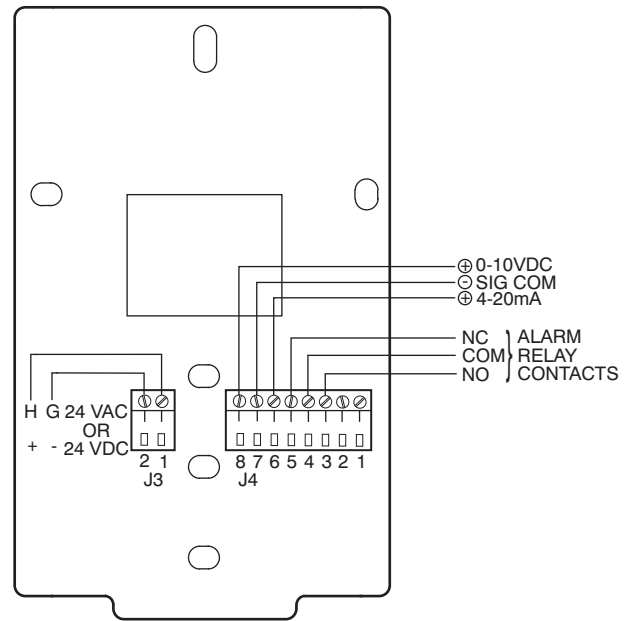
The indoor air quality sensor accessory monitors space carbon dioxide (CO₂) levels. This information is used to monitor IAQ levels. Several types of sensors are available, for wall mounting in the space or in return duct, with and without LCD display, and in combination with space temperature sensors. Sensors use infrared technology to measure the levels of CO₂ present in the space air.

The CO₂ sensors are all factory set for a range of 0 to 2000 ppm and a linear mA output of 4 to 20. Refer to the instructions supplied with the CO₂ sensor for electrical requirements and terminal locations. See Fig. 38 for typical CO₂ sensor wiring schematic.

To accurately monitor the quality of the air in the conditioned air space, locate the sensor near a return-air grille (if present) so it senses the concentration of CO₂ leaving the space. The sensor should be mounted in a location to avoid direct breath contact.

Refer to Form 33CS-68SI, PremierLink Installation, Start-up, and Configuration Instructions, for detailed configuration information.

Do not mount the IAQ sensor in drafty areas such as near supply ducts, open windows, fans, or over heat sources. Allow at least 3 ft (0.9 m) between the sensor and any corner. Avoid mounting the sensor where it is influenced by the supply air; the sensor gives inaccurate readings if the supply air is blown directly onto the sensor or if the supply air does not have a chance to mix with the room air before it is drawn into the return airstream.

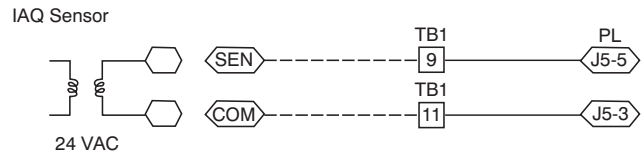


C08635

Fig. 38 - Indoor/Outdoor Air Quality (CO₂) Sensor (33ZCSENCO2) - Typical Wiring Diagram

Wiring the Indoor Air Quality Sensor: For each sensor, use two 2-conductor 18 AWG (American Wire Gage) twisted-pair cables (unshielded) to connect the separate isolated 24 vac power source to the sensor and to connect the sensor to the control board terminals.

To connect the sensor to the control, identify the positive (4 to 20 mA) and ground (SIG COM) terminals on the sensor. See Fig. 37. Connect the 4-20 mA terminal to terminal TB1-9 and connect the SIG COM terminal to terminal TB1-11. See Fig. 39.



C08636

Fig. 39 - Indoor CO₂ Sensor (33ZCSENCO2) Connections

Outdoor Air Quality Sensor

(PNO 33ZCSENCO2 plus weatherproof enclosure) —

The outdoor air CO₂ sensor is designed to monitor carbon dioxide (CO₂) levels in the outside ventilation air and interface with the ventilation damper in an HVAC system. The OAQ sensor is packaged with an outdoor cover. See Fig. 40. The outdoor air CO₂ sensor must be located in the economizer outside air hood.

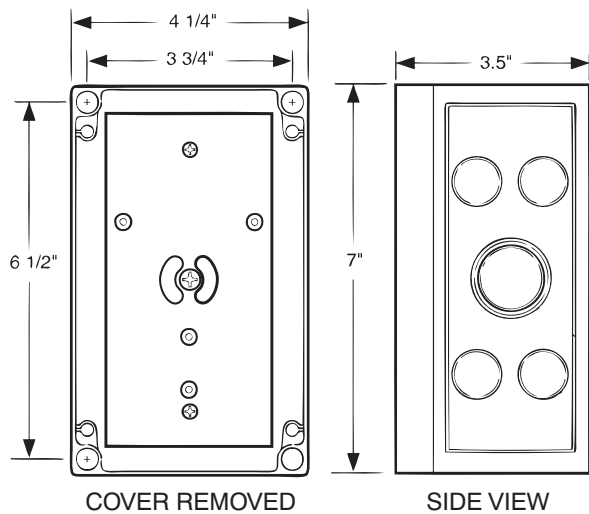


Fig. 40 - Outdoor Air Quality Sensor Cover

Wiring the Outdoor Air CO₂ Sensor: A dedicated power supply is required for this sensor. A two-wire cable is required to wire the dedicated power supply for the sensor. The two wires should be connected to the power supply and terminals 1 and 2.

To connect the sensor to the control, identify the positive (4 to 20 mA) and ground (SIG COM) terminals on the OAQ sensor. See Fig. 38. Connect the 4 to 20 mA terminal to the TB1-13 terminal of the 50TCQD . Connect the SIG COM terminal to the TB1-11 terminal of the 50TCQD. See Fig. 41.

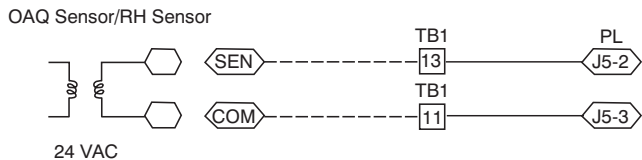


Fig. 41 - Outdoor CO₂ Sensor Connections

Smoke Detector/Fire Shutdown (FSD) —

This function is available only when PremierLink is configured for (Space) Sensor Mode. The unit is factory-wired for PremierLink FSD operation when PremierLink is factory-installed.

On 50TCQD units equipped with factory-installed Smoke Detector(s), the smoke detector controller implements the unit shutdown through its NC contact set connected to the unit's CTB input. The FSD function is initiated via the smoke detector's Alarm NO contact set. The PremierLink communicates the smoke detector's tripped status to the CCN building control. See Fig. 31, the PremierLink wiring schematic.

Filter Status Switch —

This function is available only when PremierLink is configured for (Space) Sensor Mode.

PremierLink control can monitor return filter status in two ways: By monitoring a field-supplied/installed filter pressure switch or via supply fan runtime hours.

Using Switch Input: Install the dirty filter pressure switch according to switch manufacturer's instructions, to measure pressure drop across the unit's return filters. Connect one side of the switch's NO contact set to CTB's THERMOSTAT-R terminal. Connect the other side of the NO contact set to TB1-10. Setpoint for Dirty Filter is set at the switch. See Fig. 42.

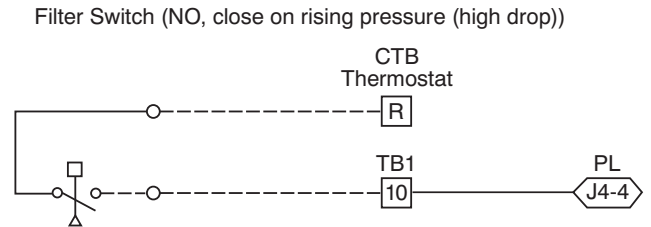


Fig. 42 - PremierLink Filter Switch Connection

When the filter switch's NO contact set closes as filter pressure drop increases (indicating dirt-laden filters), the input signal to PremierLink causes the filter status point to read "DIRTY".

Using Filter Timer Hours: Refer to Form 33CS-68SI for instructions on using the PremierLink Configuration screens and on unit alarm sequence.

Supply Fan Status Switch —

The PremierLink control can monitor supply fan operation through a field-supplied/installed differential pressure switch. This sequence will prevent (or interrupt) operation of unit cooling, heating and economizer functions until the pressure switch contacts are closed indicating proper supply fan operation.

Install the differential pressure switch in the supply fan section according to switch manufacturer's instructions. Arrange the switch contact to be open on no flow and to close as pressure rises indicating fan operation.

Connect one side of the switch's NO contact set to CTB's THERMOSTAT-R terminal. Connect the other side of the NO contact set to TB1-8. Setpoint for Supply Fan Status is set at the switch. See Fig. 43.

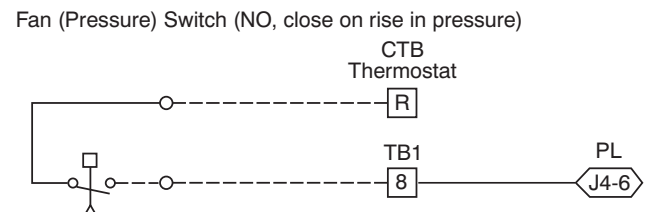


Fig. 43 - PremierLink Wiring Fan Pressure Switch Connection

Remote Occupied Switch —

The PremierLink control permits a remote timeclock to override the control's on-board occupancy schedule and

place the unit into Occupied mode. This function may also provide a “Door Switch” time delay function that will terminate cooling and heating functions after a 2-20 minute delay.

Connect one side of the NO contact set on the timeclock to CTB’s THERMOSTAT-R terminal. Connect the other side of the timeclock contact to the unit’s TB1-2 terminal.

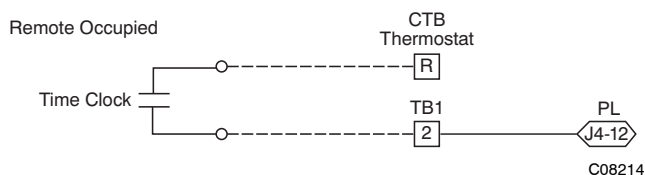


Fig. 44 - PremierLink Wiring Remote Occupied

Refer to Form 33CS-68SI for additional information on configuring the PremierLink control for Door Switch timer function.

Power Exhaust (output) -

Connect the accessory Power Exhaust contactor coils(s) per Fig. 45.

Space Relative Humidity Sensor — The RH sensor is not used with 50TCQD models at this time.

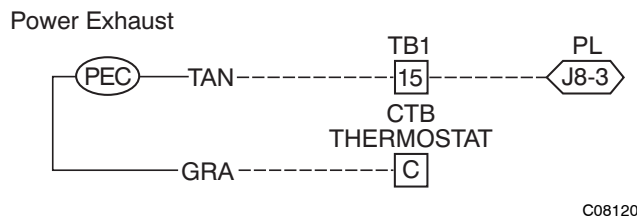


Fig. 45 - PremierLink Power Exhaust Output Connection

CCN Communication Bus —

The PremierLink controller connects to the bus in a daisy chain arrangement. Negative pins on each component must be connected to respective negative pins, and likewise, positive pins on each component must be connected to respective positive pins. The controller signal pins must be wired to the signal ground pins. Wiring connections for CCN must be made at the 3-pin plug.

At any baud (9600, 19200, 38400 baud), the number of controllers is limited to 239 devices maximum. Bus length may not exceed 4000 ft, with no more than 60 total devices on any 1000-ft section. Optically isolated RS-485 repeaters are required every 1000 ft.

NOTE: Carrier device default is 9600 band.

Communications Bus Wire Specifications: The CCN Communication Bus wiring is field-supplied and field-installed. It consists of shielded 3-conductor cable with drain (ground) wire. The cable selected must be identical to the CCN Communication Bus wire used for the entire network.

See Table 5 for recommended cable.

Table 5 – Recommended Cables

MANUFACTURER	CABLE PART NO.
Alpha	2413 or 5463
American	A22503
Belden	8772
Columbia	02525

NOTE: Conductors and drain wire must be at least 20 AWG, stranded, and tinned copper. Individual conductors must be insulated with PVC, PVC/nylon, vinyl, Teflon, or polyethylene. An aluminum/polyester 100% foil shield and an outer jacket of PVC, PVC/nylon, chrome vinyl, or Teflon with a minimum operating temperature range of -20°C to 60°C is required. Do not run communication wire in the same conduit as or next to any AC voltage wiring.

The communication bus shields must be tied together at each system element. If the communication bus is entirely within one building, the resulting continuous shield must be connected to ground at only one single point. If the communication bus cable exits from one building and enters another building, the shields must be connected to the grounds at a lightning suppressor in each building (one point only).

Connecting CCN bus:

NOTE: When connecting the communication bus cable, a color code system for the entire network is recommended to simplify installation and checkout. See Table 6 for the recommended color code.

Table 6 – Color Code Recommendations

SIGNAL TYPE	CCN BUS WIRE COLOR	CCN PLUG PIN NUMBER
+	Red	1
Ground	White	2
-	Black	3

Connect the CCN (+) lead (typically RED) to the unit’s TB1-12 terminal. Connect the CCN (ground) lead (typically WHT) to the unit’s TB1-14 terminal. Connect the CCN (-) lead (typically BLK) to the unit’s TB1-16 terminal. See Fig. 46.

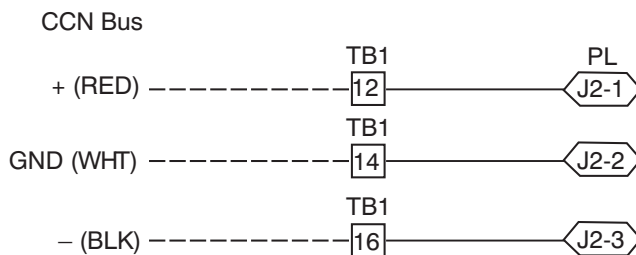


Fig. 46 - PremierLink CCN Bus Connections

RTU Open Control System

The RTU Open control is factory-mounted in the 50TCQ unit's main control box, to the right of the CTB. See Fig. 30. Factory wiring is completed through harnesses connected to the CTB. Field connections for RTU Open sensors will be made at the Phoenix connectors on the RTU Open board. The factory-installed RTU Open control includes the supply-air temperature (SAT) sensor. The outdoor air temperature (OAT) sensor is included in the FIOP/accessory EconoMi\$er2 package.

