

# INSTALLATION INSTRUCTIONS

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

### RHX036-060

**NOTE:** Read the entire instruction manual before starting the installation

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## SAFETY CONSIDERATIONS

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

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloths for brazing operations and have a fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local building codes and appropriate national electrical codes (in USA, ANSI/NFPA 70, 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 lock(s) and lockout tag(s). 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.

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.

### WARNING

#### PERSONAL INJURY AND ENVIRONMENTAL HAZARD

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

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

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

### CAUTION

#### CUT HAZARD

Failure to follow this caution may result in personal injury.

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

## Rated Indoor Airflow (cfm)

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

| Model Number | Full Load Airflow (cfm) |
|--------------|-------------------------|
| RHX036       | 1225                    |
| RHX048       | 1700                    |
| RHX060       | 1750                    |

## MODEL NOMENCLATURE

| MODEL SERIES                                                                                                                                                                                                                                                                                                                                                              | R | H    | X          | 0                        | 3 | 6 | H | D                | A                         | A  | 0                             | A                                         | A                 | A  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------|------------|--------------------------|---|---|---|------------------|---------------------------|----|-------------------------------|-------------------------------------------|-------------------|----|
| Position Number                                                                                                                                                                                                                                                                                                                                                           | 1 | 2    | 3          | 4                        | 5 | 6 | 7 | 0                | 9                         | 10 | 11                            | 12                                        | 13                | 14 |
| R = Rooftop                                                                                                                                                                                                                                                                                                                                                               |   |      |            |                          |   |   |   |                  |                           |    |                               |                                           |                   |    |
| H = Heat Pump                                                                                                                                                                                                                                                                                                                                                             |   | Type |            |                          |   |   |   |                  |                           |    |                               |                                           |                   |    |
| X = Standard 14 SEER Efficiency                                                                                                                                                                                                                                                                                                                                           |   |      | Efficiency |                          |   |   |   |                  |                           |    |                               |                                           |                   |    |
| 036 = 3 Tons<br>048 = 4 Tons<br>060 = 5 Tons                                                                                                                                                                                                                                                                                                                              |   |      |            | Nominal Cooling Capacity |   |   |   |                  |                           |    |                               |                                           |                   |    |
| K = 208/230-1-60<br>H = 208/230-3-60<br>L = 460-3-60<br>S = 575-3-60                                                                                                                                                                                                                                                                                                      |   |      |            |                          |   |   |   | Voltage          |                           |    |                               |                                           |                   |    |
| 0 = No Heat (Field Installed electric heaters available)                                                                                                                                                                                                                                                                                                                  |   |      |            |                          |   |   |   | Heating Capacity |                           |    |                               |                                           |                   |    |
| A = Standard Motor<br>B = High Static Motor<br>C = Medium Static Motor<br>X = Direct Drive ECM                                                                                                                                                                                                                                                                            |   |      |            |                          |   |   |   |                  | Motor Option (Indoor Fan) |    |                               |                                           |                   |    |
| A = None<br>B = Economizer w/Bara-relief, OA Temp sensor<br>E = Economizer w/Bara-relief + CO2 Sensor, OA Temp sensor<br>H = Economizer w/Bara-relief, enthalpy sensor<br>L = Economizer w/Bara-relief + CO2 Sensor, enthalpy sensor<br>U = Temp Ultra Low Leak Economizer w/Bara-relief<br>W = Enthalpy Ultra Low Leak Economizer w/Bara-relief<br>P = 2-Position damper |   |      |            |                          |   |   |   |                  |                           |    | Outdoor Air Options / Control |                                           |                   |    |
| 0A = No Options<br>AT = Non-powered 115v C.O.<br>4B = Non-Fused Disconnect<br>BR = Supply Air Smoke Detector<br>AA = Easy Access Hinged Panels                                                                                                                                                                                                                            |   |      |            |                          |   |   |   |                  |                           |    |                               | Factory Installed Options <sup>1</sup>    |                   |    |
| A = Aluminum / Copper Cond & Evap Coil<br>B = Precoat Alum/Copper Cond with Alum / Copper Evap (3 phase only)<br>C = E-Coated Alum/Copper Cond with Alum / Copper Evap (3 phase only)<br>D = E-Coated Alum / Copper Cond & Evap (3 phase only)<br>E = Copper/Copper Cond & Alum/Copper Evap (3 phase only)<br>F = Copper/Copper Cond & Evap (3 phase only)                |   |      |            |                          |   |   |   |                  |                           |    |                               | Condenser / Evaporator Coil Configuration |                   |    |
| A = Standard Single Speed Indoor Fan Motor. For W7212 Controls<br>B = Standard Single Speed Indoor Fan Motor. For W7220 Controls                                                                                                                                                                                                                                          |   |      |            |                          |   |   |   |                  |                           |    |                               |                                           | Motor Type Option |    |

**NOTE:** Factory installed options are NOT available on single phase models. This includes economizers and 2 position dampers.

<sup>1</sup>Combinations of FIOPS are available.

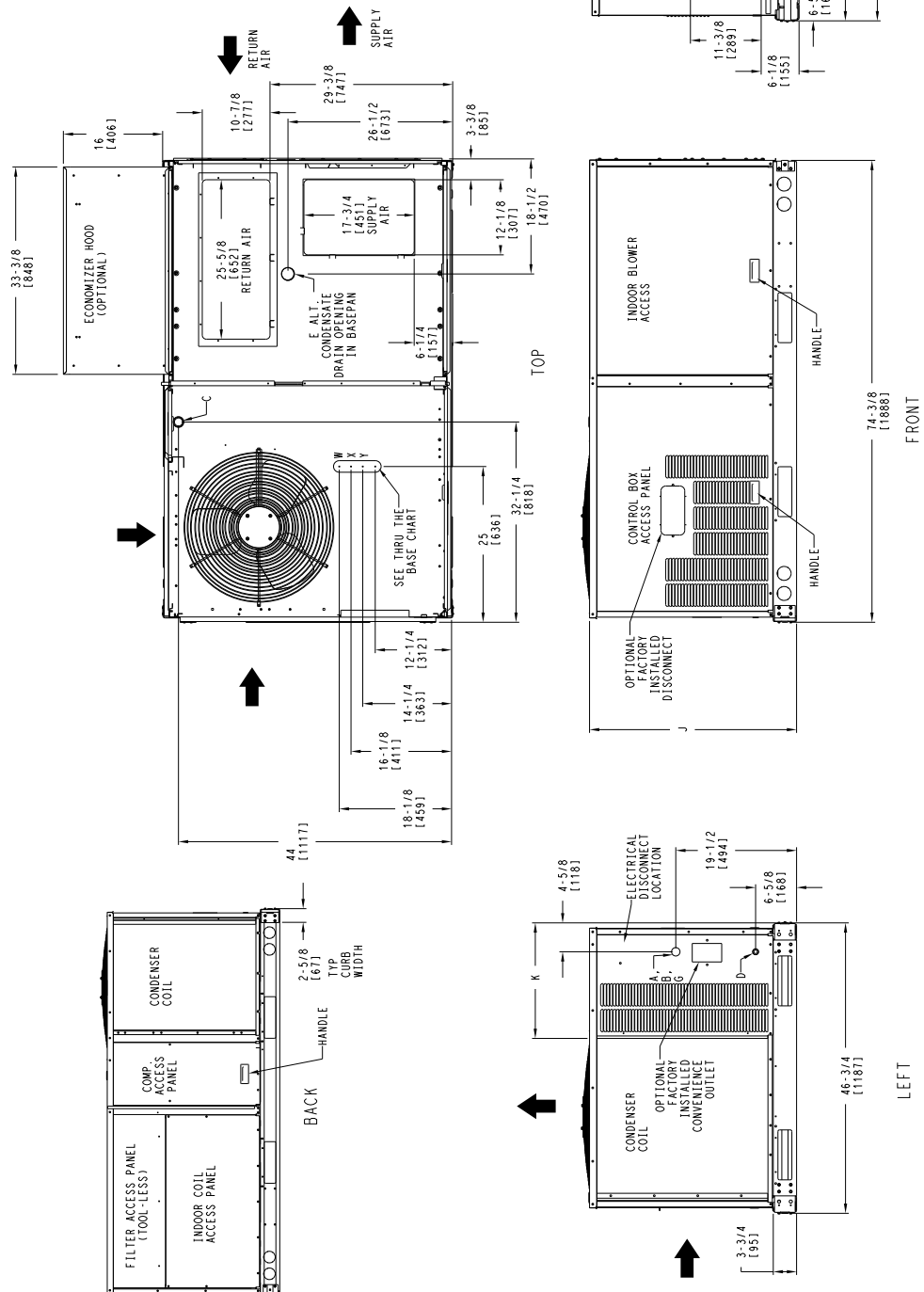
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| UNIT    | J                | K               |
|---------|------------------|-----------------|
| RHX 036 | 33 3/8<br>[847]  | 14 7/8<br>[377] |
| RHX 048 | 41 3/8<br>[1051] | 14 7/8<br>[377] |
| RHX 060 | 41 3/8<br>[1051] | 14 7/8<br>[377] |

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

|   | 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<br>THESE ARE REQUIRED FOR USE<br>C8B4W00100101           |                                                                 |                          |                            |  |
|--------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------|----------------------------|--|
|                                                                                | THREADED<br>CONDUIT SIZE                                        | WIRE<br>USE SIZES (MAX.) | REQ'D HOLE<br>SIZES (MAX.) |  |
| W                                                                              | 1/2"                                                            | ACC. 7/8" [22.2]         | 7/8" [22.2]                |  |
| X                                                                              | 1/2"                                                            | 24V 1/2"                 | 1/2"                       |  |
| Y *                                                                            | 3/4" (001)                                                      | POWER 1 1/8" [28.4]      | 1 1/8" [28.4]              |  |
| FOR "THE BASE-PLAN" FACTORY OPTION,<br>FITTINGS FOR ONLY X & Y ARE<br>PROVIDED |                                                                 |                          |                            |  |
| *                                                                              | SELECT EITHER 3/4" OR 1/2"<br>FOR POWER, DEPENDING ON WIRE SIZE |                          |                            |  |

