

# INSTALLATION INSTRUCTIONS

## R-410A Single Package Rooftop Heat Pump RHH036-060

These instructions must be read and understood completely before attempting installation

### Safety Labeling and Signal Words

#### DANGER, WARNING, CAUTION, and NOTE

The signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTE** are used to identify levels of hazard seriousness. The signal word **DANGER** is only used on product labels to signify an immediate hazard. The signal words **WARNING**, **CAUTION**, and **NOTE** will be used on product labels and throughout this manual and other manual that may apply to the product.

**DANGER** – Immediate hazards which will result in severe personal injury or death.

**WARNING** – Hazards or unsafe practices which could result in severe personal injury or death.

**CAUTION** – Hazards or unsafe practices which may result in minor personal injury or product or property damage.

**NOTE** – Used to highlight suggestions which will result in enhanced installation, reliability, or operation.

#### Signal Words in Manuals

The signal word **WARNING** is used throughout this manual in the following manner:

 **WARNING**

The signal word **CAUTION** is used throughout this manual in the following manner:

 **CAUTION**

#### Signal Words on Product Labeling

Signal words are used in combination with colors and/or pictures or product labels.

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 **WARNING**

#### **PERSONAL INJURY, AND/OR PROPERTY DAMAGE HAZARD**

Failure to carefully read and follow this warning could result in equipment malfunction, property damage, personal injury and/or death.

Installation or repairs made by unqualified persons could result in equipment malfunction, property damage, personal injury and/or death.

The information contained in this manual is intended for use by a qualified service technician familiar with safety procedures and equipped with proper tools and test instruments.

Installation must conform with local building codes and with the national Electrical Code NFPA70 current edition or Canadian Electrical Code part 1 CSA C.22.1.

## SAFETY CONSIDERATIONS

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

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

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

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

### WARNING

#### ELECTRICAL SHOCK HAZARD

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

Before performing service or maintenance operations on unit, turn off main power switch to unit and install lockout tag. Ensure electrical service to rooftop unit agrees with voltage and amperage listed on the unit rating plate. Unit may have more than one power switch.

### WARNING

#### UNIT OPERATION AND SAFETY HAZARD

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

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

### WARNING

#### PERSONAL INJURY AND ENVIRONMENTAL HAZARD

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

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

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

### CAUTION

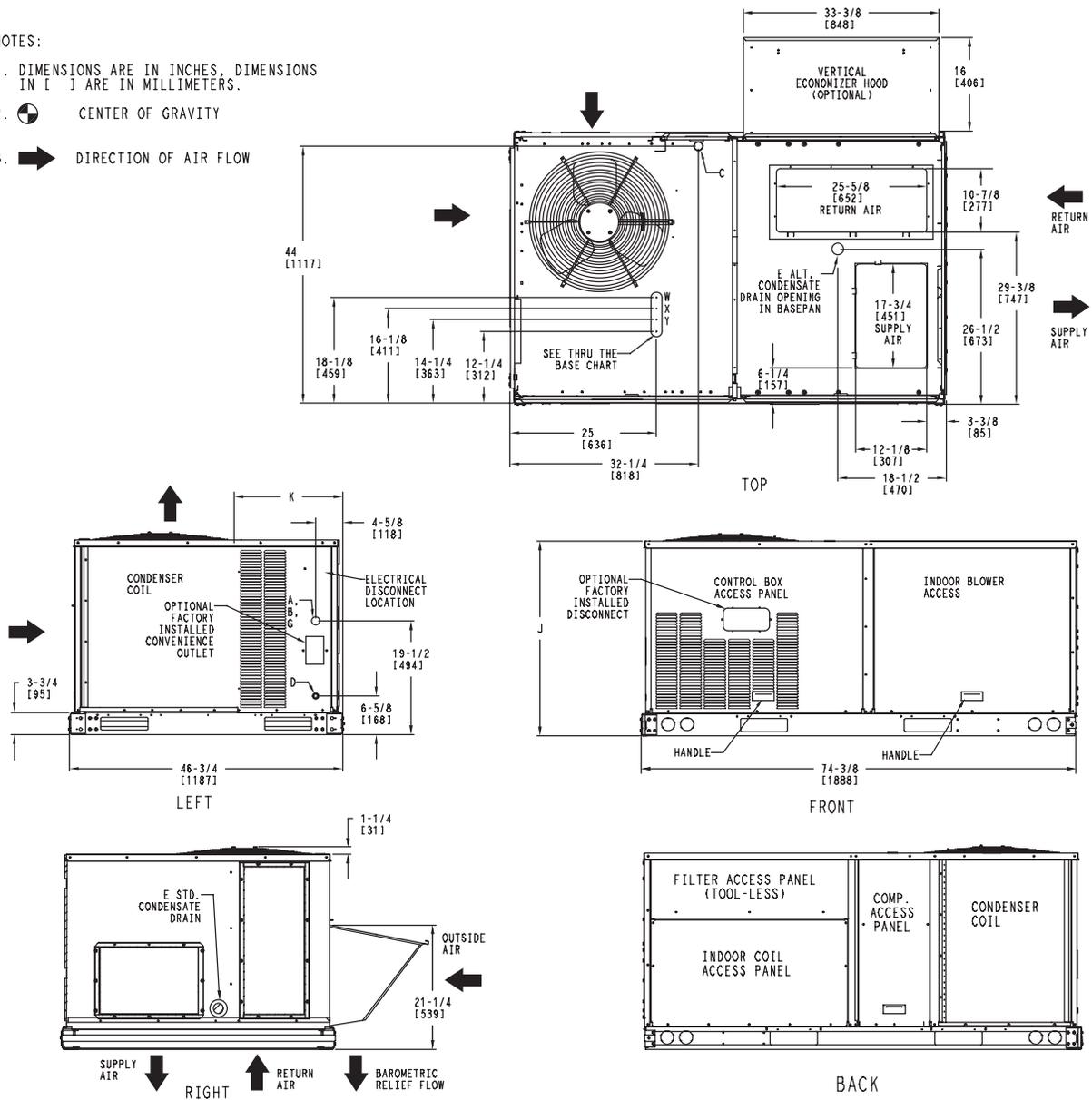
#### CUT HAZARD

Failure to follow this caution may result in personal injury.

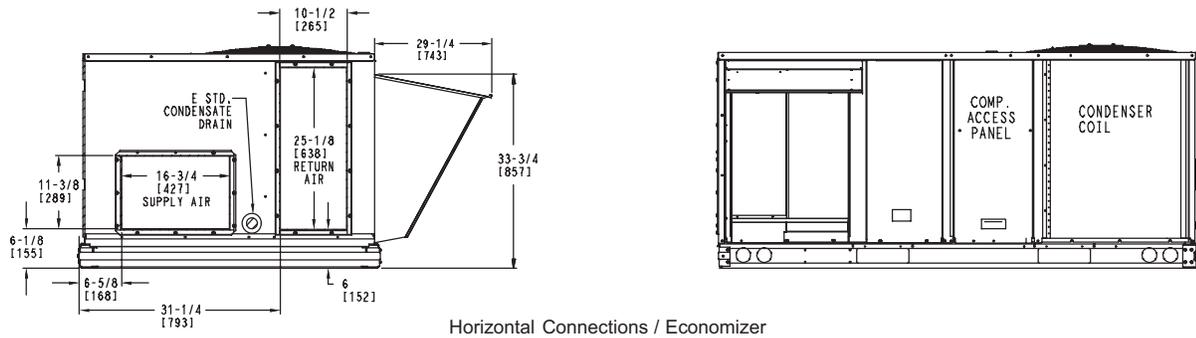
Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing, safety glasses and gloves when handling parts and servicing heat pump units.

NOTES:

1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2.  CENTER OF GRAVITY
3.  DIRECTION OF AIR FLOW



Vertical Connections / Economizer



CONNECTION SIZES	
A	1 3/8" [35] DIA FIELD POWER SUPPLY HOLE
B	2" [51] DIA POWER SUPPLY KNOCKOUT
C	1 3/4" [44] DIA GAUGE ACCESS PLUG
D	7/8" [22] DIA FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
G	2 1/2" [64] DIA POWER SUPPLY KNOCK-OUT

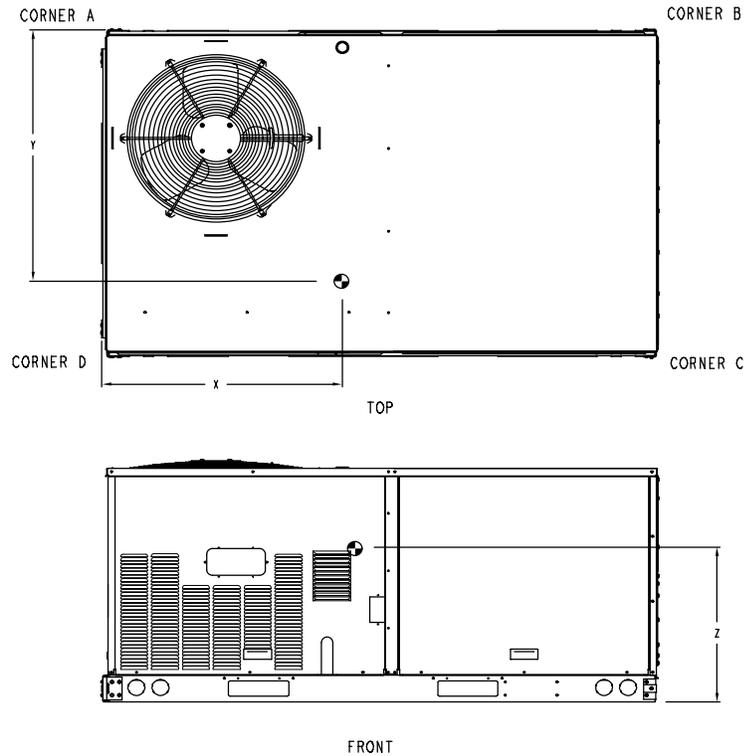
THRU-THE-BASE CHART THESE HOLES REQUIRED FOR USE CRBTMPWR001A01			
	THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
W	1/2"	ACC.	7/8" [22.2]
X *	1/2"	24V	7/8" [22.2]
Y *	3/4" [001]	POWER	1 1/8" [28.4]
FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR ONLY X & Y ARE PROVIDED			
* SELECT EITHER 3/4" OR 1/2" FOR POWER, DEPENDING ON WIRE SIZE			

UNIT	J	K
RHH036	33 3/8 [847]	18 5/8 [472]
RHH048	41 3/8 [1051]	14 7/8 [377]
RHH060	41 3/8 [1051]	14 7/8 [377]

Fig. 1 — Unit Dimensional Drawing – RHH036 – 060

C1024:

UNIT	STD. UNIT WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		HEIGHT
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
RHH036	495	225	130	59	118	54	118	54	139	59	35 3/8 [ 899 ]	23 3/8 [ 594 ]	18 3/8 [ 467 ]
RHH048	580	263	161	73	147	67	130	59	142	64	35 1/2 [ 902 ]	21 7/8 [ 556 ]	20 1/2 [ 521 ]
RHH060	610	277	165	75	152	69	141	64	152	69	35 3/4 [ 527 ]	22 1/2 [ 572 ]	20 3/4 [ 527 ]



C1024

C10243

Fig. 1 - Unit Dimensional Drawing -RHH036 - 060 (cont.)

## 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.

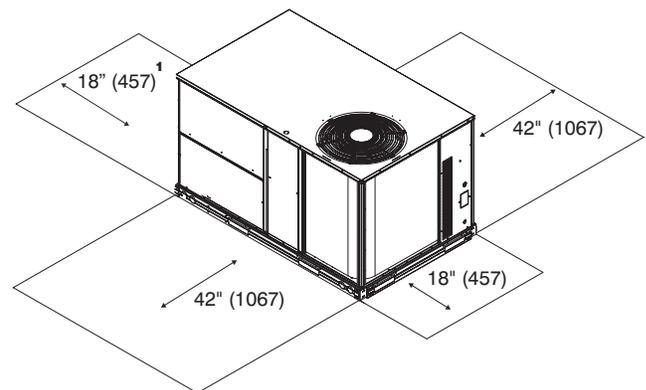
### Step 1 — Plan for Unit Location

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.

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



1C07459

Fig. 2 - Service Clearance Dimensional Drawing

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 for removal and disposal of frost and ice that will form during the heating-defrost mode as well as allow installation of condensate trap per requirements. Refer to Step 9 — Install External Condensate Trap and Line — for required trap dimensions.

## Roof Mount —

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

**Table 1 – Operating Weights**

RHH	UNITS LB (KG)		
	036	048	060
Component	036	048	060
Base Unit	495 (225)	580 (263)	610 (277)
Economizer			
Vertical	80 (36)	80 (36)	80 (36)
Horizontal	105 (48)	105 (48)	105 (48)
Powered Outlet	32 (15)	32 (15)	32 (15)
Curb			
14-in / 356 mm	110 (50)	110 (50)	110 (50)
24-in / 610 mm	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 curb
- Install field-fabricated ductwork inside curb
- Install accessory thru-base service connection package (affects curb and unit) (refer to accessory installation instructions for details)
- Prepare bottom condensate drain connection to suit planned condensate line routing (refer to Step 9 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
- 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.

**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.

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 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, attach the accessory thru-the-base service connections to the basepan in accordance with the accessory installation instructions.

### 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.

ROOFCURB ACCESSORY	A	UNIT SIZE
CRRFCURB001A02	1' - 2" [356]	RHH036 - 060
CRRFCURB002A02	2' - 0" [610]	

NOTES:

1. ROOFCURB ACCESSORY IS SHIPPED DISASSEMBLED.
2. INSULATED PANELS: 1" THK. POLYURETHANE FOAM, 1-3/4 # DENSITY.
3. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
4. ROOFCURB: 18 GAGE STEEL ON 14" CURB, AND 16 GAGE STEEL ON 24" CURB.
5. ATTACH DUCTWORK TO CURB. (FLANGES OF DUCT REST ON CURB)
6. SERVICE CLEARANCE 4" ON EACH SIDE.
7. DIRECTION OF AIR FLOW.
8. CONNECTOR PACKAGES CRBTMPWR001A01 AND 2A01 ARE FOR THRU-THE-CURB TYPE CONNECTIONS. PACKAGES CRBTMPWR003A01 AND 4A01 ARE FOR THE THRU-THE-BOTTOM TYPE CONNECTIONS.

CONNECTOR PKG. ACC.	B	C	D ALT DRAIN HOLE	POWER	CONTROL	ACCESSORY PWR
CRBTMPWR001A01 CRBTMPWR002A01	2'-8 7/16" [827]	1'-10 15/16" [583]	1 3/4" [44.5]	3/4" [19]NPT 1 1/4" [31.7]	1/2" [12.7]NPT	1/2" [12.7]NPT
CRBTMPWR003A01				3/4" [19]NPT		
CRBTMPWR004A01				1 1/4" [31.7]		

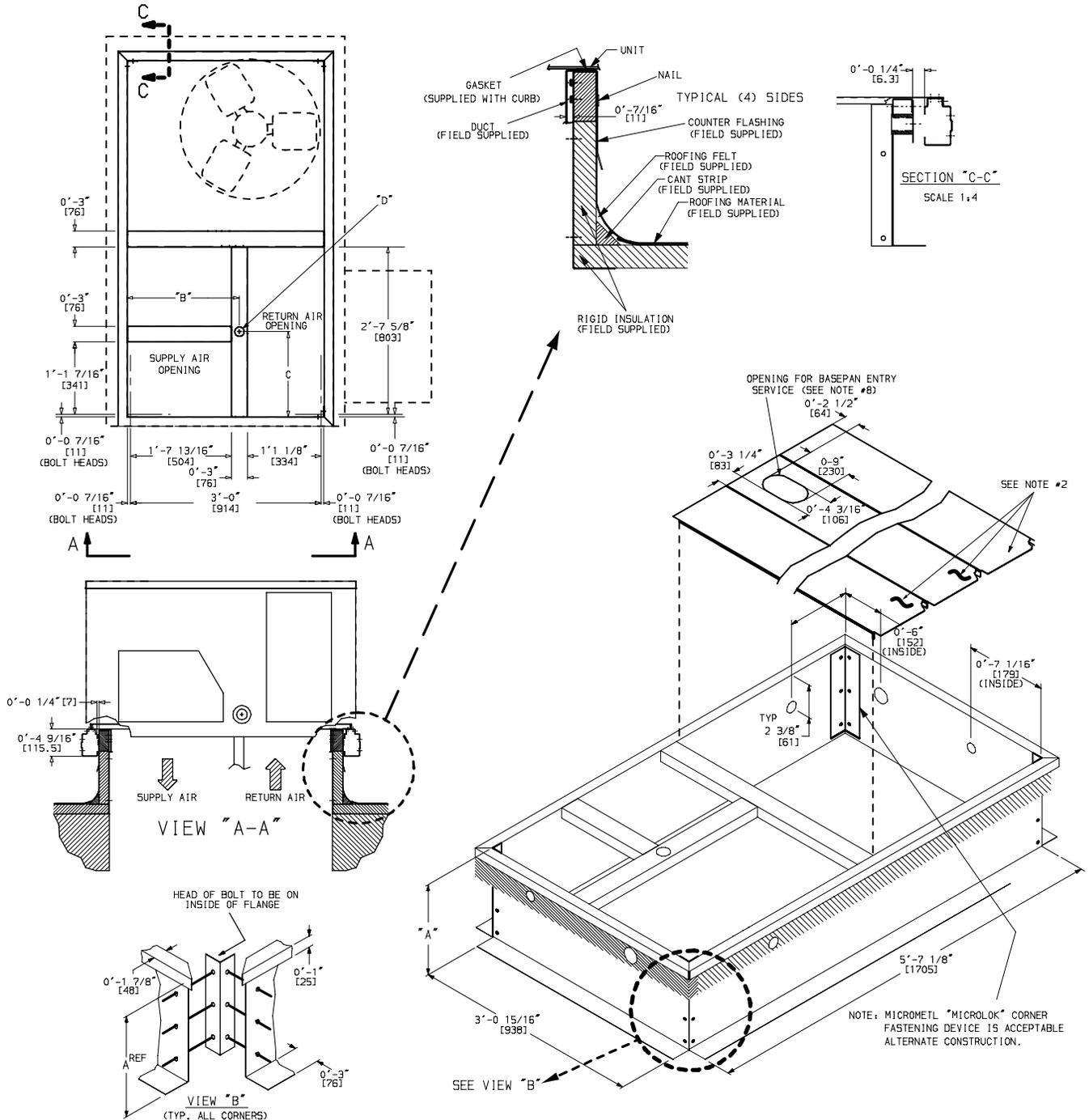
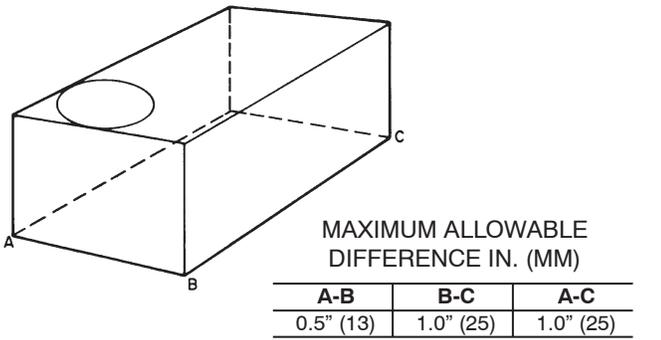


Fig. 3 — Roof Curb Details

C10244

**Fig. 3 – Roof Curb Details**



**Fig. 4 – Unit Leveling Tolerances**

C06110

**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.

**For Units with Accessory Electric Heaters —**

Horizontal applications require a minimum clearance to combustible surfaces of 1-in (25 mm) from duct for first 12-in (305 mm) away from unit. Vertical applications do not require a minimum clearance.

Minimum clearance not required around ductwork.

Outlet grilles must not lie directly below unit discharge.

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

**⚠ WARNING**

**PERSONAL INJURY HAZARD**

Failure to follow this warning could cause personal injury.

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

**Step 6 — Rig and Place Unit**

Keep unit upright and do not drop. Spreader bars are not required if top crating is left on unit. Rollers may be used to move unit across a roof. Rigging materials under unit (cardboard or wood) must be removed PRIOR to placing the unit on the roof curb. 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.

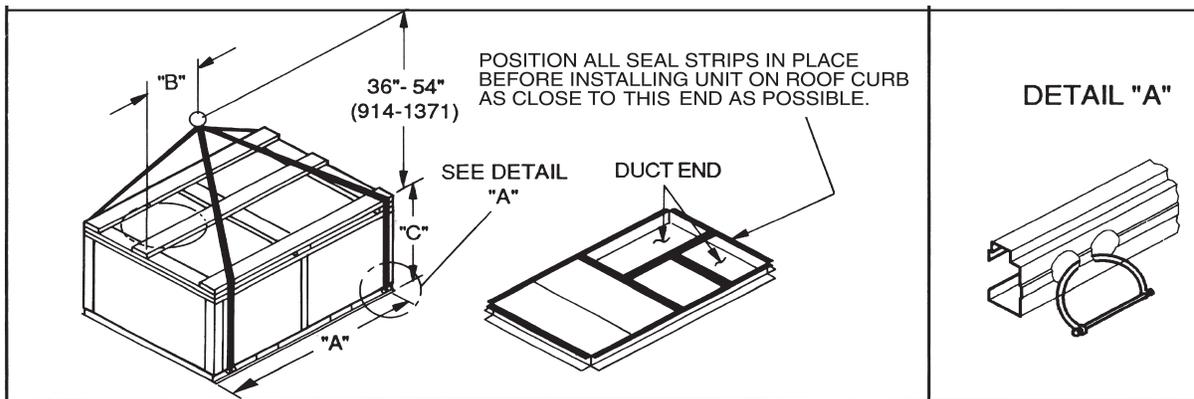
**⚠ CAUTION**

**UNIT DAMAGE HAZARD**

Failure to follow this caution may result in equipment damage.

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

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



C06005

UNIT	MAX WEIGHT		DIMENSIONS					
			A		B		C	
	LB	KG	IN	MM	IN	MM	IN	MM
RHH036	725	330	74.5	1890	38.5	980	33.5	850
RHH048	845	384	74.5	1890	37.5	955	41.5	1055
RHH060	900	409	74.5	1890	37.5	955	41.5	1055

**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. 5 – Rigging Details**

**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.

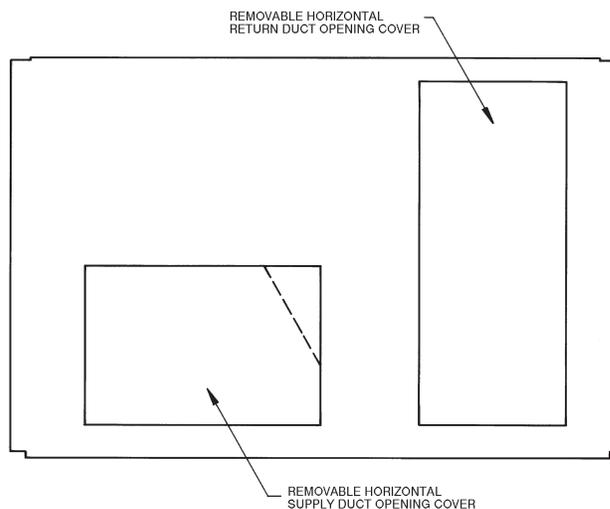
Although unit is weatherproof, guard against water from higher level runoff and overhangs.

After unit is in position, remove the compressor access panel. Holding the blocking between compressors with one hand, cut the strapping. Carefully remove the blocking without damaging tubing, wiring, or controls. Remove the strapping and replace the access panel.

Remove all shipping materials and top skid. Recycle or dispose of all 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.



C06108

**Fig. 6 – Horizontal Conversion Panels**

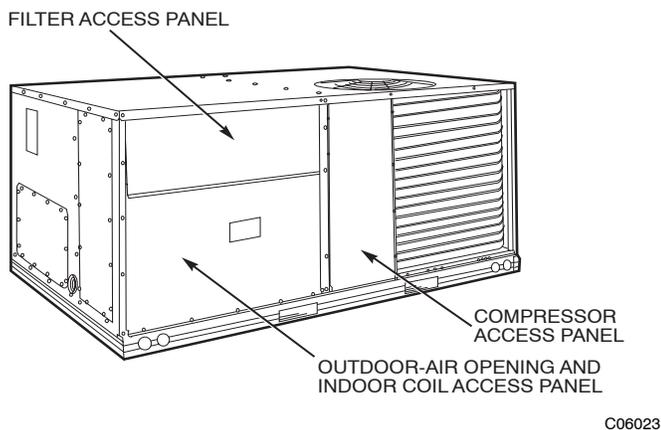
Field-supplied flanges should be attached to horizontal duct openings and all ductwork should be secured to the flanges. Insulate and weatherproof all external ductwork, joints, and roof or building openings with counter flashing and mastic in accordance with applicable codes.

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

## Step 8 — Install Outside Air Hood

### Economizer Hood Removal and Setup – Factory Option —

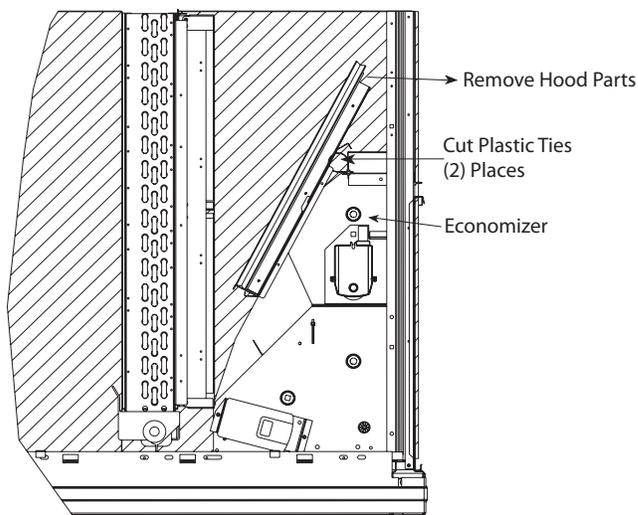
1. The hood is shipped in knock-down form and located in the return air compartment. It is attached to the economizer using two plastic tie-wraps.
2. To gain access to the hood, remove the filter access panel. (See Fig. 7.)
3. Locate and cut the (2) plastic tie-wraps, being careful to not damage any wiring. (See Fig. 8.)
4. Carefully lift the hood assembly through the filter access opening and assemble per the steps outlined in *Economizer Hood and Two-Position Hood* on next page.



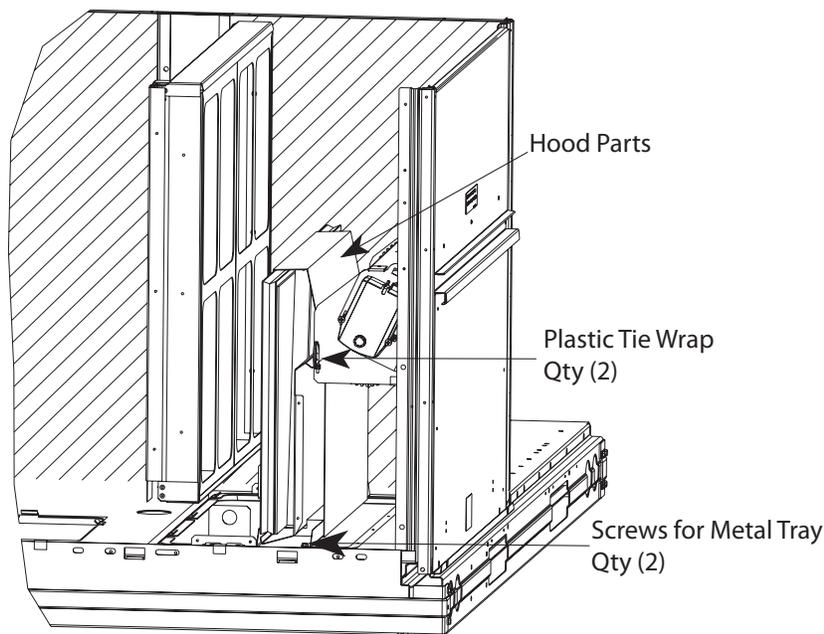
**Fig. 7 – Typical Access Panel Locations**

### Two Position Damper Hood Removal and Setup – Factory Option —

1. The hood is shipped in knock-down form and assembled to a metal support tray using plastic stretch wrap. Located in the return air compartment, the assembly's metal tray is attached to the basepan and also attached to the damper using two plastic tie-wraps.
2. To gain access to the hood, remove the filter access panel. (See Fig. 7.)
3. Locate the (2) screws holding the metal tray to the basepan and remove. Locate and cut the (2) plastic tie-wraps securing the assembly to the damper. (See Fig. 9.) Be careful to not damage any wiring or cut tie-wraps securing any wiring.
4. Carefully lift the hood assembly (with metal tray) through the filter access opening and assemble per the steps outlined in *Economizer Hood and Two-Position Hood* on next page.



**Fig. 8 – Economizer Wiring**

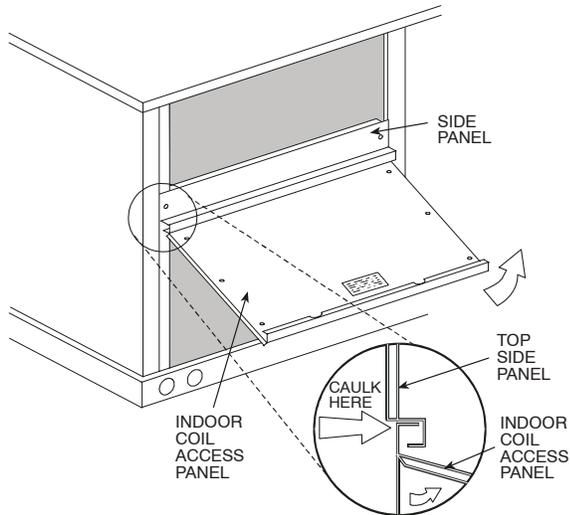


**Fig. 9 – Damper Assembly**

## Economizer Hood and Two-Position Hood —

**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.

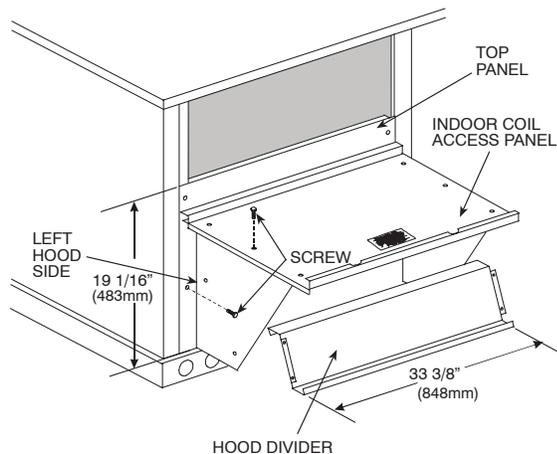
1. The indoor coil access panel will be used as the top of the hood. Remove the screws along the sides and bottom of the indoor coil access panel. See Fig. 10.



C06025

**Fig. 10 – Indoor Coil Access Panel Relocation**

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.

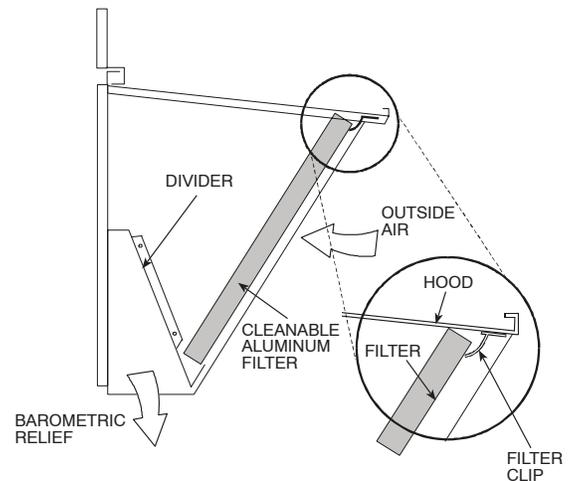


C06026

**Fig. 11 – Economizer Hood Construction**

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.



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**Fig. 12 – Economizer Filter Installation**

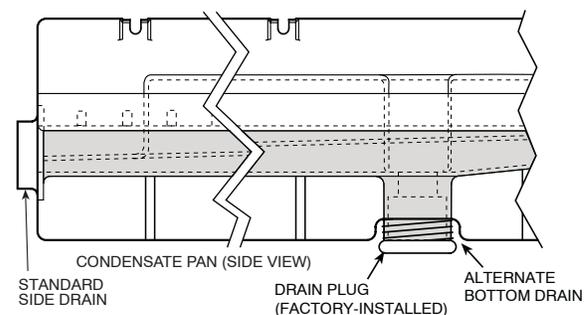
6. Caulk the ends of the joint between the unit top panel and the hood top.
7. Replace the filter access panel.

## 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. See Fig. 13. 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.

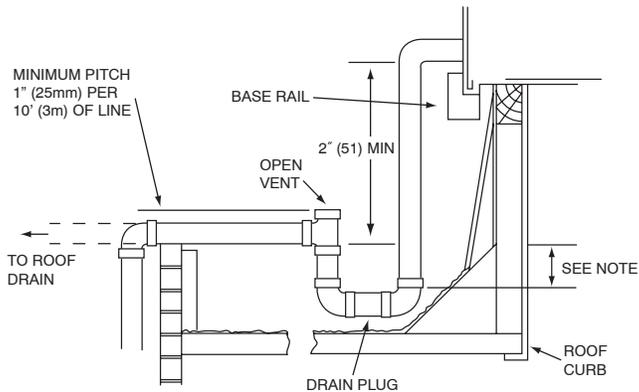
To use the alternate bottom drain connection, remove the red drain plug from the bottom connection (use a  $\frac{1}{2}$ -in. square socket drive extension) and install it in the side drain connection.



C08021

**Fig. 13 – Condensate Drain Pan (Side View)**

The piping for the condensate drain and external trap can be completed after the unit is in place. See Fig. 14.



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

C08022

**Fig. 14 – Condensate Drain Piping Details**

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

**Step 10 — Make Electrical Connections**

**⚠ WARNING**

**ELECTRICAL SHOCK HAZARD**

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

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

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

**Field Power Supply —**

If equipped with optional Powered Convenience Outlet: The power source leads to the convenience outlet's transformer primary are not factory connected. Installer must connect these leads according to required operation of the convenience outlet. If an always-energized convenience outlet operation is desired, connect the source leads to the line side of the unit-mounted disconnect. (Check with local codes to ensure this method is acceptable in your area.) If a de-energize via

unit disconnect switch operation of the convenience outlet is desired, connect the source leads to the load side of the unit disconnect. On a unit without a unit-mounted disconnect, connect the source leads to compressor contactor C and indoor fan contactor IFC pressure lugs with unit field power leads.

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. 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 or terminal board (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). (See Fig. 16)

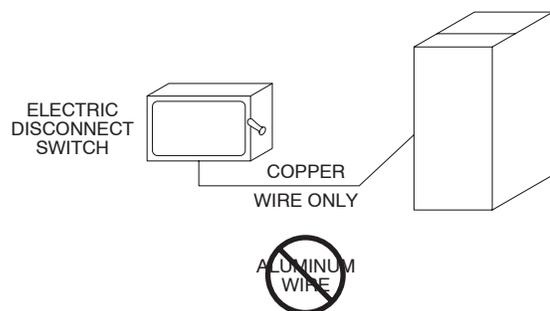
NOTE: TEST LEADS – Unit may be equipped with short leads (pigtailed) on the field line connection points on contactor C or optional disconnect switch. These leads are for factory run-test purposes only; remove and discard before connecting field power wires to unit connection points. Make field power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

**⚠ WARNING**

**FIRE HAZARD**

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

Do not connect aluminum wire between disconnect switch and furnace. Use only copper wire. (See Fig. 15.)



A93033

**Fig. 15 – Disconnect Switch and Unit**

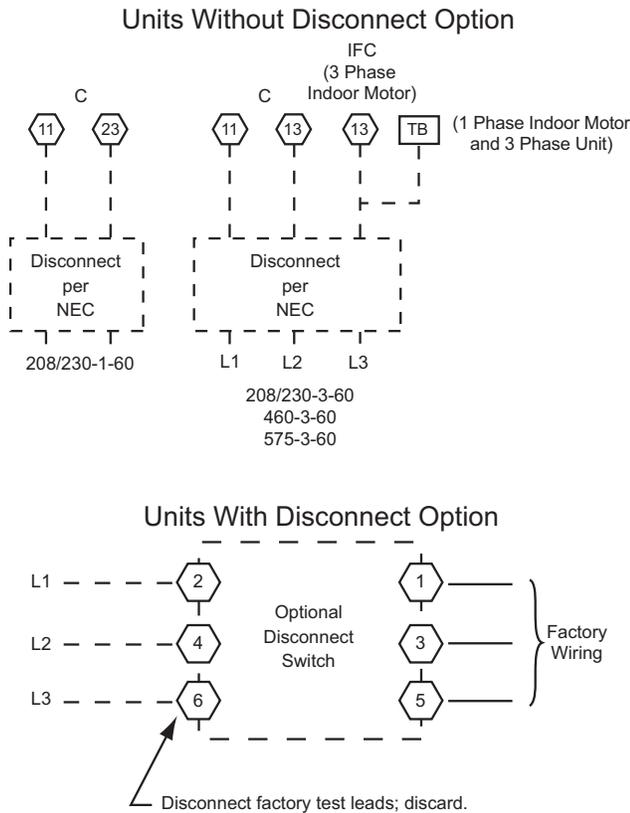
**Units Without Factory-Installed Disconnect —**

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. Discard the factory test leads (see Fig. 16).



**Fig. 16 – Power Wiring Connections**

C10241

**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. 16 and the unit label diagram for power wiring connections to the unit power terminal blocks 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.

### Convenience Outlets —

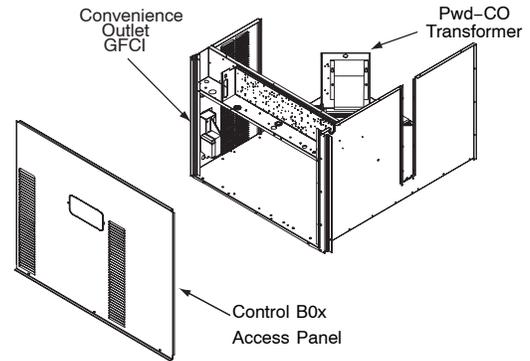
**⚠ WARNING**

**ELECTRICAL OPERATION HAZARD**

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

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

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



C08128

**Fig. 17 – Convenience Outlet Location**

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

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

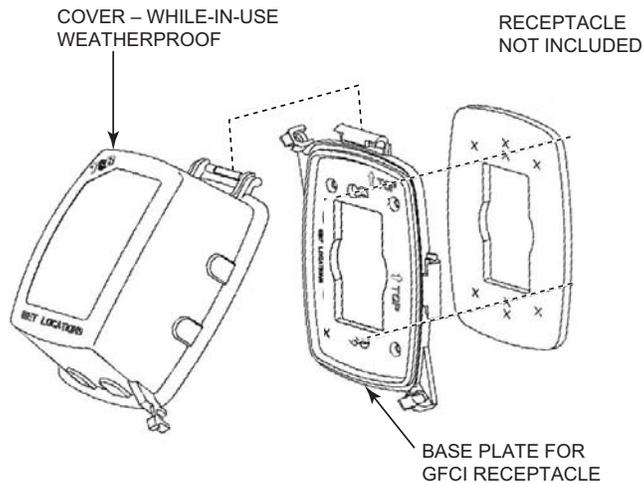
**DISCONNECT ALL POWER TO UNIT AND CONVENIENCE OUTLET.**

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

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

Mount the weatherproof cover to the backing plate as shown in Fig. 18. Remove two slot fillers in the bottom of the cover to permit service tool cords to exit the cover.

Check for full closing and latching.



C09022

**Fig. 18 – Weatherproof Cover Installation**

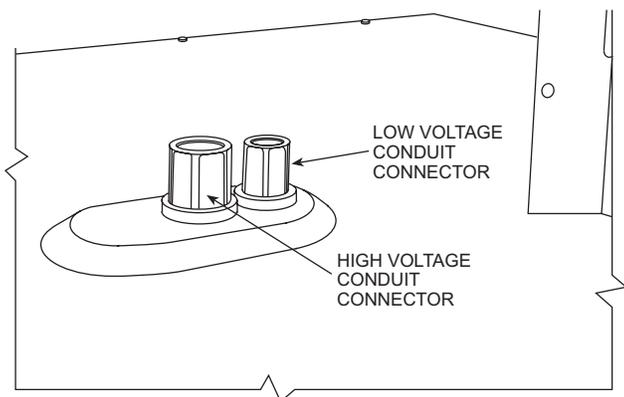
**Non-powered type:** This type requires the field installation of a general-purpose 125-volt 15-A circuit powered from a source elsewhere in the building. Observe national and local codes when selecting wire size, fuse or breaker requirements and disconnect switch size and location. Route 125-v power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

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.

**Factory-Option Thru-Base Connections —**

This service connection kit consists of a 1/2-in electrical bulkhead connector and a 3/4-in electrical bulkhead connector, all factory-installed in the embossed (raised) section of the unit basepan in the condenser section. The 1/2-in bulkhead connector enables the low-voltage control wires to pass through the basepan. The 3/4-in electrical bulkhead connector allows the high-voltage power wires to pass through the basepan. See Fig. 20.

Check tightness of connector lock nuts before connecting electrical conduits.



C08637

**Fig. 19 – Thru-Base Connection Fittings**

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.

**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.

**All Units:** Voltage to compressor terminals during operation must be within voltage range indicated on unit nameplate. See Table 5. 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 5, Note 2 (see legend and notes following Tables) 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 warranty.

**Field Control Wiring —**

The RHH unit requires an external temperature control device. This device can be a thermostat emulation device provided as part of a third-party Building Management System.

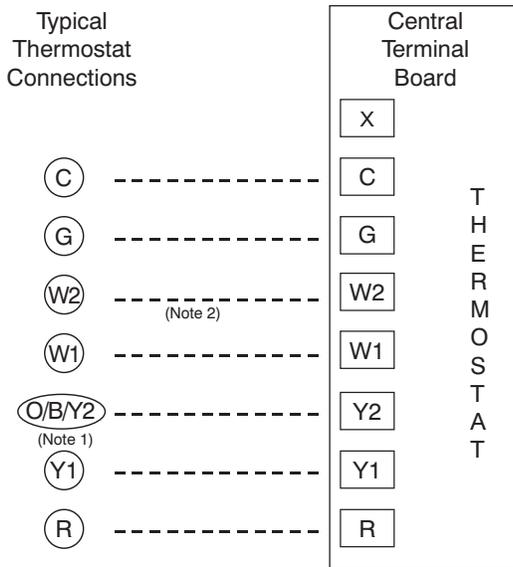
**Thermostat —**

Install an approved accessory 2 stage Cooling/Heating thermostat according to installation instructions included with the accessory. The RHH models do not require a thermostat with an O function to control the reversing valve operation. If using an electronic thermostat, configure it for “non-heat pump” operation. Locate the thermostat accessory on a solid wall in the conditioned space to sense average temperature in accordance with the thermostat installation instructions.

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

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

thermostat and will require a junction box and splice at the thermostat.



Note 1: Typical multi-function marking. Follow manufacturer's configuration instructions to select Y2. Do not configure for O output.  
 Note 2: W2 connection not required on units without electric heating.  
 --- Field Wiring

C09012

**Fig. 20 – Typical Low-Voltage Control Connections**

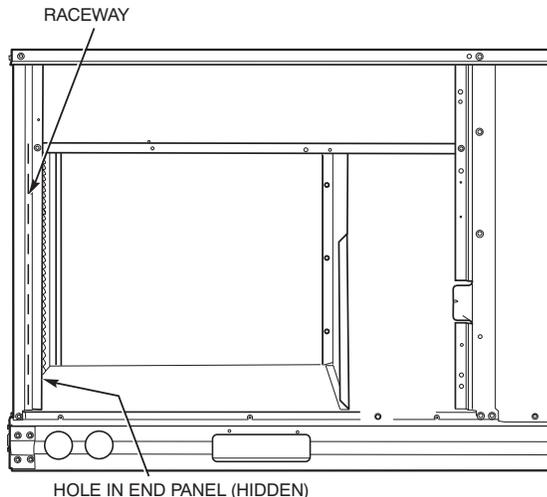
**Unit without Thru-Base Connection Kit —**

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 Central Terminal Board (CTB). See Fig. 22.

**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.



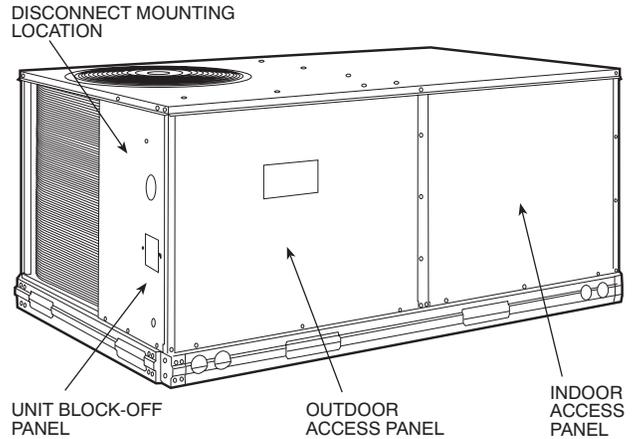
C08027

**Fig. 21 – Field Control Wiring Raceway**

**Electric Heaters**

RHH units may be equipped with field-installed accessory electric heaters. The heaters are modular in design, with heater frames holding open coil resistance wires strung through ceramic insulators, line-break limit switches and a control contactor. One or two heater modules may be used in a unit.

Heater modules are installed in the compartment below the indoor (supply) fan outlet. Access is through the indoor access panel. Heater modules slide into the compartment on tracks along the bottom of the heater opening. See Fig. 23, Fig. 24 and Fig. 25.



C08133

**Fig. 22 – Typical Access Panel Location**

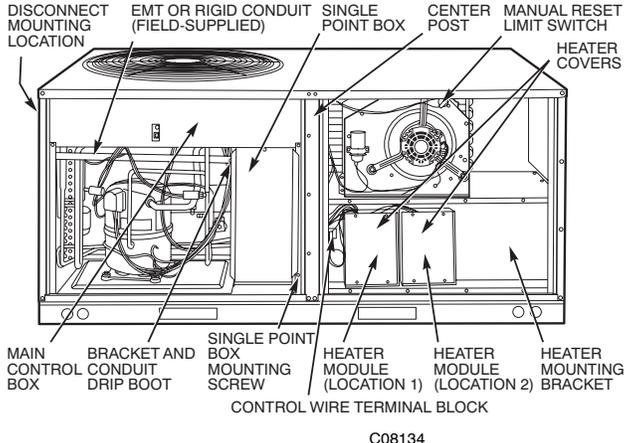
Not all available heater modules may be used in every unit. Use only those heater modules that are UL listed for use in a specific size unit. Refer to the label on the unit cabinet for the list of approved heaters.

Unit heaters are marked with Heater Model Numbers. But heaters are ordered as and shipped in cartons marked with a corresponding heater Sales Package part number. See Table 2 for correlation between heater Model Number and Sales Package part number.

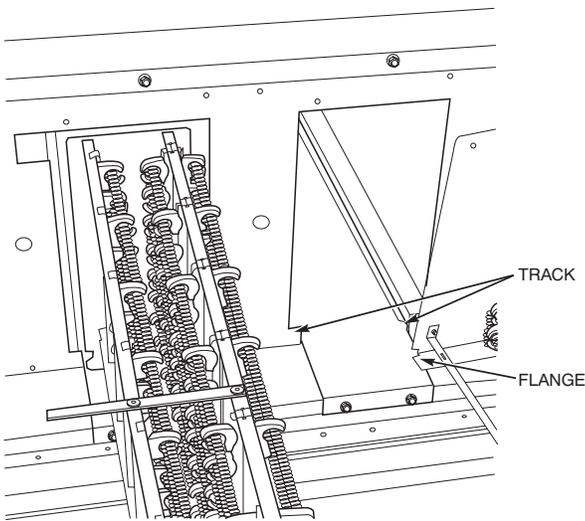
**NOTE:** The value in position 9 of the part number differs between the sales package part number (value is 1 or 3) and a bare heater model number (value is 0).

**Table 2 – Heater Model Number**

<b>Bare Heater Model Number</b>	<b>C</b>	<b>R</b>	<b>H</b>	<b>E</b>	<b>A</b>	<b>T</b>	<b>E</b>	<b>R</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>A</b>	<b>0</b>	<b>0</b>
<b>Heater Sales Package PNO Includes:</b> <b>Bare Heater</b> <b>Carton and packing materials</b> <b>Installation sheet</b>	<b>C</b>	<b>R</b>	<b>H</b>	<b>E</b>	<b>A</b>	<b>T</b>	<b>E</b>	<b>R</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>A</b>	<b>0</b>	<b>0</b>



**Fig. 23 – Typical Component Location**

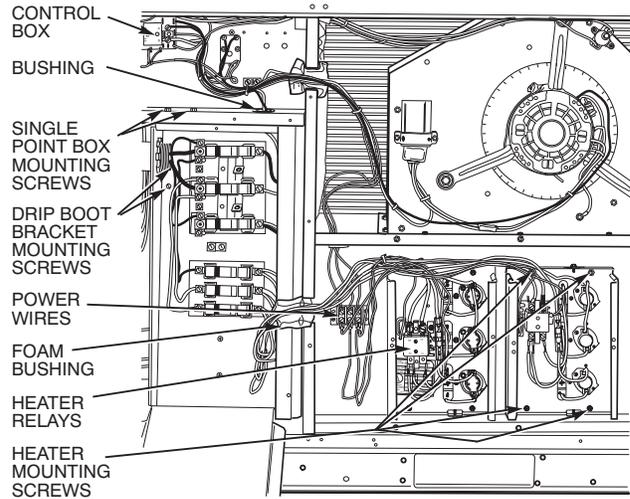


**Fig. 24 – Typical Module Installation**

**Single Point Boxes and Supplementary Fuses**

When the unit MOCP device value exceeds 60-A, unit-mounted supplementary fuses are required for each heater circuit. These fuses are included in accessory Single Point Boxes, with power distribution and fuse blocks. The single point box will be installed directly under the unit control box, just to the left of the partition

separating the indoor section (with electric heaters) from the outdoor section. The Single Point Box has a hinged access cover. See Fig. 26. The Single Point Box also includes pigtails to complete the wiring between the Single Point Box and the unit's main control box terminals. Refer to the accessory heater and Single Point Box installation instructions for details on tap connections

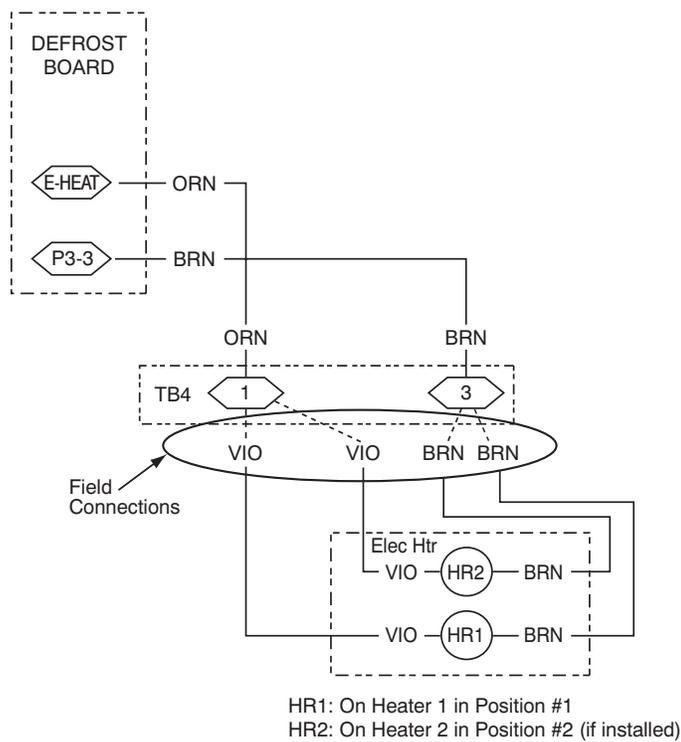


**Fig. 25 – Typical Single Point Installation**

All fuses on RHH units are 60-A. (Note that all heaters are qualified for use with a 60-A fuse, regardless of actual heater ampacity, so only 60-A fuses are necessary.)

**Single Point Boxes without Fuses:** Refer to accessory heater and Single Point Box installation instructions for details on tap connections.

**Low-Voltage Control Connections:** Run the low-voltage control leads from the heater module(s) – VIO and BRN (two of each if two modules are installed; identify for Module #1) – to the 4-pole terminal board TB4 located on the heater bulkhead to the left of Heater #1. Connect the VIO leads from Heater #1 and Heater #2 to terminal TB4-1. Connect the BRN leads to terminal TB4-3. See Fig. 27.



C09013

**Fig. 26 – Accessory Electric Heater Control Connections**

## Smoke Detectors

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

The smoke detector system consists of a four-wire controller and one or two sensors. Its primary function is to shut down the rooftop unit in order to prevent smoke from circulating throughout the building. It is not to be used as a life saving device.

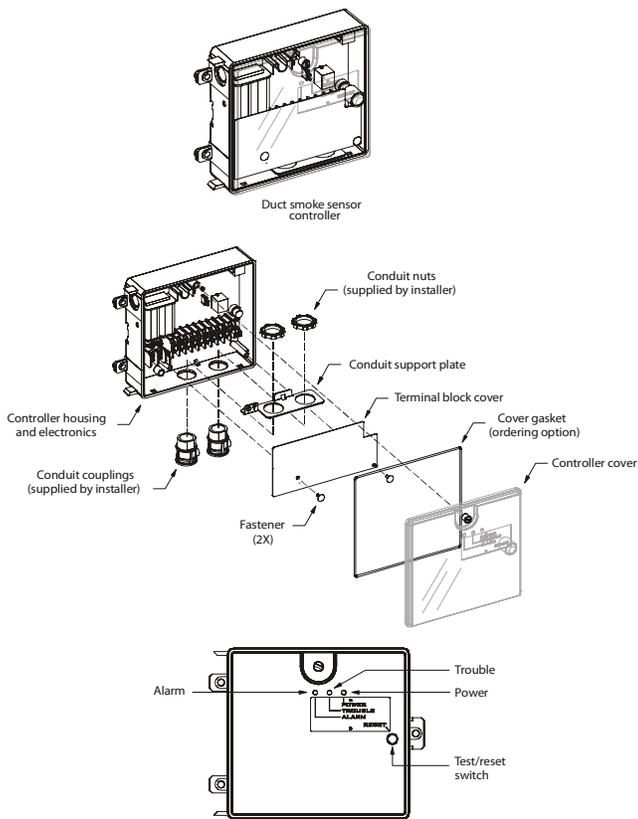
### Controller —

The controller (see Fig. 28) includes a controller housing, a printed circuit board, and a clear plastic cover. The controller can be connected to one or two compatible duct

smoke sensors. The clear plastic cover is secured to the housing with a single captive screw for easy access to the wiring terminals. The controller has three LEDs (for Power, Trouble and Alarm) and a manual test/reset button (on the cover face).

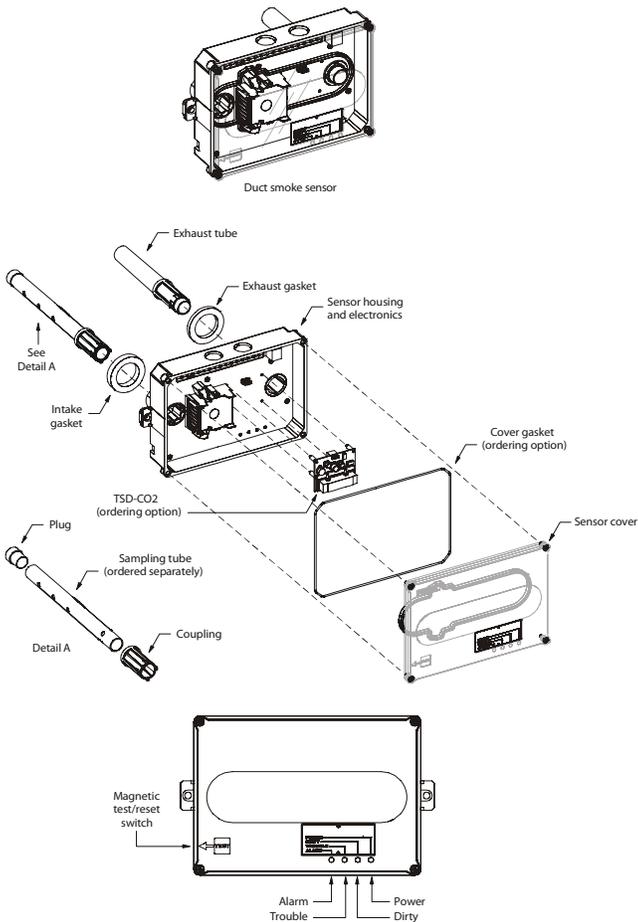
### Sensor —

The sensor (see Fig. 29) includes a plastic housing, a printed circuit board, a clear plastic cover, a sampling tube inlet and an exhaust tube. The sampling tube (when used) and exhaust tube are attached during installation. The sampling tube varies in length depending on the size of the rooftop unit. The clear plastic cover permits visual inspections without having to disassemble the sensor. The cover attaches to the sensor housing using four captive screws and forms an airtight chamber around the sensing electronics. Each sensor includes a harness with an RJ45 terminal for connecting to the controller. Each sensor has four LEDs (for Power, Trouble, Alarm and Dirty) and a manual test/reset button (on the left-side of the housing).



**Fig. 27 – Controller Assembly**

C08208



**Fig. 28 – Smoke Detector Sensor**

C08209

Air is introduced to the duct smoke detector sensor's sensing chamber through a sampling tube that extends into the HVAC duct and is directed back into the ventilation system through a (shorter) exhaust tube. The difference in air pressure between the two tubes pulls the sampled air through the sensing chamber. When a sufficient amount of smoke is detected in the sensing chamber, the sensor signals an alarm state and the controller automatically takes the appropriate action to shut down fans and blowers, change over air handling systems, notify the fire alarm control panel, etc.

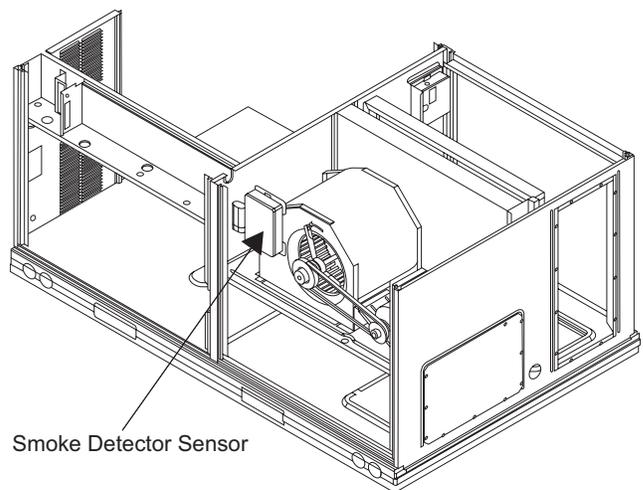
The sensor uses a process called differential sensing to prevent gradual environmental changes from triggering false alarms. A rapid change in environmental conditions, such as smoke from a fire, causes the sensor to signal an alarm state but dust and debris accumulated over time does not.

For installations using two sensors, the duct smoke detector does not differentiate which sensor signals an alarm or trouble condition.

## Smoke Detector Locations

### Supply Air —

The Supply Air smoke detector sensor is located to the left of the unit's indoor (supply) fan. See Fig. 29. Access is through the fan access panel. There is no sampling tube used at this location. The sampling tube inlet extends through the side plate of the fan housing (into a high pressure area). The controller is located on a bracket to the right of the return filter, accessed through the lift-off filter panel.



**Fig. 29 – Typical Supply Air Smoke Detector Sensor Location**

C08245

**Table 3 – Unit Wire/Fuse or HACR Breaker Sizing Data**

UNIT	NO M. V-Ph-HZ	IFM TYPE	ELEC. HTR			RE.	NO C.O. or UNPWR C.O.								
			CRHEATER***	NOM (KW)	FLA		FLA	NO P.E.				w/P.E. (pwrd fr/unit)			
								MCA	FUSE or HACR BRKR	DISC. SIZE		MCA	FUSE or HACR BRKR	DISC. SIZE	
										FLA	LRA			FLA	LRA
RHH036	208/230-1-60	DD-STD	NONE	-	-	1.9	29.2	45	29	88	31.1	45	31	90	
			101A00	3.3/4.4	15.9/18.3		49.0/52.0	60/60	47/50	104/106	50.9/53.9	60/60	49/52	106/108	
			102A00	4.9/6.5	23.5/27.1		58.5/63.0	60/70	56/60	112/115	60.4/64.9	70/70	58/62	114/117	
			103B00	6.5/8.7	31.4/36.3		68.4/74.5	70/80	65/70	119/124	70.3/76.4	80/80	67/73	121/126	
			104B00	7.9/10.5	37.9/43.8		76.5/83.9	80/90	72/79	126/132	78.4/85.8	80/90	75/81	128/134	
			102A00,102A00	9.8/13.0	46.9/54.2		87.8/96.9	90/100	83/91	182/196	89.7/98.8	90/100	85/93	184/198	
	208/230-3-60	DD-STD	NONE	-	-	1.9	21.4	30	22	82	23.3	30	24	84	
			101A00	3.3/4.4	9.2/10.6		32.9/34.7	40/40	32/34	91/93	34.8/36.6	40/40	34/36	93/95	
			102A00	4.9/6.5	13.6/15.6		38.4/40.9	45/45	37/40	96/98	40.3/42.8	45/45	39/42	98/100	
			103B00	6.5/8.7	18.1/20.9		44.0/47.5	45/50	42/46	100/103	45.9/49.4	50/50	45/48	102/105	
			104B00	7.9/10.5	21.9/25.3		48.8/53.0	50/60	47/51	104/107	50.7/54.9	60/60	49/53	106/109	
			105A00	12.0/16.0	33.4/38.5		63.2/69.5	70/70	60/66	115/121	65.1/71.4	70/80	62/68	117/123	
		MED	NONE	-	-	1.9	19.2	25	19	94	21.1	30	21	96	
			101A00	3.3/4.4	9.2/10.6		30.7/32.5	35/40	30/31	103/105	32.6/34.4	40/40	32/33	105/107	
			102A00	4.9/6.5	13.6/15.6		36.2/38.7	40/45	35/37	108/110	38.1/40.6	45/45	37/39	110/112	
			103B00	6.5/8.7	18.1/20.9		41.8/45.3	45/50	40/43	112/115	43.7/47.2	45/50	42/45	114/117	
			104B00	7.9/10.5	21.9/25.3		46.6/50.8	50/60	44/48	116/119	48.5/52.7	50/60	46/50	118/121	
			105A00	12.0/16.0	33.4/38.5		61.0/67.3	70/70	58/63	127/133	62.9/69.2	70/70	60/66	129/135	
		HIGH	NONE	-	-	1.9	19.2	25	19	105	21.1	30	21	107	
			101A00	3.3/4.4	9.2/10.6		30.7/32.5	35/40	30/31	114/116	32.6/34.4	40/40	32/33	116/118	
			102A00	4.9/6.5	13.6/15.6		36.2/38.7	40/45	35/37	119/121	38.1/40.6	45/45	37/39	121/123	
			103B00	6.5/8.7	18.1/20.9		41.8/45.3	45/50	40/43	123/126	43.7/47.2	45/50	42/45	125/128	
			104B00	7.9/10.5	21.9/25.3		46.6/50.8	50/60	44/48	127/130	48.5/52.7	50/60	46/50	129/132	
			105A00	12.0/16.0	33.4/38.5		61.0/67.3	70/70	58/63	138/144	62.9/69.2	70/70	60/66	140/146	
	460-3-60	DD-STD	NONE	-	-	1.0	11.8	15	12	43	12.8	15	13	44	
			106A00	6.0	7.2		20.8	25	20	50	21.8	25	21	51	
			107A00	8.8	10.6		25.0	25	24	54	26.0	30	25	55	
			108A00	11.5	13.8		29.0	30	28	57	30.0	30	29	58	
109A00			14.0	16.8	32.8		35	31	60	33.8	35	32	61		
MED		NONE	-	-	1.0	10.4	15	10	48	11.4	15	11	49		
		106A00	6.0	7.2		19.4	20	19	55	20.4	25	20	56		
		107A00	8.8	10.6		23.6	25	22	59	24.6	25	24	60		
		108A00	11.5	13.8		27.6	30	26	62	28.6	30	27	63		
		109A00	14.0	16.8		31.4	35	30	65	32.4	35	31	66		
HIGH		NONE	-	-	1.0	10.4	15	10	54	11.4	15	11	55		
		106A00	6.0	7.2		19.4	20	19	61	20.4	25	20	62		
		107A00	8.8	10.6		23.6	25	22	65	24.6	25	24	66		
		108A00	11.5	13.8		27.6	30	26	68	28.6	30	27	69		
		109A00	14.0	16.8		31.4	35	30	71	32.4	35	31	72		
575-3-60		DD-STD	NONE	-	-	1.9	9.3	15	10	42	11.2	15	12	44	
		MED	NONE	-	-	1.9	7.7	15	8	45	9.6	15	10	47	
		HIGH	NONE	-	-	1.9	7.3	15	7	49	9.2	15	9	51	

**NOTE:** See legend and notes following tables.

**Table 3 — Unit Wire/Fuse or HACR Breaker Sizing Data (cont)**

UNIT	NO M. V-Ph-HZ	IFM TYPE	ELEC. HTR			P.E.	NO C.O. or UNPWR C.O.								
			CRHEATER***	NOM (KW)	FLA		FLA	NO P.E.				w/P.E. (pwrd fr/unit)			
								MCA	FUSE or HACR BRKR	DISC. SIZE		MCA	FUSE or HACR BRKR	DISC. SIZE	
										FLA	LRA			FLA	LRA
RHH048	208/230-1-60	DD-STD	NONE	-	-	1.9	33.6	50	33	119	35.5	50	35	121	
			101A00	3.3/4.4	15.9/18.3		53.4/56.4	60/60	51/54	135/137	55.3/58.3	60/60	53/56	137/139	
			103B00	6.5/8.7	31.4/36.3		72.8/78.9	80/80	69/75	150/155	74.7/80.8	80/90	71/77	152/157	
			102A00,102A00	9.8/13.0	46.9/54.2		92.2/101.3	100/110	87/95	213/227	94.1/103.2	100/110	89/97	215/229	
			103B00,103B00	13.1/17.4	62.8/72.5		112.1/124.2	125/125	105/116	245/264	114.0/126.1	125/150	107/118	247/266	
			104B00,104B00	15.8/21.0	75.8/87.5		128.3/142.9	150/150	120/134	271/294	130.2/144.8	150/150	122/136	273/296	
	208/230-3-60	DD-STD	NONE	-	-	1.9	25.2	30	25	93	27.1	40	27	95	
			102A00	4.9/6.5	13.6/15.6		42.2/44.7	50/50	41/43	107/109	44.1/46.6	50/50	43/45	109/111	
			103B00	6.5/8.7	18.1/20.9		47.8/51.3	50/60	46/49	111/114	49.7/53.2	50/60	48/51	113/116	
			105A00	12.0/16.0	33.4/38.5		66.9/73.3	70/80	64/69	126/132	68.8/75.2	70/80	66/72	128/134	
				104B00,104B00	15.8/21.0	43.8/50.5		79.9/88.3	80/90	76/83	181/194	81.8/90.2	90/100	78/85	183/196
		MED	NONE	-	-	1.9	23.0	30	23	105	24.9	30	25	107	
			102A00	4.9/6.5	13.6/15.6		40.0/42.5	45/50	38/41	119/121	41.9/44.4	50/50	40/43	121/123	
			103B00	6.5/8.7	18.1/20.9		45.6/49.1	50/50	43/47	123/126	47.5/51.0	50/60	46/49	125/128	
			105A00	12.0/16.0	33.4/38.5		64.7/71.1	70/80	61/67	138/144	66.6/73.0	70/80	63/69	140/146	
				104B00,104B00	15.8/21.0	43.8/50.5		77.7/86.1	80/90	73/81	193/206	79.6/88.0	80/90	75/83	195/208
		HIGH	NONE	-	-	1.9	23.0	30	23	116	24.9	30	25	118	
			102A00	4.9/6.5	13.6/15.6		40.0/42.5	45/50	38/41	130/132	41.9/44.4	50/50	40/43	132/134	
	103B00		6.5/8.7	18.1/20.9	45.6/49.1		50/50	43/47	134/137	47.5/51.0	50/60	46/49	136/139		
	105A00		12.0/16.0	33.4/38.5	64.7/71.1		70/80	61/67	149/155	66.6/73.0	70/80	63/69	151/157		
			104B00,104B00	15.8/21.0	43.8/50.5		77.7/86.1	80/90	73/81	204/217	79.6/88.0	80/90	75/83	206/219	
	460-3-60	DD-STD	NONE	-	-	1.0	12.4	15	13	47	13.4	15	14	48	
			106A00	6.0	7.2		21.4	25	21	54	22.4	25	22	55	
			108A00	11.5	13.8		29.7	30	28	61	30.7	35	30	62	
109A00			14.0	16.8	33.4		35	32	64	34.4	35	33	65		
			108A00,108A00	23.0	27.7		47.1	50	44	102	48.1	50	46	103	
MED		NONE	-	-	1.0	11.0	15	11	52	12.0	15	12	53		
		106A00	6.0	7.2		20.0	25	19	59	21.0	25	20	60		
		108A00	11.5	13.8		28.3	30	27	66	29.3	30	28	67		
		109A00	14.0	16.8		32.0	35	30	69	33.0	35	31	70		
			108A00,108A00	23.0	27.7		45.7	50	43	107	46.7	50	44	108	
HIGH		NONE	-	-	1.0	11.0	15	11	58	12.0	15	12	59		
		106A00	6.0	7.2		20.0	25	19	65	21.0	25	20	66		
	108A00	11.5	13.8	28.3		30	27	72	29.3	30	28	73			
	109A00	14.0	16.8	32.0		35	30	75	33.0	35	31	76			
		108A00,108A00	23.0	27.7		45.7	50	43	113	46.7	50	44	114		
575-3-60	DD-STD	NONE	-	-	1.9	10.3	15	11	39	12.2	15	13	41		
	MED	NONE	-	-	1.9	8.7	15	9	42	10.6	15	11	44		
	HIGH	NONE	-	-	1.9	8.3	15	8	46	10.2	15	10	48		

**NOTE:** See legend and notes following tables.

**Table 3 — Unit Wire/Fuse or HACR Breaker Sizing Data (cont)**

UNIT	NO M. V—Ph—HZ	IFM TYPE	ELEC. HTR			P.E.	NO C.O. or UNPWR C.O.							
			CRHEATER***	NOM (KW)	FLA	FLA	NO P.E.				w/P.E. (pwrd fr/unit)			
							MCA	FUSE or HACR BRKR	DISC. SIZE		MCA	FUSE or HACR BRKR	DISC. SIZE	
									FLA	LRA			FLA	LRA
RH060	208/230—1—60	DD—STD	NONE	—	—	—	40.1	60	39	144	42.0	60	41	146
			102A00	4.9/6.5	23.5/27.1	1.9	69.4/73.9	80/80	66/70	168/171	71.3/75.8	80/80	68/72	170/173
			103B00	6.5/8.7	31.4/36.3	1.9	79.3/85.4	80/100	75/81	175/180	81.2/87.3	90/100	77/83	177/182
			102A00,102A00	9.8/13.0	46.9/54.2	1.9	98.7/107.8	100/110	93/101	238/252	100.6/109.7	110/110	95/103	240/254
			103B00,103B00	13.1/17.4	62.8/72.5	1.9	118.6/130.7	125/150	111/122	270/289	120.5/132.6	125/150	113/124	272/291
			104B00,104B00	15.8/21.0	75.8/87.5	1.9	134.8/149.4	150/150	126/139	296/319	136.7/151.3	150/175	128/142	298/321
	208/230—3—60	DD—STD	NONE	—	—	—	28.7	40	28	120	30.6	45	31	122
			102A00	4.9/6.5	13.6/15.6	1.9	45.7/48.2	50/60	44/46	134/136	47.6/50.1	60/60	46/49	136/138
			104B00	7.9/10.5	21.9/25.3	1.9	56.1/60.3	60/70	54/58	142/145	58.0/62.2	60/70	56/60	144/147
			105A00	12.0/16.0	33.4/38.5	1.9	70.4/76.8	80/80	67/73	153/159	72.3/78.7	80/80	69/75	155/161
			104B00,104B00	15.8/21.0	43.8/50.5	1.9	83.4/91.8	90/100	79/86	208/221	85.3/93.7	90/100	81/89	210/223
			104B00,105A00	19.9/26.5	55.2/63.8	1.9	97.7/108.4	100/110	92/102	230/248	99.6/110.3	100/125	94/104	232/250
		MED	NONE	—	—	—	26.5	40	26	143	28.4	40	28	145
			102A00	4.9/6.5	13.6/15.6	1.9	43.5/46.0	50/50	42/44	157/159	45.4/47.9	50/50	44/46	159/161
			104B00	7.9/10.5	21.9/25.3	1.9	53.9/58.1	60/60	51/55	165/168	55.8/60.0	60/60	53/57	167/170
			105A00	12.0/16.0	33.4/38.5	1.9	68.2/74.6	70/80	64/70	176/182	70.1/76.5	80/80	66/72	178/184
			104B00,104B00	15.8/21.0	43.8/50.5	1.9	81.2/89.6	90/90	76/84	231/244	83.1/91.5	90/100	78/86	233/246
			104B00,105A00	19.9/26.5	55.2/63.8	1.9	95.5/106.2	100/110	89/99	253/271	97.4/108.1	100/110	92/101	255/273
		HIGH	NONE	—	—	—	28.8	40	29	169	30.7	45	31	171
			102A00	4.9/6.5	13.6/15.6	1.9	45.8/48.3	50/60	44/46	183/185	47.7/50.2	60/60	46/49	185/187
			104B00	7.9/10.5	21.9/25.3	1.9	56.2/60.4	60/70	54/58	191/194	58.1/62.3	60/70	56/60	193/196
			105A00	12.0/16.0	33.4/38.5	1.9	70.5/76.9	80/80	67/73	202/208	72.4/78.8	80/80	69/75	204/210
			104B00,104B00	15.8/21.0	43.8/50.5	1.9	83.5/91.9	90/100	79/87	257/270	85.4/93.8	90/100	81/89	259/272
			104B00,105A00	19.9/26.5	55.2/63.8	1.9	97.8/108.5	100/110	92/102	279/297	99.7/110.4	100/125	94/104	281/299
460—3—60	DD—STD	NONE	—	—	—	13.6	20	14	58	14.6	20	15	59	
		106A00	6.0	7.2	1.0	22.6	25	22	65	23.6	25	23	66	
		108A00	11.5	13.8	1.0	30.8	35	29	72	31.8	35	31	73	
		109A00	14.0	16.8	1.0	34.6	35	33	75	35.6	40	34	76	
		108A00,108A00	23.0	27.7	1.0	48.2	50	45	113	49.2	50	47	114	
		108A00,109A00	25.5	30.7	1.0	51.9	60	49	119	52.9	60	50	120	
	MED	NONE	—	—	—	12.2	15	12	69	13.2	20	13	70	
		106A00	6.0	7.2	1.0	21.2	25	20	76	22.2	25	21	77	
		108A00	11.5	13.8	1.0	29.4	30	28	83	30.4	35	29	84	
		109A00	14.0	16.8	1.0	33.2	35	31	86	34.2	35	32	87	
		108A00,108A00	23.0	27.7	1.0	46.8	50	44	124	47.8	50	45	125	
		108A00,109A00	25.5	30.7	1.0	50.5	60	47	130	51.5	60	48	131	
	HIGH	NONE	—	—	—	13.0	15	13	82	14.0	20	14	83	
		106A00	6.0	7.2	1.0	22.0	25	21	89	23.0	25	22	90	
		108A00	11.5	13.8	1.0	30.2	35	29	96	31.2	35	30	97	
		109A00	14.0	16.8	1.0	34.0	35	32	99	35.0	35	33	100	
		108A00,108A00	23.0	27.7	1.0	47.6	50	45	137	48.6	50	46	138	
		108A00,109A00	25.5	30.7	1.0	51.3	60	48	143	52.3	60	49	144	
575—3—60	DD—STD	NONE	—	—	1.9	11.2	15	11	46	13.1	15	14	48	
	MED	NONE	—	—	1.9	9.2	15	9	53	11.1	15	11	55	
	HIGH	NONE	—	—	1.9	10.0	15	10	64	11.9	15	12	66	

**NOTE:** See legend and notes following tables.

## Legend and Notes for Table 3

### LEGEND:

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

### NOTES:

- 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.
- Unbalanced 3-Phase Supply Voltage**  
Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percentage of voltage imbalance.

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



Example: Supply voltage is 230-3-60



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

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

Determine maximum deviation from average voltage.

$$(AB) 227 - 224 = 3 \text{ v}$$

$$(BC) 231 - 227 = 4 \text{ v}$$

$$(AC) 227 - 226 = 1 \text{ v}$$

Maximum deviation is 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.

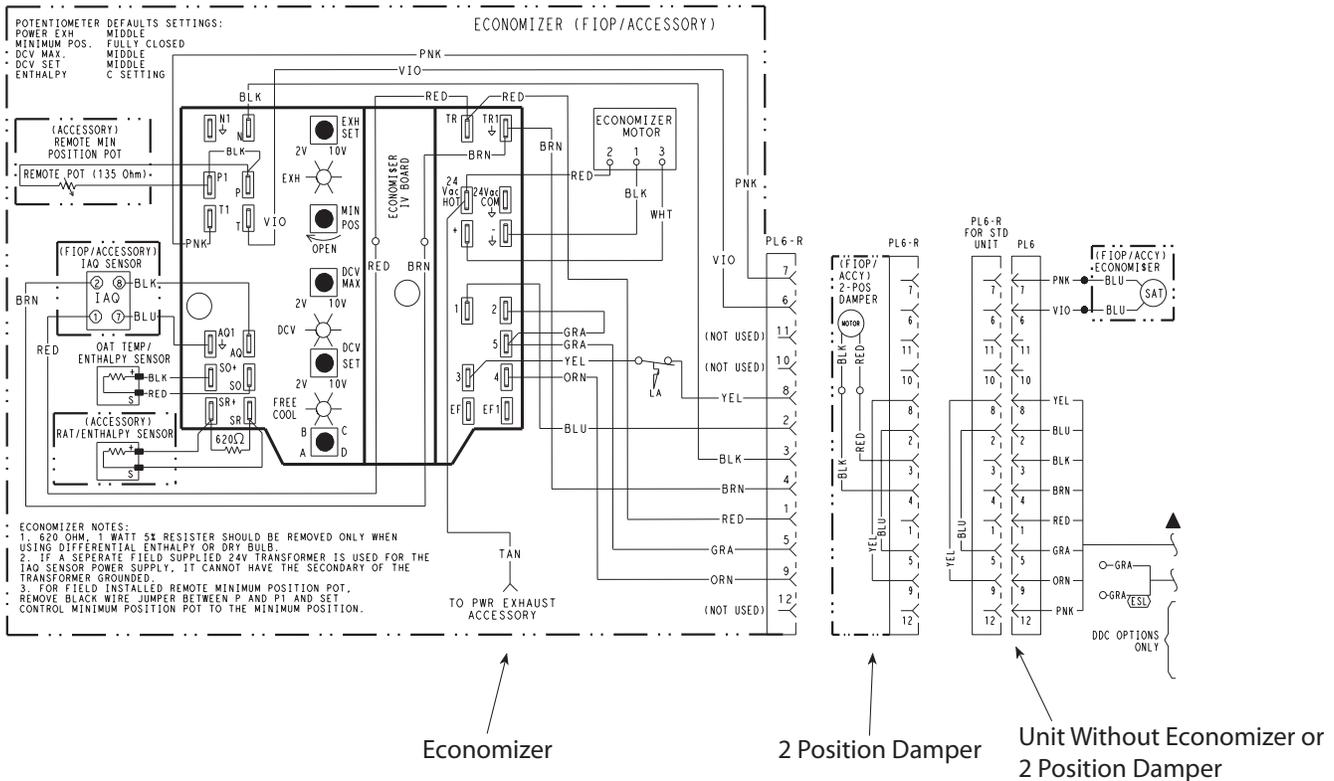


Fig. 30 - Wiring for optional Economizer

C08631

## Step 11 — Adjust Factory-Installed Options

### Smoke Detectors —

Smoke detector(s) will be connected at the Central Terminal Board (CTB), at terminals marked "Smoke Shutdown". Remove jumper JMP 3 when ready to energize unit.

### Economizer Occupancy Switch —

Refer to Fig. 30 for general Economizer wiring. External occupancy control is managed through a connection on the Central Terminal Board.

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

## Step 12 — Install Accessories

Available accessories include:

- Roof Curb
- Thru-base connection kit (must be installed before unit is set on curb)
- Manual outside air damper
- Two-Position motorized outside air damper
- Economizer (with control and integrated barometric relief)
- Power Exhaust
- Differential dry-bulb sensor (Economizer)
- Outdoor enthalpy sensor
- Differential enthalpy sensor
- Electric Heaters
- Single Point kits
- Thermostat / Sensors
- CO<sub>2</sub> sensor
- Louvered hail guard
- Phase monitor control

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

## Pre-Start and Start-Up

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