The RTU Open controller is an integrated component of the Carrier rooftop unit. Its internal application programming provides optimum performance and energy efficiency. RTU Open enables the unit to run in 100% stand-alone control mode, Carrier's I-Vu Open network, or a Third Party Building Automation System (BAS). On-board DIP switches allow you to select your protocol (and baud rate) of choice among the four most popular protocols in use today: BACnet, Modbus, Johnson N2 and LonWorks. (See Fig. 47.)

Refer to Table 7, RTU Open Controller Inputs and Outputs for locations of all connections to the RTU Open board.

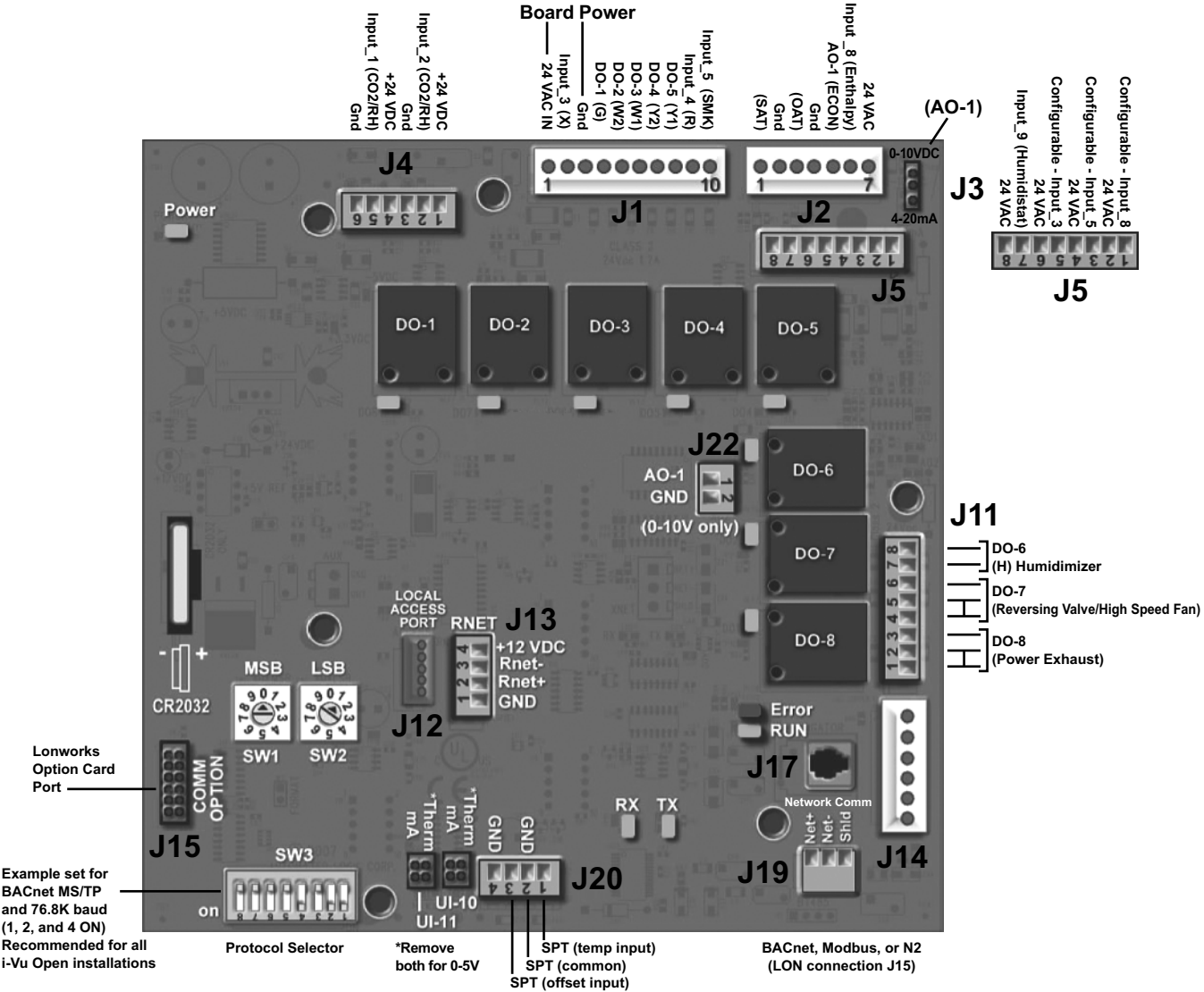


Fig. 47 - RTU Open Multi-Protocol Control Board

C12751

STD TIER HP CONTROL 208/230V, 460V, 575V

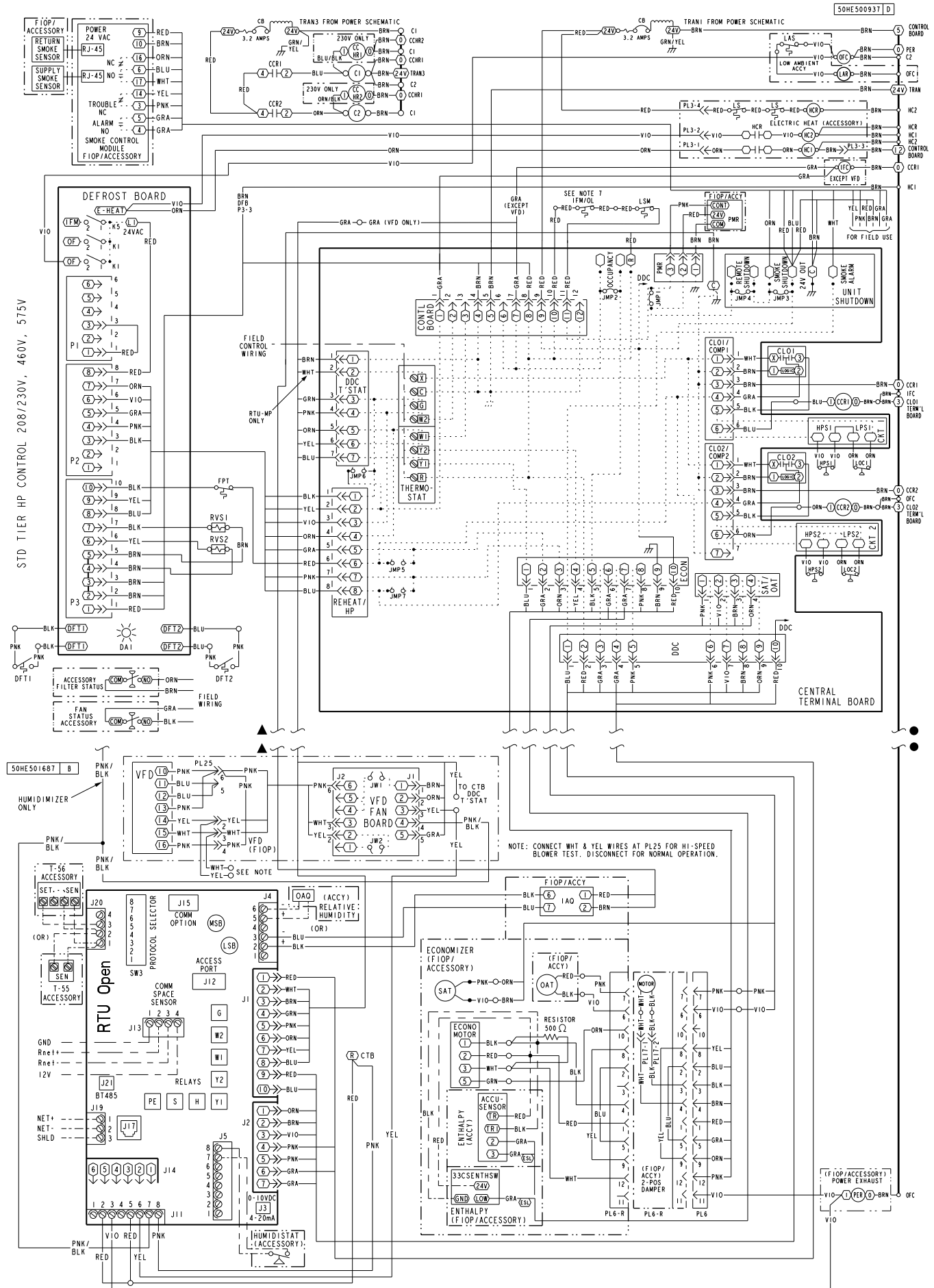


Fig. 48 - RTU Open System Control Wiring Diagram

Table 7 – RTU Open Controller Inputs and Outputs

POINT NAME04	BACnet OBJECT NAME	TYPE OF I/O	CONNECTION PIN NUMBER(S)
DEDICATED INPUTS			
Space Temp / Zone Temp	zone_temp	AI (10K Thermistor)	J20–1 & 2
Supply Air Temperature	sa_temp	AI (10K Thermistor)	J2–1 & 2
Outdoor Air Temperature	oa_temp	AI (10K Thermistor)	J2–3 & 4
Space Temperature Offset Pot	stpt_adj_offset	AI (100K Potentiometer)	J20–3 & 4
Safety Chain Feedback	safety_status	DI (24 VAC)	J1–9
Compressor Safety Status	comp_status	DI (24 VAC)	J1–2
Fire Shutdown Status	firedown_status	DI (24 VAC)	J1–10
Enthalpy Status	enthalpy_status	DI (24 VAC)	J2–6 & 7
Humidistat Input Status	humstat_status	DI (24 VAC)	J5–7 & 8
Zone Temperature	n/a	n/a	J13–1, 2, 3, 4
CONFIGURABLE INPUTS			
Indoor Air CO2	iaq	AI (4–20 ma)	J4–2 & 3 or J4–5 & 6
Outdoor Air CO2	oaq	AI (4–20 ma)	
Space Relative Humidity	space_rh	AI (4–20 ma)	
Supply Fan Status*	sfan_status	DI (24 VAC)	J5–1 or J5–3 or J5–5
Filter Status*	filter_status	DI (24 VAC)	
Door Contact Input*	door_contact_status	DI (24 VAC)	
Occupancy Contact*	occ_contact_status	DI (24 VAC)	
OUTPUTS			
Economizer Output	econ_output	AO (4–20ma)	J2–5
Supply Fan Relay State	sfan	DO Relay (24VAC , 1A)	J1–4
Compressor 1 Relay State	comp_1	DO Relay (24VAC , 1A)	J1–8
Compressor 2 Relay State	comp_2	DO Relay (24VAC , 1A)	J1–7
Heat Stage 1 Relay State	heat_1	DO Relay (24VAC , 1A)	J1–6
Heat Stage 2 Relay State	heat_2	DO Relay (24VAC , 1A)	J1–5
Power Exhaust Relay State	pexh	DO Relay (24VAC , 1A)	J11–1 & 3
Humidimizer Relay State	dehum	DO Relay (24VAC, 1A)	J11–7, 8

LEGEND

AI – Analog Input
AO – Analog Output
DI – Discrete Input
DO – Discrete Output

* These inputs (if installed) take the place of the default input on the specific channel according to schematic. Parallel pins J5–1 = J2–6, J5–3 = J1–10, J5–5 = J1–2 are used for field–installation.

The RTU Open controller requires the use of a Carrier space sensor. A standard thermostat cannot be used with the RTU Open system.

Supply Air Temperature (SAT) Sensor —

On FIOP-equipped 50TCQ unit, the unit is supplied with a supply-air temperature (SAT) sensor (33ZCSENSAT). This sensor is a tubular probe type, approx 6-inches (152 mm) in length. It is a nominal 10-k ohm thermistor.

The SAT is factory-wired. The SAT probe is wire-tied to the supply-air opening in its shipping position. Remove the sensor for installation. Re-position the sensor in the flange of the supply-air opening or in the supply air duct (as required by local codes). Drill or punch a 1/2-in. hole in the flange or duct. Use two field-supplied, self-drilling screws to secure the sensor probe in a horizontal orientation. See Fig. 32 on page 25.

Outdoor Air Temperature (OAT) Sensor —

The OAT is factory-mounted in the EconoMi\$er2 (FIOP or accessory). It is a nominal 10k ohm thermistor attached to an eyelet mounting ring.

EconoMi\$er2 —

The RTU Open control is used with EconoMi\$er2 (option or accessory) for outdoor air management. The damper position is controlled directly by the RTU Open control; EconoMi\$er2 has no internal logic device.

Outdoor air management functions can be enhanced with field-installation of these accessory control devices:

- Enthalpy control (outdoor air or differential sensors)
- Space CO₂ sensor
- Outdoor air CO₂ sensor

Field Connections

Field connections for accessory sensors and input devices are made the RTU Open, at plugs J1, J2, J4, J5, J11 and J20. All field control wiring that connects to the RTU Open must be routed through the raceway built into the corner post as shown in Fig. 24. The raceway provides the UL required clearance between high- and low-voltage wiring. Pass the control wires through the hole provided in the corner post, then feed the wires thorough the raceway

to the RTU Open. Connect to the wires to the removable Phoenix connectors and then reconnect the connectors to the board.

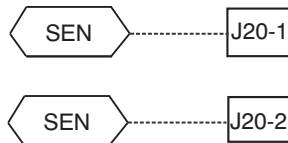
Space Temperature (SPT) Sensors —

There are two types of SPT sensors available from Carrier, resistive input non-communicating (T55, T56, and T59) and Rnet communicating (SPS, SPPL, SPP, and SPPF) sensors. Each type has a variety of options consisting of: timed override button, set point adjustment, a LCD screen, and communication tie in. Space temperature can be also be written to from a building network or zoning system. However, it is still recommended that return air duct sensor be installed to allow stand-alone operation for back-up. Refer to the configuration section for details on controller configurations associated with space sensors.

- 33ZCT55SPT, space temperature sensor with override button (T-55)
- 33ZCT56SPT, space temperature sensor with override button and setpoint adjustment (T-56)
- 33ZCT59SPT, space temperature sensor with LCD (liquid crystal display) screen, override button, and setpoint adjustment (T-59)

Use 20 gauge wire to connect the sensor to the controller. The wire is suitable for distances of up to 500 ft. Use a three-conductor shielded cable for the sensor and setpoint adjustment connections. If the setpoint adjustment (slidebar) is not required, then an unshielded, 18 or 20 gauge, two-conductor, twisted pair cable may be used.

