WeatherExpert®
50LC*B14-26 Single Package Rooftop
Cooling Only
with Puron® (R-410A) Refrigerant

Installation Instructions

CONTENTS

⚠ 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

PERSONAL INJURY 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.

MODEL NUMBER NOMENCLATURE AND DIMENSIONS

See Fig. 1 for 50LC*B model number nomenclature. See Fig. 2-16 for unit dimensional drawings. Figures 5, 10, and 15 show service clearance dimensions.

Rated Indoor Airflow

Table 1 lists the rated indoor airflow used for the AHRI efficiency rating for the units covered in this document.

Table 1 — Rated Indoor Airflow

MODEL NUMBER	FULL LOAD AIRFLOW (CFM)
50LC*B14	4375
50LC*B17	4875
50LC*B20	5690
50LC*B24	6500
5OLC*B26	7500

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

Unit Heat Type
50 - Electric Heat
Packaged Rooftop

Model Series - WeatherExpert®
LC - Ultra High Efficiency

Electric Heat Options
0 = Standard, No Electric Heat
D = Low Electric Heat
E = Medium Electric Heat
F = High Electric Heat

Refrigerant System
B = Three stage cooling capacity control
with multi-zone VAV operation

Cooling Tons
14 - 12.5 ton
17 - 15 ton
20 - 17.5 ton
24 - 20 ton
26 - 23 ton

Sensor Options
A = None
B = RA Smoke Detector
C = SA Smoke Detector
D = RA + SA Smoke Detector
E = CO_2
F = RA Smoke Detector and CO_2
G = SA Smoke Detector and CO_2
H = RA + SA Smoke Detector and CO_2

Indoor Fan Motor Options
1 = Standard Static / Vertical Supply, Return Air Flow
2 = Medium Static / Vertical Supply, Return Air Flow
3 = High Static / Vertical Supply, Return Air Flow
4 = Ultra High Static / Vertical Supply, Return Air Flow
5 = Standard Static / Horizontal Supply, Return Air Flow
6 = Medium Static / Horizontal Supply, Return Air Flow
7 = High Static / Horizontal Supply, Return Air Flow
8 = Ultra High Static / Horizontal Supply, Return Air Flow

Coil Options: Fin/Tube (Condenser – Evaporator – 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

Packaging
0 = Standard
1 = LTL

Electrical Options
A = None
B = HACR Circuit Breaker
C = 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 (required on each unit)
B = Temperature Low Leak Economizer
with Barometric Relief
C = Temperature Low Leak Economizer
with Centrifugal Power Exhaust - Vertical Only
E = Enthalpy Low Leak Economizer
with Barometric Relief
F = Enthalpy Low Leak Economizer
with Centrifugal Power Exhaust - Vertical Only
N = Temperature Ultra Low Leak Economizer
with Barometric Relief
P = Temperature Ultra Low Leak Economizer
with Centrifugal Power Exhaust - Vertical Only
R = Enthalpy Ultra Low Leak Economizer
with Barometric Relief
S = Enthalpy Ultra Low Leak Economizer
with Centrifugal Power Exhaust - Vertical Only

Base Unit Controls
1 = VAV-RTU Open Controller
(required on each model)

Design Revision
- = Factory Design Revision

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

NOTE: Not all possible options can be displayed above. Refer to other support material or your local Carrier Expert.

Fig. 1 — 50LC*B14-26 Model Number Nomenclature (Example)

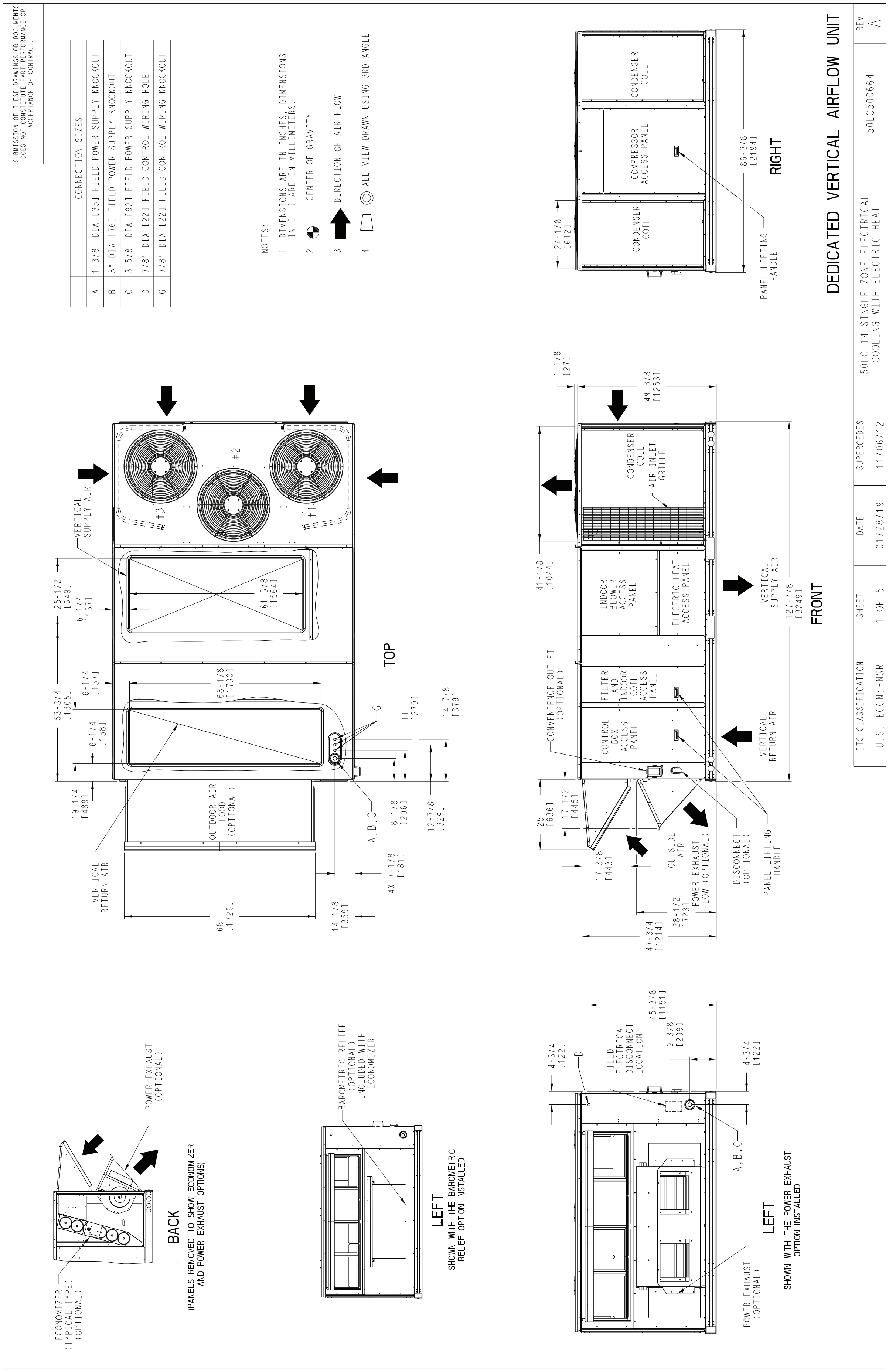


Fig. 2 — 50LC*B14 Vertical Airflow

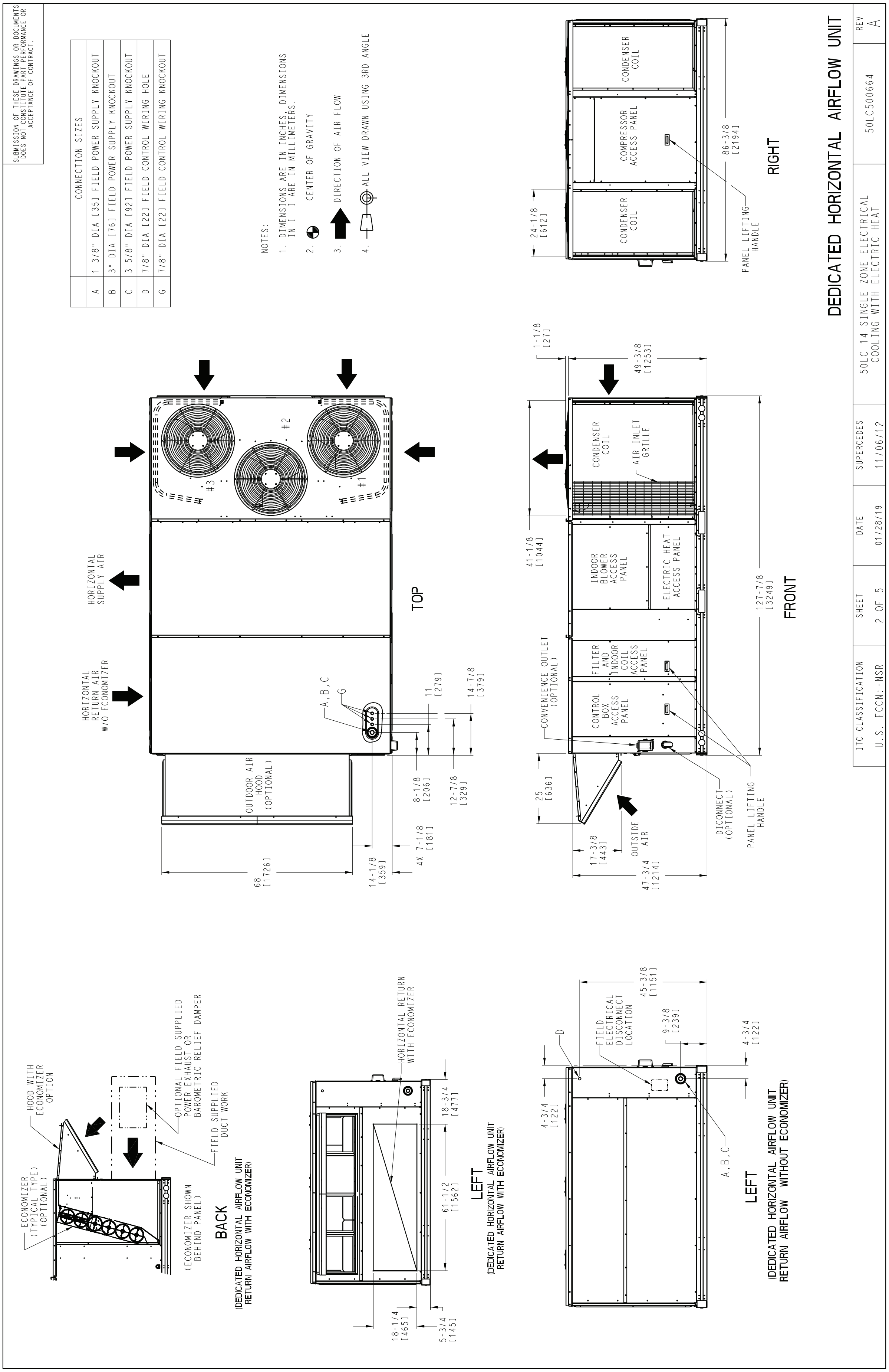


Fig. 3 — 50LCB*14 Horizontal Airflow

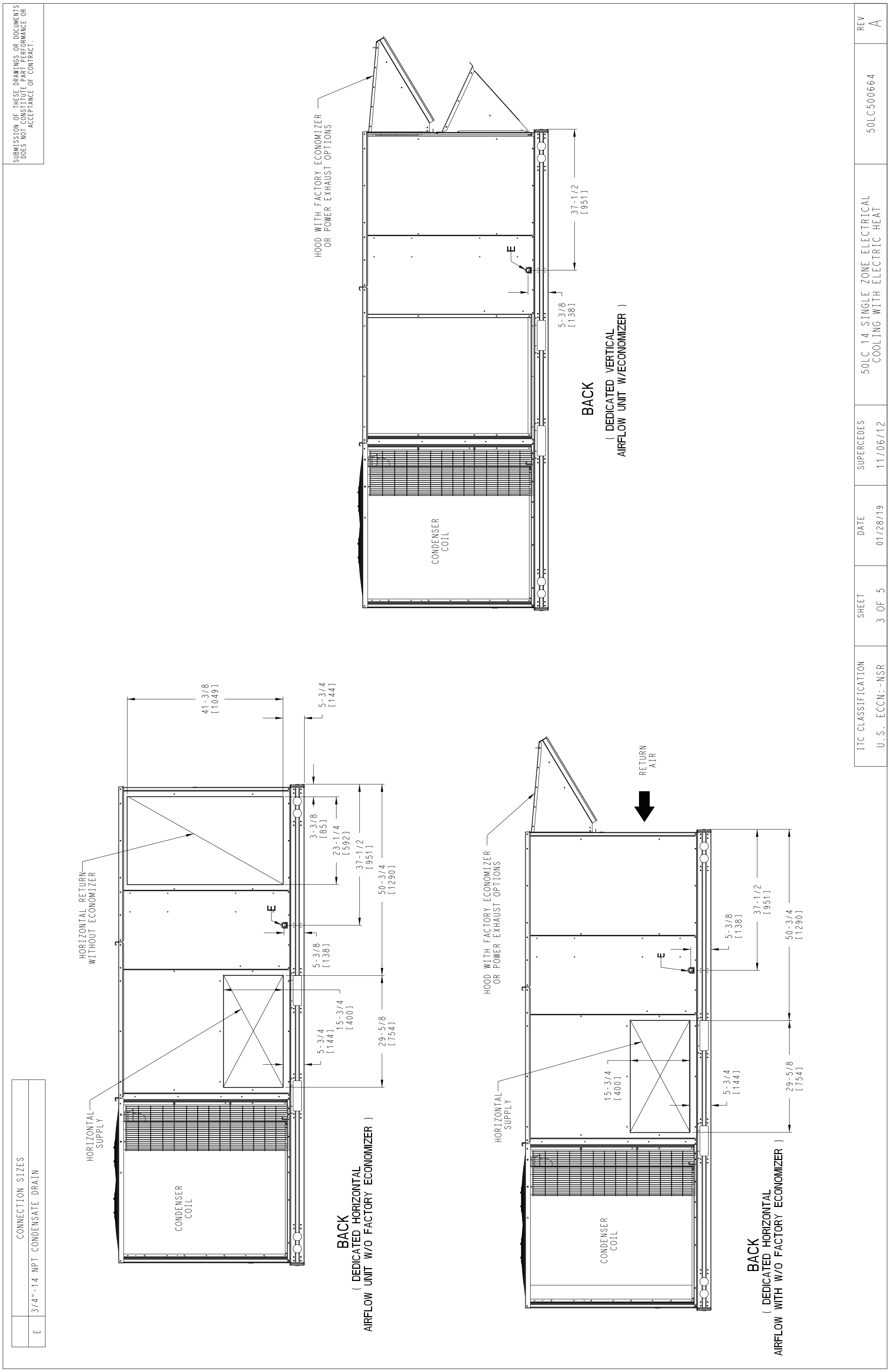
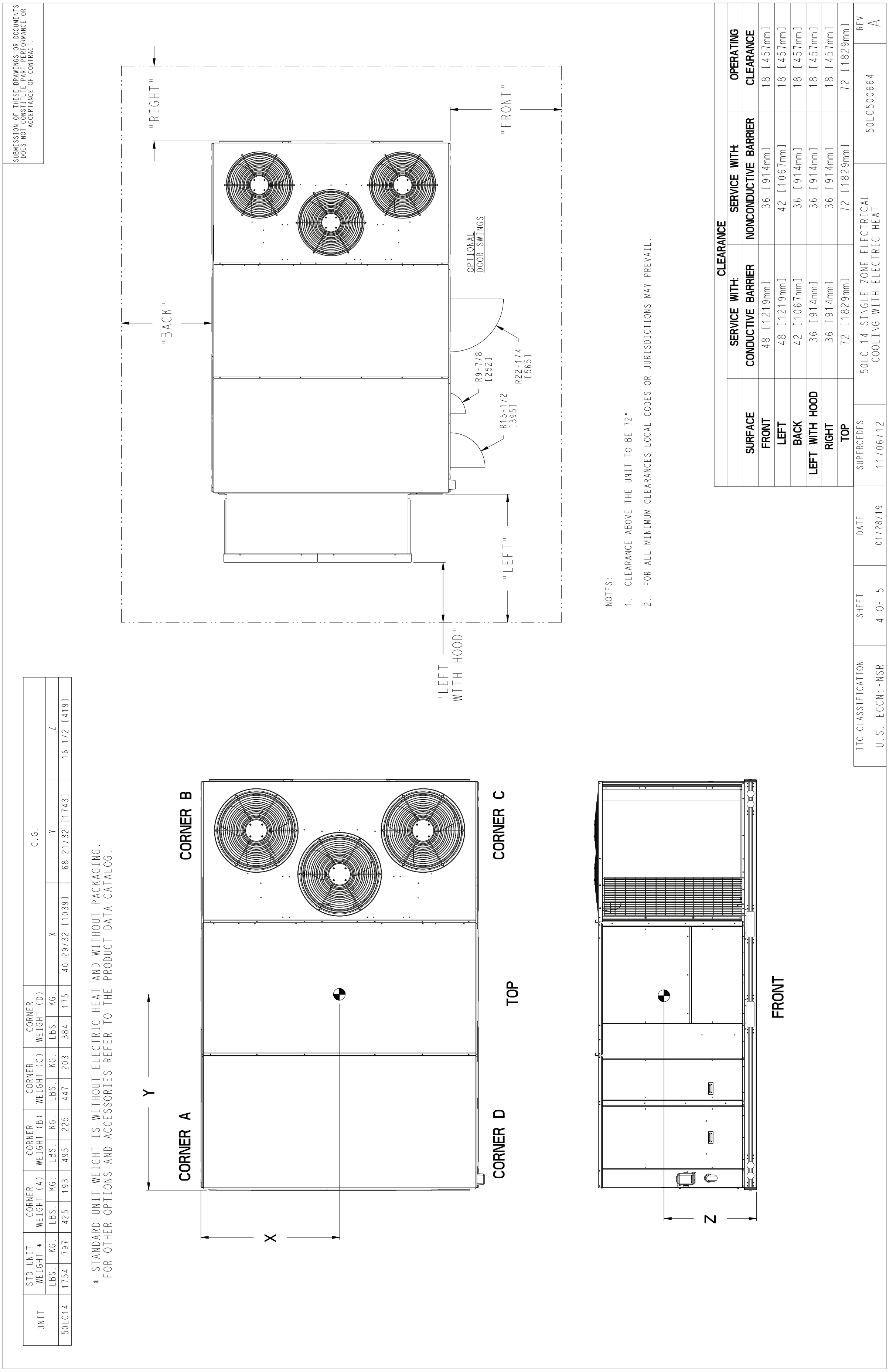


Fig. 4 — 50LCB*14 Back View and Condensate Drain Location



UNIT	STD UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
50LC14	1754	797	425	193	495	225	447	203	384	175	40 29/32 [1039]	68 21/32 [1743]	16 1/2 [419]

	CLEARANCE		
SURFACE	SERVICE WITH: CONDUCTIVE BARRIER	SERVICE WITH: NONCONDUCTIVE BARRIER	OPERATING CLEARANCE
FRONT	48 [1219mm]	36 [914mm]	18 [457mm]
LEFT	48 [1219mm]	42 [1067mm]	18 [457mm]
BACK	42 [1067mm]	36 [914mm]	18 [457mm]
LEFT WITH HOOD	36 [914mm]	36 [914mm]	18 [457mm]
RIGHT	36 [914mm]	36 [914mm]	18 [457mm]
TOP	72 [1829mm]	72 [1829mm]	72 [1829mm]

Fig. 5 — 50LCB*14 Corner Weights and Clearances

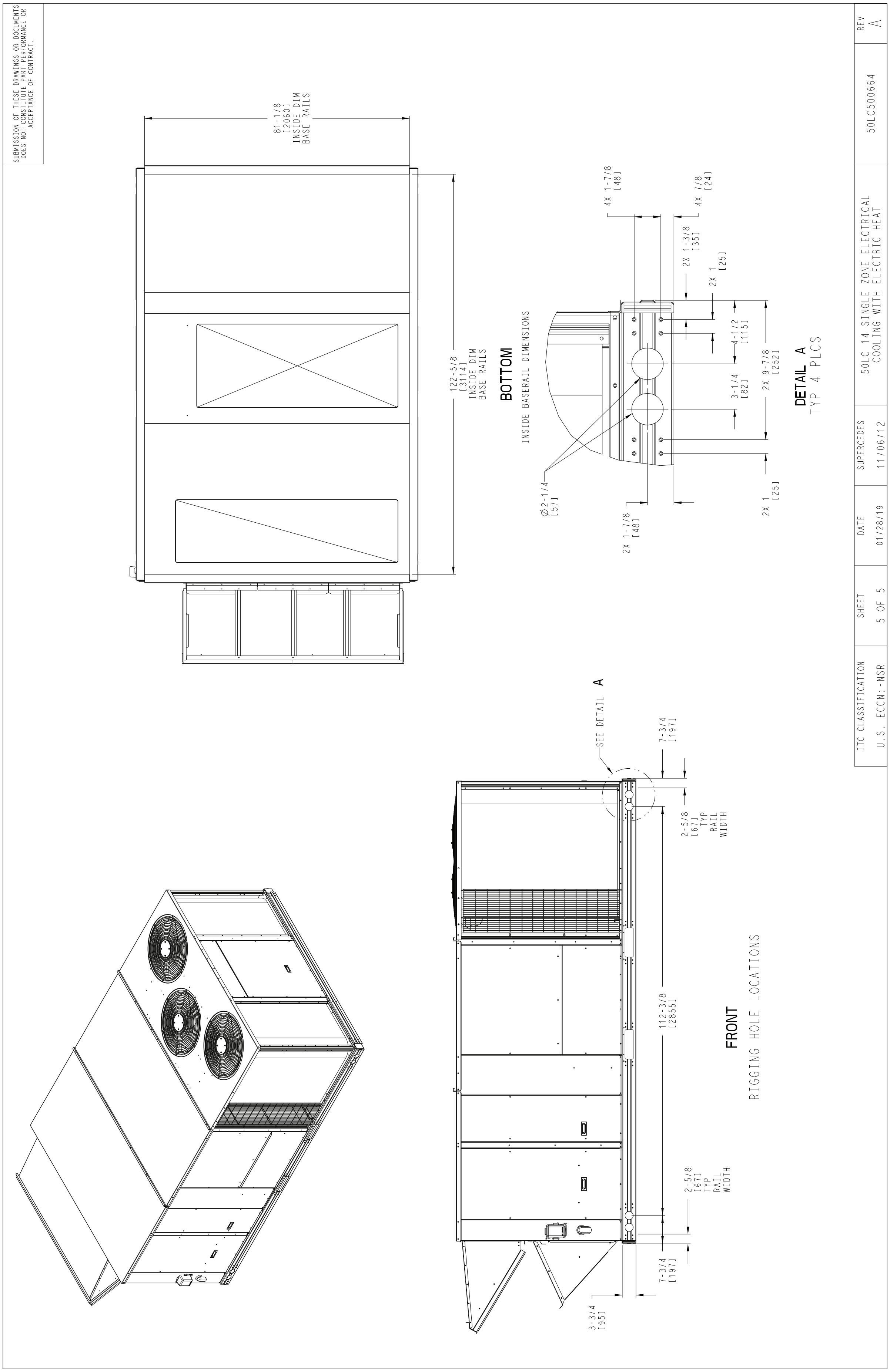


Fig. 6 — 50LCB*14 Bottom View

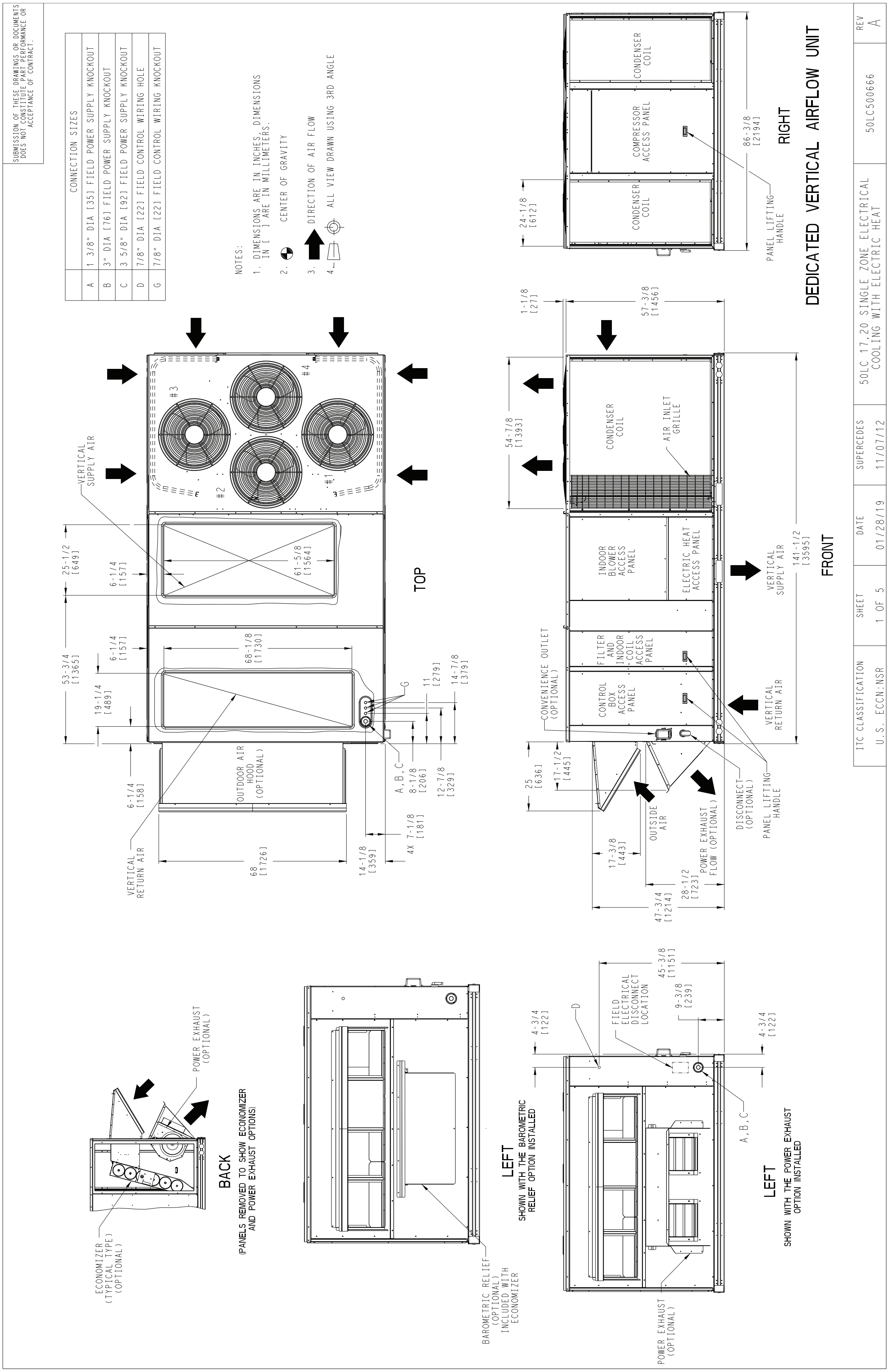


Fig. 7 — 50LCB*17-20 Vertical Airflow

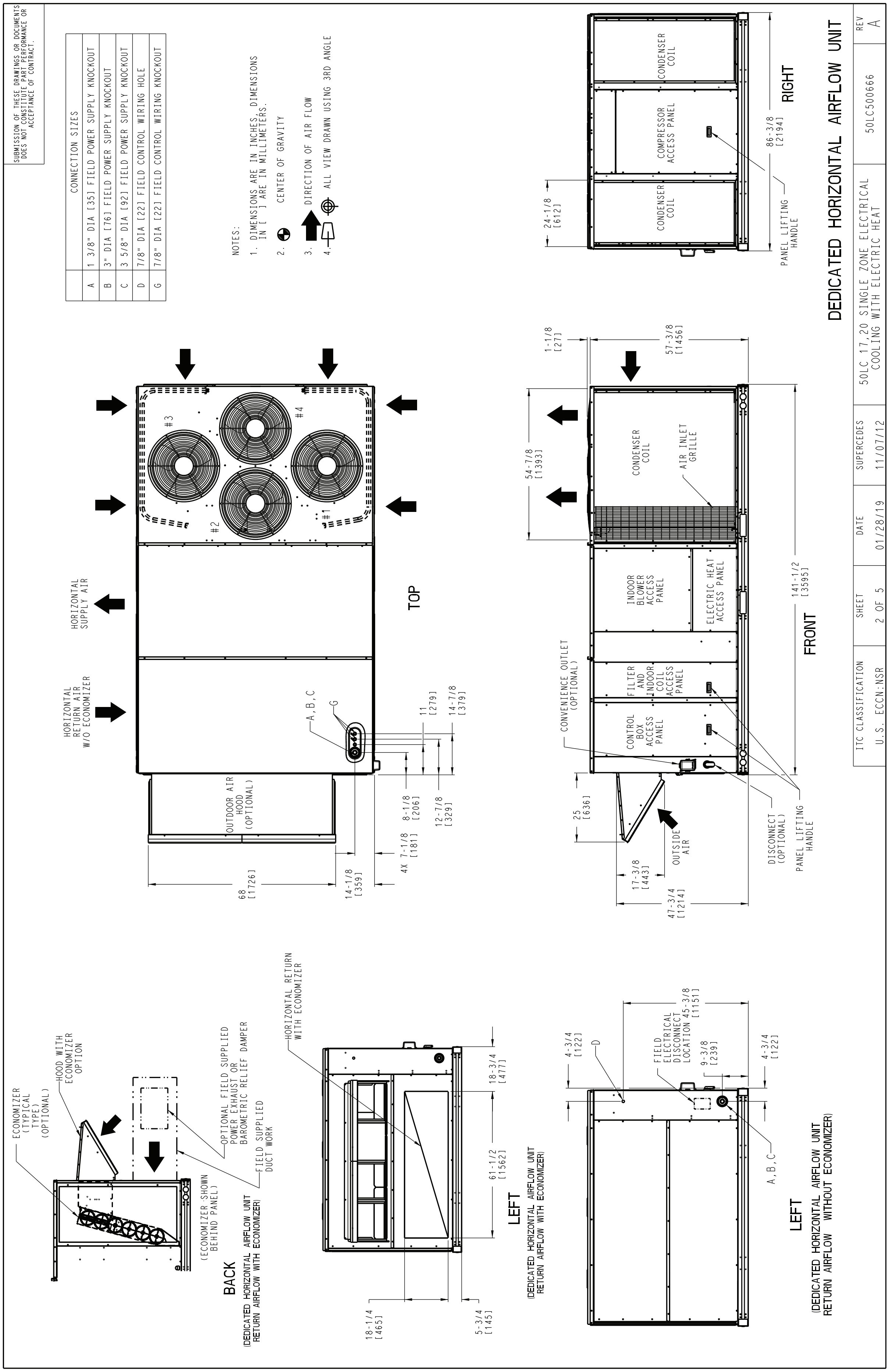


Fig. 8 — 50LCB*17-20 Horizontal Airflow

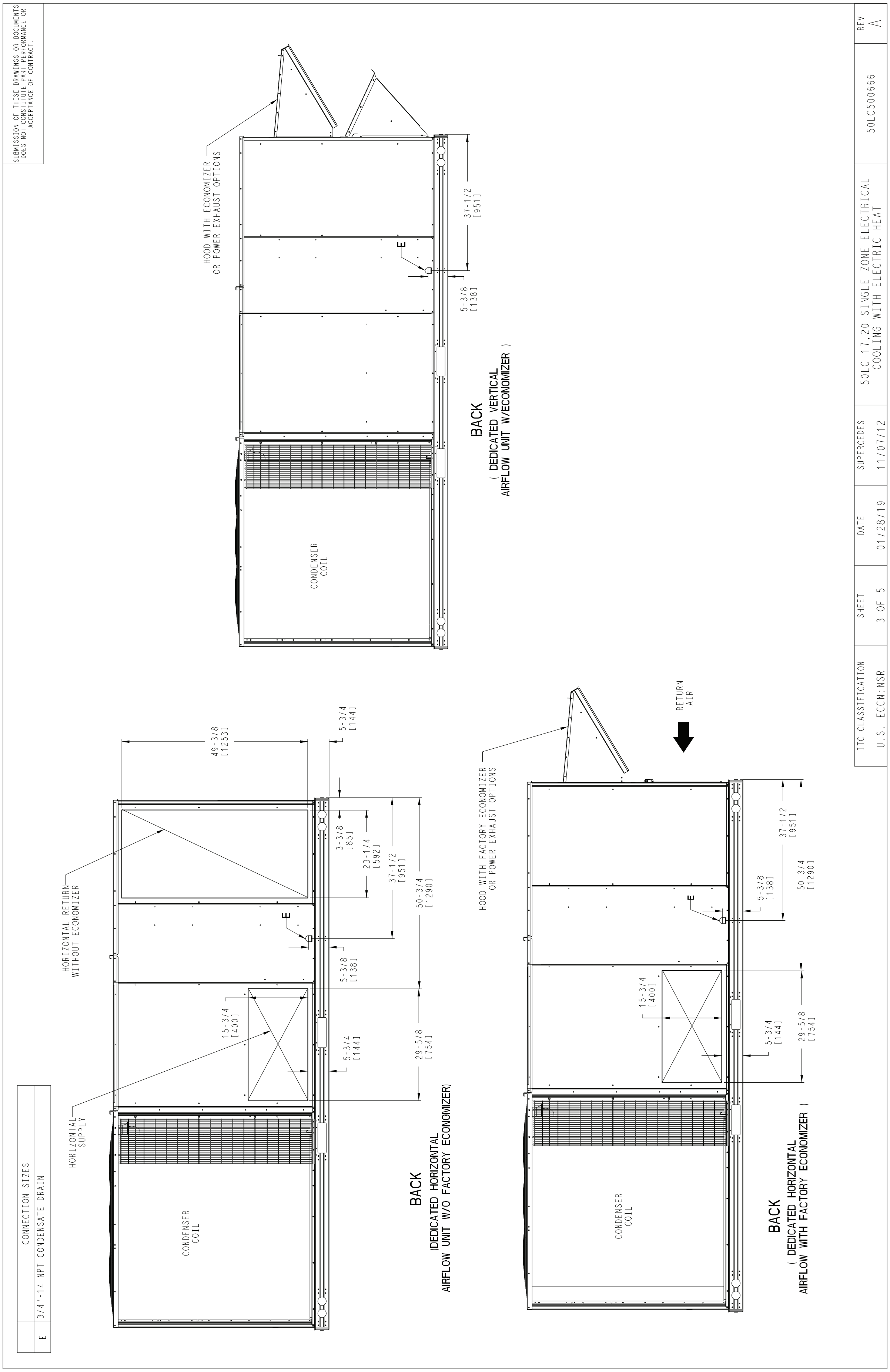
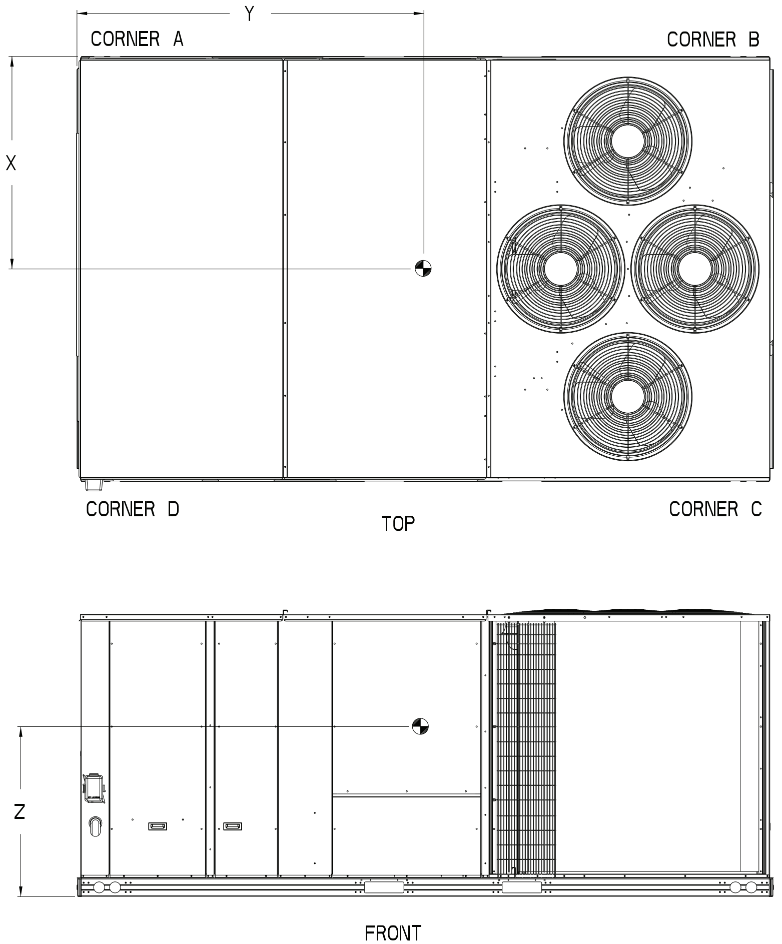


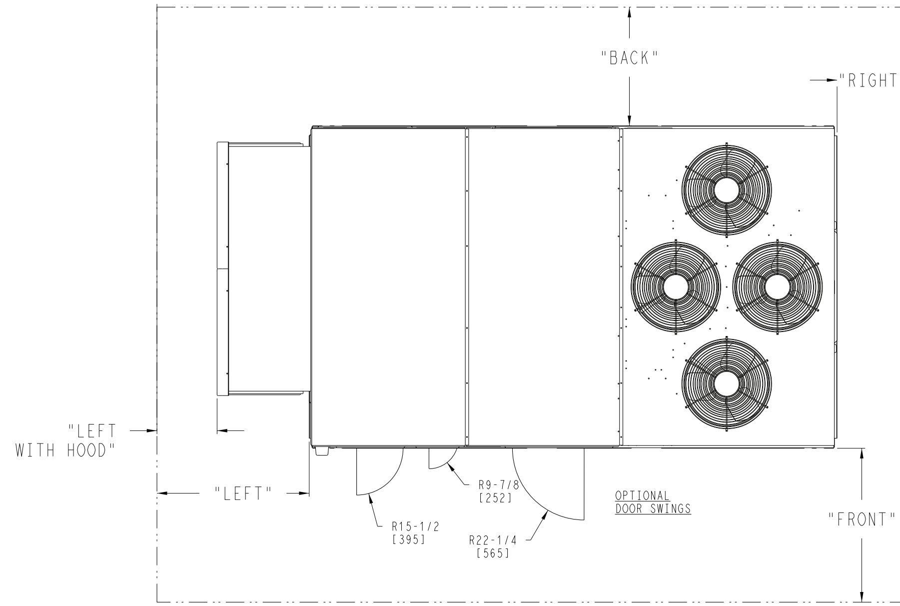
Fig. 9 — 50LCB*17-20 Back View and Condensate Drain Location

UNIT	STD UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
50LC17	1996	907.3	510.2	231.9	487.5	221.6	479.8	218.1	412.2	187.3	38 1/2 [977.90]	76 [1930.40]	19 [482.6]
50LC20	2102	955.7	537.4	244.3	625.6	284.4	505.4	229.7	434.1	197.3	38 1/2 [977.90]	76 [1930.40]	19 [482.6]

* STANDARD UNIT WEIGHT IS WITHOUT ELECTRIC HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES REFER TO THE PRODUCT DATA CATALOG.

SUBMISSION OF THESE DRAWINGS OR DOCUMENTS DOES NOT CONSTITUTE PART PERFORMANCE OR ACCEPTANCE OF CONTRACT.





NOTES:

1. CLEARANCE ABOVE THE UNIT TO BE 72"
2. FOR ALL MINIMUM CLEARANCES LOCAL CODES OR JURISDICTIONS MAY PREVAIL.

CLEARANCE			
	SERVICE WITH:	SERVICE WITH:	OPERATING
SURFACE	CONDUCTIVE BARRIER	NONCONDUCTIVE BARRIER	CLEARANCE
FRONT	48 [1219mm]	36 [914mm]	18 [457mm]
LEFT	48 [1219mm]	42 [1067mm]	18 [457mm]
BACK	42 [1067mm]	36 [914mm]	18 [457mm]
LEFT WITH HOOD	36 [914mm]	36 [914mm]	18 [457mm]
RIGHT	36 [914mm]	36 [914mm]	18 [457mm]
TOP	72 [1829mm]	72 [1829mm]	72 [1829mm]

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES			REV
U.S. ECCN:NSR	4 OF 5	01/28/19	11/07/12	50LC 17,20 SINGLE ZONE ELECTRICAL COOLING WITH ELECTRIC HEAT	50LC500666	A

Fig. 10 — 50LCB*17-20 Corner Weights and Clearances

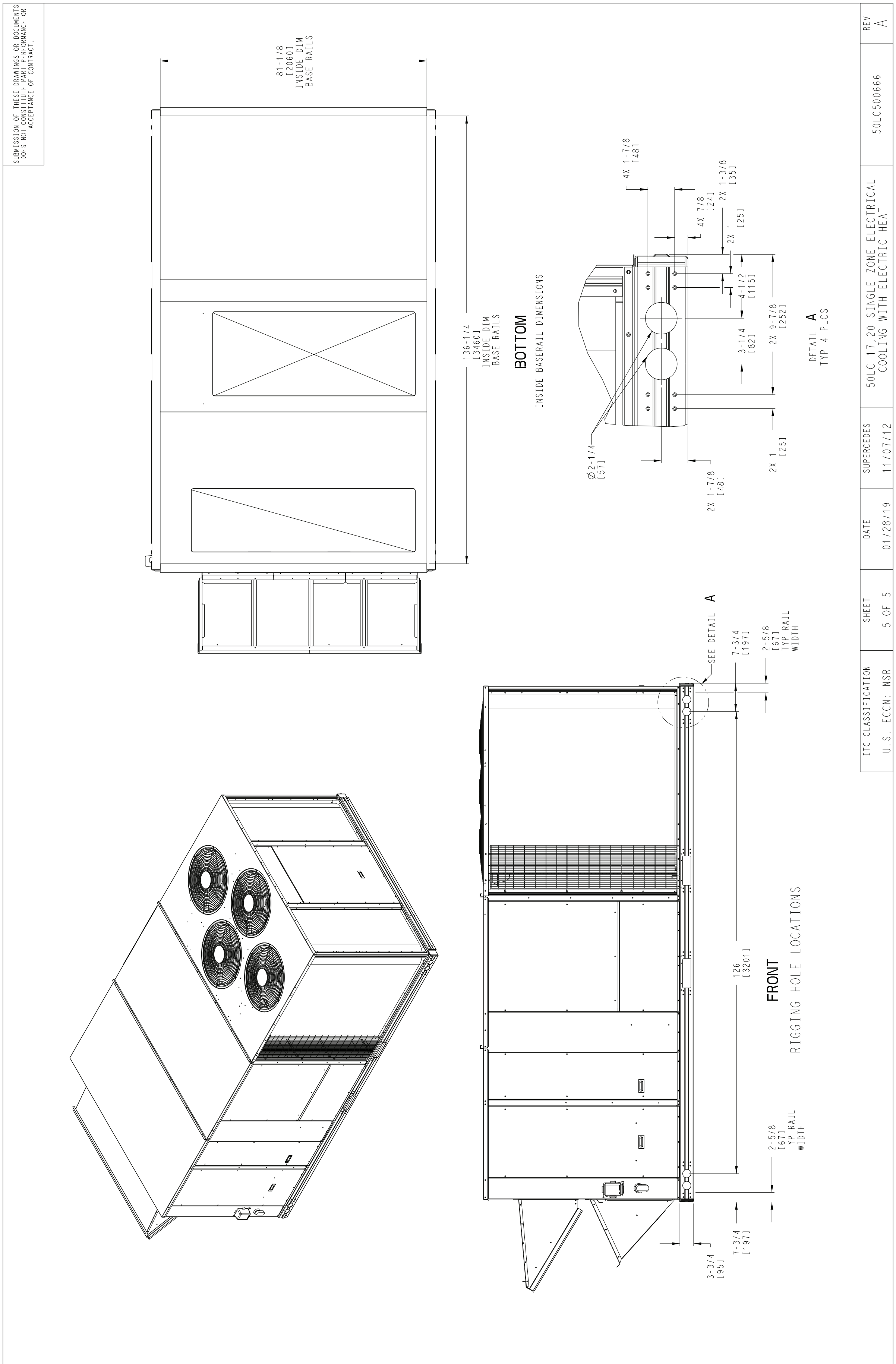


Fig. 11 — 50LCB*17-20 Bottom View

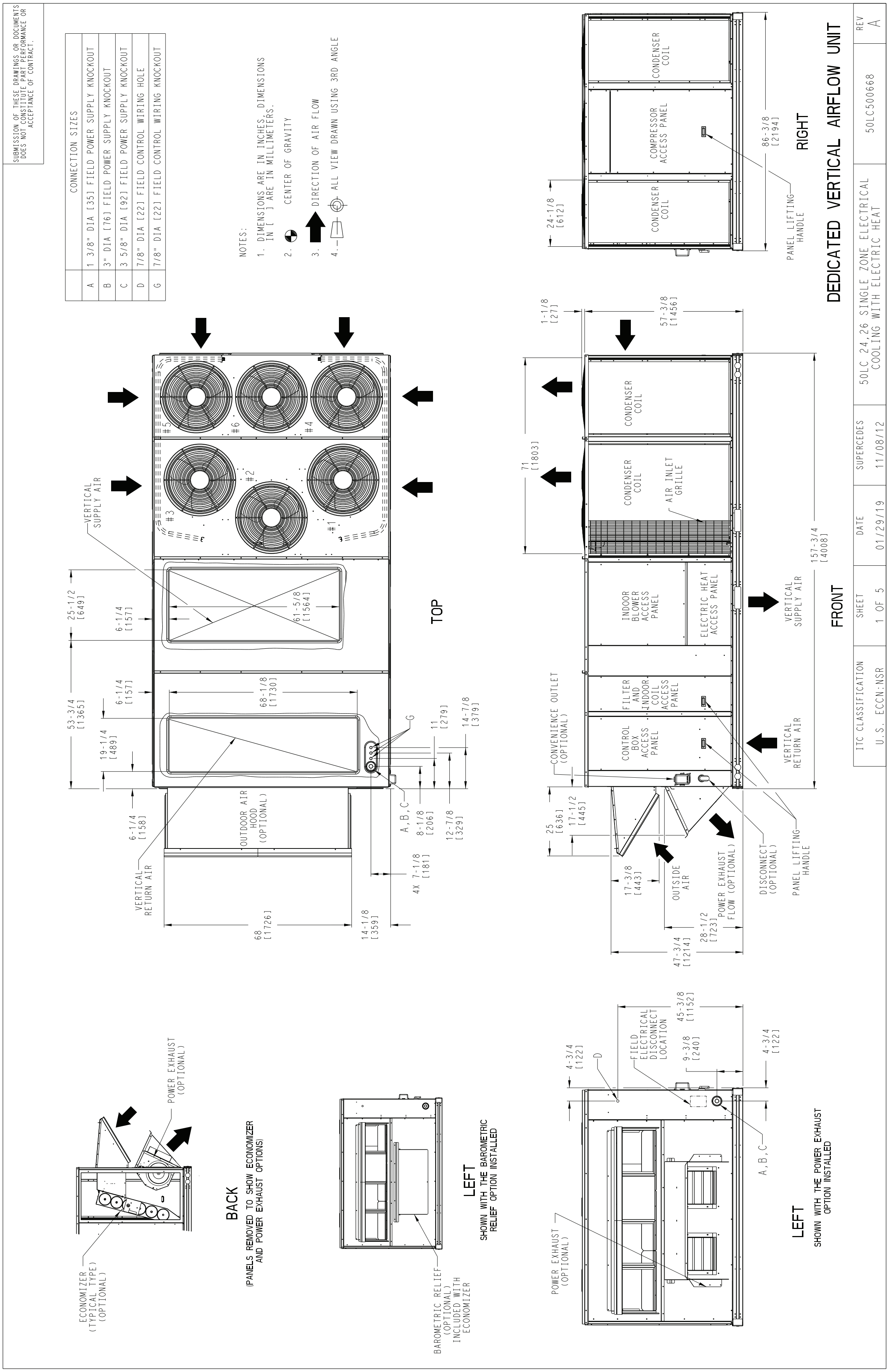


Fig. 12 — 50LCB*24-26 Vertical Airflow

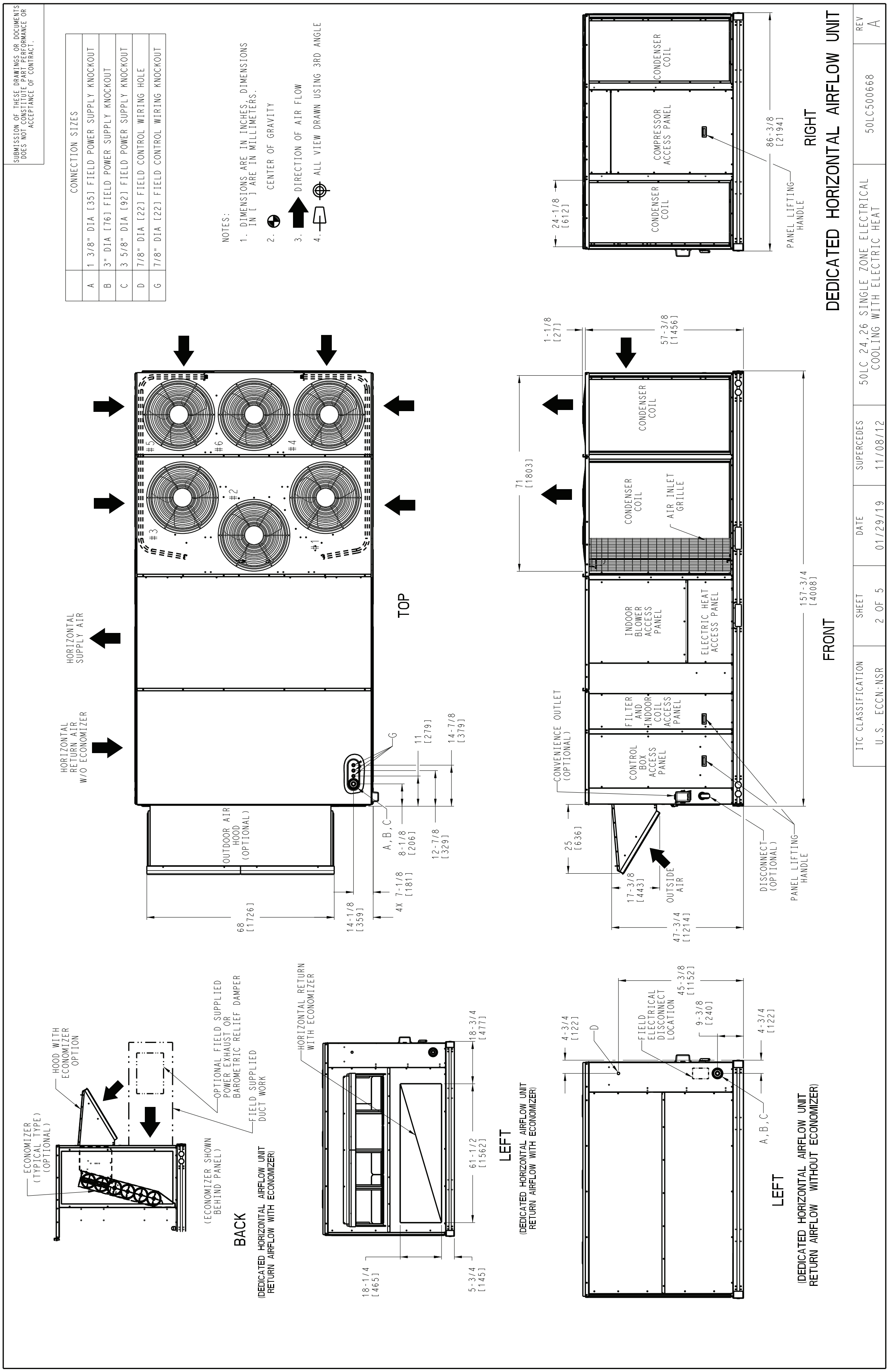


Fig. 13 — 50LCB*24-26 Horizontal Airflow

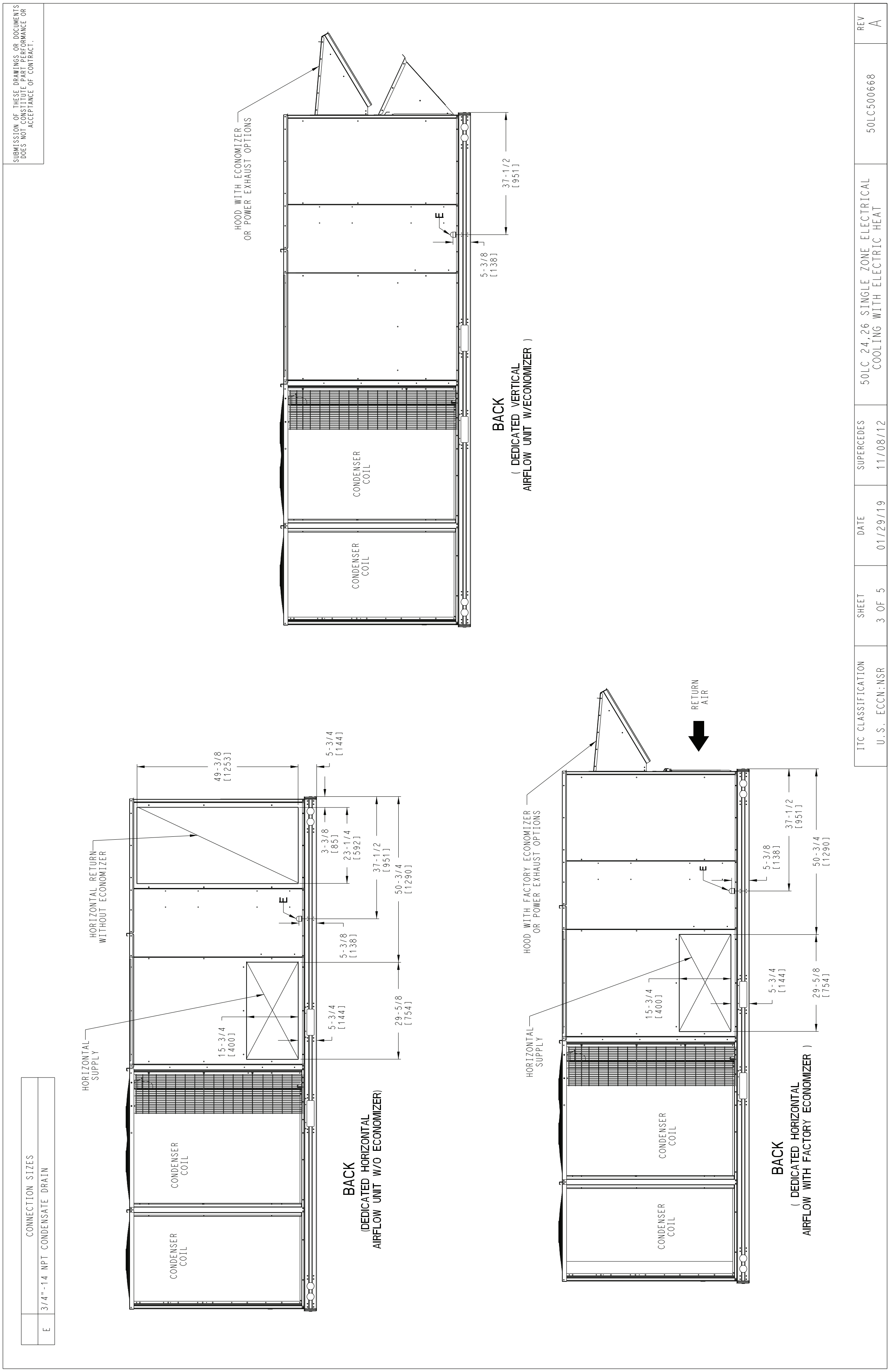
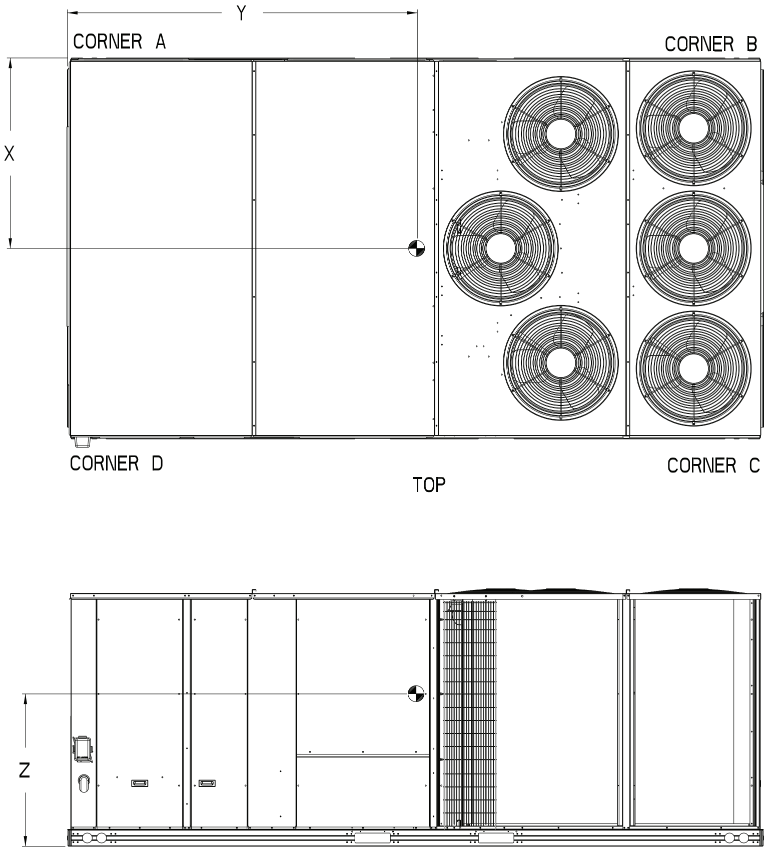


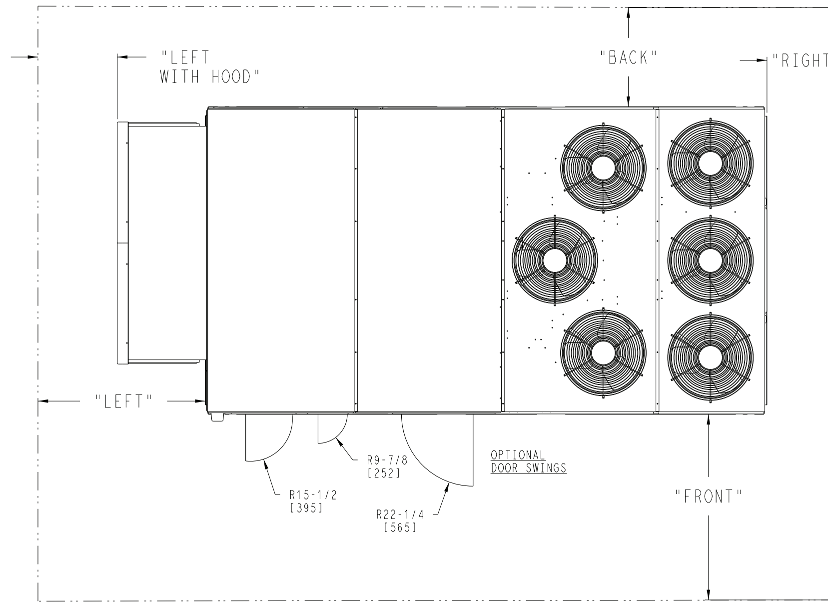
Fig. 14 — 50LCB*24-26 Back View and Condensate Drain Location

UNIT	STD UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
50LC24	2248	1022.0	458.3	208.3	537.5	244.3	676.2	307.4	576.5	262.1	48 [1219.20]	85 1/32 [2159.79]	19 [482.6]
50LC26	2393	1087.6	534.0	242.7	595.1	270.5	666.0	302.7	597.6	271.6	45 1/2 [1155.70]	83 1/32 [2108.99]	19 [482.6]

* STANDARD UNIT WEIGHT IS WITHOUT ELECTRIC HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES REFER TO THE PRODUCT DATA CATALOG.

SUBMISSION OF THESE DRAWINGS OR DOCUMENTS DOES NOT CONSTITUTE PART PERFORMANCE OR ACCEPTANCE OF CONTRACT.





NOTES:

1. CLEARANCE ABOVE THE UNIT TO BE 72"
2. FOR ALL MINIMUM CLEARANCES LOCAL CODES OR JURISDICTIONS MAY PREVAIL.

CLEARANCE			
	SERVICE WITH:	SERVICE WITH:	OPERATING
SURFACE	CONDUCTIVE BARRIER	NONCONDUCTIVE BARRIER	CLEARANCE
FRONT	48 [1219mm]	36 [914mm]	18 [457mm]
LEFT	48 [1219mm]	42 [1067mm]	18 [457mm]
BACK	42 [1067mm]	36 [914mm]	18 [457mm]
LEFT WITH HOOD	36 [914mm]	36 [914mm]	18 [457mm]
RIGHT	36 [914mm]	36 [914mm]	18 [457mm]
TOP	72 [1829mm]	72 [1829mm]	72 [1829mm]

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES			REV
U.S. ECCN:NSR	4 OF 5	01/29/19	11/08/12	50LC 24,26 SINGLE ZONE ELECTRICAL COOLING WITH ELECTRIC HEAT	50LC500668	A

Fig. 15 — 50LCB*24-26 Corner Weights and Clearances

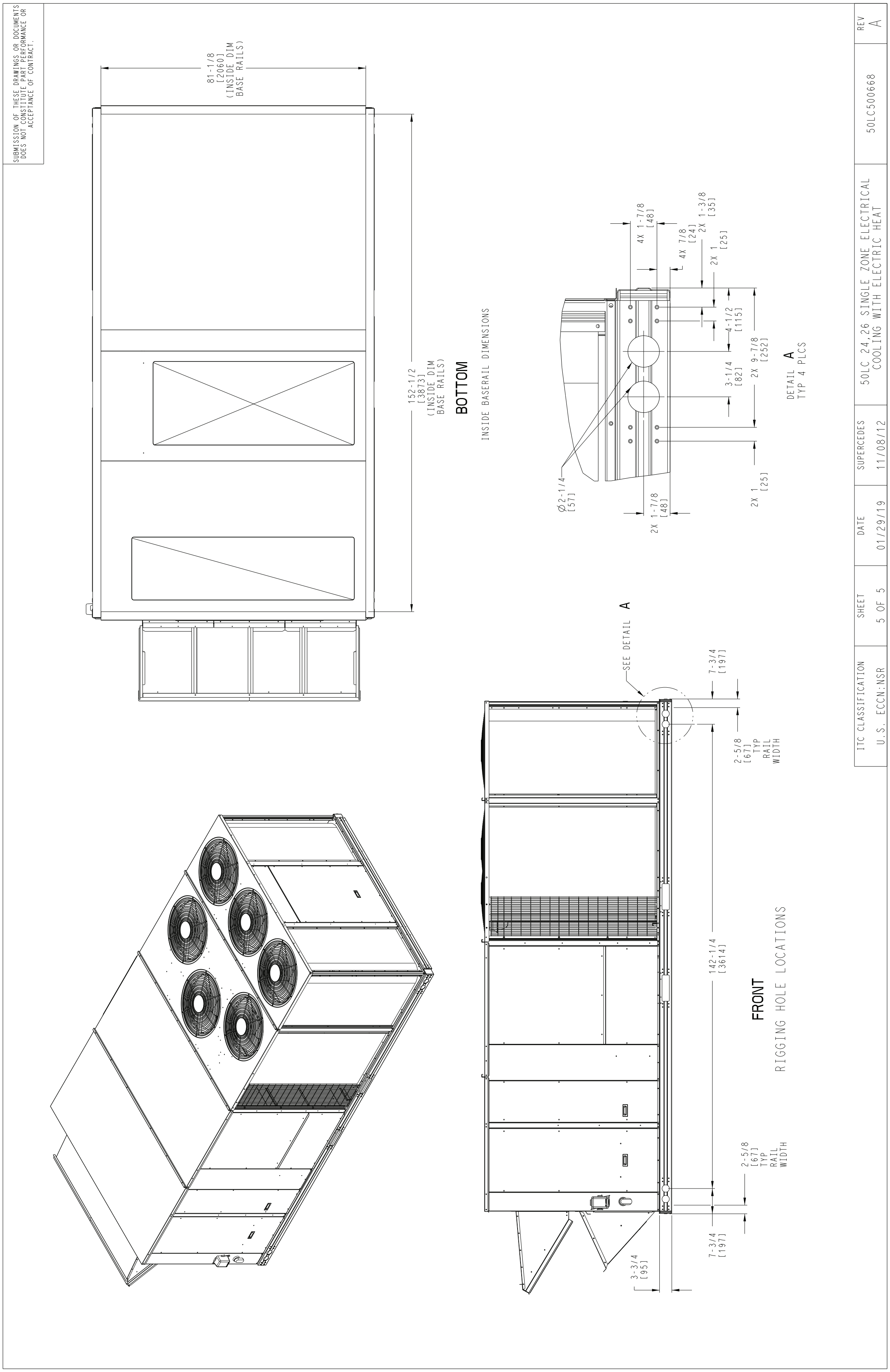


Fig. 16 — 50LCB*24-26 Bottom View

Table 2 — Operating Weights

50LC*B	UNIT LB (KG)				
	14	17	20	24	26
Base Unit	1754 (797.3)	1996 (907.3)	2102 (955.7)	2248 (1022.0)	2393 (1087.6)
Economizer	246 (112)	246 (112)	246 (112)	246 (112)	246 (112)
Powered Outlet	35 (16)	35 (16)	35 (16)	35 (16)	35 (16)
Curb					
14-in. (356 mm)	240 (109)	240 (109)	255 (116)	255 (116)	273 (124)
24-in. (610 mm)	340 (154)	340 (154)	355 (161)	355 (161)	355 (161)

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. 5, 10, and 15.

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 unit.

Select a unit mounting system that provides adequate height to allow installation of condensate trap per requirements. Refer to Step 12 — Install External Condensate Trap and Line on page 29 for required trap dimensions.

ROOF MOUNT

Check building codes for weight distribution requirements. Unit operating weight is shown in Table 2.

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 accessory thru-base service connection package (affects curb and unit)
4. Rig and place unit
5. Remove top skid
6. Install outdoor 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 tube
5. Install field-fabricated ductwork at unit duct openings
6. Install outdoor 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 the sequence 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.

On units with hinged panel option, check to be sure all latches are snug and in closed position.

Locate the carton containing the outside air hood parts. See Fig. 17. Do not remove carton until unit has been rigged and located in final position.

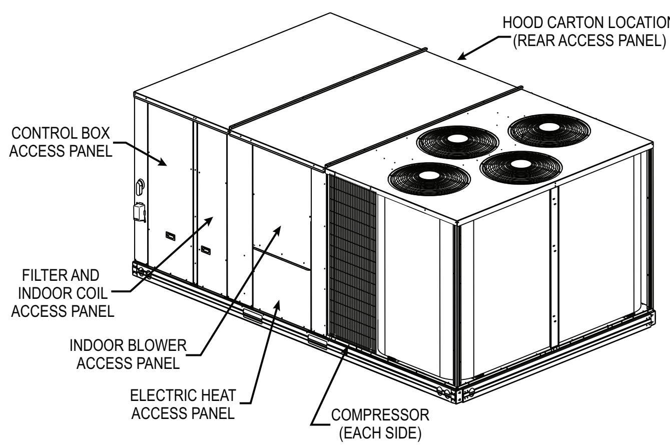


Fig. 17 — Typical Access Panel and Compressor Locations

Step 4 — Provide Unit Support

ROOF CURB MOUNT

Accessory roof curb details and dimensions are shown in Fig. 19-21. Assemble and install accessory roof curb in accordance with instructions shipped with the curb.

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. 19-21. Improperly applied gaskets 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. 18. Refer to Accessory Roof Curb Installation Instructions for additional information as required.

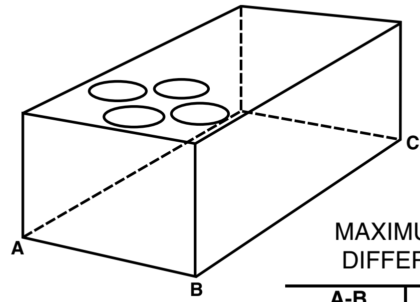
Install insulation, cant strips, roofing felt, and counter flashing as shown. *Ductwork must be attached to curb and not to the unit. The accessory thru-the-base power connection package must be installed before the unit is set on the roof curb.*

If electric and control wiring is to be routed through the basepan, remove knockouts in basepan located in control box area of access panel; see Fig. 2, 7, or 12 for basepan knockout locations. Attach the service connections to the basepans.

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.



MAXIMUM ALLOWABLE DIFFERENCE IN. (MM)

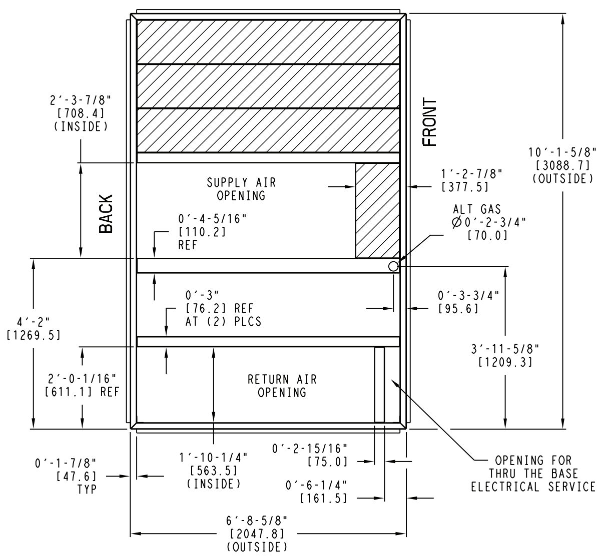
A-B	B-C	A-C
0.25 (6)	0.5 (12)	0.5 (12)

Fig. 18 — Unit Leveling Tolerances

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
14	1'-2" [356.0] 2'-0" [610.0]	CRRFCURB045A00 CRRFCURB046A00



NOTES:

1 ROOF CURB ACCESSORY IS SHIPPED UNASSEMBLED.

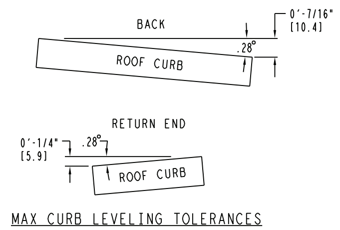
2 DIMENSIONS IN [ ] ARE IN MILLIMETERS.

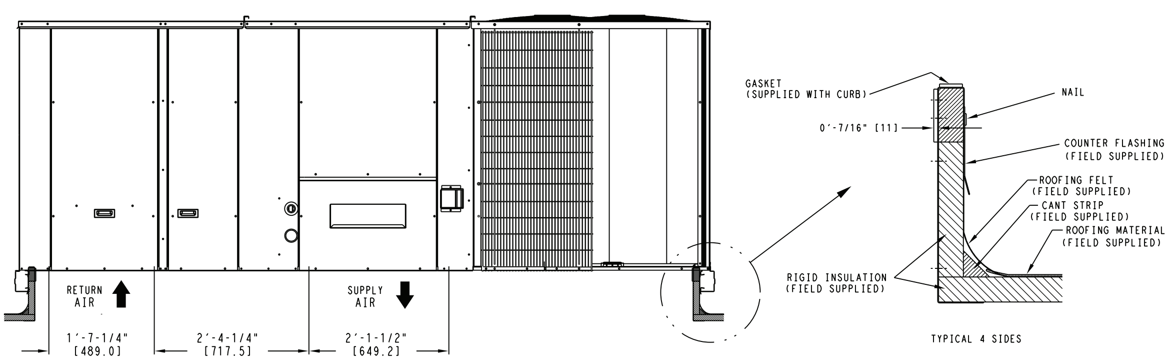
3 ROOF CURB GALVANIZED STEEL.

4 ATTACH DUCTWORK TO CURB (FLANGES ON DUCT REST ON CURB)

5 SERVICE CLEARANCE 4 ft ON EACH SIDE

➡ DIRECTION OF AIR FLOW





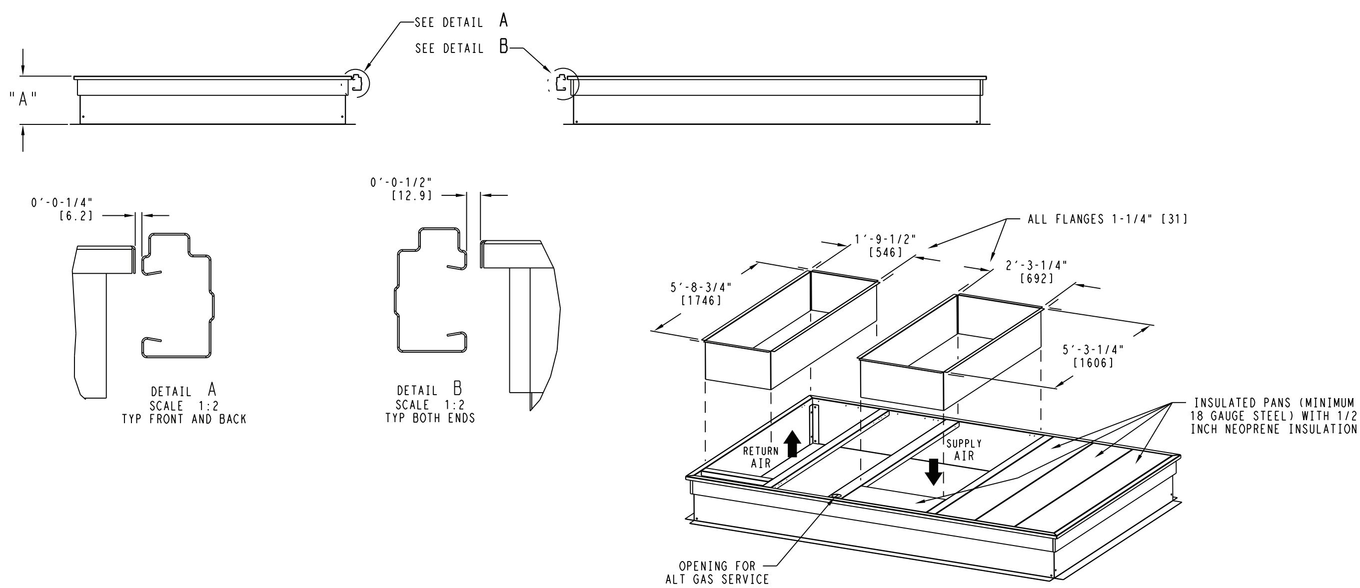
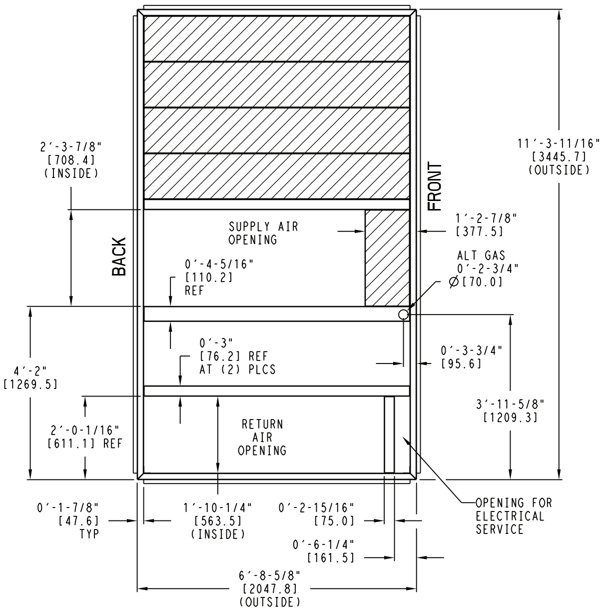


Fig. 19 — Roof Curb Details - 14 Size Unit

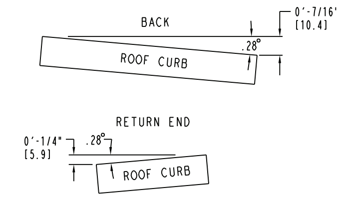
UNIT SIZE	"A"	ROOF CURB ACCESSORY
17, 20	1'-2" [356.0] 2'-0" [610.0]	CRRFCURB047A00 CRRFCURB048A00



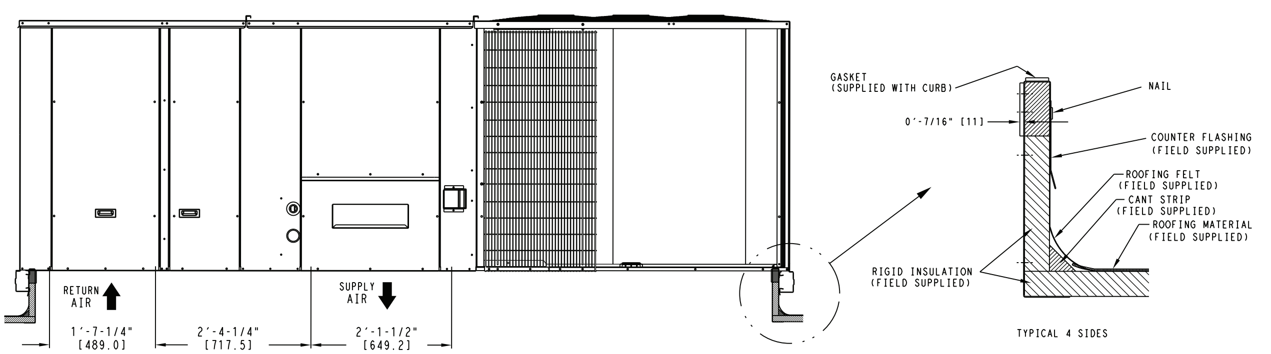
NOTES:

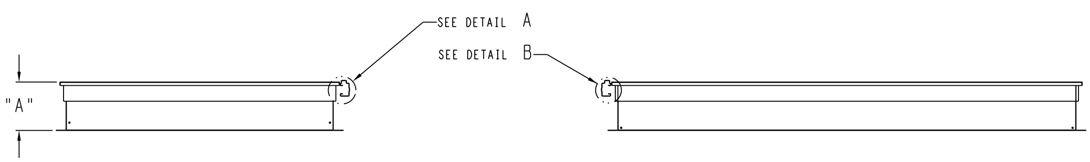
1. ROOF CURB ACCESSORY IS SHIPPED UNASSEMBLED.
2. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
3. ROOF CURB GALVANIZED STEEL.
4. ATTACH DUCTWORK TO CURB (FLANGES ON DUCT REST ON CURB)
5. SERVICE CLEARANCE 4 ft ON EACH SIDE

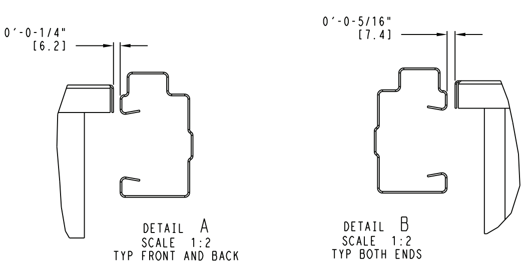
➡ DIRECTION OF AIR FLOW



MAX CURB LEVELING TOLERANCES







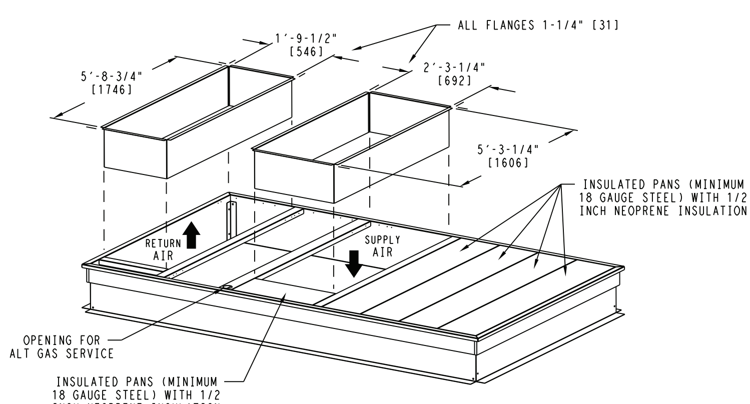


Fig. 20 — Roof Curb Details - 17 and 20 Size Units

UNIT SIZE	"A"	ROOF CURB ACCESSORY
24, 26	1′-2" [356.0] 2′-0" [610.0]	CRRFCURB049A00 CRRFCURB050A00

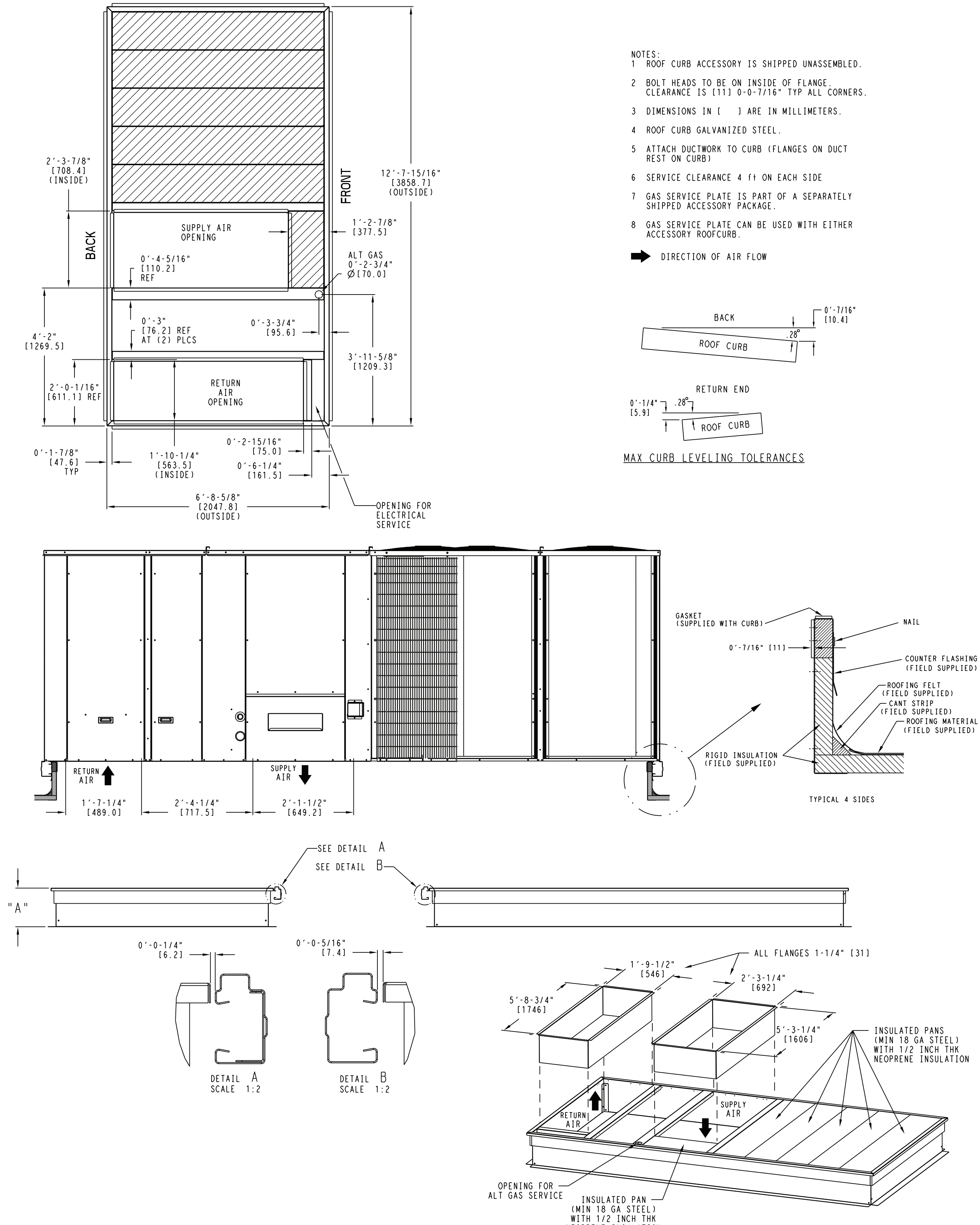


Fig. 21 — Roof Curb Details - 24 and 26 Size Units

Step 5 — Field Fabricate Ductwork

Cabinet return-air static pressure (a negative condition) shall not exceed 0.35 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.*

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

⚠ 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.

⚠ CAUTION

PROPERTY DAMAGE HAZARD

Failure to follow this caution may result in damage to roofing materials.

Membrane roofs can be cut by sharp sheet metal edges. Be careful when placing any sheet metal parts on such roof.

UNITS WITH ACCESSORY OR OPTIONAL ELECTRIC HEATERS

Minimum clearance is not required around ductwork.

Step 6 — Rig and Place 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.

If using top crate as spreader bar, once unit is set, carefully lower wooden crate off building roof top to ground. Ensure that no people or obstructions are below prior to lowering the crate.

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 2 on page 19 and Fig. 22 for additional information.

Lifting holes are provided in base rails as shown in Fig. 22. Refer to rigging instructions on unit.

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

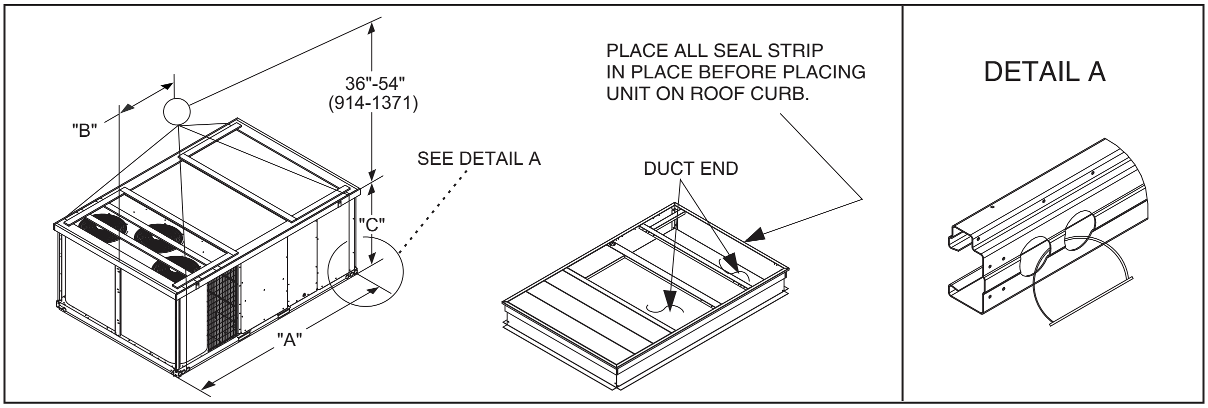
POSITIONING ON CURB

Position unit on roof curb so that the following clearances are maintained: 1/4-in. (6 mm) clearance between the roof curb and the base rail inside the right and left, 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 being approximately equal to detail A and detail B in Fig. 19-21.

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.



UNIT	MAX WEIGHT		DIMENSIONS					
			A		B		C	
	LB	KG	IN.	MM	IN.	MM	IN.	MM
50LC*B14	2004	911	127.8	3249	59.1	1501	52.3	1328
50LC*B17	2246	1021	141.5	3595	65.5	1664	60.3	1532
50LC*B20	2353	1069	141.5	3595	65.5	1664	60.3	1532
50LC*B24	2499	1136	157.8	4007	72.8	1849	60.3	1532
50LC*B26	2643	1201	157.8	4007	72.8	1849	60.3	1532

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.

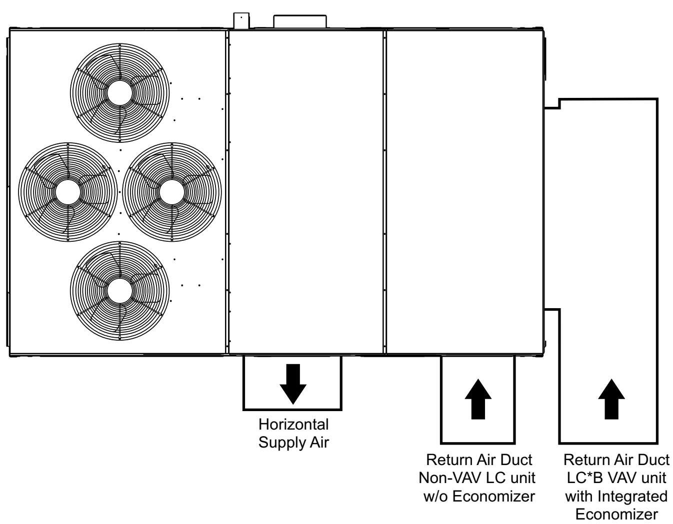
Fig. 22 — Rigging Details

Step 7 — Horizontal Duct Connection

Refer to Fig. 2-16 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. 23 for top view depicting typical horizontal duct arrangements.

Field-supplied ($\frac{3}{4}$-in.) flanges should be attached to horizontal duct openings (see Fig. 23) 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: 50LC size 17 to 26 units are factory assembled as either dedicated horizontal or vertical units. These units cannot be field converted.



	SUPPLY	NON-VAV RETURN	LC*B-VAV UNIT RETURN
Location	Back	Back	Left End
Height - in. (mm)	$15\frac{7}{8}$ (402)	$49\frac{3}{8}$ (1253)	$18\frac{3}{8}$ (467)
Width - in. (mm)	$29\frac{3}{4}$ (756)	$23\frac{3}{8}$ (593)	$61\frac{5}{8}$ (1564)

Fig. 23 — Horizontal Duct Opening Dimensions

Step 8 — VAV Duct Pressure Transducer and Field Tubing Installation

Before the multi-zone VAV rooftop unit can operate correctly, installation of the factory supplied duct pressure transducer (DPT) and plastic pneumatic tubing (field-supplied) is required. The DPT is mounted in the unit control box for shipping purposes and is shown in Fig. 24. Remove the screw holding the DPT and disconnect quick connects from the transducer terminals. For correct pressure sensing, mount the DPT externally to the main trunk duct approximately $^{2}/_{3}$ of the way from the unit. Install factory supplied duct pressure tap (located in the installer's packet) at the DPT location by inserting tap perpendicular to duct airflow with the arrow on pressure tap flange matching airflow direction.

Connect $^{1}/_{4}$-in. plastic pneumatic tubing (field supplied) to barbed fitting on pressure tap and connect the other end to "High" fitting of pressure transducer. Leave "Low" pressure connection open to the atmosphere. Connect 20 or 22 AWG insulated wire [95°F (35°C) minimum] to DPT "+" and "–" terminals. Route wiring back to rooftop unit along with the low voltage VAV terminal field control wiring. Connect wire from DPT "+" terminal to quick connect on red wire from VAV-RTU Open Board J4 – Terminal 4 and wire from DPT "–" terminal to quick connect on black wire from VAV RTU-Open Board J4-Terminal 5 with $^{3}/_{16}$-in. quick connects. Wire nuts may also be used.

Proper installation of these components is required for accurate input to Analog Input 1 (static_press) on the VAV-RTU Open Control Board. For more information, refer to the 48/50LC*B07-26 Controls, Start-Up, Operation, and Troubleshooting document.

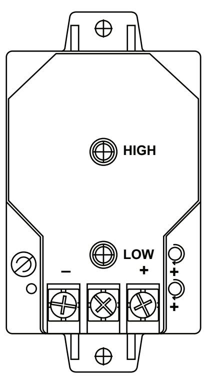


Fig. 24 — Duct Pressure Transducer

Step 9 — Install Outside Air Hood (Factory Option)

The outside air hood for the factory-option economizer 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. 25). 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. 26).

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

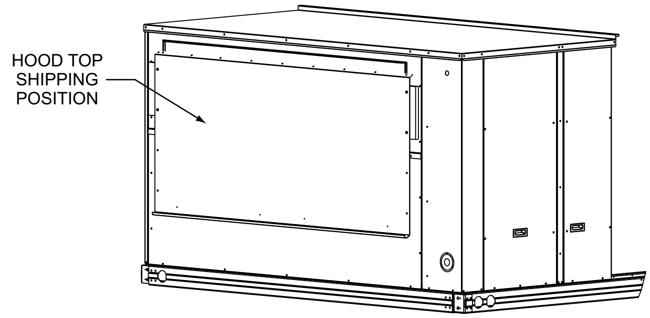


Fig. 25 — Hood Top — Shipping Position

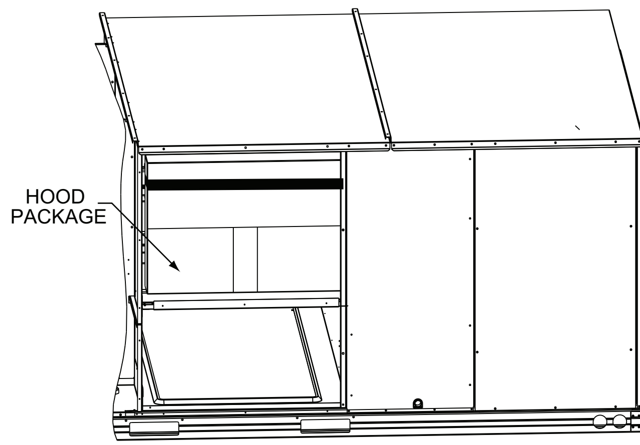
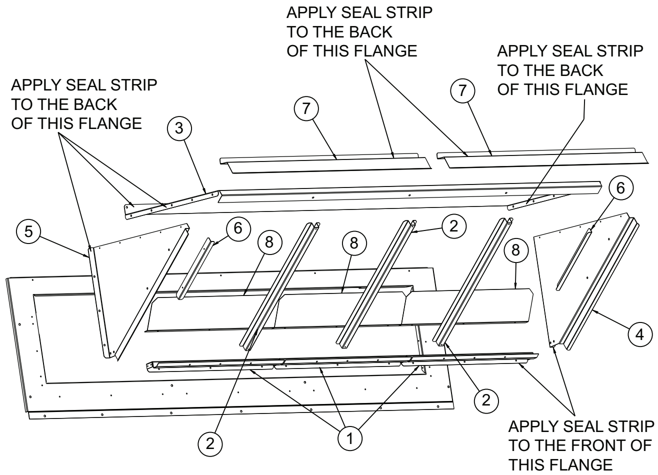


Fig. 26 — Hood Package — Shipping Location

To assemble the outside air hood (see Fig. 27 for hood component locations):

1. Remove hood top panel from shipping position on unit end.
2. Install filters supports (Item #1) to the upper end panel using the screws provided.
3. Install each deflector (Item #8) on to each filter support (Item #1) using the screws provided.
4. Apply seal strip to mating flanges on side plates of hood (Items #4 and #5).
5. Secure side panels (Items #4 and #5) to upper panel using the screws provided.
6. Apply seal strip to mating flange of the hood (see Fig. 27).
7. Secure hood top (Item #3) to upper panel using the screws provided. (On 44-in. chassis, remove the screws from across top cover of unit. The rear flange of hood top will slide behind unit top over flange.)
8. Secure side retainers (Item #6) to side panels (Items #4 and #5) using the screws provided, screwing from outside of the hood.
9. Secure each central retainer (Item #2) to the hood top (Item #3). Then align central retainers to holes located on filter support (Item #1), so central retainer is perpendicular to hood and each filter support. Secure using screws provided.
10. Apply seal strip to top diverters (Item #7).
11. Secure top diverters (Item #7) to hood top (Item #3).
12. Install outdoor air screens by sliding them into each of the four spaces created by the hood, filter support and central retainers. To do so, first insert the air screens into pocket created at the end of hood (Item #3), then fully put the air screen into place, and then slide them back into pocket created in the filter support (Item #1). Repeat this for each air screen (see Fig. 28). See Fig. 29 for completed hood assembly.



ITEM #	DESCRIPTION	QTY
1	Filter Supports	3
2	Central Retainer	3
3	Hood Top	1
4	Left Hood Side	1
5	Right Hood Side	1
6	Side Retainer	2
7	Top Diverters	2
8	Deflector	3

Fig. 27 — Hood Part Identification and Seal Strip Application Areas

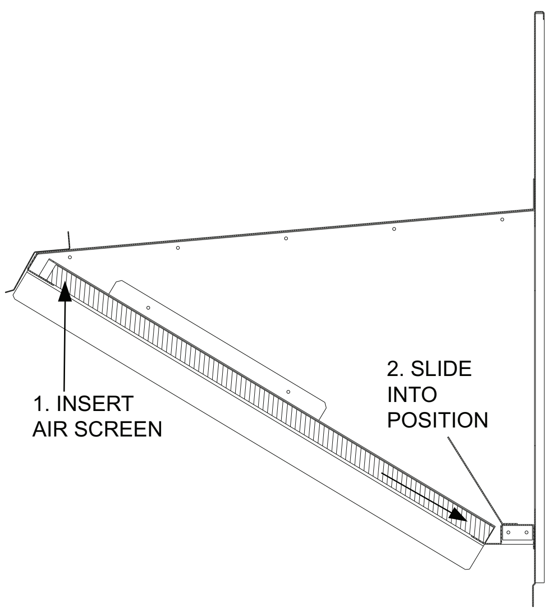


Fig. 28 — Outdoor Air Screen Installation

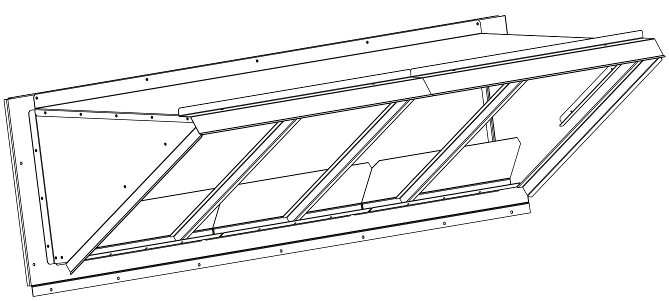


Fig. 29 — Completed Hood Assembly

Step 10 — Assemble Barometric Hood

The barometric hood can be assembled in vertical or horizontal configuration. Figure 30 illustrates the barometric hood parts.

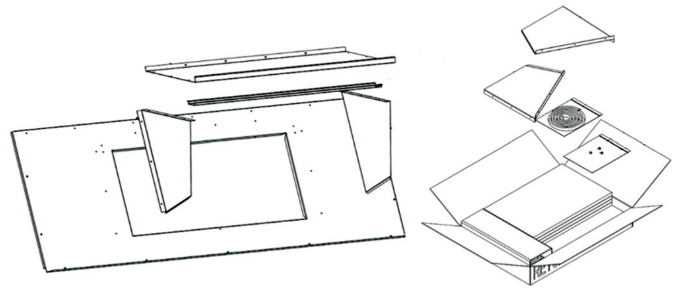


Fig. 30 — Barometric Hood Parts

BAROMETRIC HOOD (VERTICAL CONFIGURATION)

1. Remove the hood top panel from its shipping position on the unit end (see Fig. 31).

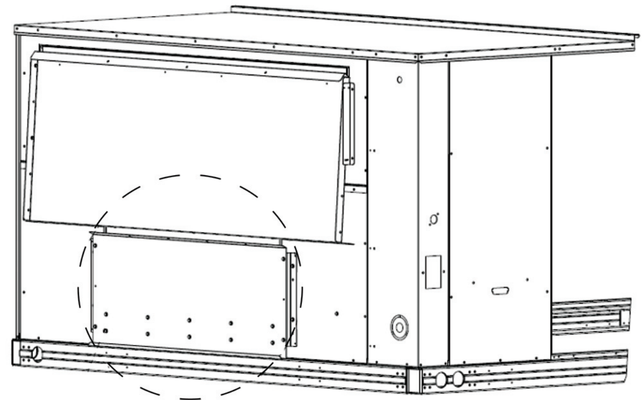


Fig. 31 — Shipping Location, Vertical Units

2. Remove the side panels located in the hood parts box (see Fig. 32).

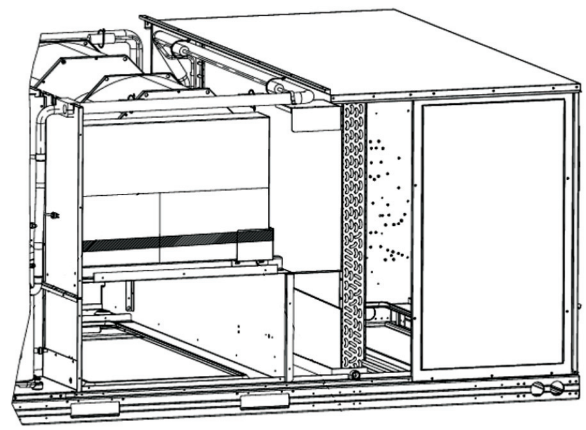


Fig. 32 — Barometric Hood Box Parts Location

3. Install parts as shown in the following exploded view (Fig. 33) using the seal strip and screws provided in the parts box.

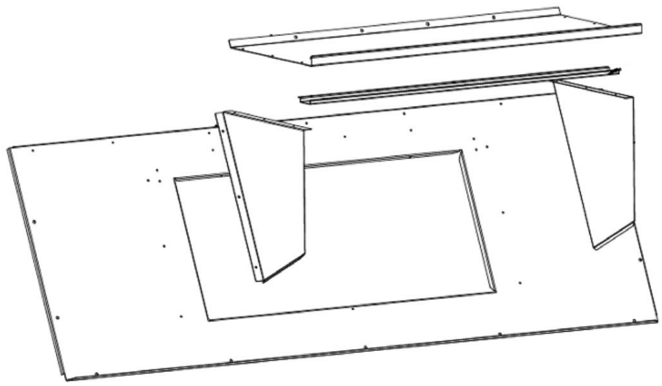


Fig. 33 — Barometric Hood Exploded View

Figure 34 illustrates the installed barometric hood parts.

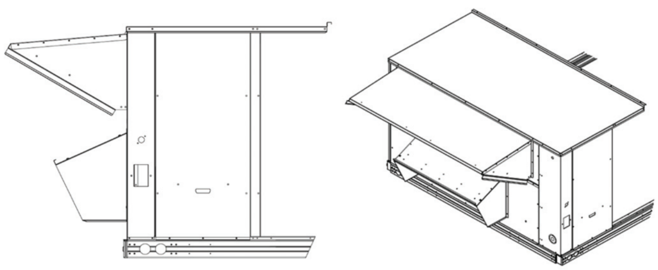


Fig. 34 — Installed Barometric Hood Side View and Isometric View

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 19 $^{1}/_{2}$ inches 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. 35.

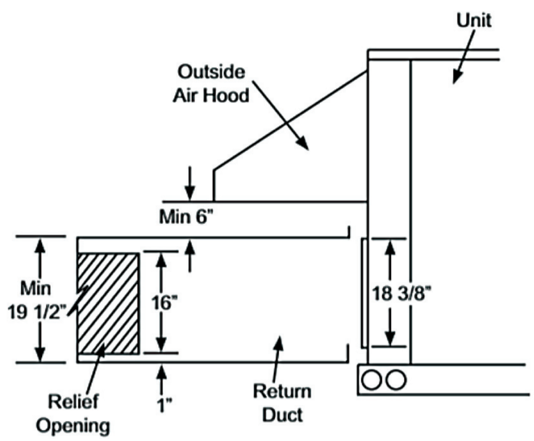


Fig. 35 — Relief Damper

2. Cut a 16 in. x 36 in. opening in the return duct for the relief damper (see Fig. 35).

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.

4. Using the blade brackets, install the relief damper onto the side of the return duct (see Fig. 36). The two brackets and relief damper are provided with the economizer.

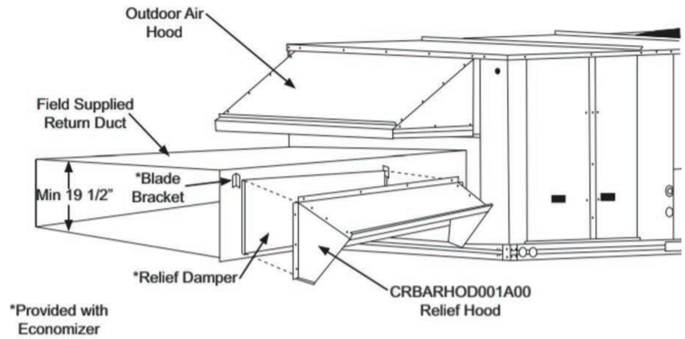


Fig. 36 — Installing CRBARHOD001A00 Over Relief Damper

5. Using the provided hardware, screw the CRBARHOD001A00 hood sides and top together (see Fig. 37).

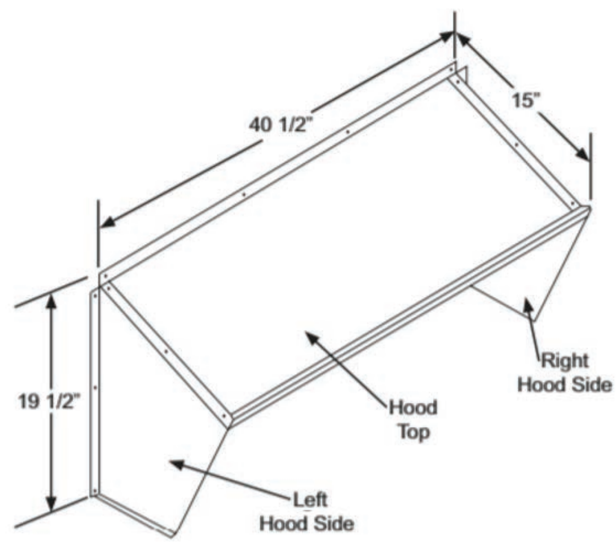


Fig. 37 — CRBARHOD001A00 Hood Sides and Top

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. 36.

Step 11 — Economizer – Horizontal Airflow Units

The barometric relief damper ships attached to the exterior return opening panel on the unit. See Fig. 38. Remove shipping cover to access the barometric relief damper, rain angle, and parts bag. These items are to be repositioned on the side of the field supplied ductwork. In addition, the barometric relief hood should be used and can be ordered separately (P/N CRBARHOD001A00) or can be field supplied.

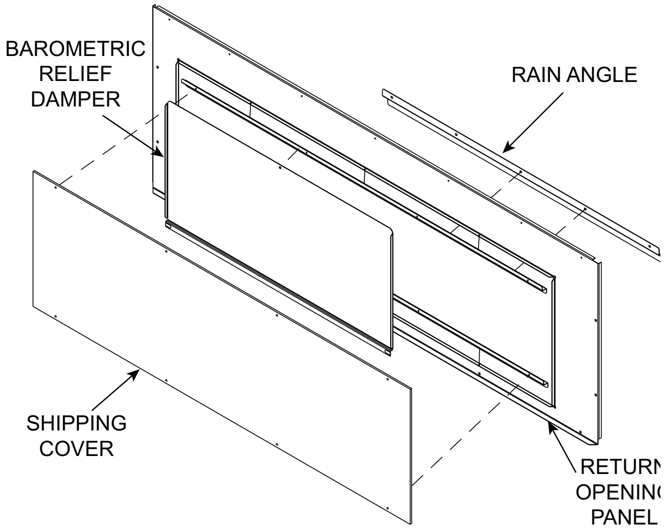


Fig. 38 — Barometric Relief Damper — Shipping Location

Step 12 — Install External Condensate Trap/Line

The unit has one $^3/_4$-in. condensate drain connection on the end of the condensate pan. See Fig. 39. See Fig. 4, 9, and 14, Item E in the view labeled "BACK (HORIZONTAL DISCHARGE W/O ECON)" for the location of the condensate drain connection.

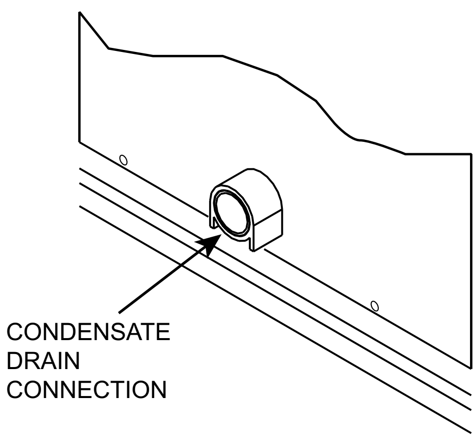
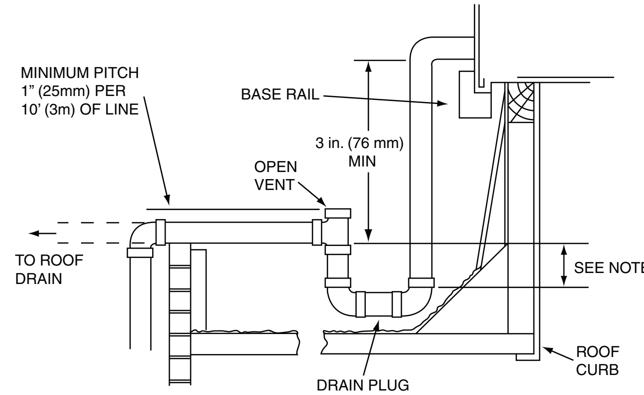


Fig. 39 — Condensate Drain Pan Connection

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. 40.



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

Fig. 40 — Condensate Drain Pan 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 per 3 m) of run. Do not use a pipe size smaller than the unit connection ($^3/_4$-in.).

Step 13 — Make Electrical Connections

⚠ WARNING

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: Field-supplied wiring shall conform with the limitations of minimum 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 or HACR, connect the source leads to the terminal block with unit field power leads. See Fig. 41.

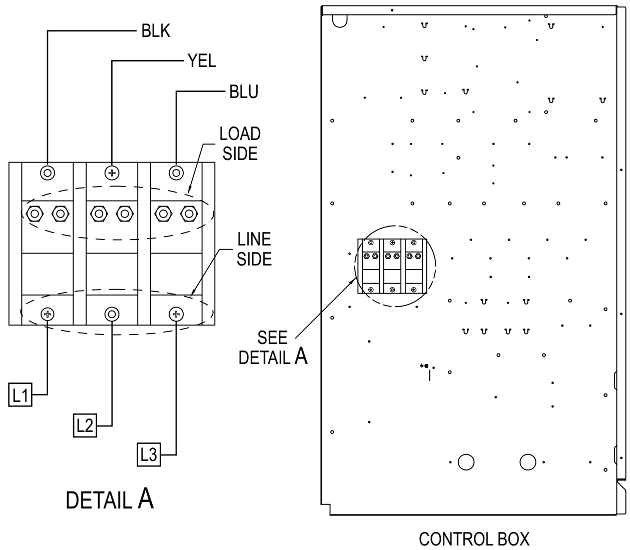


Fig. 41 — Location of TB1

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 or HACR breaker. Use copper conductors only. See Fig. 42.

Figure 43 and 44 are typical control and power wiring diagrams.

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

⚠ 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.

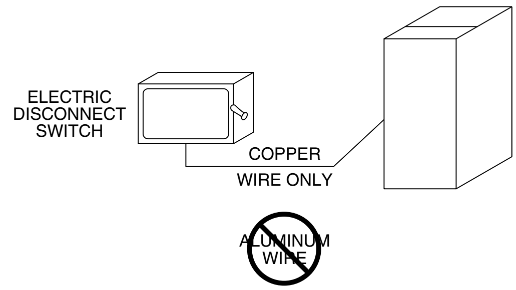


Fig. 42 — Disconnect Switch and Unit

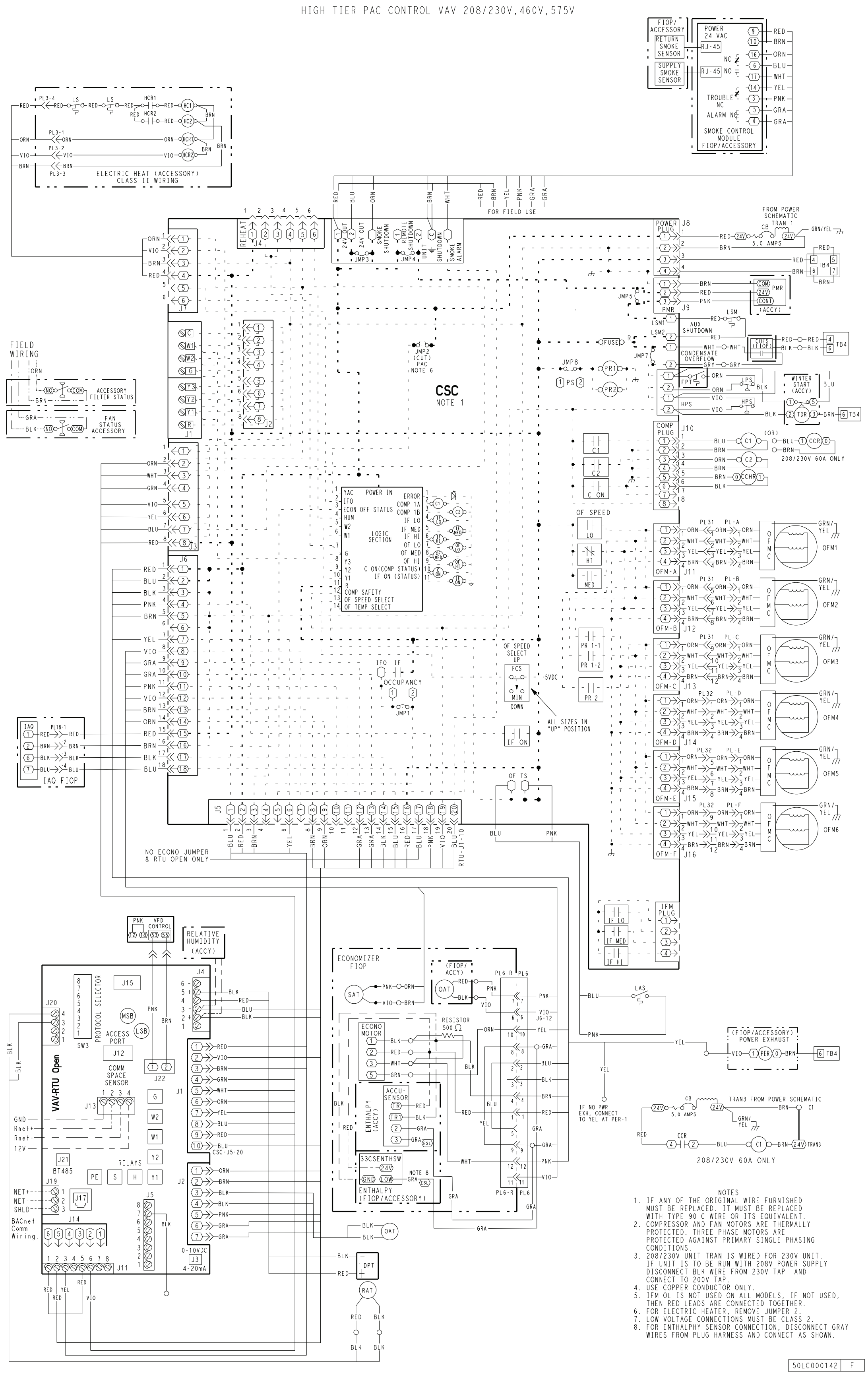


Fig. 43 — 50LC*B 14-26 VAV-RTU Open Control Wiring Diagram

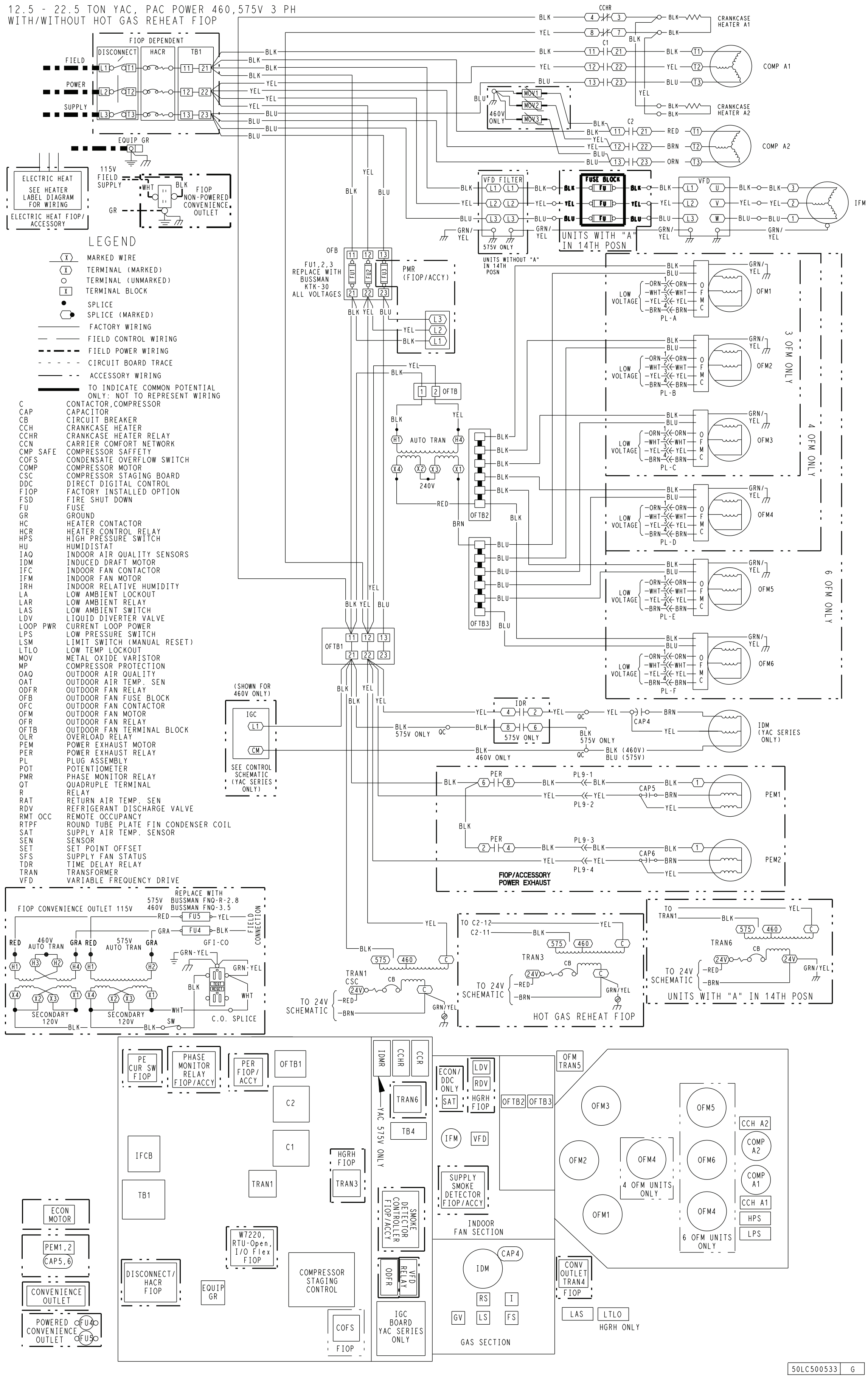


Fig. 44 — 50LC*B 14-26 Power Wiring Diagram

UNITS WITHOUT FACTORY-INSTALLED NON-FUSED DISCONNECT OR HACR

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 OR HACR

The factory-installed optional non-fused disconnect (NFD) or HACR switch 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. 45 or 46). Note that the tape covering the hole for the shaft in the corner post must be removed prior to handle and shaft installation.

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-in.
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.
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.

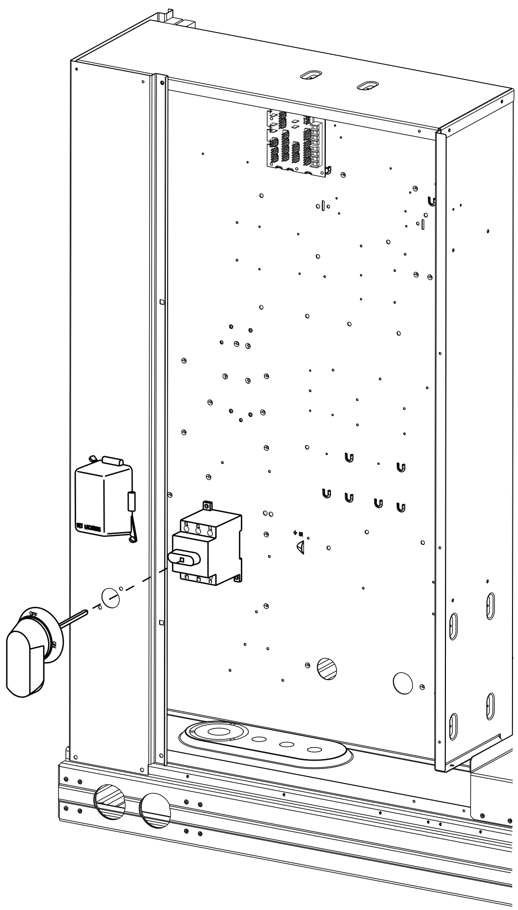


Fig. 45 — Handle and Shaft Assembly for NFD

Field-Install the HACR Shaft and Handle

1. Open the control box panel.
2. Make sure the HACR shipped from the factory is at OFF position (the white arrow pointing 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-in.
5. Tighten the locking screw to secure the shaft to the HACR.
6. Turn the handle to OFF position with red arrow pointing at OFF.
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.

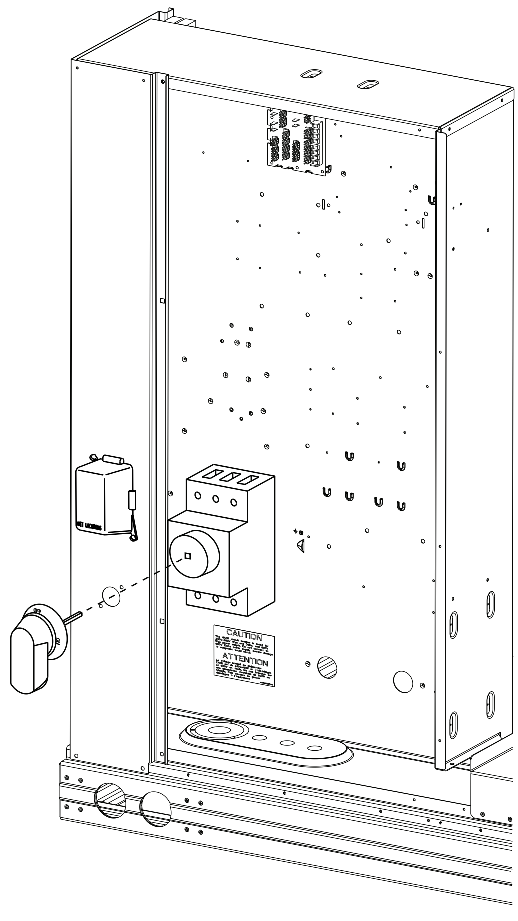


Fig. 46 — Handle and Shaft Assembly for HACR

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. 47 for power wiring connections to the unit power terminal block and equipment ground. Maximum wire size is 2/0 AWG per pole.

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 Overcurrent Protection) device size.

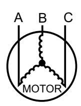
Units ordered with factory-installed HACR do not need additional ground-fault and short circuit over current protection device unless required by local codes.

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 example below to determine the percent of voltage imbalance. 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.

Example: Supply voltage is 230-3-60

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

Example: Supply voltage is 230-3-60



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

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

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.

$$\text{\% Voltage Imbalance} = 100\text{x} \frac{4}{227} = 1.78\%$$

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.

⚠ 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.

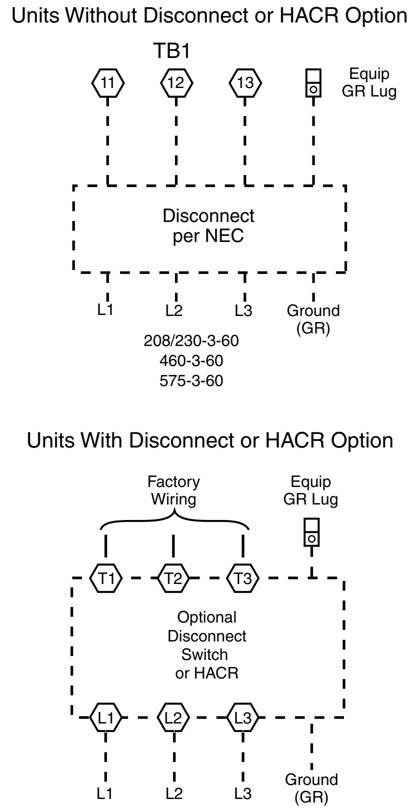


Fig. 47 — Power Wiring Connections

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. Lock-out and tag-out this switch, if necessary.

Two types of convenience outlets are offered on 50LC*B models: non unit-powered and unit-powered. Both types provide a 125-v GFCI (ground-fault circuit interrupter) duplex receptacle rated at 15A behind a hinged waterproof access cover, located on the end panel of the unit. See Fig. 48.

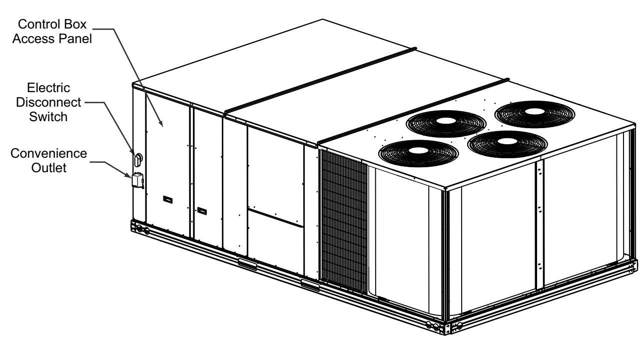


Fig. 48 — Convenience Outlet Location

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.

> **⚠ WARNING**
>
> PERSONAL INJURY HAZARD
>
> Failure to follow this caution could result in personal injury or death.
>
> Disconnect all power to unit and convenience outlet. Lock-out and tag-out all power.

1. Remove the blank cover plate at the convenience outlet; discard the blank cover.
2. Loosen the two screws at the GFCI duplex outlet, until approximately $^1/_2$-in. (13 mm) under screw heads is exposed. Press the gasket over the screw heads.
3. 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).
4. Mount the weatherproof cover to the backing plate as shown in Fig. 49.
5. Remove two slot fillers in the bottom of the cover to permit service tool cords to exit the cover.
6. Check for full closing and latching.

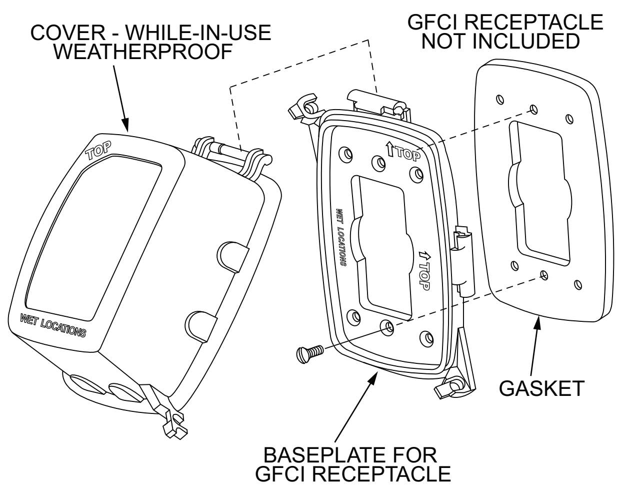


Fig. 49 — Weatherproof Cover Installation

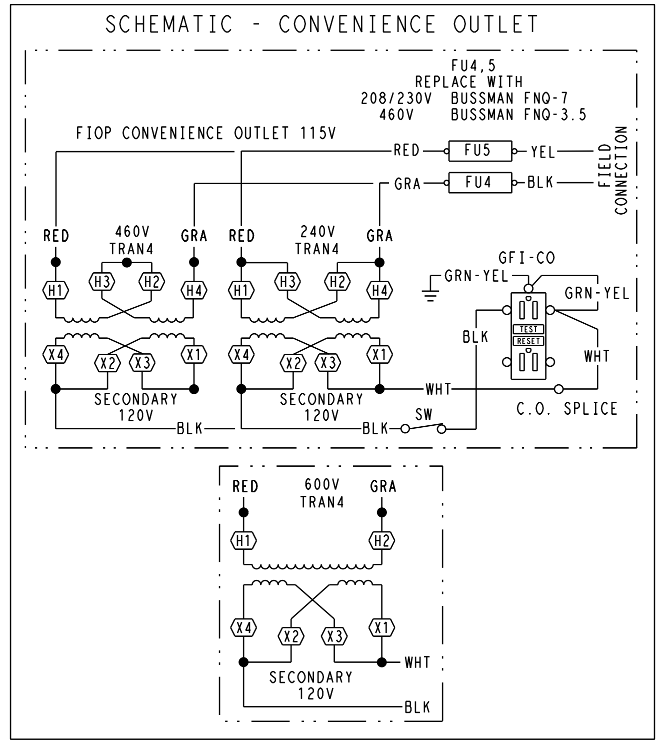
Non-Unit Powered Convenience Outlet

This type requires the field installation of a general-purpose 125-v 15A 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 125v power supply conductors into the bottom of the utility box containing the duplex receptacle.

Unit-Powered Convenience Outlet

A unit-mounted transformer is factory-installed to step down the main power supply voltage to the unit to 115v 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. 48.

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 or HACR breaker switch; this will provide service power to the unit when the unit disconnect switch or HACR switch is open. Other connection methods will result in the convenience outlet circuit being de-energized when the unit disconnect or HACR switch is open. See Fig. 50.



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. 50 — Powered Convenience Outlet Wiring

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.

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.

Duty Cycle

The unit-powered convenience outlet (see Fig. 51) 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 amps loading for continuous duty loads (such as electric heaters for overnight use). Observe a 50% limit on circuit loading above 8 amps. Convenience outlet usage rating:

- Continuous usage: 8 amps maximum
- Intermittent usage: Up to 15 amps maximum for up to 2 hours maximum

NOTICE/AVIS

Convenience Outlet Utilization
Maximum Intermittent Use 15 - Amps
Maximum Continuous Use 8 - Amps
Observe a 50% limit on the circuit
Loading above 8 - Amps

Utilisation de la prise utilitaire
Usage intermittent maximum 15 - Amps
Usage continu maximum 8 - Amps
Observez une limite de 50% sur le circuit
Chargement au-dessus de 8 - Amps

50HE501288 2.0

Fig. 51 — Convenience Outlet Utilization Notice Label

HACR AMP RATING

The amp rating of the HACR factory-installed option is based on the size, voltage, indoor motor and other electrical options of the unit as shipped from the factory. If field-installed accessories are added or changed in the field (for example, electric heat, power exhaust), the HACR may no longer be of the proper amp rating and therefore will need to be removed from the unit. See unit nameplate and label on factory-installed HACR for the amp rating of the HACR that was shipped with the unit from the factory (Fig. 52). See unit nameplates for the proper fuse, HACR or maximum over-current protection device required on the unit with field installed accessories.

⚠ CAUTION

The HACR circuit breaker is rated for 240V/480V Wye and Delta, and 600V Wye power supply. Do not connect to 600V Delta power supply. Severe damage to equipment would occur.

⚠ ATTENTION

Le voltage nominal du disjoncteur CACR est de 240V/480V en étoile-triangle, et 600V en étoile. Ne pas brancher sur une alimentation électrique de 600V en triangle. Cela causera de graves dommages à l'équipment.

48TM503700 -

Fig. 52 — HACR Caution Label

FACTORY-OPTION THRU-BASE ELECTRICAL 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 $^{7}/_{8}$-in. knock out is provided for low voltage. An additional $^{7}/_{8}$-in. knock out is provided for a 115-v line, which is used when the unit is equipped with the non-unit 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 ELECTRICAL 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. 47 on page 34.

UNITS 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 ensure separation of the field low voltage wire and the high voltage circuit. Route the low voltage wire to the Integrated Staging Control (ISC) board. See Fig. 53.

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

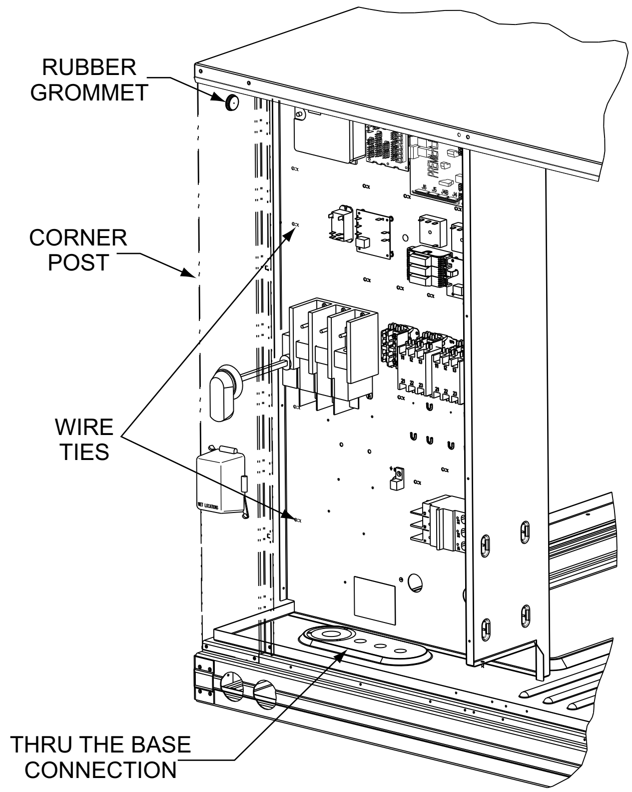


Fig. 53 — Field Control Wiring Raceway

CONFIGURING 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.

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

50LC*B units may be equipped with factory or field-installed 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. 54-56. Refer to the Electric Heater Kit Installation Instructions for complete details on field-installed electric heat accessory.

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.

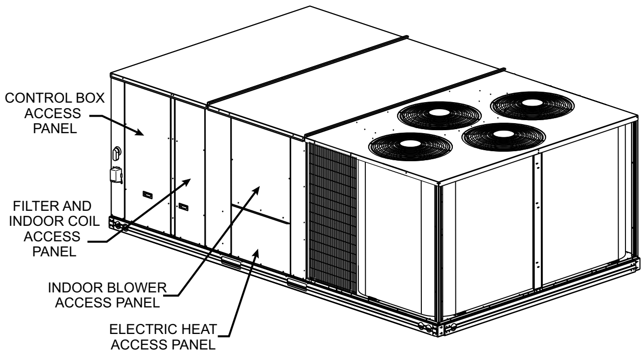


Fig. 54 — Typical Access Panel Location

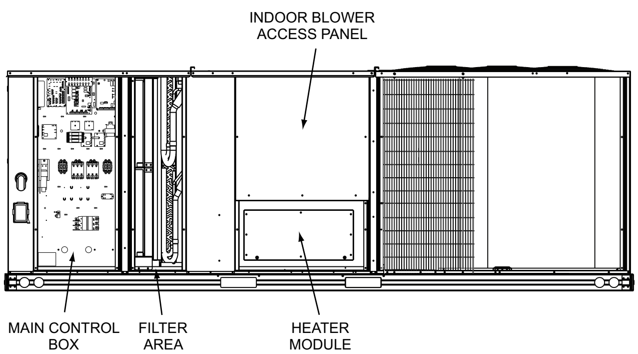


Fig. 55 — Typical Component Location

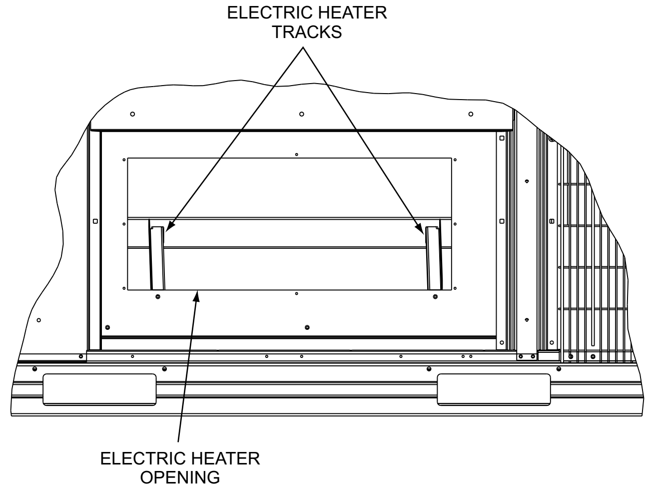


Fig. 56 — Electric Heater Compartment (Cover Removed)

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. Note that the plug will already be connected when there is factory-installed electric heat See Fig. 57.

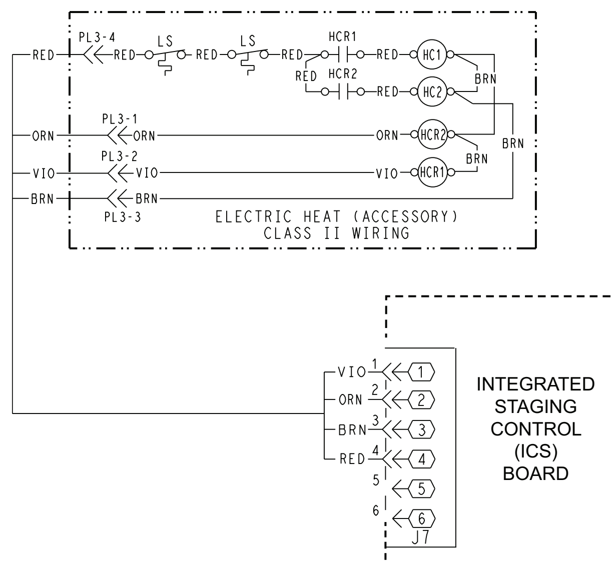


Fig. 57 — Optional or Accessory Electric Heater Control Connections

HUMIDI-MIZER® SYSTEM CONTROL CONNECTIONS

Humidi-MiZer System Duct/Space RH Controller

The Humidi-MiZer dehumidification system requires a field-supplied and field-installed space relative humidity control device. Use a duct or space-mounted RH sensor.

VAV-RTU Open Controller (50LC*B Units)

For details on the 50LC*B14-26 VAV-RTU Open option refer to *48/50LC07-26 VAV-RTU Open Controller Controls, Start-up, Operation and Troubleshooting* manual.

Integrated Staging Control (ISC)

SEQUENCE OF OPERATION

The Carrier Integrated Staging Control (ISC) is intended for use with a standard thermostat, direct digital controls (DDC) capable of three cooling stages, or the VAV-RTU Open controller (for LC*B units). After initial power to the board, a Green LED will blink with a 1 second duty cycle indicating the unit is running properly. In the event of the ISC board failing, the Green LED will be OFF or continuously ON. When the unit is not running properly, the Green LED will blink along with Red LED lights. The Red LED light configuration will indicate the type of error the board has identified. See Fig. 58 for LED locations and Table 3 for a list of status codes.

The ISC board can be remotely shut down by removing Jumper 4 and wiring to the Remote Shutdown terminal. The Smoke Control Module can shutdown the unit by removing Jumper 3 and wiring to the Smoke Shutdown terminal. The Smoke Alarm terminal on the ISC Board provides a pass through connection should a smoke alarm signal be connected. In the case of the RTU Open option, the RTU Open controller provides the signal which is passed through the ISC board to the Smoke Alarm terminal.

The crankcase heater will run at all times except when the compressors are running. An auxiliary power supply (24Vac) available at TB-4 Terminal is provided to power auxiliary equipment. An optional Phase Monitor Relay can be wired to the PMR terminal by removing Jumper 5. An optional Condensate Flow Switch can be wired to the COFS Terminal by removing Jumper 7.

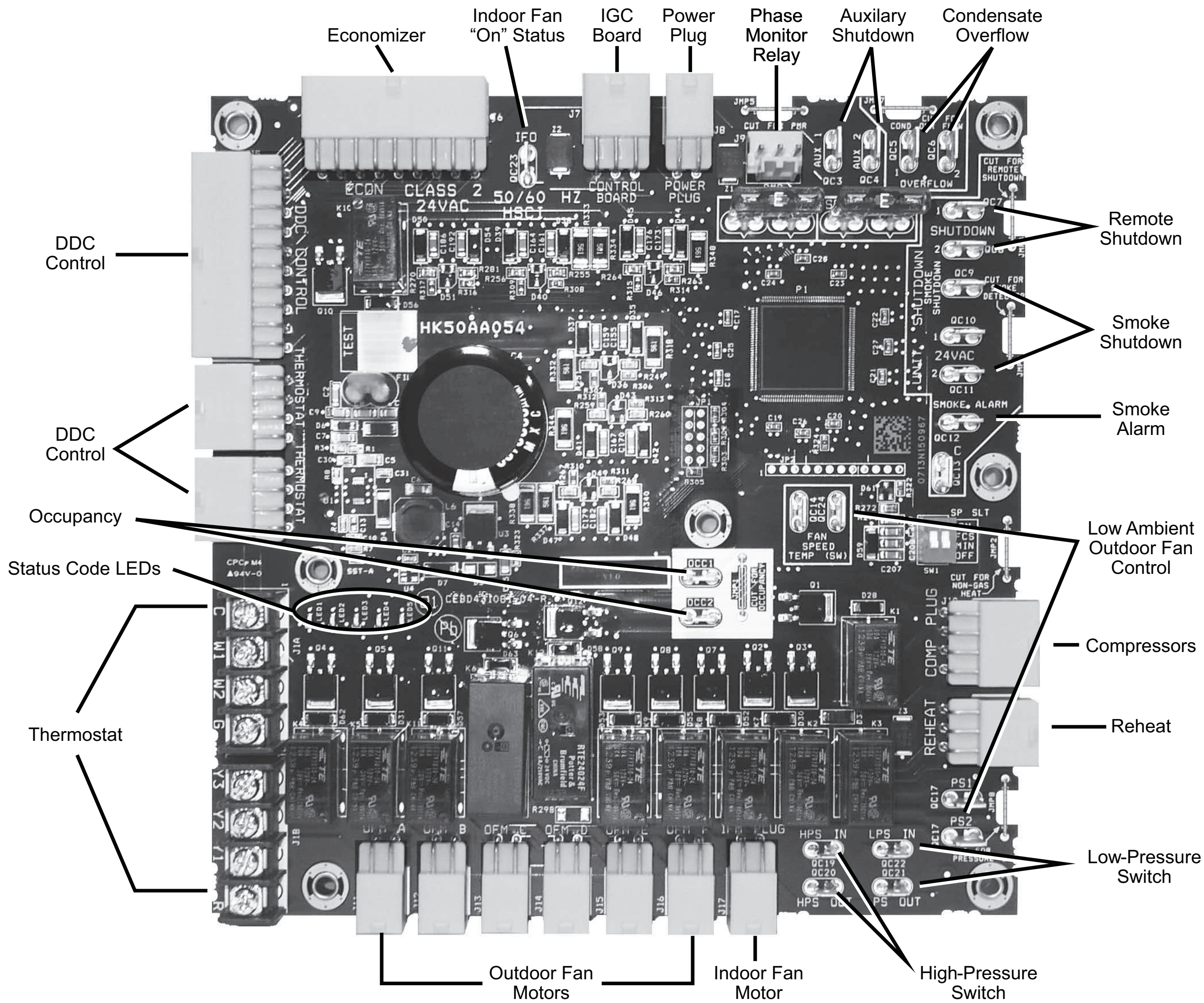


Fig. 58 — Integrated Staging Control (ISC) Board

Table 3 — ISC Board LEDs Status Code Descriptions

ERROR #	ERROR NAME	LED INDICATION				
		LED01	LED02	LED03	LED04	LED05
1	Check Smoke Detector/PMR/AUX		RED	Blinking Green LED (Note 1)		
2	Check HPS/LPS/COFS	RED	RED	Blinking Green LED (Note 1)		
3	Call for Y3 with no call for Y1. Check Y1 wiring.			Blinking Green LED (Note 1)	RED	
4	Call for Y3 with no call for Y1/Y2. Check Y1 wiring.			Blinking Green LED (Note 1)	RED	RED
5	Call for Y2 with no call for Y1. Check Y1 wiring.		RED	Blinking Green LED (Note 1)	RED	
6	Call for W2 with no call for W1. Check W1 wiring.	RED		Blinking Green LED (Note 1)		
7	Call for heat (W1/W2) and cooling (Y1/Y2/Y3). Check thermostat wiring.	RED	RED	Blinking Green LED (Note 1)	RED	RED
8	Call for heat (W1/W2) with no G. Check G wiring.		RED	Blinking Green LED (Note 1)	RED	RED
9	Call for cooling (Y1/Y2/Y3) with no G. Check G wiring.	RED	RED	Blinking Green LED (Note 1)	RED	
10	Call for heat (W1/W2) and cooling (Y1/Y2/Y3) with no G. Check thermostat and G wiring.	RED	RED	Blinking Green LED (Note 1)		RED
11	Check ISC Board and the thermostat wiring	RED		Blinking Green LED (Note 1)	RED	RED
12	Check ISC Board and the thermostat wiring	RED		Blinking Green LED (Note 1)		
13	Check ISC Board and the thermostat wiring	RED		Blinking Green LED (Note 1)	RED	
14	Check ISC Board and the thermostat wiring			Blinking Green LED (Note 1)		RED
15	Check ISC Board and the thermostat wiring		RED	Blinking Green LED (Note 1)		RED

NOTES:
1. Green LED blinking at 1HZ indicates normal operation.
2. Solid red LED indicates an error exists; see above LED configuration.

*Static Pressure Control (50LC*B Units)*

The supply fan VFD will be controlled using a PID and an analog input from a duct static pressure transducer. The supply fan will modulate its speed to maintain the desired duct static pressure setpoint.

*Field Test/Commissioning (50LC*B Units)*

The control will provide BACnet test points to activate specific test modes that can be used to commission the rooftop and the system. Test modes will be available in the Service Test screen on the Property pages and shall also be available on the local Equipment Touch device for standalone commissioning. Tests include: Fan Test, Low Heat Test, High Heat Test, Cooling Test, Power Exhaust Test, and an Economizer Test. When any test is active, the appropriate Linkage mode will be sent to the system's terminals. This will ensure appropriate system operation and airflow during any test mode.

Ventilation

In the Ventilation/Fan Mode (G), the indoor fan will run at low speed and the damper will operate at minimum position.

Supply Air Temperature Control

The control will maintain the desired supply air temperature setpoint whenever cooling is required. A user configurable setpoint will be provided (default 53°F). The control will use the appropriate method (economizer cooling, mechanical cooling, or a combination of both) to achieve this setpoint whenever the zone temperature is greater than the current cooling setpoint (occupied or unoccupied). If Supply Air Reset is enabled, the reset algorithm will calculate a proportional reset value between the Occupied Cooling setpoint and 1°F above the Occupied Heating setpoint. The amount of reset (reset ratio and maximum reset limit value) is user configurable.

Minimum Ventilation

The economizer minimum position will be adjusted as required based on the supply fan speed. Two user-configurable minimum economizer positions will be provided. The economizer will be positioned at the "Low Fan Econ Min Pos" when the fan is operating at its slowest speed. When the fan is operating at its maximum speed, the economizer will be positioned at the "Vent Dmpr Pos / DCV Min Pos". For any supply fan speed between these two points, the economizer minimum position will be calculated proportionally.

Demand Controlled Ventilation (DCV)

Whenever the unit is in an occupied mode and "DCV Control" is set to enable, a unique economizer minimum position will be calculated based on the output of the DCV calculation. Two user configurable values are provided; the "DCV Max Ctrl Setpoint" is the differential CO_2 setpoint that is used as the control point and a "DCV Max Vent Damper Pos" provides the ability to limit the maximum amount of outdoor air being introduced into the unit through the economizer by the DCV control. The economizer will be positioned at the greater of any minimum economizer position. Demand Controlled Ventilation can be used in either a differential mode where both the indoor air and outdoor air CO_2 levels are provided to the control or it may be used in a single indoor air mode with only the indoor air CO_2 level. In the latter case, the outdoor air CO_2 level is assumed at 400 ppm.

Cooling

In the Cooling Mode, the small and large compressors will be sequenced to maintain the thermostat temperature setpoint. Table 4 shows the cooling operation based on the indicated conditions.

The outdoor fan and VFD-controlled indoor-fan will operate at low, medium and high speed. The RPM is factory set by the CFM and static pressure requirements for the unit installed.

Table 4 — Cooling Mode Operation

INPUT	OUTPUT			
Thermostat	Compressor		Indoor Fan Speed	Outdoor Fan Speed
	C1	C2		
First Stage Cooling (Y1)	On	Off	Low	Low (700 RPM)
Second Stage Cooling (Y2)	Off	On	Medium	Medium (800 RPM)
Third Stage Cooling (Y2)	On	On	High	High (1000 RPM)

Mechanical Cooling Cycle

The control will operate three stages of mechanical cooling in order to maintain the desired supply air temperature whenever economizer cooling operation is unavailable but cooling is required. This condition will be determined if the OA has high enthalpy or at a temperature above the Economizer Lockout temperature. The two compressors will be staged in a binary fashion so that three stages of cooling are provided. Mechanical cooling stages will be added as required to meet the desired SA setpoint. The number of stages will depend on the return air conditions and the system load (airflow through the coil). Stages will be added or dropped as required to maintain the setpoint while also maintaining the minimum on time and minimum off time for compressor operation. Anytime the SA falls below the desired SA setpoint, stages will be dropped until only stage 1 is operating. At that point, should the SA fall below 45°F (7°C), the economizer will modulate to increase the amount of outdoor air in order to maintain this minimum SA temperature. Should the economizer reach the maximum OA position and if the SA is still below the minimum SA temperature, the first cooling stage will be disabled and the economizer will return to the minimum position.

Integrated Cooling Cycle

If economizer cooling operation is insufficient to maintain the desired SA setpoint, mechanical cooling will be activated to supplement the free economizer cooling. This condition will be determined if the OA has low enthalpy but is at a temperature at least 5°F above the desired SA setpoint and below the Economizer Lockout temperature. Mechanical cooling stages will be added as required to meet the desired SA setpoint. The number of stages will depend on the return air conditions and the system load (airflow through the coil). Stages will be added or dropped as required to maintain the setpoint while also maintaining the minimum on time and minimum off time for compressor operation. Any time the SA falls below the desired SA setpoint, stages will be dropped until only stage 1 is operating. At that point, should the SA fall below the minimum SA temperature, the economizer will modulate to increase the amount of return air in order to maintain this minimum SA temperature. Should the economizer reach the minimum OA position and if the SA is still below the minimum SA temperature, the first cooling stage will be disabled.

Economizer Cooling Cycle

The control will provide the ability to utilize outdoor air for maintaining the supply air setpoint should the outdoor air be suitable. The economizer control will utilize an OAT temperature check, a RAT temperature check if RAT is available or a SPT temperature check comparison and optionally, an OA enthalpy check to determine if OA conditions are suitable for economizing. Economizer operation, if available, will begin whenever cooling is required. The economizer will modulate the position of the OA damper to maintain the desired calculated economizer setpoint. The economizer will be controlled to meet CEC Title 24 requirements so that it will remain open 100% during integrated cooling and only partially close if required.

Humidi-MiZer® System (Optional)

In the Dehumidification Mode, both compressors will run and Indoor airflow will be rise to High Speed.

At subcooler reheating mode (reheat-1), during part load conditions when the room temperature and humidity are above the set point, the unit initiates the sub-cooling mode of operation; a call for cooling and dehumidification. RDV (Reheat Discharge Valve) and TWV (Three Way Valve) close; Indoor and Outdoor airflow will rise until reaching 100% of Speed.

At hot gas bypass reheating mode (reheat-2), when there is a call for dehumidification without a call for cooling, a portion of the hot gas from the compressor bypasses the condenser coil when RDV opens and hot gas is fed into the liquid line, TWV closes in this mode and the system provides mainly latent cooling. Indoor airflow will rise until reaching 100% of Speed, Outdoor airflow will run at High speed as long as outdoor temperature is above 80°F (26.7°C); when operating in this mode below 80°F (26.7°C) OAT, the system outdoor fan will operate as shown in Table 5 based on unit size.

Table 5 — Outdoor Fan Operation Below 80°F (26.7°C) OAT

50LC*B SIZE	RPM	NUMBER OF FANS ON	NUMBER OF FANS OFF
14	250	3	0
17	250	4	0
20	160	4	0
24	250	6	0
26	250	6	0

Economizer (Optional)

When the economizer is in Free Cooling Mode and a demand for cooling exists (Y1 on the thermostat), the economizer will modulate the outdoor-air damper to provide a 50°F (10°C) to 55°F (13°C) mixed-air temperature into the zone and run the indoor-fan at high speed. As mixed-air temperature fluctuates above 55°F (13°C) or below 50°F (10°C) dampers will be modulated (open or close) to bring the mixed-air temperature back within control. Upon more call for cooling (Y2 on the thermostat), the outdoor-air damper will maintain its current position, compressor C1 will run and the outdoor-fan will run at low speed. If there is further demand for cooling, the outdoor-air damper will maintain its current position, compressor C2 will run and the outdoor-fan will run at medium speed. The VFD controlled indoor-fan will operate at high speed regardless of the cooling demand.

If the increase in cooling capacity causes the mixed-air temperature to drop below 45°F (7°C), the outdoor-air damper will return to the minimum position. If the mixed-air temperature continues to fall, the outdoor-air damper will close. Control returns to normal once the mixed-air temperature rises above 48°F (9°C). The power exhaust fans will be energized and de-energized, if installed, as the outdoor-air damper opens and closes.

If field-installed accessory CO_2 sensors are connected to the Economizer, a demand controlled ventilation strategy will begin to operate. As the CO_2 level in the zone increases above the CO_2 setpoint, the minimum position of the damper will be increased proportionally. As the CO_2 level decreases because of the increase of fresh air, the outdoor-air damper will be proportionally closed. For economizer operation, there must be a thermostat call for the fan (G). If the unit is occupied and the fan is on, the damper will operate at minimum position. Otherwise, the damper will be closed.

Low Ambient Cooling Operation Down to 40°F (4°C)

In Low Ambient RTU conditions when the temperature is between 55°F (13°C) and 40°F (4°C), the Low Ambient Switch (LAS) will be active and the outdoor fans will run to the pre-set factory outdoor-fan speed. When the temperature is greater than 65°F (18°C), the Low Ambient Switch will deactivate and the outdoor fans will run in the standard cooling mode. If the Outdoor Fan Select Switch (see Fig. 59) is in the ON position, the outdoor fans will run in the Fan Cycle Speed Mode (FCS) set to 250 rpm. If the Outdoor Fan Select Switch is in the OFF position, the outdoor fans will run in the Minimum Fan Speed Mode (MIN) set to 160 rpm regardless of the cooling demand.

50LC*B Size 14 through 26 units have a SPST normally open Low Ambient Switch wired across the TS and OF terminal and a jumper placed across the PS terminal (see Fig. 60). When the LAS is active, the switch will close making contact to the OF terminal. This is done for units that require all outdoor fans to run at the same pre-set factory Low Ambient Speed.

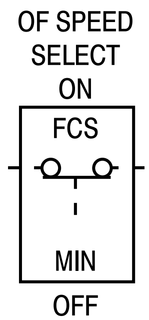


Fig. 59 — Outdoor Fan Speed Select Switch

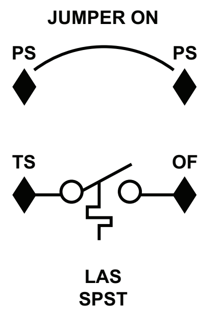


Fig. 60 — SPST Low Ambient Switch Schematic

Table 6 shows the low ambient temperature operation of the outdoor fan for each unit.

Table 6 — Low Ambient Temperature Outdoor Fan Control

50LC*B SIZE	NO. OF FANS ON	NO. OF FANS OFF	SWITCH	OUTDOOR FAN SELECT SWITCH	RPM
14	3	0	SPST	Up	250
17	4	0	SPST	Up	250
20	4	0	SPST	Up	250
24	6	0	SPST	Up	250
26	6	0	SPST	Up	250

Heating

In the Heating Mode (W1 on the thermostat), power is applied to the G and W1 terminal at the ISC board and energizes the first state of electric heat. Upon more call for heat (W2 at the thermostat), power is applied to the G and W2 terminal at the ISC board and energizes the second state of electric heat. The VFD controlled indoor fan will operate at high speed regardless of the heating demand.

Morning Warm-Up

The control will provide a Morning Warm-up cycle the first time if a transition occurs from unoccupied to occupied, if heating is required, and the unit goes into heating immediately. Whenever the unit enters the heating mode, before any heat stage is enabled, the control will provide a Linkage mode to the system that will cause the terminals to maintain sufficient airflow. The Linkage mode of Warm-up (2) will be sent to the terminal system to ensure sufficient airflow while in the heating mode; it also provides a controlled warm-up cycle to prevent overheating of some zones. As a safety measure, should the heating cycle continue and the SAT approach the "Maximum Heating SAT" limit, the Linkage mode sent will change to Pressurization (6) to ensure all terminals open to their maximum airflow. The Linkage mode will remain Pressurization until that heating cycle ends. Once the heating demand is met and the heat cycle is completed, or if cooling is required, heating will be locked out until the beginning of the next occupied period.

Occupied Heating

Optionally, the user may enable occupied heating which will allow heating whenever heating is needed during the occupied period. The cycle will operate exactly the same as Morning Warm-up above, except it will not be limited by the transition into an occupied period.

Variable Air Volume (VAV) with Variable Frequency Drive

The Variable Air Volume (VAV) system utilizes a Variable Frequency Drive (VFD) to modulate supply fan speed using a PID and an analog input from a duct static pressure sensor. The supply fan will adjust to meet the configured static setpoint regardless of cooling stage. In heating mode the latest VAV Open air terminals offer a minimum airflow setting. This shall be configured to maintain the required airflow (CFM) whenever the RTU is in a heating mode per the unit's specification. The Open VAV terminals will recognize the Heating or Warm-up modes as a heat mode and utilize the higher airflow minimum setpoint as configured. The system will further monitor the SAT of the RTU to determine if the SAT is approaching the configured maximum limit. As the limit is approached, the Linkage mode is changed to Linkage Pressurization to ensure all terminals open to their maximum supply airflow.

For more information about configuring the VFD, see the "Staged Air Volume (SAV™) with Variable Frequency Drive" section.

Staged Air Volume (SAV™) with Variable Frequency Drive

The Staged Air Volume (SAV) system utilizes a Variable Frequency Drive (VFD) to automatically adjust the indoor fan motor speed in sequence with the unit's ventilation, cooling and heating operation. Per ASHRAE 90.1-2016 standard, during the first stage of cooling operation the SAV system will adjust the fan motor to provide 66% of the design airflow rate for the unit. When the call for the second stage of cooling is required, the SAV system will allow the design airflow rate for the unit established (100%). During the heating mode, the SAV system will allow total design airflow rate (100%) operation. During ventilation mode, the SAV system will operate the fan motor at 66% speed. Figure 61 shows the Variable Frequency Drive. See Fig. 62 for the VFD location.

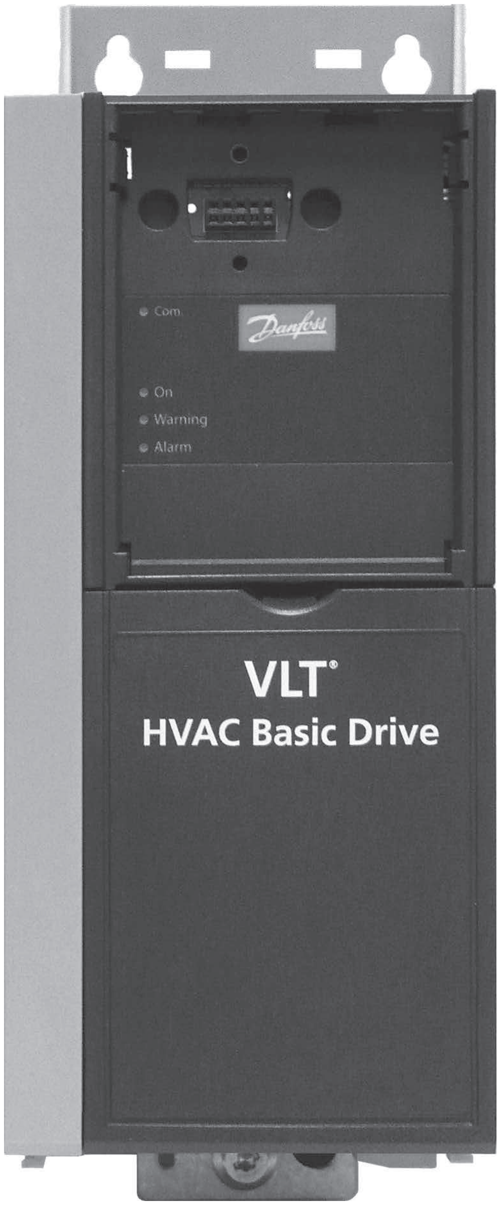
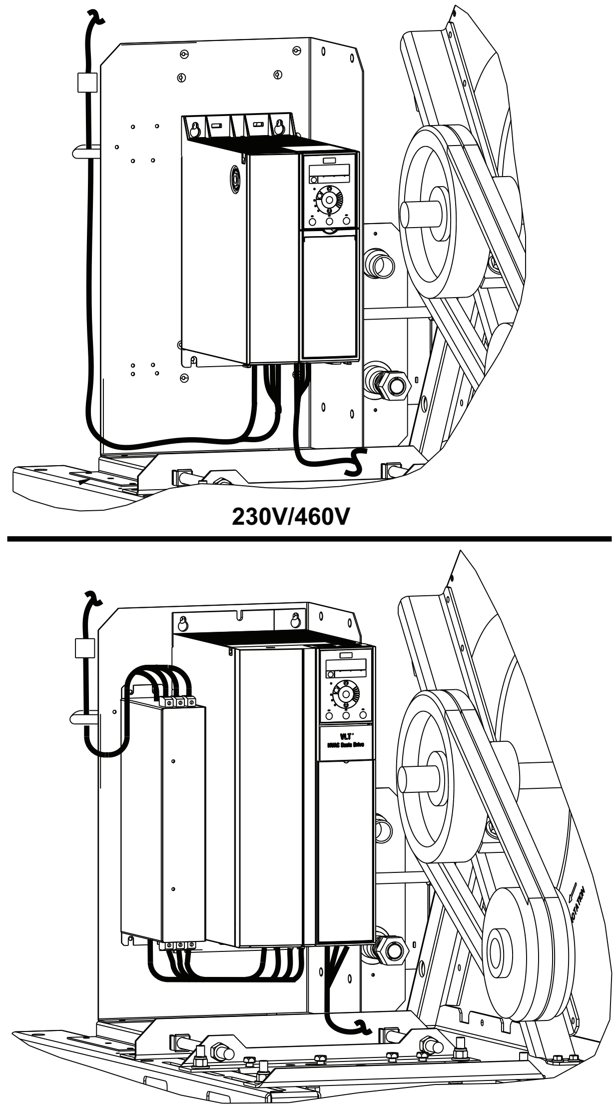


Fig. 61 — Variable Frequency Drive (VFD)



575V ONLY

Fig. 62 — VFD Location

MULTI-SPEED VFD DISPLAY KIT (FIELD-INSTALLED ACCESSORY)

NOTE: The Remote VFD Keypad is part of the Multi-Speed VFD display kit (P/N: CRDISKIT002A00), which is a field-installed accessory. It is not included with the 50LC*B size 14-26 base units.

The VFD keypad as shown in Fig. 63 consists of the following sections:

Alphanumeric Display

The LCD display is backlit with 2 alphanumeric lines. All data is displayed on the LCD (see Fig. 64).

Menu Key

Use the Menu key to select between Status, Quick Menu or Main Menu. The triangle icon at the bottom of the LCD display indicates the currently selected mode. (See number 5 in Fig. 64.)

Navigation Keys and Status LEDs

The Navigation keys and Status LEDs are detailed in Fig. 65.

Operation Keys and LEDs

Figure 66 details the functions of the Operating keys. An illuminated yellow LED above the key indicates the active key.

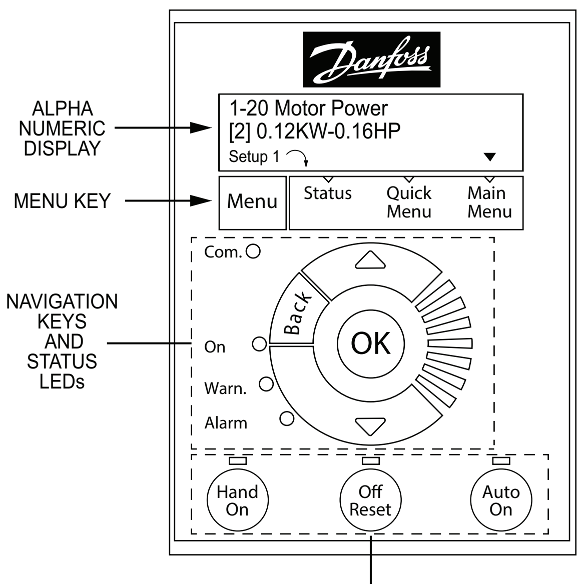
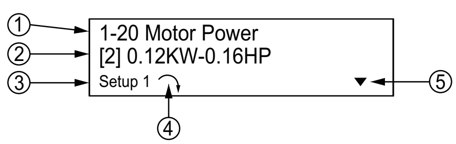


Fig. 63 — VFD Keypad



1 = Parameter number and name.

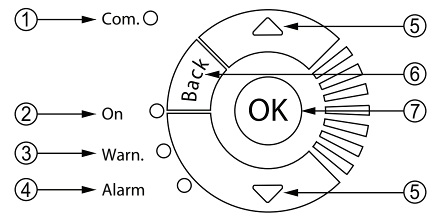
2 = Parameter value.

3 = Setup number shows the active setup and the edit setup. If the same setup acts as both the active and edit setup, only that setup number is shown (factory setting). When the active and edit setup differ, both numbers are shown in the display (SETUP 12). The flashing number indicates the edit setup.

4 = The symbol in the number 4 position in the figure above indicates motor direction. The arrow points either clockwise or counter-clockwise to show the motor's current direction.

5 = The position of the triangle indicates the currently selected menu: Status, Quick Menu or Main Menu.

Fig. 64 — Alphanumeric Display



1 = Com. LED: Flashes when bus communications is communicating.

2 = Green LED/On: Control selection is working.

3 = Yellow LED/Warn.: Indicates a warning.

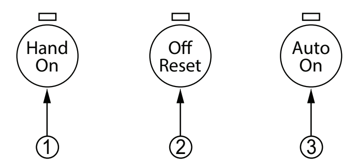
4 = Flashing Red LED/Alarm: Indicates an alarm.

5 = Arrows: Use the Up and Down arrow keys to navigate between parameter groups, parameters and within parameters. Also used for setting local reference.

6 = Back key: Press to move to the previous step or layer in the navigation structure.

7 = OK key: Press to select the currently displayed parameter and for accepting changes to parameter settings.

Fig. 65 — Navigation Keys and Status LEDs



1 = Hand On key: Starts the motor and enables control of the variable frequency drive (VFD) via the VFD Keypad option. NOTE: Please note that terminal 27 Digital Input (5-12 Terminal 27 Digital Input) has coast inverse as default setting. This means that the Hand On key will not start the motor if there is no 24V to terminal 27, so be sure to connect terminal 12 to terminal 27.

2 = Off/Reset key: Stops the motor (off). If in alarm mode the alarm will be reset.

3 = Auto On key: The variable frequency drive is controlled either via control terminals or serial communication.

Fig. 66 — Operation Keys and LEDs

Connecting the Keypad to the VFD

The VFD keypad can be mounted directly to the variable frequency drive, provided you can easily access the front panel of the VFD. If you do not have easy access to the VFD front panel, use the cable included with the kit to connect the keypad to the VFD.

Connecting the Keypad Directly to the VFD

1. Place the bottom of the VFD keypad into the variable frequency drive as shown in Fig. 67.

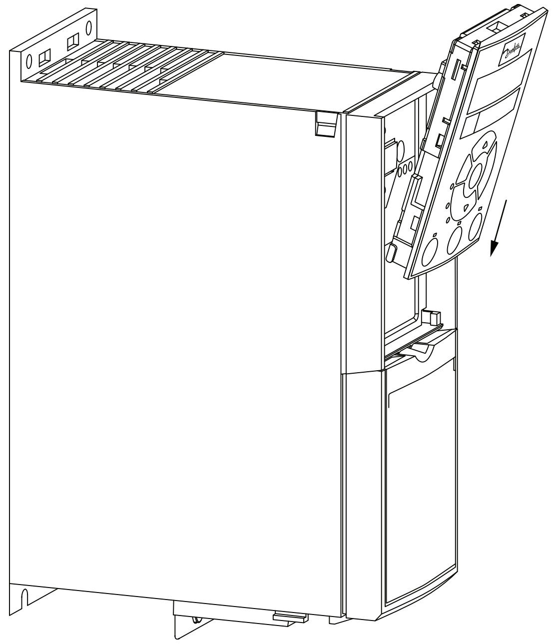


Fig. 67 — Aligning Bottom of VFD Keypad with Opening in VFD Front Panel

2. Push the top of the VFD keypad into the variable frequency drive as shown in Fig. 68.

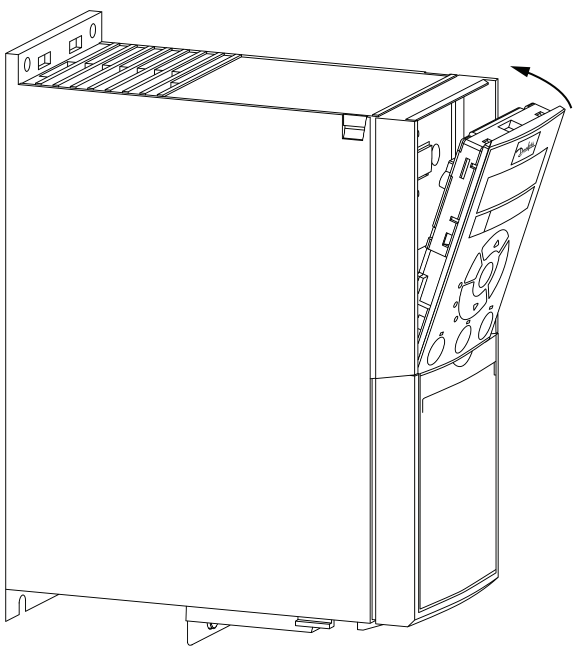


Fig. 68 — Secure Keypad in Place

<u>Using the Cable to Connect the Keypad with the VFD</u>

The VFD keypad can be connected to the variable frequency drive via the cable included with the Multi-Speed VFD display kit (P/N CRDISKIT002A00). See Fig. 69.

1. Connect the male end of the cable to the front panel of the variable frequency drive. Use 2 of the screws included with the kit to secure the cable to the VFD.
2. Connect the female end of the cable to the back panel of the VFD Remote keypad. Secure the cable to the remote keypad using the 2 remaining screws from the kit.

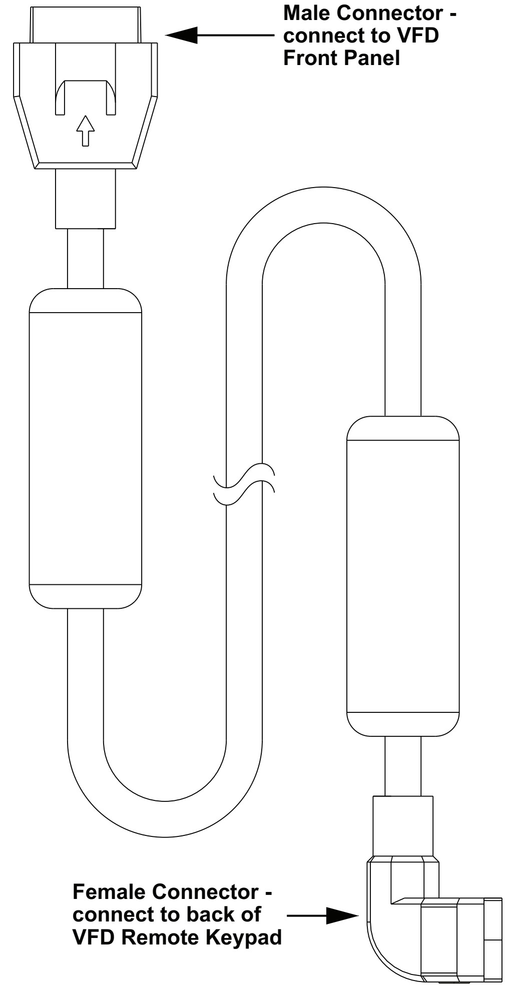


Fig. 69 — VFD Remote Keypad Cable

Program the VFD for 3 Discrete Indoor Fan Speeds

IMPORTANT: 50LC*B 14-26 units are programmed at the factory for 3 discrete indoor fan speeds. The following procedure is only to be used to recover this function after an event such as a system crash.

NOTE: This procedure requires use of the VFD Keypad which is included as part of the field-installed Multi-Speed VFD display kit (P/N CRDISKIT002A00). If the VFD keypad is not already installed, install it. See “Connecting the Keypad to the VFD” on page 43 for details.

1. At power-up: At the first power-up the LCD displays the Select Language screen The default setting is English. To change the language, press the **OK** key and use the ▲ (Up arrow) and ▼ (Down arrow) keys to scroll to the desired language. Then press **OK**. See Fig. 70.

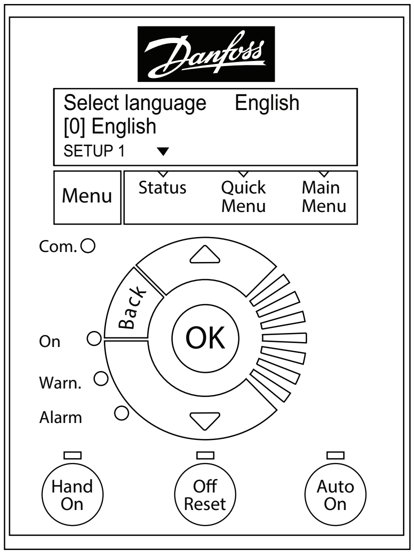


Fig. 70 — Keypad with Power Up Screen Displayed

2. Select Regional Settings:
   a. Press the **Off Reset** key.
   b. Press the Menu key to move the ▼ (triangle icon) so it is positioned over the Main Menu. The display shows the following:

0 —** Operation/Display
1 —** Load and Motor

   c. Press the **OK** key. The display changes to:

0 —0* Basic Settings
0 —1* Set-up Operations

   d. With the top row highlighted, press **OK**. The display changes to:

0 —01 Language
[0] English

NOTE: If English is not the desired language, press **OK**, select the desired language, and press **OK** again.

   e. Press ▼ (Down arrow key) once. The display changes to:

0 —03 Regional Settings
[0] International

   f. Press **OK**. The **[0]** is now highlighted.
   g. Press ▼ (Down arrow key) once. The display changes to:

0 —03 Regional Settings
[1] North America

   h. Press **OK**.

NOTE: If Alarm 060 appears, follow Step 3 to clear the alarm. be sure to press **Off Reset** when done. If there is no alarm, continue at Step 4.

3. Clear Alarm 060 (External Interlock):
   a. Press the Menu key twice to position the ▼ (triangle icon) over the Main Menu. The display changes to:

0 —** Operation/Display
1 —** Load and Motor

   b. Press the ▼ (Down arrow key) until the following display appears:

0 —** Limits/Warnings
5 —** Digital In/Out

   c. Press **OK**. The display changes to:

5 —0* Digital I/O Mode
5 —1* Digital Inputs

   d. Press ▼ (Down arrow key) once to highlight the bottom row, and press OK. The display changes to:

5—10 Terminal 18 Digital In...
[8] Start

   e. Press ▼ (Down arrow key) twice. The following display appears:

5—12 Terminal 27 Digital In...
[7] External Interlock

   f. Press **OK** to highlight the number in the brackets.
   g. Press ▼ (Down arrow key) until the following display appears:

5—12 Terminal 27 Digital In...
[0] No operation

   h. Press **OK**.
   i. Press **Off Reset**. The Alarm indicator disappears.
4. Enter Grid Type:
   a. Press the Menu key to move the ▼ (triangle icon) so it is positioned over the Main Menu. The display shows the following:

0 —0* Basic Settings
1 —1* Set-up Operations

   b. Press **OK** twice. The display changes to:

0 —01 Language
[0] English

   c. Press ▼ (Down arrow key) three times to reach the following display:

0 —06 Grid Type
[102] 200-240V/60Hz

   d. Press **OK** to highlight the number in the brackets; then use the ▲ (Up arrow) and ▼ (Down arrow) keys to select the desired voltage and Hertz for the unit.
   e. Press **OK** to accept the selection and continue.
5. Enter Motor Data:
   a. Press the Menu key to move the ▼ (triangle icon) so it is positioned over the Main Menu. The display shows the following:

0 —** Operation/Display
1 —** Load and Motor

   b. Press ▼ (Down arrow key) once to highlight the bottom row.
   c. Press **OK**. The display changes to:

1 —0* General Settings
1 —1* Motor Selection

   d. Press ▼ (Down arrow key) twice to reach the following display:

1—1* Motor Selection
1 —2* Motor Data

e. Press **OK**. The following display appears:

1 —20 Motor Power
[9] 1.5kW — 2 hp

NOTE: The number in the brackets may be different from the one shown above.

f. Press **OK**; then use the ▲ (Up arrow) and ▼ (Down arrow) keys to scroll to the proper motor horsepower. Press **OK** again to set the selected hp.

g. Press ▼ (Down arrow) once to display the following:

1 —22 Motor Voltage
230V

h. Press **OK** to highlight the voltage value; then use the ▲ (Up arrow) and ▼ (Down arrow) keys to select the nameplate voltage. Press **OK** again to set the selected voltage.

i. Press ▼ (Down arrow) once to display the following:

1 —23 Motor Frequency
60Hz

j. Press **OK** to highlight the frequency value; then use the ▲ (Up arrow) and ▼ (Down arrow) keys to select the nameplate Hz. Press **OK** again to set the selected Hz.

k. Press ▼ (Down arrow) once to display the following:

1 —24 Motor Current
6.61A

l. Press **OK** to highlight the current value; then use the ▲ (Up arrow) and ▼ (Down arrow) keys to select the Max Amps value provided. Press **OK** again to set the Max Amps.

NOTE: The Max Amps is greater than the nameplate value. Check the VFD Unit Parameters (see Tables 7-11 beginning on page 49) and use the value listed for the given unit in the column labeled "Motor Current Must-Hold Amps".

m. Press ▼ (Down arrow) once to display the following:

1 —25 Motor Nominal Speed
1740rpm

n. Press **OK** to highlight the rpm value; then use the ▲ (Up arrow) and ▼ (Down arrow) keys to select the nameplate rpm. Press **OK** again to set the selected rpm.

6. Enter parameters for 1-71, 1-73, 1-82, and 1-90:

a. Press the Menu key to move the ▼ (triangle icon) so it is positioned over the Main Menu. The display shows the following:

0 —** Operation/Display
1 —** Load and Motor

b. Press ▼ (Down arrow key) once to highlight the bottom row.

c. Press **OK**. The display changes to:

1 —0* General Settings
1 —1* Motor Selection

d. Press ▼ (Down arrow key) until the following display appears:

1—6* Load Depen.Setting
1 —7* Start Adjustments

e. Press **OK**. The following display appears:

1 —71 Start Delay
2.0s

f. Press **OK** to highlight the number; then use the ▲ (Up arrow) and ▼ (Down arrow) keys to select the number provided in Tables 7-11 beginning on page 49. Press **OK** again to set the selected value.

g. Press ▼ (Down arrow) twice. The following display appears:

1 —73 Flying Start
[1] Enabled

h. Press **OK** to highlight the number in brackets; then use the ▲ (Up arrow) and ▼ (Down arrow) keys to select the number provided in Tables 7-11 beginning on page 49. Press **OK** again to set the selected value.

i. Press the **Back** key once. The following display appears:

1—6* Load Depen. Setting
1—7* Start Adjustments

j. Press ▼ (Down arrow key) once. The following display appears:

1—7* Start Adjustments
1—8* Stop Adjustments

k. Press OK. The following display appears:

1 —80 Function at Stop
[0] Coast

l. Press ▼ (Down arrow) once. The following display appears:

1 —82 Min Speed for Function...
1.0 Hz

m. Press **OK** to highlight the number; then use the ▲ (Up arrow) and ▼ (Down arrow) keys to select the number provided in Tables 7-11 beginning on page 49. Press **OK** again to set the selected value.

n. Press the **Back** key once. The following display appears:

1—7* Start Adjustments
1—8* Stop Adjustments

o. Press ▼ (Down arrow key) once. The following display appears:

1—8* Stop Adjustments
1—9* Motor Temperature

p. Press **OK**. The following display appears:

1 —90 Motor Thermal Prote...
[4] ETR Trip 1

q. Press **OK** to highlight the number in brackets; then use the ▲ (Up arrow) and ▼ (Down arrow) keys to select the number provided in Tables 7-11 beginning on page 49. Press **OK** again to set the selected value.

7. Set References:

a. Press the Menu key to move the ▼ (triangle icon) so it is positioned over the Main Menu. The display shows the following:

0 —** Operation/Display
1 —** Load and Motor

b. Press ▼ (Down arrow key) three times. The following display appears:

2—** Brakes
3—** Reference/Ramps

c. Press **OK**. The display changes to:

3 —0* Reference Limits
3 —1* References

d. Press **OK** again. The following display appears:

3 —02 Minimum Reference
0.000

NOTE: If the bottom row displays a number other than 0.000, press **OK** and use the ▲ (Up arrow) and ▼ (Down arrow) keys to select 0.000.

e. Press ▼ (Down arrow key) once. The following display appears:

3 —03 Maximum Reference
60.000

NOTE: If the bottom row displays a number other than 60.000, press **OK** and use the ▲ (Up arrow) and ▼ (Down arrow) keys to select 60.000.

f. Press the **Back** key until the following display appears:

3 —0* Reference Limits
3 —1* References

g. Press ▼ (Down arrow key) once to move the highlight to the bottom row, then press **OK**. The following display appears:

3 —10 Preset Reference
[0]0.00%

h. Press **OK** once to highlight the number in brackets. Press **OK** again. The highlight moves to the current percent value. Use the ▲ (Up arrow) and ▼ (Down arrow) keys and the following table to enter the required Preset Reference values:

[0]0.00%	Stop
[1]LL.LL%	Low Speed (see Tables 7-11, column labeled “Preset References 3-10[1]” for the proper % for each unit)
[2]MM.MM%	Medium Speed (see Tables 7-11, column labeled “Preset References 3-10[2]” for the proper % for each unit)
[3]100%	Override (High Speed)
[4]100%	High Speed (100% or close to 100% to achieve the required CFM at high speed)
[5]100%	Stop
[6]100%	Stop
[7]100%	Stop

8. Set the Ramp Time:

a. Press the **Back** key until the following display appears:

3 —0* Reference Limits
3 —1* References

b. Press ▼ (Down arrow key) twice. The following display appears:

3—1* References
3—4* Ramp 1

c. Press **OK**. The following display appears:

3 —41 Ramp 1 Ramp up Time
3.00s

d. Press **OK** again to highlight the bottom row; then use the ▲ (Up arrow) and ▼ (Down arrow) keys to select 10.00s. Press **OK** again to set the selected Ramp up Time.

e. Press ▼ (Down arrow key) once. The following display appears:

3 —42 Ramp 1 Ramp Down Time
3.00s

f. Press **OK** again to highlight the bottom row; then use the ▲ (Up arrow) and ▼ (Down arrow) keys to select 10.00s. Press **OK** again to set the selected Ramp Down Time.

9. Set Limits:

a. Press the **Back** key until the following display appears:

2—** Brakes
3—** Reference/Ramps

b. Press ▼ (Down arrow key) once. The following display appears:

3—** Reference/Ramps
4—** Limits/Warnings

c. Press **OK**. The following display appears:

4 —1* Motor Limits
4 —4* Adj. Warning 2

d. Press **OK** again. The following display appears:

4 —10 Motor Speed Direction
[2] Both Directions

e. Press ▼ (Down arrow key) once. The following display appears:

4—12 Motor Speed Low Limi...
0.0Hz

f. Press ▼ (Down arrow key) again. The following display appears:

4—14 Motor Speed High Limi...
65.0Hz

NOTE: Press **OK** to highlight the HZ value, and then use the ▲ (Up arrow) and ▼ (Down arrow) keys to enter the required values.

g. Press ▼ (Down arrow key) once. The following display appears:

4—18 Current Limit
110%

NOTE: Press **OK** to highlight the % value, and then use the ▲ (Up arrow) and ▼ (Down arrow) keys to enter the required value. See Tables 7-11 for the proper value for this parameter. Then press **OK** to set the selected value.

h. Press ▼ (Down arrow key) once. The following display appears:

4—19 Max Output Frequency
65.0Hz

NOTE: Press **OK** to highlight the HZ value, and then use the ▲ (Up arrow) and ▼ (Down arrow) keys to enter the required values.

10. Set Digital Inputs:

a. Press the **Back** key until the following display appears:

3—** Reference/Ramps
4—** Limits/Warnings

b. Press ▼ (Down arrow key) once. The following display appears:

4—** Limits/Warnings
5—** Digital In/Out

c. Press **OK**. The following display appears:

5 —0* Digital I/O Mode
5 —1* Digital Inputs

d. Press ▼ (Down arrow key) once to move the highlight to the bottom row, then press **OK**. The following display appears:

5 —10 Terminal 18 Digital In...
[8] Start

e. Press ▼ (Down arrow key) again. The following display appears:

5 —11 Terminal 19 Digital In...
[16] Preset ref bit 0

f. Press ▼ (Down arrow key) again. The following display appears:

5 —12 Terminal 27 Digital In...
[17] Preset ref bit 1

g. Press ▼ (Down arrow key) again. The following display appears:

5 —12 Terminal 29 Digital In...
[18] Preset ref bit 2

NOTE: By pressing **OK** the number in the bracket can be changed until the desired number appears. Press **OK** again to set the selected value.

11. Set Analog Inputs:

a. Press the **Back** key until the following display appears:

4—** Limits/Warnings
5—** Digital In/Out

b. Press ▼ (Down arrow key) until the following display appears:

5—** Digital In/Out
6—** Analog In/Out

c. Press **OK**. The following display appears:

6—**Analog In/Out
6—1* Analog Input 53

d. Press ▼ (Down arrow key) once to move the highlight to the bottom row, then press **OK**. The following display appears:

6 —10 Terminal 53 Low Voltage
2V

e. Press ▼ (Down arrow key) once to move the highlight to the bottom row, then press **OK**. The following display appears:

6 —11 Terminal 53 High Voltage
[10V]

f. Press ▼ (Down arrow key) once to move the highlight to the bottom row, then press **OK**. The following display appears:

6 —14 Set Min Reference
[0 Hz]

g. Press ▼ (Down arrow key) once to move the highlight to the bottom row, then press **OK**. The following display appears:

6 —15 Set Max Reference
[60 Hz]

12. Set Reset Mode and RFI Filter:

a. Press the **Back** key until the following display appears:

0 —** Operation/Display
1 —** Load and Motor

b. Press ▼ (Down arrow key) until the following display appears:

13—** Smart Logic
14—** Special Functions

c. Press **OK**. The following display appears:

14 —0* Inverter Switching
14 —1* Mains On/Off

d. Press ▼ (Down arrow key) twice. The following display appears:

14—1* Mains On/Off
14—2* Reset Functions

e. Press **OK**. The following display appears:

14 —20 Reset Mode
[0] Manual reset

f. Press **OK** to highlight the number in the bracket.

g. Use the ▲ (Up arrow) and ▼ (Down arrow) keys to change the number to 3 for 2 automatic resets; then press **OK**. The display changes to:

14 —20 Reset Mode
[3] Automatic reset x 3

h. Press ▼ (Down arrow key) once. The following display appears:

24 —21 Automatic Restart T...
10s

i. Press **OK** to highlight the number of seconds and use the ▲ (Up arrow) and ▼ (Down arrow) keys to select 600 seconds. Press **OK** again to set the selected value.

j. Press the **Back** key once. The following display appears:

14—1* Mains On/Off
14—2* Reset Functions

k. Press ▼ (Down arrow key) twice. The following display appears:

14—4* Energy Optimizing
14—5* Environment

l. Press **OK**. The following display appears:

14 —50 RFI Filter
[1] On

m. Press **OK** to highlight the number in the brackets and use the ▲ (Up arrow) and ▼ (Down arrow) keys to select 0. Press **OK** again to set the selected value.

13. Complete reprogramming: Press the **Auto On** key before disconnecting the VFD Remote Keypad from the variable frequency drive.

Table 7 — VFD Unit Parameters - 50LC*B Size 14

MOTOR OPTION	VOLTAGE	MOTOR P/N	VFD CARRIER P/N	VFD MFR P/N	REGIONAL SETTINGS	GRID TYPE	MOTOR POWER	MOTOR VOLTAGE	MOTOR FREQUENCY (Hz)	MOTOR CURRENT (MUST-HOLD AMPS)	MOTOR NOMINAL SPEED (RPM)
					0-03	0-06	1-20	1-22	1-29	1-24	1-25
STD	208/230V	HD58FE654	HK30WA371	131L9796	[1]	[102]	[10]	230	60	9.2	1735
	460V	HD58FE654	HK30WA377	131L9864		[122]	[10]	460		4.2	1735
	575V	HD58FE577	HK30WA383	131N0227		[132]	[11]	575		4.9	1710
MID	208/230V	HD60FK658	HK30WA372	131L9797		[102]	[13]	230		13.6	1745
	460V	HD60FK658	HK30WA379	131L9866		[122]	[13]	460		6.8	1745
	575V	HD60FE576	HK30WA387	134F0217		[132]	[13]	575		6.0	1745
HIGH	208/230V	HD60FK657	HK30WA373	131L9798		[102]	[14]	230		21.2	1760
	460V	HD60FK657	HK30WA380	131L9867		[122]	[14]	460		9.7	1760
	575V	HD60FL576	HK30WA384	131N0229		[132]	[14]	575		7.2	1745
ULTRA	208/230V	HD62FK654	HK30WA374	131L9799		[102]	[15]	230		28.0	1760
	460V	HD62FK654	HK30WA381	131L9868		[122]	[15]	460		13.7	1760
	575V	HD62FL576	HK30WA384	131N0229		[132]	[15]	575		8.9	1760

MOTOR OPTION	VOLTAGE	START DELAY (SEC)	FLYING START	MIN SPEED FOR FUNCTION (Hz)	MOTOR THERMAL PROTECTION	PRESET REFERENCE							
		1-71	1-73	1-82	1-90	3-10 [0]	3-10 [1]	3-10 [2]	3-10 [3]	3-10 [4]	3-10 [5]	3-10 [6]	3-10 [7]
STD	208/230V	2.0	[1]	1.0	[4]	0%	53.43%	79.57%	100%	100%	0%	0%	0%
	460V												
	575V												
MID	208/230V												
	460V												
	575V												
HIGH	208/230V												
	460V												
	575V												
ULTRA	208/230V												
	460V												
	575V												

MOTOR OPTION	VOLTAGE	RAMP UP TIME (sec)	RAMP DOWN TIME (sec)	CURRENT LIMIT	TERMINAL 18 DIGITAL INPUT	TERMINAL 19 DIGITAL INPUT	TERMINAL 27 DIGITAL INPUT	TERMINAL 29 DIGITAL INPUT
		3-41	3-42	4-18	5-10	5-11	5-12	5-13
STD	208/230V	10.00	10.00	100%	[8]	[16]	[17]	[18]
	460V							
	575V							
MID	208/230V							
	460V							
	575V							
HIGH	208/230V							
	460V							
	575V							
ULTRA	208/230V							
	460V							
	575V							

MOTOR OPTION	VOLTAGE	TERMINAL 53 LOW VOLTAGE	TERMINAL 53 HIGH VOLTAGE	TERMINAL 53 LOW REFERENCE	TERMINAL 53 HIGH REFERENCE	RESET MODE	AUTO. RESTART TIME (s)	RFI FILTER
		6-10	6-11	6-14	6-15	14-20	14-21	14-50
STD	208/230V	2	[10]	0	[60]	[3]	600	[0]
	460V							
	575V							
MID	208/230V							
	460V							
	575V							
HIGH	208/230V							
	460V							
	575V							
ULTRA	208/230V							
	460V							
	575V							

Table 8 — VFD Unit Parameters - 50LC*B Size 17

MOTOR OPTION	VOLTAGE	MOTOR P/N	VFD CARRIER P/N	VFD MFR P/N	REGIONAL SETTINGS	GRID TYPE	MOTOR POWER	MOTOR VOLTAGE	MOTOR FREQUENCY (Hz)	MOTOR CURRENT (MUST-HOLD AMPS)	MOTOR NOMINAL SPEED (RPM)
					0-03	0-06	1-20	1-22	1-29	1-24	1-25
STD	208/230V	HD58FE654	HK30WA371	131L9796	[1]	[102]	[10]	230	60	9.2	1735
	460V	HD58FE654	HK30WA377	131L9864	[1]	[122]	[10]	460		4.2	1735
	575V	HD58FE577	HK30WA383	131N0227	[1]	[132]	[11]	575		4.9	1710
MID	208/230V	HD60FK657	HK30WA373	131L9798	[1]	[102]	[14]	230		21.2	1760
	460V	HD60FK657	HK30WA380	131L9867	[1]	[122]	[14]	460		9.7	1760
	575V	HD60FL576	HK30WA384	131N0229	[1]	[132]	[14]	575		7.2	1745
HIGH	208/230V	HD62FK654	HK30WA374	131L9799	[1]	[102]	[15]	230		28.0	1760
	460V	HD62FK654	HK30WA381	131L9868	[1]	[122]	[15]	460		13.7	1760
	575V	HD62FL576	HK30WA384	131N0229	[1]	[132]	[15]	575		8.9	1750
ULTRA	208/230V	HD64FK654	HK30WA375	131L9800	[1]	[102]	[16]	230		37.3	1755
	460V	HD64FK654	HK30WA386	131L9869	[1]	[122]	[16]	460		16.9	1755
	575V	HD64FL576	HK30WA388	131N0233	[1]	[132]	[16]	575		12.6	1755

MOTOR OPTION	VOLTAGE	START DELAY (sec)	FLYING START	MIN SPEED FOR FUNCTION (Hz)	MOTOR THERMAL PROTECTION	PRESET REFERENCE							
		1-71	1-73	1-82	1-90	3-10 [0]	3-10 [1]	3-10 [2]	3-10 [3]	3-10 [4]	3-10 [5]	3-10 [6]	3-10 [7]
STD	208/230V	2.0	[1]	1.0	[4]	0%	56.64%	82.40%	100%	100%	0%	0%	0%
	460V												
	575V												
MID	208/230V												
	460V												
	575V												
HIGH	208/230V												
	460V												
	575V												
ULTRA	208/230V												
	460V												
	575V												

MOTOR OPTION	VOLTAGE	RAMP UP TIME (sec)	RAMP DOWN TIME (sec)	CURRENT LIMIT	TERMINAL 18 DIGITAL INPUT	TERMINAL 19 DIGITAL INPUT	TERMINAL 27 DIGITAL INPUT	TERMINAL 29 DIGITAL INPUT
		3-41	3-42	4-18	5-10	5-11	5-12	5-13
STD	208/230V	10.00	10.00	100%	[8}	[16]	[17]	[18]
	460V							
	575V							
MID	208/230V							
	460V							
	575V							
HIGH	208/230V							
	460V							
	575V							
ULTRA	208/230V							
	460V							
	575V							

MOTOR OPTION	VOLTAGE	TERMINAL 53 LOW VOLTAGE	TERMINAL 53 HIGH VOLTAGE	TERMINAL 53 LOW REFERENCE	TERMINAL 53 HIGH REFERENCE	RESET MODE	AUTO. RESTART TIME (s)	RFI FILTER
		6-10	6-11	6-14	6-15	14-20	14-21	14-50
STD	208/230V	2	[10]	0	[60]	[3]	600	[0]
	460V							
	575V							
MID	208/230V							
	460V							
	575V							
HIGH	208/230V							
	460V							
	575V							
ULTRA	208/230V							
	460V							
	575V							

Table 9 — VFD Unit Parameters - 50LC*B Size 20

MOTOR OPTION	VOLTAGE	MOTOR P/N	VFD CARRIER P/N	VFD MFR P/N	REGIONAL SETTINGS	GRID TYPE	MOTOR POWER	MOTOR VOLTAGE	MOTOR FREQUENCY (Hz)	MOTOR CURRENT (MUST-HOLD AMPS)	MOTOR NOMINAL SPEED (RPM)
					0-03	0-06	1-20	1-22	1-29	1-24	1-25
STD	208/230V	HD60FE656	HK30WA372	131L9797	[1]	[102]	[11]	230	60	11.7	1750
	460V	HD60FE656	HK30WA378	131L9865		[122]	[11]	460		5.4	1750
	575V	HD58FE577	HK30WA383	131N0227		[132]	[11]	575		4.9	1710
MID	208/230V	HD60FK657	HK30WA373	131L9798		[102]	[14]	230		21.2	1760
	460V	HD60FK657	HK30WA380	131L9867		[122]	[14]	460		9.7	1760
	575V	HD60FL576	HK30WA384	131N0229		[132]	[14]	575		7.2	1745
HIGH	208/230V	HD62FK654	HK30WA374	131L9799		[102]	[15]	230		28.0	1760
	460V	HD62FK654	HK30WA381	131L9868		[122]	[15]	460		13.7	1760
	575V	HD62FL576	HK30WA384	131N0229		[132]	[15]	575		8.9	1750
ULTRA	208/230V	HD64FK654	HK30WA375	131L9800		[102]	[16]	230		37.3	1755
	460V	HD64FK654	HK30WA386	131L9869		[122]	[16]	460		16.9	1755
	575V	HD64FL576	HK30WA388	131N0233		[132]	[16]	575		12.6	1755

MOTOR OPTION	VOLTAGE	START DELAY (sec)	FLYING START	MIN SPEED FOR FUNCTION (Hz)	MOTOR THERMAL PROTECTION	PRESET REFERENCE							
		1-71	1-73	1-82	1-90	3-10 [0]	3-10 [1]	3-10 [2]	3-10 [3]	3-10 [4]	3-10 [5]	3-10 [6]	3-10 [7]
STD	208/230V	2.0	[1]	1.0	[4]	0%	52.57%	61.63%	100%	100%	0%	0%	0%
	460V												
	575V												
MID	208/230V												
	460V												
	575V												
HIGH	208/230V												
	460V												
	575V												
ULTRA	208/230V												
	460V												
	575V												

MOTOR OPTION	VOLTAGE	RAMP UP TIME (sec)	RAMP DOWN TIME (sec)	CURRENT LIMIT	TERMINAL 18 DIGITAL INPUT	TERMINAL 19 DIGITAL INPUT	TERMINAL 27 DIGITAL INPUT	TERMINAL 29 DIGITAL INPUT
		3-41	3-42	4-18	5-10	5-11	5-12	5-13
STD	208/230V	10.00	10.00	100%	[8}	[16]	[17]	[18]
	460V							
	575V							
MID	208/230V							
	460V							
	575V							
HIGH	208/230V							
	460V							
	575V							
ULTRA	208/230V							
	460V							
	575V							

MOTOR OPTION	VOLTAGE	TERMINAL 53 LOW VOLTAGE	TERMINAL 53 HIGH VOLTAGE	TERMINAL 53 LOW REFERENCE	TERMINAL 53 HIGH REFERENCE	RESET MODE	AUTO. RESTART TIME (s)	RFI FILTER
		6-10	6-11	6-14	6-15	14-20	14-21	14-50
STD	208/230V	2	[10]	0	[60]	[3]	600	[0]
	460V							
	575V							
MID	208/230V							
	460V							
	575V							
HIGH	208/230V							
	460V							
	575V							
ULTRA	208/230V							
	460V							
	575V							

Table 10 — VFD Unit Parameters - 50LC*B Size 24

MOTOR OPTION	VOLTAGE	MOTOR P/N	VFD CARRIER P/N	VFD MFR P/N	REGIONAL SETTINGS	GRID TYPE	MOTOR POWER	MOTOR VOLTAGE	MOTOR FREQUENCY (Hz)	MOTOR CURRENT (MUST-HOLD AMPS)	MOTOR NOMINAL SPEED (RPM)
					0-03	0-06	1-20	1-22	1-29	1-24	1-25
STD	208/230V	HD60FK657	HK30WA373	131L9798		[102]	[14]	230		21.2	1760
	460V	HD60FK657	HK30WA380	131L9867		[122]	[14]	460		9.7	1760
	575V	HD60FL576	HK30WA384	131N0229		[132]	[14]	575		7.2	1745
MID	208/230V	HD60FK657	HK30WA373	131L9798		[102]	[14]	230		21.2	1760
	460V	HD60FK657	HK30WA380	131L9867		[122]	[14]	460		9.7	1760
	575V	HD60FL576	HK30WA384	131N0229		[132]	[14]	575		7.2	1745
HIGH	208/230V	HD62FK654	HK30WA374	131L9799	[1]	[102]	[15]	230	60	28.0	1760
	460V	HD62FK654	HK30WA381	131L9868		[122]	[15]	460		13.7	1760
	575V	HD62FL576	HK30WA384	131N0229		[132]	[15]	575		8.9	1750
ULTRA	208/230V	HD64FK654	HK30WA375	131L9800		[102]	[16]	230		37.3	1755
	460V	HD64FK654	HK30WA386	131L9869		[122]	[16]	460		16.9	1755
	575V	HD64FL576	HK30WA388	131N0233		[132]	[16]	575		12.6	1755

MOTOR OPTION	VOLTAGE	START DELAY (sec)	FLYING START	MIN SPEED FOR FUNCTION (Hz)	MOTOR THERMAL PROTECTION	PRESET REFERENCE							
		1-71	1-73	1-82	1-90	3-10 [0]	3-10 [1]	3-10 [2]	3-10 [3]	3-10 [4]	3-10 [5]	3-10 [6]	3-10 [7]
STD	208/230V												
	460V												
	575V												
MID	208/230V												
	460V												
	575V												
HIGH	208/230V	2.0	[1]	1.0	[4]	0%	52.33%	64.48%	100%	100%	0%	0%	0%
	460V												
	575V												
ULTRA	208/230V												
	460V												
	575V												

MOTOR OPTION	VOLTAGE	RAMP UP TIME (sec)	RAMP DOWN TIME (sec)	CURRENT LIMIT	TERMINAL 18 DIGITAL INPUT	TERMINAL 19 DIGITAL INPUT	TERMINAL 27 DIGITAL INPUT	TERMINAL 29 DIGITAL INPUT
		3-41	3-42	4-18	5-10	5-11	5-12	5-13
STD	208/230V							
	460V							
	575V							
MID	208/230V							
	460V							
	575V							
HIGH	208/230V	10.00	10.00	100%	[8}	[16]	[17]	[18]
	460V							
	575V							
ULTRA	208/230V							
	460V							
	575V							

MOTOR OPTION	VOLTAGE	TERMINAL 53 LOW VOLTAGE	TERMINAL 53 HIGH VOLTAGE	TERMINAL 53 LOW REFERENCE	TERMINAL 53 HIGH REFERENCE	RESET MODE	AUTO. RESTART TIME (s)	RFI FILTER
		6-10	6-11	6-14	6-15	14-20	14-21	14-50
STD	208/230V							
	460V							
	575V							
MID	208/230V							
	460V							
	575V							
HIGH	208/230V	2	[10]	0	[60]	[3]	600	[0]
	460V							
	575V							
ULTRA	208/230V							
	460V							
	575V							

Table 11 — VFD Unit Parameters - 50LC*B Size 26

MOTOR OPTION	VOLTAGE	MOTOR P/N	VFD CARRIER P/N	VFD MFR P/N	REGIONAL SETTINGS	GRID TYPE	MOTOR POWER	MOTOR VOLTAGE	MOTOR FREQUENCY (Hz)	MOTOR CURRENT (MUST-HOLD AMPS)	MOTOR NOMINAL SPEED (RPM)
					0-03	0-06	1-20	1-22	1-29	1-24	1-25
STD	208/230V	HD60FK657	HK30WA373	131L9798	[1]	[102]	[14]	230	60	21.2	1760
	460V	HD60FK657	HK30WA380	131L9867		[122]	[14]	460		9.7	1760
	575V	HD60FL576	HK30WA384	131N0229		[132]	[14]	575		7.2	1745
MID	208/230V	HD62FK654	HK30WA374	131L9799		[102]	[15]	230		28.0	1760
	460V	HD62FK654	HK30WA381	131L9868		[122]	[15]	460		13.7	1760
	575V	HD62FL576	HK30WA384	131N0229		[132]	[15]	575		8.9	1750
HIGH	208/230V	HD64FK654	HK30WA375	131L9800		[102]	[16]	230		37.3	1755
	460V	HD64FK654	HK30WA386	131L9869		[122]	[16]	460		16.9	1755
	575V	HD64FL576	HK30WA388	131N0233		[132]	[16]	575		12.6	1755

MOTOR OPTION	VOLTAGE	START DELAY (sec)	FLYING START	MIN SPEED FOR FUNCTION (Hz)	MOTOR THERMAL PROTECTION	PRESET REFERENCE							
		1-71	1-73	1-82	1-90	3-10 [0]	3-10 [1]	3-10 [2]	3-10 [3]	3-10 [4]	3-10 [5]	3-10 [6]	3-10 [7]
STD	208/230V	2.0	[1]	1.0	[4]	0%	60.00%	72.00%	100%	100%	0%	0%	0%
	460V												
	575V												
MID	208/230V												
	460V												
	575V												
HIGH	208/230V												
	460V												
	575V												

MOTOR OPTION	VOLTAGE	RAMP UP TIME (sec)	RAMP DOWN TIME (sec)	CURRENT LIMIT	TERMINAL 18 DIGITAL INPUT	TERMINAL 19 DIGITAL INPUT	TERMINAL 27 DIGITAL INPUT	TERMINAL 29 DIGITAL INPUT
		3-41	3-42	4-18	5-10	5-11	5-12	5-13
STD	208/230V	10.00	10.00	100%	[8}	[16]	[17]	[18]
	460V							
	575V							
MID	208/230V							
	460V							
	575V							
HIGH	208/230V							
	460V							
	575V							

MOTOR OPTION	VOLTAGE	TERMINAL 53 LOW VOLTAGE	TERMINAL 53 HIGH VOLTAGE	TERMINAL 53 LOW REFERENCE	TERMINAL 53 HIGH REFERENCE	RESET MODE	AUTO. RESTART TIME (s)	RFI FILTER
		6-10	6-11	6-14	6-15	14-20	14-21	14-50
STD	208/230V	2	[10]	0	[60]	[3]	600	[0]
	460V							
	575V							
MID	208/230V							
	460V							
	575V							
HIGH	208/230V							
	460V							
	575V							

Smoke Detectors

Smoke detectors are available as factory-installed options on 50LC*B 14-26 models. Smoke detectors may be specified for supply air only, 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's Integrated Staging Control (ISC) 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. 71). Its operating location is in the return air section of the unit (see Fig. 72, unit without economizer, or Fig. 73, unit with economizer), inserted into the return air sensor module housing which protrudes through the back of the control box.

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 until the tube snaps into position.
5. Replace end panel or outside air hood.

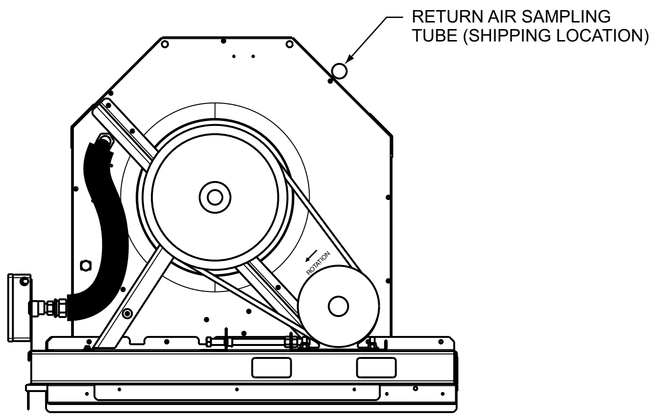


Fig. 71 — Typical Supply Air Smoke Detector Sensor Location

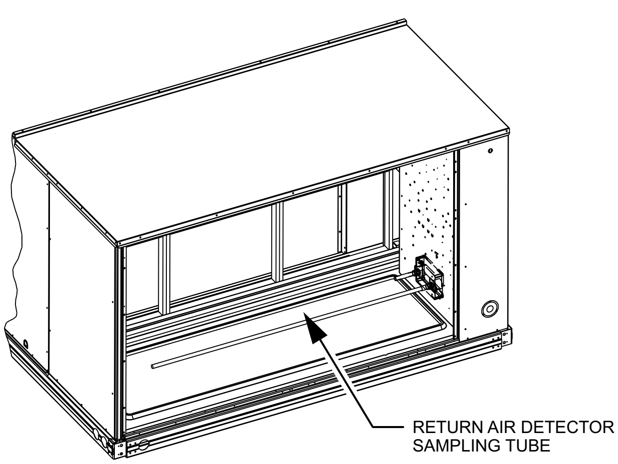


Fig. 72 — Return Air Sampling Tube Location in Unit without Economizer

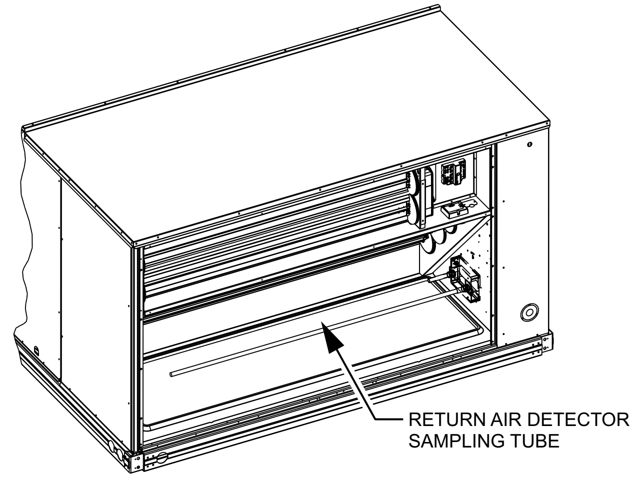


Fig. 73 — Return Air Sampling Tube Location in Unit with Economizer

SMOKE DETECTOR TEST MAGNET

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

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.

Step 14 — Install Accessories

Available accessories include:

- Roof curb (must be installed before unit)
- Electric heaters
- EconoMi$er® X (with control)
- Power exhaust
- Outdoor enthalpy sensor
- Differential enthalpy sensor
- CO_2 sensor
- Temperature and humidity sensors
- Louvered hail guard
- Phase monitor control

Refer to separate installation instructions for information on installing these accessories. See 50LC*B 14-26 Price Pages for a complete list of field-installed accessories.

Step 15 — Check Belt Tension

Measure the belt span length as shown in Fig. 74. Calculate the required deflection by multiplying the belt span length by $^1/_{64}$. For example, if the belt span length is 32 inches:

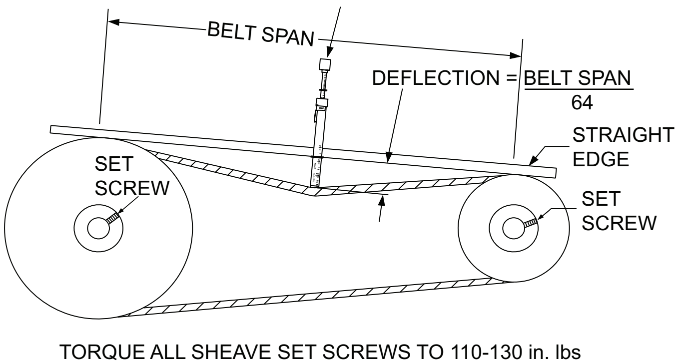
$$32 \times {}^1/_{64} = {}^1/_2 \text{ inch deflection.}$$

BELT FORCE: DEFLECTION METHOD

Check the belt tension with a spring-force belt force deflection gage.

1. Place a straightedge along the belt between the two pulleys. Measure the distance between the motor shaft and the blower shaft.
2. Set the tension gage to the desired tension (see Table 1 in Fig. 74). Place the large O-ring at that point.
3. Press the tension checker downward on the belt until the large O-ring is at the bottom of the straightedge.
4. Adjust the belt tension as needed.

Adjust belt tension by loosing the motor mounting plate front bolts and rear bolt (see Fig. 75) and sliding the plate towards the fan (to reduce tension) or away from the fan (to increase tension). Ensure the blower shaft and motor shaft are parallel to each other (pulleys aligned). Tighten all bolts securely when finished.



BELT CROSS SECTION	SMALLEST SHEAVE DIAMETER	BELT DEFLECTION FORCE (LBS)			
		UNNOTCHED BELTS		NOTCHED BELTS	
		USED	NEW	USED	NEW
A, AX	3.0-3.6	3.7	5.5	4.1	6.1
	3.8-4.8	4.5	6.8	5.0	7.4
	5.0-7.0	5.4	8.0	5.7	8.4
B, BX	3.4-4.2	—	—	4.9	7.2
	4.4-5.6	5.3	7.9	7.1	10.5
	5.8-8.6	6.3	9.4	8.5	12.6

Table 1

BELT CONDITION	TENSION FORCE IN BELT (LBS)
NEW	100
USED	80

Table 2

Fig. 74 — V-Belt Force Label

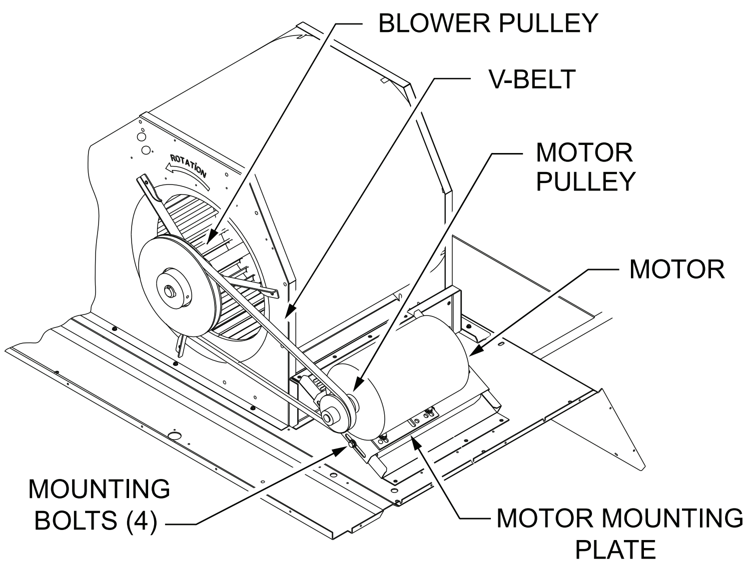


Fig. 75 — Belt Drive Motor Mounting

Pre-Start and Start-Up

This completes the mechanical installation of the unit. Refer to the unit's Service and Maintenance manual for detailed pre-start and start-up instructions.

START-UP CHECKLIST FOR 50LC*B14-26 SINGLE PACKAGE ROOFTOP COOLING ONLY
(Remove and use for job file)

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

Verify installation of outdoor air hood (Y/N) _____

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

Verify that all electrical connections and terminals are tight (Y/N) _____

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

Check that outdoor air inlet screens are in place (Y/N) _____

Verify that unit is level (Y/N) _____

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

Verify that fan sheaves are aligned and belts are properly tensioned (Y/N) _____

Verify that scroll compressors are rotating in the correct direction (Y/N) _____

Verify installation of thermostat (Y/N) _____

III. START-UP

ELECTRICAL

Supply Voltage	L1-L2_____________	L2-L3_____________	L3-L1_____________
Compressor Amps 1	L1 _____________	L2 _____________	L3 _____________
Compressor Amps 2	L1 _____________	L2 _____________	L3 _____________
Supply Fan Amps	L1 _____________	L2 _____________	L3 _____________

TEMPERATURES

Outdoor-air Temperature	_____________ °F DB (Dry Bulb)	
Return-air Temperature	_____________ °F DB	_____________ °F Wb (Wet Bulb)
Cooling Supply Air Temperature	_____________ °F	

PRESSURES

Refrigerant Suction	CIRCUIT A _____________	PSIG
	CIRCUIT B _____________	PSIG
Refrigerant Discharge	CIRCUIT A _____________	PSIG
	CIRCUIT B _____________	PSIG

Verify Refrigerant Charge using Charging Charts (Y/N) _____

GENERAL

Economizer minimum vent and changeover settings to job requirements (if equipped) (Y/N) _____
Verify smoke detector unit shutdown by utilizing magnet test (Y/N) _____

IV. HUMIDI-MIZER® START-UP

NOTE: Units equipped with either SystemVu™ or RTU Open controls have Service Test menus or modes that can assist with the Humidi-MiZer System Start-Up function and provide the means to make the observations listed for this start-up.

STEPS

1. Check CTB for jumper 5, 6, 7 (Jumper 5, 6, 7 must be cut and open) (Y/N) _____
2. Open humidistat contacts (Y/N) _____
3. Start unit In cooling (Close Y1) (Y/N) _____

OBSERVE AND RECORD

A. Suction pressure	_______________	PSIG
B. Discharge pressure	_______________	PSIG
C. Entering air temperature	_______________	° F
D. Liquid line temperature at outlet or reheat coil	_______________	° F

E. Confirm correct rotation for compressor (Y/N) _____
F. Check for correct ramp-up of outdoor fan motor as condenser coil warms (Y/N) _____

4. Check unit charge per charging chart (Y/N) _____
   (Jumper 32L Motormaster® temperature sensor during this check. Remove jumper when complete.)
5. Switch unit to high-latent mode (sub-cooler) by closing humidistat with Y1 closed (Y/N) _____

OBSERVE

A. Reduction in suction pressure (5 to 7 psi expected) (Y/N) _____
B. Discharge pressure unchanged (Y/N) _____
C. Liquid temperature drops to 50 to 55°F range (Y/N) _____
D. LSV solenoid energized (valve closes) (Y/N) _____

6. Switch unit to dehumid (reheat) by opening Y1 (Y/N) _____

OBSERVE

A. Suction pressure increases to normal cooling level (Y/N) _____
B. Discharge pressure decreases (35 to 50 psi) (Limited by Motormaster control) (Y/N) _____
C. Liquid temperature returns to normal cooling level (Y/N) _____
D. LSV solenoid energized (valve closes) (Y/N) _____
E. DSV solenoid energized, valve opens (Y/N) _____

7. With unit in dehumid mode close W1 compressor and outdoor fan stop; LSV and DSV solenoids de-energized (Y/N) _____
8. Open W1 restore unit to dehumid mode (Y/N) _____
9. Open humidistat input compressor and outdoor fan stop; LSV and DSV solenoids de-energized (Y/N) _____
10. Restore set-points for thermostat and humidistat (Y/N) _____

REPEAT PROCESS FOR 2 COMPRESSOR SYSTEMS.

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE