WeatherExpert® 48JC(G/H)*04-06 Single Package Rooftop Ultra Low NO_X (14 ng/J) Gas Heating/Electric Cooling Unit with Puron® (R-410A) Refrigerant

Installation Instructions

CONTENTS

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 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, including ANSI (American National Standards Institute) Z223.1. Wear safety glasses and work gloves. Use quenching cloth for unbrazing operations. Have fire extinguisher available for all brazing operations.

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.

Catalog No. 04-53480470-01 Printed in U.S.A. Form 48JCG-4-6-04SI Pg 1 9-23 Replaces: 48JCG-4-6-03SI

⚠ DANGER

ELECTRICAL SHOCK HAZARD

Failure to follow this warning will result in 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

FIRE, EXPLOSION HAZARD

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

Disconnect gas piping from unit when pressure testing at pressure greater than 0.5 psig (3450 Pa). 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).

⚠ 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.

⚠ WARNING

CARBON-MONOXIDE POISONING HAZARD

Failure to follow instructions could result in severe personal injury or death due to carbon-monoxide poisoning, if combustion products infiltrate into the building.

Check that all openings in the outside wall around the vent (and air intake) pipe(s) are sealed to prevent infiltration of combustion products into the building.

Check that furnace vent (and air intake) terminal(s) are not obstructed in any way during all seasons.

⚠ AVERTISSEMENT

RISQUE D'INTOXICATION AU MONOXYDE DE CARBONE

Si ces directives ne sont pas suivies, cela peut entraîner des blessures graves ou une intoxication au monoxyde de carbone pouvant causer la mort, si des produits de combustion s'infiltrent dans le bâtiment.

Vérifier que toutes les ouvertures pratiquées dans le mur extérieur autour du ou des tuyaux d'évent (et de la prise d'air) sont scellées de manière à empêcher l'infiltration de produits de combustion dans le bâtiment.

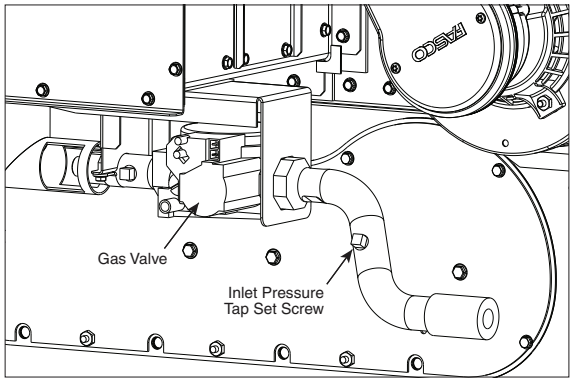
Veiller à ce que la ou les sorties de l'évent de l'appareil de chauffage (et la prise d'air) ne soient, en aucune façon, obstruées, quelle que soit la saison.

⚠ WARNING

FIRE HAZARD

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

Inlet pressure tap set screw must be tightened and 1/8-in. NPT pipe plug must be installed to prevent gas leaks.

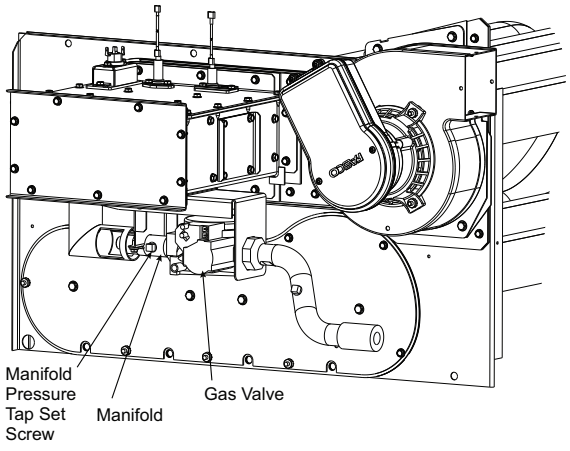


⚠ WARNING

FIRE HAZARD

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

Manifold pressure tap set screw must be tightened and 1/8-in. NPT pipe plug must be installed to prevent gas leaks.



⚠ WARNING

UNIT OPERATION HAZARD

Failure to follow this warning can result in equipment damage.

Do Not adjust the inducer motor. The inducer motor is factory set; no field adjustment is required.

⚠ CAUTION

PERSONAL INJURY 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.

⚠ CAUTION

Units can not operated with LP (liquid propane) gas under any circumstances.

⚠ CAUTION

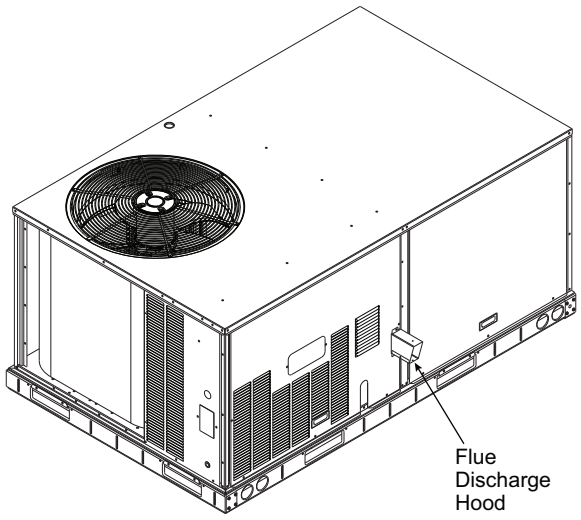
Units can not operated at altitudes greater than 2,000 feet under any circumstances.

⚠ CAUTION

Do not detach the burner box from the heat exchanger. The burner box and heat exchanger are a single assembly and must be replaced together if needed. Contact your local representative for details.

⚠ ATTENTION

A particular air odor may be experienced coming from the flue discharge during initial gas heating start up. This is normal and will subside after minimal use.



MODEL NUMBER NOMENCLATURE AND DIMENSIONS

See Fig. 1 for 48JC(G/H) model number nomenclature. See Fig. 2 (on pages 5-7) for unit dimensional drawings and service clearance dimensions.

Rated Indoor Airflow

Table 1 lists the rated indoor airflow used for the AHRI efficiency rating for the units covered in this document.

Table 1 — Rated Indoor Airflow

MODEL NUMBER	RATED INDOOR AIRFLOW (CFM)
48JC(G/H)*04	1125
48JC(G/H)*05	1430
48JC(G/H)*06	2000

Position:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Example:	4	8	J	C	G	V	0	6	A	2	A	5	–	3	A	0	A	0

Unit Heat Type
48 - Gas Heat Packaged Rooftop

Model Series - WeatherExpert®
JC - Ultra High Efficiency

Heat Options
G = ULTRA Low NOx - Low Gas Heat (14 ng/J)
H = ULTRA Low NOx - Medium Gas Heat (14 ng/J)
(All Ultra Low NOx models include Stainless Steel HX)

Refrig. Systems Options
V = Variable Speed Cooling Capacity
W= Variable Speed Cooling Capacity with Humidi-MiZer® System

Cooling Tons
04 - 3 ton
05 - 4 ton
06 - 5 ton

Sensor Options
A = None
B = RA (Return Air) Smoke Detector
C = SA (Supply Air) Smoke Detector
D = RA + SA Smoke Detector
E = CO_2
F = RA Smoke Detector and CO_2
G = SA Smoke Detector and CO_2
H = RA + SA Smoke Detector and CO_2
J = Condensate Overflow Switch
K = Condensate Overflow Switch and RA Smoke Detector
L = Condensate Overflow Switch and RA and SA Smoke Detectors
M = Condensate Overflow Switch and SA Smoke Detector
N = Condensate Overflow Switch and CO_2
P = Condensate Overflow Switch w/ CO_2 + RA Smoke Detector
Q = Condensate Overflow Switch w/ CO_2 + SA Smoke Detector
R = Condensate Overflow Switch w/ CO_2 + RA and SA Smk. Det.

Vane Axial Fan - Indoor Fan Options
1 = Direct Drive EcoBlue™ - Standard Static
2 = Direct Drive EcoBlue - Medium Static
3 = Direct Drive EcoBlue - High Static

Coil Options - Round Tube/Plate Fin Condenser Coil (Outdoor - Indoor — Hail Guard)
A = Al/Cu - Al/Cu
B = Precoat Al/Cu - Al/Cu
C = E-coat Al/Cu - Al/Cu
D = E-coat Al/Cu - E-coat Al/Cu
E = Cu/Cu - Al/Cu
F = Cu/Cu - Cu/Cu
M = Al/Cu - Al/Cu — Louvered Hail Guard
N = Precoat Al/Cu - Al/Cu — Louvered Hail Guard
P = E-coat Al/Cu - Al/Cu — Louvered Hail Guard
Q = E-coat Al/Cu - E-coat Al/Cu — Louvered Hail Guard
R = Cu/Cu - Al/Cu — Louvered Hail Guard
S = Cu/Cu - Cu/Cu — Louvered Hail Guard

Voltage
5 = 208/230-3-60
6 = 460-3-60

Design Revision
– = Factory Design Revision

Base Unit Controls
3 = SystemVu™ Controls - Standard all units

Air Intake / Exhaust Options
A = None
B = Temperature EconoMi$er®2 w/ Barometric Relief
F = Enthalpy EconoMi$er2 w/ Barometric Relief
U = Ultra Low Leak Temperature EconoMi$er2 w/ Barometric Relief
W= Ultra Low Leak Enthalpy EconoMi$er2 w/ Barometric Relief

Service Options (Foil Face Insulation Standard)
0 = None
1 = Unpowered Convenience Outlet
2 = Powered Convenience Outlet
3 = Hinged Access Panels
4 = Hinged Access Panels and Unpowered Convenience Outlet
5 = Hinged Panels and Powered Convenience Outlet
6 = MERV 8 High Efficiency Filters
7 = MERV 8 High Efficiency Filters and Unpowered Convenience Outlet
8 = MERV 8 High Efficiency Filters and Powered Convenience Outlet
9 = MERV 8 High Efficiency Filters and Hinged Panels
A = MERV 8 High Efficiency Filters, Hinged Panels and Unpowered Convenience Outlet
B = MERV 8 High Efficiency Filters, Hinged Panels and Powered Convenience Outlet

Electrical Options
A = None
B = HACR Breaker[a]
C = Non-Fused Disconnect (NFD)[b]
D = Thru-The-Base (TTB) Connections
E = HACR Circuit Breaker and TTB[a]
F = Non-Fused Disconnect and TTB[b]
N = Phase Monitor Protection
P = Phase Monitor and HACR[a]
Q = Phase Monitor and NFD[b]
R = Phase Monitor and TTB
S = Phase Monitor and HACR and TTB[a]
T = Phase Monitor and NFD and TTB[b]

Factory Assigned
0 = Standard
1 = LTL

[a]HACR are not available on 460-v models.
[b]Non-Fused Disconnect (NFD) are not available on 460-v models.

Fig. 1 — 48JC(G/H) 04-06 Model Number Nomenclature (Example)

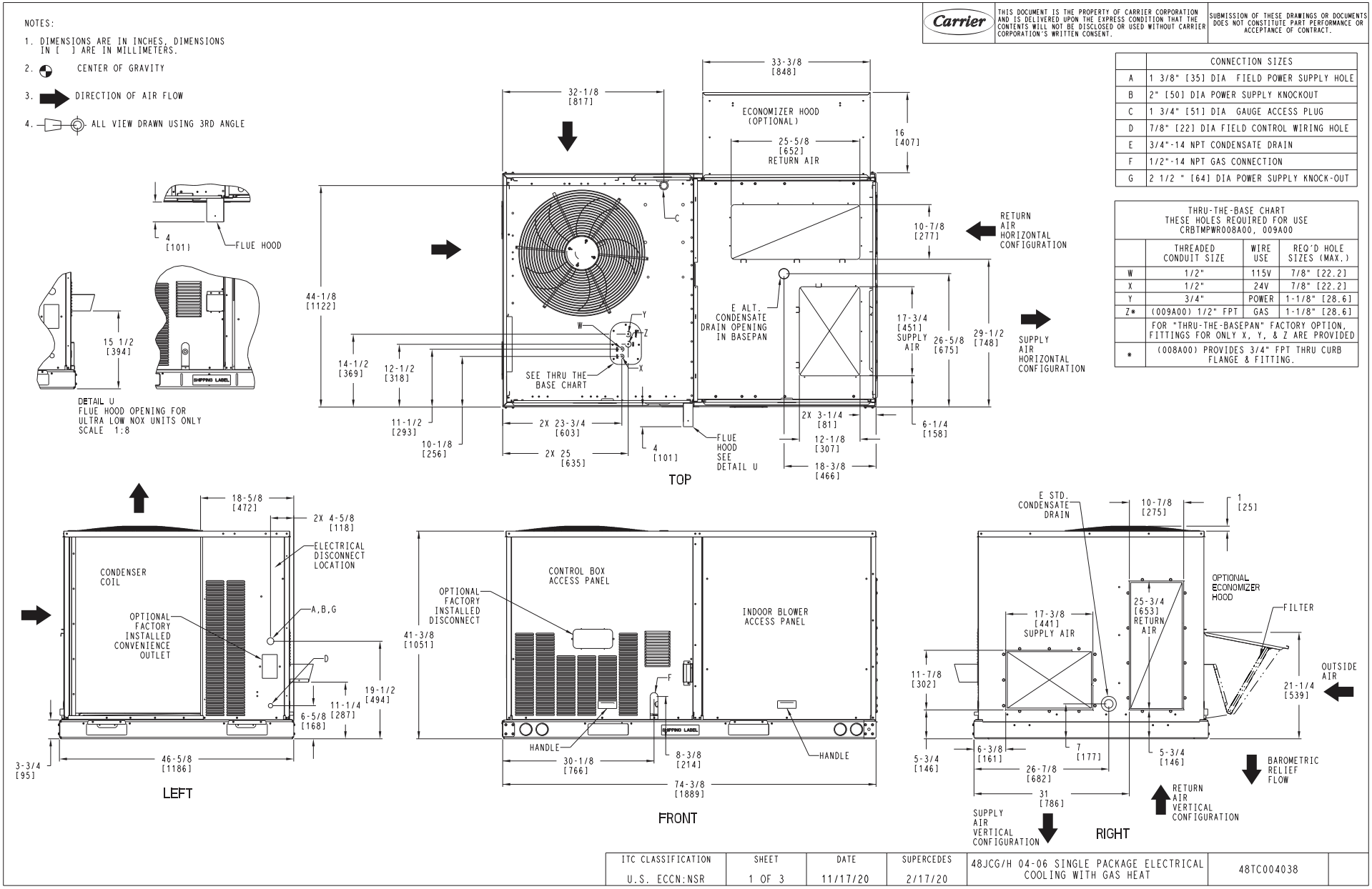
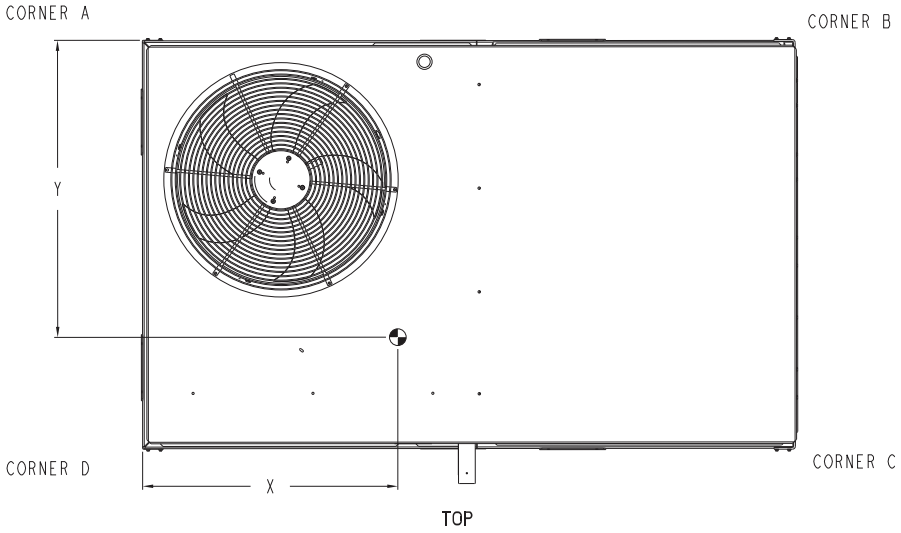
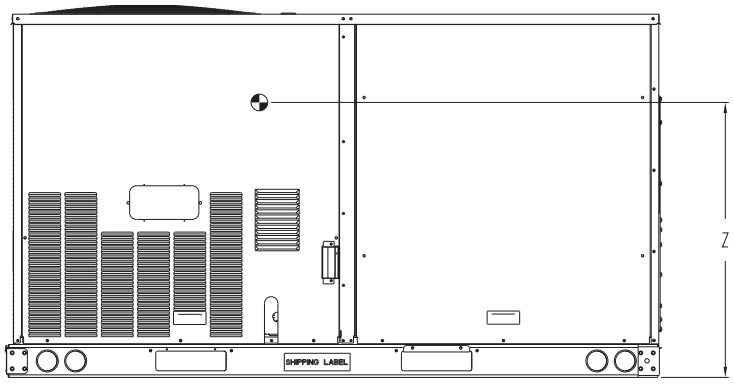


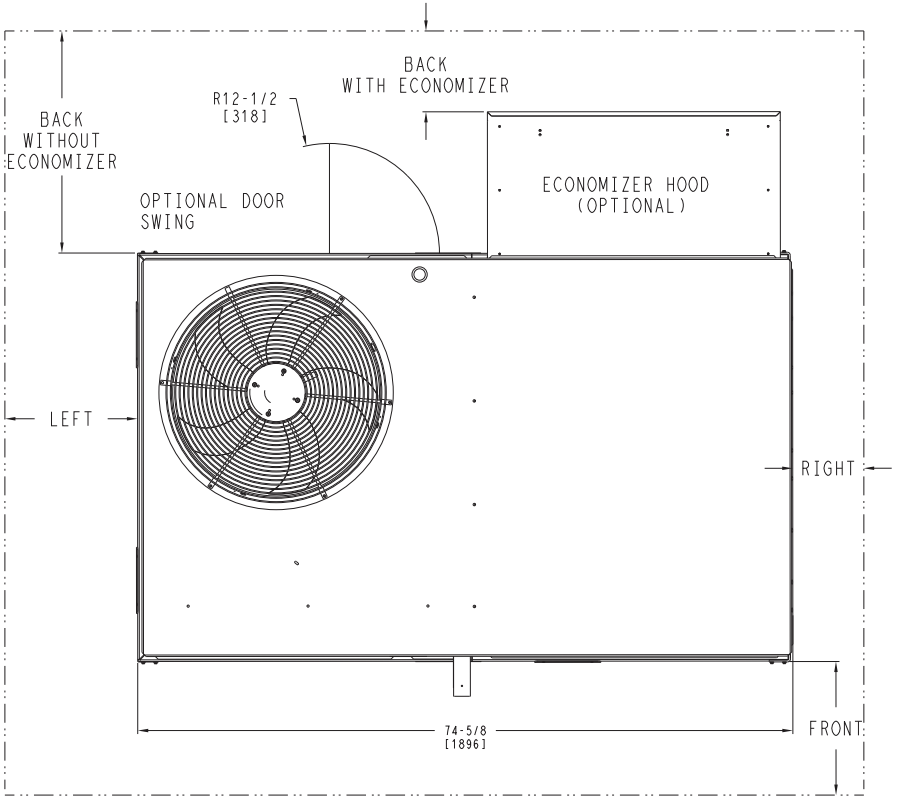
Fig. 2 — Unit Dimensional Drawing

UNIT	STD. UNIT WEIGHT **		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		HEIGHT
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
48JCG/H*04	617	280	144	65	133	60	163	74	176	80	35 3/4 [908]	25 3/4 [654]	19 1/2 [495]
48JCG/H*05	640	291	150	68	139	63	169	77	182	83	35 7/8 [911]	25 5/8 [651]	19 3/8 [492]
48JCG/H*06	642	292	152	69	140	64	168	76	182	83	35 5/8 [905]	25 1/2 [648]	19 3/8 [492]

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







NOTES:

1. FOR ALL MINIMUM CLEARANCES LOCAL CODES OR JURISDICTIONS MAY PREVAIL.

	CLEARANCE		
	SERVICE WITH:	SERVICE WITH:	OPERATING
SURFACE	CONDUCTIVE BARRIER	NONCONDUCTIVE BARRIER	CLEARANCE
FRONT	48 [1219mm]	36 [914mm]	18 [457mm]
LEFT	48 [1219mm]	42 [1067mm]	18 [457mm]
BACK W/O HOOD	48 [1219mm]	42 [1067mm]	18 [457mm]
BACK W/HOOD	36 [914mm]	36 [914mm]	18 [457mm]
RIGHT	36 [914mm]	36 [914mm]	18 [457mm]
TOP	72 [1829mm]	72 [1829mm]	72 [1829mm]

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES		
U.S. ECCN:NSR	2 OF 3	11/17/20	2/17/20	48JCG/H 04-06 SINGLE PACKAGE ELECTRICAL COOLING WITH GAS HEAT	48TC004038

Fig. 2 — Unit Dimensional Drawing (cont)

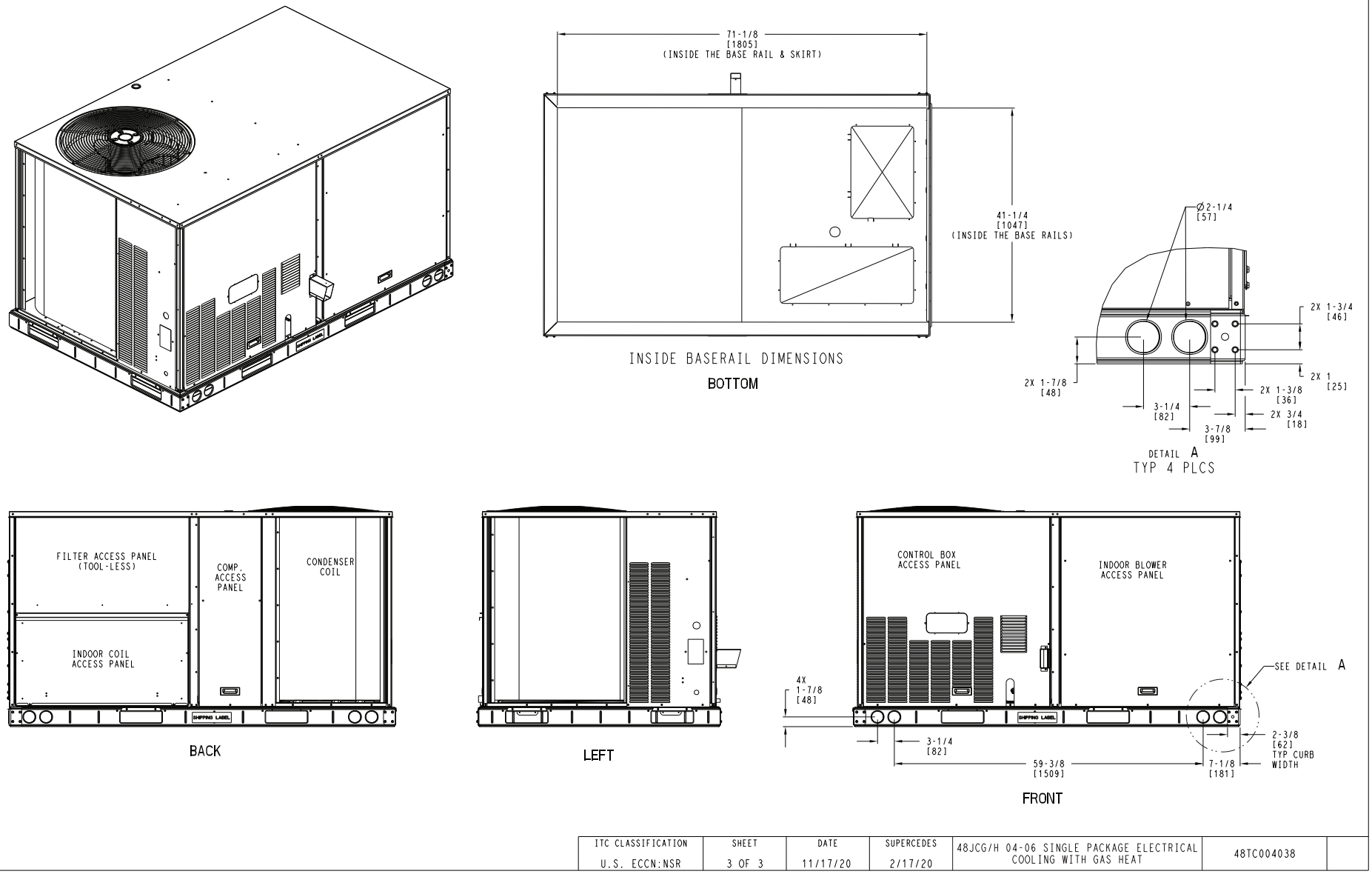


Fig. 2 — Unit Dimensional Drawing (cont)

INSTALLATION

Jobsite Survey

Complete the following checks before installation.

1. Consult local building codes and the NEC (National Electrical Code) ANSI/NFPA 70 for special installation requirements.
2. Determine unit location (from project plans) or select unit location.
3. Check for possible overhead obstructions which may interfere with unit lifting or rigging.

Step 1 — Plan for Unit Location

Select a location for the unit and its support system (curb or other) that provides for the minimum clearances required for safety. This includes the clearance to combustible surfaces, unit performance and service access below, around and above unit as specified in unit drawings. See Fig. 2 on page 6.

NOTE: Consider also the effect of adjacent units.

Be sure that unit is installed such that snow will not block the combustion intake or flue outlet.

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. 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) and NFPA (National Fire Protection Association) 54 TIA-54-84-1. In Canada, installation must be in accordance with the CAN1-B149 installation codes for gas burning appliances.

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

Locate mechanical draft system flue assembly at least 4 ft (1.2 m) from any opening through which combustion products could enter the building, and at least 4 ft (1.2 m) from any adjacent building (or per local code). Locate the flue assembly at least 10 ft (3.05 m) from an adjacent unit's fresh air intake hood if within 3 ft (0.91 m) of same elevation (or per local code). When unit is located adjacent to public walkways, flue assembly must be at least 7 ft (2.1 m) above grade.

Select a unit mounting system that provides adequate height to allow installation of condensate trap per requirements. Refer to Step 12 — Install External Condensate Trap and Line on page 17 for required trap dimensions.

ROOF MOUNT

Check building codes for weight distribution requirements. Unit operating weights are shown in Table 2.

Table 2 — Operating Weights

48JC(G/H)-	UNIT LB (KG)		
	04	05	06
Base Unit	617 (280)	640 (291)	642 (292)
Economizer			
Vertical	50 (23)	50 (23)	50 (23)
Horizontal	80 (36)	80 (36)	80 (36)
Humidi-MiZer® System	27 (10)	34 (13)	34 (13)
Cu Fins	25 (11)	43 (20)	56 (25)
Powered Outlet	35 (16)	35 (16)	35 (16)
Curb			
14 in. (356 mm)	110 (50)	110 (50)	110 (50)
24 in. (610 mm)	145 (66)	145 (66)	145 (66)

Step 2 — Plan for Sequence of Unit Installation

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

CURB-MOUNTED INSTALLATION

1. Install curb
2. Install field-fabricated ductwork inside curb
3. Install accessory thru-the-base service connection package (affects curb and unit) (refer to accessory installation instructions for details)
4. Prepare bottom condensate drain connection to suit planned condensate line routing (refer to Step 12 — Install External Condensate Trap and Line on page 17 for details)
5. Rig and place unit
6. Install outdoor air hood
7. Install flue hood
8. Install gas piping
9. Install condensate line trap and piping
10. Make electrical connections
11. Install other accessories

PAD-MOUNTED INSTALLATION

1. Prepare pad and unit supports
2. Check and tighten the bottom condensate drain connection plug
3. Rig and place unit
4. Convert unit to side duct connection arrangement
5. Install field-fabricated ductwork at unit duct openings
6. Install outdoor air hood
7. Install flue hood
8. Install gas piping
9. Install condensate line trap and piping
10. Make electrical connections
11. Install other accessories

FRAME-MOUNTED INSTALLATION

Frame-mounted applications generally follow the sequence for a curb installation. Adapt the sequence 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.

On units with hinged panel option, check to be sure all latches are snug and in closed position.

Locate the carton containing the outside air hood parts. Do not remove carton until unit has been rigged and located in final position.

Step 4 — Provide Unit Support

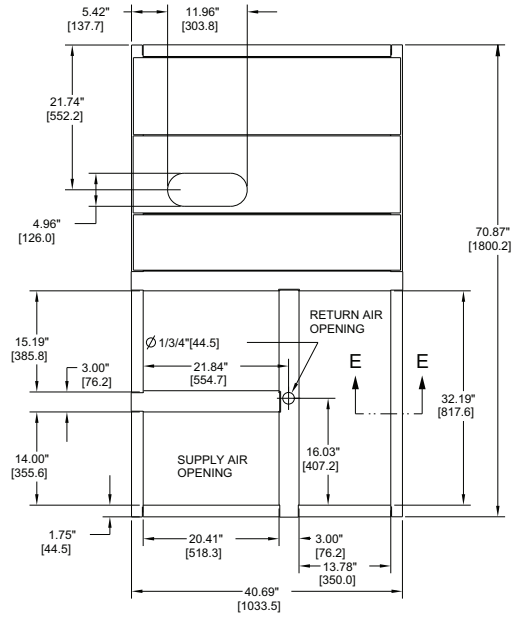
ROOF CURB MOUNT

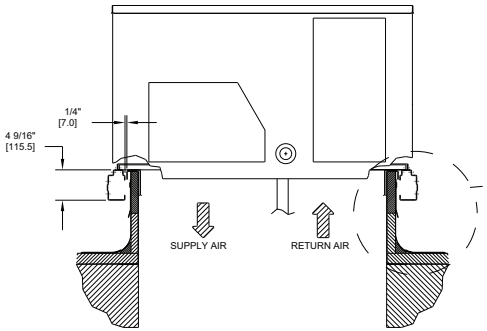
Accessory roof curb details and dimensions are shown in Fig. 3. Assemble and install accessory roof curb in accordance with instructions shipped with the curb.

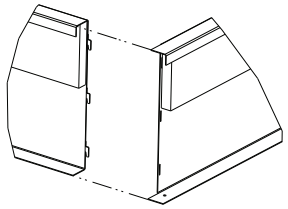
ROOF CURB ACCESSORY #	A
CRRFCURB001A01	14" [356]
CRRFCURB002A01	24" [610]

NOTES:
1. ROOFCURB ACCESSORY IS SHIPPED DISASSEMBLED.
2. INSULATED PANELS: 25.4 [1"] THK. POLYURETHANE FOAM, 44.5 [1-3/4] # DENSITY.
3. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
4. ROOFCURB: 18 GAGE STEEL.
5. ATTACH DUCTWORK TO CURB. (FLANGES OF DUCT REST ON CURB).
6. SERVICE CLEARANCE 4 FEET ON EACH SIDE.
7. DIRECTION OF AIR FLOW.
8. CONNECTOR PACKAGE CRBTMPWR001A01 IS FOR THRU-THE-CURB GAS TYPE PACKAGE CRBTMPWR003A01 IS FOR THRU-THE-BOTTOM TYPE GAS CONNECTIONS.

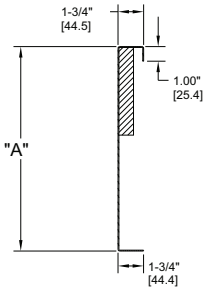
CONNECTOR PKG. ACC.	GAS CONNECTION TYPE	GAS FITTING	POWER WIRING FITTING	CONTROL WIRING FITTING	ACCESSORY CONVENIENCE OUTLET WIRING CONNECTOR
CRBTMPWR001A01	THRU THE CURB	3/4" [19] NPT	3/4" [19] NPT	1/2" [12.7] NPT	1/2" [12.7] NPT
CRBTMPWR003A01	THRU THE BOTTOM	1/2" [12.7] NPT			







VIEW "B"
CORNER DETAIL



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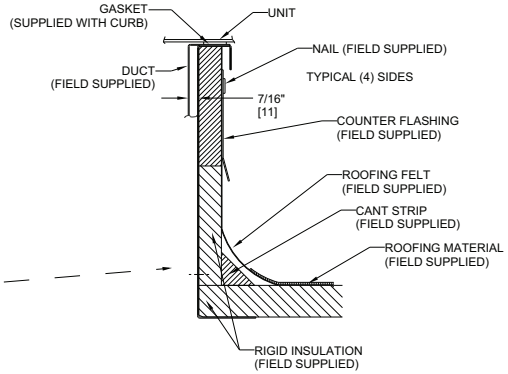
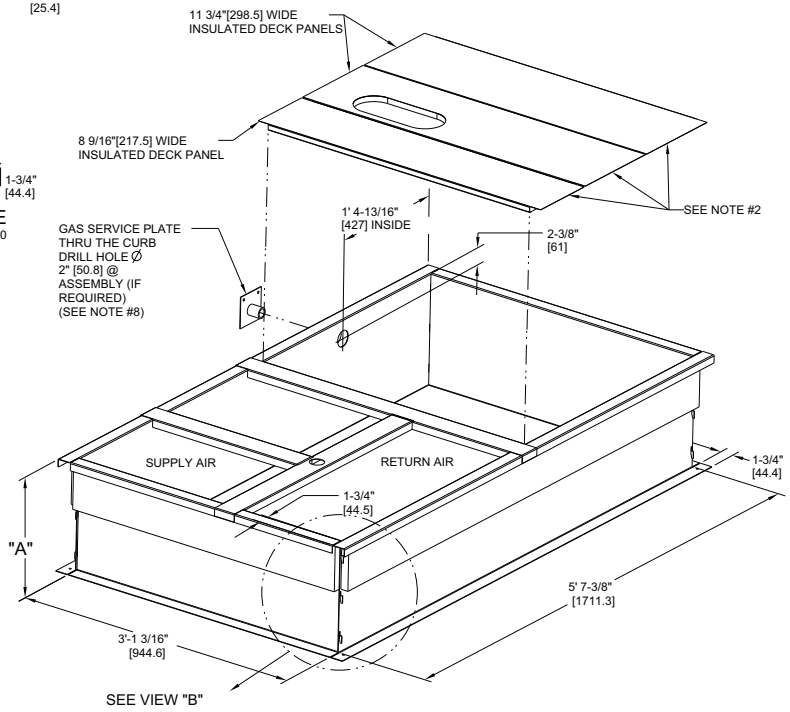




CERTIFIED DRAWING

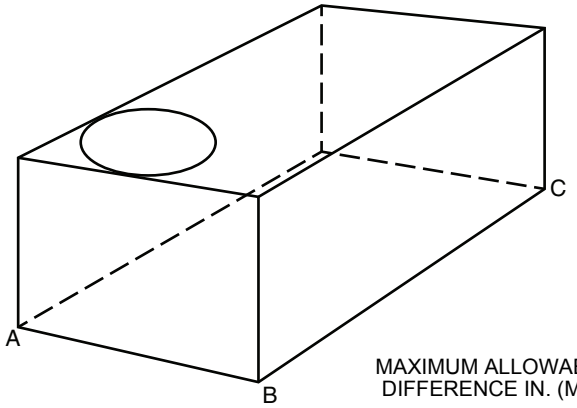
REV	REVISION RECORD	DATE	BY	CHK'D	APP'D	ECN NO.
A	OVERALL DIM. 5'-7 3/8" WAS 5'-7 7/8; 18GA MATERIAL WA 16 GA.; NAIL FIELD SUPPLIED WAS WITH CURB	04/22/13	MMC	-	-	1067898

DRAWING RELEASE LEVEL: PRODUCTION			
THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON: 1 DEC ± - 2 DEC ± - 3 DEC ± - ANG ± °		
MATERIAL - - -	AUTHORIZATION NUMBER 1041738	TITLE CURB ASY, ROOF	
ENGINEERING REQUIREMENTS T-005, Y-002	ENGINEERING - - MANUFACTURING - -	SIZE D	DRAWING NUMBER 48TC400427 SHEET 5 OF 5 REV B
WEIGHT: -	DRAFTER MMC 06/17/11 CHECKER - -		
SURFACE FINISH - MFG/PURCH PURCH	MODEL (INTERNAL USE ONLY)	NEXT DRAWING - SCALE N/A	DISTRIBUTION MMC

Fig. 3 — Roof Curb Details

NOTE: The gasketing of the unit to the roof curb is critical for a watertight seal. Install gasket supplied with the roof curb as shown in Fig. 3. Improperly applied gasket can also result in air leaks and poor unit performance.

Curb should be level. This is necessary for unit drain to function properly. Unit leveling tolerances are shown in Fig. 4. Refer to Accessory Roof Curb Installation Instructions for additional information as required.



MAXIMUM ALLOWABLE DIFFERENCE IN. (MM)

A-B	B-C	A-C
0.5 (13)	1.0 (25)	1.0 (25)

Fig. 4 — 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 and gas connection package must be installed before the unit is set on the roof curb. If field-installed thru-the-roof curb gas connections are desired, use factory-supplied 1/2 in. pipe coupling and gas plate assembly to mount the thru-the-roof curb connection to the roof curb. Gas connections and power connections to the unit must be field-installed after the unit is installed on the roof curb.

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

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.

A minimum clearance is not required around ductwork.

Step 6 — Rig and Place Unit

⚠ 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.

Keep unit upright and do not drop. Spreader bars are required. Rollers may be used to move unit across a roof. Rigging materials under unit (cardboard or wood) must be removed PRIOR to placing the unit on the roof curb. Level by using unit frame as a reference. See Table 2 and Fig. 5 for additional information.

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

Rigging materials under unit (cardboard 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 plug can be tightened with a 1/2 in. square socket drive extension. For further details, see “Step 12 — Install External Condensate Trap and Line” on page 17.

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

POSITIONING ON CURB

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

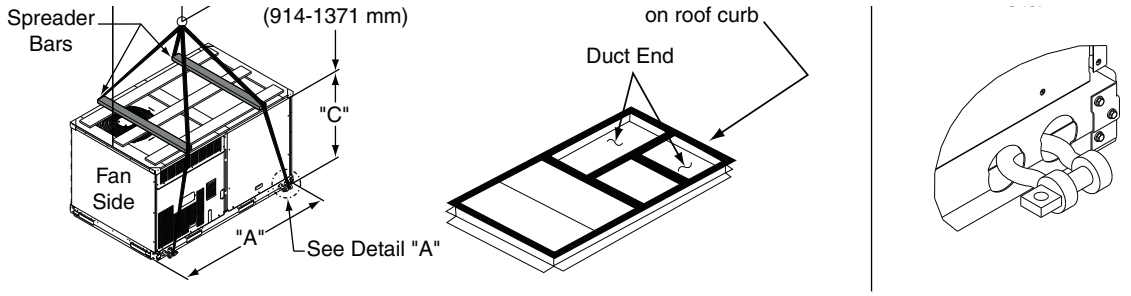
All panels must be in place when rigging. Unit is not designed for handling by fork truck when packaging is removed.

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.

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.

Flue vent discharge must have a minimum horizontal clearance of 4 ft (1220 mm) from electric and gas meters, gas regulators, and gas relief equipment. Minimum distance between unit and other electrically live parts is 48 in. (1220 mm).



NOTE(S):
1. SPREADER BARS ARE REQUIRED. Top damage will occur if spreader bars are not used.
2. Hook rigging shackles through holes in base rail, as shown in Detail A. Holes in base rails are centered around the unit center of gravity. Use wooden top to prevent rigging straps from damaging unit.

UNIT	MAX WEIGHT		DIMENSIONS					
			A		B		C	
	lb	kg	in.	mm	in.	mm	in.	mm
48JC(G/H)*04	963	437	74.5	1890	35.8	910	41.5	1055
48JC(G/H)*05	1018	462	74.5	1890	35.8	910	41.5	1055
48JC(G/H)*06	1020	463	74.5	1890	35.8	910	41.5	1055

NOTES:
1. SPREADER BARS ARE REQUIRED. Top damage will occur if spreader bars are not used.
2. Dimensions in () are in millimeters.
3. Hook rigging shackles through holes in base rail, as shown in Detail A. Holes in base rails are centered around the unit center of gravity. Use wooden top to prevent rigging straps from damaging unit.

Fig. 5 — Rigging Details

Flue gas can deteriorate building materials. Orient unit such that flue gas will not affect building materials. Locate mechanical draft system flue assembly at least 48 in. (1220 mm) from an adjacent building or combustible material.

NOTE: Installation of accessory flue discharge deflector kit will reduce the minimum clearance to combustible material to 18 in. (460 mm).

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

Step 7 — Convert to Horizontal and Connect Ductwork (When Required)

Unit is shipped in the vertical duct configuration. Unit without factory-installed economizer or return-air smoke detector option may be field-converted to horizontal ducted configuration. To convert to horizontal configuration, remove screws from side duct opening covers (see Fig. 6) and remove covers. Use the screws to install the covers on vertical duct openings with the insulation-side down. The panels must be inserted into the notches on the basepan to properly seal. The notches are covered by the tape used to secure the insulation to the basepan and are not easily seen. See Fig. 7 for position of the notches in the basepan. Seals around duct openings must be tight. Secure with screws as shown in Fig. 8. Cover seams with foil duct tape.

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.

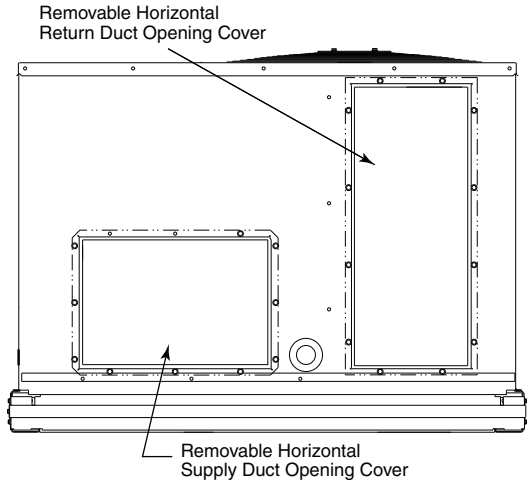


Fig. 6 — Horizontal Conversion Panels

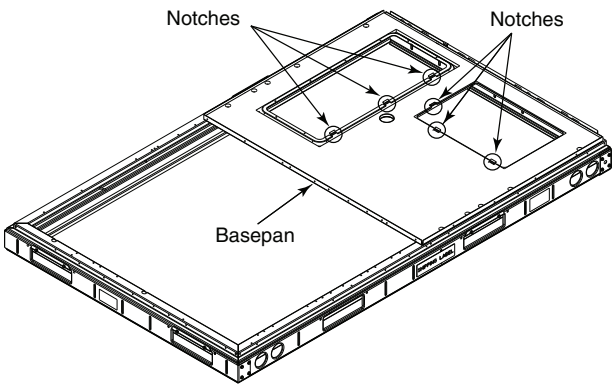


Fig. 7 — Location of Notches

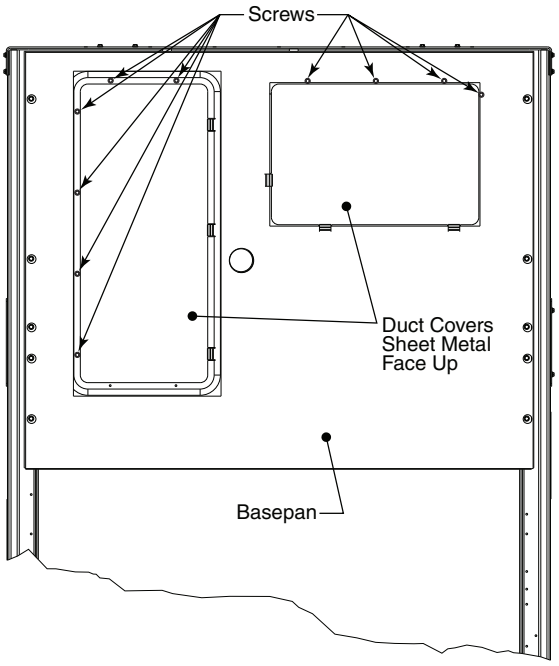


Fig. 8 — Horizontal Duct Panels In Place

Step 8 — Install Outside Air Hood

ECONOMIZER HOOD PACKAGE REMOVAL AND SETUP (FACTORY OPTION)

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.

1. To gain access to the hood, remove the filter access panel. See Fig. 9.

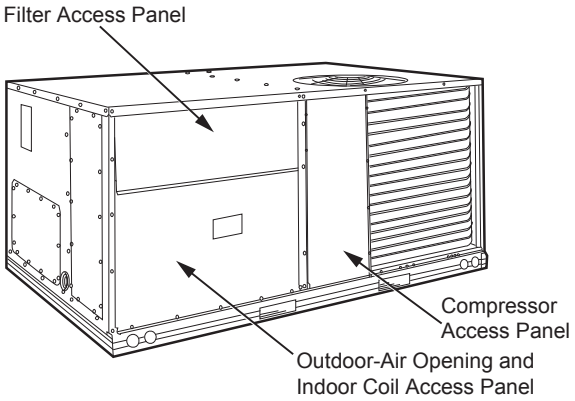


Fig. 9 — Typical Access Panel Locations

2. 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. 10. Be careful to not damage any wiring or cut tie-wraps securing any wiring.

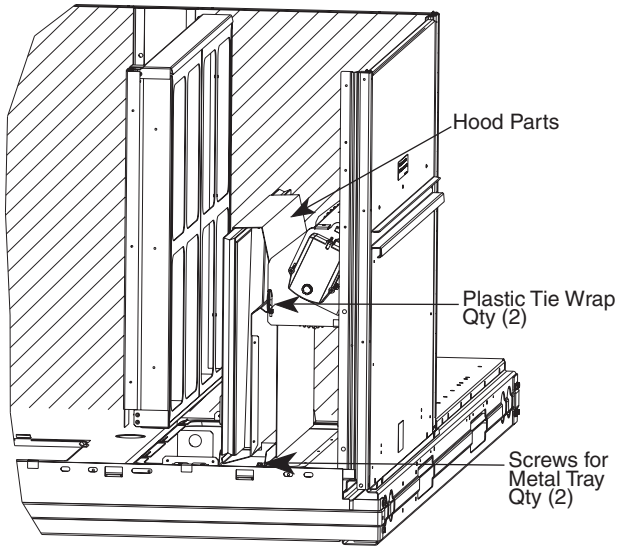


Fig. 10 — Economizer Hood Parts Location

3. Carefully lift the hood assembly (with metal tray) through the filter access opening and assemble per the steps outlined in the following section (Economizer Hood).

ECONOMIZER 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. 11.

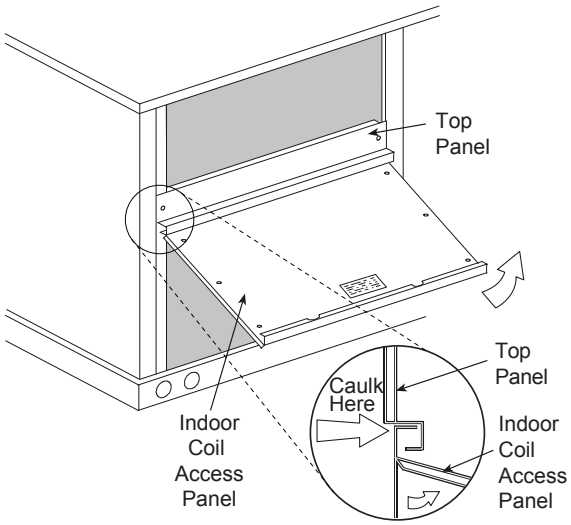


Fig. 11 — Indoor Coil Access Panel Relocation

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. 12.

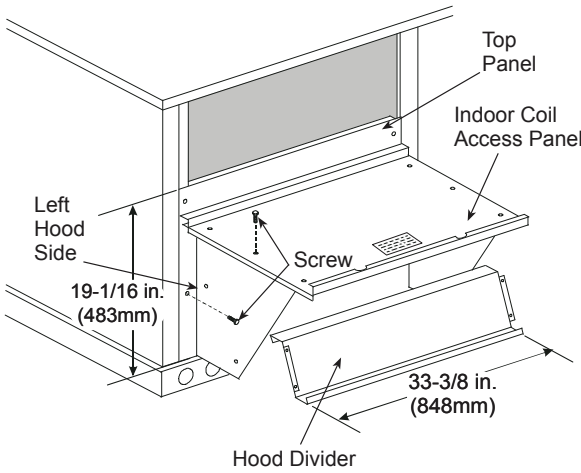


Fig. 12 — Economizer Hood Construction

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. 12 and 13. 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. 13.
6. Caulk the ends of the joint between the unit top panel and the hood top.
7. Replace the filter access panel.

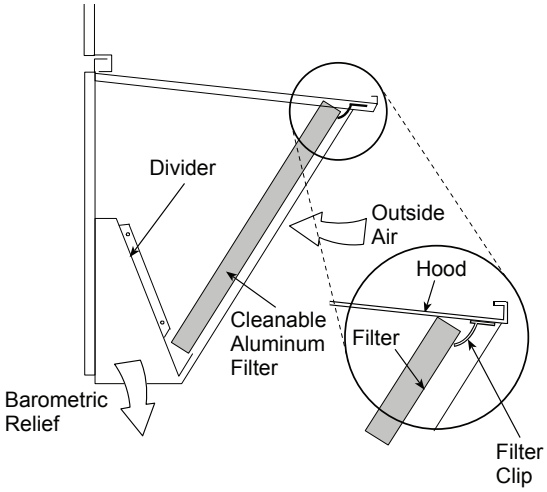


Fig. 13 — Economizer Filter Installation

Step 9 — Units with Hinged Panels Only

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

Relocate latch shipped inside the compressor compartment behind the hinged compressor door to location shown in Fig. 14 after unit installation.

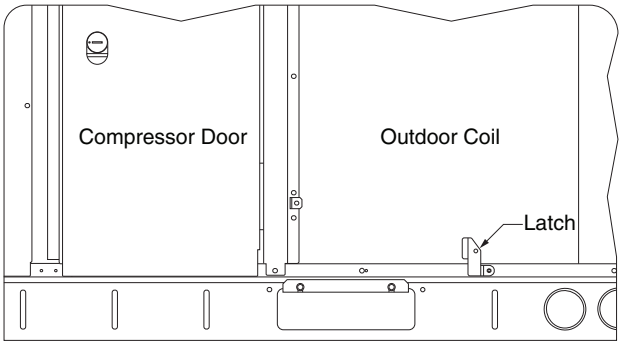


Fig. 14 — Compressor Door Latch Location

Step 10 — Install Flue Hood

Flue hood is shipped screwed to the basepan beside the burner compartment access panel. Remove from shipping location and using screws provided, install flue hood and screen in location shown in Fig. 15.

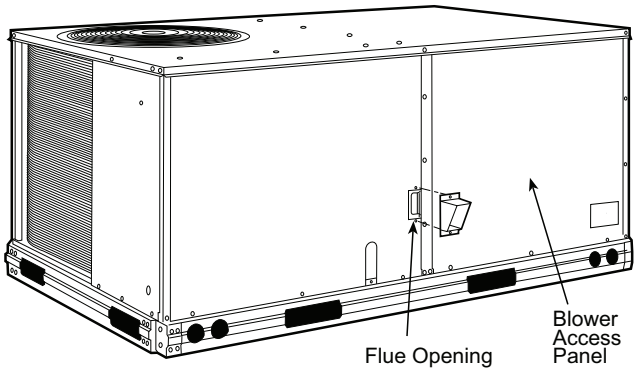


Fig. 15 — Flue Hood Details

Step 11 — Install Gas Piping

Installation of the gas piping must be in accordance with local building codes and with applicable national codes. In U.S.A., refer to NFPA 54/ANSI Z223.1 National Fuel Gas Code (NFGC). In Canada, installation must be accordance with the CAN/CSA B149.1 and CAN/CSA B149.2 installation codes for gas burning appliances.

This unit is factory-equipped for use with Natural Gas (NG) fuel at elevations up to 2000 ft (610 m) above sea level.

Furnace gas input rate on rating plate is for installation up to 2000 ft (610 m) above sea level.

⚠ CAUTION

Units can not operated at altitudes greater than 2,000 feet under any circumstances.

For natural gas applications, gas pressure at unit gas connection must not be less than 5 in. wg. (1.24 kPa) or greater than 13 in. wg. (3.23 kPa) while the unit is operating. See Table 3.

Table 3 — Natural Gas Supply Line Pressure Ranges

UNIT MODEL	UNIT SIZE	MIN.	MAX.
48JC(G/H)	04, 05, 06	5.0 in. wg (1.24 kPa)	13.0 in. wg (3.23 kPa)

The gas supply pipe enters the unit at the burner access panel on the front side of the unit, through the long slot at the bottom of the access panel. The gas connection to the unit is made to the 1/2 in. FPT gas inlet port on the unit gas valve.

Manifold pressure is factory-adjusted for natural gas fuel use. See Table 4.

Table 4 — Natural Gas Manifold Pressure

UNIT MODEL	UNIT SIZE	MANIFOLD PRESSURE
48JC(G/H)	04, 05, 06	3.2 in. wg (796 Pa)

⚠CAUTION

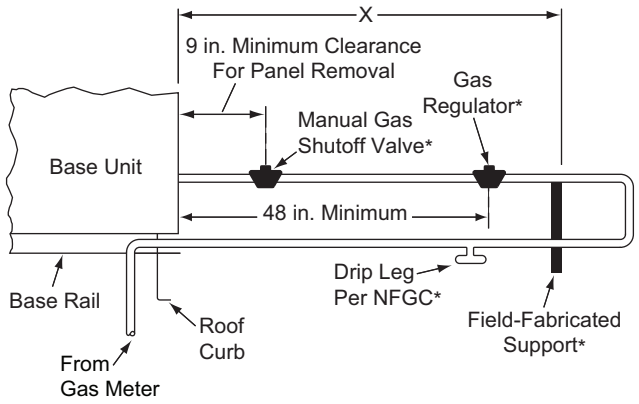
EQUIPMENT DAMAGE

Failure to follow this caution may result in equipment damage.

When connecting the gas line to the unit gas valve, the installer MUST use a backup wrench to prevent damage to the valve.

Install a gas supply line that runs to the unit heating section. Refer to the NFPA 54/NFGC or equivalent code for gas pipe sizing data. Do not use a pipe size smaller than 1/2 in. Size the gas supply line to allow for a maximum pressure drop of 0.5 in. wg (124 Pa) between gas regulator source and unit gas valve connection when unit is operating at high-fire flow rate.

The gas supply line can approach the unit in three ways: horizontally from outside the unit (across the roof), thru-curb/under unit basepan (accessory kit required), or through unit basepan (factory option or accessory kit required). Consult accessory kit installation instructions for details on these installation methods. Observe clearance to gas line components per Fig. 16.



LEGEND
NFGC — National Fuel Gas Code

NOTE: Follow all local codes.
*Field-installed.

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

Fig. 16 — Gas Piping Guide (with Accessory Thru-the-Curb Service Connections)

FACTORY OPTION THRU-BASE CONNECTIONS (GAS CONNECTIONS)

This service connection kit consists of a 1/2 in. electrical bulkhead connector and a 3/4 in. electrical bulkhead connector, connected to an "L" bracket covering the embossed (raised) section of the unit basepan in the condenser section (see Fig. 17 for shipping position).

The 3/4 in. bulkhead connector enables the low-voltage control wires to pass through the basepan. The 1/2 in. bulkhead connector allows the high-voltage power wires to pass through the basepan. See Fig. 18.

