



Installation Instructions

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SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock or other conditions which may cause 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 lock(s) and lockout tag(s). 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 units.

GENERAL

See Fig. 1 for model number nomenclature. See Fig. 2-13 for unit dimensions.

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

Unit Heat Type
50 - Electric Heat
Packaged Rooftop

Model Series - WeatherMaker®
TC - Standard Efficiency

Heat Options
- = No Heat

Refrig. Systems Options
D = Two stage cooling model

Cooling Tons
17 = 14 tons 28 = 20.8 tons
20 = 14.5 tons 30 = 23.8 tons
24 = 16.2 tons

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 and Air Flow Configuration
1 = Standard Static Option, Vertical, Return Air Flow
2 = Medium Static Option, Vertical, Return Air Flow
3 = High Static Option, Vertical, Return Air Flow
A = Standard Static High Efficiency Motor/Vertical Supply, Return Air Flow
B = Medium Static High Efficiency Motor/Vertical Supply, Return Air Flow
C = High Static High Efficiency Motor/Vertical Supply, Return Air Flow
5 = Standard Static Option, Horizontal, Return Air Flow
6 = Medium Static Option, Horizontal, Return Air Flow
7 = High Static Option, Horizontal, Return Air Flow
E = Standard Static High Efficiency Motor/Horizontal Supply, Return Air Flow
F = Medium Static High Efficiency Motor/Horizontal Supply, Return Air Flow
G = High Static High Efficiency Motor/Horizontal Supply, Return Air Flow

Packaging
0 = Standard

Electrical Options
A = None
C = Non-Fused Disconnect
D = Thru-The-Base Connections
F = Non-Fused Disconnect and Thru-The-Base Connections

Service Options
0 = Standard

Intake / Exhaust Options
A = None
B = Temperature Economizer w/ Barometric Relief
D = Temperature Economizer w/ PE (cent) - Vertical Air Only
F = Enthalpy Economizer w/ Barometric Relief
H = Enthalpy Economizer w/ PE (cent) - Vertical Air Only
K = 2-Position Damper
P = Manual Outdoor Air Damper

Base Unit Controls
0 = Base Electromechanical Controls
1 = PremierLink Controller
2 = RTU Open Multi-Protocol Controller

Design Revision
- = Factory Design Revision

Voltage
9 = 400/3/50

Coil Options – RTPF (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

Coil Options – Novation® (Outdoor – Indoor – Hail Guard)
G = Al/Al – Al/Cu
H = Al/Al – Cu/Cu
J = Al/Al – E-coat Al/Cu
K = E-coat Al/Al – Al/Cu
L = E-coat Al/Al – E-coat Al/Cu
T = Al/Al – Al/Cu – Louvered Hail Guard
U = Al/Al – Cu/Cu – Louvered Hail Guard
V = Al/Al – E-coat Al/Cu – Louvered Hail Guard
W = E-coat Al/Al – Al/Cu – Louvered Hail Guard
X = E-coat Al/Al – E-coat Al/Cu – Louvered Hail Guard

