



# Installation Instructions

**IMPORTANT:** This installation instruction contains basic unit installation information including installation of field control devices. For information on unit start-up, service, and operation, refer to the unit Controls, Start-Up, Operation, Service, and Troubleshooting Instructions also enclosed in the unit literature packet.

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## SAFETY CONSIDERATIONS

Installation and servicing of air-conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair, or service air-conditioning equipment.

Untrained personnel can perform the basic maintenance functions of cleaning coils and filters and replacing filters. All other operations should be performed by trained service personnel. When working on air-conditioning equipment, observe precautions in the literature, tags and labels attached to the unit, and other safety precautions that may apply.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for unbrazing operations. Have fire extinguishers available for all brazing operations.

**⚠ WARNING**

Before performing service or maintenance operations on unit, turn off main power switch to unit. Electrical shock could cause personal injury.

**⚠ CAUTION**

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. If service equipment is not rated for Puron refrigerant, equipment damage or personal injury may result.

**⚠ WARNING**

1. Improper installation, adjustment, alteration, service, or maintenance can cause property damage, personal injury, or loss of life. Refer to the User's Information Manual provided with this unit for more details.
2. Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

**What to do if you smell gas:**

1. DO NOT try to light any appliance.
2. DO NOT touch any electrical switch, or use any phone in your building.
3. IMMEDIATELY call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
4. If you cannot reach your gas supplier, call the fire department.

**⚠ WARNING**

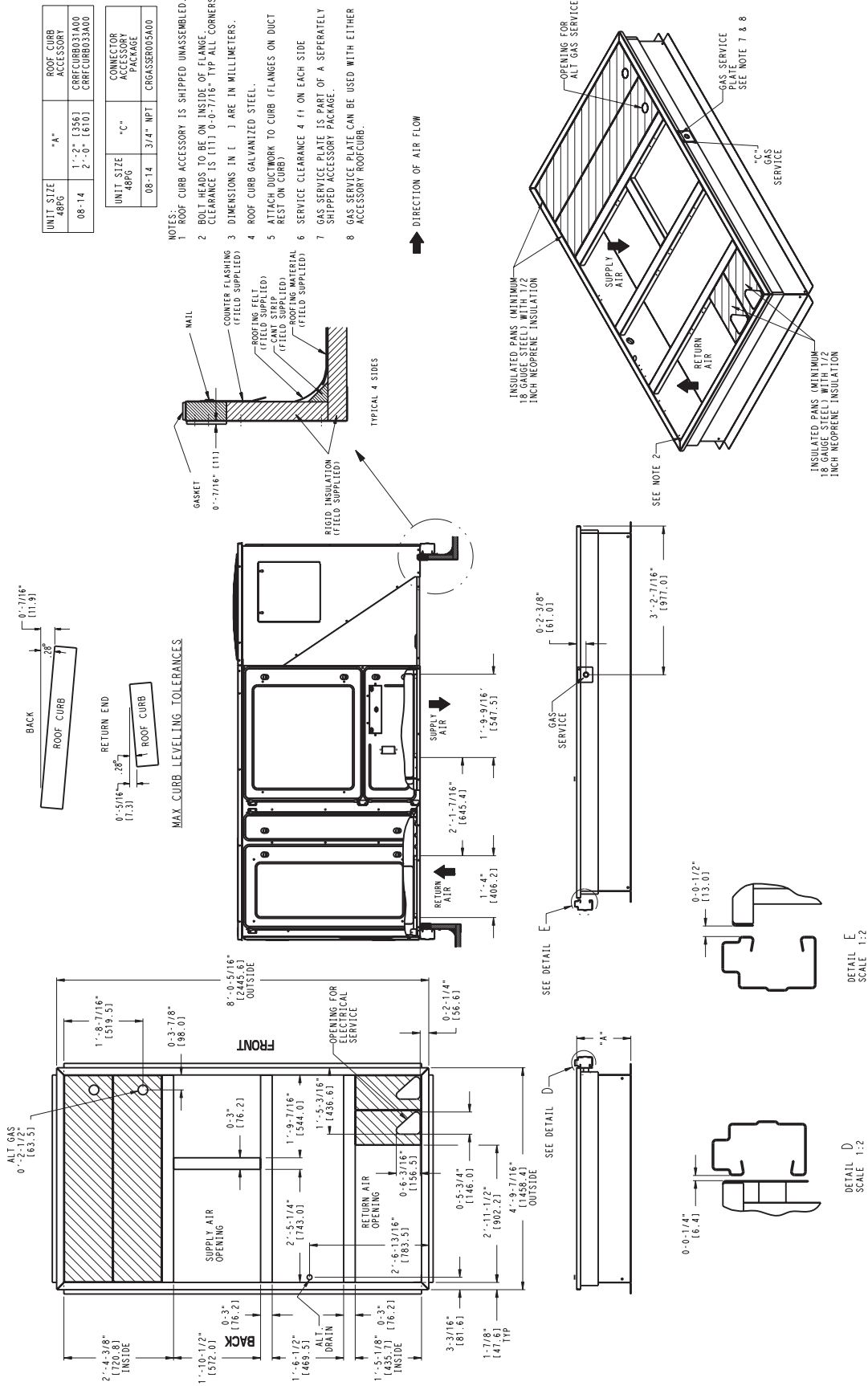
Disconnect gas piping from unit when pressure testing at pressure greater than 0.5 psig. Pressures greater than 0.5 psig will cause gas valve damage resulting in hazardous condition. If gas valve is subjected to pressure greater than 0.5 psig, it *must* be replaced before use. When pressure testing field-supplied gas piping at pressures of 0.5 psig or less, a unit connected to such piping must be isolated by closing the manual gas valve(s).

**IMPORTANT:** Units have high ambient operating limits. If limits are exceeded, the units will automatically lock the compressor out of operation. Manual reset will be required to restart the compressor.

## INSTALLATION

### Step 1 — Provide Unit Support

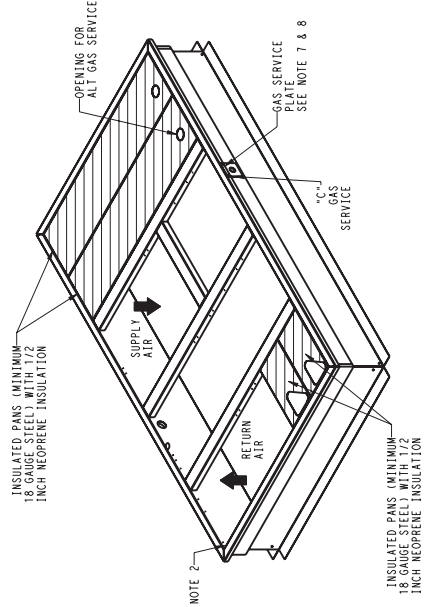
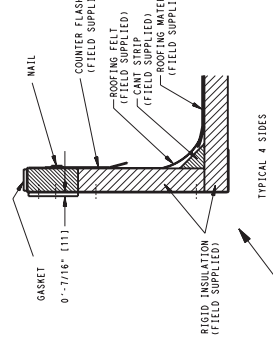
**ROOF CURB** — Assemble or install accessory roof curb in accordance with instructions shipped with this accessory. See Fig. 1. Install insulation, cant strips, roofing, and counter flashing as shown. Ductwork can be installed to roof curb before unit is set in place. Ductwork must be attached to curb and not to the unit. Curb must be level. This is necessary to permit unit drain to function properly. Unit leveling tolerance is  $\pm 1/16$  in. per linear ft in any direction. Refer to Accessory Roof Curb Installation Instructions for additional information as required. When accessory roof curb is used, unit may be installed on class A, B, or C roof covering material. Carrier roof curb accessories are for flat roofs or slab mounting.



UNIT SIZE	"A"	ROOF CURB ACCESSORY
08-14	1'-2" (386)	CRRFCURB031A00
	2'-0" (610)	CRRFCURB033A00

UNIT SIZE	"C"	CONNECTOR ACCESSORY PACKAGE
08-14	3/4" NPT	CRGASER005A00

- NOTES:**
1. ROOF CURB ACCESSORY IS SHIPPED UNASSEMBLED.
  2. BOLT HEADS TO BE ON INSIDE OF FLANGE. CLEARANCE IS (111) 0-7/16" TYP ALL CORNERS.
  3. DIMENSIONS IN ( ) ARE IN MILLIMETERS.
  4. ROOF CURB GALVANIZED STEEL.
  5. ATTACH OUTWORK TO CURB (FLANGES ON DUCT REST ON CURB).
  6. SERVICE CLEARANCE 4 FT ON EACH SIDE.
  7. GAS SERVICE PLATE IS PART OF A SEPARATELY SHIPPED ACCESSORY PACKAGE.
  8. GAS SERVICE PLATE CAN BE USED WITH EITHER ACCESSORY ROOFCURB.



**Fig. 1 — Roof Curb Details**

DETAIL E  
SCALE 1:2

DETAIL D  
SCALE 1:2

**IMPORTANT:** The gasketing of the unit to the roof curb is critical for a watertight seal. Install gasket with the roof curb as shown in Fig. 1 and 2. Improperly applied gasket can also result in air leaks and poor unit performance. Do not slide unit to position on roof curb.

**ALTERNATE UNIT SUPPORT** — When a curb cannot be used, install unit on a noncombustible surface. Support unit with sleepers, using unit curb support area. If sleepers cannot be used, support long sides of unit with a minimum of 3 equally spaced 4-in. x 4-in. pads on each side.

**Step 2 — Rig and Place Unit** — Inspect unit for transportation damage. See Table 1 for physical data. File any claim with transportation agency.

**CAUTION**

All panels must be in place when rigging. Damage to unit may result.

Do not drop unit; keep upright. Use wooden top skid or spreader bars over unit to prevent sling or cable damage. Rollers may be used to move unit across a roof. Level by using unit rail as a reference; leveling tolerance is  $\pm 1/16$  in. per linear ft in any direction. See Fig. 2 for additional information. Unit rigging weight is shown in Fig. 2.

Rigging holes are provided in the unit base rails as shown in Fig. 2. Refer to rigging instructions on unit.

**POSITIONING** — Maintain clearance, per Fig. 3, around and above unit to provide minimum distance from combustible materials, proper airflow, and service access. See Fig. 4 for panel and filter location.

Do not install unit in an indoor location. Do not locate air inlets near exhaust vents or other sources of contaminated air. For proper unit operation, adequate combustion and ventilation air must be provided in accordance with Section 5.3 (Air for

Combustion and Ventilation) of the National Fuel Gas Code, ANSI Z223.1 (American National Standards Institute).

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

Locate mechanical draft system flue assembly at least 4 ft from any opening through which combustion products could enter the building, and at least 4 ft from any adjacent building (or per local codes). When unit is located adjacent to public walkways, flue assembly must be at least 7 ft above grade. Locate unit at least 10 ft away from adjacent units.

**ROOF MOUNT** — Check building codes for weight distribution requirements. Unit operating weight is shown in Table 1.

**INSTALLATION ONTO CURB** — The 48PG units are designed to fit on the accessory full perimeter curb. Correct placement of the unit onto the curb is critical to operating performance. To aid in correct positioning, place unit on roof curb to maintain  $1/4$ -in. gap between the inside of rail and roof curb on long sides and a  $1/2$ -in. gap between the inside of rail and roof curb on both duct and condenser ends. Refer to Fig. 1 and 3, to assure proper duct opening alignment.

**NOTE:** Before positioning unit on curb, make sure bottom drain connection plug is tight. See Step 6 — Install External Trap for Condensate Drain on page 7 concerning bottom drain connection plug.

**CAUTION**

Do not slide unit to position it when it is sitting on the curb. Curb gasketing material may be damaged and leaks may result.

**SLAB MOUNT (Horizontal Units Only)** — Provide a level concrete slab that extends a minimum of 6-in. beyond unit cabinet. Install a gravel apron in front of condenser-coil air inlet to prevent grass and foliage from obstructing airflow.

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

**CAUTION-NOTICE TO RIGGERS: ACCESS PANEL MUST BE IN PLACE WHEN RIGGING.**

Hook rigging shackles through holes in base rail, as shown in Detail A. Holes in base rails are centered around the unit center of gravity. Use wooden top skid, when rigging, to prevent rigging straps from damaging unit.

UNIT SIZE	A		B		C		D		E		MAX. WEIGHT	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lb	kg
08-14	90.4	2296	36-54	914-1371	52.4	1331	48.0	1219	26.3	668	1617	735

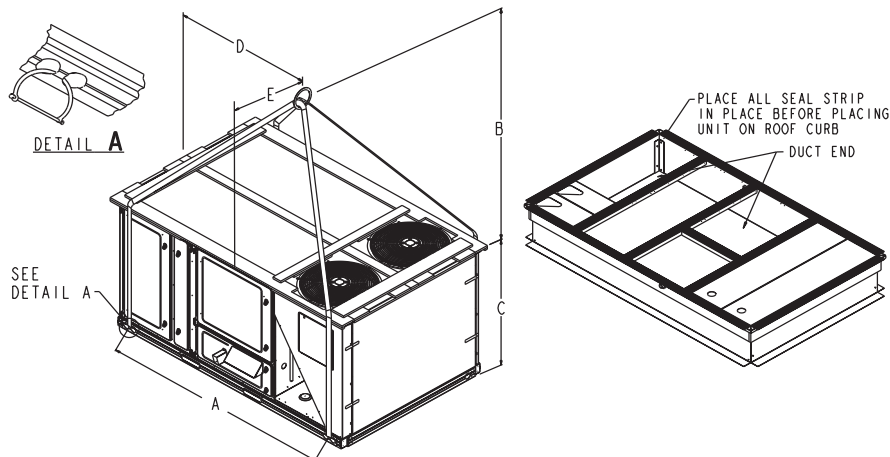


Fig. 2 — 48PG Rigging Label

**Table 1 — Physical Data**

BASE UNIT 48PG		08	09	12	14
NOMINAL CAPACITY (Tons)		7½	8½	10	12½
OPERATING WEIGHT (lb)					
Unit*		1217	1224	1324	1400
Economizer					
Vertical		57	57	57	57
Horizontal		59	59	59	59
Humidi-MiZer™ System		45	45	44	45
Roof Curb					
14-in.		180	180	180	180
24-in.		268	268	268	268
COMPRESSOR		Fully Hermetic Scroll			
Quantity		2	2	2	2
Oil Type	Sys A	Copeland 3MA	Copeland 3MA	Copeland 3MA	Copeland 3MA
	Sys B	Copeland 3MA	Copeland 3MA	Copeland 3MA	Copeland 3MA
Number of Refrigerant Circuits		2	2	2	2
Oil (oz)	Sys A	42	42	66	56
	Sys B	42	42	66	56
REFRIGERANT TYPE		R-410A (Puron® Refrigerant)			
Expansion Device		TXV	TXV	TXV	TXV
Operating Charge (lb)	Sys A	11.8	11.3	13.7	17.2
	Sys B	11.8	11.3	13.7	17.2
Operating Charge Total All Systems (lb)		23.5	22.6	27.4	34.4
Unit with Humidi-MiZer System					
Operating Charge (lb)	Sys A	16.5	16.25	17.7	22.5
	Sys B	16.7	16.25	18.2	21.8
Total All Systems (lb)		33.2	32.5	35.9	44.3
CONDENSER COIL		Enhanced Copper Tubes, Aluminum Lanced Fins, Face Split			
Condenser A (Outer)					
Rows...Fins/in.		2...17	2...17	2...17	3...17
Face Area (sq ft)		17.4	17.4	17.4	17.4
Condenser B (Inner)					
Rows...Fins/in.		2...17	2...17	2...17	3...17
Face Area (sq ft)		17.4	17.4	17.4	17.4
Humidi-MiZer Coil		Copper Enhanced Tubes with Aluminum Lanced Fins			
Rows...Fins/in.		1...17	1...17	1...17	1...17
Face Area (sq ft)		14.9	14.9	14.9	14.9
CONDENSER FAN		Propeller			
Quantity...Diameter (in.)		2...24	2...24	2...24	2...24
Nominal Cfm (Total, all fans)		7204	7204	8241	7300
Motor Hp		¼	¼	⅓	⅓
Nominal Rpm		1100	1100	1100	1100
EVAPORATOR COIL		Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Face Split			
Rows...Fins/in.		3...15	3...15	4...15	4...15
Face Area (sq ft)		14.9	14.9	14.9	14.9
EVAPORATOR FAN		Centrifugal Type, Belt Drive			
Quantity...Size (in.)	Low	1...15 x 15	1...15 x 15	1...15 x 15	1...15 x 15
	High	1...15 x 15	1...15 x 15	1...15 x 15	1...15 x 15
Type Drive	Low	Belt	Belt	Belt	Belt
	High	Belt	Belt	Belt	Belt
Nominal Cfm		3000	3400	4000	5000
Maximum Continuous Bhp	Low	2.4	2.4	3.1	3.7
	High	3.1	3.7	3.7	5.25
Motor Nominal Rpm		1725	1725	1725	1725
Motor Frame Size	Low	56Y	56Y	56Y	56Y
	High	56Y	56Y	56Y	56Y
Fan Rpm Range	Low	568-771	568-771	690-893	690-893
	High	812-1015	812-1015	852-1055	852-1055
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Fan Rpm		1600	1600	1600	1600
Motor Pulley Pitch Diameter Range (in.)	Low	2.8-3.8	2.8-3.8	3.4-4.4	3.4-4.4
	High	4.0-5.0	4.0-5.0	4.6-5.6	4.6-5.6
Fan Pulley Pitch Diameter	Low	8.5	8.5	8.5	8.5
	High	8.5	8.5	8.5	8.5
Nominal Motor Shaft Diameter (in.)	Low	5/8	5/8	7/8	7/8
	High	7/8	7/8	7/8	7/8
Belt...Pitch Length (in.)	Low	63.3	63.3	63.3	63.3
	High	65.3	65.3	65.3	65.3
Belt...Type	Low	AX	AX	AX	AX
	High	AX	AX	AX	AX
Pulley Center Line Distance Min. (in.)	Low	21.0	21.0	21.0	21.0
	High	21.0	21.0	21.0	21.0
Pulley Center Line Distance Max. (in.)	Low	23.4	23.4	23.4	23.4
	High	23.4	23.4	23.4	23.4
Speed Change per Full Turn of Movable Pulley Flange (rpm)	Low	41	41	41	41
	High	41	41	41	41
Movable Pulley Maximum Full Turns from Closed Position	Low	5	5	5	5
	High	5	5	5	5
Factory Pulley Setting (rpm)	Low	568	568	690	690
	High	812	812	852	852
Fan Shaft Diameter at Pulley (in.)		1	1	1	1
GAS HEAT SECTION					
Rollout Switch					
Open Temperature (F)	Low	225	225	225	225
	Med	225	225	225	225
	High	225	225	225	225
Closed Temperature (F)	Low	175	175	175	175
	Med	175	175	175	175
	High	175	175	175	175
Gas Input (Btuh)	Stage 1 /Stage 2				
	PGD/L	95,200/136,000	95,200/136,000	126,700/181,000	126,700/181,000
	PGE/M	126,700/181,000	126,700/181,000	158,200/226,000	158,200/226,000
	PGF/N	158,200/226,000	158,200/226,000	174,300/249,000	174,300/249,000
Burner Orifice Diameter (in. ...drill size)†					
Natural Gas		0.089...43	0.089...43	0.089...43	0.089...43
Liquid Propane		0.070...50	0.070...50	0.070...50	0.070...50
Thermostat Heat Anticipator Setting (amps)					
First Stage		.14	.14	.14	.14
Second Stage		.20	.20	.20	.20
Manifold Pressure (in. wg)					
Natural Gas		3.5	3.5	3.5	3.5
Liquid Propane		3.5	3.5	3.5	3.5
Gas Valve Quantity		1	1	1	1
Gas Supply Pressure Range (in. wg)		5.0-13.0	5.0-13.0	5.0-13.0	5.0-13.0
Field Gas Connection Size (in.)		¾	¾	¾	¾
HIGH-PRESSURE SWITCH (psig)					
Cutout		660 ± 10	660 ± 10	660 ± 10	660 ± 10
Reset (Auto.)		505 ± 20	505 ± 20	505 ± 20	505 ± 20
RETURN-AIR FILTERS		Throwaway			
Quantity...Size (in.)		4...20 x 25 x 2	4...20 x 25 x 2	4...20 x 25 x 2	4...20 x 25 x 2

LEGEND

TXV — Thermostatic Expansion Valve

\*Aluminum Evaporator Coil/Aluminum Condenser Coil.  
†For applications less than 2000 ft elevation.



**Step 3 — Field Fabricate Ductwork** — On vertical units, secure all ducts to roof curb and building structure. *Do not connect ductwork to unit.* For horizontal applications, field-supplied flanges should be attached to horizontal discharge openings and all ductwork secured to the flanges. Insulate and weatherproof all external ductwork, joints, and roof openings with counter flashing and mastic in accordance with applicable codes.

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

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

A minimum clearance is not required around ductwork. Cabinet return-air static pressure (a negative condition) shall not exceed 0.35 in. wg with economizer or 0.45 in. wg without economizer.

These units are designed for a minimum continuous return-air temperature in heating of 50 F (dry bulb), or an intermittent operation down to 45 F (dry bulb), such as when used with a night set-back thermostat.

To operate at lower return-air temperatures, a field-supplied outdoor-air temperature control must be used to initiate both stages of heat when the temperature is below 45 F. Indoor comfort may be compromised when these lower air temperatures are used with insufficient heating temperature rise.

**Step 4 — Make Unit Duct Connections**

**VERTICAL SUPPLY/RETURN CONFIGURATION** — Unit is shipped in vertical supply/return configuration. Ductwork openings are shown in Fig. 1 and 3. Attach the ductwork to the roof curb. Do not attach duct directly to the unit.

**⚠ WARNING**

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.

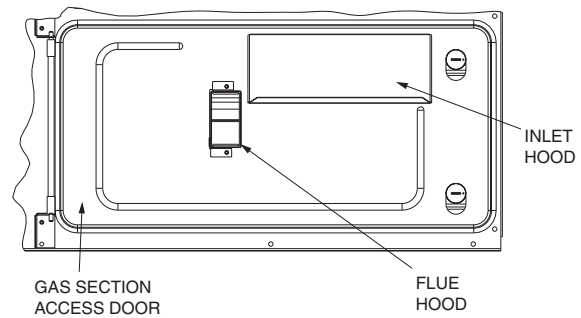
**HORIZONTAL SUPPLY/RETURN APPLICATIONS** — Unit can be field-converted from vertical supply/return to horizontal supply/return. Remove all screws securing horizontal duct covers to duct panel. Save panels. Install duct covers in the vertical duct openings in the basepan with the insulation side up. Covers will drop into openings and can be secured using field-supplied self-tapping screws. Ductwork can be attached to duct flanges provided on unit. When securing ductwork to unit, do not drill in area below bead or above top edge of duct opening. Duct openings are shown in Fig. 1 and 3.

**Step 5 — Install Flue Hood and Inlet Hood** —

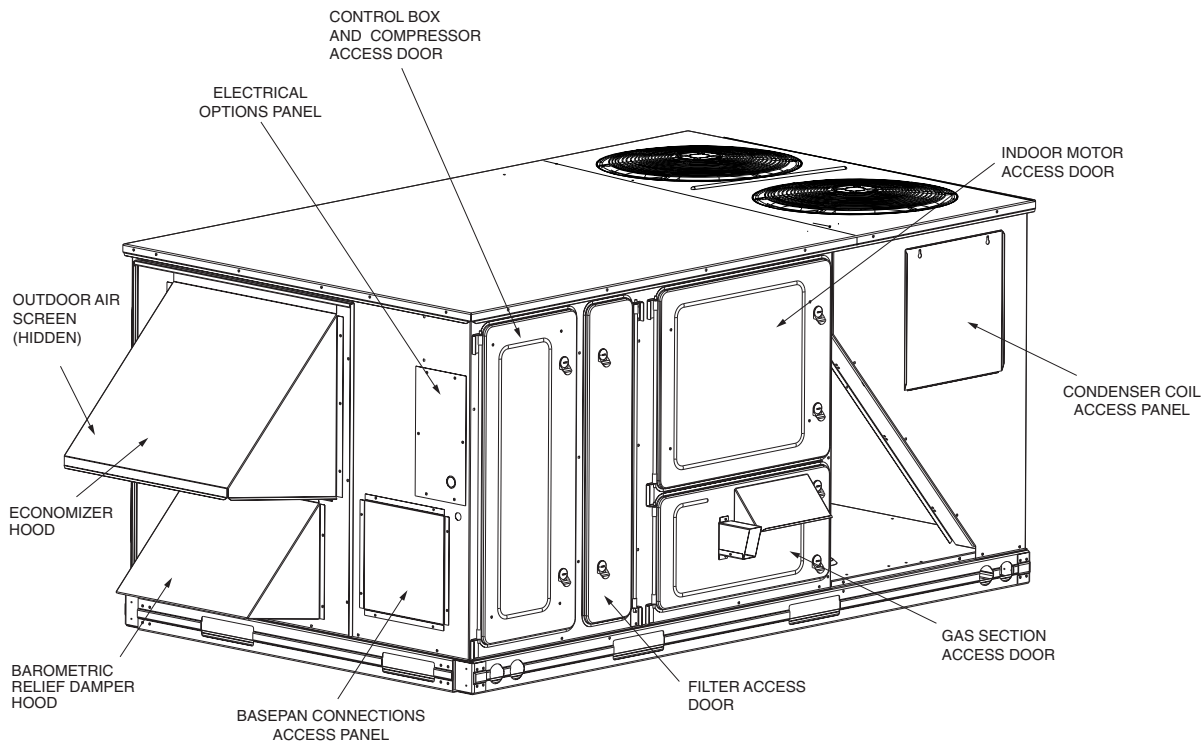
Flue hood (smaller hood), inlet hood (larger hood), and screens are shipped inside the unit in the gas section. To install, open the gas section access door. The flue hood is attached to the gas section access door from the outside using the screws provided. See Fig. 4 and 5.

The inlet hood is installed by inserting the hood through the back of the gas section access door. Attach the hood by inserting the screws provided through the clearance holes in the gas section access door and into the intake hood.

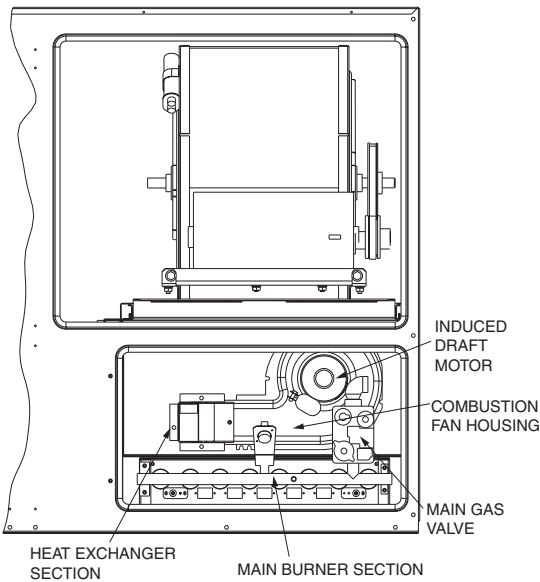
NOTE: When properly installed, the flue hood will line up with the combustion fan housing exhaust. See Fig. 6.



**Fig. 5 — Flue and Inlet Hood Locations**



**Fig. 4 — Panel and Filter Locations**



**Fig. 6 — Typical Gas Heating Section**

**Step 6 — Install External Trap for Condensate Drain** — The unit's  $\frac{3}{4}$ -in. condensate drain connections are located on the bottom and side of the unit. Unit discharge

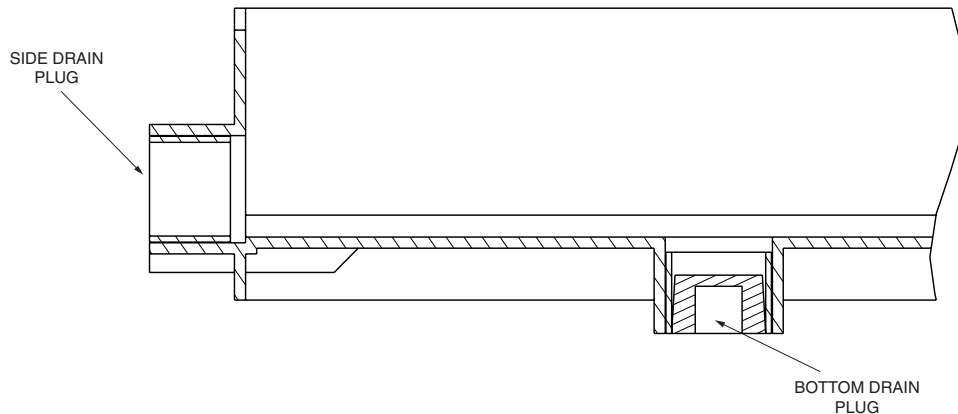
connections do not determine the use of drain connections; either drain connection can be used with vertical or horizontal applications. See Fig. 3 for locations.

When using the standard side drain connection, make sure the plug (red) covering the alternate bottom connection is tight before installing the unit. See Fig. 7.

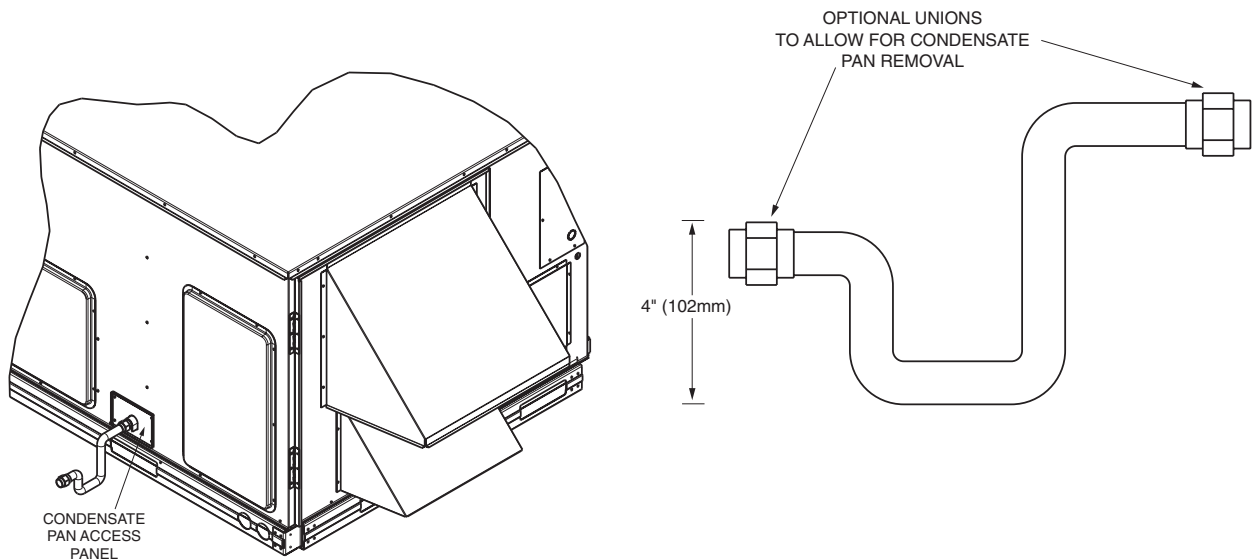
To use the bottom drain connection for a roof curb installation, relocate the factory-installed plug (red) from the bottom connection to the side connection. A  $\frac{1}{2}$ -in. socket extension can be used to remove the plug. See Fig. 7. The piping for the condensate drain and external trap can be completed after the unit is in place.

All units must have an external trap for condensate drainage. Install a trap at least 4-in. deep and protect against freeze-up. If drain line is installed downstream from the external trap, pitch the line away from the unit at 1-in. per 10 ft of run. Do not use a pipe size smaller than the unit connection ( $\frac{3}{4}$ -in.). See Fig. 8 and 9.

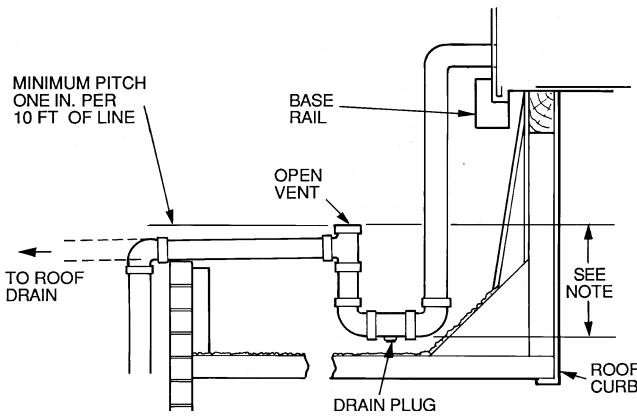
The 48PG units are provided with a removable condensate pan for ease of cleaning. It is recommended that a union be placed between the unit and condensate drainage to ease the removal of the pan during servicing. Adequate clearance should be allowed if removal of condensate pan is required. Allow 54-in. between condensate pan access panel and any obstruction for complete removal.



**Fig. 7 — Condensate Drain Pan**



**Fig. 8 — External Trap for Condensate Drain**



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

**Fig. 9 — Condensate Drain Piping Details**

**Step 7 — Orifice Change** — This unit is factory assembled for heating operation using natural gas at an elevation from sea level to 2000 ft. This unit uses orifice type LH32RFnnn, where “nnn” indicates the orifice size based on drill size diameter in thousands of an inch.

**HIGH ELEVATION (Above 2000 ft)** — Use accessory high altitude kit when installing this unit at an elevation of 2000 to 7000 ft. For elevations above 2000 ft, refer to Table 2 to identify the correct orifice size for the elevation. See Table 3 for the number of orifices required for each unit size. Purchase these orifices from your local Carrier dealer. Follow instructions in accessory Installation Instructions to install the correct orifices.

**Table 2 — Altitude Compensation\***

ELEVATION (ft)	NATURAL GAS ORIFICE†
0-1,999	43
2,000	44
3,000	44
4,000	44
5,000	45
6,000	45
7,000	47
8,000	47
9,000	47
10,000	48
11,000	49
12,000	50
13,000	50
14,000	51

\*As the height above sea level increases, there is less oxygen per cubic foot of air. Therefore, heat input rate should be reduced at higher altitudes. Includes a 4% input reduction per each 1000 ft.

†Orifices available through your Carrier dealer.

**Table 3 — Orifice Quantity**

UNIT	08	09	12	14
Low Heat (48PGD/L)	6	6	8	8
Medium Heat (48PGE/M)	8	8	10	10
High Heat (48PGF/N)	10	10	11	11

**CONVERSION TO LP (Liquid Propane) GAS** — Use accessory LP gas conversion kit when converting this unit for use with LP fuel usage for elevations up to 7000 ft. Refer to Table 4 to identify the correct orifice size for the elevation. See Table 3 for the number of orifices required for each unit size. For elevations above 7000 ft, orifices are not included in accessory and must be purchased from your local Carrier dealer. Follow instructions in accessory Installation Instructions to install the correct orifices.

**Table 4 — LP Gas Conversion\***

ELEVATION (ft)	LP GAS ORIFICE†
0-1,999	50
2,000	51
3,000	51
4,000	51
5,000	51
6,000	52
7,000	52
8,000	52
9,000	53
10,000	53
11,000	53
12,000	54
13,000	54
14,000	55

\*As the height above sea level increases, there is less oxygen per cubic foot of air. Therefore, heat input rate should be reduced at higher altitudes. Includes a 4% input reduction per each 1000 ft.

†Orifices available through your Carrier dealer.

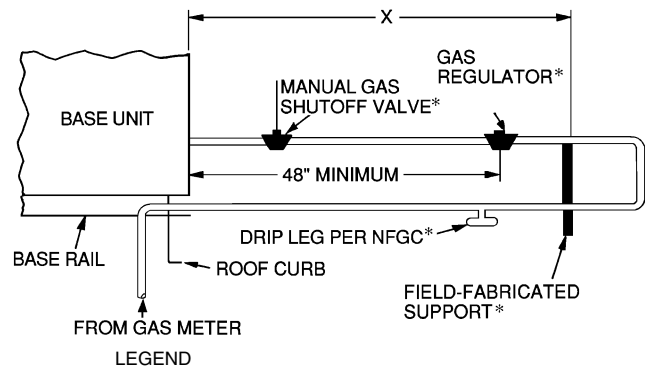
**Step 8 — Install Gas Piping** — Unit is equipped for use with natural gas. Refer to local building codes, or in the absence of local codes, to ANSI Z223.1-latest year and addendum Z223.1A-latest year entitled HFGC. In Canada, installation must be in accordance with the CAN1.B149.1 and CAN1.B149.2 installation codes for gas burning appliances.

Support gas piping as shown in the table in Fig. 10. For example, a 3/4-in. gas pipe must have one field-fabricated support beam every 8 ft. Therefore, an 18-ft long gas pipe would have a minimum of 3 support beams. See Fig. 10 for typical pipe guide and locations of external manual gas shutoff valve.

Install field-supplied manual gas shutoff valve with a 1/8-in. NPT pressure tap for test gage connection at unit. The pressure tap is located on the gas manifold, adjacent to the gas valve. Field gas piping must include sediment trap and union. See Fig. 11. Install a field-supplied gas regulator.

**⚠ WARNING**

Do not pressure test gas supply while connected to unit. Always disconnect union before servicing. High pressures can cause gas valve damage resulting in a hazardous condition.



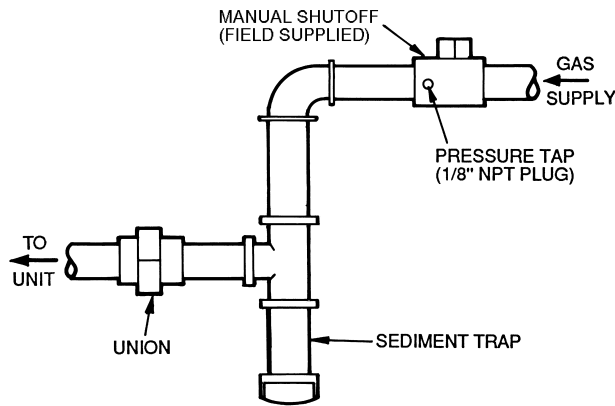
**NFGC** — National Fuel Gas Code

\*Field supplied.

NOTE: Follow all local codes.

STEEL PIPE NOMINAL DIAMETER (in.)	SPACING OF SUPPORTS X DIMENSION (ft)
1/2	6
3/4 or 1	8
1 1/4 or larger	10

**Fig. 10 — Gas Piping Guide (With Accessory Thru-the-Curb Service Connections)**



**Fig. 11 — Field Gas Piping**

**IMPORTANT:** Natural gas pressure at unit gas connection must not be less than 5.0 in. wg or greater than 13.0 in. wg for all heat sizes.

Size gas-supply piping for 0.5-in. wg maximum pressure drop. Do not use supply pipe smaller than unit gas connection.

### Step 9 — Make Electrical Connections

**FIELD POWER SUPPLY** — All 208/230-v units are factory wired for 230-v power supply. If the 208/230-v unit is to be connected to a 208-v power supply, the transformers (TRAN1 and TRAN2) must be rewired by moving the black wire with the 1/4-in. female quick connect from the 230-volt connection and moving to the 200-volt 1/4-in. male terminal on the primary side of the transformer.

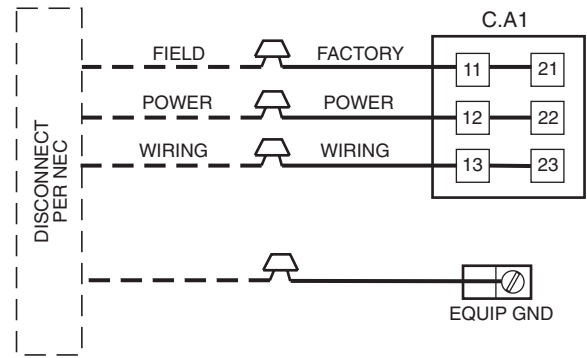
Refer to unit label diagram for additional information. Leads are provided for field wire connections. Use UL (Underwriters Laboratories) approved copper/aluminum connector.

When installing units, provide safety disconnect per NEC (National Electrical Code) Article 440 or local codes. For non-fused disconnects, size the disconnect according to the sizing data provided in the electrical data tables. If a fused disconnect is used, determine the minimum size for the switch based on the disconnect sizing data provided in the electrical data tables and then coordinate the disconnect housing size to accommodate the Maximum Overcurrent Protection (MOCP) device size as marked on the unit informative plate. See Tables 5A and 5B. All field wiring must comply with NEC and local codes. Size wire based on MCA (Minimum Circuit Amps) on the unit informative plate. See Fig. 12 for power wiring connection to the unit leads and equipment ground.

Route power and ground lines through control box end panel or unit basepan (see Fig. 3) to connections as shown on unit wiring diagram and Fig. 12. Factory leads may be wired directly to the disconnect.

### ⚠ CAUTION

The correct power phasing is critical to the operation of the scroll compressors. An incorrect phasing will result in an alarm being generated and compressor operation lockout. Should this occur, power phase correction must be made to the incoming power. Damage to compressor could result.



#### LEGEND

- C.A1** — Compressor Contactor (A1)
- EQUIP** — Equipment
- GND** — Ground
- NEC** — National Electrical Code

NOTE: The maximum wire size for C.A1 is 2/0.

**Fig. 12 — Field Power Wiring Connections**

### ⚠ WARNING

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 (National Fire Protection Association), latest edition, and local electrical codes. *Do not use gas piping as an electrical ground.* Failure to follow this warning could result in the installer being liable for personal injury through electrical shock of others.

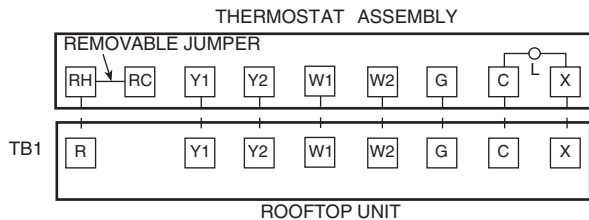
Field wiring must conform to temperature limitations for type “T” wire. All field wiring must comply with NEC and local requirements.

Operating voltage to compressor must be within voltage range indicated on unit nameplate. Voltages between phases must be balanced within 2%.

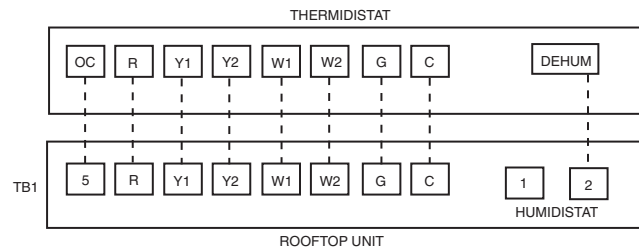
Unit failure as a result of operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components.

**FIELD CONTROL WIRING** (Units Without Optional Humidi-MiZer™ Adaptive Dehumidification System) — Unit can be controlled with either a Carrier-approved accessory thermostat or a Carrier-approved space temperature sensor. Install thermostat according to the installation instructions included with accessory. Locate thermostat assembly or space temperature sensor on a solid interior wall in the conditioned space to sense average temperature.

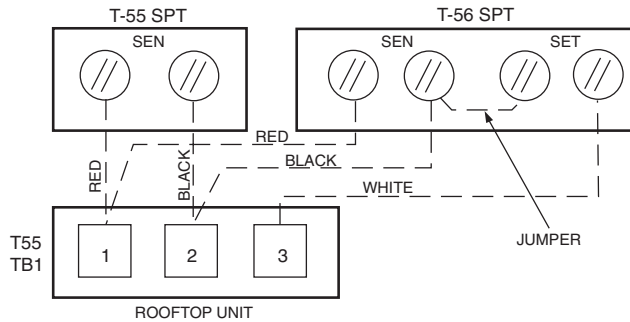
Route thermostat or space temperature sensor cable or equivalent single leads of colored wire from subbase terminals through conduit into unit to low-voltage connections as shown on unit label wiring diagram and in Fig. 13 or 14.



**Fig. 13 — Field Control Thermostat Wiring**



**Fig. 15 — Field Control Thermidstat Wiring**



SPT — Space Temperature Sensor

**Fig. 14 — Field Control Space Temperature Sensor Wiring**

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

Set heat anticipator settings as follows:

VOLTAGE	STAGE 1 (W1) ON	STAGE 1 AND 2 (W1 AND W2) ON
All	0.14	0.20

Settings may be changed slightly to provide a greater degree of comfort for a particular installation.

**FIELD CONTROL WIRING** (Units With Optional Humidi-MiZer™ Adaptive Dehumidification System) — Units require temperature control inputs for cooling and heating operation and humidity control inputs for Humidi-MiZer operation.

**Temperature Control** — The unit can be controlled with either a Carrier-approved space temperature sensor, a Carrier accessory Thermidstat™ device, or a Carrier-approved accessory thermostat. Install the temperature control device according to the installation instructions included with the accessory. Locate the device on a solid interior wall in the conditioned space to sense average temperature. Carrier space temperature sensor wiring connections are shown in Fig. 14. General thermostat field control wiring connections are shown in Fig. 13. Carrier Thermidstat device wiring connections are shown in Fig. 15. Configuration of the unit control is required to specify the control input type before unit operation.

Route thermostat or space temperature sensor cable or equivalent single leads of colored wire from subbase terminals through conduit into unit to low-voltage connections as shown on unit label wiring diagram and in Fig. 13-15.

NOTE: For wire runs up to 50 ft, use no. 18 AWG (American Wire Gage) insulated wire (35 C minimum). For 50 to 75 ft,

use no. 16 AWG insulated wire (35 C minimum). For over 75 ft, use no. 14 AWG insulated wire (35 C minimum). All wire larger than no. 18 AWG cannot be directly connected at the thermostat and will require a junction box and splice at the thermostat.

Set heat anticipator settings as follows:

VOLTAGE	STAGE 1 (W1) ON	STAGE 1 AND 2 (W1 AND W2) ON
All	0.14	0.20

Settings may be changed slightly to provide a greater degree of comfort for a particular installation.

**Humidity Control** — Unit can be controlled with either a Carrier accessory Thermidstat device or a Carrier-approved accessory humidistat (switch output). The input for an accessory humidity sensor with 4 to 20 mA output is not available. Install the humidity control device according to the installation instructions included with the accessory. Locate the device on a solid interior wall in the conditioned space to sense average humidity. Carrier Thermidstat device wiring connections are shown in Fig. 11. General humidistat wiring connections are shown in Fig. 12. Configuration of the unit control is required to specify the control input type before unit operation.

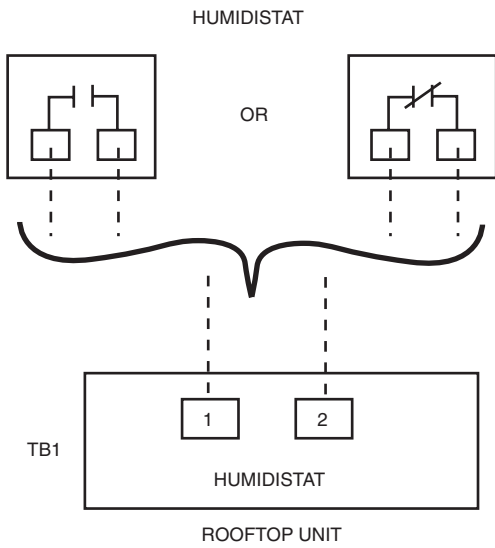
Units with the Humidi-MiZer option receive a discrete input from a field-installed device (such as from the Carrier humidistat or Thermidstat device). The discrete input is connected to the TB1 terminal strip points labeled Humidistat 1 and 2. As this is a discrete input, one of the connection points is for power to the switch and the other is the return path. See Fig. 16.

A space relative humidity sensor input (SPRH) is also available. The sensor can be connected to the OAQ point TB1-4. See Fig. 17. This input is for a different purpose than the Humidistat input and the space relative humidity sensor in no way interacts with the Humidi-MiZer system. The relative humidity value (measured by the relative humidity sensor) can be displayed on the Scrolling Marquee, in the space, through a System Pilot™ device, or can be read by other CCN devices where it can be used to perform more advanced functions. It does not affect the Humidi-MiZer system or its operation.

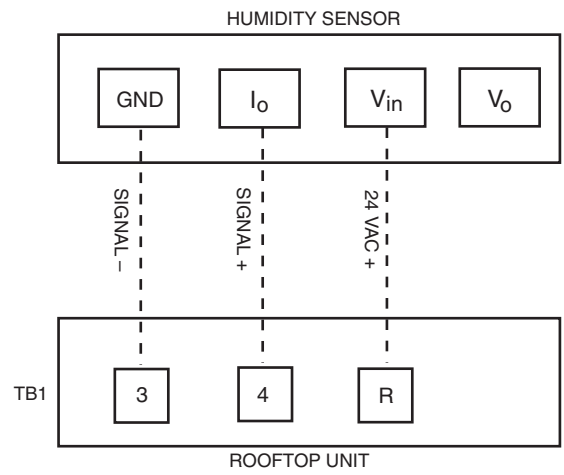
If the customer also wishes to install a smoke detector into a Humidi-MiZer equipped 48PG unit, the fire shutdown connection points are on Plug PL-19, located in the economizer section. See the unit wiring schematic for wiring.

Point 19-3 is the 24 vac power source for the detector. Point 19-4 is 24 vac power for the indoor fan contactor control. Point 19-5 is the 24 vac signal input for fire shutdown. If an immediate fan shutdown is desired, install a normally closed contactor between 19-3 and 19-4.

More information is available in the third party control section of the controls, start-up, operation, and troubleshooting manual.



**Fig. 16 — Field Control Humidistat Wiring**



**Fig. 17 — Field Control Humidity Sensor Wiring**

**Table 2A — Electrical Data — Units Without Optional Powered Convenience Outlet**

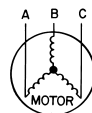
UNIT 48PG	NOMINAL POWER SUPPLY (V-Ph-Hz)	VOLTAGE RANGE		COMPRESSOR (Each)		OFM		COMBUSTION FAN MOTOR FLA	PWR EXH FLA (ea)	IFM TYPE	IFM FLA	POWER SUPPLY		DISCONNECT SIZE	
		Min	Max	RLA	LRA	Qty	FLA (ea)					MCA	MOCP	FLA	LRA
08	208/230-3-60	187	253	13.5	88	2	1.5	0.52	—	Low High	5.2 7.5	38.6/38.6 40.9/40.9	40/40 45/45	40/40 43/43	212/212 238/238
									3.0	Low High	5.2 7.5	41.6/41.6 43.9/43.9	45/45 45/45	44/44 47/47	216/216 242/242
	460-3-60	414	506	6.4	39	2	0.8	0.30	—	Low High	2.6 3.4	18.6 19.4	20 20	20 20	97 110
									1.2	Low High	2.6 3.4	19.8 20.6	20 25	21 22	100 113
	575-3-60	518	633	5.1	34	2	0.8	0.24	—	Low High	2.0 2.8	15.1 15.9	20 20	16 17	83 94
									3.0	Low High	2.0 2.8	18.1 18.9	20 20	19 20	87 98
09	208/230-3-60	187	253	16.0	91	2	1.5	0.52	—	Low High	5.2 10.2	44.2/44.2 49.2/49.2	45/45 50/50	46/46 52/52	218/218 261/261
									3.0	Low High	5.2 10.2	47.2/47.2 52.2/52.2	50/50 60/60	50/50 55/55	222/222 265/265
	460-3-600	414	506	7.1	46	2	0.8	0.30	—	Low High	2.6 4.8	20.2 22.4	25 25	21 24	111 133
									1.2	Low High	2.6 4.8	21.4 23.6	25 25	23 25	114 136
	575-3-60	518	633	5.6	37	2	0.8	0.24	—	Low High	2.0 2.8	16.2 17	20 20	17 18	89 100
									3.0	Low High	2.0 2.8	19.2 20	20 20	20 21	93 104
12	208/230-3-60	187	253	17.6	123	2	1.9	0.52	—	Low High	7.5 10.2	50.9/50.9 53.6/53.6	60/60 60/60	53/53 57/57	310/310 327/327
									3.0	Low High	7.5 10.2	53.9/53.9 56.6/56.6	60/60 60/60	57/57 60/60	314/314 331/331
	460-3-60	414	506	7.7	50	2	1.0	0.30	—	Low High	3.4 4.8	22.7 24.1	25 25	24 26	132 141
									1.2	Low High	3.4 4.8	23.9 25.3	25 30	25 27	135 144
	575-3-60	518	633	6.1	40	2	0.8	0.24	—	Low High	2.8 2.8	18.1 18.1	20 20	19 19	106 106
									3.0	Low High	2.8 2.8	21.1 21.1	25 25	23 23	110 110
14	208/230-3-60	187	253	22.4	149	2	1.9	0.52	—	Low High	10.2 15.0	64.4/64.4 69.2/69.2	70/70 70/70	68/68 73/73	379/379 388/388
									3.0	Low High	10.2 15.0	67.4/67.4 72.2/72.2	70/70 80/80	71/71 77/77	383/383 392/392
	460-3-60	414	506	10.6	75	2	1.0	0.30	—	Low High	4.8 7.4	30.7 33.3	35 35	32 35	191 195
									1.2	Low High	4.8 7.4	31.9 34.5	35 35	34 37	194 198
	575-3-60	518	633	7.7	54	2	0.8	0.24	—	Low High	2.8 5.6	21.7 24.5	25 25	23 26	134 148
									3.0	Low High	2.8 5.6	24.7 27.5	25 30	26 29	138 152

**LEGEND**

- FLA** — Full Load Amps
- HACR** — Heating, Air Conditioning and Refrigeration
- IFM** — Indoor (Evaporator) Fan Motor
- LRA** — Locked Rotor Amps
- MCA** — Minimum Circuit Amps
- MOCP** — Maximum Overcurrent Protection
- NEC** — National Electrical Code
- OFM** — Outdoor (Condenser) Fan Motor
- RLA** — Rated Load Amps



Example: Supply voltage is 230-3-60.



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

$$\text{Average Voltage} = \frac{224 + 231 + 226}{3}$$

$$= \frac{681}{3}$$

$$= 227$$

Determine maximum deviation from average voltage.

- (AB) 227 - 224 = 3 v
- (BC) 231 - 227 = 4 v
- (AC) 227 - 226 = 1 v

Maximum deviation is 4 v.

Determine percent of voltage imbalance.

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

$$= 1.76\%$$

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 the local electric utility company immediately.

**NOTES:**

1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**  
Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

% Voltage Imbalance

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

**Table 2B — Electrical Data — Units With Optional Convenience Outlet**

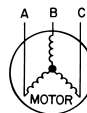
UNIT 48PG	NOMINAL POWER SUPPLY (V-Ph-Hz)	VOLTAGE RANGE		COMPRESSOR (Each)		OFM		COMBUSTION FAN MOTOR FLA	PWR EXH FLA (ea)	IFM TYPE	IFM FLA	POWER SUPPLY		DISCONNECT SIZE	
		Min	Max	RLA	LRA	Qty	FLA (ea)					MCA	MOCP	FLA	LRA
08	208/230-3-60	187	253	13.5	88	2	1.5	0.52	—	Low High	5.2 7.5	43.4/43.4 45.7/45.7	45/45 50/50	46/46 49/49	217/217 243/243
									3.0	Low High	5.2 7.5	46.4/46.4 48.7/48.7	50/50 50/50	49/49 52/52	221/221 247/247
	460-3-60	414	506	6.4	39	2	0.8	0.30	—	Low High	2.6 3.4	20.8 21.6	25 25	22 23	99 112
									1.2	Low High	2.6 3.4	22 22.8	25 25	23 24	102 115
	575-3-60	518	633	5.1	34	2	0.8	0.24	—	Low High	2.0 2.8	16.8 17.6	20 20	18 19	85 96
									3.0	Low High	2.0 2.8	19.8 20.6	20 25	21 22	89 100
09	208/230-3-60	187	253	16.0	91	2	1.5	0.52	—	Low High	5.2 10.2	49.0/49.0 54.0/54.0	50/50 60/60	52/52 58/58	223/223 266/266
									3.0	Low High	5.2 10.2	52.0/52.0 57.0/57.0	60/60 60/60	55/55 61/61	227/227 270/270
	460-3-60	414	506	7.1	46	2	0.8	0.30	—	Low High	2.6 4.8	22.4 24.6	25 25	24 26	113 135
									1.2	Low High	2.6 4.8	23.6 25.8	25 30	25 28	116 138
	575-3-60	518	633	5.6	37	2	0.8	0.24	—	Low High	2.0 2.8	17.9 18.7	20 20	19 20	91 102
									3.0	Low High	2.0 2.8	20.9 21.7	25 25	22 23	95 106
12	208/230-3-60	187	253	17.6	123	2	1.9	0.52	—	Low High	7.5 10.2	55.7/55.7 58.4/58.4	60/60 60/60	59/59 62/62	315/315 332/332
									3.0	Low High	7.5 10.2	58.7/58.7 61.4/61.4	60/60 70/70	62/62 66/66	319/319 336/336
	460-3-60	414	506	7.7	50	2	1.0	0.30	—	Low High	3.4 4.8	24.9 26.3	25 30	26 28	134 143
									1.2	Low High	3.4 4.8	26.1 27.5	30 30	28 29	137 146
	575-3-60	518	633	6.1	40	2	0.8	0.24	—	Low High	2.8 2.8	19.8 19.8	20 20	21 21	108 108
									3.0	Low High	2.8 2.8	22.8 22.8	25 25	24 24	112 112
14	208/230-3-60	187	253	22.4	149	2	1.9	0.52	—	Low High	10.2 15.0	69.2/69.2 74.0/74.0	70/70 80/80	73/73 79/79	384/384 393/393
									3.0	Low High	10.2 15.0	72.2/72.2 77.0/77.0	80/80 80/80	77/77 82/82	388/388 397/397
	460-3-60	414	506	10.6	75	2	1.0	0.30	—	Low High	4.8 7.4	32.9 35.5	35 40	35 38	193 197
									1.2	Low High	4.8 7.4	34.1 36.7	35 40	36 39	196 200
	575-3-60	518	633	7.7	54	2	0.8	0.24	—	Low High	2.8 5.6	23.4 26.2	25 30	25 28	136 150
									3.0	Low High	2.8 5.6	26.4 29.2	30 30	28 31	140 154

**LEGEND**

- FLA** — Full Load Amps
- HACR** — Heating, Air Conditioning and Refrigeration
- IFM** — Indoor (Evaporator) Fan Motor
- LRA** — Locked Rotor Amps
- MCA** — Minimum Circuit Amps
- MOCP** — Maximum Overcurrent Protection
- NEC** — National Electrical Code
- OFM** — Outdoor (Condenser) Fan Motor
- RLA** — Rated Load Amps



Example: Supply voltage is 230-3-60.



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

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

Determine maximum deviation from average voltage.

- (AB) 227 - 224 = 3 v
- (BC) 231 - 227 = 4 v
- (AC) 227 - 226 = 1 v

Maximum deviation is 4 v.

Determine percent of voltage imbalance.

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

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 the local electric utility company immediately.

**NOTES:**

1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**  
*Never operate a motor where a phase imbalance in supply voltage is greater than 2%.* Use the following formula to determine the percent of voltage imbalance.

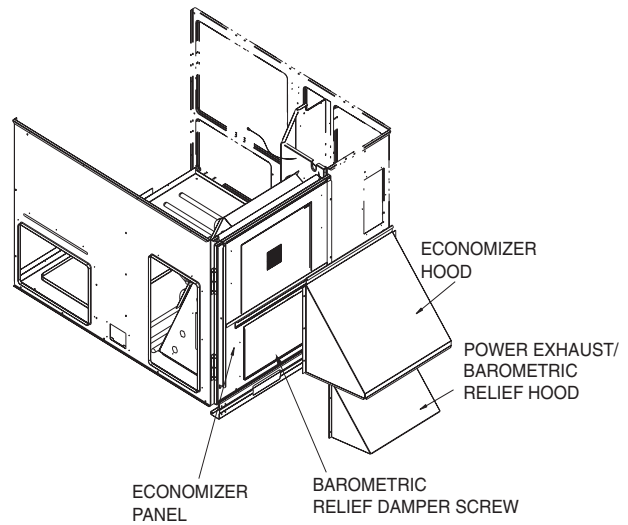
$$\% \text{ Voltage Imbalance} = 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

**Step 10 — Install Outdoor-Air Hoods (Units with Economizer)** — Perform the following procedure to install the outdoor-air hoods:

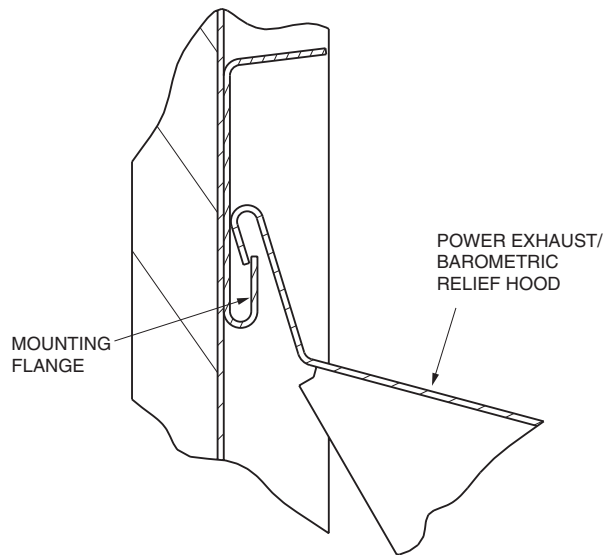
1. Economizer and barometric relief hoods are stored in the condenser section under the slanted coil for shipping. See Fig. 18. Barometric relief/power exhaust hood is shipped inside of economizer hood. Remove screws that secure the wooden rails of the hood assemblies to the unit. Save screws. Slide complete assembly from condenser section.
2. Remove the screws that secure the economizer and barometric relief/power exhaust hoods to the wooden railing. Discard or recycle wooden rails. Save screws.
3. The barometric relief damper is secured to the economizer panel for shipping. Remove the screw holding the barometric relief damper to the economizer panel. Damper should be free to swing open during operation. See Fig. 19.
4. Hang the barometric relief/power exhaust hood on the mounting flange on the economizer panel. Secure hood to panel with screws saved from Step 2. See Fig. 19 and 20.
5. Align hole in flange of economizer panel with left edge of hood. Hang economizer hood on the top flange of the economizer panel by rotating hood until top flange of the economizer hood engages the bent flange on the economizer panel. Rotate hood until hood is flush with the economizer panel. Hood will support itself from flange. Align holes in hood with holes in panel and secure hood to panel with screws saved from Step 2. See Fig. 19 and 21.

**Step 11 — Install All Accessories** — After all of the factory-installed options have been adjusted, install all field-installed accessories. Refer to the accessory installation instructions included with each accessory.

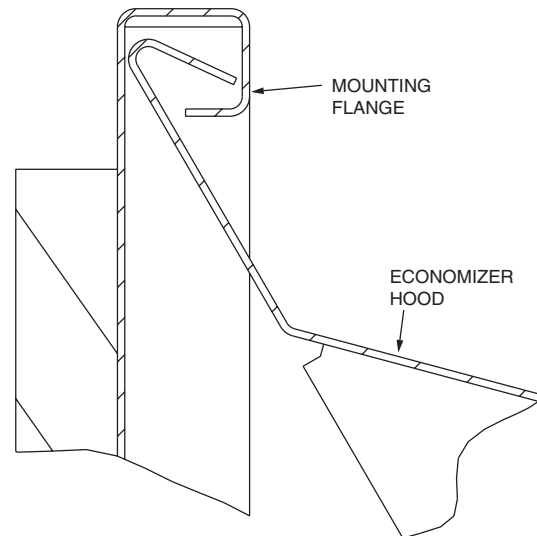
**Step 12 — Configure Controls** — Refer to unit Controls and Troubleshooting book for information on configuring unit controls.



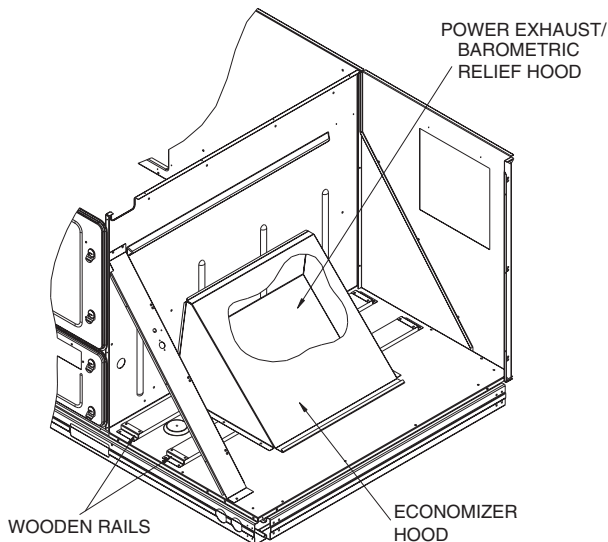
**Fig. 19 — Hood Installation**



**Fig. 20 — Barometric Relief/Power Exhaust Hood Flange**



**Fig. 21 — Economizer Flange**



**Fig. 18 — Economizer and Barometric Relief/Power Exhaust Hoods Shipping Positions**