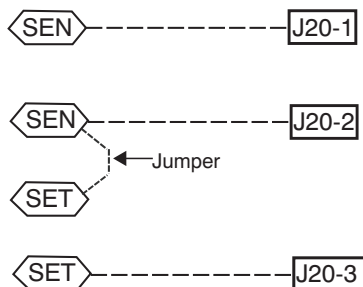
Connect T-55: See Fig. 33 for typical T-55 internal connections. Connect the T-55 SEN terminals to RTU Open J20-1 and J20-2. See Fig. 49.



C08460

Fig. 49 - RTU Open T-55 Sensor Connections

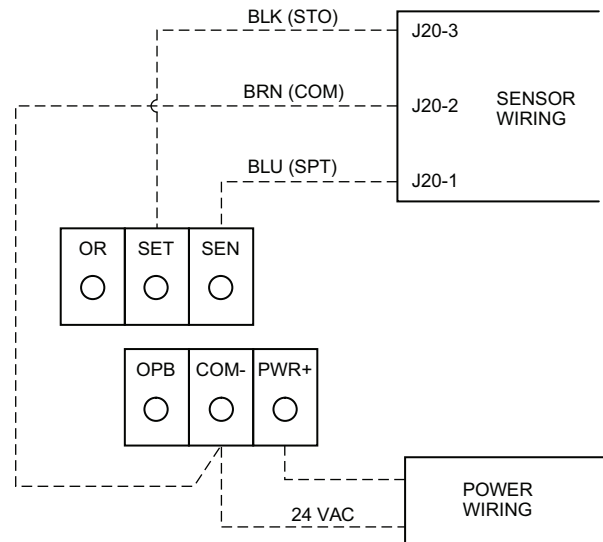
Connect T-56: See Fig. 35 for T-56 internal connections. Install a jumper between SEN and SET terminals as illustrated. Connect T-56 terminals to RTU Open J20-1, J20-2 and J20-3 per Fig. 50.



C08461

Fig. 50 - RTU Open T-56 Sensor Connections

Connect T-59: The T-59 space sensor requires a separate, isolated power supply of 24 VAC. See Fig. 51 for internal connections at the T-59. Connect the SEN terminal (BLU) to RTU Open J20-1. Connect the COM terminal (BRN) to J20-2. Connect the SET terminal (STO or BLK) to J20-3.



NOTE: Must use a separate isolated transformer.

C10291

Fig. 51 - Space Temperature Sensor Typical Wiring (33ZCT59SPT)

Indoor Air Quality (CO₂) Sensor —

The indoor air quality sensor accessory monitors space carbon dioxide (CO₂) levels. This information is used to monitor IAQ levels. Several types of sensors are available, for wall mounting in the space or in return duct, with and without LCD display, and in combination with space temperature sensors. Sensors use infrared technology to measure the levels of CO₂ present in the space air.

The CO₂ sensors are all factory set for a range of 0 to 2000 ppm and a linear mA output of 4 to 20. Refer to the instructions supplied with the CO₂ sensor for electrical requirements and terminal locations. See Fig. 38 for typical CO₂ sensor wiring schematic.

To accurately monitor the quality of the air in the conditioned air space, locate the sensor near a return-air grille (if present) so it senses the concentration of CO₂ leaving the space. The sensor should be mounted in a location to avoid direct breath contact.

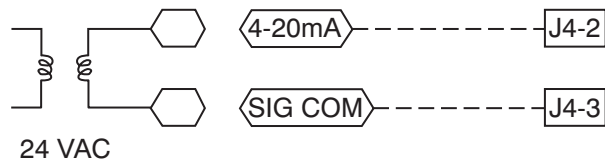
Do not mount the IAQ sensor in drafty areas such as near supply ducts, open windows, fans, or over heat sources. Allow at least 3 ft (0.9 m) between the sensor and any corner. Avoid mounting the sensor where it is influenced by the supply air; the sensor gives inaccurate readings if the supply air is blown directly onto the sensor or if the supply air does not have a chance to mix with the room air before it is drawn into the return airstream.

Wiring the Indoor Air Quality Sensor: For each sensor, use two 2-conductor 18 AWG (American Wire Gauge) twisted-pair cables (unshielded) to connect the separate

isolated 24 vac power source to the sensor and to connect the sensor to the RTU Open control board terminals.

To connect the sensor to the control, identify the positive (4 to 20 mA) and ground (SIG COM) terminals on the sensor. See Fig. 38. Connect the 4-20 mA terminal to RTU Open J4-2 and connect the SIG COM terminal to RTU Open J4-3. See Fig. 52.

IAQ Sensor



C10738

Fig. 52 - RTU Open / Indoor CO₂ Sensor (33ZCSENCO2) Connections

Outdoor Air Quality Sensor

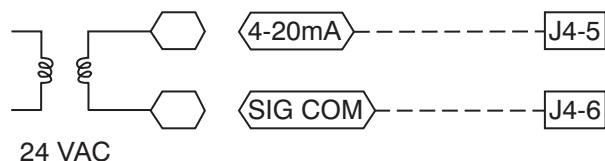
(PNO 33ZCSENCO2 plus weatherproof enclosure) —

The outdoor air CO₂ sensor is designed to monitor carbon dioxide (CO₂) levels in the outside ventilation air and interface with the ventilation damper in an HVAC system. The OAQ sensor is packaged with an outdoor cover. See Fig. 40. The outdoor air CO₂ sensor must be located in the economizer outside air hood.

Wiring the Outdoor Air CO₂ Sensor: A dedicated power supply is required for this sensor. A two-wire cable is required to wire the dedicated power supply for the sensor. The two wires should be connected to the power supply and terminals 1 and 2.

To connect the sensor to the control, identify the positive (4 to 20 mA) and ground (SIG COM) terminals on the OAQ sensor. See Fig. 38. Connect the 4 to 20 mA terminal to RTU Open J4-5. Connect the SIG COM terminal to RTU Open J4-6. See Fig. 53.

OAQ Sensor/RH Sensor



C10739

Fig. 53 - RTU Open / Outdoor CO₂ Sensor (33ZCSENCO2) Connections

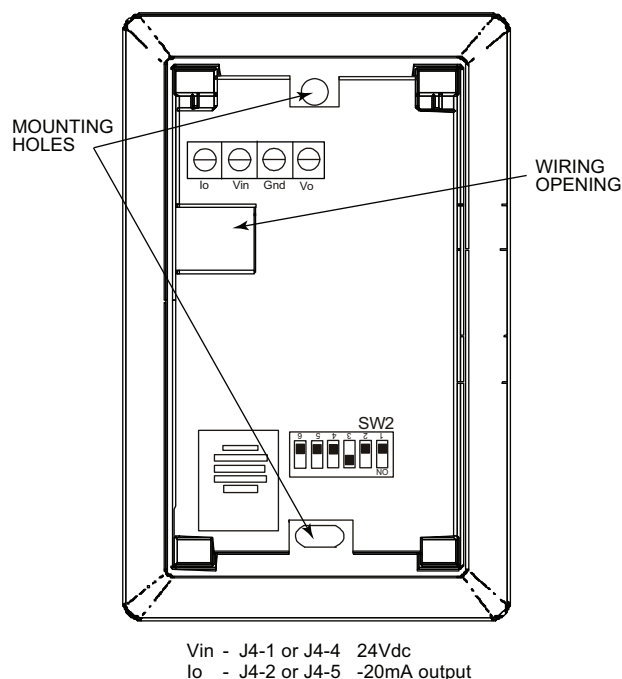
Space Relative Humidity Sensor or Humidistat —

Relative Humidity Sensors (Space or Duct Mounted):

The accessory space humidity sensor (33ZCSENSRH-01) or duct humidity sensor (33ZCSENDRH-01) is used to measure the relative humidity of air within the space or return air duct. For wiring distances up to 500 ft (152 m), use a 3-conductor, 18 or 20 AWG shielded cable. The shield must be removed from the sensor end of the cable and grounded at the unit end. The current loop power for sensor is provided by the RTU Open controller as 24vdc. Refer to the instructions supplied with the RH sensor for the electrical requirements and terminal locations. RTU Open configurations must be changed after adding an RH sensor. See Fig. 54 and 55 for typical RH sensor wiring.

- J4-1 or J4-4 = 24vdc loop power
- J4-2 or J4-5 = 4-20mA signal input

NOTE: The factory default for dehumidification control is normally open humidistat.



C11087

Fig. 54 - Space Relative Humidity Sensor Typical Wiring

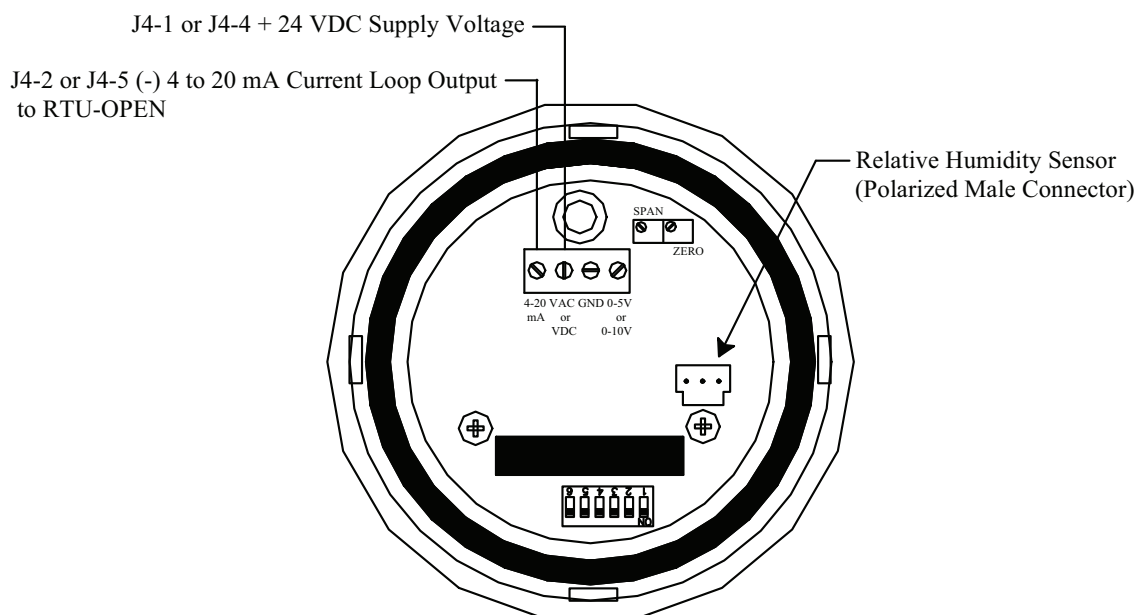


Fig. 55 - Duct Relative Humidity Sensor Typical Wiring

C10839

Humidistat: The accessory humidistat provides the RTU Open insight to the relative humidity in the space. The humidistat reads the RH level in the space and compares it to its setpoint to operate a dry contact. The humidistat is a dedicated input on the configurable input 9 and tells the RTU Open when the RH level is HIGH or LOW. The normal condition for humidity is LOW.

To wire in the field:

- J5-8 = 24 VAC source for dry contact
- J5-7 = Signal input

Smoke Detector/Fire Shutdown (FSD) —

The Fire Shutdown Switch configuration, *MENU→Config→Inputs→input 5*, identifies the normally open status of this input when there is no fire alarm.

On 50TCQ units equipped with factory-installed Smoke Detector(s), the smoke detector controller implements the unit shutdown through its NC contact set connected to the unit's CTB input. The FSD function is initiated via the smoke detector's Alarm NO contact set. The RTU Open controller communicates the smoke detector's tripped status to the BAS building control. See Fig. 48, the RTU Open System Control Wiring schematic.

Connecting Discrete Inputs —

Filter Status: The filter status accessory is a field-installed accessory. This accessory detects plugged filters. When installing this accessory, the unit must be configured for filter status by setting *MENU→Config→Inputs→input 3, 5, 8, or 9* to Filter Status and normally open (N/O) or normally closed (N/C). Input 8 or 9 is recommended for easy of installation. Refer to Fig. 47 and Fig. 48 for wire terminations at J5.

Fan Status: The fan status accessory is a field-installed accessory. This accessory detects when the indoor fan is blowing air. When installing this accessory, the unit must be configured for fan status by setting *MENU→Config→Inputs→input 3, 5, 8, or 9* to Fan Status and normally open (N/O) or normally closed (N/C). Input 8 or 9 is recommended for easy of installation. Refer to Fig. 47 and Fig. 48 for wire terminations at J5.

Remote Occupancy: The remote occupancy accessory is a field-installed accessory. This accessory overrides the unoccupied mode and puts the unit in occupied mode. When installing this accessory, the unit must be configured for remote occupancy by setting *MENU→Config→Inputs→input 3, 5, 8, or 9* to Remote Occupancy and normally open (N/O) or normally closed (N/C).

Also set *MENU→Schedules→occupancy source* to DI on/off. Input 8 or 9 is recommended for easy of installation. Refer to Fig. 47 and Table 7 for wire terminations at J5.

Power Exhaust (output): The relay used by the RTU Open board to control power exhaust is a dry contact which means it does not have 24vac. This 24vac must be connected to the relay to allow it to operate the power exhaust relay in the PE accessory. A 24vac source must be provided to J11-2 on the RTU Open control board. This can be provided by the unit's transformer from various sources. The "R" terminal on the unit's low voltage terminal board (LVTB) is a logical source. Refer to Fig. 47 and Fig. 48 for wire terminations at J11.

Communication Wiring - Protocols

General —

Protocols are the communication languages spoken by control devices. The main purpose of a protocol is to communicate information in the most efficient method possible. Different protocols exist to provide different kinds of information for different applications. In the BAS application, many different protocols are used, depending on manufacturer. Protocols do not change the function of a controller; just make the front end user different.

The RTU Open can be set to communicate on four different protocols: BACnet, Modbus, N2, and LonWorks. Switch 3 (SW3) on the board is used to set protocol and baud rate. Switches 1 and 2 (SW1 and SW2) are used to set the board’s network address. See Fig. 56 and 57 for protocol switch settings and address switches. The 3rd party connection to the RTU Open is through plug J19. See Fig. 58 for wiring.

NOTE: Power must be cycled after changing the SW1-3 switch settings.

Refer to the *RTU Open v2 Integration Guide* for more detailed information on protocols, 3rd party wiring, and networking.

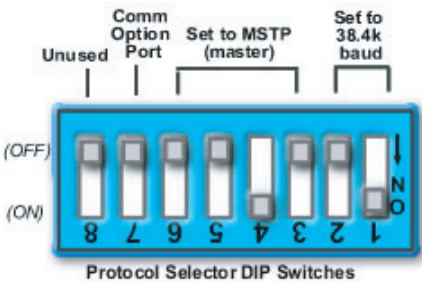
SW3 Protocol Selection

PROTOCOL	DS8	DS7	DS6	DS5	DS4	DS3	DS2	DS1
BACnet MS/TP (Master)	Unused	OFF	OFF	OFF	ON	OFF	Select Baud	Select Baud
Modbus (Slave)	Unused	OFF	OFF	ON	ON	OFF	Select Baud	Select Baud
N2 (Slave)	Unused	OFF	OFF	OFF	ON	ON	OFF	OFF
LonWorks	Unused	ON	ON	OFF	ON	OFF	OFF	ON

NOTE:
DS = Dip Switch
BACnet MS/TP SW3 example shown

Baud Rate Selections

BAUD RATE	DS2	DS1
9600	OFF	OFF
19,200	ON	OFF
38,400	OFF	ON
76,800	ON	ON



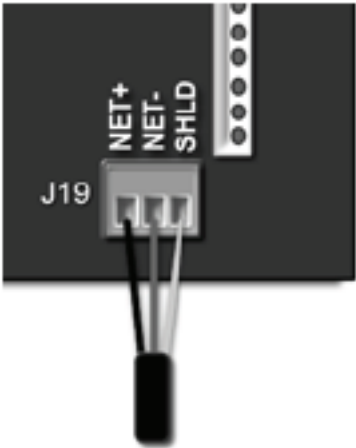
C07166

Fig. 56 - RTU Open SW3 Dip Switch Settings



C10815

Fig. 57 - RTU Open Address Switches



C10816

Fig. 58 - Network Wiring

Local Access —

BACview⁶ Handheld: The BACview⁶ is a keypad/display interface used to connect to the RTU Open to access the control information, read sensor values, and test the RTU, see Fig. 59. This is an accessory interface that does not come with the RTU Open controller and can only be used at the unit. Connect the BACview⁶ to the RTU Open J12 local access port. There are two password protected levels in the display (User and Admin). The user password is defaulted to 0000 but can be changed. The Admin password is 1111 and cannot be changed. There is a 10 minute auto logout if a screen is idle. See Appendix A of 48-50HCTQ-02T (or later), for navigation and screen content.

Virtual BACview: Virtual BACview is a freeware computer program that functions as the BACview⁶ Handheld. The

USB Link interface (USB-L) is required to connect a computer to the RTU Open board. The link cable connects a USB port to the J12 local access port. This program functions and operates identical to the handheld.

RTU Open Troubleshooting —

Communication LEDs: The LEDs indicate if the controller is speaking to the devices on the network. The LEDs should reflect communication traffic based on the baud rate set. The higher the baud rate the more solid the LEDs will appear. See Table 8.

NOTE: Refer to Catalog No. 48-50HCTQ-02T (or later) for complete configuration of RTU Open, operating sequences and troubleshooting information. Refer to *RTU Open v2 Integration Guide* for details on configuration and troubleshooting of connected networks. Have a copy of these manuals available at unit start-up.

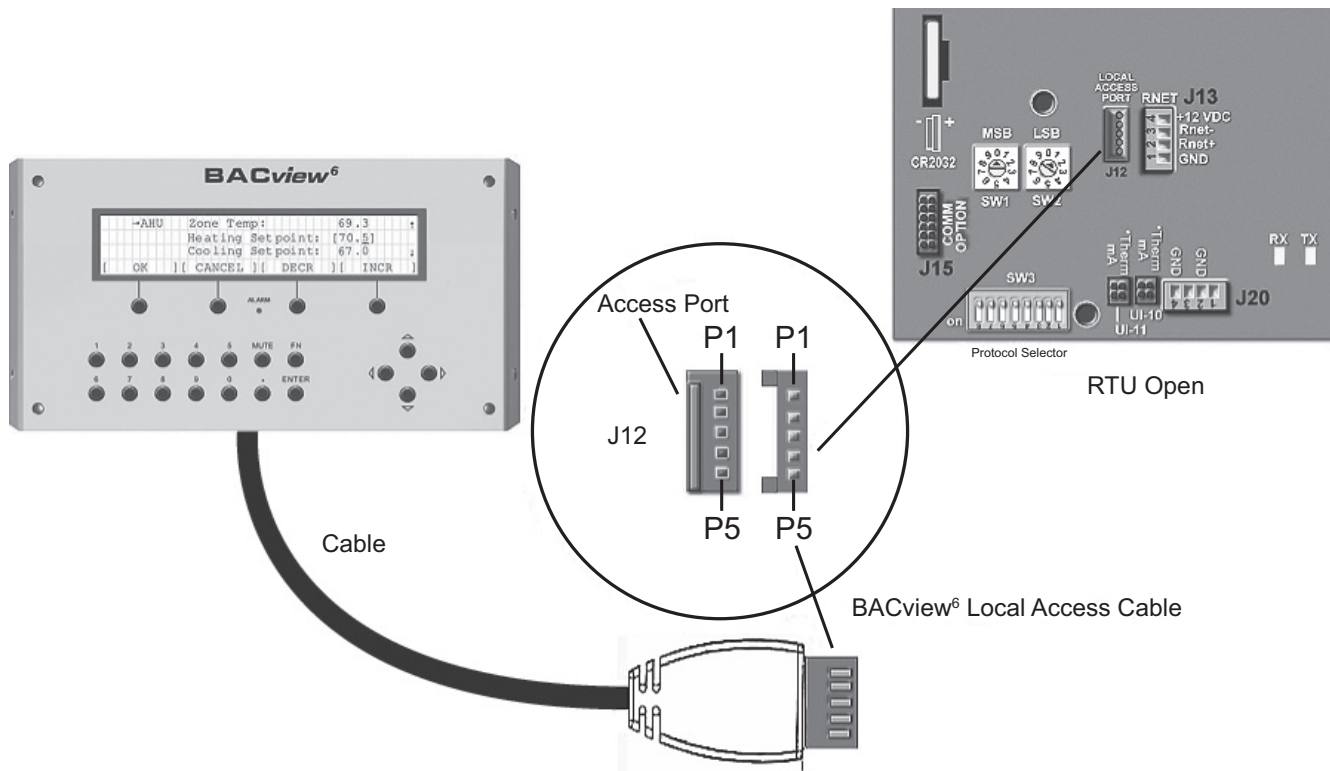


Fig. 59 - BACview⁶ Handheld Connections

C10812

Table 8 – LEDs

The LED's on the RTU Open show the status of certain functions

If this LED is on...	Status is...
Power	The RTU Open has power
Rx	The RTU Open is receiving data from the network segment
Tx	The RTU Open is transmitting data over the network segment
DO#	The digital output is active

The **Run** and **Error** LED's indicate control module and network status

If Run LED shows...	And Error LED shows...	Status is...
2 flashes per second	Off	Normal
2 flashes per second	2 flashes, alternating with Run LED	Five minute auto–restart delay after system error
2 flashes per second	3 flashes, then off	Control module has just been formatted
2 flashes per second	4 flashes, then pause	Two or more devices on this network have the same MSTP network address
2 flashes per second	On	Exec halted after frequent system errors or control programs halted
5 flashes per second	On	Exec start–up aborted, Boot is running
5 flashes per second	Off	Firmware transfer in progress, Boot is running
7 flashes per second	7 flashes per second, alternating with Run LED	Ten second recovery period after brownout
14 flashes per second	14 flashes per second, alternating with Run LED	Brownout
On	On	Failure. Try the following solutions: – Turn the RTU Open off, then on. – Format the RTU Open. – Download memory to the RTU Open. – Replace the RTU Open.

Outdoor Air Enthalpy Control (PNO 33CSENTHSW)

The enthalpy control (33CSENTHSW) is available as a field-installed accessory to be used with the EconoMi\$er2 damper system. The outdoor air enthalpy sensor is part of the enthalpy control. (The separate field-installed accessory return air enthalpy sensor (33CSENSEN) is required for differential enthalpy control. See Fig. 60.)

Locate the enthalpy control in the economizer next to the Actuator Motor. Locate two GRA leads in the factory harness and connect the gray lead labeled “ESL” to the terminal labeled “LOW”. See Fig. 60. Connect the enthalpy control power input terminals to economizer actuator power leads RED (connect to 24V) and BLK (connect to GND).

The outdoor enthalpy changeover setpoint is set at the enthalpy controller.

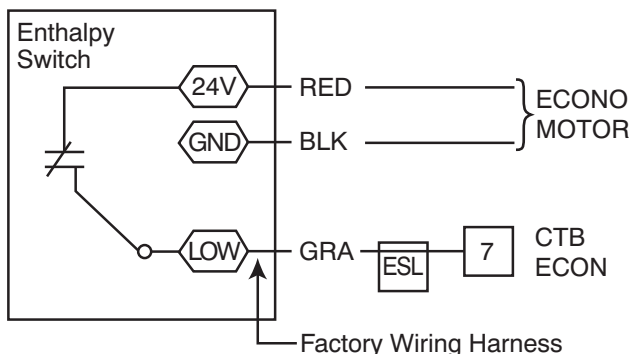


Fig. 60 - Enthalpy Switch (33CSENTHSW) Connections

C09026

Differential Enthalpy Control —

Differential enthalpy control is provided by sensing and comparing the outside air and return air enthalpy conditions. Install the outdoor air enthalpy control as described above. Add and install a return air enthalpy sensor (see Fig.61).

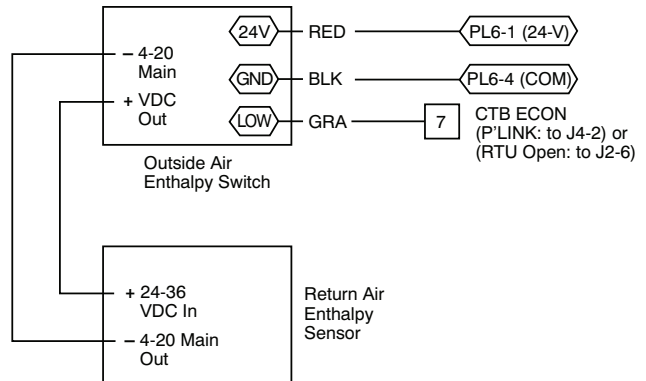


Fig. 61 - Outside & Return Air Enthalpy Sensor Wiring

C11161

To wire the return air enthalpy sensor, perform the following:

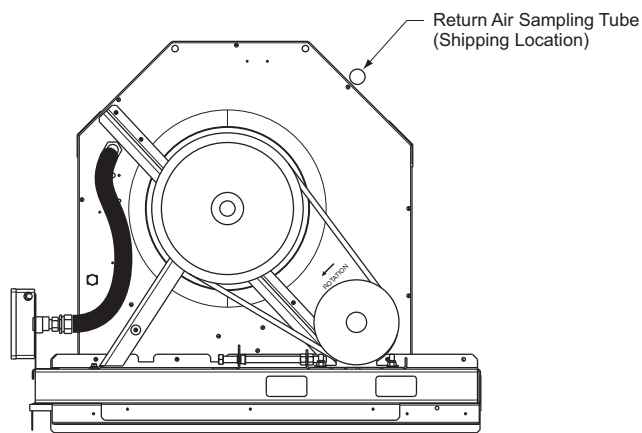
1. Use a 2-conductor, 18 or 20 AWG, twisted pair cable to connect the return air enthalpy sensor to the enthalpy controller.
2. Connect the field-supplied RED wire to (+) spade connector on the return air enthalpy sensor and the (+) terminal on the enthalpy controller. Connect the BLK wire to (-) spade connector on the return air enthalpy sensor and the (-) terminal on the enthalpy controller.

Smoke Detectors

Smoke detectors are available as factory-installed options on 50TCQD models. Smoke detectors may be specified for Supply Air only or for Return Air without or with economizer or in combination of Supply Air and Return Air. The unit is factory-configured for immediate smoke detector shutdown operation; additional wiring or modifications to unit terminal board may be necessary to complete the unit and smoke detector configuration to meet project requirements.

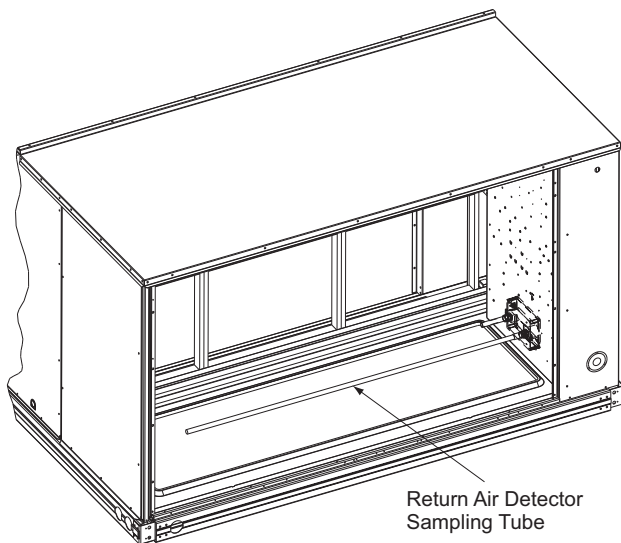
Return Air Sensor Tube Installation –

The return air sampling tube is shipped in the unit's supply fan section, attached to the blower housing (see Fig. 62). Its operating location is in the return air section of the unit (see Fig. 63, unit without economizer, or Fig. 64, unit with economizer), inserted into the return air sensor module housing which protrudes through the back of the control box.



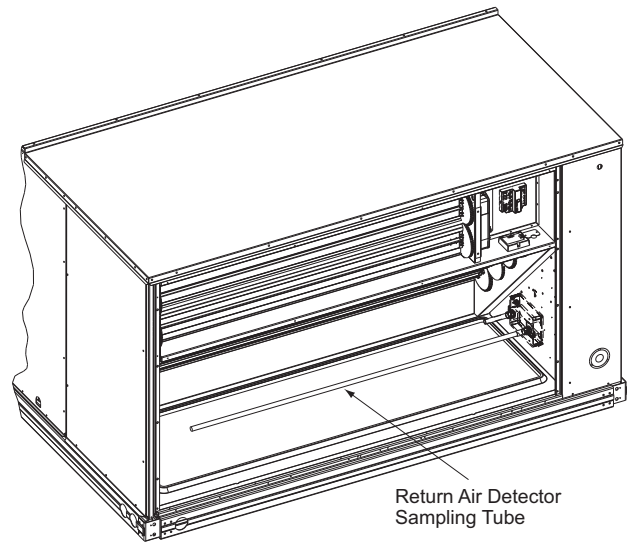
C09102

Fig. 62 - Typical Supply Air Smoke Detector Sensor Location



C09135

Fig. 63 - Return Air Sampling Tube Location in Unit without Economizer



C09136

Fig. 64 - Return Air Sampling Tube Location in Unit with Economizer

To install the return air sensor sampling tube:

1. Remove the tube from its shipping location.
2. Open the unit end to access the return air sensor (located on right-hand partition)
3. Orient the tube's sampling holes into the return air flow direction. Position the sampling holes on the bottom of the tube, facing into the bottom return duct opening.
4. Insert the sampling tube into the return air sensor module until the tube snaps into position.
5. Replace end panel or outside air hood.

Smoke Detector Test Magnet —

Locate the magnet; it is shipped in the control box area.

Additional Application Data —

Refer to Catalog No. HKRNKA-1XA for discussions on additional control features of these smoke detectors including multiple unit coordination.

ELECTRICAL DATA FOR UNITS PRODUCED ON OR AFTER JULY 30, 2012

NOTE: Check the serial number of unit to verify production date.

To confirm the date of manufacture, locate the unit nameplate and check the first four digits of the Serial Number. If the number listed in the first 4 digits of the Serial Number is 3112 or higher, the unit was produced on or after July 30, 2012.

Position:	1	2	3	4	5	6	7	8	9	10
Example:	3	1	1	2	U	1	2	3	4	5

Week of manufacture
(fiscal calendar)

Sequence number

Year of manufacture
("12" = 2012)

Manufacturing location

C12562A

50TCQD

Legend and Notes for Tables 9 - 12

LEGEND:

BRKR	–	Circuit breaker
CO	–	Convenient outlet
DD	–	Direct drive
	–	indoor fan motor
DISC	–	Disconnect
FLA	–	Full load amps
IFM	–	Indoor fan motor
LRA	–	Locked rotor amps
MCA	–	Minimum circuit amps
PE	–	Power exhaust
PWRD CO	–	Powered convenient outlet
UNPWR CO	–	Unpowered convenient outlet



NOTES:

1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.

2. Unbalanced 3-Phase Supply Voltage

Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percentage of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 230-3-60



AB = 224 v
BC = 231 v
AC = 226 v

$$\begin{aligned} \text{Average Voltage} &= \frac{(224 + 231 + 226)}{3} = \frac{681}{3} \\ &= 227 \end{aligned}$$

Determine maximum deviation from average voltage.

(AB) 227 – 224 = 3 v

(BC) 231 – 227 = 4 v

(AC) 227 – 226 = 1 v

Maximum deviation is 4 v.

Determine percent of voltage imbalance.

$$\begin{aligned} \% \text{ Voltage Imbalance} &= 100 \times \frac{4}{227} \\ &= 1.76\% \end{aligned}$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

Table 9 – Unit Wire/Fuse or HACR Breaker Sizing Data – Units Produced On or After July 30, 2012

UNIT	IFM-TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.						w/ PWRD C.O.					
		CHHEATER***A00 VERT/HORZ	Nom(kW)	FLA	NO P.E.			w/ P.E. (pwrd fr/unit)			NO P.E.			w/ P.E. (pwrd fr/unit)		
					MCA	MAX FUSE or HACR BRKR	DISC. SIZE FLA LRA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE FLA LRA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE FLA LRA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE FLA LRA
50TCQ*17	NO M.V.-Ph-HZ	STD	NONE	-	69.2/69.1	90/90	72/72 409	81.0/80.9	100/100	86/86 429	74.0/73.9	90/90	78/78 414	85.8/85.7	100/100	91/91 434
					134.3/144.2	150/150	132/141 461/469	146.1/156.0	150/175	146/155 481/489	139.1/149.0	150/150	138/147 466/474	150.9/160.8	175/175	151/160 486/494
					199.4/189.4	200/200	192/211 513/529	211.2/201.2	225/225	206/224 533/549	204.2/194.2	225/225	198/216 518/534	216.0/206.0	225/225	211/230 538/554
					225.6/249.5	250/300	252/280 565/589	237.4/261.3	250/300	266/293 585/609	230.4/254.3	250/300	258/285 570/594	242.2/266.1	250/300	271/299 590/614
208/230-3-60	MED	NONE	-	-	71.4	90	75 423	83.2	100	88 443	76.2	100	80 428	88.0	100	94 448
					136.5/146.5	150/150	135/144 475/483	148.3/158.3	150/175	148/158 495/503	141.3/151.3	150/175	140/150 480/488	153.1/163.1	175/175	154/163 500/508
					201.6/191.7	225/200	195/213 527/543	213.4/203.5	225/225	208/227 547/563	206.4/196.5	225/225	200/219 532/548	218.2/208.3	225/225	214/232 552/568
					227.8/251.8	250/300	255/282 579/603	239.6/263.6	250/300	268/296 599/623	232.6/256.6	250/300	260/288 584/608	244.4/268.4	300/300	274/301 604/628
460-3-60	HIGH	NONE	-	-	74.4/73.5	90/90	78/77 425	86.2/85.3	100/100	92/91 445	79.2/78.3	100/100	84/83 430	91.0/90.1	100/100	97/96 450
					139.5/148.6	150/150	138/146 477/485	151.3/160.4	175/175	152/160 497/505	144.3/153.4	150/175	144/152 482/490	156.1/165.2	175/175	157/165 502/510
					204.6/193.8	225/225	199/216 529/545	216.4/205.6	225/225	212/229 549/565	208.4/198.6	225/225	204/221 534/550	221.2/210.4	225/225	217/235 554/570
					230.8/253.9	250/300	258/285 581/605	242.6/265.7	250/300	272/298 601/625	235.6/258.7	250/300	264/290 586/610	247.4/270.5	300/300	277/304 606/630
50TCQ*17	STD	NONE	-	-	34.4	45	36 242	40.6	50	43 254	36.6	45	39 244	42.8	50	46 256
					72.0	80	71 272	78.2	80	78 284	74.2	80	73 274	80.4	90	80 286
					94.5	100	105 302	100.7	110	112 314	96.7	100	108 304	102.9	110	115 316
					124.6	150	140 332	130.8	150	147 344	126.8	150	142 334	133.0	150	149 346
460-3-60	MED	NONE	-	-	35.5	45	37 249	41.7	50	44 261	37.7	45	40 251	43.9	50	47 263
					73.1	80	72 279	79.3	80	79 291	75.3	80	74 281	81.5	90	82 293
					95.6	100	106 309	101.8	110	114 321	97.8	110	109 311	104.0	110	116 323
					125.7	150	141 339	131.9	150	148 351	127.9	150	144 341	134.1	150	151 353
50TCQ*17	HIGH	NONE	-	-	36.6	45	39 250	42.8	50	46 262	38.8	50	41 252	45.0	50	48 264
					74.2	80	73 280	80.4	90	80 292	76.4	80	76 282	82.6	90	83 294
					96.7	100	108 310	102.9	110	115 322	98.9	110	110 312	105.1	110	117 324
					126.8	150	142 340	133.0	150	149 352	129.0	150	145 342	135.2	150	152 354
575-3-60	STD	NONE	-	-	24.9	30	26 184	29.7	35	32 192	26.6	30	28 186	31.4	40	33 194
					54.7	60	53 208	59.5	60	59 216	56.4	60	55 210	61.2	70	61 218
					84.5	90	81 232	89.3	90	86 240	86.2	90	83 234	91.0	100	88 242
					96.5	100	108 256	101.3	110	114 264	98.2	110	110 258	103.0	110	116 266
575-3-60	MED	NONE	-	-	24.9	30	26 184	29.7	35	32 192	26.6	30	28 186	31.4	40	33 194
					54.7	60	53 208	59.5	60	59 216	56.4	60	55 210	61.2	70	61 218
					84.5	90	81 232	89.3	90	86 240	86.2	90	83 234	91.0	100	88 242
					96.5	100	108 256	101.3	110	114 264	98.2	110	110 258	103.0	110	116 266
575-3-60	HIGH	NONE	-	-	27.7	30	29 198	32.5	40	35 206	29.4	35	31 200	34.2	40	37 208
					57.5	60	57 222	62.3	70	62 230	59.2	60	59 224	64.0	70	64 232
					87.3	90	84 246	92.1	100	90 254	89.0	90	86 248	93.8	100	92 256
					99.3	110	112 270	104.1	110	117 278	101.0	110	114 272	105.8	110	119 280

See: "Legend and Notes for Tables 9 – 12" on page 41.

Table 9 - Unit Wire/Fuse or HACR Breaker Sizing Data - Units Produced On or After July 30, 2012 (cont)

UNIT	NO M. V-PH-HZ	ELEC. HTR			NO C.O. or UNPWR C.O.						w/ PWRD C.O.								
		IFM-TYPE	Nom(kW)	FLA	NO P.E.			w/ P.E. (pwrd fr/unit)			NO P.E.			w/ PWRD C.O.					
					MCA	MAX FUSE or HACR BRKR	DISC. SIZE FLA LRA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE FLA LRA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE FLA LRA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE FLA LRA			
50TCA*24	STD**	NONE	-	-	91.3/90.4	95/94	564	103.1/102.2	125/125	109/108	584	96.1/95.2	101/100	569	107.9/107.0	125/125	115/114	589	
		279/-/-/-A00	18.8/25.0	52.1/60.1	156.5/165.6	155/164	616/624	168.3/177.4	175/200	169/177	636/644	161.3/170.4	161/169	621/629	173.1/182.2	175/200	174/183	641/649	
		280/-/-/-A00	37.6/50.0	104.2/120.3	221.6/210.7	215/233	668/684	233.4/222.5	250/250	229/246	688/704	226.4/215.5	221/238	673/689	238.2/227.3	250/250	234/252	693/709	
		281/-/-/-A00	56.3/75.0	156.4/180.4	247.7/270.8	275/302	720/744	259.5/282.6	300/300	289/315	740/764	252.5/275.6	300/300	281/307	725/749	264.3/287.4	300/300	294/321	745/769
208/230-3-60	MED-High Efficiency	NONE	-	-	94.8	99	560	106.6	125	113	580	99.6	105	565	111.4	125	119	585	
		279/270A00	18.8/25.0	52.1/60.1	160.0/170.0	159/169	612/620	171.8/181.8	175/200	173/182	632/640	164.8/174.8	175/175	161/174	617/625	176.6/186.6	200/200	178/188	637/645
		280/271A00	37.6/50.0	104.2/120.3	225.1/215.1	219/238	664/680	236.9/226.9	250/250	233/251	684/700	229.9/219.9	250/250	225/243	669/685	241.7/231.7	250/250	238/257	689/705
		281/272A00	56.3/75.0	156.4/180.4	251.2/275.2	279/307	716/740	263.0/287.0	300/300	293/321	736/760	256.0/280.0	300/300	285/312	721/745	267.8/291.8	300/350	298/326	741/765
460-3-60	HIGH-High Efficiency	NONE	-	-	106.2	113	639	118.0	150	126	659	111.0	125	118	122.8	150	132	664	
		279/270A00	18.8/25.0	52.1/60.1	171.4/181.4	173/182	691/699	183.2/193.2	200/200	186/195	711/719	176.2/186.2	200/200	178/187	696/704	188.0/198.0	200/200	192/201	716/724
		280/271A00	37.6/50.0	104.2/120.3	236.5/226.5	232/251	743/759	248.3/238.3	250/250	246/265	763/779	241.3/231.3	250/250	238/256	748/764	253.1/243.1	300/300	252/270	768/784
		281/272A00	56.3/75.0	156.4/180.4	262.6/286.6	292/320	795/819	274.4/298.4	300/350	306/334	815/839	267.4/291.4	300/300	298/326	800/824	279.2/303.2	300/350	312/339	820/844
50TCA*24	STD**	NONE	-	-	49.1	51	291	55.3	60	58	303	51.3	60	293	57.5	70	61	305	
		282/-/-/-A00	25.0	30.1	86.7	86	321	92.9	100	93	333	88.9	90	323	95.1	100	96	335	
		283/-/-/-A00	50.0	60.1	109.2	120	351	115.4	125	128	363	111.4	125	123	353	117.6	125	130	365
		284/-/-/-A00	75.0	90.2	139.3	155	381	145.5	150	162	393	141.5	150	158	383	147.7	175	165	395
460-3-60	MED-High Efficiency	NONE	-	-	51.3	54	289	57.5	70	61	301	53.5	60	291	59.7	70	63	303	
		282/273A00	25.0	30.1	88.9	88	319	95.1	100	96	331	91.1	100	91	321	97.3	100	98	333
		283/274A00	50.0	60.1	111.4	123	349	117.6	125	130	361	113.6	125	125	351	119.8	125	133	363
		284/275A00	75.0	90.2	141.5	158	379	147.7	175	165	391	143.7	150	160	381	149.9	175	167	393
50TCA*24	HIGH-High Efficiency	NONE	-	-	57.0	60	329	63.2	80	68	341	59.2	70	331	65.4	80	70	343	
		282/273A00	25.0	30.1	94.6	95	359	100.8	110	102	371	96.8	100	98	361	103.0	110	105	373
		283/274A00	50.0	60.1	117.1	129	389	123.3	150	137	401	119.3	125	132	391	125.5	150	139	403
		284/275A00	75.0	90.2	147.2	164	419	153.4	175	171	431	149.4	175	167	421	155.6	175	174	433
50TCA*24	STD**	NONE	-	-	36.2	38	204	41.0	50	43	212	37.9	50	206	42.7	50	45	214	
		285/-/-/-A00	24.8	23.9	66.1	65	228	70.9	80	71	236	67.8	70	67	230	72.6	80	73	238
		286/-/-/-A00	49.6	47.7	95.8	93	252	100.6	110	98	260	97.5	100	95	254	102.3	110	100	262
		287/-/-/-A00	74.4	71.6	107.8	120	276	112.6	125	126	284	109.5	125	125	278	114.3	125	128	286
575-3-60	MED-High Efficiency	NONE	-	-	38.2	40	202	43.0	50	46	210	39.9	50	204	44.7	50	48	212	
		285/276A00	24.8	23.9	68.1	68	226	72.9	80	73	234	69.8	70	70	228	74.6	80	75	236
		286/277A00	49.6	47.7	97.8	95	250	102.6	110	101	258	99.5	100	97	252	104.3	110	103	260
		287/278A00	74.4	71.6	109.8	123	274	114.6	125	128	282	111.5	125	125	276	116.3	125	130	284
50TCA*24	HIGH-High Efficiency	NONE	-	-	40.1	42	229	44.9	50	48	237	41.8	50	231	46.6	50	50	239	
		285/276A00	24.8	23.9	70.0	70	253	74.8	80	75	261	71.7	80	72	255	76.5	80	77	263
		286/277A00	49.6	47.7	99.7	97	277	104.5	110	103	285	101.4	110	99	279	106.2	110	105	287
		287/278A00	74.4	71.6	111.7	125	301	116.5	125	130	309	113.4	125	127	303	118.2	125	132	311

See: "Legend and Notes for Tables 9 – 12" on page 41.

** STD IFM not available on horizontal 50TCA*24. STD IFM is available on vertical 50TCA*24

50TCA*24

Table 10 – Unit Wire/Fuse or HACR Breaker Sizing Data with Factory Installed 2 Speed Indoor Fan Option - Units Produced On or After July 30, 2012

UNIT	NO M, V-Ph-HZ	ELEC. HTR			NO C.O. or UNPWR C.O.						w/ P.E. (pwrd fr/unit)						NO P.E.						w/ PWRD C.O.					
		CRHEATER***A00 VERT/HORZ	Nom(kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		FLA	LRA						
							FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA								
STD		NONE	—	—	69.4/68.6	90/90	73/72	390	81.2/80.4	100/100	86/85	410	74.2/73.4	90/90	78/77	395	86.0/85.2	100/100	92/91	415								
		279/270A00	18.8/25.0	52.1/60.1	134.5/143.7	150/150	132/141	442/450	146.3/155.5	150/175	146/154	482/470	139.3/148.5	150/150	138/146	447/455	151.1/160.3	175/175	152/160	467/475								
		280/271A00	37.6/50.0	104.2/120.3	199.6/188.9	200/200	192/210	494/510	211.4/200.7	225/225	206/224	514/530	204.4/193.7	225/200	198/216	499/515	216.2/205.5	225/225	211/229	519/535								
		281/272A00	56.3/75.0	156.4/180.4	225.8/249.0	250/300	252/279	546/570	237.6/260.8	250/300	266/293	566/590	230.6/253.8	250/300	258/285	551/575	242.4/265.6	250/300	272/298	571/595								
MED	208/230-3-60	NONE	—	—	71.6/70.6	90/90	75/74	414	83.4/82.4	100/100	89/88	434	76.4/75.4	100/100	81/79	419	88.2/87.2	100/100	94/93	439								
		279/270A00	18.8/25.0	52.1/60.1	136.7/145.7	150/150	135/143	466/474	148.5/157.5	150/175	149/157	486/494	141.5/150.5	150/175	141/149	471/479	153.3/162.3	175/175	154/162	491/499								
		280/271A00	37.6/50.0	104.2/120.3	201.8/190.9	225/200	195/212	518/534	213.6/202.7	225/225	208/226	538/554	206.6/195.7	225/225	200/218	523/539	218.4/207.5	225/225	214/231	543/559								
		281/272A00	56.3/75.0	156.4/180.4	228.0/251.0	250/300	255/281	570/594	239.8/262.8	250/300	269/295	590/614	232.8/255.8	250/300	260/287	575/599	244.6/267.6	300/300	274/300	595/619								
HIGH		NONE	—	—	74.4/73.5	90/90	78/77	425	86.2/85.3	100/100	92/91	445	79.2/78.3	100/100	84/83	430	91.0/90.1	100/100	97/96	450								
		279/270A00	18.8/25.0	52.1/60.1	139.5/148.6	150/150	138/146	477/485	151.3/160.4	175/175	152/160	497/505	144.3/153.4	150/175	144/152	482/490	156.1/165.2	175/175	157/165	502/510								
		280/271A00	37.6/50.0	104.2/120.3	204.6/193.8	225/225	198/216	529/545	216.4/205.6	225/225	212/229	549/565	209.4/198.6	225/225	204/221	534/550	221.2/210.4	225/225	217/235	554/570								
		281/272A00	56.3/75.0	156.4/180.4	230.8/253.9	250/300	258/285	581/605	242.6/265.7	250/300	272/298	601/625	235.6/258.7	250/300	264/290	586/610	247.4/270.5	300/300	277/304	606/630								
STD		NONE	—	—	34.0	45	36	233	40.2	50	43	245	36.2	45	38	235	42.4	50	45	247								
		282/273A00	25.0	30.1	71.6	80	70	263	77.8	80	77	275	73.8	80	73	265	80.0	80	80	277								
		283/274A00	50.0	60.1	94.1	100	105	293	100.3	110	112	305	96.3	100	107	295	102.5	110	114	307								
		284/275A00	75.0	90.2	124.2	150	139	323	130.4	150	146	335	126.4	150	142	325	132.6	150	149	337								
MED	460-3-60	NONE	—	—	35.1	45	37	245	41.3	50	44	257	37.3	45	39	247	43.5	50	46	259								
		282/273A00	25.0	30.1	72.7	80	71	275	78.9	80	79	287	74.9	80	74	277	81.1	90	81	289								
		283/274A00	50.0	60.1	95.2	100	106	305	101.4	110	113	317	97.4	110	108	307	103.6	110	116	319								
		284/275A00	75.0	90.2	125.3	150	141	335	131.5	150	148	347	127.5	150	143	337	133.7	150	150	349								
HIGH		NONE	—	—	36.6	45	39	250	42.8	50	46	262	38.8	50	41	252	45.0	50	48	264								
		282/273A00	25.0	30.1	74.2	80	73	280	80.4	90	80	292	76.4	80	76	282	82.6	90	83	294								
		283/274A00	50.0	60.1	96.7	100	108	310	102.9	110	115	322	98.9	110	110	312	105.1	110	117	324								
		284/275A00	75.0	90.2	126.8	150	142	340	133.0	150	149	352	129.0	150	145	342	135.2	150	152	354								
STD		NONE	—	—	26.6	30	28	184	31.4	40	33	192	28.3	35	30	186	33.1	40	35	194								
		285/276A00	24.8	23.9	56.4	60	55	208	61.2	70	61	216	58.1	60	57	210	62.9	70	63	218								
		286/277A00	49.6	47.7	86.2	90	83	232	91.0	100	88	240	87.9	90	85	234	92.7	100	90	242								
		287/278A00	74.4	71.6	98.2	110	110	256	103.0	110	116	264	99.9	110	112	258	104.7	110	118	266								
MED	575-3-60	NONE	—	—	26.6	30	28	184	31.4	40	33	192	28.3	35	30	186	33.1	40	35	194								
		285/276A00	24.8	23.9	56.4	60	55	208	61.2	70	61	216	58.1	60	57	210	62.9	70	63	218								
		286/277A00	49.6	47.7	86.2	90	83	232	91.0	100	88	240	87.9	90	85	234	92.7	100	90	242								
		287/278A00	74.4	71.6	98.2	110	110	256	103.0	110	116	264	99.9	110	112	258	104.7	110	118	266								
HIGH		NONE	—	—	28.3	35	30	198	33.1	40	35	206	30.0	35	32	200	34.8	40	37	208								
		285/276A00	24.8	23.9	58.1	60	57	222	62.9	70	63	230	59.8	60	59	224	64.6	70	65	232								
		286/277A00	49.6	47.7	87.9	90	85	246	92.7	100	90	254	89.6	90	87	248	94.4	100	92	256								
		287/278A00	74.4	71.6	99.9	110	112	270	104.7	110	118	278	101.6	110	114	272	106.4	110	120	280								

See: "Legend and Notes for Tables 9 – 12" on page 41.

Table 10 - Unit Wire/Fuse or HACR Breaker Sizing Data with Factory Installed 2 Speed Indoor Fan Option - Units Produced On or After July 30, 2012 (cont)

UNIT	NO M. V-PH-HZ	ELEC. HTR			NO C.O. or UNPWR C.O.				w/ PWRD C.O.			
		CRHEATER**A00 VERT/HORZ	Nom(kW)	FLA	NO P.E.				NO P.E.			
					MCA	MAX FUSE or HACR BRKR	FLA	DISC. SIZE LRA	MCA	MAX FUSE or HACR BRKR	FLA	DISC. SIZE LRA
50TQC*24	460-3-60	STD**	NONE	-	91.3/90.4	100/100	95/94	564	103.1/102.2	125/125	109/108	584
					156.5/165.6	175/175	155/164	616/624	168.3/177.4	175/200	169/177	636/644
					221.6/210.7	225/225	215/233	668/684	233.4/222.5	250/250	229/246	688/704
					247.1/270.8	300/300	275/302	720/744	259.5/282.6	300/300	289/315	740/764
50TQC*24	208/230-3-60	MED	NONE	-	94.8	125	99	560	106.6	125	113	580
					160.0/170.0	175/175	159/169	612/620	171.8/181.8	175/200	173/182	632/640
					225.1/215.1	250/225	219/238	664/680	236.9/226.9	250/250	233/251	684/700
					251.2/275.2	300/300	279/307	716/740	263.0/287.0	300/300	293/321	736/760
50TQC*24	460-3-60	HIGH	NONE	-	106.2	125	113	639	118.0	150	126	659
					171.4/181.4	175/200	173/182	691/699	183.2/193.2	200/200	186/195	711/719
					236.5/226.5	250/250	232/251	743/759	248.3/238.3	250/250	246/265	763/779
					262.6/286.6	300/300	292/320	795/819	274.4/298.4	300/350	306/334	815/839
50TQC*24	460-3-60	STD**	NONE	-	49.1	60	51	291	55.3	60	58	303
					86.7	90	86	321	92.9	100	93	333
					109.2	125	120	351	115.4	125	123	363
					139.3	150	155	381	145.5	150	162	393
50TQC*24	460-3-60	MED	NONE	-	51.3	60	54	289	57.5	70	61	301
					88.9	90	88	319	95.1	100	96	331
					111.4	125	123	349	117.6	125	130	361
					141.5	150	158	379	147.7	175	165	391
50TQC*24	460-3-60	HIGH	NONE	-	57.0	70	60	329	63.2	80	68	341
					94.6	100	95	359	100.8	110	102	371
					117.1	125	129	389	123.3	150	137	401
					147.2	175	164	419	153.4	175	171	431
50TQC*24	460-3-60	STD**	NONE	-	36.8	45	39	204	41.6	50	44	212
					66.7	70	66	228	71.5	80	72	236
					96.4	100	93	252	101.2	110	99	260
					108.4	125	121	276	113.2	125	127	284
50TQC*24	460-3-60	MED	NONE	-	38.2	50	40	202	43.0	50	46	210
					68.1	70	68	226	72.9	80	73	234
					97.8	100	95	250	102.6	110	101	258
					109.8	125	123	274	114.6	125	128	282
50TQC*24	460-3-60	HIGH	NONE	-	40.1	50	42	229	44.9	50	48	237
					70.0	70	70	253	74.8	80	75	261
					99.7	100	97	277	104.5	110	103	285
					111.7	125	125	301	116.5	125	130	309

See: "Legend and Notes for Tables 9 - 12" on page 41.

** STD IFM not available on horizontal 50TQC*24. STD IFM is available on vertical 50TQC*24

50TQC0D

ELECTRICAL DATA FOR UNITS PRODUCED PRIOR TO JULY 30, 2012

NOTE: Check the serial number of unit to verify production date.

To confirm the date of manufacture, locate the unit nameplate and check the first four digits of the Serial Number. If the number listed in the first 4 digits of the Serial Number is 3012 or lower, the unit was produced prior to July 30, 2012.

Position:	1	2	3	4	5	6	7	8	9	10
Example:	3	0	1	2	U	1	2	3	4	5

Week of manufacture
(fiscal calendar)

Sequence number

Year of manufacture
("12" = 2012)

Manufacturing location

C13784

50TCQD

Table 11 – Unit Wire/Fuse or HACR Breaker Sizing Data - Units Produced Prior to July 30, 2012

UNIT	NO M. V.-Ph.-HZ	IFM- TYPE	ELEC. HTR		NO P.E.				NO C.O. or UNPWR C.O.				w/ P.E. (pwrdr fr/unit)				w/ PWRD C.O.				w/ P.E. (pwrdr fr/unit)			
			ELEC. HTR	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR		
							CRHEATER***A00 VERT/HORZ	Nom(KW)			FLA	FLA			LRA	FLA			LRA	FLA			LRA	FLA
		STD	NONE	—	18.8/25.0	52.1/60.1	—	68.3	90.0	71	393	80.1	100.0	85	413	73.1	90.0	77	398	84.9	100.0	90	418	
					279/270A00	18.8/25.0	52.1/60.1	133.4/143.4	150/150	131/140	445/453	145.2/155.2	150/175	145/154	485/473	138.2/148.2	150/150	137/146	450/458	150.0/160.0	150/175	150/160	470/478	
					280/271A00	37.6/50.0	104.2/120.3	198.5/188.6	200/200	191/210	497/513	210.3/200.4	225/225	205/223	517/533	203.3/193.4	225/200	197/215	502/518	215.1/205.2	225/225	210/229	522/538	
					281/272A00	56.3/75.0	156.4/180.4	224.7/248.7	250/300	251/279	549/573	236.5/260.5	250/300	265/292	569/593	229.5/253.5	250/300	257/284	554/578	241.3/265.3	250/300	270/298	574/598	
208/230-3-60		MED	NONE	—	18.8/25.0	52.1/60.1	—	71.0	90.0	74	410	82.8	100.0	88	430	75.8	100.0	80	415	87.6	100.0	93	435	
					279/270A00	18.8/25.0	52.1/60.1	136.1/146.1	150/150	134/144	462/470	147.9/157.9	150/175	148/157	482/490	140.9/150.9	150/175	140/149	467/475	152.7/162.7	175/175	153/163	487/495	
					280/271A00	37.6/50.0	104.2/120.3	201.2/191.3	225/200	194/213	514/530	213.0/203.1	225/225	208/226	534/550	206.0/196.1	225/225	200/218	519/535	217.8/207.9	225/225	213/232	539/555	
					281/272A00	56.3/75.0	156.4/180.4	227.4/251.4	250/300	254/282	566/590	239.2/263.2	250/300	268/295	586/610	232.2/256.2	250/300	260/287	571/595	244.0/268.0	300/300	273/301	591/615	
460-3-60		HIGH	NONE	—	18.8/25.0	52.1/60.1	—	75.8	100.0	80	419	87.6	100.0	93	439	80.6	100.0	85	424	92.4	100.0	99	444	
					279/270A00	18.8/25.0	52.1/60.1	140.9/150.9	150/175	140/149	471/479	152.7/162.7	175/175	153/163	491/499	145.7/155.7	150/175	145/155	476/484	157.5/167.5	175/175	159/168	496/504	
					280/271A00	37.6/50.0	104.2/120.3	206.0/196.1	225/225	200/218	523/539	217.8/207.9	225/225	213/232	543/559	210.8/200.9	225/225	205/224	528/544	222.6/212.7	225/225	219/237	548/564	
					281/272A00	56.3/75.0	156.4/180.4	232.2/256.2	250/300	260/287	575/599	244.0/268.0	300/300	273/301	595/619	237.0/261.0	250/300	265/293	580/604	248.8/272.8	300/300	279/306	600/624	
575-3-60		STD	NONE	—	282/273A00	25.0	30.1	71.2	80.0	70	264	77.4	80.0	77	276	73.4	80.0	72	266	79.6	80.0	79	278	
					283/274A00	50.0	60.1	93.7	100.0	104	294	99.9	110.0	111	306	95.9	100.0	107	286	102.1	110.0	114	308	
					284/275A00	75.0	90.2	123.8	150	139	324	130.0	150	146	336	126.0	150	141	326	132.2	150	148	338	
					NONE	—	—	35.0	45.0	37	243	41.2	50.0	44	255	37.2	45.0	39	245	43.4	50.0	46	257	
460-3-60		MED	NONE	—	282/273A00	25.0	30.1	72.6	80.0	71	273	78.8	80.0	78	285	74.8	80.0	74	275	81.0	90.0	81	287	
					283/274A00	50.0	60.1	95.1	100.0	106	303	101.3	110.0	113	315	97.3	110.0	108	305	103.5	110.0	115	317	
					284/275A00	75.0	90.2	125.2	150	140	333	131.4	150	148	345	127.4	150	143	335	133.6	150	150	347	
					NONE	—	—	37.6	45.0	40	247	43.8	50.0	47	259	39.8	50.0	42	249	46.0	50.0	49	261	
HIGH		STD	NONE	—	282/273A00	25.0	30.1	75.2	80.0	74	277	81.4	90.0	81	289	77.4	80.0	77	279	83.6	90.0	84	291	
					283/274A00	50.0	60.1	97.7	110.0	109	307	103.9	110.0	116	319	99.9	110.0	111	309	106.1	110.0	118	321	
					284/275A00	75.0	90.2	127.8	150	143	337	134.0	150	151	349	130.0	150	146	339	136.2	150	153	351	
					NONE	—	—	24.9	30.0	26	184	29.7	35.0	32	192	26.6	30.0	28	186	31.4	40.0	33	194	
575-3-60		STD	NONE	—	285/276A00	24.8	23.9	54.7	60.0	53	208	59.5	60.0	59	216	56.4	60.0	55	210	61.2	70.0	61	218	
					286/277A00	49.6	47.7	84.5	90.0	81	232	89.3	90.0	86	240	86.2	90.0	83	234	91.0	100.0	88	242	
					287/278A00	74.4	71.6	96.5	100	108	256	101.3	110	114	264	98.2	110	110	258	103.0	110	116	266	
					NONE	—	—	24.9	30.0	26	184	29.7	35.0	32	192	26.6	30.0	28	186	31.4	40.0	33	194	
575-3-60		MED	NONE	—	285/276A00	24.8	23.9	54.7	60.0	53	208	59.5	60.0	59	216	56.4	60.0	55	210	61.2	70.0	61	218	
					286/277A00	49.6	47.7	84.5	90.0	81	232	89.3	90.0	86	240	86.2	90.0	83	234	91.0	100.0	88	242	
					287/278A00	74.4	71.6	96.5	100	108	256	101.3	110	114	264	98.2	110	110	258	103.0	110	116	266	
					NONE	—	—	27.7	30.0	29	198	32.5	40.0	35	206	29.4	35.0	31	200	34.2	40.0	37	208	
HIGH		STD	NONE	—	285/276A00	24.8	23.9	57.5	60.0	57	222	62.3	70.0	62	230	59.2	60.0	59	224	64.0	70.0	64	232	
					286/277A00	49.6	47.7	87.3	90.0	84	246	92.1	100.0	90	254	89.0	90.0	86	248	93.8	100.0	92	256	
					287/278A00	74.4	71.6	99.3	110	112	270	104.1	110	117	278	101.0	110	114	272	105.8	110	119	280	
					NONE	—	—	27.7	30.0	29	198	32.5	40.0	35	206	29.4	35.0	31	200	34.2	40.0	37	208	

See: "Legend and Notes for Tables 9 – 12" on page 41.



Table 11 – Unit Wire/Fuse or HACR Breaker Sizing Data – Units Produced Prior to July 30, 2012 (cont)

UNIT	NO M. V.-Ph-HZ	ELEC. HTR			NO C.O. or UNPWR C.O.										w/ PWRD C.O.												
		CRHEATER***A00 VERT/HORZ	Nom(kW)	FLA	NO PE.					w/ P.E. (pwrdr fr/unit)					NO PE.					w/ P.E. (pwrdr fr/unit)							
					MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE				
STD		NONE	—	—	92.7	125.0	97	558	104.5	125.0	111	578	97.5	125.0	103	563	109.3	125.0	116	583	125.0	116	583	109.3	125.0	116	583
		279/270A00	18.8/25.0	52.1/60.1	157.9/167.9	175/175	157/166	610/618	169.7/179.7	175/200	171/180	630/638	162.7/172.7	175/175	162/172	615/623	174.5/184.5	175/200	176/185	635/643	175/200	176/185	635/643	174.5/184.5	175/200	176/185	635/643
		280/271A00	37.6/50.0	104.2/120.3	223.0/213.0	225/225	217/235	662/678	234.8/224.8	250/250	230/249	682/698	227.8/217.8	250/250	222/241	667/683	239.6/229.6	250/250	236/254	687/703	250/250	236/254	687/703	239.6/229.6	250/250	236/254	687/703
MED	208/230-3-60	281/272A00	56.3/75.0	156.4/180.4	249.1/273.1	300/300	277/305	714/738	260.9/284.9	300/300	290/318	734/758	253.9/277.9	300/300	282/310	719/743	265.7/289.7	300/300	296/324	739/763	300/300	296/324	739/763	265.7/289.7	300/300	296/324	739/763
		NONE	—	—	98.1	125	103	568	109.9	125	117	588	102.9	125.0	109	573	114.7	125.0	122	593	125.0	122	593	114.7	125.0	122	593
		279/270A00	18.8/25.0	52.1/60.1	163.3/173.3	175/175	163/172	620/628	175.1/185.1	200/200	177/186	640/648	168.1/178.1	175/200	169/178	625/633	179.9/189.9	200/200	182/191	645/653	200/200	182/191	645/653	179.9/189.9	200/200	182/191	645/653
HIGH		280/271A00	37.6/50.0	104.2/120.3	228.4/218.4	250/250	223/242	672/688	240.2/230.2	250/250	237/255	692/708	233.2/223.2	250/250	229/247	677/693	245.0/235.0	250/250	242/261	697/713	250/250	242/261	697/713	245.0/235.0	250/250	242/261	697/713
		281/272A00	56.3/75.0	156.4/180.4	254.5/278.5	300/300	283/311	724/748	266.3/290.3	300/300	297/324	744/768	259.3/283.3	300/300	289/316	729/753	271.1/295.1	300/350	302/330	749/773	300/350	302/330	749/773	271.1/295.1	300/350	302/330	749/773
		NONE	—	—	110.8	125	118	642	122.6	150	131	662	115.6	125.0	123	647	127.4	150	137	667	150	137	667	127.4	150	137	667
STD		279/270A00	18.8/25.0	52.1/60.1	176.0/186.0	200/200	178/187	694/702	187.8/197.8	200/200	191/201	714/722	180.8/190.8	200/200	183/193	699/707	192.6/202.6	200/225	197/206	719/727	200/225	197/206	719/727	192.6/202.6	200/225	197/206	719/727
		280/271A00	37.6/50.0	104.2/120.3	241.1/231.1	250/250	238/256	746/762	252.9/242.9	300/300	251/270	766/782	245.9/235.9	300/300	243/262	751/767	257.7/247.7	300/300	257/275	771/787	300/300	257/275	771/787	257.7/247.7	300/300	257/275	771/787
		281/272A00	56.3/75.0	156.4/180.4	267.2/291.2	300/300	298/325	798/822	279.0/303.0	300/350	311/339	818/842	272.0/296.0	300/350	303/331	803/827	283.8/307.8	300/350	317/344	823/847	300/350	317/344	823/847	283.8/307.8	300/350	317/344	823/847
MED	460-3-60	NONE	—	—	50.1	60.0	52	288	56.3	70.0	60	300	52.3	60.0	55	290	58.5	70.0	62	302	70.0	62	302	58.5	70.0	62	302
		282/273A00	25.0	30.1	87.7	90	87	318	93.9	100	94	330	89.9	100.0	90	320	96.1	100.0	97	332	100.0	97	332	96.1	100.0	97	332
		283/274A00	50.0	60.1	110.2	125	122	348	116.4	125	129	360	112.4	125.0	124	350	118.6	125.0	131	362	125.0	131	362	118.6	125.0	131	362
HIGH		284/275A00	75.0	90.2	140.3	150	156	378	146.5	175	163	390	142.5	150	159	380	148.7	175	166	392	175	166	392	148.7	175	166	392
		NONE	—	—	52.9	60	56	293	59.1	70	63	305	55.1	60.0	58	295	61.3	70.0	65	307	70.0	65	307	61.3	70.0	65	307
		282/273A00	25.0	30.1	90.5	100	90	323	96.7	100	97	335	92.7	100.0	93	325	98.9	100.0	100	337	100.0	100	337	98.9	100.0	100	337
STD		283/274A00	50.0	60.1	113.0	125	125	353	119.2	125	132	365	115.2	125.0	127	355	121.4	150.0	134	367	150.0	134	367	121.4	150.0	134	367
		284/275A00	75.0	90.2	143.1	150	159	383	149.3	175	167	395	145.3	150	162	385	151.5	175	169	397	175	169	397	151.5	175	169	397
		NONE	—	—	58.9	70	63	330	65.1	80	70	342	61.1	70.0	65	332	67.3	80	72	344	80	72	344	67.3	80	72	344
MED	575-3-60	282/273A00	25.0	30.1	96.5	100	97	360	102.7	110	104	372	98.7	100.0	100	362	104.9	110.0	107	374	110.0	107	374	104.9	110.0	107	374
		283/274A00	50.0	60.1	119.0	125	132	390	125.2	150	139	402	121.2	150.0	134	392	127.4	150.0	141	404	150.0	141	404	127.4	150.0	141	404
		284/275A00	75.0	90.2	149.1	175	166	420	155.3	175	173	432	151.3	175	169	422	157.5	175	176	434	175	176	434	157.5	175	176	434
STD		NONE	—	—	36.2	45.0	38	204	41.0	50.0	43	212	37.9	50.0	40	206	42.7	50.0	45	214	50.0	45	214	42.7	50.0	45	214
		285/276A00	24.8	23.9	66.1	70	65	228	70.9	80	71	236	67.8	70.0	67	230	72.6	80.0	73	238	80.0	73	238	72.6	80.0	73	238
		286/277A00	49.6	47.7	95.8	100	93	252	100.6	110	98	260	97.5	100.0	95	254	102.3	110.0	100	262	110.0	100	262	102.3	110.0	100	262
MED		287/278A00	74.4	71.6	107.8	125	120	276	112.6	125	126	284	109.5	125	122	278	114.3	125	128	286	125	128	286	114.3	125	128	286
		NONE	—	—	39.6	50	42	202	44.4	50	47	210	41.3	50.0	44	204	46.1	50.0	49	212	50.0	49	212	46.1	50.0	49	212
		285/276A00	24.8	23.9	69.5	70	69	226	74.3	80	75	234	71.2	80.0	71	228	76.0	80.0	77	236	80.0	77	236	76.0	80.0	77	236
HIGH		286/277A00	49.6	47.7	99.2	100	97	250	104.0	110	102	258	100.9	110.0	99	252	105.7	110.0	104	260	110.0	104	260	105.7	110.0	104	260
		287/278A00	74.4	71.6	111.2	125	124	274	116.0	125	130	282	112.9	125	126	276	117.7	125	132	284	125	132	284	117.7	125	132	284
		NONE	—	—	40.1	50	42	229	44.9	50	48	237	41.8	50.0	44	231	46.6	50	50	239	50	50	239	46.6	50	50	239
HIGH		285/276A00	24.8	23.9	70.0	70	70	253	74.8	80	75	261	71.7	80.0	72	255	76.5	80.0	77	263	80.0	77	263	76.5	80.0	77	263
		286/277A00	49.6	47.7	99.7	100	97	277	104.5	110	103	285	101.4	110.0	99	279	106.2	110.0	105	287	110.0	105	287	106.2	110.0	105	287
		287/278A00	74.4	71.6	111.7	125	125	301	116.5	125	130	309	113.4	125	127	303	118.2	125	132	311	125	132	311	118.2	125	132	311

See: "Legend and Notes for Tables 9 – 12" on page 41.