Fig. 1 — 50TC Vertical Airflow Units Model Number Nomenclature

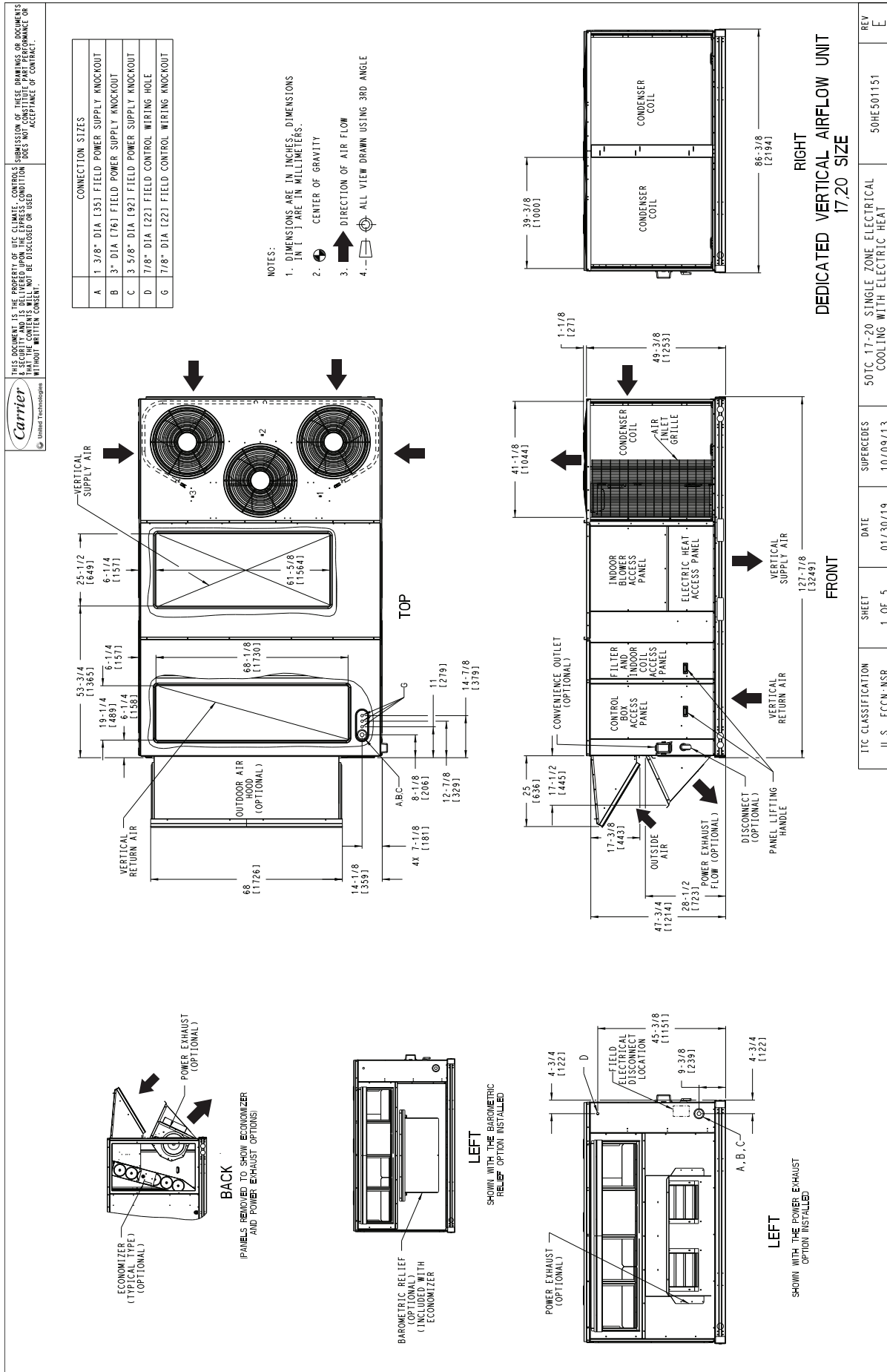


Fig. 2 — 50TC**17-20 Vertical Airflow

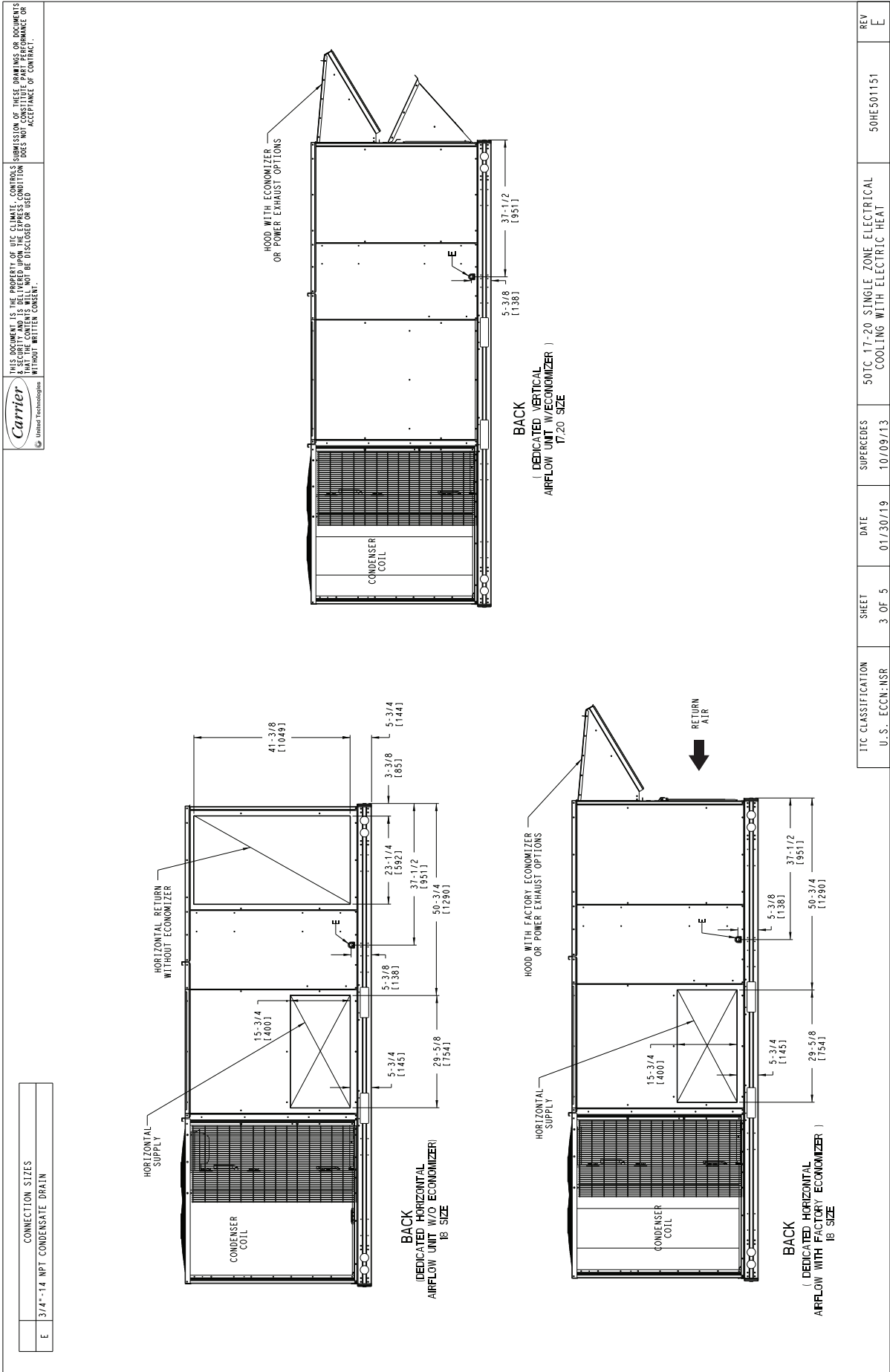


Fig. 3 — 50TC**17-20 Back View and Condensate Drain Location

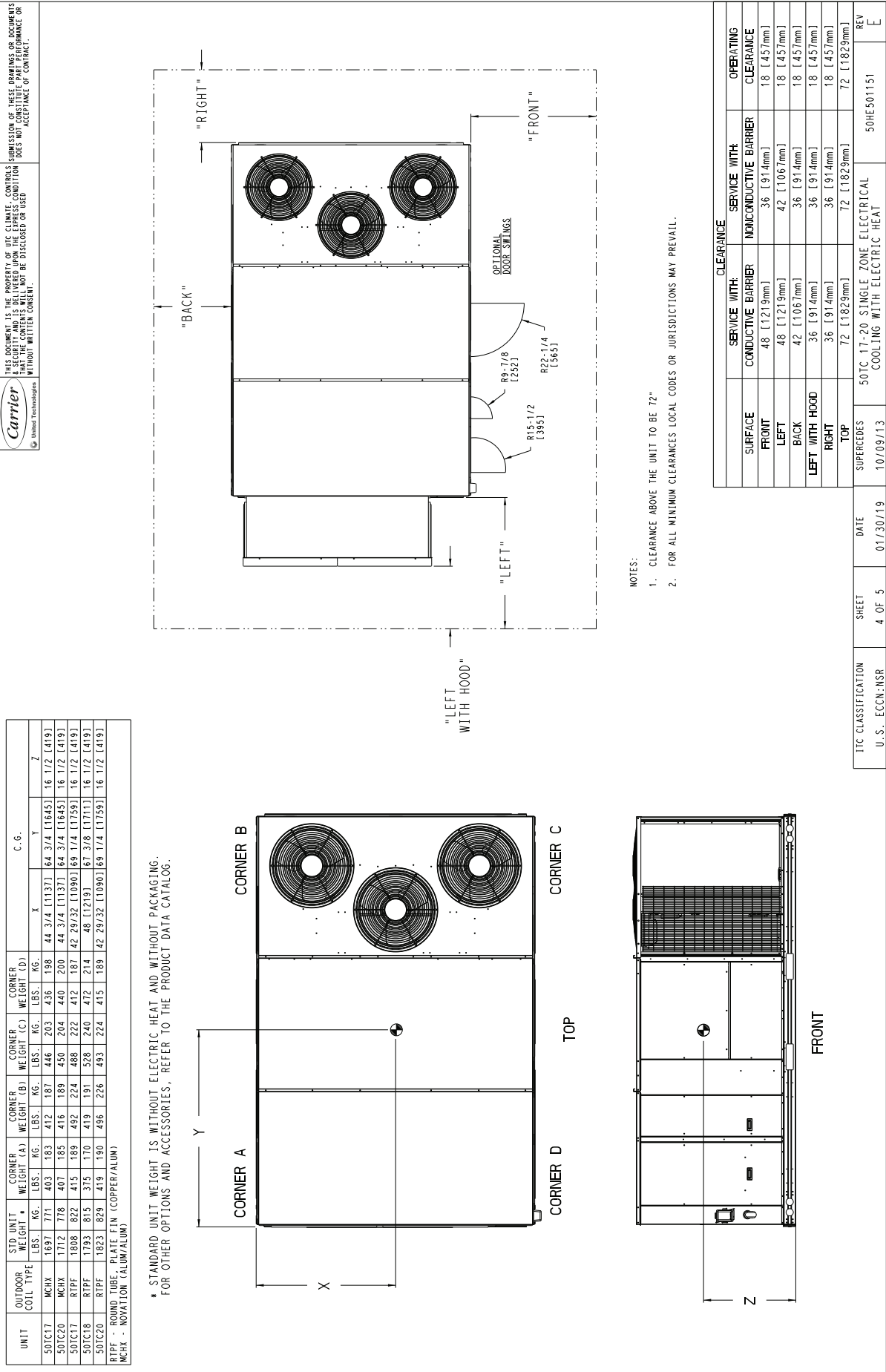


Fig. 4 — 50TC**17-20 Corner Weights and Clearances

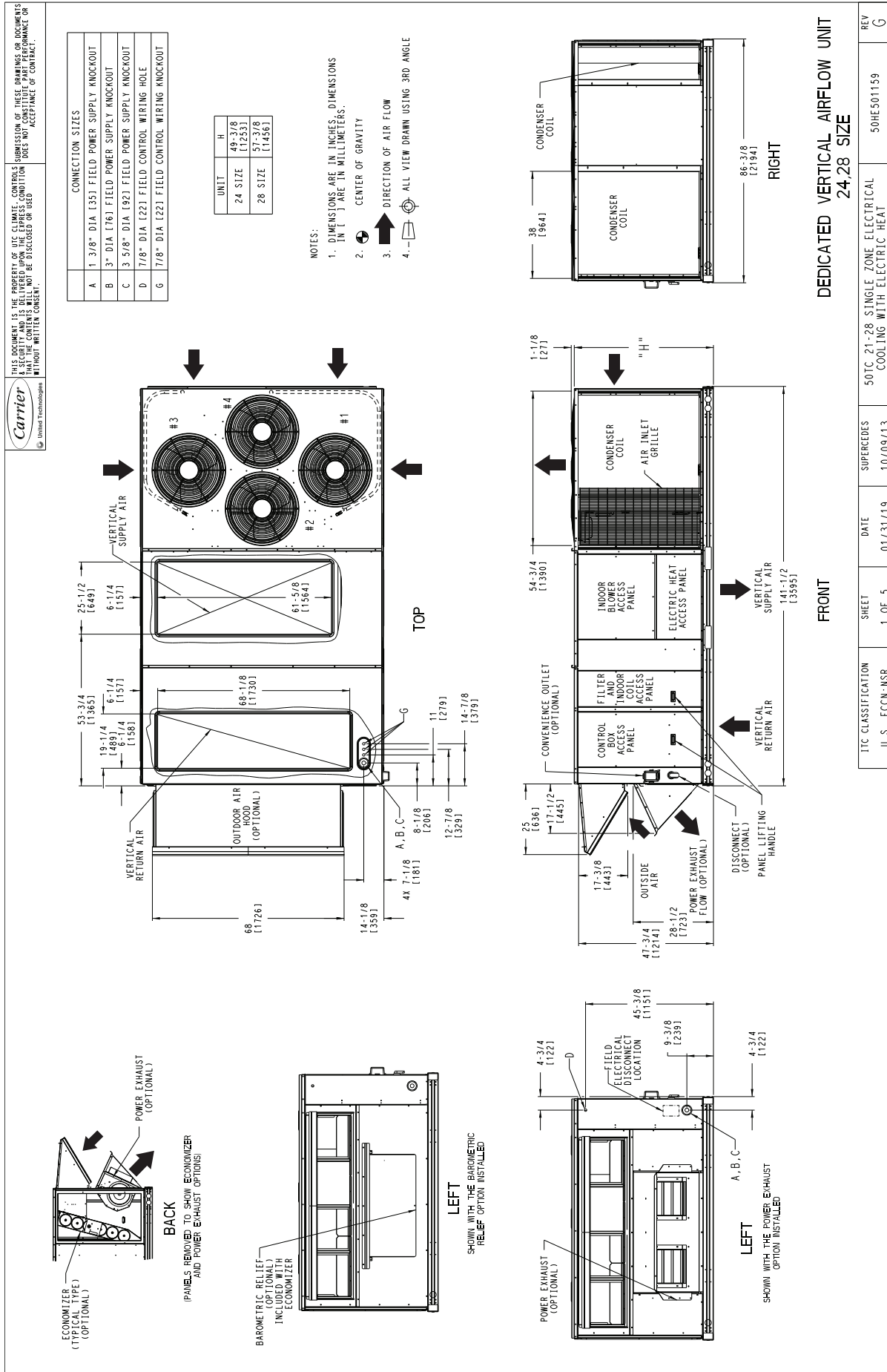
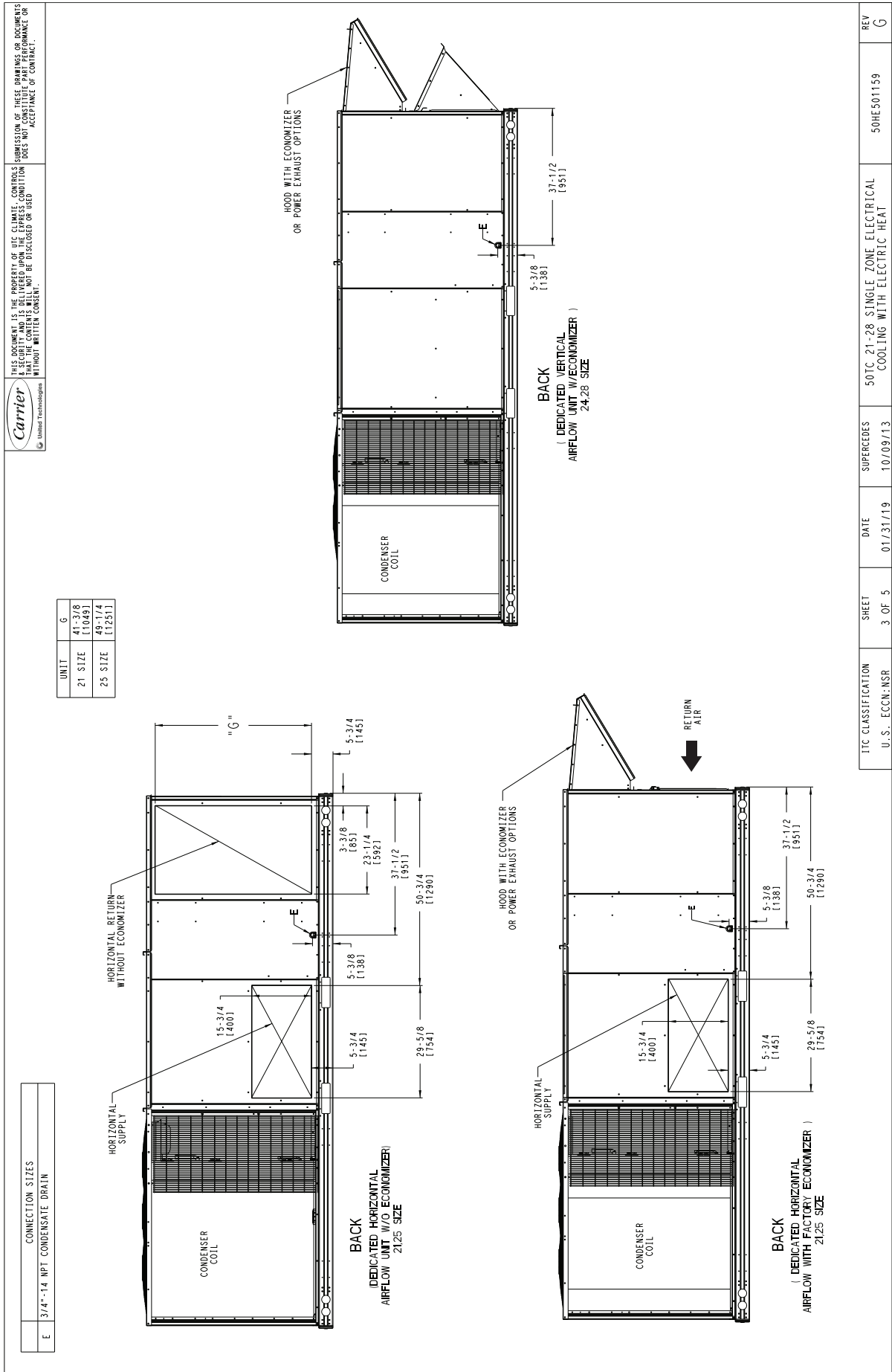


Fig. 6 — 50TC**24-28 Vertical Airflow



ITC CLASSIFICATION U.S. ECON: NSR	SHEET 3 OF 5	DATE 01/31/19	SUPERCEDES 10/09/13	50TC 21-28 SINGLE ZONE ELECTRICAL COOLING WITH ELECTRIC HEAT	50HE501159	REV G
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Fig. 7 — 50TC**24-28 Back View and Condensate Drain Location