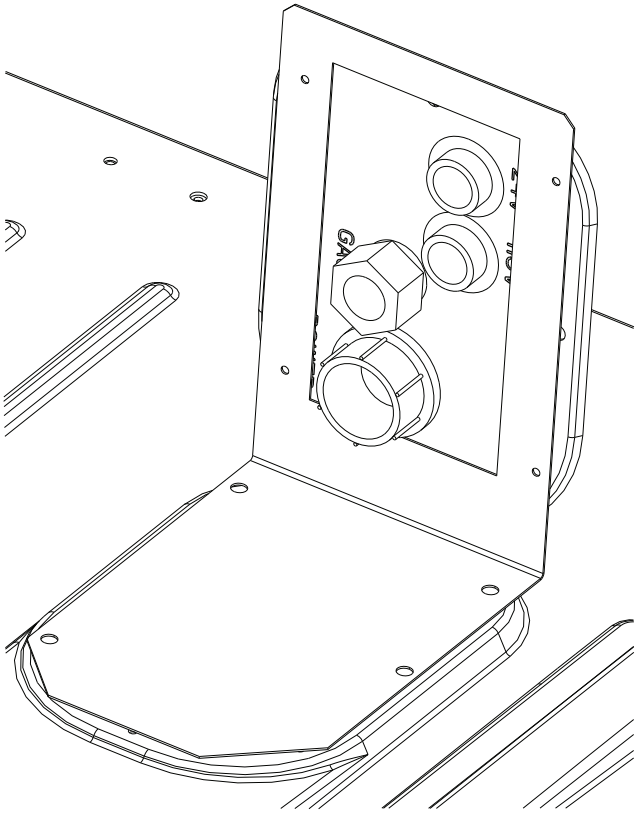


Fig. 17 — Thru-the-Base Fitting Assembly (Shown in Shipping Position)

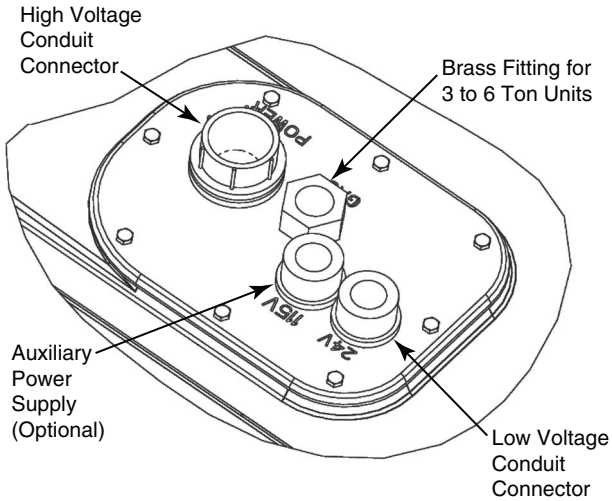


Fig. 18 — Thru-Base Connection Fittings

To prepare the unit for thru-base connections:

1. Remove the "L" bracket assembly from the unit.
2. Remove connector plate assembly from the "L" bracket and discard the "L" bracket, but retain the washer head

screws and the gasket (located between the "L" bracket and the connector plate assembly).

NOTE: Take care not to damage the gasket, as it is reused in the following step.

3. Place the gasket over the embossed area in the basepan, aligning the holes in the gasket to the holes in the basepan. See Fig. 18.
4. Install the connector plate assembly to the basepan using 8 of the washer head screws.

The thru-the-base gas connector has male and female threads. The male threads protrude above the basepan of the unit; the female threads protrude below the basepan.

Check tightness of connector lock nuts before connecting gas piping.

Install a 1/2 in. NPT street elbow on the thru-the-base gas fitting. Attach a 1/2 in. pipe nipple with minimum length of 16-in. (406 mm) (field-supplied) to the street elbow and extend it through the access panel at the gas support bracket. See Fig. 19.

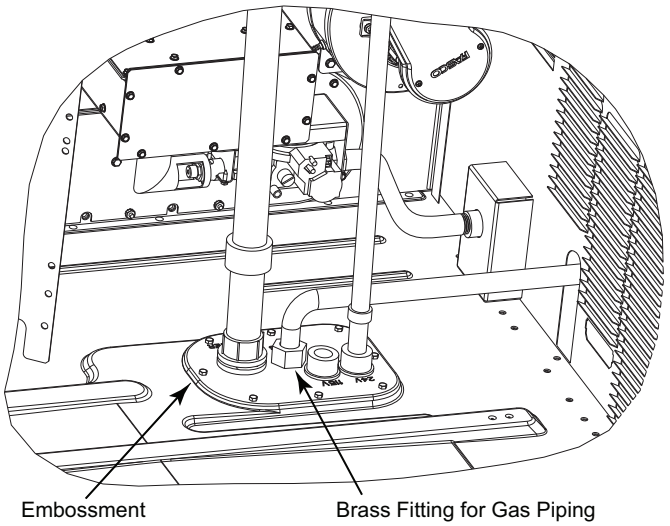


Fig. 19 — Gas Line Piping

Other hardware required to complete the installation of the gas supply line includes a manual shutoff valve, a sediment trap (drip leg) and a ground-joint union. A pressure regulator valve may also be required (to convert gas pressure from pounds to inches of pressure). The manual shutoff valve must be located within 6 ft (1.83 m) of the unit. The union, located in the final leg entering the unit, must be located at least 9 in. (230 mm) away from the access panel to permit the panel to be removed for service. If a regulator valve is installed, it must be located a minimum of 4 ft (1220 mm) away from the unit's flue outlet. Some municipal codes require that the manual shutoff valve be located upstream of the sediment trap. See Fig. 20 and 21 for typical piping arrangements for gas piping that has been routed through the sidewall of the curb. See Fig. 22 for typical piping arrangement when thru-the-base is used. Ensure that all piping does not block access to the unit's main control box or limit the required working space in front of the control box.

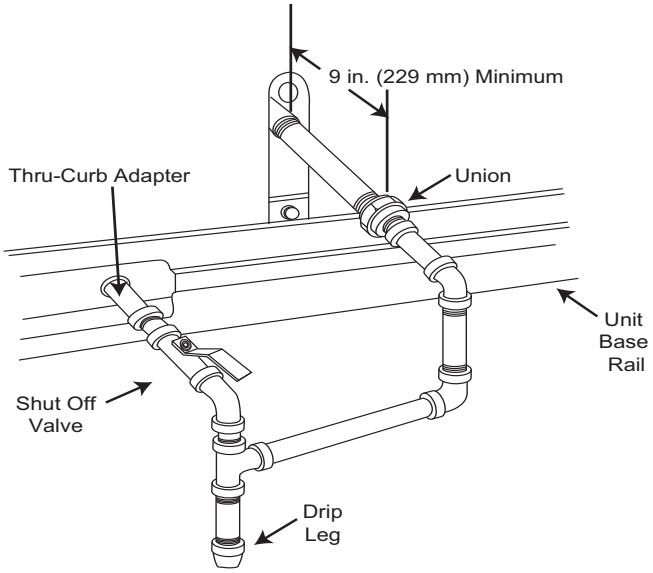


Fig. 20 — Gas Piping, Typical Curb Sidewall Piping (Example 1)

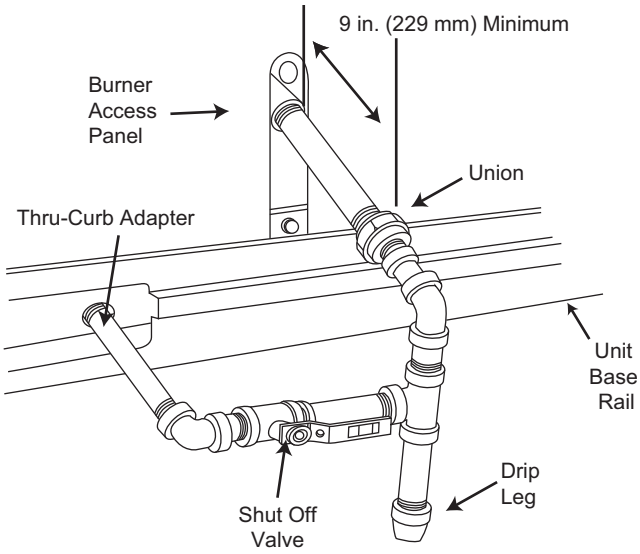


Fig. 21 — Gas Piping, Typical Curb Sidewall Piping (Example 2)

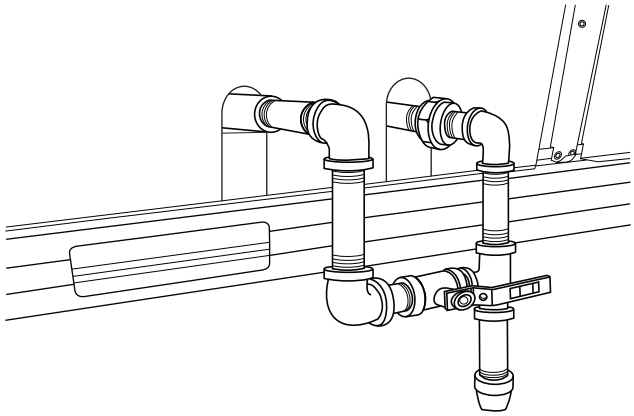


Fig. 22 — Gas Piping, Typical Thru-The-Base Connections

When installing the gas supply line, observe local codes pertaining to gas pipe installations. Refer to the NFPA 54/ANSI Z223.1 NFGC latest edition (in Canada, CAN/CSA B149.1). In the absence of local building codes, adhere to the following pertinent recommendations:

- Avoid low spots in long runs of pipe. Grade all pipe 1/4 in. per every 15 ft (7 mm per every 5 m) to prevent traps. Grade all horizontal runs downward to risers. Use risers to connect to heating section and to meter.
- Protect all segments of piping system against physical and thermal damage. Support all piping with appropriate straps, hangers, etc. Use a minimum of one hanger every 6 ft (1.8 m). For pipe sizes larger than 1/2 in., follow recommendations of national codes.
- Apply joint compound (pipe dope) sparingly and only to male threads of joint when making pipe connections. Use only pipe dope that is resistant to action of liquefied petroleum gases as specified by local and/or national codes. If using PTFE (Teflon[1]) tape, ensure the material is Double Density type and is labeled for use on gas lines. Apply tape per manufacturer's instructions.
- Pressure-test all gas piping in accordance with local and national plumbing and gas codes before connecting piping to unit.

NOTE: Pressure test the gas supply system after the gas supply piping is connected to the gas valve. The supply piping must be disconnected from the gas valve during the testing of the piping systems when test pressure is in excess of 0.5 psig (3450 Pa). Pressure test the gas supply piping system at pressures equal to or less than 0.5 psig (3450 Pa). The unit heating section must be isolated from the gas piping system by closing the external main manual shutoff valve and slightly opening the ground-joint union.

Check for gas leaks at the field-installed and factory-installed gas lines after all piping connections have been completed. Use soap-and-water solution (or method specified by local codes and/or regulations).

⚠ WARNING

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

- Connect gas pipe to unit using a backup wrench to avoid damaging gas controls.
- Never purge a gas line into a combustion chamber.
- Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections.
- Use proper length of pipe to avoid stress on gas control manifold.

NOTE: If orifice hole appears damaged or it is suspected to have been redrilled, check orifice hole with a numbered drill bit of correct size. Never redrill an orifice. A burr-free and squarely aligned orifice hole is essential for proper flame characteristics. See Fig. 23.

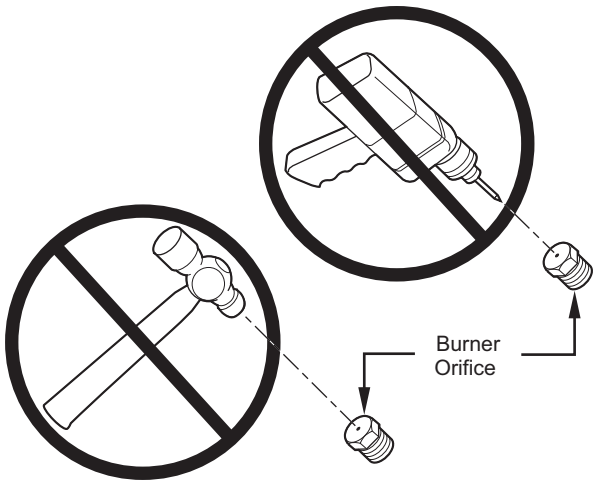
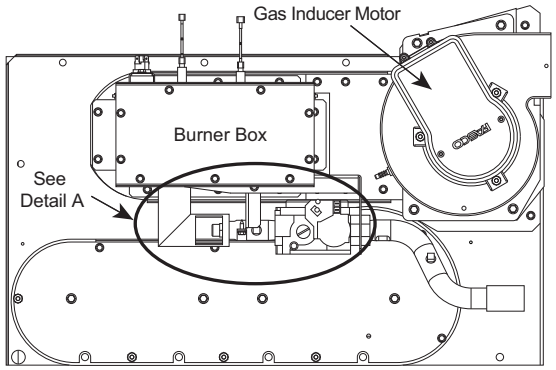


Fig. 23 — Orifice Hole

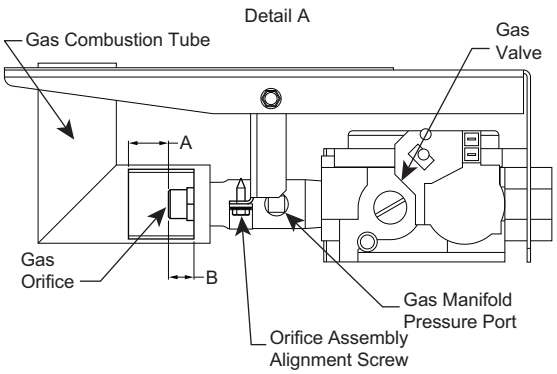
⚠ ATTENTION

After the installation of the unit gas piping and prior to gas heat start up, ensure that the distances between the main burner orifice and the burner box inlet tube meet those shown below.

If not, loosen the orifice alignment screw on the bracket shown, slide the assembly to meet those distances then tighten the screw to secure the gas orifice assembly.



Front View — Gas Assembly and Burner Box



Gas Heat Model	A	B
48JCG (Low Heat)	11/16 in. (17.4 mm)	7/16 in. (11.1 mm)
48JCH (Med Heat)	5/16 in. (8.0 mm)	7/16 in. (11.1 mm)

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Step 12 — Install External Condensate Trap and Line

The unit has one 3/4 in. condensate drain connection on the end of the condensate pan and an alternate connection on the bottom. See Fig. 24. Unit airflow configuration does not determine which drain connection to use. Either drain connection can be used with vertical or horizontal applications.

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

To use the alternate bottom drain connection, remove the red drain plug from the bottom connection (use a 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. 25.

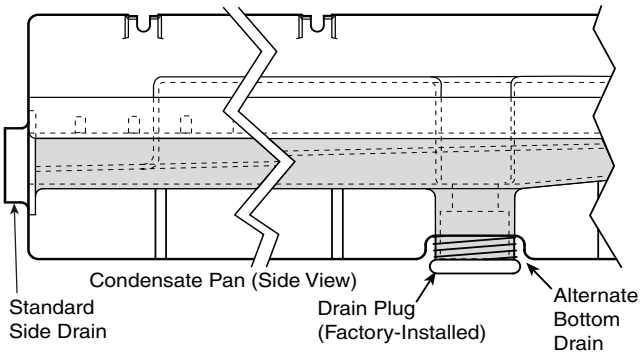
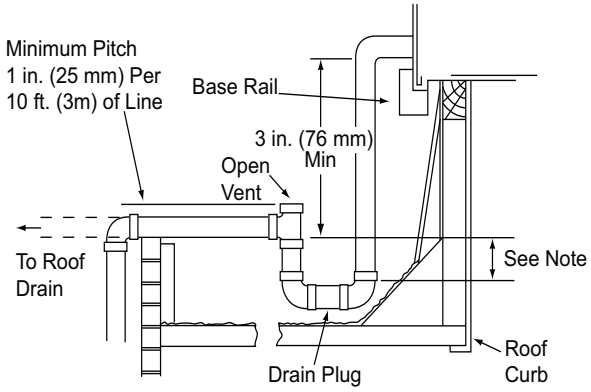


Fig. 24 — Condensate Drain Pan (Side View)



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

Fig. 25 — Condensate Drain Pan 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 per 3 m) of run. Do not use a pipe size smaller than the unit connection (3/4 in.).

Step 13 — Make Electrical Connections

⚠ WARNING

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

Do not use gas piping as an electrical ground.

Unit cabinet must have an uninterrupted, unbroken electrical ground to minimize the possibility of personal injury if an electrical fault should occur. This ground may consist of electrical wire connected to unit ground lug in control compartment, or conduit approved for electrical ground when installed in accordance with NEC (National Electrical Code); ANSI/NFPA 70, latest edition (in Canada, Canadian Electrical Code CSA [Canadian Standards Association] C22.1), and local electrical codes.

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

FIELD POWER SUPPLY

If equipped with optional Powered Convenience Outlet, the power source leads to the convenience outlet's transformer primary are not factory connected. Installer must connect these leads according to required operation of the convenience outlet. If an always-energized convenience outlet operation is desired, connect the source leads to the line side of the unit-mounted disconnect. (Check with local codes to ensure this method is acceptable in your area.) If a de-energize via unit disconnect switch operation of the convenience outlet is desired, connect the source leads to the load side of the unit disconnect. On a unit without a unit-mounted disconnect, connect the source leads to compressor contactor C lugs with unit field power leads. See Convenience Outlets on page 19 for power transformer connections.

The field power wires are connected to the unit at line-side pressure lugs on compressor contactor C (see wiring diagram label for control box component arrangement) or at factory-installed option non-fused disconnect switch or HACR. Maximum wire size is #2ga AWG (copper only) per pole on contactors and #2ga AWG (copper only) per pole on optional disconnect or HACR. See Fig. 26 and unit label diagram for field power wiring connections.

NOTE: Unit may be equipped with short test leads (pigtails) 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. See Fig. 27.

⚠ WARNING

FIRE HAZARD

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

Do not connect aluminum wire between disconnect switch and unit. Use only copper wire.

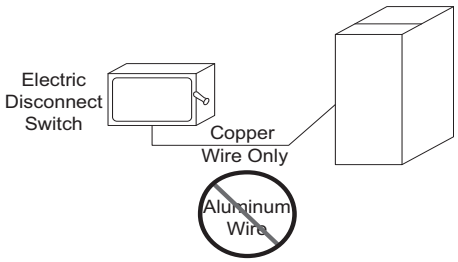


Fig. 26 — Disconnect Switch and Unit

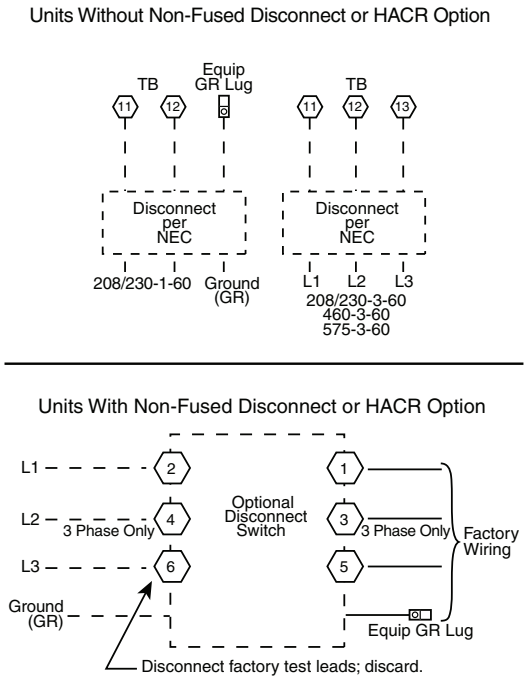


Fig. 27 — Power Wiring Connections

UNITS WITH FACTORY-INSTALLED NON-FUSED DISCONNECT OR HACR

The factory-installed option non-fused disconnect (NFD) or HACR switch is located in a weatherproof enclosure located under the main control box. The manual switch handle and shaft are shipped in the disconnect or HACR enclosure. Assemble the shaft and handle to the switch at this point. Discard the factory test leads (see Fig. 27).

NOTE: Non-fused disconnect and HACR are not available on 460-v units.

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

Field-Install the NFD Shaft and Handle

1. Remove the control box access panel. The NFD enclosure is located below the control box (see Fig. 28).
2. Remove (3) cap head screws that secure the NFD enclosure front cover — (2) on the face of the cover and (1) on the left side cover. See Fig. 29.
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. See Fig. 29.
6. Measure from the tip of the shaft to the top surface of the black pointer; the measurement should be 3.75 to 3.88 in. (95 to 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.

NOTE: Non-fused disconnect (NFD) is not available on 460-v units.

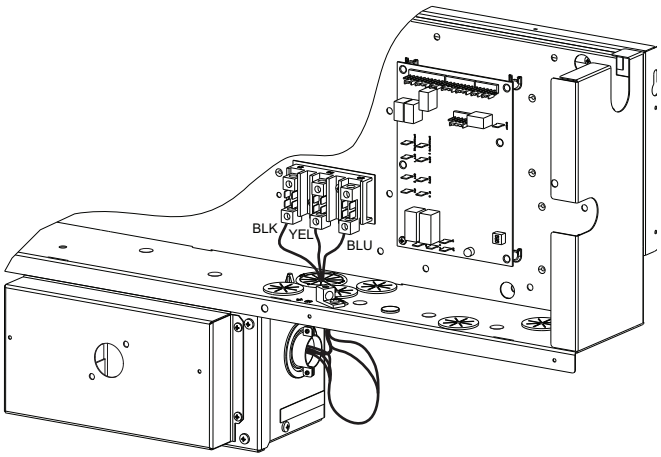


Fig. 28 — NFD Enclosure Location

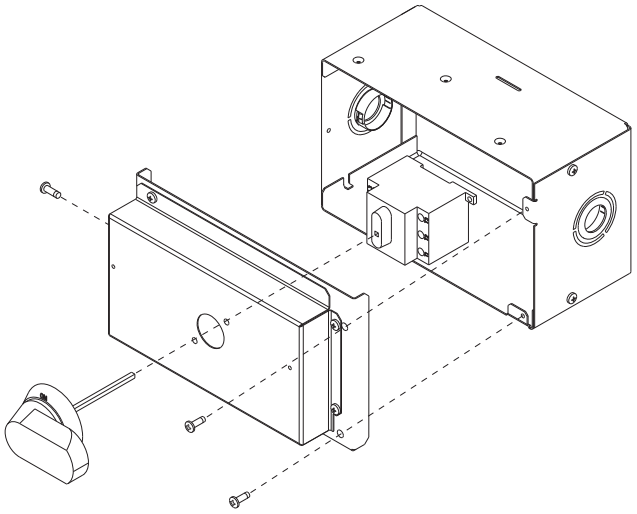


Fig. 29 — NFD Handle and Shaft Assembly

Field-Install the HACR Shaft and Handle

1. Remove the control box access panel. The HACR enclosure is located below the control box (see Fig. 30).
2. Remove (3) cap head screws that secure the HACR enclosure — (2) on the face of the cover and (1) on the left side cover. See Fig. 31.
3. Remove the front cover of the HACR enclosure.
4. Make sure the HACR shipped from the factory is at OFF position (the white arrow pointing at OFF).
5. Insert the shaft all the way with the cross pin on the top of the shaft in the horizontal position. See Fig. 31.
6. Tighten the locking screw to secure the shaft to the HACR.
7. Turn the handle to the OFF position with red arrow pointing at OFF.
8. Install the handle on to the painted cover horizontally with the red arrow pointing to the left.
9. Secure the handle to the painted cover with (2) screws and lock washers supplied.
10. Engaging the shaft into the handle socket, re-install (3) hex screws on the HACR enclosure.
11. Re-install the unit front panel.

NOTE: HACR breaker is not available on 460V units.

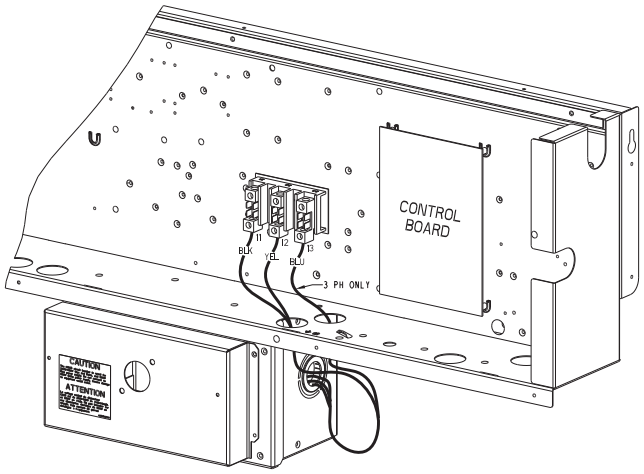


Fig. 30 — HACR Enclosure Location

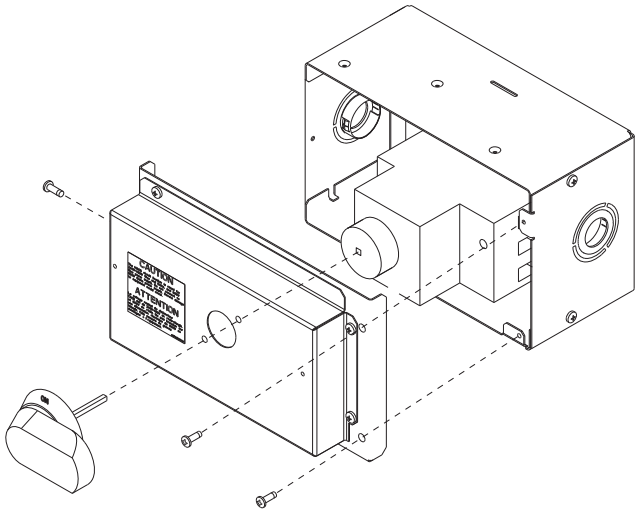


Fig. 31 — HACR Handle and Shaft Assembly

UNITS WITHOUT FACTORY-INSTALLED NON-FUSED DISCONNECT OR HACR

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. 27 and the unit label diagram for power wiring connections to the unit power terminal blocks and equipment ground. Maximum wire size is #2ga AWG (copper only) per pole on contactors. See Fig. 27 and unit label diagram for field power wiring connections.

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.

NOTE: Units ordered with factory-installed HACR do not need an additional ground fault and short circuit over-current protective device unless required by local codes.

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 at 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.

CONVENIENCE OUTLETS

⚠ WARNING

ELECTRICAL OPERATION HAZARD

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

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

Two types of convenience outlets are offered on 48JC(G/H) models: non-powered and unit-powered. Both types provide a 125-v GFCI (ground-fault circuit interrupter) duplex receptacle rated at 15A behind a hinged waterproof access cover, located on the end panel of the unit. See Fig. 32.

Figure 33 shows the Convenience Outlet Utilization label which is located below the convenience outlet.

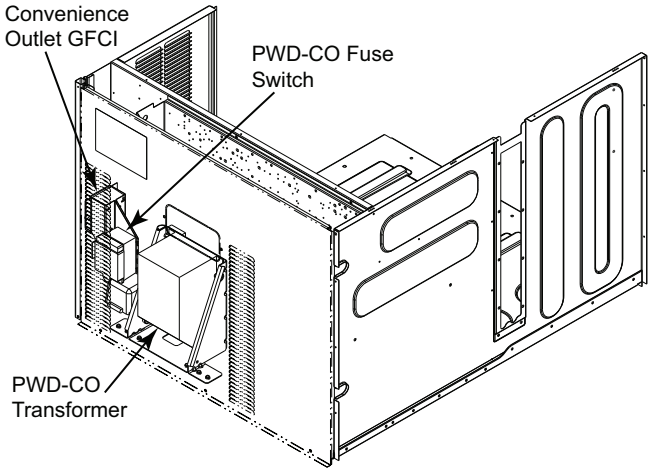


Fig. 32 — Convenience Outlet Location

NOTICE

Convenience Outlet Utilization

Maximum Continuous use: 15 Amps for receptacle outlets, and 8 Amps for factory supplied transformers

50HJ542739 C

Fig. 33 — Convenience Outlet Utilization Notice Label

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 secured to the basepan underneath the control box (see Fig. 34).

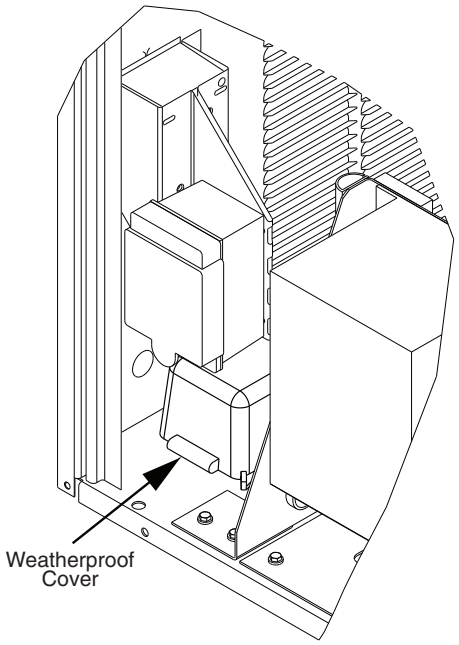


Fig. 34 — Weatherproof Cover — Shipping Location

⚠ WARNING

ELECTRICAL OPERATION HAZARD

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

Using unit-mounted convenience outlets: Units with unit-mounted convenience outlet circuits will often require that two disconnects be opened to de-energize all power to the unit. Treat all units as electrically energized until the convenience outlet power is also checked and de-energization is confirmed. Observe National Electrical Code Article 210, Branch Circuits, for use of convenience outlets.

1. Remove the blank cover plate at the convenience outlet; discard the blank cover.
2. Loosen the two screws at the GFCI duplex outlet, until approximately 1/2 in. (13 mm) under screw heads is exposed. Press the gasket over the screw heads.
3. 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).
4. Mount the weatherproof cover to the backing plate as shown in Fig. 35.
5. Remove two slot fillers in the bottom of the cover to permit service tool cords to exit the cover.
6. Check for full closing and latching.

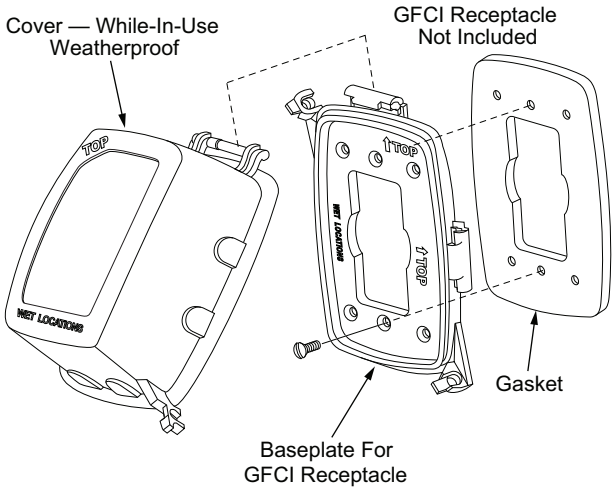


Fig. 35 — Weatherproof Cover Installation

Non-Powered Convenience Outlet

This type requires the field installation of a general-purpose 125-v 15A 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.

Unit-Powered Convenience Outlet

A unit-mounted transformer is factory-installed to step down the main power supply voltage to the unit to 115-v at the duplex receptacle. This option also includes a manual switch with fuse, located in a utility box and mounted on a bracket behind the convenience outlet; access is through the unit's control box access panel. See Fig. 32.

The primary leads to the convenience outlet transformer are not factory-connected. Selection of primary power source is a customer option. If local codes permit, the transformer primary leads can be connected at the line-side terminals on the unit-mounted non-fused disconnect or HACR breaker switch; this will provide service power to the unit when the unit disconnect switch or HACR switch is open. Other connection methods will result in the convenience outlet circuit being de-energized when the unit disconnect or HACR switch is open. See Fig. 36.

Using Unit-Mounted Convenience Outlets

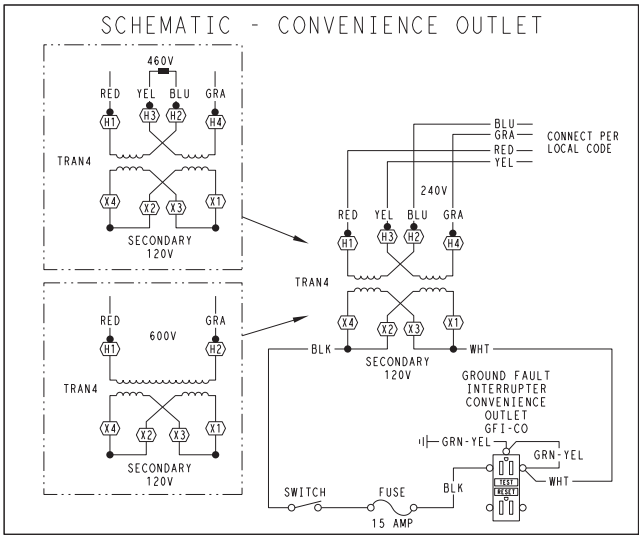
Units with unit-mounted convenience outlet circuits will often require that two disconnects be opened to de-energize all power to the unit. Treat all units as electrically energized until the convenience outlet power is also checked and de-energization is confirmed. Observe National Electrical Code Article 210, Branch Circuits, for use of convenience outlets.

Fuse On Power Type

The factory fuse is a Bussman[1] "Fusetron" T-15, non-renewable screw-in (Edison base) type plug fuse.

Test the GFCI receptacle by pressing the TEST button on the face of the receptacle to trip and open the receptacle. Check for proper grounding wires and power line phasing if the GFCI receptacle does not trip as required. Press the RESET button to clear the tripped condition.

1. Third-party trademarks and logos are the property of their respective owners.



UNIT VOLTAGE	CONNECT AS	PRIMARY CONNECTIONS	TRANSFORMER TERMINALS
208, 230	240	L1: RED + YEL L2: BLU + GRA	H1 + H3 H2 + H4
460	480	L1: RED Splice BLU + YEL L2: GRA	H1 H2 + H3 H4
575	600	L1: RED L2: GRA	H1 H2

Fig. 36 — Powered Convenience Outlet Wiring

HACR AMP RATING

The amp rating of the HACR factory-installed option is based on the size, voltage, indoor motor and other electrical options of the unit as shipped from the factory. If field-installed accessories are added or changed in the field (for example, power exhaust, ERV), the HACR may no longer be of the proper amp rating and therefore will need to be removed from the unit. See unit nameplate and label on factory-installed HACR for the amp rating of the HACR that was shipped with the unit from the factory (Fig. 37). See unit nameplates for the proper fuse, HACR or maximum over-current protection device required on the unit with field-installed accessories.

⚠ CAUTION

The HACR circuit breaker is rated for 240V/480V Wye and Delta, and 600V Wye power supply. Do not connect to 600V Delta power supply. Severe damage to equipment would occur.

⚠ ATTENTION

Le voltage nominal du disjoncteur CACR est de 240V/480V en étoile-triangle, et 600V en étoile. Ne pas brancher sur une alimentation électrique de 600V en triangle. Cela causera de graves dommages à l'équipment.

48TM503700

Fig. 37 — HACR Caution Label

FACTORY-OPTION THRU-THE-BASE CONNECTIONS (ELECTRICAL CONNECTIONS)

This service connection kit consists of a 1/2 in. NPT gas adapter fitting (brass), a 1/2 in. electrical bulkhead connector, and a 3/4 in. electrical bulkhead connector, all factory-installed in the embossed (raised) section of the unit basepan in the condenser section. The 3/4 in. bulkhead connector enables the low-voltage control wires to pass through the basepan. The 1/2 in. electrical bulkhead connector allows the high-voltage power wires to pass through the basepan. See Fig. 16 on page 14.

Check tightness of connector lock nuts before connecting electrical conduits.

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

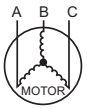
UNITS WITHOUT THRU-THE-BASE CONNECTIONS (ELECTRICAL CONNECTIONS)

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. 27 on page 18.

Voltage to compressor terminals during operation must be within voltage range indicated on unit nameplate. On 3-phase units, voltages between phases must be balanced within 2% and the current within 10%. Use the following formula 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 Carrier warranty.

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

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.

$$\text{\% Voltage Imbalance} = 100x \frac{4}{227} = 1.78\%$$

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.

FIELD CONTROL WIRING

The 48JC(G/H) unit comes standard with SystemVu controls. An external space sensor or conventional thermostat is required (field-supplied).

All low-voltage wiring should be routed through the provided raceway (see Fig. 43) built into the corner post of the unit or secured to the unit control box with the electrical conduit in order to provide UL-required clearance between high-voltage and low-voltage wiring.

SPACE TEMPERATURE SENSOR (SPT)

There are 2 types of space temperature sensors available from Carrier, resistive input non-communicating (T-55, T-56 and T-59) and Rnet communicating (ZS) sensors. Each type has a variety of options consisting of: timed override button, set point adjustment, a LCD screen, combination of humidity or CO_2 sensing and communication tie in. Space temperature can be also be written to from a building network or zoning system.

Figure 38 shows the wiring connections from the accessory space temperature sensors to the SystemVu MBB.

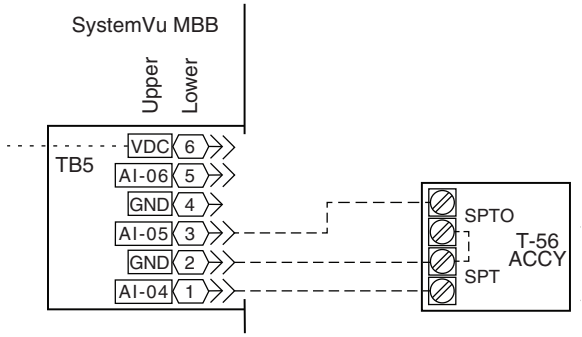


Fig. 38 — Typical Low Voltage SPT Connections

Resistive Non-Communicating Sensor Wiring

For sensor with setpoint adjustment up to 1000 ft (305m), use three-conductor shielded cable 20 gauge wire to connect the sensor to the controller. For non set point adjustment (slidebar) or return air duct sensor, an unshielded, 18 or 20 gauge, two-conductor, twisted pair cable may be used. Refer to Fig. 39 and 40 for typical connections at the sensor.

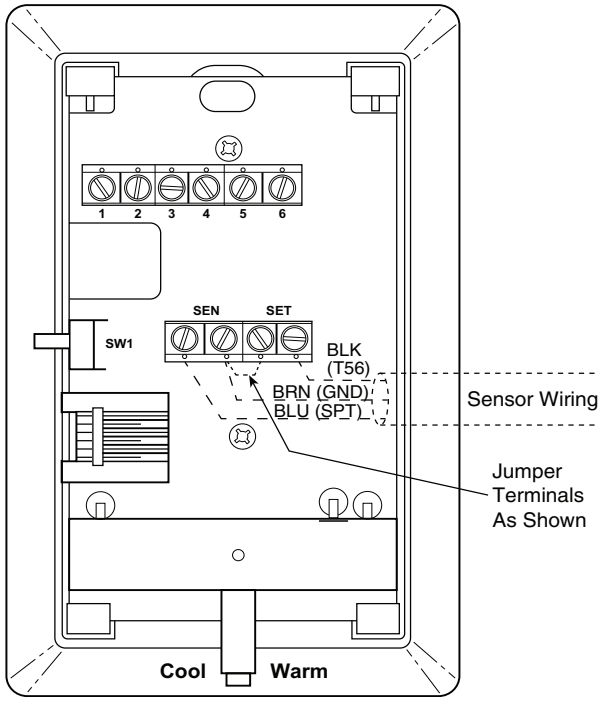


Fig. 39 — Space Temperature Sensor Typical Wiring (33ZCT56SPT)

Space Temperature Sensor (T-55)

The T-55 space temperature sensor (P/N: 33ZCT55SPT) is a field-installed accessory. The sensor is installed on a building interior wall to measure room air temperature. The T-55 sensor also includes an override button on the front cover to permit occupants to override the Unoccupied Schedule (if programmed).

TB5-1 Sensor Input

TB5-2 Sensor Common

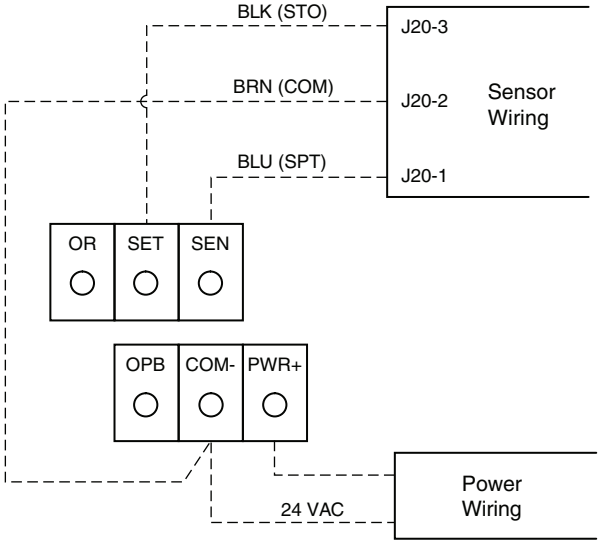
Space Temperature Sensor (T-56)

The T-56 space temperature sensor (P/N: 33ZCT56SPT) is a field-installed accessory. This sensor includes a sliding scale on the front cover that permits an occupant to adjust the space temperature set point remotely. The T-56 sensor also includes an override button on the front cover to allow occupants to override the unoccupied schedule (if programmed).

TB5-1 Sensor Input

TB5-2 Sensor Common

TB5-3 Setpoint Offset Input



NOTE: Must use a separate isolated transformer.

Fig. 40 — Space Temperature Sensor Typical Wiring (33ZCT59SPT)

ZS Space Sensors

The ZS Standard, Plus, or Pro can be wired into J20 or J24 of the SystemVu controller. J20 provides an easy field connection plug. A maximum of 5 ZS sensors can be connected but a separate power supply may be needed. Use the ZS SENSOR CFG menu (***SETTINGS → NETWORK SETTINGS***) when setting up the ZS sensors in SystemVu. The Sensor addresses have to be unique and set in the actual sensors via DIP also. The Typical default for the ZS Sensor is address 1. Follow the ZS installation instruction for further details on the sensors. ZS sensor data can be monitored on the SystemVu controller display in the ZS Sensor Info menu (***INPUTS → NETWORK → ZS SENSOR INFO***).

NOTE: Additional ZS sensors must be addressed. Use the jumpers on the ZS sensor's circuit board and refer to the sensor installation instructions for addressing.

For Rnet wiring up to 500ft (152m), use 18 AWG 4 conductor unshielded plenum rated cable. The SystemVu controller J20-RNET connection has a 4 pin PCB connector. Figure 41 shows sensor Rnet wiring.

J20-1	Sensor Common
J20-2	Sensor Positive (+)
J20-3	Sensor Negative (-)
J20-4	Sensor +12vdc Power

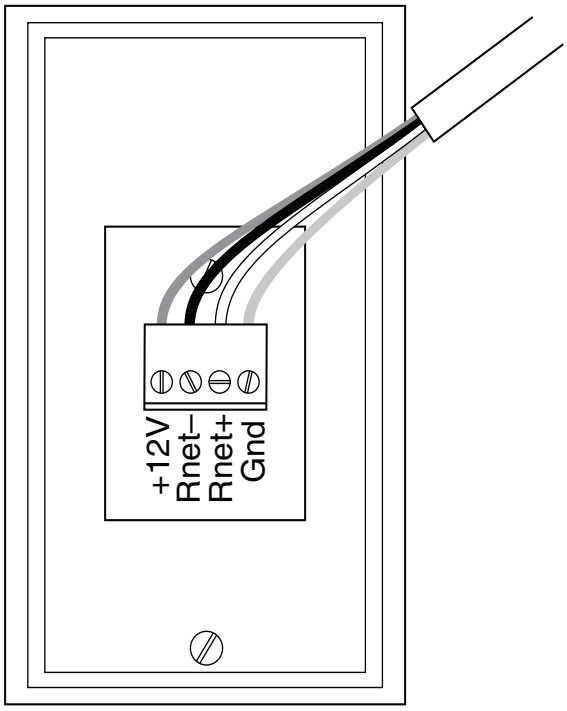


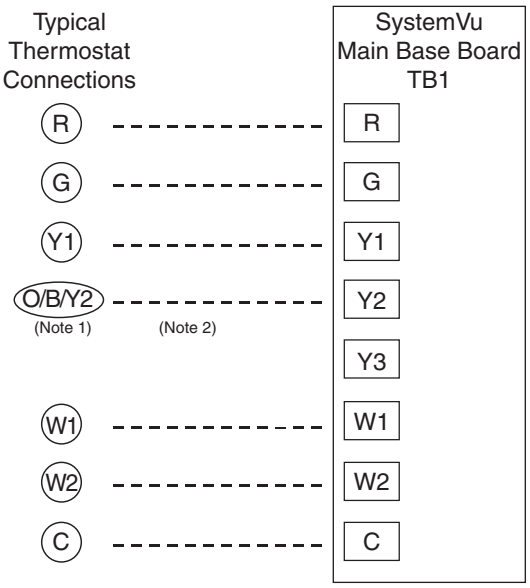
Fig. 41 — Typical Rnet Communication Sensor Wiring

THERMOSTAT

Install a Carrier-approved accessory thermostat according to installation instructions included with the accessory. For complete economizer function, select a two-stage cooling thermostat. Locate the thermostat accessory on a solid wall in the conditioned space to sense average temperature in accordance with the thermostat installation instructions. Typical low-voltage connections are shown in Fig. 42.

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

Note 2: Y2 to Y2 connection required on single-stage cooling units when integrated economizer function is desired.

Field Wiring

Fig. 42 — Low-Voltage Thermostat Connections

Thermostat Wiring, Units Without Thru-The-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 lower-left corner of the SystemVu MMB. See Fig. 43.

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

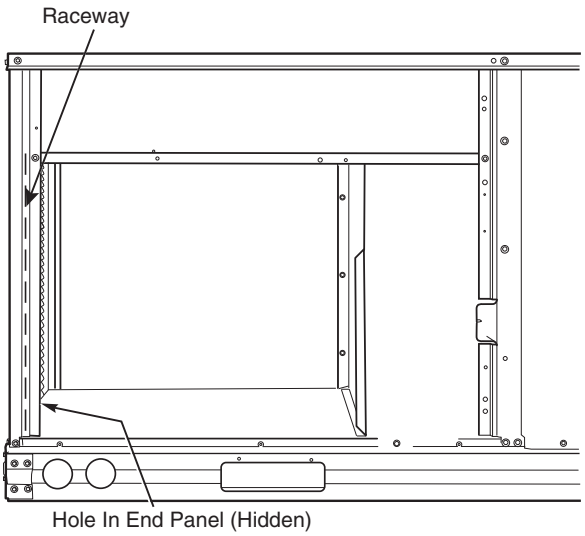


Fig. 43 — Field Control Wiring Raceway

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.

HUMIDI-MIZER® CONTROL CONNECTIONS

Humidi-MiZer® Space RH Controller

The Humidi-MiZer dehumidification system requires a field-supplied and field-installed space relative humidity control device. This device may be a separate humidistat control (contact closes on rise in space RH above control setpoint). See Fig. 44. The humidistat is normally used in applications where a temperature control is already provided (units with SystemVu™ control).

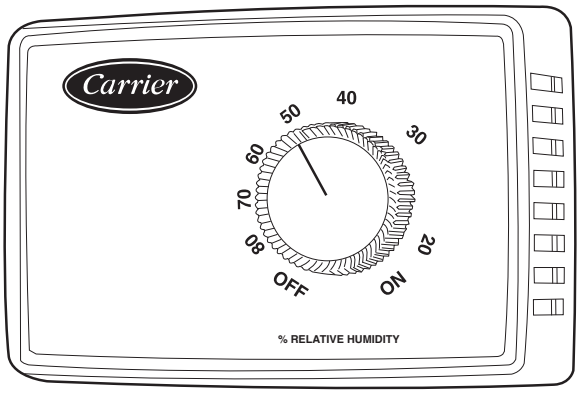


Fig. 44 — Accessory Field-Installed Humidistat

Connecting the Carrier Humidistat (HL38MG029)

1. Route the humidistat 2-conductor cable (field-supplied) through the hole provided in the unit corner post.
2. Feed wires through the raceway built into the corner post (see Fig. 43) to the 24v barrier located on the left side of the control box. The raceway provides the UL-required clearance between high-voltage and low-voltage wiring.
3. Connect one of the leads from the 2-conductor cable to the Y3 terminal on the SystemVu MBB (Main Base Board). Connect the other lead to the R terminal on the MBB. See Fig. 45.

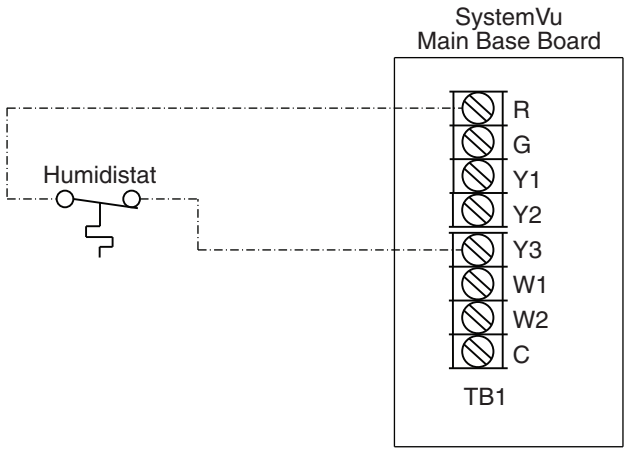


Fig. 45 — Humidistat Connections to SystemVu™ Main Base Board

UNITS WITH COPELAND ZPV COMPRESSOR

With the introduction of the Ultra High Efficiency Variable Speed JC unit, it is necessary to determine the power supply of the system before installing the product. With some power supplies, it may be necessary to add an additional transformer to ensure proper operation of the variable speed compressor.

Technical Information

The type of power supply can be identified by measuring the incoming voltage with a volt meter. The following measurements will help in determining the type of power supply. All measurements referenced are approximate, your actual field measurements may vary slightly from the numbers provided in this bulletin:

- L1 to ground
- L2 to ground
- L3 to ground

3-Phase Wye Power Supply

This type of power supply is the most common. To determine if the unit is using this power supply measure incoming power readings as follows:

208/230 VOLT SYSTEMS

L1 to Ground	120 volts
L2 to Ground	120 volts
L3 to Ground	120 volts

480 VOLT SYSTEMS

L1 to Ground	277 volts
L2 to Ground	277 volts
L3 to Ground	277 volts

The 3-Phase Wye power supply will not require further modification to allow the VFD to function properly.

Corner Grounded Delta Power Supply

This type of power supply is less common. To determine if the unit is using this power supply measure typical incoming power readings as follows:

208/230 VOLT SYSTEMS

L1 to Ground	208/230 volts
L2 to Ground	0 volts
L3 to Ground	208/230 volts

480 VOLT SYSTEMS

L1 to Ground	480 volts
L2 to Ground	0 volts
L3 to Ground	480 volts

NOTE: With a Corner Grounded Delta, 2 legs will read voltages that are the same (or approximately the same) and one leg will read 0 volts. The leg that reads 0 volts is normally leg 2 (L2).

This type of power supply may require modification for the variable speed compressor and associated components to function properly. Carrier/Emerson recommends the installation of an isolation Delta-Wye transformer to ensure proper equipment function and longevity.

High-Leg Power Supply

NOTE: Also known as “Wild-Leg” or “Stinger-Leg.”

This type of power supply is the least common. It is often located in older power systems. Typical voltage readings for High-Leg Power:

208/230 VOLT SYSTEMS

L1 to Ground	120 volts
L2 to Ground	208/230 volts
L3 to Ground	120 volts

480 VOLT SYSTEMS

L1 to Ground	277 volts
L2 to Ground	415 volts
L3 to Ground	277 volts

NOTE: Higher voltages appear on one leg with normal voltages on the other 2 legs.

Installation of a Delta-Wye transformer is required to operate the variable speed compressor and associated components in conjunction with High-Leg power supplies. Failure to do so will result in premature component failure.

TYPICAL UNIT WIRING DIAGRAMS

See Fig. 46-48 for examples of typical unit control and power wiring diagrams. These wiring diagrams are mounted on the inside of the unit control box cover.

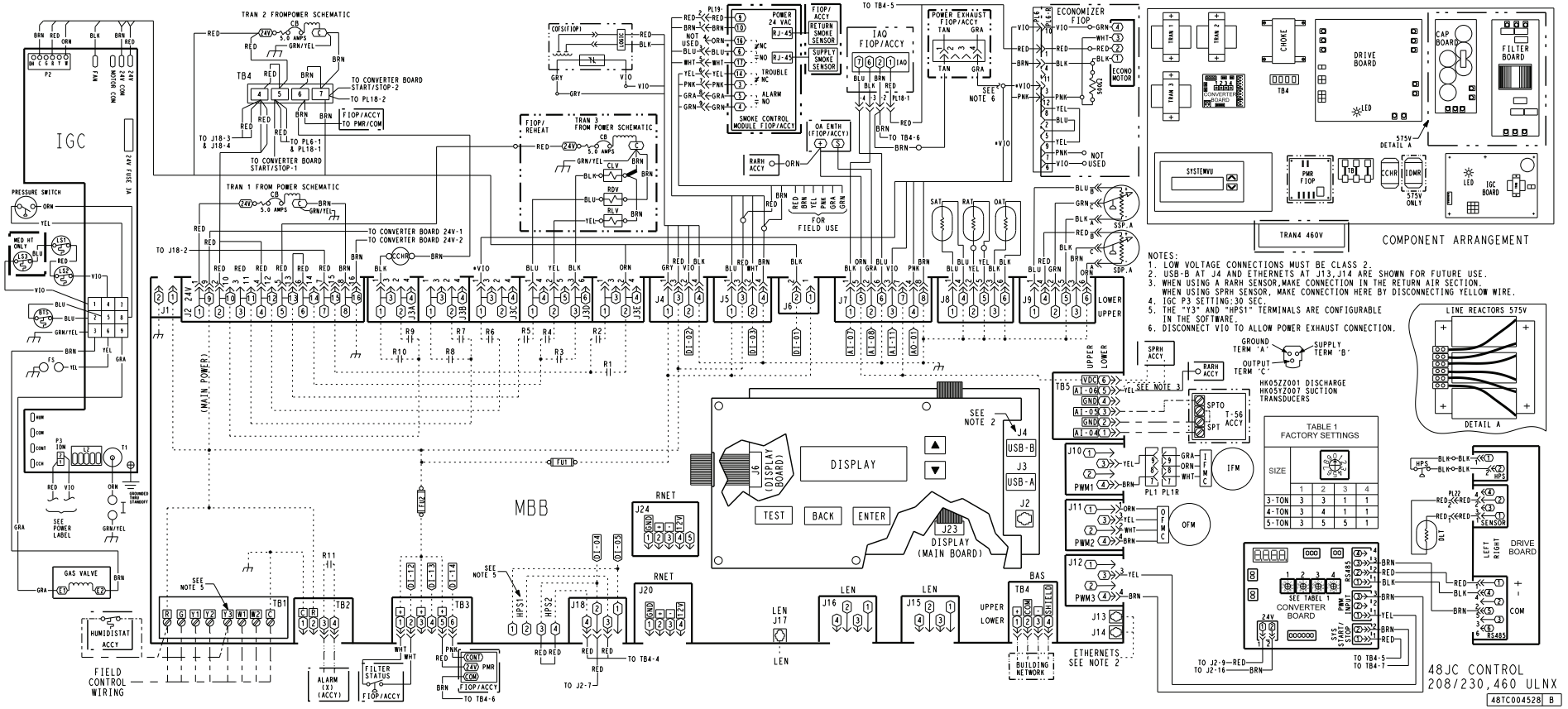


Fig. 46 — 48JC(G/H) 04-06 Typical Control Wiring Diagram, 208/230, 460-3-60 Unit Shown

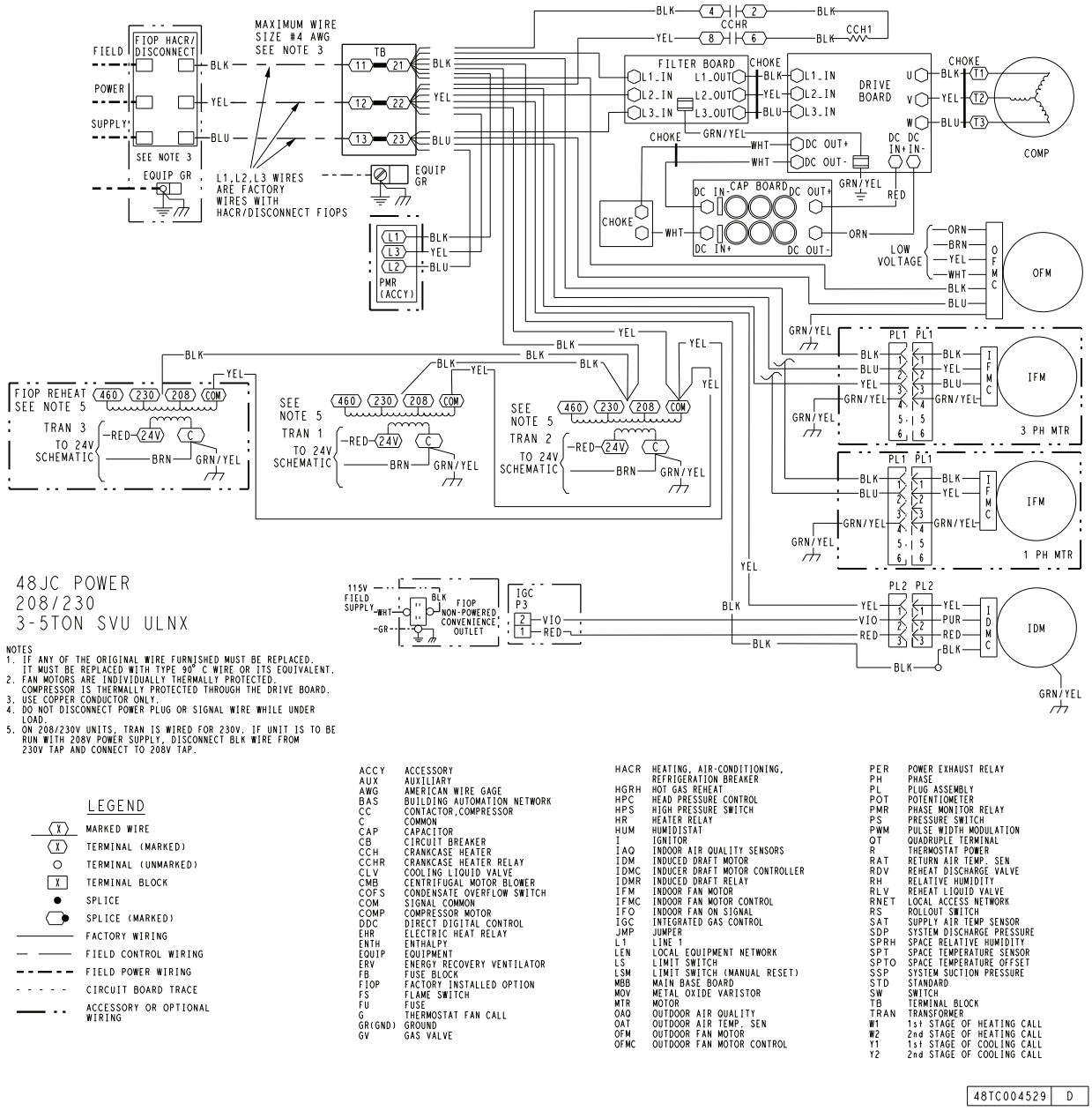
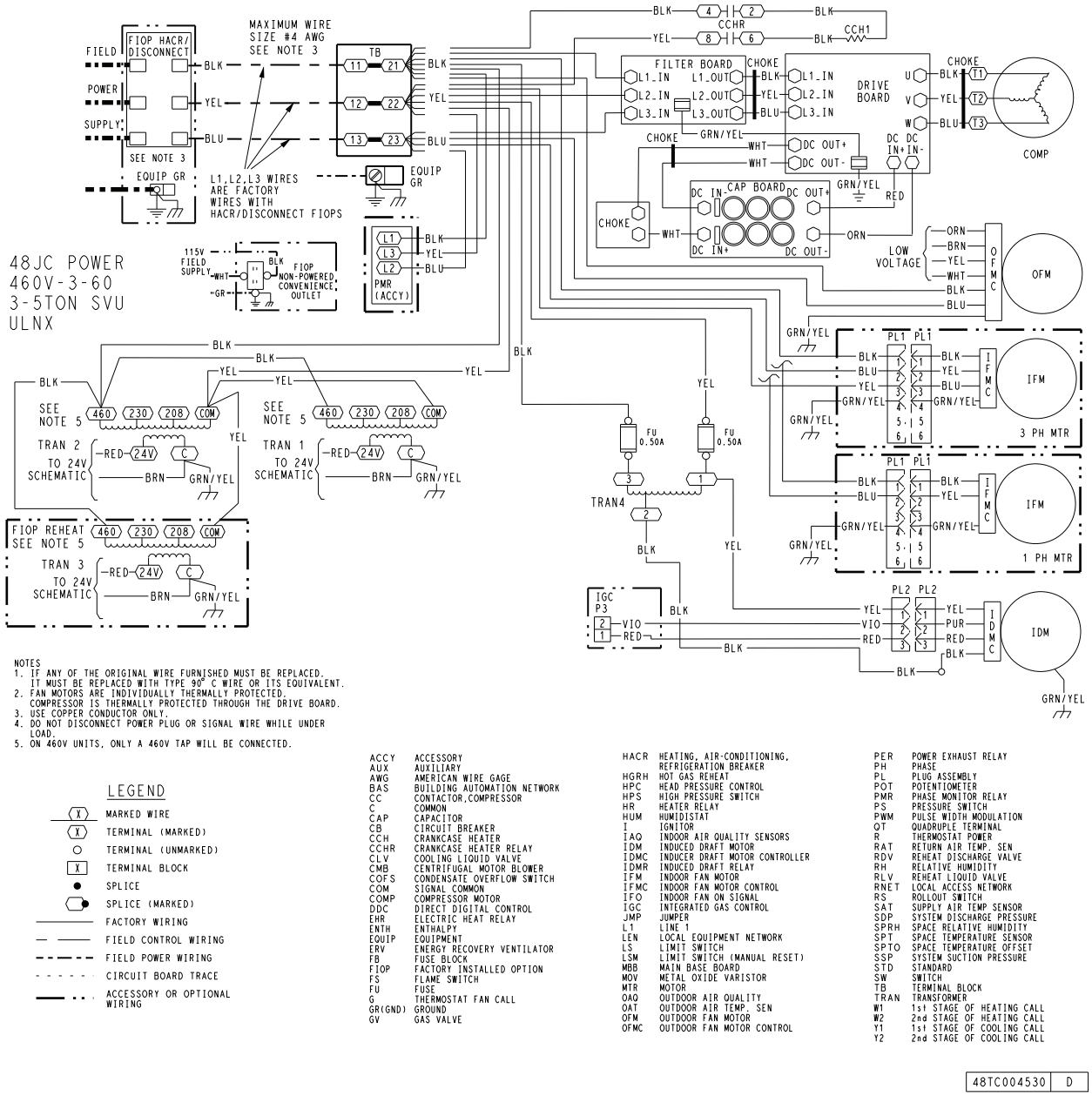


Fig. 47 — 48JC(G/H) 04-06 Typical Power Wiring Diagram, 208/230V Unit Shown



NOTES
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED. IT MUST BE REPLACED WITH TYPE 90° C WIRE OR ITS EQUIVALENT.
2. FAN MOTORS ARE INDIVIDUALLY THERMALLY PROTECTED. COMPRESSOR IS THERMALLY PROTECTED THROUGH THE DRIVE BOARD.
3. USE COPPER CONDUCTOR ONLY.
4. DO NOT DISCONNECT POWER PLUG OR SIGNAL WIRE WHILE UNDER LOAD.
5. ON 460V UNITS, ONLY A 460V TAP WILL BE CONNECTED.

LEGEND

(X)	MARKED WIRE
(X)	TERMINAL (MARKED)
○	TERMINAL (UNMARKED)
X	TERMINAL BLOCK
●	SPLICE
(X)●	SPLICE (MARKED)
———	FACTORY WIRING
— ———	FIELD CONTROL WIRING
- - - - -	FIELD POWER WIRING
- - - - - -	CIRCUIT BOARD TRACE
——— · · ·	ACCESSORY OR OPTIONAL WIRING

ACCY	ACCESSORY
AUX	AUXILIARY
AWG	AMERICAN WIRE GAGE
BAS	BUILDING AUTOMATION NETWORK
CC	CONTACTOR,COMPRESSOR
C	COMMON
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCHR	CRANKCASE HEATER RELAY
CLV	COOLING LIQUID VALVE
CMB	CENTRIFUGAL MOTOR BLOWER
COFS	CONDENSATE OVERFLOW SWITCH
COM	SIGNAL COMMON
COMP	COMPRESSOR MOTOR
DDC	DIRECT DIGITAL CONTROL
EHR	ELECTRIC HEAT RELAY
ENTH	ENTHALPY
EQUIP	EQUIPMENT
ERV	ENERGY RECOVERY VENTILATOR
FB	FUSE BLOCK
FIOP	FACTORY INSTALLED OPTION
FS	FLAME SWITCH
FU	FUSE
G	THERMOSTAT FAN CALL
GR(GND)	GROUND
GV	GAS VALVE

HACR	HEATING, AIR-CONDITIONING, REFRIGERATION BREAKER
HGRH	HOT GAS REHEAT
HPC	HEAD PRESSURE CONTROL
HPS	HIGH PRESSURE SWITCH
HR	HEATER RELAY
HUM	HUMIDISTAT
I	IGNITOR
IAQ	INDOOR AIR QUALITY SENSORS
IDM	INDUCED DRAFT MOTOR
IDMC	INDUCER DRAFT MOTOR CONTROLLER
IDMR	INDUCED DRAFT RELAY
IFM	INDOOR FAN MOTOR
IFMC	INDOOR FAN MOTOR CONTROL
IFO	INDOOR FAN ON SIGNAL
IGC	INTEGRATED GAS CONTROL
JMP	JUMPER
L1	LINE 1
LEN	LOCAL EQUIPMENT NETWORK
LS	LIMIT SWITCH
LSM	LIMIT SWITCH (MANUAL RESET)
MBB	MAIN BASE BOARD
MOV	METAL OXIDE VARISTOR
MTR	MOTOR
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFM	OUTDOOR FAN MOTOR
OFMC	OUTDOOR FAN MOTOR CONTROL

PER	POWER EXHAUST RELAY
PH	PHASE
PL	PLUG ASSEMBLY
POT	POTENTIOMETER
PMR	PHASE MONITOR RELAY
PS	PRESSURE SWITCH
PWM	PULSE WIDTH MODULATION
QT	QUADRUPLE TERMINAL
R	THERMOSTAT POWER
RAT	RETURN AIR TEMP. SEN
RDV	REHEAT DISCHARGE VALVE
RH	RELATIVE HUMIDITY
RLV	REHEAT LIQUID VALVE
RNET	LOCAL ACCESS NETWORK
RS	ROLLOUT SWITCH
SAT	SUPPLY AIR TEMP SENSOR
SDP	SYSTEM DISCHARGE PRESSURE
SPRH	SPACE RELATIVE HUMIDITY
SPT	SPACE TEMPERATURE SENSOR
SPTO	SPACE TEMPERATURE OFFSET
SSP	SYSTEM SUCTION PRESSURE
STD	STANDARD
SW	SWITCH
TB	TERMINAL BLOCK
TRAN	TRANSFORMER
W1	1st STAGE OF HEATING CALL
W2	2nd STAGE OF HEATING CALL
Y1	1st STAGE OF COOLING CALL
Y2	2nd STAGE OF COOLING CALL

48TC004530 | D

Fig. 48 — 48JC(G/H) 04-06 Typical Power Wiring Diagram, 460-3-60 Unit with SystemVu Controller Shown

Integrated Gas Controller

This unit contains an Integrated Gas Controller (IGC) board. The IGC control board uses a flue gas pressure switch that senses pressure drop in the heat exchanger due to the combustion inducer. See Fig. 49.

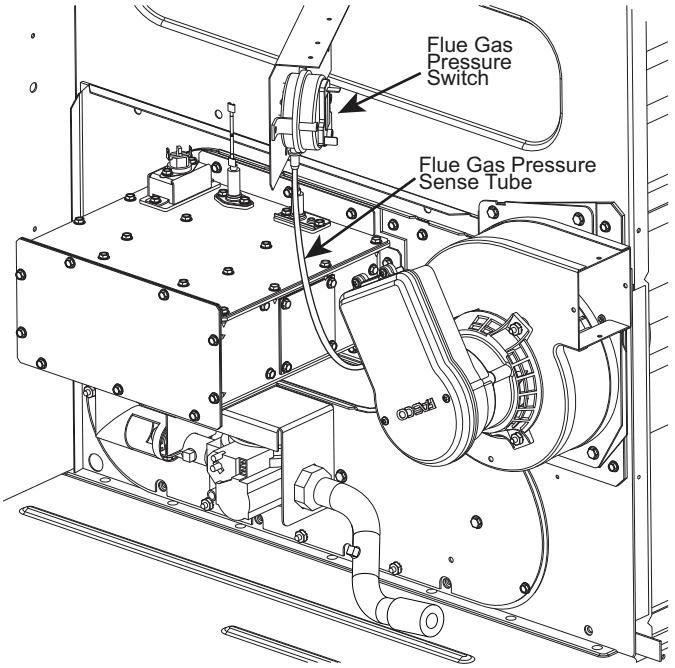


Fig. 49 — Flue Gas Pressure Switch and Pressure Sense Tube (Typical Location)

When the thermostat calls for heating, power is sent to W on the Integrated Gas Controller (IGC) board. An LED (light emitting diode) on the IGC board turns on and remains on during normal operation. A check is made to ensure that the burner thermal switch and limit switch are closed, and that the pressure switch is open. If the check was successful, the induced draft motor is energized. When the pressure in the heat exchanger is low enough to close the pressure switch, the ignition activation period begins. Once ignition occurs, the IGC board will continue to monitor the condition of the burner thermal switch, the limit switches, the pressure switch, and the flame sensor. Assuming the unit is controlled through a room thermostat set for "fan auto," 45 seconds after ignition occurs, the indoor fan motor will energize, and the outdoor air dampers will open to their minimum position. If the "over temperature limit" opens prior to the start of the indoor fan blower, the IGC will shut down the burners, and the control will shorten the 45 second delay to 5 seconds less than the time to trip the limit. For example, if the limit trips at 37 seconds, the control will change the "fan on delay" from 45 seconds to 32 seconds. Once the "fan on delay" has been modified, it will not change back to 45 seconds unless power is reset to the control.

When the thermostat is satisfied, W opens and the gas valve closes, interrupting the flow of gas to the main burners. If the call for W lasted less than 1 minute, the heating cycle will not terminate until 1 minute after W became active. If the unit is controlled through a room thermostat set for fan auto, the indoor fan motor will continue to operate for an additional 90 seconds, then stop. An LED indicator is provided on the IGC to monitor operation. See Table 5 for a listing of the LED alarm codes.

See Fig. 50 for IGC board component layout. Fig. 46 is a typical IGC control wiring diagram.

See Fig. 51 for a flow chart detailing the operating sequence for the IGC.

⚠ CAUTION

Do not detach the burner box from the heat exchanger panel. If the burner box must be replaced, refer to the Service and Maintenance Instructions for the unit.

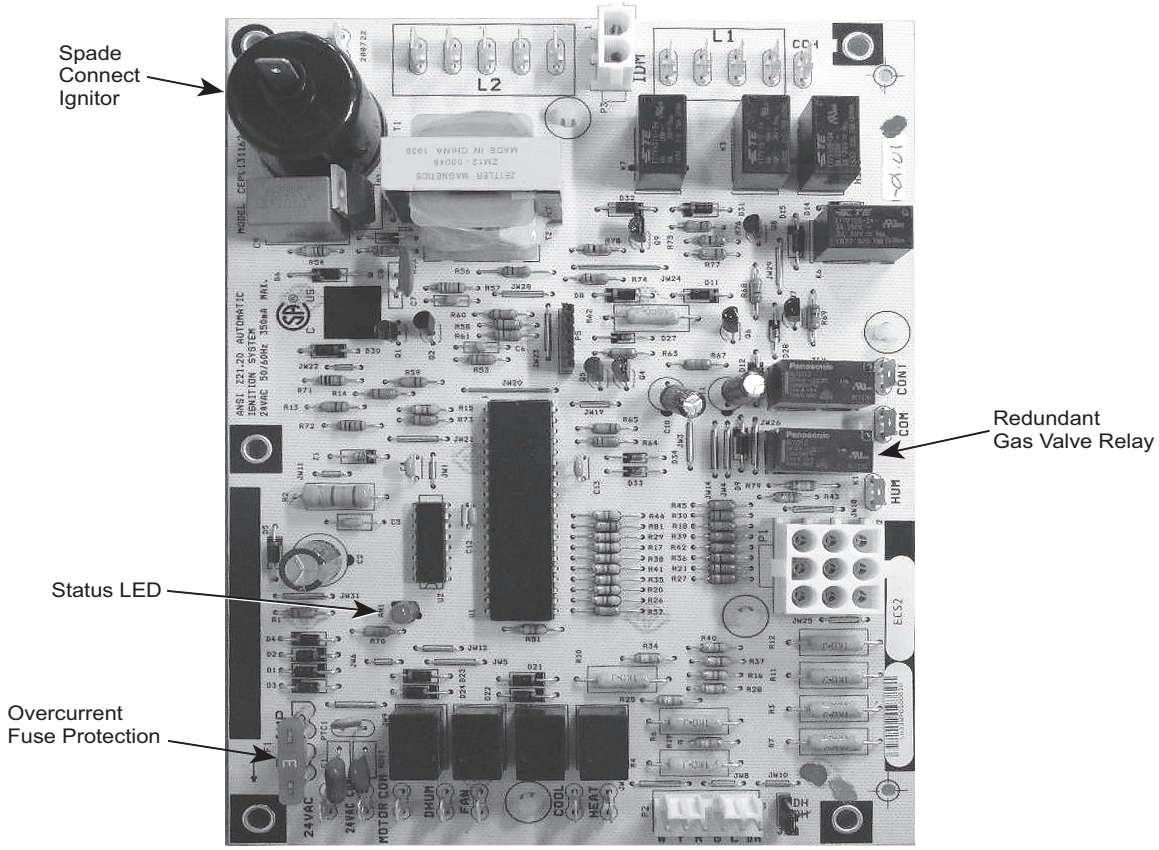


Fig. 50 — IGC Board Component Layout

Table 5 — IGC Board LED Alarm Codes[a,b,c,d]

FLASH CODE	SYMPTOM	CAUSE	REMEDY
ON	Normal Operation	—	—
OFF	No Power or Hardware Failure	Loss of power to control module (IGC).	Check 5-amp fuse on the IGC, power to unit, 24-v circuit breaker, and transformer. Units without a 24-v circuit breaker have an internal overload in the 24-v transformer. If the overload trips, allow 10 minutes for automatic reset.
1 Flash	Check Fuse, Low Voltage Circuit	Fuse is blown or missing, or short circuit in secondary (24 vac) wiring.	Replace fuse if needed. Verify no short circuit in low voltage (24 vac) wiring.
2 Flashes	Limit Switch Fault	High temperature limit switch is open.	Check the operation of the indoor (evaporator) fan motor. Ensure that the supply-air temperature rise is in accordance with the range on the unit nameplate. Clean or replace filters.
3 Flashes	Flame is Sense Fault	The IGC sensed flame that should not be present.	Reset unit. If problem persists, replace the IGC board.
4 Flashes	Four Consecutive Limit Switch Faults	Inadequate airflow to unit.	Check the operation of the indoor (evaporator) fan motor and that supply-air temperature rise agrees with range on the unit nameplate information.
5 Flashes	Ignition Lockout Fault	Unit unsuccessfully attempted ignition for 4 times.	Check igniter and flame sensor electrode spacing, gaps, etc. Ensure that flame sensor and ignition wires are properly terminated. Verify that unit is obtaining proper amount of gas.
6 Flashes	Pressure Switch Fault	Open pressure switch.	Verify wiring connections to pressure switch and inducer motor. Verify pressure switch hose is tightly connected to both inducer housing and pressure switch. Verify inducer wheel is properly attached to inducer motor shaft. Verify inducer motor shaft is turning. In 460-v units check the transformer designed for the inducer motor is operational. Also check the fuses for the inducer motor transformer (460-v units only).
7 Flashes	Burner Thermal Switch Fault	Burner thermal switch is open.	The burner thermal switch will automatically reset, but IGC will continue to lockout unit. Check any possible blockage in the access panel louver, intake tube connected to the burner box, and the flue gas exhaust. Check gas valve operation. Ensure that induced-draft blower wheel is properly secured to motor shaft. Inspect the burner mesh inside the burner box by opening the side window on the burner box. Reset the unit disconnect.
8 Flashes	Internal Control Fault	Microprocessor has sensed an error in the software or hardware.	If error code is not cleared by resetting unit power, replace the IGC board.

NOTE(S):

a. There is a 3-second pause between alarm code displays.
b. If more than one alarm code exists, all applicable alarm codes will be displayed in numerical sequence.
c. Alarm codes on the IGC will be lost if power to the unit is interrupted.
d. If the inducer pressure switch is stuck closed when a W1 call is made the unit will sit idle with no fault codes.

LEGEND

IGC — Integrated Gas Unit Control
LED — Light-Emitting Diode

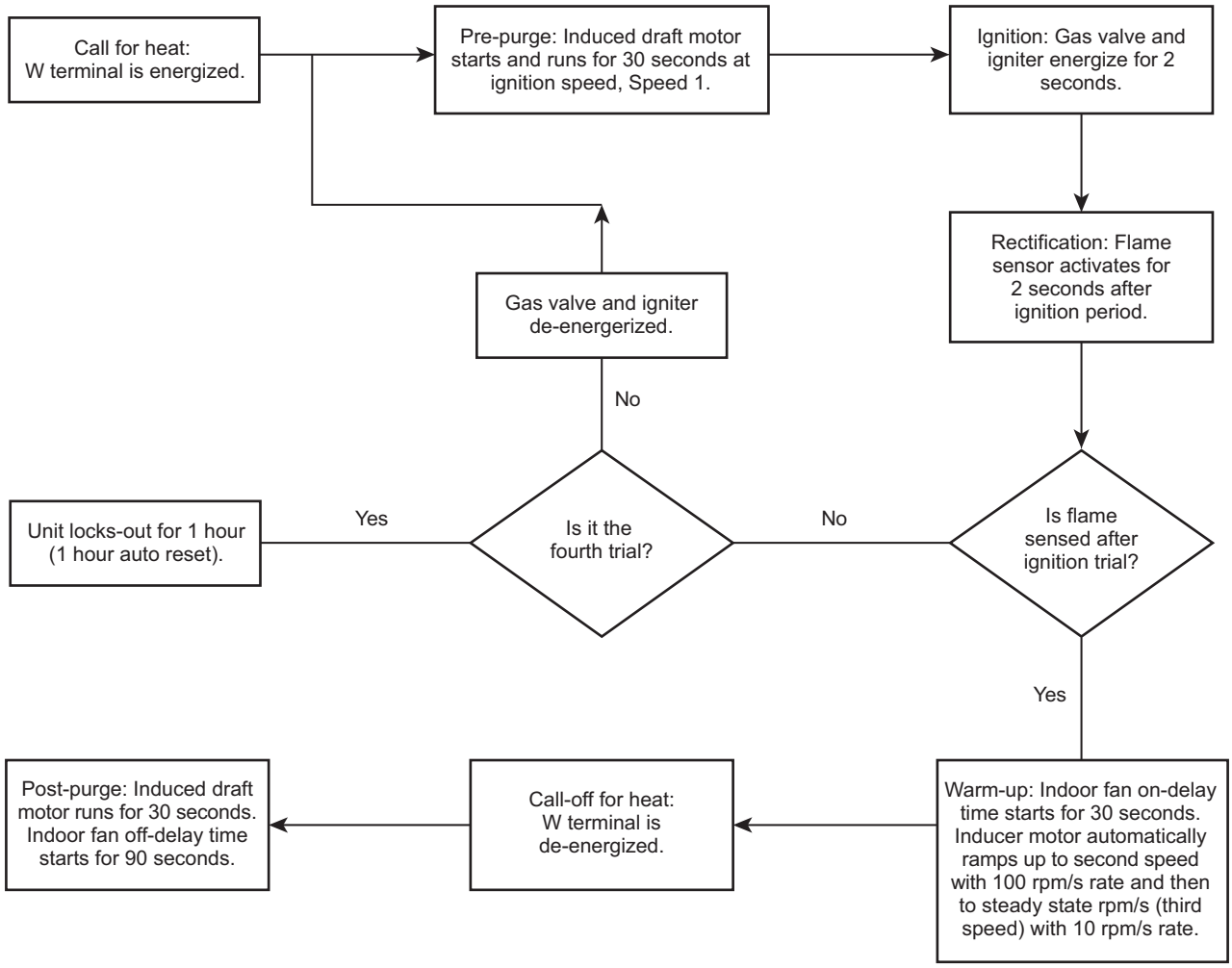


Fig. 51 — IGC Operating Sequence

Controller Options

LOW AMBIENT

Refer to the *48/50JC 04-06 Single Package Rooftop Units with SystemVu Controller Controls, Start-up, Operation and Troubleshooting* manual for details on adjusting "Cooling Lock-Out" setting and configure for the specific job requirements.

Smoke Detectors

Smoke detectors are available as factory-installed options on 48JC(G/H) models. Smoke detectors may be specified for supply air only, for return air without or with economizer, or in combination of supply air and return air. Return-air smoke detectors are arranged for vertical return configurations only. 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 may be necessary to complete the unit and smoke detector configuration to meet project requirements.

Units equipped with factory-installed optional return-air smoke detectors require a relocation of the sensor module at unit installation. See Fig. 52 for the as-shipped location.

Completing Return Air Smoke Sensor Installation

1. Unscrew the two screws holding the Return Air Smoke Detector assembly. See Fig. 53, Step 1. Save the screws.
2. Turn the assembly 90 degrees and then rotate end to end. Make sure that the elbow fitting is pointing down. See Fig. 53, Step 2.
3. Screw the sensor and detector plate into its operating position using screws from Step 1. See Fig. 53, Step 3.
4. Connect the flexible tube on the sampling inlet to the sampling tube on the basepan.

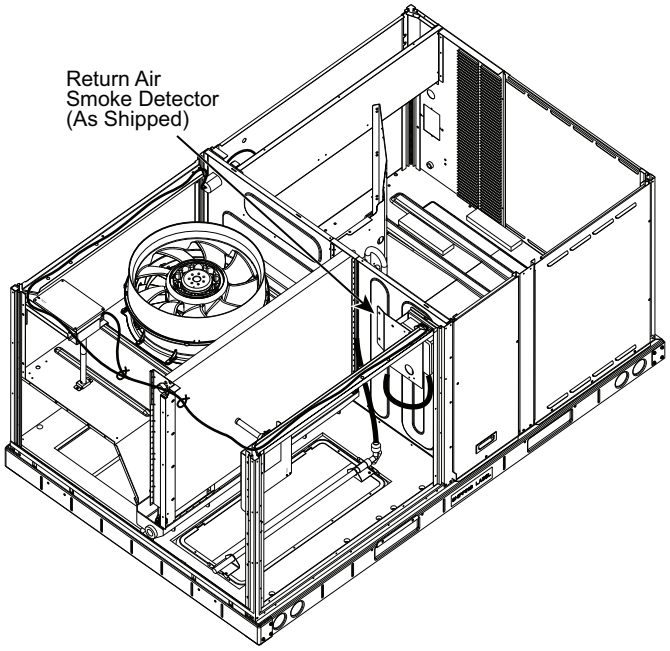


Fig. 52 — Return Air Smoke Detector, Shipping Position

Additional Application Data

Refer to the application data document *Factory-Installed Smoke Detectors for Small and Medium Rooftop Units 2 to 25 Tons* for discussions on additional control features of these smoke detectors including multiple unit coordination.

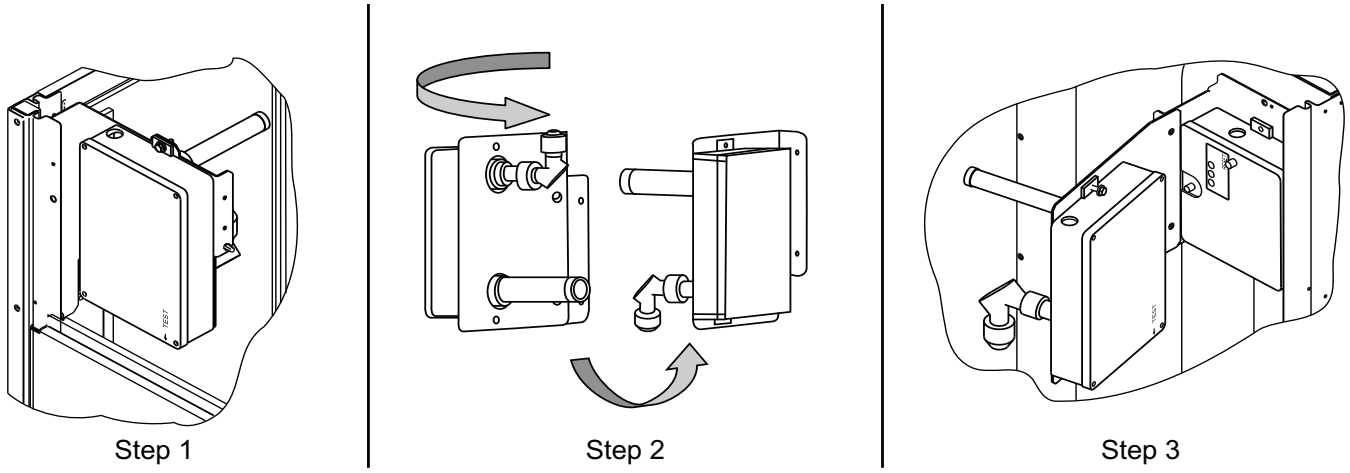


Fig. 53 — Completing Installation of Return Air Smoke Sensor

Step 14 — Adjust Factory-Installed Options

SMOKE DETECTORS

Smoke detector(s) will be connected to the SystemVu Main Base Board at J5.

Step 15 — Install Accessories

Available accessories include:

- Roof curb
- Thru-the-base connection kit (must be installed before unit is set on curb)
- Flue discharge deflector
- Manual outside air damper
- Two-position motorized outside air damper
- EconoMi$er2
- Power exhaust
- Differential dry-bulb sensor
- Outdoor enthalpy sensor
- Differential enthalpy sensor
- CO_2 sensor
- Louvered hail guard
- Phase monitor control

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

Step 16 — Fan Speed Set Up

SYSTEMVU™ CONTROLS

The fan speed settings are accessed through the SystemVu interface.

1. Check the job specifications for the CFM (cubic feet per minute) and ESP (external static pressure) required.
2. Using the chart on the Fan Speed Set Up labels (see Fig. 54), calculate the RPM from the CFM and ESP for the base unit plus any field accessories (as listed on the label).

NOTE: The fan speed set up labels are located on the High Voltage cover in the Control Box.

3. Press any key on the SystemVu interface to activate the display backlight and then press the MENU key.
4. Using the UP and DOWN arrow keys highlight SETTINGS and then press ENTER.
5. Use the DOWN arrow key highlight the UNIT CONFIGURATIONS menu then press ENTER.
6. Highlight UNIT CONFIGURATIONS then press ENTER.
7. Highlight INDOOR FAN and then press ENTER.
8. Refer to the job specifications to set the following, determining the values per the RPM Calculator label (see Fig. 54). Use the UP and DOWN arrow keys and the BACK key to set the values. Press ENTER after setting each value to continue to the next selection.

- IDF VENT SPD
- IDF HEAT SPD
- IDF LOW COOL SPD
- IDF HIGH SPD
- IDF FREE COOL SPD

For further details, see the *48/50JC Series Single Package Rooftop Units with SystemVu Controller Controls, Start-up, Operation and Troubleshooting* manual.

SystemVu™

FAN SPEED SETUP (RPM)

MAIN MENU:

SETTINGS

→ UNIT CONFIGURATIONS

→ INDOOR FAN

- → IDF VENT SPD -RPM
- → IDF HEAT SPD -RPM
- → IDF LOW COOL SPD -RPM
- → IDF HIGH COOL SPD -RPM
- → IDF FREE COOL SPD -RPM

↓ DETERMINE RPM FROM BELOW ↓

48TC003136 REV. A

RPM Calculator

UNIT MODEL NUMBER / CFM	ESP in. wg 0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0
1500	1425	1609	1764	1902	2028	2147	2260	2367		
1625	1512	1688	1839	1974	2097	2212	2322			
1750	1601	1768	1916	2047	2168	2280	2387			
1875	1692	1850	1994	2123	2241	2351				
2000	1784	1933	2073	2200	2316					
2125	1878	2018	2153	2277						
2250	1973	2104	2235	2356						
2375	2069	2192	2317							
2500	2166	2282								
Field Accessories:										
Economizer	65	65	65	65	65	65	65	65		

Fig. 54 — Example of Fan Speed Set Up Labels for SystemVu™ Controls

START-UP CHECKLIST

48JC(G/H)*04-06 SINGLE PACKAGE ROOFTOP GAS HEATING/ELECTRIC COOLING UNIT

(Remove and use for job file)

NOTE: To avoid injury to personnel and damage to equipment or property when completing the procedures listed in this start-up checklist, use good judgment, follow safe practices, and adhere to the safety considerations/information as outlined in preceding sections of this Installation Instruction document.

I. PRELIMINARY INFORMATION

MODEL NO _____

JOB NAME_____

SERIAL NO _____

ADDRESS _____

START-UP DATE_____

TECHNICIAN NAME _____

ADDITIONAL ACCESSORIES

_____

II. PRE-START-UP

Verify that all packaging materials have been removed from unit	(Y/N) _____
Verify installation of outdoor air hood	(Y/N) _____
Verify installation of flue exhaust and inlet hood	(Y/N) _____
Verify that condensate connection is installed per instructions	(Y/N) _____
Verify that all electrical connections and terminals are tight	(Y/N) _____
Verify gas pressure to unit gas valve is within specified range	(Y/N) _____
Verify ground integrity with a continuity test	(Y/N) _____
Check gas piping for leaks	(Y/N) _____
Verify the gas orifice placement dimension (Ultra Low NOx models only) is as shown in the gas piping section	(Y/N) _____
Check that indoor-air filters are clean and in place	(Y/N) _____
Check that outdoor air inlet screens are in place	(Y/N) _____
Verify that unit is level	(Y/N) _____
Verify that fan assembly is free of obstructions and rotor spins freely	(Y/N) _____
Verify that scroll compressors are rotating in the correct direction	(Y/N) _____
Verify installation of thermostat	(Y/N) _____
Verify that crankcase heaters have been energized for at least 24 hours	(Y/N) _____

III. START-UP

ELECTRICAL

Supply Voltage	L1-L2_____	L2-L3_____	L3-L1_____
Compressor Amps 1	L1 _____	L2 _____	L3 _____
Compressor Amps 2	L1 _____	L2 _____	L3 _____
Supply Fan Amps	L1 _____	L2 _____	L3 _____

TEMPERATURES

Outdoor-air Temperature	_____ °F DB (Dry Bulb)	
Return-air Temperature	_____ °F DB	_____ °F WB (Wet Bulb)
Cooling Supply Air Temperature	_____ °F	
Gas Heat Supply Air	_____ °F	

PRESSURES

Gas Inlet Pressure in. wg		_____ in. wg
Gas Manifold Pressure	STAGE 1	_____ in. wg
	STAGE 2	_____ in. wg
Refrigerant Suction		_____ psig
Refrigerant Discharge		_____ psig
Verify Refrigerant Charge using Charging Charts		(Y/N) _____

GENERAL

Economizer minimum vent and changeover settings to job requirements (if equipped) (Y/N) _____
Verify smoke detector unit shutdown by utilizing magnet test (Y/N) _____

IV. HUMIDI-MIZER® SYSTEM START-UP

STEPS

1. Check UCB (Unit Control Board) for jumper 1, 2, 3 (Jumper 1, 2, 3 must be cut and open) (Y/N) _____
2. Open humidistat contacts (Y/N) _____
3. Start unit In cooling (Close Y1) (Y/N) _____

OBSERVE AND RECORD

A. Suction pressure _____ psig
B. Discharge pressure _____ psig
C. Entering air temperature _____ °F
D. Liquid line temperature at outlet or reheat coil _____ °F
E. Confirm correct rotation for compressor (Y/N) _____
F. Check for correct ramp-up of outdoor fan motor as condenser coil warms (Y/N) _____

4. Switch unit to high-latent mode (sub-cooler) by closing humidistat with Y1 closed (Y/N) _____
5. Check unit charge per charging chart (Y/N) _____

OBSERVE

A. Reduction in suction pressure (5 to 7 psi expected) (Y/N) _____
B. Discharge pressure unchanged (Y/N) _____
C. Liquid temperature drops to 50 to 55°F range (Y/N) _____
D. LSV solenoid energized (valve closes) (Y/N) _____

6. Switch unit to dehumid (reheat) by opening Y1 (Y/N) _____

OBSERVE

A. Suction pressure increases to normal cooling level
B. Discharge pressure decreases (35 to 50 psi) (Limited by head pressure control)
C. Liquid temperature returns to normal cooling level
D. LSV solenoid energized (valve closes)
E. DSV solenoid energized, valve opens

7. With unit in dehumid mode close W1 compressor and outdoor fan stop; LSV and DSV solenoids de-energized (Y/N) _____
8. Open W1 restore unit to dehumid mode (Y/N) _____
9. Open humidistat input compressor and outdoor fan stop; LSV and DSV solenoids de-energized (Y/N) _____
10. Restore set points for thermostat and humidistat (Y/N) _____

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

Catalog No. 04-53480470-01 Printed in U.S.A. Form 48JCG-4-6-04SI Pg CL-2 9-23 Replaces: 48JCG-4-6-03SI