Table 12 – Unit Wire/Fuse or HACR Breaker Sizing Data with Factory Installed 2 Speed Indoor Fan Option – Units Produced Prior to July 30, 2012 (cont)

UNIT		ELEC. HTR		NO C.O. or UNPWR C.O.						w/ PWRD C.O.								
				NO PE.			w/ P.E. (pwrd fr/unit)			NO PE.			w/ P.E. (pwrd fr/unit)					
IFM-TYPE	ELEC. HTR	CRHEATER ***A00 VERT/HORZ	Nom(kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE			
							FLA	LRA			FLA	LRA			FLA	LRA		
STD		NONE	—	—	91.3/90.4	100/100	95/94	564	103.1/102.2	125/125	109/108	584	96.1/95.2	101/100	589	107.9/107.0	115/114	
		279/270A00	18.8/25.0	52.1/60.1	156.5/165.6	175/175	155/164	616/624	168.3/177.4	175/200	169/177	636/644	161.3/170.4	175/175	621/629	173.1/182.2	175/200	
		280/271A00	37.6/50.0	104.2/120.3	221.6/210.7	225/225	215/233	688/684	233.4/222.5	250/250	229/246	688/704	226.4/215.5	250/225	221/238	673/689	238.2/227.3	250/250
		281/272A00	56.3/75.0	156.4/180.4	247.7/270.8	300/300	275/302	720/744	259.5/282.6	300/300	289/315	740/764	252.5/275.6	300/300	281/307	725/749	264.3/287.4	300/300
MED		NONE	—	—	94.8	125	99	560	106.6	125	113	580	99.6	105	565	111.4	119	
		279/270A00	18.8/25.0	52.1/60.1	160.0/170.0	175/175	159/169	612/620	171.8/181.8	175/200	173/182	632/640	164.8/174.8	175/175	617/625	176.6/186.6	200/200	
		280/271A00	37.6/50.0	104.2/120.3	225.1/215.1	250/225	219/238	664/680	236.9/226.9	250/250	233/251	684/700	229.9/219.9	250/250	225/243	669/685	241.7/231.7	250/250
		281/272A00	56.3/75.0	156.4/180.4	251.2/275.2	300/300	279/307	716/740	263.0/287.0	300/300	293/321	736/760	256.0/280.0	300/300	285/312	721/745	267.8/291.8	300/350
HIGH		NONE	—	—	106.2	125	113	639	118.0	150	126	659	111.0	125	644	122.8	132	
		279/270A00	18.8/25.0	52.1/60.1	171.4/181.4	175/200	173/182	691/699	183.2/193.2	200/200	186/195	711/719	176.2/186.2	200/200	178/187	749/704	188.0/198.0	200/200
		280/271A00	37.6/50.0	104.2/120.3	236.5/226.5	250/250	232/251	743/759	248.3/238.3	250/250	246/265	763/779	241.3/231.3	250/250	238/256	787/64	253.1/243.1	300/300
		281/272A00	56.3/75.0	156.4/180.4	262.6/286.6	300/300	292/320	795/819	274.4/298.4	300/350	306/334	815/839	267.4/291.4	300/300	298/326	800/824	279.2/303.2	300/350
STD		NONE	—	—	49.1	60	51	291	55.3	60	58	303	51.3	60	54	293	57.5	61
		282/273A00	25.0	30.1	86.7	90	86	321	92.9	100	93	333	88.9	90	88	323	95.1	100
		283/274A00	50.0	60.1	109.2	125	120	351	115.4	125	128	363	111.4	125	123	353	117.6	125
		284/275A00	75.0	90.2	139.3	150	155	381	145.5	150	162	393	141.5	150	158	383	147.7	175
MED		NONE	—	—	51.3	60	54	289	57.5	70	61	301	53.5	60	56	291	59.7	63
		282/273A00	25.0	30.1	88.9	90	88	319	95.1	100	96	331	91.1	100	91	321	97.3	100
		283/274A00	50.0	60.1	111.4	125	123	349	117.6	125	130	361	113.6	125	125	351	119.8	125
		284/275A00	75.0	90.2	141.5	150	158	379	147.7	175	165	391	143.7	150	160	381	149.9	175
HIGH		NONE	—	—	57.0	70	60	329	63.2	80	68	341	59.2	70	63	331	65.4	80
		282/273A00	25.0	30.1	94.6	100	95	359	100.8	110	102	371	96.8	100	98	361	103.0	110
		283/274A00	50.0	60.1	117.1	125	129	389	123.3	150	137	401	119.3	125	132	391	125.5	150
		284/275A00	75.0	90.2	147.2	175	164	419	153.4	175	171	431	149.4	175	167	421	155.6	175
STD		NONE	—	—	36.8	45	39	204	41.6	50	44	212	38.5	50	41	206	43.3	50
		285/276A00	24.8	23.9	66.7	70	66	228	71.5	80	72	236	68.4	70	68	230	73.2	80
		286/277A00	49.6	47.7	96.4	100	93	252	101.2	110	99	260	98.1	100	95	254	102.9	110
		287/278A00	74.4	71.6	108.4	125	121	276	113.2	125	127	284	110.1	125	123	278	114.9	125
MED		NONE	—	—	38.2	50	40	202	43.0	50	46	210	39.9	50	42	204	44.7	50
		285/276A00	24.8	23.9	68.1	70	68	226	72.9	80	73	234	69.8	70	70	228	74.6	80
		286/277A00	49.6	47.7	97.8	100	95	250	102.6	110	101	258	99.5	100	97	252	104.3	110
		287/278A00	74.4	71.6	109.8	125	123	274	114.6	125	128	282	111.5	125	125	276	116.3	125
HIGH		NONE	—	—	40.1	50	42	229	44.9	50	48	237	41.8	50	44	231	46.6	50
		285/276A00	24.8	23.9	70.0	70	70	253	74.8	80	75	261	71.7	80	72	255	76.5	80
		286/277A00	49.6	47.7	99.7	100	97	277	104.5	110	103	285	101.4	110	99	279	106.2	110
		287/278A00	74.4	71.6	111.7	125	125	301	116.5	125	130	309	113.4	125	127	303	118.2	125

See: "Legend and Notes for Tables 9 – 12" on page 41.

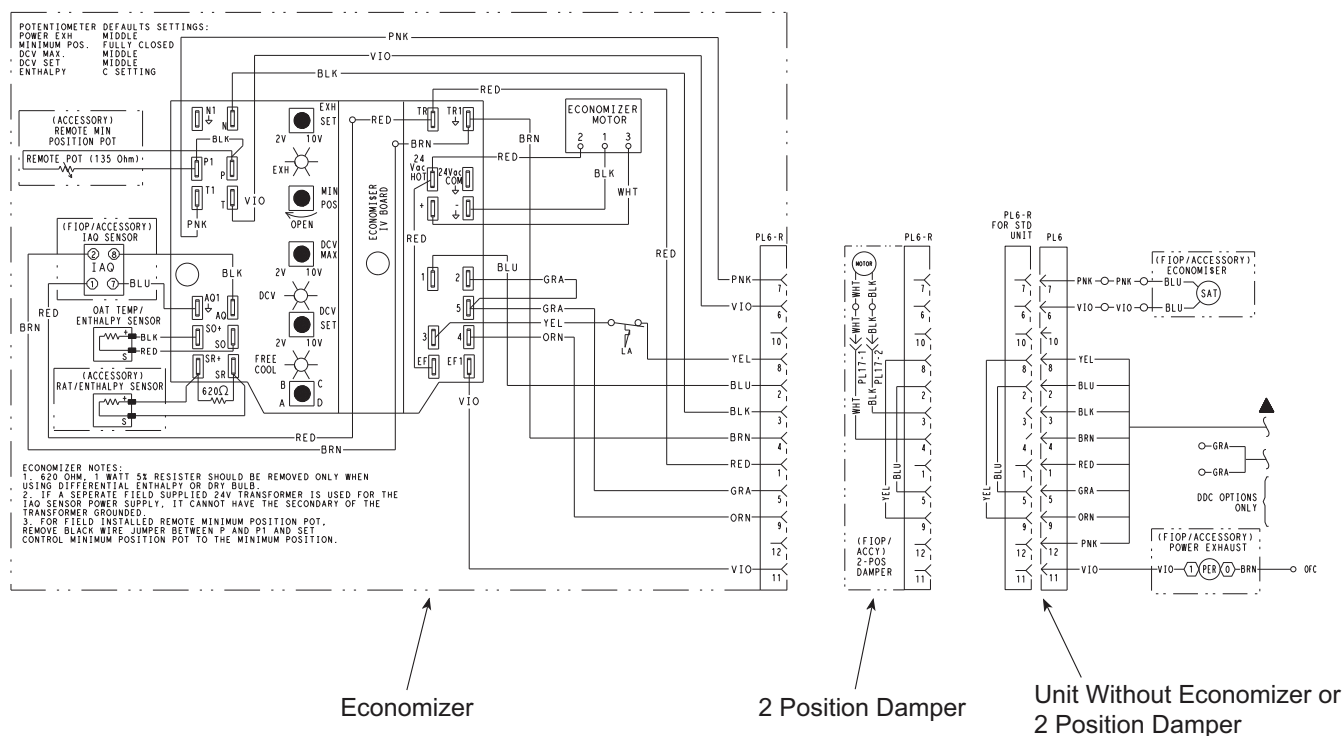


Fig. 65 - EconoMi\$er™ IV Wiring

Step 11 — Adjust Factory-Installed Options

Smoke Detectors —

Smoke detector(s) will be connected at the Controls Connections Board, at terminals marked “Smoke Shutdown”. Remove jumper JMP 3 when ready to energize unit.

EconoMi\$er IV Occupancy Switch —

Refer to Fig. 65 for general EconoMi\$er IV wiring. External occupancy control is managed through a connection on the Central Terminal Board.

If external occupancy control is desired, connect a time clock or remotely controlled switch (closed for Occupied, open for Unoccupied sequence) at terminals marked OCCUPANCY on CTB. Remove or cut jumper JMP 2 to complete the installation.

Step 12 — Install Accessories

Available accessories include:

- Roof Curb
- Thru-base connection kit (must be installed before unit is set on curb)
- Manual outside air damper
- Two-Position motorized outside air damper

EconoMi\$er IV (with control and integrated barometric relief)

EconoMi\$er2 (without control/for external signal and integrated barometric relief)

Power Exhaust

Differential dry-bulb sensor (EconoMi\$er IV)

Outdoor enthalpy sensor

Differential enthalpy sensor

Electric Heaters

Single Point kits

Low Ambient Controls

Thermostat / Sensors

CO₂ sensor

DDC interface (PremierLink)

Louvered hail guard

Phase monitor control

Winter Start kit

Refer to separate installation instructions for information on installing these accessories.

Pre-Start and Start-Up

This completes the mechanical installation of the unit. Refer to the unit’s Service Manual for detailed Pre-Start and Start-up instructions.

START-UP CHECKLIST

(Remove and Store in Job File)

I. PRELIMINARY INFORMATION

MODEL NO.: _____ SERIAL NO.: _____
 DATE: _____ TECHNICIAN: _____

II. PRE-START-UP (insert checkmark in box as each item is completed)

- ☐ VERIFY THAT JOBSITE VOLTAGE AGREES WITH VOLTAGE LISTED ON RATING PLATE
- ☐ VERIFY THAT ALL PACKAGING MATERIALS HAVE BEEN REMOVED FROM UNIT
- ☐ REMOVE ALL SHIPPING HOLD DOWN BOLTS AND BRACKETS PER INSTALLATION INSTRUCTIONS
- ☐ VERIFY THAT CONDENSATE CONNECTION IS INSTALLED PER INSTALLATION INSTRUCTIONS
- ☐ CHECK REFRIGERANT PIPING FOR INDICATIONS OF LEAKS; INVESTIGATE AND REPAIR IF NECESSARY
- ☐ CHECK ALL ELECTRICAL CONNECTIONS AND TERMINALS FOR TIGHTNESS
- ☐ CHECK THAT RETURN (INDOOR) AIR FILTERS ARE CLEAN AND IN PLACE
- ☐ VERIFY THAT UNIT INSTALLATION IS LEVEL
- ☐ CHECK FAN WHEELS AND PROPELLER FOR LOCATION IN HOUSING/ORIFICE AND SETSCREW TIGHTNESS
- ☐ CHECK TO ENSURE THAT ELECTRICAL WIRING IS NOT IN CONTACT WITH REFRIGERANT LINES OR SHARP METAL EDGES
- ☐ CHECK PULLEY ALIGNMENT AND BELT TENSION PER INSTALLATION INSTRUCTIONS

III. START-UP

(REFER TO UNIT SERVICE/MAINTENANCE MANUAL FOR START-UP INSTRUCTIONS)

ELECTRICAL

SUPPLY VOLTAGE	L1-L2	_____	L2-L3	_____	L3-L1	_____
CIRCUIT 1 COMPRESSOR AMPS	L1	_____	L2	_____	L3	_____
CIRCUIT 2 COMPRESSOR AMPS	L1	_____	L2	_____	L3	_____
INDOOR-FAN AMPS	L1	_____	L2	_____	L3	_____
OUTDOOR-FAN AMPS	NO. 1	_____	NO. 2	_____	NO. 3	_____
	NO. 4	_____	NO. 5	_____	NO. 6	_____

TEMPERATURES

OUTDOOR-AIR TEMPERATURE	_____ DB	_____ WB
RETURN-AIR TEMPERATURE	_____ DB	_____ WB
COOLING SUPPLY AIR	_____ DB	_____ WB

PRESSURES (Cooling Mode)

REFRIGERANT SUCTION, CIRCUIT 1	_____ PSIG	_____ F
REFRIGERANT SUCTION, CIRCUIT 2	_____ PSIG	_____ F
REFRIGERANT DISCHARGE, CIRCUIT 1	_____ PSIG	_____ F
REFRIGERANT DISCHARGE, CIRCUIT 2	_____ PSIG	_____ F

50TCQD

- ☐ VERIFY THAT 3-PHASE FAN MOTOR AND BLOWER ARE ROTATING IN CORRECT DIRECTION.
- ☐ VERIFY THAT 3-PHASE SCROLL COMPRESSOR IS ROTATING IN THE CORRECT DIRECTION
- ☐ VERIFY REFRIGERANT CHARGE USING CHARGING CHARTS

GENERAL

- ☐ SET ECONOMIZER MINIMUM VENT AND CHANGEOVER SETTINGS TO MATCH JOB REQUIREMENTS (IF EQUIPPED)