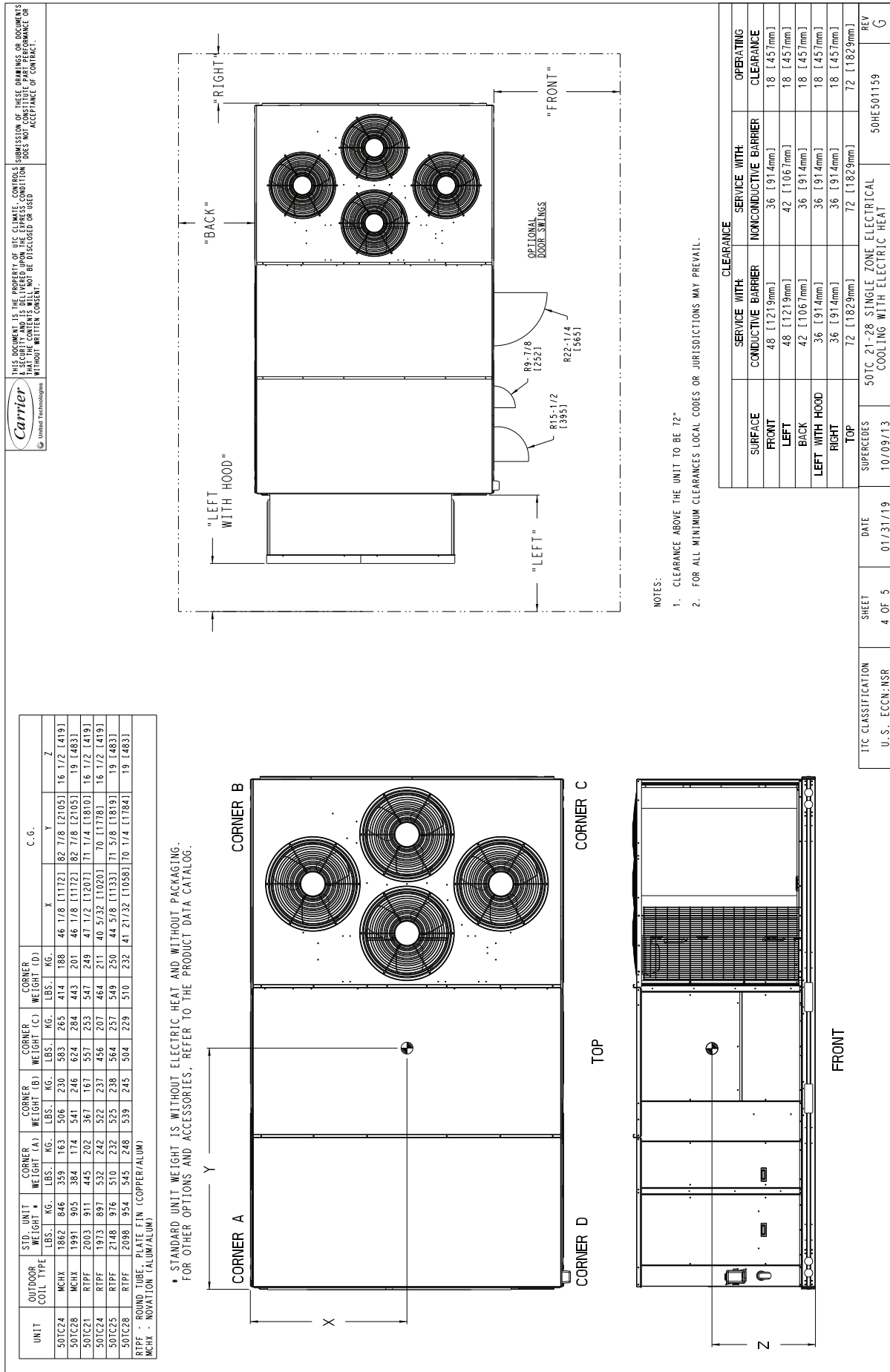


Fig. 8 — 50TC**24-28 Corner Weights and Clearances

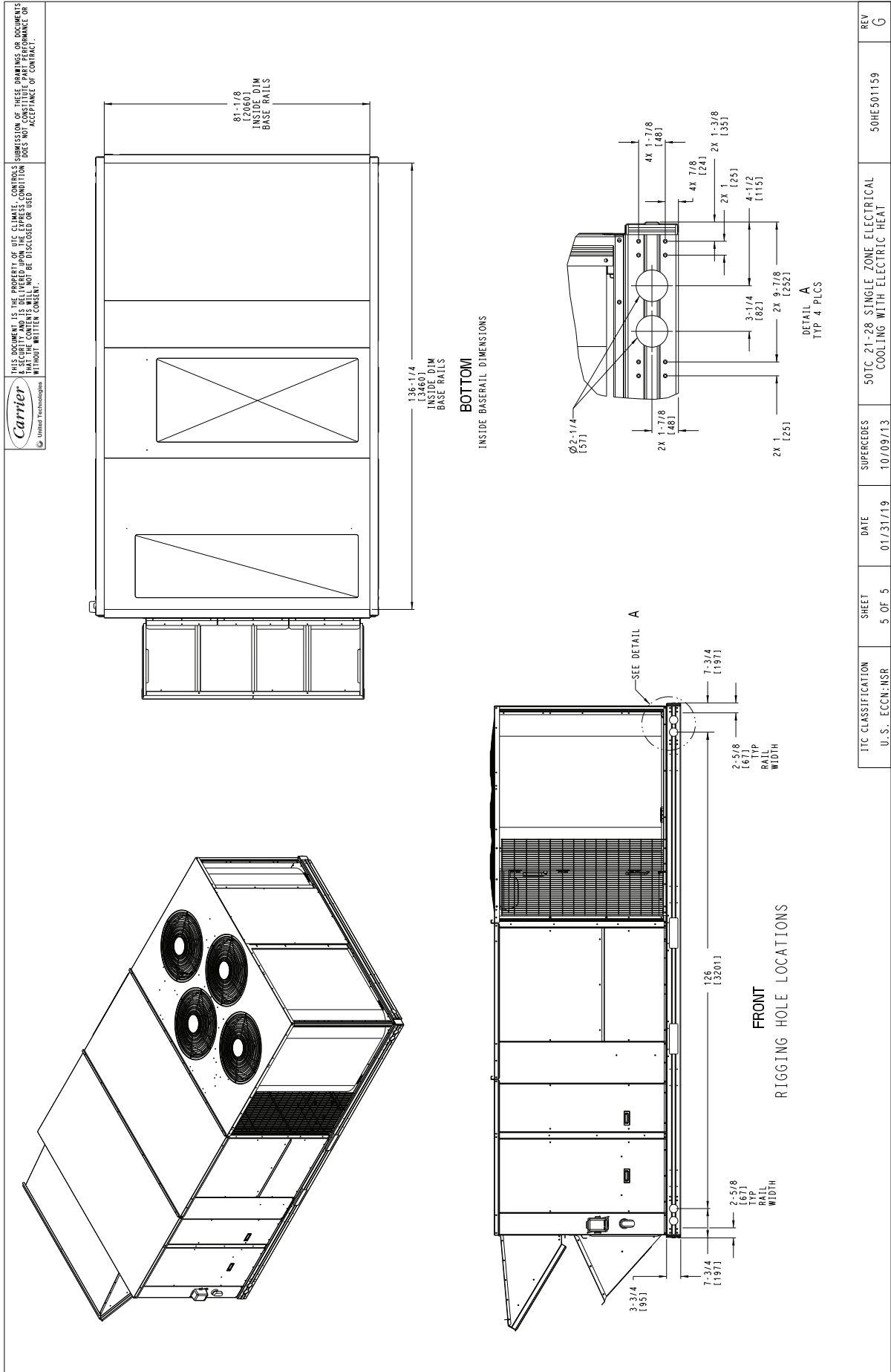
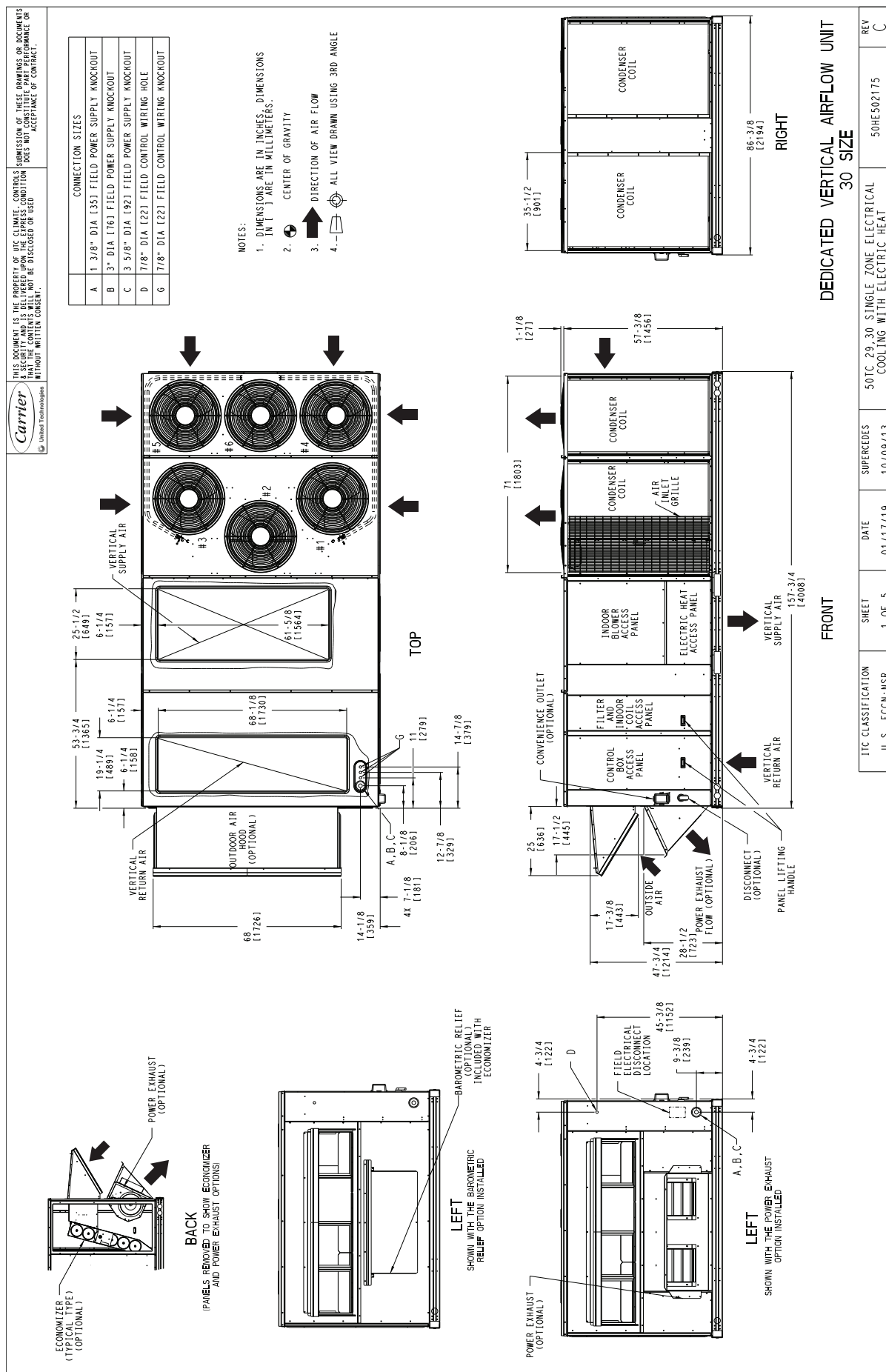


Fig. 9 — 50TC**24-28 Bottom View



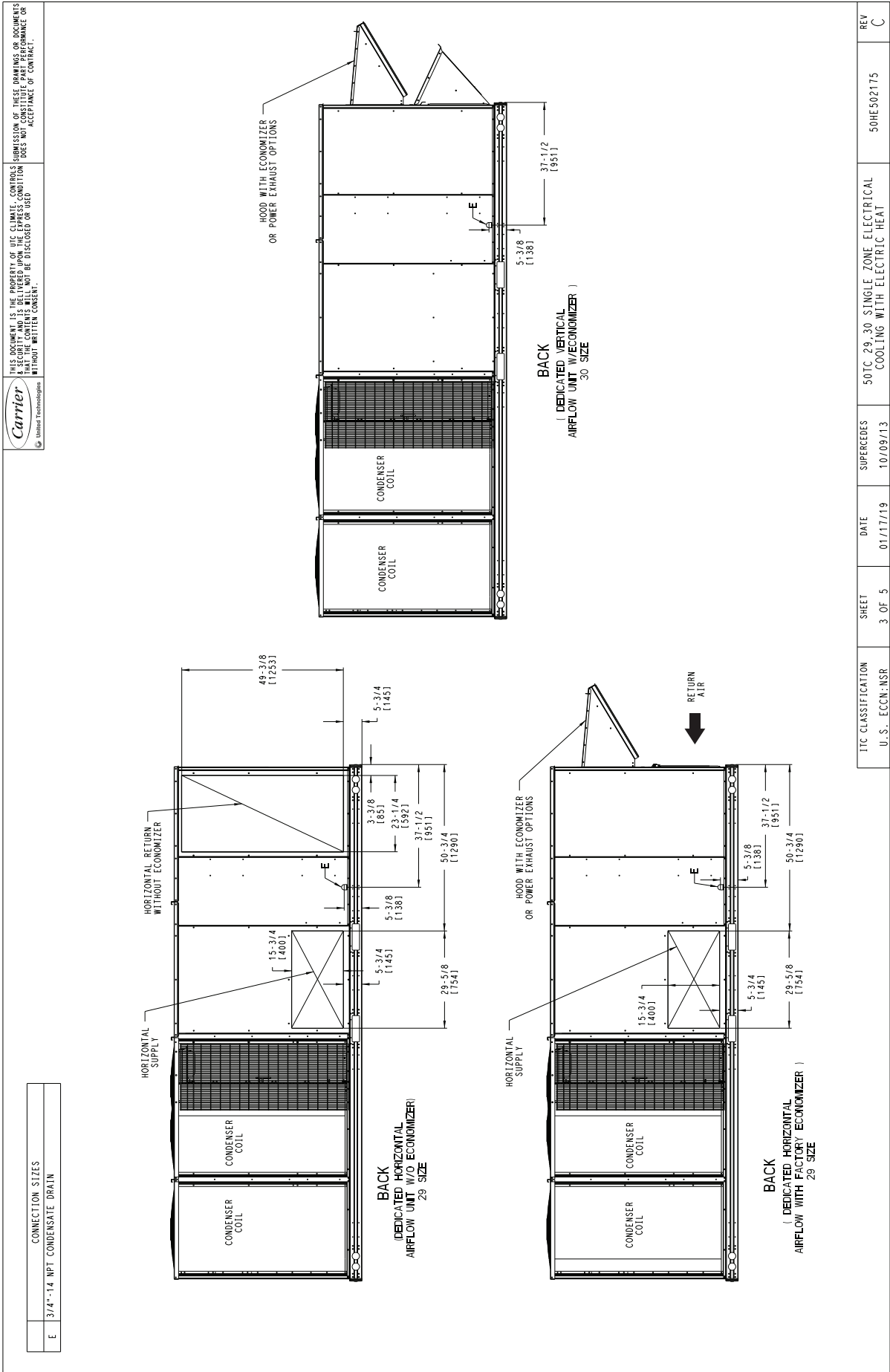


Fig. 11 — 50TC**30 Back View and Condensate Drain Location

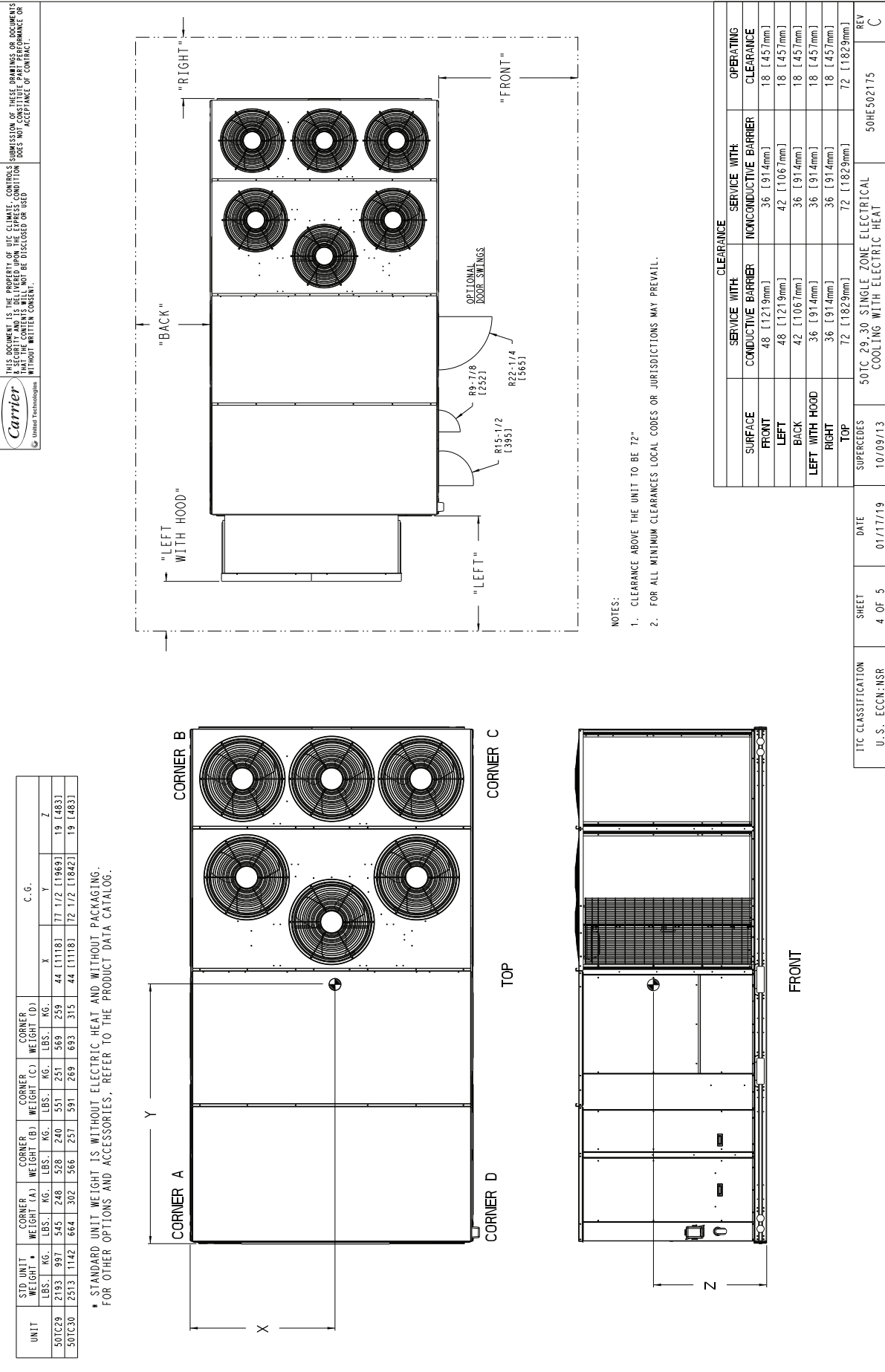


Fig. 12 — 50TC30 Corner Weights and Clearances**

INSTALLATION

Jobsite Survey

Complete the following checks before installation.

1. Consult local building codes or the U.S.A. National Electrical Code (Ref: ANSI/NFPA 70, [American National Standards Institute/National Fire Protection Association], latest revision) 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.

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.

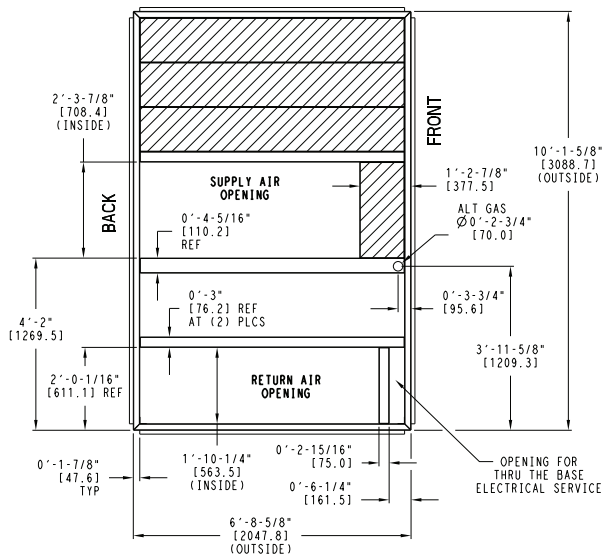
Although unit is weatherproof, avoid locations that permit water from higher level runoff and overhangs to fall onto the unit.

Select a unit mounting system that provides adequate height to allow installation of condensate trap per requirements. Refer to Step 11 — Install External Condensate Trap/Line on page 25 for required trap dimensions.

ROOF MOUNT

Check building codes for weight distribution requirements. Unit operating weight is shown in unit drawings. See Fig. 14-16 for roof curb details.

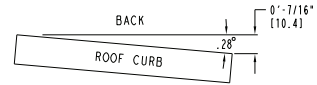
"A"	ROOF CURB ACCESSORY
1'-2" [356.0]	CRRFCURB045A00
2'-0" [610.0]	CRRFCURB046A00



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

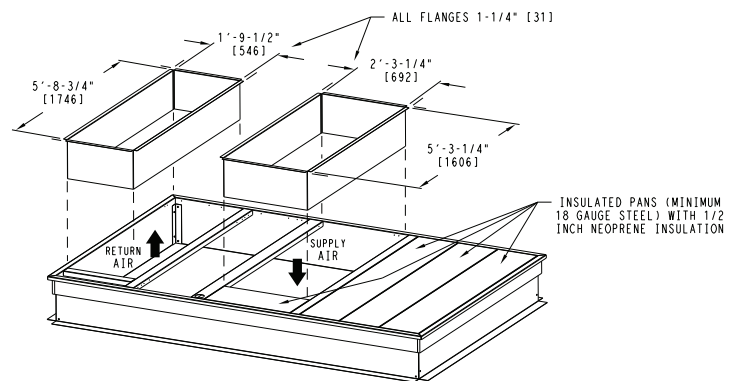
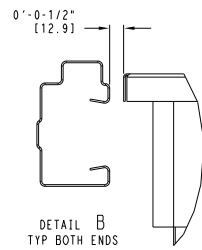
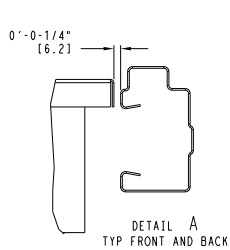
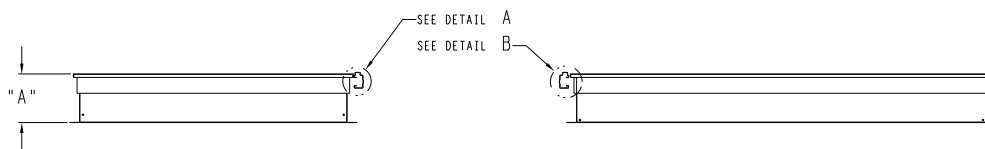
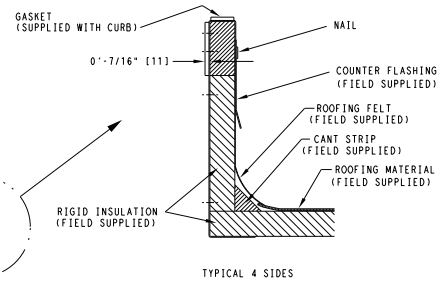
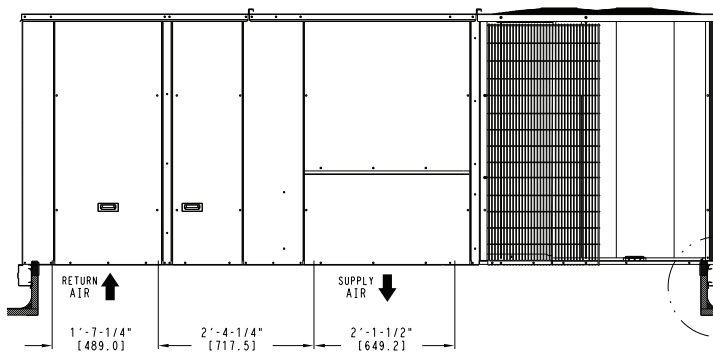
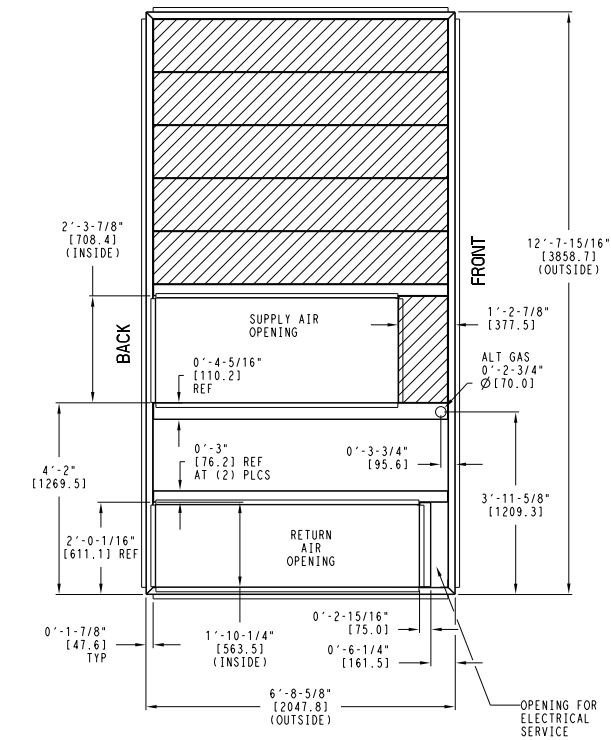


Fig. 14 — Roof Curb Details — 17 and 20 Size Units

"A"	ROOF CURB ACCESSORY
1'-2" [356.0]	CRRFCURB049A00
2'-0" [610.0]	CRRFCURB050A00



- NOTES:
- 1 ROOF CURB ACCESSORY IS SHIPPED UNASSEMBLED.
 - 2 BOLT HEADS TO BE ON INSIDE OF FLANGE. CLEARANCE IS [11] 0'-0-7/16" TYP ALL CORNERS.
 - 3 DIMENSIONS IN [] ARE IN MILLIMETERS.
 - 4 ROOF CURB GALVANIZED STEEL.
 - 5 ATTACH DUCTWORK TO CURB (FLANGES ON DUCT REST ON CURB)
 - 6 SERVICE CLEARANCE 4 ft ON EACH SIDE
- ➔ DIRECTION OF AIR FLOW

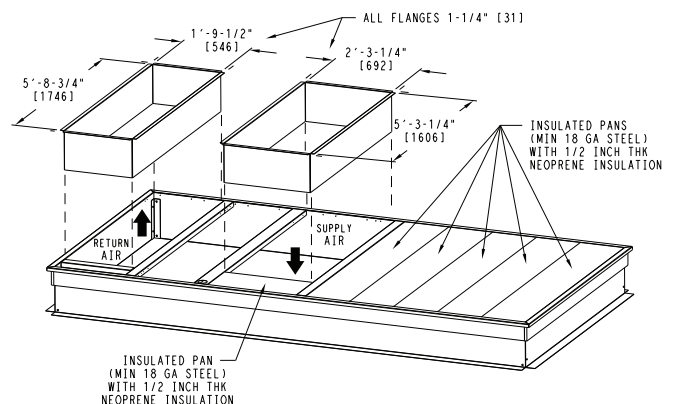
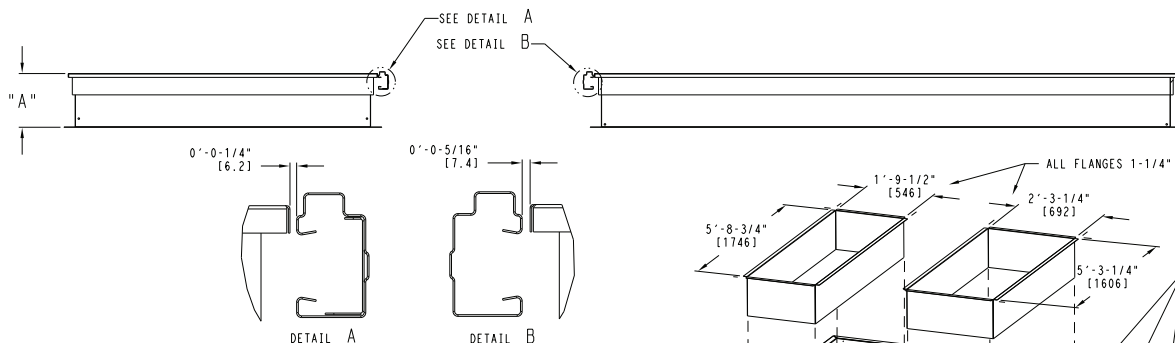
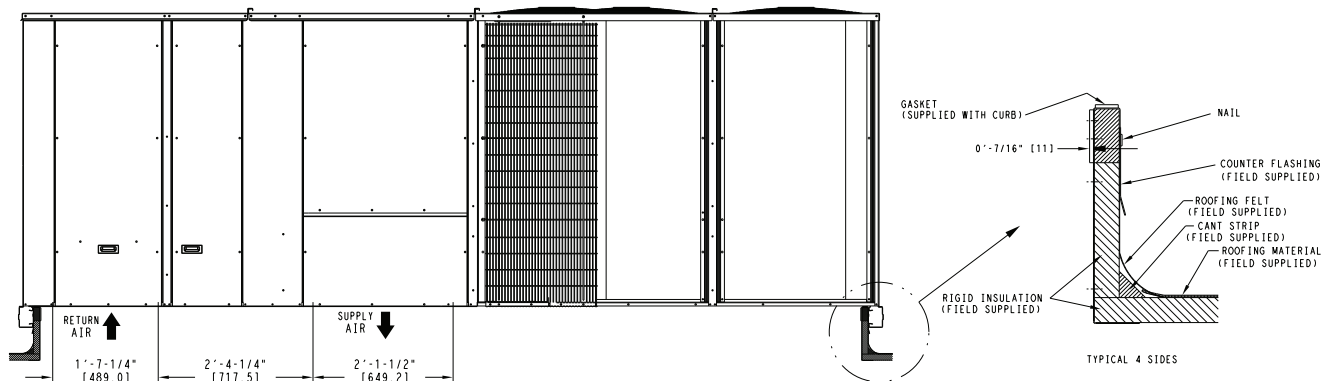
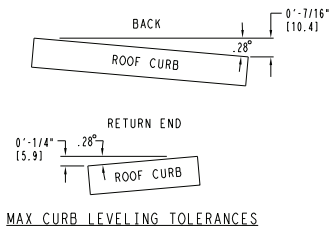


Fig. 16 — Roof Curb Details — 30 Size Units

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

1. Install curb.
2. Install field-fabricated ductwork inside curb.
3. Install thru-base service connection fittings (affects curb and unit).
4. Rig and place unit.
5. Remove top skid.
6. Install outside air hood.
7. Install smoke detector tube.
8. Install condensate line trap and piping.
9. Make electrical connections.
10. Install other accessories.

PAD-MOUNTED INSTALLATION

1. Prepare pad and unit supports.
2. Rig and place unit.
3. Remove duct covers and top skid.
4. Install Return Air smoke detector sensor tube.
5. Install field-fabricated ductwork at unit duct openings.
6. Install outside air hood.
7. Install condensate line trap and piping.
8. Make electrical connections.
9. Install other accessories.