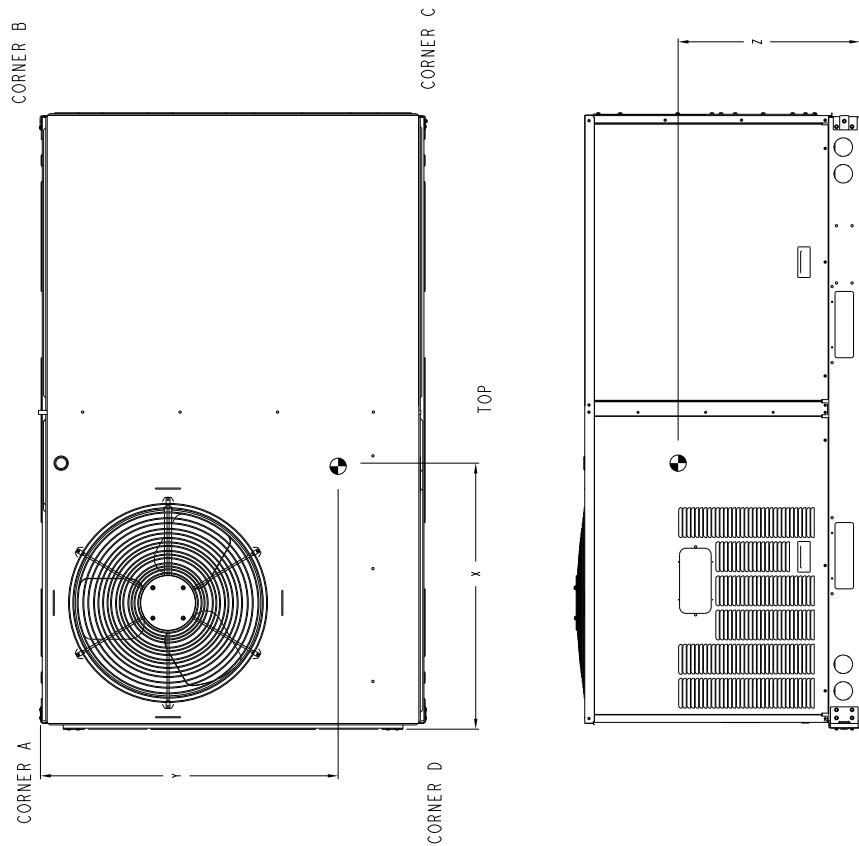


| SHEET  | DATE     | SUPPERDSS | REV        |
|--------|----------|-----------|------------|
| 1 OF 2 | 00-16-14 | -         | 48KC000289 |

**Fig. 1 - Unit Dimensional Drawing**

| UNIT    | STD. WEIGHT<br>LBS. / KG. | CORNER WEIGHT (A)<br>LBS. / KG. | CORNER WEIGHT (B)<br>LBS. / KG. | CORNER WEIGHT (C)<br>LBS. / KG. | CORNER WEIGHT (D)<br>LBS. / KG. | C.G.         |              |              | HEIGHT |
|---------|---------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|--------------|--------------|--------------|--------|
|         |                           |                                 |                                 |                                 |                                 |              | X            | Y            | Z      |
| RHX 036 | 495                       | 130                             | 53                              | 118                             | 53                              | 35 3/8 [898] | 23 3/8 [594] | 18 3/8 [467] |        |
| RHX 048 | 580                       | 161                             | 73                              | 147                             | 66                              | 35 1/2 [902] | 21 7/8 [555] | 20 1/2 [521] |        |
| RHX 060 | 610                       | 276                             | 165                             | 152                             | 69                              | 35 3/4 [908] | 22 1/2 [571] | 20 3/4 [527] |        |

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

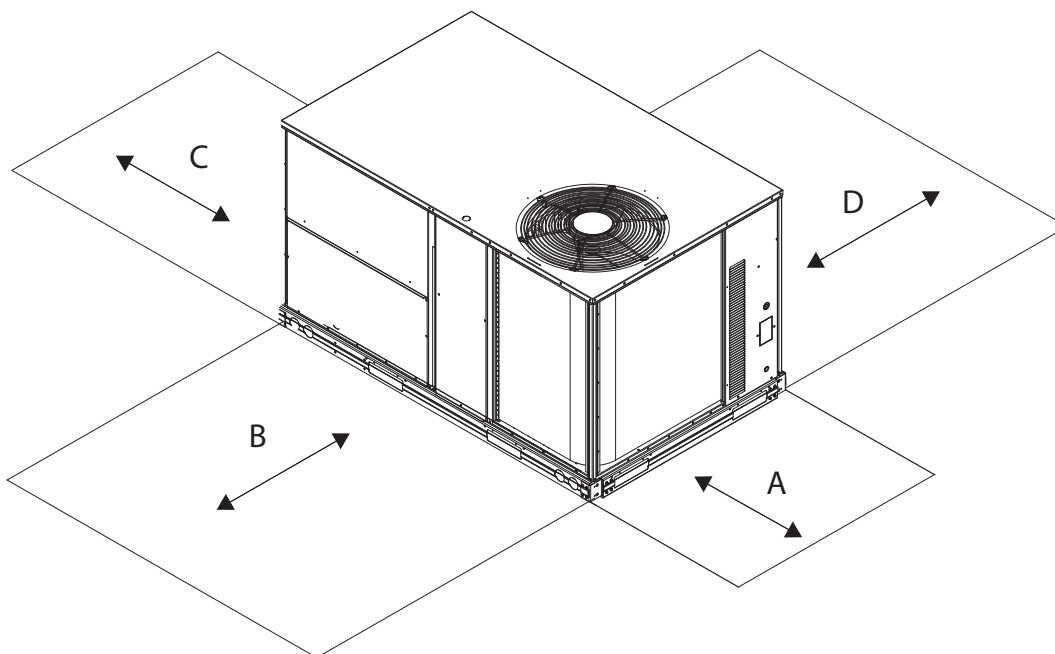


FRONT

|                 |                  |                |                                               |            |          |
|-----------------|------------------|----------------|-----------------------------------------------|------------|----------|
| SHEET<br>2 OF 2 | DATE<br>09-16-14 | SUPERCEDS<br>- | RHX 036-060 SINGLE-ZONE ELECTRIC<br>HEAT PUMP | 48KC000289 | REV<br>- |
|-----------------|------------------|----------------|-----------------------------------------------|------------|----------|

Fig. 1 - Unit Dimensional Drawing (cont.)

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| LOCATION | DIMENSION                                                             | CONDITION                                                                                                                                                                                                                                                                |
|----------|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A        | 48-in (1219 mm)<br>18-in (457 mm)<br>18-in (457 mm)<br>12-in (305 mm) | Unit disconnect is mounted on panel<br>No disconnect, convenience outlet option<br>Recommended service clearance<br>Minimum clearance                                                                                                                                    |
| B        | 42-in (1067 mm)<br>36-in (914 mm)<br>Special                          | Surface behind servicer is grounded (e.g., metal, masonry wall)<br>Surface behind servicer is electrically non-conductive (e.g., wood, fiberglass)<br>Check sources of flue products within 10-ft of unit fresh air intake hood                                          |
| C        | 36-in (914 mm)<br>18-in (457 mm)                                      | Side condensate drain is used<br>Minimum clearance                                                                                                                                                                                                                       |
| D        | 42-in (1067 mm)<br>36-in (914 mm)<br>Special                          | Surface behind servicer is grounded (e.g., metal, masonry wall, another unit)<br>Surface behind servicer is electrically non-conductive (e.g., wood, fiberglass)<br>Check for adjacent units or building fresh air intakes within 10-ft (3 m) of this unit's flue outlet |

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

**Fig. 2 - Service Clearance Dimensional Drawing**

## 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 minimum clearances required for safety (including 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.

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

Select a unit mounting system that provides adequate height to allow installation of condensate trap per requirements. Refer to Step 10 — 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.

#### 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.

**Table 1 – Operating Weights**

| RHX              | UNITS LB (KG) | UNITS LB (KG) | UNITS LB (KG) |
|------------------|---------------|---------------|---------------|
|                  | 036           | 048           | 060           |
| Base Unit        | 495 (224)     | 580 (263)     | 610 (276)     |
| Economizer       |               |               |               |
| Vertical         | 50 (23)       | 50 (23)       | 50 (23)       |
| Horizontal       | 80 (36)       | 80 (36)       | 80 (36)       |
| Cu Fins          | 25 (11)       | 43 (20)       | 56 (25)       |
| Unpowered Outlet | 5 (2)         | 5 (2)         | 5 (2)         |
| Curb             |               |               |               |
| 14-in/356 mm     | 115 (52)      | 115 (52)      | 115 (52)      |
| 24-in/610 mm     | 197 (89)      | 197 (89)      | 197 (89)      |

**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 10 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**

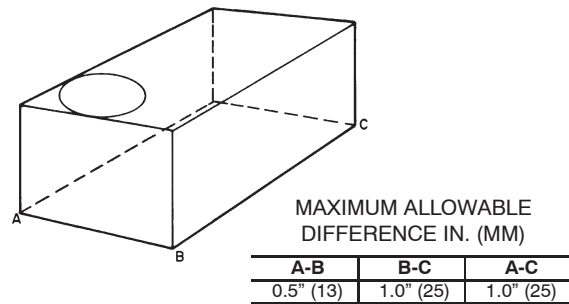
Inspect unit for transportation damage. File any claim with transportation agency.

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. 4. 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. 3. Refer to Accessory Roof Curb Installation Instructions for additional information as required.



C06110

**Fig. 3 - Unit Leveling Tolerances**

Install insulation, cant strips, roofing felt, and counter flashing as shown. *Ductwork must be attached to curb and not to the unit. 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.

**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. 4. 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.



## 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.*

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

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

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

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

### ⚠ CAUTION

#### PROPERTY DAMAGE HAZARD

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

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

## For Units with Accessory Electric Heaters —

All installations require a minimum clearance to combustible surfaces of 1-in (25 mm) from duct for first 12-in (305 mm) away from unit.

Outlet grilles must not lie directly below unit discharge.

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

### ⚠ WARNING

#### PERSONAL INJURY HAZARD

Failure to follow this warning could cause personal injury.

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

## Step 6 — Rig and Place Unit

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

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

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

→ Rigging materials under unit (cardboard or wood to prevent base pan damage) must be removed PRIOR to placing the unit on the roof curb.

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 plug can be tightened with a 1/2-in. square socket drive extension. For further details see “Step 10 - Install External Condensate Trap and Line” on page 12.

### ⚠ 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.

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

## 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 1/4 in. (6.4 mm).

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

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

# ⚠ **CAUTION - NOTICE TO RIGGERS:** ⚠ **AVERTISSEMENT - REMARQUE À L'ATTENTION DES MONTEURS**

**ALL PANELS MUST BE IN PLACE WHEN RIGGING.**  
**TOUS LES CAPOTS DOIVENT ÊTRE EN PLACE AVANT LE LEVAGE**

- Hook rigging shackles through holes in base rail, as shown in detail "A".
- Use wooden top skid, when rigging, to prevent rigging straps from damaging unit.
- Spreader bars required to lift and transport the unit.
- Accrocher les manilles des élingues de levages dans les trous situés dans le rail de base comme indiqué au détail « A ».
- Utiliser des cales en bois lors du levage pour éviter que les élingues n'endommagent le haut de l'appareil.
- Barres d'écartement requises pour soulever et transporter l'unité.

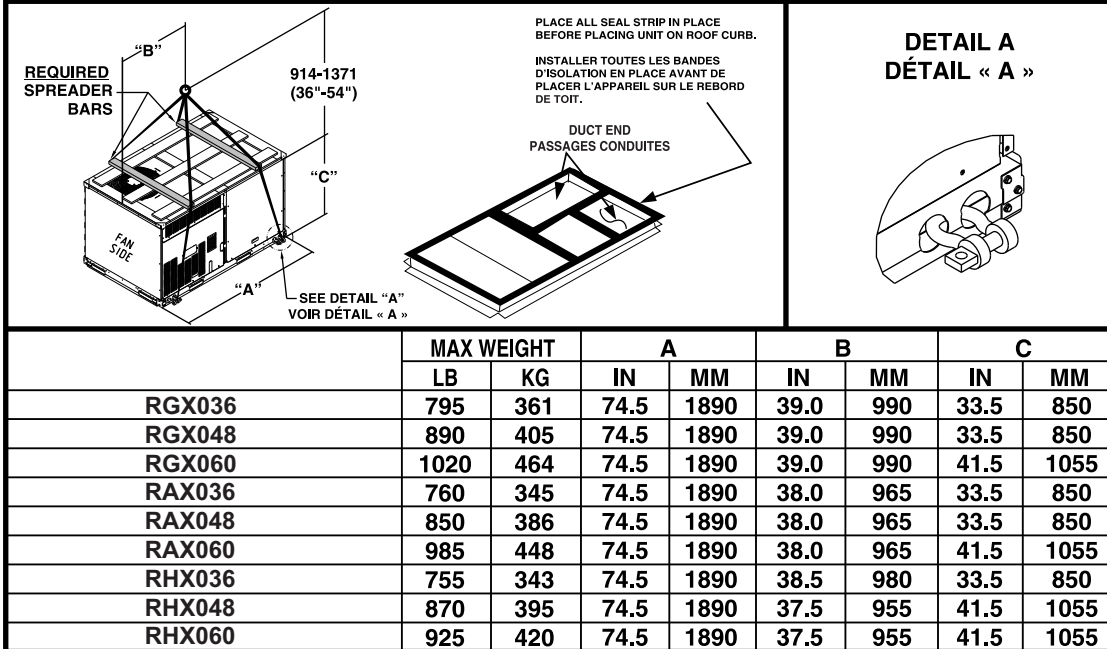


Fig. 5 - Rigging Label

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## **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.

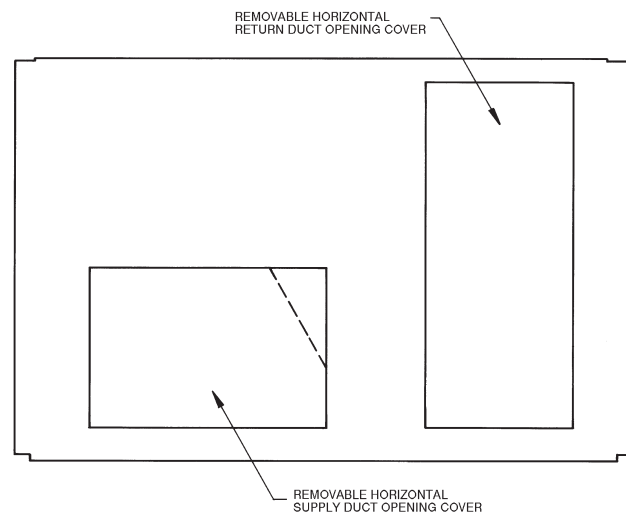


Fig. 6 - Horizontal Conversion Panels

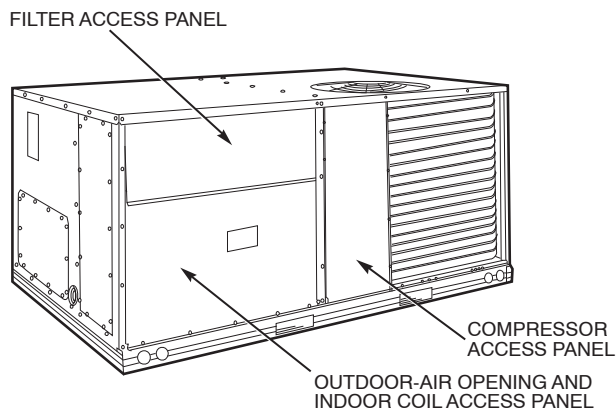
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## Step 8 — Install Outside Air Hood

### Economizer and Two Position Damper Hood Package Removal and Setup - Factory Option

**NOTE:** Economizer and Two Position Damper are not available as factory installed options for size 04-06 single phase (-3 voltage code) models.

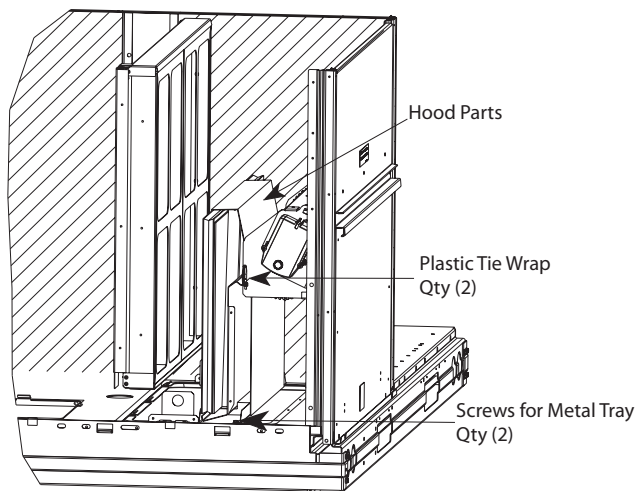
1. The hood is shipped in knock-down form and must be field assembled. The indoor coil access panel is used as the hood top while the hood sides, divider and filter are packaged together, attached to a metal support tray using plastic stretch wrap, and shipped in the return air compartment behind the indoor coil access panel. The hood 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.)



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

C06023

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. 8) Be careful to not damage any wiring or cut tie-wraps securing any wiring.



**Fig. 8 - Economizer and Two-Position Damper  
Hood Parts Location**

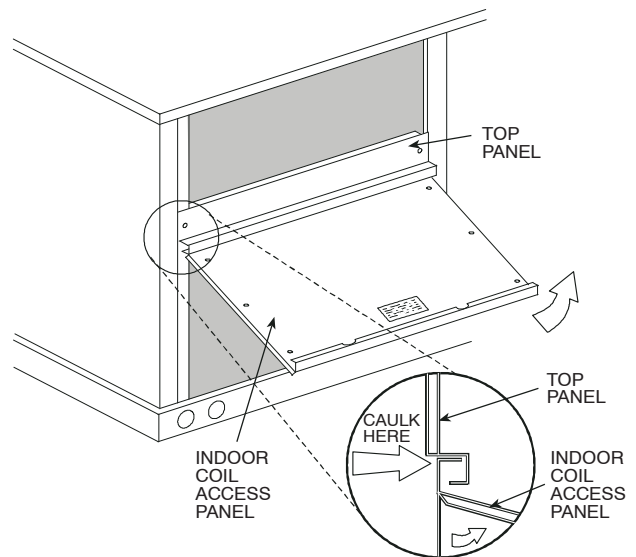
C08639

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*, below.

### 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.

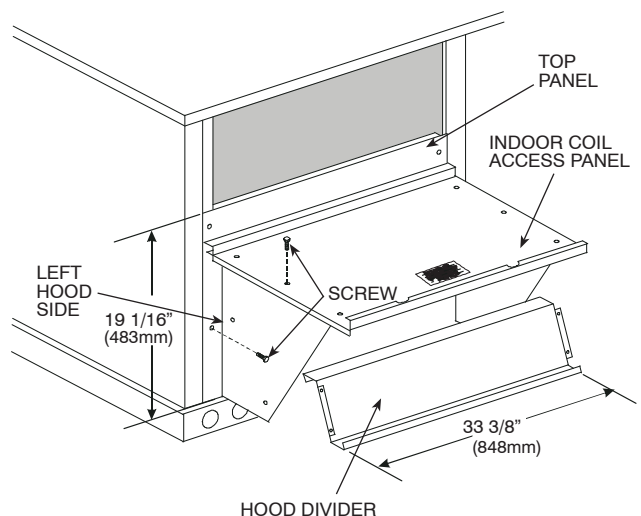
1. The indoor coil access panel will be used as the top of the hood. Remove the screws along the sides and bottom of the indoor coil access panel. See Fig. 9.



C06025

**Fig. 9 - 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. 10.

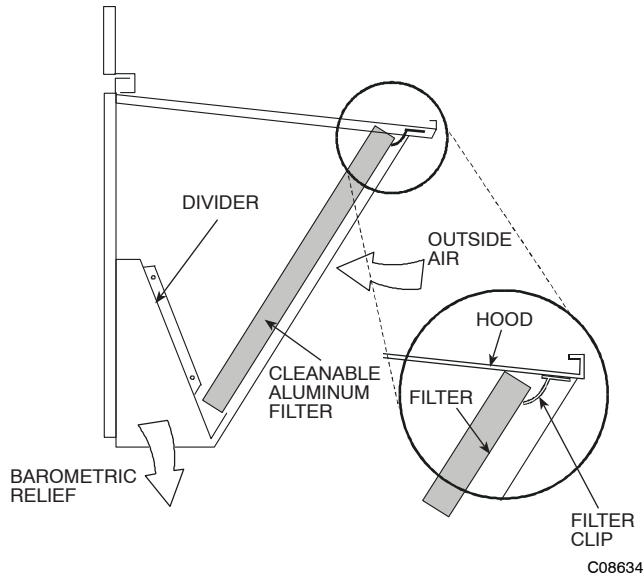


C06026

**Fig. 10 - Economizer Hood Construction**

3. Remove the shipping tape holding the economizer barometric relief damper in place (economizer only).

4. Insert the hood divider between the hood sides. See Fig. 10 and Fig. 11. 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. 11.
6. Caulk the ends of the joint between the unit top panel and the hood top.
7. Replace the filter access panel.

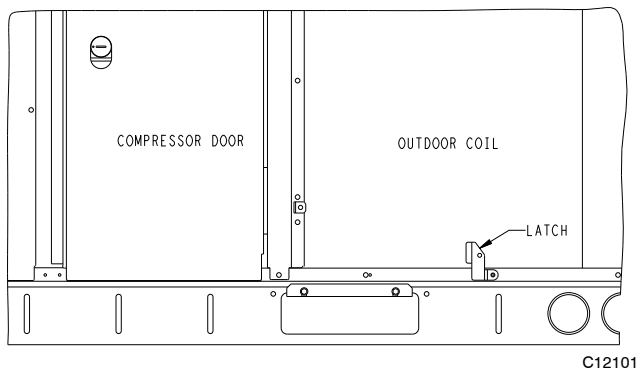


**Fig. 11 - Economizer Filter Installation**

### Step 9 — Units with Hinged Panels Only

Relocate latch shipped inside the compressor compartment behind the hinged compressor door to location shown in Fig. 12 after unit installation.

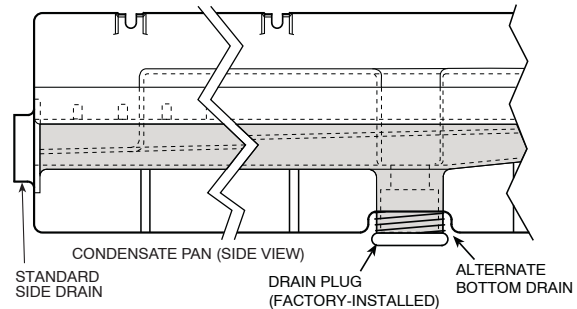
If the unit does not have hinged panels, skip this step and continue at step 10.



**Fig. 12 - Compressor Door Latch Location**

### Step 10 — Install External Condensate Trap and Line

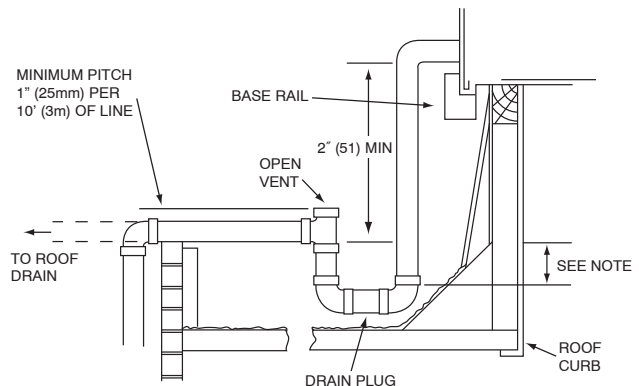
The unit has one  $\frac{3}{4}$ -in. condensate drain connection on the end of the condensate pan and an alternate connection on the bottom. See Fig. 13. Unit airflow configuration does not determine which drain connection to use. Either drain connection can be used with vertical or horizontal applications.



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

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.

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



**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 ( $\frac{3}{4}$ -in.).*

## Step 11 — Make Electrical Connections

### ⚠ WARNING

#### ELECTRICAL SHOCK HAZARD

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

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; ANSI/NFPA 70, latest edition (in Canada, Canadian Electrical Code CSA [Canadian Standards Association] C22.1), and local electrical codes.

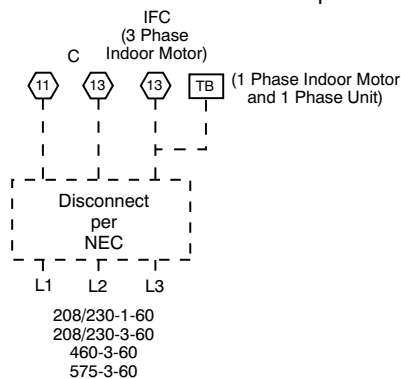
**NOTE:** Field-supplied wiring shall conform with the limitations of minimum 63°F (33°C) rise.

#### Field Power Supply —

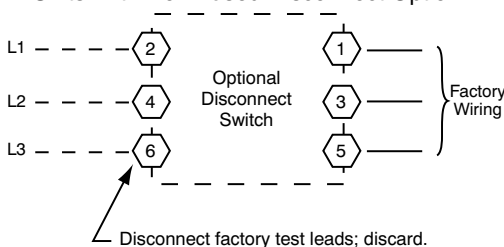
Field power wires are connected to the unit at line-side pressure lugs on compressor contactor C and indoor fan contactor IFC (see wiring diagram label for control box component arrangement) or at factory-installed option non-fused disconnect switch. Max wire size is #2 AWG (copper only). See Fig. 15 and unit label diagram for field power wiring connections.

**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 Non-Fused Disconnect Option



#### Units With Non-Fused Disconnect Option



C14264

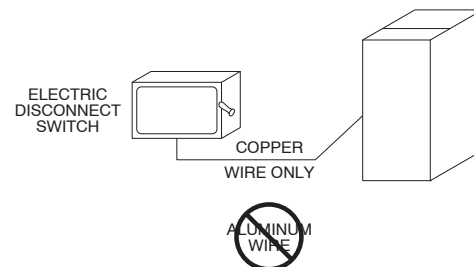
**Fig. 15 - Power Wiring Connections**

### ⚠ 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 RHX unit. Use only copper wire. (See Fig. 16.)



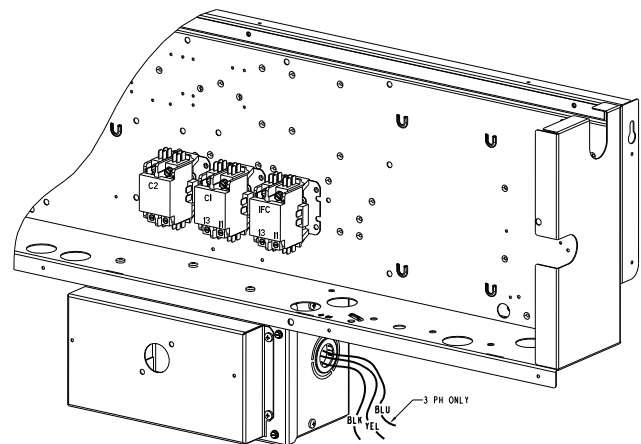
A93033

**Fig. 16 - Disconnect Switch and Unit**

#### Units with Factory-Installed Non-Fused Disconnect —

The factory-installed option non-fused disconnect (NFD) switch is located in a weatherproof enclosure located under the main control box. The manual switch handle and shaft are shipped in the disconnect enclosure. Assemble the shaft and handle to the switch at this point. Discard the factory test leads (see Fig. 15).

Connect field power supply conductors to LINE side terminals when the switch enclosure cover is removed to attach the handle.



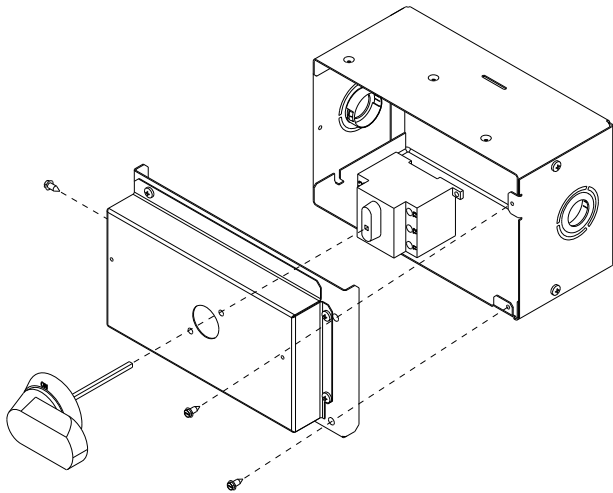
C12284

**Fig. 17 - Location of Non-Fused Disconnect Enclosure**

#### To field install the NFD shaft and handle:

1. Remove the unit front pane (see Fig. 1).
2. Remove (3) hex screws on the NFD enclosure - (2) on the face of the cover and (1) on the left side cover.
3. Remove the front cover of the NFD enclosure.
4. Make sure the NFD shipped from the factory is at OFF position (the arrow on the black handle knob is at OFF).
5. Insert the shaft with the cross pin on the top of the shaft in the horizontal position.

6. Measure from the tip of the shaft to the top surface of the black pointer; the measurement should be 3.75 – 3.88 in. (95 – 99 mm).
7. Tighten the locking screw to secure the shaft to the NFD.
8. Turn the handle to the OFF position with red arrow pointing at OFF.
9. Install the handle on to the painted cover horizontally with the red arrow pointing to the left.
10. Secure the handle to the painted cover with (2) screws and lock washers supplied.
11. Engaging the shaft into the handle socket, re-install (3) hex screws on the NFD enclosure.
12. Re-install the unit front panel.



C12279

**Fig. 18 - Handle and Shaft Assembly for NFD**

#### **Units Without Factory-Installed Non-Fused Disconnect —**

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

#### **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 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 (copper only) per pole on contactors.

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.

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 200-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.

**NOTE:** Check all factory and field electrical connections for tightness.

## **⚠ WARNING**

### **ELECTRICAL OPERATION HAZARD**

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

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

**Convenience Outlets — Non-powered -** 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.

**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.

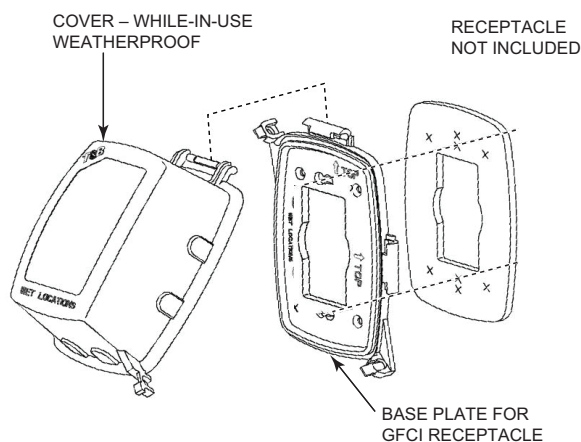
The weatherproof cover kit is shipped in the unit's control box. The kit includes the hinged cover, a backing plate and gasket.

**DISCONNECT ALL POWER TO UNIT AND CONVENIENCE OUTLET. LOCK-OUT AND TAG-OUT ALL POWER.**

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. 19. 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.



**Fig. 19 - Weatherproof Cover Installation**

C09022

### 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. 15.

Voltage to compressor terminals during operation must be within voltage range indicated on unit nameplate. See Tables 3 - 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 Tables 3 - 5, 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 warranty.

### Field Control Wiring —

The RHX unit requires an external temperature control device. This device can be a thermostat.

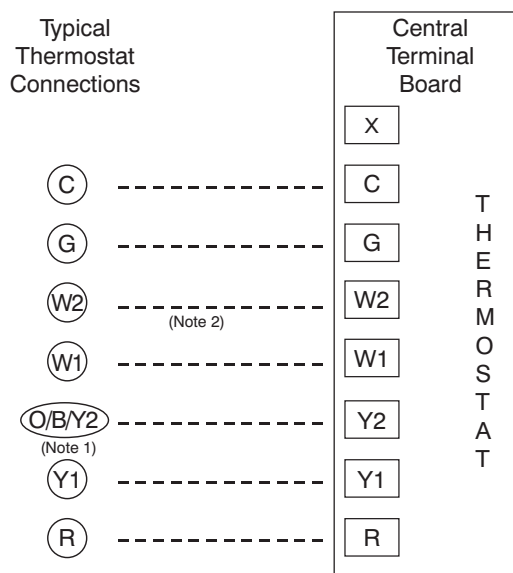
### Thermostat —

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

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

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

For wire runs up to 50 ft. (15 m), use no. 18 AWG (American Wire Gage) insulated wire [35°C (95°F) minimum]. For 50 to 75 ft. (15 to 23 m), use no. 16 AWG insulated wire [35°C (95°F) minimum]. For over 75 ft. (23 m), use no. 14 AWG insulated wire [35°C (95°F) 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

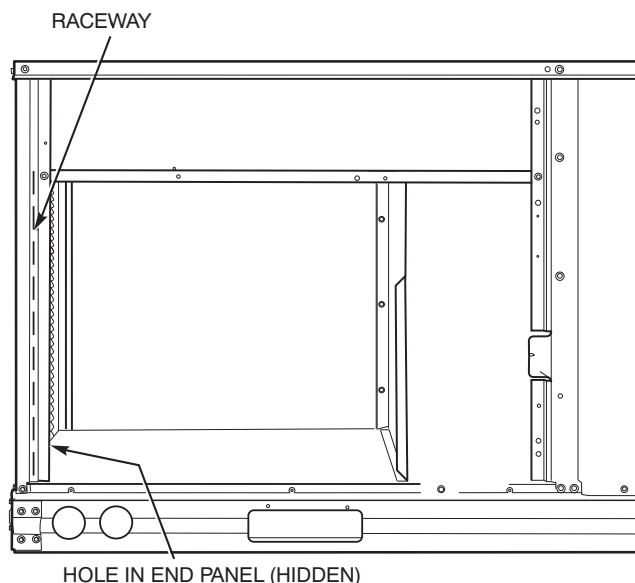
C09012

**Fig. 20 - Low-Voltage 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 Controls Connection Board. See Fig. 21.

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



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

C08027

### 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.

**Electric Heaters**

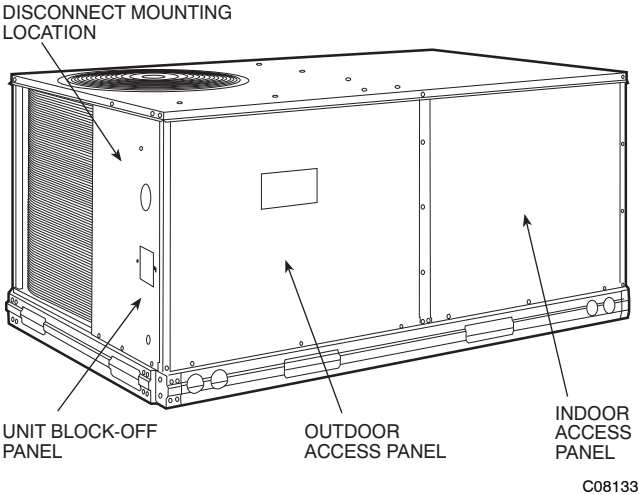
RHX units may be equipped with field-installed accessory electric heaters. The heaters are modular in design, with heater frames holding open coil resistance wires strung through ceramic insulators, line-break limit switches and a control contactor. One or two heater modules may be used in a unit.

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. 22, Fig. 23 and Fig. 24.

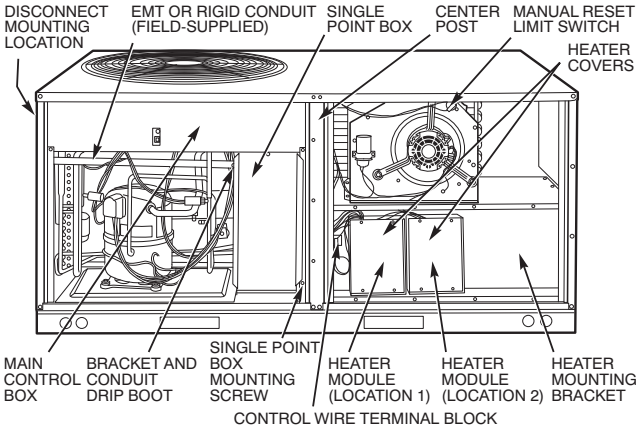
Not all available heater modules may be used in every unit. Use only those heater modules that are UL listed for use in a specific size unit. Refer to the label on the unit cabinet for the list of approved heaters.

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.

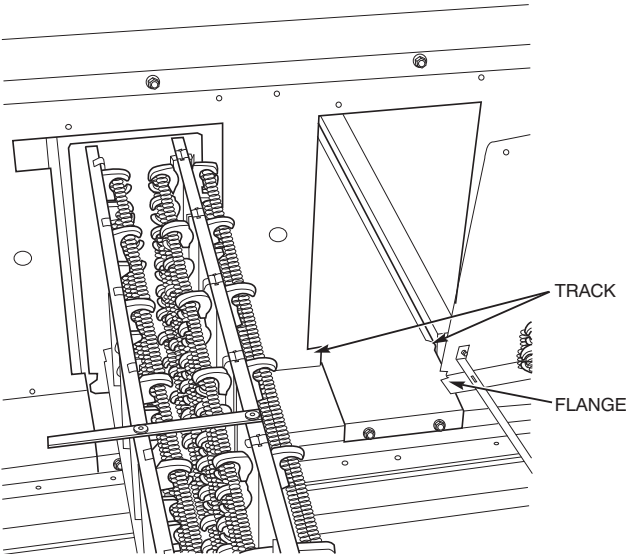
**NOTE:** The value in position 9 of the part number differs between the sales package part number (value is 1) and a bare heater model number (value is 0).



**Fig. 22 - Typical Access Panel Location (3-5 Ton)**



**Fig. 23 - Typical Component Location**



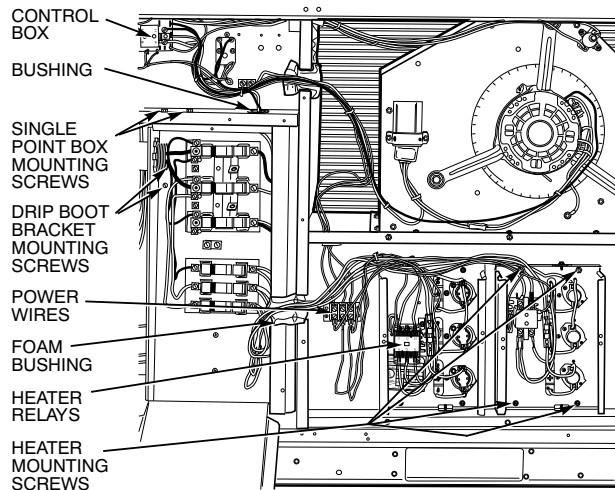
**Fig. 24 - Typical Module Installation**

**Table 2 – Heater Model Number**

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

### Single Point Boxes and Supplementary Fuses —

When the unit MOCF 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. 25. The Single Point Box also includes a set of power taps and 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.



C14253

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

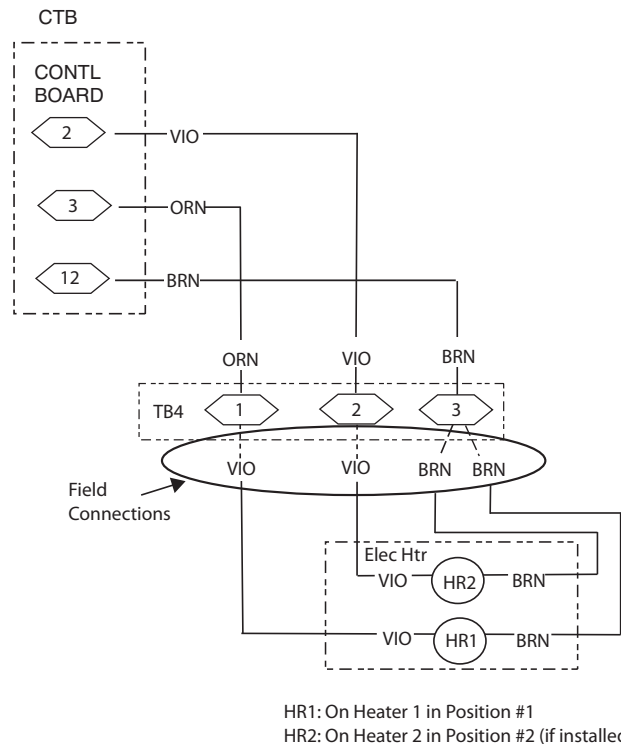
All fuses on RHX units are 60-A. (Note that all heaters are qualified for use with a 60-A fuse, regardless of actual heater ampacity, so only 60-A fuses are necessary.)

### Single Point Boxes without Fuses —

Unit heater applications not requiring supplemental fuses require a special Single Point Box without any fuses. The accessory Single Point Boxes contain a set of power taps and pigtails to complete the wiring between the Single Point Box and the unit's main control box terminals. Refer to accessory heater and Single Point Box installation instructions for details on tap connections.

### Low-Voltage Control Connections —

Pull 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 lead from Heater #1 to terminal TB4-1. For 2 stage heating, connect the VIO lead from Heater #2 to terminal TB4-2. For 1 stage heating with 2 heater modules connect the VIO lead from both Heater #1 and #2 to terminal TB4-1. Connect both BRN leads to terminal TB4-3. See Fig. 26.



C08331

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

## EconoMi\$er X (Factory-Installed Option)

For details on operating RGX/RAX/RHX units equipped with the factory-installed EconoMi\$er X option, refer to *Factory-Installed Economizers for RGH/RAH/RHH/RGS/RAS/RHS Rooftop Units, 3 to 27.5 Nominal Tons. Economizer Supplement Related to California Title 24* (Literature number: 50901170301SS, or later).

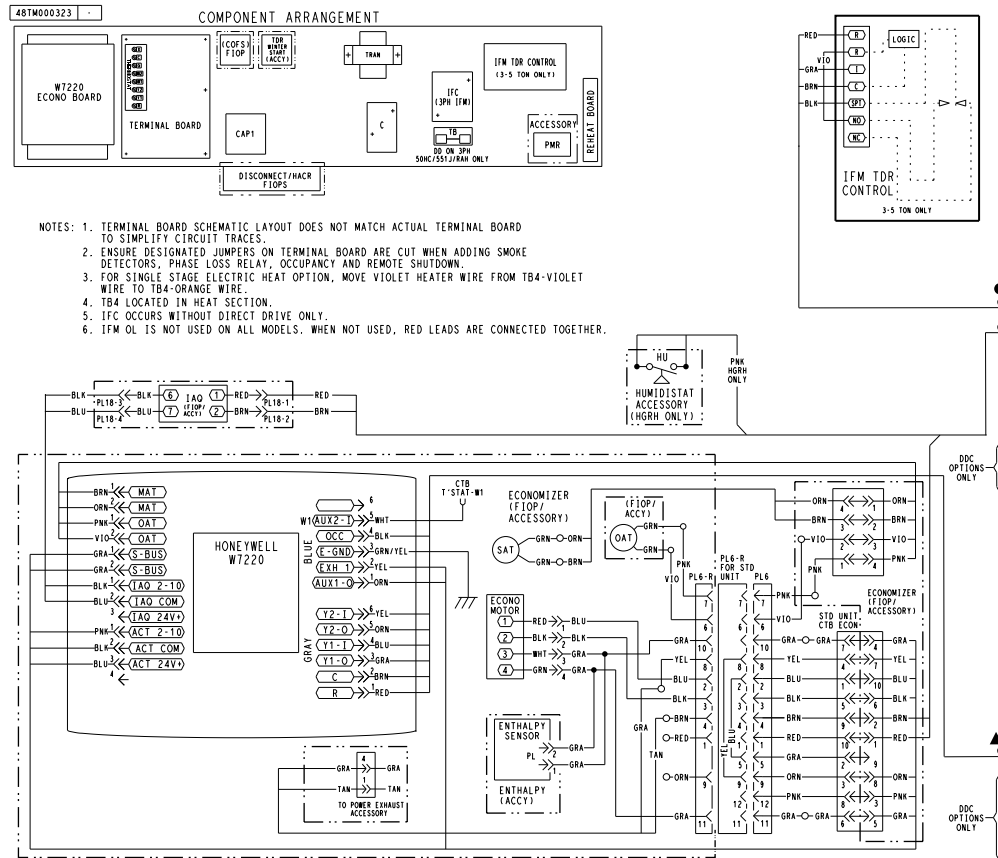


Fig. 27 - EconoMi\$er X W7220 Controller Wiring Diagram

C14225

## Smoke Detectors

Smoke detectors are available as factory-installed options on RHX 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.

**Table 3 – RHX036 Unit Wire/Fuse or HACR Breaker Sizing Data**

| UNIT   | NO M. V-Ph-HZ | IFM TYPE | ELEC. HTR      |           |           | NO C.O. or UNPWR C.O. |                       |            |         |                        |                       |            |         |
|--------|---------------|----------|----------------|-----------|-----------|-----------------------|-----------------------|------------|---------|------------------------|-----------------------|------------|---------|
|        |               |          | CRHEATER***A00 | Nom (kW)  | FLA       | NO PE.                |                       |            |         | w/ P.E. (pwrd fr/unit) |                       |            |         |
|        |               |          |                |           |           | MCA                   | MAX FUSE or HACR BRKR | DISC. SIZE |         | MCA                    | MAX FUSE or HACR BRKR | DISC. SIZE |         |
|        |               |          |                |           |           |                       |                       | FLA        | LRA     |                        |                       | FLA        | LRA     |
| RHX036 | 208/230-1-60  | DD-STD   | NONE           | —         | —         | 30                    | 45                    | 29         | 88      | 32                     | 45                    | 31         | 90      |
|        |               |          | 101A           | 3.3/4.4   | 15.9/18.3 | 49/52                 | 60/60                 | 47/50      | 104/106 | 51/54                  | 60/60                 | 49/52      | 106/108 |
|        |               |          | 102A           | 4.9/6.5   | 23.5/27.1 | 59/63                 | 60/70                 | 56/60      | 112/115 | 61/65                  | 70/70                 | 58/62      | 114/117 |
|        |               |          | 103B           | 6.5/8.7   | 31.4/36.3 | 69/75                 | 70/80                 | 65/70      | 119/124 | 71/77                  | 80/80                 | 67/73      | 121/126 |
|        |               |          | 104B           | 7.9/10.5  | 37.9/43.8 | 77/84                 | 80/90                 | 72/79      | 126/132 | 79/86                  | 80/90                 | 75/81      | 128/134 |
|        |               |          | 102A+102A      | 9.8/13.0  | 46.9/54.2 | 88/97                 | 90/100                | 83/91      | 182/196 | 90/99                  | 90/100                | 85/93      | 184/198 |
|        | 208/230-3-60  | DD-STD   | NONE           | —         | —         | 22                    | 30                    | 22         | 82      | 24                     | 30                    | 24         | 84      |
|        |               |          | 101A           | 3.3/4.4   | 9.2/10.6  | 33/35                 | 40/40                 | 32/34      | 91/93   | 35/37                  | 40/40                 | 34/36      | 93/95   |
|        |               |          | 102A           | 4.9/6.5   | 13.6/15.6 | 39/41                 | 45/45                 | 37/40      | 96/98   | 41/43                  | 45/45                 | 39/42      | 98/100  |
|        |               |          | 103B           | 6.5/8.7   | 18.1/20.9 | 44/48                 | 45/50                 | 42/46      | 100/103 | 46/50                  | 50/50                 | 45/48      | 102/105 |
|        |               |          | 104B           | 7.9/10.5  | 21.9/25.3 | 49/53                 | 50/60                 | 47/51      | 104/107 | 51/55                  | 60/60                 | 49/53      | 106/109 |
|        |               |          | 105A           | 12.0/16.0 | 33.4/38.5 | 64/70                 | 70/70                 | 60/66      | 115/121 | 66/72                  | 70/80                 | 62/68      | 117/123 |
|        |               | MED      | NONE           | —         | —         | 20/19                 | 25/25                 | 19/19      | 111     | 22/21                  | 30/30                 | 21/21      | 113     |
|        |               |          | 101A           | 3.3/4.4   | 9.2/10.6  | 31/33                 | 35/35                 | 30/31      | 120/122 | 33/35                  | 40/40                 | 32/33      | 122/124 |
|        |               |          | 102A           | 4.9/6.5   | 13.6/15.6 | 37/39                 | 40/40                 | 35/37      | 125/127 | 39/41                  | 45/45                 | 37/39      | 127/129 |
|        |               |          | 103B           | 6.5/8.7   | 18.1/20.9 | 42/45                 | 45/50                 | 40/43      | 129/132 | 44/47                  | 45/50                 | 42/45      | 131/134 |
|        |               |          | 104B           | 7.9/10.5  | 21.9/25.3 | 47/51                 | 50/60                 | 44/48      | 133/136 | 49/53                  | 50/60                 | 46/50      | 135/138 |
|        |               |          | 105A           | 12.0/16.0 | 33.4/38.5 | 61/67                 | 70/70                 | 58/63      | 144/150 | 63/69                  | 70/70                 | 60/65      | 146/152 |
|        |               | HIGH     | NONE           | —         | —         | 23/23                 | 30/30                 | 23/23      | 147     | 25/25                  | 30/30                 | 25/25      | 149     |
|        |               |          | 101A           | 3.3/4.4   | 9.2/10.6  | 34/36                 | 40/40                 | 33/35      | 156/158 | 36/38                  | 40/45                 | 36/37      | 158/160 |
|        |               |          | 102A           | 4.9/6.5   | 13.6/15.6 | 40/42                 | 45/45                 | 38/41      | 161/163 | 42/44                  | 45/50                 | 41/43      | 163/165 |
|        |               |          | 103B           | 6.5/8.7   | 18.1/20.9 | 45/49                 | 50/50                 | 44/47      | 165/168 | 47/51                  | 50/60                 | 46/49      | 167/170 |
|        |               |          | 104B           | 7.9/10.5  | 21.9/25.3 | 50/54                 | 50/60                 | 48/52      | 169/172 | 52/56                  | 60/60                 | 50/54      | 171/174 |
|        |               |          | 105A           | 12.0/16.0 | 33.4/38.5 | 65/71                 | 70/80                 | 61/67      | 180/186 | 67/73                  | 70/80                 | 63/69      | 182/188 |
|        | 460-3-60      | DD-STD   | NONE           | —         | —         | 12                    | 15                    | 12         | 43      | 13                     | 15                    | 13         | 44      |
|        |               |          | 106A           | 6.0       | 7.2       | 21                    | 25                    | 20         | 50      | 22                     | 25                    | 21         | 51      |
|        |               |          | 107A           | 8.8       | 10.6      | 25                    | 25                    | 24         | 54      | 26                     | 30                    | 25         | 55      |
|        |               |          | 108A           | 11.5      | 13.8      | 29                    | 30                    | 28         | 57      | 30                     | 30                    | 29         | 58      |
|        |               |          | 109A           | 14.0      | 16.8      | 33                    | 35                    | 31         | 60      | 34                     | 35                    | 32         | 61      |
|        |               | MED      | NONE           | —         | —         | 11                    | 15                    | 10         | 57      | 12                     | 15                    | 11         | 58      |
|        |               |          | 106A           | 6.0       | 7.2       | 20                    | 20                    | 18         | 64      | 21                     | 25                    | 20         | 65      |
|        |               |          | 107A           | 8.8       | 10.6      | 24                    | 25                    | 22         | 68      | 25                     | 25                    | 23         | 69      |
|        |               |          | 108A           | 11.5      | 13.8      | 28                    | 30                    | 26         | 71      | 29                     | 30                    | 27         | 72      |
|        |               |          | 109A           | 14.0      | 16.8      | 32                    | 35                    | 29         | 74      | 33                     | 35                    | 31         | 75      |
|        |               | HIGH     | NONE           | —         | —         | 12                    | 15                    | 12         | 75      | 13                     | 15                    | 13         | 76      |
|        |               |          | 106A           | 6.0       | 7.2       | 21                    | 25                    | 20         | 82      | 22                     | 25                    | 22         | 83      |
|        |               |          | 107A           | 8.8       | 10.6      | 26                    | 30                    | 24         | 86      | 27                     | 30                    | 25         | 87      |
|        |               |          | 108A           | 11.5      | 13.8      | 30                    | 30                    | 28         | 89      | 31                     | 35                    | 29         | 90      |
|        |               |          | 109A           | 14.0      | 16.8      | 33                    | 35                    | 31         | 92      | 34                     | 35                    | 33         | 93      |
|        | 575-3-60      | DD-STD   | NONE           | —         | —         | 10                    | 15                    | 10         | 42      | 12                     | 15                    | 12         | 44      |
|        |               | MED      | NONE           | —         | —         | 7                     | 15                    | 7          | 45      | 9                      | 15                    | 9          | 47      |
|        |               | HIGH     | NONE           | —         | —         | 9                     | 15                    | 8          | 60      | 10                     | 15                    | 10         | 62      |

See "Legend and Notes for Table 3 on page 19.

**Table 4 – RHX048 Unit Wire/Fuse or HACR Breaker Sizing Data**

| UNIT   | NO M. V-Ph-HZ    | IFM TYPE | ELEC. HTR      |           |           | NO C.O. or UNPWR C.O. |                       |            |         |                       |                       |            |         |
|--------|------------------|----------|----------------|-----------|-----------|-----------------------|-----------------------|------------|---------|-----------------------|-----------------------|------------|---------|
|        |                  |          | CRHEATER***A00 | Nom (kW)  | FLA       | NO PE.                |                       |            |         | w/ P.E. (pwr fr/unit) |                       |            |         |
|        |                  |          |                |           |           | MCA                   | MAX FUSE or HACR BRKR | DISC. SIZE |         | MCA                   | MAX FUSE or HACR BRKR | DISC. SIZE |         |
|        |                  |          |                |           |           |                       |                       | FLA        | LRA     |                       |                       | FLA        | LRA     |
| RHX048 | 208/230 – 1 – 60 | DD – STD | NONE           | –         | –         | 37                    | 50                    | 35         | 127     | 38                    | 50                    | 37         | 129     |
|        |                  |          | 101A           | 3.3/4.4   | 15.9/18.3 | 56/59                 | 60/60                 | 53/56      | 143/145 | 58/61                 | 60/70                 | 56/58      | 145/147 |
|        |                  |          | 103B           | 6.5/8.7   | 31.4/36.3 | 76/82                 | 80/90                 | 71/77      | 158/163 | 78/84                 | 80/90                 | 73/79      | 160/165 |
|        |                  |          | 102A+102A      | 9.8/13.0  | 46.9/54.2 | 95/104                | 100/110               | 89/98      | 221/235 | 97/106                | 100/110               | 91/100     | 223/237 |
|        |                  |          | 103B+103B      | 13.1/17.4 | 62.8/72.5 | 115/127               | 125/150               | 107/119    | 253/272 | 117/129               | 125/150               | 110/121    | 255/274 |
|        |                  |          | 104B+104B      | 15.8/21.0 | 75.8/87.5 | 131/146               | 150/150               | 122/136    | 279/302 | 133/148               | 150/150               | 125/138    | 281/304 |
|        | 208/230 – 3 – 60 | DD – STD | NONE           | –         | –         | 26                    | 30                    | 26         | 93      | 28                    | 40                    | 28         | 95      |
|        |                  |          | 102A           | 4.9/6.5   | 13.6/15.6 | 43/46                 | 50/50                 | 42/44      | 107/109 | 45/48                 | 50/50                 | 44/46      | 109/111 |
|        |                  |          | 103B           | 6.5/8.7   | 18.1/20.9 | 49/53                 | 50/60                 | 47/50      | 111/114 | 51/54                 | 60/60                 | 49/52      | 113/116 |
|        |                  |          | 105A           | 12.0/16.0 | 33.4/38.5 | 68/75                 | 70/80                 | 64/70      | 126/132 | 70/76                 | 70/80                 | 66/72      | 128/134 |
|        |                  |          | 104B+104B      | 15.8/21.0 | 43.8/50.5 | 81/90                 | 90/90                 | 76/84      | 181/194 | 83/91                 | 90/100                | 78/86      | 183/196 |
|        |                  | MED      | NONE           | –         | –         | 24/24                 | 30/30                 | 23/23      | 122     | 26/26                 | 30/30                 | 26/25      | 124     |
|        |                  |          | 102A           | 4.9/6.5   | 13.6/15.6 | 41/43                 | 50/50                 | 39/41      | 136/138 | 43/45                 | 50/50                 | 41/43      | 138/140 |
|        |                  |          | 103B           | 6.5/8.7   | 18.1/20.9 | 47/50                 | 50/50                 | 44/47      | 140/143 | 49/52                 | 50/60                 | 46/49      | 142/145 |
|        |                  |          | 105A           | 12.0/16.0 | 33.4/38.5 | 66/72                 | 70/80                 | 62/67      | 155/161 | 68/74                 | 70/80                 | 64/69      | 157/163 |
|        |                  |          | 104B+104B      | 15.8/21.0 | 43.8/50.5 | 79/87                 | 80/90                 | 74/81      | 210/223 | 81/89                 | 90/90                 | 76/83      | 212/225 |
|        |                  | HIGH     | NONE           | –         | –         | 27/27                 | 40/40                 | 27/27      | 158     | 29/29                 | 40/40                 | 29/29      | 160     |
|        |                  |          | 102A           | 4.9/6.5   | 13.6/15.6 | 44/47                 | 50/50                 | 43/45      | 172/174 | 46/49                 | 50/50                 | 45/47      | 174/176 |
|        |                  |          | 103B           | 6.5/8.7   | 18.1/20.9 | 50/53                 | 50/60                 | 48/51      | 176/179 | 52/55                 | 60/60                 | 50/53      | 178/181 |
|        |                  |          | 105A           | 12.0/16.0 | 33.4/38.5 | 69/75                 | 70/80                 | 65/71      | 191/197 | 71/77                 | 80/80                 | 68/73      | 193/199 |
|        |                  |          | 104B+104B      | 15.8/21.0 | 43.8/50.5 | 82/90                 | 90/90                 | 77/85      | 246/259 | 84/92                 | 90/100                | 80/87      | 248/261 |
|        | 460 – 3 – 60     | DD – STD | NONE           | –         | –         | 13                    | 15                    | 13         | 47      | 14                    | 20                    | 14         | 48      |
|        |                  |          | 106A           | 6.0       | 7.2       | 22                    | 25                    | 21         | 54      | 23                    | 25                    | 22         | 55      |
|        |                  |          | 108A           | 11.5      | 13.8      | 30                    | 30                    | 29         | 61      | 31                    | 35                    | 30         | 62      |
|        |                  |          | 109A           | 14.0      | 16.8      | 34                    | 35                    | 32         | 64      | 35                    | 35                    | 33         | 65      |
|        |                  |          | 108A+108A      | 23.0      | 27.7      | 48                    | 50                    | 45         | 102     | 49                    | 50                    | 46         | 103     |
|        |                  | MED      | NONE           | –         | –         | 12                    | 15                    | 11         | 61      | 13                    | 15                    | 12         | 62      |
|        |                  |          | 106A           | 6.0       | 7.2       | 21                    | 25                    | 19         | 68      | 22                    | 25                    | 20         | 69      |
|        |                  |          | 108A           | 11.5      | 13.8      | 29                    | 30                    | 27         | 75      | 30                    | 30                    | 28         | 76      |
|        |                  |          | 109A           | 14.0      | 16.8      | 33                    | 35                    | 30         | 78      | 34                    | 35                    | 31         | 79      |
|        |                  |          | 108A+108A      | 23.0      | 27.7      | 46                    | 50                    | 43         | 116     | 47                    | 50                    | 44         | 117     |
|        |                  | HIGH     | NONE           | –         | –         | 13                    | 15                    | 13         | 79      | 14                    | 20                    | 14         | 80      |
|        |                  |          | 106A           | 6.0       | 7.2       | 22                    | 25                    | 21         | 86      | 23                    | 25                    | 22         | 87      |
|        |                  |          | 108A           | 11.5      | 13.8      | 30                    | 30                    | 29         | 93      | 31                    | 35                    | 30         | 94      |
|        |                  |          | 109A           | 14.0      | 16.8      | 34                    | 35                    | 32         | 96      | 35                    | 35                    | 33         | 97      |
|        |                  |          | 108A+108A      | 23.0      | 27.7      | 48                    | 50                    | 45         | 134     | 49                    | 50                    | 46         | 135     |
|        | 575 – 3 – 60     | DD – STD | NONE           | –         | –         | 11                    | 15                    | 11         | 39      | 13                    | 15                    | 13         | 41      |
|        |                  | MED      | NONE           | –         | –         | 9                     | 15                    | 8          | 42      | 11                    | 15                    | 10         | 44      |
|        |                  | HIGH     | NONE           | –         | –         | 10                    | 15                    | 10         | 57      | 12                    | 15                    | 12         | 59      |

See "Legend and Notes for Table 3 on page 19.

**Table 5 – RHX060 Unit Wire/Fuse or HACR Breaker Sizing Data**

| UNIT   | NO M. V-Ph-HZ    | IFM TYPE | ELEC. HTR      |           |           | NO C.O. or UNPWR C.O. |                       |            |         |                       |                       |            |         |
|--------|------------------|----------|----------------|-----------|-----------|-----------------------|-----------------------|------------|---------|-----------------------|-----------------------|------------|---------|
|        |                  |          | CRHEATER***A00 | Nom (kW)  | FLA       | NO PE.                |                       |            |         | w/ P.E. (pwr fr/unit) |                       |            |         |
|        |                  |          |                |           |           | MCA                   | MAX FUSE or HACR BRKR | DISC. SIZE |         | MCA                   | MAX FUSE or HACR BRKR | DISC. SIZE |         |
|        |                  |          |                |           |           |                       |                       | FLA        | LRA     |                       |                       | FLA        | LRA     |
| RHX060 | 208/230 – 1 – 60 | DD–STD   | NONE           | –         | –         | 39                    | 60                    | 37         | 163     | 41                    | 60                    | 40         | 165     |
|        |                  |          | 102A           | 4.9/6.5   | 23.5/27.1 | 68/73                 | 80/80                 | 64/69      | 187/190 | 70/75                 | 80/80                 | 67/71      | 189/192 |
|        |                  |          | 103B           | 6.5/8.7   | 31.4/36.3 | 78/84                 | 80/90                 | 73/79      | 194/199 | 80/86                 | 80/100                | 76/81      | 196/201 |
|        |                  |          | 102A+102A      | 9.8/13.0  | 46.9/54.2 | 98/107                | 100/110               | 91/100     | 257/271 | 99/109                | 100/110               | 93/102     | 259/273 |
|        |                  |          | 103B+103B      | 13.1/17.4 | 62.8/72.5 | 117/130               | 125/150               | 110/121    | 289/308 | 119/131               | 125/150               | 112/123    | 291/310 |
|        |                  |          | 104B+104B      | 15.8/21.0 | 75.8/87.5 | 134/148               | 150/150               | 125/138    | 315/338 | 136/150               | 150/150               | 127/140    | 317/340 |
|        | 208/230 – 3 – 60 | DD–STD   | NONE           | –         | –         | 29                    | 40                    | 28         | 120     | 31                    | 45                    | 31         | 122     |
|        |                  |          | 102A           | 4.9/6.5   | 13.6/15.6 | 46/49                 | 50/60                 | 44/46      | 134/136 | 48/51                 | 60/60                 | 46/49      | 136/138 |
|        |                  |          | 104B           | 7.9/10.5  | 21.9/25.3 | 57/61                 | 60/70                 | 54/58      | 142/145 | 58/63                 | 60/70                 | 56/60      | 144/147 |
|        |                  |          | 105A           | 12.0/16.0 | 33.4/38.5 | 71/77                 | 80/80                 | 67/73      | 153/159 | 73/79                 | 80/80                 | 69/75      | 155/161 |
|        |                  |          | 104B+104B      | 15.8/21.0 | 43.8/50.5 | 84/92                 | 90/100                | 79/86      | 208/221 | 86/94                 | 90/100                | 81/89      | 210/223 |
|        |                  |          | 104B+105A      | 19.9/26.5 | 55.2/63.8 | 98/109                | 100/110               | 92/102     | 230/248 | 100/111               | 100/125               | 94/104     | 232/250 |
|        |                  | MED      | NONE           | –         | –         | 30/30                 | 45/45                 | 30/29      | 185     | 32/32                 | 45/45                 | 32/32      | 187     |
|        |                  |          | 102A           | 4.9/6.5   | 13.6/15.6 | 47/50                 | 50/60                 | 45/47      | 199/201 | 49/51                 | 60/60                 | 47/50      | 201/203 |
|        |                  |          | 104B           | 7.9/10.5  | 21.9/25.3 | 58/62                 | 60/70                 | 55/59      | 207/210 | 59/64                 | 60/70                 | 57/61      | 209/212 |
|        |                  |          | 105A           | 12.0/16.0 | 33.4/38.5 | 72/78                 | 80/80                 | 68/74      | 218/224 | 74/80                 | 80/80                 | 70/76      | 220/226 |
|        |                  |          | 104B+104B      | 15.8/21.0 | 43.8/50.5 | 85/93                 | 90/100                | 80/88      | 273/286 | 87/95                 | 90/100                | 82/90      | 275/288 |
|        |                  |          | 104B+105A      | 19.9/26.5 | 55.2/63.8 | 99/110                | 100/110               | 93/103     | 295/313 | 101/112               | 110/125               | 95/105     | 297/315 |
|        |                  | HIGH     | NONE           | –         | –         | 30/30                 | 45/45                 | 30/29      | 185     | 32/32                 | 45/45                 | 32/32      | 187     |
|        |                  |          | 102A           | 4.9/6.5   | 13.6/15.6 | 47/50                 | 50/60                 | 45/47      | 199/201 | 49/51                 | 60/60                 | 47/50      | 201/203 |
|        |                  |          | 104B           | 7.9/10.5  | 21.9/25.3 | 58/62                 | 60/70                 | 55/59      | 207/210 | 59/64                 | 60/70                 | 57/61      | 209/212 |
|        |                  |          | 105A           | 12.0/16.0 | 33.4/38.5 | 72/78                 | 80/80                 | 68/74      | 218/224 | 74/80                 | 80/80                 | 70/76      | 220/226 |
|        |                  |          | 104B+104B      | 15.8/21.0 | 43.8/50.5 | 85/93                 | 90/100                | 80/88      | 273/286 | 87/95                 | 90/100                | 82/90      | 275/288 |
|        |                  |          | 104B+105A      | 19.9/26.5 | 55.2/63.8 | 99/110                | 100/110               | 93/103     | 295/313 | 101/112               | 110/125               | 95/105     | 297/315 |
|        | 460 – 3 – 60     | DD–STD   | NONE           | –         | –         | 14                    | 20                    | 14         | 58      | 15                    | 20                    | 15         | 59      |
|        |                  |          | 106A           | 6.0       | 7.2       | 23                    | 25                    | 22         | 65      | 24                    | 25                    | 23         | 66      |
|        |                  |          | 108A           | 11.5      | 13.8      | 31                    | 35                    | 29         | 72      | 32                    | 35                    | 31         | 73      |
|        |                  |          | 109A           | 14.0      | 16.8      | 35                    | 35                    | 33         | 75      | 36                    | 40                    | 34         | 76      |
|        |                  |          | 108A+108A      | 23.0      | 27.7      | 49                    | 50                    | 45         | 113     | 50                    | 50                    | 47         | 114     |
|        |                  |          | 108A+109A      | 25.5      | 30.7      | 52                    | 60                    | 49         | 119     | 53                    | 60                    | 50         | 120     |
|        |                  | MED      | NONE           | –         | –         | 14                    | 20                    | 14         | 90      | 15                    | 20                    | 15         | 91      |
|        |                  |          | 106A           | 6.0       | 7.2       | 23                    | 25                    | 22         | 97      | 24                    | 25                    | 23         | 98      |
|        |                  |          | 108A           | 11.5      | 13.8      | 31                    | 35                    | 30         | 104     | 32                    | 35                    | 31         | 105     |
|        |                  |          | 109A           | 14.0      | 16.8      | 35                    | 35                    | 33         | 107     | 36                    | 40                    | 34         | 108     |
|        |                  |          | 108A+108A      | 23.0      | 27.7      | 49                    | 50                    | 46         | 145     | 50                    | 50                    | 47         | 146     |
|        |                  |          | 108A+109A      | 25.5      | 30.7      | 53                    | 60                    | 49         | 151     | 54                    | 60                    | 50         | 152     |
|        |                  | HIGH     | NONE           | –         | –         | 14                    | 20                    | 14         | 90      | 15                    | 20                    | 15         | 91      |
|        |                  |          | 106A           | 6.0       | 7.2       | 23                    | 25                    | 22         | 97      | 24                    | 25                    | 23         | 98      |
|        |                  |          | 108A           | 11.5      | 13.8      | 31                    | 35                    | 30         | 104     | 32                    | 35                    | 31         | 105     |
|        |                  |          | 109A           | 14.0      | 16.8      | 35                    | 35                    | 33         | 107     | 36                    | 40                    | 34         | 108     |
|        |                  |          | 108A+108A      | 23.0      | 27.7      | 49                    | 50                    | 46         | 145     | 50                    | 50                    | 47         | 146     |
|        |                  |          | 108A+109A      | 25.5      | 30.7      | 53                    | 60                    | 49         | 151     | 54                    | 60                    | 50         | 152     |
|        | 575 – 3 – 60     | DD–STD   | NONE           | –         | –         | 12                    | 15                    | 11         | 46      | 14                    | 15                    | 14         | 48      |
|        |                  | MED      | NONE           | –         | –         | 10                    | 15                    | 10         | 64      | 12                    | 15                    | 12         | 66      |
|        |                  | HIGH     | NONE           | –         | –         | 10                    | 15                    | 10         | 64      | 12                    | 15                    | 12         | 66      |

See “Legend and Notes for Table 3 on page 19.

## Legend and Notes for Tables 3 – 5

### 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            |
| MOCB     | – | MAX FUSE or HACR Breaker        |
| PE       | – | Power exhaust                   |
| PWRD CO  | – | Powered convenient outlet       |
| UNPWR CO | – | Unpowered convenient outlet     |

### NOTES:

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

### 2. Unbalanced 3-Phase Supply Voltage

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

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

Example: Supply voltage is 230-3-60



$$AB = 224 \text{ v}$$

$$BC = 231 \text{ v}$$

$$AC = 226 \text{ v}$$

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

Determine maximum deviation from average voltage.

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

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

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

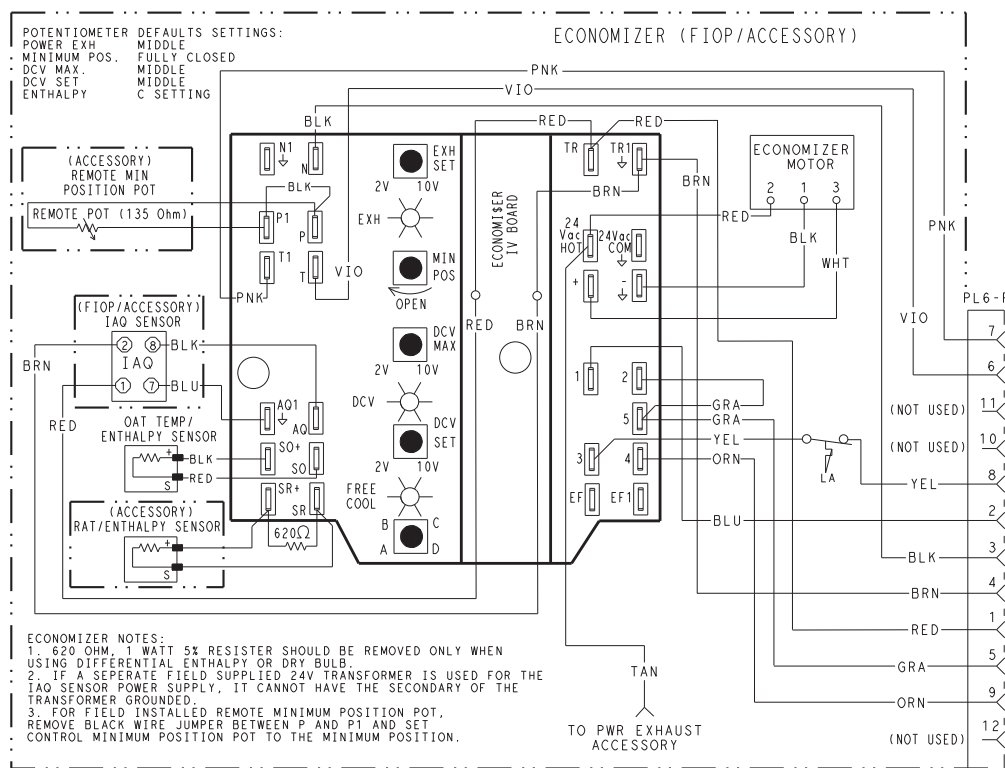
Maximum deviation is 4 v.

Determine percent of voltage imbalance.

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

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

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



**Fig. 28 - EconoMi\$er IV Wiring**

C09302

## Step 12 — Adjust Factory-Installed Options

### Smoke Detectors —

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

### EconoMi\$er IV Occupancy Switch —

Refer to Fig. 28 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. Cut jumper JMP 2 to complete the installation.

## Step 13 — Install Accessories

Available accessories include:

Curb

Thru-base connection kit (must be installed before unit is set on curb)

Electric heaters and single-point connection kits

Manual outside air damper

Two-Position motorized outside air damper

EconoMi\$er IV (with control)

Power Exhaust

CO<sub>2</sub> sensor

Louvered hail guard

Motormaster head pressure controls

Phase monitor control

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

