

# Installation Instructions

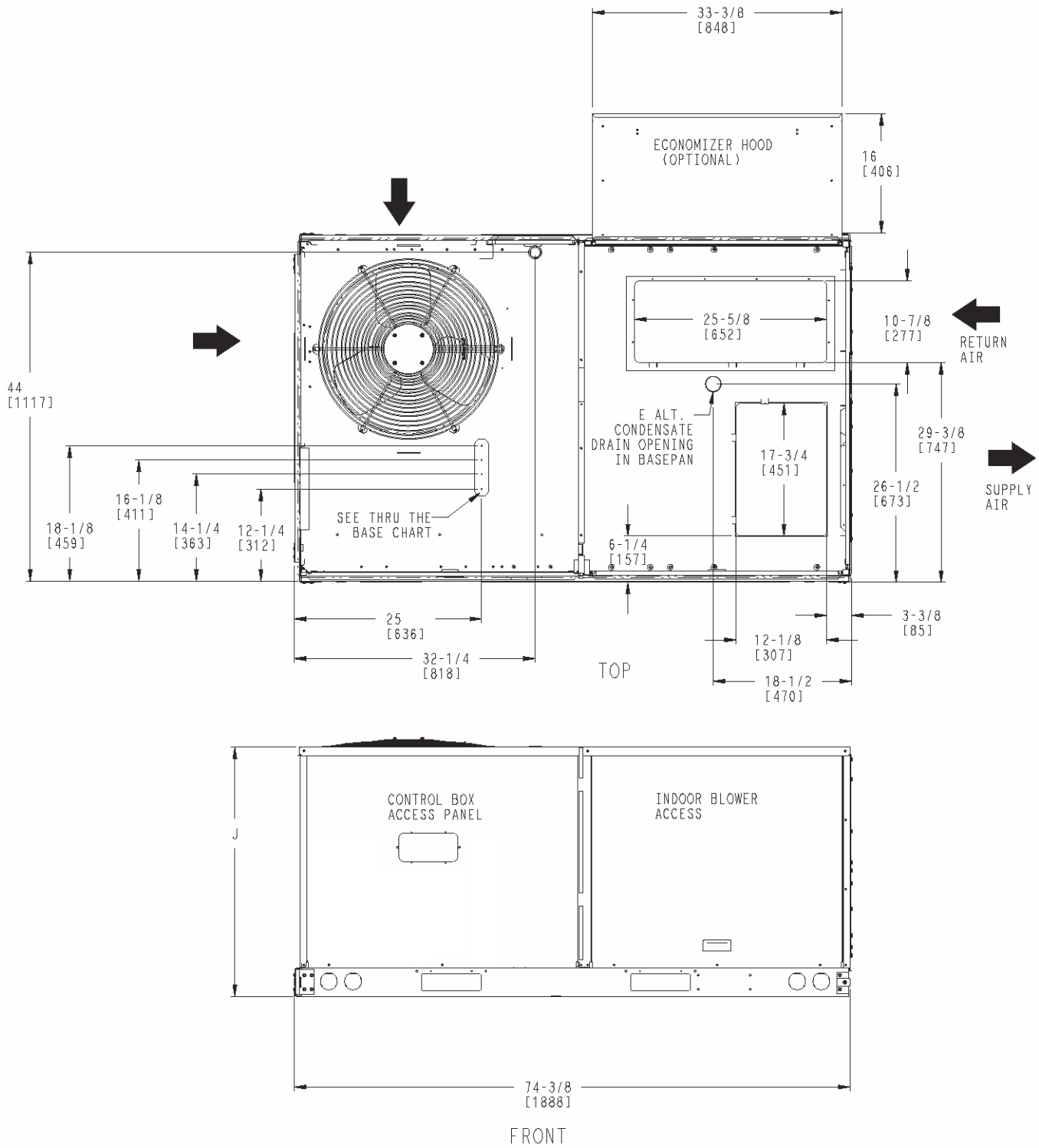
## **RAS Series - 1 & 3 Phase 3 to 6 Ton With R-410A Refrigerant**



## **PACKAGED AIR CONDITIONING UNITS**

International Comfort Products, LLC  
Lewisburg, TN. 37091

**FIGURE 1**  
**Base Unit Dimensions:**  
**RAS036-72**



## IMPORTANT - READ BEFORE INSTALLING

1. Read and become familiar with these installation instructions before installing this unit.
2. Be sure the installation conforms to all applicable local and national codes.
3. These instructions contain important information for the proper maintenance and repair of this equipment. Retain these instructions for future use.

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## SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock or other conditions which may cause personal injury or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

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

Recognize safety information. This is the safety-alert symbol. When you see this symbol in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTE**. These words are used with the

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

These instructions cover minimum requirements and conform to existing national standards and safety codes. In some instances, these instructions exceed certain local codes and ordinances, especially those that may not have kept up with changing residential construction practices. We require these instructions as a minimum for a safe installation.

### **WARNING**

#### **ELECTRICAL SHOCK HAZARD**

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

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

### **WARNING**

#### **UNIT OPERATION AND SAFETY HAZARD**

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

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

## INSTALLATION

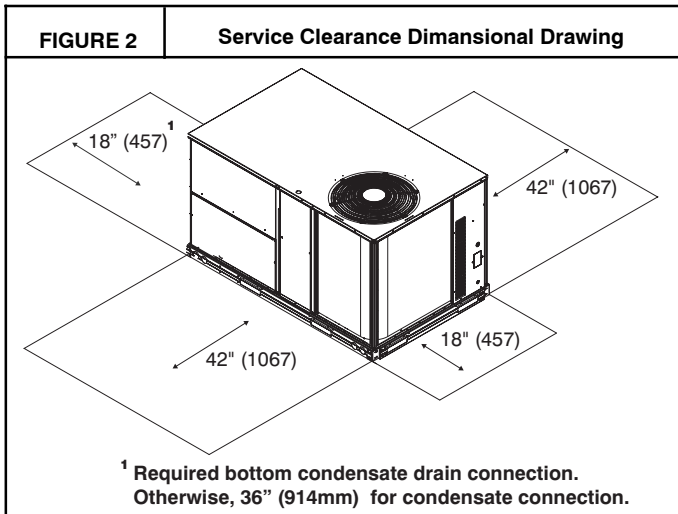
### Jobsite Survey

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. 2.



**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.

**Table 1—Operating Weights**

Component	UNITS LB (KG)			
	RAS036	RAS048	RAS060	RAS072
Unit Size (Ton)	3	4	5	6
Base Unit	438 (199)	494 (224)	524 (238)	607 (275)
Economizer				
Vertical	50 (23)	50 (23)	50 (23)	50 (23)
Horizontal	80 (36)	80 (36)	80 (36)	80 (36)
Cu Fins	25 (11)	43 (20)	56 (25)	73 (33)
Curb				
14-in/356 mm	110 (50)	110 (50)	110 (50)	110 (50)
24-in/610 mm	145 (66)	145 (66)	145 (66)	145 (66)

**Step 2 — Plan for Sequence of Unit Installation**

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

**Curb-mounted installation —**

- Install roof curb
- Install field-fabricated ductwork inside curb
- Install accessory thru-base service connection package, if used (affects curb and unit) (refer to accessory installation instructions for details)
- Prepare condensate drain connection to suit planned condensate line routing (refer to Step 11 for details)
- Rig and place unit
- Install outdoor air hood
- Install condensate line trap and piping
- Make electrical connections
- Install other accessories

**Pad-mounted installation —**

- Prepare pad and unit supports
- Check and tighten the bottom condensate drain connection plug

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

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

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

**Roof mount —**

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

Rig and place unit

- Convert unit to side duct connection arrangement
- Install field-fabricated ductwork at unit duct openings
- Install outdoor air hood
- Install condensate line trap and piping
- Make electrical connections
- Install other accessories

**Frame-mounted installation —**

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

**Step 3 — Inspect unit**

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

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

**Step 4 — Provide Unit Support**

**Roof Curb Mount —**

Accessory roof curb details and dimensions are shown in Fig. 3. Assemble and install accessory roof curb in accordance with instructions shipped with the curb.

Curb should be level. This is necessary for unit drain to function properly. Unit leveling tolerances are shown in Fig. 4. 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.* Power connections to the unit must be field installed after the unit is installed on the roof curb.

If electric and control wiring is to be routed through the basepan, attach the accessory thru-the-base service connections to the basepan in accordance with the accessory installation instructions.

**NOTE:**The gasketing of the unit to the roof curb is critical for a watertight seal. Install gasket supplied with the roof curb as

shown in Fig. 3. Improperly applied gasket can also result in air leaks and poor unit performance.

#### **Slab Mount (Horizontal Units Only) —**

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

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

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

A non-combustible sleeper rail can be used in the unit curb support area. If sleeper rails cannot be used, support the long sides of the unit with a minimum of 3 equally spaced 4-in. x 4-in. (102 mm x 102 mm) pads on each side.

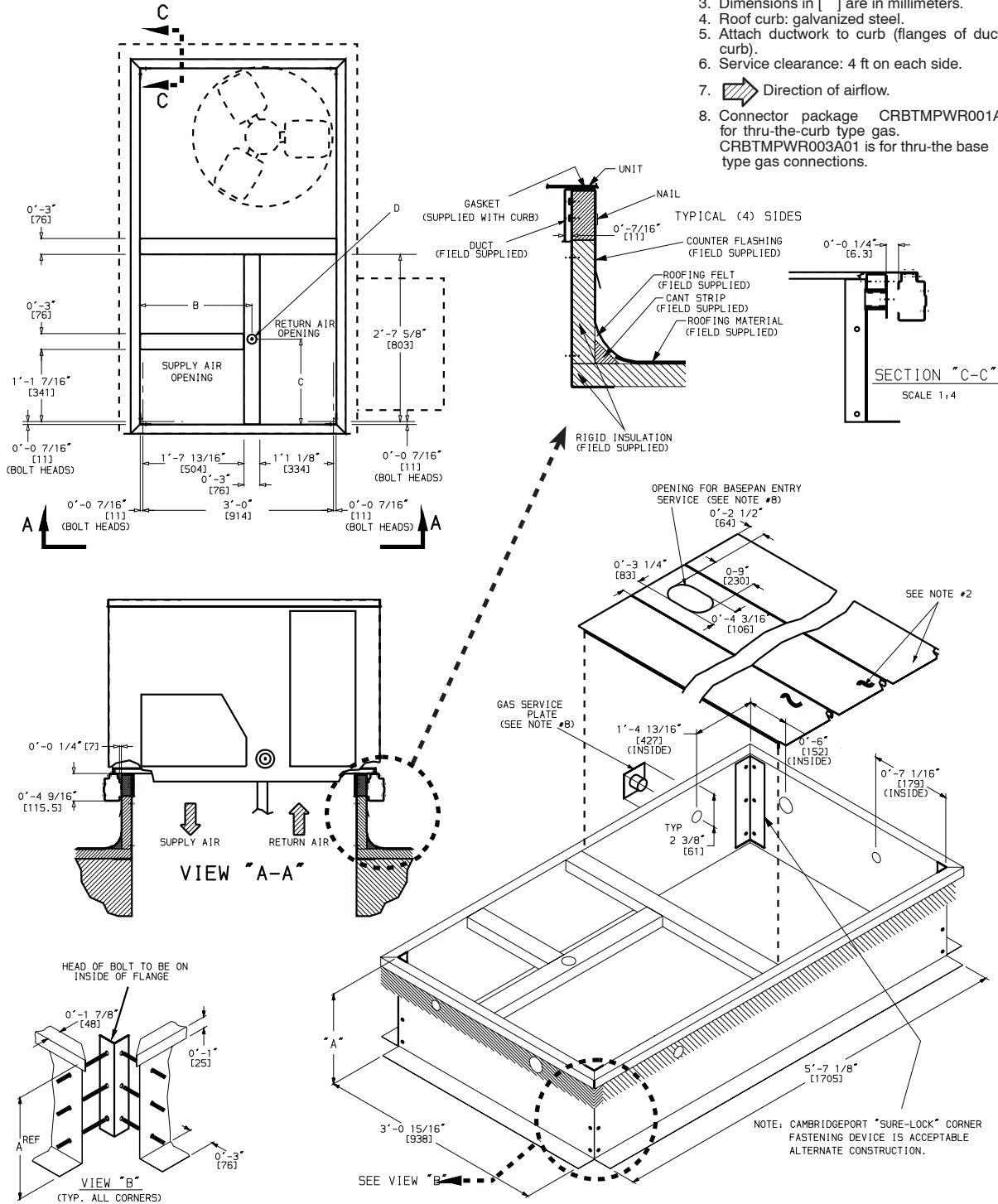
FIGURE 3

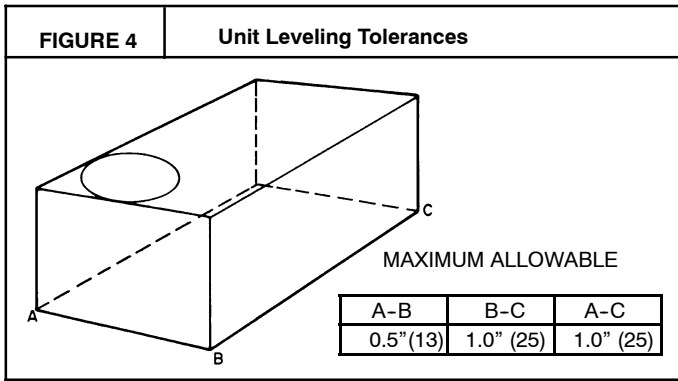
Roof Curb Details

CONNECTOR PKG. ACCY.	B	C	D ALT DRAIN HOLE	GAS	POWER	CONTROL	ACCESSORY POWER
CRBTMPWR001A01				$\frac{3}{4}$ [19] NPT	$\frac{3}{4}$ [19] NPT		
CRBTMPWR003A01	1'-9 $\frac{11}{16}$ " [551]	1'-4" [406]	1 $\frac{3}{4}$ " [44.5]	$\frac{1}{2}$ [12.7] NPT	$\frac{3}{4}$ [19] NPT	$\frac{1}{2}$ [12.7] NPT	$\frac{1}{2}$ [12.7] NPT

ROOF CURB ACCESSORY	A	UNIT SIZE
CRRFCURB001A01	1'-2" [356]	RAS036-072
CRRFCURB002A01	2'-0" [610]	

- NOTES:
1. Roof curb accessory is shipped disassembled.
  2. Insulated panels.
  3. Dimensions in [ ] are in millimeters.
  4. Roof curb: galvanized steel.
  5. Attach ductwork to curb (flanges of duct rest on curb).
  6. Service clearance: 4 ft on each side.
  7. Direction of airflow.
  8. Connector package CRBTMPWR001A01 is for thru-the-curb type gas. CRBTMPWR003A01 is for thru-the-base type gas connections.





**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 0.45 in. wg (112 Pa) without economizer.

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

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

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

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

A minimum clearance is not required around ductwork.

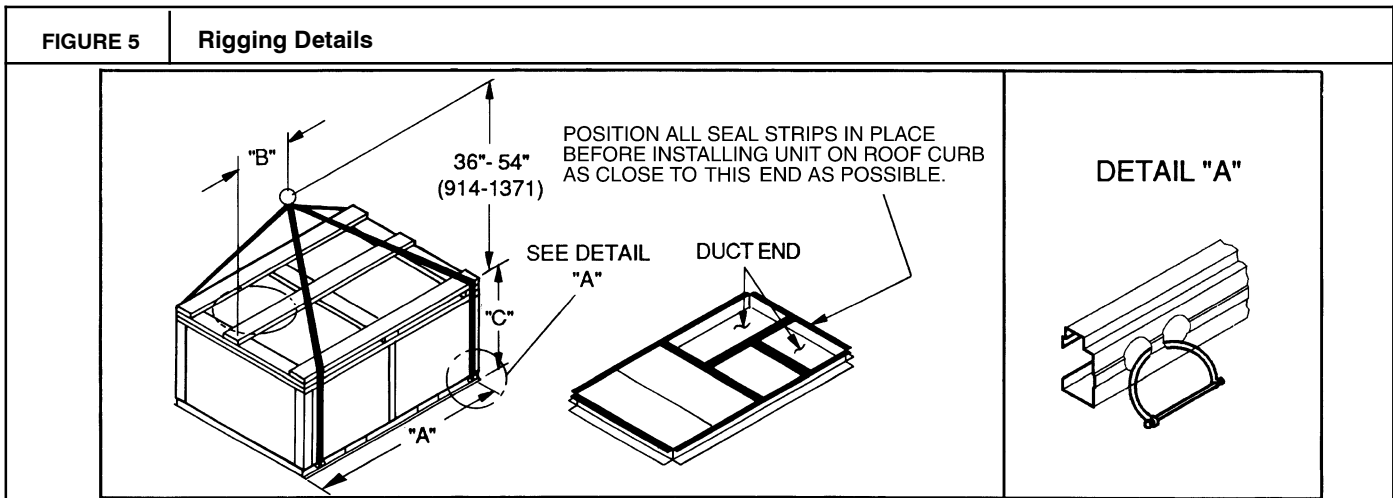
**Step 6 — Rig and Place Unit**

Keep unit upright and do not drop. Spreader bars are not required if top crating is left on unit. Rollers may be used to move unit across a roof. Level by using unit frame as a reference. See Table 1 and Fig. 5 for additional information.

Lifting holes are provided in base rails as shown in Fig. 5. Refer to rigging instructions on unit.

<b>⚠ CAUTION</b>
<b>UNIT DAMAGE HAZARD</b>
Failure to follow this caution may result in equipment damage.
All panels must be in place when rigging. Unit is not designed for handling by fork truck.

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



**NOTES:**

- Dimensions in ( ) are in millimeters.
- 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 skid when rigging to prevent rigging straps from damaging unit.

- Unit weights do not include economizer. See Table 1 for economizer weights.

UNIT	MAX WEIGHT		DIMENSIONS					
			A		B		C	
	LB	KG	IN	MM	IN	MM	IN	MM
RAS036	438	199	74.38	1888	38	965	33.38	848
RAS048	494	224	74.38	1888	38	965	33.38	848
RAS060	524	238	74.38	1888	38	965	33.38	848
RAS072	607	275	74.38	1888	38	965	41.38	1051

## Positioning on Curb —

Position unit on roof curb so that the following clearances are maintained: 1/4 in. (6.4 mm) clearance between the roof curb and the base rail inside the front and rear, 0.0 in. clearance between the roof curb and the base rail inside on the duct end of the unit. This will result in the distance between the roof curb and the base rail inside on the condenser end of the unit being approximately equal to Fig. 3, section C-C.

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

## ⚠ CAUTION

### UNIT DAMAGE HAZARD

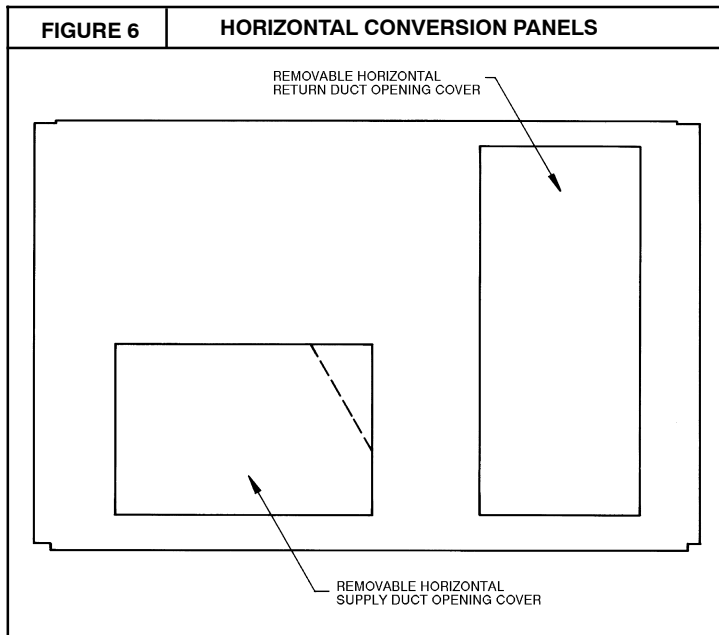
Failure to follow this caution may result in equipment damage.

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

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

## Step 7 — Convert to Horizontal and Connect Ductwork (when required)

Unit is shipped in the vertical duct configuration. Unit *without* factory-installed economizer or return air smoke detector option may be field-converted to horizontal ducted configuration. To convert to horizontal configuration, remove screws from side duct opening covers and remove covers. Using the same screws, install covers on vertical duct openings with the insulation-side down. Seals around duct openings must be tight. See Fig. 6.



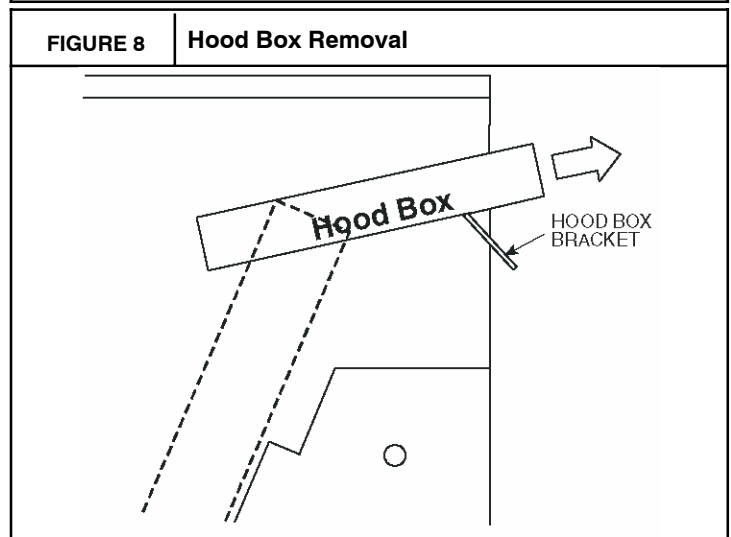
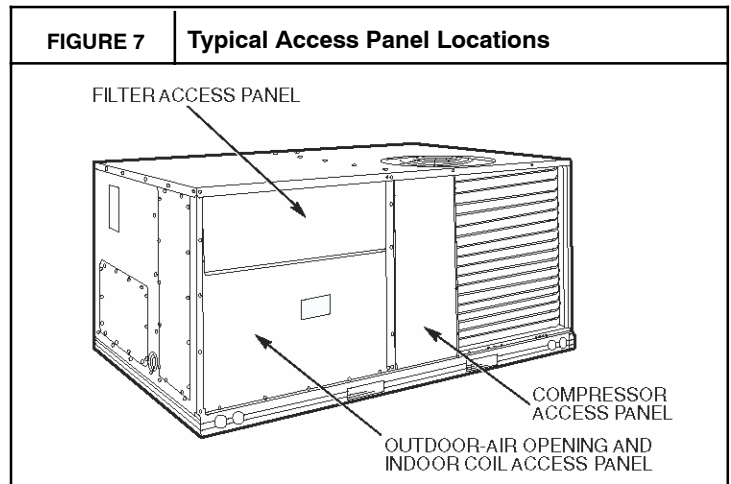
Field-supplied flanges should be attached to horizontal duct openings and all ductwork should be secured to the flanges. Insulate and weatherproof all external ductwork, joints, and roof or building openings with counter flashing and mastic in accordance with applicable codes.

Do not cover or obscure visibility to the unit's informative data plate when insulating horizontal ductwork.

## Step 8 — Install Optional Outside Air Hood

The optional outdoor hood components are shipped in a box located in the unit return air compartment behind the outdoor-air opening access panel (or economizer). Access is through the filter access panel. See Fig. 7.

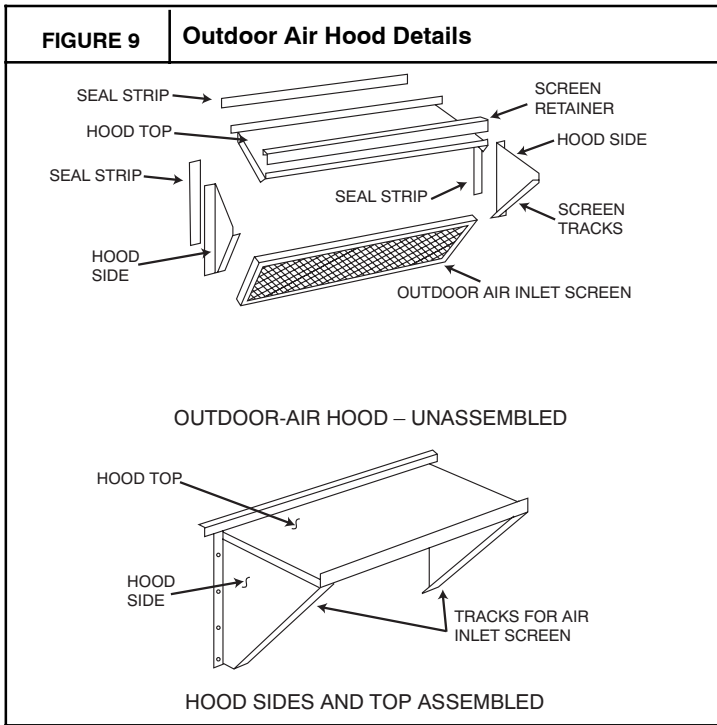
1. To remove the existing unit filter access panel, raise the panel and swing the bottom outward. The panel is now disengaged from the track and can be removed.
2. To remove the component box from its shipping position, remove the screw holding the hood box bracket to the top of the economizer. Slide the hood box out of the unit. See Fig. 8.



## Motorized 2-Position Damper Hood (Optional) —

1. Assemble outdoor-air hood top and side plates as shown in Fig. 9. Install seal strips on hood top and sides. Put aside screen retainer and screws for later assembly.
2. Fasten hood top and side plate assembly to unit with screws provided. See Fig. 9.
3. Slide outdoor-air inlet screen into screen track on hood side plates. While holding screen) in place, fasten screen retainer to hood using screws provided.
4. Replace filter access panel. See Fig. 7.

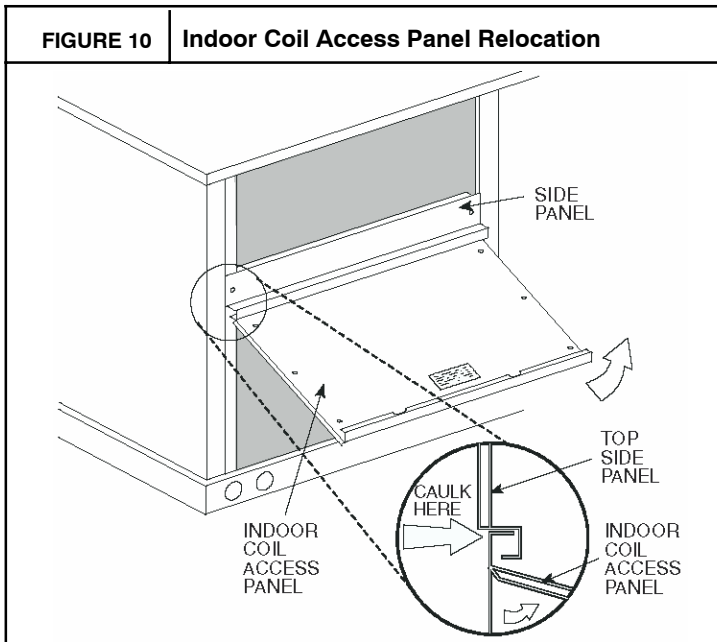




**Economizer Hood (Optional) —**

**NOTE:** If the power exhaust accessory is to be installed on the unit, the hood shipped with the unit will not be used and must be discarded. Save the aluminum filter for use in the power exhaust hood assembly.

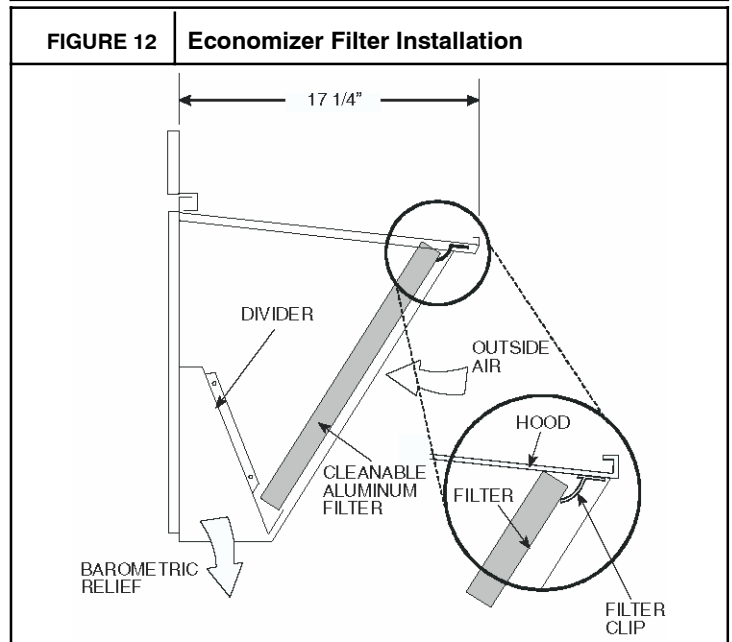
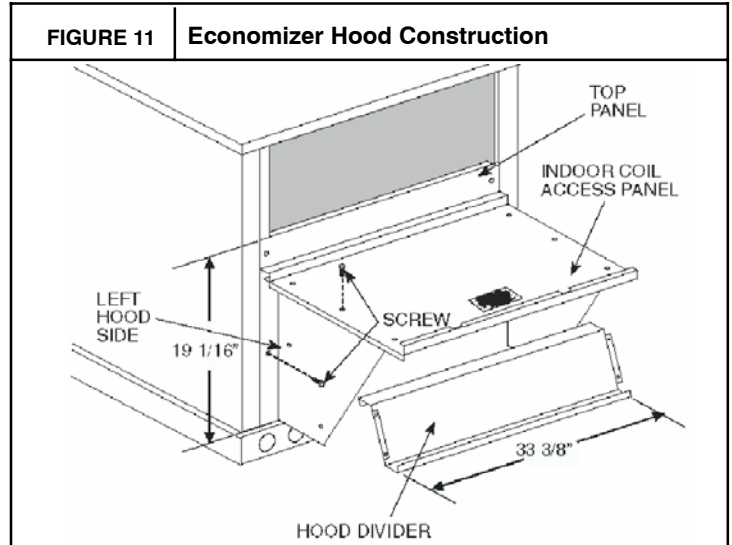
1. The indoor coil access panel will be used as the top of the hood. Remove the screws along the sides and bottom of the indoor coil access panel. See Fig. 10.



2. Swing out indoor coil access panel and insert the hood sides under the panel (hood top). Use the screws provided to attach the hood sides to the hood top. Use screws provided to attach the hood sides to the unit. See Fig. 11.
3. Remove the shipping tape holding the economizer barometric relief damper in place.

4. Insert the hood divider between the hood sides. See Fig. 11 and 12. Secure hood divider with 2 screws on each hood side. The hood divider is also used as the bottom filter rack for the aluminum filter.

5. Open the filter clips which are located underneath the hood top. Insert the aluminum filter into the bottom filter rack (hood divider). Push the filter into position past the open filter clips. Close the filter clips to lock the filter into place. See Fig. 12.



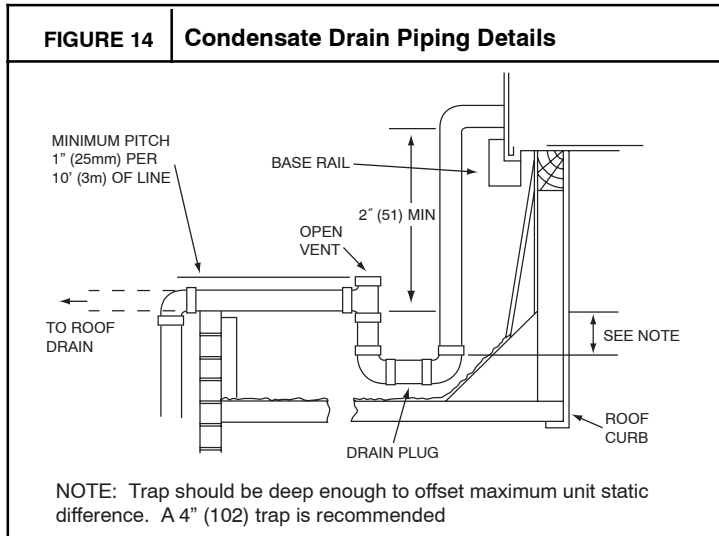
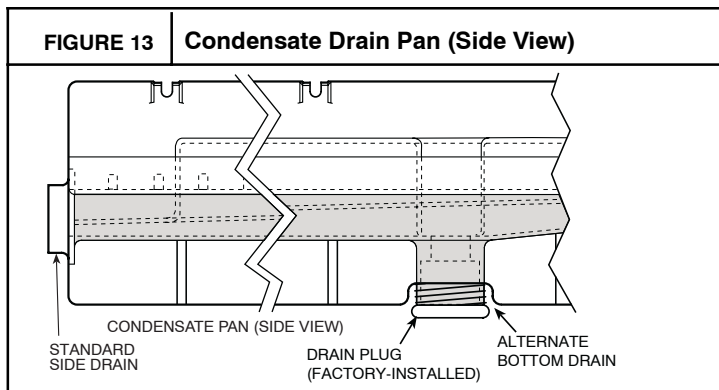
6. Caulk the ends of the joint between the unit top panel and the hood top.
7. Replace the filter access panel.

## Step 9 — Install External Condensate Trap and Line

The unit has one  $\frac{3}{4}$ -in. condensate drain connection on the end of the condensate pan and an alternate connection on the bottom. Unit airflow configuration does not determine which drain connection to use. Either drain connection can be used with vertical or horizontal applications.

When using the standard side drain connection, ensure the red plug in the alternate bottom connection is tight. Do this before setting the unit in place. The red drain pan can be tightened with a  $\frac{1}{2}$ -in. square socket drive extension.

To use the bottom drain connection for a roof curb installation, relocate the factory-installed red plug from the bottom connection to the side connection. The center drain plug looks like a star connection, however it can be removed with a  $\frac{1}{2}$ -in. square socket drive extension. See Fig. 12. The piping for the condensate drain and external trap can be completed after the unit is in place. See Fig. 13.



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

## Step 10 — Make Electrical Connections

### ⚠ WARNING

#### ELECTRICAL SHOCK HAZARD

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

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

#### Field 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  $\frac{1}{4}$ -in. female spade connector from the 230-v connection and moving it to the 200-v  $\frac{1}{4}$ -in. male terminal on the primary side of the transformer.* Refer to unit label diagram for additional information. Field power wires will be connected line-side pressure lugs on the power terminal block or at factory-installed option non-fused disconnect.

Field power wires are connected to the unit at line-side pressure lugs on compressor contactor C and indoor fan contactor IFC (see wiring diagram label for control box component arrangement) or at factory-installed option non-fused disconnect switch. Max wire size is #2 AWG (copper only).

**NOTE: TEST LEADS** - Unit may be equipped with short leads (pigtailed) on the field line connection points on contactor C or optional disconnect switch. These leads are for factory run-test purposes only; remove and discard before connecting field power wires to unit connection points. Make field power connections directly to line connection pressure lugs only.

#### Units Without Factory-Installed Disconnect —

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

#### Units with Factory-Installed Disconnect —

The factory-installed option disconnect switch is located in a weatherproof enclosure located under the main control box. The manual switch handle is accessible through an opening in the access panel.

## All units -

All field wiring must comply with NEC and all local codes. Size wire based on MCA (Minimum Circuit Amps) on the unit informative plate. See Fig. 15 for power wiring connections to the unit power terminal block and equipment ground. Maximum wire size is #2 ga AWG per pole.

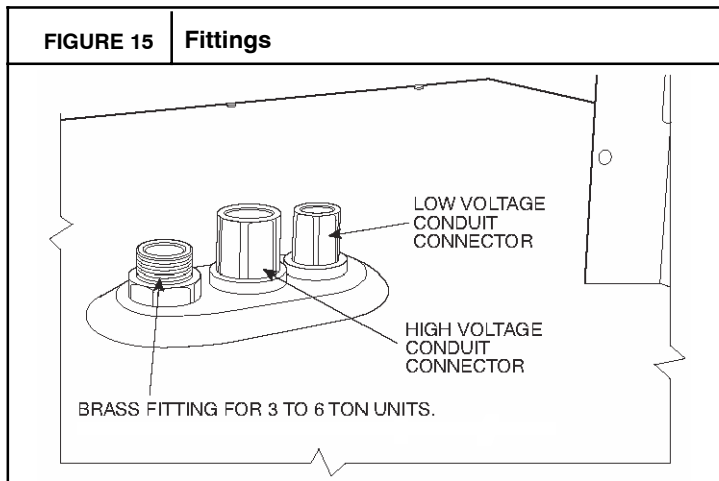
Provide a ground-fault and short-circuit over-current protection device (fuse or breaker) per NEC Article 440 (or local codes). Refer to unit informative data plate for MOCP (Maximum Over-current Protection) device size.

All field wiring must comply with the NEC and local requirements.

## Optional Thru-Base Connections —

This accessory (field installed) service connection kit consists of a 1/2-in NPT gas adapter fitting (brass), a 1/2-in electrical bulkhead connector and a 3/4-in electrical bulkhead connector, all installed in the embossed (raised) section of the unit basepan in the condenser section. The 3/4-in bulkhead connector enables the low-voltage control wires to pass through the basepan. The 1/2-in electrical bulkhead connector allows the high-voltage power wires to pass through the basepan. See Fig. 15.

**Note: this must be installed prior to mounting unit on roof curb.**



Check tightness of connector lock nuts before connecting electrical conduits.

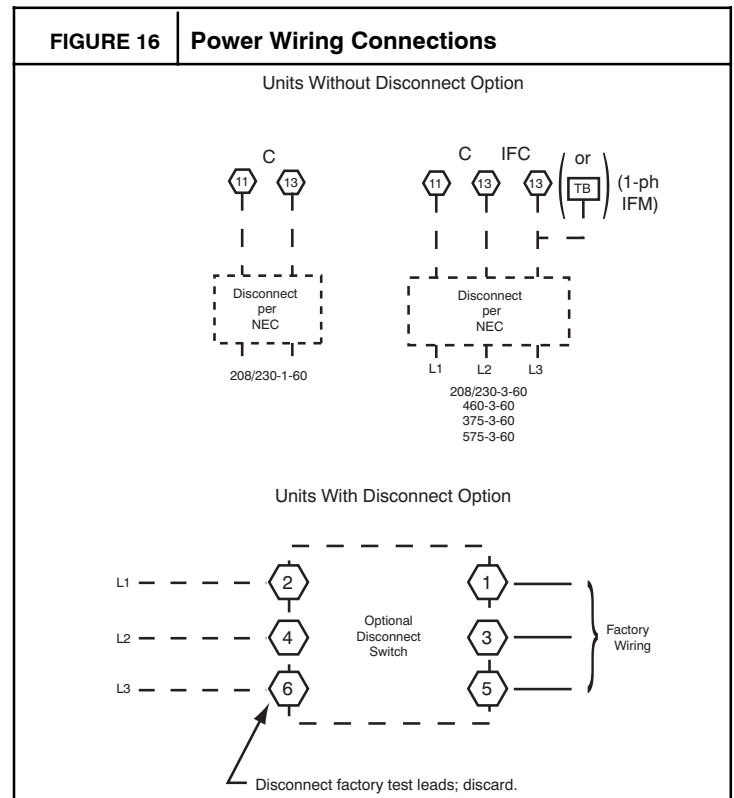
Field-supplied and field-installed liquid tight conduit connectors and conduit may be attached to the connectors on the basepan. Pull correctly rated high voltage and low voltage through appropriate conduits. Connect the power conduit to the internal disconnect (if unit is so equipped) or to the external disconnect (through unit side panel). A hole must be field cut in the main control box bottom on the left side so the 24-v control connections can be made. Connect the control power conduit to the unit control box at this hole.

Install field wiring as follows:

## Units without Thru-Base Connections —

1. Install power wiring conduit through side panel openings. Install conduit between disconnect and control box.

2. Install power lines to terminal connections as shown in Fig. 16.



Voltage to compressor terminals during operation must be within voltage range indicated on unit nameplate. See Table 2. On 3-phase units, voltages between phases must be balanced within 2% and the current within 10%. Use the formula shown in the legend for Table 2, Note 2 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 Bryant warranty.

## Field Control Wiring —

The RAS unit requires an external temperature control device. This device typically applied with a commercial thermostat (field-supplied) with both occupied and unoccupied setpoints at a minimum.

## Thermostat —

Install an approved accessory commercial thermostat according to installation instructions included with the accessory. For complete economizer function, select a two-stage cooling thermostat. Locate the thermostat accessory on a solid wall in the conditioned space to sense average temperature in accordance with the thermostat installation instructions.

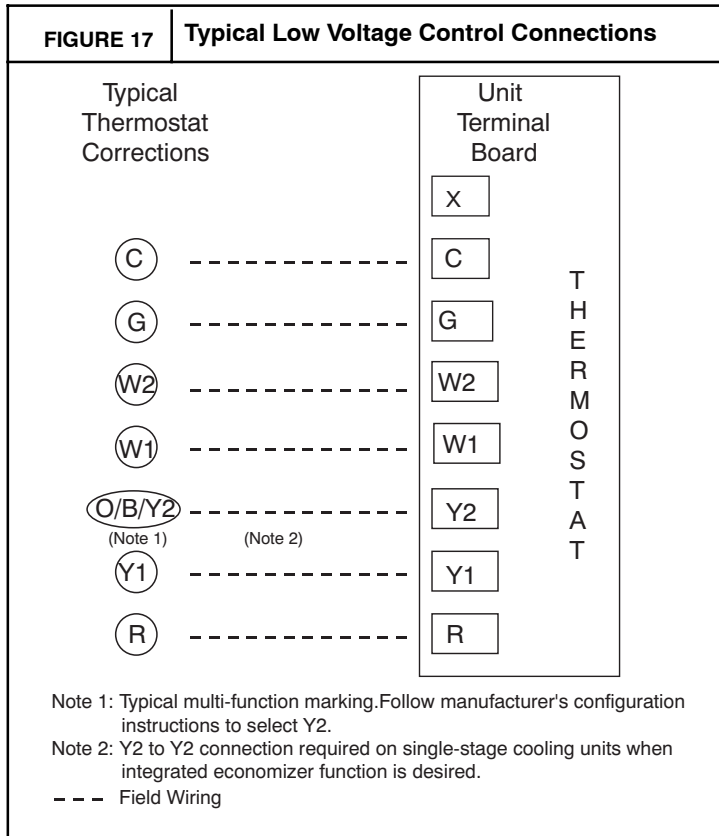
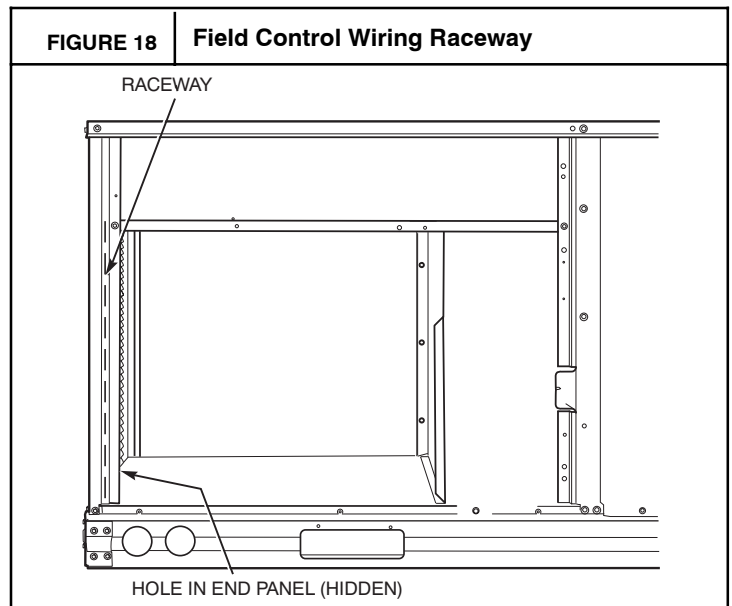
If the thermostat contains a logic circuit requiring 24-v power, use a thermostat cable or equivalent single leads of different colors with minimum of seven leads. If the thermostat does not require a 24-v source (no "C" connection required), use a thermostat cable or equivalent with minimum of six leads.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

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

**Unit without thru-base connection kit —**

Pass the thermostat control wires through the hole provided in the corner post; then feed the wires through the raceway built into the corner post to the control box. Pull the wires over to the terminal strip on the upper-left corner of the Controls Connection Board. See Fig. 18.

**NOTE:** If thru-the-bottom connections accessory is used, refer to the accessory installation instructions for information on routing power and control wiring.



**Heat Anticipator Settings —**

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

Table 2—Unit Electrical Data

UNIT	Voltage-Ph-Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATERXXXXXX	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLEXXXXXX	
						NO C.O or UNPWRD C.O	
						NO P.E.	w/P.E. (pwrd fr/unit)
RAS036	208/230-1-60	STD	101A00	4.4	3.3/4.0	-	-
			102A00	6.5	4.9/6.0	-	-
			103B00	8.7	6.5/8.0	-	-
			104B00	10.5	7.9/9.6	040A00	040A00
			102A00,102A00	13	9.8/11.9	040A00	040A00
			101A00	4.4	3.3/4.0	-	-
	208/230-3-60	HIGH	102A00	6.5	4.9/6.0	-	-
			103B00	8.7	6.5/8.0	-	-
			104B00	10.5	7.9/9.6	040A00	040A00
			102A00,102A00	13	9.8/11.9	040A00	040A00
			101A00	4.4	3.3/4.0	-	-
			105A00	16	12.0/14.7	-	-
	208/230-3-60	STD	101A00	4.4	3.3/4.0	-	-
			102A00	6.5	4.9/6.0	-	-
			103B00	8.7	6.5/8.0	-	-
			104B00	10.5	7.9/9.6	-	-
			105A00	16	12.0/14.7	-	-
			101A00	4.4	3.3/4.0	-	-
	460-3-60	HIGH	102A00	6.5	4.9/6.0	-	-
			103B00	8.7	6.5/8.0	-	-
			104B00	10.5	7.9/9.6	-	-
			105A00	16	12.0/14.7	-	-
			106A00	6	5.5	-	-
			107A00	8.8	8.1	-	-
460-3-60	STD	108A00	11.5	10.6	-	-	
		109A00	14	12.9	-	-	
		106A00	6	5.5	-	-	
		107A00	8.8	8.1	-	-	
		108A00	11.5	10.6	-	-	
		109A00	14	12.9	-	-	
RAS048	208/230-1-60	STD	101A00	4.4	3.3/4.0	-	-
			103B00	8.7	6.5/8.0	-	-
			102A00,102A00	13	9.8/11.9	040A00	040A00
			103B00,103B00	17.4	13.1/16.0	040A00	040A00
			104B00,104B00	21	15.8/19.3	040A00	040A00
			101A00	4.4	3.3/4.0	-	-
	208/230-1-60	HIGH	103B00	8.7	6.5/8.0	-	-
			102A00,102A00	13	9.8/11.9	040A00	040A00
			103B00,103B00	17.4	13.1/16.0	040A00	040A00
			104B00,104B00	21	15.8/19.3	040A00	040A00
			101A00	4.4	3.3/4.0	-	-
			103B00	8.7	6.5/8.0	-	-
	208/230-3-60	STD	102A00	6.5	4.9/6.0	-	-
			103B00	8.7	6.5/8.0	-	-
			105A00	16	12.0/14.7	-	-
			104B00,104B00	21	15.8/19.3	038A00	038A00
			102A00	6.5	4.9/6.0	-	-
			103B00	8.7	6.5/8.0	-	-
	208/230-3-60	HIGH	105A00	16	12.0/14.7	-	-
			104B00,104B00	21	15.8/19.3	038A00	038A00
			102A00	6.5	4.9/6.0	-	-
			103B00	8.7	6.5/8.0	-	-
			105A00	16	12.0/14.7	-	-
			104B00,104B00	21	15.8/19.3	038A00	038A00
460-3-60	STD	106A00	6	5.5	-	-	
		108A00	11.5	10.6	-	-	
		109A00	14	12.9	-	-	
		108A00,108A00	23	21.1	-	-	
		106A00	6	5.5	-	-	
		108A00	11.5	10.6	-	-	
460-3-60	HIGH	109A00	14	12.9	-	-	
		108A00,108A00	23	21.1	-	-	
		106A00	6	5.5	-	-	
		108A00	11.5	10.6	-	-	
		109A00	14	12.9	-	-	
		108A00,108A00	23	21.1	-	-	

See legend on next page.

**Table 2 - Unit Electrical Data (cont)**

UNIT	Voltage-Ph-Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATERXXXXXX	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER	
						CRSINGLEXXXXXX	
						NO C.O or UNPWRD C.O	
						NO P.E.	w/P.E. (pwrd fr/unit)
RAS060	208/230-1-60	STD	102A00	6.5	4.9/6.0	-	-
			103B00	8.7	6.5/8.0	-	-
			102A00,102A00	13	9.8/11.9	040A00	040A00
			103B00,103B00	17.4	13.1/16.0	040A00	040A00
			104B00,104B00	21	15.8/19.3	040A00	040A00
			102A00	6.5	4.9/6.0	-	-
		103B00	8.7	6.5/8.0	-	-	
		102A00,102A00	13	9.8/11.9	040A00	040A00	
		103B00,103B00	17.4	13.1/16.0	040A00	040A00	
		104B00,104B00	21	15.8/19.3	040A00	040A00	
		HIGH	102A00	6.5	4.9/6.0	-	-
			103B00	8.7	6.5/8.0	-	-
	102A00,102A00		13	9.8/11.9	040A00	040A00	
	103B00,103B00		17.4	13.1/16.0	040A00	040A00	
	104B00,104B00		21	15.8/19.3	040A00	040A00	
	102A00		6.5	4.9/6.0	-	-	
	208/230-3-60	STD	104B00	10.5	7.9/9.6	-	-
			105A00	16	12.0/14.7	-	-
			104B00,104B00	21	15.8/19.3	038A00	038A00
			104B00,105A00	26.5	19.9/24.3	038A00	038A00
			102A00	6.5	4.9/6.0	-	-
			104B00	10.5	7.9/9.6	-	-
		HIGH	105A00	16	12.0/14.7	-	-
			104B00,104B00	21	15.8/19.3	038A00	038A00
104B00,105A00			26.5	19.9/24.3	038A00	038A00	
102A00			6.5	4.9/6.0	-	-	
104B00			10.5	7.9/9.6	-	-	
105A00			16	12.0/14.7	-	-	
460-3-60	STD	108A00	11.5	10.6	-	-	
		109A00	14	12.9	-	-	
		108A00,108A00	23	21.1	-	-	
		108A00,109A00	25.5	23.4	-	-	
		106A00	6	5.5	-	-	
		108A00	11.5	10.6	-	-	
	HIGH	109A00	14	12.9	-	-	
		108A00,108A00	23	21.1	-	-	
		108A00,109A00	25.5	23.4	-	-	
		106A00	6	5.5	-	-	
		108A00	11.5	10.6	-	-	
		109A00	14	12.9	-	-	
RAS072	208/230-1-60	STD	102A00	6.5	4.9/6.0	-	-
			104B00	10.5	7.9/9.6	-	-
			105A00	16	12.0/14.7	-	-
			104B00,104B00	21	15.8/19.3	038A00	038A00
			104B00,105A00	26.5	19.9/24.3	038A00	038A00
			102A00	6.5	4.9/6.0	-	-
		HIGH	104B00	10.5	7.9/9.6	-	-
			105A00	16	12.0/14.7	-	-
			104B00,104B00	21	15.8/19.3	038A00	038A00
			104B00,105A00	26.5	19.9/24.3	038A00	038A00
			102A00	6.5	4.9/6.0	-	-
			104B00	10.5	7.9/9.6	-	-
	460-3-60	STD	108A00	11.5	10.6	-	-
			109A00	14	12.9	-	-
			108A00,108A00	23	21.1	-	-
			108A00,109A00	25.5	23.4	-	-
			106A00	6	5.5	-	-
			108A00	11.5	10.6	-	-
		HIGH	109A00	14	12.9	-	-
			108A00,108A00	23	21.1	-	-
			108A00,109A00	25.5	23.4	-	-
			106A00	6	5.5	-	-
			108A00	11.5	10.6	-	-
			109A00	14	12.9	-	-

**LEGEND:**

- CO – Convenient outlet
- DISC – Disconnect
- FLA – Full load amps
- IFM – Indoor fan motor
- LRA – Locked rotor amps
- MCA – Minimum circuit amps
- MOCPP – Maximum over current protection
- PE – Power exhaust
- UNPWRD CO – Unpowered convenient outlet



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 . . . . . Maximum deviation is 4 v.

(BC) 231 - 227 = 4 v . . . . . Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{4}{227} = 1.76\%$$

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.

**NOTES:**

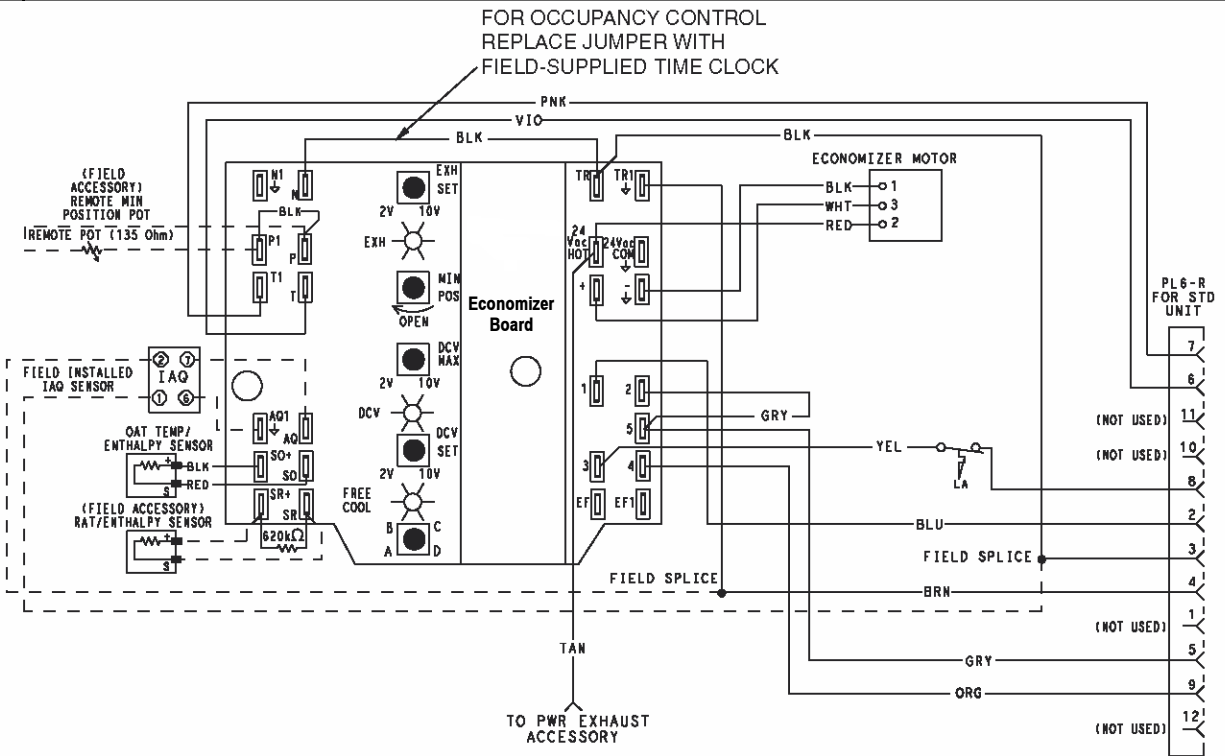
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.

**2. Unbalanced 3-Phase Supply Voltage**

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

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

**FIGURE 19** Wiring for Optional Economizer



**Step 11 — Adjust Factory-Installed Options**

**Smoke Detector —**

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

**Economiser Occupancy Switch —**

Refer to Fig. 19 for general EconoMi\$er IV wiring. External occupancy control is managed through a connection on the Controls Connections Board.

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

**Step 12 — Install Accessories as required**

Available accessories include:

- Differential dry-bulb sensor
- Outdoor enthalpy sensor
- Differential enthalpy sensor
- CO2 sensor
- Low Ambient Control
- Louvered hail guard
- Hood-type hail guard
- UV-C lamp kit
- Phase monitor control

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