PAD-MOUNTED INSTALLATION

1. Prepare pad and unit supports.
2. Rig and place unit.
3. Remove duct covers and top skid.
4. Install Return Air smoke detector sensor tube.
5. Install field-fabricated ductwork at unit duct openings.
6. Install outside air hood.
7. Install condensate line trap and piping.
8. Make electrical connections.
9. 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.

Locate the carton containing the outside air hood parts (see Fig. 18 and 22). Do not remove carton until unit has been rigged and located in final position.

Step 4 — Provide Unit Support

ROOF CURB MOUNT

Accessory roof curb details and dimensions are shown in Fig. 14-16. 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. 14-16. 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. 17. Refer to Accessory Roof Curb Installation Instructions for additional information as required.

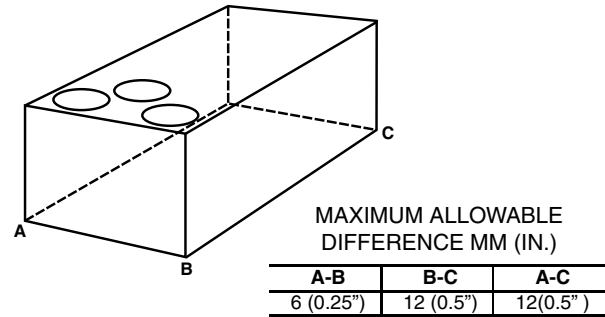


Fig. 17 — Unit Leveling Tolerance

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 base pan, remove knockouts in basepan located in control box area of access panel; see Fig. 2-13 for basepan knockout locations. Attach the service connections to the basepans.

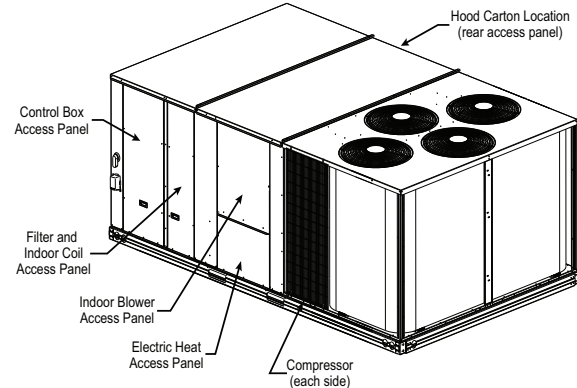


Fig. 18 — Typical Access Panel and Compressor Locations

SLAB MOUNT (HORIZONTAL UNITS ONLY)

Provide a level concrete slab that extends a minimum of 152 mm (6 in.) 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 102 mm x 102 mm (4 in. x 4 in.) pads on each side. Locate pads so that they support the rails. Make sure to avoid the fork openings.

Step 5 — Field Fabricate Ductwork

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

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

Fabricate supply ductwork so that the cross sectional dimensions are equal to or greater than the unit supply duct opening dimensions for the first 458 mm (18 in.) of duct length from the unit basepan.

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.

⚠ 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 Fig. 19 for additional information.

Lifting holes are provided in base rails as shown in Fig. 19. 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 when packaging is removed.

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

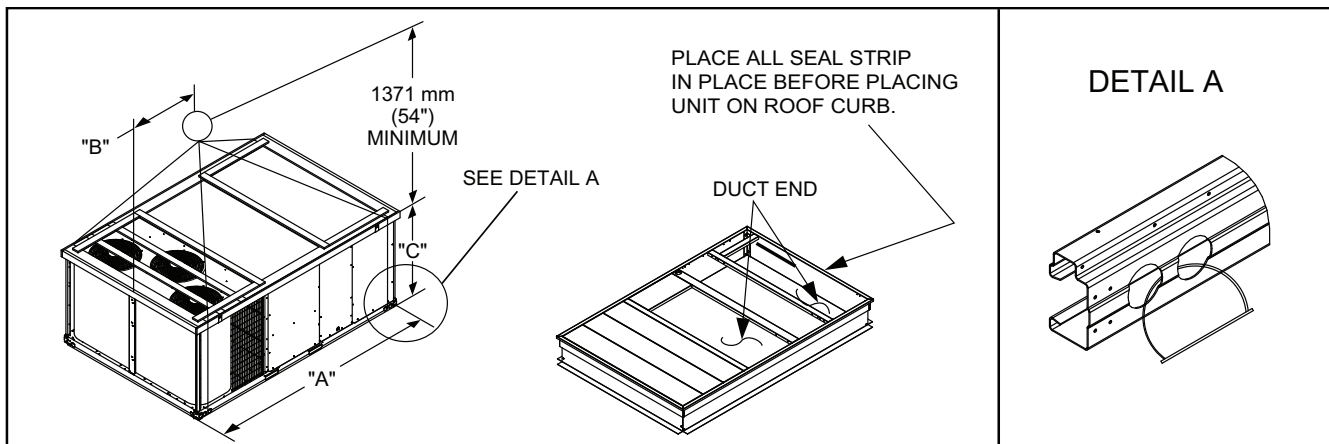
POSITIONING ON CURB

Position unit on roof curb so that the following clearances are maintained: 6 mm (1/4 in.) clearance between the roof curb and the base rail inside the right and left, 12 mm (1/2 in.) 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 being approximately equal to Detail A and Detail B in Fig. 14-16.

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.



NOTES:

1. Dimensions in () are in inches.

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.

UNIT	MAX WEIGHTS		DIMENSIONS					
	KG	LB	A		B		C	
50TC-D17	1011	2228	3249	127.8	1491	58.7	1328	52.3
50TC-D20	1017	2243	3249	127.8	1491	58.7	1328	52.3
50TC-D24	1033	2277	3595	141.5	1816	71.5	1328	52.3
50TC-D28	1145	2525	3595	141.5	1816	71.5	1532	60.3
50TC-D30	1295	2849	4007	157.8	2040	80.3	1532	60.3

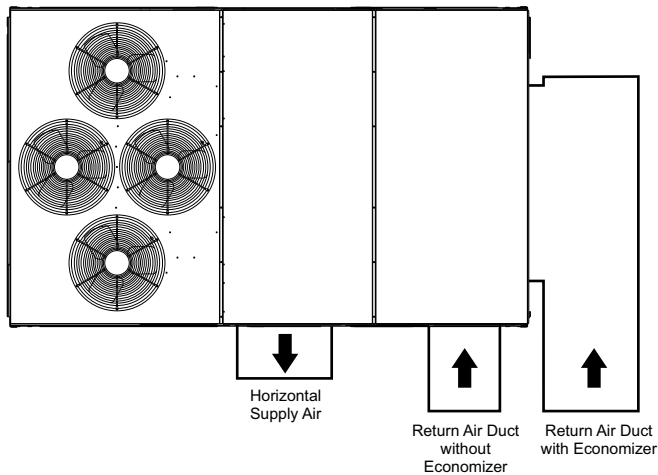
Fig. 19 — Rigging Details

Step 7 — Horizontal Duct Connection

Refer to Fig. 2-13 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. 20 for top view depicting typical horizontal duct arrangements.

Field-supplied 19 mm (3/4-in.) flanges should be attached to horizontal duct openings (see Fig. 20) 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.

NOTE: 50TC-D 50Hz size 17 to 24 units are factory assembled as either dedicated horizontal or vertical units. These units cannot be field converted.



LOCATION	SUPPLY	RETURN WITHOUT ECONOMIZER	RETURN WITH ECONOMIZER
	BACK	BACK	LEFT END
Height — mm (in.)	402 (15-7/8)	1253 (49-3/8)	467 (18-3/8)
Width — mm (in.)	756 (29-3/4)	593 (23-3/8)	1564 (61-5/8)

Fig. 20 — Horizontal Duct Opening Dimensions

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. 21). 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. 22).

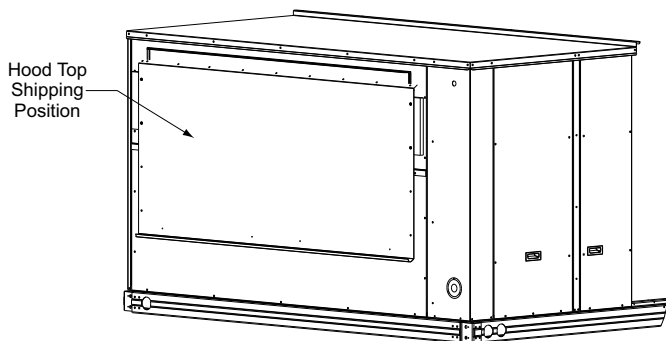


Fig. 21 — Hood Top — Shipping Position

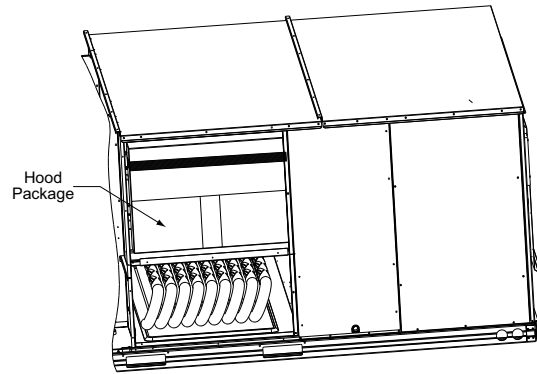


Fig. 22 — Hood Package — Shipping Location

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. 23 for identification of the various parts of the hood assembly.

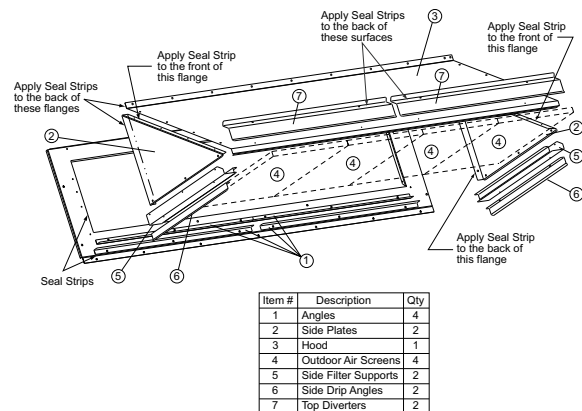


Fig. 23 — Hood Part Identification and Seal Strip Application Areas

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. 23).
4. Secure side plates to panel using the screws provided.
5. Apply seal strip to mating flange of the hood (see Fig. 24).
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.**

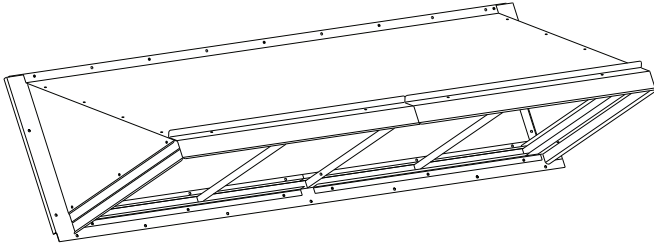


Fig. 24 — Hood Assembly-Completed

Step 9 — Assemble Barometric Hood

The barometric hood can be assembled in vertical or horizontal configuration. Figure 25 illustrates the barometric hood parts.

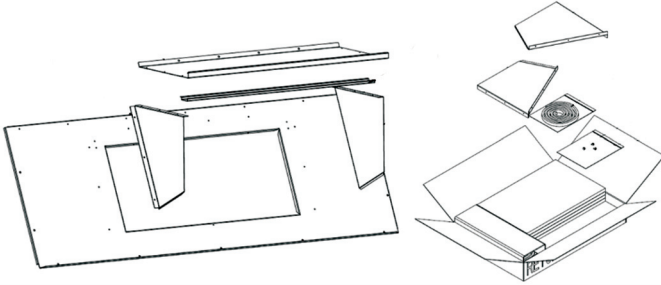


Fig. 25 — Barometric Hood Parts

BAROMETRIC HOOD (VERTICAL CONFIGURATION)

1. Remove the hood top panel from its shipping position on the unit end (see Fig. 26).

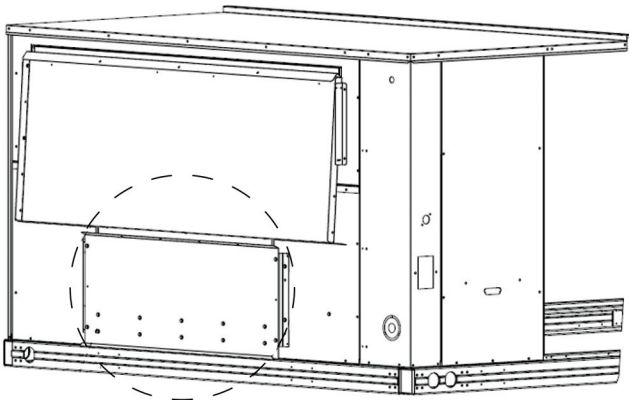


Fig. 26 — Shipping Location, Vertical Units

2. Remove the side panels located in the hood parts box (see Fig. 27).

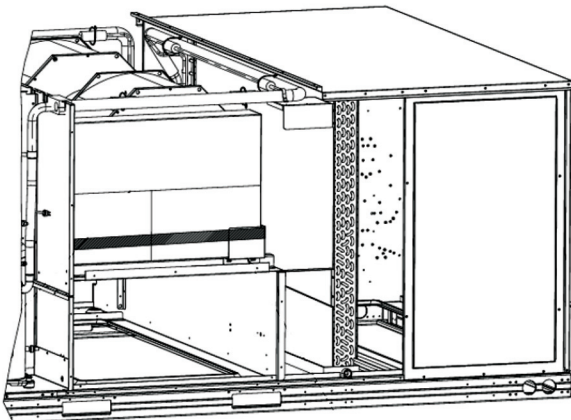


Fig. 27 — Barometric Hood Box Parts Location

3. Install parts as shown in the following exploded view (Fig. 28) using the seal strip and screws provided in the parts box.

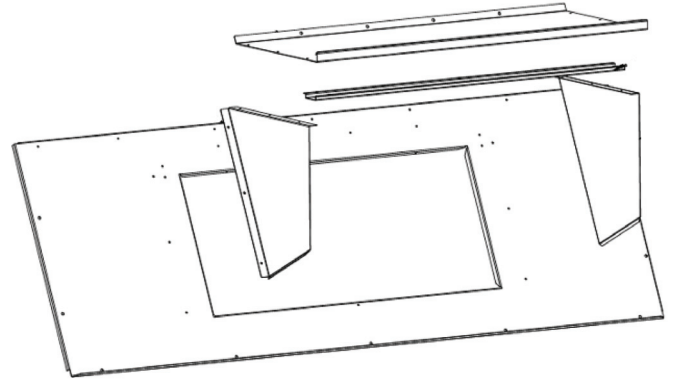


Fig. 28 — Barometric Hood Exploded View

Figure 29 illustrates the installed barometric hood parts.

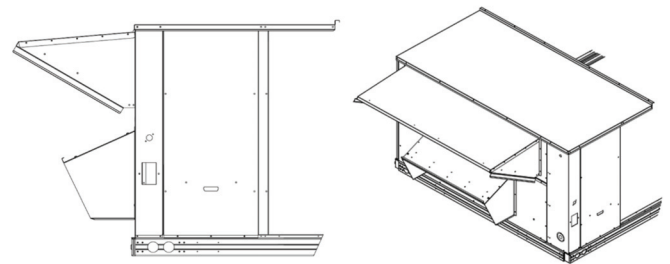


Fig. 29 — Installed Barometric Hood Side View and Isometric View

BAROMETRIC HOOD (HORIZONTAL CONFIGURATION)

For horizontal return and field installed economizer, install the economizer as follows:

1. Install the field provided horizontal ductwork onto the unit. Duct height must be at least 49.53 cm (19 1/2 in.) high, however the duct can be no taller than the top of the relief opening in the bottom panel, or airflow into the outside air hood will be restricted. See Fig. 30.

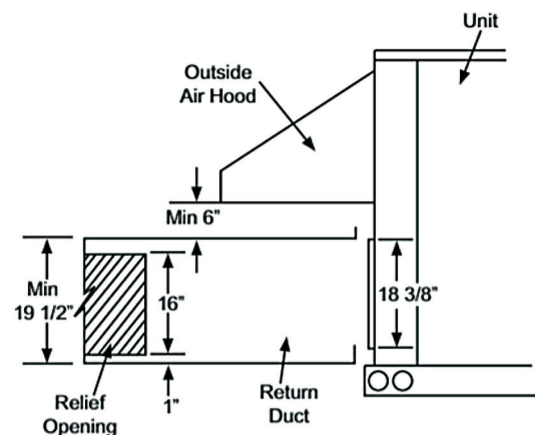


Fig. 30 — Relief Damper

2. Cut a 40.64 cm x 91.44 cm (16 in. x 36 in.) opening in the return duct for the relief damper (see Fig. 30).
3. On the field installed economizer (CRECOMZR0**A00), a birdscreen or hardware cloth is shipped attached to the bottom panel used for vertical applications.

NOTE: This panel is not used for horizontal return applications. Remove the screen from the provided panel and install it over the relief opening cut in return duct.

- Using the blade brackets, install the relief damper onto the side of the return duct (see Fig. 31). The two brackets and relief damper are provided with the economizer.

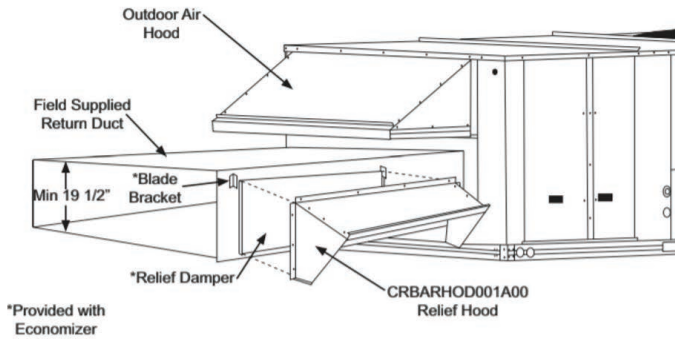


Fig. 31 — Installing CRBARHOD001A00 Over Relief Damper

- Using the provided hardware, screw the CRBARHOD001A00 hood sides and top together (see Fig. 32).

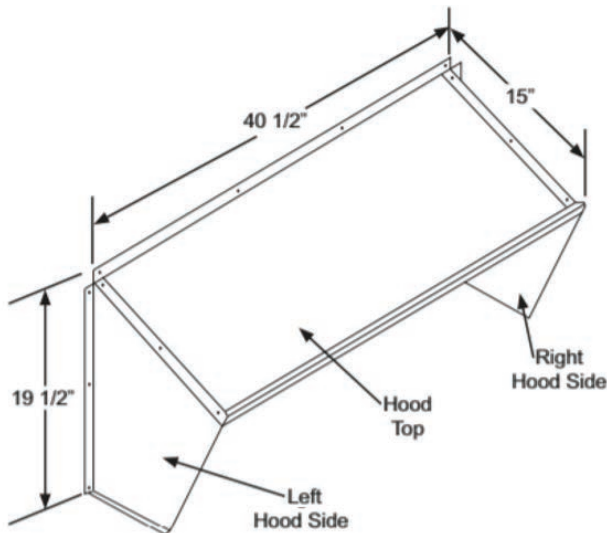


Fig. 32 — CRBARHOD001A00 Hood Sides and Top

Caulk the backside of the mating flanges to ensure a watertight seal. Install the CRBARHOD001A00 over the relief damper and screw to the return duct, as illustrated in Fig. 31.

Step 10 — Check Pulley Alignment / Belt Tension

PULLEY ALIGNMENT

The motor pulley is an adjustable-pitch type that allows implementation of changes in fan wheel speed to match as-installed ductwork systems. The pulley consists of a fixed flange side that faces the motor (secured to the motor shaft) and a movable flange side that can be rotated around the fixed flange side that increases or reduces the pitch diameter of this driver pulley (see Fig. 33).

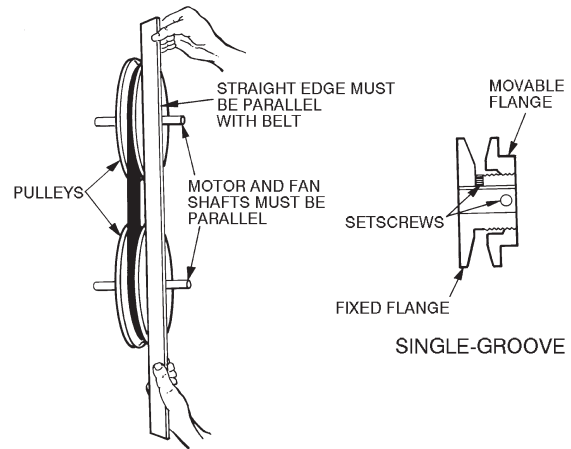


Fig. 33 — Checking Pulley

To align fan and motor pulleys:

- Loosen fan pulley setscrews.
- Slide fan pulley along fan shaft. Make angular alignment by loosening motor from mounting.
- Tighten fan pulley setscrews and motor mounting bolts to torque specifications.
- Recheck belt tension.

BELT TENSION

Check belt tension by using a spring-force tool (such as Browning's Part Number "Belt Tension Checker" or equivalent tool); tension should be between 2.3-4.5 kg (5-10 lbs) with 13.3 mm ($\frac{5}{8}$ in.) deflection when measured at the centerline of the belt span. This point is at the center of the belt when measuring the distance between the motor shaft and the blower shaft.

NOTE: Without the spring-tension tool, place a straight edge across the belt surface at the pulleys, then deflect the belt at mid-span using one finger to a 12.7 mm ($\frac{1}{2}$ in.) deflection.

Adjust the belt tension by loosening the four motor rail mounting nuts and bolts where the motor rails bolts to the blower rails. There are two jack bolts and nuts that are used to slide the motor rails to either increase or decrease belt tension. There are locking nuts on the jack bolts that need to be loosened at the motor rail. Turn the jack bolts clockwise or counter clockwise until the correct belt tension is achieved. Ensure the fan shaft and motor shaft are parallel prior to tightening motor plate nuts (see Fig. 34).

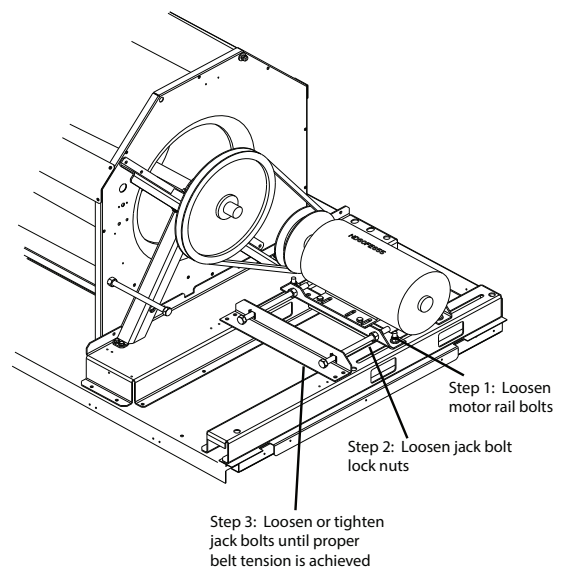


Fig. 34 — Adjusting Belt Tension

Step 11 — Install External Condensate Trap/Line

The unit has one 19 mm ($\frac{3}{4}$ in.) condensate drain connection on the end of the condensate pan (see Fig. 35). See Fig. Fig. 2-13 for item “E”, in the view labeled “BACK (HORIZONTAL DISCHARGE W/O ECON)” for the location of the condensate drain connection.

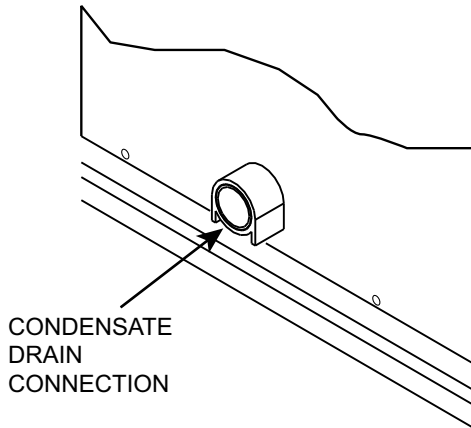
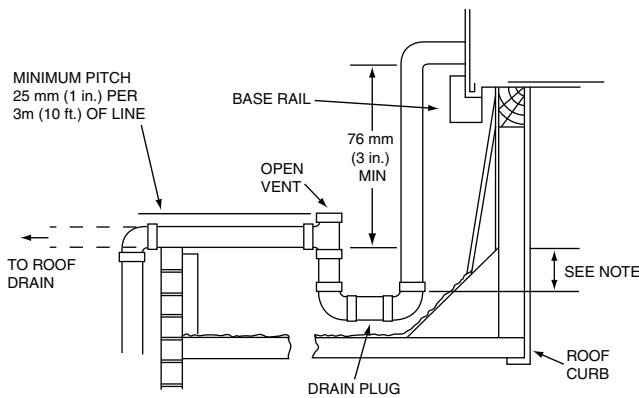


Fig. 35 — Condensation Drain Pan Connection

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. 36.)



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

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

Fig. 36 — Condensate Drain Piping Details

All units must have an external trap for condensate drainage. Install a trap at least 102 mm (4-in.) deep and protect against freeze-up. If drain line is installed downstream from the external trap, pitch the line away from the unit at 25 mm in 3 m (1 in. per 10 ft) of run. Do not use a pipe size smaller than the unit connection of 19 mm ($\frac{3}{4}$ in.)

Step 12 — 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 local electrical codes or in absence of local codes, it is recommended that the U.S.A. standard ANSI/NFPA 70, National Electrical Code (NEC), be followed.

NOTE: Field-supplied wiring shall conform with the limitations of minimum 33°C (63°F) rise.

Field power wires are connected to the unit at line-side pressure lugs on the terminal block (see Fig. 37 or the wiring diagram label for control box component arrangement) or at factory-installed option non-fused disconnect switch. Use copper conductors only.

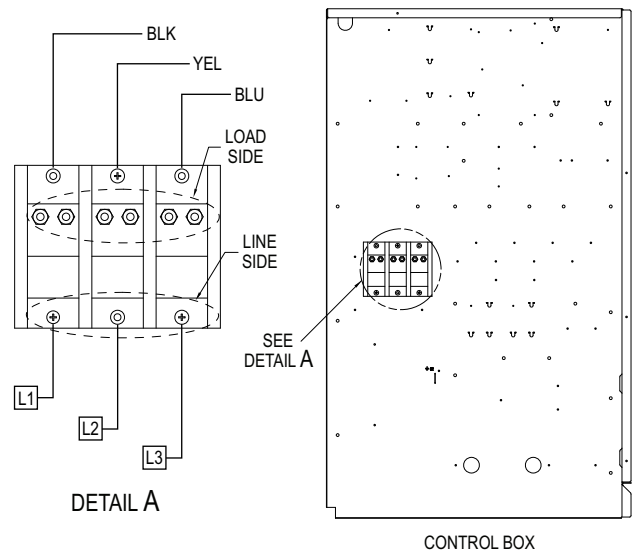


Fig. 37 — Location of TB1

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

The unit is factory wired for the voltage shown on the nameplate. Refer to unit label diagram for additional information.

⚠ WARNING

FIRE HAZARD

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

Do not connect aluminum wire between disconnect switch and unit. Use only copper wire. See Fig. 38.

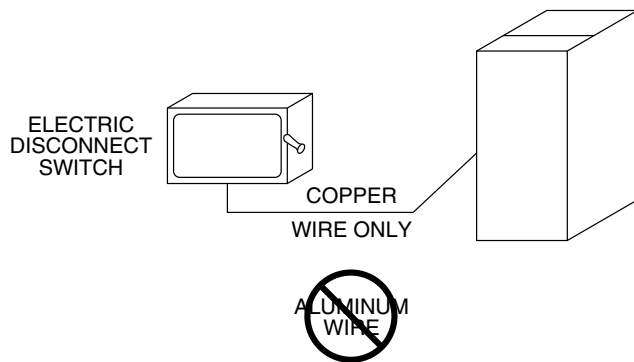


Fig. 38 — Disconnect Switch and Unit

UNITS WITHOUT FACTORY-INSTALLED DISCONNECT

When installing units, provide a disconnect switch of adequate size per local or national wiring code. 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 DISCONNECT

The factory-installed option disconnect switch is located in the main control box. The manual switch handle is accessible on the corner post adjacent to the control box access panel.

ALL UNITS

All field wiring must comply with local codes. Size wire based on MCA (Minimum Circuit Amps) on the unit informative plate. See Fig. 39 for power wiring connections to the unit power terminal block and equipment ground. Maximum wire size is 70.0 mm² (2/0 AWG) per pole.

Provide a ground-fault and short-circuit over-current protection device (fuse or breaker) per local code (or U.S.A. NEC Article 440). 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 following formula to determine the percent of voltage imbalance.

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

⚠ 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.

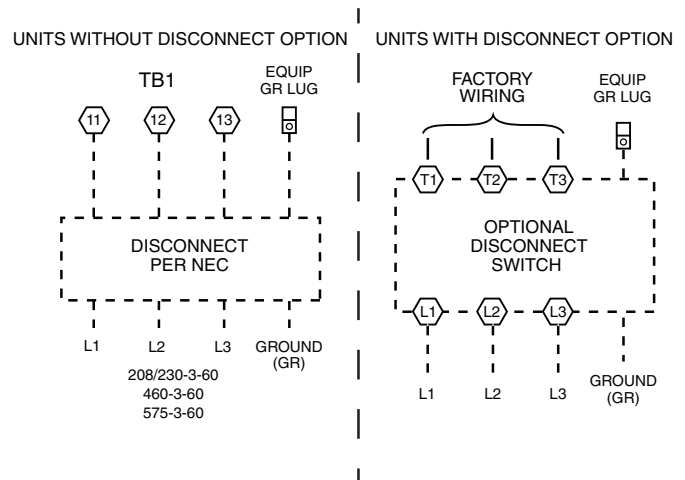


Fig. 39 — Power Wiring Connections

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 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 22 mm (7/8 in.) knock out is provided for low voltage. An additional 22 mm (7/8 in.) knock out is provided.

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 liquid tight conduit 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. 39.

FIELD CONTROL WIRING

The 50TC-D 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

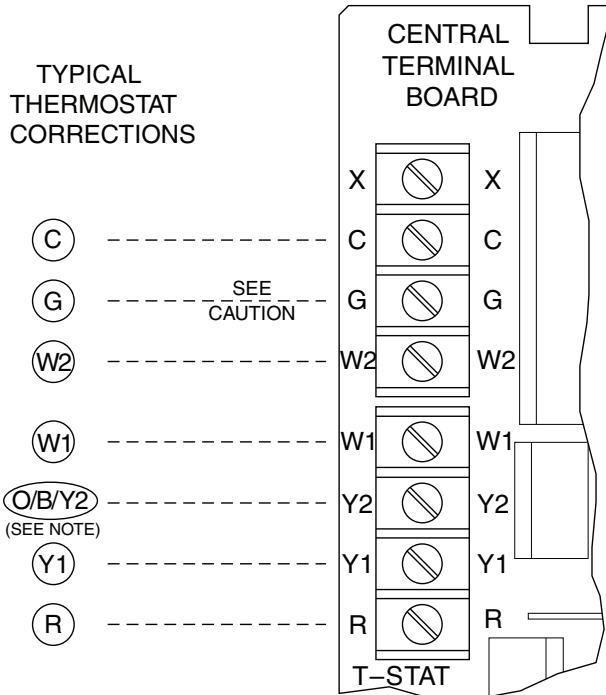
Select a Carrier approved accessory thermostat. When electric heat is installed in the 50TC unit, the thermostat must be capable of energizing the G terminal (to energize the Indoor Fan Contactor) whenever there is a space call for heat (energizing the W1 terminal). The accessory thermostats listed on 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 15 m (50 ft.), use no. 18 AWG (American Wire Gage) insulated wire (35°C minimum). For 15 to 23 m (0 to 75 ft.), use no. 16 AWG insulated wire (35°C minimum). For over 23 m (75 ft.), 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. See Fig. 40 for typical low-voltage control connections.



NOTE: Typical multi-function marking. Follow manufacturer's configuration instructions to select Y2.

--- 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.

Fig. 40 — 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. 41).

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

CONFIGURE FOR ELECTRIC HEAT

To configure the factory-approved thermostat, open the Advanced Setup menu, scroll down to ELECTRIC HEAT and change RANGE value from OFF to ON. Consult the thermostat installation instructions for full details.

HEAT ANTICIPATOR SETTINGS

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

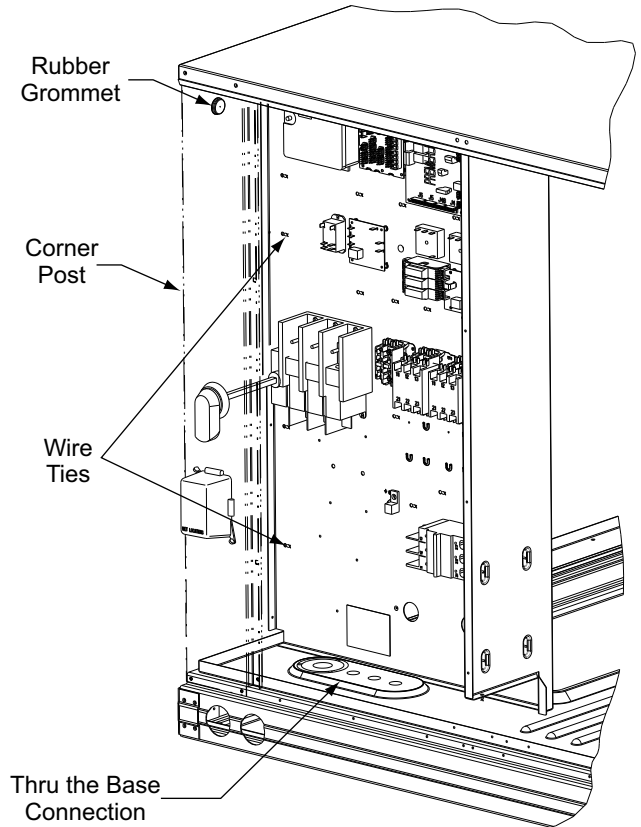


Fig. 41 — Field Control Wiring Raceway

ELECTRIC HEATERS

The 50TC-D 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. 42-44.) Refer to the Electric Heater Kit Installation Instructions for complete details.

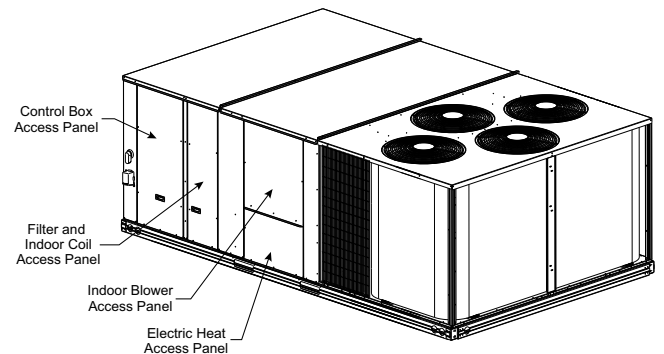


Fig. 42 — Typical Access Panel Locations

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

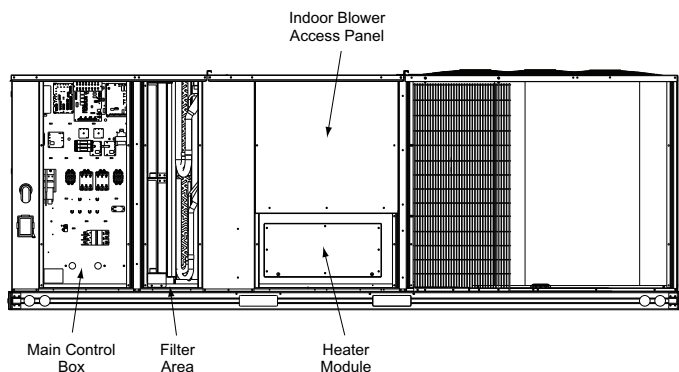


Fig. 43 — Typical Component Location

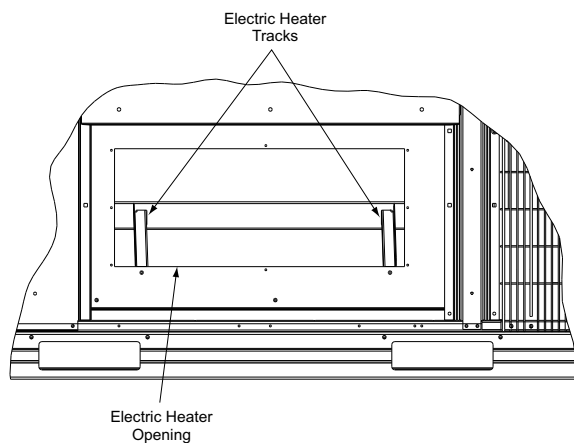


Fig. 44 — Electric Heater Compartment (Cover Removed)

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. See Fig. 45 for accessory electric heater control connections.

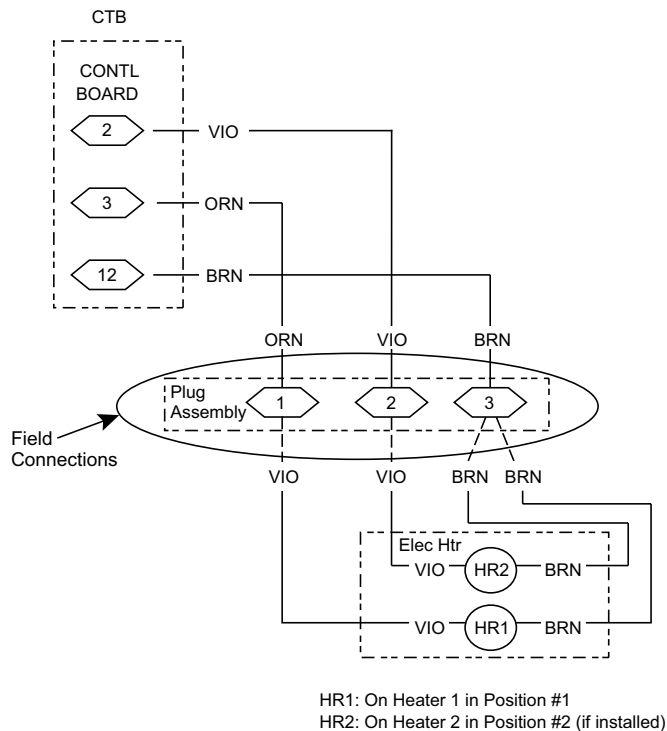


Fig. 45 — Accessory Electric Heater Control Connections

PremierLink™ Control

For details on operating units equipped with the factory-installed PremierLink controller option, refer to the *PremierLink Retrofit Rooftop Controller Version 3.x Installation, Start-Up, and Configuration Instructions* manual.

See Fig. 46 for the PremierLink wiring diagram.

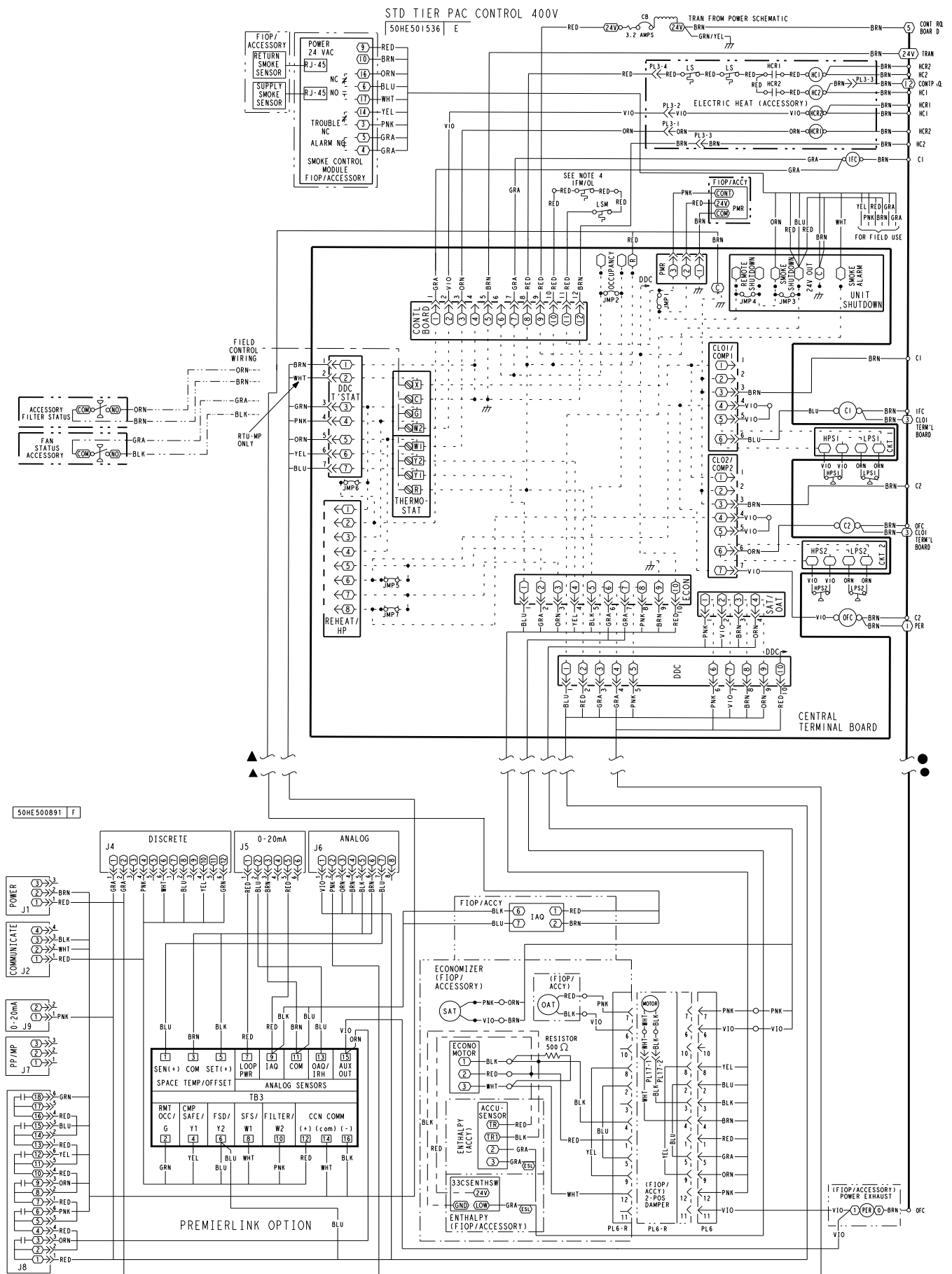


Fig. 46 — PremierLink Wiring Schematic

RTU Open Control System

For details on operating units equipped with the factory-installed RTU Open controller, refer to the *“Factory-Installed RTU Open Multi-Protocol Controller Control, Start-Up, Operation and Troubleshooting”* manual.

See Fig. 47 for the RTU Open wiring diagram.

Smoke Detectors

Smoke detectors are available as factory-installed options on 50TC-D 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. Return Air smoke detectors are arranged for vertical return configurations only. 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. 48). Its operating location is in the return air section of the unit (see Fig. 49, unit without economizer, or Fig. 50, unit with economizer), inserted into the return air sensor module housing which protrudes through the back of the control box.

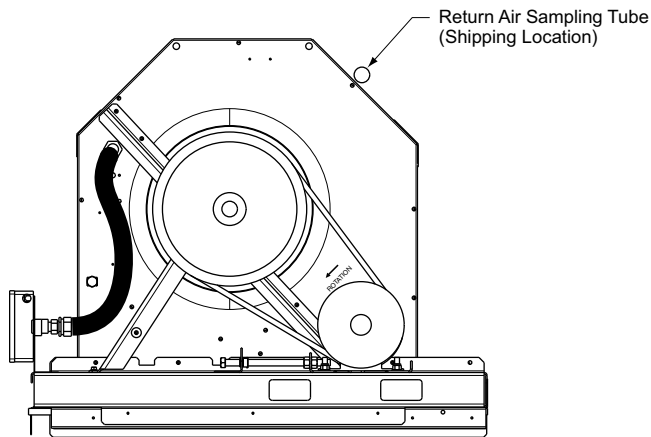


Fig. 48 — Typical Supply Air Smoke Detector Sensor Location

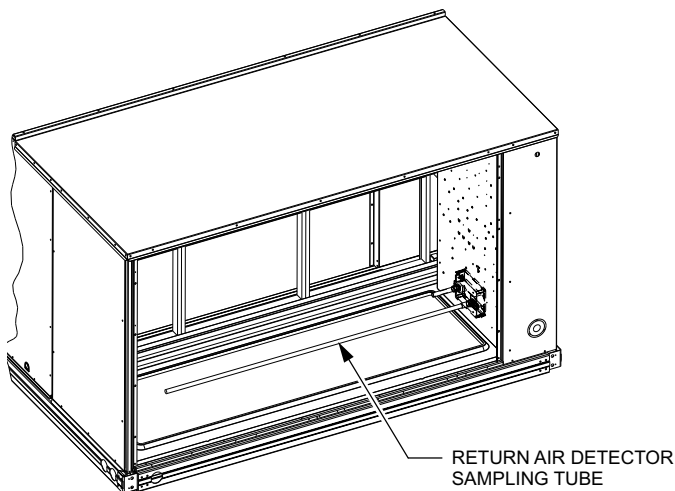


Fig. 49 — Return Air Sampling Tube Location in Unit without Economizer

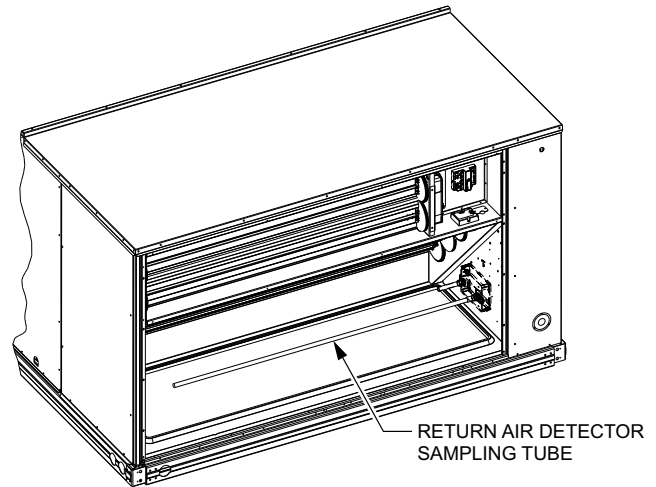


Fig. 50 — Return Air Sampling Tube Location in Unit with Economizer

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. For vertical application, position the sampling holes on the bottom of the tube, facing into the bottom return duct opening. For horizontal application, position the sampling holes on the side of the tube, facing the unit's end panel.
4. Insert the sampling tube into the return air sensor module's forward or rear opening until the tube snaps into position.
5. Replace end panel or outside air hood.

RETURN AIR SENSOR EXHAUST TUBE INSTALLATION

The exhaust tube is shipped in a bag located in the control box. The exhaust tube is 152 mm (6 inches) long with a base coupling and a gasket. Slip the gasket over the coupling end, then insert the connector into the rear opening in the sensor module until the tube snaps into location.

NOTE: The shipping bag contains a tube plug or cap. This part is not used in this installation and may be discarded. Do NOT insert the plug into the exhaust tube.

TEST/RESET MAGNET

The shipping bag also contains a magnet for testing and resetting smoke detectors. Do not discard this magnet.

ADDITIONAL APPLICATION DATA

Refer to *Factory Installed Smoke Detectors for Small and Medium Rooftop Units 2 to 25 Tons* for discussions on additional control features of these smoke detectors including multiple unit coordination.

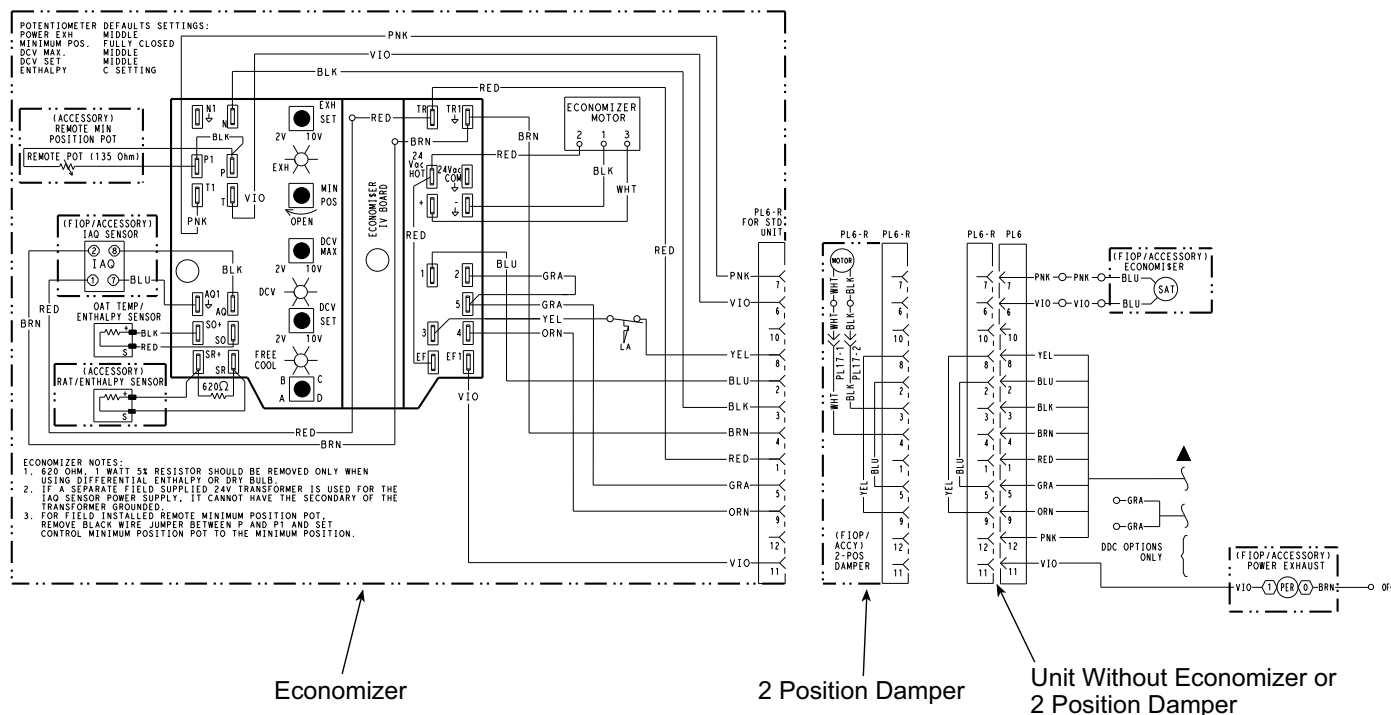


Fig. 51 — Economizer™ IV Wiring

Step 13 — Adjust Factory-Installed Options

ECONOMIZER IV OCCUPANCY SWITCH

Refer to Fig. 51 for general EconoMiSer 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 14 — 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
- EconoMiSer IV (with control and integrated barometric relief)
- EconoMiSer2 (without control/for external signal and integrated barometric relief)
- Power Exhaust
- Differential dry-bulb sensor (EconoMiSer IV)
- Outdoor enthalpy sensor
- Differential enthalpy sensor
- Electric Heaters
- Single Point kits
- Thermostat / Sensors
- CO₂ sensor
- DDC interface (PremierLink)
- Louvered hail guard
- Phase monitor control

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 and Maintenance manual for detailed PreStart and Start-up instructions.

**START-UP CHECKLIST — 50TC 17-30 SINGLE PACKAGE ROOFTOP WITH
HEAT/ELECTRIC COOLING WITH PURON® (R-410A) REFRIGERANT**

NOTE: To avoid injury to personnel and damage to equipment or property when completing the procedures listed in this start-up checklist, use good judgment, follow safe practices, and adhere to the safety considerations/information as outlined in preceding sections of this Installation Instruction document.

I. PRELIMINARY INFORMATION

MODEL NO. _____

JOB NAME _____

SERIAL NO. _____

ADDRESS _____

START-UP DATE _____

TECHNICIAN NAME _____

ADDITIONAL ACCESSORIES _____

II. PRE-START-UP

Verify that job site voltage agrees with voltage listed on rating plate (Y/N) _____

Verify that all packaging materials have been removed from unit (Y/N) _____

Remove all shipping hold down bolts and brackets per installation instructions (Y/N) _____

Verify that condensate connection is installed per installation instructions (Y/N) _____

Check refrigerant piping for indications of leaks; investigate and repair if necessary (Y/N) _____

Check all electrical connections and terminals for tightness (Y/N) _____

Check that return (indoor) air filters are clean and in place (Y/N) _____

Verify that unit installation is level (Y/N) _____

Check fan wheels and propeller for location in housing/orifice and setscrew tightness (Y/N) _____

Check to ensure that electrical wiring is not in contact with refrigerant lines or sharp metal edges (Y/N) _____

Check pulley alignment and belt tension per installation instructions (Y/N) _____

III. START-UP (Refer to Unit Service/Maintenance Manual for Start-Up Instructions)

ELECTRICAL

Supply Voltage	L1-L2 _____	L2-L3 _____	L3-L1 _____
Compressor Amps 1	L1 _____	L2 _____	L3 _____
Compressor Amps 2	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	_____ °C DB (Dry Bulb)	_____ °C WB (Wet Bulb)
Return-Air Temperature	_____ °C DB	_____ °C WB
Cooling Supply Air Temperature	_____ °C DB	_____ °C WB

PRESSURES (COOLING MODE)

REFRIGERANT SUCTION	CIRCUIT 1 _____	kPa	_____ °C
	CIRCUIT 2 _____	kPa	_____ °C
REFRIGERANT DISCHARGE	CIRCUIT 1 _____	kPa	_____ °C
	CIRCUIT 2 _____	kPa	_____ °C

Verify that 3-phase fan motor and blower are rotating in correct direction (Y/N) _____
Verify that 3-phase scroll compressor is rotating in the correct direction (Y/N) _____
Verify refrigerant charge using charging charts (Y/N) _____

GENERAL

Economizer minimum vent and changeover settings to job requirements (if equipped) (Y/N) _____

REPEAT PROCESS FOR 2 COMPRESSOR SYSTEMS

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE