



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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GENERAL


The 48PD rooftop unit uses Puron® (R-410A) refrigerant and ComfortLink™ DDC controls. It is intended to be used in either a displacement ventilation or a single-zone variable air volume application. The unit includes a factory installed variable capacity compressor and variable frequency drive indoor fan motor. This manual provides instruction for installation of the unit. Refer to the unit Controls and Troubleshooting book for additional information on configuring controls.

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 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.

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, and CAUTION. 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 a hazard 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 result in personal injury or death.

Before performing service or maintenance operations on unit, always turn off main power to unit.

CAUTION

UNIT OPERATION AND SAFETY HAZARD

Failure to follow this caution may result in personal injury or equipment damage.

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

⚠ WARNING

FIRE, EXPLOSION HAZARD

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

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

FIRE, EXPLOSION HAZARD

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

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.

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. 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 non-combustible 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

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

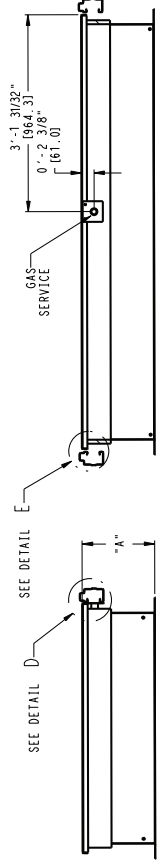
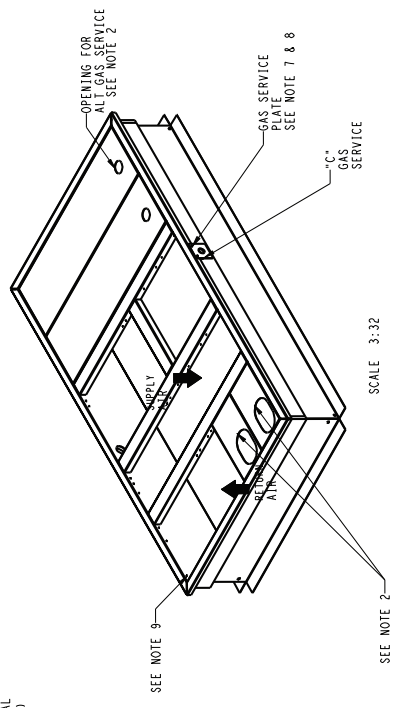
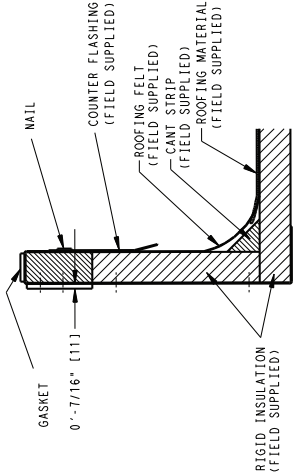
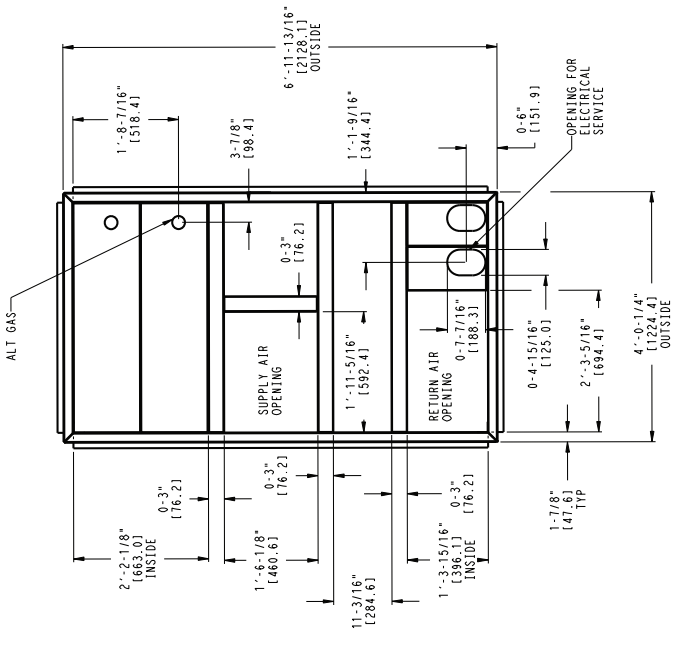
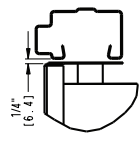
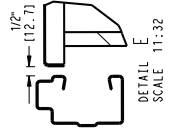
All panels must be in place when rigging. Unit is not designed for handling by fork truck.

Do not drop unit; keep upright. Use spreader bars over unit to prevent sling or cable damage. Rollers may be used to move unit across a roof. Level by using unit frame as a reference. Leveling tolerance is $\pm 1/16$ -in. per linear ft in any direction. See Fig. 3 for additional information and unit rigging weight.

UNIT SIZE 48PG-PD	"A"	ROOF CURB ACCESSORY
03-07	1'-2" [356] 2'-0" [610]	CRRECUBR020A00 CRRECUBR032A00

UNIT SIZE 48PG-PD	"C"	CONNECTOR ACCESSORY PACKAGE
03-07	1/2" NPT	CRGASPLT005A00

- NOTES:
- 1 ROOF CURB ACCESSORY IS SHIPPED UNASSEMBLED.
 - 2 INSULATED PANELS.
 - 3 DIMENSIONS IN () ARE IN MILLIMETERS.
 - 4 ROOF CURB GALVANIZED STEEL.
 - 5 ATTACH BUSHWORK 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 ROOF CURB.
 - 9 BOLT HEADS TO BE ON INSIDE OF FLANGE CLEARANCE IS (11) 0-0-7/16" TIP ALL CORNERS.



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Fig. 1 - Roof Curb Details

48PD

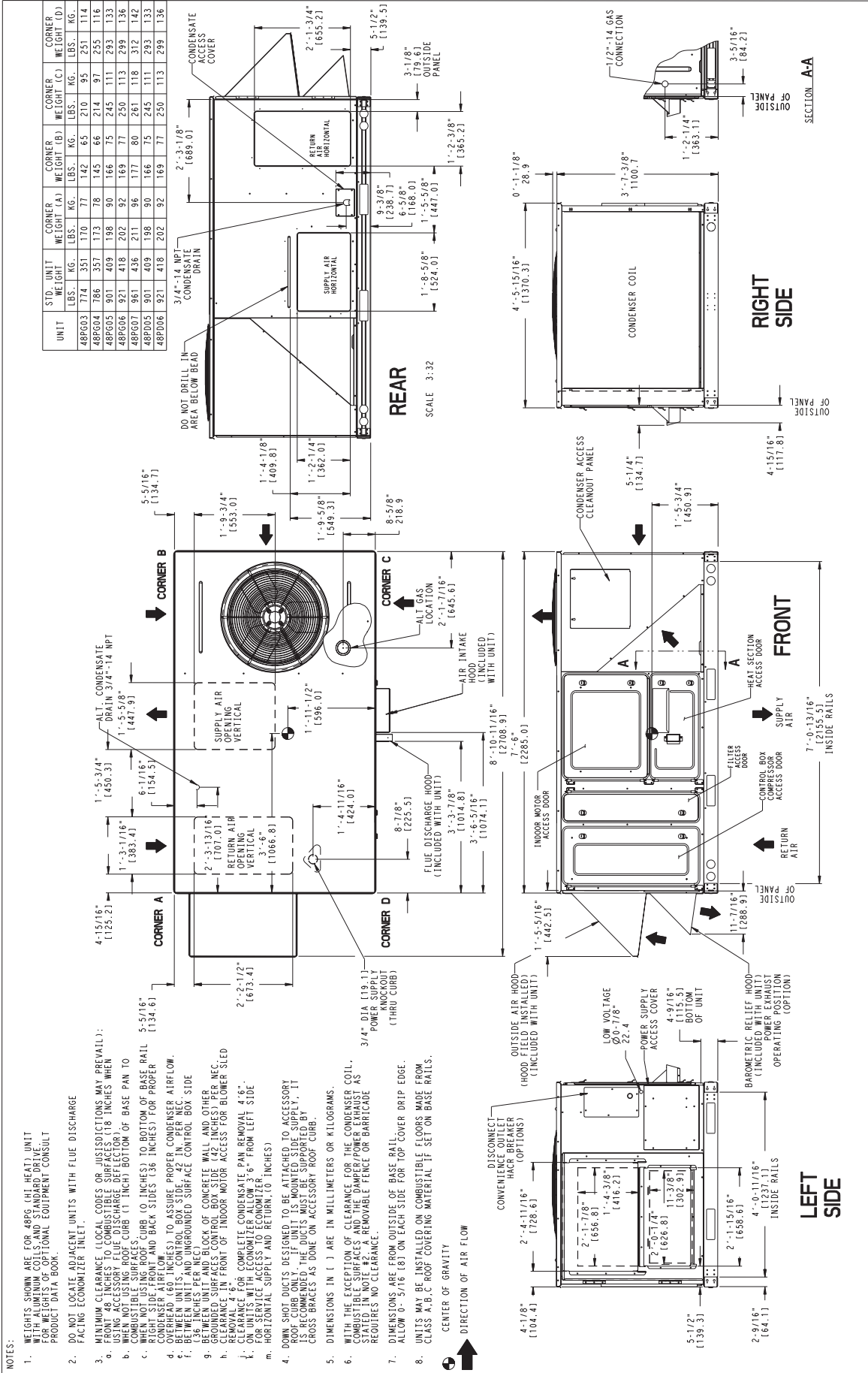


Fig. 2 - Base Unit Dimensions

**⚠ 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
05-06	77.9	1978	36-54	914-1371	44.8	1139	42.0	1067	23.5	597	1156	525

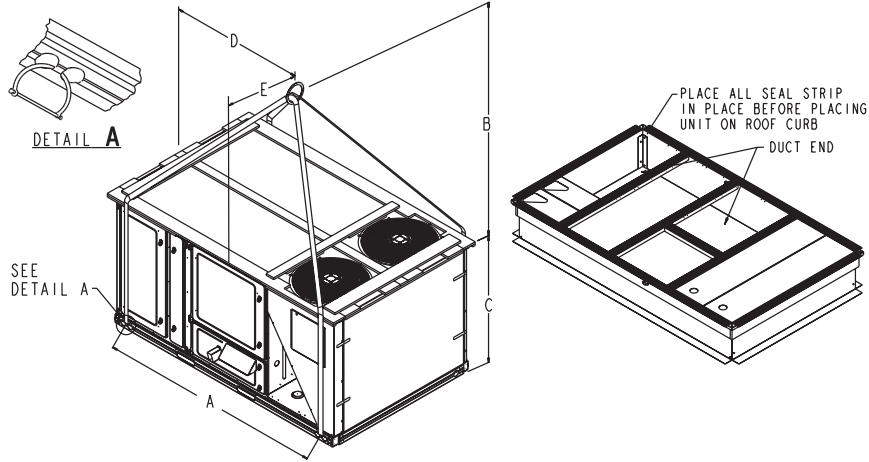


Fig. 3 - Rigging Label

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Positioning

Maintain clearance, per Fig. 2, around and above unit to provide minimum distance from combustible materials, proper airflow, and service access.

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). Locate unit at least 10 ft away from any adjacent unit. When unit is located adjacent to public walkways, flue assembly must be at least 7 ft above grade.

Roof Mount

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

Installation On Roof Curb

The 48PD units are designed to fit on the accessory full perimeter curb. Correct placement of the unit onto the curb is critical to proper 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 2 to assure proper duct opening alignment.

NOTE: Before positioning unit onto curb, refer to Step 6 - Install External Trap for Condensate Drain concerning bottom drain connection plug.

⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in damage to unit.

Do not slide unit into position 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.

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Table 1 – Physical Data (Cooling)

BASE UNIT 48PD	05	06
NOMINAL CAPACITY (Tons)	4	5
OPERATING WEIGHT (lbs)		
Unit*	901	921
Economizer		
Vertical/Horizontal	40/50	40/50
Roof Curb		
14-in./ 24-in.	122/184	122/184
REFRIGERANT SYSTEM	Puron® (R-410A) Refrigerant Balanced – Port TXV with Bypass	
Refrigerant		
Metering Device		
# Circuits/# Compressors	1/1	1/1
Charge (lbs)	14.5	16.0
High Pressure Switch Cutout (psig)	660 ± –10	660 ± –10
High Pressure Switch Auto Reset (psig)	505 ± –20	505 ± –20
COMPRESSOR	Copeland Digital Scroll Copeland 3MA	
Oil Type		
Oil (oz)	42	66
CONDENSER COIL	Round Tube Plate Fin	
Circuit	Outer/Inner	Outer/Inner
Rows/FPI	2/17	2/17
Face Area (sq ft)	12.6	12.6
CONDENSER FAN (type)	Propeller	
Quantity/Diameter (in.)	1/24	1/24
Nominal Cfm (Total, all fans)	3500	3500
Motor Hp/Watts	0.125/227	0.25/351
Nominal Rpm	825	1100
EVAPORATOR COIL	Round Tube Plate Fin	
Standard Coil Tube/Fins	Cu/Al	Cu/Al
Rows/FPI	2/15	3/15
Face Area (sq ft)	9.3	9.3
Condensate Drain Connection Size (in.)	3/4 NPT	3/4 NPT
EVAPORATOR FAN (See motor and drive tables)	Centrifugal	
Fan Quantity/Type	1/Belt	1/Belt
Belt Size (in.)	12 x 9	12 x 9
Blower Pulley Type	Fixed	Fixed
Fan Bearing Type	Ball – Concentric Lock	Ball – Concentric Lock
Maximum Fan RPM	2000	2000
FILTERS		
Unit Filter Type	Fiberglass fill, non-pleated	Fiberglass fill, non-pleated
Unit Filter Qty/Size (in.)	4/16 x 20 x 2	4/16 x 20 x 2
Economizer OA Inlet Screen Qty/Size (in.)	1/25.8 x 16.4	1/25.8 x 16.4

* Aluminum evaporator coil/Aluminum condenser coil with low heat

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Table 2 – Physical Data (Heating)

BASE UNIT 48PD		05	06
GAS HEAT SECTION			
# of Gas Valves		1	1
Gas Supply Line Pressure Range (in. wg)		5.0-13.0	5.0-13.0
Gas Supply Line Pressure Range (PSIG)		0.180–0.469	0.180–0.469
Manifold Pressure			
Natural Gas Vertical/Horizontal (in. wg)		3.50/3.50	3.50/3.50
Liquid Propane Vertical/Horizontal (in. wg)		3.50/3.50	3.50/3.50
Thermostat Heat Anticipator Setting (amps)		NA†	NA†
Field Gas Connection Size (in.)		1/2	1/2
Natural Gas			
LOW HEAT	# of burners (total)	3	4
	Rollout switch opens/closes (deg F)	195/115	195/115
	Temperature Rise Min – Max (deg F)	25–70	20–60
	Burner Orifice Diameter (in./drill size)**	0.0820/45	0.0820/45
MEDIUM HEAT	# of burners (total)	4	5
	Rollout switch opens/closes (deg F)	195/115	225/175
	Temperature Rise Min – Max (deg F)	20–60	30–75
	Burner Orifice Diameter (in./drill size)**	0.0820/45	0.0820/45
HIGH HEAT	# of burners (total)	6	8
	Rollout switch opens/closes (deg F)	225/175	195/115
	Temperature Rise Min – Max (deg F)	30–75	45–75
	Burner Orifice Diameter (in./drill size)**	0.0820/45	0.0820/45
Liquid Propane			
LOW HEAT	# of burners (total)	3	4
	Rollout switch opens/closes (deg F)	195/115	195/115
	Temperature Rise Min – Max (deg F)	25–70	20–60
	Burner Orifice Diameter (in./drill size)**	0.0650/52	0.0650/52
MEDIUM HEAT	# of burners (total)	4	5
	Rollout switch opens/closes (deg F)	195/115	225/175
	Temperature Rise Min – Max (deg F)	20–60	30–75
	Burner Orifice Diameter (in./drill size)**	0.0650/52	0.0650/52
HIGH HEAT	# of burners (total)	6	8
	Rollout switch opens/closes (deg F)	225/175	195/115
	Temperature Rise Min – Max (deg F)	30–75	45–75
	Burner Orifice Diameter (in./drill size)**	0.0650/52	0.0650/52

** For applications less than 2000 ft elevation.

† PD unit does not support the use of conventional Y1/W1 thermostat

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Table 3 – Fan and Motor Drive Data - Vertical Supply/Return

UNIT 48PD	05	06
VOLTAGE (volts)	208/230 and 460	208/230 and 460
LOW STATIC DRIVE OPTION		
Motor HP	2.4	2.4
Motor Nominal RPM	1725	1725
Maximum Continuous BHP	2.0	2.0
Maximum Continuous Watts	2000	2000
Motor Frame Size	56HZ	56HZ
Motor shaft diameter (in.)	5/8	5/8
Motor Pulley Pitch Diameter Min – Max (in)	1.9 – 2.9	2.4 – 3.4
Fan RPM Range	596–910	690–978
Blower Pulley Pitch Diameter (in.)	5.5	6.0
Pulley center line distance (in.)	16.2–20.2	16.2–20.2
Belt Quantity / Type / Pitch Length (in.)	1 / AX48 / 49.3	1 / AX48 / 49.3
Speed change per turn – moveable pulley (RPM)	63	58
Moveable pulley maximum full turns	5	5
Factory Speed setting (RPM)	596	690
HIGH STATIC DRIVE OPTION		
Motor HP	2.4	2.4
Motor Nominal RPM	1725	1725
Maximum Continuous BHP	2.0	2.0
Maximum Continuous Watts	2000	2000
Motor Frame Size	56HZ	56HZ
Motor shaft diameter (in.)	5/8	5/8
Motor Pulley Pitch Diameter Min – Max (in)	2.4 – 3.4	2.8 – 3.8
Fan RPM Range	828–1173	929–1261
Blower Pulley Pitch Diameter (in.)	5.0	5.2
Pulley center line distance (in.)	16.2–20.2	16.2–20.2
Belt Quantity / Type / Pitch Length (in.)	1 / AX48 / 49.3	1 / AX48 / 49.3
Speed change per turn – moveable pulley (RPM)	69	67
Moveable pulley maximum full turns	5	5
Factory Speed setting (RPM)	828	929

Table 4 – Fan and Motor Drive Data - Horizontal Supply/Return

UNIT 48PD	05	06
VOLTAGE (volts)	208/230 and 460	208/230 and 460
LOW STATIC DRIVE OPTION		
Motor HP	2.4	2.4
Motor Nominal RPM	1725	1725
Maximum Continuous BHP	2.0	2.0
Maximum Continuous Watts	2000	2000
Motor Frame Size	56HZ	56HZ
Motor shaft diameter (in.)	5/8	5/8
Motor Pulley Pitch Diameter Min – Max (in)	1.9 – 2.9	2.4 – 3.4
Fan RPM Range	596–910	690–978
Blower Pulley Pitch Diameter (in.)	5.5	6.0
Pulley center line distance (in.)	16.2–20.2	16.2–20.2
Belt Quantity / Type / Pitch Length (in.)	1 / AX48 / 49.3	1 / AX48 / 49.3
Speed change per turn – moveable pulley (RPM)	63	58
Moveable pulley maximum full turns	5	5
Factory Speed setting (RPM)	596	690
HIGH STATIC DRIVE OPTION		
Motor HP	2.4	2.4
Motor Nominal RPM	1725	1725
Maximum Continuous BHP	2.0	2.0
Maximum Continuous Watts	2000	2000
Motor Frame Size	56HZ	56HZ
Motor shaft diameter (in.)	5/8	5/8
Motor Pulley Pitch Diameter Min – Max (in)	2.4 – 3.4	2.8 – 3.8
Fan RPM Range	828–1173	929–1261
Blower Pulley Pitch Diameter (in.)	5.0	5.2
Pulley center line distance (in.)	16.2–20.2	16.2–20.2
Belt Quantity / Type / Pitch Length (in.)	1 / AX48 / 49.3	1 / AX48 / 49.3
Speed change per turn – moveable pulley (RPM)	69	67
Moveable pulley maximum full turns	5	5
Factory Speed setting (RPM)	828	929

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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 2. Attach the ductwork to the roof curb. Do not attach duct directly to the unit.

⚠ CAUTION

PERSONAL INJURY HAZARD

Failure to follow this caution may result in personal injury.

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

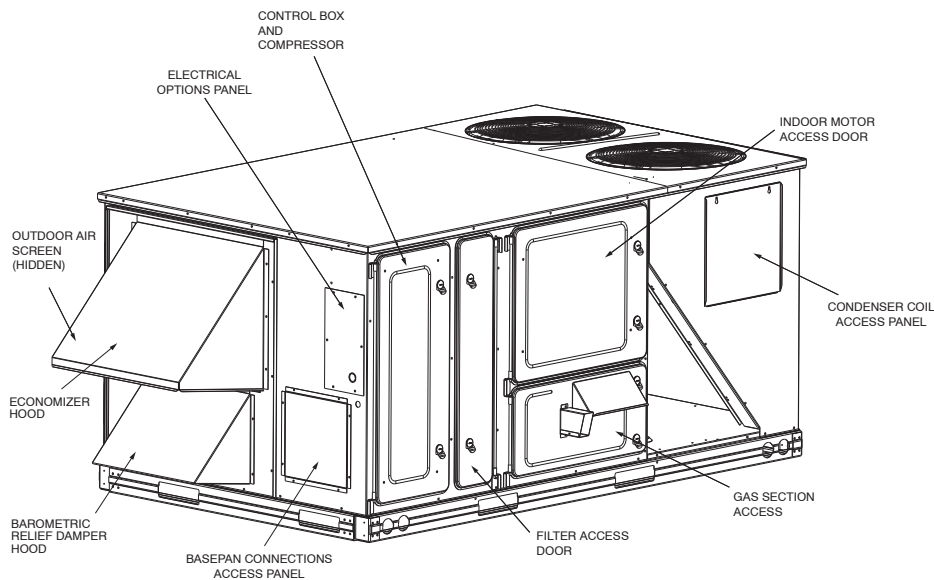


Fig. 5 - Panel and Filter Locations

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.

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 heat section door. The flue hood is attached to the heat section panel from the outside using the screws provided. (See Fig. 4 and 5.)

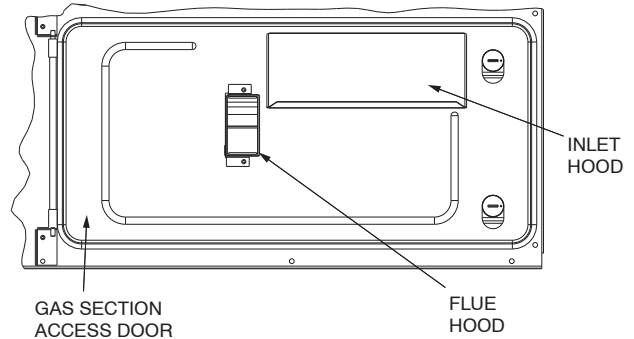


Fig. 4 - Flue and Inlet Hood

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The inlet hood is installed by inserting the hood through the back of the heat panel. Attach the hood by inserting the screws provided through the clearance holes in the heat panel and into the intake hood.

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

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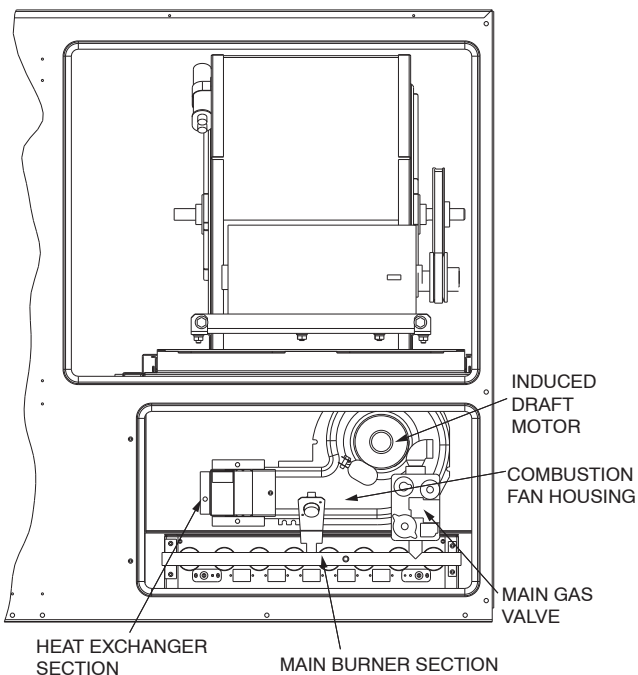


Fig. 6 - Typical Gas Heating Section

Step 6 — Install External Trap for Condensate Drain

The unit's 3/4-in. condensate drain connections are located on the bottom and side of the unit. If the down drain is used, drill a minimum of a 5/8-in. diameter hole but not larger than a 3/4-in. diameter hole through the drain pan. A dimple of 2 mm in diameter and 1.5 mm deep will be provided in the drain pan to help locate the drill bit and to start the hole. Do not cut through the PVC pipe threads. Unit discharge connections do not determine the use of drain connections; either drain connection can be used with vertical or horizontal applications. See Fig. 2 for locations.

When using the standard side drain connection, make sure the plug (red) in 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 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 (3/4-in.). (See Fig. 8 and 9.)

The 48PD units are provided with a removable condensate pan for ease of cleaning. Refer to Maintenance section in Controls and Troubleshooting book for more information. 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.

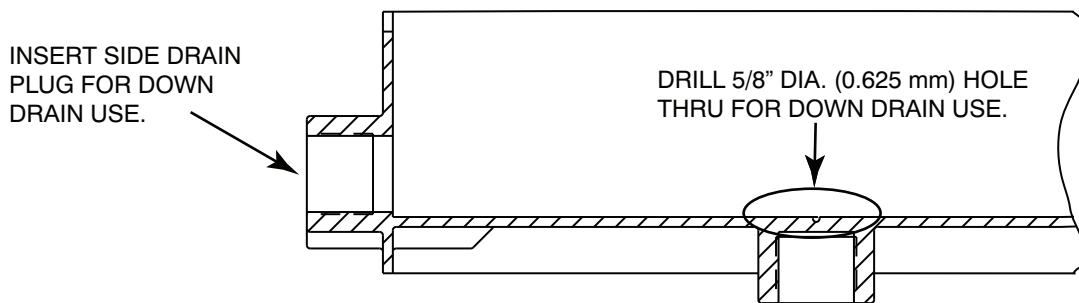


Fig. 7 - Condensate Drain Pan

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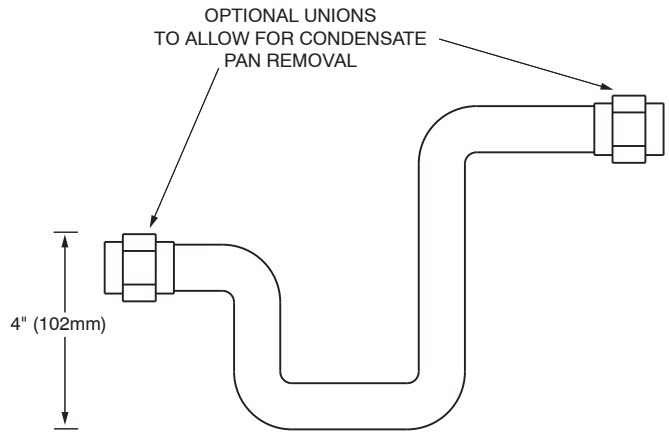
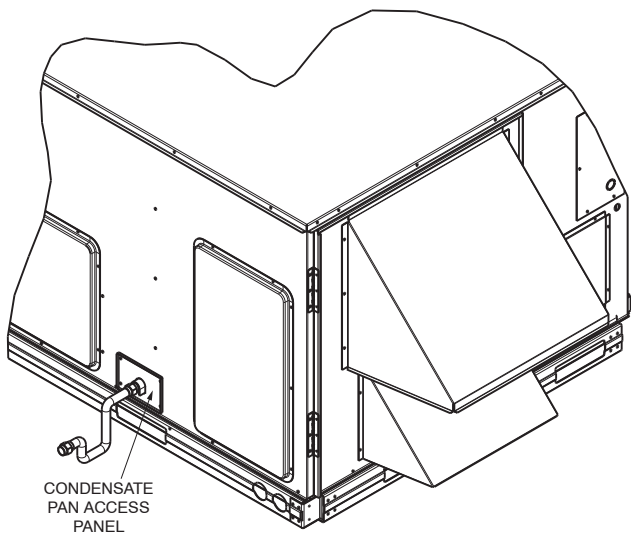
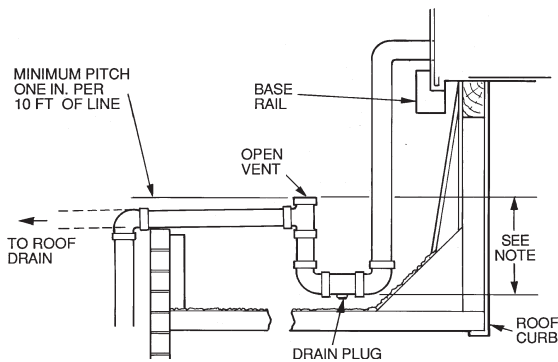


Fig. 8 - External Trap for Condensate Drain

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48PD



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

C06291

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)

Consult the local gas utility company to determine if gas supply has been de-rated for high altitude. If gas supply is not de-rated, use accessory high altitude kit when installing this unit at an elevation of 2000 to 7000 ft. For elevations above 7000 ft, refer to Table 6 to identify the correct orifice size for the elevation. See Table 7 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 5 – Altitude Compensation*

ELEVATION (ft)	NATURAL GAS ORIFICE†
0 – 1,999	45
2,000	47
3,000	47
4,000	47
5,000	48
6,000	48
7,000	48
8,000	49
9,000	49
10,000	50
11,000	51
12,000	51
13,000	52
14,000	52

* 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 6 – Orifice Quantity

UNIT	3	4	5	6	7
Low Heat (D/L)	—	3	3	4	4
Medium Heat (E/M)	—	4	4	6	6
High Heat (F/N)	3	6	6	8	8

Conversion to LP Gas

Use accessory LP gas conversion kit when converting this unit for use with LP fuel usage for elevations up to 7000 ft. For elevations above 7000 ft, refer to Table 7 to identify the correct orifice size for the elevation. See Table 6 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 7 – LP Gas Conversion*

ELEVATION (ft)	LP GAS ORIFICE †
0–1,999	52
2,000	52
3,000	53
4,000	53
5,000	53
6,000	53
7,000	53
8,000	54
9,000	54
10,000	54
11,000	54
12,000	55
13,000	55
14,000	56

* 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 piping 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 gauge 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.

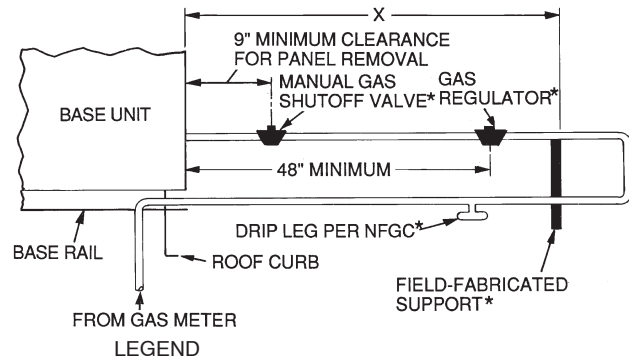
⚠ WARNING

FIRE, EXPLOSION HAZARD

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

Do not pressure test gas supply while connected to unit. Always disconnect before servicing.

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



LEGEND
NFGC — National Fuel Gas Code

*Field supplied.

NOTE: Follow all local codes.

SPACING OF SUPPORTS

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

C06115

Fig. 10 - Gas Piping Guide (With Accessory Thru-the-Cab Service Connections)

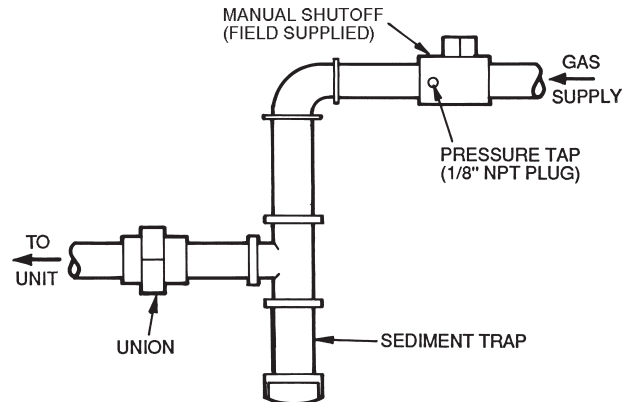


Fig. 11 - Field Gas Piping

C06236

Step 9 — Make Electrical Connections

Field Power Supply

(For more details, refer to the Controls, Start-Up, Operation, and Troubleshooting manual).

All 208/230v units are factory wired for 230v power supply. If the 208/230v unit is to be connected to a 208v power supply, the transformers (TRAN1 and TRAN2) must be rewired by moving the black wire with the 1/4-in. female quick connector from the 230volt connection and moving to the 200volt 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 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 Table 9 and 10.)

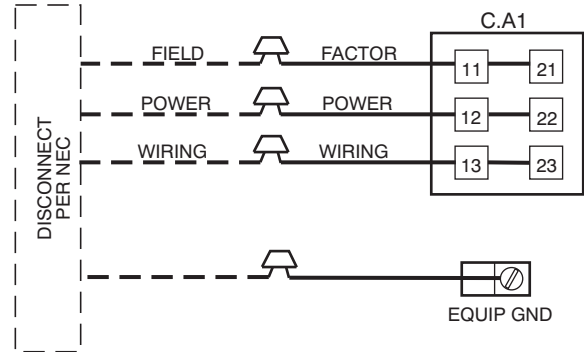
All field wiring must comply with NEC and local codes. Size wire based on MCA (Minimum Circuit Amps) on the unit informative plate. See Fig. 12 for power wiring connection to the unit leads and equipment ground.

Route power and ground lines through control box end panel or unit basepan (see Fig. 2) to connections as shown on unit wiring diagram and Fig. 12. Factory leads may be wired directly to the disconnect.

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. On 3-phase units, 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.



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.

C06237

Fig. 12 - Field Power Wiring Connections

Field Control Wiring

Unit can be controlled with a Carrier-approved accessory space temperature sensor. Install sensor according to the installation instructions included with accessory. Locate space temperature sensor on a solid interior wall in the conditioned space to sense average temperature. The 48PD unit is not compatible with a conventional Y1/W1 thermostat.

NOTE: Use 20 AWG (American Wire Gauge) wire to connect the sensor to the controller. The wire is suitable for distances of up to 500 ft. Use a three-conductor shielded cable for the sensor and set-point adjustment connections. The standard CCN communication cable can be used. If the set-point adjustment (slide bar) is not required, then an unshielded, 18 or 20 AWG (American Wire Gauge), two-conductor, twisted pair cable can be used.

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

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

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

⚠ 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 (American National Standards Institute)/NFPA (National Fire Protection Association), latest edition, and local electrical codes. *Do not use gas piping as an electrical ground.*

48PD

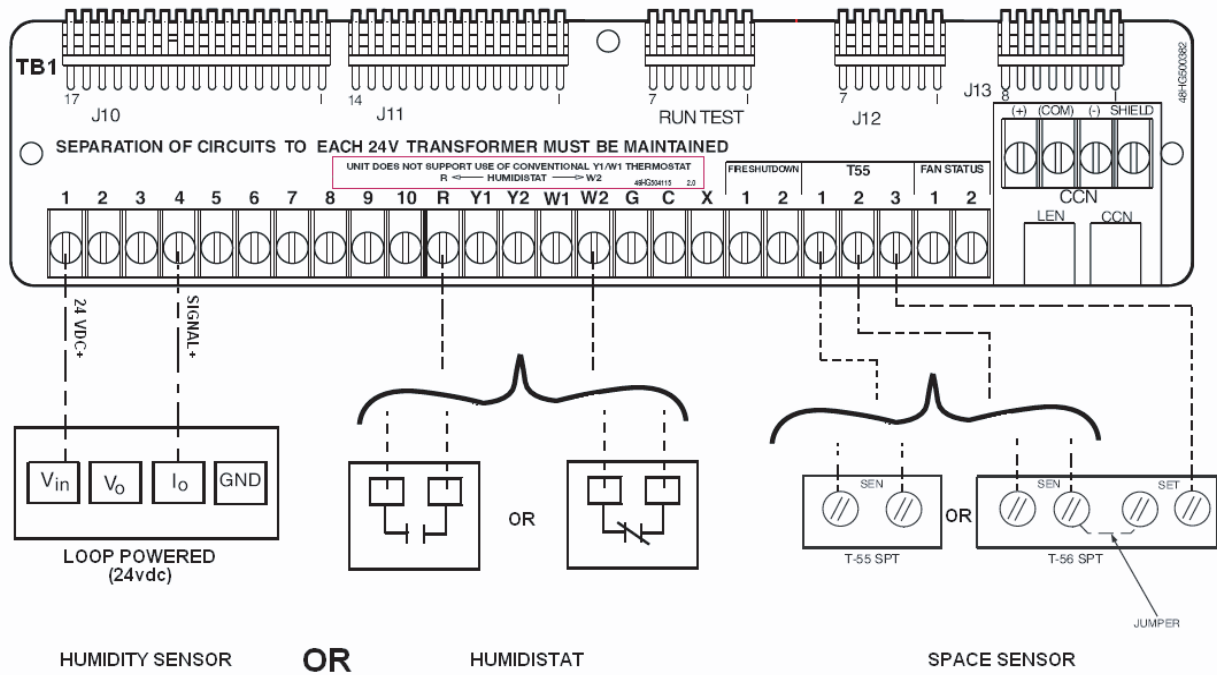


Fig. 13 - Low Voltage Terminal Board - Temperature and Humidity Control Wiring

C08434

Humidity Control

The 48PD unit can be used with a Carrier accessory humidistat switch output (HL38MG029 or TSTATCCPLH01-B) in conjunction with the space temperature sensor. The humidistat switch is a normally open switch that closes upon a rise in space humidity, above the setpoint value.

Upon a humidistat call, the supply air temperature is lowered to produce a colder evaporator coil and lower dew point temperature. When humidistat is satisfied, the supply air temperature is reset to the original supply air temperature setpoint.

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. General humidistat and humidity sensor wiring connections are shown in Fig. 13.

Configuration of the unit control is required to specify the control input type before unit operation. Refer to the Controls, Start-Up, Operation and Troubleshooting manual for configuration.

Table 8 – Electrical Data - Units Without Optional Convenience Outlet

48PD UNIT SIZE	NOMINAL POWER SUPPLY V-Ph-Hz	VOLTAGE RANGE		COMPRESSOR		OFM		COMBUST FAN MOTOR FLA	Conv Outlet	PWR EXH FLA	IFM		POWER SUPPLY		DISCONNECT SIZE	
		Min	Max	RLA	LRA	Qty	FLA (ea)				TYPE	FLA	MCA	MOCP†	FLA	LRA
05	208/230-3-60	187	253	16.1	110	1	1.0	0.52	none	-	STD	5.2	26.3/26.3	40/40	26/26	142/142
											ALT	5.2	26.3/26.3	40/40	26/26	142/142
											1.4	STD	5.2	27.7/27.7	40/40	27/27
	ALT	5.2	27.7/27.7	40/40	27/27	144/144										
	460-3-60	414	506	6.2	52	1	0.5	0.30		-	STD	2.6	10.9	15	11	68
											ALT	2.6	10.9	15	11	68
0.6									STD		2.6	11.5	15	11	69	
ALT	2.6	11.5	15	11	69											
06	208/230-3-60	187	253	17.9	110	1	1.5	0.52	none	-	STD	5.2	29.1/29.1	45/45	28/28	143/143
											ALT	5.2	29.1/29.1	45/45	28/28	143/143
											1.4	STD	5.2	30.5/30.5	45/45	30/30
	ALT	5.2	30.5/30.5	45/45	30/30	145/145										
	460-3-60	414	506	7.8	52	1	0.8	0.30		-	STD	2.6	13.2	20	13	69
											ALT	2.6	13.2	20	13	69
0.6									STD		2.6	13.8	20	14	70	
ALT	2.6	13.8	20	14	70											

Table 9 – Electrical Data - Units With Optional Convenience Outlet

48PD UNIT SIZE	NOMINAL POWER SUPPLY V-Ph-Hz	VOLTAGE RANGE		COMPRESSOR		OFM		COMBUST. FAN MOTOR FLA	Conv Outlet	PWR EXH FLA	IFM		POWER SUPPLY		DISCONNECT SIZE		
		Min	Max	RLA	LRA	Qty	FLA (ea)				TYPE	FLA	MCA	MOCP†	FLA	LRA	
05	208/230-3-60	187	253	16.1	110	1	1.0	0.52	YES	-	STD	5.2	31.1/31.1	45/45	31/31	147/147	
											ALT	5.2	31.1/31.1	45/45	31/31	147/147	
											1.4	STD	5.2	32.5/32.5	45/45	33/33	149/149
	ALT	5.2	32.5/32.5	45/45	33/33	149/149											
	460-3-60	414	506	6.2	52	1	0.5	0.30		YES	-	STD	2.6	13.1	15	13	70
												ALT	2.6	13.1	15	13	70
0.6									STD			2.6	13.7	20	14	71	
ALT	2.6	13.7	20	14	71												
06	208/230-3-60	187	253	17.9	110	1	1.5	0.52	YES	-	STD	5.2	33.9/33.9	50/50	34/34	148/148	
											ALT	5.2	33.9/33.9	50/50	34/34	148/148	
											1.4	STD	5.2	35.3/35.3	50/50	35/35	150/150
	ALT	5.2	35.3/35.3	50/50	35/35	150/150											
	460-3-60	414	506	7.8	52	1	0.8	0.30		YES	-	STD	2.6	15.4	20	15	71
												ALT	2.6	15.4	20	15	71
0.6									STD			2.6	16.0	20	16	72	
ALT	2.6	16.0	20	16	72												

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



† Fuse or Breaker
NOTES:

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

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

Example: Supply voltage is 230-3-60



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

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

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

$$= 227$$

Determine maximum deviation from average voltage.

- (AB) 227 - 224 = 3 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 your local electric utility company immediately.

48PD

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 located in the condenser section under the slanted coil for shipping. (See Fig. 14.) 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.

NOTE: The barometric relief damper is secured to the economizer panel for shipping.

DO NOT THROW THIS PANEL AWAY!

3. Remove the screw holding the barometric relief damper to the panel. Damper should be free to swing open during operation. (See Fig. 15.)

DO NOT THROW THIS PANEL AWAY!

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. 15 and 16.)
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. 15 and 17.)

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 controls (including the VFD controller).

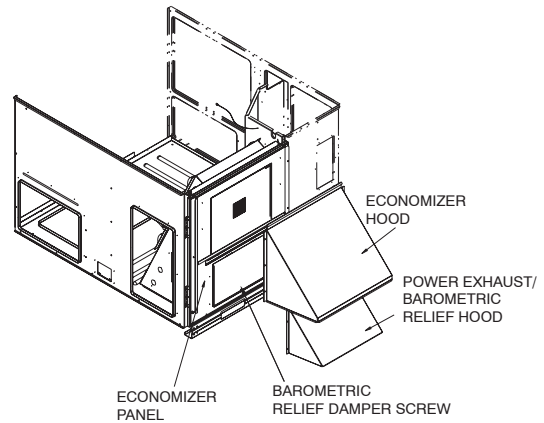


Fig. 15 - Hood Installation

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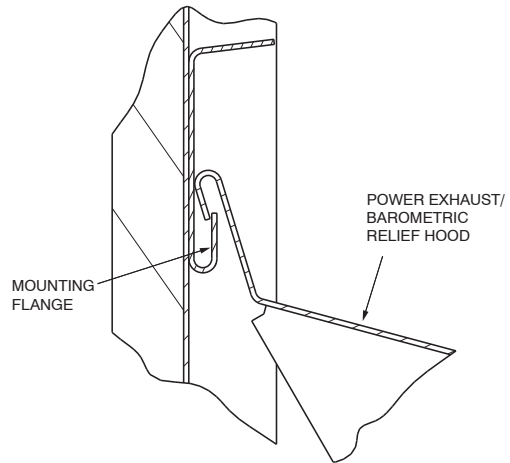


Fig. 16 - Barometric Relief/Power Exhaust Hood Flange

C06262

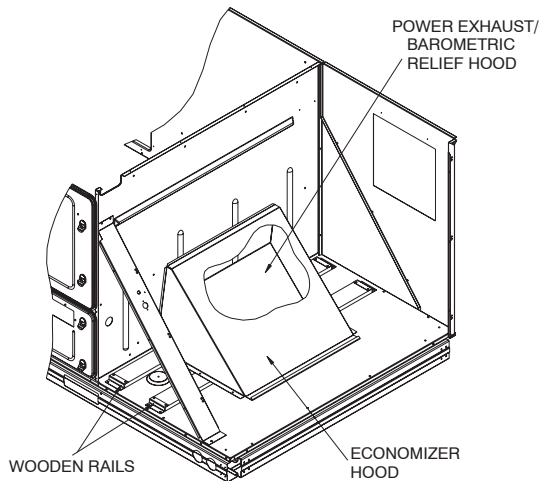


Fig. 14 - Economizer and Barometric Relief/Power Exhaust Hoods Shipping Position

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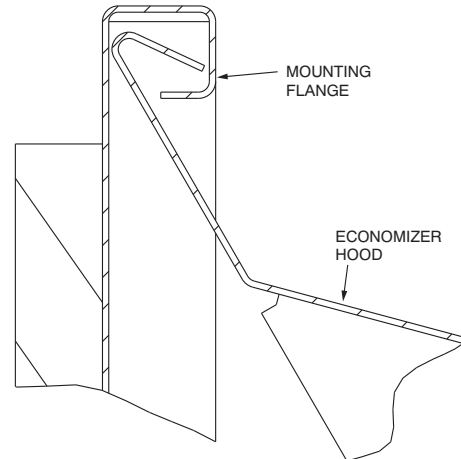


Fig. 17 - Economizer Flange

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